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TAB 7: TECHNICAL DISCIPLINES Communications

Type B:

The type of receptacles are as follows:

- > One (1) L6-20R (240V, 20A) and one (1) NEMA L5-30R (120V, 30A) for PRESTO WLAN solution at main CC rack.
- > One (1) NEMA 5-15R (120V, 15A) receptacle at main CC rack if Transit Safety is included for HCR cradles.

Type C:

The type of receptacles are as follows:

- > One (1) NEMA L5-30R (120V, 30A) and one (1) NEMA L6-20R (240V, 20A) for Bus WLAM solution at main CC rack.

Devices

SFTPs and CQDs require dedicated power circuits from UPS located in the CC Rack (UPS provided by Presto equipment supplier). Power for up to four (4) devices (SFTP and CQD) can be daisy-chain connected to the UPS in the CC Rack. If devices are daisy-chained, they shall be staggered such that devices in close proximity to each other will be fed on separate circuits. Each such circuit shall be protected by a circuit breaker (or fuse) which will also serve as an isolation point (see standard diagram P3 for power wiring termination details at CC Rack location).

An individual ground wire for each SFTP and CQD shall be run and terminated in the copper ground bus at power junction box at CC Rack location. The plugs for the SFTP and CQD must be SOW Service Cord C/W Commercial specification grade plugs to be connected to the PRESTO System UPS in CC Rack.

In order to facilitate operations and maintenance, the power cables that are connected to the Presto system UPS must be clearly labeled to indicate which device is connected to each receptacle, following Design Requirements Manual labeling guidelines.

Each SPOS (in sellers booth) is locally backed-up by its own UPS (provided by Presto equipment supplier) and requires a separate NEMA 5-15R (120V, 15A) receptacle fed from a dedicated normal power circuit. The power outlet shall be located within a maximum 2 m of the wicket.

If a Fiber Transceiver is required, the power shall be provide by electrical trade in enclosure with a pull fuse disconnect. Grounding wire to be connected to the enclosure and door of enclosure.

Wiring and circuit protection will be sized to suit the total wattage on circuit, to address potential voltage drops, and derating requirements for multiple circuits run in the same conduit. The following table provides an estimate of the maximum wattage that each device requires.



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Table 1 shows power requirements for each device.

Device	Watts
SPOS (Station Point of Sale)	200
SFTP (Station Fare Transaction Processor)	35
CQD (Card Query Device)	35
HCR (Handheld Card Reader) Cradles	120

Table 1: Power Requirements

DATA CONNECTIVITY AND WIRING

The main CC Rack shall be placed in the communications room close to the demarcation point.

PATCH PANEL

The patch panel is to be supplied and installed in the PRESTO CC rack by the electrical trade.

These panels are to terminate the cabling coming from the field devices and also to terminate the cabling that connects the presto rack to the Bell demarcation point.

Demarcation Location

1 Cat3 (telephone) cable (required for PRESTO out of band modem) shall be terminated in patch panel (and labeled). From the patch panel to be run to the bell demarcation point terminated with male RJ11 male connector at demarcation end. (leaving 1 meter coiled)

1 Cat6 cable (required for PRESTO router) shall be terminated in patch panel (with label) and run to bell demarcation point terminated with male RJ 45 male connectors at demarcation end. (leaving 1 meter coiled)

SFTP & CQD

Where possible, fare devices (SFTP & CQD) will be aggregated such that wired distances do not exceed 90 m (300 ft) from the Concentrator Complex rack. For distances within 90 m, Ethernet cable (Cat 6) shall be used and terminated with 8P8C (RJ-45) male connectors leaving 1 meter coiled at the device end and RJ45 female end into patch panel (installed by electrical trade) at the CC rack end.

SPOS

Ethernet data cable (Cat6) for SPOS shall be terminated into 8P8C (RJ-45) wall jack at device end and 8P8C (RJ-45) female connectors into patch panel at CC Rack (see standard diagram P4 for data wiring termination details at CC Rack location).

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Communications**HCR**

The HCR cradles will connect to the Tranist Safety CC in the Main Rack using Ethernet Cable (Cat6) for a distance of up to 90m. The cabling shall be terminated into 8P8C (RJ-45) wall jack at the HCR cradle end and 8P8C (RJ-45) female end into the patch panel in main rack.

