CLEARANCES FOR AERIAL CABLE AND GUYS
HEAVY LOADING AREA

CONTENTS PAGE

1. GENERAL

1.01 This section contains clearance requirements for aerial cable and guys installed in the heavy loading area. These clearances apply at 60°F under conditions of no wind or ice. Except in the case of guys, ground clearances will be somewhat reduced at higher temperatures because of the increased sags involved. Conversely, lower temperatures mean greater ground clearances are required because placing sags are reduced. (See sag tables for differences due to temperature change.)

1.02 This section has been reissued to include the information in the addendum and also to reflect changes necessitated by the 1981 Edition of the National Electrical Safety Code (NESC). Because of extensive changes, the arrows normally used to indicate revisions have been omitted.

1.03 Clearances in this section meet (and in some cases exceed) the requirements of the ***1981 Edition of the NESC***. They are to be used unless the detail plans specify other values or unless local ordinances, etc, require greater values.

1.04 The clearances required for light-weight cables are, in general, greater than the clearances for the heavier cables. This is because the lighter-weight cables are subject to greater increase in sag under storm loading, and many clearances are calculated to maintain a minimum value under storm loading.

1.05 There is no distinction between construction and maintenance clearances above ground or rails because there is little or no permanent stretching of the strand as a result of storm loading. Clearances ***under*** power wires, however, are subject to reduction as the power wires may incur extra permanent sag because of stretching. Both construction and maintenance clearances are therefore specified for these situations.

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1.06 Considerable savings in pole height can be obtained by locating poles so that the low point of a span will not occur above streets, alleys, or driveways. In some cases this will permit the use of lower clearances. (See Fig. 1 and Part 2.) Even when the ground clearance required is the same, however, the height of pole attachment can generally be reduced since it need not be based upon 100 percent of midspan sag. Table A shows the approximate percentage of midspan sag occurring at points 50 and 100 feet from the pole for various span lengths (measured along the cable route as shown in Fig. 1).

Example: For a 500-foot span, the sag 50 feet from the pole is approximately 40 percent of midspan sag; at 100 feet, the sag is 65 percent of midspan. (Interpolate for distances between 50 and 100 feet.)

1.07 Greater clearance is required for cable overhanging the traveled part of roads than for cable when no overhang is involved. Also, a distinction has been made between "major" and "minor" overhang as shown in Part 2. Large savings in pole height may be obtained by minimizing or eliminating road overhang.

1.08 To determine the clearances required from power conductors, it is necessary to know the voltage of the power wires and whether they are, or are not, part of a grounded system. Clearances for grounded power systems are based upon their voltage to ground; for other systems, clearances depend upon the voltage between wires. Most grounded power systems include a grounded conductor which has many connections to ground. Such conductors are called multigrounded neutrals and are generally considered to be effectively grounded.

TABLE A

SPAN (FT)	PERCENT OF MIDSPAN SAG "X"=50 FT	SPAN (FT)	PERCENT OF MIDSPAN SAG "X"=100 FT
180-200	80	260-290	95
201-225	75	291-325	90
226-250	70	326-360	85
251-275	65	361-400	80
276-305	60	401-440	75
306-340	55	441-490	70
341-385	50	491-540	65
386-440	45	541-600	60
441-515	40	–	–
516-600	35	–	–

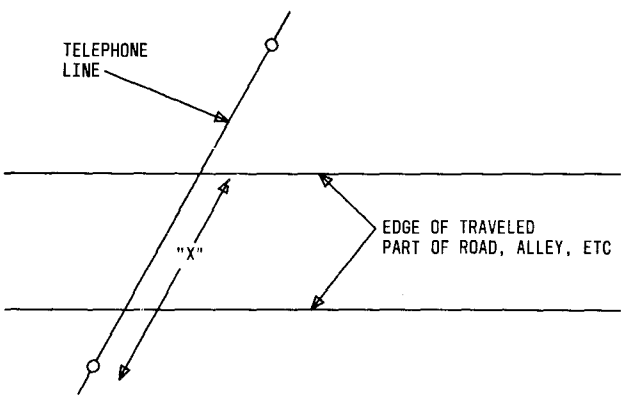
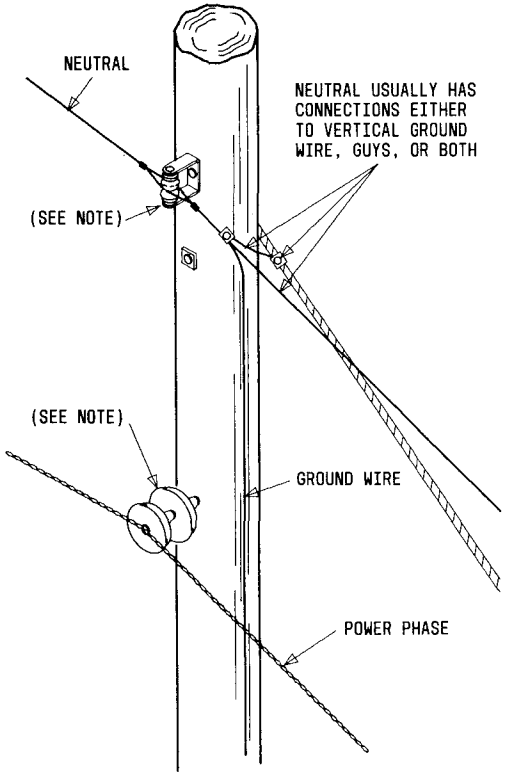


Fig. 1—Midspan Sag Diagram

Power companies occasionally attach the neutral ABOVE the phase wire as shown in Fig. 2. Therefore, it is important to identify the neutral wire before determining separation requirements. The neutral can usually be identified by observing the presence of the following:

(a) *The neutral is usually bonded to a vertical ground wire at least every 1300 feet and more often when transformers are present.*



NOTE:
COMPARE SIZE OF INSULATORS: NEUTRAL IS USUALLY ON SMALLER INSULATOR

Fig. 2—Inverted Power Construction

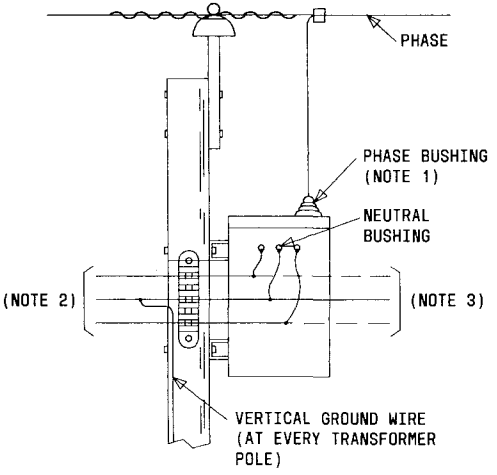
(b) *The neutral is normally bonded to power guys which do not contain insulators.*

(c) *Neutrals are sometimes carried on smaller insulators than those carrying phase wires.*

(d) *The neutral is sometimes carried on a lighter-colored insulator than the phase wires.*

(e) *On transformer poles, the bushing for the neutral is usually smaller than the bushing for the phase connection. The neutral bushing is often located near the secondary bushings (Fig. 3).*

(f) *Where secondaries are dead ended, if the phase wire is carried through, the neutral will also be carried through.*



NOTES:
1. PHASE BUSHING IS USUALLY LARGER THAN NEUTRAL BUSHING.
2. NEUTRAL CAN BE ANY ONE OF THESE. POSITION DEPENDS ON WIRING AT TRANSFORMER.
3. NEUTRAL ALWAYS CARRIES THROUGH WHEN PHASE CARRIES THROUGH. SECONDARIES ARE DEAD ENDED IN SOME CASES.

Fig. 3—Identification of Neutral at Transformer Location

Note: If, after considering these factors, sufficient identification of the neutral wire has not been made, consult your supervisor or the electric utility company. However, if the neutral is attached ***above*** the phase wire, provide the clearance specified for phase wires of appropriate voltage.

1.09 Clearances from streetlights show one value for grounded fixtures and a larger value for nongrounded fixtures. Streetlight fixtures bonded to cable suspension strand that is connected to a low-impedance ground or a ground wire of a multigrounded neutral power system are considered to be sufficiently well grounded to use the smaller clearance. Fixtures which are merely grounded to a ground rod are ***not*** considered sufficiently well grounded to use the smaller clearance.

1.10 Clearances from grounded transformers, capacitors, etc, are smaller than for nongrounded transformers, etc. Since it is not generally possible to determine by sight whether power equipment is grounded or not, local instructions will designate areas where transformer and/or capacitor cases are grounded.

1.11 Clearances for span lengths, voltages, and conditions not shown in this section are an engineering responsibility and will be shown on the detailed plans.

Note: Work prints may, in some cases, show greater clearance since the values recommended in this section are based upon a maximum vehicle or equipment height of 14 feet. In cases where greater equipment height might be reasonably expected, the engineer may elect to specify greater clearance.

2. CLEARANCES ABOVE GROUND OR RAILS

2.01 Table B contains the minimum clearances at 60°F for all weights of cable and sizes of strand (including self-supporting cable). Figures 4 through 8 are referenced in Table B. These clearances apply to any span length up to the maximum shown. Longer span lengths are permitted but will, in many cases, require greater clearances. (See Tables C through G.)

2.02 The designation in Table B marked "No Overhang—Back of Obstr" means that the line is located in back of a ditch, fence, embankment, etc, and the ground below can ordinarily be traveled by pedestrians only. The designation, "No Overhang—Not Back of Obstr" means that the line is not in back of such obstructions (ie, the ground beneath the line is not ordinarily traveled, but may be reached by vehicles). In this situation, if farm machinery is likely to pass under the line, provide sufficient clearance so at 60°F the cable will be 2 feet above the highest part of such machinery or its load.

