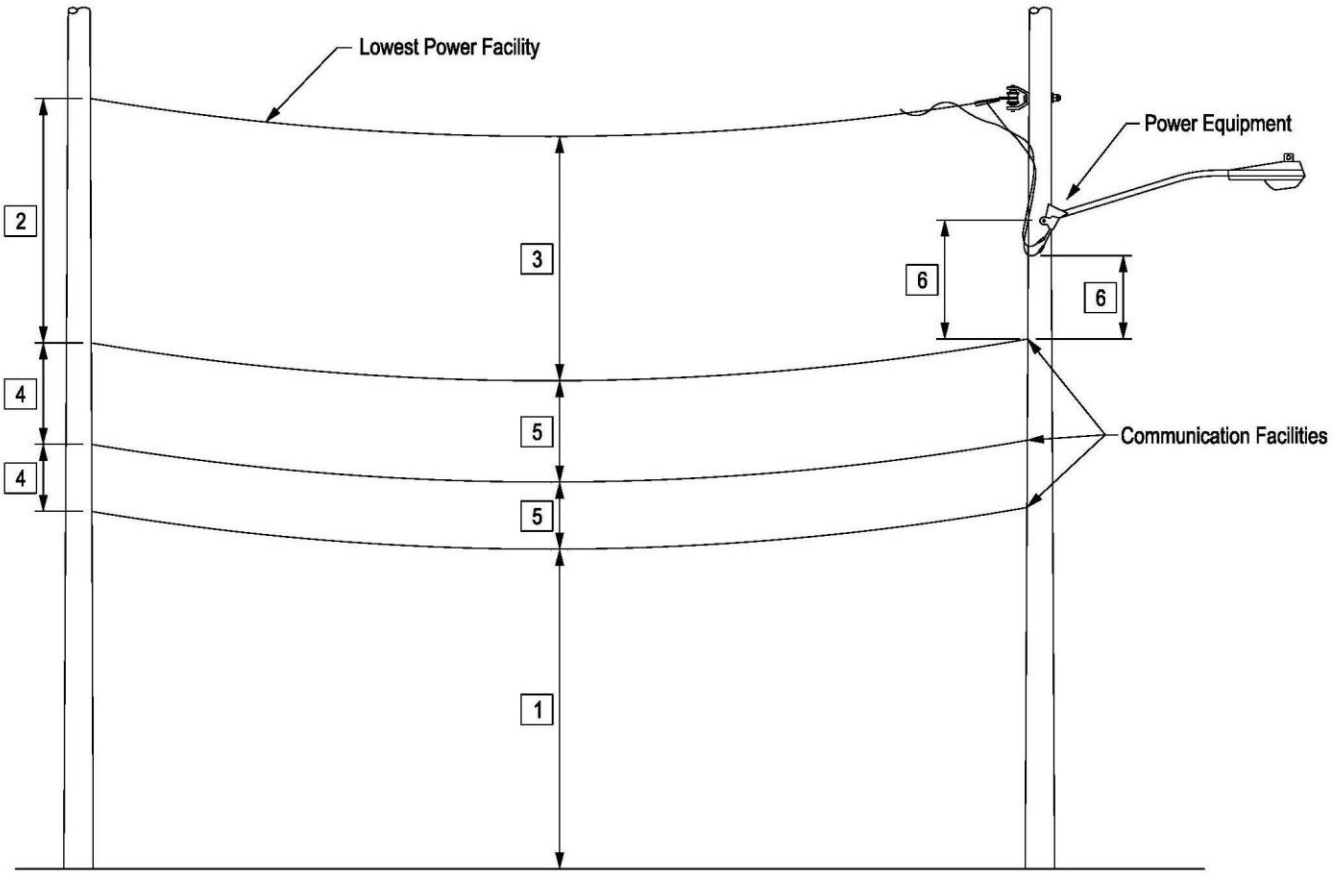
GENERAL

This section of the Standards book includes information on clearances for communication facilities attached to poles in joint use installations. Consult the Clearance (CL) section of the Standards book and the National Electric Safety Code (NESC) for additional information on clearances. This page includes common clearance information in regard to joint use installations, but it is not all inclusive. All communication facilities need to be in compliance with the NESC and any state, county or local clearance requirements. Each facility owner is responsible for having their facilities in compliance. All clearances are surface to surface. Contact the Field Application Engineer or the Material & Standards group for clarifications or situations not covered in this section.

