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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 23, 2011 | Minor edits |
| 4 | June 19, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 5 | June 19, 2013 | Incorporation of new Commissioning Specification cross reference. Incorporated several aspects of the NL building specifications. |
| 6 | July 28, 2014 | Changes to reflect renaming of commissioning specification and final review (AV) |
| **7** | **February 4, 2015** | **Updated, Finalized Specification – Reference eDOCS #5630517 v9 (AV)** |
| 8 | February 10, 2017 | Removed all listed manufacturers, replacing them with performance requirements and standards. (CPD PMO, OMM) (AV)  Updated reference standards (ANSI/IEEE 837-2014, ANSI/IEEE 80-2013) (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

## Summary

### Comply with the requirements of Division 1 – General Requirements and Section 16010 – Electrical General Requirements.

## 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].

### Section 01250 – Substitutions

### Section 01300 - Submittals

### Section 01810 – Equipment Testing and Facility Commissioning

### Section 16031 – Inspection and Testing

### Section 16010 – Electrical General Requirements

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

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

## References

### Comply with the latest edition of the following applicable statutes, codes, and standards, and all amendments thereto:

#### Nation Fire Protection Association (NFPA):

##### NFPA 780-2014, Standard for the Installation of Lightning Protection Systems, 2014 Edition

#### Canadian Standards Association (CSA)

##### CAN/CSA-B72-M87 (R2013), Installation Code for Lightning Protection Systems.

##### CAN/CSA-C22.2 No. 41-13, Grounding and Bonding Equipment (Tri-national standard, with NMX-J-590-ANCE and UL 467).

#### American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

##### ANSI/IEEE 837-2014, Standard for Qualifying Permanent Connections Used in Substation Grounding.

##### ANSI/IEEE 80-2013 ,Guide for Safety in AC Substation Grounding

##### IEEE C62.11-2012, IEEE Standard for Metal-Oxide Surge Arresters for AC Power Circuits (>1 kV)

##### IEEE C62.34-1996, IEEE Standard for Performance of Low-Voltage Surge-Protective Devices (Secondary Arresters)

#### *[Consultant to update ANSI/IEEE standard references with most current version available at time of tender]*

## 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.*]

## Scope of Work

### Provide lightning protection systems for all areas and facilities containing stacks, including, but not limited to:

#### *[Consultant to complete listing of all areas and facilities requiring lightning protection]*

## Submittals

### A copy of the lightning protection system inspection report.

### Dimensioned layout drawings showing details of lighting protection system.

### Details of components and materials. Indicate the materials and methods of attachment of the conductors to the air terminals and electrodes.

## Quality Assurance

### An independent and competent third party inspection firm [approved by the Consultant] will conduct an inspection of the lightning protection system and provide a report to the Consultant at no cost to the Region.

# PRODUCTS

## Manufacturer Requirements

### Lightning Arrester:

#### Tested shall be according to ANSI/IEEE Standards C62.11-2012 and C62.34-1996.

#### Housing is weather and UV resistant

#### Ambient operating temperature range: -40˚C to +85˚C

### Comply with the regulations, codes and standards listed in subsection ‘References’.

### Materials shall comply with the CSA, UL/ULC and NFPA requirements pertaining to lightning protection systems.

### Obtain an inspection certificate from the Consultant for the discharge conductor passing through any fire supporting membrane.

## Materials

### Aerial terminals: solid copper, minimum 16 mm diameter, point tip, mounted on bronze bases.

### Conductors: Stranded, bare, tinned copper [ ] gauge for roof grid, down-lead and buried connections.

### Thermit welds: Exothermically welded connections, compatible with materials being interconnected, designed for the specific application and grounding conductor size.

### Compression connections: Pure wrought copper material, factory fitted with oxide inhibiting compound.

### Ground rods: 19mm diameter, 3050 mm long, copper clad steel construction with copper exterior coating permanently bonded to steel core, chamfered top, machined conical point.

# EXECUTION

## Installation

### Provide system to comply with applicable codes and standards.

### Provide bare copper conductor roof and down-lead cables.

### Utilize thermite welded copper connections or mechanical connectors accepted by the Consultant for cable to ground rod, cable to cable and cable to steel connection. Ensure clean and dry connections.

### Utilize bimetal connectors accepted by the Consultant for copper to aluminum connections.

### Install solid copper aerial terminals at 7,500 mm centres maximum, securely anchored to the roof hand rail. Install terminals to project a minimum of 300 mm above highest point in the vicinity and to connect to perimeter loop system.

### Bond metal roof masts to perimeter loop system using 25 mm x 1.5 mm copper strips.

### Install ground rods.

### Connect down-lead conductors to the ground rods. Protect grounding conductors subject to mechanical damage with rigid aluminum conduit or guards bonded at ends.

### Install lightning protection in accordance with the requirements of CAN/CSA-B72-M87 (R2013).

### Bond discharge conductors to the service mast or other non-current-carrying electrical parts.

### Submit the certificate of installation to the Consultant.

## Commissioning

### For all commissioning activities on systems where components of this Specification 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 commissioning plan that shall be provided to the Consultant prior to the commencement of commissioning activities.

**END OF SECTION**