

## CLEARANCES FOR MULTIPLE LINE WIRE IN THE HEAVY LOADING AREA

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### 1. GENERAL

**1.01** This section contains the recommended minimum clearances for multiple line wires installed in the heavy loading area. The values specified meet (and in some cases exceed) the requirements of the National Electrical Safety Code (Sixth Edition). These clearances 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 should not be necessary to resag multiple line wire unless the actual storm loading experienced in quite severe.

**1.03** Maintenance clearances should exist after the wire has been through one or more cycles of storm loading and the temperature returns to 60°F. Wire should be resagged, however, if clearances fall below maintenance values at 60°F. Note, however, that sags increase as the temperature rises and clearances will, therefore, be less at sag 90° than at 60°. The amount by which clearances should be adjusted for temperature may be determined by comparing the sags shown for 60° with the sags shown for the actual temperature.

**1.04** Note that clearances shown for wires overhanging the traveled part of public roads are considerably larger than the clearances required where only minor overhang (Fig. 1) or no overhang at all is involved. Also, clearances for wires crossing roads, alleys and driveways show one set of values for general use and another set of smaller values when one pole is within 50 feet of the far edge as shown in Fig. 2.

**1.05** Where poles can be located so as to be within 50 feet of the far edge of a road, etc., as in Fig. 2 it will not always be necessary to base the height of attachment on the pole upon 100 per cent of the midspan sag. The following table shows the approximate percentage of midspan sag which should be used in locating pole attachments when Fig. 2 applies.

<u>SPAN LENGTH (FEET)</u>	<u>PER CENT OF MIDSPAN SAG</u>
180-200	80
201-225	75
226-250	70
251-275	65
276-305	60
305-340	55
341-385	50
386-400	45

Example: A 380 foot span with a sag of 65 inches crosses a residential driveway. The nearest pole is within 50 feet of the far edge of the driveway and is on ground two feet lower than the driveway. The sag at 50 feet will be 50 per cent of midspan or about 33 inches. In order to obtain the required clearance of 12 feet 1 inch, the minimum height of pole attachment would be 12 feet 1 inch plus 2 feet, plus 33 inches or 16 feet 10 inches.

**1.06** Clearances shown in this section should be used unless the work order shows other values. Clearances shown on the work print may call for somewhat different values where engineering forces have recognized factors not allowed for in this section. Clearances for span lengths, voltages and conditions not shown in this section are an engineering responsibility.

