Chapter E 90

ADOPTION OF NATIONAL ELECTRICAL CODE, 1971 AND WISCONSIN AMENDMENTS THERETO

E 90.01 Adoption of code for electrical and communication equipment and wiring. The National Electrical Code-1971 (NEC-1971), also American National Standards Institute C1-1971 (ANSI C1-1971), Article 90, chapters 1 through 9, inclusive, and index, subject to omissions shown in section E 90.03, and changes and additions shown in section E 90.04, is hereby incorporated by reference into the Wisconsin Administrative Code, Electrical, Volume 2. Interim amendments of the NEC-1971 will have no effect in the state of Wisconsin until such time as this section is correspondingly revised to reflect these changes.

History: Cr. Register, April, 1972, No. 196, eff. 5–1–72.

E 90.02 Consent to incorporate NEC-1971 by reference. Pursuant to section 227.025, Wis. Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of the standards, except for sections E 90.03 and E 90.04, contained in the NEC-1971, which can be obtained from the National Fire Protection Association, 60 Batterymarch Street, Boston, Massachusetts 02110. Copies of the aforementioned standard code are on file in the offices of the Department of Industry, Labor and Human Relations, the Public Service Commission, the Secretary of State and the Revisor of Statutes.

History: Cr. Register, April, 1972, No. 196, eff. 5–1–72.

E 90.03 Omissions from NEC-1971. (1) The following sections of the NEC-1971 are not incorporated as part of the Wisconsin State Electrical Code, volume 2:

Section 90–1
90–2
90–6
90–7
230–2 Exception No. 7

(2) The following sections or tables of the NEC-1971 are not incorporated as part of the Wisconsin State Electrical Code, volume 2,

but are considered standards acceptable to the administrative authority:

Section 230–90 Exception No. 5	Section 540–18
Table 310–2 (a)	540–22
Section 422–14	550–3 (f)
424–66	550–23 (a)
430–12 (a)	551–13 (c)
430–31 (b)	551–42
450–8	551–52
450–42	555–3
450–43 (a)	645–2 (c) (1)
500–2 (c)	670–4 (b)
503–14	
517–2	

History: Cr. Register, April, 1972, No. 196, eff. 5–1–72.

E 90.04 Changes or additions to NEC-1971. Following are the changes or additions to the NEC-1971. (The following changes or additions have been prefixed by the letter E to denote that such changes or additions are rules of this state and not those of NEC-1971. Following the E designation is the referenced NEC section or subsection. Example: E 110.02 (NEC 110–2). The word "Change" following the section number and heading means that the corresponding wording of the NEC-1971 has been changed and that the new wording is substituted at the appropriate location. The word "Addition" following the section number and heading means that a new requirement is incorporated in the NEC-1971 and that the new requirement is inserted at the appropriate location.)

ARTICLE 100—DEFINITIONS

Administrative Authority (Addition): The department of Industry, Labor and Human Relations and/or the Public Service Commission.

Special Permission (Change): The written consent of the Department of Industry, Labor and Human Relations or the Public Service Commission.

ARTICLE 110—GENERAL

E 110.02 (NEC 110–2.) Approval. (Addition)

(a) Except as otherwise permitted in this code, all electrical equipment shall be installed or used in the exact manner and for the exact purpose indicated by the manufacturer's instructions, markings or labels.

E 110.08 (NEC 110–8.) Wiring Methods. (Addition)

(a) In spaces where livestock is housed, milk houses, pump houses, root cellars, silos and poultry houses, the wiring method shall be rigid nonmetallic conduit, or types NMC, UF or other nonabsorbent nonmetallic sheathed cable. In addition, insulated boxes, lamp holders, ducts and bushings should be used. If some metal boxes must be used they shall be mounted out of contact with masonry with a minimum clearance of ¾ inch between the metal box and the masonry.

E 110.22 (NEC 110–22.) Identification. (Change)

Each disconnecting means required by this code for motors and

appliances, and each service, feeder or branch circuit at the point where it originates, shall be legibly marked to indicate its purpose. The marking shall be of sufficient durability to withstand the environment involved.

