

TRANSMITTAL No. 003

To: Battalion Chief Jim Eden
207 S.E. Douglas
Lee's Summit, MO 64063

Date: 3/4/24

Contract No: 20543M

Attn: Jim Eden

Job Name: SLE ASC Expansion

The following listed items are enclosed:

☒ Drawings ☐ Submittal Data ☒ Hydraulics ☐ Other

Copies	Dated	Drawing No.	Description
1	2/28/24	1-6 of 6	FP Drawings for Approval (PDF COPY)
1	2/28/24	Area	Hydraulic Calculations for Approval (PDF COPY)

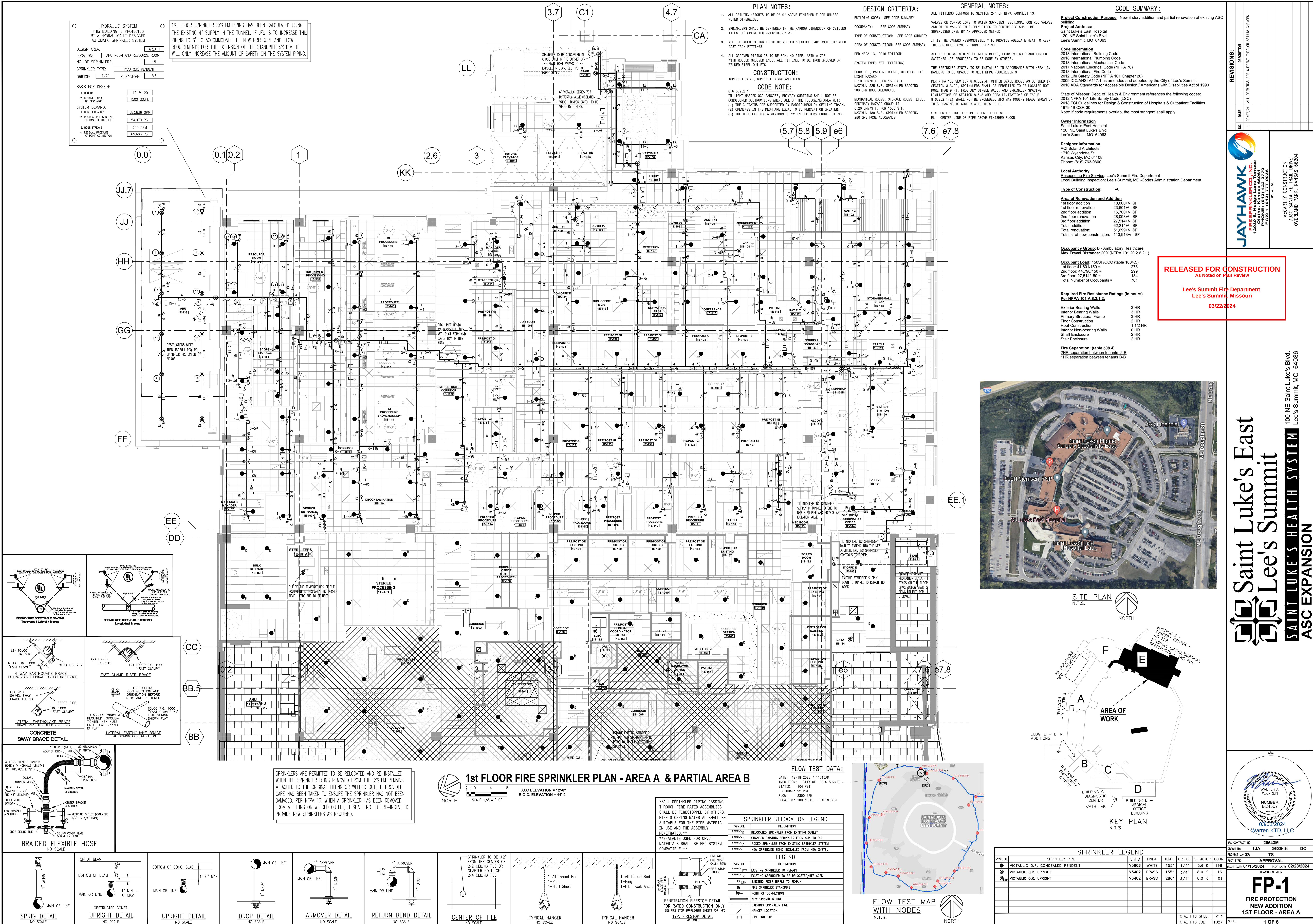
These are transmitted to you for:

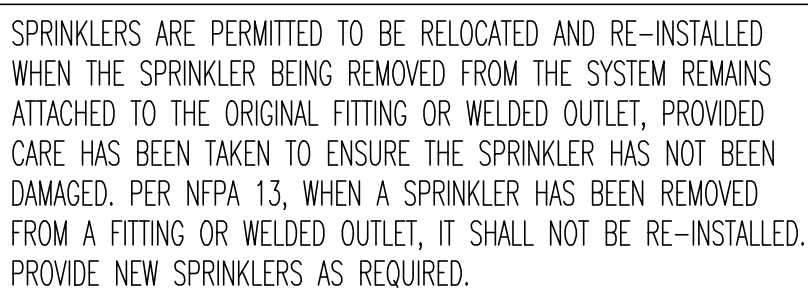
☒ Approval ☐ Your use ☐ Coordination ☐ Construction

Please return 2 copy(s) bearing your approval.

REMARKS: Please find attached the above referenced item(s).
Please return (2) copy(s) bearing your approval. If you have any
questions, please contact Tucker S. at (913) 422-3770. Thank you.

Shelly Meyers
Administrative Assistant





SPRINKLER RELOCATION LEGEND	
SYMBOL	DESCRIPTION
	RELOCATED SPRINKLER FROM EXISTING OUTLET
	CHANGES EXISTING SPRINKLER FROM S.A. TO O.R.
	ADDED SPRINKLER FROM EXISTING SPRINKLER SYSTEM
	NEW SPRINKLER BEING INSTALLED FROM NEW SYSTEM
LEGEND	
SYMBOL	DESCRIPTION
	EXISTING SPRINKLER TO REMAIN
	EXISTING SPRINKLER TO BE RELOCATED/REPLACED
	EXISTING RISER WAPIC TO REMAIN
	THE SPRINKLER STAMP/PIPE
	POINT OF CONNECTION
	NEW SPRINKLER LINE
	EXISTING SPRINKLER LINE
	HANGER LOOP CAP
	PIPE END CAP

[illegible]

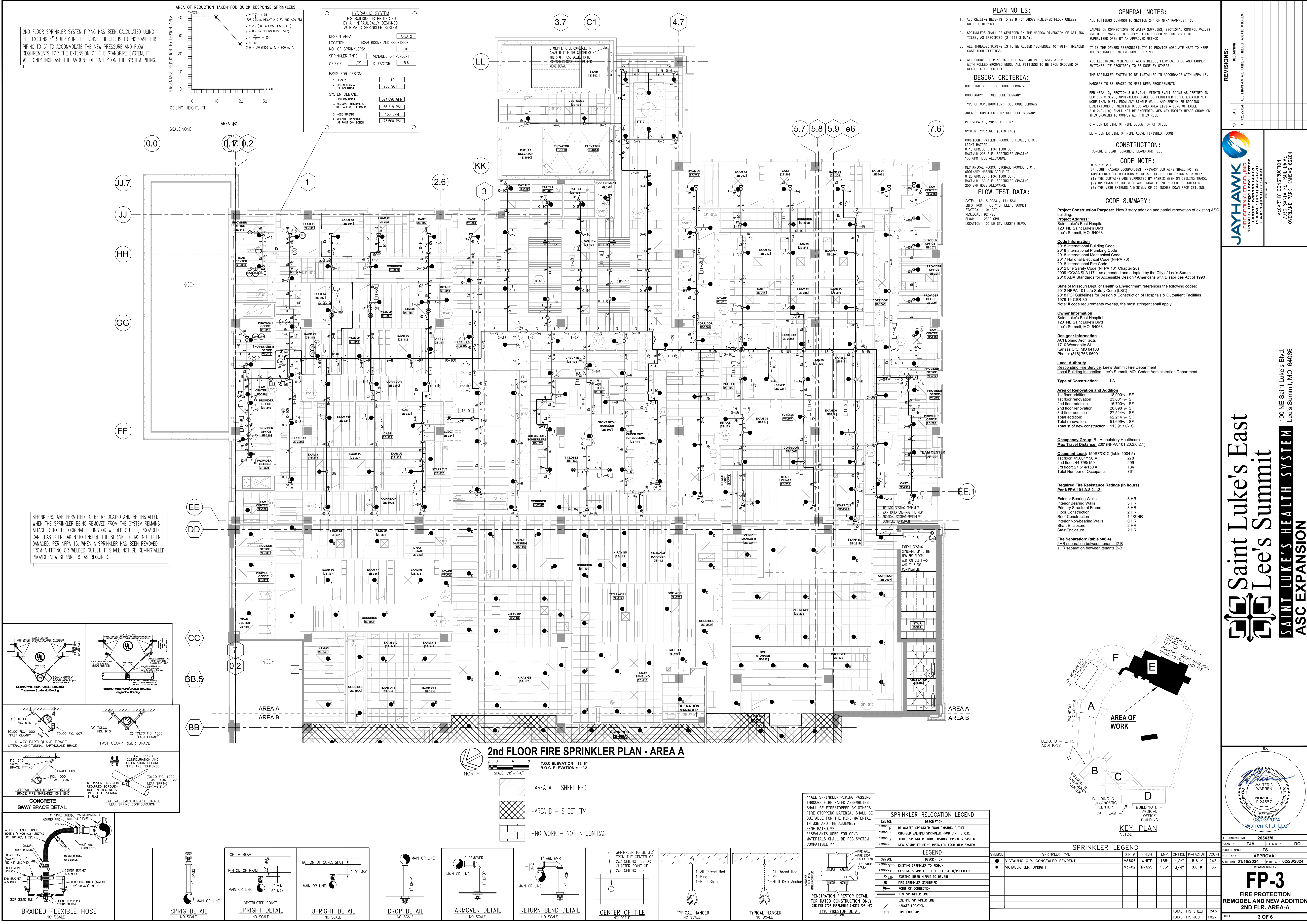
								TOTAL THIS SHEET	
								FROM THE YEAR	

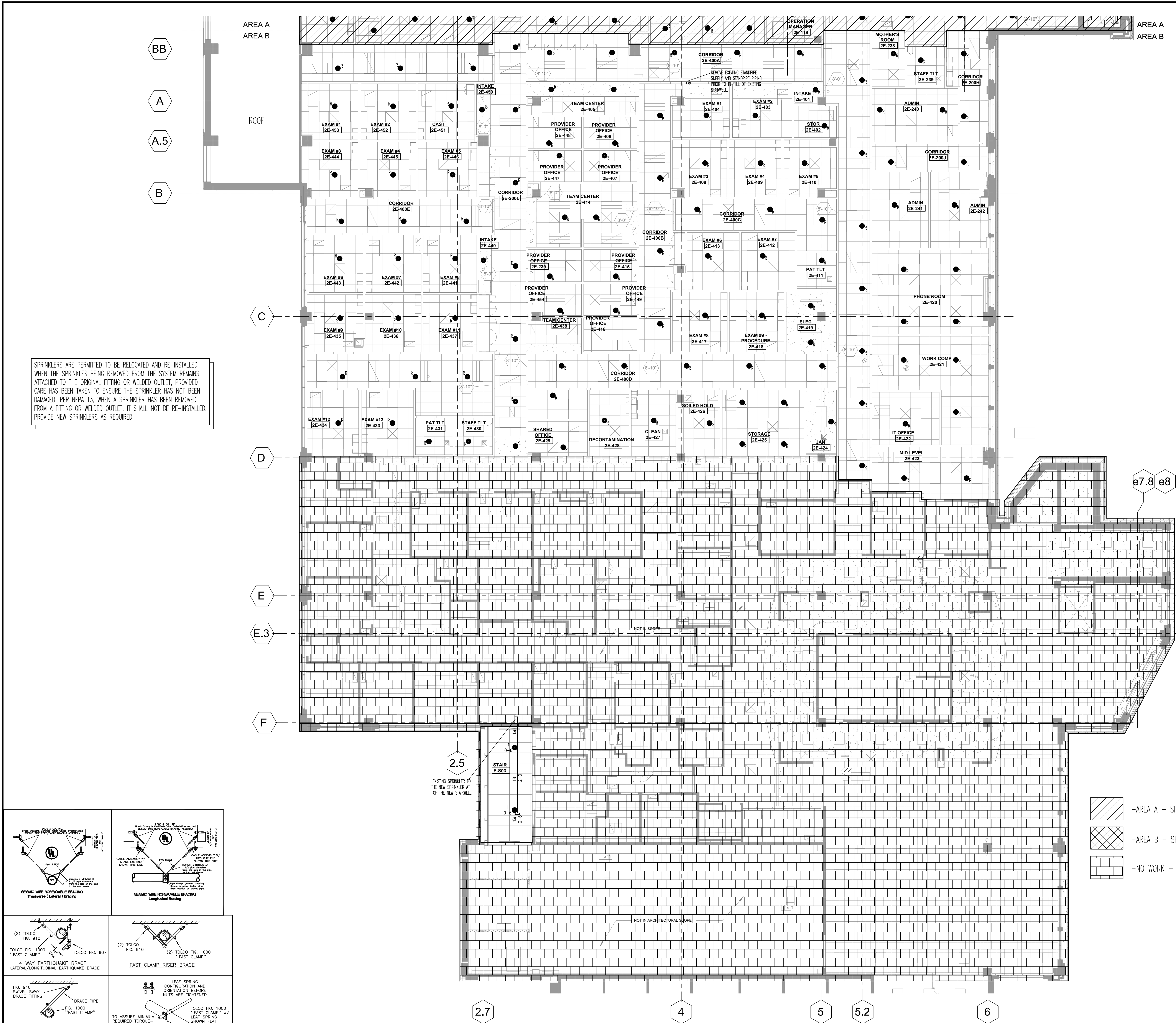
	TOTAL THIS SHEET	
	TOTAL THIS JOB	11

SHEET: 2 OF 6

SHEET: 2 OF 6

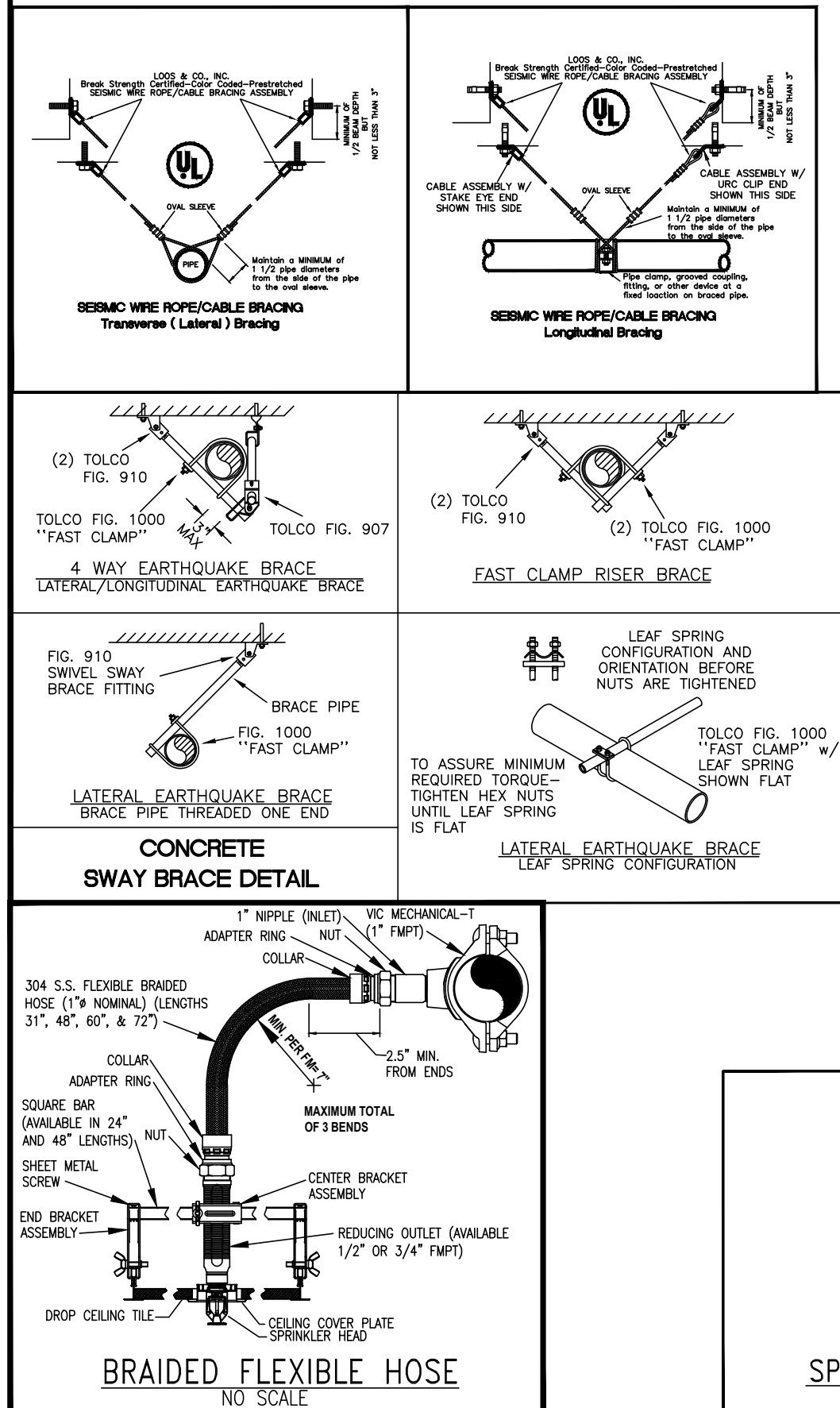
SHEET: 2 OF 6





SPRINKLERS ARE PERMITTED TO BE RELOCATED AND RE-INSTALLED 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. PER NFPA 13, WHEN A SPRINKLER HAS BEEN REMOVED FROM A FITTING OR WELDED OUTLET, IT SHALL NOT BE RE-INSTALLED. PROVIDE NEW SPRINKLERS AS REQUIRED.

- AREA A - SHEET FP3
- AREA B - SHEET FP4
- NO WORK - NOT IN CONTRACT



2nd FLOOR FIRE SPRINKLER PLAN - AREA B

ALL SPRINKLER PIPING PASSING THROUGH FIRE RATED ASSEMBLIES SHALL BE FIRESTOPPED BY OTHERS. FIRE STOPPING MATERIAL SHALL BE SUITABLE FOR THE PIPE MATERIAL IN USE AND THE ASSEMBLY PENETRATED.

