FIRE PROTECTION DESIGN CRITERIA

SYMBOL	OCCUPANCY	TYPE	DESIGN DENSITY (GPM/SF)	HYDRAULIC REMOTE AREA (SF)	MAX. COVERAGE PER SPRINKLER HEAD (SF)	HOSE STREAM		AREAS OF COVERAGE
						INSIDE (GPM)	OUTSIDE (GPM)	
LH	LIGHT HAZARD	WET	0.10	1500	225	100	–	OFFICES, OPEN AREAS, LOBBIES, CORRIDORS, TOILET ROOMS, ETC.
OH–1	ORDINARY HAZARD GROUP 1	WET	0.15	1500	130	100	150	APPARATUS ROOMS MECHANICAL ROOMS, ELECTRICAL ROOMS, JANITORS CLOSETS, ETC.
LH	LIGHT HAZARD	DRY	0.10	1950	130	100	150	EXTERIOR CANOPY AND PATIO
OH–1	ORDINARY HAZARD GROUP 1	DRY	0.15	1950	130	100	150	COVERED RE–STOCKING BAY (OUTDOOR)
OH–1	ORDINARY HAZARD GROUP 1	P.A.	0.15	1950	130	100	150	SERVER ROOM, 911 DISPATCHING ROOM, 911 DISPATCH TRAINING ROOM (PRE–ACTION SYSTEM).

APPLICABLE PUBLICATIONS:

THE FOLLOWING PUBLICATIONS SHALL BE USED AS A REFERENCE FOR THE DESIGN OF THE FIRE PROTECTION SYSTEM ON THIS PROJECT:

1. 2018 NORTH CAROLINA FIRE CODE
2. NFPA 13 – STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS – 2013 EDITION

NOTES:

1. FIRE PROTECTION WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE ABOVE PUBLICATIONS AS WELL AS WITH THE REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION (CITY, STATE, ETC.).
2. SPRINKLERS SHALL BE SPACED IN ACCORDANCE WITH NFPA 13 AND THE MANUFACTURER'S APPROVAL LISTING.
3. COORDINATE PIPE ROUTING WITH DUCT ROUTING, EQUIPMENT LOCATIONS, ELECTRICAL INSTALLATIONS, AND BUILDING STRUCTURAL MEMBERS. AVOID PENETRATING ANY MAIN STRUCTURAL BEAM. NOTIFY ARCHITECT OF ANY CONFLICTS.
4. CENTER SPRINKLERS IN CEILING TILES IN AREAS WITH LAY–IN CEILINGS AND VISUALLY ALIGNED IN AREAS WITH SMOOTH CEILINGS.
5. PROVIDE CONCEALED TYPE SPRINKLER HEADS FOR AREAS WITH LAY–IN CEILINGS AND GYPBOARD CEILINGS. PROVIDE UPRIGHT SPRINKLER HEADS FOR EXPOSED AREAS. COORDINATE COLOR OF CONCEALED SPRINKLER HEAD COVER–PLATES WITH ARCHITECT.

FLOW TEST DATA

DATE	HYDRANT LOCATION	FLOW TEST PERFORMED BY	PRESSURE		FLOW (GPM)	FLOW AT 20 PSI (GPM)
			STATIC (PSI)	RESIDUAL (PSI)		
09/28/20	HYDRANTS ON COMMERCE (643) AND FONTANA (645) STREETS	CITY OF CLINTON PUBLIC UTILITIES	52	48	1100	---

FLOW TEST NOTES:

1. SEE SITE UTILITY PLANS FOR EXACT LOCATION OF FIRE HYDRANTS.
2. THE FLOW TEST USED FOR THE WORKING PLAN DESIGN SHOULD BE PERFORMED AS INDICATED IN NFPA 13 WHICH USES TWO HYDRANTS; A PRESSURE HYDRANT AND A FLOW HYDRANT. THE TWO HYDRANTS SHALL BE AS CLOSE TO THE POINT OF CONNECTION AS POSSIBLE. A COPY OF THE FLOW TEST AND TEST HYDRANT LOCATIONS SHALL BE SUBMITTED WITH THE SHOP DRAWING PACKAGE.

