

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G57.105
Issue 1, August, 1935
AT&T Co. Prov. Std.

SUBMARINE CABLE PLACING

GENERAL

Contents	Page
General	1
Preparations for Placing Cable.....	1
Attaching Winch Line to Cable.....	1
Stoppers	2
Methods of Placing Cable.....	3
Tests on Cable During Placing Operations.....	4
Anchoring Shore Ends.....	5
Disposition of Surplus Cable.....	5
Protection of Shore Ends.....	6

1. GENERAL

1.01 The instructions included in these practices cover the general procedures for placing submarine cables. The several detail methods of placing are covered in separate sections. Supplementary instructions will usually be prepared outlining the procedure to be followed for each installation.

2. PREPARATIONS FOR PLACING CABLE

2.01 All details of the work should be planned in advance of the actual installation of a submarine cable. This is necessary in order that the work may be completed in the shortest time possible.

2.02 All materials, tools and equipment necessary for the work should be available on the job before the operation of placing the cable is started.

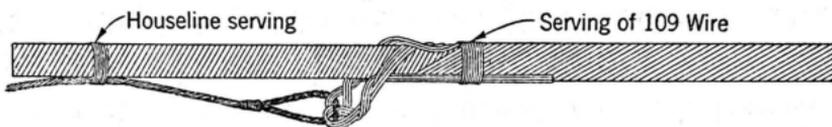
3. ATTACHING WINCH LINE TO CABLE

3.01 There are several methods that may be employed to attach the winch line to a submarine cable. A wire cable grip may be used or one of the methods covered in the

following paragraphs may be found desirable. The method used will depend on the amount of pull that will be required and local conditions of the particular project.

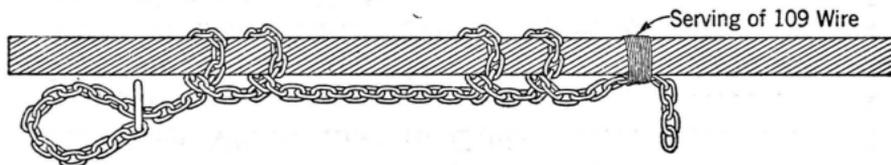
3.02 In some cases it may be found desirable to attach the winch line to the cable by means of a part of the armor wires, as shown in the following figure. The number of armor wires to be used will depend on the pull expected for the particular job.

ATTACHMENT OF WINCH LINE TO ARMOR WIRES



3.03 A convenient attachment to the winch line may be made by using a chain half hitched around the cable as shown in the following figure. Where the pull will not be excessive and where no rocks will be encountered, this same type hitch may be made using a rope instead of a chain.

ATTACHMENT OF WINCH LINE BY CHAIN

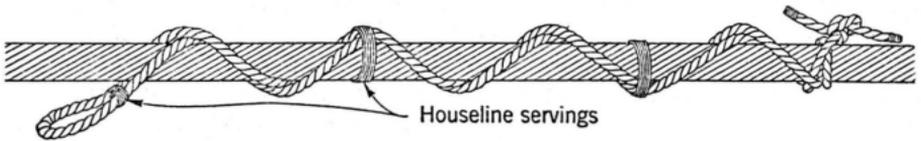


4. STOPPERS

4.01 A stopper in the form of split wire grips or a rope will often be found desirable to hold the cable temporarily during the placing operations, picking up the cable and in connection with landing the shore ends.

4.02 The method of attaching a rope stopper to the cable is shown in the following figure. Where a very large rope is required to hold the cable, it may be desirable to separate the strands of the rope and braid the ends in a flat braid to facilitate bending the rope to the cable. The flat braid will have greater holding power on the cable but will be somewhat weaker than the undisturbed rope. If the pull required to hold the cable is small, several half hitches of rope may be used instead of the rope stopper.

ROPE STOPPER



4.03 The rope for attaching the stopper to the barge or boat may be secured at the proper location by snubs or knots on the supports provided.

5. METHODS OF PLACING CABLE

5.01 The method to be employed in placing a submarine cable will depend on the length of cable involved, the nature of the body of water and the equipment available. The methods usually employed are as follows:

(a) Placing cable from a barge:

Placing cable from a barge moved by a tugboat provides a suitable method of installing submarine cable in many cases. It is possible to place as much as six miles of full size cable as a section by this method. If the length of cable to be laid exceeds that which can be placed on the barge it is frequently possible to lay the cable in sections, buoying the end of the first section so that it can be picked up later for splicing to the next section. A loaded barge has a draft of only a few feet which is an advantage where shoal water occurs in the crossing.

(b) Placing cable from a regularly equipped cable boat:

Placing cable from a regularly equipped cable boat may be found desirable in some cases where such equipment is available. Where this type of boat is used the draft should be checked to be sure that the boat does not draw too much water to operate in the depth at the crossing. Power will usually be supplied by an engine which operates the cable drum and boom as well as propels the boat.

(c) Pulling Cable Across Waterway.

(1) Pulling Cable Through The Water.

