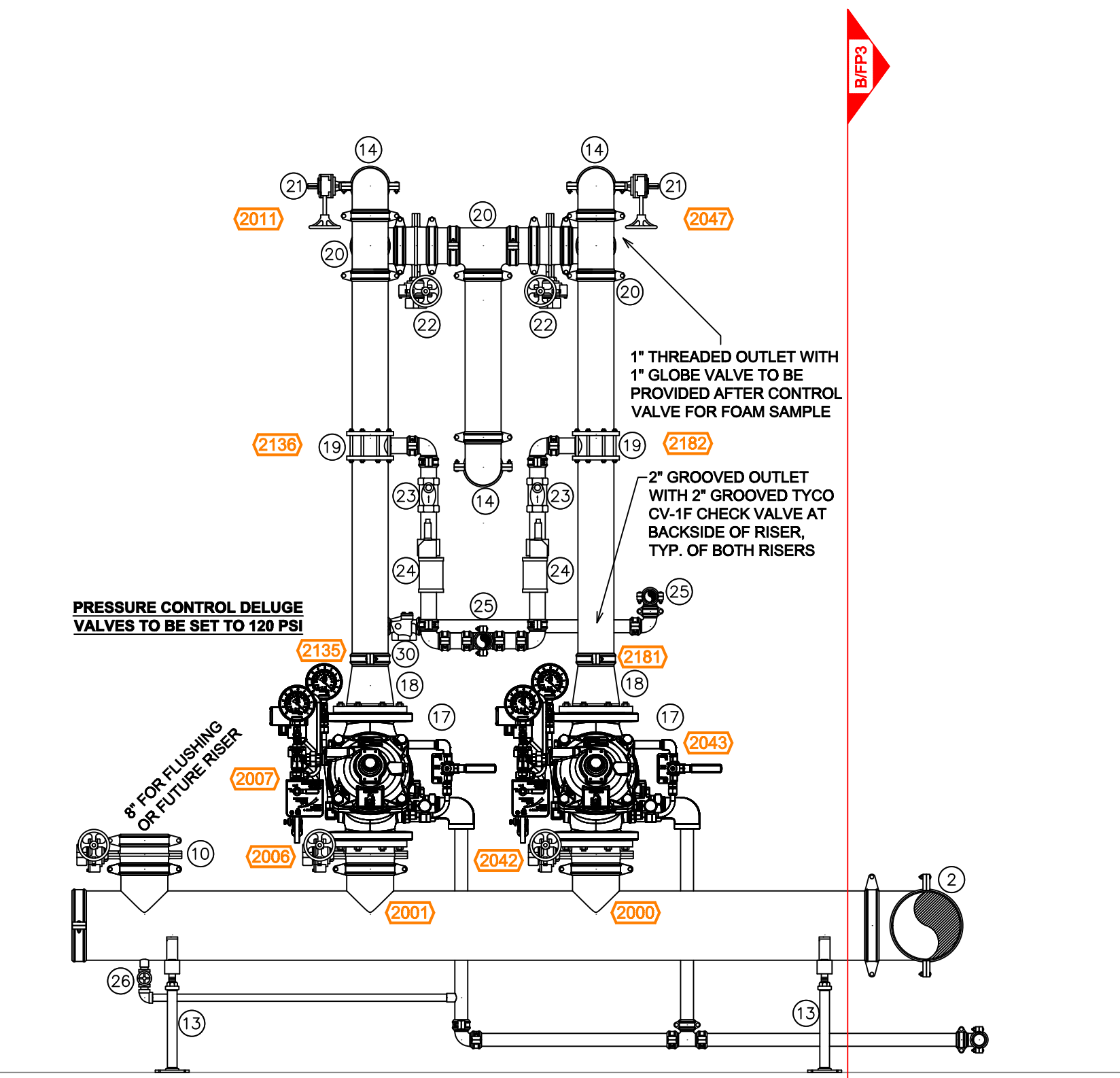
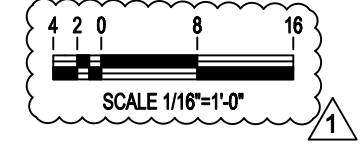
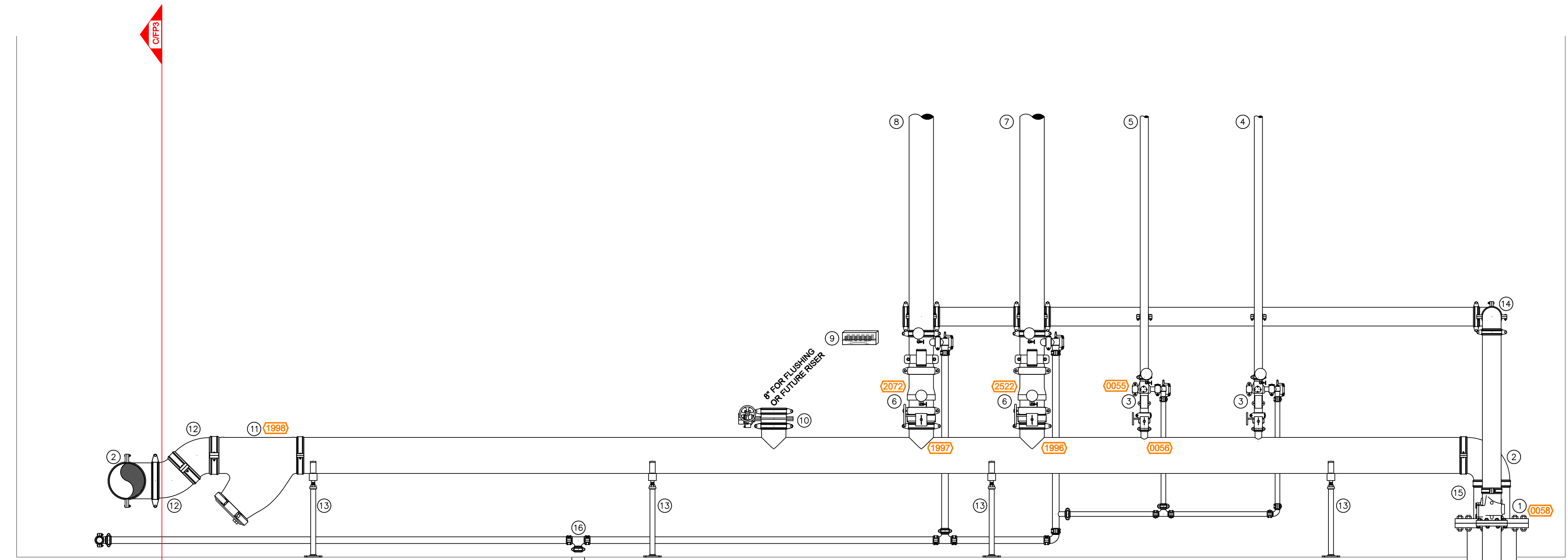
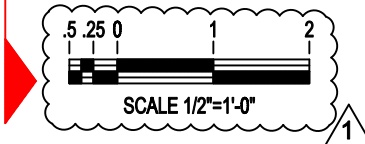


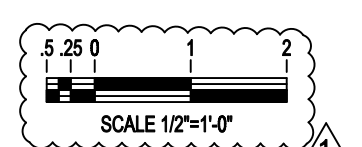
FULL HEIGHT CROSS SECTION
SCALE: 1/16"=1'-0" (SECTION 'A')



SYSTEM HEADER SECTION (SOUTH ANNEX)
SCALE: 1/2"=1'-0" (SECTION 'C')



SYSTEM HEADER SECTION (SOUTH ANNEX)
SCALE: 1/2"=1'-0" (SECTION 'B')



