

CLEARANCES FOR MULTIPLE DROP WIRE IN THE HEAVY LOADING AREA

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1. GENERAL

1.01 This section contains the recommended clearances for multiple drop wire installed in the heavy loading area. It has been reissued to correct printing errors on pages 4 and 5. The values specified meet the requirements of the National Electrical Safety Code (Sixth Edition). They apply under conditions of 60°F with no wind or ice.

1.02 "Construction" clearances generally contain an allowance for extra sag which will be introduced as a result of permanent stretching of the wire under storm loaded conditions. It will not be necessary to resag multiple drop wire unless the storm loading experienced is quite severe.

1.03 "Maintenance" clearances should exist after the wire has been through storm loading and the temperature returns to 60°F. It will be necessary to pull slack, however, if clearances at 60°F fall below maintenance values.

1.04 Note that clearance requirements shown for wire overhanging the traveled part of public roads are considerably larger than the clearances required where no such overhang exists. Note also that clearances for wire crossing alleys, roads and driveways show one set of values for general use and a second somewhat lower set of values for use when one pole is located within 50 feet of the far edge as shown in Fig. 1.

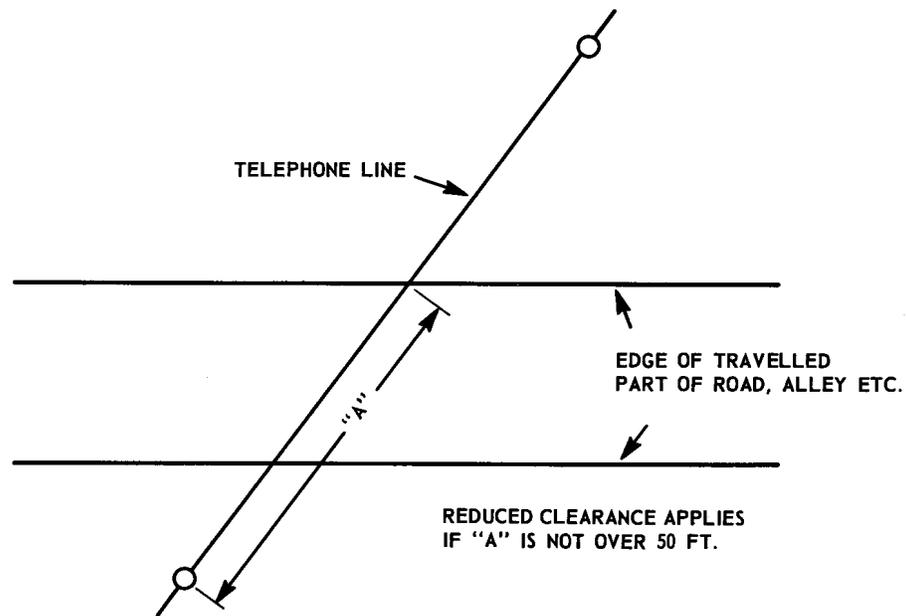


Fig. 1

SECTION 462-500-017

1.05 Multiple drop wire must be installed with relatively large sags. Hence it will generally be advantageous to locate poles and wire runs so that the middle of the span will *not* be above the traveled part of the road, alley or driveway. This will often be the case at crossings when the far edge of the road, alleys, etc, is 50 feet or less from the pole. (See Fig. 1) When this condition exists, it may be possible to base the height of pole attachment on something less than 100 per cent of the midspan. The following table shows the percentage of midspan sag to be used in determining the height of pole attachment when the 50-foot criterion applies. This procedure should be ignored for spans less than 145 feet.

<u>SPAN LENGTH (Feet)</u>	<u>PER CENT OF MIDSPAN SAG</u>
145-160	90
161-180	85
181-200	80
201-225	75
226-250	70
251-275	65
276-300	60

Example: A 275 foot span crosses a road; the midspan sag is 10 feet. The pole is within 50 feet of the far edge of the road and is on ground 2 feet higher than the road. Sag at 50 feet will be 65 per cent of midspan or 6-1/2 feet. From part 2 (b) of this section, the required clearance is 18 feet 9 inches. Minimum height of pole attachment is 18 feet 9 inches minus 2 feet plus 6 feet 6 inches or 23 feet 3 inches.

