2023 Fire Sprinkler Code Updates

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Agenda

01 Introduction

02 NFPA code reference years

03 NFPA 13 Re-organization

05 Additions and changes form 2013 to 2019

06 Plan review information

07 What's wrong??

08 Wrap-up and questions

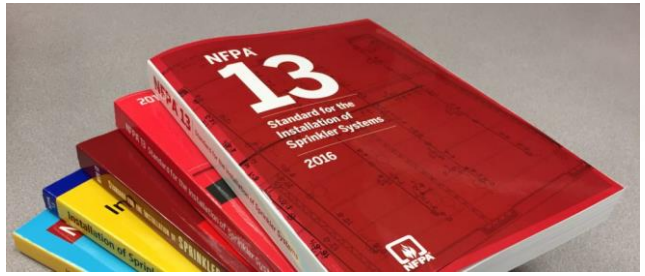
2020 Building code Reference Documents

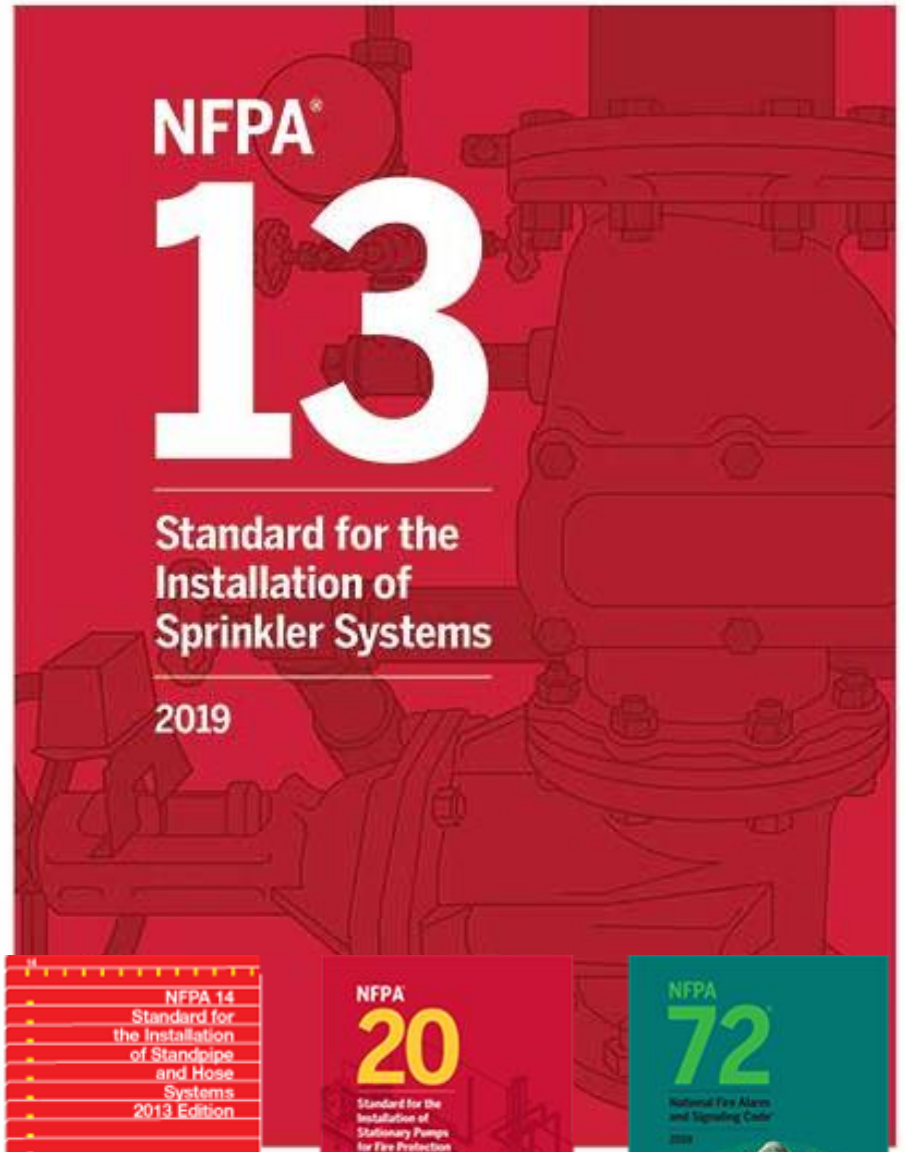
Old Code Reference Years

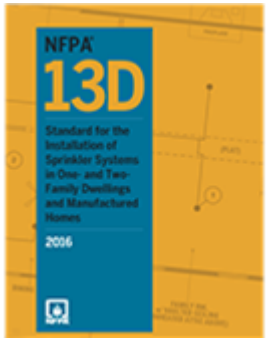
- 2018 BC Building Code reference documents for Fire Protection –
- NFPA 13 – 2013
- NFPA 13D – 2013
- NFPA 13R – 2013
- NFPA 14 – 2013
- NFPA 20 – 2013
- NFPA 72 - 2013

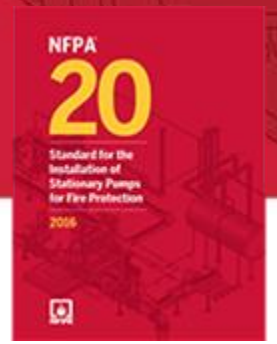
New Code Reference Years

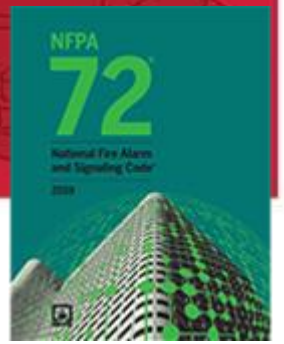
- 2020 National Building Code reference documents for Fire Protection –
- NFPA 13 – 2019 (2013 > 2016 > 2019)
- NFPA 13D – 2016
- NFPA 13R – 2019
- NFPA 14 – 2013
- NFPA 20 – 2016
- NFPA 72 - 2019











NFPA and PDF's

- After 2020, no more PDF's
- Only hard copy books
- Or "NFPA Link"

NFPA LiNK®

NFPA 13-2019
Re-organization

NFPA 13 – 2019 Major Chapter Re-organize !!

- NFPA 13 – 2013 to 2016
  - No major changes to layout
  - Same old chapters - with a few additions and changes
  - Additions and changes were difficult to find
- NFPA 13 – 2019
  - Total reorganization
  - Chapters moved and added
  - Definitions changed and relocated
  - No more Chap. 8 “Junk drawer”
  - 2019 - Every sprinkler head type has its own “Chapter”
  - New Chap. 16, “Installations of Piping, Valves and Appurtenances”

Just in case you get lost, there is a Road Map.

2016–2019 ROADMAP

2016 Edition Section Numbers	2019 Edition Section Numbers
7.7.2	8.7.2
7.7.2.1	8.7.2.1
7.7.2.2	8.7.2.2
7.7.2.3	8.7.2.3
7.7.3	8.7.3
7.7.3.1	8.7.3.1
7.7.3.2	8.7.3.2
7.7.3.3	8.7.3.3
7.7.3.4	8.7.3.4
7.7.3.5	8.7.3.5
7.7.4	8.7.4
7.7.4.1	8.7.4.1
7.7.4.2	8.7.4.2
7.7.4.2.1*	8.7.4.2.1*
7.7.4.2.2	8.7.4.2.2
7.7.4.2.3*	8.7.4.2.3*
7.7.4.3	8.7.4.3
7.7.5	8.7.5
7.7.6	8.7.6
7.7.7	8.7.7
7.7.8	8.7.8
7.7.8.1	8.7.8.1
7.7.8.2	8.7.8.2
7.7.8.3	8.7.8.3
7.7.8.4	8.7.8.4
7.7.8.5	8.7.8.5

2016 Edition Section Numbers	2019 Edition Section Numbers
7.8.2.8.2	8.8.2.8.2
7.8.2.8.2.1	8.8.2.8.2.1
7.8.2.8.2.2	8.8.2.8.2.2
7.8.2.8.3	8.8.2.8.3
7.8.2.8.3.1	8.8.2.8.3.1
7.8.2.8.3.2	8.8.2.8.3.2
7.8.2.8.4	8.8.2.8.4
7.9	8.9
7.9.1	8.9.1
7.9.2*	8.9.2*
7.9.2.1	8.9.2.1
7.9.2.3	8.9.2.2
7.9.2.4	8.9.2.3
7.9.2.5	8.9.2.4
7.9.3	8.9.3
7.9.3.1	8.9.3.1
7.9.3.2	8.9.3.2
7.9.3.3	8.9.3.3
7.9.3.4	8.9.3.4
7.9.3.4.1	8.9.3.4.1
7.9.3.5	8.9.3.5
7.9.4	8.9.4
7.9.4.1	8.9.4.1
7.9.4.2	8.9.4.2
7.9.5	8.9.5
7.9.5.1	8.9.5.1

2016 Edition Section Numbers	2019 Edition Section Numbers
8.2.1	4.5.1
8.2.2	4.5.2
8.2.3	4.5.3
8.2.4	16.9.11
8.2.4.1*	16.9.11.1
8.2.4.2	16.9.11.2
8.2.4.3	16.9.11.3
8.2.4.4	16.9.11.4
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8.3.1.2	9.4.1.2
8.3.1.3*	9.4.1.3*
8.3.1.4	9.4.1.4
8.3.1.5	9.4.1.5
8.3.1.5.1*	9.4.1.5.1*
8.3.1.5.2*	9.4.1.5.2*
8.3.1.5.3	9.4.1.5.3
8.3.2	9.4.2
8.3.2.1*	9.4.2.1*
8.3.2.2	9.4.2.2

N **8.1.1.2.1** A single pressure gauge shall be permitted to be installed on a manifold below multiple riser check valves or alarm check valves.

