1 FP100 **FIRE PROTECTION PLAN**
SCALE: 1/8" = 1'-0"

2 FP100 **FIRE SPRINKLER RISER - NEW WORK**
NOT TO SCALE

ALL WORK ON PLAN IS INCLUDED IN PHASE I SCOPE EXCEPT AS NOTED

GENERAL FIRE PROTECTION NOTES

PROVIDE WET PIPE SPRINKLER SYSTEM IN BUILDING INCLUDING INSULATED PORTIONS OF COMBUSTIBLE ATTIC SPACE.

PROTECT PORCH AND CORRESPONDING ATTICS WITH DRY PIPE SYSTEM.

PROTECT PORTE COCHERE WITH DRY PIPE SYSTEM.

SPRINKLER SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH NFPA 13 (2019), INTERNATIONAL BUILDING CODE, GEORGIA FIRE CODE 120-3-3 (2020) AND SPECIFICATIONS. PROVIDE SHOP DRAWINGS AND EQUIPMENT SUBMITTALS FOR REVIEW BY ENGINEER, AHJ AND OWNER.

EXACT LOCATIONS AND ROUGHING REQUIREMENTS FOR PIPING AND EQUIPMENT SHALL BE DETERMINED FROM ARCHITECTURAL DRAWINGS, LARGE SCALE DETAILS AND APPROVED MANUFACTURER'S SHOP DRAWINGS. PARTICULAR ATTENTION SHALL BE DIRECTED TO EQUIPMENT AND FIXTURES FURNISHED UNDER OTHER DIVISIONS.

EXACT LOCATION OF PIPING SHALL BE DETERMINED BY JOB CONDITIONS. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF HIS WORK WITH THAT OF OTHER TRADES AND ARRANGE PIPING TO CLEAR STRUCTURAL MEMBERS AND DUCTWORK.

IN FIRE WALLS, PACK ANNULAR SPACE BETWEEN PIPE AND WALL WITH FIRESTOP COMPOUND IN ACCORDANCE WITH ITS U.L. LISTING.

PROVIDE WHITE, RECESSED SPRINKLERS IN AREAS WITH FINISHED CEILINGS UNLESS NOTED OTHERWISE. LOCATE SPRINKLERS IN THE CENTER OF ACOUSTICAL TILE.

PROVIDE BRASS UPRIGHT SPRINKLERS IN ATTIC SPACE AND IN CEILING SPACE BELOW ATTIC FLOOR. PROVIDE PROTECTIVE CAGES ON SPRINKLERS WHERE SPRINKLERS COULD BE SUBJECT TO DAMAGE.

PROVIDE INTERMEDIATE - TEMPERATURE, QUICK - RESPONSE SPRINKLERS.

HAZARD CLASSIFICATION

ALL AREAS ARE LIGHT HAZARD UNLESS NOTED OTHERWISE

01 ORDINARY HAZARD GROUP 1

Include above ceiling stub outs to connect Phase 1 to Phase 2 as part of Phase 1 pricing.

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1/4 1/2 3/4 1" REFERENCE SCALE

PLOT DATE: 03/30/21
FILE NAME: 21011 MECH
PLOT SCALE: 1 = 96
RWW

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PROJECT TITLE:
JUD C HICKEY CENTER

REVISIONS

REV #	DATE	APRVD BY	REVISION
	11/17/21	JMF	65% SET
	2/16/22	JMF	ISSUE FOR PERMIT
1	9/9/22	JMF	OWNER REVISIONS

DA PROJECT NUMBER & NAME: 1893

DRAWING TITLE:
FIRE PROTECTION PLAN

DRAWING NO:
FP100

N

1 / FP101 **FIRE PROTECTION PLAN - ATTIC**

SCALE: 1/8" = 1'-0"

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FIRE PROTECTION PLAN - ATTIC

DRAWING NO:

FP101

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT APPLY TO THIS SECTION.

1.2 SUMMARY
A. THIS SECTION INCLUDES FIRE-SUPPRESSION PIPING AND EQUIPMENT FOR THE FOLLOWING BUILDING SYSTEMS:
1. WET-PIPE, FIRE-SUPPRESSION SPRINKLERS, INCLUDING PIPING, VALVES, SPECIALTIES, AND AUTOMATIC SPRINKLERS.
2. DRY-PIPE, FIRE-SUPPRESSION SPRINKLERS, INCLUDING PIPING, VALVES, SPECIALTIES, AUTOMATIC SPRINKLERS, AIR COMPRESSOR, AND ACCESSORIES.

1.3 DEFINITIONS
A. WORKING PLANS: DOCUMENTS, INCLUDING DRAWINGS, CALCULATIONS, AND MATERIAL SPECIFICATIONS PREPARED ACCORDING TO NFPA 13 FOR OBTAINING APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
B. Q.R.: QUICK RESPONSE.

