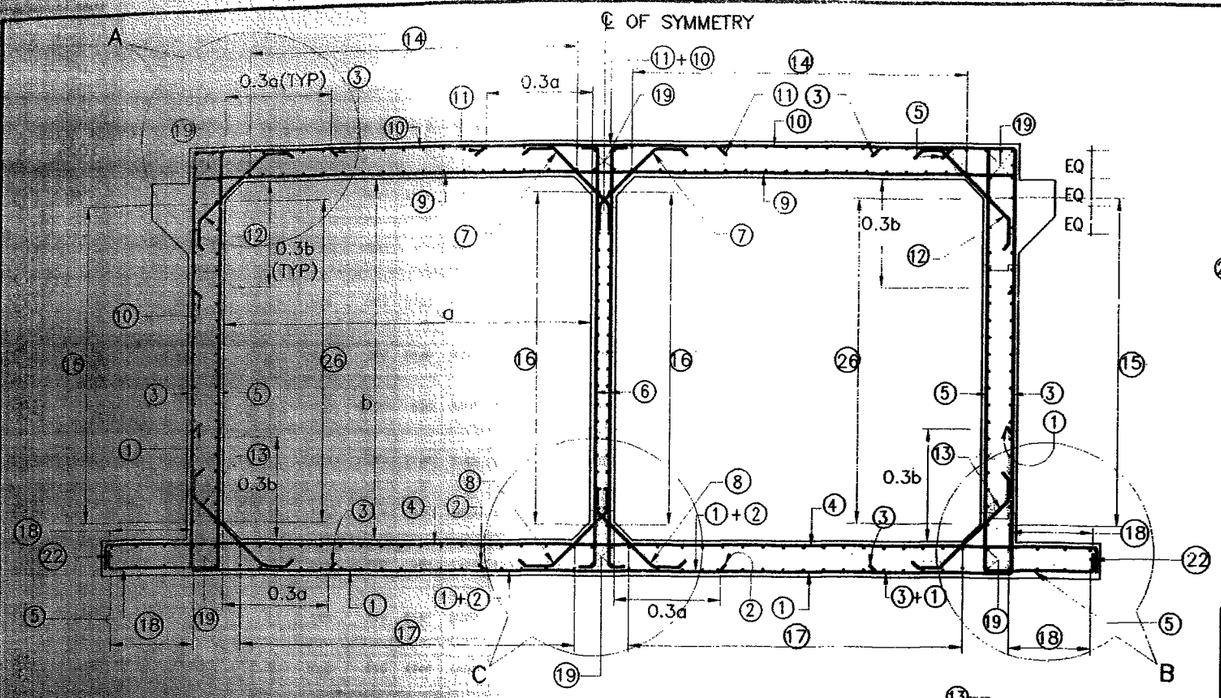
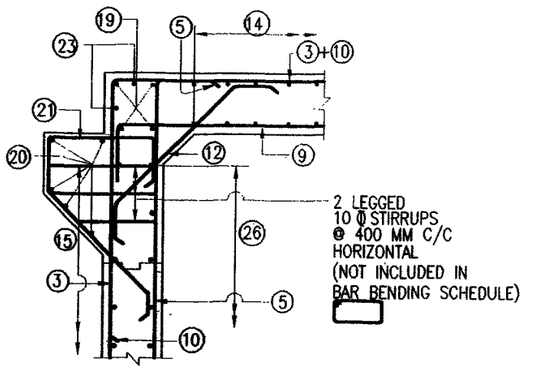
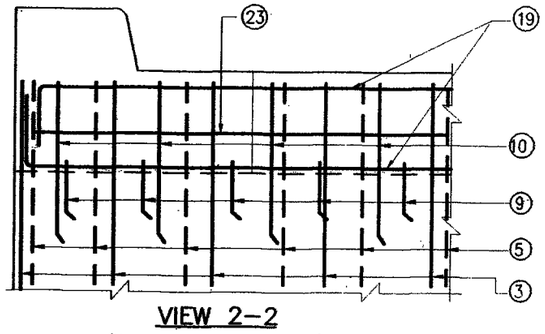
DRG.NO. SD/110 (SHEET 1 OF 2)



REINFORCEMENT DETAILS OF DOUBLE CELL BOX CULVERT



DETAIL–A



VIEW 2–2
(HAUNCH LINES NOT SHOWN)

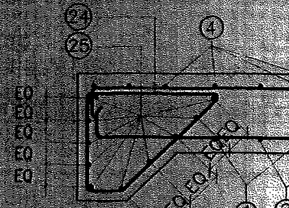
NOTES:

1. FOR GENERAL NOTES REFER DRG. NO. SD/101.
2. FOR GENERAL ARRANGEMENT REFER DRG. NO. SD/104.
3. FOR BAR BENDING SCHEDULE REFER DRAWING NO. SD/110 (SHEET 2 OF 2)
4. FOR LAP ZONES REFER DRAWING NO SD/117 (SHEET 2 OF 2)

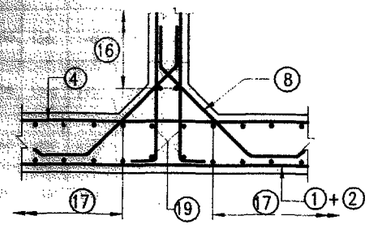
LEGEND :

——— : TOP FACE BARS/ OUTER FACE BARS

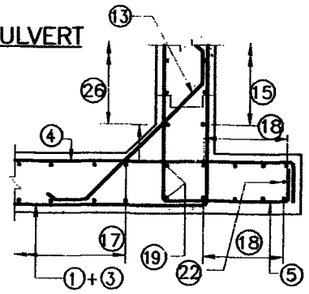
– – – – – : BOTTOM FACE BARS/ INNER FACE BARS



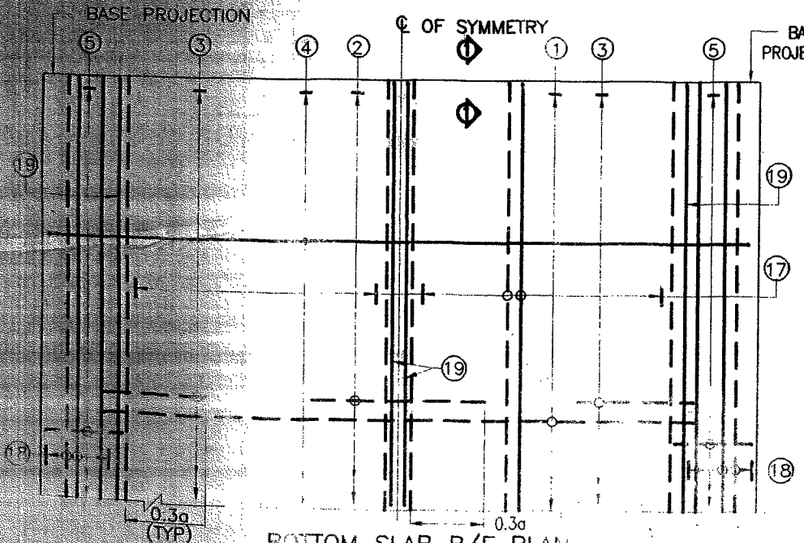
SECTION 1–1



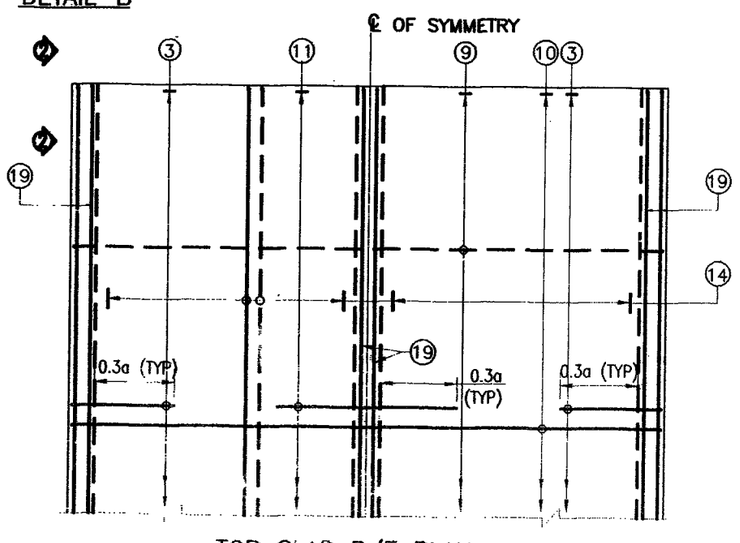
DETAIL– C



DETAIL–B



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



TOP SLAB R/F PLAN
(BAR MARK ⑤, ㉓, KERB LINES & HAUNCH LINES NOT SHOWN IN PLAN)

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

STANDARD DRAWINGS FOR BOX CELL STRUCTURES

DOUBLE 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/110 (SHEET 1 OF 2)

