

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G55.110.3**  
**Issue 3, May, 1957**  
**AT&TCo Standard**

# UNDERGROUND CABLE PLACING

## FEEDING AND PULLING CABLE

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### 1. GENERAL

1.01 This section replaces Issue 2. It is reissued to cover the use of the C Cable Lubricator, to revise information pertaining to cable lubricants, and to describe the assembly of the cable feeder.

### 2. FEEDING CABLE INTO DUCT

2.01 Use the cable feeder to protect the cable and to guide it into the duct. The main or longer section of the cable feeder fits into the nozzle which is placed in the duct; a 3-inch Nozzle is used with 3-inch round bore conduit, a 3-1/4-inch Nozzle for general use with 3-1/4-inch square or 4-inch round bore conduit, and a 3-1/4-inch S Nozzle for use with maximum size polyethylene sheathed or corrosion protected cable in 3-1/4-inch square conduit. Where an extension section of the cable feeder is also required, its nozzle end should be fitted into the bell end of the main section.

2.02 Thread the pulling line from the duct through the cable feeder. Where the cable lubricator is used, thread the pulling line through it before the connection is made between the line and the cable.

2.03 The methods of attaching the pulling line to the cable are covered in Section G55.110.2.

2.04 Watch the cable carefully as it unreels and inspect for sheath defects. If a defect is noticed, stop the pull. Cracks or breaks in the sheath should be repaired. If the crack or break is found before the pulling operation is started, the cable should be repaired and pressure tested before it is placed. Kinks or irregularities in lead sheath cable should be removed with a cable dresser.

2.05 Careful attention must be paid to signals so that the pulling can be stopped instantly whenever necessary. Signals for use of outside plant forces are given in other sections of the Bell System Practices.

### 3. LUBRICATING CABLES

3.01 Approved cable lubricants and the conditions covering<sup>†</sup> their use are shown below:

<u>Type of Lubricant</u>	<u>Type of Cable Sheath</u>	<u>Freezing Point of Lubricant</u>
B Cable Lubricant	All	32°F
C Cable Lubricant	All	10°F
Underground Cable Lubricant	<b>Only Lead Sheath or Corrosion Protected Sheath</b>	0°F*

\* Lubricant hardens but does not freeze.

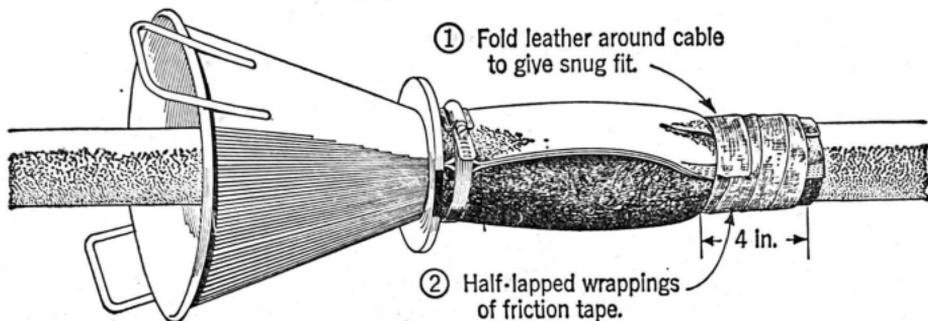
When working at temperatures of 10°F or lower the C or Underground Cable Lubricant should be protected from the cold until ready to be applied.

3.02 The quantities of lubricant required for the various sizes of cable are as follows:

<u>Cable Size (Outside Diameter in Inches)</u>	<u>Quantity of Lubricant (Pounds per 100 feet of Cable)</u>	
	<u>Normal Pulls</u>	<u>Long Pulls and Pull-Throughs</u>
Less than 1-3/8 in.	5 lbs.	10 lbs.
1-3/8 in. to 2 in.	7.5 lbs.	12.5 lbs.
Larger than 2 in.	10 lbs.	15 lbs.

