

Decision No. 71094 Application No. 47540 (Filed April 30, 1965)

F. T. Searls, John C. Morrissey and Ross Workman, for applicant.

Brundidge & Hackler, by Daniel Feins, assisted by M. A. Walters, for IBEW Local Unions; interested parties.

N. R. Johnson, for the Commission staff.

### OPINION ON REHEARING

By its application filed April 30, 1965, applicant sought amendment of this Commission's General Order No. 95 in order to permit the use of "12/20.8 kV four-wire wye common neutral overhead electric distribution lines." After public hearing the Commission, on March 29, 1966, issued Decision No. 70489 by which a large number of the rules of General Order No. 95 were amended or modified in such manner as would permit the proposed type of construction.

On April 15, 1966, the International Brotherhood of Electrical Workers Locals Nos. 18,47,465, 1245 (IBEW) petitioned for a rehearing of the matter, claiming, in essence, that certain of the clearances provided by the rules as amended would result in increased hazards to workman, that the Commission had acted arbitrarily and contrary to the evidence and that petitioner had not been afforded an opportunity to present evidence respecting the effect of such reduced clearances.

On April 18, 1966, applicant Pacific Gas and Electric Company (PG&E) also petitioned for rehearing and asked that the Commission either clarify that portion of its opinion respecting a definition of "voltage" or modify the decision so as to permit common-neutral system voltages of 22,000 volts.

The Commission granted rehearing on May 17, 1966, and on June 13, 1966 rehearing was held before Examiner Emerson at San Francisco, at the conclusion of which the matter was again submitted.

The rehearing consisted primarily of an exchange of views between the Examiner, counsel, staff and engineering experts, all as a matter of further clarifying the respective positions of the parties, and concluded with an agreement among the parties as to the extent of the required modification of the General Order. Such agreement may be summarized by stating that the IB~J opposes any modification of Table 2 clearances and that PG&E finds that modification of Table 2 is not needed in order to put the proposed common-neutral system to practical use. The record developed the fact that the so-called "12/20.8 kV" system may, during temporary conditions, actually reach a

maximum voltage (between phase conductors) of somewhat more than 22,000 volts, a situation not disclosed by PG&E at the original hearing. Staff experts suggest that in view of the existing definition of "voltage" (Rule 23.2) and the Commission's apparent intent to authorize the use of the proposed system in California, the practical point at which voltage classifications should change, in order to provide for this type of system, should be 22,500 volts instead of the 21,000 volts authorized by Decision No. 70489.

In view of the entire record in this proceeding the Commission finds and concludes that Decision No. 70489 heretofore issued in this matter should be modified to the extent set forth in the following order. It should be particularly noted that no changes in Table 2 clearances are being authorized herein.

### ORDER

IT IS ORDERED that Decision No. 70489 is modified as follows:

1. Finding No.1 in the opinion of said decision is hereby modified to read: "The public interest, including safety to workmen and the public generally, will not be adversely affected by the use of common-neutral systems up to but not above a circuit voltage of 22,500 volts."
2. Appendix A, attached to said decision is hereby replaced in toto by the appendix attached to this order. which latter appendix as a matter of convenience will be titled "Appendix B".

IT IS FURTHER ORDERED that in all other respects Decision No. 70489 shall remain in full force and effect.

The effective date of this order shall be the date hereof.

Dated at San Francisco, California. this 9<sup>th</sup> day of August 1966.

## Appendix B

The rules of General Order No. 95, amended or added to as set forth below:

1. Rule 20.7

This rule is amended to read as follows:

“COMMON NEUTRAL SYSTEMS mean those electrical supply distribution systems wherein the same specially grounded conductor is utilized as a neutral conductor of primary circuits of less than 22,500 volts and secondary circuits of 0-750 volts supplied therefrom.”

2. Rule 32.4-A2

This rule is amended to read as follows:

“(2) 0-750 VOLTS AND MORE THAN 7500 VOLTS: Supply circuits of 0-750 volts shall not be carried on the same crossarm with circuits of more than 7500 volts, except that, on transformer structures, bus conductors of 0-750 volts and bus conductors of 7500-22,500 volts may be supported on opposite ends of the same bus-supporting timbers provided the horizontal separation between conductors of different classifications supported on the same arm is not less than 36 inches, the bus conductors of 7500-22,500 volts are not extended longitudinally as line conductors, service drops are not supported on arms which support conductors of 7500-22,500 volts, and conductors on related buck arms are not less than 4 feet vertically from such bus timbers.”

3. Rule 33.1

The first sentence of this rule is amended to read as follows:

“Neutral conductors of supply circuits, other than in distribution systems of 22,500 volts or less with common primary and secondary grounded neutrals, shall be considered as carrying the same voltage as the other conductors of the circuit.”

4. Rule 37, Table 1.

The heading of Column E of the Table 1 is amended to read: “Supply conductors and supply cables, 750-22,500 volts.”

The heading of Column F of the Table 1 is amended to read: "Supply conductors and supply cables more than 22,500 volts."

References to "20,000 volts" in footnotes p, and t are amended to read "22,500 volts".

5. Rule 33.3-B

The first portion of this rule is amended to read as follows:

"Ground connections for equipment of any one of the types listed in Rule 33.3–A shall not be interconnected with ground connections for equipment of any other type listed therein, EXCEPT:

In common neutral systems the neutral conductors of 0 - 750 volt supply circuits and of supply circuits of 750 – 22,500 volts may be interconnected and grounded in accordance with the provisions of Rule 59 ; and"

6. Rule 51.6-A

Beginning with the third paragraph of this rule, the rule is amended to read as follows:

"The provisions of this Rule, 51.6-A shall not apply to the marking of poles at the levels of supply circuits of more than 22,500 volts in rural districts.

See Rule 65 for the marking of towers."

7. Rule 52.4-B2c

This rule is amended to read as follows:

"Supporting Conductors of 7500-22,500 Volts at certain Locations: At All crossings over public thoroughfares and at locations adjacent to structures such as water tanks, windmills and buildings, adjacent to wells, and at similar locations, crossarms supporting conductors of 7500-22,500 volts shall be marked as high voltage."

8. Rule 52.4B2e

This rule is amended to read as follows:

"Supporting Conductors of 7500-22,500 Volts on the Same Structure With Conductors of 750 Volts or Less: Where, on the same structures in rural

districts, crossarms supporting conductors of 7500-22,500 volts are above conductors of 750 volts or less, the crossarm supporting conductors of 7500-22,500 next above the conductors of 750 volts or less shall be marked as high voltage. All crossarms supporting conductors of 7500-22,500 volts on the same structures shall be marked as high voltage.”

9. Rule 52.4-B3

The first paragraph of this rule is amended to read as follows:

“(3) On Guarded Metal Poles: On Latticed metal Poles which are guarded with barriers as required in Rule 51.6-B, the following crossarms shall be marked as high voltage:

Crossarms supporting conductors of 750-7500 volts;

Crossarms supporting conductors of 7500-22,500 volts next above the level of conductors of 7500 volts or less;

Crossarms supporting conductors of 7500-22,500 volts below the level of conductors of 7500 or less;

Crossarms supporting any conductor of more than 7500 volts within 15 feet of walls, fire escapes, exits, windows and similar objects.”

10. Rule 54.4-A1

The first sentence of this rule is amended to read:

“(1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying 22,500-30,000 volts, inclusive, may have a clearance of less than 30 feet (Table 1, Case 4, Column F) but not less than 25 feet above ground subject to a reduction of not more than 10 per cent because of temperature and loading as specified in Rule 43.”

11. Rule 54.4-A2a

This rule is amended to read:

“a) Crossing Roads or Driveways: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 3 Column E may be reduced to 22 feet above ground for conductors not exceeding 20,000 volts crossing or overhanging traversable portions of public

or private roads or driveways. This modified minimum clearance of 22 feet shall in no case be reduced because of temperature or loading at conditions less than the maximum loading or temperature specified in Rules 43.1 and 43.2.”

12. Rule 54.4-A2b

The first sentence of this rule is amended to read:

- “b) Above Agricultural Areas Along Roads: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 4 Column E may be reduced to 18 feet above ground for lines not exceeding 20,000 volts across areas capable of being traversed by agricultural equipment and along roads where no part of the line overhangs any traversable portion of a public or private roadway.”

13. Rule 54.4-C4c

The figures “750-20,000 volts” in this rule are changed to read “750-22,500 volts”.

14. Rule 54.4-D2

The figures “7500-20,000 volts” in the second paragraph of this rule are amended to read “7500-22,500 volts”.

15. Rule 54.4-D8b

The first paragraph of this rule is amended to read:

- “b) More than 7500 Volts: A single conductor of a circuit of more than 7500 volts may be attached directly to the top of a pole or to a crossarm at the top of a pole at a distance less than as specified in Table 1, case 8, provided no apparatus carried on the pole is connected to the circuit so arranged except lighting arresters, pole-top switch, or a transformer. Where a transformer is connected to a circuit so arranged, a vertical clearance of not less than 30 inches shall be maintained between the primary conductor directly above and the unenergized metal parts of the transformer, as specified in Rule 58.3-B3e.”

16. Rule 54.4-H2

The first paragraph of this rule is amended to read:

"2) Attached Conductors: Unprotected conductors not exceeding 22,500 volts may be supported by attachments to buildings, bridges and other structures. To conductors of 0-750 volts so supported, the clearances of Table 1, case 7 columns B, C, and D shall apply. To conductors of 750-22,500 volts so supported a minimum horizontal clearance of 8 feet shall apply."

17. Rule 54.4-I

The first sentence of the second paragraph of this rule is amended to read as follows:

"Conductors of 0-22,500 volts, passing under or through bridges, viaducts or similar structures, may be attached thereto in accordance with the provision of Rule 54.4-H2."

18. Rule 54.6-F

The fourth paragraph of this rule is amended by replacing the phrase "(750-20,000 volts in vertical configuration on non-climbable poles)." With the phrase "(750-22,500 volts in vertical configuration on non-climbable poles)."

19. Rule 56.4-E

This rule is amended to read as follows:

"Where passing guys are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than 22,500 volts supported on the same pole, such guys shall be sectionalized, in addition to the normal sectionalization required by Rule 56.6, by means of insulators in accordance with Rule 56.6-A as though attached to the pole or structure."

20. Rules 56.6-A, 56.6-B 56.6-D, 56.6-E

In these four rules, each time the figures "20,000" appear said figures are amended to read "22,500".

21 Rule 58.3-B3e (New Rule)

The general order is amended by adding thereto the following new section to Rule 58.3-B3.

- "e) From 7500-22,500 volt conductor above: The clearance between Unenergized metal parts of transformers and 7500-22,500 volt conductors above shall be not less than 18 inches vertically or 18 horizontally except that the vertical clearance shall be not less than 30 inches from a conductor at the top of pole as in Rule 54.4-D8b."
22. Rule 58.3-E (New Rule)

The general order is amended by adding thereto the following new section to Rule 58.3:

"E. CONNECTIONS BETWEEN WINDINGS

Any metallic connection between the primary and secondary windings of a distribution transformer (as in common neutral systems) shall be made externally and not within the transformer case."

23. Rule 59.2

This rule is amended to read as follows:

The following rules cover certain special details for common neutral systems where the neutral conductor is common to primary circuits of less than 22,500 volts and secondary circuits of 0-750 volts supplied therefrom. These rules are supplemental to the rules given for supply lines in general and to other detailed construction requirements for supply lines."

24. Rule 59.3-B, Table 14

Table 14 in Rule 59.3-B is amended by inserting therein a primary conductor size of 715,500 circular mils and a related neutral conductor size of 350,000 mils.

25. Rule 59.3-D

This Rule is amended to read as follows:

D Neutral Conductors

The arrangement and continuity of common neutral conductors shall conform to the following requirements:



Cross ties of the neutral conductor shall be made to form a continuous interconnected grid network and there shall be two or more separate and continuous metallic return conductors to the substation constituting the source of supply thereto.

If two return conductors only are used, each shall have a minimum conductivity of approximately 50 per cent of the conductivity of the primary phase conductor of the largest overhead feeder serving the area. (See Table No. 14 of Rule 59.3-B for minimum sizes.)

If more than two return conductors are used, the current-carrying capacity of the return system shall be such that a break in any one path shall leave two or more return paths which, combined, shall have a minimum conductivity of approximately 50 per cent of the conductivity of the primary phase conductor of the largest overhead feeder serving the area, thus providing adequate current-carrying capacity for full load current. (see Table No. 14 of Rule 59.3-B for minimum sizes.)

Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they are of sufficient current-carrying capacity as specified in Rule 59.3-B and provided that they are grounded throughout in accordance with the requirements for common neutral line conductors as specified in Rule 59.4-B. Primary or secondary neutral line conductors so used shall be carried in their normal primary or secondary positions, respectively."

26. Rule 59.4-A2

This Rule is amended to read as follows, with sections a) and b), thereof thus being deleted:

"2) Grounding Electrodes: Ground electrodes on common neutral systems shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical properties) not less than 5/8 inch in diameter by 8 feet in length and driven to a minimum depth of 8 feet below the surface of the ground. Pole-butt plates or wrappings shall not be used either in lieu of the aforesaid rods or pipes or as electrodes supplementary thereto.

The driven ground rod, pipe, or equivalent shall be located not less than 2 feet from the surface of the pole. Where two or more such rods are installed, they shall be located at not less than 6-foot centers and separation required from the surface of the pole shall not be held to apply to the connection between rods."

27. Rules 59.4-A2a and 59.4-A2b are deleted.

28. Rule 59.4-B1

This rule is amended to read as follows:

"1) Location: The common neutral grid system shall be grounded at intervals not greater than 1000 feet. On branch circuits extending from a grid, where return loop paths are not available, the common neutral line conductor shall be grounded at intervals not greater than 500 feet. Each transformer installation on a branch circuit without a loop return shall be so located that there will be one or more metallic water pipe system grounds, each of a resistance not greater than 3 ½ ohms, on each side of the transformer installation."

29. Rule 59.4-C

The second paragraph of this rule is amended to read as follows:

"On common neutral systems, each transformer installation on a branch circuit without a loop return shall be so located that there will be not less than one ground, of a resistance not greater than 3 ½ ohms on each side of the transformers installation."

30. Rule 86.4-E

The figure "20,000 volts" in this rule is amended to read "22,500 volts"

31. Rule 86.6-A  
Rule 86.6-B  
Rule 86.6-C  
Rule 86.6-D

In each of these rules the figures "20,000" are amended to read "22,500"

32. Rule 86.7-A1  
Rule 86.7-A2

In each of these rules the figures "20,000" are amended to read "22,500"

33. Appendix G

The illustrative diagrams in Appendix G are modified as follows:

- Fig. 6        The figures "20,000 volts" are changed to read "22,500 volts."
- Fig 43        The primary conductor level is changed from "More than 750 Volts to "750-20,000"
- Fig 45)       All references to "20,000" volts are changed to read  
Fig 46)       "22,500 volts"  
Fig 47)  
Fig 52)
- Fig 87        Change "750-20,000 volts" to read "750-22,500 volts"

Strikeout and Underline Added May 10, 2002, by Raymond G Fugere

**Original Version**

Rule 20.7

- 20.7 **Common Neutral Systems** mean those electrical supply distribution systems wherein the same specially grounded conductor is utilized as a neutral conductor of primary circuits of less than 5000 volts and secondary circuits of 0-750 volts supplied therefrom.

