

SECTION 1000

BOX CULVERTS

STANDARD

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ROAD AND BRIDGE STANDARDS

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VIRGINIA DEPARTMENT OF TRANSPORTATION

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NOTES TO DESIGNER:

The designer shall ensure that the following checks are undertaken to ensure the suitability of the standard box culvert and wingwall designs to a particular site.

General:

The designer shall review the site investigation results and material testing to confirm the site exposure and environment is within the scope of these standards. This includes highly saline environments, maritime environments including splash zones and other aggressive chemicals.

Box Culverts:

The designer shall review the geometry and applied loading of the proposed site to ensure that the design is within the scope of these standards.

AASHTO Crack Control Criteria, Article 5.7.3.4, is ignored.

Wingwalls:

The standard wingwall designs do not allow for increased earth pressure loads due to seismic effects.

The designer shall ensure that the overall slip circle stability and wall deflections are checked in accordance with Section 11.6.2 of AASHTO LRFD.

The designer shall ensure the friction angle for founding stratum, ϕ_{found} , is a minimum of 32 degrees for 2:1 Slope Wingwalls and 34 degrees for 1.5:1 Slope Wingwalls. Where the founding stratum is a cohesive soil, the designer shall ensure that the sliding stability of the wall is verified.

Where the designer proposes to improve the foundation strata to allow the use of the standard wingwall designs, the designer shall ensure that additional sliding and bearing pressure checks are carried out at the base of the improved soil layer.

In locations where it is not practical to provide the back of wall drainage system as indicated on the drawings, the designer shall re-check the wingwall designs taking into account the site groundwater conditions. Special consideration of groundwater conditions may also be required in locations where the watercourse is prone to rapid and significant changes in water level, including seepage effects where appropriate.

The designer shall calculate the nominal bearing resistance of the foundation material using the semi-empirical approach given in AASHTO LRFD Section 10.6.3.1.3 using the width of footing at the low and high ends of the wingwall, dimensions N1 and N2, for the footing width B. The designer shall check that the factored bearing resistance at each end of the wall, qR , is greater than the minimum values given in the table below. Where the factored bearing resistance is below the minimum values given in the table the designer shall re-design the wall based on an increased footing width or provide improvement to the foundation bearing resistance such that its bearing resistance exceeds the minimum values.

2:1 Slope Wingwalls Type I

N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)	N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)
3'-0"	0.85	9'-0"	3.92
3'-6"	1.11	9'-6"	3.99
4'-0"	1.27	10'-0"	4.07
4'-6"	1.71	11'-0"	4.28
5'-0"	2.03	12'-0"	4.36
5'-6"	2.36	12'-6"	4.46
6'-0"	2.70	13'-0"	4.56
6'-6"	3.05	14'-0"	4.56
7'-0"	3.10	14'-6"	4.66
7'-6"	3.45	15'-0"	4.99
8'-0"	3.51	15'-6"	5.10
8'-6"	3.86		

2:1 Slope Wingwalls Type II

N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)	N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)
3'-0"	0.48	8'-0"	4.13
4'-0"	1.40	8'-6"	4.16
4'-6"	1.71	9'-0"	4.21
5'-0"	2.03	9'-6"	4.43
5'-6"	2.36	10'-0"	5.19
6'-0"	2.70	10'-6"	5.23
6'-6"	3.05	11'-0"	5.61
7'-0"	3.10	12'-0"	5.40
7'-6"	3.76	13'-0"	5.55

1.5:1 Slope Wingwalls Type I

N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)	N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)
3'-0"	1.02	8'-6"	3.44
3'-6"	1.15	9'-0"	3.57
4'-0"	1.50	9'-6"	3.71
4'-3"	1.68	10'-0"	4.10
4'-6"	1.88	11'-6"	4.28
4'-9"	2.08	12'-0"	4.42
5'-0"	1.98	12'-6"	4.55
5'-6"	2.40	13'-6"	4.60
6'-0"	2.53	15'-0"	4.95
6'-6"	2.65	15'-6"	5.32
7'-0"	2.78	16'-0"	5.70
7'-6"	3.18	16'-6"	6.11
		17'-6"	6.15

1.5:1 Slope Wingwalls Type II

N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)	N1 OR N2 (FT.)	$q_{r,min.}$ (ksf)
3'-0"	0.55	8'-0"	4.26
4'-0"	1.50	8'-6"	4.35
4'-3"	1.68	9'-0"	4.64
4'-6"	1.88	9'-6"	4.93
4'-9"	2.08	10'-0"	5.04
5'-0"	2.28	10'-6"	5.49
5'-3"	2.49	11'-0"	5.83
5'-6"	2.71	11'-6"	5.93
5'-9"	2.93	12'-0"	6.04
6'-0"	3.15	12'-6"	6.16
6'-6"	3.61	13'-0"	6.28
7'-0"	3.70	13'-3"	6.51
7'-6"	4.17	14'-0"	6.53
		15'-0"	6.48

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<p>NOTES TO DESIGNER</p> <p>BOX CULVERTS AND WINGS</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 <p>ROAD AND BRIDGE STANDARDS</p>	
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STANDARD

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ROAD AND BRIDGE STANDARDS

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VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

GENERAL NOTES:

Capacity: AASHTO HL-93 Loading

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications,

Design: AASHTO LRFD Bridge Design Specifications, 4th Edition 2007; 2008 and 2009 Interim Specifications; and VDOT Modifications.

All concrete shall be Class A4.

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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 VDOT Road and Bridge Specifications.

Barrels more than 35' in length shall be poured in sections by providing vertical construction joints, not exceeding 25' between joints nor more than 30' from ends of barrels.

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

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The number of BL1 and 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 and BL2 bars 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./LF shown for reinforcing steel does not include the quantity for laps of BL1 and BL2 bars. The additional weight per longitudinal lap is shown in the table.

The minimum cover of main reinforcing bars shall be 2 1/2" from the face of the concrete for culverts under 0 to 2 foot fills and shall be 2" from the face of the concrete for all other culverts.

All reinforcing steel for culverts under 0 to 2 foot fills shall be low carbon/chromium reinforcing steel conforming to ASTM A1035.

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.

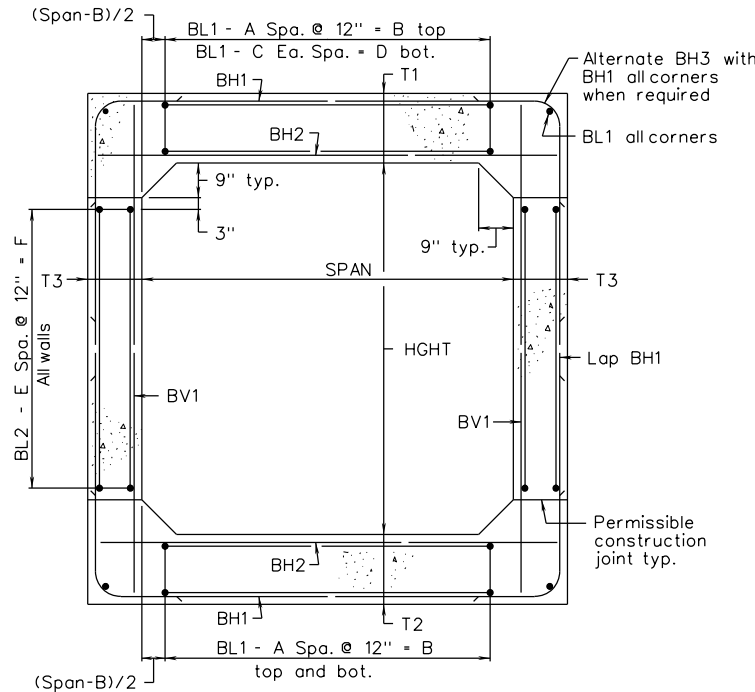
The designs are applicable to the fill height and other conditions indicated. Any change in the conditions invalidates these designs.

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 the appropriate height. For wingwall details, refer to standard series BCW for the appropriate fill slope.

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.

This standard shall be used with the BCB standard series.

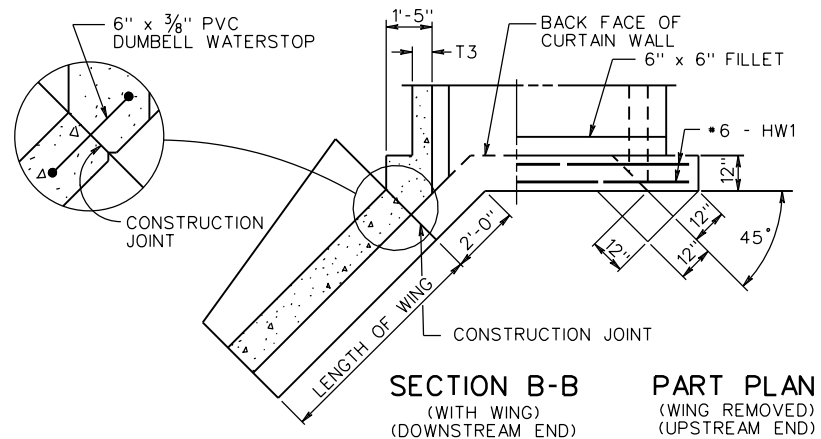
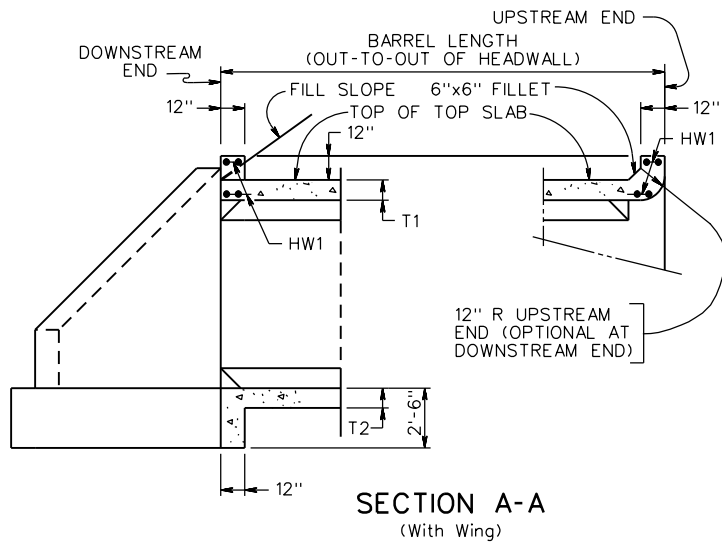
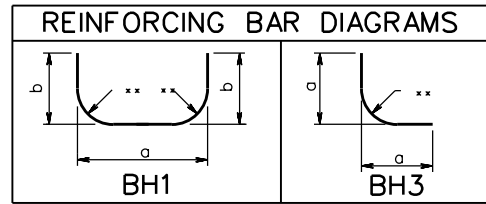
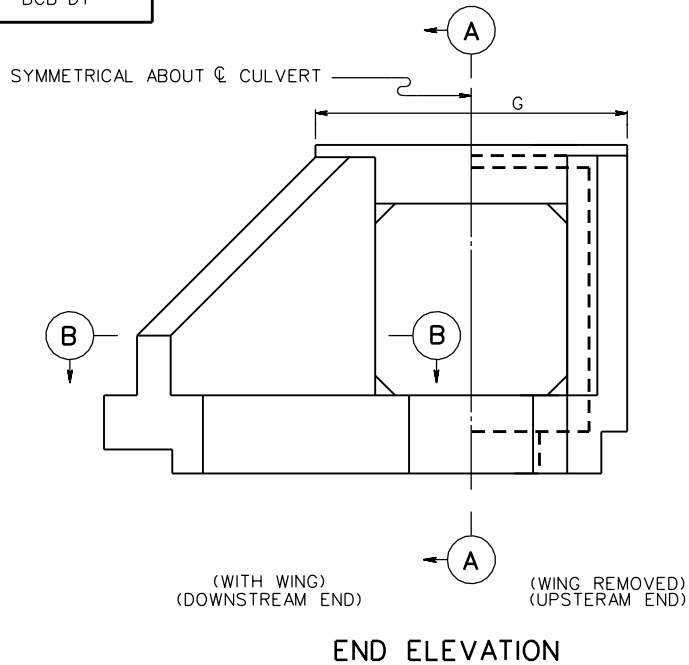


TYPICAL SECTION

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<p>OVERSIZE BOX CULVERTS</p> <p>STANDARD DETAILS</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p>ROAD AND BRIDGE STANDARDS</p>	
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BCB-DT



ROAD AND BRIDGE STANDARDS

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**OVERSIZED BOX CULVERT
STANDARD DETAILS**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																								
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS				
											SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH		
12	14	10 3/4"	10 3/4"	8"	11	11'-0"	22	11'-0"	12	12'-0"	5	7"	13'-0"	8'-4 3/4"	29'-2"	8	7"	13'-0"	4	7"	4'-6 1/2"	8'-10"	5	8 1/2"	15'-5"	63	52			
12	16	11 3/4"	11 3/4"	8 1/4"	11	11'-0"	22	11'-0"	14	14'-0"	6	6"	13'-1/2"	9'-9 1/4"	31'-10"	8	6"	13'-0"	--	---	-----	-----	5	5 1/2"	17'-8"	63	60			
14	8	10 3/4"	10 3/4"	8"	13	13'-0"	26	13'-0"	6	6'-0"	5	7"	15'-0"	5'-4 3/4"	25'-2"	7	7"	15'-0"	4	7"	4'-3 5/8"	8'-4"	4	12"	9'-5"	73	28			
14	10	11"	11"	8"	13	13'-0"	26	13'-0"	8	8'-0"	5	8 1/2"	15'-0"	6'-5"	27'-2"	8	8 1/2"	15'-0"	4	8 1/2"	4'-3 5/8"	8'-4"	4	12"	11'-6"	73	36			
14	12	11"	11"	8"	13	13'-0"	26	13'-0"	10	10'-0"	5	7 1/2"	15'-0"	7'-5"	29'-2"	8	7 1/2"	15'-0"	4	7 1/2"	4'-3 5/8"	8'-4"	5	12"	13'-6"	73	44			
14	14	11 1/2"	11 1/2"	8"	13	13'-0"	26	13'-0"	12	12'-0"	6	6 1/2"	15'-0"	8'-9"	31'-9"	8	6 1/2"	15'-0"	--	---	-----	-----	5	8"	15'-7"	73	52			
14	16	12 1/2"	12 1/2"	8 1/4"	13	13'-0"	26	13'-0"	14	14'-0"	6	5 1/2"	15'-1/2"	9'-10"	34'-0"	8	5 1/2"	15'-0"	--	---	-----	-----	6	9"	17'-9"	73	60			

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS							
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G HEADWALL LENGTH	HW1 SIZE	LENGTH	INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
12	14	70.961	1.591	376.903	14'-10"	6	14'-6"	2.927	87.116	2.961	87.116	X
12	16	73.785	1.793	479.298	14'-10"	6	14'-6"	3.064	87.116	3.097	87.116	BB
14	8	70.839	1.431	305.160	16'-10"	6	16'-6"	2.557	99.132	2.597	99.132	L
14	10	73.663	1.554	302.186	16'-10"	6	16'-6"	2.735	99.132	2.775	99.132	P
14	12	76.487	1.649	360.576	16'-10"	6	16'-6"	2.920	99.132	2.961	99.132	T
14	14	79.311	1.790	445.148	16'-10"	6	16'-6"	3.092	99.132	3.132	99.132	X
14	16	82.135	2.004	543.465	16'-10"	6	16'-6"	3.222	99.132	3.262	99.132	BB

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.


SPECIFICATION REFERENCE	<h2 style="margin: 0;">OVERSIZE BOX CULVERTS</h2> <h3 style="margin: 0;">0 TO 2 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p style="margin: 0;">ROAD AND BRIDGE STANDARDS</p>	REVISION DATE	SHEET 1 OF 1
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FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																					
SPAN	HGHT	T1	T2	T3		BH1				BH2			BH3			BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS							
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
12	14	11"	11"	8"	11	11'-0"	11	11'-0"	12	12'-0"	5	7"	13'-0"	8'-5"	29'-2"	8	7"	13'-0"	4	7"	4'-6 1/2"	8'-10"	6	8 1/2"	15'-6"	52	52
12	16	12 1/4"	12 1/4"	8 1/2"	11	11'-0"	11	11'-0"	14	14'-0"	6	6 1/2"	13'-1"	9'-10"	31'-11"	8	6 1/2"	13'-0"	4	6 1/2"	5'-1"	9'-11"	6	6"	17'-9"	52	60
14	8	10 1/4"	10 1/4"	8"	13	13'-0"	13	13'-0"	6	6'-0"	5	6"	15'-0"	5'-4 1/4"	25'-1"	7	6"	15'-0"	--	---	-----	-----	4	7 1/2"	9'-5"	60	28
14	10	10 1/4"	10 1/4"	8"	13	13'-0"	13	13'-0"	8	8'-0"	6	7"	15'-0"	6'-4 1/4"	26'-11"	8	7"	15'-0"	--	---	-----	-----	4	7 1/2"	11'-5"	60	36
14	12	10 1/2"	10 1/2"	8"	13	13'-0"	13	13'-0"	10	10'-0"	5	5 1/2"	15'-0"	7'-4 1/2"	29'-1"	7	5 1/2"	15'-0"	--	---	-----	-----	5	10"	13'-5"	60	44
14	14	11 1/2"	11 1/2"	8 1/2"	13	13'-0"	13	13'-0"	12	12'-0"	5	6 1/2"	15'-1"	8'-5 1/2"	31'-3"	8	6 1/2"	15'-0"	3	6 1/2"	4'-7"	8'-11"	6	10"	15'-7"	60	52
14	16	12 1/2"	12 1/2"	8 3/4"	13	13'-0"	13	13'-0"	14	14'-0"	6	6"	15'-1"	9'-10"	34'-0"	8	6"	15'-1"	--	---	-----	-----	6	6"	17'-9"	60	60

SPAN	HGHT	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS																				
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G	HW1		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL													
(FT.)	(FT.)				HEADWALL LENGTH	SIZE	LENGTH																		
12	14	61.776	1.610	386.454	14'-10"	6	14'-6"	2.922	87.116	2.956	87.116	X													
12	16	64.600	1.856	521.464	14'-10"	6	14'-6"	3.053	87.116	3.086	87.116	BB													
14	8	59.984	1.384	298.025	16'-10"	6	16'-6"	2.570	99.132	2.611	99.132	L													
14	10	62.808	1.479	353.948	16'-10"	6	16'-6"	2.756	99.132	2.796	99.132	P													
14	12	65.632	1.602	360.712	16'-10"	6	16'-6"	2.934	99.132	2.975	99.132	T													
14	14	68.456	1.839	412.213	16'-10"	6	16'-6"	3.092	99.132	3.132	99.132	X													
14	16	71.280	2.058	537.499	16'-10"	6	16'-6"	3.194	99.132	3.234	99.132	BB													

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 1	REVISION DATE
1001.04	07/11

OVERSIZE BOX CULVERTS
2 TO 5 FT. FILLS
 VIRGINIA DEPARTMENT OF TRANSPORTATION


SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																					
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)		BH1				BH2			BH3			BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS							
				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	
12	14	11 1/2"	11 1/2"	9"	11	11'-0"	11	11'-0"	12	12'-0"	5	6 1/2"	13'-2"	8'-5 1/2"	29'-5"	8	6 1/2"	13'-2"	4	6 1/2"	4'-7"	8'-11"	6	7 1/2"	15'-7"	52	52
12	16	12"	12"	10 1/2"	11	11'-0"	11	11'-0"	14	14'-0"	6	6"	13'-5"	9'-9 1/2"	32'-4"	8	6"	13'-5"	--	---	-----	-----	6	6"	17'-8"	52	60
14	8	11 3/4"	11 3/4"	8"	13	13'-0"	13	13'-0"	6	6'-0"	6	6 1/2"	15'-0"	5'-9 1/2"	25'-10"	8	6 1/2"	15'-0"	--	---	-----	-----	4	6"	9'-8"	60	28
14	10	11 3/4"	11 3/4"	8"	13	13'-0"	13	13'-0"	8	8'-0"	5	6"	15'-0"	6'-5 3/4"	27'-4"	8	6"	15'-0"	3	6"	4'-3 5/8"	8'-5"	4	6"	11'-8"	60	36
14	12	12"	12"	8"	13	13'-0"	13	13'-0"	10	10'-0"	5	6"	15'-0"	7'-6"	29'-4"	8	6"	15'-0"	3	6"	4'-3 5/8"	8'-5"	6	12"	13'-8"	60	44
14	14	12 1/2"	12 1/2"	9 1/2"	13	13'-0"	13	13'-0"	12	12'-0"	5	5 1/2"	15'-3"	8'-6 1/2"	31'-8"	8	5 1/2"	15'-3"	3	5 1/2"	4'-8"	9'-1"	7	12"	15'-9"	60	52
14	16	12 3/4"	12 3/4"	10 1/2"	13	13'-0"	13	13'-0"	14	14'-0"	6	5 1/2"	15'-5"	9'-10"	34'-3"	8	5 1/2"	15'-5"	--	---	-----	-----	6	7"	17'-9"	60	60

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS							
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G HEADWALL LENGTH	HW1 SIZE	LENGTH	INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
12	14	61.776	1.746	421.454	14'-10"	6	14'-6"	2.911	87.116	2.945	87.116	X
12	16	64.600	2.059	503.510	14'-10"	6	14'-6"	3.003	87.116	3.036	87.116	BB
14	8	59.984	1.521	363.885	16'-10"	6	16'-6"	2.529	99.132	2.569	99.132	L
14	10	62.808	1.619	384.341	16'-10"	6	16'-6"	2.714	99.132	2.754	99.132	P
14	12	65.632	1.741	410.358	16'-10"	6	16'-6"	2.893	99.132	2.933	99.132	T
14	14	68.456	2.029	478.737	16'-10"	6	16'-6"	3.064	99.132	3.105	99.132	X
14	16	71.280	2.276	561.097	16'-10"	6	16'-6"	3.187	99.132	3.227	99.132	BB

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SPECIFICATION REFERENCE	OVERSIZE BOX CULVERTS		 ROAD AND BRIDGE STANDARDS
	5 TO 10 FT. FILLS		
	VIRGINIA DEPARTMENT OF TRANSPORTATION		SHEET 1 OF 1
			07/11
			1001.05

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																					
SPAN	HGHT	T1	T2	T3		BH1				BH2			BH3			BVI			NO. #4 BARS	NO. #3 BARS							
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
12	14	15"	15"	11 1/2"	11	11'-0"	11	11'-0"	12	12'-0"	6	6"	13'-7"	9'-2"	31'-0"	8	6"	13'-6"	--	---	-----	-----	7	9"	16'-2"	52	52
12	16	15 1/4"	15 1/4"	13"	11	11'-0"	11	11'-0"	14	14'-0"	6	5 1/2"	13'-10"	10'-2"	33'-3"	8	5 1/2"	13'-9"	3	5 1/2"	5'-4"	10'-5"	8	11"	18'-2"	52	60
14	8	16 3/4"	16 3/4"	8"	13	13'-0"	13	13'-0"	6	6'-0"	4	5 1/2"	15'-0"	5'-11"	26'-4"	8	5 1/2"	15'-0"	4	5 1/2"	4'-4"	8'-5"	4	11"	10'-5"	60	28
14	10	16 3/4"	16 3/4"	8"	13	13'-0"	13	13'-0"	8	8'-0"	5	5"	15'-0"	7'-1"	28'-6"	8	5"	15'-0"	--	---	-----	-----	5	5"	12'-5"	60	36
14	12	16 3/4"	16 3/4"	9 1/2"	13	13'-0"	13	13'-0"	10	10'-0"	5	5"	15'-3"	8'-1"	30'-9"	8	5"	15'-3"	--	---	-----	-----	6	10"	14'-5"	60	44
14	14	16 3/4"	16 3/4"	11"	13	13'-0"	13	13'-0"	12	12'-0"	5	5"	15'-6"	9'-1"	33'-0"	8	5"	15'-6"	4	5"	5'-1"	9'-10"	7	10"	16'-5"	60	52
14	16	17"	17"	13 1/2"	13	13'-0"	13	13'-0"	14	14'-0"	6	5"	15'-11"	10'-4"	35'-8"	8	5"	15'-11"	--	---	-----	-----	7	9"	18'-6"	60	60

SPAN	HGHT	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS																			
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G	HW1		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL												
(FT.)	(FT.)				HEADWALL LENGTH	SIZE	LENGTH																	
12	14	61.776	2.287	480.799	14'-10"	6	14'-6"	2.810	87.116	2.844	87.116	X												
12	16	64.600	2.614	583.945	14'-10"	6	14'-6"	2.835	87.116	2.868	87.116	CC												
14	8	59.984	1.993	374.438	16'-10"	6	16'-6"	2.408	99.132	2.449	99.132	M												
14	10	62.808	2.086	459.403	16'-10"	6	16'-6"	2.594	99.132	2.634	99.132	Q												
14	12	65.632	2.321	466.628	16'-10"	6	16'-6"	2.779	99.132	2.820	99.132	U												
14	14	68.456	2.585	575.524	16'-10"	6	16'-6"	2.913	99.132	2.953	99.132	Y												
14	16	71.280	3.032	632.963	16'-10"	6	16'-6"	2.970	99.132	3.009	99.132	CC												

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 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 1	REVISION DATE
1001.06	07/11

OVERSIZE BOX CULVERTS

10 TO 20 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																								
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3			BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS					
											SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH		
12	14	19 1/2"	19 1/2"	12 1/2"	11	11'-0"	11	11'-0"	12	12'-0"	5	5 1/2"	13'-9"	9'-4"	31'-9"	8	5 1/2"	13'-9"	4	5 1/2"	5'-4"	10'-4"	7	8"	16'-11"	52	52			
12	16	19 1/2"	19 1/2"	15"	11	11'-0"	11	11'-0"	14	14'-0"	6	5 1/2"	14'-2"	10'-6"	34'-4"	8	5 1/2"	14'-1"	3	5 1/2"	5'-8"	11'-2"	8	10"	18'-11"	52	60			
14	8	22 1/2"	22 1/2"	8"	13	13'-0"	13	13'-0"	6	6'-0"	4	5"	15'-0"	6'-5"	27'-3"	8	5"	15'-0"	--	---	-----	-----	5	12"	11'-4"	60	28			
14	10	22 3/4"	22 3/4"	8"	13	13'-0"	13	13'-0"	8	8'-0"	4	5"	15'-0"	7'-5"	29'-4"	8	5"	15'-0"	3	5"	4'-9"	9'-4"	5	6 1/2"	13'-5"	60	36			
14	12	22 3/4"	22 3/4"	10 1/2"	13	13'-0"	13	13'-0"	10	10'-0"	5	4 1/2"	15'-5"	8'-7"	31'-11"	8	4 1/2"	15'-4"	--	---	-----	-----	6	9"	15'-5"	60	44			
14	14	22 3/4"	22 3/4"	12 1/2"	13	13'-0"	13	13'-0"	12	12'-0"	5	5"	15'-9"	9'-7"	34'-3"	8	5"	15'-8"	3	5"	5'-7"	10'-11"	5	5"	17'-5"	60	52			
14	16	22 3/4"	22 3/4"	15"	13	13'-0"	13	13'-0"	14	14'-0"	6	4 1/2"	16'-2"	10'-9"	36'-10"	8	4 1/2"	16'-2"	--	---	-----	-----	7	9"	19'-5"	60	60			

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G HEADWALL LENGTH	HW1 SIZE LENGTH		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL	
12	14	61.776	2.776	529.473	14'-10"	6	14'-6"	2.572	87.116	2.604	87.116	Y	
12	16	64.600	3.221	612.127	14'-10"	6	14'-6"	2.588	87.116	2.620	87.116	CC	
14	8	59.984	2.538	362.624	16'-10"	6	16'-6"	2.267	99.132	2.308	99.132	N	
14	10	62.808	2.655	433.615	16'-10"	6	16'-6"	2.446	99.132	2.486	99.132	R	
14	12	65.632	2.991	524.087	16'-10"	6	16'-6"	2.607	99.132	2.647	99.132	V	
14	14	68.456	3.337	568.048	16'-10"	6	16'-6"	2.653	99.132	2.692	99.132	Z	
14	16	71.280	3.786	702.626	16'-10"	6	16'-6"	2.638	99.132	2.676	99.132	DD	

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SPECIFICATION REFERENCE	<h2 style="margin: 0;">OVERSIZE BOX CULVERTS</h2> <h3 style="margin: 0;">20 TO 30 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p style="margin: 0;">ROAD AND BRIDGE STANDARDS</p>	REVISION DATE	SHEET 1 OF 1
			07/11	1001.07

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																					
SPAN	HGHT	T1	T2	T3		BH1				BH2			BH3				BV1			NO. #4 BARS	NO. #3 BARS						
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
12	14	22 3/4"	22 3/4"	14"	11	11'-0"	11	11'-0"	12	12'-0"	5	5"	14'-0"	9'-7"	32'-6"	8	5"	14'-0"	4	5"	5'-7"	10'-10"	8	10"	17'-5"	52	52
12	16	22 3/4"	22 3/4"	17"	11	11'-0"	11	11'-0"	14	14'-0"	6	5"	14'-6"	10'-9"	35'-2"	8	5"	14'-6"	3	5"	6'-0"	11'-8"	6	5"	19'-5"	52	60
14	8	27 3/4"	27 3/4"	9"	13	13'-0"	13	13'-0"	6	6'-0"	4	4 1/2"	15'-2"	6'-10"	28'-4"	8	4 1/2"	15'-1"	--	---	-----	-----	5	9"	12'-3"	60	28
14	10	27 3/4"	27 3/4"	8 1/2"	13	13'-0"	13	13'-0"	8	8'-0"	4	4 1/2"	15'-1"	7'-10"	30'-3"	8	4 1/2"	15'-0"	--	---	-----	-----	7	9"	14'-3"	60	36
14	12	27 3/4"	27 3/4"	11 1/2"	13	13'-0"	13	13'-0"	10	10'-0"	5	4 1/2"	15'-7"	9'-0"	32'-11"	8	4 1/2"	15'-6"	--	---	-----	-----	5	4 1/2"	16'-3"	60	44
14	14	27 3/4"	27 3/4"	14"	13	13'-0"	13	13'-0"	12	12'-0"	6	4 1/2"	16'-0"	10'-2"	35'-6"	8	4 1/2"	16'-0"	--	---	-----	-----	5	4 1/2"	18'-3"	60	52
14	16	27 3/4"	27 3/4"	16 1/2"	13	13'-0"	13	13'-0"	14	14'-0"	5	4 1/2"	16'-5"	11'-0"	37'-9"	8	4 1/2"	16'-5"	4	4 1/2"	6'-5"	12'-6"	8	9"	20'-3"	60	60

SPAN	HGHT	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF			HEADWALLS																			
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)		G	HW1		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL												
(FT.)	(FT.)				HEADWALL LENGTH	SIZE	LENGTH																		
12	14	61.776	3.219	584.665	14'-10"	6	14'-6"	2.351	87.116	2.382	87.116	Z													
12	16	64.600	3.751	686.358	14'-10"	6	14'-6"	2.314	87.116	2.344	87.116	DD													
14	8	59.984	3.110	410.138	16'-10"	6	16'-6"	2.063	99.132	2.103	99.132	O													
14	10	62.808	3.172	462.500	16'-10"	6	16'-6"	2.281	99.132	2.321	99.132	S													
14	12	65.632	3.577	560.733	16'-10"	6	16'-6"	2.315	99.132	2.354	99.132	W													
14	14	68.456	3.997	682.253	16'-10"	6	16'-6"	2.333	99.132	2.371	99.132	AA													
14	16	71.280	4.483	747.896	16'-10"	6	16'-6"	2.281	99.132	2.318	99.132	EE													

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 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 1	REVISION DATE
1001.08	07/11

OVERSIZE BOX CULVERTS

30 TO 40 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCB-DT.

DIMENSIONS						REINFORCING STEEL																					
SPAN	HGHT	T1	T2	T3		BH1				BH2			BH3				BVI			NO. #4 BARS	NO. #3 BARS						
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
12	14	27 1/2"	27 1/2"	15 1/2"	11	11'-0"	11	11'-0"	12	12'-0"	5	5"	14'-3"	10'-0"	33'-7"	8	5"	14'-3"	4	5"	6'-0"	11'-8"	8	10"	18'-3"	52	52
12	16	27 3/4"	27 3/4"	18 1/2"	11	11'-0"	11	11'-0"	14	14'-0"	6	4 1/2"	14'-9"	11'-2"	36'-3"	9	4 1/2"	14'-9"	3	4 1/2"	6'-5"	12'-6"	8	9"	20'-3"	52	60
14	8	31 1/2"	31 1/2"	11 3/4"	13	13'-0"	13	13'-0"	6	6'-0"	4	4 1/2"	15'-7 1/2"	7'-2"	29'-5"	9	4 1/2"	15'-7"	--	---	-----	-----	4	9"	12'-11"	60	28
14	10	31 1/2"	31 1/2"	10 3/4"	13	13'-0"	13	13'-0"	8	8'-0"	4	4 1/2"	15'-5 1/2"	8'-2"	31'-3"	9	4 1/2"	15'-5"	--	---	-----	-----	5	4 1/2"	14'-11"	60	36
14	12	31 1/4"	31 1/4"	11 1/2"	13	13'-0"	13	13'-0"	10	10'-0"	4	4 1/2"	15'-7"	9'-2"	33'-4"	9	4 1/2"	15'-6"	4	4 1/2"	5'-11"	11'-5"	7	8"	16'-10"	60	44
14	14	31 1/4"	31 1/4"	15"	13	13'-0"	13	13'-0"	12	12'-0"	5	4 1/2"	16'-2"	10'-4"	36'-1"	9	4 1/2"	16'-2"	3	4 1/2"	6'-3"	12'-4"	7	7"	18'-10"	60	52
14	16	31 1/4"	31 1/4"	17 1/2"	13	13'-0"	13	13'-0"	14	14'-0"	6	4 1/2"	16'-7"	11'-6"	38'-8"	9	4 1/2"	16'-7"	4	4 1/2"	6'-8"	13'-1"	6	4 1/2"	20'-10"	60	60

SPAN	HGHT	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS																				
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G	HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL													
(FT.)	(FT.)				HEADWALL LENGTH	SIZE	LENGTH																		
12	14	61.776	3.810	603.234	14'-10"	6	14'-6"	2.080	87.116	2.110	87.116	AA													
12	16	64.600	4.390	817.047	14'-10"	6	14'-6"	1.979	87.116	2.008	87.116	EE													
14	8	59.984	3.689	470.179	16'-10"	6	16'-6"	1.732	99.132	1.770	99.132	O													
14	10	62.808	3.735	536.664	16'-10"	6	16'-6"	1.965	99.132	2.003	99.132	S													
14	12	65.632	3.914	651.161	16'-10"	6	16'-6"	2.071	99.132	2.109	99.132	W													
14	14	68.456	4.464	743.491	16'-10"	6	16'-6"	2.010	99.132	2.047	99.132	AA													
14	16	71.280	4.961	941.671	16'-10"	6	16'-6"	1.939	99.132	1.974	99.132	EE													

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SPECIFICATION REFERENCE	OVERSIZE BOX CULVERTS		 ROAD AND BRIDGE STANDARDS
	40 TO 50 FT. FILLS		
	VIRGINIA DEPARTMENT OF TRANSPORTATION		SHEET 1 OF 1
			07/11
			1001.09

BCS-DT

GENERAL NOTES:

Capacity: AASHTO HL-93 Loading

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications,

Design: AASHTO LRFD Bridge Design Specifications, 4th Edition 2007; 2008 and 2009 Interim Specifications; and VDOT Modifications.

All concrete shall be Class A4.

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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 VDOT Road and Bridge Specifications.

Barrels more than 35' in length shall be poured in sections by providing vertical construction joints, not exceeding 25' between joints nor more than 30' from ends of barrels.

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

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The number of BL1 and 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 and BL2 bars 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./LF shown for reinforcing steel does not include the quantity for laps of BL1 and BL2 bars. The additional weight per longitudinal lap is shown in the table.

The minimum cover of main reinforcing bars shall be 2 1/2" from the face of the concrete for culverts under 0 to 2 foot fills and shall be 2" from the face of the concrete for all other culverts.

All reinforcing steel for culverts under 0 to 2 foot fills shall be low carbon/chromium reinforcing steel conforming to ASTM A1035.

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.

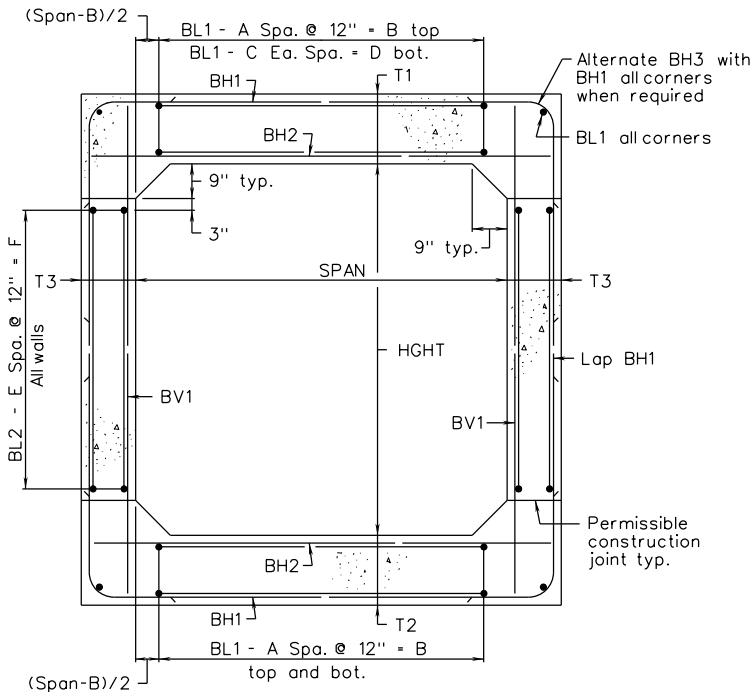
The designs are applicable to the fill height and other conditions indicated. Any change in the conditions invalidates these designs.

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 the appropriate height. For wingwall details, refer to standard series BCW for the appropriate fill slope.

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.

This standard shall be used with the BCS standard series.



TYPICAL SECTION

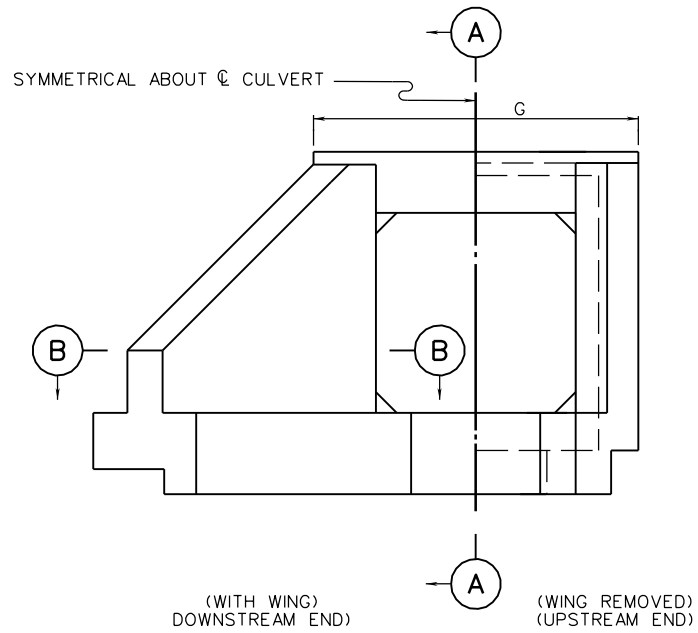
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VDOT	
ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
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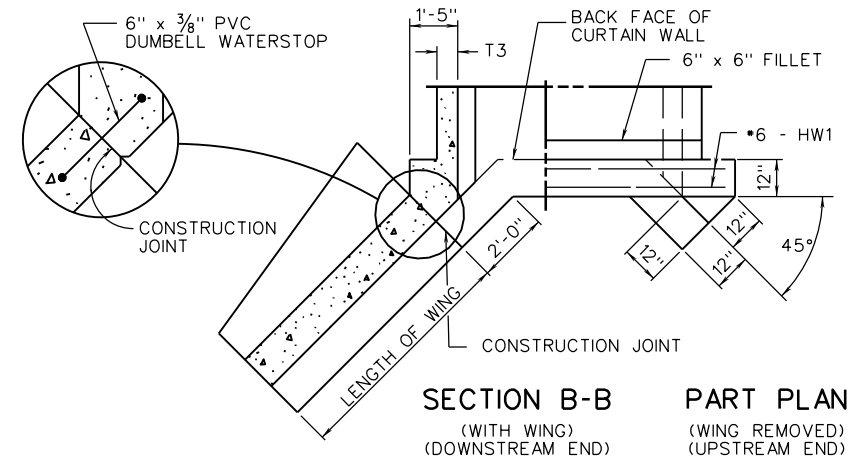
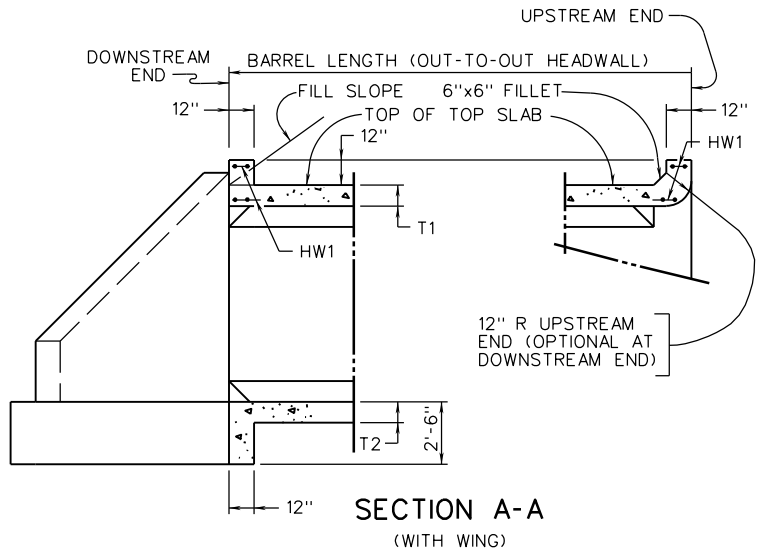
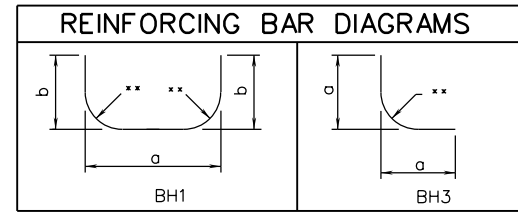
**SINGLE BOX CULVERTS
STANDARD DETAILS**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE



END ELEVATION



SPECIFICATION REFERENCE

SINGLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

REVISION DATE
07/11

SHEET 2 OF 2

1002.02


2016 ROAD & BRIDGE STANDARDS

BCS-02

FOR TYPICAL SECTION. NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS	
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)							SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C			LENGTH
3	3	8 1/2"	8 1/2"	8"	2	2'-0"	4	2'-0"	1	1'-0"	4	12"	4'-0"	2'-8 1/2"	8'-11"	5	12"	4'-0"	4	12"	2'-6"	4'-9"	4	12"	4'-1"	18	8
3	4	8 1/2"	8 1/2"	8"	2	2'-0"	4	2'-0"	2	2'-0"	4	12"	4'-0"	3'-2 1/2"	9'-11"	6	12"	4'-0"	--	--	--	--	4	12"	5'-1"	18	12
4	3	9"	9"	8"	3	3'-0"	6	3'-0"	1	1'-0"	4	12"	5'-0"	2'-9"	10'-0"	6	12"	5'-0"	--	--	--	--	4	10 1/2"	4'-2"	23	8
4	4	9"	9"	8"	3	3'-0"	6	3'-0"	2	2'-0"	4	12"	5'-0"	3'-3"	11'-0"	6	12"	5'-0"	--	--	--	--	4	12"	5'-2"	23	12
4	5	9"	9"	8"	3	3'-0"	6	3'-0"	3	3'-0"	4	12"	5'-0"	3'-9"	12'-0"	6	12"	5'-0"	--	--	--	--	4	12"	6'-2"	23	16
4	6	9"	9"	8"	3	3'-0"	6	3'-0"	4	4'-0"	4	11"	5'-0"	4'-3"	13'-0"	6	11"	5'-0"	--	--	--	--	4	12"	7'-2"	23	20
5	3	9 1/4"	9 1/4"	8"	4	4'-0"	8	4'-0"	1	1'-0"	4	11"	6'-0"	2'-9 1/4"	11'-0"	6	11"	6'-0"	--	--	--	--	4	12"	4'-2"	28	8
5	4	9 1/4"	9 1/4"	8"	4	4'-0"	8	4'-0"	2	2'-0"	4	11"	6'-0"	3'-3 1/4"	12'-0"	6	11"	6'-0"	--	--	--	--	4	12"	5'-2"	28	12
5	5	9 1/4"	9 1/4"	8"	4	4'-0"	8	4'-0"	3	3'-0"	4	10"	6'-0"	3'-9 1/4"	13'-0"	6	10"	6'-0"	--	--	--	--	4	12"	6'-2"	28	16
5	6	9"	9"	8"	4	4'-0"	8	4'-0"	4	4'-0"	4	10"	6'-0"	4'-3"	14'-0"	6	10"	6'-0"	--	--	--	--	4	12"	7'-2"	28	20
5	7	9"	9"	8"	4	4'-0"	8	4'-0"	5	5'-0"	4	9"	6'-0"	4'-9"	15'-0"	6	9"	6'-0"	--	--	--	--	4	12"	8'-2"	28	24
6	4	9 1/4"	9 1/4"	8"	5	5'-0"	10	5'-0"	2	2'-0"	4	9"	7'-0"	3'-3 1/4"	13'-0"	6	9"	7'-0"	--	--	--	--	4	12"	5'-2"	33	12
6	5	9 1/4"	9 1/4"	8"	5	5'-0"	10	5'-0"	3	3'-0"	4	9"	7'-0"	3'-9 1/4"	14'-0"	6	9"	7'-0"	--	--	--	--	4	12"	6'-2"	33	16
6	6	9 1/4"	9 1/4"	8"	5	5'-0"	10	5'-0"	4	4'-0"	4	9"	7'-0"	4'-3 1/4"	15'-0"	6	9"	7'-0"	--	--	--	--	4	12"	7'-2"	33	20
6	7	9 1/4"	9 1/4"	8"	5	5'-0"	10	5'-0"	5	5'-0"	4	8"	7'-0"	4'-9 1/4"	16'-0"	6	8"	7'-0"	--	--	--	--	4	12"	8'-2"	33	24
6	8	9 1/4"	9 1/4"	8"	5	5'-0"	10	5'-0"	6	6'-0"	4	12"	7'-0"	5'-3 1/4"	17'-0"	8	12"	7'-0"	4	12"	3'-3"	6'-4"	4	12"	9'-2"	33	28
7	4	9 1/2"	9 1/2"	8"	6	6'-0"	12	6'-0"	2	2'-0"	4	9"	8'-0"	3'-3 1/2"	14'-1"	6	9"	8'-0"	--	--	--	--	4	12"	5'-3"	38	12
7	6	9 1/2"	9 1/2"	8"	6	6'-0"	12	6'-0"	4	4'-0"	4	8"	8'-0"	4'-3 1/2"	16'-1"	6	8"	8'-0"	--	--	--	--	4	12"	7'-3"	38	20
7	8	9 1/2"	9 1/2"	8"	6	6'-0"	12	6'-0"	6	6'-0"	4	7"	8'-0"	5'-3 1/2"	18'-1"	6	7"	8'-0"	--	--	--	--	4	12"	9'-3"	38	28
7	10	9 1/2"	9 1/2"	8"	6	6'-0"	12	6'-0"	8	8'-0"	4	6"	8'-0"	6'-3 1/2"	20'-1"	6	6"	8'-0"	--	--	--	--	4	12"	11'-3"	38	36
8	4	9 3/4"	9 3/4"	8"	7	7'-0"	14	7'-0"	2	2'-0"	4	8"	9'-0"	3'-3 3/4"	15'-1"	6	8"	9'-0"	--	--	--	--	4	12"	5'-3"	43	12
8	6	9 3/4"	9 3/4"	8"	7	7'-0"	14	7'-0"	4	4'-0"	5	12"	9'-0"	4'-3 3/4"	17'-0"	8	12"	9'-0"	3	12"	3'-6"	6'-10"	4	12"	7'-3"	43	20
8	8	9 3/4"	9 3/4"	8"	7	7'-0"	14	7'-0"	6	6'-0"	5	7"	9'-0"	5'-3 3/4"	19'-0"	6	7"	9'-0"	--	--	--	--	5	12"	9'-3"	43	28
8	10	9 1/2"	9 1/2"	8"	7	7'-0"	14	7'-0"	8	8'-0"	4	9"	9'-0"	6'-3 1/2"	21'-1"	8	9"	9'-0"	4	9"	3'-7"	6'-11"	4	12"	11'-3"	43	36
9	4	9 3/4"	9 3/4"	8"	8	8'-0"	16	8'-0"	2	2'-0"	6	12"	10'-0"	3'-7 1/4"	16'-4"	8	12"	10'-0"	5	12"	3'-11"	7'-5"	4	12"	5'-3"	48	12
9	6	9 3/4"	9 3/4"	8"	8	8'-0"	16	8'-0"	4	4'-0"	5	7"	10'-0"	4'-3 3/4"	18'-0"	6	7"	10'-0"	--	--	--	--	4	12"	7'-3"	48	20
9	8	9 3/4"	9 3/4"	8"	8	8'-0"	16	8'-0"	6	6'-0"	4	6"	10'-0"	5'-3 3/4"	20'-1"	6	6"	10'-0"	--	--	--	--	4	12"	9'-3"	48	28
9	10	9 3/4"	9 3/4"	8"	8	8'-0"	16	8'-0"	8	8'-0"	5	10 1/2"	10'-0"	6'-3 3/4"	22'-0"	8	10 1/2"	10'-0"	3	10 1/2"	3'-8"	7'-3"	4	12"	11'-3"	48	36
9	12	9 3/4"	9 3/4"	8"	8	8'-0"	16	8'-0"	10	10'-0"	5	8"	10'-0"	7'-3 3/4"	24'-0"	8	8"	10'-0"	4	8"	4'-1"	7'-11"	5	11 1/2"	13'-3"	48	44
10	4	10"	10"	8"	9	9'-0"	18	9'-0"	2	2'-0"	4	7"	11'-0"	3'-6"	17'-6"	6	7"	11'-0"	4	7"	3'-10"	7'-5"	4	12"	5'-4"	53	12
10	6	10"	10"	8"	9	9'-0"	18	9'-0"	4	4'-0"	5	10"	11'-0"	4'-9"	19'-10"	7	10"	11'-0"	--	--	--	--	4	12"	7'-4"	53	20
10	8	10"	10"	8"	9	9'-0"	18	9'-0"	6	6'-0"	5	10"	11'-0"	5'-9"	21'-10"	8	10"	11'-0"	3	10"	3'-10"	7'-5"	4	12"	9'-4"	53	28
10	10	10"	10"	8"	9	9'-0"	18	9'-0"	8	8'-0"	4	8"	11'-0"	6'-6"	23'-6"	7	8"	11'-0"	4	8"	3'-10"	7'-5"	4	12"	11'-4"	53	36
10	12	10"	10"	8"	9	9'-0"	18	9'-0"	10	10'-0"	4	7"	11'-0"	7'-6"	25'-6"	8	7"	11'-0"	4	7"	4'-1"	7'-11"	5	12"	13'-4"	53	44
12	6	10 1/4"	10 1/4"	8"	11	11'-0"	22	11'-0"	4	4'-0"	6	9"	13'-0"	5'-0"	22'-3"	8	9"	13'-0"	4	9"	4'-3"	8'-5"	4	12"	7'-5"	63	20
12	8	10"	10"	8"	11	11'-0"	22	11'-0"	6	6'-0"	5	8"	13'-0"	5'-9"	23'-10"	8	8"	13'-0"	3	8"	4'-3"	8'-5"	4	12"	9'-4"	63	28
12	10	10"	10"	8"	11	11'-0"	22	11'-0"	8	8'-0"	5	7"	13'-0"	6'-9"	25'-10"	7	7"	13'-0"	--	--	--	--	4	12"	11'-4"	63	36
12	12	10 1/4"	10 1/4"	8"	11	11'-0"	22	11'-0"	10	10'-0"	5	8"	13'-0"	7'-9"	27'-11"	8	8"	13'-0"	4	8"	4'-3"	8'-5"	5	12"	13'-5"	63	44

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 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1002.03	07/11

SINGLE BOX CULVERTS
 0 TO 2 FT. FILLS
 VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH	LENGTH					
3	3	17.854	0.413	54.850	5'-10"	6	5'- 6"	1.041	33.044	1.045	33.044	A	
3	4	19.266	0.463	48.592	5'-10"	6	5'- 6"	1.134	33.044	1.137	33.044	C	
4	3	22.029	0.482	53.114	6'-10"	6	6'- 6"	1.142	39.052	1.149	39.052	A	
4	4	23.441	0.531	56.495	6'-10"	6	6'- 6"	1.235	39.052	1.242	39.052	C	
4	5	24.853	0.580	60.671	6'-10"	6	6'- 6"	1.328	39.052	1.335	39.052	E	
4	6	26.265	0.629	67.791	6'-10"	6	6'- 6"	1.420	39.052	1.427	39.052	G	
5	3	26.204	0.547	62.973	7'-10"	6	7'- 6"	1.259	45.060	1.269	45.060	B	
5	4	27.616	0.596	67.271	7'-10"	6	7'- 6"	1.351	45.060	1.362	45.060	D	
5	5	29.028	0.645	75.429	7'-10"	6	7'- 6"	1.444	45.060	1.455	45.060	F	
5	6	30.440	0.684	79.872	7'-10"	6	7'- 6"	1.518	45.060	1.529	45.060	G	
5	7	31.852	0.732	89.391	7'-10"	6	7'- 6"	1.611	45.060	1.621	45.060	I	
6	4	31.791	0.652	84.653	8'-10"	6	8'- 6"	1.449	51.068	1.463	51.068	D	
6	5	33.203	0.701	89.275	8'-10"	6	8'- 6"	1.542	51.068	1.555	51.068	F	
6	6	34.615	0.750	93.896	8'-10"	6	8'- 6"	1.634	51.068	1.648	51.068	H	
6	7	36.027	0.798	105.585	8'-10"	6	8'- 6"	1.727	51.068	1.741	51.068	J	
6	8	37.439	0.846	124.695	8'-10"	6	8'- 6"	1.820	51.068	1.833	51.068	L	
7	4	35.966	0.721	94.040	9'-10"	6	9'- 6"	1.545	57.076	1.562	57.076	D	
7	6	38.790	0.818	110.869	9'-10"	6	9'- 6"	1.730	57.076	1.747	57.076	H	
7	8	41.614	0.916	130.884	9'-10"	6	9'- 6"	1.915	57.076	1.933	57.076	L	
7	10	44.438	1.012	155.677	9'-10"	6	9'- 6"	2.101	57.076	2.118	57.076	P	
8	4	40.141	0.793	111.031	10'-10"	6	10'- 6"	1.639	63.084	1.659	63.084	D	
8	6	42.965	0.889	142.409	10'-10"	6	10'- 6"	1.824	63.084	1.845	63.084	H	
8	8	45.789	0.985	175.199	10'-10"	6	10'- 6"	2.010	63.084	2.030	63.084	L	
8	10	48.613	1.069	188.158	10'-10"	6	10'- 6"	2.197	63.084	2.218	63.084	P	
9	4	44.316	0.848	179.518	11'-10"	6	11'- 6"	1.735	69.092	1.758	69.092	D	
9	6	47.140	0.948	159.791	11'-10"	6	11'- 6"	1.920	69.092	1.944	69.092	H	
9	8	49.964	1.046	168.693	11'-10"	6	11'- 6"	2.105	69.092	2.129	69.092	L	
9	10	52.788	1.143	189.675	11'-10"	6	11'- 6"	2.291	69.092	2.315	69.092	P	
9	12	55.612	1.236	269.973	11'-10"	6	11'- 6"	2.476	69.092	2.500	69.092	T	
10	4	48.491	0.925	180.133	12'-10"	6	12'- 6"	1.826	75.100	1.853	75.100	D	
10	6	51.315	1.026	158.894	12'-10"	6	12'- 6"	2.012	75.100	2.039	75.100	H	
10	8	54.139	1.121	200.152	12'-10"	6	12'- 6"	2.197	75.100	2.224	75.100	L	
10	10	56.963	1.219	212.453	12'-10"	6	12'- 6"	2.383	75.100	2.410	75.100	P	
10	12	59.787	1.313	279.378	12'-10"	6	12'- 6"	2.568	75.100	2.595	75.100	T	
12	6	59.665	1.161	275.345	14'-10"	6	14'- 6"	2.197	87.116	2.230	87.116	H	
12	8	62.489	1.239	268.938	14'-10"	6	14'- 6"	2.387	87.116	2.421	87.116	L	
12	10	65.313	1.339	258.134	14'-10"	6	14'- 6"	2.573	87.116	2.606	87.116	P	
12	12	68.137	1.454	318.809	14'-10"	6	14'- 6"	2.753	87.116	2.786	87.116	T	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<h2 style="margin: 0;">SINGLE BOX CULVERTS</h2> <h3 style="margin: 0;">0 TO 2 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE	SHEET 2 OF 2
		07/11	1002.04


2016 ROAD & BRIDGE STANDARDS

BCS-05

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS	
											SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C			LENGTH
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	12"	4'-0"	2'-8"	8'-10"	4	12"	4'-0"	--	--	----	----	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	12"	4'-0"	3'-2"	9'-10"	4	12"	4'-0"	--	--	----	----	4	12"	5'-0"	16	12
4	3	8"	8"	8"	3	3'-0"	3	3'-0"	1	1'-0"	4	12"	5'-0"	2'-8"	9'-10"	5	12"	5'-0"	--	--	----	----	4	12"	4'-0"	20	8
4	4	8"	8"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	12"	5'-0"	3'-2"	10'-10"	5	12"	5'-0"	--	--	----	----	4	12"	5'-0"	20	12
4	5	8"	8"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	12"	5'-0"	3'-8"	11'-10"	5	12"	5'-0"	--	--	----	----	4	12"	6'-0"	20	16
4	6	8"	8"	8"	3	3'-0"	3	3'-0"	4	4'-0"	4	12"	5'-0"	4'-2"	12'-10"	5	12"	5'-0"	--	--	----	----	4	12"	7'-0"	20	20
5	3	8"	8"	8"	4	4'-0"	4	4'-0"	1	1'-0"	4	12"	6'-0"	2'-8"	10'-10"	5	12"	6'-0"	4	12"	2'-6"	4'-9"	4	12"	4'-0"	24	8
5	4	8"	8"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	12"	6'-0"	3'-2"	11'-10"	5	12"	6'-0"	--	--	----	----	4	12"	5'-0"	24	12
5	5	8"	8"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	12"	6'-0"	3'-8"	12'-10"	5	12"	6'-0"	--	--	----	----	4	12"	6'-0"	24	16
5	6	8"	8"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	12"	6'-0"	4'-2"	13'-10"	6	12"	6'-0"	--	--	----	----	4	12"	7'-0"	24	20
5	7	8"	8"	8"	4	4'-0"	4	4'-0"	5	5'-0"	4	12"	6'-0"	4'-8"	14'-10"	6	12"	6'-0"	--	--	----	----	4	12"	8'-0"	24	24
6	4	8"	8"	8"	5	5'-0"	5	5'-0"	2	2'-0"	5	12"	7'-0"	3'-2"	12'-8"	6	12"	7'-0"	--	--	----	----	4	12"	5'-0"	28	12
6	5	8"	8"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	12"	7'-0"	3'-8"	13'-10"	6	12"	7'-0"	4	12"	2'-8 ³ / ₈ "	5'-2"	4	12"	6'-0"	28	16
6	6	8"	8"	8"	5	5'-0"	5	5'-0"	4	4'-0"	4	12"	7'-0"	4'-2"	14'-10"	6	12"	7'-0"	4	12"	2'-8 ³ / ₈ "	5'-2"	4	12"	7'-0"	28	20
6	7	8"	8"	8"	5	5'-0"	5	5'-0"	5	5'-0"	4	10"	7'-0"	4'-8"	15'-10"	6	10"	7'-0"	4	10"	2'-11"	5'-8"	4	12"	8'-0"	28	24
6	8	8"	8"	8"	5	5'-0"	5	5'-0"	6	6'-0"	4	9"	7'-0"	5'-2"	16'-10"	6	9"	7'-0"	4	9"	3'-2"	6'-2"	4	12"	9'-0"	28	28
7	4	8"	8"	8"	6	6'-0"	6	6'-0"	2	2'-0"	5	11"	8'-0"	3'-2"	13'-8"	6	11"	8'-0"	--	--	----	----	4	12"	5'-0"	32	12
7	6	8"	8"	8"	6	6'-0"	6	6'-0"	4	4'-0"	4	9"	8'-0"	4'-2"	15'-10"	6	9"	8'-0"	4	9"	2'-10 ³ / ₄ "	5'-6"	4	12"	7'-0"	32	20
7	8	8"	8"	8"	6	6'-0"	6	6'-0"	6	6'-0"	4	8"	8'-0"	5'-2"	17'-10"	6	8"	8'-0"	3	8"	3'-2"	6'-2"	4	12"	9'-0"	32	28
7	10	8"	8"	8"	6	6'-0"	6	6'-0"	8	8'-0"	5	6"	8'-0"	6'-2"	19'-8"	6	6"	8'-0"	--	--	----	----	5	12"	11'-0"	32	36
8	4	8"	8"	8"	7	7'-0"	7	7'-0"	2	2'-0"	5	9"	9'-0"	3'-2"	14'-8"	6	9"	9'-0"	3	9"	3'-2"	6'-2"	4	11 ¹ / ₂ "	5'-0"	36	12
8	6	8"	8"	8"	7	7'-0"	7	7'-0"	4	4'-0"	4	8"	9'-0"	4'-2"	16'-10"	6	8"	9'-0"	4	8"	3'-2"	6'-2"	4	12"	7'-0"	36	20
8	8	8"	8"	8"	7	7'-0"	7	7'-0"	6	6'-0"	5	7"	9'-0"	5'-2"	18'-8"	6	7"	9'-0"	--	--	----	----	4	12"	9'-0"	36	28
8	10	8"	8"	8"	7	7'-0"	7	7'-0"	8	8'-0"	5	11"	9'-0"	6'-2"	20'-8"	8	11"	9'-0"	4	11"	3'-6"	6'-9"	5	12"	11'-0"	36	36
9	4	8"	8"	8"	8	8'-0"	8	8'-0"	2	2'-0"	5	8"	10'-0"	3'-2"	15'-8"	6	8"	10'-0"	3	8"	3'-3 ³ / ₈ "	6'-5"	4	8"	5'-0"	40	12
9	6	8"	8"	8"	8	8'-0"	8	8'-0"	4	4'-0"	4	7"	10'-0"	4'-2"	17'-10"	6	7"	10'-0"	4	7"	3'-3 ³ / ₈ "	6'-4"	4	11"	7'-0"	40	20
9	8	8 ¹ / ₄ "	8 ¹ / ₄ "	8"	8	8'-0"	8	8'-0"	6	6'-0"	5	10 ¹ / ₂ "	10'-0"	5'-2 ¹ / ₄ "	19'-9"	8	10 ¹ / ₂ "	10'-0"	3	10 ¹ / ₂ "	3'-3 ³ / ₈ "	6'-5"	4	12"	9'-0"	40	28
9	10	8"	8"	8"	8	8'-0"	8	8'-0"	8	8'-0"	5	10"	10'-0"	6'-2"	21'-8"	8	10"	10'-0"	4	10"	3'-6"	6'-9"	5	12"	11'-0"	40	36
9	12	8 ¹ / ₄ "	8 ¹ / ₄ "	8"	8	8'-0"	8	8'-0"	10	10'-0"	5	9 ¹ / ₂ "	10'-0"	7'-2 ¹ / ₄ "	23'-9"	8	9 ¹ / ₂ "	10'-0"	3	9 ¹ / ₂ "	3'-11"	7'-9"	6	11 ¹ / ₂ "	13'-0"	40	44
10	4	8 ³ / ₄ "	8 ³ / ₄ "	8"	9	9'-0"	9	9'-0"	2	2'-0"	6	7"	11'-0"	3'-2 ³ / ₄ "	16'-8"	6	7"	11'-0"	--	--	----	----	5	9 ¹ / ₂ "	5'-2"	44	12
10	6	8 ³ / ₄ "	8 ³ / ₄ "	8"	9	9'-0"	9	9'-0"	4	4'-0"	6	10"	11'-0"	4'-2 ³ / ₄ "	18'-8"	8	10"	11'-0"	--	--	----	----	4	9"	7'-2"	44	20
10	8	8 ³ / ₄ "	8 ³ / ₄ "	8"	9	9'-0"	9	9'-0"	6	6'-0"	6	6"	11'-0"	5'-2 ³ / ₄ "	20'-8"	6	6"	11'-0"	--	--	----	----	4	10"	9'-2"	44	28
10	10	8 ³ / ₄ "	8 ³ / ₄ "	8"	9	9'-0"	9	9'-0"	8	8'-0"	6	9 ¹ / ₂ "	11'-0"	6'-2 ³ / ₄ "	22'-8"	8	9 ¹ / ₂ "	11'-0"	3	9 ¹ / ₂ "	3'-6"	6'-10"	4	9"	11'-2"	44	36
10	12	9 ¹ / ₄ "	9 ¹ / ₄ "	8"	9	9'-0"	9	9'-0"	10	10'-0"	5	8 ¹ / ₂ "	11'-0"	7'-3 ¹ / ₄ "	24'-11"	8	8 ¹ / ₂ "	11'-0"	4	8 ¹ / ₂ "	4'-1"	7'-11"	6	12"	13'-2"	44	44
12	6	9 ¹ / ₂ "	9 ¹ / ₂ "	8"	11	11'-0"	11	11'-0"	4	4'-0"	6	8"	13'-0"	4'-3 ¹ / ₂ "	20'-9"	7	8"	13'-0"	4	8"	3'-10 ³ / ₄ "	7'-6"	4	6 ¹ / ₂ "	7'-3"	52	20
12	8	9 ³ / ₄ "	9 ³ / ₄ "	8"	11	11'-0"	11	11'-0"	6	6'-0"	6	8"	13'-0"	5'-7 ¹ / ₄ "	23'-4"	8	8"	13'-0"	3	8"	3'-10 ³ / ₄ "	7'-7"	4	8 ¹ / ₂ "	9'-3"	52	28
12	10	9 ³ / ₄ "	9 ³ / ₄ "	8"	11	11'-0"	11	11'-0"	8	8'-0"	5	8"	13'-0"	6'-3 ³ / ₄ "	25'-0"	8	8"	13'-0"	4	8"	3'-10 ³ / ₄ "	7'-6"	4	12"	11'-3"	52	36
12	12	10 ¹ / ₂ "	10 ¹ / ₂ "	8"	11	11'-0"	11	11'-0"	10	10'-0"	6	7"	13'-0"	7'-8"	27'-7"	8	7"	13'-0"	--	--	----	----	6	12"	13'-5"	52	44

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1002.05	07/11


SINGLE BOX CULVERTS
2 TO 5 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH	LENGTH					
3	3	16.184	0.401	36.185	5'-10"	6	5'- 6"	1.038	33.044	1.042	33.044	A	
3	4	17.596	0.450	40.361	5'-10"	6	5'- 6"	1.131	33.044	1.134	33.044	C	
4	3	19.524	0.450	45.279	6'-10"	6	6'- 6"	1.139	39.052	1.146	39.052	A	
4	4	20.936	0.499	49.455	6'-10"	6	6'- 6"	1.232	39.052	1.239	39.052	C	
4	5	22.348	0.548	53.631	6'-10"	6	6'- 6"	1.324	39.052	1.332	39.052	E	
4	6	23.760	0.597	57.807	6'-10"	6	6'- 6"	1.417	39.052	1.424	39.052	G	
5	3	22.864	0.498	64.065	7'-10"	6	7'- 6"	1.240	45.060	1.251	45.060	A	
5	4	24.276	0.548	55.549	7'-10"	6	7'- 6"	1.333	45.060	1.343	45.060	C	
5	5	25.688	0.597	59.725	7'-10"	6	7'- 6"	1.426	45.060	1.436	45.060	E	
5	6	27.100	0.645	69.409	7'-10"	6	7'- 6"	1.518	45.060	1.529	45.060	G	
5	7	28.512	0.695	73.585	7'-10"	6	7'- 6"	1.611	45.060	1.621	45.060	I	
6	4	27.616	0.595	77.347	8'-10"	6	8'- 6"	1.434	51.068	1.448	51.068	C	
6	5	29.028	0.644	86.051	8'-10"	6	8'- 6"	1.527	51.068	1.541	51.068	E	
6	6	30.440	0.693	90.227	8'-10"	6	8'- 6"	1.620	51.068	1.633	51.068	G	
6	7	31.852	0.741	109.627	8'-10"	6	8'- 6"	1.712	51.068	1.726	51.068	I	
6	8	33.264	0.789	124.645	8'-10"	6	8'- 6"	1.805	51.068	1.819	51.068	K	
7	4	30.956	0.644	89.885	9'-10"	6	9'- 6"	1.535	57.076	1.552	57.076	C	
7	6	33.780	0.741	118.090	9'-10"	6	9'- 6"	1.721	57.076	1.738	57.076	G	
7	8	36.604	0.838	132.362	9'-10"	6	9'- 6"	1.906	57.076	1.923	57.076	K	
7	10	39.428	0.933	190.758	9'-10"	6	9'- 6"	2.092	57.076	2.109	57.076	O	
8	4	34.296	0.691	126.785	10'-10"	6	10'- 6"	1.636	63.084	1.657	63.084	C	
8	6	37.120	0.788	142.648	10'-10"	6	10'- 6"	1.822	63.084	1.842	63.084	G	
8	8	39.944	0.886	159.699	10'-10"	6	10'- 6"	2.007	63.084	2.028	63.084	K	
8	10	42.768	0.983	183.378	10'-10"	6	10'- 6"	2.193	63.084	2.213	63.084	O	
9	4	37.636	0.738	149.809	11'-10"	6	11'- 6"	1.738	69.092	1.761	69.092	C	
9	6	40.460	0.836	165.793	11'-10"	6	11'- 6"	1.923	69.092	1.947	69.092	G	
9	8	43.284	0.950	168.414	11'-10"	6	11'- 6"	2.105	69.092	2.129	69.092	K	
9	10	46.108	1.030	206.737	11'-10"	6	11'- 6"	2.294	69.092	2.318	69.092	O	
9	12	48.932	1.143	231.984	11'-10"	6	11'- 6"	2.476	69.092	2.500	69.092	S	
10	4	40.976	0.837	189.993	12'-10"	6	12'- 6"	1.827	75.100	1.854	75.100	C	
10	6	43.800	0.936	187.456	12'-10"	6	12'- 6"	2.013	75.100	2.040	75.100	G	
10	8	46.624	1.030	244.869	12'-10"	6	12'- 6"	2.198	75.100	2.225	75.100	K	
10	10	49.448	1.130	239.860	12'-10"	6	12'- 6"	2.383	75.100	2.411	75.100	O	
10	12	52.272	1.261	276.287	12'-10"	6	12'- 6"	2.580	75.100	2.607	75.100	T	
12	6	50.480	1.100	263.413	14'-10"	6	14'- 6"	2.213	87.116	2.246	87.116	H	
12	8	53.304	1.218	286.836	14'-10"	6	14'- 6"	2.393	87.116	2.426	87.116	L	
12	10	56.128	1.317	275.717	14'-10"	6	14'- 6"	2.578	87.116	2.612	87.116	P	
12	12	58.952	1.472	350.844	14'-10"	6	14'- 6"	2.747	87.116	2.781	87.116	T	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<h1>SINGLE BOX CULVERTS</h1> <h2>2 TO 5 FT. FILLS</h2> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/11	SHEET 2 OF 2 1002.06

