The 1999 Massachusetts Electrical Code (527 CMR 12.00) of the Board of Fire Prevention Regulations shall be the 1999 National Electrical Code modified as follows:

Delete the opening narrative on the publication history and the development of the National Electrical Code, and delete the membership listing of the National Electrical Code Committee. Delete any notification of pending appeals to the NFPA Board of Directors. Insert the following provisions ahead of the Table of Contents:

Rule 1. All installations, repairs and maintenance of electrical wiring and electrical fixtures used for light, heat, power, signaling and communications purposes in buildings and structures subject to the provisions of M.G.L. c. 143 shall be reasonably safe to persons and property.

Rule 2. Conformity of installations, repairs, and maintenance of electrical wiring and electrical fixtures used for light, heat, power, signaling and communications with applicable regulations set forth in the Code, which is hereby filed with the Secretary of the Commonwealth shall be considered as complying with these requirements.

Rule 3. Additions or modifications to an existing installation shall be made in accordance with this Code without bringing the remaining part of the installation into compliance with the requirements of this Code. The installation shall not create a violation of this Code, nor shall it increase the magnitude of an existing violation.

Rule 4. Where an actual hazard exists, the owner of the property shall be notified in writing by the authority enforcing this Code. (See M.G.L. c. 166, §§ 32 and 33, for enforcement authority.)

Rule 5. References are made in this code to other standards. Those standards, where duly adopted by law or regulation, may be enforced by the appropriate official. They are not considered part of this Code and they are not enforceable under M.G.L. c. 143, § 3L.

Rule 6. The approving authority may be guided in his approval of specific items of equipment and materials contemplated by the Code, by proof that such equipment and materials have been tested and conform to suitable recognized industry standards.

Rule 7. 527 CMR 12.00 shall be effective on all installations for which a permit has been granted subsequent to December 31, 1998.

Rule 8. In accordance with the provisions of M.G.L. c. 143, § 3L, permit application form to provide notice of installation of wiring shall be uniform throughout the Commonwealth, and it shall be filed on the prescribed form.

Rule 9. Installations covered by 527 CMR 12.00 shall also comply with M.G.L. c. 141.

Rule 10. Electrical installations shall not be concealed or covered from view until inspected by the inspector of wires within and not more than 24 hours for exterior excavations nor more than 72 hours for interior installations after proper notice to the inspector, Saturdays, Sundays, and holidays excluded.

90-4. Revise the first two paragraphs to read as follows:

90-4. Enforcement. This Code shall be used by the authority enforcing the Code and exercising legal jurisdiction over electrical installations. The authority having jurisdiction of enforcement of the Code shall accept listed and labeled equipment or materials where used or installed in accordance with instructions included with the listing or labeling. The authority shall have the responsibility for deciding upon the approval of unlisted or unlabeled equipment and materials, and for granting the special permission contemplated in a number of the rules.

The authority having jurisdiction may waive specific requirements in this Code in those sections where it is specifically so stated or contemplated, or in other cases by special permission. In any such case it shall be assured that equivalent objectives of maintaining effective safety can be achieved.

90-6. Revise to read as follows:

90-6. Interpretations and Appeals. To promote uniformity of interpretation and application of the provisions of this Code, interpretations may be requested from the Board of Fire Prevention Regulations. Requests for interpretation shall be in the form of a question that can receive a "Yes" or "No" answer. This in no way supersedes the right of any individual who is aggrieved by the decision of an Inspector of Wires to appeal from that decision to the Board of Electricians' Appeals in accordance with M.G.L. c. 143, § 3P. The Board of Fire Prevention Regulations shall, upon the request of the Board of Electricians' Appeals, render interpretations to the Board of Electricians' Appeals.

It is customary to revise this Code periodically to conform with developments in the art and the result of experience, and the current edition of the Code shall always be used.

90-10. Add new section 90-10 to read:

90-10. References to Commonwealth of Massachusetts Codes, Regulations, and Laws. References are included in Appendix A for Building Codes, Elevator Regulations, Plumbing and Fuel Gas Code, Board of Fire Prevention Regulations, Division of Industrial Safety, Architectural Barriers Regulations, Permit Applications, and Chapters of the General Laws. See Appendix A.

110-14(a). Delete the last sentence of the first paragraph and insert the following two sentences in its place:

Connection by means of wire binding screws or studs and nuts having upturned lugs or equivalent shall be permitted for No. 10 or smaller solid conductors. Where stranded conductors are terminated on and not looped through such terminals, the terminals shall be identified for such use, or the strands at the terminals shall be made solid.

110-26(a)(1). Revise Exception No. 2 to read as follows:

Exception No. 2: By special permission, smaller spaces may be permitted (1) where it is judged that the particular arrangement of the installation will provide adequate accessibility; or (2) where all uninsulated parts are at a voltage no greater than 30 volts RMS, 42 volts peak, or 60 volts dc.

200-6(d). Revise Section 200-6(d) to read as follows:

(d) Grounded Conductors of Different Systems. Where conductors of different systems are installed in the same raceway, box, auxiliary gutter, or other types of enclosures, each grounded conductor shall have an outer covering similar to (a) or (b) above, and shall be identified by system. Where the identification is by color, white shall be used on systems not exceeding 150 volts to ground, and gray shall be used for systems exceeding 150 volts to ground. Where additional systems are present, each other system grounded conductor shall have an outer covering of white with an identifiable colored stripe (not green) running along the insulation, or other and different means of identification as allowed by (a) or (b).

200-7(c)(2). Revise the last sentence to read as follows:

"In these applications reidentification of the conductor with white or natural gray insulation or with three continuous white stripes shall not be required."

210-7(d)(3). Delete (c) and revise the remainder to read as follows:

(3) Where a grounding means does not exist in the receptacle enclosure, the installation shall comply with (a) or (b) below:

(a) A nongrounding-type receptacle(s) shall be permitted to be replaced with another nongrounding-type receptacle(s).

(b) Where a receptacle outlet is required to be protected by a ground-fault circuit-interrupter by this Code, a nongrounding-type receptacle shall be permitted to be replaced with a ground-fault circuit-interrupter type of receptacle(s). These receptacles shall be marked "No Equipment Ground." An equipment grounding conductor shall not be connected from the ground-fault circuit-interrupter-type receptacle to any outlet supplied from the ground-fault circuit-interrupter-type receptacle.