1.4 SYSTEM PERFORMANCE REQUIREMENTS
A. DESIGN SPRINKLERS AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
B. DESIGN SPRINKLER PIPING ACCORDING TO THE FOLLOWING AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION:
1. INCLUDE 10 PSI MARGIN OF SAFETY FOR AVAILABLE WATER PRESSURE.
2. INCLUDE LOSSES THROUGH WATER-SERVICE PIPING, VALVES, AND BACKFLOW PREVENTERS.
3. SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS: AS FOLLOWS:
a. BUILDING SERVICE AREAS: ORDINARY HAZARD, GROUP 1.
b. ELECTRICAL EQUIPMENT ROOMS: ORDINARY HAZARD, GROUP 1.
c. GENERAL STORAGE AREAS: ORDINARY HAZARD, GROUP 1.
d. MECHANICAL EQUIPMENT ROOMS: ORDINARY HAZARD, GROUP 1.
e. OFFICE AND PUBLIC AREAS: LIGHT HAZARD.
f. KITCHEN SERVICE AREAS: ORDINARY HAZARD, GROUP 1.
4. MINIMUM DENSITY FOR AUTOMATIC-SPRINKLER PIPING DESIGN: AS FOLLOWS:
a. LIGHT-HAZARD OCCUPANCY: 0.10 GPM OVER 1500-SQ. FT. AREA. AREA MAY BE REDUCED AS PERMITTED BY NFPA 13.
b. ORDINARY-HAZARD, GROUP 1 OCCUPANCY: 0.15 GPM OVER 1500- SQ. FT. AREA. AREA MAY BE REDUCED AS PERMITTED BY NFPA 13.
C. COMPONENTS AND INSTALLATION: CAPABLE OF PRODUCING PIPING SYSTEMS WITH 175-PSIG MINIMUM WORKING-PRESSURE RATING, UNLESS OTHERWISE INDICATED.

1.5 SUBMITTALS
A. PRODUCT DATA: FOR THE FOLLOWING:
1. PIPE AND FITTING MATERIALS AND METHODS OF JOINING FOR SPRINKLER PIPING.
2. PIPE HANGERS AND SUPPORTS.
3. VALVES, INCLUDING SPECIALTY VALVES, ACCESSORIES, AND DEVICES.
4. ALARM DEVICES. INCLUDE ELECTRICAL DATA.
5. AIR COMPRESSORS. INCLUDE ELECTRICAL DATA.
6. SPRINKLERS, ESCUTCHEONS, AND GUARDS. INCLUDE SPRINKLER FLOW CHARACTERISTICS, MOUNTING, FINISH, AND OTHER PERTINENT DATA.
B. FIRE-HYDRANT FLOW TEST REPORT: AS SPECIFIED IN "PREPARATION" ARTICLE.
C. APPROVED SPRINKLER PIPING DRAWINGS: WORKING PLANS, PREPARED ACCORDING TO NFPA 13, THAT HAVE BEEN APPROVED BY AUTHORITIES HAVING JURISDICTION. INCLUDE HYDRAULIC CALCULATIONS, IF APPLICABLE.
D. FIELD TEST REPORTS AND CERTIFICATES: INDICATE AND INTERPRET TEST RESULTS FOR COMPLIANCE WITH PERFORMANCE REQUIREMENTS AND AS DESCRIBED IN NFPA 13. INCLUDE "CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR ABOVEGROUND PIPING" AND "CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR UNDERGROUND PIPING."
E. MAINTENANCE DATA: FOR EACH TYPE OF SPRINKLER SPECIALTY TO INCLUDE IN MAINTENANCE MANUAL.

1.6 QUALITY ASSURANCE
A. INSTALLER QUALIFICATIONS: AN EXPERIENCED INSTALLER WHO HAS DESIGNED AND INSTALLED FIRE-SUPPRESSION PIPING SIMILAR TO THAT INDICATED FOR THIS PROJECT AND OBTAINED DESIGN APPROVAL AND INSPECTION APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
B. MANUFACTURER QUALIFICATIONS: FIRMS WHOSE EQUIPMENT, SPECIALTIES, AND ACCESSORIES ARE LISTED BY PRODUCT NAME AND MANUFACTURER IN UL'S "FIRE PROTECTION EQUIPMENT DIRECTORY" AND FM'S "FIRE PROTECTION APPROVAL GUIDE" AND THAT COMPLY WITH OTHER REQUIREMENTS INDICATED.
C. SPRINKLER COMPONENTS: LISTING/APPROVAL STAMP, LABEL, OR OTHER MARKING BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
D. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
E. NFPA STANDARDS: EQUIPMENT, SPECIALTIES, ACCESSORIES, INSTALLATION, AND TESTING COMPLYING WITH THENFPA 13.

