BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G42.120.1
Issue 1, December, 1946
AT&T Co Standard

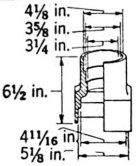
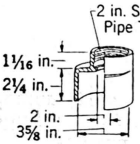
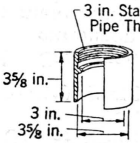
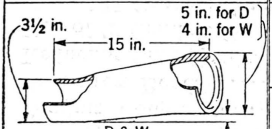
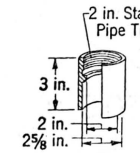
SUBSIDIARY CONDUIT
CONDUIT FITTINGS

Part **Page**

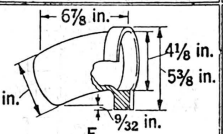
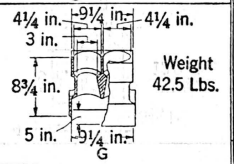
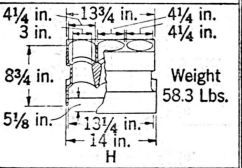
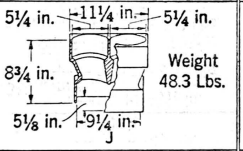
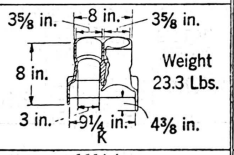
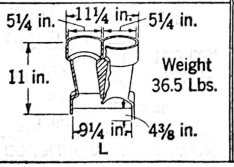
1. CONDUIT COUPLINGS

1.01 Cast iron Conduit Couplings may be required in the extension of subsidiary ducts from a main conduit run or to make connections between ducts of unlike materials or sizes in the same conduit line. Couplings are available in the types illustrated and for the purposes outlined below. Each coupling bears on its outside surface the designation of its particular type.

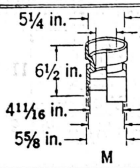
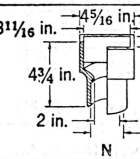
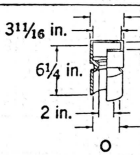
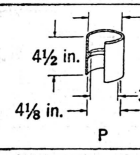
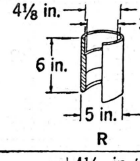
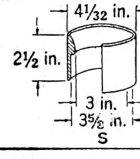
CONDUIT COUPLINGS

COUPLING & DESIGNATION	FOR CONNECTING	TO
 A Weight 14.7 Lbs.	Square or Round Bore 1 - Duct Clay Conduit 3 in. or 3½ in. Pine Conduit	3 in. or 3½ in. B or C Cement Conduit 3 in. B or C Fibre Conduit 3½ in. B Fibre Conduit 3 in. or 3½ in. Steel Pipe 3 in. or 3½ in. CI Bend
 B Weight 3.1 Lbs.	3 in. CI Bend D Conduit Coupling W Conduit Coupling	2 in. Threaded Pipe
 C Weight 3.2 Lbs.	3 in. CI Bend 3 in. B or C Cement Conduit 3 in. B Fibre Conduit D Conduit Coupling W Conduit Coupling	3 in. Threaded Pipe
 Weight D - 19.2 Lbs. W - 16.0 Lbs.	D 4 in. Sewer Pipe Bend (Bell End) W 3 in. Sewer Pipe Bend (Bell End)	CI Cap on Pole or Building B Conduit Coupling C Conduit Coupling
 E Weight 2.4 Lbs.	2 in. CI Bend 2 in. B or C Cement Conduit 2 in. B Fibre Conduit	2 in. Threaded Pipe

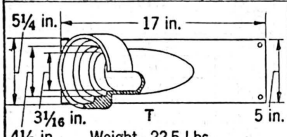
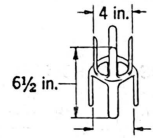
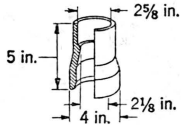
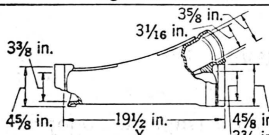
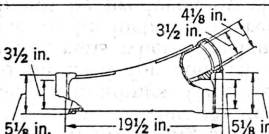
CONDUIT COUPLINGS

