



Red Oak Fire Rescue

Fire Marshal's Office

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Underground Fire Line Guidelines

These guidelines are to be followed when an underground water supply serving an automatic fire sprinkler system, standpipe, and remote FDC within the City of Red Oak is to be installed or modified. These guidelines are not to be interpreted as containing all data required for proper design, installation, or approval.

All underground lines shall conform to the 2018 International Fire Code and NFPA standards, as adopted and amended by the City of Red Oak. These guidelines are not intended to replace, nor supersede any codes and/or ordinances adopted by the City of Red Oak, or determinations and positions of the Red Oak Fire Marshal Office.

General Requirements

- 1) All underground lines shall begin at the point of connection to the underground circulating public/private water main. A valve shall be provided at the point of connection such that the fire sprinkler underground service line can be isolated from the public/private water distribution system.
- 2) Underground piping shall have a ten foot (10') minimum separation from all other utilities and placed in a separate trench. Underground piping within five feet (5') of the building may be combined with other utilities for entrance into the building.
- 3) All underground lines shall terminate at the top of the spigot no more than 5-feet inside the building and 1-foot above finished floor.
- 4) All ductile iron, retaining rods, and other non-corrosive resistant components shall be externally coated for corrosion or poly wrapped.
- 5) All underground piping up to twelve inch (12") shall be a minimum of AWWA C900 DR18.
- 6) Water supply shall be provided in conformance with the requirements of the respective standards; however, every fire protection system shall be designed with a minimum 10 psi safety factor at 20 psi residual on City mains.
- 7) The water supply test for the hydraulic design of fire protection systems shall be witnessed by the Red Oak Fire Marshal Office. The results of the flow test shall be within one year of the sprinkler plan submittal. The exact location of the static/residual hydrant and the flow hydrant shall be indicated on the design drawings. All fire protection plan submittals shall be accompanied by a water flow test report provided by the Red Oak Fire Marshal Office.

Fire Department Connection (FDC)

- 8) FDC shall be a separate and independent service main from the underground water line.
- 9) FDC's for automatic sprinkler systems and/or standpipe systems for new buildings shall be equipped with a 2 ½" Siamese connection. (See Details)
- 10) All FDC's shall be equipped with caps.
- 11) Check valves shall be accessible for 5 year inspection. If located underground, shall be installed within a meter can/valve box.
- 12) FDC shall be facing and visible from the fire lane.
- 13) FDC must be within 100 feet of a fire hydrant.
- 14) FDC installed in a "yard" should have 12" x 12" x 4" concrete pad placed at the base to provide additional stability.
- 15) The FDC shall be clear and unobstructed with a minimum of a 5-foot clear all-weather path from fire lane access.
- 16) The FDC shall be installed 18-48 inches above grade and painted **RED**.
- 17) Fire hose threads shall be national standard hose thread.
- 18) Underground piping shall be designed and constructed as required for an underground fire main using NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, as the installation standard.
- 19) The FDC shall discharge into the system on the discharge side of the pump if a pump is present.
- 20) Where the FDC is subject to vehicular damage, the connection shall be protected. Protection components shall not be closer than 36-inches to the connection and shall not interfere with the operation of the connection.
- 21) The pipe size and arrangement of the FDC should conform to the latest edition of NFPA 13, Standard for the Installation of Sprinkler Systems.

