

Design Standards  
Mechanical – Fire Protection: Division 139xx (1995);  
21xxxx(2004)

Amended February 2015

## **SPRINKLER SYSTEMS**

### **13910            Sprinkler Heads**

- .1 Concealed sprinklers heads shall not be installed, and will not be accepted.
- .2 Semi-recessed sprinkler heads with removable escutcheons shall be installed in all areas having ceiling tiles and drywall ceilings.
- .3 A set of six spare sprinklers and escutcheons of each type installed shall be turned over to the University of Toronto Fire Prevention Services. A spare head cabinet is not required

### **13915 (211100)            Sprinkler Piping**

- .1 All threaded piping shall be schedule 40 or greater.
- .2 "Threadable light wall pipe" shall not be installed, and will not be accepted.
- .3 Trim on alarm valves shall be galvanized piping.
- .4 Drain lines (two inch main drains, auxilliary drains, drains from inspector's tests etc.) shall be galvanized piping.
- .5 Piping from air compressors to system piping shall be galvanized pipe or soft copper tubing.
- .6 Piping used on dry pipe systems shall be a minimum of schedule 40 and shall be galvanized.
- .7 All nuts, washers, rod and hangers used in dry pipe systems shall be galvanized.
- .8 Excess pressure pumps shall be wired for automatic operation using a Potter control (Potter Part# PCS-300-1B) pressure switch.
- .9 Valves two inches and smaller (including valve trim, inspector's test valves etc.) shall be Watts 6000 series ball valves.
- .10 Drains shall not empty into sinks or slop sinks. A dedicated floor or hub drain (properly trapped and vented, with a trap seal primer) is to be provided. A hub drain is preferred.
- .11 Alarm valves shall have a minimum of 12 inches clear space around the valves measured beyond the trim.
- .12 Victaulic type couplings used on sprinkler systems shall be of the dry lube style, Victaulic "Vic Plus" Fire Lock 005.

## **13910            Sprinkler Valves**

.1 Alarm check valves for wet systems shall be manufactured Victaulic, series 751.

.1 The use of an alarm check valve on the incoming supply shall be avoided. A Victaulic 717R riser check may be used in place of an alarm valve.

.2 Alarm check valves for dry systems shall be manufactured by Victaulic, series 768.

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

.4 Isolation valves larger than two inch (2") shall be butterfly valves manufactured by Victaulic.

.5 Normally closed valves shall be Victaulic series 707C or 766 models.

.6 Trim on alarm valves shall be of galvanized material. This requirement extends to the two inch ( 2" ) main drain piping from the alarm valve to the termination point.

.7 The two inch (2") main drain valve, the trim control, air control, excess pressure pump, inspector's test valves shall be WATTS #6000 ball valves. Exception: When a combination inspector's test / drain valve is used it shall be a TESTanDRAIN Model 1000 / AGF Manufacturing Co., Warren N.J. or Model A61 Test and Drain / National Fire Equipment Ltd., complete with pressure gauge.

Exception: Drain valves on Victaulic dry and pre-action valves can be as supplied by Victaulic.

.8 The excess pressure pump on a wet system and the compressor on a dry system shall be wired to provide automatic operation. The pump or compressor shall be controlled by a Potter control (Potter Part# PCS-300-1B) pressure switch. The pressure switch shall be located on the system riser above the alarm valve complete with a WATTS #6000 isolation valve.

.9 The excess pressure pump installed on wet systems shall be a minimum of one half ( ½ ) horse power and the gear pump shall be high capacity..

.10 All valves shall be marked with permanent, chained tags indicating the area served or purpose of the valve. Descriptions shall match those on the fire alarm system zoning, and shall be subject to the approval of University of Toronto Fire Prevention.

.11 The two inch ( 2" ) main drain from all alarm valves shall be piped to a dedicated hub drain capable of receiving full flow. On a multiple installations the drain lines may be combined and run to a single dedicated hub drain. An acceptance test shall be done before the University accepts the work.

.12 Double check valve back flow devices shall be Watts 757 BFG models or Watts 757 DCDA BFG models depending on City of Toronto requirements.

.13 Reduced pressure principle back flow devices shall be Watts 957 BFG models.

### **13910            Zone Control Stations**

.1 Zone control stations are mandatory.

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

.3 Zone control stations shall be located in the same style of cabinet used for the Standpipe systems.

.4 Zone control stations shall be located in public spaces i.e. above or next to a fire hose cabinet. Zone control stations shall under no circumstances be installed in ceiling spaces, washrooms, janitor's rooms, change rooms or private offices.

