

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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CABLE SPLICING — BURIED

SPLICE PROTECTION

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1. GENERAL

1.01 This section outlines the method of applying protection to buried cable splices. It replaces Issue 1 and is reissued to include vinyl tape for corrosion protection and to provide mechanical protection for splices in tape and wire armored cables.

1.02 Two types of corrosion protection are available; B Polyvinyl Tape and Pitch Tape. If the cable is wire or tape armored, mechanical protection in the form of brass wire cloth or a galvanized casing should be used. Pitch tape can be used with either of these types of mechanical protection. It is practicable to use the vinyl tape only on armored cables which are protected with brass wire cloth or on cables on which no mechanical protection is necessary such as polyethylene sheathed or jute protected lead sheathed cable.

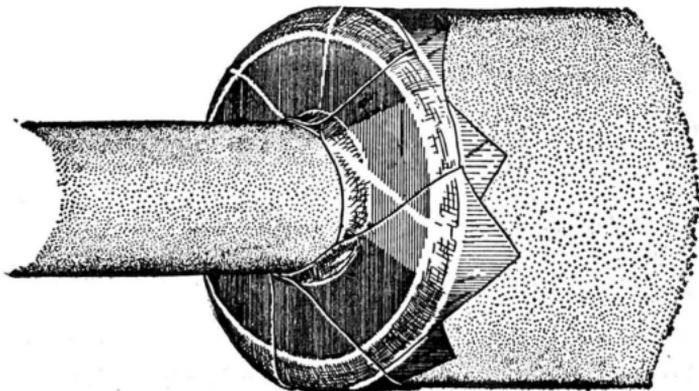
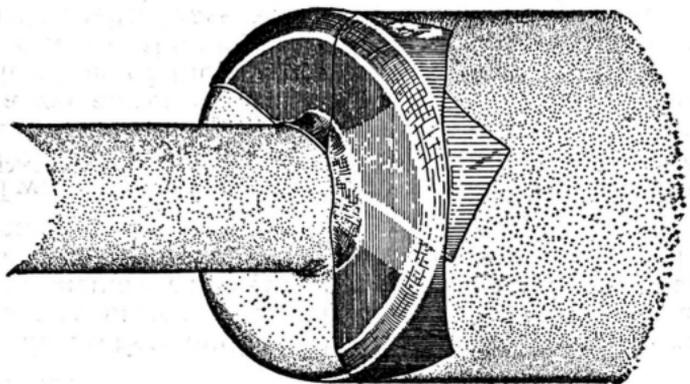
1.03 Before applying any protection clean and dry the surface of the sleeve and adjacent sheath to be covered. ↙

2. CORROSION PROTECTION—VINYL TAPE

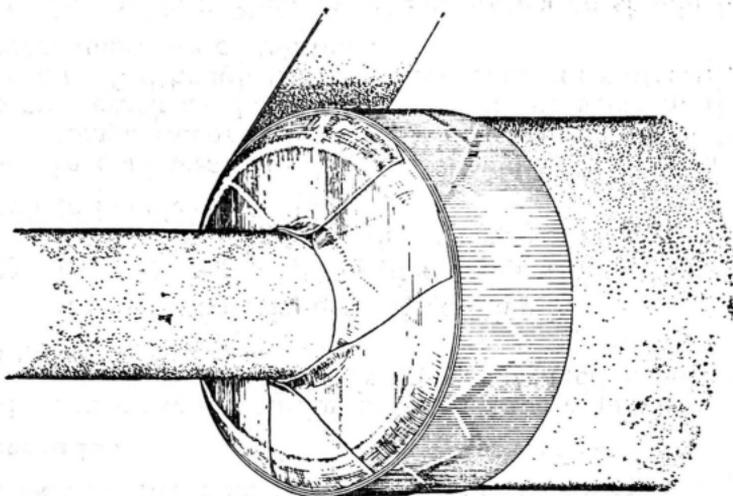
2.01 The method of applying vinyl tape outlined below may be used on cables having lead or polyethylene sheath.

