



# Table of Contents

**INTRODUCTION** ..... vii

**HOW TO USE THIS TEXTBOOK** ..... ix

**THE NATIONAL ELECTRICAL CODE** ..... xii

**PART I. GENERAL** ..... 2

250.1 Scope..... 2

250.2 Definitions..... 2

250.4 General Requirements for Grounding and Bonding... 6

250.6 Objectionable Current..... 11

250.8 Termination of Grounding and Bonding Conductors.. 14

250.10 Protection of Fittings ..... 14

250.12 Clean Surface ..... 15

**PART II. SYSTEM GROUNDING AND BONDING** ..... 15

250.20 Systems Required to be Grounded and Bonded..... 15

250.24 Grounding and Bonding at Service Equipment..... 17

250.28 Main Bonding Jumper and System Bonding Jumper..... 21

250.30 Grounding and Bonding of Separately Derived AC Systems..... 22

250.32 Buildings or Structures Supplied by a Feeder or Branch Circuit..... 27

250.34 Generators—Portable and Vehicle-Mounted..... 30

250.36 High-Impedance Grounded Neutral Systems..... 30

**PART III. GROUNDING ELECTRODE SYSTEM AND GROUNDING ELECTRODE CONDUCTOR**..... 33

250.50 Grounding Electrode System ..... 33

250.52 Grounding (Earthing) Electrodes..... 33

250.53 Installation of Grounding Electrode System..... 36

250.54 Supplementary Electrodes ..... 38

250.56 Resistance of Ground Rod Electrode ..... 38

250.58 Common Grounding (Earthing) Electrode..... 40

250.60 Lightning Protection System Grounding (Earthing) Electrode..... 40

250.62 Grounding Electrode Conductor—Material..... 41

250.64 Grounding Electrode Conductor Installation..... 41

250.66 Grounding Electrode Conductor—Size ..... 43

250.68 Grounding Electrode Conductor Termination..... 44

250.70 Grounding Electrode Conductor Termination Fitting ..... 45

**PART IV. GROUNDING (BONDING) OF ENCLOSURE, RACEWAY AND SERVICE CABLE**..... 45

250.80 Service Enclosures ..... 45

250.86 Other Enclosures..... 45

**PART V. BONDING**..... 46

250.92 Service Bonding..... 46

250.94 Grounding (Bonding) of Communications Systems ..... 48

250.96 Bonding Other Enclosures..... 49

250.97 Bonding 277V/480V..... 50

250.100 Bonding—Hazardous (Classified) Locations..... 51

250.102 Bonding Jumper..... 51

250.104 Bonding of Piping Systems and Exposed Structural Metal ..... 53

250.106 Lightning Protection System ..... 56

**PART VI. EQUIPMENT GROUNDING (BONDING) AND EQUIPMENT GROUNDING (BONDING) CONDUCTORS** ..... 57

250.110 Fixed Equipment Connected by Permanent Wiring Methods—General ..... 57

250.112 Fixed Equipment Connected by Permanent Wiring Methods—Specific ..... 57

250.114 Equipment Connected by Cord and Plug ..... 57



250.118 Types of Equipment Grounding (Bonding) Conductors . . . . .	58	250.134 Grounding (Bonding)—Fixed Equipment . . . . .	64
250.119 Identification of Equipment Grounding (Bonding) Conductor . . . . .	60	250.138 Grounding (Bonding)—Cord-and-Plug Connected Equipment. . . . .	65
250.122 Sizing Equipment Grounding (Bonding) Conductor. . . . .	61	250.140 Grounding (Bonding)—Ranges, Ovens, and Clothes Dryers . . . . .	65
250.126 Identification of Wiring Device Terminals. . . . .	63	250.142 Use of Grounded Neutral Conductor for Equipment Grounding (Bonding). . . . .	66
<b>PART VII. METHODS OF EQUIPMENT GROUNDING (BONDING)</b> . . . . .	63	250.146 Connecting Receptacle Grounding Terminal to Box . . . . .	67
250.130 Equipment Grounding (Bonding) Conductor Connections . . . . .	63	250.148 Continuity and Attachment of Equipment Grounding (Bonding) Conductors to Boxes. . . . .	69

