

DRY SPRINKLER SYSTEM SPECIFICATION

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. A SELF-CONTAINED, FULLY INTEGRATED LOW PRESSURE DRY PIPE SPRINKLER SYSTEM SHALL BE PROVIDED. THE SYSTEM MUST BE COMPRISED OF UL LISTED/FM APPROVED COMPONENTS WITHIN A CABINET SPECIFICALLY DESIGNED FOR THE INTENDED USE AS AN ASSEMBLED UNIT, CONTAINING ALL OF THE FACTORY INSTALLED HYDRAULIC AND ELECTRICAL COMPONENTS, FITTINGS, GAUGES, MECHANICAL COUPLINGS AND SUPERVISORY AIR SUPPLY NECESSARY FOR THE OPERATION OF AN APPROVED AUTOMATIC DRY SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.
- B. CABINET SHALL CONTAIN A DOMESTICALLY FACTORY-ASSEMBLED AND TESTED DRY SYSTEM RISER ASSEMBLY WITH GALVANIZED ELECTRIC ACTUATION TRIM. THE CABINET SHALL BE 12-GAUGE STEEL WITH RUSTPROOF EXTERIOR POWDER-COATED BLACK FINISH, AND RUSTPROOF INTERIOR POWDER-COATED WHITE FINISH FOR IMPROVED INTERIOR CABINET VISIBILITY. CABINET ENCLOSURE SHALL HAVE REMOVABLE PANELS FOR ACCESS TO INTERIOR COMPONENTS. CABINET DOOR SHALL BE LINED WITH A NEOPRENE GASKET AND SHALL CONTAIN VIEWING PORTS FOR WATER SUPPLY PRESSURE, SUPERVISORY AIR PRESSURE, AND SYSTEM PRESSURE GAUGES THAT ARE SECURELY MOUNTED.
- C. THE LOW PRESSURE DRY PIPE SYSTEM RISER ASSEMBLY SHALL INCLUDE A PROPERLY SIZED WATER CONTROL VALVE, WATER SUPPLY MANIFOLD AND DRAIN MANIFOLD WITH GROOVED END CONNECTIONS, SYSTEM DRAIN, GROOVED END SYSTEM CONTROL INDICATING BUTTERFLY VALVE WITH A PRE-WIRED SUPERVISORY TAMPER SWITCH ASSEMBLY, GROOVED-END SYSTEM DISCHARGE OUTLET, AND ASSOCIATED PNEUMATIC ACTUATION RELEASE TRIM LISTED AS PART OF THE DRY PIPE VALVE ASSEMBLY. DRY VALVE TRIM SHALL BE GALVANIZED AND SHALL CONSIST OF ALL COMPONENTS NECESSARY TO ENABLE THE SYSTEM TO BE USED AS A LOW PRESSURE SYSTEM. THESE COMPONENTS INCLUDE A LOW PRESSURE DRY PILOT ACTUATOR, MAIN DRAIN, ALARM LINE TEST, WATER PRESSURE GAUGES, PUSH ROD CHAMBER SUPPLY CONNECTIONS, MANUAL EMERGENCY RELEASE VALVE, PRESSURIZING LINE CONNECTION, AND 4" DIAMETER DRIP CUP ASSEMBLY. A CONDENSATE DRAIN VALVE SHALL ALSO BE INCLUDED TO PREVENT WATER COLUMNING ABOVE THE CLAPPER. LOW AIR SUPERVISORY AND WATER FLOW PRESSURE SWITCHES SHALL BE INCLUDED AS PART OF THIS ASSEMBLY.
- D. SUPERVISORY AIR SUPPLY SHALL BE PROVIDED BY AN OIL-LESS, TANK-MOUNTED AIR COMPRESSOR WITH ASSOCIATED PRESSURE SWITCH AND CHECK VALVE LOCATED WITHIN THE CABINET. DRY PIPE SYSTEM SUPERVISORY AIR SHALL BE REGULATED THROUGH A REGULATING PRESSURE MAINTENANCE DEVICE SET IN ACCORDANCE WITH THE MANUFACTURERS DATA SHEET.
- E. A 120/220 VAC WATERTIGHT TERMINAL BOX MOUNTED INSIDE THE CABINET SHALL BE PROVIDED FOR POWER CONNECTION TO THE AIR COMPRESSOR. WIRING OF CONTROL VALVE SUPERVISORY SWITCH, LOW PRESSURE ALARM SWITCH, WATERFLOW ALARM PRESSURE SWITCH, AND OPTIONAL LOW NITROGEN PRESSURE SWITCH SHALL BE TRANSLATED TO A WATERTIGHT TERMINAL BOX MOUNTED INSIDE THE CABINET. ALL FIELD WIRING SHALL BE CONNECTED TO THESE BOXES.
- F. ASSEMBLED UNIT DRY PIPE SYSTEM TO BE RELIABLE MODEL DDX-LP DRYPAK. [NOTE THAT THIS SYSTEM IS AVAILABLE IN SIZES 2 1/2", 3", 4", 6", AND 8"]