8.1.1.2.2 Pressure gauges below check valves required by 16.9.11 and 16.15.2.2(1) shall not be required.

New, revised & deleted requirements

- To ensure new or revised and deleted requirements stand out, the 2019 –
- shades revised text
- marks new mandates with the letter "N."

- NFPA 13 – 2016
- Really hard to see the changes

8.15.24 Cloud Ceilings.

8.15.24.1* Sprinklers shall be permitted to be omitted above cloud ceilings where both of the following apply:

(1)*The openings around the cloud and the maximum sprinkler protection area meet the requirements of 8.15.1.2.1.2 and Table 8.15.24.1

(2) The requirements of 8.15.24.2 are met.

9.2.7 Cloud Ceilings.

9.2.7.1* Sprinklers shall be permitted to be omitted above cloud ceilings where all of the following apply:

(1)* The combined total area of the openings around the cloud are less than or equal to 20 percent of the area of the ceiling, construction feature, or plane used to determine the boundaries of the compartment.

(2) The width of the gap and the maximum sprinkler protection area are in accordance with Table 9.2.7.1.

(3) The requirements of 9.2.7.2 are met.

(4) Spaces above cloud ceilings contain either noncombustible or limited-combustible construction with minimal combustible loading.

NFPA 13-2019 Additions and Changes from 2013 to 2016 and 2019

16.2 Sprinkler Installation.

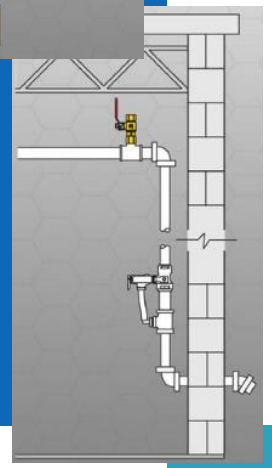
- 16.2.1 Only new sprinklers shall be installed.
- 16.2.1.1* When a sprinkler is removed from a fitting or welded outlet, it shall not be reinstalled except as permitted by 16.2.1.1.1
- 16.2.1.1.1 Dry sprinklers shall be permitted to be reinstalled when removed in accordance with the manufacturer's installation and maintenance instructions.

- Exception is a Dry Sprinkler Head
- "A.6.2.1.1 Sprinklers should be permitted to be reinstalled when the sprinkler being removed from the system remains attached to the original fitting or welded outlet, provided care has been taken to ensure the sprinkler has not been damaged. Flexible hose connections are considered a fitting."

16.8.6 Extension Fittings (also known as cheaters)

- permitted to be used with sprinklers K-8.0 or smaller.
- light hazard and ordinary hazard
- same nominal inlet diameter of the attached sprinkler.
- A single extension fitting up to a maximum of 2 in. in length

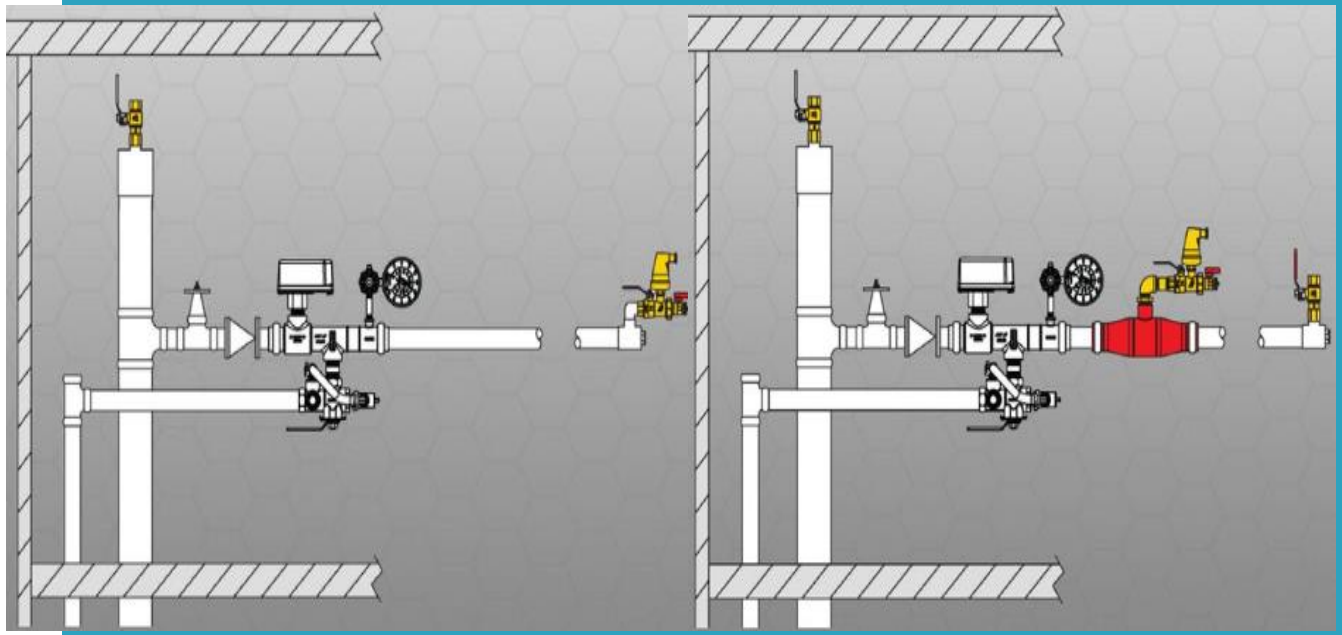
- longer than 2 in. (50 mm) shall not be permitted unless specifically listed.
- Longer than 2” shall be included in the hydraulic calculations.
- Can not nest them together. Must be a single extension!!

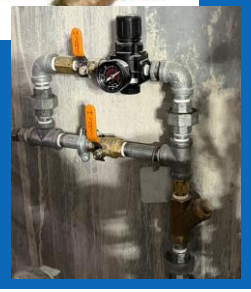


8.1.5 Air Venting.

- A single air vent with a connection conforming to Section 16.7 shall be provided on each wet pipe system utilizing metallic pipe. *(See A.16.7.)*
- 8.1.5.1 Venting from multiple points on each system shall not be required.

- 16.7* Air Venting. The vent required by 8.1.5 shall be located near a high point in the system to allow air to be removed from that portion of the system by one of the following methods:
- (1) Manual valve, minimum 1⁄2 in. (15 mm) size
- (2) Automatic air vent
- (3) Remote inspector’s test valve
- (4) Other approved means



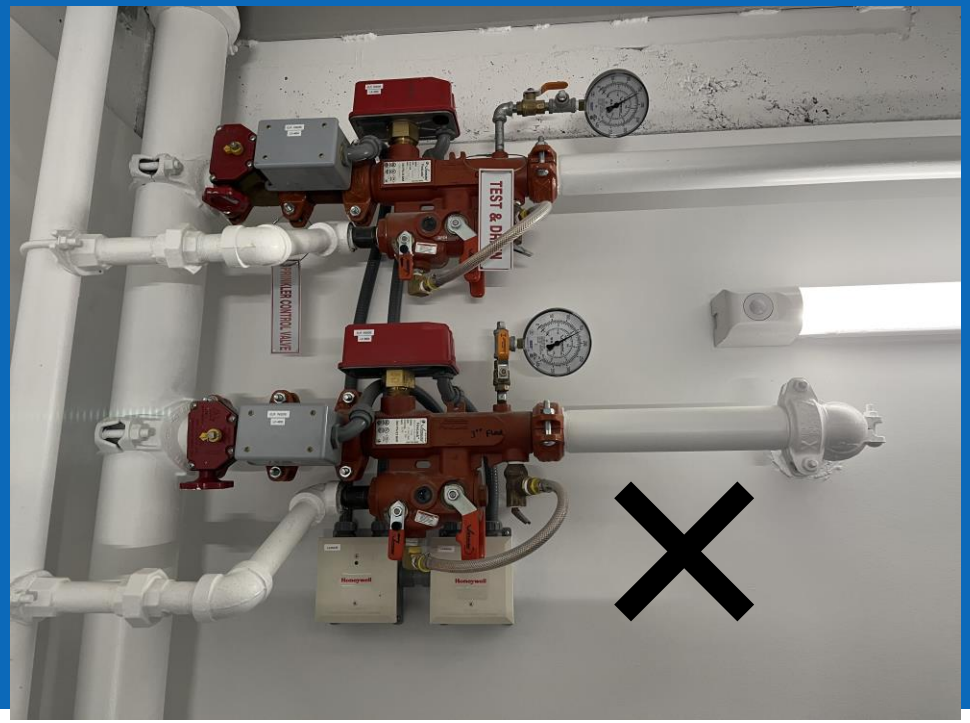


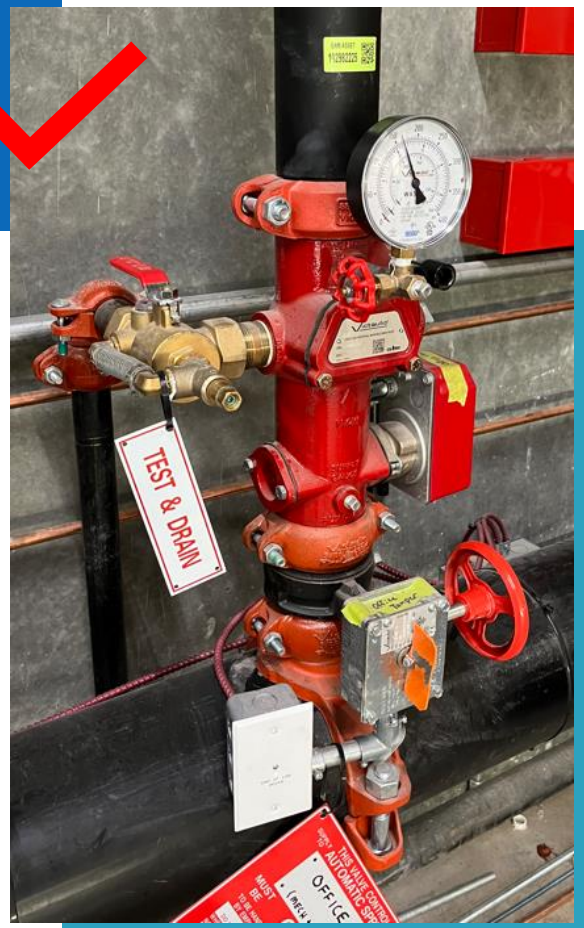
8.2.6.6 Automatic Air Maintenance.

