

GENERAL NOTES:

- 1. ALL HOLES IN WALLS AND FLOORS SHALL BE CORE DRILLED OR HAVE METALLIC PIPE SLEEVES INSTALLED.
2. ALL PENETRATIONS IN FIRE RESISTIVE RATED ASSEMBLIES SHALL BE FIRE STOPPED BY APPROVED MEANS AND THE ASSEMBLY SHALL BE RESTORED TO ITS REQUIRED FIRE RESISTANCE RATINGS.
3. SEE ARCHITECTURAL PLANS FOR CEILING TYPES AND HEIGHTS.
4. WATER DAMAGE CANNOT BE TOLERATED. TAKE ANY NECESSARY MEASURES TO KEEP THE PREMISES DRY AT ALL TIMES. REPAIR WATER DAMAGE RESULTING FROM THE WORK, WHETHER INTENTIONAL OR NOT, AT NO COST TO AND TO THE SATISFACTION OF THE OWNER.
5. PRIOR TO THE OPERATION (OPEN OR CLOSE) OF ANY VALVE CONTROLLING WATER TO THE DOMESTIC OR FIRE SYSTEMS, NOTIFICATION SHALL BE GIVEN TO, AND APPROVAL OBTAINED FROM, THE GENERAL CONTRACTOR.
6. NEITHER THE ARCHITECT, OWNER, NOR ENGINEER SHALL BE RESPONSIBLE FOR PROVIDING A SAFE WORKING PLACE FOR THE CONTRACTOR, SUBCONTRACTORS, OR THEIR EMPLOYEES, OR ANY INDIVIDUAL RESPONSIBLE TO THEM FOR THE WORK. THIS RESPONSIBILITY RESTS WITH THE CONTRACTOR.

COMPUTER ROOM FIRE SPRINKLER NOTES:

- 1. THE COMPUTER ROOM SPRINKLER SYSTEM SHALL BE AN ELECTRIC/PNEUMATIC DOUBLE INTERLOCK PREACTION SPRINKLER SYSTEM.
2. THE ELECTRIC INTERLOCK OF THE PREACTION SYSTEM SHALL RELEASE UPON INPUT FROM A DEDICATED LISTED INTELLIGENT/ADDRESSABLE RELEASING CONTROL PANEL (RCP) CONNECTED TO SPOT-TYPE PHOTOELECTRIC SMOKE DETECTORS INSTALLED IN THE COMPUTER ROOM.
3. UPON THE ACTIVATION OF A SPOT-TYPE PHOTOELECTRIC SMOKE DETECTOR IN THE COMPUTER ROOM, THE RCP SHALL ENERGIZE THE PREACTION SYSTEM SOLENOID.
4. THE RCP SHALL BE SUPERVISED FOR ALARM, SUPERVISORY, AND TROUBLE SIGNALS BY THE MAIN FIRE ALARM CONTROL PANEL.
7. THERE SHALL BE A MINIMUM OF THREE SPOT-TYPE PHOTOELECTRIC SMOKE DETECTORS INSTALLED IN THE MDF ROOM. THE FINAL QUANTITY AND SPACING SMOKE DETECTORS SHALL BE BASED ON THE AIR FLOW IN THE ROOM.

SEISMIC LOADS ANALYSIS

IBC (2009) Section 1613

Table with seismic parameters: SEISMIC IMPORTANCE FACTOR (Ie = 1.00), OCCUPANCY CATEGORY (II), MAPPED SPECTRAL RESPONSE ACCELERATION (Ss = 0.258 g, S1 = 0.092 g), SITE CLASS (CLASS C), SPECTRAL RESPONSE COEFFICIENTS (SDS = 0.206 g, SD1 = 0.104 g), SEISMIC DESIGN CATEGORY (CATEGORY B), RESPONSE MODIFICATION FACTOR (Rp = 4.5), SEISMIC DESIGN FORCE (Fp = NA x Wp).

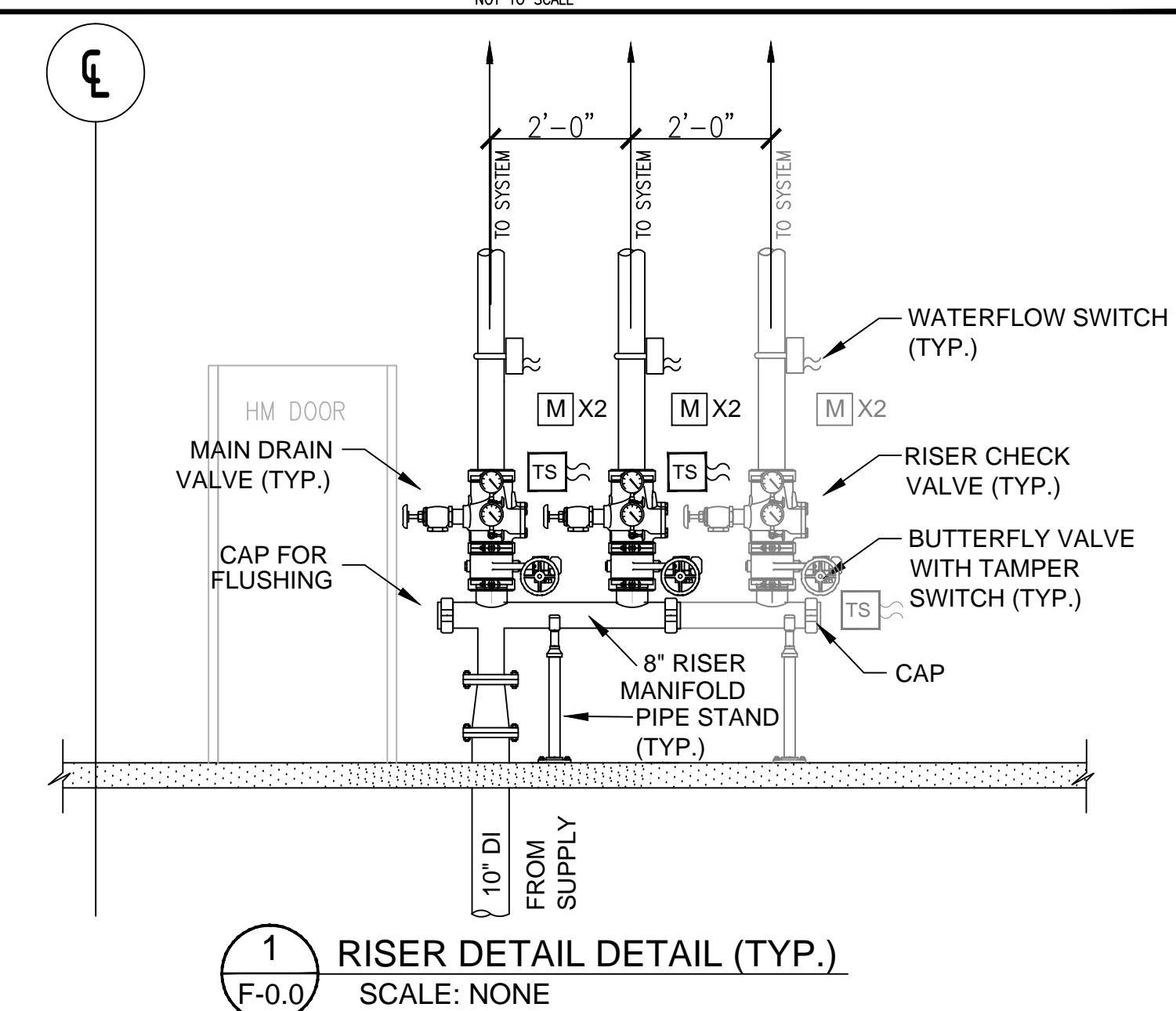
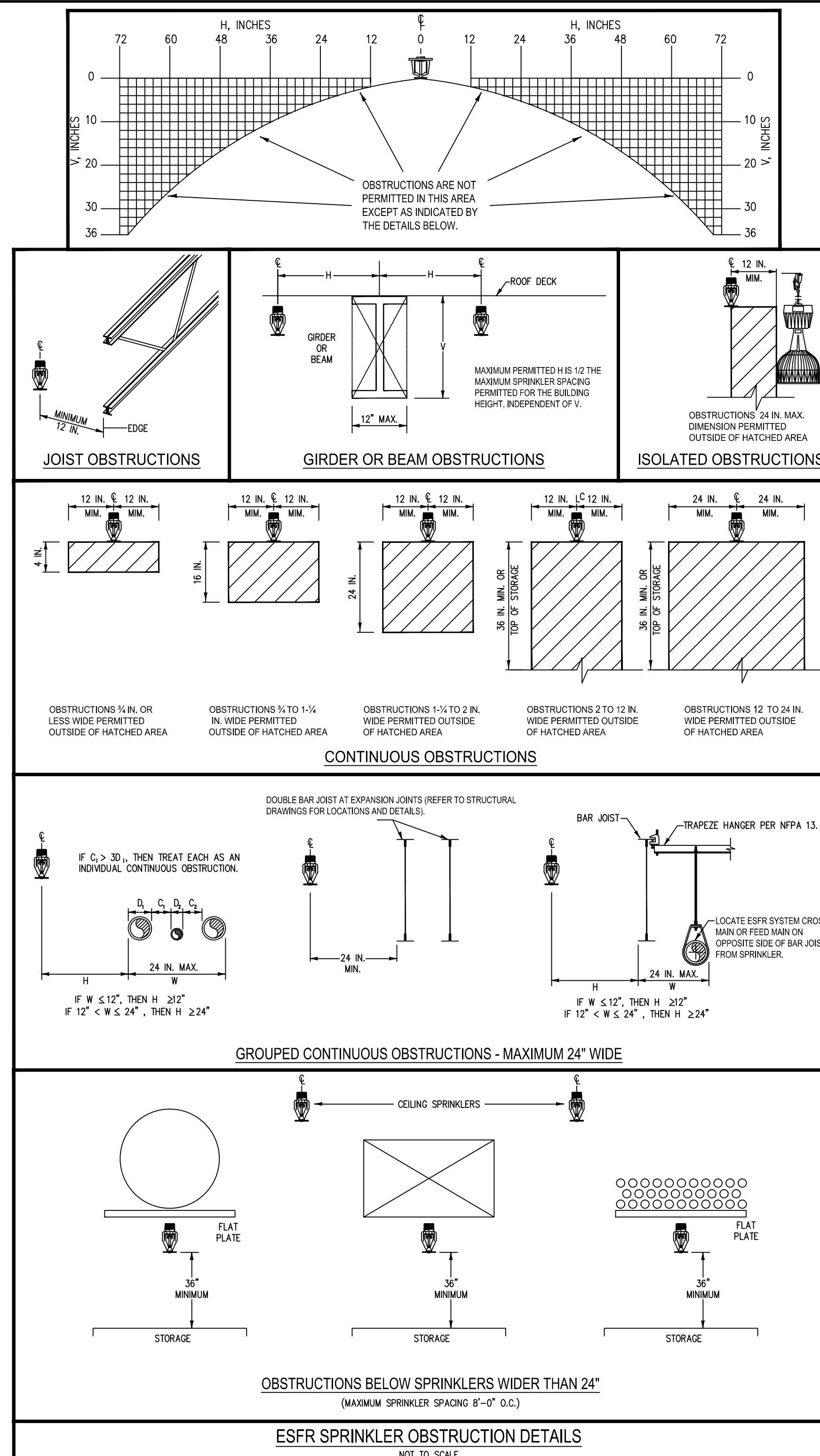
* SEISMIC BRACING NOT REQUIRED

FIRE SPRINKLER NOTES:

- 1. CONTRACTOR SHALL PROVIDE A COMPLETE AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH DRAWINGS, SPECIFICATIONS AND NFPA 13.
2. CONTRACTOR SHALL HYDRAULICALLY PROVE THE REMOTE AREA OF EACH SEPARATE HAZARD GROUP OF EACH SYSTEM.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING ALL CONFLICTS WITH LIGHTING FIXTURES, SKYLIGHTS, UNIT HEATERS, DIFFUSERS, GRILLES, DUCTS, CONDUIT, PIPING, CONVEYORS AND ALL OTHER OBSTRUCTIONS ENCOUNTERED. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL, ELECTRICAL, AND MECHANICAL WORK. ANY DEVIATIONS FROM APPROVED SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE PROCEEDING WITH THE WORK.
4. CONTRACTOR SHALL COORDINATE THE POSITION AND HANGING METHOD OF ALL SPRINKLER PIPING 4 IN. AND LARGER WITH THE STRUCTURAL DRAWINGS.
5. CONTRACTOR SHALL ENSURE ALL HORIZONTAL PIPING RUNS ARE LOCATED ABOVE THE BOTTOM CHORD OF ROOF JOIST GIRDERS.
6. CONTRACTOR SHALL ENSURE ALL HORIZONTAL PIPING RUNS BENEATH THE MEZZANINE ARE LOCATED ABOVE THE BOTTOM CHORD OF THE MEZZANINE BAR JOISTS.
7. CONTRACTOR SHALL PROVIDE ALL NECESSARY MAIN AND/OR AUXILIARY DRAINS IN THE SPRINKLER SYSTEMS AND ON RISERS AS REQUIRED BY NFPA 13. TO THE MAXIMUM EXTENT POSSIBLE, ALL DRAINS SHALL TERMINATE ON EXTERIOR WALLS WITHIN 8 IN. OF GRADE. CONCRETE SPLASH BLOCKS SHALL BE PROVIDED UNDER EACH DRAIN OUTLET WHERE NECESSARY TO PREVENT SOIL EROSION.
8. ALL MECHANICAL FITTINGS SHALL BE HELD IN PLACE WITH MECHANICAL COUPLINGS OF THE SAME MANUFACTURER.
9. SPRINKLER HANGERS AND SEISMIC BRACING SHALL BE DESIGNED, LOCATED, AND INSTALLED IN ACCORDANCE WITH NFPA 13.
10. FIRE SPRINKLER CONTRACTOR SHALL PROVIDE AND INSTALL WATERFLOW ALARM DEVICES ON ALL SPRINKLER SYSTEMS FOR MONITORING BY THE FACP.
11. FIRE SPRINKLER CONTRACTOR SHALL PROVIDE AND INSTALL VALVE SUPERVISORY TAMPER DEVICES ON ALL INTERIOR FIRE PROTECTION CONTROL VALVES IN ACCORDANCE WITH IBC/IFC 903.4 FOR MONITORING BY THE FACP.
12. AUXILIARY AREA (I.E., SATELLITE OFFICE AREAS AND BATHROOMS) SPRINKLER SYSTEMS SHALL BE FED FROM THE NEAREST CEILING SYSTEM CROSS MAIN. EACH AUXILIARY AREA SHALL HAVE A SEPARATE, LISTED, ACCESSIBLE, SUPERVISED, AND INDICATING CONTROL VALVE.
13. ALL SPRINKLERS SHALL BE INSTALLED AFTER THE PIPING HAS BEEN INSTALLED AT CEILING LEVEL, AND NOT WHILE THE PIPING IS ON GROUND LEVEL.
14. ALL MAIN AND AUXILIARY DRAINS AND INSPECTOR'S TEST CONNECTIONS TERMINATING ON THE DOCK WALLS SHALL BE RUN DOWN THE DOCK WALL ONLY AT THE PERSONNEL DOORS AND NOT BETWEEN DOCK DOORS. COORDINATE PLACEMENT OF PIPING WITH CONTROLS AND OTHER EQUIPMENT, AS REQUIRED.
15. THE DESIGN BASIS WATER SUPPLY SHALL BE THE LESSER OF THE PUBLISHED DESIGN BASIS WATER SUPPLY ON SHEET F-1.0 OR ANY NEW HYDRANT FLOW TEST.

