

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SAFETY DIVISION  
UTILITIES SAFETY BRANCH

RESOLUTION SU-15  
January .21, 1992

R E S O L U T I O N

RESOLUTION SU-15, ORDER AUTHORIZING RULE CHANGES  
TO GENERAL ORDER NOS.95 AND 128 (G.O. 95/128),  
RULES FOR OVERHEAD AND UNDERGROUND ELECTRIC AND  
COMMUNICATIONS LINE CONSTRUCTION

**SUMMARY**

1. The staff of the Safety Division's Utilities Safety Branch requests authorization for changes to G.O. 95 and 128 contained in the enclosed Appendix A.
2. The request follows submittal of proposed changes by the General Orders 95/128 Rules Committee, which is composed of representatives from operators of electric and communications lines in California. The committee has obtained a consensus of investor owned utilities, utility districts, municipalities, the California Cable Television Association, and the associated labor unions concerning the changes.
3. The changes authorized are to rules concerning insulated conductors, tree trimming, working space, conductor clearances, service poles, common neutral systems, grounding, tower lines, street lights, guys, structures, foreign - attachments, bonding, and fiber optic cable.

**BACKGROUND**

1. The changes are the result of the informal proposals by the General Orders 95/128 Rules Committee. The committee represents operators of overhead and underground lines and the associated labor unions in California. It was formed by the line operators to review electric and communication line construction and maintenance methods and materials. All operators are invited to participate in ongoing workshops held in various locations each year to consider state-of-the-art methods and materials for the industry, along with changes in the General Orders.
2. Members of the USB staff attend meetings of the rules committee and its subcommittees to participate in its discussion and assist in its work.

3. When a study group or subcommittee of the "Rules Committee" drafts a rule change proposal, the draft is sent to the entire committee for evaluation. The proposal may be modified to obtain a consensus of the committee; if consensus is not reached, the proposal is dropped.
4. After a final draft of the proposed rule changes is approved in committee meetings the draft is mailed with a ballot to all members so that those who may have missed any discussion sessions may review and vote on each change. Any dissenting vote requires that meetings be held to resolve the issues.
5. Safety is of primary concern when a rule change is proposed. As noted in the rationale for changes in Appendix A safety to workers and the general public is considered.

## DISCUSSION

1. The proposed rule changes are presented in the enclosed Appendix A for G.O. 95 and Appendix B for G.O. 128. A list of the rules is contained in the Table of Contents of Appendix A and Appendix B.
2. The rule changes are divided generically into nineteen (19) items. Each is preceded with the rationale explaining the change, followed by the existing rule and the proposed rule changes (deletions struck out and additions underlined), and the final proposed rule marked by an asterisk (\*).

The following sections of the General Orders are affected by the proposal:

General Order No.95 rules: 20.7, 20.8-G, 21.12, 22.0-F, 22.8, 34, 35, 54.4-C7, 54.4-H1, 54.4-I, 54.7-B, 54.8 TABLE 10, 54.8-G, 59.3-A, 59.3-B, 59.3-D, 59.3-E4, 59.4-A1, 59.4-A2, 59.4-8, 59.4- C, 61.6-A, 61.6-Bt 61.7, 83.4, 84.4-D4a, 84.4-E, 84.4-F, 84.8-D, 84.8-E, 84.8-E1, 86, 92.1-F1, APPENDIX E.

General Order No.128 rule: 20.2, 20.4.

3. The staff believes the changes provide for increased safety to workers and the general public; the changes incorporate state-of-the-art methods and materials and should provide for economical construction and maintenance. The USB staff recommends authorization of the changes.

## **FINDINGS**

1. We find that the changes to G.O. 95 authorized in this resolution are just and reasonable

## **THEREFORE. IT IS ORDERED THAT:**

1. The changes in text shown in Appendix A shall be made in G.O. 95. The changes in text shown in Appendix B shall be made in G.O. 128.
2. All rules changed shall be marked "Revised November 6, 1992 by resolution SU-15".
3. This resolution is effective today.

I hereby certify that this Resolution was adopted by the Public Utilities commission at its regular meeting on November 6, 1992. The following Commissioners approved it.

NEAL J. SHULMAN  
Executive Director

DANIEL Wm. FESSLER  
PRESIDENT  
JOHN B. OHANIAN  
PATRICIA M. ECKERT  
NORMAN D. SHUMWAY  
COMMISSIONERS

APPENDIX A

PROPOSED RULE CHANGE

RULES FOR OVERHEAD LINE CONSTRUCTION, GENERAL ORDER NO. 95

STATE OF CALIFORNIA PUBLIC UTILITIES COMMISSION

Note: (1) For each rule proposed to be changed, the appendix provides the rationale:

- (a) The rationale for the change.
- (b) The existing rule and the proposed rule changes, with deletions struck out and additions underlined.
- (c) The final proposed rule marked by an asterisk(\*).

(2) The changes are divided generically into 18 items.

APPENDIX A – TABLE OF CONTENTS

<u>ITEM</u>	<u>DESCRIPTION</u>
1.	Rules 20.7, 59.3-A, B, D, E4, Common Neutral Systems
2.	Rule 20.8-G, Insulated Conductors
3.	Rule 21.12, 37, Table 1, Table 10, Non-Walkable Definition
4.	Rules 22.0-F, 22.8, 54.8-G, Service Poles
5.	Rules 34, Foreign Attachments
6.	Rule 35, Appendix E, Tree Trimming
7.	Rule 54.4-C7, Conductor Clearances in Crossing Spans
8.	Rules 54.4-H1, I, Building and Bridge Clearance
9.	Rule 54.7-B, Working Spaces
10.	Rule 54.8, Building Clearances for Service Drops
11.	Rules 59.4-A1, A2, B, C Grounding

12. Rules 61.6-A, B, 61.7, Tower Lines
13. Rule 83.4, Bonding
14. Rule 84.4-D4(a) Clearances from Street and Traffic Poles
15. Rules 84.4-E, F, Building and Bridge Clearances
16. Rules 84.8-D, 84.8-E, E1, Service Drops
17. Rule 86 Guys
18. Rule 92.1-F1 Equipment Clearance

APPENDIX B

PROPOSED RULE CHANGE

RULES FOR UNDERGROUND LINE CONSTRUCTION,  
GENERAL ORDER NO. 128

STATE OF CALIFORNIA PUBLIC UTILITIES COMMISSION

Note: (1) For each rule proposed to be changed, the appendix provides the rationale:

- (a) The rationale for the change.
- (b) The existing rule and the proposed rule changes, with deletions struck out and additions underlined.
- (c) The final proposed rule marked by an asterisk(\*).

APPENDIX B – TABLE OF CONTENTS

ITEM

DESCRIPTION

1. Rules 20.2, 20.4, Fiber Optic Cable

ITEM 1

- Rule 20.7
- Rule 59.3-A
- Rule 59.3-B
- Rule 59.3-D
- Rule 59.3-E4

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 20.7  
DEFINITION COMMON NEUTRAL SYSTEMS

The proposed rule change will further clarify the definition of "Common Neutral Systems."



## EXISTING RULE

### Section II, Definitions

#### Rule COMMON NEUTRAL SYSTEMS

- 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.

#### PROPOSED RULE CHANGE (STRIKE OUT AND UNDERLINED)

- 20.7 **Common Neutral Systems** mean those electrical supply distribution systems wherein the same specially grounded conductor (see Rule 59.4-B) is utilized as both the a neutral conductor of primary circuits of less than 22,500 volts and as the neutral conductor of the secondary circuits of 0-750 volts supplied therefrom.

#### PROPOSED RULE CHANGE (FINAL)\*

- 20.7 **Common Neutral Systems** mean those electrical supply distribution systems wherein the same specially grounded conductor (see Rule 59.4-B) is utilized as both the neutral conductor of primary circuits of less than 22,500 volts and as the neutral conductor of the secondary circuits of 0-750 volts supplied therefrom.

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.3-A  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
CONDUCTORS – MATERIALS

The proposed rule change is to permit without restrictions the use of modern and common conductor materials for common neutral systems, and to simplify and clarify the present language.

Changes include removing the overall restrictions that related phase and neutral line conductors shall be of the same material, and the specific restriction that unrelated materials can be used only when the neutral conductor is of copper material.

In addition, restructured, reformatted, and made minor changes in syntax.

## EXISTING RULE

### Rule 59, Common Primary and Secondary Grounded Neutral Systems

#### Rule 59.3 Conductors

#### 59.3 Conductors

##### A Material

Conductors of common neutral systems shall be of copper, copper-covered steel, bronze, stranded composites of any of the foregoing, aluminum, aluminum cable steel reinforced, or of other corrosion-resisting metal, but shall not be galvanized iron or steel.

### PROPOSED RULE CHANGE (STRIKE OUT AND UNDERLINED)

#### 59.3 Conductors

##### A Material

Conductors of common neutral systems shall be of suitable ~~copper, copper-covered steel, bronze, stranded composites of any of the foregoing, aluminum, aluminum cable steel reinforced, or of other~~ corrosion-resisting materials ~~metal~~, but shall not be galvanized iron or steel.

### PROPOSED RULE CHANGE (FINAL)\*

#### 59.3 Conductors

##### A Material

Conductors of common neutral systems shall be of suitable corrosion-resisting materials, but shall not be galvanized iron or steel.

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.3-B  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
CONDUCTORS – SIZE

The proposed changes are to condense, simplify and clarify the rule; enhance the protection and safety of the existing defined common neutral system; and have the size of the neutral systems be one quarter (25%) of the size of the related primary phase conductors.

Changed from conductivity to ampacity as the terminology and as the terminology and measure in determining the size of the common neutral conductor in respect to the largest related primary phase conductor. Conductor ampacity is readily available in industry standards or can be determined by formulas in industry standards that take into account specific ambient temperature correction factors.

The common neutral conductor(s) shall have a relative size of not less than one-quarter (25%) that of the related primary phase conductors. The size of the neutral was reduced from 50% to 25% while enhancing the protection of the common neutral system.

To enhance the protection of the common neutral system, a short time ampacity was introduced and defined. The short time ampacity of a common neutral conductor is either: the current that a non-insulated conductor can carry for the time which the current flows without annealing, melting or separating under the applied tensions; or the current that an insulated conductor can carry for the time that the current flows without damaging the insulation.

Since conductor strength requirements are already stated in Rule 49.4, the reference to conductor strength in this Rule was deleted.

Also, restructured, reformatted, and made minor changes in syntax.

## EXISTING RULE

### Rule 59.3B Conductors

#### Rule 59.3B, SIZE

##### 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

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

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.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINE)

Rule 59.3B Conductors

Rule 59.3B, SIZE

B Size

In common neutral systems, ~~the common~~ neutral line conductor shall have a minimum ampacity at each location of not less than one-quarter (25%) that of the cross-sectional area approximately 50 percent or more of the area of the largest related primary phase line conductor, as set forth in Table No. 14 and, provided that the short time ampacity of the neutral conductor is maintained. The short time ampacity of a common neutral conductor is either: the current that a non-insulated conductor can carry for the time which the current flows without annealing, melting or separating under the applied tensions; or the current that an insulated conductor can carry for the time that the current flows without damaging the insulation.

No neutral line conductor need have greater ampacity than either: the phase line conductor which would supply the ground current, or the maximum current which can flow through the neutral line conductor to the ground or electrode of the common neutral grid system. The neutral line conductor shall have a short time ampacity adequate for the fault current which can flow in the neutral line conductor for the operating time of the system protective device. If this value cannot be readily determined, the continuous ampacity of the neutral line conductor shall not be less than the full load continuous current of the system supply transformers or other source of supply. In no case shall the neutral conductor have less ampacity 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

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

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.

PROPOSED RULE CHANGE  
(FINAL)

Rule 59.3B Conductors

Rule 59.3B, SIZE

B Size

In common neutral systems, the neutral line conductor shall have a minimum ampacity at each location of not less than one-quarter (25%) that of the largest related primary phase line conductor, provided that the short time ampacity of the neutral conductor is maintained. The short time ampacity of a common neutral conductor is either: the current that a non-insulated conductor can carry for the time which the current flows without annealing, melting or separating under the applied tensions; or the current that an insulated conductor can carry for the time that the current flows without damaging the insulation.

No neutral line conductor need have greater ampacity than either: the phase line conductor which would supply the ground current, or the maximum current which can flow through the neutral line conductor to the ground or electrode of the common neutral grid system. The neutral line conductor shall have a short time ampacity adequate for the fault current which can flow in the neutral line conductor for the operating time of the system protective device. If this value cannot be readily determined, the continuous ampacity of the neutral line conductor shall not be less than the full load continuous current of the system supply transformers or other source of supply. In no case shall the neutral conductor have less ampacity than No. 6 AWG medium-hard-drawn copper wire.

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.



RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.3-D  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
CONDUCTORS – ARRANGMENT AND CONTINUITY

The proposed changes are to clarify and simplify the rule, and enhance the protection and safety of the common neutral system. Changes include giving the rule a new title of Arrangement and Continuity, which more accurately describes what is being addressed in the rule. For clarity and simplification, the rule was broken into sub-parts to easily identify the different subcategories that are being addressed.

Used the word ampacity instead of conductivity as the terminology and measure in determining the size of the common neutral conductor in respect to the related primary phase conductor(s). Conductor ampacity is readily available in industry standards or can be determined by formulas in industry standards that take into account specific ambient temperature correction factors.

The common neutral line conductor(s) must have a relative size of not less than one-quarter (25%) that of the largest related primary size of not less than one-quarter (25%) that of the largest related primary phase line conductor, and the neutral must have at least two return paths.

To enhance the protection of the common neutral conductor, short time ampacity requirements were added to the rule. Short time ampacity is defined in proposed Rule 59.3-B.

Finally, restructured, reformatted, and made minor changes in syntax.

EXISTING RULE  
Rule 59.3-D

Rule 59.3 Conductors

Rule 59.3-D, NEUTRAL CONDUCTORS

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 not less than 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 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 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.

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
Rule 59.3-D

Rule 59.3 Conductors

D ~~NEUTRAL CONDUCTORS ARRANGEMENT AND CONTINUITY~~

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

- (1) ~~Continuity:~~ Cross ties of the common neutral conductor shall be made to form a continuous interconnected grid network, ~~and~~
- (2) ~~Minimum Number of Return Paths:~~ there shall be ~~not~~ not be less than two or more separate and continuous metallic return conductors from the grid network to the substation constituting the source of supply thereto.
- (3) ~~Two Return Conductor Paths:~~ If only two return common neutral conductors paths only are used, each path shall have a ~~minimum conductivity of approximately 50 per cent of the conductivity~~ ampacity of not less than one-quarter (25%) that of the largest related primary phase conductor, provided that the short time ampacity of the common neutral conductor is maintained of the largest overhead feeder serving the area. (See Table No. 14 of Rule 59.3-B for minimum sizes.)
- (4) ~~More Than Two Return Conductor Paths:~~ If more than two return common neutral conductors paths are used, the ~~current carrying capacity~~ ampacity of the return system shall be such that a break in any one path shall leave two or more return common neutral paths, ~~which,~~ These combined paths, shall have a ~~minimum conductivity~~ ampacity of not less than one-quarter (25%) that of approximately 50 per cent of the conductivity of the largest primary phase conductor of the largest overhead feeder serving the area, provided that the short time ampacity of the common neutral conductor is maintained thus providing adequate current carrying capacity for full load current. (see Table No. 14 of Rule 59.3-B for minimum sizes.)

(5) Primary and Secondary Neutral Conductors: Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they ~~are of~~ have sufficient ~~current-carrying capacity~~ ampacity 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.

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

PROPOSED RULE CHANGE  
(FINAL)\*  
Rule 59.3-D

Rule 59.3 Conductors

D ARRANGEMENT AND CONTINUITY

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

- (1) Continuity: Cross ties of the common neutral conductor shall be made to form a continuous interconnected grid network.
- (2) Minimum Number of Return Paths: there shall not be less than two or more separate and continuous metallic return conductors from the grid network to the substation constituting the source of supply thereto.
- (3) Two Return Conductor Paths: If only two return common neutral conductors paths ~~only~~ are used, each path shall have an ampacity of not less than one-quarter (25%) that of the largest related primary phase conductor, provided that the short time ampacity of the common neutral conductor is maintained.
- (4) More Than Two Return Conductor Paths: If more than two return common neutral conductors paths are used, the ampacity of the return system shall be such that a break in any one path shall leave two or more return common neutral paths. These combined paths, shall have a minimum ampacity of not less than one-quarter (25%) that of the largest primary phase conductor of the overhead feeder serving the area, provided that the short time ampacity of the common neutral conductor is maintained.
- (5) Primary and Secondary Neutral Conductors: Primary neutral conductors or secondary neutral conductors, where continuous, may be used as a return loop from a common neutral provided they have sufficient ampacity as specified in Rule 59.3-B and are grounded throughout in accordance with the requirements for common neutral 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.

Note Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.3-E4  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
CONDUCTORS – COMMON NEUTRAL LINE CONDUCTOR LOCATION

The proposed changes are to simplify, clarify, and update the rule to include present day construction practices. Changes include revising the heading to involve only metal riser conduits, which more accurately describes what is being addressed in the rule. At the time the rule was originally written, metal conduits were predominantly used for lead cable risers, which was the standard cable then used in the industry.

Eliminated the requirement that the insulation of the neutral conductor cannot be less than that required of the phase wires, that the neutral conductor be treated as a phase wire for the entire run between terminals, and that the metal riser be grounded at both ends. These requirements are not necessary since the phase wires or cables are fully insulated from one another in both riser and underground cable installations. Furthermore, most underground cables have either a grounded metal sheath or grounded concentric wires, which properly protect the cable by being an adequate ground.

Finally, restructured, reformatted, and made minor changes in syntax.

## EXISTING RULE

Rule 59.3 Conductors

Rule 59.3-E COMMON NEUTRAL LINE CONDUCTOR LOCATION

Rule 59.3-E4

- 4 In Conduits: Common neutral conductors may be installed in the same conduits with related phase conductors, provided that the insulation of the neutral conductor is not less than that required of the phase wires and, further, that it is treated as a phase wire for the entire run between terminals. Where the conduit installation is an effectively grounded metal riser pipe, the reference to insulation of the common neutral need not apply, provided the neutral conductor is connected to both ends of the riser pipe and effectively, grounded.

### PROPOSED RULE CHANGE (STRIKE OUT AND UNDERLINE)

Rule 59.3 Conductors

Rule 59.3-E COMMON NEUTRAL LINE CONDUCTOR LOCATION

Rule 59.3-E4

- 4 In Metal Conduits: Common neutral conductors may be installed in the same metal riser conduits with related phase conductors, provided that the ~~insulation of the neutral conductor is not less than that required of the phase wires and, further, that it is treated as a phase wire for the entire run between terminals.~~ Where the conduit installation metal riser conduit is an effectively grounded metal riser pipe, the reference to insulation of the common neutral need not apply, provided the neutral conductor is connected to both ends of the riser pipe and effectively, grounded.



PROPOSED RULE CHANGE  
(FINAL)\*

Rule 59.3 Conductors

Rule 59.3-E COMMON NEUTRAL LINE CONDUCTOR LOCATION

Rule 59.3-E4

- 4 In Metal Conduits: Common neutral conductors may be installed in the same metal riser conduits with related phase conductors, provided that the metal riser conduit is an effectively grounded.

ITEM 2

- Rule 20.8-G

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 20.8-G  
DEFINITIONS OF TERMS AS USED IN THE RULES OF THIS ORDER  
CONDUCTOR – INSULATED CONDUCTORS OR CABLES

The proposed change is to complete the definition of insulated conductors by adding the word cables to the term. This revised term and definition will clarify the interpretation of General Order No. 95 by avoiding conflicts with other defined terms and cover all categories of insulated conductors or cables in use today.

EXISTING RULE  
RULE 20.8-G  
INSULATED CONDUCTORS

20.8 Conductor means a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics.

RULE 20.8-G

G Insulated Conductors, suitable, means supply conductors which are surrounded by an insulating material, the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture. A weather-resistant covering of a supply conductor does not meet the requirements of this rule as to a suitable insulation.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 20.8-G  
INSULATED CONDUCTORS

RULE 20.8-G

G Insulated Conductors or Cables, suitable, means supply conductors or cables which are surrounded by an insulating material, the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture. A weather-resistant covering of a supply conductor does not meet the requirements of this rule as to a suitable insulation.

PROPOSED RULE CHANGE  
(FINAL)\*  
RULE 20.8-G  
INSULATED CONDUCTORS

RULE 20.8-G

G Insulated Conductors or Cables, suitable, means supply conductors or cables which are surrounded by an insulating material, the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture. A weather-resistant covering of a supply conductor does not meet the requirements of this rule as to a suitable insulation.

ITEM 3

- RULE 21.12
- RULE 37
- TABLE 1
- TABLE 10

## RATIONALE FOR PROPOSED RULE CHANGE

### NON-WALKABLE

#### -RULE 21.12-

There is no clear definition of NON-WALKABLE in G.O.-95. In the past reference to table 2A Clearances above non-walkable signs has been used.

This change will clarify that the situation, and add changes to Rule 37, Table 1, necessary to address non-walkable clearances.

Related rule changes; Rules 21.12 and 21.23 are renumbered; Rule 37 case 6A was added; add reference to Rule 37, Table 1 (yy) & (zz) and Table 10, "or other structures".

Definitions

EXISTING

- 21.12 Partial Underground Distribution means a supply system of overhead primary conductors supported in vertical configuration, without crossarms, on non-climbable, non-joint poles, and with underground secondary distribution facilities (see App. G, Fig 88).

Note: Added February 7, 1964 by Decision No. 66707.

Definitions

PROPOSED CHANGE

- 21.12 Non-Walkable means those surfaces not normally intended to support humans, such as but not limited to: handrails, fences, walls, parapet walls, chimneys, cornices, decorative appendages or other light weight material used for patio covers.

- 21.13 Partial Underground Distribution means a supply system of overhead primary conductors supported in vertical configuration, without crossarms, on non-climbable, non-joint poles, and with underground secondary distribution facilities (see App. G, Fig 88).

Note: Added February 7, 1964 by Decision No. 66707.

Definitions

FINAL\*

- 21.12 Non-Walkable means those surfaces not normally intended to support humans, such as but not limited to: handrails, fences, walls, parapet walls, chimneys, cornices, decorative appendages or other light weight material used for patio covers.

- 21.13 Partial Underground Distribution means a supply system of overhead primary conductors supported in vertical configuration, without crossarms, on non-climbable, non-joint poles, and with underground secondary distribution facilities (see App. G, Fig 88).

Note: Added February 7, 1964 by Decision No. 66707.

EXISTING  
RULE 37

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

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

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

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

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

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

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

Note: Modified January 8, 1980 by Decision No. 91186, and March 9, 1988 by Resolution E-3076



PROPOSE RULE CHANGE  
RULE 37

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

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

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

The clearance specified in Table 1, Case 1, Column C (~~22-1/2~~ 22.5 feet), shall in no case be reduced below tabular value because of temperature and loading as specified in Rule 43.

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

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

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

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

Note: Modified January 8, 1980 by Decision No. 91186, and March 9, 1988 by Resolution E-3076

FINAL\*  
RULE 37

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

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

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

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

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

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

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

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

Note: Modified January 8, 1980 by Decision No. 91186, and March 9, 1988 by Resolution E-3076

## EXISTING TABLE

**Table 1**  
Basic Minimum Allowable Vertical Clearance of Wire Above Railroads, Thoroughfares, Ground or Water Surface; Also clearances from Poles, Buildings, Structures or Other Objects(mn)  
(Letter References Denote Modifications of Minimum Clearances as Referred to in Note Following this Table)

Case	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 22.5 – 300 KV	G (mm) Supply Conductors and supply cables more 300 - 550 KV
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	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)	34 ft (g) (kk)
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) (aa)	19 ft (hh)	20 ft (ii)	25 ft (o) (ii)	30 ft (o) (ii)	30 ft (o) (ii) (kk)
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	19 ft	25 ft (o)	30 ft (o) (p)	30 ft. (o) (kk)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)	25 ft. (o) (kk)
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	20 ft (ll)
7	Horizontal clearance of conductor from buildings (except generating and substations), bridges or other structures (upon which men may	-----	3 ft (u)	3 ft	3 ft (u) (v)	6 ft (v)	6 ft (v)	15 ft (v)

	work) where such conductor is not attached thereto. (a) (t)								
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 (o) (aa) (dd)	15 or 18 in (o) (dd) (ee) (ff)	18 in (dd) (ee) (ff)	Not Applicable	
9	Distance of conductor from surface of pole, crossarm or other overhead line structure upon which it is supported, providing it complies with Case 8 above (x) (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)	½ pin spacing shown in Table 2 Case 15 (dd)	
10	Radial centerline clearance of conductor or cable (unattached) from non-climbable street lighting or traffic signal poles or standards, including mastarms, brackets and lighting fixtures.	-----	1 ft (oo) (u) (rr) (ss)	15 in. (bb) (cc)	3 ft (oo)	6 ft (pp)	10 ft (qq)	10 ft (ll)	
11	Water areas not suitable for sailboating (tt) (uu) (ww) (xx)	15'	15'	---	15'	17'	25'	25' (kk)	
12	Water areas suitable for sailboating, surface area of: (tt) (vv) (ww) (xx) (a) Less Than 20 acra (b) 20 to 200 acres (c) Over 200 to 2,000 acres (d) Over 2,000 acres	18' 26' 32' 38'	18' 26' 32' 38'	--- --- --- ---	18' 26' 32' 38'	20' 28' 34' 40'	27' 35' 41' 47'	27' (kk) 35' (kk) 41' (kk) 47' (kk)	

- a) Shall not be reduced more than 5% because of temperature or loading 37
1. Supply Lines 54.4-B1
  2. Communication Lines 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 56.4-B2
  2. Supply cables and messengers 57.4-B2
  3. Communication Guys 86.4-B2
  4. Communication cables and messengers 87.4-B2
- (f) May be reduced depending on height of trolley contact conductors.
1. Supply Service Drop 54.8-C5
  2. Communication service drops 84.8-D5
- (g) May be reduced and shall be increased depending on trolley throw
1. Supply conductors (except service drops) 54.4-B2
  2. Communication conductors (except service drops) 84.4-B2
- (h) Shall be increase where freight cars are transported.
1. Trolley contact and feeder conductors 74.4-B1
  2. Trolley span wires 77.4-A
- (i) May be reduced for trolley contact and span wires in subways, tunnels and under bridges and in fenced areas.
1. Trolley contact conductors 74.4-E
  2. Trolley span wires 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 54.8-B2
  2. Supply Guys 56.4-A
  3. Communication service drops 84.8-C2
  4. Communication guys 86.4-A
- (k) May be reduced along thoroughfares where not normally accessible to vehicles.

