ALL SAFE FIRE PROTECTION, LLC

Fire Suppression Submittal

FIRE SPRINKLER SHOP SUBMITTAL

Date: **June 11, 2024**

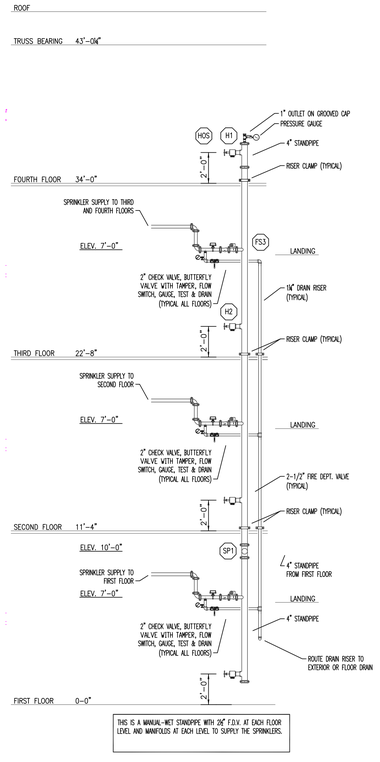
Project: **John Knox Courtyard Bldg. E**
515 NW Moore Street
Lee's Summit, MO. 64081

Architect: **SFCS Architecture**
1927 S. Tryon Street, Ste. 207
Charlotte, NC. 28203

Contractor: **Straub Construction Co., Inc.**
7775 Meadow View Dr.
Shawnee, KS 66227

Subcontractor: **All Safe Fire Protection, LLC**
6603 Royal Street. Bldg. D
Pleasant Valley, MO. 64068

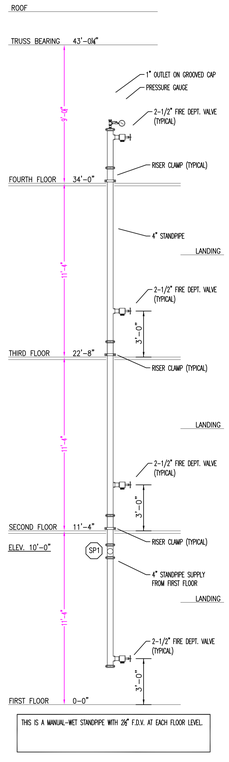
REMOTE AREA #3
STAIR #1 STANDPIPE
100 PSI AT TOP MOST OUTLET,
250 GPM FLOWING FOR MOST REMOTE OUTLET
PLUS 250 GPM AT SECOND OUTLET,
PLUS 250 GPM
FOR STAIR #2 STANDPIPE
DEMAND AT FDC:
750 GPM AT 152 PSI



THIS IS A MANUAL-WET STANDPIPE WITH 2½" F.D.V. AT EACH FLOOR LEVEL AND MANIFOLDS AT EACH LEVEL TO SUPPLY THE SPRINKLERS.

SOUTH STANDPIPE
(STAIR #1)

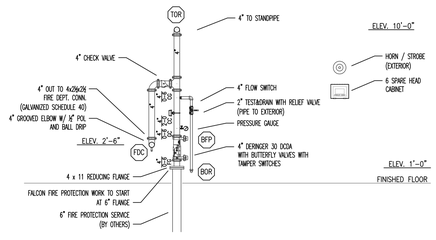
1 0 2 4
SCALE 1/4"=1'-0"



THIS IS A MANUAL-WET STANDPIPE WITH 2½" F.D.V. AT EACH FLOOR LEVEL.

NORTH STANDPIPE
(STAIR #2)

1 0 2 4
SCALE 1/4"=1'-0"



COORDINATE ALL TAMPER AND FLOW SWITCHES WITH ALARM CONTRACTOR.

PROVIDE HYDRAULIC INFORMATION NAMEPLATE ON RISER FOR ALL NEW HYDRAULIC AREA.

SPRINKLER RISER

1 0 2 4
SCALE 1/4"=1'-0"

SCOPE OF WORK

THE ENTIRE BUILDING WILL BE PROTECTED BY A NEW WET SPRINKLER SYSTEM THROUGHOUT.
THE BALCONIES WILL HAVE DRY TYPE SPRINKLERS SUPPLIED FROM THE WET SYSTEM.
THERE WILL BE A STANDPIPE SYSTEM THAT SUPPLIES HOSE VALVES IN EACH OF 2 STAIRS.
THERE WILL BE SPRINKLER CONTROL VALVES FOR EACH FLOOR CONNECTED TO THE STANDPIPE IN THE EAST STAIR (STAIR #2).
EACH FLOOR OF THE BUILDING WILL BE ON A SINGLE SPRINKLER ZONE, EXCEPT THE THIRD AND FOURTH FLOORS WILL BE SUPPLIED BY A SINGLE ZONE WITH THE VALVE ASSEMBLY AND MAIN LOCATED ON THE THIRD FLOOR.

GENERAL NOTES

THE SPRINKLER SYSTEM TO BE INSTALLED IN ACCORDANCE WITH NFPA 13R, 2016 EDITION.

ALL PIPE TO BE PLASTIC, CPVC, LISTED FOR USE IN FIRE SPRINKLER SYSTEMS.

ALL PIPE AND FITTINGS TO CONFORM WITH REQUIREMENTS OF NFPA 13.

VALVES ON CONNECTIONS TO WATER SUPPLIES, SECTIONAL CONTROL VALVES AND OTHER VALVES IN SUPPLY PIPES TO SPRINKLERS SHALL BE SUPERVISED OPEN BY AN APPROVED METHOD (BY OTHERS).

IT IS THE OWNERS RESPONSIBILITY TO PROVIDE ADEQUATE HEAT TO KEEP THE SPRINKLER SYSTEM FROM FREEZING.

ALL SECTIONS OF TRAPPED PIPING SHALL HAVE AUXILIARY DRAINS WHERE REQUIRED.

ALL ELECTRICAL WIRING OF ALARM BELLS, FLOW SWITCHES AND TAMPER SWITCHES (IF REQUIRED) TO BE DONE BY OTHERS.

THE SPRINKLER SYSTEM IS TO BE TESTED IN ACCORDANCE WITH THE LATEST APPLICABLE NFPA STANDARDS.

HANGERS TO BE SPACED TO MEET NFPA REQUIREMENTS.

SEISMIC BRACING IS NOT REQUIRED.

KEY NOTES

1 SPRINKLERS SHALL NOT BE REQUIRED IN BATHROOMS WHERE THE BATHROOM AREA DOES NOT EXCEED 55 S.F. (PER NFPA 13R: 6.6.2)

2 SPRINKLERS SHALL NOT BE REQUIRED IN CLOTHES CLOSETS, LINEN CLOSETS, AND PANTRIES WITHIN DWELLING UNITS THAT MEET ALL OF THE FOLLOWING CONDITIONS:

- THE AREA OF THE SPACE DOES NOT EXCEED 24 S.F
- THE WALLS AND CEILINGS ARE SURFACED WITH NONCOMBUSTIBLE OR LIMITED–COMBUSTIBLE MATERIALS AS DEFINED BY NFPA 220, STANDARD ON TYPES OF BUILDING CONSTRUCTION.

DESIGN CRITERIA

DWELLING UNITS:
PER NFPA 13R
SPRINKLERS SPACED PER MANUFACTURER'S LISTING
CALCULATE UP TO MAXIMUM 4 SPRINKLERS OPERATING IN A COMPARTMENT
AT PRESSURE AND FLOW PER MANUFACTURER'S LISTING OR
AT MINIMUM OF 0.05 GPM/S.F., WHICHEVER IS GREATER

CORRIDOR, STAIR:
PER NFPA 13R
SPRINKLERS SPACED PER MANUFACTURER'S LISTING
CALCULATE UP TO MAXIMUM 4 ADJACENT SPRINKLERS OPERATING
AT PRESSURE AND FLOW PER MANUFACTURER'S LISTING OR
AT MINIMUM OF 0.05 GPM/S.F., WHICHEVER IS GREATER

MECHANICAL, STORAGE:
PER NFPA13R: 7.2.3.1
PER NFPA 13, ORDINARY HAZARD GROUP 1
CALCULATE UP TO A MAXIMUM OF 4 SPRINKLERS IN A COMPARTMENT
AT 0.15 GPM/S.F.
MAXIMUM 130 S.F. PER SPRINKLER

ATRIUM:
PER NFPA 13, LIGHT HAZARD
0.10 GPM/S.F. FOR 1500 S.F.
(REDUCED OPERATING AREA FOR USE OF Q.R. SPRINKLERS AS APPLICABLE)
MAXIMUM 225 S.F. PER SPRINKLER
100 GPM HOSE ALLOWANCE
WATER CURTAIN TO BE CALCULATED AT 3 GPM PER LINEAR FOOT
PER NFPA 13: 11.3.3.1

STANDPIPE:
CLASS I STANDPIPE (WET MANUAL)
250 GPM AT 100 PSI AT TOP MOST OUTLET
PLUS 250 GPM FOR NEXT HIGHEST OUTLET
PLUS 250 GPM FOR EACH ADDITIONAL STANDPIPE
(TOTAL 750 GPM MAXIMUM FLOWING)
ASSUMED PRESSURE AT THE FDC IS 175 PSI

CONSTRUCTION

WOOD JOISTS AND TRUSSES.

FLOW TEST

FLOW TEST:

STATIC: 98 PSI

RESIDUAL: 52 PSI WITH 1875 GPM FLOWING

LOCATION: 515 NW MOORE STREET

STATIC/RESIDUAL HYDRANT:

ELEVATION: SAME AS FINISHED FLOOR

DATE: 05/02/24

INFORMATION FROM: LEE'S SUMMIT WATER

SPRINKLERS NOT REQUIRED IN CONCEALED SPACES AS FOLLOWS:
per NFPA 13R, 2013, section 6.6.6:
Sprinklers shall not be required in attics, penthouses equipment rooms, elevator machine rooms, concealed spaces dedicated exclusively to and containing only dwelling unit ventilation equipment, crawl spaces, floor/ceiling spaces, noncombustible elevator shafts where the elevator cars comply with ANSI A17.1 and other concealed spaces that are not used or intended for living purposes or storage and do not contain fuel-fired equipment.

