

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

**SECTION G41.150**  
**Issue 1, July, 1943**  
**AT&T Co Standard**

**MAIN CONDUIT**  
**REINFORCING**

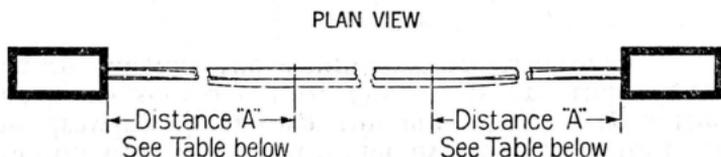
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**1. GENERAL**

1.01 This section describes the duct work required in reinforcing a subway by placing additional ducts alongside the existing conduit. For the enlargement or rearrangement of manholes incidental to the reinforcing operations see Section G43.150 on enlarging manholes.

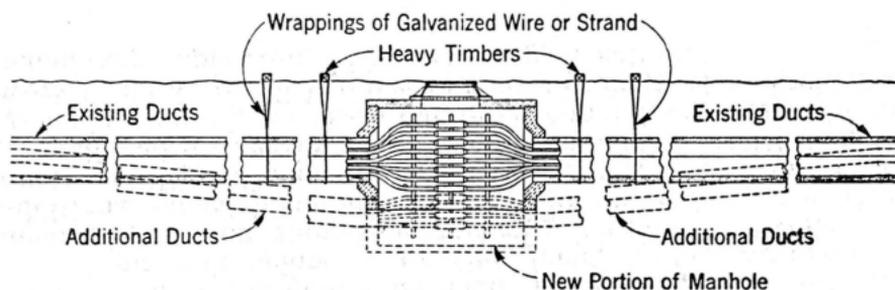
**2. ENTERING MANHOLE BELOW EXISTING ENTRANCE**

2.01 Where the additional ducts are to be brought into the manhole below the existing ducts, the general arrangement of the ducts should be as shown. The point at which the additional ducts should start to curve in and under the existing ducts will depend upon the height of the reinforcing formation, as indicated in the table, and whether or not mitered conduit is used. In general, the use of mitered conduit will result in the work being accomplished within a shorter distance and with less temporary supporting of the existing structure.



Height of Additional Duct Formation	Distance "A"
2 to 3 Ducts	25 to 30 Feet
4 to 6 Ducts	40 to 50 Feet

2.02 Between the manhole end wall and the point where the additional ducts begin to emerge from under the existing ducts, provision should be made for supporting the existing structure while the work below is in progress. This may be done by excavating to slightly below the bed of the original trench and passing ties composed of several turns of 109 steel construction wire or strand under every other 3 foot section of tile and drawing them over timbers placed across the top of the trench, as shown below. These ties are then drawn sufficiently tight to take the weight of the structure.



2.03 In making the joints in the straight section, it may be convenient to lay the tile a distance of about four inches away from the existing conduit in order to facilitate the handling of the bandages. After the laying has progressed for some distance along the trench, the conduit may be pushed into position against the existing ducts. Any shifting must, however, be done within 1 hour of the time of mixing mortar for the bandage joints, otherwise the movement may impair the joints.

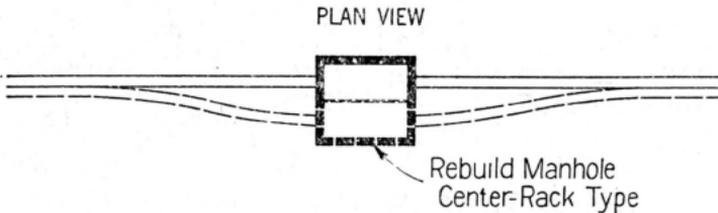
2.04 If the restriction of space below the existing conduit handicaps the completion of the bandage joint, it may be advisable to use prejoined sections where the offset is made.

2.05 The bed of the trench should be graded to afford a vertical separation between the existing ducts and the reinforcing ducts at the manhole entrance, in order to permit the proper racking of the cables.

2.06 Before releasing the tension on the ties supporting the existing ducts, the space intervening between the new ducts and the old should be backfilled with concrete or support should be furnished by means of brick piers to avoid settlement of the old structure.

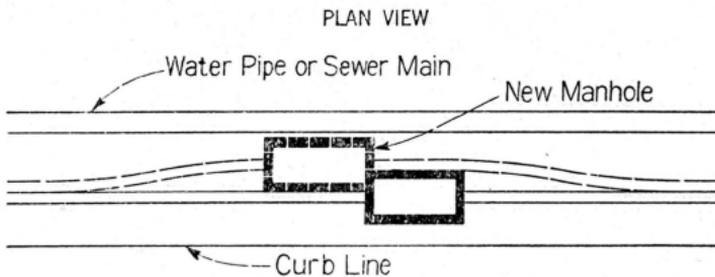
### 3. CENTER-RACK MANHOLES

3.01 Where conditions are such that it will not be practicable to bring additional ducts into the manholes underneath the existing ducts due to obstructions or excavation in rock, the manhole may be rebuilt into a center-rack manhole with the reinforcing ducts carried into the added compartment as shown. Use mitered conduit to obtain the horizontal offset into the new compartment. See Section G41.120 for the arrangement of mitered units to obtain the required offset.



### 4. SEPARATE MANHOLES

4.01 If foreign pipes or other obstructions restrict the available horizontal space, the reinforcing ducts may be brought into a separate manhole located as shown. Use mitered conduit to obtain the horizontal offset into the new manhole. See Section G41.120 for the arrangement of mitered units to obtain the required offset.



4.02 In constructing a separate manhole in this manner it will usually be advisable to place tie ducts between the new and existing manholes through the common wall. Short lengths of Pine Conduit may be embedded in the wall for this purpose.