

(2) On Related Line and Buck Arms:

- a) One Voltage Classification*: The clearances of Table 2, Case 14 (and clearances less than as specified in Cases 9 to 13) shall not be applied consecutively both above and below the same conductor. The foregoing provisions of this rule do not apply to conductors in triangular or vertical configuration, the clearances of Table 2, Case 14 being directly applicable.

Where conductors of one voltage classification only are supported on the same crossarms, the vertical clearances specified in Table 2, Case 14, are not required between conductors on line arm and conductors on related buck arm provided no conductors on the line arm cross conductors of different phase or polarity on the buck arm.

*Voltage classifications for this purpose are:

0-750 volts,
750-7500 volts,
7500-20,000 volts, and
20,000 volts and above.

- b) Combination Arms: Where conductors of 0-750 volts and conductors of 750-7500 volts are supported on the same crossarms with the nearest conductors of the two classifications separated a horizontal distance of not less than 36 inches (plus any necessary vacant pin spaces required by Rule 54.7-A3c) the vertical separation between conductors on such a line arm and conductors on a related buck arm shall be not less than 4 feet. This vertical separation may be less than 4 feet but not less than 2 feet provided the horizontal separation of conductors of the two classifications is not less than 42 inches (plus any necessary vacant pin spaces required by Rule 54.7-A3c) and all conductors of the same voltage classification are supported on the same ends of the crossarms.

Where this vertical separation of 2 feet (or less than 4 feet but more than 2 feet) between conductors on a line arm and related buck arm is utilized, any conductor on such line or

buck arm shall have a vertical clearance from any other conductor level of not less than clearances specified in Table 2, Cases 8 to 13.

(3) On the Same Crossarms:

- a) Different Voltage Classifications: Supply conductors of different voltage classifications may be supported on the same crossarms in conformity with the requirements of Rule 32.4.
- b) On Brackets Attached to Crossarms: Line conductors supported on brackets or extensions attached to crossarms shall be maintained outside of the outer pin position on the crossarm with a radial separation not less than the minimum pin spacing specified in Table 2, Case 15, from any other line conductors supported by the same arm. Line conductors supported on such brackets or crossarms extensions shall be of the same voltage classification as the conductors supported on the same side of pole by the crossarm to which the bracket or arm extension is attached. The vertical clearances specified in Table 2, Cases 1 to 14 shall be provided between the conductor on the bracket and the conductor level of any other conductors not supported on the crossarm to which the bracket is attached.
- c) Same Phase or Polarity: The clearances specified in Table 2, Cases 15 and 17, are not required between conductors of both the same potential and the same phase or polarity.

(4) Dead Ended on Pole in Vertical Configuration:

- a) Conductors of 750 Volts or Less: Where conductors of 750 volts or less are supported in vertical configuration directly on a pole without the use of crossarms, the requirements for rack construction, Rule 54.9, shall apply.
- b) Conductors of More Than 750 Volts Supported on Climable Poles: Where conductors of more than 750 volts are supported in vertical configuration directly on a climable pole without the use of crossarms at line terminations, angles or corners, the following requirements apply:

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

The vertical separation between conductors of different circuits shall be not less than the clearances specified in Table 2, Cases 8 to 13, inclusive;

Not more than two conductors of a circuit of 750-5000 volts shall be supported directly on a pole in vertical configuration without the use of crossarms. The number of conductors of a circuit of more than 5000 volts so supported is not limited. Branch circuits may be taken from such construction without the use of crossarms provided a climbing and working space as specified in Rule 54.7 is maintained; and

The clearance of conductors from surface of pole shall be not less than as specified in Rule 54.4-D6b.

See Rule 54.7-A1 for climbing space requirements for conductors dead ended on poles in vertical configuration.

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

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

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

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

- (5) Rack Construction: See Rule 54.9
- (6) From Lead Wires and Drip Loops to Other Conductors: The vertical clearances between the lowest point of lead wires (to conduit runs, transformers or other equipment), excepting drop wires to street lights, and the next supply conductor level below such lead wires may be less than the clearances specified in Table 2, Cases 9 to 12, Columns D, E, F and G, provided the vertical separation is maintained as great as practicable and in no case less than the following:

<u>Voltage of lead wires</u>	<u>Minimum distance above other conductor level</u>
0-750	12 inches
750-7500	18 inches
7500-20,000	24 inches
20,000-35,000	36 inches

- (7) Voltages of More Than 68,000 Volts:
- a) Crossing or Colinear with Wires or Cables of Other Lines: The clearances specified in Table 2, Column I, Cases 1 to 7 inclusive, for conductors of more than 68,000 volts crossing or colinear with conductors, guys and messengers which are not supported on the same poles, shall be increased by $\frac{1}{2}$ inch for each kilovolt above 68 kv.
- b) Supported on the Same Structure: The vertical separation between conductors on line arms and conductors on related buck arms (Table 2, Column I, Case 14) and the horizontal separation of conductors on crossarms (Table 2, Column I, Case 15) shall be increased $\frac{1}{2}$ inch for each kilovolt above 68 kv.

D. From Poles

The basic minimum clearances of conductors from center line and surface of poles are specified in Table 1, Cases 8 and 9. Modifications of these basic clearances are specified in Rule 37 and by the following provisions:

- (1) Center Line Clearance At Angles In Lines: The clearance specified in Table 1, Case 8 may be reduced at angles in lines where it is necessary to support conductors on the side of insulators placed on pole-pins, provided the distance between the center of any such pole-pin and the center line of the crossarm through bolt is not less than the distance specified in Table 1, Case 8. This Rule 54.4-D1 shall not be held to permit any greater reduction of climbing space widths than that specified in Rule 54.7-A2 for line angles.
- (2) Center Line Clearances For 750 Volts and Above: The clearances referred to in Table 1, Case 8, Columns E and F, apply as follows with respect to voltage:

750-7500 volts	15 inches
7500-46,000 volts	18 inches
46,000 volts and above	18 inches plus $\frac{1}{2}$ -inch per kv in excess of 46 kv.