E 110.23 (NEC 110–23.) Readily Accessible. (Addition)

Disconnect switches and circuit breakers shall be readily accessible and have the center of the operating means in its highest position not more than 6½ feet above the floor or operating level, and it is recommended that it be at least 3 feet above this level. Fuses shall be readily accessible with the location of their midpoint governed by the same dimensions as for switches and circuit breakers. The operating means of disconnect switches and circuit breakers may function through rods or cables when the switches or breakers are located outside the above range. This requirement does not cover installations specifically exempted elsewhere in this code.

(a) *Exception No. 1:* This section does not apply to equipment exceeding 600 volts.

ARTICLE 210—BRANCH CIRCUITS

E 210.05 (NEC 210–5.) **Color code.** (Change)

(b) Any conductor intended solely for grounding purposes shall be identified by a continuous green color or a continuous green color with a yellow stripe unless it be bare. Except for public highway traffic control, communications, metering, railway and railroad signal installations, branch circuit conductors and equipment lead wires, to which branch circuit conductors attach, having a continuous green color or a continuous green color with a yellow stripe, shall not be used for other than grounding purposes.

ARTICLE 220—BRANCH CIRCUIT AND FEEDER CALCULATIONS

E 220.03 (NEC 220–3.) **Branch circuits required.** (Addition)

(d) Fixed Appliances. Fixed appliances exceeding ⅛ hp or 300 watts rating shall not be connected to general purpose branch circuits. Where an air conditioner sleeve is provided in a building wall, an outlet within 4 feet of the sleeve location shall be provided. If a circuit is not run to the outlet, a raceway shall be provided. When the air conditioner is installed in the sleeve it shall be supplied by a separate circuit. A receptacle outlet installed for an air conditioner shall not be counted as one of the receptacles required by section NEC 210–22 (b).

(e) A single branch circuit shall not supply outlets in more than one apartment of a multi-family building, except rooming houses, hotels and motels.

E 220.04 (NEC 220–4.) **Calculation of feeder loads.** (Addition)

(p) Air Conditioners. Where provisions are made for installing one or more air-conditioning units, a feeder load of 1,000 watts or the nameplate rating of the appliance, whichever is larger, shall be included for each unit.

ARTICLE 230—SERVICES

E 230.02 (NEC 230–2.) **Number of services to a building or other premises served.** (Change)

Exception No. 4: Capacity requirements. Additional services may be installed by special permission, or in accordance with the following table:

Service Rating	Number of Services Permitted
0– 400 amperes	1
401– 800 amperes	2
801–1200 amperes	3

Note: 1: Where 2 services are permitted, one must be of at least 400 ampere rating. Where 3 services are permitted, 2 must be of at least 400 ampere rating.

Note 2: For services above 1200 ampere rating and 3 in number, the pattern established by the above table and Note 1 is to be continued.

Exception No. 5: Buildings of large area. Two or more sets of service conductors may be installed for the same class of service for the same consumer if located more than 150 feet apart (measured in a straight line), provided that all electrical wiring supplied by each service has no common raceway or connection with any other service.

E 230.24 (NEC 230–24.) **Clearance of service drops.** (Addition)

(b) 27 feet—over track rails of railroads.

(d) Clearance from storage tanks. A horizontal clearance of at least 15 feet shall be maintained between aboveground flammable liquids storage tanks and open conductors operating at more than 300 volts to ground. When the voltage is 300 or below, a horizontal clearance of not less than 8 feet shall be maintained.

NOTE: This requirement does not apply to LPG tanks with capacity of 1,000 gallons or less.

(e) Clearance from wells. A horizontal clearance of at least ¾ the required vertical clearance of the conductor shall be maintained between open conductors and wells.

E 230.24 (NEC 230–24.) **Clearance of service drops.** (Change)

NOTE: For clearance of conductors of over 600 volts, see Wis. Adm. Code, Electrical, volume 1, section E 123.03.

E 230.31 (NEC 230–31.) **Size of underground service conductors.** (Addition)

(a) The underground service lateral shall not extend into a building in a raceway longer than 3 feet.

