BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G52.128.1
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AT&TCo Standard

LASHED AERIAL CABLE
TWO OR MORE CABLES

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1. GENERAL

1.01 This section covers the general factors to be considered before lashing a new cable and an existing cable or cables to one suspension strand and the basic procedures for lashing two or more cables to one strand. It is issued to cover basic procedures to be followed when lashing the second cable to an existing strand and cable without removing the existing lashing wire.

1.02 The existing lashing wire should be inspected very carefully. If the lashing wire is severely corroded, pitted, or broken and there is a possibility that the sharp edges or points would damage the cable sheath, the wire should be removed. However, it is generally not necessary to remove the existing lashing wire. Aluminum cable should not be lashed to the same strand with an existing copper cable unless specified on the construction plans or when authorized by your supervisor.

1.03 This type of construction should be used only when specified on the construction plans or when authorized by your supervisor.

1.04 The lashing of an additional cable to an existing strand may result in substantial savings as additional guys, anchors, and rods will ordinarily not be required. Lashing a new cable to the same strand with an existing cable assembly may be practicable under the following conditions:

(a) Where the existing cable or cables and strand are in good condition and the strand is of adequate size to support the cables.

(b) Where the addition of another cable on a separate suspension strand, either above or below the existing strand, would require a substantial number of poles to be replaced to obtain proper ground clearance or separation from supply conductors.

(c) Where the existing strand has deteriorated to the point that replacing it at the time of adding the new cable would be warranted.

1.05 Lashing two or more cables to an existing strand will not generally be advisable if:

(a) The existing cable or cables have a large number of trouble sleeves.

(b) The combined diameters of the cables exceed the maximum diameter that can be handled by the lasher.

(c) The cables are of too great a difference in diameter. One cable should preferably be not more than twice the diameter of any of the other cables.

(d) It would be necessary to increase the size of strand and place additional guys, anchors and rods.

(e) It is practicable to prelash the new cable or to lash it directly from a moving reel to a new strand at a substantially lower over-all cost.

1.06 The arrangement of cables and supports, as illustrated, covers the lashing of two cables which will in general be encountered most frequently. The same principles apply when more than two cables are being lashed.

2. SUSPENSION STRAND

2.01 **Size:** The existing strand must be large enough to support the combined weight of the cables. Using this combined weight as applying to a single cable of equivalent weight, refer to the appropriate Section in the G51 Series to determine whether the existing strand is of the proper size.

2.02 **Condition:** If an inspection of the strand indicates that replacement of the strand because of deterioration would be required within a relatively short period, new strand

should preferably be placed and the existing cable or cables transferred in connection with placing and lashing the new cable.

2.03 **Tension:** Using a strand dynamometer, measure the strand tension with the existing cable assembly in place. The effect of adding a new cable should be considered and the required action taken before the cable is placed. Among the items to be considered are the following:

(a) If the strand tension is considerably higher than shown in the appropriate Section in the G51 Series, the addition of a cable may increase the tension beyond the safe working limit of the strand. In such cases, the existing strand should be slacked off.

(b) The addition of a cable will increase the sag. If this increase in sag would reduce the vertical clearance from the cables to ground, rails, or conductors crossed over to a value less than the minimum shown in the clearance practices, raise the strand attachment provided that the vertical separation at the pole permits. If the strand tension is too low, the strand tension may be increased as an alternative to raising the attachment level on the pole provided that the resulting tension with the cables in place does not exceed the safe working limit of the strand.

2.04 **Suspension Clamps:** If the combined diameter of the cables does not exceed 2 inches, there should be one nut between the suspension clamp and the washer. If the combined diameter of the cables exceeds 2 inches, there should be two nuts between the suspension clamp and washer to reduce the possibility of the inside cable rubbing against the pole. In all cases where the second nut is used, place a reinforcing strap as an additional support for the bolt. In any case where the strand is detached from the pole, it should be reattached in accordance with present practices so that the strand will be below the bolt.