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

- (3) Conductors Passing and Unattached: The center-line clearance between poles and conductors which pass unattached shall be not less than $1\frac{1}{2}$ times the clearance specified in Table 1, Case 8, except where the interset pole is within 10 feet of a pole to which the passing conductors are attached. Where poles of the two lines are less than 10 feet apart, clearances not less than as specified in Table 1, Case 8, shall be maintained between the center line of any pole and conductors which pass unattached.

This rule will often necessitate the use of clearance crossarms with conductor clearances as specified in Table 1, Case 8, or the alternate increased clearances for service drops as provided in Rule 54.8-C3.

- (4) Longitudinal Cables and Messengers: Messengers and longitudinal supply cables, treated as required in Rule 57.4-F, may be attached to the surface of pole and thus have clearances less than as specified in Table 1, Cases 8 and 9, Column D.
- (5) Rack Construction For 0-750 Volts: Conductors of 0-750 volts in rack construction may be attached to poles with clearances less than 15 inches and 3 inches as specified in Table 1, cases 8 and 9 respectively, provided such construction complies with the provisions of Rule 54.9 and such conductors, not including their tie wires, shall have a clearance of not less than $2\frac{1}{2}$ inches from surface of pole.
- (6) Dead Ended on Pole:
- a) 0-750 Volts: Where conductors of 0-750 volts are dead ended on a pole in vertical configuration, the clearances specified for rack construction, Rule 54.9-B1, shall apply.
- b) More Than 750 Volts Supported on Climbable Poles: Where conductors are dead-ended on a climbable pole in vertical configuration, the energized portions of such conductors shall have clearances of not less than 15 inches from the surface of pole for voltages between 750 and 7500 volts and 18 inches from surface of pole for voltages in excess of 7500 volts. Where conductors of more than one circuit are dead-ended on a pole in vertical configuration, increased pole clearances are required as follows:

All energized portions of conductors of a circuit dead ended in vertical configuration below any other circuit on a pole shall be maintained at a clearance of not less than 2 feet from the surface of the pole for conductors of 750-7500 volts and not less than 3 feet from the surface of the pole for conductors of more than 7500 volts; and

Not more than two conductors of a circuit of 750-5000 volts shall be attached directly to a pole in vertical configuration without the use of crossarms. The number of conductors of a circuit of more than 5000 volts so supported on a pole is not limited. Branch circuits may be taken from such construction without the use of crossarms provided a climbing and working space as specified in Rule 54.7 is maintained.

The clearance of not less than 18 inches between surface of pole and conductors in excess of 7500 volts, specified in Rule 54.4-D6b, and the climbing space specified in Rule 54.7-A1, need not apply to supply circuits in excess of 7500 volts supported in vertical configuration in the top circuit position on poles where conductors of such circuits are not supported on crossarms and where no branch circuit exists at this level, provided the energized portion of such circuits have clearances from center line of pole which are not less than those specified in Rule 54.4-D2, and provided climbing spaces of not less than the minimum dimensions of those in Exhibits E and C of First Supplemental Application are maintained, and further provided that a minimum vertical clearance of 6 feet shall be maintained between the lowest conductor of the top circuit and the nearest conductor of the next circuit below.

- c) More Than 750 Volts Supported On Non-Climbable Poles: Where conductors are dead-ended on a non-climbable pole in partial underground distribution, the energized portions of such conductors shall be not less than 6 inches from surface of pole (see Rule 54.4-D2).

(7) Dead Ended In Horizontal Configuration: The basic clearance of Table 1, Case 8, Column D, and clearances specified in Rule 54.4D7a shall not be held to apply to the middle conductor of a single three wire 0-750 volt circuit dead ended in horizontal configuration.

- a) 750-7500 Volts (see App. G, Figs. 13 and 14): . A conductor of a circuit of 750-7500 volts in horizontal configuration on a crossarm may be dead ended (at conductor terminations, angles, corners and for change in conductor size) in line with the center line of pole or in line with a distance from center line of pole less than the 15 inches specified in Table 1, Case 8, provided:

Where the circuit concerned is supported on a line arm only (with no related buck arm present) a conductor is so dead ended in one direction only with climbing space maintained on the opposite side of the pole and with the energized portions of the conductor so dead ended maintained at a clearance of not less than 15 inches from center line of pole;

In corner construction a conductor is so dead ended in one direction only from the line arm and one direction only from the buck arm with the energized portions of conductors so dead ended maintained at a clearance of not less than 15 inches from the surface of the pole and required climbing space maintained (see Rule 54.7); and

Where a conductor is so dead ended with a line arm and related buck arm present, no transformer or other apparatus carried on the pole is connected to the circuit concerned.

- b) More Than 7500 Volts (see App. G, Fig. 14):
A conductor of a circuit of more than 7500 volts in horizontal configuration on a crossarm may be dead ended (at conductor terminations, angles, corners and for change in conductor size) in line with the center line of pole or in line with a distance from center line of pole less than the 18 inches specified in Table 1, Case 8, provided:

Where the circuit concerned is supported on a line arm only, except at the top of a pole under the provisions of Rule 54.4-D8b, a conductor is so dead ended in one direction only with climbing space maintained on the opposite side of the pole and with the energized portions of the conductor so dead ended maintained at a clearance of not less than 18 inches from the center line of pole;

In corner construction a conductor is so dead ended in one direction only from the line arm and one direction only from the buck arm with the energized portions of conductors so dead ended maintained at a clearance of not less than 18 inches from the surface of the pole and required climbing space maintained (see Rule 54.7); and

Where a conductor is so dead ended with a line arm and related buck arm present, no transformer or other apparatus carried on the pole is connected to the circuit concerned.