COUPLING & DESIGNATION	FOR CONNECTING	TO
 Weight - 5.4 Lbs.	Y - Coupling Z - Coupling fitted with S Coupling	3½ in. CI Bend 3 in. CI Bend fitted with S Coupling
 Weight 42.5 Lbs.	2 Duct Clay Conduit	3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit 3 in. Sewer Pipe 3½ in. Steel Pipe 3 in. Steel Pipe fitted with S Coupling
 Weight 58.3 Lbs.	3 Duct Clay Conduit	3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit 3 in. Sewer Pipe 3½ in. Steel Pipe 3 in. Steel Pipe fitted with S Coupling
 Weight 48.3 Lbs.	2 Duct Clay Conduit	4 in. Sewer Pipe 4 in. C Fibre Conduit
 Weight 23.3 Lbs.	Two Ducts of 4, 6, or 8 - Duct Clay Conduit	3 in. Steel Pipe 3 in. B or C Cement Conduit 3 in. B Fibre Conduit 3 in. CI Bend
 Weight 36.5 Lbs.	Two Ducts of 4, 6, or 8 - Duct Clay Conduit	4 in. Sewer Pipe 4 in. C Fibre Conduit

CONDUIT COUPLINGS

COUPLING & DESIGNATION	FOR CONNECTING	TO
 M	3 in. or 3½ in. Pine Conduit Square or Round Bore 1-Duct Clay Conduit	4 in. Sewer Pipe
 N	2 in. Pine Conduit	2 in. B or C Cement Conduit 2 in. B Fibre Conduit 2 in. Steel Pipe 2 in. CI Bend
 O	2 in. Pine Conduit	3 in. B or C Cement Conduit 3 in. B Fibre Conduit 3 in. Steel Pipe 3 in. CI Bend
 P	3½ in. Steel Pipe 3 in. Steel Pipe fitted with S Coupling	3½ in. CI Bend 3 in. CI Bend fitted with S Coupling 3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit
 R	4 in. Sewer Pipe (Bell End)	3½ in. CI Bend 3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit 3½ in. Steel Pipe
 S	Conduit Couplings of 3½ in. Size	3 in. Steel Pipe 3 in. CI Bend 3 in. B or C Cement Conduit 3 in. B Fibre Conduit

CONDUIT COUPLINGS

COUPLING & DESIGNATION	FOR CONNECTING	TO
 Weight - 22.5 Lbs.	A Duct of Multiple Clay Conduit	3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit 3 in. C Fibre Conduit 4 in. Sewer Pipe 3½ in. Steel Pipe 3½ in. C I Bend
 Weight - 2.0 Lbs.	1 Duct Square Bore and Multiple Clay Conduit	3 in. or 3½ in. B or C Cement Conduit 3 in. or 3½ B Fibre Conduit 3 in. C Fibre Conduit 3½ in. Steel Pipe 3½ in. C I Bend 3 in. Steel Pipe or C I Bend fitted with S Coupling
 Weight - 6.3 Lbs.	3 in. Sewer Pipe (Bell End)	2 in. C I Bend 2 in. B or C Cement Conduit 2 in. B Fibre Conduit
 Weight - 30.5 Lbs.	3 in. Pine Conduit 1 Duct Round Bore Clay Conduit	3 in. C I Bends 3 in. B or C Cement Conduit 3 in. B Fibre Conduit F Conduit Couplings
 Weight - 36.0 Lbs.	3½ in. Pine Conduit 1 Duct Square Bore Clay Conduit	3½ in. C I Bends 3½ in. B or C Cement Conduit 3½ in. B Fibre Conduit

1.02 In placing any of the Conduit Couplings described above, exercise care in aligning the couplings and connecting ducts, and avoid disturbing the couplings after the joints have been made.

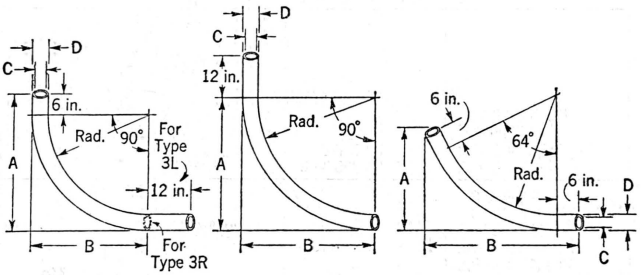
1.03 Encase all cast iron couplings in 3 inches of concrete or mortar, extending the encasement at least 6 inches beyond the ends of the couplings.

