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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | February 19, 2010 | Modified ‘Related Sections’ and approved suppliers |
| 3 | March 15, 2011 | Minor changes from Legal. |
| 4 | June 3, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 5 | June 18, 2013 | Incorporation of new Commissioning Specification cross references. Incorporated several aspects of the NL building specifications. |
| 6 | July 29, 2014 | Changes to reflect renaming of commissioning specification and final review (AV) |
| **7** | **November 17, 2014** | **Updated, Finalized Specification – Reference eDOCS #5630487 v5 (AV)** |
| 8 | February 2, 2015 | Updated standards (C22.2 No. 178-04 (R2014)) |
| 9 | February 10, 2017 | Converted Panel Enclosure to a performance based specification. (CPD PMO, OMM) Updated Reference Standards CSA C22.2 No. 40-M-1989 (R2014), CSA C22.2 No. 94.2-15), (AV & AAM) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# GEneral

## Related Sections

### [Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.

### Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.

### Contractor is responsible for coordination of the Work. Contractor is responsible for being familiar with and incorporating all required elements of cross-referenced Specifications cited.

### This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]

### [List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### [List Sections specifying products installed but not supplied under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### [List Sections specifying related requirements.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

#### Sections:

#### Section 01300 – Submittals

#### Section 01810 – Equipment Testing and Facility Commissioning

#### Section 01250 - Substitutions

#### *[Division 13 – SCADA and Instrumentation - insert applicable specifications]*

#### Section 16010 – Electrical General Requirements

#### Product requirements for [item]... for installation under this Section.

### References

#### National Electrical Manufacturers Association (NEMA) [Consultant to provide details]

#### Canadian Standards Association (CSA)

##### CSA C22.2 No. 40-M-1989 (R2014), Cutout, Junction and Pull Boxes.

##### CSA C22.2 No. 76-14, Splitters.

##### CSA C22.2 No. 94.2-15), Enclosures for Electrical Equipment, Environmental Considerations (Tri-National Standard, with NMX-J-235/2-ANCE-2015 and UL 50E).

##### C22.2 NO. 178.2-04 (R2014) - Requirements for Manually Operated Generator Transfer Panels (where applicable).

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

### The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

### All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

*If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.*]

## Shop Drawings and Product Data

### Submit shop drawings and Product data for cabinets in accordance with Section 01300 – Submittals.

### Provide manufacturer’s printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

### Provide drawings stamped and signed by professional engineer licensed to practice in the Province of Ontario.

# PRODUCTS

## Splitters

### Sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.

### [Main and branch lugs] [Connection bars] are to match with the required size and number of incoming and outgoing conductors as indicated in the Contract Documents.

### A minimum of three spare terminals on each set of lugs in splitters less than 400 A.

## Junction and Pull Boxes

### Welded steel construction with screw-on flat covers for surface mounting.

### Covers with a minimum 25 mm extension all around, for flush-mounted pull and junction boxes.

### Must be water tight.

## Cabinets

### Type E: sheet steel cabinet with hinged door and return flange overlapping sides, handle, [lock] and catch, for surface mounting.

### Type T: sheet steel cabinet, with hinged door, latch, lock, 2 keys, containing Uni-strut backing flush mounted.

## Panel Enclosure

### Provide enclosures which conform to the requirements of the NEMA type specified in the schedule or panel drawing.

#### No panels to be placed in Class 1/ Division 1 hazardous locations.

#### Panels to be NEMA 12 type for electrical rooms, NEMA 4/4X for damp areas or process areas.

#### Outdoor panels to be stainless steel NEMA 4X.

### Paint steel enclosures. Prime with one coat and finish with two coats of factory finished, epoxy-based paint. Paint the exterior colour ANSI/ASA 61 – standard gray, if not otherwise specified in the Contract Documents. Panel backplate shall be painted white. Stainless steel panels are not to shall not be painted.

### Provide each enclosure with full height, fully gasketed access doors where shown on the Drawings.

#### Construction: 3.43mm (10 gauge) thickness, single piece with edges turned back and rounded for rigidity

#### Latches: Three-point latching mechanism only. Screw clamps are not acceptable.

#### Hinge: Continuous piano hinge with removable stainless steel pin

#### Gasket: Secured resistant neoprene gasket.

#### Door handle: Automotive-type handle with latch padlock hasp. Keyed handles are not acceptable.

### Provide a minimum 250 mm wide print pocket within each enclosure.

### Fold down laptop tray shall be provided mounted on outside of control panel door at height 1.0m off the finished floor. Laptop tray shall be stud welded to the door, maintaining NEMA rating. Laptop tray and combination 120VAC/RJ45 receptacle shall be located on same door.

### Use 304 SS screws, bolts, fasteners and wall spacers.

### Control Panel(s) voltage shall be 120VAC maximum.

### All internal wiring shall be factory-installed and shall be contained in PVC raceways having removable covers. Wiring to door-mounted devices shall be extra flexible, wrapped in plastic spiral wrap, and be anchored to doors using wire anchors epoxyed in place. Exposed terminals of door-mounted devices shall be guarded to prevent accidental personnel contact with energized terminals. Follow manufacturer installation recommendations.

# EXECUTION

## Splitter Installation

### Install splitters in accordance with CSA C22.2 No. 76-14, Splitters.

### Install splitters and mount plumb, true and square to the building lines.

### Extend splitters the full length of equipment arrangement except where indicated otherwise in the Contract Documents.

## Junction, Pull Boxes and Cabinets Installation

### Install junction and pull boxes in accordance with CSA C22.2 No. 40-M-1989 (R2014), Cutout, Junction and Pull Boxes.

### Install enclosures in accordance with CSA C22.2 No. 94.2-07 (R2015), Enclosures for Electrical Equipment, Environmental Considerations (Tri-National Standard, with NMX-J-235/2-ANCE-2007 and UL 50E).

### Install pull boxes in inconspicuous but accessible locations as shown on the Contract Drawings or as approved by the Consultant.

### Mount cabinets with top a maximum of 2m above the finished floor.

### Install [terminal block] as indicated in Type T cabinets.

### Only main junction and pull boxes are indicated on the Contract Drawings. Install pull boxes so as not to exceed 30 m of conduit run between pull boxes as approved by the Consultant.

## Identification

### Provide equipment identification in accordance with Section 16010 - Electrical General Requirements.

### Install size 2 identification labels indicating the [system name] [voltage and phase].

## Commissioning

### For all commissioning activities on systems where components of this Section are integral to functionality, refer to Section 01810 – Equipment Testing and Facility Commissioning. All inspection and testing activities shall be completed in accordance with the documentation required as part of the commissioning plan that shall be provided to the Consultant prior to start of commissioning activities.

**END OF SECTION**