

CLEARANCES AND SEPARATIONS

MEASURING CLEARANCES AND SEPARATIONS AERIAL PLANT

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1. GENERAL

1.01 This practice describes the methods and tools to be used in measuring clearances and separations for aerial plant and includes the safety precautions that must be observed. This practice is reissued to update information and introduce the pocket-sized card showing the minimum clearances and separations for joint use aerial plant. See Exhibits I and II. **Remove from the file and destroy all copies of CTSP 490-060-001, Issue 1, 1970.**

1.02 Refer to the appropriate practice in the 490-06X Plant Series and the 570-150 Engineering Series of practices for information on clearances and separations.

1.03 The clearances and separations recommended by the National Electrical Safety Code (Sixth Edition) should be used as the governing principle in all planning or inspection of aerial plant. These recommendations are the allowable minimum when no other values are specified on detail plans or work orders.

1.04 The clearances and separations specified by the NESC are those which will exist under ideal weather and wind conditions (60° F. with no wind). Refer to the appropriate practice in the CTS 490-200, 490-250, 490-355 and 490-360 series for any adjustment to the sag values contained in the NESC tables. (Unless otherwise specified, the NESC tables refer to the voltages between supply wires.)

1.05 The rearrangement of existing plant to meet the minimum clearances specified in the NESC tables is not always necessary. When a clearance problem is encountered, the supervisor should be consulted to determine the corrective action to be taken in accordance with local ordinances and procedures.

NOTE: In locations where state or municipal requirements are more stringent, locally prepared instructions shall be provided.

2. SAFETY PRECAUTIONS

2.01 It is essential that special precautions and safety practices are followed when working aloft or near any structure or equipment used for the distribution of electricity.

2.02 Plan and perform work in the vicinity of power facilities on the basis that any metallic part of the power structure is alive with dangerous voltage. In addition to recognized power systems, this also includes:

- Power service drops to buildings.
- Street lighting circuits.
- Down guys, span guys, street lamp fixtures, and any other wires or hardware not normally energized.
- Unprotected power company neutral grounds attached to poles.

2.03 When selecting the proper locations for telephone plant attachments, the following precautions shall be observed:

- All methods or tools used for measuring separations shall be such that craftsmen are not exposed to foreign potentials.
- When supply circuits of less than 750 volts are present, the actual separations can be measured only along a nonmetallic surface with a standard rule. **Rubber gloves shall be worn while making measurements.**

c. If more than 750 volts are present, the clearance must be estimated where gains or bolt holes are below the supply circuits; the distance can then be measured using the gain as a reference point.

d. Generally, when supply circuits are not in place at the time the telephone attachments are to be installed, the location of future power facilities and hardware will be noted on the Job Order. If they are not, the location should be obtained from the telephone company field engineer. Separation measurements may be taken with the Perkins PM 950-25 FI measuring pole, rules or linen tapes (see paragraph 3).

2.04 When work involves any boom equipment, the craftsman must thoroughly check all overhead

clearances. If there is a doubt about the height of any wire, actual measurements must be made to determine clearances. Field engineers shall consider clearances when planning jobs and place appropriate warning notes on the prints to inform the construction forces of potential hazards.

2.05 If power facilities prevent the safe performance of work, the work shall not be commenced until arrangements have been made for the necessary safeguards.

2.06 No telephone company employee shall touch or allow equipment or material to come in contact with power conductors or associated hardware of any voltage.

2.07 No work will be performed by a telephone company employee, or with company equipment at a radial clearance of less than 36 inches from any power conductors or associated hardware which are classed as primaries (above 750 volts).

NOTE: An exception to the above is a pole being erected, removed or straightened, which may be less than the 36-inch radial clearance provided it is covered with insulating pole guards on all surfaces of potential contact. During the performance of this work, all employees in contact with the pole or equipment shall wear protective rubber gloves. Refer to CTSP 400-100-100.

2.08 The use of steel measuring tapes aloft on poles, fixtures or in any other place where there is a possibility of contact with an energized wire is prohibited. Linen tapes with metallic reinforcing strands, or tapes dampened by rain, shall not be used to measure power clearances.

3. TOOLS

3.01 Depending on the plant involved, the tools used to measure clearances are divided into three groups:

a. Contact Tools: These include Perkins PM 950-25 FI measuring poles, clearance lines, linen tapes, and ropes which touch plant to be

measured. They are used to measure the height of telephone line wires, cables, guys, and drop wires only when hazardous potentials are not present.

b. Proximity Tools: Perkins PM 950-25 FI measuring poles, tree pruner handles, pike poles and bamboo rods are used as reference markers when raised adjacent to the line. Due to the possibility of contact by teetering, their use is limited to measuring the height and vertical clearance of telephone line wires, cables, guys, and drop wires only when hazardous potentials are not present.

c. Optical Tools: These are tools equipped with lenses and include range finders (CTSP 405-600-305), height meters, etc. They are used to compute the height and vertical clearance of all telephone and supply wires and cables.

4. CLEARANCE AND SEPARATION CARD (FORM 49001-P)

4.01 Form 49001-P is a 3-1/2-inch x 6-inch plastic laminated card showing minimum clearances between power fixtures and telephone facilities carried on the same pole. Exhibit I shows the front of the card and Exhibit II shows the back.

4.02 System operating telephone companies who use the National Electrical Safety Code to meet local minimum requirements should obtain and issue the card to:

- a. Line crew personnel.
- b. Cable splicers.
- c. Installer/Repairmen.
- d. Plant Management personnel who supervise construction or maintenance of aerial plant.
- e. Outside Plant Engineers.

4.03 Ordering Information: Form 49001-P is available in packages of 25 each. Order through local Purchasing channels specifying CSS No. 95-49-001-9.

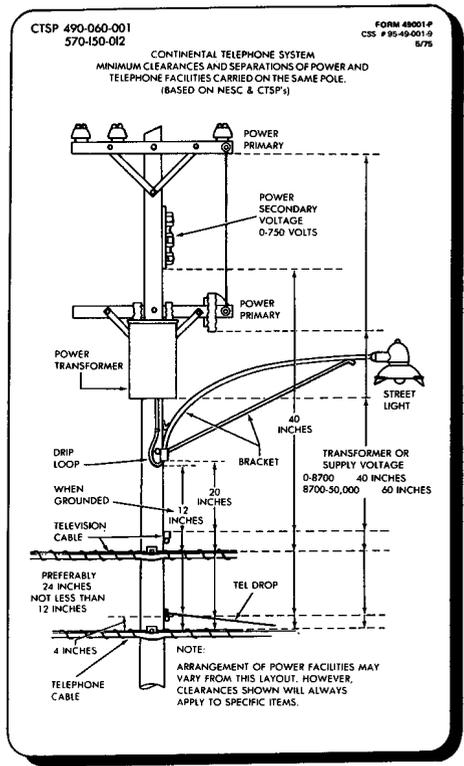


EXHIBIT I. Front of Clearances and Separations Card

MINIMUM CLEARANCE ABOVE GROUND FOR TELEPHONE OR CATV FACILITIES			
ITEM	URBAN		RURAL
	FEET	FEET	FEET
Where cables, guys, line or drop wires run along and within the limits of:			
(a) public highways, streets and roads	18	14	
(b) public alleys	15	-	
(c) ways accessible to pedestrians only	8	8	
Where cables, guys, line or drop wires cross over private property or ground:			
(a) accessible to pedestrians only	8	8	
(b) accessible to people on horses or loaded farm vehicles	-	+16	
Where cables, guys, line or drop wires cross over:			
(a) public highways, streets and roads	18	18	
(b) public alleys	+15	+15	
(c) driveways in general unless height of loaded vehicle or equipment using drive requires extra clearance	+15	+15	
(d) driveways-residential garages	10	10	
(e) ways accessible to pedestrians only	8	8	
(f) obstacles (billboards, roofs)	2	2	
(g) flat roofs which may be used by tenants or workmen	8	8	
(h) railroads-cable	25	25	
(i) railroads-wire	27	27	
(j) waterways (rivers, canals, etc.), provide clearance specified by proper authorities and on work plans			

* secure additional clearance on new construction when warranted at specific locations.

MINIMUM CLEARANCES IN FEET AT CROSSINGS OF WIRES AND CABLES CARRIED ON DIFFERENT SUPPORTS			
TYPE OF CROSSING WIRES AND CABLES	TELEPHONE OPEN WIRES, CABLES MESSENGER, DROPS AND GUYS		
	Crossing Under	Crossing Over	
Open supply wires 0-750 volts and supply cables having effectively ground sheath or messenger-all voltages			NOT CTC PROCEDURE
(a) line wires	4		
(b) service wires	2		4
Open supply, line or service wires			
(a) 750-8700 volts	*6		NOT CTC PROCEDURE
(b) 8700-50000 volts	6		
Foreign guys, span wires, lightning protection wires		2	2
Foreign communication wires, cables and fire alarm wires		2	2
Trolley contact conductors			
(a) 750 volts or less	-		4
(b) 750-8700 volts	-		6
*Clearance for (a) may be reduced to 4 feet if crossing is more than 6 feet from communication pole			
NOTE: The above clearances apply where the crossing span length of the upper conductor or wire does not exceed 175 feet for greater span lengths, increase clearances in accordance with NESC and CTS			

MINIMUM HORIZONTAL CLEARANCE OF POLES FROM OTHER OBJECTS	
OBJECT	MINIMUM CLEARANCE
Fire hydrants	Not less than 3 feet - 4 feet recommended
Curbs	6 inches measured to street side of curb
Railroad tracks	12 feet measured to nearest rail

EXHIBIT II. Back of Clearances and Separations Card