1.7 EXTRA MATERIALS
A. FURNISH EXTRA MATERIALS DESCRIBED BELOW THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.
1. SPRINKLER CABINETS: FINISHED, WALL-MOUNTING STEEL CABINET AND HINGED COVER, WITH SPACE FOR A MINIMUM OF SIX SPARE SPRINKLERS PLUS SPRINKLER WRENCH. INCLUDE THE NUMBER OF SPRINKLERS REQUIRED BY NFPA 13 AND WRENCH FOR SPRINKLERS. INCLUDE SEPARATE CABINET WITH SPRINKLERS AND WRENCH FOR EACH TYPE OF SPRINKLER ON PROJECT.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS
A. REFER TO PART 3 "PIPING APPLICATIONS" ARTICLE FOR APPLICATIONS OF PIPE, TUBE, FITTING, AND JOINING MATERIALS.

2.2 PIPES AND TUBES
A. STAINLESS STEEL TRANSITION RISER: TYPE 304 STAINLESS-STEEL PIPE; UL AND FM APPROVED FOR FIRE SERVICE.
B. STANDARD-WEIGHT STEEL PIPE: ASTM A 53, ASTM A 135, OR ASTM A 795; SCHEDULE 40 IN NPS 2 (DN150) AND SMALLER.
C. SCHEDULE 10 STEEL PIPE: ASTM A 135 OR ASTM A 795, SCHEDULE 10 IN NPS 2-1/2 AND LARGER.
D. STAINLESS STEEL TUBING: UL LISTED, ONE-PIECE FLEXIBLE TUBING SYSTEM. SYSTEM ASSEMBLY SHALL INCLUDE COUPLINGS AND CEILING GRID MOUNTING HARDWARE; PIPING ASSEMBLY SHALL BE DESIGNED FOR CONNECTING BRANCH PIPING TO SPRINKLERS AND MOUNTING SPRINKLERS IN CEILING.

2.3 PIPE AND TUBE FITTINGS
A. CAST-IRON THREADED FLANGES: ASME B16.1.
B. CAST-IRON THREADED FITTINGS: ASME B16.4.
C. MALLEABLE-IRON THREADED FITTINGS: ASME B16.3.
D. STEEL, THREADED COUPLINGS: ASTM A 865.
E. STEEL WELDING FITTINGS: ASTM A 234/A 234M, ASME B16.9, OR ASME B16.11.
F. STEEL FLANGES AND FLANGED FITTINGS: ASME B16.5.
G. STEEL, GROOVED-END FITTINGS: UL-LISTED AND FM-APPROVED, ASTM A 47 (ASTM A 47M), MALLEABLE IRON OR ASTM A 536, DUCTILE IRON; WITH DIMENSIONS MATCHING STEEL PIPE AND ENDS FACTORY GROOVED ACCORDING TO AWWA C606.

2.4 JOINING MATERIALS
A. STEEL, KEYED COUPLINGS: UL 213 AND AWWA C606, FOR STEEL-PIPE DIMENSIONS. INCLUDE ASTM A 536, DUCTILE-IRON HOUSING, RUBBER GASKETS, AND STEEL BOLTS AND NUTS. INCLUDE LISTING FOR DRY-PIPE SERVICE FOR COUPLINGS FOR DRY PIPING.
B. TRANSITION COUPLINGS: AWWA C219, SLEEVE TYPE, OR OTHER MANUFACTURED FITTING THE SAME SIZE AS, WITH PRESSURE RATING AT LEAST EQUAL TO, AND WITH ENDS COMPATIBLE WITH PIPING TO BE JOINED.

2.5 GENERAL-DUTY VALVES
A. REFER TO OTHER DIVISION 21 SECTIONS FOR GATE, BALL, BUTTERFLY, GLOBE, AND CHECK VALVES NOT REQUIRED TO BE UL LISTED AND FM APPROVED.

2.6 FIRE-PROTECTION-SERVICE VALVES
A. GENERAL: UL LISTED AND FM APPROVED, WITH MINIMUM 175-PSIG NON-SHOCK WORKING-PRESSURE RATING. VALVES FOR GROOVED-END PIPING MAY BE FURNISHED WITH GROOVED ENDS INSTEAD OF TYPE OF ENDS SPECIFIED.
B. GATE VALVES, NPS 2 AND SMALLER: UL 262; CAST-BRONZE, THREADED ENDS; SOLID WEDGE; OS&Y; AND RISING STEM.
1. INDICATOR: ELECTRICAL, PREWIRED, SUPERVISORY SWITCH. COORDINATE REQUIREMENTS WITH FIRE ALARM SYSTEM.
C. INDICATING VALVES, NPS 2-1/2 AND SMALLER: UL 1091; BUTTERFLY OR BALL-TYPE, BRONZE BODY WITH THREADED ENDS; AND INTEGRAL INDICATING DEVICE.
1. INDICATOR: ELECTRICAL, PREWIRED, SUPERVISORY SWITCH. COORDINATE REQUIREMENTS WITH FIRE ALARM SYSTEM.
D. GATE VALVES, NPS 2-1/2 AND LARGER: UL 262, IRON BODY, BRONZE MOUNTED, TAPER WEDGE, OS&Y, AND RISING STEM. INCLUDE REPLACEABLE, BRONZE, WEDGE FACING RINGS AND FLANGED ENDS.
1. INDICATOR: ELECTRICAL, PREWIRED, SUPERVISORY SWITCH. COORDINATE REQUIREMENTS WITH FIRE ALARM SYSTEM.
E. SWING CHECK VALVES, NPS 2 AND SMALLER: UL 312 OR MSS SP-80, CLASS 150; BRONZE BODY WITH BRONZE DISC AND THREADED ENDS.
F. SWING CHECK VALVES, NPS 2-1/2 AND LARGER: UL 312, CAST-IRON BODY AND BOLTED CAP, WITH BRONZE DISC OR CAST-IRON DISC WITH BRONZE-DISC RING AND FLANGED ENDS.