3.03 Place the C Cable Lubricator on the cable before the end of the cable is placed in the feeder tube. Cables up to 2.9 inches in diameter equipped with pulling-eyes can be pulled through the C Cable Lubricator. Where a cable grip is

used to pull maximum size polyethylene sheathed cable, it will be necessary to feed the cable through the lubricator before placing the grip.



3.04 As the cable is fed into the duct, guide the lubricator into the mouth of the cable feeder. Keep the lubricator filled with lubricant during the pull until only five or six turns remain on the reel.

3.05 The tape wrapping should be examined before each pull and should be replaced if the tube fits too loosely around the cable.

### Lead Sheath

3.06 Unless the section is very short (150 feet or less) and contains no sharp bends an approved cable lubricant should be used.

### Polyethylene Sheath

3.07 Lubrication is not necessary on lengths shorter than 300 feet provided that the section is free from sharp bends. Otherwise the cable should be lubricated with **B or C Cable Lubricant and with no other lubricant.**

3.08 **Soap lubricants or lubricants containing soap are definitely harmful to polyethylene sheath.** If soap has been used in quantity in a previously occupied duct, and no duct free from traces of soap is available, polyethylene sheath should not be used at this location.

3.09 With the exception of B or C Cable Lubricant, other lubricants that do not contain soap should be kept away from polyethylene sheath as much as possible. The inside of the cable feeder should be wiped free of excess lubricant before

using it. Polyethylene should only be placed in a previously occupied duct when no duct free of lubricant is available. If the deposit of lubricant has been heavy, swab the duct to remove as much of the lubricant as possible before placing the cable. After placing, wipe the exposed cable with a clean cloth before leaving the manhole.