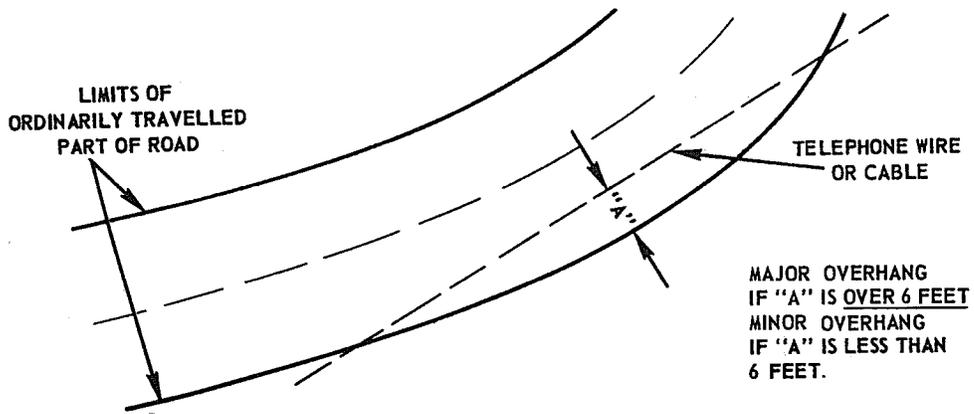


Fig. 1

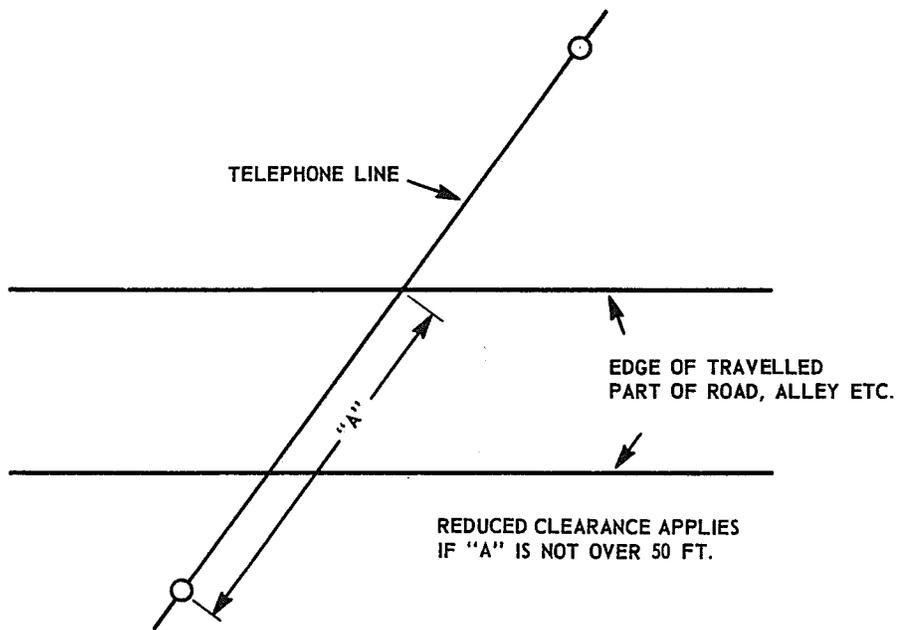


Fig. 2

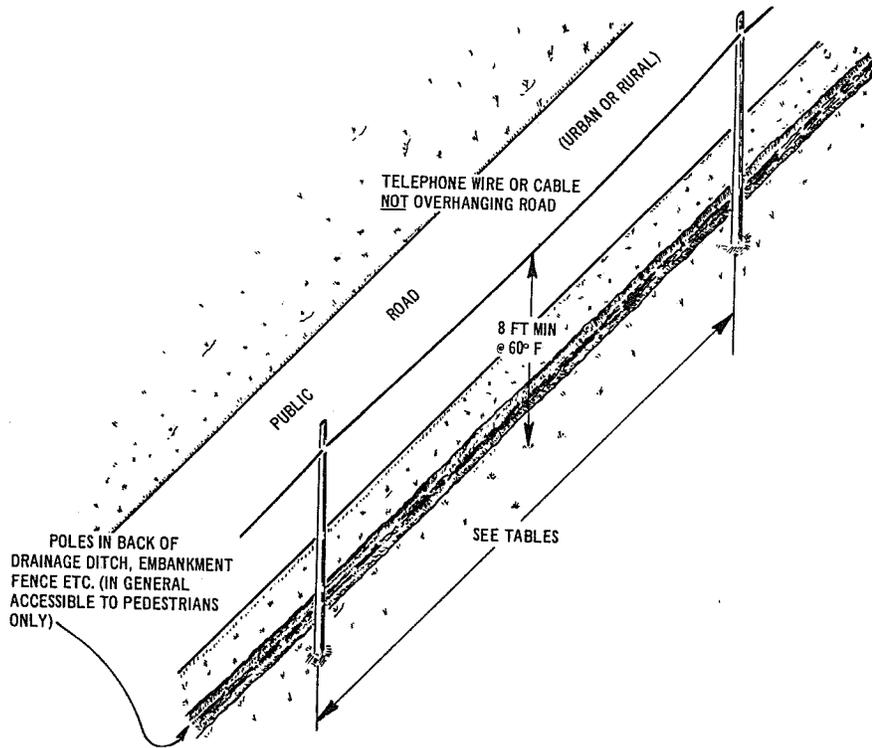
**2. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH 109 SUPPORT WIRE**