PART 2 MATERIALS

2.01 SYSTEM CONTROL VALVE

- A. A [2"] [2-1/2"] [3"] [4"] [6"] [8"] SLOW CLOSE, UL LISTED/FM APPROVED INDICATING WAFER-STYLE BUTTERFLY VALVE WITH GROOVED END CONNECTIONS AND INTEGRAL SUPERVISORY TAMPER SWITCH ASSEMBLY SHALL BE PROVIDED. BUTTERFLY VALVE SHALL HAVE A WORKING PRESSURE RATING OF 250 PSI. VALVE BODY SHALL BE CAST DUCTILE IRON CONSTRUCTION IN ACCORDANCE WITH ASTM A 536 AND STEM TO BE 416 STAINLESS STEEL. BOTH THE STEM SEAL AND THE DISC SEAL TO BE CONSTRUCTED OF NITRILE (BUNA-N) RUBBER. THE VALVE SHALL HAVE A WEATHERPROOF GEAR OPERATOR RATED FOR INDOOR/OUTDOOR USE WITH HAND WHEEL AND RAISED POSITION INDICATOR.
- B. TWO INTERNAL, FACTORY-MOUNTED SUPERVISORY SWITCHES SHALL BE HOUSED WITHIN THE SWITCH BOX HOUSING; A S.P.S.T. SWITCH HAVING A RATING OF 15A @ 125 VAC, 1/2A @ 125 VDC, AND A S.P. D. T. SWITCH HAVING A RATING OF 11A @ 125 VAC, 1 A @ 28 VDC. ALL LEAD WIRES FOR EXTERNAL CONNECTIONS ARE TO BE 18 AWG, EXITING THE SWITCH BOX HOUSING THROUGH A SINGLE HOLE SUITABLE FOR 1/2" CONDUIT FITTINGS. WATER SUPPLY CONTROL VALVE SHALL BE A [2"] [2-1/2"] [3"] [4"] [6"] [8"] NIBCO MODEL WD3510-8 BUTTERFLY VALVE.