2.03 Spans crossing or overhanging public roads should be somewhat shorter than the adjacent spans, especially for crossing or overhanging spans in excess of 200 feet.

2.04 Pole lines crossing private property (fields, woods, orchards, etc) and constructed prior to 1977 did not require specific clearances. The clearances specified for such construction was considered a "designer's choice" to accommodate the existing conditions. Very often clearances of 12, 14, or 16 feet were adequate for the terrain. The ***1977 NESC*** specified that if wire or cable was added to such a facility, the new addition must have road crossing clearances of 18 feet at 60°F. The ***1981 NESC*** states that the ***existing*** clearances can be maintained when facilities are added on lines built ***prior*** to 1977. For lines constructed ***after*** 1977, road crossing clearances must be obtained when pole lines cross fields, go through woods, etc. In either case, road crossing clearances must be maintained where pole lines cross nonresidential driveways.

TABLE B

CROSSING ABOVE:	CLEARANCE FT/IN	SPAN (FT)	REMARKS
Railroad Tracks	25-0	90	See Table C
Public Roads, Nonresidential Driveways	18-0	200	See Par. 2.03 and Fig. 5
Public Alleys	15-0	200	See Fig. 6
Residential Driveways	10-0	200	
Walks and Lanes (Pedestrian)	8-0	Any	
Flat Roof Bldgs	8-0	Any	
Peak Roof Bldgs	2-0	Any	
Billboards	2-0	Any	
Neon Signs	4-0	Any	See Note 1
Waterways	Must be shown on plans.		
RUNNING ALONG:			
Public Roads With:			
Major Overhang	18-0	200	See Par. 2.04 and Fig. 4
Minor Overhang	18-0	275	See Par. 2.03, Fig. 4, and Notes 2 and 3
Rural (Lt Traffic)	14-0	275	See Note 4
No Overhang			
Back of Obstr	8-0	Any	See Par. 2.02 and Fig. 7
Not Back of Obstr	13-0	Any	See Par. 2.02 and Fig. 8
Public Alleys	15-0	Any	See Fig. 6

Note 1: Clearance for guys may be reduced to 1 foot.

Note 2: Same clearance required for parking lots; however, if span does not exceed 150 feet, provide a minimum of 17 feet at 60° F.

Note 3: Same clearance required when crossing grazing land, forests, orchards, etc.

Note 4: Lightly traveled country lanes only. If well-traveled, consider as urban even if in rural area.

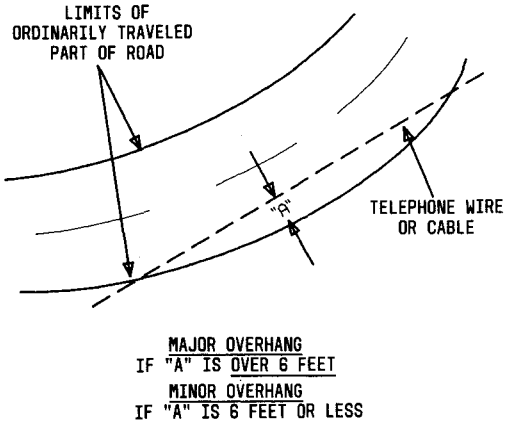


Fig. 4—Overhang—Running Along Public Roads

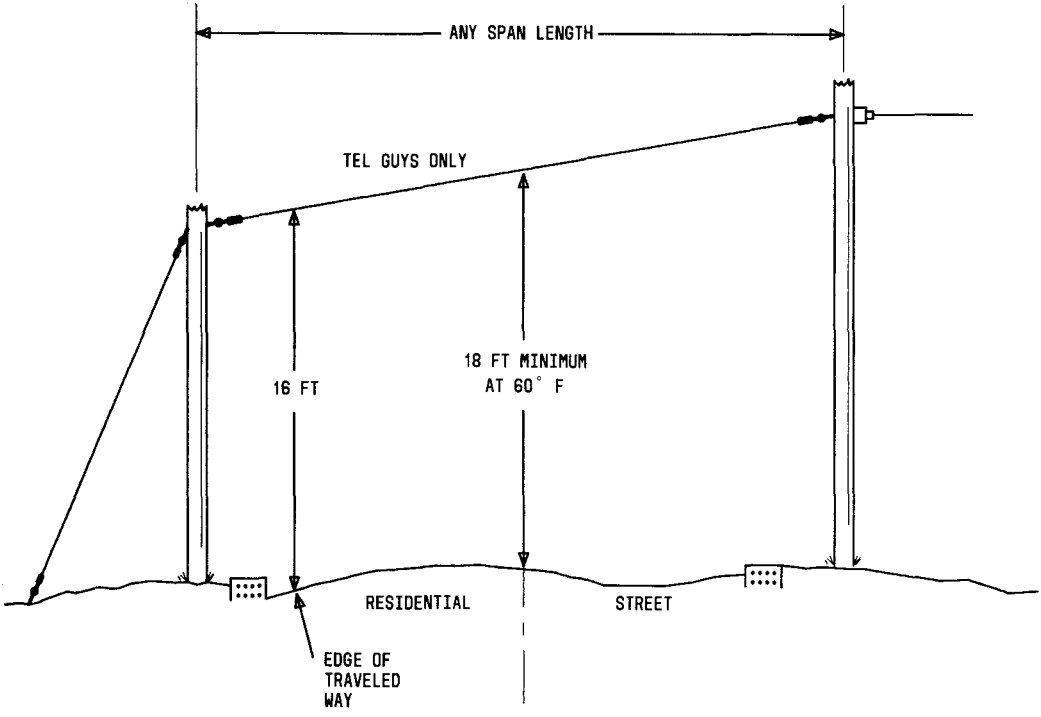


Fig. 5—Overhang—Crossing Public Roads

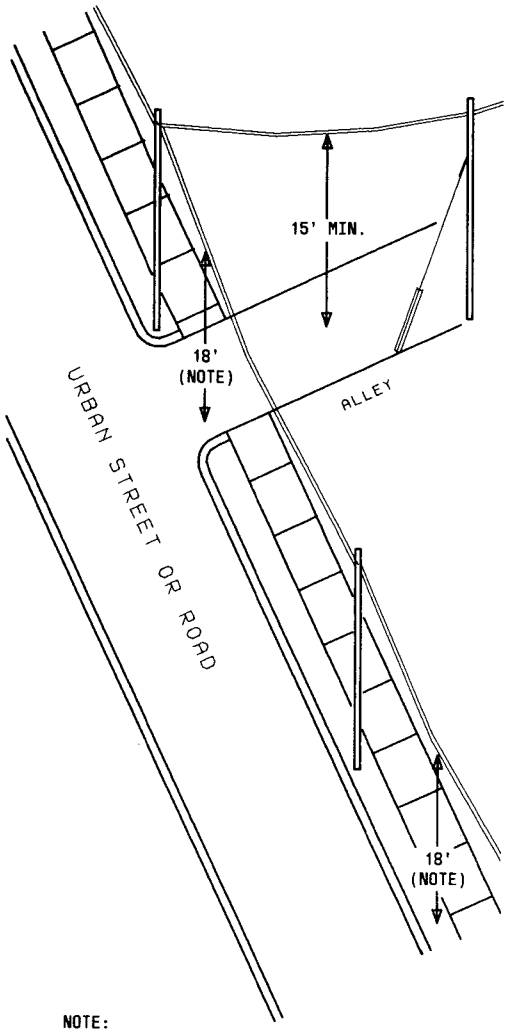


Fig. 6—Crossing Alleys With Telephone Cable

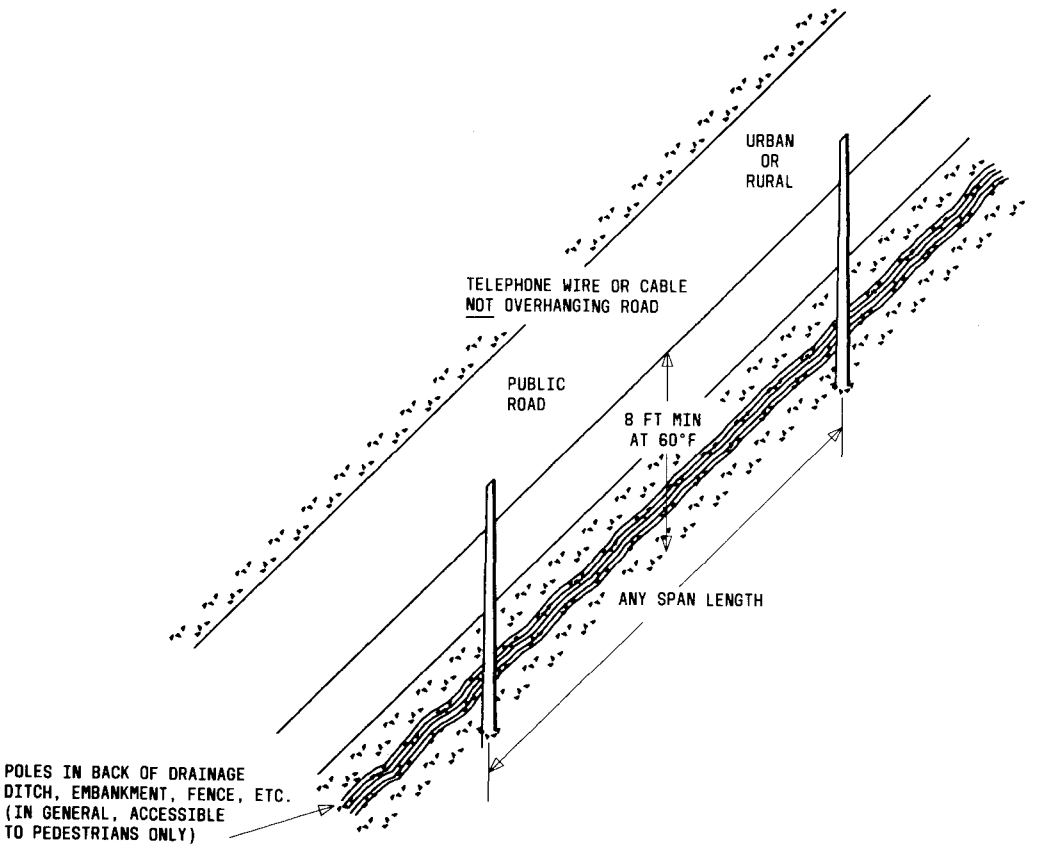


Fig. 7—Running Along Public Roads—Back of Ditches, Etc.

