

Understanding the National Electrical Code®

Volume 2

TABLE OF CONTENTS

About This Textbook	xiii	110.15	High-Leg Conductor Identification.....	84
Additional Products to Help You Learn	xvi	110.16	Arc Flash Hazard Warning.....	85
How to Use the <i>National Electrical Code</i>	1	110.21	Markings.....	87
 Article 90—Introduction to the <i>National Electrical Code</i>	7	110.22	Identification of Disconnecting Means.....	88
90.1 Purpose of the <i>NEC</i>	7	110.24	Available Fault Current.....	88
90.2 Scope of the <i>NEC</i>	8	110.25	Lockable Disconnecting Means.....	89
90.3 Code Arrangement.....	10	Part II. 1,000V, Nominal, or Less		89
90.4 Enforcement.....	11	110.26	Spaces About Electrical Equipment.....	89
90.5 Mandatory Requirements and Explanatory Material.....	13	110.27	Guarding of Live Parts.....	98
90.7 Examination of Equipment for Product Safety.....	13	110.28	Enclosure Types.....	98
90.8 Wiring Planning.....	14	Chapter 1—Practice Questions		101
 Article 90—Practice Questions	15	 CHAPTER 5—SPECIAL OCCUPANCIES		107
 CHAPTER 1—GENERAL RULES	19	Article 500—Hazardous (Classified) Locations		109
Article 100—Definitions	21	500.1 Scope—Articles 500 Through 503.....		110
100 Definitions.....	21	500.3 Other Articles.....		110
Part I. General	21	500.4 Documentation.....		110
Part III. Hazardous (Classified) Locations	66	500.5 Classifications of Hazardous Locations.....		111
 Article 110—Requirements for Electrical Installations	69	500.6 Material Groups.....		113
Part I. General Requirements	69	500.7 Protection Techniques.....		113
110.1 Scope.....	69	500.8 Equipment.....		115
110.2 Approval of Conductors and Equipment.....	69	 Article 501—Class I Hazardous (Classified) Locations		117
110.3 Use and Product Listing (Certification) of Equipment.....	70	Part I. General		117
110.4 Voltage Rating of Electrical Equipment.....	70	501.1 Scope.....		117
110.5 Conductor Material.....	70	Part II. Wiring		117
110.6 Conductor Sizes.....	71	501.10 Wiring Methods.....		117
110.7 Wiring Integrity.....	71	501.15 Raceway and Cable Seals.....		119
110.8 Suitable Wiring Methods.....	71	501.30 Grounding and Bonding.....		125
110.9 Interrupting Rating (Overcurrent Protective Devices).....	72	Part III. Equipment		126
110.10 Equipment Short-Circuit Current Rating.....	72	501.115 Enclosures Containing Make-and-Break Contact Devices.....		126
110.11 Deteriorating Agents.....	74	501.125 Motors and Generators.....		127
110.12 Mechanical Execution of Work.....	74	501.130 Luminaires.....		127
110.13 Mounting and Cooling of Equipment.....	76	501.135 Utilization Equipment.....		128
110.14 Conductor Termination and Splicing.....	77	501.140 Flexible Cords, Class I, Divisions 1 and 2.....		128
		501.145 Receptacles and Attachment Plugs.....		129
		501.150 Limited-Energy and Communications Systems.....		129

Article 502—Class II Hazardous (Classified)

Locations	131
Part I. General	131
502.1 Scope	131
502.5 Explosionproof Equipment	131
Part II. Wiring	132
502.10 Wiring Methods	132
502.15 Sealing	134
502.30 Grounding and Bonding	134
Part III. Equipment	136
502.115 Enclosures Containing Make-and-Break Contacts	136
502.125 Motors and Generators	136
502.130 Luminaires	136
502.140 Flexible Cords	137
502.145 Receptacles and Attachment Plugs	138
502.150 Limited-Energy and Communications Systems	138

Article 503—Class III Hazardous (Classified)