1. Supply Guys 56.4-A1
  2. Communication Guys 86.4-A1
- (l) May be reduced where within 12 feet of curb line of public thoroughfares
1. Supply Service drops 54.8-B1
  2. Communication service drops 84.8-C1
- (m) May be reduced for railways signal cables under special conditions 84.4-A4
- (n) May be reduced in rural districts
1. Intentionally Left Blank
  2. Intentionally Left Blank
  3. Communication conductors along roads 84.4-A2
- (o) May be reduced for transformer, regulator or capacitor leads.
1. Transformer Leads 58.3-B
  2. Regulator or Capacitor Leads 58.4-B
- (p) May be reduced across arid or mountainous areas
1. Supply Conductors of more than 22, 500 Volts 54.4-A1
  2. Communication conductors 84.4-A1
- (q) Shall be increased or may be reduced under special conditions.
1. Increased for supply service drops on industrial or commercial premises 54.8-B3a
  2. Supply service drops on residential premises 54.8-B3b
  3. Communication conductors 84.4-A3
  4. Increased for Communication service drops on industrial or commercial premises 84.8-C3a
  5. Communication service drops on residential premises 84.8-C3b



- (r) May be reduced above roofs of buildings under special conditions
  - 1. Supply overhead guys 56.4-G
  - 2. Supply service drops 54.8-B4
  - 3. Communication overhead guys 86.4-F
  - 4. Communication conductors and cables 84.4-E
  - 5. Communication service drops 84.8-C4
- (s) Also applies at fire escapes, etc.
  - 1. Supply Conductors 54.4-H1
  - 2. Supply service drops on industrial or commercial premises 54.8-B4a
  - 3. Supply service drops on residential premises 54.8-B4b
  - 4. Communication Conductor 84.4-E
- (t) Special Clearances where attached to buildings, bridges or other structures
  - 1. Supply conductors of 750-22,500 volts 54.4-H2
  - 2. Trolley Contact Conductors 74.4-E
  - 3. Communication Conductors 84.4-F
- (u) Reduced clearances permitted under special conditions
  - 1. Supply service drops on industrial or commercial premises 54.8-B4a
  - 2. Supply cables, grounded 57.4-G
  - 3. Communication cables beside buildings, etc. 84.4-E
  - 4. Communication conductors under bridges, etc. 84.4-F
  - 5. Communication service drops. 84.8-C4
  - 6. Communication cables passing on non-climbable streetlight poles, etc. 84.4-D4a
- (v) May be reduced under special conditions.
  - 1. Supply conductors of 750-7500 volts 54.4-H1
  - 2. Supply transformer lead and bus wires where guarded 58.3-B2

- (w) May be reduced at angles in lines and transportation points
1. Supply conductors 54.4-D1
  2. Communication Conductors 84.4-D5

- (x) May be reduced for suitably protected lateral or vertical runs.
1. Supply bond wires 53.4
  2. Supply ground wires 54.6-B
  3. Supply lateral conductors 54.6-C
  4. Supply vertical pins 54.6-D
  5. Supply risers 54.6-E
  6. Communication Ground Wires 84.6-B
  7. Communication lateral conductors 84.6-C
  8. Communication vertical runs 84.6-D
  9. Communication risers 84.6-E

- (y) Increased clearances for certain conductors
1. Unattached conductors on colinear lines and crossing lines 32.3
  2. Unattached supply conductors 54.4D3
  3. Supply Service drops on clearance crossarms 54.8-C2
  4. Supply Service drops on pole top extensions 54.8-C3
  5. Unattached Supply service drops 54.8-D
  6. Communication lines, collinear, conflicting or crossing 84.4-D3
  7. Communication conductors passing supply poles and unattached thereto 84.4-D4
  8. Communication service drops on clearance crossarms 84.8-D2
  9. Communication service drops on pole top extensions 84.8-D3
  10. Unattached Communication service drops 84.8-E

- (z) Special provisions for police and fire alarm conductors require increased clearances 92.2
- (aa) May be reduced under special provisions.
  - 1. Supply conductors of 0-750 volts in rack configuration 54.4-D5
  - 2. Supply service drops from racks 54.8-F
  - 3. Supply cables and messengers attached to poles 57.4-F
  - 4. Communication conductors on communication poles 84.4-D
  - 5. Communication conductors on crossarms 84.4-D1
  - 6. Communication conductors attached to poles 84.4-D2
  - 7. Communication service drops attached to poles 84.8-B
  - 8. Communication cables and messengers 87.4-D
  - 9. Supply or communication cables and messengers on jointly used poles 92.1-B
  - 10. Communication service drops on pole top extensions 92.1-C
  - 11. Multiconductor cables with bare neutral 54.10-B1
  - 12. Communication Conductors Across and Along Public Thoroughfares 84.4A6
- (bb) May be reduced for Class T conductors of not more than 750 volts and of the same potential and polarity 74.4-D
- (cc) Not applicable to trolley span wires 77.4-E
- (dd) Special clearances for pole-top and dead-end construction
  - 1. Conductors dead-ended in vertical configuration on poles 54.4-C4
  - 2. Conductors dead-ended in horizontal configuration 54.4-D7
  - 3. Conductors in pole-top construction 54.4-D8
- (ee) Clearance requirements for certain voltage classifications 54.4-D2
- (ff) Not applicable to communication conductors 84.4-D

- (gg) Clearance from crossarms may be reduced for certain conductors
  - 1. Suitably insulated leads to protected runs 54.4-E
  - 2. Leads of 0-5000 volts to equipment 54.4-E
  - 3. Leads of 0-5000 volts to cutouts or switches 58.5-C
- (hh) Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts 78.3A(1)
- (ii) Special Clearances Required Above Public and Private Swimming Pools:
  - 1. Supply line conductors 54.4-A4
  - 2. Supply service drops 54.8-B5
  - 3. Communication line conductors 84.4-A5
  - 4. Communication service drops 84.8-C5
  - 5. Supply guys, span wires 56.4-A3
  - 6. Communication guys 86.4-A3
- (jj) May be decreased in partial underground distribution 54.4-D2
- (kk) Shall be increased by 0.025 ft. per kV in excess of 300 kV.
- (ll) Shall be increased by 0.04 ft per kV in excess of 300 kV.
- (mm) proposed clearances to be submitted to the CPUC prior to construction for circuits in excess of 550 kV.
- (nn) Voltage shown in the table shall mean line – to – ground voltage for direct current (DC) systems.
- (oo) May be reduced for grounded or multi-conductor cables.
  - 1. Grounded cables 57.4-H
  - 2. Multi-Conductor cables 54.10-B6

- (pp) May be reduced to 4 feet for voltages below 7,500 volts 54.4-D3
- (qq) May be reduced to 6 feet for voltages below 75 kV
- (rr) May be reduced for supply service drops 54.8-D1
- (ss) May be reduced to communication service drops 84.4-E1
- (tt) Where a federal agency or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.
- (uu) Or Where sailboating is prohibited and where other boating activities are allowed
- (vv) Clearance above contiguous ground shall be 5 feet greater than in cases 11 or 12 for the type of water area served for boat launch facilities and for area contiguous thereto, that are posted, designated or specifically prepared for rigging of sailboats or other watercraft.
- (ww) For controlled impoundments, the surface areas and corresponding clearances shall be based upon the high water level. For other waters, the surface area shall be that enclosed by its annual flood level. The clearance over rivers, streams and canals shall be based upon the largest surface areas of any one-mile long segment which includes the crossing. The clearance over a canal, river or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water
- (xx) Water areas are lakes, ponds, reservoirs, tidal waters, rivers, streams and canals without surface obstructions

## PROPOSED TABLE

### Table 1

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

Case	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 22.5 – 300 KV	G (mm) Supply Conductors and supply cables more 300 - 550 KV
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	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)	34 ft (g) (kk)
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) (aa)	19 ft (hh)	20 ft (ii)	25 ft (o) (ii)	30 ft (o) (ii)	30 ft (o) (ii) (kk)
4	Above ground along thoroughfares in rural districts or across other areas capable of being traversed by vehicles or agricultural equipment.	15 ft (k)	15 ft (m) (n) (p)	19 ft	19 ft	25 ft (o)	30 ft (o) (p)	30 ft. (o) (kk)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)	25 ft. (o) (kk)
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	20 ft (ll)
6a	Vertical clearance above non-walkable surfaces on buildings, bridges or other structures which do not ordinarily support	2 ft	8 ft (yy)	8 ft	8 ft (zz)	8 ft	8 ft	20 ft

	conductors except generating plants or substations wheather attached or unattached								
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)	15 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 (o) (aa) (dd)	15 or 18 in (o) (dd) (ee) (jj)	18 in (dd) (ee) (jj)	Not Applicable	
9	Distance of conductor from surface of pole, crossarm or other overhead line structure upon which it is supported, providing it complies with Case 8 above (x) (ee)	-----	3 in (aa) (ff)	3 in (aa) (cc) (gg)	3 in (aa) (dd) (gg)	3 in (dd) (gg)	1/4 pin spacing shown in Table 2 Case 15 (dd)	1/2 pin spacing shown in Table 2 Case 15 (dd)	
10	Radial centerline clearance of conductor or cable (unattached) from non-climbable street lighting or traffic signal poles or standards, including mastarms, brackets and lighting fixtures.	-----	1 ft (oo) (u) (rr) (ss)	15 in. (bb) (cc)	3 ft (oo)	6 ft (pp)	10 ft (qq)	10 ft (ll)	
11	Water areas not suitable for sailboating (tt) (uu) (ww) (xx)	15'	15'	---	15'	17'	25'	25' (kk)	
12	Water areas suitable for sailboating, surface area of: (tt) (vv) (ww) (xx) (a) Less Than 20 acra (b) 20 to 200 acres (c) Over 200 to 2,000 acres (d) Over 2,000 acres	18' 26' 32' 38'	18' 26' 32' 38'	--- --- --- ---	18' 26' 32' 38'	20' 28' 34' 40'	27' 35' 41' 47'	27' (kk) 35' (kk) 41' (kk) 47' (kk)	

a) Shall not be reduced more than 5% because of temperature or loading 37

1. Supply Lines 54.4-B1

2. Communication Lines 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 56.4-B2
  - 2. Supply cables and messengers 57.4-B2
  - 3. Communication Guys 86.4-B2
  - 4. Communication cables and messengers 87.4-B2
- (f) May be reduced depending on height of trolley contact conductors.
  - 1. Supply Service Drop 54.8-C5
  - 2. Communication service drops 84.8-D5
- (g) May be reduced and shall be increased depending on trolley throw
  - 1. Supply conductors (except service drops) 54.4-B2
  - 2. Communication conductors (except service drops) 84.4-B2
- (h) Shall be increase where freight cars are transported.
  - 1. Trolley contact and feeder conductors 74.4-B1
  - 2. Trolley span wires 77.4-A
- (i) May be reduced for trolley contact and span wires in subways, tunnels and under bridges and in fenced areas.
  - 1. Trolley contact conductors 74.4-E
  - 2. Trolley span wires 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 54.8-B2
  2. Supply Guys 56.4-A
  3. Communication service drops 84.8-C2
  4. Communication guys 86.4-A
- (k) May be reduced along thoroughfares where not normally accessible to vehicles.
1. Supply Guys 56.4-A1
  2. Communication Guys 86.4-A1
- (l) May be reduced where within 12 feet of curb line of public thoroughfares
1. Supply Service drops 54.8-B1
  2. Communication service drops 84.8-C1
- (m) May be reduced for railways signal cables under special conditions 84.4-A4
- (n) May be reduced in rural districts
1. Intentionally Left Blank
  2. Intentionally Left Blank
  3. Communication conductors along roads 84.4-A2
- (o) May be reduced for transformer, regulator or capacitor leads.
1. Transformer Leads 58.3-B
  2. Regulator or Capacitor Leads 58.4-B
- (p) May be reduced across arid or mountainous areas
1. Supply Conductors of more than 22, 500 Volts 54.4-A1
  2. Communication conductors 84.4-A1
- (q) Shall be increased or may be reduced under special conditions.

1. Increased for supply service drops on industrial or commercial premises 54.8-B3a
2. Supply service drops on residential premises 54.8-B3b
3. Communication conductors 84.4-A3
4. Increased for Communication service drops on industrial or commercial premises 84.8-C3a
5. Communication service drops on residential premises 84.8-C3b

(r) May be reduced above roofs of buildings under special conditions

1. Supply overhead guys 56.4-G
2. Supply service drops 54.8-B4
3. Communication overhead guys 86.4-F
4. Communication conductors and cables 84.4-E
5. Communication service drops 84.8-C4

(s) Also applies at fire escapes, etc.

1. Supply Conductors 54.4-H1
2. Supply service drops on industrial or commercial premises 54.8-B4a
3. Supply service drops on residential premises 54.8-B4b
4. Communication Conductor 84.4-E

(t) Special Clearances where attached to buildings, bridges or other structures

1. Supply conductors of 750-22,500 volts 54.4-H2
2. Trolley Contact Conductors 74.4-E
3. Communication Conductors 84.4-F

(u) Reduced clearances permitted under special conditions

1. Supply service drops on industrial or commercial premises 54.8-B4a
2. Supply cables, grounded 57.4-G
3. Communication cables beside buildings, etc. 84.4-E
4. Communication conductors under bridges, etc. 84.4-F

5. Communication service drops. 84.8-C4
6. Communication cables passing on non-climbable streetlight poles, etc. 84.4-D4a

(v) May be reduced under special conditions.

1. Supply conductors of 750-7500 volts 54.4-H1
2. Supply transformer lead and bus wires where guarded 58.3-B2

(w) May be reduced at angles in lines and transportation points

1. Supply conductors 54.4-D1
2. Communication Conductors 84.4-D5

(x) May be reduced for suitably protected lateral or vertical runs.

1. Supply bond wires 53.4
2. Supply ground wires 54.6-B
3. Supply lateral conductors 54.6-C
4. Supply vertical pins 54.6-D
5. Supply risers 54.6-E
6. Communication Ground Wires 84.6-B
7. Communication lateral conductors 84.6-C
8. Communication vertical runs 84.6-D
9. Communication risers 84.6-E

(y) Increased clearances for certain conductors

1. Unattached conductors on colinear lines and crossing lines 32.3
2. Unattached supply conductors 54.4D3
3. Supply Service drops on clearance crossarms 54.8-C2
4. Supply Service drops on pole top extensions 54.8-C3
5. Unattached Supply service drops 54.8-D
6. Communication lines, collinear, conflicting or crossing 84.4-D3

7. Communication conductors passing supply poles and unattached thereto 84.4-D4
8. Communication service drops on clearance crossarms 84.8-D2
9. Communication service drops on pole top extensions 84.8-D3
10. Unattached Communication service drops 84.8-E

(z) Special provisions for police and fire alarm conductors require increased clearances 92.2

(aa) May be reduced under special provisions.

1. Supply conductors of 0-750 volts in rack configuration 54.4-D5
2. Supply service drops from racks 54.8-F
3. Supply cables and messengers attached to poles 57.4-F
4. Communication conductors on communication poles 84.4-D
5. Communication conductors on crossarms 84.4-D1
6. Communication conductors attached to poles 84.4-D2
7. Communication service drops attached to poles 84.8-B
8. Communication cables and messengers 87.4-D
9. Supply or communication cables and messengers on jointly used poles 92.1-B
10. Communication service drops on pole top extensions 92.1-C
11. Multiconductor cables with bare neutral 54.10-B1
12. Communication Conductors Across and Along Public Thoroughfares 84.4A6

(bb) May be reduced for Class T conductors of not more than 750 volts and of the same potential and polarity 74.4-D

(cc) Not applicable to trolley span wires 77.4-E

(dd) Special clearances for pole-top and dead-end construction

1. Conductors dead-ended in vertical configuration on poles 54.4-C4
  2. Conductors dead-ended in horizontal configuration 54.4-D7
  3. Conductors in pole-top construction 54.4-D8
- (ee) Clearance requirements for certain voltage classifications 54.4-D2
- (ff) Not applicable to communication conductors 84.4-D
- (gg) Clearance from crossarms may be reduced for certain conductors
1. Suitably insulated leads to protected runs 54.4-E
  2. Leads of 0-5000 volts to equipment 54.4-E
  3. Leads of 0-5000 volts to cutouts or switches 58.5-C
- (hh) Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts 78.3A(1)
- (ii) Special Clearances Required Above Public and Private Swimming Pools:
1. Supply line conductors 54.4-A4
  2. Supply service drops 54.8-B5
  3. Communication line conductors 84.4-A5
  4. Communication service drops 84.8-C5
  5. Supply guys, span wires 56.4-A3
  6. Communication guys 86.4-A3
- (jj) May be decreased in partial underground distribution 54.4-D2
- (kk) Shall be increased by 0.025 ft. per kV in excess of 300 kV.
- (ll) Shall be increased by 0.04 ft per kV in excess of 300 kV.
- (mm) proposed clearances to be submitted to the CPUC prior to construction for circuits in excess of 550 kV.

- (nn) Voltage shown in the table shall mean line – to – ground voltage for direct current (DC) systems.
- (oo) May be reduced for grounded or multi-conductor cables.
  - 1. Grounded cables 57.4-H
  - 2. Multi-Conductor cables 54.10-B6
- (pp) May be reduced to 4 feet for voltages below 7,500 volts 54.4-D3
- (qq) May be reduced to 6 feet for voltages below 75 kV
- (rr) May be reduced for supply service drops 54.8-D1
- (ss) May be reduced to communication service drops 84.4-E1
- (tt) Where a federal agency or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.
- (uu) Or Where sailboating is prohibited and where other boating activities are allowed
- (vv) Clearance above contiguous ground shall be 5 feet greater than in cases 11 or 12 for the type of water area served for boat launch facilities and for area contiguous thereto, that are posted, designated or specifically prepared for rigging of sailboats or other watercraft.
- (ww) For controlled impoundments, the surface areas and corresponding clearances shall be based upon the high water level. For other waters, the surface area shall be that enclosed by its annual flood level. The clearance over rivers, streams and canals shall be based upon the largest surface areas of any one-mile long segment which includes the crossing. The clearance over a canal, river or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water

(xx) Water areas are lakes, ponds, reservoirs, tidal waters, rivers, streams and canals without surface obstructions

(yy) May be reduced over non-walkable structures 54.8 (Table 10)

(zz) May be reduced to 2 ft for conductors insulated in accordance with 20.8-G

## FINAL \* TABLE Table 1

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

Cas	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 22.5 – 300 KV	G (mm) Supply Conductors and supply cables more 300 - 550 KV
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	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)	34 ft (g) (kk)
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) (aa)	19 ft (hh)	20 ft (ii)	25 ft (o) (ii)	30 ft (o) (ii)	30 ft (o) (ii) (kk)
4	Above ground along thoroughfares in rural districts or across other areas capable of being traversed by vehicles or agricultural equipment.	15 ft (k)	15 ft (m) (n) (p)	19 ft	19 ft	25 ft (o)	30 ft (o) (p)	30 ft. (o) (kk)
5	Vertical ground in areas accessible to pedestrians only.	7 ft	10 ft (m) (q)	19 ft	12 ft	17 ft	25 ft (o)	25 ft. (o) (kk)
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	20 ft (ll)
6a	Vertical clearance above non-walkable surfaces on buildings, bridges or other structures which do not ordinarily support	2 ft	8 ft (yy)	8 ft	8 ft (zz)	8 ft	8 ft	20 ft



	conductors except generating plants or substations wheather attached or unattached								
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)	15 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 (o) (aa) (dd)	15 or 18 in (o) (dd) (ee) (jj)	18 in (dd) (ee) (jj)	Not Applicable	
9	Distance of conductor from surface of pole, crossarm or other overhead line structure upon which it is supported, providing it complies with Case 8 above (x) (ee)	-----	3 in (aa) (ff)	3 in (aa) (cc) (gg)	3 in (aa) (dd) (gg)	3 in (dd) (gg)	1/4 pin spacing shown in Table 2 Case 15 (dd)	1/2 pin spacing shown in Table 2 Case 15 (dd)	
10	Radial centerline clearance of conductor or cable (unattached) from non-climbable street lighting or traffic signal poles or standards, including mastarms, brackets and lighting fixtures.	-----	1 ft (oo) (u) (rr) (ss)	15 in. (bb) (cc)	3 ft (oo)	6 ft (pp)	10 ft (qq)	10 ft (ll)	
11	Water areas not suitable for sailboating (tt) (uu) (ww) (xx)	15'	15'	---	15'	17'	25'	25' (kk)	
12	Water areas suitable for sailboating, surface area of: (tt) (vv) (ww) (xx) (a) Less Than 20 acra (b) 20 to 200 acres (c) Over 200 to 2,000 acres (d) Over 2,000 acres	18' 26' 32' 38'	18' 26' 32' 38'	--- --- --- ---	18' 26' 32' 38'	20' 28' 34' 40'	27' 35' 41' 47'	27' (kk) 35' (kk) 41' (kk) 47' (kk)	

a) Shall not be reduced more than 5% because of temperature or loading 37

1. Supply Lines 54.4-B1

2. Communication Lines 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 56.4-B2
  - 2. Supply cables and messengers 57.4-B2
  - 3. Communication Guys 86.4-B2
  - 4. Communication cables and messengers 87.4-B2
- (f) May be reduced depending on height of trolley contact conductors.
  - 1. Supply Service Drop 54.8-C5
  - 2. Communication service drops 84.8-D5
- (g) May be reduced and shall be increased depending on trolley throw
  - 1. Supply conductors (except service drops) 54.4-B2
  - 2. Communication conductors (except service drops) 84.4-B2
- (h) Shall be increase where freight cars are transported.
  - 1. Trolley contact and feeder conductors 74.4-B1
  - 2. Trolley span wires 77.4-A
- (i) May be reduced for trolley contact and span wires in subways, tunnels and under bridges and in fenced areas.
  - 1. Trolley contact conductors 74.4-E
  - 2. Trolley span wires 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 54.8-B2
  2. Supply Guys 56.4-A
  3. Communication service drops 84.8-C2
  4. Communication guys 86.4-A
- (k) May be reduced along thoroughfares where not normally accessible to vehicles.
1. Supply Guys 56.4-A1
  2. Communication Guys 86.4-A1
- (l) May be reduced where within 12 feet of curb line of public thoroughfares
1. Supply Service drops 54.8-B1
  2. Communication service drops 84.8-C1
- (m) May be reduced for railways signal cables under special conditions 84.4-A4
- (n) May be reduced in rural districts
1. Intentionally Left Blank
  2. Intentionally Left Blank
  3. Communication conductors along roads 84.4-A2
- (o) May be reduced for transformer, regulator or capacitor leads.
1. Transformer Leads 58.3-B
  2. Regulator or Capacitor Leads 58.4-B
- (p) May be reduced across arid or mountainous areas
1. Supply Conductors of more than 22, 500 Volts 54.4-A1
  2. Communication conductors 84.4-A1
- (q) Shall be increased or may be reduced under special conditions.

1. Increased for supply service drops on industrial or commercial premises 54.8-B3a
2. Supply service drops on residential premises 54.8-B3b
3. Communication conductors 84.4-A3
4. Increased for Communication service drops on industrial or commercial premises 84.8-C3a
5. Communication service drops on residential premises 84.8-C3b

(r) May be reduced above roofs of buildings under special conditions

1. Supply overhead guys 56.4-G
2. Supply service drops 54.8-B4
3. Communication overhead guys 86.4-F
4. Communication conductors and cables 84.4-E
5. Communication service drops 84.8-C4

(s) Also applies at fire escapes, etc.

1. Supply Conductors 54.4-H1
2. Supply service drops on industrial or commercial premises 54.8-B4a
3. Supply service drops on residential premises 54.8-B4b
4. Communication Conductor 84.4-E

(t) Special Clearances where attached to buildings, bridges or other structures

1. Supply conductors of 750-22,500 volts 54.4-H2
2. Trolley Contact Conductors 74.4-E
3. Communication Conductors 84.4-F

(u) Reduced clearances permitted under special conditions

1. Supply service drops on industrial or commercial premises 54.8-B4a
2. Supply cables, grounded 57.4-G
3. Communication cables beside buildings, etc. 84.4-E
4. Communication conductors under bridges, etc. 84.4-F

5. Communication service drops. 84.8-C4
6. Communication cables passing on non-climbable streetlight poles, etc. 84.4-D4a

(v) May be reduced under special conditions.

