Design Standards
Fire Alarm Systems
Division 13860 (1995 CMS); 283100 (2004 CMS)
Amended Feb 2015

13860 (283100) FIRE ALARM SYSTEM

The following standard shall be followed for the design of University of Toronto fire alarm systems.

.1 Acceptable manufacturers and model numbers are as follows:
Chubb-Edwards EST-3 series for systems with more than 8 zones or those using addressable devices;
Chubb-Edwards EST-FS fireshield series for systems with 1-8 zones provided building is not sprinklered.
Verify system selection with University of Toronto Fire Prevention during conceptual design stage.

.2 All fire alarm system devices and control units shall be purchased by the Contractor, directly from the manufacturer.

.3 New installations with more than 32 zones shall utilize *active field devices*, using analog addressable technology. Upgrades or retrofit work shall utilize this technology if budget permits. *Data communication links* for *active field devices* shall be configured in a *DCLA* style as defined by CAN/ULC-S524. System installation shall conform to CAN/ULC-S524.

.4 System Operation: Single stage operation unless otherwise approved by University of Toronto Fire Prevention. Manual signal silence only (no automatic silence feature).

.5 Signalling Appliances

.1 New installations with no OBC-mandated voice requirement: 24VDC, parallel wired horn/strobe, using temporal signal pattern in accordance with OBC – Chubb-Edwards catalog # 757-7A-TW.

.2 Existing installations/renovations: match existing.

.6 Annunciation: Locate main control panel or CACF at the designated Fire Department response point, to be used as the main annunciator. Provide light emitting diode (LED) annunciation of zones (as conventionally defined by the OBC), and liquid crystal display (LCD) annunciation of individual *active field devices* via the alphanumeric LCD. Provide water shield covers for fire alarm panels in sprinklered areas to protect panel from water damage. Fire Alarm Control Panels shall not be located in mechanical rooms where steam heat piping is present.

.7 Zone and *active field device* descriptions for annunciation & LCD programming are to be coordinated with and approved by U of T Fire Prevention.

.8 Maglocks are not permitted to be installed in U of T buildings without prior application-specific written approval by University of Toronto Fire Prevention, and will not be accepted otherwise.

.9 Standpipe main flow detection shall annunciate as a supervisory indication only.

.10 Automatic detection in elevator shafts shall be accomplished with *heat detectors*.

.11 Install automatic detection only in those places where required by OBC.

.12 Use photoelectric type *smoke detectors* when smoke detection is specifically required by the OBC. Ionization (only) detection shall not be used in University buildings unless approved by U

of T Fire Prevention. Where the code requires *fire detectors*, giving a choice between heat or smoke detection, *heat detectors* shall be used.

.13 Use only photoelectric smoke alarms in residences when smoke alarms are required by the OBC

.14 High temperature, "fixed" type *heat detectors* shall be used in high temperature areas such as boiler rooms, laundry rooms, rooms equipped with autoclaves, etc., otherwise use rate of rise type heat detection.

.15 Automatic fire detection shall not be installed in washrooms, "cold rooms", or walk-in freezers.

.16 If a floor area is fully sprinklered, *heat detectors* are not required and shall not be installed within that floor area.

.17 Door hold-open devices are required to release immediately upon activation of the fire alarm system as per OBC 3.1.8.12.

.18 Smoke detection and smoke control measures are required for an *interconnected floor space* as per OBC 3.2.8.8.

.19 Recirculating air handling units shall meet the requirements for smoke detection only where specifically required by OBC 3.2.4.12. Non-recirculating units shall not be equipped with duct smoke detection. All recirculating air handling units that do not have a smoke control mode shall shut down automatically upon any common fire alarm activation, and will be interconnected in such a way to restart automatically upon fire alarm system restoration to normal.

.20 Emergency power requirements shall be designed to the minimum requirements of OBC 3.2.7.8. If the fire alarm system is connected to an emergency generator, standby batteries shall be included to provide for 2 hours of supervisory power only.

.21 Printers and/or video displays are not desired and will not be accepted by U of T Fire Prevention.

