

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G56.120
Issue 1, April, 1934
Provisional Standard

BURIED CABLE
MANHOLES AND HANDHOLES

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1. GENERAL

Manholes

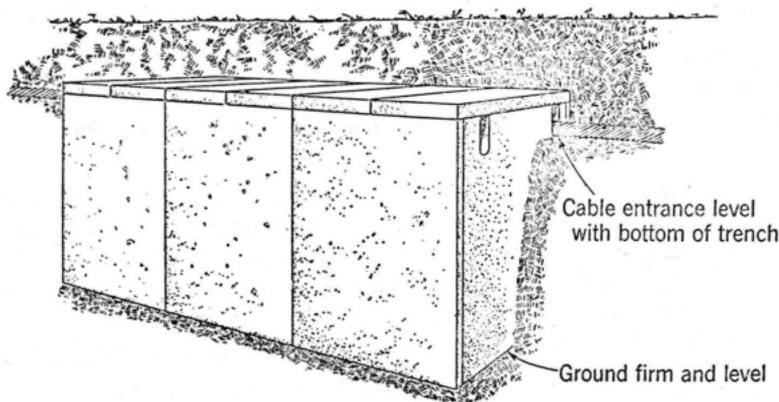
1.01 Manholes are required at loading points, cable junctions and other locations where it is necessary to provide space for considerable splicing work.

1.02 The manholes covered by these instructions are of the types particularly adapted to buried cable. These manholes are designed without a floor and with a removable roof. They are intended to be placed with the top of the manhole below the ground line and covered with an earth backfill.

1.03 These manholes should not be used at locations where it will be necessary to enter the manhole at frequent intervals nor where the excavating necessary to enter the manholes would be objectionable. For such locations manholes with standard frames and covers, constructed as specified in the practices for underground conduit construction, should be used.

1.04 The excavation should be sufficient in size to permit the convenient placing of the manhole and, in general, of sufficient depth to allow the cable to be brought in and racked level with the bottom of the trench. The soil under the bottom edge of the manhole should be firm and level to prevent excessive or uneven settling. If fluid soil is encountered additional bearing area for the base should be provided, as for

example, by placing concrete, treated wood planks or coarse gravel in the bottom of the excavation under the walls.



Handholes

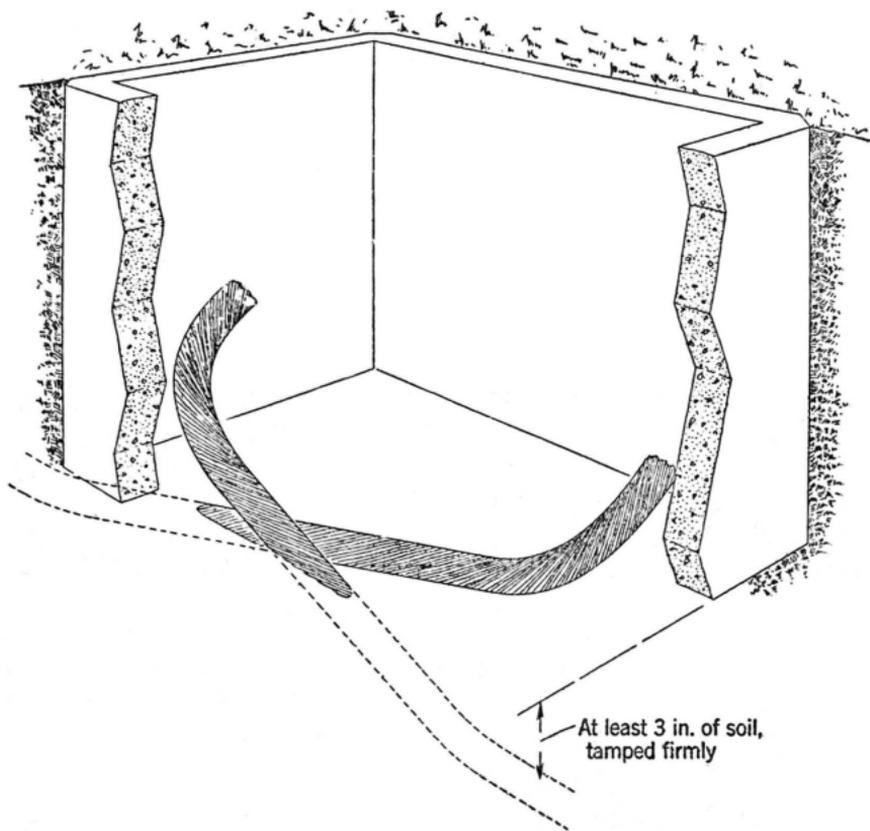
1.05 Handholes are for use at locations where U.G. terminals are to be installed and at branch cable splice points.

