SCHEDULE OF REINFORCEMENT

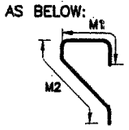
DRG.NO. SD/108 (SHEET 2 OF 6)

BAR MARK	SHAPE OF BARS (NOT TO SCALE) / BOX – CELL DESIGNATION Nc/ab/Ec	1/22/0								1/23/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	10	250	930	2500	4326	49	212.0	130.7	16	225	1270	2600	5085	54	274.6	433.4
②	M1 M2 M1	16	250	850	2630	4275	100	427.5	674.8	16	225	900	3690	5435	112	608.7	960.8
③	M1			BAR IS NOT USED								BAR IS NOT USED					
④	M2 M1 M1	16	250	280	3500	4005	49	196.2	309.7	16	250	320	5200	5785	49	283.5	447.4
⑤	M1 0.2m. 0.2m. M2	16	250	2630	700	3648	98	357.5	564.2	16	175	3690	1550	5556	138	766.9	1210.5
⑥	M2 M1 M1	16	250	280	2500	2965	49	145.3	229.3	16	250	260	2800	3065	49	150.2	237.0
⑦	M1			BAR IS NOT USED								BAR IS NOT USED					
⑧	M2 M1 M1	10	250	900	2500	4266	49	209.0	128.9	16	225	1220	2600	4985	54	269.2	424.9
⑨	M1 M2 M1	10	250	200	890	1243	98	121.8	75.1	10	250	200	989	1342	98	131.5	81.1
⑩	M1 M2 M1	12	250	200	932	1291	98	126.5	112.3	12	250	200	1060	1418	98	139.0	123.4
⑪	M2 M1 M1	10	250	225	11900	12316	16	197.1	121.5	10	250	235	11900	12338	16	197.4	121.7
⑫	M2 M1 M1	10	250	190	11900	12246	16	195.9	120.8	10	150	210	11900	12286	28	319.4	196.8
⑬	M2 M1 M1	10	250	160	11900	12186	16	195.0	120.2	10	250	175	11900	12216	24	293.2	180.8
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	10	250	190	11900	12246	12	146.9	90.6	12	250	210	11900	12279	28	343.8	305.2
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	250	1006	1268	2274	98	222.8	197.8	12	250	1006	1268	2274	98	222.8	197.8
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m R=5ø M1 M2 0.2m.	10	150	1100	1556	4207	50	210.3	129.7	10	150	1100	1556	4207	72	302.9	186.8
㉑	M1 M2 M1	10	–	160	3500	3786	20	75.7	46.7	10	–	160	5200	5486	20	109.7	67.6
㉒	M1 M2 M1	10	250	160	11900	12186	16	195.0	120.2	10	250	175	11900	12216	24	293.2	180.8
TOTAL STEEL (Kgs)		3458								5642							
TOTAL CONCRETE (cum)		54								77							

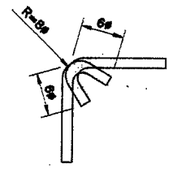
BAR MARK	SHAPE OF BARS (NOT TO SCALE) / BOX – CELL DESIGNATION Nc/ab/Ec	1/33/0								1/34/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	10	200	1270	3740	6246	61	381.0	234.9	12	225	1630	3820	7039	54	380.1	337.5
②	M1 M2 M1	16	200	1270	3740	6225	124	771.9	1218.3	16	225	1310	4830	7395	112	828.2	1307.3
③	M1	12	200	2100	–	2100	61	128.1	113.7	12	225	2100	–	2100	54	113.4	100.7
④	M2 M1 M1	16	200	320	5540	6125	61	373.6	589.7	16	225	380	7220	7925	54	428.0	675.5
⑤	M1 0.2m. 0.2m. M2	12	150	3740	1220	5298	162	858.3	762.0	16	175	4830	2060	7208	138	994.6	1569.9
⑥	M2 M1 M1	16	200	260	3740	4205	61	256.5	404.9	16	225	260	3820	4285	54	231.4	365.2
⑦	M1			BAR IS NOT USED								BAR IS NOT USED					
⑧	M2 M1 M1	10	200	1270	3740	6246	61	381.0	234.9	16	225	1600	3820	6965	54	376.1	593.6
⑨	M1 M2 M1	10	200	200	1158	1511	122	184.4	113.7	10	225	200	1257	1610	108	173.9	107.2
⑩	M1 M2 M1	10	200	200	1158	1524	122	185.9	114.6	10	225	200	1300	1666	108	179.9	110.9
⑪	M2 M1 M1	10	200	260	11900	12386	30	371.6	229.1	10	225	275	11900	12418	26	322.8	199.0
⑫	M2 M1 M1	12	200	210	11900	12279	30	368.4	327.0	12	225	240	11900	12339	26	320.8	284.8
⑬	M2 M1 M1	10	200	210	11900	12286	30	368.6	227.2	12	225	230	11900	12319	36	443.5	393.7
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	10	200	210	11900	12286	24	294.9	181.8	12	225	240	11900	12339	36	444.2	394.4
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1006	1268	2274	122	277.4	246.3	12	225	1006	1292	2298	108	248.1	220.3
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m R=5ø M1 M2 0.2m.	10	200	1100	1556	4207	58	244.0	150.4	10	150	1100	1556	4207	100	420.7	259.4
㉑	M1 M2 M1	10	–	160	5540	5826	20	116.5	71.8	10	–	160	7220	7506	20	150.1	92.6
㉒	M1 M2 M1	10	250	210	11900	12286	24	294.9	181.8	10	250	230	11900	12326	32	394.4	243.2
TOTAL STEEL (Kgs)		5688								7541							
TOTAL CONCRETE (cum)		94								124							

