UNIVERSITY OF TORONTO | Facilities & Services

Sprinkler and standpipe design standard

Revision 02

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21 05 00 – Common work results for fire suppression

1. Sprinkler heads

1.1 Spare sprinkler heads, along with escutcheon rings and a wrench matching each type and temperature rating of the installed sprinklers, shall be installed in the vicinity of the main sprinkler entrance. The surplus material specifications shall specify the required number of cabinets within the building.

1.2 All cold rooms and walk-in freezers shall be equipped with sprinkler heads rated for the room design (refer to NFPA 13 Installation of Sprinkler Systems Standard).

1.3 Consultant shall make the University of Toronto (the “University”) aware of all inspections prior to closing of finished ceilings.

2. Dry sprinkler systems

2.1 Only dry sprinkler systems shall be used in areas where potential freezing will occur.

3. Close-out documentation

3.1 The submission of close-out documents shall adhere to the requirements outlined in the deliverable standard. Warranty submittals shall be the same as the deliverable standard. In addition to the deliverable standard close-out submission, the following items are also required:

A. Initial test reports for all sprinkler equipment to address equipment pressure settings.

B. Specification sheets on each type of sprinkler used in the project.

C. Specification sheets on each type of isolation valve used in the project.

D. Specification sheets on each type of switch used in the project.

E. Specification sheets on any additional equipment used in the project, i.e. Air dryers, compressors, and nitrogen generators.

F. Alarm valve(s) owner’s manual(s).

4. Site meetings

4.1 The University’s Fire Prevention team shall be in the distribution list of the site meeting minutes and commissioning minutes.

21 11 00 – Facility fire-suppression water-service piping

1. Piping

1.1 All threaded piping shall be schedule 40 or greater.

1.2 Trim on alarm valves shall be galvanized.

1.3 Drain lines (including two-inch main drains, auxiliary drains, and drains from inspector's tests) shall be galvanized piping.

1.4 Piping from air compressors to system piping shall be galvanized pipe or soft copper tubing.

1.5 All nuts, washers, rod, and hangers used in dry pipe systems shall be galvanized.

1.6 Excess pressure pumps shall be wired for automatic operation using a Potter control pressure switch (Potter Part# PCS-300-1B).

1.7 Drains shall not empty into sinks or slop sinks. A hub drain shall be provided, properly trapped, vented, and equipped with a trap seal primer.

1.8 Alarm valves shall have a minimum clearance of 300 mm (12 in) around the valves, measured beyond the trim.

1.9 Sprinkler systems shall use rolled-grooved type couplings and fittings.

- Standard of Acceptance: Victaulic grade E, Type A, c/w FlushSeal gaskets

2. Dry pipe, pre-action, and deluge system piping

2.1 Cut ends of piping and holes made for saddle tees shall be coated with a galvanized coating.

2.2 During renovations in existing buildings, where saddle tees or mechanical tees are installed, the associated cut-out ("coupon") shall be securely zip-tied to the tee to ensure clear piping.

2.3 Drum drips shall be installed with WATTS #6000 ball valves.

2.4 Drum drips shall not be installed higher than 1,829 mm (72 in) above the finished floor.

2.5 If galvanized sprinkler piping is required to be painted, then the piping shall be installed and painted as follows:

A. Prime piping with galvanized primer and paint red.

B. Piping shall be primed and painted after the system has been installed.

2.6 If nitrogen generators are supplied for a dry or pre-action system or group of systems, they shall be Potter models.

3. Sprinkler valves

3.1 Alarm check valves (wet)

- Standard of Acceptance: Victaulic series 751.

3.2 Alarm check valves (dry)

- Standard of Acceptance: Victaulic series 768

3.3 Riser check valves

- Standard of Acceptance: Victaulic 717R

3.4 Normally closed valves

- Standard of Acceptance: Victaulic series 707C or 766 models

3.5 Isolation valves larger than 50 mm (2 in)

- Standard of Acceptance: Victaulic butterfly valves

3.6 All valves 50 mm (2 in) and smaller

- Standard of Acceptance: WATTS #6000 ball valves

3.7 Double check valve backflow devices

- Standard of Acceptance: Watts 757 BFG models or Watts 757 DCDA BFG models depending on City of Toronto requirements.