REVISIONS:

#	DATE	DESCRIPTION

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phone: 816-260-4897 fax: 816-468-5633

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info@allsafefirepro.com

JOHN KNOX VILLAGE
COURTYARDS BUILDING E
New Independent Living Building
Lee's Summit, MO

STATE OF MISSOURI
PAUL C. LINK
NUMBER E-32806
REGISTERED PROFESSIONAL ENGINEER

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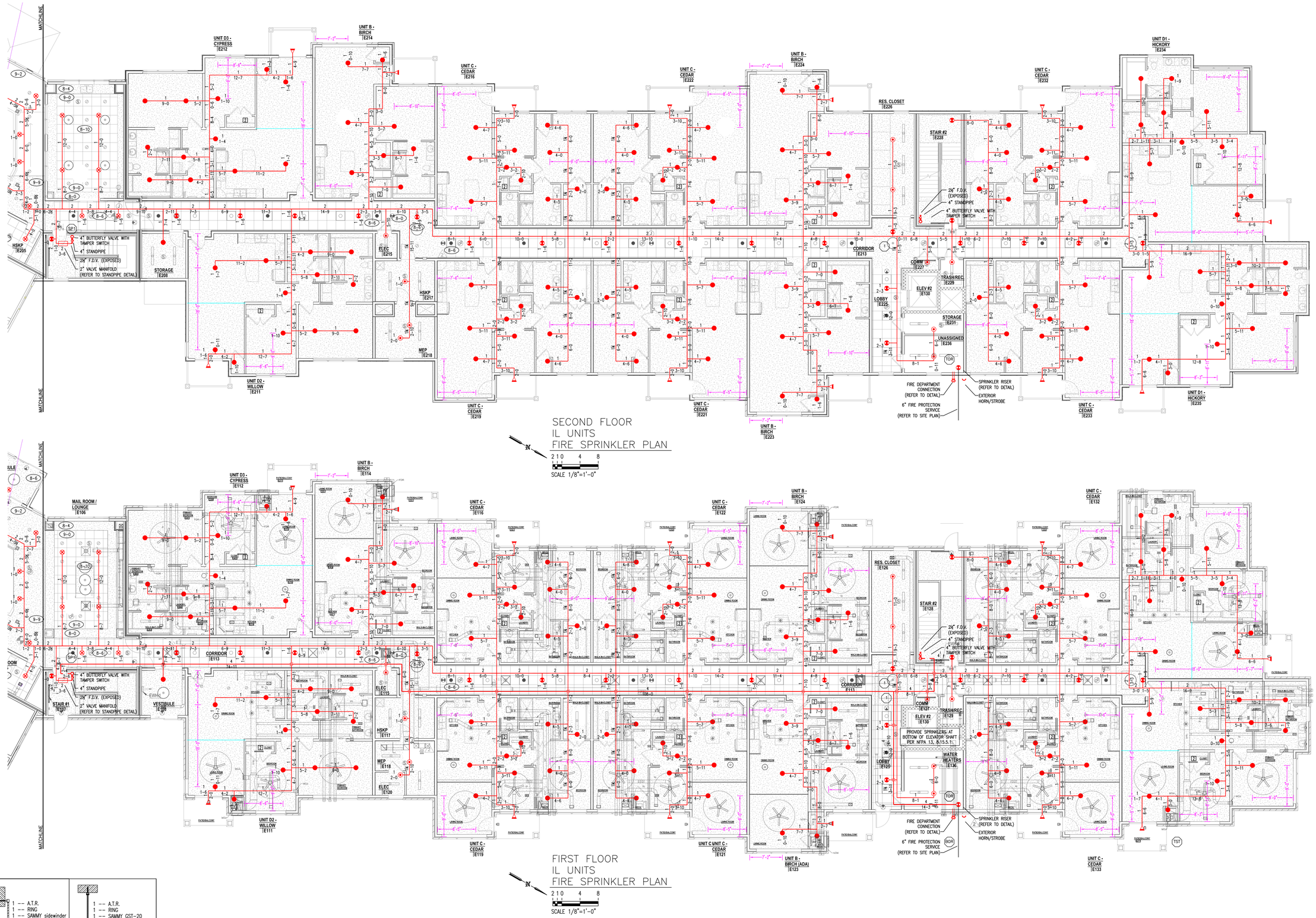


SECOND FLOOR
IL UNITS
FIRE SPRINKLER PLAN

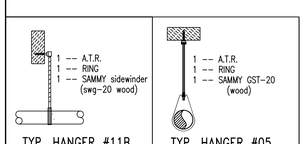
N

SCALE 1/8"=1'-0"

FIRST FLOOR
IL UNITS
FIRE SPRINKLER PLAN

N

SCALE 1/8"=1'-0"



TYP. HANGER #11B

NO SCALE

TYP. HANGER #05

NO SCALE

HANGER SPACING TABLE

PIPE SIZE (NOMINAL, INCHES)	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
STEEL PIPE (EXCEPT THREADED LIGHTWALL)	N/A	12'-0"	12'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"
STEEL PIPE (THREADED LIGHTWALL)	N/A	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"	N/A	N/A	N/A
COPPER	8'-0"	8'-0"	10'-0"	10'-0"	12'-0"	12'-0"	12'-0"	15'-0"	15'-0"	15'-0"
CPVC	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"	10'-0"	N/A	N/A	N/A

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
✳	DENOTES HYDRAULICALLY CALCULATED SPRINKLER
(H)	HYDRAULIC REFERENCE POINT
(9'-0")	CEILING HEIGHT
TOJ	TOP OF JOIST ELEVATION ABOVE FINISHED FLOOR
?'-?	CENTERLINE OF PIPE DOWN FROM CEILING OR ROOF
?'-?	CENTERLINE OF PIPE A.F.F.
RN	RISER NIPPLE
DN	PIPE DOWN
	VERTICAL SUPPLY RISER
	SPRINKLER RISER
	APPROVED TYPE HANGER ON PIPE

SPRINKLER LEGEND

SYMBOL	SPRINKLER TYPE	SIN #	FINISH	TEMP.	THREAD	K-FACTOR	1ST FLR	2ND FLR	3RD FLR	4TH FLR	TOTAL
●	RELIABLE MODEL F1Res49 RESIDENTIAL RECESSED PENDENT	R3516	WHITE	155°	1/2"	4.9	131	131	121	4	387
◉	RELIABLE MODEL RFC49 RESIDENTIAL CONCEALED PENDENT	RGC49	WHITE	165°	1/2"	4.9	21	21	20	–	62
◀	RELIABLE MODEL F1Res44 RESIDENTIAL SIDEWALL	R3531	WHITE	155°	1/2"	4.4	–	–	6	160	166
⊙	RELIABLE MODEL F1FR56 Q.R. RECESSED PENDENT	F1FR56	WHITE	155°	1/2"	5.6	13	13	33	1	60
◐	RELIABLE MODEL F1FR56 Q.R. PENDENT (EXPOSED – BELOW CEILING)	F1FR56	WHITE	155°	1/2"	5.6	–	–	–	10	10
⊗	RELIABLE MODEL G6-46 CONCEALED PENDENT	F1FR56	WHITE	155°	1/2"	5.6	28	27	6	–	61
◁	RELIABEL MODEL F3QR56 Q.R. STANDARD SPRAY DRY HORIZONTAL SIDEWALL	F3QR56	CHROME	200°	1/2"	5.6	13	13	13	13	52
						TOTAL	206	205	199	188	798

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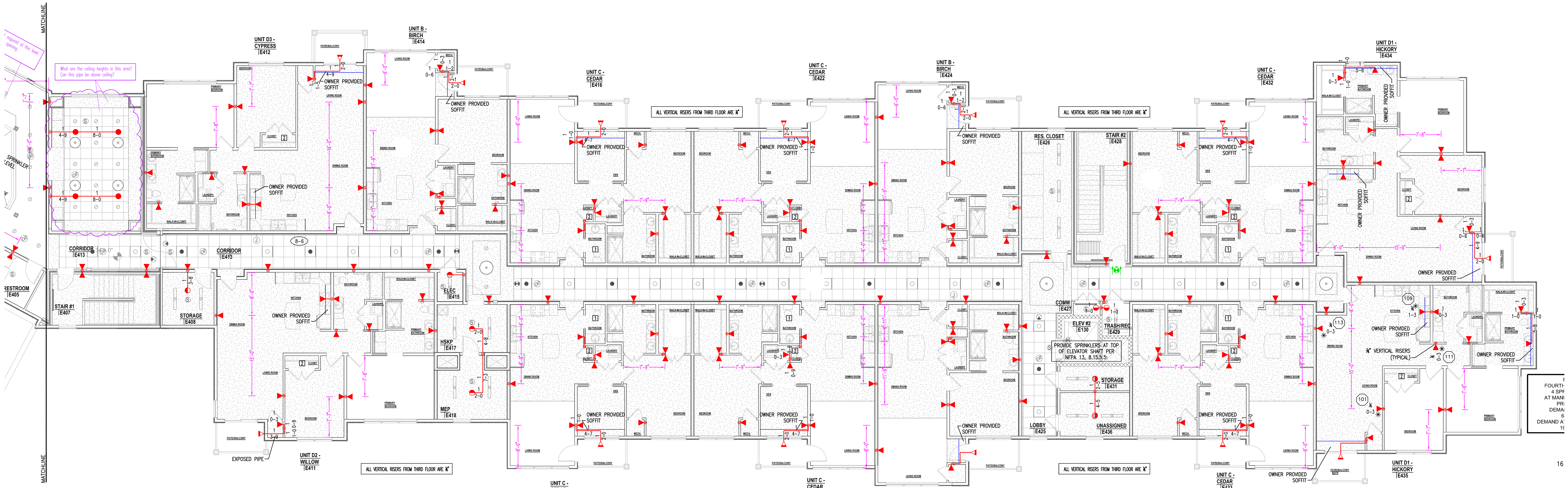
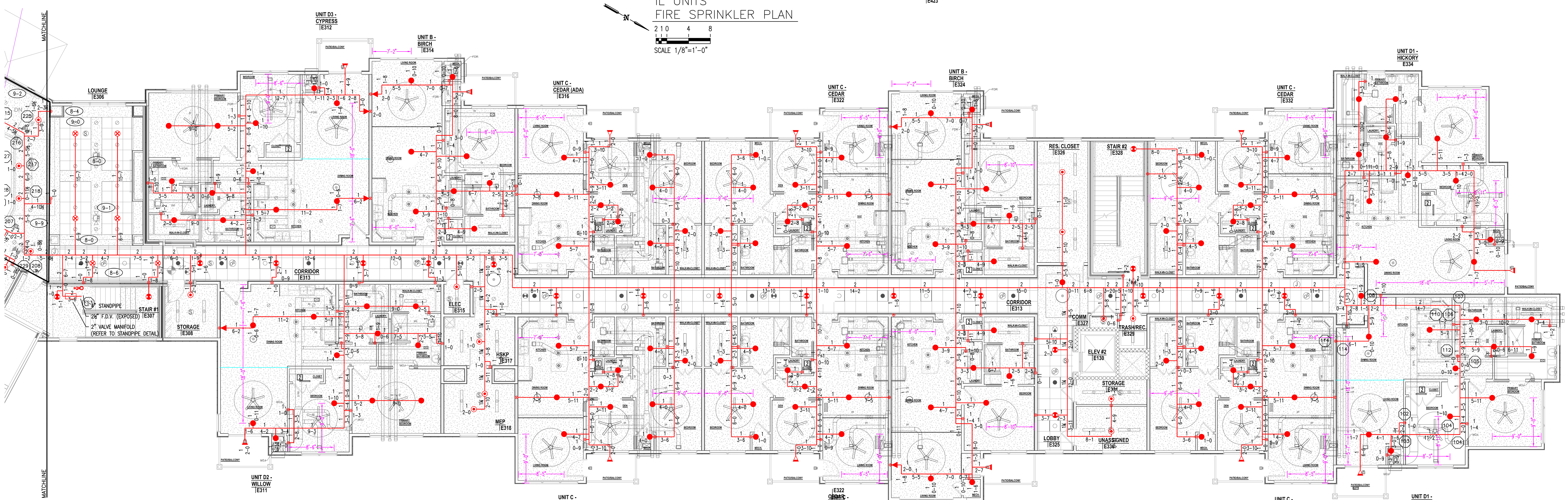


