- MANCHESTER FIRE & RESCUE

- ADOPTED EDITION OF NFPA 13, STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS

- ADOPTED EDITION OF NFPA 14, STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS - ADOPTED EDITION OF NFPA 20, STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION

CONTRACTORS RESPONSIBILITIES EXCLUDES AND ELECTRICAL WORK.

ALL MATERIALS AND DEVICES TO BE APPROVED FOR FIRE SERVICE.

ALL PIPING ON THE MAIN LEVEL AND ANY EXPOSED PIPING SHALL BE STEEL WITH GROOVED OR SCREWED FITTINGS.

ALL CONCEALED PIPING ON FLOORS 2, 3 AND 4 SHALL BE CPVC WITH CPVC FITTINGS.

ALL HANGERS SHALL BE IN ACCORDANCE WITH NFPA 13 AND THE HANGER LISTING REQUIREMENTS (SEE SPK2).

CONTRACTOR SHALL FIELD VERIFY ALL SPRINKLER AND PIPE LOCATIONS PRIOR TO INSTALLATION.

ALL STEEL PIPE MEASUREMENTS ARE CUT.

ALL CPVC PIPE MEASUREMENTS ARE CENTER-TO-CENTER.

PROVIDE AUXILIARY DRAINS THROUGHOUT FACILITY AS NEEDED IN ACCORDANCE WITH NFPA 13.

CONTRACTOR SHALL FIELD VERIFY ALL CEILING HEIGHTS PRIOR TO INSTALLATION.

PROVIDE SPARE HEAD CABINETS IN ACCORDANCE WITH NFPA 13.

PROVIDE ALL PERTINENT SIGNS IN ACCORDANCE WITH NFPA 13.

ALL HANGERS SHALL BE FIELD LOCATED IN ACCORDANCE WITH NFPA 13.

PROVIDE PIPE SLEEVES AND FIRE CAULKING IF INCLUDED IN THE CONTRACT.

CPVC COMPATIBILITY

THIS BUILDING CONTAINS A CPVC FIRE SPRINKLER SYSTEM. THIS IS A LIFE SAFETY ASSEMBLY AND MUST BE TREATED CAREFULLY. PLEASE READ THE FOLLOWING BEFORE PERFORMING ANY ACTIVITY THAT COULD COME INTO CONTACT WITH

CPVC PIPING COMPONENTS MAY BE DAMAGED BY CERTAIN SUBSTANCES AND CONSTRUCTION PRACTICES.

DO NOT STACK, SUPPORT, HANG EQUIPMENT, OR HANG FLEXIBLE WIRE OR CABLE, ESPECIALLY COMMUNICATIONS CABLE, OR OTHER MATERIAL ON THE FIRE SPRINKLER SYSTEM.

ONLY SYSTEM COMPATIBLE MATERIALS INCLUDING BUT NOT LIMITED TO SOLVENT CEMENTS, CAULKS, SEALANTS, CUTTING OILS AND THREAD PASTES AS NOTED BY THE CPVC FIRE SPRINKLER PIPING SYSTEM MANUFACTURER'S INSTALLATION INSTRUCTIONS SHOULD BE USED IN CONTACT WITH THIS SYSTEM.

DO NOT EXPOSE CPVC PRODUCTS TO INCOMPATIBLE SUBSTANCE SUCH AS CUTTING OILS, NON-WATER BASED PAINTS, PACKING OILS, TRADITIONAL PIPE THREAD PASTE AND DOPE, FUNGICIDES, TERMITICIDES, INSECTICIDES, DETERGENTS, BULKING CAULKS, ADHESIVE TAPE, SOLDER FLUX, FLEXIBLE WIRE OR CABLE (WITH SPECIAL CONSIDERATION FOR COMMUNICATIONS CABLING), AND NON-APPROVED SPRAY FOAM INSULATION MATERIALS.

DO NOT EXPOSED CPVC PRODUCTS TO EDIBLE OILS, SOLVENTS, OR GLYCOL-BASED ANTIFREEZE FLUIDS.

DO NOT DROP, DISTORT OR IMPACT CPVC PRODUCTS OR ALLOW OBJECTS TO BE DROPPED ON THEM.

DO NOT HANDLE CPVC PRODUCTS WITH GLOVES CONTAMINATED WITH OILS (HYDROCARBONS) OR OTHER INCOMPATIBLE

DO NOT INJECT SYSTEM WITH M.I.C. INHIBITORS UNLESS THEY ARE LISTED IN COMBINATION WITH THIS SYSTEM.

FAILURE TO FOLLOW THIS NOTICE MAY CAUSE CRACKS OR FRACTURES TO DEVELOP IN CPVC PRODUCTS RESULTING IN PROPERTY DAMAGE DUE TO LEAKS OR FLOODING. THE PRESENCE OF ANY VISIBLE CRACKS MAY REQUIRE PARTIAL OR FULL SYSTEM REPLACEMENT. FOR ADDITIONAL INFORMATION CONTACT THE GENERAL CONTRACTOR OR THE FIRE SPRINKLER SYSTEM INSTALLER.

DESIGN CRITERIA – SEE SPK6 & SPK9

DESIGN CRITERIA AS PER BEST & ASSOCIATES ARCHITECTS DRAWINGS FP101, FP102, FP103, FP201, AND FP202 DATED AUGUST 4, 2017. SPRINKLERS FOR THIS PROJECT ARE INTERMEDIATE-TEMPERATURE HEADS WHICH WILL PROVIDE GREATER SPRINKLER PLACEMENT FLEXIBILITY CONCERNING DISTANCES FROM HEAT SOURCES AND ELIMINATE THE GUESSWORK OF WHETHER SPRINKLERS WILL EXPERIENCE AMBIENT TEMPERATURES GREATER THAN PERMITTED WITH ORDINARY TEMPERATURE SPRINKLERS.

ALL SPRINKLERS FOR DWELLING UNITS AND CORRIDORS ON THE 2ND, 3RD AND 4TH FLOORS AND A LIMITED NUMBER OF DWELLING UNITS ON THE FIRST FLOOR SHALL BE RESIDENTIAL. ALL OTHER SPRINKLER HEADS SHALL BE QUICK-RESPONSE.

THE RESIDENTIAL SPRINKLERS ON THE FOURTH FLOOR SHALL BE HYDRAULICALLY CALCULATED BASED ON THE FOUR (4) CONTIGUOUS SPRINKLERS THAT TOGETHER PRODUCE THE GREATEST DEMAND. ONE (1) SET OF CALCULATIONS FOR THE VIKING VK486 RESIDENTIAL PENDENT SPRINKLER AND ONE (1) SET OF CALCULATIONS FOR THE VIKING VK486 RESIDENTIAL SIDEWALL SPRINKLER.

Hydraulic Information		Hydraulic Information				
Remote Area 1		Remote Area 2				
OCCUPANCY CLASSIFICATION	PANCY CLASSIFICATION Residential / Light Hazard		Residential / Light Hazard			
DENSITY (gpm/ft²)	0.10 for 900ft2 (Actual 364ft2)	DENSITY (gpm/ft²)	0.10 for 909ft2 (Actual 909ft2)			
TOTAL HEADS FLOWING	4	TOTAL HEADS FLOWING	4			
K-FACTOR	4.9	K-FACTOR	4			
TOTAL WATER REQUIRED	82.20	TOTAL WATER REQUIRED	93.79			
TOTAL PRESSURE REQUIRED	-38.23	TOTAL PRESSURE REQUIRED	-18,44			
BASE of RISER (gpm)	82.20	BASE of RISER (gpm)	93.79			
	62.78	BASE of RISER (psi)	81.52			
BASE of RISER (psi)		SAFETY MARGIN (psi)	+76.25 (131.9%)			
SAFETY MARGIN (psi) +96,08 (166.1%) VIKING, VK468 PENDENT SPRINKLER 20'X20' MAX SPACING (10 FEET MAX OFF WALLS) 1/2" NPT, K4.9, 175°F LISTED FLOW AT START POINT = 20 GPM LISTED PRESSURE AT START POINT = 16.7 PSI		VIKING, VK486 HORIZONTAL SIDEWALL SPRINKLER 18'X20' MAX SPACING (9 FEET MAX OFF WALLS) 1/2" NPT, K4.0, 175°F LISTED FLOW AT START POINT = 23 GPM LISTED PRESSURE AT START POINT = 33.1 PSI FOR INSTALLATION 6 TO 12 INCHES BELOW CLG				

FIRST FLOOR CALCULATIONS CONSIST OF TWO DESIGN AREAS: ONE (1) FOR LIGHT HAZARD OCCUPANCY AND ONE (1) FOR ORDINARY HAZARD GROUP 1 OCCUPANCY.

Hydraulic l	nformation	Hydraulic Information Remote Area 4				
Remote	Area 3					
OCCUPANCY CLASSIFICATION	Light Hazard	OCCUPANCY CLASSIFICATION	Ordinary Group I			
DENSITY (gpm/ft²)	0.10 for 1500ft2 (Actual 958ft2)	DENSITY (gpm/ft²)	0.15 for 1500ft2 (Actual 688ft2)			
QUICK RESPONSE REDUCTION	9'-2 Ceiling (40.0%) 900ft2	QUICK RESPONSE REDUCTION	8'-6 Ceiling (40.0%) 900ft2			
TOTAL HOSE STREAMS	100.00	TOTAL HOSE STREAMS	250.00			
TOTAL HEADS FLOWING	7	TOTAL HEADS FLOWING	9			
K-FACTOR	5.6	K-FACTOR	5.6			
TOTAL WATER REQUIRED	430.83	TOTAL WATER REQUIRED	410.68			
TOTAL PRESSURE REQUIRED	35.30	TOTAL PRESSURE REQUIRED	-92.77			
BASE of RISER (gpm)	330.83	BASE of RISER (gpm)	160.68			
BASE of RISER (psi)	141.96	BASE of RISER (psi)	21.69			
SAFETY MARGIN (psi)	+19.53 (35.6%)	SAFETY MARGIN (psi)	+147.87 (268.4%)			
VIKING, VK600 EXTENDED COVERAGE PENDENT 20'X20' MAX SPACING (10 FEET MAX OFF WALLS) 1/2" NPT, K5.6, 175°F LISTED FLOW AT START POINT = 40 GPM LISTED PRESSURE AT START POINT = 51.0 PSI		VIKING, VK302 STANDARD COVERAGE PENDENT 130 SF MAXIMUM SPACING 1/2" NPT, K5.6, 175°F LISTED FLOW AT START POINT = 14.81 GPM LISTED PRESSURE AT START POINT = 7 PSI				

STANDPIPE CRITERIA – SEE SPK5

STANDPIPE DESIGN TAKEN FROM BEST & ASSOCIATES ARCHITECTS DRAWING FP201 DATED AUGUST 4, 2017.

AUTOMATIC / WET STANDPIPE TYPE: STANDPIPE CLASSIFICATION: CLASS I 750 GPM REQUIRED FLOW: (500 GPM FOR 1ST STANDPIPE / 250 GPM FOR 2ND) REQUIRED PRESSURE:

FIRE PUMP CRITERIA – SEE SPK4

PUMP SIZE TAKEN FROM BEST & ASSOCIATES ARCHITECTS DRAWING FP201 DATED AUGUST 4, 2017.

ELECTRIC VERTICAL IN-LINE FIRE PUMP (8" SUCTION FLANGE / 6" DISCHARGE FLANGE)

CHURN / SHUT-OFF = 126 PSI @ 0 FLOW (140% OF PUMP'S RATED PRESSURE @ 0 FLOW)

PUMP RATING = 1000 GPM @ 90 PSI

OVERFLOW / OVERLOAD = 58.5 PSI @ 1500 GPM (65% OF RATED PRESSURE AT 150% OF RATED FLOW)



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To Whom It May Concern,

Whenever a fire booster pump is designed into a fire sprinkler system supply, with the capacity (in itself) to exceed the system demand, it is considered by any hydraulics program to be an "over-sized" pump. This simply means that, based on the information given, the program is reporting that the pump could be reduced in pressure output and still be capable of accommodating the remote area being calculated.