Locations	139
Part I. General	139
503.1 Scope	139
Part II. Wiring	139
503.10 Wiring Methods	139
503.30 Grounding and Bonding	140
Part III. Equipment	141
503.115 Enclosures Containing Make-and-Break Contacts	141
503.125 Motors and Generators	141
503.130 Luminaires	141
503.140 Flexible Cords	142
503.145 Receptacles and Attachment plugs	142
503.150 Limited-Energy and Communications Systems	142

Article 511—Commercial Garages, Repair and Storage

511.1 Scope	143
511.3 Classification of Hazardous Areas	143
511.7 Wiring and Equipment Above Hazardous (Classified) Locations	144
511.8 Underground Wiring Below Class I Locations	145
511.9 Seals	145
511.10 Special Equipment	146
511.12 GFCI-Protected Receptacles	146

Article 514—Motor Fuel Dispensing Facilities

514.1 Scope	147
514.3 Classification of Locations	147
514.4 Wiring and Equipment Within Class I Locations	148
514.7 Wiring and Equipment Above Class I Locations	148

514.8 Underground Wiring	148
514.9 Conduit Seal	149
514.16 Grounding and Bonding	150

Article 517—Health Care Facilities

Part I. General	151
517.1 Scope	151
517.2 Definitions	152
Part II. Wiring and Protection	153
517.10 Applicability	153
517.12 Wiring Methods	153
517.13 Equipment Grounding Conductor for Receptacles and Fixed Electrical Equipment in Patient Care Spaces	153
517.16 Isolated Ground Receptacles	156
517.18 General Care Spaces	157

Article 518—Assembly Occupancies

518.1 Scope	159
518.2 General Classifications	159
518.3 Other Articles	160
518.4 Wiring Methods	160
518.6 Illumination	161

Article 525—Carnivals, Circuses, Fairs, and Similar Events

Part I. General Requirements	163
525.1 Scope	163
525.2 Definitions	163
525.5 Overhead Conductor Clearances	163
525.6 Protection of Electrical Equipment	164
Part III. Wiring Methods	164
525.20 Wiring Methods	164
525.21 Rides, Tents, and Concessions	165
525.22 Outdoor Portable Distribution or Termination Boxes	165
525.23 GFCI-Protected Receptacles and Equipment	166
Part IV. Grounding and Bonding	166
525.31 Equipment Grounding	166
525.32 Portable Equipment Grounding Conductor Continuity	166

Article 547—Agricultural Buildings

547.1 Scope	167
547.2 Definitions	167
547.5 Wiring Methods	168
547.8 Luminaires	169
547.10 Equipotential Planes	169

Article 550—Mobile Homes, Manufactured Homes, and Mobile Home Parks	171
Part I. General	171
550.1 Scope	171
550.2 Definitions	171
550.4 General Requirements	172
Part II. Mobile and Manufactured Homes	172
550.13 Receptacle Outlets	172
550.15 Wiring Methods and Materials	172
550.25 AFCI Protection	172
Part III. Services and Feeders	173
550.32 Mobile and Manufactured Home Service Disconnect	173
550.33 Feeder	173
 Article 555—Marinas, Boatyards, and Docking Facilities	175
Part I. General	175
555.1 Scope	175
555.2 Definitions	175
555.3 Electrical Datum Plane Distances	177
555.4 Location of Service Equipment	177
555.5 Maximum Voltage	178
555.6 Load Calculations for Service and Feeder Conductors	178
555.7 Transformers	178
555.9 Boat Hoists	179
555.10 Electric Shock Hazard Signage	179
555.11 Motor Fuel Dispensing Stations—Hazardous (Classified) Locations	179
555.12 Repair Facilities—Hazardous (Classified) Locations	180
555.13 Bonding of Noncurrent-Carrying Metal Parts	180
Part II. Marinas, Boatyards, and Docking Facilities	180
555.30 Electrical Connections	180
555.33 Receptacles	181
555.34 Wiring Methods and Installation	182
555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit-Interrupter (GFCI) Protection	182
555.36 Boat Receptacle Disconnecting Means	183
555.37 Equipment Grounding Conductor	183
 Article 590—Temporary Installations	185
590.1 Scope	185
590.2 All Wiring Installations	185
590.3 Time Constraints	186
590.4 General	186
590.5 Listing of Decorative Lighting	188
590.6 GFCI Protection for Personnel	189
590.8 Overcurrent Protective Devices	189
 Chapter 5—Practice Questions	191