1.06 Clearances for span lengths, voltages and conditions now shown in this section are an engineering responsibility and will be shown on the detail plans. Clearances shown in this section are to be used unless the detail plans indicate otherwise. Detail plans may indicate different values where local rules differ from the Code or where engineering forces have allowed for certain factors.

2. CLEARANCES ABOVE GROUND OR RAILS

(a) Using Normal Sags

SPANS OF 175 FEET OR LESS

SITUATION	REF.	75-LESS		76-100		101-150		151-175	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
Crossing Above:									
Railroad Tracks	— Fig. 2	27-0	(27-0)	27-3	(27-0)	{ Must be supported on 6M strand for spans over 100 feet; 10M required for spans over 150 ft.			
Generally		25-0	(25-0)	25-3	(25-0)				
Special Case									
Public Roads	— Fig. 1	18-0	(18-0)	18-3	(18-0)	18-6	(18-0)	18-7	(18-0)
Generally		18-0	(18-0)	18-3	(18-0)	18-5	(18-0)	18-6	(18-0)
Pole not over 50 ft. from far edge									
Public Alleys	— Fig. 1	15-0	(15-0)	15-3	(15-0)	15-6	(15-0)	15-7	(15-0)
Generally		15-0	(15-0)	15-3	(15-0)	15-5	(15-0)	15-6	(15-0)
Pole not over 50 ft. from far edge									
Resid. Driveways	— Fig. 1	10-0	(10-0)	10-3	(10-0)	10-6	(10-0)	10-7	(10-0)
Generally		10-0	(10-0)	10-3	(10-0)	10-5	(10-0)	10-6	(10-0)
Pole not over 50 ft. from far edge									
Flat Roof Buildings	—	8-0	(8-0)	8-3	(8-0)	8-6	(8-0)	8-7	(8-0)
Peak Roof Buildings, Billboards	—	2-0	(2-0)	2-3	(2-0)	2-3	(2-0)	2-4	(2-0)
Neon Signs	—	4-0	(4-0)	4-3	(4-0)	4-6	(4-0)	4-7	(4-0)
Waterways	—	Must be shown on detail plans.							
Running Along:									
Public Roads	Fig. 3	18-0	(18-0)	18-3	(18-0)	18-6	(18-0)	18-7	(18-0)
Major Overhang									
Minor Overhang	Fig. 3								
Urban	—	18-0	(18-0)	18-3	(18-0)	18-6	(18-0)	18-7	(18-0)
Rural (Lt. Traffic)	—	14-0	(14-0)	14-3	(14-0)	14-6	(14-0)	14-7	(14-0)
No Overhang	Fig. 4 Fig. 5	8-0	(8-0)	8-3	(8-0)	8-6	(8-0)	8-7	(8-0)
Back of Obst.		13-0	(13-0)	13-3	(13-0)	13-6	(13-0)	13-7	(13-0)
Not Back of Obst.									
Public Alleys	—	15-0	(15-0)	15-3	(15-0)	15-6	(15-0)	15-7	(15-0)

WIRE CROSSING RAILROAD TRACKS - SPECIAL CASE

NOTE: 27 FT REQUIRED,
FOR WIRE IF CONTACT
WIRE IS NOT PRESENT.

