

## APPENDIX Q

# ICC INTERNATIONAL RESIDENTIAL CODE ELECTRICAL PROVISIONS/NATIONAL ELECTRICAL CODE CROSS-REFERENCE

This table is a cross-reference of the *International Residential Code*, Chapters 33 through 42, and the 2005 *National Electrical Code* (NFPA 70-2005).

<b>International Residential Code</b>	<b>National Electrical Code</b>
<b>CHAPTER 33</b>	<b>GENERAL REQUIREMENTS</b>
<b>SECTION E3301</b>	<b>GENERAL</b>
E3301.1	Applicability . . . . . None
E3301.2	Scope . . . . . 90.2
E3301.3	Not covered . . . . . 90.2
E3301.4	Additions and alterations . . . . . None
<b>SECTION E3302</b>	<b>BUILDING STRUCTURE PROTECTION</b>
E3302.1	Drilling and notching . . . . . None
E3302.2	Penetrations of fire-resistance-rated assemblies . . . . . 300.21
E3302.3	Penetrations of firestops and draftstops . . . . . 300.21
<b>SECTION E3303</b>	<b>INSPECTION AND APPROVAL</b>
E3303.1	Approval . . . . . 110.2
E3303.2	Inspection required . . . . . None
E3303.3	Listing and labeling . . . . . 110.3
<b>SECTION E3304</b>	<b>GENERAL EQUIPMENT REQUIREMENTS</b>
E3304.1	Voltages . . . . . 110.4
E3304.2	Interrupting rating . . . . . 110.9
E3304.3	Circuit characteristics . . . . . 110.10
E3304.4	Protection of equipment . . . . . 110.11
E3304.5	Unused openings . . . . . 110.12(A)
E3304.6	Integrity of electrical equipment . . . . . 110.12(C)
E3304.7	Mounting . . . . . 110.13(A)
E3304.8	Energized parts guarded against accidental contact . . . . . 110.27(A)
E3304.9	Prevent physical damage . . . . . 110.27(B)
E3304.10	Equipment identification . . . . . 110.21
E3304.11	Identification of disconnecting means . . . . . 110.22
<b>SECTION E3305</b>	<b>EQUIPMENT LOCATION AND CLEARANCES</b>
E3305.1	Working space and clearances . . . . . 110.26
Figure E3305.1	Working space and clearances . . . . . 110.26(A)
	Footnote 1 . . . . . 110.26(F)(1)(a)
	Footnote 2 . . . . . 110.26(A)(3) and 110.26(E)
	Footnote 3 . . . . . 110.26(B)
	Footnote 4 . . . . . 230.70(A), 240.24(D) and 240.24(E)
	Footnote 5 . . . . . 110.26(D)
E3305.2	Working clearances for energized equipment and panelboards . . . . . 110.26(A)(1), (2), & (3)
E3305.3	Clearances over panelboards . . . . . 110.26(F)(1)(a)
E3305.4	Location of clear spaces . . . . . 110.26(B), 230.70(A) and 240.24(D) & (E)
E3305.5	Access and entrance to working space . . . . . 110.26(C)(1)
E3305.6	Illumination . . . . . 110.26(D)
E3305.7	Headroom . . . . . 110.26(E)
<b>SECTION E3306</b>	<b>ELECTRICAL CONDUCTORS AND CONNECTIONS</b>
E3306.1	General . . . . . Articles 110, 300 and 310

**APPENDIX Q**

E3306.2	Conductor material . . . . .	110.5
E3306.3	Minimum size of conductors . . . . .	310.5
E3306.4	Stranded conductors . . . . .	310.3
E3306.5	Individual conductor insulation . . . . .	310.2(A) and 310.8
E3306.6	Conductors in parallel . . . . .	310.4
E3306.7	Conductors of the same circuit. . . . .	300.3(B)
E3306.8	Aluminum and copper connections . . . . .	110.14
E3306.9	Terminals . . . . .	110.14(A)
E3306.10	Splices . . . . .	110.14(B)
E3306.10.1	Continuity . . . . .	300.13(A)
	Exception. . . . .	300.13(A)
E3306.10.2	Device connections . . . . .	250.148 and 300.13(B)
E3306.10.3	Length of conductor for splice or termination . . . . .	300.14
<b>SECTION E3307</b>	<b>CONDUCTOR IDENTIFICATION</b>	
E3307.1	Grounded conductors . . . . .	200.6(A), 200.6(B) and 310.12(A)
E3307.2	Equipment grounding conductors. . . . .	250.119 and 310.12(B)
E3307.3	Ungrounded conductors . . . . .	310.12(C), 310.12(C), Exception and 200.7(C)(1) & (C)(2)
E3307.4	Identification of terminals . . . . .	200.10
E3307.4.1	Device terminals . . . . .	200.10(A)
E3307.4.2	Receptacles, plugs, and connectors . . . . .	200.10(B)
<b>CHAPTER 34</b>	<b>ELECTRICAL DEFINITIONS</b>	
<b>SECTION 3401</b>	<b>GENERAL</b>	Article 100, Definitions
<b>CHAPTER 35</b>	<b>SERVICES</b>	
<b>SECTION E3501</b>	<b>GENERAL SERVICES</b>	
E3501.1	Scope . . . . .	230.1
E3501.2	Number of services. . . . .	230.2
E3501.3	One building or other structure not to be supplied through another . . . . .	230.3
E3501.4	Other conductors in raceway or cable . . . . .	230.7
E3501.5	Raceway seal. . . . .	230.8
E3501.6	Service disconnect required . . . . .	230.70
E3501.6.1	Marking of service equipment and disconnects. . . . .	230.66 and 230.70(B)
E3501.6.2	Service disconnect location. . . . .	230.70 and 230.72(C)
E3501.7	Maximum number of disconnects . . . . .	230.71(A)
<b>SECTION E3502</b>	<b>SERVICE SIZE AND RATING</b>	
E3502.1	Rating of ungrounded conductors . . . . .	230.79(C) and (D)
E3502.2	Service load. . . . .	220.82(A)
E3502.2.1	Services under 100 amperes. . . . .	None
Table E3502.2	Minimum service load calculation . . . . .	220.82 (B) and (C)
E3502.3	Rating of service disconnect . . . . .	230.79 & 230.80
E3502.4	Voltage rating . . . . .	220.82(a)
<b>SECTION E3503</b>	<b>SERVICE, FEEDER AND GROUNDING ELECTRODE CONDUCTOR SIZING</b>	
E3503.1	Grounded and ungrounded service conductor size . . . . .	310.15(B)(6)
Table E3503.1	Service conductor and grounding electrode conductor sizing. Table 310.15(B)(6) and Table 250.66	
	Footnote 1 . . . . .	250.64(E)
	Footnote 2 . . . . .	250.64(B)
	Footnote 3 . . . . .	250.64(B)
	Footnote 4 . . . . .	250.66(A) and (B)
E3503.2	Ungrounded service conductors for accessory buildings and structures. . . . .	230.79(D)
	Exception 1. . . . .	and 230.79(A)
	Exception 2. . . . .	and 230.79(B)
E3503.3	Overload protection . . . . .	230.90
E3503.3.1	Ungrounded conductor . . . . .	230.90(A)