Straight Splice

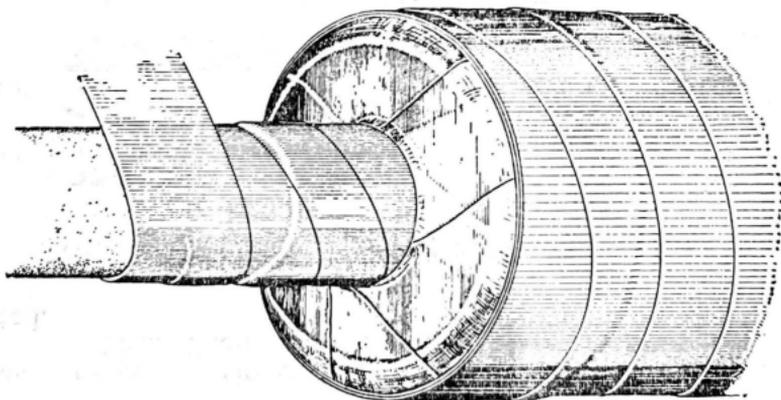
2.02 Apply strips across the end plate or beat in, as illustrated below, completely covering the surface. The tape should extend onto the sleeve a minimum of 1/2 inch. If the difference in diameter between sheath and sleeve is more than 1-1/2 inch it will be necessary to use two widths of tape.



2.03 Starting at the top of the end plate make two complete turns of tape around the sleeve binding down the strips that have been placed over the wiped joint. Then apply one half-lapped layer of tape across the sleeve finishing with two full turns of tape. Do not stretch the tape during application.

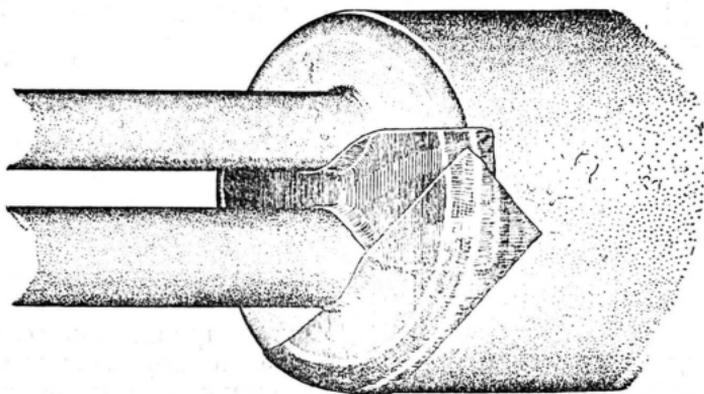


2.04 Starting at the junction of the cable and the sleeve make two turns around the cable covering the edges of the strips previously applied. Then cover the cable with one half-lapped layer of tape extending about three inches beyond the end of the corrosion protection and finish with two full turns of tape. Do not stretch the tape.



Multiple Joint

2.05 Place a strip of tape in the crotch between the two cables. Then cover the end plate or beat in as illustrated.



2.06 Wrap the sleeve and cable as outlined above.

3. CORROSION PROTECTION—PITCH TAPE

Precaution

3.01 Since the application of Pitch Tape requires the use of an acetylene torch this type of protection **must not be used in manholes.**

3.02 Keep the material dry before using it.

3.03 Keep the material out of the sun before application in warm weather; otherwise it may soften unduly and be difficult to handle.

3.04 In cold weather, the tape should be kept in a heated compartment if feasible. When the tape is chilled, the pitch may crack as the roll is unwound and some of the pitch may spall off although this condition does not materially affect the subsequent use of the tape.

3.05 In applying Pitch Tape, eye protection should be worn to protect the eyes from small particles of pitch that may fly off the tape as its surface is heated.

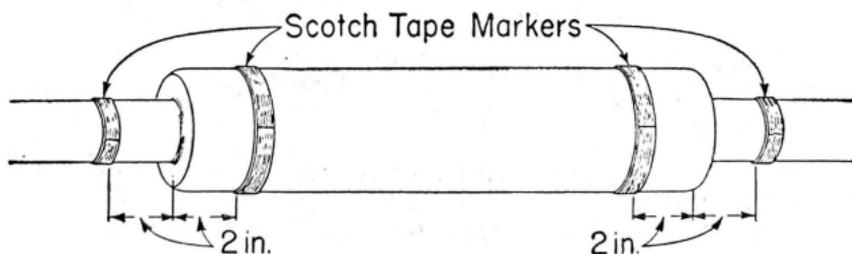
3.06 Use of a small flame will keep the above action to a minimum. **Do not overheat** as this will expose the fabric and the pitch may catch fire.