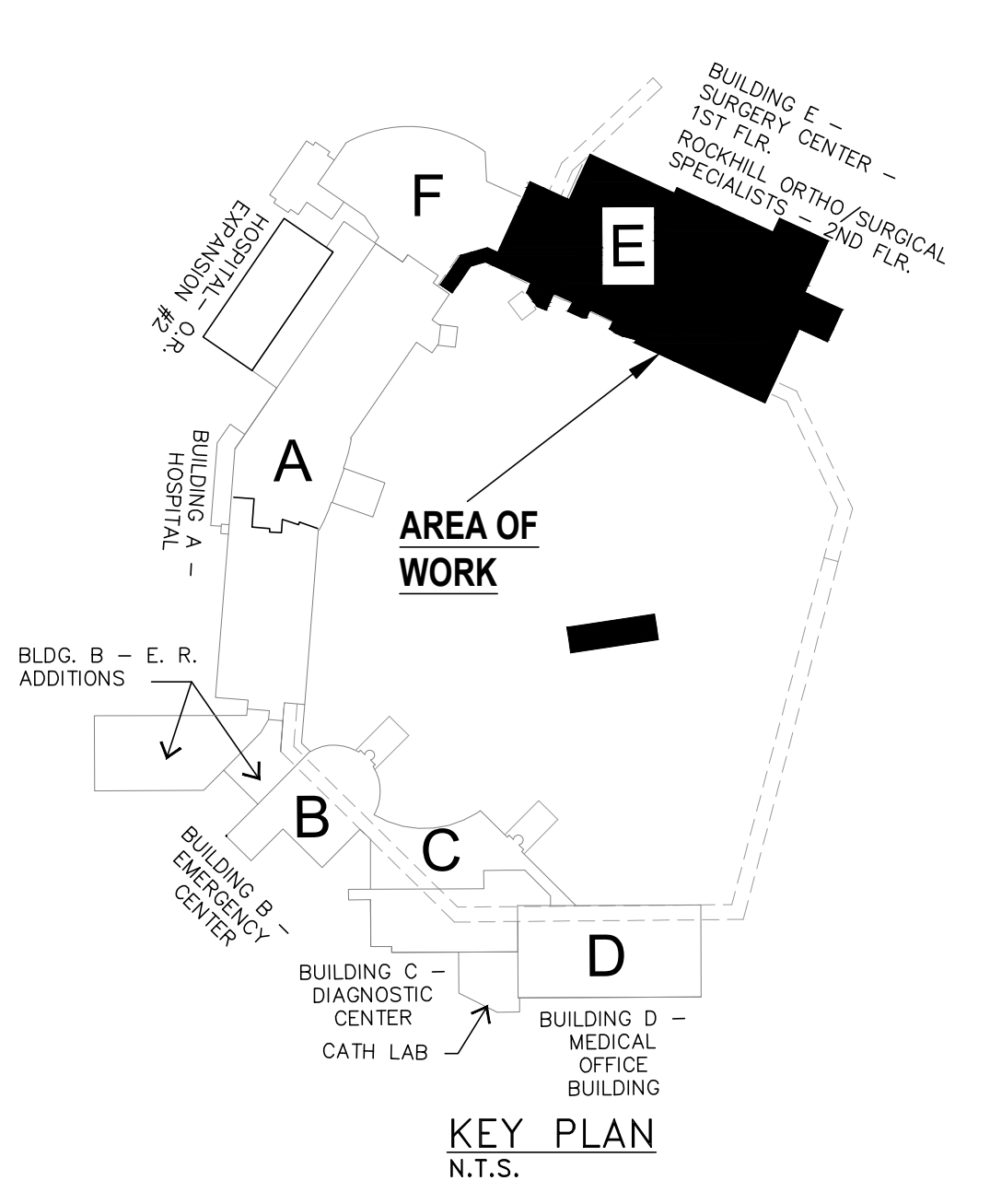
SEALANTS USED FOR CPVC MATERIALS SHALL BE FBC SYSTEM COMPATIBLE.

SPRINKLER RELOCATION LEGEND	
SYMBOL	DESCRIPTION
	RELOCATED SPRINKLER FROM EXISTING OUTLET
	CHANGED EXISTING SPRINKLER FROM S.R. TO Q.R.
	ADDED SPRINKLER FROM EXISTING SPRINKLER SYSTEM
	NEW SPRINKLER BEING INSTALLED FROM NEW SYSTEM

LEGEND	
SYMBOL	DESCRIPTION
	EXISTING SPRINKLER TO REMAIN
	EXISTING RISER PIPE TO REMAIN
	FIRE SPRINKLER STANDPIPE
	POINT OF CONNECTION
	HANGER LOCATION
	PIPE END CAP

SPRINKLER LEGEND							
SYMBOL	SPRINKLER TYPE	SIN #	FINISH	TEMP.	ORIFICE	K-FACTOR	COUNT
●	VICTAULIC Q.R. CONCEALED PENDENT	V5606	WHITE	155°	1/2"	5.6 K	116
TOTAL THIS SHEET							116
TOTAL THIS JOB							1027

- PLAN NOTES:**
- ALL CEILING HEIGHTS TO BE 9'-0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
 - SPRINKLERS SHALL BE CENTERED IN THE NARROW DIMENSION OF CEILING TILES, AS SPECIFIED (211313-3.6.A).
 - ALL THREADED PIPING IS TO BE ALLIED "SCHEDULE 40" WITH THREADED CAST IRON FITTINGS.
 - ALL GROOVED PIPING IS TO BE SCH. 40 PIPE, ASTM A-795 WITH ROLLED GROOVED ENDS. ALL FITTINGS TO BE IRON GROOVED OR WELDED STEEL OUTLETS.
- DESIGN CRITERIA:**
- BUILDING CODE: SEE CODE SUMMARY
- OCCUPANCY: SEE CODE SUMMARY
- TYPE OF CONSTRUCTION: SEE CODE SUMMARY
- AREA OF CONSTRUCTION: SEE CODE SUMMARY
- PER NFPA 13, 2016 EDITION:
- SYSTEM TYPE: WET (EXISTING)
- CORRIDOR, PATIENT ROOMS, OFFICES, ETC.: LIGHT HAZARD 0.10 GPM/S.F. FOR 1500 S.F. MAXIMUM 225 S.F. SPRINKLER SPACING 100 GPM HOSE ALLOWANCE
- MECHANICAL ROOMS, STORAGE ROOMS, ETC.: ORDINARY HAZARD GROUP 11 0.20 GPM/S.F. FOR 1500 S.F. MAXIMUM 130 S.F. SPRINKLER SPACING 350 GPM HOSE ALLOWANCE
- FLOW TEST DATA:**
- DATE: 12-18-2023 / 11:15AM
- INFO FROM: CITY OF LEE'S SUMMIT
- STATID: 104 PSI
- RESIDUAL: 92 PSI
- FLOW: 2300 GPM
- LOCATION: 100 NE ST. LUKE'S BLVD.
- GENERAL NOTES:**
- ALL FITTINGS CONFORM TO SECTION 2-4 OF NFPA PAMPHLET 13.
- VALVES ON CONNECTIONS TO WATER SUPPLIES, SECTIONAL CONTROL VALVES AND OTHER VALVES IN SUPPLY LINES TO SPRINKLERS SHALL BE SUPERVISED OPEN BY AN APPROVED METHOD.
- IT IS THE OWNER'S RESPONSIBILITY TO PROVIDE ADEQUATE HEAD TO KEEP THE SPRINKLER SYSTEM FROM FREEZING.
- ALL ELECTRICAL WIRING OF ALARM BELLS, FLOW SWITCHES AND TAMPER SWITCHES (IF REQUIRED) TO BE DONE BY OTHERS.
- THE SPRINKLER SYSTEM TO BE INSTALLED IN ACCORDANCE WITH NFPA 13.
- HANGERS TO BE SPACED TO MEET NFPA REQUIREMENTS
- PER NFPA 13, SECTION 8.6.3.2.4, WITHIN SMALL ROOMS AS DEFINED IN SECTION 3.3.20, SPRINKLERS SHALL BE PERMITTED TO BE LOCATED NOT MORE THAN 9 FT. FROM ANY SINGLE WALL, AND SPRINKLER SPACING LIMITATIONS OF SECTION 8.6.3 AND AREA LIMITATIONS OF TABLE 8.6.2.2.1(a) SHALL NOT BE EXCEEDED. JFS MAY MODIFY HEADS SHOWN ON THIS DRAWING TO COMPLY WITH THIS RULE.
- ± = CENTER LINE OF PIPE BELOW TOP OF STEEL
- EL = CENTER LINE OF PIPE ABOVE FINISHED FLOOR
- CONSTRUCTION:**
- CONCRETE SLABS, CONCRETE BEAMS AND TEES
- CODE NOTE:**
- 8.6.5.2.2.1 IN LIGHT HAZARD OCCUPANCIES, PRIVACY CURTAINS SHALL NOT BE CONSIDERED OBSTRUCTIONS WHERE ALL OF THE FOLLOWING AREA MET:
- THE CURTAINS ARE SUPPORTED BY FABRIC MESH OR CEILING TRACK.
 - OPENINGS IN THE MESH ARE EQUAL TO 70 PERCENT OR GREATER.
 - THE MESH EXTENDS A MINIMUM OF 22 INCHES DOWN FROM CEILING.
- CODE SUMMARY:**
- Project Construction Purpose:** New 3 story addition and partial renovation of existing ASC Building
- Project Address:** Saint Luke's East Hospital 120 NE Saint Luke's Blvd Lee's Summit, MO 64063
- Code Information:** 2018 International Building Code 2018 International Plumbing Code 2015 International Mechanical Code 2017 National Electrical Code (NFPA 70) 2018 International Fire Code 2012 Life Safety Code (NFPA 101 Chapter 20) 2009 ICC/ANSI A117.1 as amended and adopted by the City of Lee's Summit 2010 ADA Standards for Accessible Design / Americans with Disabilities Act of 1990
- State of Missouri Dept. of Health & Environment references the following codes:** 2012 NFPA 101 Life Safety Code (LSC) 2018 FGI Guidelines for Design & Construction of Hospitals & Outpatient Facilities 1979 19-CSR-30
- Note:** If code requirements overlap, the most stringent shall apply.
- Owner Information:** Saint Luke's East Hospital 120 NE Saint Luke's Blvd Lee's Summit, MO 64063
- Designer Information:** ACI Build Architects 1710 Wyandotte St. Kansas City, MO 64108 Phone: (816) 763-9600
- Local Authority:** Responding Fire Service: Lee's Summit Fire Department Local Building Inspection: Lee's Summit, MO -Codes Administration Department
- Type of Construction:** I-A
- Area of Renovation and Addition:** 1st floor addition 16,000+/- SF 1st floor renovation 23,601+/- SF 2nd floor addition 16,700+/- SF 2nd floor renovation 28,098+/- SF 3rd floor addition 27,514+/- SF Total addition: 62,214+/- SF Total renovation: 51,899+/- SF Total of new construction: 113,913+/- SF
- Occupancy Group:** B - Ambulatory Healthcare **Max Travel Distance:** 200' (NFPA 101 20.2.6.2.1)
- Occupant Load:** 150SP/OCC (table 1004.5) 1st floor: 41,601/150 = 278 2nd floor: 44,758/150 = 299 3rd floor: 27,514/150 = 184 Total Number of Occupants = 761
- Required Fire Resistance Ratings (in hours):** Per NFPA 101 A.8.2.1.2: Exterior Bearing Walls 3 HR Interior Bearing Walls 3 HR Primary Structural Frame 3 HR Floor Construction 2 HR Roof Construction 1 1/2 HR Interior Non-bearing Walls 0 HR Shaft Enclosure 2 HR Stair Enclosure 2 HR
- Fire Separation: (table 508.4)** 2HR separation between tenants B2-B 1HR separation between tenants B-B



JAYHAWK FIRE SPRINKLER CO., INC.
1201 E. 12TH AVE., SUITE 100
Olathe, Kansas 66061
PHONE: (816) 763-9600
FAX: (816) 777-0036
COURTESY: JAYHAWK

MADEBY CONSTRUCTION
7850 SAINT LUKE DRIVE
OVERLAND PARK, KANSAS 66204

SAINT LUKE'S HEALTH SYSTEM

ASC EXPANSION

100 NE Saint Luke's Blvd.
Lee's Summit, MO 64066

WALTER A. WARREN
REGISTERED PROFESSIONAL ENGINEER
NUMBER E-24557
03/09/2024
Warren KTD, LLC

PROJECT NO. **20543M**

DESIGN BY: **TJA** CHECKED BY: **DO**

PROJECT MANAGER: **TS**

APPROVAL

DATE: **01/15/2024** REVISION DATE: **02/28/2024**

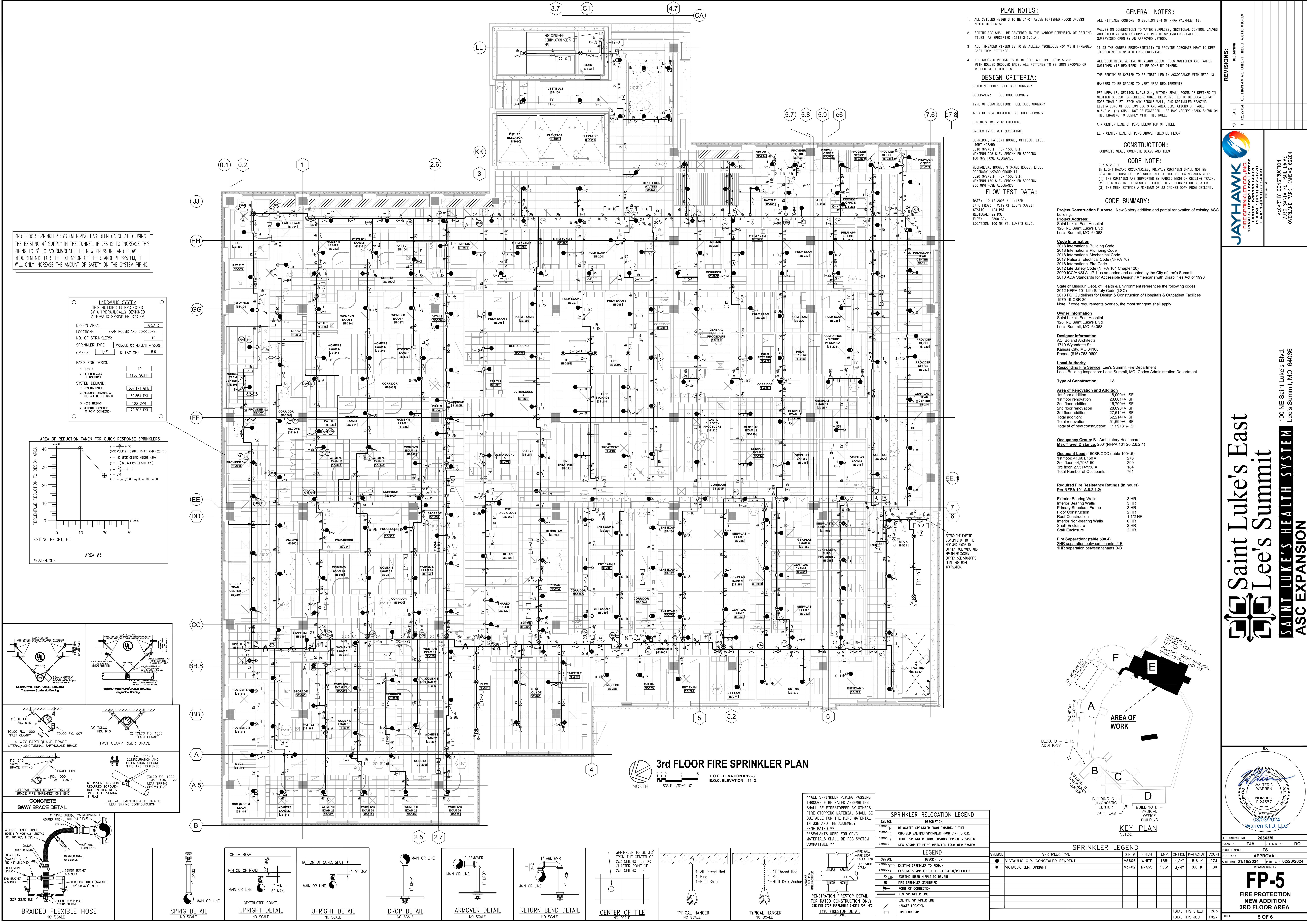
FP-4

FIRE PROTECTION HEAD RELOCATION

2ND FLR. - AREA B

TOTAL THIS SHEET: 116
TOTAL THIS JOB: 1027

4 OF 6



PLAN NOTES:

- ALL CEILING HEIGHTS TO BE 9'-0" ABOVE FINISHED FLOOR UNLESS NOTED OTHERWISE.
- SPRINKLERS SHALL BE CENTERED IN THE NARROW DIMENSION OF CEILING TILES, AS SPECIFIED (21310-3.6.A).
- ALL THREADED PIPING IS TO BE ALLED "SCHEDULE 40" WITH THREADED CAST IRON FITTINGS.
- ALL GROOVED PIPING IS TO BE SCH. 40 PIPE, ASTM A-795 WITH ROLLED GROOVED ENDS. ALL FITTINGS TO BE IRON GROOVED OR WELDED STEEL OUTLETS.

DESIGN CRITERIA:

BUILDING CODE: SEE CODE SUMMARY

OCCUPANCY: SEE CODE SUMMARY

TYPE OF CONSTRUCTION: SEE CODE SUMMARY

AREA OF CONSTRUCTION: SEE CODE SUMMARY

PER NFPA 13, 2016 EDITION:

SYSTEM TYPE: WET (EXISTING)

CORRIDOR, PATIENT ROOMS, OFFICES, ETC., LIGHT HAZARD

0.10 GPM/S.F. FOR 1500 S.F.

MAXIMUM 225 S.F. SPRINKLER SPACING

100 GPM HOSE ALLOWANCE

MECHANICAL ROOMS, STORAGE ROOMS, ETC., LIGHT HAZARD

0.10 GPM/S.F. FOR 1500 S.F.

MAXIMUM 150 S.F. SPRINKLER SPACING

250 GPM HOSE ALLOWANCE

FLOW TEST DATA:

DATE: 12-18-2023 11:15AM

INFO FROM: CITY OF LEE'S SUMMIT

STATISTICAL: 104 PSI

RESIDUAL: 92 PSI

FLOW: 2300 GPM

LOCATION: 100 NE ST. LUKES BLVD.

GENERAL NOTES:

ALL FITTINGS CONFORM TO SECTION 2-4 OF NFPA HANDBOOK 13.

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

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

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

THE SPRINKLER SYSTEM TO BE INSTALLED IN ACCORDANCE WITH NFPA 13.

HANGERS TO BE SPACED TO MEET NFPA REQUIREMENTS.

