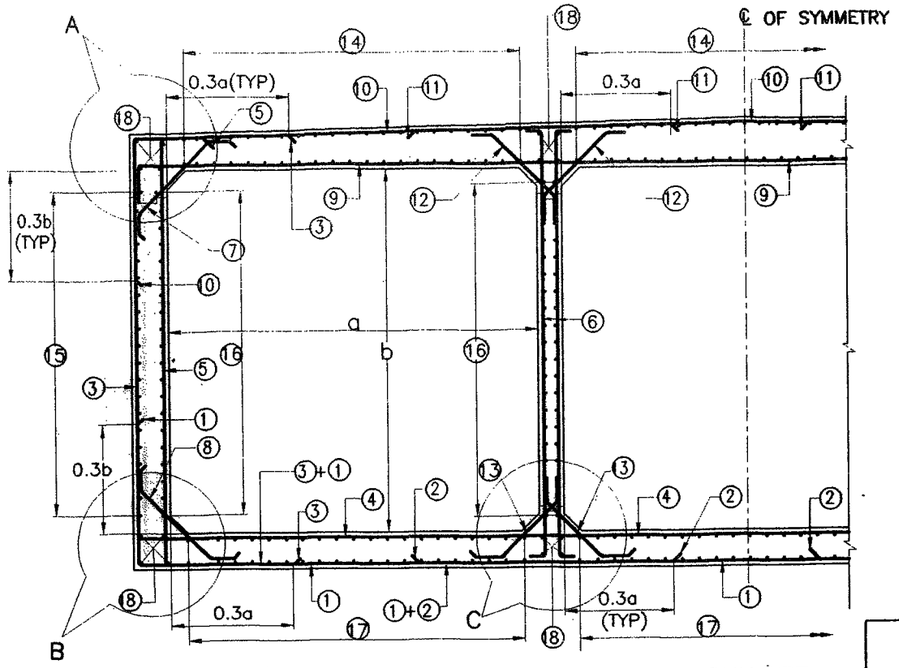
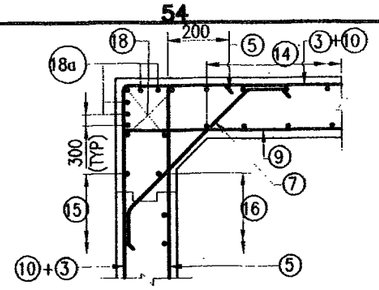
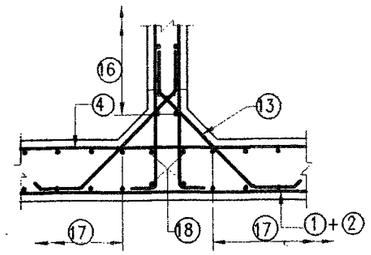
DRG.NO. SD/116 (SHEET 1 OF 3)



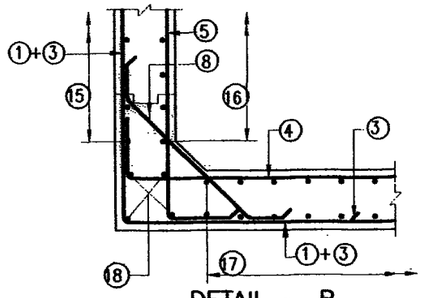
REINFORCEMENT DETAILS OF THREE CELL BOX CULVERT



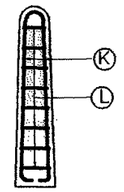
DETAIL– A



DETAIL C



DETAIL – B



SECTION 5–5

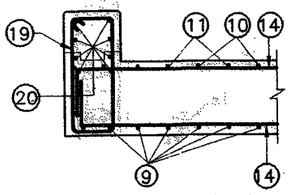
NOTES:

1. FOR GENERAL NOTES REFER DRG. NO. SD/101.
2. FOR GENERAL ARRANGEMENT REFER DRG. NO. SD/107.
3. FOR BAR BENDING SCHEDULE REFER DRAWING NO. SD/116 (SHEET 2 & 3 OF 3)
4. FOR LAP ZONES REFER DRG. NO. SD/117 (SHEET 1 OF 2)
6. BAR (18a) IS NOT SHOWN IN THE BAR BENDING SCHEDULE. THE NO OF (18a) BAR SHOULD BE DECIDED AT SITE BY ENGINEER–IN–CHARGE DEPENDING ON WALL/TOP SLAB THICKNESS AS PER MENTIONED SPACING IN DETAIL–A.