Lead Sheathed Cables

- 3.07 The method of applying the tape outlined below is applicable to **lead sheath** cables.
- 3.08 It is desirable to use a narrow roll of tape in wrapping small diameter cables, stubs, pipes, etc., adjacent to the sleeve; a wide roll can be applied more quickly to sleeve surfaces and the larger cables. Thus, a 2-inch and a 4-inch roll will be adequate for most jobs. However, these tapes can be torn or cut to narrower widths. For instance, if a 2-inch width is not on hand, short widths can be made by tearing the 4-inch tape in half lengthwise. Similarly, narrower widths can be made for very small diameter cables or pipes by tearing lengthwise the 3-inch or 2-inch widths of tape.
- 3.09 When unrolling the tape, start to unroll the tape from the edge rather than pulling the full width of the tape. Once the end is free, pull the full width of the tape.
- 3.10 The tape is softened by a light application of heat from a torch on the surface of the tape that will contact the sheath just before each strip or section of tape is placed. This application of heat accomplishes two things; first, it softens the tape so that it becomes limp and easily shaped; second, the contact surface of the tape is heated enough to liquefy the pitch and make it adhere to the cable sheath.
- 3.11 The tape will be soft enough to apply as soon as the pitch on the heated surface becomes bright and shiny.

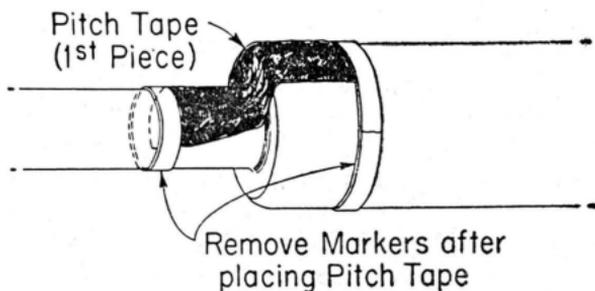
Straight Splice

- 3.12 Measure about two inches on the cable sheath and two inches on the sleeve away from the wiped joint and mark the distances with scotch tape as shown below.

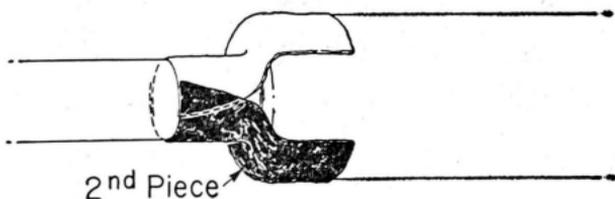


3.13 Prepare short pieces of Pitch Tape to cover the end plates or wiped joints. The length of these pieces equals the distance between the scotch tape markers measured along the surface of the sheath, plate or wiped joint and sleeve.

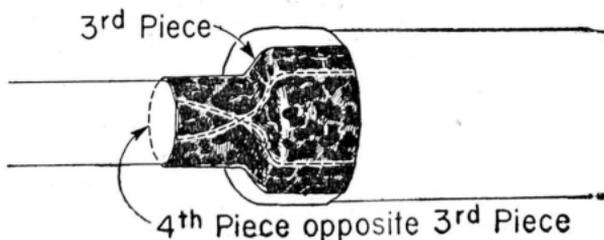
3.14 Soften and apply each piece of tape individually, making sure that the tape is sticking to the sleeve. The position of the first piece is illustrated below.



3.15 If only three pieces are used they may be applied in sequence. Where four pieces are used the second piece is applied at the opposite side of the sleeve to the first as illustrated below.