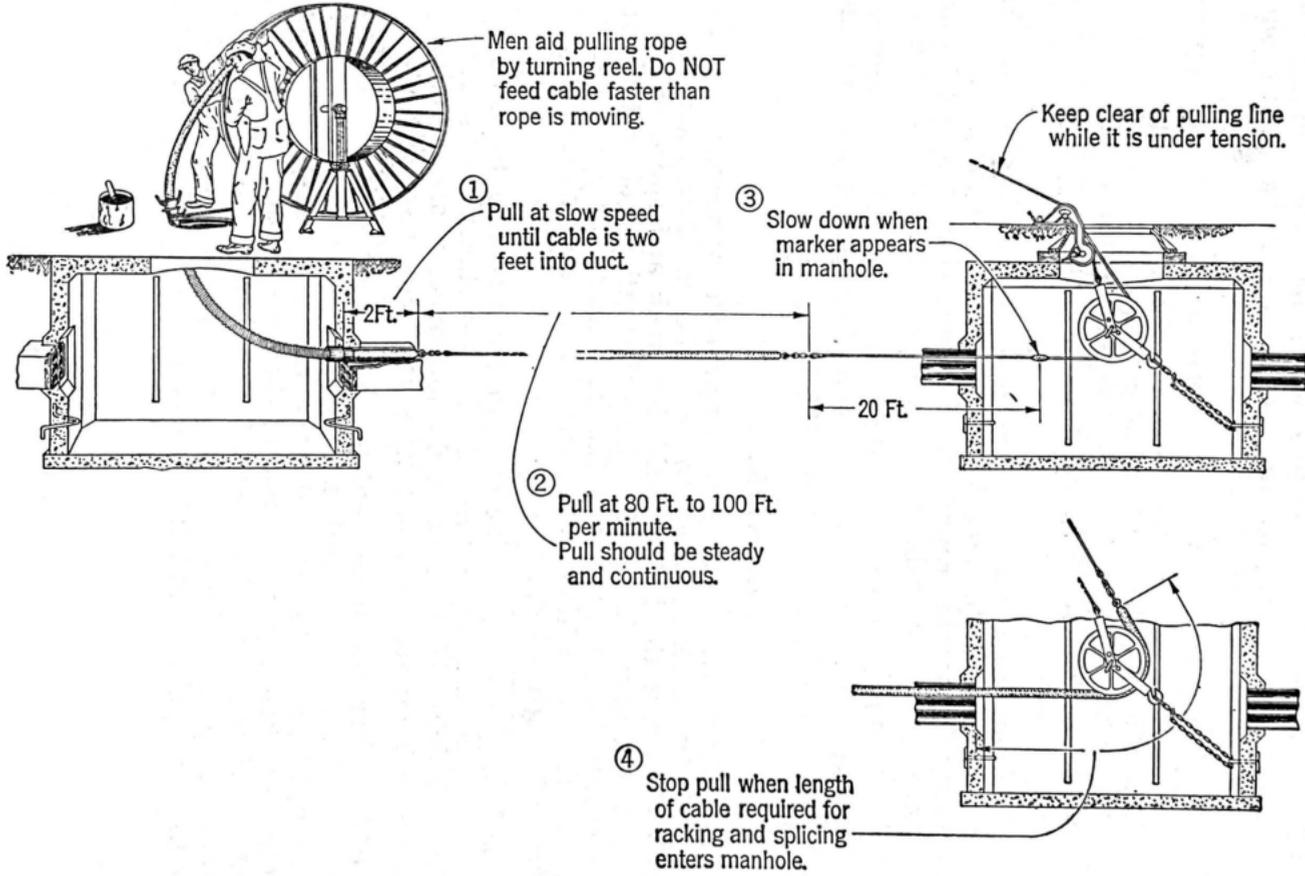
#### 4. PULLING CABLE

4.01 Before starting to pull, check the equipment carefully to make sure that it is properly set up, in order to minimize the chance of interruption once pulling has started. In so far as possible the cable should be pulled in without stopping until the required amount of cable is in each manhole. A pulling speed of 90 to 100 feet per minute is desirable.

4.02 Careful attention must be paid to signals as the cable is being pulled so that pulling may be stopped instantly whenever necessary.

4.03 If for any reason it is necessary to stop the cable between manholes the winch operator should stop the winch but not release tension unless signalled to do so. In starting up again, the inertia of the cable should be overcome by gradually increasing the tension in steps a few seconds apart until the cable starts to move.

4.04 Where necessary to luff the cable to obtain additional length in the manhole a cable removing grip can be attached to the cable near the duct entrance. A 7/16-inch wire rope sling should be attached to the winch line and the eyes of the grip with connecting links. The grip should be repositioned as close to the duct entrance as possible after each pull.



## 5. LONG LENGTHS AND PULL-THROUGHS

5.01 Lengths of cable up to 1000 feet or more including two or three intermediate manholes can be pulled with some additional preparations.

5.02 After the ducts have been selected and properly cleaned, adequate lubrication and steady pulling are required. The cable lubricator should be used at the feeder manhole and the amount of lubricant passed through it should be increased five pounds per 100 feet as indicated in Paragraph 3.02.

5.03 At intermediate manholes, guide the leading end of the cable into the duct. When it has entered the duct, place a feeder tube nozzle around the cable and slide it into the duct entrance to keep the cable from rubbing on the edge of the duct.

5.04 Tighten the nut on the pulling eye of polyethylene sheath cables with a wrench after a hard pull to maintain pressure on the sealing gasket.

## 6. LENGTHS IN MANHOLES

6.01 Leave enough cable in one or both end manholes to give the slack required to rack the cable at intermediate manholes, plus the length needed to rack and splice the cable at the end manholes. The additional length required for slack at intermediate manholes is the bent length of a flexible rule in the set-up position to be occupied by the cable, minus the straight length of the cable.

6.02 Measure the cable ends in the manholes to make sure that they agree with the lengths shown on the running sheet or print. If the lengths do not agree, measure the length of the conduit section and advise your supervisor.

6.03 After the measurements have been made, cable ends not equipped with pulling eyes or core hitches should be tapped with a hammer to make sure that the sheath has not been stretched beyond the end of the core, leaving the wires too short for splicing. Examine all pulled ends for evidence of cracks or openings due to beating rings into the sheath or to damage in pulling and take steps to seal any such openings.