	Exception . . . . .	230.90(A), Exception No. 3
E3503.3.2	Not in grounded conductor . . . . .	230.90(B)
E3503.3.3	Location . . . . .	230.91
E3503.4	Grounding electrode conductor size . . . . .	250.66
E3503.5	Temperature limitations . . . . .	110.14(C)(1)
<b>SECTION E3504</b>	<b>OVERHEAD SERVICE-DROP AND SERVICE CONDUCTOR INSTALLATION</b>	
E3504.1	Clearances on buildings . . . . .	230.9
Figure E3504.1	Clearances from building openings . . . . .	230.9
E3504.2	Vertical clearances . . . . .	230.24
E3504.2.1	Above roofs . . . . .	230.24(A)
	Exception 1 . . . . .	230.24(A), Exception No. 1
	Exception 2 . . . . .	230.24(A), Exception No. 2
	Exception 3 . . . . .	230.24(A), Exception No. 3
	Exception 4 . . . . .	230.24(A), Exception No. 4
Figure E3504.2.1	Clearances from roofs . . . . .	230.24
E3504.2.2	Vertical clearance from grade . . . . .	230.24(B)
	Item 1 . . . . .	230.24(B)(1)
	Item 2 . . . . .	230.24(B)(2)
	Item 3 . . . . .	230.24(B)(4)
E3504.3	Point of attachment . . . . .	230.26
E3504.4	Means of attachment . . . . .	230.27
E3504.5	Service masts as supports . . . . .	230.28
E3504.6	Supports over buildings . . . . .	230.29
<b>SECTION E3505</b>	<b>SERVICE-ENTRANCE CONDUCTORS</b>	
E3505.1	Insulation of service-entrance conductors . . . . .	230.41
	Exception 1 . . . . .	230.41, Exception
	Exception 2 . . . . .	230.41, Exception
E3505.2	Wiring methods for services . . . . .	230.43
E3505.3	Spliced conductors . . . . .	230.46
E3505.4	Protection against physical damage . . . . .	230.49
E3505.5	Protection of service cables against damage . . . . .	230.50(A)
E3505.6	Direct sunlight exposure . . . . .	310.8(D)
E3505.7	Mounting supports . . . . .	230.51
E3505.8	Raceways to drain . . . . .	230.53
E3505.9	Overhead service locations . . . . .	230.54
E3505.9.1	Rain-tight service head . . . . .	230.54(A)
E3505.9.2	Service cable, service head or gooseneck . . . . .	230.54(B)
E3505.9.3	Service head location . . . . .	230.54(C)
	Exception . . . . .	230.54(C), Exception
E3505.9.4	Separately bushed openings . . . . .	230.54(E)
E3505.9.5	Drip loops . . . . .	230.54(F)
E3505.9.6	Conductor arrangement . . . . .	230.54(G)
E3505.9.7	Secured . . . . .	230.54(D)
<b>SECTION E3506</b>	<b>SERVICE EQUIPMENT—GENERAL</b>	
E3506.1	Service equipment enclosures . . . . .	230.62
E3506.2	Working space . . . . .	110.26
E3506.3	Available short-circuit current . . . . .	None
E3506.4	Marking . . . . .	230.66
<b>SECTION E3507</b>	<b>SYSTEM GROUNDING</b>	
E3507.1	System service ground . . . . .	250.20(B)(1) and 250.24(A)
E3507.2	Location of grounding electrode conductor connection . . . . .	250.24(A)(1) and (A)(5)
E3507.3	Buildings or structures supplied by feeder(s) or branch circuit(s) . . . . .	250.32(A)
	Exception . . . . .	250.32(A), Exception
E3507.3.1	Equipment grounding conductor . . . . .	250.32(B)(1) and Table 250.122

**APPENDIX Q**

E3507.3.2 Grounded conductor . . . . . 250.32(B)(2)  
E3507.4 Grounding electrode conductor . . . . . 250.24(D)  
E3507.5 Main bonding jumper . . . . . 250.28  
E3507.6 Common grounding electrode . . . . . 250.58

**SECTION E3508 GROUNDING ELECTRODE SYSTEM**

E3508.1 Grounding electrode system . . . . . 250.50  
E3508.1 Exception . . . . . 250.50 Exception  
E3508.1.1 Metal underground water pipe . . . . . 250.52(A)(1)  
E3508.1.1.1 Installation . . . . . 250.53(D) and 250.53(E)  
E3508.1.2 Concrete-encased electrode . . . . . 250.502(A)(3)  
E3508.1.3 Ground Rings . . . . . 250.52(A)(4), 250.53(F)  
E3508.1.4 Rod and pipe electrodes . . . . . 250.52(A)(5)  
E3508.1.4.1 Installation . . . . . 250.53(G)  
E3508.1.5 Plate electrodes . . . . . 250.52(A)(6) and 250.53(H)  
E3508.2 Bonding Jumper . . . . . 250.53(C)  
E3508.3 Rod, pipe and plate electrode requirements . . . . . 250.53(A) and (G)  
E3508.4 Resistance of rod, pipe and plate electrodes . . . . . 250.56  
E3508.5 Aluminum Electrodes . . . . . 250.52(B)(2)  
E3508.6 Metal underground gas piping system . . . . . 250.52(B)(1)