2.7 SPECIALTY VALVES
A. ALARM CHECK VALVES: UL 193, 175-PSIG WORKING PRESSURE; DESIGNED FOR HORIZONTAL OR VERTICAL INSTALLATION, WITH CAST-IRON FLANGED INLET AND OUTLET, BRONZE GROOVED SEAT WITH O-RING SEALS, AND SINGLE-HINGE PIN AND LATCH DESIGN. INCLUDE TRIM SETS FOR BYPASS, DRAIN, ELECTRIC SPRINKLER ALARM SWITCH AND PRESSURE GAGES.
1. OPTION: GROOVED-END CONNECTIONS FOR USE WITH KEYED COUPLINGS.
2. ALARM VALVES WITH INTEGRAL INSPECTOR TEST, DRAIN AND PRESSURE RELIEF ASSEMBLIES ARE ACCEPTABLE.
B. DRY-PIPE VALVES: UL 260; DIFFERENTIAL TYPE; 175-PSIG WORKING PRESSURE; WITH CAST-IRON FLANGED INLET AND OUTLET, BRONZE SEAT WITH O-RING SEALS, AND SINGLE-HINGE PIN AND LATCH DESIGN. INCLUDE UL 1486, QUICK-OPENING DEVICES, TRIM SETS FOR AIR SUPPLY, DRAIN, PRIMING LEVEL, ALARM CONNECTIONS, BALL DRIP VALVES, PRESSURE GAGES, PRIMING CHAMBER ATTACHMENT, AND FILL-LINE ATTACHMENT.
1. OPTION: GROOVED-END CONNECTIONS FOR USE WITH KEYED COUPLINGS.
2. AIR-PRESSURE MAINTENANCE DEVICES: AUTOMATIC DEVICE TO MAINTAIN CORRECT AIR PRESSURE IN PIPING. INCLUDE SHUTOFF VALVES TO PERMIT SERVICING WITHOUT SHUTTING DOWN SPRINKLER PIPING, BYPASS VALVE FOR QUICK FILLING, PRESSURE REGULATOR OR SWITCH TO MAINTAIN PRESSURE, STRAINER, PRESSURE RATINGS WITH 14- TO 60-PSIG ADJUSTABLE RANGE, AND 175-PSIG MAXIMUM INLET PRESSURE.
3. AIR COMPRESSOR: UL 1450 LISTED; 120-V AC, 60 HZ, SINGLE PHASE.

2.8 SPRINKLERS
A. AUTOMATIC SPRINKLERS: WITH HEAT-RESPONSIVE ELEMENT COMPLYING WITH UL199.

2.9 SPECIALTY SPRINKLER FITTINGS
A. SPECIALTY FITTINGS: UL LISTED AND FM APPROVED; MADE OF STEEL, DUCTILE IRON, OR OTHER MATERIALS COMPATIBLE WITH PIPING.
B. DRY-PIPE-SYSTEM FITTINGS: UL LISTED FOR DRY-PIPE SERVICE.

2.10 SPRINKLER INSPECTOR'S TEST FITTINGS WITH INTEGRAL PRESSURE RELIEF AND DRAIN
A. STANDARD: UL OR FM GLOBAL, LISTING. NFPA 13.
B. PRESSURE RATING: 300 PSIG.
C. BODY MATERIAL: BRONZE BODY, BRASS STEM, STEEL HANDLE, CHROME-PLATED BRONZE BALL, VIRGIN TEFLON VALVE SEAT.
D. SIGHT GLASS: BRONZE HOUSING WITH VIEWING WINDOW.
E. COMPONENTS: A TAMPER RESISTANT TEST ORIFICE AND A TAPPED PORT FOR SYSTEM ACCESS.
F. PRESSURE RELIEF VALVE AND DRAINAGE PIPING:
1. BODY MATERIAL: BRONZE BODY AND STAINLESS-STEEL SPRING.
2. COMPONENTS: NYLOBRAID FLEXIBLE TUBE, ONE 1/2 INCH NPT BY BARBED 90 DEGREE ELBOW, ONE ½" NPT BY BARBED STRAIGHT ADAPTER, EXTERNAL IDENTIFICATION PLATE AND INTEGRAL FLUSHING HANDLE TO REMOVE DEBRIS
3. ½-INCH MIPT INLET, 1/2 INCH FIPT OUTLET.
4. RELIEF PRESSURE SHALL BE FACTORY SET TO PROJECT SPECIFICATIONS.
5. RELIEF VALVE SHALL OPERATE TO THE OPEN POSITION BETWEEN 90% AND 105% OF THE SET PRESSURE.
6. RELIEF VALVE SHALL RESEAT OR CLOSE AT A MINIMUM OF 80% OF SET PRESSURE.
G. SIZE: F.I.P.T., SAME AS CONNECTED PIPING.
H. INLET AND OUTLET: THREADED.

