

PUBLIC UTILITY DISTRICT NO. 1
of
CHELAN COUNTY



CHELAN COUNTY

POLE ATTACHMENT STANDARDS

Updated August 2022

This document is to be used in combination with the
Pole Attachment License Agreement and Joint Use Rules & Regulations

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SECTION 1: POLE ATTACHMENT AND COMMUNICATION LINE CLEARANCE REQUIREMENTS

The following information is provided as an abbreviated clarification of National Electric Safety Code Standards. It is the responsibility of the Attaching Entity to ensure compliance with all NESC requirements when attaching to Chelan County PUD poles. NESC clearances stated as 8.7KV apply to Chelan PUD's electrical Distribution system voltage.

A. Communication Worker Safety Zone Clearances

1. Vertical Clearances from Lowest Supply Space Cable or Conductor to Highest Comm Space Cable or Conductor at the Pole - 40 Inches

NESC Rule 235C1b, Table 235-5 (Row 1a), 235C4, 238B, Table 238-1, and 239G1 Supply lines and communication lines on the same supporting structure shall have vertical clearances no less than **40 inches**. Additional clearance is required from supply conductors over 8.7kV.

NOTE: Measurement is taken from lowest point of power to highest point of communication including hardware.

2. Vertical Clearances from Lowest Supply Space Cable or Conductor to Highest Comm Space Cable or Conductor at Midspan - 30 Inches

NESC Rule 235C2b(1)(a) Line wires, conductors, and cables supported at different levels on the same structures shall have vertical clearances at the supporting structures so adjusted that the clearance at any point in the span shall be not less than 75 percent of that required at the supports by Table 235-5 [40 inches for voltages up to 8.7kV].

3. Streetlight Bracket or Span Wire Clearance – 40 Inches

NESC Rule 238C Span wires or brackets not effectively grounded supporting luminaires require clearance of 40 inches from communication lines and equipment. If effectively grounded, clearance of 4 inches is allowed.

NOTE: Communication attachments supported on cross arms require greater clearances.

4. Streetlight Drip Loop Clearance - 12 Inches

NESC Rule 238D If a drip loop of conductors entering a luminaire, a luminaire bracket, or a traffic signal bracket is above a communication line, the lowest point of the loop shall be at least 12 inches above the highest communication cable, through bolt, or other exposed conductive objects.

B. Communication Zone Clearance & Spacing

5. Vertical Spacing from Comm to Comm at the Pole - 12 Inches

NESC Rule 235H1 The spacing between messengers supporting communication cables should not be less than 12 inches except by agreement between the parties involved including the pole owner(s).

6. Vertical Clearances from Comm to Comm at Midspan - 4 Inches

NESC Rule 235H2 The clearances between the conductors, cables, and equipment of one communication utility to those of another, anywhere in the span, shall be not less than 4 inches, except by agreement between the parties involved including the pole owner(s).

C. Service Drop Clearances

7. Clearance Between Supply Service Drops and Communication Service Drops at Midspan AND at the Service Entrance- 12 Inches

NESC Rule 235C1, Exception 3 Supply service drops of 0 to 750V running above and parallel to communication service drops on the same supporting structure shall maintain a clearance of **not less than 12 inches at any point in the span including the point of their attachment to the building or structure being served including service entrance meter poles.** (Provided that the nongrounded conductors are insulated **and** that clearance is maintained between the two service drops at the pole as required by District Standards.)

8. Attachment to Electrical Service Masts – No Communications Attachments/Service Drops Allowed

National Electrical Code (NEC) Rule 230.28 Only power service-drop conductors are to be attached to an electrical service mast.

9. Clearance (in any direction) between a Supply Service Drop in the Span and a Lateral Communication Line Attached to the Same Pole - 30 Inches

NESC Rule 235E1 & Table 235-6 (Row 5b) Clearance in any direction between supply service drops in the span to lateral communication lines attached to the same support shall be not less than **30 inches.**

D. Clearances between Wires, Conductors, and Cables Carried on Different Supporting Structures

NOTE: Crossings should be made on a common supporting structure, where practical.

10. Vertical Clearance Between Any Two Crossing or Adjacent Wires, Conductors, or Cables Carried on Different Supporting Structures - 24 Inches

NESC Rule 233C1 & Table 233-1 The vertical clearance between any two crossing or adjacent wires, conductors, or cables carried on different supporting structures shall be not less than **24 inches.**

11. Horizontal Clearance Between Any Two Crossing or Adjacent Wires, Conductors, or Cables Carried on Different Supporting Structures – 5 Feet

NESC Rule 233B1 The horizontal clearance between any two crossing or adjacent wires, conductors, or cables carried on different supporting structures shall be not less than **5 feet** for voltages between wires, conductors, and cables of less than 22kV.

E. Intersect Structure Clearances

The following requirements apply to poles, standalone streetlights, traffic signals, and other intersect structures where wires pass by but are not attached.

NOTE: If a wire, conductor, or cable meets the horizontal clearance requirement detailed below, it does not have to meet the vertical requirement and vice versa.

12. Vertical Clearance Between Intersect Structures - 4.5 Feet (for voltages below 22kV)

NESC Rule 234B2 Wires, conductors, or cables of one line passing near a lighting support, traffic signal support, a supporting structure of a second line, or intermediate poles in skip-span construction, without being attached thereto, shall have a vertical clearance from any part of such structure not less than: **4.5 feet** for voltages below 22 kV.

Exception: For effectively grounded guys and messengers, insulated communication conductors and cables, and neutrals meeting Rule 230E1 and for cables of 300 V or less to ground meeting the requirements of Rule 230C1, 230C2 or 230C3, the vertical clearance **may be reduced to 2 feet**.

13. Horizontal Clearance Between Intersect Structures - 5 Feet

NESC Rule 234B1a Wires, conductors, or cables of one line passing near a lighting support, traffic signal support, a supporting structure of a second line, or intermediate poles in skip-span construction, without being attached thereto, shall have a horizontal clearance without wind from any part of such structure not less than: **5 feet** for voltages up to 50kV.

Exception: For effectively grounded guys and messengers, insulated communication conductors and cables, neutrals meeting Rule 230E1, and cables of 300V or less to ground meeting Rule 230C1, 230C2 or 230C3, horizontal clearance **may be reduced to 3 feet**.

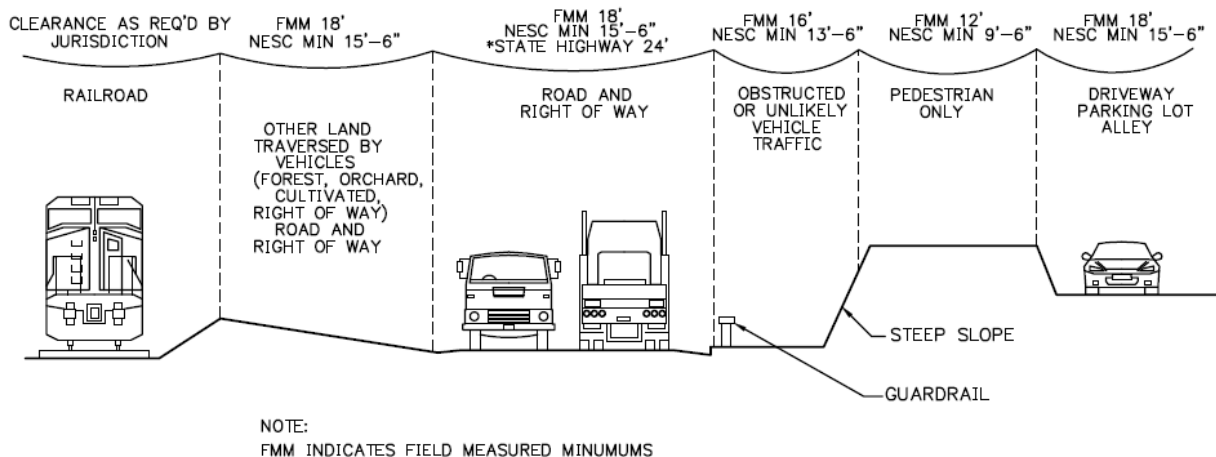
F. Vertical Clearances of Communication Lines & Equipment: Above Ground, Roadway, Rail or Water Surfaces

Exception: CCPUD required Field Measured Minimum are shown below. In most cases, the CCPUD minimum exceeds the NESC minimum.

For additional information, please reference **Table 232-1** of the NESC.

14. Vertical Clearances Above Ground

Location	Distance (ft)
Over Road, Streets, Alleys, Driveways, Parking Lots and Other Areas Subject to Truck Traffic	18
Over State Highways *Communication Joint Use with Electric	24 *20
Over Other Land Traversed by Vehicles, such as Cultivated Grazing, Forest, Orchard, Etc.	18
Over Railroad Tracks	24
Over Areas Subject to Pedestrian Traffic Only	12
Over Bridges	24
Parallel to Road, Streets, Alleys or other Road Right-of-Ways	18
Parallel to State Highways	24
Parallel to Bridges	20
Parallel to Road, Streets, Alleys, Where Travel is Obstructed or Unlikely that Vehicles will be Crossing Under the Line	16



CLEARANCE REQUIREMENTS

NOT TO SCALE

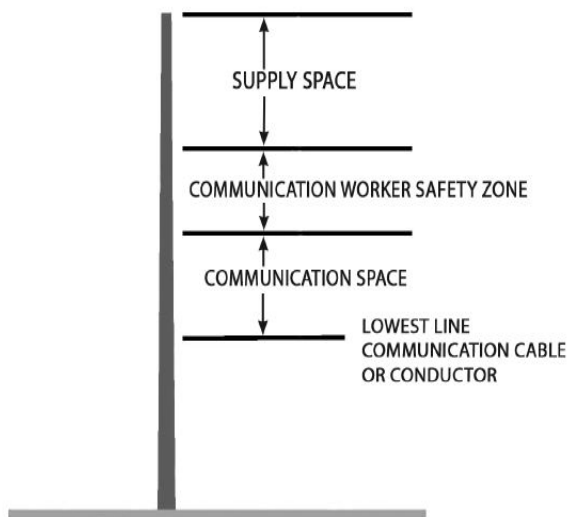
General Information

The NESC definitions split the usable space on a pole into three different “spaces”: supply space, communications worker safety zone, and communications space. These spaces are represented within the NESC definitions as follows:

supply space. The space on joint-use structures where supply facilities are separated from the communication space by the communication worker safety zone. See Figure D-5.

NOTE: Communication facilities may be located in the supply space (see Rule 224A).

communication space. The space on joint-use structures where communication facilities are separated from the supply space by the communication worker safety zone. See Figure D-1.



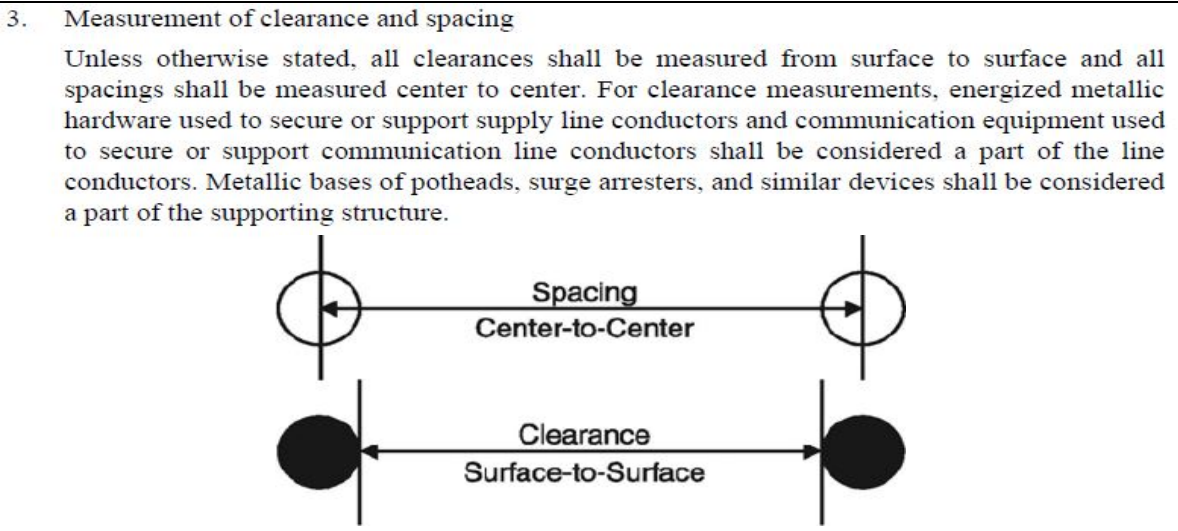
Rule 235C4 defines the communication worker safety zone as follows:

4. Communication worker safety zone

The clearances specified in Rules 235C and 238 create a *communication worker safety zone* between the facilities located in the supply space and facilities located in the communication space, both at the structure and in the span between structures. Except as allowed by Rules 238C, 238D, and 239, no supply or communication facility shall be located in the communication worker safety zone.