**SECTION E3509 BONDING**

E3509.1 General . . . . . 250.90  
E3509.2 Bonding of service equipment . . . . . 250.92(A)  
E3509.3 Bonding to other systems . . . . . 250.94  
E3509.4 Method of bonding at the service . . . . . 250.92(B)  
E3509.4.1 Grounded service conductor . . . . . 250.92(B)(1)  
E3509.4.2 Threaded connections . . . . . 250.92(B)(2)  
E3509.4.3 Threadless couplings and connectors . . . . . 250.92(B)(3)  
E3509.4.4 Other devices . . . . . 250.92(B)(4)  
E3509.5 Sizing bonding jumper on supply side of service and main bonding jumper . . . . . 250.102(C)  
E3509.6 Metal water piping bonding . . . . . 250.104(A)  
E3509.7 Bonding other metal piping . . . . . 250.104(B)

**SECTION E3510 GROUNDING ELECTRODE CONDUCTORS**

E3510.1 Continuous . . . . . 250.64(C) and (E)  
E3510.2 Securing and protection against physical damage . . . . . 250.64(A) and (B)  
E3510.3 Enclosures for grounding electrode conductors . . . . . 250.64(E)

**SECTION E3511 GROUNDING ELECTRODE CONDUCTOR CONNECTION TO GROUNDING ELECTRODES**

E3511.1 Methods of grounding connection to electrodes . . . . . 250.70  
E3511.2 Accessibility . . . . . 250.68(A)  
E3511.3 Effective grounding path . . . . . 250.68(B)  
E3511.4 Protection of ground clamps and fittings . . . . . 250.10  
E3511.5 Clean surfaces . . . . . 250.12

**CHAPTER 36 BRANCH CIRCUIT AND FEEDER REQUIREMENTS**

**SECTION E3601 GENERAL**

E3601.1 Scope . . . . . None  
E3601.2 Branch-circuit and feeder ampacity . . . . . 210.19(A) and 215.2(A)(1)  
E3601.3 Selection of ampacity . . . . . 310.15(A)(2)  
E3601.4 Multioutlet branch circuits . . . . . 210.19(A)(2)  
E3601.5 Multiwire branch circuits . . . . . 210.4

**SECTION E3602 BRANCH CIRCUIT RATINGS**

E3602.1 Branch-circuit voltage limitations . . . . . 210.6(A) and (B)  
E3602.2 Branch-circuit ampere rating . . . . . 210.3

E3602.3 Fifteen- and 20-ampere branch circuits . . . . . 210.23(A)  
 E3602.4 Thirty-ampere branch circuits . . . . . 210.23(B)  
 E3602.5 Branch circuits serving multiple loads or outlets . . . . . 210.23(A)  
 E3602.6 Branch circuits serving a single motor . . . . . 430.22(A)  
 E3602.7 Branch circuits serving motor-operated and combination loads . . . . . 220.4(A)  
 E3602.8 Branch-circuit inductive lighting loads . . . . . 220.4(B)  
 E3602.9 Branch-circuit load for ranges and cooking appliances . . . . . Table 220.19, Note 4  
 E3602.9.1 Minimum branch circuit for ranges . . . . . 210.19(A)(3)  
 E3602.10 Branch circuits serving heating loads . . . . . 422.13 and 424.3(A)  
 E3602.11 Branch circuits for air-conditioning and heat pump equipment . . . 440.35, 440.4(B) and 440.62(A)  
 E3602.12 Branch circuits serving room air conditioners . . . . . 440.62(A)  
 E3602.12.1 Where no other loads are supplied. . . . . 440.62(B)  
 E3602.12.2 Where lighting units or other appliances are also supplied . . . . . 440.62(C)  
 E3602.13 Branch-circuit requirement—summary . . . . . 210.24 and 210.25  
 Table E3602.13 Branch-circuit requirement—summary. . . . . Table 210.24

**SECTION E3603 REQUIRED BRANCH CIRCUITS**

E3603.1 Branch circuits for heating . . . . . 422.12 and 422.12 Exception  
 E3603.2 Kitchen and dining area receptacles . . . . . 210.52 (B)(1)  
 E3603.3 Laundry circuit . . . . . 210.23(A) Exception and 210.11(C)(2)  
 E3603.4 Bathroom branch circuits. . . . . 210.11(C)(3)  
 E3603.5 Number of branch circuits . . . . . 210.11(A)  
 E3603.6 Branch-circuit load proportioning . . . . . 210.11(B)

**SECTION E3604 FEEDER REQUIREMENTS**

E3604.1 Conductor size . . . . . Table 310.15(B)(6), Sections 215.2 (A)(3), (A)(4) and 220.10(A)  
 E3604.2 Minimum feeder conductor size . . . . . 215.2(A)(2)  
 E3604.3 Feeder loads . . . . . Table 220.11  
 Table E3604.3(1) Feeder load calculation . . . . . Table 220.11, Table 220.30(C), Sections 220.14, 220.15, 220.17, 220.18 and 220.19  
 Table E3604.3(2) Demand loads for electric ranges, wall-mounted ovens, counter-mounted cooking units and other cooking appliances over 1<sup>3</sup>/<sub>4</sub> kVA rating . . . . . Table 220.19  
 E3604.4 Feeder neutral load. . . . . 220.22  
 E3604.5 Lighting and convenience receptacle load . . . . . 220.3(A), Table 220.3(A)  
 E3604.6 Ampacity and computed loads. . . . . 220.10  
 E3604.7 Feeder and branch-circuit conductors . . . . . 240.21(A)