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN (FT.)	HIGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS	
											SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C			LENGTH
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	12"	4'-0"	2'-8"	8'-10"	4	12"	4'-0"	--	--	----	----	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	12"	4'-0"	3'-2"	9'-10"	4	12"	4'-0"	--	--	----	----	4	12"	5'-0"	16	12
4	3	8"	8"	8"	3	3'-0"	3	3'-0"	1	1'-0"	4	11 1/2"	5'-0"	2'-8"	9'-10"	4	11 1/2"	5'-0"	--	--	----	----	4	12"	4'-0"	20	8
4	4	8"	8"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	11"	5'-0"	3'-2"	10'-10"	4	11"	5'-0"	--	--	----	----	4	12"	5'-0"	20	12
4	5	8"	8"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	12"	5'-0"	3'-8"	11'-10"	5	12"	5'-0"	3	12"	2'-3 5/8"	4'-5"	4	12"	6'-0"	20	16
4	6	8"	8"	8"	3	3'-0"	3	3'-0"	4	4'-0"	4	12"	5'-0"	4'-2"	12'-10"	5	12"	5'-0"	3	12"	2'-9"	5'-5"	4	12"	7'-0"	20	20
5	3	8"	8"	8"	4	4'-0"	4	4'-0"	1	1'-0"	4	12"	6'-0"	2'-8"	10'-10"	5	12"	6'-0"	--	--	----	----	4	12"	4'-0"	24	8
5	4	8"	8"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	11 1/2"	6'-0"	3'-2"	11'-10"	5	11 1/2"	6'-0"	--	--	----	----	4	12"	5'-0"	24	12
5	5	8"	8"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	11"	6'-0"	3'-8"	12'-10"	5	11"	6'-0"	--	--	----	----	4	12"	6'-0"	24	16
5	6	8"	8"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	10 1/2"	6'-0"	4'-2"	13'-10"	5	10 1/2"	6'-0"	--	--	----	----	4	12"	7'-0"	24	20
5	7	8"	8"	8"	4	4'-0"	4	4'-0"	5	5'-0"	4	10"	6'-0"	4'-8"	14'-10"	5	10"	6'-0"	--	--	----	----	4	12"	8'-0"	24	24
6	4	8"	8"	8"	5	5'-0"	5	5'-0"	2	2'-0"	4	9 1/2"	7'-0"	3'-2"	12'-10"	5	9 1/2"	7'-0"	--	--	----	----	4	12"	5'-0"	28	12
6	5	8"	8"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	11 1/2"	7'-0"	3'-8"	13'-10"	6	11 1/2"	7'-0"	4	11 1/2"	2'-8 3/8"	5'-2"	4	12"	6'-0"	28	16
6	6	8"	8"	8"	5	5'-0"	5	5'-0"	4	4'-0"	4	11"	7'-0"	4'-2"	14'-10"	6	11"	7'-0"	3	11"	2'-8 3/8"	5'-2"	4	12"	7'-0"	28	20
6	7	8"	8"	8"	5	5'-0"	5	5'-0"	5	5'-0"	4	10 1/2"	7'-0"	4'-8"	15'-10"	6	10 1/2"	7'-0"	3	10 1/2"	2'-11"	5'-8"	4	12"	8'-0"	28	24
6	8	8"	8"	8"	5	5'-0"	5	5'-0"	6	6'-0"	4	10"	7'-0"	5'-2"	16'-10"	6	10"	7'-0"	4	10"	3'-2"	6'-2"	5	12"	9'-0"	28	28
7	4	8"	8"	8"	6	6'-0"	6	6'-0"	2	2'-0"	5	10"	8'-0"	3'-2"	13'-8"	6	10"	8'-0"	3	10"	2'-10 3/4"	5'-7"	4	9"	5'-0"	32	12
7	6	8"	8"	8"	6	6'-0"	6	6'-0"	4	4'-0"	4	9"	8'-0"	4'-2"	15'-10"	6	9"	8'-0"	3	9"	2'-10 3/4"	5'-7"	4	12"	7'-0"	32	20
7	8	8"	8"	8"	6	6'-0"	6	6'-0"	6	6'-0"	4	8 1/2"	8'-0"	5'-2"	17'-10"	6	8 1/2"	8'-0"	3	8 1/2"	3'-2"	6'-2"	4	12"	9'-0"	32	28
7	10	8"	8"	8"	6	6'-0"	6	6'-0"	8	8'-0"	4	7 1/2"	8'-0"	6'-2"	19'-10"	6	7 1/2"	8'-0"	3	7 1/2"	3'-6"	6'-9"	5	9"	11'-0"	32	36
8	4	8"	8"	8"	7	7'-0"	7	7'-0"	2	2'-0"	5	8 1/2"	9'-0"	3'-2"	14'-8"	6	8 1/2"	9'-0"	3	8 1/2"	3'-2"	6'-2"	4	6"	5'-0"	36	12
8	6	8"	8"	8"	7	7'-0"	7	7'-0"	4	4'-0"	4	7 1/2"	9'-0"	4'-2"	16'-10"	6	7 1/2"	9'-0"	3	7 1/2"	3'-2"	6'-2"	4	9"	7'-0"	36	20
8	8	8"	8"	8"	7	7'-0"	7	7'-0"	6	6'-0"	4	7"	9'-0"	5'-2"	18'-10"	6	7"	9'-0"	3	7"	3'-2"	6'-2"	4	12"	9'-0"	36	28
8	10	8"	8"	8"	7	7'-0"	7	7'-0"	8	8'-0"	4	6 1/2"	9'-0"	6'-2"	20'-10"	6	6 1/2"	9'-0"	3	6 1/2"	3'-6"	6'-9"	5	9"	11'-0"	36	36
9	4	8"	8"	8"	8	8'-0"	8	8'-0"	2	2'-0"	5	7 1/2"	10'-0"	3'-2"	15'-8"	6	7 1/2"	10'-0"	3	7 1/2"	3'-3 5/8"	6'-5"	4	5 1/2"	5'-0"	40	12
9	6	8 1/4"	8 1/4"	8"	8	8'-0"	8	8'-0"	4	4'-0"	5	6 1/2"	10'-0"	4'-2 1/4"	17'-9"	6	6 1/2"	10'-0"	--	--	----	----	4	7 1/2"	7'-0"	40	20
9	8	8 1/4"	8 1/4"	8"	8	8'-0"	8	8'-0"	6	6'-0"	4	6"	10'-0"	5'-2 1/4"	19'-10"	6	6"	10'-0"	3	6"	3'-3 5/8"	6'-5"	4	10 1/2"	9'-0"	40	28
9	10	8 1/2"	8 1/2"	8"	8	8'-0"	8	8'-0"	8	8'-0"	5	7 1/2"	10'-0"	6'-2 1/2"	21'-9"	7	7 1/2"	10'-0"	3	7 1/2"	3'-6"	6'-9"	5	10"	11'-1"	40	36
9	12	9"	9"	8"	8	8'-0"	8	8'-0"	10	10'-0"	6	8 1/2"	10'-0"	7'-3"	23'-8"	8	8 1/2"	10'-0"	--	--	----	----	7	12"	13'-2"	40	44
10	4	8 1/4"	8 1/4"	8"	9	9'-0"	9	9'-0"	2	2'-0"	5	6 1/2"	11'-0"	3'-2 1/4"	16'-9"	6	6 1/2"	11'-0"	3	6 1/2"	3'-6"	6'-10"	5	6"	5'-0"	44	12
10	6	8 1/2"	8 1/2"	8"	9	9'-0"	9	9'-0"	4	4'-0"	6	7 1/2"	11'-0"	4'-2 1/2"	18'-7"	7	7 1/2"	11'-0"	--	--	----	----	4	6"	7'-1"	44	20
10	8	8 3/4"	8 3/4"	8"	9	9'-0"	9	9'-0"	6	6'-0"	4	5 1/2"	11'-0"	5'-2 3/4"	20'-11"	6	5 1/2"	11'-0"	3	5 1/2"	3'-6"	6'-10"	4	9"	9'-2"	44	28
10	10	9 1/4"	9 1/4"	8"	9	9'-0"	9	9'-0"	8	8'-0"	4	5"	11'-0"	6'-3 1/4"	23'-0"	6	5"	11'-0"	--	--	----	----	5	12"	11'-2"	44	36
10	12	9 1/4"	9 1/4"	10"	9	9'-0"	9	9'-0"	10	10'-0"	4	8"	11'-4"	7'-3 1/4"	25'-4"	8	8"	11'-0"	4	8"	4'-1"	7'-11"	6	12"	13'-2"	44	44
12	6	10 3/4"	10 3/4"	8"	11	11'-0"	11	11'-0"	4	4'-0"	6	7 1/2"	13'-0"	4'-4 3/4"	21'-0"	8	7 1/2"	13'-0"	3	7 1/2"	3'-10 3/4"	7'-7"	4	5 1/2"	7'-5"	52	20
12	8	10 3/4"	10 3/4"	8"	11	11'-0"	11	11'-0"	6	6'-0"	5	6"	13'-0"	5'-4 3/4"	23'-2"	7	6"	13'-0"	--	--	----	----	4	7 1/2"	9'-5"	52	28
12	10	11"	11"	8"	11	11'-0"	11	11'-0"	8	8'-0"	5	7"	13'-0"	6'-5"	25'-2"	8	7"	13'-0"	3	7"	3'-10 3/4"	7'-7"	4	10 1/2"	11'-6"	52	36
12	12	11 1/4"	11 1/4"	10"	11	11'-0"	11	11'-0"	10	10'-0"	5	6 1/2"	13'-4"	7'-5 1/4"	27'-7"	8	6 1/2"	13'-0"	3	6 1/2"	4'-2"	8'-1"	6	12"	13'-6"	52	44

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE
1002.07 07/11

SINGLE BOX CULVERTS
5 TO 10 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH	LENGTH					
3	3	16.184	0.401	36.185	5'-10"	6	5'- 6"	1.038	33.044	1.042	33.044	A	
3	4	17.596	0.450	40.361	5'-10"	6	5'- 6"	1.131	33.044	1.134	33.044	C	
4	3	19.524	0.450	42.391	6'-10"	6	6'- 6"	1.139	39.052	1.146	39.052	A	
4	4	20.936	0.499	47.628	6'-10"	6	6'- 6"	1.232	39.052	1.239	39.052	C	
4	5	22.348	0.547	60.274	6'-10"	6	6'- 6"	1.324	39.052	1.332	39.052	E	
4	6	23.760	0.596	67.580	6'-10"	6	6'- 6"	1.417	39.052	1.424	39.052	G	
5	3	22.864	0.499	51.373	7'-10"	6	7'- 6"	1.240	45.060	1.251	45.060	A	
5	4	24.276	0.548	56.781	7'-10"	6	7'- 6"	1.333	45.060	1.343	45.060	C	
5	5	25.688	0.597	62.422	7'-10"	6	7'- 6"	1.426	45.060	1.436	45.060	E	
5	6	27.100	0.646	68.330	7'-10"	6	7'- 6"	1.518	45.060	1.529	45.060	G	
5	7	28.512	0.694	74.544	7'-10"	6	7'- 6"	1.611	45.060	1.621	45.060	I	
6	4	27.616	0.596	69.998	8'-10"	6	8'- 6"	1.434	51.068	1.448	51.068	C	
6	5	29.028	0.644	88.369	8'-10"	6	8'- 6"	1.527	51.068	1.541	51.068	E	
6	6	30.440	0.693	88.612	8'-10"	6	8'- 6"	1.620	51.068	1.633	51.068	G	
6	7	31.852	0.742	98.634	8'-10"	6	8'- 6"	1.712	51.068	1.726	51.068	I	
6	8	33.264	0.790	122.571	8'-10"	6	8'- 6"	1.805	51.068	1.819	51.068	K	
7	4	30.956	0.643	107.920	9'-10"	6	9'- 6"	1.535	57.076	1.552	57.076	C	
7	6	33.780	0.741	109.692	9'-10"	6	9'- 6"	1.721	57.076	1.738	57.076	G	
7	8	36.604	0.839	126.917	9'-10"	6	9'- 6"	1.906	57.076	1.923	57.076	K	
7	10	39.428	0.935	165.192	9'-10"	6	9'- 6"	2.092	57.076	2.109	57.076	O	
8	4	34.296	0.690	138.922	10'-10"	6	10'- 6"	1.636	63.084	1.657	63.084	C	
8	6	37.120	0.788	140.651	10'-10"	6	10'- 6"	1.822	63.084	1.842	63.084	G	
8	8	39.944	0.886	154.019	10'-10"	6	10'- 6"	2.007	63.084	2.028	63.084	K	
8	10	42.768	0.982	190.266	10'-10"	6	10'- 6"	2.193	63.084	2.213	63.084	O	
9	4	37.636	0.737	161.601	11'-10"	6	11'- 6"	1.738	69.092	1.761	69.092	C	
9	6	40.460	0.851	173.018	11'-10"	6	11'- 6"	1.920	69.092	1.944	69.092	G	
9	8	43.284	0.949	183.366	11'-10"	6	11'- 6"	2.105	69.092	2.129	69.092	K	
9	10	46.108	1.061	226.058	11'-10"	6	11'- 6"	2.288	69.092	2.311	69.092	O	
9	12	48.932	1.188	275.274	11'-10"	6	11'- 6"	2.467	69.092	2.491	69.092	S	
10	4	40.976	0.801	199.247	12'-10"	6	12'- 6"	1.835	75.100	1.862	75.100	C	
10	6	43.800	0.916	217.106	12'-10"	6	12'- 6"	2.016	75.100	2.043	75.100	G	
10	8	46.624	1.033	211.738	12'-10"	6	12'- 6"	2.198	75.100	2.225	75.100	K	
10	10	49.448	1.166	223.119	12'-10"	6	12'- 6"	2.394	75.100	2.421	75.100	P	
10	12	52.272	1.429	253.959	12'-10"	6	12'- 6"	2.580	75.100	2.607	75.100	T	
12	6	50.480	1.201	294.130	14'-10"	6	14'- 6"	2.186	87.116	2.219	87.116	H	
12	8	53.304	1.301	268.332	14'-10"	6	14'- 6"	2.371	87.116	2.405	87.116	L	
12	10	56.128	1.419	294.385	14'-10"	6	14'- 6"	2.551	87.116	2.585	87.116	P	
12	12	58.952	1.705	351.150	14'-10"	6	14'- 6"	2.731	87.116	2.765	87.116	T	


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SPECIFICATION REFERENCE	<h2 style="margin: 0;">SINGLE BOX CULVERTS</h2> <h3 style="margin: 0;">5 TO 10 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/11	SHEET 2 OF 2 1002.08

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS	
											SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	LENGTH		
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	12"	4'-0"	2'-8"	8'-10"	5	12"	4'-0"	3	12"	2'-2"	4'-1"	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	12"	4'-0"	3'-2"	9'-10"	5	12"	4'-0"	--	---	-----	-----	4	12"	5'-0"	16	12
4	3	8"	8"	8"	3	3'-0"	3	3'-0"	1	1'-0"	4	10 1/2"	5'-0"	2'-8"	9'-10"	5	10 1/2"	5'-0"	--	---	-----	-----	4	12"	4'-0"	20	8
4	4	8"	8"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	10"	5'-0"	3'-2"	10'-10"	5	10"	5'-0"	--	---	-----	-----	4	12"	5'-0"	20	12
4	5	8"	8"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	9 1/2"	5'-0"	3'-8"	11'-10"	5	9 1/2"	5'-0"	--	---	-----	-----	4	12"	6'-0"	20	16
4	6	8"	8"	8"	3	3'-0"	3	3'-0"	4	4'-0"	4	9 1/2"	5'-0"	4'-2"	12'-10"	5	9 1/2"	5'-0"	--	---	-----	-----	4	12"	7'-0"	20	20
5	3	8"	8"	8"	4	4'-0"	4	4'-0"	1	1'-0"	5	10 1/2"	6'-0"	2'-10"	11'-1"	6	10 1/2"	6'-0"	--	---	-----	-----	4	9"	4'-0"	24	8
5	4	8"	8"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	10"	6'-0"	3'-2"	11'-10"	6	10"	6'-0"	3	10"	2'-6"	4'-10"	4	12"	5'-0"	24	12
5	5	8"	8"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	9 1/2"	6'-0"	3'-8"	12'-10"	6	9 1/2"	6'-0"	3	9 1/2"	2'-6"	4'-10"	4	12"	6'-0"	24	16
5	6	8"	8"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	9"	6'-0"	4'-2"	13'-10"	6	9"	6'-0"	--	---	-----	-----	4	12"	7'-0"	24	20
5	7	8"	8"	8"	4	4'-0"	4	4'-0"	5	5'-0"	4	9"	6'-0"	4'-8"	14'-10"	6	9"	6'-0"	--	---	-----	-----	5	12"	8'-0"	24	24
6	4	8 3/4"	8 3/4"	8"	5	5'-0"	5	5'-0"	2	2'-0"	5	8"	7'-0"	3'-5"	13'-2"	6	8"	7'-0"	--	---	-----	-----	4	9"	5'-2"	28	12
6	5	8 3/4"	8 3/4"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	8"	7'-0"	3'-9"	14'-0"	6	8"	7'-0"	3	8"	2'-9"	5'-3"	4	12"	6'-2"	28	16
6	6	8 3/4"	8 3/4"	8"	5	5'-0"	5	5'-0"	4	4'-0"	4	7 1/2"	7'-0"	4'-3"	15'-0"	6	7 1/2"	7'-0"	3	7 1/2"	2'-10"	5'-4"	4	12"	7'-2"	28	20
6	7	8 3/4"	8 3/4"	8"	5	5'-0"	5	5'-0"	5	5'-0"	4	7 1/2"	7'-0"	4'-9"	16'-0"	6	7 1/2"	7'-0"	3	7 1/2"	3'-0"	5'-9"	5	12"	8'-1"	28	24
6	8	8 3/4"	8 3/4"	8"	5	5'-0"	5	5'-0"	6	6'-0"	5	7"	7'-0"	5'-5"	17'-2"	6	7"	7'-0"	--	---	-----	-----	6	12"	9'-1"	28	28
7	4	9 3/4"	9 3/4"	8"	6	6'-0"	6	6'-0"	2	2'-0"	4	7"	8'-0"	3'-4"	14'-2"	6	7"	8'-0"	3	7"	2'-11"	5'-8"	4	7 1/2"	5'-3"	32	12
7	6	10"	10"	8"	6	6'-0"	6	6'-0"	4	4'-0"	4	6 1/2"	8'-0"	4'-4"	16'-2"	6	6 1/2"	8'-0"	--	---	-----	-----	4	12"	7'-4"	32	20
7	8	10"	10"	8"	6	6'-0"	6	6'-0"	6	6'-0"	5	6 1/2"	8'-0"	5'-6"	18'-5"	6	6 1/2"	8'-0"	--	---	-----	-----	5	12"	9'-4"	32	28
7	10	10"	10"	8"	6	6'-0"	6	6'-0"	8	8'-0"	5	7 1/2"	8'-0"	6'-6"	20'-5"	7	7 1/2"	8'-0"	3	7 1/2"	3'-8"	7'-2"	6	9 1/2"	11'-4"	32	36
8	4	10 3/4"	10 3/4"	8"	7	7'-0"	7	7'-0"	2	2'-0"	4	6"	9'-0"	3'-5"	15'-4"	6	6"	9'-0"	3	6"	3'-2"	6'-1"	4	6 1/2"	5'-5"	36	12
8	6	11"	11"	8"	7	7'-0"	7	7'-0"	4	4'-0"	5	7"	9'-0"	4'-8"	17'-7"	7	7"	9'-0"	--	---	-----	-----	4	11"	7'-6"	36	20
8	8	11 1/4"	11 1/4"	8"	7	7'-0"	7	7'-0"	6	6'-0"	5	9"	9'-0"	5'-8"	19'-7"	8	9"	9'-0"	3	9"	3'-5"	6'-7"	5	12"	9'-6"	36	28
8	10	11 1/4"	11 1/4"	8"	7	7'-0"	7	7'-0"	8	8'-0"	5	5 1/2"	9'-0"	6'-8"	21'-7"	6	5 1/2"	9'-0"	--	---	-----	-----	6	10 1/2"	11'-6"	36	36
9	4	12"	12"	8"	8	8'-0"	8	8'-0"	2	2'-0"	4	5 1/2"	10'-0"	3'-6"	16'-6"	6	5 1/2"	10'-0"	3	5 1/2"	3'-4"	6'-5"	4	6"	5'-8"	40	12
9	6	12 1/4"	12 1/4"	8"	8	8'-0"	8	8'-0"	4	4'-0"	5	8"	10'-0"	4'-9"	18'-9"	8	8"	10'-0"	--	---	-----	-----	4	10"	7'-9"	40	20
9	8	12 1/4"	12 1/4"	8"	8	8'-0"	8	8'-0"	6	6'-0"	4	6 1/2"	10'-0"	5'-7"	20'-7"	7	6 1/2"	10'-0"	3	6 1/2"	3'-6"	6'-9"	5	12"	9'-8"	40	28
9	10	12 1/2"	12 1/2"	8"	8	8'-0"	8	8'-0"	8	8'-0"	5	6"	10'-0"	6'-9"	22'-10"	7	6"	10'-0"	--	---	-----	-----	7	12"	11'-8"	40	36
9	12	12 1/2"	12 1/2"	9"	8	8'-0"	8	8'-0"	10	10'-0"	6	7 1/2"	10'-2"	7'-11"	25'-2"	8	7 1/2"	10'-1"	3	7 1/2"	4'-4"	8'-5"	5	5 1/2"	13'-8"	40	44
10	4	13"	13"	8"	9	9'-0"	9	9'-0"	2	2'-0"	5	6"	11'-0"	3'-9"	17'-11"	7	6"	11'-0"	--	---	-----	-----	4	5"	5'-10"	44	12
10	6	13"	13"	8"	9	9'-0"	9	9'-0"	4	4'-0"	5	7 1/2"	11'-0"	4'-9"	19'-11"	8	7 1/2"	11'-0"	3	7 1/2"	3'-6"	6'-10"	4	8"	7'-10"	44	20
10	8	13"	13"	8"	9	9'-0"	9	9'-0"	6	6'-0"	5	7 1/2"	11'-0"	5'-9"	21'-11"	8	7 1/2"	11'-0"	3	7 1/2"	3'-7"	6'-11"	4	12"	9'-10"	44	28
10	10	13"	13"	8"	9	9'-0"	9	9'-0"	8	8'-0"	5	5 1/2"	11'-0"	6'-9"	23'-11"	7	5 1/2"	11'-0"	--	---	-----	-----	6	12"	11'-10"	44	36
10	12	13"	13"	9"	9	9'-0"	9	9'-0"	10	10'-0"	7	7"	11'-2"	8'-3"	26'-7"	8	7"	11'-1"	--	---	-----	-----	5	6"	13'-10"	44	44
12	6	15"	15"	8"	11	11'-0"	11	11'-0"	4	4'-0"	5	6 1/2"	13'-0"	4'-11"	22'-3"	8	6 1/2"	13'-0"	--	---	-----	-----	4	6"	8'-2"	52	20
12	8	15 1/4"	15 1/4"	8"	11	11'-0"	11	11'-0"	6	6'-0"	6	6"	13'-0"	6'-2"	24'-5"	8	6"	13'-0"	--	---	-----	-----	4	10"	10'-3"	52	28
12	10	15 1/4"	15 1/4"	8"	11	11'-0"	11	11'-0"	8	8'-0"	4	6"	13'-0"	6'-10"	26'-1"	8	6"	13'-0"	4	6"	4'-2"	8'-0"	6	12"	12'-2"	52	36
12	12	15 1/4"	15 1/4"	9 1/2"	11	11'-0"	11	11'-0"	10	10'-0"	6	6"	13'-3"	8'-2"	28'-8"	8	6"	13'-3"	--	---	-----	-----	5	6 1/2"	14'-2"	52	44

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1002.09	07/11

SINGLE BOX CULVERTS
10 TO 20 FT. FILLS
 VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS./LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS./LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH	LENGTH					
3	3	16.184	0.400	46.498	5'-10"	6	5'-6"	1.038	33.044	1.042	33.044	A	
3	4	17.596	0.450	44.657	5'-10"	6	5'-6"	1.131	33.044	1.134	33.044	C	
4	3	19.524	0.449	50.604	6'-10"	6	6'-6"	1.139	39.052	1.146	39.052	A	
4	4	20.936	0.498	56.391	6'-10"	6	6'-6"	1.232	39.052	1.239	39.052	C	
4	5	22.348	0.547	62.489	6'-10"	6	6'-6"	1.324	39.052	1.332	39.052	E	
4	6	23.760	0.596	67.017	6'-10"	6	6'-6"	1.417	39.052	1.424	39.052	G	
5	3	22.864	0.497	75.669	7'-10"	6	7'-6"	1.240	45.060	1.251	45.060	A	
5	4	24.276	0.546	79.112	7'-10"	6	7'-6"	1.333	45.060	1.343	45.060	C	
5	5	25.688	0.595	86.230	7'-10"	6	7'-6"	1.426	45.060	1.436	45.060	E	
5	6	27.100	0.644	84.196	7'-10"	6	7'-6"	1.518	45.060	1.529	45.060	G	
5	7	28.512	0.693	94.817	7'-10"	6	7'-6"	1.611	45.060	1.621	45.060	I	
6	4	27.616	0.627	108.307	8'-10"	6	8'-6"	1.432	51.068	1.446	51.068	C	
6	5	29.028	0.676	107.430	8'-10"	6	8'-6"	1.524	51.068	1.538	51.068	E	
6	6	30.440	0.725	117.454	8'-10"	6	8'-6"	1.617	51.068	1.631	51.068	G	
6	7	31.852	0.773	129.488	8'-10"	6	8'-6"	1.710	51.068	1.724	51.068	I	
6	8	33.264	0.821	157.284	8'-10"	6	8'-6"	1.803	51.068	1.816	51.068	K	
7	4	30.956	0.731	129.127	9'-10"	6	9'-6"	1.543	57.076	1.560	57.076	D	
7	6	33.780	0.843	126.868	9'-10"	6	9'-6"	1.727	57.076	1.744	57.076	H	
7	8	36.604	0.938	170.365	9'-10"	6	9'-6"	1.912	57.076	1.929	57.076	L	
7	10	39.428	1.033	219.296	9'-10"	6	9'-6"	2.098	57.076	2.115	57.076	P	
8	4	34.296	0.846	159.600	10'-10"	6	10'-6"	1.630	63.084	1.650	63.084	D	
8	6	37.120	0.958	172.840	10'-10"	6	10'-6"	1.813	63.084	1.833	63.084	H	
8	8	39.944	1.070	190.718	10'-10"	6	10'-6"	1.996	63.084	2.016	63.084	L	
8	10	42.768	1.165	238.930	10'-10"	6	10'-6"	2.181	63.084	2.202	63.084	P	
9	4	37.636	0.990	186.271	11'-10"	6	11'-6"	1.707	69.092	1.731	69.092	D	
9	6	40.460	1.105	190.592	11'-10"	6	11'-6"	1.889	69.092	1.913	69.092	H	
9	8	43.284	1.202	207.534	11'-10"	6	11'-6"	2.075	69.092	2.098	69.092	L	
9	10	46.108	1.312	270.322	11'-10"	6	11'-6"	2.257	69.092	2.281	69.092	P	
9	12	48.932	1.492	338.890	11'-10"	6	11'-6"	2.442	69.092	2.466	69.092	T	
10	4	40.976	1.132	222.972	12'-10"	6	12'-6"	1.780	75.100	1.807	75.100	D	
10	6	43.800	1.229	235.180	12'-10"	6	12'-6"	1.966	75.100	1.993	75.100	H	
10	8	46.624	1.328	242.383	12'-10"	6	12'-6"	2.151	75.100	2.178	75.100	L	
10	10	49.448	1.423	291.088	12'-10"	6	12'-6"	2.337	75.100	2.364	75.100	P	
10	12	52.272	1.601	398.098	12'-10"	6	12'-6"	2.522	75.100	2.549	75.100	T	
12	6	50.480	1.551	284.965	14'-10"	6	14'-6"	2.094	87.116	2.128	87.116	H	
12	8	53.304	1.665	354.490	14'-10"	6	14'-6"	2.293	87.116	2.326	87.116	M	
12	10	56.128	1.764	343.084	14'-10"	6	14'-6"	2.478	87.116	2.512	87.116	Q	
12	12	58.952	1.991	427.061	14'-10"	6	14'-6"	2.663	87.116	2.697	87.116	U	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<p style="text-align: center;">SINGLE BOX CULVERTS 10 TO 20 FT. FILLS</p> <p style="text-align: center;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>		 ROAD AND BRIDGE STANDARDS	
			REVISION DATE 07/11	SHEET 2 OF 2 1002.10

2016 ROAD & BRIDGE STANDARDS

BCS-30

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3	BH1		BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #5 BARS									
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	1 1/2"	4'-0"	2'-8"	8'-10"	5	1 1/2"	4'-0"	--	----	----	-----	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	1 1/2"	4'-0"	3'-2"	9'-10"	5	1 1/2"	4'-0"	--	----	----	-----	4	12"	5'-0"	16	12
4	3	8"	8"	8"	3	3'-0"	3	3'-0"	1	1'-0"	4	10 1/2"	5'-0"	2'-8"	9'-10"	6	10 1/2"	5'-0"	4	10 1/2"	2'-4"	4' - 5"	4	11 1/2"	4'-0"	20	8
4	4	8"	8"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	10"	5'-0"	3'-2"	10'-10"	6	10"	5'-0"	3	10"	2'-4"	4' - 5"	4	12"	5'-0"	20	12
4	5	8"	8"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	9 1/2"	5'-0"	3'-8"	11'-10"	6	9 1/2"	5'-0"	3	9 1/2"	2'-6"	4' - 10"	4	12"	6'-0"	20	16
4	6	8"	8"	8"	3	3'-0"	3	3'-0"	4	4'-0"	4	9 1/2"	5'-0"	4'-2"	12'-10"	6	9 1/2"	5'-0"	3	9 1/2"	2'-9"	5' - 3"	5	12"	7'-0"	20	20
5	3	9 1/2"	9 1/2"	8"	4	4'-0"	4	4'-0"	1	1'-0"	4	8 1/2"	6'-0"	2'-10"	11'-1"	6	8 1/2"	6'-0"	3	8 1/2"	2'-6"	4' - 10"	4	9"	4'-3"	24	8
5	4	9 3/4"	9 3/4"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	8"	6'-0"	3'-4"	12'-2"	6	8"	6'-0"	--	----	----	-----	4	12"	5'-3"	24	12
5	5	9 3/4"	9 3/4"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	8"	6'-0"	3'-10"	13'-2"	6	8"	6'-0"	--	----	----	-----	4	12"	6'-3"	24	16
5	6	9 3/4"	9 3/4"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	8"	6'-0"	4'-4"	14'-2"	6	8"	6'-0"	--	----	----	-----	5	12"	7'-3"	24	20
5	7	9 3/4"	9 3/4"	8"	4	4'-0"	4	4'-0"	5	5'-0"	4	8"	6'-0"	4'-10"	15'-2"	6	8"	6'-0"	--	----	----	-----	6	12"	8'-3"	24	24
6	4	11 1/2"	11 1/2"	8"	5	5'-0"	5	5'-0"	2	2'-0"	4	7"	7'-0"	3'-6"	13'-5"	6	7"	7'-0"	--	----	----	-----	4	12"	5'-7"	28	12
6	5	11 1/2"	11 1/2"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	6 1/2"	7'-0"	4'-0"	14'-5"	6	6 1/2"	7'-0"	--	----	----	-----	4	12"	6'-7"	28	16
6	6	11 1/2"	11 1/2"	8"	5	5'-0"	5	5'-0"	4	4'-0"	4	6 1/2"	7'-0"	4'-6"	15'-5"	6	6 1/2"	7'-0"	--	----	----	-----	4	12"	7'-7"	28	20
6	7	11 1/2"	11 1/2"	8"	5	5'-0"	5	5'-0"	5	5'-0"	4	6 1/2"	7'-0"	5'-0"	16'-5"	6	6 1/2"	7'-0"	--	----	----	-----	5	12"	8'-6"	28	24
6	8	11 1/2"	11 1/2"	8"	5	5'-0"	5	5'-0"	6	6'-0"	4	6 1/2"	7'-0"	5'-6"	17'-5"	6	6 1/2"	7'-0"	--	----	----	-----	6	10 1/2"	9'-7"	28	28
7	4	13"	13"	8"	6	6'-0"	6	6'-0"	2	2'-0"	4	6"	8'-0"	3'-7"	14'-8"	6	6"	8'-0"	--	----	----	-----	4	10 1/2"	5'-10"	32	12
7	6	13"	13"	8"	6	6'-0"	6	6'-0"	4	4'-0"	5	7 1/2"	8'-0"	4'-9"	16'-11"	8	7 1/2"	8'-0"	--	----	----	-----	4	12"	7'-10"	32	20
7	8	13"	13"	8"	6	6'-0"	6	6'-0"	6	6'-0"	5	7"	8'-0"	5'-9"	18'-11"	7	7"	8'-0"	--	----	----	-----	6	12"	9'-10"	32	28
7	10	13"	13"	9"	6	6'-0"	6	6'-0"	8	8'-0"	5	5 1/2"	8'-2"	6'-9"	21'-1"	6	5 1/2"	8'-1"	--	----	----	-----	5	5 1/2"	11'-10"	32	36
8	4	13 3/4"	13 3/4"	8"	7	7'-0"	7	7'-0"	2	2'-0"	5	8"	9'-0"	3'-10"	16'-0"	8	8"	9'-0"	3	8"	3'-2"	6' - 1"	4	8"	5'-11"	36	12
8	6	13 3/4"	13 3/4"	8"	7	7'-0"	7	7'-0"	4	4'-0"	4	8"	9'-0"	4'-8"	17'-10"	8	8"	9'-0"	3	8"	3'-3"	6' - 2"	4	12"	7'-11"	36	20
8	8	13 3/4"	13 3/4"	8"	7	7'-0"	7	7'-0"	6	6'-0"	5	6"	9'-0"	5'-10"	20'-0"	7	6"	9'-0"	--	----	----	-----	6	12"	9'-11"	36	28
8	10	13 1/2"	13 1/2"	9 1/2"	7	7'-0"	7	7'-0"	8	8'-0"	5	6"	9'-3"	6'-10"	22'-3"	7	6"	9'-3"	--	----	----	-----	5	6"	11'-11"	36	36
9	4	15 1/4"	15 1/4"	8"	8	8'-0"	8	8'-0"	2	2'-0"	4	7 1/2"	10'-0"	3'-10"	17'-1"	8	7 1/2"	10'-0"	4	7 1/2"	3'-4"	6' - 5"	4	7 1/2"	6'-2"	40	12
9	6	15 1/2"	15 1/2"	8"	8	8'-0"	8	8'-0"	4	4'-0"	4	7 1/2"	10'-0"	4'-10"	19'-1"	8	7 1/2"	10'-0"	3	7 1/2"	3'-4"	6' - 6"	4	12"	8'-3"	40	20
9	8	15 1/2"	15 1/2"	8"	8	8'-0"	8	8'-0"	6	6'-0"	4	7 1/2"	10'-0"	5'-10"	21'-1"	8	7 1/2"	10'-0"	4	7 1/2"	3'-9"	7' - 3"	6	12"	10'-2"	40	28
9	10	15 1/2"	15 1/2"	9"	8	8'-0"	8	8'-0"	8	8'-0"	5	5 1/2"	10'-0"	7'-0"	23'-6"	7	5 1/2"	10'-1"	--	----	----	-----	5	6"	12'-2"	40	36
9	12	15 1/4"	15 1/4"	11"	8	8'-0"	8	8'-0"	10	10'-0"	6	5 1/2"	10'-6"	8'-2"	25'-11"	7	5 1/2"	10'-6"	--	----	----	-----	7	9"	14'-2"	40	44
10	4	17"	17"	8"	9	9'-0"	9	9'-0"	2	2'-0"	5	5 1/2"	11'-0"	4'-2"	18'-7"	7	5 1/2"	11'-0"	--	----	----	-----	4	7 1/2"	6'-6"	44	12
10	6	17 1/4"	17 1/4"	8"	9	9'-0"	9	9'-0"	4	4'-0"	5	7"	11'-0"	5'-2"	20'-7"	8	7"	11'-0"	--	----	----	-----	4	12"	8'-6"	44	20
10	8	17 1/4"	17 1/4"	8"	9	9'-0"	9	9'-0"	6	6'-0"	5	7"	11'-0"	6'-2"	22'-7"	8	7"	11'-0"	--	----	----	-----	6	12"	10'-6"	44	28
10	10	17 1/4"	17 1/4"	9"	9	9'-0"	9	9'-0"	8	8'-0"	6	6 1/2"	11'-2"	7'-4"	24'-11"	8	6 1/2"	11'-1"	--	----	----	-----	5	6"	12'-6"	44	36
10	12	17"	17"	11"	9	9'-0"	9	9'-0"	10	10'-0"	6	6"	11'-6"	8'-3"	27'-3"	8	6"	11'-1"	--	----	----	-----	7	9 1/2"	14'-5"	44	44
12	6	19 1/2"	19 1/2"	8"	11	11'-0"	11	11'-0"	4	4'-0"	4	5 1/2"	13'-0"	5'-2"	22'-9"	8	5 1/2"	13'-0"	--	----	----	-----	4	12"	8'-11"	52	20
12	8	20"	20"	8"	11	11'-0"	11	11'-0"	6	6'-0"	5	6"	13'-0"	6'-4"	25'-1"	8	6"	13'-0"	--	----	----	-----	5	12"	11'-0"	52	28
12	10	20 1/4"	20 1/4"	8 1/2"	11	11'-0"	11	11'-0"	8	8'-0"	6	5 1/2"	13'-0"	7'-7"	27'-4"	8	5 1/2"	13'-0"	--	----	----	-----	6	9 1/2"	13'-0"	52	36
12	12	20 1/4"	20 1/4"	11"	11	11'-0"	11	11'-0"	10	10'-0"	6	5 1/2"	13'-6"	8'-7"	29'-9"	8	5 1/2"	13'-6"	--	----	----	-----	7	9 1/2"	15'-0"	52	44

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VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE
1002.11 07/11

SINGLE BOX CULVERTS
20 TO 30 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HIGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS							
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)
				HEADWALL LENGTH	SIZE	LENGTH						
3	3	16.184	0.401	41.355	5'-10"	6	5'-6"	1.038	33.044	1.042	33.044	A
3	4	17.596	0.450	46.606	5'-10"	6	5'-6"	1.131	33.044	1.134	33.044	C
4	3	19.524	0.448	69.319	6'-10"	6	6'-6"	1.139	39.052	1.146	39.052	A
4	4	20.936	0.497	69.842	6'-10"	6	6'-6"	1.232	39.052	1.239	39.052	C
4	5	22.348	0.546	77.408	6'-10"	6	6'-6"	1.324	39.052	1.332	39.052	E
4	6	23.760	0.595	87.946	6'-10"	6	6'-6"	1.417	39.052	1.424	39.052	G
5	3	22.864	0.555	85.770	7'-10"	6	7'-6"	1.259	45.060	1.269	45.060	B
5	4	24.276	0.614	81.559	7'-10"	6	7'-6"	1.352	45.060	1.362	45.060	D
5	5	25.688	0.663	86.403	7'-10"	6	7'-6"	1.444	45.060	1.455	45.060	F
5	6	27.100	0.712	96.716	7'-10"	6	7'-6"	1.537	45.060	1.547	45.060	H
5	7	28.512	0.760	109.922	7'-10"	6	7'-6"	1.630	45.060	1.640	45.060	J
6	4	27.616	0.752	100.722	8'-10"	6	8'-6"	1.442	51.068	1.456	51.068	D
6	5	29.028	0.801	111.159	8'-10"	6	8'-6"	1.535	51.068	1.548	51.068	F
6	6	30.440	0.850	116.466	8'-10"	6	8'-6"	1.627	51.068	1.641	51.068	H
6	7	31.852	0.898	128.210	8'-10"	6	8'-6"	1.720	51.068	1.734	51.068	J
6	8	33.264	0.946	147.176	8'-10"	6	8'-6"	1.813	51.068	1.827	51.068	L
7	4	30.956	0.898	125.975	9'-10"	6	9'-6"	1.523	57.076	1.540	57.076	D
7	6	33.780	0.994	167.916	9'-10"	6	9'-6"	1.708	57.076	1.726	57.076	H
7	8	36.604	1.091	188.876	9'-10"	6	9'-6"	1.894	57.076	1.911	57.076	L
7	10	39.428	1.261	241.896	9'-10"	6	9'-6"	2.079	57.076	2.096	57.076	P
8	4	34.296	1.017	180.750	10'-10"	6	10'-6"	1.602	63.084	1.622	63.084	D
8	6	37.120	1.117	168.456	10'-10"	6	10'-6"	1.787	63.084	1.808	63.084	H
8	8	39.944	1.212	226.032	10'-10"	6	10'-6"	1.973	63.084	1.993	63.084	L
8	10	42.768	1.407	260.099	10'-10"	6	10'-6"	2.160	63.084	2.181	63.084	P
9	4	37.636	1.197	198.733	11'-10"	6	11'-6"	1.685	69.092	1.709	69.092	E
9	6	40.460	1.312	192.297	11'-10"	6	11'-6"	1.868	69.092	1.891	69.092	I
9	8	43.284	1.407	234.542	11'-10"	6	11'-6"	2.053	69.092	2.077	69.092	M
9	10	46.108	1.579	293.978	11'-10"	6	11'-6"	2.239	69.092	2.262	69.092	Q
9	12	48.932	1.846	389.542	11'-10"	6	11'-6"	2.383	69.092	2.406	69.092	U
10	4	40.976	1.410	236.138	12'-10"	6	12'-6"	1.737	75.100	1.764	75.100	E
10	6	43.800	1.527	228.503	12'-10"	6	12'-6"	1.919	75.100	1.946	75.100	I
10	8	46.624	1.624	258.918	12'-10"	6	12'-6"	2.104	75.100	2.131	75.100	M
10	10	49.448	1.795	349.512	12'-10"	6	12'-6"	2.290	75.100	2.317	75.100	Q
10	12	52.272	2.066	413.087	12'-10"	6	12'-6"	2.411	75.100	2.437	75.100	U
12	6	50.480	1.921	279.204	14'-10"	6	14'-6"	2.015	87.116	2.049	87.116	I
12	8	53.304	2.058	318.713	14'-10"	6	14'-6"	2.190	87.116	2.224	87.116	M
12	10	56.128	2.210	436.661	14'-10"	6	14'-6"	2.370	87.116	2.404	87.116	Q
12	12	58.952	2.548	488.548	14'-10"	6	14'-6"	2.485	87.116	2.518	87.116	U


A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<h2 style="margin: 0;">SINGLE BOX CULVERTS</h2> <h3 style="margin: 0;">20 TO 30 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/11	SHEET 2 OF 2 1002.12

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN	HGHT	T1	T2	T3	BH1					BH2			BH3				BV1			NO. #1 BARS	NO. #3 BARS						
(FT.)	(FT.)	TOP SLAB (IN.)	BOTTOM SLAB (IN.)	WALL (IN.)	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
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	9"	4'-0"	2'-8"	8'-10"	5	9"	4'-0"	3	9"	2'-2"	4'-1"	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	9"	4'-0"	3'-2"	9'-10"	5	9"	4'-0"	--	---	----	----	4	12"	5'-0"	16	12
4	3	9 1/4"	9 1/4"	8"	3	3'-0"	3	3'-0"	1	1'-0"	4	9"	5'-0"	2'-10"	10'-1"	6	9"	5'-0"	--	---	----	----	4	12"	4'-2"	20	8
4	4	9"	9"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	8 1/2"	5'-0"	3'-3"	11'-0"	6	8 1/2"	5'-0"	--	---	----	----	4	12"	5'-2"	20	12
4	5	9"	9"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	8 1/2"	5'-0"	3'-9"	12'-0"	6	8 1/2"	5'-0"	--	---	----	----	4	12"	6'-2"	20	16
4	6	9 1/4"	9 1/4"	8"	3	3'-0"	3	3'-0"	4	4'-0"	4	8 1/2"	5'-0"	4'-4"	13'-1"	6	8 1/2"	5'-0"	--	---	----	----	6	12"	7'-2"	20	20
5	3	11 3/4"	11 3/4"	8"	4	4'-0"	4	4'-0"	1	1'-0"	4	7 1/2"	6'-0"	3'-0"	11'-6"	6	7 1/2"	6'-0"	--	---	----	----	4	11 1/2"	4'-7"	24	8
5	4	11 3/4"	11 3/4"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	7"	6'-0"	3'-6"	12'-6"	6	7"	6'-0"	--	---	----	----	4	12"	5'-7"	24	12
5	5	12"	12"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	7"	6'-0"	4'-0"	13'-6"	6	7"	6'-0"	--	---	----	----	4	12"	6'-8"	24	16
5	6	12"	12"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	7"	6'-0"	4'-6"	14'-6"	6	7"	6'-0"	--	---	----	----	5	12"	7'-8"	24	20
5	7	11 1/4"	11 1/4"	8"	4	4'-0"	4	4'-0"	5	5'-0"	4	7"	6'-0"	5'-0"	15'-5"	6	7"	6'-0"	--	---	----	----	6	10 1/2"	8'-6"	24	24
6	4	13"	13"	8"	5	5'-0"	5	5'-0"	2	2'-0"	4	6"	7'-0"	3'-7"	13'-8"	6	6"	7'-0"	--	---	----	----	4	12"	5'-10"	28	12
6	5	13"	13"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	6"	7'-0"	4'-1"	14'-8"	6	6"	7'-0"	--	---	----	----	4	12"	6'-10"	28	16
6	6	13"	13"	8"	5	5'-0"	5	5'-0"	4	4'-0"	4	6"	7'-0"	4'-7"	15'-8"	6	6"	7'-0"	--	---	----	----	5	12"	7'-10"	28	20
6	7	13"	13"	8"	5	5'-0"	5	5'-0"	5	5'-0"	4	6"	7'-0"	5'-2"	16'-8"	6	6"	7'-0"	--	---	----	----	6	12"	8'-10"	28	24
6	8	13"	13"	8 1/2"	5	5'-0"	5	5'-0"	6	6'-0"	4	6"	7'-1"	5'-8"	17'-9"	6	6"	7'-1"	--	---	----	----	6	10 1/2"	9'-10"	28	28
7	4	14 3/4"	14 3/4"	8"	6	6'-0"	6	6'-0"	2	2'-0"	4	5"	8'-0"	3'-9"	15'-0"	6	5"	8'-0"	--	---	----	----	4	12"	6'-1"	32	12
7	6	14 3/4"	14 3/4"	8"	6	6'-0"	6	6'-0"	4	4'-0"	4	5"	8'-0"	4'-9"	17'-0"	6	5"	8'-0"	--	---	----	----	5	12"	8'-1"	32	20
7	8	14 3/4"	14 3/4"	8"	6	6'-0"	6	6'-0"	6	6'-0"	4	5"	8'-0"	5'-9"	19'-0"	6	5"	8'-0"	--	---	----	----	5	7 1/2"	10'-1"	32	28
7	10	14 1/2"	14 1/2"	10 1/2"	6	6'-0"	6	6'-0"	8	8'-0"	6	8"	8'-5"	7'-1"	21'-9"	8	8"	8'-4"	--	---	----	----	6	7"	12'-1"	32	36
8	4	17"	17"	8"	7	7'-0"	7	7'-0"	2	2'-0"	4	6"	9'-0"	3'-11"	16'-4"	7	6"	9'-0"	--	---	----	----	4	12"	6'-6"	36	12
8	6	17 1/4"	17 1/4"	8"	7	7'-0"	7	7'-0"	4	4'-0"	4	6"	9'-0"	5'-0"	18'-5"	7	6"	9'-0"	--	---	----	----	5	12"	8'-6"	36	20
8	8	17 1/4"	17 1/4"	8"	7	7'-0"	7	7'-0"	6	6'-0"	5	6"	9'-0"	6'-2"	20'-7"	7	6"	9'-0"	--	---	----	----	5	7"	10'-6"	36	28
8	10	17"	17"	10 1/2"	7	7'-0"	7	7'-0"	8	8'-0"	6	7 1/2"	9'-5"	7'-3"	23'-2"	8	7 1/2"	9'-4"	--	---	----	----	6	7"	12'-5"	36	36
9	4	18 3/4"	18 3/4"	8"	8	8'-0"	8	8'-0"	2	2'-0"	4	5 1/2"	10'-0"	4'-1"	17'-8"	7	5 1/2"	10'-0"	--	---	----	----	4	12"	6'-9"	40	12
9	6	18 3/4"	18 3/4"	8"	8	8'-0"	8	8'-0"	4	4'-0"	4	5 1/2"	10'-0"	5'-1"	19'-8"	7	5 1/2"	10'-0"	--	---	----	----	4	12"	8'-9"	40	20
9	8	18 3/4"	18 3/4"	8"	8	8'-0"	8	8'-0"	6	6'-0"	4	5 1/2"	10'-0"	6'-1"	21'-8"	7	5 1/2"	10'-0"	--	---	----	----	5	7 1/2"	10'-9"	40	28
9	10	18 1/2"	18 1/2"	10"	8	8'-0"	8	8'-0"	8	8'-0"	6	7"	10'-4"	7'-5"	24'-4"	8	7"	10'-3"	--	---	----	----	5	4 1/2"	12'-8"	40	36
9	12	18 1/2"	18 1/2"	12 1/2"	8	8'-0"	8	8'-0"	10	10'-0"	7	7"	10'-9"	8'-8"	27'-1"	8	7"	10'-9"	--	---	----	----	6	6"	14'-8"	40	44
10	4	20"	20"	8"	9	9'-0"	9	9'-0"	2	2'-0"	5	6 1/2"	11'-0"	4'-5"	19'-1"	8	6 1/2"	11'-0"	--	---	----	----	4	11"	7'-0"	44	12
10	6	20 1/4"	20 1/4"	8"	9	9'-0"	9	9'-0"	4	4'-0"	5	6 1/2"	11'-0"	5'-5"	21'-1"	8	6 1/2"	11'-0"	--	---	----	----	4	12"	9'-0"	44	20
10	8	20 1/2"	20 1/2"	8"	9	9'-0"	9	9'-0"	6	6'-0"	5	6"	11'-0"	6'-5"	23'-2"	8	6"	11'-0"	--	---	----	----	5	7 1/2"	11'-1"	44	28
10	10	20 3/4"	20 3/4"	9 1/2"	9	9'-0"	9	9'-0"	8	8'-0"	6	6"	11'-3"	7'-7"	25'-7"	8	6"	11'-3"	--	---	----	----	5	4 1/2"	13'-1"	44	36
10	12	20 1/2"	20 1/2"	12 1/2"	9	9'-0"	9	9'-0"	10	10'-0"	6	5 1/2"	11'-9"	8'-7"	28'-1"	8	5 1/2"	11'-9"	--	---	----	----	6	6"	15'-1"	44	44
12	6	23 3/4"	23 3/4"	8"	11	11'-0"	11	11'-0"	4	4'-0"	5	5 1/2"	13'-0"	5'-8"	23'-7"	8	5 1/2"	13'-0"	--	---	----	----	4	9 1/2"	9'-6"	52	20
12	8	23 1/4"	23 1/4"	8"	11	11'-0"	11	11'-0"	6	6'-0"	5	5 1/2"	13'-0"	6'-8"	25'-7"	8	5 1/2"	13'-0"	--	---	----	----	5	8"	11'-6"	52	28
12	10	23"	23"	9 1/2"	11	11'-0"	11	11'-0"	8	8'-0"	5	5"	13'-3"	7'-7"	27'-10"	8	5"	13'-3"	--	---	----	----	5	5"	13'-5"	52	36
12	12	22 3/4"	22 3/4"	12"	11	11'-0"	11	11'-0"	10	10'-0"	6	5"	13'-8"	8'-10"	30'-6"	8	5"	13'-7"	--	---	----	----	7	9 1/2"	15'-7"	52	44

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1002.13	07/11

SINGLE BOX CULVERTS
30 TO 40 FT. FILLS
 VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HGHT (FT.)	REINFORCING STEEL (LBS./LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS./LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH						
3	3	16.184	0.400	55.206	5'-10"	6	5'-6"	1.038	33.044	1.042	33.044	A	
3	4	17.596	0.449	51.804	5'-10"	6	5'-6"	1.131	33.044	1.134	33.044	C	
4	3	19.524	0.490	61.854	6'-10"	6	6'-6"	1.161	39.052	1.169	39.052	B	
4	4	20.936	0.530	68.673	6'-10"	6	6'-6"	1.235	39.052	1.242	39.052	C	
4	5	22.348	0.579	73.399	6'-10"	6	6'-6"	1.328	39.052	1.335	39.052	E	
4	6	23.760	0.636	90.283	6'-10"	6	6'-6"	1.440	39.052	1.447	39.052	H	
5	3	22.864	0.643	81.426	7'-10"	6	7'-6"	1.259	45.060	1.269	45.060	B	
5	4	24.276	0.692	90.093	7'-10"	6	7'-6"	1.352	45.060	1.362	45.060	D	
5	5	25.688	0.750	95.374	7'-10"	6	7'-6"	1.444	45.060	1.455	45.060	F	
5	6	27.100	0.799	106.254	7'-10"	6	7'-6"	1.537	45.060	1.547	45.060	H	
5	7	28.512	0.818	123.095	7'-10"	6	7'-6"	1.630	45.060	1.640	45.060	J	
6	4	27.616	0.819	112.841	8'-10"	6	8'-6"	1.437	51.068	1.451	51.068	D	
6	5	29.028	0.868	118.353	8'-10"	6	8'-6"	1.530	51.068	1.544	51.068	F	
6	6	30.440	0.916	129.740	8'-10"	6	8'-6"	1.623	51.068	1.636	51.068	H	
6	7	31.852	0.965	144.111	8'-10"	6	8'-6"	1.715	51.068	1.729	51.068	J	
6	8	33.264	1.045	156.235	8'-10"	6	8'-6"	1.808	51.068	1.822	51.068	L	
7	4	30.956	0.987	143.621	9'-10"	6	9'-6"	1.512	57.076	1.529	57.076	D	
7	6	33.780	1.084	161.807	9'-10"	6	9'-6"	1.698	57.076	1.715	57.076	H	
7	8	36.604	1.181	188.072	9'-10"	6	9'-6"	1.883	57.076	1.900	57.076	L	
7	10	39.428	1.453	266.363	9'-10"	6	9'-6"	2.032	57.076	2.049	57.076	P	
8	4	34.296	1.206	159.065	10'-10"	6	10'-6"	1.590	63.084	1.611	63.084	E	
8	6	37.120	1.318	176.663	10'-10"	6	10'-6"	1.773	63.084	1.794	63.084	I	
8	8	39.944	1.412	236.248	10'-10"	6	10'-6"	1.959	63.084	1.979	63.084	M	
8	10	42.768	1.690	298.216	10'-10"	6	10'-6"	2.107	63.084	2.127	63.084	Q	
9	4	37.636	1.421	186.129	11'-10"	6	11'-6"	1.642	69.092	1.666	69.092	E	
9	6	40.460	1.519	197.639	11'-10"	6	11'-6"	1.828	69.092	1.851	69.092	I	
9	8	43.284	1.615	230.749	11'-10"	6	11'-6"	2.013	69.092	2.037	69.092	M	
9	10	46.108	1.851	336.193	11'-10"	6	11'-6"	2.162	69.092	2.185	69.092	Q	
9	12	48.932	2.201	425.353	11'-10"	6	11'-6"	2.202	69.092	2.224	69.092	U	
10	4	40.976	1.621	231.746	12'-10"	6	12'-6"	1.691	75.100	1.718	75.100	E	
10	6	43.800	1.736	244.494	12'-10"	6	12'-6"	1.872	75.100	1.899	75.100	I	
10	8	46.624	1.848	296.723	12'-10"	6	12'-6"	2.054	75.100	2.081	75.100	M	
10	10	49.448	2.081	395.781	12'-10"	6	12'-6"	2.194	75.100	2.221	75.100	Q	
10	12	52.272	2.461	463.231	12'-10"	6	12'-6"	2.236	75.100	2.262	75.100	U	
12	6	50.480	2.227	324.329	14'-10"	6	14'-6"	1.953	87.116	1.987	87.116	J	
12	8	53.304	2.323	356.451	14'-10"	6	14'-6"	2.138	87.116	2.172	87.116	N	
12	10	56.128	2.523	431.964	14'-10"	6	14'-6"	2.287	87.116	2.320	87.116	R	
12	12	58.952	2.942	534.328	14'-10"	6	14'-6"	2.327	87.116	2.359	87.116	V	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<h2 style="margin: 0;">SINGLE BOX CULVERTS</h2> <h3 style="margin: 0;">30 TO 40 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE	SHEET 2 OF 2
		07/11	1002.14


2016 ROAD & BRIDGE STANDARDS

BCS-50

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

DIMENSIONS					REINFORCING STEEL																						
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB (IN.)	T2 BOTTOM SLAB (IN.)	T3 WALL (IN.)	A	B	C	D	E	F	BH1				BH2			BH3				BV1			NO. BL1 #4 BARS	NO. BL2 #3 BARS	
											SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C			LENGTH
3	3	8"	8"	8"	2	2'-0"	2	2'-0"	1	1'-0"	4	6"	4'-0"	2'-8"	8'-10"	6	10"	4'-0"	4	10"	2'-1 1/4"	3'-11"	4	12"	4'-0"	16	8
3	4	8"	8"	8"	2	2'-0"	2	2'-0"	2	2'-0"	4	6"	4'-0"	3'-2"	9'-10"	6	10"	4'-0"	4	10"	2'-1 1/4"	3'-11"	4	12"	5'-0"	16	12
4	3	10 1/4"	10 1/4"	8"	3	3'-0"	3	3'-0"	1	1'-0"	5	8 1/2"	5'-0"	2'-10 1/4"	10'-2"	6	8"	5'-0"	--	--	----	----	4	12"	4'-5"	20	8
4	4	10 1/4"	10 1/4"	8"	3	3'-0"	3	3'-0"	2	2'-0"	4	7"	5'-0"	3'-4"	11'-2"	6	7 1/2"	5'-0"	--	--	----	----	4	12"	5'-4"	20	12
4	5	10 1/4"	10 1/4"	8"	3	3'-0"	3	3'-0"	3	3'-0"	4	8"	5'-0"	3'-10 1/4"	12'-2"	6	8"	5'-0"	--	--	----	----	5	12"	6'-5"	20	16
4	6	10 1/4"	10 1/4"	10"	3	3'-0"	3	3'-0"	4	4'-0"	4	8"	5'-0"	4'-4 1/4"	13'-2"	6	8"	5'-0"	--	--	----	----	5	12"	7'-5"	20	20
5	3	13"	13"	8"	4	4'-0"	4	4'-0"	1	1'-0"	4	6 1/2"	6'-0"	3'-1"	11'-8"	6	6 1/2"	6'-0"	--	--	----	----	4	12"	4'-10"	24	8
5	4	13"	13"	8"	4	4'-0"	4	4'-0"	2	2'-0"	4	6 1/2"	6'-0"	3'-7"	12'-8"	6	6 1/2"	6'-0"	--	--	----	----	4	12"	5'-10"	24	12
5	5	13"	13"	8"	4	4'-0"	4	4'-0"	3	3'-0"	4	6 1/2"	6'-0"	4'-1"	13'-8"	6	6 1/2"	6'-0"	--	--	----	----	5	12"	6'-10"	24	16
5	6	12 1/4"	12 1/4"	8"	4	4'-0"	4	4'-0"	4	4'-0"	4	6"	6'-0"	4'-6 1/4"	14'-6"	6	6"	6'-0"	--	--	----	----	5	10"	7'-9"	24	20
5	7	12 1/4"	12 1/4"	10"	4	4'-0"	4	4'-0"	5	5'-0"	4	6 1/2"	6'-0"	5'-1 1/4"	15'-6"	6	6 1/2"	6'-0"	--	--	----	----	5	8"	8'-9"	24	24
6	4	14 1/2"	14 1/2"	8"	5	5'-0"	5	5'-0"	2	2'-0"	4	9"	7'-0"	3'-8 1/2"	13'-11"	8	9"	7'-0"	3	9"	2'-8 3/8"	5'-2"	4	12"	6'-1"	28	12
6	5	14 1/2"	14 1/2"	8"	5	5'-0"	5	5'-0"	3	3'-0"	4	5"	7'-0"	4'-2 1/2"	14'-11"	6	5"	7'-0"	--	--	----	----	4	12"	7'-1"	28	16
6	6	14 3/4"	14 3/4"	8 3/4"	5	5'-0"	5	5'-0"	4	4'-0"	5	9"	7'-0"	4'-8 3/4"	15'-11"	8	9"	7'-0"	3	9"	3'-3"	6'-4"	5	10"	8'-1"	28	20
6	7	14 3/4"	14 3/4"	8"	5	5'-0"	5	5'-0"	5	5'-0"	5	8 1/2"	7'-0"	5'-2 3/4"	16'-10"	8	8 1/2"	7'-0"	3	8 1/2"	3'-6"	6'-10"	5	6"	9'-1"	28	24
6	8	14 1/2"	14 1/2"	10"	5	5'-0"	5	5'-0"	6	6'-0"	5	8 1/2"	7'-0"	5'-8 1/2"	17'-9"	8	8 1/2"	7'-0"	3	8 1/2"	3'-8"	7'-2"	5	6"	10'-1"	28	28
7	4	17 1/2"	17 1/2"	8"	6	6'-0"	6	6'-0"	2	2'-0"	5	8"	8'-0"	3'-11 1/2"	15'-3"	8	8"	8'-0"	--	--	----	----	4	12"	6'-7"	32	12
7	6	17 3/4"	17 3/4"	8"	6	6'-0"	6	6'-0"	4	4'-0"	5	8"	8'-0"	4'-11 3/4"	17'-5"	8	8"	8'-0"	4	8"	2'-10 3/4"	5'-6"	5	10"	8'-7"	32	20
7	8	17 1/2"	17 1/2"	8 3/4"	6	6'-0"	6	6'-0"	6	6'-0"	5	8"	8'-0"	5'-11 1/2"	19'-3"	8	8"	8'-0"	3	8"	3'-11"	7'-7"	5	6"	10'-7"	32	28
7	10	17 1/2"	17 1/2"	12"	6	6'-0"	6	6'-0"	8	8'-0"	5	8"	8'-0"	6'-11 1/2"	21'-3"	8	8"	8'-0"	3	8"	4'-4"	8'-7"	7	9"	12'-7"	32	36
8	4	18 1/4"	18 1/4"	8"	7	7'-0"	7	7'-0"	2	2'-0"	5	5 1/2"	9'-0"	4'-1 1/4"	16'-6"	7	5 1/2"	9'-0"	--	--	----	----	4	12"	6'-9"	36	12
8	6	18 1/2"	18 1/2"	8"	7	7'-0"	7	7'-0"	4	4'-0"	4	5 1/2"	9'-0"	5'-1 1/2"	18'-7"	7	5 1/2"	9'-0"	--	--	----	----	5	12"	8'-9"	36	20
8	8	18 3/4"	18 3/4"	9"	7	7'-0"	7	7'-0"	6	6'-0"	5	5 1/2"	9'-0"	6'-3 1/4"	20'-6"	7	5 1/2"	9'-0"	--	--	----	----	5	5 1/2"	10'-9"	36	28
8	10	19"	19"	12"	7	7'-0"	7	7'-0"	8	8'-0"	5	5 1/2"	9'-3 1/2"	7'-1"	22'-10"	7	5 1/2"	9'-3"	--	--	----	----	5	6"	12'-10"	36	36
9	4	20"	20"	8"	8	8'-0"	8	8'-0"	2	2'-0"	5	6 1/2"	10'-0"	4'-2"	17'-8"	8	6 1/2"	10'-0"	--	--	----	----	4	12"	7'-0"	40	12
9	6	20 1/2"	20 1/2"	8"	8	8'-0"	8	8'-0"	4	4'-0"	5	6 1/2"	10'-0"	5'-2 1/2"	19'-9"	8	6 1/2"	10'-0"	--	--	----	----	5	12"	9'-1"	40	20
9	8	20 3/4"	20 3/4"	8 1/2"	8	8'-0"	8	8'-0"	6	6'-0"	5	6"	10'-0"	6'-2 3/4"	21'-10"	8	6"	10'-0"	--	--	----	----	6	8"	11'-1"	40	28
9	10	20 3/4"	20 3/4"	12"	8	8'-0"	8	8'-0"	8	8'-0"	6	6 1/2"	10'-3 1/2"	7'-6 1/4"	24'-7"	8	6 1/2"	10'-3"	--	--	----	----	5	6"	13'-1"	40	36
9	12	21"	21"	14"	8	8'-0"	8	8'-0"	10	10'-0"	6	5 1/2"	10'-6 1/2"	8'-6 1/2"	26'-10"	8	5 1/2"	10'-6"	--	--	----	----	7	8"	15'-2"	40	44
10	4	22 1/2"	22 1/2"	8"	9	9'-0"	9	9'-0"	2	2'-0"	5	6"	11'-0"	4'-4 1/2"	19'-3"	8	6"	11'-0"	--	--	----	----	4	12"	7'-5"	44	12
10	6	22 1/4"	22 1/4"	8"	9	9'-0"	9	9'-0"	4	4'-0"	5	6"	11'-0"	5'-4 1/4"	21'-2"	8	6"	11'-0"	--	--	----	----	5	12"	9'-4"	44	20
10	8	22 1/4"	22 1/4"	8"	9	9'-0"	9	9'-0"	6	6'-0"	5	6"	11'-0"	6'-4 1/4"	23'-1"	8	6"	11'-0"	--	--	----	----	5	5 1/2"	11'-4"	44	28
10	10	22"	22"	12"	9	9'-0"	9	9'-0"	8	8'-0"	5	5 1/2"	11'-3 1/2"	7'-4"	25'-4"	8	5 1/2"	11'-3"	--	--	----	----	5	5"	13'-4"	44	36
10	12	22"	22"	14"	9	9'-0"	9	9'-0"	10	10'-0"	7	5 1/2"	11'-6 1/2"	8'-11"	28'-5"	8	5 1/2"	11'-6"	--	--	----	----	6	6"	15'-4"	44	44
12	6	27 1/2"	27 1/2"	8 1/2"	11	11'-0"	11	11'-0"	4	4'-0"	4	5"	13'-1"	5'-9 1/2"	24'-2"	8	5"	13'-1"	--	--	----	----	5	12"	10'-3"	52	20
12	8	27 1/2"	27 1/2"	8"	11	11'-0"	11	11'-0"	6	6'-0"	5	5"	13'-0"	6'-11 1/2"	26'-3"	8	5"	13'-0"	--	--	----	----	6	7"	12'-3"	52	28
12	10	27 1/2"	27 1/2"	12"	11	11'-0"	11	11'-0"	8	8'-0"	5	4 1/2"	13'-3 1/2"	7'-11 1/2"	28'-7"	8	4 1/2"	13'-3"	--	--	----	----	7	9 1/2"	14'-3"	52	36
12	12	27 1/2"	27 1/2"	14"	11	11'-0"	11	11'-0"	10	10'-0"	6	4 1/2"	13'-6 1/2"	9'-1"	31'-0"	8	4 1/2"	13'-6"	--	--	----	----	7	8"	16'-3"	52	44

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 ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1002.15	07/11

SINGLE BOX CULVERTS
40 TO 50 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

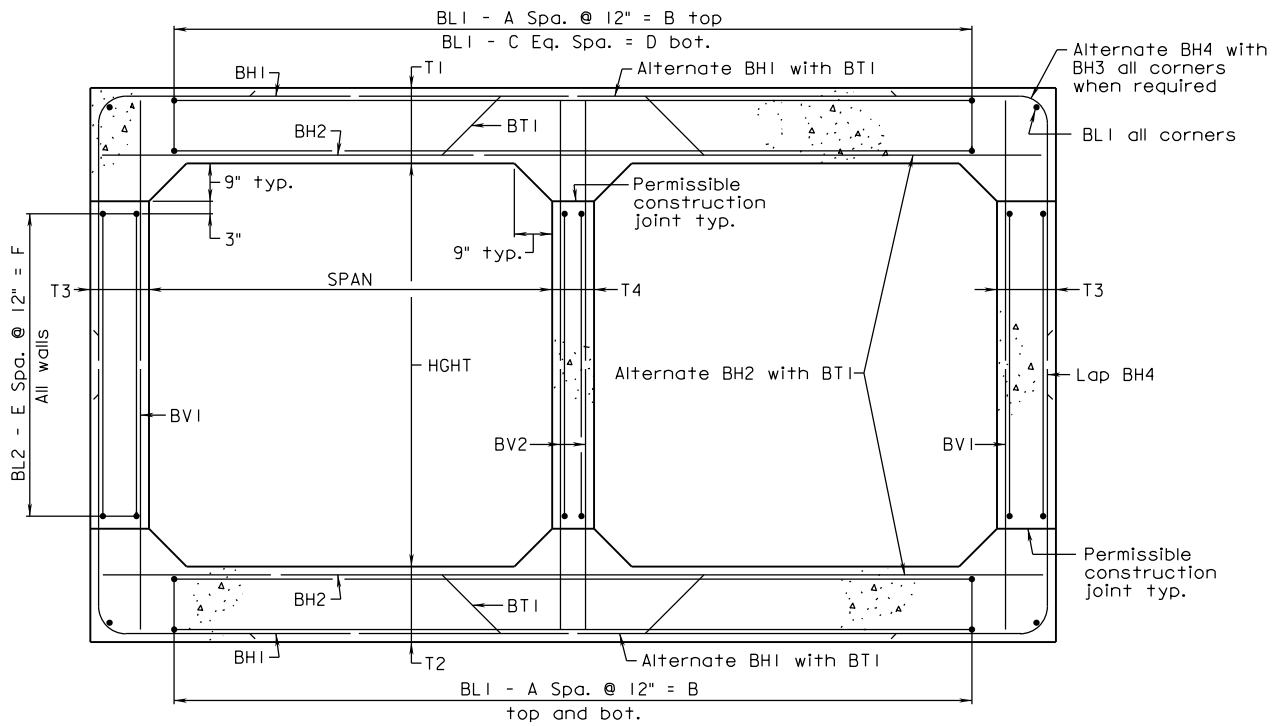
FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCS-DT.

SPAN (FT.)	HIGHT (FT.)	REINFORCING STEEL (LBS/LONG. JT)	QUAN./LF		HEADWALLS								
			CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
					HEADWALL LENGTH	SIZE	LENGTH	LENGTH					
3	3	16.184	0.399	68.962	5'-10"	6	5'- 6"	1.038	33.044	1.042	33.044	A	
3	4	17.596	0.448	74.625	5'-10"	6	5'- 6"	1.131	33.044	1.134	33.044	C	
4	3	19.524	0.522	76.100	6'-10"	6	6'- 6"	1.165	39.052	1.172	39.052	B	
4	4	20.936	0.571	75.683	6'-10"	6	6'- 6"	1.257	39.052	1.264	39.052	D	
4	5	22.348	0.620	81.181	6'-10"	6	6'- 6"	1.350	39.052	1.357	39.052	F	
4	6	23.760	0.764	86.910	6'-10"	6	6'- 6"	1.443	39.052	1.450	39.052	H	
5	3	22.864	0.691	87.548	7'-10"	6	7'- 6"	1.259	45.060	1.269	45.060	B	
5	4	24.276	0.740	92.854	7'-10"	6	7'- 6"	1.352	45.060	1.362	45.060	D	
5	5	25.688	0.789	104.834	7'-10"	6	7'- 6"	1.444	45.060	1.455	45.060	F	
5	6	27.100	0.808	119.650	7'-10"	6	7'- 6"	1.537	45.060	1.547	45.060	H	
5	7	28.512	0.968	126.150	7'-10"	6	7'- 6"	1.630	45.060	1.640	45.060	J	
6	4	27.616	0.887	116.334	8'-10"	6	8'- 6"	1.433	51.068	1.446	51.068	D	
6	5	29.028	0.935	132.479	8'-10"	6	8'- 6"	1.525	51.068	1.539	51.068	F	
6	6	30.440	1.038	155.252	8'-10"	6	8'- 6"	1.617	51.068	1.631	51.068	H	
6	7	31.852	1.041	186.084	8'-10"	6	8'- 6"	1.710	51.068	1.724	51.068	J	
6	8	33.264	1.207	195.354	8'-10"	6	8'- 6"	1.804	51.068	1.817	51.068	L	
7	4	30.956	1.128	146.481	9'-10"	6	9'- 6"	1.514	57.076	1.531	57.076	E	
7	6	33.780	1.236	194.910	9'-10"	6	9'- 6"	1.698	57.076	1.715	57.076	I	
7	8	36.604	1.371	222.064	9'-10"	6	9'- 6"	1.885	57.076	1.902	57.076	M	
7	10	39.428	1.735	257.787	9'-10"	6	9'- 6"	2.070	57.076	2.087	57.076	Q	
8	4	34.296	1.276	195.772	10'-10"	6	10'- 6"	1.579	63.084	1.599	63.084	E	
8	6	37.120	1.390	187.491	10'-10"	6	10'- 6"	1.762	63.084	1.782	63.084	I	
8	8	39.944	1.566	261.160	10'-10"	6	10'- 6"	1.945	63.084	1.965	63.084	M	
8	10	42.768	1.934	281.746	10'-10"	6	10'- 6"	1.987	63.084	2.006	63.084	Q	
9	4	37.636	1.499	207.204	11'-10"	6	11'- 6"	1.627	69.092	1.650	69.092	E	
9	6	40.460	1.628	231.090	11'-10"	6	11'- 6"	1.806	69.092	1.830	69.092	I	
9	8	43.284	1.774	288.545	11'-10"	6	11'- 6"	1.988	69.092	2.012	69.092	M	
9	10	46.108	2.166	334.834	11'-10"	6	11'- 6"	2.030	69.092	2.052	69.092	Q	
9	12	48.932	2.515	436.543	11'-10"	6	11'- 6"	2.048	69.092	2.069	69.092	U	
10	4	40.976	1.795	245.200	12'-10"	6	12'- 6"	1.671	75.100	1.698	75.100	F	
10	6	43.800	1.874	266.040	12'-10"	6	12'- 6"	1.860	75.100	1.887	75.100	J	
10	8	46.624	1.970	310.043	12'-10"	6	12'- 6"	2.046	75.100	2.073	75.100	N	
10	10	49.448	2.385	361.147	12'-10"	6	12'- 6"	2.089	75.100	2.114	75.100	R	
10	12	52.272	2.714	528.019	12'-10"	6	12'- 6"	2.109	75.100	2.133	75.100	V	
12	6	50.480	2.610	314.113	14'-10"	6	14'- 6"	1.847	87.116	1.881	87.116	K	
12	8	53.304	2.668	410.348	14'-10"	6	14'- 6"	2.065	87.116	2.099	87.116	O	
12	10	56.128	3.123	476.112	14'-10"	6	14'- 6"	2.094	87.116	2.127	87.116	S	
12	12	58.952	3.467	594.069	14'-10"	6	14'- 6"	2.106	87.116	2.137	87.116	W	

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SPECIFICATION REFERENCE	<h2 style="margin: 0;">SINGLE BOX CULVERTS</h2> <h3 style="margin: 0;">40 TO 50 FT. FILLS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p style="margin: 0;">ROAD AND BRIDGE STANDARDS</p>	
		REVISION DATE 07/11	SHEET 2 OF 2 1002.16

BCD-DT



TYPICAL SECTION

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ROAD AND BRIDGE STANDARDS

SHEET 1 OF 3

REVISION DATE

1003.01

07/11

DOUBLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

GENERAL NOTE

Capacity: AASHTO HI-93 Loading.

