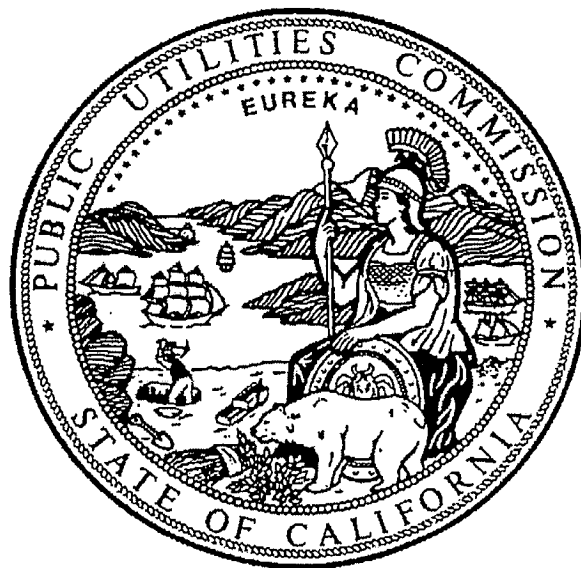


STATE OF CALIFORNIA

RULES

FOR

Overhead Electric Line Construction



Prescribed by the
PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

GENERAL ORDER No. 95

June 2009

4. Mature trees whose trunks and major limbs are located more than six inches, but less than 18 inches, from primary distribution conductors are exempt from the 18-inch minimum clearance requirement under this rule. The trunks and limbs to which this exemption applies shall only be those of sufficient strength and rigidity to prevent the trunk or limb from encroaching upon the six-inch minimum clearance under reasonably foreseeable local wind and weather conditions. The utility shall bear the risk of determining whether this exemption applies, and the Commission shall have final authority to determine whether the exemption applies in any specific instance, and to order that corrective action be taken in accordance with this rule, if it determines that the exemption does not apply.

Note: Added October 22, 1997 by Decision No. 97-10-056.

36 Pole Clearances from Railroad Tracks

Poles or other supporting structures which are set in proximity to railroad tracks shall be so located that the clearance requirements of General Order 26-D are met. The clearance requirements of General Order 26-D, applicable to pole line construction, are contained in Appendix E.

Note: Revised February 1, 1948 by Supplement No. 1 (Decision No. 41134, Case No. 4324).

37 Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc.

Clearances between overhead conductors, guys, messengers or trolley span wires and tops of rails, surfaces of thoroughfares or other generally accessible areas across, along or above which any of the former pass; also the clearances between conductors, guys, messengers or trolley span wires and buildings, poles, structures, or other objects, shall not be less than those set forth in Table 1, at a temperature of 60° F. and no wind.

The clearances specified in Table 1, Case 1, Columns A, B, D, E and F, shall in no case be reduced more than 5% below the tabular values because of temperature and loading as specified in Rule 43. The clearances specified in Table 1, Cases 2 to 6 inclusive, shall in no case be reduced more than 10% below the tabular values because of temperature and loading as specified in Rule 43.

The clearance specified in Table 1, Case 1, Column C (22.5 feet), shall in no case be reduced below the tabular value because of temperature and loading as specified in Rule 43.

The clearances specified in Table 1, Cases 11, 12 and 13, shall in no case be reduced below the tabular values because of temperatures and loading as specified in Rule 43.

Where supply conductors are supported by suspension insulators at crossings over railroads which transport freight cars, the initial clearances shall be sufficient to prevent reduction to clearances less than 95% of the clearances specified in Table 1, Case 1, through the breaking of a conductor in either of the adjoining spans.

Rule 37

Where conductors, dead ends, and metal pins are concerned in any clearance specified in these rules, all clearances of less than 5 inches shall be applicable from surface of conductors (not including tie wires), dead ends, and metal pins, except clearances between surface of crossarm and conductors supported on pins and insulators (referred to in Table 1, Case 9) in which case the minimum clearance specified shall apply between center line of conductor and surface of crossarm or other line structure on which the conductor is supported.

All clearances of 5 inches or more shall be applicable from the center lines of conductors concerned.

Note: Modified January 8, 1980 by Decision No. 91186, March 9, 1988 by Resolution E-3076; and November 6, 1992 by Resolution SU-15, September 20, 1996 by Decision 96-09-097 and January 23, 1997 by Decision 97-01-044.

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Table 1: Basic Minimum Allowable Vertical Clearance of Wires above Railroads, Thoroughfares, Ground or Water Surfaces; Also Clearances from Poles, Buildings, Structures or Other Objects (nn) (Letter References Denote Modifications of Minimum Clearances as Referred to in Notes Following This Table)