.5 The top of the zone control station cabinet shall be no more than seven feet (7ft.) from floor level.

.6 The drain line from the inspector's test / drain shall be piped to a dedicated hub drain capable of receiving full flow. On a multi-storey buildings the drain lines on a common sprinkler riser may be combined and run to a single dedicated hub drain. An acceptance test shall be done before the University accepts the work.

.7 The combination inspector's test / drain valve shall be a TESTanDRAIN Model 1000 / AGF Manufacturing Co., Warren N.J. complete with a pressure gauge.

### **13915 (211100)            DRY PIPE, PRE-ACTION AND DELUGE SYSTEM PIPING**

.1 Piping downstream of the alarm check valve shall be schedule 40 galvanized pipe. "Threadable light wall pipe" will not be accepted.

.2 All fittings including Victaulic couplings shall be galvanized.

.3 All Victaulic type couplings used on dry sprinkler systems shall be manufactured by Victaulic and shall have Victaulic grade E, Type A, FlushSeal gaskets.

.4 Victaulic grooves shall be rolled rather than cut.

.5 Piping cut ends and holes cut for saddle tees shall be coated with a galvanized coating.

.6 Black steel piping and welded outlets may be used for branch lines provided the finished product is dipped in galvanized coating.

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

.8 Drum drips shall be installed such that the highest valve is no more than seven feet (7ft.) from floor level.

.9 These specifications do not require galvanized sprinkler piping in parking garages to be painted. However, if other specifications require the sprinkler piping to be painted, (i.e. for aesthetic reasons), the piping shall be installed and painted in the following manner. All piping shall be primed with galvanized primer and painted red. This step is to be done only after the system has been installed and the University of Toronto Fire Prevention Services has signed a preliminary acceptance of the piping. The pipe may be pre-painted provided the paint stops twelve inches (12") from each end, fittings may not be pre-painted.

.Nitrogen generators shall be supplied for each dry or pre-action system or group of systems. Nitrogen generators to be Potter models.

#### **13910                      ANTIFREEZE SYSTEMS**

.1 Antifreeze systems shall not be installed. Where an antifreeze system is contemplated, the area shall either be heated, protected with dry pipe sprinkler heads, or a dry pipe system..

#### **13975 (211200)              STANDPIPE SYSTEMS**

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

#### **13???                      FIRE DEPARTMENT (SIAMESE) CONNECTIONS**

.1 Fire Department Connections shall be mounted on the building

.2 No underground piping is permitted for the Fire Department Connections

#### **13910                      FIRE PUMPS**

.1 Fire pump installations shall have flow test connections run to the outside of the building, terminating at a location approved by the University Fire Prevention Services.

.2 The termination point referred to in 3.7.1 shall be provided with an identification plate similar to the type used for the siamese connection, be provided with the required number

of two and one half (2 ½) inch threaded hose connections (complete with brass caps) to allow for an adequate flow to test the fire pump.

.3 The fire pump test connection shall be controlled by supervised butterfly valve complete with a two inch (2") Watts #6000 ball valve installed to completely 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.

.4 All piping and fittings from the isolation valve to the test connection, including drain lines, shall be schedule forty galvanized pipe.

.5 Fire pumps shall be supplied with mechanical seal construction (no packing permitted).

.6 Fire pumps shall be paired with a jockey pump. Excess pressure pumps shall not be used in place of a jockey pump.

.7 Fire pumps shall be labeled as "Sprinkler Fire Pump" or "Standpipe Fire Pump" on the pump and on the Fire Alarm Panel.

## **13050 Close-out Documentation**

.1 Before the University Fire Prevention Service provides final acceptance of any installation or renovation, **three** copies of the close-out documentation must be submitted and accepted.

.2 The close-out documents shall be submitted in three ring binder and include the following items;

- .1 Warranty on company letterhead, complete with warranty start date, period of warranty, contact names and phone numbers, after hours emergency contact information.
- .2 Hydraulic calculations.
- .3 NFPA acceptance test reports.
- .4 As-built drawings ( paper ).
- .5 As-built drawings ( AutoCad ).
- .6 Specification sheets on each type of sprinkler used in the project.
- .7 Specification sheets on each type of isolation valve used in the project.
- .8 Specification sheets on each type of switch used in the project.
- .9 Specification sheets on any additional equipment used in the project ie. Air dryers, compressors, nitrogen generators.
- .10 Alarm valve(s) owner's manual(s).
- .11 Equipment pressure settings i.e. Dry valve trip pressure, jockey pump start up and shut down pressures, fire pump start up pressure.