Specifications:

Construction - Va. Department of Transportation Road and Bridge Specifications.

Design - AASHTO LRFD Bridge Design Specifications, 4th Edition 2007; 2008 and 2009 Interim Specifications; and VDOT Modifications.

All concrete shall be Class A4.

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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 35' in length shall be poured in sections by providing vertical construction joints, not exceeding 25' between joints nor more than 30' from ends of barrels.

** All bends shall be made with a pin diameter as listed in TABLE A except for Bars BH3 and BH4 which shall have a pin diameter of 24 bar diameters.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight and #4 size unless otherwise shown. BL2 shall be #3 size.

The number of BL1 and 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 and 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./LF shown for reinforcing steel does not include quantity for laps of BL1 and BL2 bars. The additional weight per longitudinal lap is shown in the table.

The minimum cover of main reinforcing bars shall be 2 1/2" from the face of the concrete for culverts under 0 to 2 foot fills and shall be 2" from the face of concrete for all other culverts.

All reinforcing steel for culverts under 0 to 2 foot fills shall be Low Carbon/Chromium Reinforcing Steel conforming to ASTM A1035.

At the Contractor's option, BV1 and BV2 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.

Bar HW2 shall be 4" less than culvert height in length.

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.

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

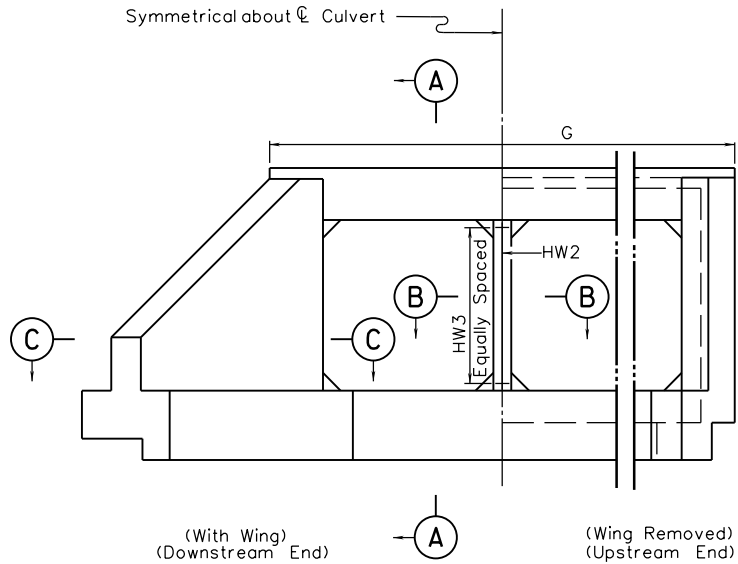
For modification of details for skewed culverts, see the skewed box details included in the road plans.

This standard shall be used with the BCD standard series.

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SPECIFICATION REFERENCE	<h2>DOUBLE BOX CULVERTS</h2> <h3>STANDARD DETAILS</h3> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/11	SHEET 2 OF 3 1003.02

BCD-DT



END ELEVATION

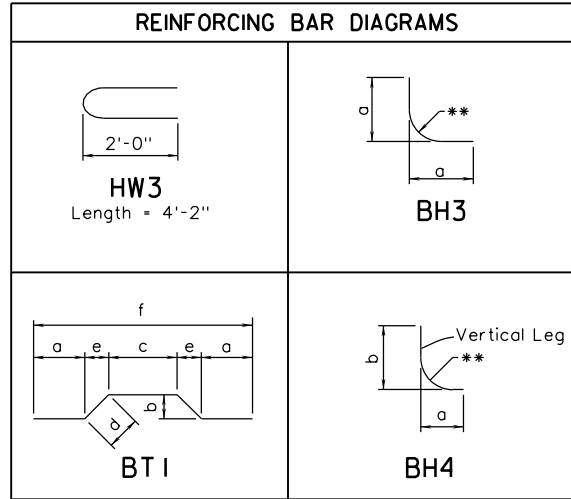
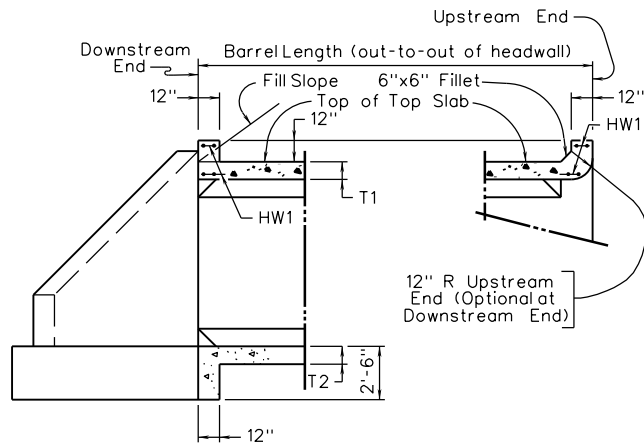
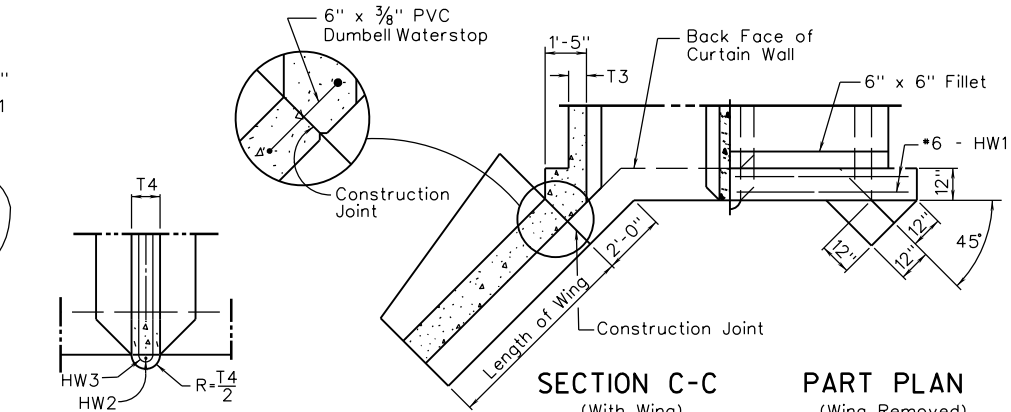


TABLE A

Bar Size	Pin Dia.
#3	2 ¹ / ₄ "
#4	3"
#5	3 ³ / ₄ "
#6	4 ¹ / ₂ "
#7	5 ¹ / ₄ "
#8	6"
#9	9"



SECTION A-A
(With Wing)



PART SECTION B-B
UPSTREAM END
(Optional at Downstream End)

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

PART PLAN
(Wing Removed)
(Upstream End)



ROAD AND BRIDGE STANDARDS

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1003.03

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**DOUBLE BOX CULVERTS
STANDARD DETAILS**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

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SPECIFICATION REFERENCE

DOUBLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

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1003.04

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCD-DT.

DIMENSIONS							REINFORCING STEEL																									
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3			BH4			BV1			BV2					
												SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	6	6'-0"	6	6'-0"	1	1'-0"	4	12"	7'-6"	4	12"	7'-8"	--	---	-----	-----	4	12"	2'-1 1/4"	2'-8"	4'-6"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	6	6'-0"	6	6'-0"	2	2'-0"	4	12"	7'-6"	4	12"	7'-8"	--	---	-----	-----	4	12"	2'-1 1/4"	3'-2"	5'-0"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	8	8'-0"	8	8'-0"	1	1'-0"	4	12"	9'-1"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-3 3/8"	2'-8"	4'-8"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	8	8'-0"	8	8'-0"	2	2'-0"	4	12"	9'-1"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-3 3/8"	3'-2"	5'-2"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	8	8'-0"	8	8'-0"	3	3'-0"	4	12"	9'-1"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-3 3/8"	3'-8"	5'-8"	4	12"	6'-0"	4	12"	6'-0"
4	6	8"	8"	8"	8"	8	8'-0"	8	8'-0"	4	4'-0"	4	12"	9'-1"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-3 3/8"	4'-2"	6'-2"	4	12"	7'-0"	4	12"	7'-0"
5	3	8"	8"	8"	8"	10	10'-0"	10	10'-0"	1	1'-0"	4	12"	10'-8"	4	12"	11'-8"	--	---	-----	-----	4	12"	2'-6"	2'-8"	4'-11"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	10	10'-0"	10	10'-0"	2	2'-0"	4	12"	10'-8"	4	12"	11'-8"	--	---	-----	-----	4	12"	2'-6"	3'-2"	5'-5"	4	12"	5'-0"	4	12"	5'-0"
5	5	8"	8"	8"	8"	10	10'-0"	10	10'-0"	3	3'-0"	4	12"	10'-8"	4	12"	11'-8"	--	---	-----	-----	4	12"	2'-6"	3'-8"	5'-11"	4	12"	6'-0"	4	12"	6'-0"
5	6	8"	8"	8"	8"	10	10'-0"	10	10'-0"	4	4'-0"	4	12"	10'-8"	4	12"	11'-8"	--	---	-----	-----	4	12"	2'-6"	4'-2"	6'-5"	4	12"	7'-0"	4	12"	7'-0"
5	7	8"	8"	8"	8"	10	10'-0"	10	10'-0"	5	5'-0"	4	12"	10'-8"	4	12"	11'-8"	--	---	-----	-----	4	12"	2'-6"	4'-8"	6'-11"	4	12"	8'-0"	4	12"	8'-0"
6	4	8"	8"	8"	8"	12	12'-0"	12	12'-0"	2	2'-0"	4	12"	12'-7"	4	12"	13'-8"	--	---	-----	-----	4	12"	2'-8 3/8"	3'-2"	5'-7"	4	12"	5'-0"	4	12"	5'-0"
6	5	8"	8"	8"	8"	12	12'-0"	12	12'-0"	3	3'-0"	4	12"	12'-7"	4	12"	13'-8"	--	---	-----	-----	4	12"	2'-8 3/8"	3'-8"	6'-1"	4	12"	6'-0"	4	12"	6'-0"
6	6	8"	8"	8"	8"	12	12'-0"	12	12'-0"	4	4'-0"	4	12"	12'-7"	4	12"	13'-8"	--	---	-----	-----	4	12"	2'-8 3/8"	4'-2"	6'-7"	4	12"	7'-0"	4	12"	7'-0"
6	7	8"	8"	8"	8"	12	12'-0"	12	12'-0"	5	5'-0"	4	12"	12'-7"	4	12"	13'-8"	--	---	-----	-----	4	12"	2'-8 3/8"	4'-8"	7'-1"	4	12"	8'-0"	4	12"	8'-0"
6	8	8"	8"	8"	8"	12	12'-0"	12	12'-0"	6	6'-0"	4	12"	12'-7"	4	12"	13'-8"	3	12"	3'-2"	6'-2"	4	12"	2'-8 3/8"	5'-2"	7'-7"	4	12"	9'-0"	4	12"	9'-0"
7	4	8"	8"	8"	8"	14	14'-0"	14	14'-0"	2	2'-0"	4	12"	14'-7"	4	12"	15'-8"	--	---	-----	-----	5	12"	2'-10 3/4"	3'-2"	5'-9"	4	12"	5'-0"	4	12"	5'-0"
7	6	8"	8"	8"	8"	14	14'-0"	14	14'-0"	4	4'-0"	4	12"	14'-7"	4	12"	15'-8"	4	12"	2'-10 3/4"	5'-6"	4	12"	2'-10 3/4"	4'-2"	6'-10"	4	12"	7'-0"	4	12"	7'-0"
7	8	8"	8"	8"	8"	14	14'-0"	14	14'-0"	6	6'-0"	4	12"	14'-7"	4	12"	15'-8"	4	12"	3'-2"	6'-2"	4	12"	2'-10 3/4"	5'-2"	7'-10"	4	12"	9'-0"	4	12"	9'-0"
7	10	8"	8"	8"	8"	14	14'-0"	14	14'-0"	8	8'-0"	4	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10 3/4"	6'-2"	8'-9"	5	10"	11'-0"	4	12"	11'-0"
8	4	8 1/4"	8 1/4"	8"	8"	16	16'-0"	16	16'-0"	2	2'-0"	4	10"	16'-7"	4	10"	17'-8"	--	---	-----	-----	5	10"	3'-1 1/4"	3'-2 1/4"	6'-0"	4	9"	5'-0"	4	12"	5'-0"
8	6	8 1/2"	8 1/2"	8"	8"	16	16'-0"	16	16'-0"	4	4'-0"	4	10"	16'-7"	4	10"	17'-8"	3	10"	3'-1 1/4"	6'-0"	4	10"	3'-1 1/4"	4'-2 1/2"	7'-1"	4	12"	7'-1"	4	12"	7'-1"
8	8	8 3/4"	8 3/4"	8"	8"	16	16'-0"	16	16'-0"	6	6'-0"	4	9"	16'-7"	4	9"	17'-8"	3	9"	3'-1 1/4"	6'-0"	4	9"	3'-1 1/4"	5'-2 3/4"	8'-1"	4	12"	9'-2"	4	12"	9'-2"
8	10	9"	9"	8"	8"	16	16'-0"	16	16'-0"	8	8'-0"	5	10"	16'-7"	4	10"	17'-8"	--	---	-----	-----	5	10"	3'-1 1/4"	6'-3"	9'-0"	5	11"	11'-2"	4	12"	11'-2"
9	4	9 1/4"	9 1/4"	8"	8"	18	18'-0"	18	18'-0"	2	2'-0"	5	9"	18'-7"	4	9"	19'-8"	4	9"	3'-3 3/8"	6'-4"	4	9"	3'-3 3/8"	3'-3 1/4"	6'-4"	4	8 1/2"	5'-2"	4	12"	5'-2"
9	6	9 1/2"	9 1/2"	8"	8"	18	18'-0"	18	18'-0"	4	4'-0"	5	9"	18'-7"	4	9"	19'-8"	3	9"	3'-3 3/8"	6'-5"	4	9"	3'-3 3/8"	4'-3 1/2"	7'-4"	4	12"	7'-3"	4	12"	7'-3"
9	8	9 3/4"	9 3/4"	8"	8"	18	18'-0"	18	18'-0"	6	6'-0"	5	9"	18'-7"	4	9"	19'-8"	3	9"	3'-3 3/8"	6'-5"	4	9"	3'-3 3/8"	5'-3 3/4"	8'-4"	4	12"	9'-3"	4	12"	9'-3"
9	10	9 3/4"	9 3/4"	8"	8"	18	18'-0"	18	18'-0"	8	8'-0"	5	9"	18'-7"	4	9"	19'-8"	4	9"	3'-8"	6'-11"	4	9"	3'-3 3/8"	6'-3 3/4"	9'-4"	5	12"	11'-3"	4	12"	11'-3"
9	12	10"	10"	8"	8"	18	18'-0"	18	18'-0"	10	10'-0"	5	8"	18'-7"	4	8"	19'-8"	4	8"	4'-1"	7'-11"	4	8"	3'-3 3/8"	7'-4"	10'-4"	5	7"	13'-4"	4	12"	13'-4"
10	4	10"	10"	8"	8"	20	20'-0"	20	20'-0"	2	2'-0"	5	8"	20'-4"	4	8"	21'-8"	4	8"	3'-6"	6'-9"	4	8"	3'-6"	3'-4"	6'-7"	4	8"	5'-4"	4	12"	5'-4"
10	6	10 1/4"	10 1/4"	8"	8"	20	20'-0"	20	20'-0"	4	4'-0"	5	9"	20'-4"	5	9"	21'-8"	--	---	-----	-----	5	9"	3'-6"	4'-4 1/4"	7'-6"	4	12"	7'-5"	4	12"	7'-5"
10	8	10 1/2"	10 1/2"	8"	8"	20	20'-0"	20	20'-0"	6	6'-0"	5	9"	20'-4"	5	9"	21'-8"	--	---	-----	-----	5	9"	3'-6"	5'-4 1/2"	8'-7"	4	12"	9'-5"	4	12"	9'-5"
10	10	10 3/4"	10 3/4"	8"	8"	20	20'-0"	20	20'-0"	8	8'-0"	5	10"	20'-4"	5	10"	21'-8"	3	10"	3'-9"	7'-4"	5	10"	3'-6"	6'-4 3/4"	9'-7"	5	12"	11'-5"	4	12"	11'-5"
10	12	10 3/4"	10 3/4"	8"	8"	20	20'-0"	20	20'-0"	10	10'-0"	5	10"	20'-4"	5	10"	21'-8"	4	10"	4'-1"	7'-11"	5	10"	3'-6"	7'-4 3/4"	10'-7"	5	6"	13'-5"	4	12"	13'-5"
12	6	12"	12"	8"	8"	24	24'-0"	24	24'-0"	4	4'-0"	6	9"	24'-7"	5	9"	25'-8"	4	9"	3'-10 3/4"	7'-6"	4	9"	3'-10 3/4"	4'-6"	8'-2"	4	11"	7'-8"	4	12"	7'-8"
12	8	12 1/4"	12 1/4"	8"	8"	24	24'-0"	24	24'-0"	6	6'-0"	6	9"	24'-7"	5	9"	25'-8"	4	9"	3'-10 3/4"	7'-6"	4	9"	3'-10 3/4"	5'-6 1/4"	9'-2"	4	12"	9'-9"	4	12"	9'-9"
12	10	12 1/2"	12 1/2"	8"	8"	24	24'-0"	24	24'-0"	8	8'-0"	6	9"	24'-7"	5	9"	25'-8"	--	---	-----	-----	5	9"	3'-10 3/4"	6'-6 1/2"	10'-1"	5	12"	11'-9"	4	12"	11'-9"
12	12	12 1/2"	12 1/2"	8"	8"	24	24'-0"	24	24'-0"	10	10'-0"	6	9"	24'-7"	6	9"	25'-8"	--	---	-----	-----	6	9"	4'-5"	7'-10"	11'-10"	5	8"	13'-9"	4	12"	13'-9"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

<p align="center">ROAD AND BRIDGE STANDARDS</p>	
SHEET 1 OF 2	REVISION DATE
1003.09	07/11

DOUBLE BOX CULVERTS

5 TO 10 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

2016 ROAD & BRIDGE STANDARDS

BCD-20

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCD-DT.

DIMENSIONS							REINFORCING STEEL																									
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3			BH4			BV1			BV2					
												SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	α	LENGTH	SIZE	SPACING C-C	α	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	6'	6'-0"	6'	6'-0"	1	1'-0"	4	12"	6'-7"	4	12"	7'-8"	--	---	-----	-----	4	12"	2'-4"	2'-9"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	6'	6'-0"	6'	6'-0"	2	2'-0"	4	12"	6'-7"	4	12"	7'-8"	--	---	-----	-----	4	12"	2'-4"	3'-3"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	8'	8'-0"	8'	8'-0"	1	1'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-4"	2'-9"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	8'	8'-0"	8'	8'-0"	2	2'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-4"	3'-3"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	8'	8'-0"	8'	8'-0"	3	3'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-4"	3'-9"	5'-9"	4	12"	6'-0"	4	12"	6'-0"
4	6	8"	8"	8"	8"	8'	8'-0"	8'	8'-0"	4	4'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	-----	-----	4	12"	2'-4"	4'-3"	6'-3"	4	12"	7'-0"	4	12"	7'-0"
5	3	8"	8"	8"	8"	10'	10'-0"	10'	10'-0"	1	1'-0"	4	12"	10'-7"	4	12"	11'-8"	4	12"	2'-6"	4'-9"	4	12"	2'-4"	2'-9"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	10'	10'-0"	10'	10'-0"	2	2'-0"	4	12"	10'-7"	4	12"	11'-8"	3	12"	2'-6"	4'-10"	4	12"	2'-4"	3'-3"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
5	5	8"	8"	8"	8"	10'	10'-0"	10'	10'-0"	3	3'-0"	4	12"	10'-7"	4	12"	11'-8"	3	12"	2'-6"	4'-10"	4	12"	2'-4"	3'-9"	5'-9"	4	12"	6'-0"	4	12"	6'-0"
5	6	8"	8"	8"	8"	10'	10'-0"	10'	10'-0"	4	4'-0"	4	12"	10'-7"	4	12"	11'-8"	3	12"	2'-9"	5'-3"	4	12"	2'-4"	4'-3"	6'-3"	4	12"	7'-0"	4	12"	7'-0"
5	7	8"	8"	8"	8"	10'	10'-0"	10'	10'-0"	5	5'-0"	4	12"	10'-7"	4	12"	11'-8"	4	12"	2'-11"	5'-7"	4	12"	2'-4"	4'-9"	6'-9"	5	12"	8'-0"	4	12"	8'-0"
6	4	9/4"	9/4"	8"	8"	12'	12'-0"	12'	12'-0"	2	2'-0"	4	12"	12'-7"	4	12"	13'-8"	4	12"	2'-9"	5'-2"	4	12"	2'-4"	3'-4"	5'-4"	4	12"	5'-2"	4	12"	5'-2"
6	5	9/2"	9/2"	8"	8"	12'	12'-0"	12'	12'-0"	3	3'-0"	4	12"	12'-7"	4	12"	13'-8"	4	12"	2'-9"	5'-2"	4	12"	2'-4"	3'-10"	5'-10"	4	12"	6'-3"	4	12"	6'-3"
6	6	9/2"	9/2"	8"	8"	12'	12'-0"	12'	12'-0"	4	4'-0"	4	12"	12'-7"	4	12"	13'-8"	4	12"	2'-10"	5'-5"	4	12"	2'-4"	4'-4"	6'-4"	4	12"	7'-3"	4	12"	7'-3"
6	7	9/2"	9/2"	8"	8"	12'	12'-0"	12'	12'-0"	5	5'-0"	4	12"	12'-7"	4	12"	13'-8"	4	12"	3'-1"	5'-10"	4	12"	2'-4"	4'-10"	6'-10"	5	12"	8'-3"	4	12"	8'-3"
6	8	9/4"	9/4"	8"	8"	12'	12'-0"	12'	12'-0"	6	6'-0"	4	12"	12'-7"	4	12"	13'-8"	4	12"	3'-3"	6'-3"	4	12"	2'-4"	5'-4"	7'-5"	5	12"	9'-3"	4	12"	9'-3"
7	4	10/2"	10/2"	8"	8"	14'	14'-0"	14'	14'-0"	2	2'-0"	4	10"	14'-7"	4	10"	15'-8"	3	10"	2'-11"	5'-8"	4	10"	2'-4"	3'-5"	5'-5"	4	12"	5'-5"	4	12"	5'-5"
7	6	10/4"	10/4"	8"	8"	14'	14'-0"	14'	14'-0"	4	4'-0"	4	10"	14'-7"	4	10"	15'-8"	--	---	-----	-----	4	10"	2'-4"	4'-5"	6'-6"	4	12"	7'-5"	4	12"	7'-5"
7	8	11"	11"	8"	8"	14'	14'-0"	14'	14'-0"	6	6'-0"	4	10"	14'-7"	4	10"	15'-8"	3	10"	3'-5"	6'-7"	4	10"	2'-4"	5'-6"	7'-6"	5	12"	9'-6"	4	12"	9'-6"
7	10	11/4"	11/4"	8"	8"	14'	14'-0"	14'	14'-0"	8	8'-0"	4	10"	14'-4"	4	10"	15'-8"	3	10"	3'-10"	7'-5"	5	10"	2'-6"	6'-8"	8'-9"	6	10/2"	11'-6"	4	12"	11'-6"
8	4	11/4"	11/4"	8"	8"	16'	16'-0"	16'	16'-0"	2	2'-0"	5	9"	16'-7"	4	9"	17'-8"	3	9"	3'-2"	6'-1"	4	9"	2'-9"	3'-6"	6'-0"	4	12"	5'-7"	4	12"	5'-7"
8	6	12"	12"	8"	8"	16'	16'-0"	16'	16'-0"	4	4'-0"	5	9"	16'-7"	4	9"	17'-8"	--	---	-----	-----	4	9"	2'-9"	4'-6"	7'-0"	4	12"	7'-8"	4	12"	7'-8"
8	8	12/4"	12/4"	8"	8"	16'	16'-0"	16'	16'-0"	6	6'-0"	5	9"	16'-7"	4	9"	17'-8"	3	9"	3'-6"	6'-9"	4	9"	2'-9"	5'-7"	8'-0"	5	12"	9'-8"	4	12"	9'-8"
8	10	12/2"	12/2"	8"	8"	16'	16'-0"	16'	16'-0"	8	8'-0"	5	9"	16'-7"	4	9"	17'-8"	4	9"	3'-11"	7'-6"	4	9"	2'-9"	6'-7"	9'-0"	5	7"	11'-9"	4	12"	11'-9"
9	4	13"	13"	8"	8"	18'	18'-0"	18'	18'-0"	2	2'-0"	5	9"	18'-7"	5	9"	19'-8"	3	9"	3'-4"	6'-5"	4	9"	2'-9"	3'-7"	6'-1"	4	11/2"	5'-9"	4	12"	5'-9"
9	6	13/4"	13/4"	8"	8"	18'	18'-0"	18'	18'-0"	4	4'-0"	5	9"	18'-7"	5	9"	19'-8"	--	---	-----	-----	4	9"	2'-9"	4'-8"	7'-1"	4	12"	7'-10"	4	12"	7'-10"
9	8	13/4"	13/4"	8"	8"	18'	18'-0"	18'	18'-0"	6	6'-0"	5	9"	18'-7"	5	9"	19'-8"	3	9"	3'-7"	6'-11"	4	9"	2'-9"	5'-8"	8'-1"	5	12"	9'-10"	4	12"	9'-10"
9	10	13/2"	13/2"	8"	8"	18'	18'-0"	18'	18'-0"	8	8'-0"	5	9"	18'-4"	5	9"	19'-8"	3	9"	4'-0"	7'-9"	5	9"	2'-11"	6'-10"	9'-4"	5	7/2"	11'-11"	4	12"	11'-11"
9	12	13/4"	13/4"	9/2"	8"	18'	18'-0"	18'	18'-0"	10	10'-0"	5	9"	18'-4"	5	9"	19'-11"	3	9"	4'-5"	8'-7"	6	9"	3'-0"	8'-0"	10'-7"	5	4/2"	13'-11"	4	12"	13'-11"
10	4	14/2"	14/2"	8"	8"	20'	20'-0"	20'	20'-0"	2	2'-0"	6	9"	20'-7"	5	9"	21'-8"	3	9"	3'-6"	6'-10"	4	9"	3'-2"	3'-9"	6'-7"	4	11/2"	6'-0"	4	12"	6'-0"
10	6	15"	15"	8"	8"	20'	20'-0"	20'	20'-0"	4	4'-0"	6	9"	20'-7"	5	9"	21'-8"	3	9"	3'-6"	6'-10"	4	9"	3'-2"	4'-9"	7'-8"	4	12"	8'-2"	4	12"	8'-2"
10	8	14/4"	14/4"	8"	8"	20'	20'-0"	20'	20'-0"	6	6'-0"	6	9"	20'-7"	5	9"	21'-8"	3	9"	3'-8"	7'-2"	4	9"	3'-2"	5'-9"	8'-8"	5	12"	10'-1"	4	12"	10'-1"
10	10	15"	15"	8"	8"	20'	20'-0"	20'	20'-0"	8	8'-0"	6	9"	20'-4"	5	9"	21'-8"	3	9"	4'-1"	8'-0"	5	9"	3'-4"	7'-0"	9'-11"	5	7/2"	12'-2"	4	12"	12'-2"
10	12	15"	15"	9/2"	8"	20'	20'-0"	20'	20'-0"	10	10'-0"	6	9"	20'-4"	5	9"	21'-11"	3	9"	4'-6"	8'-10"	6	9"	3'-5"	8'-1"	11'-1"	5	4/2"	14'-2"	4	12"	14'-2"
12	6	17/4"	17/4"	8"	8"	24'	24'-0"	24'	24'-0"	4	4'-0"	6	8"	24'-7"	5	8"	25'-8"	--	---	-----	-----	4	8"	3'-2"	5'-0"	7'-11"	4	12"	8'-7"	4	12"	8'-7"
12	8	17/4"	17/4"	8"	8"	24'	24'-0"	24'	24'-0"	6	6'-0"	6	8"	24'-7"	5	8"	25'-8"	--	---	-----	-----	4	8"	3'-2"	6'-0"	8'-11"	5	12"	10'-7"	4	12"	10'-7"
12	10	18"	18"	8"	8"	24'	24'-0"	24'	24'-0"	8	8'-0"	6	8"	24'-7"	5	8"	25'-8"	4	8"	4'-4"	8'-5"	4	8"	3'-2"	7'-0"	9'-11"	5	7"	12'-8"	4	12"	12'-8"
12	12	18"	18"	9/2"	8"	24'	24'-0"	24'	24'-0"	10	10'-0"	6	8"	24'-7"	5	8"	25'-11"	4	8"	4'-9"	9'-3"	5	8"	3'-4"	8'-3"	11'-2"	5	4/2"	14'-8"	4	11/2"	14'-8"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

 ROAD AND BRIDGE STANDARDS	REVISION DATE
	07/11
	SHEET 1 OF 2

DOUBLE BOX CULVERTS

10 TO 20 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCD-DT.

SPAN		HGHT		REINFORCING STEEL											QUAN./LF		HEADWALLS							WINGWALL			
(FT.)	(FT.)	SIZE	SPACING C-C	BT I								NO. BL1 #4 BARS	NO. BL2 #3 BARS	REINFORCING STEEL (LBS/LONG. JT)	CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G		HW I		NO. HW2 BARS	NO. HW3 BARS	INLET CONCRETE CL. A4 (CY)		INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)
				a	b	c	d	e	f	g	LENGTH						HEADWALL LENGTH	SIZE	LENGTH								
3	3	4	12"	2'- 7"	0'- 4"	1'- 10"	0'- 5/8"	0'- 3/4"	7'- 8"	-----	7'-10"	32	12	30.956	0.695	78.691	9'- 6"	6	9'- 2"	1	4	1.433	67.988	1.425	55.073	A	
3	4	4	12"	2'- 7"	0'- 4"	1'- 10"	0'- 5/8"	0'- 3/4"	7'- 8"	-----	7'-10"	32	18	33.065	0.768	84.955	9'- 6"	6	9'- 2"	1	5	1.531	71.439	1.517	55.073	C	
4	3	4	12"	3'- 5"	0'- 4"	2'- 3"	0'- 5/8"	0'- 3/4"	9'- 8"	-----	9'-10"	40	12	37.636	0.792	92.051	11'- 6"	6	11'- 2"	1	4	1.635	80.004	1.634	67.089	A	
4	4	4	12"	3'- 5"	0'- 4"	2'- 3"	0'- 5/8"	0'- 3/4"	9'- 8"	-----	9'-10"	40	18	39.745	0.866	98.315	11'- 6"	6	11'- 2"	1	5	1.734	83.455	1.726	67.089	C	
4	5	4	12"	3'- 5"	0'- 4"	2'- 3"	0'- 5/8"	0'- 3/4"	9'- 8"	-----	9'-10"	40	24	41.860	0.940	104.579	11'- 6"	6	11'- 2"	1	6	1.833	86.907	1.819	67.089	E	
4	6	4	12"	3'- 5"	0'- 4"	2'- 3"	0'- 5/8"	0'- 3/4"	9'- 8"	-----	9'-10"	40	30	43.975	1.013	110.843	11'- 6"	6	11'- 2"	1	7	1.932	90.358	1.912	67.089	G	
5	3	4	12"	4'- 2"	0'- 4"	2'- 8"	0'- 5/8"	0'- 3/4"	11'- 8"	-----	11'-10"	48	12	44.310	0.891	98.023	13'- 6"	6	13'- 2"	1	4	1.837	92.020	1.843	79.105	A	
5	4	4	12"	4'- 2"	0'- 4"	2'- 8"	0'- 5/8"	0'- 3/4"	11'- 8"	-----	11'-10"	48	18	46.425	0.965	98.856	13'- 6"	6	13'- 2"	1	5	1.936	95.471	1.935	79.105	C	
5	5	4	12"	4'- 2"	0'- 4"	2'- 8"	0'- 5/8"	0'- 3/4"	11'- 8"	-----	11'-10"	48	24	48.540	1.038	105.120	13'- 6"	6	13'- 2"	1	6	2.035	98.923	2.028	79.105	E	
5	6	4	12"	4'- 2"	0'- 4"	2'- 8"	0'- 5/8"	0'- 3/4"	11'- 8"	-----	11'-10"	48	30	50.655	1.112	111.986	13'- 6"	6	13'- 2"	1	7	2.134	102.374	2.121	79.105	G	
5	7	4	12"	4'- 2"	0'- 4"	2'- 8"	0'- 5/8"	0'- 3/4"	11'- 8"	-----	11'-10"	48	36	52.770	1.185	131.216	13'- 6"	6	13'- 2"	1	8	2.233	105.825	2.214	79.105	I	
6	4	4	12"	4'- 11"	0'- 5/4"	3'- 0"	0'- 7"	0'- 4/2"	13'- 8"	-----	13'-11"	56	18	53.105	1.168	139.704	15'- 6"	6	15'- 2"	1	5	2.127	107.487	2.133	91.121	D	
6	5	4	12"	4'- 11"	0'- 5/2"	3'- 0"	0'- 7/4"	0'- 4 3/4"	13'- 8"	-----	13'-11"	56	24	55.220	1.264	146.158	15'- 6"	6	15'- 2"	1	6	2.220	110.939	2.220	91.121	F	
6	6	4	12"	4'- 11"	0'- 5/2"	3'- 0"	0'- 7/4"	0'- 4 3/4"	13'- 8"	-----	13'-11"	56	30	57.335	1.337	153.090	15'- 6"	6	15'- 2"	1	7	2.319	114.390	2.313	91.121	H	
6	7	4	12"	4'- 11"	0'- 5/2"	3'- 0"	0'- 7/4"	0'- 4 3/4"	13'- 8"	-----	13'-11"	56	36	59.450	1.410	166.611	15'- 6"	6	15'- 2"	1	8	2.418	117.841	2.406	91.121	J	
6	8	4	12"	4'- 10"	0'- 5 3/4"	3'- 0"	0'- 7 5/8"	0'- 5"	13'- 8"	-----	14'- 0"	56	42	61.586	1.505	175.026	15'- 6"	6	15'- 2"	1	9	2.511	121.293	2.492	91.121	L	
7	4	4	10"	5'- 7"	0'- 6/2"	3'- 5"	0'- 8 3/4"	0'- 5 3/4"	15'- 8"	-----	16'- 0"	64	18	59.785	1.404	165.663	17'- 6"	6	17'- 2"	1	5	2.285	119.503	2.297	103.137	D	
7	6	4	10"	5'- 7"	0'- 6 3/4"	3'- 5"	0'- 9"	0'- 6"	15'- 8"	-----	16'- 0"	64	30	64.015	1.577	168.822	17'- 6"	6	17'- 2"	1	7	2.475	126.406	2.475	103.137	H	
7	8	4	10"	5'- 7"	0'- 7"	3'- 5"	0'- 9 3/8"	0'- 6 1/4"	15'- 8"	-----	16'- 1"	64	42	68.245	1.747	200.948	17'- 6"	6	17'- 2"	1	9	2.666	133.309	2.653	103.137	L	
7	10	4	10"	5'- 6"	0'- 7/4"	3'- 5"	0'- 9 3/4"	0'- 6 1/2"	15'- 8"	-----	16'- 1"	64	54	72.475	1.916	248.796	17'- 6"	6	17'- 2"	1	11	2.856	140.211	2.831	103.137	P	
8	4	4	9"	6'- 3"	0'- 7 3/4"	3'- 10"	0'- 10 1/2"	0'- 7"	17'- 8"	-----	18'- 1"	72	18	66.465	1.669	212.942	19'- 6"	6	19'- 2"	1	5	2.427	131.519	2.446	115.153	D	
8	6	4	9"	6'- 3"	0'- 8"	3'- 10"	0'- 10 7/8"	0'- 7 1/4"	17'- 8"	-----	18'- 1"	72	30	70.695	1.845	214.543	19'- 6"	6	19'- 2"	1	7	2.616	138.422	2.622	115.153	H	
8	8	4	9"	6'- 3"	0'- 8 1/4"	3'- 10"	0'- 11 1/8"	0'- 7 1/2"	17'- 8"	-----	18'- 2"	72	42	74.925	2.018	248.913	19'- 6"	6	19'- 2"	1	9	2.804	145.325	2.799	115.153	L	
8	10	4	9"	6'- 3"	0'- 8 1/2"	3'- 10"	0'- 11 1/2"	0'- 7 3/4"	17'- 8"	-----	18'- 2"	72	54	79.155	2.191	294.798	19'- 6"	6	19'- 2"	1	11	2.993	152.227	2.975	115.153	P	
9	4	5	9"	7'- 0"	0'- 9"	4'- 3"	1'- 1/8"	0'- 8 1/8"	19'- 8"	-----	20'- 2"	80	18	73.145	1.964	273.054	21'- 6"	6	21'- 2"	1	5	2.553	143.535	2.579	127.169	D	
9	6	5	9"	7'- 0"	0'- 9 1/4"	4'- 3"	1'- 1/2"	0'- 8 3/8"	19'- 8"	-----	20'- 2"	80	30	77.375	2.143	273.531	21'- 6"	6	21'- 2"	1	7	2.740	150.438	2.754	127.169	H	
9	8	5	9"	7'- 0"	0'- 9 1/4"	4'- 3"	1'- 1/2"	0'- 8 3/8"	19'- 8"	-----	20'- 2"	80	42	81.605	2.288	308.145	21'- 6"	6	21'- 2"	1	9	2.938	157.341	2.939	127.169	L	
9	10	5	9"	6'- 11"	0'- 9 1/2"	4'- 3"	1'- 7/8"	0'- 8 5/8"	19'- 8"	-----	20'- 3"	80	54	85.835	2.464	358.625	21'- 6"	6	21'- 2"	1	11	3.126	164.243	3.114	127.169	P	
9	12	5	9"	7'- 1"	0'- 9 3/4"	4'- 3"	1'- 1 1/8"	0'- 8 7/8"	19'- 11"	-----	20'- 6"	80	66	90.065	2.769	439.648	21'- 6"	6	21'- 2"	1	13	3.313	171.146	3.289	127.169	T	
10	4	5	9"	7'- 8"	0'- 10 1/2"	4'- 8"	1'- 2 1/4"	0'- 9 5/8"	21'- 8"	-----	22'- 3"	88	18	79.825	2.324	323.981	23'- 6"	6	23'- 2"	1	5	2.652	155.551	2.685	139.185	D	
10	6	5	9"	7'- 7"	0'- 11"	4'- 8"	1'- 3"	0'- 10 1/8"	21'- 8"	-----	22'- 4"	88	30	84.055	2.539	337.513	23'- 6"	6	23'- 2"	1	7	2.850	162.454	2.870	139.185	H	
10	8	5	9"	7'- 8"	0'- 10 3/4"	4'- 8"	1'- 2 5/8"	0'- 9 7/8"	21'- 8"	-----	22'- 4"	88	42	88.285	2.652	358.944	23'- 6"	6	23'- 2"	1	9	3.036	169.357	3.043	139.185	L	
10	10	5	9"	7'- 7"	0'- 11"	4'- 8"	1'- 3"	0'- 10 1/8"	21'- 8"	-----	22'- 4"	88	54	92.515	2.830	410.490	23'- 6"	6	23'- 2"	1	11	3.221	176.259	3.217	139.185	P	
10	12	5	9"	7'- 9"	0'- 11"	4'- 8"	1'- 3"	0'- 10 1/8"	21'- 11"	-----	22'- 7"	88	66	96.745	3.106	492.783	23'- 6"	6	23'- 2"	1	13	3.419	183.162	3.402	139.185	T	
12	6	6	8"	9'- 0"	1'- 1 3/4"	5'- 5"	1'- 6 3/4"	1'- 3/4"	25'- 8"	-----	26'- 6"	104	30	97.415	3.343	445.840	27'- 6"	6	27'- 2"	1	7	2.996	186.486	3.029	163.217	I	
12	8	6	8"	9'- 0"	1'- 1 3/4"	5'- 5"	1'- 6 3/4"	1'- 3/4"	25'- 8"	-----	26'- 6"	104	42	101.645	3.489	467.673	27'- 6"	6	27'- 2"	1	9	3.194	193.389	3.215	163.217	M	
12	10	6	8"	9'- 0"	1'- 2"	5'- 5"	1'- 7 1/8"	1'- 1"	25'- 8"	-----	26'- 6"	104	54	105.875	3.672	535.887	27'- 6"	6	27'- 2"	1	11	3.376	200.291	3.385	163.217	Q	
12	12	6	8"	9'- 2"	1'- 2"	5'- 5"	1'- 7 1/8"	1'- 1"	25'- 11"	-----	26'- 9"	104	66	110.105	3.954	615.152	27'- 6"	6	27'- 2"	1	13	3.574	207.194	3.570	163.217	U	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<h2>DOUBLE BOX CULVERTS</h2> <h3>10 TO 20 FT. FILLS</h3> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	REVISION DATE	SHEET 2 OF 2
			08/14	1003.12

2016 ROAD & BRIDGE STANDARDS

BCD-30

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCD-DT.

DIMENSIONS						REINFORCING STEEL																										
SPAN	HGHT	T1	T2	T3	T4	BH1			BH2			BH3			BH4			BV1			BV2											
(FT.)	(FT.)	TOP SLAB	BOTTOM SLAB	EXTERIOR WALL (IN.)	INTERIOR WALL (IN.)	A	B	C	D	E	F	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	6	6'- 0"	6	6'- 0"	1	1'- 0"	4	12"	6'- 7"	4	12"	7'- 8"	--	---	----	----	4	12"	2'- 4"	2'- 9"	4'- 9"	4	12"	4'- 0"	4	12"	4'- 0"
3	4	8"	8"	8"	8"	6	6'- 0"	6	6'- 0"	2	2'- 0"	4	12"	6'- 7"	4	12"	7'- 8"	--	---	----	----	4	12"	2'- 4"	3'- 3"	5'- 3"	4	12"	5'- 0"	4	12"	5'- 0"
4	3	8 1/2"	8 1/2"	8"	8"	8	8'- 0"	8	8'- 0"	1	1'- 0"	4	12"	8'- 7"	4	12"	9'- 8"	--	---	----	----	4	12"	2'- 4"	2'- 9"	4'- 9"	4	12"	4'- 0"	4	12"	4'- 0"
4	4	8 1/2"	8 1/2"	8"	8"	8	8'- 0"	8	8'- 0"	2	2'- 0"	4	12"	8'- 7"	4	12"	9'- 8"	--	---	----	----	4	12"	2'- 4"	3'- 3"	5'- 3"	4	12"	5'- 0"	4	12"	5'- 0"
4	5	8 3/4"	8 3/4"	8"	8"	8	8'- 0"	8	8'- 0"	3	3'- 0"	4	12"	8'- 7"	4	12"	9'- 8"	--	---	----	----	4	12"	2'- 4"	3'- 9"	5'- 10"	4	12"	6'- 1"	4	12"	6'- 1"
4	6	8 3/4"	8 3/4"	8"	8"	8	8'- 0"	8	8'- 0"	4	4'- 0"	4	12"	8'- 7"	4	12"	9'- 8"	--	---	----	----	4	12"	2'- 4"	4'- 3"	6'- 4"	5	12"	7'- 1"	4	12"	7'- 1"
5	3	10 1/4"	10 1/4"	8"	8"	10	10'- 0"	10	10'- 0"	1	1'- 0"	4	12"	10'- 7"	4	12"	11'- 8"	--	---	----	----	4	12"	2'- 4"	2'- 11"	4'- 11"	4	12"	4'- 4"	4	12"	4'- 4"
5	4	10 1/4"	10 1/4"	8"	8"	10	10'- 0"	10	10'- 0"	2	2'- 0"	4	12"	10'- 7"	4	12"	11'- 8"	--	---	----	----	4	12"	2'- 4"	3'- 5"	5'- 5"	4	12"	5'- 4"	4	12"	5'- 4"
5	5	10 1/4"	10 1/4"	8"	8"	10	10'- 0"	10	10'- 0"	3	3'- 0"	4	12"	10'- 7"	4	12"	11'- 8"	--	---	----	----	4	12"	2'- 4"	3'- 11"	5'- 11"	4	12"	6'- 4"	4	12"	6'- 4"
5	6	10 1/4"	10 1/4"	8"	8"	10	10'- 0"	10	10'- 0"	4	4'- 0"	4	12"	10'- 7"	4	12"	11'- 8"	3	12"	2'- 11"	5'- 7"	4	12"	2'- 4"	4'- 5"	6'- 5"	5	12"	7'- 4"	4	12"	7'- 4"
5	7	10 1/4"	10 1/4"	8"	8"	10	10'- 0"	10	10'- 0"	5	5'- 0"	4	12"	10'- 7"	4	12"	11'- 8"	4	12"	3'- 2"	5'- 11"	4	12"	2'- 4"	4'- 11"	6'- 11"	5	12"	8'- 4"	4	12"	8'- 4"
6	4	12 1/4"	12 1/4"	8"	8"	12	12'- 0"	12	12'- 0"	2	2'- 0"	4	11"	12'- 7"	4	11"	13'- 8"	--	---	----	----	4	11"	2'- 4"	3'- 7"	5'- 7"	4	12"	5'- 8"	4	12"	5'- 8"
6	5	12 1/4"	12 1/4"	8"	8"	12	12'- 0"	12	12'- 0"	3	3'- 0"	4	11"	12'- 7"	4	11"	13'- 8"	--	---	----	----	4	11"	2'- 4"	4'- 1"	6'- 1"	4	12"	6'- 8"	4	12"	6'- 8"
6	6	12"	12"	8"	8"	12	12'- 0"	12	12'- 0"	4	4'- 0"	4	11"	12'- 7"	4	11"	13'- 8"	3	11"	3'- 1"	5'- 11"	4	11"	2'- 4"	4'- 6"	6'- 7"	4	12"	7'- 8"	4	12"	7'- 8"
6	7	12"	12"	8"	8"	12	12'- 0"	12	12'- 0"	5	5'- 0"	4	10"	12'- 7"	4	10"	13'- 8"	3	10"	3'- 3"	6'- 4"	4	10"	2'- 4"	5'- 0"	7'- 1"	5	12"	8'- 8"	4	12"	8'- 8"
6	8	12"	12"	8"	8"	12	12'- 0"	12	12'- 0"	6	6'- 0"	4	10"	12'- 4"	4	10"	13'- 8"	--	---	----	----	5	10"	2'- 6"	5'- 9"	7'- 10"	5	8"	9'- 8"	4	12"	9'- 8"
7	4	13 3/4"	13 3/4"	8"	8"	14	14'- 0"	14	14'- 0"	2	2'- 0"	5	9"	14'- 7"	4	9"	15'- 8"	--	---	----	----	4	9"	2'- 9"	3'- 8"	6'- 2"	4	12"	5'- 11"	4	12"	5'- 11"
7	6	13 3/4"	13 3/4"	8"	8"	14	14'- 0"	14	14'- 0"	4	4'- 0"	5	9"	14'- 7"	4	9"	15'- 8"	--	---	----	----	4	9"	2'- 9"	4'- 8"	7'- 2"	4	12"	7'- 11"	4	12"	7'- 11"
7	8	13 3/4"	13 3/4"	8"	8"	14	14'- 0"	14	14'- 0"	6	6'- 0"	5	9"	14'- 7"	4	9"	15'- 8"	3	9"	3'- 7"	7'- 0"	4	9"	2'- 9"	5'- 8"	8'- 2"	5	8 1/2"	9'- 11"	4	12"	9'- 11"
7	10	13 3/4"	13 3/4"	9 1/2"	8"	14	14'- 0"	14	14'- 0"	8	8'- 0"	5	9"	14'- 7"	4	9"	15'- 11"	3	9"	4'- 0"	7'- 10"	5	9"	2'- 11"	6'- 10"	9'- 4"	5	5"	11'- 11"	4	12"	11'- 11"
8	4	15 1/2"	15 1/2"	8"	8"	16	16'- 0"	16	16'- 0"	2	2'- 0"	5	8"	16'- 7"	4	8"	17'- 8"	--	---	----	----	4	8"	2'- 9"	3'- 10"	6'- 3"	4	12"	6'- 3"	4	12"	6'- 3"
8	6	15 1/2"	15 1/2"	8"	8"	16	16'- 0"	16	16'- 0"	4	4'- 0"	5	8"	16'- 7"	4	8"	17'- 8"	--	---	----	----	4	8"	2'- 9"	4'- 10"	7'- 3"	4	12"	8'- 3"	4	12"	8'- 3"
8	8	15 1/2"	15 1/2"	8"	8"	16	16'- 0"	16	16'- 0"	6	6'- 0"	5	8"	16'- 7"	4	8"	17'- 8"	3	8"	3'- 9"	7'- 4"	4	8"	2'- 9"	5'- 10"	8'- 3"	5	8 1/2"	10'- 3"	4	12"	10'- 3"
8	10	15 1/2"	15 1/2"	9"	8"	16	16'- 0"	16	16'- 0"	8	8'- 0"	5	8"	16'- 6"	4	8"	17'- 9"	3	8"	4'- 2"	8'- 1"	5	8"	2'- 11"	7'- 0"	9'- 6"	5	5"	12'- 3"	4	12"	12'- 3"
9	4	17 1/4"	17 1/4"	8"	8"	18	18'- 0"	18	18'- 0"	2	2'- 0"	6	9"	18'- 7"	5	9"	19'- 8"	--	---	----	----	4	9"	3'- 2"	4'- 0"	6'- 10"	4	12"	6'- 6"	4	11"	6'- 6"
9	6	17 1/4"	17 1/4"	8"	8"	18	18'- 0"	18	18'- 0"	4	4'- 0"	6	9"	18'- 7"	5	9"	19'- 8"	--	---	----	----	4	9"	3'- 2"	5'- 0"	7'- 10"	4	12"	8'- 6"	4	11"	8'- 6"
9	8	17 1/2"	17 1/2"	8"	8"	18	18'- 0"	18	18'- 0"	6	6'- 0"	6	9"	18'- 7"	5	9"	19'- 8"	3	9"	3'- 11"	7'- 8"	4	9"	3'- 2"	6'- 0"	8'- 10"	5	8"	10'- 6"	4	11"	10'- 6"
9	10	17 1/2"	17 1/2"	9"	8"	18	18'- 0"	18	18'- 0"	8	8'- 0"	6	9"	18'- 9"	5	9"	19'- 9"	4	9"	4'- 4"	8'- 4"	4	9"	3'- 2"	7'- 0"	9'- 10"	6	7 1/2"	12'- 6"	4	11"	12'- 6"
9	12	17 1/2"	17 1/2"	11"	8"	18	18'- 0"	18	18'- 0"	10	10'- 0"	6	9"	18'- 7"	5	9"	20'- 2"	3	9"	4'- 9"	9'- 3"	6	9"	3'- 5"	8'- 4"	11'- 4"	5	5 1/2"	14'- 6"	4	11"	14'- 6"
10	4	19"	19"	8"	8"	20	20'- 0"	20	20'- 0"	2	2'- 0"	6	8"	20'- 7"	4	8"	21'- 8"	--	---	----	----	4	8"	2'- 9"	4'- 1"	6'- 7"	4	12"	6'- 9"	4	10"	6'- 9"
10	6	18 3/4"	18 3/4"	8"	8"	20	20'- 0"	20	20'- 0"	4	4'- 0"	6	9"	20'- 7"	5	9"	21'- 8"	--	---	----	----	4	9"	3'- 2"	5'- 1"	8'- 0"	4	12"	8'- 9"	4	10"	8'- 9"
10	8	18 3/4"	18 3/4"	8"	8"	20	20'- 0"	20	20'- 0"	6	6'- 0"	6	9"	20'- 7"	5	9"	21'- 8"	3	9"	4'- 0"	7'- 10"	4	9"	3'- 2"	6'- 1"	9'- 0"	5	8 1/2"	10'- 9"	4	10"	10'- 9"
10	10	19"	19"	9"	8"	20	20'- 0"	20	20'- 0"	8	8'- 0"	6	9"	20'- 6"	5	9"	21'- 9"	3	9"	4'- 6"	8'- 8"	5	9"	3'- 4"	7'- 3"	10'- 3"	6	7 1/2"	12'- 9"	4	10"	12'- 9"
10	12	19 1/4"	19 1/4"	11"	8"	20	20'- 0"	20	20'- 0"	10	10'- 0"	6	9"	20'- 7"	5	9"	22'- 2"	3	9"	4'- 11"	9'- 6"	6	9"	3'- 5"	8'- 6"	11'- 6"	7	10 1/2"	14'- 10"	4	10"	14'- 10"
12	6	22 1/4"	22 1/4"	8"	8"	24	24'- 0"	24	24'- 0"	4	4'- 0"	7	9"	24'- 7"	6	9"	25'- 8"	--	---	----	----	4	9"	3'- 10"	5'- 5"	8'- 11"	4	12"	9'- 4"	4	10"	9'- 4"
12	8	22 1/4"	22 1/4"	8"	8"	24	24'- 0"	24	24'- 0"	6	6'- 0"	7	9"	24'- 7"	6	9"	25'- 8"	3	9"	4'- 4"	8'- 5"	4	9"	3'- 10"	6'- 5"	9'- 11"	5	8"	11'- 4"	4	10"	11'- 4"
12	10	22 1/4"	22 1/4"	8 1/2"	8"	24	24'- 0"	24	24'- 0"	8	8'- 0"	7	9"	24'- 5"	6	9"	25'- 9"	3	9"	4'- 9"	9'- 3"	5	9"	4'- 0"	7'- 7"	11'- 2"	6	7 1/2"	13'- 4"	4	10"	13'- 4"
12	12	22 1/2"	22 1/2"	11"	8"	24	24'- 0"	24	24'- 0"	10	10'- 0"	7	9"	24'- 7"	6	9"	26'- 2"	3	9"	5'- 2"	10'- 1"	6	9"	4'- 1"	8'- 9"	12'- 5"	6	7 1/2"	15'- 5"	4	10"	15'- 5"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE
1003.13 07/11

DOUBLE BOX CULVERTS
20 TO 30 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

2016 ROAD & BRIDGE STANDARDS

BCD-50

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCD-DT.

DIMENSIONS							REINFORCING STEEL																									
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)		BH1				BH2			BH3			BH4				BV1			BV2								
							SIZE	SPACING C-C	LENGTH		SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH				
3	3	9/4"	9/4"	8"	8"	6	6"	8"	6'-0"	1	1'-0"	4	12"	6'-7"	4	12"	7'-8"	--	---	---	---	4	12"	2'-4"	2'-10"	4'-10"	4	12"	4'-2"	4	12"	4'-2"
3	4	9/4"	9/4"	8"	8"	6	6"	8"	6'-0"	2	2'-0"	4	12"	6'-7"	4	12"	7'-8"	--	---	---	---	4	12"	2'-4"	3'-4"	5'-4"	4	12"	5'-2"	4	12"	5'-2"
4	3	11 1/2"	11 1/2"	8"	8"	8	8"	8"	8'-0"	1	1'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	---	---	4	12"	2'-4"	3'-0"	5'-0"	4	12"	4'-6"	4	12"	4'-6"
4	4	11 1/2"	11 1/2"	8"	8"	8	8"	8"	8'-0"	2	2'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	---	---	4	12"	2'-4"	3'-6"	5'-6"	4	12"	5'-6"	4	12"	5'-6"
4	5	11 1/4"	11 1/4"	8"	8"	8	8"	8"	8'-0"	3	3'-0"	4	12"	8'-7"	4	12"	9'-8"	--	---	---	---	4	12"	2'-4"	4'-0"	6'-0"	5	12"	6'-6"	4	12"	6'-6"
4	6	11 1/4"	11 1/4"	8"	8"	8	8"	8"	8'-0"	4	4'-0"	4	12"	8'-7"	4	12"	9'-8"	4	12"	3'-0"	5'-9"	4	12"	2'-4"	4'-6"	6'-6"	5	9"	7'-6"	4	12"	7'-6"
5	3	14 1/2"	14 1/2"	8"	8"	10	10"	10"	10'-0"	1	1'-0"	4	10"	10'-7"	4	10"	11'-8"	--	---	---	---	4	10"	2'-4"	3'-3"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
5	4	14"	14"	8"	8"	10	10"	10"	10'-0"	2	2'-0"	4	10"	10'-7"	4	10"	11'-8"	--	---	---	---	4	10"	2'-4"	3'-9"	5'-9"	4	12"	6'-0"	4	12"	6'-0"
5	5	14"	14"	8"	8"	10	10"	10"	10'-0"	3	3'-0"	4	10"	10'-7"	4	10"	11'-8"	--	---	---	---	4	10"	2'-4"	4'-3"	6'-3"	5	12"	7'-0"	4	12"	7'-0"
5	6	13 3/4"	13 3/4"	8"	8"	10	10"	10"	10'-0"	4	4'-0"	4	10"	10'-7"	4	10"	11'-8"	--	---	---	---	4	10"	2'-4"	4'-8"	6'-9"	5	9"	7'-11"	4	12"	7'-11"
5	7	14"	14"	8 1/2"	8"	10	10"	10"	10'-0"	5	5'-0"	4	10"	10'-5"	4	10"	11'-9"	--	---	---	---	5	10"	2'-6"	5'-4"	7'-6"	6	10 1/2"	9'-0"	4	12"	9'-0"
6	4	16 1/2"	16 1/2"	8"	8"	12	12"	12"	12'-0"	2	2'-0"	5	9"	12'-7"	4	9"	13'-8"	--	---	---	---	4	9"	2'-9"	3'-11"	6'-4"	4	12"	6'-5"	4	10"	6'-5"
6	5	16 1/2"	16 1/2"	8"	8"	12	12"	12"	12'-0"	3	3'-0"	5	9"	12'-7"	4	9"	13'-8"	--	---	---	---	4	9"	2'-9"	4'-5"	6'-10"	5	12"	7'-5"	4	10"	7'-5"
6	6	16 1/2"	16 1/2"	8"	8"	12	12"	12"	12'-0"	4	4'-0"	5	9"	12'-7"	4	9"	13'-8"	--	---	---	---	4	9"	2'-9"	4'-11"	7'-4"	5	9"	8'-5"	4	10 1/2"	8'-5"
6	7	16 1/2"	16 1/2"	8"	8"	12	12"	12"	12'-0"	5	5'-0"	5	9"	12'-7"	4	9"	13'-8"	3	9"	3'-8"	7'-1"	4	9"	2'-9"	5'-5"	7'-10"	5	6 1/2"	9'-5"	4	10"	9'-5"
6	8	16 1/2"	16 1/2"	9 1/2"	8"	12	12"	12"	12'-0"	6	6'-0"	5	9"	12'-7"	4	9"	13'-11"	--	---	---	---	5	9"	2'-11"	6'-1"	8'-7"	7	11 1/2"	10'-5"	4	10 1/2"	10'-5"
7	4	19"	19"	8"	8"	14	14"	14"	14'-0"	2	2'-0"	6	9"	14'-7"	5	9"	15'-8"	--	---	---	---	4	9"	3'-2"	4'-1"	7'-0"	4	12"	6'-9"	4	10"	6'-9"
7	6	18 3/4"	18 3/4"	8"	8"	14	14"	14"	14'-0"	4	4'-0"	5	8"	14'-7"	5	8"	15'-8"	--	---	---	---	4	8"	2'-9"	5'-1"	7'-7"	5	9"	8'-9"	4	10"	8'-9"
7	8	18 3/4"	18 3/4"	9"	8"	14	14"	14"	14'-0"	6	6'-0"	5	8"	14'-9"	5	8"	15'-9"	3	8"	4'-0"	7'-10"	4	8"	2'-9"	6'-1"	8'-7"	6	7 1/2"	10'-9"	4	10"	10'-9"
7	10	19"	19"	12"	8"	14	14"	14"	14'-0"	8	8'-0"	5	8"	15'-0"	5	8"	16'-3"	3	8"	4'-6"	8'-8"	5	8"	2'-11"	7'-3"	9'-10"	7	9"	12'-9"	4	10"	12'-9"
8	4	21 1/2"	21 1/2"	8"	8"	16	16"	16"	16'-0"	2	2'-0"	6	9"	16'-7"	5	9"	17'-8"	--	---	---	---	4	9"	3'-2"	4'-4"	7'-2"	4	12"	7'-3"	4	10"	7'-3"
8	6	21"	21"	8"	8"	16	16"	16"	16'-0"	4	4'-0"	6	9"	16'-7"	5	9"	17'-8"	--	---	---	---	4	9"	3'-2"	5'-3"	8'-2"	5	8 1/2"	9'-2"	4	10"	9'-2"
8	8	21 1/2"	21 1/2"	9"	8"	16	16"	16"	16'-0"	6	6'-0"	6	9"	16'-6"	5	9"	17'-9"	--	---	---	---	5	9"	3'-4"	6'-6"	9'-5"	6	7 1/2"	11'-3"	4	10"	11'-3"
8	10	21 1/2"	21 1/2"	12"	8"	16	16"	16"	16'-0"	8	8'-0"	6	9"	16'-9"	5	9"	18'-3"	--	---	---	---	6	9"	3'-5"	7'-8"	10'-8"	4	4"	13'-3"	4	10"	13'-3"
9	4	24"	24"	8"	8"	18	18"	18"	18'-0"	2	2'-0"	7	9"	18'-7"	6	9"	19'-8"	--	---	---	---	4	9"	3'-10"	4'-6"	8'-1"	4	12"	7'-8"	4	9"	7'-8"
9	6	24"	24"	8"	8"	18	18"	18"	18'-0"	4	4'-0"	6	9"	18'-7"	6	9"	19'-8"	--	---	---	---	4	9"	3'-2"	5'-6"	8'-5"	5	8"	9'-8"	4	9"	9'-8"
9	8	24"	24"	8"	8"	18	18"	18"	18'-0"	6	6'-0"	6	9"	18'-7"	6	9"	19'-8"	4	9"	4'-6"	8'-8"	4	9"	3'-2"	6'-6"	9'-5"	5	4 1/2"	11'-8"	4	9"	11'-8"
9	10	24"	24"	11 1/2"	8"	18	18"	18"	18'-0"	8	8'-0"	6	9"	18'-11"	6	9"	20'-3"	3	9"	4'-10"	9'-6"	5	9"	3'-4"	7'-9"	10'-8"	6	6"	13'-8"	4	9"	13'-8"
9	12	24"	24"	14"	8"	18	18"	18"	18'-0"	10	10'-0"	6	9"	18'-10"	6	9"	20'-8"	3	9"	5'-3"	10'-4"	7	9"	3'-7"	9'-1"	12'-2"	7	9 1/2"	15'-8"	4	9"	15'-8"
10	4	26 1/2"	26 1/2"	8"	8"	20	20"	20"	20'-0"	2	2'-0"	7	8"	20'-7"	6	8"	21'-8"	--	---	---	---	4	8"	3'-10"	4'-9"	8'-3"	4	12"	8'-0"	4	8"	8'-0"
10	6	26 1/2"	26 1/2"	8"	8"	20	20"	20"	20'-0"	4	4'-0"	6	8"	20'-7"	6	8"	21'-8"	--	---	---	---	4	8"	3'-2"	5'-9"	8'-7"	6	12"	10'-0"	4	8"	10'-0"
10	8	26 1/2"	26 1/2"	8"	8"	20	20"	20"	20'-0"	6	6'-0"	6	8"	20'-7"	6	8"	21'-8"	3	8"	4'-8"	9'-2"	4	8"	3'-2"	6'-9"	9'-7"	5	4 1/2"	12'-0"	4	8"	12'-0"
10	10	26 1/2"	26 1/2"	11"	8"	20	20"	20"	20'-0"	8	8'-0"	6	8"	20'-10"	6	8"	22'-2"	3	8"	5'-1"	9'-11"	5	8"	3'-4"	7'-11"	10'-10"	8	11 1/2"	14'-0"	4	8"	14'-0"
10	12	26"	26"	14"	8"	20	20"	20"	20'-0"	10	10'-0"	7	9"	20'-10"	7	9"	22'-8"	--	---	---	---	7	9"	4'-3"	9'-3"	13'-0"	8	12"	16'-0"	4	8"	16'-0"
12	6	31 1/2"	31 1/2"	8"	8"	24	24"	24"	24'-0"	4	4'-0"	8	9"	24'-7"	6	9"	25'-8"	--	---	---	---	4	9"	4'-10"	6'-2"	10'-8"	6	10 1/2"	10'-11"	5	10 1/2"	10'-11"
12	8	31 1/2"	31 1/2"	8"	8"	24	24"	24"	24'-0"	6	6'-0"	7	9"	24'-7"	6	9"	25'-8"	3	9"	5'-1"	10'-0"	4	9"	3'-10"	7'-2"	10'-8"	8	9"	12'-11"	5	10 1/2"	12'-11"
12	10	31 1/2"	31 1/2"	9 3/4"	8"	24	24"	24"	24'-0"	8	8'-0"	7	9"	24'-8"	6	9"	25'-11"	3	9"	5'-6"	10'-9"	5	9"	4'-0"	8'-4"	11'-11"	6	5 1/2"	14'-11"	5	10 1/2"	14'-11"
12	12	31"	31"	13 1/2"	8"	24	24"	24"	24'-0"	10	10'-0"	8	9"	25'-0"	7	9"	26'-6"	3	9"	5'-10"	11'-6"	6	9"	5'-1"	9'-6"	14'-1"	8	12"	16'-9"	5	10 1/2"	16'-9"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2	REVISION DATE
1003.17	07/11

DOUBLE BOX CULVERTS

40 TO 50 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

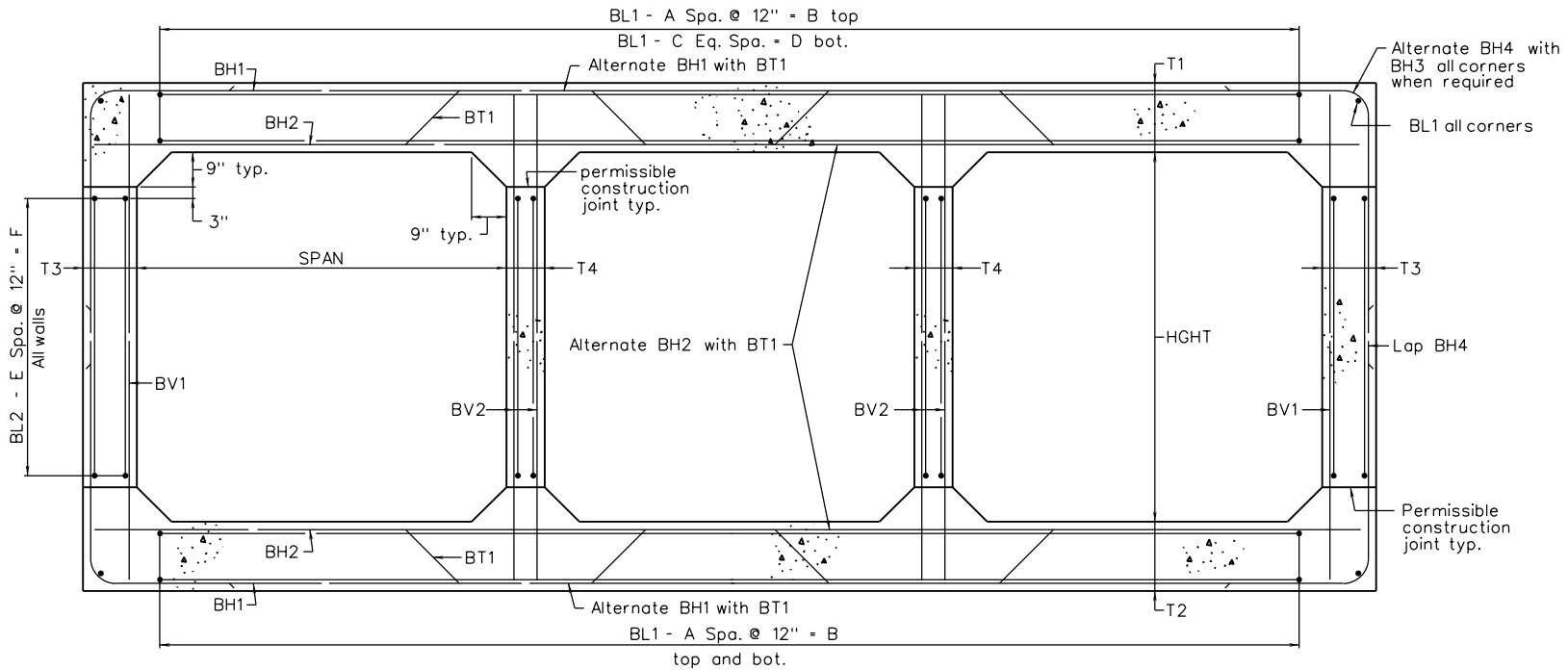
SPECIFICATION
REFERENCE

SPAN		HGHT		REINFORCING STEEL												QUAN./LF		HEADWALLS												
		BT I										NO. BL1 #4 BARS		NO. BL2 #3 BARS		REINFORCING STEEL (LBS/LONG. JT)	CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G			HW I		NO. HW2 BARS	NO. HW3 BARS	INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL
(FT.)	(FT.)	SIZE	SPACING C-C	a	b	c	d	e	f	g	LENGTH	NO. BL1 #4 BARS	NO. BL2 #3 BARS	REINFORCING STEEL (LBS/LONG. JT)	CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	HEADWALL LENGTH	SIZE	LENGTH	NO. HW2 BARS	NO. HW3 BARS	INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)	WINGWALL				
3	3	4	12"	2'-6"	0'-5 1/4"	1'-10"	0'-7"	0'-4 1/2"	7'-8"	-----	7'-11"	32	12	30.956	0.756	79.640	9'-6"	6"	9'-2"	1	4	1.445	67.988	1.437	55.073	B				
3	4	4	12"	2'-6"	0'-5 1/4"	1'-10"	0'-7"	0'-4 1/2"	7'-8"	-----	7'-11"	32	18	33.065	0.830	85.904	9'-6"	6"	9'-2"	1	5	1.544	71.439	1.530	55.073	D				
4	3	4	12"	3'-1"	0'-7 1/2"	2'-3"	0'-10 1/8"	0'-6 3/4"	9'-8"	-----	10'-1"	40	12	37.636	1.008	94.710	11'-6"	6"	11'-2"	1	4	1.614	80.004	1.613	67.089	B				
4	4	4	12"	3'-1"	0'-7 1/2"	2'-3"	0'-10 1/8"	0'-6 3/4"	9'-8"	-----	10'-1"	40	18	39.745	1.082	100.974	11'-6"	6"	11'-2"	1	5	1.716	83.455	1.708	67.089	D				
4	5	4	12"	3'-1"	0'-7 1/4"	2'-3"	0'-9 3/4"	0'-6 1/2"	9'-8"	-----	10'-1"	40	24	41.860	1.140	111.954	11'-6"	6"	11'-2"	1	6	1.815	86.907	1.801	67.089	F				
4	6	4	12"	3'-1"	0'-7 1/4"	2'-3"	0'-9 3/4"	0'-6 1/2"	9'-8"	-----	10'-1"	40	30	43.975	1.212	139.379	11'-6"	6"	11'-2"	1	7	1.913	90.358	1.894	67.089	H				
5	3	4	10"	3'-8"	0'-10 1/2"	2'-8"	1'-2 3/8"	0'-9 3/4"	11'-8"	-----	12'-4"	48	12	44.310	1.372	102.348	13'-6"	6"	13'-2"	1	4	1.755	92.020	1.761	79.105	B				
5	4	4	10"	3'-8"	0'-10"	2'-8"	1'-1 5/8"	0'-9 1/4"	11'-8"	-----	12'-3"	48	18	46.425	1.408	108.467	13'-6"	6"	13'-2"	1	5	1.854	95.471	1.853	79.105	D				
5	5	4	10"	3'-8"	0'-10"	2'-8"	1'-1 5/8"	0'-9 1/4"	11'-8"	-----	12'-3"	48	24	48.540	1.482	120.249	13'-6"	6"	13'-2"	1	6	1.953	98.923	1.946	79.105	F				
5	6	4	10"	3'-8"	0'-9 3/4"	2'-8"	1'-1 1/4"	0'-9"	11'-8"	-----	12'-3"	48	30	50.655	1.536	132.826	13'-6"	6"	13'-2"	1	7	2.052	102.374	2.039	79.105	H				
5	7	4	10"	3'-9"	0'-10"	2'-8"	1'-1 5/8"	0'-9 1/4"	11'-9"	-----	12'-4"	48	36	52.770	1.656	161.030	13'-6"	6"	13'-2"	1	8	2.155	105.825	2.136	79.105	J				
6	4	4	9"	4'-4"	1'-0 1/2"	3'-0"	1'-5 1/8"	0'-11 3/4"	13'-8"	-----	14'-5"	56	18	53.105	1.793	170.667	15'-6"	6"	15'-2"	1	5	1.980	107.487	1.986	91.121	E				
6	5	4	9"	4'-4"	1'-0 1/2"	3'-0"	1'-5 1/8"	0'-11 3/4"	13'-8"	-----	14'-5"	56	24	55.220	1.866	183.206	15'-6"	6"	15'-2"	1	6	2.085	110.939	2.085	91.121	G				
6	6	4	9"	4'-4"	1'-0 1/2"	3'-0"	1'-5 1/8"	0'-11 3/4"	13'-8"	-----	14'-5"	56	30	57.335	1.939	196.142	15'-6"	6"	15'-2"	1	7	2.184	114.390	2.178	91.121	I				
6	7	4	9"	4'-4"	1'-0 1/2"	3'-0"	1'-5 1/8"	0'-11 3/4"	13'-8"	-----	14'-5"	56	36	59.450	2.010	229.353	15'-6"	6"	15'-2"	1	8	2.283	117.841	2.270	91.121	K				
6	8	4	9"	4'-5"	1'-0 1/2"	3'-0"	1'-5 1/8"	0'-11 3/4"	13'-11"	-----	14'-8"	56	42	61.565	2.183	247.076	15'-6"	6"	15'-2"	1	9	2.388	121.293	2.369	91.121	M				
7	4	5	9"	4'-11"	1'-3"	3'-5"	1'-8 5/8"	1'-2 1/8"	15'-8"	-----	16'-7"	64	18	59.785	2.238	242.577	17'-6"	6"	17'-2"	1	5	2.072	119.503	2.085	103.137	E				
7	6	5	8"	4'-11"	1'-2 3/4"	3'-5"	1'-8 1/4"	1'-1 7/8"	15'-8"	-----	16'-7"	64	30	64.015	2.359	269.293	17'-6"	6"	17'-2"	1	7	2.255	126.406	2.255	103.137	I				
7	8	4	8"	5'-0"	1'-2 3/4"	3'-5"	1'-8 3/8"	1'-2"	15'-9"	-----	16'-9"	64	42	68.245	2.573	308.734	17'-6"	6"	17'-2"	1	9	2.453	133.309	2.441	103.137	M				
7	10	4	8"	5'-3"	1'-3"	3'-5"	1'-8 3/4"	1'-2 1/4"	16'-3"	-----	17'-3"	64	54	72.475	2.998	366.819	17'-6"	6"	17'-2"	1	11	2.526	140.211	2.500	103.137	Q				
8	4	6	9"	5'-6"	1'-5 1/2"	3'-10"	2'-0"	1'-4 1/2"	17'-8"	-----	18'-9"	72	18	66.465	2.746	292.460	19'-6"	6"	19'-2"	1	5	2.121	131.519	2.141	115.153	E				
8	6	6	9"	5'-7"	1'-5"	3'-10"	1'-11 1/4"	1'-4"	17'-8"	-----	18'-9"	72	30	70.695	2.837	320.630	19'-6"	6"	19'-2"	1	7	2.328	138.422	2.335	115.153	I				
8	8	5	9"	5'-7"	1'-5 1/2"	3'-10"	2'-0 1/8"	1'-4 5/8"	17'-9"	-----	18'-11"	72	42	74.925	3.109	356.576	19'-6"	6"	19'-2"	1	9	2.526	145.325	2.520	115.153	M				
8	10	5	9"	5'-10"	1'-5 1/2"	3'-10"	2'-0 1/8"	1'-4 5/8"	18'-3"	-----	19'-5"	72	54	79.155	3.518	399.907	19'-6"	6"	19'-2"	1	11	2.580	152.227	2.561	115.153	Q				
9	4	6	9"	6'-1"	1'-8"	4'-3"	2'-3 1/2"	1'-7"	19'-8"	-----	20'-11"	80	18	73.145	3.314	376.717	21'-6"	6"	21'-2"	1	5	2.148	143.535	2.173	127.169	F				
9	6	6	9"	6'-1"	1'-8"	4'-3"	2'-3 1/2"	1'-7"	19'-8"	-----	20'-11"	80	30	77.375	3.462	379.124	21'-6"	6"	21'-2"	1	7	2.356	150.438	2.369	127.169	J				
9	8	6	9"	6'-1"	1'-8"	4'-3"	2'-3 1/2"	1'-7"	19'-8"	-----	20'-11"	80	42	81.605	3.604	456.056	21'-6"	6"	21'-2"	1	9	2.564	157.341	2.565	127.169	N				
9	10	6	9"	6'-5"	1'-8"	4'-3"	2'-3 1/2"	1'-7"	20'-3"	-----	21'-6"	80	54	85.835	4.052	501.203	21'-6"	6"	21'-2"	1	11	2.614	164.243	2.601	127.169	R				
9	12	6	9"	6'-7"	1'-8"	4'-3"	2'-3 1/2"	1'-7"	20'-8"	-----	21'-11"	80	66	90.065	4.483	586.026	21'-6"	6"	21'-2"	1	13	2.669	171.146	2.643	127.169	V				
10	4	6	8"	6'-8"	1'-10 1/2"	4'-8"	2'-7 1/8"	1'-9 1/2"	21'-8"	-----	23'-1"	88	18	79.825	3.944	453.636	23'-6"	6"	23'-2"	1	5	2.157	155.551	2.190	139.185	F				
10	6	6	8"	6'-8"	1'-10 1/2"	4'-8"	2'-7 1/8"	1'-9 1/2"	21'-8"	-----	23'-1"	88	30	84.055	4.093	449.514	23'-6"	6"	23'-2"	1	7	2.355	162.454	2.375	139.185	J				
10	8	6	8"	6'-8"	1'-10 1/2"	4'-8"	2'-7 1/8"	1'-9 1/2"	21'-8"	-----	23'-1"	88	42	88.285	4.235	519.462	23'-6"	6"	23'-2"	1	9	2.565	169.357	2.573	139.185	N				
10	10	6	8"	6'-11"	1'-10 1/2"	4'-8"	2'-7 1/8"	1'-9 1/2"	22'-2"	-----	23'-7"	88	54	92.515	4.646	575.846	23'-6"	6"	23'-2"	1	11	2.611	176.259	2.605	139.185	R				
10	12	7	9"	7'-3"	1'-10"	4'-8"	2'-6 1/4"	1'-8 3/4"	22'-8"	-----	24'-0"	88	66	96.745	5.054	710.678	23'-6"	6"	23'-2"	1	13	2.663	183.162	2.644	139.185	V				
12	6	7	9"	7'-11"	2'-3 1/2"	5'-5"	3'-2"	2'-2 1/4"	25'-8"	-----	27'-5"	104	30	97.415	5.537	609.729	27'-6"	6"	27'-2"	1	7	2.259	186.486	2.292	163.217	K				
12	8	7	9"	7'-11"	2'-3 1/2"	5'-5"	3'-2"	2'-2 1/4"	25'-8"	-----	27'-5"	104	42	101.645	5.682	652.348	27'-6"	6"	27'-2"	1	9	2.472	193.389	2.493	163.217	O				
12	10	7	9"	8'-0"	2'-3 1/2"	5'-5"	3'-2"	2'-2 1/4"	25'-11"	-----	27'-9"	104	54	105.875	5.991	700.081	27'-6"	6"	27'-2"	1	11	2.509	200.291	2.516	163.217	S				
12	12	7	9"	8'-5"	2'-3"	5'-5"	3'-1 3/8"	2'-1 3/4"	26'-6"	-----	28'-4"	104	66	110.105	6.467	837.137	27'-6"	6"	27'-2"	1	13	2.544	207.194	2.538	163.217	W				

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	DOUBLE BOX CULVERTS 40 TO 50 FT. FILL VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	

BCT-DT



TYPICAL SECTION

A copy of the original sealed and signed drawing is on file in the central office.



