National Electrical Code 2017:
Grounding and Bonding

Agenda

Presented by Ron Shapiro

Introduction to Grounding and Bonding Part 1
Definitions
Introduce basic concepts

Introduction to Grounding and Bonding Part 2
Review ohms law
Electric shock hazards
250.4 - General requirements for grounding and bonding
250.36 - High-impedance grounded neutral systems

Grounding Electrode System
250.50 - Grounding electrode system
250.52 - Grounding electrodes
250.53 - Grounding electrode system installation
250.54 - Auxiliary grounding electrodes

Grounding Electrode Conductors
250.62 - Grounding electrode conductor materials
250.64 - GEC installation
250.68 - GEC and bonding
250.70 - Methods of grounding and bonding

System Grounding Part 1
250.20 - AC systems to be grounded
250.21 - AC systems not required to be grounded
250.22 - Circuits not to be grounded
250.24(A) System grounding connections

System Grounding Part 2
250.24(B) - Main bonding jumpers
250.24(C) - Grounded conductors in service equipment
250.30 - Grounding separately derived AC systems
250.32 - Separate building feeders

Bonding Part 1
250.90 - General requirements
250.92 - Bonding of services
250.96 - Bonding other enclosures

Bonding Part 2
250.102 - Bonding conductors and jumpers
250.104 - Bonding pipe systems and structural metal
250.106 - Lightning protection systems

Equipment Grounding & Conductors
250.110 - Equipment fastened in place
250.114 - Equipment connected by cord and plug
250.118 - Types of equipment grounding conductors
250.119 - ID of equipment grounding conductors
250.120 - GEC installation
250.122 - GEC sizing
250.126 - ID of wiring device terminals

Methods of Equipment Grounding
250.130 - GEC connections
250.136 - Equipment considered grounded
250.142 - Grounded conductor and grounding equipment
250.148 - GEC continuity and attachment

Learning Objectives

You’ll be able to:

Understand and use common terminology found in the National Electrical Code.

Review Ohms law, and discuss ground fault paths and electric shock hazards.

Review requirements for installing grounding electrode systems.

Identify AC systems to be grounded and AC systems not required to be grounded.

Differentiate grounding requirements for equipment fastened in place and equipment connected by cord and plug.

Comply with requirements for bonding of services, and for bonding conductors and jumpers.

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National Electrical Code 2017: Grounding and Bonding
Albany, NY - Tuesday, May 12, 2020

Review the basics of grounding and bonding
Get tips on system grounding
Learn about grounding electrode conductors
Comply with general requirements for bonding
Review requirements for equipment grounding and conductors
Discuss methods of equipment grounding

Continuing Education Credits
Architects
7.0 HSW Continuing Ed. Hours
7.0 AIA LU|HSW

Professional Engineers
7.0 Continuing Ed. Hours

International Code Council
.7 CEUs (Electrical)

Contractors
Non-Credit Continuing Ed.
Faculty

Ron Shapiro, P.E., DLB Associates

Mr. Shapiro is a professional engineer licensed in New York State and has been practicing in the field of data center design and construction related electrical engineering for almost 30 years. Mr. Shapiro has a diverse background in the design and development of reliable electrical distribution, emergency power, lighting, and fire protection systems for commercial, educational, industrial and health care data center facilities. He is experienced in conceptual and actual critical electrical system design, coordination of internal and external trades, client communication and construction administration. Mr. Shapiro also has experience in power distribution design (switchgmr, switchboards, transformer, standby power generation, UPS, and associated protection schemes); fire alarms (air aspiration and addressable types); system and raised floor grounding; security access control and CCTV; lighting design and associated manual or automatic controls, short circuit, coordination and arc flash studies, voltage drop, lighting protection and miscellaneous power. His experience also includes providing analysis/evaluation of existing and new electrical distribution systems and ancillary electrical infrastructure. Mr. Shapiro plays a critical role as technical code/theory adviser and internal educator for DLB Associates. He has coauthored “NEC 645 might not be for You” and “A Comparison Of Arc-Flash Incident Energy Reduction Techniques Using Low-Voltage Power Circuit Breakers”. Mr. Shapiro has lectured regarding varied data center-related electrical topics such as: “Fire Alarm Monitoring and Control Systems” for the Society of Fire Protection Engineers, and “Are We Readying the Data Center,” “Arc Flash in the Data Center Environment” and “Industry Trends in Electrical Distribution” for the Data Center Journal. He has recently presented the 2017 NEC Update Seminar with HalfMoon Education.

Additional Learning

Webinar Series

Compliance with the 2018 International Building Code

• Compliance with the 2018 International Building Code, Part I
  Wed., April 8, 2020, 11:00 AM - 1:00 PM PDT
• Compliance with the 2018 International Building Code, Part II
  Wed., April 8, 2020, 1:30 - 3:30 PM PDT
• Compliance with the 2018 International Building Code, Part III
  Thurs., April 9, 2020, 11:00 AM - 12:30 PM PDT

Tree Science

• Biology and Benefits of Trees
  Wed., April 15, 2020, 11:00 AM - 1:00 PM PDT
• Tree Infrastructure: Design Elements That Appreciate
  Wed., April 15, 2020, 1:30 - 5:00 PM PDT
• Trees and Site Requirements
  Thurs., April 16, 2020, 11:00 AM - 12:00 PM PDT
• Project Completion and Tree Threat Prevention
  Thurs., April 16, 2020, 12:30 - 2:30 PM PDT

Structural Forensic Engineering

• Overview of the Role of Forensic Engineering
  Thurs., April 16, 2020, 11:00 - 12:30 PM PDT
• Forensic Engineering Process and Forensic Engineering Report
  Thurs., April 16, 2020, 1:00 - 3:00 PM PDT
• Causes of Structural Failures
  Fri., April 17, 2020, 11:00 - 12:30 PM PDT
• Forensic Examination of Structures and Use in Litigation
  Fri., April 17, 2020, 1:00 - 3:00 PM PDT

Special Inspections under the IBC Chapter 17

• Special Inspections under the IBC Chapter 17, Part I
  Wed., April 29, 2020, 11:00 AM - 2:15 PM PDT
• Special Inspections under the IBC Chapter 17, Part II
  Thurs., April 30, 2020, 11:00 AM - 3:15 PM PDT

For more information and other online learning opportunities visit www.halfmoonevents.org/webinars/

Continuing Education Credit Information

This seminar is open to the public and offers up to 7.0 HSW continuing education hours to architects and 7.0 continuing education hours to professional engineers in many states, including New York and New Jersey (HalfMoon Education is an approved continuing education sponsor for New Jersey engineers (Approval No. 24G00000700).

HalfMoon Education is deemed a New York-approved continuing education provider for engineers and architects via its registration with the American Institute of Architects Continuing Education System (Regulations of the Commissioner §64.1(1)(2) and §64.6(1)(2)). This event is approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Sponsor No. AIA98). Visit www.halfmoonevents.org to view complete AIA information under this course listing. Only full attendance is reportable to the AIA/ELES.

The International Code Council has approved this course for .7 CEUS in specialty area of Electrical (Preferred Provider No. 1232). This event offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any state with a continuing education requirement for contractors.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

How to Register

Online: www.halfmoonevents.org
Phone: 715-835-5900
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Complete the entire form. Attach duplicates if necessary.

Register

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Albany, NY - Tuesday, May 12, 2020

Additional Registrants:

Name: __________________________
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State: ___________________________
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Tuition

I will be attending the live seminar. Single Registrant - $299.00. Three or more registrants from the same company registering at the same time - $279.00 each.

Checks: Make payable to HalfMoon Education Inc.

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