ESFR SPRINKLER (PENDENT TYPE) COORDINATION NOTES:

- 1. THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER CONSIDERATION AND COORDINATION OF ALL OBSTRUCTIONS AND OTHER INSTALLED EQUIPMENT WHICH MAY HAVE AN IMPACT ON THE OPERATION OF ESFR SPRINKLERS.
2. PRIOR TO THE START OF CONSTRUCTION, THE SPRINKLER CONTRACTOR SHALL CLOSELY COORDINATE WITH ALL OTHER TRADES-INCLUDING, BUT NOT LIMITED TO, STRUCTURAL STEEL, MECHANICAL, ELECTRICAL, PLUMBING, DATA PROCESSING, AND MATERIAL HANDLING-TO ENSURE THE WATER DISCHARGE FROM ESFR SPRINKLERS WILL NOT BE PROHIBITED FROM REACHING BURNING COMMODITIES AT HIGH VOLUME AND HIGH MOMENTUM.
3. THE STANDARD TO BE UTILIZED IN IDENTIFYING ESFR SPRINKLER PLACEMENT AND OBSTRUCTION ISSUES SHALL BE THE LATEST VERSION OF FM GLOBAL PROPERTY LOSS PREVENTION DATA SHEET 2-0 FOR STORAGE SPRINKLERS. ANY OBSTRUCTION ISSUE IDENTIFIED DURING THE COURSE OF CONSTRUCTION OR ACCEPTANCE INSPECTIONS SHALL BE CORRECTED TO MEET THE REQUIREMENTS OF THIS STANDARD AT NO ADDITIONAL COST TO THE CONTRACT.
4. THE FOLLOWING ARE THE MOST COMMON RULES FOUND IN THE STANDARD FOR HANDLING OBSTRUCTIONS LOCATED ENTIRELY BELOW THE SPRINKLERS. COMPLIANCE WITH THESE RULES IN NO WAY RELIEVES THE CONTRACTOR FROM FULL COMPLIANCE WITH THE STANDARD.
A. INDIVIDUAL OBSTRUCTIONS MEASURING 3/4-IN. WIDE OR LESS AND AT LEAST 4 IN. BELOW THE SPRINKLER DEFLECTOR OR LOCATED AT LEAST 12 IN. HORIZONTALLY FROM THE CENTERLINE OF THE SPRINKLER MAY BE IGNORED.
B. CONTINUOUS OBSTRUCTIONS WIDER THAN 3/4 IN. AND NO WIDER THAN 1-1/4 IN. SHALL BE LOCATED AT LEAST 12 IN. HORIZONTALLY FROM THE CENTERLINE OF THE SPRINKLER OR AT LEAST 16 IN. VERTICALLY BELOW THE SPRINKLER DEFLECTOR.
C. CONTINUOUS OBSTRUCTIONS WIDER THAN 1-1/4 IN. AND NO WIDER THAN 2 IN. SHALL BE LOCATED AT LEAST 12 IN. HORIZONTALLY FROM THE CENTERLINE OF THE SPRINKLER OR AT LEAST 24 IN. VERTICALLY BELOW THE SPRINKLER DEFLECTOR.
D. CONTINUOUS OBSTRUCTIONS WIDER THAN 2 IN. AND NO WIDER THAN 12 IN. SHALL BE LOCATED AT LEAST 12 IN. HORIZONTALLY FROM THE CENTERLINE OF THE SPRINKLER.
E. CONTINUOUS OBSTRUCTIONS WIDER THAN 12 IN. AND NO WIDER THAN 24 IN. SHALL BE LOCATED AT LEAST 24 IN. HORIZONTALLY FROM THE CENTERLINE OF THE SPRINKLER.
F. ISOLATED RECTANGULAR OR ROUND OBSTRUCTIONS (SUCH AS LIGHT FIXTURES, JUNCTION BOXES, ETC.) IN WHICH ALL DIMENSIONS PARALLEL TO THE FLOOR ARE NO GREATER THAN 24 IN., SHALL BE LOCATED AT LEAST 12 IN. FROM THE CENTERLINE OF THE SPRINKLER.
G. OBSTRUCTIONS WIDER THAN 24 IN. IN LENGTH AND WIDTH SHALL BE POSITIONED IN ACCORDANCE WITH FIGURE 31 OF THE STANDARD, OTHERWISE ADDITIONAL SPRINKLERS SHALL BE INSTALLED UNDERNEATH THE OBSTRUCTION. IF ADDITIONAL SPRINKLERS ARE INSTALLED BENEATH A CONTINUOUS OBSTRUCTION, UP TO TWO SPRINKLERS OPERATING AT THE SAME PRESSURE AS THOSE AT THE CEILING SHALL BE ADDED TO THE CEILING DEMAND.
5. THE RULES NOTED ABOVE ASSUME OBSTRUCTIONS ARE LOCATED ON ONE SIDE OF THE ESFR SPRINKLER ONLY. ALL OBJECTS ON THE OPPOSITE SIDE OF THE SPRINKLER SHALL BE POSITIONED IN ACCORDANCE WITH FIGURE 31 OF THE STANDARD.
6. VERTICAL DUCT WORK SUPPLYING UNIT HEATERS SHALL BE CENTERED BETWEEN ESFR SPRINKLERS.
7. THE CONTRACTOR SHALL SPACE ESFR SPRINKLERS WITH CONSIDERATION OF THE LOCATION OF ALL SKYLIGHTS SO THAT AN ESFR SPRINKLER IS NOT LOCATED DIRECTLY UNDERNEATH A SKYLIGHT. REFER TO ARCHITECTURAL DRAWINGS FOR THE LOCATIONS OF SKYLIGHTS. INDICATE COORDINATION ON THE SHOP DRAWINGS.
8. THE HYDRAULIC DESIGN OF THE ESFR SPRINKLER SYSTEM SHALL CONSIDER TWO ADDITIONAL SPRINKLERS IN THE SYSTEM DESIGN AREA TO ACCOUNT FOR ADDITIONAL SPRINKLERS INSTALLED BENEATH CONVEYORS, OR OTHER OBSTRUCTIONS. REFER TO THE SPECIFICATIONS.
9. ESFR SPRINKLER LOCATIONS SHALL BE COORDINATED WITH THE LIGHTING FIXTURE LOCATIONS, AS INDICATED ON THE ELECTRICAL DRAWINGS, IN ORDER TO AVOID POTENTIAL OBSTRUCTION ISSUES. SEE DETAIL ON ELECTRICAL DRAWINGS FOR THE MINIMUM REQUIRED CLEARANCES TO THE FIXTURE. INDICATE COORDINATION ON THE SHOP DRAWINGS.
10. COORDINATE THE LOCATION OF ALL HIGH-VOLUME LOW-SPEED (HVLS) CEILING FANS SUCH THAT THE FAN HUB IS INSTALLED CENTERED BETWEEN FOUR ESFR SPRINKLERS AND THAT THE TOP OF THE FAN BLADES (AIRFOILS) ARE A MINIMUM OF 36" BELOW THE SPRINKLER DEFLECTOR. INDICATE COORDINATION ON THE SHOP DRAWINGS.
11. PROVIDE SPRINKLER PROTECTION BELOW CONVEYOR OBSTRUCTIONS INDICATED ON THE PLANS. SPRINKLER PROTECTION SHALL CONSIST OF ESFR SPRINKLERS (OF THE SAME TYPE AT THE CEILING) HYDRAULIC DESIGN SHALL CONSIDER TWO OF THESE SPRINKLERS OPERATING SIMULTANEOUSLY WITH 12 SPRINKLERS AT THE CEILING. REFER TO SPRINKLER DESIGN SCHEDULE FOR ADDITIONAL DESIGN REQUIREMENTS.

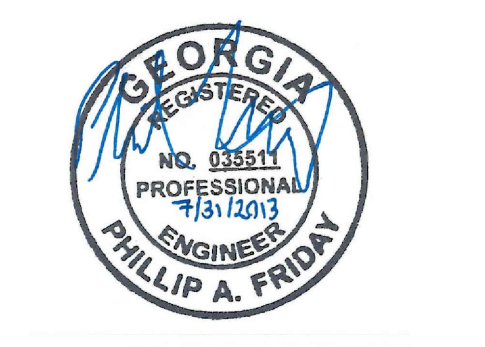


LEGEND table listing symbols for FACP, ANN, TVSS, NAC, F, R, M, C, XX, X, P, RCP, DACT, 2-WAY FIRE HYDRANT, 3-WAY FIRE HYDRANT, AWWA GATE VALVE WITH POST INDICATOR, AWWA GATE VALVE WITH ROADWAY BOX, FIRE DEPT. CONNECTION (4 INLETS), SPRINKLER DESIGN SCHEDULE ITEM, DRY CONTACTS, FLOW SWITCH, TAMPER SWITCH, DUCT SMOKE DETECTOR, INDICATES WEATHERPROOF DEVICE, INDICATES CEILING MOUNTED DEVICE, HEAT DETECTOR.

SPRINKLER DESIGN SCHEDULE (REFERENCE SPECIFICATION SECTION 13930) table with columns for AREA DESIGNATION, AREA DESCRIPTION, AREA CEILING HEIGHT, HAZARD DESCRIPTION, SYSTEM NO., SYSTEM TYPE, DENSITY, REMOTE AREA, NO. SPKR, PRESSURE OR FLOW, SPKR TYPE, SPKR SPACING, SYSTEM NO., NO. SPKR, PRESSURE OR FLOW, SPKR TYPE, WRR # LEVELS & TYPE, DRR # LEVELS & TYPE, SRR # LEVELS & TYPE, INSIDE/OUTSIDE HOSE (GPM), and NOTES.



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PRINT RECORD table with columns for NUMBER, DATE, and DESCRIPTION.

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DATE: 07/24/13 PROJECT NO: 2013-018

SHEET TITLE: FIRE PROTECTION NOTES AND DETAILS

SHEET NUMBER

F-0.0

FOR CONSTRUCTION

13/07/13 Project: Center.dwg

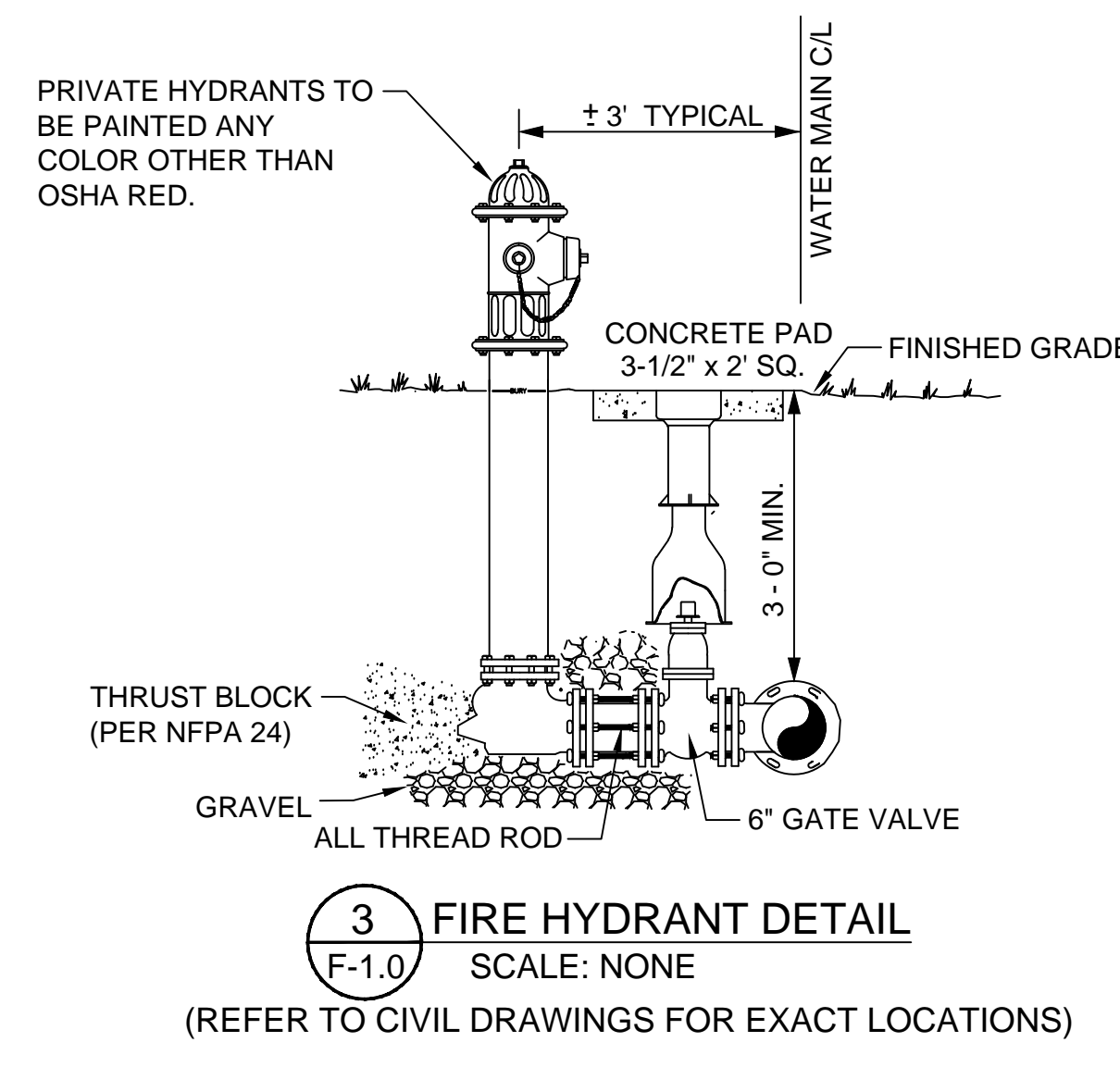
PLOT DATE: July 31, 2013 - 4:19pm

PRIVATE UNDERGROUND FIRE SERVICE MAIN NOTES:

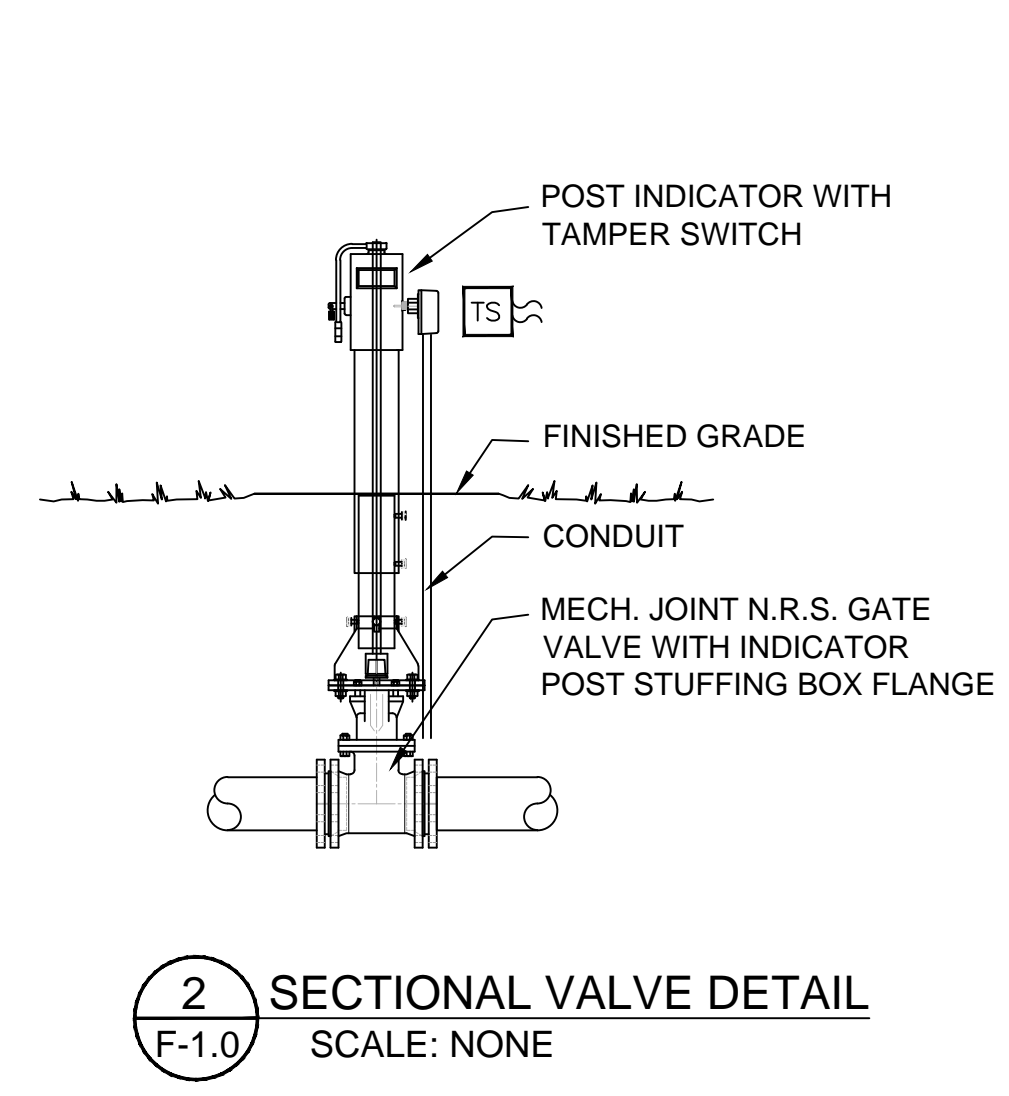
- ALL UNDERGROUND PIPING, VALVES, AND APPURTENANCES (DOWNSTREAM OF THE FIRE PUMP) SHALL BE RATED FOR A MINIMUM WORKING PRESSURE OF 175 PSI.
- THE TOP OF ALL UNDERGROUND MAINS SHALL HAVE A MINIMUM DEPTH OF COVER BELOW EARTH GRADE AS REQUIRED BY LOCAL BUILDING CODES OR NFPA 24, WHICHEVER IS GREATER.
- UNDERGROUND MAINS DOWNSTREAM OF THE FIRE PUMP SHALL BE MECHANICALLY RESTRAINED AGAINST MOVEMENT OR HAVE CONCRETE THRUST BLOCKS INSTALLED AT ALL CHANGES IN DIRECTION, BEHIND TEES, HYDRANTS AND DEAD END LINES OR CAPPED TEES. BOTH MECHANICAL JOINT RESTRAINTS AND THRUST BLOCK SHALL BE USED TO RESTRAIN ALL SPRINKLER RISER STUB-INS. MECHANICAL JOINT RESTRAINTS AND/OR THRUST BLOCKS SHALL BE DESIGNED IN ACCORDANCE WITH NFPA 24 BASED UPON A TEST PRESSURE OF 225 PSI AND THE SOIL RESISTANCE DETERMINED BY THE SOILS ENGINEER, USING A MINIMUM SAFETY FACTOR OF 1.5.
- ALL UNDERGROUND RODS, NUTS, BOLTS AND WASHERS SHALL BE COATED WITH AN ACCEPTABLE CORROSION-RETARDING MATERIAL. CORROSION PROTECTION SHALL MEET THE REQUIREMENTS OF NFPA 24.
- ALL UNDERGROUND PIPING, INCLUDING THE FIRE DEPARTMENT CONNECTION LINE, SHALL BE COMPLETELY FLUSHED IN ACCORDANCE WITH NFPA 24 PRIOR TO CONNECTION TO ABOVEGROUND PIPING. FLUSHING PROCEDURES ARE SUBJECT TO THE APPROVAL OF THE FIRE PROTECTION ENGINEER AND THE AUTHORITIES HAVING JURISDICTION.
- ALL UNDERGROUND PIPING SHALL BE HYDROSTATICALLY TESTED FOR 2 HOURS IN ACCORDANCE WITH NFPA 24. PIPING DOWNSTREAM OF THE FIRE PUMP (INCLUDING FIRE DEPARTMENT CONNECTION PIPING) SHALL BE TESTED AT 225 PSI. BEFORE TESTING, THE TRENCH SHALL BE BACKFILLED BETWEEN JOINTS. ALL JOINTS AND THRUST BLOCKS SHALL BE LEFT EXPOSED DURING THE TESTS.
- EACH HYDRANT SHALL BE FULLY OPENED AND CLOSED UNDER FULL SYSTEM PRESSURE AND CHECKED FOR PROPER DRAINAGE.
- GUARD POSTS SHALL BE PROVIDED AROUND ALL ABOVEGROUND FIRE SPRINKLER WATER SUPPLY COMPONENTS SUBJECT TO VEHICULAR DAMAGE IN ACCORDANCE WITH THE IFC. COMPONENTS TO BE PROTECTED INCLUDE, BUT ARE NOT LIMITED TO, ON-SITE HYDRANTS, FREESTANDING FIRE DEPARTMENT CONNECTIONS, AND YARD POST INDICATORS (PIVs). THE POSTS SHALL BE A MINIMUM OF 6-INCH SCHEDULE 40 PIPE FILLED WITH CONCRETE. THE TOP OF EACH POST SHALL BE 4 FEET ABOVE GRADE LEVEL AND SHALL EXTEND A MINIMUM OF 3 FEET BELOW GRADE. POSTS SHALL BE ANCHORED IN CONCRETE. A MINIMUM CLEAR SPACE OF 3 FEET SHALL BE PROVIDED BETWEEN EACH POST AND THE COMPONENT BEING PROTECTED.
- A FIRE DEPARTMENT CONNECTION (FDC) SHALL BE PROVIDED WHERE INDICATED. A BALL DRIP VALVE SHALL BE INSTALLED AT THE BASE OF THE FDC IN THE BACKFLOW VAULT. GRADE THE LINE FROM THE FDC TO THE BUILDING SO THAT IT WILL DRAIN IN THE VAULT. THE FLOOR OF THE VAULT SHALL BE DESIGNED TO PROPERLY DRAIN AWAY THE DISCHARGE OF THE BALL DRIP.

DESIGN BASIS WATER SUPPLY DATA	
STATIC :	68.0 PSI
RESIDUAL:	58.0 PSI
FLOW:	1,404 GPM
ELEV:	896 FT
MAXIMUM STATIC 134 PSI ELEVATION: 906 FT. (AT PUMP CENTERLINE)	
EFFECTIVE POINT AT CONNECTION TO 12 INCH PUBLIC WATER LINE. SEE CIVIL DRAWINGS.	

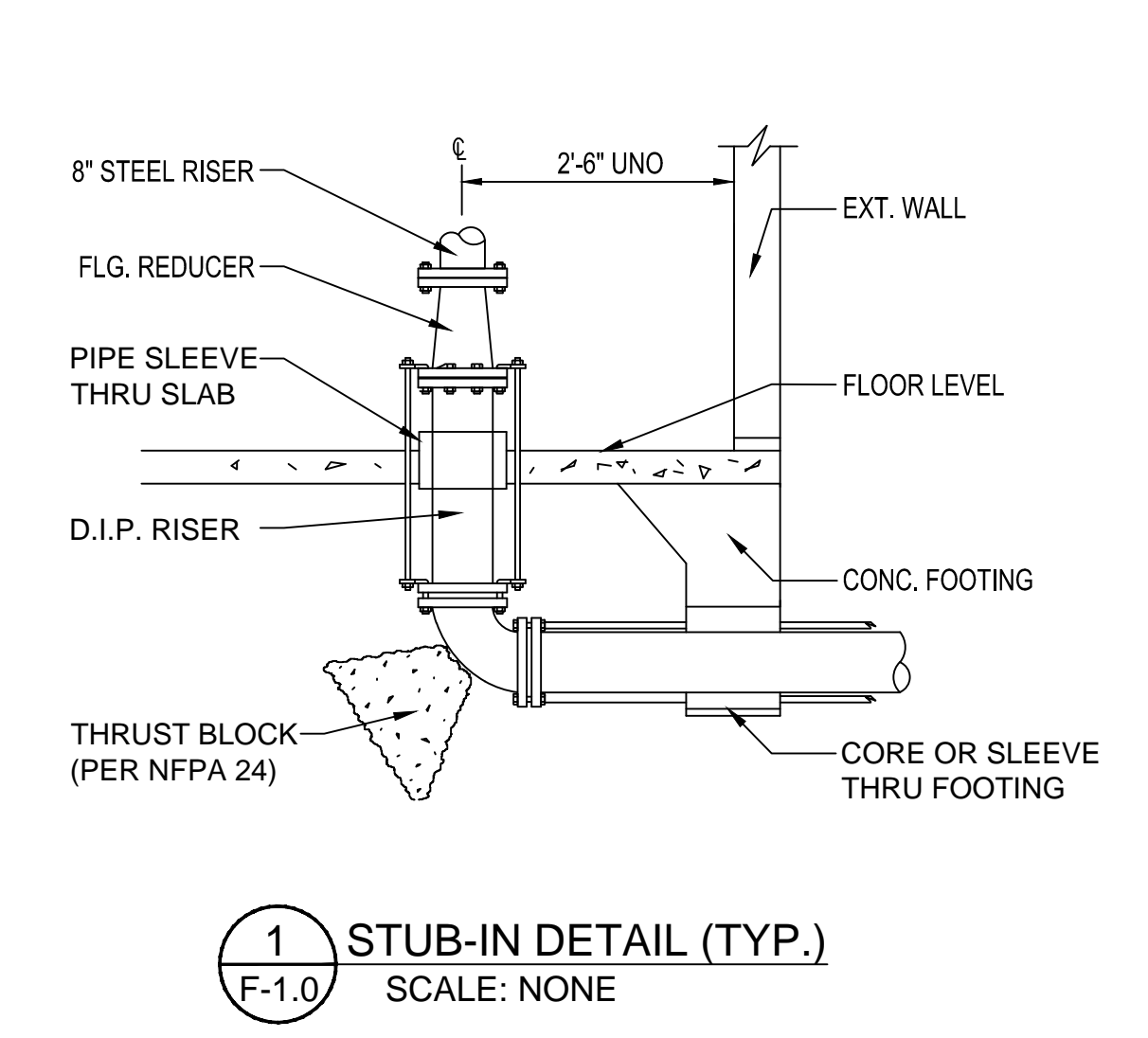
- REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT RISER LEAD-IN/STUB-UP LOCATIONS
- REFER TO THE FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. IN THE EVENT OF CONFLICTS, CONSTRUCT FIRE SERVICE MAINS TO THE MOST STRINGENT REQUIREMENTS, AS DETERMINED BY THE FIRE PROTECTION ENGINEER.
- THE INSTALLING CONTRACTOR SHALL SUBMIT THEIR FLUSHING PROCEDURES FOR REVIEW. THE PROCEDURE SHALL INCLUDE THE FOLLOWING CRITERIA (FROM NFPA 20 AND 24):
 - UNDER NO CIRCUMSTANCES SHALL THE PRESSURE ON THE PUBLIC WATER SUPPLY BE ALLOWED TO DROP BELOW 20 PSI.
 - THE FLOW RATE (GPM) DURING EACH FLUSHING OPERATION SHALL BE MEASURED. AN INDIRECT MEASUREMENT OF THE FLOW BASED ON THE FIRE PUMP ACCEPTANCE TEST IS SUFFICIENT.
 - THE 12-INCH UNDERGROUND MAINS SHALL BE FLUSHED AT A MINIMUM FLOW RATE OF 3,250 GPM.
 - THE 10-INCH UNDERGROUND SPRINKLER RUN-INS SHALL BE FLUSHED AT A MINIMUM FLOW RATE OF 2,440 GPM.
 - THE MINIMUM FLUSHING DURATION SHALL BE BASED ON THE LENGTH OF THE PIPING TO BE FLUSHED DIVIDED BY A MINIMUM FLUSHING VELOCITY OF 10 FPS. IF THE ABOVE REFERENCED FLOW RATE IS NOT ACHIEVED, THE DURATION SHALL BE BASED ON THE ACTUAL VELOCITY. FOR EXAMPLE, FLOW VELOCITY IN 12-INCH PIPE (IN FPS) = 0.00283 X FLOW RATE (IN GPM). A SAFETY FACTOR OF AT LEAST 2 SHALL BE APPLIED TO THE MINIMUM FLUSHING DURATION TO ACCOUNT FOR LARGER OBJECTS THAT MAY BE ROLLING ALONG THE BOTTOM OF THE PIPE RATHER THAN TRAVELING WITHIN THE WATER STREAM.
 - IF THE FLUSHING RATES AND/ OR DURATIONS INDICATED ABOVE ARE NOT ACHIEVABLE WITHOUT THE FIRE PUMP, ADDITIONAL FLUSHING WILL BE REQUIRED AFTER THE FIRE PUMP ACCEPTANCE TEST.
 - THE UNDERGROUND LOOP SHALL BE FLUSHED IN SUCH A MANNER SO AS TO ACHIEVE FULL FLUSHING WITH AN OVERLAP OF THE FLUSHED SEGMENTS (WITH AN ISOLATION VALVE CLOSED, FLUSH CLOCKWISE, THEN WITH A DIFFERENT ISOLATION VALVE CLOSED, FLUSH COUNTERCLOCKWISE PAST THE PREVIOUS OUTLET).
- PROVIDE A COPY OF THE CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING IN ADDITION TO ANY PHOTOS OR OTHER DOCUMENTATION OF THE FLUSHING FOR THE PROJECT RECORD.