Where the length of the crossing does not exceed 1,000 feet it is usually practicable to pull the cable across the waterway by means of the winch line from a truck. When using this method for crossings more than a few hundred feet wide, or for shorter lengths if the bottom is rocky, it is generally advisable to buoy the cable by means of pontoons or floats attached to it

at intervals. By using a sufficient number of floats it is often possible to pull lengths greater than 1,000 feet. However, the transportation of large cable reels to the location of the crossing, unless a railroad siding is available in the vicinity, may present difficulties too great to make this method practicable for lengths in excess of 1,000 feet.

(2) Placing Cable Through Ice :

If the cable is to be placed during cold weather when the waterway is frozen over it can sometimes be placed through a slot cut in the ice. The placing operation can be greatly facilitated in this manner as comparatively long sections of cable can be pulled over ice and snow without the use of special equipment. The conditions which would make such a procedure desirable are swampy land on one or both sides of the crossing making the transportation of cable and placing equipment to the waterway difficult, except over frozen ground; or fairly wide sections of low land on either side of the waterway that require submarine cable making it necessary to set up the reel a considerable distance from the waterway and pull the cable over the ground.

6. TESTS ON CABLE DURING PLACING OPERATION

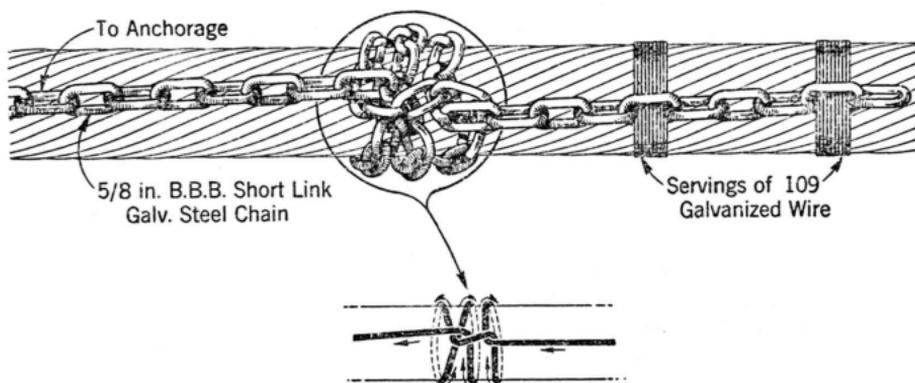
6.01 For the longer cable crossings it is often advisable to test submarine cables during the placing operations as a means of detecting any sheath openings that may occur, in order to permit location and repair of breaks before the cable is seriously damaged. This may be accomplished by making an insulation resistance test on the cable conductors at frequent intervals or by placing the cable under gas pressure and then taking readings of the pressure within the cable at frequent intervals.

6.02 The condition which would favor making an insulation resistance test or a pressure test will depend on the length of the cable and the method employed in placing it. Facilities for making electrical tests on cables are provided in some cases aboard barges or boats equipped for placing submarine cables. When such facilities are provided on the barge or boat or when the cable consists of more than one reel length and the connecting splices between the various lengths will be made prior to the placing operation, it will usually be advisable to make insulation resistance tests. When only one reel length of cable is involved, it may be advisable to make a pressure test.

7. ANCHORING SHORE ENDS

7.01 The shore ends of submarine cables are usually anchored by means of commercial 5/8-inch BBB short link galvanized steel chains attached to terminal poles, piles or eye bolts embedded in the masonry of bridge piers or retaining walls. Where such facilities for anchoring the cable are not available at the landing point, it will be necessary to provide other means of anchoring.

7.02 To anchor the cable, one end of the chain should be attached to the cable by means of a hitch leaving a free end of about 12 inches which should be lashed securely to the cable with galvanized iron wire. The chain should then be passed around poles, piles or anchors, or passed through eye bolts and where practicable the second end should be brought back and attached to the cable in the same manner as the first end. The method of attaching the chain to the cable is shown in the following figure.



7.03 When the shore end will be landed on a dock, the cable should be chained to the piling of the dock as near the bottom as practicable in order to prevent any likelihood of injury to the cable from passing boats.

8. DISPOSITION OF SURPLUS CABLE

8.01 Should there be any surplus cable after both shore ends are landed, it may be disposed of in one of the following ways:

- (a) If the beach is sandy and not commonly used, the cable may be formed in a large "S" loop and buried to a depth of at least two feet in the sand above high water.

(b) The surplus cable may be formed in a large "S" loop in the water off-shore, provided the loop is in a sheltered bay or inlet where there would be no tendency for the cable to shift with the action of the tide or current and become kinked.

3. PROTECTION OF SHORE ENDS

9.01 The shore ends of submarine cables are usually protected by burying them in a trench. When, however, the cable will terminate in a manhole for splicing to an underground cable, the shore end may be placed in a conduit constructed of 5 or 6-inch sewer pipe. Where the shore ends will be laid in shallow water, the excavation for the cable or conduit should be of sufficient depth to prevent any likelihood of injury to the cable or conduit from ice or debris.