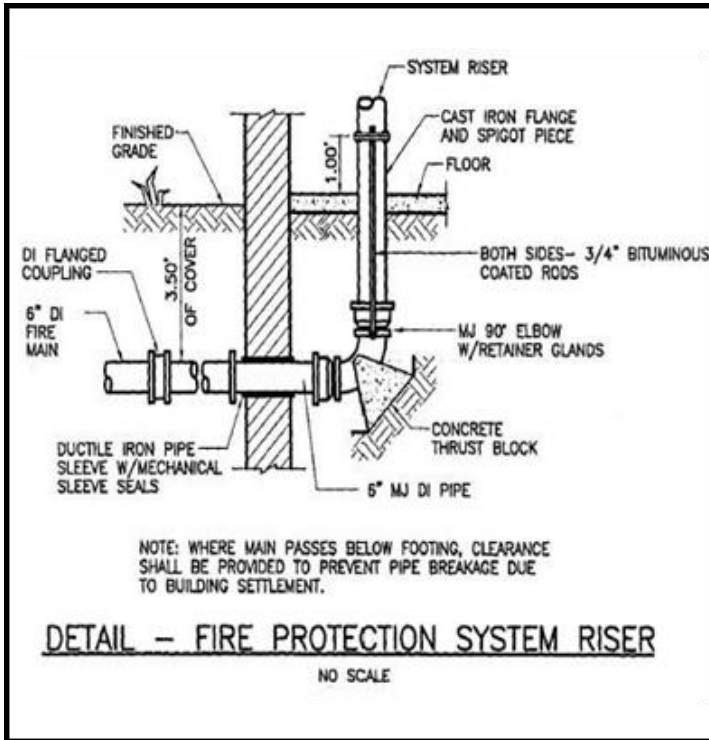
Inspection Requirements

- 22) Visual: **All underground piping, joints, and thrust blocks must be uncovered and exposed, with labeling of the pipe legible from grade.** All ductile iron, retaining rods, and other non-plastic components shall be externally coated for corrosion and poly wrapped.
- 23) Hydrostatic Test: Visual inspection must be approved prior to hydrostatic test. The test will be at 200 psi or at 50 psi pressure in excess of the maximum static pressure when the maximum static pressure exceeds 150 psi, for a minimum of two hours. Testing to be from the gate valve to the top of the spigot, no pressure drop or gain allowed.
- 24) Flush: Upon completion of the underground hydrostatic test, the underground piping will be flushed, witnessed by the Fire Department. All piping used to flush must be properly secured or restrained. The flushing must be completed prior to stacking the riser to the overhead piping.
- 25) Fire Sprinkler Underground Final: Final sign-off of completion of all inspections and the receipt of all State require paperwork.