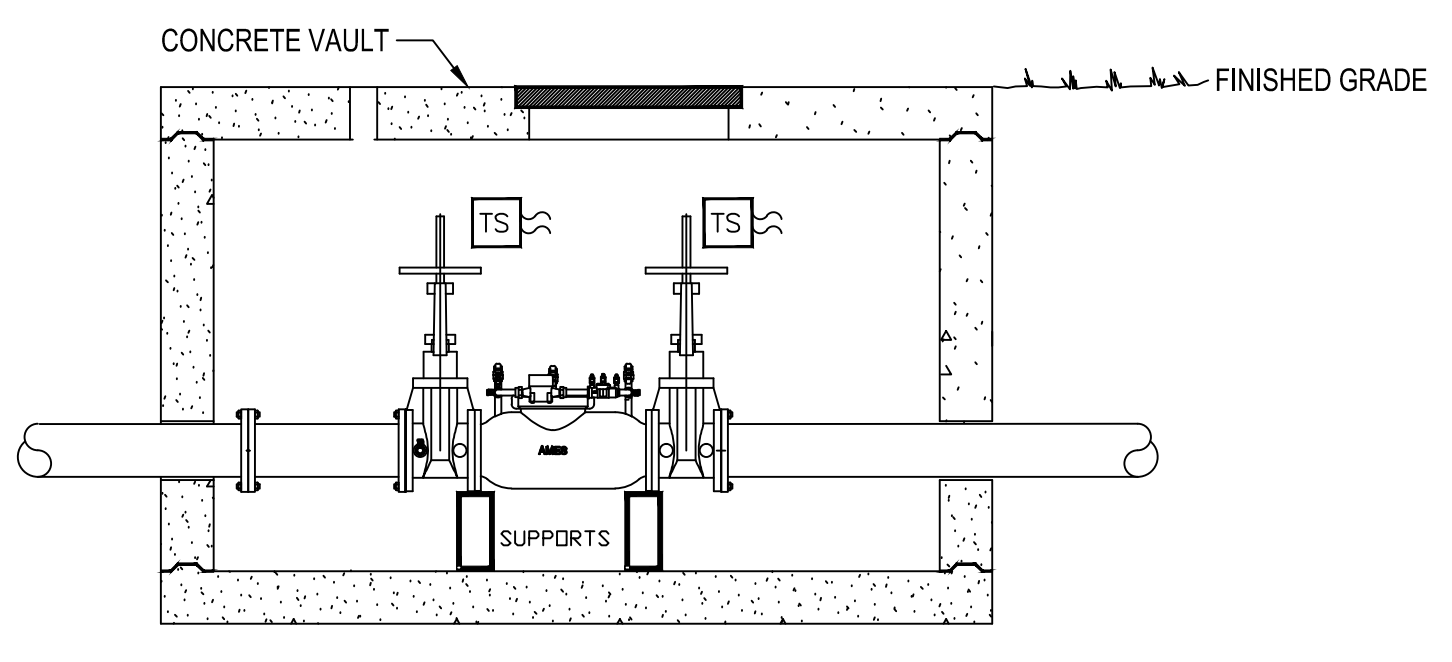
3 FIRE HYDRANT DETAIL
SCALE: NONE
(REFER TO CIVIL DRAWINGS FOR EXACT LOCATIONS)



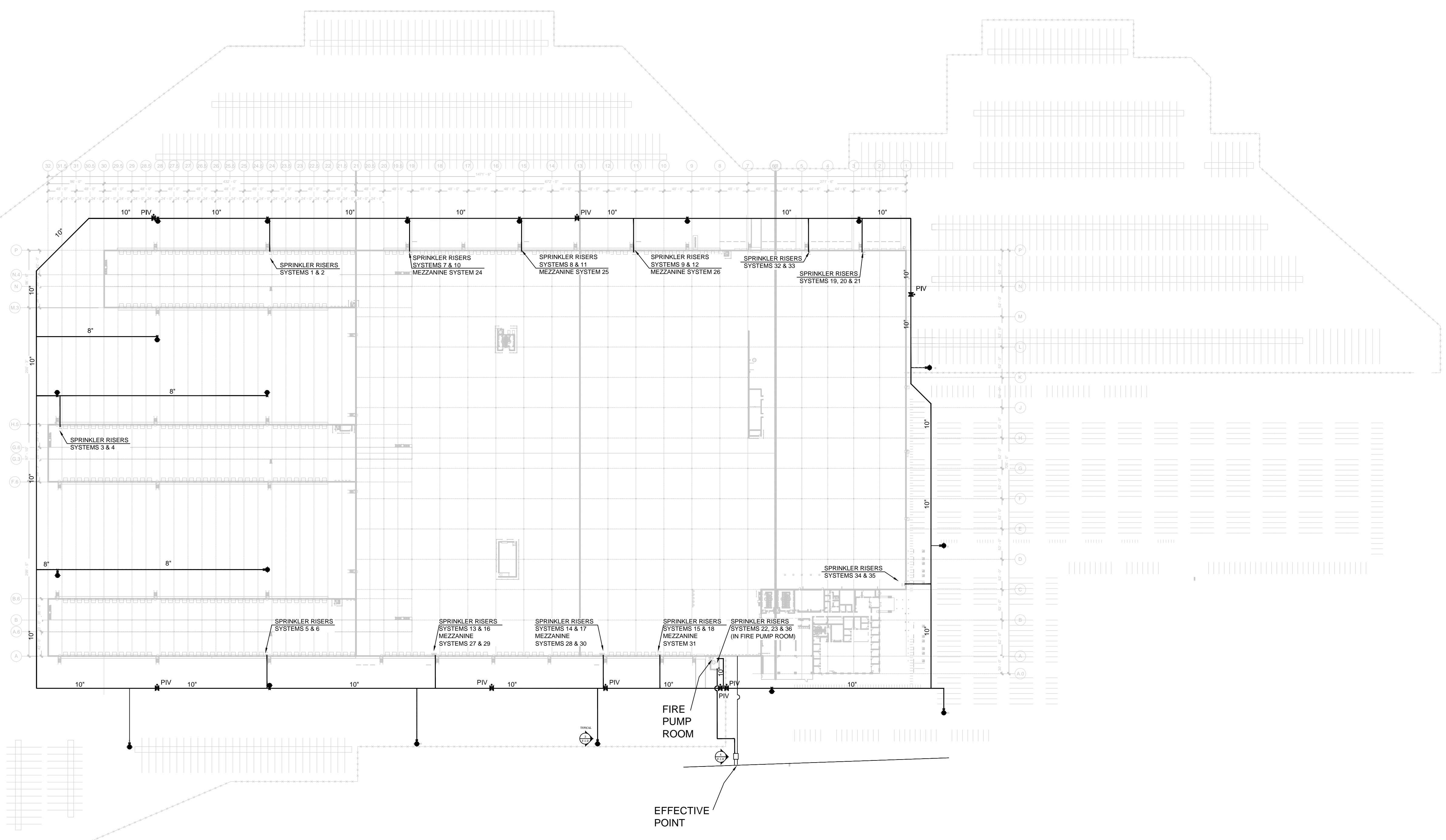
2 SECTIONAL VALVE DETAIL
SCALE: NONE



1 STUB-IN DETAIL (TYP.)
SCALE: NONE



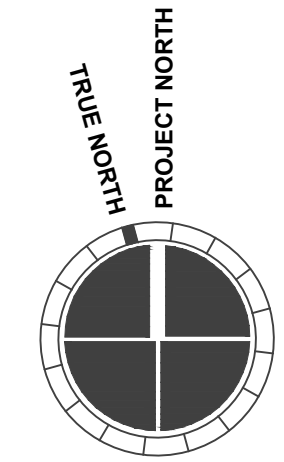
4 DOUBLE CHECK DETECTOR CHECK
BACKFLOW PREVENTER IN VAULT DETAIL
SCALE: NONE



1 FIRE PROTECTION SITE PLAN
SCALE: 1" = 100'-0"
Scale: 1" = 100'-0"

KEY:

(Symbol)	EXISTING PUBLIC WATER MAIN PIPING
(Symbol)	NEW PUBLIC WATER MAIN PIPING
(Symbol)	PRIVATE FIRE SERVICE WATER MAIN



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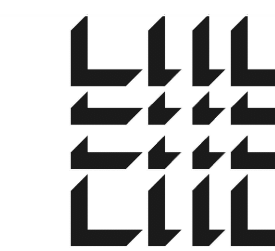
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AT THE SITE BEFORE PROCEEDING WITH EACH PHASE OF HIS WORK.
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DATE	PROJECT NO.
07/24/13	2013-018

SHEET TITLE
FIRE PROTECTION UNDERGROUND

SHEET NUMBER
F-1.0

FOR CONSTRUCTION



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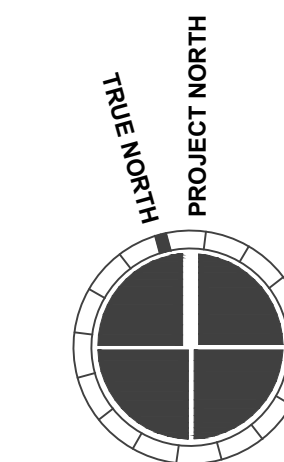
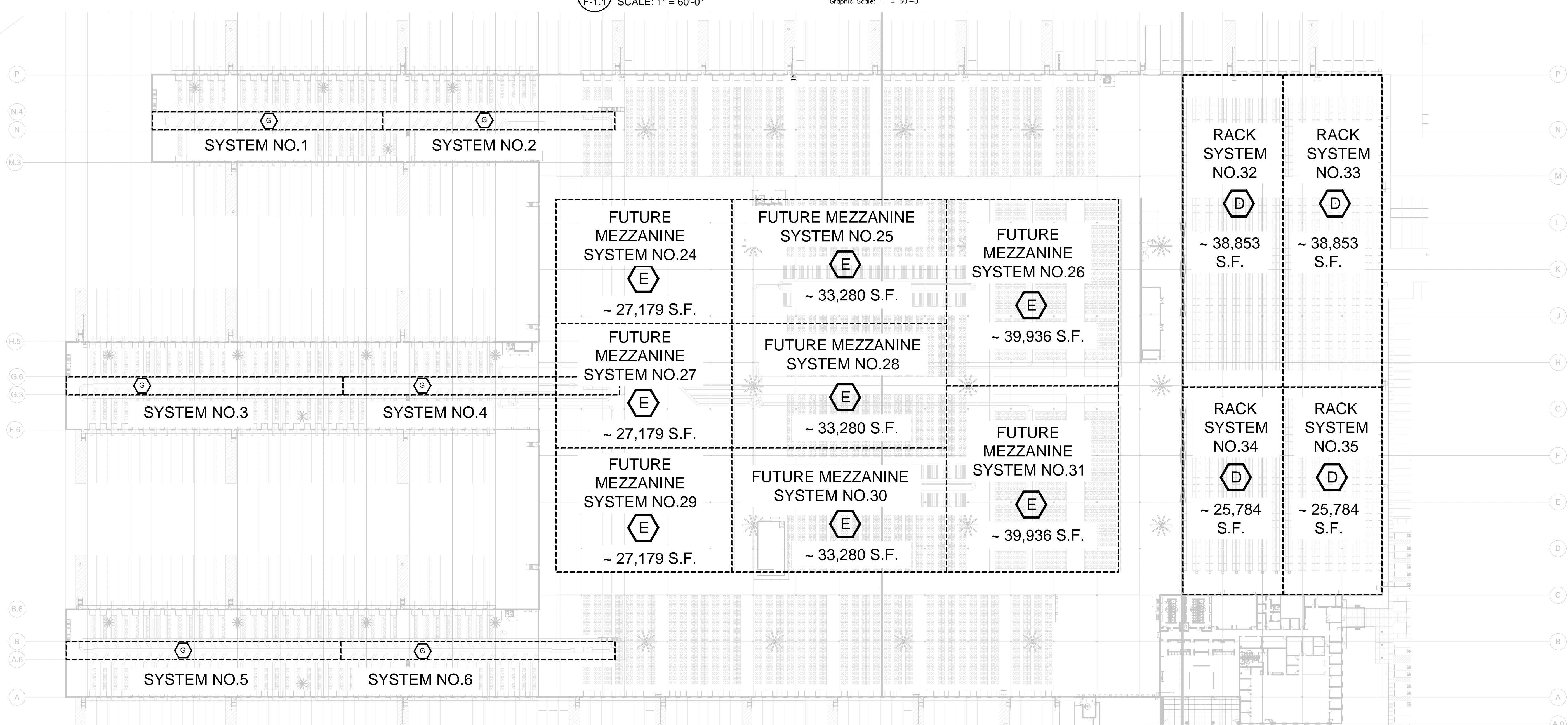
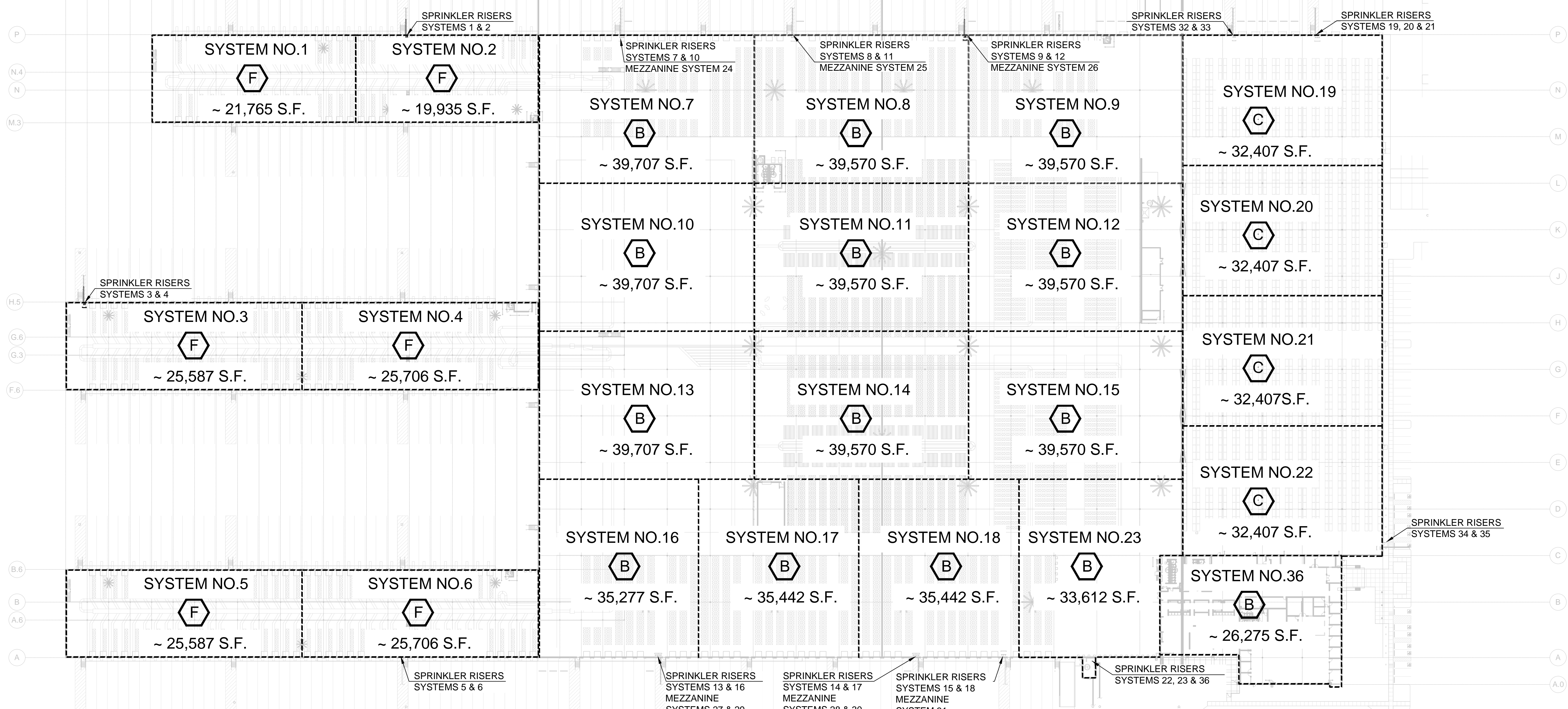
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AT THE SITE BEFORE PROCEEDING WITH EACH PHASE OF HIS WORK.
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DATE	PROJECT NO.
07/24/13	2013-018

