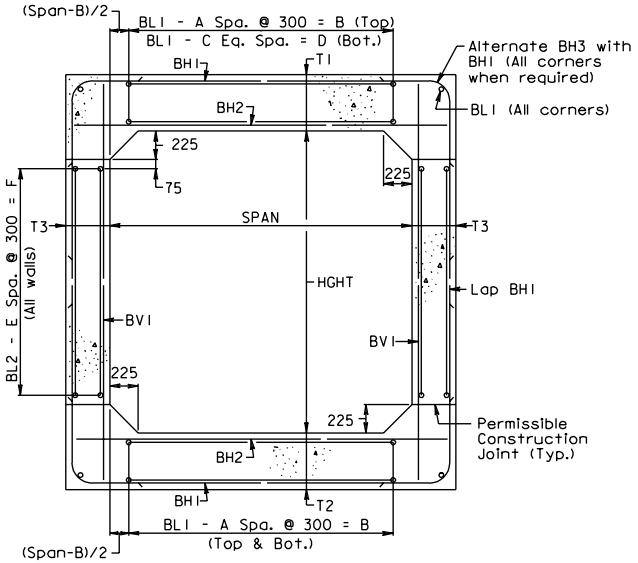
BS-DT



TYPICAL SECTION

(All dimensions are in mm unless otherwise noted)

GENERAL NOTE

Capacity: MS18 Loading and Alternate Military Loading.

Specifications:

Construction - Va. Department of Transportation Metric Road and Bridge Specifications, Current Edition.
Design - AASHTO Standard Specifications for Highway Bridges, 1983, including Interim Specifications, 1984, 1985 and VDOT Modifications, using Load Factor Design.

All concrete shall be Class 30.

Deformed reinforcing bars shall conform to ASTM A615M, Grade 420. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

Construction joints shall be constructed and bonded in accordance with the current Road and Bridge Specifications.

Barrels more than 10 m in length shall be poured in sections by providing vertical construction joints, not exceeding 7 m between joints nor more than 9 m from ends of barrels.

**Bars BH1 & BH3 shall have a pin diameter of 24 bar diameters.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight and #13 in size unless otherwise shown. BL2 shall be #10 in size.

The number of BL1 & BL2 bars shown in the table is the number of longitudinal bars shown in the Typical Section and may not equal the total number of bars required. BL1 & BL2 shall have a lap of 30 bar diameters at splices. At construction joints, first placed bars shall project 30 bar diameters beyond the joint. Estimated QUAN./meter shown for reinforcing steel does not include quantity for laps of BL1 & BL2 bars. The additional weight per longitudinal lap is shown in the table.

The centers of main reinforcing bars shall be 50 mm from the face of the concrete.

When concrete protective coating is required, all steel shall be epoxy-coated. All reinforcing steel for culverts under 0 to 0.6 m fills shall be epoxy-coated.

At the Contractor's option, BV1 bars may be spliced at the permissible construction joint in order to facilitate construction. No additional compensation shall be provided for the increase in reinforcing steel quantity due to the splices.

Headwall quantities shown assume wingwalls are to be built at a 45° angle to the headwall.

The designs are applicable to the fill height and other conditions indicated. Any change in the conditions invalidates these designs.

Wingwalls referenced by letter apply when the acceptable foundation level is the same for both box and wings. If foundation levels are different, the height of the wingwall shall be adjusted by selection of another lettered wingwall of appropriate height. For wingwall details, refer to standard series BCW for the appropriate fill slope.

Depth of foundation shall be investigated in accordance with Sec. 401.03(b) of the specifications.

For details of extending existing boxes, refer to Standard BCE-01.

For modification of details for skewed culverts, see the Skewed Box Details included in the road plans.

Dimensions shown in the tables are in millimeters with the exception of culvert span and height.

This standard shall be used with the BB standard series.

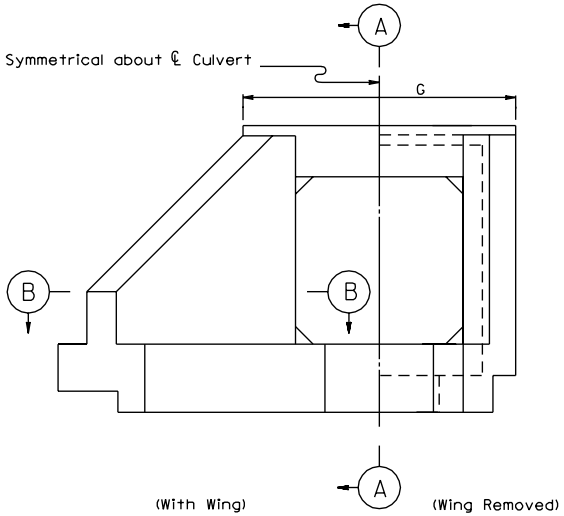
SINGLE BOX CULVERTS

STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

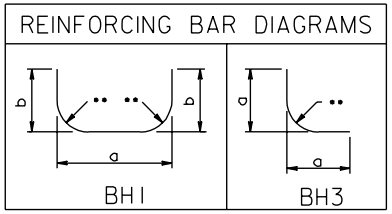
1002.01

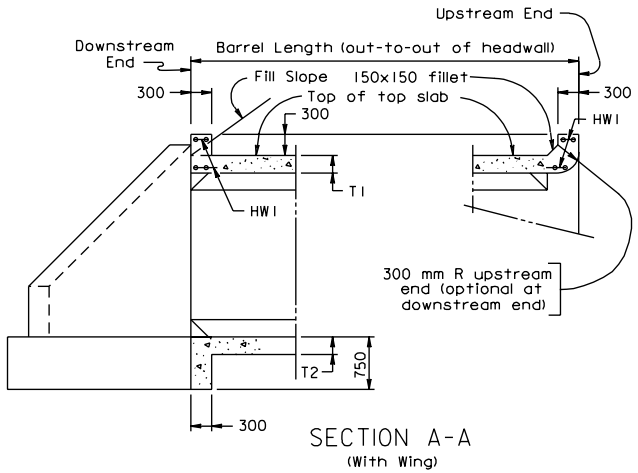
STRUCTURE AND BRIDGE DIVISION



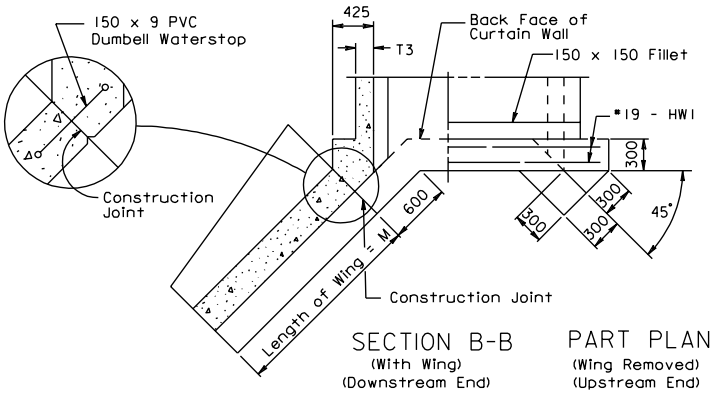
END ELEVATION

REINFORCING BAR DIAGRAMS





SECTION A-A
(With Wing)



SECTION B-B
(With Wing)
(Downstream End)

PART PLAN
(Wing Removed)
(Upstream End)

(All dimensions are in mm unless otherwise noted)

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS00.6

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1			NO. BL1 BARS	NO. BL2 BARS
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH		
0.91	0.91	215	215	200	2	600	4	600	1	300	13	300	1220	830	2720	16	300	1220	13	300	640	1190	13	300	1240	18	8
0.91	1.21	215	215	200	2	600	4	600	2	600	13	300	1220	980	3020	19	300	1220	--	--	--	--	13	300	1550	18	12
1.21	0.91	225	225	200	3	900	6	900	1	300	13	300	1520	840	3050	19	300	1520	--	--	--	--	13	265	1270	23	8
1.21	1.21	225	225	200	3	900	6	900	2	600	13	300	1520	990	3350	19	300	1520	--	--	--	--	13	300	1570	23	12
1.21	1.52	225	225	200	3	900	6	900	3	900	13	300	1520	1140	3660	19	300	1520	--	--	--	--	13	300	1880	23	16
1.21	1.82	225	225	200	3	900	6	900	4	1200	13	275	1520	1300	3960	19	275	1520	--	--	--	--	13	300	2180	23	20
1.52	0.91	230	230	200	4	1200	8	1200	1	300	13	275	1830	840	3350	19	275	1830	--	--	--	--	13	300	1270	28	8
1.52	1.21	230	230	200	4	1200	8	1200	2	600	13	275	1830	1000	3660	19	275	1830	--	--	--	--	13	300	1570	28	12
1.52	1.52	230	230	200	4	1200	8	1200	3	900	13	250	1830	1150	3960	19	250	1830	--	--	--	--	13	300	1880	28	16
1.52	1.82	225	225	200	4	1200	8	1200	4	1200	13	250	1830	1300	4270	19	250	1830	--	--	--	--	13	300	2180	28	20
1.52	2.13	225	225	200	4	1200	8	1200	5	1500	13	225	1830	1450	4570	19	225	1830	--	--	--	--	13	300	2490	28	24
1.82	1.21	230	230	200	5	1500	10	1500	2	600	13	225	2130	1000	3960	19	225	2130	--	--	--	--	13	300	1570	33	12
1.82	1.52	230	230	200	5	1500	10	1500	3	900	13	225	2130	1150	4270	19	225	2130	--	--	--	--	13	300	1880	33	16
1.82	1.82	230	230	200	5	1500	10	1500	4	1200	13	225	2130	1300	4570	19	225	2130	--	--	--	--	13	300	2180	33	20
1.82	2.13	230	230	200	5	1500	10	1500	5	1500	13	200	2130	1450	4880	19	200	2130	--	--	--	--	13	300	2490	33	24
1.82	2.43	230	230	200	5	1500	10	1500	6	1800	13	300	2130	1610	5180	25	300	2130	13	300	820	1570	13	300	2790	33	28
2.13	1.21	240	240	200	6	1800	12	1800	2	600	13	225	2440	1000	4290	19	225	2440	--	--	--	--	13	300	1600	38	12
2.13	1.82	240	240	200	6	1800	12	1800	4	1200	13	200	2440	1310	4900	19	200	2440	--	--	--	--	13	300	2210	38	20
2.13	2.43	240	240	200	6	1800	12	1800	6	1800	13	175	2440	1610	5510	19	175	2440	--	--	--	--	13	300	2820	38	28
2.13	3.04	240	240	200	6	1800	12	1800	8	2400	13	150	2440	1920	6120	19	150	2440	--	--	--	--	13	300	3430	38	36
2.43	1.21	245	245	200	7	2100	14	2100	2	600	13	200	2740	1010	4600	19	200	2740	--	--	--	--	13	300	1600	43	12
2.43	1.82	245	245	200	7	2100	14	2100	4	1200	16	300	2740	1310	5180	25	300	2740	10	300	950	1830	13	300	2210	43	20
2.43	2.43	245	245	200	7	2100	14	2100	6	1800	16	175	2740	1620	5790	19	175	2740	--	--	--	--	13	300	2820	43	28
2.43	3.04	240	240	200	7	2100	14	2100	8	2400	13	225	2740	1920	6430	25	225	2740	13	225	950	1800	13	300	3430	43	36
2.74	1.21	245	245	200	8	2400	16	2400	2	600	19	300	3050	1010	4830	25	300	3050	16	300	1010	1910	13	300	1600	48	12
2.74	1.82	245	245	200	8	2400	16	2400	4	1200	16	175	3050	1310	5490	19	175	3050	--	--	--	--	13	300	2210	48	20
2.74	2.43	245	245	200	8	2400	16	2400	6	1800	13	150	3050	1620	6120	19	150	3050	--	--	--	--	13	300	2820	48	28
2.74	3.04	245	245	200	8	2400	16	2400	8	2400	16	265	3050	1920	6710	25	265	3050	10	265	1010	1960	13	300	3430	48	36
2.74	3.65	245	245	200	8	2400	16	2400	10	3000	16	200	3050	2230	7320	25	200	3050	13	200	1010	1930	13	290	4040	48	44
3.04	1.21	250	250	200	9	2700	18	2700	2	600	13	175	3350	1020	5230	19	175	3350	13	175	1070	2060	13	300	1630	53	12
3.04	1.82	250	250	200	9	2700	18	2700	4	1200	16	250	3350	1320	5790	22	250	3350	--	--	--	--	13	300	2240	53	20
3.04	2.43	250	250	200	9	2700	18	2700	6	1800	16	250	3350	1630	6400	25	250	3350	10	250	1070	2080	13	300	2840	53	28
3.04	3.04	250	250	200	9	2700	18	2700	8	2400	13	200	3350	1930	7060	22	200	3350	13	200	1070	2060	13	300	3450	53	36
3.04	3.65	250	250	200	9	2700	18	2700	10	3000	13	175	3350	2240	7670	25	175	3350	13	175	1070	2060	13	300	4060	53	44
3.65	1.82	260	260	200	11	3300	22	3300	4	1200	19	225	3960	1330	6380	25	225	3960	13	225	1190	2290	13	300	2260	63	20
3.65	2.43	250	250	200	11	3300	22	3300	6	1800	16	200	3960	1630	7010	25	200	3960	10	200	1190	2310	13	300	2840	63	28
3.65	3.04	250	250	200	11	3300	22	3300	8	2400	16	175	3960	1930	7620	22	175	3960	--	--	--	--	13	300	3450	63	36
3.65	3.65	260	260	200	11	3300	22	3300	10	3000	16	200	3960	2240	8250	25	200	3960	13	200	1190	2290	13	300	4090	63	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