2.11 ALARM DEVICES
A. GENERAL: TYPES MATCHING PIPING AND EQUIPMENT CONNECTIONS.
B. ELECTRICALLY OPERATED ALARM BELL:
1. STANDARD: UL464
2. TYPE: VIBRATING, METAL ALARM BELL.
3. SIZE: 6-INCH MINIMUM DIAMETER.
4. FINISH: RED-ENAMEL FACTORY FINISH, SUITABLE FOR OUTDOOR USE.
C. WATER-FLOW INDICATORS: UL 346; ELECTRICAL-SUPERVISION, VANE-TYPE WATER-FLOW DETECTOR; WITH 250-PSIG PRESSURE RATING; AND DESIGNED FOR HORIZONTAL OR VERTICAL INSTALLATION. INCLUDE TWO SINGLE-POLE, DOUBLE-THROW, CIRCUIT SWITCHES FOR ISOLATED ALARM AND AUXILIARY CONTACTS, 7 A, 125-V AC AND 0.25 A, 24-V DC; COMPLETE WITH FACTORY-SET, FIELD-ADJUSTABLE RETARD ELEMENT TO PREVENT FALSE SIGNALS AND TAMPERPROOF COVER THAT SENDS SIGNAL IF REMOVED.
D. PRESSURE SWITCHES: UL 753; ELECTRICAL-SUPERVISION-TYPE, WATER-FLOW SWITCH WITH RETARD FEATURE. INCLUDE SINGLE-POLE, DOUBLE-THROW, NORMALLY CLOSED CONTACTS AND DESIGN THAT OPERATES ON RISING PRESSURE AND SIGNALS WATER FLOW.

2.12 PRESSURE GAGES
A. PRESSURE GAGES: UL 393, 3-1/2- TO 4-1/2-INCH DIAMETER DIAL WITH DIAL RANGE OF 0 TO 250 PSIG.

2.13 AIR VENTING DEVICE

PRODUCT DATA SHEET 0 -
A. PRODUCT: DEVICE WHICH AUTOMATICALLY VENTS AIR FROM WET PIPE SPRINKLER SYSTEM..
1. STANDARD: UL OR FM GLOBAL, LISTING. NFPA 13.
2. PRESSURE RATING: 300 PSIG, 175 PSI FOR AIR VENT.
3. BODY MATERIAL: FORGED BRASS BODY.
4. COMPONENTS: BALL VALVE, STAINLESS STEEL STRAINER, PURGE VALVE WITH HOSE CONNECTION, THREAD CAP WITH LANYARD, AUTOMATIC AIR VENT.

PART 3 - EXECUTION

3.1 PREPARATION
A. PERFORM FIRE-HYDRANT FLOW TEST ACCORDING TO NFPA 13. USE RESULTS FOR SYSTEM DESIGN CALCULATIONS REQUIRED IN "QUALITY ASSURANCE" ARTICLE IN PART 1 OF THIS SECTION.
B. REPORT TEST RESULTS PROMPTLY AND IN WRITING.

3.2 PIPING APPLICATIONS
A. DO NOT USE WELDED JOINTS WITH GALVANIZED STEEL PIPE.
B. FLANGES, UNIONS, AND TRANSITION AND SPECIAL FITTINGS WITH PRESSURE RATINGS THE SAME AS OR HIGHER THAN SYSTEM'S PRESSURE RATING MAY BE USED IN ABOVEGROUND APPLICATIONS, UNLESS OTHERWISE INDICATED.
C. UNDERGROUND SERVICE-ENTRANCE PIPING:
1. USE ONE-PIECE STAINLESS STEEL TRANSITION RISER.
D. WET-PIPE SPRINKLERS: USE THE FOLLOWING:
1. NPS 2 AND SMALLER: SCHEDULE 40 STEEL PIPE WITH THREADED ENDS, CAST- OR MALLEABLE-IRON THREADED FITTINGS, AND THREADED JOINTS.
2. NPS 1-1/4 AND LARGER: SCHEDULE 10 STEEL PIPE WITH ROLL-GROOVED ENDS; STEEL, GROOVED-END FITTINGS; AND GROOVED JOINTS.
3. NPS 2-1/2 AND LARGER: SCHEDULE 10 STEEL PIPE WITH PLAIN ENDS, STEEL WELDING FITTINGS, AND WELDED JOINTS.
E. DRY-PIPE SPRINKLERS: USE THE FOLLOWING:
1. NPS 2 AND SMALLER: SCHEDULE 40 STEEL PIPE WITH THREADED ENDS; CAST- OR MALLEABLE-IRON THREADED FITTINGS; AND THREADED JOINTS.
2. NPS 1-1/4 AND LARGER : SCHEDULE 10 STEEL PIPE WITH GROOVED ENDS; STEEL, GROOVED-END FITTINGS; STEEL, KEYED COUPLINGS; AND GROOVED JOINTS.
3. NPS 2-1/2 AND LARGER: SCHEDULE 40 STEEL PIPE WITH THREADED ENDS; CAST- OR MALLEABLE-IRON THREADED FITTINGS; AND THREADED JOINTS.