210-8(a)(1). Add the following exception and fine print note:

Exception: One receptacle located within dedicated space for each laundry appliance which in normal use is not easily moved from one place to another.

(FPN): See definition of receptacle in Article 100.

12.00: continued

210-8(a)(3). Designate the existing exception as Exception No. 1 and add a second exception as follows:

Exception No. 2: Ground-fault circuit-interrupter protection for personnel shall not be required for a 125-volt, 15- or 20-ampere outdoor receptacle where the sole purpose of the receptacle is for a wheelchair lift and the receptacle is a NEMA L5-15R or 20R receptacle and is in addition to the receptacle(s) required by Section 210-52(e) and is in accordance with the provisions of Section 410-57.

210-8(a)(5). Insert a new Exception No. 3 as follows:

Exception No. 3: A receptacle supplying a permanently installed fire alarm or burglar alarm system.

210-8(b). Add a third item to the list as follows:

(3) Outdoors, if installed as required by Section 210-63.

210.12(B) Revise (B) and add a fine print note and a new (C) as follows

(B) Dwelling Unit Bedrooms. All 15- and 20 ampere 120-volt branch circuits that supply dwelling unit bedrooms shall be protected by an arc-fault circuit interrupter (AFCI) listed to provide protection for the entire branch circuit.

FPN: Where installed as the first device on a branch circuit, some receptacles are listed as providing AFCI protection for the entire branch circuit.

(C) Overcurrent Device Replacements. Where panelboards are replaced that contain one or more circuits requiring AFCI protection by this or other sections of the Code, AFCI protection shall be provided for such circuits.

Exception: For panel board replacements made before January 1, 2005, AFCI protection shall not be required on existing circuit branches.

210-25. Add an exception as follows:

Exception: Branch circuits supplying lighting outlets in common areas on the same floor as a dwelling unit in a new or existing two-family or an existing three-family building shall be permitted to be supplied from equipment that supplies one or more of those dwelling units.

210-52. Revise the first paragraph to read as follows:

The receptacles required by this section shall be in addition to any receptacle that is part of any lighting fixture or appliance, or that is located within cabinets or cupboards, or that is controlled by a wall switch in accordance with Section 210-70(a), or that is located over 5½ feet (1.68 m) above the floor.

210-63. Revise to read as follows:

210-63. Heating, Air-Conditioning, and Refrigeration Equipment Outlet. A 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet shall be installed at an accessible location for servicing of heating, air conditioning, and refrigeration equipment located outdoors including on rooftops, and in attics and crawl spaces. The receptacle shall be located on the same level and within 25 ft (7.62 m) of the heating, air conditioning, and refrigeration equipment. The receptacle outlet shall not be connected to the load side of the equipment disconnecting means.

210-70(a)(2). Revise to read as follows:

(2) Stairs, Halls, Entrances and Exits. At least one wall switch-controlled lighting outlet shall be installed in hallways, stairways, attached garages, and detached garages with electric power; and to provide illumination on the exterior side of outdoor entrances or exits with grade level

access. For interior stairways connecting finished areas or areas with a second exit, where the difference between floor levels is six steps or more, there shall be a wall switch at each floor level to control that outlet. A vehicle door in a garage shall not be considered as an outdoor entrance.

220-3(a). Revise the listed items in Table 220-3(a) as follows:

Type of Occupancy	Unit Load per Sq. Ft. (Volt-Amperes)
Banks	¼ (reduced from ½)
Garages	3** (reduced from 3½)
Office Buildings	½ (increased from ¼)
Warehouses	2½** (reduced from 3)

12.00: continued

Table 220-36. Revise the title and the body of the table to read as follows:

Table 220-36
Optional Method—Permitted Load Calculations for
Service-Entrance and Feeder Conductors for New Restaurants

Total Connected Load (kVA)	All Electric Restaurant Calculated Loads (kVA)	Not All Electric Restaurant Calculated Loads (kVA)
0 – 200	80%	100%
201 – 325	10% (amount over 200) + 160.0	50% (amount over 200) + 200.0
326 – 800	50% (amount over 325) + 172.5	45% (amount over 325) + 262.5
Over 800	50% (amount over 800) + 410.0	20% (amount over 800) + 476.3

(The note remains as in the NEC without change.)

225-30(e). Revise to read as follows:

(e) Documented Switching Procedures. Additional feeders or branch circuits shall be permitted to supply large capacity multibuilding industrial or institutional installations under single management where documented safe switching procedures are established and maintained for disconnection.

225-32 Exception No. 1. Revise to read as follows:

Exception No. 1: For large capacity multibuilding industrial or institutional installations under single management where documented safe switching procedures are established and maintained for disconnection, the disconnecting means shall be permitted to be located elsewhere on the premises.

230-40. Amend Exception No. 1 to read:

Exception No. 1: By special permission, where there is no available space for service equipment accessible to all the occupants, buildings with more than one occupancy shall be permitted to have one set of service entrance conductors run to each occupancy or to a group of occupancies.

230-70(a). Revise the first paragraph to read as follows:

(a) Location. The service disconnecting means shall be installed at a readily accessible location either outside and attached to or immediately adjacent to the building or structure served, or inside nearest the point of entrance of the service conductors.

230-72(c). Add a second exception as follows:

Exception No. 2: In a multiple occupancy building where each occupant has grouped, readily accessible means to disconnect all ungrounded conductors within that occupancy with no more than six motions of the hand, the service disconnecting means shall be permitted to be accessible to authorized management personnel only.

240-24(b). Add an exception at the end of the subsection after all listed items, as follows:

Exception to all of Section 240-24(b): In a multiple occupancy building where each occupant has grouped, readily accessible means to disconnect all ungrounded conductors within that occupancy with no more than six motions of the hand, the overcurrent devices protecting the source of supply to that occupancy shall be permitted to be accessible to authorized management personnel only.

250-30(a)(1). Revise by changing the internal reference from “250-24(a)(4)” to “250-24(a)(3)”.

12.00: continued

250-32(a). Revise the Exception to read as follows:

Exception: A grounding electrode at a separate building or structure shall not be required where no branch circuits originate at that building or structure. The branch circuit(s) shall include an equipment grounding conductor for grounding the noncurrent-carrying parts of all equipment.