PER NFPA 13, SECTION 8.6.3.2.4, WITHIN SHALL BE DEFINED IN SECTION 3.3.2.3, SPRINKLERS SHALL BE PERMITTED TO BE LOCATED NOT MORE THAN 9 FT. FROM ANY SINGLE WALL, AND SPRINKLER SPACING LIMITATIONS OF SECTION 8.6.3 AND AREA LIMITATIONS OF TABLE 8.6.2.2.1(a) SHALL NOT BE EXCEEDED. JFS MAY MODIFY HEADS SHOWN ON THIS DRAWING TO COMPLY WITH THIS RULE.

EL = CENTER LINE OF PIPE BELOW TOP OF STEEL

EL = CENTER LINE OF PIPE ABOVE FINISHED FLOOR

CONSTRUCTION:

CONCRETE SLABS, CONCRETE BEAMS AND TEES

CODE NOTE:

8.6.5.2.2.1

IN LIGHT HAZARD OCCUPANCIES, PRIVACY CURTAINS SHALL NOT BE CONSIDERED OBSTRUCTIONS WHERE ALL OF THE FOLLOWING AREA MET:

- THE CURTAINS ARE SUPPORTED BY FABRIC MESH ON CEILING TRACK.
- OPENINGS IN THE MESH ARE EQUAL TO 70 PERCENT OR GREATER.
- THE MESH EXTENDS A MINIMUM OF 22 INCHES DOWN FROM CEILING.

CODE SUMMARY:

New 3 story addition and partial renovation of existing ASC building.

Project Address:

Saint Luke's East Hospital

120 NE Saint Luke's Blvd

Lee's Summit, MO 64063

Code Information:

2018 International Building Code

2018 International Plumbing Code

2018 International Mechanical Code

2017 National Electrical Code (NFPA 70)

2018 International Fire Code

2012 Life Safety Code (NFPA 101 Chapter 20)

2009 CCA/ANSI A117.1 as amended and adopted by the City of Lee's Summit

2010 ADA Standards for Accessible Design / Americans with Disabilities Act of 1990

State of Missouri Dept. of Health & Environment references the following codes:

2012 NFPA 101 Life Safety Code (LSC)

2018 FGI Guidelines for Design & Construction of Hospitals & Outpatient Facilities

1979 19-CSR-30

Note: If code requirements overlap, the most stringent shall apply.

Owner Information:

Saint Luke's East Hospital

120 NE Saint Luke's Blvd

Lee's Summit, MO 64063

Designer Information:

ACI Global Architects

1710 Wyandotte St.

Kansas City, MO 64108

Phone: (816) 763-9000

Local Authority:

Responding Fire Service: Lee's Summit Fire Department

Local Building Inspection: Lee's Summit, MO-Codes Administration Department

Type of Construction:

I-A

Area of Renovation and Addition

1st floor addition	18,000+/- SF
1st floor renovation	23,800+/- SF
2nd floor addition	16,700+/- SF
2nd floor renovation	28,080+/- SF
3rd floor addition	7,751+/- SF
Total addition	62,214+/- SF
Total renovation	51,880+/- SF
Total of new construction	113,914+/- SF

Occupancy Group: B - Ambulatory Healthcare

Max Travel Distance: 200' (NFPA 101 20.2.6.2.1)

Occupant Load: 1505/IOCC (table 1004.5)

1st floor: 41,601/150 =	278
2nd floor: 44,758/150 =	299
3rd floor: 27,514/150 =	184
Total Number of Occupants =	761

Required Fire Resistance Ratings (in hours)

Per NFPA 101 A.5.2.1.2:

Exterior Bearing Walls	3 HR
Interior Bearing Walls	3 HR
Primary Structural Frame	3 HR
Floor Construction	2 HR
Roof Construction	1 1/2 HR
Interior Non-bearing Walls	0 HR
Shaft Enclosure	2 HR
Stair Enclosure	2 HR

Fire Separation: (table 508.4)

2 HR separation between tenants I-B

1 HR separation between tenants B-B

JAYHAWK FIRE SPRINKLER CO., INC.

1201 E. 12TH AVE., SUITE 100
OMAHA, NE 68114
PHONE: (402) 466-1111
FAX: (402) 466-1112

MASSBY CONSTRUCTION

7850 S. 11TH AVE., SUITE 100
OVERLAND PARK, KANSAS 66204

Saint Luke's East

Lee's Summit

SAINT LUKE'S HEALTH SYSTEM

ASC EXPANSION

100 NE Saint Luke's Blvd.
Lee's Summit, MO 64066

WALTER A. WARREN

PROFESSIONAL ENGINEER

03/09/2024

Warren KTD, LLC

20543M

DESIGNED BY: TJA

CHECKED BY: DO

PROJECT NUMBER: TS

DATE: 01/15/2024

ISSUE DATE: 01/15/2024

LAST DATE: 02/28/2024

FP-5

FIRE PROTECTION

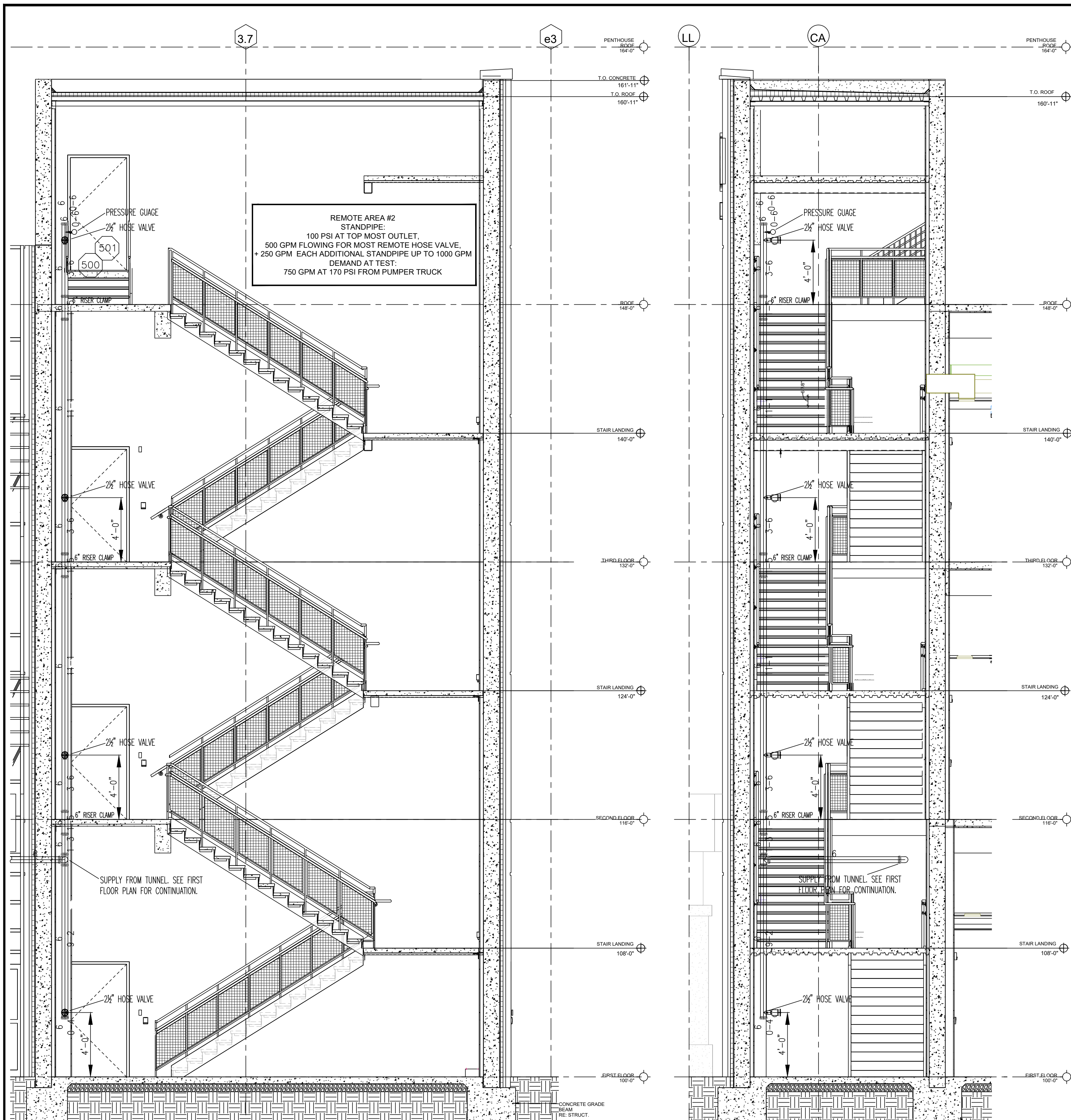
NEW ADDITION

3RD FLOOR AREA

TOTAL THIS SHEET: 283

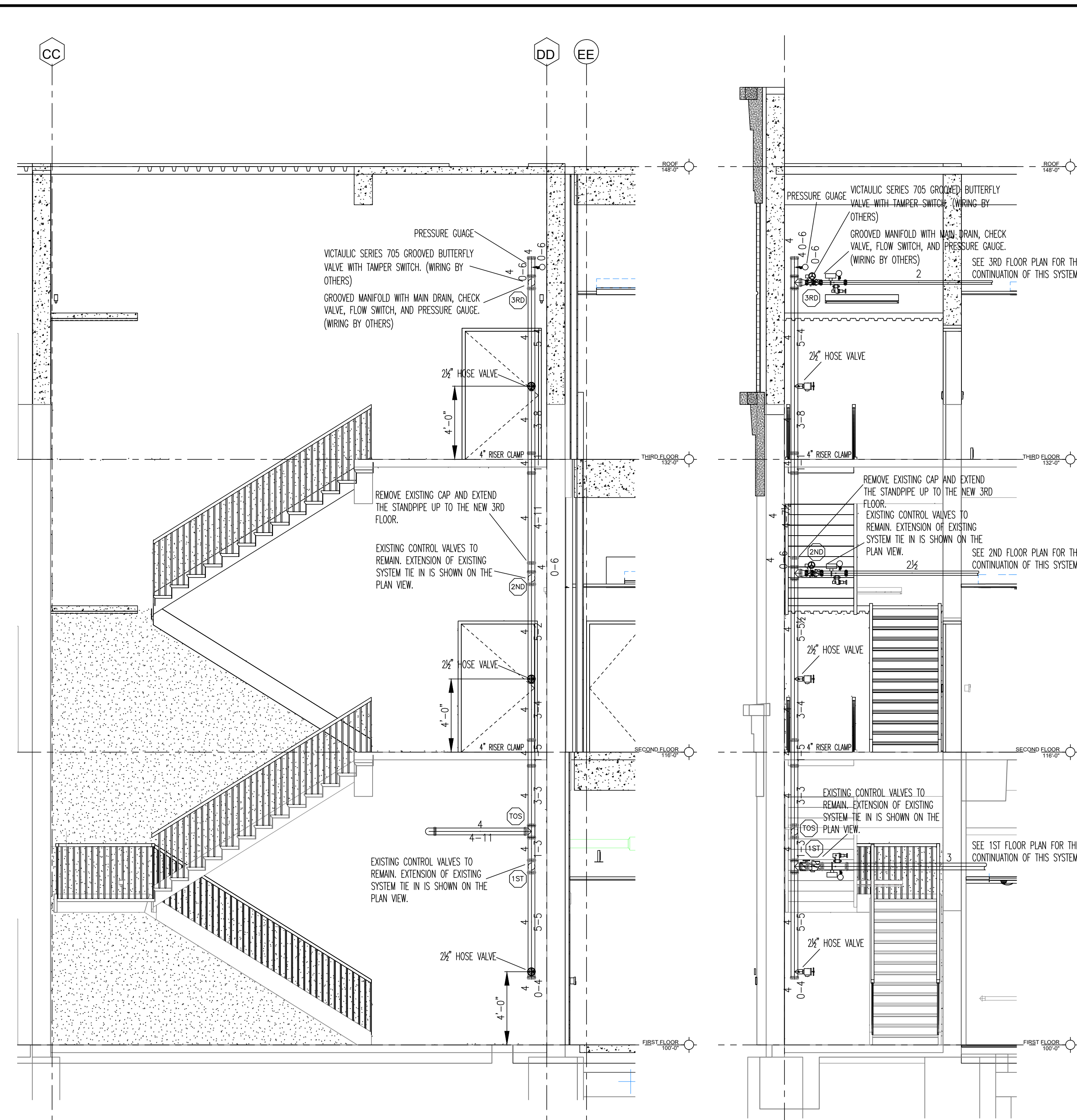
TOTAL THIS JOB: 1027

5 OF 6



NEW STAIR - E-S02 - LOOKING WEST

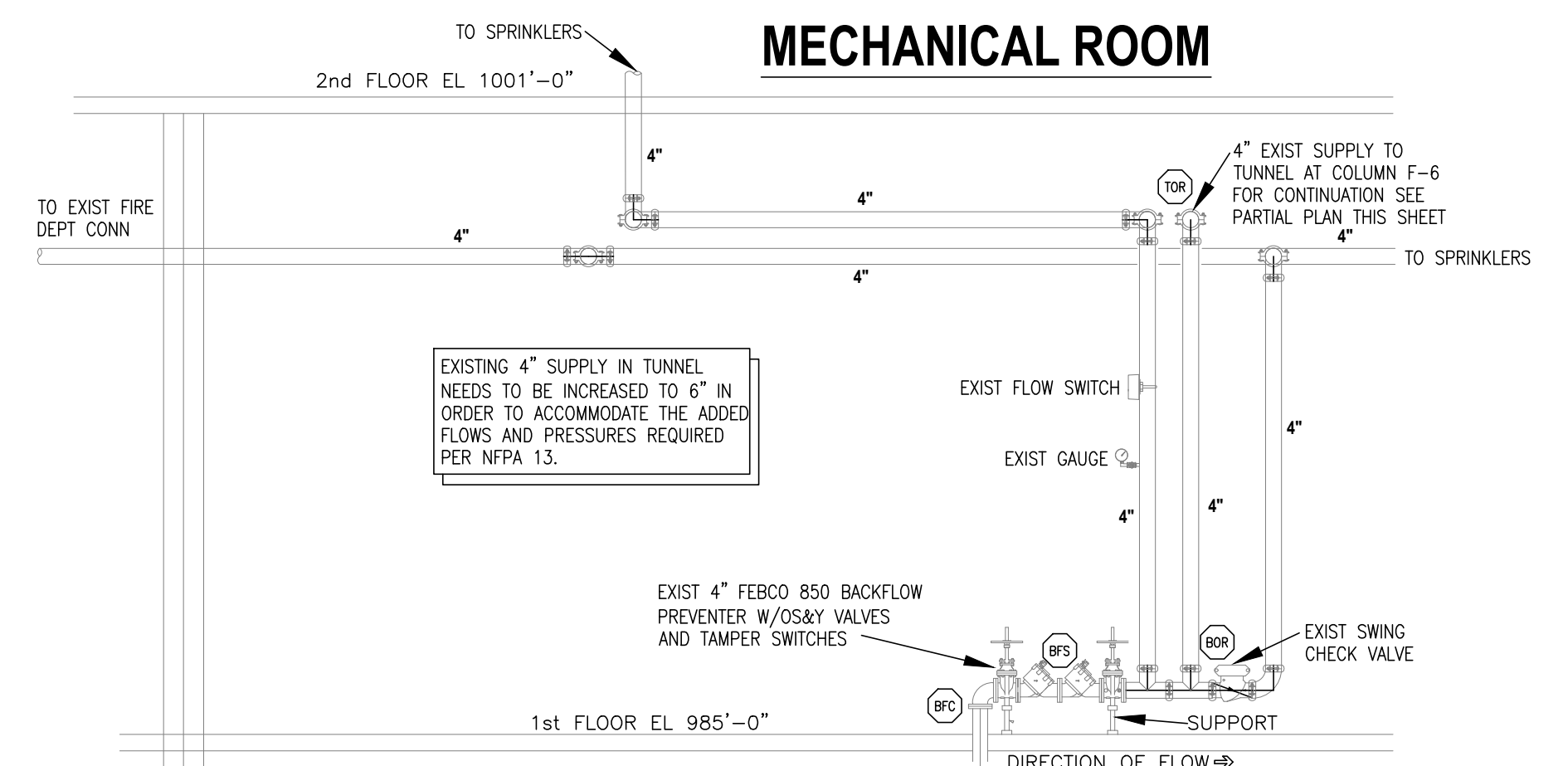
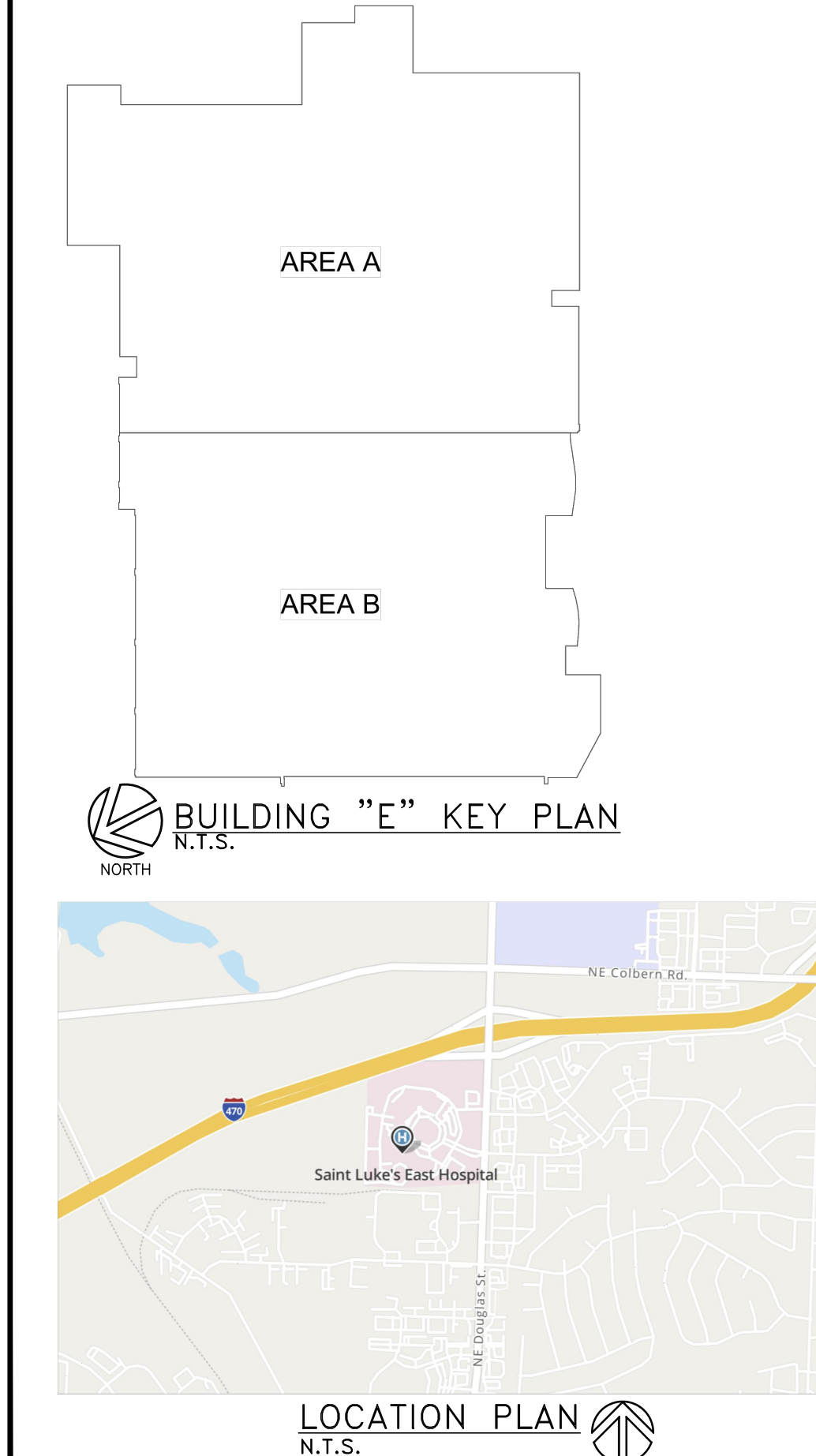
NEW STAIR - E-S02 - LOOKING SOUTH