3.3 VALVE APPLICATIONS
A. DRAWINGS INDICATE VALVE TYPES TO BE USED. WHERE SPECIFIC VALVE TYPES ARE NOT INDICATED, THE FOLLOWING REQUIREMENTS APPLY:
1. FIRE-PROTECTION-SERVICE VALVES: UL LISTED AND FM APPROVED FOR APPLICATIONS WHERE REQUIRED BY NFPA 13.
a. SHUTOFF DUTY: USE GATE VALVES.
2. GENERAL-DUTY VALVES: FOR APPLICATIONS WHERE UL-LISTED AND FM-APPROVED VALVES ARE NOT REQUIRED BY NFPA 13.
a. SHUTOFF DUTY: USE GATE, BALL, OR BUTTERFLY VALVES.
b. THROTTLING DUTY: USE GLOBE, BALL, OR BUTTERFLY VALVES.

3.4 JOINT CONSTRUCTION
A. STEEL-PIPING, GROOVED JOINTS: USE SCHEDULE 40 STEEL PIPE WITH CUT OR ROLL-GROOVED ENDS AND SCHEDULE 30 OR THINNER STEEL PIPE WITH ROLL-GROOVED ENDS; STEEL, GROOVED-END FITTINGS; AND STEEL, KEYED COUPLINGS. ASSEMBLE JOINTS WITH COUPLINGS, GASKETS, LUBRICANT, AND BOLTS ACCORDING TO COUPLING MANUFACTURER'S WRITTEN INSTRUCTIONS. USE GASKETS LISTED FOR DRY-PIPE SERVICE FOR DRY PIPING.
B. DISSIMILAR-PIPING-MATERIAL JOINTS: CONSTRUCT JOINTS USING ADAPTERS OR COUPLINGS COMPATIBLE WITH BOTH PIPING MATERIALS. USE DIELECTRIC FITTINGS IF BOTH PIPING MATERIALS ARE METAL.

3.5 SERVICE-ENTRANCE PIPING
A. CONNECT SPRINKLER PIPING TO WATER-SERVICE PIPING OF SIZE AND IN LOCATION INDICATED FOR SERVICE ENTRANCE TO BUILDING.
B. INSTALL SHUTOFF VALVE, CHECK VALVE, PRESSURE GAGE, DRAIN, AND OTHER ACCESSORIES AT CONNECTION TO WATER SERVICE.
C. CONNECTION TO THE INTERIOR SPRINKLER SYSTEM IS TO BE DONE AFTER THE UNDERGROUND FIRE SERVICE MAINS HAVE BEEN FLUSHED AND TESTED IN ACCORDANCE WITH NFPA 24.