250-50. Identify the present exception as Exception No. 2 and add a new Exception No. 1 to follow the first paragraph as follows:

Exception No. 1: Where located on the premises and within 200 feet (61.0 m) of a new building or structure directly supplied by a well, and where none of the items (a) through (d) below are available, metallic well casings in direct contact with the earth for 10 feet (3.05 m) or more shall be included in the grounding electrode system.

250-50. Revise the NEC exception to the fourth paragraph, which is Exception No. 2 in Massachusetts, to read as follows:

Exception No. 2: In industrial and commercial buildings where conditions of maintenance and supervision ensure that only qualified persons will service the installation and the entire length, other than short sections passing directly through partitions, of the interior metal water pipe that is being used for the conductor is exposed.

250-50(c). Add a fine print note as follows:

(FPN): These electrodes, where available due to the footings not yet having been poured, are usually far lower in impedance than made electrodes.

250-66. Add a new subsection (d) as follows:

(d) Connections to Well Casings. Where connected to a metal well casing as provided in the exception to the first paragraph of Section 250-50, that portion of a grounding electrode conductor that is the sole connection to the well casing shall not be smaller than No. 4 copper wire. That portion of an existing grounding electrode conductor that is the sole connection to a metal well casing shall not be required to be larger than No. 4.

250-130(c). Delete this subsection.

250-142(b). Insert an additional fourth exception as follows:

Exception No. 4: A grounded neutral conductor derived from the supply system shall be connected to the pressure vessel containing the electrodes of an electrode-type boiler operating over 600 volts in accordance with Section 490-72(e)(1). All exposed noncurrent-carrying metal parts of the boiler and exposed grounded structures or equipment shall be bonded to the pressure vessel or to the derived neutral conductor, in accordance with Section 490-74.

300-4(d). Delete this subsection.

300-5(a). Add a fine print note to this subsection as follows:

(FPN): Cables suitable for direct burial are often sleeved in various raceways for design reasons. If such cable is installed with sufficient cover for direct burial, then the characteristics of that raceway need not be evaluated. Other rules of this Code that apply to raceways generally may apply. See Section 300-5(h).

300-11(a). Revise this subsection as follows:

1. Delete the second sentence in Section 300-11(a) which reads “Support wires and associated fittings that provide secure support and that are installed in addition to the ceiling grid support wires shall be permitted as the sole support.”

2. Revise Section 300-11(a)(2) to read as follows:
   (2) Nonfire-Rated Assemblies. Branch-circuit wiring associated with equipment that is located within, supported by, or secured to a suspended ceiling that is not an integral portion of a fire-rated floor/ceiling or roof/ceiling assembly shall be permitted to be supported by the ceiling support wires.
3. Delete Section 300-11(a)(2) Exception.

300-15. Revise this section to read as follows:

300-15. Boxes, Conduit Bodies, or Fittings — Where Required. Where the wiring method is raceway or multiconductor cable, a box or conduit body complying with Article 370 shall be installed at each conductor splice point, outlet, switch point, junction point, or pull point, unless otherwise permitted in (a) through (m) below. A box shall be installed at each outlet and switch point for concealed knob-and-tube wiring. Fittings and connectors shall be used only with the specific wiring methods for which they are designed and listed.

(a) Wiring Methods With Interior Access. A box or conduit body shall not be required for splice, junction, switch, pull, and outlet points in wiring methods with removable covers, including busways, header-ducts, multioutlet assemblies, auxiliary gutters, and some surface raceways. The covers shall be accessible after installation.

(b) Equipment. An integral junction box or wiring compartment as part of approved equipment shall be permitted in lieu of a box.

(c) Protection. A box or conduit body shall not be required where cables enter or exit from conduit or tubing that is used to provide cable support or protection against physical damage. A fitting shall be provided on the end(s) of the conduit or tubing to protect the cable from abrasion.

(d) Type MI Cable. A box or conduit body shall not be required where accessible fittings are used for straight-through splices in mineral-insulated metal-sheathed cable.

(e) Integral Enclosure. A wiring device with integral enclosure identified for the use, having brackets that securely fasten the device to walls or ceilings of conventional on-site frame construction, for use with nonmetallic-sheathed cable, shall be permitted in lieu of a box or conduit body.

(FPN): See Sections 336-18, Exception No. 2; 545-10; 550-10(j); and 551-47(e), Exception No. 1.

(f) Fitting. A fitting identified for the use shall be permitted in lieu of a box or conduit body where no conductors are spliced or terminated within the fitting. The fitting shall be accessible after installation.

(g) Direct-Buried Conductors. A box or conduit body shall not be required for splices and taps in direct-buried conductors and cables made in accordance with Section 300-5(e).

(h) Insulated Devices. A box or conduit body shall not be required for insulated devices supplied by nonmetallic-sheathed cable in accordance with the provisions of Section 336-21.

(i) Enclosures. A box or conduit body shall not be required where a splice, switch, or pull point is in a cabinet or cutout box, or in an enclosure for a switch or overcurrent device as covered in Section 373-8 or in a motor controller as covered in Section 430-10(a), or in a switchboard or motor control center.

(j) Fixtures. A box or conduit body shall not be required where a fixture is used as a raceway in accordance with one of the exceptions to Section 410-31.

(k) Embedded. A box or conduit body shall not be required for splices where conductors are embedded as covered in Sections 424-40; 424-41(d); 426-22(b); 426-24(a); and 427-19(a).

(l) Closed Loop. A box shall not be required with a closed-loop power distribution system where a device identified and listed as suitable for installation without a box is used.

(m) Manholes. A box or conduit body shall not be required for splice, junction, and pull points in manholes and other electric enclosures intended for personnel entry where accessible to qualified persons only. The installation shall comply with the provisions of Part D of Article 370.

300-17. Add a second paragraph to Section 300-17 as follows:

Where different raceway wiring methods are joined together without a pull point at the transition, there shall not be more than the equivalent of four quarter bends (360 degrees total) between pull points, e.g., conduit bodies and boxes.

12.00: continued

300-37. Insert the following sentence after the first sentence:

Where rigid nonmetallic conduit is used, it shall be Schedule 80 or it shall be suitably encased in not less than two inches (50.8 mm) of concrete.

305-6(a) Exception No. 2. Revise to read as follows:

Exception No. 2: Where conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in Section 305-6(b)(2) shall be permitted to be utilized for all receptacle outlets.