E 230.41 (NEC 230–41.) **Size of service entrance conductors, overhead system and underground system.** (Change)

Exception No. 1: For single-family residences requiring more than three 2-wire branch circuits or having an area of more than 500 square feet (external dimensions), the service shall be a minimum of 100 amperes, 3-wire or 4-wire. For multioccupancy residential buildings requiring more than three 2-wire branch circuits, the service shall be a minimum of 150 amperes, 3-wire or 4-wire, and each unit requiring more than two 2-wire branch circuits shall have a 3-wire service or feeder. Services or feeders to each unit of multioccupancy residential buildings shall be a minimum of 50 amperes.

E 230.51 (NEC 230–51.) **Connections at service head.** (Addition)

(h) Service head and service drop attachments and communication cables or conductors attached to or carried along the surface of a building shall be so located that no part of the drop loops or service drop conductors within 3 feet of the service head and service drop attachments shall be less than 12 inches from communication cables or conductors.

E 230.70 (NEC 230–70.) **General.** (Change)

(a) *Disconnection from service conductors.* Means shall be provided for disconnecting all conductors in the buildings or other structure from the service conductors. The disconnecting means for each set of service conductors shall consist of:

1. A single main disconnecting means for single occupancy buildings or other structures, or
2. A single main disconnecting means for each metered service in each occupancy of a multioccupancy building having service conductors run to each occupancy, or
3. A single main disconnecting means for each metered service up to and including 6, or
4. Not more than 6 switches or 6 circuit breakers where the combined rating of the service disconnecting means exceeds 400 amperes, or
5. Not more than 6 switches or 6 circuit breakers for each farm service entrance, whether on a pole or in separate buildings, except for the residence which shall have a single main disconnecting means.
6. Not more than 6 switches or 6 circuit breakers for additions to existing services installed prior to February 1, 1968.

Note 1: Main disconnects for fire pumps, water pumps, emergency lighting or fire alarm systems shall not be counted as disconnecting means so far as the limit of the number of disconnecting means is concerned.

Note 2: A water pump may be connected in such a way that opening of other than its own circuit protection will not interrupt service to the pump.

(b) *Location.* The disconnecting means shall be located at a readily accessible point nearest to the entrance of the conductors, either inside or outside the building or other structure.

In a multiple-occupancy building, each occupant shall have access to his disconnecting means. A multiple-occupancy building having individual occupancy above the second floor shall have service equipment grouped in a common accessible place. Multiple-occupancy buildings that do not have individual occupancy above the second floor may have service conductors run to each occupancy in accordance with section NEC 230–2 Exception No. 3 (b).

(g) *Switch and circuit breaker.* Where more than one switch is permitted in section E 230.70 (a), they shall be in a common enclosure or in a group of separate enclosures.

E 230.71 (NEC 230–71.) **Rating of service equipment.** (Change)

Exception No. 1: For single-family residences requiring more than three 2-wire branch circuits or having an area of more than 500 square feet (external dimensions), the service equipment shall have a rating of not less than 100 amperes, 3-wire or 4-wire. For multi-occupancy residential buildings requiring more than three 2-wire branch circuits, the service equipment shall have a rating of not less

than 150 amperes, 3-wire or 4-wire. Service or feeder equipment for each unit of multi-occupancy residential buildings shall have a rating of not less than 50 amperes.

E 230.71 (NEC 230–71.) **Rating of service equipment.** (Addition)

Exception No. 3: For installations consisting of a single branch circuit, a circuit breaker of 15 or 20 ampere rating may be used.

ARTICLE 240—OVERCURRENT PROTECTION

E 240.16 (NEC 240–16.) **Location in premises.** (Change)

(a) Readily accessible, except as provided in sections NEC 230–91 and NEC 230–92 for service equipment, NEC 364–11 for busways, E 600.06 and NEC 600–6 for signs, and NEC 610–42 for cranes and hoists.

ARTICLE 250—GROUNDING

E 250.92 (NEC 250–92.) **Installation.** (Addition)

Except where fished in hollow spaces of finished buildings, No. 6 or larger grounding conductors shall be fastened at intervals not exceeding 4½ feet and within 12 inches of every cabinet, box, or fitting.