1. Supply conductors of 750-7500 volts 54.4-H1
2. Supply transformer lead and bus wires where guarded 58.3-B2

(w) May be reduced at angles in lines and transportation points

1. Supply conductors 54.4-D1
2. Communication Conductors 84.4-D5

(x) May be reduced for suitably protected lateral or vertical runs.

1. Supply bond wires 53.4
2. Supply ground wires 54.6-B
3. Supply lateral conductors 54.6-C
4. Supply vertical pins 54.6-D
5. Supply risers 54.6-E
6. Communication Ground Wires 84.6-B
7. Communication lateral conductors 84.6-C
8. Communication vertical runs 84.6-D
9. Communication risers 84.6-E

(y) Increased clearances for certain conductors

1. Unattached conductors on colinear lines and crossing lines 32.3
2. Unattached supply conductors 54.4D3
3. Supply Service drops on clearance crossarms 54.8-C2
4. Supply Service drops on pole top extensions 54.8-C3
5. Unattached Supply service drops 54.8-D
6. Communication lines, collinear, conflicting or crossing 84.4-D3

7. Communication conductors passing supply poles and unattached thereto 84.4-D4
8. Communication service drops on clearance crossarms 84.8-D2
9. Communication service drops on pole top extensions 84.8-D3
10. Unattached Communication service drops 84.8-E

(z) Special provisions for police and fire alarm conductors require increased clearances 92.2

(aa) May be reduced under special provisions.

1. Supply conductors of 0-750 volts in rack configuration 54.4-D5
2. Supply service drops from racks 54.8-F
3. Supply cables and messengers attached to poles 57.4-F
4. Communication conductors on communication poles 84.4-D
5. Communication conductors on crossarms 84.4-D1
6. Communication conductors attached to poles 84.4-D2
7. Communication service drops attached to poles 84.8-B
8. Communication cables and messengers 87.4-D
9. Supply or communication cables and messengers on jointly used poles 92.1-B
10. Communication service drops on pole top extensions 92.1-C
11. Multiconductor cables with bare neutral 54.10-B1
12. Communication Conductors Across and Along Public Thoroughfares 84.4A6

(bb) May be reduced for Class T conductors of not more than 750 volts and of the same potential and polarity 74.4-D

(cc) Not applicable to trolley span wires 77.4-E

(dd) Special clearances for pole-top and dead-end construction

1. Conductors dead-ended in vertical configuration on poles 54.4-C4
  2. Conductors dead-ended in horizontal configuration 54.4-D7
  3. Conductors in pole-top construction 54.4-D8
- (ee) Clearance requirements for certain voltage classifications 54.4-D2
- (ff) Not applicable to communication conductors 84.4-D
- (gg) Clearance from crossarms may be reduced for certain conductors
1. Suitably insulated leads to protected runs 54.4-E
  2. Leads of 0-5000 volts to equipment 54.4-E
  3. Leads of 0-5000 volts to cutouts or switches 58.5-C
- (hh) Reduced clearance permitted from temporary fixtures and lighting circuits 0-300 volts 78.3A(1)
- (ii) Special Clearances Required Above Public and Private Swimming Pools:
1. Supply line conductors 54.4-A4
  2. Supply service drops 54.8-B5
  3. Communication line conductors 84.4-A5
  4. Communication service drops 84.8-C5
  5. Supply guys, span wires 56.4-A3
  6. Communication guys 86.4-A3
- (jj) May be decreased in partial underground distribution 54.4-D2
- (kk) Shall be increased by 0.025 ft. per kV in excess of 300 kV.
- (ll) Shall be increased by 0.04 ft per kV in excess of 300 kV.
- (mm) proposed clearances to be submitted to the CPUC prior to construction for circuits in excess of 550 kV.

- (nn) Voltage shown in the table shall mean line – to – ground voltage for direct current (DC) systems.
- (oo) May be reduced for grounded or multi-conductor cables.
  - 1. Grounded cables 57.4-H
  - 2. Multi-Conductor cables 54.10-B6
- (pp) May be reduced to 4 feet for voltages below 7,500 volts 54.4-D3
- (qq) May be reduced to 6 feet for voltages below 75 kV
- (rr) May be reduced for supply service drops 54.8-D1
- (ss) May be reduced to communication service drops 84.4-E1
- (tt) Where a federal agency or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.
- (uu) Or Where sailboating is prohibited and where other boating activities are allowed
- (vv) Clearance above contiguous ground shall be 5 feet greater than in cases 11 or 12 for the type of water area served for boat launch facilities and for area contiguous thereto, that are posted, designated or specifically prepared for rigging of sailboats or other watercraft.
- (ww) For controlled impoundments, the surface areas and corresponding clearances shall be based upon the high water level. For other waters, the surface area shall be that enclosed by its annual flood level. The clearance over rivers, streams and canals shall be based upon the largest surface areas of any one-mile long segment which includes the crossing. The clearance over a canal, river or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water



- (xx) Water areas are lakes, ponds, reservoirs, tidal waters, rivers, streams and canals without surface obstructions
- (yy) May be reduced over non-walkable structures 54.8 (Table 10)
- (zz) May be reduced to 2 ft for conductors insulated in accordance with 20.8-G

EXISTING

TABLE 10

Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G) ) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs, more than 3/8 pitch (approximately 37 degrees from horizontal, see sketch)

PROPOSED

TABLE 10

Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G) ) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover, or other structure.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs, more than 3/8 pitch (approximately 37 degrees from horizontal, see sketch)

PROPOSED

TABLE 10

Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G) ) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover, or other structure.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs, more than 3/8 pitch (approximately 37 degrees from horizontal, see sketch)

ITEM 4

- Rule 22.0-F
  - 22.8
  - 54.8-G

RATIONALE FOR PROPOSED RULE CHANGES  
RULE 54.8-G (NEW RULE)  
CONSTRUCTION REQUIREMENTS FOR SERVICE / CLEARANCE POLES  
RULE 22.0-F (NEW RULE)  
DEFINITION OF SERVICE / CLEARANCE POLE  
AND  
ASSOCIATED RULE CHANGE  
RULE 22.8  
DEFINITION OF SERVICE DROPS

There is no provisions under the existing rules of the Order that allows the installation of a service / clearance pole in order to maintain the above ground clearance for supply service drops (e.g.: at street crossings) or to maintain the supply service drop span limitation of 150 feet without treating the span between the main pole line and the service / clearance pole or between service / clearance poles as 0-750 volt supply conductors. This currently requires the use of the strength requirements for supply conductors, when the strength requirements for supply service drops would be both adequate and practical.

The proposed rule changes will allow the reduced strength requirements for supply service drops to be applied to the supply conductors between the main pole line and the service / clearance pole or between service / clearance poles when certain requirements are met. There will be no reduction in above ground or conductor to conductor clearances.

The proposed rule changes will afford the workman and the general public the same safety as is currently provided for supply service drops. Also this change will reduce exposure to the public by eliminating unnecessary anchor guys and multiple supply service drops that are now required under the existing rules.

The associated rule change, (Rule 22.8) definition of Service Drops, proposes a change in language from "conductors strung" to "that portion of a circuit located". This change will help clarify the clearance requirements of communication service drops from supply and trolley conductors.

PROPOSED RULE CHANGES  
NEW RULES  
RULE 54.8-G  
SERVICE / CLEARANCE POLES  
AND  
RULE 22.0-F  
DEFINITION OF SERVICE / CLEARANCE POLE

Rule 54.8 Service Drops, 0-750 Volts

Rule 54.8-G (New Rule)

G. Service / Clearance Poles (See Rule 22.0 – F For Definition)

(1) Service / Clearance Poles Shall Support Only:

- (a) 0 - 750 Volt conductors (See Rule 54.8–G2 )
- (b) Service drops
- (c) Associated risers and runs
- (d) Associated guys
- (e) Lighting and its associated equipment
- (f) Communication facilities

(2) Construction Requirements:

- (a) All supply service drop strength requirements may be applied to 0 - 750 volt conductors (secondary) installed under this Rule.
- (b) Span lengths shall not exceed 150 feet.
- (c) Supply conductors (secondary) installed between service / clearance poles shall meet the 0 - 750 volt conductor clearance requirements of Rule 37 , Table 1, Column D and Rule 38 , Table 2, Column D .
- (d) Multiple service drops, risers and street lights may be served from 0 - 750 volt conductor (secondary) installed under this Rule.

RULE 22.0 POLE

RULE 22.0-F (NEW RULE)

- F. Service/Clearance Pole means a pole, required only to maintain above-ground clearances for service drops or to maintain service drop span limitations. Permissible attachments are limited to 0 - 750 volt conductors, supply service drops, associated risers and runs, communication facilities, lighting and its associated equipment, and guys.



ASSOCIATED RULE CHANGE

EXISTING RULE  
RULE 22.8  
DEFINITION OF SERVICE DROPS

- 22.8 Service Drops mean the conductors strung between a pole line and a building, a structure or a service and meter pole.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINE)

- 22.8 Service Drops means the conductors strung that portion of a circuit located between a pole line and a building, a structure or a service and meter pole.

PROPOSED RULE CHANGE  
(FINAL)\*

- 22.8 Service Drops means that portion of a circuit located between a pole line and a building, a structure or a service and meter pole.

ITEM 5

- Rule 34

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 34  
FOREIGN ATTACHMENTS

The proposed rule change expands the scope of the Rule 34, Foreign Attachments, and states specific requirements for energized and non-energized material and equipment. Currently utilities must refer to Rule 78.3, Requirements For Trolley Lines Foreign Conductors, for dispensing information to outside agencies for the installation of temporary or permanent foreign attachments. The expansion of Rule 34 in Section III., Requirements for All Lines, will more appropriately address solely and jointly owned poles so as foreign attachments will be in compliance with General Order 95.

## EXISTING RULE

### RULE 34

#### 34 Foreign Attachments

Nothing in these rules shall be construed as permitting the unauthorized attachment, to supply or communication poles, of radio antennas, ropes, signs, and any such equipment foreign to the purpose of overhead electric line construction.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

34. FOREIGN ATTACHMENTS

Nothing in these rules shall be construed as permitting the unauthorized attachment, to supply, street light or communication poles or structures, of antennas, signs, posters, banners, decorations, wires, lighting fixtures, guys, ropes and any other such equipment foreign to the purposes of overhead electric line construction.

Nothing herein contained shall be construed as requiring utilities to grant permission for such use of their overhead facilities; or permitting any use of joint poles or facilities for such permanent or temporary construction without the consent of all parties having any ownership whatever in the poles or structures to which attachments may be made; or granting authority for the use of any poles, structures or facilities without the owner's or owners' consent.

All permanent attachments must be approved by the Commission (see Rule 15.1) and the owner(s) involved.

All temporary attachments shall be restricted to installations where the period is estimated to be one year or less.

The utilities, or other governmental entities may require construction standards which are more restrictive than the requirements of this Rule 34.

The following rules shall apply to approved temporary foreign attachments installed on climbable poles and structures and shall be maintained as required by Rule 12.2.

A. SUPPORTS

(1) Messengers and Span Wires: Messengers and Span Wires (when used under the definitions of Rules 21.11 and 22.9 respectively) may be used as supports when the following requirements are met.

(a) Material and Size Requirements: See Rule 49.7 Messengers and Span Wires.

(b) Sectionalizing Requirements: Insulators shall be installed in all messengers and span wires, when used within the scope of this rule, and shall be located at a distance of not less than 6 feet and not more than 9 feet, measured along the messenger or span wire, from the points of attachment to the poles or structures. Sectionalizing insulators shall meet the requirements of Rules 56.8 and 86.8.

(c) Attachments: Messengers and span wires shall be attached to poles with through bolts and shall be protected by the use of guy thimbles or their equivalent where attached to the through bolts. Steel pole bands or their equivalent shall be used for steel and concrete poles.

In no case shall any apparatus (decorations, banner, wire, cable, lights, etc.) be supported by the utilities' or licensees' conductors, cables, messengers, span wires or guys.

(2) Rope: Rope may be used as a support for banners and decorations for short periods of time (to be determined by the granting authority) when the following conditions are met:

(a) Only non-energized banners and decorations shall be supported with rope.

(b) The rope must be securely tied to the pole or structure with all excess rope removed and must not contact or obstruct any pole steps.

(c) The rope must supply a safe minimum working load strength of 200 pounds, which is equivalent to 3/8 inch manila rope.

(3) Apparatus Supported on Brackets Attached To Poles: All attachments supported on brackets with a supply voltage of 0-750 volts shall meet the requirements of Rules 58.2-B and 92.I-F5.

## B. CLIMBING SPACE

All apparatus shall be installed outside of climbing space.

EXCEPTION: When temporary pole bands or ropes are used to support attachments, the bands or ropes shall be limited to 3 inches in width with no more than one band or width of rope allowed in any 24 inch section of climbing space.

C. Clearances

(1) Messengers and Span Wires:

(a) Messengers: Messengers supporting energized apparatus, insulated wires or cables, etc. shall meet the clearance requirements of Rule 57.

(b) Span Wires: Span wires supporting non-energized equipment (banners, decorations, etc.) shall meet the clearance requirements of Rule 56.

(2) Energized Apparatus: All energized apparatus (decorations, wire, cable, lights, etc.) shall maintain the same clearances from conductors as those required for 0 - 750 volt service drops ( Table 2, Column D , and Rule 54.8 ).

(3) Non-Energized Apparatus, Vertical and Radial Clearances:

(a) A minimum vertical clearance of 6 feet below any energized conductor level shall be maintained to any part of attachments supporting non-energized equipment.

(b) A minimum radial clearance of 1 foot shall be maintained from any street light and its supporting fixtures.

(c) A minimum radial clearance of 1 foot shall be maintained from all communication cables and messengers.

(4) Miscellaneous Equipment: A minimum radial clearance of 1 foot shall be maintained from any supply or communication device (power supply cabinets, communication drop distribution terminals, switch enclosures, operating equipment, etc.) where access may be required by workers.

To ensure access and operation a greater clearance may be required by the utility or licensee involved.

D. Vertical Clearance Requirements above Thoroughfares, Ground, etc.

Vertical clearance requirements as in Rule 37, Table 1, Column B, Cases 1 to 5 inclusive, shall be maintained.

E. Vertical and Lateral Runs

For the requirements of vertical and lateral runs of conductors see Rule 54.6 .

F. Energized Conductor (Wire or Cable)

All energized conductor (wire or cable) shall be covered with an insulation suitable for the voltage involved (See Rule 20.8–G ).

G. Guying

Where mechanical loads imposed on poles or structures exceed safety factors as specified in Rule 44, or at the request of the granting authority, additional strength shall be provided by the use of guys or other suitable construction. When guying is required, refer to Rules 56 and 86 for applicable requirements.



PROPOSED RULE CHANGE  
(FINAL)\*

34. FOREIGN ATTACHMENTS

Nothing in these rules shall be construed as permitting the unauthorized attachment, to supply, street light or communication poles or structures, of antennas, signs, posters, banners, decorations, wires, lighting fixtures, guys, ropes and any other such equipment foreign to the purposes of overhead electric line construction.

Nothing herein contained shall be construed as requiring utilities to grant permission for such use of their overhead facilities; or permitting any use of joint poles or facilities for such permanent or temporary construction without the consent of all parties having any ownership whatever in the poles or structures to which attachments may be made; or granting authority for the use of any poles, structures or facilities without the owner's or owners' consent.

All permanent attachments must be approved by the Commission (see Rule 15.1) and the owner(s) involved.

All temporary attachments shall be restricted to installations where the period is estimated to be one year or less.

The utilities, or other governmental entities may require construction standards which are more restrictive than the requirements of this Rule 34.

The following rules shall apply to approved temporary foreign attachments installed on climbable poles and structures and shall be maintained as required by Rule 12.2.

A. SUPPORTS

(1) Messengers and Span Wires: Messengers and Span Wires (when used under the definitions of Rules 21.11 and 22.9 respectively) may be used as supports when the following requirements are met.

(a) Material and Size Requirements: See Rule 49.7 Messengers and Span Wires.

- (b) Sectionalizing Requirements: Insulators shall be installed in all messengers and span wires, when used within the scope of this rule, and shall be located at a distance of not less than 6 feet and not more than 9 feet, measured along the messenger or span wire, from the points of attachment to the poles or structures. Sectionalizing insulators shall meet the requirements of Rules 56.8 and 86.8.
- (c) Attachments: Messengers and span wires shall be attached to poles with through bolts and shall be protected by the use of guy thimbles or their equivalent where attached to the through bolts. Steel pole bands or their equivalent shall be used for steel and concrete poles.

In no case shall any apparatus (decorations, banner, wire, cable, lights, etc.) be supported by the utilities' or licensees' conductors, cables, messengers, span wires or guys.

- (2) Rope: Rope may be used as a support for banners and decorations for short periods of time (to be determined by the granting authority) when the following conditions are met:
  - (a) Only non-energized banners and decorations shall be supported with rope.
  - (b) The rope must be securely tied to the pole or structure with all excess rope removed and must not contact or obstruct any pole steps.
  - (c) The rope must supply a safe minimum working load strength of 200 pounds, which is equivalent to 3/8 inch manila rope.
- (3) Apparatus Supported on Brackets Attached To Poles: All attachments supported on brackets with a supply voltage of 0-750 volts shall meet the requirements of Rules 58.2-B and 92.I-F5.

## B. CLIMBING SPACE

All apparatus shall be installed outside of climbing space.

EXCEPTION: When temporary pole bands or ropes are used to support attachments, the bands or ropes shall be limited to 3 inches in width with no more than one band or width of rope allowed in any 24 inch section of climbing space.

C. Clearances

- (1) Messengers and Span Wires:
  - (a) Messengers: Messengers supporting energized apparatus, insulated wires or cables, etc. shall meet the clearance requirements of Rule 57.
  - (b) Span Wires: Span wires supporting non-energized equipment (banners, decorations, etc.) shall meet the clearance requirements of Rule 56.
- (2) Energized Apparatus: All energized apparatus (decorations, wire, cable, lights, etc.) shall maintain the same clearances from conductors as those required for 0 - 750 volt service drops ( Table 2, Column D , and Rule 54.8 ).
- (3) Non-Energized Apparatus, Vertical and Radial Clearances:
  - (a) A minimum vertical clearance of 6 feet below any energized conductor level shall be maintained to any part of attachments supporting non-energized equipment.
  - (b) A minimum radial clearance of 1 foot shall be maintained from any street light and its supporting fixtures.
  - (c) A minimum radial clearance of 1 foot shall be maintained from all communication cables and messengers.
- (4) Miscellaneous Equipment: A minimum radial clearance of 1 foot shall be maintained from any supply or communication device (power supply cabinets, communication drop distribution terminals, switch enclosures, operating equipment, etc.) where access may be required by workers.

To ensure access and operation a greater clearance may be required by the utility or licensee involved.

- D. Vertical Clearance Requirements above Thoroughfares, Ground, etc.

Vertical clearance requirements as in Rule 37, Table 1, Column B, Cases 1 to 5 inclusive, shall be maintained.

- E. Vertical and Lateral Runs

For the requirements of vertical and lateral runs of conductors see Rule 54.6 .

- F. Energized Conductor (Wire or Cable)

All energized conductor (wire or cable) shall be covered with an insulation suitable for the voltage involved (See Rule 20.8–G ).

- G. Guying

Where mechanical loads imposed on poles or structures exceed safety factors as specified in Rule 44, or at the request of the granting authority, additional strength shall be provided by the use of guys or other suitable construction. When guying is required, refer to Rules 56 and 86 for applicable requirements.

ITEM 6

- Rule 35
- Appendix E

## RATIONALE FOR PROPOSED NEW RULE

### APPENDIX E

#### TREE TRIMMING GUIDELINES

These clearances and other recommended tree-trimming practices are guidelines only. These are meant to compliment Rule 35.

It is believed impractical to require specific clearances for tree trimming. Meeting rule prescribed clearances in all locations and situations, is judged to be very difficult – and not realistic – due to the wide variety of factors that affect and condition response to tree – trimming needs.

Such problems include increasing objections to tree-owners and even by community officials, to tree-trimming, based upon environmental and aesthetic reasons. Wind and weather vary within franchise areas, thus requiring increased line protection (greater separation from limbs) in some locations. Also, the lines' locale, whether urban, suburban or rural, condition similar protection needs due to the varying exposure to the public and traffic. Growth rates of trees and vegetation vary according to species as well as regional location. Another important factor affecting the amount of clearance separation needs is that of the frequency of patrol and trimming conducted by the utility.

Finally, the type of conductors in use should be considered. "Primary tree wire" is a conductor covered by a highly abrasion resistant material. It is much more costly than ordinary conductor but may be used where ordinary tree trimming is not possible or is impractical. It is used where such reduced clearances would allow only infrequent or intermittent line contact between foliage and limbs and the tree-wire. The expanding use of multi-conductor insulated, abrasion-resistant, bare neutral supported cable, for low voltage secondary and service drop circuits also reduces, if not eliminates, and clearances needs in such situations.

EXISTING RULE  
RULE 35

35 Tree Trimming

Where overhead wires pass through trees, safety and reliability of service demand that a reasonable amount of tree trimming be done in order that the wires may clear branches and foliage.

Trees so located that they can fall into a crossing span or into any span that could communicate the trouble to a crossing span shall be removed wherever practicable.

PROPOSED RULE CHANGE  
RULE 35

35 Tree Trimming

Where overhead wires pass through trees, safety and reliability of service demand that a reasonable amount of tree trimming be done in order that the wires may clear branches and foliage.

Trees so located that they can fall into a crossing span or into any span that could communicate the trouble to a crossing span shall be removed wherever practicable. (see Appendix E, page 2)

PROPOSED RULE CHANGE  
RULE 35

35 Tree Trimming

Where overhead wires pass through trees, safety and reliability of service demand that a reasonable amount of tree trimming be done in order that the wires may clear branches and foliage.

Trees so located that they can fall into a crossing span or into any span that could communicate the trouble to a crossing span shall be removed wherever practicable. (see Appendix E, page 2)

## PROPOSED NEW RULE

### APPENDIX E (Page 2)

The following clearances are guidelines only. These are meant to compliment Rule 35.

#### RECOMMENDED CLEARANCES

The radial clearances shown below are only a guide for minimum clearances that should be established, when trimming, between the vegetation and the energized conductors and associated live parts whenever practicable.

- A. Radial clearances for any conductor of a line operating at 110,000 or more volts, \_\_\_\_\_ 10 feet
- B. Radial clearances for any conductor of a line operating at 72,000 or more volts, but less than 110,000 volts \_\_\_\_\_ 6 feet
- C. Radial clearances for any conductor of a line operating at 2,400 or more volts, but less than 72,000 volts \_\_\_\_\_ 4 feet

Trimming clearances for voltages between 2,400 and 72,000 volts may be reduced where primary tree wire is used.

Dead, rotten, and diseased trees or portions thereof that overhang or lean toward and may fall into the line should be felled or trimmed as soon as practicable.

Communication land electrical supply secondary (low voltage) circuits, including their service drops, should be kept clear of limbs and foliage, in new construction and when circuits are reconstructed or repaired, whenever practicable. When any of these circuits become under strain or begin to evidence abrasion, they should be remedied by slacking line or trimming. Tree guard covering is one means of protecting such circuits.



## PROPOSED NEW RULE

### APPENDIX E (Page 2)

The following clearances are guidelines only. These are meant to compliment Rule 35.

#### RECOMMENDED CLEARANCES

The radial clearances shown below are only a guide for minimum clearances that should be established, when trimming, between the vegetation and the energized conductors and associated live parts whenever practicable.

- A. Radial clearances for any conductor of a line operating at 110,000 or more volts, 10 feet
- B. Radial clearances for any conductor of a line operating at 72,000 or more volts, but less than 110,000 volts 6 feet
- C. Radial clearances for any conductor of a line operating at 2,400 or more volts, but less than 72,000 volts 4 feet

Trimming clearances for voltages between 2,400 and 72,000 volts may be reduced where primary tree wire is used.

Dead, rotten, and diseased trees or portions thereof that overhang or lean toward and may fall into the line should be felled or trimmed as soon as practicable.

Communication land electrical supply secondary (low voltage) circuits, including their service drops, should be kept clear of limbs and foliage, in new construction and when circuits are reconstructed or repaired, whenever practicable. When any of these circuits become under strain or begin to evidence abrasion, they should be remedied by slacking line or trimming. Tree guard covering is one means of protecting such circuits.

