*AETech Electrical Training Center*

*Arne Electro-Tech Seminars*

 P.O. Box 2272

Steve Arne Rapid City, SD 57709

Email: office@aetech.com Phone: (605) 342-9088

**Continuing Education for the Electrical Professional**

Course: 2017 NEC Grounding vs. Bonding, 8 hour, 1-day program

Schedule: 8:00 a.m. – 5:00 p.m. each day; sign-in starts at 7:30 a.m.

Format: Lecture format using Power Point slides and in-class discussion over Mike Holt’s Grounding vs. Bonding book, changes made to this edition.

Text book: 2017 National Electrical Code

Instructor: Jeff Larus, Master Electrician, Licensed Electrical Inspector

Objectives: Provide a review of important Code requirements regarding Grounding vs.

Bonding.

Criteria used to identify successful course completion:

 Daily attendance sign-in sheets and instructor observation of attendance/application.

**Course Outline**:

 **Part I. General**

 Scope: 250.1

 Definition: 250.2

 General Requirements for Grounding and Bonding: 250.4

 Objectionable Current: 250.6

 Termination of Grounding and Bonding Conductors: 250.8

 Protection of Fittings: 250.10

 Clean Surfaces: 250.12

 **Part II. System Grounding and Bonding**

 Systems Required to be Grounded: 250.20

 Ungrounded Systems—50V to 1,000V: 250.21

 Service Equipment—Grounding and Bonding: 250.24

 Main Bonding Jumper and System Bonding Jumper: 250.28

 Separately Derived Systems—Grounding and Bonding: 250.30

 Buildings Supplied by a Feeder: 250.32

 Generators—Portable and Vehicle-Mounted: 250.34

 Permanently Installed Generators: 250.35

 High-Impedance Grounded Systems: 250.36

 **Part III. Grounding Electrode System and Grounding**

 **Electrode Conductor**

 Grounding Electrode System: 250.50

 Grounding Electrode Types: 250.52

 Grounding Electrode Installation Requirements: 250.53

 Auxiliary Grounding Electrodes: 250.54

 Lightning Protection Electrode: 250.60

 Grounding Electrode Conductor: 250.62

 Grounding Electrode Conductor Installation: 250.64

 Sizing Grounding Electrode Conductor: 250.66

 Termination to the Grounding Electrode: 250.68

 Grounding Electrode Conductor Termination Fittings: 250.70

 **Part IV. Grounding Enclosure, Raceway, and Service Cable**

 **Connections**

 Service Raceways and Enclosures: 250.80

 Other Enclosures: 250.86

 **Part V. Bonding**

 General: 250.90

 Bonding Equipment for Services: 250.92

 Intersystem Bonding Termination: 250.94

 Bonding Other Enclosures: 250.96

 Bonding Metal Parts Containing 277V and 480V Circuits: 250.97

 Bonding Loosely Jointed Metal Raceways: 250.98

 Bonding in Hazardous (Classified) Locations: 250.100

 Bonding Conductors and Jumpers: 250.102

 Bonding of Piping Systems and Exposed Structural Metal: 250.104

 Lightning Protection System: 250.106

**Part VI. Equipment Grounding and Equipment**

**Grounding Conductors**

 Fixed Equipment Connected by Permanent Wiring

Methods—General: 250.110

Specific Equipment Fastened in Place or Connected by permanent

 Wiring Methods: 250.112

Cord-and Plug-Connected Equipment: 250.114

Types of Equipment Grounding Conductors: 250.118

Identification of Equipment Grounding Conductors: 250.119

Equipment Grounding Conductor Installation: 250.120

Use of Equipment Grounding Conductors: 250.121

Sizing Equipment Grounding Conductor: 250.122

**Part VII: Methods of Equipment Grounding**

Equipment Grounding Conductor Connections: 250.130

Equipment Connected by Permanent Wiring Methods: 250.134

Equipment Considered Grounded: 250.136

Cord-and-Plug-Connected Equipment: 250.138

Ranges, Ovens, and Clothes Dryers: 250.140

Use of Neutral Conductor for Equipment Grounding: 250.142

Connecting Receptacle Grounding Terminal to

Metal Enclosure: 250.146

Continuity and Attachment of Equipment Grounding

 Conductors in Metal Boxes: 250.14

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**Note:** State “reciprocal” acceptance of CEU classes can change without notice; be sure to check with the state from which you wish to receive credit to verify that they will accept our classes.

**References:**

All references herein to the National Electrical Code, "The code", or "NEC" are references to The National Electrical Code, published by The National Fire Protection Association of Batterymarch Park, Quincy, MA.

Mike Holt’s Illustrated Guide to Understanding NEC Requirements for Grounding vs. Bonding; Based on the NEC Electrical Code Book.

Additional books, video training classes and resources are available at our web site: [www.aetech.com](http://www.aetech.com)