ARTICLE 334—METAL-CLAD CABLE

E 334.04 (NEC 334–4.) **Construction.** (Addition)

(a) One or more grounding conductors shall be incorporated under the metallic covering. The total cross section of the grounding conductor shall be approximately equal to one-half the cross section of one phase conductor.

E 334.12 (NEC 334–12.) **Exposed work.** (Addition)

(d) Running boards shall not be less than 2 inches wide.

ARTICLE 336—NONMETALLIC-SHEATHED CABLE

E 336.13 (NEC 336–13.) **Running boards.** (Addition)

Running boards shall not be less than 2 inches wide.

ARTICLE 338—SERVICE-ENTRANCE CONDUCTOR

E 338.02 (NEC 338–2.) **Use as service-entrance conductors.** (Addition)

(a) Type USE service-entrance cable used as service conductors in direct earth burial shall be buried not less than 24 inches below the surface, when supplementary protection from physical injury, such as a covering board, concrete pad, raceway, etc., is not provided.

E 338.03 (NEC 338–3.) **Use as branch circuits or feeders.** (Addition)

(d) Type USE service-entrance cable used as branch circuit or feeder conductors in direct earth burial shall be buried not less than 18 inches below the surface, when supplementary protection from physical injury, such as a covering board, concrete pad, raceway, etc., is not provided.

ARTICLE 354—UNDERFLOOR RACEWAYS

E 354.15 (NEC 354–15.) **Connections to cabinets and wall outlets.** (Change)

Connections between raceways and distribution centers and wall

outlets shall be made by means of approved raceways or by means of fittings approved for the purpose.

ARTICLE 370—OUTLET, SWITCH AND JUNCTION BOXES, AND FITTINGS

E 370.18 (NEC 370–18.) **Pull and junction boxes.** (Addition)

(a) (4) The depth opposite the side of the cover shall conform to the specifications of NEC Table 373–6 (a) column No. 1.

ARTICLE 400—FLEXIBLE CORDS AND CABLES

E 400.04 (NEC 400–4.) **Prohibited uses.** (Addition)

(6) Above false ceilings.

ARTICLE 450—TRANSFORMERS AND VAULTS

E 450.08 (NEC 450–8.) **Ventilation.** (Addition)

Vaults containing oil-filled equipment shall be vented to the outside.

E 450.26 (NEC 450–26.) **Oil-insulated transformers installed on roofs.** (Addition)

Oil-insulated transformers installed on the roof of a building shall comply with the following conditions:

(a) The structure of the building shall be of sufficient strength to carry the weight of the transformers, their enclosures, the equipment used in connection therewith, plus the superimposed live load. There shall be a path from the edge of the roof to the transformer location of sufficient strength to support the transformer.

NOTE: See Wis. Adm. Code chapters Ind 50–59—Building and Heating, Ventilating and Air Conditioning—chapter Ind 53 for structural requirements.

(b) Where the roof construction has a 2-hour fire-resistive rating or greater, the transformers shall be installed in a fenced enclosure, vault or other enclosure where the live parts are guarded against accidental contact. Where a fence is used, it shall be of a type that cannot be readily climbed and shall not be less than 6 feet in height excluding any barbed wire. A locked gate shall be provided. Where the transformers are installed in other than a vault, a curb or basin shall be provided. The curb shall be high enough to contain the oil from the largest of the transformers, but in no case less than 6 inches high. A drain shall be provided to carry any oil away from the building.

(c) Where the roof construction has less than a 2-hour fire-resistive rating, the transformers shall be enclosed in a vault complying with NEC Article 450, Part C—Provisions for Transformer Vaults.

NOTE: See Wis. Adm. Code chapters Ind 50–59—Building and Heating, Ventilating and Air Conditioning—chapter Ind 51 for fire-resistive standards.

E 450.41 (NEC 450–41.) **Location.** (Change)

Vaults containing oil-insulated transformers shall be located where they can be ventilated to the outside air without using flues or ducts.

Exception: Where special permission is granted by the administrative authority.