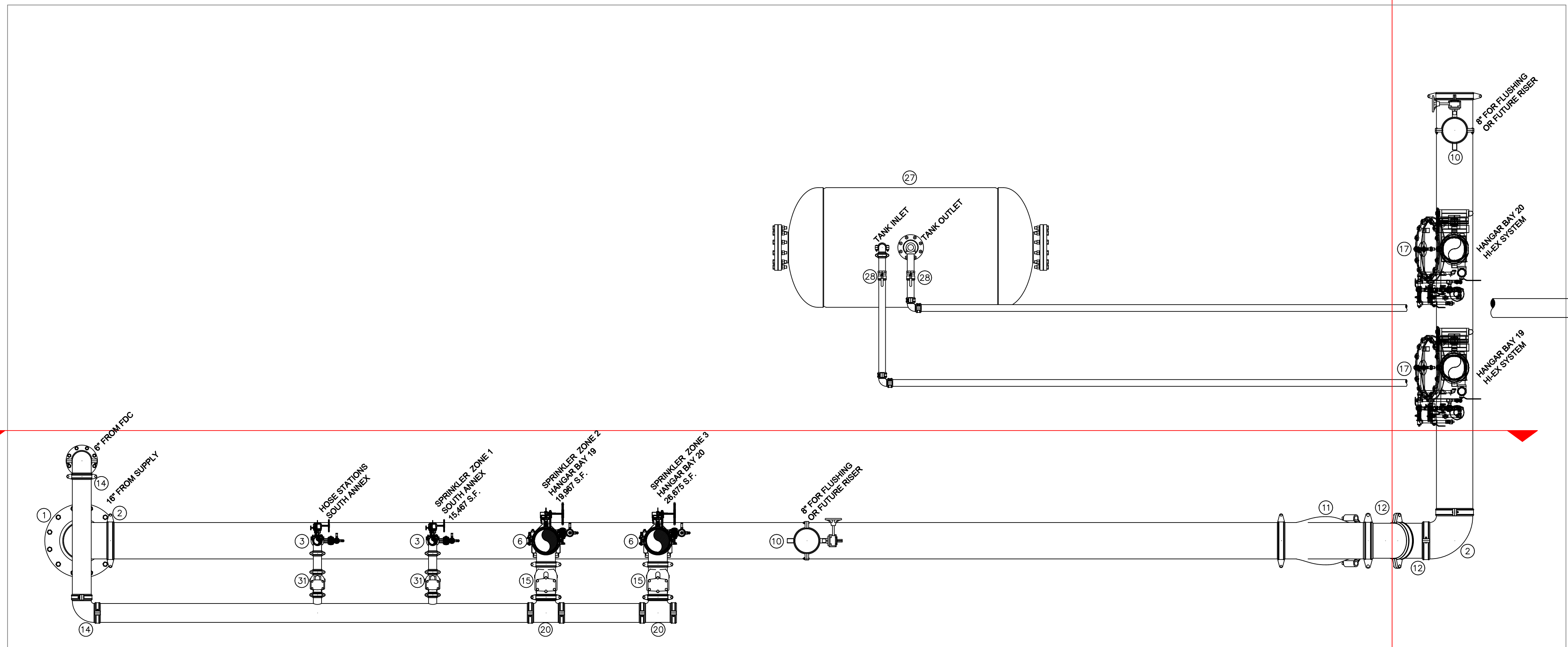
JOB GENERAL NOTES

- SCOPE OF WORK IS TO PROVIDE FOUR ELECTRICALLY ACTUATED DELUGE SYSTEMS TO FEED THIRTEEN HIGH EXPANSION GENERATORS PER NFPA 11 2019 EDITION & NFPA 409 2016 EDITION, FOUR OVERHEAD WET PIPE SPRINKLER SYSTEMS TO PROTECT HANGER BAYS 19-22 PER NFPA 13 2019 EDITION & NFPA 409 2016 EDITION, AND TWO WET PIPE SPRINKLER SYSTEMS PROTECTING THE NORTH AND SOUTH TIVO LEVEL ANNEXES PER NFPA 13 2019 EDITION. WILL ALSO PROVIDE HOSE VALVES FOR EACH TWO LEVEL ANNEX AND FOUR FOAM HOSE STATIONS IN HANGER BAYS 19-22.
- SCOPE OF WORK BEGINS AT THE 16" FLANGE STUB UP PROVIDED BY OTHERS.
- TOTAL AREA OF THE AIRCRAFT HANGER IS 88,256 FT².
- ALL ELECTRICAL DETECTION AND WIRING OF ELECTRICAL DEVICES IS TO BE BY OTHERS.
- THE OVERHEAD WET SYSTEMS IN HANGER BAYS 19-22 ARE DESIGNED TO PROVIDE A DENSITY OF 0.17 GPM/FT² OVER THE MOST DEMANDING 15,000 FT².
- THE HIGH EXPANSION FOAM SYSTEMS ARE DESIGNED TO FLOW THIRTEEN FOAM GENERATORS AT A MINIMUM OF 223 GPM, 26,322 FT³/MIN, EACH WITH A MINIMUM PRESSURE OF 62 PSI.
- EACH OVERHEAD WET SYSTEM HAS BEEN CALCULATED FOR THE SIMULTANEOUS FLOW WITH THE HIGH EXPANSION FOAM SYSTEM.
- ALL 1" PIPING IS SCHEDULE 40 BLACK STEEL JOINED WITH CAST IRON THREADED AND VICTAULIC "GS" GROOVED FITTINGS.
- ALL 1-1/4" PIPING IS SCHEDULE 40 BLACK STEEL JOINED WITH VICTAULIC "INSTALLATION READY" GROOVED FITTINGS AND CONTAIN SHOP WELDED OUTLETS FOR THE ATTACHMENT OF SPRINKLER HEADS AND ARMORS.
- ALL 1-1/2" - 2" PIPING IS SCHEDULE 10 BLACK STEEL PIPE JOINED WITH VICTAULIC "INSTALLATION READY" GROOVED FITTINGS AND CONTAIN SHOP WELDED OUTLETS FOR THE ATTACHMENT OF SPRINKLER HEADS, BRANCH LINES, AND ARMORS.
- ALL 2-1/2" AND LARGER PIPING IS SCHEDULE 10 BLACK STEEL JOINED WITH VICTAULIC "FIRELOCK" GROOVED FITTINGS AND CONTAIN SHOP WELDED OUTLETS FOR THE ATTACHMENT OF BRANCH LINES.
- ALL FOAM CONCENTRATE PIPE IS SCHEDULE 40 304 STAINLESS STEEL JOINED WITH VICTAULIC "INSTALLATION READY" GROOVED FITTINGS.
- ALL SPRINKLER HEADS LOCATED IN LAY-IN CEILING TILE ARE TO BE LOCATED IN THE QUARTER POINTS OF THE TILES.
- ALL PIPING TO UPRIGHT SPRINKLERS ON A SPRIG IS SCHEDULE 40 BLACK STEEL JOINED WITH CAST IRON THREADED FITTINGS.
- SAS IS NOT RESPONSIBLE FOR DETERMINING THE CAPACITY OF THE BUILDING STRUCTURE TO SUPPORT THE FIRE PROTECTION SYSTEMS.
- ALL DELUGE SYSTEM PIPING SHALL BE RESTRAINED FROM MOVEMENT DURING OPERATION.

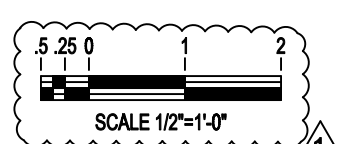
- SYMBOL LEGEND**
- 100' PIPE ELEVATION A.F.F
 - 102' PIPE ELEVATION BELOW B.O.D
 - (RH) ROOM HAZARD CLASSIFICATION (ALL ROOMS ARE CONSIDERED LIGHT HAZARD UNLESS NOTED)
 - (E) HYDRAULIC CALCULATION POINT
 - CEILING HEIGHT
 - 4-WAY BRACING
 - 2-WAY BRACING
 - TRAPEZOID

RISER LEGEND (SOUTH ANNEX)