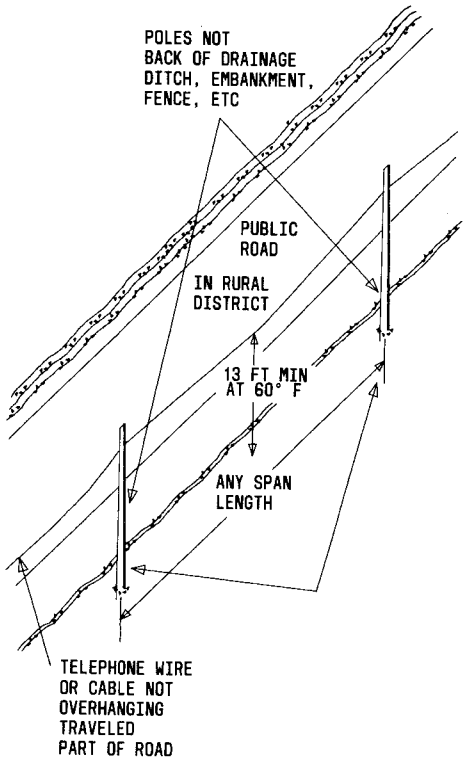


Fig. 8—Running Along, But Not Overhanging, Public Roads

TABLE C

AT RAILROAD CROSSINGS WEIGHT OF CABLE	STRAND SIZE	SPAN LENGTH IN FEET			
		91-120 FT IN.	121-150 FT IN.	151-190 FT IN.	191-225 FT IN.
Self-supporting (Any wt)*	– –	25-6	26-0	– –	– –
Less than 1/2 lb/ft	6M†	25-0	25-5	– –	– –
	10M‡	25-0	25-2	25-9	26-3
	16M§	25-0	25-0	25-4	25-9
Between 1/2 and 2 lb/ft	6M†	25-0	25-2	– –	– –
	10M‡	25-0	25-1	25-6	26-0
	16M§	25-0	25-0	25-3	25-8
Over 2 lb/ft	6M	25-0	25-0	– –	– –
	10M	25-0	25-0	25-2	25-6
	16M	25-0	25-0	25-0	25-3
	25M	25-0	25-0	25-0	25-1
Guys	Any	25-0	25-0	25-0	25-0

* Maximum span length for self-supporting cable is 150 feet.

† Maximum span length for 6M is 150 feet; maximum cable weight is 2-1/4 lb/ft.

‡ Maximum cable weight for 10M is 5 lb/ft; maximum span length is 150 feet if cable weight is over 2-1/4 lb/ft.

§ Maximum cable weight for 16M is 8-1/2 lb/ft; maximum span length is 150 feet if cable weight is over 5 lb/ft.

TABLE D

SELF-SUPPORTING CABLE SPAN LENGTH (NOTE)	CROSSING OVER						RUNNING ALONG PUBLIC ROADS		
	PUBLIC ROADS		PUBLIC ALLEYS		RES. DRIVE				
	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	MAJOR OVERHANG URBAN OR RURAL AREAS (SEE FIG. 4)	MINOR OVERHANG URBAN AREAS (SEE FIG. 4)	MINOR OVERHANG RURAL AREAS
FEET	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.
201/225	18-7	18-7	15-7	15-7	10-7	10-7	18-7	18-0	14-0
226/250	19-2	18-11	16-2	15-11	11-2	10-11	19-2	18-0	14-0
251/275	19-9	19-5	16-9	16-5	11-9	11-5	19-9	18-0	14-0
276/300	20-4	19-9	17-4	16-9	12-4	11-9	20-4	18-4	14-4
301/325	20-11	20-0	17-11	17-0	12-11	12-0	20-11	18-11	14-11
326/350	21-6	20-4	18-6	17-4	13-6	12-4	21-6	19-6	15-6
351/375	22-1	20-6	19-1	17-6	14-1	12-6	22-1	20-1	16-1
376/400	22-8	20-9	19-8	17-9	14-8	12-9	22-8	20-8	16-8
401/425	23-3	20-11	20-3	17-11	15-3	12-11	23-3	21-3	17-3
426/450	23-10	21-1	20-10	18-1	15-10	13-1	23-10	21-10	17-10
451/475	24-5	21-3	21-5	18-3	16-5	13-3	24-5	22-5	18-5
476/500	25-0	21-5	22-0	18-5	17-0	13-5	25-0	23-0	19-0
501/525	25-7	21-6	22-7	18-6	17-7	13-6	25-7	23-7	19-7
526/550	26-2	21-8	23-2	18-8	18-2	13-8	26-2	24-2	20-2

Note: Clearances for shorter spans and other conditions are shown in Tables B and C.

TABLE E

SPAN LENGTH (NOTE)	SELF-SUPPORTING CABLE CROSSING OVER						RUNNING ALONG PUBLIC ROADS		
	PUBLIC ROADS		PUBLIC ALLEYS		RES. DRIVE				
	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	MAJOR OVERHANG URBAN OR RURAL AREAS (SEE FIG. 4)	MINOR OVERHANG URBAN AREAS (SEE FIG. 4)	MINOR OVERHANG RURAL AREAS
FEET	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.
For Cables (Weighing 1/2 lb/ft or less) Supported on 6M and 10M Strand									
266/300	18-6	18-1	15-6	15-1	10-6	10-1	18-6	18-0	14-0
301/333	19-0	18-4	16-0	15-4	11-0	10-4	19-0	18-0	14-0
334/366	19-6	18-7	16-6	15-7	11-6	10-7	19-6	18-0	14-0
367/400	20-0	18-9	17-0	15-9	12-0	10-9	20-0	18-0	14-0
401/433	20-6	18-11	17-6	15-11	12-6	10-11	20-6	18-6	14-6
434/466	21-0	19-1	18-0	16-1	13-0	11-1	21-0	19-0	15-0
467/500	21-6	19-2	18-6	16-2	13-6	11-2	21-6	19-6	15-6
501/533	22-0	19-3	19-0	16-3	14-0	11-3	22-0	20-0	16-0
534/566	22-6	19-4	19-6	16-4	14-6	11-4	22-6	20-6	16-6
567/600	23-0	19-5	20-0	16-5	15-0	11-5	23-0	21-0	17-0
For Cables (Weighing 1/2 lb/ft or less) Supported on 16M Strand									
334/366	18-6	18-0	15-6	15-0	10-6	10-0	18-6	18-0	14-0
367/400	19-0	18-0	16-0	15-0	11-0	10-0	19-0	18-0	14-0
401/433	19-6	18-2	16-6	15-2	11-6	10-2	19-6	18-0	14-0
434/466	20-0	18-5	17-0	15-5	12-0	10-5	20-0	18-0	14-0
467/500	20-6	18-6	18-6	15-6	12-6	10-6	20-6	18-6	14-6
501/533	21-0	18-8	19-0	15-8	13-0	10-8	21-0	19-0	15-0
534/566	21-6	18-9	19-6	15-9	13-6	10-9	21-6	19-6	15-6
567/600	22-0	18-10	20-0	16-10	14-0	10-10	22-0	20-0	16-0

Note: Clearances for shorter spans and other conditions are shown in Tables B.