PRE-ACTION SYSTEM

DOUBLE INTERLOCK SYSTEM

WHERE A PRE–ACTION SYSTEM IS REQUIRED, THE FIRE PROTECTION/SPRINKLER CONTRACTOR SHALL PROVIDE DESIGN, FABRICATION AND INSTALLATION OF A HYDRAULICALLY CALCULATED AUTOMATIC, DOUBLE INTERLOCKED, PRE–ACTION SPRINKLER SYSTEM WHICH WILL MEET ALL THE APPLICABLE REQUIREMENTS OF NFPA 13. FINAL SYSTEM SELECTION AND SPECIFICATION SHALL BE BY THE FIRE PROTECTION/SPRINKLER CONTRACTOR, WITH THE APPROVAL OF THE A/E. THE SYSTEM MUST MEET AND/OR EXCEED THE FOLLOWING REQUIREMENTS:

1. THIS SYSTEM MUST PROVIDE MAXIMUM PROTECTION AGAINST UNINTENTIONAL SPRINKLER SYSTEM DISCHARGE.
2. FOR WATER TO FLOW INTO THE SYSTEM, TWO EVENTS MUST TAKE PLACE:A FIRE PROTECTION DEVICE MUST OPERATE AND THE LOW PRESSURE SWITCH MUST BE ACTIVATED BY THE LOSS OF SYSTEM AIR PRESSURE (INDICATING A SPRINKLER HAS OPENED). THESE TWO SIGNALS MUST BE RECEIVED SIMULTANEOUSLY AT THE RELEASING CONTROL PANEL, SO THAT THE SOLENOID VALVE IS ENERGIZED , CAUSING WATER FLOW INTO THE SYSTEM.
3. FIRE PROTECTION DEVICES AND SYSTEM AIR PRESSURE MUST PROVIDE SEPARATE SIGNALS TO A CROSS–ZONED RELEASING CONTROL PANEL.
4. IN THE EVENT THAT THE SYSTEM PIPING IS RUPTURED OR A SPRINKLER HEAD IS ACCIDENTALLY OPENED, ONLY THE LOW PRESSURE SWITCH WILL OPERATE AND AN ALARM WILL SOUND. THE DELUGE VALVE WILL NOT BE RELEASED TO FLOW SINCE THE SOLENOID RELEASING VALVE REMAINS CLOSED DUE TO THE CROSS–ZONED CONTROL PANEL CONFIGURATION.
5. IN THE EVENT THAT A FIRE PROTECTION DEVICE IS FALSELY OPERATED, THE CONTROL PANEL WILL ACTIVATE AND ALARM. THE DELUGE VALVE WILL NOT BE RELEASED TO FLOW WATER SINCE THE SOLENOID VALVE REMAINS CLOSED DUE TO THE CROSS–ZONED CONTROL PANEL CONFIGURATION.
6. ALL SYSTEM COMPONENTS SHALL BE NEW AND BY CURRENT MANUFACTURERS AND SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES.
7. THE CONTROL PANELS USED FOR THE AUTOMATIC FIRE DETECTION AND PRE–ACTION FIRE SYSTEM SHALL BE UL/FM LISTED/APPROVED AND PROVIDED BY SPRINKLER CONTRACTOR. THE ELECTRICAL SMOKE AND HEAT DETECTORS AND WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR; THE CONTROL PANEL SHALL BE WIRED TO SHUT DOWN THE COMPUTER ROOM HVAC UNITS AND CLOSE DAMPERS WHEN PRE–ACTION SYSTEM FINAL CONNECTIONS TO RELEASING CONTROL BY SPRINKLER CONTRACTOR.
8. PROVIDE A MANUAL RELEASE STATION WITH PROTECTION AGAINST ACCIDENTAL OPERATION. THE MANUAL RELEASE STATION SHALL NOT BE CONNECTED TO THE DETECTOR CIRCUIT.
9. ALL MATERIALS AND WORKMANSHIP SHALL BE UL/FM APPROVED AND CONFORM TO ALL REQUIREMENTS AS LISTED IN THE LATEST EDITIONS OF THE NFPA STANDARDS.