The above definition specifies that no supply or communication facility can be located in the communication worker safety zone unless otherwise allowed by 238C, 238D, or 239. 238C applies to span wires or brackets carrying luminaires, traffic signals, or trolley conductors, 238D applies to drip loops associated with luminaires and traffic signals, and 239 applies to vertical and lateral facilities on the same supporting structure. (Since PUD fiber does not fall within the above three exemptions, it cannot be located in the communication worker safety zone and must either be located in the supply space or in the communications space.)

Clearances and spacing shall be measured in accordance with Rule 230A(3) as follows:



Clearances and spacing shall be maintained as specified in each Rule under conditions of Zone.

Table 230-1—Ice thickness for purposes of calculating clearances

	Clearance zone (for use with Rules 232, 233, 234, and 235)				
	Zone 1 see Figure 230-1	Zone 2 see Figure 230-1	Zone 3 see Figure 230-1	Zone 4: Warm islands ^①	
				Altitudes sea level to 2743 m (9000 ft)	Altitudes above 2743 m (9000 ft)
Radial thickness of ice					
(mm)	12.5	6.5	0	0	6.5
(in)	0.50	0.25	0	0	0.25

Table 230-2—Ice, wind pressures, temperatures, and additive constants for purposes of calculating final inelastic deformation

	Clearance zone (for use with Rules 232, 233, 234, and 235)				
	Zone 1 Heavy ice: see Figure 230-1	Zone 2 Moderate ice: see Figure 230-1	Zone 3 Little or no ice: see Figure 230-1	Zone 4: Warm islands ^①	
				Altitudes sea level to 2743 m (9000 ft)	Altitudes above 2743 m (9000 ft)
Radial thickness of ice					
(mm)	12.5	6.5	0	0	6.5
(in)	0.50	0.25	0	0	0.25
Horizontal wind pressure					
(Pa)	190	190	430	430	190
(lb/ft ²)	4	4	9	9	4
Temperature					
(°C)	-20	-10	-1	+10	-10
(°F)	0	+15	+30	+50	+15
Constant to be added to the resultant ^②					
(N/m)	4.40	2.90	0.73	0.73	2.90
(lb/ft)	0.30	0.20	0.05	0.05	0.20

G. Vertical Clearances from Lowest Supply Space Cable or Conductor to Highest Comm Space Cable or Conductor at the Pole – 40 Inches

The NESC details the required clearance between the communication cables located in the communication space and the lowest cable or conductor located in the supply space at the pole in rule Rule 235C1(b) as follows:

- C. Vertical clearance at the support for line conductors and service drops
- All line wires, conductors, cables, and service drops located at different levels on the same supporting structure shall have vertical clearances not less than the following:
1. Basic clearance for line wires, conductors, and cables, and service drops of same or different circuits
 - b. Between supply lines and communication lines
The clearance requirements given in Table 235-5 shall apply.

The applicable clearances are shown in NESC Table 235-5 below. Row 1(a) shows the minimum clearance between communication lines and hardware in the communication space and the lowest supply space attachment (for supply conductors under 8.7kV) as 40 inches. See table below for further detail:

Table 235-5—

Vertical clearance between conductors at supports

(When using column and row headings, voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. When calculating clearance values within the table, all voltages are between the conductors involved. See the definitions section for voltages of other systems.

See also Rules 235A, 235C1, 235C2, and 235F.)

Conductors and cables usually at lower levels ^⑩	Conductors and cables usually at upper levels ^⑩			
	Supply cables meeting Rule 230C1, 230C2, or 230C3; neutral conductors meeting Rule 230E1; communications cables meeting Rule 224A2 (in)	Open supply conductors		
		0 to 8.7 kV ^⑩ (in)	Over 8.7 kV to 50 kV	
	Same utility ^⑦ (in)		Different utilities ^⑦ (in)	
1. Communication conductors and cables				
a. Located in the communication space	40 ^{① ⑤}	40	40	40 plus 0.4 per kV ^⑥ in excess of 8.7 kV
b. Located in the supply space	16 ^{⑨ ⑩}	16 ^⑩	40 ^⑩	40 plus 0.4 per kV ^⑥ in excess of 8.7 kV

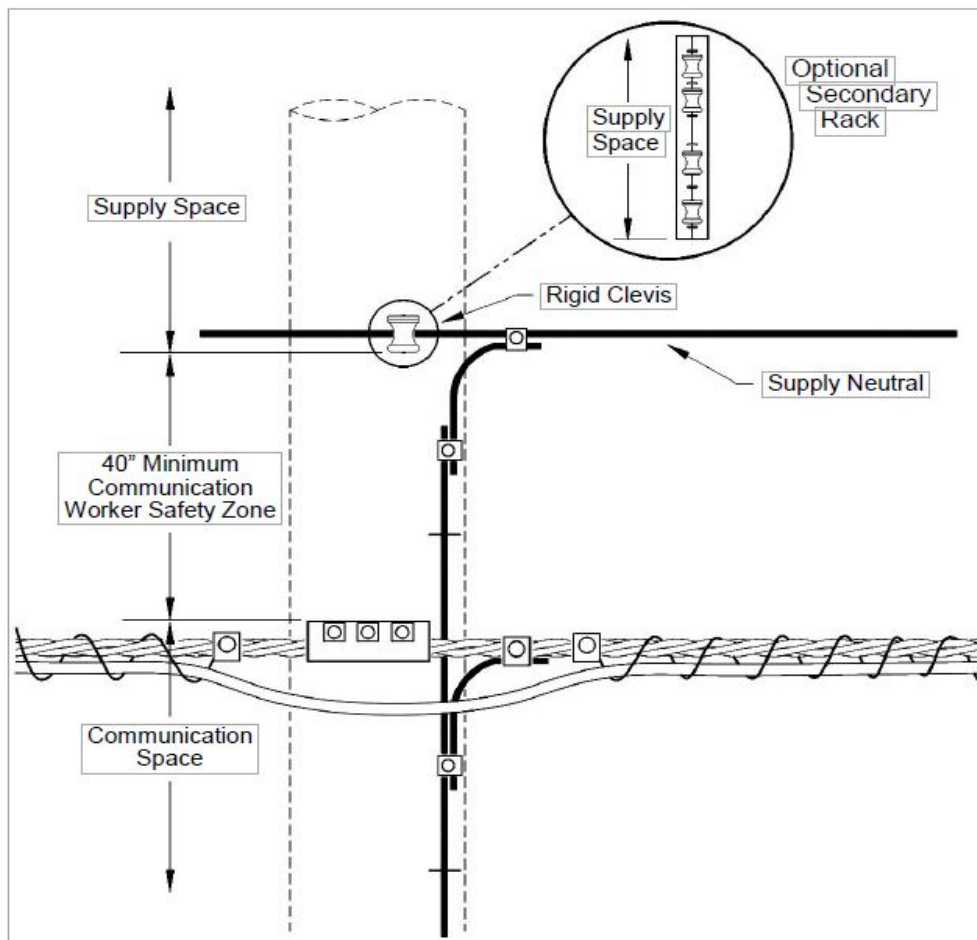
Per footnote 5 of table 235-5, the vertical clearance requirement for a communication cable located in the communication space can be reduced from 40 inches to 30 inches if the lowest supply zone cable or conductor meets one of the following criteria:

- Neutral conductors that are effectively grounded throughout their length and associated with circuits of 0 to 22 kV to ground. (230E1)
- Communications cable located in the supply space (If PUD fiber is within 30" of the neutral, it is part of the supply space. If it is at 30" or further, then it is in the communication space.)
 - Communications companies must be 30" minimum away from the PUD fiber if fiber is in the supply space.

This reduction may be allowed for any communications cable where the above criteria applies, not just CCPUD fiber. **HOWEVER, any clearance under the 40 inches to be specified in our design standard must first be analyzed on a per structure basis as reviewed and approved via CCPUD Standards Variance Form.**

NOTE: The lowest supply conductor would be the top of an electrical riser, bottom of a drip loop or bottom of secondary if any of these are lower than the neutral.

Clearance to Supply Neutral in the Common Position



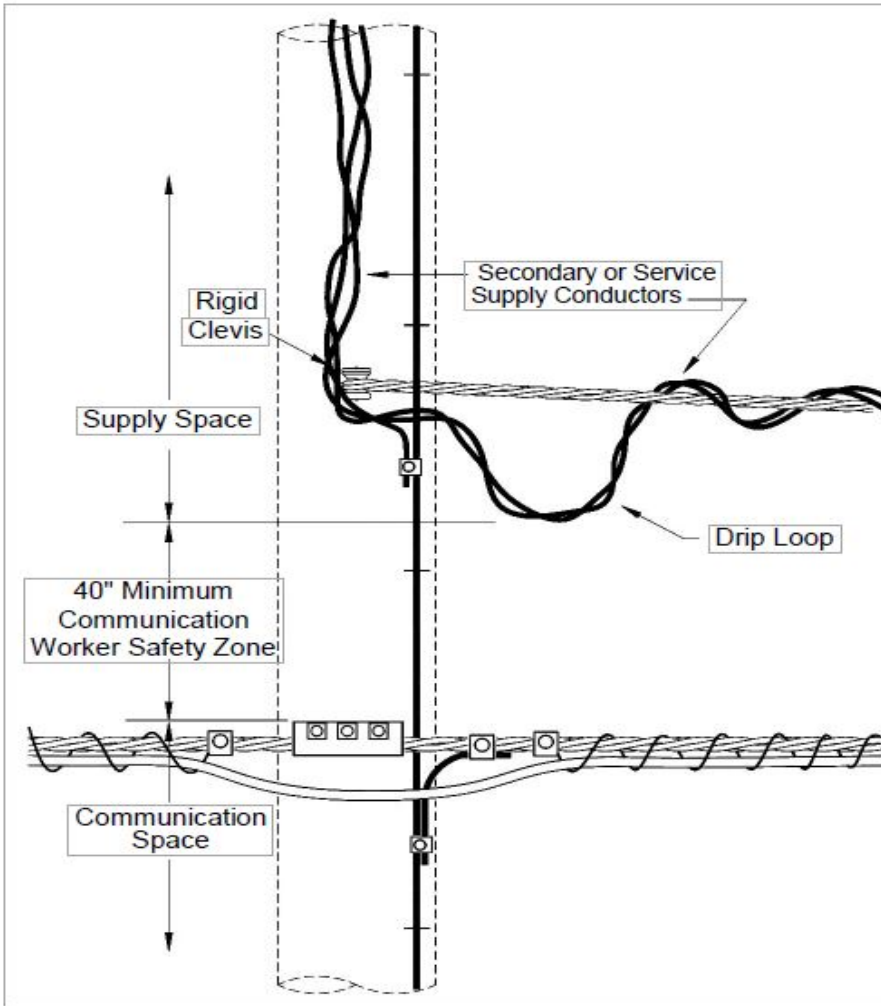
Minimum Clearance*
40 inches

* The minimum clearance may be reduced to 30 inches on a per structure basis as reviewed and approved by the CCPUD Standards Variance Form

