

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G43.130.1
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MANHOLES
BRICK MANHOLES

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1. GENERAL—MATERIAL AND BRICKWORK

1.01 This section covers the construction of manholes using brick as the wall material. Except as noted, the construction of the floor and roof follows the procedure outlined for similar construction in G43.122.1 and G43.126.1 for concrete manholes.

1.02 The size of the excavation and the requirements for drainage, timbering, etc., are as outlined in G43.118.1.

Material

1.03 The material used shall be common brick; sound, hard and well-burned. The metallic "ring" of two bricks struck together, or with a trowel is usually a dependable test of a well-burned brick.

1.04 Not over 10 per cent. of broken bricks in any shipment of brick shall be accepted.

1.05 The tabulations of the material tables section will be of assistance in determining the quantities of brick and mortar required for manholes of the various types and sizes.

Brickwork

1.06 Before laying, except in freezing weather, all brick shall be thoroughly wetted, but shall not be soaked to the point of saturation.

1.07 All brickwork shall be laid plumb, true to line and level, with all required angles built up level, square, sharp and true to dimensions.

1.08 Unless otherwise shown in the detail plans, all brick shall be laid with four courses of running bond and a full header course every fifth course.

1.09 All brick shall be laid in full flat bed joints. All vertical and horizontal joints shall be filled with mortar and shall be finished as flush joints. The thickness of the mortar joints shall not exceed 1/2 inch.

1.10 The composition and preparation of mortars recommended for brick masonry are included in G45.160.1.

2. FLOOR CONSTRUCTION

2.01 In placing the floors for brick manholes, concrete of the grade specified in G45.140.1 shall be used. The thickness of the concrete and the size and arrangement of the reinforcing, if required, are determined as outlined in G43.122.1.

2.02 After provision for drainage during construction has been made, as outlined in G43.118.1, the floor is to be laid so as to completely cover the bottom of the excavation. After depositing, the concrete shall be allowed to gain sufficient strength before building the brick walls upon it.

3. WALL CONSTRUCTION

Bricklaying

3.01 The starting course of brick for each wall shall be a header course. Begin this course so as to allow a minimum of 3 inches between the outside of the brick and the sheeting or the wall of the excavation.

3.02 As the brick is laid and the outside joints are filled and struck off, the 3-inch space should be backfilled with earth and tamped firmly. The backfilling should be done progressively so that not over 18 inches of wall shall have been erected before the intervening space is filled.

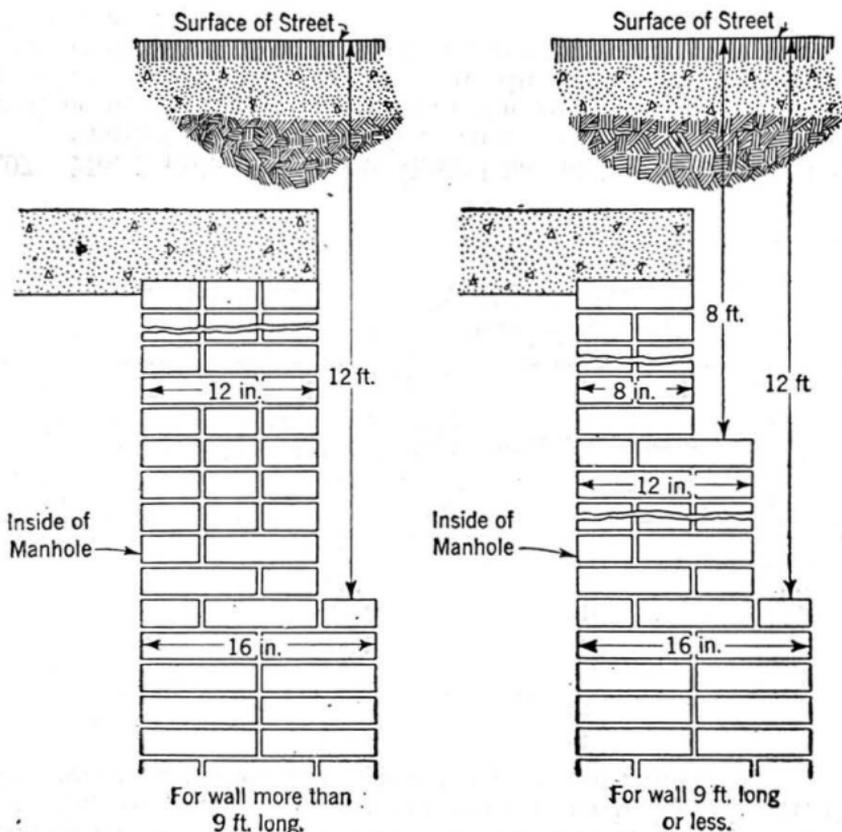
3.03 Where the walls are sheeted, the bracing may be removed beginning at the bottom as the bricklaying progresses, except in very unstable soil where the lateral soil pressure might disturb the brickwork before the mortar has attained sufficient strength to withstand the load. In such cases, the bracing should be transferred to the interior of the manhole as the bricklaying progresses.