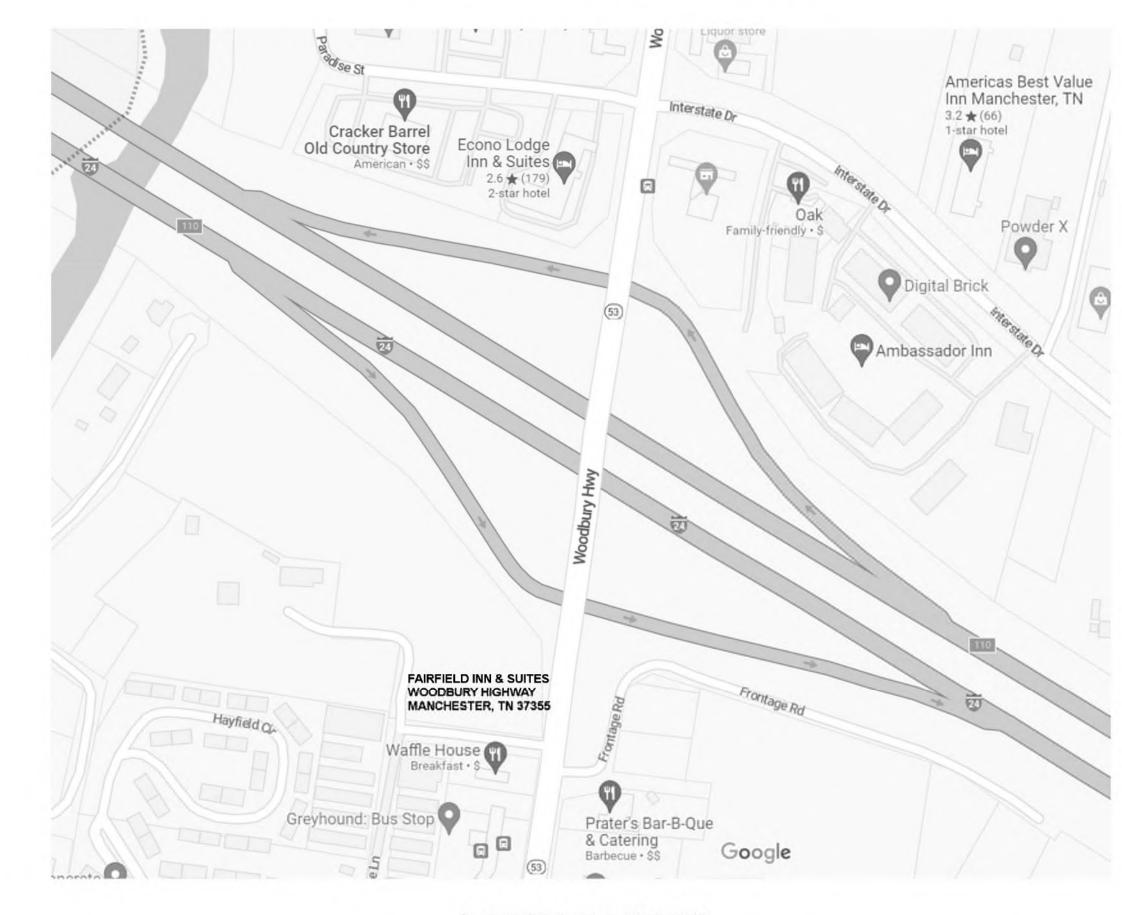
This condition commonly occurs when a pump is required for a more demanding system area but a specific calculation is for a less demanding area. With an over-sized booster pump, the negative pressures being reported from the suction-side of the pump to the source are accounting for the friction losses within this piping; and, a negative required pressure at the source is quite simply saying that this is the amount of pressure that is not needed from the available pressure at the source.

When viewed with this in mind, there is really no better way to accurately report this circumstance. A few other hydraulic software programs use some "creative reporting methods" to avoid showing these negative values; we chose not to do so. We do have an option in the program that will report the Required Pressure of 0.0 PSI, at the Supply on the Hydraulic Summary report, which is also an accurate statement. The Hydraulic Analysis report, however, still reports the actual values. This is only available in AutoSPRINK 2019 and older versions. AutoSPRINK 2020 and newer does not support this feature.

A negative Required Pressure in no way implies any problem with the City/District water supply, quite to the contrary. The most obvious time that there would be a problem with the water supply is if the demand GPM of the system were to exceed the available GPM @ 0.0 PSI. (The City/District water provider may have their own restrictions for a minimum drawdown pressure.)



FAIRFIELD MANCHESTER



↑ SITE LOCATION

ACTUAL FLOOR AREAS

FIRST FLOOR - 11,026 SF

SECOND FLOOR - 10,955 SF

THIRD FLOOR - 10,955 SF

FOURTH FLOOR - 10,955 SF

CODE COMPLIANCE

INSTALLATIONS SHALL COMPLY WITH THE FOLLOWING: TENNESSEE STATE FIRE MARSHAL:

TFM NUMBER: 18976 PROJECT NUMBER: 2017-06-28-02

TOTAL AREA - 43,891 SF NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPES AND HOSE SYSTEMS NFPA 20 - STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION

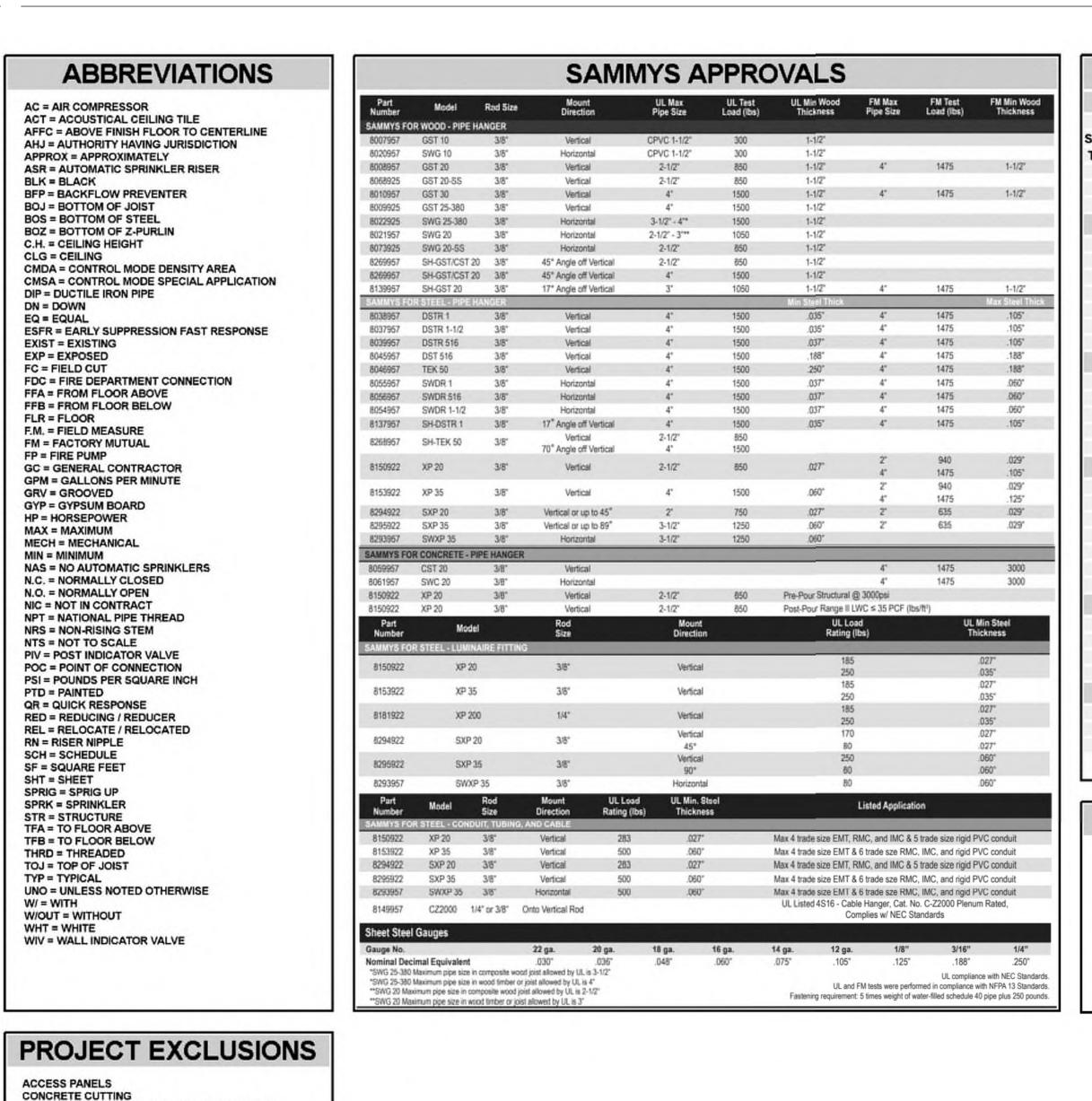
AUTHORITIES HAVING JURISDICTION (AHJ):

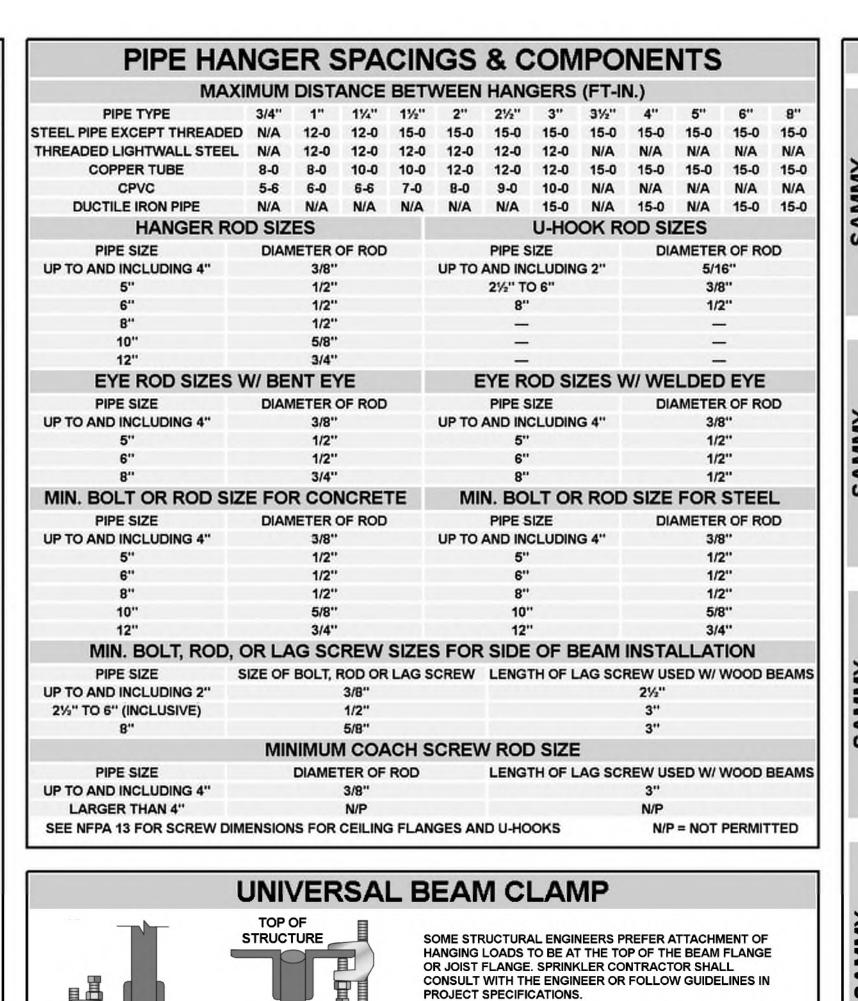
FIRE CHIEF: GEORGE CHAMBERS, 200 WEST FORT STREET, MANCHESTER, TN 37355 EMAIL: GCHAMBER@CITYOFMANCHESTERTN.COM OFFICE: (931) 728-2999 CELL: (931) 952-1911