NOTES:

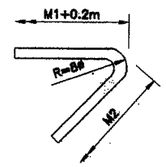
1. JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGERED AS PER CLAUSE 304.6 OF IRC:21–1987.
2. FULL SCALE ELEVATION FOR THE BARS SHALL BE LINED OUT ON A PLAIN PLASTERED FLOOR TO THE DIMENSIONS SHOWN ON THE DRAWING SO AS TO GET CORRECT CLEARANCE BETWEEN DIFFERENT BARS AND THEN THE BARS SHALL BE BENT TO PROPER SHAPE.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING No. SD/108 (SHEET 1 OF 6).
4. QUANTITY OF CONCRETE DOES NOT INCLUDE RAILINGS.
5. QUANTITY OF STEEL DOES NOT INCLUDE 5% EXTRA FOR WASTAGE AND LAPS.
6. BAR No.17 IS DETAILED AS BELOW:



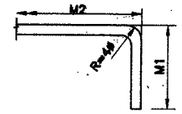
BENDING OF BARS



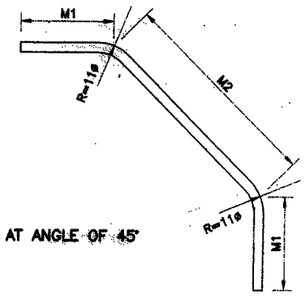
BEND WITH CLOSE HOOKS



BEND AT ANGLE OF 135°



BEND AT RIGHT ANGLE



BEND AT ANGLE OF 45°

LEGEND : ø SHOWS DIA. OF BAR

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

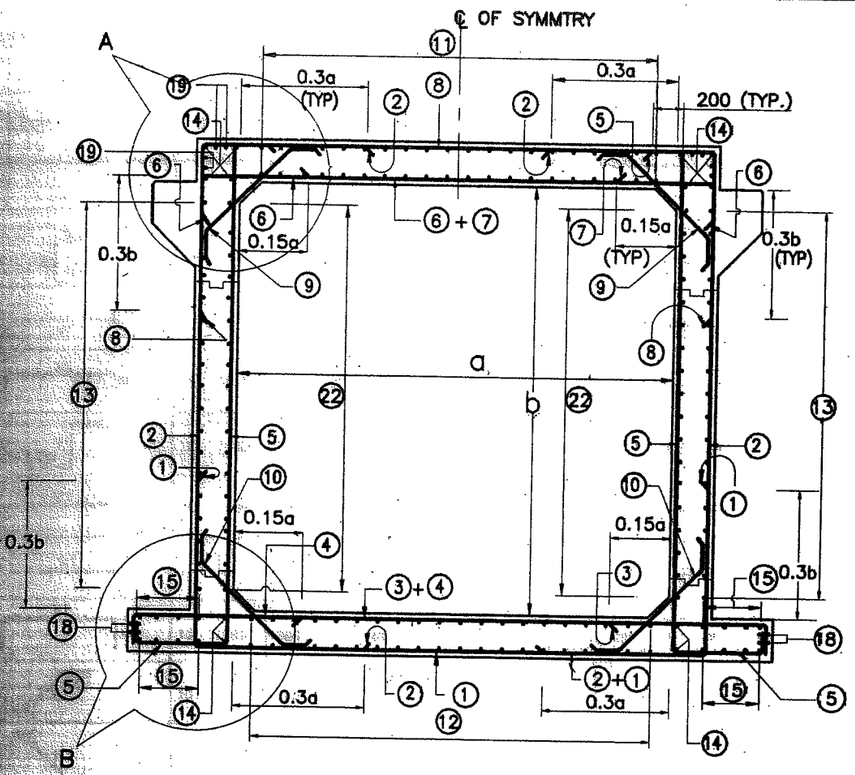
SINGLE CELL R.C.C BOX CULVERTS
2m x 2m TO 8m x7m
(WITHOUT EARTH CUSHION)

BAR BENDING SCHEDULE

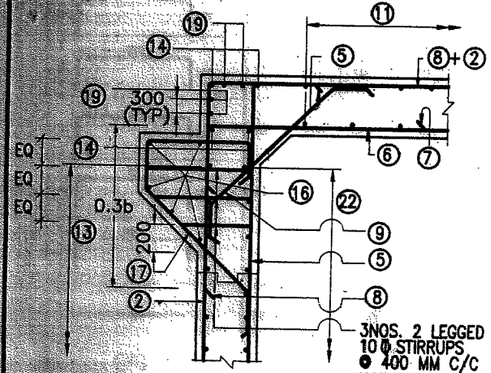
DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E. (R) S&R MOST	DRG. NO. SD/108 (SHEET 2 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com

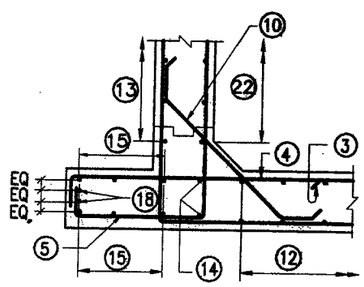
DRG.NO. SD/108 (SHEET 1 OF 6)



