BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G56.130.1
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AT&T Co Standard

BURIED CABLE
PLACING

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1. LENGTH OF SECTIONS OF CABLE

1.01 The length of sections of buried cable will depend upon the conditions encountered on the particular project. In general, the location of the splices will be given on the detail plans and the best length of section to meet these locations and the placing conditions on the job should be used.

1.02 The location and nature of obstructions encountered, such as roads, streets, railroads, pipe lines, etc., will vary the placing conditions and consequently the length of section that can be employed.

1.03 Splice points on the shorter cables will usually fall at the location of manholes, handholes, branch cable junctions or terminals. If terminals are located at frequent intervals, a single length of cable can extend through several terminal locations. There are also conditions, especially on the longer cables, that necessitate splices at locations other than those indicated. Such locations will require making a buried splice.

1.04 In placing service cable a sufficient length of cable should generally be used so that it will not be necessary to make a splice in the cable between the terminal and the wiring in the building. Accurately measuring the lengths required and matching these with the lengths available will minimize the number of short lengths left over.

1.05 When buried cable is placed, sufficient overlap should be provided at splice points to make the splice. The lengths of overlap generally required for some of the more common types of splice points are as follows:

Type of Splice	Feet Overlapped	
	Non-Quadded	Quadded
Buried Splice.	3	4
In Manholes. (In addition to amount required for proper bends and racking.)	3	4
At Poles.	3	4
At Handholes.	9	
At Pedestal Terminals (with Cable Cut).	8	
At Pedestal Terminals (with Cable Looped).	7	Length of Cable in Loop.

2. METHOD OF PLACING

2.01 The method to be used in placing buried cable will depend on the location of the route, location and kind of obstructions encountered, soil conditions, topography of the route and the apparatus available. The method which best suits the local conditions should be selected. Some of the methods are discussed in the following paragraphs.

3. PLACING CABLE IN OPEN TRENCH

3.01 When the trench is free from obstructions and the nature of the soil is such that the sides of the trench will not cave in, the cable may be placed direct from a reel mounted on a trailer which is pulled along over the trench. The trailer may be pulled by a separate unit or attached directly to the trenching machine. If the ground is reasonably level and the equipment is available, time may be saved by attaching two trailers, laying the cable from the rear reel first and then passing the cable from the front reel over the drum of the rear reel into the trench. A man should follow closely behind the

trailer to see that the cable does not stick on the reel and that it lies reasonably flat along the bottom of the trench. When this method is used it will be necessary to secure the end of the cable until the weight of cable removed from the reel is sufficient to hold it in place at the point of overlap with the preceding section.

3.02 There may be locations where, due to obstructions or other local conditions, it is desirable to pull the trailer along beside the trench and have the cable guided into the trench by hand.

3.03 Where there are steep grades, gullies, fluid soil conditions or obstructions such as streets, roads, pipe lines, etc., it may be necessary to pull the cable into the trench from a reel located at the end of the cable section or at some intermediate point. Where this method is applied trench rollers or other supporting devices should be used unless the section is short. The rollers should be spaced at intervals so that any dragging on the bottom of the trench will not damage the protective coverings nor result in an excessive pull on the end of the cable.

3.04 There may be conditions where it is advantageous to use a combination of the placing methods described above. Where this is done the procedure outlined for each of the methods should be followed for the portion to which it applies.

4. PLACING CABLE IN ADVANCE OF TRENCHING

4.01 Some conditions will warrant laying the cable along the route in advance of the trenching operation and then placing it in the trench later. However, due to the possibility of damaging the cable during trenching operations this method should not be used where other methods are applicable. The cable can be laid on the ground either direct from the reel as it is pulled along the route or by pulling the cable over rollers placed on the surface of the ground. When the cable is later placed in the trench the placing operations should be started at one end of the section and continued progressively along the section to the other end.

5. PLACING CABLE BY MEANS OF A PLOW

5.01 Buried cable may be placed in the ground by means of a cable laying plow. When the cable laying plow is used care should be exercised to place the cable in the ground at the specified depth for the soil conditions encountered. The depth of the plow should be observed continuously as there may be cases where due to abrupt changes in grade the desired depth cannot be obtained with the plow and it will be

necessary to lower the cable by hand digging. In placing cable by means of a plow there may be locations where requirements for greater depth of covering or the presence of exceptionally soft ground will make it desirable to open sections of the trench in advance of the plow.