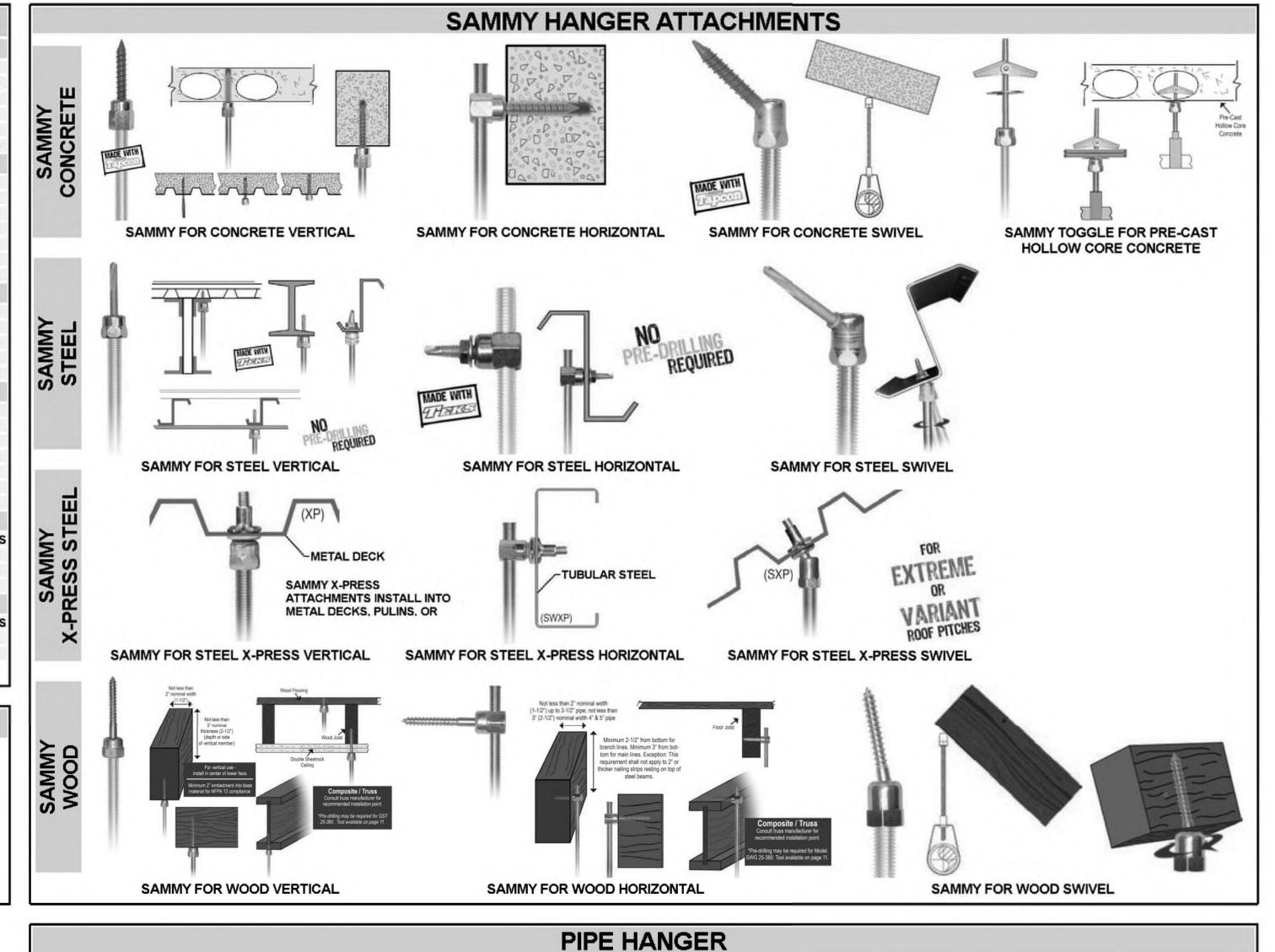
FIRE INSPECTOR: ALLEN BAUMSTEIN, 200 WEST FORT STREET, MANCHESTER, TN 37355 EMAIL: ABAUMSTEIN@CITYOFMANCHESTERTN.COM OFFICE: (931) 723-1464 CELL: (931) 581-4260

BUILDING INSPECTOR: BRITTANY FISKE, 200 WEST FORT STREET, MANCHESTER, TN 37355 EMAIL: BFISKE@CITYOFMANCHESTERTN.COM OFFICE: (931) 723-1464 CELL: (931) 952-9017





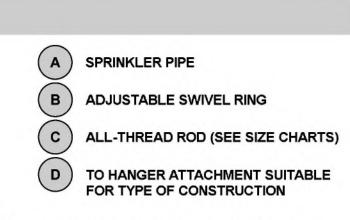




RESTRAINING STRAPS SHALL BE UTILIZED ON PROJECTS

BAR JOIST SHOWN BUT STRUCTURE TYPE WILL VARY.

REQUIRING SEISMIC BRACING.



ALL HANGERS SHALL BE PLACED AND

PRODUCT SPECIFICATIONS AND PROJECT SPECIFICATIONS.

NORTH STAIRS SPACED IN ACCORDANCE WITH NFPA 13,

UNSUPPORTED LENGTHS AND ARMOVERS

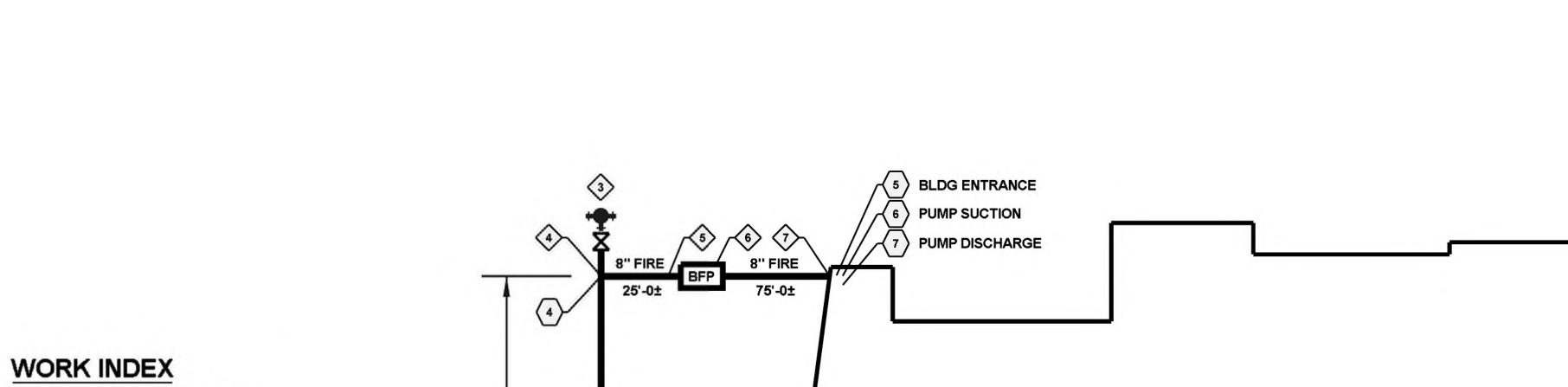
UNSUPPORTED LENGTHS - FOR STEEL PIPE, THE UNSUPPORTED HORIZONTAL LENGTH BETWEEN THE END SPRINKLER AND THE LAST HANGER ON THE LINE SHALL NOT BE GREATER THAN 36 IN. FOR 1 IN. PIPE, 48 IN. FOR 11/4 IN. PIPE, AND 60 IN. FOR 11/4 IN. OR LARGER PIPE.

UNSUPPORTED LENGTH WITH MAXIMUM PRESSURE EXCEEDING 100 PSI AND BRANCH LINE ABOVE CEILING SUPPLYING SPRINKLERS IN PENDENT POSITION BELOW CEILING — THE UNSUPPORTED LENGTH BETWEEN THE END SPRINKLER IN A PENDENT POSITION OR DROP NIPPLE AND THE LAST HANGER ON THE BRANCH LINE SHALL NOT BE GREATER THAN 12 IN. FOR

UNSUPPORTED ARMOVER LENGTH — THE CUMULATIVE HORIZONTAL LENGTH OF AN UNSUPPORTED ARMOVER TO A SPRINKLER, SPRINKLER DROP, OR SPRIG SHALL NOT EXCEED 24 IN. FOR STEEL PIPE.

UNSUPPORTED ARMOVER LENGTH WITH MAXIMUM PRESSURE EXCEEDING 100 PSI AND BRANCH LINE ABOVE CEILING SUPPLYING SPRINKLERS IN PENDENT POSITION BELOW CEILING — THE CUMULATIVE HORIZONTAL LENGTH OF AN

WHEN ANY OF THE ABOVE LIMITS ARE EXCEEDED, THE PIPE SHALL BE EXTENDED BEYOND THE END SPRINKLER AND SHALL BE SUPPORTED BY AN ADDITIONAL HANGER.



1 TEST HYDRANT ON WOODBURY HIGHWAY 53 2 POINT OF CONNECTION FOR NEW 8" PUBLIC WATER LINE

CONCRETE PADS FOR PUMP AND JOCKEY PUMP

PAINTING OR PREPPING PIPE FOR PAINTING BY OTHERS

WATER CONNECTION TAP OR WATER USAGE FEES

ELECTRICAL WIRING OR DEVICE HOOK-UPS

FIRE ALARM SYSTEM OR MONITORING

FIRE EXTINGUISHERS OR CABINETS HEAT TAPE, HEAT TRACING OR INSULATION

SMOKE DETECTORS

UNDERGROUND SUPPLY

(3) NEW PUBLIC FIRE HYDRANT & ISOLATION VALVE

4 POINT OF CONNECTION FOR NEW 8" DEDICATED FIRE LINE

5 NEW 8" DEDICATED FIRE LINE (6) NEW 8" BACKFLOW PREVENTER IN ABOVE-GROUND HEATED ENCLOSURE

7 NEW 8" FIRE LINE ENTRANCE INTO PUMP ROOM

RISER EQUIPMENT I.D. HYDRAULIC REFERENCE NODE

WOODBURY HIGHWAY 53

FIRE HYDRANT FLOW TEST **TEST DATE – APRIL 12, 2023** STATIC: 58 PSI RESIDUAL: 47 PSI FLOW: 844 GPM

SITE PLAN SHOWN FOR REFERENCE ONLY ALL UNDERGROUND INSTALLATIONS SHALL BE BY OTHERS ----FRONTAGE ROAD BY VATER HAND

FIRE Syste

✗ CLIPPING FROM C-3 SITE UTILITY PLAN NTS - DRAWING DATED MAY 4, 2017 - JOB NO. 17-000 SADLER & ASSOCIATES CONSULTING ENGINEERS, INC. 4866 WOODBURY HIGHWAY - MANCHESTER, TN 37355 PHONE: (931) 728-4961 - FAX: (931) 728-9004

WOODBURY HIGHWAY 53 – MANCHESTER, TN 37355

PROPOSED FAIRFIELD INN & SUITES - MARRIOTT

➢ SITE PLAN

STAIRS

BOTTOM OF

STRUCTURE

EXIST 8" WATER MAIN **APPROX 415'-0**

-ROADSIDE CURBING

EXIST 8" WATER MAIN

PARALLEL WITH HIGHWAY 53

FRONTAGE ROAD RUNNING

APPROX 50'-0 2

FLOW TEST BY MANCHESTER

FIRE & RESCUE

EMAIL: KSADLER@CHARTER.NET

ASSEMBLY OR TOP LANDING.

ALL REFERENCES SHOWN BELOW ARE FROM THE 2019 EDITION OF NFPA 13, CHAPTER 18 (INSTALLATION REQUIREMENTS FOR SEISMIC PROTECTION). THE SECTION HEADINGS IN LARGER TYPE ALSO INDICATE THE CORRESPONDING SECTION NUMBERS FROM PREVIOUS EDITIONS 2010, 2013 AND 2016. REFERENCES SHOWN ARE FOR SOME OF THE MORE COMMON SEISMIC RULES. REFER TO THE STANDARDS FOR A COMPLETE LIST.