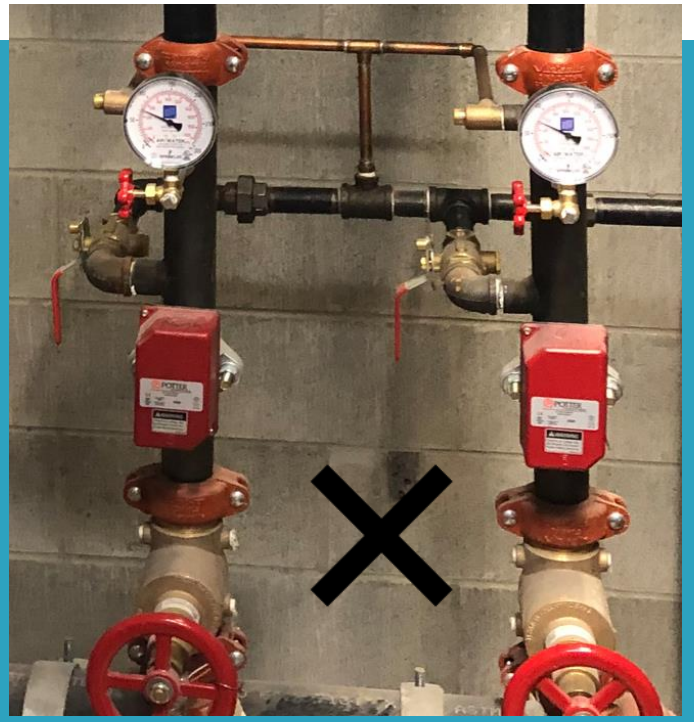
- **8.2.6.6.3.1** Each dry pipe system shall have a dedicated air maintenance device.
- **8.2.6.6.5** Where an air compressor is the dedicated air supply, it shall be installed in accordance with *NFPA 70*, Article 430.
- **8.2.6.6.5.1** The disconnecting means for an automatic air compressor shall not be a general-use light switch or a cord and-plug connected motor.

“16.9.11.1 Floor Control Valve Assemblies.

- **16.9.11.1** Multistory buildings exceeding two stories in height shall be provided with a floor control valve, check valve, main drain valve, and flow switch for isolation, control, and annunciation of water flow for each individual floor level.



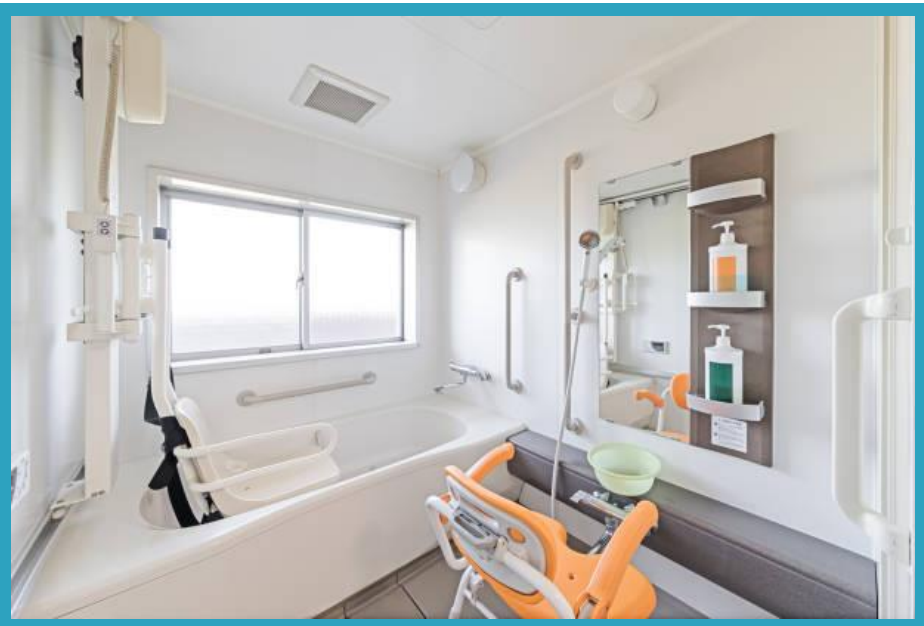




9.2.4.1 Bathrooms.

- sprinklers shall not be required in bathrooms that are located within dwelling units, that do not exceed 55 ft_2 (5.1 m_2) in area, and that have walls and ceilings of noncombustible or limited-combustible materials with a 15-minute thermal barrier rating, including the walls and ceilings behind any shower enclosure or tub.

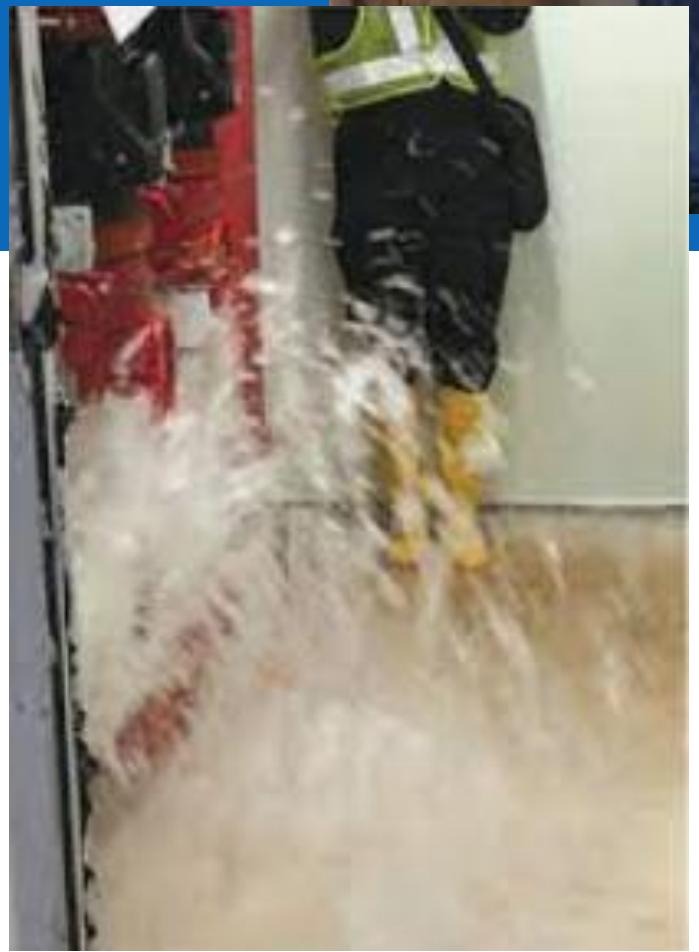
- Sprinklers shall be required in bathrooms of limited care facilities and nursing homes
- Sprinklers shall be required in bathrooms opening directly onto public corridors or exitways.



8.15.8.2 Closets and Pantries.

- Sprinklers are not required in clothes closets, linen closets, and pantries within dwelling units in hotels and motels where the area of the space does not exceed 24 ft2 (2.2 m2) and the walls and ceilings are surfaced with noncombustible or limited-combustible materials

- 8.15.25 Revolving Doors Enclosures
- Sprinkler protection shall not be required within revolving door enclosures.

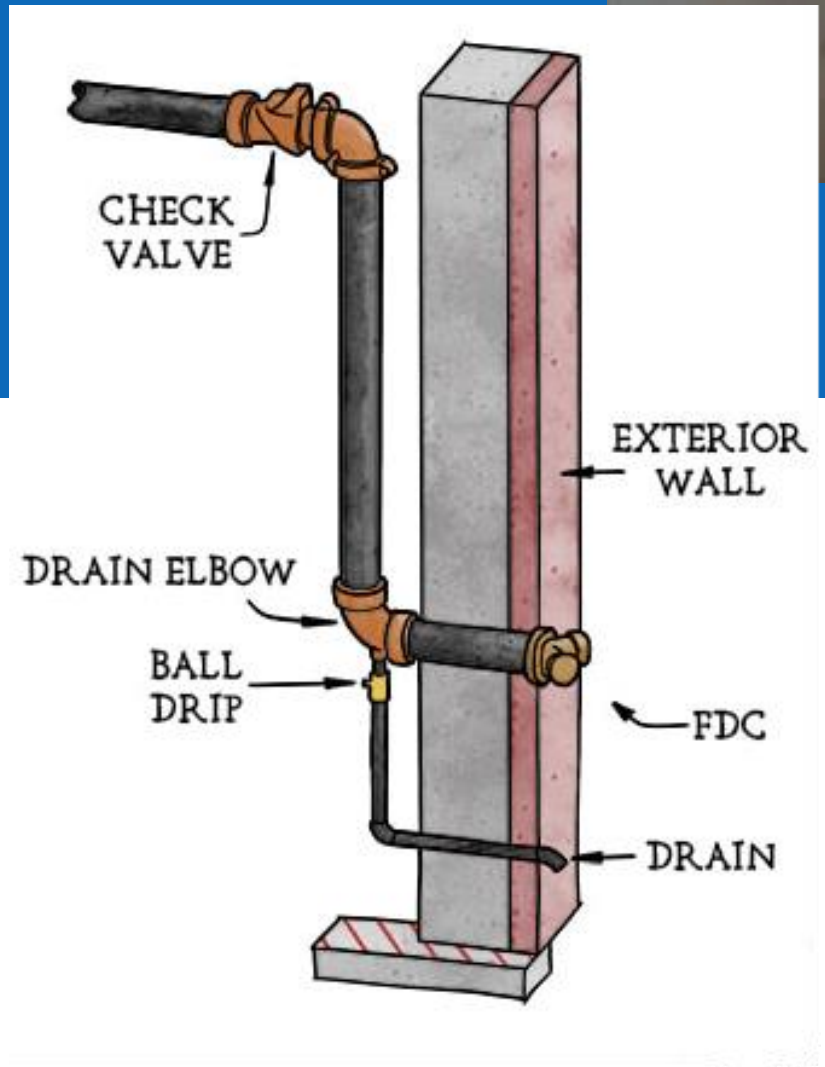


16.10.4.6* Main Drain Test Connections.