**SECTION E3605 CONDUCTOR SIZING AND OVERCURRENT PROTECTION**

E3605.1 General . . . . . 310.15(A)  
 Table E3605.1 Allowable ampacities . . . . . Tables 310.16 and 240.4 D  
 E3605.2 Correction factors for ambient temperatures . . . . . Table 310.16  
 Table E3605.2 Ambient temperature correction factors . . . . . Table 310.16, Correction factors  
 E3605.3 Adjustment factor for conductor proximity . . . . . 310.15(B)(2)(a)  
 Table E3605.3 Conductor proximity adjustment factors . . . . . Table 310.15(B)(2)(a)  
 E3605.4 Temperature limitations . . . . . 110.14(C)  
 E3605.4.1 Conductors rated 60°C. . . . . 110.14(C)(1)(a)  
 E3605.4.2 Conductors rated 75°C. . . . . 110.14(C)(1)(b)  
 E3605.4.3 Separately installed pressure connectors . . . . . 110.14(C)(2)  
 E3605.4.4 Conductors of type NM cable . . . . . 334.80 and 334.112  
 E3605.5 Overcurrent protection required . . . . . Table 310.15(B)(6), Sections 240.4, 240.5, 240.21  
 E3605.5.1 Cords . . . . . 240.5  
 E3605.5.2 Overcurrent devices of the next higher size . . . . . 240.4(B)  
 E3605.5.3 Small conductors. . . . . 240.4(D)  
 E3605.5.4 Air conditioning and heat pump equipment . . . . . 240.4(G)  
 E3605.6 Fuses and fixed trip circuit breakers . . . . . Section 240.6  
 E3605.7 Location of overcurrent devices in or on premises . . . . . 240.24(A),(C),(D),(E)  
 E3605.8 Ready access for occupants . . . . . Section 240.24(B)

**APPENDIX Q**

E3605.9	Enclosures for overcurrent devices . . . . .	Section 240.30 (A) and (B)
<b>SECTION E3606</b>	<b>PANELBOARDS</b>	
E3606.1	Panelboard rating . . . . .	408.13
E3606.2	Panelboard circuit identification . . . . .	408.4
E3606.3	Panelboard overcurrent protection . . . . .	408.16(A)
E3606.4	Grounded conductor terminations . . . . .	408.41
E3606.5	Back-fed devices . . . . .	408.36(F)
<b>CHAPTER 37</b>	<b>WIRING METHODS</b>	
<b>SECTION E3701</b>	<b>GENERAL REQUIREMENTS</b>	
E3701.1	Scope . . . . .	Section 300.1
E3701.2	Allowable wiring methods . . . . .	Sections 110.8 and 300.3(A)
Table E3701.2	Allowable wiring methods . . . . .	None
E3701.3	Circuit conductors . . . . .	300.3(B)
E3701.4	Wiring method applications . . . . .	Chapter 3 and Section 300.2
Table E3701.4	Allowable applications for wiring methods . . . . .	Chapter 3 and Section 300.2
<b>SECTION E3702</b>	<b>ABOVE-GROUND INSTALLATION REQUIREMENTS</b>	
E3702.1	Installation and support requirements . . . . .	Chapter 3
Table E3702.1	General installation and support requirements for wiring methods . . . . .	Chapter 3
E3702.2	Cables in accessible attics . . . . .	320.23 and 334.23
E3702.2.1	Across structural members . . . . .	320.23(A) and 334.23
E3702.2.2	Cable installed through or parallel to framing members . . . . .	320.17, 320.23(A), 334.17, 334.23 and 300.4(B)
E3702.3	Exposed cable . . . . .	320.15 and 334.15
E3702.3.1	Surface installation . . . . .	334.15(A)
E3702.3.2	Protection from physical damage . . . . .	334.15(B)
E3702.3.3	Locations exposed to direct sunlight . . . . .	310.8(D)
E3702.4	In unfinished basements . . . . .	334.15(C)
E3702.5	Bends . . . . .	320.24 and 334.24
E3702.6	Raceways exposed to different temperatures . . . . .	Section 300.7(A)
<b>SECTION E3703</b>	<b>UNDERGROUND INSTALLATION REQUIREMENTS</b>	
E3703.1	Minimum cover requirements . . . . .	300.5(A)
Table E3703.1	Minimum cover requirements, burial in inches . . . . .	Table 300.5
E3703.2	Warning ribbon . . . . .	300.5(D)(3)
E3703.3	Protection from damage . . . . .	300.5(D)
E3703.4	Splices and taps . . . . .	300.5(E)
E3703.5	Backfill . . . . .	300.5(F)
E3703.6	Raceway seals . . . . .	300.5(G)
E3703.7	Bushing . . . . .	300.5(H)
E3703.8	Single conductors . . . . .	300.5(I)
E3703.9	Ground movement . . . . .	Section 300.5(J)
<b>CHAPTER 38</b>	<b>POWER AND LIGHTING DISTRIBUTION</b>	
<b>SECTION E3801</b>	<b>RECEPTACLE OUTLETS</b>	
E3801.1	General . . . . .	210.50 and 210.52
E3801.2	General-use receptacle distribution . . . . .	210.52(A)
E3801.2.1	Spacing . . . . .	210.52(A)(1)
E3801.2.2	Wall space . . . . .	210.52(A)(2)
E3801.2.3	Floor receptacles . . . . .	210.52(3)
E3801.3	Small appliance receptacles . . . . .	210.52(B)(1)
E3801.3.1	Other outlets prohibited . . . . .	210.52(B)(2)
E3801.3.2	Limitations . . . . .	210.52(B)(3)
E3801.4	Countertop receptacles . . . . .	210.52(C)
E3801.4.1	Wall counter space . . . . .	210.52(C)(1)