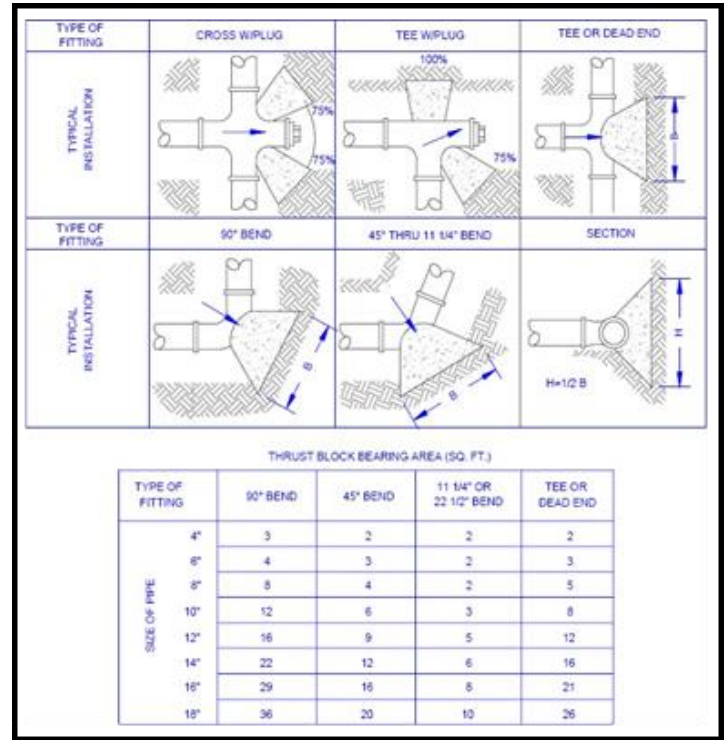
Submittal Requirements

- 1) Plans shall be clear and legible and all sheets shall be in a common and appropriate scale (preferably computer generated). A minimum of three (3) sets of plans, one PDF copy of plans, and minimum of one (1) set of specifications/cut sheets shall be submitted. Plans shall contain sufficient detail to enable the plan reviewer to accomplish a complete review. **Plans that do not conform to the submittal requirements or are not clearly legible will be rejected and require a re-submittal**
- 2) Each submittal shall have a:
 - a) Red Oak Fire Marshal Office Permit Application.
 - b) A copy of State of Texas Fire Sprinkler RME-Underground license is required for the installing contractor.
 - c) If system is designed by a RME-G: A copy of State of Texas Fire Sprinklers General-RME license is required for the designing contractor.
 - d) If system is designed by a PE: A State of Texas Engineers stamp is required on all pages.
 - e) A copy of State of Texas Fire Sprinkler SCR license is required for the installing company.
- 3) The following items shall be provided on the plans:
 - Both "Wet" RME-U and RME-G or PE signatures
 - Project name and address
 - A scaled Site Plan that indicate the location of all fire hydrants and fire lanes servicing the building or site
 - Location of all underground utilities servicing the building or site
 - Flow test data, witnessed by the Red Oak Fire Department
 - Size and type of all piping
 - Standard details (See attached pages for standard detail sets)
 - Location and size of all thrust blocks
 - Thrust block details (See detail)
 - Detail of the spigot piece and/or and in-building riser turn (See detail)
 - Embedment detail (See detail). Embedment material shall be No. 4 crushed stone or sand.
 - Depth of bury. Minimum is 42 inches.
 - Type of fittings/joints, methods of connection and rod size
 - Remote Fire Department Connection (FDC), details if applicable. FDC to be marked with a sign on an independent pole.

