
260560 GROUNDING AND BONDING

Part 1 – GENERAL

1.1 Description

A. This section details the guidelines and expectations for the design and installation of grounding and lightning protection systems on Johns Hopkins University Homewood Campus. Project conditions and requirements vary, thus precluding the absolute adherence to the items identified herein in all cases. However, unless there is adequate written justification and approval from the JHFRE Engineering and Energy Department, it is expected that these guidelines will govern the design and specifications.

1.2 Submittals

N/A

1.3 Quality Assurance

A. Maximum ground resistance shall be 5 ohms at all transformer locations per NFPA and IEEE recommended value.

Part 2 – PRODUCTS

2.1 All grounding and bonding materials shall be copper.

2.2 Copper materials in all locations except where the use of aluminum materials is necessary for galvanic compatibility.

2.3 Grounding electrode conductors shall be stranded cable and insulated with green colored insulation.

2.4 Grounding electrodes shall be 3/4" x 10' copper-clad steel.

2.5 Grounding bus bars shall be 1/4" x 2" or 4" in cross section by 24" long with standoff insulators. Ground bus bars shall be provided in all electrical and telecom rooms.

2.6 Install lightning protection to comply with UL 96A, NFPA 70, and NFPA 780. Conform to the most stringent requirement in NFPA 78.

2.7 No single rod lightning protection shall be used.

Part 3 – EXECUTION

3.1 All service entrances shall be solidly grounded using a grounding electrode system connection between ground rods, building steel, metallic cold-water and gas piping.

- 3.2 All new buildings shall have a counterpoise ring installed to ensure a low resistance ground for the building.
- 3.3 Air terminals shall be solid type with a safety tip, 10" minimum height and spaced no farther than twenty feet from each other.
- 3.4 Air terminals, conductors, fasteners, and connectors shall be galvanically compatible with surfaces to which they are mounted. Utilize bimetallic fittings when joining metals that are not galvanically compatible.
- 3.5 Bond exterior metals including flashing, roof drains, vent stacks, fans, water pipes, metal raceways, enclosures, frames, and other non-current carrying metal parts of electrical and mechanical equipment on roof to lightning protection system.
- 3.6 Bond lower end of exhaust ducts, vent stacks, etc. passing through roof.
- 3.7 For below-grade or concealed cable connections, utilize approved exothermic-welded connections for all conductor splices and connections between conductors and other components.
- 3.8 For all exposed cable connections, utilize approved mechanical connections.