SHEET TITLE
FIRE PROTECTION SYSTEM PLAN

SHEET NUMBER
F-1.1

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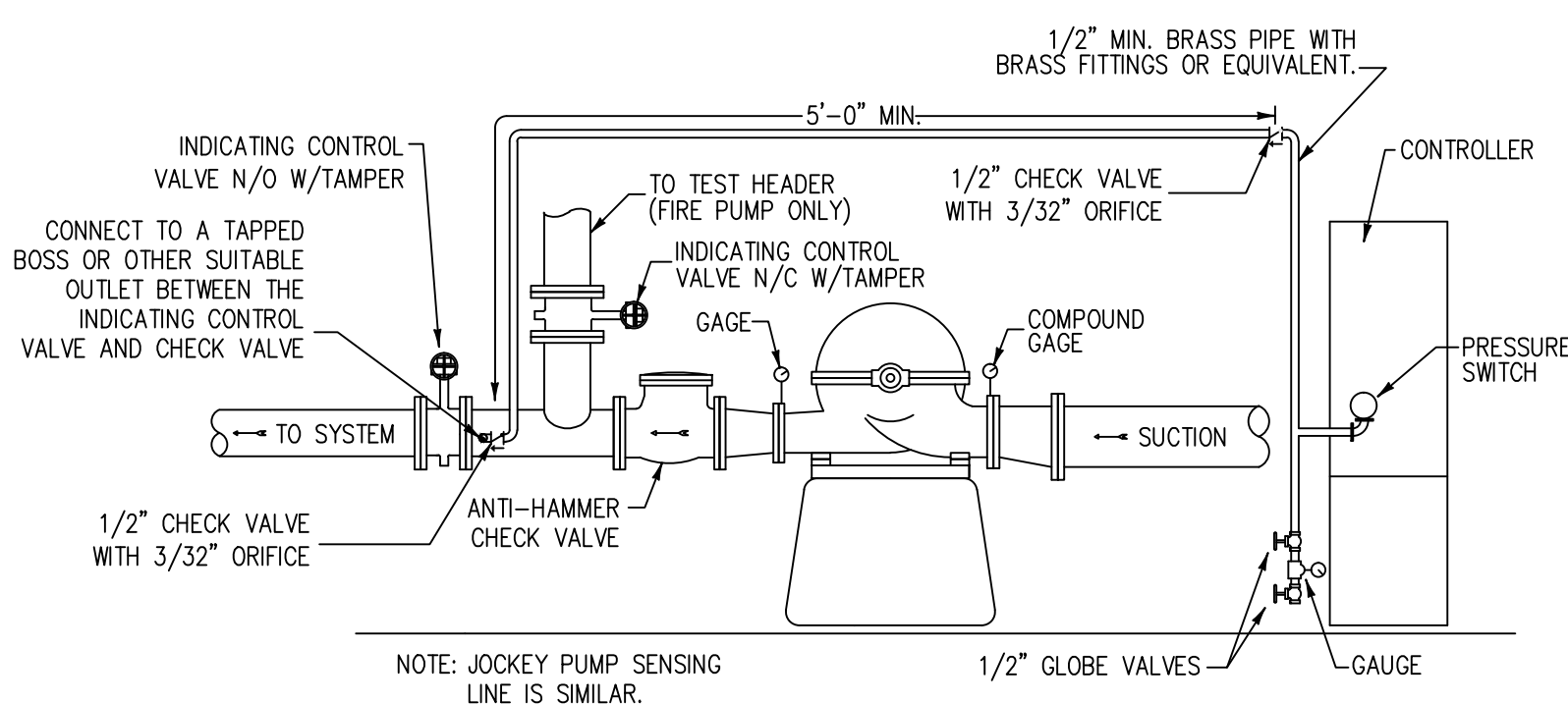
DIESEL FIRE PUMP NOTES:

- A COMPLETE DIESEL ENGINE DRIVEN FIRE PUMP AND ASSOCIATED PUMP ROOM INSTALLATION SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 20 AND NFPA 24 AND THE DRAWINGS AND SPECIFICATIONS.
- PUMP CASING RELIEF VALVE (IF PROVIDED) DISCHARGE AND PACKING GLAND DRAIN PORTS SHALL BE SEPARATELY ROUTED TO FLOOR DRAIN OR EXTERIOR. ROUTE PIPE TO AVOID CREATING TRIP HAZARDS. FLOOR DRAIN SHALL DISCHARGE AS REQUIRED PER LOCAL REQUIREMENTS.
- FIRE PUMP AND JOCKEY PUMP CONTROLLER PRESSURE SENSING LINES SHALL BE COMPLETELY SEPARATE AND INDEPENDENT. SENSING LINE CONNECTIONS SHALL BE MADE BETWEEN THE DISCHARGE CHECK VALVES AND DISCHARGE CONTROL VALVES.
- PROVIDE PIPE STANDS, HANGERS AND SEISMIC BRACING IN ACCORDANCE WITH NFPA 13 AND NFPA 20.
- FIRE ALARM CONTROL PANEL SHALL MONITOR THE FOLLOWING CONDITIONS FROM THE FIRE PUMP CONTROLLER:
 - ENGINE RUNNING CONDITION (SUPERVISORY).
 - CONTROLLER/ ENGINE TROUBLE (SUPERVISORY), INCLUDING ALL CONDITIONS REQUIRED BY NFPA 20
 - FIRE PUMP CONTROLLER MAIN SWITCH IN THE OFF OR MANUAL POSITION (SUPERVISORY).
 - FUEL LEAKAGE IN ANNULAR SPACE OF FUEL TANK (SUPERVISORY)
 - LOW PUMP ROOM TEMPERATURE (SUPERVISORY)
- SEQUENCE OF OPERATION:
 - MAIN RELIEF VALVE SET POINT SHALL BE 175 PSI.
 - JOCKEY PUMP STOP POINT SHALL BE 175 PSI.
 - JOCKEY PUMP START POINT SHALL BE 160 psi.
 - FIRE PUMP START POINT SHALL BE 155 PSI.
 - THE FIRE PUMP SHALL BE ARRANGED TO RUN UNTIL MANUALLY SHUT OFF. AUTOMATIC SHUTOFF CAPABILITIES SHALL NOT BE INSTALLED OR CONNECTED.
- FIRE PUMP SHALL BE CERTIFIED PER NFPA 20. FIRE PUMP AND CONTROLLER MANUFACTURER'S REPRESENTATIVES MUST BE PRESENT FOR ACCEPTANCE TESTING.
- FIRE SPRINKLER CONTRACTOR SHALL PROVIDE AND INSTALL THE FOLLOWING DEVICES REQUIRED TO BE MONITORED BY THE FIRE ALARM SYSTEM AS EITHER DISTINCT ADDRESSABLE POINTS OR THROUGH THE COMMON TROUBLE CONTACT
 - PUMP ROOM LOW TEMPERATURE SWITCH
 - DIESEL FUEL LEAKAGE SWITCH
 - DIESEL FUEL LEVEL SWITCH
- COORDINATE DEVICE AND EQUIPMENT LOCATIONS IN THE PUMP ROOM WITH ACTUAL DOOR PLACEMENT.
- PDL HAS BEEN UTILIZED DUE TO THE MAXIMUM ANTICIPATED STSTIC PRESSURE.

DIESEL FIRE PUMP ROOM EQUIPMENT LIST			
NO.	NAME	NO.	NAME
1	SUPPLY PIPING	16	ECCENTRIC REDUCER (IF REQUIRED)
2	OS&Y VALVE WITH TAMPER SWITCH	17	45° ELBOW (ANGLED DOWN) AND CONCRETE SPLASH BLOCK
3	2000 GPM DIESEL FIRE PUMP (CW ROTATION)	18	10"x10"x6" REDUCING TEE TO RELIEF VALVE
4	BATTERIES	19	JOCKEY PUMP (JP-1)
5	CONCENTRIC REDUCER (IF REQUIRED)	20	JOCKEY PUMP CONTROLLER
6	6" PRESSURE RELIEF VALVE AND 6"x10" ENCLOSED WASTE CONE	21	VENTILATION OPENING
7	CHECK VALVE - ANTI-HAMMER TYPE	22	STAINLESS STEEL JACKETED, INSULATED EXHAUST PIPE AND MUFFLER
8	BUTTERFLY VALVE WITH TAMPER SWITCH (SUPERVISED CLOSED)	23	NOT USED
9	FIRE PUMP TEST HEADER W/SIX 2-1/2" HOSE VALVES WITH BALL DRIP	24	MONITOR MODULES FOR FLOW AND TAMPER SWITCHES
10	10"x10"x8" REDUCING TEE TO TEST HEADER	25	AIR RELEASE
11	BUTTERFLY VALVE WITH TAMPER SWITCH	26	PIPE STAND
12	CHECK VALVE FOR BY-PASS LINE	27	1-1/4" OS&Y VALVE
13	FIRE PUMP CONTROLLER (PDL CONTROL MAY BE CONSIDERED)	28	1-1/4" RUBBER-SEATED SPRING LOADED CHECK VALVE
14	FUEL TANK WITH CONTAINMENT DOUBLE WALL FUEL TANK	29	WALL POST INDICATOR
15	MONITOR MODULES FOR FIRE PUMP MONITORING	30	NOT USED

PUMP SCHEDULE						
MARK	SERVICE	RATED FLOW (GPM)	MAX. NET SHUT-OFF PRESSURE (PSI)	RPM	MAX. RATED HP	VOLTAGE PHASE HERTZ
FP-2	FIRE PUMP	2,000	95	2,100	154	120 / 3 / 60
JP-1	JOCKEY PUMP	15	130	3,500	3	480 / 3 / 60

NOTES: PREFERRED FIRE PUMP MANUFACTURERS: PATTERSON, PEERLESS



3 TYPICAL PUMP SENSING LINE DETAIL
SCALE: NONE

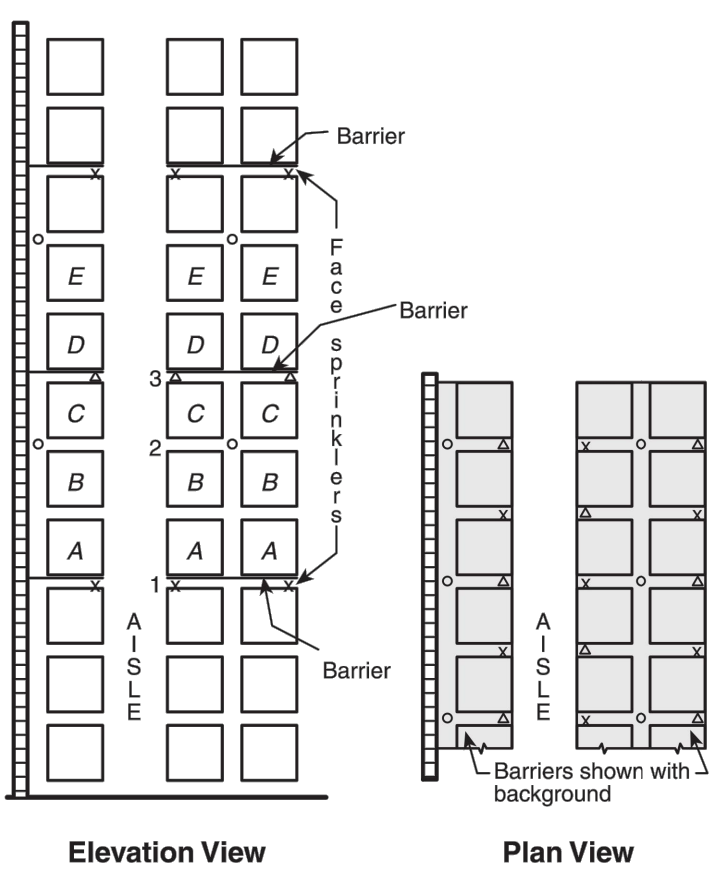


FIGURE 17.3.1.2(a) In-Rack Sprinkler Arrangement, Group A Plastic Commodities, Storage Height Over 25 ft (7.6 m) - Option 1.

- Notes:
- Sprinklers and barriers labeled 1 shall be required where loads labeled A or B represent top of storage.
 - Sprinklers labeled 1 and 2 and barriers labeled 1 shall be required where loads labeled C represent top of storage.
 - Sprinklers and barriers labeled 1 and 3 shall be required where loads labeled D or E represent top of storage.
 - For storage higher than represented by loads labeled E, the cycle defined by Notes 2 and 3 is repeated.
 - Symbol Δ or x indicates face sprinklers on vertical or horizontal stagger.
 - Symbol o indicates longitudinal flue space sprinklers.
 - Each square represents a storage cube measuring 4 ft to 5 ft (1.22 m to 1.53 m) on a side. Actual load heights can vary from approximately 18 in. (0.46 m) up to 10 ft (3.05 m). Therefore, there could be as few as one load or as many as six or seven loads between in-rack sprinklers that are spaced 10 ft (3.05 m) apart vertically.

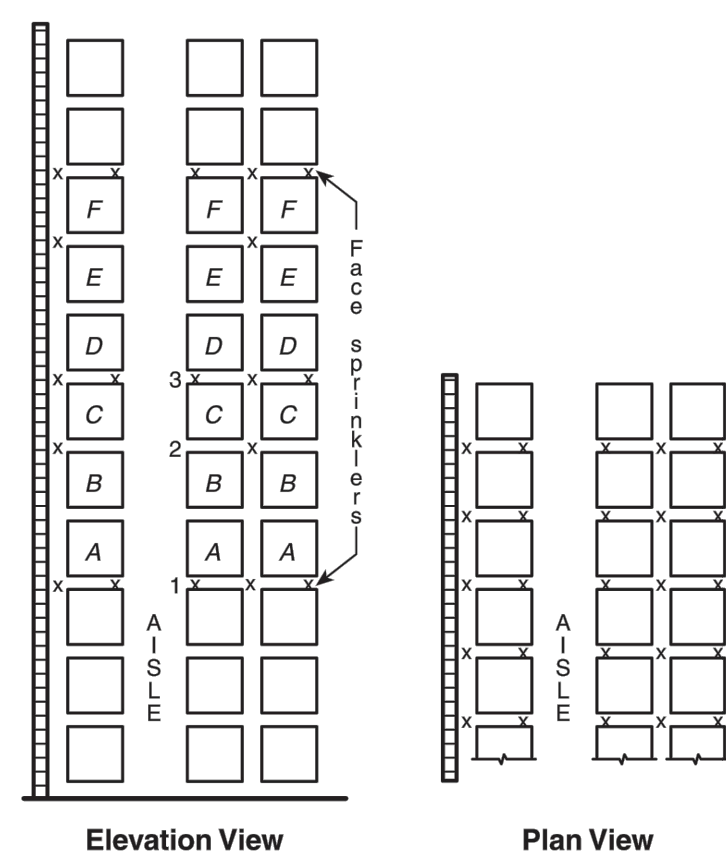


FIGURE 17.3.1.2(b) In-Rack Sprinkler Arrangement, Group A Plastic Commodities, Storage Height Over 25 ft (7.6 m) - Option 2.

- Notes:
- Sprinklers labeled 1 shall be required where loads labeled A or B represent top of storage.
 - Sprinklers labeled 1 and 2 shall be required where loads labeled C represent top of storage.
 - Sprinklers labeled 1 and 3 shall be required where loads labeled D or E represent top of storage.
 - For storage higher than loads labeled F, the cycle defined by Notes 2 and 3 is repeated.
 - Symbol x indicates face and in-rack sprinklers.
 - Each square represents a storage cube measuring 4 ft to 5 ft (1.22 m to 1.53 m) on a side. Actual load heights can vary from approximately 18 in. (0.46 m) up to 10 ft (3.05 m). Therefore, there could be as few as one load or as many as six or seven loads between in-rack sprinklers that are spaced 10 ft (3.05 m) apart vertically.