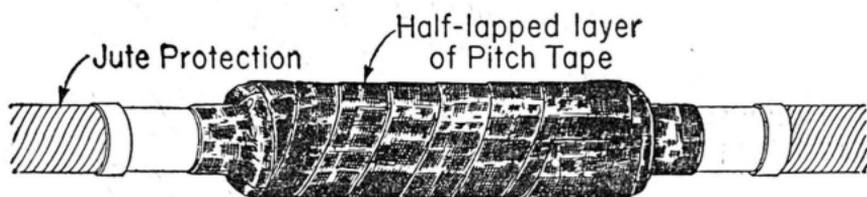


3.16 Apply additional pieces illustrated below.

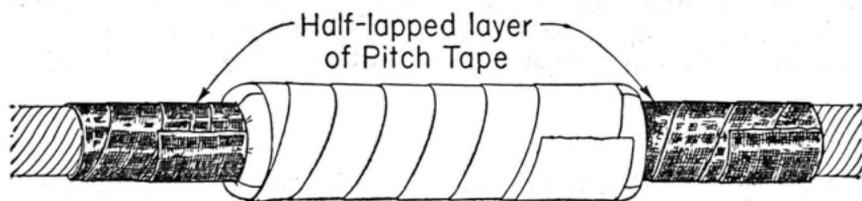


3.17 Place a piece of tape over the pressure testing flange or other projection and form it snugly around the protection.

3.18 Apply a half-lapped spiral wrapping of tape to the sleeve, heating the inside surface of the tape in convenient lengths as the wrapping progresses. This wrapping should overlap the longitudinal strips on the sleeve as illustrated below.



3.19 Apply a half-lapped layer of tape to the exposed cable sheath at each end of the sleeve as illustrated below, overlapping the edges of the tape on the wipe and extending about three inches over the protective covering on the cable.

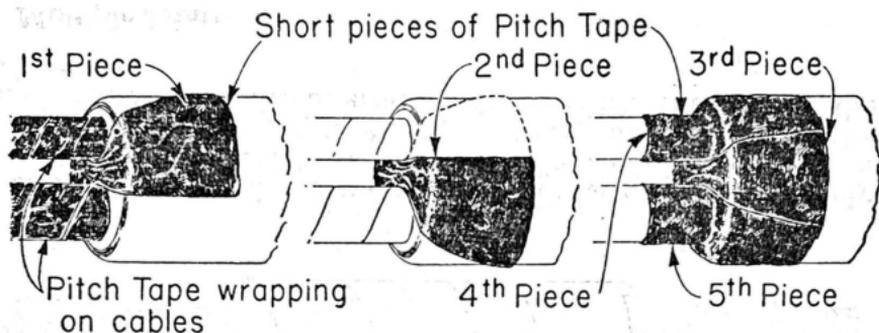


3.20 After the sleeve and cable sheath have been completely wrapped, **carefully heat** the surface of the tape with a torch to melt the pitch. A bright, glossy appearance of the pitch indicates sufficient heating. **Overheating will expose the fabric.**

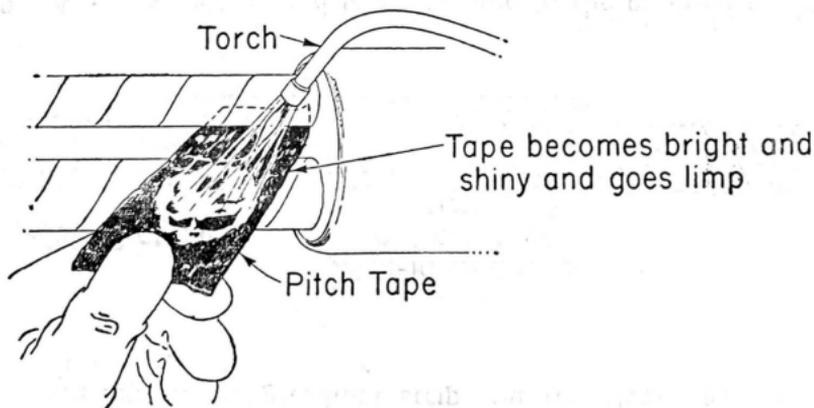
Multiple Joints

3.21 First wrap each individual cable, stub, pressure pipe or other auxiliary cable that enters the sleeve. The tape should be applied as a half-lapped layer, starting at the sleeve and carrying the wrapping three inches over the protection on the cable, if furnished, or until the exposed sheath is covered.

3.22 Cover the crotch area with a sufficient number of short pieces to completely cover the crotch, as illustrated below.

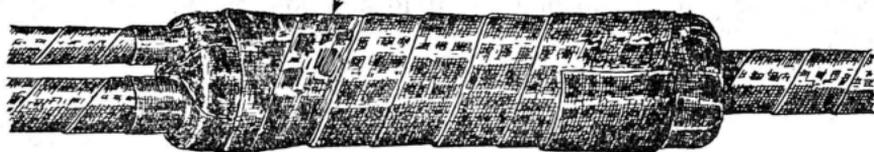


3.23 In covering the crotch area where the space between the branch cables is limited, insert the end of the cut length without heating. Then hold the free end in one hand and apply the heat carefully until the piece of tape goes limp, then remove the heat. The limp piece can now be worked into position from both sides.