Spigot Detail

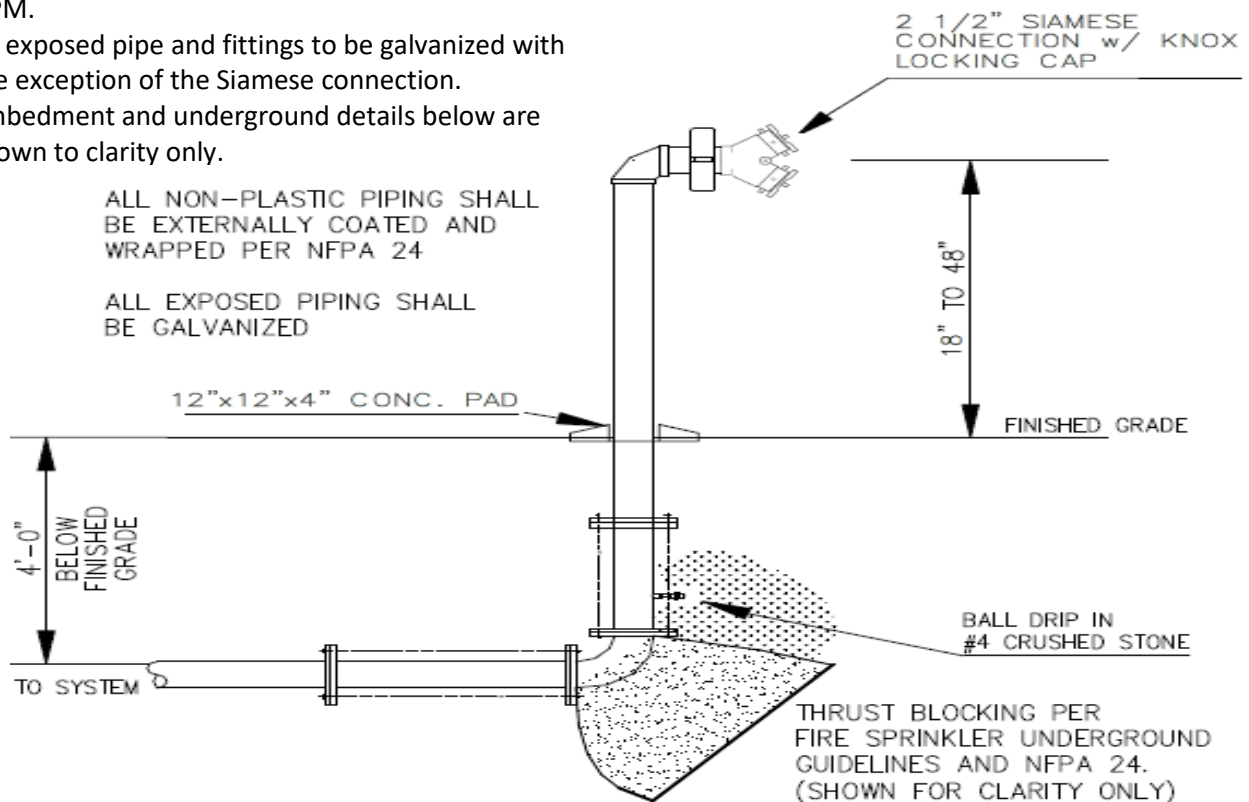


Thrust Block Details

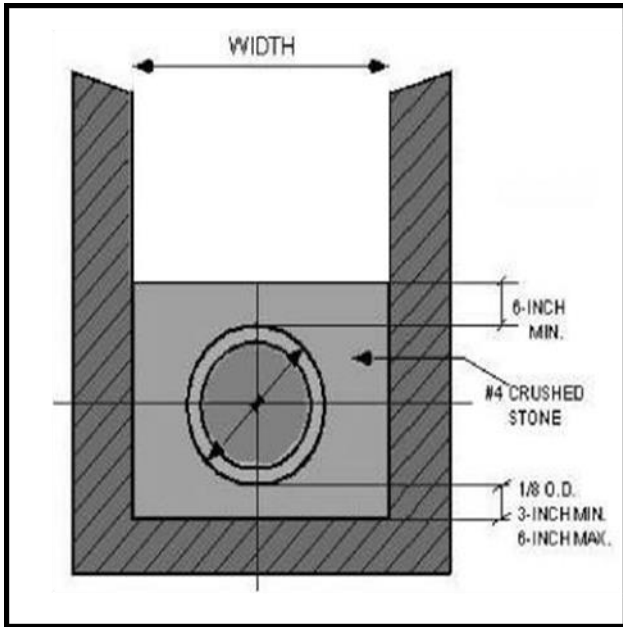


General Notes

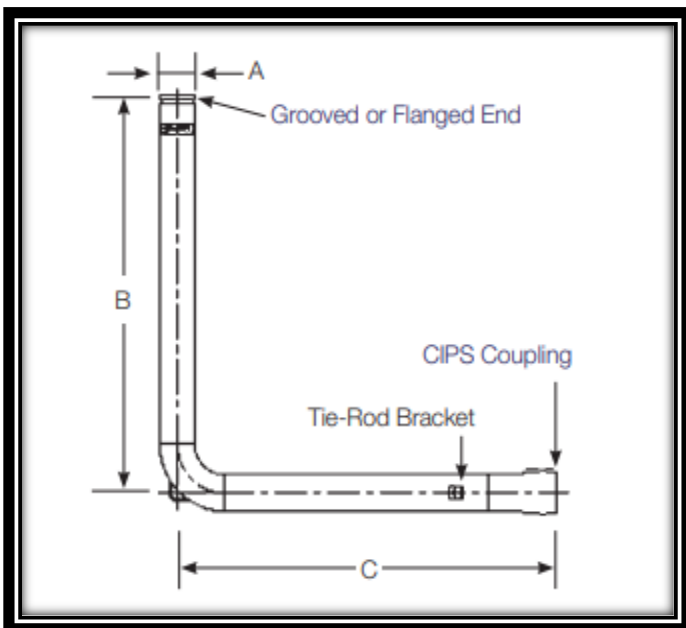
1. Minimum pipe size leading to the FDC shall be a min of 4" for all systems. A 6" min pipe is required for all systems with a total demand exceeding 750 GPM.
2. All exposed pipe and fittings to be galvanized with the exception of the Siamese connection.
3. Embedment and underground details below are shown to clarify only.



Embedment Details



Preferred 90° Single Section Stainless Steel Pipe for Fire Protection Riser



FDC Sign Requirement



Red metal sign with 6" white letters 2" wide. On an independent pole.