3. EXISTING CABLE

3.01 **Cable Bowing:** Where severe bowing exists, consideration should be given to removing the bows before a new cable is lashed to the same strand. If only minor bowing exists, the increase in sag due to the additional cable will tend to reduce minor bows in the existing assembly. In the case of extremely taut cables, such as cables from which bows were previously removed, the addition of another cable may increase the tension in the existing cable or cables to an undesirable degree. Where this is expected to occur, tension in the existing cable assembly should be relieved before the new cable is placed.

3.02 **Sheath Defects:** Ring cuts and other sheath defects that are likely to develop into sheath failure should preferably be repaired before placing the additional cable. Where extensive repairs are to be made, cable rings or lashing wire should be removed and the cable assembly supported by sliding rings, cable blocks, or temporary loops. If sliding rings or temporary loops are used, a pulling-in line for the new cable should be placed in connection with transferring the existing cable assembly.

4. REMOVAL OF ATTACHMENTS

4.01 Remove span clamps from the strand and temporarily support the drop wires at the pole provided that electrical and vertical clearances can be maintained in this manner. Where drop wires can not be temporarily supported at the pole, or where there are numerous span clamps, a temporary strand may be placed on either side of the pole above the level of the existing strand to provide a support for the span clamps. The temporary strand should be dead-ended by the wrap method, and secured to intermediate poles by wrapping four turns of 109 construction wire around both the pole and the temporary strand.

Note: **Do Not Ride the Temporary Strand.** After lashing has been completed, transfer span clamps and remove the temporary strand.

4.02 The removal of other attachments such as aerial or lashed cable supports, cable rings, grade clamps, wire ties, lashing wire, etc., will be done in connection with cable repair operations or as part of the placing and lashing operations.

5. RELATIVE POSITION OF CABLES

5.01 Placing the additional cable and lashing the cables can be facilitated by positioning the cables with proper relation to branch cables, terminal stubs, poles, etc. Ordinarily, the cable which will have the greater number of pole mounted terminals should be positioned nearer the pole. Where sheath mounted terminals are involved, access to terminals which are to remain in plant should not be obstructed by other cables.

6. PLACING NEW CABLE (Removing Existing Cable Rings or Lashing Wire)

6.01 Preparatory to placing the new cable, remove rings, grade clamps, cable supports, wire ties, lashing wire, etc., from the existing cable assembly. B support rings are particularly well suited for use at temporary supports for the

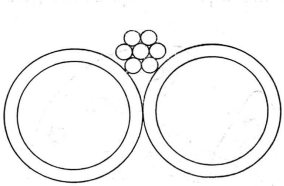
existing cable assembly and also for positioning the new cable, but cable blocks or temporary wire loops may be used if B support rings are not available.

6.02 In riding the strand to remove existing rings, etc., transfer the existing cable assembly to temporary supports (B support rings, cable blocks, loops) and place the pulling-in line for the new cable, taking care to see that the pulling-in line (a) does not pass around existing cables and (b) rests in the proper position relative to the existing assembly, cable terminals, and poles. Terminal stubs, branch cables, etc., should be secured to the existing cable assembly with lashed or aerial cable supports, or marline ties to reduce strain on the joint. Sheath mounted terminals which are to remain in plant should be secured temporarily to an existing cable.

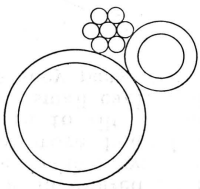
6.03 Pull the new cable into the temporary supports, and secure the end from which lashing is to start to the strand. If lashing is to start from some intermediate point, both ends of the cable should be secured to the strand until the end section is tensioned preparatory to lashing.

7. LASHING

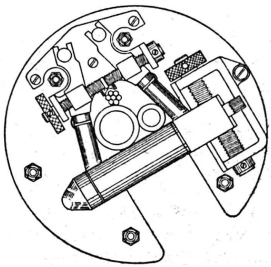
7.01 Cables of equal or nearly equal diameter present little difficulty in lashing and normally are positioned properly in triangular relation with the strand during the lashing operation.