1.06 The handhole is a small splicing box designed to be placed with the top of the box level with the ground line and equipped with a metal cover.

1.07 The covers for handholes are not designed to carry traffic loads. Handholes should, therefore, be used only at locations where they will not be subjected to vehicular traffic. Where necessary to support traffic loads, small manholes with standard frames and covers should be used as outlined in the practices for underground conduit construction.

1.08 At handholes, the cable should be deep enough to permit placing at least three inches of earth between the top of the cable and the bottom of the box, in order to avoid damage to the cable. It will, in general, be found desirable to install handholes after the cable has been placed.

1.09 The excavation should be of a size that will permit convenient placing of the handhole. The bottom should be smooth and firm to prevent excessive or uneven settling. If fluid soils are encountered additional bearing area for the base should be provided, as for example, by placing concrete, treated wood planks, or coarse gravel in the bottom of the excavation under the walls.

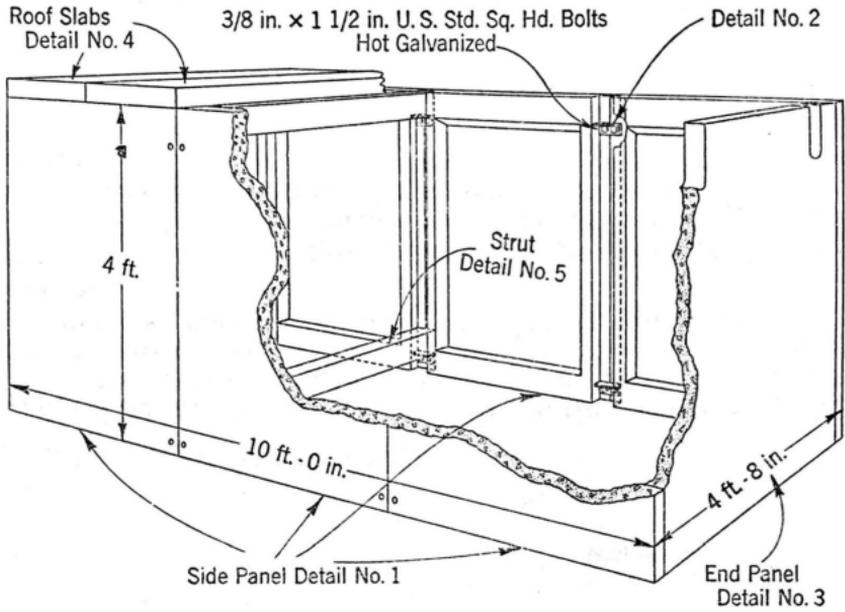


2. CONCRETE MANHOLES

2.01 The concrete manholes for buried cable may be of the sectional type precast at a centralized point or may be constructed in the field at their final location. A suitable derrick should be available for handling the precast sections.

2.02 The sectional type manhole is so designed that it can be made approximately 6, 9 or 12 feet long. The following figures illustrate the assembly and details of these manholes.