| Case No. | Nature of Clearance | Wire or Conductor Concerned | | | | | | |
|----------|---|---|---|---|--|---|--|--|
| | | A | B | C | D | E | F | G |
| | | Span Wires (Other than Trolley Span Wires) Overhead Guys and Messengers | Communication Conductors (including Open Wire, Cables and Service Drops), Supply Service Drops of 0 - 750 Volts | Trolley Contact, Feeder and Span Wires, 0 - 5,000 Volts | Supply Conductors of 0 - 750 Volts and Supply Cables Treated as in Rule 57.8 | Supply Conductors and Supply Cables, 750 - 22,500 Volts | Supply Conductors and Supply Cables, 22.5 - 300 KV | Supply Conductors and Supply Cables, 300 - 550 KV (mm) |
| 1 | Crossing above tracks of railroads which transport or propose to transport freight cars (maximum height 15 feet, 6 inches) where not operated by overhead contact wires. (a) (b) (c) (d) | 25 Feet | 25 Feet | 22.5 Feet | 25 Feet | 28 Feet | 34 Feet | 34 Feet (kk) |
| 2 | Crossing or paralleling above tracks of railroads operated by overhead trolleys. (b) (c) (d) | 26 Feet (e) | 26 Feet (e) (f) (g) | 19 Feet (h) (i) (j) (k) (l) (m) (n) (p) | 27 Feet (e) (g) | 30 Feet (g) | 34 Feet (g) | 34 Feet (g) (kk) |
| 3 | Crossing or along thoroughfares in urban districts or crossing thoroughfares in rural districts. (c) (d) | 18 Feet (l) (k) (i) (j) (m) (n) (p) | 18 Feet (l) (m) (n) (p) | 19 Feet (hh) (iii) (eee) | 20 Feet (ii) | 25 Feet (o) (ii) | 30 Feet (o) (ii) (kk) | 30 Feet (o) (ii) (kk) |
| 4 | Above ground along thoroughfares in rural districts or across other areas capable of being traversed by vehicles or agricultural equipment. | 15 Feet (k) | 15 Feet (m) (n) (p) | 19 Feet (eee) | 19 Feet | 25 Feet (o) | 30 Feet (o) (p) | 30 Feet (o) (kk) |
| 5 | Above ground in areas accessible to pedestrians only | 8 Feet | 10 Feet (m) (q) | 19 Feet (eee) | 12 Feet | 17 Feet | 25 Feet (o) | 25 Feet (o) (kk) |
| 6 | Vertical clearance above walkable surfaces on buildings, (except generating plants or substations) bridges or other structures which do not ordinarily support conductors, whether attached or unattached. | 8 Feet (r) | 8 Feet (r) | 8 Feet | 8 Feet | 12 Feet | 12 Feet | 20 Feet (ll) |
| 6a | Vertical clearance above non-walkable surfaces on buildings, (except generating plants or substations) bridges or other structures, which do not ordinarily support conductors, whether attached or unattached | 2 Feet | 8 Feet (yy) | 8 Feet | 8 Feet (zz) | 8 Feet | 8 Feet | 20 Feet |
| 7 | Horizontal clearance of conductor at rest from buildings (except generating plants and substations), bridges or other structures (upon which men may work) where such conductor is not attached thereto (s) (t) | - | 3 Feet (u) | 3 Feet | 3 Feet (uu) (v) | 6 Feet (v) | 6 Feet (v) | 15 Feet (v) |
| 8 | Distance of conductor from center line of pole, whether attached or unattached (w) (x) (y) | - | 15 inches (s) (aa) | 15 inches (aa) (bb) (cc) | 15 inches (o) (aa) (dd) | 15 or 18 inches (o) (dd) (ee) (jj) | 18 inches (dd) (ee) | Not Applicable |
| 9 | Distance of conductor from surface of pole crossarm or other overhead line structure upon which it is supported, providing it complies with case 8 above (x) | - | 3 inches (aa) (ff) | 3 inches (aa) (cc) (gg) | 3 inches (aa) (dd) (gg) | 3 inches (dd) (gg) (jj) | 1/4 Pin Spacing Shown in Table 2 Case 15 (dd) | 1/2 Pin Spacing Shown in Table 2 Case 15 (dd) |

Table 1 (Continued)

| Case No. | Nature of Clearance | Wire or Conductor Concerned | | | | | | | Rule |
|----------|--|--|--|--|---|--|---|---|------|
| | | A Span Wires (Other than Trolley Span Wires) Overhead Guys and Messengers | B Communication Conductors (Including Open Wire, Cables and Service Drops), Supply Service Drops of 0-750 Volts | C Trolley Contact, Feeder and Span Wires, 0-5,000 Volts | D Supply Conductors of 0-750 Volts and Supply Cables Treated as in Rule 57.8 | E Supply Conductors and Supply Cables, 750-22,500 Volts | F Supply Conductors and Supply Cables, 22.5-300 kV | G Supply Conductors and Supply Cables, 300-550 kV (mm) | |
| 10 | Radial centerline clearance of conductor or cable (unattached) from non-climbable street lighting or traffic signal poles or standards, including mastarms, brackets and lighting fixtures | - | 1 Foot (u) (tr) (ss) | 15 inches (bb) (cc) | 3 Feet (oo) | 6 Feet (pp) | 10 Feet (qq) | 10 Feet (ll) | |
| 11 | Water areas not suitable for sailboating (tt) (uu) (ww) (xx) | 15 Feet | 15 Feet | - | 15 Feet | 17 Feet | 25 Feet | 25 Feet (kk) | |
| 12 | Water areas suitable for sailboating, surface area of: (t) (vv) (ww) (xx) | | | | | | | | |
| | (A) Less than 20 acres | 18 Feet | 18 Feet | - | 18 Feet | 20 Feet | 27 Feet | 27 Feet (kk) | |
| | (B) 20 to 200 acres | 26 Feet | 26 Feet | - | 26 Feet | 28 Feet | 35 Feet | 35 Feet (kk) | |
| | (C) Over 200 to 2,000 acres | 32 Feet | 32 Feet | - | 32 Feet | 34 Feet | 41 Feet | 41 Feet (kk) | |
| | (D) Over 2,000 acres | 38 Feet | 38 Feet | - | 38 Feet | 40 Feet | 47 Feet | 47 Feet (kk) | |
| 13 | Radial clearance of bare line conductors from tree branches or foliage (aaa) (ddd) | - | - | 18 inches (bbb) | - | 18 inches (bbb) | 1/4 pin spacing shown in table 2, Case 15 (bbb) (ccc) | 1/2 pin spacing shown in table 2, Case 15 | |