2.02 DELUGE VALVE

- A. THE ASSEMBLED UNIT DRY PIPE SYSTEM SHALL UTILIZE A [2"] [2-1/2"] [3"] [4"] [6"] [8"] RELIABLE MODEL DDX DELUGE VALVE. 2", 2 1/2", 3", AND 8" DELUGE VALVES SHALL HAVE A RATED WORKING PRESSURE OF 250 PSI AND SHALL BE FACTORY HYDROSTATIC TESTED AT 500 PSI. 4" AND 6" DELUGE VALVES SHALL HAVE A RATED WORKING PRESSURE OF 300 PSI AND SHALL BE FACTORY HYDROSTATIC TESTED AT 600 PSI.
- B. DELUGE VALVE SHALL BE A [2"] [2-1/2"] [3"] [4"] [6"] [8"] UL LISTED/FM APPROVED HYDRAULICALLY OPERATED, DIFFERENTIAL LATCHING CLAPPER-TYPE VALVE. DELUGE VALVE CONSTRUCTION SHALL BE OF LIGHTWEIGHT, DUCTILE-IRON CONSTRUCTION WITH "SCREW IN" STAINLESS STEEL SEAT AND CLAPPER ASSEMBLY. SEAT SHALL HAVE O-RING SEALS TO RESIST CORROSION AND LEAKAGE. CLAPPER FACING SHALL BE PRESSURE ACTUATED, PROVIDING A LIMITED COMPRESSION SEAT FOR THE SEALING FORCE BETWEEN THE CLAPPER RUBBER FACING AND THE VALVE SEAT. DELUGE VALVE SHALL HAVE AN EXTERNAL RESET KNOB FOR RESETTING THE CLAPPER WITHOUT HAVING TO REMOVE THE VALVE FACE PLATE. PUSH-ROD CHAMBER DESIGN SHALL CONSIST OF A STAINLESS STEEL PISTON/ PUSH-ROD AND SPRING ASSEMBLY WITH DIAPHRAGM SEAL SECURED TO THE CASTING THROUGH A PUSH-ROD GUIDE CONSTRUCTED OF A SYNTHETIC ENGINEERING PLASTIC TO RESIST CORROSION. CASTING SHALL HAVE A BLEEDER HOLE LOCATED ON THE PUSHROD CHAMBER FOR AIR/WATER LEAKAGE INDICATION. TRIP RATIO SHALL BE APPROXIMATELY A 3:1 FORCE DIFFERENTIAL. DELUGE VALVE SHALL BE OF THE STRAIGHT-THROUGH DESIGN TO MINIMIZE FRICTION LOSS AND SHALL BE ACTIVATED BY PNEUMATIC ACTUATION TRIM. INLET RESTRICTION ORIFICE SHALL BE FACTORY INSTALLED INTO INLET PORT OF DELUGE VALVE PUSH-ROD COVER PLATE AND NOT BE A SEPARATE PART OF THE DELUGE VALVE TRIM. END CONNECTION STYLE TO BE GROOVED INLET AND GROOVED OUTLET, PER ANSI/AWWA C606.
- C. VALVE TRIM SHALL CONSIST OF GALVANIZED AND BRASS COMPONENTS SPECIFICALLY LISTED/APPROVED WITH THE DELUGE VALVE. TRIM COMPONENTS SHALL INCLUDE [1-1/4-INCH] [2-INCH] MAIN DRAIN, ALARM LINE TEST, WATER PRESSURE GAUGES, PUSH ROD CHAMBER SUPPLY CONNECTIONS, MANUAL EMERGENCY RELEASE VALVE, AND 4" DIAMETER DRIP CUP ASSEMBLY. CONDENSATE DRAIN VALVE SHALL ALSO BE INCLUDED TO PREVENT WATER COLUMNING ABOVE THE CLAPPER. DELUGE VALVE RELEASING DEVICE SHALL BE A LOW PNEUMATIC PRESSURE DRY PILOT ACTUATOR.

2.03 DRY PILOT ACTUATOR

- A. THE LOW PRESSURE PNEUMATIC ACTUATOR SHALL BE OF CAST IRON CONSTRUCTION UTILIZING A DIAPHRAGM AND COMPRESSION SPRING DESIGN TO SEPARATE THE PUSH-ROD CHAMBER WATER PRESSURE FROM THE SYSTEM PIPING PNEUMATIC SUPERVISORY PRESSURE. THE LOW PRESSURE ACTUATOR SHALL ONLY REQUIRE BETWEEN 8 AND 28 PSI SUPERVISORY PRESSURE FOR PROPER SETTING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. LOW PRESSURE ACTUATOR SHALL BE RELIABLE MODEL LP ACTUATOR.

2.04 SUPERVISORY AIR SUPPLY

- A. A TANK-MOUNTED AIR COMPRESSOR WITH ASSOCIATED PRESSURE SWITCH AND CHECK VALVE SHALL BE CONTAINED WITHIN THE CABINET. COMPRESSOR SHALL BE SELECTED FROM THOSE AVAILABLE FROM MANUFACTURER AND LISTED WITH UNIT BASED UPON SYSTEM SIZE, MOTOR SIZE, VOLTAGE, AND OTHER ELECTRICAL CHARACTERISTICS SHALL BE COORDINATED WITH ELECTRICAL SUBCONTRACTOR. AIR

SUPPLY SHALL BE REGULATED BY AN APPROVED REGULATING TYPE AIR MAINTENANCE DEVICE CONTAINING A FIELD ADJUSTABLE REGULATOR HAVING A RANGE OF 5 TO 100 PSI, A CHECK VALVE, STRAINER, AND A RAPID FILL VALVE. DRY SYSTEM SUPERVISORY AIR PRESSURE SHALL BE SET IN ACCORDANCE WITH THE MANUFACTURERS DATA SHEET.