E 450.42 (NEC 450–42.) **Walls, roof and floor.** (Change)

The walls and roofs of vaults shall be constructed of reinforced concrete, brick, load-bearing tile, concrete block, or other fire-resistive

construction which has adequate structural strength for the conditions, and a minimum fire-resistive rating of 3 hours. The floors of vaults in contact with the earth shall be of concrete not less than 4 inches thick, but when the vault is constructed with a vacant space or other stories below it, the floor shall have adequate structural strength for the dead and/or superimposed live loads imposed thereon and a minimum fire-resistive rating of 3 hours.

NOTE: See Wis. Adm. Code chapters Ind 50–59—Building and Heating, Ventilating and Air Conditioning—chapter Ind 51 for fire-resistive standards and chapter Ind 53 for structural requirements.

ARTICLE 511—COMMERCIAL GARAGES

E 511.02 (NEC 511–2.) **Hazardous areas.** (Change)

(d) Adjacent areas at the same or higher elevation and in which hazardous vapors are not likely to be released, such as offices, salesrooms, stockrooms, switchboard rooms and other similar locations, shall not be classed as hazardous.

ARTICLE 515—BULK STORAGE PLANTS

E 515.02 (NEC 515–2.) **Hazardous areas.** (Addition)

(d) (5) Open conductors shall not pass over aboveground flammable liquids storage tanks. Such conductors operating at more than 300 volts to ground shall be kept at least 15 feet horizontally from such tanks. When the voltage is 300 or below, a horizontal clearance of not less than 8 feet shall be maintained.

ARTICLE 600—ELECTRIC SIGNS AND OUTLINE LIGHTING

E 600.02 (NEC 600–2.) **Disconnect required.** (Addition)

The switch or breaker required by this section may control one or more signs or outline lighting installations.

E 600.03 (NEC 600–3.) **Sign enclosures as raceways.** (Addition)

A sign enclosure shall not be used as a pull box or raceway for conductors supplying other signs or equipment.

E 600.06 (NEC 600–6.) **Load of branch circuit.** (Addition)

Branch circuit overcurrent devices, if on or within the body of the sign, shall be mounted in a separate accessible compartment.

ARTICLE 620—ELEVATORS, DUMBWAITERS, ESCALATORS, AND MOVING WALKS

See Wis. Adm. Code chapter Ind 4—Elevator Code.

ARTICLE 670—METALWORKING MACHINE TOOLS

E 670.01 (NEC 670–1.) **Scope and standard for metalworking machine tools.** (Change)

(a) The provisions of this article apply to the size and overcurrent protection of supply conductors to metalworking machine tools and to the nameplate data required on each such tool.

(b) Electrical equipment, apparatus and wiring furnished as part of metalworking machine tools, shall comply with a standard acceptable to the administrative authority.

NOTE: The administrative authority considers NFPA "Standard on Metalworking Machine Tools" (No. 79)—1971 to be an acceptable standard.

ARTICLE 700—EMERGENCY SYSTEMS

E 700.05 (NEC 700–5.) **Capacity and systems.** (Change)

(a) Emergency systems shall have adequate capacity and rating for the emergency operation of all equipment connected to the system.

(b) Current supply shall be such that in the event of failure of the normal building supply to or within the building or group of buildings concerned, emergency lighting, or emergency power, or both emergency lighting and power, will be immediately available. The supply system for emergency purposes may comprise one or more of the types of system covered in sections E 700.07, NEC 700–7 through NEC 700–10 and E 700.22, NEC 700–22, except as limited by section E 700.06. The "one service, in accordance with Article 230," referred to in sections E 700.07, NEC 700–7 and NEC 700–8, may consist of the normal building service, a building feeder or branch circuit.

(c) Consideration must be given to the type of service to be rendered, whether of short time duration, as for exit lights of a theater, or of long duration, as for supplying emergency power and lighting due to a long period of current failure from trouble either inside or outside the building, as in the case of a hospital.

E 700.06 (NEC 700–6.) **Standby emergency power.** (Change)

(a) Standby emergency power of a type recognized by sections E 700.07, NEC 700–7, NEC 700–8, or E 700.22, NEC 700–22 shall be provided as a source of supply for required exit lights, emergency lighting or power in occupancies where people are housed, assembled, confined or congregated with a capacity or area equal to or greater than either Column B or C of Table E 700.06.

