Chapter E 730

OUTSIDE BRANCH CIRCUITS AND FEEDERS

E 730.01 Scope. This chapter applies to electrical equipment or wiring located on private or public premises, attached to the outside of or run between buildings or structures, but shall not apply to equipment or wiring of an electric or communication utility used in the exercise of its function as a utility.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.02 Application of other chapters. Application of other chapters, including additional requirements to specific cases of equipment and conductors, are as follows:

CHAPTERS

E 200—Polarity Identification.
E 210—Branch Circuits.
E 215—Feeders.
E 230—Services.
E 250—Grounding.
E 500—Hazardous Locations, General.
E 510—Hazardous Locations, Specific.
E 600—Signs and Outline Lighting.
E 710—Circuits and Equipment Operating at More Than 600 Volts.
E 725—Remote Control and Signal Circuits.
E 800—Communication Circuits.
E 810—Radio and Television Circuits.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.03 Calculation of load. (1) BRANCH CIRCUITS. The load on every outdoor branch circuit is to be determined by the applicable provisions of chapter E 220.

(2) FEEDERS. The load to be expected on every outdoor feeder is to be determined by the procedure specified in chapter E 220.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.04 Conductor insulation. Where within 10 feet of any building or structure, open conductors supported on insulators shall be of the rubber-covered type, thermoplastic type, or weatherproof-covered type. Conductors in cables or raceways, except type MI cable, shall be of the rubber-covered type or thermoplastic type and in wet locations shall comply with section E 310.05. Conductors for festoon lighting shall be of the rubber-covered or thermoplastic type.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.05 Size of conductors. The current-carrying capacity of outdoor branch circuits and feeder conductors shall be according to the rating in tables E 310.12 through E 310.15 in order to carry the loads determined under section E 730.03.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.06 Minimum size of conductor. (1) OVERHEAD SPANS. Overhead conductors shall not be smaller than No. 10 for spans up to 50 feet in length, and not smaller than No. 8 for longer spans.

(2) FESTOON LIGHTING. Overhead conductors for festoon lighting shall not be smaller than No. 12 unless supported by messenger wires. (See section E 730.25).

(3) OVER 600 VOLTS. Overhead conductors operating at more than 600 volts shall not be smaller than No. 6 when open individual conductors nor smaller than No. 8 when in cable.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.07 Lighting equipment on a pole. (1) For the supply of lighting equipment installed on a single pole or structure, the branch circuits shall comply with the requirements of chapter E 210.

(2) For multiwire branch circuits, a common neutral may be employed for the branch circuits, provided not more than 8 ungrounded conductors are used. Such a common neutral shall have a carrying capacity of not less than the maximum load of all the ungrounded conductors connected to any phase or polarity.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.08 Disconnection. (1) For branch circuits as required in chapter E 210.

(2) For feeders as required in chapter E 215. (At each building supplied by a feeder see subsection E 230.070 (4)).

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.09 Overcurrent protection. (1) For branch circuits as required in chapter E 210.

(2) For feeders as required in chapter E 215.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.10 Wiring on buildings. Outside wiring on surfaces of buildings may be installed, for circuits of 600 volts or less, as open conductors on insulating supports, as multiple-conductor cable approved

for the purpose, as aluminum sheathed cable, in rigid metal conduit, in busways as provided in chapter E 364, or in electrical metallic tubing. Circuits of more than 600 volts shall be installed as provided for services in section E 230.101. Circuits for sign and outline lighting shall be installed as provided in chapter E 600.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.11 Circuit exits and entrances. Where outside branch and feeder circuits exit from or enter into buildings the installation shall comply with those requirements of chapter E 230 which apply to service entrance conductors.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.12 Open conductor supports. Open conductors shall be supported on glass or porcelain knobs, racks, brackets, or strain insulators, approved for the purpose.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.13 Festoon supports. In spans exceeding 40 feet the conductors shall be supported by a messenger wire supported by approved strain insulators. Conductors or messenger wires shall not be attached to any fire escape, downspout, or plumbing equipment.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.14 Open conductor spacings. Conductors shall conform to the following spacings:

(1) OPEN CONDUCTORS EXPOSED TO THE WEATHER. As provided in section E 230.047.

(2) OPEN CONDUCTORS NOT EXPOSED TO WEATHER. As provided in section E 230.048.

(3) OVER 600 VOLTS. As provided in subsection E 230.101 (3).