(8) At Top of Pole:

- a) 0-7500 Volts in Triangular Configuration: A single conductor of a circuit of 0-7500 volts may be attached at the top of a pole provided the other conductors of the same circuit are on a crossarm and are not less than 2 feet vertically below the level of such single conductor, except that such a 2-foot vertical separation is not required for dead-ended conductors conforming to provisions of Rule 54.4-D7a.

Where this triangular configuration is used, all conductors of other circuits on crossarms on the pole shall be not less than 4 feet below the level of the lower conductors of the pole-top circuit and conductors of 0-750 volts in rack construction shall conform to the requirements of Rule 54.9-E.

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

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

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

- (9) Lateral and Vertical Conductors: Unprotected lateral and vertical conductors (excepting ground wires installed as specified in Rule 54.6-B, bond wires installed as specified in Rule 53.4, and suitably insulated conductors of 0-750 volts entering terminal fittings mounted on the surface of poles as specified in Rule 54.6-F) shall not be attached to the surface of poles, but shall be

supported on crossarms or other supports and arranged to maintain the specified clearances from poles, towers or structures and other conductors (Table 1, Cases 8 and 9, and Table 2, Cases 15, 16, and 17), and to maintain the climbing and working spaces as required in Rule 54.7. In lieu of the foregoing, lateral and vertical conductors may be installed on the surface of poles provided the conductors are suitably insulated and protected as specified in Rule 54.6.

E. From Crossarms

The minimum distances of unprotected conductors from the surface of crossarms are specified in Table 1, Case 9. These clearances from the surface of crossarms are not required for suitably insulated conductors in runs which are protected as specified in Rule 54.6-C or for suitably insulated conductors where entering such protected runs.

Lead wires of 0-5000 volts may be less than 3 inches, but shall be not less than 1 inch, from the surface of crossarms where equipment (cutouts, switches, etc.) mounted on the crossarms is so constructed that clearances of less than 3 inches are necessary for the entrance of such leads to the equipment.

F. From Guys and Messengers (see Table 2, Column A, Rule 56.4-C and Rule 57.4)

G. From Grounded Metal Boxes and Equipment

On wood poles or structures, all grounded metal boxes and grounded metal cases for equipment shall be not less than 3 feet above or 6 feet below the level of unprotected supply conductors, excepting street light drop wires which are not less than the distances specified in Rule 92.1-F5 from the messengers, conductors or metal boxes therein mentioned. Where it is impracticable to obtain a clearance of at least 6 feet below unprotected supply conductors of 750 volts or less, a clearance of not less than 4 feet below such conductors will be permitted if a protective covering or guard is provided above such metal box or case.

This requirement does not apply to bends and terminals of risers or runs, which shall be treated as specified in Rule 54.6-F, nor to certain transformer cases as provided in Rule 58.3-C3, nor to the cases of oil switches treated as specified in Rule 52.7-F2.

Metal conduit boxes and fittings of runs or risers shall be treated in accordance with the provisions of Rules 54.6-D, E and F.

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 firemen 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, Case 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 or less is in excess of 35 feet, the horizontal clearance from 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 Rule 58.3-B2.

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

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

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

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

54.5 Sags

Minimum conductor sags shall be such that, under the loading conditions specified in Rule 43, the safety factor specified in Table 4, Rule 44, shall be met. See Charts in Appendix C for suggested sags at normal temperatures.

54.6 Vertical and Lateral Conductors

A. Unprotected Conductors (see Rule 20.8-D for definition)

Unprotected conductors from one level on a pole or structure to another level shall not pass within the climbing space; shall not pass within the working space, except as permitted by Rule 54.7-B2; shall not pass between the conductors of any other circuit; except between pole pin conductor positions; and shall clear the conductors of other circuits by distances not less than the following:

<u>Highest voltage classification of conductors concerned</u>	<u>Minimum radial distance between conductors</u>
0-5000 volts	11½ inches
5000-7500 volts	17½ inches
7500-20,000 volts	24 inches
20,000 volts and above	36 inches

Where the distance between levels is in excess of 12 feet and unprotected conductors pass between the pole-pin conductor positions of any other circuit, additional supports shall be installed so that the maximum length of conductor between supports is not more than 12 feet.

The clearances in the above tabulation do not apply between taps in buckarm construction, the clearances specified in Table 2, Case 16 being directly applicable.

For clearances between street light drop wires and cables, other conductors and metal boxes, see Rules 58.2-B3 and 92.1-F5.

B. Ground Wires

Ground wires shall have a conductivity and mechanical strength at least equal to that of No. 8 AWG medium-hard-drawn copper wire; they shall not be installed on the top surfaces of crossarms; and they shall have clearances of not less than 1½ inches from hardware in accordance with the provisions of Rules 52.7-B and 52.7-C.

Ground wires attached to or run on the face, back or underside of wood crossarms or on the surface of wood poles and structures shall be covered throughout their length by a suitable protective covering (see Rule 22.2), excepting that ground wires of 0-750 volt circuits or equipment are not required to be covered where installed on the underside of crossarms or the portions of crossarms supporting 0-750 volt conductors.

Ground wires of common neutral systems are specially required to comply with the provisions of Rules 59.3-C and 59.4 in addition to the provisions of this Rule 54.6-B.

Ground wires connected to overhead lightning-protection wires installed on poles or crossarms supporting only circuits of more than 35,000 volts need not be covered by a suitable protective covering above the level of 8 feet from the ground provided (1) said lines are situated in rural areas; (2) the ground wires have mechanical strength not less than that of #4 solid soft-drawn bare copper wire; and (3) the ground wires conform to the requirements of Rule 49.4-A with respect to the use of corrosion-resisting material.

