



**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
4 IRVING PLACE
NEW YORK, NY 10003**

**DISTRIBUTION ENGINEERING
DEPARTMENT OFFICE**

**SPECIFICATION EO – 2018
REVISION 2
September, 2017**

**EFFECTIVE DATE
SEPTEMBER 1, 2017**

**GROUNDING OF METAL ENCLOSURES
FOR DISTRIBUTION TRANSFORMERS**

FILE: APPLICATION AND DESIGN MANUAL NO. 4

TARGET AUDIENCE	DISTRIBUTION ENGINEERING REGIONAL ENGINEERING
NESC REFERENCE	093 C 6, 093 E

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1.0 PURPOSE

This specification provides guidance on the method for grounding fences and other metal enclosures for distribution transformers.

- 1.1 Electrical equipment and metallic structures are grounded to assure safety to personnel during normal operation, maintenance and testing operations, faults and lightening conditions.
- 1.2 This is accomplished by grounding all exposed metallic parts of transformer tanks, fences, and various other electrical equipment and components to limit the differences of electrical potential between these substation objects.

2.0 APPLICATION

This specification applies to all personnel in Distribution Engineering and Regional Engineering Departments who are responsible for designing, fabricating, and installing grounding for fences and other metal enclosures for distribution transformers.

3.0 ENCLOSURE AT GRADE ON OPEN GROUND

- 3.1 Bury a 4/0 bare tinned copper cable 12 inch deep in a closed loop along the outer perimeter of the enclosure at a horizontal distance of 2.5 feet outside of the enclosure.
- 3.2 Make a connection from the approximate center of each side of the enclosure and both sides of the entrance gate, using # 4 AWG copper conductor, to the buried cable. The connections to the enclosure and to the buried cable shall be made with copper ground clamps.
- 3.3 Connect gates/s to the metallic fence using an appropriate braided copper conductor.
- 3.4 Use a buried bonding jumper to bond across a gate or any other opening in the fence, unless a non-conducting fence section is used.
- 3.5 If barbed wire strands are used above the fence fabric, the barbed wire strands shall be connected to the grounding conductor or fence.
- 3.6 When fence posts are of conducting material, the grounding conductor shall be connected to the fence posts, as required with suitable connecting means.

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- 3.7 When fence posts are of non-conducting material, suitable bonding connection shall be made to the fence mesh strands and the barbed wire strand at each grounding conductor point.
- 3.8 Connect the buried cable to the ground stud of the distribution transformer using 4/0 AWG bare copper cable.
- 3.9 Install driven ground rods at intervals of approximately 30 feet in accordance with Con Edison Drawing EO-8265 (latest revision) and make connections to the buried cable with copper ground clamps.

4.0 ENCLOSURES ABOVE GRADE

- 4.1 Connect the frame of the enclosure to the ground stud of the transformer with a 4/0 AWG bare copper cable.

5.0 REFERENCES

5.1 The latest editions of the following laws, regulations, codes and standards issued by the following organizations and agencies are applicable to the scope of work covered in this specification:

- 5.1.1 The Institute of Electrical and Electronics Engineers (IEEE)
- 5.1.2 National Electric Code (NEC)
 - a. Article 250 “Grounding”
- 5.1.3 National Electric Safety Code (NESC)
- 5.1.4 American National Standards Institute (ANSI)
- 5.1.5 National Electric Manufacturers Association (NEMA)
- 5.1.6 New York State Department of Environmental Conservation (NYSDEC)
- 5.1.7 New York City Department of Environmental Protection (NYCDEP)
- 5.1.8 United States Environmental Protection Agency (EPA)
- 5.1.9 Occupational Health and Safety Administration (OSHA)
- 5.1.10 “Articles of the General Condition” of the Consolidated Edison Company of New York, Inc.

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5.1.11 Dwg. EO-8265 – Installation of Driven Ground Rods.

5.1.12 Con Edison Dwg. 181895 – Typical Gnd. Connections for Electrical Equipment & Structures in Area Substations & Switching Stations.

5.1.13 Con Edison Specification EO-1070 – Specification Writer’s Guide.

5.1.14 Con Edison Specification EO-1058 – Specification Process

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