6. PLACING BURIED SERVICE CABLE

6.01 In general, buried service cables will be placed in an open trench. Since service cables weigh less than one-half pound per foot and since the lengths to be placed are usually short, the cable can generally be carried or pulled into the trench from a reel located on the street or alley adjacent to the property. Excessive pulls on the cable should, of course, be avoided since this type of cable has very little tensile strength.

7. CONSTRUCTION WHERE FOREIGN STRUCTURES ARE INVOLVED

7.01 At crossings, the relative levels, protection, and separations between buried cables and foreign structures shall be as follows:

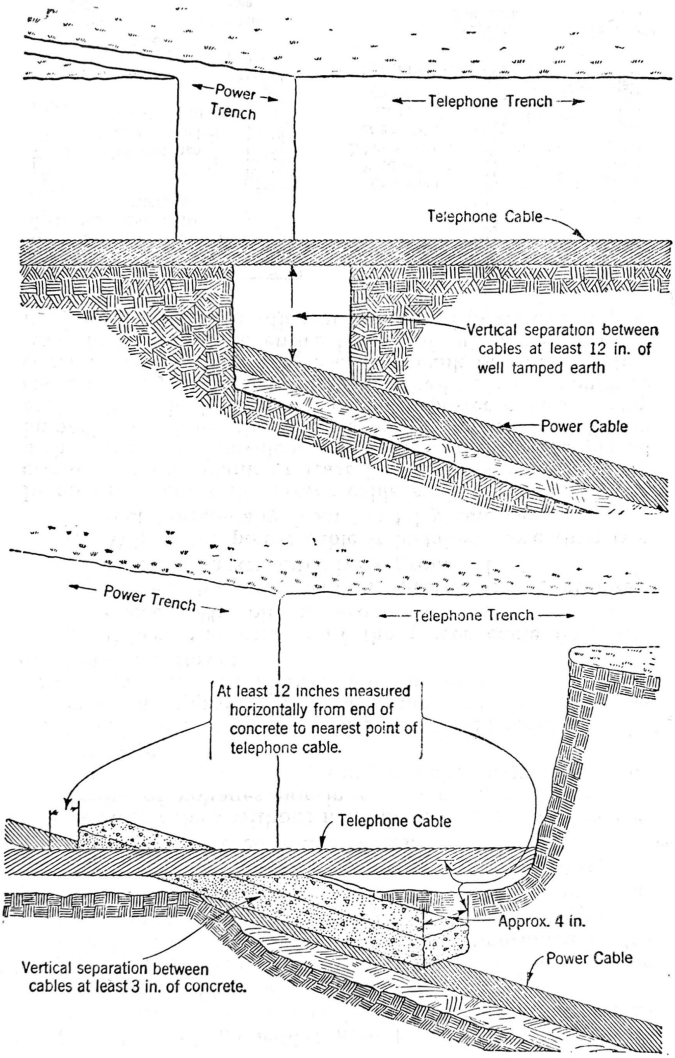
(a) Buried cables may be placed either above or below gas or water mains or services, or ducts carrying power cables. Buried telephone cables shall be placed above buried power cables and below pipe lines carrying petroleum products, where practicable.

(b) Where buried telephone cable crosses above gas, water or oil mains or services, the cable should be protected from digging operations by concrete or treated wood planking for at least 3 feet each way from the point of crossing. At all crossings of buried telephone and power cables the cable in the top position should be protected from digging operations in a similar manner.

(c) Separations from foreign structures, such as gas, water, or oil mains shall be at least 6 inches of well-tamped earth or 3 inches of concrete.

(d) Separations from ducts containing power cables shall be at least 12 inches of well-tamped earth or 3 inches of concrete.

(e) Separations from buried power cables with or without metallic sheath shall be at least 12 inches of well-tamped earth or 3 inches of concrete as shown in the following figures. Where concrete is used at crossings it shall be at least 3 inches by 4 inches in cross-section and shall extend along the power cable on both sides of the point of crossing to points at least 12 inches away from the telephone cable.