310-8(d). Add an exception as follows:

Exception: For drip loops installed to comply with Section 230-54(f), or for similar drip loops formed in branch-circuit or feeder conductors, conductors extending not more than 3 ft (914 mm) from a cable sheath or from a raceway shall not be required to be sunlight resistant.

310-12(c). Add a second paragraph, exception, and fine print note as follows:

Ungrounded system conductors of electric light and power circuits shall be identified by phase or line, and by system where more than one voltage system is present in the building. The identification shall be visible at every splice and termination in the wiring system. The method of identification of each conductor, whether by color coding, marking tape, tagging, or other equally effective means, shall be permanently posted at each switchboard and panelboard in the building.

Exception: Identification shall be permitted to be omitted on ungrounded conductors in multiconductor cables where only one voltage system is present at the point of splice or termination.
(FPN): An example of color coding is:
120/240 volt, single-phase, three-wire: Black, Red
120/208 volt, three-phase, four-wire: Black, Red, Blue
277/480 volt, three-phase, four-wire: Brown, Orange, Yellow

Table 310-15(b)(2). Revise as follows:

Number of Current-Carrying Conductors	Percent of Values in Tables 310-16, 310-17, 310-18, 310-19, as Adjusted for Ambient Temperature if Necessary
4 through 6	80
7 through 24	70
25 through 42	60
43 and above	50

(FPN): Overheating may occur where continuous, fully loaded conductor diversity is less than 50% and the number of current-carrying conductors exceeds nine. See Section 310-10.

310-15(b)(2)(a). Add a fifth exception as follows:

Exception No. 5: Derating factors shall not apply where 30 or fewer current-carrying conductors occupy no more than 20 percent of the interior cross sectional area of Underfloor Raceways, Article 354; Cellular Metal Floor Raceways, Article 356; and Cellular Concrete Floor Raceways, Article 358.

336-5(a)(1). Add an exception as follows:

Exception: Type NM, Type NMC, and Type NMS cables shall be permitted to be used in one and two-family dwellings, multi-family dwellings and other structures, provided that where such dwellings or structures exceed three floors above grade type NM and NMC cables shall not be permitted to leave the floor or dwelling unit from which the cables originated.

12.00: continued

336-9. Revise Section 336-9 to read as follows:

336-9. Through or Parallel to Framing Members. Types NM, NMC, or NMS cable shall comply with Section 300-4 where installed through studs, joists, rafters, and similar members.

In both exposed and concealed locations, where the cable is installed parallel to framing members, such as joists, rafters, or studs, the cable shall be secured so that the nearest outside surface of the cable is not less than ¾ inch (19.1 mm) from the nearest edge of the framing member where nails or screws are likely to penetrate. Where this distance cannot be maintained, the cable shall be protected from penetration by nails or screws by a steel plate, sleeve, or equivalent at least 1/16 inch (1.59 mm) thick.

Exception No. 1: For concealed work in finished buildings, or finished panels for prefabricated buildings where such supporting is impracticable, it shall be permitted to fish the cable between access points.

Exception No. 2: For mobile homes and recreational vehicles.

336-18. Revise Section 336-18 as follows (FPN and exceptions unchanged from the NEC):

336-18. Supports. Nonmetallic-sheathed cable shall be secured by staples, cable ties, straps, or similar fittings so designed and installed as to not damage the cable. Where staples are used for cable sizes smaller than three No. 8 conductors, they shall be of the insulated type, or listed noninsulated staples driven by staple guns shall be permitted. Cable shall be secured in place at intervals not exceeding 4½ feet (1.37 m) and within 12 inches (305 mm) from every cabinet, box, or fitting. For other than within 12 inches (305 mm) of a cable termination at a cabinet, box, or fitting, cables passing through successive holes in adjacent framing members no more than 24 inches (610 mm) apart shall be considered to be secured.

336-26. Revise to read as follows:

336-26. Ampacity. Type NM, NMC, and NMS cable shall have conductors rated at 90°C (194°F). Where installed in thermal insulation, the ampacity of conductors shall be that of 60°C (140°F) conductors.

338-4(a). Identify the existing fine print note as (FPN No. 1) and add a second fine print note as follows:

(FPN No. 2): This section includes service entrance cables with a round configuration commonly known as SER cable. The interior installation of this cable is governed by the same rules as apply to nonmetallic sheathed cable.

346-1. Add an exception as follows:

Exception: Rigid metal conduit made from stainless steel or from nonferrous metals other than aluminum shall be permitted to be approved.

347-3(g). Add a new (g) to read as follows:

(g) Where used in buildings more than 70 feet (21.3 m) above mean grade, unless encased in not less than two inches (50.8 mm) of concrete or concealed behind a thermal barrier as described in Section 331-3(2) and Section 331-3(5).

347-9. Revise to read as follows:

347-9. Expansion Joints. Expansion fittings for rigid nonmetallic conduit shall be provided to compensate for thermal expansion and contraction where the length change will exceed, in accordance with Tables 347-9(A) and (B), $^{1}/_{8}$ inch (3.18 mm) at securely mounted items such as boxes, cabinets, elbows, or other conduit terminations.

12.00: continued

364-6. Revise as follows:

364-6. Installation Requirements.

(a) Through Walls and Floors. It shall be permissible to extend unbroken lengths of busways through dry walls. It shall be permissible to extend busways vertically through dry floors if totally enclosed (unventilated) where passing through and for a minimum distance of six feet (1.83 m) above the floor to provide adequate protection from physical damage.

(FPN): See Section 300-21, Spread of Fire of Products of Combustion.

(b) Protection from Liquids, Moisture and Other Contaminants. Busway shall be protected from liquids, moisture, and other contaminants or corrosion which may result in electrical failure.

1. During Construction. Indoor busways shall be protected from moisture during storage as well as during or after installation. Special consideration shall be given to riser busways to protect them from moisture from uncompleted roofs, walls, etc.

Outdoor busways shall be treated the same as indoor busways until after busway is properly installed, as it is not weather resistant until completely and properly installed.

Busway shall have the exposed ends of uncompleted runs protected to prevent accidental contamination during the construction period.

2. Protection from Snow Buildup. Outdoor busway shall be mounted in such a manner as to prevent snow or ice buildup forcing water into the busway through weep holes. This may require that consideration be given to horizontal snow or ice buildup or drifting of snow.