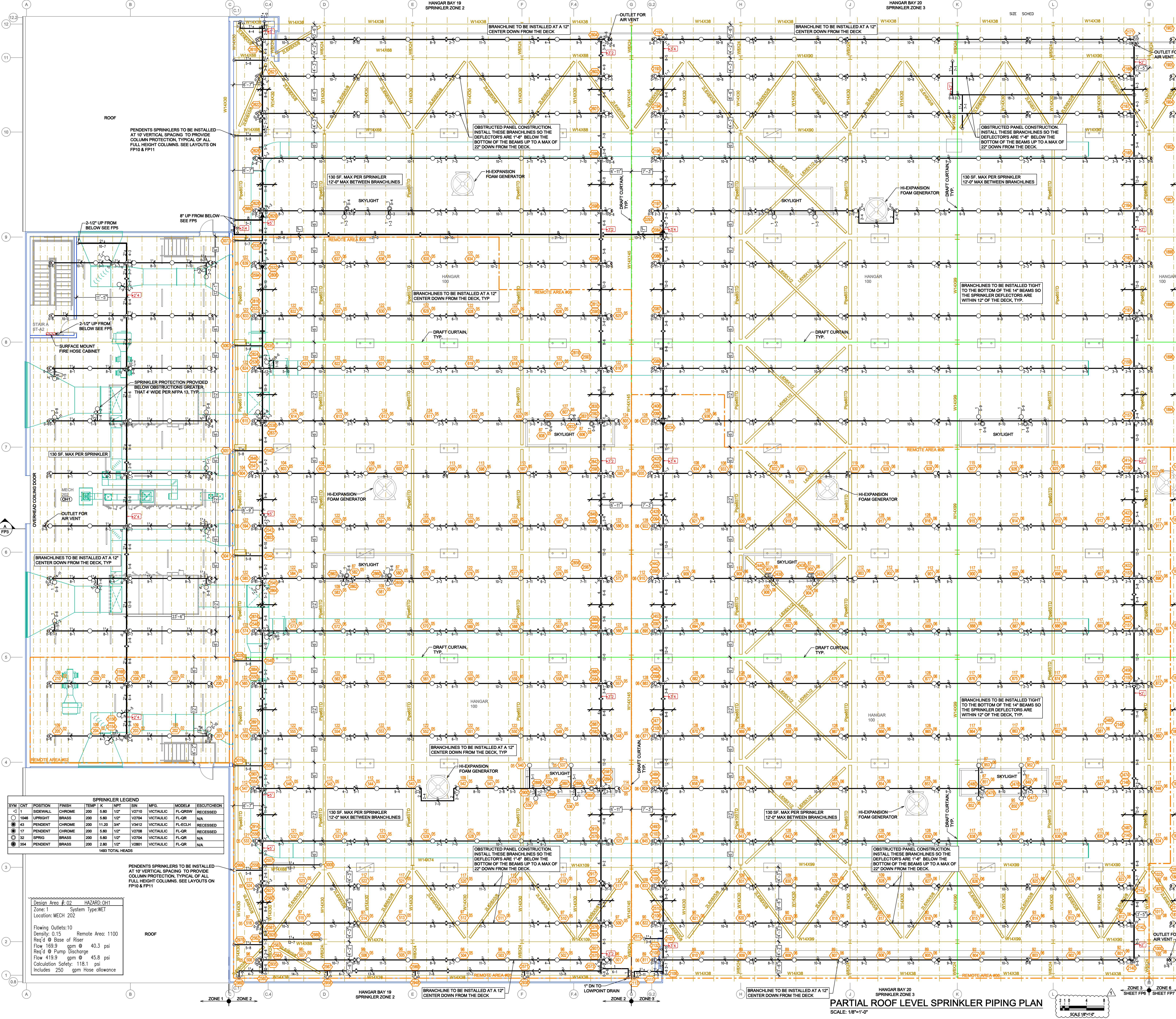
- 16" x 12" WELDED REDUCING FLANGE
- 12" GROOVED 90 ELL
- 2-1/2" VICTAULIC UNIVERSAL MANIFOLD CHECK ASSEMBLY (UMC)
- 2-1/2" TO SOUTH ANNEX HOSE STATIONS
- 2-1/2" TO SOUTH ANNEX WET SYSTEM (SPRINKLER ZONE 1)
- 8" VICTAULIC UNIVERSAL MANIFOLD CHECK ASSEMBLY (UMC)
- 8" TO HANGER BAY 19 WET SYSTEM (SPRINKLER ZONE 2)
- 8" TO HANGER BAY 20 WET SYSTEM (SPRINKLER ZONE 3)
- SPARE SPRINKLER CABINET w/ WRENCHES
- 8" VICTAULIC MODEL 706 BUTTERFLY VALVE w/ TAMPER SWITCH (FOR FUTURE)
- 12" SHURLOUNT MODEL 726 Y STRAINER w/ 1-1/2" DRAIN AND 1/4" BASKET
- 12" GROOVED 45 ELL
- PIPE STAND
- 8" GROOVED 90 ELL
- 8" VICTAULIC MODEL 717 SWING CHECK VALVE
- 2" MAIN DRAIN PIPED TO 6" FLOOR DRAIN
- 8" BERHAD MODEL FP-8" 400Y-30V-C-AS-ER-40C-NN-P6 ELECTRICALLY ACTUATED ON/OFF PRESSURE CONTROL DELUGE VALVE
- 8" x 8" VICTAULIC NO.50 GROOVED CONCENTRIC REDUCER
- 8" ANSUL BETWEEN THE FLANGE PROPORTIONER
- 8" GROOVED TEE
- 8" VICTAULIC MODEL 706 BUTTERFLY VALVE w/ TAMPER SWITCH
- 8" VICTAULIC MODEL 707C "NORMALLY CLOSED" BUTTERFLY VALVE w/ TAMPER SWITCH
- 2" ANSUL SWING CHECK VALVE
- 2" ANSUL WATER POWERED BALL VALVE
- 2" PIPED TO ANSUL HORIZONTAL BLADDER TANK
- 1" GLOBE VALVE
- 400 GALLON ANSUL HORIZONTAL BLADDER TANK COMPLETE w/ PRESSURE RELIEF VALVE PIPED TO NEAREST FLOOR DRAIN
- 2" ANSUL LEVER OPERATED BALL VALVE
- 2-1/2" BRASS FIRE HOSE VALVE
- 2" TYCO CV-IF GROOVED CHECK VALVE
- 2-1/2" VICTAULIC MODEL 717 SWING CHECK VALVE



SYSTEM HEADER DETAIL (SOUTH ANNEX)
SCALE: 1/2"=1'-0" (DETAIL '1')



**AIRBUS HANGAR 31 (A220)
BAYS 19-22**
320 AIRBUS WAY
MOBILE, ALABAMA 36615



KEY PLAN

NFPA 13 STEEL PIPE HANGER SPACING (EXCEPT LIGHT WALL THRU PIPING)	
NOMINAL SIZE	MAX SPACING
1"	12'-0"
1-1/4"	12'-0"
1-1/2"	15'-0"
2"	15'-0"
2-1/2"	15'-0"
3"	15'-0"
4" LARGER	15'-0"

Design Area # 05
 Occupancy: Aircraft Hangar per NFPA 409
 Location: Hangar Bay 19 + Hi-Ex Foam
 No. Sprinklers/Generators (Calcd): 237/13
 Density: 0.17 gpm/s.f.
 Area: 15,000 sq. ft.
 Hose Stream Allowance: 500 (120 Inside + 380 Outside)
 Sq. Ft. per Sprinkler: 130
 Sprinkler K-Factor: 5.6
 Hi-Ex Generator Flow/Pressure: 223gpm @ 62psi
 Required at Hangar 19 Sprinkler Riser: 4441.7 gpm @ 93.2 psi
 Required at Hangar 19 Hi-Ex Riser: 679.5 gpm @ 106.1 psi
 Required at Hangar 20 Hi-Ex Riser: 673.2 gpm @ 106.1 psi
 Required at Hangar 21 Hi-Ex Riser: 671.8 gpm @ 110.4 psi
 Required at NF Hose Riser: 120 gpm @ 110.5 psi
 Required at Pump Discharge: 7862.9 gpm @ 125.7 psi
 Safety Margin: 10.1 psi

Design Area # 06
 Occupancy: Aircraft Hangar per NFPA 409
 Location: Hangar Bay 20 + Hi-Ex Foam
 No. Sprinklers/Generators (Calcd): 160/13
 Density: 0.17 gpm/s.f.
 Area: 15,000 sq. ft.
 Hose Stream Allowance: 500 (120 Inside + 380 Outside)
 Sq. Ft. per Sprinkler: 130
 Sprinkler K-Factor: 5.6
 Hi-Ex Generator Flow/Pressure: 223gpm @ 62psi
 Required at Hangar 20 Sprinkler Riser: 3762.5 gpm @ 101.9 psi
 Required at Hangar 19 Hi-Ex Riser: 704.6 gpm @ 111.9 psi
 Required at Hangar 20 Hi-Ex Riser: 698.7 gpm @ 111.9 psi
 Required at Hangar 21 Hi-Ex Riser: 691.9 gpm @ 115.4 psi
 Required at Hangar 22 Hi-Ex Riser: 924.2 gpm @ 115 psi
 Required at NF Hose Riser: 120 gpm @ 115.5 psi
 Required at Pump Discharge: 7282 gpm @ 129.2 psi
 Safety Margin: 11.2 psi