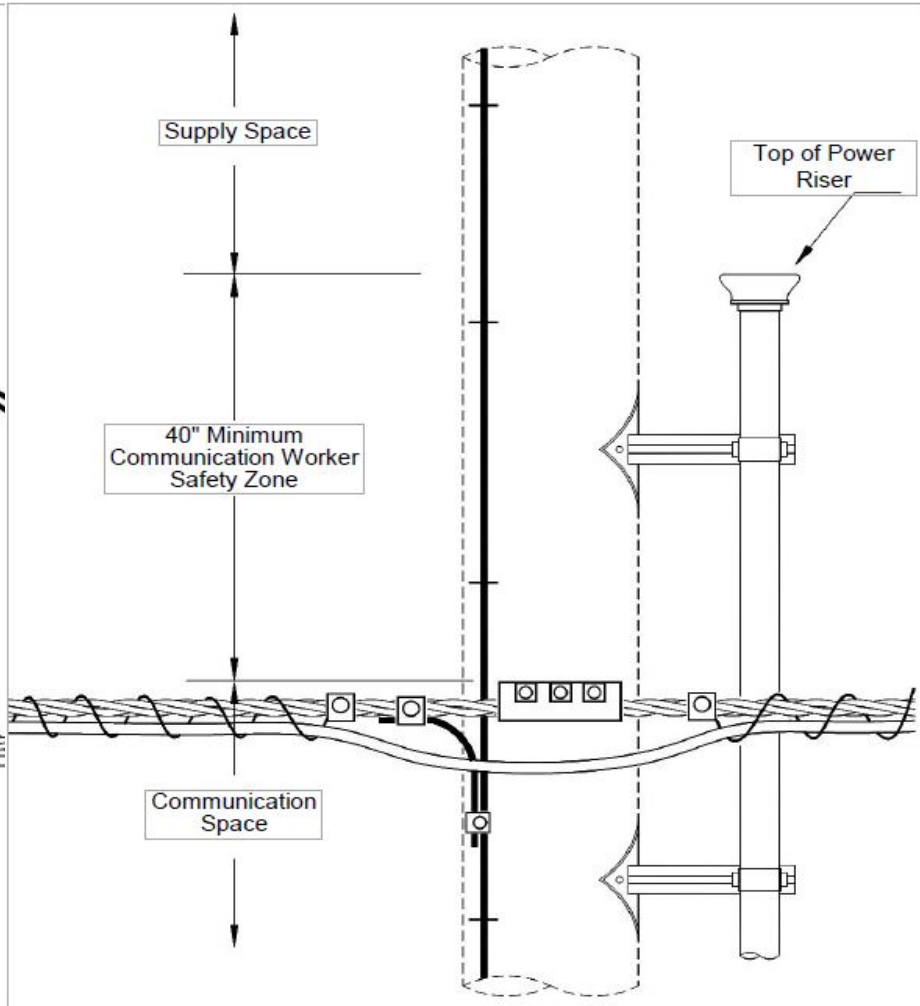
H. Additional Examples of Required Vertical Clearances at the Pole

Clearance to Secondary Conductor in the Common Position

Clearance to Power Riser Termination (Top of the Conduit)



Minimum Clearance
40 inches



Minimum Clearance
40 inches

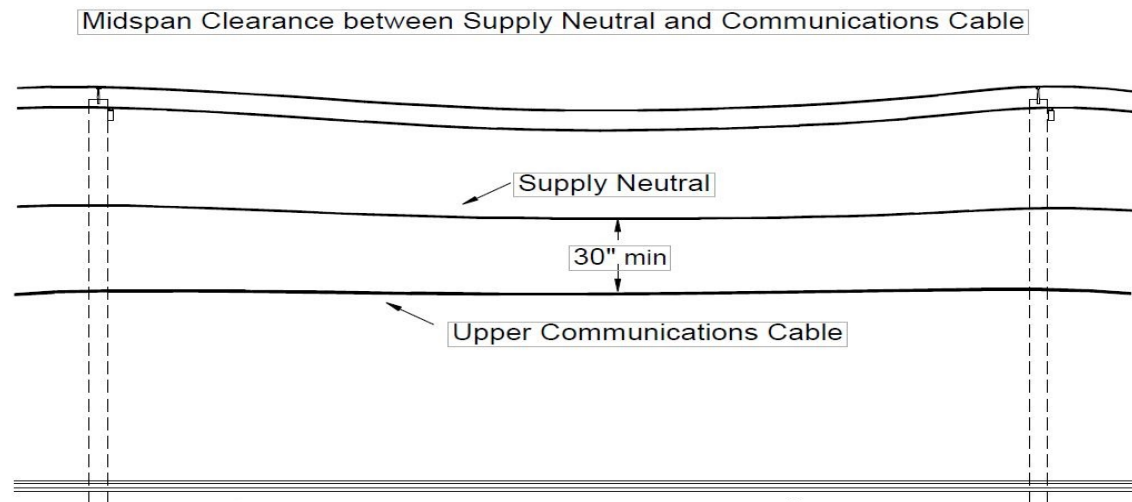
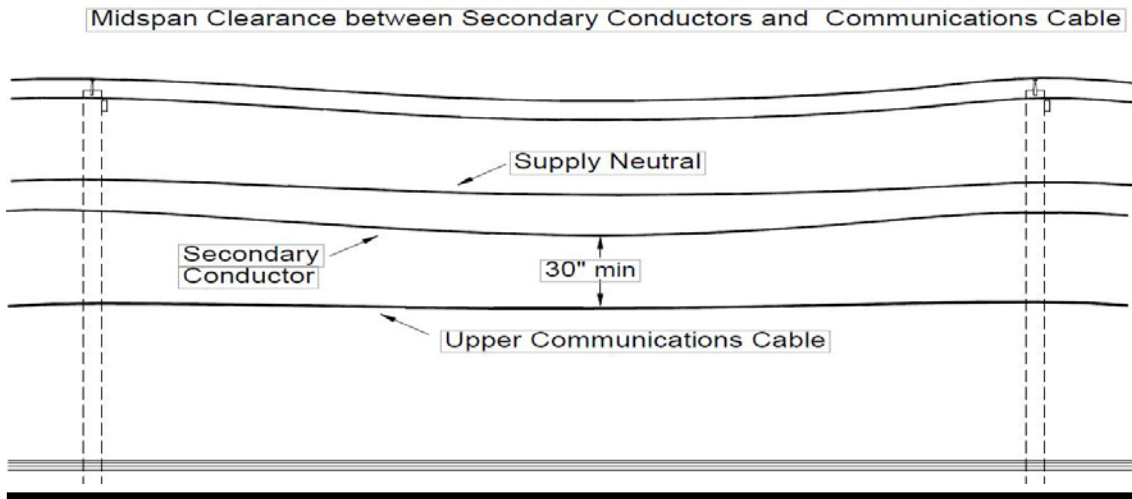
I. Vertical Clearances from Lowest Supply Space Cable or Conductor to Highest Comm Space Cable or Conductor at Midspan – 30 Inches

In the “Vertical Clearance Between Supply Space and Comm Space at Pole” section above, we established that a minimum clearance of 40” must be maintained from the lowest cable or conductor located in the supply space to the highest cable or conductor located in the communications space.

The NESC details required midspan clearance between the communication cables located in the communication space and the lowest cable or conductor located in the supply space in Rule 235C2b(1)(a) as follows:

- b. Sag-related clearances
 - (1) Line wires, conductors, and cables supported at different levels on the same structures shall have vertical clearances at the supporting structures so adjusted that the clearance at any point in the span shall be not less than any of the following:
 - (a) For voltages less than 50 kV between conductors, 75% of that required at the supports by Table 235-5.

Since we established that the minimum required clearance at the pole is 40 inches, the required midspan clearance would be 75% of that which equates to 30 inches (for voltages less than 8.7kV).



J. Streetlight Bracket or Span Wire Clearance Requirement – 40 Inches

NESC Rule 238C refers to Table 238-2 to specify the required clearance for streetlight span wires and brackets as they relate to communications facilities. Rule 238C reads as follows:

C. Clearances for span wires or brackets

Span wires or brackets carrying luminaires, traffic signals, or trolley conductors shall have vertical clearances from communications lines and equipment not less than the values specified in Table 238-2.

The applicable clearances are shown in NESC Table 238-2 below:

Table 238-2—Vertical clearance of span wires and brackets from communication lines and equipment

(See also Rule 238C.)

	Carrying luminaires, traffic signals, or trolley conductors			
	Not effectively grounded		Effectively grounded	
	(mm)	(in)	(mm)	(in)
Above communication support arms	1000	40	500	20 ^①
Below communication support arms	1000	40	600	24
Above messengers carrying communication cables	1000	40	100	4
Below messengers carrying communication cables	1000	40	100	4
From terminal box of communication cable	1000	40	100	4
From communication brackets, bridle wire rings, or drive hooks	1000	40	100	4

Span wires and brackets not effectively grounded supporting luminaires require clearance of 40 inches from messengers carrying communication cables. If effectively grounded, clearance of 4 inches is allowed.

NOTE: Communications attachments supported on cross arms require greater clearances. See Table 238-2.

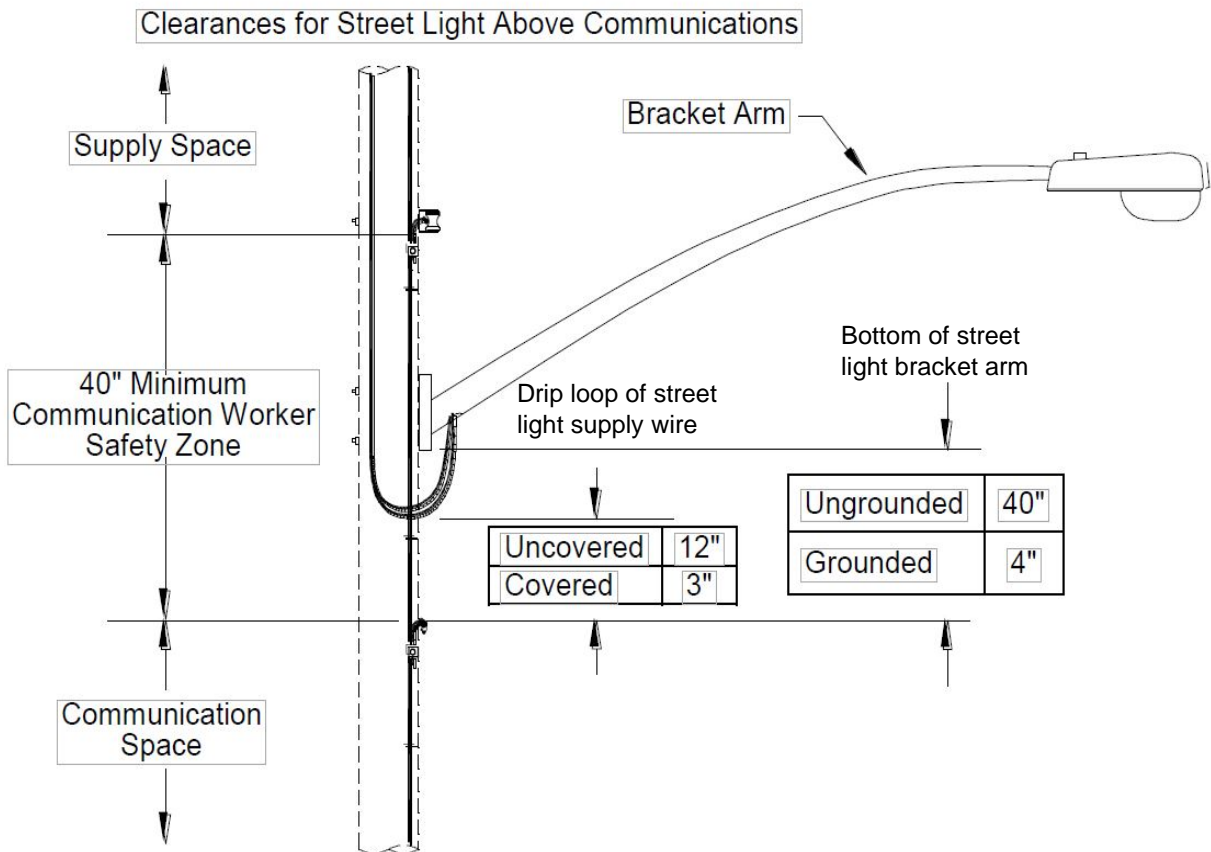
K. Streetlight Drip Loop Clearance Requirement – 12 Inches

The NESC details the required clearance for streetlight drip loops in rule 238D as follows:

D. Clearance of drip loops associated with luminaires and traffic signals

If a drip loop of conductors entering a luminaire, a luminaire bracket, or a traffic signal bracket is above a communication cable, the lowest point of the loop shall be not less than 300 mm (12 in) above the highest (1) communication cable, or (2) through bolt or other equipment.