0 TO 0.6 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.03

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	8.10	1.019	77.01	1780	19	1680	0.893	15.02	0.896	15.02	A
0.91	1.21	8.74	1.139	73.07	1780	19	1680	0.988	15.02	0.991	15.02	C
1.21	0.91	9.99	1.180	79.73	2080	19	1980	0.967	17.70	0.973	17.70	A
1.21	1.21	10.63	1.299	84.83	2080	19	1980	1.063	17.70	1.068	17.70	C
1.21	1.52	11.27	1.422	91.18	2080	19	1980	1.159	17.70	1.165	17.70	E
1.21	1.82	11.91	1.541	101.84	2080	19	1980	1.255	17.70	1.260	17.70	G
1.52	0.91	11.88	1.336	94.69	2390	19	2290	1.069	20.47	1.077	20.47	B
1.52	1.21	12.53	1.456	101.16	2390	19	2290	1.164	20.47	1.172	20.47	D
1.52	1.52	13.17	1.578	113.46	2390	19	2290	1.261	20.47	1.269	20.47	F
1.52	1.82	13.81	1.678	120.15	2390	19	2290	1.329	20.47	1.336	20.47	G
1.52	2.13	14.45	1.800	134.51	2390	19	2290	1.425	20.47	1.433	20.47	I
1.82	1.21	14.42	1.590	127.23	2690	19	2590	1.235	23.15	1.246	23.15	D
1.82	1.52	15.06	1.713	134.26	2690	19	2590	1.332	23.15	1.342	23.15	F
1.82	1.82	15.70	1.832	141.14	2690	19	2590	1.427	23.15	1.438	23.15	H
1.82	2.13	16.34	1.954	158.86	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	16.98	2.072	178.52	2690	19	2590	1.620	23.15	1.630	23.15	L
2.13	1.21	16.31	1.782	141.47	3000	19	2900	1.308	25.93	1.320	25.93	D
2.13	1.82	17.59	2.022	166.86	3000	19	2900	1.500	25.93	1.513	25.93	H
2.13	2.43	18.87	2.263	197.06	3000	19	2900	1.692	25.93	1.705	25.93	L
2.13	3.04	20.15	2.502	234.48	3000	19	2900	1.884	25.93	1.897	25.93	P
2.43	1.21	18.21	1.951	167.03	3300	19	3200	1.377	28.61	1.392	28.61	D
2.43	1.82	19.49	2.189	208.42	3300	19	3200	1.569	28.61	1.584	28.61	H
2.43	2.43	20.77	2.428	249.79	3300	19	3200	1.761	28.61	1.776	28.61	L
2.43	3.04	22.05	2.641	271.02	3300	19	3200	1.954	28.61	1.969	28.61	P
2.74	1.21	20.10	2.091	257.31	3610	19	3510	1.449	31.38	1.467	31.38	D
2.74	1.82	21.38	2.336	248.84	3610	19	3510	1.641	31.38	1.659	31.38	H
2.74	2.43	22.66	2.579	254.08	3610	19	3510	1.833	31.38	1.851	31.38	L
2.74	3.04	23.94	2.821	277.22	3610	19	3510	2.025	31.38	2.043	31.38	P
2.74	3.65	25.22	3.052	373.20	3610	19	3510	2.217	31.38	2.235	31.38	T
3.04	1.21	21.99	2.272	261.99	3910	19	3810	1.517	34.06	1.537	34.06	D
3.04	1.82	23.27	2.520	232.14	3910	19	3810	1.709	34.06	1.729	34.06	H
3.04	2.43	24.55	2.756	291.76	3910	19	3810	1.901	34.06	1.921	34.06	L
3.04	3.04	25.84	2.998	308.74	3910	19	3810	2.093	34.06	2.113	34.06	P
3.04	3.65	27.12	3.232	390.27	3910	19	3810	2.285	34.06	2.305	34.06	T
3.65	1.82	27.06	2.885	395.86	4520	19	4420	1.844	39.51	1.869	39.51	H
3.65	2.43	28.34	3.049	389.12	4520	19	4420	2.042	39.51	2.067	39.51	L
3.65	3.04	29.62	3.294	378.47	4520	19	4420	2.234	39.51	2.259	39.51	P
3.65	3.65	30.90	3.611	445.26	4520	19	4420	2.420	39.51	2.445	39.51	T

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

0 TO 0.6 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS01.5

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	300	1220	810	2690	13	300	1220	--	--	--	--	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	300	1220	970	3000	13	300	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	300	1520	810	3000	16	300	1520	--	--	--	--	13	300	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	300	1520	970	3300	16	300	1520	--	--	--	--	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	300	1520	1120	3610	16	300	1520	--	--	--	--	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	300	1520	1270	3910	16	300	1520	--	--	--	--	13	300	2130	20	20
1.52	0.91	200	200	200	4	1200	4	1200	1	300	13	300	1830	810	3300	16	300	1830	13	300	760	1450	13	300	1220	24	8
1.52	1.21	200	200	200	4	1200	4	1200	2	600	13	300	1830	970	3610	16	300	1830	--	--	--	--	13	300	1520	24	12
1.52	1.52	200	200	200	4	1200	4	1200	3	900	13	300	1830	1120	3910	16	300	1830	--	--	--	--	13	300	1830	24	16
1.52	1.82	200	200	200	4	1200	4	1200	4	1200	13	300	1830	1270	4220	19	300	1830	--	--	--	--	13	300	2130	24	20
1.52	2.13	200	200	200	4	1200	4	1200	5	1500	13	300	1830	1420	4520	19	300	1830	--	--	--	--	13	300	2440	24	24
1.82	1.21	200	200	200	5	1500	5	1500	2	600	16	300	2130	970	3860	19	300	2130	--	--	--	--	13	300	1520	28	12
1.82	1.52	200	200	200	5	1500	5	1500	3	900	13	300	2130	1120	4220	19	300	2130	13	300	820	1570	13	300	1830	28	16
1.82	1.82	200	200	200	5	1500	5	1500	4	1200	13	300	2130	1270	4520	19	300	2130	13	300	820	1570	13	300	2130	28	20
1.82	2.13	200	200	200	5	1500	5	1500	5	1500	13	250	2130	1420	4830	19	250	2130	13	250	820	1570	13	300	2440	28	24
1.82	2.43	200	200	200	5	1500	5	1500	6	1800	13	225	2130	1570	5130	19	225	2130	13	225	820	1570	13	300	2740	28	28
2.13	1.21	200	200	200	6	1800	6	1800	2	600	16	275	2440	970	4170	19	275	2440	--	--	--	--	13	300	1520	32	12
2.13	1.82	200	200	200	6	1800	6	1800	4	1200	13	225	2440	1270	4830	19	225	2440	13	225	880	1680	13	300	2130	32	20
2.13	2.43	200	200	200	6	1800	6	1800	6	1800	13	200	2440	1570	5440	19	200	2440	10	200	880	1700	13	300	2740	32	28
2.13	3.04	200	200	200	6	1800	6	1800	8	2400	16	150	2440	1880	5990	19	150	2440	--	--	--	--	13	300	3350	32	36
2.43	1.21	200	200	200	7	2100	7	2100	2	600	16	225	2740	970	4470	19	225	2740	10	225	950	1830	13	290	1520	36	12
2.43	1.82	200	200	200	7	2100	7	2100	4	1200	13	200	2740	1270	5130	19	200	2740	13	200	950	1800	13	300	2130	36	20
2.43	2.43	200	200	200	7	2100	7	2100	6	1800	16	175	2740	1570	5690	19	175	2740	--	--	--	--	13	300	2740	36	28
2.43	3.04	200	200	200	7	2100	7	2100	8	2400	16	275	2740	1880	6300	25	275	2740	13	275	950	1800	13	300	3350	36	36
2.74	1.21	200	200	200	8	2400	8	2400	2	600	16	200	3050	970	4780	19	200	3050	10	200	1010	1960	13	200	1520	40	12
2.74	1.82	200	200	200	8	2400	8	2400	4	1200	13	175	3050	1270	5440	19	175	3050	13	175	1010	1930	13	275	2130	40	20
2.74	2.43	207	207	200	8	2400	8	2400	6	1800	16	265	3050	1580	6020	25	265	3050	10	265	1010	1960	13	300	2740	48	28
2.74	3.04	200	200	200	8	2400	8	2400	8	2400	16	250	3050	1880	6600	25	250	3050	13	250	1010	1930	13	300	3350	40	36
2.74	3.65	207	207	200	8	2400	8	2400	10	3000	16	240	3050	2190	7240	25	240	3050	10	240	1010	1960	13	290	3960	40	44
3.04	1.21	220	220	200	9	2700	9	2700	2	600	19	175	3350	980	5080	19	175	3350	--	--	--	--	16	240	1570	44	12
3.04	1.82	220	220	200	9	2700	9	2700	4	1200	19	250	3350	1290	5690	25	250	3350	--	--	--	--	13	225	2180	44	20
3.04	2.43	220	220	200	9	2700	9	2700	6	1800	19	150	3350	1590	6300	19	150	3350	--	--	--	--	13	250	2790	44	28
3.04	3.04	220	220	200	9	2700	9	2700	8	2400	19	240	3350	1900	6910	25	240	3350	10	240	1070	2080	13	300	3400	44	36
3.04	3.65	230	230	200	9	2700	9	2700	10	3000	16	215	3350	2220	7590	25	215	3350	13	215	1070	2060	13	300	4010	44	44
3.65	1.82	240	240	200	11	3300	11	3300	4	1200	19	200	3960	1310	6320	22	200	3960	13	200	1190	2290	13	165	2210	52	20
3.65	2.43	245	245	200	11	3300	11	3300	6	1800	19	200	3960	1620	6960	25	200	3960	10	200	1190	2310	13	215	2820	52	28
3.65	3.04	245	245	200	11	3300	11	3300	8	2400	16	200	3960	1920	7620	25	200	3960	13	200	1190	2290	13	300	3430	52	36
3.65	3.65	265	265	200	11	3300	11	3300	10	3000	19	175	3960	2250	8200	25	175	3960	--	--	--	--	13	300	4090	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

0.6 TO 1.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.05

SPAN	HGHT	REINFORCING STEEL (kg/LONG. JT)	QUAN./m		HEADWALLS							
			CONCRETE CLASS A4 (m^3/m)	REINFORCING STEEL (kg/m)	G	HWI		INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	
(m)	(m)				HEADWALL LENGTH	SIZE	LENGTH					WINGWALL
0.91	0.91	7.34	0.982	54.38	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.102	60.66	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.101	68.05	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.220	74.27	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.343	80.62	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.462	86.83	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.221	96.44	2390	19	2290	1.039	20.47	1.047	20.47	A
1.52	1.21	11.01	1.343	83.51	2390	19	2290	1.134	20.47	1.142	20.47	C
1.52	1.52	11.65	1.466	89.79	2390	19	2290	1.231	20.47	1.239	20.47	E
1.52	1.82	12.29	1.584	104.40	2390	19	2290	1.326	20.47	1.334	20.47	G
1.52	2.13	12.93	1.707	110.68	2390	19	2290	1.423	20.47	1.431	20.47	I
1.82	1.21	12.53	1.458	116.30	2690	19	2590	1.208	23.15	1.218	23.15	C
1.82	1.52	13.17	1.581	129.43	2690	19	2590	1.305	23.15	1.315	23.15	E
1.82	1.82	13.81	1.700	135.64	2690	19	2590	1.400	23.15	1.410	23.15	G
1.82	2.13	14.45	1.821	158.90	2690	19	2590	1.497	23.15	1.507	23.15	I
1.82	2.43	15.09	1.939	177.06	2690	19	2590	1.592	23.15	1.602	23.15	K
2.13	1.21	14.04	1.580	135.33	3000	19	2900	1.284	25.93	1.297	25.93	C
2.13	1.82	15.32	1.819	177.96	3000	19	2900	1.476	25.93	1.489	25.93	G
2.13	2.43	16.60	2.061	193.29	3000	19	2900	1.668	25.93	1.681	25.93	K
2.13	3.04	17.88	2.295	270.83	3000	19	2900	1.861	25.93	1.873	25.93	O
2.43	1.21	15.55	1.693	187.24	3300	19	3200	1.358	28.61	1.373	28.61	C
2.43	1.82	16.84	1.935	209.11	3300	19	3200	1.550	28.61	1.565	28.61	G
2.43	2.43	18.12	2.175	240.53	3300	19	3200	1.742	28.61	1.757	28.61	K
2.43	3.04	19.40	2.417	254.45	3300	19	3200	1.934	28.61	1.949	28.61	O
2.74	1.21	17.07	1.812	225.89	3610	19	3510	1.434	31.38	1.452	31.38	C
2.74	1.82	18.35	2.053	249.91	3610	19	3510	1.626	31.38	1.644	31.38	G
2.74	2.43	22.66	2.340	260.08	3610	19	3510	1.816	31.38	1.834	31.38	K
2.74	3.04	20.91	2.536	291.70	3610	19	3510	2.011	31.38	2.028	31.38	O
2.74	3.65	22.19	2.822	304.46	3610	19	3510	2.201	31.38	2.218	31.38	S
3.04	1.21	18.58	2.062	286.09	3910	19	3810	1.501	34.06	1.521	34.06	C
3.04	1.82	19.87	2.307	282.41	3910	19	3810	1.693	34.06	1.713	34.06	G
3.04	2.43	21.15	2.540	369.17	3910	19	3810	1.885	34.06	1.905	34.06	K
3.04	3.04	22.43	2.787	345.45	3910	19	3810	2.077	34.06	2.097	34.06	O
3.04	3.65	23.71	3.097	366.43	3910	19	3810	2.293	34.06	2.313	34.06	T
3.65	1.82	22.90	2.723	396.76	4520	19	4420	1.855	39.51	1.880	39.51	H
3.65	2.43	24.18	3.003	432.20	4520	19	4420	2.045	39.51	2.069	39.51	L
3.65	3.04	25.46	3.249	415.70	4520	19	4420	2.237	39.51	2.262	39.51	P
3.65	3.65	26.74	3.645	492.69	4520	19	4420	2.418	39.51	2.443	39.51	T