Design Area # 07 (Supply Calc)
 Occupancy: Aircraft Hangar per NFPA 409
 Location: Hi-Ex Foam Generators
 No. Generators (Calcd): 13
 Hi-Ex Generator Flow/Pressure: 223gpm @ 62psi
 South Annex Requirements:
 Required at Hangar 19 Hi-Ex Riser: 741.2 gpm @ 120 psi
 Required at Hangar 20 Hi-Ex Riser: 735.7 gpm @ 120 psi
 Water Flow Rate at BOR: 1476.9 gpm
 1476.9 gpm x 2% Foam Solution: 29.5 gpm Hi-Ex Foam
 29.5 gpm x 12 min Duration: 354.5 Gallons Hi-Ex Foam
 North Annex Requirements:
 Required at Hangar 21 Hi-Ex Riser: 712.5 gpm @ 119.9 psi
 Required at Hangar 22 Hi-Ex Riser: 952.2 gpm @ 119.5 psi
 Water Flow Rate at BOR: 1664.7 gpm
 1664.7 gpm x 2% Foam Solution: 33.3 gpm Hi-Ex Foam
 33.3 gpm x 12 min Duration: 399.6 Gallons Hi-Ex Foam

APPLICATION CALCULATIONS
 (PER NFPA 409:6.2.5.4)
 $R = 3(A) + R_s$
 $R = 3(88,256) + 32,220$
 $R = 296,988 \text{ FT}^3/\text{MIN REQ.}$
 $296,988 \text{ TOTAL REQ.} / 13 \text{ GENERATORS} =$
 $22,845 \text{ FT}^3/\text{MIN. REQ. PER GENERATOR}$
 WHERE:
 $R = \text{RATE OF DISCHARGE REQUIRED IN FT}^3/\text{MIN}$
 $A = \text{SUBMERGENCE VOLUME IN FT}^3$
 $R_s = \text{RATE OF FOAM BREAKDOWN BY FRIT/MIN}$
 ANSUL JET-X-27 GENERATOR
 MINIMUM PRESSURE = 62 PSI
 $\text{CFM/GEN} = 26,322 \text{ FT}^3/\text{MIN}$
 $13 \text{ GEN. TOTAL} = 342,186 \text{ FT}^3/\text{MIN}$
 $RS = 5XQ$
 $Rs = 10 \times 3,222$
 $Rs = 32,220 \text{ FT}^3/\text{MIN}$
 WHERE:
 $S = \text{FOAM BREAKDOWN IN 10 FT}^3/\text{MIN}$
 $Q = \text{TOTAL DISCHARGE FOR SPRINKLER SYSTEM (3,222 GPM)}$
 NOTE: DOES NOT INCLUDE FLOW FROM COLUMN SPRINKLERS

SPRINKLER LEGEND

SYM	CNT	POSITION	FINISH	TEMP	K	NPT	SW	MFG.	MODEL#	ESCOUT/CHEN
<1	1	SIDEWALL	CHROME	180	12"	V2710	VICTALIC	FL-GRW	RECESSED	N/A
1046	1	UPRIGHT	BRASS	200	5.60	12"	V2704	VICTALIC	FL-GR	N/A
43	1	PENDENT	CHROME	200	11.20	3/4"	V3412	VICTALIC	FL-ECLH	RECESSED
17	1	PENDENT	CHROME	200	5.60	12"	V2708	VICTALIC	FL-OR	RECESSED
32	1	SPRNG	BRASS	200	5.60	12"	V2704	VICTALIC	FL-OR	N/A
354	1	PENDENT	BRASS	200	2.80	1/2"	V2801	VICTALIC	FL-OR	N/A

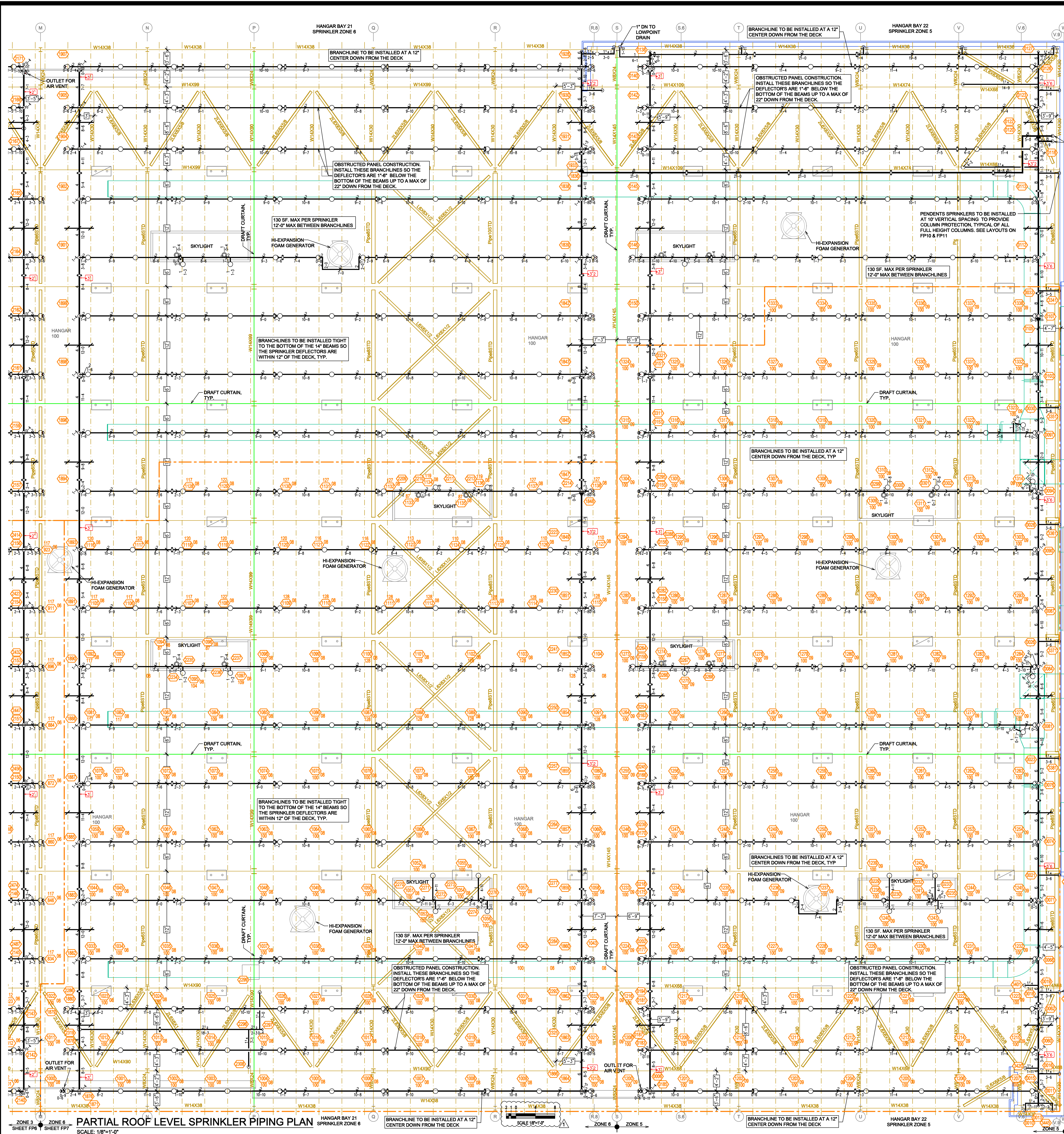
1483 TOTAL HEADS

Design Area # 02 HAZARD: OH1
 Zone: 1 System Type: WET
 Location: MECH 202
 Flowing Outlets: 10 Remote Area: 1100
 Req'd @ Base of Riser
 Flow 169.9 gpm @ 40.3 psi
 Req'd @ Pump Discharge
 Flow 419.9 gpm @ 45.8 psi
 Calculation Safety: 118.1 psi
 Includes: 250 gpm hose allowance