1.04 Cement Conduit couplings and Fibre Conduit couplings are described in G40.060.1.

2. CAST IRON BENDS

2.01 In branching subsidiary ducts from a main line or for constructing 90 degree vertical bends at terminating poles or buildings, Cast Iron Bends are employed. They may also be used for constructing 90 degree horizontal bends in conduit runs where the length of the run and the size of the cable to be installed therein are such that pulling difficulties will not be produced by virtue of the short radii of the Cast Iron Bends. Information concerning Cast Iron Bends is shown in the following illustration and table.

CAST IRON BENDS



TYPES 3R AND 3L TYPES 2L AND 3½L TYPES 3-64° AND 3½-64°

Sizes and Dimensions

Cast Iron Bend Type	Dimensions-Inches					Weight Pounds
	Radius	A	B	C	D	
2L	24	26⅝	26⅝	2	2½	27
3R	24	33¾	27¾	3	3½	41
3L	30	39¾	33¾	3	3½	58
3-64°	24	22⅝	33½	3	3½	38
3½-64°	24	23 3/16	34	3½	4	44
3½L	30	34¼	34¼	3½	4	66

2.02 The type 3R Cast Iron Bend of 24-inch radius is intended for use in terminating 3-inch subsidiary conduit on private property or in other locations where the conduit may be laid with a cover of 18 inches. In this use the bend is placed with the 6-inch straight section joined to the conduit. By reversing the bend so that the straight section appears at the ground line, conduit depths to 24 inches can be accommodated.

2.03 The type 3L Cast Iron Bend of 30-inch radius has, in addition to a 6-inch straight section at one end, a 12-inch straight extension at the opposite end. This provides for depths of setting below the ground line of approximately 30 and 36 inches with 6 inches appearing above the ground line.

2.04 The Type 3-1/2L Cast Iron Bend of 30-inch radius has a single 12-inch straight section to provide for depths of cover of 24 and 36 inches, depending on the position of the straight section.

2.05 The 64 degree bends are for use with Types T, Y, and Z couplings.

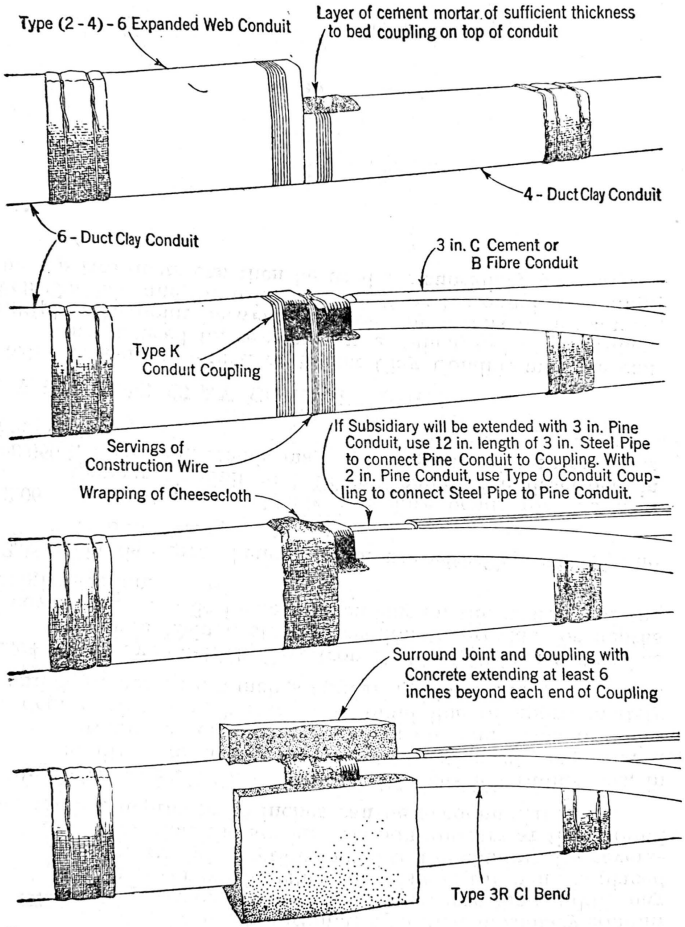
2.06 Pre-cast cement bends and fibre bends for use with Cement Conduit and Fibre Conduit are described in G40.060.1. Cast Iron Bends may also be used with these types of conduit.

