# AERIAL RAILROAD CROSSINGS

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## 1. GENERAL

**1.01** This section is intended to supplement the detail plans that are prepared to cover aerial crossing of telephone lines over railroads.

**1.02** This section is reissued to revise the method of placing self-supporting cable at aerial railroad crossings and to include an additional precaution. Arrows are used to indicate significant changes.

**1.03** The standard practices applying generally to outside plant construction and maintenance apply also to crossings of telephone lines over railroads, except as otherwise provided for in this section or in the detail plans.

**1.04** Notification should be given to the railroad 15 working days before any telephone work proceeds at the railroad crossing.

**1.05** A modernized version of the specification of the Association of American Railroads covering the construction and maintenance of telephone lines crossing the tracks of railroads is contained in Section 919-000-100. The complete specification is intended primarily for the use of the plant engineers. It is not in convenient form for use by the field forces. The detail plans will generally provide practically all the additional information required for constructing the crossing in accordance with the complete specification. This section covers only those details that are not conveniently included in the detail plans and differ from the standard practices.

## 2. SAFETY PRECAUTIONS

**2.01** Because of the hazards involved at railroad crossings, the following safety precautions must be strictly adhered to:

(a) ***Insulating gloves must be worn at all times when working at any electrified railroad crossing.***

(b) At an overhead electrified section of track in the railroad crossing, the rope screen described in Section 623-500-240 should be used to prevent telephone plant from falling across railroad power lines during work operations.

(c) At railroad crossings where the power source is a "Third Rail," use extreme safety measures to prevent the ends of strand or open wire from whipping and accidentally making contact.

(d) Workmen should be located at strategic points on the track to warn the construction crews in sufficient time of approaching trains from either direction. This is especially important where the track curves out of sight of the crossing.

(e) Use care to prevent telephone plant from short-circuiting railroad or Western Union signaling circuits along railroad right-of-way at the crossing.

(f) ▶The cable and strand shall have a minimum clearance of at least 10 feet from the nearest energized part (catenary, contact conductors, hangers, etc).◀

## 3. POLES

**3.01** ***Marking poles:*** The crossing poles shall be plainly marked by means of metal characters or other equivalent designations showing the name or initials of the company owning the poles. If the line is located on or closely parallels railroad right-or-way for at least three poles adjacent to the crossing and it is the standard practice to mark at least every fifth pole in the line, no additional marking will be required on the crossing poles.

**3.02** ***Fire hazard:*** The crossing poles shall be located as far distant as practicable from flammable structures and the space around the poles shall be free from flammable material.

**3.03** Crossing poles should be set at a minimum distance of 12 feet from the tracks. Crossarms should be installed so the minimum distance to the tracks is not less than 8 feet. For lesser clearances, permission must be obtained from the railroad and specified on the detail plans.

**3.04** ***Depth of setting poles:*** In certain cases the crossing poles are of such size that no guys are required on them. The depth of setting required for unguyed crossing poles exceeds slightly, in some cases, the depths required in normal pole line construction. These cases are shown in Table A. In all other cases, set the poles to the depths recommended in Section 621-200-021.

## 4. DROP WIRE AND C RURAL WIRE

**4.01** For supporting drop wires, standard drive hooks may be used. Each span of drop wire should be attached to the drive hook by means of a drop wire clamp. The number of drop wires crossing the tracks and attached to a drive hook should not exceed two. Drop wires without a suspension strand shall in no case be used for spans longer than 100 feet in the heavy loading area, 125 feet in the medium loading area, and 150 feet in the light loading area.

**4.02** Where the crossing span exceeds the maximum limits for any loading area (paragraph 4.01), the drop wire must be supported by suspension strand in the crossing. The drop wires should be attached to the suspension strand by span clamps, lashed to the strand, or by rings of an existing ringed cable. The support attachments should be made at a point 3 feet outside each rail of each track crossed except where the distance between any two tracks is 16 feet or less. In such cases, the attachment should be placed midway between the tracks.

**4.03** Drop wires should be dead ended in both directions on the crossing poles. A drive hook is required on each side of the crossing pole in the direction of the crossing span.

**4.04** C rural wire should be dead ended on drive hooks in crossing spans as described for drop wire with the exception that only ***one*** C rural wire can be dead ended on a drive hook. Section 624-700-200 describes the method for dead ending C rural wire using dead-end supports.