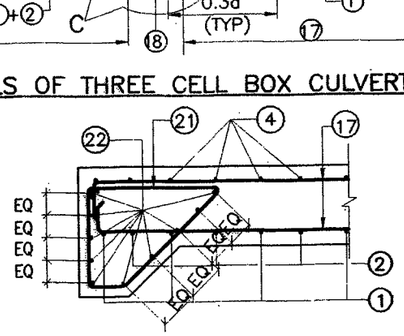
LEGEND :

——— : TOP FACE BARS/ OUTER FACE BARS

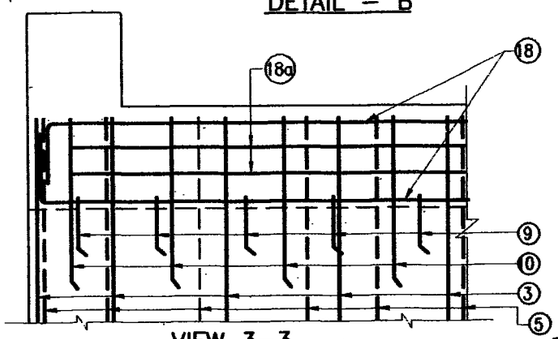
– – – – – : BOTTOM FACE BARS/ INNER FACE BARS



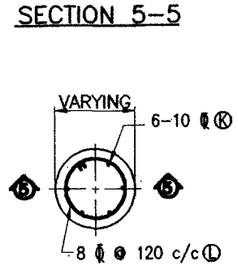
SECTION 1–1



SECTION 2–2

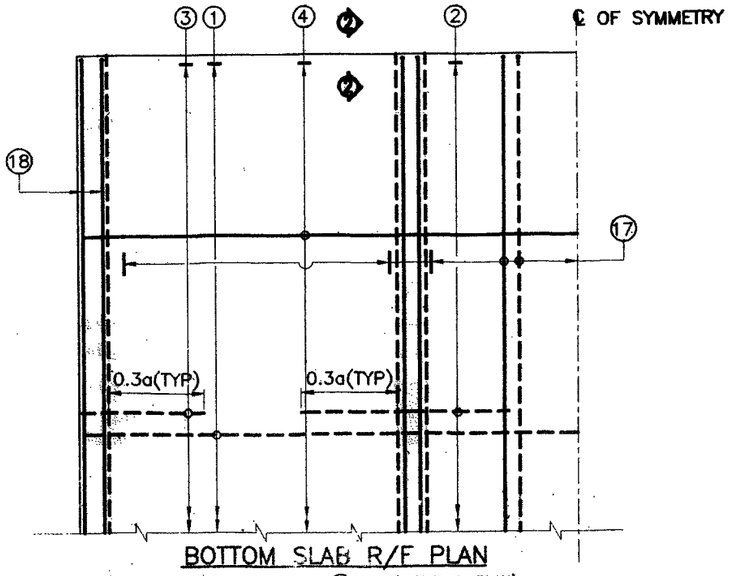


VIEW 3–3
(HAUNCH LINES NOT SHOWN)

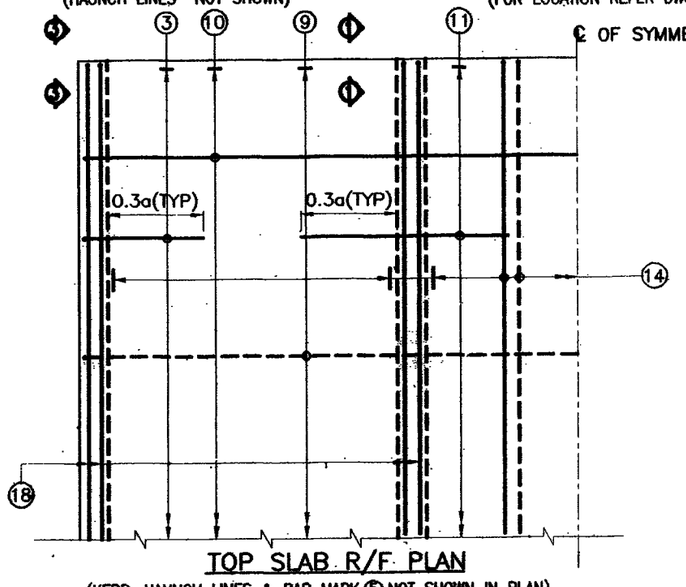


SECTION 4–4

R/F DETAILS OF PRECAST GUARD STONE
(FOR LOCATION REFER DWG NO.SD/107)