CONTACT WIRE (S)
FOR TROLLEY OR
TRACKLESS TROLLEY

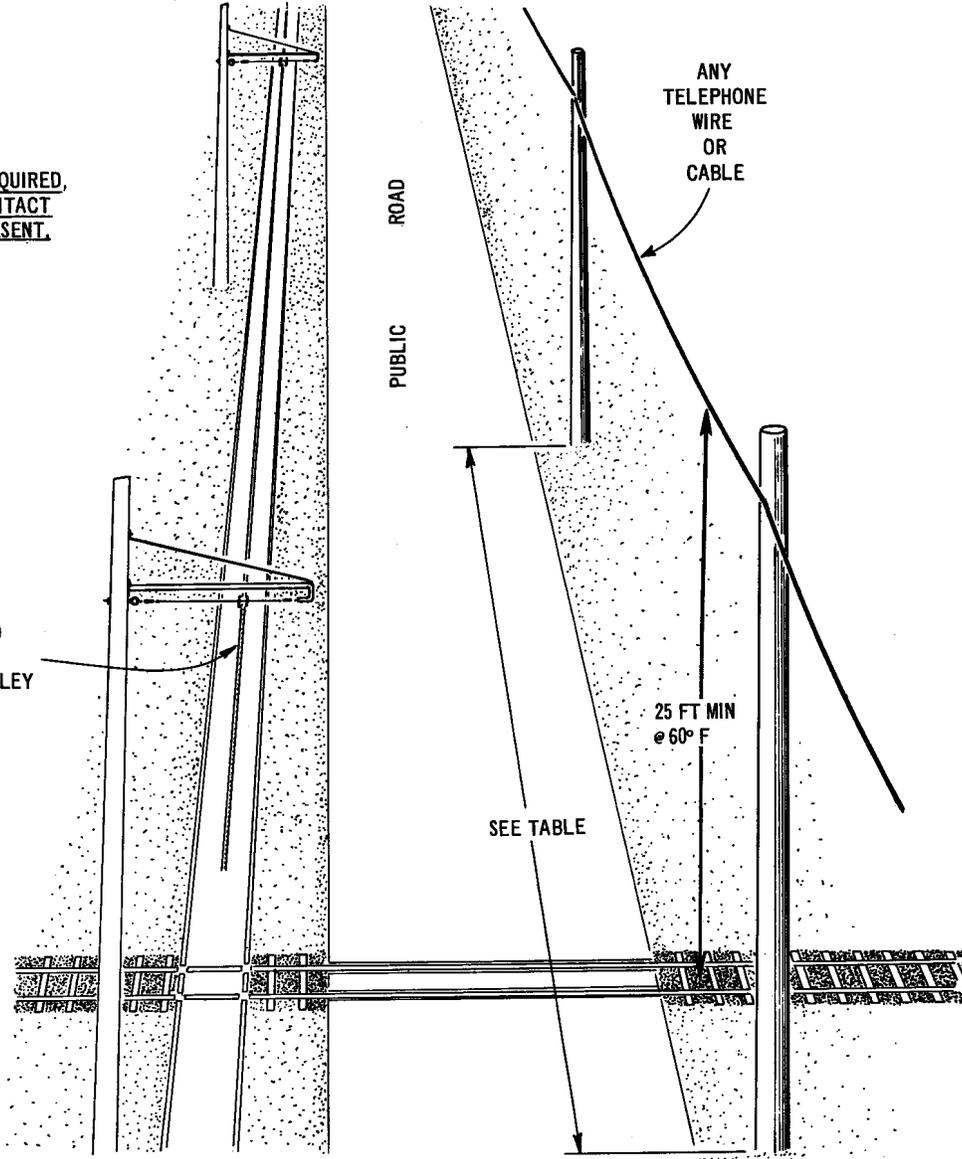


Fig. 2

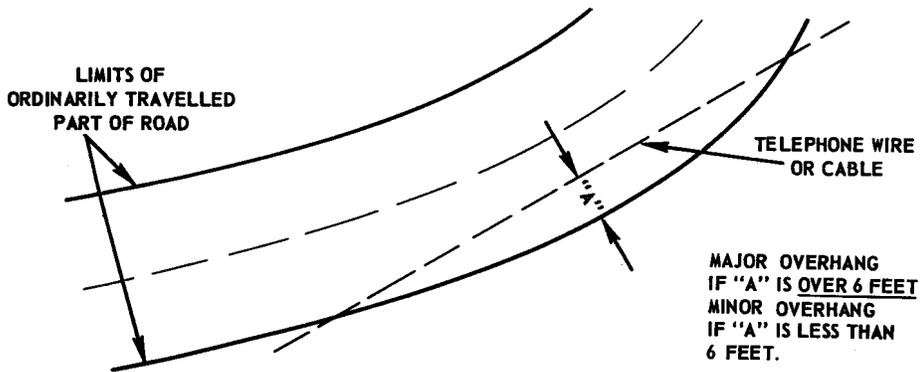


Fig. 3

RUNNING ALONG PUBLIC ROADS - BACK OF DITCHES ETC.
(NO OVERHANG)