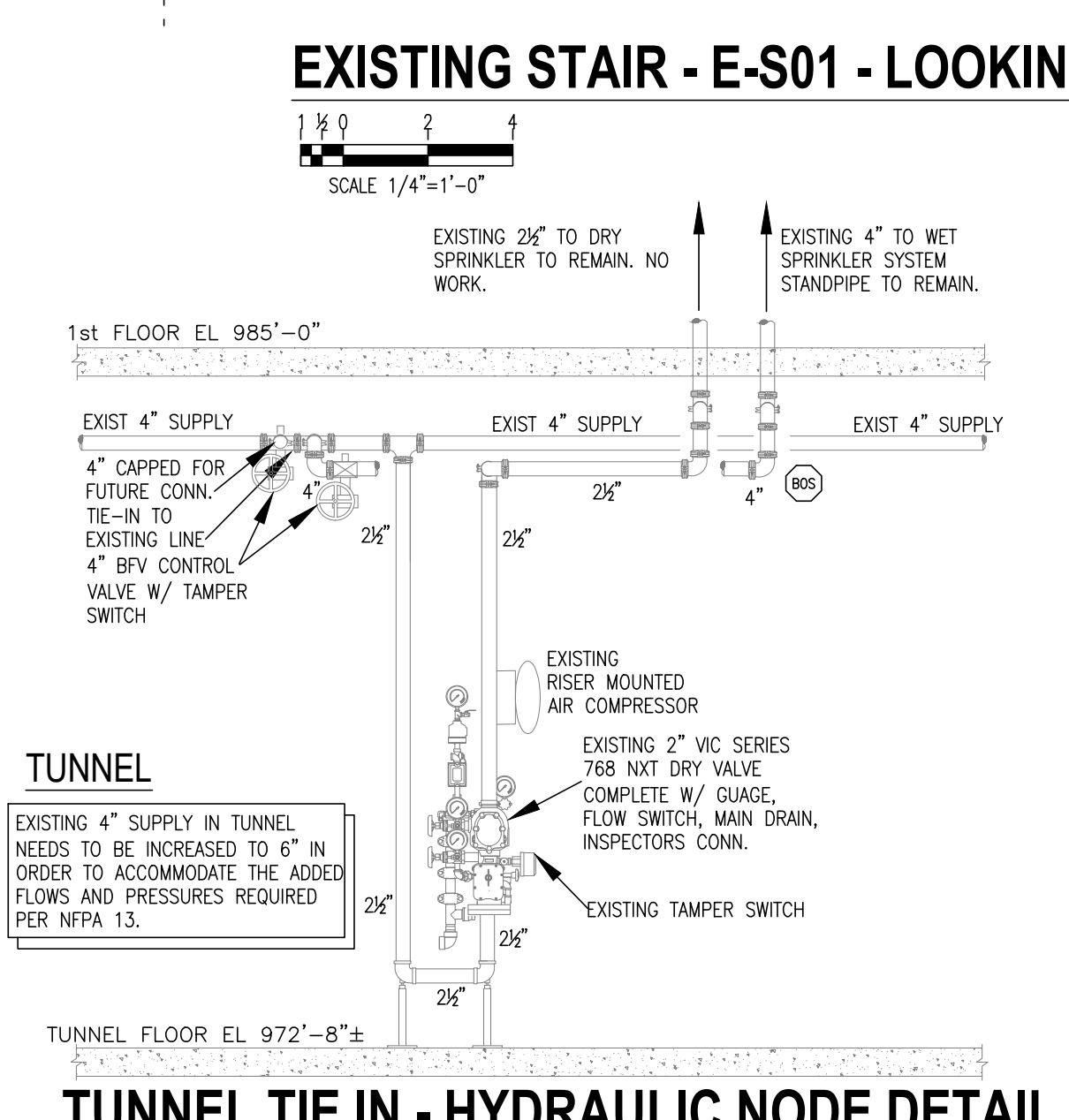
EXISTING STAIR - E-S01 - LOOKING NORTH

EXISTING STAIR - E-S01 - LOOKING WEST

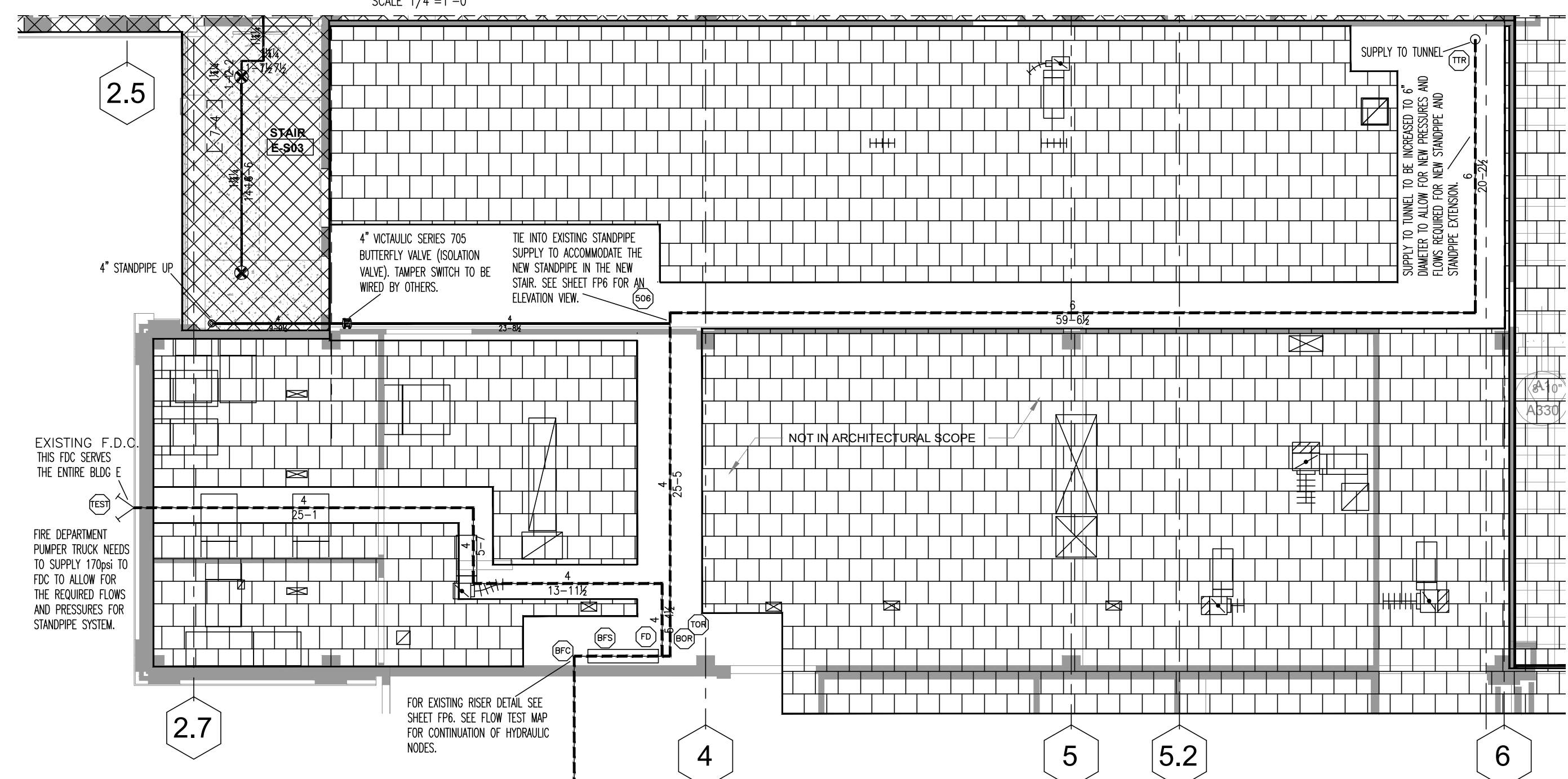
NEW STAIR - E-S03 - LOOKING WEST



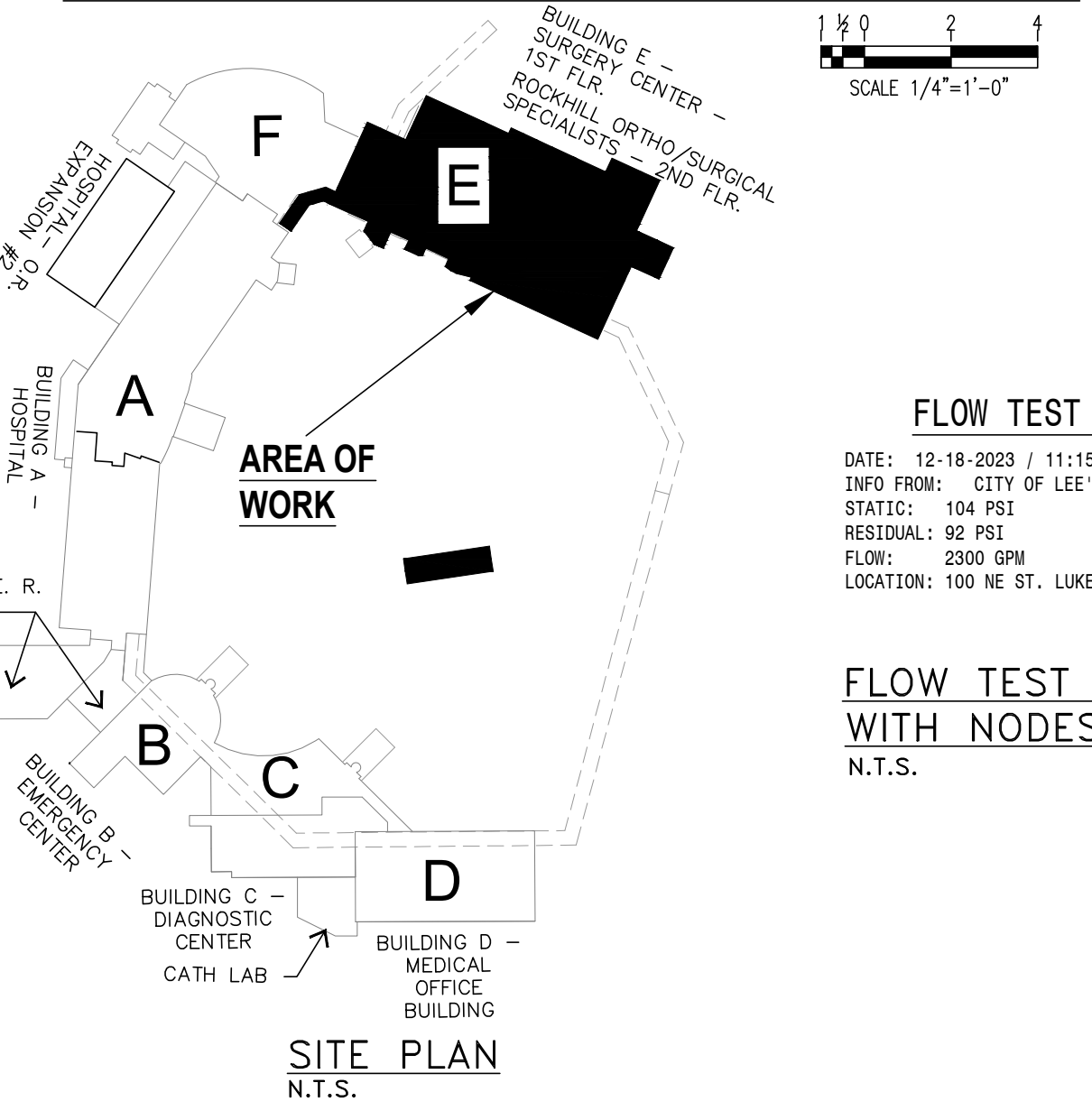
EXISTING RISER DETAIL - LOOKING NORTH WEST



TUNNEL TIE IN - HYDRAULIC NODE DETAIL



1st FLOOR FIRE SPRINKLER PLAN



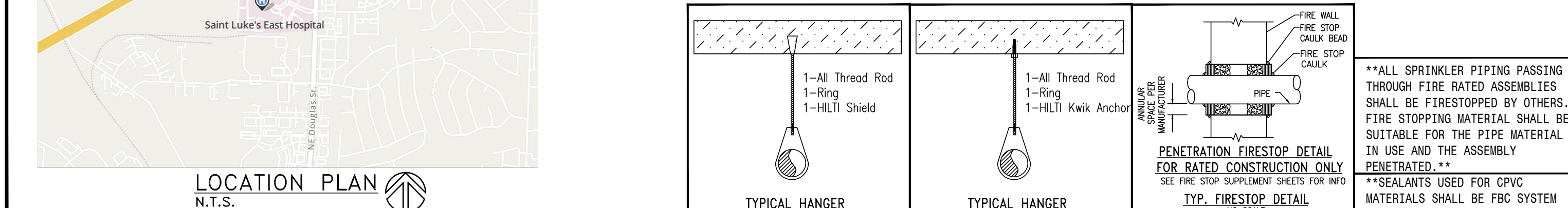
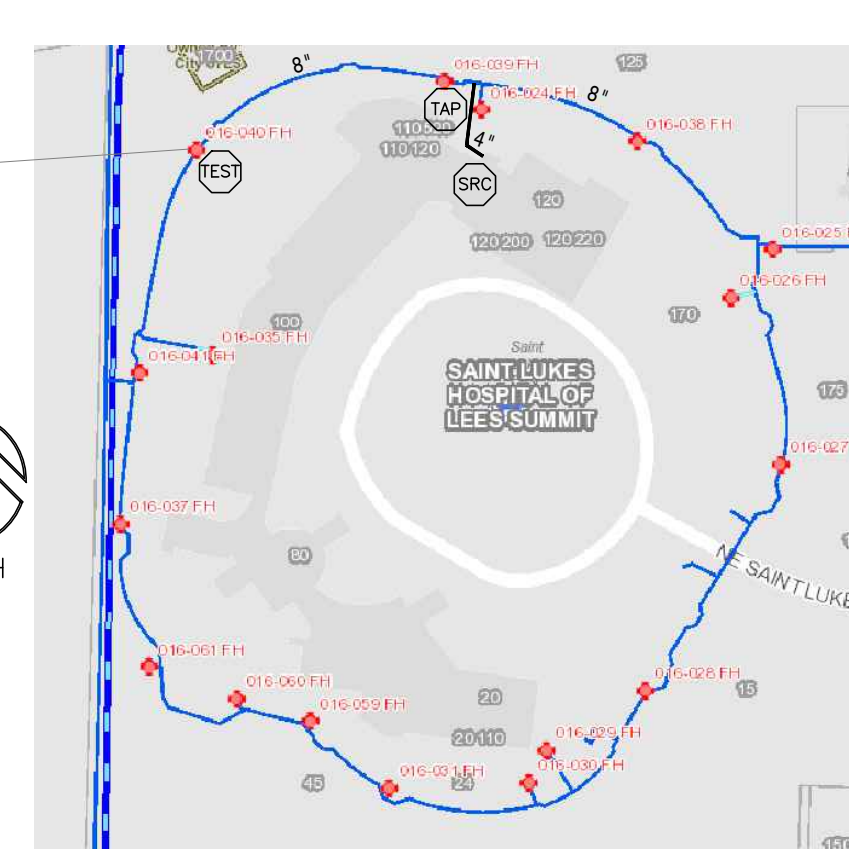
SITE PLAN

FLOW TEST DATA:

DATE: 12-18-2023 / 11:15AM
INFO FROM: CITY OF LEE'S SUMMIT
STATICS: 104 PSI
RESIDUAL: 92 PSI
FLOW: 2300 GPM
LOCATION: 100 NE ST. LUKE'S BLVD.

FLOW TEST MAP WITH NODES

N.T.S.