**SPAN LENGTHS IN FEET**

SITUATION	REF.	155-LESS		156-175		176-200		201-225		226-250	
		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.
<b>Crossing Above:</b> Railroad Tracks Generally		25-0	(25-0)	Must be supported on strand; 6M required for spans up to 150 feet 10M required for longer spans.							
Public Roads Generally	—	18-0	(18-0)	18-8	(18-8)	19-5	(19-4)	20-3	(20-1)	21-1	(20-10)
Pole not over 50 ft. from far edge	Fig. 1	18-0	(18-0)	18-0	(18-0)	18-4	(18-3)	18-8	(18-6)	19-0	(18-9)
Public Alleys Generally	—	15-0	(15-0)	15-8	(15-8)	16-5	(16-4)	17-3	(17-1)	18-1	(17-10)
Pole not over 50 ft. from far edge	Fig. 1	15-0	(15-0)	15-0	(15-0)	15-4	(15-3)	15-8	(15-6)	16-0	(15-9)
Resid. Driveways Generally	—	10-0	(10-0)	10-8	(10-8)	11-5	(11-4)	12-3	(12-1)	13-1	(12-10)
Pole not over 50 ft. from far edge	Fig. 1	10-0	(10-0)	10-0	(10-0)	10-4	(10-3)	10-8	(10-6)	11-0	(10-9)
Flat Roof Bldgs.	—	8-0	(8-0)	8-0	(8-0)	8-1	(8-0)	8-2	(8-0)	8-3	(8-0)
Peak Roof Bldgs. Billboards	—	2-0	(2-0)	2-0	(2-0)	2-0	(2-0)	2-1	(2-0)	2-1	(2-0)
Neon Signs ∅	—	4-0	(4-0)	4-0	(4-0)	4-0	(4-0)	4-1	(4-0)	4-1	(4-0)
Waterways	—	Must be shown on detail plans.									
<b>Running Along:</b> Public Roads Major Overhang	Fig. 2	18-0	(18-0)	18-8	(18-8)	19-5	(19-4)	20-3	(20-1)	21-1	(20-10)
Minor Overhang Urban	Fig. 2 —	18-0	(18-0)	18-0	(18-0)	18-4	(18-3)	18-8	(18-6)	19-0	(18-9)
Rural (Lt. Traffic)	—	14-0	(14-0)	14-0	(14-0)	14-4	(14-3)	14-8	(14-6)	15-0	(14-9)
No Overhang Back of Obst.	Fig. 3	8-0	(8-0)	8-0	(8-0)	8-1	(8-0)	8-2	(8-0)	8-3	(8-0)
Not back of Obst.	Fig. 4	13-0	(13-0)	13-0	(13-0)	13-1	(13-0)	13-2	(13-0)	13-3	(13-0)
Public Alleys		15-0	(15-0)	15-0	(15-0)	15-4	(15-3)	15-8	(15-6)	16-0	(15-9)