CHAPTER 6—SPECIAL EQUIPMENT	215
Article 600—Electric Signs and Outline Lighting	217
Part I. General	217
600.1 Scope	217
600.2 Definitions	218
600.3 Listing	218
600.4 Markings	219
600.5 Branch Circuits	219
600.6 Disconnecting Means	220
600.7 Grounding and Bonding	222
600.9 Location	224
600.21 Ballasts, Transformers, Class 2 Power Sources, and Electronic Power Supplies	224
600.24 Class 2 Power Sources	224
Part II. Field-Installed Skeleton Tubing, Outline Lightning, and Secondary Wiring	225
600.34 Photovoltaic (PV) Powered Sign	225
600.35 Retrofit Kits	225
 Article 604—Manufactured Wiring Systems	227
604.1 Scope	227
604.2 Definition	227
604.6 Listing Requirements	227
604.7 Installation—Securing and Supporting	228
604.10 Uses Permitted	228
 Article 620—Elevators, Escalators, and Moving Walks	229
Part I. General	229
620.1 Scope	229
620.6 GFCI-Protected Receptacles	229
Part II. Conductors	230
620.13 Feeder and Branch-Circuit Conductors	230
620.16 Short-Circuit Current Rating	230
Part III. Wiring	230
620.22 Branch Circuits for Elevator Car(s)	230
620.23 Branch Circuits for Machine Room/Machinery Space	231
620.24 Branch Circuit for Hoistway Pit Lighting and Receptacles	231
Part IV. Installation of Conductors	231
620.37 Wiring in Elevator Hoistways, Control, and Machine Rooms/Spaces	231
Part VI. Disconnecting Means and Control	232
620.51 Disconnecting Means	232
 Article 625—Electric Vehicle Power Transfer System	233
Part I. General	233
625.1 Scope	233
625.2 Definitions	233

625.5	Listed.....	234
Part III. Installation		234
625.40	Electric Vehicle Branch Circuit.....	234
625.41	Overcurrent Protection	234
625.42	Rating.....	235
625.43	Disconnecting Means	235
625.48	Interactive Systems	235
625.50	Location	235
625.52	Ventilation	236
625.54	Ground-Fault Circuit-Interrupter Protection for Personnel.....	236
625.60	Alternating-Current Electric Vehicle Power Export (EVPE) Receptacles	236

Article 630—Electric Welders.....237

Part I. General

630.1	Scope	237
630.6	Listing.....	237

Part II. Arc Welders

630.11	Ampacity of Supply Conductors	237
630.12	Overcurrent Protection	240
630.13	Disconnecting Means	240

Part III. Resistance Welders.....240

630.31	Ampacity of Supply Conductor	240
630.32	Overcurrent Protection	242
630.33	Disconnecting Means	242

Article 640—Audio Signal Amplification and Reproduction Equipment.....243

Part I. General

640.1	Scope	243
640.2	Definitions	243
640.3	Locations and Other Articles	244
640.4	Protection of Electrical Equipment.....	244
640.6	Mechanical Execution of Work	244
640.9	Wiring Methods	245
640.10	Audio Systems Near Bodies of Water	245

Part II. Permanent Audio System Installations

640.21	Use of Flexible Cords and Flexible Cables	245
640.23	Conduit or Tubing	246

Article 645—Information Technology Equipment (ITE).....247

645.1	Scope	247
645.2	Definitions	247
645.3	Other Articles.....	247
645.4	Special Requirements	248
645.5	Supply Circuits and Interconnecting Cables	248
645.10	Disconnecting Means	251
645.15	Equipment Grounding and Bonding	251