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

0.6 TO 1.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS03.0

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	300	1220	810	2690	13	300	1220	--	--	--	--	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	300	1220	970	3000	13	300	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	290	1520	810	3000	13	290	1520	--	--	--	--	13	300	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	275	1520	970	3300	13	275	1520	--	--	--	--	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	300	1520	1120	3610	16	300	1520	10	300	700	1350	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	300	1520	1270	3910	16	300	1520	10	300	700	1350	13	300	2130	20	20
1.52	0.91	200	200	200	4	1200	4	1200	1	300	13	300	1830	810	3300	16	300	1830	--	--	--	--	13	300	1220	24	8
1.52	1.21	200	200	200	4	1200	4	1200	2	600	13	290	1830	970	3610	16	290	1830	--	--	--	--	13	300	1520	24	12
1.52	1.52	200	200	200	4	1200	4	1200	3	900	13	275	1830	1120	3910	16	275	1830	--	--	--	--	13	300	1830	24	16
1.52	1.82	200	200	200	4	1200	4	1200	4	1200	13	265	1830	1270	4220	16	265	1830	--	--	--	--	13	300	2130	24	20
1.52	2.13	200	200	200	4	1200	4	1200	5	1500	13	250	1830	1420	4520	16	250	1830	--	--	--	--	13	300	2440	24	24
1.82	1.21	200	200	200	5	1500	5	1500	2	600	13	240	2130	970	3910	16	240	2130	--	--	--	--	13	300	1520	28	12
1.82	1.52	200	200	200	5	1500	5	1500	3	900	13	290	2130	1120	4220	19	290	2130	13	290	820	1570	13	300	1830	28	16
1.82	1.82	200	200	200	5	1500	5	1500	4	1200	13	275	2130	1270	4520	19	275	2130	10	275	820	1570	13	300	2130	28	20
1.82	2.13	200	200	200	5	1500	5	1500	5	1500	13	265	2130	1420	4830	19	265	2130	10	265	820	1570	13	300	2440	28	24
1.82	2.43	200	200	200	5	1500	5	1500	6	1800	13	250	2130	1570	5130	19	250	2130	13	250	820	1570	13	300	2740	28	28
2.13	1.21	200	200	200	6	1800	6	1800	2	600	16	250	2440	970	4170	19	250	2440	10	250	880	1700	13	225	1520	32	12
2.13	1.82	200	200	200	6	1800	6	1800	4	1200	13	225	2440	1270	4830	19	225	2440	10	225	880	1700	13	300	2130	32	20
2.13	2.43	200	200	200	6	1800	6	1800	6	1800	13	215	2440	1570	5440	19	215	2440	10	215	880	1700	13	300	2740	32	28
2.13	3.04	200	200	200	6	1800	6	1800	8	2400	13	190	2440	1880	6050	19	190	2440	10	190	880	1700	13	300	3350	32	36
2.43	1.21	200	200	200	7	2100	7	2100	2	600	16	215	2740	970	4470	19	215	2740	10	215	950	1830	13	150	1520	36	12
2.43	1.82	200	200	200	7	2100	7	2100	4	1200	13	190	2740	1270	5130	19	190	2740	10	190	950	1830	13	225	2130	36	20
2.43	2.43	200	200	200	7	2100	7	2100	6	1800	13	175	2740	1570	5740	19	175	2740	10	175	950	1830	13	300	2740	36	28
2.43	3.04	200	200	200	7	2100	7	2100	8	2400	13	165	2740	1880	6350	19	165	2740	10	165	950	1830	13	300	3350	36	36
2.74	1.21	200	200	200	8	2400	8	2400	2	600	16	190	3050	970	4780	19	190	3050	10	190	1010	1960	13	140	1520	40	12
2.74	1.82	207	207	200	8	2400	8	2400	4	1200	16	165	3050	1280	5410	19	165	3050	--	--	--	--	13	190	2130	40	20
2.74	2.43	207	207	200	8	2400	8	2400	6	1800	13	150	3050	1580	6050	19	150	3050	10	150	1010	1960	13	265	2740	40	28
2.74	3.04	215	215	200	8	2400	8	2400	8	2400	16	190	3050	1890	6630	22	190	3050	10	190	1010	1960	13	300	3380	40	36
2.74	3.65	225	225	200	8	2400	8	2400	10	3000	19	215	3050	2210	7210	25	215	3050	--	--	--	--	13	250	4010	40	44
3.04	1.21	207	207	200	9	2700	9	2700	2	600	16	165	3350	970	5110	19	165	3350	10	165	1070	2080	16	150	1520	44	12
3.04	1.82	215	215	200	9	2700	9	2700	4	1200	19	190	3350	1280	5660	22	190	3350	--	--	--	--	13	150	2160	44	20
3.04	2.43	220	220	200	9	2700	9	2700	6	1800	13	140	3350	1590	6380	19	140	3350	10	140	1070	2080	13	225	2790	44	28
3.04	3.04	230	230	200	9	2700	9	2700	8	2400	13	125	3350	1910	7010	19	125	3350	--	--	--	--	13	300	3400	44	36
3.04	3.65	230	230	200	9	2700	9	2700	10	3000	13	200	3350	2220	7620	25	200	3350	13	200	1070	2060	13	300	4010	44	44
3.65	1.82	270	270	200	11	3300	11	3300	4	1200	19	190	3960	1340	6400	25	190	3960	10	190	1190	2310	13	140	2260	52	20
3.65	2.43	270	270	200	11	3300	11	3300	6	1800	16	150	3960	1640	7060	22	150	3960	--	--	--	--	13	190	2870	52	28
3.65	3.04	275	275	200	11	3300	11	3300	8	2400	16	175	3960	1960	7670	25	175	3960	10	175	1190	2310	13	265	3510	52	36
3.65	3.65	280	280	200	11	3300	11	3300	10	3000	16	165	3960	2270	8310	25	165	3960	10	165	1190	2310	13	300	4110	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

1.5 TO 3.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.07

SPAN	HGHT	REINFORCING STEEL (kg/LONG. JT)	QUAN./m		HEADWALLS							
			CONCRETE CLASS A4 (m^3/m)	REINFORCING STEEL (kg/m)	G	HWI		INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	
(m)	(m)				HEADWALL LENGTH	SIZE	LENGTH					WINGWALL
0.91	0.91	7.34	0.982	54.38	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.102	60.66	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.101	63.43	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.220	71.52	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.342	90.70	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.461	96.91	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.223	77.22	2390	19	2290	1.039	20.47	1.047	20.47	A
1.52	1.21	11.01	1.342	84.98	2390	19	2290	1.134	20.47	1.142	20.47	C
1.52	1.52	11.65	1.465	93.86	2390	19	2290	1.231	20.47	1.239	20.47	E
1.52	1.82	12.29	1.584	102.26	2390	19	2290	1.326	20.47	1.334	20.47	G
1.52	2.13	12.93	1.707	112.13	2390	19	2290	1.423	20.47	1.431	20.47	I
1.82	1.21	12.53	1.460	104.56	2690	19	2590	1.208	23.15	1.218	23.15	C
1.82	1.52	13.17	1.580	132.20	2690	19	2590	1.305	23.15	1.315	23.15	E
1.82	1.82	13.81	1.700	133.23	2690	19	2590	1.400	23.15	1.410	23.15	G
1.82	2.13	14.45	1.823	142.87	2690	19	2590	1.497	23.15	1.507	23.15	I
1.82	2.43	15.09	1.940	165.52	2690	19	2590	1.592	23.15	1.602	23.15	K
2.13	1.21	14.04	1.577	162.59	3000	19	2900	1.284	25.93	1.297	25.93	C
2.13	1.82	15.32	1.820	165.20	3000	19	2900	1.476	25.93	1.489	25.93	G
2.13	2.43	16.60	2.062	184.39	3000	19	2900	1.668	25.93	1.681	25.93	K
2.13	3.04	17.88	2.302	214.92	3000	19	2900	1.861	25.93	1.873	25.93	O
2.43	1.21	15.55	1.691	203.22	3300	19	3200	1.358	28.61	1.373	28.61	C
2.43	1.82	16.84	1.935	205.52	3300	19	3200	1.550	28.61	1.565	28.61	G
2.43	2.43	18.12	2.176	228.24	3300	19	3200	1.742	28.61	1.757	28.61	K
2.43	3.04	19.40	2.417	253.72	3300	19	3200	1.934	28.61	1.949	28.61	O
2.74	1.21	17.07	1.811	241.02	3610	19	3510	1.434	31.38	1.452	31.38	C
2.74	1.82	18.35	2.096	257.65	3610	19	3510	1.624	31.38	1.642	31.38	G
2.74	2.43	19.63	2.338	276.34	3610	19	3510	1.816	31.38	1.834	31.38	K
2.74	3.04	20.91	2.628	311.40	3610	19	3510	2.006	31.38	2.024	31.38	O
2.74	3.65	22.19	2.929	358.91	3610	19	3510	2.196	31.38	2.213	31.38	S
3.04	1.21	18.58	1.972	297.03	3910	19	3810	1.505	34.06	1.525	34.06	C
3.04	1.82	19.87	2.267	323.99	3910	19	3810	1.695	34.06	1.715	34.06	G
3.04	2.43	21.15	2.547	314.90	3910	19	3810	1.885	34.06	1.905	34.06	K
3.04	3.04	22.43	2.859	317.71	3910	19	3810	2.101	34.06	2.121	34.06	P
3.04	3.65	23.71	3.100	344.74	3910	19	3810	2.293	34.06	2.313	34.06	T
3.65	1.82	22.90	2.960	438.39	4520	19	4420	1.839	39.51	1.864	39.51	H
3.65	2.43	24.18	3.209	404.11	4520	19	4420	2.031	39.51	2.056	39.51	L
3.65	3.04	25.46	3.488	443.60	4520	19	4420	2.220	39.51	2.245	39.51	P
3.65	3.65	26.74	3.768	481.96	4520	19	4420	2.409	39.51	2.434	39.51	T

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

1.5 TO 3.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS04.5

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1			NO. BL1 BARS	NO. BL2 BARS
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH		
0.91	0.91	200	200	200	2	600	2	600	1	300	13	300	1220	810	2690	13	300	1220	--	--	--	--	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	300	1220	970	3000	13	300	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	300	1520	810	3000	16	300	1520	--	--	--	--	13	300	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	300	1520	970	3300	16	300	1520	--	--	--	--	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	290	1520	1120	3610	16	290	1520	--	--	--	--	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	275	1520	1270	3910	16	275	1520	--	--	--	--	13	300	2130	20	20
1.52	0.91	200	200	200	4	1200	4	1200	1	300	13	240	1830	810	3300	16	240	1830	--	--	--	--	13	290	1220	24	8
1.52	1.21	200	200	200	4	1200	4	1200	2	600	13	225	1830	970	3610	16	225	1830	--	--	--	--	13	300	1520	24	12
1.52	1.52	200	200	200	4	1200	4	1200	3	900	13	290	1830	1120	3910	19	290	1830	10	290	760	1470	13	300	1830	24	16
1.52	1.82	200	200	200	4	1200	4	1200	4	1200	13	275	1830	1270	4220	19	275	1830	--	--	--	--	13	300	2130	24	20
1.52	2.13	200	200	200	4	1200	4	1200	5	1500	13	265	1830	1420	4520	19	265	1830	--	--	--	--	13	300	2440	24	24
1.82	1.21	200	200	200	5	1500	5	1500	2	600	16	240	2130	970	3860	19	240	2130	--	--	--	--	13	225	1520	28	12
1.82	1.52	200	200	200	5	1500	5	1500	3	900	13	225	2130	1120	4220	19	225	2130	10	225	820	1570	13	300	1830	28	16
1.82	1.82	200	200	200	5	1500	5	1500	4	1200	13	215	2130	1270	4520	19	215	2130	10	215	820	1570	13	300	2130	28	20
1.82	2.13	200	200	200	5	1500	5	1500	5	1500	13	215	2130	1420	4830	19	215	2130	10	215	820	1570	13	300	2440	28	24
1.82	2.43	200	200	200	5	1500	5	1500	6	1800	13	200	2130	1570	5130	19	200	2130	10	200	820	1570	13	300	2740	28	28
2.13	1.21	200	200	200	6	1800	6	1800	2	600	16	200	2440	970	4170	19	200	2440	--	--	--	--	13	150	1520	32	12
2.13	1.82	207	207	200	6	1800	6	1800	4	1200	13	190	2440	1280	4830	19	190	2440	10	190	880	1700	13	275	2130	32	20
2.13	2.43	207	207	200	6	1800	6	1800	6	1800	13	175	2440	1580	5440	19	175	2440	10	175	880	1700	13	300	2740	32	28
2.13	3.04	207	207	200	6	1800	6	1800	8	2400	13	165	2440	1890	6050	19	165	2440	10	165	880	1700	13	300	3350	32	36
2.43	1.21	225	225	200	7	2100	7	2100	2	600	16	175	2740	990	4520	19	175	2740	--	--	--	--	13	150	1570	36	12
2.43	1.82	225	225	200	7	2100	7	2100	4	1200	13	165	2740	1300	5180	19	165	2740	10	165	950	1830	13	200	2180	36	20
2.43	2.43	230	230	200	7	2100	7	2100	6	1800	16	150	2740	1610	5770	19	150	2740	--	--	--	--	13	300	2790	36	28
2.43	3.04	230	230	200	7	2100	7	2100	8	2400	16	225	2740	1910	6380	25	225	2740	10	225	950	1830	13	300	3400	36	36
2.74	1.21	245	245	200	8	2400	8	2400	2	600	16	150	3050	1010	4880	19	150	3050	--	--	--	--	19	240	1600	40	12
2.74	1.82	250	250	200	8	2400	8	2400	4	1200	16	225	3050	1320	5490	25	225	3050	10	225	1010	1960	13	190	2240	40	20
2.74	2.43	250	250	200	8	2400	8	2400	6	1800	16	225	3050	1630	6100	25	225	3050	10	225	1010	1960	13	240	2840	40	28
2.74	3.04	260	260	200	8	2400	8	2400	8	2400	19	200	3050	1940	6680	25	200	3050	--	--	--	--	13	300	3480	40	36
2.74	3.65	260	260	200	8	2400	8	2400	10	3000	16	190	3050	2240	7340	25	190	3050	13	190	1010	1930	13	190	4090	40	44
3.04	1.21	265	265	200	9	2700	9	2700	2	600	16	140	3350	1030	5210	19	140	3350	--	--	--	--	19	200	1650	44	12
3.04	1.82	270	270	200	9	2700	9	2700	4	1200	19	200	3350	1340	5790	25	200	3350	--	--	--	--	13	165	2260	44	20
3.04	2.43	275	275	200	9	2700	9	2700	6	1800	19	150	3350	1650	6400	22	150	3350	--	--	--	--	13	275	2900	44	28
3.04	3.04	275	275	200	9	2700	9	2700	8	2400	16	190	3350	1960	7060	25	190	3350	10	190	1070	2080	13	300	3510	44	36
3.04	3.65	280	280	200	9	2700	9	2700	10	3000	19	150	3350	2270	7650	22	150	3350	--	--	--	--	13	225	4110	44	44
3.65	1.82	320	320	200	11	3300	11	3300	4	1200	16	140	3960	1390	6550	22	140	3960	--	--	--	--	16	200	2360	52	20
3.65	2.43	320	320	200	11	3300	11	3300	6	1800	19	165	3960	1700	7110	25	165	3960	--	--	--	--	13	225	2970	52	28
3.65	3.04	325	325	200	11	3300	11	3300	8	2400	16	165	3960	2010	7770	25	165	3960	10	165	1190	2310	13	300	3610	52	36
3.65	3.65	325	325	200	11	3300	11	3300	10	3000	19	125	3960	2310	8330	22	125	3960	--	--	--	--	13	300	4220	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