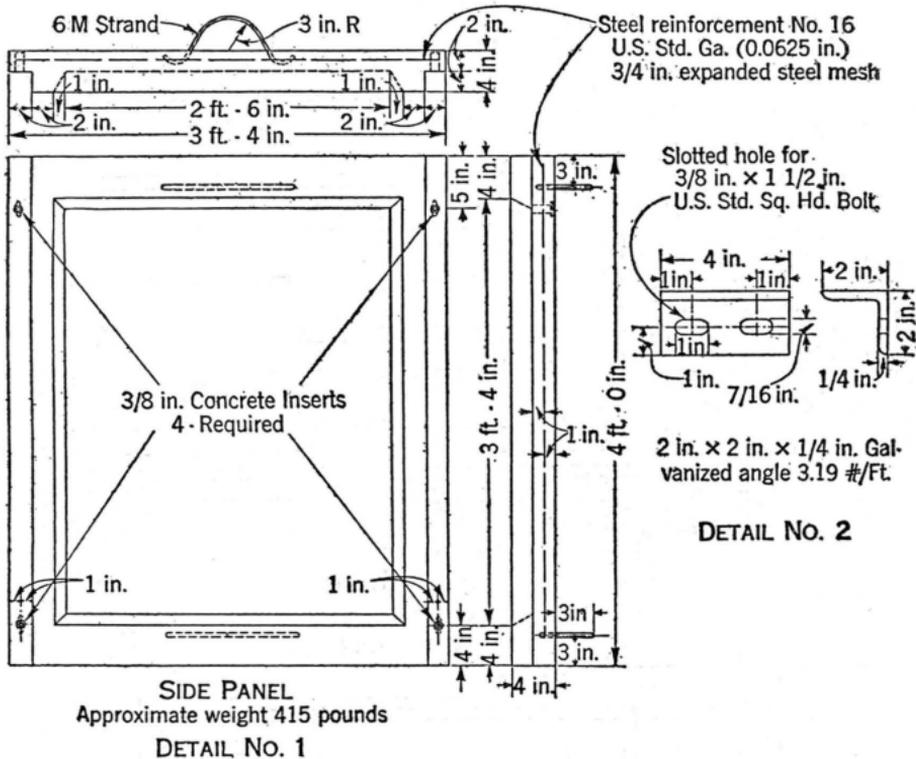
ASSEMBLY OF SECTIONAL CONCRETE MANHOLE FOR BURIED CABLE



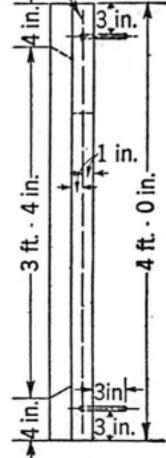
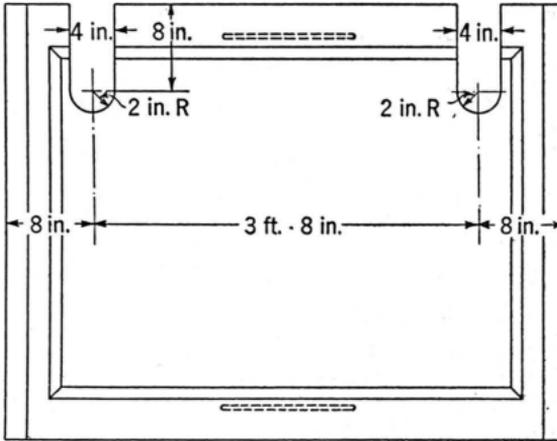
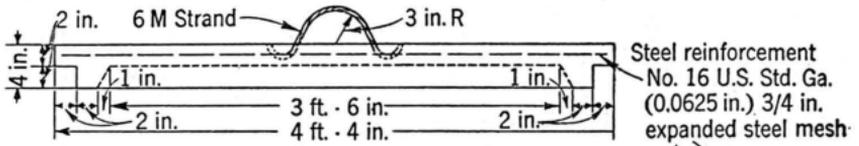
DETAILS REQUIRED

Nominal size of manhole	Detail No. 1 Side	Detail No. 2 angle	Detail No. 3 end	Detail No. 4 roof slab	Detail No. 5 Strut
4 ft. x 4 ft. x 6 ft.	4	4	2	4	2
4 ft. x 4 ft. x 9 ft.	6	8	2	6	4
4 ft. x 4 ft. x 12 ft.	8	12	2	8	6