2.05 SPRINKLERS

- A. REFER TO SPRINKLER SECTION OF SPECIFICATIONS

2.06 ACCELERATOR

- A. FOR SYSTEM CAPACITIES IN ACCORDANCE WITH NFPA 13, AN ACCELERATOR WITH ASSOCIATED GALVANIZED TRIM KIT SHALL BE PROVIDED TO EXHAUST AIR PRESSURE FROM THE PNEUMATIC ACTUATOR TRIM PIPING IN ORDER TO HASTEN OPERATION OF THE DRY PIPE SYSTEM. MINIMUM PNEUMATIC PRESSURE SHALL BE 15 PSI TO ENSURE PROPER ACCELERATOR OPERATION. ACCELERATOR SHALL BE UL LISTED/FM APPROVED FOR USE WITH THE LOW PRESSURE DRY PIPE VALVE TRIM. ACCELERATOR SHALL BE CAPABLE OF ADJUSTING FOR SMALL FLUCTUATIONS IN SYSTEM AIR PRESSURE WITHOUT CAUSING OPERATION. THE ACCELERATOR SHALL CONTAIN AN INTEGRAL ACCELO-CHECK (ANTI-FLOODING) ASSEMBLY TO PREVENT ENTRY OF WATER AND DEBRIS INTO CRITICAL INTERNAL AREAS DURING OPERATION. ACCELERATOR BODY AND DOME TO BE OF CAST ALUMINUM AND EPOXY COATED INSIDE AND OUT. DIAPHRAGM CONSTRUCTION SHALL CONSIST OF DUPONT FAIRPRENE BN 5049 WITH STAINLESS STEEL FILTER ASSEMBLY. TRIM KIT SHALL CONSIST OF ALL GALVANIZED AND BRASS PARTS, INCLUDING AN ISOLATING BALL VALVE. ACCELERATOR AND TRIM KIT SHALL BE RELIABLE MODEL B-1 ACCELERATOR TRIM KIT.

2.07 LOW AIR SUPERVISORY PRESSURE SWITCH

- A. SUPERVISORY AIR PRESSURE WITHIN THE DRY SYSTEM PIPING SHALL BE MONITORED THROUGH THE USE OF A LOW AIR SUPERVISORY PRESSURE SWITCH. IT SHALL BE UL LISTED/FM APPROVED. THE SWITCH SHALL BE A FIELD-ADJUSTABLE, BELLOWS-ACTIVATED TYPE PRESSURE SWITCH COMPATIBLE WITH SYSTEM DEVICES. THE PRESSURE SWITCH SHALL HAVE THE CAPABILITY TO PROVIDE ALARM RESPONSE BETWEEN 10 AND 100 PSI, AND SHALL BE FIELD ADJUSTED TO CORRELATE WITH NORMAL SYSTEM OPERATING PRESSURE. THE PRESSURE SWITCH SHALL HAVE TWO FIELD-REPLACEABLE SPDT CONTACTS RATED AT 10.0 AMP @ 125/250 VAC AND 2.5 AMP @ 6/12/24 VDC. SWITCH SHALL BE PROVIDED WITH A 1/2" NPT MALE GLASS-REINFORCED NYLON PRESSURE CONNECTION, AND SHALL HAVE A MAXIMUM PRESSURE RATING OF 250 PSI. TWO CONDUIT CONNECTION HOLES SHALL BE PROVIDED IN THE MOUNTING PLATE TO ACCEPT STANDARD 1/2" CONDUIT FITTINGS. THE SWITCH ENCLOSURE SHALL BE WEATHERPROOF AND CARRY A UL 4X/NEMA 4 RATING WHEN USED WITH PROPER ELECTRICAL FITTINGS AND CONDUIT. THE COVER SHALL HAVE THE WIRING DIAGRAM CAST INTO IT AND INCORPORATE TAMPER-RESISTANT SCREWS. LOW AIR SUPERVISORY PRESSURE SWITCH SHALL BE A SYSTEM SENSOR EPS 40-2 PRESSURE SWITCH.

2.08 WATER FLOW PRESSURE SWITCH

- A. AN ALARM PRESSURE SWITCH INSTALLED ON THE ALARM LINE TRIM OF THE DELUGE VALVE SHALL PROVIDE A WATER FLOW ALARM. IT SHALL BE [CULUS LISTED] [FM APPROVED] [NYC MEA APPROVED]; THE SWITCH SHALL BE A FIELD-ADJUSTABLE, BELLOWS-ACTIVATED TYPE PRESSURE SWITCH COMPATIBLE WITH SYSTEM DEVICES. THE PRESSURE SWITCH SHALL HAVE THE CAPABILITY TO PROVIDE ALARM RESPONSE BETWEEN 4 AND 20 PSI, BUT SHALL BE FACTORY ADJUSTED TO RESPOND AT 4 TO 8 PSI ON RISING PRESSURE. THE PRESSURE SWITCH SHALL HAVE A FIELD-REPLACEABLE SPDT CONTACT(S) RATED AT 10.0 AMP @ 125/250 VAC AND 2.5 AMP @ 6/12/24 VDC. SWITCH SHALL BE PROVIDED WITH A 1/2" NPT MALE GLASS-REINFORCED NYLON PRESSURE CONNECTION, AND SHALL HAVE A MAXIMUM PRESSURE RATING OF 250 PSI. TWO CONDUIT CONNECTION HOLES SHALL BE PROVIDED IN THE MOUNTING PLATE TO ACCEPT STANDARD 1/2" CONDUIT FITTINGS. THE SWITCH ENCLOSURE SHALL BE WEATHERPROOF AND CARRY A UL 4X/NEMA 4 RATING WHEN USED WITH PROPER ELECTRICAL FITTINGS AND CONDUIT. THE COVER SHALL HAVE THE WIRING DIAGRAM CAST INTO IT AND INCORPORATE TAMPER-RESISTANT SCREWS. ALARM PRESSURE SWITCH SHALL BE A SYSTEM SENSOR EPS 10-1 PRESSURE SWITCH.