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

SCHEDULE OF REINFORCEMENT

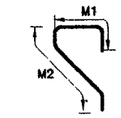
BAR MARK	SHAPE OF BARS (NOT TO SCALE) — BOX – CELL DESIGNATION Nc/ab/Ec	2/22/0								2/23/0							
		BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.	BAR DIA in mm.	SPACING in mm.	M1 in mm.	M2 in mm.	LENGTH in mm.	NO. OF BARS	TOTAL LENGTH in meters	WEIGHT in kgs.
①	M1 M2 M1	10	200	950	4940	6806	61	415.1	256.0	10	200	1270	5000	7506	61	457.8	282.3
②	M1	10	200	1500	–	1500	60	90.0	55.5	10	200	1500	–	1500	60	90.0	55.5
③	M1 M2 M1	12	200	920	2700	4499	122	548.9	487.3	16	200	950	3720	5565	122	678.9	1071.6
④	M2 M1 M1	12	150	300	5540	6099	81	494.0	438.6	12	125	320	5600	6199	97	601.3	533.8
⑤	0.2m M1 0.2m M2	12	125	2700	570	3608	194	700.0	621.5	12	175	3720	600	4658	138	642.8	570.7
⑥	M2 M1 M1	16	200	260	2700	3165	122	386.1	609.5	16	200	260	3720	4185	122	510.6	805.9
⑦	M2 M1 M1	12	200	200	961	1304	122	159.1	141.2	12	200	200	961	1304	122	159.1	141.2
⑧	M1 M2 M1	12	200	200	961	1304	122	159.1	141.2	12	200	200	989	1332	122	162.5	144.3
⑨	M2 M1 M1	12	125	200	4940	5299	97	514.0	456.3	12	125	200	5000	5359	97	519.8	461.5
⑩	M2 M1 M1	10	200	950	4940	6806	61	415.1	256.0	12	200	1250	5000	7459	61	455.0	403.9
⑪	M1	16	200	1500	–	1500	60	90.0	142.1	16	200	1500	–	1500	60	90.0	142.1
⑫	M2 M1 M1	12	200	200	1060	1403	122	171.2	152.0	12	200	200	1102	1445	122	176.3	156.6
⑬	M1 M2 M1	12	200	200	1060	1403	122	171.2	152.0	12	200	200	1130	1474	122	179.8	159.6
⑭	M2 M1 M1	8	150	250	11900	12373	52	643.4	253.9	10	150	250	11900	12366	52	643.0	396.4
⑮	M2 M1 M1	8	150	185	11900	12243	26	318.3	125.6	10	150	200	11900	12266	38	466.1	287.4
⑯	M2 M1 M1	8	150	150	11900	12173	26	316.5	124.9	10	150	160	11900	12186	38	463.1	285.5
⑰	M2 M1 M1	8	150	200	11900	12273	52	638.2	251.8	10	150	210	11900	12286	52	638.9	393.9
⑱	M2 M1 M1	8	150	200	11900	12273	12	147.3	58.1	10	150	210	11900	12286	12	147.4	90.9
⑲	M2 M1 M1	10	–	160	11900	12186	16	195.0	120.2	10	–	160	11900	12186	16	195.0	120.2
⑳	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
㉑	M1 M2	12	200	1006	1268	2274	122	277.4	266.3	12	200	1006	1268	2274	122	277.4	246.3
㉒	M1 M1 M2	10	–	160	11900	12186	2	24.3	15.0	10	–	160	11900	12186	2	24.4	15.0
㉓	M1 M1 M2	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
㉔	M1 150 25 M2 0.2m	10	150	1100	1556	4207	76	319.7	197.1	10	150	1100	1556	4207	78	328.1	202.3
㉕	M1 M1 M2	10	–	160	5540	5826	20	116.5	71.8	10	–	160	5600	5886	20	117.7	72.6
㉖	M2 M1 M1	10	250	185	11900	12236	16	195.8	120.7	10	250	200	11900	12266	24	294.4	181.5
TOTAL STEEL (Kgs)		5650								7377							
TOTAL CONCRETE (cum)		91								108							