- Main drain test connections shall be installed that the valve can be opened wide for a sufficient time to assure a proper test without causing water damage.
- New in 2016

16.12 Fire Department Connections

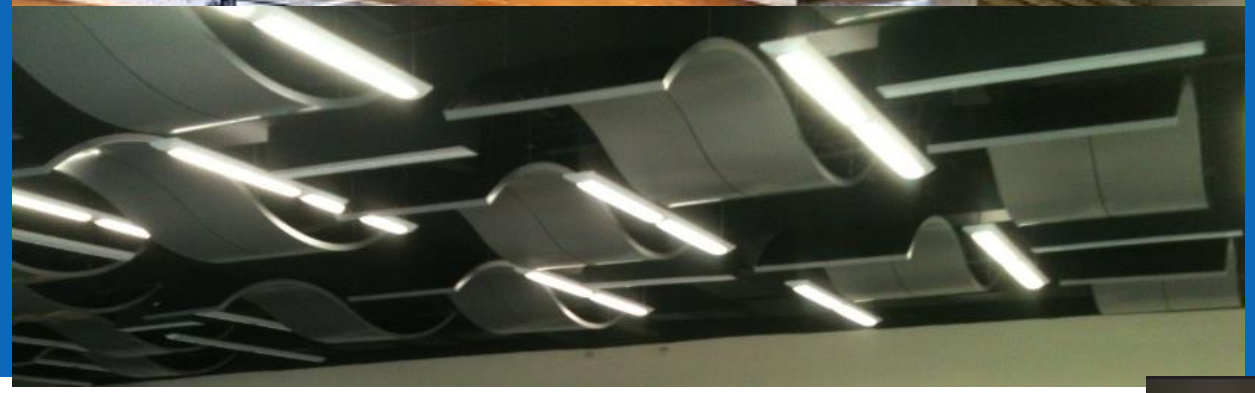
- **16.12.7.1** The automatic drain valve shall be installed in a location that permits inspection and testing as required by NFPA 25.



FDC Signs

- Do we need a sign to indicate “Max. 175 PSI”??
- NO!
- We need the opposite- We need to tell the Fire Dept. how much to PSI they need to supply.
- We need to tell them the Minimum PSI

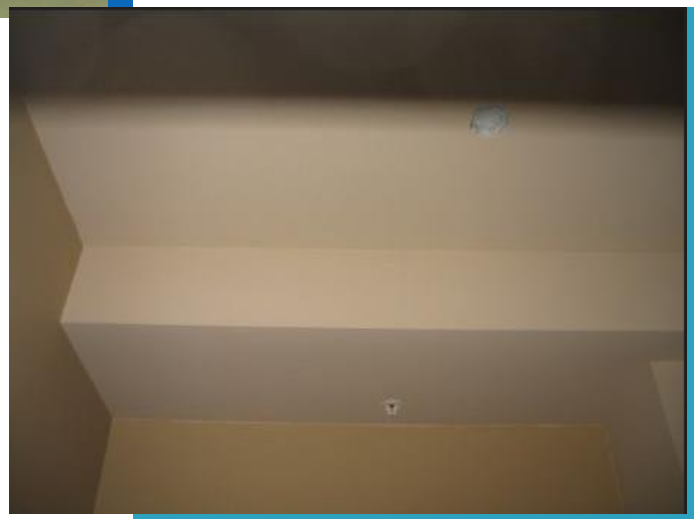
- **16.12.5.8.2** A sign shall also indicate the pressure required at the inlets to deliver the greatest system demand.
- **16.12.5.8.3** The sign required in 16.12.5.8.2 shall not be required where the system demand pressure is less than 150 psi



9.2.7 Cloud Ceilings.

- Sprinklers shall be permitted to be omitted above cloud ceilings
- openings around the cloud are less than or equal to 20 percent of the area ofthe ceiling
- **Table 9.2.7.1 - Ceiling Cloud Width and Opening Width**

- **Closets.**
- **9.5.5.4 -** all closets and compartments
- Not larger than 400 ft_3
- a single sprinkler
- highest ceiling level - Without regard for obstructions, “don’t care”
- **10.2.8 Clearance to Storage**
- if not directly below sprinklers, the shelves, including storage, shall be permitted to extend above the level of a plane located 18 in. below ceiling sprinkler deflectors.



Closet Sprinklers Temperature?

- **9.4.2 Temperature Ratings.**
- Clothes dryer normally have required intermediate-temperature sprinkler head

- What about the NEW ventless Clothes Dryer??

- **9.4.2.5***
- (11) Sprinklers in closets containing ventless clothes dryers shall be of the intermediate-temperature classification or higher.

Sprinkler Obstructions!

- Pendant and sidewalls
- Standard spray, extended and especially Resident Sprinklers.
- Lots of new rules
- Each Chapter in 2019 for each sprinkler type really helps Clarify rules for that head.

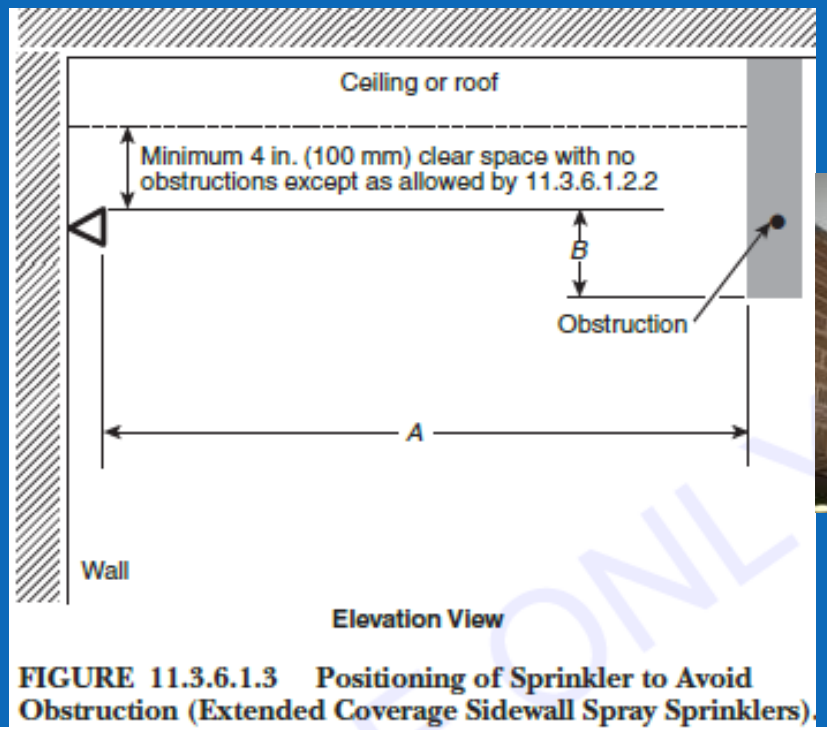
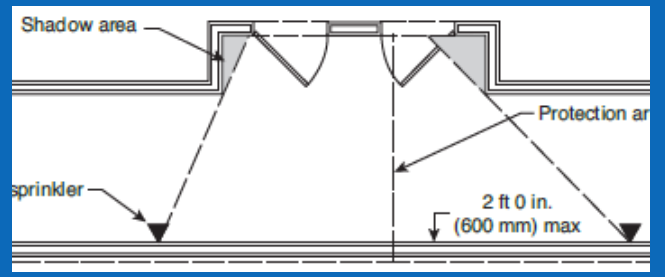


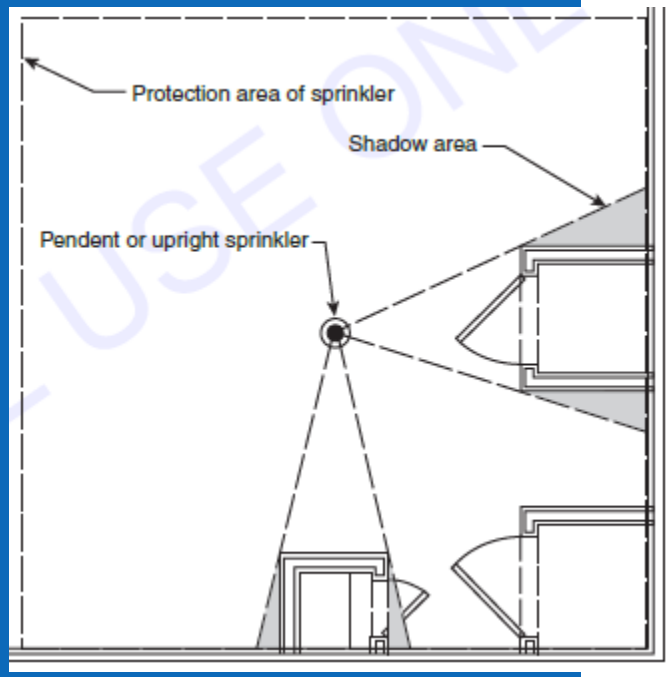
FIGURE 11.3.6.1.3 Positioning of Sprinkler to Avoid Obstruction (Extended Coverage Sidewall Spray Sprinklers).