EXCEPTION: The above clearance may be reduced to 75 mm (3 in) if the loop is covered by a suitable nonmetallic covering that extends at least 50 mm (2 in) beyond the loop.



L. Vertical Spacing from Comm to Comm at the Pole – 12 Inches

NESC Rule 235C1(c) refers to Rule 235H to specify the required spacing between communication lines located in the communication space at the pole. Rule 235C1(c) reads as follows:

C. Vertical clearance at the support for line conductors and service drops

All line wires, conductors, cables, and service drops located at different levels on the same supporting structure shall have vertical clearances not less than the following:

1. Basic clearance for line wires, conductors, and cables, and service drops of same or different circuits

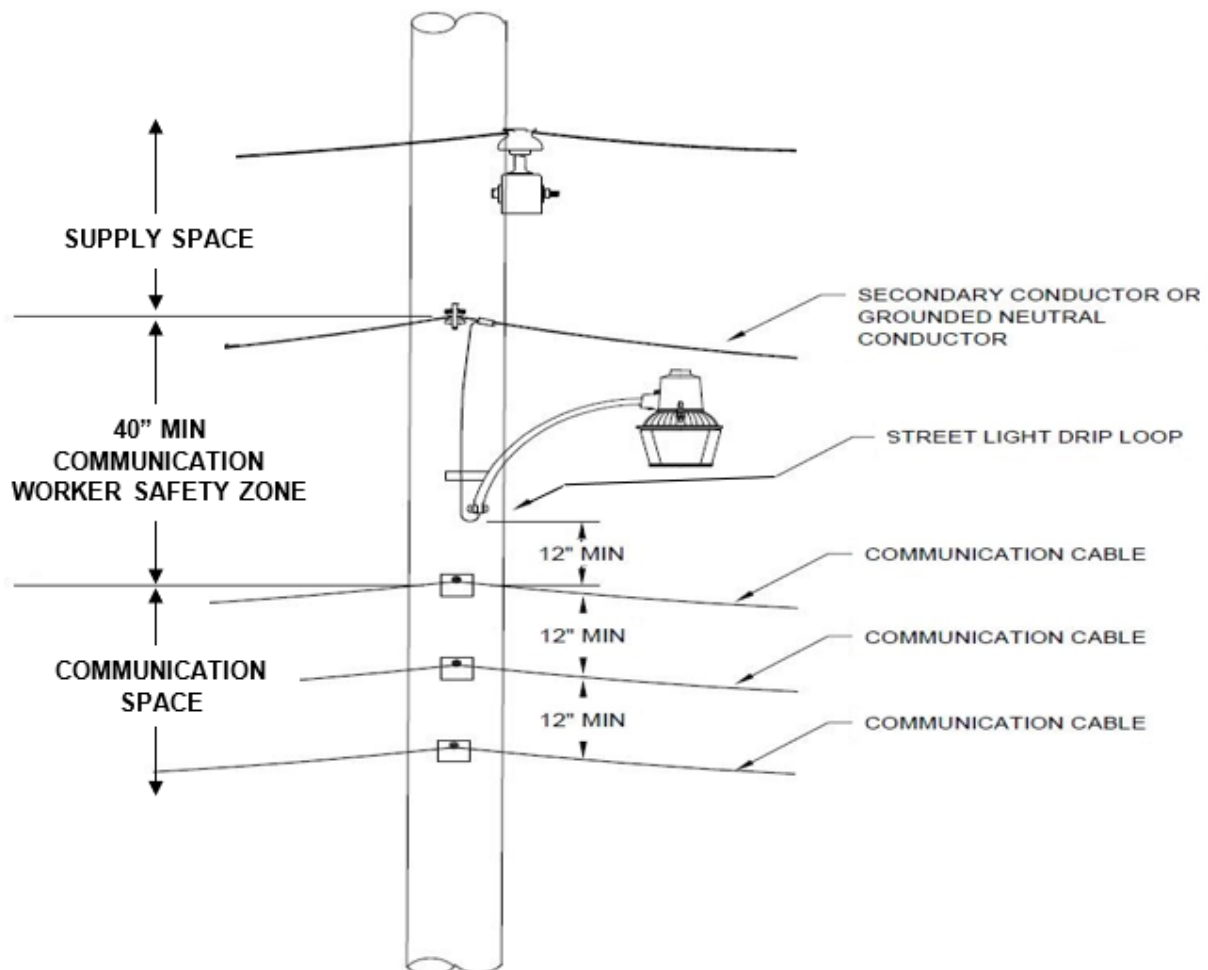
c. Between communication lines located in the communication space

The clearance and spacing requirements of Rule 235H shall apply to communication lines located in the communication space.

The applicable spacing is detailed in NESC Rule 235H(1) as follows:

H. Clearance and spacing between communication conductors, cables, and equipment

1. The spacing between messengers supporting communication cables should be not less than 300 mm (12 in) except by agreement between the parties involved including the pole owner(s).

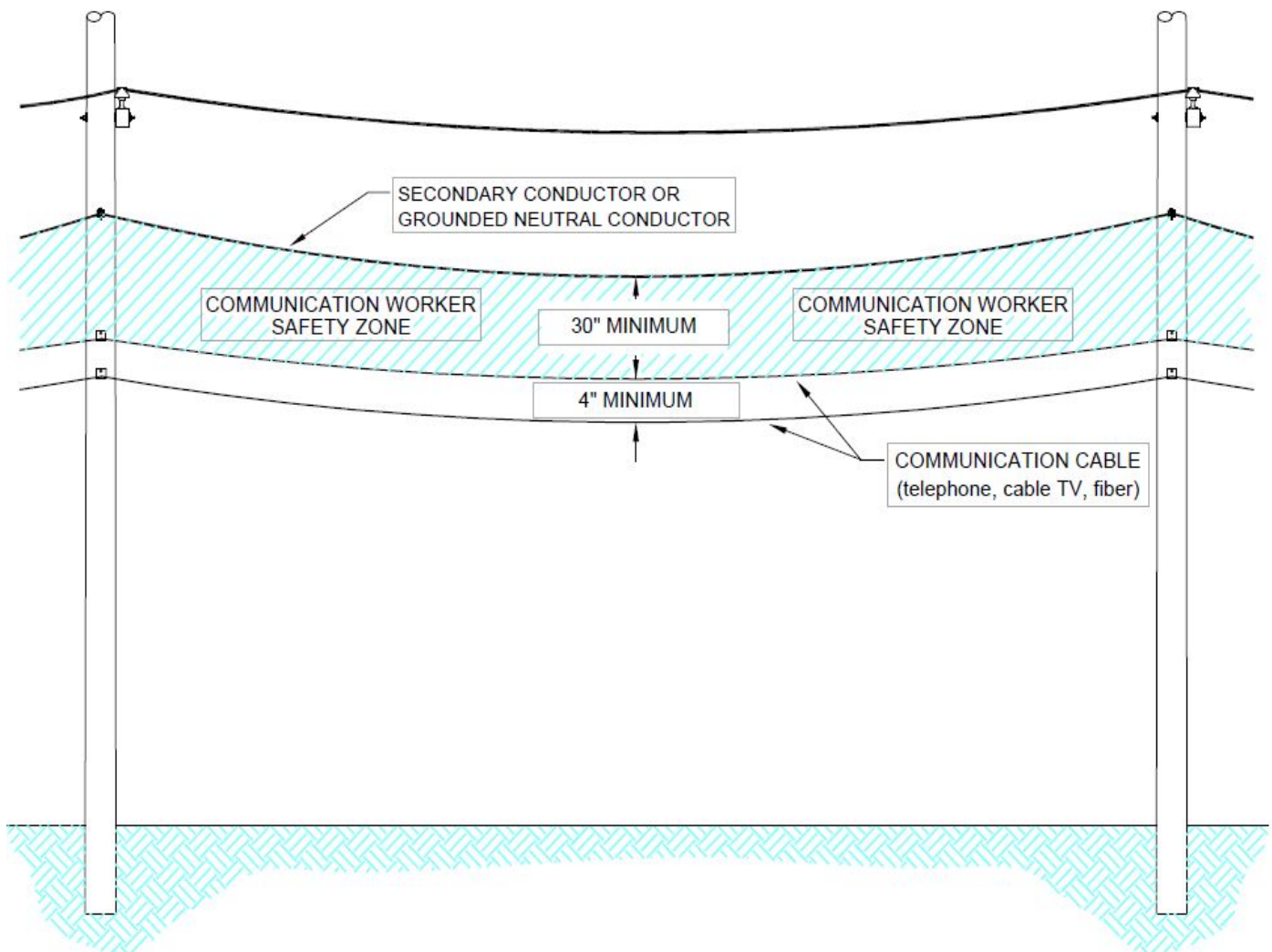


M. Vertical Clearances from Comm to Comm at Midspan – 4 Inches

The NESC details required minimum clearance between communication cables, conductors, and equipment located in the communication space anywhere in the span in NESC Rule 235H(2) as follows:

- H. Clearance and spacing between communication conductors, cables, and equipment
2. The clearances between the conductors, cables, and equipment of one communication utility to those of another, anywhere in the span, shall be not less than 100 mm (4 in), except by agreement between the parties involved including the pole owner(s).

NOTE: The 4-inch minimum clearance is applicable to communications equipment as well as conductors and cables.

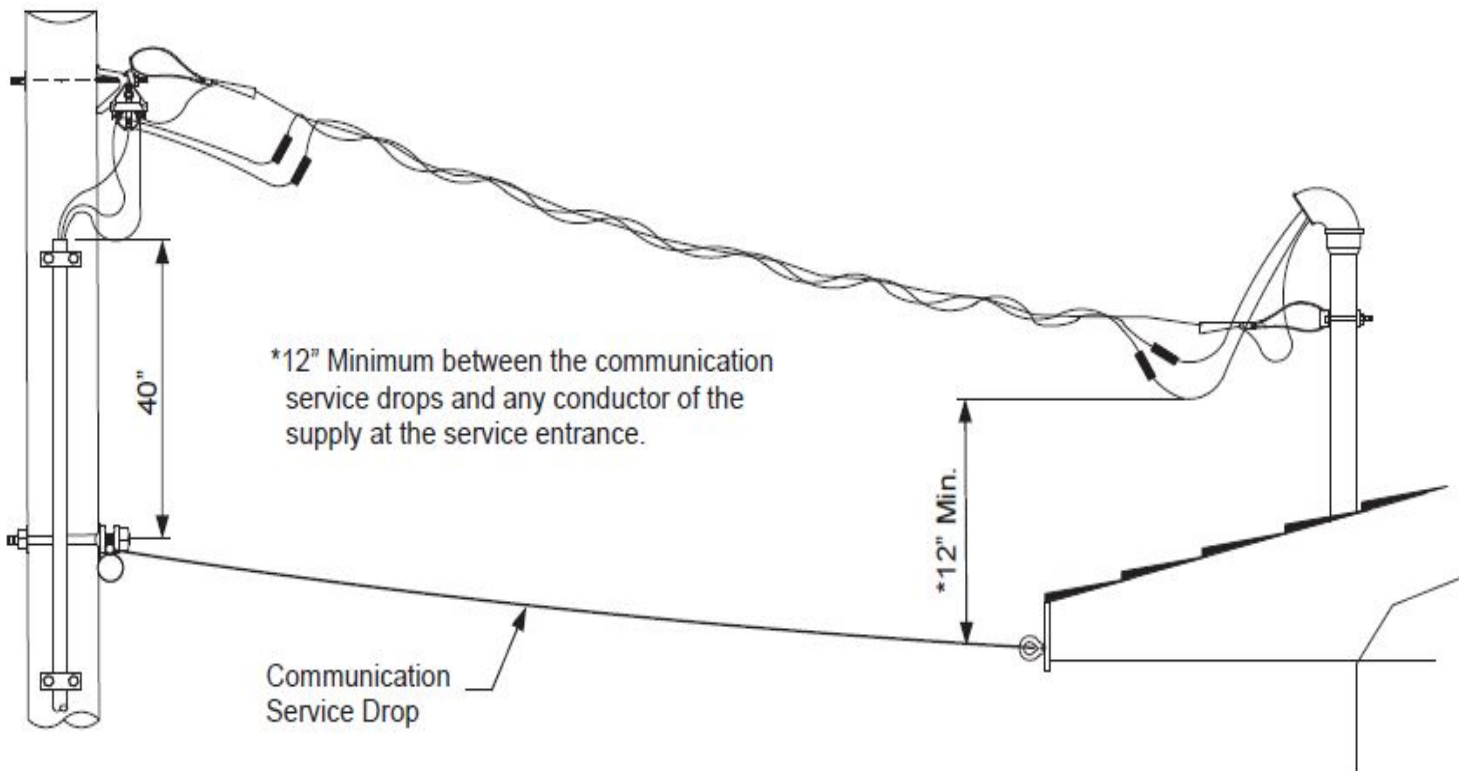


N. Clearance between Supply Service Drops and Communication Service Drops at Midspan AND at the Service Entrance – 12 Inches