EXISTING RULE  
APPENDICES

CONTENTS

Appendices		Page
A	Loading District Map	A-1
B	Mechanical and Loading Data for Conductors	B-1
C	Conductor Sags	C-1
D	Typical Communication Line Construction	D-1
E	Clearance of Poles, Towers, and Structures from Railroad Tracks	E-1
F	Typical Problems	F-1
	Part 1 Crossing Problem	F-1
	Part 2 Dead-end Problem	F-18
	Part 3 Angle Pole Problem	F-23
G	Illustrative Diagrams	G-1

PROPOSED RULE CHANGE  
APPENDICES

CONTENTS

Appendices		Page
A	Loading District Map	A-1
B	Mechanical and Loading Data for Conductors	B-1
C	Conductor Sags	C-1
D	Typical Communication Line Construction	D-1
E	Clearance of Poles, Towers, and Structures from Railroad Tracks	E-1
	<u>Tree Trimming Guidelines</u>	<u>E-2</u>
F	Typical Problems	F-1
	Part 1 Crossing Problem	F-1
	Part 2 Dead-end Problem	F-18
	Part 3 Angle Pole Problem	F-23
G	Illustrative Diagrams	G-1

FINAL\*  
APPENDICES

CONTENTS

Appendices		Page
A	Loading District Map	A-1
B	Mechanical and Loading Data for Conductors	B-1
C	Conductor Sags	C-1
D	Typical Communication Line Construction	D-1
E	Clearance of Poles, Towers, and Structures from Railroad Tracks	E-1
	Tree Trimming Guidelines	E-2
F	Typical Problems	F-1
	Part 1 Crossing Problem	F-1
	Part 2 Dead-end Problem	F-18
	Part 3 Angle Pole Problem	F-23
G	Illustrative Diagrams	G-1

ITEM 7

- Rule 54.4-C7

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 54.4-C7 (NEW RULE)

Present General Order 95 rules do not differentiate between supply conductors crossing in spans that are electrically connected and those that are not.

This proposed rule adds language to include clearance reduction for supply conductors crossing in spans where related conductors are to be electrically connected.

Related rules to change are Rule 38, Table 2 Cases 4,5,6 and 7, by adding additional reference section, which refers to new rule 54.4-C7.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
ADD NEW RULE 54.4-C7

Rule 54 – Conductors  
Rule 54.4 – Clearances  
Rule 54.4-C – Between Conductors

Rule 54.4-C7

(7) Vertically at Crossings in Spans:

The Vertical clearance required at crossings in spans by Table 2, Cases 4, 5, 6 and 7, may be reduced when:

1. All conductors are of the same circuit, and
2. Vertical taps are installed between related crossing conductors.

The minimum vertical clearance shall be the following:

<u>Supply Conductor</u>	<u>Minimum Vertical</u>
<u>Voltage:</u>	<u>Clearance:</u>
<u>0 - 750 Volts</u>	<u>12 inches</u>
<u>750 - 20,000</u> <u>Volts</u>	<u>24 inches</u>
<u>20,000 - 35,000</u> <u>Volts</u>	<u>30 inches</u>
<u>35,000 - 75,000</u> <u>Volts</u>	<u>48 inches</u>

EXCEPTIONS:

- (a) In vertical configuration, there is no specific vertical clearance required between conductors that are mechanically and electrically connected at the crossing.
- (b) There is no specific clearance required for 0 - 750 volt multiconductor cable having a bare neutral (Rule 54.10 ) provided the messengers are mechanically connected.

PROPOSED RULE CHANGE  
(FINAL\*)  
ADD NEW RULE 54.4-C7

Rule 54.4-C7

(7) Vertically at Crossings in Spans:

The Vertical clearance required at crossings in spans by Table 2, Cases 4, 5, 6 and 7, may be reduced when:

1. All conductors are of the same circuit, and
2. Vertical taps are installed between related crossing conductors.

The minimum vertical clearance shall be the following:

Supply Conductor Voltage:	Minimum Vertical Clearance:
0 - 750 Volts	12 inches
750 - 20,000 Volts	24 inches
20,000 - 35,000 Volts	30 inches
35,000 - 75,000 Volts	48 inches

EXCEPTIONS:

- (a) In vertical configuration, there is no specific vertical clearance required between conductors that are mechanically and electrically connected at the crossing.
- (b) There is no specific clearance required for 0 - 750 volt multiconductor cable having a bare neutral (Rule 54.10 ) provided the messengers are mechanically connected.



ASSOCIATED RULE CHANGE  
\*(FINAL)  
RULE 38 (TABLE 2)  
CASES 4, 5, 6 & 7  
(qq) TO REFERENCE SECTION OF RULE 38 (TABLE 2)

RULE 38  
TABLE 2

Case  
No.

4. Supply conductors, service drops and trolley feeders 0-750 volts (qq)
5. Supply conductors, 750-7500 volts (qq)
6. Supply conductors 7500-20,000 volts (qq)
7. Supply conductors, more than 20,000 volts (qq)

(qq) Vertical clearances may be reduced between supply conductors of the same circuit at crossings in spans 54.4-C7

Initial, Proposed, and Final versions (added by Raymond G Fugere on 1/6/03.

Original Version (SU-15)

Table 2

Basic Minimum Allowable Clearance of Wires from Other Wires at Crossings, in Midspans and at Supports  
 (Letter references Denote Modifications of Minimum Clearances Referred to in Notes Following this Table)  
 All Clearances Are in Inches

Case No.	Nature of Clearance and Class of Voltage of wire, cable or conductor concerned	Other Wire, cable or conductor concerned										
		Supply conductor (including supply cables)										K 300,000 - 550,000 volts
A Span wires, guys and messengers	B Trolley contact conductors 0-750 volts	C Communication conductors (including open wire, cables and service drops)	D 0-750 volts (including service drops and trolley feeders (a))	E 750-7,500 Volts	F 7,500-20,000 volts	G 20,000-35,000 volts	H 35,000-75,000 volts	I 75,000-150,000 volts	J 150,000 - 300,000 volts			
1	<b>Clearance between wires, cables, and conductors not supported on the same poles, vertically at crossings in spans, and radially where collinear or approaching crossing</b> Span wires, guys and messengers (b) Trolley contact conductors 0-750 volts Communication conductors Supply conductors, service drops and trolley feeders 0-750 volts Supply conductors, 750-7500 volts Supply conductors 7500-20,000 volts Supply conductors, more than 20,000 volts <b>Vertical separation between conductors and / or cables on separate crossarms or other</b>	18 (c)	48 (d, e)	24 (e)	24 (e)	36 (f)	36	72	72	78	78(gg)	138(hh)
2		48 (d, e)	-----	48 (d)	48 (d, h)	48	72	96	96	96	96 (gg)	156(hh)
3		24 (e)	48 (d)	24	48 (i)	48 (dd)	72	96	96	96 (gg)	96 (gg)	156(hh)
4		24 (e)	48 (d, h)	48 (i)	24	48	48	96	96	96 (gg)	96 (gg)	156(hh)
5		36 (f)	48	48 (dd)	48	48 (h)	72	96	96	96 (gg)	96 (gg)	156(hh)
6		36	72	72	48	72	96(oo)	96	96	96 (gg)	96 (gg)	156(hh)
7		72(g)	96(g)	96(g)	96(g) (oo)	96(g)	96(g) (oo)	96(g)	96	96 (gg)	96 (gg)	156(hh)



19	circuit), and guys approximately parallel to conductors supported on the same poles Guys and spans wires passing conductors supported on the same poles <b>Vertical and Horizontal insulator-Vertical clearance between conductors</b>	(ee)	(bb)	3	3	6	9	12	18	24	48 (ll)	86 (jj)
20	Vertical Clearance between conductors of the same circuit on Horizontal <del>post</del> insulators	-	-	-	-	24	24	30	36 or 48 (ii) (mm)	48 (mm)	48(mm )	48(mm)

(a)	The clearances in Column D are also applicable to supply cables of any voltage under certain conditions	57.4
(b)	Clearances for guys and span wires apply vertically at crossings; see Case 18 for radial clearances from conductors. <ol style="list-style-type: none"> <li>1. Supply guys and span wires from conductors</li> <li>2. Supply guys and span wires from guys and span wires</li> <li>3. Communication guys and span wires from conductors</li> <li>4. Communication guys and span wires from guys and span wires</li> </ol>	56.4-C 56.4-D1 86.4-C 86.4-D1
(c)	Not applicable between messengers or span wires of the same system. <ol style="list-style-type: none"> <li>1. Supply messengers</li> <li>2. Trolley span wires</li> <li>3. Communication messengers</li> </ol>	57.4-E 77.4-D 87.4-G
(d)	Protection required on guys, span wires, messengers, and cables where within trolley throw <ol style="list-style-type: none"> <li>1. Supply Guys and Span wires</li> <li>2. Supply Messengers and Cables</li> <li>3. Communication guys and span wires</li> <li>4. Communication messengers</li> </ol>	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(e)	Not applicable to certain conductors supported on trolley span wires. <ol style="list-style-type: none"> <li>1. Trolley contact and feeder conductors</li> <li>2. Trolley feeder conductors</li> <li>3. Trolley system communication conductors</li> <li>4. Foreign conductors</li> </ol>	74.4-G 78.1 78.2 78.3
(f)	Increased clearance required over trolley contact conductors of 750-7500 volts	74.4-G2
(g)	Shall be increased for conductors of more than 75,000 volts. As required by Table 2 Columns I, J, and K	
(h)	May be reduced for certain conductors of Class T circuits of the same system	74.4-C

(i)	<p>May be reduced for service drops under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops and communication service drops</li> <li>3. Communication service drops and supply line conductors</li> <li>4. Communication service drops and supply service drops</li> </ol>	<p>54.8-C1a 54.8-C4 84.8-D1a 84.8-D4</p>
(j)	<p>May be reduced or shall be increased for certain communication conductors or cables.</p> <ol style="list-style-type: none"> <li>1. Open wire conductors, attached to poles, within 3 feet of topmost conductor</li> <li>2. Line conductors of police or fire-alarm circuits and service drops from other communication circuits.</li> <li>3. Cables and messengers attached to poles</li> </ol>	<p>84.4-C1a 84.8-D1b 87.4-C3</p>
(k)	<p>Special clearances for 0-750 volt conductors in rack configuration and messengers and cables attached to poles.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply cables and messengers attached to poles</li> <li>3. Communication cables and messengers attached to poles</li> <li>4. On Jointly used poles</li> </ol>	<p>54.9 57.4-F 87.4-C3 92.1</p>
(l)	<p>May be reduced for service drops, and police or fire-alarm conductors, under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops on clearance arms</li> <li>3. Supply service drops on pole-top extensions</li> <li>4. Supply service drops and communication service drops</li> <li>5. Communication service drops and police, fire-alarm or supply line conductors</li> <li>6. Communication service drops on clearance arms</li> <li>7. Communication service drops on pole-top extensions</li> <li>8. Communication service drops and supply service drops</li> <li>9. Police or fire-alarm conductors</li> </ol>	<p>54.8-C1b 54.8-C2 54.8-C3 54.8-C4 84.8-D1b 84.8-D2 84.8-D3 84.8-D4 92.2</p>

(m)	May be reduced for lead wires <ol style="list-style-type: none"> <li>1. Supply lead wires above supply conductors</li> <li>2. Supply drip loops above communication conductors</li> </ol>	54.4-C6 92.1-F3
(n)	May be reduced for supply conductors and private communication conductors of the same ownership	89.2-B
(o)	May be reduced or increased for triangular or vertical configuration or for pole-top construction. <ol style="list-style-type: none"> <li>1. Triangular or vertical configuration on crossarms</li> <li>2. Dead-ended on pole in vertical configuration</li> <li>3. Conductors of 0-7500 volts in triangular configuration at top of pole</li> <li>4. Conductors of more than 7500 volts at top of pole</li> </ol>	54.4-C1c 54.4-C4  54.4-D8a 54.4-D8b
(p)	May be reduced for supply service drops of 0-750 volts	54.8-C6
(q)	Shall be increased between circuits where conductors of more than 7500 volts are at pole top.	54.4-D8b
(r)	May be reduced under special conditions <ol style="list-style-type: none"> <li>1. Supply conductors of 750-7500 volts</li> <li>2. Supply conductors of 7500-20,000 volts</li> </ol>	54.4-C1a 54.4-C1b
(s)	Does not apply where conductors do not cross. <ol style="list-style-type: none"> <li>1. Supply conductors of different phase polarity</li> <li>2. Communication conductors</li> </ol>	54.4-C2a 84.4-C1a
(t)	Shall not be applied consecutively both above and below the same supply conductors	54.4-2a
(u)	Shall be increased where conductors of different classifications are supported on the same crossarms. <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts and conductors of 7500-20,000 volts</li> <li>2. Supply conductors of 0-750 volts and conductors of 750-7500 volts</li> </ol>	32.4-A2 32.4-A3
(v)	Not applicable to certain kinds of conductors. <ol style="list-style-type: none"> <li>1. Supply conductors of same phase or polarity</li> <li>2. Insulated supply conductors in multiple-conductor cables</li> <li>3. Communication insulated conductors or multiple-conductor cables</li> </ol>	54.4-C3c 57.4-C  87.4-C1

(w)	Shall apply radially to conductors on brackets attached to crossarms. 1. Supply conductors 2. Communication conductors	54.4-C3b 84.8-C1b
(x)	Shall be increased between conductors of different classifications supported on the same crossarm. 1. Supply conductors of different voltage classification 2. Supply circuits of 0-750 volts and communication circuits 3. Supply circuits and private communication circuits.	32.4-A 32.4-B 89.2-A
(y)	Special clearances for unprotected supply conductors from one level to another level	54.6-A 58.2-B3 92.1-F5
(z)	Not applicable to the following: 1. Clearances between conductors at different levels specified in Cases 8 to 13 inclusive. 2. Supply lateral conductors, suitably protected 3. Supply vertical runs, suitably protected 4. Supply risers, suitably protected 5. Communication Conductors	54.6-C 54.6-D 54.6-E 87.4-C1
(aa)	Not applicable between cables and their supporting messengers. 1. Supply 2. Communication	57.4-D 87.4-F
(bb)	May be reduced for communication guys and communication conductors supported on the same poles 1. Supply 2. Communication	56.4-C4 86.4-C
(cc)	Clearance required between guys. 1. Supply guys, crossing 2. Supply guys, approximately parallel 3. Communication guys, crossing 4. Communication guys, approximately parallel	56.4-D2 56.4-D3 86.4-D2 86.4-D3
(dd)	Shall be increased where within 6 feet of a pole	103.5
(ee)	May be decreased in partial underground distribution	54.4-C4c
(ff)	shall be increased by 0.40 inches per kV in excess of 75 kV	
(gg)	shall be increased by 0.40 inches per kV in excess of 150 kV	
(hh)	shall be increased by 0.40 inches per kV in excess of 300 kV	
(ii)	shall be increased by 0.25 inches per kV in excess of 150 kV	



(jj)	shall be increased by 0.25 inches per kV in excess of 300 kV	
(kk)	proposed clearances to submitted to the CPUC prior to construction for circuits in excess of 550 kV	
(ll)	36-inch clearance applies 35 kV to 68kV 48-inch clearance applies over 68 kV	
(mm)	vertical clearance shall be increased by ½ inch for each kilovolt over 68 kV	
(nn)	The vertical separation between supply conductors and service drops Of 0-750 volts and 20,000-22,500-volt conductors may be reduced to 48 inches.	
(oo)	May be reduced to 72 inches for conductors of 20,000-22,500 volts.	
(pp)	May be reduced to 36 inches vertically at midspan only when the supply conductors consist of abrasion resistant cable with a grounded metallic sheath or neutral-supported cable as specified in Rules 57 and 54.10.	

## Strike Out and Underlined Version (SU-15)

### Table 2

Basic Minimum Allowable Clearance of Wires from Other Wires at Crossings, in Midspans and at Supports  
(Letter references Denote Modifications of Minimum Clearances Referred to in Notes Following this Table)

All Clearances Are in Inches

Case No.	Nature of Clearance and Class of Voltage of wire, cable or conductor concerned	Other Wire, cable or conductor concerned																					
		Span wires, guys and messengers		Trolley contact conductors 0-750 volts		Communication conductors (including open wire, cables and service drops)		0-750 volts (including service drops and trolley feeders (a))		750-7,500 Volts		7,500-20,000 volts		20,000-35,000 volts		35,000-75,000 volts		75,000-150,000 volts		150,000 - 300,000 volts		300,000 - 550,000 volts	
A	B	C	D	E	F	G	H	I	J	K													
1	<b>Clearance between wires, cables, and conductors not supported on the same poles, vertically at crossings in spans, and radially where collinear or approaching crossing</b> Span wires, guys and messengers (b) Trolley contact conductors 0-750 volts Communication conductors Supply conductors, service drops and trolley feeders 0-750 volts (gd) Supply conductors, 750-7500 volts (gg) Supply conductors 7500-20,000 volts (gg) Supply conductors, more than 20,000 volts (gg) <b>Vertical separation between conductors and / or cables on separate crossarms or other supports at different levels (excepting on related line and buck arms on the</b>	18 (c)	48 (d, e)	24 (e)	24 (e)	36 (f)	36	72	72	78	78(gg)	138(hh)											
2		48 (d, e)	-----	48 (d)	48 (d, h)	48	72	96	96	96	96(gg)	156(hh)											
3		24 (e)	48 (d)	24	48 (i)	48 (dd)	72	96	96	96	96(gg)	156(hh)											
4		24 (e)	48 (d, h)	48 (i)	24	48	48	96	96	96	96(gg)	156(hh)											
5		36 (f)	48	48 (dd)	48	48 (h)	72	96	96	96	96(gg)	156(hh)											
6		36	72	72	48	72	96	96	96	96	96(gg)	156(hh)											
7		72(g)	96(g)	96(g)	96(g) (oo)	96(g) (oo)	96(g) (oo)	96(g) (oo)	96(g)	96	96(gg)	156(hh)											

8	<b>same pole and in adjoining Midspans)</b> Communication conductors and service drops	-----	-----	12 (j)	48 (k, l, m, n, pp)	48 (k)	72 (m, n)	72(m)	72	78	87 (gg)	147(hh)
9		Supply Conductors, service drops and trolley feeders 0-750 volts	-----	-----	48 (k, l, m, n, pp)	48 (k, m, p)	48 (k, m, q)	72(m)	72	78	87 (gg)	147(hh)
10		Supply conductors, 750-7500 volts	-----	-----	48 (k)	48 (k, m, p)	48 (m, q)	48(q)	48(q)	60(ff)	90 (gg)	150(hh)
11	Supply conductors 7500-20,000 volts	-----	-----	72 (m, n)	48 (k, m, q)	48 (m, o, r, ee)	48 (m, q)	48(q)	60(ff)	90 (gg)	150(hh)	
12	Supply conductors 20,000-66,000 75,000 volts	-----	-----	72 (m)	72 (m)	48 (m, q)	48 (m, q)	48(o, q)	60(ff)	90 (gg)	150(hh)	
13	Supply conductors, more than 66,000 75,000 volts	-----	-----	72	72	60 (q)	60 (q)	60(q)	60(ff)	90 (gg)	150(hh)	
14	<b>Vertical arms above or below conductors on related line arms and buck arms.</b> Line arms above or below related buck arms (s, t) <b>Horizontal separation of conductors on same crossarm</b>	-----	-----	6	12 (u)	18 (u)	18 (u)	24	48	60(ff)	90 (gg)	150(hh)
15	Pin spacings of longitudinal conductors, vertical conductors and service drops (v, w) <b>Radial separation of conductors on same crossarm, pole or structure</b> <b>Incidental pole wiring</b>	-----	-----	3(x)	11 1/2 (h, x)	11 1/2 (x)	17 1/2 (x)	24 (x)	48	60(ff)	90 (gg)	150(hh)
16	Conductors, tap or lead wires of different circuits (v, y, z)	-----	-----	3 (x)	11 1/2 (h, x)	11 1/2 (x)	17 1/2 (x)	24 (x)	48	60(ff)	90 (gg)	150(hh)
17	Conductors, tap or lead wires of same circuits (v, z, aa) <u>Radial separation between guys and conductors</u>	-----	-----	3	3	6 (x)	6	12	24	60(ff)	90 (gg)	150(hh)
18	Guys passing conductors supported on other poles (excluding poles of same circuit), and guys approximately parallel to conductors supported on the	-----	-----	3 (bb)	12	18	18	30	36	36 (ff)	78 (gg)	138(hh)

19	same poles Guys and spans wires passing conductors supported on the same poles <b>Vertical and Horizontal insulator-Vertical clearance between conductors</b>	(ee)	(bb)	3	3	6	9	12	18	24	48 (ll)	86 (lj)
20	Vertical Clearance between conductors of the same circuit on Horizontal <del>post</del> insulators	-	-	-	-	24	24	30	36 or 48 (ll) (mm)	48 (mm)	48(mm )	48(mm)

(a)	The clearances in Column D are also applicable to supply cables of any voltage under certain conditions	57.4
(b)	Clearances for guys and span wires apply vertically at crossings; see Case 18 for radial clearances from conductors. <ol style="list-style-type: none"> <li>1. Supply guys and span wires from conductors</li> <li>2. Supply guys and span wires from guys and span wires</li> <li>3. Communication guys and span wires from conductors</li> <li>4. Communication guys and span wires from guys and span wires</li> </ol>	56.4-C 56.4-D1 86.4-C 86.4-D1
(c)	Not applicable between messengers or span wires of the same system. <ol style="list-style-type: none"> <li>1. Supply messengers</li> <li>2. Trolley span wires</li> <li>3. Communication messengers</li> </ol>	57.4-E 77.4-D 87.4-G
(d)	Protection required on guys, span wires, messengers, and cables where within trolley throw <ol style="list-style-type: none"> <li>1. Supply Guys and Span wires</li> <li>2. Supply Messengers and Cables</li> <li>3. Communication guys and span wires</li> <li>4. Communication messengers</li> </ol>	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(e)	Not applicable to certain conductors supported on trolley span wires. <ol style="list-style-type: none"> <li>1. Trolley contact and feeder conductors</li> <li>2. Trolley feeder conductors</li> <li>3. Trolley system communication conductors</li> <li>4. Foreign conductors</li> </ol>	74.4-G 78.1 78.2 78.3
(f)	Increased clearance required over trolley contact conductors of 750-7500 volts	74.4-G2
(g)	Shall be increased for conductors of more than 75,000 volts. As required by Table 2 Columns I, J, and K	
(h)	May be reduced for certain conductors of Class T circuits of the same system	74.4-C

(i)	<p>May be reduced for service drops under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops and communication service drops</li> <li>3. Communication service drops and supply line conductors</li> <li>4. Communication service drops and supply service drops</li> </ol>	<p>54.8-C1a 54.8-C4 84.8-D1a 84.8-D4</p>
(j)	<p>May be reduced or shall be increased for certain communication conductors or cables.</p> <ol style="list-style-type: none"> <li>1. Open wire conductors, attached to poles, within 3 feet of topmost conductor</li> <li>2. Line conductors of police or fire-alarm circuits and service drops from other communication circuits.</li> <li>3. Cables and messengers attached to poles</li> </ol>	<p>84.4-C1a 84.8-D1b 87.4-C3</p>
(k)	<p>Special clearances for 0-750 volt conductors in rack configuration and messengers and cables attached to poles.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply cables and messengers attached to poles</li> <li>3. Communication cables and messengers attached to poles</li> <li>4. On Jointly used poles</li> </ol>	<p>54.9 57.4-F 87.4-C3 92.1</p>
(l)	<p>May be reduced for service drops, and police or fire-alarm conductors, under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops on clearance arms</li> <li>3. Supply service drops on pole-top extensions</li> <li>4. Supply service drops and communication service drops</li> <li>5. Communication service drops and police, fire-alarm or supply line conductors</li> <li>6. Communication service drops on clearance arms</li> <li>7. Communication service drops on pole-top extensions</li> <li>8. Communication service drops and supply service drops</li> <li>9. Police or fire-alarm conductors</li> </ol>	<p>54.8-C1b 54.8-C2 54.8-C3 54.8-C4 84.8-D1b 84.8-D2 84.8-D3 84.8-D4 92.2</p>

(m)	May be reduced for lead wires 1. Supply lead wires above supply conductors 2. Supply drip loops above communication conductors	54.4-C6 92.1-F3
(n)	May be reduced for supply conductors and private communication conductors of the same ownership	89.2-B
(o)	May be reduced or increased for triangular or vertical configuration or for pole-top construction. 1. Triangular or vertical configuration on crossarms 2. Dead-ended on pole in vertical configuration 3. Conductors of 0-7500 volts in triangular configuration at top of pole 4. Conductors of more than 7500 volts at top of pole	54.4-C1c 54.4-C4  54.4-D8a 54.4-D8b
(p)	May be reduced for supply service drops of 0-750 volts	54.8-C6
(q)	Shall be increased between circuits where conductors of more than 7500 volts are at pole top.	54.4-D8b
(r)	May be reduced under special conditions 1. Supply conductors of 750-7500 volts 2. Supply conductors of 7500-20,000 volts	54.4-C1a 54.4-C1b
(s)	Does not apply where conductors do not cross. 1. Supply conductors of different phase polarity 2. Communication conductors	54.4-C2a 84.4-C1a
(t)	Shall not be applied consecutively both above and below the same supply conductors	54.4-2a
(u)	Shall be increased where conductors of different classifications are supported on the same crossarms. 1. Supply conductors of 0-750 volts and conductors of 7500-20,000 volts 2. Supply conductors of 0-750 volts and conductors of 750-7500 volts	32.4-A2 32.4-A3
(v)	Not applicable to certain kinds of conductors. 1. Supply conductors of same phase or polarity 2. Insulated supply conductors in multiple-conductor cables 3. Communication insulated conductors or multiple-conductor cables	54.4-C3c 57.4-C  87.4-C1