E3801.4.2	Island counter spaces . . . . .	210.52(C)(2)
E3801.4.3	Peninsular counter space . . . . .	210.52(C)(3)
E3801.4.4	Separate spaces . . . . .	210.52(C)(4)
E3801.4.5	Receptacle outlet location . . . . .	210.52(C)(5)
E3801.5	Appliance outlets . . . . .	210.50(C)
E3801.6	Bathroom . . . . .	210.52(D)
E3801.7	Outdoor outlets . . . . .	210.52(E)
E3801.8	Laundry areas . . . . .	210.52(F)
E3801.9	Basements and garages . . . . .	210.52(G)
E3801.10	Hallways . . . . .	210.52(H)
E3801.11	HVAC outlet . . . . .	210.63
<b>SECTION E3802</b>	<b>GROUND-FAULT AND ARC-FAULT CIRCUIT-INTERRUPTER PROTECTION</b>	
E3802.1	Bathroom receptacles . . . . .	210.8(A)(1)
E3802.2	Garage and accessory building receptacles . . . . .	210.8(A)(2)
E3802.3	Outdoor receptacles . . . . .	210.8(A)(3)
E3802.4	Crawl space receptacles . . . . .	210.8(A)(4)
E3802.5	Unfinished basement receptacles . . . . .	210.8(A)(5)
E3802.6	Kitchen receptacles . . . . .	210.8(A)(6)
E3802.7	Laundry, utility and wet bar sink receptacles . . . . .	210.8(A)(7)
E3802.8	Boathouse receptacles . . . . .	210.8(A)(8)
E3802.9	Boat hoists . . . . .	210.8(C)
E3802.10	Electrically heated floors . . . . .	424.44(G)
E3802.11	Exempt receptacles . . . . .	210.8(A)(2)
E3802.12	Bedroom outlets . . . . .	210.12
<b>SECTION E3803</b>	<b>LIGHTING OUTLETS</b>	
E3803.1	General . . . . .	210.70(A)
E3803.2	Habitable rooms . . . . .	210.70(A)(1)
E3803.3	Additional locations . . . . .	210.70(A)(2)
E3803.4	Storage or equipment spaces . . . . .	210.70(A)(3)
<b>SECTION E3804</b>	<b>GENERAL INSTALLATION REQUIREMENTS</b>	
E3804.1	Electrical continuity of metal raceways and enclosures . . . . .	300.10
E3804.2	Mechanical continuity—raceways and cables . . . . .	300.12
E3804.3	Securing and supporting . . . . .	300.11(A)
E3804.3.1	Prohibited means of support . . . . .	300.11(C)
E3804.4	Raceways as means of support . . . . .	300.11(B)
E3804.5	Raceway installations . . . . .	300.18
E3804.6	Conduit and tubing fill . . . . .	300.17 and Chapter 9, Table 1
Tables E3804.6(1)- E3804.6(10)	Maximum number of conductors in conduit or tubing . . . . .	300.17 and Chapter 9, Table 1, Note 1
E3804.7	Air handling—stud cavity and joist spaces . . . . .	Section 300.22(C), Exception
<b>CHAPTER E3805</b>	<b>BOXES, CONDUIT BODIES, AND FITTINGS</b>	
E3805.1	Box, conduit body or fitting—where required . . . . .	300.15
E3805.1.1	Equipment . . . . .	300.15(B)
E3805.1.2	Protection . . . . .	300.15(C)
E3805.1.3	Integral enclosure . . . . .	300.15(E)
E3805.1.4	Fitting . . . . .	300.15(F)
E3805.1.5	Buried conductors . . . . .	300.15(G)
E3805.1.6	Luminaires . . . . .	300.15(J)
E3805.1.7	Closed loop . . . . .	300.15(M)
E3805.2	Metal boxes . . . . .	314.4
E3805.3	Nonmetallic boxes . . . . .	314.3
E3805.3.1	Nonmetallic-sheathed cable and nonmetallic boxes . . . . .	314.17(C)
E3805.3.2	Securing to box . . . . .	314.17(B) and (C)

**APPENDIX Q**

E3805.3.3 Conductor rating . . . . . 314.17(C)  
E3805.4 Minimum depth of outlet boxes . . . . . 314.24  
E3805.5 Boxes enclosing flush-mounted devices . . . . . 314.19  
E3805.6 Boxes at luminaire (lighting fixture) outlets . . . . . 314.27(A)  
E3805.7 Maximum luminaire (fixture) weight . . . . . 314.27(B)  
E3805.8 Floor boxes . . . . . 314.27(C)  
E3805.9 Boxes at fan outlets. . . . . 314.27(D)  
E3805.10 Conduit bodies, junction, pull and outlet boxes to be accessible . . . . . 314.29  
E3805.11 Damp or wet locations . . . . . 314.2  
E3805.12 Number of conductors in outlet, device, and junction boxes and conduit boxes . . . . . 314.16  
E3805.12.1 Box volume calculations . . . . . 314.16(A)  
Table E3805.12.1 Maximum number of conductors in metal boxes . . . . . Table 314.16  
E3805.12.1.1 Standard boxes . . . . . 314.16(A)(1)  
E3805.12.1.2 Other boxes. . . . . 314.16(A)(2)  
E3805.12.2 Box fill calculations . . . . . 314.16(B)  
E3805.12.2.1 Conductor fill . . . . . 314.16(B)(1) and Table 314.16  
Table E3805.12.2.1 Volume allowance required per conductor . . . . . Table 314.16  
E3805.12.2.2 Clamp fill . . . . . 314.16(B)(2)  
E3805.12.2.3 Support fittings fill . . . . . 314.16(B)(3)  
E3805.12.2.4 Device or equipment fill . . . . . 314.16(B)(4)  
E3805.12.2.5 Equipment grounding conductor fill . . . . . 314.16(B)(5)  
E3805.12.3 Conduit bodies . . . . . 314.16(C)(1)  
E3805.12.3.1 Splices, taps or devices . . . . . 314.16(C)(2)

**SECTION E3806 INSTALLATION OF BOXES, CONDUIT BODIES AND FITTINGS**

E3806.1 Conductors entering boxes, conduit bodies or fittings . . . . . 314.17  
E3806.1.1 Insulated fittings . . . . . 300.4(F)  
E3806.2 Openings . . . . . 314.17(A)  
E3806.3 Metal boxes, conduit bodies and fittings . . . . . 314.17, 314.17(B)  
E3806.4 Unused openings. . . . . 110.12(A)  
E3806.5 In wall or ceiling. . . . . 314.20  
E3806.6 Plaster, gypsum board and plasterboard . . . . . 314.21  
E3806.7 Exposed surface extensions . . . . . 314.22  
E3806.8 Supports. . . . . 314.23  
E3806.8.1 Surface mounting . . . . . 314.23(A)  
E3806.8.2 Structural mounting . . . . . 314.23(B)  
E3806.8.2.1 Nails . . . . . 314.23(B)(1)  
E3806.8.2.2 Braces . . . . . 314.23(B)(2)  
E3806.8.3 Mounting in finished surfaces . . . . . 314.23(C)  
E3806.8.4 Raceway supported enclosures without devices or fixtures . . . . . 314.23(E)  
E3806.8.5 Raceway supported enclosures with devices or fixtures . . . . . 314.23(F)  
E3806.8.6 Enclosures in concrete or masonry . . . . . 314.23(G)  
E3806.9 Covers and canopies . . . . . 314.25  
E3806.10 Metal covers and plates . . . . . 314.25(A)  
E3806.11 Exposed combustible finish . . . . . 314.25(B)