FOURTH FLOOR
IL UNITS
FIRE SPRINKLER PLAN

SCALE 1/8"=1'-0"



THIRD FLOOR
IL UNITS
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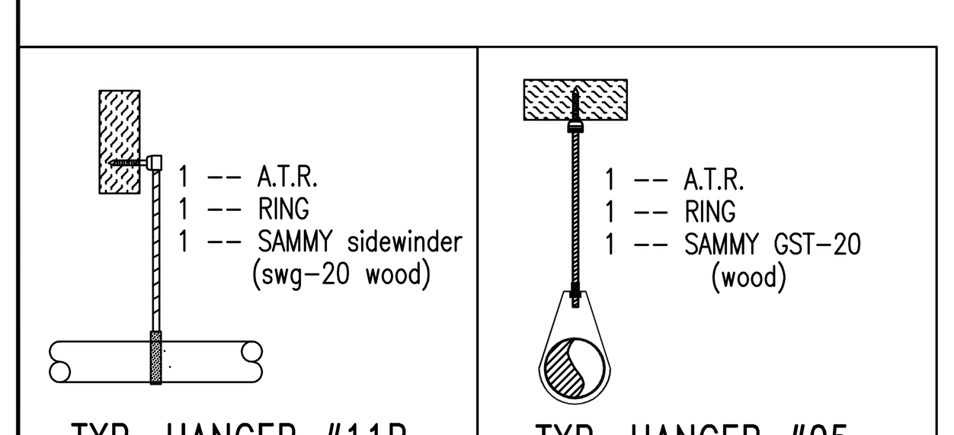

TYP. HANGER #11B
NO SCALE

TYP. HANGER #05
NO SCALE

HANGER SPACING TABLE

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[℄ ?'-?"]	CENTERLINE OF PIPE DOWN FROM CEILING OR ROOF
[EL ?'-?"]	CENTERLINE OF PIPE A.F.F.
◎ RN	RISER NIPPLE
◎ DN	PIPE DOWN
○	VERTICAL SUPPLY RISER
⊗	SPRINKLER RISER
⟋	APPROVED TYPE HANGER ON PIPE

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⊙	RELIABLE MODEL F1FR56 Q.R. RECESSED PENDENT	F1FR56	WHITE	155°	1/2"	5.6	13	13	33	1	60
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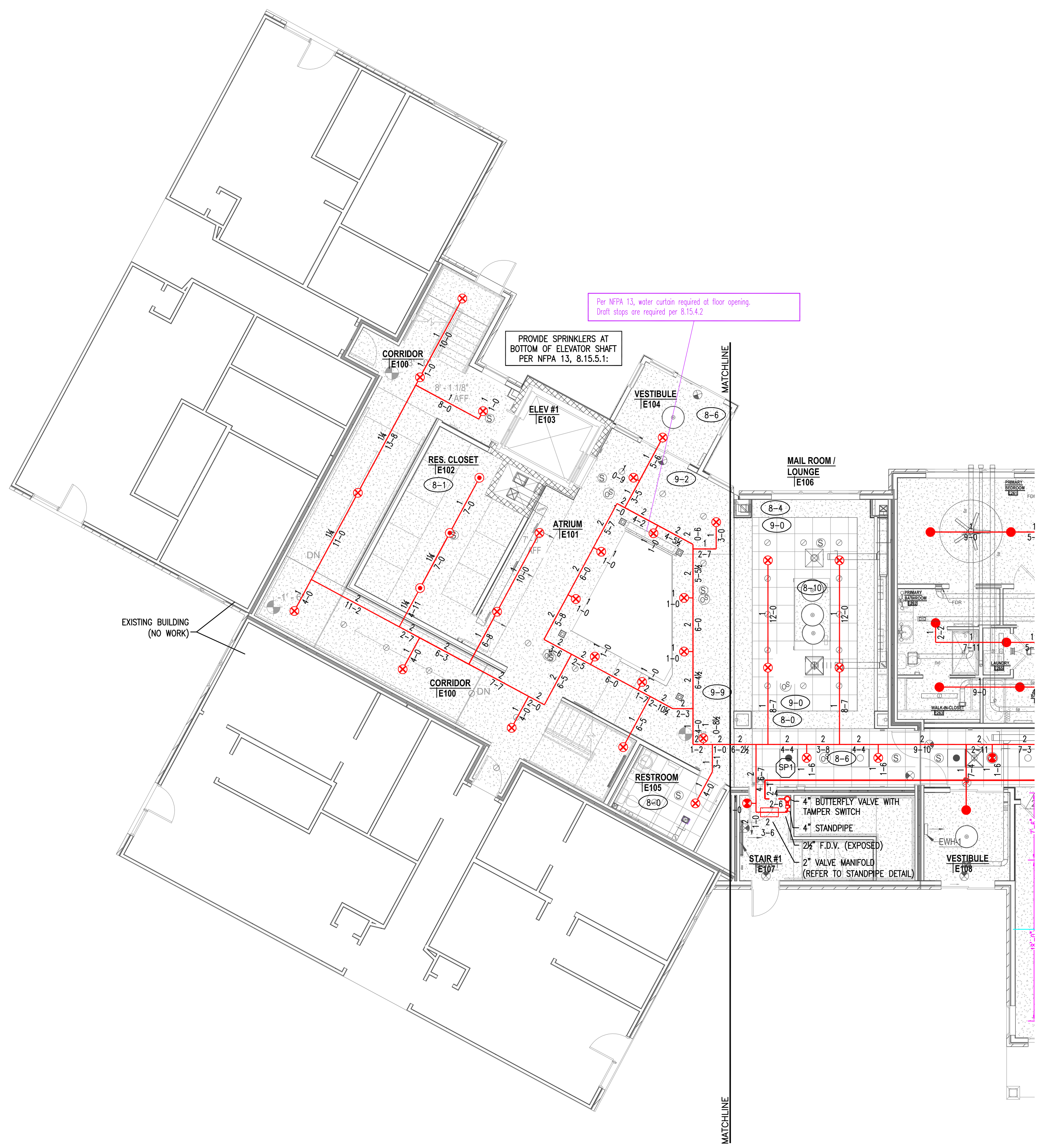
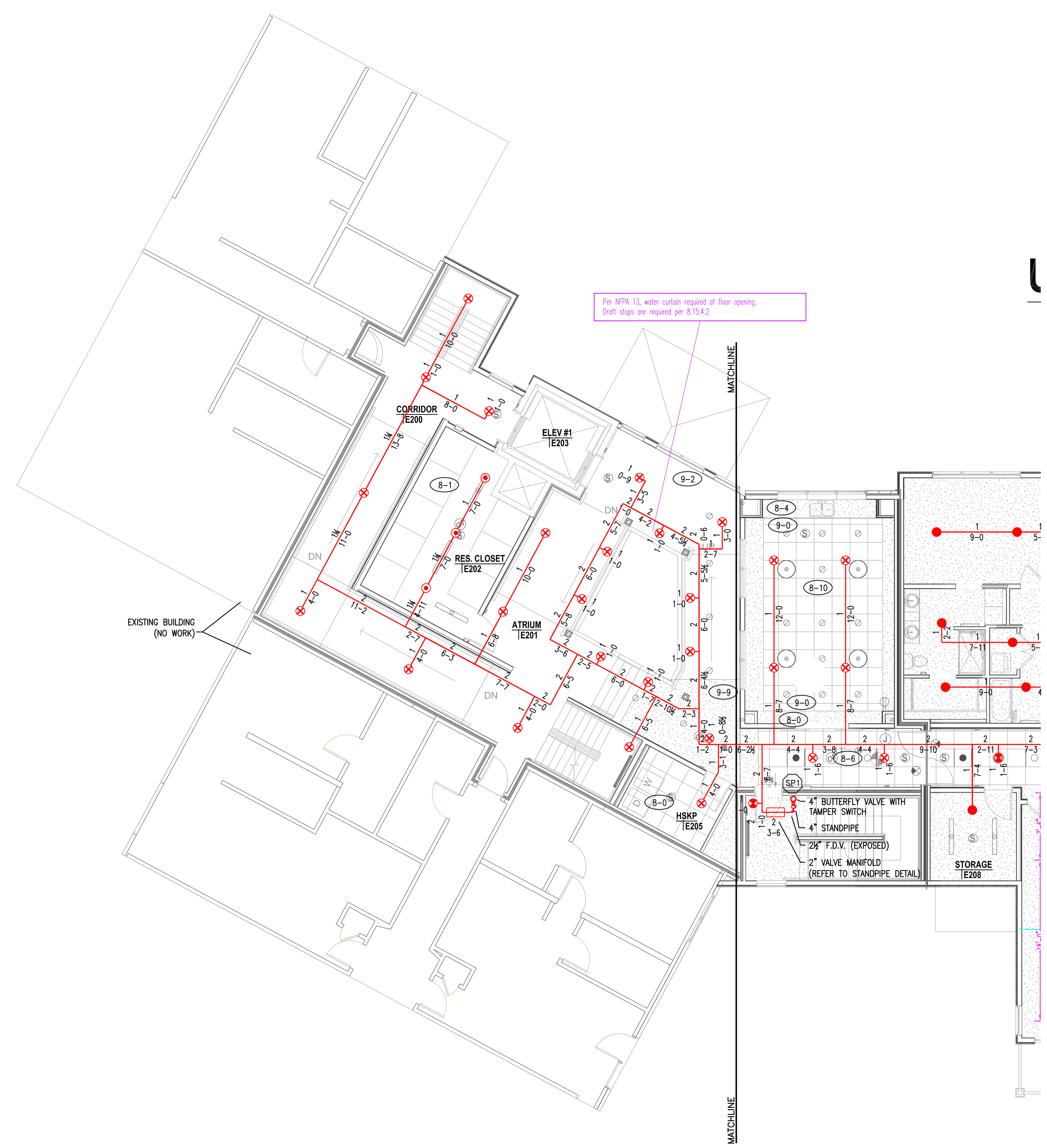