CLEAN AGENT SYSTEM

1. PROVIDE A COMPLETE CLEAN AGENT FIRE SUPPRESSION SYSTEM IN THE ROOMS INDICATED ON THE FIRE PROTECTION DRAWINGS. THE CLEAN AGENT FIRE SUPPRESSION SYSTEM SHALL BE DESIGNED AND INSTALLED IN FULL COMPLIANCE WITH THE REQUIREMENTS OF NFPA 2001.
2. THE CLEAN AGENT FIRE SUPPRESSION SYSTEM SHALL EMPLOY PHOTOELECTRIC AND IONIZATION SMOKE DETECTION, TO BE FURNISHED AND INSTALLED BY THE FIRE ALARM CONTRACTOR.
3. LOCATE CLEAN AGENT CYLINDERS AND PANELS AS INDICATED ON DRAWING. A SINGLE DETECTOR ACTIVATED SHALL CAUSE AN ALARM SIGNAL TO BE GENERATED. A SECOND DETECTOR ACTIVATED SHALL GENERATE A PRE–DISCHARGE SIGNAL AND START THE PRE– DISCHARGE CONDITION.
4. THE SUPPRESSANT SUBSYSTEM SHALL PROVIDE HIGH SPEED RELEASE OF CLEAN AGENT PROVIDING TOTAL FLOODING FIRE PROTECTION FOR ENCLOSED AREAS. A UNIFORM EXTINGUISHING CONCENTRATION SHALL BE PROVIDED. CONCENTRATION SHALL BE AS SPECIFIED IN NFPA 2001 FOR THE CHOSEN CLEAN AGENT.
5. CLEAN AGENT SHALL BE STORED IN MODULAR OR CENTRAL STORAGE STEEL ALLOY STORAGE CONTAINERS COMPLYING W/ D.O.T. SPECIFICATION 4BA OR 4BW AND SHALL BE EQUIPPED W/ DIFFERENTIAL PRESSURE VALVES. NO REPLACEMENT PARTS SHALL BE NECESSARY TO RECHARGE THE CONTAINERS.
6. CLEAN AGENT SHALL BE DISCHARGED THROUGH THE OPERATION OF A SOLENOID OPERATED DEVICE WHICH RELEASES THE AGENT THROUGH A DIFFERENTIAL PRESSURE VALVE. SYSTEMS WHICH EMPLOY EXPLOSIVE OR PYROTECHNIC DEVICES SHALL NOT BE PERMITTED. THE SYSTEM DISCHARGE TIME SHALL BE IN ACCORDANCE WITH THE NFPA 2001 STANDARD OF 10 SECONDS.
7. ALL SYSTEM COMPONENTS SHALL BE NEW AND BY CURRENT MANUFACTURERS AND INSTALLED IN ACCORDANCE WITH LOCAL CODES.
8. THE CONTROL PANELS USED FOR THE AUTOMATIC FIRE DETECTION AND CLEAN AGENT FIRE SUPPRESSION SYSTEM SHALL BE UL/FM APPROVED AND LISTED. THE ELECTRICAL SMOKE DETECTORS UNITS AND WIRING SHALL BE PROVIDED BY THE SPRINKLER CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR. THE CONTROL PANEL SHALL BE WIRED TO SHUT DOWN MECHANICAL UNITS AND CLOSE DAMPERS WHEN THE CLEAN AGENT SYSTEM IS ACTIVATED.
9. THE CROSS–ZONE DETECTION (IONIZATION AND PHOTOELECTRIC DETECTORS) SHALL BE INSTALLED ON SEPARATE ZONES OF THE CROSS–ZONE SYSTEM. THE MANUAL RELEASE STATION SHALL NOT BE CONNECTED TO THE DETECTOR CIRCUIT. CLASS B PARALLEL WIRING IS REQUIRED. INCLUDE A BATTERY STANDBY POWER OF SUFFICIENT CAPACITY FOR 24 HOURS OF STANDBY OPERATION PLUS 5 MINUTES OF ALARM.
10. PROVIDE AN ELECTRICAL STROBE LIGHT TO INDICATE THE CLEAN AGENT SYSTEM IS OPERATING OR DISCHARGING. WIRE TO CONTROL PANEL AND MOUNT 80" AFF AT DOOR TO ROOM.
11. FINAL TESTING AND ACCEPTANCE SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER REPRESENTATIVE (COMMISSIONING AGENT WHEN APPLICABLE), AND LOCAL AUTHORITY. THE TEST SHALL BE CONDUCTED BY THE CONTRACTOR AND THE CLEAN AGENT SYSTEM MANUFACTURER'S REPRESENTATIVE.
12. CONSULT LOCAL AUTHORITY AS TO HVAC SHUTDOWN REQUIREMENTS AND OTHER CODE REQUIREMENTS.
13. ALL MATERIALS AND WORKMANSHIP SHALL BE UL/FM APPROVED.
14. CLEAN AGENT SYSTEM CONTROL PANEL AND ALL DEVICES SHALL BE COMPATIBLE WITH THE BUILDING FIRE ALARM SYSTEM.

