



ANNA FIRE MARSHAL'S OFFICE – PREVENTION DIVISION

Underground Fire Line and Fire Department Connection Requirements

This guide is intended as a resource and policy statement for all commercial buildings, structures, or facilities (new and existing) within the City of Anna. For the purposes of these instructions and any other guidelines or requirements of the Anna Fire Marshal's Office, all Underground Fire Lines/Mains and Fire Department Connections (FDC) shall conform to the International Fire Code as adopted and amended by the City of Anna. These guidelines do not replace or supersede any codes and/or ordinances adopted by the City of Anna, nor do they supersede any determinations, interpretations, and positions of the Anna Fire Marshal's Office. Questions can be directed to the Anna Fire Marshal's Office (Fire Prevention Division) at (214) 831-5342 or by emailing firecad@annatexas.gov

All Underground Fire Lines (*also known as Underground Fire Mains - UFM*) and Fire Department Connections (FDC) shall conform to the 2015 International Fire Code, as adopted and amended by the City of Anna and NFPA 24. Equipment and devices shall meet the requirements set forth in the Anna Fire Marshal's Office written policy statements.

GENERAL REQUIREMENTS

- 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.
- **Underground piping shall have a 5-foot minimum separation from all other utilities and be installed in a separate trench.** Underground piping within 5-feet of the building may be combined with other utilities for entrance into the building.
- All underground lines shall terminate at the top of the spigot at a point no greater than 5-feet inside the building and 1-foot above the finished floor.
- Exterior vaults containing double-check valves for underground fire lines are **not permitted**.
- Double-check valves shall be installed in the riser room, the main sprinkler control valve room, or as directed by the Fire Marshal's Office.
- All ductile iron, retaining rods, and other non-corrosive resistant components shall be externally coated for corrosion or poly wrapped.
- All underground piping shall be a minimum of **Class 200 DR-14** or greater.
- 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 5 psi safety factor at 20 psi residual on City mains.



- *The following information is for informational purposes only and, although may be provided, is not required for the underground fire line submittal.*
 - The water supply test for the hydraulic design of fire protection systems shall be witnessed by the Anna Fire Marshal's 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.
- All commercial underground fire sprinkler service lines (i.e., underground fire mains and FDC's) shall be 4-inch minimum diameter.
- **All underground mechanical joint connections shall be installed using forty-five degree (45°) angular joints.** Angular joints greater than forty-five degrees (45°) must be approved by the selected plan reviewer or Fire Code Official prior to installation. A hydraulic analysis shall be performed and approved by the selected plan reviewer and must include design calculations for fire flow and friction loss related to the entire water-based automatic fire sprinkler system. Additional thrust blocking is also required for ninety degree (90°) angular joints.
- **Grooved couplings are strictly prohibited on any underground fire line piping.**

FIRE DEPARTMENT CONNECTIONS (FDC)

- An FDC shall be a separate and independent service main from the underground water line.
- FDC's shall be five-inch (5") Storz connection with a 30-45 degree down elbow and locking "Knox" cap. Traditional 2-way Siamese connection with locking "Knox" caps may be used when approved by the Anna Fire Department.
- All Fire Department Connections shall be equipped with a locking Knox FDC Cap. 5-inch Storz connections shall be provided with a *model #5002* Knox Cap. 2.5-inch connections shall be provided with either a *model #3043* or *model #3041* Knox Cap. Missing or damaged FDC caps on new and existing structures shall be replaced with locking Knox FDC Caps. Knox product may be ordered online at www.knoxbox.com.
- FDC shall be facing and visible from the fire lane.
- All FDC's must be installed 3 to 6 feet behind the curb.
- A minimum of 3 feet of clearance must be maintained around all FDC's.
- FDC's shall not be obstructed by vehicle parking spaces and where possible, must be installed within the radii of the nearest available parking island or landscaped area.
- Where the FDC is serving more than 500 GPM, the building shall be provided with one five-inch (5") Storz connection AND one 2-way Siamese connection.
- Remote FDC's shall connect to the fire sprinkler riser inside the fire sprinkler riser room post all double-check valves or backflow preventers.
- FDC's shall be installed remotely and outside of a structure's collapse zone. The Fire Code Official may, where applicable, seek an equivalency to this requirement at his discretion.
- Hydrants required to provide supplemental water supply for automatic fire protection systems and/or



fire department standpipe systems shall be installed within 100 feet of the FDC for such systems.

- FDC's shall be installed 36-48 inches above grade.
- Fire hose threads shall be *National Standard* hose thread.
- 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.
- The FDC shall discharge into the system on the discharge side of the pump if a pump is present.
- Where the FDC is subject to vehicular damage, the connection shall be protected. Protection components, such as bollards, shall not be closer than 36-inches to the connection and shall not interfere with the operation of the connection.
- 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

- **Visual Inspection:** *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.
- **Hydrostatic Test:** Visual inspection must be approved prior to hydrostatic test. The test will be at 200 psi, for a minimum of two (2) hours. Testing to be from the gate valve to the top of the spigot, no significant pressure reductions are allowed during the test.
- **Line Flush:** Upon completion of the underground hydrostatic test, the underground piping will be flushed while witnessed by the Anna Fire Department. All piping used to flush must be properly secured or restrained. **The flush must be completed prior to stacking the riser to the overhead piping.**