(b) The capacity of assembly hall type occupancies shall be based upon the entire area within each assembly hall occupancy separation as provided in the Wisconsin state building code, chapter Ind 55. This area may include one or more rooms or floors.

TABLE E 700.06
OCCUPANCIES REQUIRING STANDBY EMERGENCY POWER

Column A Occupancy	Column B No. Persons Accommodated	Column C Calculated Capacity or Area
1. Apartment buildings	200	200 bedrooms
2. Apartment buildings (housing for elderly or homes for the aged)	30	30 bedrooms
3. Arenas	200	800 square feet. (Use seated space only.)
4. Art galleries	200	20,000 square feet
5. Assembly halls such as church dining rooms and fellowship halls, dance halls, banquet halls, dining rooms, restaurants, taverns, night clubs, school multipurpose rooms and similar occupancies	200	2,000 square feet
6. Assembly halls with stage	200	1,400 square feet
7. Asylums	30	30 inmate beds
8. Auditoriums	200	1,400 square feet
9. Banks	400	30,000 square feet
10. Bowling alleys	200	200 persons based on 5 persons per alley plus number of spectator seats and 10 square feet per person for bar and dining areas.

Column A Occupancy	Column B No. Persons Accommodated	Column C Calculated Capacity or Area
11. Children's homes	30	30 beds
12. Convents	200	200 beds
13. Dormitories including those used in detention schools	200	200 beds
14. Exhibition buildings	200	20,000 square feet
15. Factories	400	30,000 square feet
16. Field houses	200	800 square feet. (Use seated space only.)
17. Gymnasiums	200	200 persons based on 6 square feet per person for seated space and 15 square feet per person for unseated space.
18. Hospitals	30	30 patient beds
19. Hotels	200	200 rooms
20. Jails	30	30 inmate beds
21. Lecture halls	200	1,400 square feet
22. Libraries	200	200 persons based on 20 square feet per person for reading rooms and 100 square feet per person for the balance.
23. Lodge halls	200	200 persons based on 6 square feet per person for seated space and 15 square feet per person for unseated space.
24. Motels	200	100 rooms
25. Museums	200	20,000 square feet
26. Nursing homes	30	30 patient beds
27. Office buildings	400	30,000 square feet
28. Rooming houses	200	200 rooms
29. Skating rinks	200	3,000 square feet
30. Stores	200	200 persons based on 30 square feet per person for first floor and 60 square feet per person for second floor and above.
31. Swimming pools (indoor)	30	450 square feet
32. Theaters and theater lobbies	200	1,400 square feet. (Theater and lobby must be combined in determining total area.)
33. Warehouses	400	120,000 square feet

NOTE: The square foot figures noted in Column C are based on net area which would include internal room and corridor areas. The area occupied by toilets, stairwells, elevator shafts, janitor's closets, boiler and equipment rooms, and similar areas need not be included in calculating capacity. Areas within rooms occupied by furniture, machinery or display counters must be included. The area occupied by a bar or serving counter, such as is found in a tavern, restaurant or drugstore, and the area behind them where employes work need not be included.

E700.07 (NEC 700–7.) **Storage battery.** (Addition)

An automatic battery charging means shall be provided.

E 700.14 (NEC 700–14.) **Emergency illumination.** (Change)

Emergency illumination shall include all required exit lights and emergency lighting required by the Illumination code—chapter Ind 19, Part G. When standby emergency power is required by section E 700.06, the required exit lights and emergency lighting shall be supplied from the standby source.

(a) *Exception:* Required exit lights in occupancies not requiring standby emergency power under E 700.06 may be supplied from a separate switch or circuit breaker in a branch circuit or feeder panelboard, or the load side of the service disconnect, under the following conditions:

1. The exit lights are supplied from separate circuits not supplying other lights or equipment.

2. The exit-light wiring shall comply with sections E 700.17 and NEC 700–17 from the point where it leaves the separate switch or breaker, branch circuit or feeder panelboard.