18.1.3 OBSTRUCTIONS TO SPRINKLERS (2010, 2013, 2016: 9.3.1.3)

BRACES AND RESTRAINTS SHALL NOT OBSTRUCT SPRINKLERS AND SHALL COMPLY WITH THE OBSTRUCTION RULES OF **CHAPTERS 10 THROUGH 14.**

18.2.2 FLEXIBLE COUPLINGS SHALL BE ARRANGED TO COINCIDE WITH STRUCTURAL SEPARATIONS WITHIN A BUILDING.

18.2 FLEXIBLE COUPLINGS (2010, 2013, 2016: 9.3.2)

A.18.2 FLEXIBILITY CAN BE PROVIDED BY USING LISTED FLEXIBLE COUPLINGS, BY JOINING GROOVED END PIPE AT CRITICAL POINTS, AND BY ALLOWING CLEARANCES AT WALLS AND FLOORS. TANK OR PUMP RISERS SHOULD BE TREATED THE SAME AS SPRINKLER RISERS FOR THEIR PORTION WITHIN A BUILDING. THE DISCHARGE PIPE OF TANKS ON BUILDINGS SHOULD HAVE A CONTROL VALVE ABOVE THE ROOF LINE SO ANY PIPE BREAK WITHIN THE BUILDING CAN BE CONTROLLED. PIPING 2 IN. OR SMALLER IN SIZE IS PLIABLE ENOUGH SO THAT FLEXIBLE COUPLINGS ARE NOT USUALLY NECESSARY. "RIGID-TYPE" COUPLINGS THAT PERMIT LESS THAN 1 DEGREE OF ANGULAR MOVEMENT AT THE GROOVED CONNECTIONS ARE NOT CONSIDERED TO BE FLEXIBLE COUPLINGS.

18.2.1 FLEXIBLE COUPLINGS JOINING GROOVED END PIPE SHALL BE PROVIDED AS FLEXURE JOINTS TO ALLOW INDIVIDUAL SECTIONS OF PIPING 2½ IN. OR LARGER TO MOVE DIFFERENTIALLY WITH THE INDIVIDUAL SECTIONS OF THE BUILDING TO WHICH IT IS ATTACHED.

18.2.3 SYSTEMS HAVING MORE FLEXIBLE COUPLINGS THAN REQUIRED BY THIS SECTION SHALL BE PROVIDED WITH ADDITIONAL SWAY BRACING AS REQUIRED IN 18.5.5.9.

18.2.3.1 THE FLEXIBLE COUPLINGS SHALL BE INSTALLED AS FOLLOWS

(1)*WITHIN 24 IN. OF THE TOP AND BOTTOM OF ALL RISERS, UNLESS THE FOLLOWING PROVISIONS ARE MET: (A) IN RISERS LESS THAN 3 FT IN LENGTH, FLEXIBLE COUPLINGS SHALL BE PERMITTED TO BE OMITTED.

(B) IN RISERS 3 FT TO 7 FT IN LENGTH, ONE FLEXIBLE COUPLING SHALL BE ADEQUATE.

A.18.2.3.1(1) RISERS DO NOT INCLUDE RISER NIPPLES AS DEFINED IN 3.3.180. (2) WITHIN 12 IN. ABOVE AND WITHIN 24 IN. BELOW THE FLOOR IN MULTISTORY BUILDINGS, UNLESS THE FOLLOWING PROVISION IS MET: (A)* IN RISERS UP TO 7 FT IN LENGTH TERMINATING ABOVE THE ROOF ASSEMBLY OR TOP LANDING, THE FLEXIBLE COUPLING SHALL NOT BE REQUIRED ABOVE THE LANDING OR ROOF ASSEMBLY

A.18.2.3.1(2)(A) SEE FIGURE A.18.2.3.1(2)(A).

(3) ON BOTH SIDES OF CONCRETE OR MASONRY WALLS WITHIN 1 FT OF THE WALL SURFACE, UNLESS CLEARANCE IS PROVIDED IN

(4)*WITHIN 24 IN. OF BUILDING EXPANSION JOINTS

A.18.2.3.1(4) A BUILDING EXPANSION JOINT IS USUALLY A BITUMINOUS FIBER STRIP USED TO SEPARATE BLOCKS OR UNITS OF CONCRETE TO PREVENT CRACKING DUE TO EXPANSION AS A RESULT OF TEMPERATURE CHANGES. WHERE BUILDING EXPANSION JOINTS ARE USED, THE FLEXIBLE COUPLING IS REQUIRED ON ONE SIDE OF THE JOINT BY 18.2.3.1(4). FOR SEISMIC SEPARATION JOINTS, CONSIDERABLY MORE FLEXIBILITY IS NEEDED, PARTICULARLY FOR PIPING ABOVE THE FIRST FLOOR. FIGURE A.18.3(A) SHOWS A METHOD OF PROVIDING ADDITIONAL FLEXIBILITY THROUGH THE USE OF SWING JOINTS.

IT IS IMPORTANT TO REMEMBER THAT THE REQUIREMENTS OF SECTION 18.2 APPLY TO ALL RISERS AS DEFINED IN 3.3.181 AND ARE NOT LIMITED TO JUST SYSTEM RISERS.

(5) WITHIN 24 IN. OF THE TOP OF DROPS EXCEEDING 15 FT IN LENGTH TO PORTIONS OF SYSTEMS SUPPLYING MORE THAN ONE SPRINKLER, REGARDLESS OF PIPE SIZE

(6) WITHIN 24 IN. ABOVE AND 24 IN. BELOW ANY INTERMEDIATE POINTS OF SUP PORT FOR A RISER OR OTHER VERTICAL PIPE 18.2.3.2 WHEN THE FLEXIBLE COUPLING BELOW THE FLOOR IS ABOVE THE TIE-IN MAIN TO THE MAIN SUP PLYING THAT FLOOR, A

FLEXIBLE COUPLING SHALL BE PROVIDED IN ACCORDANCE WITH ONE OF THE FOLLOWING:

(1)*ON THE HORIZONTAL PORTION WITHIN 24 IN. OF THE TIE-IN WHERE THE TIE-IN IS HORIZONTAL (2)*ON THE VERTICAL PORTION OF THE TIE-IN WHERE THE TIE-IN INCORPORATES A RISER

A.18.2.3.2(1) SEE FIGURE A.18.2.3.2(1).

A.18.2.3.2(2) THE FLEXIBLE COUPLING SHOULD BE AT THE SAME ELEVATION AS THE FLEXIBLE COUPLING ON THE MAIN RISER. [SEE FIGURE A.18.2.3.2(2).]

18.2.4* FLEXIBLE COUPLINGS FOR DROPS (2010, 2013, 2016: 9.2.3.4)

INSTALLED REGARDLESS OF PIPE SIZES AS FOLLOWS: (1) WITHIN 24 IN. OF THE TOP OF THE DROP

(2) WITHIN 24 IN. ABOVE THE UPPERMOST DROP SUPPORT ATTACHMENT, WHERE DROP SUP PORTS ARE PROVIDED TO THE STRUCTURE, RACK, OR MEZZANINE

(3) WITHIN 24 IN. ABOVE THE BOTTOM OF THE DROP WHERE NO ADDITIONAL DROP SUPPORT IS PROVIDED

18.3 SEISMIC SEPARATION ASSEMBLY (2010, 2013, 2016: 9.3.3) AN APPROVED SEISMIC SEPARATION ASSEMBLY SHALL BE INSTALLED WHERE SPRINKLER PIPING, REGARDLESS OF SIZE, CROSSES

BUILDING SEISMIC SEPARATION JOINTS AT GROUND LEVEL AND ABOVE. SEE STANDARD FOR COMPLETE DETAILS.

18.4 CLEARANCE (2010, 2013, 2016: 9.3.4) 18.4.1* CLEARANCE SHALL BE PROVIDED AROUND ALL PIPING EXTENDING THROUGH WALLS, FLOORS, PLATFORMS, AND FOUNDATIONS

INCLUDING DRAINS, FIRE DEPARTMENT CONNECTIONS. AND OTHER AUXILIARY PIPING. SEE STANDARD FOR COMPLETE DETAILS. 18.5 SWAY BRACING (2010, 2013, 2016: 9.3.5)

18.5.1.1 THE SYSTEM PIPING SHALL BE BRACED TO RESIST BOTH LATERAL AND LONGITUDINAL HORIZONTAL SEISMIC LOADS AND TO PREVENT VERTICAL MOTION RESULTING FROM SEISMIC LOADS.

18.5.2 LISTING (2010: N/A / 2013, 2016: 9.3.5.2)

18.5.2.1 SWAY BRACING ASSEMBLIES SHALL BE LISTED FOR A MAXIMUM LOAD RATING, UNLESS THE REQUIREMENTS OF 18.5.2.2 ARE MET.

18.5.2.2 WHERE SWAY BRACING UTILIZING PIPE, ANGLES, FLATS, OR RODS AS SHOWN IN TABLE 18.5.11.8(A) THROUGH TABLE 18.5.11.8(F) IS USED, THE COMPONENTS SHALL NOT REQUIRE LISTING.

18.5.2.2.1 BRACING FITTINGS AND CONNECTIONS USED WITH THOSE SPECIFIC MATERIALS SHALL BE LISTED.

SWAY BRACE COMPONENTS, OTHER THAN PIPES, ANGLES, FLATS, AND RODS, MUST BE LISTED. THESE COMPONENTS INCLUDE THE BRACE FITTINGS THAT ATTACH TO THE PIPE AND TO THE BUILDING STRUCTURE.

18.5.5 LATERAL SWAY BRACING (2010: 9.3.5.3 / 2013, 2016: 9.3.5.5) SEE STANDARD FOR A COMPLETE LIST OF LATERAL BRACING REQUIREMENTS.

18.5.5.1* LATERAL SWAY BRACING SHALL BE PROVIDED ON ALL FEED AND CROSS MAINS REGARDLESS OF SIZE AND ALL BRANCH LINES AND OTHER PIPING WITH A DIAMETER OF 21/2 IN. AND LARGER.

18.5.5.2.2 SPACING SHALL NOT EXCEED A MAXIMUM INTERVAL OF 40 FT ON CENTER.

18.5.5.2.3 THE MAXIMUM PERMISSIBLE LOAD IN THE ZONE OF INFLUENCE OF A SWAY BRACE SHALL NOT EXCEED THE VALUES GIVEN IN TABLE 18.5.5.2(A) THROUGH TABLE 18.5.5.2(L) OR THE VALUES CALCULATED IN ACCORDANCE WITH 18.5.5.3.

18.5.5.4 THE REQUIREMENTS OF 18.5.5.1 SHALL NOT APPLY TO 2½ IN. STARTER PIECES THAT DO NOT EXCEED 12 FT IN LENGTH.

18.5.5.5 THE DISTANCE BETWEEN THE LAST BRACE AND THE END OF THE PIPE SHALL NOT EXCEED 6 FT.

18.5.5.7 THE LAST LENGTH OF PIPE AT THE END OF A FEED OR CROSS MAIN SHALL BE PROVIDED WITH A LATERAL BRACE.

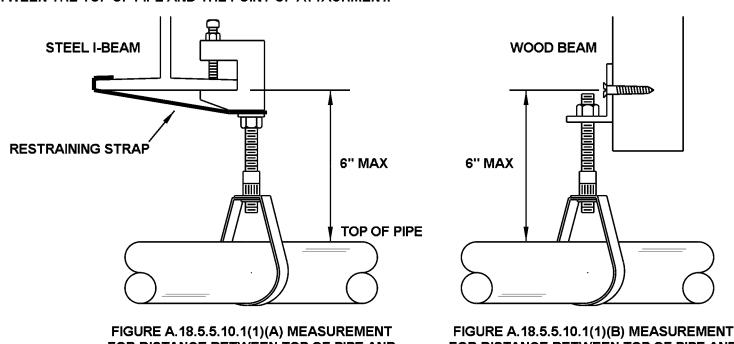
18.5.5.8 LATERAL BRACES SHALL BE ALLOWED TO ACT AS LONGITUDINAL BRACES IF THEY ARE WITHIN 24 IN. OF THE CENTERLINE OF

THE PIPING BRACED LONGITUDINALLY AND THE LATERAL BRACE IS ON A PIPE OF EQUAL OR GREATER SIZE THAN THE PIPE BEING BRACED LONGITUDINALLY. 18.5.5.9 WHERE FLEXIBLE COUPLINGS ARE INSTALLED ON MAINS OTHER THAN AS REQUIRED IN SECTION 18.2. A LATERAL BRACE

SHALL BE PROVIDED WITHIN 24 IN. OF EVERY OTHER COUPLING, INCLUDING FLEXIBLE COUPLINGS AT GROOVED FITTINGS, BUT NOT MORE THAN 40 FT ON CENTER.

18.5.5.10.1 BRANCH LINES SHALL COMPLY WITH THE FOLLOWING: (1)*THE BRANCH LINES SHALL BE INDIVIDUALLY SUPPORTED WITHIN 6 IN. OF THE STRUCTURE. MEASURED BETWEEN THE TOP OF THE PIPE AND THE POINT OF ATTACHMENT TO THE BUILDING STRUCTURE.