NESC Rule 235C1, Exception 3 details the required clearance at midspan and at the service entrance. Rule 235C1 Exception 3 reads as follows:

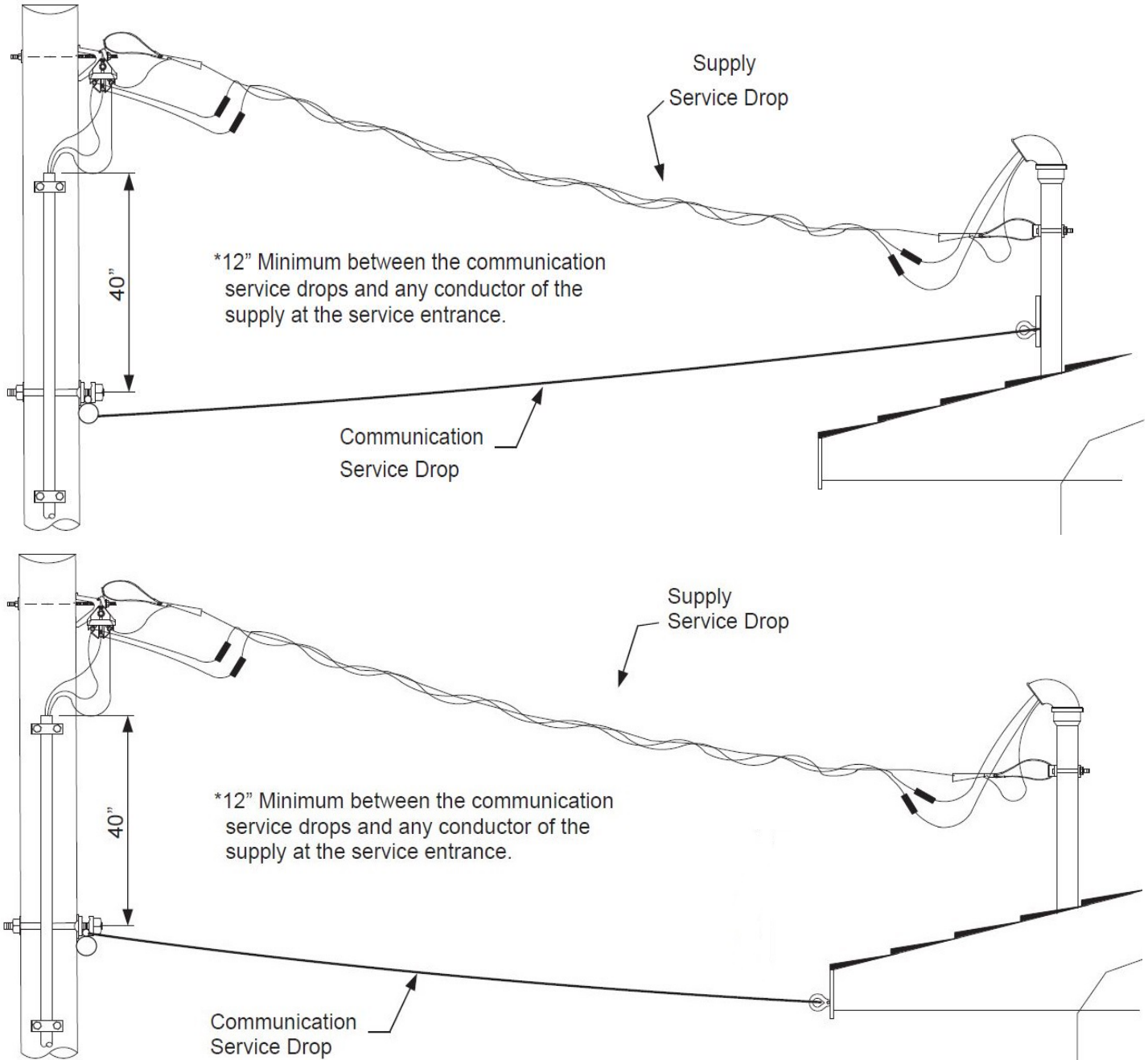
EXCEPTION 3: Supply service drops of 0 to 750 V running above and parallel to communication service drops may have a clearance of not less than 300 mm (12 in) at any point in the span including the point of their attachment to the building or structure being served provided that the nongrounded conductors are insulated and that the clearance as otherwise required by this rule is maintained between the two service drops at the pole.

As covered by prior requirements detailed in this document, required clearance between supply and communication service drops at the pole is 40 inches.



O. Attachment to Electrical Service Masts – No Communications Attachments/Service Drops Allowed

NEC Rule 230.28 details the requirements for using service masts as supports. Rule 230.28 reads as follows:
230.28 Service Masts as Supports. Only power service-drop or overhead service conductors shall be permitted to be attached to a service mast. Service masts used for the support of service-drop or overhead service conductors shall be installed in accordance with 230.28(A) and (B).



P. Clearance (in any direction) between a Supply Service Drop in the Span and a Lateral Communication Line Attached to the Same Pole – 30 Inches

NESC Rule 235E1 refers to Table 235-6 to specify the required clearance, in any direction, between supply service drops in the span and lateral communication lines supported by the same structure. Rule 235E1 reads as follows:

- E. Clearances in any direction at or near a support from line conductors to supports, and to vertical or lateral conductors, service drops, and span or guy wires, attached to the same support
1. Fixed supports
Clearances shall be not less than those given in Table 235-6.

The applicable clearances are shown in NESC Table 235-6 Row 5(b) below:

Table 235-6— (continued)

Clearance in any direction from line conductors at or near a support to supports, and to vertical or lateral conductors, service drops, span or guy wires, and to communication antennas attached to the same support

[See also Rules 235A, 235E1, 235E3b(2), and 235I.]

Clearance of line conductors from	Communication lines in general (in)	Communication lines on jointly used structures (in)	Supply lines			
			Neutral conductors meeting Rule 230E1 (in)	Circuit phase-to-phase voltage		
				0 to 8.7 kV ⁽¹⁾ (in)	Over 8.7 kV to 50 kV (in)	Over 50 kV to 814 kV ^{(4) (5)} (in)
4. Surface of structures— at the support						
a. On jointly used structures	—	5 ⁽²⁾	5 ⁽⁶⁾	5 ^{(3) (8)}	5 plus 0.2 per kV in excess of 8.7 kV ^{(8) (18)}	13 plus 0.2 per kV in excess of 50 kV
b. All other	3 ⁽²⁾	—	—	3 ⁽⁸⁾	3 plus 0.2 per kV in excess of 8.7 kV ^{(8) (18)}	11 plus 0.2 per kV in excess of 50 kV
5. Service drops— in the span⁽¹⁵⁾						
a. Communication	12	12	30 ⁽¹⁸⁾	30	30 plus 0.4 per kV in excess of 8.7 kV	47 plus 0.4 per kV in excess of 50 kV
b. Supply	N/A	30	12	12	12 plus 0.4 per kV in excess of 8.7 kV	29 plus 0.4 per kV in excess of 50 kV

Q. Vertical Clearance between Any Two Crossing or Adjacent Wires, Conductors, or Cables Carried on Different Supporting Structures – 24 Inches

NESC Rule 233C1 specifies the required vertical clearance between any two crossing or adjacent wires, conductors, or cables carried on different supporting structures where the voltages between the crossing or adjacent wires, conductors, or cables does not exceed 22kV. (Greater clearance is required where the voltages between the crossing or adjacent wires, conductors, or cables exceeds 22kV). Rule 233C1 reads as follows:

C. Vertical clearance

1. Clearance requirements

The vertical clearance between any crossing or adjacent wires, conductors, or cables carried on different supporting structures shall be not less than that shown in Table 233-1.

The applicable clearances are shown in NESC Table 233-1 below:

**Table 233-1—
Vertical clearance between wires, conductors, and cables
carried on different supporting structures**

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems.
See Rules 233A, 233C1 and 233C2a.)

Lower level	Upper level				
	Effectively grounded communication guys ^① , span wires and messengers, communication conductors and cables (ft)	Effectively grounded supply guys ^① , span wires and messengers, neutral conductors meeting Rule 230E1, and overhead shield/surge-protection wires (ft)	Supply cables meeting Rule 230C1, and supply cables of 0 to 750 V meeting Rule 230C2 or 230C3 (ft)	Open supply conductors 0 to 750 V ^② , and supply cables over 750 V meeting Rule 230C2 or 230C3 (ft)	Open supply conductors over 750 V to 22 kV (ft)
1. Effectively grounded supply guys ^① , span wires and messengers, neutral conductors meeting Rule 230E1, and overhead shield/surge-protection wires	2.0 ^{① ②}	2.0 ^{① ②}	2.0 ^②	2.0	2.0
2. Effectively grounded communication guys ^① , span wires and messengers; communication conductors and cables	2.0 ^{① ②}	2.0 ^①	2.0	4.0 ^③	5.0 ^⑤
3. Supply cables meeting Rule 230C1, and supply cables of 0 to 750 V meeting Rule 230C2 or 230C3	2.0	2.0	2.0	2.0	2.0
4. Open supply conductors, 0 to 750 V ^② ; supply cables over 750 V meeting Rule 230C2 or 230C3	4.0 ^③	2.0	2.0	2.0	2.0

SECTION 2: GENERAL POLE ATTACHMENT REQUIREMENTS

Compliance with the NESC, CCPUD Construction and Design Requirements, and other local, state, and federal laws, rules, and regulations is at all times the responsibility of the Communications Attacher. Attaching parties are responsible for the engineering and design of their system.

1. Location of Installation for Communication Line and Cables

- Communications lines and cables must be installed on the same side of poles (typically the roadside) as other communication attachments. In the absence of any existing communication installation on a pole, communications attachments should be installed on the same side of the pole as the supply neutral. If the supply neutral is on a cross-arm, then the communication attachment shall be installed on the roadside of the pole.
- Pole attachments to both sides of the pole (boxing) is not permissible.
- The installation of new aerial inner-duct is not allowed.
- Licensees will be required to attach to all new mid-set poles located within 3' of communications wires per **NESC Rule 234B1a**.

2. Method of Attachment

- Communications cables shall be affixed by a direct through-bolt. The use of attachment arms, extension arms, stand-off brackets or similar hardware must be approved in advance by CCPUD for each Pole. The use of dead-end attachments for communication wires shall be used at pole locations where CCPUD uses dead-end attachments for wires. The proposed use of attachment arms, extension arms, stand-off brackets or similar hardware by Licensee shall be identified on the Application for Permit and shall not be used to achieve required vertical clearances and separation.
- No bolts installed on CCPUD poles for communication attachments shall extend or project more than one (1) inch beyond its nut.

3. Attachment to Steel Poles

- The District will consider requests by a Licensee to access existing steel Poles. Proposed Attachments to steel poles must reviewed and approved by the District
- Attachments using through bolts in approved field drilled holes, welded vangs installed by certified welder or other approved project specific attachment method that matches the aesthetics of the steel pole will be considered.
- The use of a self-tapping set screw for grounding of equipment or other non-load bearing attachment methods, (e.g. Rivnuts), may be considered on a case by case basis.
- The use of stainless-steel bands on District weathering steel poles will not be allowed.