FIRST FLOOR
ATRIUM
FIRE SPRINKLER PLAN

SCALE 1/8"=1'-0"



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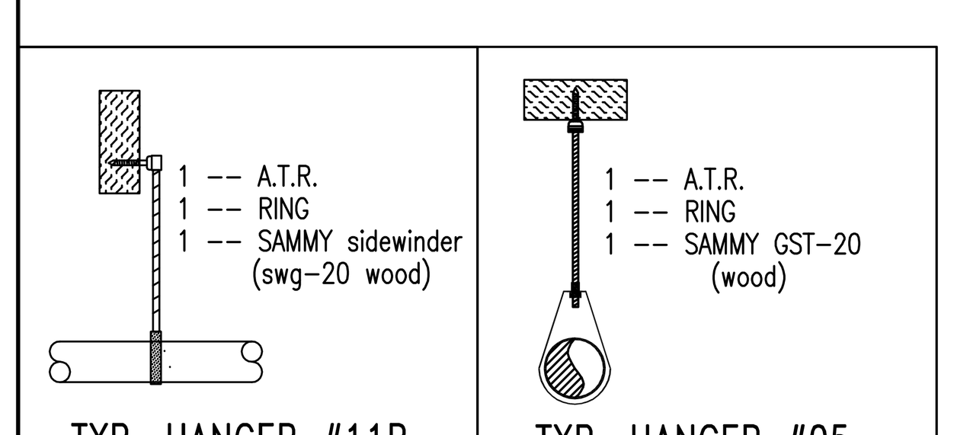

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8.15.4* Vertical Openings.

8.15.4.1* General. Unless the requirements of 8.15.4.4 are met, where moving stairways, staircases, or similar floor openings are unenclosed and where sprinkler protection is serving as the alternative to enclosure of the vertical opening, the floor openings involved shall be protected by closely spaced sprinklers in combination with draft stops in accordance with 8.15.4.2 and 8.15.4.3.

8.15.4.2 Draft Stops. Draft stops shall meet all of the following criteria:

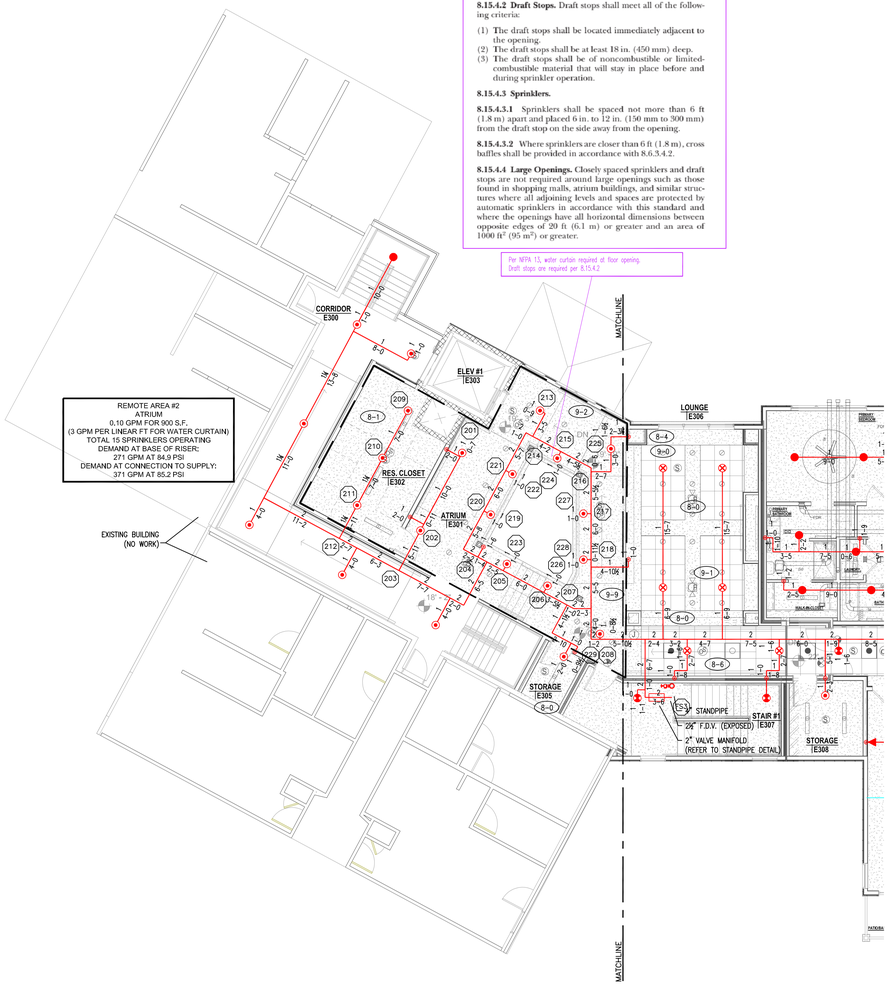
(1) The draft stops shall be located immediately adjacent to the opening.
(2) The draft stops shall be at least 18 in. (450 mm) deep.
(3) The draft stops shall be of noncombustible or limited-combustible material that will stay in place before and during sprinkler operation.

8.15.4.3 Sprinklers.

8.15.4.3.1 Sprinklers shall be spaced not more than 6 ft (1.8 m) apart and placed 6 in. to 12 in. (150 mm to 300 mm) from the draft stop on the side away from the opening.

8.15.4.3.2 Where sprinklers are closer than 6 ft (1.8 m), cross baffles shall be provided in accordance with 8.6.3.4.2.

8.15.4.4 Large Openings. Closely spaced sprinklers and draft stops are not required around large openings such as those found in shopping malls, atrium buildings, and similar structures where all adjoining levels and spaces are protected by automatic sprinklers in accordance with this standard and where the openings have all horizontal dimensions between opposite edges of 20 ft (6.1 m) or greater and an area of 1000 ft² (95 m²) or greater.

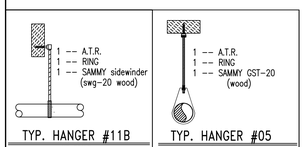


THIRD FLOOR
ATRIUM
FIRE SPRINKLER PLAN

SCALE 1/8"=1'-0"

FOURTH FLOOR
ATRIUM
FIRE SPRINKLER PLAN

SCALE 1/8"=1'-0"



TYP. HANGER #11B

NO SCALE

TYP. HANGER #05

NO SCALE

HANGER SPACING TABLE

PIPE SIZE (NOMINAL, INCHES)	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
STEEL PIPE (EXCEPT THREADED LIGHTWALL)	N/A	12'-0"	12'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"
STEEL PIPE (THREADED LIGHTWALL)	N/A	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"	12'-0"	N/A	N/A	N/A
COPPER	8'-0"	8'-0"	10'-0"	10'-0"	12'-0"	12'-0"	12'-0"	15'-0"	15'-0"	15'-0"
CPVC	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"	10'-0"	N/A	N/A	N/A

SYMBOLS LEGEND

SYMBOL	DESCRIPTION
✳	DENOTES HYDRAULICALLY CALCULATED SPRINKLER
(H)	HYDRAULIC REFERENCE POINT
(?'-?")	CEILING HEIGHT
TOJ	TOP OF JOIST ELEVATION ABOVE FINISHED FLOOR
?'-?	CENTERLINE OF PIPE DOWN FROM CEILING OR ROOF
?'-?	CENTERLINE OF PIPE A.F.F.
RN	RISER NIPPLE
DN	PIPE DOWN
	VERTICAL SUPPLY RISER
	SPRINKLER RISER
	APPROVED TYPE HANGER ON PIPE