(2) AT LEAST 75 PERCENT OF ALL THE HANGERS ON THE BRANCH LINE SHALL MEET THE REQUIREMENTS OF 18.5.5.10.1(1). (3) CONSECUTIVE HANGERS ON THE BRANCH LINE SHALL NOT BE PERMITTED TO EXCEED THE LIMITATION IN 18.5.5.10.1(1). EXEMPTING LATERAL SWAY BRACES WITH SHORT HANGERS HAS BEEN MET WITH SOME CONCERN, PARAGRAPHS 18.5.5.10.1 AND A.18.5.5.10.1(1) PROVIDE ADDITIONAL CLARIFICATION ON THE MINIMUM REQUIREMENTS FOR THE SHORT ROD EXCEPTION. A.18.5.5.10.1(1) FIGURE A.18.5.5.10.1(1)(A) AND FIGURE A.18.5.5.10.1(1)(B) ARE EXAMPLES OF HOW TO MEASURE THE DISTANCE BETWEEN THE TOP OF PIPE AND THE POINT OF ATTACHMENT.



18.5.6 LONGITUDINAL SWAY BRACING (2010: 9.3.5.4 / 2013, 2016: 9.3.5.6)

THE PIPING BRACED LATERALLY.

FOR DISTANCE BETWEEN TOP OF PIPE AND FOR DISTANCE BETWEEN TOP OF PIPE AND POINT OF ATTACHMENT (EXAMPLE 1) POINT OF ATTACHMENT (EXAMPLE 2)

18.5.6.1 LONGITUDINAL SWAY BRACING SPACED AT A MAXIMUM OF 80 FT ON CENTER SHALL BE PROVIDED FOR FEED AND CROSS MAINS.

18.5.6.2 LONGITUDINAL BRACES SHALL BE ALLOWED TO ACT AS LATERAL BRACES IF THEY ARE WITHIN 24 IN. OF THE CENTERLINE OF

18.5.6.3 THE DISTANCE BETWEEN THE LAST BRACE AND THE END OF THE PIPE OR A CHANGE IN DIRECTION SHALL NOT EXCEED 40 FT.

18.5.7 PIPE WITH CHANGE(S) IN DIRECTION (2010: 9.3.5.11.2 / 2013, 2016: 9.3.5.7) 18.5.7.1 EACH RUN OF PIPE BETWEEN CHANGES IN DIRECTION SHALL BE PROVIDED WITH BOTH LATERAL AND LONGITUDINAL BRACING, UNLESS THE REQUIREMENTS OF 18.5.7.2 ARE MET.

18.5.7.2* PIPE RUNS LESS THAN 12 FT IN LENGTH SHALL BE PERMITTED TO BE SUPPORTED BY THE BRACES ON ADJACENT RUNS OF PIPE.

18.5.8 SWAY BRACING OF RISERS (2010: 9.3.5.5 / 2013, 2016: 9.3.5.8) 18.5.8.1* TOPS OF RISERS EXCEEDING 3 FT IN LENGTH SHALL BE PROVIDED WITH A FOUR-WAY BRACE.

A.18.5.8.1 THE FOUR-WAY BRACE PROVIDED AT THE RISER CAN ALSO PROVIDE LONGITUDINAL AND LATERAL BRACING FOR ADJACENT MAINS. THIS SECTION IS NOT INTENDED TO REQUIRE FOUR-WAY BRACING ON A SPRIG OR ON A DROP TO A SINGLE SPRINKLER.

18.5.8.1.1* THE FOUR-WAY BRACE SHALL NOT BE REQUIRED FOR RISERS UP TO 7 FT IN LENGTH THAT TERMINATE ABOVE THE ROOF

18.5.8.2 RISER NIPPLES SHALL BE PERMITTED TO OMIT THE FOUR-WAY BRACE REQUIRED BY 18.5.8.1.

CENTERLINE OF THE RISER AND THE LOADS FOR THAT BRACE SHALL INCLUDE BOTH THE VERTICAL AND HORIZONTAL PIPE.

18.5.8.5 FOUR-WAY BRACING SHALL NOT BE REQUIRED WHERE RISERS PENETRATE INTERMEDIATE FLOORS IN MULTISTORY BUILDINGS WHERE THE CLEARANCE DOES NOT EXCEED THE LIMITS OF SECTION 18.4.

18.5.8.3 WHEN A FOUR-WAY BRACE AT THE TOP OF A RISER IS ATTACHED ON THE HORIZONTAL PIPING, IT SHALL BE WITHIN 24 IN. OF THE

18.5.12 FASTENERS (2010: 9.3.5.9 / 2013, 2016: 9.3.5.12)

18.5.8.4 DISTANCE BETWEEN FOUR-WAY BRACES FOR RISERS SHALL NOT EXCEED 25 FT.

18.5.12.7.1 POST-INSTALLED CONCRETE ANCHORS SHALL BE PREQUALIFIED FOR SEISMIC APPLICATIONS IN ACCORDANCE WITH ACI 355.2, QUALIFICATION OF POST-INSTALLED MECHANICAL ANCHORS IN CONCRETE AND COMMENTARY, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

18.6 RESTRAINT OF BRANCH LINES (2010, 2013, 2016: 9.3.6)

18.6.1* RESTRAINT IS CONSIDERED A LESSER DEGREE OF RESISTING LOADS THAN BRACING AND SHALL BE PROVIDED BY USE OF ONE OF THE FOLLOWING:

(2) WRAPAROUND U-HOOK SATISFYING THE REQUIREMENTS OF 18.5.5.11

(3) NO. 12, 440 LB (200 KG) WIRE INSTALLED AT LEAST 45 DEGREES FROM THE VERTICAL PLANE AND ANCHORED ON BOTH SIDES OF THE

(5)* HANGER NOT LESS THAN 45 DEGREES FROM VERTICAL INSTALLED WITHIN 6 IN. (150 MM) OF THE VERTICAL HANGER ARRANGED FOR RESTRAINT AGAINST UPWARD MOVEMENT, PROVIDED IT IS UTILIZED SUCH THAT L/R DOES NOT EXCEED 400, WHERE THE ROD EXTENDS TO THE PIPE OR A SURGE CLIP HAS BEEN INSTALLED (6) OTHER APPROVED MEANS

A.18.6.1 WIRES USED FOR PIPING RESTRAINTS SHOULD BE ATTACHED TO THE BRANCH LINE WITH TWO TIGHT TURNS AROUND THE PIPE AND FASTENED WITH FOUR TIGHT TURNS WITHIN 1-1/2 IN. AND SHOULD BE ATTACHED TO THE STRUCTURE IN ACCORDANCE WITH THE DETAILS SHOWN IN FIGURE A.18.6.1(A) THROUGH FIGURE A.18.6.1(D) OR OTHER APPROVED METHOD.

18.6.2.1 WIRE USED FOR RESTRAINT SHALL BE LOCATED WITHIN 2 FT OF A HANGER

18.6.2.2 THE HANGER CLOSEST TO A WIRE RESTRAINT SHALL BE OF A TYPE THAT RESISTS UPWARD MOVEMENT OF A BRANCH LINE.

18.6.3 THE END SPRINKLER ON A BRANCH LINE SHALL BE RESTRAINED

THE ENTIRE HANGER ASSEMBLY MUST RESIST UPWARD MOVEMENT

18.6.3.1 THE LOCATION OF THE RESTRAINT FROM END OF THE LINE SHALL NOT BE GREATER THAN 36 IN. FOR 1 IN. PIPE, 48 IN. FOR 1-1/4 IN. PIPE, AND 60 IN. FOR 1-1/2 IN. OR LARGER PIPE.

18.6.5 WHERE THE BRANCH LINES ARE SUPPORTED BY RODS LESS THAN 6 IN. LONG MEASURED BETWEEN THE TOP OF THE PIPE AND THE POINT OF ATTACHMENT TO THE BUILDING STRUCTURE, THE REQUIREMENTS OF 18.6.1 THROUGH 18.6.4 SHALL NOT APPLY AND ADDITIONAL RESTRAINT SHALL NOT BE REQUIRED FOR THE BRANCH LINES.

18.6.6* SPRIGS 4 FT OR LONGER SHALL BE RESTRAINED AGAINST LATERAL MOVEMENT.

18.6.7 DROPS AND ARMOVERS SHALL NOT REQUIRE RESTRAINT.

18.7 HANGERS AND FASTENERS SUBJECT TO EARTHQUAKES (2010, 2013, 2016: 9.3.7) SEE STANDARD FOR A COMPLETE LIST OF FASTENER REQUIREMENTS.

18.7.1 WHERE SEISMIC PROTECTION IS PROVIDED, C-TYPE CLAMPS (INCLUDING BEAM AND LARGE FLANGE CLAMPS) USED TO ATTACH HANGERS TO THE BUILDING STRUCTURE SHALL BE EQUIPPED WITH A RESTRAINING STRAP UNLESS THE PROVISIONS OF 18.7.1.1 ARE

BEGINNING WITH THE 1996 EDITION OF NFPA 13. RESTRAINING STRAPS WERE REQUIRED ON ALL C-TYPE CLAMPS USED FOR SYSTEM HANGERS IN EARTHQUAKE-PRONE AREAS EXEMPLIFIED IN EXHIBIT 18.9.

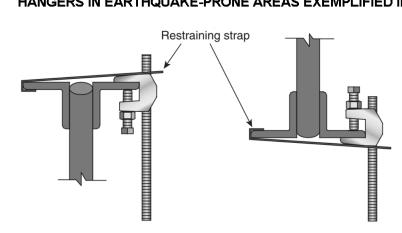


EXHIBIT 18.9 Retainer Straps on Typical Upper Hanger Assemblies Consisting of Universal Beam Clamp and All-Thread

Rod. (Based on artwork provided by AFCON)

18.7.2 THE RESTRAINING STRAP SHALL BE LISTED FOR USE WITH A C-TYPE CLAMP OR SHALL BE A STEEL STRAP OF NOT LESS THAN 16 GAUGE THICKNESS AND NOT LESS THAN 1 IN. WIDE FOR PIPE DIAMETERS 8 IN. OR LESS AND 14 GAUGE THICKNESS AND NOT LESS THAN 1-1/4 IN. WIDE FOR PIPE DIAMETERS GREATER THAN 8 IN.

18.7.3 THE RESTRAINING STRAP SHALL WRAP AROUND THE BEAM FLANGE NOT LESS THAN 1 IN.

18.7.4 A LOCK NUT ON A C-TYPE CLAMP SHALL NOT BE USED AS A METHOD OF RESTRAINT.

18.7.5 A LIP ON A "C" OR "Z" PURLIN SHALL NOT BE USED AS A METHOD OF 18.7.6 WHERE PURLINS OR BEAMS DO NOT PROVIDE A SECURE LIP TO A

RESTRAINING STRAP, THE STRAP SHALL BE THROUGH-BOLTED OR SECURED BY A SELF-TAPPING SCREW.

18.7.7 IN AREAS WHERE THE HORIZONTAL FORCE FACTOR EXCEEDS 0.50 WP, POWDER-DRIVEN STUDS SHALL BE PERMITTED TO ATTACH HANGERS TO THE BUILDING STRUCTURE WHERE THEY ARE SPECIFICALLY LISTED FOR USE IN AREAS SUBJECT TO EARTHQUAKES. 18.7.8 WHERE SEISMIC PROTECTION IS PROVIDED, CONCRETE ANCHORS USED TO SECURE HANGERS TO THE BUILDING STRUCTURE

SHALL BE IN ACCORDANCE WITH ACI 355.2, QUALIFICATION OF POST-INSTALLED MECHANICAL ANCHORS IN CONCRETE AND COMMENTARY, AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 18.7.9 WHERE SEISMIC PROTECTION IS PROVIDED, CAST-IN-PLACE ANCHORS USED TO SECURE HANGERS TO THE BUILDING STRUCTURE

SHALL BE IN ACCORDANCE WITH ICC-ES AC446, ACCEPTANCE CRITERIA FOR HEADED CAST-IN SPECIALTY INSERTS IN CONCRETE, AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

QUICK GLANCE SUMMARY FOR SPRINKLER FITTERS BRACING & RESTRAINTS NOT REQUIRED ON DRAIN PIPING DOWNSTREAM OF VALVE.