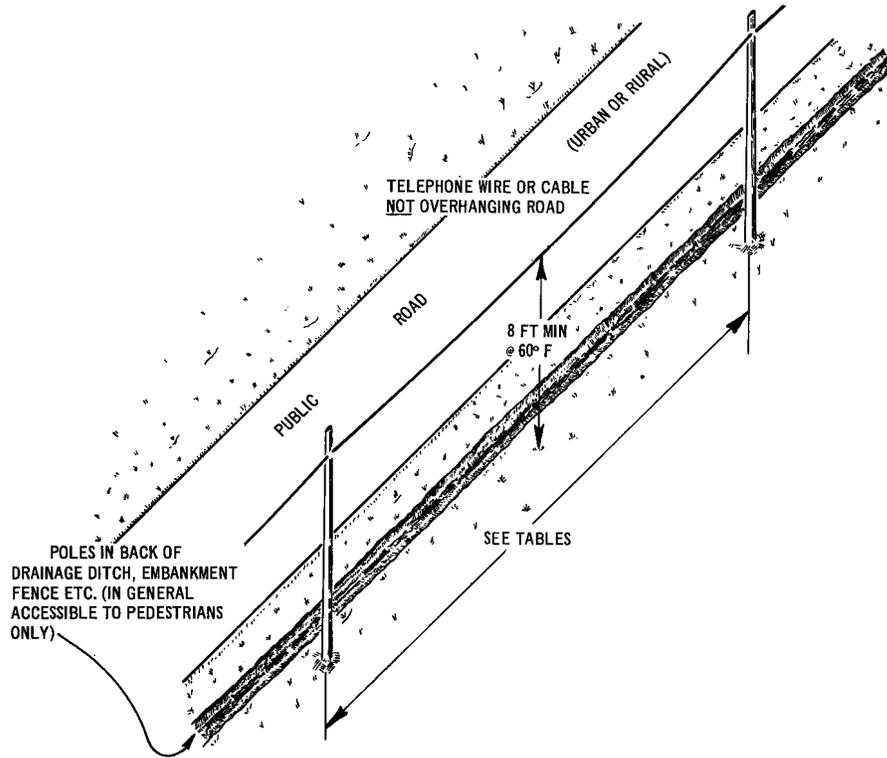


Fig. 4

RUNNING ALONG, BUT NOT OVERHANGING PUBLIC ROADS
(NOT BACK OF OBSTRUCTION)