3.8 Reduced pressure principal backflow devices

- Standard of Acceptance: Watts 957 BFG models

3.9 Control valve assemblies for pre-action or deluge systems shall be prepackaged systems manufactured by Victaulic.

3.10 Galvanized material is required for trim on alarm valves.

3.11 When a combination inspector’s test/drain valve is used, it shall include a pressure gauge and conform to either “TESTanDRAIN Model 1000” or “Model A61 Test and Drain” specifications.

3.12 Automatic operation is required for the excess pressure pump on a wet system and the compressor on a dry system.

3.13 The pressure switch, along with a WATTS #6000 isolation valve, shall be located on the system riser above the alarm valve.

3.14 All valves shall be marked with permanent, chained tags indicating the area served or purpose, consistent with descriptions on the fire alarm system zoning.

3.15 The 50 mm (2 in) main drain from all alarm valves shall be piped to a dedicated hub drain capable of accommodating full flow. For multiple installations, the drain lines may be combined and directed to a single dedicated hub drain. An acceptance test shall be done before the U of T accepts the work.

3.16 For valves 50 mm (2 in) and smaller, including valve trim and inspector's test valves, Watts 6000 series ball valves shall be used.

4. Zone control stations

4.1 Zone control stations shall consist of monitored isolation valve, a check valve, a flow switch, and a combination inspector's test/drain valve.

4.2 Zone control stations shall be housed in the same style of cabinet used for the standpipe systems.

4.3 Zone control stations shall be provided and located in public areas adjacent to fire hose cabinets.

4.4 Zone control stations shall not be located in ceiling spaces, washrooms, janitor's rooms, change rooms, or private offices.

4.5 The top of the zone control station cabinet shall be installed no higher than 2,134 mm (84 in) above the finished floor.

4.6 The drain line from the inspector's test/drain shall be piped to a dedicated hub drain capable of receiving full flow. In multi-storey buildings, drain lines from a common sprinkler riser may be combined and directed to a single dedicated hub drain. An acceptance test shall be done before the U of T accepts the work.

5. Backflow preventors

5.1 As per the City of Toronto Municipal Code for water supply requirements, a backflow preventor shall be installed on sprinkler systems and standpipe systems in all buildings.

21 11 19 – Fire department connections

1. General

1.1 Free standing fire department connections are not acceptable.

21 12 00 – Fire-suppression standpipes

1. General

1.1 Standpipe systems shall be supplied with isolation, isolation supervision and draining provisions at the base of all risers.

21 30 00 – Fire pumps

1. General

1.1 Fire pump installations shall include flow test connections that extend to the outside of the building, terminating at a location approved by the U of T Fire Prevention team.

1.2 The flow test connection termination point shall be provided with an identification plate similar to the type used for the fire department connection.

1.3 The flow test connections shall be provided with the required 65 mm (2 ½ in) threaded hose connections (complete with brass caps) to facilitate adequate flow for testing the fire pump.

1.4 The fire pump test connection shall be controlled by a supervised butterfly valve, complete with a 50 mm (2 in) Watts #6000 ball valve installed to fully drain the piping from the isolation valve to the test connection. This two-inch drain line shall terminate in a dedicated hub drain capable of receiving full flow.

1.5 All piping and fittings from the isolation valve to the test connection, including drain lines, shall be schedule 40 galvanized pipes.

1.6 Fire pumps shall be supplied with mechanical seal construction, and packing is not allowed.

1.7 Fire pumps shall be paired with a jockey pump. Excess pressure pumps shall not be used as substitutes.

1.8 Fire pumps shall be labeled as either “Sprinkler Fire Pump” or “Standpipe Fire Pump” on both the pump itself and on the fire alarm panel zones.