BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G32.170
Issue 2, January, 1935
AT&T Co. Standard

DROP AND BLOCK WIRING
SERVICE CABLES

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1. GENERAL

1.01 This section describes the service cables used for underground connections to subscribers' premises and outlines their methods of installation with the following exceptions. The placing of service cable in a trench is covered in the Buried Cable Practices and the termination of service cable at subscribers' premises will be found in the Station Installation and Maintenance Practices.

1.02 The reissue of this section is necessitated by the standardization of Types LR and TR Cables to replace Types LS and ALS Cables and the standardization of the new Type JR Cable.

1.03 The conduit provided for service cables shall conform with the Practices covering Underground Conduit for Service Connections.

1.04 Where a two-pair cable is not sufficient to provide for the ultimate requirements, paper insulated lead covered cable shall be used and the work done in accordance with the instructions covering Underground Cable and Cable Splicing.

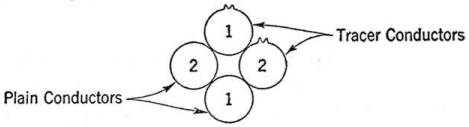
1.05 When the installation of service cables involves work in manholes, observe the precautions which apply to guarding the open manhole, testing for gas in the manhole and ventilation.

1.06 If the conduit is occupied by cable or wires other than the pulling-in line, refer the condition to your supervisor so that he may discuss it with the Office before placing the service cable.

2. DESCRIPTION OF SERVICE CABLES

2.01 Three types of service cables are available in one and two-pair sizes for underground connections to subscribers' premises. Type LR, which replaces Type LS, consists of rubber insulated 22-gauge tinned copper conductors sheathed with lead antimony alloy. Type TR, which replaces Type ALS, is the same as Type LR with protective coverings of jute, steel tape and asphaltic compound. Type JR is an additional cable which is the same as Type LR with protective coverings of jute, paper tape, and asphaltic compound.

2.02 The two conductors which have longitudinal ridges in the rubber insulation shall be considered as the tracers and each of these tracers shall be grouped with a plain conductor to form a pair.



Use conductors 1 and 1 to form one pair.
Use conductors 2 and 2 to form the other pair.

2.03 The following table gives the diameters and weights of the service cables.

Type of Cable	Number of Pairs	Overall Diameter (Inches)	Weight per 1000 ft. (Pounds)
LR	1	1/4	275
(Lead Covered)	2	5/16	310
JR	1	15/32	370
(Jute Protected)	2	17/32	410
TR	1	9/16	530
(Tape Armored)	2	5/8	580

2.04 Type LR Cable is intended for installation in conduit. Types TR and JR Cables are designed to be buried directly in the ground. Type JR will ordinarily be

satisfactory for the latter use, but where some mechanical protection is required, Type TR shall be employed.

3. PLACING SERVICE CABLE IN CONDUIT

3.01 The cable may be pulled from either end of the conduit, depending on which is the more practicable.

3.02 Where cable reel is located at pole or manhole, set it up over the conduit in such a manner that the cable can be passed from the top of the reel in a long smooth bend into the conduit. The reel shall be jacked up so that it is clear of the ground and is approximately level.

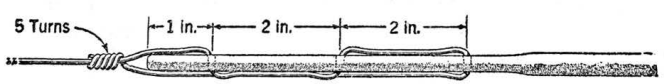
3.03 Attach pulling-in line, 083 or larger size galvanized wire, to service cable preferably by means of a 3/8-inch Cable Grip as illustrated. When using the grip on the one-pair cable, apply several layers of 3/4-inch Black Friction Tape at end of grip to insure that grip will not loosen and become detached during the pulling-in operation.

3.04 When a 3/8-inch Cable Grip is not available, attach 083 galvanized wire directly to the service cable as follows:

(1) Flatten end of cable for approximately 6 inches.

(2) Drill three 3/32-inch holes with Automatic Drill or drive three holes with a 4d. nail from alternate sides of cable at approximately 2-inch intervals.