ROAD AND BRIDGE STANDARDS

TRIPLE BOX CULVERTS
 STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
 REFERENCE

SHEET 1 OF 3

REVISION DATE

1004.01

07/11

GENERAL NOTE

Capacity: AASHTO HI-93 Loading.

Specifications:

Construction - Virginia Department of Transportation Road and Bridge Specifications.

Design - AASHTO LRFD Bridge Design Specifications, 4th Edition 2007; 2008 and 2009 Interim Specifications; and VDOT Modifications.

All concrete shall be Class A4.

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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 35' in length shall be poured in sections by providing vertical construction joints, not exceeding 25' between joints nor more than 30' from ends of barrels.

** All bends shall be made with a pin diameter as listed in TABLE A except for Bars BH3 and BH4 which shall have a pin diameter of 24 bar diameters.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight and #4 size unless otherwise shown. BL2 shall be #3 size.

The number of BL1 and 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 and 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./LF shown for reinforcing steel does not include quantity for laps of BL1 and BL2 bars. The additional weight per longitudinal lap is shown in the table.

The minimum cover of main reinforcing bars shall be 2 1/2" from the face of the concrete for culverts under 0 to 2 foot fills and shall be 2" from the face of concrete for all other culverts.

All reinforcing steel for culverts under 0 to 2 foot fills shall be Low Carbon/Chromium Reinforcing Steel conforming to ASTM A1035.

At the Contractor's option, BV1 and BV2 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.

Bar HW2 shall be 4" less than culvert height in length.

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.

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.

This standard shall be used with the BCT standard series.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<h2 style="margin: 0;">TRIPLE BOX CULVERTS</h2> <h3 style="margin: 0;">STANDARD DETAILS</h3> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	ROAD AND BRIDGE STANDARDS	
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BCT-DT

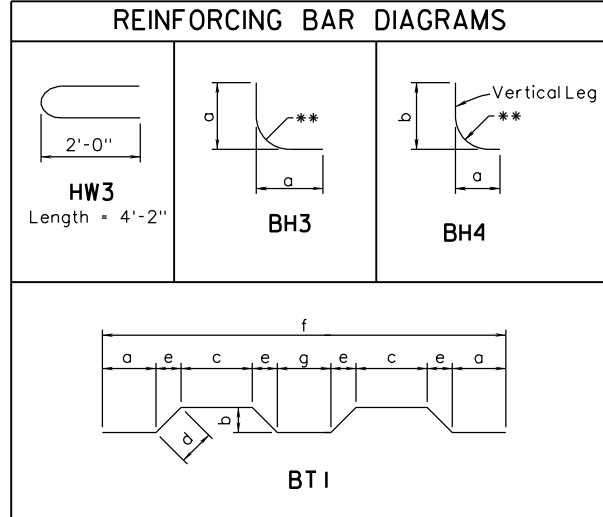
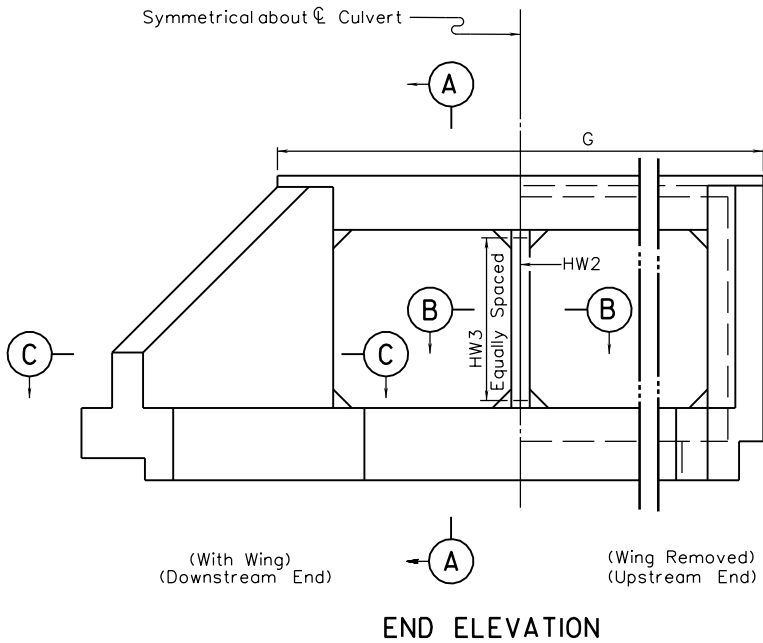
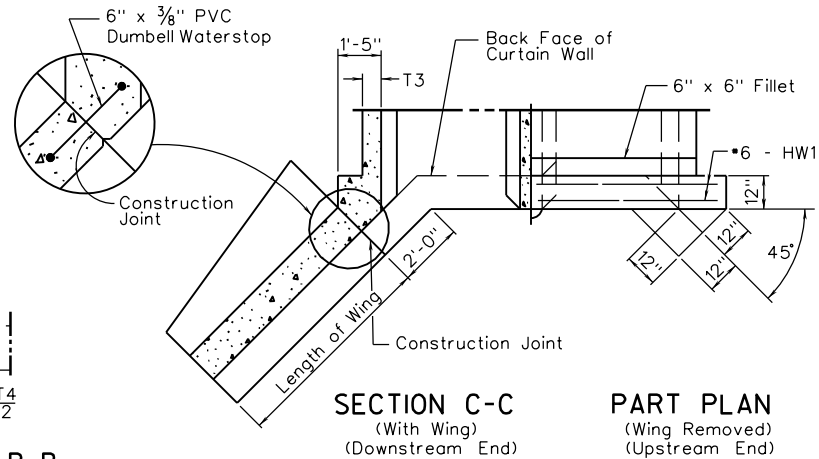
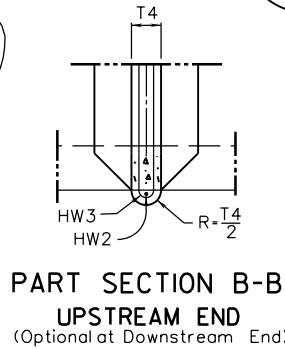
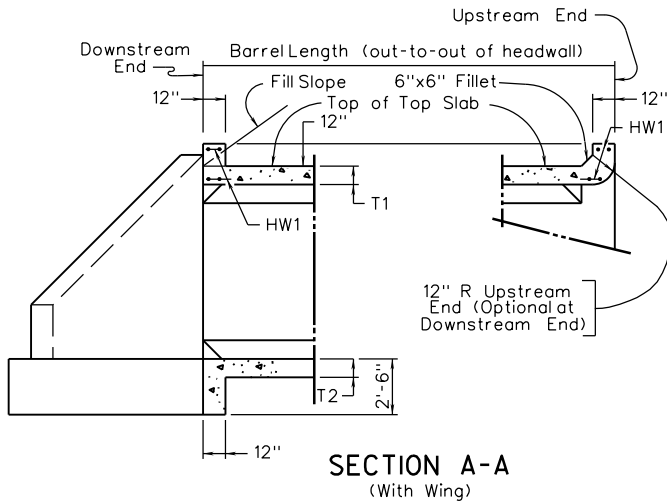


TABLE A	
Bar Size	Pin Dia.
#3	2 1/4"
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"
#9	9"



ROAD AND BRIDGE STANDARDS

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TRIPLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

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SPECIFICATION REFERENCE	TRIPLE BOX CULVERTS STANDARD DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	 ROAD AND BRIDGE STANDARDS	SHEET 1 OF 1


2016 ROAD & BRIDGE STANDARDS

BCT-05

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

DIMENSIONS										REINFORCING STEEL																						
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3			BH4			BV1			BV2					
												SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	9'	9'-0"	9'	9'-0"	1	1'-0"	4	12"	11'-2"	4	12"	11'-4"	--	---	----	----	4	12"	2'-1 1/4"	2'-8"	4'-6"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	9'	9'-0"	9'	9'-0"	2	2'-0"	4	12"	11'-2"	4	12"	11'-4"	--	---	----	----	4	12"	2'-1 1/4"	3'-2"	5'-0"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	12'	12'-0"	12'	12'-0"	1	1'-0"	4	12"	13'-9"	4	12"	14'-4"	--	---	----	----	4	12"	2'-3 3/8"	2'-8"	4'-8"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	12'	12'-0"	12'	12'-0"	2	2'-0"	4	12"	13'-9"	4	12"	14'-4"	--	---	----	----	4	12"	2'-3 3/8"	3'-2"	5'-2"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	12'	12'-0"	12'	12'-0"	3	3'-0"	4	12"	13'-9"	4	12"	14'-4"	--	---	----	----	4	12"	2'-3 3/8"	3'-8"	5'-8"	4	12"	6'-0"	4	12"	6'-0"
4	6	8"	8"	8"	8"	12'	12'-0"	12'	12'-0"	4	4'-0"	4	12"	13'-9"	4	12"	14'-4"	--	---	----	----	4	12"	2'-3 3/8"	4'-2"	6'-2"	4	12"	7'-0"	4	12"	7'-0"
5	3	8"	8"	8"	8"	15'	15'-0"	15'	15'-0"	1	1'-0"	4	12"	16'-4"	4	12"	17'-4"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	2'-8"	4'-11"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	15'	15'-0"	15'	15'-0"	2	2'-0"	4	12"	16'-4"	4	12"	17'-4"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	3'-2"	5'-5"	4	12"	5'-0"	4	12"	5'-0"
5	5	8"	8"	8"	8"	15'	15'-0"	15'	15'-0"	3	3'-0"	4	12"	16'-4"	4	12"	17'-4"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	3'-8"	5'-11"	4	12"	6'-0"	4	12"	6'-0"
5	6	8"	8"	8"	8"	15'	15'-0"	15'	15'-0"	4	4'-0"	4	12"	16'-4"	4	12"	17'-4"	4	12"	2'-9"	5'-5"	4	12"	2'-6"	4'-2"	6'-5"	4	12"	7'-0"	4	12"	7'-0"
5	7	8"	8"	8"	8"	15'	15'-0"	15'	15'-0"	5	5'-0"	4	12"	16'-4"	4	12"	17'-4"	4	12"	2'-11"	5'-8"	4	12"	2'-6"	4'-8"	6'-11"	4	12"	8'-0"	4	12"	8'-0"
6	4	8"	8"	8"	8"	18'	18'-0"	18'	18'-0"	2	2'-0"	4	12"	19'-3"	4	12"	20'-4"	--	---	----	----	5	12"	2'-8 3/8"	3'-2"	5'-6"	4	12"	5'-0"	4	11"	5'-0"
6	5	8"	8"	8"	8"	18'	18'-0"	18'	18'-0"	3	3'-0"	4	12"	19'-3"	4	12"	20'-4"	--	---	----	----	5	12"	2'-8 3/8"	3'-8"	6'-0"	4	12"	6'-0"	4	11"	6'-0"
6	6	8"	8"	8"	8"	18'	18'-0"	18'	18'-0"	4	4'-0"	4	12"	19'-3"	4	12"	20'-4"	--	---	----	----	5	12"	2'-8 3/8"	4'-2"	6'-6"	4	12"	7'-0"	4	11"	7'-0"
6	7	8"	8"	8"	8"	18'	18'-0"	18'	18'-0"	5	5'-0"	4	12"	19'-3"	4	12"	20'-4"	--	---	----	----	5	12"	2'-8 3/8"	4'-8"	7'-0"	4	12"	8'-0"	4	11"	8'-0"
6	8	8"	8"	8"	8"	18'	18'-0"	18'	18'-0"	6	6'-0"	4	11"	19'-3"	4	11"	20'-4"	4	11"	3'-2"	6'-2"	4	11"	2'-8 3/8"	5'-2"	7'-7"	4	12"	9'-0"	4	11 1/2"	9'-0"
7	4	8"	8"	8"	8"	21'	21'-0"	21'	21'-0"	2	2'-0"	4	9"	22'-3"	4	9"	23'-4"	4	9"	2'-10 3/4"	5'-6"	4	9"	2'-10 3/4"	3'-2"	5'-10"	4	12"	5'-0"	4	10"	5'-0"
7	6	8"	8"	8"	8"	21'	21'-0"	21'	21'-0"	4	4'-0"	4	9"	22'-3"	4	9"	23'-4"	4	9"	2'-10 3/4"	5'-6"	4	9"	2'-10 3/4"	4'-2"	6'-10"	4	12"	7'-0"	4	10"	7'-0"
7	8	8"	8"	8"	8"	21'	21'-0"	21'	21'-0"	6	6'-0"	4	9"	22'-3"	4	9"	23'-4"	4	9"	3'-2"	6'-2"	4	9"	2'-10 3/4"	5'-2"	7'-10"	4	12"	9'-0"	4	10"	9'-0"
7	10	8"	8"	8"	8"	21'	21'-0"	21'	21'-0"	8	8'-0"	4	9"	22'-3"	5	9"	23'-4"	4	9"	3'-6"	6'-9"	4	9"	2'-10 3/4"	6'-2"	8'-10"	5	12"	11'-0"	4	10"	11'-0"
8	4	8"	8"	8"	8"	24'	24'-0"	24'	24'-0"	2	2'-0"	5	11"	25'-0"	5	11"	26'-4"	--	---	----	----	6	11"	3'-7"	3'-6"	6'-8"	4	12"	5'-0"	4	7 1/2"	5'-0"
8	6	8"	8"	8"	8"	24'	24'-0"	24'	24'-0"	4	4'-0"	5	11"	25'-0"	5	11"	26'-4"	4	11"	3'-1 1/4"	5'-11"	5	11"	3'-1 1/4"	4'-2"	6'-11"	4	12"	7'-0"	4	7 1/2"	7'-0"
8	8	8"	8"	8"	8"	24'	24'-0"	24'	24'-0"	6	6'-0"	5	11"	25'-0"	5	11"	26'-4"	4	11"	3'-1 1/4"	5'-11"	5	11"	3'-1 1/4"	5'-2"	7'-11"	4	12"	9'-0"	4	7 1/2"	9'-0"
8	10	8"	8"	8"	8"	24'	24'-0"	24'	24'-0"	8	8'-0"	5	11"	25'-0"	5	11"	26'-4"	4	11"	3'-6"	6'-9"	6	11"	3'-7"	6'-6"	9'-8"	4	9"	11'-0"	4	8"	11'-0"
9	4	9 1/2"	9 1/4"	8"	8"	27'	27'-0"	27'	27'-0"	2	2'-0"	5	11"	28'-0"	5	11"	29'-4"	4	11"	3'-3 3/8"	6'-4"	6	11"	3'-10"	3'-7"	7'-0"	4	12"	5'-2"	4	7 1/2"	5'-2"
9	6	9 1/2"	9 1/2"	8"	8"	27'	27'-0"	27'	27'-0"	4	4'-0"	5	10"	28'-0"	5	10"	29'-4"	4	10"	3'-3 3/8"	6'-4"	5	10"	3'-3 3/8"	4'-3 1/2"	7'-3"	4	12"	7'-3"	4	7 1/2"	7'-3"
9	8	9 1/2"	9 1/2"	8"	8"	27'	27'-0"	27'	27'-0"	6	6'-0"	5	10"	28'-0"	5	10"	29'-4"	5	10"	3'-3 3/8"	6'-3"	5	10"	3'-3 3/8"	5'-3 1/2"	8'-3"	4	12"	9'-3"	4	7"	9'-3"
9	10	9 1/2"	9 1/2"	8"	8"	27'	27'-0"	27'	27'-0"	8	8'-0"	5	9"	28'-0"	5	9"	29'-4"	5	9"	3'-8"	6'-11"	5	9"	3'-3 3/8"	6'-3 1/2"	9'-3"	5	12"	11'-3"	4	7"	11'-3"
9	12	9 3/4"	9 3/4"	8"	8"	27'	27'-0"	27'	27'-0"	10	10'-0"	5	9"	28'-0"	5	9"	29'-4"	5	9"	4'-1"	7'-11"	5	9"	3'-3 3/8"	7'-3 3/4"	10'-3"	5	8"	13'-3"	4	7 1/2"	13'-3"
10	4	9 1/2"	9 1/2"	8"	8"	30'	30'-0"	30'	30'-0"	2	2'-0"	5	9"	31'-0"	5	9"	32'-4"	--	---	----	----	5	9"	3'-6"	3'-3 1/2"	6'-6"	4	12"	5'-3"	5	10 1/2"	5'-3"
10	6	9 1/2"	9 1/2"	8"	8"	30'	30'-0"	30'	30'-0"	4	4'-0"	5	10"	31'-0"	5	10"	32'-4"	4	10"	3'-6"	6'-9"	5	10"	3'-6"	4'-3 1/2"	7'-6"	4	12"	7'-3"	4	6 1/2"	7'-3"
10	8	9 1/2"	9 1/2"	8"	8"	30'	30'-0"	30'	30'-0"	6	6'-0"	5	9"	31'-0"	5	9"	32'-4"	4	9"	3'-6"	6'-9"	5	9"	3'-6"	5'-3 1/2"	8'-6"	4	12"	9'-3"	4	7"	9'-3"
10	10	9 3/4"	9 3/4"	8"	8"	30'	30'-0"	30'	30'-0"	8	8'-0"	5	9"	31'-0"	5	9"	32'-4"	4	9"	3'-8"	6'-11"	5	9"	3'-6"	6'-3 3/4"	9'-6"	4	9"	11'-3"	4	7 1/2"	11'-3"
10	12	9 3/4"	9 3/4"	8"	8"	30'	30'-0"	30'	30'-0"	10	10'-0"	6	12"	31'-0"	6	12"	32'-4"	4	12"	4'-1"	7'-11"	6	12"	4'-0"	7'-8"	11'-3"	5	8"	13'-3"	4	8"	13'-3"
12	6	10"	10"	8"	8"	36'	36'-0"	36'	36'-0"	4	4'-0"	5	9"	37'-0"	5	9"	38'-4"	--	---	----	----	6	9"	4'-5"	4'-8"	8'-8"	4	12"	7'-4"	5	9"	7'-4"
12	8	10"	10"	8"	8"	36'	36'-0"	36'	36'-0"	6	6'-0"	6	12"	37'-0"	6	12"	38'-4"	--	---	----	----	7	12"	4'-10"	5'-11"	10'-3"	4	12"	9'-4"	4	6"	9'-4"
12	10	10"	10"	8"	8"	36'	36'-0"	36'	36'-0"	8	8'-0"	5	8"	37'-0"	5	8"	38'-4"	4	8"	3'-10 3/4"	7'-6"	5	8"	3'-10 3/4"	6'-4"	9'-11"	4	10"	11'-4"	5	9 1/2"	11'-4"
12	12	10 1/4"	10 1/4"	8"	8"	36'	36'-0"	36'	36'-0"	10	10'-0"	6	11"	37'-0"	6	11"	38'-4"	4	11"	4'-1"	7'-11"	6	11"	4'-5"	7'-8"	11'-8"	5	8"	13'-5"	4	6 1/2"	13'-5"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

 ROAD AND BRIDGE STANDARDS	<p style="text-align: center; font-size: 24pt; margin: 0;">TRIPLE BOX CULVERTS</p> <p style="text-align: center; font-size: 18pt; margin: 0;">2 TO 5 FT. FILLS</p> <p style="text-align: center; font-size: 12pt; margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>		SPECIFICATION REFERENCE
	SHEET 1 OF 2	REVISION DATE	
1004.07	07/11		

BCT-10

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

DIMENSIONS							REINFORCING STEEL																									
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3			BH4			BV1			BV2					
												SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	9	9'- 0"	9	9'- 0"	1	1'- 0"	4	12"	11'- 2"	4	12"	11'- 4"	--	----	-----	-----	4	12"	2'- 1 1/4"	2'- 8"	4'- 6"	4	12"	4'- 0"	4	12"	4'- 0"
3	4	8"	8"	8"	8"	9	9'- 0"	9	9'- 0"	2	2'- 0"	4	12"	11'- 2"	4	12"	11'- 4"	--	----	-----	-----	4	12"	2'- 1 1/4"	3'- 2"	5'- 0"	4	12"	5'- 0"	4	12"	5'- 0"
4	3	8"	8"	8"	8"	12	12'- 0"	12	12'- 0"	1	1'- 0"	4	12"	13'- 9"	4	12"	14'- 4"	--	----	-----	-----	4	12"	2'- 3 5/8"	2'- 8"	4'- 8"	4	12"	4'- 0"	4	12"	4'- 0"
4	4	8"	8"	8"	8"	12	12'- 0"	12	12'- 0"	2	2'- 0"	4	12"	13'- 9"	4	12"	14'- 4"	--	----	-----	-----	4	12"	2'- 3 5/8"	3'- 2"	5'- 2"	4	12"	5'- 0"	4	12"	5'- 0"
4	5	8"	8"	8"	8"	12	12'- 0"	12	12'- 0"	3	3'- 0"	4	12"	13'- 9"	4	12"	14'- 4"	--	----	-----	-----	4	12"	2'- 3 5/8"	3'- 8"	5'- 8"	4	12"	6'- 0"	4	12"	6'- 0"
4	6	8"	8"	8"	8"	12	12'- 0"	12	12'- 0"	4	4'- 0"	4	12"	13'- 9"	4	12"	14'- 4"	--	----	-----	-----	4	12"	2'- 3 5/8"	4'- 2"	6'- 2"	4	12"	7'- 0"	4	12"	7'- 0"
5	3	8"	8"	8"	8"	15	15'- 0"	15	15'- 0"	1	1'- 0"	4	12"	16'- 4"	4	12"	17'- 4"	--	----	-----	-----	4	12"	2'- 6"	2'- 8"	4'- 11"	4	12"	4'- 0"	4	12"	4'- 0"
5	4	8"	8"	8"	8"	15	15'- 0"	15	15'- 0"	2	2'- 0"	4	12"	16'- 4"	4	12"	17'- 4"	--	----	-----	-----	4	12"	2'- 6"	3'- 2"	5'- 5"	4	12"	5'- 0"	4	12"	5'- 0"
5	5	8"	8"	8"	8"	15	15'- 0"	15	15'- 0"	3	3'- 0"	4	12"	16'- 4"	4	12"	17'- 4"	--	----	-----	-----	4	12"	2'- 6"	3'- 8"	5'- 11"	4	12"	6'- 0"	4	12"	6'- 0"
5	6	8"	8"	8"	8"	15	15'- 0"	15	15'- 0"	4	4'- 0"	4	12"	16'- 4"	4	12"	17'- 4"	--	----	-----	-----	4	12"	2'- 6"	4'- 2"	6'- 5"	4	12"	7'- 0"	4	12"	7'- 0"
5	7	8"	8"	8"	8"	15	15'- 0"	15	15'- 0"	5	5'- 0"	4	12"	16'- 4"	4	12"	17'- 4"	--	----	-----	-----	4	12"	2'- 6"	4'- 8"	6'- 11"	4	12"	8'- 0"	4	12"	8'- 0"
6	4	8"	8"	8"	8"	18	18'- 0"	18	18'- 0"	2	2'- 0"	4	12"	19'- 3"	4	12"	20'- 4"	3	12"	2'- 8 3/8"	5'- 2"	4	12"	2'- 8 3/8"	3'- 2"	5'- 7"	4	12"	5'- 0"	4	12"	5'- 0"
6	5	8"	8"	8"	8"	18	18'- 0"	18	18'- 0"	3	3'- 0"	4	12"	19'- 3"	4	12"	20'- 4"	--	----	-----	-----	4	12"	2'- 8 3/8"	3'- 8"	6'- 1"	4	12"	6'- 0"	4	12"	6'- 0"
6	6	8"	8"	8"	8"	18	18'- 0"	18	18'- 0"	4	4'- 0"	4	12"	19'- 3"	4	12"	20'- 4"	--	----	-----	-----	4	12"	2'- 8 3/8"	4'- 2"	6'- 7"	4	12"	7'- 0"	4	12"	7'- 0"
6	7	8"	8"	8"	8"	18	18'- 0"	18	18'- 0"	5	5'- 0"	4	12"	19'- 3"	4	12"	20'- 4"	--	----	-----	-----	4	12"	2'- 8 3/8"	4'- 8"	7'- 1"	4	12"	8'- 0"	4	12"	8'- 0"
6	8	8"	8"	8"	8"	18	18'- 0"	18	18'- 0"	6	6'- 0"	4	12"	19'- 3"	4	12"	20'- 4"	3	12"	3'- 2"	6'- 2"	4	12"	2'- 8 3/8"	5'- 2"	7'- 7"	4	12"	9'- 0"	4	12"	9'- 0"
7	4	8"	8"	8"	8"	21	21'- 0"	21	21'- 0"	2	2'- 0"	4	12"	22'- 3"	4	12"	23'- 4"	--	----	-----	-----	5	12"	2'- 10 3/4"	3'- 2"	5'- 9"	4	11 1/2"	5'- 0"	4	12"	5'- 0"
7	6	8"	8"	8"	8"	21	21'- 0"	21	21'- 0"	4	4'- 0"	4	12"	22'- 3"	4	12"	23'- 4"	4	12"	2'- 10 3/4"	5'- 6"	4	12"	2'- 10 3/4"	4'- 2"	6'- 10"	4	12"	7'- 0"	4	12"	7'- 0"
7	8	8"	8"	8"	8"	21	21'- 0"	21	21'- 0"	6	6'- 0"	4	12"	22'- 3"	4	12"	23'- 4"	4	12"	3'- 2"	6'- 2"	4	12"	2'- 10 3/4"	5'- 2"	7'- 10"	4	12"	9'- 0"	4	12"	9'- 0"
7	10	8"	8"	8"	8"	21	21'- 0"	21	21'- 0"	8	8'- 0"	4	11"	22'- 3"	4	11"	23'- 4"	--	----	-----	-----	5	11"	2'- 10 3/4"	6'- 2"	8'- 9"	5	10"	11'- 0"	4	12"	11'- 0"
8	4	8"	8"	8"	8"	24	24'- 0"	24	24'- 0"	2	2'- 0"	4	11"	25'- 0"	4	11"	26'- 4"	3	11"	3'- 1 1/4"	6'- 0"	5	11"	3'- 1 1/4"	3'- 2"	5'- 11"	4	8"	5'- 0"	4	12"	5'- 0"
8	6	8 1/4"	8 1/4"	8"	8"	24	24'- 0"	24	24'- 0"	4	4'- 0"	4	10"	25'- 0"	4	10"	26'- 4"	--	----	-----	-----	5	10"	3'- 1 1/4"	4'- 2 1/4"	7'- 0"	4	12"	7'- 0"	4	12"	7'- 0"
8	8	8 1/2"	8 1/2"	8"	8"	24	24'- 0"	24	24'- 0"	6	6'- 0"	4	10"	25'- 0"	4	10"	26'- 4"	--	----	-----	-----	5	10"	3'- 1 1/4"	5'- 2 1/2"	8'- 0"	4	12"	9'- 1"	4	12"	9'- 1"
8	10	8 3/4"	8 3/4"	8"	8"	24	24'- 0"	24	24'- 0"	8	8'- 0"	4	9"	25'- 0"	4	9"	26'- 4"	--	----	-----	-----	5	9"	3'- 1 1/4"	6'- 2 3/4"	9'- 0"	5	11"	11'- 2"	4	12"	11'- 2"
9	4	8 3/4"	8 3/4"	8"	8"	27	27'- 0"	27	27'- 0"	2	2'- 0"	4	9"	28'- 0"	4	9"	29'- 4"	3	9"	3'- 3 5/8"	6'- 5"	5	9"	3'- 3 5/8"	3'- 2 3/4"	6'- 2"	4	7 1/2"	5'- 2"	4	12"	5'- 2"
9	6	9"	9"	8"	8"	27	27'- 0"	27	27'- 0"	4	4'- 0"	4	9"	28'- 0"	4	9"	29'- 4"	--	----	-----	-----	5	9"	3'- 3 5/8"	4'- 3"	7'- 3"	4	12"	7'- 2"	4	12"	7'- 2"
9	8	9 1/4"	9 1/4"	8"	8"	27	27'- 0"	27	27'- 0"	6	6'- 0"	4	9"	28'- 0"	5	9"	29'- 4"	--	----	-----	-----	5	9"	3'- 3 5/8"	5'- 3/4"	8'- 3"	4	12"	9'- 2"	4	12"	9'- 2"
9	10	9 1/2"	9 1/2"	8"	8"	27	27'- 0"	27	27'- 0"	8	8'- 0"	4	9"	28'- 0"	5	9"	29'- 4"	--	----	-----	-----	5	9"	3'- 3 5/8"	6'- 3/2"	9'- 3"	5	12"	11'- 3"	4	12"	11'- 3"
9	12	9 1/2"	9 1/2"	8"	8"	27	27'- 0"	27	27'- 0"	10	10'- 0"	4	8"	28'- 0"	4	8"	29'- 4"	3	8"	4'- 1"	7'- 11"	5	8"	3'- 3 5/8"	7'- 3/2"	10'- 3"	5	7"	13'- 3"	4	12"	13'- 3"
10	4	9 3/4"	9 3/4"	8"	8"	30	30'- 0"	30	30'- 0"	2	2'- 0"	5	8"	31'- 3"	4	8"	32'- 4"	--	----	-----	-----	5	8"	3'- 6"	3'- 3 3/4"	6'- 6"	4	7"	5'- 3"	4	12"	5'- 3"
10	6	10"	10"	8"	8"	30	30'- 0"	30	30'- 0"	4	4'- 0"	5	9"	31'- 3"	5	9"	32'- 4"	--	----	-----	-----	5	9"	3'- 6"	4'- 4"	7'- 6"	4	11"	7'- 4"	4	12"	7'- 4"
10	8	10"	10"	8"	8"	30	30'- 0"	30	30'- 0"	6	6'- 0"	5	8"	31'- 3"	5	8"	32'- 4"	3	8"	3'- 6"	6'- 10"	4	8"	3'- 6"	5'- 4"	8'- 7"	4	12"	9'- 4"	4	12"	9'- 4"
10	10	10 1/4"	10 1/4"	8"	8"	30	30'- 0"	30	30'- 0"	8	8'- 0"	5	8"	31'- 3"	5	8"	32'- 4"	4	8"	3'- 8"	6'- 11"	4	8"	3'- 6"	6'- 4 1/4"	9'- 7"	5	12"	11'- 5"	4	12"	11'- 5"
10	12	10 1/2"	10 1/2"	8"	8"	30	30'- 0"	30	30'- 0"	10	10'- 0"	5	11"	31'- 3"	5	11"	32'- 4"	3	11"	4'- 2"	8'- 2"	6	11"	4'- 0"	7'- 8"	11'- 4"	5	7"	13'- 5"	4	12"	13'- 5"
12	6	11 1/2"	11 1/2"	8"	8"	36	36'- 0"	36	36'- 0"	4	4'- 0"	5	9"	37'- 0"	5	9"	38'- 4"	3	9"	3'- 10 3/4"	7'- 7"	5	9"	3'- 10 3/4"	4'- 5 1/2"	8'- 0"	4	9"	7'- 7"	4	12"	7'- 7"
12	8	11 3/4"	11 3/4"	8"	8"	36	36'- 0"	36	36'- 0"	6	6'- 0"	5	9"	37'- 0"	5	9"	38'- 4"	3	9"	3'- 10 3/4"	7'- 7"	5	9"	3'- 10 3/4"	5'- 5 3/4"	9'- 1"	4	12"	9'- 8"	4	12"	9'- 8"
12	10	11 3/4"	11 3/4"	8"	8"	36	36'- 0"	36	36'- 0"	8	8'- 0"	6	9"	37'- 0"	5	9"	38'- 4"	3	9"	3'- 10 3/4"	7'- 7"	5	9"	3'- 10 3/4"	6'- 5 3/4"	10'- 1"	5	12"	11'- 8"	4	12"	11'- 8"
12	12	12"	12"	8"	8"	36	36'- 0"	36	36'- 0"	10	10'- 0"	6	9"	37'- 0"	5	9"	38'- 4"	--	----	-----	-----	6	9"	4'- 5"	7'- 10"	11'- 10"	6	11 1/2"	13'- 8"	4	12"	13'- 8"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE

1004.09 07/11

TRIPLE BOX CULVERTS
5 TO 10 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

2016 ROAD & BRIDGE STANDARDS

BCT-20

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

DIMENSIONS						REINFORCING STEEL																										
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3				BH4				BV1			BV2			
												SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	o	LENGTH	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH
3	3	8"	8"	8"	8"	9	9'-0"	9	9'-0"	1	1'-0"	4	12"	10'-3"	4	12"	11'-4"	--	---	----	----	4	12"	2'-4"	2'-8"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	9	9'-0"	9	9'-0"	2	2'-0"	4	12"	10'-3"	4	12"	11'-4"	--	---	----	----	4	12"	2'-4"	3'-2"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	12	12'-0"	12	12'-0"	1	1'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	2'-8"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	12	12'-0"	12	12'-0"	2	2'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	3'-2"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	12	12'-0"	12	12'-0"	3	3'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	3'-8"	5'-9"	4	12"	6'-0"	4	12"	6'-0"
4	6	8"	8"	8"	8"	12	12'-0"	12	12'-0"	4	4'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	4'-2"	6'-3"	4	12"	7'-0"	4	12"	7'-0"
5	3	8"	8"	8"	8"	15	15'-0"	15	15'-0"	1	1'-0"	4	12"	16'-4"	4	12"	17'-3"	4	12"	2'-6"	4'-9"	4	12"	2'-4"	2'-8"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	15	15'-0"	15	15'-0"	2	2'-0"	4	12"	16'-4"	4	12"	17'-3"	4	12"	2'-6"	4'-9"	4	12"	2'-4"	3'-2"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
5	5	8"	8"	8"	8"	15	15'-0"	15	15'-0"	3	3'-0"	4	12"	16'-4"	4	12"	17'-3"	3	12"	2'-6"	4'-10"	4	12"	2'-4"	3'-8"	5'-9"	4	12"	6'-0"	4	12"	6'-0"
5	6	8"	8"	8"	8"	15	15'-0"	15	15'-0"	4	4'-0"	4	12"	16'-4"	4	12"	17'-3"	3	12"	2'-9"	5'-3"	4	12"	2'-4"	4'-2"	6'-3"	4	12"	7'-0"	4	12"	7'-0"
5	7	8"	8"	8"	8"	15	15'-0"	15	15'-0"	5	5'-0"	4	12"	16'-4"	4	12"	17'-3"	4	12"	2'-11"	5'-7"	4	12"	2'-4"	4'-8"	6'-9"	5	12"	8'-0"	4	12"	8'-0"
6	4	9"	9"	8"	8"	18	18'-0"	18	18'-0"	2	2'-0"	4	12"	19'-4"	4	12"	20'-3"	4	12"	2'-9"	5'-2"	4	12"	2'-4"	3'-3"	5'-4"	4	12"	5'-2"	4	12"	5'-2"
6	5	9"	9"	8"	8"	18	18'-0"	18	18'-0"	3	3'-0"	4	11"	19'-4"	4	11"	20'-3"	4	11"	2'-9"	5'-2"	4	11"	2'-4"	3'-9"	5'-10"	4	12"	6'-2"	4	12"	6'-2"
6	6	9 1/4"	9 1/4"	8"	8"	18	18'-0"	18	18'-0"	4	4'-0"	4	11"	19'-4"	4	11"	20'-3"	4	11"	2'-10"	5'-5"	4	11"	2'-4"	4'-4"	6'-4"	4	12"	7'-2"	4	12"	7'-2"
6	7	9 1/4"	9 1/4"	8"	8"	18	18'-0"	18	18'-0"	5	5'-0"	4	11"	19'-4"	4	11"	20'-3"	4	11"	3'-1"	5'-9"	4	11"	2'-4"	4'-10"	6'-10"	5	12"	8'-2"	4	12"	8'-2"
6	8	9 1/4"	9 1/4"	8"	8"	18	18'-0"	18	18'-0"	6	6'-0"	4	11"	19'-4"	4	11"	20'-3"	4	11"	3'-3"	6'-2"	4	11"	2'-4"	5'-4"	7'-4"	5	12"	9'-2"	4	12"	9'-2"
7	4	10 1/2"	10 1/2"	8"	8"	21	21'-0"	21	21'-0"	2	2'-0"	4	10"	22'-4"	4	10"	23'-3"	3	10"	2'-11"	5'-8"	4	10"	2'-4"	3'-5"	5'-5"	4	12"	5'-5"	4	12"	5'-5"
7	6	10 3/4"	10 3/4"	8"	8"	21	21'-0"	21	21'-0"	4	4'-0"	4	10"	22'-4"	4	10"	23'-3"	3	10"	3'-0"	5'-8"	4	10"	2'-4"	4'-5"	6'-6"	4	12"	7'-5"	4	12"	7'-5"
7	8	11"	11"	8"	8"	21	21'-0"	21	21'-0"	6	6'-0"	4	9"	22'-4"	4	9"	23'-3"	3	9"	3'-5"	6'-7"	4	9"	2'-4"	5'-5"	7'-6"	5	12"	9'-6"	4	12"	9'-6"
7	10	11"	11"	8 1/2"	8"	21	21'-0"	21	21'-0"	8	8'-0"	4	9"	22'-1"	4	9"	23'-5"	--	---	----	----	5	9"	2'-6"	6'-7"	8'-9"	5	7"	11'-6"	4	12"	11'-6"
8	4	11 1/4"	11 1/4"	8"	8"	24	24'-0"	24	24'-0"	2	2'-0"	4	9"	25'-4"	5	9"	26'-3"	3	9"	3'-2"	6'-1"	4	9"	2'-4"	3'-6"	5'-7"	4	11"	5'-7"	4	12"	5'-7"
8	6	12"	12"	8"	8"	24	24'-0"	24	24'-0"	4	4'-0"	4	9"	25'-4"	5	9"	26'-3"	3	9"	3'-2"	6'-1"	4	9"	2'-4"	4'-6"	6'-7"	4	12"	7'-8"	4	12"	7'-8"
8	8	12 1/4"	12 1/4"	8"	8"	24	24'-0"	24	24'-0"	6	6'-0"	4	9"	25'-4"	5	9"	26'-3"	3	9"	3'-6"	6'-9"	4	9"	2'-4"	5'-7"	7'-7"	5	12"	9'-8"	4	12"	9'-8"
8	10	12 1/2"	12 1/2"	8"	8"	24	24'-0"	24	24'-0"	8	8'-0"	4	9"	25'-0"	5	9"	26'-3"	3	9"	3'-11"	7'-7"	5	9"	2'-6"	6'-9"	8'-10"	5	7"	11'-9"	4	12"	11'-9"
9	4	13"	13"	8"	8"	27	27'-0"	27	27'-0"	2	2'-0"	5	9"	28'-4"	5	9"	29'-3"	3	9"	3'-4"	6'-5"	4	9"	2'-9"	3'-7"	6'-1"	4	10"	5'-10"	4	12"	5'-10"
9	6	13"	13"	8"	8"	27	27'-0"	27	27'-0"	4	4'-0"	5	9"	28'-4"	5	9"	29'-3"	3	9"	3'-4"	6'-5"	4	9"	2'-9"	4'-7"	7'-1"	4	12"	7'-10"	4	12"	7'-10"
9	8	13 1/4"	13 1/4"	8"	8"	27	27'-0"	27	27'-0"	6	6'-0"	5	9"	28'-4"	5	9"	29'-3"	3	9"	3'-7"	6'-11"	4	9"	2'-9"	5'-8"	8'-1"	5	12"	9'-10"	4	12"	9'-10"
9	10	13 1/4"	13 1/4"	8"	8"	27	27'-0"	27	27'-0"	8	8'-0"	5	9"	28'-0"	5	9"	29'-3"	3	9"	4'-0"	7'-9"	5	9"	2'-11"	6'-10"	9'-4"	6	8 1/2"	11'-10"	4	12"	11'-10"
9	12	13 1/2"	13 1/2"	9 1/2"	8"	27	27'-0"	27	27'-0"	10	10'-0"	5	8"	28'-3"	5	8"	29'-6"	4	8"	4'-5"	8'-6"	5	9"	2'-11"	7'-10"	10'-4"	6	7 1/2"	13'-11"	4	12"	13'-11"
10	4	14 1/4"	14 1/4"	8"	8"	30	30'-0"	30	30'-0"	2	2'-0"	5	9"	31'-0"	5	9"	32'-3"	--	---	----	----	5	9"	2'-11"	3'-11"	6'-5"	4	10"	6'-0"	4	12"	6'-0"
10	6	14 1/2"	14 1/2"	8"	8"	30	30'-0"	30	30'-0"	4	4'-0"	5	9"	31'-3"	5	9"	32'-3"	3	9"	3'-6"	6'-10"	4	9"	2'-9"	4'-9"	7'-2"	4	12"	8'-0"	4	12"	8'-0"
10	8	14 1/2"	14 1/2"	8"	8"	30	30'-0"	30	30'-0"	6	6'-0"	5	9"	31'-0"	5	9"	32'-3"	--	---	----	----	5	9"	2'-11"	5'-11"	8'-5"	5	12"	10'-0"	4	12"	10'-0"
10	10	14 1/2"	14 1/2"	8"	8"	30	30'-0"	30	30'-0"	8	8'-0"	5	9"	31'-0"	5	9"	32'-3"	3	9"	4'-1"	7'-11"	5	9"	2'-11"	6'-11"	9'-5"	6	9"	12'-0"	4	12"	12'-0"
10	12	14 3/4"	14 3/4"	9 1/2"	8"	30	30'-0"	30	30'-0"	10	10'-0"	5	9"	31'-0"	5	9"	32'-6"	3	9"	4'-6"	8'-9"	6	9"	3'-0"	8'-1"	10'-8"	6	7 1/2"	14'-1"	4	12"	14'-1"
12	6	17"	17"	8"	8"	36	36'-0"	36	36'-0"	4	4'-0"	6	9"	37'-3"	6	9"	38'-4"	3	9"	3'-11"	7'-8"	4	9"	3'-2"	4'-11"	7'-10"	4	12"	8'-6"	4	12"	8'-6"
12	8	17"	17"	8"	8"	36	36'-0"	36	36'-0"	6	6'-0"	6	9"	37'-3"	6	9"	38'-4"	3	9"	3'-11"	7'-8"	4	9"	3'-2"	5'-11"	8'-10"	5	12"	10'-6"	4	12"	10'-6"
12	10	17 1/4"	17 1/4"	8"	8"	36	36'-0"	36	36'-0"	8	8'-0"	6	9"	37'-0"	6	9"	38'-4"	3	9"	4'-4"	8'-5"	5	9"	3'-4"	7'-2"	10'-1"	6	9"	12'-6"	4	12"	12'-6"
12	12	17 1/4"	17 1/4"	9 1/2"	8"	36	36'-0"	36	36'-0"	10	10'-0"	6	9"	37'-0"	6	9"	38'-7"	3	9"	4'-9"	9'-2"	6	9"	3'-5"	8'-4"	11'-4"	5	5"	14'-6"	4	12"	14'-6"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

ROAD AND BRIDGE STANDARDS	<h3 style="margin: 0;">TRIPLE BOX CULVERTS</h3> <h4 style="margin: 0;">10 TO 20 FT. FILLS</h4> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SPECIFICATION REFERENCE				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: none;">SHEET 1 OF 2</td> <td style="border-bottom: none;">REVISION DATE</td> </tr> <tr> <td style="text-align: center;">1004.11</td> <td style="text-align: center;">07/11</td> </tr> </table>	SHEET 1 OF 2	REVISION DATE	1004.11	07/11		
SHEET 1 OF 2	REVISION DATE					
1004.11	07/11					

2016 ROAD & BRIDGE STANDARDS

BCT-30

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

DIMENSIONS						REINFORCING STEEL																										
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)							BH1			BH2			BH3			BH4			BV1			BV2					
						A	B	C	D	E	F	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	a	LENGTH	SIZE	SPACING c-c	a	b	LENGTH	SIZE	SPACING c-c	LENGTH	SIZE	SPACING c-c	LENGTH
3	3	8"	8"	8"	8"	9	9'-0"	9	9'-0"	1	1'-0"	4	12"	10'-3"	4	12"	11'-4"	--	---	----	----	4	12"	2'-4"	2'-8"	4'-9"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	9	9'-0"	9	9'-0"	2	2'-0"	4	12"	10'-3"	4	12"	11'-4"	--	---	----	----	4	12"	2'-4"	3'-2"	5'-3"	4	12"	5'-0"	4	12"	5'-0"
4	3	8 1/2"	8 1/2"	8"	8"	12	12'-0"	12	12'-0"	1	1'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	2'-9"	4'-9"	4	12"	4'-1"	4	12"	4'-1"
4	4	8 1/2"	8 1/2"	8"	8"	12	12'-0"	12	12'-0"	2	2'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	3'-3"	5'-3"	4	12"	5'-1"	4	12"	5'-1"
4	5	8 1/2"	8 1/2"	8"	8"	12	12'-0"	12	12'-0"	3	3'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	3'-9"	5'-9"	4	12"	6'-1"	4	12"	6'-1"
4	6	8 1/2"	8 1/2"	8"	8"	12	12'-0"	12	12'-0"	4	4'-0"	4	12"	13'-3"	4	12"	14'-4"	--	---	----	----	4	12"	2'-4"	4'-3"	6'-3"	5	12"	7'-1"	4	12"	7'-1"
5	3	10"	10"	8"	8"	15	15'-0"	15	15'-0"	1	1'-0"	4	12"	16'-4"	4	12"	17'-3"	3	12"	2'-6"	4'-10"	4	12"	2'-4"	2'-10"	4'-11"	4	12"	4'-4"	4	12"	4'-4"
5	4	10"	10"	8"	8"	15	15'-0"	15	15'-0"	2	2'-0"	4	12"	16'-4"	4	12"	17'-3"	3	12"	2'-6"	4'-10"	4	12"	2'-4"	3'-4"	5'-5"	4	12"	5'-4"	4	12"	5'-4"
5	5	10 1/4"	10 1/4"	8"	8"	15	15'-0"	15	15'-0"	3	3'-0"	4	12"	16'-4"	4	12"	17'-3"	3	12"	2'-9"	5'-3"	4	12"	2'-4"	3'-11"	5'-11"	4	12"	6'-4"	4	12"	6'-4"
5	6	10"	10"	8"	8"	15	15'-0"	15	15'-0"	4	4'-0"	4	12"	16'-4"	4	12"	17'-3"	4	12"	2'-11"	5'-6"	4	12"	2'-4"	4'-4"	6'-5"	5	12"	7'-4"	4	12"	7'-4"
5	7	10"	10"	8"	8"	15	15'-0"	15	15'-0"	5	5'-0"	4	12"	16'-4"	4	12"	17'-3"	4	12"	3'-1"	5'-11"	4	12"	2'-4"	4'-10"	6'-11"	5	12"	8'-3"	4	12"	8'-3"
6	4	12"	12"	8"	8"	18	18'-0"	18	18'-0"	2	2'-0"	4	10"	19'-4"	4	10"	20'-3"	--	---	----	----	4	10"	2'-4"	3'-6"	5'-7"	4	12"	5'-8"	4	12"	5'-8"
6	5	12 1/4"	12 1/4"	8"	8"	18	18'-0"	18	18'-0"	3	3'-0"	4	10"	19'-4"	4	10"	20'-3"	--	---	----	----	4	10"	2'-4"	4'-1"	6'-1"	4	12"	6'-8"	4	12"	6'-8"
6	6	12 1/4"	12 1/4"	8"	8"	18	18'-0"	18	18'-0"	4	4'-0"	4	10"	19'-4"	4	10"	20'-3"	--	---	----	----	4	10"	2'-4"	4'-7"	6'-7"	4	12"	7'-8"	4	12"	7'-8"
6	7	11 1/2"	11 1/2"	8"	8"	18	18'-0"	18	18'-0"	5	5'-0"	4	10"	19'-4"	4	10"	20'-3"	3	10"	3'-3"	6'-3"	4	10"	2'-4"	5'-0"	7'-0"	5	12"	8'-6"	4	12"	8'-6"
6	8	11 3/4"	11 3/4"	8"	8"	18	18'-0"	18	18'-0"	6	6'-0"	4	10"	19'-0"	4	10"	20'-3"	--	---	----	----	5	10"	2'-6"	5'-8"	7'-9"	5	9"	9'-7"	4	12"	9'-7"
7	4	13 3/4"	13 3/4"	8"	8"	21	21'-0"	21	21'-0"	2	2'-0"	4	9"	22'-4"	5	9"	23'-3"	--	---	----	----	4	9"	2'-4"	3'-8"	5'-8"	4	12"	5'-10"	4	12"	5'-10"
7	6	13 3/4"	13 3/4"	8"	8"	21	21'-0"	21	21'-0"	4	4'-0"	4	9"	22'-4"	5	9"	23'-3"	--	---	----	----	4	9"	2'-4"	4'-8"	6'-8"	4	12"	7'-10"	4	12"	7'-10"
7	8	13 3/4"	13 3/4"	8"	8"	21	21'-0"	21	21'-0"	6	6'-0"	4	9"	22'-4"	5	9"	23'-3"	3	9"	3'-7"	6'-11"	4	9"	2'-4"	5'-8"	7'-8"	5	9"	9'-10"	4	12"	9'-10"
7	10	13 3/4"	13 3/4"	9 1/2"	8"	21	21'-0"	21	21'-0"	8	8'-0"	4	9"	22'-3"	5	9"	23'-6"	3	9"	4'-0"	7'-9"	5	9"	2'-6"	6'-10"	8'-11"	7	11 1/2"	11'-10"	4	12"	11'-10"
8	4	15"	15"	8"	8"	24	24'-0"	24	24'-0"	2	2'-0"	5	9"	25'-4"	5	9"	26'-3"	--	---	----	----	4	9"	2'-9"	3'-9"	6'-3"	4	12"	6'-2"	4	12"	6'-2"
8	6	15"	15"	8"	8"	24	24'-0"	24	24'-0"	4	4'-0"	5	9"	25'-4"	5	9"	26'-3"	--	---	----	----	4	9"	2'-9"	4'-9"	7'-3"	4	12"	8'-1"	4	12"	8'-1"
8	8	15"	15"	8"	8"	24	24'-0"	24	24'-0"	6	6'-0"	5	9"	25'-4"	5	9"	26'-3"	3	9"	3'-9"	7'-3"	4	9"	2'-9"	5'-9"	8'-3"	5	9 1/2"	10'-1"	4	12"	10'-1"
8	10	15"	15"	9 1/2"	8"	24	24'-0"	24	24'-0"	8	8'-0"	5	9"	25'-3"	5	9"	26'-6"	3	9"	4'-1"	8'-0"	5	9"	2'-11"	6'-11"	9'-6"	7	11 1/2"	12'-1"	4	12"	12'-1"
9	4	16 1/2"	16 1/2"	8"	8"	27	27'-0"	27	27'-0"	2	2'-0"	5	8"	28'-4"	5	8"	29'-3"	--	---	----	----	4	8"	2'-9"	3'-11"	6'-4"	4	12"	6'-5"	4	12"	6'-5"
9	6	16 1/2"	16 1/2"	8"	8"	27	27'-0"	27	27'-0"	4	4'-0"	5	9"	28'-4"	5	9"	29'-3"	--	---	----	----	4	9"	2'-9"	4'-11"	7'-4"	4	12"	8'-4"	4	12"	8'-4"
9	8	16 1/2"	16 1/2"	8"	8"	27	27'-0"	27	27'-0"	6	6'-0"	5	8"	28'-4"	5	8"	29'-3"	3	8"	3'-10"	7'-6"	4	8"	2'-9"	5'-11"	8'-4"	5	9 1/2"	10'-4"	4	12"	10'-4"
9	10	16 1/2"	16 1/2"	9"	8"	27	27'-0"	27	27'-0"	8	8'-0"	5	8"	28'-2"	5	8"	29'-6"	3	8"	4'-3"	8'-3"	5	8"	2'-11"	7'-1"	9'-7"	7	11 1/2"	12'-4"	4	12"	12'-4"
9	12	16 3/4"	16 3/4"	11"	8"	27	27'-0"	27	27'-0"	10	10'-0"	6	9"	28'-0"	6	9"	29'-9"	--	---	----	----	7	9"	3'-7"	8'-6"	11'-7"	6	7 1/2"	14'-5"	4	12"	14'-5"
10	4	18 1/4"	18 1/4"	8"	8"	30	30'-0"	30	30'-0"	2	2'-0"	6	9"	31'-3"	6	9"	32'-3"	--	---	----	----	4	9"	3'-2"	4'-1"	6'-11"	4	12"	6'-8"	4	11"	6'-8"
10	6	18 1/4"	18 1/4"	8"	8"	30	30'-0"	30	30'-0"	4	4'-0"	6	9"	31'-3"	6	9"	32'-3"	--	---	----	----	4	9"	3'-2"	5'-1"	7'-11"	4	12"	8'-8"	4	11"	8'-8"
10	8	18 1/4"	18 1/4"	8"	8"	30	30'-0"	30	30'-0"	6	6'-0"	6	9"	31'-3"	6	9"	32'-3"	3	9"	4'-0"	7'-9"	4	9"	3'-2"	6'-1"	8'-11"	5	9 1/2"	10'-8"	4	11"	10'-8"
10	10	18 1/2"	18 1/2"	9"	8"	30	30'-0"	30	30'-0"	8	8'-0"	6	9"	31'-2"	6	9"	32'-5"	3	9"	4'-5"	8'-7"	5	9"	3'-4"	7'-3"	10'-2"	6	8"	12'-9"	4	11"	12'-9"
10	12	18 1/2"	18 1/2"	11"	8"	30	30'-0"	30	30'-0"	10	10'-0"	6	9"	31'-3"	6	9"	32'-9"	4	9"	4'-10"	9'-4"	6	9"	3'-5"	8'-5"	11'-5"	5	5 1/2"	14'-9"	4	11"	14'-9"
12	6	21 1/2"	21 1/2"	8"	8"	36	36'-0"	36	36'-0"	4	4'-0"	6	8"	37'-3"	6	8"	38'-4"	--	---	----	----	4	8"	3'-2"	5'-4"	8'-2"	4	12"	9'-3"	4	10"	9'-3"
12	8	21 1/2"	21 1/2"	8"	8"	36	36'-0"	36	36'-0"	6	6'-0"	6	8"	37'-3"	6	8"	38'-4"	3	8"	4'-3"	8'-4"	4	8"	3'-2"	6'-4"	9'-2"	5	9"	11'-3"	4	10"	11'-3"
12	10	21 1/2"	21 1/2"	8 1/2"	8"	36	36'-0"	36	36'-0"	8	8'-0"	6	8"	37'-1"	6	8"	38'-4"	3	8"	4'-8"	9'-1"	5	8"	3'-4"	7'-6"	10'-5"	6	8"	13'-3"	4	10"	13'-3"
12	12	21 3/4"	21 3/4"	11"	8"	36	36'-0"	36	36'-0"	10	10'-0"	6	8"	37'-6"	6	8"	38'-10"	4	8"	5'-1"	9'-10"	5	8"	3'-4"	8'-6"	11'-5"	5	5 1/2"	15'-3"	4	10"	15'-3"

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VDOT ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1004.13	07/11

TRIPLE BOX CULVERTS
20 TO 30 FT. FILLS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

2016 ROAD & BRIDGE STANDARDS

BCT-50

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

Table with columns: DIMENSIONS (SPAN, HGHT, T1, T2, T3, T4), REINFORCING STEEL (BH1, BH2, BH3, BH4, BV1, BV2). Rows list various span and height combinations with corresponding reinforcing steel specifications.

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

VDOT ROAD AND BRIDGE STANDARDS SHEET 1 OF 2 REVISION DATE 07/11 1004.17

TRIPLE BOX CULVERTS 40 TO 50 FT. FILLS VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCT-DT.