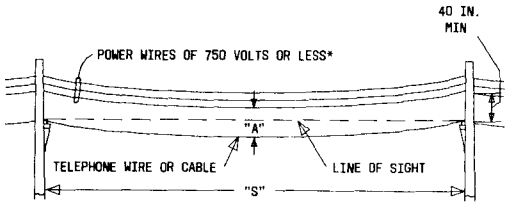
TABLE F

SPAN LENGTH	CROSSING OVER						RUNNING ALONG PUBLIC ROADS		
	PUBLIC ROADS		PUBLIC ALLEYS		RES. DRIVE				
	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	MAJOR OVERHANG URBAN OR RURAL AREAS (SEE FIG. 4)	MINOR OVERHANG URBAN AREAS (SEE FIG. 4)	MINOR OVERHANG RURAL AREAS
FEET	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.
For Cables (Weighing 1/2 to 1 lb/ft) Supported on 10M Strand									
301/333	18-5	18-0	15-5	15-0	10-5	10-0	18-5	18-0	14-0
334/366	18-10	18-1	15-10	15-1	10-10	10-1	18-10	18-0	14-0
367/400	19-3	18-2	16-3	15-2	11-3	10-2	19-3	18-0	14-0
401/433	19-8	18-4	16-8	15-4	11-8	10-4	19-8	18-0	14-0
434/466	20-2	18-6	17-2	15-6	12-2	10-6	20-2	18-2	14-2
467/500	20-8	18-8	17-8	15-8	12-8	10-8	20-8	18-8	14-8
501/533	21-2	18-9	18-2	15-9	13-2	10-9	21-2	19-2	15-2
534/566	21-8	18-10	18-8	15-10	13-8	10-10	21-8	19-8	15-8
For Cables (Weighing 1/2 to 1 lb/ft) Supported on 16M Strand									
334/366	18-5	18-0	15-5	15-0	10-5	10-0	18-5	18-0	14-0
367/400	18-10	18-0	15-10	15-0	10-10	10-0	18-10	18-0	14-0
401/433	19-3	18-0	16-3	15-0	11-3	10-0	19-3	18-0	14-0
434/466	19-8	18-2	16-8	15-2	11-8	10-2	19-8	18-0	14-0
467/500	20-1	18-3	17-1	15-3	12-1	10-3	20-1	18-1	14-1
501/533	20-6	18-4	17-6	15-4	12-6	10-4	20-6	18-6	14-6
534/566	20-11	18-5	17-11	15-5	12-11	10-5	20-11	18-11	14-11
567/600	21-4	18-6	18-4	15-6	13-4	10-6	21-4	19-4	15-4

TABLE G

SPAN LENGTH	CROSSING OVER						RUNNING ALONG PUBLIC ROADS		
	PUBLIC ROADS		PUBLIC ALLEYS		RES. DRIVE				
	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	GENERALLY	POLE WITHIN 100 FEET OF FAR EDGE (SEE FIG. 1 AND TABLE A)	MAJOR OVERHANG URBAN OR RURAL AREAS (SEE FIG. 4)	MINOR OVERHANG URBAN AREAS (SEE FIG. 4)	MINOR OVERHANG RURAL AREAS
FEET	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.
For Cables (Weighing 1 to 2 lb/ft) Supported on 10M Strand									
339 / Less	18-0	18-0	15-0	15-0	10-0	10-0	18-0	18-0	14-0
340 / 400	18-8	18-0	15-8	15-0	10-8	10-0	18-8	18-0	14-0
401 / 460	19-4	18-0	16-4	15-0	11-4	10-0	19-4	18-0	14-0
For Cables (Weighing 1 to 2 lb/ft) Supported on 16M Strand									
374 / Less	18-0	18-0	15-0	15-0	10-0	10-0	18-0	18-0	14-0
375 / 425	18-6	18-0	15-6	15-0	10-6	10-0	18-6	18-0	14-0
426 / 475	19-1	18-0	16-1	15-0	11-1	10-0	19-1	18-0	14-0
476 / 525	19-7	18-0	16-7	15-0	11-7	10-0	19-7	18-0	14-0
526 / 550	19-10	18-0	16-10	15-0	11-10	10-0	19-10	18-0	14-0
For Cables (Weighing over 2 lb/ft) Supported on 10M Strand									
385 / Less	18-0	18-0	15-0	15-0	10-0	10-0	18-0	18-0	14-0
For Cables (Weighing over 2 lb/ft) Supported on 16M Strand									
425 / Less	18-0	18-0	15-0	15-0	10-0	10-0	18-0	18-0	14-0
426 / 450	18-3	18-0	15-3	15-0	10-3	10-0	18-3	18-0	14-0
For Cables (Weighing over 2 lb/ft) Supported on 25M Strand									
445 / Less	18-0	18-0	15-0	15-0	10-0	10-0	18-0	18-0	14-0
446 / 510	18-7	18-0	15-7	15-0	10-7	10-0	18-7	18-0	14-0
511 / 575	19-2	18-0	16-2	15-0	11-2	10-0	19-2	18-0	14-0

3. JOINT-USE SEPARATION IN THE SPAN AND ON THE POLE FROM POWER CONDUCTORS



750 VOLTS OR LESS: INCLUDES NEUTRALS, OTHER THAN MULTIGROUNDED, ASSOCIATED WITH CONDUCTORS OF 750 VOLTS OR LESS			
SPAN LENGTH (S) IN FEET	MIDSPAN SEPARATION (A) IN INCHES		CLEARANCE AT THE POLE IN INCHES
	CONSTRUCTION	MAINTENANCE	
150 or Less	36	30	40*
150-200	42 or sag of tel plus 12 if greater†	30 or sag of tel if greater†	40*

* May have to be greater than 40 inches to meet midspan requirements.

† Lowest power wire must be above the line of sight.

Fig. 9—Separation—Power Conductors of 750 Volts or Less

3.01 Separation requirements between telephone and power conductors of 750 volts or less are shown in Fig. 9.

Example:

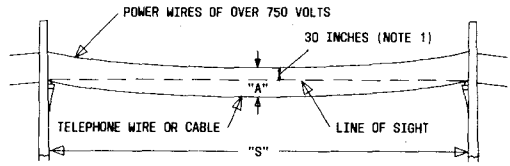
Span length is 140 feet.

Power secondaries have a 35-inch sag.

Telephone cable has a 15-inch sag.

Midspan separation required is 36 inches. Standard 40-inch separation at the pole will provide only (40 − 35) + 15, or 20 inches; thus, the separation at the pole must be increased by the amount of the shortage, which would be 36 − 20 or 16 inches. Separation at the pole would be 40 + 16, or 56 inches.

3.02 Separation requirements between telephone cable and power conductors of over 750 volts are shown in Fig. 10.



GROUNDED POWER SYSTEMS OF UP TO 15,000 VOLTS BETWEEN WIRES (8700 VOLTS TO GROUND) AND OTHER SYSTEMS OF UP TO 8700 VOLTS BETWEEN WIRES			
SPAN LENGTH (S) IN FEET	MIDSPAN SEPARATION (A) IN INCHES		CLEARANCE AT THE POLE IN INCHES (NOTE 2)
	CONSTRUCTION	MAINTENANCE	
150 or Less	36	30	40
150-200	42 plus sag of tel wire	30 plus sag of tel wire	40
GROUNDED POWER SYSTEMS OF 15,000-86,500 VOLTS BETWEEN WIRES (8700-50,000 VOLTS GROUNDED AND OTHER SYSTEMS OF 8700-50,000 VOLTS BETWEEN WIRES			
150 or Less	51	45	60
150-200	57 or tel sag plus 42 if greater	45 or tel sag plus 30 if greater	60

Notes:
1. Power wires must be at least 30 inches above the line of sight if "S" exceeds 150 feet.
2. Clearance at the pole is minimum. Greater clearance may be necessary to meet midspan requirements.

Fig. 10—Separation—Power Conductors of Over 750 Volts

Example:

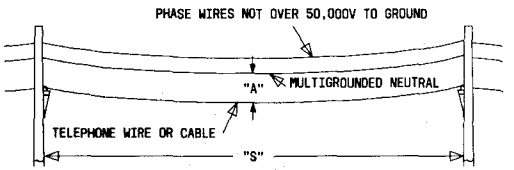
Span length is 175 feet.

Power conductors carry 7600 volts to ground and have a sag of 24 inches.

Telephone cable has a sag of 20 inches.

Required midspan separation is 42 inches plus telephone sag or 62 inches. Standard separation of 40 inches at the pole will provide (40 − 24) + 20, or 36 inches midspan separation. This is 26 less than the required 62 inches, and separation at the pole must be increased by 26 inches.

3.03 Separation requirements between telephone cables and multigrounded neutrals are shown in Fig. 11.

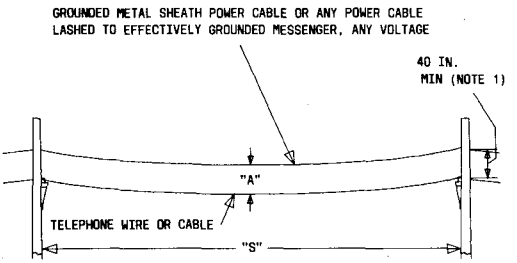


SYSTEMS OF: 22,000 VOLTS OR LESS TO GROUND 38,000 VOLTS OR LESS BETWEEN WIRES			
SPAN LENGTH (S) IN FEET	MIDSPAN SEPARATION (A) IN INCHES		CLEARANCE AT THE POLE IN INCHES (NOTE)
	CONSTRUCTION	MAINTENANCE	
150 or Less	36	30	40
151-200	42	30	40
SYSTEMS OF: 22,000 TO 50,000 VOLTS TO GROUND 38,000 TO 86,500 VOLTS BETWEEN WIRES			
150 or Less	51	45	60
151-200	57	45	60

Note: Clearance at the pole is minimum. Greater clearance may be necessary to meet midspan requirements.

Fig. 11—Separation—Multigrounded Neutrals

3.04 Separation requirements between telephone cable and power cables (except spacer-type cables) are shown in Fig. 12.

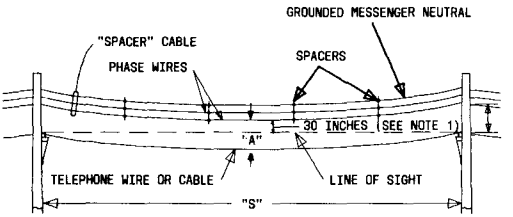


GROUNDED POWER CABLE (EXCEPT SPACER CABLE) GROUNDED METALLIC SHEATH, NONMETALLIC SHEATH CABLES LASHED TO GROUNDED MESSENGER, ETC		
SPAN LENGTH (S) IN FEET	MIDSPAN SEPARATION (A) IN INCHES	CLEARANCE AT THE POLE IN INCHES (NOTE 1)
	CONSTRUCTION AND MAINTENANCE	
Any	30	40
NONGROUNDED POWER CABLES (NOTE 2) 8700 VOLTS OR LESS		
Any	30	40
NONGROUNDED POWER CABLES (NOTE 2) 8700 - 50,000 VOLTS		
Any	45	60

Notes:
1. Clearance at the pole is minimum. Greater clearance may be necessary to meet midspan requirements.
2. Generally excludes spacer cable since the supporting messenger is usually grounded.