SEISMIC RESTRAINT NOTES

1. THIS IS A SEISMIC SITE CLASS D AND SEISMIC DESIGN CATEGORY C PROJECT.
2. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE FIRE SUPPRESSION SYSTEM(S) IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE (IBC), NFPA 13 (2016) AND ASCE 7–10, CHAPTER 13. REFER TO THE STRUCTURAL DESIGN CRITERIA ON SHEET S001 TO CONFIRM SEISMIC DESIGN CATEGORY OF THE PROJECT SITE.
3. REFER TO NFPA 13 (2016) CHAPTER 9.3 "PROTECTION OF PIPING AGAINST DAMAGE WHERE SUBJECT TO EARTHQUAKES" TO DETERMINE THE CORRECT RESTRAINTS FOR PIPING.
4. REQUIRED RESTRAINT DEVICES AND MATERIALS SHALL BE AN INTEGRAL PART OF THE DESIGN AND INCLUDED IN THE SPRINKLER SYSTEM SHOP DRAWINGS. PROVIDE BRACING, ISOLATORS, SEISMIC MOUNTS, RESTRAINTS, ETC. AS NECESSARY TO COMPLY WITH ALL APPLICABLE REQUIREMENTS. PROVIDE SUPPORTING CALCULATIONS AND BRACING DETAILS AS APPLICABLE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED SPECIAL INSPECTIONS AND ASSOCIATED DOCUMENTATION. THE CONTRACTOR SHALL PROVIDE VERIFICATION IN WRITING OF COMPLIANCE WITH THE APPROVED SHOP DRAWINGS.
6. REVIEW AND APPROVAL OF THE SHOP DRAWINGS BY THE ARCHITECT/ENGINEER/ SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE, NFPA 13 (2013) AND ASCE 7–10.
7. ALTERNATIVE METHODS OF PROVIDING EARTHQUAKE PROTECTION OF SPRINKLER SYSTEMS BASED ON A SEISMIC ANALYSIS CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER SUCH THAT SYSTEM PERFORMANCE WILL BE AT LEAST EQUAL TO THAT OF THE BUILDING STRUCTURE UNDER EXPECTED SEISMIC FORCES SHALL BE PERMITTED (NFPA 13–2016 SECTION 9.3.1.2).

GROOVED PIPING SYSTEM NOTES

GROOVED PIPING SYSTEM

1. GROOVED MECHANICAL PIPE COUPLINGS, FITTINGS, VALVES AND OTHER GROOVED COMPONENTS MAY BE USED AS AN OPTION TO WELDING, THREADING OR FLANGED METHODS. ALL GROOVED COMPONENTS SHALL BE OF ONE MANUFACTURER, AND SHALL BE UL LISTED AND/OR FM GLOBAL APPROVED. GROOVED END PRODUCT MANUFACTURER TO BE ISO–9001 CERTIFIED. GROOVED COUPLINGS SHALL MEET THE REQUIREMENTS OF NFPA–13. BASIS OF DESIGN: VICTAULIC COMPANY OF AMERICA
2. PIPE/GROOVED (STANDARD/LIGHTWALL): CARBON STEEL, A–53B/A–106B – ROLL OR CUT GROOVED–ENDS AS APPROPRIATE TO PIPE MATERIAL WALL THICKNESS, PRESSURES, SIZE AND METHOD OF JOINING. PIPE ENDS TO BE GROOVED IN ACCORDANCE WITH VICTAULIC CURRENT LISTED STANDARDS CONFORMING TO ANSI/AWWA C–606.
3. MECHANICAL COUPLINGS FOR JOINING CARBON STEEL PIPE: MANUFACTURED IN TWO SEGMENTS OF CAST DUCTILE IRON, CONFORMING TO ASTM A–536, GRADE 65–45–12. GASKETS SHALL BE PRESSURE–RESPONSIVE SYNTHETIC RUBBER, GRADE TO SUIT THE INTENDED SERVICE, CONFORMING TO ASTM D–2000. MECHANICAL COUPLING BOLTS SHALL BE ZINC PLATED (ASTM B–633) HEAT TREATED CARBON STEEL TRACK HEAD CONFORMING TO PHYSICAL PROPERTIES OF ASTM A–449, MINIMUM TENSILE STRENGTH 110,000 PSI AS PROVIDED STANDARD.

