BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G31.505
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Standard

OPEN WIRE REMOVAL

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1. GENERAL

1.01 This practice sets forth methods and safety precautions to be followed in the removal of open wire.

2. PRECAUTIONS

2.01 Before climbing or working on poles which are not definitely known to be strong enough to withstand additional loads to which they may be subjected, precautions should be taken as set forth in Section G10.305.

2.02 Safety precautions as described in paragraph 3.04 must be taken when removing open wire crossing over electric light, power or trolley wires, railroads, streets and heavily traveled highways. To further minimize the possibility of electrical hazard it is advisable to avoid contact with any light, power, or trolley attachments which are normally free from dangerous voltages but which may become energized; as, for example, guys which are improperly insulated, transformer cases, light fixtures, trolley fixtures, span supports, extension braces, etc.

2.03 When circuits are working on the lead involved it is essential that work be executed so as to minimize ser-

vice interruptions resulting from "shorts" and "crosses." To this end it is necessary to keep in close touch with the test board and to prevent contact between wire being removed and that on which service is being maintained. Tools, tie wires, etc., carried in the body belt are frequent causes of service interruptions.

3. REMOVAL OF WIRE

3.01 Wires or guys should not be cut in such a manner as will introduce unbalanced loads because of the possibility of breaking crossarms or poles. For example, a crossarm or pole may break under the unbalanced load caused by cutting wires along one face without releasing the tension in the opposite direction. Where unbalanced loads cannot be avoided, compensating temporary guys shall be placed.

3.02 No wire should be untied or removed within one-half mile of a crossing over light or power wires, trolley wires, a railway, or a heavily traveled highway prior to removing the wire from the crossing span, and the work should be planned accordingly. This is to preclude accidents which may result from slack running ahead of the removal job.

3.03 After wire has been removed from the crossing span, removal work may proceed in the usual manner.

3.04 The successive steps to be followed in the removal of wire crossing over power wires, railways, and heavily traveled highways and special precautions to be taken during the course of such work are set forth below:

(a) If practicable arrange with power company operating the power wires to shut off current during the removal work and for power company's linemen to open circuits or place "short" or "ground" straps within sight of the crossing.

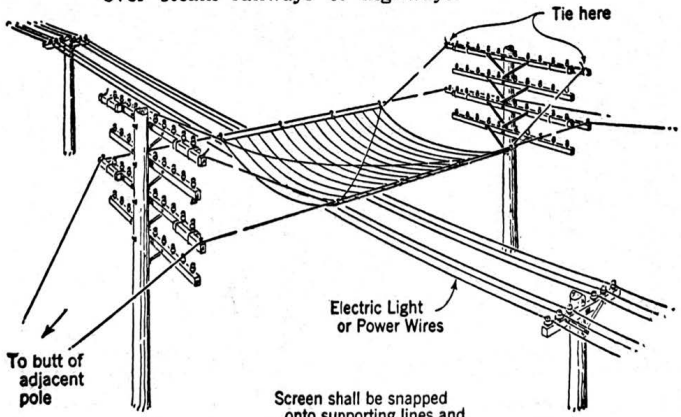
(b) Manila rope, dry and free from metallic strands, shall be the only type of rope used for removing wire at crossings involving power wires.

(c) Head guy each crossing pole away from the crossing span by means of 3/4 inch rope or larger. Attach these guys near the top of each crossing pole and near the ground line of the adjacent poles or to other satisfactory anchorage.