3. REDUCING CLAY CONDUIT RUNS

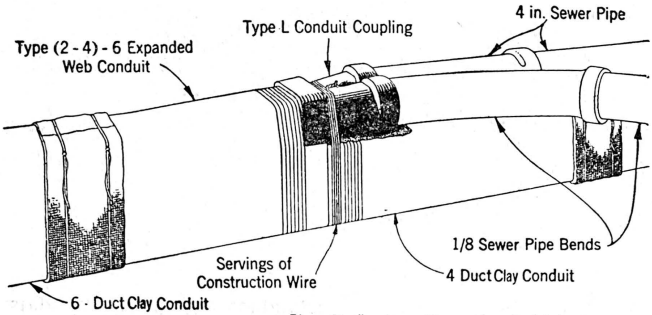
3.01 A 4-duct, 6-duct, or 8-duct Clay Conduit multiple can be reduced to, respectively, a 2-duct, 4-duct, or 6-duct multiple at a point between manholes by means of Expanded Web Conduit, and, by using a Type K or L Conduit Coupling. The top two ducts can then be used for subsidiary purposes.

3.02 The methods of installing K and L Conduit Couplings are illustrated in the following figures:

(a) Type K Conduit Coupling.

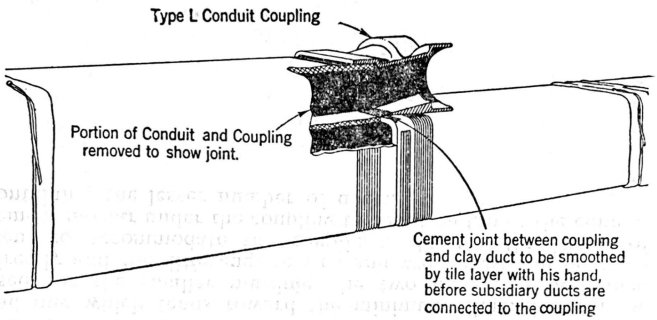


(b) Type L Conduit Coupling.



3.03 If expanded web conduit as shown in 3.02 is not available, the 6- and 4-duct Clay Conduit or the 4- and 2-duct Clay Conduit can still be joined in a manner to permit the couplings to be employed. Ordinarily there are slight variations in the over-all dimensions between conduit units of the same multiple. If a unit which tends toward the maximum over-all dimension can be used for the larger multiple and one which tends toward the minimum dimension can be used for the smaller multiple, the two units can be joined directly and the difference in web and wall levels will be sufficient to accommodate the couplings. Place a thin layer of cement mortar under the coupling to bed it on top of the conduit containing the lesser number of ducts.

3.04 After the coupling has been secured in place with wire servings, the bottom of the joint between the coupling and the Clay Conduit should be pointed with cement mortar before the subsidiary ducts are connected to the coupling, shown as follows:

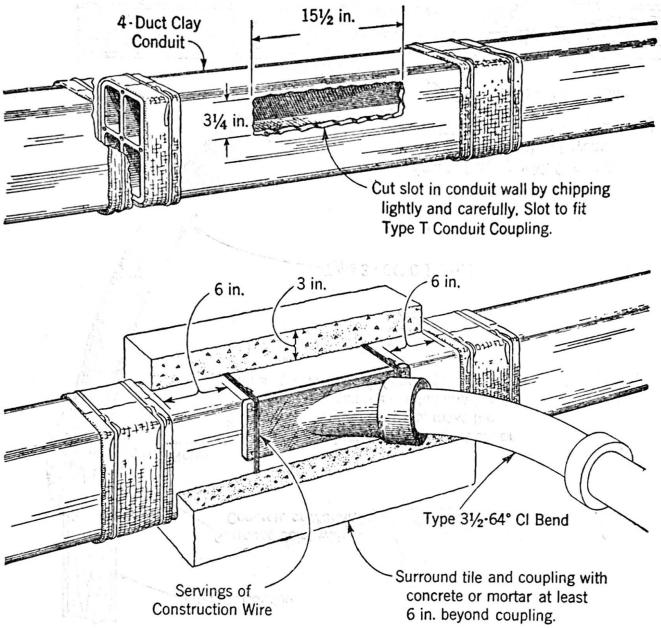


3.05 Encase the coupling and conduit in 3 inches of concrete, extending this encasement 6 inches beyond both ends of the coupling.