Sidewall Sprinklers

- Huge change in 2016 and revised again in 2019
- **Extended Coverage Sidewall Spray Sprinklers& Residential Sidewalls**
- **11.3.6.1.2** Sidewall sprinklers shall not be installed less than 8 ft (2.4 m) from light fixtures or similar obstructions unless the requirements of 11.3.6.1.2.1 or 11.3.6.1.2.2 are met.

- **N 11.3.6.1.2.1** For obstructions such as light fixtures, where the greatest dimension of the obstruction is less than 2 ft (0.6 m), sidewall sprinklers shall be permitted to be installed at a minimum distance of four times the greatest dimension.
- **N 11.3.6.1.2.2** For obstructions located 4 in. or greater above the plane of the sprinkler deflector the sprinkler shall be permitted to be located less than 8 ft (2.4 m) from the obstruction.





Residential Sprinklers

- New Chapter – all rules in one spot.
- Shadow Areas. - 15 ft_2 per sprinkler.
- **Residential Sidewall Spray Sprinklers**
- Same rules as Extended Coverage
- 8Ft to Light fixtures or 4 times rule
- Require the 4” clearance above deflector

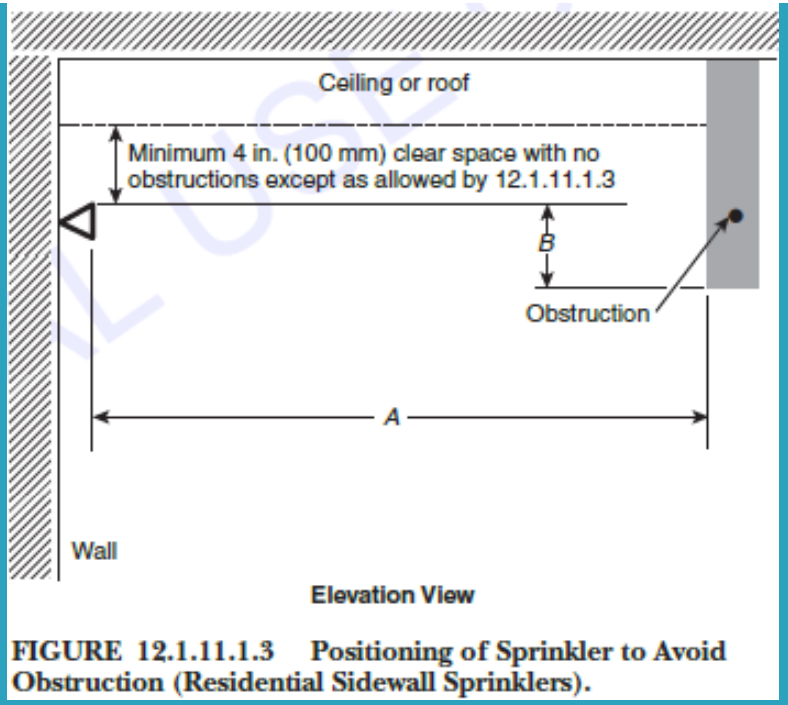
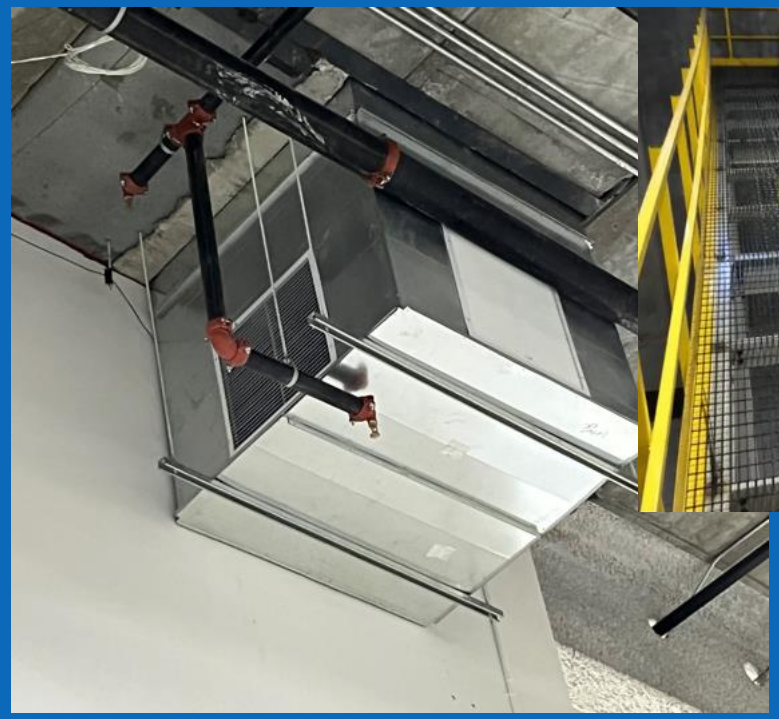


FIGURE 12.1.11.1.3 Positioning of Sprinkler to Avoid Obstruction (Residential Sidewall Sprinklers).



Sprinklers Under Obstructions More than 18 inches below the sprinkler

- 9.5.5.3.1* Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m~~) wide~~ in width .
- N 9.5.5.3.1.1* Open grate flooring over 4 ft (1.2 m) in width shall require sprinkler protection below the grating.

- 9.5.5.3.1.2* Sprinklers located under obstructions shall comply with one of the following:
- (1) Installed below the obstruction
- (2) Installed adjacent to the obstruction not more than 3 in. (75 mm) from the outside edge of the obstruction
- 9.5.5.3.1.3 Where sprinklers are located adjacent to the obstruction, they shall be of the intermediate level rack type.
- 9.5.5.3.3 Sprinklers installed under obstructions shall be of the same type (spray, CMSA, ESFR, residential) as installed at the ceiling

- These are not “Heat Collectors.”
- There is no such thing as a heat collector.
- **9.5.4.1.4*** Heat collectors shall not be used as a means to assist the activation of a sprinkler.

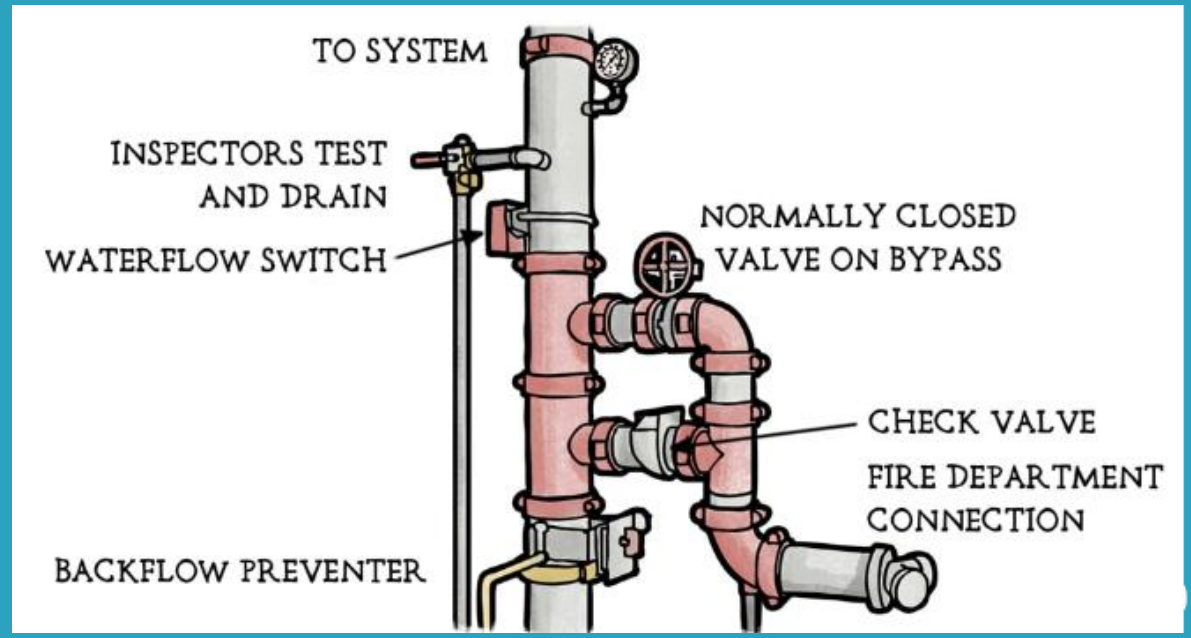
Round ducts

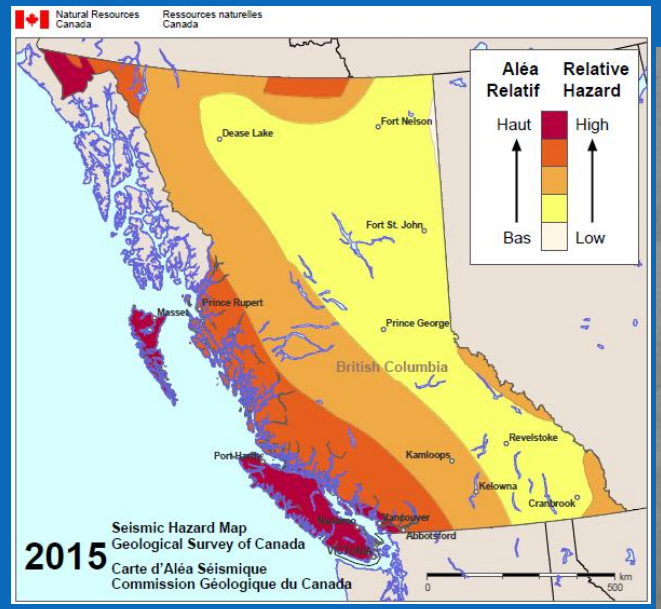
- Never new what to do??
- New in 2016
- **10.2.7.3.5** Sprinklers installed under round ducts shall be of the intermediate level/rack storage type or otherwise shielded from the discharge of overhead sprinklers.