ACCESS POINTS (AP)

The AP (Access Points) for the WLAN solution at Bus Facilities shall be connected to the BUS CC rack in the main rack or secondary rack using Ethernet cable (Cat6) for distances of up to 90m. The cabling shall be terminated with 8P8C (RJ-45) male connectors leaving 10 meter coiled at the AP end and 8P8C (RJ-45) female ends into patch panel in rack.

FIBER CABLING

Fiber optic cable shall be used for distances exceeding 90 m for connection to Fibre Transceiver (installed by PRESTO).

Rack to Fibre Transceiver - Multimode fiber that can extend up to 2 km shall be employed and shall be terminated with LC connectors at CC rack patch panel (installed by electrical trade) and terminated with SC connectors into a patch panel (installed by electrical trade) in Fibre Transceiver enclosure (Stations).

Rack to Rack – Multimode fiber that can extend up to 2 km shall be employed and shall be terminated with LC connectors at main CC rack patch panel (installed by electrical trade) and terminated with LC connectors in secondary CC rack patch panel (installed by electrical trade)

Fiber optic cable shall be 62.5/125 um, 6-strand, tight buffered, OFNP. Cable shall be comprised of individually, jacketed and uniquely identified fibers with an overall orange sheath suitable for outdoor underground installation.

Fiber optic cable shall be converted into Cat 6 cable through a transceiver (provided by Presto equipment supplier) close to device locations at stations. Each transceiver is equipped with 4 - 8 Ethernet outputs to serve 4 - 8 devices. An enclosure to house a fiber transceiver shall be provided by electrical trade (see standard diagram P5 for transceiver enclosure detail) at Stations. At Bus Facilities, secondary racks shall be provided by PRESTO equipment providers to house the network switch with fibre for the APs. Cat 6 cable shall be terminated with 8P8C (RJ-45) male ends in the rack patch panel.

CC RACK**Stations**

At all new rail stations, Presto and Network equipment will share the same rack; (supplied by construction contract); the rack is physically segregated and separately locked doors are provided for each section. The rack is also to include a 21 RU Security front and rear door for the lower half. This is to protect



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Presto equipment from tampering. This is also to include a full depth shelf installed directly in-line with the top of the security door to provide further separation and protection.

The network rack front rails are to be set back from the front of the rack by 120mm for proper cable bend radius with the door closed.

All rack frames and accessories are to be Middle Atlantic WMRK Series and are to conform to IT current standards and are to conform to the following specifications.

Overall dimensions shall be 2034H x 650W x 1124D; depth suitable for the installation of deeper hardware such as a server.

- > All racks are to include 70% vented locking front door
- > All racks are to include split 79% vented locking rear doors
- > All racks are to include locking, removable side panels
- > All racks are to be grounded to the communications room grounding bus-bar
- > All racks are to be ganged together for stability

All Metrolinx equipment is to be installed above the middle shelf and all PRESTO equipment is to be installed below middle shelf.

If the space is limited at existing facilities, a wall mounted CC Rack may be used and installed. The maximum capacity of the rack and weight shall be stamped on the rack for future information and mounting requirements.

Bus Facilities

At bus maintenance and storage facilities, the PRESTO equipment shall be in a separate CC Rack from GO Network rack. These CC racks will be supplied by the PRESTO equipment providers but shall be installed by the electrical trade.

Type A facilities - The rack is installed in the main communications room and is typically an HP Rack 10636 G2 36U or equivalent with the following dimensions:

HxDxW: 68.6 x 39.691 x 24 in (173.5 x 101.5 x 59.7 cm)

Any secondary racks will be installed in the Garage area and is typically an APC NetShelter WX 13U w/vented front door or equivalent with the following dimensions:

HxDxW: 26 x 24.5 x 23 in (654 x 622 x 584 mm)



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Installation and Testing of Presto system infrastructure (conduit, wiring, bases, etc) as described in this document and shown on standard drawings shall be completed at least six(6) to eight(8) weeks prior to new area/device/station opening to allow for device installation and testing by supplier.

These design requirements shall be also read in conjunction with the PRESTO installations guidelines provided by Metrolinx's **Fare Systems** department.