   RIGID TYPE: RIGID JOINTS SHALL BE DESIGNED FOR DIRECT "STAB" INSTALLATION ONTO GROOVED PIPE WITHOUT PRIOR DISASSEMBLY OF THE COUPLING. HOUSINGS SHALL BE CAST WITH OFFSETTING, ANGLE–PATTERN BOLT PADS. HOUSINGS SHALL BE CAST WITH OFFSETTING, ANGLE–PATTERN BOLT PADS TO PROVIDE SYSTEM RIGIDITY AND SUPPORT AND HANGING IN ACCORDANCE WITH NFPA 13.

   FLEXIBLE TYPE: USE IN SEISMIC AREAS WHERE REQUIRED BY NFPA 13.
4. MECHANICAL COUPLING GASKETS: PRESSURE–RESPONSIVE, SYNTHETIC RUBBER LISTED FOR USE WITH THE HOUSINGS. FIRE PROTECTION SERVICE TEMPERATURE RANGE GASKET RECOMMENDATION DRY SYSTEMS AMBIENT FLUSHSEAL, GRADE EPDM, TYPE A FREEZER APPLICATIONS –40°F TO 0°F FLUSHSEAL, GRADE L, SILICONE WATER/WET SYSTEMS AMBIENT TO 150°F EPDM, TYPE E.
5. FLANGE ADAPTERS: FOR USE WITH GROOVED END PIPE AND FITTINGS, FOR MATING TO ANSI CLASS 125/150 FLANGES. FOR MATING TO ANSI CLASS 300 FLANGES USE.
6. GROOVED END FITTINGS: FITTINGS SHALL BE CAST OF DUCTILE IRON CONFORMING TO ASTM A–536, GRADE 65–45–12, FORGED STEEL CONFORMING TO ASTM A–234, GRADE WPB 0.375" WALL, OR FABRICATED FROM STD. WT. CARBON STEEL PIPE CONFORMING TO ASTM A–53, TYPE F, E OR S, GRADE B. FITTINGS PROVIDED WITH AN ALKYD ENAMEL FINISH OR HOT DIP GALVANIZED TO ASTM A– 153. ZINC ELECTROPLATED FITTINGS AND COUPLINGS CONFORM TO ASTM B633.

BRANCH OUTLETS

1. BOLTED BRANCH OUTLET: BRANCH REDUCTIONS ON 2" THROUGH 8" HEADER PIPING. BOLTED BRANCH OUTLETS SHALL BE MANUFACTURED FROM DUCTILE IRON CONFORMING TO ASTM ASTM A–536, GRADE 65–45– 12, WITH SYNTHETIC RUBBER GASKET, AND HEAT TREATED CARBON STEEL ZINC PLATED BOLTS AND NUTS CONFORMING TO PHYSICAL PROPERTIES OF ASTM A–183.
2. STRAPLESS OUTLET: 1/2" OR 3/4" NPT OUTLET ON 4" (DN100) AND LARGER HEADER SIZES RATED FOR 300 PSI.
3. STRAPLESS THERMOMETER OUTLET: TO ACCOMMODATE INDUSTRIAL GLASS BULB THERMOMETERS WITH STANDARD 1–1/4"–18 NEF 2B EXTRA FINE THREAD AND 6" NOMINAL BULB LENGTH ON 4" AND LARGER HEADER SIZES RATED FOR 300 PSI.