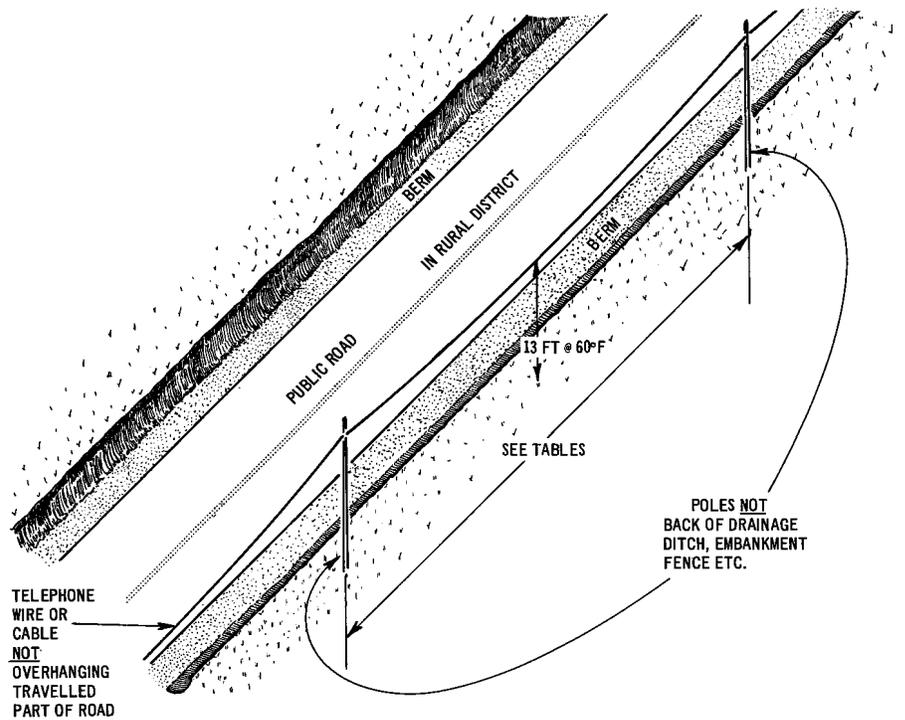


Fig. 5

2. CLEARANCES ABOVE GROUND OR RAILS

(a) Using Normal Sags (Cont.)

SPANS OF 176-250 FEET

SITUATION	REF.	176-200		201-225		226-250	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
Crossing Above: Railroad Tracks Generally Special Case	Fig. 2	Must be supported on 10M strand for these span lengths.					
Public Roads Generally Pole not over 50 ft. from far edge	— Fig. 1	18-10 18-6	(18-3) (18-0)	19-2 18-7	(18-6) (18-0)	19-6 18-7	(18-9) (18-0)
Public Alleys Generally Pole not over 50 ft. from far edge	— Fig. 1	15-10 15-6	(15-3) (15-0)	16-2 15-7	(15-6) (15-0)	16-6 15-7	(15-9) (15-0)
Resid. Driveways Generally Pole not over 50 ft. from far edge	— Fig. 1	10-10 10-6	(10-3) (10-0)	11-2 10-7	(10-6) (10-0)	11-6 10-8	(10-9) (10-1)
Flat Roof Buildings	—	8-7	(8-0)	8-8	(8-0)	8-9	(8-0)
Peak Roof Buildings, Billboards	—	2-4	(2-0)	2-4	(2-0)	2-5	(2-0)
Neon Signs	—	4-7	(4-0)	4-8	(4-0)	4-9	(4-0)
Waterways	—	Must be shown on detail plans.					
Running Along: Public Roads Major Overhang	Fig. 3	18-10	(18-3)	19-2	(18-6)	19-6	(18-9)
Minor Overhang Urban	Fig. 3 —	18-10	(18-3)	19-2	(18-6)	19-6	(18-9)
Rural (Lt. Traffic)	—	14-10	(14-3)	15-2	(14-6)	15-6	(14-9)
No Overhang Back of Obst.	Fig. 4	8-7	(8-0)	8-8	(8-0)	8-9	(8-0)
Not Back of Obst.	Fig. 5	13-7	(13-0)	13-8	(13-0)	13-9	(13-0)
Public Alleys	—	15-10	(15-3)	16-2	(15-6)	16-6	(15-9)