3.04 Projecting brick should be left in the fourth and fifth courses from the top of the wall, to support the cross-braces for the roof form. This construction is illustrated in Part 4 of this section.

Thickness

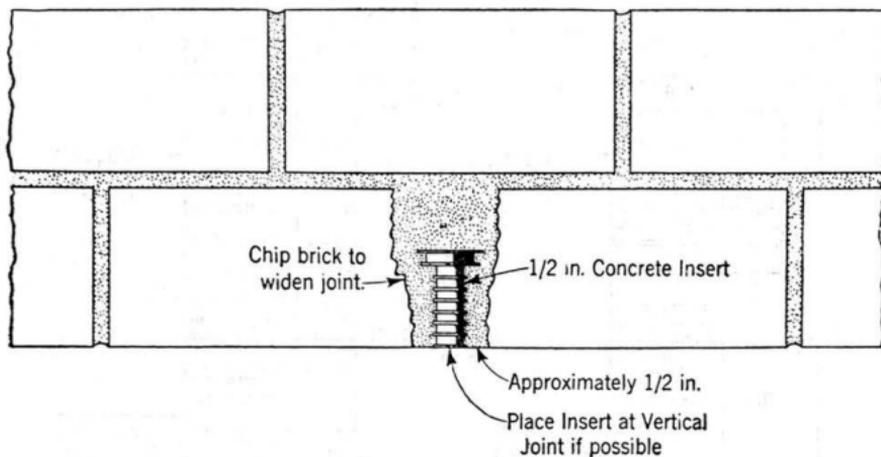
3.05 The walls will be of solid brick construction 8 inches in thickness except as noted below:

- (a) If the walls are longer than 9 feet or,
- (b) If the manhole extends more than 8 feet below the surface of the street, the thickness of the walls shall be increased as shown below.



Provision for Manhole Hardware

3.06 In brick manhole construction 1/2-inch concrete inserts for the support of cable racks or tee irons should be placed as the walls are built, as shown below. If for any reason, the placing of anchorages for hardware must be done later, the walls should be drilled for 1/2-inch expansion shields.



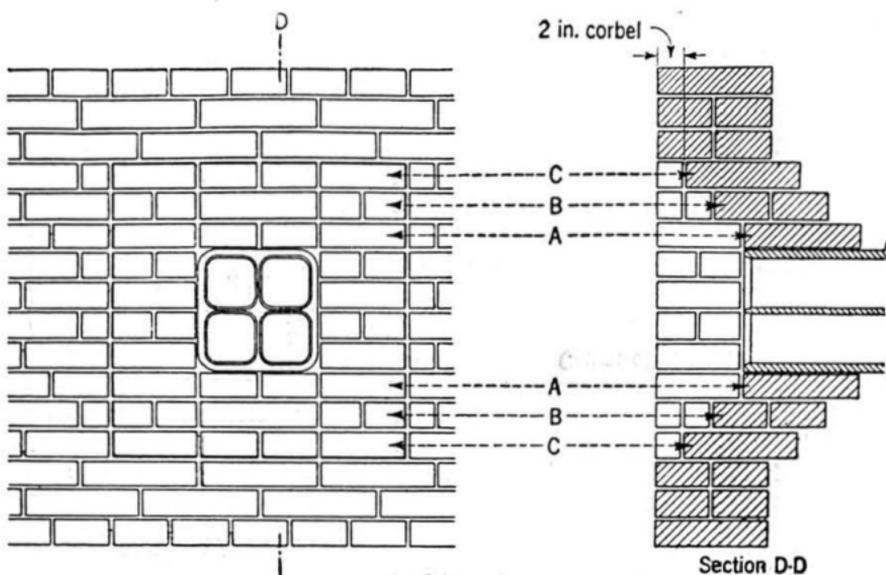
3.07 No. 1 pulling-in irons should be set in the walls of the manholes as the bricklaying progresses. The irons should be set in the walls opposite the duct entrances, usually at a point from 6 to 12 inches below the ducts with which they are associated and in line with the center line of the duct or bank of ducts.