References to Rules Modifying Minimum Clearances in Table 1

| | | | | |
|-----|---|---------|-----|--|
| (a) | Shall not be reduced more than 5% because of temperature or loading | 37 | (f) | May be reduced depending on height of trolley contact conductors |
| 1 | Supply lines | 54.4-B1 | 1 | Supply service drops |
| 2 | Communication lines | 84.4-B1 | 2 | Communication service drops |
| (b) | Shall be increased for supply conductors on suspension insulators, under certain conditions | 37 | (g) | May be reduced and shall be increased depending on trolley throw |
| (c) | Special clearances are provided for traffic signal equipment | 58.4-C | 1 | Supply conductors (except service drops) |
| (d) | Special clearances are provided for street lighting equipment | 58.5-B | 2 | Communication conductors (except service drops) |
| (e) | Based on trolley pole throw of 26 feet, may be reduced where suitably protected | 56.4-B2 | (h) | Shall be increased where freight cars are transported |
| 1 | Supply guys | 56.4-B2 | 1 | Trolley contact and feeder conductors |
| 2 | Supply cables and messengers | 56.4-B2 | 2 | Trolley span wires |
| 3 | Communication guys | 57.4-B2 | (i) | May be reduced for trolley contact and span wires in subways, tunnels, under bridges and in fenced areas |
| 4 | Communication cables and messengers | 86.4-B2 | 1 | Trolley contact conductors |
| | | 87.4-B2 | 2 | Trolley span wires |
| | | | | 74.4-B1 |
| | | | | 77.4-A |
| | | | | 84.4-B2 |
| | | | | 84.4-B2 |
| | | | | 84.8-C5 |
| | | | | 84.8-D5 |

References to Rules Modifying Minimum Clearances in Table 1

| | Rule |
|--|----------|
| (j) May be reduced at crossings over private thoroughfares and entrances to private property and over private property | |
| 1 Supply service drops | 54.8-B2 |
| 2 Supply guys | 56.4-A |
| 3 Communication service drops | 84.8-C2 |
| 4 Communication guys | 86.4-A |
| (k) May be reduced along thoroughfares where not normally accessible to vehicles | |
| 1 Supply guys | 56.4-A1 |
| 2 Communication guys | 86.4-A1 |
| (l) May be reduced where within 12 feet of curb line of public thoroughfares | |
| 1 Supply service drops | 54.8-B1 |
| 2 Communication service drops | 84.8-C1 |
| (m) May be reduced for railway signal cables under special conditions | 84.4-A4 |
| (n) May be reduced in rural districts | |
| 1 Intentionally left blank | |
| 2 Intentionally left blank | |
| 3 Communication conductors along roads | 84.4-A2 |
| (o) May be reduced for transformer, regulator or capacitor leads | |
| 1 Transformer leads | 58.1-B |
| 2 Regulator or capacitor leads | 58.1-B |
| (p) May be reduced across arid or mountainous areas | |
| 1 Supply conductors of more than 22,500 volts | 54.4-A1 |
| 2 Communications conductors | 84.4-A1 |
| (q) Shall be increased or may be reduced under special conditions | |
| 1 Intentionally left blank | |
| 2 Intentionally left blank | |
| 3 Communications conductors | 84.4-A3 |
| 4 Increased for communication service drops on industrial or commercial premises | 84.8-C3a |
| 5 Communication service drops on residential premises | 84.8-C3b |
| (r) May be reduced above roofs of buildings under special conditions | |
| 1 Supply overhead guys | 56.4-G |
| 2 Supply service drops | 54.8-B4 |
| 3 Communication overhead guys | 86.4-F |
| 4 Communication conductors and cables | 84.4-E |

| | Rule |
|---|----------|
| 5 Communication service drops | 84.8-C4 |
| (s) Also applies at fire escapes, etc. | |
| 1 Supply conductors | 54.4-H1 |
| 2 Vertical clearances | 54.8B4a |
| 3 Horizontal clearance | 54.8-B4b |
| 4 Communication conductors | 84.4-E |
| (t) Special clearances where attached to buildings, bridges or other structures | |
| 1 Supply conductors of 750 – 22,500 volts | 54.4-H2 |
| 2 Trolley contact conductors | 74.4-E |
| 3 Communication conductors | 84.4-F |
| (u) Reduced clearances permitted under special conditions | |
| 1 Supply service drops on industrial or commercial premises | 54.8-B4a |
| 2 Supply cables, grounded | 57.4-G |
| 3 Communication cables beside buildings, etc. | 84.4-E |
| 4 Communication conductors under bridges, etc. | 84.4-F |
| 5 Communication service drops | 84.8-C4 |
| 6 Communication cables passing nonclimbable street light poles, etc. | 84.4-D4a |
| (v) May be reduced under special conditions | |
| 1 Supply conductors of 750 – 7,500 volts | 54.4-H1 |
| 2 Supply transformer lead and bus wires, where guarded | 58.1 |
| (w) May be reduced at angles in lines and transposition points | |
| 1 Supply conductors | 54.4-D1 |
| 2 Communication conductors | 84.4-D5 |
| (x) May be reduced for suitably protected lateral or vertical runs | |
| 1 Supply bond wires | 53.4 |
| 2 Supply ground wires | 54.6-B |
| 3 Supply lateral conductors | 54.6-C |
| 4 Supply vertical runs | 54.6-D |
| 5 Supply risers | 54.6-E |
| 6 Communication ground wires | 84.6-B |
| 7 Communication lateral conductors | 84.6-C |
| 8 Communication vertical runs | 84.6-D |
| 9 Communication risers | 84.6-E |