3. Curbing. Four inch (102 mm) high minimum curbs shall be installed around all floor openings for riser busways to prevent floor level liquids from entering the opening.

4. Protection from Falling Liquids. Slant shields, drip pans, or other approved protective shields shall be installed to protect indoor busway in locations where there is a possibility of water spillage or dripping condensate from roof drains, water pipes, and the like.

5. Tests Prior to Energizing. Busway system joint tightness and joint resistance, phasing, and insulation resistance shall be verified by test prior to energizing the system for the first time. A written record of these tests shall be made available to the authority having jurisdiction.

364-8(b)(2). Revise the rule and the exception to read as follows:

(2) The length of the cord or cable from a busway plug-in device to a suitable tension take-up support device shall not exceed eight feet (2.44 m).

Exception: By special permission in industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified persons will service the installation, flexible cord suitable for hard usage or extra hard usage or bus drop cable shall be permitted to extend horizontally greater lengths than eight feet (2.44 m) where the longer length is essential for periodic repositioning of equipment. The flexible cord or bus drop cable shall be supported at intervals not to exceed eight feet (2.44 m), and suitable tension take-up device(s) shall be installed at the end of the horizontal run to relieve strain in both the horizontal and vertical directions.

400-5. Revise the table following the first paragraph to read as follows:

Number of Current-Carrying Conductors	Percent of Values in Tables 400-5A and 400-5B
4 through 6	80
7 through 24	70
25 through 42	60
43 and above	50

(FPN): Overheating may occur where continuous, fully loaded conductor diversity is less than 50% and the number of current-carrying conductors exceeds nine. See Section 310-10.

12.00: continued

400-8(4). Revise the existing exception as follows:

Exception: Flexible cord and cable shall be permitted to be installed in accordance with Section 364-8(b). For other applications, where the length of the cord from the supply termination to a suitable tension take-up device is limited to eight feet (2.44 m), flexible cord shall be permitted to have one connection to the building surface.

400-8(6). Add an exception as follows:

Exception: Flexible cord shall be permitted to be installed in raceways where its calculated ampacity has been further derated by a factor of 0.8, or where its ampacity has been calculated under Section 310-15(c).

410-16(c). Add a second paragraph as follows:

In addition to, or in lieu of, the mechanical fastening means, electric fixtures containing ballasts, other than simple fluorescent reactance ballasts, shall be supported directly to the building structure by wire, chain, or threaded rod of sufficient strength to carry the fixture. Fluorescent fixtures shall be supported at each end of a diagonal axis of the fixture.

Table 430-152. In the left column, change "Other than Design E" to "Other than Design E or Design B Energy Efficient" and change "Design E" to "Design E or Design B Energy Efficient".

500-4(f). Delete paragraph (1) and (1) (FPN No. 1). Redesignate (FPN No. 2) as (FPN), applying only to the initial paragraph of Section 500-4(f), and ahead of the subsequent paragraphs. Change "(2)" to"(1)" and "(2)a." to "(2)".

511-1. Add a fine print note as follows:

(FPN): The scope of this article is intended to include commercial repair and storage facilities for motor boats.

511-10. Revise and add an exception as follows:

511-10. Ground-Fault Circuit-Interrupter for Personnel. All 125-volt single phase 15- and 20-ampere receptacles installed in areas where electrical diagnostic equipment, electrical hand tools, portable lighting equipment, or portable appliances are to be used shall have ground-fault circuit-interrupter protection for personnel.

Exception: Where an individual branch circuit supplies a single receptacle that is located and identified for the specific use of computerized diagnostic equipment, it shall be permitted to omit the ground-fault circuit-interrupter protection for personnel.

517-13(a) Exception No. 3. Revise the exception to read as follows:

Exception No. 3: Lighting fixtures more than 7½ feet (2.29 m) above the floor in a patient care area and switches located outside of a patient vicinity shall be permitted to utilize any of the types of equipment grounding conductors included in Sec. 250-118, and any of the wiring methods otherwise permitted for the location by Chapter 3 of this Code.

517-13(b). Add an exception as follows:

Exception: Wiring that is used to supply or control lighting fixtures more than 7½ feet (2.29 m) above the floor in a patient care area shall be permitted to utilize any of the wiring methods recognized in Chapter 3 of this Code provided all of the following conditions are met:

a. No portion of the wiring installed in accordance with this exception and located at or below the 7½ foot (2.29 m) level is exposed;

b. No outlet(s) supplied by such wiring is (are) located at or below the 7½ foot (2.29 m) level in any patient care area; and
c. No control point(s) supplied by such wiring is (are) located in any patient vicinity.

517-45(b)(3). Add the following second paragraph:

For the purpose of this section, the term "electrical life support equipment" includes electric hemodialysis and other equipment that, if inadvertently disconnected, could endanger the patient's life.

547-8. Identify the definition of “distribution point” as (d) and revise (c) to read as follows:

(c) Disconnecting Means Without Overcurrent Protection at the Distribution Point. Where a service disconnecting means is located at the distribution point, overcurrent protection shall be permitted to be omitted for the feeder(s) originating at that point provided all the following conditions are met:

(1) Single Management. All buildings and premises wiring shall be under single management.

(2) Disconnecting Means. The disconnecting means at the distribution point shall simultaneously disconnect all ungrounded conductors it controls, and it shall be approved as suitable to disconnect the load served at the system voltage. It shall be permitted to be accessible by portable means. Where it is not readily accessible, it shall be capable of operation from a readily accessible point.

(3) Wiring Methods. The feeder conductors shall be wired as service conductors in accordance with the applicable requirements of Parts A, B, C, and D of Article 230.

(4) Building Disconnects and Overcurrent Protection. The feeder(s) running to each building served shall terminate in one or more building disconnecting means meeting the requirements of Part B of Article 225. The feeder(s) shall have overload protection sized and located in accordance with the requirements in Section 230-90 and 230-91 for service conductors.

(5) System Grounding. The grounded conductor of the system shall be grounded at the distribution point. It shall be connected to a grounding electrode through a grounding electrode conductor in accordance with the requirements of Part C of Article 250. The grounded circuit conductor shall not be connected to a grounding electrode or to any equipment grounding conductor on the load side of the distribution point.