4. Cable Position

- To reduce the impact of communication attachments on mechanical pole loading and to preserve CCPUD's ability to place electric facilities on its poles, attachments should generally be installed as indicated in Section G, "Communication Space Clearances". Attachments should be placed at the position which complies with CCPUD recommendations per Section G and the NESC, maintaining required clearance from electrical supply and other communication facilities.
- No attachments shall be made below 18' on a pole.
- The owner of the proposed communication line shall not "weave" its lines from one vertical position to another with respect to other communication lines and cables on the same side of the pole line route. "Weaving" from one side of the pole to the other along the pole line route (except where it crosses a road) is also not permitted.

5. Pole Drilling

- Any hole field drilled in a treated wood pole must be treated by drenching with high strength penta chlorophenol (Penta) solution, or high strength copper naphthenate (CU NAP) solution. Class 1 or H1 poles also require fiber washers impregnated with appropriate preservative material.
- To maintain structural integrity of the pole, holes drilled into poles shall follow the requirements below:
 - Holes on the same side of the pole shall be no closer than six inches (6")
 - Holes that are perpendicular shall be no closer than three inches (3")

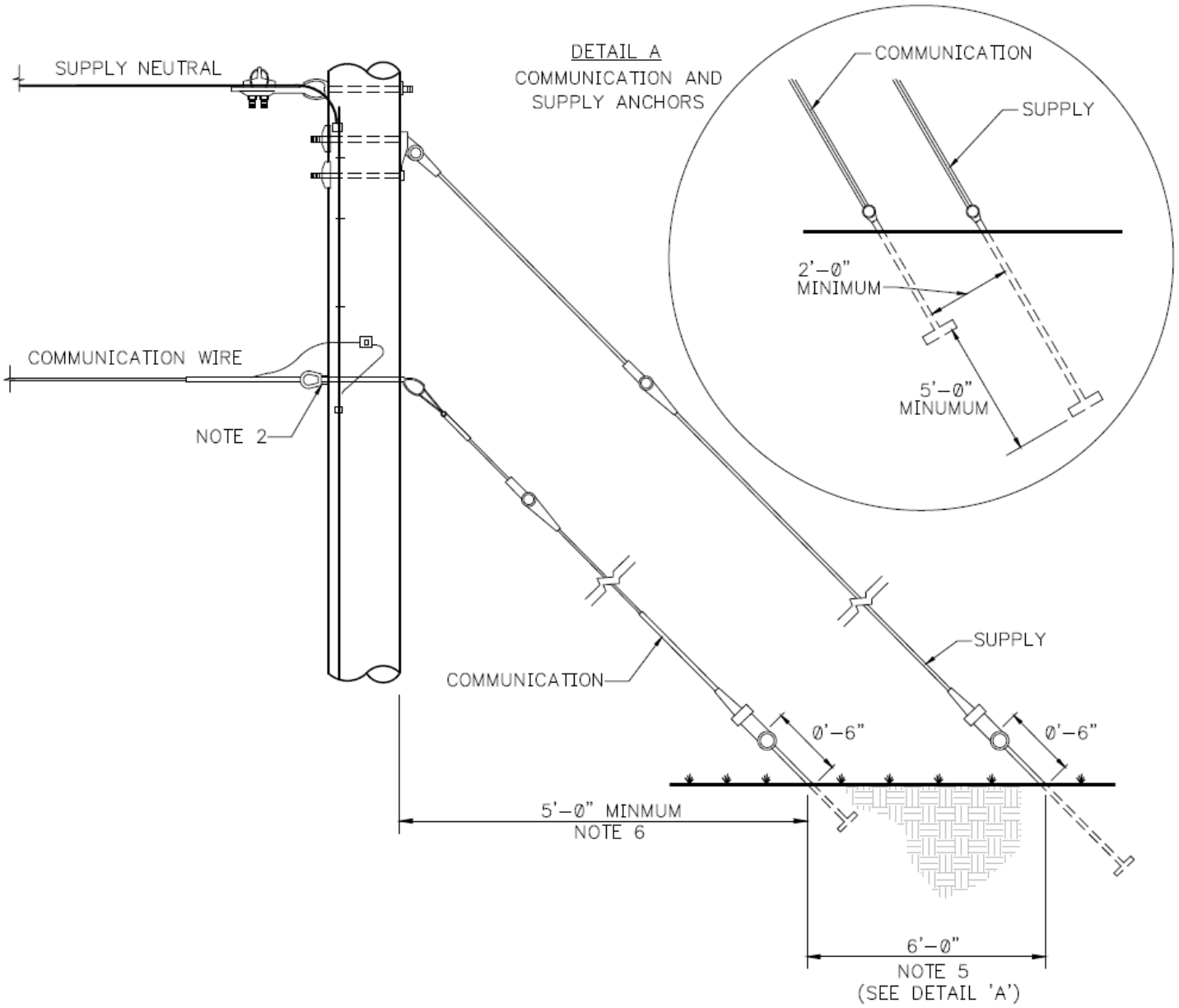
6. Ground Mounted Equipment

- Subsurface handholes and ground mounted pedestals should be:
 - Located on the road or field side of the pole or grouped with any existing handholes/pedestals.
 - Be a minimum of four feet (4'), six to ten feet is preferred, from the base of the pole
- Do not install handholes/pedestals or underground conduit in the pole line where it would conflict with the future replacement of the pole.

A. Down Guys and Anchors

1. Communication Attachers shall be responsible for procuring and installing all anchors and guy wires to support the additional stress placed on CCPUD's Poles by Licensee's Attachments. Communication attachments must not alter the vertical position of CCPUD poles or change the sag characteristics of CCPUD supply conductors or existing communication lines and cables.
2. Anchors and guy wires must be installed on each CCPUD Pole where an angle or a dead-end occurs, including Attachers angles and dead-ends that differ from CCPUD lines. The Communication Attacher shall make guy attachments to poles at or below the attachment point of its communication line/cable.
3. Communication Attacher's down guys shall be insulated. (NESC 279A1)
4. Guy strain insulators must be located so the bottom of the insulator is always above the communications attachment if the guy wire were to break. Guy insulators must be rated for the highest voltage on the pole and for the full mechanical strength of the guy strand.
5. No proposed anchor can be within six (6) feet of an existing anchor without written consent of CCPUD.
6. No anchor shall be installed closer than four feet (5') from a pole.
7. Communication Attachers may not attach guy wires to CCPUD anchors without CCPUD's specific prior written consent and only if guy strain insulators are used, provided the anchor has sufficient unused strength to support the attachment. Prior to approving the attachment of communication guys to CCPUD anchors, a holding and strength calculation shall be performed and provided to determine anchor strength capacity.
8. Licensee shall not install "marriage" clamps or other similar attachments that would fasten two guy wires together to achieve ground clearance.
9. Licensee shall not install span guying on CCPUD Poles without the use of a down guy to an anchor. Existing pole-to-pole guy wires when identified will require removal or rework.
10. No Attachment may be installed on a CCPUD Pole until all required guys and anchors are installed. No Attachment may be modified, added to or relocated in such a way as will materially increase the stress or loading on CCPUD Poles until all required guys and anchors are installed.
11. Guy markers shall be installed and maintained on all guys.
12. The proposed communication line/cable should be installed with the proper tension so that its final sag meets clearance requirements to existing electrical and communication facilities. Communication cables shall be adequately guyed to withstand all tensions attributed to the attachment under applicable NESC wind and ice loading conditions.
13. Attaching parties are responsible for the costs of any damages to CCPUD facilities resulting from improper guying and anchoring of its installation.
14. All down guys, head guys, or messenger dead ends installed shall be attached to jointly used poles using through bolts.

B. Supply and Communication Down Guys and Anchors



**SUPPLY AND COMMUNICATION
DOWN GUYS AND ANCHORS**
NOT TO SCALE

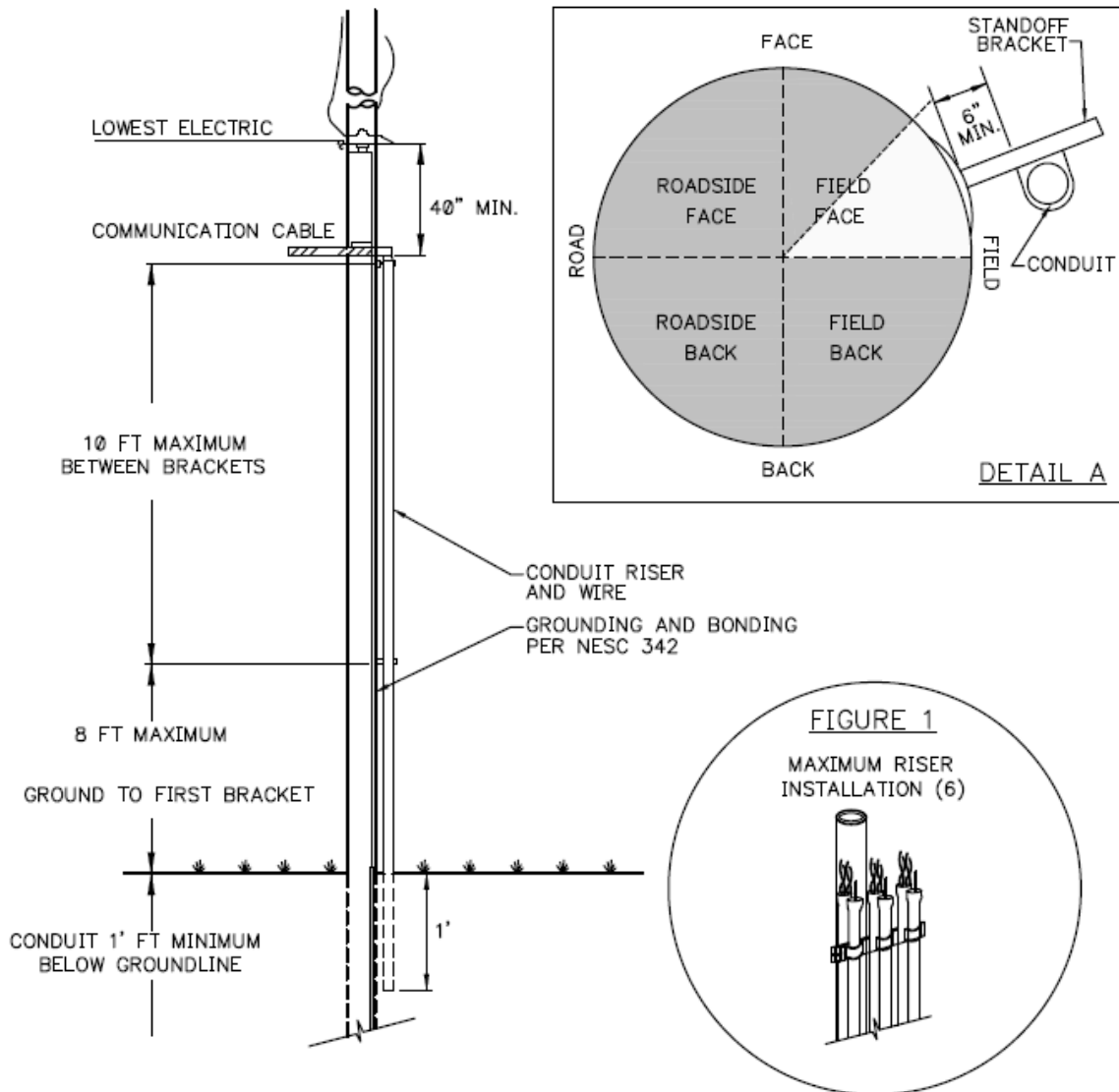
C. Tagging

Communication Attachers are required to install a tag (aerial cable marker) on their attachments **at each pole**. This benefits crews during pole replacements, repairs, and emergency service providers during emergencies.

1. All communication attachments will be marked with a cable marker with the owner clearly identified. Tags are required for all cables, wires, conduit risers, and ancillary equipment.
2. Cables shall be marked at the time of installation.
3. All tags shall:
 - Be secured so as to remain permanently affixed to the attaching company's line.
 - Be durable and resistant to fading from the effects of weather, chemicals, etc.
 - Include at least the communication company's name.
 - Avoid the use of sharp edges and corners to prevent injury to personnel and damage to lines and cables.
 - Markers should be affixed at the point of attachment, no farther than twelve inches (12") from the pole.
 - Multiple attachments on same pole shall be marked separately.
4. Lines and cables must be tagged at the time of installation. Attaching companies should make tagging an ongoing effort, and work toward complete tagging of all existing lines and cables not previously tagged. Existing Licensees with attachments to less than one-hundred (100) poles shall tag attachments within 18 months of a signed Licensing Agreement.
5. It is the responsibility of the attaching party to install tags such that the communication company's name can be easily identified from the ground.