**SECTION E3807 CABINETS AND PANELBOARDS**

E3807.1 Enclosures for switches or overcurrent devices . . . . . 312.8  
E3807.2 Damp or wet locations . . . . . 312.2(A)  
E3807.3 Position in wall . . . . . 312.3  
E3807.4 Repairing plaster, drywall and plasterboard . . . . . 312.4  
E3807.5 Unused openings . . . . . 110.12(A), 408.7  
E3807.6 Conductors entering cabinets. . . . . 300.4(F) and 312.5(B)  
E3807.7 Openings to be closed. . . . . 312.5(A)  
E3807.8 Cables. . . . . 312.5(C)



<b>SECTION E3808</b>	<b>GROUNDING</b>	
E3808.1	Metal enclosures . . . . .	250.86
E3808.2	Equipment fastened in place or connected by permanent wiring methods (fixed) . . . . .	250.110(1), (2), and (3)
E3808.3	Specific equipment fastened in place or connected by permanent wiring methods . . . . .	250.112(J), (L), and (M)
E3808.4	Performance of fault current path . . . . .	250.4(A)(5)
E3808.5	Earth as a grounding conductor . . . . .	250.4(A)(5)
E3808.6	Load-side neutral . . . . .	250.24(A)(5)
E3808.7	Load-side equipment . . . . .	250.142 (B)
E3808.8	Types of equipment grounding conductors . . . . .	250.118
E3808.8.1	Flexible metal conduit . . . . .	250.118(5)
E3808.8.2	Liquid-tight flexible metal conduit . . . . .	250.118(6)
E3808.8.3	Nonmetallic sheathed cable (Type NM) . . . . .	334.108
E3808.9	Equipment fastened in place or connected by permanent wiring methods . . . . .	250.134
E3808.10	Methods of equipment grounding . . . . .	250 Part (VII)
E3808.11	Equipment grounding conductor installation . . . . .	250.120
E3808.12	Equipment grounding conductor size . . . . .	250.122(A) and (B)
Table E3808.12	Equipment grounding conductor sizing . . . . .	Table 250.122
E3808.12.1	Multiple circuits . . . . .	250.122(C)
E3808.13	Continuity and attachment of equipment grounding conductors to boxes . . . . .	250.148
E3808.14	Connecting receptacle grounding terminal to box . . . . .	250.146(A), (B), and (C)
E3808.15	Metal boxes . . . . .	250.8, 250.148(C)
E3808.16	Nonmetallic boxes . . . . .	250.148(D)
E3808.17	Clean surfaces . . . . .	250.12
E3808.18	Bonding other enclosures . . . . .	250.96(A)
E3808.19	Size of equipment bonding jumper on load side of service . . . . .	250.102(D)
E3808.20	Installation—equipment bonding jumper . . . . .	250.102(E)
<b>SECTION E3809</b>	<b>FLEXIBLE CORDS</b>	
E3809.1	Where permitted . . . . .	400.7 and 400.8
E3809.2	Loading and protection . . . . .	240.4, 240.5(A), 240.5(B)(1), 400.5, and 400.13
Table E3809.2	Maximum ampere load for flexible cords . . . . .	Table 400.5(A)
E3809.3	Splices . . . . .	400.9
E3809.4	Attachment plugs . . . . .	400.7(B)
<b>CHAPTER 39</b>	<b>DEVICES AND LIGHTING FIXTURES</b>	
<b>SECTION E3901</b>	<b>SWITCHES</b>	
E3901.1	Rating and application of snap switches . . . . .	404.14(A)
E3901.2	CO/ALR snap switches . . . . .	404.14(C)
E3901.3	Indicating . . . . .	404.7
E3901.4	Time switches and similar devices . . . . .	404.5
E3901.5	Grounding of enclosures . . . . .	404.12
E3901.6	Access . . . . .	404.8(A)
E3901.7	Wet locations . . . . .	404.4
E3901.8	Grounded conductors . . . . .	404.2(B)
E3901.9	Switch connections . . . . .	404.2(A)
E3901.10	Box mounted . . . . .	404.10(B)
E3901.11	Snap switch faceplates . . . . .	404.9(A)
E3901.11.1	Faceplate grounding . . . . .	404.9(B)
E3901.12	Dimmer switches . . . . .	404.14(E)
<b>SECTION E3902</b>	<b>RECEPTACLES</b>	
E3902.1	Rating and type . . . . .	406.2(A)(B)
E3902.1.1	Single receptacle . . . . .	210.21(B)(1)
E3902.1.2	Two or more receptacles . . . . .	210.21(B)(3)
Table E3902.1.2	Receptacle ratings for various size multioutlet circuits . . . . .	Table 210.21(B)(3)

## APPENDIX Q

E3902.2	Grounding type . . . . .	406.3(A)
E3902.3	CO/ALR receptacles . . . . .	406.2(C)
E3902.4	Faceplates . . . . .	406.5(B)
E3902.5	Position of receptacle faces . . . . .	406.4(D), and 406.5
E3902.6	Receptacles mounted in boxes . . . . .	406.4(A), and 406.4(B)
E3902.7	Receptacles mounted on covers . . . . .	406.4(C)
E3902.8	Damp locations . . . . .	406.8(A)
E3902.9	15- and 20-ampere receptacles in wet locations. . . . .	406.8(B)(1)
E3902.10	Other receptacles in wet locations. . . . .	406.8(B)(2)
E3902.11	Bathtub and shower space. . . . .	406.8(C)
E3902.12	Flush mounting with faceplate . . . . .	406.8(E)