(6) Equipment Grounding. An equipment grounding conductor shall be run with each feeder. It shall be of the same size as the largest feeder conductor, if of the same material, or adjusted in size in accordance with the equivalent size columns of Table 250-122 if of different materials. The equipment grounding conductors shall be bonded to the grounded circuit conductor at the distribution point, or at the source of a separately derived system.

(7) Building Electrodes. A grounding electrode system meeting the requirements of Part C of Article 250 shall be provided at each building. It shall be connected to the equipment grounding conductor running with the feeder conductors to the building.

Exception to (5), (6), and (7) above: The grounded circuit conductor shall be permitted to be connected to the building disconnecting means and to the grounding electrode system of that building where all the requirements of Section 250-32(b)(2) are met.

550-2. Manufactured Home. (FPN No. 2). Add the following sentence:

Manufactured housing that is not designed to be transportable on running gear, and that is not produced under regulations that expressly cover such housing, is classified under Article 545.

600-7. Add the following as a second paragraph:

Signs or outline lighting installed inside a fountain shall have all metal parts and equipment grounding conductors bonded to the equipment grounding conductor for the fountain recirculating system. The bonding connection shall be as near as practicable to the fountain, and shall be permitted to be made to metal piping systems that are bonded in accordance with Section 680-53.

645-5(d)(3). Revise Section 645-5(d)(3) by adding the following sentence at the end:

The ventilation system shall be so arranged, with approved smoke detection devices, that upon the sensation of fire or products of combustion in the underfloor space the circulation of air will cease.

645-10. Insert the following sentence at the end of the paragraph:

Where a push button is used as a means to disconnect power, pushing the button in shall disconnect the power.

680-7. Designate the existing fine print note as (FPN No. 1) and add a second fine print note as follows:

(FPN): Unlisted swimming pool pump motors for permanently installed pools may be supplied with undersized cords, cords of excessive length, cord connectors on outdoor applications that are unsuitable for wet locations, and other violations of this Code. The fact that a manufacturer may supply them in this form is not intended to excuse compliance with the rules of this Code.

Listed storable swimming pool pump motors with long factory-supplied cords are prominently marked as such and are not covered in Part B of Article 680. They are not intended for use with permanently installed pools and they need not be bonded where used as intended. See Section 680-30.

680-10. In the second sentence, delete "a nonmetallic raceway system" and substitute "rigid nonmetallic conduit."

680-12. Revise this section to read as follows:

680-12. Disconnecting Means. One or more disconnecting means shall be installed for motor-operated pool, spa, or hot tub equipment, and for pool, spa, or hot tub heating equipment. The disconnecting means shall be located within sight of the equipment supplied, and at least five feet (1.52 m) horizontally from the inside walls of the pool, spa, or hot tub.

680-20(b)(1). Revise the second paragraph to read as follows:

Conduit shall extend from the forming shell to a suitable junction box or other enclosure located as provided in Section 680-21. Conduit shall be rigid metal, intermediate metal, or rigid nonmetallic conduit.

680-20(c). Revise the first sentence of the second paragraph to read as follows:

“Approved rigid metal conduit, intermediate metal conduit, or rigid nonmetallic conduit shall be installed from the fixture to the service equipment or panelboard.”

680-22(a)(1). Delete the last sentence and insert the following exception:

Exception: Where reinforcing steel is effectively insulated by an encapsulating non-conductive compound at the time of manufacture, it shall be permitted to be unbonded provided No. 8 or larger bare solid copper conductors are run in the pour around the perimeter of the pool below the normal water line, and through the pour at other locations such that no point in the pour, measured through the pour, is more than 15 feet (4.58 m) from a bonding conductor.

680-22(a)(4). Add a second paragraph as follows:

Where a double-insulated water-pump motor is installed under the provisions of this exception, a solid No. 8 copper conductor that is of sufficient length to make a bonding connection to a replacement motor shall be extended from the bonding grid to an accessible point in the motor vicinity. Where there is no connection between the swimming pool bonding grid and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit.

12.00: continued

680-25(b)(2). Revise to read as follows:

(2) The equipment grounding conductor shall be an insulated copper conductor and shall be installed with the circuit conductors in rigid metal conduit, intermediate metal conduit, or rigid nonmetallic conduit.

695-3(b). Revise to read as follows:

(b)[x] Multiple Sources. Where reliable power cannot be obtained from a source described in Section 695-3(a), power shall be supplied from an approved combination of two or more of either of such sources, or from an approved combination of feeders constituting two or more power sources as covered in (2) below, or from an approved combination of one or more of such power sources in combination with an on-site standby generator complying with (1) and (3) below.

700-9(d). Revise to read as follows:

(d) Fire Separation: Emergency system feeders, wiring to elevator machine rooms including the cab lighting disconnecting means, and wiring to fire pumps shall comply with (1) and (2) below:

(1) All required emergency systems generation and distribution equipment shall be located in 2-hour fire resistive rated rooms, closets or shafts. Equipment, conduit, piping, or ductwork alien to the emergency system shall not be located within these rooms, closets, or shafts.

Exception: Equipment for feeder circuits (including transfer switches, transformers, panelboards, etc.) for legally required standby purposes in compliance with the provisions of Article 701, or for the equipment system of a hospital as covered in Sections 517-30(b)(3) and 517-34, or for the critical branch of a nursing home as covered in Section 517-43, shall be permitted in the same room. Nonemergency equipment shall be installed sufficiently remote from emergency equipment that a failure within one will be unlikely to damage the other.

(2) All portions of emergency system feeders located outside of rooms, closets, or shafts required by Section 700-9(d)(1) shall be enclosed within 2-hour fire resistive rated enclosures or be part of an assembly that has a 2-hour fire resistive rating.

(FPN): Available methods for achieving the required fire resistance rating may include electric circuit protective systems, thermal barrier systems for electrical system components, listed fire-rated assemblies, and cables listed to maintain circuit integrity where installed in accordance with applicable listing requirements. Further details may be found in directories of building materials published by qualified testing laboratories.

Exception to (1) and (2) above: In buildings or structures less than 70 feet (21.3 m) in height, or for new emergency feeders or equipment in existing buildings, alternative methods of protection may be accepted by the authority having jurisdiction where it is assured that equivalent objectives can be achieved.

(FPN): Many techniques intended to prevent the deflection of steel members at high temperatures will not materially increase the survival time of circuits in electric raceways.