3.24 Wrap the sleeve with a half-lapped layer of Pitch Tape as covered under straight splices. The completed cover is shown below.

Half-lapped layer of
Pitch Tape



- 3.25 Heat the surface of the Pitch Tape wrapping carefully as covered under straight splices.

Polyethylene Sheathed Cables

3.26 Where alpeh or stalpeh cables are buried, wrap the main sleeve and the auxiliary sleeves with Pitch Tape as outlined above. The Pitch Tape should extend over the glass cloth tape on the auxiliary sleeve to about $\frac{1}{2}$ inch from the exposed sheath.

3.27 The final heating of the Pitch Tape should be done carefully to avoid heating the sheath or the exposed glass cloth tape.

4. MECHANICAL PROTECTION

4.01 Where the cable protection includes steel tape or wire armor all splices or other gaps in the continuity of the mechanical protection should be safeguarded by installing either brass wire cloth or a buried splice casing over the corrosion protection.

Brass Wire Cloth

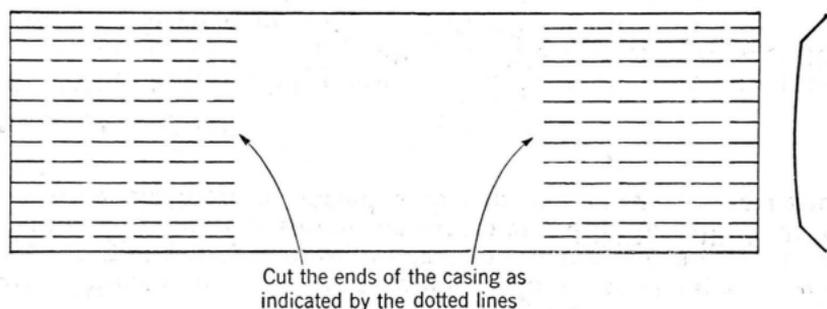
4.02 The brass wire cloth, which is preferable from the standpoint of longer effective life and ease of installation may be used over vinyl or Pitch Tape as outlined.

(a) Cut a piece of cloth about 6 inches longer than the length of the Pitch Tape corrosion protection and about 2 inches wider than its circumference. Form the wire cloth around the sleeve using a tourniquet, if necessary, to make the cloth fit snugly around the splice. The ends of the wire cloth will extend as a "tube" over the end of the splice. Form the "tube" ends around the cable by increasing the overlap of the edges until the wire cloth fits snugly around the splice ends and cable. At branch splices, the ends of the casing should be formed into the crotch between cables to close any openings through which rodents might enter. Lash the casing in place with construction wire or lashing wire.

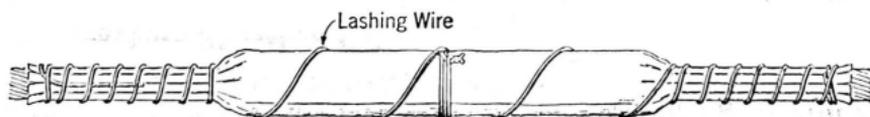
Buried Splice Casing

4.03 If brass wire cloth is not available install a buried splice casing. In such cases Pitch Tape will be used for the corrosion protection. The casing should be made of 24-gauge galvanized sheet steel. It should be about six inches longer than the Pitch Tape corrosion protection and about two inches wider than its circumference.

4.04 A prepared casing is shown below. The ends are slit as illustrated to facilitate forming the casing around the cable.



4.05 Install the casing by forming the sheet metal around the previously placed corrosion protection. Draw it down tightly by means of a tourniquet, forming the longitudinally cut ends of the casing closely around the cable. Lash the casing in place with wire as shown below. Then apply Pitch Tape to the casing as outlined in Part 3.



5. SUPPORTING SPLICE

5.01 In order to prevent fracture of the sheath at the wiped joints where the soil conditions are such that the splice may settle, the splice should be lashed to a creosoted plank with wire or houseline. The plank should be about 3 feet longer than the lead sleeve. Shims should be placed under the cable adjacent to the wipes to prevent strain on the joints or sheath.