

DOUBLE INTERLOCK PREACTION SPRINKLER SYSTEM SEQUENCE OF OPERATION

1. **SET POSITION:**

WHEN SYSTEM IS SET FOR SERVICE, THERE IS NO WATER IN THE SYSTEM PIPING, NOMINAL AIR PRESSURE IS INTRODUCED INTO THE SPRINKLER PIPING AND A SUPERVISORY LOW PRESSURE ALARM SWITCH IS USED TO SUPERVISE FOR A LOW PRESSURE CONDITION. THE SENSING END OF THE PNEUMATIC ACTUATOR IS PRESURIZED, THIS CLOSES THE PNEUMATIC ACTUATOR. THE CLOSED PNEUMATIC ACTUATOR AND THE NORMALLY CLOSED SOLENOID VALVE PREVENT PRIME WATER FROM ESCAPING THE PRIME CHAMBER OF THE PREACTION VALVE. WHEN THE PRIME WATER ENTERS THE PRIME CHAMBER, THE ROLLING DIAPHRAGM IS PRESSED, CAUSING IT TO EXPAND AND DOWNWARD INTO THE WATER SEAT.

SUBSTANTIAL LOSS OF PRESSURE FROM THE SYSTEM AT THE RATE THAT CANNOT BE MAINTAINED BY THE AUTOMATIC PRESSURE MAINTENANCE DEVICE, TO BELOW NOMINAL AIR PRESSURE DUE TO DAMAGED SPRINKLER OR PIPING, WILL RESULT IN A SUPERVISORY ALARM INDICATING THAT THE SYSTEM PIPING OR SPRINKLERS ARE IN NEED OF REPAIR. THE PREACTION VALVE AND THE SOLENOID VALVE WILL NOT OPEN DUE TO LOSS OF SUPERVISORY AIR.

2. FIRE CONDITION:

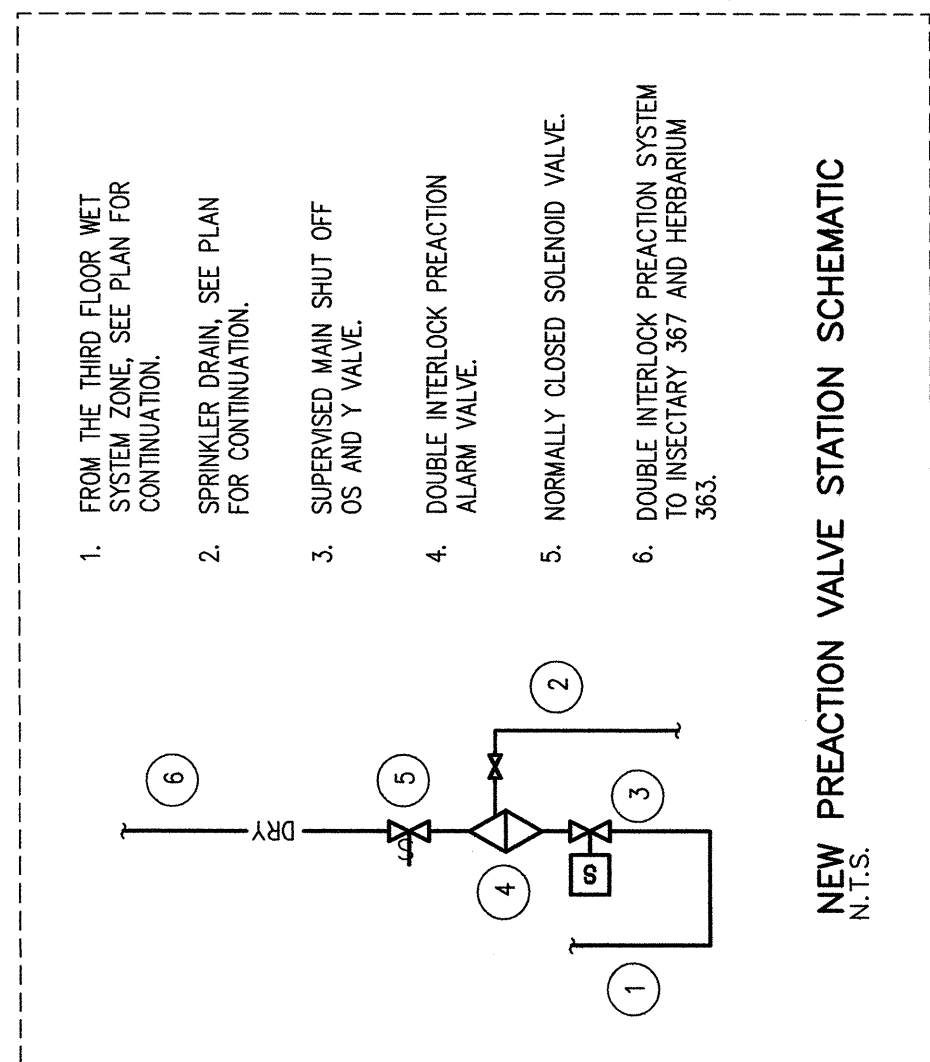
WHEN THE ELECTRIC HEAT DETECTION SYSTEM OPERATES, THE NORMALLY CLOSED SOLENOID VALVE IS POWERED OPEN BY THE RELEASE CONTROL PANEL AND AN ELECTRIC ALARM IS ACTIVATED. AT THIS POINT, THE PRIME WATER IS STILL HELD IN THE PRIME CHAMBER BY THE CLOSED PNEUMATIC ACTUATOR AND THE PREACTION VALVE WILL NOT OPEN.