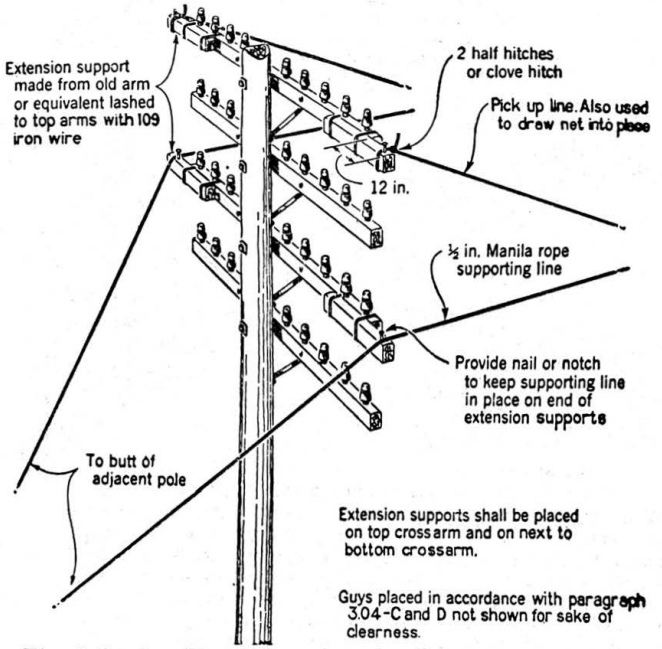
(d) Tie the crossing poles together by means of a manila rope, 3/4 inch or larger. This rope should be attached to crossing poles near point of attachment of head guys placed in accordance with paragraph 3.04 (c).

(e) Place a manila rope, 1/2 inch or larger, from the crossarm of each of the crossing poles to the butts of the adjacent line poles. These ropes are used for withdrawing the wires from the span and should be attached to the crossarms on the crossing poles in a temporary manner and so that when untied the ends will extend approximately 18 inches into the crossing span. There should be an eye, spliced or tied, in each end of the lines attached to the crossarms for attachment of the crossing wires. See illustrations under paragraphs 3.04 (i) and (j).

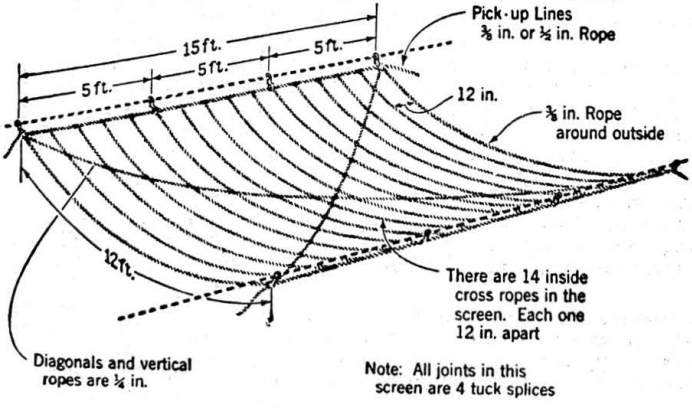
(f) If the power has not been shut off or if there is any doubt as to whether this has been done and the voltage on the power conductors exceeds 220 volts a screen of manila rope or an approved equivalent should be placed between telephone and power conductors at the point of crossing. The screen is to be employed in addition to other precautions mentioned but is not required if but one or two wires are involved in the removal, nor is it required at crossings over steam railways or highways.



Open Wire Removal



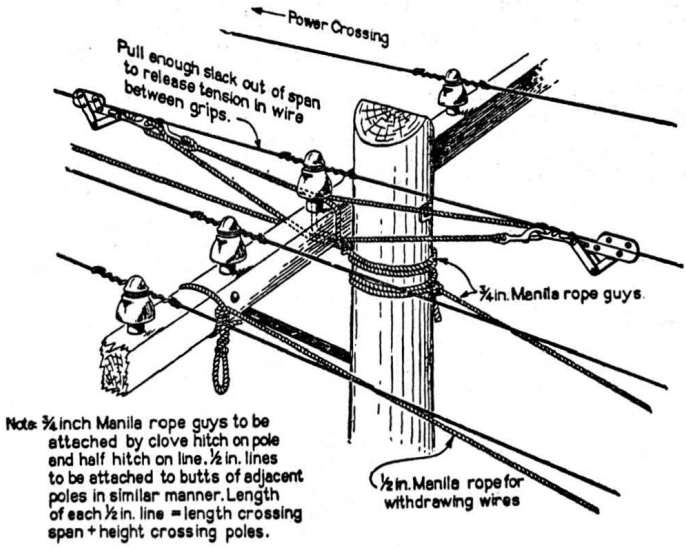
The following illustration gives details of the screen.