Article 680—Swimming Pools, Spas, Hot Tubs, Fountains, and Similar Installations.....253

Part I. General Requirements for Pools, Spas, Hot Tubs, and Fountains.....253

680.1	Scope	253
680.2	Definitions	254
680.3	Approval of Equipment	257
680.4	Inspections After Installation.....	257
680.5	Ground-Fault Circuit Interrupters.....	257
680.6	Bonding and Equipment Grounding	257
680.7	Bonding and Equipment Grounding Terminals	257
680.9	Overhead Conductor Clearance	257
680.10	Electric Water Heaters.....	258
680.11	Underground Wiring.....	259
680.12	Equipment Rooms and Pits.....	259
680.13	Maintenance Disconnecting Means.....	259
680.14	Wiring Methods in Corrosive Environment.....	260

Part II. Permanently Installed Pools

680.20	General.....	260
680.21	Pool Motors.....	260
680.22	Receptacles, Luminaires, and Switches.....	261
680.23	Underwater Pool Luminaires	264
680.24	Junction Box, Transformer, or GFCI Enclosure	267
680.25	Feeders	268
680.26	Equipotential Bonding	268
680.27	Specialized Equipment	273
680.28	Gas-Fired Water Heaters	273

Part III. Storable Pools, Spas, Hot Tubs, and Immersion Pools.....273

680.30	General.....	273
680.31	Pumps	273
680.32	GFCI Protection.....	273
680.34	Receptacle Locations	274
680.35	Storable and Portable Immersion Pools	274

Part IV. Spas and Hot Tubs, and Permanently Installed Immersion Pools.....274

680.40	General.....	274
680.41	Emergency Switch for Spas and Hot Tubs	274
680.42	Outdoor Installations.....	275
680.43	Indoor Installations	275
680.44	GFCI Protection.....	276
680.45	Permanently Installed Immersion Pools	277

Part V. Fountains.....277

680.50	General.....	277
680.51	Luminaires and Submersible Equipment	277
680.54	Connection to an Equipment Grounding Conductor.....	278
680.55	Methods of Equipment Grounding	278
680.56	Cord-and-Plug-Connected Equipment.....	278
680.57	Electric Signs in or Adjacent to Fountains.....	278
680.58	GFCI Protection for Adjacent Receptacles	278

