



**Shoreline Fire Department Standard**  
**SHFDS 5.0**  
**Underground Fire Service Mains**  
**Revised 2/25/2026**

**5.0 General**

**5.1. Scope:**

This standard covers the permitting, installation, inspection testing and maintenance of underground fire service mains in the Cities of Shoreline, Kenmore Lake Forest Park, and the Town of Woodway. Underground fire service mains shall meet the requirements of the currently adopted codes and standards, unless specifically amended or noted otherwise, and as approved by the FCO (Fire Code Official).

Referenced Standards and Codes

1. NFPA 24 Standards for the Installation of Private Fire Service Mains and Appurtenances.
2. NFPA 25 Standards for ITM of Water Based Fire Protection Systems.
3. The International Fire Code (IFC), Washington State Amendments and City Municipal Codes as amended by the cities of Shoreline, Kenmore, Lake Forest Park and The Town of Woodway.

**5.1.1 Underground Fire Service Main**

1. A State of Washington Level U or Level 3 license is required to perform and supervise the installation, inspection, maintenance, repair, and testing of underground fire service mains and piping.
2. No inspection of underground fire service main piping shall be requested without a valid underground material and test certificate documenting the installation is clear and proper per NFPA 13, Chapter 10.10.1 and NFPA 24 standards.
3. A State of Washington Department of Health approved back flow prevention is required on all systems. Submittals shall indicate the specific device to be used and the location of the backflow device in the riser room. A certified backflow assembly tester shall test this assembly. After this test is complete and prior to the request for final system acceptance, the completed backflow assembly test form shall be submitted to the respective water utility where the device is installed.
4. All NFPA 13 fire sprinkler systems serving commercial or multi-family structures shall be fed by a minimum of 6" ductile iron underground pipe

unless hydraulic calculations by a sprinkler designer prove a different size is acceptable to the Fire Code Official. The FDC line and the underground supply line shall be the same size and shall not be less than the size of the system riser. Where applicable, an allowance for interior hose streams from standpipes shall be included.

### 5.1.2 Design Requirements

1. Systems shall be designed under the currently adopted codes and standards that have been referenced in this standard.
2. System designer qualification shall comply with chapter 212-80 WAC, Chapter 18.160 RCW, and Chapter 18.270 RCW as administered by the WSP (<http://www.wsp.wa.gov/fire-sprinklers/>).
3. All plans and calculations shall be stamped with a valid Washington State certificate seal identifying the appropriate level of competency.
4. Hydrants shall be within 75 feet or less of FDC's.

### 5.1.3 Permits Required

1. A fire permit is required for all underground fire service main installations and modification work. The application for a fire construction permit is available on the City of Shoreline's website permitting portal at [Permit Applications | City of Shoreline](#) or the Shoreline Fire Department website for work being performed in the Cities of Kenmore and Lake Forest Park at [Fire System Permits - Shoreline Fire Department](#).

### 5.1.4 Permit Submittal Requirements

The following information is required at the time of application:

1. Working plans of the system, per **NFPA 24 Standards**
2. Manufacturer specification sheets for all materials used. A copy of the "Contractor's Material & test Certificate for "Underground Piping" as required by NFPA 24 shall be provided to the AHJ prior to above ground tie in. Please email certificate to [FMO@shorelinefire.com](mailto:FMO@shorelinefire.com)
3. Completed permit application through the City of Shoreline or the Shoreline Fire Department for work within the City of Kenmore or Lake Forest Park.
4. Copy of current WA State U-License.

### 5.1.5 Contractor Licensing

1. Contractors must be licensed in Washington for the type of work performed. (U = **Underground; Level 1 = 13D; Level 2 = 13R & 13D; Level 3 = 13, 13R, 13D & Underground**). Proof of licensing shall be available onsite for all workers. A copy of the installation contractors U licensing shall be provided at the time of plan submittal (unless otherwise approved).

### 5.1.6 Underground Piping

1. Underground fire line permits shall be approved by the water supplier and the Shoreline Fire Department. Inspection and Testing of underground fire service main is required before the underground fire service main supply can be tied into fire riser. Contact inspections inspection@shorelinefire.com.