E 700.17 (NEC 700–17.) **Independent wiring.** (Addition)
Emergency circuit wiring shall be in approved raceways.

E 700.22 (NEC 700–22.) **Unit equipments.** (Change)
(d) A relaying device arranged to energize the lamps automatically upon failure of the normal supply to the area served by the unit equipment.

E 700.23 (NEC 700–23.) **Fire alarm wiring.** (Addition)
(a) The energy for operation of fire alarm systems shall be taken from sources suited to the design of the system. Batteries shall not be used.

(b) A 3-wire 120–240 volt or 120–208 volt (3-phase, 4-wire) service shall be provided for required electrical fire alarm systems. The system shall be supervised with the operating current secured from one ungrounded conductor and the neutral or grounded conductor and the current for operating trouble signal or signals secured from the other ungrounded conductor and the neutral or grounded conductor. Alarm indicating device circuits shall be designed for operation on 120 volt AC power. The signal voltage measured across all open alarm initiating device contacts shall be no less than 20 volts.

(c) Electrical wiring in connection with fire alarm systems shall be installed in rigid metal conduit, flexible metal conduit, electrical metallic tubing or surface metal raceway. Fire alarm systems are considered emergency wiring and shall comply with sections E 700.17 and NEC 700–17. Metal-clad cable may be used where it can be fished in hollow spaces of walls or partitions in apartments or rooming houses not over 3 stories in height. Where the wiring is subject to excessive moisture or severe mechanical injury, rigid metal conduit shall be used. The smallest size conductor to be used in any fire alarm system in a building over 3 stories in height shall be No. 14 AWG or No. 16 AWG for buildings not over 3 stories in height. The wires shall be provided with insulation suitable for use on circuits not exceeding 600 volts. Fire alarm systems shall be connected to the line side of the main service switch or to the emergency feeder through 2 single pole breakers or switches used for no other purpose and arranged so they can be locked in the "on" position, and under the supervision of a qualified person. The breaker and switches shall be identified by a red color. Two pole breakers shall not be used.

NOTE: See Wis. Adm. Code chapters Ind 50–59—Building and Heating, Ventilating and Air Conditioning—section Ind 51.24 for general requirements covering fire alarm systems.

ARTICLE 730—OUTSIDE BRANCH CIRCUITS AND FEEDERS

E 730.04 (NEC 730–4.) **Conductor covering.** (Addition)
Approved factory assembled cables, consisting of one or more insulated conductors lashed or twisted with an uninsulated and effectively grounded messenger or neutral, may be used for outdoor overhead branch circuits and feeders. The uninsulated conductor, when used as a neutral, shall not be used as an equipment grounding conductor.

E 730.18 (NEC 730–18.) **Clearance from ground.** (Addition)
27 feet—over track rails of railroads.

E 730.18 (NEC 730–18.) **Clearance from ground.** (Change)
NOTE: For clearance of conductors of over 600 volts, see Wis. Adm. Code volume 1, Electrical, section E 123.03.

E 730.19 (NEC 730–19.) **Clearances from buildings for conductors not in excess of 600 volts.** (Addition)
(c) Conductors run above the top level of a window are considered out of reach of that window.

E 730.19 (NEC 730–19.) **Clearances from buildings for conductors not in excess of 600 volts.** (Change)
NOTE: For clearance of conductors of over 600 volts, see Wis. Adm. Code volume 1, Electrical, section E 123.03.

ARTICLE 800—COMMUNICATION CIRCUITS

E 800.02 (NEC 800–2.) **Protective devices.** (Addition)
Underground circuits buried without separation from power conductors shall be provided with protectors.

E 800.21 (NEC 800–21.) **Underground circuits.** (Change)
(a) *With electric light or power conductors.* See Wis. Adm. Code volume 1, Electrical, chapter E 129.
History: Cr. Register, April, 1972, No. 196, eff. 5–1–72.

INDEX

Volume 2

References are to rule numbers unless otherwise noted. This index applies only to Wis. Adm. Code, Electrical, Volume No. 2. See National Electrical Code-1971 for index of NEC-1971.

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