680.59	GFCI Protection for Permanently Installed Nonsubmersible Pumps	278	Part VIII. Energy Storage Systems	318
Part VII. Hydromassage Bathtubs		279	690.71	Energy Storage Systems
680.70	General	279	690.72	Self-Regulated PV Charge Control
680.71	GFCI Protection	279		318
680.73	Accessibility	279	Article 691—Large-Scale Photovoltaic (PV) Electric Supply Stations	319
680.74	Equipotential Bonding	280	691.1	Scope
Part VIII. Electrically Powered Pool Lifts		280	691.4	Special Requirements for Large-Scale PV Electric Supply Stations
680.80	General	280		319
680.81	Equipment Approval	280	691.5	Equipment
680.82	Protection	280	691.6	Engineered Design
680.83	Bonding	281	691.7	Conformance of Construction to Engineered Design
680.84	Switching Devices and Receptacles	281	691.8	Direct-Current Operating Voltage
			691.9	Disconnect for Isolating Photovoltaic Equipment
			691.10	Arc-Fault Mitigation
			691.11	Fence Bonding and Grounding
				320
Article 690—Solar Photovoltaic (PV) Systems		283	Article 695—Fire Pumps	321
Part I. General		283	695.1	Scope
690.1	Scope	283	695.3	Electric Power Source(s)
690.2	Definitions	284	695.4	Continuity of Power
690.4	General Requirements	288	695.5	Transformers
690.6	Alternating-Current Modules and Systems	289	695.6	Power Wiring
Part II. Circuit Requirements		290	695.7	Voltage Drop
690.7	Maximum PV System Direct-Current Circuit Voltage	290	695.10	Listed Equipment
690.8	Circuit Current and Conductor Sizing	294	695.14	Control Wiring
690.9	Overcurrent Protection	300	695.15	Surge Protection
690.10	Stand-Alone Systems	301		326
690.11	Arc-Fault Circuit Protection	301		326
690.12	Rapid Shutdown	301	Chapter 6—Practice Questions	327
Part III. Disconnect		303		
690.13	PV System Disconnect	303	CHAPTER 7—SPECIAL CONDITIONS	349
690.15	PV Equipment Disconnecting Means to Isolate PV Equipment	304	Article 700—Emergency Systems	351
Part IV. Wiring Methods		306	Part I. General	351
690.31	Wiring Methods	306	700.1	Scope
690.32	Component Interconnections	311	700.2	Definitions
690.33	Connectors (Mating)	311	700.3	Tests and Maintenance
690.34	Access to Boxes	312	700.4	Capacity and Rating
Part V. Grounding and Bonding		312	700.5	Transfer Equipment
690.43	Equipment Grounding and Bonding	312	700.7	Signs
690.45	Size of Equipment Grounding Conductors	314	700.8	Surge Protection
690.47	Grounding Electrode System	314		353
Part VI. Markings and Labels		315	Part II. Circuit Wiring	353
690.53	Direct-Current PV Circuit Label	315	700.10	Wiring
690.54	Interactive System Point of Interconnection	316		353
690.55	Energy Storage	316	Part III. Sources of Power	355
690.56	Identification of Power Sources	316	700.12	General Requirements
Part VII. Connections to Other Sources		317		355
690.59	Connection to Other Power Sources	317	Part IV. Emergency System Circuits for Lighting and Power	357
			700.15	Loads on Emergency Branch Circuits
			700.16	Emergency Illumination
			700.19	Multiwire Branch Circuits
				357

Part VI. Overcurrent Protection	357	705.28	Circuit Sizing and Current.....	383	
700.30	Accessibility.....	357	705.30	Overcurrent Protection	384
700.32	Selective Coordination.....	358	705.32	Ground-Fault Protection	384
			705.40	Loss of Utility Power	384
			705.45	Unbalanced Interconnections.....	385
Article 701—Legally Required Standby Systems	359	Part II. Microgrid Systems		386	
Part I. General	359	705.50	System Operation	386	
701.1	Scope	359	705.60	Primary Power Source Connection	386
701.2	Definition.....	359			
701.3	Tests and Maintenance	360	Article 706—Energy Storage Systems	387	
701.4	Capacity and Rating.....	360	Part I. General	387	
701.5	Transfer Equipment	360	706.1	Scope	387
701.6	Signals.....	361	706.2	Definitions	388
701.7	Signs.....	361	706.3	Qualified Personnel.....	388
Part II. Circuit Wiring	361	706.4	System Requirements	388	
701.10	Wiring.....	361	706.5	Listing.....	389
Part III. Sources of Power	361	706.6	Multiple Systems.....	389	
701.12	General Requirements.....	361	706.8	Storage Batteries	389
Part IV. Overcurrent Protection	362	706.9	Maximum Voltage	389	
701.30	Accessibility.....	362	Part II. Disconnect	389	
701.32	Selective Coordination.....	363	706.15	Disconnect.....	389
			Part III. Installation Requirements	390	
Article 702—Optional Standby Systems	365	706.20	General.....	390	
Part I. General	365	706.21	Directory (Identification of Power Sources)	391	
702.1	Scope	365	Part IV. Circuit Requirements	391	
702.2	Definition.....	366	706.30	Circuit Sizing and Current.....	391
702.4	Capacity and Rating.....	366	706.31	Overcurrent Protection	392
702.5	Transfer Equipment	367	706.33	Charge Control.....	392
702.6	Signals.....	368	Part V. Flow Battery Energy Storage Systems	393	
702.7	Signs.....	368			
Part II. Circuit Wiring	368	Article 710—Stand-Alone Systems		395	
702.10	Wiring.....	368	710.1	Scope	395
702.11	Portable Generator Grounding	369	710.6	Equipment Approval	395
702.12	Outdoor Generator Sets	369	710.10	Identification of Power Sources.....	396
			710.12	Stand-Alone Inverter Input Circuit Current	396
			710.15	General.....	396
Article 705—Interconnected Electric Power Production Sources	371	Article 725—Remote-Control, Signaling, and Power-Limited Circuits		399	
Part I. General	371	Part I. General		399	
705.1	Scope	725.1	Scope	399	
705.2	Definitions	725.2	Definitions	400	
705.6	Equipment Approval	725.3	Other Articles.....	400	
705.8	System Installation	725.21	Electrical Equipment Behind Access Panels.....	404	
705.10	Identification of Power Sources.....	725.24	Mechanical Execution of Work	404	
705.11	Supply-Side Source Connections	725.25	Abandoned Cable.....	405	
705.12	Load-Side Source Connections	725.31	Safety-Control Equipment.....	406	
705.13	Power Control Systems	725.35	Circuit Requirements	406	
705.16	Interrupting and Short-Circuit Current Rating.....				
705.20	Disconnect.....				
705.25	Wiring Methods				