Fig. 12—Separation—Power Cables (Except Spacer Cables)

3.05 Separation requirements between telephone cables and spacer-type power cables are shown in Fig. 13.



SYSTEMS OF: 8700 VOLTS OR LESS TO GROUND 15,000 VOLTS OR LESS BETWEEN WIRES		
SPAN LENGTH (S) IN FEET	MIDSPAN SEPARATION (A) IN INCHES CONSTRUCTION AND MAINTENANCE	CLEARANCE AT THE POLE IN INCHES (NOTE 2)
150 or Less	30	40
151-Over	30 plus sag of tel	40
8700 - 50,000 VOLTS TO GROUND 15,000 - 86,500 VOLTS BETWEEN WIRES		
150 or Less	45	60
151 and Over	45 or if larger, 30 plus sag of tel	60

Notes:
1. Power wires must be at least 30 inches above the line of sight if "S" exceeds 150 feet.
2. Clearance at the pole is minimum. Greater clearance may be necessary to meet midspan requirements.

Fig. 13—Separation—Spacer-Type Power Cables

4. CLEARANCES ON JOINT-USE POLES—OTHER

4.01 Clearances from power transformers, voltage regulators, capacitors, pins, racks, and crossarms are shown in Tables H, I, and J and Fig. 14 and 15.

TABLE H

POWER FACILITY	TABLE	FIG.
Secondary racks	I	Fig. 14*
Steel pins	I	Fig. 14*
Power transformers, capacitors, regulators, etc	I	Fig. 15†
Metal crossarm braces attached to metal crossarms within 1 inch of nongrounded transformer or capacitor cases or supports	I	
Attached to wood crossarms less than 1 inch below top of arm	I	
Attached to wood crossarm 1 inch or more below top of arm and 1 inch or more from non-grounded transformer, etc	J	

* Generally 40 inches.

† May be reduced to 30 inches for grounded power circuits if case is effectively grounded.

TABLE I

FOR GROUNDED POWER CIRCUITS		
VOLTAGE TO GROUND	VOLTAGE BETWEEN LINES	CLEARANCE (INCHES)
8700V or Less	15,000V or Less	40
8701V – 50,000V	15,001V – 86,500	60
FOR OTHER POWER CIRCUITS		
–	8700V or Less	40
–	8701V – 50,000V	60

TABLE J

FOR GROUNDED POWER CIRCUITS		
VOLTAGE TO GROUND	VOLTAGE BETWEEN LINES	CLEARANCE (INCHES)
8700V or Less	15,000V or Less	12
8701V – 50,000V	15,001V – 86,500V	30
FOR OTHER POWER CIRCUITS		
–	8700V or Less	12
–	8701V – 50,000V	30

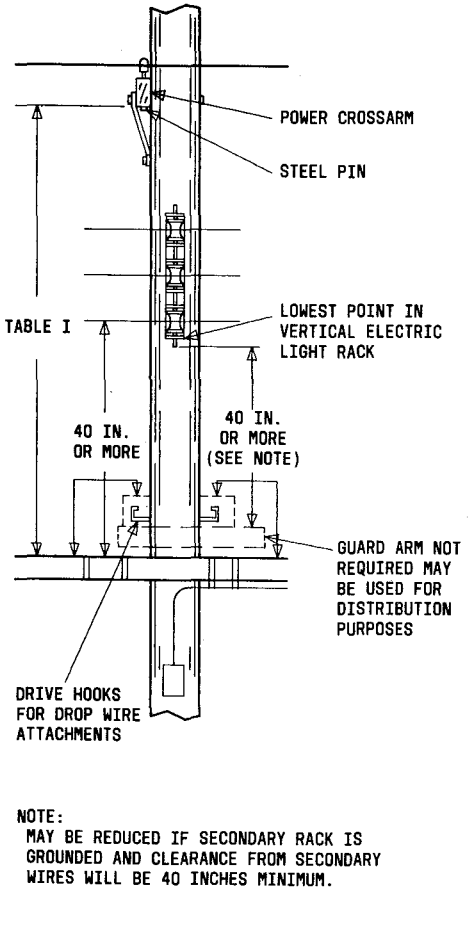


Fig. 14—Vertical Clearances Between Cable and Power Attachments

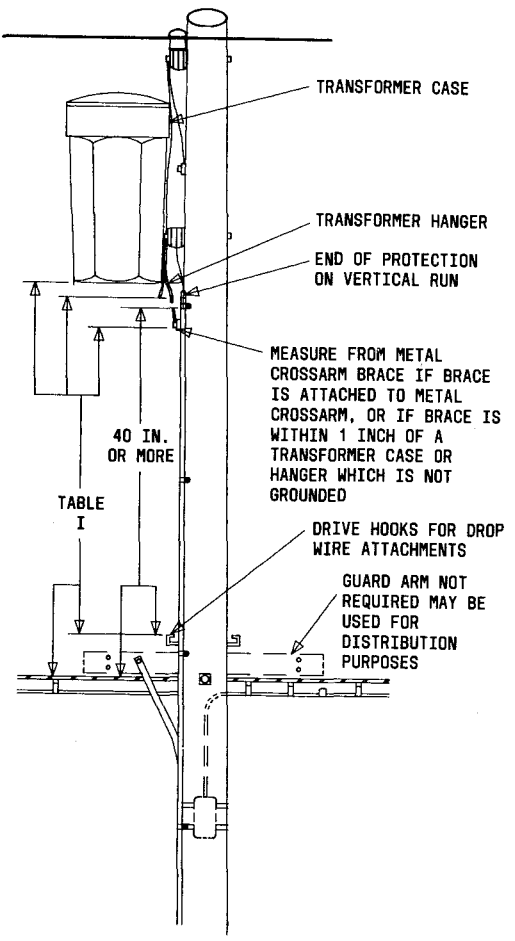
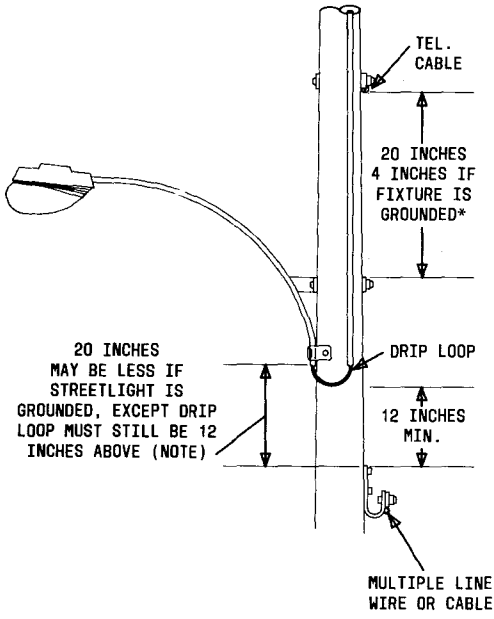


Fig. 15—Vertical Clearances Between Power Transformers and Cables

4.02 Clearances from streetlights, traffic lights, trolley wires, and associated fixtures, brackets, and wiring are shown in Table K and Fig. 16 through 22.

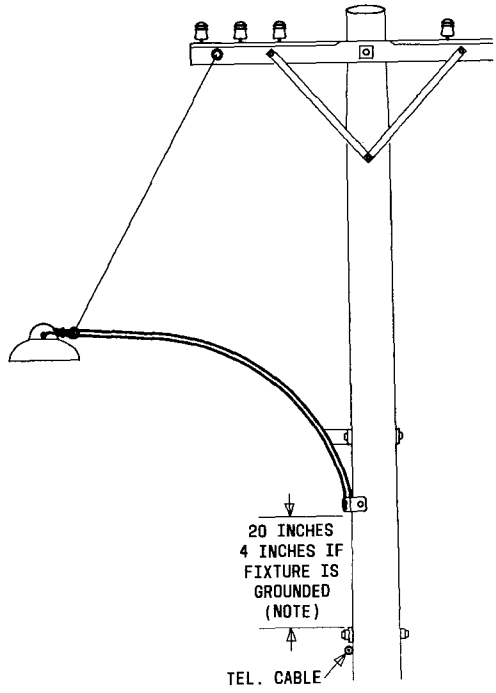
TABLE K

FACILITY	TELEPHONE PLANT	CLEARANCE INCHES	
		GROUNDED	NOT GROUNDED
STREETLIGHT FIXTURE AND ASSOCIATED WIRING (FIG. 16 THROUGH 19)			
Streetlight fixtures and span wires	Cable Guys	4	20
Drip loop entering fixture from surface of pole	Cable Guys	12	
Streetlight feed on pins and insulators	Cable Guys	6 5	
Streetlight feed run direct to fixture 40 inches from surface of pole	Cable Guys	20 6	
TRAFFIC LIGHT FIXTURES AND ASSOCIATED WIRING			
Traffic light fixtures and span wires	Cable Guys	4	20
Traffic light control cables	Cable Guys	24 below 12 if necessary	
Vertical runs for traffic light fixtures and controls	Cable Guys	Same as power vertical runs	
TROLLEY SPAN WIRES AND BRACKETS (FIG. 20 THROUGH 22)			
Span wires and brackets	Cable Guys	4	12



NOTE:
TO BE GROUNDED, FIXTURE MUST BE BONDED TO A GROUNDED STRAND OR TO A GROUND WIRE OF AN MGN SYSTEM.

