

TABLE OF CONTENTS

About This Textbook	x	Part II. Not Over 1000V	50
Additional Products to Help You Learn	xiii	110.26 Working Spaces About Electrical Equipment	50
How to Use the <i>National Electrical Code</i>	1	110.27 Protection Against Physical Damage.....	60
Article 90—Introduction to the <i>National Electrical Code</i>	7	110.28 NEMA Enclosure Types.....	60
90.1 Scope.....	7	110.29 In Sight From (Within Sight From, Within Sight)	61
90.2 Scope and Application of the <i>NEC</i>	7	Chapter 1—Review Questions	63
90.3 <i>Code</i> Arrangement.....	11	CHAPTER 2—WIRING AND PROTECTION	65
90.4 <i>NEC</i> Enforcement	11	Article 200—Use and Identification of Grounded Conductors	67
90.5 Mandatory and Permissive Rules, and Explanatory Material	13	200.1 Scope	68
90.7 Examination of Equipment for Safety	13	200.7 Identification of Grounded Conductors.....	68
Article 90—Review Questions	15	200.8 Use of White or Gray Color	70
CHAPTER 1—GENERAL RULES	17	Article 210—Branch Circuits	73
Article 100—Definitions	19	Part I. General	73
100 Scope	19	210.1 Scope	73
Article 110—General Requirements for Electrical Installations	37	210.5 Conductor Identification.....	73
Part I. General Requirements	37	210.8 GFCI Protection.....	75
110.1 Scope	37	210.12 Arc-Fault Circuit-Interrupter Protection	86
110.2 Approval of Conductors and Equipment.....	37	Part II. Branch-Circuit Ratings	90
110.3 Installation and Use of Equipment	38	210.21 Receptacle Rating.....	90
110.5 Conductor Material	39	Part III. Required Outlets	91
110.6 Conductor Sizes	39	210.52 Dwelling Unit Receptacle Outlet Requirements.....	91
110.8 Suitable Wiring Methods	40	210.70 Lighting Outlet Requirements.....	99
110.12 Mechanical Execution of Work	40	Article 250—Grounding and Bonding	103
110.13 Equipment Mounting and Cooling.....	42	Part I. General	103
110.14 Electrical Connections.....	42	250.1 Scope	103
110.22 Identification of Disconnecting Means	50	Part III. Grounding Electrode System and Grounding Electrode Conductor	104
110.25 Lockable Disconnecting Means	50	250.50 Grounding Electrode System	104
		250.52 Grounding Electrode Types	105
		250.53 Grounding Electrode Installation	109