700-12. Add an exception after the first paragraph as follows:

Exception: A fire pump shall be permitted to use a connection ahead of the service disconnecting means in accordance with Section 695-3(a)(1).

12.00: continued

700-12. Revise the fourth paragraph to read as follows:

Equipment for sources of power as described in Section 700-12(a) through (d) shall comply with Section 700-9(d)(1) of this Code where circuit(s) covered in Section 700-9(d) are supplied.

700-12(e). Delete the second sentence of the second paragraph which reads:

"Flexible cord- and plug-connection shall be permitted provided that the cord does not exceed three feet (914 mm) in length."

701-11(f). Delete the second sentence of the second paragraph which reads:

"Flexible cord- and plug-connection shall be permitted provided that the cord does not exceed three feet (914 mm) in length."

702-6. Revise this section by adding the following paragraph at the end:

Transfer equipment shall be required for all permanently installed standby systems subject to the provisions of this article and for which an electric-utility supply is either the normal or standby source.

725-23. Designate the existing exception as Exception No. 1 and add a second exception as follows:

Exception No. 2: Conductors qualifying under the provisions of Section 725-27(c) shall be protected by overcurrent devices rated or set not over five amperes for No. 20 and larger conductors, and not over three amperes for No. 22 conductors.

725-27. Add a new subsection (c) as follows:

(c) Instrumentation Tray Cable, Type ITC. Class 1 control circuits other than those covered in Section 725-8(a) shall be permitted to be wired using multiconductor factory-assembled cables containing two or more conductors with insulation rated for 300 volts, cabled with or without grounding conductor(s), and enclosed in a nonmetallic jacket. The cables shall be permitted to be shielded, and a metallic sheath or armor shall be permitted to be applied over the nonmetallic jacket.

(1) Uses Permitted. Type ITC cable shall be permitted to be used only in industrial establishments where the conditions of maintenance and supervision assure that only qualified persons will service the installation. The cable shall only be permitted to be used where provided with additional protection and support as follows:

1. In cable trays.
2. In raceways.
3. In hazardous locations as permitted in Articles 501, 502 and 503 and 505.
4. As open wiring where equipped with a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with this section.The cable shall be supported and secured at intervals not exceeding six ft (1.83 m).

Exception No.1: Type ITC cable without a metallic sheath or armor shall be permitted to be installed as open wiring between cable tray and equipment in lengths not to exceed 50 ft, where the cable is supported and protected against physical damage using mechanical protection, such as dedicated struts, angles, or channels. The cable shall be supported and secured at intervals not exceeding six ft (1.83 m).

Exception No. 2: Type ITC cable that complies with the crush and impact requirements of Type MC cable and is identified for such use shall be permitted as open wiring between the cable tray and the equipment in lengths not to exceed 50 ft (15.2m). The cable shall be supported and secured at intervals not exceeding six ft (1.83 m).

5. As aerial cable on a messenger.
6. Direct buried where identified for the use.
7. Under raised floors in control rooms and rack rooms where arranged to prevent damage to the cable.

12.00: continued

(2) Uses Not Permitted. Type ITC cable shall not be installed for circuits operating at more than 150 volts nominal, or more than 5.0 amperes. Type ITC cable shall not be installed with power, lighting, or other nonpower limited circuits.

Exception No. 1: Type ITC cable shall be permitted to terminate within enclosures where the conductors are permanently and effectively separated from other nonpower limited conductors in accordance with the requirements for the separation of Class 2 and Class 3 circuits from nonpower limited circuits in Section 725-54(a)(1) Exception No. 2 or Exception No. 3. For the purposes of applying Exception No. 2 only, the insulation on Type ITC cables shall be assumed to be equivalent to Class 3 insulation.
Exception No. 2: Type ITC cable shall be permitted to be installed with power, lighting, or other nonpower limited circuits where otherwise permitted for Class 1 circuits by this article, and in addition where a smooth metallic sheath, welded and corrugated metallic sheath, or interlocking metallic tape armor is applied over the nonmetallic jacket.

(3) Construction. The insulated conductors of Type ITC cable shall be in sizes No. 22 through No. 12. The conductor material shall be copper or thermocouple alloy.

(4) Marking. Type ITC cable shall be marked in accordance with Section 310-11.

(5) Bends. Bends in Type ITC cable shall be made so as to not damage the cable.

Article 727. Delete this article. Where a provision of the National Electrical Code refers to requirements for overcurrent protection for Type ITC cable, said provision shall apply to Section 725-23 Exception No. 2 of this Code. Where a provision of the National Electrical Code refers to other requirements for Type ITC cable, said provision shall apply to Section 725-27(c) of this Code.

760-21. Add a second sentence and fine print note as follows:

These circuits shall not be supplied through ground-fault circuit-interrupters.

(FPN): See Section 210-8(a)(5) Exception No. 3 for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

760-41. Designate the existing fine print note as (FPN No. 1) Add a second sentence and second fine print note as follows:

These circuits shall not be supplied through ground-fault circuit-interrupters.

(FPN No. 2): See Section 210-8(a)(5) Exception No. 3 for receptacles in dwelling-unit unfinished basements that supply power for fire alarm systems.

800-11(c). Delete this subsection.

800-52(a)(1)(c). Make no change in the requirements. Delete the heading "1." and the title thereof "In Raceways, Compartments and Boxes." (The result is that (c) becomes the title of the rule that in the NEC has the title: "1. In Raceways, Compartments, and Boxes.")