GROOVED END VALVES

1. BUTTERFLY VALVES: UL/FM GLOBAL APPROVED, 300 PSI, GROOVED ENDS, POLYPHENYLENE SULFIDE (PPS) COATED DUCTILE IRON BODY (ASTM A–536, GRADE 65–45–12). DUCTILE IRON DISC, SYNTHETIC RUBBER ENCAPSULATED SUITED FOR THE INTENDED SERVICE, WITH INTEGRALLY CAST STEM. COMPLETE WITH WEATHERPROOF ACTUATOR AND PRE–WIRED SUPERVISORY SWITCHES.
2. CHECK VALVES: UL/FM GLOBAL APPROVED. SIZE 4" THROUGH 14", SPRING ASSISTED; BLACK ENAMEL COATED DUCTILE IRON BODY, ASTM A–536, GRADE 65–45–12, ELASTOMER ENCAPSULATED DUCTILE IRON DISC SUITABLE FOR INTENDED SERVICE, STAINLESS STEEL SPRING AND SHAFT, WELDED–IN NICKEL SEAT, 300 PSI.
3. DRY SYSTEM CHECK VALVE: BLACK ENAMEL COATED DUCTILE IRON BODY CONFORMING TO ASTM A– 536, GRADE 65–45–12, ALUMINUM BRONZE CLAPPER, STAINLESS STEEL SPRING AND SHAFT, EPDM SEAL, AND NITRILE SEAT O–RINGS. VALVE INTERNAL PARTS SHALL BE REPLACEABLE WITHOUT REMOVING THE VALVE FROM THE INSTALLED POSITION. VALVE SHALL BE EXTERNALLY RESETTABLE. VALVE AIR TO WATER PRESSURE RATIO SHALL BE APPROXIMATELY 1 TO 8.
4. SPRINKLER HEADS: DIE–CAST BRASS FRAME, TEFLON ENCAPSULATED BELLEVILLE SPRING SEAL AND FRANGIBLE GLASS BULB. BODY CAST WITH HEX SHAPED WRENCH BOSS. QUICK OR STANDARD RESPONSE TYPE.
5. GUARDS AND ESCUTCHEONS: GUARDS AND ESCUTCHEONS SHALL BE LISTED, SUPPLIED, AND APPROVED FOR USE WITH THE SPRINKLER BY THE SPRINKLER MANUFACTURER.

ASSEMBLY

1. PIPE ENDS SHALL BE CLEAN AND FREE FROM INDENTATIONS, PROJECTIONS AND ROLL MARKS IN THE AREA FROM PIPE END TO GROOVE.
2. THE GASKET STYLE AND ELASTOMERIC MATERIAL (GRADE) SHALL BE VERIFIED AS SUITABLE FOR THE INTENDED SERVICE AS SPECIFIED.
3. GROOVED COUPLING MANUFACTURER'S FACTORY TRAINED FIELD REPRESENTATIVE SHALL PROVIDE ON–SITE TRAINING FOR CONTRACTOR'S FIELD PERSONNEL IN THE PROPER USE OF GROOVING TOOLS, APPLICATION OF GROOVED, AND INSTALLATION OF GROOVED PIPING PRODUCTS.

FLEXIBLE STAINLESS STEEL SPRINKLER FITTING SYSTEM

1. IN LIEU OF RIGID PIPE OFFSETS OR RETURN BENDS FOR SPRINKLER DROPS, A STAINLESS STEEL SPRINKLER FITTING SYSTEM MAY BE USED.
2. THE SYSTEM SHALL CONSIST OF BRAIDED TYPE 304 STAINLESS STEEL FLEXIBLE TUBE, A ZINC PLATED STEEL 1" NPT MALE THREADED NIPPLE FOR CONNECTION TO BRANCHLINE PIPING, AND A ZINC PLATED STEEL REDUCER WITH A 1/2" OR 3/4" NPT FEMALE THREAD FOR CONNECTION TO THE SPRINKLER HEAD. UNION JOINTS SHALL BE PROVIDED FOR EASE OF INSTALLATION.
3. THE FLEXIBLE DROP SHALL ATTACH TO THE CEILING GRID USING A ONE–PIECE OPEN GATE BRACKET. (THE BRACKET SHALL ALLOW FOR SPRINKLER INSTALLATION BEFORE OR AFTER THE BRACKET IS SECURED TO THE SPRINKLER GRID.)
4. THE FLEXIBLE DROP SYSTEM SHALL BE FM APPROVED FOR SPRINKLER SERVICES TO 200 PSI AND ABLE TO BE INSTALLED WITHOUT THE USE OF TOOLS.

