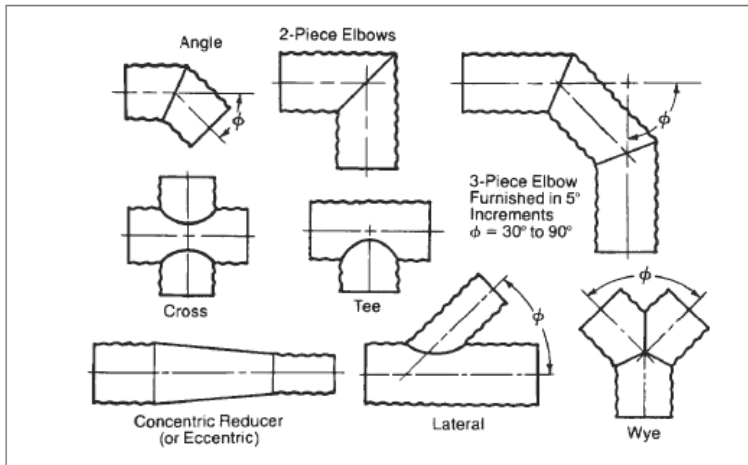


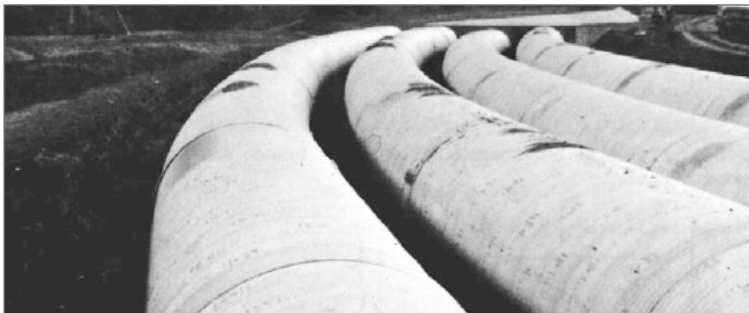
Fittings

One of the benefits of corrugated steel pipe is that it can be easily and economically fabricated into an assortment of fittings. Table 2.54 provides minimum dimensions for CSP elbows (round pipe). Table 2.55 provides minimum dimensions for CSP tees, crosses, laterals and wyes (round pipe).

Structural plate fittings are shop cut from curved corrugated plates and welded together. These structures are usually assembled and bolted in the shop in a trial fit to assure that all parts mate properly. The parts are then clearly marked for field assembly.



■ **Figure 2.23** Shop fittings for corrugated steel pipe and pipe arch. Shop fabricated fittings are available for a wide variety of conditions.



■ Moderate horizontal curvature in a culvert or sewer can be achieved with ordinary couplings. Greater changes in alignment will require fabricated fittings.

Table 2.54

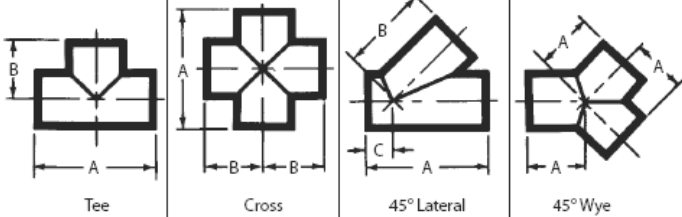
Minimum dimensions for elbows for round CSP --- all corrugations

Pipe Diameter (in.)	A (ft)	Total Length (ft)	Pipe Diameter (in.)	A (ft)	Total Length (ft)	Pipe Diameter (in.)	A (in.)	B (in.)	C (in.)	Total Length (ft)
6-18	1	2	6-10	1	2	6	13 1/2	8	8	2
21-48	2	4	12-27	2	4	8	14	9	7 1/2	2
54-96	3	6	30-42	3	6	10	14	10	7	2
			48-66	4	8	12	25 1/2	11	18 1/2	4
			72-84	5	10	15	26 1/2	12	18	4
			90-96	6	12	18	27	14	17	4
						21	27	15	16 1/2	4
						24	27 1/2	16	16	4
						27	27 1/2	17	15 1/2	4
						30	40	19	26 1/2	6
						33	40	20	26	6
						36	40 1/2	21	25 1/2	6
						42	41	23	24 1/2	6
						48	53 1/2	26	35	8
						54	54	28	34	8
						60	54 1/2	31	32 1/2	8
						66	54	33	31 1/2	8
						72	67 1/2	36	42	10
						78	68	39	40 1/2	10
						84	68 1/2	41	39 1/2	10
						90	70	46	37	10
						96	82	46	49	12

Notes: The total length (ft) and pipe diameter (in.) listed are minimum requirements for fitting fabrication. Fittings with other dimensions to satisfy specific needs are also available. All dimensions are nominal.