SPRINKLER LEGEND

SYMBOL	SPRINKLER TYPE	SIN #	FINISH	TEMP.	THREAD	K-FACTOR	1ST FLR	2ND FLR	3RD FLR	4TH FLR	TOTAL
●	RELIABLE MODEL F1Res49 RESIDENTIAL RECESSED PENDENT	R3516	WHITE	155°	1/2"	4.9	131	131	121	4	387
◉	RELIABLE MODEL RFC49 RESIDENTIAL CONCEALED PENDENT	RGC49	WHITE	165°	1/2"	4.9	21	21	20	–	62
◀	RELIABLE MODEL F1Res44 RESIDENTIAL SIDEWALL	R3531	WHITE	155°	1/2"	4.4	–	–	6	160	166
⊙	RELIABLE MODEL F1FR56 Q.R. RECESSED PENDENT	F1FR56	WHITE	155°	1/2"	5.6	13	13	33	1	60
◐	RELIABLE MODEL F1FR56 Q.R. PENDENT (EXPOSED – BELOW CEILING)	F1FR56	WHITE	155°	1/2"	5.6	–	–	–	10	10
⊗	RELIABLE MODEL G6-46 CONCEALED PENDENT	F1FR56	WHITE	155°	1/2"	5.6	28	27	6	–	61
◁	RELIABLE MODEL F3QR56 Q.R. STANDARD SPRAY DRY HORIZONTAL SIDEWALL	F3QR56	CHROME	200°	1/2"	5.6	13	13	13	13	52
						TOTAL	206	205	199	188	798

REVISIONS:

#	DATE	DESCRIPTION

Fire Sprinkler Solutions, Inc.
1704 NE 82nd Terrace, Kansas City, MO 64118
phone: 816-260-4897 fax: 816-468-5633

ALL SAFE FIRE PROTECTION LLC
6603D Royal Street
Pleasant Valley, MO. 64068
P:816-492-7202
F:816-492-7310
info@allsafefirepro.com

JOHN KNOX VILLAGE
COURTYARDS BUILDING E
New Independent Living Building
Lee's Summit, MO

STATE OF MISSOURI
PATRICK L. LINK
NUMBER E-29281
REGISTERED PROFESSIONAL ENGINEER

CONTRACT NO.

CONTRACT WITH
Straub Construction

DRAWN BY:
PCL

CHECKED BY:
VC

PLOTTED FOR:
APPROVAL

DOCUMENT DATE:
06-11-24

SHEET NUMBER:
5 OF 5

Hydraulic Calculations

John Knox Village
Courtyards Building E

New Independent Living Building
Lee's Summit, MO
Date: 06-11-24
Calculated by: Paul C. Link, P.E.

Area Summary:

Area	Description	GPM	PSI	Demand Location
Area #1	Fourth floor dwelling unit	168	61.2	at conn. to street main
Area #2	Third floor atrium	371	85.2	at conn. to street main
Area #3	Standpipe	750	152	at conn. to FDC

ALL SAFE FIRE PROTECTION LLC
6603D Royal Street
Pleasant Valley, MO. 64068
P:816-492-7202
F:816-492-7310
info@allsafefirepro.com

Fire Sprinkler Solutions, Inc.
1704 NE 82nd Terrace, Kansas City, MO 64118
phone: 816-260-4897 * fax: 816-468-5633

From: Ryan McCormick <Ryan.McCormick@cityofls.net>
Date: May 2, 2024 at 3:04:26 PM CDT
To: Vincent Corbin <vcorbin@allsafefirepro.com>
Subject: RE: 515 NW Moore St - Fire Hydrant Flow Data Request

Date: 5/2/24
Time: 2:20 pm

Static PSI: 98
Residual PSI: 52
Flow GPM: 1875

Yours Truly,

Ryan McCormick | Operations Technician
1200 SE Hamblen Road | Lee's Summit, MO 64081
816.969.1900 |lswater.net **|** Ryan.McCormick@cityofls.net

HYDRAULIC DESIGN INFORMATION SHEET

Name - John Knox Village Building E - Area #1 Date - 06-11-24
Location - 4th floor apartment
Building - John Knox Village Building E System No. - wet
Contractor - All Safe Fire Protection Contract No. -
Calculated By - Paul C. Link, P.E. Drawing No. -
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 9'
OCCUPANCY - apartment

SYSTEM DESIGN

Type of Calculation: ( )NFPA 13 Residential (X)NFPA 13R ( )NFPA 13D
Number of Sprinklers Flowing: ( )1 ( )2 (X`)4 ( )
( )OtherCalculate per llisting
( )Specific Ruling Made by Date

Listed Flow at Start Point - 16 Gpm System Type
Listed Pres. at Start Point - 13.3 Psi (X) Wet ( ) Dry
MAXIMUM LISTED SPACING 16 x 20 ( ) Deluge ( ) PreAction
Domestic Flow Added - N/A Gpm Sprinkler or Nozzle
Additional Flow Added - 100 Gpm Make Reliable Model F1Res44
Elevation at Highest Outlet - 42'8 Feet Size 1/2" K-Factor 4.4
Note:calc 4 sprinklers in compartment Temperature Rating 155
maximum spacing is 16' x 18'

Calculation Summary: Gpm Required 168 Psi Required 61.2 at base of riser
C-Factor Used: Overhead 150 Underground 140

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 05-02-24	Rated Cap.	Cap.
Time of Test -	@ Psi	Elev.
Static (Psi) - 98	Elev.	
Residual (Psi) - 52	Other	Well
Flow (Gpm) - 1875		Proof Flow Gpm
Elevation - 0		

Location: 515 NW Moore Street

Source of Information: Lee's Summit Water

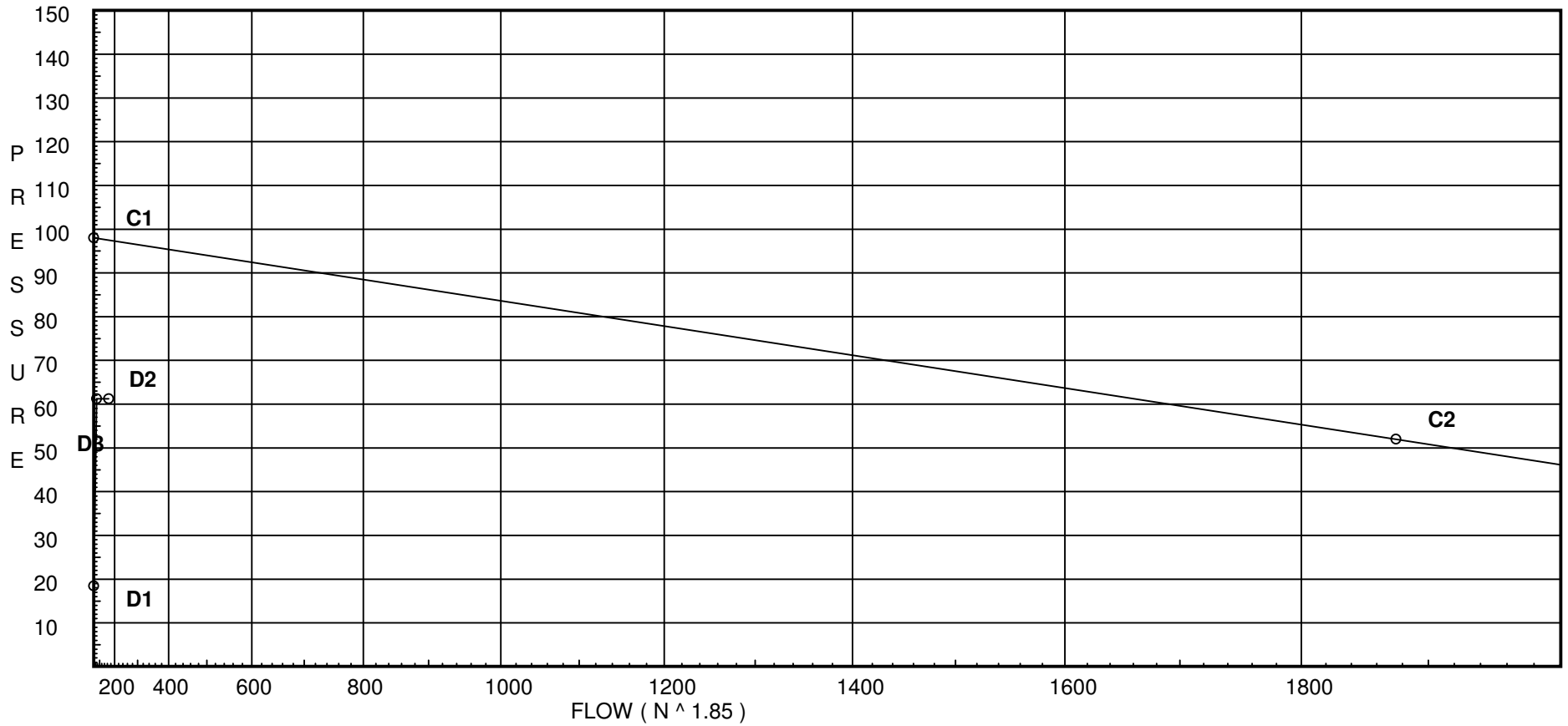
Water Supply Curve C

Fire Sprinkler Solutions, Inc.
John Knox building E - Area #1

Date 06-11-24

City Water Supply:
- C1 - Static Pressure : 98
- C2 - Residual Pressure: 52
- C2 - Residual Flow : 1875

Demand:
- D1 - Elevation : 18.480
- D2 - System Flow : 67.945
- D2 - System Pressure : 61.204
- Hose (Demand) : 100
- D3 - System Demand : 167.945
- Safety Margin : 36.266



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TST	98.0	52	1875.0	97.47	167.94	61.204