DETAILS OF SECTIONAL MANHOLE FOR BURIED CABLES



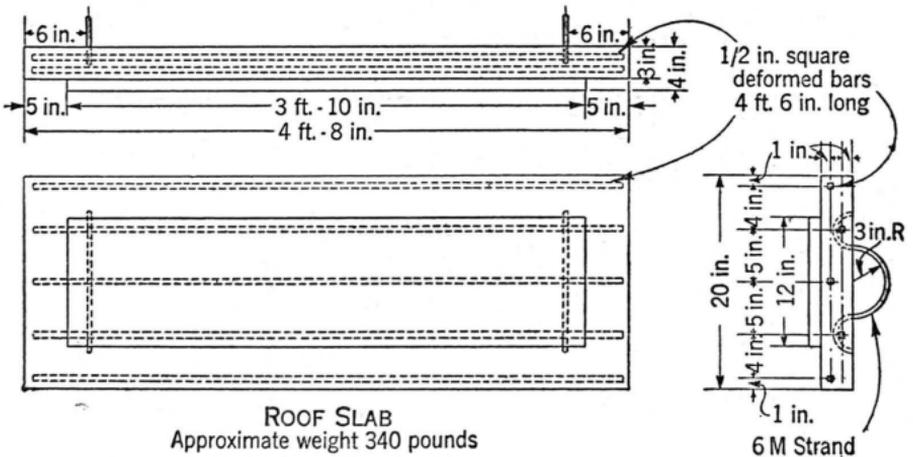
DETAILS OF SECTIONAL CONCRETE MANHOLE FOR BURIED CABLES



END PANEL

Approximate weight 525 pounds

DETAIL NO. 3



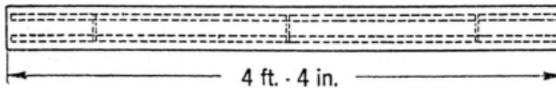
ROOF SLAB

Approximate weight 340 pounds

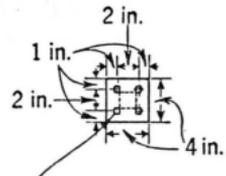
DETAIL NO. 4

DETAIL OF SECTIONAL MANHOLE FOR BURIED CABLES

Four 1/2 in. square deformed bars 4 ft. 2 in. long
welded or tied to spacers about 18 in. C. to C.



STRUT
Approximate weight 72 pounds
DETAIL No. 5



Spacers may be 1/4 in.
round rod or other
similar support for
vertical reinforcement
may be employed.

2.03 These manholes should be made of approximately 3000 pound concrete. The maximum size of the coarse aggregate should be 3/8 inch.

2.04 The racks in these manholes may be attached by means of concrete inserts placed at the time the manholes are formed, if the location is definitely known in advance, or they may be attached later by drilling the concrete and using standard anchoring devices.

2.05 If the manholes are to be constructed by pouring the concrete in forms in the excavation, the walls and ends should be made four inches thick using a maximum size coarse aggregate of 3/4 inch. The expanded mesh reinforcement should be continuous through the side and end walls. No struts need be used except for long manholes. The roof slabs should be made the same as those shown.

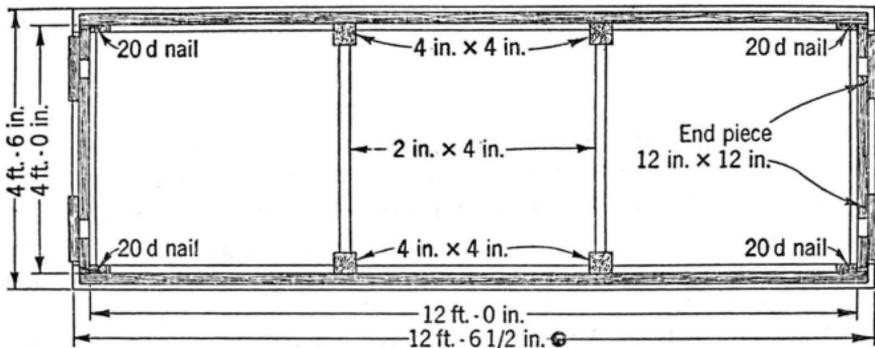
3. WOOD MANHOLES

3.01 Wood manholes for buried cable should be made of sound wood that has been properly treated by a creosoting process or from a wood that is known to have a long service life in the particular locality.

3.02 The manholes should be made of the length specified in the detail plans for the project and should in general be constructed as shown in the following figure.