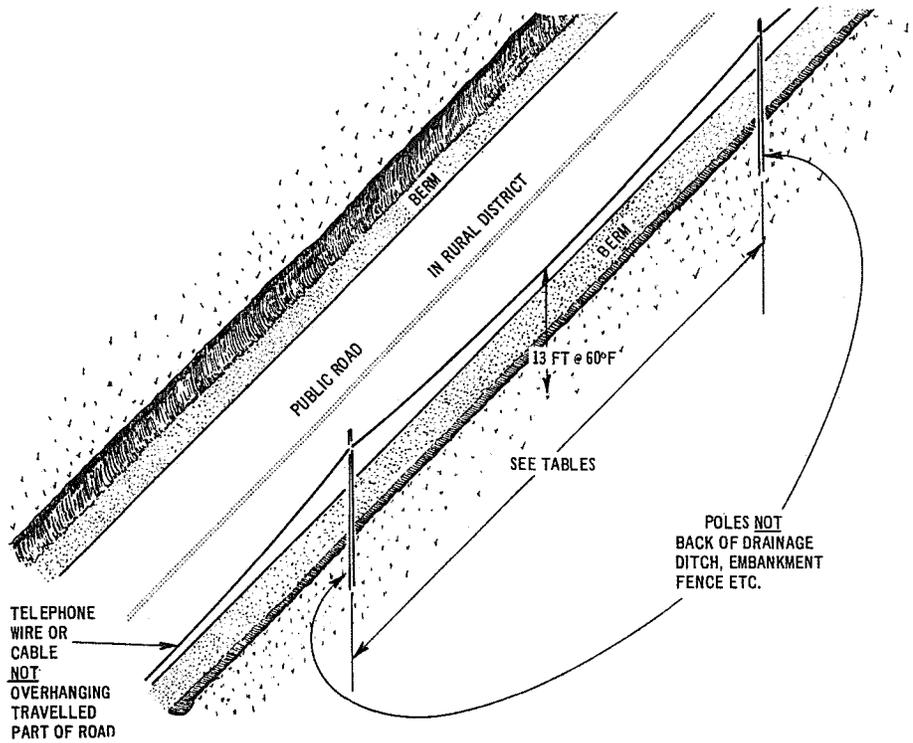
∅ Wire guard required for span lengths over 175 feet if pole is over 35 feet from neon sign.

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



**Fig. 3**

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



**Fig. 4**

2. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH 109 SUPPORT WIRE (Cont)

SPAN LENGTHS IN FEET

SITUATION	REF.	251-275		276-300		301-325		326-350	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
<b>Crossing Above:</b> Railroad Tracks Generally		To be shown on detail plans for these span lengths.							
Public Roads Generally Pole not over 50 ft. from far edge	— Fig. 1	To be shown on detail plans for these span lengths.							
Public Alley Generally Pole not over 50 ft. from far edge	— Fig. 1	19-4	(19-1)	19-7	(19-3)	19-11	(19-5)	20-1	(19-6)
Resid. Driveways Generally Pole not over 50 ft. from far edge	— Fig. 1	19-3	(18-10)	20-4	(19-8)	21-5	(20-6)	22-6	(21-4)
		16-4	(16-1)	16-7	(16-3)	16-11	(16-5)	17-1	(16-6)
Flat Roof Bldgs.	—	14-3	(13-10)	15-4	(14-8)	16-5	(15-6)	17-6	(16-4)
		11-4	(11-1)	11-7	(11-3)	11-11	(11-5)	12-1	(11-6)
Peak Roof Bldgs. Billboards	—	8-5	(8-0)	8-8	(8-0)	8-8	(8-0)	8-8	(8-0)
Neon Signs ∅	—	2-2	(2-0)	2-4	(2-0)	2-4	(2-0)	2-7	(2-0)
Waterways	—	4-2	(4-0)	4-4	(4-0)	4-5	(4-0)	4-7	(4-0)
<b>Running Along:</b> Public Roads Major Overhang	— Fig. 2	Must be shown on detail plans.							
Minor Overhang Urban	— Fig. 2	22-3	(21-10)	23-4	(22-8)	24-5	(23-6)	25-6	(24-4)
Rural (Lt. Traffic)	—	19-5	(19-0)	19-11	(19-3)	20-5	(19-6)	20-11	(19-9)
No Overhang Back of Obst. Not back of Obst.	Fig. 3 Fig. 4	15-5	(15-0)	15-11	(15-3)	16-5	(15-6)	16-11	(15-9)
		8-5	(8-0)	8-8	(8-0)	8-8	(8-0)	8-8	(8-0)
Public Alleys	—	13-5	(13-0)	13-8	(13-0)	13-11	(13-0)	14-2	(13-0)
		16-5	(16-0)	16-11	(16-3)	17-5	(16-6)	17-11	(16-9)

∅ Wire guard required if pole is over 35 feet from neon sign.