BOTTOM SLAB R/F PLAN
(HAUNCH LINES & BAR MARK ⑤ NOT SHOWN IN PLAN)



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

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

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

TRIPLE CELL BOX CULVERT
(WITH 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/116 (SHEET 1 OF 3)

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

DRG.NO. SD/116 (SHEET 2 OF 3)

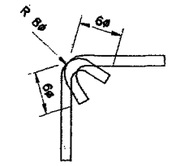
SCHEDULE OF REINFORCEMENT

BAR MARK	SHAPE OF BARS (NOT TO SCALE) / BOX – CELL DESIGNATION Nc/ab/Ec	3/22/3								3/22/4								3/22/5							
		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	12	250	850	6900	8600	97	834.2	740.6	12	240	870	7000	8740	117	1022.6	907.9	12	260	900	6960	8760	124	1086.2	964.4
②	M1	12	250	–	1450	1450	192	278.4	247.2	12	240	–	1450	1450	232	336.4	298.7	16	260	–	1450	1450	246	356.7	563.0
③	M1 M2 M1	10	250	800	2470	4070	196	797.7	491.8	10	240	850	2520	4220	236	995.9	614.0	12	260	830	2550	4210	250	1052.5	934.4
④	M1 M2 M1	12	180	200	6900	7300	134	978.2	868.5	12	160	200	7000	7400	175	1295.0	1149.7	12	150	200	6960	7360	214	1575.0	1398.3
⑤	0.2 M2 0.2 M1	10	200	160	2470	2790	242	675.2	416.3	10	200	160	2520	2840	282	800.9	493.8	10	200	160	2550	2870	322	924.1	569.8
⑥	M2 M1 M1	10	250	160	2470	2790	388	1082.5	667.4	10	250	160	2520	2840	452	1283.7	791.4	10	250	160	2550	2870	516	1480.9	913.0
⑦	M2 M1 M1	10	250	200	706	1106	194	214.6	132.3	10	240	200	819	1219	234	285.3	175.9	10	260	200	791	1191	248	295.3	182.1
⑧	M1 M2 M1	10	250	200	749	1148	194	222.8	137.4	12	240	200	848	1247	234	291.9	259.2	10	260	200	862	1262	248	312.9	192.9
⑨	M1 M2 M1	10	160	160	6890	7210	150	1081.5	666.8	12	200	200	6988	7388	141	1041.7	924.8	12	170	200	6948	7348	189	1388.8	1233.0
⑩	M1 M2 M1	12	250	820	6900	8540	97	828.4	735.4	10	240	850	7000	8700	117	1017.9	627.6	12	260	850	6980	8660	124	1073.8	953.4
⑪	M1	12	250	–	1450	1450	192	278.4	247.2	16	240	–	1450	1450	232	336.4	531.0	16	260	–	1450	1450	246	356.7	563.0
⑫	M1 M2 M1	10	250	200	706	1106	388	429.1	264.6	10	240	200	749	1148	468	537.5	331.4	10	260	200	749	1148	496	569.6	351.2
⑬	M1 M2 M1	10	250	200	749	1148	388	445.6	274.7	10	240	200	777	1177	468	550.7	339.5	10	260	200	819	1219	496	604.7	372.8
⑭	M2 M1 M1	10	250	160	23848	24168	48	1160.1	715.2	10	250	160	27848	28168	48	1352.1	833.6	10	250	160	31848	32168	48	1544.1	952.0
⑮	M2 M1 M1	10	250	160	23848	24168	16	386.7	238.4	10	250	160	27848	28168	16	450.7	277.9	10	250	160	31848	32168	16	514.7	317.3
⑯	M2 M1 M1	10	250	160	23848	24168	48	1160.1	715.2	10	250	160	27848	28168	48	1352.1	833.6	10	250	160	31848	32168	48	1544.1	952.0
⑰	M2 M1 M1	10	250	160	23848	24168	48	1160.1	715.2	10	250	160	27848	28168	48	1352.1	833.6	10	250	160	31848	32168	48	1544.1	952.0
⑱	M2 M1 M1	10	–	160	23848	24168	32	773.4	476.8	10	–	160	27848	28168	32	901.4	555.7	10	–	160	31848	32168	32	1029.4	634.6
⑲	M1 M2	10	150	150	470	1240	94	116.6	71.9	10	150	150	500	1300	96	124.8	76.9	10	150	150	500	1300	96	124.8	76.9
⑳	M1 M2 M1	10	–	160	6900	7220	16	115.5	71.2	10	–	160	7000	7320	16	117.1	72.2	10	–	160	6960	7280	16	116.5	71.8
㉑	M1+0.2m M1 M2 0.2	10	150	1100	1556	4207	94	395.5	243.8	10	150	1100	1556	4207	96	403.9	249.0	10	150	1100	1556	4207	96	403.9	249.0
㉒	M1 M2 M1	10	–	160	6900	7220	20	144.4	89.0	10	–	160	7000	7320	20	146.4	90.3	10	–	160	6960	7280	20	145.6	89.8
TOTAL STEEL (Kgs)		9226.9								11267.6								13486.7							
TOTAL CONCRETE (cum)		163.05								205.64								236.37							