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
101	42.67	4.4	13.23	16.0	
102	33.0		20.76		
103	33.0		21.44		
104	33.0		22.26		
105	33.0		22.87		
106	33.0		24.0		
107	33.0		27.83		
108	33.0		28.17		
FS3	29.67		42.79		
SP1	10.0		51.37		
1	10.0		51.74		
TOR	10.0		51.83		
BOR	0.0		61.18		
TST	0.0		61.2	100.0	
109	42.67	4.4	15.34	17.24	
110	33.0		23.68		
111	42.67	4.4	13.84	16.37	
112	33.0		22.24		
113	42.67	4.4	17.36	18.33	
114	33.0		26.74		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
101	42.67	4.40	16.00	0.75	2N	14.0	10.080	150	13.231	
to						0.0	14.000		4.188	
102	33		16.0	0.874		0.0	24.080	0.1387	3.340	Vel = 8.56
102	33		0.0	1	N	7.0	3.170	150	20.759	
to					O	5.0	12.000		0.0	
103	33		16.0	1.101		0.0	15.170	0.0451	0.684	Vel = 5.39
103	33		0.0	1	N	7.0	11.170	150	21.443	
to						0.0	7.000		0.0	
104	33		16.0	1.101		0.0	18.170	0.0451	0.819	Vel = 5.39
104	33		0.0	1		0.0	13.420	150	22.262	
to						0.0	0.0		0.0	
105	33		16.0	1.101		0.0	13.420	0.0450	0.604	Vel = 5.39
105	33		16.38	1		0.0	6.830	150	22.866	
to						0.0	0.0		0.0	
106	33		32.38	1.101		0.0	6.830	0.1659	1.133	Vel = 10.91
106	33		17.23	1	N	7.0	3.500	150	23.999	
to						0.0	7.000		0.0	
107	33		49.61	1.101		0.0	10.500	0.3653	3.836	Vel = 16.72
107	33		0.0	2		0.0	16.750	150	27.835	
to						0.0	0.0		0.0	
108	33		49.61	2.003		0.0	16.750	0.0198	0.332	Vel = 5.05
108	33		18.34	2	6N	66.0	263.750	150	28.167	
to					2O	20.0	108.039		1.442	
FS3	29.67		67.95	2.003	B	7.779	371.789	0.0355	13.182	Vel = 6.92
					S	14.261				
FS3	29.67		0.0	4	T	26.334	19.750	120	42.791	
to						0.0	26.334		8.519	
SP1	10		67.95	4.26		0.0	46.084	0.0013	0.062	Vel = 1.53
SP1	10		0.0	4	4E	52.668	193.500	120	51.372	
to					T	26.334	79.002		0.0	
1	10		67.95	4.26		0.0	272.502	0.0014	0.371	Vel = 1.53
1	10		0.0	4	2E	26.334	39.080	120	51.743	
to						0.0	26.334		0.0	
TOR	10		67.95	4.26		0.0	65.414	0.0013	0.088	Vel = 1.53
TOR	10		0.0	4		0.0	10.000	120	51.831	
to						0.0	0.0		9.331	* * Fixed Loss = 5
BOR	0		67.95	4.26		0.0	10.000	0.0014	0.014	Vel = 1.53
BOR	0		0.0	6	E	20.084	100.000	140	61.176	
to					T	43.037	67.425		0.0	
TST	0		67.95	6.16	G	4.304	167.425	0.0002	0.028	Vel = 0.73
			100.00							Qa = 100.00
TST			167.95						61.204	K Factor = 21.47
109	42.67	4.40	17.24	0.75	N	7.0	16.080	150	15.344	
to					O	3.0	10.000		4.188	
110	33		17.24	0.874		0.0	26.080	0.1590	4.148	Vel = 9.22
110	33		0.0	1	O	5.0	1.170	150	23.680	
to						0.0	5.000		0.0	
106	33		17.24	1.101		0.0	6.170	0.0517	0.319	Vel = 5.81

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*******	Notes	******
			0.0									
106			17.24						23.999	K Factor = 3.52		
111	42.67	4.40	16.37	0.75	2N	14.0	15.080	150	13.842			
to						0.0	14.000		4.188			
112	33		16.37	0.874		0.0	29.080	0.1446	4.206	Vel = 8.75		
112	33		0.0	1	N	7.0	1.420	150	22.236			
to					O	5.0	12.000		0.0			
105	33		16.37	1.101		0.0	13.420	0.0469	0.630	Vel = 5.52		
			0.0									
105			16.37						22.866	K Factor = 3.42		
113	42.67	4.40	18.33	0.75	2N	14.0	15.080	150	17.364			
to						0.0	14.000		4.188			
114	33		18.33	0.874		0.0	29.080	0.1783	5.186	Vel = 9.80		
114	33		0.0	1	N	7.0	12.660	150	26.738			
to					O	5.0	12.000		0.0			
108	33		18.33	1.101		0.0	24.660	0.0579	1.429	Vel = 6.18		
			0.0									
108			18.33						28.167	K Factor = 3.45		

Hydraulic Design Information Sheet

Name - John Knox Village building E - area #2 Date - 06-11-24
Location - third floor atrium
Building - John Knox Village building E System No. - wet
Contractor - All Safe Fire Protection Contract No. -
Calculated By - Paul C. Link, P.E. Drawing No. -
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height - varies
Occupancy - apartment

SYSTEM DESIGN

(X) NFPA 13 (X) Lt. Haz. Ord.Haz.Gp. (X) 1 ( ) 2 ( ) 3 ( ) Ex.Haz.
( ) NFPA 231 ( ) NFPA 231C ( ) Figure Curve
Other reduced operating area for use of QR sprinklers
Specific Ruling Made By Date

Area of Sprinkler Operation - 900	System Type	Sprinkler/Nozzle	
Density - 0.10	(X) Wet	Make Reliable	
Area Per Sprinkler - varies	( ) Dry	Model F1FR56	
Elevation at Highest Outlet - 33'	( ) Deluge	Size 1/2"	
Hose Allowance - Inside -	( ) Preaction	K-Factor 5.6	
Rack Sprinkler Allowance -	( ) Other	Temp.Rat.155	
Hose Allowance - Outside - 100			

Note water curtain calculated at 3 gpm per linear foot

Calculation Summary: Flow Required - 371 Press Required - 85.2 at conn to main
C-Factor Used: 120 Overhead 140 Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test - 05-02-24		Cap. -
Time of Test -	Rated Cap.-	Elev.-
Static Press - 98	@ Press -	
Residual Press - 52	Elev. -	Well
Flow - 1875		Proof Flow
Elevation - 0		

Location - 515 NW Moore Street

Source of Information - Lee's Summit Water

COMMODITY STORAGE

Commodity Class Location
Storage Ht. Area Aisle W.
Storage Method: Solid Piled % Palletized % Rack

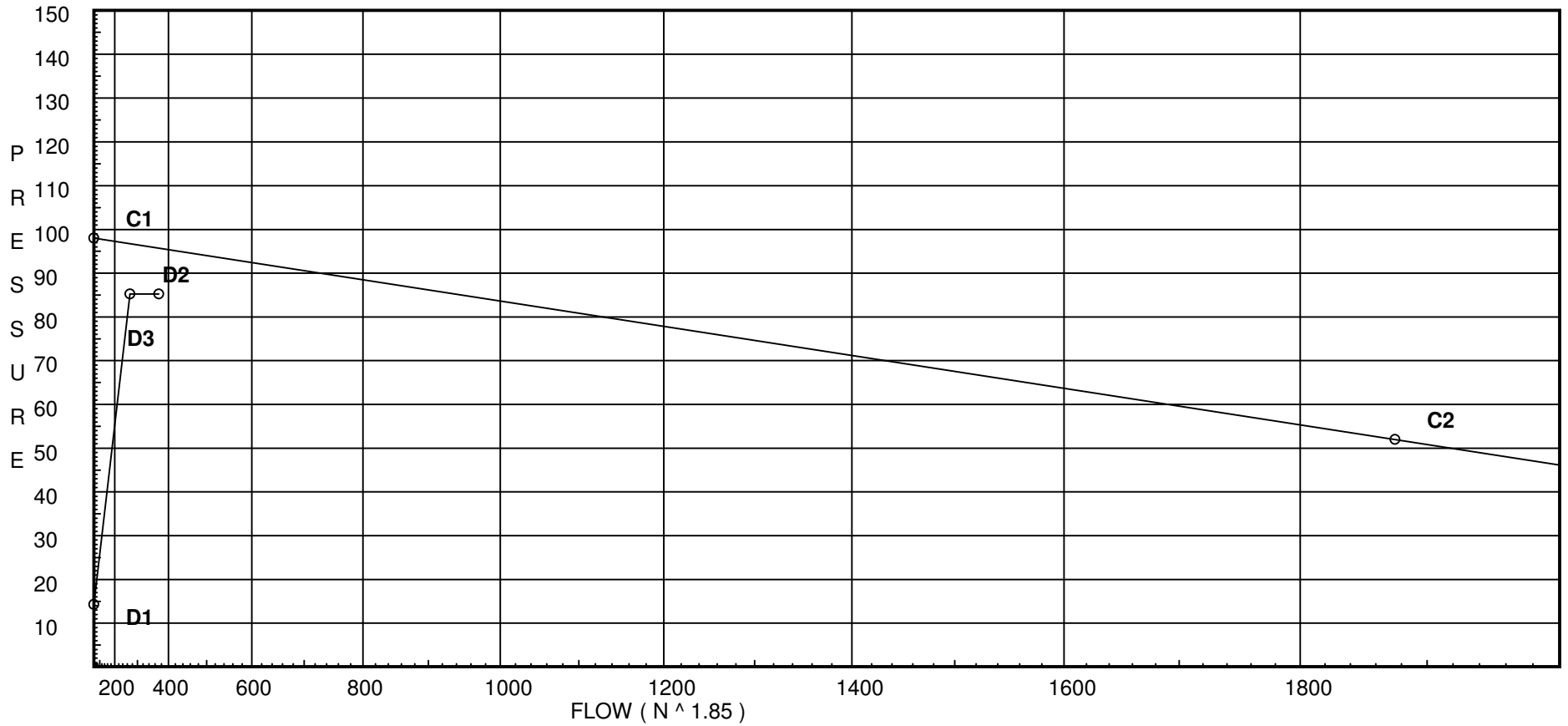
	( ) Single Row	( ) Conven. Pallet	( ) Auto. Storage	( ) Encap.
R	( ) Double Row	( ) Slave Pallet	( ) Solid Shelf	( ) Non
A	( ) Mult. Row		( ) Open Shelf	
C				
K	Flue Spacing	Clearance:Storage to Ceiling		
	Longitudinal	Transverse		

Horizontal Barriers Provided:

Water Supply Curve C

City Water Supply:
- C1 - Static Pressure : 98
- C2 - Residual Pressure: 52
- C2 - Residual Flow : 1875

Demand:
- D1 - Elevation : 14.292
- D2 - System Flow : 271.101
- D2 - System Pressure : 85.225
- Hose (Demand) : 100
- D3 - System Demand : 371.101
- Safety Margin : 10.478



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
N *	CPVC 90'Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TST	98.0	52	1875.0	95.702	371.1	85.225

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
DP03	31.0	5.6	7.0	14.82	
EQ03	33.0		6.41		
DP01	32.0	5.6	10.34	18.01	
EQ01	33.0		9.97		
DP05	32.0	5.6	7.18	15.01	
EQ05	33.0		6.99		
DP04	32.0	5.6	7.18	15.01	
EQ04	33.0		6.79		
DP02	31.0	5.6	7.0	14.82	
EQ02	33.0		6.21		
201	33.0	5.76	6.79	15.01	K=K @ EQ04
202	33.0	5.68	7.53	15.58	K=K @ EQ05
203	33.0		9.16		
204	33.0		10.88		
205	33.0		10.98		
206	33.0		11.35		
207	33.0		13.76		
208	33.0		19.96		
FS3	29.67		60.09		
SP1	10.0		69.41		
1	10.0		74.2		
TOR	10.0		75.35		
BOR	0.0		84.86		
TST	0.0		85.22	100.0	
209	33.0	5.94	6.86	15.57	K=K @ EQ02
210	33.0	5.85	7.46	15.99	K=K @ EQ03
211	33.0	5.85	7.81	16.36	K=K @ EQ03
212	33.0		9.0		
213	33.0	5.76	9.85	18.08	K=K @ EQ04
214	33.0		11.16		
215	33.0		11.27		
216	33.0		12.0		
217	33.0		12.37		
218	33.0		12.94		
219	33.0	5.7	10.14	18.17	K=K @ EQ01
220	33.0		10.88		
221	33.0		10.91		
222	33.0	5.7	10.17	18.19	K=K @ EQ01
223	33.0	5.7	10.23	18.25	K=K @ EQ01
224	33.0	5.7	10.51	18.49	K=K @ EQ01
225	33.0	5.68	10.94	18.77	K=K @ EQ05
226	33.0	5.7	10.58	18.55	K=K @ EQ01

NODE ANALYSIS (cont.)

Node Tag	*Elevation*	*Node Type*	*Pressure at Node*	*Discharge at Node*	*Notes*
227	33.0	5.7	11.54	19.38	K=K @ EQ01
228	33.0	5.7	12.07	19.82	K=K @ EQ01
229	33.0	5.76	18.67	24.89	K=K @ EQ04

Node1 / to / Node2	Elev1 / Elev2	K / Fact	Qa / Qt	Nom / Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact / Pf/Ft	Pt Pe Pf	******* Notes ******
DP03	31	5.60	14.82	1	O	5.0	2.000	150	7.000	
to						0.0	5.000		-0.866	
EQ03	33		14.82	1.101		0.0	7.000	0.0390	0.273	Vel = 4.99
			0.0							
EQ03			14.82						6.407	K Factor = 5.85
DP01	32	5.60	18.01	1		0.0	1.000	150	10.343	
to						0.0	0.0		-0.433	
EQ01	33		18.01	1.101		0.0	1.000	0.0560	0.056	Vel = 6.07
			0.0							
EQ01			18.01						9.966	K Factor = 5.70
DP05	32	5.60	15.01	1	O	5.0	1.000	150	7.184	
to						0.0	5.000		-0.433	
EQ05	33		15.01	1.101		0.0	6.000	0.0400	0.240	Vel = 5.06
			0.0							
EQ05			15.01						6.991	K Factor = 5.68
DP04	32	5.60	15.01	1		0.0	1.000	150	7.184	
to						0.0	0.0		-0.433	
EQ04	33		15.01	1.101		0.0	1.000	0.0400	0.040	Vel = 5.06
			0.0							
EQ04			15.01						6.791	K Factor = 5.76
DP02	31	5.60	14.82	1		0.0	2.000	150	7.000	
to						0.0	0.0		-0.866	
EQ02	33		14.82	1.101		0.0	2.000	0.0390	0.078	Vel = 4.99
			0.0							
EQ02			14.82						6.212	K Factor = 5.95
201	33	5.76	15.01	1	N	7.0	11.500	150	6.791	K = K @ EQ04
to						0.0	7.000		0.0	
202	33		15.01	1.101		0.0	18.500	0.0400	0.740	Vel = 5.06
202	33	5.68	15.58	1	O	5.0	5.920	150	7.531	K = K @ EQ05
to						0.0	5.000		0.0	
203	33		30.59	1.101		0.0	10.920	0.1494	1.631	Vel = 10.31
203	33		47.92	2	N	11.0	16.000	150	9.162	
to					O	10.0	21.000		0.0	
204	33		78.51	2.003		0.0	37.000	0.0463	1.714	Vel = 7.99
204	33		-4.87	2		0.0	2.420	150	10.876	
to						0.0	0.0		0.0	
205	33		73.64	2.003		0.0	2.420	0.0413	0.100	Vel = 7.50
205	33		18.25	2		0.0	6.000	150	10.976	
to						0.0	0.0		0.0	
206	33		91.89	2.003		0.0	6.000	0.0620	0.372	Vel = 9.36
206	33		18.55	2	N	11.0	6.700	150	11.348	
to					O	10.0	21.000		0.0	
207	33		110.44	2.003		0.0	27.700	0.0871	2.412	Vel = 11.24
207	33		135.77	2	N	11.0	5.160	150	13.760	
to						0.0	11.000		0.0	
208	33		246.21	2.003		0.0	16.160	0.3838	6.202	Vel = 25.07
208	33		24.89	2	2N	22.0	20.300	150	19.962	
to					2O	20.0	64.039		1.442	
FS3	29.67		271.1	2.003	B	7.779	84.339	0.4586	38.682	Vel = 27.60

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
					S	14.261				
FS3	29.67		0.0	4	T	26.334	19.750	120	60.086	
to						0.0	26.334		8.519	
SP1	10		271.1	4.26		0.0	46.084	0.0176	0.810	Vel = 6.10
SP1	10		0.0	4	4E	52.668	193.500	120	69.415	
to					T	26.334	79.002		0.0	
1	10		271.1	4.26		0.0	272.502	0.0176	4.787	Vel = 6.10
1	10		0.0	4	2E	26.334	39.080	120	74.202	
to						0.0	26.334		0.0	
TOR	10		271.1	4.26		0.0	65.414	0.0176	1.149	Vel = 6.10
TOR	10		0.0	4		0.0	10.000	120	75.351	
to						0.0	0.0		9.331	* * Fixed Loss = 5
BOR	0		271.1	4.26		0.0	10.000	0.0176	0.176	Vel = 6.10
BOR	0		0.0	6	E	20.084	100.000	140	84.858	
to					T	43.037	67.425		0.0	
TST	0		271.1	6.16	G	4.304	167.425	0.0022	0.367	Vel = 2.92
			100.00							Qa = 100.00
TST			371.10						85.225	K Factor = 40.20
209	33	5.94	15.57	1	N	7.0	7.000	150	6.862	K = K @ EQ02
to						0.0	7.000		0.0	
210	33		15.57	1.101		0.0	14.000	0.0428	0.599	Vel = 5.25
210	33	5.85	15.99	1.25		0.0	7.000	150	7.461	K = K @ EQ03
to						0.0	0.0		0.0	
211	33		31.56	1.394		0.0	7.000	0.0501	0.351	Vel = 6.63
211	33	5.85	16.36	1.25	O	6.0	4.920	150	7.812	K = K @ EQ03
to						0.0	6.000		0.0	
212	33		47.92	1.394		0.0	10.920	0.1086	1.186	Vel = 10.07
212	33		0.0	2		0.0	8.830	150	8.998	
to						0.0	0.0		0.0	
203	33		47.92	2.003		0.0	8.830	0.0186	0.164	Vel = 4.88
			0.0							
203			47.92						9.162	K Factor = 15.83
213	33	5.76	18.08	1	2N	14.0	4.170	150	9.850	K = K @ EQ04
to					O	5.0	19.000		0.0	
214	33		18.08	1.101		0.0	23.170	0.0565	1.308	Vel = 6.09
214	33		41.23	2		0.0	4.170	150	11.158	
to						0.0	0.0		0.0	
215	33		59.31	2.003		0.0	4.170	0.0276	0.115	Vel = 6.04
215	33		18.49	2	N	11.0	4.990	150	11.273	
to						0.0	11.000		0.0	
216	33		77.8	2.003		0.0	15.990	0.0455	0.728	Vel = 7.92
216	33		18.77	2		0.0	5.470	150	12.001	
to						0.0	0.0		0.0	
217	33		96.57	2.003		0.0	5.470	0.0680	0.372	Vel = 9.83
217	33		19.38	2		0.0	6.000	150	12.373	
to						0.0	0.0		0.0	
218	33		115.95	2.003		0.0	6.000	0.0952	0.571	Vel = 11.81
218	33		19.82	2		0.0	6.390	150	12.944	
to						0.0	0.0		0.0	
207	33		135.77	2.003		0.0	6.390	0.1277	0.816	Vel = 13.82