In the NESC, the lowest power facility is often referred to as the lower boundary of the supply space. The uppermost communication facility is usually referred to as the upper boundary of the communication space. In between the supply space and the communication space is the communication worker safety zone (NESC 238E).

Use the figure below as a reference to find the applicable clearance section.



1. Ground clearance information for communication facilities.
2. Clearances at the pole between power wires and communication facilities.
3. Clearances in the span between power wires and communication facilities.
4. Clearances at the pole between communication facilities.
5. Clearances in the span between communication facilities.
6. Clearances at the pole between power equipment (street lights, transformers, etc.) and communication facilities.

1. GROUND CLEARANCE INFORMATION FOR COMMUNICATION FACILITIES

The vertical clearance at the lowest point in a span and the ground shall be not less than:

- 17 feet over Wisconsin state highways and county roads.
- 18 feet over Michigan state highways.
- 15.5 feet over other roadways and areas potentially accessible to vehicle traffic (NESC Table 232-1 #1).
- Consult the NESC and the CL section for other ground clearances information (navigable waterways, railroad crossings, buildings, driveways, etc.).

The clearance required shall be calculated under worst-case conditions (per NESC 232A). The larger of the two calculations is the required clearance.

- Cable/conductor at 120 degrees F with no wind or ice load.

or

- Cable/conductor at 32 degrees F with ½ inch of radial ice and no wind load.

2. CLEARANCES AT THE POLE BETWEEN POWER WIRES AND COMMUNICATION FACILITIES

Table 1 outlines the clearances required at the pole between power facilities and communication facilities.

NOTE: Minimum clearances at the pole may not allow facilities to maintain mid-span clearances. See section 3 below.

TABLE 1

Voltage & Type of Conductors	Minimum Clearance to Communication Facility (inches)
Neutral only *	30" *
Secondary conductors (0 to 750 Volts)	40"
Top of U-guard	40"
Primary (up to 14.4/24.9 kV)	43"
Sub-Transmission (34.5 kV)	51"
Sub-Transmission (46 kV)	55"

*30 inches of clearance to a multi-grounded neutral conductor is only allowable at the discretion of the Field Application Engineer.

3. CLEARANCES IN THE SPAN BETWEEN POWER WIRES AND COMMUNICATION FACILITIES

Vertical clearances shall be adjusted at a pole between power and communication facilities so that the minimum clearance at any point in the span is not less than indicated in Figures 1 & 2, and Table 2.

Determine the worst-case clearance by calculating the clearances under the following two conductor loading conditions. (NESC Rule 235C2c.)

1. The upper conductor is at final sag at the maximum operating temperature for which the line is designed to operate (200°F for secondary conductors and 120° F for the power neutral) and the lower communication conductor is at final sag at the same ambient condition (assume 90° F) without electrical loading.

2. The upper conductor is at final sag at 32 degrees F with ½ inch radial thickness of ice and the lower conductor is at final sag at 32 degrees F without ice or electrical loading.

EXCEPTION:

On those spans where we have only primary and multi-grounded neutral conductors and are reasonably certain we will not have any secondary in the span in the future, and the communication is bonded to all of our grounds (which are connected to our neutral) throughout the entire communication system, the clearance of the mid-span can be reduced to 12 inches, and at the pole to 30 inches. This shall be at the discretion of the Field Application Engineer.

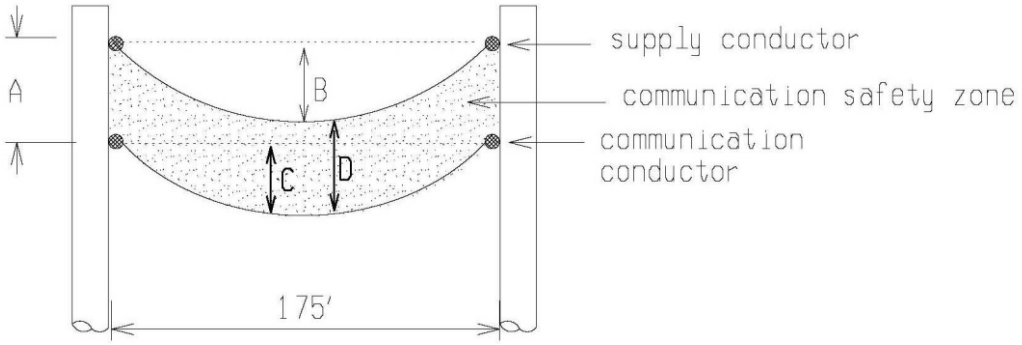


FIG. 1

The formula for determining the vertical clearance "A" at the pole to obtain mid-span clearances:

A ≥ B+D-C

- "A" MUST MEET THE "MINIMUM A" CLEARANCE IN TABLE 2.

A. The minimum separation required at the pole to maintain the minimum separation required at all points in the span. (See Table 1 and NESC Rule 235C2b).

B. The final sag of the upper power conductor under the loading conditions listed above.

C. The final sag of the lower communication conductor under the loading conditions listed above. (Sag information for communication facilities will need to be obtained from the facility owner).

D. The minimum separation required at all points in the span. (See Table 2 below and NESC Rule 235C2b).

TABLE 2

Voltage Type of Conductors	Minimum "A" Clearance (inches)	Final "A" Due to Sag Differences	Minimum "D" Clearance (inches)
Neutral only *	30" *	A=B+D-C	12" *
Secondary conductors (0 to 750 Volts)	40"	A=B+D-C	30"
Primary (up to 14.4/24.9 kV)	43"	A=B+D-C	33"
Sub-Transmission (34.5 kV)	51"	A=B+D-C	39"
Sub-Transmission (46 kV)	55"	A=B+D-C	42"
Over 50 kV - Contact the American Transmission Company			

*This clearance shall only be utilized at the discretion of the local Applications Engineer. Communication facilities shall be bonded throughout the system to the power supply grounds wherever a ground goes down the pole. Otherwise, 40" at the pole and 30" mid-span clearances must be maintained. See NESC 235C2b.

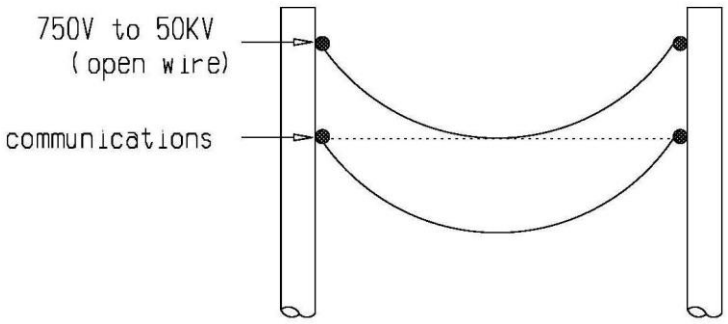
Example:

- 175 foot span of 1/0 Triplex (short span) – See Std OSAG155.
- B = Maximum sag is 49” – loaded to 200 degrees F
  - (assume ambient 104 degrees F temperature)
- C = Communication conductor sag is 10” at 104 degrees F.
- D = Minimum required mid-span clearance is 30”

A=B+D-C or 49”+30”-10” = 69”

- 69” of separation at the pole is required to meet mid-span clearances under worst case conditions

In addition to the information above, the vertical clearance at the structure between OPEN (uninsulated) supply conductors and communication cables or conductors shall be adjusted so that under conditions of conductor temperature of 60 degrees F (15 degrees C), no wind displacement and final unloaded sag, no OPEN supply conductor of over 750V but less than 50 kV shall be lower in the span than a straight line joining the points of support of the highest communication conductor or cable. See Figure 3.



For power service drops running above and parallel to communication service drops, 12 inches of clearance is required in the span between *covered* power services and communication services (NESC 235C Exception 3). 40 inches of clearance is still required at the pole.

4. CLEARANCES AT THE POLE BETWEEN COMMUNICATION FACILITIES

The clearance required at the pole between communication facilities shall not be less than 12 inches (NESC 235H1).

5. CLEARANCES IN THE SPAN BETWEEN COMMUNICATION FACILITIES

The clearance required in the span between communication facilities shall not be less than 6 inches (NESC 235H2). Design for 12” to allow for future overlashing, both for the lasher and increased sag that may occur from the additional overlash.

6. CLEARANCES AT THE POLE BETWEEN POWER EQUIPMENT (STREET LIGHTS, TRANSFORMERS, ETC.) AND COMMUNICATION FACILITIES.

Communication facilities must have clearance of at least 30 inches to a grounded transformer tank (NESC 238B, Table 238-1). 43 inches of clearance is required from an ungrounded transformer tank of the upper communication cable. Metal supports or braces that are attached to or less than 1” from ungrounded metal supports of energized conductors or equipment cases that contain energized parts of 8,700 volts to 15,000 volts shall have 43” of clearance from communication and of 0 to 8,700 volts, 40” of clearance.

Communication facilities mounted below a street light or luminaire must have at least 4 inches of clearance from a bonded streetlight arm, 40 inches of clearance from an arm and associated hardware that is not bonded, and/or 12 inches of clearance from the drip loop of the luminaire service, whichever is larger.

New attachments above lights are generally not allowed. On a We Energies owned light fed from above the light it may be considered if the NESC clearance of 72" above the bottom of the riser down to the light can be met, as well as proper clearance above the communication line as required. Municipal lights fed from underground by a riser will generally not be allowed as they often place temporary overhead feeds when the underground feed fails.

NOTE: We Energies street lights are generally bonded/grounded. Municipal and Wisconsin Public Service street lights are generally not grounded/bonded. The clearance to luminaires assumes that the luminaire is operating at 150 V or less. Consult NESC Table 238-2 for luminaires operating above 150 V.

ADDITIONAL INFORMATION

1. Contracts with communication companies have provisions that if the Company needs space in the future for additional equipment, communication companies must vacate their attachments or pay for pole replacements to allow the Company to obtain necessary clearances. Consult the Joint Use Department if this situation arises as there are some exceptions.

2. For sag information provided in the the Standards manual, inelastic deformation has been calculated and included in the final sag tables. Per NESC 230B, a constant shall be applied to the conductor to account for inelastic deformation of the conductor. Wisconsin and Michigan are located in Zone 1 (NESC Figure 230-1) and the constant is 0.30 lb./ft. (NESC Table 230-2). Communication companies are responsible for determining the inelastic deformation sag impact for their facilities.

3. Communication extension arms or brackets less than 2ft are allowed on Company-owned poles where poles are out of alignment or clearance issues exist to nearby structures. These installations require approval prior to installation.

4. In general, when telephone and CATV cables both attach to the pole, CATV will occupy the upper communication cable position.

5. All communication facilities shall be installed on the same side of the pole (no boxing in of poles).

6. On transformer poles, the communication service drops shall be located so that they come from the messenger on the side of the pole opposite the transformer, so that the transformer can be raised into position with a boom truck.

7. NO ADJUSTMENT TO ELECTRIC FACILITIES ALLOWED OTHER THAN BY COMPANY LINE PERSONNEL OR COMPANY-APPROVED CONTRACTORS WORKING AT THE DIRECTION OF THE COMPANY.

8. WSEC – Wisconsin State Electrical Code, Volume 1, latest issue based on the National Electric Safety Code (NESC which is part of WSEC). For Michigan – MI Dept of Consumer and Industry Services latest issue based on the NESC.

9. Each communication company is allocated one foot of space on pole. Initial ideal attachment is to be at the bottom of that one foot of space to allow for future electric secondary conductor.

10. Overlashing cannot be done without the pole owner's consent. Overlashing can result in excessive sag and excessive transverse loading. It is the responsibility of the party doing the overlashing to work with the pole owner and other communication companies to determine that the extra sags meet codes and required pole strengths. A make ready request shall be submitted with a detailed engineering study (contact the Joint Use Department for additional information).

11. Communication drops shall be from the strand. Driving hooks into the pole to hold the service drops is not allowed. Where attachment is made to a road crossover pole, an eyebolt shall be used on new construction and rebuilds.

12. Communication company service drops that cross a road to a crossover pole or to a building shall have the same sag as the power supply service drop.

13. CATV power supplies shall not be installed on poles that have transformers, voltage regulators, capacitors, reclosers, or sectionalizers mounted to them. Exceptions shall only be made by the Field Application Engineer.