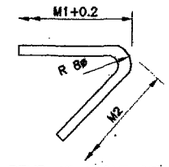
NOTES

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 CLEARENCE 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/109 (SHEET 1 OF 16).
4. QUANTITY OF CONCRETE DOES NOT INCLUDE GUARD STONES.
5. QUANTITY OF STEEL DOES NOT INCULDE 5% EXTRA FOR WASTAGE AND LAPS.

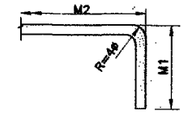
BENDING OF BARS



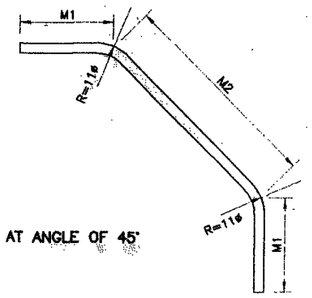
BEND WITH CLOSE HOOKS



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

TRIPLE CELL BOX CULVERT
2m x 2m TO 3m x 3m
(WITH 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/116 (SHEET 2 OF 3)

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

DRG.NO. SD/116 (SHEET 3 OF 3)

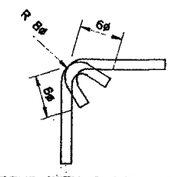
SCHEDULE OF REINFORCEMENT

BAR MARK	BOX – CELL DESIGNATION Nc/ab/Ec / SHAPE OF BARS (NOT TO SCALE)	3/33/3								3/33/4								3/33/5							
		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	260	1250	10100	12600	93	1171.8	1849.5	16	240	1300	10200	12800	117	1497.6	2363.7	16	250	1330	10240	12900	129	1664.1	2626.5
②	M1	12	260	–	2050	2050	184	377.2	334.9	12	240	–	2050	2050	232	475.6	422.2	16	250	–	2050	2050	256	524.8	828.3
③	M1 M2 M1	12	260	1200	3650	6050	188	1137.4	1009.8	12	240	1250	3750	6250	236	1475.0	1309.5	16	250	1270	3830	6370	260	1656.2	2614.0
④	M1 M1 M2	16	200	260	10100	10620	121	1285.0	2028.2	16	180	260	10200	10720	156	1672.3	2639.5	16	170	260	10240	10760	189	2033.6	3209.8
⑤	0.2 M1 0.2 M2	10	200	160	3650	3970	242	960.7	592.3	10	200	160	3750	4070	282	1147.7	707.6	10	200	160	3830	4150	322	1336.3	823.9
⑥	M1 M2 M1	10	250	160	3650	3970	388	1540.3	949.7	10	250	160	3750	4070	452	1839.6	1134.2	10	250	160	3830	4150	516	2141.4	1320.2
⑦	M1 M2 M1	10	260	200	961	1361	186	253.1	156.0	10	240	200	1102	1502	234	351.5	216.7	10	250	200	1201	1601	258	413.1	254.7
⑧	M1 M2 M1	10	260	200	1031	1431	186	266.2	164.1	10	240	200	1173	1573	234	368.0	226.9	10	250	200	1244	1643	258	424.0	261.4
⑨	M1 M2 M1	12	150	200	10088	10488	160	1678.1	1489.8	12	140	200	10188	10588	200	2117.6	1880.0	16	220	260	10224	10744	146	1568.6	2475.8
⑩	M1 M2 M1	16	260	1200	10100	12500	93	1162.5	1834.8	12	240	1250	10200	12700	117	1485.9	1319.2	16	250	1300	10240	12840	129	1656.4	2614.3