References to Rules Modifying Minimum Clearances in Table 1

| | Rule |
|--|----------|
| (y) Increased clearances required for certain conductors | |
| 1 Unattached conductors on collinear and crossing lines | 32.3 |
| 2 Unattached supply conductors | 54.4-D3 |
| 3 Supply service drops on clearance crossarms | 54.8-C2 |
| 4 Supply service drops on pole top extensions | 54.8-C3 |
| 5 Unattached supply service drops | 54.8-D |
| 6 Communication lines, collinear, conflicting or crossing | 84.4-D3 |
| 7 Communication conductors passing supply poles and unattached thereto | 84.4-D4 |
| 8 Communication service drops on clearance crossarms | 84.8-D2 |
| 9 Communication service drops on pole top extensions | 84.8-D3 |
| 10 Unattached communication service drops | 84.8-E |
| (z) Special provisions for police and fire alarm conductors require increased clearances | 92.2 |
| (aa) May be reduced under special provisions | |
| 1 Supply conductors of 0 - 750 volts in rack configuration | 54.4-D5 |
| 2 Service supply drops from racks | 54.8-F |
| 3 Supply cables and messengers attached to poles | 57.4-F |
| 4 Communication conductors on communication poles | 84.4-D |
| 5 Communication conductors on crossarms | 84.4-D1 |
| 6 Communication conductors attached to poles | 84.4-D2 |
| 7 Communication service drops attached to poles | 84.8-B |
| 8 Communication cables and messengers | 87.4-D |
| 9 Supply or communication cables and messengers on jointly used poles | 92.1-B |
| 10 Communication open wire on jointly used poles | 92.1-C |
| 11 Multiconductor cable with bare neutral | 54.10-B1 |
| 12 Communication conductors across or along public thoroughfares | 84.4-A6 |
| (bb) May be reduced for class t conductors of not more than 750 volts and of the same potential and polarity | 74.4-D |
| (cc) Not applicable to trolley span wires | 77.4-E |
| (dd) Special clearances for pole-top and deadend construction | |
| 1 Conductors deadended in vertical configuration on poles | 54.4-C4 |
| 2 Conductors deadended in horizontal configuration | 54.4-D8 |
| (ee) Clearance requirements for certain voltage classifications | 54.4-D2 |

| | Rule |
|--|----------|
| (ff) Not applicable to communication conductors | 84.4-D |
| (gg) Clearance from crossarms may be reduced for certain conductors | |
| 1 Suitable insulated leads to protect runs | 54.4-E |
| 2 Leads of 0 - 5,000 volts to equipment | 54.4-E |
| 3 Leads of 0 - 5,000 volts to cutouts or switches | 58.3-A2 |
| (hh) Reduced clearance permitted from temporary fixtures and lighting circuits 0 - 300 volts | 78.3-A1 |
| (ii) Special Clearances Required Above Public and Private Swimming Pools | |
| 1 Supply line conductors | 54.4-A3 |
| 2 Supply service drops | 54.8-B5 |
| 3 Communication line conductors | 84.4-A5 |
| 4 Communication service drops | 84.8-C5 |
| 5 Supply guys, span wires | 56.4-A3 |
| 6 Communication guys | 86.4-A3 |
| (jj) May be decreased in partial underground distribution | 54.4-D2 |
| (kk) Shall be increased by 0.025 feet per kV in excess of 300 kV | |
| (ll) Shall be increased by 0.04 feet per KV in excess of 300 kV | |
| (mm) Proposed clearances to be submitted to the opuc prior to construction for circuits in excess of 550 kV. | |
| (nn) Voltage shown in the table shall mean line-to-ground voltage for direct current (DC) systems | |
| (oo) May Be reduced for grounded or multi-conductor cables | |
| 1 Grounded cables | 57.4-H |
| 2 Multi-Conductor cables | 54.10-B6 |
| (pp) May be reduced to 4 feet for voltages below 7,500 volts | 54.4-D3 |
| (qq) May be reduced to 6 feet for voltages below 75 kV | |
| (rr) May be reduced for supply service drops | 54.8-D1 |
| (ss) May be reduced for communications service drops | 84.8-E1 |
| (tt) Where a federal agency or surrogate thereof has issued a crossing permit, clearances of that permit shall govern. | |
| (uu) Or Where sailboating is prohibited and where other boating activities are allowed | |
| (vv) Clearance above contiguous ground shall be 5 feet greater than in cases 11 or 12 for the type of water area served for boat launch facilities and for area contiguous thereto, that are posted, designated or specifically prepared for rigging of sailboats or other watercraft. | |

References to Rules Modifying Minimum Clearances in Table 1

Rule

- (ww) For controlled impoundments, the surface areas and corresponding clearances shall be based upon the high water level. For other waters, the surface area shall be that enclosed by its annual flood level. The clearance over rivers, streams and canals shall be based upon the largest surface areas of any one-mile long segment which includes the crossing. The clearance over a canal, river or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.
- (xx) Water areas are lakes, ponds, reservoirs, tidal waters, rivers, streams and canals without surface obstructions
- (yy) May be reduced over non-walkable structures 54.8
(Table 10)
- (zz) May be reduced to 2 feet for conductors insulated in accordance with 20.8-G
- (aaa) Special requirements for communication and supply circuits energized at 0 - 750 volts 35
- (bbb) May be reduced for conductor of less than 60,000 volts when protected from abrasion and grounding by contact with tree 35
- (ccc) For 22.5 kV to 105 kV, minimum clearance shall be 18 inches.

Rule

(ddd) Clearances in this case shall be maintained for normal annual weather variations, rather than at 60 degrees, no wind.