(3) Thread pulling-in line through holes in the arrangement illustrated, inserting approximately 18 inches of wire through hole nearest end of cable in order to minimize distortion of holes when threading wire through other two holes.



3.05 When 083 or larger size galvanized wire is found in the conduit, and an inspection of the visible portion indicates that the wire is in good condition, it may be used as the pulling-in line. Wire larger than 109, however, shall not be attached directly to the service cable.

3.06 The men at the pulling end of the cable shall watch for signals so that the pull may be stopped instantly if necessary.

3.07 Where a power winch is used, pull cable at a speed of not more than 90 feet per minute.

3.08 Exercise care to avoid kinking or flattening the cable and do not allow the cable to scrape against the edge of the manhole frame or end of conduit. If necessary, protect cable with a Rope Mat placed over the edge of the manhole opening.

3.09 Watch the cable as it unreels and stop the pull if any defect is noticed. Do not pull in cable having cracked or broken sheath unless such defects are repaired by soldering.

3.10 Leave a sufficient length of cable at the subscriber's premises to permit terminating in accordance with the Station Installation and Maintenance Practices.

3.11 Leave a sufficient length of cable at the pole or manhole to permit terminating as described in Part 4 or Part 5.

3.12 After the cable has been placed, seal the conduit around the cable at the manhole and also at the subscriber's premises. Plug the conduit with Oakum and cover the Oakum with either a 1-inch layer of Rugby cement or mortar composed of equal parts of Plaster of Paris and sand, or a 3/8-inch layer of mortar composed of one part cement and three parts sand.

4. TERMINATING SERVICE CABLE AT POLE

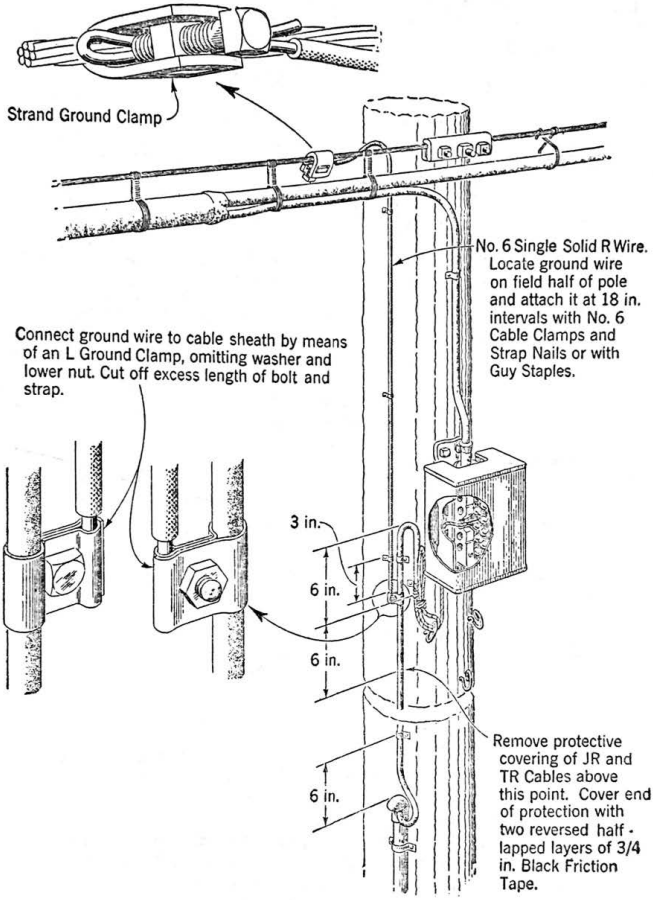
4.01 Attach the service cable to pole at two-foot intervals by means of cable clamps and strap nails, selecting the proper size clamp from the following table.

