
York University Building Standards

Note to the Designer/Architect/Engineer: These standards are basic minimum criteria to be met in preparing the final project specifications for this section, which is the responsibility of the Designer

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1.0 GENERAL

1.1 Guiding Principles

- .1 The public announcement system provides a networked emergency communication tool via integration with the local building fire alarm system that is capable of broadcasting fire emergency voice communication in the event of a fire alarm and overriding the non-fire public announcement.

1.2 Scope of Work

- .1 This standard defines minimum functional and technical requirements for a public announcement system (PAS) that interfaces with the existing Commend intercom based campus wide public announcement system and the local emergency voice enabled building fire alarm system.
- .2 This standard shall apply for all York University buildings, including, but not limited to academic, administrative, and housing buildings.

1.3 Related York University Standards

- .1 York University Network and Communications Services Facilities Standard (latest iteration)

1.4 Performance Standards References

- .1 Comply with all applicable municipal, provincial, federal and trade standards in this specification, unless more stringent requirements are given herein.
- .2 Ontario Building Code of Canada (2012) including the amendments effective January 1, 2015.
- .3 Ontario Electrical Safety Code, 25th Edition (2012)
- .4 NFPA 72, National Fire Alarm and Signaling Code, 2013 Edition, Emergency Communications Systems.
- .5 York University, UIT – Public Announcement System Network Infrastructure.

1.5 Submissions

- .1 For system installers submit three copies (CD or on USB key) of shop drawings following contract award and prior to proceeding with installation. Shop drawing submission shall include floor plans indicating equipment location (server, local intercom, fire alarm demarcation point, additional speakers and strobes where applicable, etc.), battery calculations, data sheets for equipment. Submit to PA System Consultant for review and acceptance.
- .2 Submit three copies (CD or on USB key) of the as built drawings for installed building Public Announcement System denoting the location of wiring, control equipment, local intercom, and other system elements.
- .3 Submit one copy of As Built drawings to PA System Consultant for review and approval

- .4 Submit one copy of As Built drawings of PAS As Built drawings to Manager - Planning and Architectural Design Department, CSBO, Manager - Infrastructure Operations, and UIT
- .5 As built drawings shall be submitted using AutoCAD format (please consult York University Project Representative for details of AutoCAD version to use)
- .6 Written sequence of operations in the non-fire and fire emergency.
- .7 Written text of the pre-recorded messages for non-fire and fire emergency.
- .8 Owner's Operation and Maintenance Manual in three copies (hard copy in binder and USB key) containing the as-built documents, device datasheets, commissioning reports, manufacturer's published specifications, and warranties.
- .9 Submit a copy of the shop-drawings to York University Project Representative for review before applying for the city building permit.

1.6 Standard Warranties and Extended Warranties

- .1 The contractor shall guarantee that all provided and installed materials and equipment will be free from defects, workmanship and will remain so for a period of one year from the date of a satisfactory User Acceptance Test (UAT) with no deficiencies.
- .2 Commend specific hardware shall have a one-year manufacturer's warranty.
- .3 The contractor shall provide the York University project representative all equipment warranty documents.
- .4 The contractor shall certify and provide sign-off that PA system equipment and materials conforms to York University Building Standard Section 27 51 16.

2.0 Materials (Products)

2.1 System General Functional Requirements

- .1 The Public Announcement System via integration with the emergency voice enabled fire alarm system shall meet, or exceed the following functional requirements:
 - .1 PA system shall be capable of integration with existing classroom technology on campus for shutdown of A/V equipment where required via the local fire alarm control panel.
 - .2 PA system shall permit paging, capable of selecting individual buildings, villages (as designated by York University's Security Services) as well as all-call by campus..
 - .3 PA system shall be integrated with the building fire alarm system for activation of notification devices (speakers and blue strobes).
 - .4 PA System shall have back-up emergency power capable for 24-hours stand-by (or dormant) mode, as well as 30 mins full-load (2 hrs for high buildings. This uninterrupted emergency power should be independent of other existing emergency power supplies available on campus.
 - .5 PA System shall be connected to York University Security Services Primary Control Centre (located at William Small Centre) as well as the Alternate Security Control Centre (located at Bennett Centre Parking Structure)

- .6 PA system shall have the capability to store a number of pre-recorded messages.
- .7 PA system shall have the ability to access PA functions from local building, from the Primary and Alternate Security Control Centres, and from telephone via either land line or cellular channels.
- .8 PA System shall include local intercom unit and Commend server integrated with the building fire alarm system.
- .9 PA System architecture shall be modular and scalable, such that new buildings, new zones can be brought on line as required
- .10 PA system shall employ existing York University Data Network infrastructure. All network switches, network drops, routers, etc., shall be supplied, programmed and installed by UIT
- .11 PA system expansion shall integrate, and be based on the existing Commend Public Announcement system, features and selected interface components shall form an integrated PA system.