Fig. 16—Clearance From Streetlight Fixture Drip Loop Above Cable or Multiple Line Wire



NOTE:
TO BE GROUNDED, FIXTURE MUST BE BONDED TO A GROUNDED STRAND OR TO A GROUND WIRE OF AN MGN SYSTEM.

Fig. 17—Clearance of Cable From Streetlight Fixture Mounted Above Cable

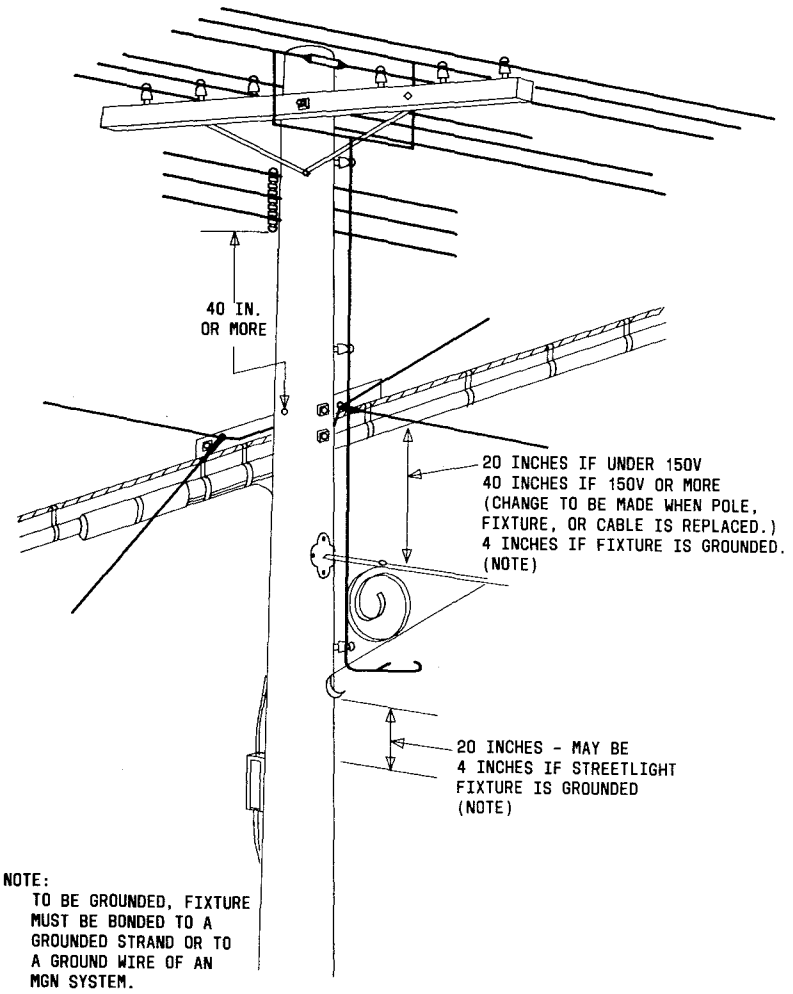
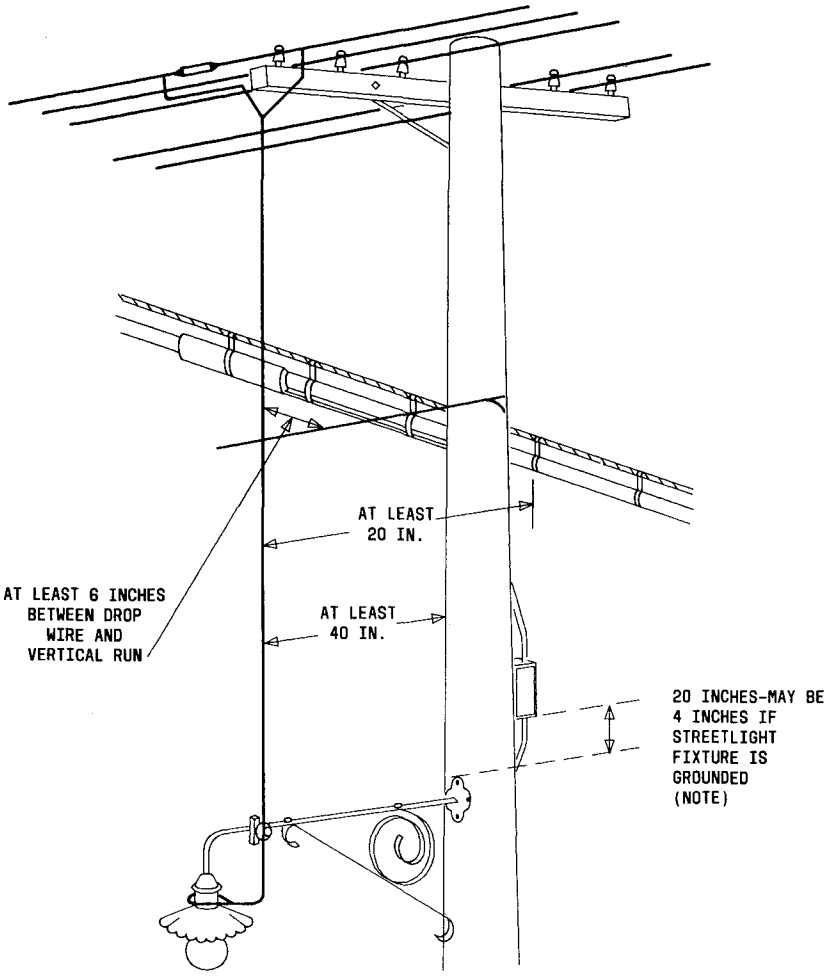


Fig. 18—Clearances of Cable and Pole-Mounted Terminal From Streetlight Fixture Mounted Below Cable



NOTE:
TO BE GROUNDED, FIXTURE MUST BE BONDED TO A GROUNDED STRAND OR TO A GROUND WIRE OF AN MGN SYSTEM.