Type of Cable	Size of Cable Clamp
LR	No. 4
*JR	No. 9
*TR	No. 11

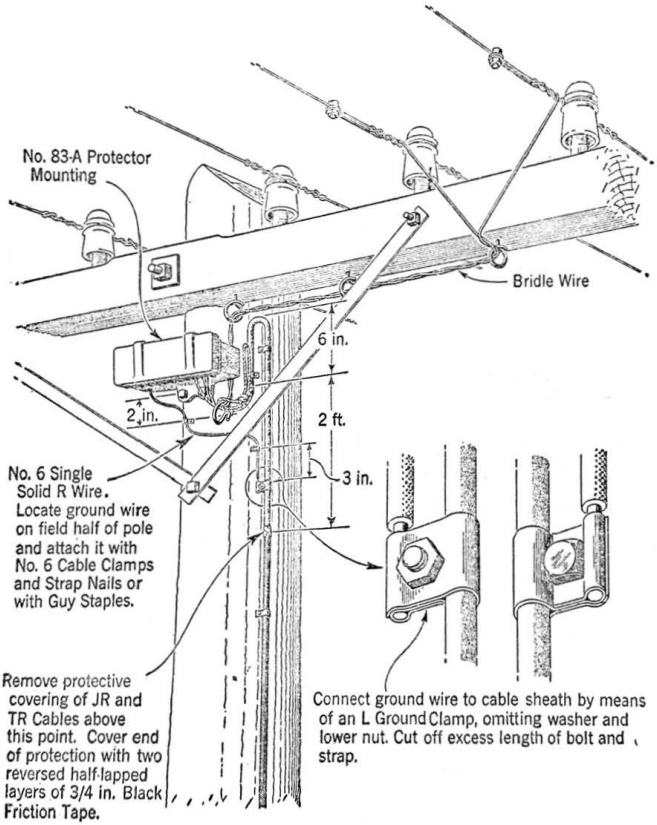
*Use No. 4 Cable Clamp where protective covering has been removed.

4.02 Terminate the service cable at outside distributing terminals as illustrated. Where only one pair of a two-pair cable is used initially, the length of the unused pair shall be sufficient to permit terminating on any pair of binding posts. Wrap each pair of conductors from end of cable sheath to edge of terminal face plate with two reversed half-lapped layers of 3/4-inch Black Friction Tape. Cover junction of taped conductors and cable sheath with friction tape in the same manner. Route conductors through the first

ring when entering left side of terminal and through the three rings when entering right side of terminal. Dispose of unused pair by turning it back on itself around the first ring and tape the end securely to the same pair.

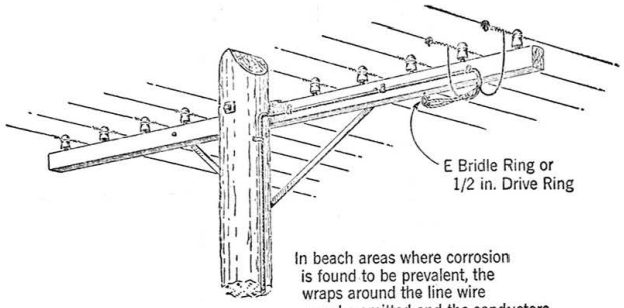


4.03 When the service cable is to be connected to open wire and cable protection is required, terminate the cable conductors in a No. 83-A Protector Mounting and bridle to the open wire as illustrated. Where only one pair of a two-pair cable is used initially, the length of the unused pair shall be sufficient to permit terminating on any pair of binding posts. Tape conductors and dispose of unused pair as outlined in Paragraph 4.02.



4.04 Where more than one service cable is terminated at a pole and cable protection is required, bond the sheaths of these cables together by means of L Ground Clamps and No. 6 Single Solid R Wire. In all cases, one of the bonded sheaths shall be connected to either the cable suspension strand or the No. 83-A Protector Mounting ground post.

4.05 When a No. 83-A Protector Mounting is not required, connect the service cable directly to the open wire as illustrated. Wrap unused pair of conductors with two reversed half-lapped layers of 3/4-inch Black Friction Tape and cover junction of conductors and cable sheath with friction tape in the same manner. Dispose of unused pair by turning it back on itself around the ring and tape the end securely to the same pair.