2.09 PIPING

- A. SYSTEM PIPING AND FITTINGS SHALL BE AS RECOMMENDED BY NFPA 13. REFER TO PIPING SECTION OF SPECIFICATIONS.

2.10 SYSTEM DRAIN

- A. THE SINGLE DRAIN COLLECTOR OF THE DRY SYSTEM SHALL BE CONNECTED TO AN OPEN DRAIN CONSISTING OF A VERTICAL PIPE WITH AN AIR GAP AROUND THE DRAIN COLLECTOR PIPE.
- B. THE DRAIN PIPING SHALL NOT BE RESTRICTED OR REDUCED AND SHALL BE OF THE SAME DIAMETER AS THE DRAIN COLLECTOR.
- C. MULTIPLE DRAIN COLLECTORS AND OPEN DRAIN CUPS INSIDE THE CABINET WILL NOT BE ACCEPTED.

PART 3 EXECUTION

3.01 INSTALLATION

- A. THE INSTALLATION MUST MEET ALL ESTABLISHED STANDARDS AND BE ACCORDING TO ALL APPLICABLE LAWS, REGULATIONS AND CODES.
- B. THE PROPER OPERATION AND COORDINATION FOR THE SYSTEM'S INSTALLATION, INCLUDING THE AUTOMATIC SPRINKLER SYSTEM, AND INITIAL START-UP ARE ALL UNDER THE RESPONSIBILITY OF THE FIRE PROTECTION CONTRACTOR.
- C. WATER SUPPLY FOR THE CABINET SHALL ALLOW A GROOVED CONNECTION TO SUPPLY MANIFOLD FROM THE LEFT OR RIGHT-HAND SIDE OF THE UNIT.
- D. DRAIN OUTPUT FOR THE CABINET SHALL BE CONNECTED THROUGH THE BOTTOM CENTER OF THE UNIT.

3.02 TRAINING

- A. THE CONTRACTOR MUST PLAN AND ORGANIZE A TRAINING SESSION OF AT LEAST TWO HOURS FOR THE BUILDING MAINTENANCE STAFF, IN THE PRESENCE OF BUILDING OWNER OR HIS REPRESENTATIVE.
- B. THE TRAINING SESSION MUST INCLUDE NORMAL OPERATION, EMERGENCY PROCEDURES AND SYSTEM MAINTENANCE.

3.03 TESTS AND VERIFICATIONS

- A. HYDROSTATIC TESTS MUST BE PERFORMED ON THE ENTIRE SPRINKLER PIPING SYSTEM, AS REQUIRED BY NFPA 13.
- B. A DRAIN TEST USING THE AUXILIARY DRAIN VALVE FULLY OPEN (DRAIN LOCATED ON WATER SUPPLY SIDE, DRY VALVE INLET) MUST BE PERFORMED TO MAKE SURE THAT NO BACK PRESSURE IN DRAIN PIPING EXISTS, WHICH COULD AFFECT THE PROPER OPERATION OF THE DRY SYSTEM.
- C. AN AIR SUPPLY TEST MUST BE PERFORMED, TO CONFIRM THAT NORMAL AIR PRESSURE CAN BE RESTORED WITHIN 30 MINUTES.

3.04 REPORT & CERTIFICATE

- A. AN INSPECTION REPORT AND A CERTIFICATE MUST BE SUPPLIED TO THE ENGINEER AT THE COMPLETION OF THE PROJECT. ALL TEST RESULTS SHALL BE REGISTERED IN A BOOKLET TO BE INCLUDED WITH THE INSPECTION REPORT.

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KEY PLAN

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DRAWN BY : M.ESPINAL

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DWG NUMBER :

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TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.