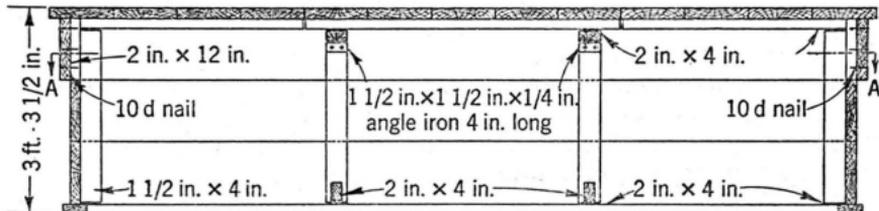
CREOSOTED WOOD MANHOLE BOX

SECTION A A



Dimensions shown for 12 ft. Manhole

SECTION B B



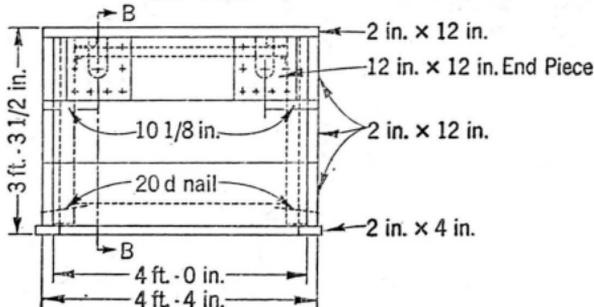
Dimensions for wood such as 3 in. x 4 in. are nominal dimensions. Actual dimensions will be smaller by the amount of the finish.

Use 20 d nails to assemble parts except roof boards and where specified otherwise.

Use 2-10d nails in each roof board.

In assembling parts clinch all nails that extend through the wood more than 1/8 in.

END VIEW

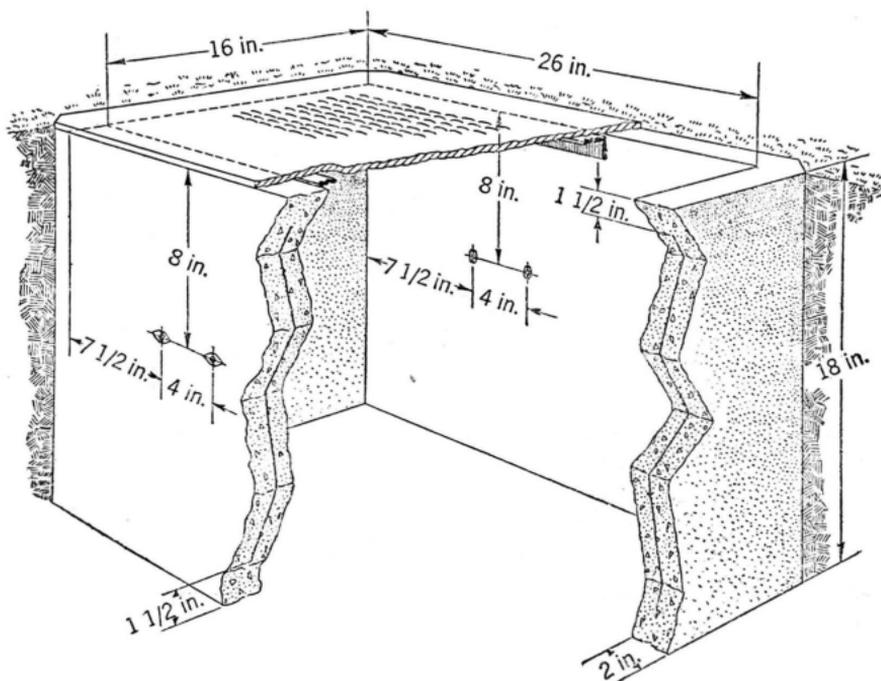


3.03 The cable racks should be attached to the manhole walls by means of galvanized bolts at the locations required.

4. HANDHOLES

4.01 Handholes for buried cable should be made of concrete or creosoted wood as specified on the detail plans.

4.02 The concrete handholes may be precast at a centralized point or constructed at the final location. A suitable derrick should be available for handling the precast handholes. The construction should be as shown in the following figure except that where the handhole is constructed at the final location no reinforcing is required. The concrete used should be approximately 2500 pound concrete with 3/8-inch maximum size coarse aggregate.



4.03 Unless the handhole is to be used as a housing for a U. G. terminal, the concrete inserts shown above need not be placed. The cables should be attached directly to the walls by means of cable clamps and the necessary anchoring devices.

4.04 Handholes may also be constructed from creosoted wood using a method of construction similar to that given for wood manholes. The inside dimensions of a wood handhole should be the same as those shown for concrete handholes. The same cover should be used.