Part II. Class 1 Circuit Requirements	406	Part IV. Listing Requirements	428
725.41 Class 1 Circuit Classifications and Requirements	406	760.179 Listing and Marking of Power-Limited Fire Alarm Cables (PLFA).....	428
725.43 Class 1 Circuit Overcurrent Protection.....	407		
725.45 Class 1 Circuit Overcurrent Protective Device Location	407	Article 770—Optical Fiber Cables	429
725.46 Class 1 Circuit Wiring Methods.....	407	Part I. General	429
725.48 Conductors of Different Circuits in Same Cable, Cable Tray, Enclosure, or Raceway	407	770.1 Scope	429
725.49 Class 1 Circuit Conductors.....	408	770.2 Definitions	429
725.51 Number of Conductors in a Raceway	408	770.3 Other Articles.....	430
Part III. Class 2 Circuit Requirements	408	770.21 Access to Electrical Equipment Behind Panels Designed to Allow Access	430
725.121 Power Sources for Class 2 Circuits	408	770.24 Mechanical Execution of Work	430
725.124 Circuit Marking.....	409	770.25 Abandoned Cable.....	431
725.127 Wiring Methods on Supply Side of the Class 2 Power Source	409	770.26 Spread of Fire or Products of Combustion	432
725.130 Wiring Methods on Load Side of the Class 2 Power Source	409	Part V. Installation Methods Within Buildings	432
725.135 Installation of Class 2 Cables.....	410	770.110 Raceways and Cable Routing Assemblies, and Cable Trays for Optical Fiber Cables	432
725.136 Separation from Power Conductors.....	411	770.113 Installation of Optical Fiber Cables.....	433
725.139 Conductors of Different Circuits in Same Cable, Enclosure, Cable Tray, Raceway, or Cable Routing Assembly.....	413	770.114 Grounding	433
725.143 Support	414	770.133 Installation of Optical Fiber Cables and Electrical Conductors	434
725.144 Transmission of Power and Data.....	414	770.154 Applications of Listed Optical Fiber Cables	434
725.154 Applications of Class 2 Cables.....	415	Chapter 7—Practice Questions	435
Part IV. Listing Requirements	415		
725.170 Listing and Marking of Equipment for Power and Data Transmission	415	CHAPTER 8—COMMUNICATIONS SYSTEMS	455
725.179 Listing and Marking of Class 2 Cables.....	416	Article 800—General Requirements for Communications Systems	457
Article 760—Fire Alarm Systems	419	Part I. General	457
Part I. General	419	800.1 Scope	457
760.1 Scope	419	800.2 Definitions	457
760.2 Definitions	419	800.3 Other Articles.....	458
760.3 Other Articles.....	420	800.21 Access to Electrical Equipment Behind Panels Designed to Allow Access	459
760.21 Access to Electrical Equipment Behind Panels Designed to Allow Access	422	800.24 Mechanical Execution of Work	459
760.24 Mechanical Execution of Work	422	800.25 Abandoned Cable.....	460
760.25 Abandoned Cables.....	423	800.26 Spread of Fire or Products of Combustion	460
760.30 Fire Alarm Circuit Identification.....	424	Part II. Wires and Cables Outside and Entering Buildings	462
760.35 Fire Alarm Circuit Requirements	424	800.49 Metal Entrance Conduit Bonding	462
Part III. Power-Limited Fire Alarm (PLFA) Circuits	424	800.53 Separation from Lightning Conductors	462
760.121 Power Sources for Power-Limited Fire Alarm Circuits	424	Part III. Bonding Methods	462
760.124 Marking.....	425	800.100 Cable and Primary Protector Bonding	462
760.127 Wiring Methods on Supply Side of the Power-Limited Fire Alarm Source	425	Part IV. Installation Methods Within Buildings	464
760.130 Wiring Methods on Load Side of the Power-Limited Fire Alarm Power Source	425	800.110 Raceways and Cable Routing Assemblies	464
760.135 Installation of PLFA Cables in Buildings	426	800.113 Installation of Communications Wires, Cables, Raceways, and Cable Routing Assemblies.....	465
760.136 Separation from Power Conductors.....	427	800.154 Applications of Listed Communications Wires, Cables, and Raceways, and Listed Cable Routing Assemblies.....	466
760.143 Support of PLFA Cables	427	800.179 Plenum, Riser, General-Purpose, and Limited-Use Cables.....	466
760.154 Applications of Power-Limited Fire Alarm Cables (PLFA)	427		