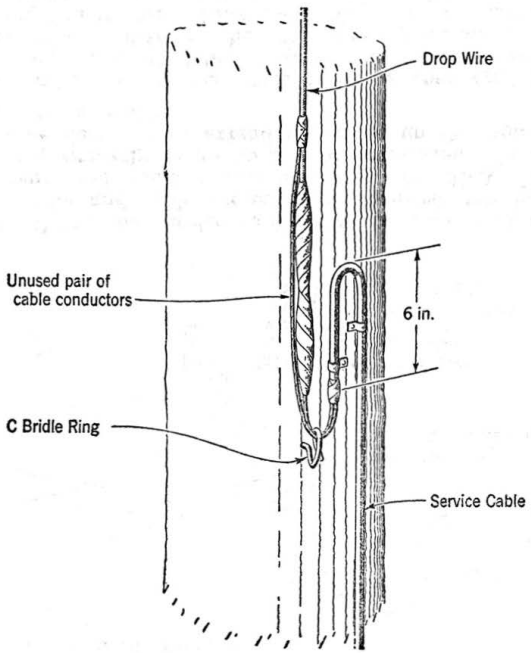


In beach areas where corrosion is found to be prevalent, the wraps around the line wire may be omitted and the conductors brought directly to the bridging connectors.

4.06 When the service cable is to be connected to drop wire and cable protection is required, terminate the drop wire and cable conductors in a No. 83-A Protector Mounting similarly to an open wire connection. In general, it will be desirable to extend the cable up the pole to the usual terminal height.

4.07 When the service cable is to be connected to drop wire and no cable protection is required, splice the service cable directly to the drop wire by means of No. 1A Bridging Connectors. Tape each joint and the entire splice as specified in the Practices covering bridging connectors. Wrap each pair of conductors from end of cable sheath to splice or end of wire with two reversed half-lapped layers

of 3/4-inch Black Friction Tape. Cover junction of taped conductors and cable sheath with friction tape in the same manner. Tape the end of the unused pair securely to the drop wire.



5. TERMINATING SERVICE CABLE AT MANHOLE

5.01 Attach service cable to manhole wall by means of cable clamps and hammer drive anchors, spaced approximately 17 inches apart, in an arrangement which will permit terminating on the proper binding posts with sufficient slack to allow transferring to any other pair in the terminal. The sizes of cable clamps and anchors required for each type of cable are as follows:

Type of Cable	Size of Cable Clamp	Size of Hammer Drive Anchor
LR	No. 4	3/16 in. x 7/8 in.
*JR	No. 9	1/4 in. x 1 in.
*TR	No. 11	1/4 in. x 1 in.

* Use No. 4 Cable Clamp where protective covering has been removed.

5.02 Terminate service cable at UG16 Cable Terminal as follows:

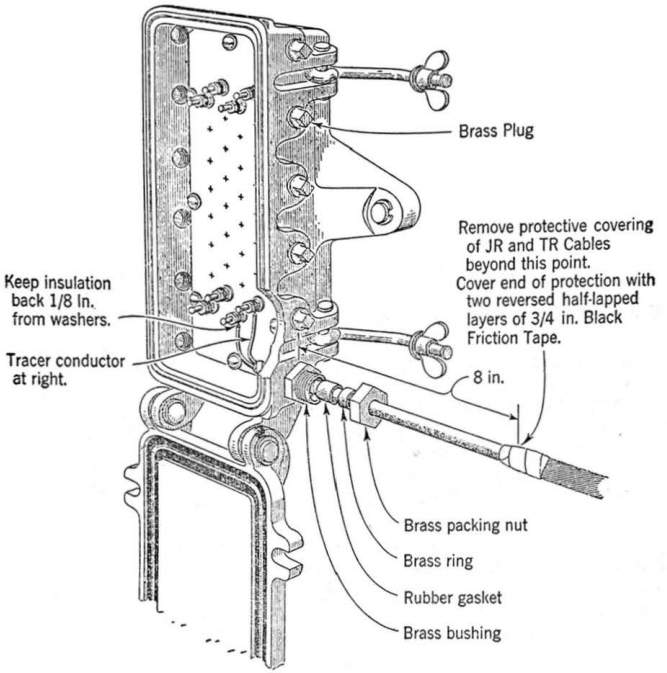
(1) Replace brass plug nearest binding posts on which service cable is to be terminated with brass bushing of a stuffing box, coating the threads with plumbers' lead or other compound. The UG Cable Terminal Wrench shall be used in removing brass plug and placing stuffing box.