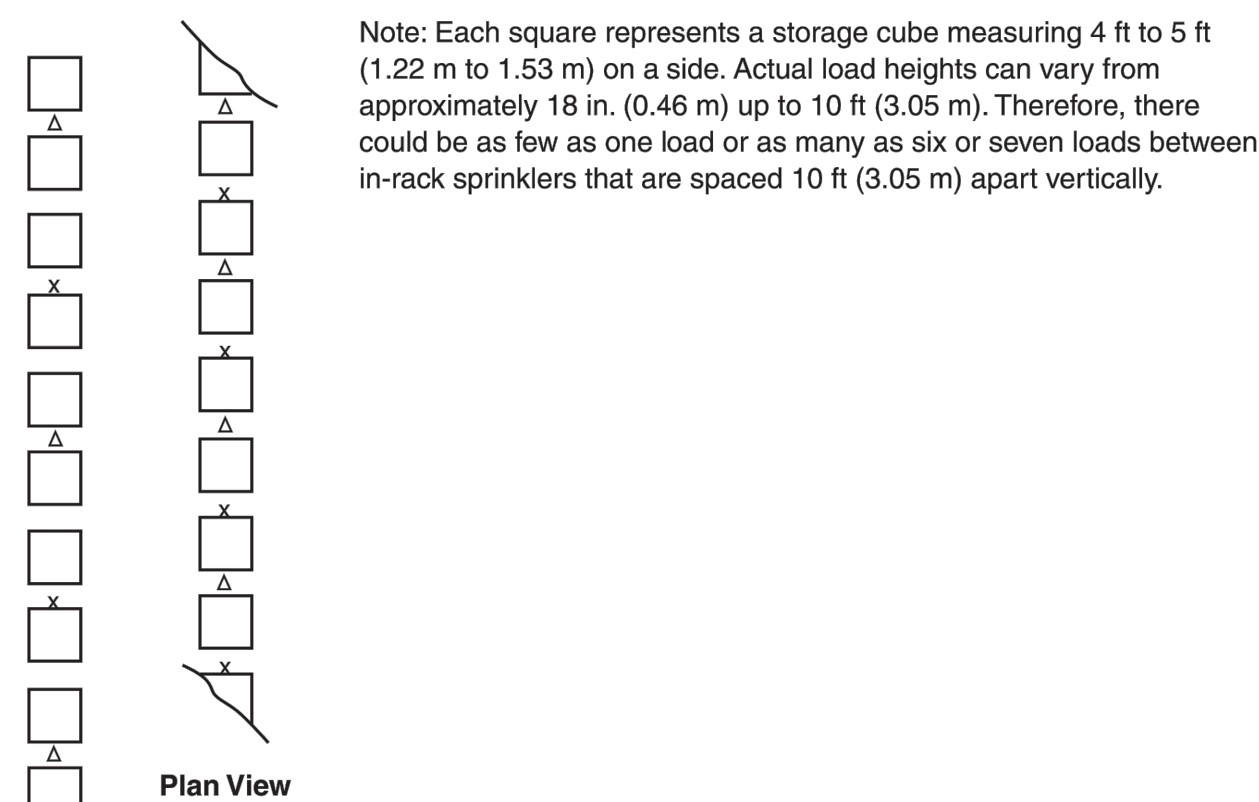


FIGURE 17.3.1.2.1(a) In-Rack Sprinkler Arrangement, Group A Plastic Commodities, Single-Row Racks, Storage Height Over 25 ft (7.6 m) - Option 1.

A BASE BID IN-RACK SPRINKLER LAYOUT

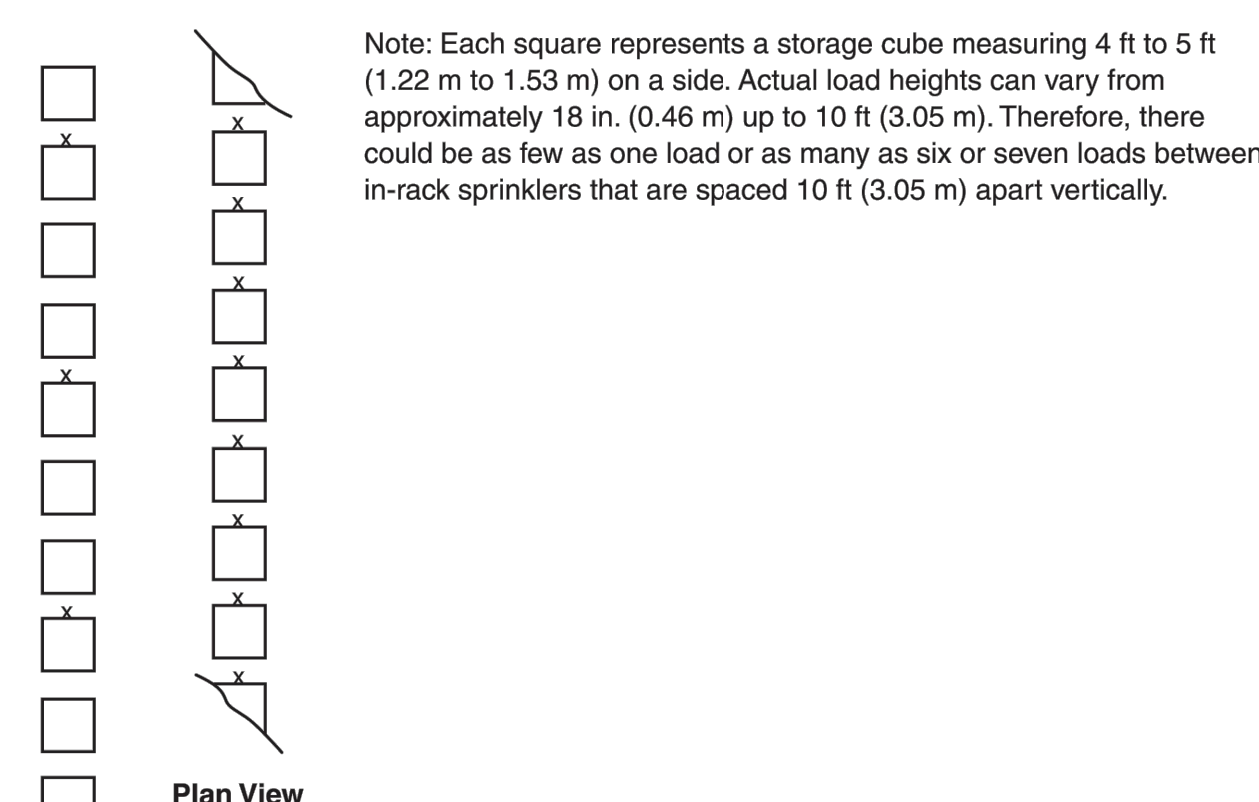
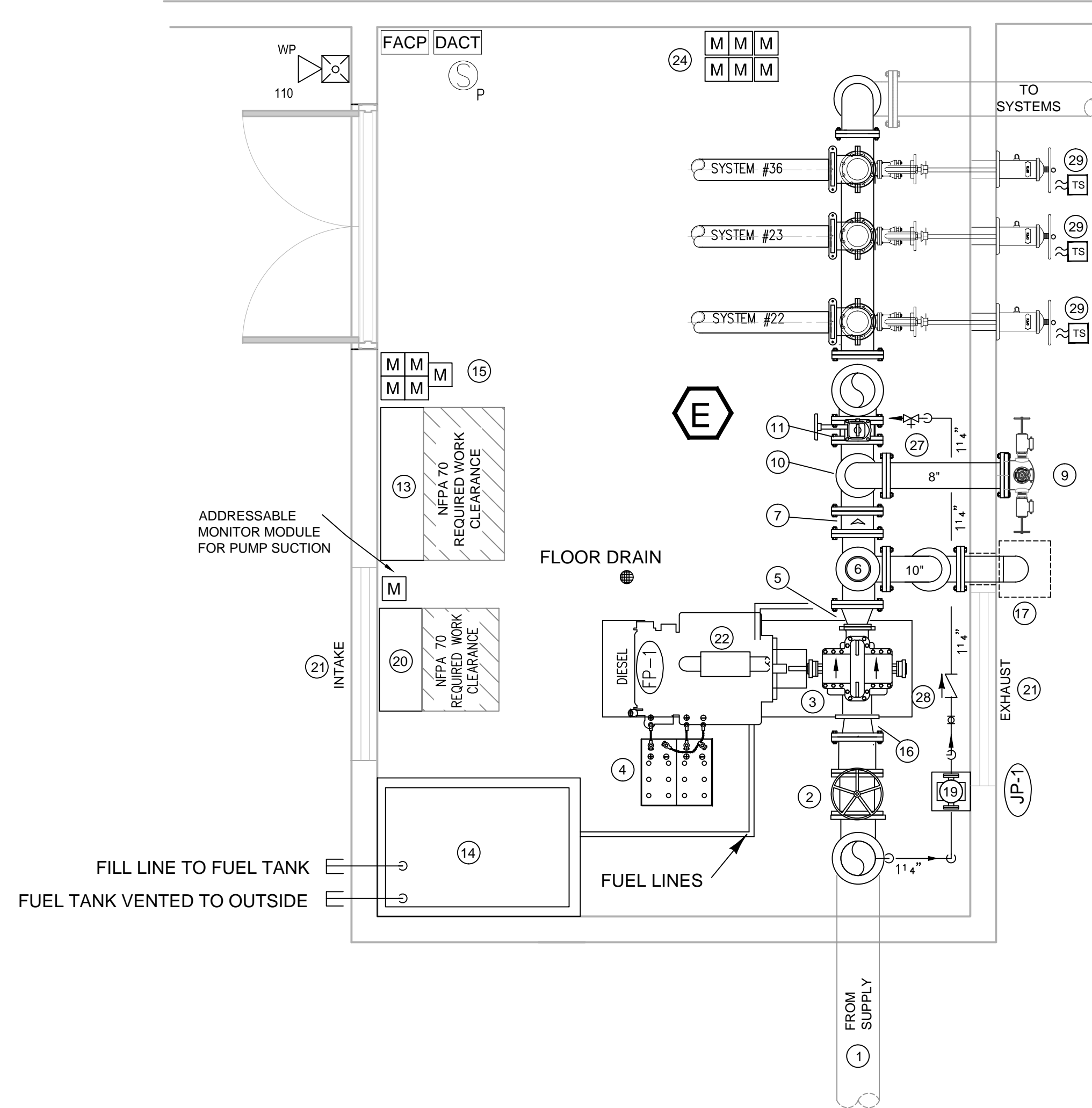
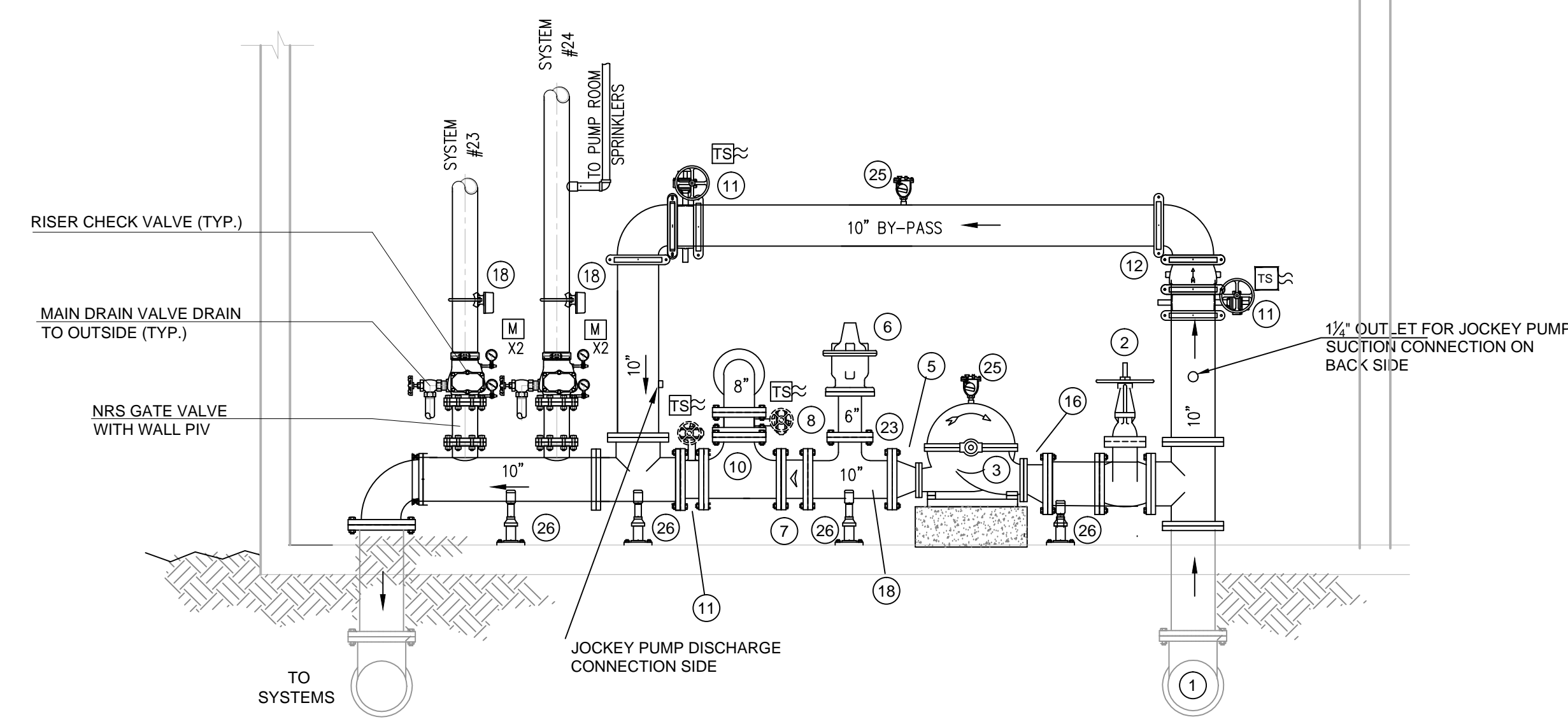


FIGURE 17.3.1.2.1(b) In-Rack Sprinkler Arrangement, Group A Plastic Commodities, Single-Row Racks, Storage Height Over 25 ft (7.6 m) - Option 2.