AIRBUS HANGAR 31 (A220)
BAYS 19-22
 320 AIRBUS WAY
 MOBILE, ALABAMA 36615

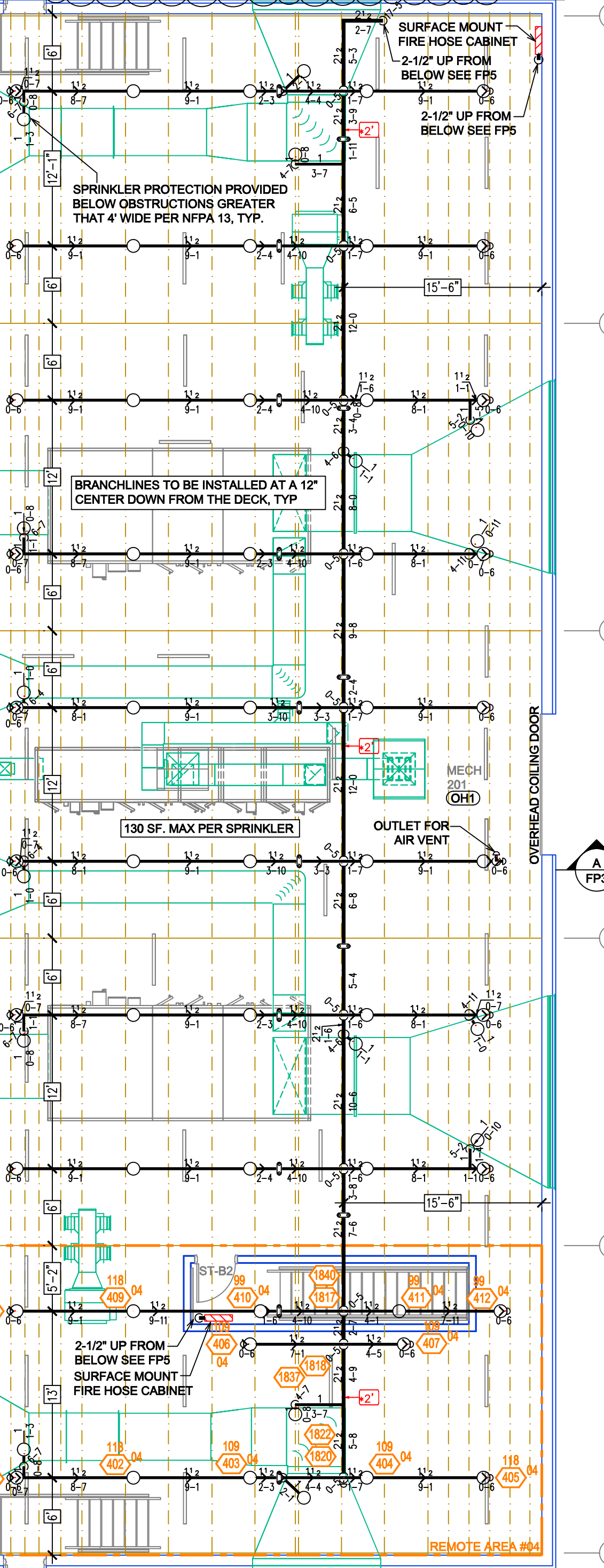
PARTIAL ROOF LEVEL SPRINKLER PIPING PLAN
 SCALE: 1/8"=1'-0"





Design Area # 08
 Occupancy: Aircraft Hangar per NFPA 409
 Location: Hangar Bay 21 + Hi-Ex Foam
 No. Sprinklers/Generators (Cold): 155/13
 Density: 0.17 gpm/sq. ft.
 Area: 15,000 sq. ft.
 Hose Stream Allowance: 500 (120 Inside + 380 Outside)
 Sq. Ft. per Sprinkler: 130
 Sprinkler K-Factor: 5.6
 Hi-Ex Generator Flow/Pressure: 223gpm @ 62psi
 Required at Hangar 22 Sprinkler Riser: 3965.8 gpm @ 115.0 psi
 Required at Hangar 19 Hi-Ex Riser: 713.4 gpm @ 117.1 psi
 Required at Hangar 20 Hi-Ex Riser: 707.6 gpm @ 117.1 psi
 Required at Hangar 21 Hi-Ex Riser: 912.8 gpm @ 113.6 psi
 Required at Hangar 22 Hi-Ex Riser: 682.0 gpm @ 114.3 psi
 Required at NFF Hose Riser: 120 gpm @ 115.0 psi
 Required at Pump Discharge: 7211.8 gpm @ 125.2 psi
 Safety Margin: 15.7 psi

Design Area # 09
 Occupancy: Aircraft Hangar per NFPA 409
 Location: Hangar Bay 22 + Hi-Ex Foam
 No. Sprinklers/Generators (Cold): 223/13
 Density: 0.17 gpm/sq. ft.
 Area: 15,000 sq. ft.
 Hose Stream Allowance: 500 (120 Inside + 380 Outside)
 Sq. Ft. per Sprinkler: 130
 Sprinkler K-Factor: 5.6
 Hi-Ex Generator Flow/Pressure: 223gpm @ 62psi
 Required at Hangar 22 Sprinkler Riser: 4660.3 gpm @ 113.1 psi
 Required at Hangar 19 Hi-Ex Riser: 710.0 gpm @ 116.3 psi
 Required at Hangar 20 Hi-Ex Riser: 704.2 gpm @ 116.2 psi
 Required at Hangar 21 Hi-Ex Riser: 902.2 gpm @ 112.4 psi
 Required at Hangar 22 Hi-Ex Riser: 674.2 gpm @ 112.4 psi
 Required at NFF Hose Riser: 120 gpm @ 113.1 psi
 Required at Pump Discharge: 8151.0 gpm @ 125.8 psi
 Safety Margin: 7.7 psi



SPRINKLER LEGEND

SYM	CONT	POSITION	FINISH	TEMP	K	RPT	SN	MFG.	MODEL#	ESG/CY/CRON
○	11	SIDEWALL	CHROME	200	5.60	1/2"	V2710	VICTALIC	FL-GRW	RECESSED
○	104	UPRUSH	BRASS	200	5.60	1/2"	V2704	VICTALIC	FL-GRW	N/A
○	43	PENDENT	CHROME	200	11.20	3/4"	V3412	VICTALIC	FL-GLH	RECESSED
○	17	PENDENT	CHROME	200	5.60	1/2"	V2708	VICTALIC	FL-GR	RECESSED
○	32	SPRNG	BRASS	200	5.60	1/2"	V2704	VICTALIC	FL-GR	N/A
○	154	PENDENT	BRASS	200	2.80	1/2"	V2801	VICTALIC	FL-GR	N/A

1483 TOTAL HEADS

NFPA 13 STEEL PIPE HANGER SPACING
 EXCEPT LIGHT WALL THRU FRP

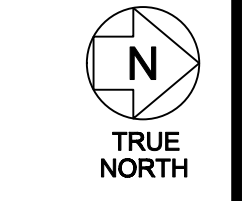
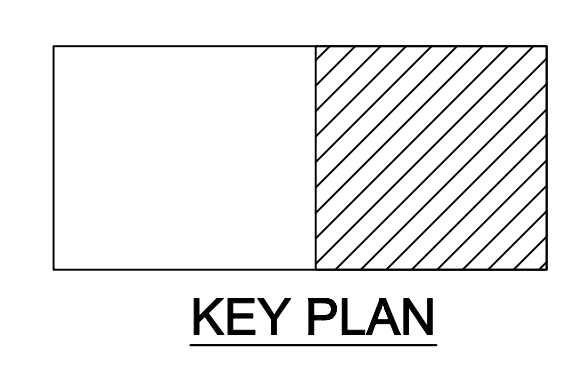
NOMINAL SIZE	MAX SPACING
1"	12'-0"
1-1/4"	12'-0"
1-1/2"	15'-0"
2"	15'-0"
2-1/2"	15'-0"
3"	15'-0"
4" & LARGER	15'-0"