D. Communication Risers

1. Communication facilities transitioning from overhead to underground shall be mounted in riser conduit. On a going forward basis, all risers must be attached to the pole with stand-off brackets in order to provide safe climbing space on poles.
2. Unless otherwise directed by the District, risers shall be installed on existing stand-off brackets.
3. In the in the absence of stand-off brackets, the attaching party shall provide and install approved brackets (AlumaForm part # 6B-CSO -18 or Barfield part # BASOCL-6H-18) conforming to the requirements stated below and shown in the diagram on Page 27. Stand-off brackets shall be:
 - a. Placed on the field-face quarter section of the pole
 - b. No lower than 8 ft. from the ground or other accessible surface
 - c. Mounted within six inches (6") of the top end of any stick of conduit
 - d. Evenly spaced along the pole and no more than 10 feet apart
 - e. Of sufficient length to provide a minimum of six inches (6") of clearance between the pole and riser.
4. The total quantity of risers on a pole shall not be more than six (6). (See Figure 1 below)
5. Only one (1) stand-off bracket assembly is permitted per pole.
6. CCPUD power risers should be located closest to the pole.
7. Minimum spacing between conduits shall be at least one and one-half inches (1.5").
8. Communication conduit must be two inches and at least Schedule 40 or stronger. One inch risers are allowed for communication power risers, these risers must be made of steel.
9. Service Drops must be encased in a minimum 1" Schedule 40 or stronger riser
10. The entire length of conduit riser should parallel the pole structure, regardless of taper of the pole.
11. A forty-inch (40") separation from the top of communication risers to the lowest electric attachment shall be maintained.
12. Attaching parties shall relocate their riser at their expense if CCPUD replaces or relocates the pole.



Notes:

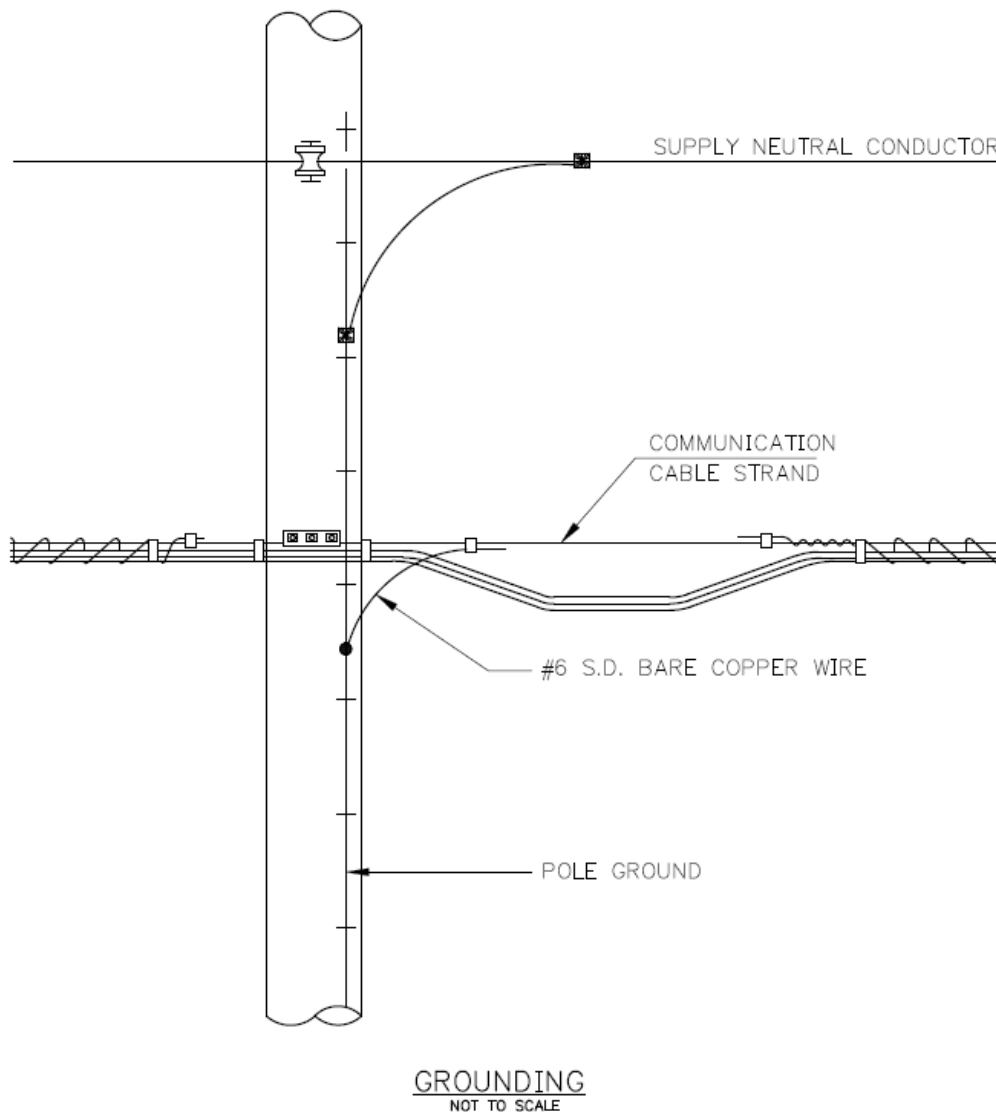
1. Risers shall be installed on existing stand-off brackets if available, unless otherwise directed by the District.
2. In the absence of stand-off brackets, the attaching party shall provide and install approved brackets on the field-face quarter section of the pole (See Detail A).
3. Maximum of (6) conduit risers per standoff bracket (See Figure 1) and ONE standoff bracket location per pole.
4. Nails shall not be used for attachment of any type of conduit riser. Lag screws only, (3/8"X3" Min.).
5. Attaching parties shall consult section 239 of the NESC for situations not covered by the above requirements.

E. Grounding & Bonding

Communication Attachers must bond their messengers, wires, cables, and ancillary equipment in accordance with the NESC. Metallic and/or conductive communication facilities shall be bonded to CCPUD's vertical pole ground on each pole where a ground is present using #6 S.D. bare copper wire (or larger). If an attaching company requires a separate bond and ground, it must be bonded to the grounding conductor at the base of the pole in accordance with the NESC.

if a ground is needed and no District pole ground is available, the licensee shall install their ground and extend a #6 solid soft drawn copper ground wire up to the top of the communication space, leaving sufficient ground wire coiled to reach and connect to the District's neutral. immediately notify the district office at (509)663-8121 that the ground wire is ready for connection and the District will extend and connect the ground wire to the District's neutral.

NOTE: Non-metallic/non-conductive self- supporting messengers (i.e. Kevlar type) do not require bonding.



F. Climbing Space

All poles shall be climbable to the requirements of the NESC. Attachments shall neither obstruct the climbing space nor present a climbing hazard to utility personnel.

1. Both back quadrants of the pole are reserved for climbing by utility personnel, no attachments shall be made in these quadrants. (see Figure 1 below)
2. A clear climbing space of 30 inches between communication cables must be provided. This space must extend 42 inches above and below the limiting cables.
3. Service Drops are to be taken off the strand at least 24 inches from the outside of the pole using a crimp-on method, not off the pole with temporary equipment (j-hooks, etc.).
4. All service drops shall be so arranged as not to interfere with climbing or working space.

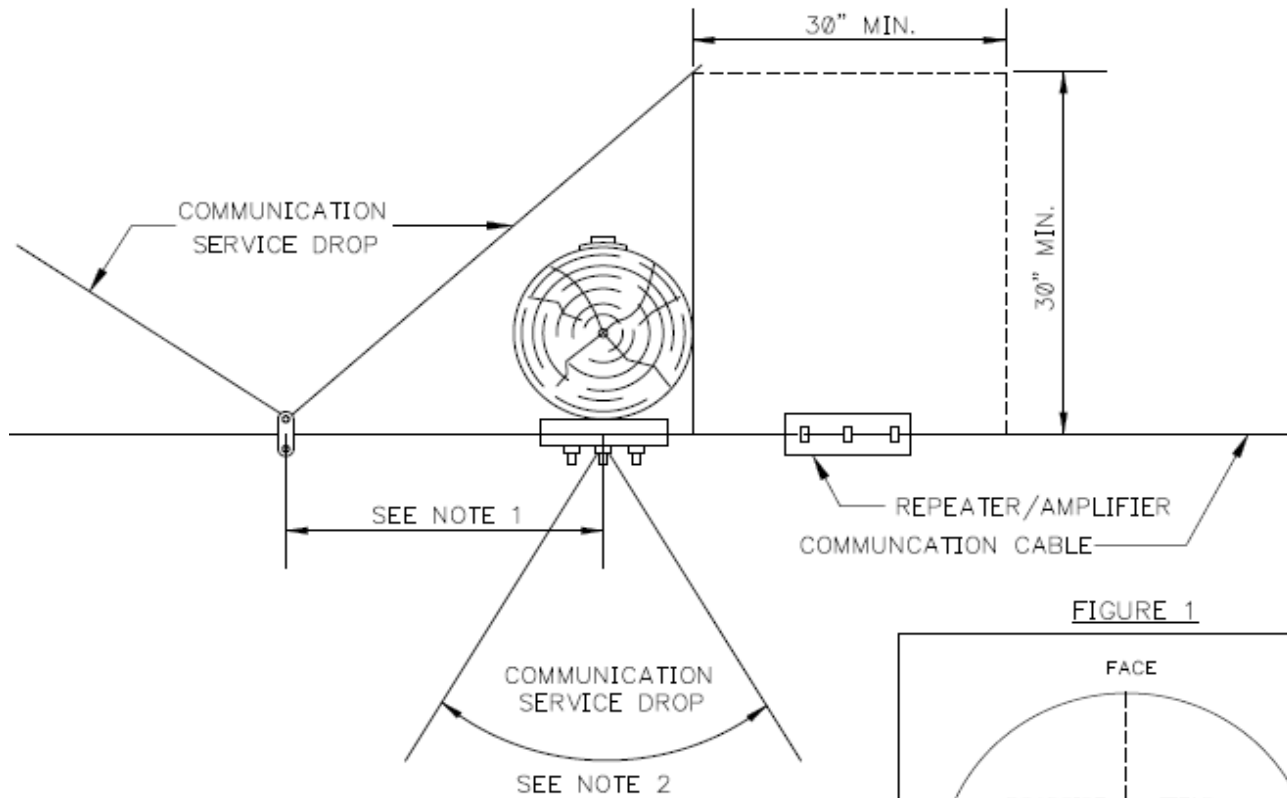
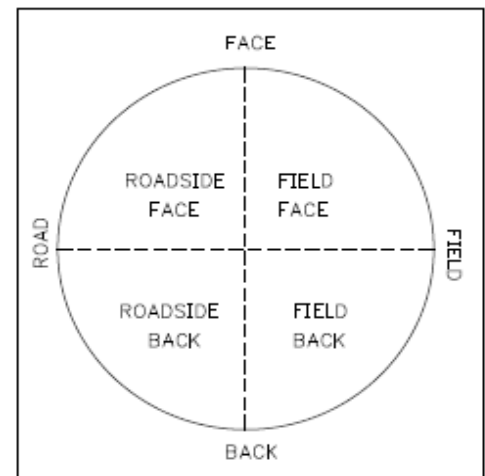