Where a small cable and a considerably larger cable are to be lashed, the small cable should be nested above the larger cable.



This nesting is facilitated by lashing in the direction which will cause the lashing wire to pull the small cable upward. It may also prove helpful where small and large cables are being lashed to tilt the lasher by means of the towing line so that the small cable will be raised with respect to the large cable as they pass over the cable lifters in the lasher.



7.02 If there is still some slack in the existing cable assembly after the new cable is pulled in, it may be desirable to start lashing at some intermediate location (preferably at a terminal splice) so that this slack can be worked to corners or dead ends where it may be disposed of without cutting out slack. However, where a small cable and a relatively large cable are to be lashed it may not be practicable to lash toward both ends as the upward pull of the lashing wire would only be partly effective in nesting the small cable in its proper position, as discussed in Paragraph 7.01.

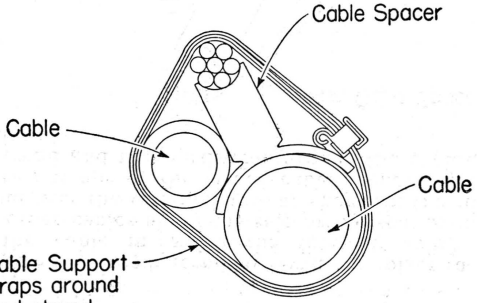
7.03 Using separate sets of tensioning devices, tension each cable preparatory to lashing. Several spans of the new cable may be tensioned in one operation. Tensioning locations for existing cables should be selected so that a branch cable splice or a splice for a pole mounted terminal will not be included within the section of cable being tensioned.

7.04 If the cables are in their proper relative positions, lash them in the regular manner. If, during the lashing operation, slack in an existing cable is being pushed ahead to an extent that might cause damage to the pole mounted terminal stub, detach the terminal from the pole and support it temporarily from the strand. Drop wires should be handled in the same manner if there is any possibility that movement of the terminal away from the pole might result in service interruptions.

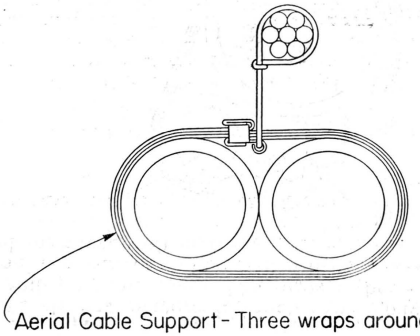
7.05 Terminate lashing wire in the regular manner. Locate cable supports in accordance with the instructions applicable to a single lashed cable using lashed cable supports (or aerial cable supports when required).

8. INSTALLATION OF SUPPORTS

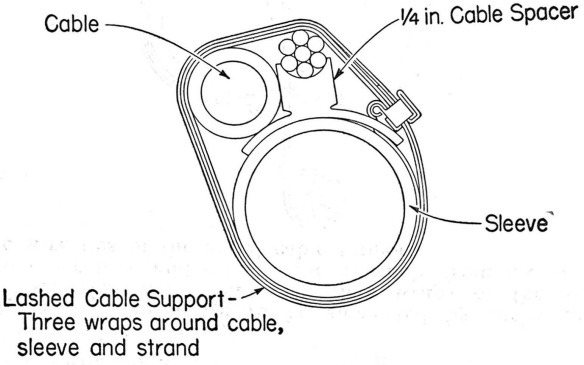
8.01 Where cables are to be supported by lashed cable supports, position a cable spacer on one of the cables—if the cables are of unequal diameter, the spacer should be positioned on the larger cable. The other cables are positioned along the side of the cable spacer on top of the flange. When installing the lashed cable support, the three wraps are made around the entire assembly of strand and cables.