BRACING & RESTRAINTS NOT REQUIRED ON DROPS / ARMOVERS.

SWAY BRACING OF RISERS - TOPS OF RISERS EXCEEDING 3-FT IN LENGTH SHALL BE PROVIDED WITH A 4-WAY BRACE. THE 4-WAY BRACE PROVIDED AT THE RISER CAN ALSO PROVIDE LONGITUDINAL AND LATERAL **BRACING FOR ADJACENT MAINS** - THE FOUR-WAY BRACE SHALL NOT BE REQUIRED FOR RISERS UP TO 7 FT IN LENGTH THAT TERMINATE ABOVE THE ROOF ASSEMBLY OR TOP LANDING.

SHALL BE WITHIN 24 IN. OF THE CENTERLINE OF THE RISER AND THE LOADS FOR THAT BRACE SHALL INCLUDE BOTH THE VERTICAL AND HORIZONTAL PIPE. **LATERAL BRACING** - REQUIRED ON ALL FEED AND CROSS MAINS REGARDLESS OF SIZE AND ALL BRANCH LINES AND

- WHEN A FOUR-WAY BRACE AT THE TOP OF A RISER IS ATTACHED ON THE HORIZONTAL PIPING, IT

OTHER PIPING WITH A DIAMETER OF 21/2" AND LARGER. - MAXIMUM SPACING @ 40'-0 ON CENTER. - ON THE LAST PIECE OF MAIN WITHIN 6'-0 OF THE END.

LONGITUDINAL BRACING REQUIRED ON ALL FEED AND CROSS MAINS. - MAXIMUM SPACING @ 80'-0 ON CENTER.

- LAST BRACE MUST BE LOCATED WITHIN 40'-0 OF THE END OF THE PIPE OR A CHANGE IN DIRECTION.

- THE END SPRINKLER OF A BRANCH LINE MUST BE RESTRAINED - RESTRAINT MUST BE INSTALLED WITHIN 2'-0- OF A HANGER

- HANGER NEAREST RESTRAINT REQUIRES A SURGE CLIP BRACING & RESTRAINTS NOT REQUIRED ON PIPE WITH HANGER ROD LESS THAN 6" (FROM TOP OF PIPE

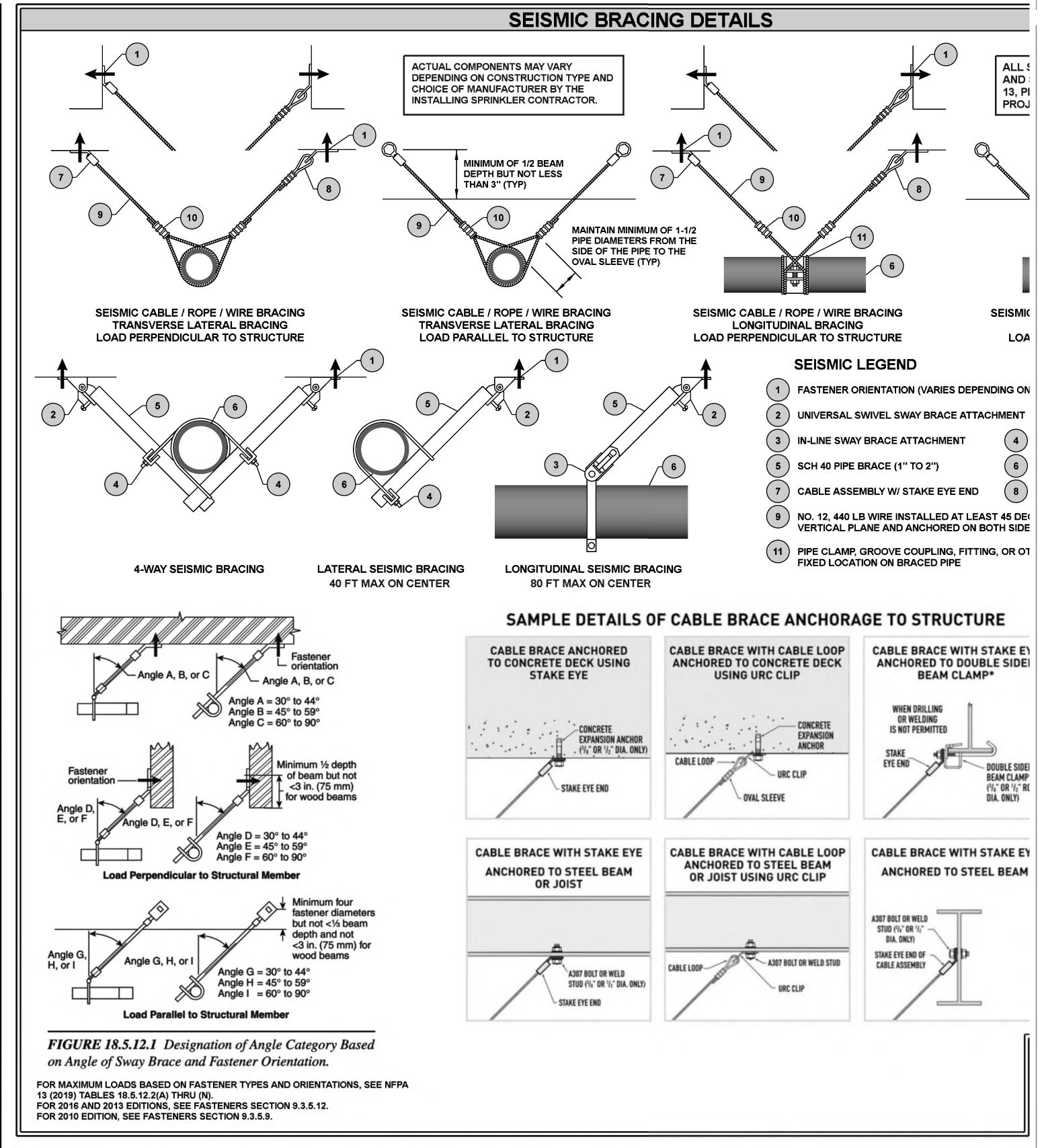
PIPE SLEEVE NOTES

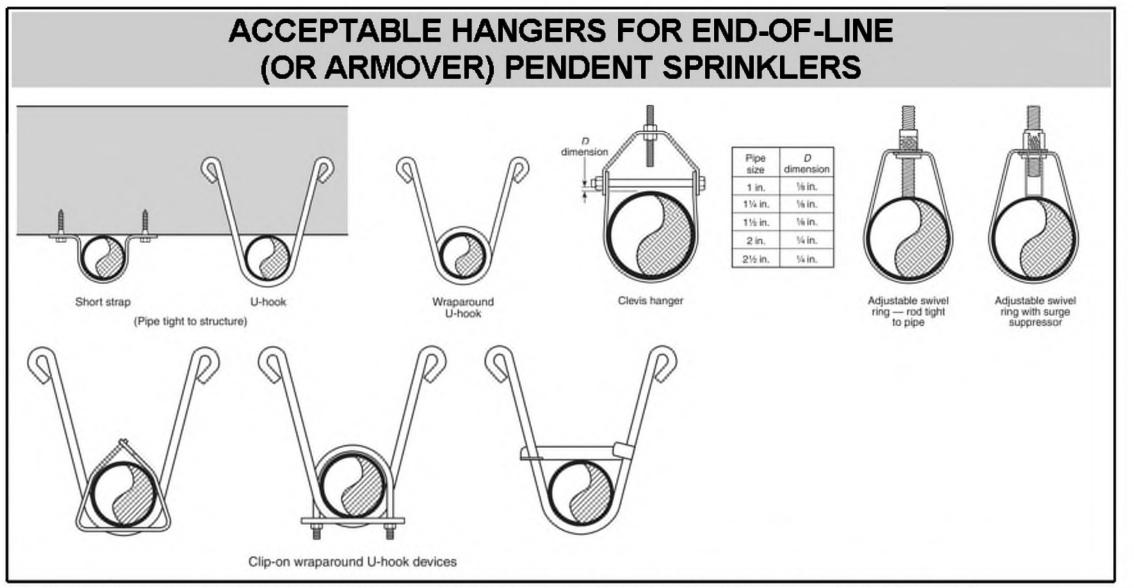
WHERE FLEXIBLE COUPLINGS ARE PROVIDED WITHIN 1 FT OF EACH SIDE OF WALL: - SLEEVES ARE TO BE A NOMINAL DIAMETER 1-IN. LARGER THAN PIPE

WHERE FLEXIBLE COUPLINGS ARE NOT PROVIDED:

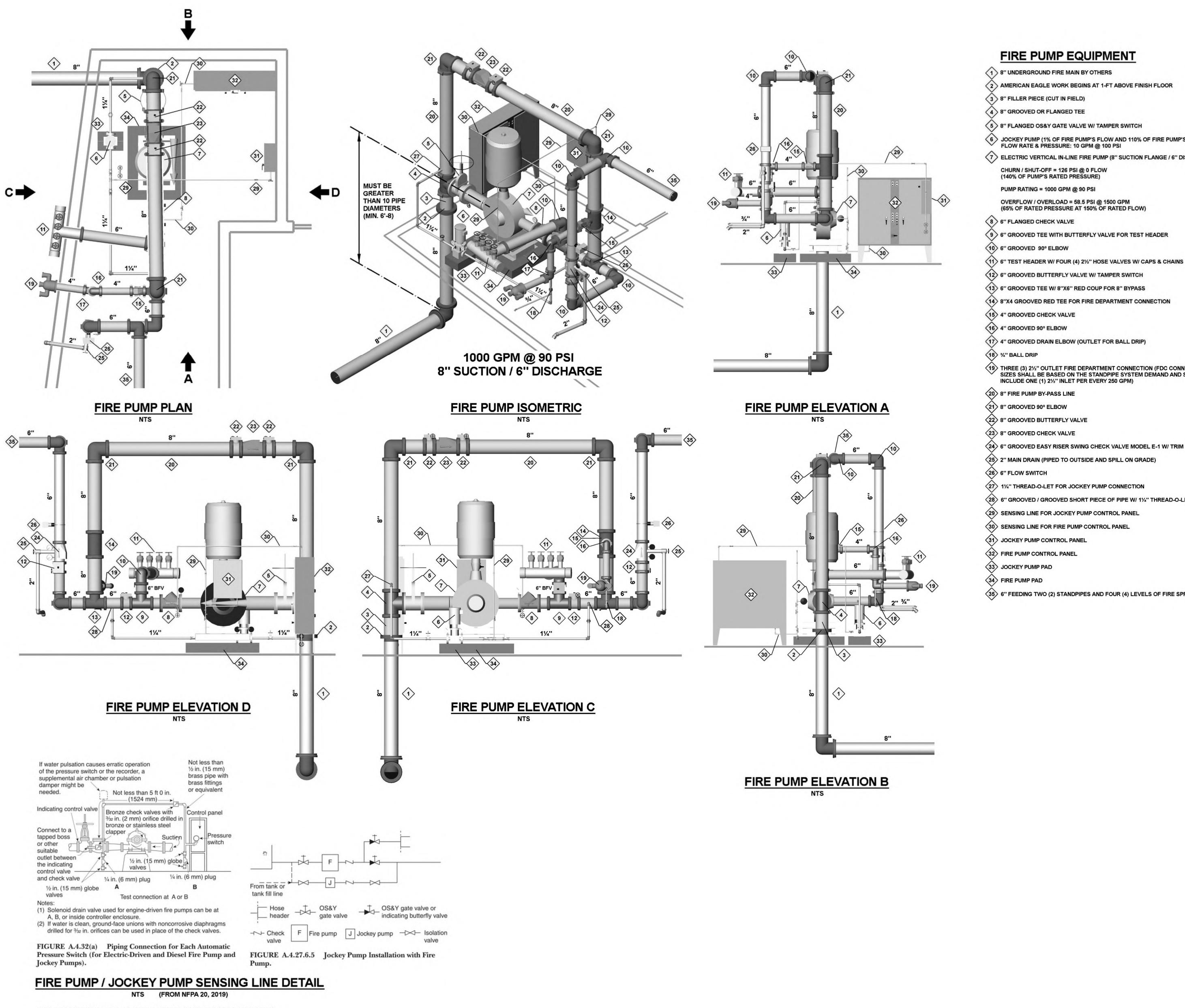
- SLEEVES ARE TO BE A NOMINAL DIAMETER OF 2-IN. LARGER THAN THE NOMINAL PIPE DIAMETER FOR PIPE SIZES LESS THAN 4-IN. - SLEEVES ARE TO BE A NOMINAL DIAMETER OF 4-IN. LARGER THAN THE NOMINAL PIPE DIAMETER FOR PIPE SIZES 4-IN. AND 6-IN. - BY CHOICE, PIPING DESIGN FOR 8-IN. PIPE WILL INCORPORATE FLEXIBLE COUPLINGS ALLOWING FOR 10-IN. DIAMETER SLEEVES

APPLY FIRE CAULK IN ACCORDANCE WITH PROJECT DOCUMENTS AT ALL SLEEVED PENETRATIONS OF FIRE RATED WALLS.