16.14.5* Backflow Devices.

- 2013/2016 - a backflow prevention valves need a forward flow test
- minimum flow rate of the system demand
- 2019 added “shall be serviceable without requiring - to modify the system to perform the test.”

- **N 16.14.5.1.1** The arrangement required in 16.14.5.1 shall be serviceable without requiring the owner to modify the system to perform the test.
- **A.16.14.5.1** System demand refers to flow rate and pressure.
- This test is only concerned with testing at the proper flow rate.
- The full flow test of the backflow prevention valve can be performed with a test header or other connection downstream of the valve. A bypass around the check valve in the fire department connector line with a control valve in the normally closed position can be an acceptable arrangement.





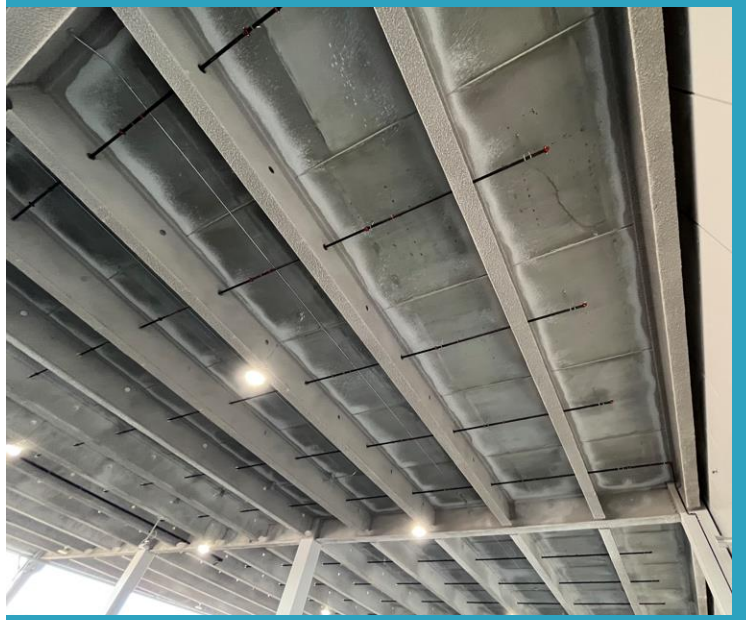
Restraints

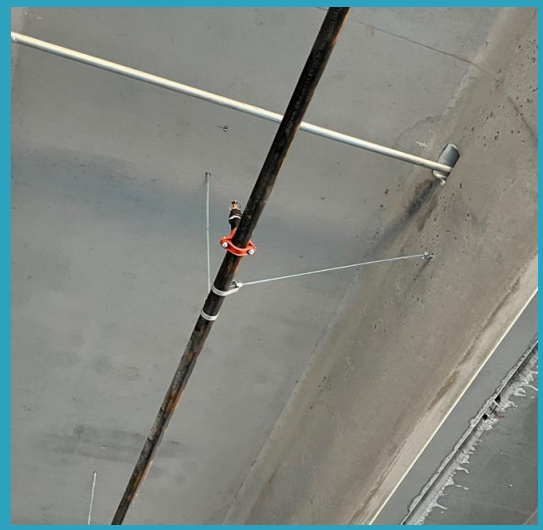
- **N 18.6.3.1** The location of the restraint from end of the line shall not be greater than 36 in. (900 mm) for 1 in. (25 mm) pipe, 48 in. (1200 mm) for 1¼ in. (32 mm) pipe, and 60 in. (1.5 m) for 1½ in. (40 mm) or larger pipe.

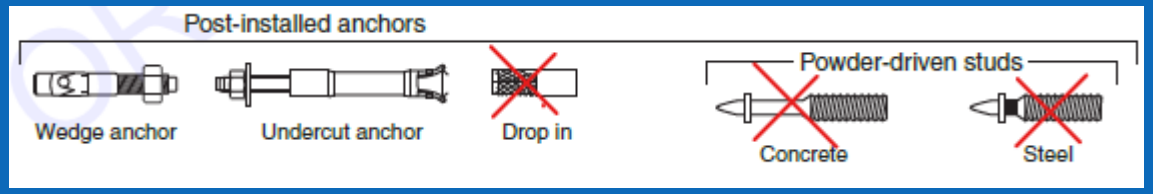
- **18.6.4*** Branch lines shall be laterally restrained at intervals not exceeding those specified in Table 18.6.4(a)
- We are the worst seismic Zone in Canada

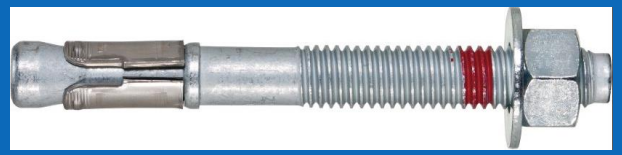
Table 18.6.4(a) Maximum Spacing [ft (m)] of Steel Pipe Restraints

Pipe	Seismic Coefficient, C_p		
[in. (mm)]	$C_p \le 0.50$	$0.5 < C_p \le 0.71$	$0.71 < C_p$
½ (15)	34 (10.3)	29 (8.8)	20 (6
¾ (20)	38 (11.6)	32 (9.7)	23 (7
1 (25)	43 (13.1)	36 (11.0)	26 (7
1¼ (32)	46 (14.0)	39 (11.9)	27 (8
1½ (40)	49 (14.9)	41 (12.5)	29 (8
2 (50)	53 (16.1)	45 (13.7)	31 (9





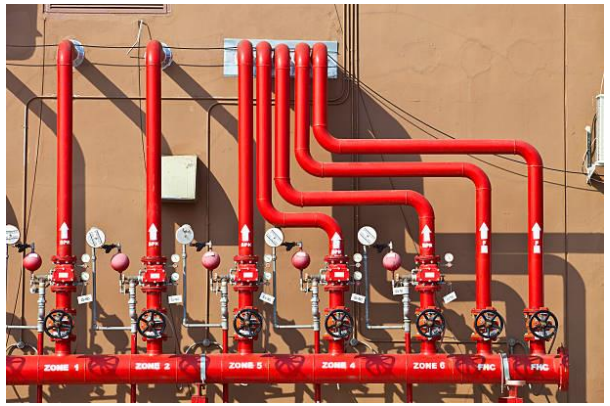


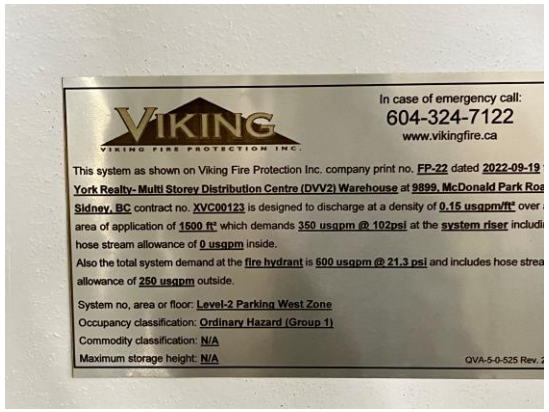


18.5.12.7 Concrete Anchors.

- **18.5.12.7.1*** Post-installed concrete anchors shall be prequalified for seismic applications in accordance with ACI 355.2, *Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary*, and installed in accordance with the manufacturer's instructions.

- BCBC – No drop in inserts or any power-driven fasteners for hanging pipe.
- Concrete Anchor must be listed for "Cracked Concrete"
- All structural concrete is considered cracked





Plan review information

- **Chapter 19 Design Approaches**
- **Chapter 27 Plans and Calculations**

303	4.90	90.00	13.28	7.34	1.50	13.28	0.03867	15.00	0.580
304	4.90	90.00	13.79	7.92	1.598	39.28	-----	0.00	0.000
	BLAZEMASTER CPVC				150	6.28	0	15.00	0.580
304	4.90	90.00	13.79	7.92	1.50	13.79	0.06748	15.00	1.012
305	4.90	90.00	14.65	8.94	1.598	53.07	-----	0.00	0.000
	BLAZEMASTER CPVC				150	8.49	0	15.00	1.012
305	4.90	90.00	14.65	8.94	1.50	14.65	0.10593	15.00	1.589
306	4.90	90.00	15.90	10.53	1.598	67.72	-----	0.00	0.000
	BLAZEMASTER CPVC				150	10.83	0	15.00	1.589
306	4.90	90.00	15.90	10.53	1.50	15.90	0.15648	15.00	2.347
307	4.90	90.00	17.58	12.87	1.598	83.62	-----	0.00	0.000
	BLAZEMASTER CPVC				150	13.38	0	15.00	2.347
350	0.00	29.00	100.00	61.22	4.00	0.00	0.00284	115.50	0.447
351	0.00	29.00	0.00	60.77	4.260	101.20	3EG	42.00	0.000
	SCHED 10 WET STEEL				120	2.28	0	157.50	0.447

Inside Hose Allowance

- Plan checking – looking for the 100 GPM in the Hydraulic calc, usually was the farthest hose valve on the standpipe.
- New in 2016, now 2019 – not required
- BCBC requires a Class 1 standpipe.

- **19.2.6.3.1** Where the system is a combined sprinkler/standpipe system (Class I or Class III) and the building is fully sprinklered in accordance with NFPA 13, no inside hose demand shall be required at any of the standpipe outlets.
- So where do we add it in??