TYPICAL HANGER

TYPICAL HANGER

PENETRATION FIRESTOP DETAIL

FOR RATED CONSTRUCTION ONLY
SEE FIRE STOP SUPPLEMENT SHEETS FOR INFO
TYP. FIRESTOP DETAIL
NO SCALE

PENETRATION FIRESTOP DETAIL

FOR RATED CONSTRUCTION ONLY
SEE FIRE STOP SUPPLEMENT SHEETS FOR INFO
TYP. FIRESTOP DETAIL
NO SCALE

PENETRATION FIRESTOP DETAIL

FOR RATED CONSTRUCTION ONLY
SEE FIRE STOP SUPPLEMENT SHEETS FOR INFO
TYP. FIRESTOP DETAIL
NO SCALE

JAYHAWK
FIRE SPRINKLER CO., INC.
1200 E. 12TH AVE., SUITE 100
Olathe, Kansas 66061
TEL: (816) 777-0036
FAX: (816) 777-0036

MADEBY CONSTRUCTION
7850 SAINT LUKE BLVD
OVERLAND PARK, KANSAS 66204

SAINT LUKE'S HEALTH SYSTEM
ASC EXPANSION

100 NE Saint Luke's Blvd.
Lee's Summit, MO 64086

REVISIONS:

NO.	DATE	DESCRIPTION
1	12/27/24	ALL DRAWINGS ARE CURRENT THROUGH ALL 178 CHANGES

FP-6
FIRE PROTECTION
STANDPIPE AND DETAILS

9 OF 9



Hydraulic Calculations by HydraCALC

JAYHAWK FIRE SPRINKLER CO. INC
12030 S. HEDGE LANE TERRACE
OLATHE, KS 66061
913-422-3770
785-232-0975

Job Name : SLE ASC Expansion - 1st Floor (Approval)
Drawing : FP1
Location : 100 NE SAINT LUKE'S BLVD
Remote Area : 1
Contract : 20543M
Data File : SLE ASC Expansion - 1st Floor (Approval) Area 1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME SLE ASC Expansion - 1st Floor (Approval)
Location 100 NE SAINT LUKE'S BLVD
Drawing # FP1
Contract # 20543M
Date 02/27/2024

DESIGN

Remote area # 1
Remote area location 1ST FLR. AHU ROOM, RESOURCE ROOM
Occupancy classification ORDINARY HAZARD GROUP II / LIGHT HAZARD
Density .20 & .10 - Gpm/SqFt
Area of application 1500 - SqFt
Coverage/sprinkler VARIES - SqFt
Type of sprinkler calculated VICTUALIC Q.R. UPRIGHT & PENDENT
Sprinklers calculated 15
In-rack demand NA - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 583.836 - GPM @ 65.686 - Psi
Type of system WET
Volume of system (dry or pre-action) NA - Gal

WATER SUPPLY INFORMATION

Test date 12-18-2023
Location ONSITE
Source of info CITY OF LEE'S SUMMIT

CONTRACTOR INFO JAYHAWK FIRE SPRINKLER CO. INC
Address 12030 S. HEDGE LANE TERRACE / OLATHE, KS 66061 / 913-422-377
Phone # 785-232-0975
Name of designer TJA
Authority having jurisdiction CITY OF LEE'S SUMMIT / LEE'S SUMMIT FIRE DEPT.
NOTES: NA

text1(35) - invisible

Water Supply Curve

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

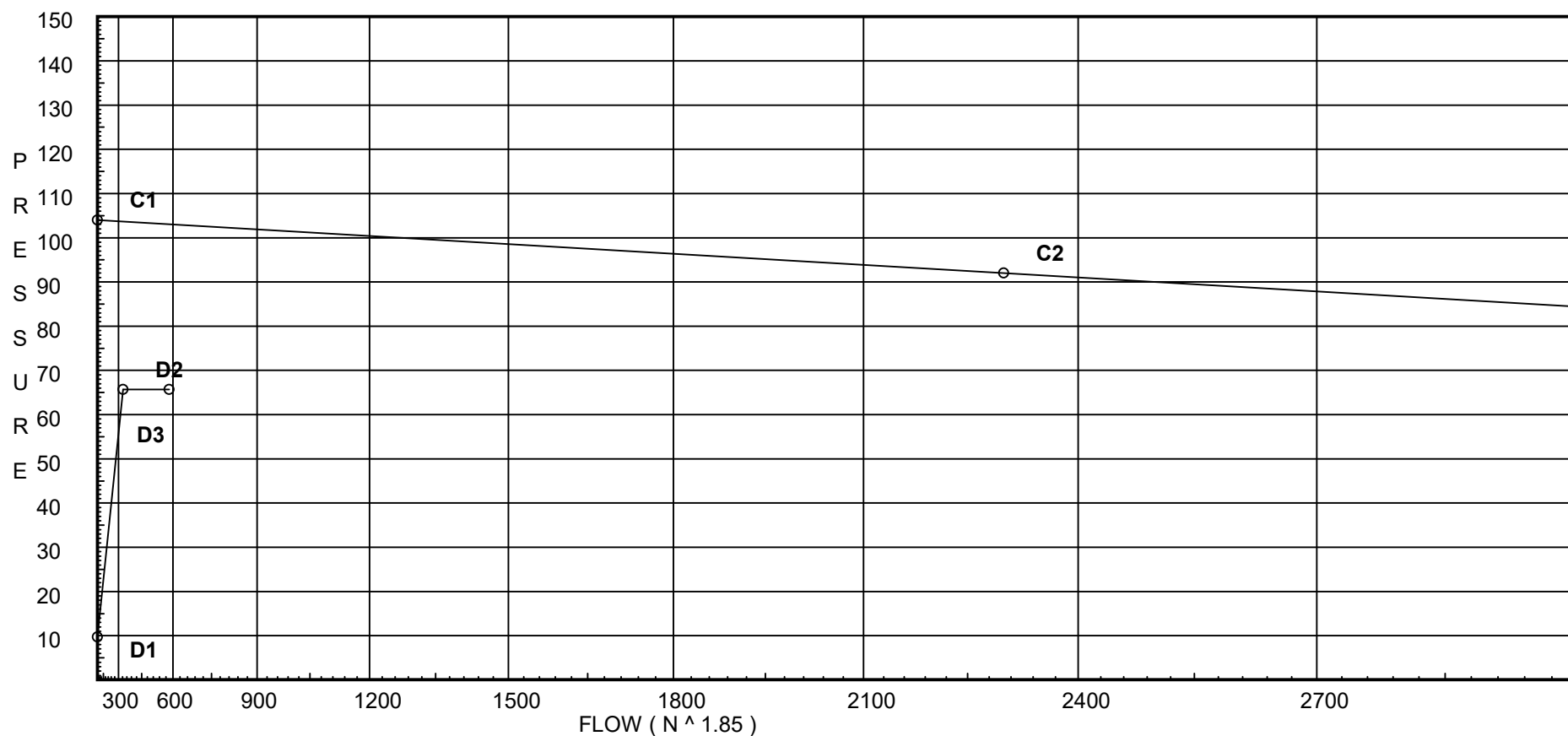
Page 2
Date

City Water Supply:

C1 - Static Pressure : 104
C2 - Residual Pressure: 92
C2 - Residual Flow : 2300

Demand:

D1 - Elevation : 9.706
D2 - System Flow : 333.836
D2 - System Pressure : 65.686
Hose (Demand) : 250
D3 - System Demand : 583.836
Safety Margin : 37.364



Fittings Used Summary

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

Page 3
Date

Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	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
C	Roll Groove Coupling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0

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.

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	104.0	92	2300.0	103.05	583.84	65.686

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
DP01	994.12	5.6	7.0	14.82	0.1	144
EQ01	995.29		6.73			
DP02	994.12	5.6	7.0	14.82	0.1	104
EQ02	996.29		6.37			
SP03	1005.54	8	7.0	21.17	0.2	100
EQ03	1004.7		8.21			
1	1004.7	7.39	8.21	21.17	K=K @ EQ03	
2	1004.7	7.39	8.59	21.65	K=K @ EQ03	
3	1004.7	7.39	9.99	23.35	K=K @ EQ03	
4	1004.7		12.17			
5	1004.7		12.21			
6	995.29		16.81			
7	995.29		16.97			
8	995.29		17.09			
A	995.29		30.64			
1ST	995.29		37.59			
TOS	978.12		45.76			
BOS	978.12		47.05			
TTR	995.29		45.9			
TOR	995.29		50.49			
BOR	987.29		54.97			
BFS	987.29		56.4			
BFC	987.29		60.53			
SRC	982.29		64.55			
TAP	982.29		65.25			
TEST	982.29		65.69	250.0		
9	1004.7	7.39	9.36	22.61	K=K @ EQ03	
10	1004.7	7.39	9.79	23.12	K=K @ EQ03	
11	995.29	5.71	14.39	21.67	K=K @ EQ01	
12	995.29		15.27			
13	995.29		15.75			
14	995.29	5.71	14.84	22.0	K=K @ EQ01	
15	1004.7	7.39	8.24	21.21	K=K @ EQ03	
16	1004.7	7.39	8.62	21.69	K=K @ EQ03	
17	1004.7	7.39	10.02	23.39	K=K @ EQ03	
18	1004.7	7.39	9.4	22.65	K=K @ EQ03	
19	1004.7	7.39	9.83	23.16	K=K @ EQ03	
20	995.29	5.71	14.64	21.85	K=K @ EQ01	
21	995.29		15.54			
22	995.29		16.02			
23	995.29	5.71	15.1	22.19	K=K @ EQ01	
24	996.29	5.87	14.2	22.12	K=K @ EQ02	

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
25	996.29		15.14		

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
DP01 to EQ01	994.12 995.29	5.60	14.82 14.82	1 1.049	E 2.0	1.170 2.000 3.170	120 0.0748	7.000 -0.507 0.237		Vel = 5.50	
EQ01			0.0 14.82					6.730		K Factor = 5.71	
DP02 to EQ02	994.12 996.29	5.60	14.82 14.82	1 1.049	E 2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ02			0.0 14.82					6.372		K Factor = 5.87	
SP03 to EQ03	1005.54 1004.7	8.00	21.17 21.17	1 1.049	T 5.0	0.830 5.000 5.830	120 0.1444	7.000 0.364 0.842		Vel = 7.86	
EQ03			0.0 21.17					8.206		K Factor = 7.39	
1 to 2	1004.7 1004.7	7.39	21.17 21.17	1.25 1.38		10.000 10.000	120 0.0380	8.206 0.0 0.380		K = K @ EQ03 Vel = 4.54	
2 to 3	1004.7 1004.7	7.39	21.65 42.82	1.25 1.38		10.000 10.000	120 0.1400	8.586 0.0 1.400		K = K @ EQ03 Vel = 9.18	
3 to 4	1004.7 1004.7	7.39	23.34 66.16	1.25 1.38	T 6.0	0.970 6.000 6.970	120 0.3131	9.986 0.0 2.182		K = K @ EQ03 Vel = 14.19	
4 to 5	1004.7 1004.7		45.73 111.89	4 4.026		10.000 10.000	120 0.0045	12.168 0.0 0.045		Vel = 2.82	
5 to 6	1004.7 995.29		112.11 224.0	4 4.026	2V 13.6	18.220 13.600 31.820	120 0.0162	12.213 4.075 0.517		Vel = 5.65	
6 to 7	995.29 995.29		43.67 267.67	4 4.026		7.440 7.440	120 0.0226	16.805 0.0 0.168		Vel = 6.75	
7 to 8	995.29 995.29		22.12 289.79	4 4.026		4.560 4.560	120 0.0263	16.973 0.0 0.120		Vel = 7.30	
8 to A	995.29 995.290		44.05 333.84	4 4.026	20V 2X 32.0	230.340 168.000 398.340	120 0.0340	17.093 0.0 13.542		Vel = 8.41	
A to 1ST	995.290 995.290		0.0 333.84	3 3.068	2V B C Fsp 10.0 10.0 1.0 0.0	10.000 21.000 31.000	120 0.1277	30.635 3.000 3.959		* * Fixed Loss = 3 Vel = 14.49	
1ST to TOS	995.290 978.120		0.0 333.84	4 4.026	T 20.0	1.500 20.000 21.500	120 0.0340	37.594 7.436 0.732		Vel = 8.41	
TOS to BOS	978.120 978.120		0.0 333.84	4 4.026	2E 20.0	17.920 20.000 37.920	120 0.0340	45.762 0.0 1.289		Vel = 8.41	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
BOS to TTR	978.120 995.290		0.0 333.84	4 4.026	E 10.0	175.000 10.000 185.000	120 0.0340	47.051 -7.436 6.289		Vel = 8.41	
TTR to TOR	995.290 995.290		0.0 333.84	4 4.026	3E 30.0	104.750 30.000 134.750	120 0.0340	45.904 0.0 4.581		Vel = 8.41	
TOR to BOR	995.290 987.290		0.0 333.84	4 4.026	2E 20.0	10.000 20.000 30.000	120 0.0340	50.485 3.465 1.020		Vel = 8.41	
BOR to BFS	987.290 987.290		0.0 333.84	4 4.026	T B 20.0 12.0	10.000 32.000 42.000	120 0.0340	54.970 0.0 1.428		Vel = 8.41	
BFS to BFC	987.290 987.290		0.0 333.84	4 4.026		4.000 4.000	120 0.0340	56.398 4.000 0.136		* * Fixed Loss = 4 Vel = 8.41	
BFC to SRC	987.290 982.290		0.0 333.84	4 4.1	2E 29.067	50.000 29.067 79.067	140 0.0234	60.534 2.166 1.849		Vel = 8.11	
SRC to TAP	982.290 982.290		0.0 333.84	6 6.16	T E G 43.037 20.084 4.304	150.000 67.425 217.425	140 0.0032	64.549 0.0 0.701		Vel = 3.59	
TAP to TEST	982.290 982.290		0.0 333.84	8 8.27	T G 2E 55.354 6.326 56.936	450.000 118.616 568.616	140 0.0008	65.250 0.0 0.436		Vel = 1.99	
TEST			250.00 583.84					65.686		Qa = 250.00 K Factor = 72.04	
9 to 10	1004.7 1004.7	7.39	22.61	1.25		10.000	120	9.363 0.0		K = K @ EQ03	
10 to 4	1004.7 1004.7	7.39	22.61 45.73	1.38		10.000 15.030	0.0429 0.1581	0.429 2.376		Vel = 4.85 Vel = 9.81	
4			0.0 45.73					12.168		K Factor = 13.11	
11 to 12	995.29 995.29	5.71	21.67	1 1.049	T 5.0	0.830 5.000 5.830	120 0.1509	14.394 0.0 0.880		K = K @ EQ01 Vel = 8.04	
12 to 13	995.29 995.29		0.0 21.67	1.25 1.38		12.000 12.000	120 0.0397	15.274 0.0 0.476		Vel = 4.65	
13 to 6	995.29 995.29		22.00 43.67	1.25 1.38	T 6.0	1.270 6.000 7.270	120 0.1451	15.750 0.0 1.055		Vel = 9.37	
6			0.0 43.67					16.805		K Factor = 10.65	
14 to 13	995.29 995.29	5.71	22.00 22.0	1 1.049	T 5.0	0.830 5.000 5.830	120 0.1552	14.845 0.0 0.905		K = K @ EQ01 Vel = 8.17	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 1st Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
13			0.0 22.00					15.750		K Factor = 5.54	
15 to 16	1004.7 1004.7	7.39	21.21	1.25		10.000	120	8.237 0.0		K = K @ EQ03	
16 to 17	1004.7 1004.7	7.39	21.21	1.38		10.000	0.0382	0.382		Vel = 4.55	
16 to 17	1004.7 1004.7	7.39	21.69	1.25		10.000	120	8.619 0.0		K = K @ EQ03	
17 to 5	1004.7 1004.7	7.39	42.9	1.38		10.000	0.1404	1.404		Vel = 9.20	
17 to 5	1004.7 1004.7	7.39	23.39	1.25	T 6.0	0.970 6.000 6.970	120	10.023 0.0		K = K @ EQ03	
			66.29	1.38			0.3142	2.190		Vel = 14.22	
5			0.0 66.29					12.213		K Factor = 18.97	
18 to 19	1004.7 1004.7	7.39	22.65	1.25		10.000	120	9.398 0.0		K = K @ EQ03	
19 to 5	1004.7 1004.7	7.39	22.65	1.38		10.000	0.0431	0.431		Vel = 4.86	
19 to 5	1004.7 1004.7	7.39	23.16	1.25	T 6.0	9.030 6.000 15.030	120	9.829 0.0		K = K @ EQ03	
			45.81	1.38			0.1586	2.384		Vel = 9.83	
5			0.0 45.81					12.213		K Factor = 13.11	
20 to 21	995.29 995.29	5.71	21.85	1	T 5.0	0.830 5.000 5.830	120	14.643 0.0		K = K @ EQ01	
21 to 22	995.29 995.29		21.85	1.049			0.1533	0.894		Vel = 8.11	
21 to 22	995.29 995.29		0.0	1.25		12.000	120	15.537 0.0			
22 to 8	995.29 995.29		21.85	1.38		12.000	0.0402	0.483		Vel = 4.69	
22 to 8	995.29 995.29		22.20	1.25	T 6.0	1.270 6.000 7.270	120	16.020 0.0			
			44.05	1.38			0.1476	1.073		Vel = 9.45	
8			0.0 44.05					17.093		K Factor = 10.65	
23 to 22	995.29 995.29	5.71	22.19	1	T 5.0	0.830 5.000 5.830	120	15.101 0.0		K = K @ EQ01	
			22.19	1.049			0.1576	0.919		Vel = 8.24	
22			0.0 22.19					16.020		K Factor = 5.54	
24 to 25	996.29 996.29	5.87	22.12	1	T 5.0	1.000 5.000 6.000	120	14.199 0.0		K = K @ EQ02	
25 to 7	996.29 995.29		22.12	1.049			0.1567	0.940		Vel = 8.21	
25 to 7	996.29 995.29		0.0	1.25	3E T 9.0 6.0	18.980 15.000 33.980	120	15.139 0.433			
			22.12	1.38			0.0412	1.401		Vel = 4.74	
7			0.0 22.12					16.973		K Factor = 5.37	



Hydraulic Calculations by HydraCALC

JAYHAWK FIRE SPRINKLER CO. INC
12030 S. HEDGE LANE TERRACE
OLATHE, KS 66061
913-422-3770
785-232-0975

Job Name : SLE ASC Expansion - 2nd Floor (Approval)
Drawing : FP3
Location : 100 NE SAINT LUKE'S BLVD
Remote Area : 2
Contract : 20543M
Data File : SLE ASC Expansion - 2nd Floor (Approval) Area 2.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME SLE ASC Expansion
Location 100 NE SAINT LUKE'S BLVD
Drawing # FP3
Contract # 20543M
Date 02/27/2024

DESIGN

Remote area # 2
Remote area location 2ND FLR. EXAM ROOMS AND CORRIDOR
Occupancy classification LIGHT HAZARD
Density .10 - Gpm/SqFt
Area of application 900 - SqFt
Coverage/sprinkler VARIES - SqFt
Type of sprinkler calculated VICTUALIC Q.R. PENDENT
Sprinklers calculated 10
In-rack demand NA - GPM
Hose streams 100 - GPM
Total water required (including hose streams) 324.098 - GPM @ 73.560 - Psi
Type of system WET
Volume of system (dry or pre-action) NA - Gal

WATER SUPPLY INFORMATION

Test date 12-18-2023
Location ONSITE
Source of info CITY OF LEE'S SUMMIT

CONTRACTOR INFO JAYHAWK FIRE SPRINKLER CO. INC
Address 12030 S. HEDGE LANE TERRACE / OLATHE, KS 66061 / 913-422-377
Phone # 785-232-0975
Name of designer TJA
Authority having jurisdiction CITY OF LEE'S SUMMIT / LEE'S SUMMIT FIRE DEPT.
NOTES: NA

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Water Supply Curve

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

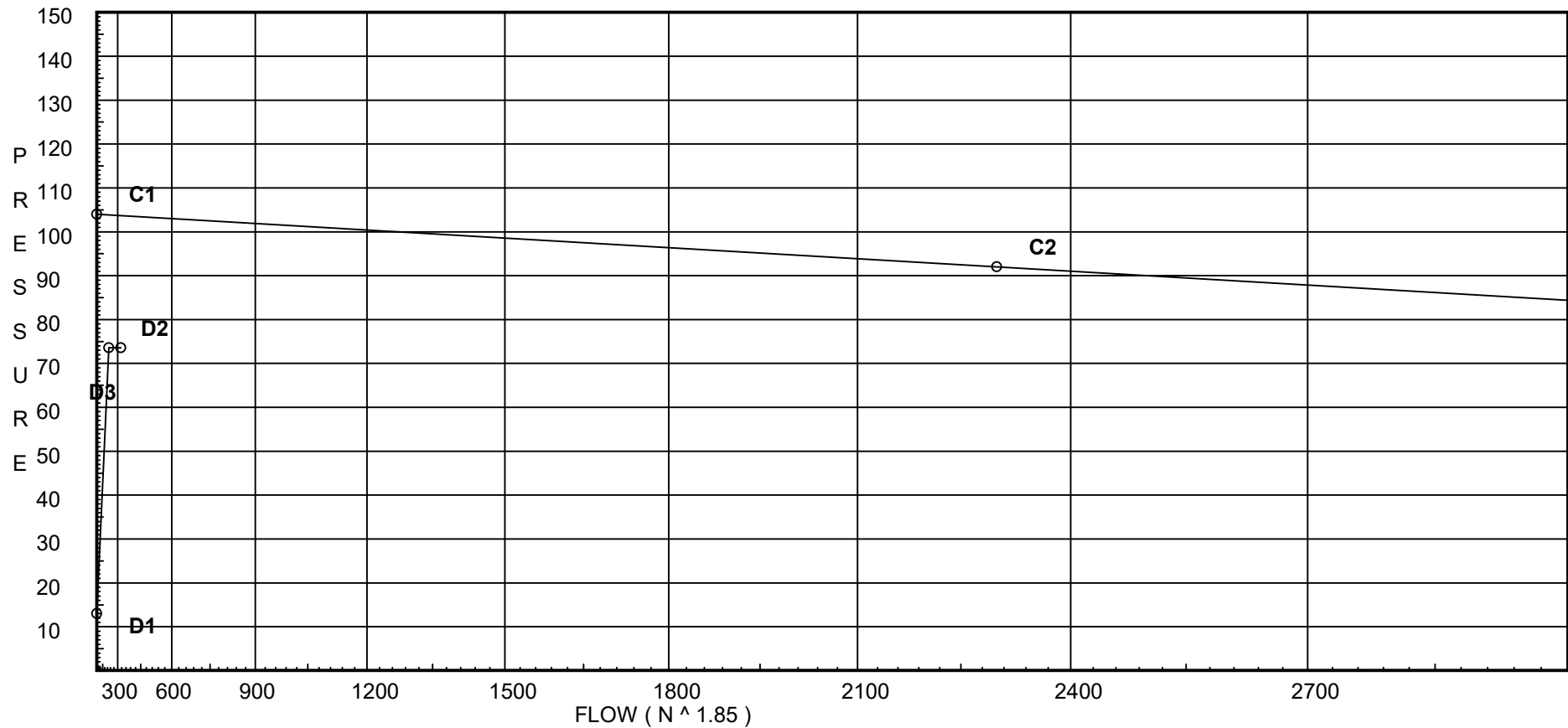
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City Water Supply:

C1 - Static Pressure : 104
C2 - Residual Pressure: 92
C2 - Residual Flow : 2300

Demand:

D1 - Elevation : 12.993
D2 - System Flow : 224.098
D2 - System Pressure : 73.560
Hose (Demand) : 100
D3 - System Demand : 324.098
Safety Margin : 30.120



Fittings Used Summary

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	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
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.