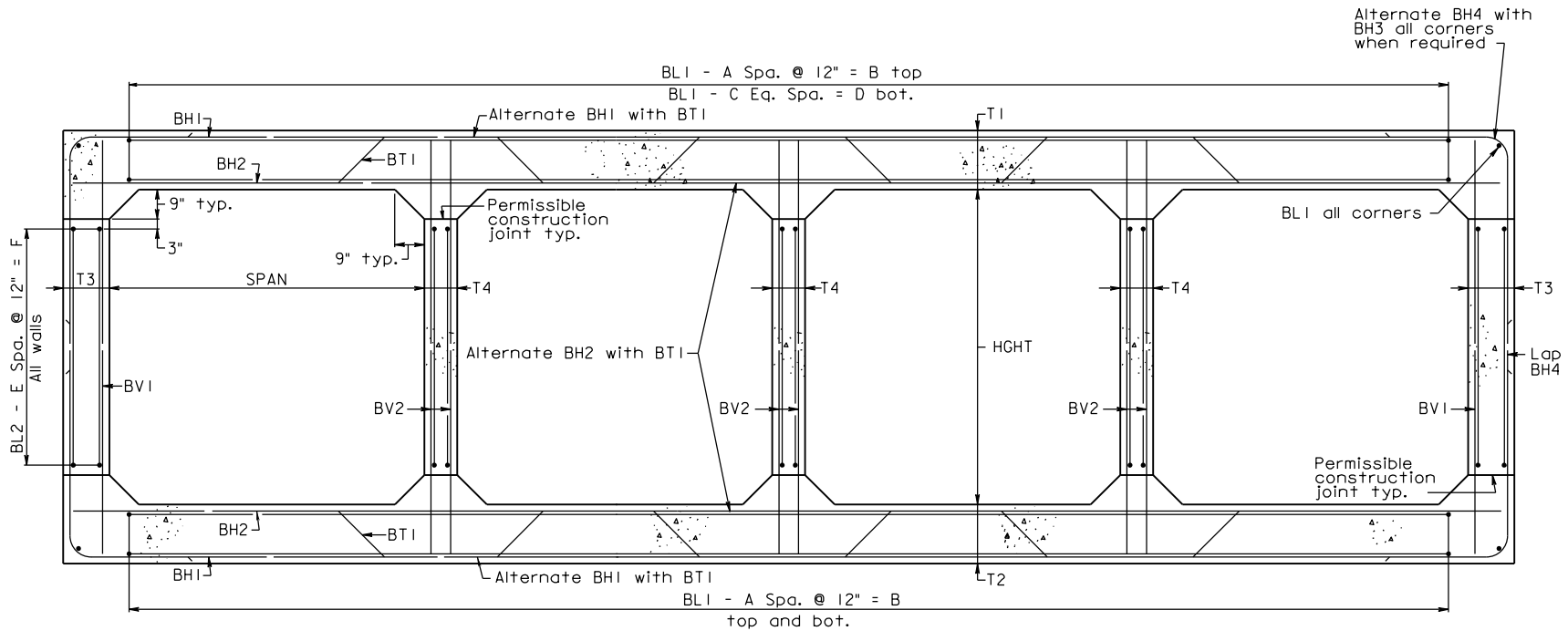
BCT-50

SPAN		HIGHT		REINFORCING STEEL											QUAN./LF		HEADWALLS								WINGWALL			
(FT.)	(FT.)	SIZE	SPACING C-C	BT1								NO. B1 #4 BARS	NO. B12 #3 BARS	REINFORCING STEEL (LBS/LONG. JT)	CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G			HW1		NO. HW2 BARS	NO. HW3 BARS	INLET CONCRETE CL. A4 (CY)		INLET REINFORCING STEEL (LBS)	OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)
				a	b	c	d	e	f	g	LENGTH						HEADWALL LENGTH	SIZE	LENGTH									
3	3	4	12"	2'-6"	0'- 5"	1'-10"	0'- 6 ⁵ / ₈ "	0'- 4 ¹ / ₄ "	11'-3"	1'-1"	11'-10"	44	16	42.388	1.061	109.676	13'- 2"	6	12'-10"	2	8	1.811	102.932	1.791	77.103	A		
3	4	4	12"	2'-6"	0'- 5"	1'-10"	0'- 6 ⁵ / ₈ "	0'- 4 ¹ / ₄ "	11'-3"	1'-1"	11'-10"	44	24	45.212	1.159	118.028	13'- 2"	6	12'-10"	2	10	1.916	109.835	1.884	77.103	C		
4	3	4	12"	3'-2"	0'- 7"	2'-3"	0'- 9 ³ / ₈ "	0'- 6 ¹ / ₄ "	14'-3"	1'-4"	15'-2"	56	16	52.408	1.407	131.864	16'- 2"	6	15'-10"	2	8	2.072	120.956	2.063	95.127	B		
4	4	4	12"	3'-1"	0'- 7 ¹ / ₄ "	2'-3"	0'- 9 ³ / ₈ "	0'- 6 ¹ / ₄ "	14'-3"	1'-3"	15'-2"	56	24	55.232	1.528	140.485	16'- 2"	6	15'-10"	2	10	2.171	127.859	2.149	95.127	D		
4	5	4	12"	3'-2"	0'- 7"	2'-3"	0'- 9 ³ / ₈ "	0'- 6 ¹ / ₄ "	14'-3"	1'-4"	15'-2"	56	32	58.056	1.603	153.443	16'- 2"	6	15'-10"	2	12	2.282	134.761	2.248	95.127	F		
4	6	4	12"	3'-1"	0'- 7 ¹ / ₄ "	2'-3"	0'- 9 ³ / ₈ "	0'- 6 ¹ / ₄ "	14'-3"	1'-3"	15'-2"	56	40	60.880	1.722	183.256	16'- 2"	6	15'-10"	2	14	2.381	141.664	2.334	95.127	H		
5	3	4	9"	3'-9"	0'- 9 ¹ / ₂ "	2'-8"	1'- 1"	0'- 8 ³ / ₄ "	17'-4"	1'-6"	18'-6"	68	16	62.428	1.879	182.405	19'- 2"	6	18'-10"	2	8	2.269	138.980	2.270	113.151	B		
5	4	4	9"	3'-9"	0'- 9 ¹ / ₂ "	2'-8"	1'- 1"	0'- 8 ³ / ₄ "	17'-4"	1'-6"	18'-6"	68	24	65.252	1.978	191.202	19'- 2"	6	18'-10"	2	10	2.374	145.883	2.362	113.151	D		
5	5	4	9"	3'-9"	0'- 9 ¹ / ₂ "	2'-8"	1'- 1"	0'- 8 ³ / ₄ "	17'-4"	1'-6"	18'-6"	68	32	68.076	2.075	205.187	19'- 2"	6	18'-10"	2	12	2.471	152.785	2.446	113.151	F		
5	6	4	9"	3'-9"	0'- 9 ¹ / ₂ "	2'-8"	1'- 1"	0'- 8 ³ / ₄ "	17'-4"	1'-6"	18'-6"	68	40	70.900	2.173	219.080	19'- 2"	6	18'-10"	2	14	2.576	159.688	2.539	113.151	H		
5	7	4	10"	3'-9"	0'- 9 ¹ / ₂ "	2'-8"	1'- 1"	0'- 8 ³ / ₄ "	17'-5"	1'-6"	18'-7"	68	48	73.724	2.299	238.475	19'- 2"	6	18'-10"	2	16	2.681	166.591	2.632	113.151	J		
6	4	4	9"	4'-4"	1'- 1/2"	3'-0"	1'- 5 ¹ / ₈ "	0'-11 ³ / ₄ "	20'-4"	1'-8"	21'-11"	80	24	75.272	2.606	240.773	22'- 2"	6	21'-10"	2	10	2.526	163.907	2.524	131.175	E		
6	5	4	9"	4'-4"	1'- 0"	3'-0"	1'- 4 ¹ / ₂ "	0'-11 ¹ / ₄ "	20'-4"	1'-9"	21'-10"	80	32	78.096	2.640	254.688	22'- 2"	6	21'-10"	2	12	2.631	170.809	2.617	131.175	G		
6	6	4	9"	4'-4"	1'- 0"	3'-0"	1'- 4 ¹ / ₂ "	0'-11 ¹ / ₄ "	20'-4"	1'-9"	21'-10"	80	40	80.920	2.738	266.899	22'- 2"	6	21'-10"	2	14	2.758	177.712	2.732	131.175	I		
6	7	4	9"	4'-4"	1'- 0"	3'-0"	1'- 4 ¹ / ₂ "	0'-11 ¹ / ₄ "	20'-4"	1'-9"	21'-10"	80	48	83.744	2.834	299.565	22'- 2"	6	21'-10"	2	16	2.864	184.615	2.825	131.175	K		
6	8	4	9"	4'-6"	1'- 0"	3'-0"	1'- 4 ¹ / ₂ "	0'-11 ¹ / ₄ "	20'-7"	1'-9"	22'-1"	80	56	86.568	3.030	331.062	22'- 2"	6	21'-10"	2	18	2.969	191.517	2.917	131.175	M		
7	4	5	9"	4'-11"	1'- 2 ¹ / ₂ "	3'-5"	1'- 7 ¹ / ₈ "	1'- 1 ⁵ / ₈ "	23'-4"	1'-11"	25'-2"	92	24	85.292	3.198	321.237	25'- 2"	6	24'-10"	2	10	2.649	181.931	2.657	149.199	E		
7	6	5	9"	4'-11"	1'- 2 ¹ / ₂ "	3'-5"	1'- 7 ¹ / ₈ "	1'- 1 ⁵ / ₈ "	23'-4"	1'-11"	25'-2"	92	40	90.940	3.393	351.266	25'- 2"	6	24'-10"	2	14	2.859	195.736	2.842	149.199	I		
7	8	5	9"	5'-1"	1'- 2"	3'-5"	1'- 7 ¹ / ₈ "	1'- 1 ⁵ / ₈ "	23'-7"	2'-0"	25'-4"	92	56	96.588	3.616	398.726	25'- 2"	6	24'-10"	2	18	3.069	209.541	3.028	149.199	M		
7	10	5	9"	5'-3"	1'- 2"	3'-5"	1'- 7 ¹ / ₈ "	1'- 1 ⁵ / ₈ "	23'-11"	2'-0"	25'-8"	92	72	102.236	3.986	482.871	25'- 2"	6	24'-10"	2	22	3.140	223.347	3.073	149.199	Q		
8	4	6	9"	5'-7"	1'- 5"	3'-10"	1'-11 ¹ / ₄ "	1'- 4"	26'-4"	2'-2"	28'-6"	104	24	95.312	3.942	457.422	28'- 2"	6	27'-10"	2	10	2.703	199.955	2.721	167.223	E		
8	6	5	8"	5'-6"	1'- 5"	3'-10"	1'-11 ³ / ₈ "	1'- 4 ¹ / ₈ "	26'-4"	2'-1"	28'-6"	104	40	100.960	4.142	421.090	28'- 2"	6	27'-10"	2	14	2.913	213.760	2.906	167.223	I		
8	8	5	8"	5'-7"	1'- 4 ¹ / ₂ "	3'-10"	1'-10 ³ / ₄ "	1'- 3 ⁵ / ₈ "	26'-5"	2'-2"	28'-6"	104	56	106.608	4.288	483.673	28'- 2"	6	27'-10"	2	18	3.123	227.565	3.092	167.223	M		
8	10	5	8"	5'-10"	1'- 4 ¹ / ₂ "	3'-10"	1'-10 ³ / ₄ "	1'- 3 ⁵ / ₈ "	26'-11"	2'-2"	29'-0"	104	72	112.256	4.735	546.994	28'- 2"	6	27'-10"	2	22	3.190	241.371	3.132	167.223	Q		
9	4	6	9"	6'-2"	1'- 7"	4'-3"	2'- 2 ¹ / ₈ "	1'- 6"	29'-4"	2'-5"	31'-9"	116	24	105.332	4.693	504.698	31'- 2"	6	30'-10"	2	10	2.765	217.979	2.793	185.247	F		
9	6	6	9"	6'-2"	1'- 7"	4'-3"	2'- 2 ¹ / ₈ "	1'- 6"	29'-4"	2'-5"	31'-9"	116	40	110.980	4.888	538.646	31'- 2"	6	30'-10"	2	14	2.975	231.784	2.978	185.247	J		
9	8	6	9"	6'-3"	1'- 7"	4'-3"	2'- 2 ¹ / ₈ "	1'- 6"	29'-5"	2'-5"	31'-10"	116	56	116.628	5.117	610.412	31'- 2"	6	30'-10"	2	18	3.185	245.589	3.164	185.247	N		
9	10	6	9"	6'-6"	1'- 7"	4'-3"	2'- 2 ¹ / ₈ "	1'- 6"	29'-11"	2'-5"	32'-4"	116	72	122.276	5.571	681.462	31'- 2"	6	30'-10"	2	22	3.249	259.395	3.201	185.247	R		
9	12	6	9"	6'-8"	1'- 7"	4'-3"	2'- 2 ¹ / ₈ "	1'- 6"	30'-4"	2'-5"	32'-9"	116	88	127.924	6.050	761.471	31'- 2"	6	30'-10"	2	26	3.317	273.200	3.243	185.247	V		
10	4	6	9"	6'-9"	1'-10"	4'-8"	2'- 6 ³ / ₈ "	1'- 9"	32'-3"	2'-6"	35'-2"	128	24	115.352	5.720	556.431	34'- 2"	6	33'-10"	2	10	2.731	236.003	2.769	203.271	F		
10	6	6	9"	6'-9"	1'- 9 ¹ / ₂ "	4'-8"	2'- 5 ⁵ / ₈ "	1'- 8 ¹ / ₂ "	32'-3"	2'-7"	35'-1"	128	40	121.000	6.814	592.755	34'- 2"	6	33'-10"	2	14	2.941	249.808	2.954	203.271	J		
10	8	6	9"	6'-9"	1'- 9 ¹ / ₂ "	4'-8"	2'- 5 ⁵ / ₈ "	1'- 8 ¹ / ₂ "	32'-3"	2'-7"	35'-1"	128	56	126.648	6.006	662.601	34'- 2"	6	33'-10"	2	18	3.152	263.613	3.140	203.271	N		
10	10	6	9"	7'-0"	1'- 9 ¹ / ₂ "	4'-8"	2'- 5 ⁵ / ₈ "	1'- 8 ¹ / ₂ "	32'-9"	2'-7"	35'-7"	128	72	132.296	6.463	725.436	34'- 2"	6	33'-10"	2	22	3.210	277.419	3.172	203.271	R		
10	12	6	9"	7'-3"	1'- 9 ¹ / ₂ "	4'-8"	2'- 5 ⁵ / ₈ "	1'- 8 ¹ / ₂ "	33'-3"	2'-7"	36'-1"	128	88	137.944	6.992	804.999	34'- 2"	6	33'-10"	2	26	3.275	291.224	3.211	203.271	V		
12	6	7	9"	8'-0"	2'- 2 ¹ / ₂ "	5'-5"	3'- 5 ⁸ / ₁₆ "	2'- 1 ¹ / ₄ "	38'-3"	3'-0"	41'-9"	152	40	141.040	7.932	855.425	40'- 2"	6	39'-10"	2	14	2.828	285.856	2.861	239.319	K		
12	8	7	9"	8'-0"	2'- 2 ¹ / ₂ "	5'-5"	3'- 5 ⁸ / ₁₆ "	2'- 1 ¹ / ₄ "	38'-3"	3'-0"	41'-9"	152	56	146.688	8.124	919.861	40'- 2"	6	39'-10"	2	18	3.063	299.661	3.071	239.319	O		
12	10	7	8"	8'-1"	2'- 2 ¹ / ₂ "	5'-5"	3'- 5 ⁸ / ₁₆ "	2'- 1 ¹ / ₄ "	38'-7"	3'-0"	42'-0"	152	72	152.336	8.471	1103.668	40'- 2"	6	39'-10"	2	22	3.089	313.467	3.071	239.319	S		
12	12	7	8"	8'-5"	2'- 2 ¹ / ₂ "	5'-5"	3'- 5 ⁸ / ₁₆ "	2'- 1 ¹ / ₄ "	39'-1"	3'-0"	42'-7"	152	88	157.984	9.025	1194.524	40'- 2"	6	39'-10"	2	26	3.123	327.272	3.079	239.319	W		

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SPECIFICATION REFERENCE	<p style="text-align: center;">TRIPLE BOX CULVERTS 40 TO 50 FT. FILLS</p> <p style="text-align: center;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p style="text-align: center;">ROAD AND BRIDGE STANDARDS</p>	REVISION DATE	SHEET 2 OF 2
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BCQ-DT



TYPICAL SECTION

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ROAD AND BRIDGE STANDARDS

SHEET 1 OF 3

REVISION DATE

1005.01

07/11

QUADRUPLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

GENERAL NOTE

Capacity: AASHTO HI-93 Loading.

Specifications:

Construction - Virginia Department of Transportation Road and Bridge Specifications.

Design - AASHTO LRFD Bridge Design Specifications, 4th Edition 2007; 2008 and 2009 Interim Specifications; and VDOT Modifications.

All concrete shall be Class A4.

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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 35' in length shall be poured in sections by providing vertical construction joints, not exceeding 25' between joints nor more than 30' from ends of barrels.

** All bends shall be made with a pin diameter as listed in TABLE A except for Bars BH3 and BH4 which shall have a pin diameter of 24 bar diameters.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight and #4 size unless otherwise shown. BL2 shall be #3 size.

The number of BL1 and 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 and 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./LF shown for reinforcing steel does not include quantity for laps of BL1 and BL2 bars. The additional weight per longitudinal lap is shown in the table.

The minimum cover of main reinforcing bars shall be 2 1/2" from the face of the concrete for culverts under 0 to 2 foot fills and shall be 2" from the face of concrete for all other culverts.

All reinforcing steel for culverts under 0 to 2 foot fills shall be Low Carbon/Chromium Reinforcing Steel conforming to ASTM A1035.

At the Contractor's option, BV1 and BV2 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.

Bar HW2 shall be 4" less than culvert height in length.

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.

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

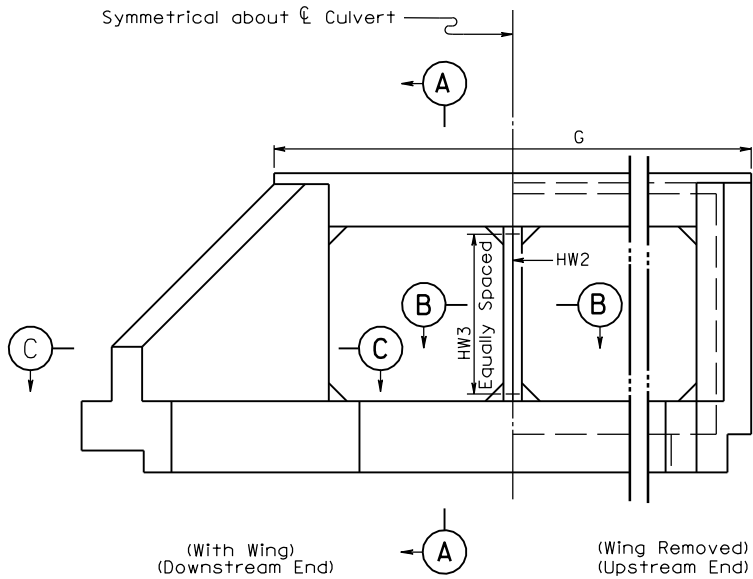
For modification of details for skewed culverts, see the skewed box details included in the road plans.

This standard shall be used with the BCQ standard series.

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SPECIFICATION REFERENCE	<p>QUADRUPLE BOX CULVERTS</p> <p>STANDARD DETAILS</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
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BCQ-DT



END ELEVATION

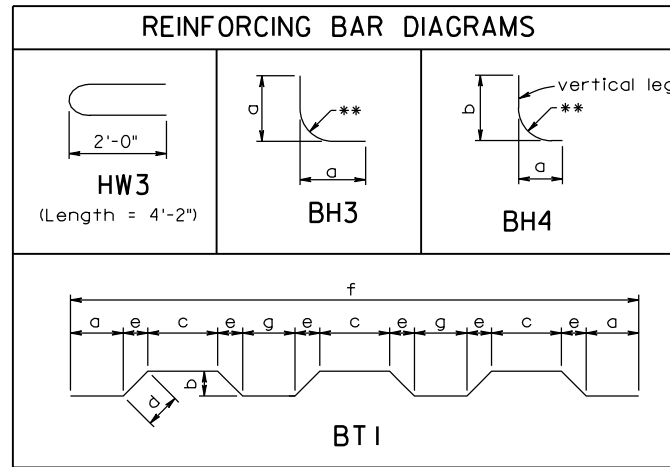
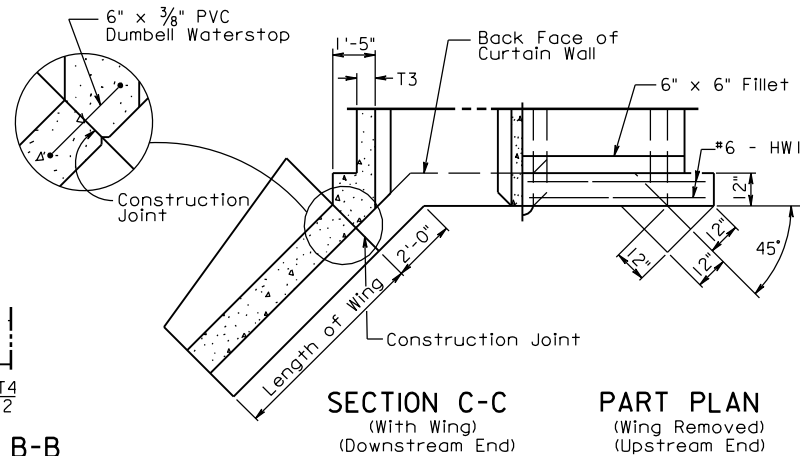
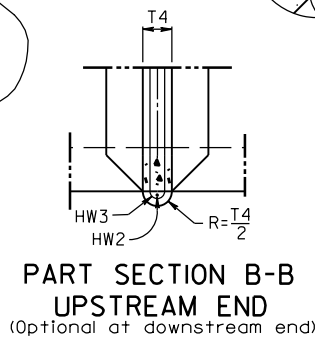
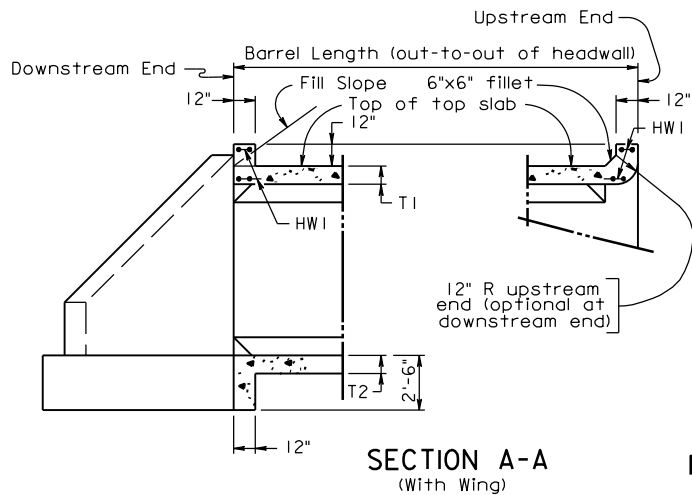


TABLE A	
Bar Size	Pin Dia.
#3	2 1/4"
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"
#9	9"



ROAD AND BRIDGE STANDARDS

SHEET 3 OF 3

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1005.03

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QUADRUPLE BOX CULVERTS
STANDARD DETAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

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SPECIFICATION REFERENCE

QUADRUPLE BOX CULVERTS
STANDARD DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

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1005.04

2016 ROAD & BRIDGE STANDARDS

BCQ-02

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCQ-DT.

DIMENSIONS						REINFORCING STEEL																													
SPAN	HGHT	T1	T2	T3	T4	BH1			BH2			BH3			BH4			BV1			BV2														
(FT.)	(FT.)	TOP SLAB	BOTTOM SLAB	EXTERIOR WALL (IN.)	INTERIOR WALL (IN.)	A	B	C	D	E	F	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH			
3	3	8"	8"	8"	8"	13	13'- 0"	26	13'- 0"	1	1'- 0"	4	12"	14'- 10"	4	12"	15'- 0"	--	---	-----	-----	4	12"	2'- 1 1/4"	2'- 8"	4'- 6"	4	12"	4'- 0"	4	12"	4'- 0"	4	12"	4'- 0"
3	4	8"	8"	8"	8"	13	13'- 0"	26	13'- 0"	2	2'- 0"	4	12"	14'- 10"	4	12"	15'- 0"	4	12"	2'- 4"	4'- 6"	4	12"	2'- 1 1/4"	3'- 2"	5'- 0"	4	12"	5'- 0"	4	10"	5'- 0"			
4	3	9/4"	9/4"	8"	8"	17	17'- 0"	34	17'- 0"	1	1'- 0"	4	12"	18'- 5"	4	12"	19'- 0"	4	12"	2'- 3 3/8"	4'- 4"	4	12"	2'- 3 3/8"	2'- 9/4"	4'- 10"	4	12"	4'- 2"	4	12"	4'- 2"	4	12"	4'- 2"
4	4	9/4"	9/4"	8"	8"	17	17'- 0"	34	17'- 0"	2	2'- 0"	4	12"	18'- 5"	4	12"	19'- 0"	4	12"	2'- 3 3/8"	4'- 4"	4	12"	2'- 3 3/8"	3'- 3/4"	5'- 4"	4	12"	5'- 2"	4	9/2"	5'- 2"			
4	5	9/2"	9/2"	8"	8"	17	17'- 0"	34	17'- 0"	3	3'- 0"	4	12"	18'- 5"	4	12"	19'- 0"	4	12"	2'- 8"	5'- 1"	4	12"	2'- 3 3/8"	3'- 9/2"	5'- 10"	4	12"	6'- 3"	4	9"	6'- 3"			
4	6	9/2"	9/2"	8"	8"	17	17'- 0"	34	17'- 0"	4	4'- 0"	4	12"	18'- 5"	4	12"	19'- 0"	4	12"	2'- 11"	5'- 7"	4	12"	2'- 3 3/8"	4'- 3 1/2"	6'- 4"	4	12"	7'- 3"	4	9"	7'- 3"			
5	3	9"	9"	8"	8"	21	21'- 0"	42	21'- 0"	1	1'- 0"	4	11"	22'- 0"	4	11"	23'- 0"	4	11"	2'- 6"	4'- 9"	4	11"	2'- 6"	2'- 9"	5'- 0"	4	12"	4'- 2"	4	10"	4'- 2"			
5	4	9"	9"	8"	8"	21	21'- 0"	42	21'- 0"	2	2'- 0"	4	11"	22'- 0"	4	11"	23'- 0"	4	11"	2'- 6"	4'- 9"	4	11"	2'- 6"	3'- 3"	5'- 6"	4	12"	5'- 2"	4	7 1/2"	5'- 2"			
5	5	9"	9"	8"	8"	21	21'- 0"	42	21'- 0"	3	3'- 0"	4	11"	22'- 0"	4	11"	23'- 0"	4	11"	2'- 6"	4'- 9"	4	11"	2'- 6"	3'- 9"	6'- 0"	4	12"	6'- 2"	4	7"	6'- 2"			
5	6	9"	9"	8"	8"	21	21'- 0"	42	21'- 0"	4	4'- 0"	4	11"	22'- 0"	5	11"	23'- 0"	4	11"	2'- 11"	5'- 7"	4	11"	2'- 6"	4'- 3"	6'- 6"	4	12"	7'- 2"	4	7"	7'- 2"			
5	7	9"	9"	8"	8"	21	21'- 0"	42	21'- 0"	5	5'- 0"	4	10"	22'- 0"	4	10"	23'- 0"	4	10"	3'- 1"	5'- 10"	4	10"	2'- 6"	4'- 9"	7'- 0"	4	12"	8'- 2"	4	6 1/2"	8'- 2"			
6	4	8 3/4"	8 3/4"	8"	8"	25	25'- 0"	50	25'- 0"	2	2'- 0"	4	9"	25'- 11"	4	9"	27'- 0"	4	9"	2'- 8 3/8"	5'- 2"	4	9"	2'- 8 3/8"	3'- 2 3/4"	5'- 8"	4	12"	5'- 2"	5	9/2"	5'- 2"			
6	5	8 3/4"	8 3/4"	8"	8"	25	25'- 0"	50	25'- 0"	3	3'- 0"	4	9"	25'- 11"	4	9"	27'- 0"	4	9"	2'- 8 3/8"	5'- 2"	4	9"	2'- 8 3/8"	3'- 8 3/4"	6'- 2"	4	12"	6'- 2"	5	9"	6'- 2"			
6	6	8 3/4"	8 3/4"	8"	8"	25	25'- 0"	50	25'- 0"	4	4'- 0"	4	9"	25'- 11"	4	9"	27'- 0"	4	9"	2'- 8 3/8"	5'- 2"	4	9"	2'- 8 3/8"	4'- 2 3/4"	6'- 8"	4	12"	7'- 2"	4	5 1/2"	7'- 2"			
6	7	8 3/4"	8 3/4"	8"	8"	25	25'- 0"	50	25'- 0"	5	5'- 0"	4	9"	25'- 11"	4	9"	27'- 0"	4	9"	3'- 1"	5'- 10"	4	9"	2'- 8 3/8"	4'- 8 3/4"	7'- 2"	4	12"	8'- 2"	4	5 1/2"	8'- 2"			
6	8	8 3/4"	8 3/4"	8"	8"	25	25'- 0"	50	25'- 0"	6	6'- 0"	4	8"	25'- 11"	4	8"	27'- 0"	4	8"	3'- 4"	6'- 6"	4	8"	2'- 8 3/8"	5'- 2 3/4"	7'- 8"	4	12"	9'- 2"	4	5 1/2"	9'- 2"			
7	4	8 3/4"	8 3/4"	8"	8"	29	29'- 0"	58	29'- 0"	2	2'- 0"	4	8"	29'- 11"	4	8"	31'- 0"	4	8"	2'- 10 3/4"	5'- 6"	4	8"	2'- 10 3/4"	3'- 2 3/4"	5'- 10"	4	12"	5'- 2"	4	7"	5'- 2"			
7	6	8 3/4"	8 3/4"	8"	8"	29	29'- 0"	58	29'- 0"	4	4'- 0"	4	8"	29'- 11"	4	8"	31'- 0"	4	8"	2'- 10 3/4"	5'- 6"	4	8"	2'- 10 3/4"	4'- 2 3/4"	6'- 10"	4	12"	7'- 2"	4	7"	7'- 2"			
7	8	8 3/4"	8 3/4"	8"	8"	29	29'- 0"	58	29'- 0"	6	6'- 0"	5	11"	29'- 11"	5	11"	31'- 0"	4	11"	3'- 4"	6'- 6"	5	11"	2'- 10 3/4"	5'- 2 3/4"	7'- 10"	4	12"	9'- 2"	4	7"	9'- 2"			
7	10	9"	9"	8"	8"	29	29'- 0"	58	29'- 0"	8	8'- 0"	5	11"	29'- 11"	5	11"	31'- 0"	4	11"	3'- 8"	6'- 11"	5	11"	2'- 10 3/4"	6'- 3"	8'- 10"	4	12"	11'- 2"	4	7 1/2"	11'- 2"			
8	4	9"	9"	8"	8"	33	33'- 0"	66	33'- 0"	2	2'- 0"	5	12"	33'- 8"	5	12"	35'- 0"	--	---	-----	-----	6	12"	3'- 7"	3'- 7"	6'- 9"	4	12"	5'- 2"	5	9 1/2"	5'- 2"			
8	6	9"	9"	8"	8"	33	33'- 0"	66	33'- 0"	4	4'- 0"	5	11"	33'- 8"	5	11"	35'- 0"	4	11"	3'- 1 1/4"	5'- 11"	5	11"	3'- 1 1/4"	4'- 3"	7'- 0"	4	12"	7'- 2"	4	6"	7'- 2"			
8	8	9/4"	9/4"	8"	8"	33	33'- 0"	66	33'- 0"	6	6'- 0"	5	11"	33'- 8"	5	11"	35'- 0"	4	11"	3'- 1 1/4"	5'- 11"	5	11"	3'- 1 1/4"	5'- 3 1/4"	8'- 1"	4	12"	9'- 2"	5	9/2"	9'- 2"			
8	10	9/4"	9/4"	8"	8"	33	33'- 0"	66	33'- 0"	8	8'- 0"	5	10"	33'- 8"	5	10"	35'- 0"	4	10"	3'- 8"	6'- 11"	5	10"	3'- 1 1/4"	6'- 3 1/4"	9'- 1"	4	12"	11'- 2"	4	6 1/2"	11'- 2"			
9	4	9 1/2"	9 1/2"	8"	8"	37	37'- 0"	74	37'- 0"	2	2'- 0"	5	11"	37'- 8"	5	11"	39'- 0"	--	---	-----	-----	6	11"	3'- 10"	3'- 7"	7'- 0"	4	12"	5'- 3"	4	5 1/2"	5'- 3"			
9	6	9 1/2"	9 1/2"	8"	8"	37	37'- 0"	74	37'- 0"	4	4'- 0"	5	10"	37'- 8"	5	10"	39'- 0"	4	10"	3'- 3 3/8"	6'- 4"	5	10"	3'- 3 3/8"	4'- 3 1/2"	7'- 3"	4	12"	7'- 3"	4	5 1/2"	7'- 3"			
9	8	9 1/2"	9 1/2"	8"	8"	37	37'- 0"	74	37'- 0"	6	6'- 0"	5	10"	37'- 8"	5	10"	39'- 0"	4	10"	3'- 3 3/8"	6'- 4"	5	10"	3'- 3 3/8"	5'- 3 1/2"	8'- 3"	4	12"	9'- 3"	4	5 1/2"	9'- 3"			
9	10	9"	9"	8"	8"	37	37'- 0"	74	37'- 0"	8	8'- 0"	5	9"	37'- 8"	5	9"	39'- 0"	4	9"	3'- 8"	6'- 11"	5	9"	3'- 3 3/8"	6'- 3"	9'- 3"	4	12"	11'- 2"	5	8"	11'- 2"			
9	12	9"	9"	8"	8"	37	37'- 0"	74	37'- 0"	10	10'- 0"	6	12"	37'- 8"	6	12"	39'- 0"	5	12"	4'- 1"	7'- 11"	6	12"	3'- 10"	7'- 7"	11'- 0"	5	10 1/2"	13'- 2"	4	5 1/2"	13'- 2"			
10	4	9 3/4"	9 3/4"	8"	8"	41	41'- 0"	82	41'- 0"	2	2'- 0"	5	10"	41'- 8"	5	10"	43'- 0"	--	---	-----	-----	6	10"	4'- 0"	3'- 8"	7'- 3"	4	12"	5'- 3"	5	8"	5'- 3"			
10	6	9 3/4"	9 3/4"	8"	8"	41	41'- 0"	82	41'- 0"	4	4'- 0"	5	9"	41'- 8"	5	9"	43'- 0"	--	---	-----	-----	5	9"	3'- 6"	4'- 3 3/4"	7'- 6"	4	12"	7'- 3"	4	5"	7'- 3"			
10	8	9 3/4"	9 3/4"	8"	8"	41	41'- 0"	82	41'- 0"	6	6'- 0"	6	12"	41'- 8"	6	12"	43'- 0"	4	12"	3'- 6"	6'- 9"	6	12"	4'- 0"	5'- 8"	9'- 3"	4	12"	9'- 3"	4	5"	9'- 3"			
10	10	9 3/4"	9 3/4"	8"	8"	41	41'- 0"	82	41'- 0"	8	8'- 0"	5	8"	41'- 8"	5	8"	43'- 0"	4	8"	3'- 8"	6'- 11"	5	8"	3'- 6"	6'- 3 3/4"	9'- 6"	4	12"	11'- 3"	5	8"	11'- 3"			
10	12	9 3/4"	9 3/4"	8"	8"	41	41'- 0"	82	41'- 0"	10	10'- 0"	5	8"	41'- 8"	5	8"	43'- 0"	4	8"	4'- 1"	7'- 11"	5	8"	3'- 6"	7'- 3 3/4"	10'- 6"	5	10 1/2"	13'- 3"	5	8"	13'- 3"			
12	6	10 1/4"	10 1/4"	8"	8"	49	49'- 0"	98	49'- 0"	4	4'- 0"	6	8"	49'- 8"	5	8"	51'- 0"	4	8"	3'- 10 3/4"	7'- 6"	5	8"	3'- 10 3/4"	4'- 4 1/4"	7'- 11"	4	12"	7'- 5"	5	6 1/2"	7'- 5"			
12	8	10 1/4"	10 1/4"	8"	8"	49	49'- 0"	98	49'- 0"	6	6'- 0"	5	8"	49'- 8"	5	8"	51'- 0"	4	8"	3'- 10 3/4"	7'- 6"	5	8"	3'- 10 3/4"	5'- 4 1/4"	8'- 11"	4	10 1/2"	9'- 5"	5	6 1/2"	9'- 5"			
12	10	10 1/4"	10 1/4"	8"	8"	49	49'- 0"	98	49'- 0"	8	8'- 0"	6	11"	49'- 8"	6	11"	51'- 0"	--	---	-----	-----	7	11"	4'- 10"	6'- 11"	11'- 3"	4	12"	11'- 5"	6	9 1/2"	11'- 5"			
12	12	10 1/4"	10 1/4"	8"	8"	49	49'- 0"	98	49'- 0"	10	10'- 0"	6	10"	49'- 8"	6	10"	51'- 0"	4	10"	4'- 1"	7'- 11"	6	10"	4'- 5"	7'- 8"	11'- 8"	5	10"	13'- 5"	6	9 1/2"	13'- 5"			

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE
1005.05 07/11

QUADRUPLE BOX CULVERTS
0 TO 2 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCQ-DT.

BCQ-02

SPAN		HGHT		REINFORCING STEEL											QUAN./LF		HEADWALLS							WINGWALL		
(FT.)	(FT.)	SIZE	SPACING C-C	a	b	c	d	e	f	g	LENGTH	NO. BL1 #4 BARS	NO. BL2 #3 BARS	REINFORCING STEEL (LBS/LONG. FT)	CONCRETE CLASS A4 (CY/LF)	REINFORCING STEEL (LBS/LF)	G HEADWALL LENGTH	HW I SIZE	HW I LENGTH	NO. HW2 BARS	NO. HW3 BARS	INLET CONCRETE CL. A4 (CY)	INLET REINFORCING STEEL (LBS)		OUTLET CONCRETE CL. A4 (CY)	OUTLET REINFORCING STEEL (LBS)
3	3	4	12"	2'- 8 3/8"	0'- 4 1/2"	1'- 6 5/8"	0'- 5 7/8"	0'- 3 3/4"	14'- 11 7/8"	1'- 5 7/8"	15'- 9"	73	20	68.015	1.283	150.583	16'- 10"	6	16'- 6"	3	12	2.222	137.876	2.191	99.132	A
3	4	4	12"	2'- 8 3/8"	0'- 4 1/2"	1'- 6 5/8"	0'- 5 7/8"	0'- 3 3/4"	14'- 11 7/8"	1'- 5 7/8"	15'- 9"	73	30	71.545	1.404	182.264	16'- 10"	6	16'- 6"	3	15	2.333	148.230	2.284	99.132	C
4	3	4	12"	3'- 5 7/8"	0'- 5 3/4"	1'- 10 1/4"	0'- 7 5/8"	0'- 5"	19'- 0"	1'- 11 3/4"	20'- 0"	93	20	84.715	1.626	193.113	20'- 10"	6	20'- 6"	3	12	2.595	161.908	2.577	123.164	B
4	4	4	12"	3'- 5 7/8"	0'- 5 3/4"	1'- 10 1/4"	0'- 7 5/8"	0'- 5"	19'- 0"	1'- 11 3/4"	20'- 0"	93	30	88.245	1.749	209.002	20'- 10"	6	20'- 6"	3	15	2.706	172.262	2.670	123.164	D
4	5	4	12"	3'- 5 3/4"	0'- 6"	1'- 10"	0'- 8"	0'- 5 1/4"	19'- 0"	1'- 11 1/2"	20'- 1"	93	40	91.775	1.901	225.081	20'- 10"	6	20'- 6"	3	18	2.808	182.616	2.753	123.164	F
4	6	4	12"	3'- 5 3/4"	0'- 6"	1'- 10"	0'- 8"	0'- 5 1/4"	19'- 0"	1'- 11 1/2"	20'- 1"	93	50	95.305	2.023	245.516	20'- 10"	6	20'- 6"	3	21	2.919	192.970	2.845	123.164	H
5	3	4	11"	4'- 3 5/8"	0'- 5 1/2"	2'- 3 1/4"	0'- 7 1/4"	0'- 4 3/4"	23'- 0"	2'- 7 1/4"	24'- 0"	113	20	101.415	1.815	237.595	24'- 10"	6	24'- 6"	3	12	2.979	185.940	2.974	147.196	A
5	4	4	11"	4'- 3 5/8"	0'- 5 1/2"	2'- 3 1/4"	0'- 7 1/4"	0'- 4 3/4"	23'- 0"	2'- 7 1/4"	24'- 0"	113	30	104.945	1.937	257.242	24'- 10"	6	24'- 6"	3	15	3.090	196.294	3.067	147.196	C
5	5	4	11"	4'- 3 5/8"	0'- 5 1/2"	2'- 3 1/4"	0'- 7 1/4"	0'- 4 3/4"	23'- 0"	2'- 7 1/4"	24'- 0"	113	40	108.475	2.060	273.033	24'- 10"	6	24'- 6"	3	18	3.201	206.648	3.160	147.196	E
5	6	4	11"	4'- 3 5/8"	0'- 5 1/2"	2'- 3 1/4"	0'- 7 1/4"	0'- 4 3/4"	23'- 0"	2'- 7 1/4"	24'- 0"	113	50	112.005	2.180	316.776	24'- 10"	6	24'- 6"	3	21	3.313	217.002	3.253	147.196	G
5	7	4	10"	4'- 3 5/8"	0'- 5 1/2"	2'- 3 1/4"	0'- 7 1/4"	0'- 4 3/4"	23'- 0"	2'- 7 1/4"	24'- 0"	113	60	115.535	2.302	329.987	24'- 10"	6	24'- 6"	3	24	3.424	227.356	3.345	147.196	I
6	4	4	9"	5'- 1 3/8"	0'- 5 1/4"	2'- 8 1/4"	0'- 6 7/8"	0'- 4 1/2"	27'- 0"	3'- 2 3/4"	27'- 11"	133	30	121.645	2.112	329.861	28'- 10"	6	28'- 6"	3	15	3.499	220.326	3.489	171.228	C
6	5	4	9"	5'- 1 3/8"	0'- 5 1/4"	2'- 8 1/4"	0'- 6 7/8"	0'- 4 1/2"	27'- 0"	3'- 2 3/4"	27'- 11"	133	40	125.175	2.233	359.273	28'- 10"	6	28'- 6"	3	18	3.610	230.680	3.582	171.228	E
6	6	4	9"	5'- 1 3/8"	0'- 5 1/4"	2'- 8 1/4"	0'- 6 7/8"	0'- 4 1/2"	27'- 0"	3'- 2 3/4"	27'- 11"	133	50	128.705	2.355	379.181	28'- 10"	6	28'- 6"	3	21	3.721	241.034	3.674	171.228	G
6	7	4	9"	5'- 1 3/8"	0'- 5 1/4"	2'- 8 1/4"	0'- 6 7/8"	0'- 4 1/2"	27'- 0"	3'- 2 3/4"	27'- 11"	133	60	132.235	2.477	397.761	28'- 10"	6	28'- 6"	3	24	3.833	251.388	3.767	171.228	I
6	8	4	8"	5'- 1 3/8"	0'- 5 1/4"	2'- 8 1/4"	0'- 6 7/8"	0'- 4 1/2"	27'- 0"	3'- 2 3/4"	27'- 11"	133	70	135.765	2.598	438.628	28'- 10"	6	28'- 6"	3	27	3.944	261.742	3.860	171.228	K
7	4	4	8"	5'- 11"	0'- 5 1/4"	3'- 1 1/8"	0'- 6 7/8"	0'- 4 1/2"	31'- 1/8"	3'- 9 7/8"	31'- 11"	153	30	138.345	2.323	397.868	32'- 10"	6	32'- 6"	3	15	3.894	244.358	3.898	195.260	C
7	6	4	8"	5'- 11"	0'- 5 1/4"	3'- 1 1/8"	0'- 6 7/8"	0'- 4 1/2"	31'- 1/8"	3'- 9 7/8"	31'- 11"	153	50	145.405	2.568	426.453	32'- 10"	6	32'- 6"	3	21	4.117	265.066	4.083	195.260	G
7	8	5	11"	5'- 11"	0'- 5 3/8"	3'- 1 1/8"	0'- 7"	0'- 4 1/2"	31'- 1/8"	3'- 9 7/8"	31'- 11"	153	70	152.465	2.810	481.580	32'- 10"	6	32'- 6"	3	27	4.339	285.774	4.268	195.260	K
7	10	5	11"	5'- 10 7/8"	0'- 5 5/8"	3'- 7/8"	0'- 7 3/8"	0'- 4 3/4"	31'- 1/8"	3'- 9 5/8"	32'- 0"	153	90	159.525	3.104	507.590	32'- 10"	6	32'- 6"	3	33	4.543	306.482	4.435	195.260	O
8	4	5	12"	6'- 8 3/8"	0'- 5 5/8"	3'- 5 3/8"	0'- 7 3/8"	0'- 4 3/4"	34'- 11 7/8"	4'- 4 7/8"	35'- 11"	173	30	155.045	2.590	442.425	36'- 10"	6	36'- 6"	3	15	4.267	268.390	4.284	219.292	C
8	6	5	11"	6'- 8 3/8"	0'- 5 5/8"	3'- 5 3/8"	0'- 7 3/8"	0'- 4 3/4"	34'- 11 7/8"	4'- 4 7/8"	35'- 11"	173	50	162.105	2.833	501.470	36'- 10"	6	36'- 6"	3	21	4.490	289.098	4.469	219.292	G
8	8	5	11"	6'- 8 1/4"	0'- 5 5/8"	3'- 5 3/8"	0'- 7 3/4"	0'- 5"	34'- 11 7/8"	4'- 4 5/8"	36'- 0"	173	70	169.165	3.132	531.756	36'- 10"	6	36'- 6"	3	27	4.708	309.806	4.651	219.292	L
8	10	5	10"	6'- 8 1/4"	0'- 5 5/8"	3'- 5 3/8"	0'- 7 3/4"	0'- 5"	34'- 11 7/8"	4'- 4 5/8"	36'- 0"	173	90	176.225	3.374	587.781	36'- 10"	6	36'- 6"	3	33	4.931	330.514	4.836	219.292	P
9	4	5	11"	7'- 5 3/4"	0'- 6 1/8"	3'- 10"	0'- 8 1/8"	0'- 5 1/4"	39'- 0"	4'- 11 1/2"	40'- 1"	193	30	171.745	2.928	517.402	40'- 10"	6	40'- 6"	3	15	4.627	292.422	4.657	243.324	D
9	6	5	10"	7'- 5 3/4"	0'- 6 1/8"	3'- 10"	0'- 8 1/8"	0'- 5 1/4"	39'- 0"	4'- 11 1/2"	40'- 1"	193	50	178.805	3.170	581.291	40'- 10"	6	40'- 6"	3	21	4.850	313.130	4.843	243.324	H
9	8	5	10"	7'- 5 3/4"	0'- 6 1/8"	3'- 10"	0'- 8 1/8"	0'- 5 1/4"	39'- 0"	4'- 11 1/2"	40'- 1"	193	70	185.865	3.414	614.912	40'- 10"	6	40'- 6"	3	27	5.072	333.838	5.028	243.324	L
9	10	5	9"	7'- 6"	0'- 5 5/8"	3'- 10 1/2"	0'- 7 3/8"	0'- 4 3/4"	39'- 0"	5'- 0"	39'- 11"	193	90	192.925	3.534	695.825	40'- 10"	6	40'- 6"	3	33	5.327	354.546	5.246	243.324	O
9	12	6	12"	7'- 6"	0'- 5 3/4"	3'- 10 1/2"	0'- 7 1/2"	0'- 4 3/4"	39'- 0"	5'- 0"	39'- 11"	193	110	199.985	3.775	776.824	40'- 10"	6	40'- 6"	3	39	5.550	375.254	5.431	243.324	S
10	4	5	10"	8'- 3 1/4"	0'- 6 3/8"	4'- 2 1/2"	0'- 8 3/8"	0'- 5 1/2"	43'- 0"	5'- 6 1/2"	44'- 1"	213	30	188.445	3.224	595.266	44'- 10"	6	44'- 6"	3	15	4.985	316.454	5.028	267.356	D
10	6	5	9"	8'- 3 1/4"	0'- 6 3/8"	4'- 2 1/2"	0'- 8 3/8"	0'- 5 1/2"	43'- 0"	5'- 6 1/2"	44'- 1"	213	50	195.505	3.466	651.157	44'- 10"	6	44'- 6"	3	21	5.207	337.162	5.213	267.356	H
10	8	6	12"	8'- 3 1/4"	0'- 6 1/2"	4'- 2 1/2"	0'- 8 1/2"	0'- 5 1/2"	43'- 0"	5'- 6 1/2"	44'- 1"	213	70	202.565	3.706	739.583	44'- 10"	6	44'- 6"	3	27	5.430	357.870	5.399	267.356	L
10	10	5	8"	8'- 3 1/4"	0'- 6 3/8"	4'- 2 1/2"	0'- 8 3/8"	0'- 5 1/2"	43'- 0"	5'- 6 1/2"	44'- 1"	213	90	209.625	3.948	809.034	44'- 10"	6	44'- 6"	3	33	5.653	378.578	5.584	267.356	P
10	12	5	8"	8'- 3 1/4"	0'- 6 3/8"	4'- 2 1/2"	0'- 8 3/8"	0'- 5 1/2"	43'- 0"	5'- 6 1/2"	44'- 1"	213	110	216.685	4.191	862.850	44'- 10"	6	44'- 6"	3	39	5.875	399.286	5.770	267.356	T
12	6	5	8"	9'- 10 1/4"	0'- 6 7/8"	4'- 11 5/8"	0'- 9 1/8"	0'- 6"	51'- 1/8"	6'- 8 3/8"	52'- 3"	253	50	228.905	4.085	928.213	52'- 10"	6	52'- 6"	3	21	5.904	385.226	5.937	315.420	H
12	8	5	8"	9'- 10 1/4"	0'- 6 7/8"	4'- 11 5/8"	0'- 9 1/8"	0'- 6"	51'- 1/8"	6'- 8 3/8"	52'- 3"	253	70	235.965	4.334	906.204	52'- 10"	6	52'- 6"	3	27	6.127	405.934	6.122	315.420	L
12	10	6	11"	9'- 10 1/4"	0'- 7"	4'- 11 5/8"	0'- 9 1/4"	0'- 6"	51'- 1/8"	6'- 8 3/8"	52'- 3"	253	90	243.025	4.577	949.949	52'- 10"	6	52'- 6"	3	33	6.349	426.642	6.308	315.420	P
12	12	6	10"	9'- 10 1/4"	0'- 7"	4'- 11 5/8"	0'- 9 1/4"	0'- 6"	51'- 1/8"	6'- 8 3/8"	52'- 3"	253	110	250.085	4.815	1,069.659	52'- 10"	6	52'- 6"	3	39	6.572	447.350	6.493	315.420	T

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE	<h2>QUADRUPLE BOX CULVERTS</h2> <h3>0 TO 2 FT. FILLS</h3> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

BCQ-05

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCQ-DT.

DIMENSIONS							REINFORCING STEEL																												
SPAN	HGHT	T1	T2	T3	T4		BH1			BH2			BH3				BH4				BV1		BV2												
(FT.)	(FT.)	TOP SLAB	BOTTOM SLAB	EXTERIOR WALL (IN.)	INTERIOR WALL (IN.)	A	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	a	LENGTH	SIZE	SPACING C-C	a	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH								
3	3	8"	8"	8"	8"	13	13'-0"	13	13'-0"	1	1'-0"	4	12"	14'-10"	4	12"	15'-0"	--	---	-----	-----	4	12"	2'-1 1/4"	2'-8"	4'-6"	4	12"	4'-0"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	13	13'-0"	13	13'-0"	2	2'-0"	4	12"	14'-10"	4	12"	15'-0"	--	---	-----	-----	4	12"	2'-1 1/4"	3'-2"	5'-0"	4	12"	5'-0"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	17	17'-0"	17	17'-0"	1	1'-0"	4	12"	18'-5"	4	12"	19'-0"	--	---	-----	-----	4	12"	2'-3 5/8"	2'-8"	4'-8"	4	12"	4'-0"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	17	17'-0"	17	17'-0"	2	2'-0"	4	12"	18'-5"	4	12"	19'-0"	4	12"	2'-3 5/8"	4'-4"	4	12"	2'-3 5/8"	3'-2"	5'-2"	4	12"	5'-0"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	17	17'-0"	17	17'-0"	3	3'-0"	4	12"	18'-5"	4	12"	19'-0"	4	12"	2'-6"	4'-9"	4	12"	2'-3 5/8"	3'-8"	5'-8"	4	12"	6'-0"	4	11 1/2"	6'-0"	4	11 1/2"	6'-0"
4	6	8"	8"	8"	8"	17	17'-0"	17	17'-0"	4	4'-0"	4	12"	18'-5"	4	12"	19'-0"	4	12"	2'-9"	5'-5"	4	12"	2'-3 5/8"	4'-2"	6'-2"	4	12"	7'-0"	4	11"	7'-0"	4	11"	7'-0"
5	3	8"	8"	8"	8"	21	21'-0"	21	21'-0"	1	1'-0"	4	12"	22'-0"	4	12"	23'-0"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	2'-8"	4'-11"	4	12"	4'-0"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	21	21'-0"	21	21'-0"	2	2'-0"	4	12"	22'-0"	4	12"	23'-0"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	3'-2"	5'-5"	4	12"	5'-0"	4	10"	5'-0"	4	10"	5'-0"
5	5	8"	8"	8"	8"	21	21'-0"	21	21'-0"	3	3'-0"	4	12"	22'-0"	4	12"	23'-0"	4	12"	2'-6"	4'-9"	4	12"	2'-6"	3'-8"	5'-11"	4	12"	6'-0"	4	10"	6'-0"	4	10"	6'-0"
5	6	8"	8"	8"	8"	21	21'-0"	21	21'-0"	4	4'-0"	4	12"	22'-0"	4	12"	23'-0"	4	12"	2'-9"	5'-5"	4	12"	2'-6"	4'-2"	6'-5"	4	12"	7'-0"	4	10"	7'-0"	4	10"	7'-0"
5	7	8"	8"	8"	8"	21	21'-0"	21	21'-0"	5	5'-0"	4	12"	22'-0"	4	12"	23'-0"	4	12"	2'-11"	5'-8"	4	12"	2'-6"	4'-8"	6'-11"	4	12"	8'-0"	4	9 1/2"	8'-0"	4	9 1/2"	8'-0"
6	4	8"	8"	8"	8"	25	25'-0"	25	25'-0"	2	2'-0"	4	12"	25'-8"	4	12"	27'-0"	--	---	-----	-----	5	12"	2'-8 3/8"	3'-2"	5'-6"	4	12"	5'-0"	4	9"	5'-0"	4	9"	5'-0"
6	5	8"	8"	8"	8"	25	25'-0"	25	25'-0"	3	3'-0"	4	12"	25'-8"	4	12"	27'-0"	--	---	-----	-----	5	12"	2'-8 3/8"	3'-8"	6'-0"	4	12"	6'-0"	4	8"	6'-0"	4	8"	6'-0"
6	6	8"	8"	8"	8"	25	25'-0"	25	25'-0"	4	4'-0"	4	12"	25'-8"	4	12"	27'-0"	--	---	-----	-----	5	12"	2'-8 3/8"	4'-2"	6'-6"	4	12"	7'-0"	4	7 1/2"	7'-0"	4	7 1/2"	7'-0"
6	7	8"	8"	8"	8"	25	25'-0"	25	25'-0"	5	5'-0"	4	11"	25'-8"	4	11"	27'-0"	--	---	-----	-----	5	11"	2'-8 3/8"	4'-8"	7'-0"	4	12"	8'-0"	4	7 1/2"	8'-0"	4	7 1/2"	8'-0"
6	8	8"	8"	8"	8"	25	25'-0"	25	25'-0"	6	6'-0"	4	11"	25'-8"	4	11"	27'-0"	4	11"	3'-2"	6'-2"	5	11"	2'-8 3/8"	5'-2"	7'-6"	4	12"	9'-0"	4	7 1/2"	9'-0"	4	7 1/2"	9'-0"
7	4	8"	8"	8"	8"	29	29'-0"	29	29'-0"	2	2'-0"	4	8"	29'-11"	4	8"	31'-0"	4	8"	2'-10 3/4"	5'-6"	4	8"	2'-10 3/4"	3'-2"	5'-10"	4	12"	5'-0"	4	7"	5'-0"	4	7"	5'-0"
7	6	8"	8"	8"	8"	29	29'-0"	29	29'-0"	4	4'-0"	4	8"	29'-11"	4	8"	31'-0"	4	8"	2'-10 3/4"	5'-6"	4	8"	2'-10 3/4"	4'-2"	6'-10"	4	12"	7'-0"	5	9 1/2"	7'-0"	4	9 1/2"	7'-0"
7	8	8"	8"	8"	8"	29	29'-0"	29	29'-0"	6	6'-0"	4	8"	29'-11"	4	8"	31'-0"	4	8"	3'-2"	6'-2"	4	8"	2'-10 3/4"	5'-2"	7'-10"	4	12"	9'-0"	4	6"	9'-0"	4	6"	9'-0"
7	10	8"	8"	8"	8"	29	29'-0"	29	29'-0"	8	8'-0"	4	8"	29'-11"	4	8"	31'-0"	4	8"	3'-6"	6'-9"	4	8"	2'-10 3/4"	6'-2"	8'-10"	5	12"	11'-0"	5	9"	11'-0"	4	9"	11'-0"
8	4	8"	8"	8"	8"	33	33'-0"	33	33'-0"	2	2'-0"	5	10"	33'-8"	5	10"	35'-0"	4	10"	3'-1 1/4"	5'-11"	5	10"	3'-1 1/4"	3'-2"	5'-11"	4	12"	5'-0"	4	6"	5'-0"	4	6"	5'-0"
8	6	8 1/4"	8 1/4"	8"	8"	33	33'-0"	33	33'-0"	4	4'-0"	5	11"	33'-8"	5	11"	35'-0"	--	---	-----	-----	6	11"	3'-7"	4'-6"	7'-9"	4	12"	7'-0"	4	5 1/2"	7'-0"	4	5 1/2"	7'-0"
8	8	8 1/4"	8 1/4"	8"	8"	33	33'-0"	33	33'-0"	6	6'-0"	6	11"	33'-8"	5	11"	35'-0"	4	11"	3'-1 1/4"	5'-11"	6	11"	3'-7"	5'-6"	8'-9"	4	12"	9'-0"	5	8"	9'-0"	4	8"	9'-0"
8	10	8 1/2"	8 1/2"	8"	8"	33	33'-0"	33	33'-0"	8	8'-0"	5	10"	33'-8"	5	10"	35'-0"	4	10"	3'-6"	6'-9"	5	10"	3'-1 1/4"	6'-2 1/2"	9'-0"	5	12"	11'-1"	5	8"	11'-1"	4	8"	11'-1"
9	4	8 1/2"	8 1/2"	8"	8"	37	37'-0"	37	37'-0"	2	2'-0"	5	9"	37'-8"	5	9"	39'-0"	4	9"	3'-3 5/8"	6'-4"	5	9"	3'-3 5/8"	3'-2 1/2"	6'-2"	4	12"	5'-1"	4	5 1/2"	5'-1"	4	5 1/2"	5'-1"
9	6	8 1/2"	8 1/2"	8"	8"	37	37'-0"	37	37'-0"	4	4'-0"	5	9"	37'-8"	5	9"	39'-0"	4	9"	3'-3 5/8"	6'-4"	5	9"	3'-3 5/8"	4'-2 1/2"	7'-2"	4	12"	7'-1"	5	8"	7'-1"	4	8"	7'-1"
9	8	8 1/2"	8 1/2"	8"	8"	37	37'-0"	37	37'-0"	6	6'-0"	5	9"	37'-8"	5	9"	39'-0"	4	9"	3'-3 5/8"	6'-4"	5	9"	3'-3 5/8"	5'-2 1/2"	8'-2"	4	12"	9'-1"	5	8"	9'-1"	4	8"	9'-1"
9	10	9"	9"	8"	8"	37	37'-0"	37	37'-0"	8	8'-0"	5	9"	37'-8"	5	9"	39'-0"	4	9"	3'-8"	6'-11"	5	9"	3'-3 5/8"	6'-3"	9'-3"	5	12"	11'-2"	4	5 1/2"	11'-2"	4	5 1/2"	11'-2"
9	12	9"	9"	8"	8"	37	37'-0"	37	37'-0"	10	10'-0"	6	12"	37'-8"	6	12"	39'-0"	4	12"	4'-1"	7'-11"	6	12"	3'-10"	7'-7"	11'-0"	5	8"	13'-2"	5	9"	13'-2"	4	9"	13'-2"
10	4	9"	9"	8"	8"	41	41'-0"	41	41'-0"	2	2'-0"	6	12"	41'-8"	6	12"	43'-0"	--	---	-----	-----	7	12"	4'-5"	3'-10"	7'-9"	4	12"	5'-2"	4	5"	5'-2"	4	5"	5'-2"
10	6	9"	9"	8"	8"	41	41'-0"	41	41'-0"	4	4'-0"	6	12"	41'-8"	6	12"	43'-0"	--	---	-----	-----	7	12"	4'-5"	4'-10"	8'-9"	4	12"	7'-2"	5	7 1/2"	7'-2"	4	7 1/2"	7'-2"
10	8	9 1/4"	9 1/4"	8"	8"	41	41'-0"	41	41'-0"	6	6'-0"	5	8"	41'-8"	5	8"	43'-0"	4	8"	3'-6"	6'-9"	5	8"	3'-6"	5'-3 1/4"	8'-5"	4	12"	9'-2"	4	5"	9'-2"	4	5"	9'-2"
10	10	9 1/2"	9 1/2"	8"	8"	41	41'-0"	41	41'-0"	8	8'-0"	6	11"	41'-8"	6	11"	43'-0"	4	11"	3'-8"	6'-11"	6	11"	4'-0"	6'-7"	10'-3"	4	8 1/2"	11'-3"	5	8"	11'-3"	4	8"	11'-3"
10	12	9 3/4"	9 3/4"	8"	8"	41	41'-0"	41	41'-0"	10	10'-0"	6	11"	41'-8"	6	11"	43'-0"	--	---	-----	-----	7	11"	4'-5"	7'-11"	11'-10"	5	8"	13'-3"	4	5 1/2"	13'-3"	4	5 1/2"	13'-3"
12	6	10 1/2"	10 1/2"	8"	8"	49	49'-0"	49	49'-0"	4	4'-0"	6	12"	49'-8"	6	12"	51'-0"	--	---	-----	-----	7	12"	4'-10"	5'-0"	9'-4"	4	12"	7'-5"	5	7 1/2"	7'-5"	4	7 1/2"	7'-5"
12	8	10 1/4"	10 1/4"	8"	8"	49	49'-0"	49	49'-0"	6	6'-0"	6	8"	49'-8"	5	8"	51'-0"	4	8"	3'-10 3/4"	7'-6"	5	8"	3'-10 3/4"	5'-4 1/4"	8'-11"	4	12"	9'-5"	4	4 1/2"	9'-5"	4	4 1/2"	9'-5"
12	10	10 1/4"	10 1/4"	8"	8"	49	49'-0"	49	49'-0"	8	8'-0"	6	10"	49'-8"	6	10"	51'-0"	4	10"	3'-10 3/4"	7'-6"	6	10"	4'-5"	6'-8"	10'-8"	4	10"	11'-5"	5	7 1/2"	11'-5"	4	7 1/2"	11'-5"
12	12	10"	10"	8"	8"	49	49'-0"	49	49'-0"	10	10'-0"	6	9"	49'-8"	6	9"	51'-0"	4	9"	4'-1"	7'-11"	6	9"	4'-5"	7'-8"	11'-8"	5	9"	13'-4"	6	9 1/2"	13'-4"	4	9 1/2"	13'-4"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT
ROAD AND BRIDGE STANDARDS

SHEET 1 OF 2 REVISION DATE
1005.07 07/11

QUADRUPLE BOX CULVERTS
2 TO 5 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

BCQ-10

FOR TYPICAL SECTION, NOTES AND OTHER DETAILS, REFER TO STANDARD BCQ-DT.

DIMENSIONS						REINFORCING STEEL																										
SPAN (FT.)	HIGHT (FT.)	T1 TOP SLAB	T2 BOTTOM SLAB	T3 EXTERIOR WALL (IN.)	T4 INTERIOR WALL (IN.)	A	B	C	D	E	F	BH1			BH2			BH3			BH4			BV1			BV2					
												SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	α	LENGTH	SIZE	SPACING C-C	α	b	LENGTH	SIZE	SPACING C-C	LENGTH	SIZE	SPACING C-C	LENGTH
3	3	8"	8"	8"	8"	13	13'-0"	13	13'-0"	1	1'-0"	4	12"	14'-10"	4	12"	15'-0"	--	---	-----	-----	4	12"	2'-1 1/4"	2'-8"	4'-6"	4	12"	4'-0"	4	12"	4'-0"
3	4	8"	8"	8"	8"	13	13'-0"	13	13'-0"	2	2'-0"	4	12"	14'-10"	4	12"	15'-0"	--	---	-----	-----	4	12"	2'-1 1/4"	3'-2"	5'-0"	4	12"	5'-0"	4	12"	5'-0"
4	3	8"	8"	8"	8"	17	17'-0"	17	17'-0"	1	1'-0"	4	12"	18'-5"	4	12"	19'-0"	--	---	-----	-----	4	12"	2'-3 3/8"	2'-8"	4'-8"	4	12"	4'-0"	4	12"	4'-0"
4	4	8"	8"	8"	8"	17	17'-0"	17	17'-0"	2	2'-0"	4	12"	18'-5"	4	12"	19'-0"	--	---	-----	-----	4	12"	2'-3 3/8"	3'-2"	5'-2"	4	12"	5'-0"	4	12"	5'-0"
4	5	8"	8"	8"	8"	17	17'-0"	17	17'-0"	3	3'-0"	4	12"	18'-5"	4	12"	19'-0"	--	---	-----	-----	4	12"	2'-3 3/8"	3'-8"	5'-8"	4	12"	6'-0"	4	12"	6'-0"
4	6	8"	8"	8"	8"	17	17'-0"	17	17'-0"	4	4'-0"	4	12"	18'-5"	4	12"	19'-0"	--	---	-----	-----	4	12"	2'-3 3/8"	4'-2"	6'-2"	4	12"	7'-0"	4	12"	7'-0"
5	3	8"	8"	8"	8"	21	21'-0"	21	21'-0"	1	1'-0"	4	12"	22'-0"	4	12"	23'-0"	--	---	-----	-----	4	12"	2'-6"	2'-8"	4'-11"	4	12"	4'-0"	4	12"	4'-0"
5	4	8"	8"	8"	8"	21	21'-0"	21	21'-0"	2	2'-0"	4	12"	22'-0"	4	12"	23'-0"	--	---	-----	-----	4	12"	2'-6"	3'-2"	5'-5"	4	12"	5'-0"	4	12"	5'-0"
5	5	8"	8"	8"	8"	21	21'-0"	21	21'-0"	3	3'-0"	4	12"	22'-0"	4	12"	23'-0"	--	---	-----	-----	4	12"	2'-6"	3'-8"	5'-11"	4	12"	6'-0"	4	12"	6'-0"
5	6	8"	8"	8"	8"	21	21'-0"	21	21'-0"	4	4'-0"	4	12"	22'-0"	4	12"	23'-0"	--	---	-----	-----	4	12"	2'-6"	4'-2"	6'-5"	4	12"	7'-0"	4	12"	7'-0"
5	7	8"	8"	8"	8"	21	21'-0"	21	21'-0"	5	5'-0"	4	12"	22'-0"	4	12"	23'-0"	--	---	-----	-----	4	12"	2'-6"	4'-8"	6'-11"	4	12"	8'-0"	4	12"	8'-0"
6	4	8"	8"	8"	8"	25	25'-0"	25	25'-0"	2	2'-0"	4	12"	25'-11"	4	12"	27'-0"	4	12"	2'-8 3/8"	5'-2"	4	12"	2'-8 3/8"	3'-2"	5'-7"	4	12"	5'-0"	4	12"	5'-0"
6	5	8"	8"	8"	8"	25	25'-0"	25	25'-0"	3	3'-0"	4	12"	25'-11"	4	12"	27'-0"	4	12"	2'-8 3/8"	5'-2"	4	12"	2'-8 3/8"	3'-8"	6'-1"	4	12"	6'-0"	4	12"	6'-0"
6	6	8"	8"	8"	8"	25	25'-0"	25	25'-0"	4	4'-0"	4	12"	25'-11"	4	12"	27'-0"	4	12"	2'-8 3/8"	5'-2"	4	12"	2'-8 3/8"	4'-2"	6'-7"	4	12"	7'-0"	4	12"	7'-0"
6	7	8"	8"	8"	8"	25	25'-0"	25	25'-0"	5	5'-0"	4	12"	25'-11"	4	12"	27'-0"	4	12"	2'-11"	5'-8"	4	12"	2'-8 3/8"	4'-8"	7'-1"	4	12"	8'-0"	4	12"	8'-0"
6	8	8"	8"	8"	8"	25	25'-0"	25	25'-0"	6	6'-0"	4	12"	25'-11"	4	12"	27'-0"	4	12"	3'-2"	6'-2"	4	12"	2'-8 3/8"	5'-2"	7'-7"	4	12"	9'-0"	4	12"	9'-0"
7	4	8"	8"	8"	8"	29	29'-0"	29	29'-0"	2	2'-0"	4	12"	29'-8"	4	12"	31'-0"	--	---	-----	-----	5	12"	2'-10 3/4"	3'-2"	5'-9"	4	12"	5'-0"	4	12"	5'-0"
7	6	8"	8"	8"	8"	29	29'-0"	29	29'-0"	4	4'-0"	4	12"	29'-8"	4	12"	31'-0"	--	---	-----	-----	5	12"	2'-10 3/4"	4'-2"	6'-9"	4	12"	7'-0"	4	12"	7'-0"
7	8	8"	8"	8"	8"	29	29'-0"	29	29'-0"	6	6'-0"	4	12"	29'-8"	4	12"	31'-0"	--	---	-----	-----	5	12"	2'-10 3/4"	5'-2"	7'-9"	4	12"	9'-0"	4	11 1/2"	9'-0"
7	10	8"	8"	8"	8"	29	29'-0"	29	29'-0"	8	8'-0"	4	11"	29'-8"	4	11"	31'-0"	--	---	-----	-----	5	11"	2'-10 3/4"	6'-2"	8'-9"	5	10"	11'-0"	4	12"	11'-0"
8	4	8 1/4"	8 1/4"	8"	8"	33	33'-0"	33	33'-0"	2	2'-0"	4	11"	33'-8"	4	11"	35'-0"	3	11"	3'-1 1/4"	6'-0"	5	11"	3'-1 1/4"	3'-2 1/4"	6'-0"	4	9"	5'-0"	4	12"	5'-0"
8	6	8 1/2"	8 1/2"	8"	8"	33	33'-0"	33	33'-0"	4	4'-0"	4	11"	33'-8"	4	11"	35'-0"	--	---	-----	-----	5	11"	3'-1 1/4"	4'-2 1/2"	7'-0"	4	12"	7'-1"	4	12"	7'-1"
8	8	8 1/2"	8 1/2"	8"	8"	33	33'-0"	33	33'-0"	6	6'-0"	4	10"	33'-8"	4	10"	35'-0"	--	---	-----	-----	5	10"	3'-1 1/4"	5'-2 1/2"	8'-0"	4	12"	9'-1"	4	12"	9'-1"
8	10	8 3/4"	8 3/4"	8"	8"	33	33'-0"	33	33'-0"	8	8'-0"	4	9"	33'-8"	4	9"	35'-0"	--	---	-----	-----	5	9"	3'-1 1/4"	6'-2 3/4"	9'-0"	5	11"	11'-2"	4	12"	11'-2"
9	4	9"	9"	8"	8"	37	37'-0"	37	37'-0"	2	2'-0"	5	9"	37'-11"	4	9"	39'-0"	3	9"	3'-3 5/8"	6'-5"	5	9"	3'-3 5/8"	3'-3"	6'-3"	4	8"	5'-2"	4	12"	5'-2"
9	6	9 1/4"	9 1/4"	8"	8"	37	37'-0"	37	37'-0"	4	4'-0"	5	9"	37'-11"	4	9"	39'-0"	--	---	-----	-----	5	9"	3'-3 5/8"	4'-3 1/4"	7'-3"	4	12"	7'-2"	4	12"	7'-2"
9	8	9 1/2"	9 1/2"	8"	8"	37	37'-0"	37	37'-0"	6	6'-0"	5	9"	37'-11"	4	9"	39'-0"	4	9"	3'-3 5/8"	6'-4"	4	9"	3'-3 5/8"	5'-3 1/2"	8'-4"	4	12"	9'-3"	4	12"	9'-3"
9	10	9 1/2"	9 1/2"	8"	8"	37	37'-0"	37	37'-0"	8	8'-0"	5	9"	37'-11"	5	9"	39'-0"	--	---	-----	-----	5	9"	3'-3 5/8"	6'-3 1/2"	9'-3"	5	12"	11'-3"	4	12"	11'-3"
9	12	9 3/4"	9 3/4"	8"	8"	37	37'-0"	37	37'-0"	10	10'-0"	4	8"	37'-11"	4	8"	39'-0"	4	8"	4'-1"	7'-11"	5	8"	3'-3 5/8"	7'-3 3/4"	10'-3"	5	6"	13'-3"	4	12"	13'-3"
10	4	9 3/4"	9 3/4"	8"	8"	41	41'-0"	41	41'-0"	2	2'-0"	5	8"	41'-11"	4	8"	43'-0"	--	---	-----	-----	5	8"	3'-6"	3'-3 3/4"	6'-6"	4	7"	5'-3"	4	12"	5'-3"
10	6	10"	10"	8"	8"	41	41'-0"	41	41'-0"	4	4'-0"	5	8"	41'-11"	4	8"	43'-0"	--	---	-----	-----	5	8"	3'-6"	4'-4"	7'-6"	4	11 1/2"	7'-4"	4	12"	7'-4"
10	8	10 1/4"	10 1/4"	8"	8"	41	41'-0"	41	41'-0"	6	6'-0"	5	8"	41'-11"	4	8"	43'-0"	4	8"	3'-6"	6'-9"	4	8"	3'-6"	5'-4 1/4"	8'-7"	4	12"	9'-5"	4	12"	9'-5"
10	10	10 1/2"	10 1/2"	8"	8"	41	41'-0"	41	41'-0"	8	8'-0"	5	8"	41'-11"	5	8"	43'-0"	--	---	-----	-----	5	8"	3'-6"	6'-4 1/4"	9'-6"	5	12"	11'-5"	4	12"	11'-5"
10	12	10 1/2"	10 1/2"	8"	8"	41	41'-0"	41	41'-0"	10	10'-0"	5	10"	41'-11"	5	10"	43'-0"	3	10"	4'-1"	7'-11"	6	10"	4'-0"	7'-8"	11'-4"	5	7"	13'-5"	4	12"	13'-5"
12	6	11 3/4"	11 3/4"	8"	8"	49	49'-0"	49	49'-0"	4	4'-0"	6	12"	49'-8"	6	12"	51'-0"	3	12"	3'-10 3/4"	7'-7"	6	12"	4'-5"	4'-9"	8'-10"	4	10"	7'-8"	4	10"	7'-8"
12	8	11 3/4"	11 3/4"	8"	8"	49	49'-0"	49	49'-0"	6	6'-0"	6	11"	49'-8"	6	11"	51'-0"	--	---	-----	-----	6	11"	4'-5"	5'-9"	9'-10"	4	12"	9'-8"	4	12"	9'-8"
12	10	12"	12"	8"	8"	49	49'-0"	49	49'-0"	8	8'-0"	6	9"	49'-8"	5	9"	51'-0"	3	9"	3'-10 3/4"	7'-7"	5	9"	3'-10 3/4"	6'-6"	10'-1"	5	12"	11'-8"	4	12"	11'-8"
12	12	12 1/4"	12 1/4"	8"	8"	49	49'-0"	49	49'-0"	10	10'-0"	6	9"	49'-8"	5	9"	51'-0"	--	---	-----	-----	6	9"	4'-5"	7'-10"	11'-10"	6	10 1/2"	13'-9"	4	12"	13'-9"

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VDOT ROAD AND BRIDGE STANDARDS	
SHEET 1 OF 2	REVISION DATE
1005.09	07/11

QUADRUPLE BOX CULVERTS
5 TO 10 FT. FILLS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

BCW-11

GENERAL NOTES

Specifications:

AASHTO LRFD Bridge Design Specifications 5th Edition 2010; 2011 Interim Revisions; and VDOT Modifications

Limits of validity for Standard Wingwall design

The standard wingwall designs are based on the following assumptions:

there is no structural connection between the wall and the box culvert traffic surcharge loading is neglected.

Backfill

Backfill shall comprise granular material with an internal friction angle ϕ' of at least 34°. Cohesive backfill shall not be permitted. Compaction of the backfill material within a distance of one-half the height of the wall shall be by hand compactors only.

Drainage

The Contractor shall provide the drainage system indicated on Sheet 1.

The cost for the drainage system (including porous backfill, 6" diameter non-rigid tubing and other items required) shall be incidental to the cost bid for Concrete.

Concrete

All concrete shall be Class A4.

Reinforcement

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The concrete cover to the outermost reinforcement bars shall be as follows:

Wall footing (all faces) 3" minimum cover
Wall stem (all faces) 2 1/2" minimum cover

At the Contractor's option WV Series bars may be spliced at top of the footing in order to facilitate construction. Splice lengths shall be in accordance with Table C on Sheet 1. No additional compensation shall be provided for the increase in reinforcing steel quantity due to the splices.

Miscellaneous

Weepholes shall be placed at the lowest point feasible for free drainage away from the wing.

Four Type I Wings are to be used for straight crossings and skewers up to 20°. Two Type I and two Type II Wings are to be used for skewers from 25° to 45°. For skewers above 45°, special design wings are required. The wingwall to be used for each culvert is shown on the BC series sheets.

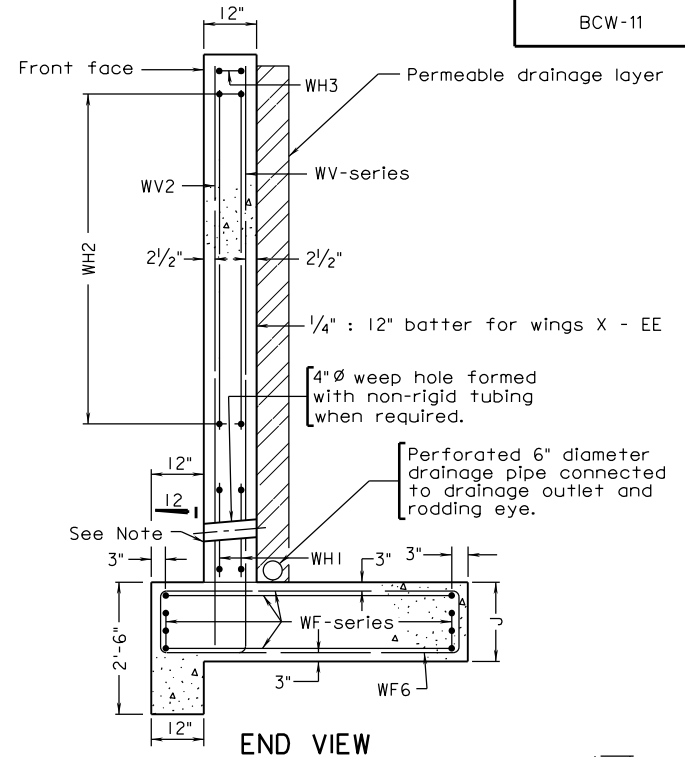
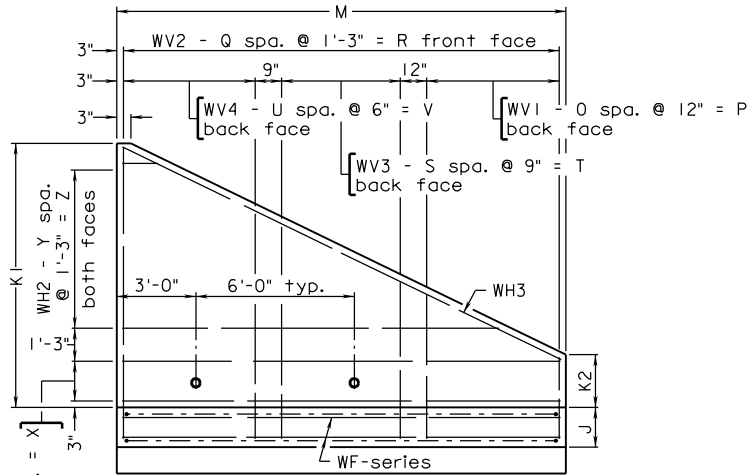
The designs shown are applicable for a 45° skew with the roadway and other conditions indicated. Any change in these conditions invalidates these designs.

Quantities shown are for one wing.

WING	Wall Quantities		qr_min	qr_min
	Concrete CY	Reinforcement LB	ksf High End	ksf Low End
A	1.7	162	1.10	0.57
B	2.1	193	1.28	0.57
C	2.5	221	1.50	0.57
D	2.7	236	1.68	0.63
E	3.2	265	1.88	0.63
F	3.7	299	2.08	0.63
G	4.1	353	2.13	0.76
H	4.6	382	2.40	0.76
I	5.4	460	2.52	0.84
J	6.2	509	2.65	0.84
K	7.1	619	2.78	1.02
L	7.4	653	2.92	1.02
M	8.1	718	3.18	1.02
N	8.9	922	3.19	1.15
O	9.7	968	3.44	1.15
P	10.7	1117	3.57	1.15
Q	11.5	1240	3.71	1.28
R	12.6	1379	3.84	1.28
S	13.5	1478	4.10	1.28
T	18.0	1815	4.28	1.56
U	18.7	2063	4.42	1.79
V	20.3	2318	4.55	1.79
W	22.3	2619	4.60	1.79
X	25.1	2822	4.74	1.98
Y	26.6	3173	4.95	1.98
Z	28.5	3423	5.10	1.98
AA	30.0	3765	5.32	1.98
BB	31.4	4553	5.47	2.11
CC	33.0	4977	5.70	2.11
DD	40.5	5679	6.11	2.28
EE	42.4	6262	6.15	2.53

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 ROAD AND BRIDGE STANDARDS		WING DETAIL 1/2: 1 FILL SLOPE - TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 8	REVISION DATE		
1006.01	07/12		



FRONT ELEVATION

END VIEW

WH1-W eq. spa. = X
both faces

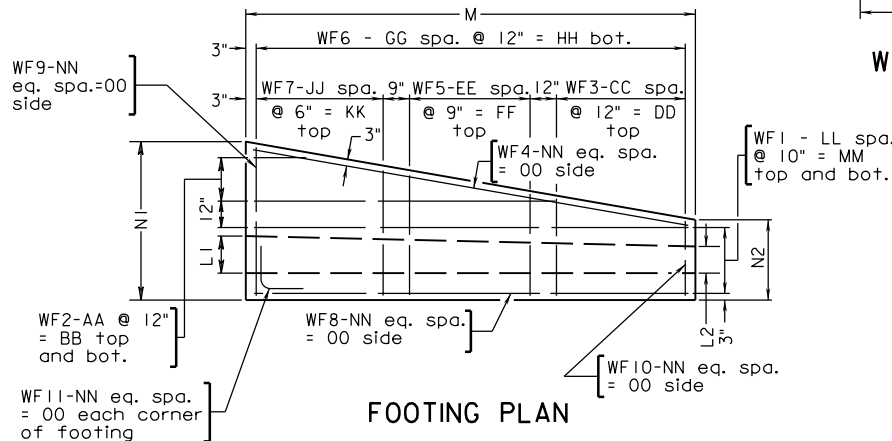
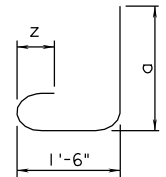
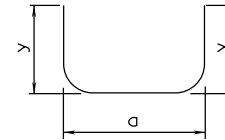
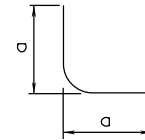


TABLE A	
Wall	y
A-W	9 1/2"
X	1'-0 1/2"
Y-CC	1'-3 1/2"
DD-EE	1'-9 1/2"

TABLE B		
Bar Size	Pin Dia.	Z
#3	2 1/4"	4"
#4	3"	4 1/2"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9"	10 1/8"

TABLE C	
Bar Size	Splice Length
#4	1'- 9"
#5	2'- 4"
#6	2'- 7"
#7	3'- 3"
#8	4'- 2"
#9	5'- 4"

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SPECIFICATION REFERENCE

WING DETAIL

1 1/2 : 1 FILL SLOPE - TYPE I

VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

REVISION DATE

07/16

SHEET 2 OF 8

1006.02

2016 ROAD & BRIDGE STANDARDS

BCW-11


WING	WALL DIMENSIONS								No. WEEP HOLES	FOOTING BAR SPACINGS													
	J	K1	K2	L1	L2	M	N1	N2		WF1		WF2		WF3		WF4, WF8 to WF10		WF5		WF6		WF7	
										LL	MM	AA	BB	CC	DD	NN	OO	EE	FF	GG	HH	JJ	KK
A	1'-6"	4'-0"	1'-9"	1'-0"	1'-0"	5'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	4	4'-0"	1	0'-8"	-	-	4	4'-0"	-	-
B	1'-6"	4'-6"	1'-9"	1'-0"	1'-0"	6'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	5	5'-0"	1	0'-8"	-	-	5	5'-0"	-	-
C	1'-6"	5'-0"	1'-9"	1'-0"	1'-0"	7'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	6	6'-0"	1	0'-8"	-	-	6	6'-0"	-	-
D	1'-6"	5'-6"	2'-3"	1'-0"	1'-0"	7'-0"	4'-3"	3'-0"	-	3	2'-6"	-	-	6	6'-0"	1	0'-8"	-	-	6	6'-0"	-	-
E	1'-6"	6'-0"	2'-3"	1'-0"	1'-0"	8'-0"	4'-6"	3'-0"	-	3	2'-6"	-	-	7	7'-0"	1	0'-8"	-	-	7	7'-0"	-	-
F	1'-6"	6'-6"	2'-3"	1'-0"	1'-0"	9'-0"	4'-9"	3'-0"	-	3	2'-6"	-	-	8	8'-0"	1	0'-8"	-	-	8	8'-0"	-	-
G	1'-6"	7'-0"	2'-9"	1'-0"	1'-0"	9'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	4	4'-0"	1	0'-8"	6	4'-6"	8	8'-0"	-	-
H	1'-6"	7'-6"	2'-9"	1'-0"	1'-0"	10'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	5	5'-0"	1	0'-8"	6	4'-6"	9	9'-0"	-	-
I	1'-6"	8'-0"	3'-0"	1'-0"	1'-0"	11'-0"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	5	5'-0"	1	0'-8"	6	4'-6"	10	10'-0"	-	-
J	1'-6"	8'-6"	3'-0"	1'-0"	1'-0"	12'-0"	6'-6"	3'-0"	-	3	2'-6"	2	2'-0"	6	6'-0"	1	0'-8"	6	4'-6"	11	11'-0"	-	-
K	1'-6"	9'-0"	3'-6"	1'-0"	1'-0"	13'-0"	7'-0"	3'-0"	-	3	2'-6"	2	2'-0"	7	7'-0"	1	0'-8"	6	4'-6"	12	12'-0"	-	-
L	1'-6"	9'-6"	3'-6"	1'-0"	1'-0"	13'-0"	7'-6"	3'-0"	-	3	2'-6"	3	3'-0"	7	7'-0"	1	0'-8"	6	4'-6"	12	12'-0"	-	-
M	1'-6"	10'-0"	3'-6"	1'-0"	1'-0"	14'-0"	7'-6"	3'-0"	-	3	2'-6"	3	3'-0"	6	6'-0"	1	0'-8"	8	6'-0"	13	13'-0"	-	-
N	1'-6"	10'-6"	4'-0"	1'-0"	1'-0"	14'-0"	8'-6"	3'-6"	-	3	2'-6"	4	4'-0"	4	4'-0"	1	0'-8"	5	3'-9"	13	13'-0"	8	4'-0"
O	1'-6"	11'-0"	4'-0"	1'-0"	1'-0"	15'-0"	8'-6"	3'-6"	-	3	2'-6"	4	4'-0"	4	4'-0"	1	0'-8"	5	3'-9"	14	14'-0"	8	4'-0"
P	1'-6"	11'-6"	4'-0"	1'-0"	1'-0"	16'-0"	9'-0"	3'-6"	-	3	2'-6"	4	4'-0"	5	5'-0"	1	0'-8"	7	5'-3"	15	15'-0"	10	5'-0"
Q	1'-6"	12'-0"	4'-6"	1'-0"	1'-0"	16'-0"	9'-6"	4'-0"	-	4	3'-4"	4	4'-0"	5	5'-0"	1	0'-8"	7	5'-3"	15	15'-0"	10	5'-0"
R	1'-6"	12'-6"	4'-6"	1'-0"	1'-0"	17'-0"	10'-0"	4'-0"	-	4	3'-4"	4	4'-0"	5	5'-0"	1	0'-8"	7	5'-3"	16	16'-0"	10	5'-0"
S	1'-6"	13'-0"	4'-6"	1'-0"	1'-0"	18'-0"	10'-0"	4'-0"	-	4	3'-4"	4	4'-0"	5	5'-0"	1	0'-8"	7	5'-3"	17	17'-0"	10	5'-0"
T	2'-0"	13'-6"	4'-9"	1'-0"	1'-0"	19'-0"	11'-6"	4'-6"	-	4	3'-4"	6	6'-0"	6	6'-0"	1	1'-2"	8	6'-0"	18	18'-0"	12	6'-0"
U	2'-0"	14'-0"	5'-3"	1'-0"	1'-0"	19'-0"	12'-0"	4'-6"	-	4	3'-4"	6	6'-0"	6	6'-0"	1	1'-2"	8	6'-0"	18	18'-0"	12	6'-0"
V	2'-0"	14'-6"	5'-3"	1'-0"	1'-0"	20'-0"	12'-6"	4'-6"	1	4	3'-4"	7	7'-0"	6	6'-0"	1	1'-2"	8	6'-0"	19	19'-0"	12	6'-0"
W	2'-0"	15'-0"	5'-3"	1'-0"	1'-0"	21'-0"	13'-6"	4'-6"	1	4	3'-4"	8	8'-0"	6	6'-0"	1	1'-2"	8	6'-0"	20	20'-0"	12	6'-0"
X	2'-0"	15'-6"	5'-9"	1'-3 3/4"	1'-1 1/8"	21'-0"	15'-0"	5'-0"	1	5	4'-2"	8	8'-0"	6	6'-0"	1	1'-2"	8	6'-0"	20	20'-0"	12	6'-0"
Y	2'-0"	16'-0"	5'-9"	1'-4"	1'-1 1/8"	22'-0"	15'-0"	5'-0"	1	5	4'-2"	8	8'-0"	7	7'-0"	2	0'-7"	10	7'-6"	21	21'-0"	14	7'-0"
Z	2'-0"	16'-6"	5'-9"	1'-4 1/8"	1'-1 1/4"	23'-0"	15'-6"	5'-0"	1	5	4'-2"	9	9'-0"	7	7'-0"	2	0'-7"	10	7'-6"	22	22'-0"	14	7'-0"
AA	2'-0"	17'-0"	5'-9"	1'-4 1/4"	1'-1 1/4"	24'-0"	15'-6"	5'-0"	1	5	4'-2"	9	9'-0"	7	7'-0"	2	0'-7"	10	7'-6"	23	23'-0"	14	7'-0"
BB	2'-0"	17'-6"	6'-3"	1'-4 3/8"	1'-1 1/4"	24'-0"	16'-0"	5'-6"	1	6	5'-0"	9	9'-0"	7	7'-0"	2	0'-7"	10	7'-6"	23	23'-0"	14	7'-0"
CC	2'-0"	18'-0"	6'-3"	1'-4 1/2"	1'-1 1/4"	25'-0"	16'-0"	5'-6"	2	6	5'-0"	9	9'-0"	8	8'-0"	2	0'-7"	11	8'-3"	24	24'-0"	16	8'-0"
DD	2'-6"	18'-6"	6'-3"	1'-4 5/8"	1'-1 3/8"	26'-0"	16'-6"	6'-0"	2	6	5'-0"	9	9'-0"	8	8'-0"	2	0'-10"	11	8'-3"	25	25'-0"	16	8'-0"
EE	2'-6"	19'-0"	6'-9"	1'-4 3/4"	1'-1 3/8"	26'-0"	17'-6"	6'-0"	2	6	5'-0"	10	10'-0"	8	8'-0"	2	0'-10"	11	8'-3"	25	25'-0"	16	8'-0"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS		WING DETAILS 1 1/2: 1 FILL SLOPE -TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION										SPECIFICATION REFERENCE	
SHEET 3 OF 8		REVISION DATE											
1006.03		07/12											

WING	WF 1				WF 2							WF 3							
	SIZE	α		Eα	SIZE	α			LENGTH			Eα	SIZE	α			LENGTH		
		FROM	TO			VARY BY	FROM	TO	VARY BY	FROM	TO			VARY BY	FROM	TO	VARY BY		
A	4	4'-5"	5'-9"	2	4	0'-8"	5'-8"	-	2'-0"	7'-0"	-	2	4	3'-4"	2'-7"	0'-2 ³ / ₈ "	4'-9"	3'-11"	0'-2 ³ / ₈ "
B	4	5'-5"	6'-9"	2	4	0'-11"	6'-11"	-	2'-3"	8'-3"	-	2	4	3'-5"	2'-7"	0'-2"	4'-9"	3'-11"	0'-2"
C	4	6'-5"	7'-9"	2	4	1'-2"	8'-2"	-	2'-6"	9'-6"	-	2	4	3'-5"	2'-6"	0'-1 ⁵ / ₈ "	4'-9"	3'-11"	0'-1 ⁵ / ₈ "
D	4	6'-5"	7'-9"	2	4	2'-2"	7'-9"	-	3'-7"	9'-2"	-	2	4	3'-7"	2'-7"	0'-2 ¹ / ₈ "	5'-0"	3'-11"	0'-2 ¹ / ₈ "
E	4	7'-5"	8'-9"	2	4	3'-5"	3'-5"	-	4'-9"	4'-9"	-	2	4	3'-10"	2'-7"	0'-2 ¹ / ₄ "	5'-3"	3'-11"	0'-2 ¹ / ₄ "
F	4	8'-5"	9'-9"	2	4	4'-6"	4'-6"	-	5'-11"	5'-11"	-	2	4	4'-1"	2'-7"	0'-2 ¹ / ₄ "	5'-6"	3'-11"	0'-2 ¹ / ₄ "
G	4	8'-5"	9'-9"	2	4	5'-8"	2'-1"	3'-7 ¹ / ₈ "	7'-1"	3'-5"	3'-7 ¹ / ₈ "	2	4	3'-4"	2'-3"	0'-3 ¹ / ₄ "	4'-8"	3'-7"	0'-3 ¹ / ₄ "
H	4	9'-5"	10'-9"	2	4	6'-5"	2'-5"	4'-0"	7'-9"	3'-9"	4'-0"	2	4	3'-6"	2'-3"	0'-3"	4'-10"	3'-7"	0'-3"
I	4	10'-5"	11'-9"	2	4	7'-8"	4'-0"	3'-8"	9'-0"	5'-4"	3'-8"	2	4	3'-10"	2'-6"	0'-3 ¹ / ₄ "	5'-3"	3'-10"	0'-3 ¹ / ₄ "
J	4	11'-5"	12'-9"	2	4	8'-10"	1'-11"	3'-5 ¹ / ₈ "	10'-2"	3'-4"	3'-5 ¹ / ₈ "	2	4	4'-3"	2'-6"	0'-3 ¹ / ₂ "	5'-7"	3'-10"	0'-3 ¹ / ₂ "
K	4	12'-5"	13'-9"	2	4	9'-11"	3'-5"	3'-3"	11'-4"	4'-10"	3'-3"	2	4	4'-8"	2'-6"	0'-3 ⁵ / ₈ "	6'-0"	3'-10"	0'-3 ⁵ / ₈ "
L	4	12'-5"	13'-9"	2	4	10'-3"	1'-7"	2'-10 ⁵ / ₈ "	11'-7"	2'-11"	2'-10 ⁵ / ₈ "	2	4	4'-11"	2'-6"	0'-4 ¹ / ₈ "	6'-4"	3'-11"	0'-4 ¹ / ₈ "
M	4	13'-5"	14'-9"	2	4	11'-1"	1'-9"	3'-1 ¹ / ₄ "	12'-5"	3'-1"	3'-1 ¹ / ₄ "	2	4	4'-7"	2'-8"	0'-3 ³ / ₄ "	6'-0"	4'-0"	0'-3 ³ / ₄ "
N	4	13'-5"	14'-9"	2	4	12'-8"	1'-6"	2'-9 ¹ / ₂ "	14'-1"	2'-10"	2'-9 ¹ / ₂ "	2	4	4'-5"	3'-0"	0'-4 ¹ / ₄ "	5'-10"	4'-5"	0'-4 ¹ / ₄ "
O	4	14'-5"	15'-9"	2	4	13'-8"	1'-8"	3'-0"	15'-0"	3'-0"	3'-0"	2	4	4'-8"	3'-4"	0'-4"	6'-1"	4'-9"	0'-4"
P	4	15'-5"	16'-9"	2	4	14'-8"	3'-0"	2'-10 ³ / ₄ "	16'-0"	4'-4"	2'-10 ³ / ₄ "	2	4	4'-3"	2'-6"	0'-4 ¹ / ₈ "	5'-7"	3'-10"	0'-4 ¹ / ₈ "
Q	4	15'-5"	16'-9"	2	4	13'-8"	2'-1"	2'-10 ³ / ₄ "	15'-1"	3'-4"	2'-10 ³ / ₄ "	2	4	4'-8"	3'-0"	0'-4 ¹ / ₈ "	6'-1"	4'-3"	0'-4 ¹ / ₈ "
R	4	16'-5"	17'-9"	2	4	14'-9"	3'-5"	2'-10"	16'-1"	4'-9"	2'-10"	2	4	5'-1"	3'-4"	0'-4 ¹ / ₈ "	6'-6"	4'-8"	0'-4 ¹ / ₈ "
S	4	17'-5"	18'-9"	2	4	15'-8"	3'-8"	3'-0"	17'-0"	5'-0"	3'-0"	2	4	5'-4"	3'-8"	0'-4"	6'-9"	5'-1"	0'-4"
T	4	18'-5"	20'-9"	2	4	18'-2"	1'-10"	2'-8 ¹ / ₂ "	20'-6"	4'-3"	2'-8 ¹ / ₂ "	2	4	5'-9"	3'-7"	0'-4 ³ / ₈ "	8'-2"	5'-11"	0'-4 ³ / ₈ "
U	4	18'-5"	20'-9"	2	4	18'-2"	3'-0"	2'-6 ³ / ₈ "	20'-6"	5'-3"	2'-6 ³ / ₈ "	2	4	5'-11"	3'-6"	0'-4 ⁵ / ₈ "	8'-3"	5'-11"	0'-4 ⁵ / ₈ "
V	4	19'-5"	21'-9"	2	4	19'-2"	1'-8"	2'-6"	21'-7"	4'-1"	2'-6"	2	4	6'-4"	3'-11"	0'-4 ³ / ₄ "	8'-8"	6'-4"	0'-4 ³ / ₄ "
W	4	20'-5"	22'-9"	2	4	20'-2"	1'-6"	2'-4"	22'-7"	3'-11"	2'-4"	2	4	6'-11"	4'-4"	0'-5 ¹ / ₈ "	9'-4"	6'-9"	0'-5 ¹ / ₈ "
X	4	20'-5"	22'-9"	2	5	19'-6"	2'-8"	2'-1 ¹ / ₈ "	21'-10"	5'-0"	2'-1 ¹ / ₈ "	2	5	7'-9"	4'-11"	0'-5 ⁵ / ₈ "	10'-1"	7'-3"	0'-5 ⁵ / ₈ "
Y	4	21'-5"	23'-9"	2	5	20'-6"	2'-10"	2'-2 ³ / ₈ "	22'-9"	5'-2"	2'-2 ³ / ₈ "	2	5	6'-11"	3'-9"	0'-5 ³ / ₈ "	9'-3"	6'-1"	0'-5 ³ / ₈ "
Z	4	22'-5"	24'-9"	2	5	21'-6"	1'-9"	2'-2 ¹ / ₄ "	23'-9"	4'-1"	2'-2 ¹ / ₄ "	2	5	7'-5"	4'-2"	0'-5 ³ / ₈ "	9'-8"	6'-6"	0'-5 ³ / ₈ "
AA	4	23'-5"	25'-9"	2	5	22'-5"	1'-10"	2'-3 ³ / ₈ "	24'-9"	4'-2"	2'-3 ³ / ₈ "	2	5	7'-8"	4'-8"	0'-5 ¹ / ₄ "	10'-0"	7'-0"	0'-5 ¹ / ₄ "
BB	4	23'-5"	25'-9"	2	5	21'-8"	1'-1"	2'-3 ³ / ₈ "	24'-0"	3'-5"	2'-3 ³ / ₈ "	2	6	8'-2"	5'-2"	0'-5 ¹ / ₄ "	10'-6"	7'-5"	0'-5 ¹ / ₄ "
CC	4	24'-5"	26'-9"	2	5	22'-7"	1'-2"	2'-4 ¹ / ₂ "	24'-11"	3'-6"	2'-4 ¹ / ₂ "	2	6	7'-9"	4'-5"	0'-5"	10'-0"	6'-8"	0'-5"
DD	5	25'-5"	28'-8"	2	5	24'-9"	2'-6"	2'-5 ⁵ / ₈ "	28'-1"	5'-10"	2'-5 ⁵ / ₈ "	2	6	8'-7"	5'-4"	0'-4 ³ / ₄ "	11'-10"	8'-7"	0'-4 ³ / ₄ "
EE	5	25'-5"	28'-8"	2	5	24'-10"	2'-2"	2'-3 ¹ / ₈ "	28'-2"	5'-6"	2'-3 ¹ / ₈ "	2	6	8'-10"	5'-4"	0'-5 ¹ / ₄ "	12'-1"	8'-7"	0'-5 ¹ / ₄ "


A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<p>WING DETAILS 1/2: 1 FILL SLOPE -TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 4 OF 8 1006.04

BCW-11


WING	WF4			WF5						WF6						
	SIZE	LENGTH	SIZE	α			LENGTH			SIZE	α			LENGTH		
				FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	4'-3"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-2 ³ / ₈ "	4'-8"	3'-11"	0'-2 ³ / ₈ "
B	4	5'-3"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-2"	4'-9"	3'-11"	0'-2"
C	4	6'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-1 ⁵ / ₈ "	4'-9"	3'-10"	0'-1 ⁵ / ₈ "
D	4	6'-3"	-	-	-	-	-	-	-	4	3'-7"	2'-6"	0'-2 ¹ / ₈ "	4'-11"	3'-11"	0'-2 ¹ / ₈ "
E	4	7'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'-2 ¹ / ₄ "	5'-2"	3'-11"	0'-2 ¹ / ₄ "
F	4	8'-3"	-	-	-	-	-	-	-	4	4'-1"	2'-6"	0'-2 ¹ / ₄ "	5'-5"	3'-11"	0'-2 ¹ / ₄ "
G	4	8'-6"	4	4'-10"	3'-7"	0'-2 ³ / ₈ "	6'-3"	5'-0"	0'-2 ³ / ₈ "	4	4'-10"	2'-7"	0'-3 ¹ / ₄ "	6'-2"	4'-0"	0'-3 ¹ / ₄ "
H	4	9'-4"	4	4'-10"	3'-9"	0'-2 ¹ / ₄ "	6'-3"	5'-1"	0'-2 ¹ / ₄ "	4	4'-10"	2'-7"	0'-3"	6'-2"	3'-11"	0'-3"
I	4	10'-7"	4	5'-4"	4'-1"	0'-2 ³ / ₈ "	6'-9"	5'-6"	0'-2 ³ / ₈ "	4	5'-4"	2'-7"	0'-3 ¹ / ₄ "	6'-8"	3'-11"	0'-3 ¹ / ₄ "
J	4	11'-8"	4	5'-10"	4'-6"	0'-2 ⁵ / ₈ "	7'-3"	5'-11"	0'-2 ⁵ / ₈ "	4	5'-10"	2'-7"	0'-3 ¹ / ₂ "	7'-2"	4'-0"	0'-3 ¹ / ₂ "
K	4	12'-9"	5	6'-4"	4'-11"	0'-2 ³ / ₄ "	7'-8"	6'-3"	0'-2 ³ / ₄ "	4	6'-4"	2'-7"	0'-3 ⁵ / ₈ "	7'-8"	4'-0"	0'-3 ⁵ / ₈ "
L	4	12'-11"	5	6'-10"	5'-3"	0'-3"	8'-2"	6'-7"	0'-3"	4	6'-9"	2'-8"	0'-4 ¹ / ₈ "	8'-2"	4'-0"	0'-4 ¹ / ₈ "
M	4	13'-10"	5	6'-10"	4'-11"	0'-2 ³ / ₄ "	8'-2"	6'-3"	0'-2 ³ / ₄ "	4	6'-10"	2'-7"	0'-3 ³ / ₄ "	8'-2"	4'-0"	0'-3 ³ / ₄ "
N	4	14'-0"	5	6'-2"	4'-10"	0'-3 ¹ / ₈ "	7'-5"	6'-1"	0'-3 ¹ / ₈ "	4	7'-9"	3'-2"	0'-4 ¹ / ₄ "	9'-2"	4'-6"	0'-4 ¹ / ₄ "
O	4	15'-0"	5	6'-3"	5'-0"	0'-3"	7'-7"	6'-4"	0'-3"	4	7'-10"	3'-1"	0'-4"	9'-2"	4'-6"	0'-4"
P	4	16'-1"	5	6'-4"	4'-7"	0'-3"	7'-8"	5'-10"	0'-3"	4	8'-3"	3'-2"	0'-4 ¹ / ₈ "	9'-8"	4'-6"	0'-4 ¹ / ₈ "
Q	4	16'-1"	5	6'-10"	5'-1"	0'-3"	8'-2"	6'-4"	0'-3"	4	8'-9"	3'-8"	0'-4 ¹ / ₈ "	10'-2"	5'-0"	0'-4 ¹ / ₈ "
R	4	17'-2"	5	7'-4"	5'-5"	0'-3 ¹ / ₈ "	8'-7"	6'-9"	0'-3 ¹ / ₈ "	4	9'-3"	3'-8"	0'-4 ¹ / ₈ "	10'-8"	5'-0"	0'-4 ¹ / ₈ "
S	4	18'-2"	5	7'-5"	5'-8"	0'-3"	8'-9"	7'-0"	0'-3"	4	9'-4"	3'-7"	0'-4"	10'-8"	5'-0"	0'-4"
T	4	19'-5"	5	8'-4"	6'-1"	0'-3 ¹ / ₄ "	10'-8"	8'-5"	0'-3 ¹ / ₄ "	4	10'-9"	4'-2"	0'-4 ³ / ₈ "	13'-2"	6'-6"	0'-4 ³ / ₈ "
U	4	19'-7"	5	8'-8"	6'-3"	0'-3 ¹ / ₂ "	11'-0"	8'-7"	0'-3 ¹ / ₂ "	4	11'-3"	4'-2"	0'-4 ⁵ / ₈ "	13'-8"	6'-7"	0'-4 ⁵ / ₈ "
V	4	20'-8"	6	9'-1"	6'-9"	0'-3 ¹ / ₂ "	11'-5"	9'-0"	0'-3 ¹ / ₂ "	4	11'-9"	4'-2"	0'-4 ³ / ₄ "	14'-2"	6'-7"	0'-4 ³ / ₄ "
W	4	22'-0"	6	9'-11"	7'-4"	0'-3 ³ / ₄ "	12'-2"	9'-7"	0'-3 ³ / ₄ "	4	12'-9"	4'-2"	0'-5 ¹ / ₈ "	15'-2"	6'-7"	0'-5 ¹ / ₈ "
X	4	22'-5"	6	11'-1"	8'-3"	0'-4 ¹ / ₄ "	13'-4"	10'-6"	0'-4 ¹ / ₄ "	5	14'-3"	4'-9"	0'-5 ⁵ / ₈ "	16'-7"	7'-1"	0'-5 ⁵ / ₈ "
Y	4	23'-4"	6	10'-9"	7'-4"	0'-4"	13'-1"	9'-8"	0'-4"	5	14'-3"	4'-9"	0'-5 ³ / ₈ "	16'-7"	7'-0"	0'-5 ³ / ₈ "
Z	4	24'-5"	7	11'-3"	7'-10"	0'-4"	13'-6"	10'-1"	0'-4"	5	14'-9"	4'-9"	0'-5 ³ / ₈ "	17'-1"	7'-0"	0'-5 ³ / ₈ "
AA	4	25'-4"	7	11'-5"	8'-2"	0'-3 ³ / ₄ "	13'-8"	10'-4"	0'-3 ³ / ₄ "	5	14'-9"	4'-9"	0'-5 ¹ / ₄ "	17'-1"	7'-0"	0'-5 ¹ / ₄ "
BB	4	25'-4"	7	11'-11"	8'-8"	0'-3 ³ / ₄ "	14'-2"	10'-10"	0'-3 ³ / ₄ "	5	15'-3"	5'-2"	0'-5 ¹ / ₄ "	17'-7"	7'-6"	0'-5 ¹ / ₄ "
CC	4	26'-3"	7	11'-8"	8'-2"	0'-3 ³ / ₄ "	13'-10"	10'-5"	0'-3 ³ / ₄ "	5	15'-3"	5'-2"	0'-5"	17'-7"	7'-6"	0'-5"
DD	5	27'-2"	7	12'-3"	8'-11"	0'-3 ⁵ / ₈ "	15'-6"	12'-2"	0'-3 ⁵ / ₈ "	5	15'-9"	5'-8"	0'-4 ³ / ₄ "	19'-1"	9'-0"	0'-4 ³ / ₄ "
EE	5	27'-7"	7	12'-11"	9'-3"	0'-3 ³ / ₄ "	16'-2"	12'-6"	0'-3 ³ / ₄ "	5	16'-9"	5'-8"	0'-5 ¹ / ₄ "	20'-1"	9'-0"	0'-5 ¹ / ₄ "

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS		<h2>WING DETAILS</h2> <p>1¹/₂: 1 FILL SLOPE - TYPE I</p> VIRGINIA DEPARTMENT OF TRANSPORTATION			SPECIFICATION REFERENCE
SHEET 5 OF 8	REVISION DATE				
1006.05	07/12				

WING	WF7							WF8		WF9		WF10		WF11			
	SIZE	ø			LENGTH			SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	ø	LENGTH	• Eø
		FROM	TO	VARY BY	FROM	TO	VARY BY										
A	-	-	-	-	-	-	-	4	4'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
B	-	-	-	-	-	-	-	4	5'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
C	-	-	-	-	-	-	-	4	6'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
D	-	-	-	-	-	-	-	4	6'-2"	4	3'-5"	4	2'-2"	4	2'-2"	4'-2"	4
E	-	-	-	-	-	-	-	4	7'-2"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
F	-	-	-	-	-	-	-	4	8'-2"	4	3'-11"	4	2'-2"	4	2'-2"	4'-2"	4
G	-	-	-	-	-	-	-	4	8'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
H	-	-	-	-	-	-	-	4	9'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
I	-	-	-	-	-	-	-	4	10'-2"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
J	-	-	-	-	-	-	-	4	11'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
K	-	-	-	-	-	-	-	4	12'-2"	4	6'-2"	4	2'-2"	4	2'-2"	4'-2"	4
L	-	-	-	-	-	-	-	4	12'-2"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
M	-	-	-	-	-	-	-	4	13'-2"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
N	5	7'-10"	6'-5"	0'-2 1/8"	9'-2"	7'-9"	0'-2 1/8"	4	13'-2"	4	7'-8"	4	2'-8"	4	2'-2"	4'-2"	4
O	5	7'-10"	6'-6"	0'-2"	9'-2"	7'-10"	0'-2"	4	14'-2"	4	7'-8"	4	2'-8"	4	2'-2"	4'-2"	4
P	5	8'-4"	6'-7"	0'-2"	9'-8"	7'-11"	0'-2"	4	15'-2"	4	8'-2"	4	2'-8"	4	2'-2"	4'-2"	4
Q	6	8'-10"	7'-1"	0'-2"	10'-2"	8'-5"	0'-2"	4	15'-2"	4	8'-8"	4	3'-2"	4	2'-2"	4'-2"	4
R	6	9'-4"	7'-7"	0'-2"	10'-7"	8'-10"	0'-2"	4	16'-2"	4	9'-2"	4	3'-2"	4	2'-2"	4'-2"	4
S	6	9'-4"	7'-8"	0'-2"	10'-7"	8'-11"	0'-2"	4	17'-2"	4	9'-2"	4	3'-2"	4	2'-2"	4'-2"	4
T	6	10'-10"	8'-7"	0'-2 1/8"	13'-1"	10'-11"	0'-2 1/8"	4	18'-2"	4	10'-8"	4	3'-8"	4	2'-2"	4'-2"	4
U	6	11'-4"	8'-11"	0'-2 3/8"	13'-7"	11'-3"	0'-2 3/8"	4	18'-2"	4	11'-2"	4	3'-8"	4	2'-2"	4'-2"	4
V	7	11'-10"	9'-5"	0'-2 3/8"	14'-0"	11'-8"	0'-2 3/8"	4	19'-2"	4	11'-8"	4	3'-8"	4	2'-2"	4'-2"	4
W	7	12'-10"	10'-3"	0'-2 1/2"	15'-0"	12'-5"	0'-2 1/2"	4	20'-2"	4	12'-8"	4	3'-8"	4	2'-2"	4'-2"	4
X	7	14'-4"	11'-5"	0'-2 3/4"	16'-6"	13'-8"	0'-2 3/4"	4	20'-2"	4	14'-2"	4	4'-2"	4	2'-2"	4'-2"	4
Y	7	14'-4"	11'-1"	0'-2 5/8"	16'-6"	13'-4"	0'-2 5/8"	4	21'-2"	4	14'-2"	4	4'-2"	4	2'-2"	4'-2"	4
Z	7	14'-10"	11'-7"	0'-2 5/8"	17'-0"	13'-10"	0'-2 5/8"	4	22'-2"	4	14'-8"	4	4'-2"	4	2'-2"	4'-2"	4
AA	7	14'-10"	11'-9"	0'-2 5/8"	17'-0"	14'-0"	0'-2 5/8"	4	23'-2"	4	14'-8"	4	4'-2"	4	2'-2"	4'-2"	4
BB	8	15'-4"	12'-3"	0'-2 5/8"	17'-6"	14'-5"	0'-2 5/8"	4	23'-2"	4	15'-2"	4	4'-8"	4	2'-2"	4'-2"	4
CC	8	15'-4"	11'-11"	0'-2 1/2"	17'-6"	14'-1"	0'-2 1/2"	4	24'-2"	4	15'-2"	4	4'-8"	4	2'-2"	4'-2"	4
DD	8	15'-10"	12'-7"	0'-2 3/8"	19'-0"	15'-9"	0'-2 3/8"	5	25'-2"	5	15'-8"	5	5'-2"	5	2'-9"	5'-4"	4
EE	8	16'-10"	13'-3"	0'-2 5/8"	20'-0"	16'-5"	0'-2 5/8"	5	25'-2"	5	16'-8"	5	5'-2"	5	2'-9"	5'-4"	4

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SPECIFICATION REFERENCE	<p>WING DETAILS 1 1/2: 1 FILL SLOPE - TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 6 OF 8 1006.06

2016 ROAD & BRIDGE STANDARDS

BCW-11


WING	STEM BAR SPACINGS												SIZE	WV1						WV2					
	WV1		WV2		WV3		WV4		WH1		WH2			α			LENGTH			SIZE	LENGTH				
	O	P	Q	R	S	T	U	V	W	X	Y	Z		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY		
A	4	4'-0"	3	3'-9"	-	-	-	-	1	1'-3"	1	1'-3"	4	4'-11"	3'-1"	0'-5 3/8"	6'-10"	5'-0"	0'-5 3/8"	4	4'-11"	3'-2"	0'-6 3/4"		
B	5	5'-0"	4	5'-0"	-	-	-	-	1	0'-6"	1	1'-3"	4	5'-5"	3'-1"	0'-5 1/2"	7'-4"	5'-0"	0'-5 1/2"	4	5'-5"	3'-1"	0'-6 3/4"		
C	6	6'-0"	5	6'-3"	-	-	-	-	1	1'-0"	1	1'-3"	4	5'-11"	3'-1"	0'-5 3/8"	7'-10"	5'-0"	0'-5 3/8"	4	5'-11"	3'-0"	0'-7"		
D	6	6'-0"	5	6'-3"	-	-	-	-	2	1'-6"	1	1'-3"	4	6'-5"	3'-7"	0'-5 3/8"	8'-4"	5'-6"	0'-5 3/8"	4	6'-5"	3'-6"	0'-7"		
E	7	7'-0"	6	7'-6"	-	-	-	-	1	0'-9"	2	2'-6"	4	6'-11"	3'-7"	0'-5 5/8"	8'-10"	5'-6"	0'-5 5/8"	4	6'-11"	3'-4"	0'-7"		
F	8	8'-0"	6	7'-6"	-	-	-	-	1	1'-3"	2	2'-6"	4	7'-5"	3'-7"	0'-5 5/8"	9'-4"	5'-6"	0'-5 5/8"	4	7'-5"	3'-10"	0'-7 1/8"		
G	4	4'-0"	6	7'-6"	6	4'-6"	-	-	2	1'-9"	2	2'-6"	4	5'-4"	3'-5"	0'-5 5/8"	7'-2"	5'-3"	0'-5 5/8"	4	7'-5"	4'-4"	0'-7 1/8"		
H	5	5'-0"	7	8'-9"	6	4'-6"	-	-	2	2'-3"	2	2'-6"	4	5'-9"	3'-5"	0'-5 5/8"	7'-8"	5'-3"	0'-5 5/8"	4	8'-5"	4'-3"	0'-7 1/8"		
I	5	5'-0"	8	10'-0"	6	4'-6"	-	-	2	1'-6"	3	3'-9"	4	6'-5"	4'-1"	0'-5 3/8"	8'-4"	6'-0"	0'-5 3/8"	4	8'-11"	4'-4"	0'-6 3/4"		
J	6	6'-0"	9	11'-3"	6	4'-6"	-	-	2	2'-0"	3	3'-9"	4	6'-11"	4'-1"	0'-5 1/2"	8'-9"	6'-0"	0'-5 1/2"	4	9'-5"	4'-3"	0'-6 3/4"		
K	7	7'-0"	10	12'-6"	6	4'-6"	-	-	2	2'-6"	3	3'-9"	4	7'-7"	4'-7"	0'-5"	9'-6"	6'-6"	0'-5"	4	9'-11"	4'-7"	0'-6 3/8"		
L	7	7'-0"	10	12'-6"	6	4'-6"	-	-	3	3'-0"	3	3'-9"	4	7'-10"	4'-7"	0'-5 1/2"	9'-9"	6'-6"	0'-5 1/2"	4	10'-5"	4'-7"	0'-6 3/4"		
M	6	6'-0"	10	12'-6"	8	6'-0"	-	-	2	2'-3"	4	5'-0"	4	7'-8"	4'-10"	0'-5 1/2"	9'-7"	6'-9"	0'-5 1/2"	4	10'-11"	5'-1"	0'-7"		
N	4	4'-0"	10	12'-6"	5	3'-9"	8	4'-0"	3	2'-9"	4	5'-0"	5	7'-0"	5'-1"	0'-5 1/2"	8'-11"	7'-1"	0'-5 1/2"	4	11'-5"	5'-7"	0'-7"		
O	4	4'-0"	11	13'-9"	5	3'-9"	8	4'-0"	3	3'-3"	4	5'-0"	5	7'-6"	5'-7"	0'-5 5/8"	9'-5"	7'-6"	0'-5 5/8"	4	11'-11"	5'-6"	0'-7"		
P	5	5'-0"	12	15'-0"	7	5'-3"	10	5'-0"	2	2'-6"	5	6'-3"	5	6'-9"	4'-5"	0'-5 5/8"	8'-8"	6'-4"	0'-5 5/8"	4	12'-5"	5'-4"	0'-7"		
Q	5	5'-0"	12	15'-0"	7	5'-3"	10	5'-0"	3	3'-0"	5	6'-3"	5	7'-3"	4'-11"	0'-5 5/8"	9'-2"	6'-10"	0'-5 5/8"	4	12'-11"	5'-10"	0'-7"		
R	5	5'-0"	13	16'-3"	7	5'-3"	10	5'-0"	3	3'-6"	5	6'-3"	4	7'-9"	5'-5"	0'-5 5/8"	9'-8"	7'-3"	0'-5 5/8"	4	13'-5"	5'-9"	0'-7"		
S	5	5'-0"	14	17'-6"	7	5'-3"	10	5'-0"	4	4'-0"	5	6'-3"	5	8'-3"	5'-10"	0'-5 5/8"	10'-2"	7'-10"	0'-5 5/8"	4	13'-11"	5'-7"	0'-7"		
T	6	6'-0"	14	17'-6"	8	6'-0"	12	6'-0"	3	3'-3"	6	7'-6"	5	8'-7"	5'-9"	0'-5 1/2"	10'-6"	7'-9"	0'-5 1/2"	4	14'-11"	6'-10"	0'-6 3/4"		
U	6	6'-0"	14	17'-6"	8	6'-0"	12	6'-0"	3	3'-9"	6	7'-6"	5	9'-1"	6'-3"	0'-5 1/2"	11'-0"	8'-3"	0'-5 1/2"	4	15'-5"	7'-4"	0'-6 3/4"		
V	6	6'-0"	15	18'-9"	8	6'-0"	12	6'-0"	4	4'-3"	6	7'-6"	5	9'-6"	6'-9"	0'-5 1/2"	11'-6"	8'-8"	0'-5 1/2"	4	15'-11"	7'-3"	0'-6 3/4"		
W	6	6'-0"	16	20'-0"	8	6'-0"	12	6'-0"	4	4'-9"	6	7'-6"	5	10'-0"	7'-3"	0'-5 1/2"	11'-11"	9'-2"	0'-5 1/2"	4	16'-5"	7'-1"	0'-6 3/4"		
X	6	6'-0"	16	20'-0"	8	6'-0"	12	6'-0"	5	5'-3"	6	7'-6"	5	10'-6"	7'-9"	0'-5 1/2"	12'-5"	9'-8"	0'-5 1/2"	4	16'-11"	7'-7"	0'-6 3/4"		
Y	7	7'-0"	17	21'-3"	10	7'-6"	14	7'-0"	4	4'-6"	7	8'-9"	5	9'-10"	6'-7"	0'-5 1/2"	11'-9"	8'-6"	0'-5 1/2"	4	17'-5"	7'-6"	0'-7"		
Z	7	7'-0"	18	22'-6"	10	7'-6"	14	7'-0"	4	5'-0"	7	8'-9"	6	10'-4"	7'-0"	0'-5 5/8"	12'-4"	9'-1"	0'-5 5/8"	4	17'-11"	7'-4"	0'-7"		
AA	7	7'-0"	18	22'-6"	10	7'-6"	14	7'-0"	4	4'-3"	8	10'-0"	6	10'-9"	7'-6"	0'-5 5/8"	12'-10"	9'-6"	0'-5 5/8"	4	18'-5"	7'-10"	0'-7"		
BB	7	7'-0"	18	22'-6"	10	7'-6"	21	10'-6"	4	4'-9"	8	10'-0"	7	9'-8"	6'-4"	0'-5 5/8"	11'-9"	8'-5"	0'-5 5/8"	4	18'-11"	8'-4"	0'-7"		
CC	8	8'-0"	19	23'-9"	11	8'-3"	24	12'-0"	5	5'-3"	8	10'-0"	7	9'-1"	5'-3"	0'-5 5/8"	11'-2"	7'-5"	0'-5 5/8"	4	19'-5"	8'-3"	0'-7"		
DD	8	8'-0"	20	25'-0"	11	8'-3"	24	12'-0"	5	5'-9"	8	10'-0"	7	10'-0"	6'-3"	0'-5 5/8"	12'-2"	8'-4"	0'-5 5/8"	4	20'-5"	8'-7"	0'-7"		
EE	8	8'-0"	20	25'-0"	11	8'-3"	24	12'-0"	5	6'-3"	8	10'-0"	7	10'-6"	6'-9"	0'-5 5/8"	12'-8"	8'-10"	0'-5 5/8"	4	20'-11"	9'-1"	0'-7"		

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 ROAD AND BRIDGE STANDARDS		<h2 style="margin: 0;">WING DETAILS</h2> <p style="margin: 0;">1 1/2' : 1 FILL SLOPE - TYPE I</p> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SPECIFICATION REFERENCE
SHEET 7 OF 8	REVISION DATE		
1006.07	07/12		

WING	SIZE	WV3						WV4						WH1			WH2				WH3					
		a			LENGTH			SIZE	a			LENGTH			SIZE	LENGTH	* Eo	SIZE	LENGTH			SIZE	LENGTH			
		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY					FROM	TO	VARY BY			* EA		
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4'-6"	2	4	4	2'-1"	-	-	2	4	4	5'-0"
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5'-6"	2	4	4	4'-8"	2'-0"	2'-7 1/2"	2	4	4	6'-1"
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6'-6"	2	4	4	4'-7"	2'-0"	2'-6 3/4"	2	4	4	7'-3"
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6'-6"	2	4	4	4'-7"	2'-0"	2'-6 3/4"	2	4	4	7'-3"
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	7'-6"	2	4	4	7'-2"	2'-0"	2'-7"	2	4	4	8'-4"
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8'-6"	2	4	4	7'-2"	2'-0"	2'-7"	2	4	4	12'-5"
G	4	7'-11"	5'-9"	0'-4 1/4"	9'-10"	7'-8"	0'-4 1/4"	-	-	-	-	-	-	-	4	8'-6"	2	4	4	7'-2"	2'-0"	2'-7"	2	4	4	13'-5"
H	4	8'-5"	6'-3"	0'-4 1/4"	10'-4"	8'-2"	0'-4 1/4"	-	-	-	-	-	-	-	4	9'-6"	2	4	4	7'-2"	2'-0"	2'-7"	2	4	4	10'-7"
I	5	8'-11"	6'-10"	0'-4 1/8"	10'-10"	8'-10"	0'-4 1/8"	-	-	-	-	-	-	-	4	10'-6"	2	4	4	10'-2"	2'-1"	2'-8 1/4"	2	4	4	11'-7"
J	5	9'-5"	7'-4"	0'-4 1/8"	11'-4"	9'-3"	0'-4 1/8"	-	-	-	-	-	-	-	4	11'-6"	2	4	4	10'-1"	2'-1"	2'-8"	2	4	4	12'-8"
K	6	9'-11"	8'-0"	0'-3 3/4"	11'-11"	10'-0"	0'-3 3/4"	-	-	-	-	-	-	-	4	12'-6"	2	4	4	11'-0"	2'-3"	2'-10 3/4"	2	4	4	13'-7"
L	6	10'-5"	8'-4"	0'-4 1/8"	12'-5"	10'-4"	0'-4 1/8"	-	-	-	-	-	-	-	4	12'-6"	2	4	4	10'-0"	2'-0"	2'-7 3/4"	2	4	4	13'-10"
M	6	10'-11"	8'-1"	0'-4 1/8"	12'-11"	10'-2"	0'-4 1/8"	-	-	-	-	-	-	-	4	13'-6"	2	4	4	12'-8"	2'-0"	2'-7 3/4"	2	4	4	14'-11"
N	6	9'-3"	7'-5"	0'-4 1/8"	11'-3"	9'-6"	0'-4 1/8"	6	11'-5"	9'-7"	0'-2 3/4"	13'-5"	11'-7"	0'-2 3/4"	4	13'-6"	2	4	4	12'-8"	2'-0"	2'-7 3/4"	2	4	4	14'-11"
O	6	9'-8"	7'-11"	0'-4 1/8"	11'-9"	10'-0"	0'-4 1/8"	6	11'-11"	10'-0"	0'-2 3/4"	13'-11"	12'-1"	0'-2 3/4"	4	14'-6"	2	4	4	12'-7"	2'-0"	2'-7 1/2"	2	4	4	16'-1"
P	6	9'-9"	7'-3"	0'-4 1/8"	11'-9"	9'-3"	0'-4 1/8"	6	12'-5"	10'-1"	0'-2 3/4"	14'-5"	12'-1"	0'-2 3/4"	4	15'-6"	2	4	4	15'-2"	2'-0"	2'-7 1/2"	2	4	4	17'-2"
Q	6	10'-3"	7'-9"	0'-4 1/8"	12'-3"	9'-9"	0'-4 1/8"	6	12'-11"	10'-7"	0'-2 3/4"	14'-11"	12'-7"	0'-2 3/4"	4	15'-6"	2	4	4	15'-2"	2'-0"	2'-7 1/2"	2	4	4	17'-2"
R	6	10'-8"	8'-3"	0'-4 1/4"	12'-9"	10'-3"	0'-4 1/4"	7	13'-5"	11'-1"	0'-2 3/4"	15'-6"	13'-2"	0'-2 3/4"	4	16'-6"	2	4	4	15'-1"	2'-0"	2'-7 1/4"	2	4	4	18'-3"
S	6	11'-2"	8'-8"	0'-4 1/4"	13'-3"	10'-9"	0'-4 1/4"	7	13'-11"	11'-7"	0'-2 3/4"	16'-0"	13'-8"	0'-2 3/4"	4	17'-6"	2	4	4	15'-1"	2'-0"	2'-7 3/8"	2	4	4	19'-5"
T	6	11'-10"	9'-0"	0'-4 1/8"	13'-10"	11'-1"	0'-4 1/8"	7	14'-11"	12'-2"	0'-2 3/4"	17'-0"	14'-3"	0'-2 3/4"	4	18'-6"	2	4	4	18'-2"	2'-1"	2'-8"	2	4	4	20'-5"
U	7	12'-4"	9'-6"	0'-4 1/8"	14'-5"	11'-8"	0'-4 1/8"	8	15'-5"	12'-8"	0'-2 3/4"	17'-7"	14'-10"	0'-2 3/4"	4	18'-6"	2	4	4	18'-2"	2'-1"	2'-8"	2	4	4	20'-5"
V	7	12'-9"	10'-0"	0'-4 1/8"	14'-11"	12'-1"	0'-4 1/8"	8	15'-11"	13'-2"	0'-2 3/4"	18'-1"	15'-4"	0'-2 3/4"	4	19'-6"	2	4	4	18'-1"	2'-0"	2'-8"	2	4	4	21'-6"
W	7	13'-3"	10'-6"	0'-4 1/8"	15'-5"	12'-7"	0'-4 1/8"	9	16'-5"	13'-7"	0'-2 3/4"	18'-10"	16'-1"	0'-2 3/4"	4	20'-6"	2	4	4	18'-0"	2'-0"	2'-7 3/4"	2	4	4	22'-8"
X	7	13'-9"	11'-0"	0'-4 1/8"	15'-11"	13'-1"	0'-4 1/8"	8	16'-11"	14'-1"	0'-2 3/4"	19'-1"	16'-4"	0'-2 3/4"	4	20'-6"	2	4	4	18'-0"	2'-0"	2'-7 3/4"	2	4	4	22'-8"
Y	7	13'-10"	10'-3"	0'-4 1/8"	15'-11"	12'-5"	0'-4 1/8"	8	17'-5"	14'-2"	0'-2 3/4"	19'-7"	16'-4"	0'-2 3/4"	4	21'-6"	2	4	4	20'-8"	2'-0"	2'-7 3/4"	2	4	4	23'-9"
Z	7	14'-3"	10'-9"	0'-4 1/8"	16'-5"	12'-11"	0'-4 1/8"	8	17'-11"	14'-8"	0'-2 3/4"	20'-1"	16'-10"	0'-2 3/4"	4	22'-6"	2	4	4	20'-7"	2'-1"	2'-7 3/4"	2	4	4	24'-11"
AA	7	14'-9"	11'-3"	0'-4 1/8"	16'-11"	13'-4"	0'-4 1/8"	9	18'-5"	15'-2"	0'-2 3/4"	20'-10"	17'-7"	0'-2 3/4"	4	23'-6"	2	4	4	23'-2"	2'-1"	2'-7 1/2"	2	4	4	26'-0"
BB	8	13'-8"	10'-1"	0'-4 1/8"	15'-10"	12'-4"	0'-4 1/8"	9	18'-11"	14'-0"	0'-2 3/4"	21'-4"	16'-5"	0'-2 3/4"	4	23'-6"	2	4	4	23'-2"	2'-1"	2'-7 1/2"	2	4	4	26'-0"
CC	8	13'-5"	9'-6"	0'-4 1/8"	15'-7"	11'-9"	0'-4 1/8"	9	19'-5"	13'-9"	0'-2 3/4"	21'-10"	16'-3"	0'-2 3/4"	4	24'-6"	2	4	4	23'-1"	2'-0"	2'-7 1/2"	2	4	4	27'-1"
DD	8	14'-5"	10'-6"	0'-4 1/8"	16'-7"	12'-8"	0'-4 1/8"	9	20'-5"	14'-9"	0'-2 3/4"	22'-10"	17'-2"	0'-2 3/4"	4	25'-6"	2	4	4	23'-1"	2'-0"	2'-7 1/2"	2	4	4	28'-3"
EE	8	14'-11"	11'-0"	0'-4 1/8"	17'-1"	13'-2"	0'-4 1/8"	10	20'-11"	15'-3"	0'-2 3/4"	23'-4"	17'-8"	0'-2 3/4"	4	25'-6"	2	4	4	23'-1"	2'-0"	2'-7 1/2"	2	4	4	28'-3"

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SPECIFICATION REFERENCE	<h3>WING DETAILS</h3> <p>1 1/2: 1 FILL SLOPE - TYPE I</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>		 ROAD AND BRIDGE STANDARDS	
		REVISION DATE	SHEET	8 OF 8
	07/12		1006.08	

BCW-12

GENERAL NOTES

Specifications:

AASHTO LRFD Bridge Design Specifications 5th Edition 2010; 2011 Interim Revisions; and VDOT Modifications

Limits of validity for Standard Wingwall design

The standard wingwall designs are based on the following assumptions:

there is no structural connection between the wall and the box culvert traffic surcharge loading is neglected.

Backfill

Backfill shall comprise granular material with an internal friction angle ϕ' of at least 34°. Cohesive backfill shall not be permitted. Compaction of the backfill material within a distance of one-half the height of the wall shall be by hand compactors only.

Drainage

The Contractor shall provide the drainage system indicated on Sheet I.

The cost for the drainage system (including porous backfill, 6" diameter non-rigid tubing and other items required) shall be incidental to the cost bid for Concrete.

Concrete

All concrete shall be Class A4.

Reinforcement

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The concrete cover to the outermost reinforcement bars shall be as follows:

Wall footing (all faces) 3" minimum cover
Wall stem (all faces) 2 1/2" minimum cover

At the Contractor's option WV Series bars may be spliced at top of the footing in order to facilitate construction. Splice lengths shall be in accordance with Table C on Sheet I. No additional compensation shall be provided for the increase in reinforcing steel quantity due to the splices.

Miscellaneous

Weepholes shall be placed at the lowest point feasible for free drainage away from the wing.


Four Type I Wings are to be used for straight crossings and skews up to 20°. Two Type I and two Type II Wings are to be used for skews from 25° to 45°. For skews above 45°, special design wings are required. The wingwall to be used for each culvert is shown on the BC series sheets.

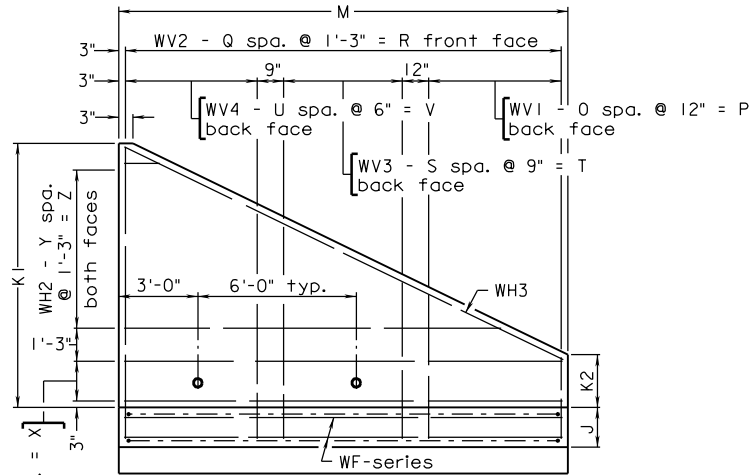
The designs shown are applicable for a 45° skew with the roadway and other conditions indicated. Any change in these conditions invalidates these designs.

Quantities shown are for one wing.

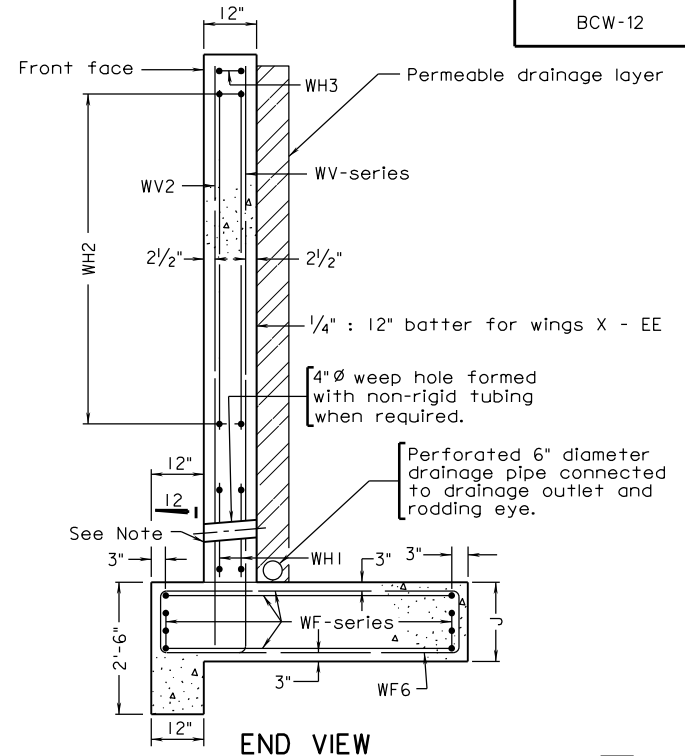
WING	Wall Quantities		qr_min	qr_min
	Concrete CY	Reinforcement LB	ksf High End	ksf Low End
A	2.1	201	1.10	0.47
B	2.5	236	1.28	0.47
C	2.9	263	1.50	0.47
D	3.4	292	1.68	0.47
E	3.9	331	1.88	0.47
F	4.5	361	2.08	0.47
G	5.1	416	2.28	0.47
H	5.9	467	2.49	0.47
I	6.6	671	2.71	0.47
J	7.3	731	2.93	0.47
K	8.0	853	3.15	0.47
L	8.9	935	3.25	0.47
M	9.6	972	3.61	0.47
N	10.6	1064	3.70	0.47
O	11.8	1209	3.80	0.47
P	12.6	1304	4.17	0.47
Q	13.7	1463	4.26	0.47
R	14.9	1670	4.35	0.47
S	17.2	1800	4.64	0.51
T	19.9	2056	4.93	0.55
U	21.4	2504	5.04	0.55
V	23.0	2779	5.15	0.55
W	24.0	3342	5.49	0.55
X	26.9	3415	5.83	0.55
Y	28.7	3602	5.93	0.55
Z	30.6	3846	6.04	0.55
AA	32.5	4425	6.16	0.55
BB	34.5	5408	6.28	0.55
CC	36.3	5571	6.51	0.55
DD	38.7	6063	6.53	0.55
EE	42.1	7235	6.48	0.55

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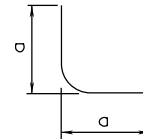
 ROAD AND BRIDGE STANDARDS		WING DETAIL 1 1/2 : 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 8	REVISION DATE		
1006.09	07/12		



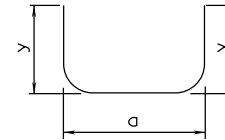
FRONT ELEVATION



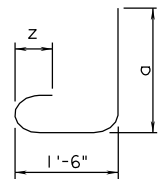
END VIEW



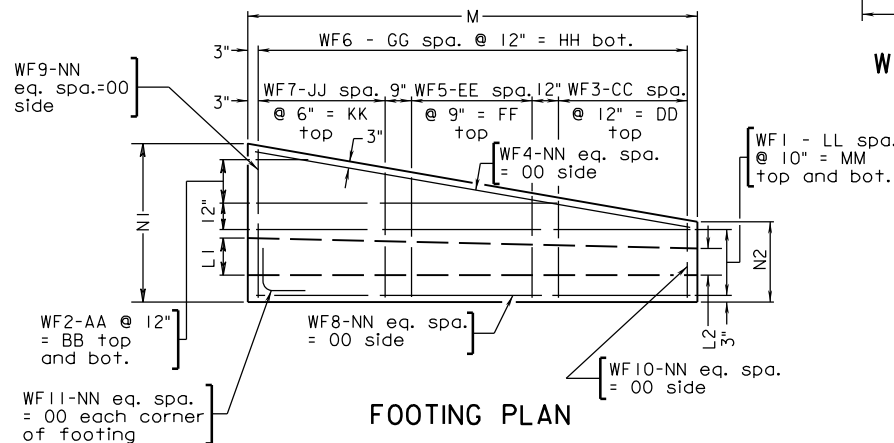
WF11



WF1 TO WF3, WF5 TO WF7



WV1, WV3, WV4



FOOTING PLAN

Wall	y
A-W	9 1/2"
X	1'-0 1/2"
Y-CC	1'-3 1/2"
DD-EE	1'-9 1/2"

Bar Size	Pin Dia.	Z
#3	2 1/4"	4"
#4	3"	4 1/2"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9"	10 7/8"

Bar Size	Splice Length
#4	1'- 9"
#5	2'- 4"
#6	2'- 7"
#7	3'- 3"
#8	4'- 2"
#9	5'- 4"

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SPECIFICATION REFERENCE

WING DETAIL

1/2: 1 FILL SLOPE - TYPE II

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT

ROAD AND BRIDGE STANDARDS

REVISION DATE

SHEET 2 OF 8

07/16


1006.10

2016 ROAD & BRIDGE STANDARDS

BCW-12

WING	WALL DIMENSIONS								No. WEEP HOLES	FOOTING BAR SPACINGS													
	J	K1	K2	L1	L2	M	N1	N2		WF1		WF2		WF3		WF4, WF8 to WF10		WF5		WF6		WF7	
	LL	MM	AA	BB	CC	DD	NN	OO		EE	FF	GG	HH	JJ	KK								
A	1'-6"	4'-0"	1'-0"	1'-0"	1'-0"	6'-6"	4'-0"	3'-0"	-	3	2'-6"	-	-	7	7'-0"	1	0'-8"	-	-	6	6'-0"	-	-
B	1'-6"	4'-6"	1'-0"	1'-0"	1'-0"	7'-6"	4'-0"	3'-0"	-	3	2'-6"	-	-	8	8'-0"	1	0'-8"	-	-	7	7'-0"	-	-
C	1'-6"	5'-0"	1'-0"	1'-0"	1'-0"	8'-6"	4'-0"	3'-0"	-	3	2'-6"	-	-	9	9'-0"	1	0'-8"	-	-	8	8'-0"	-	-
D	1'-6"	5'-6"	1'-0"	1'-0"	1'-0"	9'-6"	4'-3"	3'-0"	-	3	2'-6"	-	-	10	10'-0"	1	0'-8"	-	-	9	9'-0"	-	-
E	1'-6"	6'-0"	1'-0"	1'-0"	1'-0"	10'-6"	4'-6"	3'-0"	-	3	2'-6"	-	-	11	11'-0"	1	0'-8"	-	-	10	10'-0"	-	-
F	1'-6"	6'-6"	1'-0"	1'-0"	1'-0"	11'-6"	4'-9"	3'-0"	-	3	2'-6"	-	-	12	12'-0"	1	0'-8"	-	-	11	11'-0"	-	-
G	1'-6"	7'-0"	1'-0"	1'-0"	1'-0"	12'-6"	5'-0"	3'-0"	-	3	2'-6"	-	-	7	7'-0"	1	0'-8"	5	3'-9"	12	12'-0"	-	-
H	1'-6"	7'-6"	1'-0"	1'-0"	1'-0"	14'-0"	5'-3"	3'-0"	-	3	2'-6"	-	-	8	8'-0"	1	0'-8"	6	4'-6"	13	13'-0"	-	-
I	1'-6"	8'-0"	1'-0"	1'-0"	1'-0"	15'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	6	6'-0"	1	0'-8"	8	6'-0"	14	14'-0"	12	6'-0"
J	1'-6"	8'-6"	1'-0"	1'-0"	1'-0"	16'-0"	5'-9"	3'-0"	-	3	2'-6"	1	1'-0"	6	6'-0"	1	0'-8"	8	6'-0"	15	15'-0"	12	6'-0"
K	1'-6"	9'-0"	1'-0"	1'-0"	1'-0"	17'-0"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	6	6'-0"	1	0'-8"	8	6'-0"	16	16'-0"	12	6'-0"
L	1'-6"	9'-6"	1'-0"	1'-0"	1'-0"	18'-0"	6'-6"	3'-0"	-	3	2'-6"	2	2'-0"	6	6'-0"	1	0'-8"	8	6'-0"	17	17'-0"	12	6'-0"
M	1'-6"	10'-0"	1'-0"	1'-0"	1'-0"	19'-0"	6'-6"	3'-0"	-	3	2'-6"	2	2'-0"	6	6'-0"	1	0'-8"	8	6'-0"	18	18'-0"	12	6'-0"
N	1'-6"	10'-6"	1'-0"	1'-0"	1'-0"	20'-0"	7'-0"	3'-0"	1	3	2'-6"	2	2'-0"	7	7'-0"	1	0'-8"	10	7'-6"	19	19'-0"	14	7'-0"
O	1'-6"	11'-0"	1'-0"	1'-0"	1'-0"	21'-6"	7'-6"	3'-0"	1	3	2'-6"	3	3'-0"	7	7'-0"	1	0'-8"	10	7'-6"	21	20'-0"	14	7'-0"
P	1'-6"	11'-6"	1'-0"	1'-0"	1'-0"	22'-6"	7'-6"	3'-0"	1	3	2'-6"	3	3'-0"	8	8'-0"	1	0'-8"	11	8'-3"	22	22'-0"	16	8'-0"
Q	1'-6"	12'-0"	1'-0"	1'-0"	1'-0"	23'-6"	8'-0"	3'-0"	1	3	2'-6"	3	3'-0"	8	8'-0"	1	0'-8"	11	8'-3"	23	23'-0"	16	8'-0"
R	1'-6"	12'-6"	1'-0"	1'-0"	1'-0"	24'-6"	8'-6"	3'-0"	1	3	2'-6"	4	4'-0"	8	8'-0"	1	0'-8"	11	8'-3"	24	24'-0"	16	8'-0"
S	1'-9"	13'-0"	1'-0"	1'-0"	1'-0"	25'-6"	9'-0"	3'-0"	2	3	2'-6"	4	4'-0"	8	8'-0"	1	0'-11"	11	8'-3"	25	25'-0"	16	8'-0"
T	2'-0"	13'-6"	1'-0"	1'-0"	1'-0"	26'-6"	9'-6"	3'-0"	2	3	2'-6"	5	5'-0"	9	9'-0"	1	1'-2"	12	9'-0"	26	26'-0"	18	9'-0"
U	2'-0"	14'-0"	1'-0"	1'-0"	1'-0"	27'-6"	10'-0"	3'-0"	2	3	2'-6"	5	5'-0"	9	9'-0"	1	1'-2"	12	9'-0"	27	27'-0"	18	9'-0"
V	2'-0"	14'-6"	1'-0"	1'-0"	1'-0"	28'-6"	10'-6"	3'-0"	2	3	2'-6"	6	6'-0"	10	10'-0"	1	1'-2"	14	10'-6"	28	28'-0"	20	10'-0"
W	2'-0"	15'-0"	1'-0"	1'-0"	1'-0"	29'-6"	10'-6"	3'-0"	2	3	2'-6"	6	6'-0"	10	10'-0"	1	1'-2"	14	10'-6"	29	29'-0"	20	10'-0"
X	2'-0"	15'-6"	1'-0"	1'-0"	1'-0"	31'-0"	11'-0"	3'-0"	3	3	2'-6"	6	6'-0"	11	11'-0"	2	0'-7"	15	11'-3"	30	30'-0"	22	11'-0"
Y	2'-0"	16'-0"	1'-0"	1'-4"	1'-1/8"	32'-0"	11'-6"	3'-0"	3	3	2'-6"	7	7'-0"	11	11'-0"	2	0'-7"	15	11'-3"	31	31'-0"	22	11'-0"
Z	2'-0"	16'-6"	1'-0"	1'-4/8"	1'-1/4"	33'-0"	12'-0"	3'-0"	3	3	2'-6"	7	7'-0"	11	11'-0"	2	0'-7"	15	11'-3"	32	32'-0"	22	11'-0"
AA	2'-0"	17'-0"	1'-0"	1'-4/4"	1'-1/4"	34'-0"	12'-6"	3'-0"	3	3	2'-6"	8	8'-0"	11	11'-0"	2	0'-7"	15	11'-3"	33	33'-0"	22	11'-0"
BB	2'-0"	17'-6"	1'-0"	1'-4 3/8"	1'-1/4"	35'-0"	13'-0"	3'-0"	4	3	2'-6"	8	8'-0"	12	12'-0"	2	0'-7"	16	12'-0"	34	34'-0"	24	12'-0"
CC	2'-0"	18'-0"	1'-0"	1'-4 1/2"	1'-1/4"	36'-0"	13'-3"	3'-0"	4	3	2'-6"	8	8'-0"	12	12'-0"	2	0'-7"	16	12'-0"	35	35'-0"	24	12'-0"
DD	2'-0"	18'-6"	1'-0"	1'-4 5/8"	1'-1 3/8"	37'-0"	14'-0"	3'-0"	4	3	2'-6"	9	9'-0"	13	13'-0"	2	0'-7"	18	13'-6"	36	36'-0"	26	13'-0"
EE	2'-0"	19'-0"	1'-0"	1'-4 3/4"	1'-1 3/8"	38'-6"	15'-0"	3'-0"	4	3	2'-6"	10	10'-0"	13	13'-0"	2	0'-7"	18	13'-6"	38	38'-0"	26	13'-0"

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 ROAD AND BRIDGE STANDARDS	
SHEET 3 OF 8	REVISION DATE
1006.11	07/12

WING DETAILS
 1 1/2: 1 FILL SLOPE -TYPE II
 VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

WING	WF 1				WF2								WF3							
	SIZE	a		Ea	SIZE	a			LENGTH			Ea	SIZE	a			LENGTH			
		FROM	TO			VARY BY	FROM	TO	VARY BY	FROM	TO			VARY BY	FROM	TO	VARY BY			
A	4	5'-11"	7'-3"	2	4	1'-0"	7'-6"	-	2'-5"	8'-11"	-	2	4	3'-5"	2'-4"	0'-1 ⁷ / ₈ "	4'-9"	3'-8"	0'-1 ⁷ / ₈ "	
B	4	6'-11"	8'-3"	2	4	1'-3"	8'-9"	-	2'-8"	10'-2"	-	2	4	3'-5"	2'-4"	0'-1 ¹ / ₂ "	4'-9"	3'-8"	0'-1 ¹ / ₂ "	
C	4	7'-11"	9'-3"	2	4	1'-6"	10'-0"	-	2'-11"	11'-5"	-	2	4	3'-5"	2'-4"	0'-1 ³ / ₈ "	4'-9"	3'-8"	0'-1 ³ / ₈ "	
D	4	8'-11"	10'-3"	2	4	3'-2"	10'-9"	-	4'-7"	12'-2"	-	2	4	3'-8"	2'-4"	0'-1 ¹ / ₂ "	5'-0"	3'-8"	0'-1 ¹ / ₂ "	
E	4	9'-11"	11'-3"	2	4	4'-8"	4'-8"	-	6'-0"	6'-0"	-	2	4	3'-11"	2'-4"	0'-1 ³ / ₈ "	5'-3"	3'-8"	0'-1 ⁵ / ₈ "	
F	4	10'-11"	12'-3"	2	4	5'-11"	5'-11"	-	7'-4"	7'-4"	-	2	4	4'-2"	2'-4"	0'-1 ⁷ / ₈ "	5'-6"	3'-8"	0'-1 ⁷ / ₈ "	
G	4	11'-11"	13'-3"	2	4	7'-2"	7'-2"	-	8'-7"	8'-7"	-	2	4	3'-7"	2'-6"	0'-1 ⁷ / ₈ "	5'-0"	3'-10"	0'-1 ⁷ / ₈ "	
H	4	13'-5"	14'-9"	2	4	8'-9"	8'-9"	-	10'-1"	10'-1"	-	2	4	3'-9"	2'-5"	0'-1 ⁷ / ₈ "	5'-1"	3'-10"	0'-1 ⁷ / ₈ "	
I	4	14'-5"	15'-9"	2	4	9'-11"	3'-11"	6'-0"	11'-3"	5'-3"	6'-0"	2	4	2'-7"	1'-7"	0'-2"	4'-0"	3'-0"	0'-2"	
J	4	15'-5"	16'-9"	2	4	11'-0"	5'-2"	5'-9 ³ / ₄ "	12'-5"	6'-7"	5'-9 ³ / ₄ "	2	4	2'-9"	1'-8"	0'-2"	4'-2"	3'-1"	0'-2"	
K	4	16'-5"	17'-9"	2	4	12'-2"	6'-6"	5'-8"	13'-6"	7'-10"	5'-8"	2	4	2'-11"	1'-11"	0'-2"	4'-4"	3'-3"	0'-2"	
L	4	17'-5"	18'-9"	2	4	13'-6"	3'-3"	5'-1 ⁵ / ₈ "	14'-11"	4'-7"	5'-1 ⁵ / ₈ "	2	4	3'-2"	2'-0"	0'-2 ¹ / ₄ "	4'-7"	3'-5"	0'-2 ¹ / ₄ "	
M	4	18'-5"	19'-9"	2	4	14'-4"	3'-5"	5'-5 ⁵ / ₈ "	15'-8"	4'-10"	5'-5 ⁵ / ₈ "	2	4	3'-4"	2'-3"	0'-2 ¹ / ₈ "	4'-9"	3'-7"	0'-2 ¹ / ₈ "	
N	4	19'-5"	20'-9"	2	4	15'-8"	5'-8"	5'-0"	17'-0"	7'-0"	5'-0"	2	4	3'-1"	1'-9"	0'-2 ³ / ₈ "	4'-6"	3'-1"	0'-2 ³ / ₈ "	
O	4	20'-11"	22'-3"	2	4	17'-4"	3'-0"	4'-9 ¹ / ₄ "	18'-8"	4'-4"	4'-9 ¹ / ₄ "	2	4	3'-6"	2'-0"	0'-2 ¹ / ₂ "	4'-10"	3'-4"	0'-2 ¹ / ₂ "	
P	4	21'-11"	23'-3"	2	4	18'-2"	3'-2"	5'-0"	19'-6"	4'-6"	5'-0"	2	4	3'-3"	1'-8"	0'-2 ³ / ₈ "	4'-8"	3'-1"	0'-2 ³ / ₈ "	
Q	4	22'-11"	24'-3"	2	4	19'-4"	5'-3"	4'-8 ³ / ₈ "	20'-9"	6'-8"	4'-8 ³ / ₈ "	2	4	3'-6"	1'-10"	0'-2 ¹ / ₂ "	4'-11"	3'-2"	0'-2 ¹ / ₂ "	
R	4	23'-11"	25'-3"	2	4	20'-6"	2'-9"	4'-5 ³ / ₈ "	21'-11"	4'-1"	4'-5 ³ / ₈ "	2	4	3'-10"	2'-0"	0'-2 ⁵ / ₈ "	5'-2"	3'-5"	0'-2 ⁵ / ₈ "	
S	4	24'-11"	26'-9"	2	4	21'-8"	4'-8"	4'-3"	23'-7"	6'-7"	4'-3"	2	4	4'-1"	2'-3"	0'-2 ⁷ / ₈ "	6'-0"	4'-1"	0'-2 ⁷ / ₈ "	
T	4	25'-11"	28'-3"	2	4	22'-10"	2'-5"	4'-0 ⁷ / ₈ "	25'-2"	4'-10"	4'-0 ⁷ / ₈ "	2	4	4'-0"	1'-10"	0'-2 ⁷ / ₈ "	6'-5"	4'-2"	0'-2 ⁷ / ₈ "	
U	4	26'-11"	29'-3"	2	4	23'-11"	4'-3"	3'-11 ¹ / ₈ "	26'-4"	6'-8"	3'-11 ¹ / ₈ "	2	4	4'-4"	2'-0"	0'-3"	6'-8"	4'-5"	0'-3"	
V	4	27'-11"	30'-3"	2	4	25'-0"	2'-3"	3'-9 ¹ / ₂ "	27'-5"	4'-7"	3'-9 ¹ / ₂ "	2	4	4'-0"	1'-4"	0'-3 ¹ / ₈ "	6'-4"	3'-9"	0'-3 ¹ / ₈ "	
W	4	28'-11"	31'-3"	2	5	25'-11"	2'-4"	3'-11 ¹ / ₈ "	28'-3"	4'-8"	3'-11 ¹ / ₈ "	2	4	4'-2"	1'-8"	0'-3"	6'-7"	4'-0"	0'-3"	
X	4	30'-5"	32'-9"	2	5	27'-6"	4'-3"	3'-10 ¹ / ₂ "	29'-10"	6'-7"	3'-10 ¹ / ₂ "	2	4	4'-2"	1'-4"	0'-3"	6'-6"	3'-8"	0'-3"	
Y	4	31'-5"	33'-9"	2	5	28'-7"	2'-2"	3'-9 ¹ / ₈ "	30'-10"	4'-6"	3'-9 ¹ / ₈ "	2	4	4'-6"	1'-7"	0'-3 ¹ / ₈ "	6'-10"	3'-11"	0'-3 ¹ / ₈ "	
Z	4	32'-5"	34'-9"	2	5	29'-8"	4'-0"	3'-8"	31'-11"	6'-3"	3'-8"	2	4	4'-10"	1'-10"	0'-3 ¹ / ₄ "	7'-2"	4'-2"	0'-3 ¹ / ₄ "	
AA	4	33'-5"	35'-9"	2	5	30'-8"	2'-1"	3'-6 ⁷ / ₈ "	33'-0"	4'-5"	3'-6 ⁷ / ₈ "	2	4	5'-2"	2'-1"	0'-3 ¹ / ₄ "	7'-6"	4'-5"	0'-3 ¹ / ₄ "	
BB	4	34'-5"	36'-9"	2	5	31'-9"	3'-9"	3'-6"	34'-1"	6'-1"	3'-6"	2	4	5'-0"	1'-7"	0'-3 ³ / ₈ "	7'-4"	3'-11"	0'-3 ³ / ₈ "	
CC	4	35'-5"	37'-9"	2	5	32'-9"	4'-8"	3'-6 ¹ / ₈ "	35'-1"	7'-0"	3'-6 ¹ / ₈ "	2	4	5'-3"	1'-10"	0'-3 ³ / ₈ "	7'-8"	4'-3"	0'-3 ³ / ₈ "	
DD	4	36'-5"	38'-9"	2	5	33'-10"	3'-7"	3'-4 ¹ / ₄ "	36'-2"	5'-11"	3'-4 ¹ / ₄ "	2	4	4'-11"	1'-1"	0'-3 ¹ / ₂ "	7'-4"	3'-5"	0'-3 ¹ / ₂ "	
EE	4	37'-11"	40'-3"	2	5	35'-6"	3'-5"	3'-2 ³ / ₈ "	37'-10"	5'-9"	3'-2 ³ / ₈ "	2	4	5'-6"	1'-6"	0'-3 ⁵ / ₈ "	7'-11"	3'-10"	0'-3 ⁵ / ₈ "	

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE


SPECIFICATION REFERENCE	<p>WING DETAILS 1/2: 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 4 OF 8 1006.12

2016 ROAD & BRIDGE STANDARDS

BCW-12


WING	WF4			WF5						WF6						
	SIZE	LENGTH	SIZE	α			LENGTH			SIZE	α			LENGTH		
				FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	5'-8"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-1 ⁷ / ₈ "	4'-9"	3'-9"	0'-1 ⁷ / ₈ "
B	4	6'-8"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-1 ¹ / ₂ "	4'-9"	3'-9"	0'-1 ¹ / ₂ "
C	4	7'-8"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-1 ³ / ₈ "	4'-9"	3'-9"	0'-1 ³ / ₈ "
D	4	8'-9"	-	-	-	-	-	-	-	4	3'-7"	2'-5"	0'-1 ¹ / ₂ "	5'-0"	3'-9"	0'-1 ¹ / ₂ "
E	4	9'-9"	-	-	-	-	-	-	-	4	3'-10"	2'-5"	0'-1 ⁵ / ₈ "	5'-3"	3'-9"	0'-1 ⁵ / ₈ "
F	4	10'-9"	-	-	-	-	-	-	-	4	4'-1"	2'-5"	0'-1 ⁷ / ₈ "	5'-6"	3'-9"	0'-1 ⁷ / ₈ "
G	4	11'-9"	4	4'-4"	3'-9"	0'-1 ³ / ₈ "	5'-9"	5'-2"	0'-1 ³ / ₈ "	4	4'-4"	2'-5"	0'-1 ⁷ / ₈ "	5'-9"	3'-9"	0'-1 ⁷ / ₈ "
H	4	13'-4"	4	4'-8"	3'-11"	0'-1 ³ / ₈ "	6'-0"	5'-3"	0'-1 ³ / ₈ "	4	4'-7"	2'-6"	0'-1 ⁷ / ₈ "	6'-0"	3'-10"	0'-1 ⁷ / ₈ "
I	4	14'-4"	4	3'-9"	2'-9"	0'-1 ¹ / ₂ "	5'-2"	4'-2"	0'-1 ¹ / ₂ "	4	4'-10"	2'-6"	0'-2"	6'-3"	3'-11"	0'-2"
J	4	15'-4"	4	4'-0"	2'-11"	0'-1 ¹ / ₂ "	5'-4"	4'-4"	0'-1 ¹ / ₂ "	4	5'-1"	2'-6"	0'-2"	6'-5"	3'-11"	0'-2"
K	4	16'-5"	5	4'-2"	3'-1"	0'-1 ¹ / ₂ "	5'-6"	4'-5"	0'-1 ¹ / ₂ "	4	5'-4"	2'-6"	0'-2"	6'-8"	3'-11"	0'-2"
L	4	17'-6"	5	4'-7"	3'-5"	0'-1 ³ / ₄ "	5'-11"	4'-9"	0'-1 ³ / ₄ "	4	5'-10"	2'-6"	0'-2 ¹ / ₄ "	7'-2"	3'-11"	0'-2 ¹ / ₄ "
M	4	18'-5"	5	4'-8"	3'-6"	0'-1 ⁵ / ₈ "	5'-11"	4'-10"	0'-1 ⁵ / ₈ "	4	5'-10"	2'-6"	0'-2 ¹ / ₈ "	7'-2"	3'-11"	0'-2 ¹ / ₈ "
N	4	19'-6"	4	4'-10"	3'-4"	0'-1 ³ / ₄ "	6'-2"	4'-8"	0'-1 ³ / ₄ "	4	6'-4"	2'-6"	0'-2 ³ / ₈ "	7'-8"	3'-11"	0'-2 ³ / ₈ "
O	4	21'-1"	4	5'-3"	3'-8"	0'-1 ⁷ / ₈ "	6'-7"	5'-1"	0'-1 ⁷ / ₈ "	4	6'-10"	2'-5"	0'-2 ¹ / ₂ "	8'-2"	3'-10"	0'-2 ¹ / ₂ "
P	4	22'-1"	4	5'-1"	3'-6"	0'-1 ³ / ₄ "	6'-6"	4'-10"	0'-1 ³ / ₄ "	4	6'-10"	2'-5"	0'-2 ³ / ₈ "	8'-2"	3'-10"	0'-2 ³ / ₈ "
Q	4	23'-2"	4	5'-6"	3'-9"	0'-1 ⁷ / ₈ "	6'-11"	5'-1"	0'-1 ⁷ / ₈ "	4	7'-4"	2'-5"	0'-2 ¹ / ₂ "	8'-8"	3'-10"	0'-2 ¹ / ₂ "
R	4	24'-3"	4	5'-11"	4'-1"	0'-2"	7'-4"	5'-5"	0'-2"	4	7'-10"	2'-5"	0'-2 ⁵ / ₈ "	9'-2"	3'-10"	0'-2 ⁵ / ₈ "
S	4	25'-4"	4	6'-4"	4'-4"	0'-2"	8'-2"	6'-3"	0'-2"	4	8'-4"	2'-5"	0'-2 ⁷ / ₈ "	10'-2"	4'-4"	0'-2 ⁷ / ₈ "
T	4	26'-5"	4	6'-6"	4'-3"	0'-2 ¹ / ₈ "	8'-10"	6'-8"	0'-2 ¹ / ₈ "	4	8'-10"	2'-5"	0'-2 ⁷ / ₈ "	11'-2"	4'-10"	0'-2 ⁷ / ₈ "
U	4	27'-6"	4	6'-10"	4'-7"	0'-2 ¹ / ₄ "	9'-3"	6'-11"	0'-2 ¹ / ₄ "	4	9'-4"	2'-5"	0'-3"	11'-8"	4'-10"	0'-3"
V	4	28'-7"	4	7'-0"	4'-3"	0'-2 ¹ / ₄ "	9'-5"	6'-8"	0'-2 ¹ / ₄ "	4	9'-10"	2'-5"	0'-3 ¹ / ₈ "	12'-2"	4'-10"	0'-3 ¹ / ₈ "
W	4	29'-7"	5	7'-1"	4'-5"	0'-2 ¹ / ₄ "	9'-5"	6'-9"	0'-2 ¹ / ₄ "	5	9'-10"	2'-5"	0'-3"	12'-2"	4'-9"	0'-3"
X	4	31'-2"	5	7'-4"	4'-5"	0'-2 ¹ / ₄ "	9'-8"	6'-9"	0'-2 ¹ / ₄ "	5	10'-4"	2'-7"	0'-3"	12'-8"	4'-11"	0'-3"
Y	4	32'-3"	5	7'-9"	4'-9"	0'-2 ³ / ₈ "	10'-1"	7'-1"	0'-2 ³ / ₈ "	5	10'-10"	2'-7"	0'-3 ¹ / ₈ "	13'-2"	4'-11"	0'-3 ¹ / ₈ "
Z	4	33'-4"	5	8'-2"	5'-1"	0'-2 ³ / ₈ "	10'-6"	7'-5"	0'-2 ³ / ₈ "	5	11'-4"	2'-7"	0'-3 ¹ / ₄ "	13'-8"	4'-11"	0'-3 ¹ / ₄ "
AA	4	34'-5"	6	8'-7"	5'-5"	0'-2 ¹ / ₂ "	10'-10"	7'-8"	0'-2 ¹ / ₂ "	5	11'-10"	2'-7"	0'-3 ¹ / ₄ "	14'-2"	4'-11"	0'-3 ¹ / ₄ "
BB	4	35'-7"	6	8'-8"	5'-3"	0'-2 ¹ / ₂ "	11'-0"	7'-7"	0'-2 ¹ / ₂ "	5	12'-4"	2'-7"	0'-3 ³ / ₈ "	14'-8"	4'-11"	0'-3 ³ / ₈ "
CC	4	36'-7"	6	9'-0"	5'-7"	0'-2 ¹ / ₂ "	11'-3"	7'-10"	0'-2 ¹ / ₂ "	5	12'-7"	2'-7"	0'-3 ³ / ₈ "	14'-11"	4'-11"	0'-3 ³ / ₈ "
DD	4	37'-9"	6	9'-3"	5'-3"	0'-2 ⁵ / ₈ "	11'-6"	7'-6"	0'-2 ⁵ / ₈ "	5	13'-4"	2'-7"	0'-3 ¹ / ₂ "	15'-7"	4'-11"	0'-3 ¹ / ₂ "
EE	4	39'-6"	6	10'-1"	5'-10"	0'-2 ³ / ₄ "	12'-4"	8'-1"	0'-2 ³ / ₄ "	5	14'-4"	2'-5"	0'-3 ⁵ / ₈ "	16'-7"	4'-9"	0'-3 ⁵ / ₈ "

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS	<h2>WING DETAILS</h2> <p>1¹/₂: 1 FILL SLOPE - TYPE II</p> VIRGINIA DEPARTMENT OF TRANSPORTATION		SPECIFICATION REFERENCE
	SHEET 5 OF 8 1006.13	REVISION DATE 07/12	

WING	WF7							WF8		WF9		WF10		WF11			
	SIZE	α			LENGTH			SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	α	LENGTH	• Eα
		FROM	TO	VARY BY	FROM	TO	VARY BY										
A	-	-	-	-	-	-	-	4	5'-8"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
B	-	-	-	-	-	-	-	4	6'-8"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
C	-	-	-	-	-	-	-	4	7'-8"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
D	-	-	-	-	-	-	-	4	8'-8"	4	3'-5"	4	2'-2"	4	2'-2"	4'-2"	4
E	-	-	-	-	-	-	-	4	9'-8"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
F	-	-	-	-	-	-	-	4	10'-8"	4	3'-11"	4	2'-2"	4	2'-2"	4'-2"	4
G	-	-	-	-	-	-	-	4	11'-8"	4	4'-2"	4	2'-2"	4	2'-2"	4'-2"	4
H	-	-	-	-	-	-	-	4	13'-2"	4	4'-5"	4	2'-2"	4	2'-2"	4'-2"	4
I	5	4'-11"	3'-11"	0'-0 ⁷ / ₈ "	6'-2"	5'-2"	0'-0 ⁷ / ₈ "	4	14'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
J	5	5'-1"	4'-1"	0'-1"	6'-5"	5'-5"	0'-1"	4	15'-2"	4	4'-11"	4	2'-2"	4	2'-2"	4'-2"	4
K	5	5'-4"	4'-4"	0'-1"	6'-8"	5'-8"	0'-1"	4	16'-2"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
L	5	5'-10"	4'-8"	0'-1 ¹ / ₈ "	7'-2"	6'-0"	0'-1 ¹ / ₈ "	4	17'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
M	5	5'-10"	4'-9"	0'-1"	7'-2"	6'-1"	0'-1"	4	18'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
N	5	6'-4"	5'-0"	0'-1 ¹ / ₈ "	7'-8"	6'-3"	0'-1 ¹ / ₈ "	4	19'-2"	4	6'-2"	4	2'-2"	4	2'-2"	4'-2"	4
O	5	6'-10"	5'-5"	0'-1 ¹ / ₄ "	8'-2"	6'-9"	0'-1 ¹ / ₄ "	4	20'-8"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
P	5	6'-10"	5'-3"	0'-1 ¹ / ₈ "	8'-2"	6'-7"	0'-1 ¹ / ₈ "	4	21'-8"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
Q	6	7'-4"	5'-8"	0'-1 ¹ / ₄ "	8'-8"	6'-11"	0'-1 ¹ / ₄ "	4	22'-8"	4	7'-2"	4	2'-2"	4	2'-2"	4'-2"	4
R	6	7'-10"	6'-1"	0'-1 ¹ / ₄ "	9'-2"	7'-4"	0'-1 ¹ / ₄ "	4	23'-8"	4	7'-8"	4	2'-2"	4	2'-2"	4'-2"	4
S	6	8'-4"	6'-6"	0'-1 ³ / ₈ "	10'-2"	8'-3"	0'-1 ³ / ₈ "	4	24'-8"	4	8'-2"	4	2'-2"	4	2'-2"	4'-2"	4
T	6	8'-10"	6'-7"	0'-1 ³ / ₈ "	11'-2"	8'-11"	0'-1 ³ / ₈ "	4	25'-8"	4	8'-8"	4	2'-2"	4	2'-2"	4'-2"	4
U	7	9'-4"	7'-1"	0'-1 ¹ / ₂ "	11'-7"	9'-3"	0'-1 ¹ / ₂ "	4	26'-8"	4	9'-2"	4	2'-2"	4	2'-2"	4'-2"	4
V	7	9'-10"	7'-3"	0'-1 ¹ / ₂ "	12'-1"	9'-5"	0'-1 ¹ / ₂ "	4	27'-8"	4	9'-8"	4	2'-2"	4	2'-2"	4'-2"	4
W	7	9'-10"	7'-4"	0'-1 ¹ / ₂ "	12'-1"	9'-6"	0'-1 ¹ / ₂ "	4	28'-8"	4	9'-8"	4	2'-2"	4	2'-2"	4'-2"	4
X	7	10'-4"	7'-6"	0'-1 ¹ / ₂ "	12'-7"	9'-9"	0'-1 ¹ / ₂ "	4	30'-2"	4	10'-2"	4	2'-2"	4	2'-2"	4'-2"	4
Y	7	10'-10"	7'-11"	0'-1 ¹ / ₂ "	13'-1"	10'-2"	0'-1 ¹ / ₂ "	4	31'-2"	4	10'-8"	4	2'-2"	4	2'-2"	4'-2"	4
Z	7	11'-4"	8'-4"	0'-1 ⁵ / ₈ "	13'-7"	10'-7"	0'-1 ⁵ / ₈ "	4	32'-2"	4	11'-2"	4	2'-2"	4	2'-2"	4'-2"	4
AA	7	11'-10"	8'-9"	0'-1 ⁵ / ₈ "	14'-1"	11'-0"	0'-1 ⁵ / ₈ "	4	33'-2"	4	11'-8"	4	2'-2"	4	2'-2"	4'-2"	4
BB	8	12'-4"	8'-11"	0'-1 ⁵ / ₈ "	14'-6"	11'-1"	0'-1 ⁵ / ₈ "	4	34'-2"	4	12'-2"	4	2'-2"	4	2'-2"	4'-2"	4
CC	8	12'-7"	9'-2"	0'-1 ⁵ / ₈ "	14'-9"	11'-4"	0'-1 ⁵ / ₈ "	4	35'-2"	4	12'-5"	4	2'-2"	4	2'-2"	4'-2"	4
DD	8	13'-4"	9'-6"	0'-1 ³ / ₄ "	15'-6"	11'-8"	0'-1 ³ / ₄ "	4	36'-2"	4	13'-2"	4	2'-2"	4	2'-2"	4'-2"	4
EE	9	14'-4"	10'-3"	0'-1 ³ / ₄ "	16'-4"	12'-4"	0'-1 ³ / ₄ "	4	37'-8"	4	14'-2"	4	2'-2"	4	2'-2"	4'-2"	4

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<p>WING DETAILS 1/2: 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 6 OF 8 1006.14

BCW-12


WING	STEM BAR SPACINGS												SIZE	WV1						SIZE	WV2		
	WV1		WV2		WV3		WV4		WH1		WH2			α			LENGTH				LENGTH		
	O	P	Q	R	S	T	U	V	W	X	Y	Z		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY
A	7	7'-0"	4	5'-0"	-	-	-	-	-	-	1	1'-3"	4	4'-11"	1'-8"	0'-5½"	6'-10"	3'-7"	0'-5½"	4	4'-11"	2'-7"	0'-7"
B	8	8'-0"	5	6'-3"	-	-	-	-	1	0'-6"	1	1'-3"	4	5'-5"	1'-8"	0'-5⅝"	7'-4"	3'-7"	0'-5⅝"	4	5'-5"	2'-6"	0'-7"
C	9	9'-0"	6	7'-6"	-	-	-	-	-	-	2	2'-6"	4	5'-11"	1'-8"	0'-5⅝"	7'-10"	3'-7"	0'-5⅝"	4	5'-11"	2'-4"	0'-7½"
D	10	10'-0"	7	8'-9"	-	-	-	-	-	-	2	2'-6"	4	6'-5"	1'-8"	0'-5⅝"	8'-4"	3'-7"	0'-5⅝"	4	6'-5"	2'-3"	0'-7½"
E	11	11'-0"	8	10'-0"	-	-	-	-	-	-	3	3'-9"	4	6'-11"	1'-8"	0'-5¾"	8'-10"	3'-7"	0'-5¾"	4	6'-11"	2'-1"	0'-7½"
F	12	12'-0"	8	10'-0"	5	-	-	-	-	-	3	3'-9"	4	7'-5"	1'-8"	0'-5¾"	9'-4"	3'-7"	0'-5¾"	4	7'-5"	2'-7"	0'-7½"
G	7	7'-0"	9	11'-3"	6	3'-9"	-	-	1	0'-6"	3	3'-9"	4	5'-7"	2'-3"	0'-5¾"	7'-6"	4'-2"	0'-5¾"	4	7'-11"	2'-6"	0'-7½"
H	8	8'-0"	10	12'-6"	5	4'-6"	-	-	-	-	4	5'-0"	4	5'-9"	2'-1"	0'-5½"	7'-9"	4'-0"	0'-5½"	4	8'-5"	2'-7"	0'-7"
I	6	6'-0"	11	13'-9"	8	6'-0"	12	6'-0"	-	-	4	5'-0"	4	2'-6"	1'-8"	0'-5⅝"	4'-4"	3'-7"	0'-5⅝"	4	8'-11"	2'-6"	0'-7"
J	6	6'-0"	12	15'-0"	8	6'-0"	12	6'-0"	-	-	5	6'-3"	4	2'-11"	1'-8"	0'-5⅝"	4'-10"	3'-7"	0'-5⅝"	4	9'-5"	2'-4"	0'-7"
K	6	6'-0"	13	16'-3"	8	6'-0"	12	6'-0"	-	-	5	6'-3"	4	3'-5"	1'-8"	0'-5⅝"	5'-4"	3'-7"	0'-5⅝"	4	9'-11"	2'-3"	0'-7"
L	6	6'-0"	14	17'-6"	8	6'-0"	12	6'-0"	1	0'-6"	5	6'-3"	4	3'-11"	1'-8"	0'-5⅝"	5'-10"	3'-7"	0'-5⅝"	4	10'-5"	2'-2"	0'-7"
M	6	6'-0"	14	17'-6"	8	6'-0"	12	6'-0"	-	-	6	7'-6"	4	4'-5"	1'-8"	0'-5⅝"	6'-3"	3'-7"	0'-5⅝"	4	10'-11"	2'-7"	0'-7½"
N	7	7'-0"	15	18'-9"	10	7'-6"	14	7'-0"	-	-	6	7'-6"	4	3'-8"	1'-8"	0'-5⅝"	5'-7"	3'-7"	0'-5⅝"	4	11'-5"	2'-6"	0'-7½"
O	7	7'-0"	16	20'-0"	10	7'-6"	14	7'-0"	-	-	7	8'-9"	4	4'-4"	1'-8"	0'-5½"	6'-3"	3'-7"	0'-5½"	4	11'-11"	2'-7"	0'-7"
P	8	8'-0"	17	21'-3"	11	8'-3"	16	8'-0"	-	-	7	8'-9"	4	4'-0"	1'-8"	0'-5½"	5'-11"	3'-7"	0'-5½"	4	12'-5"	2'-6"	0'-7"
Q	8	8'-0"	18	22'-6"	11	8'-3"	16	8'-0"	1	0'-6"	7	8'-9"	4	4'-6"	1'-8"	0'-5⅝"	6'-4"	3'-7"	0'-5⅝"	4	12'-11"	2'-4"	0'-7"
R	8	8'-0"	19	23'-9"	11	8'-3"	16	8'-0"	-	-	8	10'-0"	4	4'-11"	1'-8"	0'-5⅝"	6'-10"	3'-7"	0'-5⅝"	4	13'-5"	2'-3"	0'-7"
S	8	8'-0"	20	25'-0"	11	8'-3"	16	8'-0"	-	-	8	10'-0"	4	5'-8"	1'-11"	0'-5⅝"	7'-7"	3'-10"	0'-5⅝"	4	14'-2"	2'-4"	0'-7"
T	9	9'-0"	20	25'-0"	12	9'-0"	18	9'-0"	-	-	9	11'-3"	4	5'-7"	1'-8"	0'-5⅝"	7'-6"	3'-7"	0'-5⅝"	4	14'-11"	3'-1"	0'-7"
U	9	9'-0"	21	26'-3"	12	9'-0"	18	9'-0"	-	-	9	11'-3"	4	6'-1"	1'-9"	0'-5⅝"	7'-11"	3'-8"	0'-5⅝"	4	15'-5"	3'-0"	0'-7"
V	10	10'-0"	22	27'-6"	14	10'-6"	20	10'-0"	1	0'-6"	9	11'-3"	4	5'-4"	1'-8"	0'-5⅝"	7'-3"	3'-7"	0'-5⅝"	4	15'-11"	2'-10"	0'-7½"
W	10	10'-0"	23	28'-9"	14	10'-6"	20	10'-0"	-	-	10	12'-6"	4	5'-10"	1'-8"	0'-5⅝"	7'-9"	3'-7"	0'-5⅝"	4	16'-5"	2'-9"	0'-7½"
X	11	11'-0"	24	30'-0"	15	11'-3"	22	11'-0"	-	-	10	12'-6"	4	5'-8"	1'-8"	0'-5⅝"	7'-7"	3'-7"	0'-5⅝"	4	16'-11"	2'-10"	0'-7"
Y	11	11'-0"	25	31'-3"	15	11'-3"	22	11'-0"	-	-	11	13'-9"	4	6'-2"	1'-8"	0'-5⅝"	8'-0"	3'-7"	0'-5⅝"	4	17'-5"	2'-9"	0'-7"
Z	11	11'-0"	26	32'-6"	15	11'-3"	22	11'-0"	-	-	11	13'-9"	4	6'-7"	1'-8"	0'-5⅝"	8'-6"	3'-7"	0'-5⅝"	4	17'-11"	2'-7"	0'-7"
AA	11	11'-0"	26	32'-6"	15	11'-3"	22	11'-0"	1	0'-6"	11	13'-9"	4	7'-1"	1'-11"	0'-5⅝"	9'-0"	3'-10"	0'-5⅝"	4	18'-5"	3'-1"	0'-7"
BB	12	12'-0"	27	33'-9"	16	12'-0"	36	18'-0"	-	-	12	15'-0"	4	3'-11"	1'-8"	0'-5⅝"	5'-10"	3'-7"	0'-5⅝"	4	18'-11"	3'-0"	0'-7"
CC	12	12'-0"	28	35'-0"	16	12'-0"	36	18'-0"	-	-	12	15'-0"	4	4'-5"	1'-8"	0'-5⅝"	6'-3"	3'-7"	0'-5⅝"	4	19'-5"	2'-10"	0'-7"
DD	13	13'-0"	29	36'-3"	18	13'-6"	39	19'-6"	-	-	13	16'-3"	4	3'-5"	1'-8"	0'-5⅝"	5'-4"	3'-7"	0'-5⅝"	4	19'-11"	2'-9"	0'-7"
EE	13	13'-0"	30	37'-6"	18	13'-6"	39	19'-6"	-	-	13	16'-3"	4	4'-2"	1'-8"	0'-5⅝"	6'-0"	3'-7"	0'-5⅝"	4	20'-5"	2'-10"	0'-7"

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 ROAD AND BRIDGE STANDARDS		<h2 style="margin: 0;">WING DETAILS</h2> <p style="margin: 0;">1½: 1 FILL SLOPE - TYPE II</p> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SPECIFICATION REFERENCE
SHEET 7 OF 8	REVISION DATE		
1006.15	07/12		

WING	SIZE	WV3						SIZE	WV4						SIZE	LENGTH	• Ea	SIZE	WH2				SIZE	LENGTH
		o			LENGTH				o			LENGTH							LENGTH					
		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY					FROM	TO	VARY BY	• EA		
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6'-0"	2	4	4'-8"	2'-0"	2'-7½"	2	4	6'-8"
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	7'-0"	2	4	4'-7"	2'-0"	2'-6¾"	2	4	7'-9"
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8'-0"	2	4	7'-2"	2'-0"	2'-6¾"	2	4	8'-11"
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9'-0"	2	4	7'-2"	2'-0"	2'-6¾"	2	4	10'-0"
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	10'-0"	2	4	9'-8"	1'-11"	2'-6¾"	2	4	11'-2"
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	11'-0"	2	4	9'-8"	1'-11"	2'-6¾"	2	4	12'-3"
G	4	7'-11"	6'-1"	0'-4¼"	9'-10"	8'-0"	0'-4¼"	-	-	-	-	-	-	-	4	12'-0"	2	4	9'-8"	1'-11"	2'-6¾"	2	4	13'-4"
H	4	8'-5"	6'-4"	0'-4½"	10'-4"	8'-3"	0'-4½"	-	-	-	-	-	-	-	4	13'-6"	2	4	12'-8"	2'-0"	2'-7¾"	2	4	14'-11"
I	4	5'-9"	2'-11"	0'-4½"	7'-8"	4'-10"	0'-4½"	5	8'-11"	6'-1"	0'-2¾"	10'-10"	8'-1"	0'-2¾"	4	14'-6"	2	4	12'-7"	2'-0"	2'-7½"	2	4	16'-1"
J	4	6'-3"	3'-5"	0'-4½"	8'-2"	5'-4"	0'-4½"	5	9'-5"	6'-7"	0'-2¾"	11'-4"	8'-6"	0'-2¾"	4	15'-6"	2	4	15'-2"	2'-0"	2'-7½"	2	4	17'-2"
K	4	6'-9"	3'-11"	0'-4¼"	8'-7"	5'-9"	0'-4¼"	6	9'-11"	7'-1"	0'-2¾"	11'-11"	9'-1"	0'-2¾"	4	16'-6"	2	4	15'-1"	2'-0"	2'-7¼"	2	4	18'-3"
L	4	7'-3"	4'-4"	0'-4¼"	9'-1"	6'-3"	0'-4¼"	6	10'-5"	7'-7"	0'-2¾"	12'-5"	9'-7"	0'-2¾"	4	17'-6"	2	4	15'-1"	2'-0"	2'-7¾"	2	4	19'-5"
M	4	7'-8"	4'-10"	0'-4¼"	9'-7"	6'-9"	0'-4¼"	6	10'-11"	8'-1"	0'-2¾"	12'-11"	10'-1"	0'-2¾"	4	18'-6"	2	4	17'-8"	2'-0"	2'-7¼"	2	4	20'-6"
N	4	7'-9"	4'-2"	0'-4¼"	9'-7"	6'-1"	0'-4¼"	6	11'-5"	8'-1"	0'-2¾"	13'-5"	10'-1"	0'-2¾"	4	19'-6"	2	4	17'-7"	2'-0"	2'-7¾"	2	4	21'-8"
O	5	8'-4"	4'-10"	0'-4½"	10'-3"	6'-9"	0'-4½"	6	11'-11"	8'-8"	0'-2¾"	13'-11"	10'-8"	0'-2¾"	4	21'-0"	2	4	20'-8"	2'-0"	2'-7¾"	2	4	23'-3"
P	5	8'-4"	4'-5"	0'-4½"	10'-3"	6'-5"	0'-4½"	6	12'-5"	8'-8"	0'-2¾"	14'-5"	10'-8"	0'-2¾"	4	22'-0"	2	4	20'-7"	2'-0"	2'-7¼"	2	4	24'-4"
Q	5	8'-10"	4'-11"	0'-4½"	10'-9"	6'-11"	0'-4½"	6	12'-11"	9'-2"	0'-2¾"	14'-11"	11'-2"	0'-2¾"	4	23'-0"	2	4	20'-7"	2'-0"	2'-7¼"	2	4	25'-5"
R	5	9'-4"	5'-5"	0'-4½"	11'-3"	7'-4"	0'-4½"	7	13'-5"	9'-8"	0'-2¾"	15'-6"	11'-9"	0'-2¾"	4	24'-0"	2	4	23'-2"	2'-1"	2'-7½"	2	4	26'-7"
S	5	10'-0"	6'-2"	0'-4½"	12'-0"	8'-1"	0'-4½"	7	14'-2"	10'-5"	0'-2¾"	16'-3"	12'-6"	0'-2¾"	4	25'-0"	2	4	23'-1"	2'-1"	2'-7½"	2	4	27'-8"
T	5	10'-4"	6'-1"	0'-4¼"	12'-3"	8'-0"	0'-4¼"	7	14'-11"	10'-8"	0'-2¾"	17'-0"	12'-9"	0'-2¾"	4	26'-0"	2	4	25'-8"	2'-0"	2'-7½"	2	4	28'-10"
U	6	10'-10"	6'-6"	0'-4¼"	12'-10"	8'-7"	0'-4¼"	8	15'-5"	11'-2"	0'-2¾"	17'-7"	13'-4"	0'-2¾"	4	27'-0"	2	4	25'-7"	2'-0"	2'-7¾"	2	4	29'-11"
V	6	10'-10"	5'-10"	0'-4¼"	12'-10"	7'-10"	0'-4¼"	8	15'-11"	11'-2"	0'-2¾"	18'-1"	13'-5"	0'-2¾"	4	28'-0"	2	4	25'-7"	2'-0"	2'-7¾"	2	4	31'-0"
W	6	11'-4"	6'-4"	0'-4¼"	13'-4"	8'-4"	0'-4¼"	9	16'-5"	11'-8"	0'-2¾"	18'-10"	14'-1"	0'-2¾"	4	29'-0"	2	4	28'-2"	2'-0"	2'-7¾"	2	4	32'-2"
X	6	11'-5"	6'-2"	0'-4½"	13'-5"	8'-2"	0'-4½"	8	16'-11"	11'-9"	0'-2¾"	19'-1"	14'-0"	0'-2¾"	4	30'-6"	2	4	28'-7"	2'-0"	2'-7¼"	2	4	33'-9"
Y	6	11'-11"	6'-7"	0'-4½"	13'-11"	8'-8"	0'-4½"	8	17'-5"	12'-3"	0'-2¾"	19'-7"	14'-5"	0'-2¾"	4	31'-6"	2	4	31'-2"	2'-0"	2'-7¼"	2	4	34'-10"
Z	7	12'-5"	7'-1"	0'-4½"	14'-6"	9'-3"	0'-4½"	8	17'-11"	12'-9"	0'-2¾"	20'-1"	14'-11"	0'-2¾"	4	32'-6"	2	4	31'-1"	2'-1"	2'-7½"	2	4	35'-11"
AA	7	12'-10"	7'-7"	0'-4½"	15'-0"	9'-8"	0'-4½"	9	18'-5"	13'-3"	0'-2¾"	20'-10"	15'-8"	0'-2¾"	4	33'-6"	2	4	31'-1"	2'-1"	2'-7½"	2	4	37'-1"
BB	7	10'-1"	4'-5"	0'-4½"	12'-2"	6'-6"	0'-4½"	9	18'-11"	10'-5"	0'-2¾"	21'-4"	12'-10"	0'-2¾"	4	34'-6"	2	4	33'-8"	2'-0"	2'-7½"	2	4	38'-2"
CC	7	10'-7"	4'-10"	0'-4¼"	12'-8"	7'-0"	0'-4¼"	9	19'-5"	10'-11"	0'-2¾"	21'-10"	13'-4"	0'-2¾"	4	35'-6"	2	4	33'-7"	2'-1"	2'-7½"	2	4	39'-4"
DD	7	10'-4"	3'-11"	0'-4¼"	12'-5"	6'-0"	0'-4¼"	9	19'-11"	10'-8"	0'-2¾"	22'-4"	13'-2"	0'-2¾"	4	36'-6"	2	4	36'-2"	2'-0"	2'-7½"	2	4	40'-5"
EE	7	10'-11"	4'-7"	0'-4½"	13'-1"	6'-9"	0'-4½"	10	20'-5"	11'-3"	0'-2¾"	22'-10"	13'-9"	0'-2¾"	4	38'-0"	2	4	36'-7"	2'-0"	2'-7¼"	2	4	42'-0"

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SPECIFICATION REFERENCE	<p>WING DETAILS 1½: 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	REVISION DATE	SHEET 8 OF 8
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BCW-21

GENERAL NOTES

Specifications:

AASHTO LRFD Bridge Design Specifications 5th Edition 2010; 2011 Interim Revisions; and VDOT Modifications

Limits of validity for Standard Wingwall design

The standard wingwall designs are based on the following assumptions:

there is no structural connection between the wall and the box culvert traffic surcharge loading is neglected.

Backfill

Backfill shall comprise granular material with an internal friction angle Φ' of at least 32°. Cohesive backfill shall not be permitted. Compaction of the backfill material within a distance of one-half the height of the wall shall be by hand compactors only.

Drainage

The Contractor shall provide the drainage system indicated on Sheet 1.

The cost for the drainage system (including porous backfill, 6" diameter non-rigid tubing and other items required) shall be incidental to the cost bid for Concrete.

Concrete

All concrete shall be Class A4.

Reinforcement

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The concrete cover to the outermost reinforcement bars shall be as follows:

Wall footing (all faces) 3" minimum cover
Wall stem (all faces) 2 1/2" minimum cover

At the Contractor's option WV Series bars may be spliced at top of the footing in order to facilitate construction. Splice lengths shall be in accordance with Table C on Sheet 1. No additional compensation shall be provided for the increase in reinforcing steel quantity due to the splices.

Miscellaneous

Weepholes shall be placed at the lowest point feasible for free drainage away from the wing.

Four Type I Wings are to be used for straight crossings and skews up to 20°. Two Type I and two Type II Wings are to be used for skews from 25° to 45°. For skews above 45°, special design wings are required. The wingwall to be used for each culvert is shown on the BC series sheets.

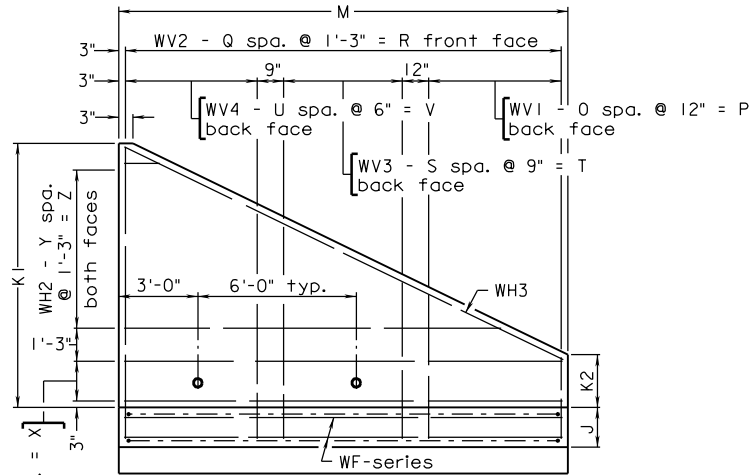
The designs shown are applicable for a 45° skew with the roadway and other conditions indicated. Any change in these conditions invalidates these designs.

Quantities shown are for one wing.

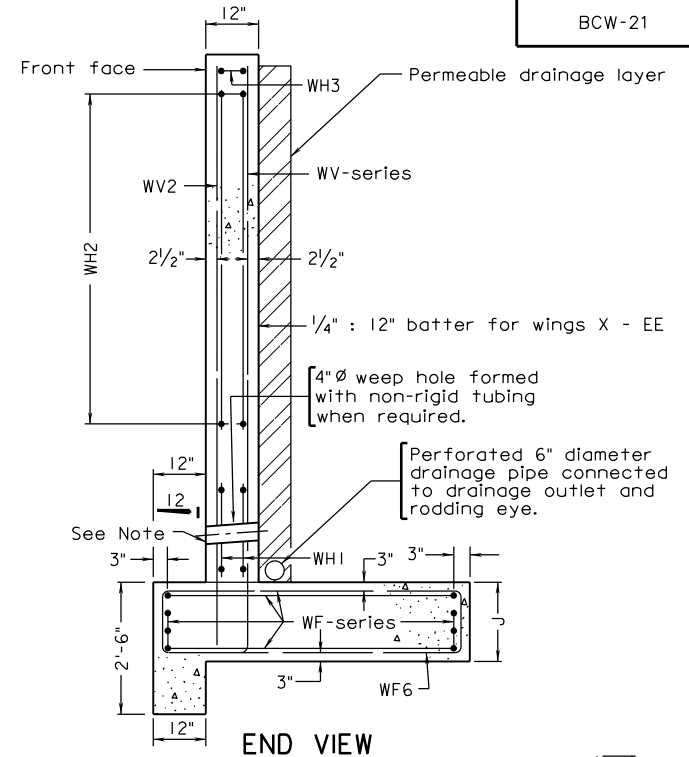
WING	Wall Quantities		qr_min	qr_min
	Concrete CY	Reinforcement LB	ksf High End	ksf Low End
A	2.3	209	0.91	0.46
B	2.8	245	1.05	0.46
C	3.2	273	1.21	0.49
D	4.0	306	1.49	0.52
E	4.4	346	1.49	0.52
F	4.9	376	1.71	0.52
G	5.6	434	1.79	0.55
H	6.2	463	2.03	0.55
I	7.1	552	2.10	0.60
J	7.7	589	2.36	0.60
K	8.6	672	2.43	0.65
L	9.3	738	2.70	0.65
M	10.3	870	2.76	0.71
N	10.7	950	3.05	0.85
O	11.7	1014	3.10	0.85
P	13.2	1172	3.17	0.88
Q	14.0	1337	3.45	0.88
R	15.3	1444	3.51	0.95
S	16.5	1591	3.58	0.95
T	17.5	1695	3.86	1.03
U	18.8	2002	3.92	1.03
v	20.3	2238	3.99	1.11
W	21.7	2403	4.07	1.11
X	27.0	2884	4.28	1.27
Y	31.7	3334	4.36	1.30
Z	33.9	3578	4.46	1.39
AA	35.9	3876	4.56	1.39
BB	38.8	4522	4.56	1.48
CC	41.0	4747	4.66	1.48
DD	50.0	5689	4.99	1.71
EE	52.6	6313	5.10	1.71

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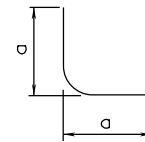
 ROAD AND BRIDGE STANDARDS		WING DETAIL 2:1 FILL SLOPE - TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 8	REVISION DATE		
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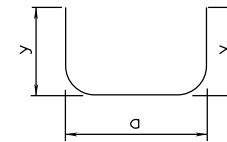
FRONT ELEVATION



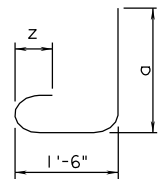
END VIEW



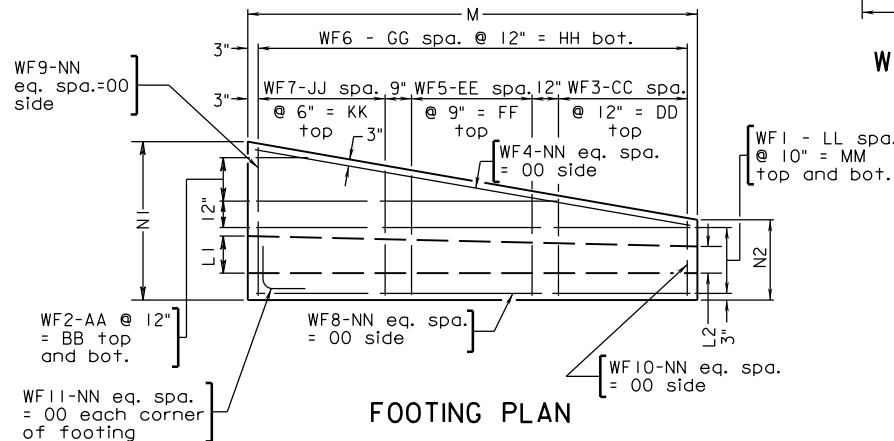
WF11



WF1 TO WF3, WF5 TO WF7



WV1, WV3, WV4



FOOTING PLAN

TABLE A	
Wall	y
A-W	9 1/2"
X	1'-0 1/2"
Y-CC	1'-3 1/2"
DD-EE	1'-9 1/2"

TABLE B		
Bar Size	Pin Dia.	Z
#3	2 1/4"	4"
#4	3"	4 1/2"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9"	10 7/8"

TABLE C	
Bar Size	Splice Length
#4	1'- 9"
#5	2'- 4"
#6	2'- 7"
#7	3'- 3"
#8	4'- 2"
#9	5'- 4"

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SPECIFICATION REFERENCE

WING DETAIL
2: 1 FILL SLOPE - TYPE I
 VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

REVISION DATE

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1007.02

BCW-21


WING	WALL DIMENSIONS								No. WEEP HOLES	FOOTING BAR SPACINGS													
	J	K1	K2	L1	L2	M	N1	N2		WF1		WF2		WF3		WF4, WF8 to WF10		WF5		WF6		WF7	
										LL	MM	AA	BB	CC	DD	NN	OO	EE	FF	GG	HH	JJ	KK
A	1'-6"	4'-0"	1'-6"	1'-0"	1'-0"	7'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	6	6'-0"	1	0'-8"	-	-	6	6'-0"	-	-
B	1'-6"	4'-6"	1'-6"	1'-0"	1'-0"	8'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	7	7'-0"	1	0'-8"	-	-	7	7'-0"	-	-
C	1'-6"	5'-0"	1'-9"	1'-0"	1'-0"	9'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	8	8'-0"	1	0'-8"	-	-	8	8'-0"	-	-
D	1'-6"	5'-6"	2'-0"	1'-0"	1'-0"	10'-0"	4'-6"	3'-0"	-	3	2'-6"	-	-	9	9'-0"	1	0'-8"	-	-	9	9'-0"	-	-
E	1'-6"	6'-0"	2'-0"	1'-0"	1'-0"	11'-0"	4'-6"	3'-0"	-	3	2'-6"	-	-	10	10'-0"	1	0'-8"	-	-	10	10'-0"	-	-
F	1'-6"	6'-6"	2'-0"	1'-0"	1'-0"	12'-0"	4'-6"	3'-0"	-	3	2'-6"	-	-	11	11'-0"	1	0'-8"	-	-	11	11'-0"	-	-
G	1'-6"	7'-0"	2'-3"	1'-0"	1'-0"	13'-0"	5'-0"	3'-0"	-	3	2'-6"	-	-	12	12'-0"	1	0'-8"	-	-	12	12'-0"	-	-
H	1'-6"	7'-6"	2'-3"	1'-0"	1'-0"	14'-0"	5'-0"	3'-0"	-	3	2'-6"	-	-	13	13'-0"	1	0'-8"	-	-	13	13'-0"	-	-
I	1'-6"	8'-0"	2'-6"	1'-0"	1'-0"	15'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	9	9'-0"	1	0'-8"	6	4'-6"	14	14'-0"	-	-
J	1'-6"	8'-6"	2'-6"	1'-0"	1'-0"	16'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	9	9'-0"	1	0'-8"	7	5'-3"	15	15'-0"	-	-
K	1'-6"	9'-0"	2'-9"	1'-0"	1'-0"	17'-0"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	10	10'-0"	1	0'-8"	7	5'-3"	16	16'-0"	-	-
L	1'-6"	9'-6"	2'-9"	1'-0"	1'-0"	18'-0"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	10	10'-0"	1	0'-8"	8	6'-0"	17	17'-0"	-	-
M	1'-6"	10'-0"	3'-0"	1'-0"	1'-0"	19'-0"	6'-6"	3'-0"	-	3	2'-6"	2	2'-0"	11	11'-0"	1	0'-8"	8	6'-0"	18	18'-0"	-	-
N	1'-6"	10'-6"	3'-6"	1'-0"	1'-0"	19'-0"	6'-6"	3'-0"	-	3	2'-6"	2	2'-0"	11	11'-0"	1	0'-8"	8	6'-0"	18	18'-0"	-	-
O	1'-6"	11'-0"	3'-6"	1'-0"	1'-0"	20'-0"	7'-0"	3'-0"	1	3	2'-6"	2	2'-0"	12	12'-0"	1	0'-8"	8	6'-0"	19	19'-0"	-	-
P	1'-6"	11'-6"	3'-9"	1'-0"	1'-0"	21'-0"	7'-6"	3'-6"	1	3	2'-6"	3	3'-0"	12	12'-0"	1	0'-8"	10	7'-6"	20	20'-0"	-	-
Q	1'-6"	12'-0"	3'-9"	1'-0"	1'-0"	22'-0"	7'-6"	3'-6"	1	3	2'-6"	3	3'-0"	13	13'-0"	1	0'-8"	10	7'-6"	21	21'-0"	-	-
R	1'-6"	12'-6"	4'-0"	1'-0"	1'-0"	23'-0"	8'-0"	3'-6"	1	3	2'-6"	3	3'-0"	10	10'-0"	1	0'-8"	9	6'-9"	22	22'-0"	8	4'-0"
S	1'-6"	13'-0"	4'-0"	1'-0"	1'-0"	24'-0"	8'-6"	3'-6"	1	3	2'-6"	4	4'-0"	11	11'-0"	1	0'-8"	9	6'-9"	23	23'-0"	8	4'-0"
T	1'-6"	13'-6"	4'-3"	1'-0"	1'-0"	25'-0"	8'-6"	3'-6"	2	3	2'-6"	4	4'-0"	12	12'-0"	1	0'-8"	9	6'-9"	24	24'-0"	8	4'-0"
U	1'-6"	14'-0"	4'-3"	1'-0"	1'-0"	26'-0"	9'-0"	3'-6"	2	3	2'-6"	4	4'-0"	12	12'-0"	1	0'-8"	9	6'-9"	25	25'-0"	10	5'-0"
V	1'-6"	14'-6"	4'-6"	1'-0"	1'-0"	27'-0"	9'-6"	3'-6"	2	3	2'-6"	5	5'-0"	10	10'-0"	1	0'-8"	13	9'-9"	26	26'-0"	10	5'-0"
W	1'-6"	15'-0"	4'-6"	1'-0"	1'-0"	28'-0"	10'-0"	3'-6"	2	3	2'-6"	5	5'-0"	11	11'-0"	1	0'-8"	13	9'-9"	27	27'-0"	10	5'-0"
X	1'-9"	15'-6"	4'-9"	1'-3 3/4"	1'-1 1/8"	29'-0"	11'-9"	4'-0"	2	4	3'-4"	5	5'-0"	11	11'-0"	1	0'-11"	13	9'-9"	28	28'-0"	12	6'-0"
Y	2'-0"	16'-0"	4'-9"	1'-4"	1'-1 1/8"	30'-0"	12'-0"	4'-6"	3	4	3'-4"	6	6'-0"	10	10'-0"	2	0'-7"	17	12'-9"	29	29'-0"	10	5'-0"
Z	2'-0"	16'-6"	5'-0"	1'-4 1/8"	1'-1 1/4"	31'-0"	12'-6"	4'-6"	3	4	3'-4"	7	7'-0"	10	10'-0"	2	0'-7"	17	12'-9"	30	30'-0"	12	6'-0"
AA	2'-0"	17'-0"	5'-0"	1'-4 1/4"	1'-1 1/4"	32'-0"	13'-0"	4'-6"	3	4	3'-4"	7	7'-0"	11	11'-0"	2	0'-7"	17	12'-9"	31	31'-0"	12	6'-0"
BB	2'-0"	17'-6"	5'-3"	1'-4 3/8"	1'-1 1/4"	33'-0"	14'-0"	4'-6"	3	4	3'-4"	8	8'-0"	12	12'-0"	2	0'-7"	17	12'-9"	32	32'-0"	12	6'-0"
CC	2'-0"	18'-0"	5'-3"	1'-4 1/2"	1'-1 1/4"	34'-0"	14'-6"	4'-6"	3	4	3'-4"	9	9'-0"	13	13'-0"	2	0'-7"	17	12'-9"	33	33'-0"	12	6'-0"
DD	2'-6"	18'-6"	5'-6"	1'-4 5/8"	1'-1 3/8"	35'-0"	15'-0"	5'-0"	4	5	4'-2"	8	8'-0"	12	12'-0"	2	0'-10"	17	12'-9"	34	34'-0"	16	8'-0"
EE	2'-6"	19'-0"	5'-6"	1'-4 3/4"	1'-1 3/8"	36'-0"	15'-6"	5'-0"	4	5	4'-2"	9	9'-0"	12	12'-0"	2	0'-10"	17	12'-9"	35	35'-0"	18	9'-0"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS	WING DETAILS 2:1 FILL SLOPE -TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION		SPECIFICATION REFERENCE
	SHEET 3 OF 8 1007.03	REVISION DATE 07/12	

WING	WF 1				WF 2							WF 3							
	SIZE	α	LENGTH	Eα	SIZE	α			LENGTH			Eα	SIZE	α			LENGTH		
						FROM	TO	VARY BY	FROM	TO	VARY BY			FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	6'-5"	7'-9"	2	4	1'-2"	8'-2"	-	2'-6"	9'-6"	-	2	4	3'-5"	2'-6"	0'-1 3/4"	4'-9"	3'-11"	0'-1 3/4"
B	4	7'-5"	8'-9"	2	4	1'-5"	9'-5"	-	2'-9"	10'-9"	-	2	4	3'-5"	2'-6"	0'-1 1/2"	4'-9"	3'-11"	0'-1 1/2"
C	4	8'-5"	9'-9"	2	4	1'-8"	10'-8"	-	3'-0"	12'-0"	-	2	4	3'-5"	2'-6"	0'-1 1/4"	4'-9"	3'-11"	0'-1 1/4"
D	4	9'-5"	10'-9"	2	4	4'-5"	4'-5"	-	5'-9"	5'-9"	-	2	4	3'-11"	2'-6"	0'-1 3/4"	5'-3"	3'-11"	0'-1 3/4"
E	4	10'-5"	11'-9"	2	4	4'-11"	4'-11"	-	6'-3"	6'-3"	-	2	4	3'-11"	2'-6"	0'-1 5/8"	5'-3"	3'-11"	0'-1 5/8"
F	4	11'-5"	12'-9"	2	4	5'-5"	5'-5"	-	6'-9"	6'-9"	-	2	4	3'-11"	2'-6"	0'-1 1/2"	5'-3"	3'-11"	0'-1 1/2"
G	4	12'-5"	13'-9"	2	4	7'-6"	7'-6"	-	8'-11"	8'-11"	-	2	4	4'-5"	2'-6"	0'-1 3/4"	5'-9"	3'-11"	0'-1 3/4"
H	4	13'-5"	14'-9"	2	4	8'-2"	8'-2"	-	9'-6"	9'-6"	-	2	4	4'-5"	2'-6"	0'-1 3/4"	5'-9"	3'-11"	0'-1 3/4"
I	4	14'-5"	15'-9"	2	4	9'-11"	3'-11"	6'-0"	11'-3"	5'-3"	6'-0"	2	4	4'-0"	2'-6"	0'-2"	5'-4"	3'-10"	0'-2"
J	4	15'-5"	16'-9"	2	4	10'-7"	4'-2"	6'-4 7/8"	11'-11"	5'-7"	6'-4 7/8"	2	4	3'-11"	2'-6"	0'-1 7/8"	5'-3"	3'-10"	0'-1 7/8"
K	4	16'-5"	17'-9"	2	4	12'-2"	6'-6"	5'-8"	13'-6"	7'-10"	5'-8"	2	4	4'-3"	2'-6"	0'-2 1/4"	5'-8"	3'-11"	0'-2 1/4"
L	4	17'-5"	18'-9"	2	4	12'-11"	6'-11"	6'-0"	14'-3"	8'-3"	6'-0"	2	4	4'-3"	2'-7"	0'-2"	5'-7"	3'-11"	0'-2"
M	4	18'-5"	19'-9"	2	4	14'-4"	3'-5"	5'-5 1/8"	15'-8"	4'-10"	5'-5 1/8"	2	4	4'-7"	2'-7"	0'-2 1/8"	5'-11"	3'-11"	0'-2 1/8"
N	4	18'-5"	19'-9"	2	4	14'-4"	3'-5"	5'-5 1/8"	15'-8"	4'-10"	5'-5 1/8"	2	4	4'-7"	2'-7"	0'-2 1/8"	5'-11"	3'-11"	0'-2 1/8"
O	4	19'-5"	20'-9"	2	4	15'-8"	5'-8"	5'-0"	17'-0"	7'-0"	5'-0"	2	4	5'-0"	2'-7"	0'-2 3/8"	6'-4"	3'-11"	0'-2 3/8"
P	4	20'-5"	21'-9"	2	4	19'-1"	3'-4"	5'-3"	20'-5"	4'-8"	5'-3"	2	4	5'-3"	3'-0"	0'-2 3/8"	6'-8"	4'-4"	0'-2 3/8"
Q	4	21'-5"	22'-9"	2	4	20'-0"	3'-6"	5'-6"	21'-5"	4'-11"	5'-6"	2	4	5'-4"	3'-0"	0'-2 1/8"	6'-8"	4'-4"	0'-2 1/8"
R	4	22'-5"	23'-9"	2	4	21'-1"	5'-9"	5'-1 1/3"	22'-6"	7'-2"	5'-1 1/3"	2	4	4'-11"	3'-0"	0'-2 1/2"	6'-4"	4'-4"	0'-2 1/2"
S	4	23'-5"	24'-9"	2	4	22'-2"	3'-0"	4'-9 1/2"	23'-7"	4'-4"	4'-9 1/2"	2	4	5'-4"	3'-0"	0'-2 3/8"	6'-8"	4'-4"	0'-2 3/8"
T	4	24'-5"	25'-9"	2	4	23'-2"	3'-2"	5'-0"	24'-6"	4'-6"	5'-0"	2	4	5'-4"	3'-0"	0'-2 1/2"	6'-9"	4'-4"	0'-2 1/2"
U	4	25'-5"	26'-9"	2	4	24'-2"	5'-3"	4'-8 3/4"	25'-7"	6'-8"	4'-8 3/4"	2	4	5'-6"	3'-0"	0'-2 5/8"	6'-11"	4'-4"	0'-2 5/8"
V	4	26'-5"	27'-9"	2	4	25'-3"	2'-9"	4'-6"	26'-8"	4'-2"	4'-6"	2	4	5'-2"	3'-0"	0'-2 3/4"	6'-7"	4'-4"	0'-2 3/4"
W	4	27'-5"	28'-9"	2	4	26'-4"	4'-9"	4'-3 3/4"	27'-8"	6'-2"	4'-3 3/4"	2	4	5'-6"	3'-0"	0'-2 7/8"	6'-11"	4'-4"	0'-2 7/8"
X	4	28'-5"	30'-3"	2	5	26'-0"	5'-3"	4'-1 3/4"	27'-9"	7'-1"	4'-1 3/4"	2	5	6'-2"	3'-6"	0'-3"	8'-0"	5'-4"	0'-3"
Y	4	29'-5"	31'-9"	2	5	29'-1"	5'-1"	4'-0"	31'-4"	4'-8"	4'-0"	2	5	6'-6"	4'-0"	0'-3"	8'-10"	6'-4"	0'-3"
Z	4	30'-5"	32'-9"	2	5	30'-1"	2'-11"	3'-10 1/2"	32'-5"	5'-3"	3'-10 1/2"	2	5	6'-7"	4'-0"	0'-3 1/8"	8'-11"	6'-4"	0'-3 1/8"
AA	4	31'-5"	33'-9"	2	5	31'-1"	4'-9"	3'-9 1/8"	33'-5"	7'-0"	3'-9 1/8"	2	5	6'-11"	4'-0"	0'-3 1/2"	9'-3"	6'-4"	0'-3 1/2"
BB	4	32'-5"	34'-9"	2	5	32'-1"	4'-4"	3'-5 3/8"	34'-5"	6'-7"	3'-5 3/8"	2	5	7'-5"	4'-0"	0'-3 1/2"	9'-9"	6'-4"	0'-3 1/2"
CC	4	33'-5"	35'-9"	2	5	33'-1"	2'-6"	3'-4 3/4"	35'-5"	4'-10"	3'-4 3/4"	2	5	7'-10"	4'-0"	0'-3 1/2"	10'-2"	6'-4"	0'-3 1/2"
DD	5	34'-5"	37'-8"	2	5	32'-11"	4'-11"	3'-6"	36'-3"	8'-3"	3'-6"	2	5	7'-11"	4'-6"	0'-3 1/2"	11'-3"	7'-10"	0'-3 1/2"
EE	5	35'-5"	38'-8"	2	5	33'-11"	3'-1"	3'-5 1/8"	37'-3"	6'-5"	3'-5 1/8"	2	5	8'-0"	4'-6"	0'-3 1/2"	11'-4"	7'-10"	0'-3 1/2"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE


SPECIFICATION REFERENCE	<p>WING DETAILS 2: 1 FILL SLOPE -TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 4 OF 8 1007.04

2016 ROAD & BRIDGE STANDARDS

BCW-21


WING	WF4			WF5						WF6						
	SIZE	LENGTH	SIZE	α			LENGTH			SIZE	α			LENGTH		
				FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	6'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-1 ⁵ / ₈ "	4'-9"	3'-10"	0'-1 ⁵ / ₈ "
B	4	7'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-1 ¹ / ₂ "	4'-9"	3'-10"	0'-1 ¹ / ₂ "
C	4	8'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-1 ¹ / ₂ "	4'-9"	3'-10"	0'-1 ¹ / ₂ "
D	4	9'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'-1 ³ / ₄ "	5'-3"	3'-10"	0'-1 ³ / ₄ "
E	4	10'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'-1 ⁵ / ₈ "	5'-3"	3'-10"	0'-1 ⁵ / ₈ "
F	4	11'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'-1 ¹ / ₂ "	5'-3"	3'-10"	0'-1 ¹ / ₂ "
G	4	12'-3"	-	-	-	-	-	-	-	4	4'-4"	2'-6"	0'-1 ³ / ₄ "	5'-9"	3'-10"	0'-1 ³ / ₄ "
H	4	13'-3"	-	-	-	-	-	-	-	4	4'-4"	2'-6"	0'-1 ⁵ / ₈ "	5'-9"	3'-10"	0'-1 ⁵ / ₈ "
I	4	14'-4"	4	4'-11"	4'-2"	0'-1 ¹ / ₂ "	6'-3"	5'-6"	0'-1 ¹ / ₂ "	4	4'-10"	2'-6"	0'-2"	6'-3"	3'-11"	0'-2"
J	4	15'-4"	4	4'-11"	4'-1"	0'-1 ³ / ₈ "	6'-3"	5'-5"	0'-1 ³ / ₈ "	4	4'-10"	2'-6"	0'-1 ⁷ / ₈ "	6'-3"	3'-10"	0'-1 ⁷ / ₈ "
K	4	16'-5"	4	5'-5"	4'-5"	0'-1 ¹ / ₂ "	6'-9"	5'-10"	0'-1 ¹ / ₂ "	4	5'-4"	2'-6"	0'-2"	6'-9"	3'-11"	0'-2"
L	4	17'-5"	4	5'-5"	4'-5"	0'-1 ¹ / ₂ "	6'-9"	5'-9"	0'-1 ¹ / ₂ "	4	5'-4"	2'-6"	0'-2"	6'-9"	3'-11"	0'-2"
M	4	18'-5"	5	5'-11"	4'-9"	0'-1 ⁵ / ₈ "	7'-2"	6'-1"	0'-1 ⁵ / ₈ "	4	5'-10"	2'-6"	0'-2 ¹ / ₈ "	7'-2"	3'-11"	0'-2 ¹ / ₈ "
N	4	18'-5"	5	5'-11"	4'-9"	0'-1 ⁵ / ₈ "	7'-2"	6'-1"	0'-1 ⁵ / ₈ "	4	5'-10"	2'-6"	0'-2 ¹ / ₈ "	7'-2"	3'-11"	0'-2 ¹ / ₈ "
O	4	19'-6"	5	6'-4"	5'-2"	0'-1 ³ / ₄ "	7'-8"	6'-6"	0'-1 ³ / ₄ "	4	6'-4"	2'-6"	0'-2 ³ / ₈ "	7'-8"	3'-11"	0'-2 ³ / ₈ "
P	4	20'-6"	6	6'-11"	5'-5"	0'-1 ⁵ / ₈ "	8'-2"	6'-9"	0'-1 ⁵ / ₈ "	4	6'-10"	3'-0"	0'-2 ¹ / ₄ "	8'-2"	4'-5"	0'-2 ¹ / ₄ "
Q	4	21'-6"	6	6'-11"	5'-6"	0'-1 ⁵ / ₈ "	8'-2"	6'-9"	0'-1 ⁵ / ₈ "	4	6'-10"	3'-0"	0'-2 ¹ / ₈ "	8'-2"	4'-5"	0'-2 ¹ / ₈ "
R	4	22'-7"	5	6'-5"	5'-1"	0'-1 ³ / ₄ "	7'-9"	6'-5"	0'-1 ³ / ₄ "	4	7'-4"	3'-0"	0'-2 ¹ / ₄ "	8'-8"	4'-5"	0'-2 ¹ / ₄ "
S	4	23'-7"	5	6'-11"	5'-6"	0'-1 ⁷ / ₈ "	8'-2"	6'-10"	0'-1 ⁷ / ₈ "	4	7'-10"	3'-0"	0'-2 ¹ / ₂ "	9'-2"	4'-5"	0'-2 ¹ / ₂ "
T	4	24'-7"	6	6'-11"	5'-7"	0'-1 ⁵ / ₈ "	8'-2"	6'-10"	0'-1 ⁵ / ₈ "	4	7'-10"	3'-0"	0'-2 ³ / ₈ "	9'-2"	4'-5"	0'-2 ³ / ₈ "
U	4	25'-9"	6	7'-2"	5'-9"	0'-1 ⁷ / ₈ "	8'-5"	7'-0"	0'-1 ⁷ / ₈ "	4	8'-4"	3'-0"	0'-2 ¹ / ₂ "	9'-8"	4'-5"	0'-2 ¹ / ₂ "
V	4	26'-10"	6	7'-7"	5'-5"	0'-2"	8'-10"	6'-8"	0'-2"	4	8'-10"	3'-1"	0'-2 ⁵ / ₈ "	10'-2"	4'-5"	0'-2 ⁵ / ₈ "
W	4	27'-11"	7	8'-0"	5'-9"	0'-2"	9'-3"	7'-0"	0'-2"	4	9'-4"	3'-1"	0'-2 ³ / ₄ "	10'-8"	4'-5"	0'-2 ³ / ₄ "
X	4	29'-0"	6	8'-9"	6'-4"	0'-2 ¹ / ₈ "	10'-6"	8'-2"	0'-2 ¹ / ₈ "	5	10'-4"	3'-7"	0'-2 ⁷ / ₈ "	12'-2"	5'-5"	0'-2 ⁷ / ₈ "
Y	4	30'-1"	6	9'-11"	6'-9"	0'-1 ¹ / ₄ "	12'-2"	9'-0"	0'-1 ¹ / ₄ "	5	11'-4"	4'-1"	0'-3"	13'-8"	6'-5"	0'-3"
Z	4	31'-2"	6	10'-1"	6'-10"	0'-2 ¹ / ₄ "	12'-5"	9'-1"	0'-2 ¹ / ₄ "	5	11'-10"	4'-1"	0'-3"	14'-2"	6'-5"	0'-3"
AA	4	32'-3"	7	10'-7"	7'-2"	0'-2 ³ / ₈ "	12'-9"	9'-5"	0'-2 ³ / ₈ "	5	12'-4"	4'-1"	0'-3 ¹ / ₈ "	14'-8"	6'-5"	0'-3 ¹ / ₈ "
BB	4	33'-6"	7	11'-5"	7'-9"	0'-2 ¹ / ₂ "	13'-7"	9'-11"	0'-2 ¹ / ₂ "	5	13'-4"	4'-1"	0'-3 ³ / ₈ "	15'-8"	6'-5"	0'-3 ³ / ₈ "
CC	4	34'-7"	7	11'-10"	8'-1"	0'-2 ⁵ / ₈ "	14'-1"	10'-4"	0'-2 ⁵ / ₈ "	5	13'-10"	4'-1"	0'-3 ¹ / ₂ "	16'-2"	6'-5"	0'-3 ¹ / ₂ "
DD	5	35'-7"	7	11'-10"	8'-2"	0'-2 ¹ / ₂ "	15'-1"	11'-5"	0'-2 ¹ / ₂ "	5	14'-4"	4'-7"	0'-3 ³ / ₈ "	17'-8"	7'-11"	0'-3 ³ / ₈ "
EE	5	36'-8"	7	12'-0"	8'-3"	0'-2 ⁵ / ₈ "	15'-3"	11'-6"	0'-2 ⁵ / ₈ "	5	14'-10"	4'-7"	0'-3 ¹ / ₂ "	18'-2"	7'-11"	0'-3 ¹ / ₂ "