C. Lateral Conductors

- (1) Conductors of 0-750 Volts: Lateral runs of conductors of 0-750 volts may be less than the clearances from center line and surface of pole, and from the surface of crossarm, as specified in Table 1, Cases 8 and 9, provided such conductors are suitably insulated and placed along the bottom surface of crossarms and are protected by wood moulding or impregnated fiber conduit of thicknesses not less

than as specified in Rule 22.2 or are protected by plastic pipe having the properties of the material designated as Type II in the standard specified in Rule 22.2-D. The plastic pipe shall have a minimum wall thickness of 0.10 inch. Except that the neutral conductor of a 0-750 volt lateral run need not be suitably insulated.

- (2) Conductors of More Than 750 Volts: Lateral runs of conductors of more than 750 volts may be less than the clearances from center line and surface of pole, and from the surface of crossarm, as specified in Table 1, Cases 8 and 9, provided such conductors are suitably insulated and are protected by the impregnated fiber conduit or plastic pipe specified in Rule 54.6-C(1), such conduit or pipe being placed along and attached to the bottom surface of crossarm.
- (3) Extent of Run: The wood moulding, fiber conduit, or plastic pipe required for protection by this Rule 54.6-C shall extend substantially under and along the arm to the outer position of any conductor in the run and in no case shall the covering be terminated within 15 inches from center line of pole.
- (4) Conductor Clearances: The radial clearances between conductors, specified in Table 2, Cases 16 and 17, are not required between the suitably insulated conductors in the same lateral run.

D. Vertical Runs

Conductors installed in the form of vertical runs on the surface of poles or not more than 18 inches from the center line of a pole shall be suitably insulated and covered throughout by a suitable protective covering (See Rule 22.2 for the definition of a suitable protective covering). The plastic pipe specified in Rule 22.2-D shall have a minimum wall thickness of 0.15 inch. This protective covering is not required over vertical runs in metal conduit attached to metal poles, towers or other structures provided pipe and structure are metallically connected and effectively grounded.

Conductors in the form of vertical runs more than 18 inches from the center line of any pole shall be suitably insulated and covered by a suitable protective covering or by securely supported impregnated fiber conduit without metal pipe as specified in Rule 22.2-D.

Vertical runs, where encased in grounded non-climbable metal poles, grounded metal conduit, plastic pipe, sheath, or shield, shall be treated as risers.

Conductors installed in the form of vertical runs which extend within 8 feet of the ground shall be treated as risers. Runs which terminate in the top of enclosures which afford ample mechanical protection to the runs may extend within 8 feet of the ground but not less than 6 feet of the ground without being treated as risers.

The radial clearances between conductors, specified in Table 2, Cases 16 and 17, are not required between suitably insulated conductors in the same vertical run.

E. Risers

Risers from underground cables or other conductors shall be encased in securely grounded iron or steel pipe (or other covering of equal strength) from the ground line to a level not less than 8 feet above the ground line (see App. G, Fig. 61.) A cable U guard made of No. 14 gauge steel shall be considered of sufficient strength for 0-750 volt risers. Plastic pipe is permitted in lieu of the grounded iron or steel pipe required by this rule, provided that risers of circuits in excess of 750 volts shall have an effectively grounded metallic shield. Such plastic pipe shall be of material as specified in Rule 22.2-D having a wall thickness not less than 0.2 inch.

Any riser on the surface of a pole or not more than 18 inches from the center line of a pole shall be covered by a suitable protective covering where within a vertical distance of 8 feet from the level of communication conductors (including cables) or unprotected supply conductors (including the leads from the terminal) supported by the same pole or where within a radial distance of 6 feet from conductors not supported by the same pole.

Any riser more than 18 inches from the center line of a pole shall be covered by a suitable protective covering, or by securely supported impregnated fiber conduit without metal pipe, where within a vertical distance of 8 feet from the level of communication conductors (including cables) or unprotected supply conductors (including the leads from the terminal) supported by the same pole or within a radial distance of 6 feet from conductors not supported by the same pole.

The portion of any riser between the insulating covering required on the upper section and the metal or plastic covering required on the lower section by the foregoing shall be covered by the extension of either or both of such coverings. Where fiber conduit over metal pipe is used as a protective covering, the fiber conduit shall not extend within 8 feet of the ground line and shall be installed in a workmanlike manner and securely supported in order to prevent it from slipping downward and exposing any upper sections of the metal pipe.

The radial clearances between conductors, specified in Table 2, Cases 16 and 17, are not required between suitably insulated conductors in the same riser.

Protective covering (suitable) is not required over risers encased in effectively grounded non-climbable metal poles or in iron or steel pipe attached to a steel pole, tower or other metal structure, provided the iron or steel pipe is effectively grounded and is metallically connected to such metal structure.

F. Terminals of Encased Risers and Runs

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

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

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

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

Cable or conduit bends and the terminals of risers or runs of conductors of more than 750 volts supported on climbable poles or structures shall be arranged with as little exposed surface as practicable but are not required to be covered by a protective covering provided that no portion of the terminal or associated unprotected conductors are within the climbing space or within the clearance from center line of pole specified in Table 1, Case 8 (15 or 18 inches). All exposed grounded surfaces of such terminal fittings and bends of risers and runs shall be not less than 18 inches vertically above the conductor level, and not less than 2 feet radially from any conductor at the next conductor level, of unprotected conductors of another circuit which is entirely below the level of the circuit to which the riser is connected.

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

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

The vertical clearances between the lowest point of lead wires of a riser or run (vertical or lateral) and the next conductor level below shall conform to the requirements specified in Rule 54.4-C6. See App. G, Fig. 61.

G. Clearance From Hardware on Wood Poles or Structures

On wood poles or structures, all ground wires, conductor sheaths (metallic or nonmetallic braids, tapes or coverings), metal conduits of risers or runs, and hardware used for attaching such risers or runs to structures, shall be not less than $1\frac{1}{2}$ inches from guy shims, bolts, braces, pole steps, and other

hardware not associated with the risers or runs. In cases where it is not practicable to obtain at least $1\frac{1}{2}$ inches of air-gap and creepage distance, suitable insulating sheet fiber or fiber conduit or other suitable means shall be used to provide a creepage distance of not less than $1\frac{1}{2}$ inches.