### 5.1.7 Thrust Bocking and Pipe Restraint

Two forms of Pipe restraint are required.

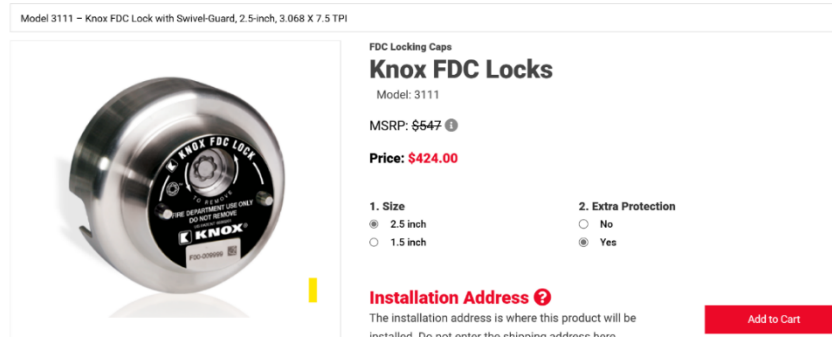
1. Thrust blocks shall be permitted where soil is stable and capable of resisting the anticipated thrust forces.
2. Thrust blocks shall be placed between undisturbed earth and the fitting to be restrained and shall be capable of resisting the calculated thrust forces.
3. Wherever possible, thrust blocks shall be located so that the joints are accessible for repair.
4. Restrained joint system: Underground fire service mains using restrained joint systems shall include one or more of the following:
  - a. Locking mechanical or push-on-joints
  - b. Mechanical joints utilizing setscrew retainer glands
  - c. Bolted flange joints
  - d. Pipe clamps and tie rods
  - e. Other approved methods or devices.

### 5.1.8 Post Indicator Valves (PIV's)

1. Where post indicator valves are required by other Shoreline Fire Standards or by the FCO, they shall be set so that the post is 32 inches to 40 inches above final grade. Upon final installation of the PIV, a lock shall be placed on the PIV by the building owner with the PIV in the OPEN position.
2. Where PIV's are used, they shall be protected from damage as required by the International Fire Code or the FCO.
3. PIV's shall be monitored by tamper switch.

### 5.1.9 FDC Locking CAPS

1. Knox Locking FDC Caps are required to be installed on all new FDC installations prior to final building sign off. Please obtain model #3111 from [Product - Knox Rapid Access System](#)



## **5.2 FDC Installation Standard**

1. FDC's shall be installed per Shoreline Fire Department Standard 9.0.

### **5.2.1 Construction Inspections and Acceptance Testing**

New underground fire service mains and their appurtenances shall be inspected and tested by a representative from the Shoreline Fire Department. The following is a list of required inspection steps to perform for system acceptance.

1. Fire inspections are required by the Shoreline Fire Department for permitted work. For scheduling an inspection, please email the Shoreline Fire Department at [inspections@shorelinefire.com](mailto:inspections@shorelinefire.com). Response times and scheduling may vary depending on current workloads.
2. Required inspections
  - a. Restraint/thrust blocking/placement inspection: must be completed prior to covering pipe installed
  - b. Hydrostatic Testing. Maintain 200PSI for 2 hours +/- 5 PSI. Time stamped image required at start of hydrostatic test.
  - c. Flush and Final acceptance. Flushing of underground fire service mains shall be performed prior to supply pipe connection to fire riser. Contractor shall pre-flush lines prior to inspection time. Jumper connection size shall match pipe diameter. Burlap bags shall be attached to end of hose lines for inspector verification that the piping is clear of all debris. Ball drip function will be tested to ensure proper drainage of the FDC. Knox Lock Caps shall be installed after final to protect FDC line from debris.

### **5.2.3 System Maintenance (ITM)**

Contractors performing inspection, testing and maintenance (ITM) on underground fire service mains and their appurtenances shall submit all reports to The Compliance Ending within (5) five business days at the completion of work.

- 5.2.3.1** ITM work shall be completed as required by NFPA 25, and this standard.