

Chesterfield Fire and EMS

Fire and Life Safety Division

HORIZONTAL STANDPIPES

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HORIZONTAL STANDPIPE SYSTEM

NFPA – 24 (Underground)

Project Name: _____

Project Address: _____

File Number: _____ Date: _____

Code Edition: _____

All supporting documentation showing items listed below are required for review.

General (All submissions shall include the following):

- Plans and calculations shall be provided as needed, per applicable National Standards and Codes.
- Plans shall clearly indicate the name of owner and/or occupant, project street address, tenant space designation, the responsible designer's name, address, and telephone number.
- Drawings are to be uniform size and drawn to a recognized scale.
- Provide a method of maintaining the ball drip/drain vault free of all standing water. The method of maintaining the vault free of standing water shall be one of the following:
 - Sump and drain line to storm sewer or acceptable daylight location.
 - Sump pump and drain line to storm sewer or acceptable daylight location.
- Show the point of connection and location of the Fire Department Connection (FDC) and Fire Department hose connection.
- Plans shall show the location of nearest fire hydrant (within 50' of FDC).
- Submitted plans shall indicate the minimum depth of cover for all Fire Protection Underground Piping. The minimum depth of cover shall be 3'-6" in accordance with the recommended depth of cover shown in NFPA 24 – 8-1.1.

- Submitted plans shall indicate the location of **ALL** thrust blocks, rodding and restraint devices being used. Thrust blocks shall be installed in accordance with NFPA-24 and the tables listed in this review checklist.
- Plans shall clearly indicate the method of providing corrosion protection after installation of rods, nuts, bolts, washers, clamps and other restraining devices, except thrust blocks, in accordance with the latest referenced edition of NFPA 24. (8-6.2.8)
- Plans shall include thrust block bearing area table(s), thrust block details, water pressure, soil resistance pressure and minimum thrust block concrete requirements in accordance with NFPA 24, see attached thrust block bearing area and details.
- Provide the following manufacturer's product data sheets with the submitted plans required above:
 - Ball drip valve
 - Sump pump if required and shown in the above referenced plan submittal.
 - Access door to vault
 - Pipe penetration seals at vault (flexible)
 - Pre-fabricated vault construction details are referenced in the plan submittal.
 - Fire department connection with 2½" NST hose connections (Female/Male).
 - Pipe, fittings and restraint devices, including fire department connection (FDC) piping and fittings.
 - Other

CONCRETE THRUST BLOCKS, MINIMUM AREA OF BEARING						
Pipe Size	90° Bend		45° Bend		Tees, Plugs, Caps, & Hydrants	
	in.	ft ²	m ²	ft ²	m ²	ft ²
4	2	0.19	2	0.19	2	0.19
6	5	0.46	3	0.28	4	0.37
8	8	0.74	5	0.46	6	0.56
10	13	1.21	7	0.65	9	0.84
12	18	1.67	10	0.93	13	1.21

Areas in table have been derived using a water pressure of 225 psi (15.5 bars) and a soil resistance of 2000 pounds per square foot (1.0 bars). The values include a 1.5 safety factor. 1992 NFPA 24;Table 8-6.2.8.

CONCRETE THRUST BLOCKS, MINIMUM AMOUNT OF CONCRETE	
Size of Fitting	Cubic Yards
3"-8"	¾
10"-12"	1 ½

THRUST @ 100 PSI WATER PRESSURE FOR FITTINGS			
Pipe	90° Bend	45° Bend	Dead End
4	2,559	1,385	1,810
6	5,288	2,862	3,739
8	9,097	4,923	6,433
10	13,685	7,406	9,677
12	19,353	10,474	13,685

Water Pressure > 100 psi MULTIPLY Table by Ratio of Pressure ... 150 psi/100 psi = 1.5 Factor
1999 NFPA 13:Table A-6-3.2(a), 2002 NFPA 24;Table A-10.8.2(a),(b)

Minimum Thrust Block Size

$$A_b = (h)(b) = T (S_f) / S_b$$

(h) = block height, (b) = block width

T = thrust force table,

S_f = safety factor (1.5)

S_b = soil bearing from table

SOIL	BEARING lb/ft ²
SOFT CLAY	1,000
SAND	4,000
SAND CLAY	6,000
HARD CLAY	9,000

ROD NUMBER – DIAMETER COMBINATIONS				
Pipe Size	5/8 in.	3/4 in.	7/8 in.	1 in.
4	2	_____	_____	_____
6	2	_____	_____	_____
8	3	2	_____	_____
10	4	3	2	_____
12	6	4	3	2

Table derived using pressure of 225 psi (15.5 bars) and design stress of 25,000.
1999 NFPA 13:Table 6-3.3.1.2.