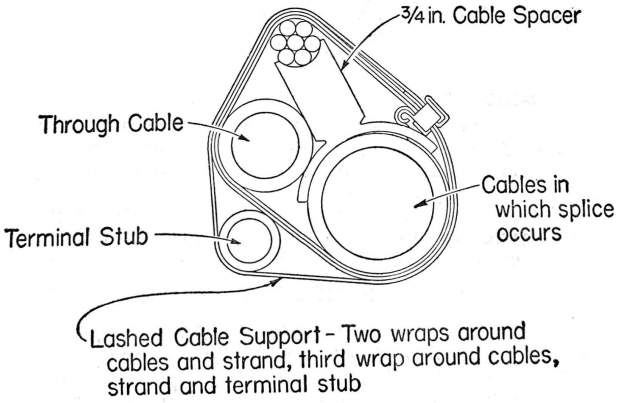
8.02 Where cables are to be supported by aerial cable supports, make three complete wraps of the strap around the cables, and support the assembly from the strand by the wire ties of the aerial cable support.



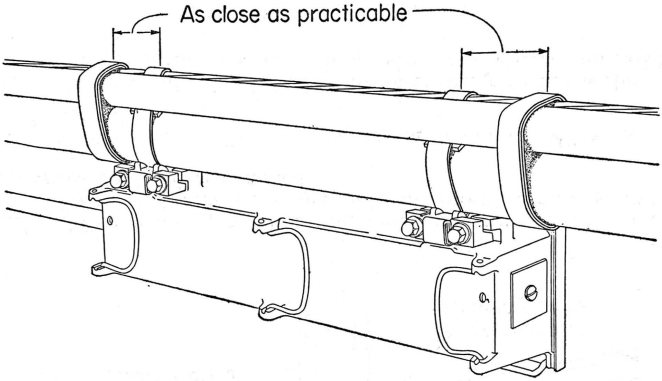
8.03 At sleeves, place a 1/4-inch cable spacer on the sleeve, and position the cables along the side of the cable spacer on top of the flange. Install lashed cable support as discussed in Paragraph 8.01.

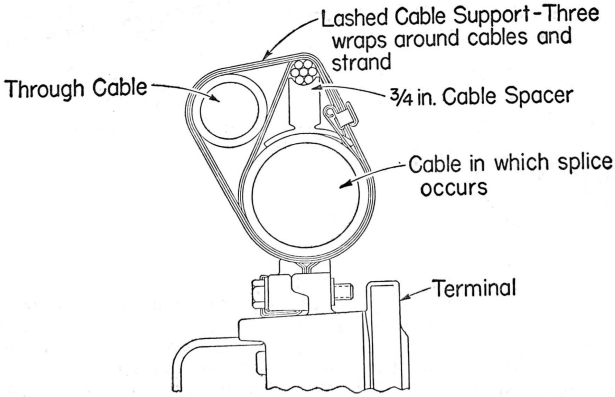


8.04 At pole mounted terminal locations place a spacer on the cable in which the terminal splice occurs, position the other cables along the side of the spacer on top of the flange and nest the terminal stub as shown in the following figure with two wraps of the lashed cable support around the cables and strand and the third wrap around the cables, strand and terminal stub.

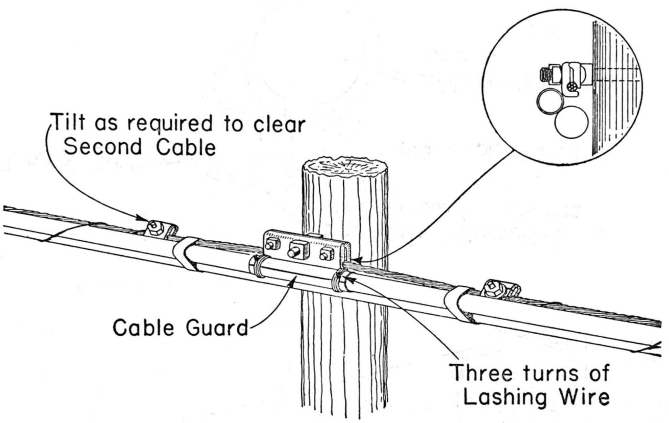


8.05 At sheath mounted terminal locations, place 3/4-inch cable spacers on the cable in which the terminal splice occurs, and remount the terminal in accordance with standard practices. Position the other cables along the side of the spacers and support them with two lashed cable supports positioned outside of, and as close as practicable to the terminal mountings.