(eee) May be reduced to 18 feet if the voltage does not exceed 1000 volts and the clearance is not reduced to more than 5% below the reduced value of 18 feet because of temperature and loading as specified in Rules 37 and 43.

Note: Revised February 1, 1948 by Supplement No. 1 (Decision No. 41134, Case No. 4324); January 2, 1962 by Resolution E-1109; February 7, 1964 by Decision No. 66707; March 29, 1966 by Decision No. 70489; August 9, 1966 by Decision No. 71094; September 18, 1967 by Decision No. 72984; March 30, 1968 by Decision No. 73813; January 8, 1980 by Decision No. 91186; March 9, 1988 by Resolution E-3076; November 21, 1990 by Resolution SU-6; January 21, 1992 by Resolution SU-10; and November 6, 1992 by Resolution SU-15. September 20, 1996 by Decision 96-09-097. October 9, 1996 by Resolution SU-40 and January 23, 1997 by Decision 97-01-044.

38 Minimum Clearances of Wires from Other Wires

The minimum vertical, horizontal or radial clearances of wires from other wires shall not be less than the values given in Table 2 and are based on a temperature of 60° F. and no wind. Conductors may be deadended at the crossarm or have reduced clearances at points of transposition, and shall not be held in violation of Table 2, Cases 8-15, inclusive.

The clearances in Table 2 shall in no case be reduced more than 10 percent because of temperature and loading as specified in Rule 43 or because of a difference in size or design of the supporting pins, hardware or insulators. All clearances of less than 5 inches shall be applied between surfaces, and clearances of 5 inches or more shall be applied to the center lines of such items.

Note: Revised May 22, 1990 by Resolution No. SU-5.

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Table 2: Basic Minimum Allowable Clearance of Wires from Other Wires at Crossings, in Midspans and at Supports (Letter References Denote Modifications of Minimum Clearances as Referred to in Notes Following This Table) All Clearances are in Inches

| Case No. | Nature of Clearance and Class and Voltage of Wire, Cable or Conductor Concerned | Other Wire, Cable or Conductor Concerned | | | | | | | | | | |
|----------|--|--|----------------------------|--|---|-------------------|----------------------|-----------------------|-----------------------|------------------------|-------------------------|-------------------------|
| | | A | B | C | D | E | F | G | H | I | J | K (kk) |
| | | Span Wires, Guys and Messengers | Trolley Contact Conductors | Communication Conductors (Including Open Wire, Cables and Service Drops) | 0 - 750 Volts (Including Service Drops) and Trolley Feeders (a) | 750 - 7,500 Volts | 7,500 - 20,000 Volts | 20,000 - 35,000 Volts | 35,000 - 75,000 Volts | 75,000 - 150,000 Volts | 150,000 - 300,000 Volts | 300,000 - 550,000 Volts |
| 1 | Clearance between wires, cables and conductors not supported on the same poles, vertically at crossings in spans and radially where colinear or approaching crossings | 18 (c) | 48 (d, e) | 24 (e) | 24 (e) | 36 (f) | 36 | 72 | 72 | 78 | 78 (gg) | 138 (hh) |
| 2 | Span wires, guys and messengers (b) | 48 (d, e) | - | 48 (d) | 48 (d, h) | 48 | 72 | 96 | 96 | 96 | 96 (gg) | 156 (hh) |
| 3 | Communication conductors | 24 (e) | 48 (d) | 24 | 48 (f) | 48 (dd) | 72 | 96 | 96 | 96 | 96 (gg) | 156 (hh) |
| 4 | Supply conductors, service drops and trolley feeders, 0 - 750 volts (qq) | 24 (e) | 48 (d, h) | 48 (f) | 24 | 48 | 48 | 96 (oo) | 96 | 96 | 96 (gg) | 156 (hh) |
| 5 | Supply conductors, 750 - 7,500 volts (qq) | 36 (f) | 48 | 48 (dd) | 48 | 48 (h) | 72 | 96 (oo) | 96 | 96 | 96 (gg) | 156 (hh) |
| 6 | Supply conductors, 7,500 - 20,000 volts (qq) | 36 | 72 | 72 | 48 | 72 | 72 | 96 (oo) | 96 | 96 | 96 (gg) | 156 (hh) |
| 7 | Supply conductors, more than 20,000 volts (qq) | 72 (g) | 96 (g) | 96 (g) | 96 (g, oo) | 96 (g, oo) | 96 (g, oo) | 96 (g, oo) | 96 (g) | 96 | 96 (gg) | 156 (hh) |
| 8 | Vertical separation between conductors and/or cables, on separate crossarms or other supports at different levels (excepting on related line and buck arms) on the same pole and in adjoining midspans | - | - | 12 (j) | 48 (k, l, m, n, pp) | 48 (k) | 72 (m, n) | 72 (m) | 72 | 78 | 87 (gg) | 147 (hh) |
| 9 | Communication Conductors and Service Drops | - | - | 48 (k, l, m, n, pp) | 24 (h, k, m, o) | 48 (k, m, p) | 48 (k, m, q) | 72 (m, nn) | 72 | 78 | 87 (gg) | 147 (hh) |
| | Supply Conductors Service Drops and Trolley Feeders, 0 - 750 Volts | - | - | 48 (k, l, m, n, pp) | 24 (h, k, m, o) | 48 (k, m, p) | 48 (k, m, q) | 72 (m, nn) | 72 | 78 | 87 (gg) | 147 (hh) |