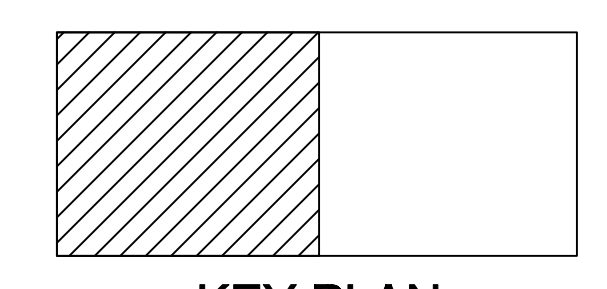
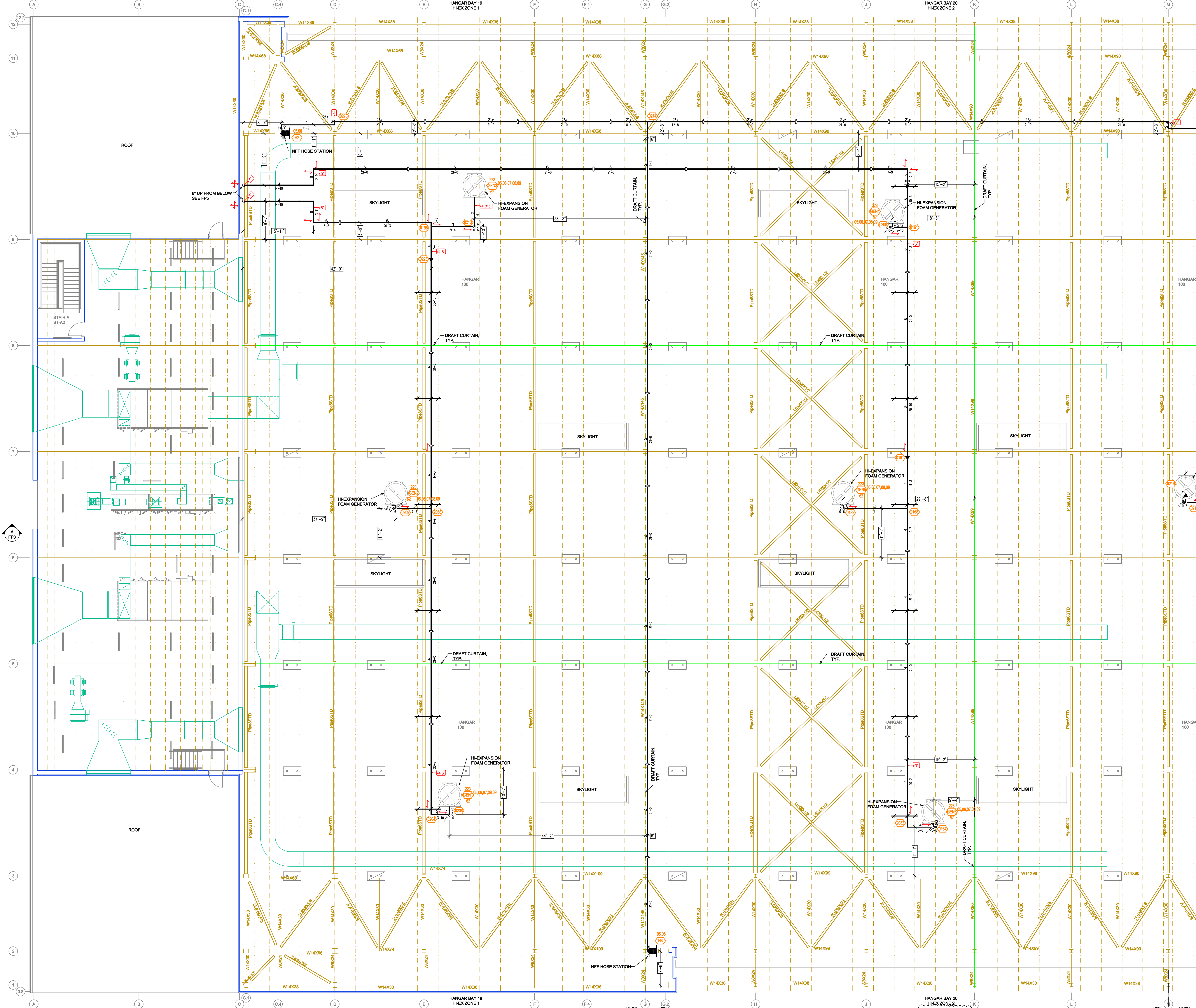
Design Area # 04 HAZARD: OH1
 Zone 4 - Mech 201 System Type: WET
 Location: MECH 201

Flowing Outlets: 12
 Density: 0.15
 Remote Area: 1100
 Req'd @ Base of Riser
 Flow 236.3 gpm @ 60.9 psi
 Req'd @ Pump Discharge
 Flow 486.3 gpm @ 69.6 psi
 Calculation Safety: 94.3 psi
 Includes 250 gpm Hose allowance

ZONE 3 ZONE 6 PARTIAL ROOF LEVEL SPRINKLER PIPING PLAN HANGAR BAY 21 HANGAR BAY 22
 SHEET FP7 SHEET FP7 SPRINKLER ZONE 6 SPRINKLER ZONE 5
 SCALE: 1/8"=1'-0"