3.08 Further details regarding the placing of racks, rack supports, tee irons, pulling-in irons, etc., will be found in G43.140.1.

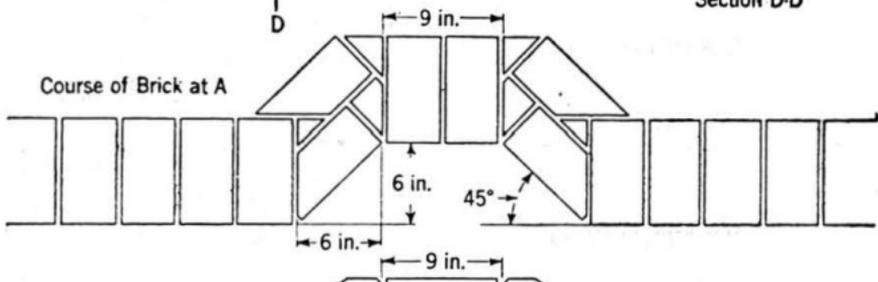
Recessing Duct Entrances

3.09 Recessed duct entrances are to be provided where shown on the detail plans or as indicated in G43.110.1.

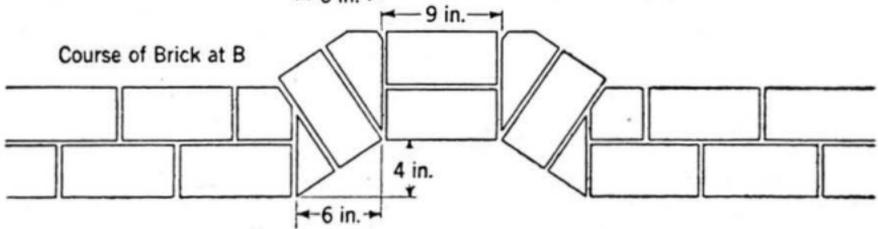
3.10 The details of building a recess in a brick manhole are shown in the following illustrations. Recesses of depths other than that illustrated shall be laid up in a similar manner. In no case shall one course of brick be corbelled more than 2 inches.



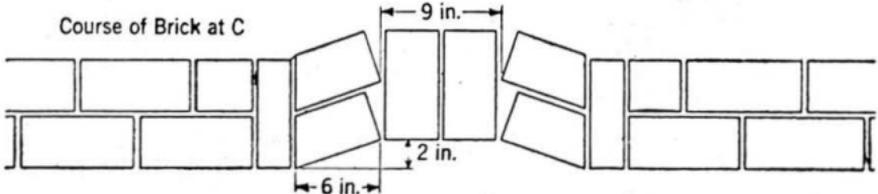
Course of Brick at A

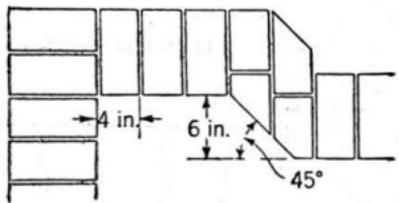
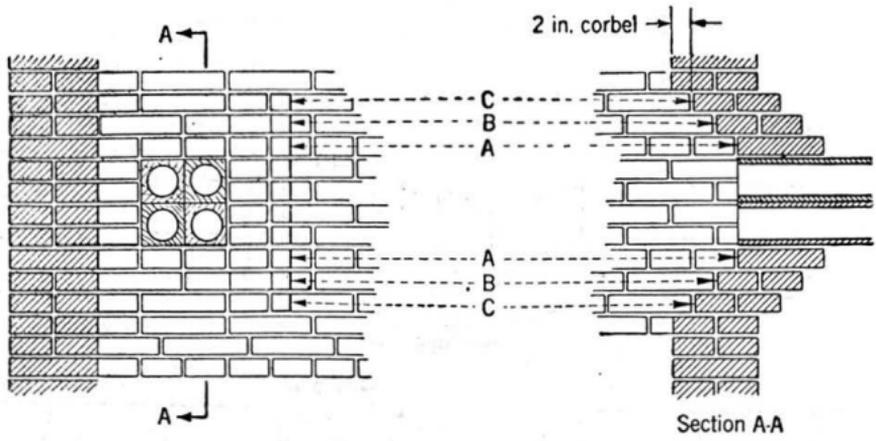