2. CLEARANCES ABOVE GROUND OR RAILS

(b) Using Minimum Sags

SPAN LENGTHS OF 175 FEET OR LESS

SITUATION	REF.	75-LESS		76-100		101-150		151-175	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
Crossing Above: Railroad Tracks Generally Special Case	— Fig. 2	27-3 25-3	(27-0) (25-0)	27-7 25-7	(27-0) (25-0)	{ Must be supported on 6M strand for spans of 101-150 feet; 10M required over 150 feet.			
Public Roads Generally Pole not over 50 ft. from far edge	— Fig. 1	18-3 18-3	(18-0) (18-0)	18-7 18-7	(18-0) (18-0)	18-8 18-7	(18-0) (18-0)	18-9 18-7	(18-0) (18-0)
Public Alleys Generally Pole not over 50 ft. from far edge	— Fig. 1	15-3 15-3	(15-0) (15-0)	15-7 15-7	(15-0) (15-0)	15-8 15-7	(15-0) (15-0)	15-9 15-7	(15-0) (15-0)
Resid. Driveways Generally Pole not over 50 ft. from far edge	— Fig. 1	10-3 10-3	(10-0) (10-0)	10-7 10-7	(10-0) (10-0)	10-8 10-7	(10-0) (10-0)	10-9 10-7	(10-0) (10-0)
Flat Roof Buildings	—	8-3	(8-0)	8-7	(8-0)	8-8	(8-0)	8-7	(8-0)
Peak Roof Buildings, Billboards	—	2-3	(2-0)	2-7	(2-0)	2-8	(2-0)	2-8	(2-0)
Neon Signs	—	4-3	(4-0)	4-7	(4-0)	4-8	(4-0)	4-9	(4-0)
Waterways	—	Must be shown on detail plans.							
Running Along: Public Roads Major Overhang	Fig. 3	18-3	(18-0)	18-7	(18-0)	18-8	(18-0)	18-9	(18-0)
Minor Overhang Urban Rural (Lt. Traffic)	Fig. 3 — —	18-3 14-3	(18-0) (14-0)	18-7 14-7	(18-0) (18-0)	18-8 14-8	(18-0) (14-0)	18-9 14-9	(18-0) (14-0)
No Overhang Back of Obst. Not Back of Obst.	Fig. 4 Fig. 5	8-3 13-3	(8-0) (13-0)	8-7 13-7	(8-0) (13-0)	8-8 13-8	(8-0) (13-0)	8-9 13-9	(8-0) (13-0)
Public Alleys	—	15-3	(15-0)	15-7	(15-0)	15-8	(15-0)	15-9	(15-0)

2. CLEARANCES ABOVE GROUND OR RAILS

(b) Using Minimum Sags

SPAN LENGTHS OF 176-300 FEET

SITUATION	REF.	176-200		201-225		226-250		251-275		276-300	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
Crossing Above: Railroad Tracks Generally Special Case	— Fig. 2	Must be supported on 10M strand.									
Public Roads Generally Pole not over 50 ft. from far edge	— Fig. 1	19-1 18-8	(18-3) (18-0)	19-5 18-8	(18-6) (18-0)	19-10 18-8	(18-9) (18-0)	To be shown on plans.			
Public Alleys Generally Pole not over 50 ft. from far edge	— Fig. 1	16-1 15-8	(15-3) (15-0)	16-5 15-8	(15-6) (15-0)	16-10 15-8	(15-9) (15-0)	17-3 15-9	(16-0) (15-0)	17-6 15-9	(16-3) (15-0)
Resid. Driveways Generally Pole not over 50 ft. from far edge	— Fig. 1	11-1 10-7	(10-3) (10-0)	11-5 10-8	(10-6) (10-0)	11-10 10-9	(10-9) (10-1)	12-3 11-0	(11-0) (10-3)	12-6 11-1	(11-3) (10-4)
Flat Roof Buildings	—	8-10	(8-0)	8-11	(9-0)	9-1	(8-0)	9-3	(8-0)	9-3	(8-0)
Peak Roof Buildings, Billboards	—	2-8	(2-0)	2-8	(2-0)	2-8	(2-0)	2-8	(2-0)	2-8	(2-0)
Neon Signs	—	4-10	(4-0)	4-11	(4-0)	5-1	(4-0)	5-2	(4-0)	5-3	(4-0)
Waterways	—	Must be shown on detail plans.									
Running Along: Public Roads Major Overhang	Fig. 3	19-1	(18-3)	19-5	(18-6)	19-10	(18-9)	20-3	(19-0)	20-6	(19-3)
Minor Overhang Urban Rural (Lt. Traffic)	Fig. 3 — —	19-1 15-1	(18-3) (14-3)	19-5 15-5	(18-6) (14-6)	19-10 15-10	(18-9) (14-9)	20-3 16-3	(19-0) (15-0)	20-6 16-6	(19-6) (15-3)
No Overhang Back of Obst. Not Back of Obst.	Fig. 4 Fig. 5	8-10 13-10	(8-0) (13-0)	8-11 13-11	(8-0) (13-0)	9-1 14-1	(8-0) (13-0)	9-3 14-3	(8-0) (13-0)	9-3 14-3	(8-0) (13-0)
Public Alleys	—	16-1	(15-3)	16-5	(15-6)	16-10	(15-9)	17-3	(16-0)	17-6	(16-3)