Power Trench
Telephone Trench
Telephone Cable
Vertical separation between cables at least 12 in. of well tamped earth
Power Cable
Power Trench
Telephone Trench
At least 12 inches measured horizontally from end of concrete to nearest point of telephone cable.
Telephone Cable
Approx. 4 in.
Power Cable
Vertical separation between cables at least 3 in. of concrete.

7.02 Buried telephone cables may be placed in the same trench with power cables in ducts, provided the separations specified in 7.01(d) are obtained.

7.03 Buried telephone cables may be placed in the same trench with the buried power cables mentioned in (a) provided the construction specified in (b) or (c) is employed.

(a) Types of buried power cable with which joint construction is considered satisfactory are as follows:

Metallic sheathed power cables.

Power cables without metallic sheath containing circuits of voltages not in excess of 2,900 to ground, except that series lighting circuits may be of any voltage.

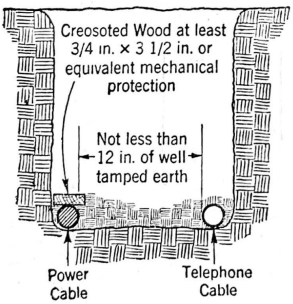
(b) Telephone and power cables (or conductors) may be buried at approximately the same depth without supplementary mechanical protection for the power cables in the following cases:

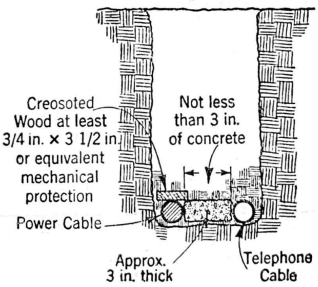
(1) Where the voltage of the power cable does not exceed 300 volts to ground.

(2) Where the power cable is encased in a continuous metallic sheath effectively grounded.

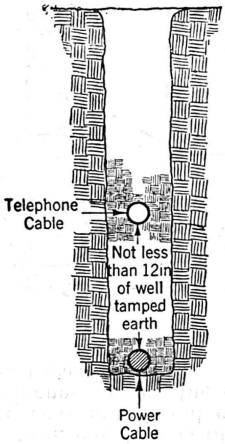
(3) Where the power cable is installed more than two feet horizontally from the telephone cable.

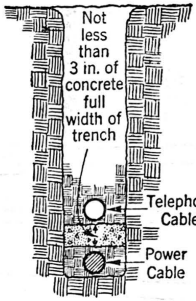
In all other cases the power cable shall be covered by a creosoted wood plank at least 3-1/2 inches wide and 3/4 inch thick, or equivalent mechanical protection, placed immediately above the cable so as to project equally on each side of it. Where two or more power cables occupy space in the joint trench, the plank shall be wide enough to cover all of the power cables. The plank or other protection shall extend the entire length of the power cable in the joint trench, with adjacent sections of plank overlapping at the ends.





(c) Power and telephone cables may also be buried in a narrow trench with the power cable at the bottom, in which case the separations specified in 7.01(e) shall be provided vertically between the two cables.





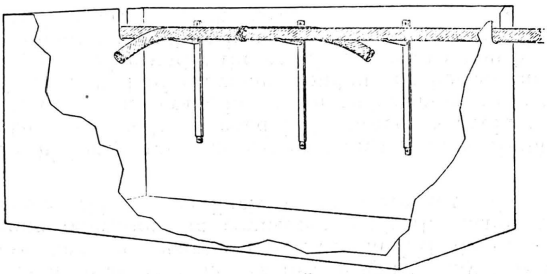
7.04 Where buried power cables other than those listed in 7.03(a) are concerned, the telephone cable shall be placed in a separate trench, unless special authorization is obtained for joint trench construction. The separation between a telephone cable and a power cable placed in separate trenches shall be as great as practicable and in any case shall be not less than the separation specified in 7.03(b)3 to ensure that digging operations in connection with the maintenance of one cable will not be likely to interfere with the other cable.