3.0 TO 4.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.09

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.982	54.38	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.102	60.66	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.101	68.05	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.220	74.27	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.343	81.98	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.462	90.62	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.222	87.70	2390	19	2290	1.039	20.47	1.047	20.47	A
1.52	1.21	11.01	1.341	97.79	2390	19	2290	1.134	20.47	1.142	20.47	C
1.52	1.52	11.65	1.463	111.31	2390	19	2290	1.231	20.47	1.239	20.47	E
1.52	1.82	12.29	1.583	109.42	2390	19	2290	1.326	20.47	1.334	20.47	G
1.52	2.13	12.93	1.706	118.24	2390	19	2290	1.423	20.47	1.431	20.47	I
1.82	1.21	12.53	1.456	137.58	2690	19	2590	1.208	23.15	1.218	23.15	C
1.82	1.52	13.17	1.579	144.15	2690	19	2590	1.305	23.15	1.315	23.15	E
1.82	1.82	13.81	1.697	155.58	2690	19	2590	1.400	23.15	1.410	23.15	G
1.82	2.13	14.45	1.821	162.74	2690	19	2590	1.497	23.15	1.507	23.15	I
1.82	2.43	15.09	1.939	177.85	2690	19	2590	1.592	23.15	1.602	23.15	K
2.13	1.21	14.04	1.575	177.93	3000	19	2900	1.284	25.93	1.297	25.93	C
2.13	1.82	15.32	1.853	186.39	3000	19	2900	1.476	25.93	1.488	25.93	G
2.13	2.43	16.60	2.094	211.53	3000	19	2900	1.668	25.93	1.680	25.93	K
2.13	3.04	17.88	2.335	236.24	3000	19	2900	1.860	25.93	1.873	25.93	O
2.43	1.21	15.55	1.832	213.47	3300	19	3200	1.353	28.61	1.368	28.61	C
2.43	1.82	16.84	2.073	230.14	3300	19	3200	1.545	28.61	1.561	28.61	G
2.43	2.43	18.12	2.341	271.00	3300	19	3200	1.764	28.61	1.779	28.61	L
2.43	3.04	19.40	2.583	281.47	3300	19	3200	1.956	28.61	1.971	28.61	P
2.74	1.21	17.07	2.090	268.15	3610	19	3510	1.449	31.38	1.467	31.38	D
2.74	1.82	18.35	2.364	277.36	3610	19	3510	1.640	31.38	1.657	31.38	H
2.74	2.43	19.63	2.606	290.34	3610	19	3510	1.832	31.38	1.849	31.38	L
2.74	3.04	20.91	2.905	353.46	3610	19	3510	2.021	31.38	2.039	31.38	P
2.74	3.65	22.19	3.144	395.05	3610	19	3510	2.213	31.38	2.231	31.38	T
3.04	1.21	18.58	2.369	309.81	3910	19	3810	1.511	34.06	1.531	34.06	D
3.04	1.82	19.87	2.643	344.67	3910	19	3810	1.701	34.06	1.722	34.06	H
3.04	2.43	21.15	2.913	406.98	3910	19	3810	1.892	34.06	1.912	34.06	L
3.04	3.04	22.43	3.162	367.12	3910	19	3810	2.084	34.06	2.104	34.06	P
3.04	3.65	23.71	3.428	468.54	3910	19	3810	2.274	34.06	2.294	34.06	T
3.65	1.82	22.90	3.368	416.83	4520	19	4420	1.811	39.51	1.836	39.51	H
3.65	2.43	24.18	3.604	476.93	4520	19	4420	2.003	39.51	2.028	39.51	L
3.65	3.04	25.46	3.891	464.00	4520	19	4420	2.192	39.51	2.217	39.51	P
3.65	3.65	26.74	4.118	594.91	4520	19	4420	2.384	39.51	2.409	39.51	T

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

3.0 TO 4.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS06.0

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	300	1220	810	2690	16	300	1220	10	300	640	1220	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	300	1220	970	3000	16	300	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	265	1520	810	3000	16	265	1520	--	--	--	--	13	300	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	250	1520	970	3300	16	250	1520	--	--	--	--	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	240	1520	1120	3610	16	240	1520	--	--	--	--	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	240	1520	1270	3910	16	240	1520	--	--	--	--	13	300	2130	20	20
1.52	0.91	200	200	200	4	1200	4	1200	1	300	16	265	1830	810	3250	19	265	1830	--	--	--	--	13	225	1220	24	8
1.52	1.21	200	200	200	4	1200	4	1200	2	600	13	250	1830	970	3610	19	250	1830	10	250	760	1470	13	300	1520	24	12
1.52	1.52	200	200	200	4	1200	4	1200	3	900	13	240	1830	1120	3910	19	240	1830	10	240	760	1470	13	300	1830	24	16
1.52	1.82	200	200	200	4	1200	4	1200	4	1200	13	225	1830	1270	4220	19	225	1830	--	--	--	--	13	300	2130	24	20
1.52	2.13	200	200	200	4	1200	4	1200	5	1500	13	225	1830	1420	4520	19	225	1830	--	--	--	--	13	300	2440	24	24
1.82	1.21	220	220	200	5	1500	5	1500	2	600	16	200	2130	980	3910	19	200	2130	--	--	--	--	13	225	1570	28	12
1.82	1.52	220	220	200	5	1500	5	1500	3	900	13	200	2130	1140	4240	19	200	2130	10	200	820	1570	13	300	1880	28	16
1.82	1.82	220	220	200	5	1500	5	1500	4	1200	13	190	2130	1290	4550	19	190	2130	10	190	820	1570	13	300	2180	28	20
1.82	2.13	220	220	200	5	1500	5	1500	5	1500	13	190	2130	1440	4850	19	190	2130	10	190	820	1570	13	300	2490	28	24
1.82	2.43	220	220	200	5	1500	5	1500	6	1800	16	175	2130	1590	5130	19	175	2130	--	--	--	--	13	300	2790	28	28
2.13	1.21	245	245	200	6	1800	6	1800	2	600	13	175	2440	1010	4290	19	175	2440	10	175	880	1700	13	190	1600	32	12
2.13	1.82	250	250	200	6	1800	6	1800	4	1200	13	165	2440	1320	4930	19	165	2440	--	--	--	--	13	300	2240	32	20
2.13	2.43	250	250	200	6	1800	6	1800	6	1800	16	165	2440	1630	5490	19	165	2440	--	--	--	--	13	300	2840	32	28
2.13	3.04	250	250	200	6	1800	6	1800	8	2400	16	190	2440	1930	6100	22	190	2440	10	190	880	1700	13	240	3450	32	36
2.43	1.21	270	270	200	7	2100	7	2100	2	600	13	150	2740	1040	4650	19	150	2740	10	150	950	1830	13	165	1650	36	12
2.43	1.82	275	275	200	7	2100	7	2100	4	1200	16	175	2740	1350	5230	22	175	2740	--	--	--	--	13	275	2290	36	20
2.43	2.43	280	280	200	7	2100	7	2100	6	1800	16	225	2740	1660	5870	25	225	2740	10	225	950	1830	13	300	2900	36	28
2.43	3.04	280	280	200	7	2100	7	2100	8	2400	16	140	2740	1960	6480	19	140	2740	--	--	--	--	13	265	3510	36	36
2.74	1.21	300	300	200	8	2400	8	2400	2	600	13	140	3050	1070	5030	19	140	3050	10	140	1010	1960	13	150	1730	40	12
2.74	1.82	305	305	200	8	2400	8	2400	4	1200	16	200	3050	1380	5610	25	200	3050	--	--	--	--	13	250	2360	40	20
2.74	2.43	305	305	200	8	2400	8	2400	6	1800	13	165	3050	1680	6250	22	165	3050	10	165	1010	1960	13	300	2970	40	28
2.74	3.04	315	315	200	8	2400	8	2400	8	2400	16	150	3050	1990	6830	22	150	3050	--	--	--	--	13	300	3580	40	36
2.74	3.65	315	315	200	8	2400	8	2400	10	3000	19	190	3050	2300	7390	25	190	3050	10	190	1010	1960	13	140	4190	40	44
3.04	1.21	325	325	200	9	2700	9	2700	2	600	16	150	3350	1090	5330	22	150	3350	--	--	--	--	13	125	1780	44	12
3.04	1.82	325	325	200	9	2700	9	2700	4	1200	16	190	3350	1400	5940	25	190	3350	10	190	1070	2080	13	200	2390	44	20
3.04	2.43	325	325	200	9	2700	9	2700	6	1800	16	190	3350	1700	6550	25	190	3350	10	190	1070	2080	13	300	3000	44	28
3.04	3.04	325	325	200	9	2700	9	2700	8	2400	16	140	3350	2010	7160	22	140	3350	--	--	--	--	13	300	3610	44	36
3.04	3.65	325	325	200	9	2700	9	2700	10	3000	22	175	3350	2310	7700	25	175	3350	--	--	--	--	13	150	4220	44	44
3.65	1.82	375	375	200	11	3300	11	3300	4	1200	16	165	3960	1450	6650	25	165	3960	--	--	--	--	13	150	2490	52	20
3.65	2.43	380	380	200	11	3300	11	3300	6	1800	19	150	3960	1760	7240	25	150	3960	--	--	--	--	13	250	3120	52	28
3.65	3.04	380	380	200	11	3300	11	3300	8	2400	13	150	3960	2060	7920	25	150	3960	13	150	1190	2290	13	300	3730	52	36
3.65	3.65	380	380	200	11	3300	11	3300	10	3000	19	150	3960	2370	8460	25	150	3960	--	--	--	--	13	165	4340	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

4.5 TO 6.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.11

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.981	68.03	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.101	65.20	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.100	72.75	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.219	81.79	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.342	90.53	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.461	97.24	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.219	108.05	2390	19	2290	1.039	20.47	1.047	20.47	A
1.52	1.21	11.01	1.339	115.25	2390	19	2290	1.134	20.47	1.142	20.47	C
1.52	1.52	11.65	1.461	125.13	2390	19	2290	1.231	20.47	1.239	20.47	E
1.52	1.82	12.29	1.582	122.81	2390	19	2290	1.326	20.47	1.334	20.47	G
1.52	2.13	12.93	1.705	129.76	2390	19	2290	1.423	20.47	1.431	20.47	I
1.82	1.21	12.53	1.542	156.71	2690	19	2590	1.208	23.15	1.218	23.15	C
1.82	1.52	13.17	1.666	156.59	2690	19	2590	1.305	23.15	1.315	23.15	E
1.82	1.82	13.81	1.784	169.71	2690	19	2590	1.400	23.15	1.410	23.15	G
1.82	2.13	14.45	1.907	177.14	2690	19	2590	1.497	23.15	1.507	23.15	I
1.82	2.43	15.09	2.024	207.40	2690	19	2590	1.592	23.15	1.602	23.15	K
2.13	1.21	14.04	1.801	188.09	3000	19	2900	1.307	25.93	1.320	25.93	D
2.13	1.82	15.32	2.071	183.35	3000	19	2900	1.499	25.93	1.512	25.93	H
2.13	2.43	16.60	2.308	235.69	3000	19	2900	1.691	25.93	1.704	25.93	L
2.13	3.04	17.88	2.547	278.37	3000	19	2900	1.883	25.93	1.896	25.93	P
2.43	1.21	15.55	2.084	232.99	3300	19	3200	1.372	28.61	1.387	28.61	D
2.43	1.82	16.84	2.354	251.56	3300	19	3200	1.563	28.61	1.579	28.61	H
2.43	2.43	18.12	2.624	266.64	3300	19	3200	1.755	28.61	1.770	28.61	L
2.43	3.04	19.40	2.862	313.43	3300	19	3200	1.947	28.61	1.962	28.61	P
2.74	1.21	17.07	2.435	269.58	3610	19	3510	1.434	31.38	1.451	31.38	D
2.74	1.82	18.35	2.709	277.97	3610	19	3510	1.624	31.38	1.642	31.38	H
2.74	2.43	19.63	2.952	289.49	3610	19	3510	1.816	31.38	1.834	31.38	L
2.74	3.04	20.91	3.251	348.69	3610	19	3510	2.006	31.38	2.023	31.38	P
2.74	3.65	22.19	3.482	448.42	3610	19	3510	2.198	31.38	2.215	31.38	T
3.04	1.21	18.58	2.780	324.94	3910	19	3810	1.489	34.06	1.509	34.06	D
3.04	1.82	19.87	3.022	340.36	3910	19	3810	1.681	34.06	1.701	34.06	H
3.04	2.43	21.15	3.265	350.92	3910	19	3810	1.873	34.06	1.893	34.06	L
3.04	3.04	22.43	3.503	392.15	3910	19	3810	2.065	34.06	2.085	34.06	P
3.04	3.65	23.71	3.728	544.11	3910	19	3810	2.257	34.06	2.277	34.06	T
3.65	1.82	22.90	3.814	411.69	4520	19	4420	1.780	39.51	1.805	39.51	H
3.65	2.43	24.18	4.085	517.70	4520	19	4420	1.997	39.51	2.022	39.51	M
3.65	3.04	25.46	4.335	472.01	4520	19	4420	2.189	39.51	2.214	39.51	Q
3.65	3.65	26.74	4.564	590.50	4520	19	4420	2.381	39.51	2.406	39.51	U