Measuring Contact Resistance of Electrodes to Earth 109

Part VI. Equipment Grounding Conductors 113

250.119 Identification of Wire-Type Equipment Grounding
Conductors 113

250.120 Equipment Grounding Conductor Installation 114

250.146 Receptacle Grounding Terminal Bonding 114

250.148 Continuity and Connections of Equipment Grounding
Conductors in Boxes 115

Chapter 2—Review Questions 119

CHAPTER 3—WIRING METHODS AND MATERIALS 123

Article 300—General Requirements for Wiring Methods and Materials 125

Part I. General Requirements 125

300.1 Scope 125

300.4 Fire and Water Damage 126

300.5 Conductors 126

300.6 Protection Against Physical Damage 129

300.7 Underground Installations 133

300.9 Raceways Exposed to Different Temperatures 135

300.12 Electrical Continuity 136

300.13 Securing and Supporting 137

300.14 Mechanical Continuity 140

300.15 Mechanical and Electrical Continuity of Conductors 140

300.16 Conductor Length at Boxes 141

300.17 Boxes or Fittings, Splices and Terminations 141

Article 310—Conductors for General Wiring 145

Part I. General 145

310.1 Scope 145

310.5 Conductors, Minimum Size and Material 145

310.6 Conductor Identification 146

Part III. Installation 147

310.10 Uses Permitted 147

Article 312—Cabinets and Meter Socket Enclosures 151

Part I. General 151

312.1 Scope 151

312.4 Damp or Wet Locations 151

312.5 Position in Walls 152

312.7 Repairing Gaps in Noncombustible Surfaces 152

312.8 Cable Termination to Enclosures 152

Article 314—Boxes, Conduit Bodies, and Handhole Enclosures 155

Part I. General 155

314.1 Scope 155

Part II. Installation 155

314.15 Wet Locations 155

314.16 Outlet Box Sizing 155

314.17 Cables That Enter Boxes 162

314.20 Flush-Mounted Boxes 163

314.21 Repairing Noncombustible Surfaces 163

314.23 Supporting Enclosures 164

314.25 Box Covers 167

314.29 Wiring to be Accessible 167

314.30 Handhole Enclosures 168

Article 320—Armored Cable (AC Cable) 171

Part I. General 171

320.1 Scope 171

Part II. Installation 172

320.10 Uses Permitted 172

320.12 Uses Not Permitted 172

320.15 Exposed Work 172

320.30 Securing and Supporting 172

320.40 Boxes and Fittings 173

Article 330—Metal-Clad Cable (MC Cable) 175

Part I. General 175

330.1 Scope 175

Part II. Installation 176

330.10 Uses Permitted 176

330.12 Uses Not Permitted 176

330.30 Securing and Supporting 176

Article 334—Nonmetallic-Sheathed Cable (NM Cable) 179

Part I. General 179

334.1 Scope 179

Part II. Installation 180

334.10 Uses Permitted 180

334.12 Uses Not Permitted 181

334.30 Securing and Supporting 182

334.40 Boxes and Fittings 183

Article 336—Power and Control Tray Cable (TC Cable) 185

Part I. General 185

336.1 Scope 185

Part II. Installation 185

336.10 Uses Permitted 185

336.12 Uses Not Permitted 186

336.30 Securing and Supporting 186

Article 338—Service-Entrance Cable (SE and USE Cable) 187

Part I. General 187

338.1 Scope 187

Part II. Installation 188

338.10 Uses Permitted 188

338.12 Uses Not Permitted 188

Article 340—Underground Feeder and Branch-Circuit Cable (UF Cable) 189

Part I. General 189

340.1 Scope 189

Part II. Installation 189

340.10 Uses Permitted 189

340.12 Uses Not Permitted 190

Article 342—Intermediate Metal Conduit (IMC) 191

Part I. General 191

342.1 Scope 191

Part II. Installation 192

342.10 Uses Permitted 192

342.24 Bends 192

342.28 Reaming 192

342.29 Paired Locknuts 193

342.30 Securing and Supporting 193

342.42 Couplings and Connectors 194

342.46 Bushings 195

Article 344—Rigid Metal Conduit (RMC) 197

Part I. General 197

344.1 Scope 197

Part II. Installation 198

344.10 Uses Permitted 198

344.24 Bends 198

344.28 Reaming 198

344.29 Paired Locknuts 199

344.30 Securing and Supporting 199

344.42 Couplings and Connectors 200

344.46 Bushings 201

Article 348—Flexible Metal Conduit (FMC) 203

Part I. General 203

348.1 Scope 203

Part II. Installation 203

348.10 Uses Permitted 203

348.12 Uses Not Permitted 203

348.24 Bends 204

348.28 Trimming 204