3.6 PIPING INSTALLATION
A. REFER TO OTHER DIVISION 21 SECTIONS FOR BASIC PIPING INSTALLATION.
B. LOCATIONS AND ARRANGEMENTS: DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING. INSTALL PIPING AS INDICATED, AS FAR AS PRACTICAL.
1. DEVIATIONS FROM APPROVED WORKING PLANS FOR PIPING REQUIRE WRITTEN APPROVAL FROM AUTHORITIES HAVING JURISDICTION. FILE WRITTEN APPROVAL WITH THE DESIGN PROFESSIONAL BEFORE DEVIATING FROM APPROVED WORKING PLANS.
C. INSTALL UNDERGROUND SERVICE-ENTRANCE PIPING ACCORDING TO NFPA 24.
D. USE APPROVED FITTINGS TO MAKE CHANGES IN DIRECTION, BRANCH TAKEOFFS FROM MAINS, AND REDUCTIONS IN PIPE SIZES.
E. INSTALL UNIONS ADJACENT TO EACH VALVE IN PIPES NPS 2 AND SMALLER. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES OR IN PIPING INSTALLATIONS USING GROOVED JOINTS.
F. INSTALL FLANGES OR FLANGE ADAPTERS ON VALVES, APPARATUS, AND EQUIPMENT HAVING NPS 2-1/2 AND LARGER CONNECTIONS.
G. INSTALL "INSPECTOR'S TEST CONNECTIONS" IN SPRINKLER PIPING, COMPLETE WITH SHUTOFF VALVE, SIZED AND LOCATED ACCORDING TO NFPA 13.
H. INSTALL SPRINKLER PIPING WITH DRAINS FOR COMPLETE SYSTEM DRAINAGE.
I. INSTALL PRESSURE RELIEF VALVES. ROUTE PRESSURE RELIEF VALVE OUTLET TO SYSTEM DRAIN PIPING.
J. INSTALL ALARM DEVICES IN PIPING SYSTEMS.
K. HANGERS AND SUPPORTS: COMPLY WITH NFPA 13 FOR HANGER MATERIALS. INSTALL ACCORDING TO NFPA 13 FOR SPRINKLER PIPING.
L. INSTALL PIPING WITH GROOVED JOINTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. CONSTRUCT RIGID PIPING JOINTS, UNLESS OTHERWISE INDICATED.
M. INSTALL FLEXIBLE STAINLESS-STEEL TUBING SYSTEMS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
N. INSTALL PRESSURE GAGES ON RISER OR FEED MAIN, AT EACH SPRINKLER TEST CONNECTION, AND AT TOP OF EACH STANDPIPE. INCLUDE PRESSURE GAGES WITH CONNECTION NOT LESS THAN NPS 1/4 (DN8) AND WITH SOFT METAL SEATED GLOBE VALVE, ARRANGED FOR DRAINING PIPE BETWEEN GAGE AND VALVE. INSTALL GAGES TO PERMIT REMOVAL AND INSTALL WHERE THEY WILL NOT BE SUBJECT TO FREEZING.
O. INSTALL AUTOMATIC AIR VENTING DEVICE AT HIGH POINT OF WET PIPE SPRINKLER SYSTEMS.

3.7 SPECIALTY SPRINKLER FITTING INSTALLATION
A. INSTALL SPECIALTY SPRINKLER FITTINGS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

3.8 VALVE INSTALLATION
A. INSTALL FIRE-PROTECTION SPECIALTY VALVES, TRIM, FITTINGS, CONTROLS, AND SPECIALTIES ACCORDING TO NFPA 13, MANUFACTURER'S WRITTEN INSTRUCTIONS, AND AUTHORITIES HAVING JURISDICTION.
B. GATE VALVES: INSTALL FIRE-PROTECTION-SERVICE VALVES SUPERVISED-OPEN, LOCATED TO CONTROL SOURCES OF WATER SUPPLY. PROVIDE PERMANENT IDENTIFICATION SIGNS INDICATING PORTION OF SYSTEM CONTROLLED BY EACH VALVE.
C. ALARM CHECK VALVES: INSTALL VALVES IN VERTICAL POSITION FOR PROPER DIRECTION OF FLOW, INCLUDING BYPASS CHECK VALVE AND RETARD CHAMBER DRAIN-LINE CONNECTION.
D. DRY-PIPE VALVES: INSTALL TRIM SETS FOR AIR SUPPLY, DRAIN, PRIMING LEVEL, ALARM CONNECTIONS, BALL DRIP VALVES, PRESSURE GAGES, PRIMING CHAMBER ATTACHMENT, AND FILL-LINE ATTACHMENT.
1. AIR-PRESSURE MAINTENANCE DEVICES FOR DRY-PIPE SYSTEMS: INSTALL SHUTOFF VALVES TO PERMIT SERVICING WITHOUT SHUTTING DOWN SPRINKLER SYSTEM; BYPASS VALVE FOR QUICK SYSTEM FILLING; PRESSURE REGULATOR OR SWITCH TO MAINTAIN SYSTEM PRESSURE; STRAINER; PRESSURE RATINGS WITH 14- TO 60-PSIG ADJUSTABLE RANGE; AND 175-PSIG MAXIMUM INLET PRESSURE.
2. INSTALL AIR COMPRESSOR AND COMPRESSED-AIR SUPPLY PIPING.

3.9 SPRINKLER APPLICATIONS
A. GENERAL: USE SPRINKLERS ACCORDING TO THE FOLLOWING APPLICATIONS:
1. ROOMS WITHOUT CEILINGS: Q.R. BRASS UPRIGHT SPRINKLERS.
2. ROOMS WITH SUSPENDED CEILINGS: Q.R. WHITE RECESSED SPRINKLERS.
3. WALL MOUNTING: Q.R. WHITE SIDEWALL SPRINKLERS.
4. SPACES SUBJECT TO FREEZING: Q.R. UPRIGHT; PENDENT, DRY-TYPE; AND SIDEWALL, DRY-TYPE SPRINKLERS.
5. SPRINKLER FINISHES: USE SPRINKLERS WITH THE FOLLOWING FINISHES:
a. UPRIGHT SPRINKLERS: ROUGH BRONZE IN UNFINISHED SPACES NOT EXPOSED TO VIEW. PROVIDE SPRINKLER GUARDS WHERE SPRINKLERS COULD BE SUBJECTED TO DAMAGE.
b. PENDENT SPRINKLERS: ROUGH BRONZE IN UNFINISHED SPACES NOT EXPOSED TO VIEW.
c. RECESSED SPRINKLERS: ROUGH BRASS, WITH FACTORY-PAINTED WHITE FINISH.
d. SIDEWALL SPRINKLERS: CHROME-PLATED FINISH IN FINISHED SPACES.