COORDINATION DRAWINGS

PER SPECIFICATION SECTION 01 31 00 PROJECT MANAGEMENT AND COORDINATION, THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF COORDINATION DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA, AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS AND COORDINATION DRAWINGS:

1. ALL COORDINATION DRAWINGS WILL BE PRODUCED AT 1/4"= 1'–0 SCALE.
2. COORDINATION DRAWINGS WILL BE DISTRIBUTED ON REPRODUCIBLE MATERIAL 48"X36".
3. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
4. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

FIRE PROTECTION LEGEND

SYMBOL	ABBREV.	DESCRIPTION
F	F	FIRE MAIN (ABOVE CEILING)
UGM	UGM	FIRE SERVICE MAIN (UNDERGROUND)
OS&Y	OS&Y	OS&Y VALVE WITH TAMPER SWITCH
BFY	BFY	BUTTERFLY VALVE WITH TAMPER SWITCH
EB	EB	ELECTRIC BELL
TS	TS	TAMPER SWITCH
FS	FS	FLOW SWITCH

FIRE PROTECTION NOTES

GENERAL REQUIREMENTS:

1. THE INTENT OF THESE PLANS IS TO PROVIDE INFORMATION TO THE REVIEWING AUTHORITIES THAT THE BUILDING WILL BE PROTECTED BY A SPRINKLER SYSTEM. SPRINKLER (HEAD) LAYOUT INCLUDED WITH THIS SET OF PLANS IS PROVIDED FOR COORDINATION AND AS A REFERENCE ONLY, AND SHALL NOT BE CONSIDERED AN ACTUAL DESIGN OR CONSTRUCTION DOCUMENT.
2. WHERE DISCREPANCIES OCCUR BETWEEN THE DRAWINGS AND THE BOOK SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT THE ENGINEER OF RECORD FOR CLARIFICATION.
3. PROVIDE DESIGN, FABRICATION AND INSTALLATION OF A HYDRAULICALLY CALCULATED AUTOMATIC SPRINKLER SYSTEM INCLUDING ALL SERVICES, MATERIALS, LABOR AND EQUIPMENT REQUIRED FOR A COMPLETE WORKING SPRINKLER SYSTEM IN FULL COMPLIANCE WITH THE REQUIREMENTS OF NFPA 13 (2013 EDITION), THE OWNER'S INSURANCE UNDERWRITER AND THE LOCAL AUTHORITY.
4. OBTAIN A CURRENT FLOW TEST, LESS THAN 1 YEAR OLD, PRIOR TO STARTING THE DESIGN OF THE SPRINKLER SYSTEM. THE FLOW TEST CRITERIA SHALL INCLUDE THE STATIC PRESSURE, RESIDUAL PRESSURE, FLOW IN GPM, HORIZONTAL AND VERTICAL DISTANCE OF TEST FROM BASE OF FIRE RISER, THE NAME OF THE PERSON AND COMPANY WHOM PERFORMED THE FLOW TEST, THE TESTING COMPANY'S PHONE NUMBER, AND THE DATE AND TIME THE TEST WAS PERFORMED.
5. OBTAIN A COMPLETE AND CURRENT SET OF THE PROJECT CONSTRUCTION DOCUMENTS INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS. COORDINATE SPRINKLER SHOP DRAWINGS WITH ALL TRADES PRIOR TO STARTING CONSTRUCTION. COORDINATE THE LOCATION OF SPRINKLERS AND SPRINKLER PIPING WITH THE WORK OF OTHER TRADES.
6. DESIGN AND HYDRAULICALLY CALCULATE THE SPRINKLER SYSTEM UTILIZING THE INFORMATION INCLUDED HEREIN AND CURRENT FLOW TEST DATA. MEET ALL NFPA 13 REQUIREMENTS WHETHER OR NOT SPECIFICALLY INDICATED WITHIN THESE DOCUMENTS. TERMINATE THE HYDRAULIC CALCULATIONS AT THE CITY CONNECTION MINIMUM. INDICATE ON DRAWINGS ALL UNDERGROUND PIPE AND FITTINGS BOTH NEW AND EXISTING.
7. THE CONTRACTOR SHALL HAVE A DESIGNER ON STAFF WITH A CURRENT N.I.C.E.T. LEVEL IV CERTIFICATION TO PREPARE THE WORKING PLANS AND HYDRAULIC CALCULATIONS IN ACCORDANCE WITH N.F.P.A. 13 CHAPTER 22 "PLANS AND CALCULATIONS". THE N.I.C.E.T. DESIGNERS NAME, SIGNATURE AND CERTIFICATE NUMBER SHALL APPEAR ON THE WORKING DRAWINGS AND HYDRAULIC CALCULATIONS.
8. SUBMIT WORKING PLANS, HYDRAULIC CALCULATIONS AND MATERIALS DATA TO THE ARCHITECT / ENGINEER FOR REVIEW AND OBTAIN APPROVAL BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.
9. THE CONTRACTOR SHALL SUBMIT WORKING PLANS AND HYDRAULIC CALCULATIONS EXPEDIENTLY TO THE AUTHORITIES HAVING JURISDICTION. APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION SHALL BE OBTAINED BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.
10. AT THE COMPLETION OF THE PROJECT, PROVIDE TWO SETS OF RECORD DRAWINGS TO THE OWNER, CLEARLY SHOWING ANY CHANGES AND/OR MODIFICATIONS, ADDITIONS OR DELETIONS TO AND FROM THE CONSTRUCTION DOCUMENTS. THESE SETS SHALL BE REVIEWED BY THE ARCHITECT / ENGINEER BEFORE BEING TURNING OVER TO THE OWNER.