8.06 To prevent abrasion at pole locations, place cable guards around those cables having separations from the pole, suspension clamp or other attachments of less than 1/2 inch. It may be necessary to tilt the cable lashing clamps to prevent abrasion of the sheath of the cables.

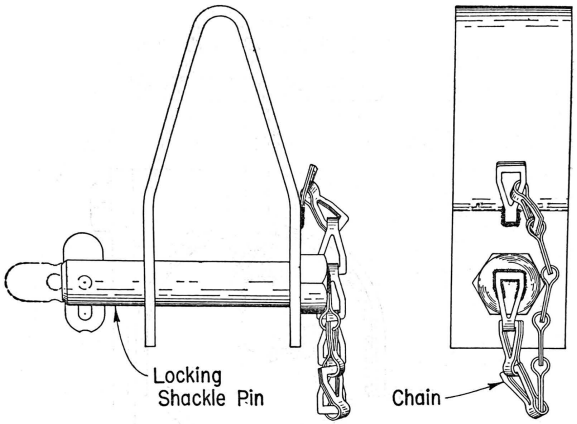


8.07 After lashing, terminating, and supporting have been completed any detached pole mounted terminals and drop wires shall be reattached.

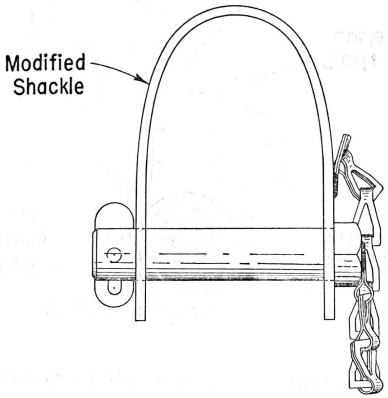
9. PLACING NEW CABLE (Existing Lashing Wire Not Removed)

9.01 The second cable is lashed to an existing strand without removing the existing lashing wire. (See Paragraph 1.02.)

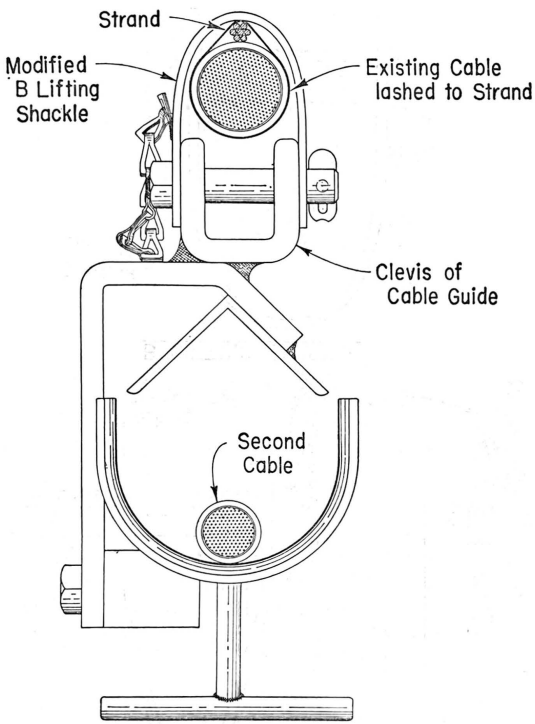
9.02 The cable may be placed by using B support rings or if conditions permit, the direct lashing method may be used. When using the direct lashing method it will be necessary to modify a B Lifting Shackle to be used with the cable guide.



B LIFTING SHACKLE



9.03 The modified B Lifting Shackle is placed over the existing strand and cable and attached to the clevis at the rear of the cable guide using the shackle pin.