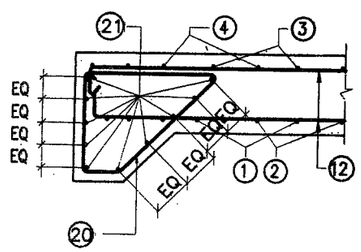
REINFORCEMENT DETAILS OF SINGLE CELL BOX CULVERT



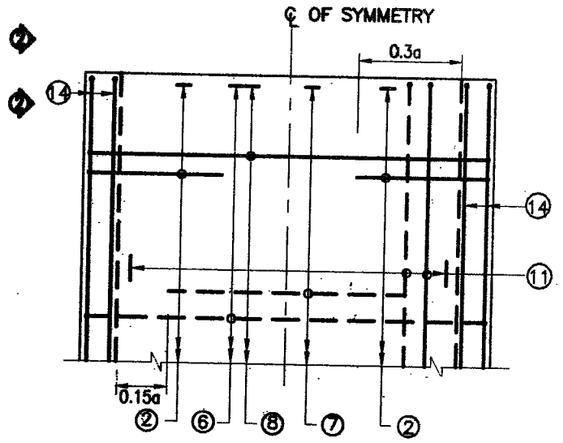
DETAIL– A



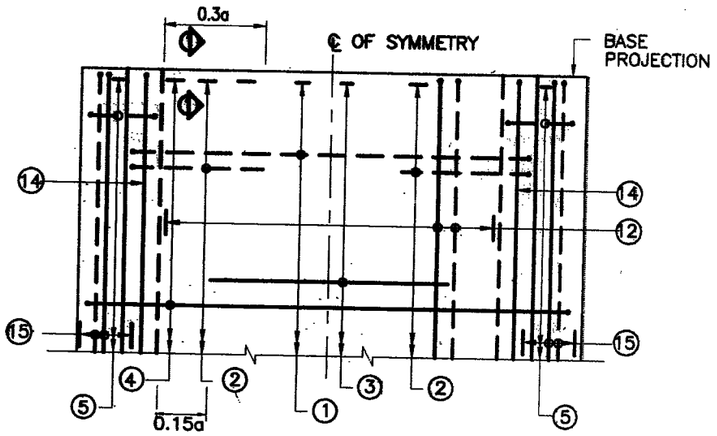
DETAIL–B



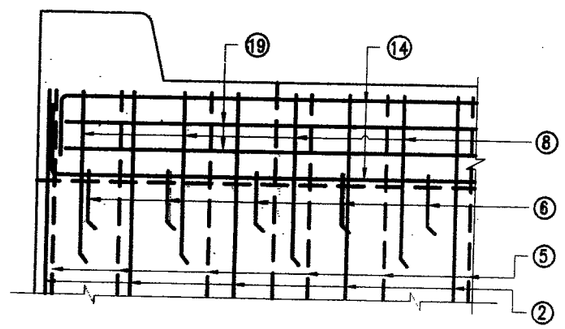
SECTION 1–1



TOP SLAB R/F PLAN
(BAR MARK ⑤ ,⑲ KERB, BRACKET & HAUNCH LINES NOT SHOWN IN PLAN)



BOTTOM SLAB R/F PLAN
(HAUNCH LINES NOT SHOWN IN PLAN)



VIEW 2–2
(HAUNCH LINES NOT SHOWN)

NOTES:

1. FOR GENERAL NOTES REFER DRG. NO. SD/101.
2. FOR GENERAL ARRANGEMENT REFER DRG. NO. SD/102.
3. FOR BAR BENDING SCHEDULE REFER DRAWING NO. SD/108 (SHEET 2 TO 6 OF 6)
4. FOR LAP ZONES REFER DRAWING NO. SD/117 (SHEET 2 OF 2)

LEGEND :

——— : TOP FACE BARS/ OUTER FACE BARS

– – – – : BOTTOM FACE BARS/ INNER FACE BARS

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

SINGLE CELL R.C.C BOX CULVERTS
(WITHOUT EARTH CUSHION)
TYPICAL REINFORCEMENT DETAILS

DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E (R) S&R MOST	DRG. NO. SD/108 (SHEET 1 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com

SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE OF BARS (NOT TO SCALE) / BOX – CELL DESIGNATION Nc/ab/Ec	1/43/0								1/44/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS.	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	10	200	1350	4900	7566	61	461.5	284.5	12	200	1700	5000	8359	61	509.9	452.7
②	M1 M2 M1	20	200	1650	3850	7081	124	878.1	2165.5	20	200	1700	4930	8261	124	1024.4	2526.3
③	M1	12	200	2800	–	2800	61	170.8	151.6	12	200	2800	–	2800	61	170.8	151.6
④	M2 M1 M1	16	200	400	5700	6445	61	393.1	620.5	16	200	450	7400	8245	61	502.9	793.8
⑤	0.2m. M1 0.2m M2	12	175	3850	800	4988	138	688.4	611.1	12	150	4930	1650	6918	162	1120.7	995.0
⑥	M2 M1 M1	16	200	260	4900	5365	61	327.3	516.5	16	200	260	5000	5465	61	333.4	526.2
⑦	M1	8	200	2800	–	2800	60	168.0	66.3	8	200	2800	–	2800	60	168.0	66.3
⑧	M2 M1 M1	10	200	1300	4900	7466	61	455.4	280.8	16	200	1630	5000	8205	61	500.5	790.0
⑨	M1 M2 M1	10	200	200	1314	1667	122	203.4	125.4	10	200	200	1427	1780	122	217.2	133.9
⑩	M1 M2 M1	10	200	200	1385	1750	122	213.5	131.7	10	200	200	1526	1892	122	230.8	142.3
⑪	M2 M1 M1	10	200	275	11900	12416	40	496.6	306.2	10	200	290	11900	12446	40	497.8	306.9
⑫	M2 M1 M1	12	200	250	11900	12359	40	494.4	438.9	12	200	275	11900	12409	40	496.4	440.7
⑬	M2 M1 M1	12	200	250	11900	12359	30	370.8	329.2	12	200	275	11900	12409	40	496.4	440.7
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	10	200	250	11900	12366	12	148.4	91.5	10	200	275	11900	12416	28	347.6	214.3
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1006	1348	2354	122	287.2	255.0	12	200	1006	1419	2425	122	295.8	262.6
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m M1 45° M2 0.2m	10	150	1100	1556	4207	78	328.1	202.3	10	150	1100	1556	4207	102	429.1	264.6
㉑	M1 M2 M1	10	–	160	5700	5986	20	119.7	73.8	10	–	160	7400	7686	20	153.7	94.8
㉒	M2 M1 M1	10	250	250	11900	12366	24	296.8	183.0	10	230	275	11900	12416	36	447.0	275.6
TOTAL STEEL (Kgs)		7120								9164							
TOTAL CONCRETE (cum)		114								149							

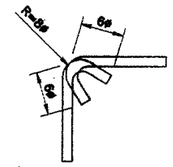
BAR MARK	1/45/0								1/53/0							
	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	10	200	2070	5160	9266	61	565.2	348.5	12	200	1420	6040	8839	61	539.2	478.7
②	20	200	1780	6040	9531	124	1181.9	2914.7	20	200	2020	3970	7941	124	984.7	2428.5
③	12	200	2800	–	2800	61	170.8	151.6	16	200	3500	–	3500	61	213.5	337.0
④	16	200	520	8960	9945	61	606.6	957.5	16	200	470	6640	7525	61	459.0	724.5
⑤	12	150	6040	2430	8808	162	1426.9	1266.8	12	175	3970	770	5078	138	700.8	622.2
⑥	20	200	320	5160	5731	61	349.6	862.2	16	200	260	6040	6505	61	396.8	626.3
⑦	12	200	2800	–	2800	60	168.0	149.2	12	200	3500	–	3500	60	210.0	186.4
⑧	12	200	1970	5160	9059	61	552.6	490.6	16	200	1350	6040	8885	61	529.8	836.2
⑨	10	200	200	1597	1950	122	237.9	146.6	10	200	200	1484	1836	122	224.1	138.1
⑩	12	200	200	1738	2097	122	255.8	227.1	10	200	200	1583	1948	122	237.7	146.6
⑪	10	200	310	11900	12486	40	499.4	307.9	10	200	300	11900	12468	50	623.3	384.3
⑫	12	175	310	11900	12479	46	574.0	509.6	12	200	285	11900	12429	50	621.4	551.7
⑬	12	200	315	11900	12489	50	624.4	554.4	12	200	565.5	285	11900	12429	372.9	331.0
⑭	10	–	160	11900	12186	12	146.2	90.2	8	–	128	11900	12129	12	145.5	57.4
⑮	10	200	310	11900	12486	44	549.4	338.7	10	200	285	11900	12436	12	149.2	92.0
⑯	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	12	200	1051	1532	2583	122	315.1	279.7	12	200	1008	1447	2453	122	299.3	265.7
⑱	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	10	150	1100	1556	4207	122	513.2	316.4	10	150	1100	1556	4207	92	387.0	238.6
㉑	10	–	160	8960	9246	20	184.9	114.0	10	–	160	6640	6926	20	138.5	85.4
㉒	10	200	315	11900	12496	50	624.8	385.2	10	220	285	11900	12436	28	348.2	214.7
TOTAL STEEL (Kgs)	10607								8941							
TOTAL CONCRETE (cum)	194								142							

DRG.NO. SD/108 (SHEET 3 OF 6)

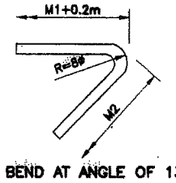
NOTES:

1. FOR ALL NOTES REFER. DRG. NO. SD/108 (SHEET 2 OF 6)

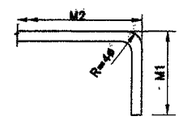
BENDING OF BARS



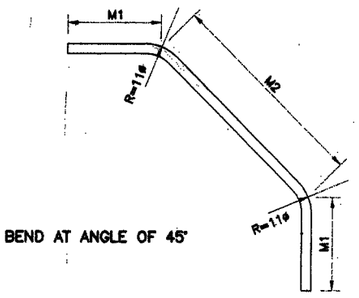
BEND WITH CLOSE HOOKS



BEND AT ANGLE OF 135°



BEND AT RIGHT ANGLE



BEND AT ANGLE OF 45°

LEGEND : ø SHOWS DIA. OF BAR

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING), NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