Fig. 19—Clearances From Vertical Feed Wire of Streetlight Fixture

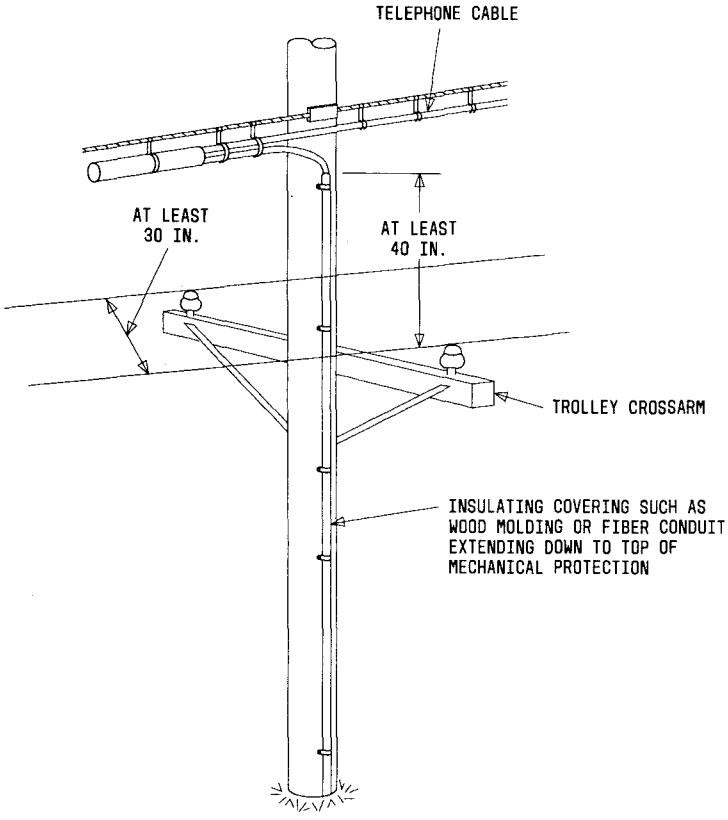


Fig. 20—Clearances Between Trolley Crossarms and Telephone Cable

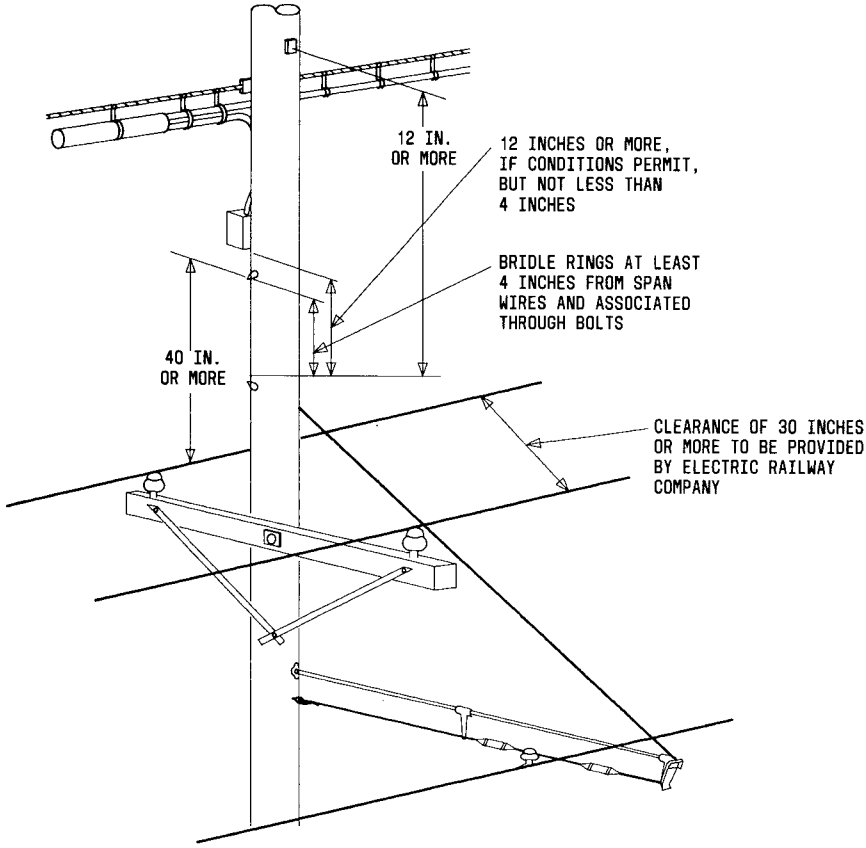


Fig. 21—Clearances Between Telephone Attachments and Trolley Wire Attachments

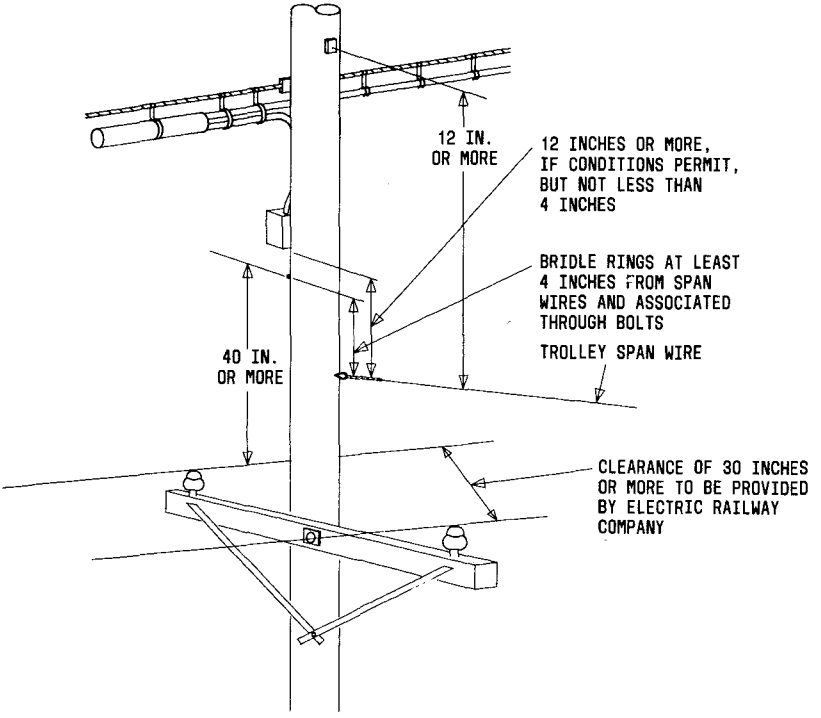


Fig. 22—Clearances Between Telephone Attachments and Trolley Span Wire

4.03 Clearances from power guys and clearances of telephone guys from telephone wire or cable are shown in Table L and Fig. 23.

TABLE L

CONDITION	CLEARANCE IN INCHES
POWER GUYS (FIG. 23)	
Power side guys attached above primary wires	40*
Pole-to-pole power guy attached above primary wires	30
Power guys attached to transmission line poles 15,000 volts to ground or higher	24
Pole-to-pole power guys not attached above primary wires but within 12 inches of bare secondary wires and within 12 inches of telephone wires	3†
TELEPHONE GUYS	
From telephone wire	6 where practical, but not less than 3

* From any part of guy which lies between guy insulator and pole. Refer to Section 621-405-201 for information on placing insulators.

† Power guys should be grounded and covered with suitable insulation when they pass power conductors or contain an insulator below the lowest power conductor and above the highest telephone cable. If none of these conditions have been met, notify the supervisor before continuing work operations.

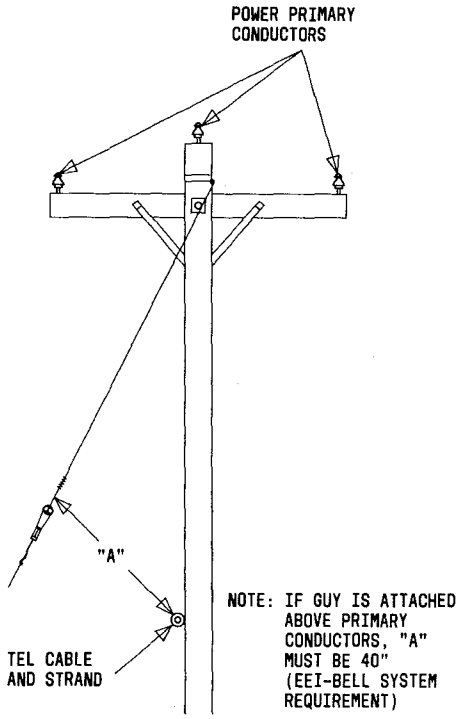


Fig. 23—Clearance Between Power Guy and Telephone Cable and Strand

4.04 Clearances from power vertical runs are shown in Table M and Fig. 24.

TABLE M

VERTICAL RUNS (FIG. 24)	
KIND OF VERTICAL RUN	CLEARANCE IN INCHES
Power service under 750 volts on pins and insulators	3
Power service on surface of pole from telephone hardware	2-minimum 1/8 pole circumference generally
Bare grounding conductors from telephone hardware	1

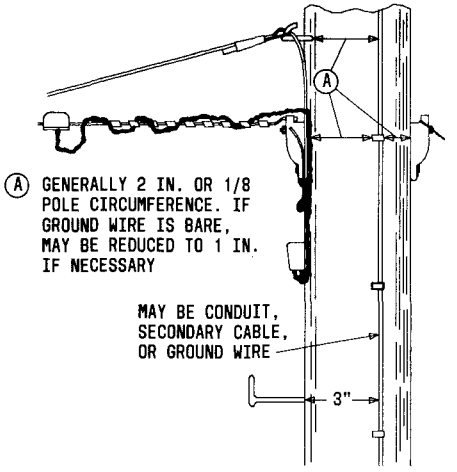


Fig. 24—Clearance Between Power Vertical Run on Pole Surface and Telephone Hardware

4.05 Clearances from licensee cable, wire, and attachments are shown in Table N and Fig. 25 through 29.

TABLE N

LICENSEE ATTACHMENTS (FIG. 25 THROUGH 29)	
LICENSEE ATTACHMENT	**CLEARANCE IN INCHES**
Licensee cable and telephone cable on opposite sides of pole (Fig. 25)	12* Diagonal
Suspension bolts of licensee and telephone cables (Fig. 25)	Not less than 4
Licensee cable and telephone cable or between two or more licensee cables (Fig. 26)	12†
Licensee strand mounted equipment or expansion loops and telephone cable (Fig. 26)	6
Power vertical run to licensee amplifier or meter and cable, bolts, washers, etc (Fig. 27 thru 29)	2 in any Direction

* Where agreement with the power utility permits.

† May be reduced by agreement of both licensee companies.