### SECTION E3903 LUMINAIRES

E3903.1	Energized parts . . . . .	410.3
E3903.2	Luminaires near combustible material . . . . .	410.5
E3903.3	Exposed conductive parts. . . . .	410.18(A)
E3903.4	Screw-shell type . . . . .	410.47
E3903.5	Recessed incandescent luminaires . . . . .	410.65(C)
E3903.6	Thermal protection . . . . .	410.73(E)
E3903.7	High-intensity discharge luminaires . . . . .	410.73(F)
E3903.8	Wet or damp locations . . . . .	410.4(A)
E3903.9	Lampholders in wet or damp locations . . . . .	410.49
E3903.10	Bathtub and shower area. . . . .	410.4(D)
E3903.11	Luminaires in clothes closets. . . . .	410.8(A), (B), (C), and (D)
Figure E3903.11	Closet storage space . . . . .	Figure 410.8
E3903.12	Luminaire wiring—general . . . . .	410.22
E3903.12.1	Polarization of luminaires . . . . .	410.23
E3903.12.2	Luminaires as raceways . . . . .	410.31

### SECTION E3904 LUMINAIRE INSTALLATION

E3904.1	Outlet box covers . . . . .	410.12
E3904.2	Combustible material at outlet boxes . . . . .	410.13
E3904.3	Access . . . . .	410.16(B)
E3904.4	Supports. . . . .	410.15(A)
E3904.5	Means of support . . . . .	410.16(A)
E3904.6	Exposed ballasts . . . . .	410.76(A)
E3904.7	Combustible low-density cellulose fiberboard . . . . .	410.76(B)
E3904.8	Recessed fixture clearance. . . . .	410.66(A)(1),(A)(2)
E3904.9	Recessed fixture installation. . . . .	410.66(B)

### SECTION E3905 TRACK LIGHTING

E3905.1	Installation. . . . .	410.101(A) and (B)
E3905.2	Fittings. . . . .	410.101(A) and (D)
E3905.3	Connected load . . . . .	410.101(B)
E3905.4	Prohibited locations . . . . .	410.101(C)
E3905.5	Fastening. . . . .	410.104
E3905.6	Grounding . . . . .	410.105(B)

## CHAPTER 40 APPLIANCE INSTALLATION

### SECTION E4001 GENERAL

E4001.1	Scope . . . . .	422.1 and 424.1
E4001.2	Installation . . . . .	110.3(B) and 422.17
E4001.3	Flexible cords. . . . .	422.16
Table E4001.3	Flexible cord length . . . . .	422.16(B)(1), (2) and (4)
E4001.4	Overcurrent protection . . . . .	422.11
E4001.4.1	Single nonmotor-operated appliance . . . . .	422.11(E)
E4001.5	Disconnecting means . . . . .	422.30, 422.35 and 424.19

Table E4001.5	Disconnecting means . . . . .	422.31(A),(B), 422.34, 422.35, 424.19, 424.20 and 440.14
E4001.6	Support of ceiling-suspended paddle fans . . . . .	422.18
E4001.7	Snow-melting and deicing equipment protection . . . . .	210.8(A)(3) Exception and 426.28

## CHAPTER 41 SWIMMING POOLS

### SECTION E4101 GENERAL

E4101.1	Scope . . . . .	Section 680.1
E4101.2	Definitions . . . . .	680.2

### SECTION E4102 WIRING METHODS FOR POOLS, SPAS, HOT TUBS AND HYDROMASSAGE BATHTUBS

E4102.1	General . . . . .	680.7, 680.23(B), 680.21(A), 680.23(F), 680.25(A), 680.40, 680.42, 680.43 and 680.70
E4102.2	Flexible cords . . . . .	680.7(A), (B), 680.22(B)(5), 680.42, and 680.43 Exception
E4102.3	Double insulated pool pumps . . . . .	680.21(B)

### SECTION E4103 EQUIPMENT LOCATION AND CLEARANCES

E4103.1	Receptacle outlets . . . . .	680.22(A)(6)
E4103.1.1	Location . . . . .	680.22(A)(1)
E4103.1.2	Where required . . . . .	680.22(A)(3)
E4103.1.3	Restricted space . . . . .	680.22(A)(4)
E4103.1.4	GFCI protection . . . . .	680.22(A)(5)
E4103.1.5	Indoor locations . . . . .	680.43(A) and (A)(1)
E4103.1.6	Indoor GFCI protection . . . . .	680.43(A)(2)
E4103.2	Switching devices . . . . .	680.22(C), 680.43(C), 680.72
E4103.3	Disconnecting means . . . . .	680.12
E4103.4	Luminaires and ceiling fans . . . . .	680.22(B)
E4103.4.1	Outdoor location . . . . .	680.22(B)(1)
E4103.4.2	Indoor location . . . . .	680.22(B)(2)
E4103.4.3	Existing lighting outlets and luminaires . . . . .	680.22(B)(3)
E4103.4.4	Indoor spas and hot tubs . . . . .	680.43(B)
E4103.4.5	GFCI protection in adjacent areas . . . . .	680.22(B)(4)
E4103.5	Overhead conductor clearances . . . . .	680.8
Table E4103.5	Overhead conductor clearances . . . . .	Table 680.8
Figure E4103.5	Overhead conductor clearances . . . . .	Figure 680.8
E4103.6	Underground wiring . . . . .	680.10
Table E4103.6	Underground wiring . . . . .	Table 680.10

### SECTION E4104 BONDING

E4104.1	Performance . . . . .	680.26(A)
E4104.2	Bonded parts . . . . .	680.26(B), 680.26(E), 680.42(B) and 680.43(D)(4)
E4104.3	Parts not required to be bonded . . . . .	680.43(D)(4) Exception
E4104.4	Methods of bonding . . . . .	680.26(A), 680.26(C), 680.26(D), 680.42(B) and 680.43(E)