(4) SEPARATION FROM OTHER CIRCUITS. Open conductors shall be separated from open conductors of other circuits or systems by not less than 4 inches.

(5) CONDUCTORS ON POLES. Conductors on poles shall have a separation of not less than 1 foot except when placed on racks or brackets. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(a) Power conductors, below communication conductors—30 inches
(b) Power conductors alone or above communication conductors:
Less than 300 volts—24 inches
Exceeding 300 volts—30 inches
(c) Communication conductors below power conductors—same as power conductors
(d) Communication conductors alone or above power conductors—no requirement

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.15 Supports over buildings. See section E 230.025.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.16 Point of attachment to buildings. See section E 230.026.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.17 Means of attachment to buildings. See section E 230.027.

History: Cr. Register, April, 1964, No. 100, eff. 5-1-64.

E 730.18 Clearance from ground. (1) Open conductors of not over 600 volts shall conform to the following:

MINIMUM VERTICAL CLEARANCES OF WIRES (IN FEET) FROM GROUND OR RAILS (z)

Location of Wires and Cables	Guys, Communication Cables, Messengers and Wires Grounded Supply Cables, Messengers, and Lightning Protection Wires (a) (b) (o)	Open Supply Line Wires and Service Drops (o) 0-600 V.
Over track rails of railroads (e)	27 (f) (q)	27 (f) (q)
Over streets, alleys or roads (g)	18 (r)	18
Along streets or alleys in urban districts (g)	18 (h) (r)	18 (h)
Along roads in rural districts (g)	14 (h) (t)	15 (h)
Over areas used for agricultural purposes	15	15
Over fenced or otherwise guarded rights of way in which only authorized persons are permitted (i)	15 (j)	15 (x)
Over normal high water of lakes, streams or ponds. See (y)	18	18
Over parking lots and drive-ins	12	15
Over driveways to:		
Residence garages	12	15 (s)
Commercial and industrial areas	18 (r)	18
Farm areas	15	15
Over footwalks and spaces accessible to pedestrians only	15 (w)	15 (x)
Over spaces or ways not covered above:		
In rural districts (p)	10 (j)	15 (x)
In urban districts (p)	10 (j)	18 (x)

(a) Including supply line guys where effectively grounded or insulated against voltage to which they are exposed.

Note: No clearance from ground is required for anchor guys not crossing streets, driveways, roads or pathways nor for anchor guys provided with traffic guards and paralleling sidewalk curbs.

(b) This relates to a supply cable of any voltage having an effectively grounded continuous metal sheath supported by a continuous grounded messenger and to insulated conductors lashed to or twisted with an effectively grounded messenger or neutral. This does not include a so-called cable where a messenger supports separate conductors with an insulating yoke.

(e) In the case of electrified railroads served by overhead trolley conductors, these clearances do not apply if other orders require greater clearances.

(f) This clearance may be reduced to 25 feet where paralleled by trolley contact conductor on the same street or highway.

(g) These requirements apply only to wires within the limits of public highways or other public rights of way for traffic.

(h) Where a pole line along a road is located relative to fences, ditches, embankments, etc., so that the grounds under the line will never be traveled except by pedestrians, this clearance may be reduced to the following values:

1. Communication conductors limited to 160 volts to ground and communication cables 8 feet
2. Conductors of other communication circuits 10 feet
3. Supply conductors 12 feet
4. Guys 8 feet

(i) These clearance requirements do not apply in transformer or substation areas which are so fenced or guarded that they are never accessible to other than authorized persons. (See section E 112.05)

(j) This clearance may be reduced to 8 feet for guys, cables, messengers and communication wires limited to 160 volts where the ground underneath the wires or cables is accessible to pedestrians only.

(o) A diagonal clearnce the same as the vertical clearance, shall be maintained to uneven or sloping terrain within a horizontal distance of ¾ of the vertical clearance. All distances to be measured from the conductors in their deflected position.

(p) See subsection E 128.07 (5) for street lamps and drops.

(q) This value may be reduced to 25 feet for guys, for cables having effectively grounded continuous metal sheaths, for insulated conductors lashed to or twisted with an effectively grounded messenger or neutral, and for conductors effectively grounded throughout their length and associated with supply circuit of 0 to 22,000 volts only if such conductors are stranded, are of corrosion-resistant material, and conform to the strength and tension requirements for messengers given in subsection E 126.02 (7).

(r) Where communication wires or cables cross over or run along alleys, this clearance may be reduced to 15 feet.