BAR MARK	SHAPE OF BARS (NOT TO SCALE) — BOX – CELL DESIGNATION Nc/ab/Ec	2/32/0								2/33/0							
		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	1000	7000	8966	61	546.9	337.2	10	200	1300	7090	9656	61	589.0	363.1
②	M1	10	200	2100	–	2100	60	126.0	77.7	10	200	2150	–	2150	60	129.0	79.5
③	M1 M2 M1	16	200	1250	2800	5245	122	639.9	1010.0	16	200	1270	3820	6305	122	769.2	1214.1
④	M2 M1 M1	16	200	350	7600	8245	61	502.9	793.8	16	200	350	7690	8335	61	508.4	802.5
⑤	0.2m M1 0.2m M2	12	125	2800	600	3738	194	725.2	643.9	20	200	3820	620	4737	122	577.9	1425.2
⑥	M2 M1 M1	12	125	200	2800	3159	194	612.8	544.1	16	200	260	3820	4285	122	522.8	825.1
⑦	M2 M1 M1	12	200	200	1031	1375	122	167.7	148.9	12	200	200	1130	1474	122	179.8	159.6
⑧	M1 M2 M1	12	200	200	1031	1375	122	167.7	148.9	12	200	200	1102	1445	122	176.3	156.6
⑨	M2 M1 M1	16	200	260	7000	7465	61	455.4	718.7	16	200	260	7090	7555	61	460.9	727.4
⑩	M2 M1 M1	12	200	1000	7000	8959	61	548.5	485.2	12	200	1320	7090	9689	61	591.0	524.7
⑪	M1	16	200	2100	–	2100	60	126.0	198.9	20	200	2150	–	2150	60	129.0	318.1
⑫	M2 M1 M1	12	200	200	1173	1516	122	185.0	164.2	12	200	200	1229	1573	122	191.9	170.3
⑬	M1 M2 M1	12	200	200	1173	1516	122	185.0	164.2	12	200	200	1201	1544	122	188.4	167.3
⑭	M2 M1 M1	10	150	250	11900	12366	76	939.8	579.4	10	150	250	11900	12366	76	939.8	579.4
⑮	M2 M1 M1	10	150	200	11900	12266	26	318.9	196.6	10	150	210	11900	12286	38	466.9	287.8
⑯	M2 M1 M1	10	150	160	11900	12186	26	316.8	195.3	10	150	160	11900	12186	38	463.1	285.5
⑰	M2 M1 M1	10	150	225	11900	12316	76	936.0	577.1	10	150	225	11900	12316	76	936.0	577.1
⑱	M2 M1 M1	10	150	225	11900	12316	12	147.8	91.1	10	150	225	11900	12316	12	147.8	91.1
⑲	M2 M1 M1	10	–	160	11900	12186	16	195.0	120.2	10	–	160	11900	12186	16	195.0	120.2
⑳	M1	12	–	11900	–	11900	10	119.0	105.7	12	–	11900	–	11900	10	119.0	105.7
㉑	M1 M2	12	200	1006	1268	2274	122	277.4	266.3	12	200	1006	1268	2274	122	277.4	310.7
㉒	M1 M1 M2	10	–	160	11900	12186	2	24.4	15.0	10	–	160	11900	12186	2	24.4	15.0
㉓	M1 M1 M2	10	–	160	11900	12186	4	48.7	30.1	10	–	160	11900	12186	4	48.7	30.1
㉔	M1 150 25 M2 0.2m	10	150	1100	1556	4207	104	437.5	269.8	10	150	1100	1556	4207	106	445.9	274.9
㉕	M1 M1 M2	10	–	160	7600	7886	20	157.7	97.2	10	–	160	7690	7976	20	159.5	98.3
㉖	M2 M1 M1	10	250	200	11900	12266	16	196.3	121.0	10	250	210	11900	12286	24	294.9	181.8
TOTAL STEEL (Kgs)		8103								9895							
TOTAL CONCRETE (cum)		125								144							

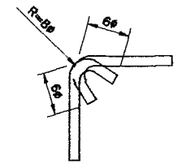
DRG.NO. SD/110 (SHEET 2 OF 2)

NOTES:

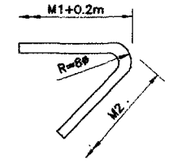
1. JOINT OR LAPPING OF BARS SHALL BE SUITABLY STAGGERED AS PER CLAUSE 304.6 OF IRC:21–1987.
2. FULL SCALE ELEVATION FOR THE BARS SHALL BE LINED OUT ON A PLAIN PLASTERED FLOOR TO THE DIMENSIONS SHOWN ON THE DRAWING SO AS TO GET CORRECT CLEARANCE BETWEEN DIFFERENT BARS AND THEN THE BARS SHALL BE BENT TO PROPER SHAPE.
3. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING No. SD/110 (SHEET 1 OF 2).
4. QUANTITY OF CONCRETE DOES NOT INCLUDE RAILINGS
5. QUANTITY OF STEEL DOES NOT INCLUDE 5% EXTRA FOR WASTAGE AND LAPS.
6. BAR No.21 IS DETAILED AS BELOW:



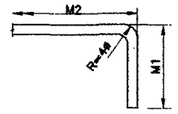
BENDING OF BARS



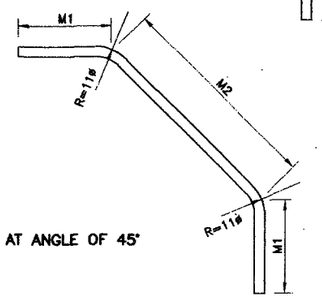
BEND WITH CLOSE HOOKS



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

DOUBLE CELL R.C.C BOX CULVERTS
2m x 2m TO 3m x3m
(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/110 (SHEET 2 OF 2)

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