Overall Network Summary

Number Of Unique Pipe Sections:	17	
Number Of Flowing Sprinklers:	7	
Pipe System Water Volume:	379.86	gal
Sprinkler Flow:	101.20	gpm
Non-Sprinkler Flow:	100.00	gpm
Minimum Required Residual Pressure At System Inflow Node:	66.45	psi
Demand Flow At System Inflow Node:	201.20	gpm

19.4.4 Sprinkler-Protected Glazing.

- Three new clauses for these designs.
- **19.4.4.1 –** how many heads
- **19.4.4.2 –** balance the demand with hydraulic calc.
- **19.4.4.1 –** calculation is include adjacent heads also

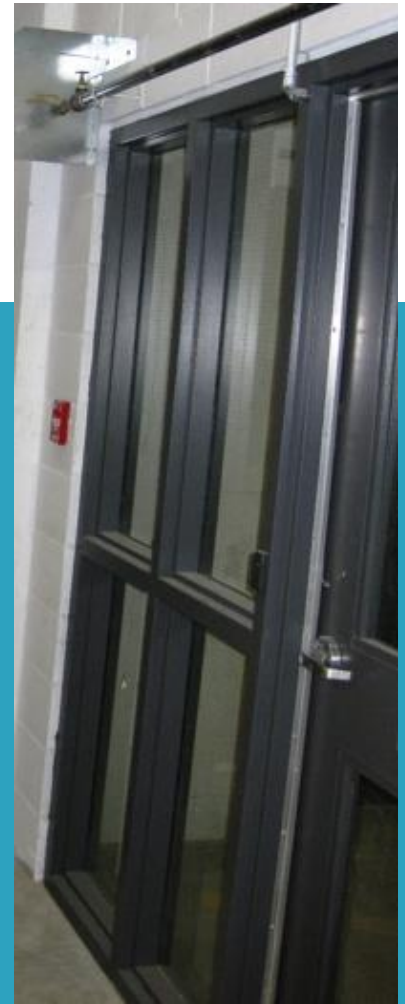
- **9.3.15* Sprinkler-Protected Glazing.**

NFPA	13-2019(6)	Standard for the Installation of Sprinkler Systems

(6) Subsection 9.3.15, Sprinkler-Protected Glazing, does not apply in the context of Division B.

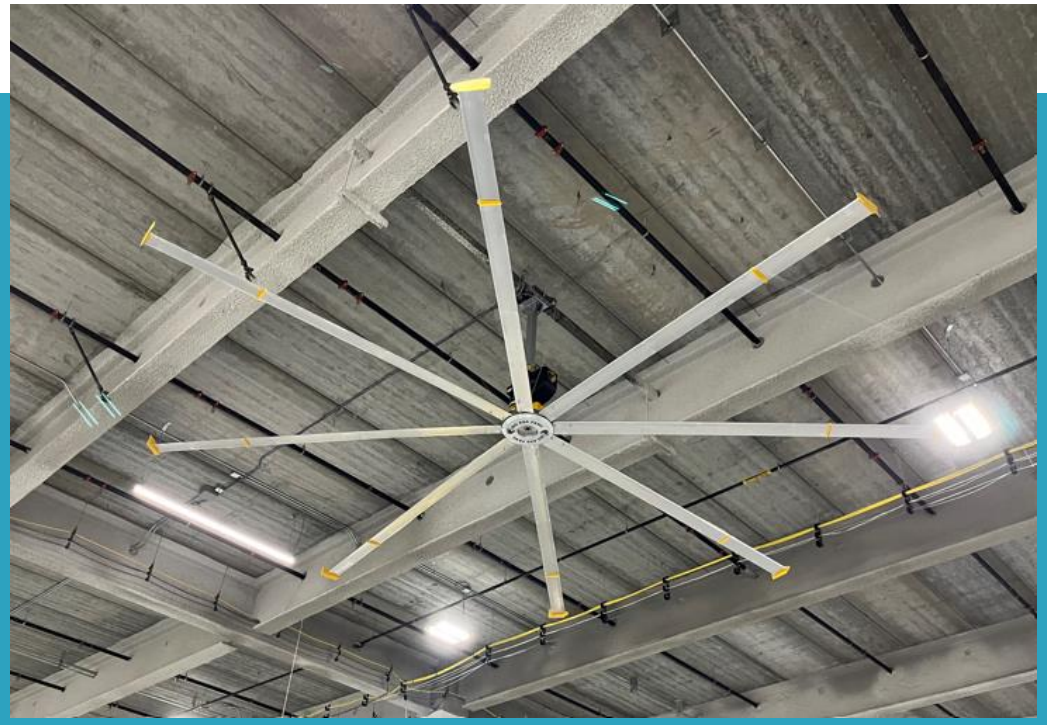
9.3.15* Sprinkler-Protected Glazing.

- Guidance only
- Listed sprinklers window application
- Wet system
- Glazing shall be heat-strengthened, tempered, or glass ceramic and shall be fixed.
- protected from both sides
- non-load-bearing walls.
- glazed assembly, NO horizontal members



19.2.7* High Volume Low Speed (HVLS) Fans.

- (4) All HVLS fans shall be interlocked to shut down immediately upon a waterflow alarm. Where the building is protected with a fire alarm system, this interlock shall be in accordance with the requirements of NFPA 72.



- **11.3.1.3**
- Unless the requirements of 11.3.1.4 are met, the minimum required discharge from each of the four hydraulically most demanding sprinklers design area sprinkler shall be the greater of the following:
- (1) In accordance with minimum flow rates indicated in ~~individual~~ the sprinkler listings
- (2) ~~Calculated based on delivering a minimum of 0.1 gpm/ft 2 (4.1 mm/min) over the design area in accordance with the provisions of 8.5.2.1 or 8.6.2.1.2~~ In rooms or compartments greater than 800 ft² (74.3 m 2), calculated based on delivering a minimum of 0.1 gpm/ft 2 (4.1 mm/min) over the design area in accordance with the provisions of 8.5.2.1
- (3) In rooms or compartments 800 ft 2 (74.3 m 2) or less calculated based on delivering a minimum of 0.1 gpm/ft 2 (4.1 mm/min) over the room or the compartment using the area of the room divided by the number of sprinklers in the room

QR Reduction

- **19.3.3.2.3 Quick-Response Sprinklers.**

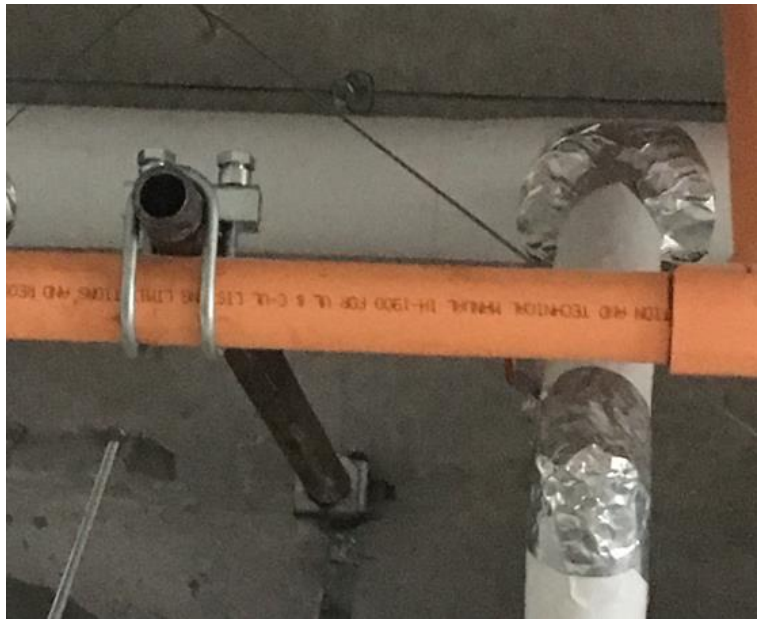
- (1) Wet pipe system
- (2) Light hazard or ordinary hazard occupancy
- (3) 20 ft (6.1 m) maximum ceiling height
- (4~~) There are no~~ No unprotected ceiling pockets as allowed by 8.6.7 and 8.8.7 exceeding 32 ft2 (3 m2)
- (5) No unprotected areas above cloud ceilings as allowed by 8.15.24