(s) Service drop operating at less than 600 volts may have the clearance reduced to 12 feet.
(t) This clearance may be reduced to 13 feet for communication conductors where no part of the line overhangs any part of the highway which is ordinarily traveled, and where it is unlikely that loaded vehicles will be crossing under the line into a field.
(w) This clearance may be reduced to the following values:

1. For communication conductors of circuits limited to 160 volts to ground, and communication cables ..... 8 feet
2. For conductors of other communication circuits ..... 10 feet
3. For guys ..... 8 feet
4. For supply cable having effectively grounded continuous metal sheath or for insulated conductors lashed to or twisted with an effectively grounded messenger or neutral, all voltages ..... 10 feet

(x) This clearance may be reduced to the following values:

1. Supply wires (except trolley contract wires) limited to 300 volts to ground ..... 12 feet
2. Supply wires (except trolley contact wires) limited to 150 volts to ground and located at entrances to buildings ..... 10 feet
3. Where supply circuits of 550 volts or less, with transmitted power of 3,200 watts or less, are run along fenced (or otherwise guarded) private rights of way in accordance with the provisions specified in subsection E 122.01 (2) (c) ..... 10 feet

(y) Lines shall not obstruct, or endanger navigation or activities associated therewith. Application of section 30.15 Wis. Stats. may require greater clearances than shown and clearances specified by the Army Engineers over water considered navigable by the United States may be greater. The largest requirement shall be complied with.
(z) For limitations of temperature and span length, or for clearances for other types of lines see E 123.03 Volume 1.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.19 Clearances from buildings for conductors not in excess of 600 volts. (1) OVER ROOFS. Open conductors shall not be less than 8 feet from the highest point of roofs. Conductors attached to roof structures shall be substantially supported. Wherever practicable, conductors crossing over buildings shall be supported on structures which are independent of the building. Where a branch circuit or feeder conduit extends through a roof, the branch circuit or feeder conductors, if operating at less than 300 volts between conductors, may have a clearance of not less than 18 inches vertically above the roof providing such conductors do not extend more than 45 inches across the roof.

Note: For service drop conductors, see subsection E 230.024 (1).

(2) HORIZONTAL CLEARANCES. Open conductors not attached to a building shall have a minimum horizontal clearance of 36 inches.

(3) FINAL SPANS. Final spans of feeders or branch circuits to buildings which they supply or from which they are fed may be attached to the building but they shall be kept 3 feet from windows, doors, porches, fire escapes or similar locations. The clearance from windows refers only to those portions of windows which are normally capable of being opened. Conductors run above a window are considered inaccessible from that window. No clearance is required from windows consisting of glass block or fixed panes which cannot be opened.

(4) ZONE FOR FIRE LADDERS. Where buildings exceed 3 stories, or 50 feet in height, overhead lines shall be arranged where practicable so that a clear space (or zone) at least 6 feet wide will be left either adjacent to the buildings or beginning not over 8 feet from them, to facilitate the raising of ladders when necessary for fire fighting.

Note: For clearance of conductors over 600 volts, consult Volume 1 of the Wisconsin State Electrical Code.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.20 Mechanical protection of conductors. Mechanical protection of conductors on buildings, structures or poles shall be as provided for services, section E 230.046.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.21 Conductors entering buildings. Conductors entering buildings shall be as provided for services, sections E 230.044, E 230.049 and E 230.051.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.22 Multiple conductor cables on exterior surfaces of buildings. Multiple conductor cables on exterior surfaces of buildings shall be as provided for service cable, section E 230.050.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.23 Raceways on exterior surfaces of buildings. Raceways on exterior surfaces of buildings shall be made raintight and suitably drained.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.24 Underground circuits. Underground circuits shall be as provided for services, sections E 230.030 to E 230.034.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.25 Outdoor lighting equipment; lampholders. Lampholders shall be of molded composition, or other approved material of the weatherproof type, and where they are attached as pendants shall have the connections to the circuit wires staggered. Where lampholders have terminals of a type which puncture the insulation and make contact with the conductors, they shall be attached only to conductors of the stranded type.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.

E 730.26 Outdoor lighting equipment; location of lamps. Location of lamps for outdoor lighting shall be below all live conductors, transformers, or other electrical equipment, unless clearances or other safeguards are provided for relamping operations, or unless the installation is controlled by a disconnecting means which can be locked in the open position.

History: Cr. Register, April, 1964, No. 100, eff. 5–1–64.