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
			0.0							
207			135.77						13.760	K Factor = 36.60
219	33	5.7	18.17	1	N	7.0	1.000	150	10.141	K = K @ EQ01
to					O	5.0	12.000		0.0	
220	33		18.17	1.101		0.0	13.000	0.0570	0.741	Vel = 6.12
220	33		4.87	2		0.0	6.000	150	10.882	
to						0.0	0.0		0.0	
221	33		23.04	2.003		0.0	6.000	0.0047	0.028	Vel = 2.35
221	33		18.19	2	N	11.0	6.580	150	10.910	
to						0.0	11.000		0.0	
214	33		41.23	2.003		0.0	17.580	0.0141	0.248	Vel = 4.20
			0.0							
214			41.23						11.158	K Factor = 12.34
222	33	5.7	18.19	1	N	7.0	1.000	150	10.168	K = K @ EQ01
to					O	5.0	12.000		0.0	
221	33		18.19	1.101		0.0	13.000	0.0571	0.742	Vel = 6.13
			0.0							
221			18.19						10.910	K Factor = 5.51
223	33	5.7	18.25	1	N	7.0	1.000	150	10.229	K = K @ EQ01
to					O	5.0	12.000		0.0	
205	33		18.25	1.101		0.0	13.000	0.0575	0.747	Vel = 6.15
			0.0							
205			18.25						10.976	K Factor = 5.51
224	33	5.7	18.49	1	N	7.0	1.000	150	10.508	K = K @ EQ01
to					O	5.0	12.000		0.0	
215	33		18.49	1.101		0.0	13.000	0.0588	0.765	Vel = 6.23
			0.0							
215			18.49						11.273	K Factor = 5.51
225	33	5.68	18.77	1	N	7.0	5.590	150	10.936	K = K @ EQ05
to					O	5.0	12.000		0.0	
216	33		18.77	1.101		0.0	17.590	0.0605	1.065	Vel = 6.33
			0.0							
216			18.77						12.001	K Factor = 5.42
226	33	5.7	18.55	1	N	7.0	1.000	150	10.578	K = K @ EQ01
to					O	5.0	12.000		0.0	
206	33		18.55	1.101		0.0	13.000	0.0592	0.770	Vel = 6.25
			0.0							
206			18.55						11.348	K Factor = 5.51
204	33		4.87	2	N	11.0	9.170	150	10.876	
to						0.0	11.000		0.0	
220	33		4.87	2.003		0.0	20.170	0.0003	0.006	Vel = 0.50
			0.0							
220			4.87						10.882	K Factor = 1.48
227	33	5.7	19.38	1	N	7.0	1.000	150	11.538	K = K @ EQ01
to					O	5.0	12.000		0.0	
217	33		19.38	1.101		0.0	13.000	0.0642	0.835	Vel = 6.53
			0.0							

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
217			19.38						12.373	K Factor = 5.51
228	33	5.7	19.82	1	N	7.0	1.000	150	12.074	K = K @ EQ01
to					O	5.0	12.000		0.0	
218	33		19.82	1.101		0.0	13.000	0.0669	0.870	Vel = 6.68
			0.0							
218			19.82						12.944	K Factor = 5.51
229	33	5.76	24.89	1	N	7.0	0.690	150	18.668	K = K @ EQ04
to					O	5.0	12.000		0.0	
208	33		24.89	1.101		0.0	12.690	0.1020	1.294	Vel = 8.39
			0.0							
208			24.89						19.962	K Factor = 5.57

HYDRAULIC DESIGN INFORMATION SHEET

Name - John Knox building E - Standpipe - Area #5 Date - 06-11-24
Location - stair
Building - John Knox building E System No. - standpipe
Contractor - All Safe Fire Protection Contract No. -
Calculated By - Paul C. Link, P.E. Drawing No. -
Occupancy - apartments

SYSTEM DESIGN

(X)NFPA 14 Number of Standpipes ( )1 (X)2 ( )3 ( )4 ( )
( )Other
( )Specific Ruling Made by Date

Flow at Top Most Outlet	- 250	Gpm	System Type	
Pres. at Top Most Outlet	- 100	Psi	(X) Wet	( ) Dry
Flow For Ea. Additional Standpipe	- 250	Gpm		
Total Additional Flow	- 250	Gpm		
Elevation at Highest Outlet	- 36.0	Feet		
Hose Valve Connection	( )1 1/2"	(X)2 1/2"		
Class Service (X)I	( )II	( )III		
Note:				

Calculation Summary: Gpm Required 750; Psi Required 152; Fire Dept. Conn.; C-Factor Used: Overhead 120; Underground

WATER SUPPLY

Water Flow Test:	Pump Data:	Tank or Reservoir:
Date of Test -		Cap.
Time of Test -	Rated Cap.	Elev.
Static (Psi) - 175	@ Psi	
Residual (Psi) - 175	Elev.	Well
Flow (Gpm) - 750		Proof Flow Gpm
Elevation - FDC		

Location: 175 psi at FDC

Source of Information:

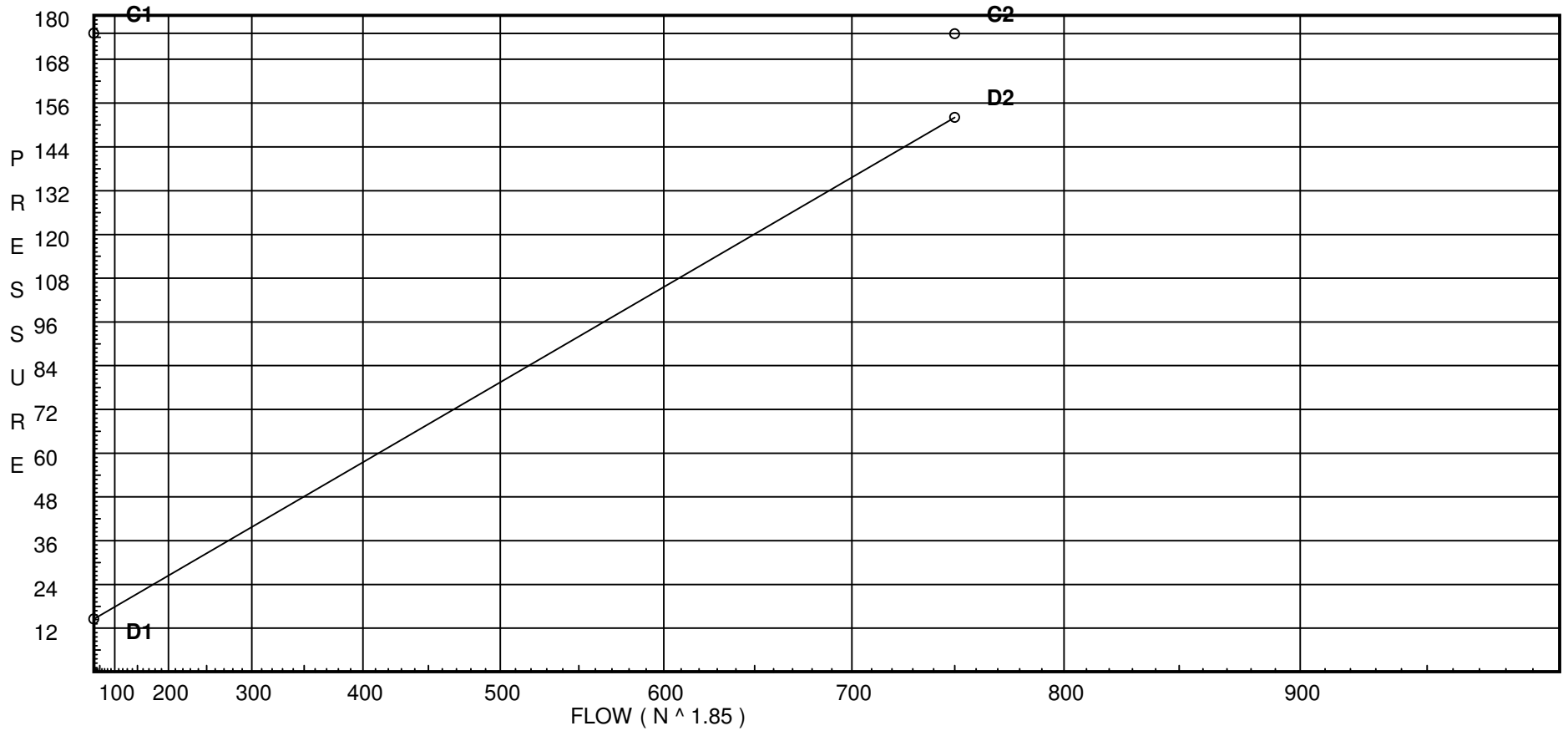
Water Supply Curve C

Fire Sprinkler Solutions, Inc.
John Know building E - Standpipe area #3

Date 06-11-24

City Water Supply:
- C1 - Static Pressure : 175.1
- C2 - Residual Pressure: 175
- C2 - Residual Flow : 750

Demand:
- D1 - Elevation : 14.509
- D2 - System Flow : 750
- D2 - System Pressure : 152.080
- Hose (Demand) : _____
- D3 - System Demand : 750
- Safety Margin : 22.920



Fittings Used Summary

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
FDC	175.1	175	750.0	175.0	750.0	152.08

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
HOS	36.0	25	100.0	250.0	
H1	36.0		102.91		
H2	42.5		100.26	250.0	
SP1	10.0		116.58		
1	10.0		132.29	250.0	
TOR	10.0		139.83		
FDC	2.5		152.08		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
HOS	36	25.00	250.00	2.5	T	12.0	0.500	120	100.000	
to					G	1.0	13.000		0.0	
H1	36		250.0	2.469		0.0	13.500	0.2154	2.908	Vel = 16.75
H1	36		0.0	4		0.0	11.330	120	102.908	
to						0.0	0.0		-2.815	
H2	42.500		250.0	4.26		0.0	11.330	0.0151	0.171	Vel = 5.63
H2	42.500+	250.00	250.00	4	T	26.334	14.660	120	100.264	
to						0.0	26.334		14.076	
SP1	10		500.0	4.26		0.0	40.994	0.0545	2.235	Vel = 11.25
SP1	10		0.0	4	4E	52.668	193.500	120	116.575	
to					T	26.334	94.802		0.0	
1	10		500.0	4.26	B	15.8	288.302	0.0545	15.717	Vel = 11.25
1	10	+ 250.00	250.00	4	2E	26.334	39.000	120	132.292	
to						0.0	26.334		0.0	
TOR	10		750.0	4.26		0.0	65.334	0.1154	7.541	Vel = 16.88
TOR	10		0.0	4	E	13.167	9.500	120	139.833	
to					T	26.334	68.469		3.248	
FDC	2.500		750.0	4.26	S	28.968	77.969	0.1154	8.999	Vel = 16.88
			0.0							
FDC			750.00						152.080	K Factor = 60.82