(2) Remove a sufficient length of sheath from the cable to permit terminating the conductors on the proper binding posts. Where only one pair of a two-pair cable is used initially, the length of the unused conductors shall be sufficient to permit terminating on any pair of binding posts.

(3) Place brass packing nut, brass ring and rubber gasket of stuffing box on the cable in the order named.

(4) Cover junction of conductors and sheath of two-pair cable with two reversed half-lapped layers of 3/4-inch Black Friction Tape. Substitute rubber tape for friction tape on the one-pair cable and extend one half-lapped layer 2-1/2 inches along cable in order to insure a water-tight connection at the stuffing box.

(5) Insert conductors through the brass bushing and pull cable into the terminal so that the end of the sheath will extend approximately 1/4-inch inside the terminal.

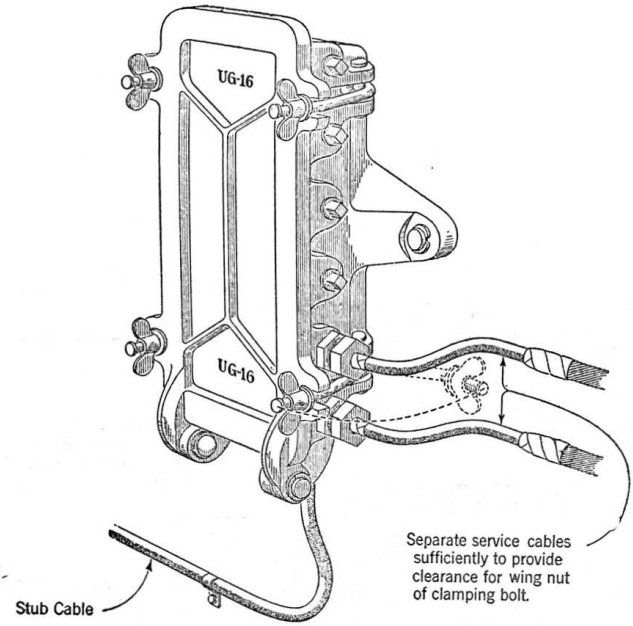


(6) Insert rubber gasket into the brass bushing and place brass ring close to rubber gasket.

(7) Screw brass packing nut firmly into the brass bushing.

(8) Tape ends of unused conductors and arrange them so that they will not be in contact with binding posts or interfere with other wiring.

(9) Close terminal cover and engage clamping bolts with the notches in the cover, making sure that the bolts fully engage the notches, and then turn the wing nuts down as tightly as possible by hand.



5.03 Terminals found to have damaged clamping bolts, deteriorated cover gaskets or missing brass plugs shall be repaired immediately if workman detecting the condition has the necessary materials, or if not the terminal shall be reported for repair as soon as practicable.

6. TERMINATING SERVICE CABLE AT PEDESTAL TYPE CABLE TERMINAL

6.01 Insert service cable through one of the elongated holes in base of pedestal into cable terminal box and terminate it in the arrangement illustrated. Where only one pair of a two-pair cable is used initially, the length of the unused pair shall be sufficient to permit terminating on any pair of binding posts. Dispose of unused pair by turning it back on itself around the No. 8 A Distributing Ring and tape the end securely to the same pair.