2.2 System Description

- .1 The University Public Announcement System is a dedicated analog to digital line intercom system based on Commend IP Intercom Servers.
- .2 Public Announcement System hardware consists of a PA communication network comprised of (at building): IP intercom server, building telephone interface (local intercom), and related equipment, equipment cabinets for servers, UPS for servers, wiring, and other related building equipment. At the Security Control Centre (and its alternate site) the system includes IP intercom server, system control module, microphone, UPS, and other system access equipment (hardware and firmware) including a touch-screen graphical user interface (GUI).
- .3 PA System control server, and security operations interface shall be located at the Security Services Security Control Centre (located at William Small Building) with a complete alternate set up site located at the Security Services Alternate (or Standby) Security Control Centre located at the Bennett Centre for Student Services Parking Structure.
- .4 PA System shall be capable of broadcasting pre-recorded, or live messages designated by Security Services campus zones (Villages). The PA system shall be capable of broadcasting to the following pre-defined addressable zones:
 - .1 Entire campus (all building indoor and outdoor speakers and blue strobe lights) also known as "all call" to all zones and buildings
 - .2 Specific campus zone, or groupings of buildings known by York University Security Services as "Villages"
 - .3 Individual building all indoor and outdoor speakers and blue strobe lights.
- .5 The PA System shall be accessible (issue announcements) from the following sites/modalities:
 - .1 Primary and Alternate Security Control Centres.
 - .2 The fire alarm emergency voice communication microphone provided in the building's fire alarm annunciation panel.
 - .3 Through a security protocol via any telephone or cellular telephone.
- .6 PA Access to zones or buildings shall be via a PA control panel through a series of preset codes or through a graphical user interface (GUI).

- .7 PAS is designed to provide continuous electrical supervision for the complete and entire system (i.e. contact switches controls, master control station(s), audio, data, busses, main and UPS etc.,) Such that if a component is removed or not functioning, the PA system shall create a trouble signal. This does not apply for supervision of the local building fire alarm system which is supervised separately.
- .8 The fire alarm system shall take precedence. The integration of the PA and fire alarm systems shall permit the fire alarm system to override any PA system announcement in the event of a fire condition. In the event of a fire condition during normal status, the fire alarm panel shall activate the fire alert/alarm signal sequence and disregard any input from the PAS. In the event of a fire condition during a PA system announcement, the fire alarm system shall cease broadcasting the PA announcement and activate the fire alert/alarm signal sequence.
- .9 Noise filters and surge protectors shall be provided for each building equipment interface cabinet to ensure protection from input primary AC power surges and to insure noise glitches are not induced into the low voltage data circuits.
- .10 Wire types as specified in section 3.1.
- .11 PA System shall be integrated with the building fire alarm systems such that an audio signal initiated from the Command control system shall be broadcasted over the fire alarm system speakers. Additionally, the blue strobes shall be activated during this time.
- .12 PA System Performance Criteria shall be based on the fire alarm performance provided for the individual buildings in compliance with the Ontario Building Code.
- .13 PA System Supervision: The PA system shall be fully supervised at the primary and back up head ends. System Supervision shall be achieved through the existing COMWIN system control. At a minimum system supervision shall monitor the status of deployed (in the field) IP Servers and power supplies. Speaker, strobe, and amplifier supervision shall be handled by the building fire alarm system.

2.3 System Performance

- .1 PA system audio input minimum performance requirements: the signal level of each audio input channel at each input point shall be a minimum of zero (0) decibels (dBm), measured +0.10 dBm across 150 Ohms, balanced
- .2 PA system audio output minimum performance requirements: the audio signal level at each indoor and outdoor speaker shall be in accordance with the Ontario Building Code for fire alarm systems.

2.4 Acceptable Products

- .1 The York University Public Announcement System is based on the Command intercom system as such any new building or major renovation shall adopt a Command intercom Public Announcement system that is entirely integrated within the existing PA system infrastructure.
- .2 PA System minimum building level hardware requirements include but are not limited to the following items:
 - .1 Command GE 800 Digital IP-Intercom Server
 - .2 Command GE 300 Digital IP-Intercom Server
 - .3 Command L8-ICX GE800 License for ICX interface