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	104.0	92	2300.0	103.68	324.1	73.56

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
DP05	1010.12	5.6	7.0	14.82	0.1	96
EQ05	1012.29		6.37			
DP06	1010.12	5.6	7.0	14.82	0.1	112
EQ06	1012.29		6.37			
DP02	1010.12	5.6	7.0	14.82	0.1	120
EQ02	1011.12		6.79			
DP01	1010.12	5.6	7.0	14.82	0.1	65
EQ01	1011.12		6.79			
DP04	1010.12	5.6	7.0	14.82	0.1	64
EQ04	1012.29		6.37			
DP08	1010.12	5.6	7.0	14.82	0.1	116
EQ08	1012.74		6.21			
DP07	1010.12	5.6	7.0	14.82	0.1	96
EQ07	1012.74		6.21			
DP03	1010.12	5.6	7.86	15.7	0.1	157
EQ03	1012.29		7.27			
200	1012.29	5.82	7.27	15.7	K=K @ EQ03	
201	1011.95		8.1			
202	1011.95		8.18			
203	1011.95		9.67			
204	1011.95		10.87			
205	1011.95		16.95			
206	1011.95		28.53			
207	1011.95		28.7			
208	1011.95		28.83			
2ND	995.29		54.89			
TOS	978.12		62.88			
BOS	978.12		63.5			
TTR	995.29		59.07			
TOR	995.29		61.27			
BOR	987.29		65.22			
BFS	987.29		65.9			
BFC	987.29		69.97			
SRC	982.29		73.02			
TAP	982.29		73.35			
TEST	982.29		73.56	100.0		
209	1012.29	5.87	7.25	15.81	K=K @ EQ04	
210	1011.95		8.1			
211	1011.12	5.69	9.01	17.06	K=K @ EQ02	
212	1011.95		9.58			
213	1012.29	5.87	9.85	18.42	K=K @ EQ05	
214	1012.29	5.87	15.48	23.09	K=K @ EQ05	

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
215	1011.12	5.69	18.78	24.64	K=K @ EQ01
216	1010.79		20.51		
217	1010.79		20.82		
218	1011.95		28.53		
219	1011.12	5.69	19.06	24.82	K=K @ EQ01
220	1012.74	5.95	20.64	27.01	K=K @ EQ07
221	1012.41		22.65		
222	1012.41		23.3		
223	1012.74	5.95	21.25	27.4	K=K @ EQ08
224	1012.29	5.87	26.37	30.14	K=K @ EQ06
225	1012.29		27.08		

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
DP05 to EQ05	1010.12 1012.29	5.60	14.82 14.82	1 1.049	E 2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ05			0.0 14.82					6.372		K Factor = 5.87	
DP06 to EQ06	1010.12 1012.29	5.60	14.82 14.82	1 1.049	E 2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ06			0.0 14.82					6.372		K Factor = 5.87	
DP02 to EQ02	1010.12 1011.12	5.60	14.82 14.82	1 1.049	E 2.0	1.000 2.000 3.000	120 0.0747	7.000 -0.433 0.224		Vel = 5.50	
EQ02			0.0 14.82					6.791		K Factor = 5.69	
DP01 to EQ01	1010.12 1011.12	5.60	14.82 14.82	1 1.049	E 2.0	1.000 2.000 3.000	120 0.0747	7.000 -0.433 0.224		Vel = 5.50	
EQ01			0.0 14.82					6.791		K Factor = 5.69	
DP04 to EQ04	1010.12 1012.29	5.60	14.82 14.82	1 1.049	E 2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ04			0.0 14.82					6.372		K Factor = 5.87	
DP08 to EQ08	1010.12 1012.74	5.60	14.82 14.82	1 1.049	E 2.0	2.620 2.000 4.620	120 0.0747	7.000 -1.135 0.345		Vel = 5.50	
EQ08			0.0 14.82					6.210		K Factor = 5.95	
DP07 to EQ07	1010.12 1012.74	5.60	14.82 14.82	1 1.049	E 2.0	2.620 2.000 4.620	120 0.0747	7.000 -1.135 0.345		Vel = 5.50	
EQ07			0.0 14.82					6.210		K Factor = 5.95	
DP03 to EQ03	1010.12 1012.29	5.60	15.70 15.7	1 1.049	E 2.0	2.170 2.000 4.170	120 0.0832	7.860 -0.940 0.347		Vel = 5.83	
EQ03			0.0 15.70					7.267		K Factor = 5.82	
200 to 201	1012.29 1011.95	5.82	15.70 15.7	1 1.049	E T 2.0 5.0	1.250 7.000 8.250	120 0.0832	7.267 0.147 0.686		K = K @ EQ03 Vel = 5.83	
201 to 202	1011.95 1011.95		0.0 15.7	1.25 1.38		3.800 3.800	120 0.0218	8.100 0.0 0.083		Vel = 3.37	
202 to 203	1011.95 1011.95		15.81 31.51	1.25 1.38	2T 12.0	6.690 12.000 18.690	120 0.0793	8.183 0.0 1.483		Vel = 6.76	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
203 to 204	1011.95 1011.95		17.06 48.57	1.25 1.38			6.800 6.800	120 0.1768	9.666 0.0 1.202		Vel = 10.42	
204 to 205	1011.95 1011.95		18.42 66.99	1.25 1.38	2E	6.0	13.000 6.000 19.000	120 0.3203	10.868 0.0 6.086		Vel = 14.37	
205 to 206	1011.95 1011.95		23.09 90.08	1.25 1.38	2E T	6.0 6.0	8.890 12.000 20.890	120 0.5540	16.954 0.0 11.574		Vel = 19.32	
206 to 207	1011.95 1011.95		49.46 139.54	3 3.068			6.920 6.920	120 0.0254	28.528 0.0 0.176		Vel = 6.06	
207 to 208	1011.95 1011.95		30.14 169.68	3 3.068			3.430 3.430	120 0.0364	28.704 0.0 0.125		Vel = 7.36	
208 to 2ND	1011.95 995.290		54.42 224.1	3 3.068	14E	98.0	210.520 98.000 308.520	120 0.0611	28.829 7.215 18.848		Vel = 9.73	
2ND to TOS	995.290 978.120		0.0 224.1	4 4.026	T	20.0	14.167 20.000 34.167	120 0.0163	54.892 7.436 0.556		Vel = 5.65	
TOS to BOS	978.120 978.120		0.0 224.1	4 4.026	2E	20.0	17.920 20.000 37.920	120 0.0163	62.884 0.0 0.617		Vel = 5.65	
BOS to TTR	978.120 995.290		0.0 224.1	4 4.026	E	10.0	175.000 10.000 185.000	120 0.0163	63.501 -7.436 3.009		Vel = 5.65	
TTR to TOR	995.290 995.290		0.0 224.1	4 4.026	3E	30.0	104.750 30.000 134.750	120 0.0163	59.074 0.0 2.191		Vel = 5.65	
TOR to BOR	995.290 987.290		0.0 224.1	4 4.026	2E	20.0	10.000 20.000 30.000	120 0.0163	61.265 3.465 0.488		Vel = 5.65	
BOR to BFS	987.290 987.290		0.0 224.1	4 4.026	T B	20.0 12.0	10.000 32.000 42.000	120 0.0163	65.218 0.0 0.683		Vel = 5.65	
BFS to BFC	987.290 987.290		0.0 224.1	4 4.026			4.000 4.000	120 0.0162	65.901 4.000 0.065		* * Fixed Loss = 4 Vel = 5.65	
BFC to SRC	987.290 982.290		0.0 224.1	4 4.1	2E	29.067	50.000 29.067 79.067	140 0.0112	69.966 2.166 0.884		Vel = 5.45	
SRC to TAP	982.290 982.290		0.0 224.1	6 6.16	T E G	43.037 20.084 4.304	150.000 67.425 217.425	140 0.0015	73.016 0.0 0.336		Vel = 2.41	
TAP to TEST	982.290 982.290		0.0 224.1	8 8.27	T G 2E	55.354 6.326 56.936	450.000 118.616 568.616	140 0.0004	73.352 0.0 0.208		Vel = 1.34	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
			100.00 324.10					73.560	Qa = 100.00 K Factor = 37.79		
209 to 210	1012.29 1011.95	5.87	15.81	1	E T 2.0 5.0	1.250 7.000 8.250	120	7.255 0.147 0.695	K = K @ EQ04		
210 to 202	1011.95 1011.95		15.81 0.0	1.049 1.25		3.910 3.910	0.0842 120	8.097 0.0	Vel = 5.87		
202			15.81	1.38		3.910	0.0220	0.086	Vel = 3.39		
			0.0 15.81					8.183	K Factor = 5.53		
211 to 212	1011.12 1011.95	5.69	17.06	1	E T 2.0 5.0	2.560 7.000 9.560	120	9.008 -0.359 0.927	K = K @ EQ02		
212 to 203	1011.95 1011.95		17.06 0.0	1.049 1.25		3.540 3.540	0.0970 120	0.927 9.576 0.0	Vel = 6.33		
203			17.06	1.38		3.540	0.0254	0.090	Vel = 3.66		
			0.0 17.06					9.666	K Factor = 5.49		
213 to 204	1012.29 1011.95	5.87	18.42	1	E T 2.0 5.0	0.830 7.000 7.830	120	9.846 0.147 0.875	K = K @ EQ05		
204			18.42	1.049		7.830	0.1117	0.875	Vel = 6.84		
			0.0 18.42					10.868	K Factor = 5.59		
214 to 205	1012.29 1011.95	5.87	23.09	1	E T 2.0 5.0	0.830 7.000 7.830	120	15.478 0.147 1.329	K = K @ EQ05		
205			23.09	1.049		7.830	0.1697	1.329	Vel = 8.57		
			0.0 23.09					16.954	K Factor = 5.61		
215 to 216	1011.12 1010.79	5.69	24.64	1	E T 2.0 5.0	1.320 7.000 8.320	120	18.778 0.143 1.592	K = K @ EQ01		
216 to 217	1010.79 1010.79		24.64 0.0	1.049 1.25		6.100 6.100	0.1913 120	1.592 20.513 0.0	Vel = 9.15		
217			24.64	1.38		6.100	0.0503	0.307	Vel = 5.29		
217 to 218	1010.79 1011.95		24.82	1.25	6E T 18.0 6.0	20.920 24.000 44.920	120	20.820 -0.502 8.208	Vel = 10.61		
218 to 206	1011.95 1011.95		0.0	3		0.500	120	28.526 0.0			
206			49.46	3.068		0.500	0.0040	0.002	Vel = 2.15		
			0.0 49.46					28.528	K Factor = 9.26		
219 to 217	1011.12 1010.79	5.69	24.82	1	E T 2.0 5.0	1.320 7.000 8.320	120	19.062 0.143 1.615	K = K @ EQ01		
217			24.82	1.049		8.320	0.1941	1.615	Vel = 9.21		
			0.0 24.82					20.820	K Factor = 5.44		

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 2nd Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
220 to 221	1012.74 1012.41	5.95	27.01 27.01	1 1.049	E T 2.0 5.0	1.250 7.000 8.250	120 0.2269	20.638 0.143 1.872	K = K @ EQ07 Vel = 10.03		
221 to 222	1012.41 1012.41		0.0 27.01	1.25 1.38		10.910 10.910	120 0.0597	22.653 0.0 0.651	Vel = 5.79		
222 to 208	1012.41 1011.95		27.40 54.41	1.25 1.38	2E T 6.0 6.0	12.430 12.000 24.430	120 0.2180	23.304 0.199 5.326	Vel = 11.67		
208			0.0 54.41					28.829	K Factor = 10.13		
223 to 222	1012.74 1012.41	5.95	27.40 27.4	1 1.049	E T 2.0 5.0	1.220 7.000 8.220	120 0.2331	21.245 0.143 1.916	K = K @ EQ08 Vel = 10.17		
222			0.0 27.40					23.304	K Factor = 5.68		
224 to 225	1012.29 1012.29	5.87	30.14 30.14	1 1.049	E T 2.0	0.540 2.000 2.540	120 0.2780	26.369 0.0 0.706	K = K @ EQ06 Vel = 11.19		
225 to 207	1012.29 1011.95		0.0 30.14	1 1.049	T 5.0	0.330 5.000 5.330	120 0.2780	27.075 0.147 1.482	Vel = 11.19		
207			0.0 30.14					28.704	K Factor = 5.63		



Hydraulic Calculations by HydraCALC

JAYHAWK FIRE SPRINKLER CO. INC
12030 S. HEDGE LANE TERRACE
OLATHE, KS 66061
913-422-3770
785-232-0975

Job Name : SLE ASC Expansion - 3rd Floor (Approval)
Drawing : FP5
Location : 100 NE SAINT LUKE'S BLVD
Remote Area : 3
Contract : 20543M
Data File : SLE ASC Expansion - 3rd Floor (Approval) Area 3.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME SLE ASC Expansion
Location 100 NE SAINT LUKE'S BLVD
Drawing # FP5
Contract # 20543M
Date 02/27/2024

DESIGN

Remote area # 3
Remote area location 3RD FLR. EXAM ROOMS AND CORRIDOR
Occupancy classification LIGHT HAZARD
Density .10 - Gpm/SqFt
Area of application 1100 - SqFt
Coverage/sprinkler VARIES - SqFt
Type of sprinkler calculated VICTUALIC Q.R. PENDENT
Sprinklers calculated 12
In-rack demand NA - GPM
Hose streams 100 - GPM
Total water required (including hose streams) 307.171 - GPM @ 70.602 - Psi
Type of system WET
Volume of system (dry or pre-action) NA - Gal

WATER SUPPLY INFORMATION

Test date 12-18-2023
Location ONSITE
Source of info CITY OF LEE'S SUMMIT

CONTRACTOR INFO JAYHAWK FIRE SPRINKLER CO. INC
Address 12030 S. HEDGE LANE TERRACE / OLATHE, KS 66061 / 913-422-377
Phone # 785-232-0975
Name of designer TJA
Authority having jurisdiction CITY OF LEE'S SUMMIT / LEE'S SUMMIT FIRE DEPT.
NOTES: NA

text1(35) - invisible

Water Supply Curve

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

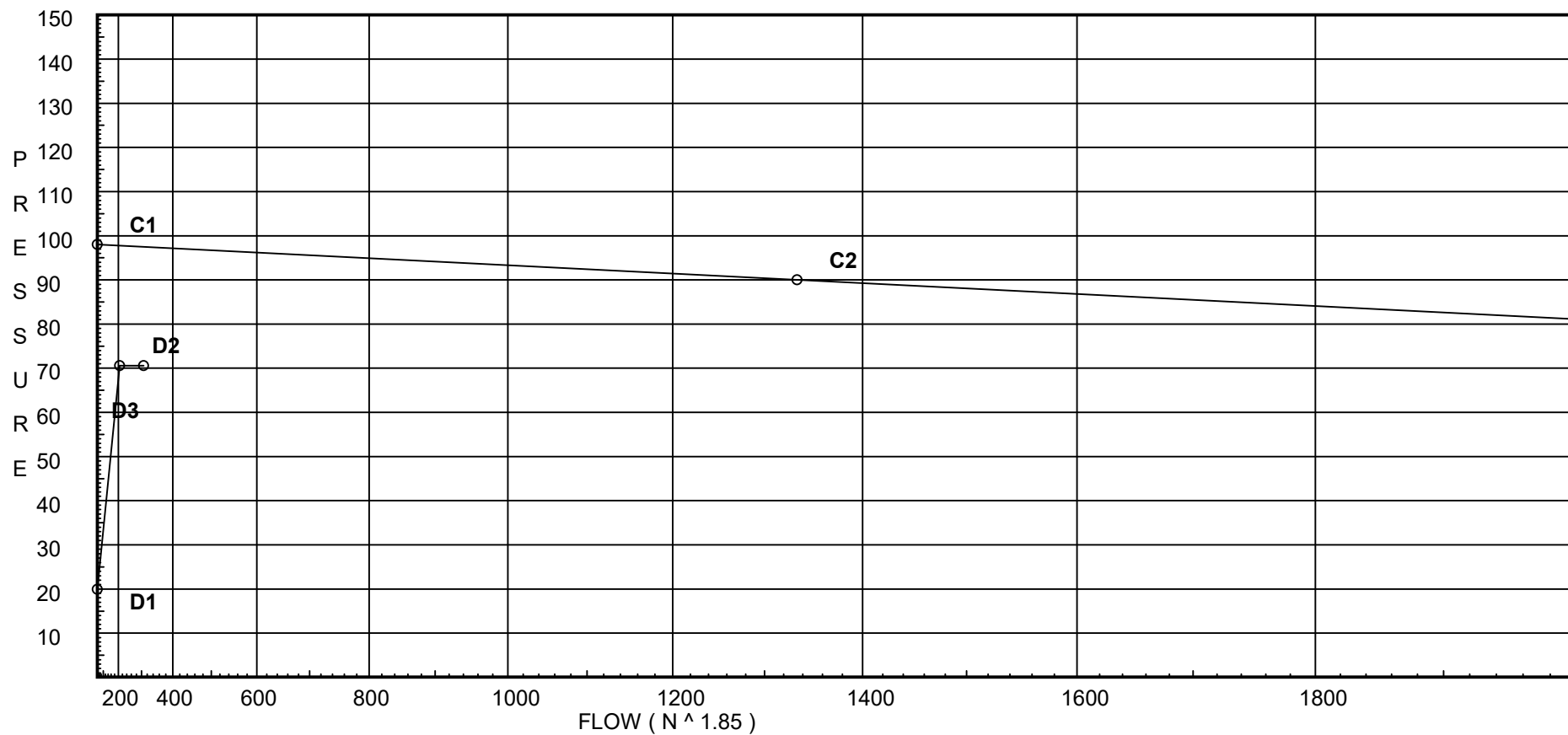
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City Water Supply:

C1 - Static Pressure : 98
C2 - Residual Pressure: 90
C2 - Residual Flow : 1334

Demand:

D1 - Elevation : 19.923
D2 - System Flow : 207.171
D2 - System Pressure : 70.602
Hose (Demand) : 100
D3 - System Demand : 307.171
Safety Margin : 26.869



Fittings Used Summary

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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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
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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.