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

4.5 TO 6.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS07.5

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1			NO. BL1 BARS	NO. BL2 BARS
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH		
0.91	0.91	200	200	200	2	600	2	600	1	300	13	300	1220	810	2690	16	300	1220	10	300	640	1220	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	300	1220	970	3000	16	300	1220	10	300	640	1220	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	225	1520	810	3000	16	225	1520	--	--	--	--	13	300	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	275	1520	970	3300	19	275	1520	10	275	700	1350	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	275	1520	1120	3610	19	275	1520	10	275	700	1350	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	265	1520	1270	3910	19	265	1520	10	265	700	1350	13	300	2130	20	20
1.52	0.91	215	215	200	4	1200	4	1200	1	300	16	225	1830	830	3280	19	225	1830	--	--	--	--	13	225	1240	24	8
1.52	1.21	215	215	200	4	1200	4	1200	2	600	16	215	1830	980	3580	19	215	1830	--	--	--	--	13	290	1550	24	12
1.52	1.52	215	215	200	4	1200	4	1200	3	900	13	215	1830	1130	3940	19	215	1830	10	215	760	1470	13	300	1850	24	16
1.52	1.82	220	220	200	4	1200	4	1200	4	1200	13	215	1830	1290	4240	19	215	1830	--	--	--	--	13	300	2180	24	20
1.52	2.13	220	220	200	4	1200	4	1200	5	1500	13	200	1830	1440	4550	19	200	1830	--	--	--	--	13	300	2490	24	24
1.82	1.21	250	250	200	5	1500	5	1500	2	600	13	190	2130	1020	4010	19	190	2130	10	190	820	1570	13	225	1630	28	12
1.82	1.52	260	260	200	5	1500	5	1500	3	900	13	190	2130	1170	4320	19	190	2130	--	--	--	--	13	300	1960	28	16
1.82	1.82	260	260	200	5	1500	5	1500	4	1200	13	175	2130	1330	4620	19	175	2130	--	--	--	--	13	300	2260	28	20
1.82	2.13	260	260	200	5	1500	5	1500	5	1500	13	175	2130	1480	4930	19	175	2130	--	--	--	--	13	300	2570	28	24
1.82	2.43	260	260	200	5	1500	5	1500	6	1800	16	175	2130	1630	5210	19	175	2130	--	--	--	--	13	300	2870	28	28
2.13	1.21	290	290	200	6	1800	6	1800	2	600	13	165	2440	1050	4390	19	165	2440	--	--	--	--	13	200	1700	32	12
2.13	1.82	295	295	200	6	1800	6	1800	4	1200	13	150	2440	1370	5000	19	150	2440	--	--	--	--	13	300	2340	32	20
2.13	2.43	295	295	200	6	1800	6	1800	6	1800	13	150	2440	1670	5610	19	150	2440	--	--	--	--	13	300	2950	32	28
2.13	3.04	295	295	200	6	1800	6	1800	8	2400	16	190	2440	1970	6200	22	190	2440	10	190	880	1700	13	165	3560	32	36
2.43	1.21	320	320	200	7	2100	7	2100	2	600	16	215	2740	1090	4720	25	215	2740	10	215	950	1830	13	190	1750	36	12
2.43	1.82	325	325	200	7	2100	7	2100	4	1200	16	215	2740	1400	5330	25	215	2740	--	--	--	--	13	300	2390	36	20
2.43	2.43	325	325	200	7	2100	7	2100	6	1800	16	215	2740	1700	5940	25	215	2740	10	215	950	1830	13	300	3000	36	28
2.43	3.04	325	325	200	7	2100	7	2100	8	2400	16	125	2740	2010	6550	19	125	2740	--	--	--	--	16	265	3610	36	36
2.74	1.21	340	340	200	8	2400	8	2400	2	600	16	150	3050	1100	5050	22	150	3050	--	--	--	--	13	165	1800	40	12
2.74	1.82	340	340	200	8	2400	8	2400	4	1200	13	190	3050	1410	5720	25	190	3050	13	190	1010	1930	13	290	2410	40	20
2.74	2.43	340	340	200	8	2400	8	2400	6	1800	16	190	3050	1710	6270	25	190	3050	10	190	1010	1960	13	300	3020	40	28
2.74	3.04	340	340	200	8	2400	8	2400	8	2400	16	150	3050	2020	6880	22	150	3050	--	--	--	--	13	225	3630	40	36
2.74	3.65	330	330	200	8	2400	8	2400	10	3000	19	175	3050	2320	7440	25	175	3050	--	--	--	--	13	115	4220	40	44
3.04	1.21	370	370	200	9	2700	9	2700	2	600	13	150	3350	1140	5460	22	150	3350	13	150	1070	2060	13	150	1850	44	12
3.04	1.82	375	375	200	9	2700	9	2700	4	1200	16	140	3350	1450	6050	22	140	3350	--	--	--	--	13	275	2490	44	20
3.04	2.43	375	375	200	9	2700	9	2700	6	1800	13	175	3350	1750	6710	25	175	3350	13	175	1070	2060	13	300	3100	44	28
3.04	3.04	375	375	200	9	2700	9	2700	8	2400	19	165	3350	2060	7210	25	165	3350	--	--	--	--	13	225	3710	44	36
3.04	3.65	375	375	200	9	2700	9	2700	10	3000	19	165	3350	2360	7820	25	165	3350	--	--	--	--	13	115	4320	44	44
3.65	1.82	440	440	200	11	3300	11	3300	4	1200	13	150	3960	1510	6830	25	150	3960	10	150	1190	2310	13	250	2620	52	20
3.65	2.43	445	445	200	11	3300	11	3300	6	1800	16	115	3960	1820	7420	22	115	3960	--	--	--	--	13	300	3230	52	28
3.65	3.04	445	445	200	11	3300	11	3300	8	2400	19	150	3960	2130	7980	25	150	3960	--	--	--	--	13	250	3840	52	36
3.65	3.65	445	445	200	11	3300	11	3300	10	3000	19	150	3960	2430	8590	25	150	3960	--	--	--	--	16	190	4440	52	44

Sheet 1 of 2

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

6.0 TO 7.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.13

SPAN	HGHT	REINFORCING STEEL (kg/LONG. JT)	QUAN./m		HEADWALLS							
			CONCRETE CLASS A4 (m^3/m)	REINFORCING STEEL (kg/m)	G	HWI		INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	
(m)	(m)				HEADWALL LENGTH	SIZE	LENGTH					WINGWALL
0.91	0.91	7.34	0.981	68.03	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.100	74.31	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.099	79.92	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.217	96.23	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.340	102.77	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.459	111.58	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.275	120.90	2390	19	2290	1.040	20.47	1.048	20.47	A
1.52	1.21	11.01	1.394	130.93	2390	19	2290	1.136	20.47	1.143	20.47	C
1.52	1.52	11.65	1.518	134.87	2390	19	2290	1.232	20.47	1.240	20.47	E
1.52	1.82	12.29	1.658	126.75	2390	19	2290	1.328	20.47	1.336	20.47	G
1.52	2.13	12.93	1.780	139.92	2390	19	2290	1.425	20.47	1.433	20.47	I
1.82	1.21	12.53	1.675	159.53	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	1.845	145.09	2690	19	2590	1.332	23.15	1.342	23.15	F
1.82	1.82	13.81	1.963	160.90	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.086	168.71	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	15.09	2.201	209.35	2690	19	2590	1.619	23.15	1.630	23.15	L
2.13	1.21	14.04	2.030	174.42	3000	19	2900	1.303	25.93	1.316	25.93	D
2.13	1.82	15.32	2.297	197.49	3000	19	2900	1.494	25.93	1.507	25.93	H
2.13	2.43	16.60	2.539	214.10	3000	19	2900	1.687	25.93	1.699	25.93	L
2.13	3.04	17.88	2.772	294.32	3000	19	2900	1.879	25.93	1.891	25.93	P
2.43	1.21	15.55	2.365	249.29	3300	19	3200	1.363	28.61	1.378	28.61	D
2.43	1.82	16.84	2.638	241.04	3300	19	3200	1.554	28.61	1.569	28.61	H
2.43	2.43	18.12	2.877	277.43	3300	19	3200	1.746	28.61	1.761	28.61	L
2.43	3.04	19.40	3.111	358.86	3300	19	3200	1.938	28.61	1.953	28.61	P
2.74	1.21	17.07	2.683	296.38	3610	19	3510	1.422	31.38	1.440	31.38	D
2.74	1.82	18.35	2.927	295.27	3610	19	3510	1.614	31.38	1.632	31.38	H
2.74	2.43	19.63	3.167	328.55	3610	19	3510	1.806	31.38	1.824	31.38	L
2.74	3.04	20.91	3.407	358.07	3610	19	3510	1.998	31.38	2.016	31.38	P
2.74	3.65	22.19	3.574	465.88	3610	19	3510	2.193	31.38	2.211	31.38	T
3.04	1.21	18.58	3.088	337.82	3910	19	3810	1.472	34.06	1.492	34.06	D
3.04	1.82	19.87	3.364	352.65	3910	19	3810	1.662	34.06	1.682	34.06	H
3.04	2.43	21.15	3.608	355.10	3910	19	3810	1.855	34.06	1.875	34.06	L
3.04	3.04	22.43	3.840	453.33	3910	19	3810	2.047	34.06	2.067	34.06	P
3.04	3.65	23.71	4.075	516.23	3910	19	3810	2.239	34.06	2.259	34.06	T
3.65	1.82	22.90	4.340	418.51	4520	19	4420	1.772	39.51	1.797	39.51	I
3.65	2.43	24.18	4.614	498.55	4520	19	4420	1.961	39.51	1.986	39.51	M
3.65	3.04	25.46	4.852	549.96	4520	19	4420	2.153	39.51	2.178	39.51	Q
3.65	3.65	26.74	5.087	614.62	4520	19	4420	2.345	39.51	2.370	39.51	U

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

6.0 TO 7.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS09.0

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	290	1220	810	2690	16	290	1220	--	--	--	--	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	275	1220	970	3000	16	275	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	200	200	200	3	900	3	900	1	300	13	265	1520	810	3000	19	265	1520	13	265	700	1320	13	290	1220	20	8
1.21	1.21	200	200	200	3	900	3	900	2	600	13	250	1520	970	3300	19	250	1520	10	250	700	1350	13	300	1520	20	12
1.21	1.52	200	200	200	3	900	3	900	3	900	13	240	1520	1120	3610	19	240	1520	10	240	700	1350	13	300	1830	20	16
1.21	1.82	200	200	200	3	900	3	900	4	1200	13	240	1520	1270	3910	19	240	1520	10	240	700	1350	13	300	2130	20	20
1.52	0.91	240	240	200	4	1200	4	1200	1	300	13	215	1830	850	3380	19	215	1830	10	215	760	1470	13	225	1300	24	8
1.52	1.21	245	245	200	4	1200	4	1200	2	600	13	200	1830	1010	3680	19	200	1830	--	--	--	--	13	300	1600	24	12
1.52	1.52	245	245	200	4	1200	4	1200	3	900	13	200	1830	1160	3990	19	200	1830	--	--	--	--	13	300	1910	24	16
1.52	1.82	245	245	200	4	1200	4	1200	4	1200	13	200	1830	1310	4290	19	200	1830	--	--	--	--	13	300	2210	24	20
1.52	2.13	245	245	200	4	1200	4	1200	5	1500	13	200	1830	1470	4600	19	200	1830	--	--	--	--	13	300	2510	24	24
1.82	1.21	290	290	200	5	1500	5	1500	2	600	13	175	2130	1050	4090	19	175	2130	--	--	--	--	13	300	1700	28	12
1.82	1.52	290	290	200	5	1500	5	1500	3	900	13	165	2130	1210	4390	19	165	2130	--	--	--	--	13	300	2010	28	16
1.82	1.82	290	290	200	5	1500	5	1500	4	1200	13	165	2130	1360	4700	19	165	2130	--	--	--	--	13	300	2310	28	20
1.82	2.13	290	290	200	5	1500	5	1500	5	1500	13	165	2130	1510	5000	19	165	2130	--	--	--	--	13	300	2620	28	24
1.82	2.43	290	290	200	5	1500	5	1500	6	1800	13	165	2130	1660	5310	19	165	2130	--	--	--	--	13	265	2920	28	28
2.13	1.21	325	325	200	6	1800	6	1800	2	600	13	150	2440	1090	4470	19	150	2440	--	--	--	--	13	265	1780	32	12
2.13	1.82	325	325	200	6	1800	6	1800	4	1200	16	190	2440	1400	5030	25	190	2440	--	--	--	--	13	300	2390	32	20
2.13	2.43	325	325	200	6	1800	6	1800	6	1800	16	175	2440	1700	5640	22	175	2440	--	--	--	--	13	300	3000	32	28
2.13	3.04	325	325	200	6	1800	6	1800	8	2400	16	140	2440	2010	6250	19	140	2440	--	--	--	--	13	140	3610	32	36
2.43	1.21	345	345	200	7	2100	7	2100	2	600	16	200	2740	1110	4780	25	200	2740	10	200	950	1830	13	200	1830	36	12
2.43	1.82	345	345	200	7	2100	7	2100	4	1200	13	200	2740	1420	5410	25	200	2740	10	200	950	1830	13	300	2440	36	20
2.43	2.43	345	345	200	7	2100	7	2100	6	1800	16	150	2740	1720	5990	22	150	2740	--	--	--	--	13	300	3050	36	28
2.43	3.04	340	340	200	7	2100	7	2100	8	2400	16	150	2740	2020	6580	22	150	2740	--	--	--	--	13	150	3630	36	36
2.74	1.21	380	380	200	8	2400	8	2400	2	600	13	190	3050	1150	5180	25	190	3050	13	190	1010	1930	13	190	1910	40	12
2.74	1.82	390	390	200	8	2400	8	2400	4	1200	13	190	3050	1460	5820	25	190	3050	10	190	1010	1960	13	300	2510	40	20
2.74	2.43	390	390	200	8	2400	8	2400	6	1800	13	190	3050	1770	6430	25	190	3050	13	190	1010	1930	13	300	3120	40	28
2.74	3.04	390	390	200	8	2400	8	2400	8	2400	16	140	3050	2070	6990	22	140	3050	--	--	--	--	13	150	3730	40	36
2.74	3.65	380	380	215	8	2400	8	2400	10	3000	19	140	3070	2370	7570	22	140	3070	--	--	--	--	19	225	4340	40	44
3.04	1.21	425	425	200	9	2700	9	2700	2	600	16	140	3350	1190	5540	22	140	3350	--	--	--	--	13	190	1980	44	12
3.04	1.82	430	430	200	9	2700	9	2700	4	1200	16	175	3350	1500	6170	25	175	3350	--	--	--	--	13	300	2590	44	20
3.04	2.43	430	430	200	9	2700	9	2700	6	1800	16	175	3350	1810	6780	25	175	3350	--	--	--	--	13	300	3200	44	28
3.04	3.04	430	430	200	9	2700	9	2700	8	2400	19	165	3350	2110	7340	25	165	3350	--	--	--	--	13	150	3810	44	36
3.04	3.65	425	425	220	9	2700	9	2700	10	3000	19	150	3390	2410	7980	25	150	3380	--	--	--	--	19	240	4420	44	44
3.65	1.82	490	490	200	11	3300	11	3300	4	1200	13	140	3960	1560	6930	25	140	3960	--	--	--	--	13	300	2720	52	20
3.65	2.43	500	500	200	11	3300	11	3300	6	1800	16	150	3960	1880	7520	25	150	3960	--	--	--	--	13	300	3350	52	28
3.65	3.04	507	507	200	11	3300	11	3300	8	2400	19	140	3960	2190	8100	25	140	3960	--	--	--	--	16	240	3960	52	36
3.65	3.65	507	507	220	11	3300	11	3300	10	3000	19	140	4000	2500	8740	25	140	3990	--	--	--	--	19	240	4570	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