3. CLEARANCES CROSSING BELOW POWER WIRES AND CABLES**CONSTRUCTION³ CLEARANCES
FOR POWER SPAN LENGTHS OF**

KIND OF POWER FACILITY	100-LESS ft. in.	101-150 ft. in.	151-175 ft. in.
300 volts ¹ or less			
Service wires or cables	2-0	2-6	2-9
Line wires	2-0	2-6	2-9
If within 6 feet of telephone pole ⁴ (See Section 620-210-012)	4-0	4-6	4-9
301-750 volts ¹ — phase wires	4-0	4-6	4-9
751-8700 volts ¹ — phase wires	4-0	4-6	4-9
If within 6 feet of telephone pole ⁴ (See Section 620-210-012)	6-0	6-6	6-9
8701-50,000 volts ¹ — phase wires	6-0	6-6	6-9
If near telephone pole, see Section 620-210-012			
Grounded neutrals — systems of:			
Up to 22,000 volts to ground	2-0	2-6	2-9
Over 22,000 volts to ground	Same as associated phase wires.		
Other neutrals	Same as associated phase wires.		
Grounded metal sheath cables or any cable lashed to grounded strand, any voltage	2-0	2-0	2-0
Spacer cables ²			
300 volts ¹ or less	2-0	2-0	2-0
If within 6 feet of telephone pole ⁴	4-0	4-0	4-0
301-750 volts ¹	4-0	4-0	4-0
751-8700 volts ¹	4-0	4-0	4-0
If within 6 feet of telephone pole ⁴	6-0	6-0	6-0
8701-50,000 volts ¹	6-0	6-0	6-0

1. Voltage to ground if power circuit is grounded; voltage between wires if not.
2. Illustrated in Section 620-216-013.
3. Maintenance clearances for span lengths up to 175 feet are the same as construction clearances for span lengths of 100 feet or less.
4. Every effort should be made to avoid these situations and establish a common pole crossing instead.

4. MISCELLANEOUS CLEARANCES

Multiple Drop Wire Above:

Power service drops or power line wires of 300 volts or less, foreign guys, foreign communication cables, trolley span wires.

SPAN LENGTH OF MULTIPLE DROP WIRE (Feet)	CLEARANCE IN FEET, INCHES	
	CONSTRUCTION	MAINTENANCE
USING NORMAL SAGS		
100-less	2-3	2-0
101-150	2-6	2-0
151-175	2-7	2-0
176-191	3-1	2-6
192-208	3-7	3-0
209-225	4-2	3-6
226-241	4-9	4-0
USING MINIMUM SAGS		
100-less	2-7	2-0
101-150	2-8	2-0
151-175	2-9	2-0
176-191	3-4	2-6
192-208	3-10	3-0
209-225	4-5	3-6
226-241	5-0	4-0
242-258	5-7	4-6
259-275	6-3	5-0
Trolley contact wires 750 volts — less (Normal or Minimum Sags)		
75-less*	4-3	4-0
76-175*	4-9	4-0
Multiple Drop Wire Below:		
Foreign guys or communication cables ∅		
Any span length	2-0	2-0
Neon Signs		
Any span length	4-0	4-0
Multiple Drop Wire Alongside:		
Neon Signs		
Any span length	2-0	2-0

* Place wire guard at point of crossing.

∅ Span length of foreign cable not over 175 feet.