SINGLE CELL R.C.C BOX CULVERTS
2m x 2m TO 8m x7m
(WITHOUT EARTH CUSHION)
BAR BENDING SCHEDULE

DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E (R) S&R MOST	DRG. NO. SD/108 (SHEET 3 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com

SCHEDULE OF REINFORCEMENT

DRG.NO. SD/108 (SHEET 4 OF 6)

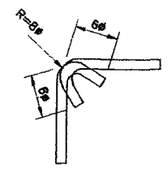
BAR MARK	BOX – CELL DESIGNATION Nc/ab/Ec / SHAPE OF BARS (NOT TO SCALE)	1/54/0								1/55/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	20	200	1750	6140	9571	61	583.9	1439.9	16	200	2130	6300	10505	61	640.8	1011.4
②	M1 M2 M1	16	200	2070	5020	9105	124	129.0	1782.0	20	200	2150	6160	10391	124	1288.5	3177.7
③	M1	16	200	3500	–	3500	61	213.5	337.0	16	200	3500	–	3500	61	213.5	337.0
④	M2 M1 M1	16	200	500	7740	8685	61	529.8	836.2	25	200	580	9300	10374	61	632.8	2438.5
⑤	M1 0.2m 0.2m M2	12	150	5020	1320	6678	162	1081.9	960.5	16	200	6160	2100	8578	122	1046.5	1651.7
⑥	M2 M1 M1	20	200	320	6140	6711	61	409.4	1009.6	20	200	320	6300	6871	61	419.2	1033.7
⑦	M1	12	200	3500	–	3500	60	210.0	186.4	BAR IS NOT USED							
⑧	M2 M1 M1	16	200	1670	6140	9425	61	574.9	907.4	16	200	2030	6300	10305	61	628.6	992.2
⑨	M1 M2 M1	10	200	200	1583	1935	122	236.1	145.6	10	200	200	1781	2133	122	260.3	160.5
⑩	M1 M2 M1	10	200	200	1696	2061	122	251.5	155.1	10	200	200	1922	2288	122	279.1	172.1
⑪	M2 M1 M1	10	150	310	11900	12486	66	824.1	508.1	10	200	340	11900	12546	50	627.3	386.7
⑫	M2 M1 M1	10	125	300	11900	12466	78	972.3	599.5	10	125	340	11900	12546	78	978.6	603.3
⑬	M2 M1 M1	10	125	310	11900	12486	62	774.1	477.3	10	125	350	11900	12566	78	980.1	604.3
⑭	M2 M1 M1	8	–	128	11900	12129	12	145.5	57.4	8	–	128	11900	12129	12	145.5	57.4
⑮	M2 M1 M1	10	200	300	11900	12486	20	249.3	153.7	10	150	340	11900	12546	44	552.0	340.3
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1041	1518	2559	122	312.1	277.1	12	200	1121	1631	2752	122	335.7	298.0
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m M1 R=6ø 6ø M2 6ø	10	150	1100	1556	4207	106	445.9	274.9	10	150	1100	1556	4207	126	530.1	326.8
㉑	M1 M2 M1	10	–	160	7740	8026	20	160.5	99.0	10	–	160	9300	9586	20	191.7	118.2
㉒	M2 M1 M1	10	210	310	11900	12486	38	474.5	292.5	10	180	350	11900	12566	56	703.7	433.8
TOTAL STEEL (Kgs)		10695								14339							
TOTAL CONCRETE (cum)		174								224							

BAR MARK	1/63/0								1/64/0							
	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	16	200	1570	7340	10425	61	635.9	1003.7	20.	200	1870	7400	11071	61	675.4	1665.5
②	20	200	2470	4300	9171	124	1137.2	2804.6	20	200	2500	5300	10231	124	1268.7	3128.8
③	20	200	4200	–	4200	61	256.2	631.8	20	200	4200	–	4200	61	256.2	631.8
④	12	200	620	7940	9139	61	557.5	494.9	16	200	620	8000	9185	61	560.3	884.3
⑤	12	150	4300	920	5558	162	900.4	799.4	12	150	5300	950	6588	162	1067.3	947.6
⑥	16	200	260	7340	7805	61	476.1	751.5	20	200	320	7400	7971	61	486.3	1199.2
⑦	16	200	4200	–	4200	60	252.0	397.7	16	200	4200	–	4200	60	252.0	397.7
⑧	16	200	1530	7340	10345	61	631.0	996.0	16	200	1830	7400	11005	61	671.3	1059.6
⑨	10	200	200	1950	2303	122	281.0	173.2	10	200	200	1993	2346	122	286.2	176.4
⑩	10	200	200	2007	2373	122	289.5	178.5	10	200	200	2049	2415	122	294.6	181.6
⑪	10	150	390	11900	12646	78	986.4	608.1	10	150	390	11900	12646	78	986.4	608.1
⑫	10	125	360	11900	12586	94	1183.1	729.4	12	125	360	11900	12579	94	1182.4	1049.8
⑬	10	125	360	11900	12586	46	578.9	356.9	10	125	375	11900	12616	62	782.2	482.2
⑭	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	10	150	360	11900	12586	12	151.0	93.1	10	150	360	11900	12586	12	151.0	93.1
⑯	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	12	200	1141	1659	2800	122	341.6	303.3	12	200	1171	1702	2872	122	350.4	311.1
⑱	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	4	12186	48.7	30.1
⑲	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	8	12186	97.5	60.1
⑳	10	150	1100	1556	4207	108	454.4	280.1	10	150	1100	1556	4207	110	462.8	285.3
㉑	10	–	160	7940	8226	20	164.5	101.4	10	–	160	8000	8286	20	165.7	102.2
㉒	10	180	360	11900	12586	32	402.7	248.3	10	170	375	11900	12616	46	580.3	357.8
TOTAL STEEL (Kgs)	11238								13848							
TOTAL CONCRETE (cum)	201								222							