H. Attachment of Protective Covering

Protective covering shall be attached to poles, cross-arms, or structures by means of corrosion-resisting metal straps or staples which are adequate to maintain such covering in its proper position. The distance between straps or staples shall not exceed 3 feet where such covering is a hardwood moulding. Due care shall be exercised to avoid the possibility of nails protruding through any inner surface of any wood casing used as a protective covering.

54.7 Climbing and Working Space

A. Climbing Space

Climbing space, measured from center line of pole, shall be provided on one side or in one quadrant of all poles or structures, with dimensions as specified in Rules 54.7-A1, 54.7-A2 and 54.7-A3.

The climbing space shall be maintained in the same position for a distance of not less than 4 feet vertically both above and below each conductor level through which it passes. Compliance with this requirement necessitates that the position of the climbing space shall not be changed through conductor levels which are less than 4 feet apart. Where the vertical distance between consecutive conductor levels is 4 feet or more, and less than 8 feet, the position of the climbing space through such consecutive levels may be shifted not more than one-quarter of the distance around the pole. Where a conductor is installed at the top of a pole under the provisions of Rule 54.4-D8, the climbing space shall extend up to the level of such pole-top conductor but need not be provided through and above such level.

The requirements of Rule 54.7-A that climbing space shall be maintained for a distance of not less than 4 feet vertically both above and below each conductor level through which it passes and the requirements of Rule 54.7-A3b which relate to leaving certain pin holes in line arms and/or buck arms vacant, shall not be held to apply to a single circuit of more than 750 volts in flat construction at the top of the pole, provided:

No portion of any conductor of such a circuit shall have clearances from the center line of pole, less than that required by Rule 37, Table 1, Case 8.

Climbing space as required by Rule 54.7-A2 shall be maintained through the level of the conductors on the lower arm, and where a related buck arm is involved said climbing space need not extend above the level of the conductors on the upper arm, but shall extend to such level.

Allowable obstructions of these climbing spaces, where necessary, are specified in Rule 54.7-A4.

On poles having 0-750 volts secondary aerial cable with the supporting messenger attached to the surface of the pole, the climbing space shall be measured from the center line of pole on the side of the pole opposite the cable. The center line of the pole shall be approximately midway on one side of the climbing space which shall have minimum dimensions of 30 inches by 30 inches. On corner or dead end poles, the climbing space shall be a square of 30 inches by 30 inches horizontal dimensions. One side of such climbing space shall be bounded by a vertical plane through the dead-ended cable with the center line of pole bisecting each side. (Similar to Fig. 15 of Appendix G) or climbing space may be in a quadrant.

This Rule 54.7-A need not apply to non-climbable poles in partial underground distribution.

- (1) Dimensions Where Crossarms Are Not Involved: Climbing space through the levels of conductors in vertical configuration on tangent, angle and dead-end poles shall be a square of the horizontal dimensions tabulated below. For dead-end construction, one side of the climbing space shall be bounded by the vertical plane of the dead-ended conductors with the center line of pole bisecting such side (see App. G, Fig. 15):

<u>Voltage of conductors</u>	<u>Dimensions of square</u>
750-7500 volts	30 inches
7500-46,000 volts	36 inches
More than 46,000 volts	36 inches plus $\frac{1}{2}$ inch per kv in excess of 46 kv.

For climbing space dimensions for low voltage rack construction see Rule 54.9-F. The clearance of not less than 18 inches between surface of pole and conductors in excess of 7,500 volts, specified in Rule 54.4D6b and the climbing space specified in Rule 54.7-A1 need not apply to supply circuits

in excess of 7,500 volts supported in vertical configuration in the top circuit position on poles, provided the energized portion of such circuits have clearances from center line of pole which are not less than those specified in Rule 54.4D2, and provided climbing space is maintained.

- (2) Dimensions Where Line Arms Only Are Involved: The climbing space through levels where line arms without related buck arms are present on poles or structures shall be on one side or face of the pole, with the center line of pole approximately midway on one side of the climbing space (see App. G, Fig. 16), and shall have the following dimensions:

For conductors of 0-7500 volts, the climbing space shall be not less than 30 inches square except that for combination arm construction the climbing space shall be not less than 36 inches square. (See Rule 54.8-E for additional requirements where service drops from combination line arms are involved.)

For conductors of 7500-46,000 volts the climbing space shall be not less than 36 inches square.

For conductors of more than 46,000 volts the climbing space shall be a square the sides of which shall be not less than 36 inches plus $\frac{1}{2}$ inch per kv in excess of 46 kv.

The above dimensions may be reduced not more than 2 per cent because of line angles.

- (3) Dimensions Where Buck Arms Are Involved: The climbing space where line arms and related buck arms are involved on poles or structures shall be in a quadrant and shall have at least the dimensions, determined according to voltage classification, as given below. These dimensions are based on the minimum clearance from center line of pole (Table 1, Case 8) and the minimum pin spacings (Table 2, Case 15) for the voltages involved, with the pin positions numbered outward from the pole on the climbing side.

Where metal back braces are used they shall be considered as one of the arms of double arm construction.

- a) For Conductors of 0-750 Volts: Where single line arm and single buck arm construction is involved and the climbing space is left open on the opposite side of the pole from the arms, the No. 1 pin position shall be left vacant in one arm. (See App. G, Fig. 17)

Where double line arm and single buck arm, or vice versa, construction is involved and the climbing space is left open on the side of the pole opposite the single arm, the No. 1 pin position shall be left vacant in the single arm. (See App. G, Fig. 18.)