Table 2 (Continued)

| Case No. | Nature of Clearance and Class and Voltage of Wire, Cable or Conductor Concerned | Other Wire, Cable or Conductor Concerned | | | | | | | | | | |
|----------|---|--|--|--|---|------------------|---------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|
| | | A | B | C | D | E | F | G | H | I | J | K (kk) |
| | | Span Wires, Guys and Messengers | Trolley Contact Conductors 0-750 Volts | Communication Conductors (Including Open Wire, Cables and Service Drops) | 0-750 Volts (Including Service Drops and Trolley Feeders (a)) | 750-7,500 Volts | 7,500-20,000 Volts | 20,000-35,000 Volts | 35,000-75,000 Volts | 75,000-150,000 Volts | 150,000-300,000 Volts | 300,000-550,000 Volts |
| 10 | Supply conductors, 750 - 7,500 volts | - | - | 48 (k) | 48 (k, m, p) | 48 (m, o, r, ee) | 48 (m, q) | 48 (m, q) | 48 (q) | 60 (ff) | 90 (gg) | 150 (hh) |
| 11 | Supply conductors, 7,500 - 20,000 volts | - | - | 72 (m, n) | 48 (k, m, q) | 48 (m, q) | 48 (m, o, q, r, ee) | 48 (m, q) | 48 (q) | 60 (ff) | 90 (gg) | 150 (hh) |
| 12 | Supply conductors, 20,000 - 75,000 volts | - | - | 72 (m) | 72 (m) | 48 (m, q) | 48 (m, q) | 48 (o, q) | 48 (o, q) | 60 (ff) | 90 (gg) | 150 (hh) |
| 13 | Supply conductors, more than 75,000 volts | - | - | 72 | 72 | 60 (q) | 60 (q) | 60 (q) | 60 (q) | 60 (ff) | 90 (gg) | 150 (hh) |
| 14 | Vertical clearance between conductors on related line arms and buck arms Line arms above or below related buck arms (s, t) Horizontal separation of conductors on same crossarm | - | - | 6 | 12 (u) | 18 (u) | 18 (u) | 24 | 48 | 60 (ff) | 90 (gg) | 150 (hh) |
| 15 | Pin spacing of longitudinal conductors vertical conductors and service drops (v, w) Radial separation of conductors on same crossarm, pole or structure—incidental pole wiring | - | - | 3 (x) | 11-1/2 (h, x) | 11 1/2 (x) | 17-1/2 (x) | 24 (x) | 48 | 60 (ff) | 90 (gg) | 150 (hh) |
| 16 | Conductors, taps or lead wires of different circuits (v, y, s) | - | - | 3 (x) | 11-1/2 (h, x) | 11 1/2 (x) | 17-1/2 (x) | 24 (x) | 48 | 60 (ff) | 90 (gg) | 150 (hh) |
| 17 | Conductors, taps or lead wires of the same circuit (v, s, aa) | - | - | 3 | 3 | 6 | 6 | 12 | 24 | 60 (ff) | 90 (gg) | 150 (hh) |

Table 2 (Continued)

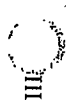
| Case No. | Nature of Clearance and Class and Voltage of Wire, Cable or Conductor Concerned | Other Wire, Cable or Conductor Concerned | | | | | | | | | | | Rule |
|----------|---|--|--|--|---|-----------------|--------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------|
| | | A | B | C | D | E | F | G | H | I | J | K (kk) | |
| | | Span Wires, Guys and Messengers | Trolley Contact Conductors 0-750 Volts | Communication Conductors (Including Open Wire, Cables and Service Drops) | 0-750 Volts (Including Service Drops) and Trolley Feeders (a) | 750-7,500 Volts | 7,500-20,000 Volts | 20,000-35,000 Volts | 35,000-75,000 Volts | 75,000-150,000 Volts | 150,000-300,000 Volts | 300,000-550,000 Volts | |
| 18 | Radial separation between guys and conductors | - | - | 3 | 11-1/2 | 11-1/2 | 17-1/2 | 24 | 36 | 36 (ff) | 78 (gg) | 138 (hh) | |
| 19 | Guys passing conductors supported on the same poles | (cc) | - | 3 (bb) | 3 | 6 | 9 | 12 | 18 | 24 | 48 (ii) | 86 (jj) | |
| 20 | Vertical and horizontal insulators clearances between conductors | - | - | - | - | 24 | 24 | 24 | 36 or 48 (ll, mm) | 48 (mm) | 48 (mm) | 48 (mm) | |

References to Rules Modifying Minimum Clearances in Table 2

| Reference | Rule |
|--|---------|
| (a) The clearances in column D are also applicable to supply cables of any voltage under certain conditions | 57.4 |
| (b) Clearances for guys and span wires apply vertically at crossings (see case 18 for radial clearances from conductors) | |
| 1 Supply guys and span wires from conductors | 56.4-C |
| 2 Supply guys and span wires from guys and span wires | 56.4-D1 |
| 3 Communication guys and span wires from conductors | 86.4-C |
| 4 Communication guys and span wires from guys and span wires | 86.4-D1 |
| (c) Not applicable between messengers or span wires of the same system | |
| 1 Supply messengers | 57.4-E |
| 2 Trolley span wires | 77.4-D |
| 3 Communication messengers | 87.4-G |
| (d) Protection Required on guys, span wires, messengers and cables where within trolley throw | |
| 1 Supply guys and span wires | 56.4-B2 |
| 2 Supply messengers and cables | 57.4-B2 |
| 3 Communication guys and span wires | 86.4-B2 |
| 4 Communication messengers | 87.4-B2 |
| (e) Not applicable to certain conductors supported on trolley span wires | |
| 1 Trolley contact and feeder conductors | 74.4-G2 |
| 2 Trolley feeder conductors | 78.1 |
| 3 Trolley system communication conductors | 78.2 |
| 4 Foreign conductors | 78.3 |
| (f) Increased clearance required over trolley contact conductors | |
| 750-7,500 volts | 74.4-G2 |

References to Rules Modifying Minimum Clearances in Table 2

| | Rule | Rule |
|-----|--|------------------------------|
| (g) | Shall be increased for voltages above 75,000 as required by Table 2, Columns I, J and K | N/A |
| (h) | May be reduced for certain conductors of Class T Circuits of the same system | 74.4-C |
| (i) | May be reduced for service drops under special conditions | |
| | 1 Supply service drops and communication line conductors | 54.8-C1a |
| | 2 Supply service drops and communication service drops | 54.8-C4 |
| | 3 Communication service drops and supply line conductors | 84.8-D1a |
| | 4 Communication service drops and supply service drops | 84.8-D4 |
| (j) | May be reduced or shall be increased for certain communication conductors or cables | |
| | 1 Open wire conductors, attached to poles, within 3 feet of topmost conductor | 84.4C1c |
| | 2 Line conductors of police or fire-alarm circuits and service drops from other communication circuits | 84.8-D1b |
| | 3 Cables and messengers attached to poles | 87.4-C3 |
| (k) | Special clearances for 0-750 volts in rack configuration and messengers and cables attached to poles | |
| | 1 Supply conductors of 0-750 volts in rack configuration | 54.9 |
| | 2 Supply cables and messengers attached to poles | 57.4-F |
| | 3 Communication cables and messengers attached to poles | 87.4-C3 |
| | 4 On jointly used poles | 92.1 |
| (l) | May be reduced for service drops and police and fire-alarm conductors, under special conditions | |
| | 1 Supply service drops and communication line conductors | 54.8-D1b |
| | 2 Supply service drops on clearance arms | 54.8-C2 |
| | 3 Supply service drops on pole-top extensions | 54.8-C3 |
| | 4 Supply service drops and communication service drops | 54.8-C4 |
| | 5 Communication service drops and police, fire-alarm or supply line conductors | 84.8-D1b |
| | 6 Communication service drops on clearance arms | 84.8-D2 |
| | 7 Communication service drops on pole-top extensions | 84.8-D3 |
| | 8 Communication service drops and supply service drops | 84.8-D4 |
| | 9 Police or fire-alarm conductors | 92.2 |
| (m) | May be reduced for lead wires | |
| | 1 Supply lead wires above supply conductors | 54.4-C6 |
| | 2 Supply drip loops above communication conductors | 92.1-F3 |
| (n) | May be reduced for supply conductors and private communication conductors of the same ownership | 89.2-B |
| (o) | May be reduced or shall be increased for triangular or vertical configuration or for pole-top construction | |
| | 1 Triangular or vertical configuration on crossarms | 54.4-C1c |
| | 2 deadended on pole in vertical configuration | 54.4-C4 |
| (p) | May be reduced for supply service drops of 0-750 volts | 54.8-C6 |
| (q) | Shall be increased between circuits where conductors are at pole top | 54.4-D8 |
| (r) | May be reduced under special conditions | |
| | 1 Supply conductors of 750-7,500 volts | 54.4-C1a |
| | 2 Supply conductors of 7,500-20,000 volts | 54.4C1b |
| (s) | Does not apply where conductors do not cross | |
| | 1 Supply conductors of different phase or polarity | 54.4-C2a |
| | 2 Communication conductors | 84.4-C1a |
| (t) | Shall not be applied consecutively both above and below the same supply conductors | 54.4-C2a |
| (u) | Shall be increased where conductors of different classification are supported on the same crossarm | |
| | 1 Supply conductors of 0-750 volts and conductors of 7,500-22,500 volts | 32.4-A2 |
| | 2 Supply conductors of 0-750 volts and conductors of 750-7,500 volts | 32.4-A3 |
| (v) | Not applicable to certain kinds of conductors | |
| | 1 Supply conductors of same phase or polarity | 54.4-C3c |
| | 2 Insulated supply conductors in multiple-conductor cables | 57.4-C |
| | 3 Communication insulated conductors or multiple-conductor cables | 87.4-C1 |
| (w) | Shall apply radially to conductors on brackets attached to crossarms | |
| | 1 Supply conductors | 54.4-C3b |
| | 2 Communication conductors | 84.4-C1b |
| (x) | Shall be increased between conductors of different classification supported on the same crossarm | |
| | 1 Supply conductors of different voltage classification | 32.4-A |
| | 2 Supply circuits of 0-750 volts and communication circuits | 32.4-B |
| | 3 Supply circuits and private communications circuits | 89.2-A |
| (y) | Special clearances for unprotected supply conductors from one level to another level | 54.6-A 58.2-B3 92.1-F5 |



References to Rules Modifying Minimum Clearances in Table 2

Rule

(z) Not applicable to the following:

| | |
|--|---------|
| 1 Clearances between conductors at different levels specified in cases 8 to 13 inclusive | N/A |
| 2 Supply lateral conductors, suitably protected | 54.6-C |
| 3 Supply vertical runs, suitably protected | 54.6-D |
| 4 Supply risers, suitably protected | 54.6-E |
| 5 Communication conductor | 87.4-C1 |

(aa) Not applicable between cables and their supporting messengers

| | |
|-----------------------|--------|
| 1 Supply | 57.4-D |
| 2 Communication | 87.4-F |

(bb) May be reduced for guys and communication conductors supported on the same pole

| | |
|-----------------------|---------|
| 1 Supply | 56.4-C4 |
| 2 Communication | 86.4-C |