7.5 TO 9.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.15

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.982	59.97	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.101	68.15	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.096	100.67	2080	19	1980	0.963	17.70	0.968	17.70	A
1.21	1.21	9.50	1.216	102.19	2080	19	1980	1.058	17.70	1.063	17.70	C
1.21	1.52	10.14	1.339	111.78	2080	19	1980	1.155	17.70	1.160	17.70	E
1.21	1.82	10.78	1.458	118.49	2080	19	1980	1.250	17.70	1.256	17.70	G
1.52	0.91	10.37	1.371	124.44	2390	19	2290	1.070	20.47	1.078	20.47	B
1.52	1.21	11.01	1.511	118.66	2390	19	2290	1.166	20.47	1.173	20.47	D
1.52	1.52	11.65	1.634	126.03	2390	19	2290	1.262	20.47	1.270	20.47	F
1.52	1.82	12.29	1.753	133.24	2390	19	2290	1.358	20.47	1.365	20.47	H
1.52	2.13	12.93	1.876	140.55	2390	19	2290	1.454	20.47	1.462	20.47	J
1.82	1.21	12.53	1.854	146.69	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	1.976	160.71	2690	19	2590	1.332	23.15	1.342	23.15	F
1.82	1.82	13.81	2.095	168.67	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.218	176.58	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	15.09	2.337	187.10	2690	19	2590	1.619	23.15	1.629	23.15	L
2.13	1.21	14.04	2.206	183.84	3000	19	2900	1.299	25.93	1.312	25.93	D
2.13	1.82	15.32	2.443	243.06	3000	19	2900	1.491	25.93	1.504	25.93	H
2.13	2.43	16.60	2.686	252.23	3000	19	2900	1.684	25.93	1.696	25.93	L
2.13	3.04	17.88	2.921	319.71	3000	19	2900	1.876	25.93	1.888	25.93	P
2.43	1.21	15.55	2.504	264.24	3300	19	3200	1.358	28.61	1.373	28.61	D
2.43	1.82	16.84	2.751	246.28	3300	19	3200	1.550	28.61	1.565	28.61	H
2.43	2.43	18.12	2.987	306.76	3300	19	3200	1.742	28.61	1.757	28.61	L
2.43	3.04	19.40	3.197	351.35	3300	19	3200	1.935	28.61	1.950	28.61	P
2.74	1.21	17.07	2.935	288.61	3610	19	3510	1.438	31.38	1.456	31.38	E
2.74	1.82	18.35	3.243	279.15	3610	19	3510	1.628	31.38	1.645	31.38	I
2.74	2.43	19.63	3.483	311.34	3610	19	3510	1.820	31.38	1.837	31.38	M
2.74	3.04	20.91	3.716	396.88	3610	19	3510	2.012	31.38	2.029	31.38	Q
2.74	3.65	22.19	4.013	525.73	3610	19	3510	2.167	31.38	2.185	31.38	U
3.04	1.21	18.58	3.466	339.58	3910	19	3810	1.479	34.06	1.499	34.06	E
3.04	1.82	19.87	3.745	333.65	3910	19	3810	1.669	34.06	1.689	34.06	I
3.04	2.43	21.15	3.987	352.99	3910	19	3810	1.861	34.06	1.881	34.06	M
3.04	3.04	22.43	4.215	474.57	3910	19	3810	2.054	34.06	2.074	34.06	Q
3.04	3.65	23.71	4.593	567.55	3910	19	3810	2.194	34.06	2.214	34.06	U
3.65	1.82	22.90	4.747	404.08	4520	19	4420	1.744	39.51	1.769	39.51	I
3.65	2.43	24.18	5.065	454.96	4520	19	4420	1.930	39.51	1.955	39.51	M
3.65	3.04	25.46	5.347	606.44	4520	19	4420	2.119	39.51	2.144	39.51	Q
3.65	3.65	26.74	5.770	666.96	4520	19	4420	2.255	39.51	2.280	39.51	U

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

7.5 TO 9.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS10.5

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	250	1220	810	2690	16	250	1220	--	--	--	--	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	250	1220	970	3000	16	250	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	215	215	215	3	900	3	900	1	300	16	240	1550	830	3000	19	240	1550	10	240	710	1370	13	275	1240	20	8
1.21	1.21	215	215	215	3	900	3	900	2	600	13	240	1550	980	3350	19	240	1550	10	240	710	1370	13	300	1550	20	12
1.21	1.52	215	215	215	3	900	3	900	3	900	13	225	1550	1130	3660	19	225	1550	--	--	--	--	13	300	1850	20	16
1.21	1.82	220	220	200	3	900	3	900	4	1200	13	225	1520	1290	3940	19	225	1520	--	--	--	--	13	300	2180	20	20
1.52	0.91	270	270	200	4	1200	4	1200	1	300	13	200	1830	880	3430	19	200	1830	--	--	--	--	13	265	1350	24	8
1.52	1.21	270	270	200	4	1200	4	1200	2	600	13	190	1830	1040	3730	19	190	1830	--	--	--	--	13	300	1650	24	12
1.52	1.52	270	270	200	4	1200	4	1200	3	900	13	190	1830	1190	4040	19	190	1830	--	--	--	--	13	300	1960	24	16
1.52	1.82	275	275	200	4	1200	4	1200	4	1200	13	190	1830	1350	4370	19	190	1830	--	--	--	--	13	300	2290	24	20
1.52	2.13	275	275	200	4	1200	4	1200	5	1500	13	190	1830	1500	4670	19	190	1830	--	--	--	--	13	300	2590	24	24
1.82	1.21	320	320	200	5	1500	5	1500	2	600	13	165	2130	1090	4140	19	165	2130	--	--	--	--	13	300	1750	28	12
1.82	1.52	325	325	200	5	1500	5	1500	3	900	13	165	2130	1240	4470	19	165	2130	--	--	--	--	13	300	2080	28	16
1.82	1.82	325	325	200	5	1500	5	1500	4	1200	13	165	2130	1400	4780	19	165	2130	--	--	--	--	13	300	2390	28	20
1.82	2.13	325	325	200	5	1500	5	1500	5	1500	13	165	2130	1550	5080	19	165	2130	--	--	--	--	13	300	2690	28	24
1.82	2.43	325	325	200	5	1500	5	1500	6	1800	13	165	2130	1700	5380	19	165	2130	--	--	--	--	16	300	3000	28	28
2.13	1.21	330	330	200	6	1800	6	1800	2	600	13	140	2440	1100	4470	19	140	2440	--	--	--	--	13	225	1780	32	12
2.13	1.82	340	340	200	6	1800	6	1800	4	1200	13	125	2440	1410	5110	19	125	2440	--	--	--	--	13	300	2410	32	20
2.13	2.43	330	330	200	6	1800	6	1800	6	1800	13	125	2440	1710	5690	19	125	2440	--	--	--	--	13	275	3000	32	28
2.13	3.04	325	325	200	6	1800	6	1800	8	2400	16	200	2440	2010	6250	25	200	2440	10	200	880	1700	13	125	3610	32	36
2.43	1.21	390	390	200	7	2100	7	2100	2	600	16	150	2740	1160	4850	22	150	2740	--	--	--	--	13	250	1910	36	12
2.43	1.82	390	390	200	7	2100	7	2100	4	1200	13	150	2740	1460	5510	22	150	2740	--	--	--	--	13	300	2510	36	20
2.43	2.43	390	390	200	7	2100	7	2100	6	1800	16	150	2740	1770	6070	22	150	2740	--	--	--	--	13	265	3120	36	28
2.43	3.04	380	380	200	7	2100	7	2100	8	2400	19	150	2740	2060	6630	22	150	2740	--	--	--	--	13	125	3730	36	36
2.74	1.21	430	430	200	8	2400	8	2400	2	600	16	150	3050	1200	5260	22	150	3050	--	--	--	--	13	250	1980	40	12
2.74	1.82	440	440	200	8	2400	8	2400	4	1200	16	150	3050	1510	5870	22	150	3050	--	--	--	--	13	300	2620	40	20
2.74	2.43	440	440	200	8	2400	8	2400	6	1800	13	190	3050	1820	6530	25	190	3050	13	190	1010	1930	13	250	3230	40	28
2.74	3.04	430	430	200	8	2400	8	2400	8	2400	19	140	3050	2110	7040	22	140	3050	--	--	--	--	13	125	3810	40	36
2.74	3.65	425	425	230	8	2400	8	2400	10	3000	19	140	3110	2410	7700	22	140	3120	--	--	--	--	19	215	4420	40	44
3.04	1.21	465	465	200	9	2700	9	2700	2	600	16	165	3350	1230	5610	25	165	3350	--	--	--	--	13	225	2060	44	12
3.04	1.82	470	470	200	9	2700	9	2700	4	1200	16	165	3350	1540	6250	25	165	3350	--	--	--	--	13	300	2670	44	20
3.04	2.43	480	480	200	9	2700	9	2700	6	1800	16	165	3350	1860	6880	25	165	3350	--	--	--	--	13	265	3300	44	28
3.04	3.04	480	480	200	9	2700	9	2700	8	2400	19	165	3350	2170	7440	25	165	3350	--	--	--	--	16	190	3910	44	36
3.04	3.65	475	475	230	9	2700	9	2700	10	3000	22	150	3420	2460	8050	25	150	3430	--	--	--	--	13	100	4520	44	44
3.65	1.82	530	530	215	11	3300	11	3300	4	1200	13	140	3990	1610	7040	25	140	3990	--	--	--	--	13	300	2820	52	20
3.65	2.43	530	530	200	11	3300	11	3300	6	1800	13	140	3960	1910	7620	25	140	3960	--	--	--	--	13	300	3430	52	28
3.65	3.04	530	530	200	11	3300	11	3300	8	2400	16	125	3960	2220	8200	25	125	3960	--	--	--	--	19	290	4040	52	36
3.65	3.65	530	530	230	11	3300	11	3300	10	3000	19	140	4030	2520	8810	25	140	4040	--	--	--	--	19	240	4650	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

9.0 TO 10.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.17

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.981	65.01	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.100	71.70	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.183	113.78	2080	19	1980	0.954	17.70	0.959	17.70	A
1.21	1.21	9.50	1.313	106.28	2080	19	1980	1.046	17.70	1.051	17.70	C
1.21	1.52	10.14	1.447	104.23	2080	19	1980	1.140	17.70	1.145	17.70	E
1.21	1.82	10.78	1.524	110.54	2080	19	1980	1.254	17.70	1.259	17.70	G
1.52	0.91	10.37	1.488	113.46	2390	19	2290	1.072	20.47	1.080	20.47	B
1.52	1.21	11.01	1.606	123.59	2390	19	2290	1.168	20.47	1.175	20.47	D
1.52	1.52	11.65	1.729	131.13	2390	19	2290	1.264	20.47	1.272	20.47	F
1.52	1.82	12.29	1.868	139.01	2390	19	2290	1.360	20.47	1.368	20.47	H
1.52	2.13	12.93	1.991	146.38	2390	19	2290	1.457	20.47	1.465	20.47	J
1.82	1.21	12.53	1.986	153.73	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	2.132	162.14	2690	19	2590	1.332	23.15	1.342	23.15	F
1.82	1.82	13.81	2.251	170.17	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.374	178.01	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	15.09	2.491	197.08	2690	19	2590	1.619	23.15	1.629	23.15	L
2.13	1.21	14.04	2.230	195.63	3000	19	2900	1.299	25.93	1.312	25.93	D
2.13	1.82	15.32	2.521	227.50	3000	19	2900	1.490	25.93	1.503	25.93	H
2.13	2.43	16.60	2.712	246.92	3000	19	2900	1.683	25.93	1.696	25.93	L
2.13	3.04	17.88	2.921	322.36	3000	19	2900	1.876	25.93	1.888	25.93	P
2.43	1.21	15.55	2.758	269.19	3300	19	3200	1.377	28.61	1.392	28.61	E
2.43	1.82	16.84	3.005	247.78	3300	19	3200	1.569	28.61	1.584	28.61	I
2.43	2.43	18.12	3.241	311.61	3300	19	3200	1.761	28.61	1.776	28.61	M
2.43	3.04	19.40	3.414	423.97	3300	19	3200	1.955	28.61	1.970	28.61	Q
2.74	1.21	17.07	3.248	294.78	3610	19	3510	1.424	31.38	1.442	31.38	E
2.74	1.82	18.35	3.553	313.50	3610	19	3510	1.614	31.38	1.631	31.38	I
2.74	2.43	19.63	3.796	317.39	3610	19	3510	1.806	31.38	1.823	31.38	M
2.74	3.04	20.91	3.957	477.84	3610	19	3510	2.001	31.38	2.018	31.38	Q
2.74	3.65	22.19	4.432	537.73	3610	19	3510	2.114	31.38	2.131	31.38	U
3.04	1.21	18.58	3.742	335.52	3910	19	3810	1.464	34.06	1.484	34.06	E
3.04	1.82	19.87	4.018	351.53	3910	19	3810	1.655	34.06	1.675	34.06	I
3.04	2.43	21.15	4.328	374.93	3910	19	3810	1.843	34.06	1.863	34.06	M
3.04	3.04	22.43	4.557	490.66	3910	19	3810	2.035	34.06	2.055	34.06	Q
3.04	3.65	23.71	5.020	666.44	3910	19	3810	2.147	34.06	2.166	34.06	U
3.65	1.82	22.90	5.157	408.00	4520	19	4420	1.724	39.51	1.748	39.51	J
3.65	2.43	24.18	5.312	423.06	4520	19	4420	1.941	39.51	1.966	39.51	N
3.65	3.04	25.46	5.535	589.47	4520	19	4420	2.133	39.51	2.158	39.51	R
3.65	3.65	26.74	6.051	673.52	4520	19	4420	2.241	39.51	2.266	39.51	V