IF PROJECT IS DESIGNED FOR SEISMIC CONDITIONS, EACH END OF LINE (OR ARMOVER) SHALL BE RESTRAINED AGAINST UPWARD MOVEMENT ALSO SEE SEISMIC CABLE DETAILS ABOVE



FIRE PUMP EQUIPMENT

- 2 AMERICAN EAGLE WORK BEGINS AT 1-FT ABOVE FINISH FLOOR

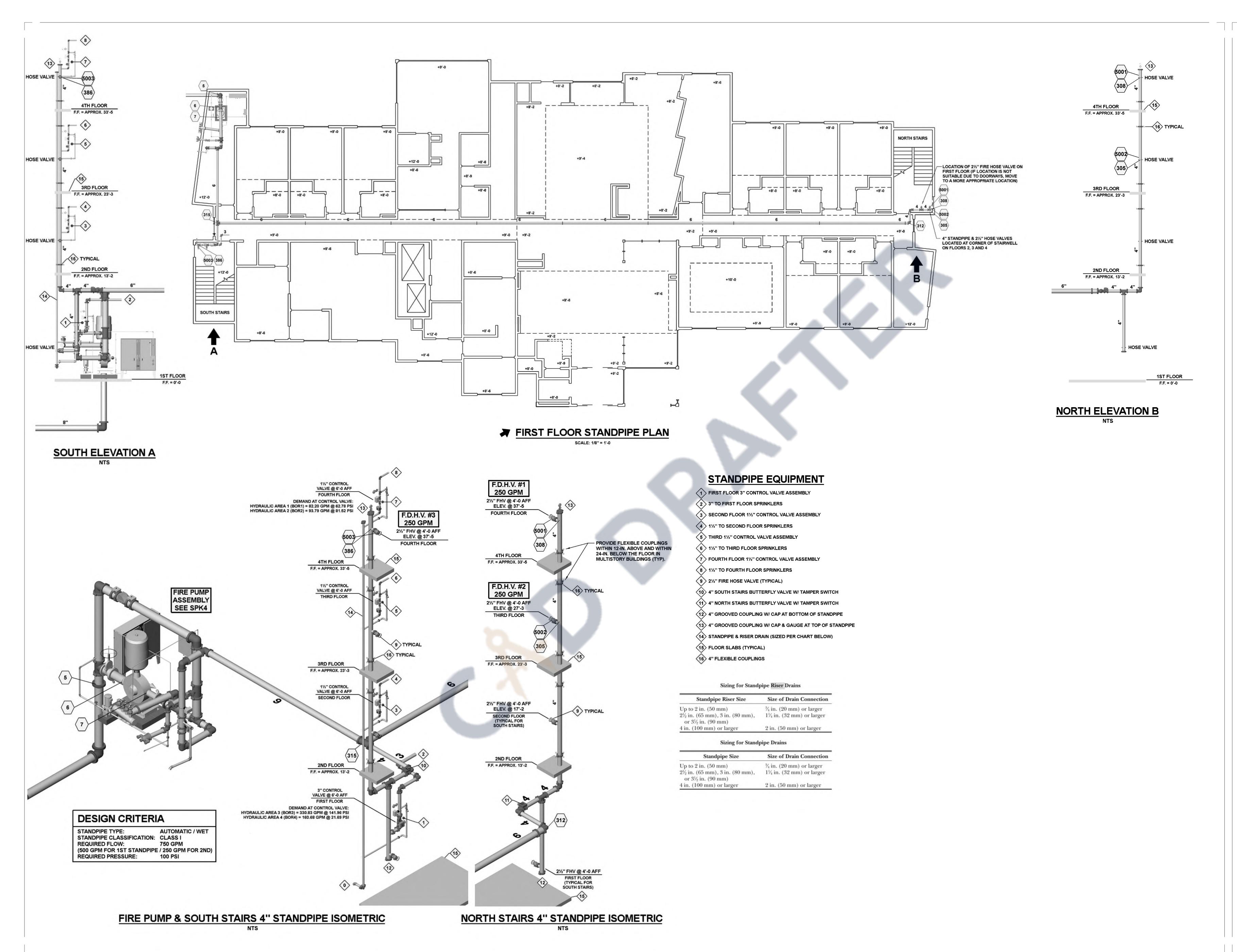
- (5) 8" FLANGED OS&Y GATE VALVE W/ TAMPER SWITCH
- 6 JOCKEY PUMP (1% OF FIRE PUMP'S FLOW AND 110% OF FIRE PUMP'S PRESSURE) FLOW RATE & PRESSURE: 10 GPM @ 100 PSI
- (7) ELECTRIC VERTICAL IN-LINE FIRE PUMP (8" SUCTION FLANGE / 6" DISCHARGE FLANGE)
- OVERFLOW / OVERLOAD = 58.5 PSI @ 1500 GPM (65% OF RATED PRESSURE AT 150% OF RATED FLOW)
- (9) 6" GROOVED TEE WITH BUTTERFLY VALVE FOR TEST HEADER
- (11) 6" TEST HEADER W/ FOUR (4) 21/2" HOSE VALVES W/ CAPS & CHAINS
- (14) 8"X4 GROOVED RED TEE FOR FIRE DEPARTMENT CONNECTION
- (17) 4" GROOVED DRAIN ELBOW (OUTLET FOR BALL DRIP)
- THREE (3) 2½" OUTLET FIRE DEPARTMENT CONNECTION (FDC CONNECTION SIZES SHALL BE BASED ON THE STANDPIPE SYSTEM DEMAND AND SHALL INCLUDE ONE (1) 2½" INLET PER EVERY 250 GPM)

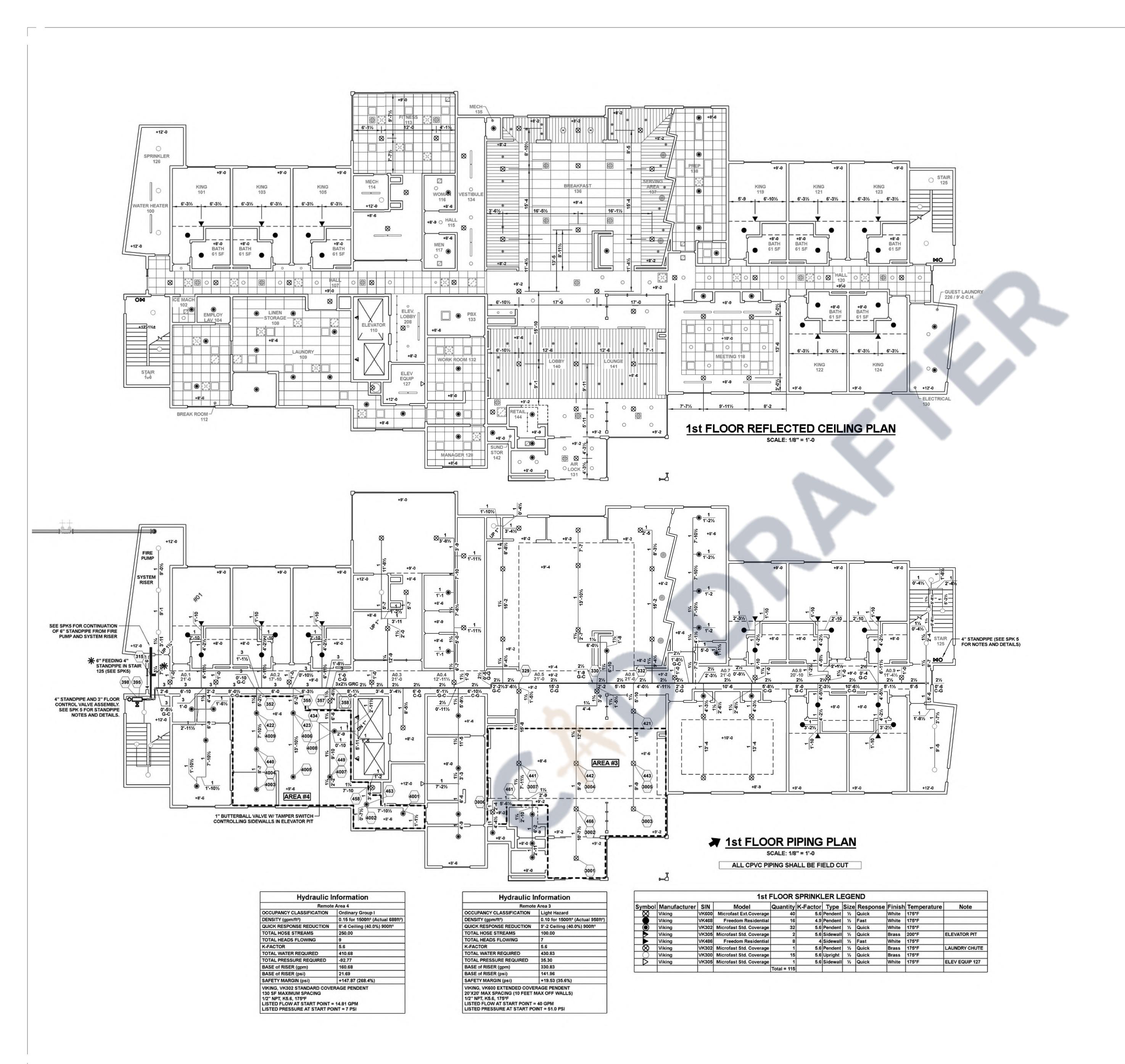
- 27 11/4" THREAD-O-LET FOR JOCKEY PUMP CONNECTION
- (28) 6" GROOVED / GROOVED SHORT PIECE OF PIPE W/ 11/4" THREAD-O-LET FOR JOCKEY PUMP CONNECTION
- (29) SENSING LINE FOR JOCKEY PUMP CONTROL PANEL
- (30) SENSING LINE FOR FIRE PUMP CONTROL PANEL
- (31) JOCKEY PUMP CONTROL PANEL
- (35) 6" FEEDING TWO (2) STANDPIPES AND FOUR (4) LEVELS OF FIRE SPRINKLERS