WHEN A SPRINKLER OPERATES, AIR PRESSURE IS LOST ON THE SENSING END OF THE PNEUMATIC ACTUATOR, CAUSING THE PNEUMATIC ACTUATOR TO OPEN, WITH BOTH THE PNEUMATIC ACTUATOR AND SOLENOID VALVE OPEN, PRIME WATER IS DRAINED FROM THE PRIME CHAMBER CAUSING THE PREACTION VALVE TO OPEN.

THE WATERFLOW ALARMS WILL BE INITIATED AND FILLING THE PIPING WITH WATER WHICH WILL BE DISCHARGED FROM ANY SPRINKLERS OPERATING.

1. REFER TO SPECIFICATIONS FOR HAZARDOUS MATERIALS ASSESSMENT AND CONSTRUCTION REQUIREMENTS.
2. CONTRACTOR SHALL COORDINATE AND SCAN EXISTING CONCRETE STRUCTURE PRIOR TO CORING NEW OPENINGS.
3. COORDINATE WITH EXISTING CEILING, DIFFUSER, GRILLE, REGISTER, DUCTWORK AND LIGHTING FIXTURE LAYOUT ON SITE.

F1.1	INFILL ABANDONED WALL OPENING THROUGH CONCRETE BLOCK NEW IN CEILING SPACE.
F1.2	NEW WET LINE UP TO PORCHHOUSE LEVEL, AWAY FROM HERBARIUM, WEST AND BACK-LEED TO EXISTING THIRD FLOOR NORTH SYSTEM AT ROOM 355.
F1.3	EXISTING THIRD FLOOR WET ZONE TAMPER VALVE AND FLOW SWITCH TO REMAIN.
F1.4	EXISTING SPRINKLER PIPING SHALL BE THOROUGHLY DRAINED PRIOR TO CONVERTING TO DRY PREACTION DUTY.



FIRE PROTECTION LEGEND	
●	RECESSED, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
○	UPRIGHT OR PENDENT, 15mm (1/2"), X FACTOR 80.7(5.6), 100(21.2), BRASS
⊙	PENDANT, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME PLATED TWO-PIECE ESUTOCHRON.
◐	FLUSH, CONCEALED, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
◑	RECESSED, QUICK RESPONSE, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
⊗	UPRIGHT, 15mm (1/2"), X FACTOR 80.7(5.6), 100(21.2), BRASS AND RECESSED, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
◉	DRY PENDANT, 15mm (1/2"), X FACTOR 80.7(5.6), 100(21.2), CHROME w/CHROME PLATED ESUTOCHRON.
▽	SIDEWALL, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME ESUTOCHRON.
▽	DRY SIDEWALL, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME ESUTOCHRON.
▼	SIDEWALL, QUICK RESPONSE, 15mm (1/2"), X FACTOR 80.7(5.6), 74(10.5), CHROME w/CHROME ESUTOCHRON.
*	INDICATES CHROME PLATED LISTED GUARD.

FIRE PROTECTION LEGEND	
●	RECESSED, 19.1mm (3/4"), X FACTOR 18.3(11.4), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
◐	UPRIGHT OR PENDENT, 19.1mm (3/4"), X FACTOR 18.3(11.4), 100(21.2), BRASS
⊙	UPRIGHT OR PENDENT, 19.1mm (3/4"), X FACTOR 18.3(11.4), 100(21.2), BRASS AND RECESSED, 19.1mm (3/4"), X FACTOR 18.3(11.4), 74(10.5), CHROME w/CHROME PLATED ESUTOCHRON.
◆	WET ALARM VALVE
◇	DRY ALARM VALVE
◻	PREDICTION ALARM VALVE
□	WATERFLOW SWITCH
◻	WATER PRESSURE SWITCH
◻	SUPERVISED SHUT-OFF NEW SPRINKLER PIPE
—	EXISTING WET SPRINKLER PIPE
—	NEW DRY SYSTEM PIPE
—	EXISTING DRY SPRINKLER PIPE
○	EXISTING BRASS
●	EXISTING PENDING
⊙	EXISTING UPRIGHT AND PENDING
—	EXISTING HEAD/PIPING TO BE REMOVED

NOTE: SPRINKLERS IN LIGHT HAZARD OCCUPANCIES SHALL BE OF THE QUICK RESPONSE TYPE AS PER NFPA 13, 2010.	
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WATER SUPPLY DATA

APPLIED BY : MURRAY JOHNSON ENGINEERING LTD.

2012

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STATIC PRESSURE : [kPa] 647

RESIDUAL PRESSURE : [kPa] 551

RESIDUAL FLOW : 4560 [L/min]

0071 [ind6c9]

CORRECTION FACTOR = 0.90

STATIC PRESSURE (kPa)	578
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RESIDUAL PRESSURE:	(psi)	84
	(KPa)	495

RESIDUAL FLOW:

(US gpm/min) 1080

PWGSC - B1 - 1000x707