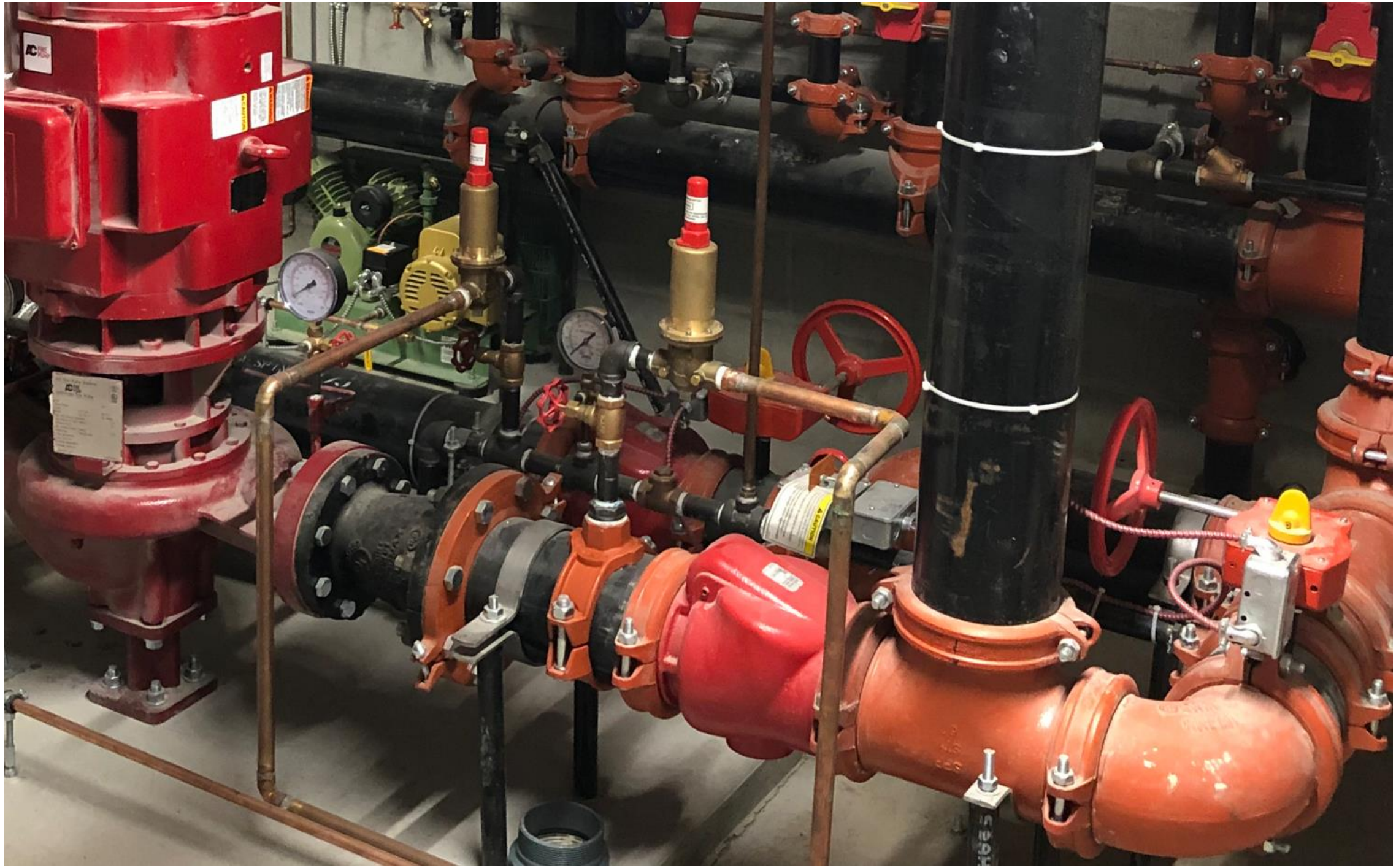
NFPA 13-2019
What’s Wrong

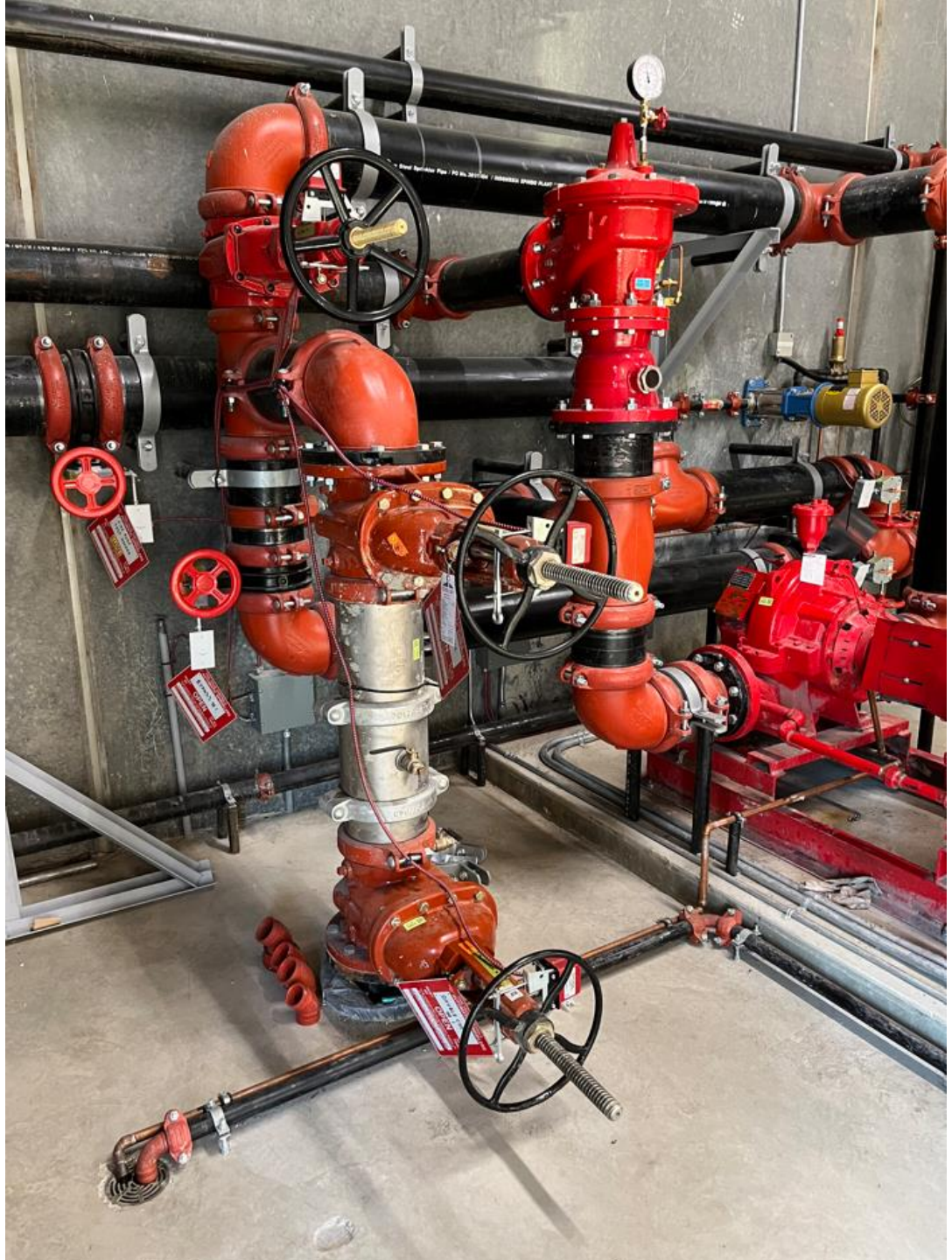

PRESSURE GAUGE
FOR FIRE PROTECTION
SERVICE
psi
kPa
LynCar
MADE IN U.S.A.


250
ORA Group I
Sprinkler Limited
ASHCROFT


SCH40 ERW BPE








CLARKE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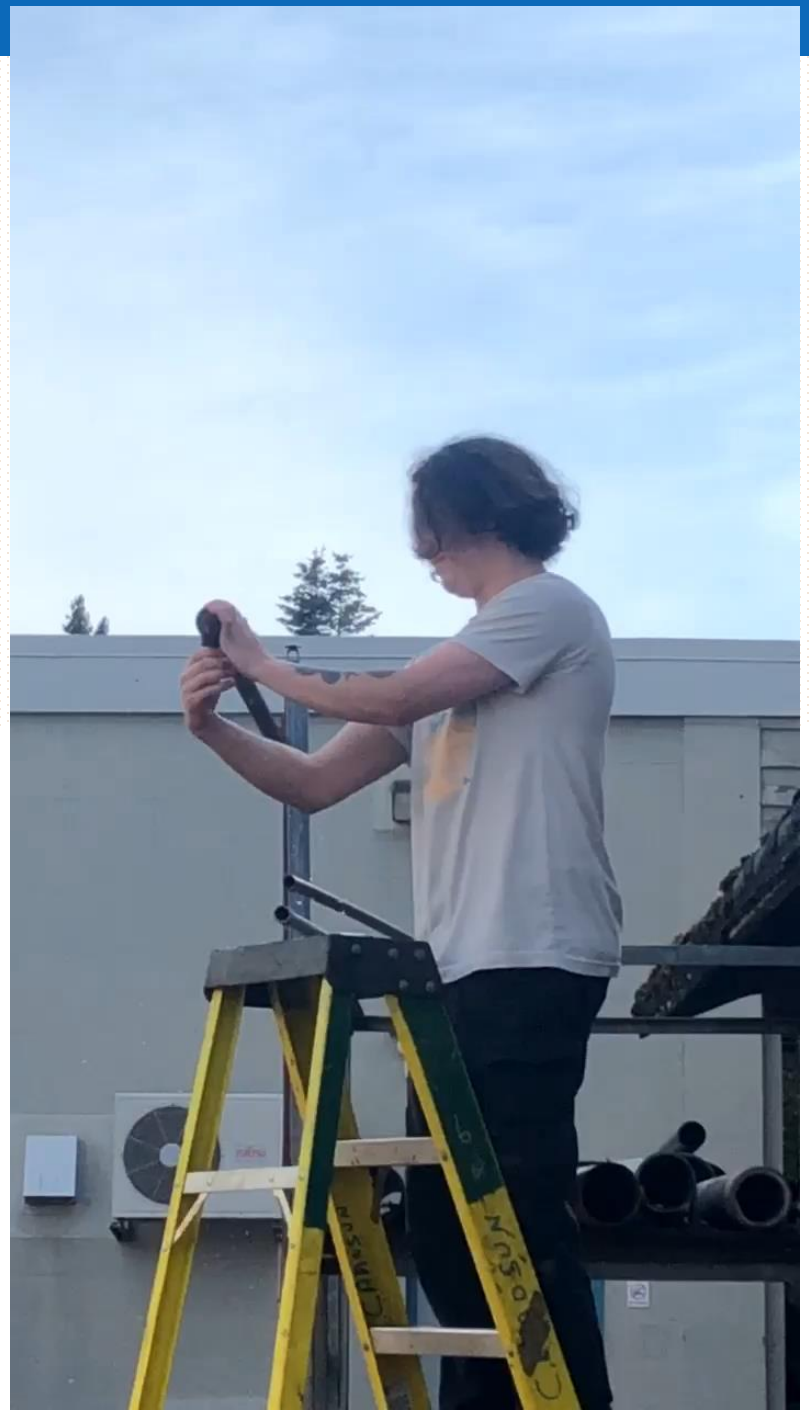
HASSCO INDUSTRIES INC.

Sprinkler Installation



Thank you

What questions do you have?