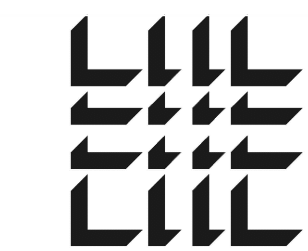
B ALTERNATE BID IN-RACK SPRINKLER LAYOUT



1 ELECTRIC FIRE PUMP ROOM PLAN
SCALE: 3/8" = 1'-0"

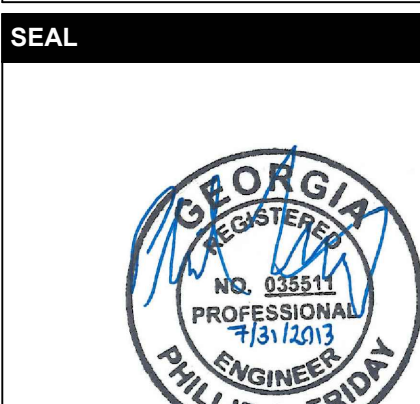


2 ELECTRIC FIRE PUMP ROOM SECTION
SCALE: 3/8" = 1'-0"



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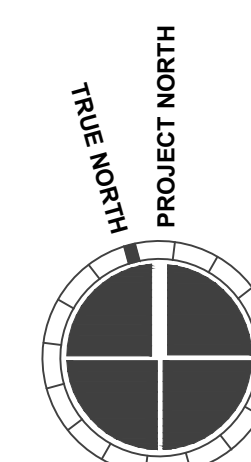
DATE	PROJECT NO.
07/24/13	2013-018

SHEET TITLE
FIRE PUMP PLAN
NOTES AND DETAILS

SHEET NUMBER

F-1.2

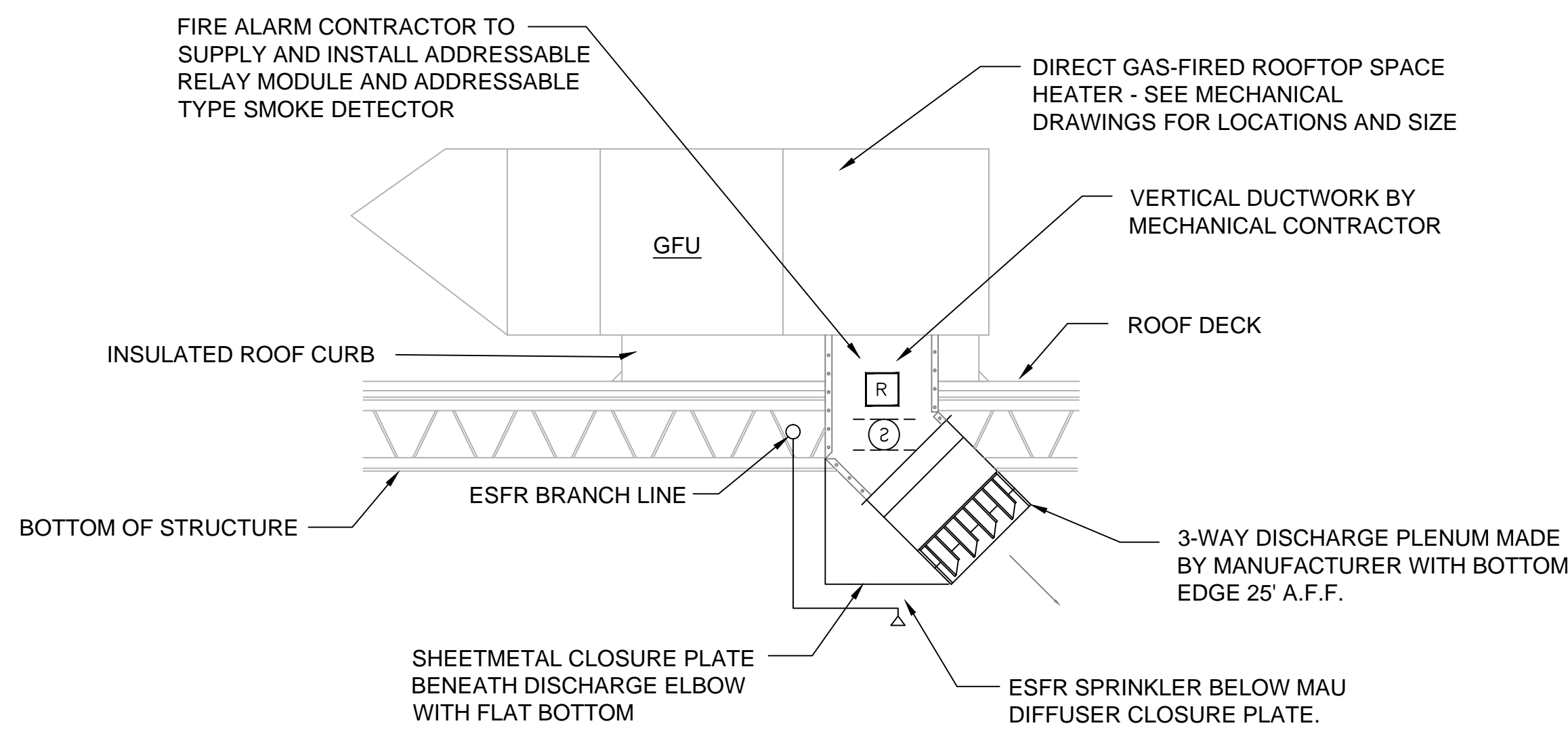
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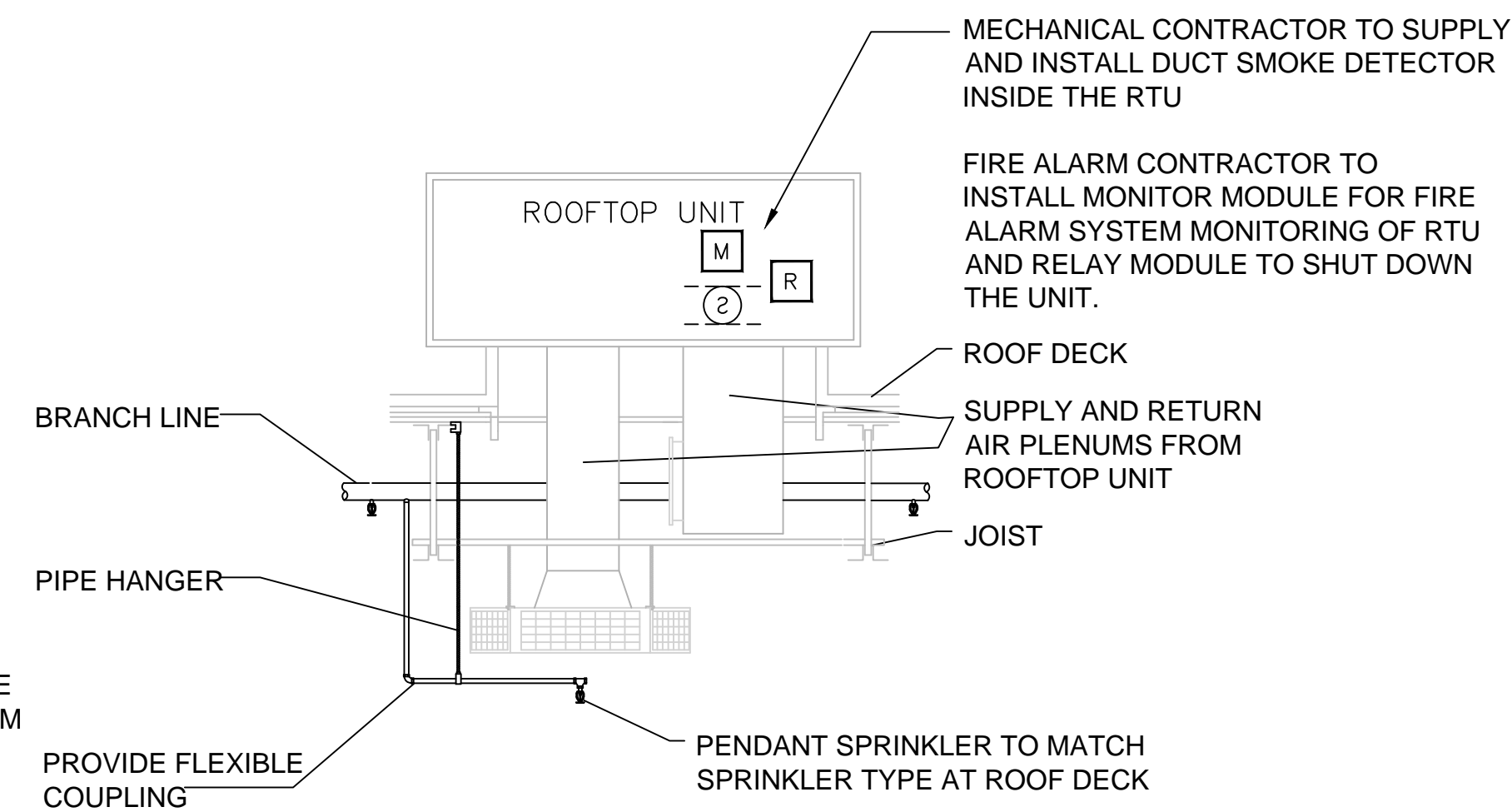
FIRE ALARM SYSTEM NOTES:

- AN INTELLIGENT/ADDRESSABLE FIRE ALARM SIGNALING SYSTEM SHALL BE INSTALLED TO MONITOR SMOKE DETECTORS, WATERFLOW ALARM SWITCHES, VALVE TAMPER SUPERVISORY SWITCHES, AND FIRE PUMP SUPERVISORY CONDITIONS AND INITIATE EMERGENCY FORCES/OCCUPANT NOTIFICATION IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, AND NFPA 72.
- PROVIDE VISUAL OCCUPANT NOTIFICATION APPLIANCES FOR THE BULK AND RACK STORAGE AREAS AS INDICATED ON THE DRAWINGS.
- AUDIBLE OCCUPANT NOTIFICATION SHALL BE DESIGNED IN ACCORDANCE WITH NFPA 72 REQUIREMENTS FOR THE ENTIRE FACILITY. THE CONTRACTOR IS RESPONSIBLE FOR ADDING HORNS OR SPEAKERS AS NECESSARY TO ENSURE AUDIBILITY THROUGHOUT THE BUILDING. THE EXPECTED VARIOUS AMBIENT NOISE LEVEL ARE AS FOLLOWS:

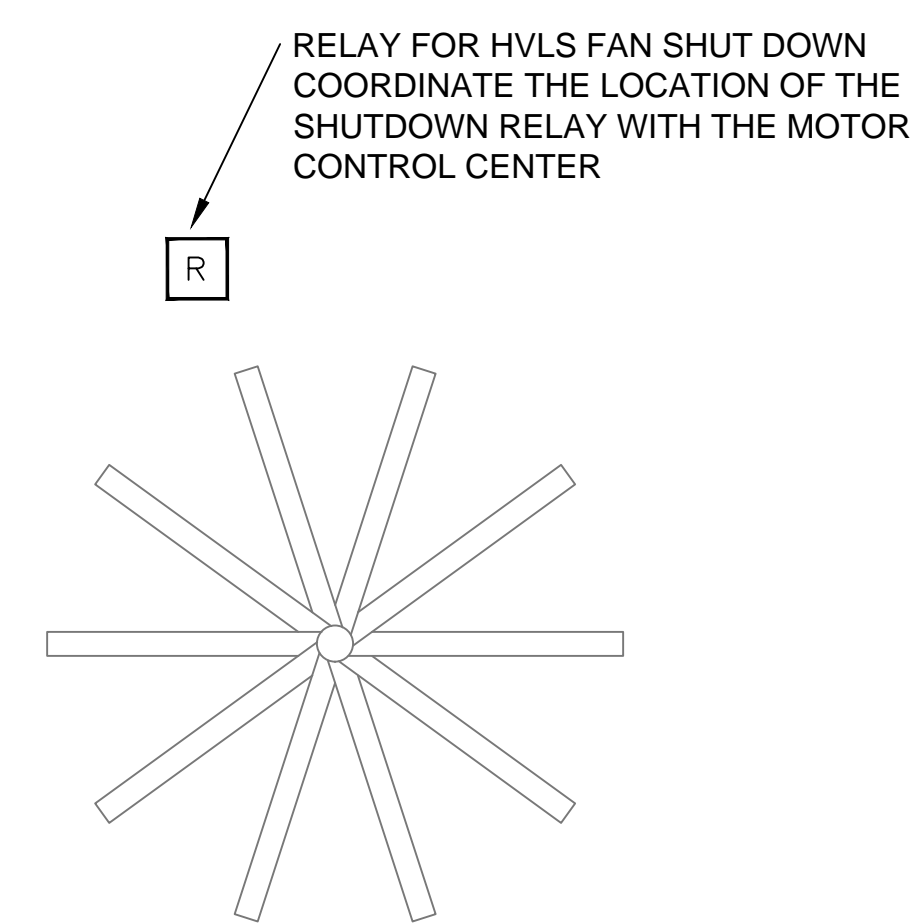
OFFICE AREAS	45 dBA
BULK AND RACK STORAGE AREAS	60 dBA
ABOVE PROCESS MEZZANINE	75 dBA
BELOW PROCESS MEZZANINE	75 dBA
STORAGE MEZZANINE	75 dBA
ADJACENT TO CONVEYORS	90 dBA
- THE FIRE ALARM SYSTEM SHALL BE UL-LISTED FOR CENTRAL STATION SERVICE AND RELEASING SERVICE.
- THE FIRE ALARM CONTROL PANEL (FACP) SHALL BE INSTALLED ACROSS FROM THE SECURITY DESK AND RECESSED IN THE WALL.
- A MANUAL FIRE ALARM PULL STATION SHALL BE INSTALLED ADJACENT TO THE FACP ACROSS FROM THE SECURITY DESK AND RECESSED IN THE WALL.
- ALL INITIATING DEVICES SHALL BE INTELLIGENT/ADDRESSABLE WHERE POSSIBLE. SEPARATE ADDRESSABLE MONITOR MODULES SHALL BE PROVIDED FOR EACH CONVENTIONAL INPUT DEVICE SUCH THAT EACH ALARM DEVICE CAN COMMUNICATE WITH THE FACP AS A DISTINCT ALARM INPUT.
- A DIGITAL ALARM COMMUNICATOR TRANSMITTER (DACT) SHALL BE PROVIDED WITH THE CAPABILITY TO TRANSMIT DISTINCT ALARM, SUPERVISORY, AND TROUBLE SIGNALS BY DEVICE ADDRESS TO THE CENTRAL STATION USING CONTACT ID FORMAT.
- FIRE ALARM CONTROL PANEL SHALL MONITOR THE FOLLOWING CONDITIONS FROM THE FIRE PUMP CONTROLLERS.
 - PUMP RUNNING CONDITION (SUPERVISORY)
 - LOSS OF PHASE (POWER) AT CONTROLLER (SUPERVISORY)
 - PHASE REVERSAL (SUPERVISORY)
 - FIRE PUMP CONTROLLER MAIN SWITCH IN THE OFF OR MANUAL POSITION (SUPERVISORY)
- ALL WIRES SHALL BE CHECKED FOR GROUNDS, SHORTS, OPENS, AND CORRECT RESISTANCE, CAPACITANCE AND OTHER APPLICABLE PARAMETERS PRIOR TO TERMINATION OF THE CIRCUITS AT THE FIRE ALARM CONTROL PANEL OR SUBPANELS AND PRIOR TO THE INSTALLATION OF DEVICES. THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION AND CERTIFICATION OF THIS TESTING ON A PER CIRCUIT BASIS.
- THE FIRE ALARM SYSTEM SHALL BE INTERLOCKED TO SHUT DOWN ALL HVAC EQUIPMENT TO INCLUDE: RTUs, GFUs, AND ALL HIGH VOLUME/LOW VELOCITY (HVLV) CEILING FANS IN THE WAREHOUSE PER THE FIRE ALARM SEQUENCE OF OPERATIONS. REFER TO MECHANICAL/ELECTRICAL PLANS FOR NUMBER AND LOCATIONS OF FANS AND CONTROLS.
- WATERFLOW SWITCHES, VALVE TAMPER SWITCHES, AND OTHER SPRINKLER SYSTEM SUPERVISORY CONTACTS SHALL BE PROVIDED AND INSTALLED BY THE FIRE SPRINKLER CONTRACTOR AND UTILITY CONTRACTOR FOR MONITORING BY THE FACP VIA ADDRESSABLE MONITOR MODULES. FIRE ALARM CONTRACTOR IS RESPONSIBLE TO CONNECT MONITOR MODULE TO THE SWITCHES AND TO THE FACP. REFER TO PLANS FOR LOCATION AND NUMBER OF SWITCHES REQUIRED.
- ALL ADDRESSABLE DUCT DETECTORS (GFUs) ARE TO BE FURNISHED AND INSTALLED BY THE FIRE ALARM CONTRACTOR. ALL NON-ADDRESSABLE DUCT DETECTORS (RTUs) ARE TO BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. THE FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF ALL MONITOR MODULES, RELAY MODULES, SUPPLEMENTAL RELAYS, AND INTERCONNECTING WIRING ASSOCIATED WITH ALL DUCT DETECTORS AND RELATED FACP MONITORING, SHUTDOWN AND CONTROL FUNCTIONS. REFER TO MECHANICAL PLANS FOR NUMBER AND LOCATIONS OF AIR HANDLING UNITS TO BE EQUIPPED WITH DUCT DETECTORS.
- THE DESIGN CONTEMPLATES UP TO 30 NAC POWER SUPPLY PANELS IN TWELVE LOCATIONS. THE NAC POWER SUPPLY PANELS ARE TO BE LOCATED ON THE PERIMETER WALLS OF THE WAREHOUSE, IN EITHER OF THE UTILITY ELECTRICAL ROOMS OF THE MAIN OFFICE, OR IN ONE OF THE REMOTE ELECTRICAL ROOMS. UNDER NO CONDITIONS WILL NAC POWER SUPPLY PANELS BE PERMITTED IN OTHER LOCATIONS, INCLUDING ALONG THE EXTERIOR WALL OF THE OFFICE OR UNDER THE MEZZANINES. IF THE CONTRACTOR DESIRES TO UTILIZE ADDITIONAL NAC POWER SUPPLY PANELS, THE CONTRACTOR SHALL PROVIDE ADDITIONAL POWER CIRCUITS AT NO ADDITIONAL COST TO THE OWNER.
- THE NAC POWER SUPPLY PANELS AND PREACTION RELEASING PANEL SHALL BE PROVIDED WITH AN ADDRESSABLE PHOTOELECTRIC SPOT-TYPE SMOKE DETECTOR MOUNTED ON THE WALL WITHIN 6 FT OF THE PANEL WHERE THE CEILING HEIGHT EXCEEDS 15 FT IN ACCORDANCE WITH THE 2010 EDITION OF NFPA 72.