SUBMITTAL REQUIREMENTS

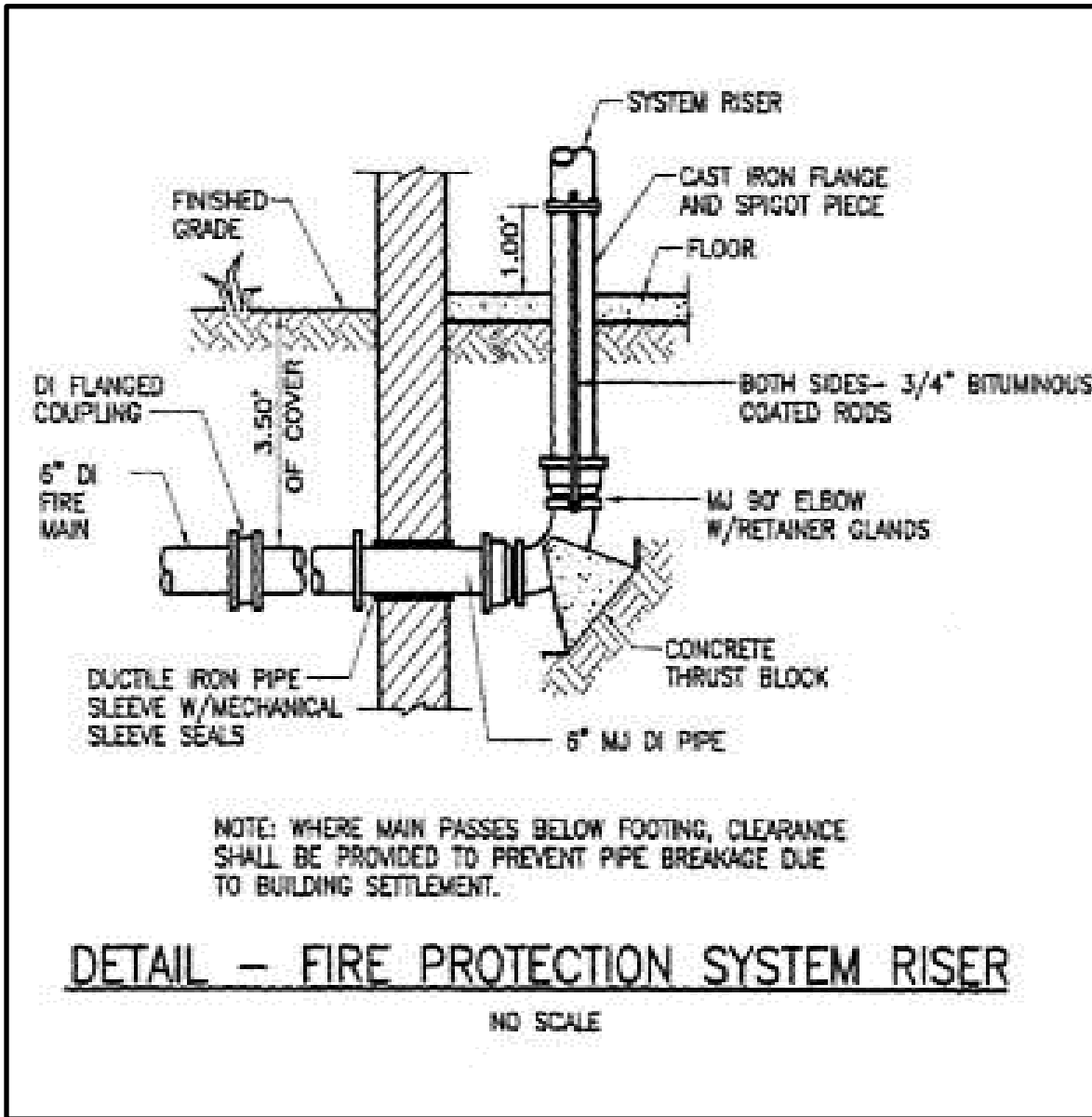
- Plans are reviewed by the Anna Fire Marshal's Office.
- Plans shall be clear and legible, and all sheets shall be in a common and appropriate scale (preferably computer generated). Plans shall contain sufficient detail to enable the plan reviewer to accomplish a complete review. **Plans that do not conform to the submittal requirements or are not clearly legible will be rejected.**
- Each submittal shall contain the following:
 - A copy of State of Texas Fire Sprinkler RME-Underground license as required for the installing contractor.
 - 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.
 - If System is designed by a PE, a State of Texas Engineers stamp is required on all pages.
 - A copy of State of Texas Fire Sprinkler SCR license is required for the installing company.



- The following items shall be provided in the plan set:
 - Both “Wet” RME-U and RME-G or PE signatures
 - Project name and address
 - A scaled Site Plan that indicates the location of all fire hydrants and fire lanes servicing the building or site.
 - Size and type of all piping
 - Standard Details
 - Location and size of all thrust blocks
 - Thrust block detail
 - Detail of the spigot section and/or in-building riser turn
 - Embedment detail; embedment material shall be sand
 - Depth of bury (Minimum of 42 inches)
 - Type of fittings/joints, methods of connection and rod size
 - FDC detail if applicable
 - For Existing Buildings - the location of all underground utilities servicing the building or site



FDC & UFM DETAILS





GENERAL NOTES

1. Minimum pipe size leading to the FDC shall be determined by hydraulic calculations, but shall be a minimum of 4" for all systems. A 6" minimum pipe is required for all systems with a total demand exceeding 750 GPM.
2. Knox locking caps are required on all connections.
3. All exposed piping and fittings to be galvanized with the exception of the Siamese connection.
4. Embedment and underground details below are shown to clarify only. Refer to Fire Sprinkler Underground Guidelines for details.

5" STORZ CONNECTION w/ KNOX LOCKING CAP REQUIRED

*IF GREATER THAN 500 GMP, ADD ADDITIONAL 2 1/2" SIAMESE CONNECTION w/ KNOX LOCKING CAP