INSTALLATION REQUIREMENTS:

1. PROVIDE ALL NECESSARY OFFSETS, RISES OR DROPS IN THE PIPING AND AUXILIARY DRAINS AS REQUIRED BY ALL APPLICABLE CODES WHETHER OR NOT SHOWN ON THE PLANS.
2. CONNECT ALL SPRINKLER ALARM, TAMPER AND DETECTION SYSTEMS TO THE BUILDINGS CENTRAL FIRE ALARM SYSTEM, COORDINATE LOCATIONS AND REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.
3. PROVIDE CUTTING AND PATCHING OF EXISTING FLOORS, WALLS AND CEILINGS, AS REQUIRED FOR THE INSTALLATION OF THE FIRE PROTECTION SYSTEM. COORDINATE WITH THE GENERAL CONTRACTOR AND ALL OTHER TRADES.
4. CONCEAL FIRE PROTECTION SYSTEM PIPING ABOVE CEILINGS UNLESS NOTED OTHERWISE.
5. PAINT ALL EXPOSED FIRE PROTECTION SYSTEM PIPING (IN CLOSETS, MECHANICAL ROOMS, ETC.). COLOR TO BE SELECTED BY THE ARCHITECT.
6. SPRINKLER LOCATIONS ARE TO BE IN THE CENTER OF THE CEILING TILE USING THE REFLECTIVE CEILING PLANS AND AS COORDINATED WITH THE CEILING CONTRACTOR.
7. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE AMOUNT OF TIME SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.

MATERIALS:

1. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
2. ABOVE GRADE PIPING: BLACK STEEL PIPING (ASTM A53, ASTM A135, OR ASTM A795) SHALL BE LISTED FOR FIRE SPRINKLER PIPING USE AND INCLUDE FM APPROVED MIC INHIBITING COATING. PIPING 2" AND SMALLER SHALL BE SCHEDULE 40 BLACK STEEL PIPE WELDED OR ROLL GROOVED FOR MECHANICAL FITTINGS. PIPING 2½" AND LARGER SHALL BE SCHEDULE 10 BLACK STEEL PIPE THREADED, WELDED, OR ROLL GROOVED FOR MECHANICAL FITTINGS.
3. THREADED FITTINGS: UL–LISTED, STANDARD WEIGHT SUITABLE FOR PRESSURE UP TO 175 PSIG, CAST IRON MEETING ASTM A126 OR MALLEABLE IRON MEETING ASTM A197. THREADED CAST IRON FITTINGS SHALL MEET ANSI B16.4; FLANGED CAST IRON FITTINGS SHALL MEET ANSI B16.1. THREADED MALLEABLE IRON FITTINGS SHALL MEET ANSI B16.3.
4. GROOVED FITTINGS AND COUPLINGS: UL–LISTED, DUCTILE IRON MEETING ASTM A536, UTILIZING AN EDPM GASKET. REFER TO GROOVED PIPE SYSTEM NOTES ON THIS SHEET.
5. USE HOT–DIPPED GALVANIZED PIPING AND FITTINGS FOR COMPRESSED AIR PIPING, WATER MOTOR ALARM PIPING, BALL DRIP DISCHARGES AND TEST / DRAIN PIPING SUBJECT TO ALTERNATE WETTING AND DRYING.
6. PIPE HANGERS: UL–LISTED SWIVEL LOOP TYPE WITH PRE–GALVANIZED CARBON STEEL BAND, HANGER RODS SIZED PER NFPA 13, UL–LISTED STEEL OR MALLEABLE IRON BEAM CLAMPS