(w)	Shall apply radially to conductors on brackets attached to crossarms. 1. Supply conductors 2. Communication conductors	54.4-C3b 84.8-C1b
(x)	Shall be increased between conductors of different classifications supported on the same crossarm. 1. Supply conductors of different voltage classification 2. Supply circuits of 0-750 volts and communication circuits 3. Supply circuits and private communication circuits.	32.4-A 32.4-B 89.2-A
(y)	Special clearances for unprotected supply conductors from one level to another level	54.6-A 58.2-B3 92.1-F5
(z)	Not applicable to the following: 1. Clearances between conductors at different levels specified in Cases 8 to 13 inclusive. 2. Supply lateral conductors, suitably protected 3. Supply vertical runs, suitably protected 4. Supply risers, suitably protected 5. Communication Conductors	54.6-C 54.6-D 54.6-E 87.4-C1
(aa)	Not applicable between cables and their supporting messengers. 1. Supply 2. Communication	57.4-D 87.4-F
(bb)	May be reduced for communication guys and communication conductors supported on the same poles 1. Supply 2. Communication	56.4-C4 86.4-C
(cc)	Clearance required between guys. 1. Supply guys, crossing 2. Supply guys, approximately parallel 3. Communication guys, crossing 4. Communication guys, approximately parallel	56.4-D2 56.4-D3 86.4-D2 86.4-D3
(dd)	Shall be increased where within 6 feet of a pole	103.5
(ee)	May be decreased in partial underground distribution	54.4-C4c
(ff)	shall be increased by 0.40 inches per kV in excess of 75 kV	
(gg)	shall be increased by 0.40 inches per kV in excess of 150 kV	
(hh)	shall be increased by 0.40 inches per kV in excess of 300 kV	
(ii)	shall be increased by 0.25 inches per kV in excess of 150 kV	



(jj)	shall be increased by 0.25 inches per kV in excess of 300 kV	
(kk)	proposed clearances to submitted to the CPUC prior to construction for circuits in excess of 550 kV	
(ll)	36-inch clearance applies 35 kV to 68kV 48-inch clearance applies over 68 kV	
(mm)	vertical clearance shall be increased by ½ inch for each kilovolt over 68 kV	
(nn)	The vertical separation between supply conductors and service drops Of 0-750 volts and 20,000-22,500-volt conductors may be reduced to 48 inches.	
(oo)	May be reduced to 72 inches for conductors of 20,000-22,500 volts.	
(pp)	May be reduced to 36 inches vertically at midspan only when the supply conductors consist of abrasion resistant cable with a grounded metallic sheath or neutral-supported cable as specified in Rules 57 and 54.10 .	
(qq)	<u>Vertical clearances may be reduced between supply conductors of the same circuit at crossings in spans</u>	<u>54.4– C7</u>

Final Version (SU-15)  
Table 2

Basic Minimum Allowable Clearance of Wires from Other Wires at Crossings, in Midspans and at Supports  
(Letter references Denote Modifications of Minimum Clearances Referred to in Notes Following this Table)  
All Clearances Are in Inches

Case No.	Nature of Clearance and Class of Voltage of wire, cable or conductor concerned	Other Wire, cable or conductor concerned																					
		Span wires, guys and messengers		Trolley contact conductors 0-750 volts		Communication conductors (including open wire, cables and service drops)		0-750 volts (including service drops and trolley feeders (a))		750-7,500 Volts		7,500-20,000 volts		20,000-35,000 volts		35,000-75,000 volts		75,000-150,000 volts		150,000 - 300,000 volts		300,000 - 550,000 volts	
A	B	C	D	E	F	G	H	I	J	K													
1	<b>Clearance between wires, cables, and conductors not supported on the same poles, vertically at crossings in spans, and radially where collinear or approaching crossing</b> Span wires, guys and messengers (b) Trolley contact conductors 0-750 volts Communication conductors Supply conductors, service drops and trolley feeders 0-750 volts (qq) Supply conductors, 750-7500 volts (qq) Supply conductors 7500-20,000 volts (qq) Supply conductors, more than 20,000 volts (qq) <b>Vertical separation between conductors and / or cables on separate crossarms or other supports at different levels (excepting on related line and buck arms on the</b>	18 (c)	48 (d, e)	24 (e)	24 (e)	36 (f)	36	72	72	78	78(gg)	138(hh)											
2		48 (d, e)	-----	48 (d)	48 (d, h)	48	72	96	96	96	96 (gg)	156(hh)											
3		24 (e)	48 (d)	24	48 (i)	48 (dd)	72	96	96	96	96 (gg)	156(hh)											
4		24 (e)	48 (d, h)	48 (i)	24	48	48	96	96	96	96 (gg)	156(hh)											
5		36 (f)	48	48 (dd)	48	48 (h)	72	96	96	96	96 (gg)	156(hh)											
6		36	72	72	48	72	72	96	96	96	96 (gg)	156(hh)											
7		72(g)	96(g)	96(g)	96(g) (oo)	96(g) (oo)	96(g) (oo)	96(g) (oo)	96(g)	96	96 (gg)	156(hh)											

8	<b>same pole and in adjoining Midspans)</b> Communication conductors and service drops	-----	-----	12 (j)	48 (k, l, m, n, pp)	48 (k)	72 (m, n)	72(m)	72	78	87 (gg)	147(hh)
9		Supply Conductors, service drops and trolley feeders 0-750 volts	-----	-----	48 (k, l, m, n, pp)	48 (k, m, p)	48 (k, m, q)	48 (k, m, q)	72	78	87 (gg)	147(hh)
10		Supply conductors, 750-7500 volts	-----	-----	48 (k)	48 (k, m, p)	48 (m, q)	48 (m, q)	48(q)	48(q)	60(ff)	90 (gg)
11	Supply conductors 7500-20,000 volts	-----	-----	72 (m, n)	48 (k, m, q)	48 (m, q)	48 (m, o, q, r, ee)	48(q)	48(q)	60(ff)	90 (gg)	150(hh)
12	Supply conductors 20,000-66,000 75,000 volts	-----	-----	72 (m)	72 (m)	48 (m, q)	48 (m, q)	48(o, q)	48(o, q)	60(ff)	90 (gg)	150(hh)
13	Supply conductors, more than 66,000 75,000 volts	-----	-----	72	72	60 (q)	60 (q)	60(q)	60(q)	60(ff)	90 (gg)	150(hh)
14	<b>Vertical arms above or below conductors on related line arms and buck arms.</b> Line arms above or below related buck arms (s, t) <b>Horizontal separation of conductors on same crossarm</b>	-----	-----	6	12 (u)	18 (u)	18 (u)	24	48	60(ff)	90 (gg)	150(hh)
15	Pin spacings of longitudinal conductors, vertical conductors and service drops (v, w) <b>Radial separation of conductors on same crossarm, pole or structure</b> <b>Incidental pole wiring</b>	-----	-----	3(x)	11 1/2 (h, x)	11 1/2 (x)	17 1/2 (x)	24 (x)	48	60(ff)	90 (gg)	150(hh)
16	Conductors, tap or lead wires of different circuits (v, y, z)	-----	-----	3 (x)	11 1/2 (h, x)	11 1/2 (x)	17 1/2 (x)	24 (x)	48	60(ff)	90 (gg)	150(hh)
17	Conductors, tap or lead wires of same circuits (v, z, aa) Radial separation between guys and conductors	-----	-----	3	3	6 (x)	6	12	24	60(ff)	90 (gg)	150(hh)
18	Guys passing conductors supported on other poles (excluding poles of same circuit), and guys approximately parallel to conductors supported on the	-----	-----	3 (bb)	12	18	18	30	36	36 (ff)	78 (gg)	138(hh)

19	same poles Guys and spans wires passing conductors supported on the same poles <b>Vertical and Horizontal insulator-Vertical clearance between conductors</b>	(ee)	(bb)	3	3	6	9	12	18	24	48 (ll)	86 (jj)
20	Vertical Clearance between conductors of the same circuit on Horizontal <del>post</del> insulators	-	-	-	-	24	24	30	36 or 48 (ll) (mm)	48 (mm)	48(mm )	48(mm)

(a)	The clearances in Column D are also applicable to supply cables of any voltage under certain conditions	57.4
(b)	Clearances for guys and span wires apply vertically at crossings; see Case 18 for radial clearances from conductors. <ol style="list-style-type: none"> <li>1. Supply guys and span wires from conductors</li> <li>2. Supply guys and span wires from guys and span wires</li> <li>3. Communication guys and span wires from conductors</li> <li>4. Communication guys and span wires from guys and span wires</li> </ol>	56.4-C 56.4-D1 86.4-C 86.4-D1
(c)	Not applicable between messengers or span wires of the same system. <ol style="list-style-type: none"> <li>1. Supply messengers</li> <li>2. Trolley span wires</li> <li>3. Communication messengers</li> </ol>	57.4-E 77.4-D 87.4-G
(d)	Protection required on guys, span wires, messengers, and cables where within trolley throw <ol style="list-style-type: none"> <li>1. Supply Guys and Span wires</li> <li>2. Supply Messengers and Cables</li> <li>3. Communication guys and span wires</li> <li>4. Communication messengers</li> </ol>	56.4-B2 57.4-B2 86.4-B2 87.4-B2
(e)	Not applicable to certain conductors supported on trolley span wires. <ol style="list-style-type: none"> <li>1. Trolley contact and feeder conductors</li> <li>2. Trolley feeder conductors</li> <li>3. Trolley system communication conductors</li> <li>4. Foreign conductors</li> </ol>	74.4-G 78.1 78.2 78.3
(f)	Increased clearance required over trolley contact conductors of 750-7500 volts	74.4-G2
(g)	Shall be increased for conductors of more than 75,000 volts. As required by Table 2 Columns I, J, and K	
(h)	May be reduced for certain conductors of Class T circuits of the same system	74.4-C

(i)	<p>May be reduced for service drops under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops and communication service drops</li> <li>3. Communication service drops and supply line conductors</li> <li>4. Communication service drops and supply service drops</li> </ol>	<p>54.8-C1a 54.8-C4 84.8-D1a 84.8-D4</p>
(j)	<p>May be reduced or shall be increased for certain communication conductors or cables.</p> <ol style="list-style-type: none"> <li>1. Open wire conductors, attached to poles, within 3 feet of topmost conductor</li> <li>2. Line conductors of police or fire-alarm circuits and service drops from other communication circuits.</li> <li>3. Cables and messengers attached to poles</li> </ol>	<p>84.4-C1a 84.8-D1b 87.4-C3</p>
(k)	<p>Special clearances for 0-750 volt conductors in rack configuration and messengers and cables attached to poles.</p> <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts in rack configuration</li> <li>2. Supply cables and messengers attached to poles</li> <li>3. Communication cables and messengers attached to poles</li> <li>4. On Jointly used poles</li> </ol>	<p>54.9 57.4-F 87.4-C3 92.1</p>
(l)	<p>May be reduced for service drops, and police or fire-alarm conductors, under special conditions.</p> <ol style="list-style-type: none"> <li>1. Supply service drops and communication line conductors</li> <li>2. Supply service drops on clearance arms</li> <li>3. Supply service drops on pole-top extensions</li> <li>4. Supply service drops and communication service drops</li> <li>5. Communication service drops and police, fire-alarm or supply line conductors</li> <li>6. Communication service drops on clearance arms</li> <li>7. Communication service drops on pole-top extensions</li> <li>8. Communication service drops and supply service drops</li> <li>9. Police or fire-alarm conductors</li> </ol>	<p>54.8-C1b 54.8-C2 54.8-C3 54.8-C4 84.8-D1b 84.8-D2 84.8-D3 84.8-D4 92.2</p>

(m)	May be reduced for lead wires <ol style="list-style-type: none"> <li>1. Supply lead wires above supply conductors</li> <li>2. Supply drip loops above communication conductors</li> </ol>	54.4-C6 92.1-F3
(n)	May be reduced for supply conductors and private communication conductors of the same ownership	89.2-B
(o)	May be reduced or increased for triangular or vertical configuration or for pole-top construction. <ol style="list-style-type: none"> <li>1. Triangular or vertical configuration on crossarms</li> <li>2. Dead-ended on pole in vertical configuration</li> <li>3. Conductors of 0-7500 volts in triangular configuration at top of pole</li> <li>4. Conductors of more than 7500 volts at top of pole</li> </ol>	54.4-C1c 54.4-C4  54.4-D8a 54.4-D8b
(p)	May be reduced for supply service drops of 0-750 volts	54.8-C6
(q)	Shall be increased between circuits where conductors of more than 7500 volts are at pole top.	54.4-D8b
(r)	May be reduced under special conditions <ol style="list-style-type: none"> <li>1. Supply conductors of 750-7500 volts</li> <li>2. Supply conductors of 7500-20,000 volts</li> </ol>	54.4-C1a 54.4-C1b
(s)	Does not apply where conductors do not cross. <ol style="list-style-type: none"> <li>1. Supply conductors of different phase polarity</li> <li>2. Communication conductors</li> </ol>	54.4-C2a 84.4-C1a
(t)	Shall not be applied consecutively both above and below the same supply conductors	54.4-2a
(u)	Shall be increased where conductors of different classifications are supported on the same crossarms. <ol style="list-style-type: none"> <li>1. Supply conductors of 0-750 volts and conductors of 7500-20,000 volts</li> <li>2. Supply conductors of 0-750 volts and conductors of 750-7500 volts</li> </ol>	32.4-A2 32.4-A3
(v)	Not applicable to certain kinds of conductors. <ol style="list-style-type: none"> <li>1. Supply conductors of same phase or polarity</li> <li>2. Insulated supply conductors in multiple-conductor cables</li> <li>3. Communication insulated conductors or multiple-conductor cables</li> </ol>	54.4-C3c 57.4-C  87.4-C1

(w)	Shall apply radially to conductors on brackets attached to crossarms. 1. Supply conductors 2. Communication conductors	54.4-C3b 84.8-C1b
(x)	Shall be increased between conductors of different classifications supported on the same crossarm. 1. Supply conductors of different voltage classification 2. Supply circuits of 0-750 volts and communication circuits 3. Supply circuits and private communication circuits.	32.4-A 32.4-B 89.2-A
(y)	Special clearances for unprotected supply conductors from one level to another level	54.6-A 58.2-B3 92.1-F5
(z)	Not applicable to the following: 1. Clearances between conductors at different levels specified in Cases 8 to 13 inclusive. 2. Supply lateral conductors, suitably protected 3. Supply vertical runs, suitably protected 4. Supply risers, suitably protected 5. Communication Conductors	54.6-C 54.6-D 54.6-E 87.4-C1
(aa)	Not applicable between cables and their supporting messengers. 1. Supply 2. Communication	57.4-D 87.4-F
(bb)	May be reduced for communication guys and communication conductors supported on the same poles 1. Supply 2. Communication	56.4-C4 86.4-C
(cc)	Clearance required between guys. 1. Supply guys, crossing 2. Supply guys, approximately parallel 3. Communication guys, crossing 4. Communication guys, approximately parallel	56.4-D2 56.4-D3 86.4-D2 86.4-D3
(dd)	Shall be increased where within 6 feet of a pole	103.5
(ee)	May be decreased in partial underground distribution	54.4-C4c
(ff)	shall be increased by 0.40 inches per kV in excess of 75 kV	
(gg)	shall be increased by 0.40 inches per kV in excess of 150 kV	
(hh)	shall be increased by 0.40 inches per kV in excess of 300 kV	
(ii)	shall be increased by 0.25 inches per kV in excess of 150 kV	



(jj)	shall be increased by 0.25 inches per kV in excess of 300 kV	
(kk)	proposed clearances to submitted to the CPUC prior to construction for circuits in excess of 550 kV	
(ll)	36-inch clearance applies 35 kV to 68kV 48-inch clearance applies over 68 kV	
(mm)	vertical clearance shall be increased by ½ inch for each kilovolt over 68 kV	
(nn)	The vertical separation between supply conductors and service drops Of 0-750 volts and 20,000-22,500-volt conductors may be reduced to 48 inches.	
(oo)	May be reduced to 72 inches for conductors of 20,000-22,500 volts.	
(pp)	May be reduced to 36 inches vertically at midspan only when the supply conductors consist of abrasion resistant cable with a grounded metallic sheath or neutral-supported cable as specified in Rules 57 and 54.10 .	
(qq)	Vertical clearances may be reduced between supply conductors of the same circuit at crossings in spans	54.4– C7

ITEM 8

- RULE 54.4-H1
- Rule 54.4-I

RATIONALE FOR PROPOSED RULE CHANGES  
RULE 54.4-H1  
AND  
RULE 54.4-I  
CLEARANCES

The proposed rule change add language and specific clearance requirements for conductors that are neither directly above or along side buildings, bridges or other structures, but could be in the immediate proximity and close enough to pose a possible danger to workers or the general public. Also, a new figure (Fig 54-12) will be added to clarify the content of these rules.

EXISTING RULES  
RULE 54.4-H1  
RULE 54.4-I  
CLEARANCES

Rule 54.4-H1

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

- 1 Unattached Conductors: Conductors shall be so arranged as to hamper and endanger fireman and workmen as little as possible in the performance of their duties. The basic clearances of conductors from buildings are specified in Table 1, Cases 6 and 7. The requirements of Table 1, Cases 7 also apply at fire escapes, exits, windows, etc., at which human contact may be expected.

Where the vertical distance above ground of conductors of 7500 volts less is in excess of 35 feet, the horizontal clearances front eh buildings may be less than 6 feet (Table 1, Case 7, Column E) but shall be not less than 4 feet. See Rule 54.8-B4 for service drop clearance requirements.

For special treatment of bus and lead wires of transformer installations in alleys, etc., see rules 58.3-B2.

Rule 54.4-I

I 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.

Note: Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

PROPOSED RULE CHANGES  
(STRIKE OUT AND UNDERLINED)

Rule 54.4-H1

H. ~~Above, or Along the Sides~~ Alongside, or in Immediate Proximity to of Buildings, Bridges and Other Structures

- 1 Unattached Conductors: Conductors ~~shall~~ should be so arranged so as to hamper and or endanger workers ~~fireman and workmen~~ firefighters ~~as little as possible in the performance of~~ while performing their duties. The basic clearances of conductors from buildings are specified in Table 1, Cases 6 and 7. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 54-12). The horizontal clearance The requirements of Table 1, Cases 7 also apply at fire escapes, exits, windows, etc., at which human contact may be reasonably expected.

Where the vertical distance above ground of conductors of 7500 volts less is in excess of 35 feet, the horizontal clearances front eh buildings may be less than 6 feet (Table 1, Case 7, Column E) but shall ~~be not~~ be less than 4 feet. See Rule 54.8-B4 for service drop clearance requirements.

For special treatment of bus and lead wires of transformer installations in alleys, etc., see rules 58.3-B2.

Rule 54.4-I

- I ~~Under~~ Below, Alongside, or Through, or Immediate Proximity to Bridges, Viaducts or Similar Structures

Unprotected supply conductors which pass unattached ~~under~~ below or in immediate proximity to bridges, viaducts or ~~other~~ similar structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6 ~~incl.~~ inclusive; 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. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 54-12).

Conductors of 0-22,500 volts, passing ~~under~~ below 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~~ below bridges, viaducts or ~~other~~ similar structures shall be enclosed in grounded metal conduit or in other effectively grounded sheath or grounded shield suitably protected from mechanical injury.

Note: Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

PROPOSED RULE CHANGES  
(FINAL)\*

Rule 54.4-H1

H. Above, Alongside, or in Immediate Proximity to of Buildings, Bridges and Other Structures

- 1 Unattached Conductors: Conductors should be arranged so as to hamper and or endanger workers and firefighters while performing their duties. The basic clearances of conductors from buildings are specified in Table 1, Cases 6 and 7. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 54-12). The horizontal clearance The requirements of Table 1, Cases 7 also apply at fire escapes, exits, windows, etc., at which human contact may be reasonably expected.

Where the vertical distance above ground of conductors of 7500 volts less is in excess of 35 feet, the horizontal clearances front eh buildings may be less than 6 feet (Table 1, Case 7, Column E) but shall not be less than 4 feet. See Rule 54.8-B4 for service drop clearance requirements.

For special treatment of bus and lead wires of transformer installations in alleys, etc., see rules 58.3-B2.

Rule 54.4-I

- I Below, Alongside, Through, or Immediate Proximity to Bridges, Viaducts or Similar Structures

Unprotected supply conductors which pass unattached below or in immediate proximity to bridges, viaducts or similar structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6 inclusive; 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. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 54-12).

Conductors of 0-22,500 volts, passing below 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 below bridges, viaducts or similar structures shall be enclosed in grounded metal conduit or in other effectively grounded sheath or grounded shield suitably protected from mechanical injury.

Note: Revised March 29, 1966 by Decision No. 70489 and August 9, 1966 by Decision No. 71094.

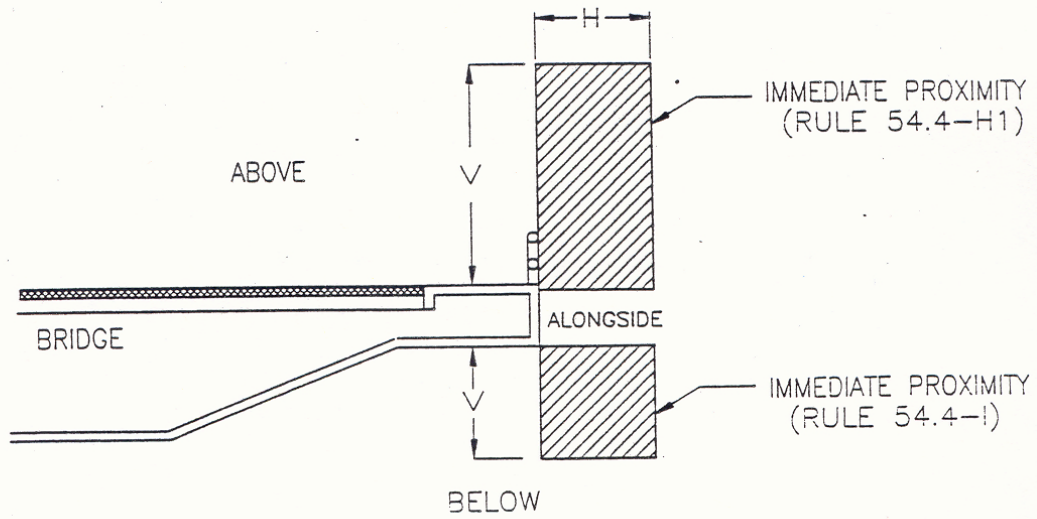
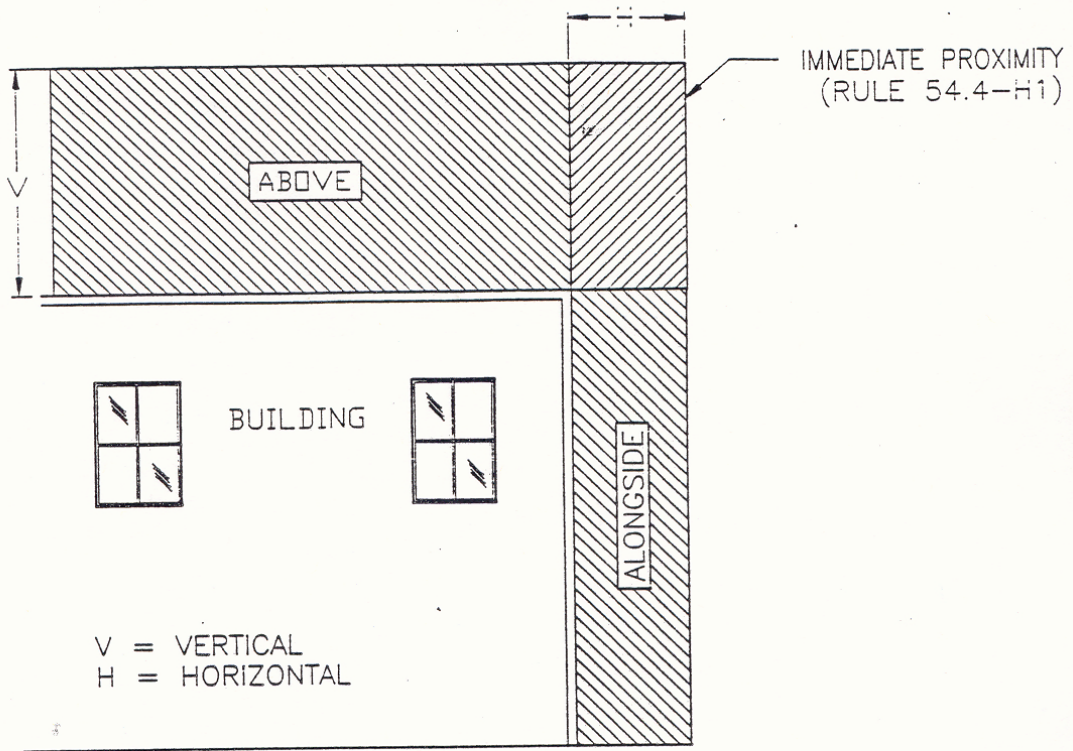


FIGURE 54 - 12

ITEM 9

- Rule 54.7-B

EXISTING RULE  
RULE 54.7-B  
WORKING SPACE

Rule 54.7-B

B Working Space

Working Spaces, unobstructed by conductors or other equipment except as provided in Rule 54.7-B2, of the dimensions as specified in Rule 54.7-B1, shall be provided dimensions as specified in Rule 54.7-B1, Shall be provided between conductor levels on all poles in such positions that the working levels on all poles and in such positions that the working space include the climbing space.

- 1 Dimensions of Working Space: The vertical dimensions of the working space above and below any conductor level shall be equal to the vertical clearances between conductors specified in Table 2, Cases 8 to 14 inclusive, for the voltages involved.

The width of the working space where crossarms are involved shall be the distance between outside pin positions of the crossarms involved. The depth of the working space where crossarms are involved shall be equal to the width of the climbing space and shall be measured perpendicularly from the face of crossarm. (See Figures 54-8 A, B and C.)