348.30 Securing and Supporting 204

348.42 Connectors 205

Article 350—Liquidtight Flexible Metal Conduit (LFMC) 207

Part I. General 207

350.1 Scope 207

Part II. Installation 208

350.10 Uses Permitted 208

350.12 Uses Not Permitted 208

350.24 Bends 208

350.28 Trimming 208

350.30 Securing and Supporting 208

350.42 Connectors 209

Article 352—Rigid Polyvinyl Chloride Conduit (PVC) 211

Part I. General 211

352.1 Scope 211

Part II. Installation 212

352.10 Uses Permitted 212

352.12 Uses Not Permitted 212

352.24 Bends 213

352.28 Trimming 213

352.30 Securing and Supporting 213

352.44 Expansion Fittings 214

352.46 Bushing or Adapter 215

Article 356—Liquidtight Flexible Nonmetallic Conduit (LFNC)	217	Article 380—Multioutlet Assemblies	235
Part I. General	217	Part I. General	235
356.1 Scope.....	217	380.1 Scope.....	235
Part II. Installation	218	Part II. Installation	235
356.10 Uses Permitted.....	218	380.10 Uses Permitted.....	235
356.12 Uses Not Permitted.....	218	380.12 Uses Not Permitted.....	236
356.24 Bends.....	218		
356.30 Securing and Supporting.....	218	Article 386—Surface Metal Raceways	237
356.42 Fittings.....	219	Part I. General	237
		386.1 Scope.....	237
		Part II. Installation	237
Article 358—Electrical Metallic Tubing (EMT)	221	386.10 Uses Permitted.....	237
Part I. General	221	386.12 Uses Not Permitted.....	238
358.1 Scope.....	221	386.30 Supporting.....	238
Part II. Installation	221		
358.10 Uses Permitted.....	221	Article 392—Cable Trays	239
358.12 Uses Not Permitted.....	222	Part I. General	239
358.24 Bends.....	222	392.1 Scope.....	239
358.28 Reaming.....	223	Part II. Installation	239
358.30 Securing and Supporting.....	223	392.10 Uses Permitted.....	239
358.42 Couplings and Connectors.....	224	392.12 Uses Not Permitted.....	241
		392.18 Cable Tray Installations.....	241
		392.30 Securing and Supporting.....	242
Article 362—Electrical Nonmetallic Tubing (ENT)	227	Chapter 3—Review Questions	243
Part I. General	227		
362.1 Scope.....	227	CHAPTER 4—EQUIPMENT FOR GENERAL USE	255
Part II. Installation	228	Article 404—Switches	257
362.10 Uses Permitted.....	228	Part I. Installation	257
362.12 Uses Not Permitted.....	229	404.1 Scope.....	257
362.24 Bends.....	229	404.5 Switch and Circuit Breaker Enclosures.....	257
362.28 Trimming.....	230	404.6 Damp or Wet Locations.....	258
362.30 Securing and Supporting.....	230	404.9 Indicating.....	259
362.46 Bushings.....	230	404.10 Accessibility and Grouping.....	259
362.48 Joints.....	230		
		Article 406—Wiring Devices	261
Article 376—Metal Wireways	231	Part I. General	261
Part I. General	231	406.1 Scope.....	261
376.1 Scope.....	231	406.2 Listing Requirements.....	261
Part II. Installation	231	406.9 Wiring Devices in Damp or Wet Locations.....	261
376.10 Uses Permitted.....	231	Part II. Receptacles, Cord Connectors, and Attachment Plugs (Caps)	264
376.12 Uses Not Permitted.....	232	406.14 Receptacle Mounting.....	264
376.30 Supports.....	232	406.16 Receptacle Faceplates or Cover Plates.....	265
376.56 Splices, Taps, and Power Distribution Blocks.....	232		

Part III. General-Use Snap Switches, Dimmers, and Electronic Control Switches.....266

406.42 Snap Switches, Dimmers, and Control Switches
Mounting.....266

Article 408—Switchboards and Panelboards.....267

Part I. General.....267

408.1 Scope.....267

408.4 Circuit Directory and Description.....267

408.7 Unused Openings.....269

Article 410—Luminaires.....271

Part I. General.....271

410.1 Scope.....271

410.2 Listing Requirements.....271

Part II. Luminaire Locations.....272

410.10 Luminaires in Specific Locations.....272

Part V. Grounding (Bonding).....272

410.44 Connection to the Equipment Grounding Conductor.....272

Article 422—Appliances.....275

Part I. General.....275

422.1 Scope.....275

Part II. Branch-Circuit Requirements.....275

422.16 Flexible Cords.....275

Chapter 4—Review Questions.....279

FINAL EXAM A—STRAIGHT ORDER.....283

FINAL EXAM B—RANDOM ORDER.....289

ABOUT THE AUTHOR.....299

ABOUT THE MIKE HOLT TEAM.....301