⑪	M1	16	260	–	2050	2050	184	377.2	595.3	20	240	–	2050	2050	232	475.6	1172.9	16	250	–	2050	2050	256	524.8	828.3
⑫	M1 M2 M1	10	260	200	819	1219	372	453.5	279.6	10	240	200	890	1290	468	603.7	372.2	10	250	200	961	1361	516	702.1	432.9
⑬	M1 M2 M1	10	260	200	890	1290	372	479.8	295.8	10	240	200	961	1361	468	636.8	392.6	10	250	200	1003	1403	516	724.0	446.4
⑭	M2 M1 M1	10	250	160	23848	24168	72	1740.1	1072.8	10	250	160	27848	28168	72	2028.1	1250.4	10	250	160	31848	32168	72	2316.1	1428.0
⑮	M2 M1 M1	10	250	160	23848	24168	24	580.0	357.6	10	250	160	27848	28168	24	676.0	416.8	10	250	160	31848	32168	24	772.0	476.0
⑯	M2 M1 M1	10	250	160	23848	24168	72	1740.1	1072.8	10	250	160	27848	28168	72	2028.1	1250.4	10	250	160	31848	32168	72	2316.1	1428.0
⑰	M2 M1 M1	10	250	160	23848	24168	72	1740.1	1072.8	10	240	160	27848	28168	78	2197.1	1354.6	10	220	160	31848	32168	84	2702.1	1666.0
⑱	M2 M1 M1	10	–	160	23848	24168	32	773.4	476.8	10	–	160	27848	28168	32	901.4	555.7	10	–	160	31848	32168	32	1029.4	634.6
⑲	M1 M2	10	150	150	550	1400	138	193.2	119.1	10	150	150	600	1500	138	207.0	127.6	10	150	150	650	1600	140	224.0	138.1
⑳	M1 M2 M1	10	–	160	10100	10420	16	166.7	102.8	10	–	160	10200	10520	16	168.3	103.8	10	–	160	10240	10560	16	169.0	104.2
㉑	M1+0.2m M1 135° M2 0.2	10	150	1100	1556	4207	138	580.6	357.9	10	150	1100	1556	4207	138	580.6	357.9	10	150	1100	1556	4207	140	589.0	363.1
㉒	M1 M2 M1	10	–	160	10100	10420	20	208.4	128.5	10	–	160	10200	10520	20	210.4	129.7	10	–	160	10240	10560	20	211.2	130.2
TOTAL STEEL (Kgs)		16341.3								19704.3								25104.6							
TOTAL CONCRETE (cum)		298.06								384.25								468.42							

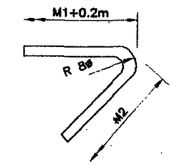
NOTES:

1. FOR ALL NOTES REFER DRG. NO. SD/116 (SHEET 2 OF 3).

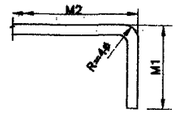
BENDING OF BARS



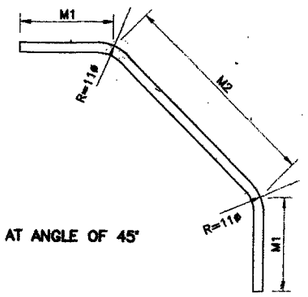
BEND WITH CLOSE HOOKS



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

TRIPLE CELL BOX CULVERT
2m x 2m TO 3m x 3m
(WITH 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/116 (SHEET 3 OF 3)

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