(cc) Clearance required between guys

| | |
|--|---------|
| 1 Supply guys, crossing | 56.4-D2 |
| 2 Supply guys, approximately parallel | 56.4-D3 |
| 3 Communication guys, crossing | 86.4-D2 |
| 4 Communication guys, approximately parallel | 86.4-D3 |

(dd) Shall be increased where within 6 feet of a pole

(ee) May be decreased in partial underground distribution

Rule

(ff) Shall be increased by 0.40 inch per kV in excess of 75 kV

(gg) Shall be increased by 0.40 inch per kV in excess of 150 kV

(hh) Shall be increased by 0.40 inch per kV in excess of 300 kV

(ii) Shall be increased by 0.25 inch per kV in excess of 150 kV

(jj) Shall be increased by 0.25 inch per kV in excess of 300 kV

(kk) Proposed clearances to be submitted to the CPUC prior to construction for circuits in excess of 550 kV

(ll) 36-inch clearance applies 35 kV to 68 kV.
42-inch clearance applies over 68 kV.

(mm) Vertical clearances shall be increased by 1/2 inch for each kV over 68 kV

(nn) The vertical separation between supply conductors and service drops of 0 - 750 volts and supply conductors of 20,000 - 22,500 volts may be reduced to 48 inches

(oo) May be reduced to 72 inches for conductors of 20,000 - 22,500 volts

(pp) May be reduced to 36 inches vertically at midspan only when the supply conductors consist of abrasion resistant cable with a grounded metallic sheath or neutral-supported cable as specified in Rules 57 and 54.10.

(qq) Vertical clearances may be reduced between supply conductors of the same circuit at crossings in spans

Note: Revised February 7, 1964 by Decision No. 66707; September 18, 1967 by Decision No. 72984; March 30, 1968 by Decision No. 73813; July 22, 1968 by Decision No. 74342; September 11, 1974 by Decision No. 83420; March 9, 1988 by Resolution E-3076; November 6, 1992 by Resolution No. SU-15, January 19, 1994 by Resolution SU-25 and October 9, 1996 by Resolution SU-40.

39 Minimum Clearances of Wires from Signs

Clearance between any overhead line conductor and all signs, whether mounted on buildings, isolated structures or otherwise constructed shall not be less than the values given in Table 2-A at a temperature of 60° F. and no wind.

The clearances specified in Table 2-A shall in no case be reduced more than 10% because of temperature and loading as specified in Rule 43. All clearances of more than 5 inches shall be applicable from the centerlines of conductors concerned. Lesser clearances shall be applicable from conductor surfaces.

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Table 2-A Minimum Clearances of Wires from Signs Mounted on Buildings and Isolated Structures (a) (Letter References Denote Modifications of Minimum Clearances as Referred to in Notes Following this Table)

| Case No. | Nature of Clearance Type of Sign | A | | | | | Rule |
|----------|---|---|---|---|--|---|------|
| | | Span Wires (Other than Trolley Span Wires) Overhead Guys and Messengers, Communication Cables and Communication Service Drops | Communication Open Wire Conductors Supply Cables Treated as in Rule 57.8 and Supply Service Drops 0-750 Volts | Supply Conductors, Supply Cables and Trolley Span Wires | Supply Conductors and Supply Cables, 750-300,000 Volts (b) | Supply Conductors and Supply Cables, 300-550 KV | |
| 1 | Vertical clearance above all signs upon which men can walk | 8 Feet | 8 Feet | 8 Feet | 12 Feet | 20 Feet (g) | |
| 2 | Vertical clearance above all signs upon which men cannot walk | 2 Feet | 2 Feet | 3 Feet | 8 Feet | 20 Feet (g) | |
| 3 | Vertical clearance under signs which are illuminated | 2 Feet (c) | 2 Feet (e) | 3 Feet | Prohibited (f) | Prohibited | |
| 4 | Vertical clearance under signs which are non-illuminated | 6" (d) | 1 Foot | 3 Feet | Prohibited (f) | Prohibited | |
| 5 | Horizontal clearance from signs which are illuminated | 3 Feet (c) | 3 Feet (e) | 3 Feet | 6 Feet | 15 Feet (h) | |
| 6 | Horizontal clearance from signs which are non-illuminated. | 6" (d) | 1 Foot | 3 Feet | 6 Feet | 15 Feet (h) | |

References to Rules Modifying Minimum Clearances in Table 2-A

- (a) These clearances do not apply to service drop conductors which are attached to signs for the purpose of serving such signs.
- (b) Nothing herein contained shall be construed as authorization of noncompliance with standards of the California division of industrial safety, including article e760-2 entitled "provision for preventing accidents due to proximity of high-voltage lines, 24 Cal. Adm. Code, Part 3, Basic Electrical Regulations.
- (c) May be reduced to 6 inches provided illuminated sign is grounded.
- (d) May be reduced if adequate separation is provided by means of a suitable non-conducting separator.
- (e) May be reduced to 1 foot for communication open wire conductors only, provided illuminated sign is grounded
- (f) When conductors are at a level of 8 feet or more below the level of the lowest portion of the sign but not vertically under the sign, no horizontal clearance is required between the vertical planes through the conductor nearest the sign and the vertical projection of the extremities of the sign. Also note (b) above.
- (g) Shall be increased by 0.04 foot per KV in excess of 300 KV.
- (h) Not applicable to certain kinds of conductors.
 - 1 Supply conductors of same phase and polarity 54.4-C3c
 - 2 Insulated supply conductors in multi-conductor cables 57.4-C
 - 3 Communication insulated conductors or multiple-conductor cables 87.4-CL

Note: Resolution E-1068 dated May 31, 1960 authorized the addition of the above Rule 39 and Table 2-A to be effective July 1, 1960. Revised March 30, 1968 by Decision No. 73813.