**2. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH  
109 SUPPORT WIRE (Cont)**

## SPAN LENGTHS IN FEET

SITUATION	REF.	351-375		376-400	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
<b>Crossing Above:</b> Railroad Tracks Generally	—	Not recommended for these span lengths.			
Public Roads Generally Pole not over 50 ft. from far edge	Fig. 1	To be shown on plans.			
		20-1	(19-4)	20-4	(19-4)
Public Alleys Generally Pole not over 50 ft. from far edge	— Fig. 1	23-2 17-1	(21-5) (16-4)	24-4 17-4	(21-9) (16-4)
Resid. Driveways Generally Pole not over 50 ft. from far edge	— Fig. 1	18-2 12-1	(16-5) (11-4)	19-4 12-4	(16-9) (11-3)
Flat Roof Bldgs.	—	8-8	(8-0)	8-8	(8-0)
Peak Roof Bldgs. Billboards	—	2-10	(2-0)	3-3	(2-0)
Neon Signs ∅	—	4-10	(4-0)	5-3	(4-0)
Waterways	—	Must be shown on plans.			
<b>Running Along:</b> Public Roads Major Overhang	Fig. 2	26-2	(24-5)	27-4	(24-9)
Minor Overhang Urban	Fig. 2 —	21-9	(20-0)	22-10	(20-3)
Rural (Lt. Traffic)	—	17-9	(16-0)	18-10	(16-3)
No Overhang Back of Obst.	Fig. 3	8-8	(8-0)	8-8	(8-0)
Not Back of Obst.	Fig. 4	14-9	(13-0)	15-7	(13-0)
Public Alleys	—	18-9	(17-0)	19-10	(17-3)

∅ Wire guard required if pole is over 35 feet from neon sign.

### 3. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH 120 SUPPORT WIRE

#### SPAN LENGTHS IN FEET

SITUATION	REF.	165-LESS		166-175		176-200		201-225		226-250	
		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.
<b>Crossing Above:</b> Railroad Tracks Generally	—	25-0	(25-0)	Must be supported on strand; 6M required for spans up to 150 feet; 10M required for longer spans.							
Public Roads Generally Pole not over 50 ft. from far edge	—	18-0	(18-0)	18-2	(18-2)	18-10	(18-7)	19-5	(19-1)	20-0	(19-8)
	Fig. 1	18-0	(18-0)	18-0	(18-0)	18-2	(18-0)	18-3	(18-0)	18-3	(18-0)
Public Alleys Generally Pole not over 50 ft. from far edge	—	15-0	(15-0)	15-2	(15-2)	15-10	(15-7)	16-5	(16-1)	17-0	(16-8)
	Fig. 1	15-0	(15-0)	15-0	(15-0)	15-2	(15-0)	15-3	(15-0)	15-3	(15-0)
Resid. Driveways Generally Pole not over 50 ft. from far edge	—	10-0	(10-0)	10-2	(10-2)	10-10	(10-7)	11-5	(11-1)	12-0	(11-8)
	Fig. 1	10-0	(10-0)	10-0	(10-0)	10-2	(10-0)	10-3	(10-1)	10-5	(10-2)
Flat Roof Bldgs.	—	8-0	(8-0)	8-0	(8-0)	8-3	(8-0)	8-4	(8-0)	8-4	(8-0)
Peak Roof Bldgs. Billboards	—	2-0	(2-0)	2-0	(2-0)	2-1	(2-0)	2-2	(2-0)	2-2	(2-0)
Neon Signs ∅	—	4-0	(4-0)	4-0	(4-0)	4-1	(4-0)	4-2	(4-0)	4-2	(4-0)
Waterways	—	Must be shown on detail plans									
<b>Running Along:</b> Public Roads Major Overhang	Fig. 2	18-0	(18-0)	18-2	(18-2)	18-10	(18-7)	19-5	(19-1)	20-0	(19-8)
Minor Overhang Urban Rural (Lt. Traffic)	Fig. 2	18-0	(18-0)	18-0	(18-0)	18-6	(18-3)	18-10	(18-6)	19-1	(18-9)
	—	14-0	(14-0)	14-0	(14-0)	14-6	(14-3)	14-10	(14-6)	15-1	(14-9)
No Overhang Back of Obst. Not back of Obst.	Fig. 3	8-0	(8-0)	8-0	(8-0)	8-3	(8-0)	8-4	(8-0)	8-4	(8-0)
	Fig. 4	13-0	(13-0)	13-0	(13-0)	13-3	(13-0)	13-4	(13-0)	13-4	(13-0)
Public Alleys	—	15-0	(15-0)	15-0	(15-0)	15-6	(15-3)	15-10	(15-6)	16-1	(15-9)