**4.05** The restrictions that apply to the maximum drop wire span lengths (paragraph 4.01) apply equally to C rural wire. Where suspension strand is required, support attachment to the strand over the tracks should be made using the same methods and measurements described for drop wire.

## 5. MULTIPLE WIRE

**5.01** Where multiple wire is used in aerial railroad crossings, the B wire bracket described in Section 624-200-205 can be used for attachment to the crossing poles. It must also be supported in the span by a suspension strand.

**5.02** Use 6M or 6.6M strand to provide support for multiple wire in aerial railroad crossings on span lengths of ***150 feet or less.*** 10M strand is required for spans exceeding 150 feet. Figure 1 illustrates a multiple wire support attachment to suspension strand by using a 3-bolt suspension clamp, an S reinforcing strap, and a 1-bolt guy clamp.

**5.03** Strand supports should be placed 3 feet outside the outside rails of each track crossed. On multiple sets of tracks, two supports are required for each 16 feet of track crossing area.

## 6. OPEN WIRE

**6.01** At ***minor*** railroad crossings, wooden pole brackets in duplicate can be used on the crossing poles. Additional information can be found in Section 919-000-100.

## TABLE A

### MINIMUM DEPTH OF SETTING FOR UNGUYED POLES

| LENGTH OF POLE IN FEET | DEPTH IN FEET IN AVERAGE SOIL FOR DIFFERENT CLASSES OF POLES | | | | DEPTH IN FEET IN ROCK ALL CLASSES |
|---|---|---|---|---|---|
| | CLASS 1 AND 2 | CLASS 3 AND 4 | CLASS 5 AND 6 | CLASS 7 | |
| 25 | 5-1/2 | 5-1/4 | 4-3/4 | 4-1/2 | 3-3/4 |
| 30 | 6 | 5-3/4 | 5-1/4 | 5 | 4-1/4 |
| 35 | 6-1/2 | 6 | 5-1/2 | 5-1/4 | 4-1/2 |
| 40 | 6-3/4 | 6-1/4 | 5-3/4 | 5-1/2 | 4-3/4 |
| 45 | 7 | 6-1/2 | 6 | 5-3/4 | 5 |
| 50 | 7-1/4 | 6-3/4 | 6-1/4 | 6 | 5-1/4 |
| 55 | 7-1/2 | 7 | 6-1/2 | — | 5-1/2 |
| 60 | 7-3/4 | 7-1/4 | 6-3/4 | — | 5-3/4 |
| 65 | 8 | 7-1/2 | 7 | — | 6 |
| 70 | 8-1/2 | 8 | 7-1/2 | — | 6 |
| 75 | 9 | 8-1/2 | 8 | — | 6 |
| 80 | 9-1/2 | 9 | 8-1/2 | — | — |
| 85 | 10 | 9-1/2 | 9 | — | — |
| 90 | 10-1/2 | 10 | 9-1/2 | — | — |

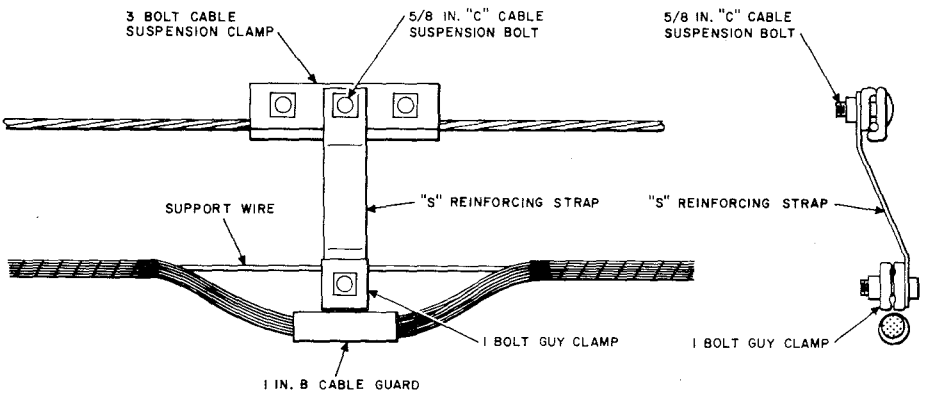


**Fig. 1—Reinforced Strand Support for Multiple Wire**

**6.02** At ***major*** crossings, double crossarms are required on each of the crossing poles. Each conductor, unless dead ended, should be tied to the insulators on each crossarm at the crossing poles. Spiral ties should be used for securing the open wire to the insulator. If there is not sufficient space between the crossarms to permit the use of a spiral tie on each insulator, place a spiral tie on the insulator toward the crossing span and a horseshoe tie on the other insulator. Section 623-235-203 describes the method for making the ties.