Where double line arm and double buck arm construction is involved, the No. 1 pin position shall be left vacant in each double arm. (See App. G, Fig. 19.)

- b) For Conductors of More Than 750 Volts: Where single line arm and single buck arm construction is involved and the climbing space is left open on the opposite side of the pole from the arms, the No. 1 pin position shall be left vacant in both line arm and buck arm (see App. G, Fig. 20). As an alternative, where the conductors are of 750-7500 volts, the No. 1 and No. 2 pin positions in one arm may be left vacant provided the arms involved are in the top positions on the pole.

Where double line arm and single buck arm, or vice versa, construction is involved and the climbing space is left open on the side of the pole opposite the single arm, the No. 1 pin position shall be left vacant in both line arm and buck arm (see App. G, Fig. 21). As an alternative, where the conductors are of 750-7500 volts, the No. 1 and No. 2 pin positions may be left vacant in the single arm provided the arms involved are in the top positions on the pole.

Where double line arm and double buck arm construction is involved the No. 1 pin position shall be left vacant in one double arm and the No. 1 and No. 2 pin positions shall be left vacant in the other double arm. (See App. G, Fig. 22.)

The requirements of Rule 54.7-A that climbing space shall be maintained for a distance of not less than 4 feet vertically both above and below

each conductor level through which it passes and the requirements of Rule 54.7-A3b which relate to leaving certain pin holes in line arms and/or buck arms vacant, shall not be held to apply to a single circuit of more than 750 volts in flat construction at the top of the pole, provided:

No portion of any conductor of such a circuit shall have clearances from the center line of pole, less than that required by Rule 37, Table 1, Case 8.

Climbing space as required by Rule 54.7-A2 shall be maintained through the level of the conductors on the lower arm, and where a related buck arm is involved said climbing space need not extend above the level of the conductors on the upper arm, but shall extend to such level.

- c) For Combination Arm Construction With Line Arm and Line Buck Arm or Service Buck Arm: (See Rule 54.8-E for additional requirements where service drops are involved.)

Where the vertical separation between conductor levels on line and buck arms is not less than 4 feet and the climbing space is in a 0-750 volt quadrant, the climbing space dimensions shall be not less than those prescribed in Rule 54.7-A3a for 0-750 volt conductors provided that the required vacant pin spaces shall be in addition to the 36-inch horizontal conductor separation required in Rule 54.4-C2b. (See App. G, Figs. 23, 24 and 25.)

Where the vertical separation between conductor levels on line and buck arms is not less than 4 feet and the climbing space is in a 750-7500 volt quadrant, the climbing space dimensions shall be not less than those prescribed in Rule 54.7-A3b for 750-7500 volt conductors provided that the required vacant pin spaces shall be in addition to the 36-inch horizontal conductor separation required in Rule 54.4-C2b. (See App. G, Figs. 26, 27 and 28.)

Where the vertical separation between conductor levels on line and buck arms is less than 4 feet such separation shall be not less than 2 feet

and the climbing space dimensions, in any quadrant, shall be not less than those prescribed in Rule 54.7-A3b for 750-7500 volt conductors, provided that the required vacant pin spaces shall be in addition to the 42-inch horizontal conductor separation required in Rule 54.4-C2b. (See App. G, Fig. 29, 30 and 31.)

- d) Alternatives: Where a single line arm or single buck arm is involved and it is impractical to locate the climbing space in the quadrant on the opposite side of the pole from the single arm, it may be located in another quadrant provided that any single arm or arms within the climbing space shall be treated as a double arm.

In applying the pin position spacings as prescribed in Rule 54.7 not less than the minimum spacings of Table 2, Case 15 shall be used. In the event the crossarms used are not bored for the minimum spacings, a spacing of conductors to give equivalent dimensions will be considered as meeting the requirements.

- (4) Allowable Climbing Space Obstructions: Crossarms and their supporting members are allowed in climbing spaces provided that, where buck arms are involved, any arms within climbing spaces are treated as double arms.

Suitably protected vertical conductors attached to the surfaces of poles, and guys, (except those guys contacting metal pins or dead-end hardware as specified in Rule 52.7-D) are allowed in climbing spaces provided that not more than one guy and one vertical riser, run, or ground wire are installed in any 4-foot vertical section of climbing space. The terminals or terminal fittings of risers or runs shall not be installed within climbing spaces.

Pin-type insulators which support line conductors of 20,000 volts or less may extend not more than one-half of their diameter into the climbing space. Dead-end or strain type insulators which support line conductors of 0-750 volts may extend not more than one-half of their diameter into the climbing space.

Dead end or strain type insulators which support line conductors of a single circuit of 750-20,000 volts located at the top circuit level of a pole may extend not more than one half of their diameter into the climbing space at that level.

Modifications of these requirements for rack construction are specified in Rule 54.9-F. Pin type or post type insulators which support line conductors of more than 20,000 volts in vertical configuration at the top circuit position may extend into the climbing space provided the conductors clear the surface and center line of pole as specified in Table I.

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 conductor levels on all poles and in such positions that the working spaces 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.

- (2) Allowable Working Space Obstructions: Taps from conductors on line arms to conductors on related buck arms may pass through the working space between the levels of conductors on related line and buck arm.

Service drops of 0-750 volts may pass through the working space of conductors supported on the same crossarm with the drop 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 in the climbing space).

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

54.8 Service Drops, 0-750 Volts

A. Material and Size

Supply service drops of 0-750 volts shall be of material and size as specified in Table 8 and Rule 49.4-C7a and shall have a weather-resistant covering at least equivalent to double-braid weatherproofing except to bare neutral may be used as specified in Rule 49.4-C7a.