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	98.0	90	1334.0	97.471	307.17	70.602

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
DP08	1026.12	5.6	7.0	14.82	0.1	114
EQ08	1028.29		6.37			
DP07	1026.12	5.6	8.16	16.0	0.1	160
EQ07	1028.29		7.58			
DP02	1026.12	5.6	7.0	14.82	0.1	112
EQ02	1028.37		6.34			
DP10	1026.12	5.6	7.0	14.82	0.1	126
EQ10	1028.29		6.37			
DP06	1026.12	5.6	7.0	14.82	0.1	70
EQ06	1028.29		6.37			
DP03	1026.12	5.6	7.0	14.82	0.1	65
EQ03	1028.37		6.34			
DP05	1026.12	5.6	11.15	18.7	0.1	187
EQ05	1028.29		10.69			
DP04	1026.12	5.6	7.0	14.82	0.1	110
EQ04	1028.37		6.34			
DP01	1026.12	5.6	7.0	14.82	0.1	109
EQ01	1028.37		6.34			
DP09	1026.12	5.6	7.0	14.82	0.1	84
EQ09	1028.29		6.37			
300	1028.29	5.72	10.74	18.74	K=K @ EQ05	
301	1027.95		11.82			
302	1027.95		11.95			
303	1027.95		15.28			
304	1027.45		16.04			
305	1027.45		16.55			
306	1027.45		17.03			
307	1027.45		17.37			
308A	1027.45		18.3			
308	1027.45		19.23			
309	1027.45		19.75			
310	1027.45		20.56			
311	1027.45		21.52			
312	1027.45		21.9			
313	1027.45		23.14			
314	1027.45		23.68			
315	1027.45		24.07			
316	1027.45		24.99			
317	1026.79		30.16			
318	1026.79		30.58			
3RD	995.29		53.16			
TOS	978.12		61.07			

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
BOS	978.12		61.61		
TTR	995.29		56.77		
TOR	995.29		58.67		
BOR	987.29		62.55		
BFS	987.29		63.14		
BFC	987.29		67.2		
SRC	982.29		70.13		
TAP	982.29		70.42		
TEST	982.29		70.6	100.0	
319	1028.29	5.72	10.86	18.85	K=K @ EQ05
320	1028.29	5.72	10.92	18.9	K=K @ EQ05
321	1027.95		11.96		
322	1027.95		14.87		
323	1026.95		15.73		
324	1027.95		15.86		
325	1027.95		16.41		
326	1027.95		16.85		
327	1027.95		17.21		
328A	1027.95		18.35		
328	1027.95		18.83		
329	1027.95		19.32		
330	1027.95		19.83		
331	1027.95		21.05		
332	1027.95		21.46		
333	1027.95		21.74		
334	1027.95		22.07		
335	1027.95		22.32		
336	1027.95		22.45		
337	1027.95		22.48		
338	1027.79		29.68		
339	1027.95		15.23		
340	1027.95		9.07		
341	1027.95		8.6		
342	1027.95		8.45		
343	1027.95		8.49		
344	1027.95		9.3		
345	1027.95		14.42		
346	1026.95		15.69		
347	1028.29	5.87	7.48	16.05	K=K @ EQ08
348	1028.29	5.81	7.58	16.0	K=K @ EQ07
349	1028.29	5.87	7.75	16.34	K=K @ EQ09
350	1028.29	5.87	8.28	16.89	K=K @ EQ06
351	1028.29	5.87	8.18	16.79	K=K @ EQ10
352	1028.37	5.88	8.27	16.91	K=K @ EQ02
353	1028.04		9.28		
354	1028.04		9.57		
355	1028.37	5.88	8.37	17.02	K=K @ EQ03
356	1028.04		9.28		
357	1028.04		9.65		
358	1028.37	5.88	8.64	17.3	K=K @ EQ01
359	1028.37	5.88	8.73	17.38	K=K @ EQ04

Flow Summary - NFPA

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
360	1027.95		22.9		
361	1027.95		29.24		

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
DP08 to EQ08	1026.12 1028.29	5.60	14.82 14.82	1 1.049	E	2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ08			0.0 14.82						6.372		K Factor = 5.87	
DP07 to EQ07	1026.12 1028.29	5.60	16.00 16.0	1 1.049	E	2.0	2.170 2.000 4.170	120 0.0863	8.163 -0.940 0.360		Vel = 5.94	
EQ07			0.0 16.00						7.583		K Factor = 5.81	
DP02 to EQ02	1026.12 1028.37	5.60	14.82 14.82	1 1.049	E	2.0	2.250 2.000 4.250	120 0.0746	7.000 -0.974 0.317		Vel = 5.50	
EQ02			0.0 14.82						6.343		K Factor = 5.88	
DP10 to EQ10	1026.12 1028.29	5.60	14.82 14.82	1 1.049	E	2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ10			0.0 14.82						6.372		K Factor = 5.87	
DP06 to EQ06	1026.12 1028.29	5.60	14.82 14.82	1 1.049	E	2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	
EQ06			0.0 14.82						6.372		K Factor = 5.87	
DP03 to EQ03	1026.12 1028.37	5.60	14.82 14.82	1 1.049	E	2.0	2.250 2.000 4.250	120 0.0746	7.000 -0.974 0.317		Vel = 5.50	
EQ03			0.0 14.82						6.343		K Factor = 5.88	
DP05 to EQ05	1026.12 1028.29	5.60	18.70 18.7	1 1.049	E	2.0	2.170 2.000 4.170	120 0.1149	11.151 -0.940 0.479		Vel = 6.94	
EQ05			0.0 18.70						10.690		K Factor = 5.72	
DP04 to EQ04	1026.12 1028.37	5.60	14.82 14.82	1 1.049	E	2.0	2.250 2.000 4.250	120 0.0746	7.000 -0.974 0.317		Vel = 5.50	
EQ04			0.0 14.82						6.343		K Factor = 5.88	
DP01 to EQ01	1026.12 1028.37	5.60	14.82 14.82	1 1.049	E	2.0	2.250 2.000 4.250	120 0.0746	7.000 -0.974 0.317		Vel = 5.50	
EQ01			0.0 14.82						6.343		K Factor = 5.88	
DP09 to EQ09	1026.12 1028.29	5.60	14.82 14.82	1 1.049	E	2.0	2.170 2.000 4.170	120 0.0748	7.000 -0.940 0.312		Vel = 5.50	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
SLE ASC Expansion - 3rd Floor (Approval)

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Date

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
EQ09			0.0 14.82						6.372		K Factor = 5.87	
300 to 301	1028.29 1027.95	5.72	18.74	1 1.049	E T	2.0 5.0	1.080 7.000 8.080	120	10.736 0.147 0.932		K = K @ EQ05 Vel = 6.96	
301 to 302	1027.95 1027.95		-8.50 10.24	1.25 1.38			14.000 14.000	120	11.815 0.0 0.139		Vel = 2.20	
302 to 303	1027.95 1027.95		18.85 29.09	1.25 1.38	T	6.0	42.650 6.000 48.650	120	11.954 0.0 3.329		Vel = 6.24	
303 to 304	1027.95 1027.45		42.88 71.97	2.5 2.469	2E	12.0	13.100 12.000 25.100	120	15.283 0.217 0.540		Vel = 4.82	
304 to 305	1027.45 1027.45		33.08 105.05	2.5 2.469			11.880 11.880	120	16.040 0.0 0.514		Vel = 7.04	
305 to 306	1027.45 1027.45		-2.07 102.98	2.5 2.469			11.420 11.420	120	16.554 0.0 0.477		Vel = 6.90	
306 to 307	1027.45 1027.45		-1.39 101.59	2.5 2.469			8.250 8.250	120	17.031 0.0 0.336		Vel = 6.81	
307 to 308A	1027.45 1027.450		-1.88 99.71	2.5 2.469	2E	12.0	11.730 12.000 23.730	120	17.367 0.0 0.933		Vel = 6.68	
308A to 308	1027.450 1027.45		-4.31 95.4	2.5 2.469	2E	12.0	13.750 12.000 25.750	120	18.300 0.0 0.934		Vel = 6.39	
308 to 309	1027.45 1027.45		3.28 98.68	2.5 2.469			13.350 13.350	120	19.234 0.0 0.515		Vel = 6.61	
309 to 310	1027.45 1027.45		3.47 102.15	2.5 2.469	2E	12.0	7.770 12.000 19.770	120	19.749 0.0 0.813		Vel = 6.85	
310 to 311	1027.45 1027.45		5.52 107.67	2.5 2.469	2E	12.0	9.170 12.000 21.170	120	20.562 0.0 0.960		Vel = 7.22	
311 to 312	1027.45 1027.45		4.15 111.82	2.5 2.469			7.830 7.830	120	21.522 0.0 0.380		Vel = 7.49	
312 to 313	1027.45 1027.45		3.91 115.73	2.5 2.469	2E	12.0	11.890 12.000 23.890	120	21.902 0.0 1.238		Vel = 7.76	
313 to 314	1027.45 1027.45		1.76 117.49	2.5 2.469			10.170 10.170	120	23.140 0.0 0.542		Vel = 7.87	
314 to 315	1027.45 1027.45		10.03 127.52	2.5 2.469			6.200 6.200	120	23.682 0.0 0.385		Vel = 8.55	

Final Calculations : Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
315 to 316	1027.45 1027.45		11.05 138.57	2.5 2.469			12.820 12.820	120 0.0723	24.067 0.0 0.927			
316 to 317	1027.45 1026.79		13.38 151.95	2.5 2.469	3E	18.0	38.950 18.000 56.950	120 0.0857	24.994 0.286 4.883		Vel = 9.29	
317 to 318	1026.79 1026.79		26.78 178.73	2.5 2.469			3.560 3.560	120 0.1157	30.163 0.0 0.412		Vel = 10.18	
318 to 3RD	1026.79 995.290		28.44 207.17	2.5 2.469	E B S Fsp	6.0 7.0 14.0 0.0	12.030 27.000 39.030	120 0.1521	30.575 16.643 5.938		* * Fixed Loss = 3 Vel = 13.88	
3RD to TOS	995.290 978.120		0.0 207.17	4 4.026	T	20.0	14.167 20.000 34.167	120 0.0141	53.156 7.436 0.481		Vel = 5.22	
TOS to BOS	978.120 978.120		0.0 207.17	4 4.026	2E	20.0	17.920 20.000 37.920	120 0.0141	61.073 0.0 0.533		Vel = 5.22	
BOS to TTR	978.120 995.290		0.0 207.17	4 4.026	E	10.0	175.000 10.000 185.000	120 0.0141	61.606 -7.436 2.602		Vel = 5.22	
TTR to TOR	995.290 995.290		0.0 207.17	4 4.026	3E	30.0	104.750 30.000 134.750	120 0.0141	56.772 0.0 1.895		Vel = 5.22	
TOR to BOR	995.290 987.290		0.0 207.17	4 4.026	2E	20.0	10.000 20.000 30.000	120 0.0141	58.667 3.465 0.422		Vel = 5.22	
BOR to BFS	987.290 987.290		0.0 207.17	4 4.026	T B	20.0 12.0	10.000 32.000 42.000	120 0.0141	62.554 0.0 0.591		Vel = 5.22	
BFS to BFC	987.290 987.290		0.0 207.17	4 4.026			4.000 4.000	120 0.0140	63.145 4.000 0.056		* * Fixed Loss = 4 Vel = 5.22	
BFC to SRC	987.290 982.290		0.0 207.17	4 4.1	2E	29.067	50.000 29.067 79.067	140 0.0097	67.201 2.166 0.765		Vel = 5.03	
SRC to TAP	982.290 982.290		0.0 207.17	6 6.16	T E G	43.037 20.084 4.304	150.000 67.425 217.425	140 0.0013	70.132 0.0 0.289		Vel = 2.23	
TAP to TEST	982.290 982.290		0.0 207.17	8 8.27	T G 2E	55.354 6.326 56.936	450.000 118.616 568.616	140 0.0003	70.421 0.0 0.181		Vel = 1.24	
TEST			100.00 307.17						70.602		Qa = 100.00 K Factor = 36.56	
319 to 302	1028.29 1027.95	5.72	18.85 18.85	1 1.049	E T	2.0 5.0	1.080 7.000 8.080	120 0.1167	10.864 0.147 0.943		K = K @ EQ05 Vel = 7.00	

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JAYHAWK FIRE SPRINKLER CO. INC
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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
302			0.0 18.85					11.954		K Factor = 5.45	
320 to 321	1028.29 1027.95	5.72	18.90	1	E T 2.0 5.0	0.660 7.000 7.660	120	10.918 0.147 0.898		K = K @ EQ05	
321 to 322	1027.95 1027.95		18.9	1.049			0.1172			Vel = 7.02	
321 to 322	1027.95 1027.95		8.50	1.25	3E 9.0	38.390 9.000 47.390	120	11.963 0.0			
322 to 323	1027.95 1026.95		27.4	1.38			0.0613	2.905		Vel = 5.88	
322 to 323	1027.95 1026.95		0.0	1.25	T 6.0	1.000 6.000 7.000	120	14.868 0.433 0.429			
323 to 324	1026.95 1027.95		39.19	2.5	3E 18.0	12.160 18.000 30.160	120	15.730 -0.433 0.562		Vel = 4.46	
324 to 325	1027.95 1027.95		66.59	2.469			0.0186				
324 to 325	1027.95 1027.95		35.53	2.5		13.500	120	15.859 0.0			
325 to 326	1027.95 1027.95		102.12	2.469		13.500	0.0411	0.555		Vel = 6.84	
325 to 326	1027.95 1027.95		2.07	2.5		10.260	120	16.414 0.0			
326 to 327	1027.95 1027.95		104.19	2.469		10.260	0.0427	0.438		Vel = 6.98	
326 to 327	1027.95 1027.95		1.39	2.5		8.170	120	16.852 0.0			
327 to 328	1027.95 1027.95		105.58	2.469		8.170	0.0437	0.357		Vel = 7.08	
327 to 328A	1027.95 1027.950		1.88	2.5	2E 12.0	13.203 12.000 25.203	120	17.209 0.0 1.138			
328A to 328	1027.950 1027.95		107.46	2.469			0.0452			Vel = 7.20	
328A to 328	1027.950 1027.95		4.31	2.5		9.917	120	18.347 0.0			
328 to 329	1027.95 1027.95		111.77	2.469		9.917	0.0486	0.482		Vel = 7.49	
328 to 329	1027.95 1027.95		-3.28	2.5		10.770	120	18.829 0.0			
329 to 330	1027.95 1027.95		108.49	2.469		10.770	0.0460	0.495		Vel = 7.27	
329 to 330	1027.95 1027.95		-3.47	2.5		11.720	120	19.324 0.0			
330 to 331	1027.95 1027.95		105.02	2.469		11.720	0.0433	0.508		Vel = 7.04	
330 to 331	1027.95 1027.95		-5.52	2.5	4E 24.0	7.070 24.000 31.070	120	19.832 0.0 1.217			
331 to 332	1027.95 1027.95		99.5	2.469			0.0392			Vel = 6.67	
331 to 332	1027.95 1027.95		-4.15	2.5		11.380	120	21.049 0.0			
332 to 333	1027.95 1027.95		95.35	2.469		11.380	0.0362	0.412		Vel = 6.39	
332 to 333	1027.95 1027.95		-3.91	2.5		8.320	120	21.461 0.0			
333 to 334	1027.95 1027.95		91.44	2.469		8.320	0.0335	0.279		Vel = 6.13	
333 to 334	1027.95 1027.95		-11.79	2.5		12.800	120	21.740 0.0			
334 to 335	1027.95 1027.95		79.65	2.469		12.800	0.0259	0.332		Vel = 5.34	
334 to 335	1027.95 1027.95		-11.05	2.5		12.620	120	22.072 0.0			
335	1027.95		68.6	2.469		12.620	0.0197	0.249		Vel = 4.60	

Final Calculations : Hazen-Williams

JAYHAWK FIRE SPRINKLER CO. INC
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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
335 to 336	1027.95 1027.95		-13.38 55.22	2.5 2.469			9.750 9.750	120 0.0131	22.321 0.0 0.128		Vel = 3.70	
336 to 337	1027.95 1027.95		-26.78 28.44	2.5 2.469			8.220 8.220	120 0.0039	22.449 0.0 0.032		Vel = 1.91	
337 to 338	1027.95 1027.79		0.0 28.44	1.25 1.38	T 6E	6.0 18.0	84.610 24.000 108.610	120 0.0657	22.481 0.069 7.132		Vel = 6.10	
338 to 318	1027.79 1026.79		0.0 28.44	1.25 1.38	T	6.0	1.000 6.000 7.000	120 0.0657	29.682 0.433 0.460		Vel = 6.10	
318			0.0 28.44						30.575		K Factor = 5.14	
301 to 321	1027.95 1027.95		8.50 8.5	1.25 1.38	2E	6.0	15.090 6.000 21.090	120 0.0070	11.815 0.0 0.148		Vel = 1.82	
321			0.0 8.50						11.963		K Factor = 2.46	
303 to 339	1027.95 1027.95		-42.89 -42.89	2.5 2.469			6.310 6.310	120 -0.0082	15.283 0.0 -0.052		Vel = 2.87	
339 to 340	1027.95 1027.95		0.0 -42.89	1.25 1.38	T	6.0	37.900 6.000 43.900	120 -0.1403	15.231 0.0 -6.161		Vel = 9.20	
340 to 341	1027.95 1027.95		16.80 -26.09	1.25 1.38			8.420 8.420	120 -0.0561	9.070 0.0 -0.472		Vel = 5.60	
341 to 342	1027.95 1027.95		16.34 -9.75	1.25 1.38	2E	6.0	10.590 6.000 16.590	120 -0.0090	8.598 0.0 -0.150		Vel = 2.09	
342 to 343	1027.95 1027.95		16.05 6.3	1.25 1.38			10.050 10.050	120 0.0041	8.448 0.0 0.041		Vel = 1.35	
343 to 344	1027.95 1027.95		16.00 22.3	1.25 1.38	2E	6.0	13.350 6.000 19.350	120 0.0419	8.489 0.0 0.810		Vel = 4.78	
344 to 345	1027.95 1027.95		16.89 39.19	1.25 1.38	3E	9.0	34.140 9.000 43.140	120 0.1188	9.299 0.0 5.123		Vel = 8.41	
345 to 346	1027.95 1026.95		0.0 39.19	1.25 1.38	T	6.0	1.000 6.000 7.000	120 0.1189	14.422 0.433 0.832		Vel = 8.41	
346 to 323	1026.95 1026.95		0.0 39.19	2.5 2.469			6.120 6.120	120 0.0070	15.687 0.0 0.043		Vel = 2.63	
323			0.0 39.19						15.730		K Factor = 9.88	

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
347 to 342	1028.29 1027.95	5.87	16.05 16.05	1 1.049	E T 2.0 5.0	2.460 7.000 9.460	120 0.0867	7.481 0.147 0.820	K = K @ EQ08 Vel = 5.96		
342			0.0 16.05					8.448	K Factor = 5.52		
348 to 343	1028.29 1027.95	5.81	16.00 16.0	1 1.049	E T 2.0 5.0	1.810 7.000 8.810	120 0.0862	7.583 0.147 0.759	K = K @ EQ07 Vel = 5.94		
343			0.0 16.00					8.489	K Factor = 5.49		
349 to 341	1028.29 1027.95	5.87	16.34 16.34	1 1.049	E T 2.0 5.0	0.840 7.000 7.840	120 0.0895	7.749 0.147 0.702	K = K @ EQ09 Vel = 6.07		
341			0.0 16.34					8.598	K Factor = 5.57		
350 to 344	1028.29 1027.95	5.87	16.89 16.89	1 1.049	E T 2.0 5.0	2.200 7.000 9.200	120 0.0952	8.276 0.147 0.876	K = K @ EQ06 Vel = 6.27		
344			0.0 16.89					9.299	K Factor = 5.54		
351 to 340	1028.29 1027.95	5.87	16.79 16.79	1 1.049	E T 2.0 5.0	0.840 7.000 7.840	120 0.0943	8.184 0.147 0.739	K = K @ EQ10 Vel = 6.23		
340			0.0 16.79					9.070	K Factor = 5.58		
352 to 353	1028.37 1028.04	5.88	16.92 16.92	1 1.049	E T 2.0 5.0	2.110 7.000 9.110	120 0.0955	8.267 0.143 0.870	K = K @ EQ02 Vel = 6.28		
353 to 354	1028.04 1028.04		-1.14 15.78	1.25 1.38		12.920 12.920	120 0.0221	9.280 0.0 0.285	Vel = 3.38		
354 to 304	1028.04 1027.45		17.30 33.08	1.25 1.38	9E T 27.0 6.0	38.650 33.000 71.650	120 0.0868	9.565 0.256 6.219	Vel = 7.10		
304			0.0 33.08					16.040	K Factor = 8.26		
355 to 356	1028.37 1028.04	5.88	17.02 17.02	1 1.049	E T 2.0 5.0	0.950 7.000 7.950	120 0.0965	8.370 0.143 0.767	K = K @ EQ03 Vel = 6.32		
356 to 357	1028.04 1028.04		1.13 18.15	1.25 1.38		13.080 13.080	120 0.0287	9.280 0.0 0.375	Vel = 3.89		
357 to 324	1028.04 1027.95		17.38 35.53	1.25 1.38	5E T 15.0 6.0	41.200 21.000 62.200	120 0.0991	9.655 0.039 6.165	Vel = 7.62		
324			0.0 35.53					15.859	K Factor = 8.92		

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JAYHAWK FIRE SPRINKLER CO. INC
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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
358 to 354	1028.37 1028.04	5.88	17.30 17.3	1 1.049	E T 2.0 5.0	0.830 7.000 7.830	120 0.0995	8.643 0.143 0.779	K = K @ EQ01 Vel = 6.42		
354			0.0 17.30					9.565	K Factor = 5.59		
359 to 357	1028.37 1028.04	5.88	17.38 17.38	1 1.049	E T 2.0 5.0	0.810 7.000 7.810	120 0.1004	8.728 0.143 0.784	K = K @ EQ04 Vel = 6.45		
357			0.0 17.38					9.655	K Factor = 5.59		
353 to 356	1028.04 1028.04		1.14 1.14	1.25 1.38		3.990 3.990	120 0	9.280 0.0 0.0	Vel = 0.24		
356			0.0 1.14					9.280	K Factor = 0.37		
325 to 305	1027.95 1027.45		-2.07 -2.07	1.25 1.38	2T 8E 12.0 24.0	111.940 36.000 147.940	120 -0.0005	16.414 0.217 -0.077	Vel = 0.44		
305			0.0 -2.07					16.554	K Factor = -0.51		
326 to 306	1027.95 1027.45		-1.39 -1.39	1.25 1.38	2T 9E 12.0 27.0	110.070 39.000 149.070	120 -0.0003	16.852 0.217 -0.038	Vel = 0.30		
306			0.0 -1.39					17.031	K Factor = -0.34		
327 to 307	1027.95 1027.45		-1.87 -1.87	1.25 1.38	2T 6E 12.0 18.0	106.140 30.000 136.140	120 -0.0004	17.209 0.217 -0.059	Vel = 0.40		
307			0.0 -1.87					17.367	K Factor = -0.45		
328 to 308	1027.95 1027.45		3.28 3.28	1.25 1.38	2T 11E 12.0 33.0	110.950 45.000 155.950	120 0.0012	18.829 0.217 0.188	Vel = 0.70		
308			0.0 3.28					19.234	K Factor = 0.75		
329 to 309	1027.95 1027.45		3.48 3.48	1.25 1.38	2T 10E 12.0 30.0	112.740 42.000 154.740	120 0.0013	19.324 0.217 0.208	Vel = 0.75		
309			0.0 3.48					19.749	K Factor = 0.78		
330 to 310	1027.95 1027.45		5.52 5.52	1.25 1.38	2T 12E 12.0 36.0	114.730 48.000 162.730	120 0.0032	19.832 0.217 0.513	Vel = 1.18		
310			0.0 5.52					20.562	K Factor = 1.22		
331 to 311	1027.95 1027.45		4.15 4.15	1.25 1.38	6E 2T 18.0 12.0	107.460 30.000 137.460	120 0.0019	21.049 0.217 0.256	Vel = 0.89		

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
311			0.0 4.15						21.522		K Factor = 0.89	
332 to 312	1027.95 1027.45		3.92 3.92	1.25 1.38	2T 4E	12.0 12.0	110.300 24.000 134.300	120 0.0017	21.461 0.217 0.224		Vel = 0.84	
312			0.0 3.92						21.902		K Factor = 0.84	
333 to 360	1027.95 1027.95		11.79 11.79	1.25 1.38	2T 2E	12.0 6.0	72.330 18.000 90.330	120 0.0129	21.740 0.0 1.162		Vel = 2.53	
360 to 313	1027.95 1027.45		-10.04 1.75	1.25 1.38	3E T	9.0 6.0	42.060 15.000 57.060	120 0.0004	22.902 0.217 0.021		Vel = 0.38	
313			0.0 1.75						23.140		K Factor = 0.36	
360 to 314	1027.95 1027.45		10.03 10.03	1.25 1.38	3E T	9.0 6.0	44.000 15.000 59.000	120 0.0095	22.902 0.217 0.563		Vel = 2.15	
314			0.0 10.03						23.682		K Factor = 2.06	
334 to 315	1027.95 1027.45		11.05 11.05	1.25 1.38	2T 10E	12.0 30.0	113.820 42.000 155.820	120 0.0114	22.072 0.217 1.778		Vel = 2.37	
315			0.0 11.05						24.067		K Factor = 2.25	
335 to 316	1027.95 1027.45		13.38 13.38	1.25 1.38	2T 8E	12.0 24.0	114.880 36.000 150.880	120 0.0163	22.321 0.217 2.456		Vel = 2.87	
316			0.0 13.38						24.994		K Factor = 2.68	
336 to 361	1027.95 1027.95		26.77 26.77	1.25 1.38	T 8E	6.0 24.0	85.660 30.000 115.660	120 0.0587	22.449 0.0 6.791		Vel = 5.74	
361 to 317	1027.95 1026.79		0.0 26.77	1.25 1.38	T	6.0	1.170 6.000 7.170	120 0.0587	29.240 0.502 0.421		Vel = 5.74	
317			0.0 26.77						30.163		K Factor = 4.87	
328A to 308A	1027.950 1027.450		-4.32 -4.32	1.25 1.38	7E	21.0	110.250 21.000 131.250	120 -0.0020	18.347 0.217 -0.264		Vel = 0.93	
308A			0.0 -4.32						18.300		K Factor = -1.01	



Hydraulic Calculations by HydraCALC

JAYHAWK FIRE SPRINKLER CO. INC
12030 S. HEDGE LANE TERRACE
OLATHE, KS 66061
913-422-3770
785-232-0975

Job Name : STANDPIPE UPGRADE FROM 4 TO 6
Drawing : BUILDING E - EXPANSION
Location : 100 NE SAINT LUKE'S BLVD. - BUILDING E EXPANSION
Remote Area :
Contract : 20543KM
Data File : STANDPIPE CALC - Upgrade to 6inch Area 4.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - STANDPIPE UPGRADE FROM 4 TO 6 Date - 02/27/2024
Location - 100 NE SAINT LUKE'S BLVD. - BUILDING E EXPANSION
Building - BUILDING E - EXPANSION System No. -
Contractor - JAYHAWK FIRE SPRINKLER CO., INC. Contract No. - 20543KM
Calculated By - TJA Drawing No. - FP1 & FP6
Occupancy - LIGHT HAZARD

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

T
E Flow at Top Most Outlet - 500 Gpm System Type
M Pres. at Top Most Outlet - 100 Psi (X) Wet () Dry
Flow For Ea. Additional Standpipe - 250 Gpm
D Total Additional Flow - Gpm
E Elevation at Highest Outlet - 52 Feet
S Hose Valve Connection ()1 1/2" (X)2 1/2"
I Class Service ()I ()II (X)III
G Note:
N

Calculation Gpm Required 750 Psi Required 170 At Test
Summary C-Factor Used: Overhead 120 Underground 120

W Water Flow Test: Pump Data: Tank or Reservoir:
A Date of Test - Cap.
T Time of Test - Rated Cap. Elev.
E Static (Psi) - 172 @ Psi
R Residual (Psi) - 171 Elev. Well
Flow (Gpm) - 750 Proof Flow Gpm
S Elevation - 989.29

U
P Location: AT CONNECTION TO BUILDING FDC

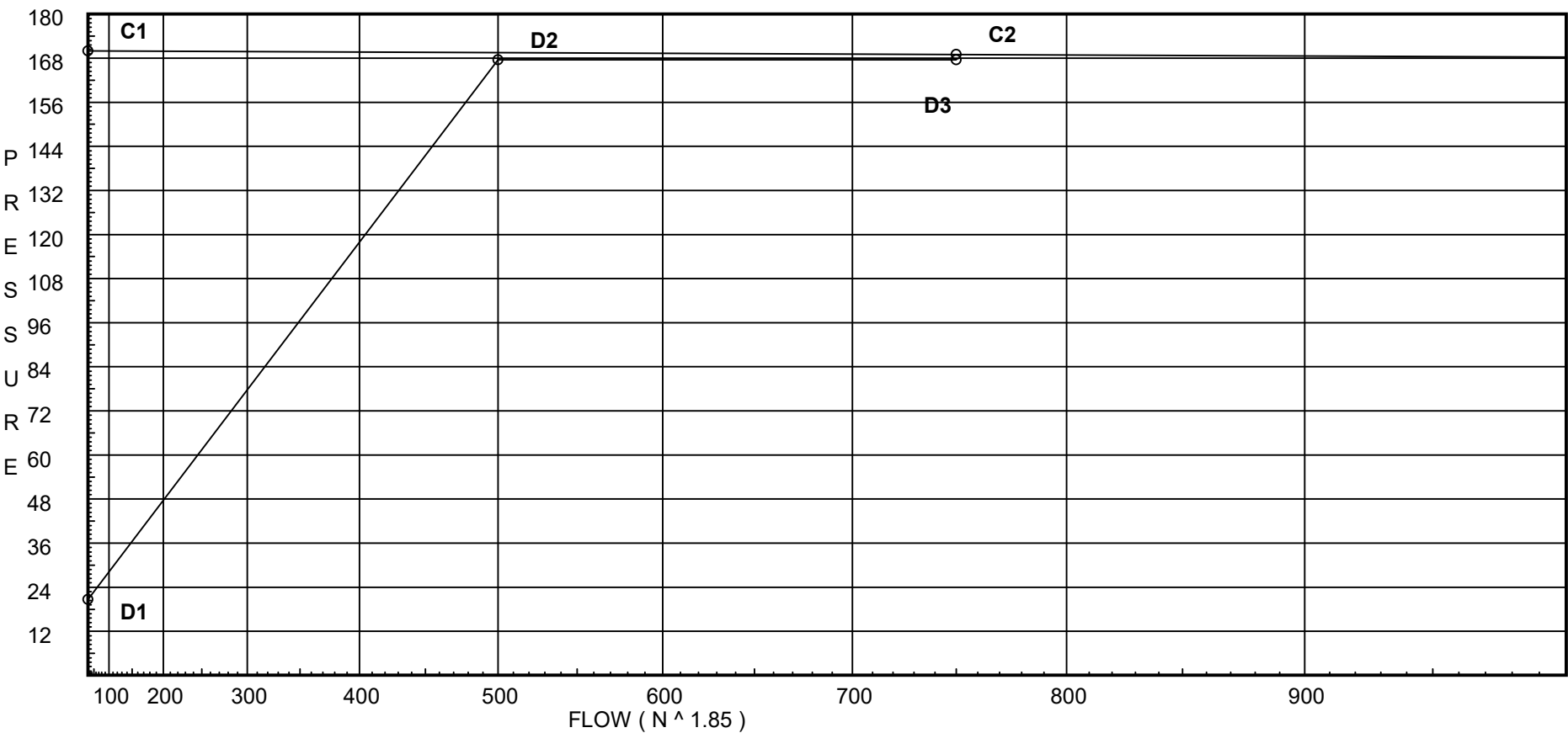
P
L Source of Information:
Y

Water Supply Curve

JAYHAWK FIRE SPRINKLER CO. INC
STANDPIPE UPGRADE FROM 4 TO 6

City Water Supply:
C1 - Static Pressure : 170
C2 - Residual Pressure: 169
C2 - Residual Flow : 750

Demand:
D1 - Elevation : 20.715
D2 - System Flow : 500
D2 - System Pressure : 167.549
Hose (Demand) : 250
D3 - System Demand : 750
Safety Margin : 1.451



Fittings Used Summary

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Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	0	0	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	0	0	0	0	0	0	0

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.

Flow Summary - NFPA

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SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	170.0	169	750.0	169.0	750.0	167.549

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
500	1037.12	50	100.0	500.0	0.1	100
501	1037.12		105.3			
502	996.62		126.21			
503	996.62		126.25			
BOS	978.12		134.81			
TTR	978.12		138.4			
506	995.29		134.11			
TOR	995.29		138.88			
BOR	987.29		144.9			
FD	987.29		147.48			
TEST	989.29		167.55			
600	1021.12		114.71	250.0		
TOS	978.12		133.82			

Final Calculations : Hazen-Williams

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STANDPIPE UPGRADE FROM 4 TO 6

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
500 to 501	1037.12 1037.12	50.00	500.00 500.0	2.5 2.469	E	6.0	0.830 6.000 6.830	120	100.000 0.0			
								0.7766	5.304	Vel =	33.51	
501 to 502	1037.12 996.62		0.0 500.0	6 6.065	12V B	120.0 10.0	215.070 130.000 345.070	120	105.304 17.540			
								0.0098	3.368	Vel =	5.55	
502 to 503	996.62 996.62		0.0 500.0	6 6.065			4.220 4.220	120	126.212 0.0			
								0.0097	0.041	Vel =	5.55	
503 to BOS	996.62 978.120		0.0 500.0	6 6.065	2V	20.0	35.820 20.000 55.820	120	126.253 8.012			
								0.0098	0.545	Vel =	5.55	
BOS to TTR	978.120 978.120		250.00 750.0	6 6.065			173.880 173.880	120	134.810 0.0			
								0.0207	3.592	Vel =	8.33	
TTR to 506	978.120 995.290		0.0 750.0	6 6.065	5V	50.0	102.020 50.000 152.020	120	138.402 -7.436			
								0.0207	3.141	Vel =	8.33	
506 to TOR	995.290 995.290		0.0 750.0	4 4.026	V	6.8	24.600 6.800 31.400	120	134.107 0.0			
								0.1520	4.772	Vel =	18.90	
TOR to BOR	995.290 987.290		0.0 750.0	4 4.026	V	6.8	10.000 6.800 16.800	120	138.879 3.465			
								0.1520	2.553	Vel =	18.90	
BOR to FD	987.290 987.290		0.0 750.0	4 4.026	X	16.0	1.000 16.000 17.000	120	144.897 0.0			
								0.1519	2.583	Vel =	18.90	
FD to TEST	987.290 989.290		0.0 750.0	4 4.026	6V S	40.8 22.0	74.950 62.800 137.750	120	147.480 -0.866			
								0.1520	20.935	Vel =	18.90	
TEST			0.0 750.00						167.549	K Factor =	57.94	
600 to TOS	1021.120 978.120	H250	250.00	4			24.333	120	114.708 18.623			
								0.0199	0.485	Vel =	6.30	
TOS to BOS	978.120 978.120		0.0 250.0	4 4.026	2E B	20.0 12.0	17.920 32.000 49.920	120	133.816 0.0			
								0.0199	0.994	Vel =	6.30	
BOS			0.0 250.00						134.810	K Factor =	21.53	