**6.03** Conductors in the crossing span should not be smaller than indicated in Table B.

## 7. CABLE AND STRAND

**7.01** For spans of 150 feet or less, Table C shows the minimum sizes of suspension strand to be used for supporting different sizes of cables at railroad crossings.

> ***Note:*** On spans exceeding 150 feet, use the next larger size of strand. Additional information can be found in Section 919-000-100.

**7.02** Where cable is lashed to the strand at a railroad crossing, place a lashed cable support around the cable and strand at a point 3 feet outside each rail of each track as shown in Fig. 2. Where the distance between any two sets of track centers is 16 feet or less, place the cable lashing support between the tracks instead of each side of the tracks otherwise required.

**7.03** In placing the supports, exercise care to avoid pressing the lashing wire against the cable sheath. Either thread the band between the cable sheath and lashing wire or locate the support at a point where the lashing wire crosses and is not in contact with the cable sheath.

**7.04** ▶Where self-supporting cable is used at an aerial railroad crossing, it must be attached to each crossing pole with a C cable clamp. ***Do not use a cable suspension clamp or a corner suspension clamp at railroad crossing poles.***◀

> ***Note:*** The requirements of paragraphs 7.02 through 7.04 are in excess of the requirements of the complete specification covering crossings of telephone lines over railroads and also the National Electrical Safety Code. They are included in these supplementary instructions in order to provide additional safeguards against the possibility of cables becoming separated from the suspension strand and reducing the clearances over the railroad tracks.

**7.05** ▶Spiral the self-supporting cable as outlined in Sections 627-700-014 and 627-390-011.

**7.06** See Sections 627-390-011 and 627-390-205 for methods of preventing dancing of reinforced self-supporting cable.◀

**TABLE B**

**MINIMUM OPEN WIRE SIZES**

| CONDUCTOR | SPANS 125 FT OR LESS | SPANS EXCEEDING 125 FT UP TO 150 FT (Note) |
|---|---|---|
| Copper | 104 | 128 |
| Galv. steel | | |
| In general | 134 | 128(Copper) |
| In rural districts of arid regions | 109 | 134 |
| Copper-steel | 104 | 104 |

***Note:*** Spans in excess of 150 feet should be avoided if possible.

**TABLE C**

**MINIMUM SIZES OF SUSPENSION STRAND**

| SPANS OF 150 FEET OR LESS | |
|---|---|
| WEIGHT OF CABLE (IN LBS PER FT) | SUSPENSION STRAND (NOMINAL ULTIMATE STRENGTH IN LBS) |
| Less than 2.25 | 6,000 or 6,600 |
| 2.25 to 5 | 10,000 |
| Exceeding 5 and less than 8.5 | 16,000 |

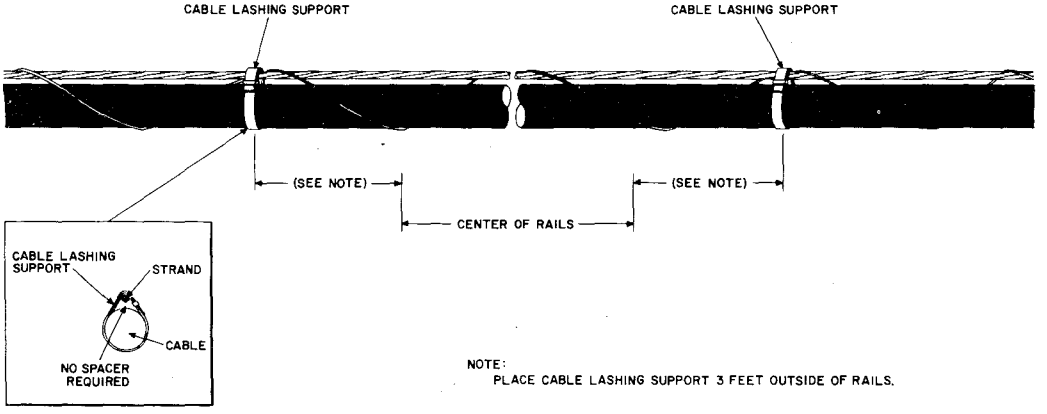


**Fig. 2—Placing Cable Lashing Supports**