B. Clearances Above Ground, Buildings, Etc.

The vertical clearances of supply service drops above ground, buildings, etc., shall be not less than the minimum clearances specified in Rule 37, Table 1, Column B, with the following modifications:

- (1) Above Public Thoroughfares: Service drop conductors shall have a vertical clearance of not less than 18 feet above public thoroughfares, except that this clearance may grade from 18 feet at a position not more than 12 feet horizontally from the curb line to a clearance of not less than 16 feet at the curb line, provided the clearance at the center line of any public thoroughfare shall in no case be less than 18 feet. Where there are no curbs the foregoing provisions shall apply using the outer limits of possible vehicular movement in lieu of a curb line.
- (2) Above Private Thoroughfares and Other Private Property:
 - a) Industrial or Commercial Premises: Over private driveways, lanes, or other private property areas accessible to vehicles on premises used for industrial or commercial purposes, service drops shall have a vertical clearance of not less than 16 feet.

- b) Residential Premises: Over private driveways or lanes or other private property areas accessible to vehicles on premises used for residential purposes only, service drops shall have a vertical clearance of not less than 12 feet. If the building served does not permit an attachment which will afford a clearance of at least 12 feet over such areas without the installation of a structure on the building to provide additional height, the vertical clearance of service drops of 0-300 volts only may be less than 12 feet but shall be maintained as great as possible and shall be not less than 10 feet.
- (3) Above Ground in Areas Accessible to Pedestrians Only:
- a) Industrial and Commercial Premises: Over areas accessible to pedestrians only on premises used for industrial or commercial purposes, service drops shall be maintained at a vertical clearance of not less than 12 feet.
 - b) Residential Premises: Over areas accessible to pedestrians only on residential premises, service drops shall be maintained at a vertical clearance of not less than 8 feet.
- (4) From Buildings and Structures: Service drops shall be so arranged as to hamper and endanger workmen and firemen as little as possible in the performance of their duties.
- a) Industrial and Commercial Premises: On premises used for industrial or commercial purposes service drops shall be maintained at a vertical clearance of not less than 8 feet over all or any portions of buildings and structures, except that service drops of 0-300 volts may be less than 8 feet, but not less than 12 inches, above the cornice, decorative appendage, eave, roof or parapet wall of the building served provided:

The cornice, decorative appendage, eave, roof or parapet wall less than 8 feet below such service drops is non-metallic;

The point of attachment of the service drops is not more than 18 inches back of the front face of the building wall facing the pole line from which the service drops originate; and

The cornice or decorative appendage which is less than 8 feet below such service drops does not extend more than 12 inches from said front face of the building wall.

Service drops are not required to clear buildings any specified horizontal distance but shall be so installed that they clear fire escapes, exits, windows, doors and other points at which human contact might be expected, a horizontal distance of not less than 3 feet.

- b) Residential Premises: On premises used for residential purposes only, service drops of 300-750 volts shall be maintained at a vertical clearance of not less than 8 feet over all buildings and structures.

The clearance above buildings of service drops of 0-300 volts shall be not less than the distance specified in Table 10.

TABLE 10

Minimum Allowable Clearance of Service Drops of 0-300 Volts Above Buildings

Type of Roof	Minimum Clearance Above		
	Building Served	Other Buildings On Premises Served	Buildings On Other Premises
Metal roof, 3/8 pitch or less (a)	8 ft.	8 ft.	8 ft.
Metal roof, more than 3/8 pitch	2 ft.	2 ft.	8 ft.
Nonmetallic roof, 3/8 pitch or less	(b)	2 ft.	8 ft.
Nonmetallic roof, more than 3/8 pitch	(b)	2 ft.	2 ft.

(a) 3/8 pitch is approximately 37 degrees from the horizontal.

(b) No limit specified but the greatest practicable clearance should be obtained.

Service drops are not required to clear buildings on residential premises any specified horizontal distance, but shall be so installed that they clear fire escapes, exits, windows, doors, and other points at which human contact might be expected, a horizontal distance of not less than 3 feet.

- (5) Above Swimming Pools: Installations of service drops above public and private swimming pools shall be avoided where practicable. Where service drop conductors are installed above a swimming pool, the conductors shall have a radial clearance of not less than 20 feet from the top edge of the pool walls and shall have a vertical clearance of not less than 18 feet above the highest water level of the pool surface. Service drops having coverings of materials specially approved by the Commission for installation above swimming pools may have vertical clearances above the pool and radial clearances from the top edge of the pool wall of not less than 16 feet for public and commercially operated pools and not less than 12 feet for residential pools.

No service drop may be installed less than 16 feet vertically above the horizontal plane through a diving board or platform, the area of such plane being within 8 feet radially of the diving board or platform and over the water surface of the pool.

No service drop may be installed less than 12 feet vertically above the horizontal plane through a diving board or platform, the area of such plane being the area within 3 feet radially of the diving board or platform and not over the water surface of the pool.

The following conductor covering materials are authorized for 0-300 volt service drop installations above swimming pools at the reduced clearances permitted in Rule 54.8B(5):

- a) Abrasion-resistant cables having a grounded metallic sheath, designated as armored service drop cable.
- b) Neutral-Supported Service Drop Cable manufactured in accordance with Standard No. WC-5-1961 or Standard No. WC-3-1959 of the National Electric Manufacturers Association.

C. Clearances Between Supply Service Drops and Other Conductors

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

- (1) From Fire Alarm or Other Communication Line Conductors:
 - a) Crossings in Spans: At crossings in spans, supply service drop conductors may have a clearance of less than 48 inches (Table 2, Case 3, Column D; and Case 4, Column C) but not less than 24 inches above any communication line conductors or below communication line conductors not supported on a messenger, provided the crossing is 6 feet or more from any pole which does not support both conductors involved in the crossing (see App. G, Fig. 42).
 - b) Supported on the Same Pole: Supply service drop conductors, other than those on a pole-top clearance attachment, may have a clearance of less than 48 inches (Table 2, Case 8, Column D; and Case 9, Column C) above or below communication line conductors supported by the same pole and not on a messenger provided such clearance is 6 feet or more from any pole which does not support both conductors involved, and provided clearances at least equal to those shown in Table 11 are maintained.