(g) Operations (i), (j), (k) and (l) shall be completed on one crossing pole before the same operations are performed on the other pole and men shall not be on both crossing poles simultaneously while the wire is being handled.

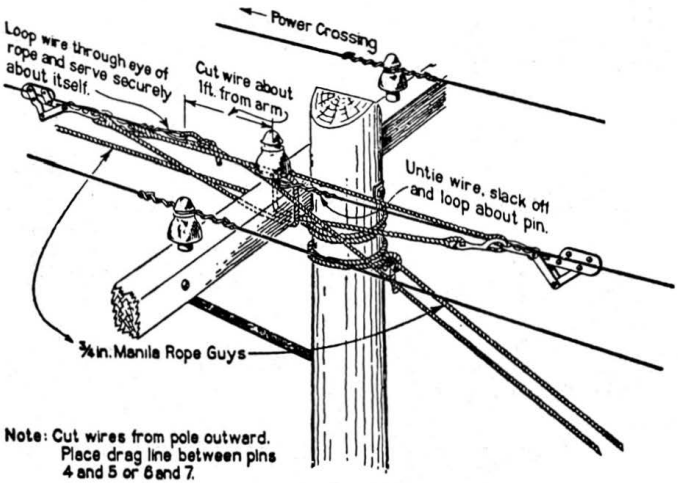
(h) Rubber gloves shall be worn at all times while cutting and withdrawing wires from crossings at which there is an electrical hazard.

(i) Place pair of wire grips or slack blocks over arm and attach to wire on each side of arm so that wire between grips will be slack.



(j) Cut line wire about one foot from crossarm on crossing side. Untie 1/2 inch manila rope line from arm and loop end of wire over crossing through the eye of this line and serve the wire about itself securely. This wire should be drawn tightly enough so that excess sag will not develop when grips are removed.

Open Wire Removal



Note: Cut wires from pole outward. Place drag line between pins 4 and 5 or 6 and 7.

(k) Loop other end of wire about pin. This end of wire should be slacked off so that the full load of the dead-end will not be carried by the arm on the crossing pole. Because of this release in tension a temporary guy is not required unless the arm is badly deteriorated.

(l) Operations should be completed on one wire before starting to work on the adjacent wire and should proceed from the pole outward. It is generally undesirable to pull out more than five wires at a time. After the wires to be removed at one pull have been cut and attached to the 1/2 inch manila line on one crossing pole, the corresponding operations should be repeated on the same wires on the other crossing pole.

(m) The wires should be withdrawn from the crossing by drawing on one of the 1/2 inch manila lines and permitting the other to slide over the crossarm into the crossing span. This work should be performed by men standing on the ground and sufficient tension should be maintained on the ropes during the entire operation to prevent the wires or ropes falling into the rope basket or contacting the power conductors.

(n) Repeat operations (e), (i), (j), (k), (l), and (m) for the remaining wires on the crossarm and in turn for such other wires as are to be removed.

3.05 In pulling out wires crossing under light, power, or trolley circuits, keep the wires taut by means of a handline to avoid the possibility of the ends flipping up and making contact with the foreign circuits. When there is an up pull at the point of the crossing, the wires to be removed should be held down by a loop around the crossarm to prevent such contact.

3.06 Wire in sections not involved in crossing spans should be cut into convenient lengths and dropped to the ground for recovery provided right-of-way conditions permit and provided there is no likelihood of introducing service interruptions. Otherwise, it should be drawn out over the crossarms after having been untied from the insulators and cut into convenient section lengths.

3.07 The intervals at which wires are cut will depend upon local conditions such as location of corner poles, crossings over electric light or power wires, railroads, highways, tree interference, etc. Favorable cutting points are:

(a) Guyed poles, because each guy in place and intact may serve as the equivalent of a temporary guy in the same direction or a push brace in the opposite direction.

(b) The poles at the ends of a section of tree interference.