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

9.0 TO 10.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS12.0

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	225	1220	810	2690	16	225	1220	10	225	640	1220	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	225	1220	970	3000	16	225	1220	--	--	--	--	13	300	1520	16	12
1.21	0.91	230	230	200	3	900	3	900	1	300	13	225	1520	840	3050	19	225	1520	--	--	--	--	13	300	1270	20	8
1.21	1.21	225	225	200	3	900	3	900	2	600	13	215	1520	990	3350	19	215	1520	--	--	--	--	13	300	1570	20	12
1.21	1.52	225	225	200	3	900	3	900	3	900	13	215	1520	1140	3660	19	215	1520	--	--	--	--	13	300	1880	20	16
1.21	1.82	230	230	200	3	900	3	900	4	1200	13	215	1520	1300	3960	19	215	1520	--	--	--	--	13	300	2180	20	20
1.52	0.91	295	295	200	4	1200	4	1200	1	300	13	190	1830	910	3480	19	190	1830	--	--	--	--	13	290	1420	24	8
1.52	1.21	295	295	200	4	1200	4	1200	2	600	13	175	1830	1060	3780	19	175	1830	--	--	--	--	13	300	1730	24	12
1.52	1.52	300	300	200	4	1200	4	1200	3	900	13	175	1830	1220	4110	19	175	1830	--	--	--	--	13	300	2030	24	16
1.52	1.82	300	300	200	4	1200	4	1200	4	1200	13	175	1830	1370	4420	19	175	1830	--	--	--	--	13	300	2340	24	20
1.52	2.13	280	280	200	4	1200	4	1200	5	1500	13	175	1830	1500	4670	19	175	1830	--	--	--	--	13	265	2590	24	24
1.82	1.21	325	325	200	5	1500	5	1500	2	600	13	150	2130	1090	4170	19	150	2130	--	--	--	--	13	300	1780	28	12
1.82	1.52	325	325	200	5	1500	5	1500	3	900	13	150	2130	1240	4470	19	150	2130	--	--	--	--	13	300	2080	28	16
1.82	1.82	325	325	200	5	1500	5	1500	4	1200	13	150	2130	1400	4780	19	150	2130	--	--	--	--	13	300	2390	28	20
1.82	2.13	325	325	200	5	1500	5	1500	5	1500	13	150	2130	1550	5080	19	150	2130	--	--	--	--	13	300	2690	28	24
1.82	2.43	325	325	200	5	1500	5	1500	6	1800	13	150	2130	1700	5380	19	150	2130	--	--	--	--	16	265	3000	28	28
2.13	1.21	370	370	200	6	1800	6	1800	2	600	13	125	2440	1140	4550	19	125	2440	--	--	--	--	13	300	1850	32	12
2.13	1.82	370	370	200	6	1800	6	1800	4	1200	13	125	2440	1440	5160	19	125	2440	--	--	--	--	13	300	2460	32	20
2.13	2.43	370	370	200	6	1800	6	1800	6	1800	13	125	2440	1750	5770	19	125	2440	--	--	--	--	13	190	3070	32	28
2.13	3.04	365	365	215	6	1800	6	1800	8	2400	19	200	2460	2040	6300	25	200	2460	--	--	--	--	16	175	3680	32	36
2.43	1.21	425	425	200	7	2100	7	2100	2	600	13	150	2740	1190	4980	22	150	2740	--	--	--	--	13	300	1980	36	12
2.43	1.82	430	430	200	7	2100	7	2100	4	1200	13	150	2740	1500	5590	22	150	2740	--	--	--	--	13	300	2590	36	20
2.43	2.43	430	430	200	7	2100	7	2100	6	1800	16	150	2740	1810	6170	22	150	2740	--	--	--	--	13	175	3200	36	28
2.43	3.04	425	425	215	7	2100	7	2100	8	2400	19	190	2770	2110	6730	25	190	2770	--	--	--	--	16	175	3810	36	36
2.74	1.21	470	470	200	8	2400	8	2400	2	600	13	140	3050	1240	5360	22	140	3050	--	--	--	--	13	300	2060	40	12
2.74	1.82	470	470	200	8	2400	8	2400	4	1200	13	140	3050	1540	5970	22	140	3050	--	--	--	--	13	300	2670	40	20
2.74	2.43	470	470	200	8	2400	8	2400	6	1800	13	140	3050	1850	6580	22	140	3050	--	--	--	--	13	190	3280	40	28
2.74	3.04	465	465	215	8	2400	8	2400	8	2400	19	175	3070	2150	7110	25	175	3070	--	--	--	--	13	115	3890	40	36
2.74	3.65	465	465	250	8	2400	8	2400	10	3000	22	175	3150	2450	7770	25	175	3150	--	--	--	--	16	150	4500	40	44
3.04	1.21	500	500	200	9	2700	9	2700	2	600	16	165	3350	1270	5690	25	165	3350	--	--	--	--	13	275	2130	44	12
3.04	1.82	507	507	200	9	2700	9	2700	4	1200	16	165	3350	1580	6320	25	165	3350	--	--	--	--	13	300	2740	44	20
3.04	2.43	515	515	200	9	2700	9	2700	6	1800	16	150	3350	1890	6930	25	150	3350	--	--	--	--	13	190	3380	44	28
3.04	3.04	520	520	215	9	2700	9	2700	8	2400	19	150	3380	2200	7540	25	150	3380	--	--	--	--	13	115	3990	44	36
3.04	3.65	515	515	250	9	2700	9	2700	10	3000	19	140	3450	2500	8200	25	140	3450	--	--	--	--	16	150	4600	44	44
3.65	1.82	580	580	200	11	3300	11	3300	4	1200	16	140	3960	1660	7090	25	140	3960	--	--	--	--	13	240	2900	52	20
3.65	2.43	580	580	200	11	3300	11	3300	6	1800	16	140	3960	1960	7700	25	140	3960	--	--	--	--	13	200	3510	52	28
3.65	3.04	575	575	215	11	3300	11	3300	8	2400	16	125	3990	2260	8310	25	125	3990	--	--	--	--	13	125	4110	52	36
3.65	3.65	570	570	250	11	3300	11	3300	10	3000	19	125	4060	2560	8940	25	125	4060	--	--	--	--	19	240	4720	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

10.5 TO 12.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.19

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.979	81.21	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.100	76.03	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.194	89.92	2080	19	1980	0.996	17.70	1.001	17.70	B
1.21	1.21	9.50	1.297	99.58	2080	19	1980	1.063	17.70	1.068	17.70	C
1.21	1.52	10.14	1.420	106.74	2080	19	1980	1.159	17.70	1.165	17.70	E
1.21	1.82	10.78	1.555	113.74	2080	19	1980	1.283	17.70	1.288	17.70	H
1.52	0.91	10.37	1.583	117.54	2390	19	2290	1.074	20.47	1.082	20.47	B
1.52	1.21	11.01	1.701	131.72	2390	19	2290	1.170	20.47	1.178	20.47	D
1.52	1.52	11.65	1.843	139.70	2390	19	2290	1.267	20.47	1.275	20.47	F
1.52	1.82	12.29	1.962	147.52	2390	19	2290	1.362	20.47	1.370	20.47	H
1.52	2.13	12.93	2.009	156.52	2390	19	2290	1.457	20.47	1.465	20.47	J
1.82	1.21	12.53	2.007	165.09	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	2.130	173.29	2690	19	2590	1.332	23.15	1.342	23.15	F
1.82	1.82	13.81	2.249	181.69	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.372	189.90	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	15.09	2.489	213.43	2690	19	2590	1.619	23.15	1.629	23.15	L
2.13	1.21	14.04	2.431	210.40	3000	19	2900	1.295	25.93	1.308	25.93	D
2.13	1.82	15.32	2.672	228.63	3000	19	2900	1.487	25.93	1.500	25.93	H
2.13	2.43	16.60	2.913	258.63	3000	19	2900	1.679	25.93	1.692	25.93	L
2.13	3.04	17.88	3.232	355.78	3000	19	2900	1.838	25.93	1.850	25.93	P
2.43	1.21	15.55	2.961	232.76	3300	19	3200	1.370	28.61	1.386	28.61	E
2.43	1.82	16.84	3.231	249.37	3300	19	3200	1.562	28.61	1.577	28.61	I
2.43	2.43	18.12	3.465	326.63	3300	19	3200	1.754	28.61	1.769	28.61	M
2.43	3.04	19.40	3.789	397.70	3300	19	3200	1.912	28.61	1.927	28.61	Q
2.74	1.21	17.07	3.503	268.79	3610	19	3510	1.413	31.38	1.431	31.38	E
2.74	1.82	18.35	3.744	285.97	3610	19	3510	1.605	31.38	1.623	31.38	I
2.74	2.43	19.63	3.985	315.74	3610	19	3510	1.797	31.38	1.815	31.38	M
2.74	3.04	20.91	4.299	448.17	3610	19	3510	1.955	31.38	1.973	31.38	Q
2.74	3.65	22.19	4.867	570.68	3610	19	3510	2.046	31.38	2.063	31.38	U
3.04	1.21	18.58	3.983	334.22	3910	19	3810	1.451	34.06	1.471	34.06	E
3.04	1.82	19.87	4.272	353.31	3910	19	3810	1.641	34.06	1.661	34.06	I
3.04	2.43	21.15	4.564	415.65	3910	19	3810	1.830	34.06	1.850	34.06	M
3.04	3.04	22.43	4.949	536.61	3910	19	3810	1.984	34.06	2.003	34.06	Q
3.04	3.65	23.71	5.493	621.19	3910	19	3810	2.075	34.06	2.094	34.06	U
3.65	1.82	22.90	5.468	468.86	4520	19	4420	1.721	39.51	1.746	39.51	J
3.65	2.43	24.18	5.708	497.74	4520	19	4420	1.914	39.51	1.938	39.51	N
3.65	3.04	25.46	6.024	597.20	4520	19	4420	2.071	39.51	2.096	39.51	R
3.65	3.65	26.74	6.563	742.02	4520	19	4420	2.161	39.51	2.184	39.51	V

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

10.5 TO 12.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS13.5

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	275	1220	810	2690	19	275	1220	13	275	640	1190	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	265	1220	970	3000	19	265	1220	13	265	640	1190	13	300	1520	16	12
1.21	0.91	250	250	200	3	900	3	900	1	300	13	215	1520	860	3100	19	215	1520	--	--	--	--	13	300	1320	20	8
1.21	1.21	240	240	200	3	900	3	900	2	600	13	200	1520	1000	3380	19	200	1520	--	--	--	--	13	300	1600	20	12
1.21	1.52	240	240	200	3	900	3	900	3	900	13	200	1520	1160	3680	19	200	1520	--	--	--	--	13	300	1910	20	16
1.21	1.82	245	245	200	3	900	3	900	4	1200	13	200	1520	1310	3990	19	200	1520	--	--	--	--	13	300	2210	20	20
1.52	0.91	325	325	200	4	1200	4	1200	1	300	13	175	1830	940	3560	19	175	1830	--	--	--	--	13	300	1470	24	8
1.52	1.21	325	325	200	4	1200	4	1200	2	600	13	175	1830	1090	3860	19	175	1830	--	--	--	--	13	300	1780	24	12
1.52	1.52	325	325	200	4	1200	4	1200	3	900	13	175	1830	1240	4170	19	175	1830	--	--	--	--	13	300	2080	24	16
1.52	1.82	295	295	200	4	1200	4	1200	4	1200	13	165	1830	1370	4390	19	165	1830	--	--	--	--	13	300	2340	24	20
1.52	2.13	295	295	200	4	1200	4	1200	5	1500	13	165	1830	1520	4700	19	165	1830	--	--	--	--	13	215	2640	24	24
1.82	1.21	330	330	200	5	1500	5	1500	2	600	13	225	2130	1100	4170	25	225	2130	10	225	820	1570	13	300	1780	28	12
1.82	1.52	340	340	200	5	1500	5	1500	3	900	16	175	2130	1260	4440	22	175	2130	--	--	--	--	13	300	2110	28	16
1.82	1.82	340	340	200	5	1500	5	1500	4	1200	13	225	2130	1410	4800	25	225	2130	10	225	820	1570	13	300	2410	28	20
1.82	2.13	340	340	200	5	1500	5	1500	5	1500	16	215	2130	1560	5050	25	215	2130	10	215	820	1570	13	265	2720	28	24
1.82	2.43	340	340	200	5	1500	5	1500	6	1800	16	175	2130	1710	5360	22	175	2130	--	--	--	--	13	150	3020	28	28
2.13	1.21	400	400	200	6	1800	6	1800	2	600	13	200	2440	1170	4620	25	200	2440	10	200	880	1700	13	300	1930	32	12
2.13	1.82	405	405	200	6	1800	6	1800	4	1200	13	200	2440	1480	5230	25	200	2440	13	200	880	1680	13	300	2540	32	20
2.13	2.43	405	405	200	6	1800	6	1800	6	1800	16	200	2440	1780	5820	25	200	2440	10	200	880	1700	13	150	3150	32	28
2.13	3.04	400	400	225	6	1800	6	1800	8	2400	16	200	2490	2080	6450	25	200	2490	13	200	910	1730	19	240	3760	32	36
2.43	1.21	450	450	200	7	2100	7	2100	2	600	13	190	2740	1220	5030	25	190	2740	13	190	950	1800	13	300	2030	36	12
2.43	1.82	455	455	200	7	2100	7	2100	4	1200	13	190	2740	1530	5640	25	190	2740	13	190	950	1800	13	300	2670	36	20
2.43	2.43	465	465	200	7	2100	7	2100	6	1800	13	190	2740	1840	6270	25	190	2740	13	190	950	1800	13	150	3280	36	28
2.43	3.04	465	465	225	7	2100	7	2100	8	2400	16	190	2790	2150	6880	25	190	2790	10	190	970	1880	19	240	3890	36	36
2.74	1.21	500	500	200	8	2400	8	2400	2	600	16	175	3050	1270	5380	25	175	3050	--	--	--	--	13	300	2130	40	12
2.74	1.82	500	500	200	8	2400	8	2400	4	1200	16	165	3050	1570	5990	25	165	3050	--	--	--	--	13	300	2740	40	20
2.74	2.43	507	507	200	8	2400	8	2400	6	1800	16	175	3050	1890	6630	25	175	3050	--	--	--	--	13	150	3350	40	28
2.74	3.04	507	507	225	8	2400	8	2400	8	2400	16	125	3100	2190	7290	22	125	3100	--	--	--	--	19	240	3960	40	36
2.74	3.65	507	507	265	8	2400	8	2400	10	3000	19	150	3180	2500	7920	25	150	3180	--	--	--	--	16	140	4570	40	44
3.04	1.21	525	525	200	9	2700	9	2700	2	600	13	150	3350	1300	5790	25	150	3350	--	--	--	--	13	300	2180	44	12
3.04	1.82	525	525	200	9	2700	9	2700	4	1200	13	150	3350	1600	6400	25	150	3350	--	--	--	--	13	300	2790	44	20
3.04	2.43	530	530	200	9	2700	9	2700	6	1800	16	140	3350	1910	6990	25	140	3350	--	--	--	--	16	240	3430	44	28
3.04	3.04	530	530	225	9	2700	9	2700	8	2400	19	140	3400	2220	7590	25	140	3400	--	--	--	--	13	115	4040	44	36
3.04	3.65	540	540	265	9	2700	9	2700	10	3000	19	140	3480	2530	8280	25	140	3480	--	--	--	--	19	200	4650	44	44
3.65	1.82	640	640	200	11	3300	11	3300	4	1200	13	125	3960	1710	7240	25	125	3960	--	--	--	--	13	300	3020	52	20
3.65	2.43	640	640	200	11	3300	11	3300	6	1800	16	125	3960	2020	7800	25	125	3960	--	--	--	--	13	150	3630	52	28
3.65	3.04	630	630	230	11	3300	11	3300	8	2400	16	125	4030	2320	8460	25	125	4040	--	--	--	--	16	190	4240	52	36
3.65	3.65	630	630	265	11	3300	11	3300	10	3000	19	115	4090	2620	9090	25	115	4090	--	--	--	--	19	200	4850	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