TABLE 11

Minimum Radial Clearance Between Supply Service Drop Conductors and Communication Line Conductors Not on Messengers

Radial distance of Crossing from supporting pole (feet)	Minimum radial clearance (inches)	
	From police and fire alarm conductors	From other communication conductors
5 or less	6	12
10 or less, but more than 5	9	18
15 or less, but more than 10	15	24
20 or less, but more than 15	21	24
More than 20	24	24

Supply service drop conductors may have a clearance of less than 48 inches (as specified in Table 2, Case 8, Column D; and Case 9, Column C) but not less than 24 inches above and laterally from communication line conductors supported on a messenger by the same pole provided such clearance is 6 feet or more from any pole which does not support both conductors. The vertical clearances of not less than 24 inches above or 48 inches below communication conductors supported on messengers are not required where the supply service drop conductors are 24 inches or more horizontally from the vertical plane of the communication messenger. (See App. G, Fig. 42.)

- (2) On Clearance Crossarms: Supply service drops may be supported on a clearance crossarm at a vertical distance less than 48 inches (specified in Table 2, Case 8, Column D, and Case 9, Column C) but not less than 24 inches above or below either supply circuits of 0-750 volts or communication circuits not supported on a messenger, or above communication or supply circuits which are supported on a messenger, provided the supply service drop unprotected conductors are at least 25 inches horizontally from the center line of the pole or are attached to suitable brackets (at least 25 inches from center line of pole) on each end of the clearance arm and carried on the underside of the clearance arm from end to end in fiber or plastic conduit or under wood protective covering as specified in Rule 54.6-C.

The installation of service drops in accordance with this rule will not entail any change in the communication conductors supported on the pole. (See App. G, Fig. 40)

- (3) On Pole Top Extensions: Supply service drops may be carried in a clearance crossing on pole top extensions or brackets above either supply circuits of 0-750 volts or communication circuits, with a vertical conductor clearance less than 48 inches (Table 2, Case 8, Column D; Case 9, Column C) but not less than 2 feet provided the service drop conductors clear the center line of the pole (projected) not less than 25 inches horizontally, and also provided the service drop conductors clear the outside pin position conductors of the other circuit not less than 2 feet. Where, in addition to the pole top bracket

or extension, the supply service drop conductors are supported on a bracket on the end of the other line crossarm, a clearance of not less than 12 inches will be permitted at the points of crossing of line conductors in the outside pin positions. In such construction the crossarm of the extension shall be of wood. The installation of service drops in accordance with this rule will not entail any change in the communication conductors supported on the pole. (See App. G, Fig. 41.)

- (4) From Communication Service Drops: The radial clearance between supply service drop conductors and communication service drop conductors may be less than 48 inches as specified in Table 2, Column C, Cases 4 and 9; Column D, Cases 3 and 8, but shall be not less than 24 inches. Where within 15 feet of the point of attachment of either service drop on a building, this clearance may be further reduced but shall be not less than 12 inches.
- (5) Above Trolley Contact Conductors: Service drops may be installed above trolley contact conductors, including messenger in catenary construction, at a vertical distance of not less than 4 feet, provided the service drops clear the top of rails a vertical distance of not less than 26 feet where the railroad crossed transports standard freight cars, or not less than 23 feet where the railroad does not transport standard freight cars. (See Rule 74.4-B1.)
- (6) From Conductors of 750-7500 Volts: Service drops may cross above or below line conductors of 750-7500 volts supported on the same pole at clearances less than specified in Table 2, Case 10, Column D, provided such drops shall be not less than 2 feet vertically or 1 foot horizontally from the supply line conductors.

D. Clearance From Other Poles

The clearance between service drop conductors and the center line of any pole not supporting them shall be not less than $22\frac{1}{2}$ inches (Rule 32.3). In case the pole involved in this clearance is within 10 feet of a pole supporting the service drop, this clearance may be less than $22\frac{1}{2}$ inches but shall be not less than 15 inches.

E. Clearances From Conductors on Combination Arms

In combination arm construction the following clearances are required between service drop conductors of 0-750 volts and the conductors of 750-7500 volts:

(1) 36-Inch Minimum Pole Pin Position Separation:
Where conductors of the two voltage classifications are supported on opposite ends of a crossarm with a minimum horizontal separation of 36 inches between pole pin positions, service drops which are run directly from such crossarm shall not cross conductors of the 750-7500 volt classification on the same arm.

(2) 42-Inch Minimum Pole Pin Position Separation:

a) Services from Line Arms: Where conductors of the two voltage classifications are supported on opposite ends of the crossarm with a minimum horizontal separation of 42 inches between pole pin positions, service drops may be run directly from the 0-750 volt portion of a line arm and may cross below conductors of 750-7500 volts on the same arm. Under these conditions the vertical separation at the point of crossing shall be not less than 2 feet, and the point of crossing shall be not less than 6 feet radially from the center line of pole.

b) Services from Buck Arms: Where conductors of the two voltage classifications are supported on opposite ends of the buck arm with a minimum horizontal separation of 42 inches between pole pin positions and not less than 2 feet vertical separation between line arm conductor level and buck arm conductor level, service drops may be run from line buck arms or service buck arms, provided:

Such service drops shall clear conductors of 750-7500 volts by not less than 2 feet vertically at the point of crossing;

Such service drops shall not pass through the climbing space specified in Rule 54,7-A3c;

Such service drops shall not cross under the 750-7500 volt end of the line arm within the third pin position; and

Where such service drops are run from double buck arms, or from single buck arms installed on the side of the pole below the 750-7500 volt portion of the related line arm, the pole-pin position on the 750-7500 volt end of the line arm shall be left vacant.