Generally, it will be desirable to limit the length of the sections into which the wire is cut so that the weight of the wire removed from each will not exceed 200 pounds. As a rule, it will be more advantageous to handle short lengths of a relatively large number of wires rather than a long length of a lesser number of wires because of the difference in time involved in coiling. The lengths of wires of various gauges weighing approximately 200 pounds are tabulated below:

APPROXIMATE NUMBER OF SPANS OF WIRE WEIGHING 200 POUNDS

COPPER WIRE

Size	Feet of Wire	Span Length (ft.) 100	130	163
080	10300	104	80	67
104	6100	61	47	37
128	4030	40	31	24
165	2430	25	19	15

IRON WIRE

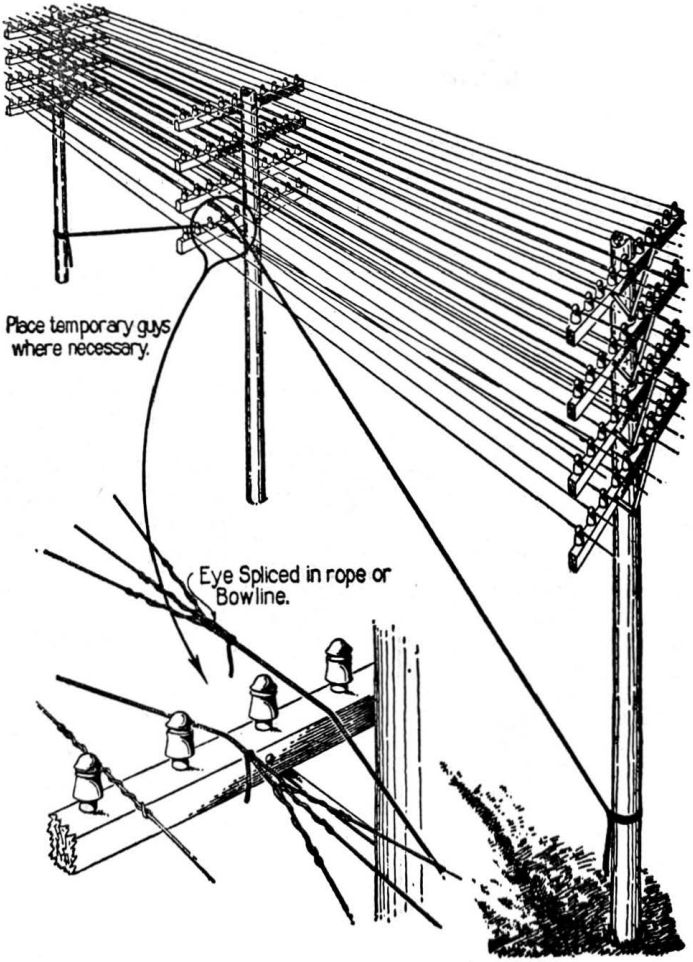
Size	Feet of Wire	Span Length (ft.) 100	130	163
083	10690	110	82	65
109	6220	67	48	38

3.08 The successive steps involved in the method in which wires are drawn out over the tops of crossarms are as follows:

(a) Place two 1/2 inch manila rope lines over the crossarm at which wires are to be cut and secure to butts of the adjacent poles. Each line shall be about 300 feet in length and should have an eye spliced or tied into the end attached to the crossarms to permit of fastening the wires to the rope as they are cut. One line should be placed so that the eye extends about two feet beyond the crossarm and the other should be placed so that the eye just reaches the crossarm.

(b) At the pole at which the ropes meet, cut one wire at a time about one foot from the crossarm on the side on which there is the greater distance between the arm and the rope eye. Loop the ends of the wires through the rope eyes and serve the wires upon themselves securely enough so that they will not become detached while pulling them out. Cut as many wires as can conveniently be removed in a single pull and bunch them so as not to retard pulling operations. Wires to be removed from the top crossarm may be bunched in any convenient position, either on the top arm or on an adjacent arm. Wires on other arms should be bunched either on the same arm from which they were untied or on

an adjacent arm and on the same side of the lead as the pins from which they were removed. The set-up is illustrated below:



(c) Cut or untie the tie wires on all wires to be removed throughout the length of the particular section. Bunch the wires as described in the preceding paragraph. Remove or straighten and turn back all ties to prevent them from catching on pins or crossarms.