12.0 TO 13.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

1002.21

STRUCTURE AND BRIDGE DIVISION

SPAN	HGHT	REINFORCING STEEL (kg/LONG. JT)	QUAN./m		HEADWALLS							
					G	HW1						
(m)	(m)		CONCRETE CLASS A4 (m^3/m)	REINFORCING STEEL (kg/m)	HEADWALL LENGTH	SIZE	LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.978	84.95	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.097	93.64	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.258	93.37	2080	19	1980	0.999	17.70	1.004	17.70	B
1.21	1.21	9.50	1.345	104.77	2080	19	1980	1.093	17.70	1.098	17.70	D
1.21	1.52	10.14	1.468	112.05	2080	19	1980	1.189	17.70	1.195	17.70	F
1.21	1.82	10.78	1.603	119.36	2080	19	1980	1.286	17.70	1.291	17.70	H
1.52	0.91	10.37	1.697	125.26	2390	19	2290	1.077	20.47	1.085	20.47	B
1.52	1.21	11.01	1.816	132.96	2390	19	2290	1.172	20.47	1.180	20.47	D
1.52	1.52	11.65	1.939	140.71	2390	19	2290	1.269	20.47	1.277	20.47	F
1.52	1.82	12.29	1.943	153.03	2390	19	2290	1.362	20.47	1.370	20.47	H
1.52	2.13	12.93	2.065	167.91	2390	19	2290	1.459	20.47	1.466	20.47	J
1.82	1.21	12.53	2.028	174.04	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	2.193	203.58	2690	19	2590	1.331	23.15	1.342	23.15	F
1.82	1.82	13.81	2.315	188.27	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.434	229.66	2690	19	2590	1.524	23.15	1.534	23.15	J
1.82	2.43	15.09	2.551	252.66	2690	19	2590	1.619	23.15	1.629	23.15	L
2.13	1.21	14.04	2.582	213.22	3000	19	2900	1.319	25.93	1.332	25.93	E
2.13	1.82	15.32	2.848	242.17	3000	19	2900	1.511	25.93	1.524	25.93	I
2.13	2.43	16.60	3.085	295.54	3000	19	2900	1.703	25.93	1.716	25.93	M
2.13	3.04	17.88	3.488	355.42	3000	19	2900	1.839	25.93	1.851	25.93	Q
2.43	1.21	15.55	3.099	260.84	3300	19	3200	1.366	28.61	1.381	28.61	E
2.43	1.82	16.84	3.369	275.95	3300	19	3200	1.557	28.61	1.572	28.61	I
2.43	2.43	18.12	3.665	312.80	3300	19	3200	1.747	28.61	1.762	28.61	M
2.43	3.04	19.40	4.099	379.64	3300	19	3200	1.880	28.61	1.895	28.61	Q
2.74	1.21	17.07	3.688	294.51	3610	19	3510	1.405	31.38	1.422	31.38	E
2.74	1.82	18.35	3.927	328.68	3610	19	3510	1.597	31.38	1.614	31.38	I
2.74	2.43	19.63	4.212	355.92	3610	19	3510	1.787	31.38	1.804	31.38	M
2.74	3.04	20.91	4.645	465.58	3610	19	3510	1.919	31.38	1.936	31.38	Q
2.74	3.65	22.19	5.279	570.19	3610	19	3510	1.990	31.38	2.007	31.38	U
3.04	1.21	18.58	4.157	319.10	3910	19	3810	1.442	34.06	1.462	34.06	E
3.04	1.82	19.87	4.398	335.71	3910	19	3810	1.634	34.06	1.654	34.06	I
3.04	2.43	21.15	4.662	448.89	3910	19	3810	1.852	34.06	1.872	34.06	N
3.04	3.04	22.43	5.096	569.05	3910	19	3810	1.983	34.06	2.002	34.06	R
3.04	3.65	23.71	5.811	634.19	3910	19	3810	2.049	34.06	2.068	34.06	V
3.65	1.82	22.90	5.956	449.77	4520	19	4420	1.688	39.51	1.713	39.51	J
3.65	2.43	24.18	6.186	560.90	4520	19	4420	1.880	39.51	1.905	39.51	N
3.65	3.04	25.46	6.601	608.01	4520	19	4420	2.001	39.51	2.025	39.51	R
3.65	3.65	26.74	7.198	820.65	4520	19	4420	2.080	39.51	2.103	39.51	V

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

12.0 TO 13.5 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

BS15.0

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3							BH1					BH2			BH3				BV1				
(m)	(m)	TOP SLAB (mm)	BOTTOM SLAB (mm)	WALL (mm)	A	B	C	D	E	F	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	NO. BL1 BARS	NO. BL2 BARS
0.91	0.91	200	200	200	2	600	2	600	1	300	13	250	1220	810	2690	19	250	1220	13	250	640	1190	13	300	1220	16	8
0.91	1.21	200	200	200	2	600	2	600	2	600	13	250	1220	970	3000	19	250	1220	13	250	640	1190	13	300	1520	16	12
1.21	0.91	260	260	200	3	900	3	900	1	300	13	200	1520	870	3100	19	200	1520	--	--	--	--	13	300	1350	20	8
1.21	1.21	250	250	200	3	900	3	900	2	600	13	190	1520	1020	3400	19	190	1520	--	--	--	--	13	300	1630	20	12
1.21	1.52	260	260	200	3	900	3	900	3	900	13	200	1520	1170	3710	19	200	1520	--	--	--	--	13	300	1960	20	16
1.21	1.82	260	260	200	3	900	3	900	4	1200	13	200	1520	1330	4010	19	200	1520	--	--	--	--	13	300	2260	20	20
1.52	0.91	325	325	200	4	1200	4	1200	1	300	13	165	1830	940	3560	19	165	1830	--	--	--	--	13	300	1470	24	8
1.52	1.21	325	325	200	4	1200	4	1200	2	600	13	165	1830	1090	3860	19	165	1830	--	--	--	--	13	300	1780	24	12
1.52	1.52	325	325	200	4	1200	4	1200	3	900	13	165	1830	1240	4170	19	165	1830	--	--	--	--	13	300	2080	24	16
1.52	1.82	305	305	200	4	1200	4	1200	4	1200	13	150	1830	1380	4420	19	150	1830	--	--	--	--	13	300	2360	24	20
1.52	2.13	305	305	200	4	1200	4	1200	5	1500	13	165	1830	1530	4720	19	165	1830	--	--	--	--	16	300	2670	24	24
1.82	1.21	365	365	200	5	1500	5	1500	2	600	13	225	2130	1130	4240	25	225	2130	10	225	820	1570	13	300	1850	28	12
1.82	1.52	365	365	200	5	1500	5	1500	3	900	13	125	2130	1280	4550	19	125	2130	--	--	--	--	13	300	2160	28	16
1.82	1.82	370	370	200	5	1500	5	1500	4	1200	13	225	2130	1440	4850	25	225	2130	10	225	820	1570	13	300	2460	28	20
1.82	2.13	370	370	200	5	1500	5	1500	5	1500	16	215	2130	1590	5130	25	215	2130	10	215	820	1570	16	300	2770	28	24
1.82	2.43	365	365	200	5	1500	5	1500	6	1800	16	215	2130	1740	5410	25	215	2130	10	215	820	1570	13	140	3070	28	28
2.13	1.21	440	440	200	6	1800	6	1800	2	600	16	200	2440	1210	4650	25	200	2440	--	--	--	--	13	300	2010	32	12
2.13	1.82	445	445	200	6	1800	6	1800	4	1200	13	200	2440	1520	5310	25	200	2440	13	200	880	1680	13	300	2620	32	20
2.13	2.43	440	440	200	6	1800	6	1800	6	1800	16	200	2440	1820	5870	25	200	2440	10	200	880	1700	19	290	3230	32	28
2.13	3.04	440	440	200	6	1800	6	1800	8	2400	16	200	2440	2120	6480	25	200	2440	10	200	880	1700	22	225	3840	32	36
2.43	1.21	455	455	200	7	2100	7	2100	2	600	13	140	2740	1230	5030	22	140	2740	--	--	--	--	13	300	2060	36	12
2.43	1.82	465	465	200	7	2100	7	2100	4	1200	13	140	2740	1540	5660	22	140	2740	--	--	--	--	13	300	2670	36	20
2.43	2.43	470	470	200	7	2100	7	2100	6	1800	16	140	2740	1850	6250	22	140	2740	--	--	--	--	13	140	3280	36	28
2.43	3.04	475	475	245	7	2100	7	2100	8	2400	16	140	2830	2160	6960	22	140	2820	--	--	--	--	13	115	3910	36	36
2.74	1.21	500	500	200	8	2400	8	2400	2	600	16	165	3050	1270	5380	25	165	3050	--	--	--	--	13	300	2130	40	12
2.74	1.82	515	515	200	8	2400	8	2400	4	1200	16	165	3050	1590	6020	25	165	3050	--	--	--	--	13	300	2770	40	20
2.74	2.43	520	520	200	8	2400	8	2400	6	1800	16	150	3050	1900	6650	25	150	3050	--	--	--	--	16	200	3380	40	28
2.74	3.04	520	520	245	8	2400	8	2400	8	2400	19	165	3140	2200	7290	25	165	3120	--	--	--	--	13	115	3990	40	36
2.74	3.65	525	525	280	8	2400	8	2400	10	3000	19	140	3210	2510	8000	25	140	3200	--	--	--	--	19	200	4620	40	44
3.04	1.21	565	565	200	9	2700	9	2700	2	600	13	150	3350	1330	5870	25	150	3350	--	--	--	--	13	300	2260	44	12
3.04	1.82	560	560	200	9	2700	9	2700	4	1200	13	150	3350	1630	6450	25	150	3350	--	--	--	--	13	300	2840	44	20
3.04	2.43	560	560	200	9	2700	9	2700	6	1800	16	150	3350	1940	7040	25	150	3350	--	--	--	--	13	140	3450	44	28
3.04	3.04	550	550	245	9	2700	9	2700	8	2400	16	140	3440	2240	7720	25	140	3430	--	--	--	--	13	125	4060	44	36
3.04	3.65	550	550	280	9	2700	9	2700	10	3000	22	140	3520	2540	8310	25	140	3510	--	--	--	--	16	150	4670	44	44
3.65	1.82	690	690	215	11	3300	11	3300	4	1200	13	125	3990	1770	7370	25	125	3990	--	--	--	--	13	300	3120	52	20
3.65	2.43	690	690	200	11	3300	11	3300	6	1800	16	125	3960	2070	7900	25	125	3960	--	--	--	--	16	190	3730	52	28
3.65	3.04	690	690	245	11	3300	11	3300	8	2400	16	115	4050	2370	8610	25	115	4040	--	--	--	--	19	240	4340	52	36
3.65	3.65	690	690	280	11	3300	11	3300	10	3000	19	115	4130	2680	9250	25	115	4110	--	--	--	--	19	200	4950	52	44

For Typical Section, notes and other details, refer to standard BS-DT

SINGLE BOX CULVERTS

13.5 TO 15.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

1002.23

SPAN (m)	HGHT (m)	REINFORCING STEEL (kg/LONG. JT)	QUAN./m CONCRETE CLASS A4 (m^3/m)	QUAN./m REINFORCING STEEL (kg/m)	HEADWALLS G HEADWALL LENGTH	HWI SIZE	HWI LENGTH	INLET CONCRETE CL. A4 (m^3)	INLET REINFORCING STEEL (kg)	OUTLET CONCRETE CL. A4 (m^3)	OUTLET REINFORCING STEEL (kg)	WINGWALL
0.91	0.91	7.34	0.978	90.60	1780	19	1680	0.889	15.02	0.892	15.02	A
0.91	1.21	7.98	1.097	97.29	1780	19	1680	0.984	15.02	0.987	15.02	C
1.21	0.91	8.86	1.290	98.09	2080	19	1980	1.001	17.70	1.006	17.70	B
1.21	1.21	9.50	1.376	108.74	2080	19	1980	1.094	17.70	1.100	17.70	D
1.21	1.52	10.14	1.532	112.68	2080	19	1980	1.193	17.70	1.198	17.70	F
1.21	1.82	10.78	1.651	119.89	2080	19	1980	1.288	17.70	1.294	17.70	H
1.52	0.91	10.37	1.697	130.55	2390	19	2290	1.077	20.47	1.085	20.47	B
1.52	1.21	11.01	1.816	138.45	2390	19	2290	1.172	20.47	1.180	20.47	D
1.52	1.52	11.65	1.939	146.42	2390	19	2290	1.269	20.47	1.277	20.47	F
1.52	1.82	12.29	1.980	163.81	2390	19	2290	1.363	20.47	1.370	20.47	H
1.52	2.13	12.93	2.103	171.37	2390	19	2290	1.459	20.47	1.467	20.47	J
1.82	1.21	12.53	2.184	175.13	2690	19	2590	1.235	23.15	1.245	23.15	D
1.82	1.52	13.17	2.304	199.64	2690	19	2590	1.331	23.15	1.341	23.15	F
1.82	1.82	13.81	2.448	189.04	2690	19	2590	1.427	23.15	1.437	23.15	H
1.82	2.13	14.45	2.566	239.07	2690	19	2590	1.523	23.15	1.534	23.15	J
1.82	2.43	15.09	2.661	260.29	2690	19	2590	1.619	23.15	1.629	23.15	L
2.13	1.21	14.04	2.784	220.96	3000	19	2900	1.315	25.93	1.328	25.93	E
2.13	1.82	15.32	3.050	243.49	3000	19	2900	1.507	25.93	1.520	25.93	I
2.13	2.43	16.60	3.261	304.36	3000	19	2900	1.700	25.93	1.712	25.93	M
2.13	3.04	17.88	3.496	372.35	3000	19	2900	1.892	25.93	1.904	25.93	Q
2.43	1.21	15.55	3.129	246.65	3300	19	3200	1.365	28.61	1.380	28.61	E
2.43	1.82	16.84	3.428	264.12	3300	19	3200	1.555	28.61	1.570	28.61	I
2.43	2.43	18.12	3.688	355.68	3300	19	3200	1.746	28.61	1.761	28.61	M
2.43	3.04	19.40	4.314	400.40	3300	19	3200	1.830	28.61	1.845	28.61	Q
2.74	1.21	17.07	3.686	308.68	3610	19	3510	1.405	31.38	1.422	31.38	E
2.74	1.82	18.35	4.021	329.45	3610	19	3510	1.592	31.38	1.610	31.38	I
2.74	2.43	19.63	4.287	407.08	3610	19	3510	1.783	31.38	1.801	31.38	M
2.74	3.04	20.91	4.889	476.64	3610	19	3510	1.866	31.38	1.883	31.38	Q
2.74	3.65	22.19	5.533	604.71	3610	19	3510	1.942	31.38	1.958	31.38	U
3.04	1.21	18.58	4.432	320.69	3910	19	3810	1.455	34.06	1.475	34.06	F
3.04	1.82	19.87	4.639	336.70	3910	19	3810	1.648	34.06	1.668	34.06	J
3.04	2.43	21.15	4.871	431.55	3910	19	3810	1.841	34.06	1.861	34.06	N
3.04	3.04	22.43	5.411	494.31	3910	19	3810	1.926	34.06	1.945	34.06	R
3.04	3.65	23.71	6.013	725.36	3910	19	3810	2.002	34.06	2.020	34.06	V
3.65	1.82	22.90	6.456	454.41	4520	19	4420	1.659	39.51	1.684	39.51	K
3.65	2.43	24.18	6.589	576.21	4520	19	4420	1.880	39.51	1.905	39.51	O
3.65	3.04	25.46	7.219	664.22	4520	19	4420	1.954	39.51	1.978	39.51	S
3.65	3.65	26.74	7.849	830.49	4520	19	4420	2.024	39.51	2.048	39.51	W

STRUCTURE AND BRIDGE DIVISION

SINGLE BOX CULVERTS

13.5 TO 15.0 m FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION