
SECTION 21 11 00
FIRE LINE SPECIFICATIONS**PART 1 - GENERAL**

- 1.1 ALL FIRE LINE CONNECTIONS SHALL BE A SEPARATE TAP ON THE WATER MAIN! INSPECTION MUST BE ARRANGED AT LEAST 48 HOURS IN ADVANCE AND PRIOR TO BACKFILLING ANY EXCAVATION!
- 1.2 The North Carolina State Construction Office, hereinafter referred to as "SCO". An application for a fire line can only be made if the requesting party is (or will be) a SCO Stockholder. Fire lines shall be a separate tap (connection) on SCO's water main. Under no circumstances shall a fire line be connected to the Stockholder's domestic water service. Fire lines are considered private mains owned by the Stockholder, not SCO.

PART 2 – PRODUCTS - Not Used.**PART 3 - EXECUTION****FIRE LINE CONNECTION TO THE MAIN:**

Fire line connections 3-inch and larger will be installed as a tee to the existing or proposed water main including installation of an auxiliary valve. Design and installation are the responsibility of the Stockholder with review and inspection by SCO. The Stockholder and their consultants must meet with SCO's staff to obtain the process and requirements for the review and submittal.

3.1 FIRE LINE SERVICE REVIEW PROCESS:

The stockholder shall submit a construction drawing to SCO from which the Stockholders contactor will install said fire line service from the auxiliary valve at the main, fire line vault and backflow prevention assembly. This drawing (sample attached) shall be prepared and stamped by a Registered Professional Engineer licensed in the State of North Carolina. SCO's review of said drawing is to determine compliance with Company specifications and details only. The review and approval of said drawing in no way relieves the engineer, or Stockholder of the responsibility or liability for the design. The Stockholder will submit a copy of the drawing, once approved, to the governing Fire District for review. Final approval of this project will be determined by an inspection of the completed construction.

3.2 FIRE LINE INSTALLATION:

The design and construction by the Stockholder or their consultant shall meet these specifications and details as well as the engineering standards of the Denver Water Department.

- All pipe shall be Ductile Iron Class 52 from the water main to the building for fire lines above 2 inches.
- Type K copper is allowed for two (2) inch fire lines, which is the minimum diameter approved by SCO.
- Any bends in the fire line service will be reviewed in advance of installation.
- All pipe shall be polyethylene wrapped and bedded at a minimum with 6-inches of bedding material over and under the pipe.
- All valves and fittings must be restrained with adequate rodding or the equivalent.
- A concrete vault of the size designated in the table below will house a single detector check valve supported with a pipe stand and control valve (O.S. & Y. Valve, Flanged, and Resilient Seat).
- The center of the meter vault shall be set 18-inches inside the Public Right-of-Way or SCO easement and a minimum of 5' from side lot lines. Meters may be installed on private property within 5' of the property line as a result of site limitations. The location of the meter vault must be approved by the Company prior to installation, and property corners must be in place to assure proper placement. The meter vault ring

and cover shall be 2-inches above final grade for new construction or as specified by SCO inspector/representative.

FIRE LINE SERVICE	DOMESTIC SERVICE *			
	NO DOMESTIC IN VAULT	3/4" and 1"	1-1/2" and 2"	3" and 4"
2"	72" Round x 6' High	72" Round x 6' High	7' x 8' x 6'	8' x 10' x 6'
**3" and 4"	72" Round x 6' High	6' x 6' x 6'	7' x 8' x 6'	8' x 10' x 6'
**6"	72" Round x 6' High	6' x 6' x 6'	7' x 8' x 6'	8' x 10' x 6'
**8"	72" Round x 6' High	6' x 6' x 6'	7' x 8' x 6'	8' x 10' x 6'
**10"	7' x 6' x 6'	7' x 8' x 6'	7' x 8' x 6'	8' x 10' x 6'

(All dimensions shown are inside dimensions)

Vault:

- Piping through the vault shall be installed 24-inches above the vault floor.
- The vault or manhole shall be H-20 LOAD RATED in accordance with AASHTO Specifications.
- The roof shall be flat having a 24-inch or 36-inch eccentric opening.
- Total inside height of the vault shall be 72-inches minimum. □ The vault shall have a ladder or steps installed under the opening in the roof.
- The steps shall be set 12-inches apart with the top step set 12 to 18 inches below final grade, and the bottom step set 12-inches above the bottom of the floor.
- The vault shall have a 6-inch min. thick concrete floor with a 12-inch diameter by 3-inches deep sump hole.
- The vault shall be bedded on a minimum of 8-inches of 1-1/2-inches of crushed rock.
- The Manhole Cover shall be a 24-inch or 36-inch style cast iron ring and cover, marked "WATER". Aluminum covers are not allowed.
- The manhole cover shall be set 2 inches above final grade.
- The vault sections, extension rings, roof and cover shall be jointed with a mastic sealant.
- The holes for the piping shall be sealed both inside and outside the vault with a non-shrinking hydraulic cement (Water Plug).

3.4 BACKFLOW PREVENTION:

The backflow prevention assembly is required to be installed within 5 feet of the line entry into the structure to be served. UNDER NO CIRCUMSTANCES will any connection be allowed on the Fire Line prior to the backflow prevention assembly. All piping inside the structure between the backflow prevention assembly and the exterior

wall shall be visible for inspection. The backflow prevention assembly may either be installed inside the structure or outside in a protective heated enclosure. Backflow prevention assemblies installed inside the structure require an adequately sized floor drain and shall have at least 3 feet of clearance around the assembly for inspection and maintenance. The area surrounding the backflow prevention assembly shall maintain a minimum temperature of 40 degrees Fahrenheit and have adequate lighting. Backflow prevention assemblies installed outside the shall have a protective heated enclosure installed to protect against vandalism and freezing. The enclosure shall have a rust resistant exterior, structural internal insulation and thermostatically controlled heat. The heat source shall protect against freezing to 30 degrees Fahrenheit. The power source to the enclosure shall be equipped with a protective "Ground Fault" circuit. Access to the backflow prevention assembly shall be provided through doors and/or hinged lid for testing, and the enclosure shall be totally removable for maintenance purposes. The enclosure shall contain drain openings at each end, sized to accommodate a full flow discharge.

The backflow prevention assembly for all Fire Line installations shall be a Reduced Pressure Principle Assembly (RP), which must be lead-free and approved by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC). The RP shall be installed in the USC approved orientation and be easily accessible for testing, maintenance, and replacement. The assembly shall not be installed in any areas with hazardous gasses, fixtures, or extreme temperatures. The assembly shall not be installed underground or in any pits. The RP shall not be modified in any way after it leaves the manufacturer's factory that would void USC approval. The Backflow Prevention Department can provide complete lists of approved RP assembly models upon request when given the correct connection size. The installation shall maintain an air gap between the relief valve at the bottom of the assembly and the flood level rim of any drainage that is at least 2X the connection size but no less than 1-inch.

The RP assembly shall be tested by an American Society of Sanitary Engineering (ASSE) or American Backflow Prevention Association (ABPA) certified backflow tester upon installation and at least annually thereafter. A SCO Backflow Prevention Technician must be present to witness the initial backflow test. Testing results must be properly submitted by the tester or testing company through SCO's online portal (SCO.tokaytest.com). The stockholder shall retain the test reports for a period of at least three (3) years. If the RP assembly fails the initial or annual test, the stockholder shall have it repaired and retested within the compliancy period or the domestic water service would be discontinued until compliance is met.

3.5 INSPECTION:

All pipe and appurtenances shall be inspected by an authorized SCO employee prior to backfill. Once the Stockholder's contractor has completed the fire line installation and is ready to backfill they shall call for an inspection. **INSPECTION MUST BE ARRANGED AT LEAST 48 HOURS IN ADVANCE AND PRIOR TO BACKFILLING ANY EXCAVATION!**

- All fire lines shall be hydrostatically tested after the installation has been completed by the installing contractor or stockholder's representative.
- The fire line shall be pressurized to a minimum 200 pounds per square inch (psi) for a period of two hours.
- The test must be done in the vault at the street side of the detector check.
- All tests shall be witnessed by an authorized representative of SCO and the governing Fire Protection District.
- All components of the fire line installation shall meet the engineering standards of the Denver Water Department as a minimum. SCO may, in its sole discretion, require a higher standard for any portion of, or all of the installation.

These inspection requirements are in addition to those required by the governing Fire Protection District.

END OF SECTION