

## Amendment Notice: Mini Hub Room Requirements

This Bulletin applies to and amends the following document:

- GO Design Requirements Manual (DRM), GO-DRM-STD-2017 Revision 3, dated February 2020

This Bulletin updates existing DRM (Feb. 2020) requirements for Mini Hub Rooms, to ensure they are the primary solution to span beyond limitations of the Communications Hub Room. Communication Hub Rooms are currently required every 90m, with Mini Hub Rooms provided to span beyond 90m and in areas where devices require consequential infrastructure.

From lessons learned, building a Mini Hub Room is not always a feasible solution to span beyond limitations of the Communication Hub Room and in some cases it creates complications. To address instances when a Mini Hub Room alternative is proposed, requirements have been added to the DRM to ensure alignment between related Metrolinx standards. Requirements indicate that any alternative to a Mini Hub Room must be identified in early design stages and the Metrolinx Business Technology (BT) team must be involved to verify that BT standards are addressed in the alternate proposed solution.

The revision mandates that Mini Hub Rooms will remain required for consequential infrastructure, in areas where devices are deployed in numbers and on rail platforms. The revision also outlines design considerations for Mini Hub Rooms that share space with electrical-sub rooms and indicates that where possible, Mini Hub Rooms shall be installed outside the vicinity of Overhead Contact Line Zones (OCLZ).

Amendments to the DRM are provided in the following attachments:

- Attachment 1: Revisions to GO DRM Feb. 2020 - Electrical, Mini Hub Rooms

On MyLinx the Bulletin is available for staff to download from the [Go Manual](#) page.

The Bulletin will be available for external users to download via the Metrolinx public download site ([http://www.gosite.ca/engineering\\_public/](http://www.gosite.ca/engineering_public/)).

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including solar load) g the following design criteria

- Outdoor temperatures

Use 2½% winter & summer design temperatures per Ontario Building Code for the geographical location. Indoor temperatures:

- Winter design: 15°C
- Summer design: 22°C D B with a maximum of 50% relative humidity
- An infiltration rate from outside of 0.5 air changes per hour
- A recirculation rate of 100% for the air conditioning system
- A safety factor of 5%

The air conditioning system shall be selected to suit the specific capacity by taking into consideration the room's very high sensible load factor. Heat loss calculation shall not include credit for equipment and lighting heat gain.

### 7.2.22.3 Emergency Cooling

Provisions for emergency cooling in communication and electrical rooms:

- Provide a 6" vent opening provision, secured from inside, for portable A/C unit in both electrical and communication rooms, venting to the outside
- Provide dedicated 120V, 20A, 5-20R and 120V, 30A, 5-30R power receptacles (generator backed-up) from dedicated circuit breakers for portable A/C unit, in Electrical and Communication rooms.
- Receptacles to be mounted at 300mm height above finished floor
- Contractor to provide Labels above receptacles stating: the respective Amps, panel and circuit numbers and "DEDICATED FOR PORTABLE A/C UNIT"
- Provide an exhaust fan controlled by a reverse acting thermostat and an override switch
- High/low temperature alarm
- All alarm inputs to be placed in Chubb System and BAS

The sequence of operations shall be as follows:

- When A/C unit fails and temperature starts rising, the high temperature sensor sends an alarm to the current corporate supplier of security and monitoring services
- Station Operations will be notified to send a portable A/C unit and the HVAC service contractor is notified to repair the broken A/C unit
- The ventilation system will then kick-in to help reduce the temperature until a portable A/C unit is installed
- Station Ops will install the portable A/C unit and switch off the ventilation system

### 7.2.23 Electrical Rooms

#### 7.2.23.1 Design Considerations

Electrical service Substations are typical at GO/ Metrolinx Rail Service Centres but can occur at a large station, maintenance facilities or where ever else Metrolinx requires them.- For an example of a substation,

see Standard Layover drawings. Install HVAC in all electrical rooms w/auto changeover.

Whenever possible there shall be one main Electrical Room that feeds the entire site, as it is the goal at most facilities to have only one utility power source. Sub Room(s) shall be strategically placed around the main Electrical Room to facilitate an efficient distribution of power to loads to boilers, tunnels, bridges, main and sub- structures (e.g. parking structures, stations, service and storage buildings and maintenance facilities), as required. Electrical closets shall be provided to minimize the number of home runs from distribution panels to their respective sub-panels or equipment loads, and to reduce the number of conductors and minimize voltage drop or in preparation for future requirements.

The typical Electrical Room at Metrolinx facilities shall include space for locating:

- Distribution panels, switches and boards
- Metering Cabinets
- Transformers
- Uninterruptible power supply (UPS)
- Transfer Switches
- Battery Pack backup emergency lighting above and beyond the generator backed up lighting and UPS lighting of the space.
- Automatic Transfer Switch (ATS)
- Data and telephone outlets
- A service-working station by the door with power and data connections
- The station shall be a cabinet-lectern combination sized to hold ANSI B drawings, to serve as a working surface and storage for drawings, manuals and onsite component and parts
- A minimum continuous 17 m of wall space is required for equipment installation

All wall installed panels and conduits or ducts shall be installed on strut channel mounting system. All floor mounted panels and equipment shall be installed on housekeeping concrete pads. The housekeeping pad shall be a minimum of 100 mm above the floor and shall extend beyond the equipment footprint as per manufacturer's requirements.

A non-fade single line diagram of the electrical system related to the room shall be framed and posted under a polycarbonate cover adjacent to the entrance of the Electrical Room. The diagram shall be legible from a distance of 1 m.

Provide markings on the floor showing the arc flash boundaries in around equipment and panels.

### **7.2.24 Communications and Hub Rooms**

#### **7.2.24.1 Design Considerations**

All Communications Rooms shall be designed in accordance with ANSI/TIA/EIA-569-A-Commercial Building Standard for Telecommunications Pathways and Spaces.

The Room shall accommodate the following equipment (refer to IT Telecommunications and Systems Document for list of IT equipment):

- Network System Rack
- CCTV System Rack

- PA System Rack
- Passenger Notification System (PINS, Whiteboard, etc.)
- Telephone Infrastructure
- Two-way Communication Infrastructure (elevator cab intercom and information intercom)
- Fare Collection Equipment: Presto and legacy
- Alarm and Security Monitoring Equipment
- Fire Safety System
- Space Counting System (in parking structures)
- Building Automation System Server (all support systems shall be located appropriately with the equipment)

Communications Room shall be located next to the Electrical Room with exterior access if possible, within parking garages these rooms shall open onto the interior of the garage.

At facilities where the distance of cable runs exceeds 90 m (300 ft.) between the end device and accumulation point as deemed necessary by Metrolinx, Communications Hub Room(s) shall be implemented. Hub Rooms are satellite Communications Rooms, designed to accommodate a minimum of two floor-mounted racks. Hub Room's purposes are to minimize the number of home runs from remote devices to their respective head end equipment; reduce ~~usage us—age~~ of optical fiber and associated equipment; concentrate the distribution of collocated devices; facilitate future implementation of Communications systems.

#### 7.2.24.1.1 Mini Hub Rooms

**Communication Hub Rooms on the rail platforms are termed "Mini Hub Rooms".** Mini Hub Rooms shall be provided **on rail platforms** to span beyond the 90 m limitations of Power over Ethernet (PoE) I&IT Architecture and in areas where devices are deployed in numbers that require consequential<sup>1</sup> infrastructure. Standalone cabinets, wall mounted or otherwise, shall not be used **on rail platforms or where devices are deployed in numbers.**

**A Mini Hub Room is the preferred solution to span beyond limitations of the Communications Hub Room on rail platforms. Where an alternative to the Mini Hub Room is identified in early design stages, the Consultant shall engage Metrolinx Business Technology Team to ensure Business Technology I&IT standards are addressed in the alternate solution to Mini Hub Rooms.**

<sup>1</sup> Consequential infrastructure is defined as the use of multiples of support enclosures and devices, additional/costly components and resource and infrastructure intensive to install and maintain.

#### 7.2.24.1.2 Interior

Mini Hub Rooms shall, at a minimum, be of sufficient size to house one full size network rack that is capable of pivoting to allow technicians to access the rear of devices which are mounted on the rack.

All interior walls shall be constructed from concrete block, and be finished with 23mm thick fire resistant plywood, void free, with two coats of white or light gray fire rated paint.

Doors for the Mini Hub Room shall be fire rated per applicable codes, and have the capability to be held in the open position during maintenance periods.

The **Mini\_Hub** Room floor shall be slightly raised to prevent pooling and be coated with an anti-static finish.

An HVAC system shall be provided by a heat pump type A/C unit, a fan-forced heater shall be provided as a redundancy. A multi-split unit may be provided for elevator area and Mini Hub Room, where feasible. A

dedicated heater and condensing unit shall be located within the Mini Hub Room.

### 7.2.24.1.3 Power

Grounding shall be provided from a single point within the main Electrical Room utilizing the “HALO” distribution method. Grounding shall be provided to all systems, racking and supporting infrastructure within the room including doors and door frames.