3.10 SPRINKLER INSTALLATION
A. INSTALL SPRINKLERS IN SUSPENDED CEILINGS IN CENTER OF ACOUSTICAL PANELS AND TILES.
B. DO NOT INSTALL PENDENT OR SIDEWALL, WET-TYPE SPRINKLERS IN AREAS SUBJECT TO FREEZING. USE DRY-TYPE SPRINKLERS WITH WATER SUPPLY FROM HEATED SPACE.

3.11 CONNECTIONS
A. CONNECT WATER SUPPLIES TO SPRINKLERS.
B. CONNECT PIPING TO SPECIALTY VALVES, HOSE VALVES, SPECIALTIES, FIRE DEPARTMENT CONNECTIONS, AND ACCESSORIES.
C. ELECTRICAL CONNECTIONS: POWER WIRING IS SPECIFIED IN ELECTRICAL DIVISION.
D. CONNECT ALARM DEVICES TO FIRE ALARM.
E. CONNECT COMPRESSED-AIR SUPPLY TO DRY-PIPE SPRINKLER PIPING.
F. CONNECT AIR COMPRESSOR TO THE FOLLOWING PIPING AND WIRING:
1. PRESSURE GAGES AND CONTROLS.
2. ELECTRICAL POWER SYSTEM.
3. FIRE ALARM SYSTEM DEVICES, INCLUDING LOW-PRESSURE ALARM.

3.12 LABELING AND IDENTIFICATION
A. INSTALL LABELING AND PIPE MARKERS ON EQUIPMENT AND PIPING ACCORDING TO REQUIREMENTS IN NFPA 13.

3.13 FIELD QUALITY CONTROL
A. FLUSH, TEST, AND INSPECT SPRINKLER PIPING ACCORDING TO NFPA 13.
B. REPLACE PIPING SYSTEM COMPONENTS THAT DO NOT PASS TEST PROCEDURES AND RETEST TO DEMONSTRATE COMPLIANCE. REPEAT PROCEDURE UNTIL SATISFACTORY RESULTS ARE OBTAINED.
C. REPORT TEST RESULTS PROMPTLY AND IN WRITING TO THE DESIGN PROFESSIONAL AND AUTHORITIES HAVING JURISDICTION.

3.14 CLEANING
A. CLEAN DIRT AND DEBRIS FROM SPRINKLERS. WHERE ADHESIVE MATERIALS SUCH AS PAINT AND DRYWALL MUD HAVE ADHERED TO SPRINKLERS, THEY SHALL BE REPLACED ENTIRELY.
B. REMOVE AND REPLACE SPRINKLERS HAVING PAINT OTHER THAN FACTORY FINISH.

3.15 PROTECTION
A. PROTECT SPRINKLERS FROM DAMAGE UNTIL MATERIAL COMPLETION.

3.16 COMMISSIONING
A. VERIFY THAT SPECIALTY VALVES, TRIM, FITTINGS, CONTROLS, AND ACCESSORIES ARE INSTALLED AND OPERATE CORRECTLY.
B. VERIFY THAT AIR COMPRESSORS AND THEIR ACCESSORIES ARE INSTALLED AND OPERATE CORRECTLY.
C. VERIFY THAT SPECIFIED TESTS OF PIPING ARE COMPLETE.
D. VERIFY THAT DAMAGED SPRINKLERS AND SPRINKLERS WITH PAINT OR COATING NOT SPECIFIED ARE REPLACED WITH NEW, CORRECT TYPE.
E. VERIFY THAT SPRINKLERS ARE CORRECT TYPES, HAVE CORRECT FINISHES AND TEMPERATURE RATINGS, AND HAVE GUARDS AS REQUIRED FOR EACH APPLICATION.
F. DRAIN DRY-PIPE SPRINKLER PIPING.
G. PRESSURIZE AND CHECK DRY-PIPE SPRINKLER PIPING AIR-PRESSURE MAINTENANCE DEVICES AND AIR COMPRESSORS.
H. FILL WET-PIPE SPRINKLER PIPING WITH WATER.
I. ENERGIZE CIRCUITS TO ELECTRICAL EQUIPMENT AND DEVICES.
J. START AND RUN AIR COMPRESSORS.
K. ADJUST OPERATING CONTROLS AND PRESSURE SETTINGS.
L. COORDINATE WITH FIRE ALARM TESTS. OPERATE AS REQUIRED.

3.17 DEMONSTRATION
A. DEMONSTRATE EQUIPMENT, SPECIALTIES, AND ACCESSORIES. REVIEW OPERATING AND MAINTENANCE INFORMATION.
B. SCHEDULE DEMONSTRATION WITH OWNER WITH AT LEAST SEVEN DAYS' ADVANCE NOTICE.

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