.22 New systems shall be designed and installed as part of the University of Toronto fire alarm central monitoring system, reporting system alarm and system trouble information back to the Central Monitoring location at the Campus Police Station, 21 Sussex Avenue.

.1 Design and installation of the interconnection on site shall be to Chubb-Edwards Systems specifications under the direction of U of T Fire Prevention.

.2 The Contractor shall co-ordinate wiring or fibre runs and tie-in with University of Toronto Computing and Networking Services and University of Toronto Fire Prevention.

.3 The Contractor shall arrange for setup of monitoring connections through the U of T Project Manager at least two weeks prior to the date required for Toronto Fire inspection.

.4 The Contractor shall terminate the required connections for central monitoring in a junction box within 1m of the fire alarm system wallbox where the connection is required to be tied in.

.5 The Contractor shall pre-schedule final system tie-in at least 7 days in advance, with University of Toronto’s Fire Alarm Testing & Maintenance Contractor, who shall make the final connections between the junction box and the control panel and test the circuits. The Contractor shall carry the cost of this work by U of T’s Fire Alarm Testing & Maintenance Contractor.

.22 New EST-3 systems shall include the following common control features (password protected):

-sprinkler test mode switch
-silent test switch
-ancillary bypass switch
-one minute inhibit bypass switch

.23 Beam type smoke detectors shall not be incorporated as a means of smoke detection without prior application-specific written approval from U of T Fire Prevention.

.24 Data Gathering Panels or remote annunciators (distributed intelligence) shall not be used without prior application-specific written approval from U of T Fire Prevention.

3.1 As-Built Drawings

.1 A complete set of as-built drawings shall be compiled and submitted to U of T Fire Prevention, showing locations of all fire alarm devices, conduits, junction boxes, and end of line devices. Drawings shall identify numbers of conductors and zones served, as well as device addresses for addressable systems. The installation will not be accepted until this documentation has been received in full.

3.2 CONDUITS AND WIRING

.1 Fire alarm system conduits shall be identified every 3 metres by a band of red tape or other means deemed acceptable in writing by U of T Fire Prevention. Junction boxes for fire alarm system wiring shall be similarly identified or marked “F/A”. Signal circuit wiring shall be run in a separate conduit from initiating circuit wiring or communication wiring (including active field device wiring).

.2 Where fire alarm junction boxes will normally be inaccessible, properly identified access hatches shall be provided. Locations of access hatches shall be shown on as-built drawings and shall be identifiable in the field by permanently affixed markings to the approval of University of Toronto Fire Prevention.

.3 All conduits shall enter the fire alarm control units from the bottom of the cabinet. Two additional knockouts shall be punched in the bottom of each cabinet, and fitted with a wire mesh screen in order to protect system components from possible water damage that may enter the control panel via conduits. Fire alarm control units shall be protected from sprinkler discharge by adequate drip trays.

3.3 WITNESSING OF FIRE ALARM/SPRINKLER VERIFICATION

.1 All fire alarm system modifications and new installations shall be verified in accordance with the requirements of the Ontario Fire Code. Verification in its entirety shall be witnessed by the University of Toronto’s Fire Alarm Testing & Maintenance Contractor, to help to ensure the integrity of the field verification process. The contractor performing the Work shall include the cost of subcontracting this work in his bid as a separate identified price, and shall schedule the verification with University of Toronto’s Fire Alarm Testing & Maintenance Contractor at least two weeks in advance of its commencement. Verification will not be accepted without a letter of witnessing from the University’s Fire Alarm Testing & Maintenance Contractor. Any exceptions to this requirement shall be authorized in writing, at the discretion of University of Toronto Fire Prevention, acting in the best interests of the University.

.2 Further to sentence 3.3.1, when a relocation, addition, or deletion of a device has been carried out, all devices in the zone shall be tested and documented for proper operation. This applies to both alarm initiating and signal (output) circuits. This testing shall be witnessed as noted in the previous item, and the cost for such shall be included in the Contractor's bid.