4. USE OF T CONDUIT COUPLING

4.01 The T Conduit Coupling is used to connect an outside duct of a multiple Clay Conduit formation to a single subsidiary duct. The following illustration shows the successive steps in placing the coupling:

TYPE T CONDUIT COUPLING



5. USE OF U CONDUIT COUPLING

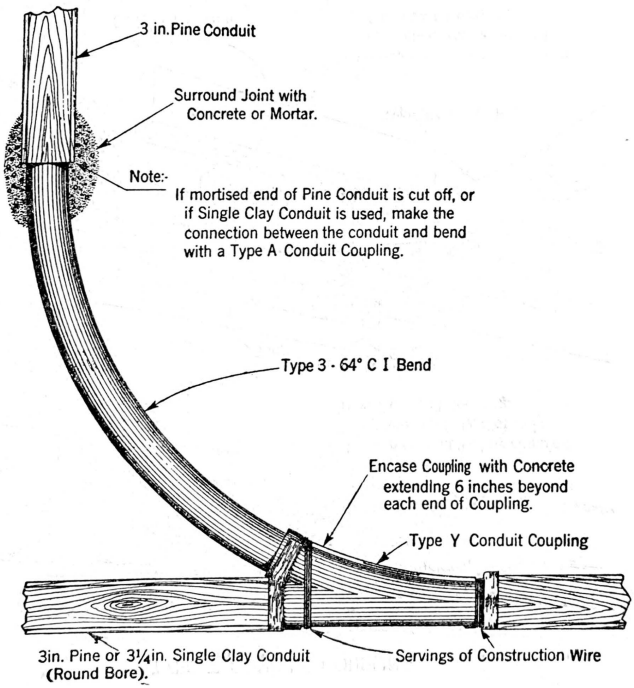
5.01 The U Conduit Coupling, made of malleable iron, is intended to connect a 1-duct square bore or multiple Clay Conduit to Cement Conduit, Fibre Conduit, steel pipe or a Cast Iron Bend. The prongs at one end of the coupling are placed in the corners of the square bore Clay Conduit and the prongs at the other end are placed on the outside of the round conduit or CI bend. The prongs may be bent to obtain a secure fit. The joints should be wrapped with cheese cloth and surrounded with 3 inches of concrete which should extend at least 6 inches beyond the coupling. An illustration of the use of the U Conduit Coupling appears in G41.120.

6. USE OF Y AND Z CONDUIT COUPLINGS

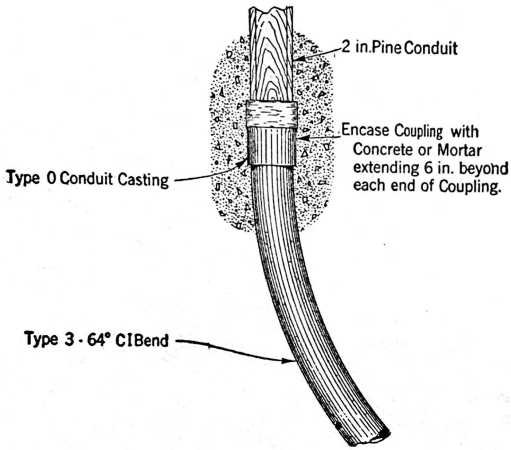
6.01 Type Y and Z Conduit Couplings can be used for making connections to either Pine Conduit or 1-duct Clay Conduct. The Y coupling is used for 3-inch Pine Conduit or 1-duct round bore Clay Conduit and the Z coupling is used for 3-1/2-inch Pine Conduit or 1-duct square bore Clay Conduit.

6.02 Place the lower half of the coupling after making sure that the foundation is solid. Place the top half and tie the two sections together with iron wire. Plaster the side seams and joints with cement mortar and encase the coupling in concrete.

6.03 In cases where the subsidiary duct leaves the main conduit at an angle of 90 degrees, join the coupling to the subsidiary duct by means of a Type 3-64° Cast Iron Bend as shown below.



6.04 When 2-inch Pine Conduit is used to construct the subsidiary, the connection between the CI bend and the 2-inch Pine Conduit should be made by means of a Type O Conduit Coupling as shown below:



6.05 When it is necessary to cross over a duct adjacent to the duct to be extended, this may be done by placing the Y coupling in a vertical position and connecting the subsidiary duct to the coupling by means of an F Conduit Coupling and a Type 3-1/2L CI bend as shown below. A Type 3L CI bend fitted with an S Conduit Coupling may be substituted for the Type 3-1/2L CI bend.