∅ Wire guard for span lengths over 200 feet if pole is over 50 feet from neon sign.

## 3. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH 120 SUPPORT WIRE (Cont)

SPAN LENGTHS IN FEET

SITUATION	REF.	251-275		276-300		301-325		326-350	
		CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.	CONST ft. in.	(MTCE) ft. in.
<b>Crossing Above:</b> Railroad Tracks Generally	—	To be shown on detail plans for these span lengths.							
Public Roads Generally	—	To be shown on detail plans for these span lengths.							
Pole not over 50 ft. from far edge	Fig. 1	18-10	(18-7)	19-1	(18-8)	19-4	(18-10)	19-5	(18-10)
Public Alleys Generally	—	18-5	(17-11)	19-4	(18-8)	20-3	(19-4)	21-2	(19-10)
Pole not over 50 ft. from far edge	Fig. 1	15-10	(15-7)	16-1	(15-8)	16-4	(15-10)	16-5	(15-10)
Resid. Driveways Generally	—	13-5	(12-11)	14-4	(13-8)	15-3	(14-4)	16-2	(14-10)
Pole not over 50 ft. from far edge	Fig. 1	10-10	(10-7)	11-1	(10-8)	11-4	(10-10)	11-5	(10-10)
Flat Roof Bldgs.	—	8-6	(8-0)	8-8	(8-0)	8-11	(8-0)	9-5	(8-0)
Peak Roof Bldgs. Billboards	—	2-3	(2-0)	2-4	(2-0)	2-6	(2-0)	2-8	(2-0)
Neon Signs ∅	—	4-3	(4-0)	4-4	(4-0)	4-6	(4-0)	4-8	(4-0)
Waterways	—	Must be shown on detail plans.							
<b>Running Along:</b> Public Roads Major Overhang	Fig. 2	21-5	(20-11)	22-4	(21-8)	23-3	(22-4)	24-2	(22-10)
Minor Overhang Urban	Fig. 2 —	19-6	(19-0)	19-11	(19-3)	20-5	(19-6)	21-2	(19-9)
Rural (Lt. Traffic)	—	15-6	(15-0)	15-11	(15-3)	16-5	(15-6)	17-2	(15-9)
No Overhang Back of Obst.	Fig. 3	8-6	(8-0)	8-8	(8-0)	8-11	(8-0)	9-5	(8-0)
Not back of Obst.	Fig. 4	13-6	(13-0)	13-8	(13-0)	13-11	(13-0)	14-5	(13-0)
Public Alleys	—	16-6	(16-0)	16-11	(16-3)	17-5	(16-6)	18-2	(16-9)

∅ Wire guard required if pole is over 50 feet from neon sign.