### SECTION E4105 GROUNDING

E4105.1	Equipment to be grounded . . . . .	680.6
E4105.2	Luminaires and related equipment . . . . .	680.23(F)(2), 680.24(F)
E4105.3	Nonmetallic conduit . . . . .	680.23(B)(2)(b)
E4105.4	Flexible cords . . . . .	680.23(B)(3)
E4105.5	Motors . . . . .	680.21(A)(1)
E4105.6	Panelboards . . . . .	680.25(B) and (B)(1)
E4105.6.1	Separate Buildings . . . . .	680.25(B)(2)
E4105.7	Cord-connected equipment . . . . .	Section 680.7
E4105.8	Other equipment . . . . .	680.6 and Article 250 Parts V, VI, and VII

### SECTION E4106 EQUIPMENT INSTALLATION

E4106.1	Transformers . . . . .	680.23(A)(2)
E4106.2	Ground-fault circuit-interrupters . . . . .	680.5
E4106.3	Wiring on load side of ground-fault circuit-interrupters and transformers . . . . .	680.23(F)(3)
E4106.4	Underwater luminaires . . . . .	680.23(A)(1),(A)(3) and (A)(7)

**APPENDIX Q**

E4106.4.1	Maximum voltage . . . . .	680.23(A)(4)
E4106.4.2	Luminaire location . . . . .	680.23(A)(5) and (A)(6)
E4106.5	Wet-niche luminaires . . . . .	680.23(B)(1), (B)(2), (B)(4) and (B)(5)
E4106.5.1	Servicing . . . . .	680.23(B)(6)
E4106.6	Dry-niche luminaires . . . . .	680.23(C)(1) and (C)(2)
E4106.7	No-niche luminaires . . . . .	680.23(D)
E4106.8	Through-wall lighting assembly . . . . .	680.23(E)
E4106.9	Junction boxes and enclosures for transformers or ground-fault circuit interrupters . . . . .	680.24(A) through (E)
E4106.9.1	Junction boxes . . . . .	680.24(A)(1) and (A)(2)
E4106.9.2	Other enclosures . . . . .	680.24(B)(1) and (2)
E4106.9.3	Protection of junction boxes and enclosures . . . . .	680.24(C)
E4106.9.4	Grounding terminals . . . . .	680.24(D)
E4106.9.5	Strain relief . . . . .	680.24(E)
E4106.10	Underwater audio equipment . . . . .	680.27(A)
E4106.10.1	Speakers . . . . .	680.27(A)(1)
E4106.10.2	Wiring methods . . . . .	680.27(A)(2)
E4106.10.3	Forming shell and metal screen . . . . .	680.27(A)(3)
E4106.11	Electrically operated pool covers . . . . .	680.27(B)(1) and (B)(2)
E4106.12	Electric pool water heaters . . . . .	680.9
E4106.13	Pool area heating . . . . .	680.27(C)
E4106.13.1	Unit heaters . . . . .	680.27(C)(1)
E4106.13.2	Permanently wired radiant heaters . . . . .	680.27(C)(2)
E4106.13.3	Radiant heating cables prohibited . . . . .	680.27(C)(3)
E4106.14	Double insulated pool pumps . . . . .	Section 680.21(B)
<b>SECTION E4107</b>	<b>STORABLE SWIMMING POOLS</b>	
E4107.1	Pumps . . . . .	680.31
E4107.2	Ground-fault circuit-interrupters required . . . . .	680.32
E4107.3	Luminaires . . . . .	680.33
E4107.3.1	Fifteen (15) volts or less . . . . .	680.33(A)
E4107.3.2	Not over 150 volts . . . . .	680.33(B)
E4107.4	Receptacle locations . . . . .	680.34
<b>SECTION E4108</b>	<b>SPAS AND HOT TUBS</b>	
E4108.1	Ground-fault circuit-interrupters . . . . .	680.44(A) and (C)
E4108.2	Electric water heaters . . . . .	680.9
E4108.3	Underwater audio equipment . . . . .	680.43(G)
E4108.4	Emergency switch for spas and hot tubs . . . . .	680.41
<b>SECTION E4109</b>	<b>HYDROMASSAGE BATHTUBS</b>	
E4109.1	Ground-fault circuit-interrupters . . . . .	680.71
E4109.2	Other electric equipment . . . . .	680.72
E4109.3	Accessibility . . . . .	680.73
E4109.4	Bonding . . . . .	680.74
<b>CHAPTER 42</b>	<b>CLASS 2 REMOTE CONTROL, SIGNALING, AND POWER-LIMITED CIRCUITS</b>	
<b>SECTION E4201</b>	<b>GENERAL</b>	
E4201.1	Scope . . . . .	725.1
E4201.2	Definitions . . . . .	Article 100 and Section 725.2
<b>SECTION E4202</b>	<b>POWER SOURCES</b>	
E4202.1	Power sources for Class 2 circuits . . . . .	725.41(A)
E4202.2	Interconnection of power sources . . . . .	725.41(B)
<b>SECTION E4203</b>	<b>WIRING METHODS</b>	
E4203.1	Wiring methods on supply side of Class 2 power source . . . . .	725.51

E4203.2	Wiring methods and materials on load side of the Class 2 power source . . . . .	725.52, 725.61, 725.82, Table 725.61
Table E4203.2	Cable uses and permitted substitutions . . . . .	725.61 and Table 725.61
E4203.2.1	Type CL2P cables . . . . .	725.61(A) and 725.82(A)
E4203.2.2	Type CL2 Cables . . . . .	725.82(C)
E4203.2.3	Type CL2X Cables . . . . .	725.61(E)(4) and 725.82(D)
E4203.2.4	Marking . . . . .	725.82(L)

**SECTION E4204 INSTALLATION REQUIREMENTS**

E4204.1	Separation from other conductors . . . . .	725.55(A), (B), (C), (D)
E4204.2	Other applications . . . . .	725.55(J)
E4204.3	Class 2 circuits with communication circuits . . . . .	725.56(D)
E4204.4	Class 2 cables with other circuit cables . . . . .	725.56(E)(1) through (5)
E4204.5	Installation of conductors and cables . . . . .	725.7, 725.8, 725.58, 300.11(B)(2)