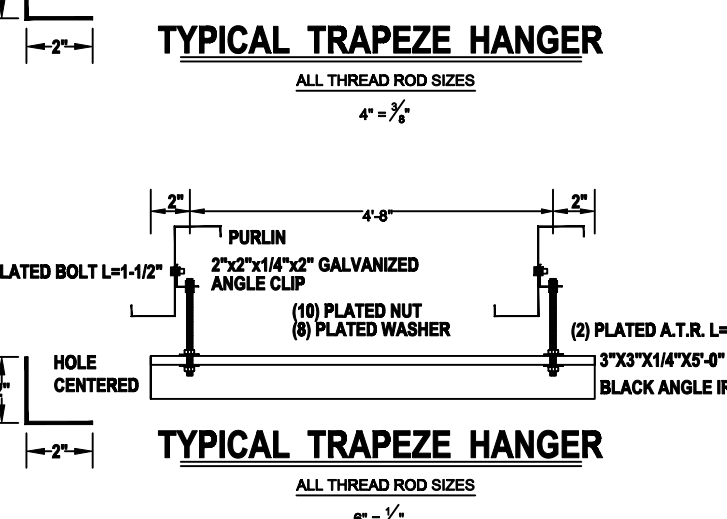
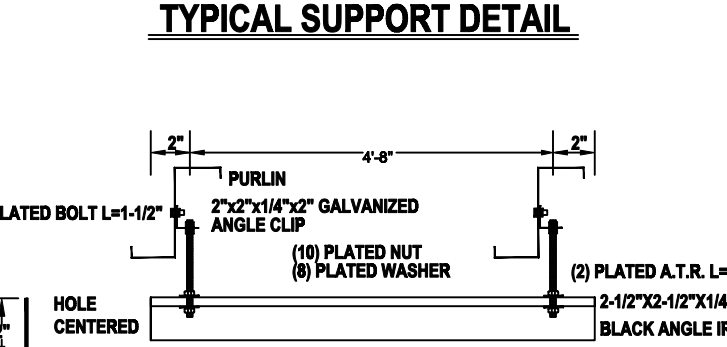
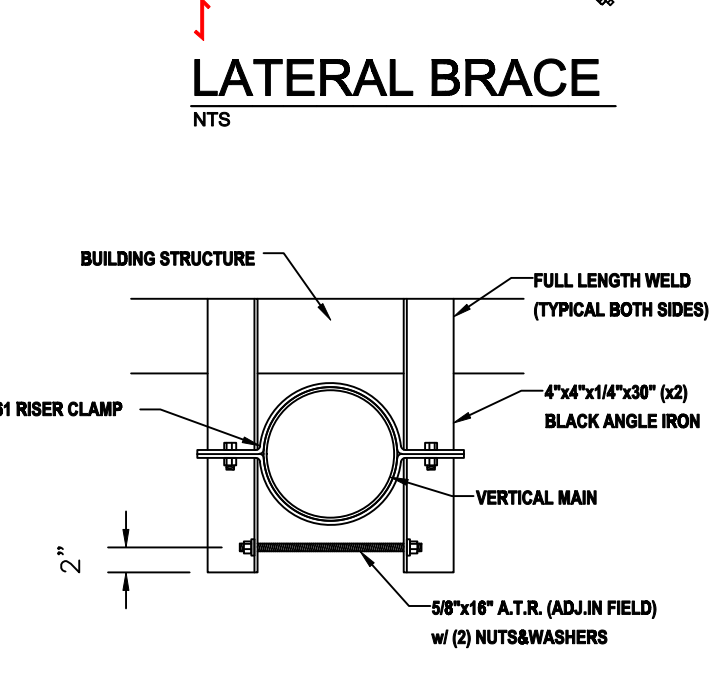
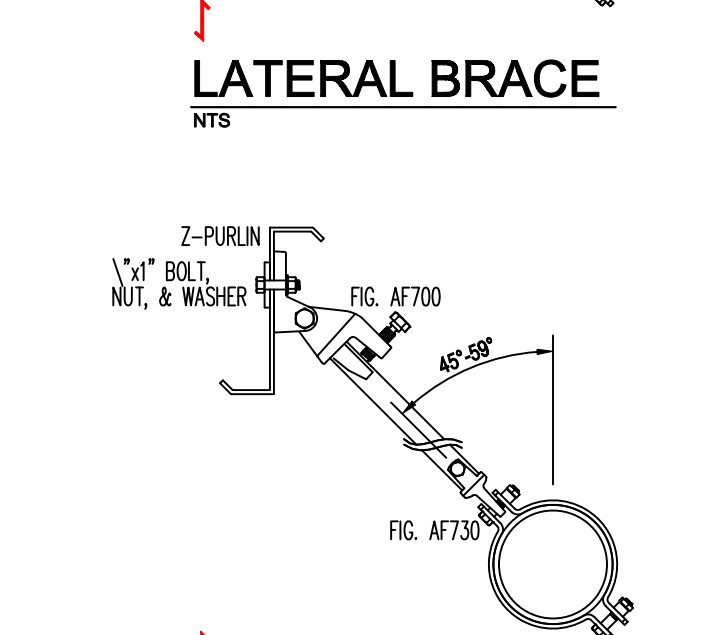
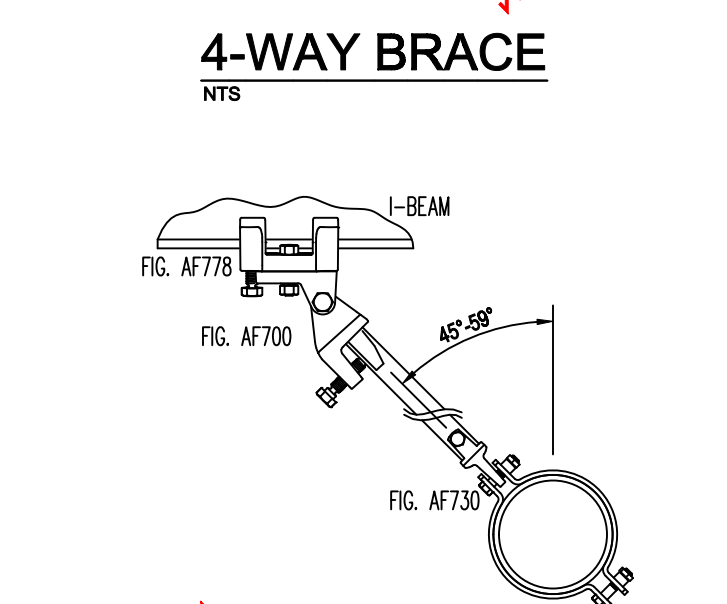
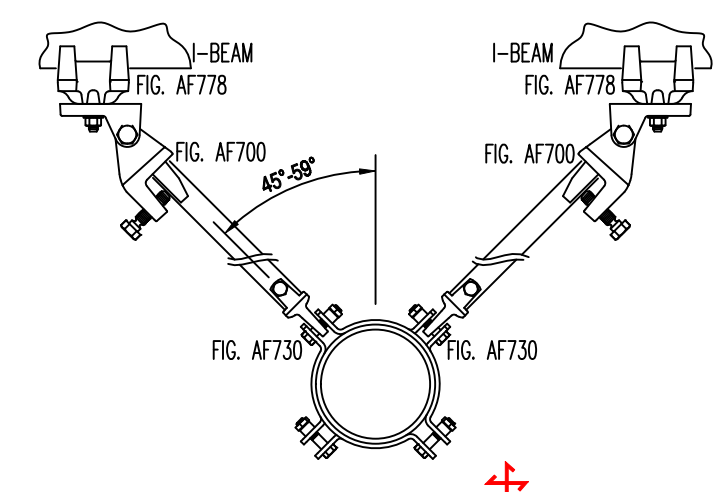
AIRBUS HANGAR 31 (A220)
BAYS 19-22
 320 AIRBUS WAY
 MOBILE, ALABAMA 36615





NFPA 13 STEEL PIPE HANGER SPACING
(EXCEPT LIGHT WALL THIRD PIPING)

NOMINAL SIZE INCHES	MAX SPACING FEET
1"	12'-0"
1-1/4"	12'-0"
1-1/2"	15'-0"
2"	15'-0"
2-1/2"	15'-0"
3"	15'-0"
4" & LARGER	15'-0"



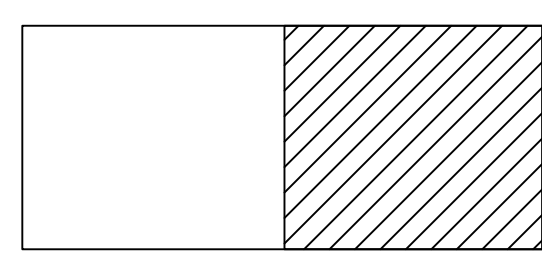
BAY 19&20 HI-EX & FOAM HOSE PIPING PLAN
SCALE: 1/8"=1'-0"

HANGAR BAY 20 HI-EX ZONE 2
SCALE: 1/8"=1'-0"

HANGAR BAY 19 HI-EX ZONE 1
SCALE: 1/8"=1'-0"

AIRBUS HANGAR 31 (A220)
BAYS 19-22
320 AIRBUS WAY
MOBILE, ALABAMA 36615

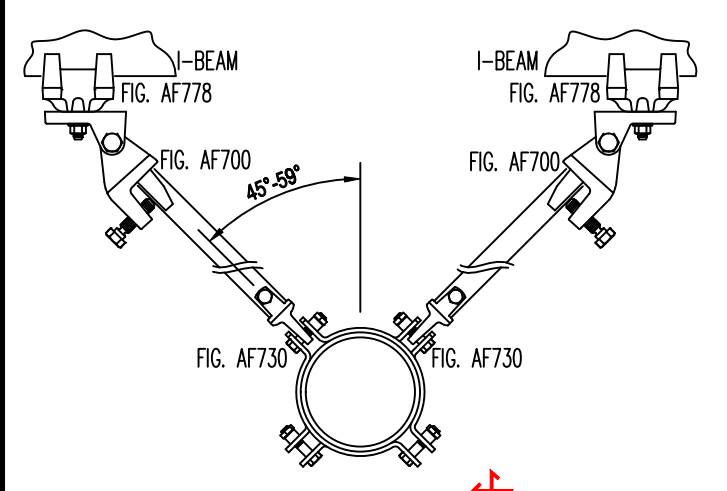




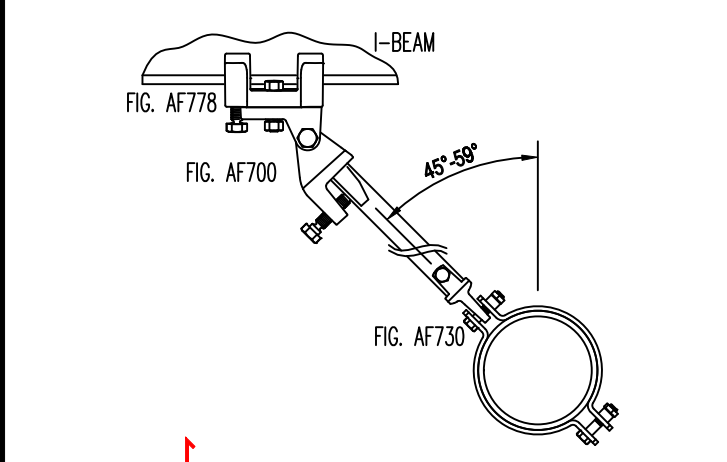
KEY PLAN

NFPA 13 STEEL PIPE HANGER SPACING
(EXCEPT LIGHT WALL THROPPING)