**3. CLEARANCES ABOVE GROUND OR RAILS FOR MULTIPLE LINE WIRE WITH  
120 SUPPORT WIRE (Cont)**

SPAN LENGTHS IN FEET

SITUATION	REF.	351-375		376-400	
		CONST. ft. in.	MTCE. ft. in.	CONST. ft. in.	MTCE. ft. in.
<b>Crossing Above</b> Railroad Tracks Generally		Note recommended for these span lengths.			
Public Roads Generally Pole Not Over 50 ft. From Far Edge	— Fig. 1	To be shown on plans.			
		19-7	(18-9)	19-9	(18-9)
Public Alleys Generally Pole Not Over 50 ft. From Far Edge	— Fig. 1	22-0 16-7	(20-2) (15-9)	22-11 16-9	(20-7) (15-9)
Resid. Driveways Generally Pole Not Over 50 ft. From Far Edge	— Fig. 1	17-0 11-7	(15-2) (10-9)	17-11 11-9	(15-7) (10-9)
Flat Roof Bldgs.	—	9-6	(8-0)	9-6	(8-0)
Peak Roof Bldgs. Billboards	—	2-11	(2-0)	3-2	(2-0)
Neon Signs ∅	—	4-11	(4-0)	5-2	(4-0)
Waterways	—	To be shown on detail plans.			
<b>Running Along</b> Public Roads Major Overhang	Fig. 2	25-0	(23-2)	25-11	(23-7)
Minor Overhang Urban Rural (Lt. Traffic)	Fig. 2	21-10 17-10	(20-0) (16-0)	22-7 18-7	(20-3) (16-3)
No Overhang Back of Obst. Not Back of Obst.	Fig. 3 Fig. 4	9-6 14-10	(8-0) (13-0)	9-6 15-4	(8-0) (13-0)
Public Alleys	—	18-10	(17-0)	19-7	(17-3)

∅ Wire guard required if pole is over 50 feet from neon sign.

## 4. CLEARANCES CROSSING BELOW POWER WIRES AND CABLES

CONSTRUCTION<sup>3</sup> CLEARANCES  
FOR POWER SPAN LENGTHS OF:

## Any Kind of Multiple Line Wire Below:

KIND OF POWER FACILITY	100-LESS ft. in.	101-150 ft. in.	151-175 ft. in.
300 Volts <sup>1</sup> or less Service Wires or Cables	2-0	2-6	2-9
Line Wires If within 6 feet of telephone pole <sup>4</sup> (See Section 620-210-012)	2-0 4-0	2-6 4-6	2-9 4-9
301-750 Volts <sup>1</sup> — Phase wires	4-0	4-6	4-9
751-8700 Volts <sup>1</sup> — Phase wires If within 6 feet of telephone pole <sup>4</sup> (See Section 620-210-012)	4-0 6-0	4-6 6-6	4-9 6-9
8701-50,000 Volts <sup>1</sup> — Phase wires If near telephone pole see Section 620-210-012	6-0	6-6	6-9
Ground 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 <sup>2</sup> 300 Volts <sup>1</sup> and less If within 6 feet of telephone pole <sup>4</sup>	2-0 4-0	2-0 4-0	2-0 4-0
301-750 Volts <sup>1</sup>	4-0	4-0	4-0
751-8700 Volts <sup>1</sup> — generally If within 6 feet of telephone pole <sup>4</sup>	4-0 6-0	4-0 6-0	4-0 6-0
8701-50,000 Volts <sup>1</sup>	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 of 101 to 175 feet are the same as construction clearances for span lengths of 100 feet and less.
4. Every effort should be made to avoid these situations and establish a common pole crossing instead.

## 5. MISCELLANEOUS CLEARANCES

<b>Any Kind of Multiple Line Wire Above:</b>		
Power service drops or power line wires of 300 volts or less, foreign guys, foreign communications cables, trolley span wires.		
<u>SPAN LENGTH OF MULTIPLE LINE WIRE (FEET)</u>	<u>CLEARANCE IN FEET, INCHES CONSTRUCTION</u>	<u>MAINTENANCE</u>
175-less	2-0	2-0
176-200	3-0	2-9
201-225	3-10	3-6
<b>Trolley Contact Wires 750 Volts — Less</b>		
175-less*	4-0	4-0
176-200*	5-0	4-9
<b>Any Kind of Multiple Line Wire Below:</b>		
Foreign guys, communication cables ∅		
Any span length	2-0	2-0
<b>Neon Signs</b>		
Any span length	4-0	4-0
<b>Any Kind of Multiple Line Wire Alongside:</b>		
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.