FIGURE 1

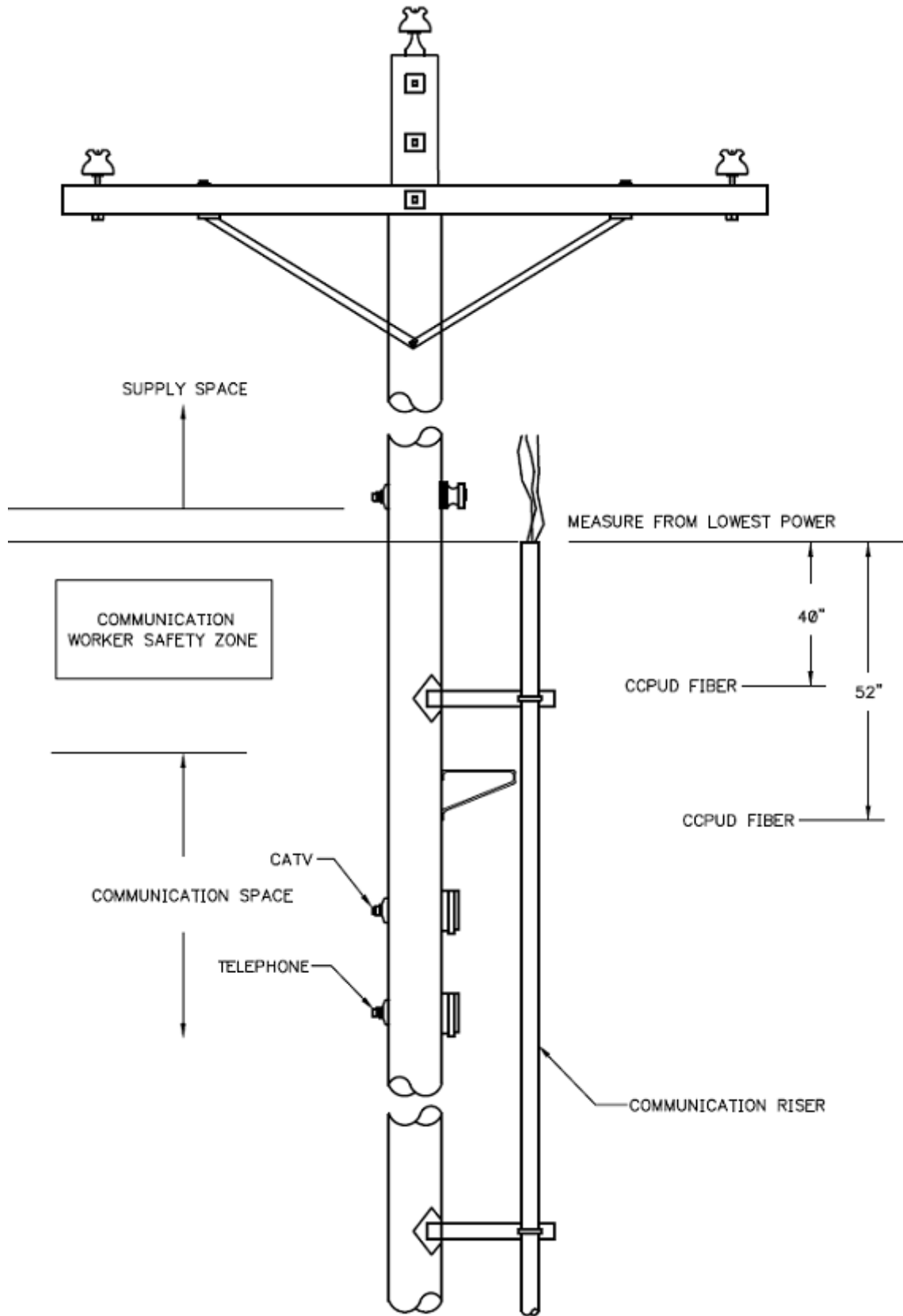


Notes:

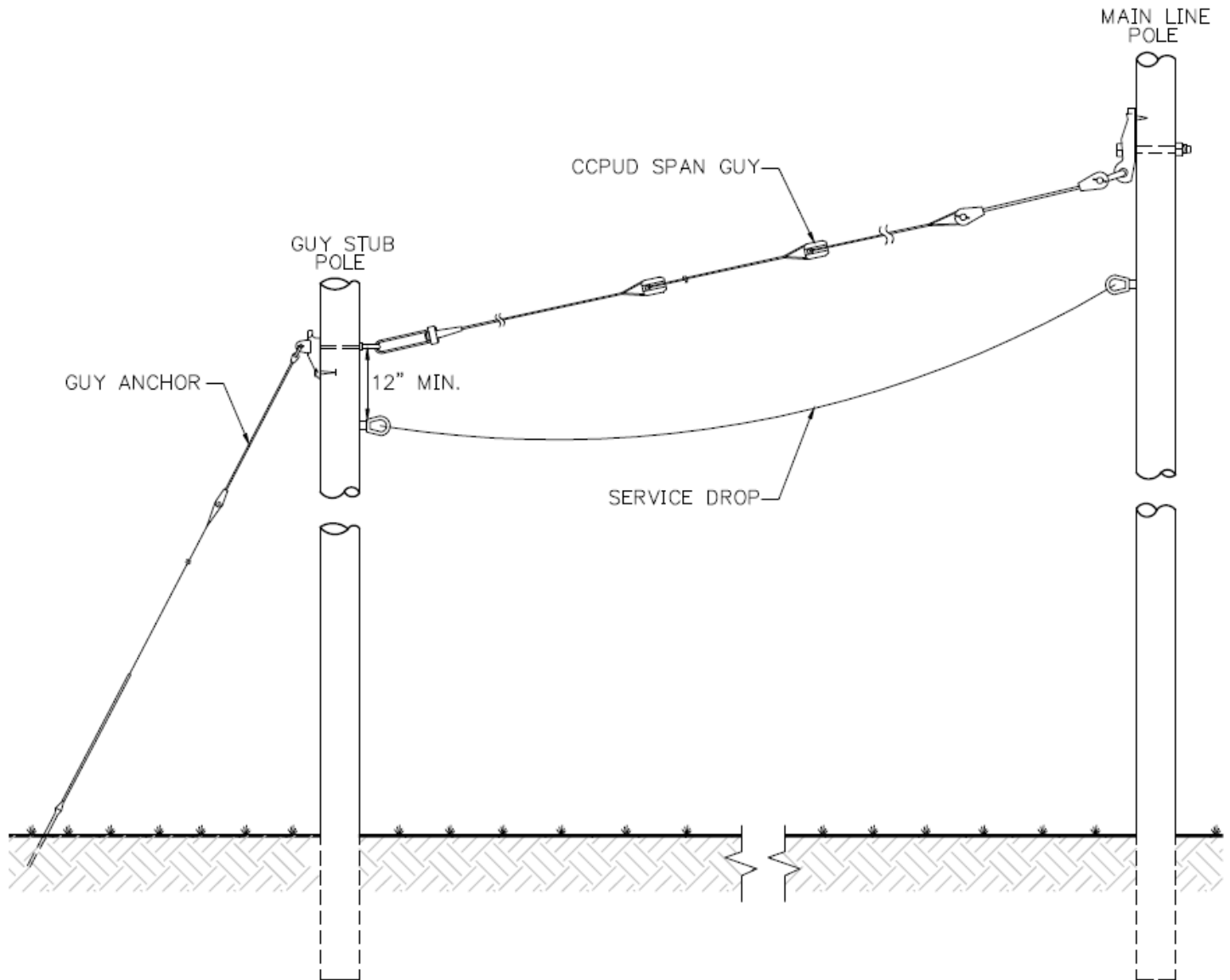
1. Service Drops are to be taken off the strand at least 24 inches from the outside of the pole, this distance may need to be greater to ensure sufficient climbing space is maintained.
2. Service Drops on the street or alley side of poles should be pulled off the pole.

CLIMBING SPACE
NOT TO SCALE

G. Communication Space Clearances



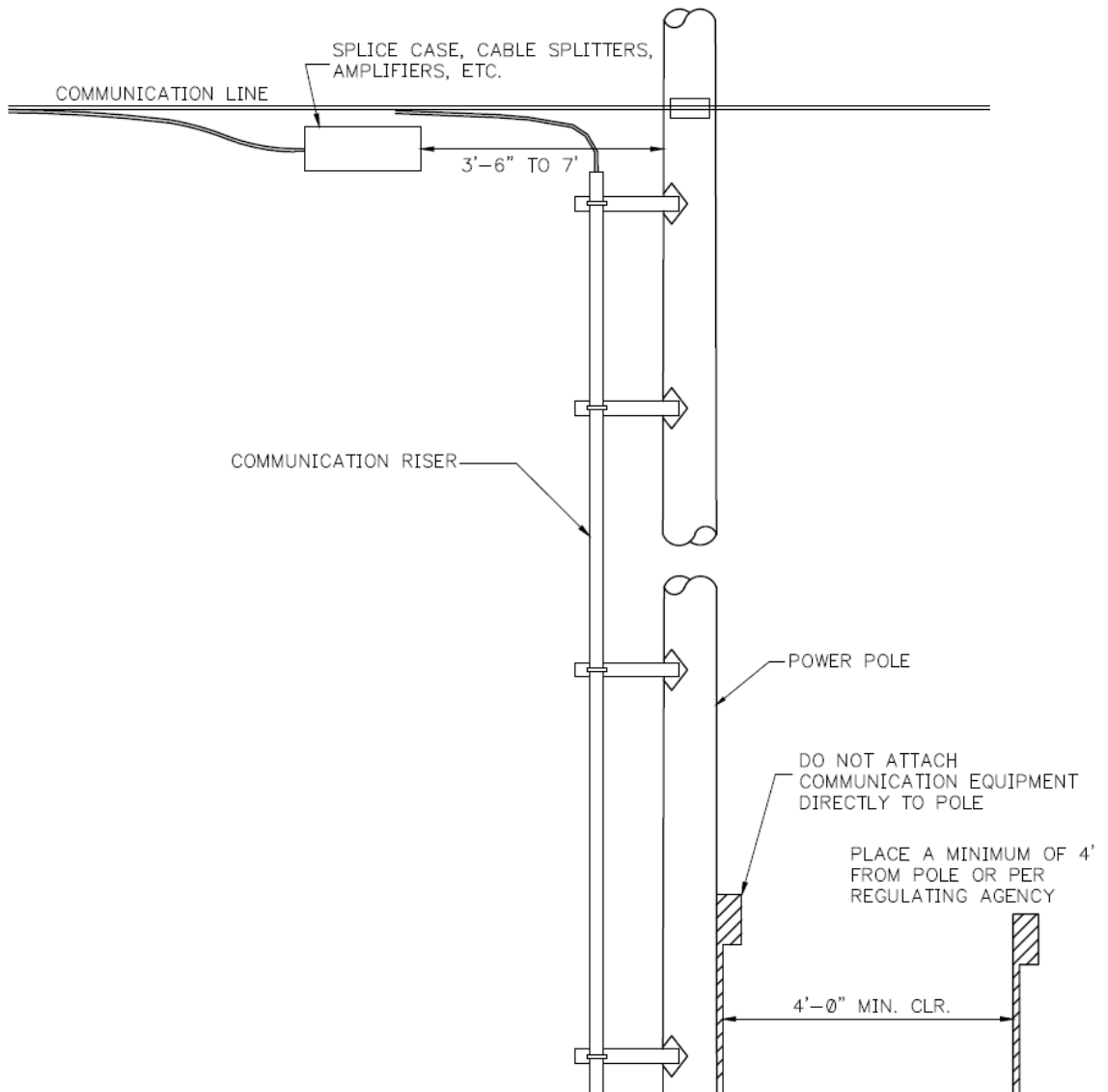
H. Communication Attachments to CCPUD Guy Stub Poles



Notes:

1. Communications attachments to guy stub poles must be made at a minimum of 12" below CCPUD span guy attachments.
2. Attachments must be made with eye bolts or other bolted attachment. No J-Hook attachments.

I. Splice Cases, Storage Loops, Slack Spans, Snow Shoes or Other Equipment



To limit excessive loading on poles and ensure climbing space, the following restrictions apply:

1. Splice cases: preferred method is to riser down using standoff brackets (see figure) and place splice case in a vault. alternately, if mounted on licensee cable, splice case must not be closer than three feet, six inches to the pole, and not further than seven feet from the pole (see figure). Splice cases must not exceed 50 pounds.
2. Licensee storage loops (coils) are not allowed on poles.
3. Slack span and snowshoes: a slack span is limited to a maximum of 25 feet on either side of the pole and a maximum of 100 feet of slack per pole. snowshoes should be equally spaced from pole to distribute weight evenly.
4. If licensee performs work on existing poles with splice cases, storage loops, slack spans or other equipment attached to poles, the licensee is required to meet current specifications.