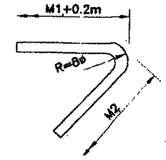
NOTES:

1. FOR ALL NOTES REFER. DRG. NO. SD/108 (SHEET 2 OF 6)

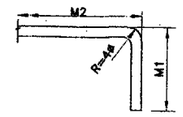
BENDING OF BARS



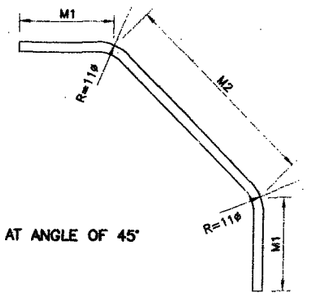
BEND WITH CLOSE HOOKS



BEND AT ANGLE OF 135°



BEND AT RIGHT ANGLE



BEND AT ANGLE OF 45°

LEGEND : ø SHOWS DIA. OF BAR

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) , NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

SINGLE CELL R.C.C BOX CULVERTS
2m x 2m TO 8m x7m
(WITHOUT EARTH CUSHION)
BAR BENDING SCHEDULE

DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E (R) S&R MOST	DRG. NO. SD/108 (SHEET 4 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com

SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE OF BARS (NOT TO SCALE) — BOX – CELL DESIGNATION Nc/ab/Ec	1/65/0								1/66/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	20	200	2200	7400	11731	61	715.6	1764.8	20	200	2550	7600	12631	61	770.5	1900.2
②	M1 M2 M1	20	200	2500	6330	11261	124	1396.4	3443.8	20	200	2600	7400	12531	124	1553.9	3832.1
③	M1	16	200	4200	–	4200	61	256.2	404.4	16	200	4200	–	4200	61	256.2	404.4
④	M2 M1 M1	20	200	650	9600	10831	61	660.7	1629.4	20	200	700	11200	12531	61	764.4	1885.2
⑤	M1 0.2m. 0.2m. M2	12	125	6330	1750	8418	194	1633.1	1449.9	12	125	7400	2550	10268	194	1995.9	1772.0
⑥	M2 M1 M1	16	200	260	7400	7865	61	479.8	757.2	25	200	400	7600	8314	61	507.2	1954.3
⑦	M1	12	200	4200	–	4200	60	252.0	223.7	12	200	4200	–	4200	60	252.0	223.7
⑧	M2 M1 M1	10	200	2130	7400	11628	61	709.2	437.2	16	200	2450	7600	12445	61	759.1	1198.2
⑨	M1 M2 M1	10	200	200	1993	2346	122	286.2	176.4	10	200	200	2162	2515	122	306.9	189.2
⑩	M1 M2 M1	10	200	200	2092	2457	122	299.8	184.8	10	200	200	2304	2669	122	325.7	200.8
⑪	M2 M1 M1	10	150	390	11900	12646	78	986.4	608.1	10	150	400	11900	12666	78	987.9	609.1
⑫	M2 M1 M1	12	150	375	11900	12609	78	983.5	873.2	12	150	400	11900	12659	78	987.4	876.6
⑬	M2 M1 M1	12	150	375	11900	12609	66	832.2	738.8	12	150	425	11900	12709	78	991.3	880.1
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	10	150	375	11900	12616	36	454.2	280.0	10	150	400	11900	12666	52	658.6	406.1
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1171	1702	2872	122	350.4	311.1	12	200	1271	1843	3114	122	379.9	337.3
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m M1 45° M2 0.2m.	10	150	1100	1556	4207	130	546.9	337.2	10	150	1100	1556	4207	152	639.5	394.3
㉑	M1 M2 M1	10	–	160	9600	9886	20	197.7	121.9	10	–	160	11200	11486	20	229.7	141.6
㉒	M2 M1 M1	10	170	375	11900	12616	58	731.7	451.1	12	220	425	11900	12709	54	686.3	609.3
TOTAL STEEL (Kgs)		14479								18100							
TOTAL CONCRETE (cum)		258								315							