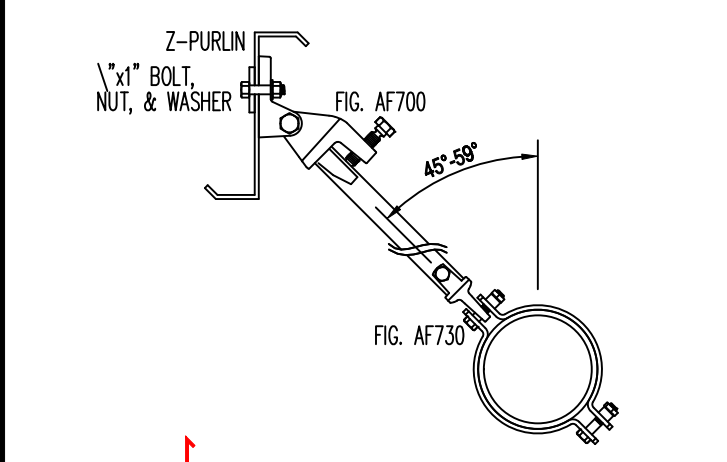
NOMINAL SIZE Inches	MAX SPACING feet
1"	12'-0"
1-1/4"	12'-0"
1-1/2"	15'-0"
2"	15'-0"
2-1/2"	15'-0"
3"	15'-0"
4" & LARGER	15'-0"



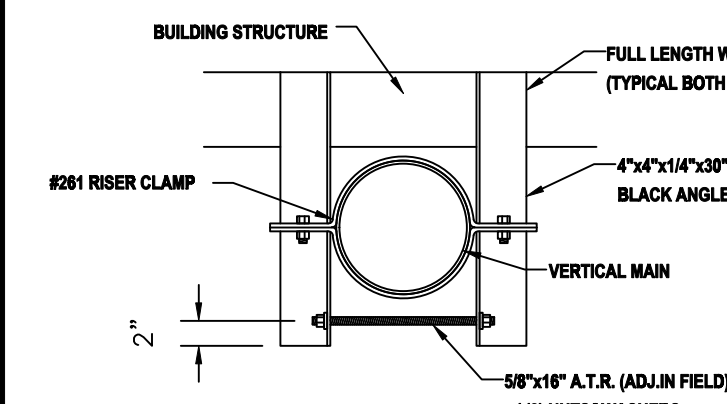
4-WAY BRACE
NTS



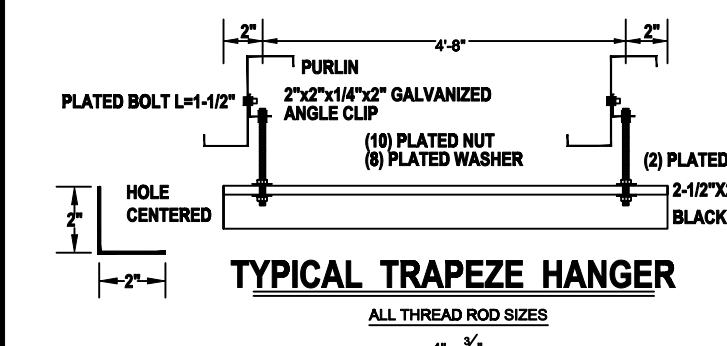
LATERAL BRACE
NTS



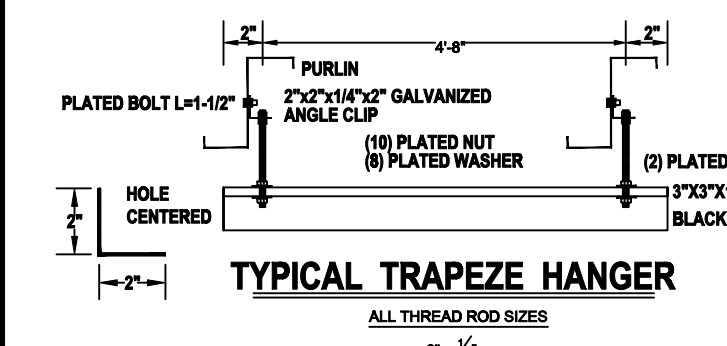
LATERAL BRACE
NTS



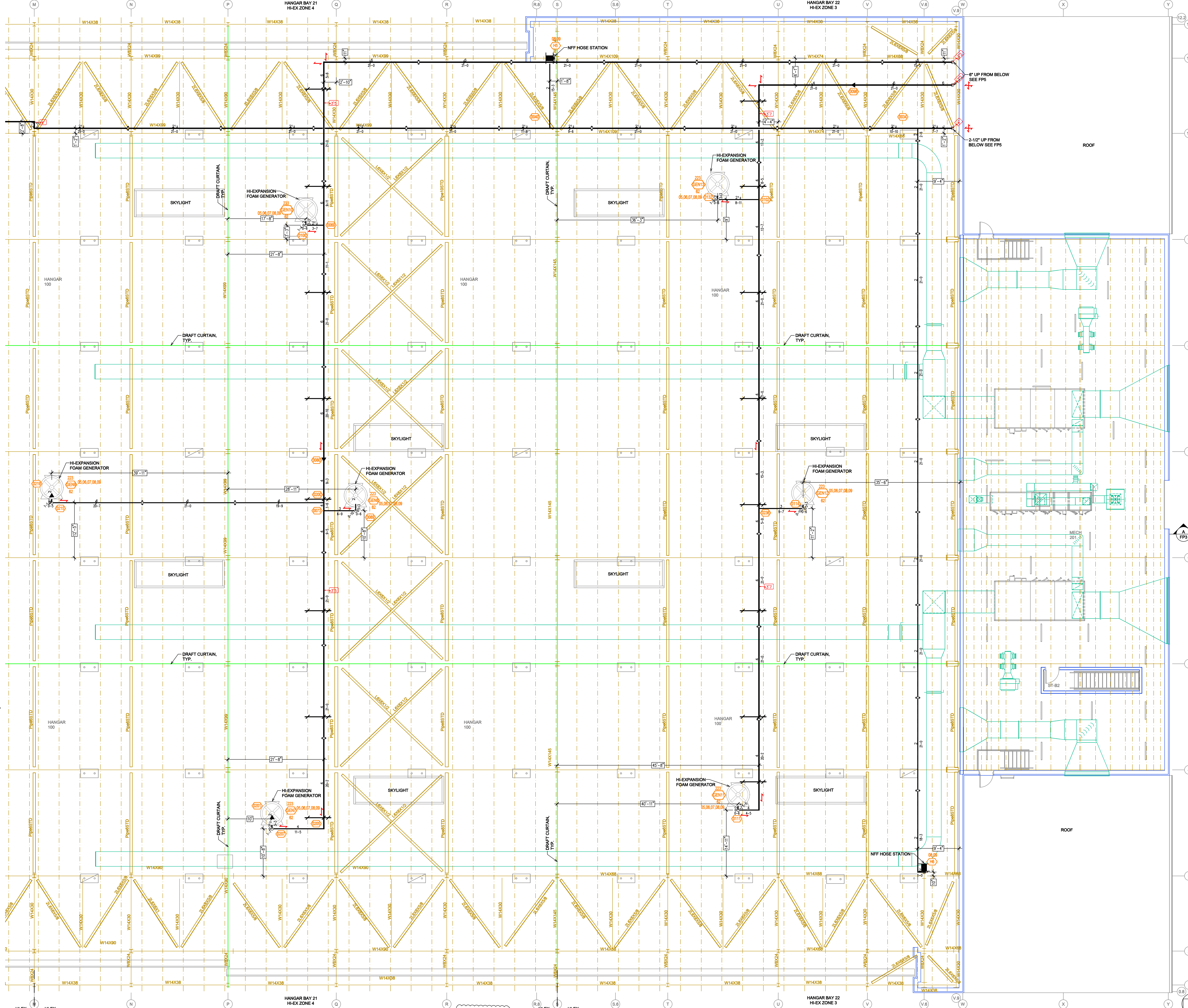
TYPICAL SUPPORT DETAIL



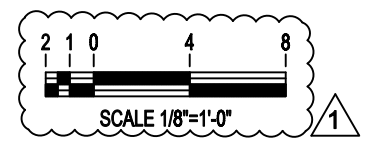
TYPICAL TRAPEZE HANGER
ALL THROPPING SIDES



TYPICAL TRAPEZE HANGER
ALL THROPPING SIDES



BAY 21&22 HI-EX & FOAM HOSE PIPING PLAN
SCALE: 1/8"=1'-0"



AIRBUS HANGAR 31 (A220)
BAYS 19-22
320 AIRBUS WAY
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