7.05 At highway and railroad crossings it is advisable to place the cable in conduit in order to avoid future disturbance of the sub-grade in case of replacement. In general, the simplest method of providing conduit for buried cable is by pushing steel pipe under the crossing. Construction on railroad right-of-way should be in accordance with the portion of G41.140 which relates to such work.

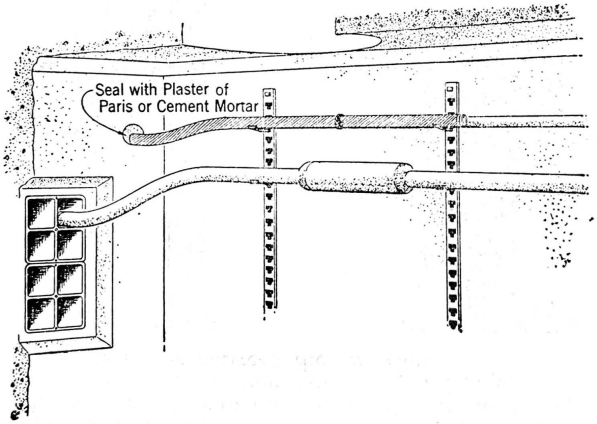
8. CABLE AT MANHOLES

8.01 At buried manhole locations the cable should be brought into the manhole as shown. The location of the overlap for splicing will generally be shown on the detail

plans. The cable entrance should be sealed with cement mortar or with a mortar made from equal parts of plaster of Paris and sand, after the cable is placed.

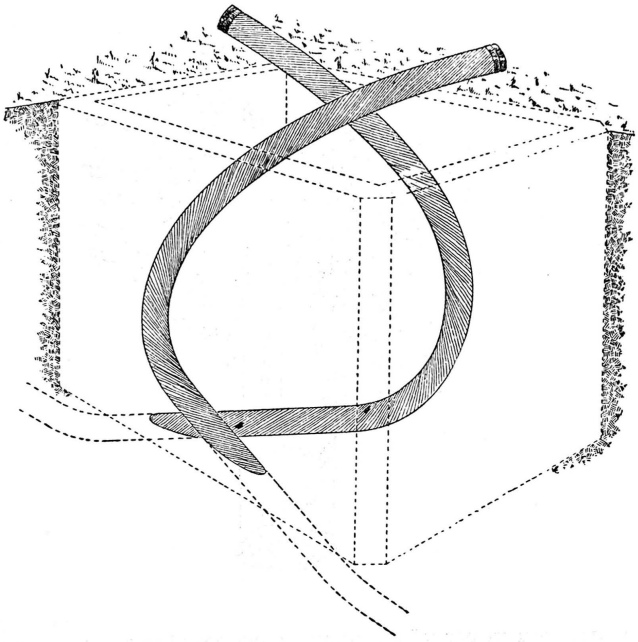


8.02 When a buried cable enters a manhole of an underground conduit system, the cable should be brought in through the wall, preferably at the end of the manhole. The entrance should be sealed with cement mortar or with a mortar made from equal parts of plaster of Paris and sand. The protective covering should extend into the manhole for at least three inches so that the mortar will not come in contact with the lead sheath.



9. CABLE AT HANDHOLES

9.01 The ends of the buried cable at handhole locations should be placed as shown so that the handhole box can be set down over them. The cable should be formed carefully, avoiding all sharp bends.

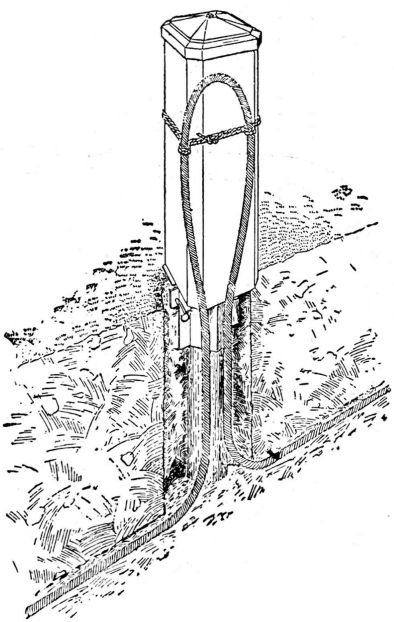


9.02 If the handhole box is placed in advance of the cable, the cable should be brought under the walls into the box and similar bends made.