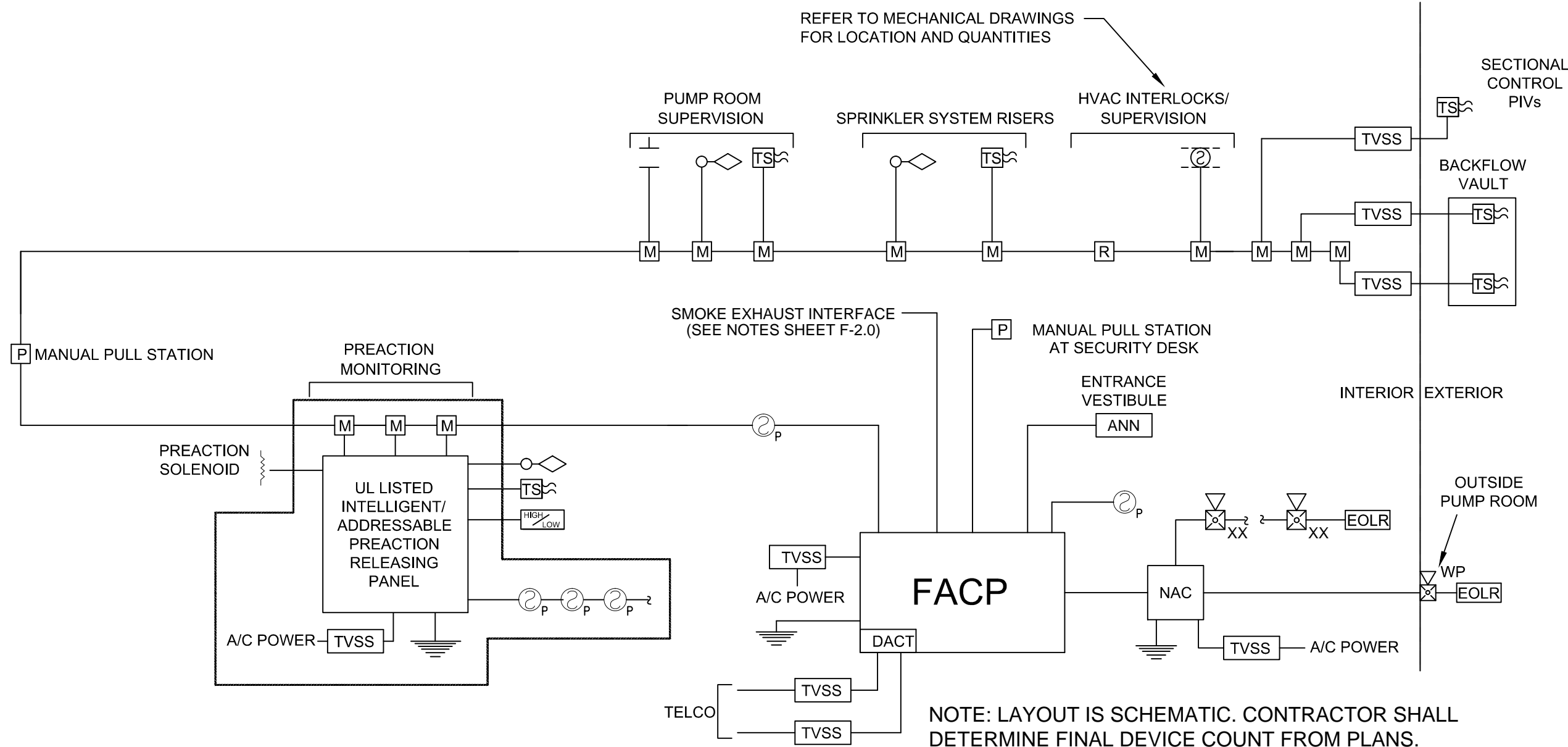
1 ROOF TOP GAS FIRED SPACE HEATER DETAIL
SCALE: NONE



2 ROOF TOP UNIT DETAIL
SCALE: NONE



3 HVLV FAN DETAIL
SCALE: NONE



FIRE ALARM SCHEMATIC

System Outputs

	Control Unit Annunciation	Notification	Misc.
1	Actuate common Alarm signal indicator		
2	Actuate audible signal at panel		
3	Actuate common Supervisory indicator		
4	Actuate common Trouble indicator		
5	Annunciate origin and description of signal on LCD display		
6	Transient distinct Alarm signal to FACP		
7	Transient distinct Supervisory signal to FACP		
8	Transient distinct Trouble signal to FACP		
9	Energize preaction solenoid		

System Inputs

	A	B	C	D	E	F	G	H	I
1	Preaction System Waterflow	+	+						1
2	Smoke detector(s) (MDF Room)	+	+						2
3	Valve tamper switch	+	+						3
4	High/low air pressure	+	+						4
5	Releasing Panel AC power failure	+	+						5
6	Releasing Panel low battery	+	+						6
7	Open circuit	+	+						7
8	Ground fault	+	+						8
9	Wire-to-wire short (SLC & NAC)	+	+						9
10	Wire-to-wire short (IDC) Alarm devices	+	+						10
11	Wire-to-wire short (IDC) Supervisory devices	+	+						10

PREACTION SYSTEM SEQUENCE OF OPERATIONS

	Control Unit Annunciation	Notification	Misc.
1	Actuate common Alarm signal indicator		
2	Actuate audible signal at panel		
3	Actuate common Supervisory indicator		
4	Actuate common Trouble indicator		
5	Annunciate origin and description of signal on LCD display		
6	Actuate notify strobe devices		
7	Transient distinct Alarm signal to monitoring station		
8	Transient distinct Supervisory signal to monitoring station		
9	Transient distinct Trouble signal to monitoring station		
10	Shutdown all warehouse air handling equipment (ATUs, RTUs, HVLV fans, and Cambridge units)		
11	Shutdown respective RTU		
12	Disable Access Control System		

System Inputs

	A	B	C	D	E	F	G	H	I	J	K	L
1	Sprinkler waterflow	+	+									1
2	Smoke detector (FACP)	+	+									2
3	Manual pull station	+	+									3
4	Duct smoke detector	+	+									4
5	Valve tamper switch	+	+									5
6	Fire alarm system AC power failure	+	+									6
7	Fire alarm system low battery	+	+									7
8	Open circuit	+	+									8
9	Ground fault	+	+									9
10	Wire-to-wire short (SLC & NAC)	+	+									10
11	Wire-to-wire short (IDC) Alarm devices	+	+									11
12	Wire-to-wire short (IDC) Supervisory devices	+	+									12
13	Loss of carrier	+	+									13

PREACTION SYSTEM MONITORING

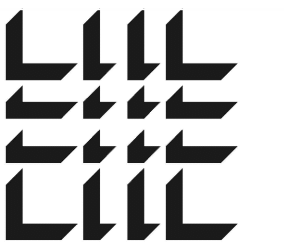
	A	B	C	D	E	F	G	H	I	J	K	L
14	Preaction Alarm Signal	+	+									14
15	Preaction Supervisory Signal	+	+									15
16	Preaction Trouble Signal	+	+									16

DIESEL FIRE PUMP MONITORING:

	A	B	C	D	E	F	G	H	I	J	K	L
17	Fire pump - engine running	+	+									17
18	Fire pump main switch in "off" or "manual" position	+	+									18
19	Fire pump/pump room trouble	+	+									19
20	Fire pump room/ house low temperature	+	+									20
21	Low fuel level	+	+									21
22	Diesel fuel tank leak	+	+									22

As applicable for supplied electric fire pump controller
* When equipped with an automatic transfer switch

FIRE ALARM SYSTEM SEQUENCE OF OPERATIONS



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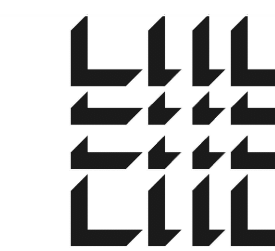
DATE	PROJECT NO
07/24/13	2013-018

SHEET TITLE
FIRE ALARM NOTES AND DETAILS

SHEET NUMBER

F-2.0

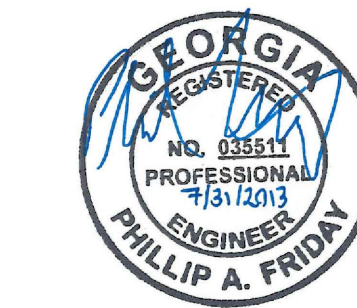
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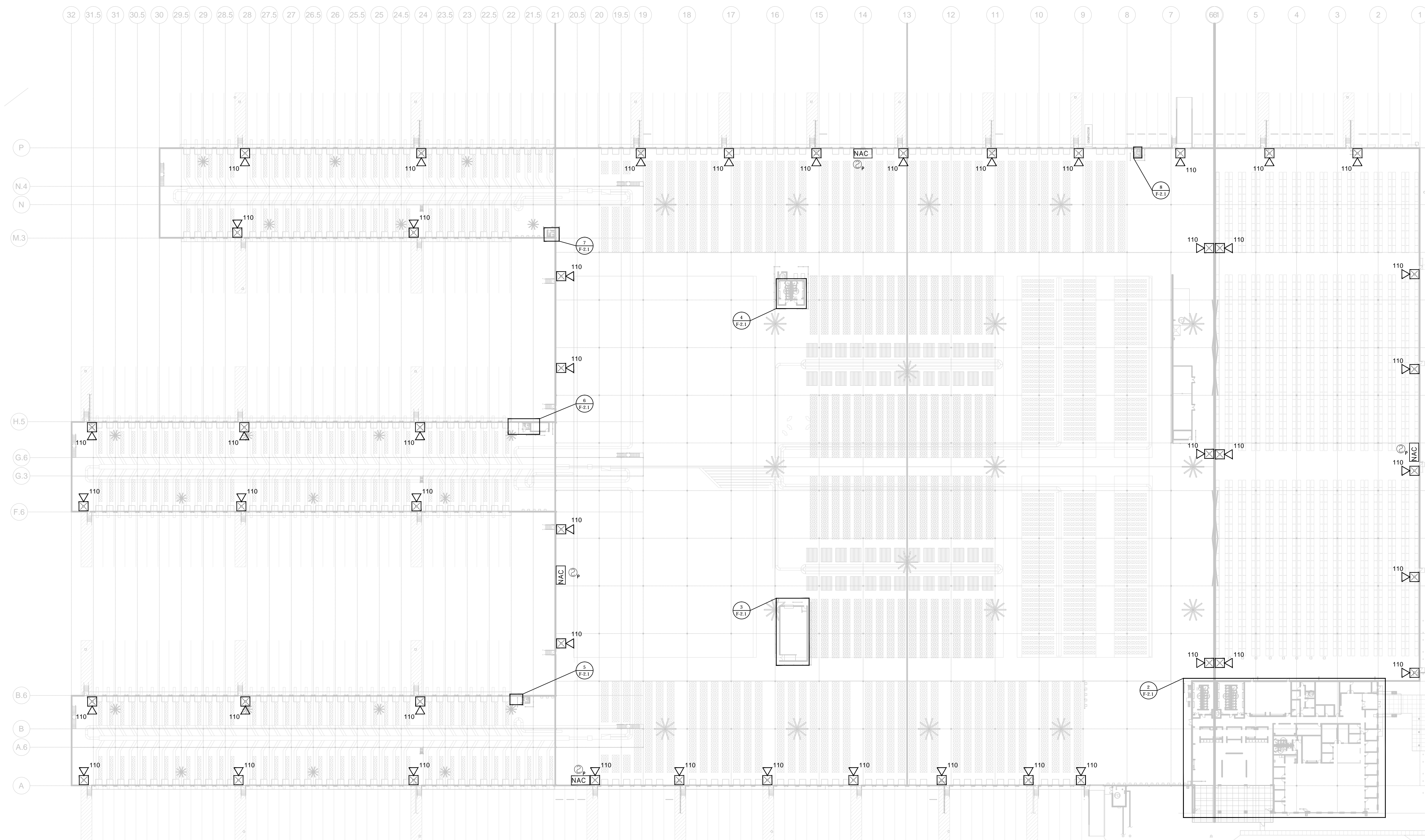
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DATE	PROJECT NO
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SHEET TITLE
FIRE ALARM PLAN

SHEET NUMBER
F-2.1

FOR CONSTRUCTION



1 FIRE ALARM PLAN
F-2.1 SCALE: 1" = 60'-0"

Graphic Scale: 1" = 60'-0"

5 RESTROOM FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

4 MAIN RESTROOMS FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

6 RESTROOM AND BREAKROOM FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

7 RESTROOM FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

8 RESTROOM FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

3 DATA CENTER FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

2 MAIN OFFICE FIRE ALARM PLAN
F-2.1 SCALE: 1/16" = 1'-0"

Graphic Scale: 1/16" = 1'-0"