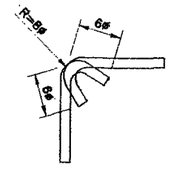
BAR MARK	SHAPE OF BARS (NOT TO SCALE) — BOX – CELL DESIGNATION Nc/ab/Ec	1/75/0								1/76/0							
		BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA. in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	20	200	2300	8600	13131	61	801.0	1975.4	25	200	2670	8800	14054	61	857.3	3303.5
②	M1 M2 M1	20	200	2900	6500	12231	124	1516.7	3740.4	20	200	3000	7600	13531	124	1677.9	4137.9
③	M1	20	200	4900	–	4900	61	298.9	737.1	20	200	4900	–	4900	61	298.9	737.1
④	M2 M1 M1	20	200	750	9800	11231	61	685.1	1689.6	20	200	820	11200	12771	61	779.1	1921.3
⑤	M1 0.2m. 0.2m. M2	12	150	6500	1350	8188	162	1326.5	1177.7	12	125	7600	2050	9988	194	1937.7	1720.3
⑥	M2 M1 M1	20	200	320	8600	9171	61	559.5	1379.7	20	200	320	8800	9371	61	571.7	1409.8
⑦	M1	12	200	4900	–	4900	60	294.0	261.0	12	200	4900	–	4900	60	294.0	261.0
⑧	M2 M1 M1	16	200	2200	8600	12945	61	789.6	1246.3	16	200	2530	8800	13805	61	842.1	1329.1
⑨	M1 M2 M1	10	200	200	2233	2586	122	315.5	194.5	10	200	200	2417	2770	122	337.9	208.3
⑩	M1 M2 M1	10	200	200	2375	2740	122	334.3	206.1	10	200	200	2615	2981	122	363.6	224.2
⑪	M2 M1 M1	12	150	425	11900	12709	92	1169.2	1038.0	12	150	440	11900	12739	92	1172.0	1040.5
⑫	M2 M1 M1	12	125	425	11900	12709	110	1398.0	1241.1	12	125	460	11900	12779	110	1405.7	1248.0
⑬	M2 M1 M1	12	125	425	11900	12709	78	991.3	880.1	12	125	475	11900	12809	94	1204.0	1069.0
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	12	150	425	11900	12709	20	254.2	225.7	12	150	460	11900	12779	36	460.0	408.4
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1271	1843	3114	122	379.9	337.3	12	200	1371	1985	3355	122	409.3	363.4
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	4	12186	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	8	12186	97.5	60.1
⑳	M1+0.2m M1 45° M2 0.2m.	10	150	1100	1556	4207	134	563.7	347.6	10	150	1120	1584	4275	152	649.8	400.6
㉑	M1 M2 M1	10	–	160	9800	10088	20	201.7	124.4	10	–	160	11200	11486	20	229.7	141.6
㉒	M2 M1 M1	12	220	425	11900	12709	46	584.6	519.0	12	190	475	11900	12809	62	794.1	705.1
TOTAL STEEL (Kgs)		17607								20915							
TOTAL CONCRETE (cum)		301								365							

DRG.NO. SD/108 (SHEET 5 OF 6)

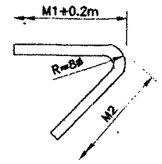
NOTES:

1. FOR ALL NOTES REFER. DRG. NO. SD/108 (SHEET 2 OF 6)

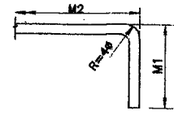
BENDING OF BARS



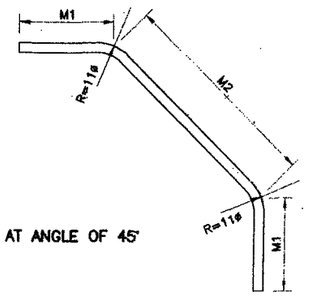
BEND WITH CLOSE HOOKS



BEND AT ANGLE OF 135°



BEND AT RIGHT ANGLE



BEND AT ANGLE OF 45°

LEGEND : ø SHOWS DIA. OF BAR

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) , NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

SINGLE CELL R.C.C BOX CULVERTS
2m x 2m TO 8m x7m
(WITHOUT EARTH CUSHION)

BAR BENDING SCHEDULE

DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E (R) S&R MOST	DRG. NO. SD/108 (SHEET 5 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com

SCHEDULE OF REINFORCEMENT

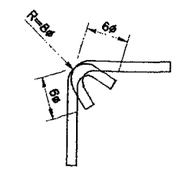
DRG.NO. SD/108 (SHEET 6 OF 6)

BAR MARK	BOX – CELL DESIGNATION Nc/ab/Ec — SHAPE OF BARS (NOT TO SCALE)	1/77/0								1/85/0								1/86/0								1/87/0							
		BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	16	200	3000	8800	14745	61	899.4	1419.6	16	200	2400	9800	14545	61	887.2	1400.4	20	200	2720	9900	15271	61	931.6	2297.4	25	200	3150	10300	16514	61	1007.4	3881.7
②	M1 M2 M1	25	200	3000	8630	14544	124	1803.5	6949.5	25	200	3300	6650	13164	124	1632.4	6290.1	25	200	3350	7690	14304	124	1773.7	6834.8	25	200	3550	8850	15864	124	1967.2	7580.2
③	M1	25	200	4900	–	4900	61	298.9	1151.8	25	200	5600	–	5600	61	341.6	1316.3	25	200	5600	–	5600	61	341.6	1316.3	25	200	5600	–	5600	61	341.6	1316.3
④	M2 M1 M1	16	200	850	11400	13045	61	795.7	1256.0	16	200	850	10400	12045	61	784.7	1159.7	16	200	870	11700	13385	61	816.5	1288.7	16	200	1000	12900	14845	61	905.5	1429.3
⑤	M1 0.2m 0.2m M2	12	150	8630	2150	11118	162	1801.1	1599.1	12	150	6650	1150	8138	162	1318.4	1170.5	12	150	7690	1800	9828	162	1592.2	1413.6	12	150	8850	2400	11588	162	1877.3	1666.7
⑥	M2 M1 M1	20	200	320	8800	9371	61	571.7	1409.8	20	200	320	9800	10371	61	632.7	1560.2	20	200	320	9900	10471	61	638.8	1575.3	20	200	320	10300	10871	61	663.2	1635.4
⑦	M1	16	200	4900	–	4900	60	294.0	464.0	16	200	5600	–	5600	60	336.0	530.3	12	200	5600	–	5600	60	336.0	298.3	12	200	5600	–	5600	60	336.0	298.3
⑧	M2 M1 M1	16	200	2830	8800	14405	61	878.7	1386.9	16	200	2250	9800	14245	61	868.9	1371.5	16	200	2570	9900	14985	61	914.1	1442.7	16	200	2900	10300	16045	61	978.7	1544.8
⑨	M1 M2 M1	10	200	200	2417	2770	122	337.9	208.3	10	200	200	2445	2798	122	341.4	210.5	10	200	200	2544	2897	122	353.4	217.9	10	200	200	2869	3222	122	393.1	242.4
⑩	M1 M2 M1	10	200	200	2657	3023	122	368.8	227.4	10	200	200	2657	3023	122	368.8	227.4	10	200	200	2756	3122	122	380.9	234.8	10	200	200	3223	3589	122	437.8	269.9
⑪	M2 M1 M1	12	150	440	11900	12739	92	1172.0	1040.5	12	150	450	11900	12759	106	1352.4	1200.7	12	150	460	11900	12779	106	1354.6	1202.6	12	150	475	11900	12809	106	1357.7	1205.4
⑫	M2 M1 M1	12	125	475	11900	12809	110	1409.0	1250.9	12	125	475	11900	12809	126	1613.9	1432.9	12	100	485	11900	12829	156	2001.3	1776.8	12	100	550	11900	12959	156	2021.6	1794.8
⑬	M2 M1 M1	12	125	475	11900	12809	110	1409.0	1250.9	12	125	475	11900	12809	78	999.1	887.0	12	100	1131.0	11900	12859	116	1491.6	1324.3	12	100	600	11900	13059	136	1776.0	1576.8
⑭	M2 M1 M1	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2	10	–	160	11900	12186	12	146.2	90.2
⑮	M2 M1 M1	12	150	475	11900	12809	40	512.4	454.9	12	150	475	11900	12809	12	153.7	136.5	12	150	485	11900	12829	28	359.2	318.9	12	150	550	11900	12959	40	518.4	460.2
⑯	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
⑰	M1 M2	12	200	1371	1985	3355	122	409.3	363.4	12	200	1371	1985	3355	122	409.3	363.4	12	200	1421	2055	3476	122	424.1	376.5	12	200	1621	2338	3959	122	483.0	428.8
⑱	M1 M2 M1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
⑲	M1 M2 M1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1	10	–	160	11900	12186	8	97.5	60.1
⑳	M1+0.2m M1 135° M2 0.2m	10	150	1150	1626	4378	154	674.2	415.6	10	150	1150	1626	4378	142	621.6	383.3	10	150	1170	1655	4448	158	702.5	433.1	10	150	1300	1838	4890	174	850.8	524.6
㉑	M1 M2 M1	10	–	160	11400	11686	20	233.7	144.1	10	–	160	10400	10686	20	213.7	131.8	10	–	160	11700	11986	20	239.7	147.8	10	–	160	12900	13186	20	263.7	162.6
㉒	M1 M2 M1	12	190	475	11900	12809	74	947.9	841.5	12	190	475	11900	12809	52	666.1	591.3	12	180	500	11900	12859	66	848.7	753.5	12	150	600	11900	13059	92	1201.4	1066.6
TOTAL STEEL (Kgs)		22120								20650								23539								27371							
TOTAL CONCRETE (cum)		394								350								478								502							

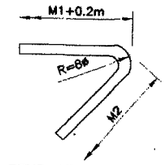
NOTES:

1. FOR ALL NOTES REFER. DRG. NO. SD/108 (SHEET 2 OF 6)

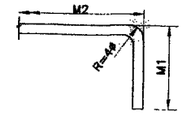
BENDING OF BARS



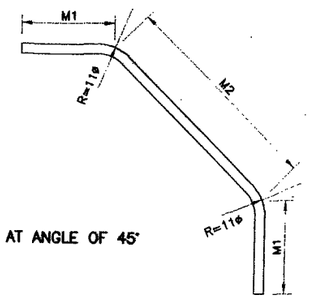
BEND WITH CLOSE HOOKS



BEND AT ANGLE OF 135°



BEND AT RIGHT ANGLE



BEND AT ANGLE OF 45°

LEGEND : ø SHOWS DIA. OF BAR

GOVERNMENT OF INDIA
MINISTRY OF SURFACE TRANSPORT
(ROADS WING) , NEW DELHI.

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

SINGLE CELL R.C.C BOX CULVERTS
2m x 2m TO 8m x7m
(WITHOUT EARTH CUSHION)

BAR BENDING SCHEDULE

DESIGNED BY	CHECKED BY	APPROVED FOR ISSUE BY	1999
(A.R.GHOSH) CES (I) LTD	(M.C.TANDON) TCPL	(C.C.BHATTACHARYA) C.E.(R) S&R, MOST	DRG. NO. SD/108 (SHEET 6 OF 6)

Source: MoST Standard Drawings for Box Cell Culverts (2000) - older reference, verify with current IRC / MoRTH. Scan cleaned by helptheengineer.com