Article 805—General Requirements for Communications Circuits	467
Part I. General	467
805.1 Scope	467
805.2 Definitions	467
805.18 Installation of Equipment	467
Part III. Protection	468
805.90 Primary Protection	468
805.93 Bonding or Interruption	468
Part IV. Installation Methods Within Buildings	468
805.133 Installation of Communications Wires, Cables, and Equipment.....	468
805.154 Communications Cable(s) Substitutions	469
805.156 Dwelling Unit Communications Outlet	469

Article 810—Radio and Television Antenna Equipment	471
Part I. General	471
810.1 Scope	471
810.4 Community Television Antenna	472
Part II. Receiving Equipment—Antenna Systems	472
810.12 Supports	472
810.13 Avoid Contact with Conductors of Other Systems	472
810.15 Metal Antenna Supports—Bonding	473
810.18 Clearances	473
810.20 Antenna Discharge Unit.....	473
810.21 Bonding Conductors and Grounding Electrode Conductors....	474
Part III. Amateur and Citizen Band Transmitting and Receiving Stations—Antenna Systems	476
810.51 Other Sections.....	476
810.57 Antenna Discharge Units—Transmitting Stations	476
810.58 Bonding Conductors and Grounding Electrode Conductors—Amateur and Citizen Band Transmitting and Receiving Stations	476

Article 820—Community Antenna Television (CATV) and Radio Distribution Systems (Coaxial Cable)	477
Part I. General	477
820.1 Scope	477
Part III. Protection	478
820.93 Grounding of the Outer Conductive Shield of Coaxial Cables ...	478
Part IV. Grounding Methods	478
820.100 Bonding and Grounding Methods.....	478
Part V. Installation Methods Within Buildings	478
820.133 Installation of Coaxial Cables and Equipment.....	478
Chapter 8—Practice Questions	481

Final Exam A—Straight Order	487
--	-----

Final Exam B—Random Order	497
--	-----

INDEX	507
--------------------	-----

About the Author	515
-------------------------------	-----

About the Illustrator	516
------------------------------------	-----

About the Mike Holt Team	517
---------------------------------------	-----