(d) Repeat operations described in paragraphs 3.08 (a) and (b) at opposite end of section from pulling line. The wires may then be withdrawn by means of a power driven wire take up reel or by hand, the drag line being used to prevent the accumulation of excessive sag and to control the ends of the wires.

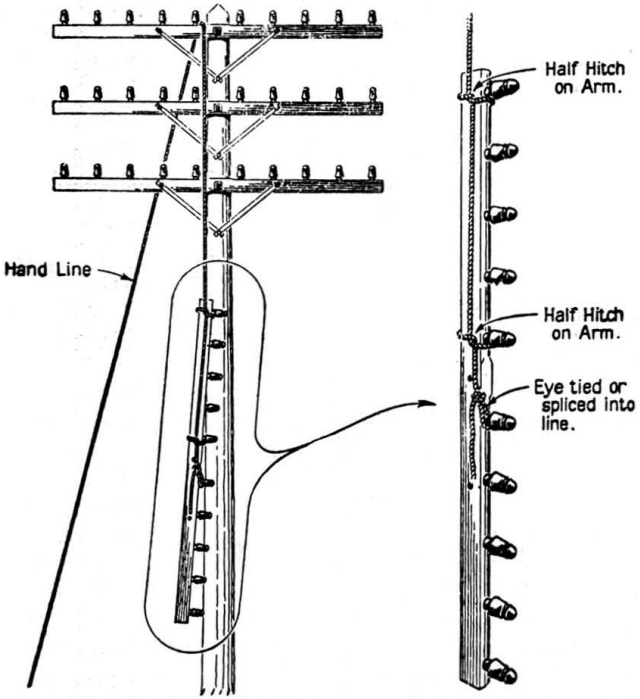
3.09 Copper wire has a high salvage value and should be neatly coiled with ties placed at least three points on the coil. The wire should then be returned to the storeroom for weighing or disposed of in accordance with other instructions or routines. Copper ties and pieces of copper wire should also be salvaged.

3.10 Iron wire has no salvage value but should be gathered up and disposed of to the best advantage consistent with safety and good public relations.

4. REMOVAL OF CROSSARMS AND OTHER EQUIPMENT

4.01 If because of right of way conditions, public relations, or other reasons it is desirable to remove crossarms from poles while still in the air, proceed as follows:

(a) Pass handline over upper crossarm or attach the line to the arm by means of a block and lower the arm to be removed as shown below:



The handline should be passed through a rope lashing placed near the top of the pole for removal of top arm.

(b) Remove drive screw holding crossarm braces by means of a lineman's wrench or a bit brace socket wrench.

(c) Remove crossarm bolt by turning nut so that there is not quite a nut full of the bolt remaining in the nut. Drive bolt out as far as nut will permit and after removing nut lift off arm and lower it to the ground with a handline. The removal of the bolt from the pole can be completed by using a one-half inch bolt or similar article as a drift pin. Keep head back from bolt as far as practicable to prevent any particles of spelter flying into the eyes. Do not permit the bolt to fall to the ground.

(d) Crossarm equipment, such as braces, insulators, transposition brackets, etc., should generally be removed from crossarms after the arms have been lowered to the ground.

4.02 In removing insulators care should be taken to avoid injury from cracked or chipped glass.

5. SORTING AND DISPOSING OF WIRE, CROSSARMS AND OTHER EQUIPMENT

5.01 Crossarms and other equipment should be sorted at a convenient point and divided as between junk and good material. In some cases, crossarms which are not suitable for reuse as such, may be cut and reused as guard arms.

5.02 Insulators should be sorted according to type and returned to the storeroom or disposed of in accordance with other instructions. Broken insulators or insulators having no reuse value should be buried at convenient points or disposed of otherwise.

5.03 Crossarm braces, if in good condition, may be reused.

5.04 Crossarm bolts, if in satisfactory condition, may be reused.

5.05 Transposition brackets may be reused if in good condition, otherwise they should be disposed of as junk.

5.06 As a general rule it is inadvisable to reuse hardware which is ungalvanized or on which the galvanizing is chipped or deteriorated to any marked degree.