APPENDIX A†

780 CMR: MASSACHUSETTS STATE BUILDING CODE

6th Edition with changes and corrections up to 3/1/98

†*The provisions of the regulations cited in this appendix are noted to assist the users of this Code in properly considering various electrical design constraints of other building systems. They are generally unenforceable by an Inspector of Wires. See Rule 5 of this Code.*

High rise buildings	403.0 complete
Alarm (in all buildings with atrium)	404.6
Underground structures	405.0 complete
Use Group I-2 Smoke/heat detection	409.5.1
Use group I-3 Remote release	410.4.1 through 410.4.5
Lighting control (theaters)	411.4
Footlights and stage electrical equipment	412.3.3
Automatic fire detection systems (airport traffic control towers)	414.4
Standby power, light, and emergency systems (airport traffic control towers)	414.5
HPM Use facilities (Hazardous Production Materials)	416.0 complete
Swimming pools, alarmed access, where required	421.10.1.9
Group residence (fire warning system)	423.7.2
Child day care centers	424.0 complete
Limited group residence	427.0 complete
Detoxification facilities	428.0 complete
Penetrations (documentation)	703.2
Penetrations (electrical outlet boxes)	709.6.3
Penetrations (protection)	713.4
Smoke actuated closing devices	716.5.1
Fire protection system approval/acceptance	903.0 complete
Fire protective signaling systems	917.0 complete
Automatic fire detection systems	918.0 complete
Single and multiple-station smoke detectors	919.0 complete
Smoke control systems	921.0 complete
Supervision (fire suppression systems)	923.1
Fire protective signaling systems	923.2
Penetrations of interior stairway enclosures	1014.11.2
Exit signs and lights	1023.1 through 1023.4
Means of egress lighting	1024.0 complete
Light and ventilation required (bathroom, toilet room, and general)	1205.0 through 1209.0
Cutting, notching, and boring in wood framing members	2305.3
Electrical lighting fixtures	2604.5.4
Plenums	2805.0 complete
Power venters (power exhausters)	2812.0 complete
Elevator, dumbwaiter, and conveyor equipment installation requirements	Chapter 30 complete
Illuminated signs	3102.13
Portable signs	3102.14
Electrical system protection with reference to base flood elevation	3107.7
Precautions during building operations (lighting)	3315.0 complete
Historic buildings	3409.0 complete

780 CMR: CHAPTER 13 ENERGY CONSERVATION

Recessed light fixtures (IC labeled)	1306.4.1
Air leakage for all buildings (openings around wiring; outlet plate gaskets)	1307.4
Zoning for temperature control	1310.7.3
Heating, ventilating, and air-conditioning equipment	1311.0 complete
Electrical power distribution	1312.0 complete
Lighting systems	1313.0 complete
Assumed combined lighting and equipment power densities for shell buildings	1314.3.4
Building design by systems analysis	1315.0 complete
Energy provisions for existing buildings	3407.0 complet

780 CMR: CHAPTER 36 ONE AND TWO FAMILY DWELLINGS

Required lighting, including control locations	3603.6.1
Mechanical ventilation	3603.6.2
Artificial light (illumination levels)	3603.6.5.1
Fire protection (smoke detection)	3603.16.1 through 603.16.13
Recessed light fixtures	3603.21
Drilling and notching - studs	3606.2.5
Mechanical equipment, general	3611, 3612, and 3613 generally
Heating and cooling equipment	3614 generally
Electric resistance heating	3615 generally

*Note: For energy conservation provisions for low-rise residential occupancies, see Building Code Appendix J.

DIVISION OF INDUSTRIAL SAFETY

454 CMR 10.00 Construction Industry Rules and Regulations: Part 17, Tunnels and Shafts, Caissons, Cofferdams, and Compressed Air

10.175 Tunnels and Shafts

10.175(12) Electrical Equipment

10.178 Compressed Air

10.178(11) Electricity

ELEVATOR REGULATIONS

524 CMR 15.00 through 35.00

BOARD OF STATE EXAMINERS OF PLUMBERS AND GAS FITTERS

248 CMR 6.00: NATIONAL FUEL GAS CODE (NFPA 54)

5.4.3(d): Proper permanent lighting shall be provided at the roof access. The switch for such lighting shall be located inside the building near the access means leading to the roof.

BOARD OF FIRE PREVENTION REGULATIONS

527 CMR 5.00: Operation and maintenance of buildings or other structures used as garages, service stations and the related storage, keeping and use of gasoline or other motor fuel.

5.07 Dispensing Equipment

(2) Heat activated shutoff switch

(5) Emergency pump shutoff switches/circuit breakers

527 CMR 15.00: Keeping, handling and transportation of flammable and combustible liquids, and the disposition of crude petroleum or any of its products in harbors or other waters of the Commonwealth.

15.09 General Provisions [Marinas]

(1)(a), (b), (c). Equipment ratings, emergency shutoffs, permitted wiring locations

ARCHITECTURAL ACCESS BOARD

521 CMR:

39.3 HEIGHT

The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 521 CMR 6.5, Forward Reach and 521 CMR 6.6, Side Reach.

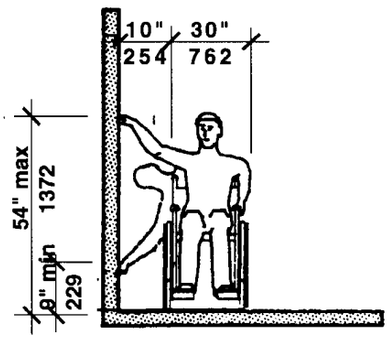
39.3.1 Electrical and communications system receptacles on walls shall be mounted between 15 inches (15" = 381mm) and 48 inches (48" = 1219mm) above the floor, measured at the centerline of the lowest receptacle.

Exception: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

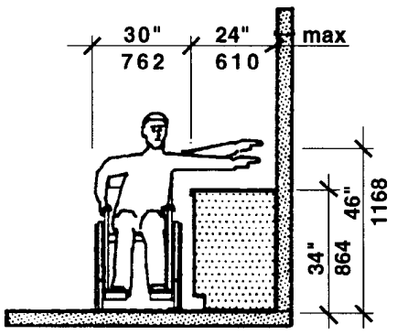
12.00: continued

39.4 LOCATION

All such controls shall be located at least 18 inches (18" = 457mm) from an interior corner.



High and Low Side Reach
Figure 6m



Maximum Side Reach over Obstruction
Figure 6n

6.5 FORWARD REACH

If the *clear floor space* only allows forward approach to an object, the maximum high forward reach allowed shall be 48 inches (48" = 1219mm) (See Fig. 6k). The minimum low forward reach is 15 inches (15" = 381mm). If the high forward reach is over an obstruction, reach and clearances shall be as shown in Fig. 6l.

6.6 SIDE REACH

If the *clear floor space* allows parallel approach by a person in a wheelchair, the maximum high side reach allowed shall be 54 inches (54" = 1372mm) and the low side reach shall be no less than nine inches (9" = 229mm) above the floor (See Fig. 6m). If the side reach is over an obstruction, reach and clearances shall be as shown in Fig. 6n.

REGULATORY AUTHORITY

NON-TEXT PAGE