Power panels shall be provided, minimum one UPS and one regular power.

Provide a cable tray and cable ladders to facilitate wiring infrastructure within the Mini Hub Room.

Two receptacles shall be provided on the cable tray above the network rack with each having a distinct and separate UPS circuit to provide power for systems within the rack.

Provide two wall mounted GFI receptacles on generator power for maintenance.

Illumination shall be provided in front of the racks and be tied to a hinge switch.

High/Low temperature sensors and access control utilizing Keypad/FOB for entry shall be implemented.

Power bars shall not to be used within the Mini Hub rooms.

### 7.2.24.1.4 Utilization

Rail platforms used by GO Transit are minimum 315\_m long. To provide infrastructure for the number of current and future systems, it is necessary to provide more than one Mini Hub Room for each rail platform.

Mini Hub Rooms shall be located adjacent to elevator enclosures to maximize infrastructure support for all platform devices and adjoining tunnel and bridge area devices. When this location is not available or feasible, locate the Mini Hub Room at the closed end of a stairwell opening. All alternative locations shall be pre-approved by Metrolinx.

The Mini Hub Rooms location shall not impede with passenger flow and be positioned so they don't disrupt sight lines to be compliant with CPTED.

Mini Hub Rooms shall meet or exceed rail corridor regulations and all regulatory items that apply.

### 7.2.24.1.5 Exterior

Exterior cladding shall match adjoining structural material palette to give a consistent, cohesive, uniform appearance. This includes the wall shared by the Mini Hub Room and an enclosure.

Where a Mini Hub Room is located under a platform canopy, extend the exterior enclosure of the Mini Hub Room to be continuous to the underside of the platform canopy. Where the location does not have a canopy, extend the exterior finish of the Mini Hub Room to the height of the adjacent structure (elevator or stairwell).

Where possible, the Mini Hub Room shall be installed outside of the OCLZ.

~~For further information regarding Mini Hub Rooms refer to the Service Rooms Requirements (General) section of this document.~~

At multi-level parking structures, Communications Hub Room(s) shall be strategically placed directly above the main Communications Room and centrally located to meet the 90 m (300 ft.) cable run distance limitation. One Hub Room can serve more than one floor. In Parking Structures, careful planning is required when locating the Communications and Hub Rooms. Attention must be paid to equipment placement within these rooms in relation to the structural ceiling elements. The required vertical clearance above the racks must also be taken into account. Ideally, cable trays shall be kept level, precast openings in structural “T”s as determined by the structural engineer, to get to the sidewalls of the room.

Communications Hub Rooms and Mini Hub Rooms shall be dedicated and not be shared with other functions, including, but not limited to: custodial, access services, electrical, mechanical and

storage. Access to Communications Hub Rooms and Mini Hub Rooms via (pass through) Electrical, Mechanical, Maintenance/Janitor Rooms, etc., shall not be permitted. ~~shall be avoided.~~ The Hub Rooms may share space with an electrical-sub room e.g. at stairways for bridges, tunnels and elevator machine rooms, provided that the following requirements are met:

- There is sufficient clearance between the electrical equipment and the communication racks;
- The electrical equipment is limited to 100 A at 120/208 V, 3 phase or 100 A at 120/240 V, single phase; and
- There is no electrical equipment rated 600 V, or 600 V-120/208 V stepdown transformers.

For further information regarding Mini Hub Rooms refer to the Service Rooms Requirements (General) section of this document and the Electrical Communications Infrastructure Mini Hub Rooms drawing in the GO Standard Drawings and Specifications.

#### 7.2.24.2 System Controller

The System Controller shall provide the following primary functions:

- Switches of audio channels to the required zone drivers
- The switching function shall be performed by the zone switching card
- Allows programming and testing through a RS 232 /RS 485 port
- Supplies power to the system processor, display and interface cards
- Four audio input channels that can each provide an audio output on any pre-configured group combination or manually selected zone
- Provision shall be made for an ALL Call broadcast to all zones simultaneously
- Appropriate Zone Driver and Zone Relay Cards for the requisite number of drivers/zones within the system
- The audio channels are interfaced to the driver input/output circuits by zone driver and relay cards
- Provides appropriate Paging Telephone interface
- Configurable automatic Day/Night audio level capability
- Automatic Daylight saving time adjustments

#### 7.2.24.3 Room Construction

Room dimensions (minimum wall to wall):

**Table 44: Minimum Room Dimensions**

Location	Size
Communications Hub Room	3200 mm wide x 3600 mm long
Communications Rooms at stations and small to medium sized facilities	3200 mm wide x 4800 mm long