Table 2.55

Minimum dimensions for CSP round fittings

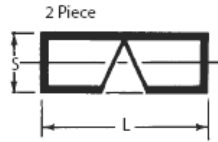
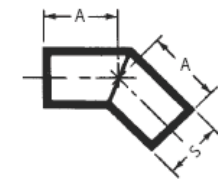
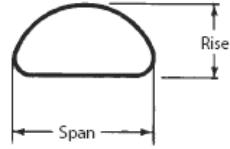


Main Diam. (in.)	Stub Same or Smaller Than Main Diameter												
	Tee			Cross			45° Lateral				45° Wye		
	A (ft-in.)	B (ft-in.)	TL (ft-in.)	A (ft-in.)	B (ft-in.)	TL (ft-in.)	A (ft-in.)	B (ft-in.)	C (ft-in.)	TL (ft-in.)	A (ft-in.)	B (ft-in.)	TL (ft-in.)
6	2-6	1-3	3-9	2-6	1-3	5-0	2-9	1-6	1-2	4-3	1-1	1-3	3-7
8	2-8	1-4	4-0	2-8	1-4	5-4	3-0	1-8	1-2	4-8	1-2	1-4	3-10
10	2-10	1-5	4-2	2-10	1-5	5-8	3-2	1-10	1-2	5-0	1-2	1-5	4-0
12	3-0	1-6	4-6	3-0	1-6	6-0	3-5	2-0	1-3	5-5	1-3	1-6	4-3
15	3-3	1-8	4-11	3-3	1-8	6-6	3-9	2-3	1-3	6-0	1-3	1-8	4-7
18	3-6	1-9	5-3	3-6	1-9	7-0	4-2	2-6	1-4	6-8	1-4	1-9	4-10
21	3-9	1-11	5-10	3-9	1-11	7-6	4-6	2-9	1-4	7-3	1-4	1-11	5-2
24	4-0	2-0	6-0	4-0	2-0	8-0	4-10	3-0	1-5	7-10	1-5	2-0	5-5
27	4-3	2-2	6-5	4-3	2-2	8-6	5-2	3-3	1-6	8-5	1-5	2-2	5-9
30	4-6	2-3	6-9	4-6	2-3	9-0	5-6	3-6	1-6	9-0	1-6	2-3	6-0
33	4-9	2-5	7-2	4-9	2-5	9-6	5-11	3-9	1-7	9-8	1-7	2-4	6-3
336	5-0	2-6	7-6	5-0	2-6	10-0	6-3	4-0	1-8	10-3	1-8	2-6	6-8
42	5-6	2-9	8-3	5-6	2-9	11-0	7-0	4-6	1-9	11-6	1-9	2-9	7-3
48	6-0	3-0	9-0	6-0	3-0	12-0	7-8	5-0	1-10	12-8	1-10	3-0	7-10
54	6-6	3-3	9-9	-	-	-	8-4	5-6	1-11	13-10	1-11	3-3	8-5
60	7-0	3-6	10-6	-	-	-	9-1	6-0	2-0	15-1	2-0	3-6	9-0
66	7-6	3-9	11-3	-	-	-	9-9	6-6	2-2	16-3	2-2	3-9	9-8
72	8-0	4-0	12-0	-	-	-	10-6	7-0	2-3	17-6	2-3	4-0	10-3
78	8-6	4-3	12-9	-	-	-	11-2	7-6	2-4	18-8	2-4	4-3	10-10
84	9-0	4-6	13-6	-	-	-	11-11	8-0	2-5	19-11	2-5	4-6	11-5
90	9-6	4-9	14-3	-	-	-	12-8	8-6	2-7	21-2	2-7	4-9	12-1
96	10-0	5-0	15-0	-	-	-	13-4	9-0	2-8	22-4	2-8	5-0	12-8

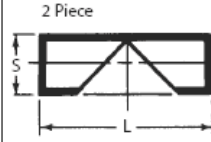
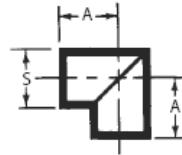
Notes: 12 in. minimum stub dimension to allow for use of 12 in. wide connecting band.
TL - total net length needed to fabricate fitting.

Table 2.56

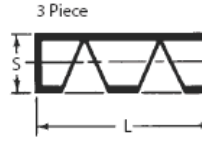
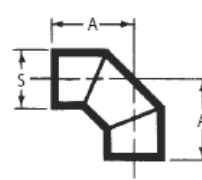
Minimum dimensions for CSP pipe arch fittings