The width of the working space where crossarms are not involved (e.g., vertical and triangular construction without crossarms) shall extend from the climbing space to the outmost conductor position on the conductor support involved. The depth of the working space shall have the same dimension as the climbing space and shall be measured from the centerline of pole (See Figure 54- 8D). When conductors are located on one side of the pole only (e.g., vertical construction) the dimensions of working space shall be applied as illustrated in Figures 54-8 E and F. When climbing space is located in a quadrant, working space shall be applied as illustrated in Figure 54-8G.

- 2 Allowable Working Space Obstructions: Taps from conductors on line arms, or other supports, extending to conductors on related buck arms may pass through the working space between the levels of conductors.

Service drops of 0-750 volts may pass through the working space of conductors and may pass through working space of 750-7500 volt conductors provided not less than the clearance between service drop and line conductors specified in Rule 54.8-C6 are maintained.

Cutouts and their leads may be installed in the working space (but not the climbing space).

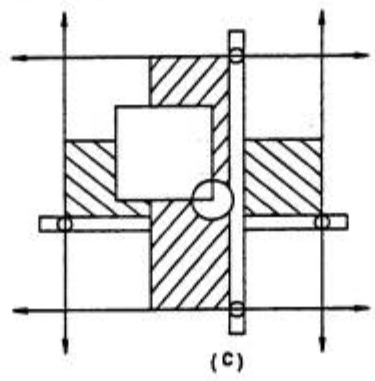
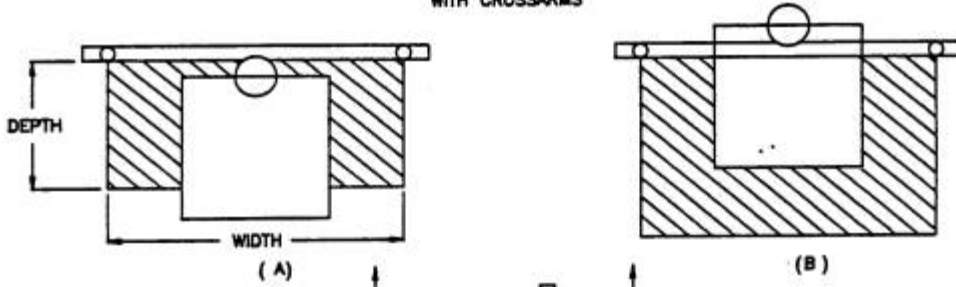
Switches and their leads may extend into the working space (but not the working space).

Lead wires to transformers or capacitors may pass through the working space adjacent to the line conductors to which such leads are attached.

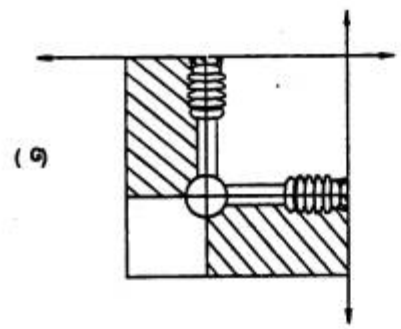
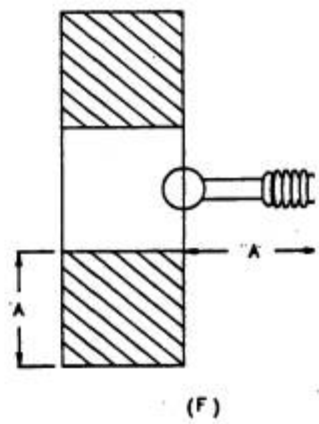
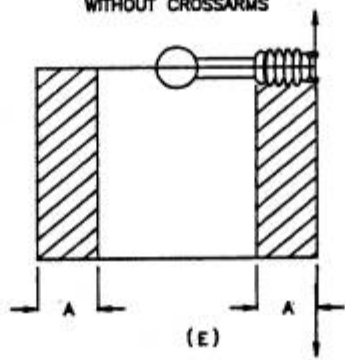
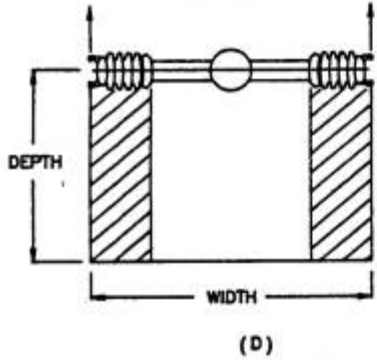
Terminal fittings of risers and runs, and their taps, may extend into the working space provided these fittings are the only obstruction of the working space at their level on the same side of the climbing space.

WORKING SPACE  
Rule 54.7-B1

WITH CROSSARMS



WITHOUT CROSSARMS



 CLIMBING SPACE    
  WORKING SPACE

FIGURE 54-8

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

Rule 54.7-B

B Working Space

Working Spaces, unobstructed by conductors or other equipment except as provided in Rule 54.7-B2, of the dimensions as specified in Rule 54.7-B1, shall be provided dimensions as specified in Rule 54.7-B1, Shall be provided between supply conductor levels on all poles in such positions that the working levels on all poles and in such positions that the working space include the climbing space.

1 Dimensions of Working Space:

- a \_\_\_\_\_ The vertical dimensions of the working space above and below ~~any~~ supply conductor levels energized above 750 volts shall be equal to the entire vertical clearances distance between the supply conductors specified in Table 2, Cases 8 to 14 inclusive, for the voltages involved (e.g. the entire vertical distance between a 7500-20,000 volt level and a 0-750 volt level).
- b \_\_\_\_\_ When there is no supply conductor level below a conductor level that is energized above 750 volt, the vertical dimension of working space shall be 6 feet.
- c \_\_\_\_\_ The vertical dimension of working space between supply conductor levels of 0-750 volts shall be equal to the vertical distance between such levels.
- d \_\_\_\_\_ The width of the working space where wood crossarms are involved shall be the distance between outside pin positions of the crossarms involved. The depth of the working space where crossarms are involved shall be equal to the width of the climbing space and shall be measured perpendicularly from the face centerline of crossarm pole on the climbing side of pole. (See Figures 54-8 A, B and C.)
- e \_\_\_\_\_ The width of the working space of supply circuits above 750 volts where wood crossarms are not involved (e.g., vertical and triangular construction without wood crossarms) shall extend from the climbing space to the outmost conductor

position on the conductor support involved. The depth of the working space shall have the same dimension as the climbing space and shall be measured from the centerline of pole (See Figure 54- 8D and 54-8H). When conductors above 750 volts are located on one side of the pole only (e.g., vertical construction) the dimensions of working space shall be applied as illustrated in Figures 54-8 E and 54-8F (dimension "A" is equal to the distance from the climbing space to the outmost conductor position). When climbing space is located in a quadrant, working space shall be applied as illustrated in Figure 54-8G.

f The width and depth of the working space supply circuits of 0-750 volts where wood crossarms are not involved shall be the same width and depth as the climbing space.

2 Allowable Working Space Obstructions:

a Taps from conductors on line arms, or other supports, extending to conductors on related buck arms may pass through the working space between the levels of conductors.

b Service drops of 0-750 volts may pass through the working space of conductors and may pass through working space of 750-7500 volt conductors provided not less than the clearance between service drop and line conductors specified in Rule 54.8-C6 are maintained.

c Cutouts, disconnects, switches and their leads may be installed in the working space (but not the climbing space).

~~Switches and their leads may extend into the working space (but not the climbing space).~~

d Lead wires to transformers, ~~or capacitors, oil switches, vacuum switches, and other similar apparatus~~ may pass through the working space adjacent to the line conductors to which such leads are attached.

e Terminal fittings of risers and runs, and their taps, may extend into the working space provided these fittings are the only obstruction of the working space at their level on the same side of the climbing space.



f Street lights and their associated hardware may extend into the working space.

Requirements For Supply Lines

With Wood Crossarms

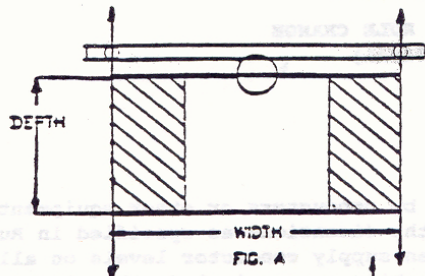


FIG. A

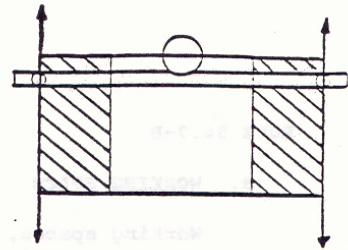


FIG. B

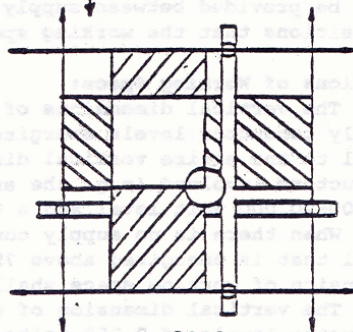


FIG. C

Without Wood Crossarms

(e.g. Metallic Brackets, Arms, Supports, etc.)

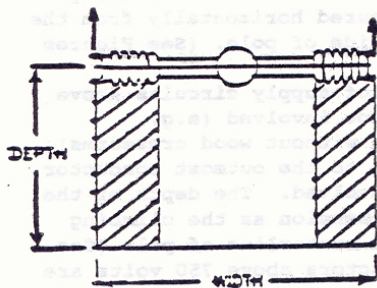


FIG. D

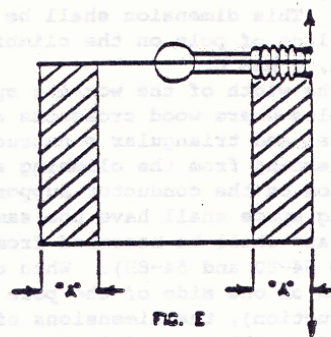


FIG. E

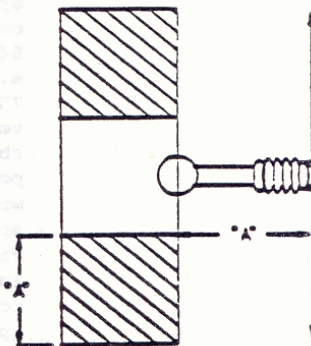


FIG. F

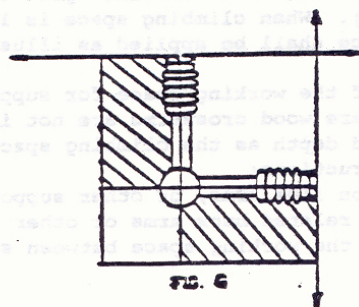


FIG. G

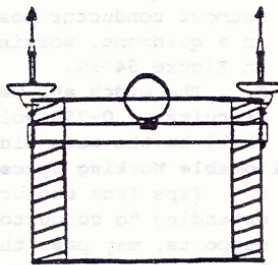


FIG. H

Rule 54.7-B

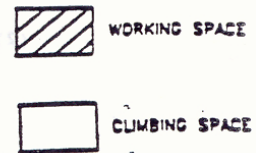


Fig. 54-9

PROPOSED RULE CHANGE  
(FINAL)\*

Rule 54.7-B

B Working Space

Working Spaces, unobstructed by conductors or other equipment except as provided in Rule 54.7-B2, of the dimensions as specified in Rule 54.7-B1, shall be provided between supply conductor levels on all poles in such positions that the working levels on all poles and in such positions that the working space include the climbing space.

1 Dimensions of Working Space:

- a The vertical dimensions of the working space above and below supply conductor levels energized above 750 volts shall be equal to the entire vertical distance between the supply conductors involved (e.g. the entire vertical distance between a 7500-20,000 volt level and a 0-750 volt level).
- b When there is no supply conductor level below a conductor level that is energized above 750 volt, the vertical dimension of working space shall be 6 feet.
- c The vertical dimension of working space between supply conductor levels of 0-750 volts shall be equal to the vertical distance between such levels.
- d The width of the working space where wood crossarms are involved shall be the distance between outside pin positions of the crossarms involved. The depth of the working space where crossarms are involved shall be equal to the width of the climbing space and shall be measured perpendicularly from the face centerline of pole on the climbing side of pole. (See Figures 54-8 A, B and C.)
- e The width of the working space of supply circuits above 750 volts where wood crossarms are not involved (e.g., vertical and triangular construction without wood crossarms) shall extend from the climbing space to the outmost conductor position on the conductor support involved. The depth of the working space shall have the same dimension as the

climbing space and shall be measured from the centerline of pole (See Figure 54- 8D and 54-8H). When conductors above 750 volts are located on one side of the pole only (e.g., vertical construction) the dimensions of working space shall be applied as illustrated in Figures 54-8 E and 54-8F (dimension "A" is equal to the distance from the climbing space to the outmost conductor position). When climbing space is located in a quadrant, working space shall be applied as illustrated in Figure 54-8G.

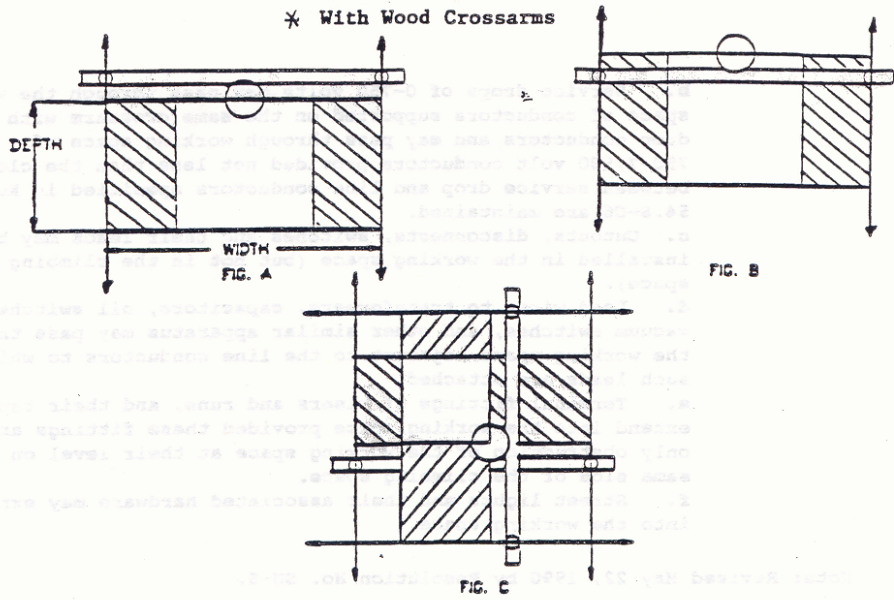
- f The width and depth of the working space supply circuits of 0-750 volts where wood crossarms are not involved shall be the same width and depth as the climbing space.

2 Allowable Working Space Obstructions:

- a Taps from conductors on line arms, or other supports, extending to conductors on related buck arms may pass through the working space between the levels of conductors.
- b Service drops of 0-750 volts may pass through the working space of conductors and may pass through working space of 750-7500 volt conductors provided not less than the clearance between service drop and line conductors specified in Rule 54.8-C6 are maintained.
- c Cutouts, disconnects, switches and their leads may be installed in the working space (but not the climbing space).
- d Lead wires to transformers, or capacitors, oil switches, vacuum switches, and other similar apparatus may pass through the working space adjacent to the line conductors to which such leads are attached.
- e Terminal fittings of risers and runs, and their taps, may extend into the working space provided these fittings are the only obstruction of the working space at their level on the same side of the climbing space.
- f Street lights and their associated hardware may extend into the working space.

Requirements For Supply Lines

\* With Wood Crossarms



Without Wood Crossarms

(e.g. Metallic Brackets, Arms, Supports, etc.)

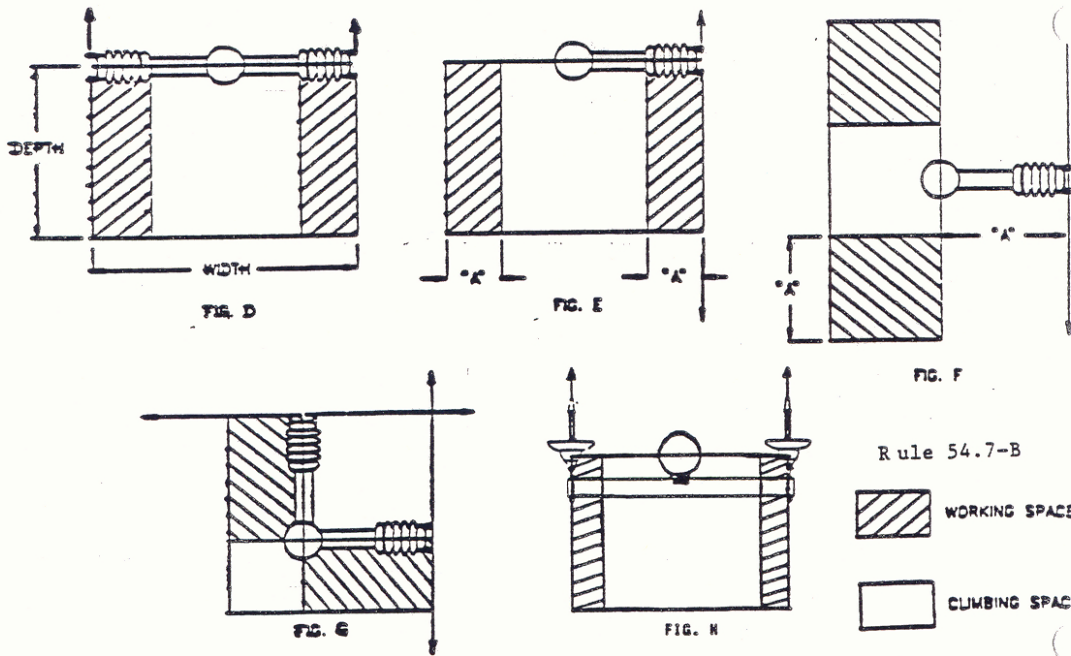


Fig. 54-9

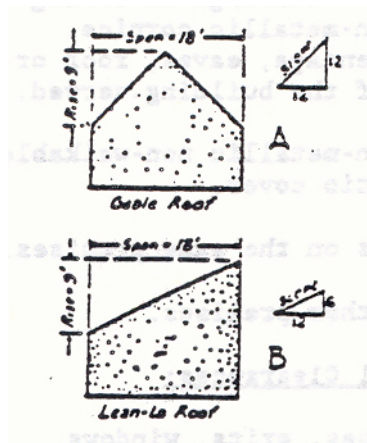
ITEM 10

- Rule 54.8

RATRIONALE FOR PROPOSED RULE CHANGE  
RULE 54.8  
TABLE 10  
HORIZONTAL & RADIAL CLEARANCES: 1-C

This proposed rule change is to simplify the term (pitch).

The term "pitch" is misleading and ambiguous and should never be used except for gable roofs as at A. The confusion may be appreciated by considering the two roofs illustrated. Both have the same pitch of "one-half" but they have quite different slops (12 to 12 and 6 to 12).\*



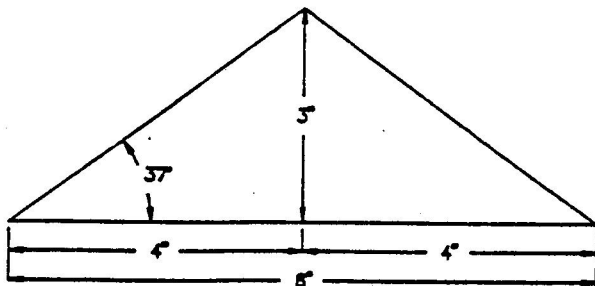
\* Source- Basic Building Data 3<sup>rd</sup> Edition, 1985 Van Nostrand Reinhold Co.

PROPOSED NEW TABLE  
EXISTING

Table 10:  
Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs, more than 3/8 pitch (approximately 37 degrees from horizontal, see sketch)



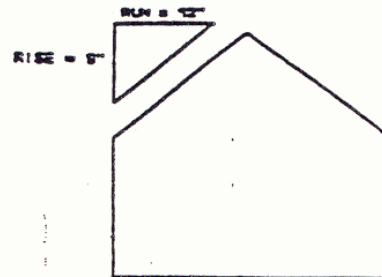
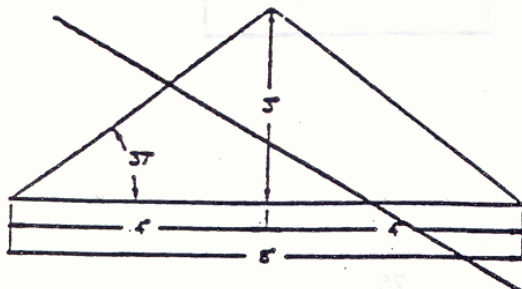


PROPOSED NEW TABLE  
(STRIKE OUT AND UNDERLINED)

Table 10:  
Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs, ~~more than 3/8 pitch~~ (approximately 37 degrees from horizontal, see sketch) roofs when roof slope exceeds 9 inches of rise per 12 inches of run (see sketch).

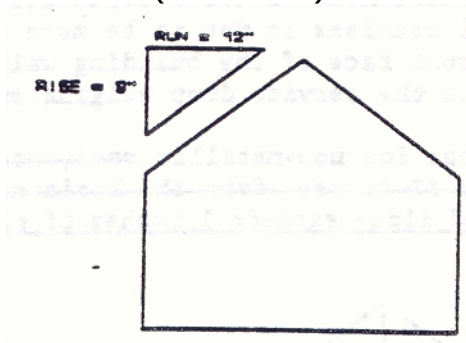


PROPOSED NEW TABLE  
(FINAL)\*

Table 10:  
Minimum Allowable Clearance of Service Drops of  
0 - 750 Volts from Buildings

	Minimum Clearance from Buildings	
	Weather Resistant Covered Conductors 0 - 750 Volts	Insulated Conductors (Rule 20.8-G ) 0 - 750 Volts
<b>Vertical Clearances Above:</b>		
1) All portions of buildings including metallic or non-metallic cornice, decorative appendage, eaves, roof or parapet wall of the building served.	8 Feet	(a) (b)
2) Metallic or non-metallic non-walkable overhang, patio cover.	8 Feet	(a) (b)
3) Other buildings on the same premises.	8 Feet	2 Feet
4) Buildings on other premises.	8 Feet	8 Feet (c)
<b>Horizontal &amp; Radial Clearances:</b>		
1) From fire escapes, exits, windows and doors.	3 Feet	3 Feet

- (a) No limit specified but the greatest practicable clearance should be obtained.
- (b) The point of attachment of the service drop for industrial and commercial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
- (c) Reduce to 2 feet for non-metallic roofs when roof slope exceeds 9 inches of rise per 12 inches of run (see sketch).



ITEM 11

- Rule 59.4-A1
- Rule 59.4-A2
- Rule 59.4-B
- Rule 59.4-C

## EXISTING RULE

### Rule 59.4 Grounding

#### Rule 59.4-A1

##### A MATERIAL AND SIZE

- 1 Grounding Conductors: The grounding conductor from each ground electrode to the base of pole shall be not less than 1 foot below the surface of the ground and shall have not less conductivity and mechanical strength than the grounding conductor from the base of the pole to the common neutral line conductor. The grounding conductor to the common neutral line conductor shall be continuous unless suitable electrical compression connections are used and shall be not less than No. 4 AWG cooper.

Note Revised September 11, 1974 by Decision No. 83420.

PROPOSED RULE  
(STRIKE OUT AND UNDERLINED)

Rule 59.4 Grounding

Rule 59.4-A1

A MATERIAL AND SIZE

- 1 Grounding Conductors: The grounding conductors of the common neutral system shall conform to each of the following requirements:
  - a. The grounding conductor from each ground rod electrode to the base of the pole shall be not be less than 1 foot below the surface of the ground.
  - b. and The grounding conductor from each ground rod to base of the pole shall not have not less ampacity conductivity and mechanical strength than the grounding conductor from the base of the pole to the common neutral line conductor.
  - c. The grounding conductor from the ground rod to the common neutral line-conductor shall be continuous unless suitable electrical compression connections are used
  - d. and The grounding conductor shall be not less than have a minimum ampacity equivalent to No. 4 AWG cooper.

Note Revised September 11, 1974 by Decision No. 83420.

PROPOSED RULE  
(FINAL)\*

Rule 59.4 Grounding

Rule 59.4-A1

A MATERIAL AND SIZE

- 1 Grounding Conductors: The grounding conductors of the common neutral system shall conform to each of the following requirements:
  - a. The grounding conductor from each ground rod to the base of the pole shall not be less than 1 foot below the surface of the ground.
  - b. The grounding conductor from each ground rod to base of the pole shall not have less ampacity and mechanical strength than the grounding conductor from the base of the pole to the common neutral conductor.
  - c. The grounding conductor from the ground rod to the common neutral conductor shall be continuous unless suitable electrical compression connections are used
  - d. The grounding conductor shall have a minimum ampacity equivalent to No. 4 AWG cooper.

Note Revised September 11, 1974 by Decision No. 83420.

RATIONALE FOR PROPOISED RULE CHANGE  
RULE 59.42  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
CONDUCTORS - GROUNDING - MATERIAL AND SIZE

The proposed changes are to simplify and clarify the rule. For clarity and simplification, the rule was broken into sub-parts to easily identify the different subcategories that are being addressed.

Since it is used more common terminology used in the industry, changed the term ground electrode to ground rod.

Used the word ampacity instead of conductivity as the terminology and measure in determining the size of the grounding conductor.

For clarification, added the statement that one end of the ground rod shall be 8 feet below the surface of the ground. Also, rephrased the statement that the mentioned 24 inch clearance applies to the distance that the ground rod is from the pole. This ensures that the ground rod is installed in undisturbed earth, which facilitates a good ground installation. The 24 inch clearance from the pole does not need to be maintained for the grounding conductor that connects two ground rods, where required.

Finally, restructured, reformatted, and made minor changes in syntax.

## EXISTING RULE

### Rule 59.4 Grounding

#### Rule 59.4-A2

##### 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.

On branch circuits extending from the grid where return metallic paths are not available, the driven ground rod, pipe, or equivalent shall be located not less than 24 inches 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.

Note: Revised March 29, 1966 by Decision No. 70489; August 9, 1966 by Decision No. 71094; September 11, 1974 by Decision No. 83420



PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

Rule 59.4 Grounding

Rule 59.4-A2

A. Material and Size

- 2 Ground Rods (Grounding Electrodes): Ground electrodes rods on common neutral systems shall conform to each of the following requirements:
- a. Ground Rods shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical properties).
  - b. Ground Rods shall not be less than 5/8 inch in diameter by 8 feet in length
  - c. Ground Rods and shall be driven into the ground so that one end of the ground is at a minimum depth of 8 feet below the surface of the ground.
  - d. Pole-butt plates or wrappings shall not be used either in lieu of the aforesaid ground rods, or pipes, or as electrodes supplementary thereto.
  - e. On branch circuits extending from the grid where return metallic paths are not available, the driven ground rod, pipe, or equivalent shall be located not less than 24 inches or more from the surface of the pole. This 24 inch clearance does not apply to the grounding conductor between ground rods.
  - f. Where two or more such ground 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.

Note: Revised March 29, 1966 by Decision No. 70489; August 9, 1966 by Decision No. 71094; September 11, 1974 by Decision No. 83420

PROPOSED RULE CHANGE  
(FINAL)\*

Rule 59.4 Grounding

Rule 59.4-A2

A. Material and Size

- 2 Ground Rods (Grounding Electrodes): Ground rods on common neutral systems shall conform to each of the following requirements:
  - a. Ground Rods shall be one-piece corrosion-resisting metal rods or pipes (or equivalent in physical and electrical properties).
  - b. Ground Rods shall not be less than 5/8 inch in diameter by 8 feet in length
  - c. Ground Rods shall be driven into the ground so that one end of the ground is at a minimum depth of 8 feet below the surface of the ground.
  - d. Pole-butt plates or wrappings shall not be used either in lieu of the aforesaid ground rods, or pipes, or as electrodes supplementary thereto.
  - e. On branch circuits extending from the grid where return metallic paths are not available, the driven ground rod, pipe, or equivalent shall be located 24 inches or more from the surface of the pole. This 24 inch clearance does not apply to the grounding conductor between ground rods.
  - f. Where two or more such ground rods are installed, they shall be located at not less than 6-foot centers.

Note: Revised March 29, 1966 by Decision No. 70489; August 9, 1966 by Decision No. 71094; September 11, 1974 by Decision No. 83420

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.4-B  
COMMON PRIMARY AND SECONDARY GROUNDED NEUTRAL SYSTEMS  
GROUNDING – NEUTRAL CONDUCTORS

The Proposed changes are to condense, simplify and clarify the rule, and revise the grounding requirements for transformers on branch circuits without a loop return.

Retained the standard that the ground resistance most not exceed 3.5 ohms for each transformer installed on a branch circuit without a loop return, but eliminated the requirement that the 3.5 ohm ground must be maintained on each side of the transformer. The dual 3.5 ohms requirement has little practical value in improving the neutral ground.

Finally, restructured, reformatted, and made minor changes to syntax.

## EXISTING RULE

### Rule 59.4 Grounding

#### Rule 59.4-B NEUTRAL CONDUCTOR

##### 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.
- 2 Resistance: Where a common neutral system is used the resistance of the continuous metallic neutral grid to ground at any point shall not exceed  $3 \frac{1}{2}$  ohms at any time.

If, after definite effort has been made, it is found not practicable to meet the above requirement, the following alternate requirement will be accepted:

The resistance between any point of said grid and the ground connection at the substation shall not exceed 1 ohm, and furthermore, the resistance of the ground connection at the substation either shall not exceed 1 ohm or, if in excess of 1 ohm, shall be lower than that of any individual ground connection on the grid and in no case in excess of 2 ohms.

Measurement of resistance by any approved method is recognized. In lieu of measurements of resistance of the neutral conductor under the second alternative prescribed above, approved joints and demonstrable calculations will be accepted.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

Rule 59.4 Grounding

Rule 59.4-B NEUTRAL CONDUCTOR

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. For Each transformer installation installed on a branch circuit without a loop return, the transformer shall be so located that there will be not less than one grounds, each of a resistance not greater than ~~3-1/2~~5 ohms, ~~on each side of the transformer installation.~~
  
- 2 Resistance: Where a common neutral system is used, the resistance of the continuous metallic neutral grid to ground at any point shall not exceed ~~3-1/2~~5 ohms at any time.

EXCEPTION: If, after a definite effort has been made, it is found not practicable to meet the above requirement, the following alternate requirement will be accepted:

The resistance between any point of ~~said~~ the continuous metallic neutral grid and the ground connection at the substation shall normally not exceed 1 ohm, ~~However, if and furthermore, the resistance exceeds 1 ohm, it of the ground connection at the substation either shall not exceed 1 ohm or, if in excess of 1 ohm,~~ shall be lower than that of any individual ground connection on the grid, but and in no case ~~in excess of~~ shall it be greater than 2 ohms.

- 3 Measurement of Resistance: Measurement of resistance by any ~~approved~~ suitable method is recognized.

Note: Under the requirements of Rule 59.4-B2. ~~In lieu of measurements of resistance of the neutral conductor under the second alternative prescribed above,~~ when the

resistance exceeds 1 ohm but is to be less than 2 ohms, approved suitable ground rod connections( joints) and demonstrable calculations, instead of neutral conductor resistance measurements, will be accepted.

PROPOSED RULE CHANGE  
(FINAL)\*

Rule 59.4 Grounding

Rule 59.4-B NEUTRAL CONDUCTOR

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 conductor shall be grounded at intervals not greater than 500 feet. For Each transformer installed on a branch circuit without a loop return, the transformer shall be so located that there will be not less than one grounds, each of a resistance not greater than 3.5 ohms.
- 2 Resistance: Where a common neutral system is used, the resistance of the continuous metallic neutral grid to ground at any point shall not exceed 3.5 ohms at any time.

EXCEPTION: If, after a definite effort has been made, it is found not practicable to meet the above requirement, the following alternate requirement will be accepted:

The resistance between any point of ~~said~~ the continuous metallic neutral grid and the ground connection at the substation shall normally not exceed 1 ohm. However, if the resistance exceeds 1 ohm, it shall be lower than that that of any individual ground connection on the grid, but and in no case shall it be greater than 2 ohms.

- 3 Measurement of Resistance: Measurement of resistance by any suitable method is recognized.

Note: Under the requirements of Rule 59.4-B2. when the resistance exceeds 1 ohm but is to be less than 2 ohms, suitable ground rod connections( joints) and demonstrable calculations, instead of neutral conductor resistance measurements, will be accepted.

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 59.4-C  
COMMON PRIMARY AND SECONDARY NEUTRAL SYSTEMS  
GROUNDINGS – TRANSFORMERS

The proposed changes are to condense, simplify and clarify the rule, and revise the grounding requirement for transformers on branch circuits without a common neutral loop return.

Retained the standard that the ground resistance must not exceed 3.5 ohms for each transformer installed on a branch circuit without a common neutral loop return but eliminated the requirement that the 3.5 ohm ground must be maintained on each side of the transformer. The dual 3.5 ohm requirement has little practical value in improving the neutral ground.

Finally, restructured, reformatted, and made minor changes to syntax.



## EXISTING RULE

### Rule 59.4 GROUNDING

#### RULE 59.4-C TRANSFORMERS

##### 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.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

Rule 59.4 GROUNDING

RULE 59.4-C TRANSFORMERS

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 with transformers installation installed~~ on a branch circuit without a common neutral loop return, each transformer shall be so located that there will be not less than one ground of a resistance not greater than ~~3-1/2~~ 5 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 ~~3-1/2~~ 5 ohms, to the common neutral line conductor either at the transformer pole or at an adjacent pole.

PROPOSED RULE CHANGE  
(FINAL)\*

Rule 59.4 GROUNDING

RULE 59.4-C TRANSFORMERS

C TRANSFORMERS

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

On common neutral systems with transformers installed on a branch circuit without a common neutral loop return, each transformer shall be so located that there will be not less than one ground of a resistance not greater than 3.5 ohms.

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 3.5 ohms, to the common neutral line conductor either at the transformer pole or at an adjacent pole.

ITEM 12

- Rule 61.6-A
- Rule 61.6-B
- Rule 61.7

RATIONALE FOR PROPOSED RULE CHANGE  
REQUIREMENTS FOR TOWER LINES  
RULE 61.6-A – MARKING  
RULE 61.6-B – GUARDING  
RULE 61.7 – STEPPING

The proposed rule changes will clarify the intent of the existing rules. The addition of language to Rule 61.6-B clearly identifies suitable barriers. The addition of language to Rule 61.6-A and Rule 61.7 will exempt towers and structures from certain requirements of marking and stepping if they are protected by suitable barriers (Rule 61.6-B).

Deleting a portion of the last paragraph in Rule 61.6-B removes an exemption to the rule, enhancing safety to the public.

EXISTING RULE  
RULE 61.6-A  
MARKING

Rule 61.6 Marking and Guarding (Requirement for Tower Lines)

61.6 Marking and Guarding

A Marking

All towers or structures which are of a design easily climbed and which are located in urban districts or in cultivated agricultural areas or near roads or trails which are frequently traveled shall be equipped with signs so worded as to warn the public of the danger of climbing same. Such signs shall be placed and arranged so that they may be read from the four corners of the structure. Such signs shall be neither less than 8 feet nor more than 20 feet above the ground except where the lowest horizontal member of the tower or structure is more than 20 feet above the ground in which case the sign shall be not more than 30 feet above the ground.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 61.6-A

Rule 61.6     Marking and Guarding (Requirement for Tower Lines)

61.6     Marking and Guarding

A     Marking

All towers or structures which are of a design easily climbed and which are located in urban districts or in cultivated agricultural areas or near roads or trails which are frequently traveled shall be equipped with signs so worded as to warn the public of the danger of climbing same. Such signs shall be placed and arranged so that they may be read from the four corners of the structure. Such signs shall be neither less than 8 feet nor more than 20 feet above the ground except where the lowest horizontal member of the tower or structure is more than 20 feet above the ground in which case the sign shall be not more than 30 feet above the ground.

When a fence or wall is used as a barrier around a tower or structure (Rule 61.6-B), they shall be equipped with signs so worded as to warn the public of the danger of unauthorized entry. Warning signs shall be installed at every gate and at intervals of not more than 100 feet along each fence or wall that is used as a barrier. When warning signs are installed on barrier fencing or walls, no signs are required to be installed on the tower or structure.

PROPOSED RULE CHANGE  
(FINAL)\*  
RULE 61.6-A

Rule 61.6 Marking and Guarding (Requirement for Tower Lines)

61.6 Marking and Guarding

A Marking

All towers or structures which are of a design easily climbed and which are located in urban districts or in cultivated agricultural areas or near roads or trails which are frequently traveled shall be equipped with signs so worded as to warn the public of the danger of climbing same. Such signs shall be placed and arranged so that they may be read from the four corners of the structure. Such signs shall be neither less than 8 feet nor more than 20 feet above the ground except where the lowest horizontal member of the tower or structure is more than 20 feet above the ground in which case the sign shall be not more than 30 feet above the ground.

When a fence or wall is used as a barrier around a tower or structure (Rule 61.6-B), they shall be equipped with signs so worded as to warn the public of the danger of unauthorized entry. Warning signs shall be installed at every gate and at intervals of not more than 100 feet along each fence or wall that is used as a barrier. When warning signs are installed on barrier fencing or walls, no signs are required to be installed on the tower or structure.



RATIONALE FOR PROPOSED RULE CHANGE  
REQUIREMENTS FOR TOWER LINES  
RULE 61.6-A – MARKING  
RULE 61.6-B – GUARDING  
RULE 61.7 – STEPPING

The proposed rule changes will clarify the intent of the existing rules. The addition of language to Rule 61.6-B clearly identifies suitable barriers. The addition of language to Rule 61.6-A and Rule 61.7 will exempt towers and structures from certain requirements of marking and stepping if they are protected by suitable barriers (Rule 61.6-B).

Deleting a portion of the last paragraph in Rule 61.6-B removes an exemption to the rule, enhancing safety to the public.

EXISTING RULE  
RULE 61.6-B  
GUARDING

Rule 61.6 Marking and Guarding (Requirement for Tower Lines)

61.6 Marking and Guarding

B Guarding

Where a tower of a design which can be easily climbed supports supply conductors and is located in urban districts, or in rural areas adjacent to schools, dwellings, permanent or seasonal camps, or in orchards, or near roads or trails which are frequently traveled, a barrier or other provisions shall be made to prevent easy climbing.

The provisions of this rule shall not apply to towers or structures on which all conductors have a 5 feet or more horizontal clearance from the supporting structure, nor to towers or structures within fenced substation yards.

Note: It is the intent of Rule 61.6-B to require such guarding as will prevent easy climbing of these towers by young persons who do not realize the danger of contact with live conductors supported thereon. It is not intended that such guarding will be required in sparsely settled districts, mountainous and desert areas, and similar locations.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 61.6-B

Rule 61.6 Marking and Guarding (Requirement for Tower Lines)

61.6 Marking and Guarding

B Guarding

Where a tower or structure of a design which can be easily climbed supports supply conductors and is located in urban districts, or in rural areas adjacent to schools, dwellings, permanent or seasonal camps, or in orchards, or near roads or trails which are frequently traveled, a suitable barrier shall be installed on or around such towers and structures, or other provisions shall be made to prevent easy climbing.

When a fence or wall is used as a suitable barrier around a tower or structure the construction shall be designed, installed and maintained in such manner as to reasonably deny access over, under or through the fencing or wall to all but authorized persons.

Material and Height:

- (1) Fencing shall be of a fabric, such as galvanized steel, woven mesh or links (commonly known as chain-link or cyclone fencing) or other suitable metallic or nonmetallic material, extending from ground level to a minimum height of eight feet, or extending from ground level to a minimum height of seven feet with an extension of not less than 12 inches of barbed wire (three or more strands), razor wire or similar deterrent.
- (2) Walls or other types of construction shall be of a material which will present an equivalent barrier to climbing or other unauthorized entry, extending from ground level to a minimum height of eight feet, or extending from ground level to a minimum height of seven feet with an extension of not less than 12 inches of barbed wire (three or more strands), razor wire or similar deterrent.

Gates shall be of a design and maintained in a manner compatible with the barriers specified in this rule.

A minimum radial distance of six feet shall be maintained between any portion of the fence or wall and the tower or structure.

The provisions of this rule shall not apply to towers or structures on which all conductors have a 5-foot or more horizontal clearance from the supporting structure, nor to towers or structures within fenced substation yards.

Note: It is the intent of Rule 61.6-B to require such guarding as will prevent easy climbing of these towers by young persons who do not realize the danger of contact with live conductors supported thereon. It is not intended that such guarding will be required in sparsely settled districts, mountainous and desert areas, and similar locations.

PROPOSED RULE CHANGE  
(FINAL)\*  
RULE 61.6-B

Rule 61.6 Marking and Guarding (Requirement for Tower Lines)

61.6 Marking and Guarding

B Guarding

Where a tower or structure of a design which can be easily climbed supports supply conductors and is located in urban districts, or in rural areas adjacent to schools, dwellings, permanent or seasonal camps, or in orchards, or near roads or trails which are frequently traveled, a suitable barrier shall be installed on or around such towers and structures, or other provisions shall be made to prevent easy climbing.

When a fence or wall is used as a suitable barrier around a tower or structure the construction shall be designed, installed and maintained in such manner as to reasonably deny access over, under or through the fencing or wall to all but authorized persons.

Material and Height:

- (1) Fencing shall be of a fabric, such as galvanized steel, woven mesh or links (commonly known as chain-link or cyclone fencing) or other suitable metallic or nonmetallic material, extending from ground level to a minimum height of eight feet, or extending from ground level to a minimum height of seven feet with an extension of not less than 12 inches of barbed wire (three or more strands), razor wire or similar deterrent.
- (2) Walls or other types of construction shall be of a material which will present an equivalent barrier to climbing or other unauthorized entry, extending from ground level to a minimum height of eight feet, or extending from ground level to a minimum height of seven feet with an extension of not less than 12 inches of barbed wire (three or more strands), razor wire or similar deterrent.

Gates shall be of a design and maintained in a manner compatible with the barriers specified in this rule.

A minimum radial distance of six feet shall be maintained between any portion of the fence or wall and the tower or structure.

The provisions of this rule shall not apply to towers or structures within fenced substation yards.

Note: It is the intent of Rule 61.6-B to require such guarding as will prevent easy climbing of these towers by young persons who do not realize the danger of contact with live conductors supported thereon. It is not intended that such guarding will be required in sparsely settled districts, mountainous and desert areas, and similar locations.

RATIONALE FOR PROPOSED RULE CHANGE  
REQUIREMENTS FOR TOWER LINES  
RULE 61.6-A – MARKING  
RULE 61.6-B – GUARDING  
RULE 61.7 – STEPPING

The proposed rule changes will clarify the intent of the existing rules. The addition of language to Rule 61.6-B clearly identifies suitable barriers. The addition of language to Rule 61.6-A and Rule 61.7 will exempt towers and structures from certain requirements of marking and stepping if they are protected by suitable barriers (Rule 61.6-B).

Deleting a portion of the last paragraph in Rule 61.6-B removes an exemption to the rule, enhancing safety to the public.

EXISTING RULE  
RULE 61.7  
STEPPING

Rule 61.7 Stepping

All towers upon which it may be necessary for workmen to climb shall be provided with steps or ladders, which shall start at not less than 7 feet 6 inches from the ground line. The spacing between steps on the same side of the tower legs shall not exceed 36 inches.

Where the members of the tower are so arranged that the tower may be climbed with safety, no steps or ladders need be provided.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

Rule 61.7 Stepping

All towers upon which it may be necessary for workmen to climb shall be provided with steps or ladders, which shall start at not less than 7 feet 6 inches from the ground line. The spacing between steps on the same side of the tower legs shall not exceed 36 inches.

When a fence or wall is used as a suitable barrier (Rule 61.6-B) the steps or ladders may extend to the ground level.

Where the members of the tower are so arranged that the tower may be climbed with safety, no steps or ladders need be provided.



PROPOSED RULE CHANGE  
(FINAL)\*

Rule 61.7 Stepping

All towers upon which it may be necessary for workmen to climb shall be provided with steps or ladders, which shall start at not less than 7 feet 6 inches from the ground line. The spacing between steps on the same side of the tower legs shall not exceed 36 inches.

When a fence or wall is used as a suitable barrier (Rule 61.6-B) the steps or ladders may extend to the ground level.

Where the members of the tower are so arranged that the tower may be climbed with safety, no steps or ladders need be provided.

ITEM 13

- Rule 83.4

## RATIONALE FOR PROPOSED RULE CHANGE 83.4

This proposed rule change is added as a note to include the bonding of strand supporting electric utility internal communication system cable to strand supporting communication utility or cable TV cables when placed at the communication level on poles and an agreement between parties is so effected. The last paragraph starting "Communication systems owned by electric utilities are exempt from these requirements." will be deleted.

Certain measurable distances from electric utility generating or substation facilities will be exempt from such bonding for electrical protection purposes. Electric utilities will provide geographic location information on a case specific basis to communication utilities and cable TV companies upon request where such bonding is not permissible. All other locations will be treated under the same conditions given in this rule.

Addition of bonding as described above will eliminate differences in ground potential on messengers in communication level.

EXISTING RULE  
RULE 83.4

83.4 Bonding

Where separate communication messengers, or guys, or both, of the same or different ownership, are attached to the same pole, and they are in proximity to electric supply circuits (see Rule 21.3-D), railway signal circuits or Class T electric railway or trolley circuits, such messengers, or guys, or both, shall be bonded together at frequent intervals (See Rule 83.4-A). For purpose of this rule, communication messengers and guys are those which support Major Class C circuits (see Rule 20.5) and those Minor Class C Circuits which are used for television transmission.

Where bonding is required, the bond wire or bond strap shall have a conductivity of not less than No. 6 AWG copper wire, and shall be securely attached to the messenger or guy. Such a bond wire or bond strap may be attached to the surface of a pole or to the underside of a crossarm using metal staples, but shall in no case be attached to the top surface of any crossarm. Bond wires or bond straps placed in the climbing space shall be covered by a suitable protective covering (see Rule 22.2).

Communication systems owned by electric utilities are exempt from these requirements.

PROPOSED RULE CHANGE  
CROSS OUT AND UNDERLINE  
RULE 83.4

83.4 Bonding

Where separate communication messengers, or guys, or both, of the same or different ownership, are attached tot the same pole, and they are in proximity to electric supply circuits (see Rule 21.3-D), railway signal circuits or Class T electric railway or trolley circuits, such messengers, or guys, or both, shall be bonded together at frequent intervals (See Rule 83.4-A). For purpose of this rule, communication messengers and guys are those which support Major Class C circuits (see Rule 20.5) and those Minor Class C Circuits which are used for television transmission.

Where bonding is required, the bond wire or bond strap shall have a conductivity of not less than No. 6 AWG copper wire, and shall be securely attached to the messenger or guy. Such a bond wire or bond strap may be attached tot eh surface of a pole or to the underside of a crossarm using metal staples, but shall in no case be attached to the top surface of any crossarm. Bond wires or bond straps placed in the climbing space shall be covered by a suitable protective covering (see Rule 22.2).

~~Communication systems owned by electric utilities are exempt from these requirements.~~

NOTE: Bonding of communication systems owned by electric utilities to other communication systems, while not required, is acceptable by mutual agreement between all parties.

PROPOFINAL RULE CHANGE\*  
RULE 83.4

83.4 Bonding

Where separate communication messengers, or guys, or both, of the same or different ownership, are attached to the same pole, and they are in proximity to electric supply circuits (see Rule 21.3-D), railway signal circuits or Class T electric railway or trolley circuits, such messengers, or guys, or both, shall be bonded together at frequent intervals (See Rule 83.4-A). For purpose of this rule, communication messengers and guys are those which support Major Class C circuits (see Rule 20.5) and those Minor Class C Circuits which are used for television transmission.

Where bonding is required, the bond wire or bond strap shall have a conductivity of not less than No. 6 AWG copper wire, and shall be securely attached to the messenger or guy. Such a bond wire or bond strap may be attached to the surface of a pole or to the underside of a crossarm using metal staples, but shall in no case be attached to the top surface of any crossarm. Bond wires or bond straps placed in the climbing space shall be covered by a suitable protective covering (see Rule 22.2).

NOTE: Bonding of communication systems owned by electric utilities to other communication systems, while not required, is acceptable by mutual agreement between all parties.

ITEM 14

- RULE 84.4-D4(a)

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 84.4-D4a

The proposed changes clarify this rule to reflect generic work operations and to eliminate unnecessary wording.



EXISTING RULE  
RULE 84.4-D4(a)

RULE 84.4-D4(a)

- (a) From Non-climbable Street Lighting or Traffic Signal Poles or Standards:

Communications cables passing (unattached) non-climbable street lighting and traffic signal poles or standards including mastarms, brackets and lighting fixtures, shall clear a radial distance of 12 inches as specified in Table 1, Case 10, Column B; except when the cable sheath and messenger are suitably insulated for the highest voltage involved and mechanically protected from abrasion where necessary. Such mechanical protection shall extend not less than 15 inches in each direction along the cable from centerline of pole, standard, attaching mastarms or fixtures; whether passing above, below or alongside. The cable shall be installed in such a manner so as not to interfere with light distribution from lighting fixtures and shall not hamper workmen changing lamps or maintaining equipment.

EXISTING RULE  
(STRIKE OUT AND UNDERLINED)  
RULE 84.4-D4(a)

RULE 84.4-D4(a)

- (a) From Non-climbable Street Lighting or Traffic Signal Poles or Standards (including mastarms, brackets and lighting fixtures):

When Passing Communications cables passing (unattached) non-climbable street lighting and traffic signal poles or standards including mastarms, street lighting, traffic signals poles or standards (including mastarms, brackets and lighting fixtures), shall clear a radial distance a clearance of 12 inches, as specified in Table 1, Case 10, Column B; except may be reduced when the cable sheath and messenger are suitably insulated for the highest voltage of open wire involved and mechanically protected from abrasion is provided where necessary. Such mechanical protection shall extend not less than 15 inches in each direction along the cable from centerline of pole, standard, attaching mastarms or fixtures; whether passing above, below or alongside. There The cable shall be installed in such a manner so as not to shall be no interference with light distribution from lighting fixtures and workers shall not be hampered workmen changing lamps or maintaining equipment or endangered in the performance of their duties.

EXISTING RULE  
(STRIKE OUT AND UNDERLINED)  
RULE 84.4-D4(a)

RULE 84.4-D4(a)

- (a) From Non-climbable Street Lighting or Traffic Signal Poles or Standards (including mastarms, brackets and lighting fixtures):

When Passing street lighting, traffic signals poles or standards (including mastarms, brackets and lighting fixtures) a clearance of 12 inches, as specified in Table 1, Case 10, Column B; may be reduced when suitable insulation for the highest voltage of open wire involved and mechanically protection from abrasion is provided where necessary. Such mechanical protection shall extend not less than 15 inches in each direction centerline of pole, standard, attaching mastarms or fixtures; whether passing above, below or alongside. There shall be no interference with light distribution from lighting fixtures and workers shall not be hampered or endangered in the performance of their duties.

ITEM 15

- Rule 84.4-E
- Rule 84.4-F

RATIONALE FOR PROPOSED RULE CHANGES  
RULE 84.4-E  
AND  
RULE 84.4-F  
CLEARANCES

The proposed rule changes add language and specific clearance requirements for conductors that are neither directly above or along side buildings, bridges or other structures, but could be in immediate proximity and close enough to pose a possible danger to workers or other general public. Also a new figure (Fig 84-4) will be added to clarify the content of these rules.

EXISTING RULES  
RULE 84.4-E  
RULE 84.4-F  
CLEARANCES

RULE 84.4-E

E Above Or Beside Buildings, Bridges And Other Similar Structures

Conductors should be so arranged so as not to hamper or endanger firefighters and workers in performing their duties. The basic clearances of communication conductors from buildings are specified in Table 1, Cases 6 and 7, Column B. The requirements of Table 1, Case 7, Column B also apply to fire escapes, windows, and any other points of entrance or exit where human contact might be expected.

Communication cables are not required to be any specified distance from the sides of buildings, bridges and other similar structures, but they shall be installed so that they do not interfere with the free use of fire escapes, exits, and any other points of entrance or exit where human contact might be expected.

The vertical clearance of communication conductor (including cables) above buildings as specified in Table 1, Case 6, Column B may be reduced to not less than 2 feet under the following conditions:

1. Over roofs of 3/8 pitch (37 degrees from the horizontal) or greater, or
2. Over roofs where the conductor does not overhang the building by more than 6 feet.

See Rule 84.8-C4 for service drop clearance requirements

Rule 84.4-F

F Under Or Through Bridges, Viaducts or Similar Structures

Open wire communication conductors which cross under or through bridges, viaducts, or similar structures shall be maintained at clearances above ground and walkways as specified in Table 1, Cases 1 to 6; at a radial clearance from unprotected conductors of other classifications not less than as specified in Table 2, Case 3; at clearance from walls and the underside of such structures as specified in Table 1, Case 7 except where

it is not practicable to obtain the 3-foot clearance therein specified this clearances may be reduced to not less than 6 inches where the voltage does not exceed 160 volts; or where supported on the walls or underside of such structures, at clearances as specified in Table 1, Case 9 with supports at least every 50 feet.

In lieu of the above requirements, conductors which cross under or through bridges, viaducts, or similar structure shall be enclosed in metal sheaths, run in metal conduits ill or be placed in ring construction on a messenger.

PROPOSED RULE CHANGES  
(STRIKE OUT AND UNDERLINED)

RULE 84.4-E

E ~~Above Or Beside~~ Alongside or in Immediate Proximity to Buildings, Bridges  
And Other Similar Structures

Conductors should be ~~so~~ arranged so as not to hamper or endanger firefighters and workers in performing their duties. The basic clearances of communication conductors from buildings are specified in Table 1, Cases 6 and 7, Column B. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Figure 84-4). The requirements of Table 1, Case 7, Column B also apply to ~~at~~ fire escapes, windows, and any other points of entrance or exit where human contact might be reasonably expected.

Communication cables are not required to be any specified distance from the sides of buildings, bridges and other similar structures, but they shall be installed so that they do not interfere with the free use of fire escapes, exits, and any other points of entrance or exit where human contact might be reasonably expected.

The vertical clearance of communication conductor (including cables) above buildings as specified in Table 1, Case 6, Column B may be reduced to not less than 2 feet under the following conditions:

1. Over roofs of 3/8 pitch (37 degrees from the horizontal) or greater, or
2. Over roofs where the conductor does not overhang the building by more than 6 feet.

See Rule 84.8-C4 for service drop clearance requirements

Rule 84.4-F

F ~~Under Or~~ Below, Alongside, Through or In Immediate Proximity to  
Bridges, Viaducts or Similar Structures

Open wire communication conductors which cross ~~under or~~ below through or in immediate proximity to bridges, viaducts, or similar structures shall be maintained at clearances above ground and walkways a two specified



in Table 1, Cases 1 to 6; at a radial clearance from unprotected conductors of other classifications not less than as specified in Table 2, Case 3; at clearance from walls and the underside of such structures as specified in Table 1, Case 7. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 84-4). ~~except w~~Where it is not practicable to obtain the 3-foot clearance, ~~therein specified~~ these clearances may be reduced to not less than 6 inches where the voltage does not exceed 160 volts; or where supported on the walls or underside of such structures, at clearances as specified in Table 1, Case 9 with supports at least every 50 feet.

In lieu of the above requirements, conductors which cross ~~under~~below or through bridges, viaducts, or similar structures shall be enclosed in metal sheaths, run in metal conduits or be placed in ring construction on a messenger.

PROPOSED RULE CHANGES  
(FINAL)\*

RULE 84.4-E

E Above Alongside or in Immediate Proximity to Buildings, Bridges And Other Structures

Conductors should be so arranged so as not to hamper or endanger firefighters and workers in performing their duties. The basic clearances of communication conductors from buildings are specified in Table 1, Cases 6 and 7, Column B. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Figure 84-4 ). The requirements of Table 1, Case 7, Column B also apply to at fire escapes, windows, and any other points of entrance or exit where human contact might be reasonably expected.

Communication cables are not required to be any specified distance from the sides of buildings, bridges and other similar structures, but they shall be installed so that they do not interfere with the free use of fire escapes, exits, and any other points of entrance or exit where human contact might be reasonably expected.

The vertical clearance of communication conductor (including cables) above buildings as specified in Table 1, Case 6, Column B may be reduced to not less than 2 feet under the following conditions:

1. Over roofs of 3/8 pitch (37 degrees from the horizontal) or greater, or
2. Over roofs where the conductor does not overhang the building by more than 6 feet.

See Rule 84.8-C4 for service drop clearance requirements

Rule 84.4-F

F Below, Alongside, Through or In Immediate Proximity to Bridges, Viaducts or Similar Structures

Open wire communication conductors which cross below through or in immediate proximity to bridges, viaducts, or similar structures shall be maintained at clearances above ground and walkways as two specified in

Table 1, Cases 1 to 6; at a radial clearance from unprotected conductors of other classifications not less than as specified in Table 2, Case 3; at clearance from walls and the underside of such structures as specified in Table 1, Case 7. The horizontal clearance (Table 1, Case 7) shall be maintained until the vertical clearance (Table 1, Case 6) is attained (see Fig. 84-4). Where it is not practicable to obtain the 3-foot clearance, this clearances may be reduced to not less than 6 inches where the voltage does not exceed 160 volts; or where supported on the walls or underside of such structures at clearances as specified in Table 1, Case 9 with supports at least every 50 feet.

In lieu of the above requirements, conductors which cross below or through bridges, viaducts, or similar structure shall be enclosed in metal sheaths, run in metal conduits or be placed in ring construction on a messenger.

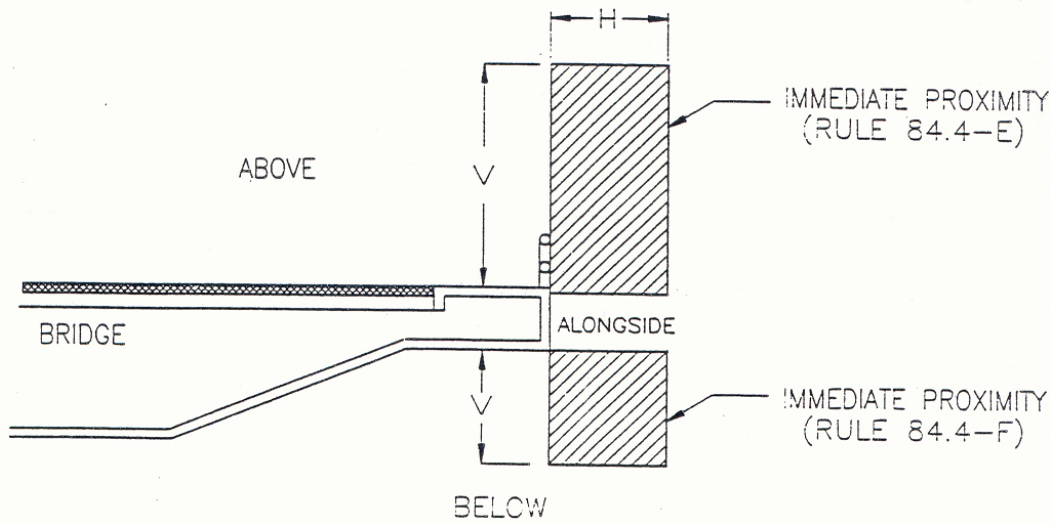
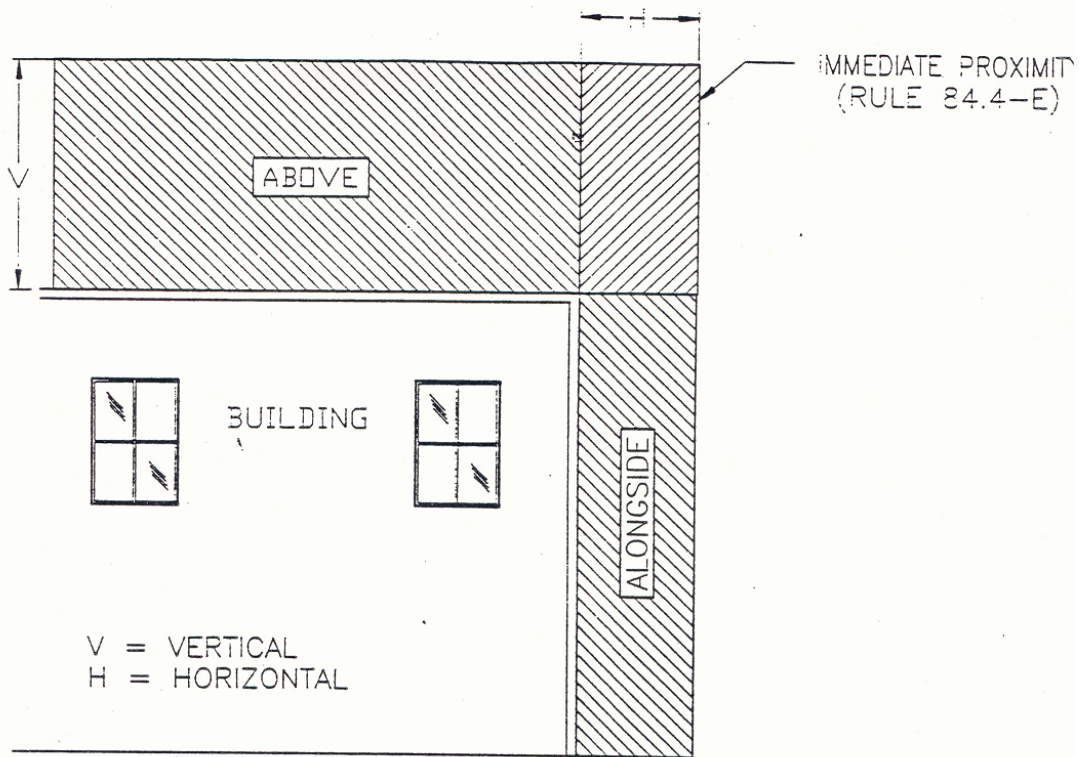


FIGURE 84 - 4

ITEM 16

- Rule 84.8-D
- Rule 84.8-E
- Rule 84.8-E1

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 84.8-D  
SERVICE DROPS

This proposed rule change edits the text simplify and clarify the intent of the rule.

EXISTING RULE  
RULE 84.8-D  
SERVICE DROPS

RULE 84.8-D

D Clearances Between Conductors

The clearances of communication service drop conductors from other conductors shall be not less than the minimum clearances specified in Rule 38, Table 2, Column C, with the following modifications:

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 84.8-D  
SERVICE DROPS

RULE 84.8-D

D Clearances Between Conductors and Service Drops

~~These clearances of communication service drop conductors from other conductors shall be not less than the minimums clearances specified in Rule 38, Table 2, Column C, with the following modifications:~~

PROPOSED RULE CHANGE  
(FINAL)\*  
RULE 84.8-D  
SERVICE DROPS

RULE 84.8-D

D Clearances Between Conductors and Service Drops

These clearances shall not be less than the minimums specified in Rule 38, Table 2, Column C, with the following modifications:

RATIONALE FOR PROPOSED RULE CHANGE  
RULE 84.8-E  
SERVICE DROPS

This proposed rule change corrects grammatical style and fractions to decimal values.



EXISTING G.O. 95 RULE  
RULE 84.8-E  
SERVICVE DROPS

Rule 84.8-E

E Clearance From Other Poles

Service drops shall clear the center line of any pole by which they are not supported by not less than 22 ½ inches, except where such pole is less than 10 feet from the pole which supports the service drops. Where these two poles are less than 10 feet apart this clearance may be less than 22 ½ inches but shall be not less than 15 inches.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 84.8-E  
SERVICVE DROPS

Rule 84.8-E

E Clearance From Other Poles

Service drops shall clear the center line of any pole by which they are not supported by not less than 22 ½.5 inches, except where such pole is less than 10 feet from the pole which supports the service drops. Where these two poles are less than 10 feet apart this clearance may be less than 22 ½.5 inches but shall ~~be~~ be not be less than 15 inches.

PROPOSED RULE CHANGE  
(FINAL)\*  
RULE 84.8-E  
SERVICVE DROPS

Rule 84.8-E

E Clearance From Other Poles

Service drops shall clear the center line of any pole by which they are not supported by not less than 22.5 inches, except where such pole is less than 10 feet from the pole which supports the service drops. Where these two poles are less than 10 feet apart this clearance may be less than 22.5 inches but shall not be less than 15 inches.

RATIONALE FOR PROPOSED RULE CHANGE  
84.8-E(1)  
SERVICE DROPS

The proposed Rule Change eliminates duplication of wordage by referencing another rule having identical content.

EXISTING RULE  
Rule 84.8-E1

RULE 84.8-E(1)

(1) From Non-climbable Street Lighting or Traffic Signal Poles or Standards:

Communications service drops passing (unattached) non-climbable street lighting and traffic signal poles, or standards, including mastarms, brackets and lighting fixtures shall clear a radial distance of 12 inches as specified in Table 1, Case 10, Column B; except when the service drops are suitably insulated for the voltage involved and mechanically protected from abrasion where necessary. Such mechanical protection shall extend not less than 15 inches in each direction along the cable from centerline of pole, standard, attaching mastarms or fixtures; whether passing above, below or alongside. The conductors shall be installed in such a manner so as not to interfere with light distribution from lighting fixtures and shall not hamper workmen changing lamps or maintaining equipment.

EXISTING RULE  
(STRIKE OUT AND UNDERLINED)  
Rule 84.8-E1

RULE 84.8-E(1)

- (1) From Non-climbable Street Lighting or Traffic Signal Poles or Standards:  
(See Rule 84.4-D4a)

~~Communications service drops passing (unattached) non-climbable street lighting and traffic signal poles, or standards, including mastarms, brackets and lighting fixtures shall clear a radial distance of 12 inches as specified in Table 1, Case 10, Column B; except when the service drops are suitably insulated for the voltage involved and mechanically protected from abrasion where necessary. Such mechanical protection shall extend not less than 15 inches in each direction along the cable from centerline of pole, standard, attaching mastarms or fixtures; whether passing above, below or alongside. The conductors shall be installed in such a manner so as not to interfere with light distribution from lighting fixtures and shall not hamper workmen changing lamps or maintaining equipment.~~

\*PROPOSED FINAL RULE CHANGE  
Rule 84.8-E1

RULE 84.8-E(1)

- (1) From Non-climbable Street Lighting or Traffic Signal Poles or Standards:  
(See Rule 84.4-D4a)

ITEM 17

- Rule 86

RATIONALE FOR PROPOSED RULE CHANGE

RULE 86  
GUYS AND ANCHORS

This proposed rule change is to rename the title of this section to cohere with the text in this rule section 86 and definition which is dealing with overhead and anchor guys.

EXISTING RULE  
RULE 86  
GUYS AND ANCHORS

RULE 86

1. GUYS AND ANCHORS

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)  
RULE 86  
GUYS AND ANCHORS

RULE 86

1. ~~GUYS AND ANCHORS~~

PROPOSED RULE CHANGE  
\*(FINAL)  
RULE 86  
GUYS AND ANCHORS

RULE 86

1. GUYS

ITEM 18

- Rule 92.1-F1



RATIONALE FOR PROPOSED RULE CHANGE  
RULE 92.1-F1  
VERTICAL CLEARANCES  
BETWEEN CONDUCTORS, CABLES, MESSENGERS  
AND MISCELLANEOUS EQUIPMENT

The proposed rule change clarifies the intent of the rule by adding "Parts of Energized Equipment" and removing the reference to "Undergrounded Equipment". There should be no distinction between grounded or undergrounded parts of energized equipment. The vertical clearances should be the same. By increasing the required vertical clearance below such equipment to the more typical 48 inches this rule becomes more consistent to the Order. By adding "of different ownership" we will further clarify that this rule was not meant to require this vertical clearance for a qualified worker of a single ownership.

EXISTING RULE  
Rule 92.1 Vertical Clearances  
RULE 92.1-F1

RULE 92.1-F1

F Between Conductors, Cables, Messengers and Miscellaneous Equipment

- 1) Unenergized and Ungrounded Equipment: Communication conductors or 0-750 volt supply conductors, which are on crossarms with not less than 15-inch clearance from center line of pole or which are attached to pole surface and provided with guard arm, shall be not less than 40 inches below unenergized and ungrounded cases or enclosures of apparatus of the other classification.

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

RULE 92.1-F1

F Between Conductors, Cables, Messengers and Miscellaneous Equipment

- 1) Unenergized and Ungrounded Parts of Energized Equipment:  
cCommunication conductors or 0-750 volt supply conductors, of  
different ownership which are on crossarms with not less than 15-  
inch clearance either supported 15 inches or more from center line  
of pole, or which are attached to the pole, surface and provided  
with guard arm, shall be not less than 40 48 inches or more below  
the unenergized and ungrounded cases or enclosures of the  
energized apparatus of the other classification.

PROPOSED RULE CHANGE  
(FINAL\*)

RULE 92.1-F1

F Between Conductors, Cables, Messengers and Miscellaneous Equipment

- 1) Unenergized Parts of Energized Equipment: communication  
conductors or 0-750 volt supply conductors, of different ownership  
which are either supported 15 inches or more from center line of  
pole, or are attached to the surface and provided with guard arm,  
shall be 48 inches or more below the unenergized cases or  
enclosures of the energized apparatus of the other classification.

(GO 128)

ITEM 1

- Rule 20.2
- Rule 20.4

RATIONALE FOR PROPOSED RULE CHANGE  
G.O. 128 RULES 20.2 & 20.4  
FIBER OPTIC CABLE

The present language in General Order 128 does not appropriately address the newly developed Fiber Optics technology. These rule changes broaden the definitions of "CABLE" and "COMMUNICATION SYSTEM" in such a manner that the general context of the general order can now be applied to Fiber Optic construction.

EXISTING RULES  
G.O. 128 RULES 20.2 & 20.4  
DEFINITIONS OF "CABLE" &  
"COMMUNICATION SYSTEM"

- 20.2 CABLE means an insulated conductor or a combination of insulated conductors which are enclosed in a sheath.
- A. BURIED CABLE means a suitably insulated cable installed directly in the earth (not in conduit or duct).

20.4 COMMUNICATION SYSTEM means an underground communication system including all of the subsurface and associated above ground structures, cables, ducts, manholes, equipment and appurtenances used for transmitting intelligence by electrical means. Circuits of a communication system not contained in grounded metallic sheathed-or shielded cable shall not operate at more than 400 volts to ground or 750 volts between any two points of such circuit, nor shall the transmitted power exceed 150 watts; except that when operated at less than 150 volts, no limit is placed on the transmitted power.

NOTE: As limited above, with respect to voltage, power and cable shield or sheath; telephone, telegraph, messenger-call, clock, police, fire alarm, and traffic control circuits may be classified as circuits of a Communication System. Other circuits, not exceeding the above limitations, used for signal or control purposes may also be included.

- A. PUBLIC COMMUNICATION SYSTEM means a communication system used to provide communication service to the general public.
- B. PRIVATE COMMUNICATION CIRCUIT means a circuit used for private communication, signal, or control purposes in the operation of other facilities.
- C. RAILWAY SIGNAL CIRCUIT means those supply and communication circuits used primarily for supplying energy for controlling the operation of railway block signals, highway crossing signals, interlocking apparatus and their appurtenances. Railway signal circuits which operate at less than 400 volts to ground may be considered as private communication circuits provided that if the potential exceeds 150 volts between conductors, the power transmitted shall not exceed 150 watts. Where all the circuits and underground system are owned and operated by one utility, the potential between conductors carrying in excess of 150 watts may be increased to not more than 250 volts. Railway signal circuits not meeting the foregoing requirements shall be treated as circuits of a supply system. (Rule 23.3.)

PROPOSED RULE CHANGE  
(STRIKE OUT AND UNDERLINED)

- 20.2 CABLE means an insulated conductor or a combination of insulated conductors, and/or fiber or group of fibers which are enclosed in a sheath.
- A. BURIED CABLE means a suitably insulated cable installed directly in the earth (not in conduit or duct).
- B. Fiber Optic Cable means a transparent fiber or group of fibers used to transmit light for communication purposes.
- (1) Dielectric Fiber Optic Cable means a fiber optic cable which contains no components capable of conducting electricity.
- (2) Non-Dielectric Fiber Optic Cable means a fiber optic cable which contains components capable of conducting electricity.

20.4 COMMUNICATION SYSTEM means an underground communication system including all of the subsurface and associated above ground structures, cables, ducts, manholes, equipment and appurtenances used for transmitting intelligence by electrical means information. Circuits of a communication system not contained in grounded metallic sheathed-or shielded cable shall not operate at more than 400 volts to ground or 750 volts between any two points of such circuit, nor shall the transmitted power exceed 150 watts; except that when operated at less than 150 volts, no limit is placed on the transmitted power.

NOTE: As limited above, with respect to voltage, power and cable shield or sheath; telephone, telegraph, messenger-call, clock, police, fire alarm, and traffic control circuits may be classified as circuits of a Communication System. Other circuits, not exceeding the above limitations, used for signal or control purposes may also be included.

- A. PUBLIC COMMUNICATION SYSTEM means a communication system used to provide communication service to the general public.
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- C. RAILWAY SIGNAL CIRCUIT means those supply and communication circuits used primarily for supplying energy for controlling the operation of railway block signals, highway crossing signals, interlocking apparatus and their appurtenances. Railway signal circuits which operate at less than 400 volts to ground may be considered as private communication circuits provided that if the potential exceeds 150 volts between conductors, the power transmitted shall not exceed 150 watts. Where all the circuits and underground system are owned and operated by one utility, the potential between conductors carrying in excess of 150 watts may be increased to not more than 250 volts. Railway signal circuits not meeting the foregoing requirements shall be treated as circuits of a supply system. (Rule 23.3.)



PROPOSED RULE CHANGE  
(FINAL)\*

- 20.2 CABLE means an insulated conductor or a combination of insulated conductors, and/or fiber or group of fibers which are enclosed in a sheath.
- A. BURIED CABLE means a suitably insulated cable installed directly in the earth (not in conduit or duct).
  - B. Fiber Optic Cable means a transparent fiber or group of fibers used to transmit light for communication purposes.
    - (1) Dielectric Fiber Optic Cable means a fiber optic cable which contains no components capable of conducting electricity.
    - (2) Non–Dielectric Fiber Optic Cable means a fiber optic cable which contains components capable of conducting electricity.

20.4 COMMUNICATION SYSTEM means an underground communication system including all of the subsurface and associated above ground structures, cables, ducts, manholes, equipment and appurtenances used for transmitting information. Circuits of a communication system not contained in grounded metallic sheathed-or shielded cable shall not operate at more than 400 volts to ground or 750 volts between any two points of such circuit, nor shall the transmitted power exceed 150 watts; except that when operated at less than 150 volts, no limit is placed on the transmitted power.

NOTE: As limited above, with respect to voltage, power and cable shield or sheath; telephone, telegraph, messenger-call, clock, police, fire alarm, and traffic control circuits may be classified as circuits of a Communication System. Other circuits, not exceeding the above limitations, used for signal or control purposes may also be included.

- A. PUBLIC COMMUNICATION SYSTEM means a communication system used to provide communication service to the general public.
- B. PRIVATE COMMUNICATION CIRCUIT means a circuit used for private communication, signal, or control purposes in the operation of other facilities.
- C. RAILWAY SIGNAL CIRCUIT means those supply and communication circuits used primarily for supplying energy for controlling the operation of railway block signals, highway crossing signals, interlocking apparatus and their appurtenances. Railway signal circuits which operate at less than 400 volts to ground may be considered as private communication circuits provided that if the potential exceeds 150 volts between conductors, the power transmitted shall not exceed 150 watts. Where all the circuits and underground system are owned and operated by one utility, the potential between conductors carrying in excess of 150 watts may be increased to not more than 250 volts. Railway signal circuits not meeting the foregoing requirements shall be treated as circuits of a supply system. (Rule 23.3.)