- .4 Commend L3-ICX GE300 License for ICX interface
- .5 Commend L8-NETLAN-4 License: 4 LAN Connections via G8-NET
- .6 Commend L3-LAN-4 License: 4 LAN Connections via G3-GEP
- .7 Commend G8-GED-4B Connection of 4 Digital Subscriber Boards – B level Firmware
- .8 Commend G8A-K G8 Installation Board with terminal strip screw connectors
- .9 Commend L8-GED-4P License: Upgrade G8-GED-4B to G8-GED-4P
- .10 Commend G3-GED-4B Connection of 4 Digital Subscriber Boards – B level Firmware
- .11 Commend L3-GED-4P License: Upgrade G3-GED-4B to G3-GED-4P
- .12 Commend G8-IP-4B G8 IP Subscriber Board – 4IP subscriber Feature Level B
- .13 Commend G3-IP-4B G3 IP Subscriber Board – 4IP subscriber feature Level B
- .13 Commend G8-16E, GE800 interface with 16 inputs
- .14 Commend G3-16E, GE300 interface with 16 inputs
- .15 Commend G3-8E8A GE300 interface with 8 inputs and 8 outputs
- .16 Commend G8-AUD-2B G8 Audio Interface Board
- .17 Commend L8-AUD-2D License: Upgrade G8-AUD-2B to G8-AUD2D
- .18 Commend G8-LAN-8 G8 LAN IP Network Card: 8 IP Connections
- .19 Commend G3-LAN-8 G3 LAN IP Network Card: 8 IP Connections
- .20 Commend ET 901-A IP Intercom Box
- .21 Commend ST801 Audiocom Interface 1 Channel to A-B-C-D
- .22 18 AWG Shielded Twisted pair Cable (as per York specifications – Section 27 51 16)
- .23 16 AWG twisted pair cable (as per York specifications – Section 27 51 16)
- .24 CAT6 Network cable (as per York specifications – Section 27 51 16)
- .25 Dedicated (where space is not available in existing UIT Telecom room racks) equipment rack for PAS shall be capable of accommodating system components including (but not limited to): digital IP server and UPS. System rack shall be enclosed type, steel construction with internal mounting rails, wire, and cable entrances with smooth edges protected by rubber edging, with four adjustable leveling feet
- .26 Uninterrupted Power Supply UPS and suitably to the PAS Digital IP Intercom Server to accommodate system standby power requirement
- .27 1000VA step-down transformer (rack mounted) from 208VAC to 110VAC to power the control equipment in the telecom rooms¹
- .28 A rack mounted power bar shall be provided to plug in the control equipment to the transformer

3.0 EXECUTION

3.1 Installation

- .1 In addition to the Ontario Building Code requirements on the fire alarm system, the following notification devices shall be provided on the in-building integrated fire alarm / mass notification system for the following areas:
 - .1 Exterior speakers near building entrances.
 - .2 Exterior blue strobe lights near building entrances with the speakers.

¹ Note that York University UIT Department is in the process of upgrading all Keele campus telecom and data rooms from 110VAC to 208VAC.

- .3 Interior blue strobes lights in the following areas:
 - .1 building corridors, including corridors within suites.
 - .2 indoor building open spaces such as atria, and public areas of congregation.
 - .3 cafeterias and lounges
 - .4 daycare facilities
 - .5 classrooms, lecture halls, theatres, cinemas, gymnasias, dance studios, and visual or other performance studios with a seating capacity of 75 or more.
 - .6 laboratories with a seating capacity of 50 or more
 - .7 libraries, including study areas
 - .8 athletic service spaces – including locker rooms and shower rooms as defined by COU Category 6 Recreational / Athletic space
 - .9 residence sleeping rooms designated for the hearing impaired and a minimum of one sleeping room per floor
 - .10 residence laundry rooms
- .2 Speaker and mounting shall be self-contained.
- .3 Exterior speakers shall be wall mounted and encased in a water and weather resistant metal vandal proof housing with compatible metal baffle.
- .4 For interior Commend equipment interconnections, microphone intercom cabling and other network cabling, provide CAT6 cable that is FT6 plenum rated and yellow in colour
- .5 For line level audio and microphone cable inside racks and conduits. In addition to this, provide:
 - .1 shielded, twisted pair minimum 22 AWG, stranded conductors and 24 AWG drain wire with overall jacket
 - .2 speaker level wire to be rated either for 70 or 25 Volts cable riser rated, 18 AWG stranded pair minimum, cable must be UL-1333 listed
 - .3 cabling shall be riser, plenum rated
- .6 Provide a backup battery supply or UPS system to be connected to the buildings' PA system to permit normal operation of this system as specified in 2.1.
- .7 The UPS shall be connected to all active PA system components including (but not limited to): Digital IP Intercom Server, local intercom, and all control centre equipment
- .8 PA System equipment including Commend IP Intercom Server, and UPS and other relevant building PA level control equipment shall be located in a secure Telecommunications room and space within the Telecomm room to be assigned by York University's UIT
- .9 Install all equipment in accordance with manufacturer's instructions and industry accepted best practices
- .10 Provide labels for all control equipment identifying each piece of equipment in the telecom room (i.e. PAS server, PAS power supplies, etc.) Including IP addresses for any networked devices.
- .11 The building Commend server shall interconnect with the building Notifier fire alarm system via the Notifier Digital Voice Controller (DVC). The output of the Commend audio bus shall connect to the auxiliary input channel of the Notifier DVC. An output relay from the Commend Server shall be connected to an input module on the Notifier fire alarm system that will signal the building fire alarm system to activate the notification circuits (all speakers and blue strobes) and prepare to broadcast from the auxiliary input channel.