10° - 45° Elbow



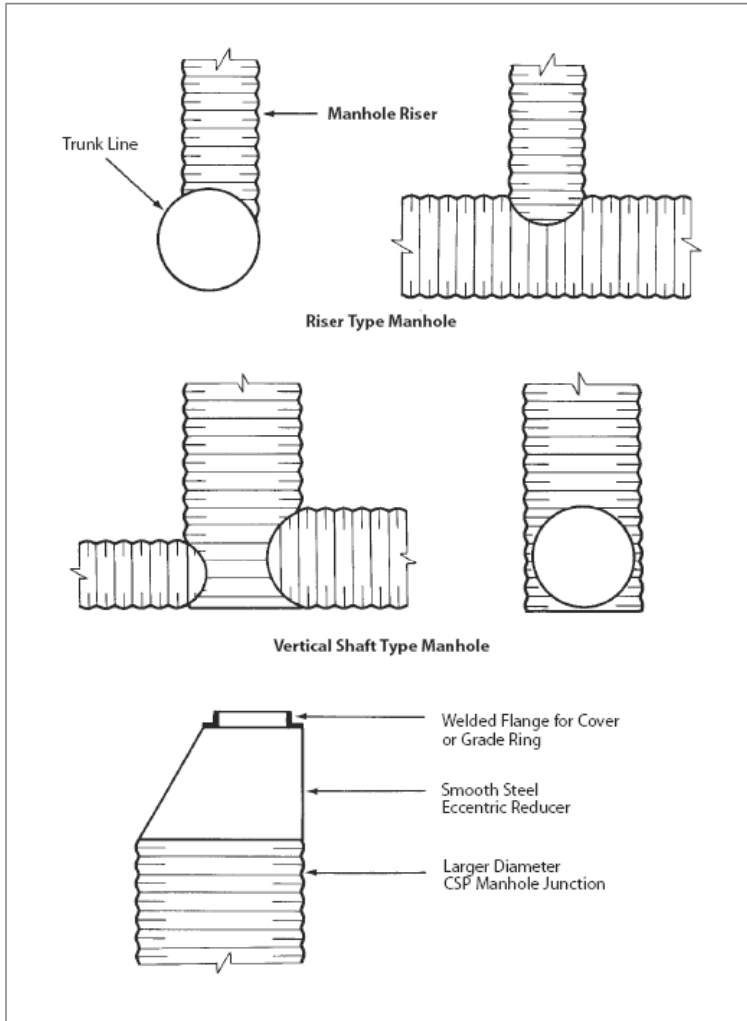
50° - 90° Elbow



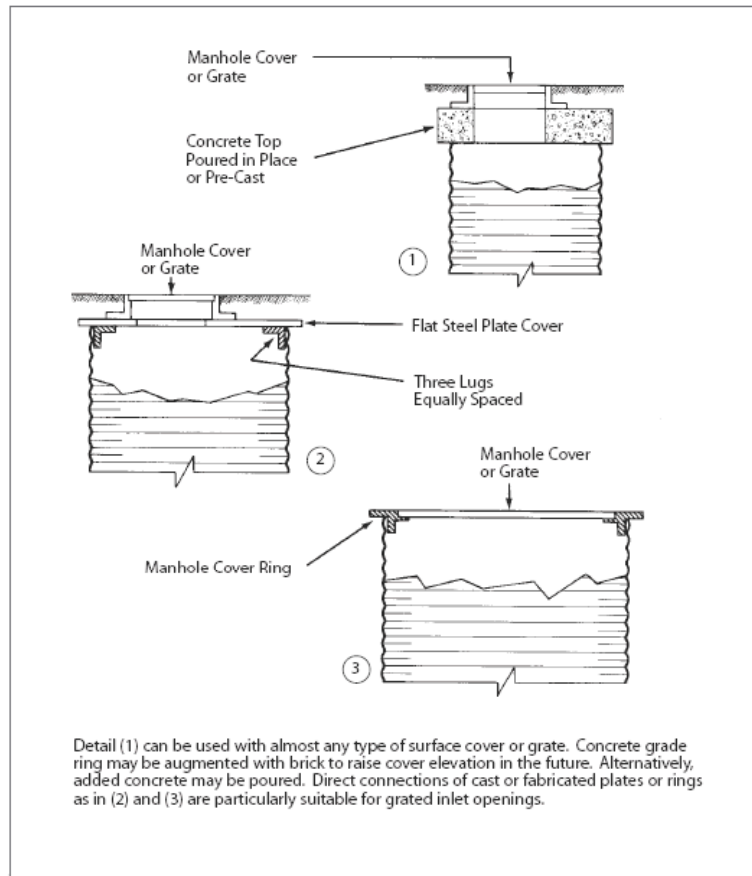
90° Elbow

Equivalent Round Diameter	Span S	Rise R	45° Elbow 2 Piece		90° Elbow 2 Piece		90° Elbow 3 Piece	
			A	L	A	L	A	L
			(in.)	(ft)	(in.)	(ft)	(in.)	(ft)
15	17	13	20	4	27	6	31	6
18	21	15	20	4	25	6	30	6
21	24	18	19	4	24	6	29	6
24	28	20	18	4	34	8	28	6
30	35	24	16	4	30	8	38	8
36	42	29	27	6	38	10	35	8
42	49	33	25	6	35	10	45	10
48	57	38	24	6	43	12	42	10
54	64	43	34	8	52	14	52	12
60	71	47	33	8	60	16	62	14
66	77	52	43	10	56	16	60	14
72	83	57	42	10	56	18	70	16

Notes: All dimensions are nominal.
L—length for fabrication



■ **Figure 2.27** Manholes and catchbasins.



■ **Figure 2.28** Manhole and catchbasin covers.

The manhole covers shown in Figure 2.28 transfer any load on the cover directly to the manhole riser. For this reason, manhole covers of this type should be placed only where vehicular traffic is not expected. If the manhole will be subjected to wheel loads, the manhole riser should be designed as per Chapter 8 of this manual.