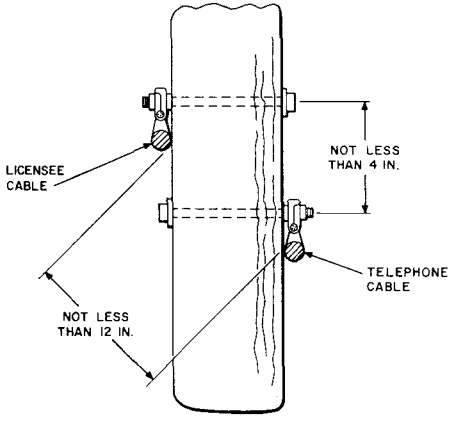


Fig. 25—Diagonal Clearance Between Licensee and Telephone Cables

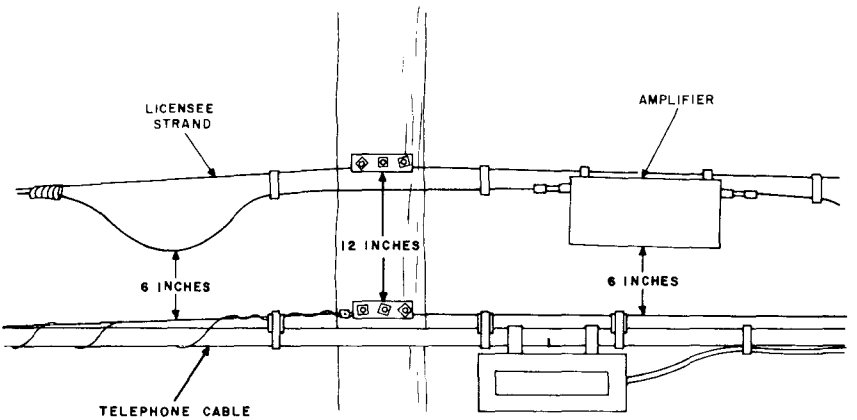


Fig. 26—Clearance Between Licensee Equipment and Telephone Company Cable

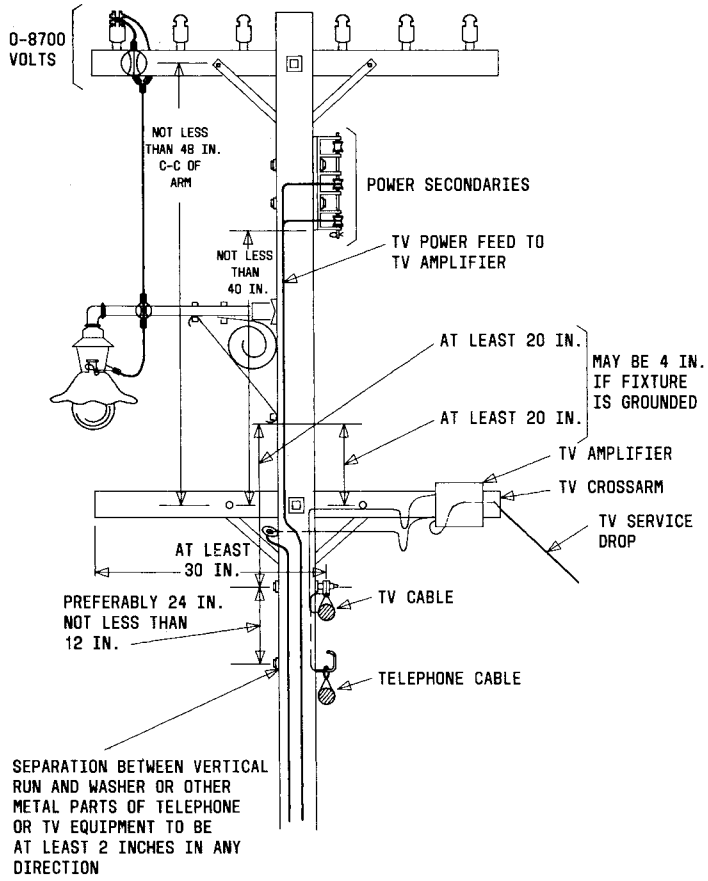


Fig. 27—Clearances on Joint-Use Pole With TV Amplifier Mounted on Crossarm

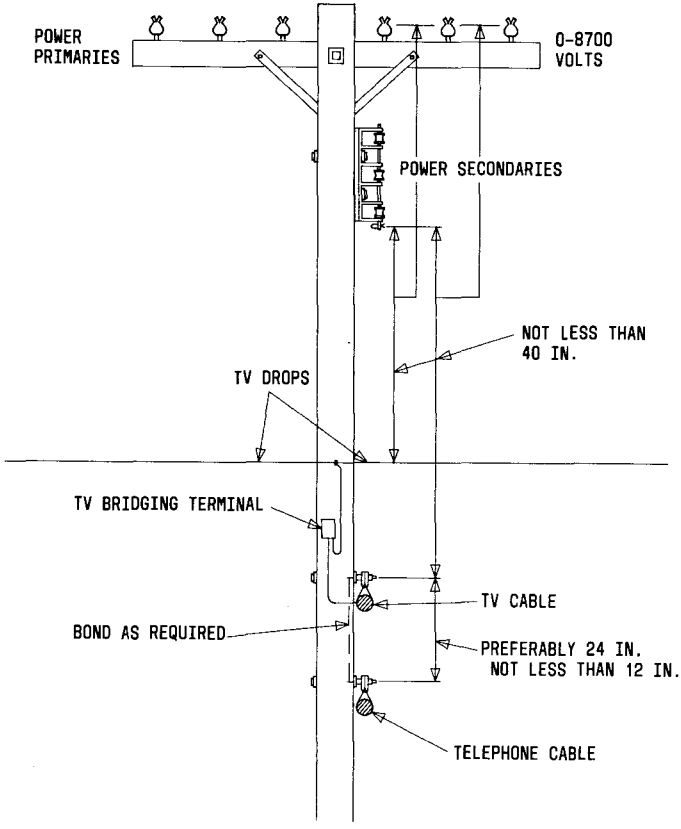


Fig. 28—Clearances on Joint-Use Pole With No TV Amplifier or Meter

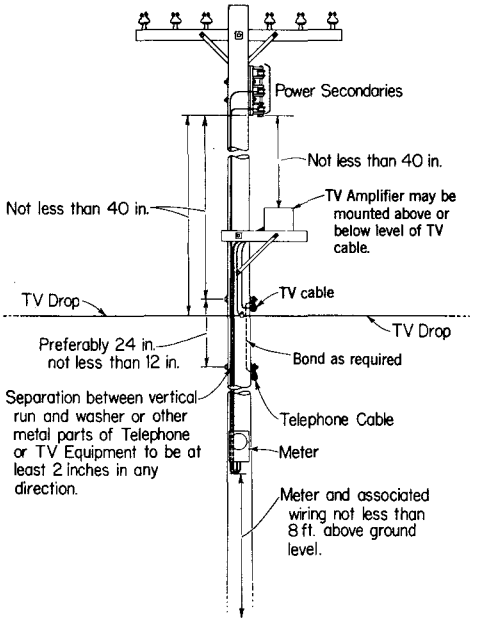


Fig. 29—Clearances on Joint-Use Pole With TV Amplifier and Meter Mounted on Pole

5. CLEARANCES FOR TELEPHONE GUYS AND CABLES

5.01 Clearances for telephone guys and cables crossing below power wires or cables (nonjoint) are shown in Table O.

TABLE O

POWER FACILITY	CONSTRUCTION			MAINTENANCE
	SPAN LENGTH IN FEET OF POWER FACILITY			
OPEN POWER CONDUCTORS*	100 OR LESS	101 – 150	151 – 175	175 OR LESS
	CLEARANCE IN FEET-INCHES			
300 Volts or Less				
Service Wires or Cables	2-0	2-6	3-0	2-0
Line Wires Generally	4-0	4-0	4-0	4-0
Within 6 Ft of Tel Pole†	4-0	4-6	5-0	4-0
301 – 750 Volts – Phase Wires				
Above Telephone Cable	4-0	4-6	5-0	4-0
Above Telephone Guy	2-0	2-6	3-0	2-0
751 – 8700 Volts – Phase Wires				
Above Telephone Cable or Guy	4-0	4-6	5-0	4-0
Within 6 Ft of Tel Pole†	6-0	6-6	7-0	6-0
8701 – 50,000 Volts – Phase Wires				
Above Telephone Cable	6-0	6-6	7-0	6-0
Above Telephone Guy	4-0	4-6	5-0	4-0
Grounded Neutrals				
22,000 Volts or Less to Gnd	2-0	2-6	3-0	2-0
Above 22,000 Volts to Gnd	Same as Associated Phase Wires			
Other Neutrals	See Paragraph 1.08 and Fig. 2 and 3.			
	Same as Associated Phase Wires			
Grounded Metal Sheath Cables	2-0	2-0	2-0	2-0
Any Cable (Grounded or Nongrounded Sheath Lashed to Ground Stand – Any Voltage	4-0	4-0	4-0	4-0
Spacer Cable*				
300 Volts or Less – Phase Wires	4-0	4-0	4-0	4-0
Within 6 Ft of Tel Pole†	4-0	4-0	4-0	4-0
301 – 750 Volts – Phase Wires				
Above Telephone Cable	4-0	4-0	4-0	4-0
Above Telephone Guy	2-0	2-0	2-0	2-0
751 – 8700 Volts – Phase Wires				
Above Telephone Cable or Guy	4-0	4-0	4-0	4-0
Within 6 Ft of Tel Pole†	6-0	6-0	6-0	6-0
8701 – 50,000 Volts – Phase Wires				
Above Telephone Cable	6-0	6-0	6-0	6-0
Above Telephone Guy	4-0	4-0	4-0	4-0

* Voltage to ground if power circuit is grounded; voltage between wires if not.

† Every effort shall be made to avoid these situations and establish a common crossing pole instead.

6. MISCELLANEOUS CLEARANCES

6.01 Miscellanceous clearances for telephone cables and guys are shown in Table P and Fig. 30.

TABLE P

FACILITY	CLEARANCE IN FEET-INCHES
	TELEPHONE SPANS 350 FEET OR LESS
TELEPHONE CABLE AND GUYS ABOVE	
Power Service Drops or Wires 300 Volts or Less Trolley Span Wires Foreign Communication Wires Cables Guys	2-0*
Trolley Contact Wires 750 Volts or Less	4-0†
TELEPHONE CABLES ALONGSIDE	
Neon Signs	4-0
TELEPHONE GUYS ALONGSIDE	
Neon Signs	1-0
Fire Hydrants (Fig. 30) Signal Pedestals	3-0
TELEPHONE CABLES AND GUYS BELOW	
Foreign Guys	2-0
Neon Signs	4-0‡
Foreign Communication Cables	2-0

* If cable crosses open power wires, increase clearance by 2 feet.

† Place guard at point of crossing and increase clearance if practical.

‡ Clearance for telephone guys is 1 foot.

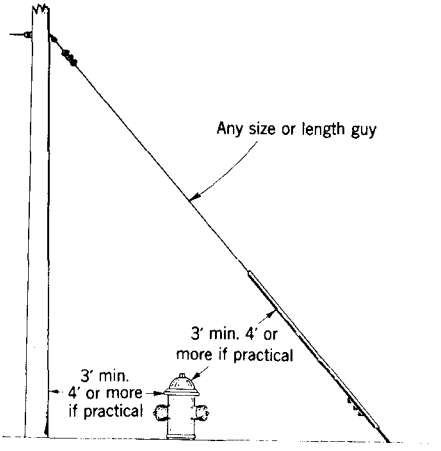


Fig. 30—Telephone Cable on Guys Above or Alongside Fire Hydrants, Signal Pedestals