Course of Brick at B

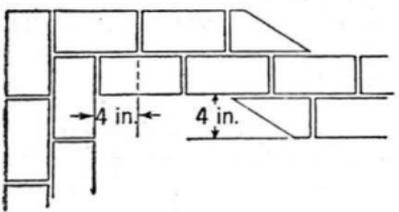


Course of Brick at C

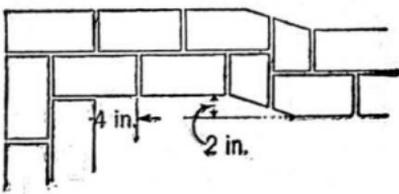




Course of Brick at A



Course of Brick at B

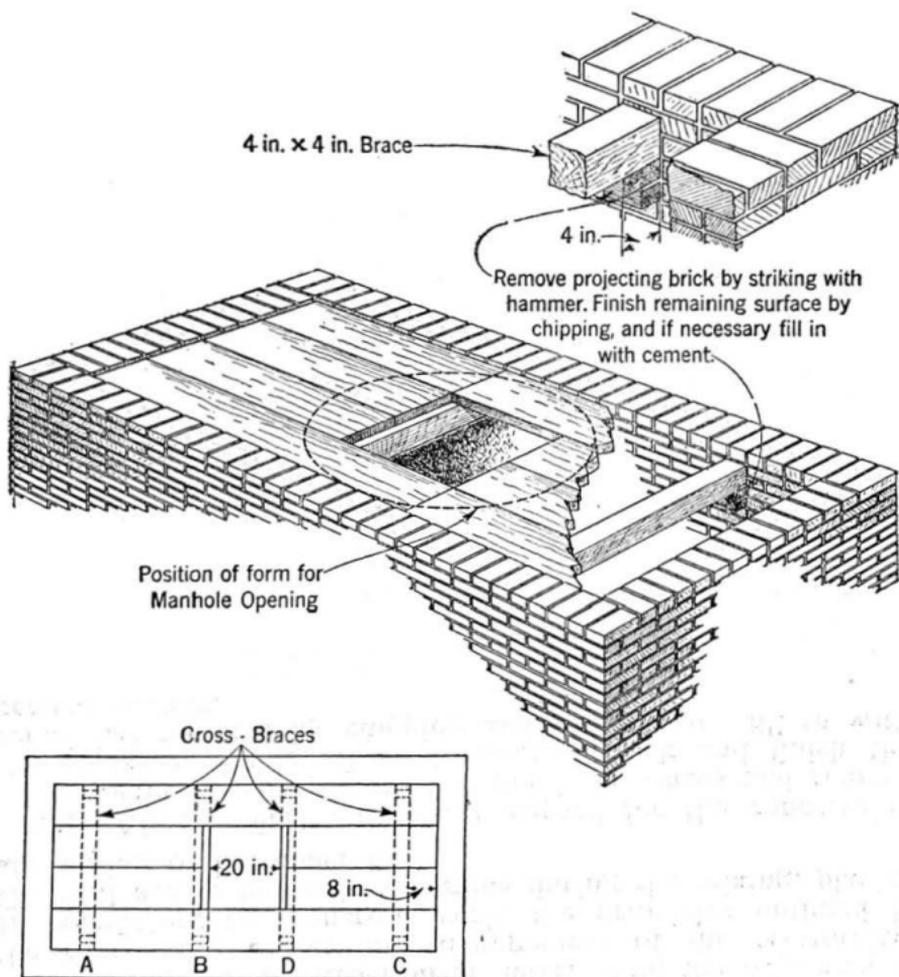


Course of Brick at C

4. ROOF CONSTRUCTION

4.01 For roofs of brick manholes, concrete of the grade specified in G45.140.1 shall be used.

4.02 After the walls have been built up to the required height and the top course has been finished, 2-inch planking may be placed for the roof form. The planking should be supported by 4-inch x 4-inch cross-braces resting on brick projecting from the manhole walls, as shown below. Cover the planking with roofing paper before placing the concrete. Do not allow the paper to extend over the walls.



In taking down roof form remove cross-braces in sequence shown by letters.

4.03 Place the manhole opening form.

4.04 Follow the instructions of G43.126.1 for concrete manhole roof construction in determining the thickness of the roof and the size and arrangement of the reinforcing. In completing the concrete work, the principles outlined in G45.150.1 are to be used as a guide during the mixing, placing and curing of the concrete.

4.05 After sufficient time has elapsed for the concrete to gain strength, knock out the form braces and remove the planking. Strike off the projecting brick and finish the remaining surfaces by chipping and if necessary fill in with cement mortar.