Strikeout and Underline Version

Rule 20.7

- 20.7 **Common Neutral Systems** mean those electrical supply distribution systems wherein the same specially grounded conductor is utilized as a neutral conductor of primary circuits of less than 22,500 ~~5000~~ volts and secondary circuits of 0-750 volts supplied therefrom.

Final Version

Rule 20.7

- 20.7 **Common Neutral Systems** mean those electrical supply distribution systems wherein the same specially grounded conductor is utilized as a neutral conductor of primary circuits of less than 22,500 volts and secondary circuits of 0-750 volts supplied therefrom.

**Original Version**  
Rule 32.4-A2

32.4A Supply Circuits

- 2 0-750 Volts and More Than 7500 Volts: Supply circuits of 0-750 volts shall not be carried on the same crossarm with circuits of more than 7500 volts, except that, on transformer structures, bus conductors of 0-750 volts and bus conductors of 7500-20,000 volts may be supported on opposite ends of the same bus-supporting timbers provided the horizontal separation between conductors of different classifications supported on the same arm is not less than 36 inches, the bus conductors of 7500-20,000 volts are not extended longitudinally as line conductors, service drops are not supported on arms which support conductors of 7500-20,000 volts, and conductors on related buck arms are not less than 4 feet vertically from such bus timbers.

**Strikeout and Underline Version**  
Rule 32.4-A2

32.4A Supply Circuits

- (2) 0-750 Volts And More Than 7500 Volts: Supply circuits of 0-750 volts shall not be carried on the same crossarm with circuits of more than 7500 volts, except that, on transformer structures, bus conductors of 0-750 volts and bus conductors of 7500-22,500 ~~20,000~~ volts may be supported on opposite ends of the same bus-supporting timbers provided the horizontal separation between conductors of different classifications supported on the same arm is not less than 36 inches, the bus conductors of 7500- 22,500 ~~20,000~~ volts are not extended longitudinally as line conductors, service drops are not supported on arms which support conductors of 7500-~~7500-22,500~~ ~~20,000~~-volts, and conductors on related buck arms are not less than 4 feet vertically from such bus timbers.

**Final Version**

Rule 32.4-A2

32.4A Supply Circuits

- (2) 0-750 Volts And More Than 7500 Volts: Supply circuits of 0-750 volts shall not be carried on the same crossarm with circuits of more than 7500 volts, except that, on transformer structures, bus conductors of 0-750 volts and bus conductors of 7500-22,500 volts may be supported on opposite ends of the same bus-supporting timbers provided the horizontal separation between conductors of different classifications supported on the same arm is not less than 36 inches, the bus conductors of 7500- 22,500 volts are not extended longitudinally as line conductors, service drops are not supported on arms which support conductors of 7500-22,500 volts, and conductors on related buck arms are not less than 4 feet vertically from such bus timbers.

**Original Version**  
Rule 33.1

33.1 Neutral Conductors

Neutral conductors of supply circuits, other than in distribution systems of 5000 volts or less with common primary and secondary grounded neutrals, shall be considered as carrying the same voltage as the other conductors of the circuits. Insulators used to support neutral conductors shall meet the requirements of Rule 55, based on the nominal voltage of the circuit, but are not required to have the same insulating value as insulators actually used on the phase conductors. Where a common neutral system is installed, the neutral conductor may be considered as carrying the same voltage as any of its related systems conductors, compliance with special practices and construction requirements being necessary (see Rule 59).

**Strikeout and Underline Version**  
Rule 33.1

33.1 Neutral Conductors

Neutral conductors of supply circuits, other than in distribution systems of ~~5000~~ 21,000 volts or less with common primary and secondary grounded neutrals, shall be considered as carrying the same voltage as the other conductors of the circuits. Insulators used to support neutral conductors shall meet the requirements of Rule 55, based on the nominal voltage of the circuit, but are not required to have the same insulating value as insulators actually used on the phase conductors. Where a common neutral system is installed, the neutral conductor may be considered as carrying the same voltage as any of its related systems conductors, compliance with special practices and construction requirements being necessary (see Rule 59).

## **Final Version**

### Rule 33.1

#### 33.1 Neutral Conductors

Neutral conductors of supply circuits, other than in distribution systems of 21,000 volts or less with common primary and secondary grounded neutrals, shall be considered as carrying the same voltage as the other conductors of the circuits. Insulators used to support neutral conductors shall meet the requirements of Rule 55, based on the nominal voltage of the circuit, but are not required to have the same insulating value as insulators actually used on the phase conductors. Where a common neutral system is installed, the neutral conductor may be considered as carrying the same voltage as any of its related systems conductors, compliance with special practices and construction requirements being necessary (see Rule 59).



## Original Version

### Table 1

Basic Minimum Allowable Vertical Clearance of Wire Above Railroads, Thoroughfares and Ground; Also clearances from Poles, Buildings, Structures or Other Objects  
(Letter References Denote Modifications of Minimum Clearances as Referred to in Note Following this Table)

Case No	Nature of Clearance	Wire or Conductor Concerned					
		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 0-5000 volts	D Supply conductors of 0-750 volts and supply cables treated as in Rule 57.8	E Supply Conductors and supply cables, 750-20,000 volts	F Supply Conductors and supply cables more than 20,000 volts
1	Crossing above tracks of railroads which transport or propose to transport freight cars (max height 15 ft 1in) where not operated by overhead contact wires (a) (b) (c) (d)	25 ft	25 ft	22 ft	25 ft	28 ft	34 ft
2	Crossing or paralleling above tracks of railroads operated by overhead trolleys (b) (c) (d)	26 ft (e)	26 ft (e) (f) (g)	19 ft (h) (i)	27 ft (e) (g)	30 ft (g)	34 ft (g)
3	Crossing or along thoroughfares in Urban districts or crossings thoroughfares in rural districts (c) (d)	18 ft (j) (k) (ii)	18 ft (j) (l) (m) (ii)	19 ft (hh)	20 ft (ii)	25 ft (n) (o) (ii)	30 ft (o) (ii)
4	Above ground along thoroughfares in rural districts or across other areas capable of being transversed by vehicles or agricultural equipment.	15 ft (k)	15 ft (m) (n) (p)	19 ft	16 ft	25 ft (n) (o)	30 ft (o) (p)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)
6	Vertical clearance above buildings and bridges (or other structures which do not ordinarily support conductors and on which men can walk) whether attached or unattached.	8 ft (r)	8 ft (r)	8 ft	8 ft	12 ft	12 ft
7	Horizontal clearance of conductor from buildings (except generating and substations), bridges or other structures (upon which men may work) where such conductor is not attached thereto. (a) (t)	-----	3 ft (u)	3 ft	3 ft (u) (v)	6 ft (v)	6 ft (v)
8	Distance of conductor from center line of pole, whether attached or unattached (w) (x) (y)	-----	15 in (a) (aa)	15 in (aa) (bb) (cc)	15 in (aa) (dd)	15 or 18 in (dd) (ee) (ii)	18 in (dd) (ee) (jj)
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) (ee)	-----	3 in (aa) (ff)	3 in (aa) (cc) (gg)	3 in (aa) (dd) (gg)	3 in (dd) (gg)	¼ pin spacing shown in Table 2 Case 15 (dd)



(a)	Shall not be reduced more than 5% because of temperature or loading 1. Supply Lines 2. Communication Lines	37 54.4-B1 84.4-B1
(b)	Shall be increased for supply conductors on Suspension insulators, under certain conditions	37
(c)	Special clearances are provided for traffic signal equipment	58.1-C
(d)	Special clearances are provided for street lighting equipment	58.2-B
(e)	Based on trolley pole throw of 26 feet. May be reduced where suitably protected. 1. Supply Guys 2. Supply cables and messengers 3. Communication Guys 4. Communication cables and messengers	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(f)	May be reduced depending on height of trolley contact conductors. 1. Supply Service Drop 2. Communication service drops	54.8-C5 84.8-D5
(g)	May be reduced and shall be increased depending on trolley throw 1. Supply conductors (except service drops) 2. Communication conductors (except service drops)	54.4-B2 84.4-B2
(h)	Shall be increase where freight cars are transported. 1. Trolley contact and feeder conductors 2. Trolley span wires	74.4-B1 77.4-A
(i)	May be reduced for trolley contact and span wires in subways, tunnels and under bridges 1. Trolley contact conductors 2. Trolley span wires	74.4-E 77.4-A
(j)	May be reduced at crossings over private thoroughfares and entrances to private property and over private property. 1. Supply Service drops 2. Supply Guys 3. Communication service drops 4. Communication guys	54.8-B2 56.4-A 84.8-C2 86.4-A
(k)	May be reduced along thoroughfares where not normally accessible to vehicles. 1. Supply Guys 2. Communication Guys	56.4-A1 86.4-A1
(l)	May be reduced where within 12 feet of curb line of public thoroughfares 1. Supply Service drops 2. Communication service drops	54.8-B1 84.8-C1
(m)	May be reduced for railways signal cables under special conditions	84.4-A4
(n)	May be reduced in rural districts 1. Supply conductors, 750-20,000 volts, crossing roads or driveways 2. Supply conductors, 750-2000 volts, above agricultural areas and along roads 3. Communication conductors along roads	54.4-A2a 54.4-A2b 84.4-A2
(o)	May be reduced for transformer, regulator or capacitor leads. 1. Transformer Leads 2. Regulator or Capacitor Leads	58.3-B1a 58.4-B1
(p)	May be reduced across arid or mountainous areas 1. Supply Conductors of more than 20, 000 Volts 2. Communication conductors	54.4-A1 84.4-A1

(q)	<p>Shall be increased or may be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Increased for supply service drops on industrial or commercial premises</li> <li>2. Supply service drops on residential premises</li> <li>3. Communication conductors</li> <li>4. Increased for Communication service drops on industrial or commercial premises</li> <li>5. Communication service drops on residential premises</li> </ol>	<p>54.8-B3a 54.8-B3b 84.4-A3  84.8-C3a 84.8-C3b</p>
(r)	<p>May be reduced above roofs of buildings under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply overhead guys</li> <li>2. Supply service drops</li> <li>3. Communication overhead guys</li> <li>4. Communication conductors and cables</li> <li>5. Communication service drops</li> </ol>	<p>56.4-G 54.8-B4 86.4-F 84.4-E 84.8-C4</p>
(s)	<p>Also applies at fire escapes, etc.</p> <ol style="list-style-type: none"> <li>1. Supply Conductors</li> <li>2. Supply service drops on industrial or commercial premises</li> <li>3. Supply service drops on residential premises</li> <li>4. Communication Conductor</li> </ol>	<p>54.4-H1 54.8-B4a 54.8-B4b 84.4-E</p>
(t)	<p>Special Clearances where attached to buildings, bridges or other structures</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-20,000 volts</li> <li>2. Trolley Contact Conductors</li> <li>3. Communication Conductors</li> </ol>	<p>54.4-H2 74.4-E 84.4-F</p>
(u)	<p>Reduced clearances permitted under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply service drops on industrial or commercial premises</li> <li>2. Supply cables, grounded</li> <li>3. Communication cables beside buildings, etc.</li> <li>4. Communication conductors under bridges, etc.</li> <li>5. Communication service drops.</li> </ol>	<p>54.8-B4a 57.4-G 84.4-E 84.4-F 84.8-C4</p>
(v)	<p>May be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-7500 volts</li> <li>2. Supply transformer lead and bus wires where guarded</li> </ol>	<p>54.4-H1 58.3-B2</p>
(w)	<p>May be reduced at angles in lines and transportation points</p> <ol style="list-style-type: none"> <li>1. Supply conductors</li> <li>2. Communication Conductors</li> </ol>	<p>54.4-D1 84.4-D5</p>
(x)	<p>May be reduced for suitably protected lateral or vertical runs.</p> <ol style="list-style-type: none"> <li>1. Supply bond wires</li> <li>2. Supply ground wires</li> <li>3. Supply lateral conductors</li> <li>4. Supply vertical pins</li> <li>5. Supply risers</li> <li>6. Communication Ground Wires</li> <li>7. Communication lateral conductors</li> <li>8. Communication vertical runs</li> <li>9. Communication risers</li> </ol>	<p>53.4 54.6-B 54.6-C 54.6-D 54.6-E 84.6-B 84.6-C 84.6-D 84.6-E</p>

(y)	<p>Increased clearances for certain conductors</p> <ol style="list-style-type: none"> <li>1. Unattached conductors on colinear lines and crossing lines</li> <li>2. Unattached supply conductors</li> <li>3. Supply Service drops on clearance crossarms</li> <li>4. Supply Service drops on pole top extensions</li> <li>5. Unattached Supply service drops</li> <li>6. Communication lines, collinear, conflicting or crossing</li> <li>7. Communication conductors passing supply poles and unattached thereto</li> <li>8. Communication service drops on clearance crossarms</li> <li>9. Communication service drops on pole top extensions</li> <li>10. Unattached Communication service drops</li> </ol>	<p>32.3</p> <p>54.4D3</p> <p>54.8-C2</p> <p>54.8-C3</p> <p>54.8-D</p> <p>84.4-D3</p> <p>84.4-D4</p> <p>84.8-D2</p> <p>84.8-D3</p> <p>84.8-E</p>
(z)	Special provisions for police and fire alarm conductors require increased clearances	92.2
(aa)	<p>May be reduced under special provisions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply service drops from racks</li> <li>3. Supply cables and messengers attached to poles</li> <li>4. Communication conductors on communication poles</li> <li>5. Communication conductors on crossarms</li> <li>6. Communication conductors attached to poles</li> <li>7. Communication service drops attached to poles</li> <li>8. Communication cables and messengers</li> <li>9. Supply or communication cables and messengers on jointly used poles</li> <li>10. Communication service drops on pole top extensions</li> </ol>	<p>54.4-D5</p> <p>54.8-F</p> <p>57.4-F</p> <p>84.4-D</p> <p>84.4-D1</p> <p>84.4-D2</p> <p>84.8-B</p> <p>87.4-D</p> <p>92.1-B</p> <p>92.1-C</p>
(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)	<p>Special clearances for pole-top and dead-end construction</p> <ol style="list-style-type: none"> <li>1. Conductors dead-ended in vertical configuration on poles</li> <li>2. Conductors dead-ended in horizontal configuration</li> <li>3. Conductors in pole-top construction</li> </ol>	<p>54.4-C4</p> <p>54.4-D7</p> <p>54.4-D8</p>
(ee)	Clearance requirements for certain voltage classifications	54.4-D2
(ff)	Not applicable to communication conductors	84.4-D
(gg)	<p>Clearance from crossarms may be reduced for certain conductors</p> <ol style="list-style-type: none"> <li>1. Suitably insulated leads to protected runs</li> <li>2. Leads of 0-5000 volts to equipment</li> <li>3. Leads of 0-5000 volts to cutouts or switches</li> </ol>	<p>54.4-E</p> <p>54.4-E</p> <p>58.5-C</p>
(hh)	Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts	78.3A(1)
(ii)	<p>Special Clearances Required Above Public and Private Swimming Pools:</p> <ol style="list-style-type: none"> <li>1. Supply line conductors</li> <li>2. Supply service drops</li> <li>3. Communication line conductors</li> <li>4. Communication service drops</li> <li>5. Supply guys, span wires</li> <li>6. Communication guys</li> </ol>	<p>54.4-A4</p> <p>54.8-B5</p> <p>84.4-A5</p> <p>84.8-C5</p> <p>56.4-A3</p> <p>86.4-A3</p>
(jj)	May be decreased in partial underground distribution	54.4-D2

## Strikeout and Underline Version

### Table 1

Basic Minimum Allowable Vertical Clearance of Wire Above Railroads, Thoroughfares and Ground; Also clearances from Poles, Buildings, Structures or Other Objects  
(Letter References Denote Modifications of Minimum Clearances as Referred to in Note Following this Table)

Case No	Nature of Clearance	Wire or Conductor Concerned					
		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 0-5000 volts	D Supply conductors of 0-750 volts and supply cables treated as in Rule 57.8	E Supply Conductors and supply cables, 750- <del>20,000</del> <u>22,500</u> volts	F Supply Conductors and supply cables more than <del>20,000</del> <u>22,500</u> volts
1	Crossing above tracks of railroads which transport or propose to transport freight cars (max height 15 ft 1in) where not operated by overhead contact wires (a) (b) (c) (d)	25 ft	25 ft	22 ft	25 ft	28 ft	34 ft
2	Crossing or paralleling above tracks of railroads operated by overhead trolleys (b) (c) (d)	26 ft (e)	26 ft (e) (f) (g)	19 ft (h) (i)	27 ft (e) (g)	30 ft (g)	34 ft (g)
3	Crossing or along thoroughfares in Urban districts or crossings thoroughfares in rural districts (c) (d)	18 ft (j) (k) (ii)	18 ft (j) (l) (m) (ii)	19 ft (hh)	20 ft (ii)	25 ft (n) (o) (ii)	30 ft (o) (ii)
4	Above ground along thoroughfares in rural districts or across other areas capable of being transversed by vehicles or agricultural equipment.	15 ft (k)	15 ft (m) (n) (p)	19 ft	16 ft	25 ft (n) (o)	30 ft (o) (p)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)
6	Vertical clearance above buildings and bridges (or other structures which do not ordinarily support conductors and on which men can walk) whether attached or unattached.	8 ft (r)	8 ft (r)	8 ft	8 ft	12 ft	12 ft
7	Horizontal clearance of conductor from buildings (except generating and substations), bridges or other structures (upon which men may work) where such conductor is not attached thereto. (a) (t)	-----	3 ft (u)	3 ft	3 ft (u) (v)	6 ft (v)	6 ft (v)
8	Distance of conductor from center line of pole, whether attached or unattached (w) (x) (y)	-----	15 in (a) (aa)	15 in (aa) (bb) (cc)	15 in (aa) (dd)	15 or 18 in (dd) (ee) (ii)	18 in (dd) (ee) (jj)
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) (ee)	-----	3 in (aa) (ff)	3 in (aa) (cc) (gg)	3 in (aa) (dd) (gg)	3 in (dd) (gg)	¼ pin spacing shown in Table 2 Case 15 (dd)

(a)	Shall not be reduced more than 5% because of temperature or loading 1. Supply Lines 2. Communication Lines	37 54.4-B1 84.4-B1
(b)	Shall be increased for supply conductors on Suspension insulators, under certain conditions	37
(c)	Special clearances are provided for traffic signal equipment	58.1-C
(d)	Special clearances are provided for street lighting equipment	58.2-B
(e)	Based on trolley pole throw of 26 feet. May be reduced where suitably protected. 1. Supply Guys 2. Supply cables and messengers 3. Communication Guys 4. Communication cables and messengers	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(f)	May be reduced depending on height of trolley contact conductors. 1. Supply Service Drop 2. Communication service drops	54.8-C5 84.8-D5
(g)	May be reduced and shall be increased depending on trolley throw 1. Supply conductors (except service drops) 2. Communication conductors (except service drops)	54.4-B2 84.4-B2
(h)	Shall be increase where freight cars are transported. 1. Trolley contact and feeder conductors 2. Trolley span wires	74.4-B1 77.4-A
(i)	May be reduced for trolley contact and span wires in subways, tunnels and under bridges 1. Trolley contact conductors 2. Trolley span wires	74.4-E 77.4-A
(j)	May be reduced at crossings over private thoroughfares and entrances to private property and over private property. 1. Supply Service drops 2. Supply Guys 3. Communication service drops 4. Communication guys	54.8-B2 56.4-A 84.8-C2 86.4-A
(k)	May be reduced along thoroughfares where not normally accessible to vehicles. 1. Supply Guys 2. Communication Guys	56.4-A1 86.4-A1
(l)	May be reduced where within 12 feet of curb line of public thoroughfares 1. Supply Service drops 2. Communication service drops	54.8-B1 84.8-C1
(m)	May be reduced for railways signal cables under special conditions	84.4-A4
(n)	May be reduced in rural districts 1. Supply conductors, 750-20,000 volts, crossing roads or driveways 2. Supply conductors, 750-2000 volts, above agricultural areas and along roads 3. Communication conductors along roads	54.4-A2a 54.4-A2b 84.4-A2
(o)	May be reduced for transformer, regulator or capacitor leads. 1. Transformer Leads 2. Regulator or Capacitor Leads	58.3-B1a 58.4-B1
(p)	May be reduced across arid or mountainous areas 1. Supply Conductors of more than <del>20,000</del> <u>22,500</u> Volts 2. Communication conductors	54.4-A1 84.4-A1

(q)	<p>Shall be increased or may be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Increased for supply service drops on industrial or commercial premises</li> <li>2. Supply service drops on residential premises</li> <li>3. Communication conductors</li> <li>4. Increased for Communication service drops on industrial or commercial premises</li> <li>5. Communication service drops on residential premises</li> </ol>	<p>54.8-B3a 54.8-B3b 84.4-A3  84.8-C3a 84.8-C3b</p>
(r)	<p>May be reduced above roofs of buildings under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply overhead guys</li> <li>2. Supply service drops</li> <li>3. Communication overhead guys</li> <li>4. Communication conductors and cables</li> <li>5. Communication service drops</li> </ol>	<p>56.4-G 54.8-B4 86.4-F 84.4-E 84.8-C4</p>
(s)	<p>Also applies at fire escapes, etc.</p> <ol style="list-style-type: none"> <li>1. Supply Conductors</li> <li>2. Supply service drops on industrial or commercial premises</li> <li>3. Supply service drops on residential premises</li> <li>4. Communication Conductor</li> </ol>	<p>54.4-H1 54.8-B4a 54.8-B4b 84.4-E</p>
(t)	<p>Special Clearances where attached to buildings, bridges or other structures</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-<del>20,000</del> <u>22,500</u> volts</li> <li>2. Trolley Contact Conductors</li> <li>3. Communication Conductors</li> </ol>	<p>54.4-H2 74.4-E 84.4-F</p>
(u)	<p>Reduced clearances permitted under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply service drops on industrial or commercial premises</li> <li>2. Supply cables, grounded</li> <li>3. Communication cables beside buildings, etc.</li> <li>4. Communication conductors under bridges, etc.</li> <li>5. Communication service drops.</li> </ol>	<p>54.8-B4a 57.4-G 84.4-E 84.4-F 84.8-C4</p>
(v)	<p>May be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-7500 volts</li> <li>2. Supply transformer lead and bus wires where guarded</li> </ol>	<p>54.4-H1 58.3-B2</p>
(w)	<p>May be reduced at angles in lines and transportation points</p> <ol style="list-style-type: none"> <li>1. Supply conductors</li> <li>2. Communication Conductors</li> </ol>	<p>54.4-D1 84.4-D5</p>
(x)	<p>May be reduced for suitably protected lateral or vertical runs.</p> <ol style="list-style-type: none"> <li>1. Supply bond wires</li> <li>2. Supply ground wires</li> <li>3. Supply lateral conductors</li> <li>4. Supply vertical pins</li> <li>5. Supply risers</li> <li>6. Communication Ground Wires</li> <li>7. Communication lateral conductors</li> <li>8. Communication vertical runs</li> <li>9. Communication risers</li> </ol>	<p>53.4 54.6-B 54.6-C 54.6-D 54.6-E 84.6-B 84.6-C 84.6-D 84.6-E</p>



(y)	<p>Increased clearances for certain conductors</p> <ol style="list-style-type: none"> <li>1. Unattached conductors on colinear lines and crossing lines</li> <li>2. Unattached supply conductors</li> <li>3. Supply Service drops on clearance crossarms</li> <li>4. Supply Service drops on pole top extensions</li> <li>5. Unattached Supply service drops</li> <li>6. Communication lines, collinear, conflicting or crossing</li> <li>7. Communication conductors passing supply poles and unattached thereto</li> <li>8. Communication service drops on clearance crossarms</li> <li>9. Communication service drops on pole top extensions</li> <li>10. Unattached Communication service drops</li> </ol>	<p>32.3</p> <p>54.4D3</p> <p>54.8-C2</p> <p>54.8-C3</p> <p>54.8-D</p> <p>84.4-D3</p> <p>84.4-D4</p> <p>84.8-D2</p> <p>84.8-D3</p> <p>84.8-E</p>
(z)	Special provisions for police and fire alarm conductors require increased clearances	92.2
(aa)	<p>May be reduced under special provisions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply service drops from racks</li> <li>3. Supply cables and messengers attached to poles</li> <li>4. Communication conductors on communication poles</li> <li>5. Communication conductors on crossarms</li> <li>6. Communication conductors attached to poles</li> <li>7. Communication service drops attached to poles</li> <li>8. Communication cables and messengers</li> <li>9. Supply or communication cables and messengers on jointly used poles</li> <li>10. Communication service drops on pole top extensions</li> </ol>	<p>54.4-D5</p> <p>54.8-F</p> <p>57.4-F</p> <p>84.4-D</p> <p>84.4-D1</p> <p>84.4-D2</p> <p>84.8-B</p> <p>87.4-D</p> <p>92.1-B</p> <p>92.1-C</p>
(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)	<p>Special clearances for pole-top and dead-end construction</p> <ol style="list-style-type: none"> <li>1. Conductors dead-ended in vertical configuration on poles</li> <li>2. Conductors dead-ended in horizontal configuration</li> <li>3. Conductors in pole-top construction</li> </ol>	<p>54.4-C4</p> <p>54.4-D7</p> <p>54.4-D8</p>
(ee)	Clearance requirements for certain voltage classifications	54.4-D2
(ff)	Not applicable to communication conductors	84.4-D
(gg)	<p>Clearance from crossarms may be reduced for certain conductors</p> <ol style="list-style-type: none"> <li>1. Suitably insulated leads to protected runs</li> <li>2. Leads of 0-5000 volts to equipment</li> <li>3. Leads of 0-5000 volts to cutouts or switches</li> </ol>	<p>54.4-E</p> <p>54.4-E</p> <p>58.5-C</p>
(hh)	Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts	78.3A(1)
(ii)	<p>Special Clearances Required Above Public and Private Swimming Pools:</p> <ol style="list-style-type: none"> <li>1. Supply line conductors</li> <li>2. Supply service drops</li> <li>3. Communication line conductors</li> <li>4. Communication service drops</li> <li>5. Supply guys, span wires</li> <li>6. Communication guys</li> </ol>	<p>54.4-A4</p> <p>54.8-B5</p> <p>84.4-A5</p> <p>84.8-C5</p> <p>56.4-A3</p> <p>86.4-A3</p>
(jj)	May be decreased in partial underground distribution	54.4-D2

## Final Version

### Table 1

Basic Minimum Allowable Vertical Clearance of Wire Above Railroads, Thoroughfares and Ground: Also clearances from Poles, Buildings, Structures or Other Objects  
(Letter References Denote Modifications of Minimum Clearances as Referred to in Note Following this Table)

Case No	Nature of Clearance	Wire or Conductor Concerned					
		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 0-5000 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 more than 22,500 volts
1	Crossing above tracks of railroads which transport or propose to transport freight cars (max height 15 ft 1in) where not operated by overhead contact wires (a) (b) (c) (d)	25 ft	25 ft	22 ft	25 ft	28 ft	34 ft
2	Crossing or paralleling above tracks of railroads operated by overhead trolleys (b) (c) (d)	26 ft (e)	26 ft (e) (f) (g)	19 ft (h) (i)	27 ft (e) (g)	30 ft (g)	34 ft (g)
3	Crossing or along thoroughfares in Urban districts or crossings thoroughfares in rural districts (c) (d)	18 ft (j) (k) (ii)	18 ft (j) (l) (m) (ii)	19 ft (hh)	20 ft (ii)	25 ft (n) (o) (ii)	30 ft (o) (ii)
4	Above ground along thoroughfares in rural districts or across other areas capable of being transversed by vehicles or agricultural equipment.	15 ft (k)	15 ft (m) (n) (p)	19 ft	16 ft	25 ft (n) (o)	30 ft (o) (p)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)
6	Vertical clearance above buildings and bridges (or other structures which do not ordinarily support conductors and on which men can walk) whether attached or unattached.	8 ft (r)	8 ft (r)	8 ft	8 ft	12 ft	12 ft
7	Horizontal clearance of conductor from buildings (except generating and substations), bridges or other structures (upon which men may work) where such conductor is not attached thereto. (a) (t)	-----	3 ft (u)	3 ft	3 ft (u) (v)	6 ft (v)	6 ft (v)
8	Distance of conductor from center line of pole, whether attached or unattached (w) (x) (y)	-----	15 in (a) (aa)	15 in (aa) (bb) (cc)	15 in (aa) (dd)	15 or 18 in (dd) (ee) (ii)	18 in (dd) (ee) (jj)
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) (ee)	-----	3 in (aa) (ff)	3 in (aa) (cc) (gg)	3 in (aa) (dd) (gg)	3 in (dd) (gg)	¼ pin spacing shown in Table 2 Case 15 (dd)

(a)	Shall not be reduced more than 5% because of temperature or loading 1. Supply Lines 2. Communication Lines	37 54.4-B1 84.4-B1
(b)	Shall be increased for supply conductors on Suspension insulators, under certain conditions	37
(c)	Special clearances are provided for traffic signal equipment	58.1-C
(d)	Special clearances are provided for street lighting equipment	58.2-B
(e)	Based on trolley pole throw of 26 feet. May be reduced where suitably protected. 1. Supply Guys 2. Supply cables and messengers 3. Communication Guys 4. Communication cables and messengers	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(f)	May be reduced depending on height of trolley contact conductors. 1. Supply Service Drop 2. Communication service drops	54.8-C5 84.8-D5
(g)	May be reduced and shall be increased depending on trolley throw 1. Supply conductors (except service drops) 2. Communication conductors (except service drops)	54.4-B2 84.4-B2
(h)	Shall be increase where freight cars are transported. 1. Trolley contact and feeder conductors 2. Trolley span wires	74.4-B1 77.4-A
(i)	May be reduced for trolley contact and span wires in subways, tunnels and under bridges 1. Trolley contact conductors 2. Trolley span wires	74.4-E 77.4-A
(j)	May be reduced at crossings over private thoroughfares and entrances to private property and over private property. 1. Supply Service drops 2. Supply Guys 3. Communication service drops 4. Communication guys	54.8-B2 56.4-A 84.8-C2 86.4-A
(k)	May be reduced along thoroughfares where not normally accessible to vehicles. 1. Supply Guys 2. Communication Guys	56.4-A1 86.4-A1
(l)	May be reduced where within 12 feet of curb line of public thoroughfares 1. Supply Service drops 2. Communication service drops	54.8-B1 84.8-C1
(m)	May be reduced for railways signal cables under special conditions	84.4-A4
(n)	May be reduced in rural districts 1. Supply conductors, 750- 20,000 volts, crossing roads or driveways 2. Supply conductors, 750-2000 volts, above agricultural areas and along roads 3. Communication conductors along roads	54.4-A2a 54.4-A2b 84.4-A2
(o)	May be reduced for transformer, regulator or capacitor leads. 1. Transformer Leads 2. Regulator or Capacitor Leads	58.3-B1a 58.4-B1
(p)	May be reduced across arid or mountainous areas 1. Supply Conductors of more than 750- 22,500 Volts 2. Communication conductors	54.4-A1 84.4-A1

(q)	<p>Shall be increased or may be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Increased for supply service drops on industrial or commercial premises</li> <li>2. Supply service drops on residential premises</li> <li>3. Communication conductors</li> <li>4. Increased for Communication service drops on industrial or commercial premises</li> <li>5. Communication service drops on residential premises</li> </ol>	<p>54.8-B3a 54.8-B3b 84.4-A3  84.8-C3a 84.8-C3b</p>
(r)	<p>May be reduced above roofs of buildings under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply overhead guys</li> <li>2. Supply service drops</li> <li>3. Communication overhead guys</li> <li>4. Communication conductors and cables</li> <li>5. Communication service drops</li> </ol>	<p>56.4-G 54.8-B4 86.4-F 84.4-E 84.8-C4</p>
(s)	<p>Also applies at fire escapes, etc.</p> <ol style="list-style-type: none"> <li>1. Supply Conductors</li> <li>2. Supply service drops on industrial or commercial premises</li> <li>3. Supply service drops on residential premises</li> <li>4. Communication Conductor</li> </ol>	<p>54.4-H1 54.8-B4a 54.8-B4b 84.4-E</p>
(t)	<p>Special Clearances where attached to buildings, bridges or other structures</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-750- 22,500 volts</li> <li>2. Trolley Contact Conductors</li> <li>3. Communication Conductors</li> </ol>	<p>54.4-H2 74.4-E 84.4-F</p>
(u)	<p>Reduced clearances permitted under special conditions</p> <ol style="list-style-type: none"> <li>1. Supply service drops on industrial or commercial premises</li> <li>2. Supply cables, grounded</li> <li>3. Communication cables beside buildings, etc.</li> <li>4. Communication conductors under bridges, etc.</li> <li>5. Communication service drops.</li> </ol>	<p>54.8-B4a 57.4-G 84.4-E 84.4-F 84.8-C4</p>
(v)	<p>May be reduced under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 750-7500 volts</li> <li>2. Supply transformer lead and bus wires where guarded</li> </ol>	<p>54.4-H1 58.3-B2</p>
(w)	<p>May be reduced at angles in lines and transportation points</p> <ol style="list-style-type: none"> <li>1. Supply conductors</li> <li>2. Communication Conductors</li> </ol>	<p>54.4-D1 84.4-D5</p>
(x)	<p>May be reduced for suitably protected lateral or vertical runs.</p> <ol style="list-style-type: none"> <li>1. Supply bond wires</li> <li>2. Supply ground wires</li> <li>3. Supply lateral conductors</li> <li>4. Supply vertical pins</li> <li>5. Supply risers</li> <li>6. Communication Ground Wires</li> <li>7. Communication lateral conductors</li> <li>8. Communication vertical runs</li> <li>9. Communication risers</li> </ol>	<p>53.4 54.6-B 54.6-C 54.6-D 54.6-E 84.6-B 84.6-C 84.6-D 84.6-E</p>

(y)	<p>Increased clearances for certain conductors</p> <ol style="list-style-type: none"> <li>1. Unattached conductors on colinear lines and crossing lines</li> <li>2. Unattached supply conductors</li> <li>3. Supply Service drops on clearance crossarms</li> <li>4. Supply Service drops on pole top extensions</li> <li>5. Unattached Supply service drops</li> <li>6. Communication lines, collinear, conflicting or crossing</li> <li>7. Communication conductors passing supply poles and unattached thereto</li> <li>8. Communication service drops on clearance crossarms</li> <li>9. Communication service drops on pole top extensions</li> <li>10. Unattached Communication service drops</li> </ol>	<p>32.3</p> <p>54.4D3</p> <p>54.8-C2</p> <p>54.8-C3</p> <p>54.8-D</p> <p>84.4-D3</p> <p>84.4-D4</p> <p>84.8-D2</p> <p>84.8-D3</p> <p>84.8-E</p>
(z)	Special provisions for police and fire alarm conductors require increased clearances	92.2
(aa)	<p>May be reduced under special provisions.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply service drops from racks</li> <li>3. Supply cables and messengers attached to poles</li> <li>4. Communication conductors on communication poles</li> <li>5. Communication conductors on crossarms</li> <li>6. Communication conductors attached to poles</li> <li>7. Communication service drops attached to poles</li> <li>8. Communication cables and messengers</li> <li>9. Supply or communication cables and messengers on jointly used poles</li> <li>10. Communication service drops on pole top extensions</li> </ol>	<p>54.4-D5</p> <p>54.8-F</p> <p>57.4-F</p> <p>84.4-D</p> <p>84.4-D1</p> <p>84.4-D2</p> <p>84.8-B</p> <p>87.4-D</p> <p>92.1-B</p> <p>92.1-C</p>
(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)	<p>Special clearances for pole-top and dead-end construction</p> <ol style="list-style-type: none"> <li>1. Conductors dead-ended in vertical configuration on poles</li> <li>2. Conductors dead-ended in horizontal configuration</li> <li>3. Conductors in pole-top construction</li> </ol>	<p>54.4-C4</p> <p>54.4-D7</p> <p>54.4-D8</p>
(ee)	Clearance requirements for certain voltage classifications	54.4-D2
(ff)	Not applicable to communication conductors	84.4-D
(gg)	<p>Clearance from crossarms may be reduced for certain conductors</p> <ol style="list-style-type: none"> <li>1. Suitably insulated leads to protected runs</li> <li>2. Leads of 0-5000 volts to equipment</li> <li>3. Leads of 0-5000 volts to cutouts or switches</li> </ol>	<p>54.4-E</p> <p>54.4-E</p> <p>58.5-C</p>
(hh)	Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts	78.3A(1)
(ii)	<p>Special Clearances Required Above Public and Private Swimming Pools:</p> <ol style="list-style-type: none"> <li>1. Supply line conductors</li> <li>2. Supply service drops</li> <li>3. Communication line conductors</li> <li>4. Communication service drops</li> <li>5. Supply guys, span wires</li> <li>6. Communication guys</li> </ol>	<p>54.4-A4</p> <p>54.8-B5</p> <p>84.4-A5</p> <p>84.8-C5</p> <p>56.4-A3</p> <p>86.4-A3</p>
(jj)	May be decreased in partial underground distribution	54.4-D2

**Original Version**  
Rule 33.3-B

33.3B Independent Ground Connections

Ground connections for equipment of any one of the types listed in Rule 33.3-A shall not be interconnected with ground connections for equipment of any other type listed therein, except:

In common neutral systems the neutral conductors of 0-750 volt supply circuits and of supply circuits of 750-5000 volts may be interconnected and grounded in accordance with the provisions of Rule 59; and

A ground connection for a set of lighting arresters may be interconnected with:

A ground connection for neutral conductor of the circuit protected by the set of lighting arresters ,

The cable sheath or body of the cable pothead where the cable conductors are connected to the circuit protected by set of lighting arresters,

Metallic conduit enclosing conductors of the circuit protected by the set of lighting arresters,

Transformer cases grounded in accordance with Rule 58.3-C3 where transformers are connected to the circuit protected by the set of lighting arresters, and

The ground connection of another set of lighting arresters, provided the circuits protected are of the same voltage classification.

Where more than two sets of lighting arresters on supply circuits of the same voltage classification are installed on a pole or structure, and their ground terminals are interconnected at the top of the ground connections, two complete and effective ground connections will be considered sufficient for the purpose of this rule. Connection to an effectively grounded cable sheath or conduit of a circuit protected by the lighting arresters will be considered as one of these two effective ground connections.

## Strikeout and Underline Version

### Rule 33.3-B

#### 33.3B Independent Ground Connections

Ground connections for equipment of any one of the types listed in Rule 33.3-A shall not be interconnected with ground connections for equipment of any other type listed therein, except:

In common neutral systems the neutral conductors of 0-750 volt supply circuits and of supply circuits of 750-~~5000~~ 22,500 volts may be interconnected and grounded in accordance with the provisions of Rule 59; and

A ground connection for a set of lighting arresters may be interconnected with:

A ground connection for neutral conductor of the circuit protected by the set of lighting arresters ,

The cable sheath or body of the cable pothead where the cable conductors are connected to the circuit protected by set of lighting arresters,

Metallic conduit enclosing conductors of the circuit protected by the set of lighting arresters,

Transformer cases grounded in accordance with Rule 58.3-C3 where transformers are connected to the circuit protected by the set of lighting arresters, and

The ground connection of another set of lighting arresters, provided the circuits protected are of the same voltage classification.

Where more than two sets of lighting arresters on supply circuits of the same voltage classification are installed on a pole or structure, and their ground terminals are interconnected at the top of the ground connections, two complete and effective ground connections will be considered sufficient for the purpose of this rule. Connection to an effectively grounded cable sheath or conduit of a circuit protected by the lighting arresters will be considered as one of these two effective ground connections.

**Final Version**  
Rule 33.3-B

33.3B Independent Ground Connections

Ground connections for equipment of any one of the types listed in Rule 33.3-A shall not be interconnected with ground connections for equipment of any other type listed therein, except:

In common neutral systems the neutral conductors of 0-750 volt supply circuits and of supply circuits of 750-22,500 volts may be interconnected and grounded in accordance with the provisions of Rule 59; and

A ground connection for a set of lighting arresters may be interconnected with:

A ground connection for neutral conductor of the circuit protected by the set of lighting arresters ,

The cable sheath or body of the cable pothead where the cable conductors are connected to the circuit protected by set of lighting arresters,

Metallic conduit enclosing conductors of the circuit protected by the set of lighting arresters,

Transformer cases grounded in accordance with Rule 58.3-C3 where transformers are connected to the circuit protected by the set of lighting arresters, and

The ground connection of another set of lighting arresters, provided the circuits protected are of the same voltage classification.

Where more than two sets of lighting arresters on supply circuits of the same voltage classification are installed on a pole or structure, and their ground terminals are interconnected at the top of the ground connections, two complete and effective ground connections will be considered sufficient for the purpose of this rule. Connection to an effectively grounded cable sheath or conduit of a circuit protected by the lighting arresters will be considered as one of these two effective ground connections.



**Original Version**  
Rule 51.6-A

51.6A Marking of Poles where conductors are not on Crossarms

Wood or Metal poles which support conductors of more than 750 volts in vertical configuration and not on crossarms shall have bands of bright yellow color not less than one foot in width painted around them. The top of such a band shall be neither less than 2 ½ feet nor more than 3 feet below the lowest conductor of each circuit of more than 750 volts so supported.

In lieu of the paint required by this rule, similarly located signs, showing the words "High Voltage" in letters not less than 3 inches in height, shall be used. The letters on such signs shall be white on a green or black background, or such signs shall be of corrosion-resisting metal with the letters cut out therefrom and clearly legible.

The provisions of this rule, 51.6-A shall not apply to the marking of poles at the levels of supply circuits of more than 20,000 volts in rural districts.

See Rule 65 for marking of Towers

## **Strikeout and Underline Version**

### Rule 51.6-A

#### 51.6A Marking of Poles where conductors are not on Crossarms

Wood or Metal poles which support conductors of more than 750 volts in vertical configuration and not on crossarms shall have bands of bright yellow color not less than one foot in width painted around them. The top of such a band shall be neither less than 2 ½ feet nor more than 3 feet below the lowest conductor of each circuit of more than 750 volts so supported.

In lieu of the paint required by this rule, similarly located signs, showing the words "High Voltage" in letters not less than 3 inches in height, shall be used. The letters on such signs shall be white on a green or black background, or such signs shall be of corrosion-resisting metal with the letters cut out therefrom and clearly legible.

The provisions of this rule, 51.6-A shall not apply to the marking of poles at the levels of supply circuits of more than 22,500 ~~20,000~~ volts in rural districts.

See Rule 65 for marking of Towers

**Final Version**

**Rule 51.6-A**

**51.6A Marking of Poles where conductors are not on Crossarms**

Wood or Metal poles which support conductors of more than 750 volts in vertical configuration and not on crossarms shall have bands of bright yellow color not less than one foot in width painted around them. The top of such a band shall be neither less than 2 ½ feet nor more than 3 feet below the lowest conductor of each circuit of more than 750 volts so supported.

In lieu of the paint required by this rule, similarly located signs, showing the words "High Voltage" in letters not less than 3 inches in height, shall be used. The letters on such signs shall be white on a green or black background, or such signs shall be of corrosion-resisting metal with the letters cut out therefrom and clearly legible.

The provisions of this rule, 51.6-A shall not apply to the marking of poles at the levels of supply circuits of more than 22,500 volts in rural districts.

See Rule 65 for marking of Towers.

**Original Version**

Rule 52.4-B2c

52.4-B2 Marking

- c) Supporting Conductors of 7500-20,000 Volts at certain Locations: At All crossings over public thoroughfares and at locations adjacent to structures such as water tanks, windmills and buildings, adjacent to wells, and at similar locations, crossarms supporting conductors of 7500-20,000 volts shall be marked as high voltage.

**Strikeout and Underline Version**

Rule 52.4-B2c

52.4-B2 Marking

- c) Supporting Conductors of 7500-~~20,000~~ 22,500 Volts at certain Locations: At All crossings over public thoroughfares and at locations adjacent to structures such as water tanks, windmills and buildings, adjacent to wells, and at similar locations, crossarms supporting conductors of 7500-~~20,000~~ 22,500 volts shall be marked as high voltage.

**Final Version**

Rule 52.4-B2c

52.4-B2 Marking

- c) Supporting Conductors of 7500-22,500 Volts at certain Locations: At All crossings over public thoroughfares and at locations adjacent to structures such as water tanks, windmills and buildings, adjacent to wells, and at similar locations, crossarms supporting conductors of 7500-22,500 volts shall be marked as high voltage.

**Original Version**

Rule 52.4-B2e

52.4-B2 Marking

- e) Supporting Conductors of 7500-20,000 Volts on the Same Structure With Conductors of 750 Volts or Less: Where, on the same structures in rural districts, crossarms supporting conductors of 7500-20,000 volts are above conductors of 750 volts or less, the crossarm supporting conductors of 7500-20,000 next above the conductors of 750 volts or less shall be marked as high voltage. All crossarms supporting conductors of 7500-20,000 volts on the same structures shall be marked as high voltage.

**Strikeout and Underline Version**

Rule 52.4-B2e

52.4-B2 Marking

- e) Supporting Conductors of 7500-~~20,000~~ 22,500 Volts on the Same Structure With Conductors of 750 Volts or Less: Where, on the same structures in rural districts, crossarms supporting conductors of 7500-~~20,000~~ 22,500 volts are above conductors of 750 volts or less, the crossarm supporting conductors of 7500-~~20,000~~ 22,500 next above the conductors of 750 volts or less shall be marked as high voltage. All crossarms supporting conductors of 7500-~~20,000~~ 22,500 volts on the same structures shall be marked as high voltage.

**Final Version**  
Rule 52.4-B2e

52.4-B2      Marking

- e)      Supporting Conductors of 7500-22,500 Volts on the Same Structure With Conductors of 750 Volts or Less: Where, on the same structures in rural districts, crossarms supporting conductors of 7500-22,500 volts are above conductors of 750 volts or less, the crossarm supporting conductors of 7500-22,500 next above the conductors of 750 volts or less shall be marked as high voltage. All crossarms supporting conductors of 7500-22,500 volts on the same structures shall be marked as high voltage.

**Original Version**  
Rule 52.4-B3

52.4-B3      On Guarded Metal Poles: On Latticed metal Poles which are guarded with barriers as required in Rule 51.6-B, the following crossarms shall be marked as high voltage:

Crossarms supporting conductors of 750-7500 volts;

Crossarms supporting conductors of 7500-20,000 volts next above the level of conductors of 7500 volts or less;

Crossarms supporting conductors of 7500-20,000 volts below the level of conductors of 7500 or less;

Crossarms supporting any conductor of more than 7500 volts within 15 feet of walls, fire escapes, exits, windows and similar objects.

Where all conductors on a latticed metal pole which is guarded carry more than 7500 volts and the lowest crossarm supporting them is not required to be marked in accordance with the foregoing provisions of this rule , the entire pole shall be marked as high voltage by means of signs placed on any two opposite sides of the pole at a point above the barrier and below the lowest conductor level.

## **Strikeout and Underline Version**

### Rule 52.4-B3

52.4-B3 On Guarded Metal Poles: On Latticed metal Poles which are guarded with barriers as required in Rule 51.6-B, the following crossarms shall be marked as high voltage:

Crossarms supporting conductors of 750-7500 volts;

Crossarms supporting conductors of 7500-~~20,000~~ 22,500 volts next above the level of conductors of 7500 volts or less;

Crossarms supporting conductors of 7500-~~20,000~~ 22,500 volts below the level of conductors of 7500 or less;

Crossarms supporting any conductor of more than 7500 volts within 15 feet of walls, fire escapes, exits, windows and similar objects.

Where all conductors on a latticed metal pole which is guarded carry more than 7500 volts and the lowest crossarm supporting them is not required to be marked in accordance with the foregoing provisions of this rule , the entire pole shall be marked as high voltage by means of signs placed on any two opposite sides of the pole at a point above the barrier and below the lowest conductor level.



**Final Version**

Rule 52.4-B3

52.4-B3 On Guarded Metal Poles: On Latticed metal Poles which are guarded with barriers as required in Rule 51.6-B, the following crossarms shall be marked as high voltage:

Crossarms supporting conductors of 750-7500 volts;

Crossarms supporting conductors of 7500-22,500 volts next above the level of conductors of 7500 volts or less;

Crossarms supporting conductors of 7500-22,500 volts below the level of conductors of 7500 or less;

Crossarms supporting any conductor of more than 7500 volts within 15 feet of walls, fire escapes, exits, windows and similar objects.

Where all conductors on a latticed metal pole which is guarded carry more than 7500 volts and the lowest crossarm supporting them is not required to be marked in accordance with the foregoing provisions of this rule , the entire pole shall be marked as high voltage by means of signs placed on any two opposite sides of the pole at a point above the barrier and below the lowest conductor level.

**Original Version**  
Rule 54.4-A1

54.4A Clearances, Above Ground

1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying 20,000-30,000 volts, inclusive, may have a clearance of less than 30 feet (Table 1, Case 4, Column F) but not less than 25 feet above ground subject to a reduction of not more than 10 per cent because of temperature and loading as specified in Rule 43. Upon special permission from the Rail Road Commission, a minimum clearance of 25 feet above ground may be applied in similar areas to circuits in excess of 30,000 volts, in which case no reduction of the 25 feet will be permitted for conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2.

**Strikeout and Underline Version**  
Rule 54.4-A1

54.4A Clearances, Above Ground

1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying ~~20,000~~22,500-30,000 volts, inclusive, may have a clearance of less than 30 feet (Table 1, Case 4, Column F) but not less than 25 feet above ground subject to a reduction of not more than 10 per cent because of temperature and loading as specified in Rule 43. Upon special permission from the Rail Road Commission, a minimum clearance of 25 feet above ground may be applied in similar areas to circuits in excess of 30,000 volts, in which case no reduction of the 25 feet will be permitted for conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2.

**Final Version**

Rule 54.4-A1

54.4A Clearances, Above Ground

1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying 22,500-30,000 volts, inclusive, may have a clearance of less than 30 feet (Table 1, Case 4, Column F) but not less than 25 feet above ground subject to a reduction of not more than 10 per cent because of temperature and loading as specified in Rule 43. Upon special permission from the Rail Road Commission, a minimum clearance of 25 feet above ground may be applied in similar areas to circuits in excess of 30,000 volts, in which case no reduction of the 25 feet will be permitted for conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2.

**Original Version**  
Rule 54.4-A2

54.4-A2 In Rural Districts, Conductors of 750-20,000 Volts:

- a) Crossing Roads or Driveways: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 3 Column E may be reduced to 22 feet above ground for conductors crossing or overhanging traversable portions of public or private roads or driveways. This modified minimum clearance of 22 feet shall in no case be reduced because of temperature or loading at conditions less than the maximum loading or temperature specified in Rules 43.1 and 43.2.
  
- b) Above Agricultural Areas Along Roads: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 4 Column E may be reduced to 18 feet above ground lines across areas capable of being traversed by agricultural equipment and along roads where no part of the line overhangs any traversable portion of a public or private roadway. This modified minimum clearance of 18 feet shall in no case be reduced because of temperature or loading at conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2. Care should be exercised in using this minimum clearance along roads, above or along ditches where mechanical devices are used for maintenance, near trees in orchards, near trees or structures which can be climbed and in other similar situations.

## Strikeout and Underline Version

### Rule 54.4-A2

54.4-A2

In Rural Districts, Conductors of 750-20,000 Volts:

- a) Crossing Roads or Driveways: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 3 Column E may be reduced to 22 feet above ground for conductors not exceeding 20,000 volts crossing or overhanging traversable portions of public or private roads or driveways. This modified minimum clearance of 22 feet shall in no case be reduced because of temperature or loading at conditions less than the maximum loading or temperature specified in Rules 43.1 and 43.2.
- b) Above Agricultural Areas Along Roads: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 4 Column E may be reduced to 18 feet above ground for lines not exceeding 20,000 volts across areas capable of being traversed by agricultural equipment and along roads where no part of the line overhangs any traversable portion of a public or private roadway. This modified minimum clearance of 18 feet shall in no case be reduced because of temperature or loading at conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2. Care should be exercised in using this minimum clearance along roads, above or along ditches where mechanical devices are used for maintenance, near trees in orchards, near trees or structures which can be climbed and in other similar situations.

**Final Version**  
Rule 54.4-A2

54.4-A2 In Rural Districts, Conductors of 750-20,000 Volts:

- a) Crossing Roads or Driveways: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 3 Column E may be reduced to 22 feet above ground for conductors not exceeding 20,000 volts crossing or overhanging traversable portions of public or private roads or driveways. This modified minimum clearance of 22 feet shall in no case be reduced because of temperature or loading at conditions less than the maximum loading or temperature specified in Rules 43.1 and 43.2.
  
- b) Above Agricultural Areas Along Roads: In rural districts the minimum clearance of 25 feet specified in Table 1, Case 4 Column E may be reduced to 18 feet above ground for lines not exceeding 20,000 volts across areas capable of being traversed by agricultural equipment and along roads where no part of the line overhangs any traversable portion of a public or private roadway. This modified minimum clearance of 18 feet shall in no case be reduced because of temperature or loading at conditions less than maximum loadings or temperature specified in Rules 43.1 and 43.2. Care should be exercised in using this minimum clearance along roads, above or along ditches where mechanical devices are used for maintenance, near trees in orchards, near trees or structures which can be climbed and in other similar situations.

**Original Version**

Rule 54.4-C4c

54.4-C4 Between Conductors Dead Ended on Pole in Vertical Configuration

- c) Conductors of More than 750 Volts supported on non-climbable pole,: Where conductors of more than 750 volts are supported in vertical configuration on non-climbable poles in partial underground distribution at line terminations, angles, or corners, the following requirements apply:

Not more than three conductors of a single circuit of 750-20,000 volts shall be supported directly on the pole in vertical configuration without the use of crossarms, Branch circuits may be taken from such construction without the use of crossarms provided that conductors are supported on not more than three sides of the pole, there being four sides (see App. G, Fig. 88);

The vertical separation between conductors shall be not less than the pin spacings specified in Table 2, Case 15;

The clearance of conductors from surface of pole shall be not less than, as specified in Rule 54.4-D2.

## Strikeout and Underline Version

### Rule 54.4-C4c

#### 54.4-C4 Between Conductors Dead Ended on Pole in Vertical Configuration

- c) Conductors of More than 750 Volts supported on non-climbable pole,: Where conductors of more than 750 volts are supported in vertical configuration on non-climbable poles in partial underground distribution at line terminations, angles, or corners, the following requirements apply:

Not more than three conductors of a single circuit of ~~750-20,000~~ 22,500 volts shall be supported directly on the pole in vertical configuration without the use of crossarms, Branch circuits may be taken from such construction without the use of crossarms provided that conductors are supported on not more than three sides of the pole, there being four sides (see App. G, Fig. 88);

The vertical separation between conductors shall be not less than the pin spacings specified in Table 2, Case 15;

The clearance of conductors from surface of pole shall be not less than, as specified in Rule 54.4-D2.



**Final Version**

Rule 54.4-C4c

54.4-C4 Between Conductors Dead Ended on Pole in Vertical Configuration

- c) Conductors of More than 750 Volts supported on non-climbable pole,: Where conductors of more than 750 volts are supported in vertical configuration on non-climbable poles in partial underground distribution at line terminations, angles, or corners, the following requirements apply:

Not more than three conductors of a single circuit of 750-22,500 volts shall be supported directly on the pole in vertical configuration without the use of crossarms, Branch circuits may be taken from such construction without the use of crossarms provided that conductors are supported on not more than three sides of the pole, there being four sides (see App. G, Fig. 88);

The vertical separation between conductors shall be not less than the pin spacings specified in Table 2, Case 15;

The clearance of conductors from surface of pole shall be not less than, as specified in Rule 54.4-D2.

**Original Version**  
Rule 54.4-D2

54.4- D      From Poles

- 2      Center Line Clearances For 750 Volts and Above: The clearances referred to in Table 1, Case 8 Columns E and F, apply as follows with respect to voltage.

750-7500volts - - - - -	15 inches
7500-46,000 volts- - - - -	18 inches
46,000 volts and above - - - - -	18 inches plus
	½ inch per kV in excess of 46kV

These clearances from center line of pole need not apply to conductors of 750-7500 volts and 7500-20,000 volts supported in vertical configuration in partial underground distribution provided: a) such conductors have clearances from surface of pole of not less than 6 inches, b) in tangent construction, conductors so supported are not attached to more than one side of pole, and c) in dead-end construction conductors so supported are not attached to more than three sides of a pole (there being four sides, see App. G, Fig. 88).

**Strikeout and Underline Version**

Rule 54.4-D2

54.4- D From Poles

- 2 Center Line Clearances For 750 Volts and Above: The clearances referred to in Table 1, Case 8 Columns E and F, apply as follows with respect to voltage.

750-7500volts	-----	15 inches
7500-46,000 volts	-----	18 inches
46,000 volts and above	-----	18 inches plus ½ inch per kV in excess of 46kV

These clearances from center line of pole need not apply to conductors of 750-7500 volts and ~~7500-20,000~~ 22,500 volts supported in vertical configuration in partial underground distribution provided: a) such conductors have clearances from surface of pole of not less than 6 inches, b) in tangent construction, conductors so supported are not attached to more than one side of pole, and c) in dead-end construction conductors so supported are not attached to more than three sides of a pole (there being four sides, see App. G, Fig. 88).

**Final Version**

**Rule 54.4-D2**

54.4- D From Poles

- 2 Center Line Clearances For 750 Volts and Above: The clearances referred to in Table 1, Case 8 Columns E and F, apply as follows with respect to voltage.

750-7500volts	-----	15 inches
7500-46,000 volts	-----	18 inches
46,000 volts and above	-----	18 inches plus
		½ inch per kV in excess of 46kV

These clearances from center line of pole need not apply to conductors of 750-7500 volts and 7500-22,500 volts supported in vertical configuration in partial underground distribution provided: a) such conductors have clearances from surface of pole of not less than 6 inches, b) in tangent construction, conductors so supported are not attached to more than one side of pole, and c) in dead-end construction conductors so supported are not attached to more than three sides of a pole (there being four sides, see App. G, Fig. 88).

**Original Version**  
Rule 54.4-D8b

54.4-D8      At Top of Pole

- b)      More than 7500 Volts: A single conductor of a circuit of more than 7500 volts may be attached directly to the top of a pole or to a crossarm at the top of a pole at a distance less than as specified in Table 1, case 8, provided no transformer or other apparatus (excepting pole-top switches or lighting arresters) carried on the pole is connected to the circuit so arranged.

Where this construction is used, all conductors of other circuits on the pole shall be not less than 6 feet below the pole-top conductor except that in rural districts the conductors of a 0-750 volt secondary circuit may be not less than 4 feet below the conductor level of such a primary circuit by means of which the secondary is supplied.

Dead ending of a conductor at top of pole under these provisions is optional with dead ending under the requirements of Rule 54.4-D7b.

## Strikeout and Underline Version

### Rule 54.4-D8b

#### 54.4-D8 At Top of Pole

- b) More than 7500 Volts: A single conductor of a circuit of more than 7500 volts may be attached directly to the top of a pole or to a crossarm at the top of a pole at a distance less than as specified in Table 1, case 8, provided no transformer or other apparatus (excepting pole-top switches or lighting arresters) carried on the pole is connected to the circuit so arranged. Except lighting arresters, a pole-top switch, or a transformer. Where a transformer is connected to a circuit so arranged, a vertical clearance of not less than 30 inches shall be maintained between the primary conductor directly above and the Unenergized metal parts of the transformer, as specified in Rule 58.3-B3e.

Where this construction is used, all conductors of other circuits on the pole shall be not less than 6 feet below the pole-top conductor except that in rural districts the conductors of a 0-750 volt secondary circuit may be not less than 4 feet below the conductor level of such a primary circuit by means of which the secondary is supplied.

Dead ending of a conductor at top of pole under these provisions is optional with dead ending under the requirements of Rule 54.4-D7b.

**Final Version**  
Rule 54.4-D8b

54.4-D8      At Top of Pole

- b)      More than 7500 Volts: A single conductor of a circuit of more than 7500 volts may be attached directly to the top of a pole or to a crossarm at the top of a pole at a distance less than as specified in Table 1, case 8, provided no apparatus carried on the pole is connected to the circuit so arranged except lighting arresters, a pole-top switch, or a transformer. Where a transformer is connected to a circuit so arranged, a vertical clearance of not less than 30 inches shall be maintained between the primary conductor directly above and the Unenergized metal parts of the transformer, as specified in Rule 58.3-B3e.

Where this construction is used, all conductors of other circuits on the pole shall be not less than 6 feet below the pole-top conductor except that in rural districts the conductors of a 0-750 volt secondary circuit may be not less than 4 feet below the conductor level of such a primary circuit by means of which the secondary is supplied.

Dead ending of a conductor at top of pole under these provisions is optional with dead ending under the requirements of Rule 54.4-D7b.

## **Original Version**

### Rule 54.4-H2

#### 54.4-H Above or Along the Sides of Buildings, Bridges and Other Structures

- 2 Attached Conductors: Unprotected conductors not exceeding 20,000 volts may be supported by attachments to buildings, bridges and other structures. To conductors of 0-750 volts so supported, the clearances of Table 1, case 7 columns B, C, and D shall apply. To conductors of 750-20,000 volts so supported a minimum horizontal clearance of 8 feet shall apply.

In lieu of these requirements for unprotected conductors, supply conductors may be installed on the surface of buildings, bridges and other structures in grounded metal conduit or other grounded sheath or grounded shield suitably protected from mechanical injury.



## **Strikeout and Underline Version**

### Rule 54.4-H2

54.4-H Above or Along the Sides of Buildings, Bridges and Other Structures

- 2 Attached Conductors: Unprotected conductors not exceeding ~~20,000~~ 22,500 volts may be supported by attachments to buildings, bridges and other structures. To conductors of 0-750 volts so supported, the clearances of Table 1, case 7 columns B, C, and D shall apply. To conductors of 750-~~20,000~~ 22,500 volts so supported a minimum horizontal clearance of 8 feet shall apply.

In lieu of these requirements for unprotected conductors, supply conductors may be installed on the surface of buildings, bridges and other structures in grounded metal conduit or other grounded sheath or grounded shield suitably protected from mechanical injury.

**Final Version**

Rule 54.4-H2

54.4-H Above or Along the Sides of Buildings, Bridges and Other Structures

- 2 Attached Conductors: Unprotected conductors not exceeding 22,500 volts may be supported by attachments to buildings, bridges and other structures. To conductors of 0-750 volts so supported, the clearances of Table 1, case 7 columns B, C, and D shall apply. To conductors of 750-22,500 volts so supported a minimum horizontal clearance of 8 feet shall apply.

In lieu of these requirements for unprotected conductors, supply conductors may be installed on the surface of buildings, bridges and other structures in grounded metal conduit or other grounded sheath or grounded shield suitably protected from mechanical injury.

## **Original Version**

### Rule 54.4I

#### 54.4I Under or Through Bridges, Viaducts or Similar Structures

Unprotected supply conductors which pass unattached under bridges, viaducts or other structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6 incl.; at clearances from walls and underneath parts of such structures as specified in Table 1, Case 7; and at clearances from conductors of other classifications as specified in Table 2, Case 3.

Conductors of 0-20,000 volts, passing under or through bridges, viaducts or similar structures, may be attached thereto in accordance with the provision of Rule 54.4-H2. Warning signs of a substantial character with letters not less than 3 inches in height reading "High Voltage" for voltages in excess of 750 volts shall be placed conspicuously on each crossarm or structural member supporting the conductors.

In lieu of these requirements for unprotected conductors, supply conductors which cross under bridges, viaducts or other structures shall be enclosed in grounded metal conduit or in other effectively grounded sheath or grounded shield suitably protected from mechanical injury.

## **Strikeout and Underline Version**

### Rule 54.4I

#### 54.4I Under or Through Bridges, Viaducts or Similar Structures

Unprotected supply conductors which pass unattached under bridges, viaducts or other structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6 incl.; at clearances from walls and underneath parts of such structures as specified in Table 1, Case 7; and at clearances from conductors of other classifications as specified in Table 2, Case 3.

Conductors of 0-~~20,000~~ 22,500 volts, passing under or through bridges, viaducts or similar structures, may be attached thereto in accordance with the provision of Rule 54.4-H2. Warning signs of a substantial character with letters not less than 3 inches in height reading "High Voltage" for voltages in excess of 750 volts shall be placed conspicuously on each crossarm or structural member supporting the conductors.

In lieu of these requirements for unprotected conductors, supply conductors which cross under bridges, viaducts or other structures shall be enclosed in grounded metal conduit or in other effectively grounded sheath or grounded shield suitably protected from mechanical injury.

## **Final Version**

### **Rule 54.4I**

#### **54.4I Under or Through Bridges, Viaducts or Similar Structures**

Unprotected supply conductors which pass unattached under bridges, viaducts or other structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6 incl.; at clearances from walls and underneath parts of such structures as specified in Table 1, Case 7; and at clearances from conductors of other classifications as specified in Table 2, Case 3.

Conductors of 0-22,500 volts, passing under or through bridges, viaducts or similar structures, may be attached thereto in accordance with the provision of Rule 54.4-H2. Warning signs of a substantial character with letters not less than 3 inches in height reading "High Voltage" for voltages in excess of 750 volts shall be placed conspicuously on each crossarm or structural member supporting the conductors.

In lieu of these requirements for unprotected conductors, supply conductors which cross under bridges, viaducts or other structures shall be enclosed in grounded metal conduit or in other effectively grounded sheath or grounded shield suitably protected from mechanical injury.

**Original Version**  
Rule 54.6-F

54.6 Vertical and Lateral Conductors

F Terminals of Encased Riser and Runs

Terminals of risers or runs shall not extend above the level of line conductors to which the terminal leads are connected except as follows:

Where the line conductors are installed in vertical configuration in partial underground distribution, or where the line conductors are dead-ended on the opposite side of the arms from the terminals and no line conductors supported on the same crossarm and the same side of pole extend past the terminals and no buckram construction is involved, or

Where conductors in excess of 7500 volts are installed in vertical configuration on crossarms, and the terminals are mounted on the same arms which support the conductors to which the terminals are connected.

At the upper end of vertical runs or risers on wood poles, any terminal or terminal fitting within distances from center line of poles less than as specified in Table 1, Case 8, shall be protected by a crossarm or wood block placed above it at a distance not exceeding 4 inches. The wood block may be omitted if the terminal or terminal fitting at the upper end of a vertical run or riser of 750 volts or less is on the same side of a pole as, and not more than 1 foot below a transformer or where the conductors of a vertical run or riser are enclosed in plastic pipe (sec Rule 22.2-C) and do not terminate in a grounded terminal or terminal fitting.

Cable or conduit bends and the terminals of riser or runs of conductors of more than 750 volts on climbable poles or structures shall be arranged with as little exposed surface as practicable but are not required to be covered by a protective covering provided that no portion of the terminal or associated unprotected conductors are within the climbing space or within the clearance from center line of pole specified in Table 1, case 8 (15 or 18

inches). All exposed grounded surfaces of such terminal fittings and bends of risers and runs shall not be less than 18 inches vertically above the conductor level, and not less than 2 feet radially from any conductor at the next conductor level, of unprotected conductors of another circuit which is entirely below the level of the circuit to which the riser is connected.

The terminal fittings of risers or runs of conductors of 0-750 volts installed on the surfaces of poles shall be within the climbing space and unprotected leads to or from such terminals shall not pass within the climbing space but may have a clearance of less than 15 inches from center line of pole (Table 1, Case 8) and less than 3 inches from the surface of pole or crossarm (Table 1, Case 9). It is recommended that conductors from such terminal fittings be suitably installed and, where practicable, carried as protected lateral runs on the bottom surface of crossarms (see Rule 54.6-C)

In partial underground distribution (750-20,000 volts in vertical configuration on non-climbable poles), energized portions of the terminals may be less than the clearances from center line of pole specified in Table 1, Case 8, Column E (15 or 18 inches) but shall be not less than 6 inches from the surface of the non-climbable metal pole and grounded metal surfaces associated therewith.

The Vertical clearances between the lowest point of lead wires of a riser or run (vertical or lateral) and the next conductor level below shall conform to the requirements specified in Rule 54.4-C6.

See App. G, Fig. 61

## **Strikeout and Underline Version**

### Rule 54.6-F

#### 54.6 Vertical and Lateral Conductors

##### F Terminals of Encased Riser and Runs

Terminals of risers or runs shall not extend above the level of line conductors to which the terminal leads are connected except as follows:

Where the line conductors are installed in vertical configuration in partial underground distribution, or where the line conductors are dead-ended on the opposite side of the arms from the terminals and no line conductors supported on the same crossarm and the same side of pole extend past the terminals and no buckram construction is involved, or

Where conductors in excess of 7500 volts are installed in vertical configuration on crossarms, and the terminals are mounted on the same arms which support the conductors to which the terminals are connected.

At the upper end of vertical runs or risers on wood poles, any terminal or terminal fitting within distances from center line of poles less than as specified in Table 1, Case 8, shall be protected by a crossarm or wood block placed above it at a distance not exceeding 4 inches. The wood block may be omitted if the terminal or terminal fitting at the upper end of a vertical run or riser of 750 volts or less is on the same side of a pole as, and not more than 1 foot below a transformer or where the conductors of a vertical run or riser are enclosed in plastic pipe (sec Rule 22.2-C) and do not terminate in a grounded terminal or terminal fitting.

Cable or conduit bends and the terminals of riser or runs of conductors of more than 750 volts on climbable poles or structures shall be arranged with as little exposed surface as practicable but are not required to be covered by a protective covering provided that no portion of the terminal or associated unprotected conductors are within the climbing space or within the clearance



from center line of pole specified in Table 1, case 8 (15 or 18 inches). All exposed grounded surfaces of such terminal fittings and bends of risers and runs shall not be less than 18 inches vertically above the conductor level, and not less than 2 feet radially from any conductor at the next conductor level, of unprotected conductors of another circuit which is entirely below the level of the circuit to which the riser is connected.

The terminal fittings of risers or runs of conductors of 0-750 volts installed on the surfaces of poles shall be within the climbing space and unprotected leads to or from such terminals shall not pass within the climbing space but may have a clearance of less than 15 inches from center line of pole (Table 1, Case 8) and less than 3 inches from the surface of pole or crossarm (Table 1, Case 9). It is recommended that conductors from such terminal fittings be suitably installed and, where practicable, carried as protected lateral runs on the bottom surface of crossarms (see Rule 54.6-C)

In partial underground distribution (~~750-20,000~~ 22,500 volts in vertical configuration on non-climbable poles), energized portions of the terminals may be less than the clearances from center line of pole specified in Table 1, Case 8, Column E (15 or 18 inches) but shall be not less than 6 inches from the surface of the non-climbable metal pole and grounded metal surfaces associated therewith.

The Vertical clearances between the lowest point of lead wires of a riser or run (vertical or lateral) and the next conductor level below shall conform to the requirements specified in Rule 54.4-C6.

See App. G, Fig. 61

## **Final Version**

### **Rule 54.6-F**

#### **54.6 Vertical and Lateral Conductors**

##### **F Terminals of Encased Riser and Runs**

Terminals of risers or runs shall not extend above the level of line conductors to which the terminal leads are connected except as follows:

Where the line conductors are installed in vertical configuration in partial underground distribution, or where the line conductors are dead-ended on the opposite side of the arms from the terminals and no line conductors supported on the same crossarm and the same side of pole extend past the terminals and no buckram construction is involved, or

Where conductors in excess of 7500 volts are installed in vertical configuration on crossarms, and the terminals are mounted on the same arms which support the conductors to which the terminals are connected.

At the upper end of vertical runs or risers on wood poles, any terminal or terminal fitting within distances from center line of poles less than as specified in Table 1, Case 8, shall be protected by a crossarm or wood block placed above it at a distance not exceeding 4 inches. The wood block may be omitted if the terminal or terminal fitting at the upper end of a vertical run or riser of 750 volts or less is on the same side of a pole as, and not more than 1 foot below a transformer or where the conductors of a vertical run or riser are enclosed in plastic pipe (sec Rule 22.2-C) and do not terminate in a grounded terminal or terminal fitting.

Cable or conduit bends and the terminals of riser or runs of conductors of more than 750 volts on climbable poles or structures shall be arranged with as little exposed surface as practicable but are not required to be covered by a protective covering provided that no portion of the terminal or associated unprotected conductors are within the climbing space or within the clearance from center line of pole specified in Table 1, case 8 (15 or 18

inches). All exposed grounded surfaces of such terminal fittings and bends of risers and runs shall not be less than 18 inches vertically above the conductor level, and not less than 2 feet radially from any conductor at the next conductor level, of unprotected conductors of another circuit which is entirely below the level of the circuit to which the riser is connected.

The terminal fittings of risers or runs of conductors of 0-750 volts installed on the surfaces of poles shall be within the climbing space and unprotected leads to or from such terminals shall not pass within the climbing space but may have a clearance of less than 15 inches from center line of pole (Table 1, Case 8) and less than 3 inches from the surface of pole or crossarm (Table 1, Case 9). It is recommended that conductors from such terminal fittings be suitably installed and, where practicable, carried as protected lateral runs on the bottom surface of crossarms (see Rule 54.6-C)

In partial underground distribution (750-22,500 volts in vertical configuration on non-climbable poles), energized portions of the terminals may be less than the clearances from center line of pole specified in Table 1, Case 8, Column E (15 or 18 inches) but shall be not less than 6 inches from the surface of the non-climbable metal pole and grounded metal surfaces associated therewith.

The Vertical clearances between the lowest point of lead wires of a riser or run (vertical or lateral) and the next conductor level below shall conform to the requirements specified in Rule 54.4-C6.

See App. G, Fig. 61

**Original Version**  
Rule 56.4-E

56.4E From Poles

Where passing guys are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than 20,000 volts supported on the same pole, such guys shall be sectionalized, in addition to the normal sectionalization required by Rule 56.6, by means of insulators in accordance with Rule 56.6-A as though attached to the pole or structure.

**Strikeout and Underline Version**  
Rule 56.4-E

56.4E From Poles

Where passing guys are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than ~~20,000~~ 22,500 volts supported on the same pole, such guys shall be sectionalized, in addition to the normal sectionalization required by Rule 56.6, by means of insulators in accordance with Rule 56.6-A as though attached to the pole or structure.

**Final Version**  
Rule 56.4-E

56.4E From Poles

Where passing guys are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than 22,500 volts supported on the same pole, such guys shall be sectionalized, in addition to the normal sectionalization required by Rule 56.6, by means of insulators in accordance with Rule 56.6-A as though attached to the pole or structure.

**Original Version**  
Rule 56.6

56.6 Requirements for sectionalizing with Insulators

- A Guys in Proximity to Supply Conductors of Less Than 20,000 Volts  
(See Rule 21.3-D for definition of proximity and Fig 45 of App. G)

All portions of guys within both a vertical distance of 8 feet from the level of supply conductors of less than 20,000 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7.

- B Guys To Arms Supporting Conductors of Less Than 20,000 Volts

All portions of arm guys within 6 feet of points of attachment to wood crossarms, or metal crossarms on wood poles, shall not be grounded if the crossarms support supply conductors of less than 20,000 volts. Where necessary to avoid the grounding of such portions, arm guys shall be sectionalized by means of insulators at locations as specified in Rule 56.7.

- C Underground Overhead Guys

All overhead guys which are not grounded (by means of ground wires, grounded anchor guys, attachment to grounded metal poles, or otherwise) shall be sectionalized at the locations measured from each attachment to poles or structures, as specified in Rule 56.7-A (6 feet to 9 feet from attachments).

- D Guys Exposed to 20,000 Volts or More

Guys exposed to conductors of 20,000 volts or more (see App. G, Fig. 52) shall not be sectionalized and shall have their lower ends securely grounded (by means of ground wires, anchor guys, or attachments to securely grounded metal poles or structures). Excepted from the above requirements are:

Guys which are required to be sectionalized in accordance with Rule 56.6-A because of proximity of wood poles and supply conductors of less than 20,000 volts or in accordance with Rule 56.6-B; and

Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for lightning conditions.

E Guys Attached To Grounded Poles or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 56.6-A because of proximity to supply conductors of less than 20,000 volts supported on wood poles, or by Rule 56.6-B.

## Strikeout and Underline Version

### Rule 56.6

#### 56.6 Requirements for sectionalizing with Insulators

- A Guys in Proximity to Supply Conductors of Less Than ~~20,000~~ 22,500 Volts (See Rule 21.3-D for definition of proximity and Fig 45 of App. G)

All portions of guys within both a vertical distance of 8 feet from the level of supply conductors of less than ~~20,000~~ 22,500 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7.

- B Guys To Arms Supporting Conductors of Less Than ~~20,000~~ 22,500 Volts

All portions of arm guys within 6 feet of points of attachment to wood crossarms, or metal crossarms on wood poles, shall not be grounded if the crossarms support supply conductors of less than ~~20,000~~ 22,500 volts. Where necessary to avoid the grounding of such portions, arm guys shall be sectionalized by means of insulators at locations as specified in Rule 56.7.

- C Underground Overhead Guys

All overhead guys which are not grounded (by means of ground wires, grounded anchor guys, attachment to grounded metal poles, or otherwise) shall be sectionalized at the locations measured from each attachment to poles or structures, as specified in Rule 56.7-A (6 feet to 9 feet from attachments).

- D Guys Exposed to ~~20,000~~ 22,500 Volts or More

Guys exposed to conductors of ~~20,000~~ 22,500 volts or more (see App. G, Fig. 52) shall not be sectionalized and shall have their lower ends securely grounded (by means of ground wires, anchor guys, or attachments to securely grounded metal poles or structures). Excepted from the above requirements are:

Guys which are required to be sectionalized in accordance with Rule 56.6-A because of proximity of wood poles and supply conductors of less than ~~20,000~~ 22,500 volts or in accordance with Rule 56.6-B; and

Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for lightning conditions.

E Guys Attached To Grounded Poles or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 56.6-A because of proximity to supply conductors of less than ~~20,000~~ 22,500 volts supported on wood poles, or by Rule 56.6-B.



## Final Version

### Rule 56.6

#### 56.6 Requirements for sectionalizing with Insulators

- A Guys in Proximity to Supply Conductors of Less Than 22,500 Volts  
(See Rule 21.3-D for definition of proximity and Fig 45 of App. G)

All portions of guys within both a vertical distance of 8 feet from the level of supply conductors of less than 22,500 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7.

- B Guys To Arms Supporting Conductors of Less Than 22,500 Volts

All portions of arm guys within 6 feet of points of attachment to wood crossarms, or metal crossarms on wood poles, shall not be grounded if the crossarms support supply conductors of less than 22,500 volts. Where necessary to avoid the grounding of such portions, arm guys shall be sectionalized by means of insulators at locations as specified in Rule 56.7.

- C Underground Overhead Guys

All overhead guys which are not grounded (by means of ground wires, grounded anchor guys, attachment to grounded metal poles, or otherwise) shall be sectionalized at the locations measured from each attachment to poles or structures, as specified in Rule 56.7-A (6 feet to 9 feet from attachments).

- D Guys Exposed to 22,500 Volts or More

Guys exposed to conductors of 22,500 volts or more (see App. G, Fig. 52) shall not be sectionalized and shall have their lower ends securely grounded (by means of ground wires, anchor guys, or attachments to securely grounded metal poles or structures). Excepted from the above requirements are:

Guys which are required to be sectionalized in accordance with Rule 56.6-A because of proximity of wood poles and

supply conductors of less than 22,500 volts or in accordance with Rule 56.6-B; and

Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for lightning conditions.

E Guys Attached To Grounded Poles or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 56.6-A because of proximity to supply conductors of less than 22,500 volts supported on wood poles, or by Rule 56.6-B.

**Original Rule**  
Rule 58.3-B3e

58.3-B3 Above Ground

New Rule

**Strikeout and Underline Rule**  
Rule 58.3-B3e

58.3-B3 Above Ground

e From 7500-22,500 Volt conductor Above: The clearance between unenergized metal parts of transformers and 7500-22,500 volt conductors above shall be not less than 18 inches vertically or 18 inches horizontally except that the vertical clearance shall be not less than 30 inches from a conductor at the top of pole as in Rule 54.4-Db8.

**Final Rule**  
Rule 58.3-B3e

58.3-B3 Above Ground

e From 7500-22,500 Volt conductor Above: The clearance between unenergized metal parts of transformers and 7500-22,500 volt conductors above shall be not less than 18 inches vertically or 18 inches horizontally except that the vertical clearance shall be not less than 30 inches from a conductor at the top of pole as in Rule 54.4-Db8.

**Original Rule**

Rule 58.3-E

58.3 Transformers

E New Rule

**Strikeout and Underline Rule**

Rule 58.3-E

58.3 Transformers

E Connections Between Windings

Any metallic connection between the primary and secondary windings of a distribution transformer (as in common neutral systems) shall be made externally and not within the transformer case.

**Final Rule**

Rule 58.3-E

58.3 Transformers

E Connections Between Windings

Any metallic connection between the primary and secondary windings of a distribution transformer (as in common neutral systems) shall be made externally and not within the transformer case.

**Original Version**  
Rule 59.2

59.2 Applicability

The following rules cover certain special details for common neutral systems where the neutral conductor is common to primary circuits of less than 5,000 volts and secondary circuits of 0-750 volts supplied therefrom. These rules are supplemental to the rules given for supply lines in general and to other detailed construction requirements for supply lines.

**Strikeout and Underline Version**  
Rule 59.2

59.2 Applicability

The following rules cover certain special details for common neutral systems where the neutral conductor is common to primary circuits of less than ~~5,000~~ 22,500 volts and secondary circuits of 0-750 volts supplied therefrom. These rules are supplemental to the rules given for supply lines in general and to other detailed construction requirements for supply lines.

**Final Version**  
Rule 59.2

59.2 Applicability

The following rules cover certain special details for common neutral systems where the neutral conductor is common to primary circuits of less than 22,500 volts and secondary circuits of 0-750 volts supplied therefrom. These rules are supplemental to the rules given for supply lines in general and to other detailed construction requirements for supply lines.

**Original Version**

Rule 59.3B

59.3 B Size

In common neutral systems the common neutral line conductor shall have a cross-sectional area approximately 50 percent or more of the area of the largest related primary phase conductor, as set forth in Table No. 14 and in no case shall have less conductivity or mechanical strength than No. 6 AWG medium-hard-drawn copper wire.

Table 14

Relative Sizes of Common Neutral System Line Conductors

Size of Primary phase conductor (cir mils or AWG)	Minimum size of neutral conductor (AWG)
500,000	4/0
350,000	3/0
250,000	2/0
4/0	1/0
3/0	1
2/0	2
1/0	3
1	3
2	6
4	6
5	6

This Table is based on the requirement that the common neutral line conductor shall have a minimum area of approximately 50 per cent of the area of the largest related primary phase conductor and that the phase and neutral conductors are of the same material. Where these are not of the same material, the copper conductance equivalents of the table will be considered as meeting the requirements.

## Strikeout and Underline Version

### Rule 59.3B

#### 59.3 B Size

In common neutral systems the common neutral line conductor shall have a cross-sectional area approximately 50 percent or more of the area of the largest related primary phase conductor, as set forth in Table No. 14 and in no case shall have less conductivity or mechanical strength than No. 6 AWG medium-hard-drawn copper wire.

Table 14

Relative Sizes of Common Neutral System Line Conductors

Size of Primary phase conductor (cir mils or AWG)	Minimum size of neutral conductor (AWG)
<u>715,500</u>	<u>350,000</u>
500,000	4/0
350,000	3/0
250,000	2/0
4/0	1/0
3/0	1
2/0	2
1/0	3
1	3
2	6
4	6
5	6

This Table is based on the requirement that the common neutral line conductor shall have a minimum area of approximately 50 per cent of the area of the largest related primary phase conductor and that the phase and neutral conductors are of the same material. Where these are not of the same material, the copper conductance equivalents of the table will be considered as meeting the requirements.

**Final Version**  
Rule 59.3B

59.3 B      Size

In common neutral systems the common neutral line conductor shall have a cross-sectional area approximately 50 percent or more of the area of the largest related primary phase conductor, as set forth in Table No. 14 and in no case shall have less conductivity or mechanical strength than No. 6 AWG medium-hard-drawn copper wire.

Table 14  
Relative Sizes of Common Neutral System Line Conductors

Size of Primary phase conductor (cir mils or AWG)	Minimum size of neutral conductor (AWG)
715,000	350,000
500,000	4/0
350,000	3/0
250,000	2/0
4/0	1/0
3/0	1
2/0	2
1/0	3
1	3
2	6
4	6
5	6

This Table is based on the requirement that the common neutral line conductor shall have a minimum area of approximately 50 per cent of the area of the largest related primary phase conductor and that the phase and neutral conductors are of the same material. Where these are not of the same material, the copper conductance equivalents of the table will be considered as meeting the requirements.



## **Original Version**

### Rule 59.3-D

#### 59.3-D Neutral Conductors

The arrangement and continuity of common neutral conductors shall conform to the following requirements:

Wherever existing plant permits, cross ties of the neutral conductor shall be made to form a continuous interconnected grid network. From each grid section there shall be two or more separate and continuous metallic return conductors to the source of supply.

If two return conductors only are used, each shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area. (See Table No. 14 of Rule 59.3-B for minimum sizes.)

If more than two return conductors are used, the current-carrying capacity of the return system shall be such that a break in any one path shall leave two or more return paths which, combined, shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area, thus providing adequate current-carrying capacity for full load current. (see Table No. 14 of Rule 59.3-B for minimum sizes.)

Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they are of sufficient current-carrying capacity as specified in Rule 59.3-B and provided that they are grounded throughout in accordance with the requirements for common neutral line conductors as specified in Rule 59.4-B. Primary or secondary neutral line conductors so used shall be carried in their normal primary or secondary positions respectively.

## Strikeout and Underline Version

### Rule 59.3-D

#### 59.3-D Neutral Conductors

The arrangement and continuity of common neutral conductors shall conform to the following requirements:

~~Wherever existing plant permits, c~~Cross ties of the neutral conductor shall be made to form a continuous interconnected grid network; and ~~From each grid section~~ there shall be two or more separate and continuous metallic return conductors from the grid network to the substation constituting ~~to~~ the source of supply thereto.

If two return conductors only are used, each shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area. (See Table No. 14 of Rule 59.3-B for minimum sizes.)

If more than two return conductors are used, the current-carrying capacity of the return system shall be such that a break in any one path shall leave two or more return paths which, combined, shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area, thus providing adequate current-carrying capacity for full load current. (see Table No. 14 of Rule 59.3-B for minimum sizes.)

Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they are of sufficient current-carrying capacity as specified in Rule 59.3-B and provided that they are grounded throughout in accordance with the requirements for common neutral line conductors as specified in Rule 59.4-B. Primary or secondary neutral line conductors so used shall be carried in their normal primary or secondary positions respectively.

## **Final Version**

### **Rule 59.3-D**

#### **59.3-D Neutral Conductors**

The arrangement and continuity of common neutral conductors shall conform to the following requirements:

Cross ties of the neutral conductor shall be made to form a continuous interconnected grid network and there shall be two or more separate and continuous metallic return conductors from the grid network to the substation constituting the source of supply thereto.

If two return conductors only are used, each shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area. (See Table No. 14 of Rule 59.3-B for minimum sizes.)

If more than two return conductors are used, the current-carrying capacity of the return system shall be such that a break in any one path shall leave two or more return paths which, combined, shall have a minimum area of approximately 50 per cent of the area of the primary phase conductor of the largest overhead feeder serving the area, thus providing adequate current-carrying capacity for full load current. (see Table No. 14 of Rule 59.3-B for minimum sizes.)

Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they are of sufficient current-carrying capacity as specified in Rule 59.3-B and provided that they are grounded throughout in accordance with the requirements for common neutral line conductors as specified in Rule 59.4-B. Primary or secondary neutral line conductors so used shall be carried in their normal primary or secondary positions respectively.

**Original Version**  
Rule 59.4-A2

59.4-A      Material and Size

2      Grounding Electrodes: Ground electrodes on common neutral systems shall conform to the following specifications as a minimum:

- a)      Not part of a water system; Ground electrodes which are not part of a water system shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical qualities) 5/8 inch in diameter by 8 feet in length and driven to a minimum depth of 8 feet below the surface of the ground.

The driven ground rod, pipe, or equivalent shall be located not less than 2 feet from the surface of the pole. Where two or more such rods are installed, they shall be located at not less than 6-foot centers and separation required from the surface of the pole shall not be held to apply to the connection between rods.

- b)      Part of a water system: Where ground conductors are attached directly to a water pipe system, they shall be connected on the main line side of any water metering equipment.

## Strikeout and Underline Version

### Rule 59.4-A2

#### 59.4-A Material and Size

2 Grounding Electrodes: Ground electrodes on common neutral systems shall conform to the following specifications as a minimum:

a) ~~Not part of a water system;~~ Ground electrodes which are not part of a water system shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical qualities properties) not less than 5/8 inch in diameter by 8 feet in length and driven to a minimum depth of 8 feet below the surface of the ground. Pole-butt plates or wrappings shall not be used either in lieu of the aforesaid rods or pipes or as electrodes supplementary thereto.

The driven ground rod, pipe, or equivalent shall be located not less than 2 feet from the surface of the pole. Where two or more such rods are installed, they shall be located at not less than 6-foot centers and separation required from the surface of the pole shall not be held to apply to the connection between rods.

b) ~~Part of a water system: Where ground conductors are attached directly to a water pipe system, they shall be connected on the main line side of any water metering equipment.~~

**Final Version**

Rule 59.4-A2

59.4-A Material and Size

- 2 Grounding Electrodes: Ground electrodes on common neutral systems shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical properties) not less than 5/8 inch in diameter by 8 feet in length and driven to a minimum depth of 8 feet below the surface of the ground. Pole-butt plates or wrappings shall not be used either in lieu of the aforesaid rods or pipes or as electrodes supplementary thereto.

The driven ground rod, pipe, or equivalent shall be located not less than 2 feet from the surface of the pole. Where two or more such rods are installed, they shall be located at not less than 6-foot centers and separation required from the surface of the pole shall not be held to apply to the connection between rods.

**Original Version**  
Rule 59.4-B1

59.4 B      Neutral Conductors

- 1      Location: The common neutral grid system shall be grounded at intervals not greater than 1500 feet. On branch circuits extending from a grid, where return loop paths are not available, the common neutral line conductor shall be grounded at intervals not greater than 800 feet. Each transformer installation on a branch circuit without a loop return shall be so located that there will be one or more metallic water pipe system grounds, each of a resistance not greater than 3 ½ ohms, on each side of the transformer installation.

**Strikeout and Underline Version**  
Rule 59.4-B1

59.4 B      Neutral Conductors

- 1      Location: The common neutral grid system shall be grounded at intervals not greater than ~~1500~~ 1000 feet. On branch circuits extending from a grid, where return loop paths are not available, the common neutral line conductor shall be grounded at intervals not greater than ~~800~~ 500 feet. Each transformer installation on a branch circuit without a loop return shall be so located that there will be not less than ~~one or more~~ metallic water pipe system grounds, each of a resistance not greater than 3 ½ ohms, on each side of the transformer installation.

**Final Version**

Rule 59.4-B1

59.4 B Neutral Conductors

- 1 Location: The common neutral grid system shall be grounded at intervals not greater than 1000 feet. On branch circuits extending from a grid, where return loop paths are not available, the common neutral line conductor shall be grounded at intervals not greater than 500 feet. Each transformer installation on a branch circuit without a loop return shall be so located that there will be not less than one grounds, each of a resistance not greater than  $3 \frac{1}{2}$  ohms, on each side of the transformer installation.



**Original Version**  
Rule 59.4-C

59.4 Grounding

C Transformers

Ground conductors of Transformers on common neutral systems shall conform to the requirements of Rule 59.4-A1.

On common neutral systems, each transformer installation on a branch circuit without a loop return shall be so located that there will be one or more metallic water pipe systems grounds of a resistance not greater than 3 ½ ohms on each side of the transformers installation.

A transformer installation located on a grid section of a common neutral system requires no independent ground provided that there is a ground connection, having a resistance not in excess of 3 ½ ohms, to the common neutral line conductor either at the transformer pole or at an adjacent pole.

**Strikeout and Underline Version**  
Rule 59.4-C

59.4 Grounding

C Transformers

Ground conductors of Transformers on common neutral systems shall conform to the requirements of Rule 59.4-A1.

On common neutral systems, each transformer installation on a branch circuit without a loop return shall be so located that there will be not less than ~~one or more metallic water pipe systems grounds~~ ground of a resistance not greater than 3 ½ ohms on each side of the transformers installation.

A transformer installation located on a grid section of a common neutral system requires no independent ground provided that there is a ground connection, having a resistance not in excess of 3 ½ ohms, to the common neutral line conductor either at the transformer pole or at an adjacent pole.

**Final version**  
Rule 59.4-C

59.4 Grounding

C Transformers

Ground conductors of Transformers on common neutral systems shall conform to the requirements of Rule 59.4-A1.

On common neutral systems, each transformer installation on a branch circuit without a loop return shall be so located that there will be not less than one ground of a resistance not greater than 3 ½ ohms on each side of the transformers installation.

A transformer installation located on a grid section of a common neutral system requires no independent ground provided that there is a ground connection, having a resistance not in excess of 3 ½ ohms, to the common neutral line conductor either at the transformer pole or at an adjacent pole.

**Original Version**

Rule 86.4-E

86.4-E From Poles

Where guys passing poles supporting supply conductors are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than 20,000 volts supported on such pole, the guys shall be sectionalized, in addition to the normal sectionalization required by Rule 86.6, by means of insulators in accordance with Rule 86.6-B2 as though attached to the pole or structure.

**Strikeout and Underline Version**

Rule 86.4-E

86.4-E From Poles

Where guys passing poles supporting supply conductors are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than ~~20,000~~ 22,500 volts supported on such pole, the guys shall be sectionalized, in addition to the normal sectionalization required by Rule 86.6, by means of insulators in accordance with Rule 86.6-B2 as though attached to the pole or structure.

**Final Version**

Rule 86.4-E

86.4-E From Poles

Where guys passing poles supporting supply conductors are less than 15 inches from surface of pole and less than 8 feet below supply conductors of less than 22,500 volts supported on such pole, the guys shall be sectionalized, in addition to the normal sectionalization required by Rule 86.6, by means of insulators in accordance with Rule 86.6-B2 as though attached to the pole or structure.

**Original Version**  
Rule 86.6

86.6 Sectionalizing and Grounding Requirements

The general requirements governing the sectionalizing of guys by means of insulators are based upon the exposure or proximity of the guys to supply conductors. For definitions of guys exposed and guys in proximity to supply conductors see Rules 21.3-C and D respectively (see also App. G, Figs. 44 and 45). The following requirements shall apply to the treatment and sectionalizing of guys.

A Where Not Exposed To Supply Conductors

Guys attached to or passing poles or structures supporting only communication conductors need not be sectionalized or grounded provided such guys are not exposed to supply conductors of 250-20,000 volts and are not in proximity to supply conductors of 0-20,000 volts.

B Sectionalized Because Of Exposure Or Proximity To Supply Conductors:

- (1) Overhead Guys Exposed To Supply Conductors Of 250-20,000 Volts: Ungrounded overhead guys which are exposed to supply conductors of 250-20,000 volts, and which are not in proximity to supply conductors of 0-20,000 volts shall be sectionalized by means of insulators located as specified in Rule 86.7-A1 (see App. G, Fig. 44).
- (2) Guys In Proximity: Every overhead or anchor guy, any portion of which is in proximity to a wood pole and supply conductors of 0-20,000 volts (see App. G, Figs 45, 48 and 49) shall be sectionalized by means of insulators as specified in Rule 86.7-A2 or Rule 86.7-B and no portion in proximity to such supply conductors shall be grounded. Excepted from this requirement are anchor guys, and grounded overhead guys, which are attached to poles at a level less than 8 feet but not less than 6 feet below the level of supply conductors provided the level of the guy attachment is at or below the level of communication cable messenger attached to the same pole (see App. G, Figs 48a and 49f). Also excepted from this requirement are anchor guys, and grounded overhead guys, which are attached to poles at a level less than 6

feet but not less than 4 feet below the level of supply conductors of 0-750 volts provided such guys are extensions of or attached to a cable messenger, are in the same vertical plane (or extension thereof) as the messenger, and are below the guard arms required by Rule 87.7-B for such a messenger (see App. G, Fig. 48a).

C Exposed To Supply Conductors Of More Than 20,000 Volts

Portions of guys exposed to supply conductors of more than 20,000 volts shall be securely grounded and such guys need not be sectionalized, unless sectionalization is required by Rule 86.6-B2 because of proximity to supply conductors of 0-20,000 volts. (See App. G, Fig. 52c.)

D Guys Attached To Grounded Poles Or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 86.6-B2 because of proximity to supply conductors of less than 20,000 volts supported on wood poles.

E Anchor Guys Through Supply Conductor Levels

An anchor guy which passes through the level of supply conductors at positions other than between pole pin positions or outside of the outer pin positions shall have insulators above and below the level of supply conductors at locations as specified in Rule 86.7-B. (See App. G, Fig. 49d.)

## Strikeout and Underline Version

### Rule 86.6

#### 86.6 Sectionalizing and Grounding Requirements

The general requirements governing the sectionalizing of guys by means of insulators are based upon the exposure or proximity of the guys to supply conductors. For definitions of guys exposed and guys in proximity to supply conductors see Rules 21.3-C and D respectively (see also App. G, Figs. 44 and 45). The following requirements shall apply to the treatment and sectionalizing of guys.

##### A Where Not Exposed To Supply Conductors

Guys attached to or passing poles or structures supporting only communication conductors need not be sectionalized or grounded provided such guys are not exposed to supply conductors of 250-~~20,000~~ 22,500 volts and are not in proximity to supply conductors of 0-~~20,000~~ 22,500 volts.

##### B Sectionalized Because Of Exposure Or Proximity To Supply Conductors:

- (1) Overhead Guys Exposed To Supply Conductors Of 250-~~20,000~~ 22,500 Volts: Ungrounded overhead guys which are exposed to supply conductors of 250-~~20,000~~ 22,500 volts, and which are not in proximity to supply conductors of 0-~~20,000~~ 22,500 volts shall be sectionalized by means of insulators located as specified in Rule 86.7-A1 (see App. G, Fig. 44).
- (2) Guys In Proximity: Every overhead or anchor guy, any portion of which is in proximity to a wood pole and supply conductors of 0-~~20,000~~ 22,500 volts (see App. G, Figs 45, 48 and 49) shall be sectionalized by means of insulators as specified in Rule 86.7-A2 or Rule 86.7-B and no portion in proximity to such supply conductors shall be grounded. Excepted from this requirement are anchor guys, and grounded overhead guys, which are attached to poles at a level less than 8 feet but not less than 6 feet below the level of supply conductors provided the level of the guy attachment is at or below the level of communication cable messenger attached to the same pole (see App. G, Figs 48a

and 49f). Also excepted from this requirement are anchor guys, and grounded over-head guys, which are attached to poles at a level less than 6 feet but not less than 4 feet below the level of supply conductors of 0-750 volts provided such guys are extensions of or attached to a cable messenger, are in the same vertical plane (or extension thereof) as the messenger, and are below the guard arms required by Rule 87.7-B for such a messenger (see App. G, Fig. 48a).

C Exposed To Supply Conductors Of More Than ~~20,000~~ 22,500 Volts

Portions of guys exposed to supply conductors of more than ~~20,000~~ 22,500 volts shall be securely grounded and such guys need not be sectionalized, unless sectionalization is required by Rule 86.6-B2 because of proximity to supply conductors of 0-~~20,000~~ 22,500 volts. (See App. G, Fig. 52c.)

D Guys Attached To Grounded Poles Or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 86.6-B2 because of proximity to supply conductors of less than ~~20,000~~ 22,500 volts supported on wood poles.

E Anchor Guys Through Supply Conductor Levels

An anchor guy which passes through the level of supply conductors at positions other than between pole pin positions or outside of the outer pin positions shall have insulators above and below the level of supply conductors at locations as specified in Rule 86.7-B. (See App. G, Fig. 49d.)

## Final Version

### Rule 86.6

#### 86.6 Sectionalizing and Grounding Requirements

The general requirements governing the sectionalizing of guys by means of insulators are based upon the exposure or proximity of the guys to supply conductors. For definitions of guys exposed and guys in proximity to supply conductors see Rules 21.3-C and D respectively (see also App. G, Figs. 44 and 45). The following requirements shall apply to the treatment and sectionalizing of guys.

##### A Where Not Exposed To Supply Conductors

Guys attached to or passing poles or structures supporting only communication conductors need not be sectionalized or grounded provided such guys are not exposed to supply conductors of 250-22,500 volts and are not in proximity to supply conductors of 0-22,500 volts.

##### B Sectionalized Because Of Exposure Or Proximity To Supply Conductors:

- (1) Overhead Guys Exposed To Supply Conductors Of 250-22,500 Volts: Ungrounded overhead guys which are exposed to supply conductors of 250-22,500 volts, and which are not in proximity to supply conductors of 0-22,500 volts shall be sectionalized by means of insulators located as specified in Rule 86.7-A1 (see App. G, Fig. 44).
- (2) Guys In Proximity: Every overhead or anchor guy, any portion of which is in proximity to a wood pole and supply conductors of 0-22,500 volts (see App. G, Figs 45, 48 and 49) shall be sectionalized by means of insulators as specified in Rule 86.7-A2 or Rule 86.7-B and no portion in proximity to such supply conductors shall be grounded. Excepted from this requirement are anchor guys, and grounded overhead guys, which are attached to poles at a level less than 8 feet but not less than 6 feet below the level of supply conductors provided the level of the guy attachment is at or below the level of communication cable messenger attached to the same pole (see App. G, Figs 48a and 49f). Also excepted from this requirement are anchor guys, and grounded over-



head guys, which are attached to poles at a level less than 6 feet but not less than 4 feet below the level of supply conductors of 0-750 volts provided such guys are extensions of or attached to a cable messenger, are in the same vertical plane (or extension thereof) as the messenger, and are below the guard arms required by Rule 87.7-B for such a messenger (see App. G, Fig. 48a).

C Exposed To Supply Conductors Of More Than 22,500 Volts

Portions of guys exposed to supply conductors of more than 22,500 volts shall be securely grounded and such guys need not be sectionalized, unless sectionalization is required by Rule 86.6-B2 because of proximity to supply conductors of 0-22,500 volts. (See App. G, Fig. 52c.)

D Guys Attached To Grounded Poles Or Structures

Guys attached to securely grounded metal poles or structures are not required to be sectionalized except as required by Rule 86.6-B2 because of proximity to supply conductors of less than 22,500 volts supported on wood poles.

E Anchor Guys Through Supply Conductor Levels

An anchor guy which passes through the level of supply conductors at positions other than between pole pin positions or outside of the outer pin positions shall have insulators above and below the level of supply conductors at locations as specified in Rule 86.7-B. (See App. G, Fig. 49d.)

**Original Version**  
Rule 86.7-A

86.7 Location of Sectionalizing Insulators

- A Overhead Guys All insulators in overhead guys shall be not less than 8 feet above the ground.
- (1) Exposed: Ungrounded overhead guys which are required by Rule 86.6-B1 to be sectionalized because of exposure to supply conductors of 250-20,000 volts shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to wood poles or structures which support conductors. One insulator will suffice where such an overhead guy is less than 17 feet in length between wood poles or structures.
  - (2) In Proximity: Overhead guys which are required to be sectionalized by Rule 86.6-B2 shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to poles, crossarms or structures (see App. G, Figs. 47 and 48).

Excepted from this requirement are guys to poles which support no conductors provided such guys are not in proximity to supply conductors of 0-20,000 volts on any poles other than the poles to which they are attached. Such guys, if required to be sectionalized by Rule 86.6-B2, shall have an insulator 6 to 9 feet from the point of attachment to the pole which supports conductors (see App. G, Figs. 44b and 44e).

## Strikeout and Underline Version

### Rule 86.7-A

#### 86.7 Location of Sectionalizing Insulators

- A Overhead Guys All insulators in overhead guys shall be not less than 8 feet above the ground.
- (1) Exposed: Ungrounded overhead guys which are required by Rule 86.6-B1 to be sectionalized because of exposure to supply conductors of ~~250-20,000~~ 22,500 volts shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to wood poles or structures which support conductors. One insulator will suffice where such an overhead guy is less than 17 feet in length between wood poles or structures.
  - (2) In Proximity: Overhead guys which are required to be sectionalized by Rule 86.6-B2 shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to poles, crossarms or structures (see App. G, Figs. 47 and 48).

Excepted from this requirement are guys to poles which support no conductors provided such guys are not in proximity to supply conductors of ~~0-20,000~~ 22,500 volts on any poles other than the poles to which they are attached. Such guys, if required to be sectionalized by Rule 86.6-B2, shall have an insulator 6 to 9 feet from the point of attachment to the pole which supports conductors (see App. G, Figs. 44b and 44e).

**Final Version**  
Rule 86.7-A

86.7 Location of Sectionalizing Insulators

- A Overhead Guys All insulators in overhead guys shall be not less than 8 feet above the ground.
- (1) Exposed: Ungrounded overhead guys which are required by Rule 86.6-B1 to be sectionalized because of exposure to supply conductors of 250-22,500 volts shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to wood poles or structures which support conductors. One insulator will suffice where such an overhead guy is less than 17 feet in length between wood poles or structures.
  - (2) In Proximity: Overhead guys which are required to be sectionalized by Rule 86.6-B2 shall have an insulator not less than 6 feet and not more than 9 feet (measured along the guy) from each point of attachment to poles, crossarms or structures (see App. G, Figs. 47 and 48).

Excepted from this requirement are guys to poles which support no conductors provided such guys are not in proximity to supply conductors of 0-22,500 volts on any poles other than the poles to which they are attached. Such guys, if required to be sectionalized by Rule 86.6-B2, shall have an insulator 6 to 9 feet from the point of attachment to the pole which supports conductors (see App. G, Figs. 44b and 44e).