FIRE Syste

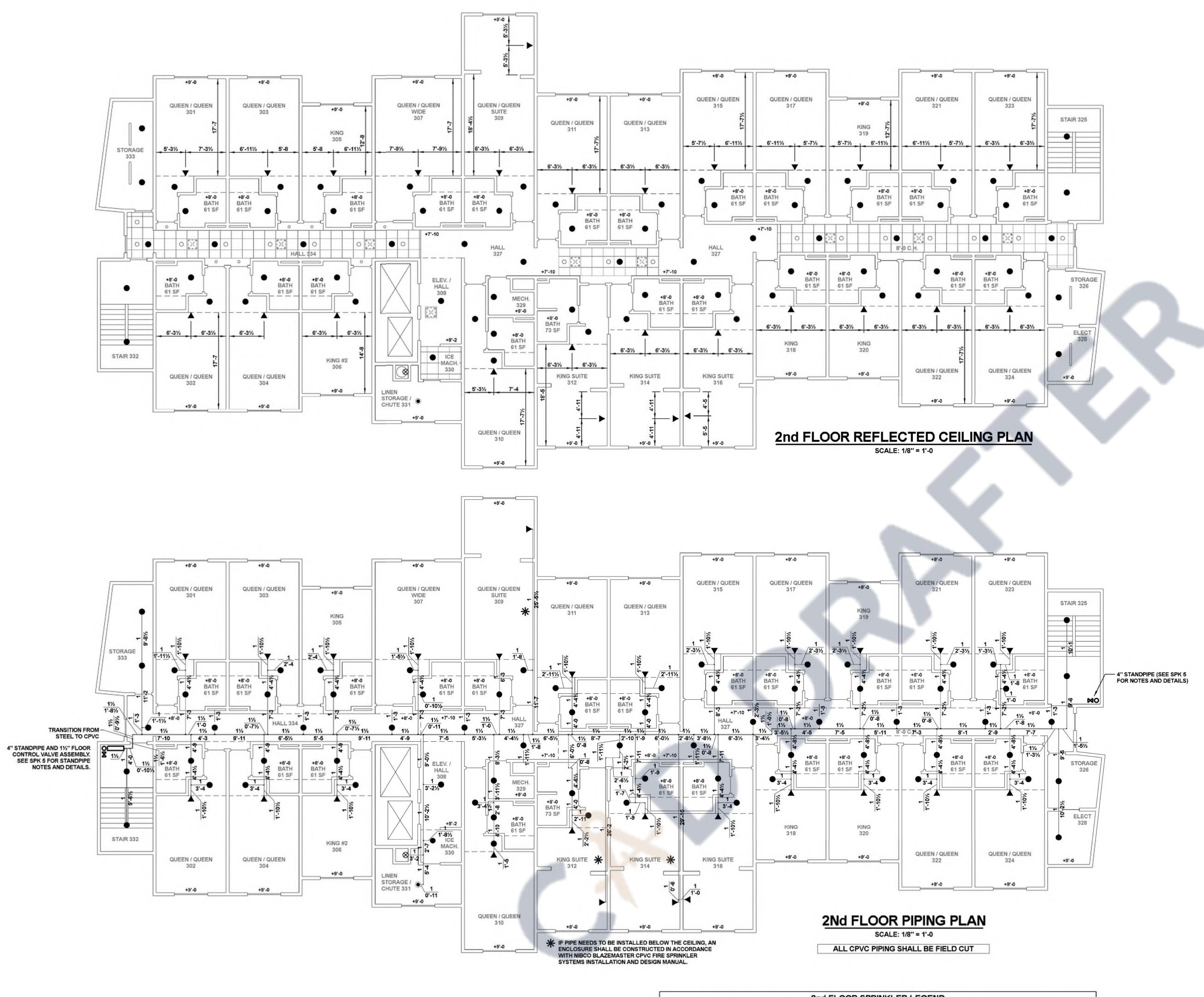
CHECKLIST FOR INSTALLATION OF SENSING LINES IN JOCKEY AND FIRE PUMP SYSTEMS

- BOTH FIRE PUMP AND JOCKEY PUMP SENSING LINES ARE PIPED EXACTLY THE SAME WITH SEPARATE CONNECTIONS.
- NON-FERROUS MATERIAL IS USED FOR THE SENSING LINE (BRONZE, STAINLESS, OR COPPER). - BOTH LINES HAVE 2 ORIFICES DRILLED INTO CHECK VALVES AT LEAST 5 FEET APART
- SIZE OF THE ORIFICE IN CHECK VALVES IS 3/32 INCH - ARROWS ON CHECK VALVES POINT AWAY FROM THE CONTROL PANEL - SIZE OF SENSING LINES ARE 1/2"
- JOCKEY PUMP IS INSTALLED ON THE HIGH PRESSURE SIDE OF THE FIRE PUMP PIPING. - FIRE PUMP IS INSTALLED ON THE HIGH PRESSURE SIDE OF THE FIRE PUMP PIPING.
- A 3/4" CASING RELIEF VALVE HAS BEEN INSTALLED ON THE DISCHARGE SIDE OF THE FIRE PUMP BEFORE THE FIRE
- THE DIRECTION OF THE ARROW ON THE CASING RELIEF VALVE IS POINTING TOWARDS THE DRAIN.

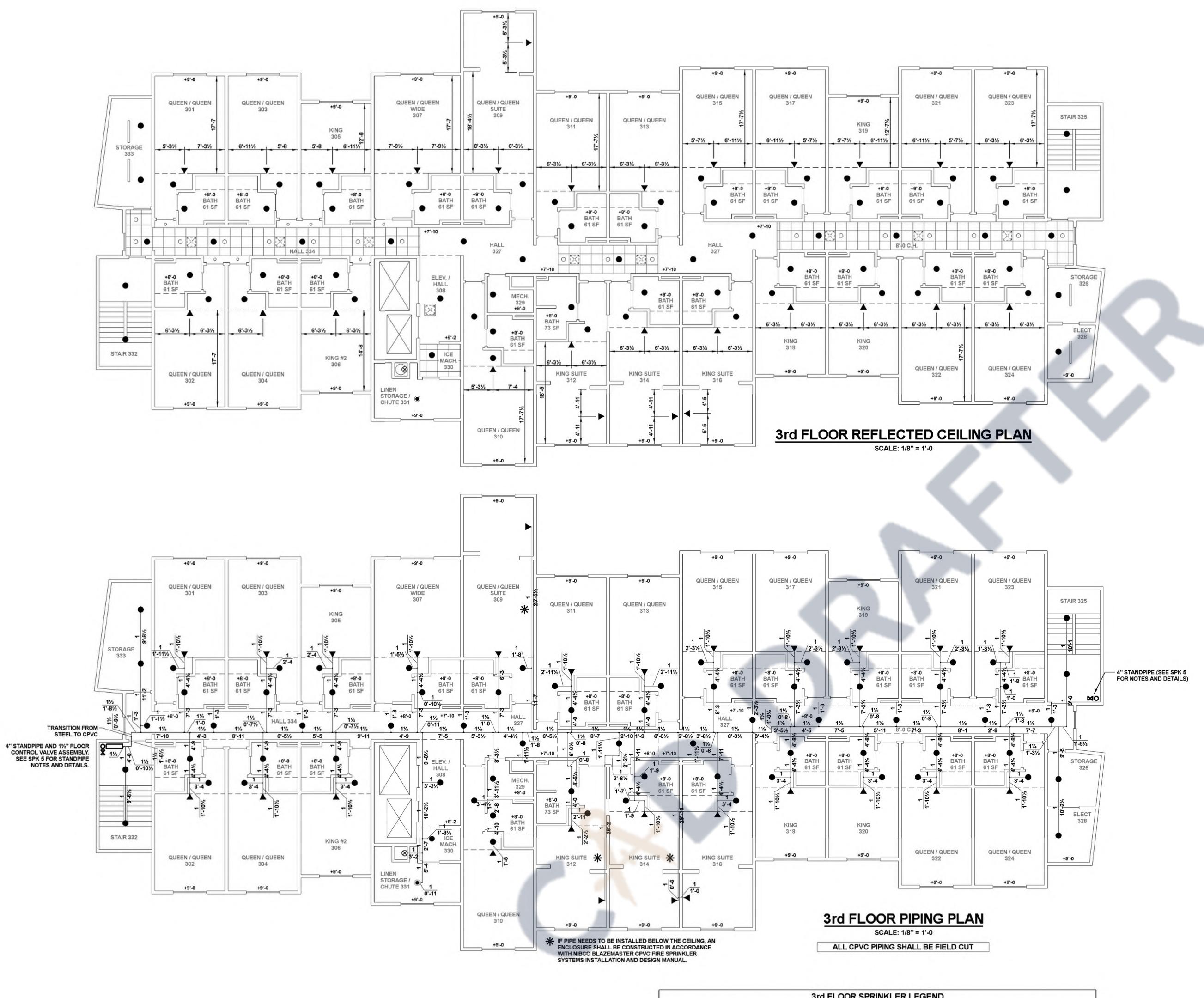




FIRE Syste

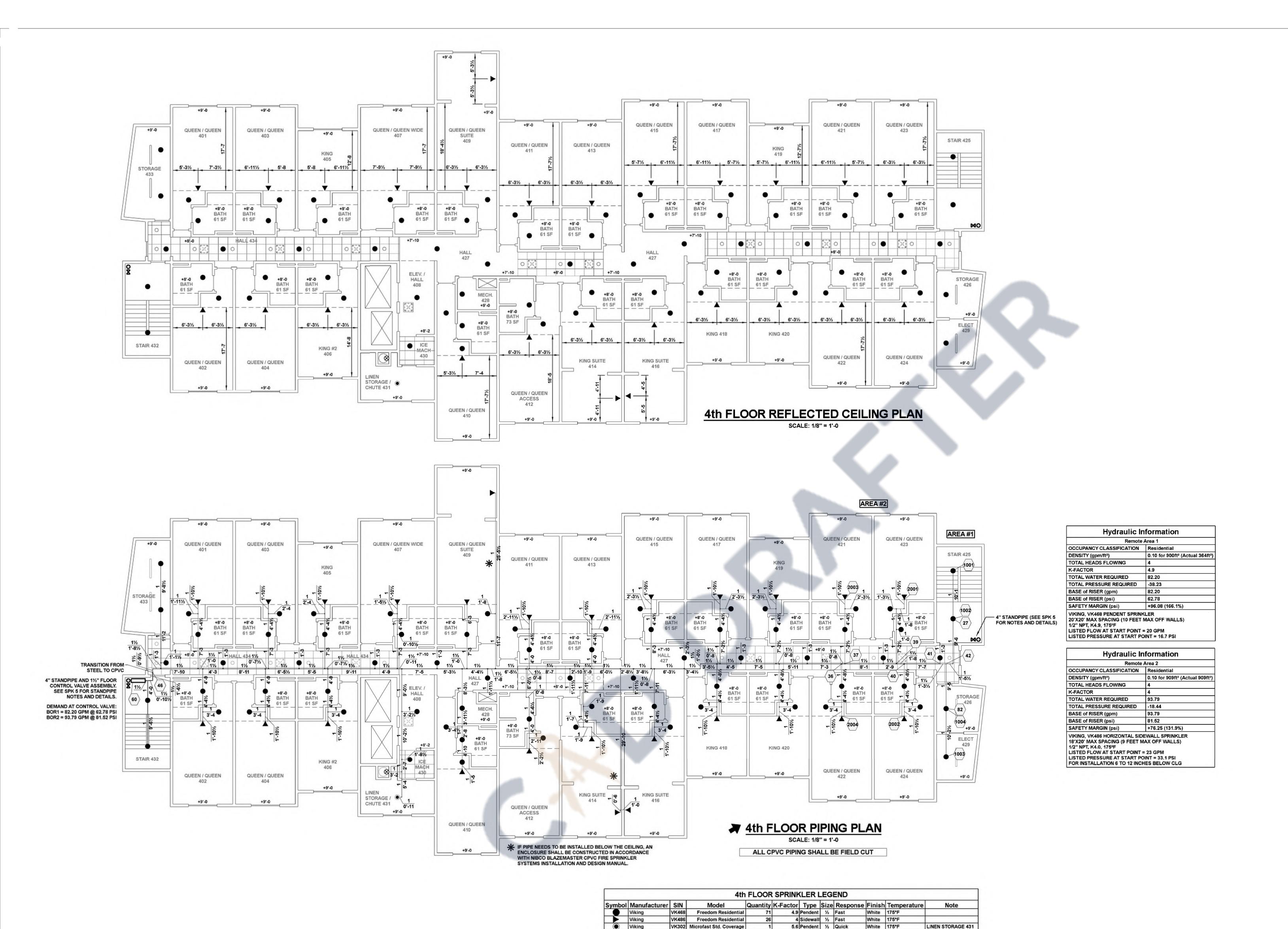


	2nd FLOOR SPRINKLER LEGEND										
Symbol	Manufacturer	SIN	Model	Quantity	K-Factor	Type	Size	Response	Finish	Temperature	Note
	Viking	VK468	Freedom Residential	71	4,9	Pendent	1/2	Fast	White	175°F	
	Viking	VK486	Freedom Residential	27	4	Sidewall	1/2	Fast	White	175°F	
•	Viking	VK302	Microfast Std. Coverage	1	5,6	Pendent	1/2	Quick	White	175°F	LINEN STORAGE 33
⊗ Viki	Viking	VK302	Microfast Std. Coverage	1	5,6	Pendent	1/2	Quick	Brass	200°F	LAUNDRY CHUTE
				Total = 100							



3rd FLOOR SPRINKLER LEGEND Note VK302 Microfast Std. Coverage LINEN STORAGE 331 VK302 Microfast Std. Coverage LAUNDRY CHUTE





VK302 Microfast Std. Coverage

5,6 Pendent 1/2 Quick

LAUNDRY CHUTE