3.2 Coordination

- .1 Coordinate work with York's University Information Technology, Campus Services Business and Operations (CSBO) Project Representative, Maintenance Department (CSBO), external electrical contractor, and any other internal or external trades or contractors (e.g. PA System Integrator/Consultant)
- .2 Electrical contractor is required to conduct a building assessment, review of this York University standard, York University's Network and Communications Services Facilities Standard and other PA system technical and functional requirements in order to determine performance requirements, fire alarm integration requirements, backup power requirements, and cabling requirements.
- .3 Coordinate work specifically with regards to the integration of the Public Announcement system to the Fire Alarm systems with representative of York University's Building and Fire Code Compliance Office whom take ownership of the fire alarm portions of the integrated system.
- .4 Coordinate work with the Office of Emergency Preparedness (OEP) whom shall take ownership of the public announcement portion of the integrated system.

3.3 System Acceptance Testing (Commissioning)

- .1 System Comment IP Intercom Testing
 - .1 Contractor shall conduct a test of each installed commend control equipment to ensure it conforms to PA system performance requirements, and manufacturers' published specifications
 - .2 Contractor shall undertake PA system test of all relevant components with integration to the University Commend Intercom Based Public Announcement System and local building Fire Alarm System. Contractor is responsible for coordination with the fire alarm contractor for testing of the interconnection.
 - .3 The Building PA test shall establish connectivity and functionality of the installed building PA components and integration within the University Public Announcement System and local building fire alarm system.
 - .4 Deficiencies and errors in establishing building level PA to University level PA integration shall be addressed by the Contractor
 - .5 A report of the building PA system test shall be provided to the York University Project Representative
- .2 Speaker and Strobe Testing
 - .1 System audibility and intelligibility testing of each speaker shall be conducted during the fire alarm system verification and is not the responsibility of the PAS Contractor.
 - .2 System visual indicator testing of each strobe shall be conducted during the fire alarm system verification and is not the responsibility of the PAS Contractor.

- .3 Contractor shall perform functional test to confirm that speaker circuits and blue strobe circuits activate on fire alarm system when initiated from Command control equipment.
 - .4 A report of the field-testing of the speakers and strobes shall be provided to the York University Project Representative and Consultant as proof of field test
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- .3 Public Announcement User System Acceptance Testing (UAT)
 - .1 Following the contractor PA system integration test as described in the previous sections, a PA system user acceptance test shall be conducted in the presence of the Owner and Consultant.
 - .2 Test parameters for the user acceptance test shall include at a minimum the following required elements:
 - .1 test integration of building within the University PA system zone set up. This feature shall be tested using the Graphical User Interface, the building control intercom, and via telephone. Test shall establish capability to address the building as follows:
 - .1 as a stand-alone building within the PA system,
 - .2 as part of a global all building entire campus annunciation, via all modalities
 - .3 as part of a group of buildings (zones or villages) via all system modalities
 - .2 Test capability to issue prerecorded messages, via all system modalities
 - .3 Test capability to issue live messages, via all system modalities
 - .4 Test system integration with building fire alarm system for activation of speakers and blue strobes
 - .5 Test shall verify that the total PA system meets all the requirements of this standard
 - .6 System testing shall be conducted in the presence of the York University Project Representative, Manager, Emergency Preparedness Program, representative from UIT, PAS Consultant, and other York University stakeholders as required
 - .7 The acceptance test shall be performed on a “go-no-go” basis
 - .8 Only those operator adjustments required to show proof of performance shall be permitted
 - .9 Test shall demonstrate and verify that the PA system installed in a specific building complies with all requirements of this standard under normal operating conditions
 - .10 The system shall be rated by the York University representative or Consultant as either acceptable, or unacceptable, at the conclusion of the test
 - .11 Failure of any part of the system that precludes completion of the system testing, and which cannot be repaired within 4 hours, shall be cause for termination of the test of the system.
 - .12 Repeated failures that require more than 8 hours of repairs shall cause the entire system to be considered unacceptable

- .13 Rescheduling of the user acceptance test shall be arranged with the York University Project representative

End of Section