Rear View of Cable Guide in place

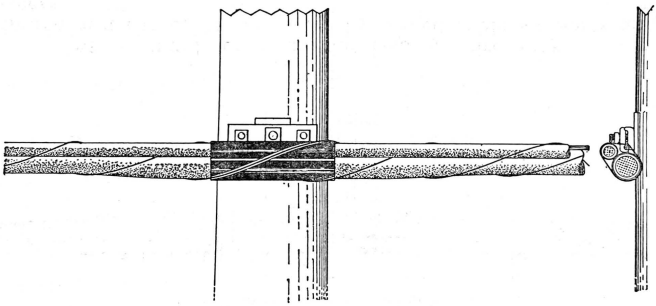
9.04 The "B" cable lasher will lash two cables with a combined diameter of 2-5/8 inches regardless of the size of the existing lashing wire. The lasher is operated with the ring pusher in the open position.

The "C" cable lasher will lash two cables with a combined diameter of 1-1/2 inches provided the existing lashing wire is not larger than .045. The lasher is operated with the strand tensioning roller in the open position.

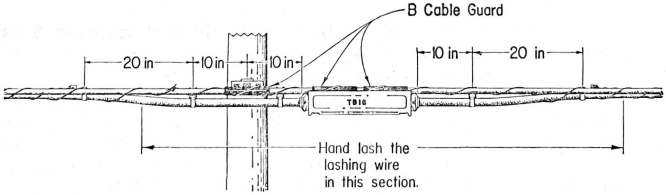
To avoid slippage of the rollers on the strand, the pulling line of the lasher must be kept at 45° or greater from horizontal.

The "D" cable lasher cannot be used. The strand tensioning roller, which must be left open, will damage the cable sheath. To remove the strand tensioning roller would require the lasher to be partially dismantled. This is not recommended.

9.05 Lashing wire may be terminated in accordance with present practices. At straight line poles where the existing lashing wire is not terminated, the second lashing wire may be carried past the pole. B cable guards are used to protect the cable.

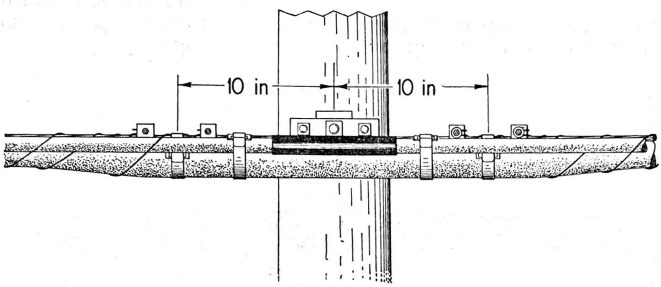


At locations where the existing lashing wire is terminated the second cable may be lashed to the strand without using supports and spacers.

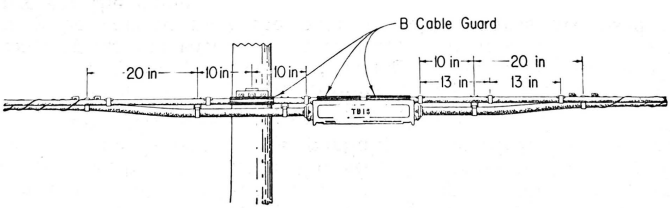


When the lasher is pulled up to the lashing wire clamp, a lashing wire grip is placed and enough lashing wire is pulled from the machine to hand lash past the pole. Cut the lashing wire and transfer the lasher around the pole. After the hand lashing is completed the lashing wire is spliced.

At pole or splice locations where the first lashing wire has been terminated, the second lashing wire may be terminated using additional supports and spacers.



At terminal locations the lashing wire may be terminated and the cable supported by lashed cable supports and spacers.



Note: B cable guards placed to protect the cable.

After lashing, terminating, and supporting operations have been completed, any detached drop wires shall be reattached.