10. CABLE AT PEDESTAL TERMINALS

10.01 When the pedestal is to be installed after the cable is placed, the ends of the cable or the loop, as the case may be, should be left so that it is protected as much as practicable. In some cases it may be desirable to place the ends in the trench and cover them with a small amount of backfill.

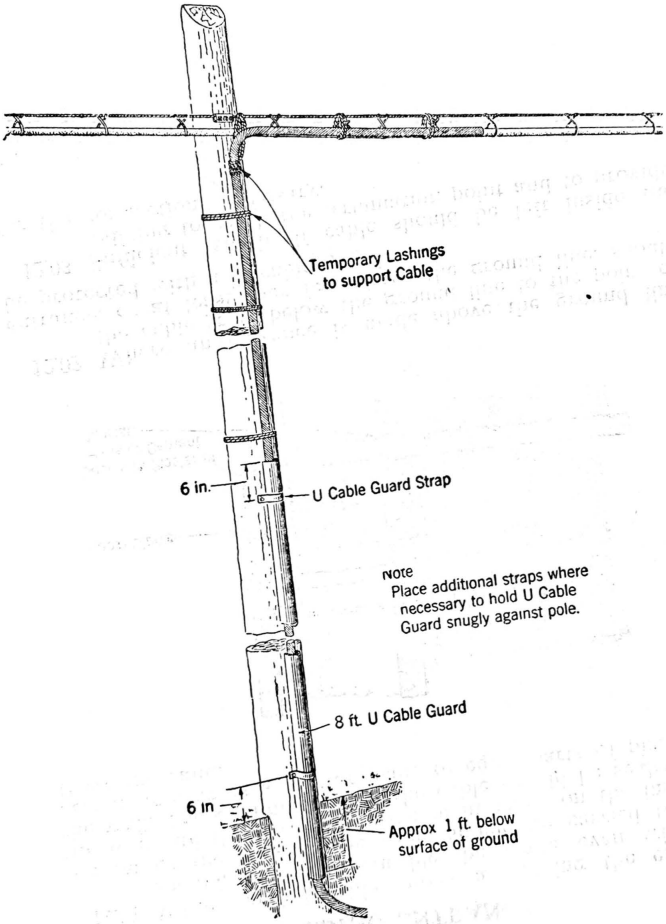
10.02 If the pedestals are installed in advance of or at the time the cable is placed, the cable should be lashed to the pedestal as shown, unless additional protection is required, in which case the exposed cable should be placed in the trench and covered.



11. CABLE AT POLES

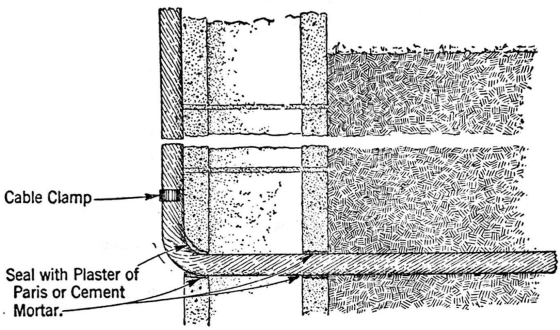
11.01 The end of the buried cable section terminating at a pole should be extended up the pole as shown and should be protected with a cable guard of the proper size.

ufficient length of cable should be left to make the necessary onnections. The location of the splice will depend on the par- icular conditions at the pole.



12. CABLE AT BUILDING ENTRANCE

12.01 Where buried cable enters a building the entrance should, where practicable, be made even with the bottom of the trench. The cable should be carried through the wall and the necessary attachment made on the inside of the wall. The opening around the cable should be sealed with cement mortar or a mortar made of equal parts of plaster of Paris and sand.



12.02 Where an entrance is made above the ground line the cable from below the ground line to the point of entrance, or at least four feet above the ground line, should be protected with a U cable guard.

12.03 Sufficient length of cable should be left inside the building to reach the termination point and to provide for the connections necessary.