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

 ROAD AND BRIDGE STANDARDS		WING DETAILS 2: 1 FILL SLOPE - TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION			SPECIFICATION REFERENCE
					SHEET 5 OF 8

WING	WF7							WF8		WF9		WF10		WF11			
	SIZE	α			LENGTH			SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	α	LENGTH	• Eα
		FROM	TO	VARY BY	FROM	TO	VARY BY										
A	-	-	-	-	-	-	-	4	6'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
B	-	-	-	-	-	-	-	4	7'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
C	-	-	-	-	-	-	-	4	8'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
D	-	-	-	-	-	-	-	4	9'-2"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
E	-	-	-	-	-	-	-	4	10'-2"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
F	-	-	-	-	-	-	-	4	11'-2"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
G	-	-	-	-	-	-	-	4	12'-2"	4	4'-2"	4	2'-2"	4	2'-2"	4'-2"	4
H	-	-	-	-	-	-	-	4	13'-2"	4	4'-2"	4	2'-2"	4	2'-2"	4'-2"	4
I	-	-	-	-	-	-	-	4	14'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
J	-	-	-	-	-	-	-	4	15'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
K	-	-	-	-	-	-	-	4	16'-2"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
L	-	-	-	-	-	-	-	4	17'-2"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
M	-	-	-	-	-	-	-	4	18'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
N	-	-	-	-	-	-	-	4	18'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
O	-	-	-	-	-	-	-	4	19'-2"	4	6'-2"	4	2'-2"	4	2'-2"	4'-2"	4
P	-	-	-	-	-	-	-	4	20'-2"	4	6'-8"	4	2'-8"	4	2'-2"	4'-2"	4
Q	-	-	-	-	-	-	-	4	21'-2"	4	6'-8"	4	2'-8"	4	2'-2"	4'-2"	4
R	5	7'-4"	6'-7"	0'-1 1/8"	8'-8"	7'-11"	0'-1 1/8"	4	22'-2"	4	7'-2"	4	2'-8"	4	2'-2"	4'-2"	4
S	6	7'-10"	7'-0"	0'-1 1/4"	9'-2"	8'-4"	0'-1 1/4"	4	23'-2"	4	7'-8"	4	2'-8"	4	2'-2"	4'-2"	4
T	6	7'-10"	7'-1"	0'-1 1/8"	9'-2"	8'-4"	0'-1 1/8"	4	24'-2"	4	7'-8"	4	2'-8"	4	2'-2"	4'-2"	4
U	6	8'-4"	7'-4"	0'-1 1/4"	9'-8"	8'-7"	0'-1 1/4"	4	25'-2"	4	8'-2"	4	2'-8"	4	2'-2"	4'-2"	4
V	6	8'-10"	7'-9"	0'-1 1/2"	10'-2"	9'-0"	0'-1 1/2"	4	26'-2"	4	8'-8"	4	2'-8"	4	2'-2"	4'-2"	4
W	6	9'-4"	8'-2"	0'-1 3/8"	10'-8"	9'-6"	0'-1 3/8"	4	27'-2"	4	9'-2"	4	2'-8"	4	2'-2"	4'-2"	4
X	6	10'-4"	8'-11"	0'-1 3/8"	12'-2"	10'-8"	0'-1 3/8"	4	28'-2"	4	10'-2"	4	3'-2"	4	2'-2"	4'-2"	4
Y	7	11'-4"	10'-1"	0'-1 1/2"	13'-7"	12'-4"	0'-1 1/2"	4	29'-2"	4	11'-2"	4	3'-8"	4	2'-2"	4'-2"	4
Z	7	11'-10"	10'-4"	0'-1 1/2"	14'-1"	12'-6"	0'-1 1/2"	4	30'-2"	4	11'-8"	4	3'-8"	4	2'-2"	4'-2"	4
AA	7	12'-4"	10'-9"	0'-1 1/2"	14'-7"	13'-0"	0'-1 1/2"	4	31'-2"	4	12'-2"	4	3'-8"	4	2'-2"	4'-2"	4
BB	7	13'-4"	11'-7"	0'-1 5/8"	15'-7"	13'-10"	0'-1 5/8"	4	32'-2"	4	13'-2"	4	3'-8"	4	2'-2"	4'-2"	4
CC	7	13'-10"	12'-1"	0'-1 3/4"	16'-1"	14'-4"	0'-1 3/4"	4	33'-2"	4	13'-8"	4	3'-8"	4	2'-2"	4'-2"	4
DD	7	14'-4"	12'-1"	0'-1 5/8"	17'-7"	15'-3"	0'-1 5/8"	5	34'-2"	5	14'-2"	5	4'-2"	5	2'-9"	5'-4"	4
EE	7	14'-10"	12'-3"	0'-1 3/4"	18'-1"	15'-5"	0'-1 3/4"	5	35'-2"	5	14'-8"	5	4'-2"	5	2'-9"	5'-4"	4

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SPECIFICATION REFERENCE	<p>WING DETAILS 2: 1 FILL SLOPE - TYPE I VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 6 OF 8 1007.06

2016 ROAD & BRIDGE STANDARDS

BCW-21


WING	STEM BAR SPACINGS												WV1						WV2					
	WV1		WV2		WV3		WV4		WH1		WH2		SIZE	α			LENGTH			SIZE	LENGTH			
	0	P	Q	R	S	T	U	V	W	X	Y	Z		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	
A	6	6'-0"	5	6'-3"	-	-	-	-	-	-	1	1'-3"	4	4'-11"	2'-9"	0'-4 3/8"	6'-10"	4'-8"	0'-4 3/8"	4	4'-11"	2'-8"	0'-5 3/8"	
B	7	7'-0"	6	7'-6"	-	-	-	-	1	0'-6"	1	1'-3"	4	5'-5"	2'-9"	0'-4 1/2"	7'-4"	4'-8"	0'-4 1/2"	4	5'-5"	2'-7"	0'-5 5/8"	
C	8	8'-0"	6	7'-6"	-	-	-	-	1	1'-0"	1	1'-3"	4	5'-11"	3'-0"	0'-4 3/8"	7'-10"	4'-11"	0'-4 3/8"	4	5'-11"	3'-2"	0'-5 3/8"	
D	9	9'-0"	7	8'-9"	-	-	-	-	-	-	2	2'-6"	4	6'-11"	3'-3"	0'-4 3/8"	8'-10"	5'-2"	0'-4 3/8"	4	6'-11"	3'-5"	0'-6"	
E	10	10'-0"	8	10'-0"	-	-	-	-	1	0'-9"	2	2'-6"	4	6'-11"	3'-3"	0'-4 3/8"	8'-10"	5'-2"	0'-4 3/8"	4	6'-11"	3'-3"	0'-5 3/8"	
F	11	11'-0"	9	11'-3"	-	-	-	-	1	1'-3"	2	2'-6"	4	7'-5"	3'-3"	0'-4 1/2"	9'-4"	5'-2"	0'-4 1/2"	4	7'-5"	3'-2"	0'-5 5/8"	
G	12	12'-0"	10	12'-6"	-	-	-	-	2	1'-9"	2	2'-6"	4	7'-11"	3'-6"	0'-4 3/8"	9'-10"	5'-5"	0'-4 3/8"	4	7'-11"	3'-4"	0'-5 1/2"	
H	13	13'-0"	10	12'-6"	-	-	-	-	1	1'-0"	3	3'-9"	4	8'-5"	3'-6"	0'-4 1/2"	10'-4"	5'-5"	0'-4 1/2"	4	8'-5"	3'-8"	0'-5 5/8"	
I	9	9'-0"	11	13'-9"	6	4'-6"	-	-	2	1'-6"	3	3'-9"	4	6'-11"	3'-7"	0'-4 3/8"	8'-9"	5'-6"	0'-4 3/8"	4	8'-11"	3'-10"	0'-5 1/2"	
J	9	9'-0"	12	15'-0"	7	5'-3"	-	-	2	2'-0"	3	3'-9"	4	7'-1"	3'-8"	0'-4 1/2"	8'-11"	5'-7"	0'-4 1/2"	4	9'-5"	3'-9"	0'-5 5/8"	
K	10	10'-0"	13	16'-3"	7	5'-3"	-	-	1	1'-3"	4	5'-0"	4	7'-7"	3'-11"	0'-4 3/8"	9'-6"	5'-10"	0'-4 3/8"	4	9'-11"	3'-11"	0'-5 1/2"	
L	10	10'-0"	14	17'-6"	8	6'-0"	-	-	2	1'-9"	4	5'-0"	4	7'-9"	4'-0"	0'-4 1/2"	9'-8"	5'-11"	0'-4 1/2"	4	10'-5"	3'-10"	0'-5 5/8"	
M	11	11'-0"	14	17'-6"	8	6'-0"	-	-	2	2'-3"	4	5'-0"	4	8'-4"	4'-3"	0'-4 3/8"	10'-3"	6'-2"	0'-4 3/8"	4	10'-11"	4'-5"	0'-5 1/2"	
N	11	11'-0"	14	17'-6"	8	6'-0"	-	-	3	2'-9"	4	5'-0"	5	8'-10"	4'-9"	0'-4 3/8"	10'-9"	6'-8"	0'-4 3/8"	4	11'-5"	4'-11"	0'-5 1/2"	
O	12	12'-0"	15	18'-9"	8	6'-0"	-	-	2	2'-0"	5	6'-3"	5	9'-3"	4'-9"	0'-4 1/2"	11'-3"	6'-8"	0'-4 1/2"	4	11'-11"	4'-10"	0'-5 5/8"	
P	12	12'-0"	16	20'-0"	10	7'-6"	-	-	2	2'-6"	5	6'-3"	5	9'-3"	4'-10"	0'-4 3/8"	11'-3"	6'-9"	0'-4 3/8"	4	12'-5"	5'-0"	0'-5 1/2"	
Q	13	13'-0"	17	21'-3"	10	7'-6"	-	-	3	3'-0"	5	6'-3"	5	9'-9"	4'-10"	0'-4 1/2"	11'-8"	6'-9"	0'-4 1/2"	4	12'-11"	4'-11"	0'-5 5/8"	
R	10	10'-0"	18	22'-6"	9	6'-9"	8	4'-0"	3	3'-6"	5	6'-3"	5	8'-9"	5'-1"	0'-4 3/8"	10'-9"	7'-0"	0'-4 3/8"	4	13'-5"	5'-1"	0'-5 1/2"	
S	11	11'-0"	18	22'-6"	9	6'-9"	8	4'-0"	3	2'-9"	6	7'-6"	5	9'-3"	5'-1"	0'-4 1/2"	11'-2"	7'-0"	0'-4 1/2"	4	13'-11"	5'-5"	0'-5 5/8"	
T	12	12'-0"	19	23'-9"	9	6'-9"	8	4'-0"	3	3'-3"	6	7'-6"	5	9'-9"	5'-4"	0'-4 3/8"	11'-9"	7'-3"	0'-4 3/8"	4	14'-5"	5'-7"	0'-5 1/2"	
U	12	12'-0"	20	25'-0"	9	6'-9"	10	5'-0"	3	3'-9"	6	7'-6"	5	9'-10"	5'-4"	0'-4 1/2"	11'-9"	7'-3"	0'-4 1/2"	4	14'-11"	5'-6"	0'-5 5/8"	
V	10	10'-0"	21	26'-3"	13	9'-9"	10	5'-0"	3	3'-0"	7	8'-9"	5	9'-3"	5'-7"	0'-4 3/8"	11'-3"	7'-6"	0'-4 3/8"	4	15'-5"	5'-8"	0'-5 1/2"	
W	11	11'-0"	22	27'-6"	13	9'-9"	10	5'-0"	3	3'-6"	7	8'-9"	5	9'-9"	5'-7"	0'-4 1/2"	11'-8"	7'-6"	0'-4 1/2"	4	15'-11"	5'-7"	0'-5 5/8"	
X	11	11'-0"	22	27'-6"	13	9'-9"	12	6'-0"	4	4'-0"	7	8'-9"	5	10'-2"	6'-1"	0'-4 3/8"	12'-1"	8'-0"	0'-4 3/8"	4	16'-8"	6'-5"	0'-5 1/2"	
Y	10	10'-0"	23	28'-9"	17	12'-9"	10	5'-0"	3	3'-3"	8	10'-0"	5	10'-1"	6'-4"	0'-4 1/2"	12'-0"	8'-3"	0'-4 1/2"	4	17'-5"	6'-7"	0'-5 5/8"	
Z	10	10'-0"	24	30'-0"	17	12'-9"	12	6'-0"	3	3'-9"	8	10'-0"	5	10'-4"	6'-7"	0'-4 3/8"	12'-3"	8'-6"	0'-4 3/8"	4	17'-11"	6'-9"	0'-5 1/2"	
AA	11	11'-0"	25	31'-3"	17	12'-9"	12	6'-0"	4	4'-3"	8	10'-0"	5	10'-9"	6'-7"	0'-4 1/2"	12'-8"	8'-6"	0'-4 1/2"	4	18'-5"	6'-8"	0'-5 5/8"	
BB	12	12'-0"	26	32'-6"	17	12'-9"	12	6'-0"	4	4'-9"	8	10'-0"	6	11'-3"	6'-10"	0'-4 3/8"	13'-4"	8'-10"	0'-4 3/8"	4	18'-11"	6'-10"	0'-5 1/2"	
CC	13	13'-0"	26	32'-6"	17	12'-9"	12	6'-0"	4	4'-0"	9	11'-3"	6	11'-9"	6'-10"	0'-4 1/2"	13'-9"	8'-10"	0'-4 1/2"	4	19'-5"	7'-2"	0'-5 5/8"	
DD	12	12'-0"	27	33'-9"	17	12'-9"	16	8'-0"	4	4'-6"	9	11'-3"	6	12'-1"	7'-7"	0'-4 3/8"	14'-1"	9'-7"	0'-4 3/8"	4	20'-5"	7'-10"	0'-5 1/2"	
EE	12	12'-0"	28	35'-0"	17	12'-9"	18	9'-0"	4	5'-0"	9	11'-3"	6	12'-1"	7'-7"	0'-4 1/2"	14'-1"	9'-7"	0'-4 1/2"	4	20'-11"	7'-9"	0'-5 5/8"	

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 ROAD AND BRIDGE STANDARDS	<h2>WING DETAILS</h2> <h3>2: 1 FILL SLOPE - TYPE I</h3> VIRGINIA DEPARTMENT OF TRANSPORTATION		SPECIFICATION REFERENCE
	SHEET 7 OF 8 1007.07	REVISION DATE 07/12	

WING	SIZE	WV3						SIZE	WV4						WH1			WH2					WH3	
		a			LENGTH				a			LENGTH			SIZE	LENGTH	• Ea	LENGTH				SIZE	LENGTH	
		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY				FROM	TO	VARY BY	• EA			
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6'-6"	2	4	6'-0"	2'-7"	3'-4/8"	2	4	6'-11"
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	7'-6"	2	4	5'-9"	2'-6"	3'-2/2"	2	4	8'-1"
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8'-6"	2	4	6'-0"	2'-7"	3'-4/4"	2	4	9'-1"
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9'-6"	2	4	9'-1"	2'-6"	3'-3/4"	2	4	10'-1"
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	10'-6"	2	4	9'-4"	2'-7"	3'-4/8"	2	4	11'-1"
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	11'-6"	2	4	9'-1"	2'-6"	3'-3/8"	2	4	12'-4"
G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12'-6"	2	4	9'-4"	2'-7"	3'-4/4"	2	4	13'-4"
H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	13'-6"	2	4	12'-4"	2'-6"	3'-3/8"	2	4	14'-4"
I	4	8'-11"	7'-3"	0'-3/4"	10'-10"	9'-2"	0'-3/4"	-	-	-	-	-	-	-	4	14'-6"	2	4	12'-7"	2'-7"	3'-4/8"	2	4	15'-6"
J	4	9'-5"	7'-5"	0'-3/8"	11'-4"	9'-4"	0'-3/8"	-	-	-	-	-	-	-	4	15'-6"	2	4	12'-4"	2'-6"	3'-3/8"	2	4	16'-6"
K	5	9'-11"	8'-0"	0'-3/4"	11'-10"	9'-11"	0'-3/4"	-	-	-	-	-	-	-	4	16'-6"	2	4	16'-0"	2'-7"	3'-4/8"	2	4	17'-6"
L	5	10'-5"	8'-2"	0'-3/8"	12'-4"	10'-11"	0'-3/8"	-	-	-	-	-	-	-	4	17'-6"	2	4	15'-9"	2'-7"	3'-3/2"	2	4	18'-9"
M	6	10'-11"	8'-8"	0'-3/4"	12'-11"	10'-9"	0'-3/4"	-	-	-	-	-	-	-	4	18'-6"	2	4	16'-0"	2'-7"	3'-4/8"	2	4	19'-9"
N	6	11'-5"	9'-2"	0'-3/4"	13'-5"	11'-3"	0'-3/4"	-	-	-	-	-	-	-	4	18'-6"	2	4	16'-0"	2'-7"	3'-4/8"	2	4	19'-9"
O	6	11'-11"	9'-8"	0'-3/8"	13'-11"	11'-8"	0'-3/8"	-	-	-	-	-	-	-	4	19'-6"	2	4	19'-0"	2'-6"	3'-3/8"	2	4	20'-9"
P	6	12'-5"	9'-8"	0'-3/4"	14'-5"	11'-8"	0'-3/4"	-	-	-	-	-	-	-	4	20'-6"	2	4	19'-3"	2'-7"	3'-4/8"	2	4	21'-11"
Q	7	12'-11"	10'-1"	0'-3/8"	15'-0"	12'-3"	0'-3/8"	-	-	-	-	-	-	-	4	21'-6"	2	4	19'-0"	2'-6"	3'-3/8"	2	4	23'-0"
R	6	11'-8"	9'-2"	0'-3/4"	13'-8"	11'-2"	0'-3/4"	6	13'-5"	11'-11"	0'-2/8"	15'-5"	14'-0"	0'-2/8"	4	22'-6"	2	4	19'-3"	2'-7"	3'-4/8"	2	4	24'-0"
S	6	12'-2"	9'-7"	0'-3/8"	14'-2"	11'-7"	0'-3/8"	6	13'-11"	12'-5"	0'-2/4"	15'-11"	14'-5"	0'-2/4"	4	23'-6"	2	4	22'-5"	2'-7"	3'-3/8"	2	4	25'-2"
T	6	12'-8"	10'-2"	0'-3/4"	14'-8"	12'-2"	0'-3/4"	6	14'-5"	12'-11"	0'-2/8"	16'-5"	15'-0"	0'-2/8"	4	24'-6"	2	4	22'-8"	2'-7"	3'-4/8"	2	4	26'-2"
U	7	12'-9"	10'-3"	0'-3/8"	14'-10"	12'-4"	0'-3/8"	7	14'-11"	13'-0"	0'-2/4"	17'-0"	15'-2"	0'-2/4"	4	25'-6"	2	4	22'-5"	2'-7"	3'-3/8"	2	4	27'-3"
V	7	13'-3"	9'-8"	0'-3/4"	15'-5"	11'-9"	0'-3/4"	7	15'-5"	13'-7"	0'-2/8"	17'-6"	15'-8"	0'-2/8"	4	26'-6"	2	4	26'-0"	2'-7"	3'-4/8"	2	4	28'-3"
W	7	13'-9"	10'-1"	0'-3/8"	15'-10"	12'-2"	0'-3/8"	7	15'-11"	14'-0"	0'-2/4"	18'-0"	16'-2"	0'-2/4"	4	27'-6"	2	4	25'-9"	2'-6"	3'-3/4"	2	4	29'-5"
X	7	14'-2"	10'-6"	0'-3/4"	16'-3"	12'-8"	0'-3/4"	7	16'-8"	14'-5"	0'-2/8"	18'-9"	16'-7"	0'-2/8"	4	28'-6"	2	4	26'-0"	2'-7"	3'-4/8"	2	4	30'-5"
Y	7	15'-3"	10'-6"	0'-3/8"	17'-4"	12'-7"	0'-3/8"	7	17'-5"	15'-6"	0'-2/4"	19'-6"	17'-8"	0'-2/4"	4	29'-6"	2	4	29'-0"	2'-7"	3'-3/4"	2	4	31'-6"
Z	7	15'-5"	10'-8"	0'-3/4"	17'-6"	12'-9"	0'-3/4"	7	17'-11"	15'-8"	0'-2/8"	20'-0"	17'-10"	0'-2/8"	4	30'-6"	2	4	29'-3"	2'-7"	3'-4/8"	2	4	32'-7"
AA	7	15'-11"	11'-1"	0'-3/8"	18'-0"	13'-2"	0'-3/8"	7	18'-5"	16'-2"	0'-2/4"	20'-6"	18'-3"	0'-2/4"	4	31'-6"	2	4	29'-0"	2'-7"	3'-3/4"	2	4	33'-7"
BB	8	16'-5"	11'-8"	0'-3/4"	18'-7"	13'-10"	0'-3/4"	8	18'-11"	16'-8"	0'-2/8"	21'-1"	18'-11"	0'-2/8"	4	32'-6"	2	4	29'-3"	2'-7"	3'-4/8"	2	4	34'-7"
CC	8	16'-11"	12'-1"	0'-3/8"	19'-1"	14'-4"	0'-3/8"	8	19'-5"	17'-2"	0'-2/4"	21'-7"	19'-4"	0'-2/4"	4	33'-6"	2	4	32'-4"	2'-7"	3'-3/4"	2	4	35'-10"
DD	8	17'-2"	12'-5"	0'-3/4"	19'-4"	14'-7"	0'-3/4"	8	20'-5"	17'-5"	0'-2/8"	22'-7"	19'-8"	0'-2/8"	4	34'-6"	2	4	32'-7"	2'-8"	3'-4"	2	4	36'-10"
EE	8	17'-3"	12'-6"	0'-3/8"	19'-6"	14'-8"	0'-3/8"	9	20'-11"	17'-6"	0'-2/4"	23'-4"	20'-0"	0'-2/4"	4	35'-6"	2	4	32'-4"	2'-7"	3'-3/4"	2	4	37'-11"

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SPECIFICATION REFERENCE	<p>WING DETAILS 2: 1 FILL SLOPE - TYPE I</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	REVISION DATE	SHEET 8 OF 8
			07/12	1007.08

BCW-22

GENERAL NOTES

Specifications:

AASHTO LRFD Bridge Design Specifications 5th Edition 2010; 2011 Interim Revisions; and VDOT Modifications

Limits of validity for Standard Wingwall design

The standard wingwall designs are based on the following assumptions:

there is no structural connection between the wall and the box culvert traffic surcharge loading is neglected.

Backfill

Backfill shall comprise granular material with an internal friction angle ϕ' of at least 32°. Cohesive backfill shall not be permitted. Compaction of the backfill material within a distance of one-half the height of the wall shall be by hand compactors only.

Drainage

The Contractor shall provide the drainage system indicated on Sheet 2.

The cost for the drainage system (including porous backfill, 6" diameter non-rigid tubing and other items required) shall be incidental to the cost bid for Concrete.

Concrete

All concrete shall be Class A4.

Reinforcement

Deformed reinforcing bars shall conform to ASTM A615, Grade 60. 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.

Dimensions on bar diagrams are out-to-out of bars. Bars are straight unless otherwise shown.

The concrete cover to the outermost reinforcement bars shall be as follows:

Wall footing (all faces) 3" minimum cover
Wall stem (all faces) 2 1/2" minimum cover

At the Contractor's option WV Series bars may be spliced at top of the footing in order to facilitate construction. Splice lengths shall be in accordance with Table C on Sheet 2. No additional compensation shall be provided for the increase in reinforcing steel quantity due to the splices.

Miscellaneous

Weepholes shall be placed at the lowest point feasible for free drainage away from the wing.

Four Type I Wings are to be used for straight crossings and skews up to 20°. Two Type I and two Type II Wings are to be used for skews from 25° to 45°. For skews above 45°, special design wings are required. The wingwall to be used for each culvert is shown on the BC series sheets.

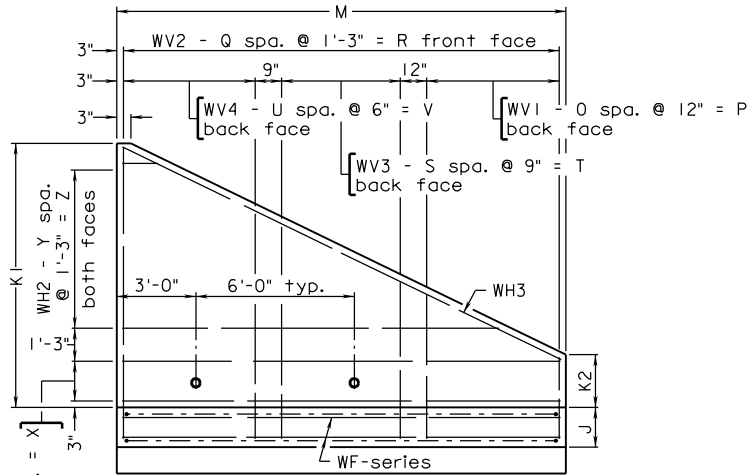
The designs shown are applicable for a 45° skew with the roadway and other conditions indicated. Any change in these conditions invalidates these designs.

Quantities shown are for one wing.

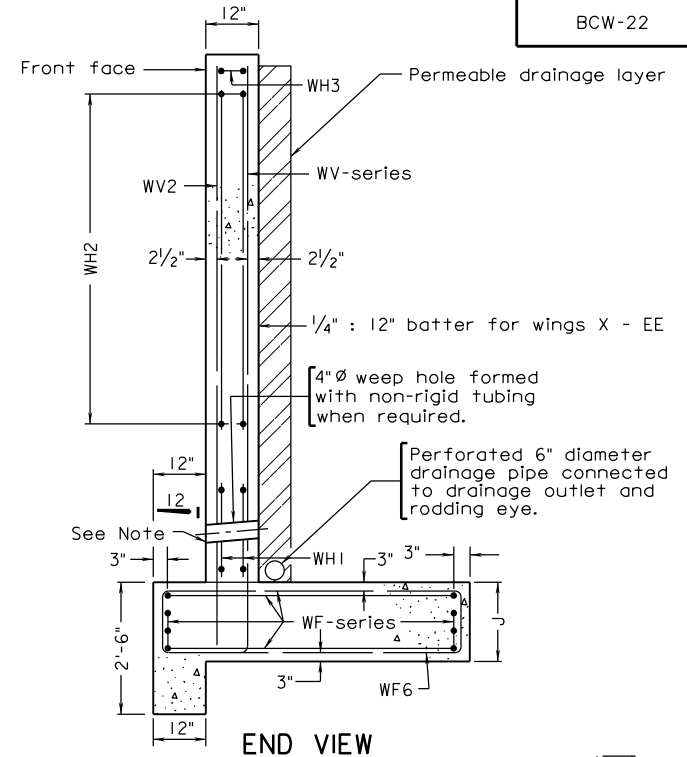
WING	Wall Quantities		qr_min	qr_min
	Concrete CY	Reinforcement LB	ksf High End	ksf Low End
A	2.9	253	0.91	0.41
B	3.5	309	1.05	0.41
C	3.9	334	1.21	0.41
D	4.6	371	1.40	0.41
E	5.5	434	1.49	0.41
F	6.2	472	1.71	0.41
G	7.1	550	1.79	0.41
H	7.9	590	2.03	0.41
I	8.8	661	2.10	0.41
J	9.7	742	2.36	0.41
K	10.9	856	2.43	0.41
L	11.8	950	2.70	0.41
M	13.1	1124	2.76	0.41
N	14.1	1241	3.05	0.41
O	15.3	1350	3.10	0.41
P	16.8	1508	3.17	0.41
Q	17.9	1773	3.45	0.41
R	19.1	1812	3.76	0.41
S	20.8	2030	3.80	0.41
T	22.0	2223	4.13	0.41
U	23.5	2475	4.16	0.41
V	25.3	2682	4.21	0.41
W	29.2	3124	4.43	0.44
X	34.5	3479	4.85	0.48
Y	36.3	3853	5.19	0.48
Z	38.8	4162	5.23	0.48
AA	41.0	4469	5.28	0.48
BB	42.9	4902	5.61	0.48
CC	46.6	5345	5.40	0.48
DD	50.5	5863	5.28	0.48
EE	52.5	6610	5.55	0.48

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 ROAD AND BRIDGE STANDARDS		WING DETAIL 2: 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 8	REVISION DATE		
1007.09	07/12		

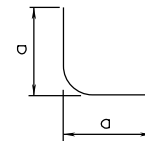


FRONT ELEVATION

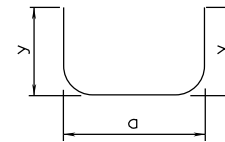


END VIEW

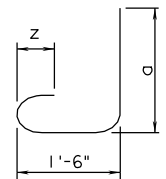
WH1-W eq. spa. = X
both faces



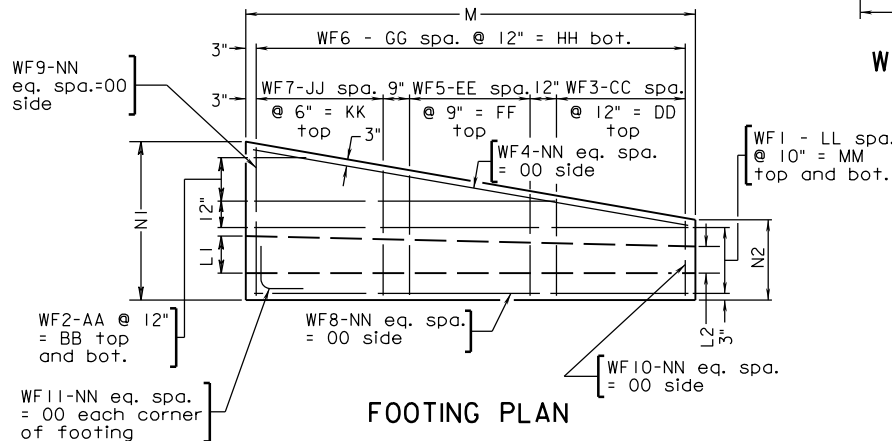
WF11



WF1 TO WF3, WF5 TO WF7



WV1, WV3, WV4



FOOTING PLAN

TABLE A	
Wall	y
A-W	9 1/2"
X	1'-0 1/2"
Y-CC	1'-3 1/2"
DD-EE	1'-9 1/2"

TABLE B		
Bar Size	Pin Dia.	Z
#3	2 1/4"	4"
#4	3"	4 1/2"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9"	10 7/8"

TABLE C	
Bar Size	Splice Length
#4	1'- 9"
#5	2'- 4"
#6	2'- 7"
#7	3'- 3"
#8	4'- 2"
#9	5'- 4"

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SPECIFICATION REFERENCE

WING DETAIL
2: 1 FILL SLOPE - TYPE II
 VIRGINIA DEPARTMENT OF TRANSPORTATION



ROAD AND BRIDGE STANDARDS

REVISION DATE

SHEET 2 OF 8

07/16


1007.10

2016 ROAD & BRIDGE STANDARDS

BCW-22


WING	J	K1	K2	L1	L2	M	N1	N2	NO. WEEP HOLES	FOOTING BAR SPACINGS													
										WF1		WF2		WF3		WF4, WF8 TO WF10		WF5		WF6		WF7	
										LL	MM	AA	BB	CC	DD	NN	OO	EE	FF	GG	HH	JJ	KK
A	1'-6"	4'-0"	1'-0"	1'-0"	1'-0"	9'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	8	8'-0"	1	0'-8"	-	-	8	8'-0"	-	-
B	1'-6"	4'-6"	1'-0"	1'-0"	1'-0"	10'-6"	4'-0"	3'-0"	-	3	2'-6"	-	-	10	10'-0"	1	0'-8"	-	-	10	10'-0"	-	-
C	1'-6"	5'-0"	1'-0"	1'-0"	1'-0"	11'-6"	4'-0"	3'-0"	-	3	2'-6"	-	-	11	11'-0"	1	0'-8"	-	-	11	11'-0"	-	-
D	1'-6"	5'-6"	1'-0"	1'-0"	1'-0"	13'-0"	4'-0"	3'-0"	-	3	2'-6"	-	-	12	12'-0"	1	0'-8"	-	-	12	12'-0"	-	-
E	1'-6"	6'-0"	1'-0"	1'-0"	1'-0"	14'-6"	4'-6"	3'-0"	-	3	2'-6"	-	-	14	14'-0"	1	0'-8"	-	-	14	14'-0"	-	-
F	1'-6"	6'-6"	1'-0"	1'-0"	1'-0"	16'-0"	4'-6"	3'-0"	-	3	2'-6"	-	-	15	15'-0"	1	0'-8"	-	-	15	15'-0"	-	-
G	1'-6"	7'-0"	1'-0"	1'-0"	1'-0"	17'-6"	5'-0"	3'-0"	-	3	2'-6"	-	-	17	17'-0"	1	0'-8"	-	-	17	17'-0"	-	-
H	1'-6"	7'-6"	1'-0"	1'-0"	1'-0"	19'-0"	5'-0"	3'-0"	-	3	2'-6"	-	-	18	18'-0"	1	0'-8"	-	-	18	18'-0"	-	-
I	1'-6"	8'-0"	1'-0"	1'-0"	1'-0"	20'-0"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	12	12'-0"	1	0'-8"	8	6'-0"	19	19'-0"	-	-
J	1'-6"	8'-6"	1'-0"	1'-0"	1'-0"	21'-6"	5'-6"	3'-0"	-	3	2'-6"	1	1'-0"	12	12'-0"	1	0'-8"	10	7'-6"	21	21'-0"	-	-
K	1'-6"	9'-0"	1'-0"	1'-0"	1'-0"	23'-0"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	13	13'-0"	1	0'-8"	11	8'-3"	22	22'-0"	-	-
L	1'-6"	9'-6"	1'-0"	1'-0"	1'-0"	24'-6"	6'-0"	3'-0"	-	3	2'-6"	1	1'-0"	14	14'-0"	1	0'-8"	12	9'-0"	24	24'-0"	-	-
M	1'-6"	10'-0"	1'-0"	1'-0"	1'-0"	26'-0"	6'-6"	3'-0"	2	3	2'-6"	2	2'-0"	15	15'-0"	1	0'-8"	12	9'-0"	25	25'-0"	-	-
N	1'-6"	10'-6"	1'-0"	1'-0"	1'-0"	27'-6"	6'-6"	3'-0"	2	3	2'-6"	2	2'-0"	16	16'-0"	1	0'-8"	13	9'-9"	27	27'-0"	-	-
O	1'-6"	11'-0"	1'-0"	1'-0"	1'-0"	28'-6"	7'-0"	3'-0"	2	3	2'-6"	2	2'-0"	17	17'-0"	1	0'-8"	13	9'-9"	28	28'-0"	-	-
P	1'-6"	11'-6"	1'-0"	1'-0"	1'-0"	30'-0"	7'-6"	3'-0"	3	3	2'-6"	3	3'-0"	18	18'-0"	1	0'-8"	14	10'-6"	29	29'-0"	-	-
Q	1'-6"	12'-0"	1'-0"	1'-0"	1'-0"	31'-6"	7'-6"	3'-0"	3	3	2'-6"	3	3'-0"	18	18'-0"	1	0'-8"	16	12'-0"	31	31'-0"	-	-
R	1'-6"	12'-6"	1'-0"	1'-0"	1'-0"	33'-0"	7'-6"	3'-0"	3	3	2'-6"	3	3'-0"	15	15'-0"	1	0'-8"	13	9'-9"	32	32'-0"	12	6'-0"
S	1'-6"	13'-0"	1'-0"	1'-0"	1'-0"	34'-6"	8'-0"	3'-0"	3	3	2'-6"	3	3'-0"	15	15'-0"	1	0'-8"	13	9'-9"	34	34'-0"	15	7'-6"
T	1'-6"	13'-6"	1'-0"	1'-0"	1'-0"	36'-0"	8'-0"	3'-0"	4	3	2'-6"	3	3'-0"	14	14'-0"	1	0'-8"	15	11'-3"	35	35'-0"	17	8'-6"
U	1'-6"	14'-0"	1'-0"	1'-0"	1'-0"	37'-0"	8'-6"	3'-0"	4	3	2'-6"	4	4'-0"	14	14'-0"	1	0'-8"	17	12'-9"	36	36'-0"	16	8'-0"
V	1'-6"	14'-6"	1'-0"	1'-0"	1'-0"	38'-6"	9'-0"	3'-0"	4	3	2'-6"	4	4'-0"	15	15'-0"	1	0'-8"	17	12'-9"	38	38'-0"	17	8'-6"
W	1'-9"	15'-0"	1'-0"	1'-0"	1'-0"	40'-0"	9'-6"	3'-0"	5	3	2'-6"	5	5'-0"	15	15'-0"	1	0'-11"	19	14'-3"	39	39'-0"	17	8'-6"
X	2'-0"	15'-6"	1'-0"	1'-3 3/4"	1'-0 1/4"	41'-6"	10'-0"	3'-0"	5	3	2'-6"	5	5'-0"	17	17'-0"	2	0'-7"	17	12'-9"	41	41'-0"	19	9'-6"
Y	2'-0"	16'-0"	1'-0"	1'-4"	1'-0 1/4"	43'-0"	10'-0"	3'-0"	5	3	2'-6"	5	5'-0"	20	20'-0"	2	0'-7"	15	11'-3"	42	42'-0"	19	9'-6"
Z	2'-0"	16'-6"	1'-0"	1'-4 1/8"	1'-0 1/4"	44'-6"	10'-6"	3'-0"	5	3	2'-6"	6	6'-0"	20	20'-0"	2	0'-7"	17	12'-9"	44	44'-0"	19	9'-6"
AA	2'-0"	17'-0"	1'-0"	1'-4 1/4"	1'-0 1/4"	45'-6"	11'-0"	3'-0"	6	3	2'-6"	6	6'-0"	19	19'-0"	2	0'-7"	19	14'-3"	45	45'-0"	20	10'-0"
BB	2'-0"	17'-6"	1'-0"	1'-4 3/8"	1'-0 1/4"	47'-0"	11'-0"	3'-0"	6	3	2'-6"	6	6'-0"	20	20'-0"	2	0'-7"	19	14'-3"	46	46'-0"	21	10'-6"
CC	2'-0"	18'-0"	1'-0"	1'-4 1/2"	1'-0 1/4"	48'-6"	12'-0"	3'-0"	6	3	2'-6"	7	7'-0"	19	19'-0"	2	0'-7"	21	15'-9"	48	48'-0"	23	11'-6"
DD	2'-0"	18'-6"	1'-0"	1'-4 5/8"	1'-0 1/4"	50'-0"	13'-0"	3'-0"	7	3	2'-6"	8	8'-0"	18	18'-0"	2	0'-7"	23	17'-3"	49	49'-0"	25	12'-6"
EE	2'-0"	19'-0"	1'-0"	1'-4 3/4"	1'-0 1/4"	51'-6"	13'-0"	3'-0"	7	3	2'-6"	8	8'-0"	18	18'-0"	2	0'-7"	25	18'-9"	51	51'-0"	25	12'-6"

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 ROAD AND BRIDGE STANDARDS		<h2 style="margin: 0;">WING DETAILS</h2> <p style="margin: 0;">2: 1 FILL SLOPE - TYPE II</p> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SPECIFICATION REFERENCE
SHEET 3 OF 8	REVISION DATE		
1007.11	07/12		

WING	WF 1				WF 2							WF 3								
	SIZE	a	LENGTH	• Ea	SIZE	a			LENGTH				• Ea	SIZE	a			LENGTH		
						FROM	TO	VARY BY	FROM	TO	VARY BY	FROM			TO	VARY BY	FROM	TO	VARY BY	
A	4	8'-4"	9'-9"	2	4	1'-8"	10'-8"	-	3'-0"	12'-0"	-	2	4	3'-5"	2'-6"	0'-1¼"	4'-9"	3'-11"	0'-1¼"	
B	4	9'-11"	11'-3"	2	4	2'-0"	12'-6"	-	3'-5"	13'-11"	-	2	4	3'-5"	2'-5"	0'-1½"	4'-9"	3'-10"	0'-1½"	
C	4	10'-11"	12'-3"	2	4	2'-3"	13'-9"	-	3'-8"	15'-2"	-	2	4	3'-5"	2'-5"	0'-1"	4'-9"	3'-10"	0'-1"	
D	4	12'-4"	13'-9"	2	4	2'-8"	15'-8"	-	4'-0"	17'-0"	-	2	4	3'-5"	2'-6"	0'-0¾"	4'-9"	3'-10"	0'-0¾"	
E	4	13'-11"	15'-3"	2	4	6'-8"	6'-8"	-	8'-0"	8'-0"	-	2	4	3'-11"	2'-5"	0'-1½"	5'-3"	3'-10"	0'-1½"	
F	4	15'-4"	16'-9"	2	4	7'-5"	7'-5"	-	8'-9"	8'-9"	-	2	4	3'-11"	2'-6"	0'-1½"	5'-3"	3'-10"	0'-1½"	
G	4	16'-11"	18'-3"	2	4	10'-4"	10'-4"	-	11'-8"	11'-8"	-	2	4	4'-5"	2'-5"	0'-1¾"	5'-9"	3'-10"	0'-1¾"	
H	4	18'-5"	19'-9"	2	4	11'-3"	11'-3"	-	12'-8"	12'-8"	-	2	4	4'-5"	2'-6"	0'-1¼"	5'-9"	3'-10"	0'-1¼"	
I	4	19'-5"	20'-9"	2	4	13'-5"	5'-5"	8'-0"	14'-9"	6'-9"	8'-0"	2	4	4'-0"	2'-6"	0'-1½"	5'-5"	3'-11"	0'-1½"	
J	4	20'-11"	22'-3"	2	4	14'-5"	5'-10"	8'-7½"	15'-10"	7'-2"	8'-7½"	2	4	3'-11"	2'-6"	0'-1¾"	5'-3"	3'-11"	0'-1¾"	
K	4	22'-5"	23'-9"	2	4	16'-8"	9'-0"	7'-8"	18'-0"	10'-4"	7'-8"	2	4	4'-2"	2'-6"	0'-1½"	5'-7"	3'-10"	0'-1½"	
L	4	23'-11"	25'-3"	2	4	17'-9"	9'-7"	8'-2"	19'-2"	11'-0"	8'-2"	2	4	4'-2"	2'-5"	0'-1¾"	5'-6"	3'-10"	0'-1¾"	
M	4	25'-5"	26'-9"	2	4	19'-10"	4'-11"	7'-5½"	21'-2"	6'-4"	7'-5½"	2	4	4'-6"	2'-6"	0'-1½"	5'-11"	3'-11"	0'-1½"	
N	4	26'-11"	28'-3"	2	4	21'-0"	5'-3"	7'-10¼"	22'-4"	6'-8"	7'-10¼"	2	4	4'-6"	2'-6"	0'-1½"	5'-11"	3'-10"	0'-1½"	
O	4	27'-11"	29'-3"	2	4	22'-6"	8'-3"	7'-1½"	23'-11"	9'-8"	7'-1½"	2	4	4'-10"	2'-6"	0'-1¾"	6'-3"	3'-10"	0'-1¾"	
P	4	29'-5"	30'-9"	2	4	24'-5"	4'-5"	6'-8"	25'-9"	5'-9"	6'-8"	2	4	5'-2"	2'-5"	0'-1¾"	6'-6"	3'-10"	0'-1¾"	
Q	4	30'-11"	32'-3"	2	4	25'-8"	4'-8"	7'-0"	27'-0"	6'-0"	7'-0"	2	4	5'-0"	2'-5"	0'-1¾"	6'-5"	3'-10"	0'-1¾"	
R	4	32'-4"	33'-9"	2	4	26'-11"	4'-11"	7'-4"	28'-3"	6'-3"	7'-4"	2	4	4'-6"	2'-5"	0'-1¾"	5'-10"	3'-10"	0'-1¾"	
S	4	33'-11"	35'-3"	2	4	28'-8"	8'-0"	6'-10¾"	30'-1"	9'-5"	6'-10¾"	2	4	4'-8"	2'-5"	0'-1¾"	6'-0"	3'-10"	0'-1¾"	
T	4	35'-4"	36'-9"	2	4	30'-0"	8'-5"	7'-2¾"	31'-4"	9'-9"	7'-2¼"	2	4	4'-5"	2'-5"	0'-1¾"	5'-9"	3'-10"	0'-1¾"	
U	4	36'-4"	37'-9"	2	4	31'-4"	4'-5"	6'-8½"	32'-8"	5'-10"	6'-8½"	2	4	4'-6"	2'-5"	0'-1¾"	5'-11"	3'-10"	0'-1¾"	
V	4	37'-11"	39'-3"	2	4	33'-1"	7'-5"	6'-5"	34'-5"	8'-9"	6'-5"	2	4	4'-10"	2'-5"	0'-1¾"	6'-2"	3'-10"	0'-1¾"	
W	4	39'-4"	41'-3"	2	5	34'-9"	4'-0"	6'-1¾"	36'-7"	5'-10"	6'-1¾"	2	4	4'-11"	2'-5"	0'-1¾"	6'-9"	4'-4"	0'-1¾"	
X	4	40'-11"	43'-3"	2	5	36'-5"	6'-9"	5'-11½"	38'-9"	9'-1"	6'-11½"	2	4	5'-4"	2'-6"	0'-2"	7'-8"	4'-10"	0'-2"	
Y	4	42'-4"	44'-9"	2	5	37'-9"	7'-1"	6'-1½"	40'-1"	9'-5"	6'-1½"	2	4	5'-9"	2'-5"	0'-1¾"	8'-1"	4'-10"	0'-1¾"	
Z	4	43'-11"	46'-3"	2	5	39'-5"	3'-10"	5'-11½"	41'-9"	6'-2"	5'-11½"	2	4	5'-10"	2'-6"	0'-2"	8'-2"	4'-10"	0'-2"	
AA	4	44'-11"	47'-3"	2	5	40'-7"	6'-6"	5'-8¼"	42'-11"	8'-10"	5'-8¼"	2	4	5'-10"	2'-6"	0'-2"	8'-2"	4'-10"	0'-2"	
BB	4	46'-4"	48'-9"	2	5	42'-0"	6'-9"	5'-10½"	44'-4"	9'-1"	5'-10½"	2	4	5'-10"	2'-6"	0'-2"	8'-3"	4'-10"	0'-2"	
CC	4	47'-11"	50'-3"	2	5	43'-10"	6'-1"	5'-4½"	46'-2"	8'-5"	5'-4½"	2	4	6'-0"	2'-6"	0'-2½"	8'-4"	4'-10"	0'-2½"	
DD	4	49'-4"	51'-9"	2	5	45'-8"	5'-8"	5'-0"	47'-11"	7'-11"	5'-0"	2	4	6'-1"	2'-6"	0'-2¾"	8'-5"	4'-10"	0'-2¾"	
EE	4	50'-11"	53'-3"	2	5	47'-0"	5'-10"	5'-1¾"	49'-4"	8'-2"	5'-1¾"	2	4	6'-0"	2'-6"	0'-2¼"	8'-4"	4'-10"	0'-2¼"	


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SPECIFICATION REFERENCE	<p>WING DETAILS 2: 1 FILL SLOPE - TYPE II</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 4 OF 8 1007.12

BCW-22

WING	WF4			WF5						WF6						
	SIZE	LENGTH	SIZE	a			LENGTH			SIZE	a			LENGTH		
				FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	8'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'-1 ¹ / ₄ "	4'-9"	3'-10"	0'-1 ¹ / ₄ "
B	4	9'-8"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-1 ¹ / ₈ "	4'-9"	3'-9"	0'-1 ¹ / ₈ "
C	4	10'-8"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-1"	4'-9"	3'-9"	0'-1"
D	4	12'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-5"	0'-0 ³ / ₄ "	4'-9"	3'-10"	0'-0 ³ / ₄ "
E	4	13'-8"	-	-	-	-	-	-	-	4	3'-10"	2'-5"	0'-1 ¹ / ₈ "	5'-3"	3'-9"	0'-1 ¹ / ₈ "
F	4	15'-2"	-	-	-	-	-	-	-	4	3'-10"	2'-5"	0'-1 ¹ / ₈ "	5'-3"	3'-10"	0'-1 ¹ / ₈ "
G	4	16'-9"	-	-	-	-	-	-	-	4	4'-4"	2'-5"	0'-1 ³ / ₈ "	5'-9"	3'-9"	0'-1 ³ / ₈ "
H	4	18'-3"	-	-	-	-	-	-	-	4	4'-4"	2'-5"	0'-1 ¹ / ₄ "	5'-9"	3'-10"	0'-1 ¹ / ₄ "
I	4	19'-3"	4	4'-11"	4'-2"	0'-1 ¹ / ₈ "	6'-3"	5'-6"	0'-1 ¹ / ₈ "	4	4'-10"	2'-6"	0'-1 ¹ / ₂ "	6'-3"	3'-10"	0'-1 ¹ / ₂ "
J	4	20'-9"	4	4'-11"	4'-0"	0'-1"	6'-3"	5'-5"	0'-1"	4	4'-10"	2'-5"	0'-1 ³ / ₈ "	6'-3"	3'-9"	0'-1 ³ / ₈ "
K	4	22'-4"	4	5'-5"	4'-4"	0'-1 ¹ / ₈ "	6'-9"	5'-8"	0'-1 ¹ / ₈ "	4	5'-4"	2'-6"	0'-1 ¹ / ₂ "	6'-9"	3'-10"	0'-1 ¹ / ₂ "
L	4	23'-10"	4	5'-5"	4'-3"	0'-1"	6'-9"	5'-8"	0'-1"	4	5'-4"	2'-5"	0'-1 ³ / ₈ "	6'-9"	3'-9"	0'-1 ³ / ₈ "
M	4	25'-4"	5	5'-11"	4'-8"	0'-1 ¹ / ₈ "	7'-2"	6'-0"	0'-1 ¹ / ₈ "	4	5'-10"	2'-6"	0'-1 ¹ / ₂ "	7'-3"	3'-10"	0'-1 ¹ / ₂ "
N	4	26'-10"	5	5'-11"	4'-8"	0'-1 ¹ / ₈ "	7'-2"	6'-0"	0'-1 ¹ / ₈ "	4	5'-10"	2'-5"	0'-1 ¹ / ₂ "	7'-3"	3'-9"	0'-1 ¹ / ₂ "
O	4	27'-11"	5	6'-5"	5'-0"	0'-1 ¹ / ₄ "	7'-8"	6'-4"	0'-1 ¹ / ₄ "	4	6'-4"	2'-5"	0'-1 ⁵ / ₈ "	7'-9"	3'-9"	0'-1 ⁵ / ₈ "
P	4	29'-6"	6	6'-11"	5'-4"	0'-1 ¹ / ₄ "	8'-2"	6'-7"	0'-1 ¹ / ₄ "	4	6'-10"	2'-6"	0'-1 ³ / ₄ "	8'-3"	3'-10"	0'-1 ³ / ₄ "
Q	4	30'-11"	6	6'-11"	5'-2"	0'-1 ¹ / ₄ "	8'-2"	6'-5"	0'-1 ¹ / ₄ "	4	6'-10"	2'-5"	0'-1 ⁵ / ₈ "	8'-3"	3'-9"	0'-1 ⁵ / ₈ "
R	4	32'-5"	5	6'-0"	4'-8"	0'-1 ¹ / ₈ "	7'-3"	5'-11"	0'-1 ¹ / ₈ "	4	6'-10"	2'-6"	0'-1 ⁵ / ₈ "	8'-3"	3'-10"	0'-1 ⁵ / ₈ "
S	4	34'-0"	5	6'-2"	4'-9"	0'-1 ¹ / ₄ "	7'-6"	6'-1"	0'-1 ¹ / ₄ "	4	7'-4"	2'-5"	0'-1 ⁵ / ₈ "	8'-9"	3'-9"	0'-1 ⁵ / ₈ "
T	4	35'-6"	5	6'-1"	4'-6"	0'-1 ¹ / ₈ "	7'-5"	5'-10"	0'-1 ¹ / ₈ "	4	7'-4"	2'-6"	0'-1 ⁵ / ₈ "	8'-9"	3'-10"	0'-1 ⁵ / ₈ "
U	4	36'-6"	5	6'-7"	4'-8"	0'-1 ¹ / ₄ "	7'-11"	6'-0"	0'-1 ¹ / ₄ "	4	7'-10"	2'-6"	0'-1 ³ / ₄ "	9'-3"	3'-10"	0'-1 ³ / ₄ "
V	4	38'-1"	5	6'-11"	4'-11"	0'-1 ³ / ₈ "	8'-3"	6'-3"	0'-1 ³ / ₈ "	4	8'-4"	2'-5"	0'-1 ³ / ₄ "	9'-9"	3'-9"	0'-1 ³ / ₄ "
W	4	39'-8"	5	7'-4"	5'-1"	0'-1 ³ / ₈ "	9'-2"	6'-11"	0'-1 ³ / ₈ "	5	8'-10"	2'-6"	0'-1 ³ / ₄ "	10'-8"	4'-4"	0'-1 ³ / ₄ "
X	4	41'-3"	5	7'-8"	5'-6"	0'-1 ¹ / ₂ "	10'-0"	7'-10"	0'-1 ¹ / ₂ "	5	9'-4"	2'-5"	0'-2"	11'-8"	4'-9"	0'-2"
Y	4	42'-8"	5	7'-8"	5'-11"	0'-1 ³ / ₈ "	10'-0"	8'-2"	0'-1 ³ / ₈ "	5	9'-4"	2'-6"	0'-1 ³ / ₄ "	11'-8"	4'-10"	0'-1 ³ / ₄ "
Z	4	44'-3"	6	8'-2"	6'-0"	0'-1 ¹ / ₂ "	10'-5"	8'-3"	0'-1 ¹ / ₂ "	5	9'-10"	2'-5"	0'-2"	12'-2"	4'-9"	0'-2"
AA	4	45'-4"	6	8'-6"	6'-0"	0'-1 ¹ / ₂ "	10'-9"	8'-3"	0'-1 ¹ / ₂ "	5	10'-4"	2'-5"	0'-2"	12'-8"	4'-9"	0'-2"
BB	4	46'-10"	6	8'-6"	6'-0"	0'-1 ¹ / ₂ "	10'-9"	8'-4"	0'-1 ¹ / ₂ "	5	10'-4"	2'-6"	0'-2"	12'-8"	4'-10"	0'-2"
CC	4	48'-6"	6	9'-1"	6'-2"	0'-1 ⁵ / ₈ "	11'-4"	8'-5"	0'-1 ⁵ / ₈ "	5	11'-4"	2'-5"	0'-2 ¹ / ₈ "	13'-8"	4'-9"	0'-2 ¹ / ₈ "
DD	4	50'-2"	6	9'-9"	6'-3"	0'-1 ³ / ₄ "	12'-0"	8'-6"	0'-1 ³ / ₄ "	5	12'-4"	2'-6"	0'-2 ³ / ₈ "	14'-8"	4'-10"	0'-2 ³ / ₈ "
EE	4	51'-7"	7	9'-10"	6'-2"	0'-1 ⁵ / ₈ "	12'-0"	8'-4"	0'-1 ⁵ / ₈ "	5	12'-4"	2'-5"	0'-2 ¹ / ₄ "	14'-8"	4'-9"	0'-2 ¹ / ₄ "

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 ROAD AND BRIDGE STANDARDS	
SHEET 5 OF 8	REVISION DATE
1007.13	07/12

WING DETAILS
2:1 FILL SLOPE - TYPE II
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

WING	SIZE	WF 7						WF 8		WF 9		WF 10		WF 11			
		α			LENGTH			SIZE	LENGTH	SIZE	LENGTH	SIZE	α	LENGTH	• Eg		
		FROM	TO	VARY BY	FROM	TO	VARY BY										
A	-	-	-	-	-	-	-	4	8'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
B	-	-	-	-	-	-	-	4	9'-8"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
C	-	-	-	-	-	-	-	4	10'-8"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
D	-	-	-	-	-	-	-	4	12'-2"	4	3'-2"	4	2'-2"	4	2'-2"	4'-2"	4
E	-	-	-	-	-	-	-	4	13'-8"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
F	-	-	-	-	-	-	-	4	15'-2"	4	3'-8"	4	2'-2"	4	2'-2"	4'-2"	4
G	-	-	-	-	-	-	-	4	16'-8"	4	4'-2"	4	2'-2"	4	2'-2"	4'-2"	4
H	-	-	-	-	-	-	-	4	18'-2"	4	4'-2"	4	2'-2"	4	2'-2"	4'-2"	4
I	-	-	-	-	-	-	-	4	19'-2"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
J	-	-	-	-	-	-	-	4	20'-8"	4	4'-8"	4	2'-2"	4	2'-2"	4'-2"	4
K	-	-	-	-	-	-	-	4	22'-2"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
L	-	-	-	-	-	-	-	4	23'-8"	4	5'-2"	4	2'-2"	4	2'-2"	4'-2"	4
M	-	-	-	-	-	-	-	4	25'-2"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
N	-	-	-	-	-	-	-	4	26'-8"	4	5'-8"	4	2'-2"	4	2'-2"	4'-2"	4
O	-	-	-	-	-	-	-	4	27'-8"	4	6'-2"	4	2'-2"	4	2'-2"	4'-2"	4
P	-	-	-	-	-	-	-	4	29'-2"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
Q	-	-	-	-	-	-	-	4	30'-8"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
R	5	6'-11"	6'-1"	0'-0¾"	8'-2"	7'-5"	0'-0¾"	4	32'-2"	4	6'-8"	4	2'-2"	4	2'-2"	4'-2"	4
S	6	7'-5"	6'-4"	0'-0¾"	8'-8"	7'-7"	0'-0¾"	4	33'-8"	4	7'-2"	4	2'-2"	4	2'-2"	4'-2"	4
T	6	7'-5"	6'-2"	0'-0¾"	8'-8"	7'-6"	0'-0¾"	4	35'-2"	4	7'-2"	4	2'-2"	4	2'-2"	4'-2"	4
U	6	7'-11"	6'-8"	0'-0¾"	9'-2"	8'-0"	0'-0¾"	4	36'-2"	4	7'-8"	4	2'-2"	4	2'-2"	4'-2"	4
V	6	8'-5"	7'-1"	0'-0¾"	9'-8"	8'-4"	0'-0¾"	4	37'-8"	4	8'-2"	4	2'-2"	4	2'-2"	4'-2"	4
W	6	8'-11"	7'-6"	0'-0¾"	10'-8"	9'-3"	0'-0¾"	4	39'-2"	4	8'-8"	4	2'-2"	4	2'-2"	4'-2"	4
X	6	9'-4"	7'-9"	0'-1"	11'-8"	10'-1"	0'-1"	4	40'-8"	4	9'-2"	4	2'-2"	4	2'-2"	4'-2"	4
Y	7	9'-5"	7'-10"	0'-0¾"	11'-7"	10'-1"	0'-0¾"	4	42'-2"	4	9'-2"	4	2'-2"	4	2'-2"	4'-2"	4
Z	7	9'-10"	8'-3"	0'-1"	12'-1"	10'-6"	0'-1"	4	43'-8"	4	9'-8"	4	2'-2"	4	2'-2"	4'-2"	4
AA	7	10'-4"	8'-7"	0'-1"	12'-7"	10'-10"	0'-1"	4	44'-8"	4	10'-2"	4	2'-2"	4	2'-2"	4'-2"	4
BB	7	10'-4"	8'-7"	0'-1"	12'-7"	10'-10"	0'-1"	4	46'-2"	4	10'-2"	4	2'-2"	4	2'-2"	4'-2"	4
CC	7	11'-4"	9'-3"	0'-1"	13'-7"	11'-5"	0'-1"	4	47'-8"	4	11'-2"	4	2'-2"	4	2'-2"	4'-2"	4
DD	7	12'-4"	9'-10"	0'-1½"	14'-7"	12'-1"	0'-1½"	4	49'-2"	4	12'-2"	4	2'-2"	4	2'-2"	4'-2"	4
EE	7	12'-4"	9'-11"	0'-1½"	14'-7"	12'-2"	0'-1½"	4	50'-8"	4	12'-2"	4	2'-2"	4	2'-2"	4'-2"	4

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE


SPECIFICATION REFERENCE	<p>WING DETAILS 2: 1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	
		REVISION DATE 07/12	SHEET 6 OF 8 1007.14

2016 ROAD & BRIDGE STANDARDS

BCW-22


WING	STEM BAR SPACINGS												WV1						WV2					
	WV1		WV2		WV3		WV4		WH1		WH2		SIZE	α			LENGTH			SIZE	LENGTH			
	O	P	Q	R	S	T	U	V	W	X	Y	Z		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	
A	8	8'-0"	6	7'-6"	-	-	-	-	-	-	1	1'-3"	4	4'-11"	2'-3"	0'-4"	6'-10"	4'-1"	0'-4"	4	4'-11"	2'-5"	0'-5"	
B	10	10'-0"	8	10'-0"	-	-	-	-	1	0'-6"	1	1'-3"	4	5'-5"	2'-1"	0'-4"	7'-4"	3'-11"	0'-4"	4	5'-5"	2'-1"	0'-5"	
C	11	11'-0"	8	10'-0"	-	-	-	-	-	-	2	2'-6"	4	5'-11"	2'-1"	0'-4 1/8"	7'-10"	4'-0"	0'-4 1/8"	4	5'-11"	2'-5"	0'-5 1/4"	
D	12	12'-0"	10	12'-6"	-	-	-	-	-	-	2	2'-6"	4	6'-5"	2'-3"	0'-4 1/8"	8'-4"	4'-2"	0'-4 1/8"	4	6'-5"	2'-1"	0'-5 1/8"	
E	14	14'-0"	11	13'-9"	-	-	-	-	-	-	3	3'-9"	4	6'-11"	2'-1"	0'-4 1/8"	8'-10"	4'-0"	0'-4 1/8"	4	6'-11"	2'-2"	0'-5 1/8"	
F	15	15'-0"	12	15'-0"	-	-	-	-	-	-	3	3'-9"	4	7'-5"	2'-3"	0'-4 1/8"	9'-4"	4'-2"	0'-4 1/8"	4	7'-5"	2'-3"	0'-5 1/8"	
G	17	17'-0"	13	16'-3"	-	-	-	-	1	0'-6"	3	3'-9"	4	7'-11"	2'-1"	0'-4 1/8"	9'-10"	4'-0"	0'-4 1/8"	4	7'-11"	2'-4"	0'-5 1/8"	
H	18	18'-0"	14	17'-6"	-	-	-	-	-	-	4	5'-0"	4	8'-5"	2'-3"	0'-4"	10'-4"	4'-2"	0'-4"	4	8'-5"	2'-5"	0'-5 1/8"	
I	12	12'-0"	15	18'-9"	8	6'-0"	-	-	-	-	4	5'-0"	4	6'-5"	2'-3"	0'-4 1/8"	8'-4"	4'-2"	0'-4 1/8"	4	8'-11"	2'-4"	0'-5 1/4"	
J	12	12'-0"	16	20'-0"	10	7'-6"	-	-	-	-	5	6'-3"	4	6'-5"	2'-3"	0'-4 1/8"	8'-4"	4'-2"	0'-4 1/8"	4	9'-5"	2'-5"	0'-5 1/4"	
K	13	13'-0"	18	22'-6"	11	8'-3"	-	-	-	-	5	6'-3"	4	6'-8"	2'-2"	0'-4 1/8"	8'-7"	4'-1"	0'-4 1/8"	4	9'-11"	2'-1"	0'-5 1/8"	
L	14	14'-0"	19	23'-9"	12	9'-0"	-	-	1	0'-6"	5	6'-3"	4	6'-11"	2'-1"	0'-4 1/8"	8'-10"	4'-0"	0'-4 1/8"	4	10'-5"	2'-2"	0'-5 1/8"	
M	15	15'-0"	20	25'-0"	12	9'-0"	-	-	-	-	6	7'-6"	4	7'-5"	2'-3"	0'-4 1/8"	9'-4"	4'-2"	0'-4 1/8"	4	10'-11"	2'-3"	0'-5 1/8"	
N	16	16'-0"	21	26'-3"	13	9'-9"	-	-	-	-	6	7'-6"	5	7'-8"	2'-2"	0'-4 1/8"	9'-8"	4'-1"	0'-4 1/8"	4	11'-5"	2'-4"	0'-5 1/8"	
O	17	17'-0"	22	27'-6"	13	9'-9"	-	-	-	-	7	8'-9"	5	8'-2"	2'-2"	0'-4 1/8"	10'-1"	4'-1"	0'-4 1/8"	4	11'-11"	2'-3"	0'-5 1/4"	
P	18	18'-0"	23	28'-9"	14	10'-6"	-	-	-	-	7	8'-9"	5	8'-5"	2'-1"	0'-4 1/8"	10'-4"	4'-0"	0'-4 1/8"	4	12'-5"	2'-4"	0'-5 1/4"	
Q	18	18'-0"	24	30'-0"	16	12'-0"	-	-	1	0'-6"	7	8'-9"	5	8'-4"	2'-1"	0'-4 1/8"	10'-4"	4'-0"	0'-4 1/8"	4	12'-11"	2'-5"	0'-5 1/4"	
R	15	15'-0"	26	32'-6"	13	9'-9"	12	6'-0"	-	-	8	10'-0"	4	7'-4"	2'-1"	0'-4 1/8"	9'-2"	4'-0"	0'-4 1/8"	4	13'-5"	2'-1"	0'-5 1/8"	
S	15	15'-0"	27	33'-9"	13	9'-9"	15	7'-6"	-	-	8	10'-0"	4	7'-4"	2'-1"	0'-4 1/8"	9'-2"	4'-0"	0'-4 1/8"	4	13'-11"	2'-2"	0'-5 1/8"	
T	14	14'-0"	28	35'-0"	15	11'-3"	17	8'-6"	-	-	9	11'-3"	4	6'-11"	2'-1"	0'-4 1/8"	8'-10"	4'-0"	0'-4 1/8"	4	14'-5"	2'-3"	0'-5 1/8"	
U	14	14'-0"	29	36'-3"	17	12'-9"	16	8'-0"	-	-	9	11'-3"	4	7'-0"	2'-1"	0'-4 1/8"	8'-11"	4'-0"	0'-4 1/8"	4	14'-11"	2'-2"	0'-5 1/4"	
V	15	15'-0"	30	37'-6"	17	12'-9"	17	8'-6"	1	0'-6"	9	11'-3"	4	7'-4"	2'-1"	0'-4 1/8"	9'-3"	4'-0"	0'-4 1/8"	4	15'-5"	2'-3"	0'-5 1/4"	
W	15	15'-0"	31	38'-9"	19	14'-3"	17	8'-6"	-	-	10	12'-6"	4	7'-7"	2'-4"	0'-4 1/8"	9'-6"	4'-3"	0'-4 1/8"	4	16'-2"	2'-7"	0'-5 1/4"	
X	17	17'-0"	32	40'-0"	17	12'-9"	19	9'-6"	-	-	10	12'-6"	4	8'-6"	2'-7"	0'-4 1/8"	10'-5"	4'-6"	0'-4 1/8"	4	16'-11"	2'-11"	0'-5 1/4"	
Y	20	20'-0"	34	42'-6"	15	11'-3"	19	9'-6"	-	-	11	13'-9"	4	9'-7"	2'-7"	0'-4 1/8"	11'-5"	4'-6"	0'-4 1/8"	4	17'-5"	2'-7"	0'-5 1/8"	
Z	20	20'-0"	35	43'-9"	17	12'-9"	19	9'-6"	-	-	11	13'-9"	4	9'-7"	2'-7"	0'-4 1/8"	11'-5"	4'-6"	0'-4 1/8"	4	17'-11"	2'-8"	0'-5 1/8"	
AA	19	19'-0"	36	45'-0"	19	14'-3"	20	10'-0"	1	0'-6"	11	13'-9"	4	9'-3"	2'-7"	0'-4 1/8"	11'-2"	4'-6"	0'-4 1/8"	4	18'-5"	2'-7"	0'-5 1/4"	
BB	20	20'-0"	37	46'-3"	19	14'-3"	21	10'-6"	-	-	12	15'-0"	4	9'-7"	2'-7"	0'-4 1/8"	11'-6"	4'-6"	0'-4 1/8"	4	18'-11"	2'-8"	0'-5 1/4"	
CC	19	19'-0"	38	47'-6"	21	15'-9"	23	11'-6"	-	-	12	15'-0"	4	9'-3"	2'-7"	0'-4 1/8"	11'-2"	4'-6"	0'-4 1/8"	4	19'-5"	2'-9"	0'-5 1/4"	
DD	18	18'-0"	39	48'-9"	23	17'-3"	25	12'-6"	-	-	13	16'-3"	4	8'-10"	2'-7"	0'-4 1/8"	10'-9"	4'-6"	0'-4 1/8"	4	19'-11"	2'-10"	0'-5 1/4"	
EE	18	18'-0"	40	50'-0"	25	18'-9"	25	12'-6"	-	-	13	16'-3"	4	8'-10"	2'-7"	0'-4 1/8"	10'-9"	4'-6"	0'-4 1/8"	4	20'-5"	2'-11"	0'-5 1/4"	

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 ROAD AND BRIDGE STANDARDS		WING DETAILS 2:1 FILL SLOPE - TYPE II VIRGINIA DEPARTMENT OF TRANSPORTATION		SPECIFICATION REFERENCE	
SHEET 7 OF 8	REVISION DATE				
1007.15	07/12				

WING	SIZE	WV3						WV4						WH1			WH2				WH3			
		g			LENGTH			SIZE	g			LENGTH			SIZE	LENGTH	Eo	LENGTH			SIZE	LENGTH		
		FROM	TO	VARY BY	FROM	TO	VARY BY		FROM	TO	VARY BY	FROM	TO	VARY BY				FROM	TO	VARY BY			EA	
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	8'-6"	2	4	6'-6"	2'-10"	3'-7 1/2"	2	4	9'-0"
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	10'-0"	2	4	6'-7"	2'-10"	3'-8 3/8"	2	4	10'-7"
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	11'-0"	2	4	9'-10"	2'-9"	3'-6 3/8"	2	4	11'-7"
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	12'-6"	2	4	9'-10"	2'-9"	3'-6 1/4"	2	4	13'-3"
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	14'-0"	2	4	13'-6"	2'-9"	3'-6 3/4"	2	4	14'-10"
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	15'-6"	2	4	13'-7"	2'-10"	3'-7"	2	4	16'-5"
G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	17'-0"	2	4	13'-7"	2'-10"	3'-7"	2	4	18'-0"
H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	18'-6"	2	4	17'-3"	2'-10"	3'-7 1/4"	2	4	19'-6"
I	4	8'-11"	6'-10"	0'-3 1/8"	10'-10"	8'-8"	0'-3 1/8"	-	-	-	-	-	-	-	4	19'-6"	2	4	16'-11"	2'-9"	3'-6 3/8"	2	4	20'-8"
J	4	9'-5"	6'-9"	0'-3 1/8"	11'-4"	8'-8"	0'-3 1/8"	-	-	-	-	-	-	-	4	21'-0"	2	4	20'-6"	2'-9"	3'-6 1/2"	2	4	22'-3"
K	5	9'-11"	7'-0"	0'-3 1/8"	11'-10"	9'-0"	0'-3 1/8"	-	-	-	-	-	-	-	4	22'-6"	2	4	20'-6"	2'-9"	3'-6 5/8"	2	4	23'-9"
L	5	10'-5"	7'-3"	0'-3 1/8"	12'-4"	9'-3"	0'-3 1/8"	-	-	-	-	-	-	-	4	24'-0"	2	4	20'-8"	2'-9"	3'-6 7/8"	2	4	25'-5"
M	6	10'-11"	7'-10"	0'-3"	12'-11"	9'-10"	0'-3"	-	-	-	-	-	-	-	4	25'-6"	2	4	24'-3"	2'-9"	3'-6 7/8"	2	4	27'-0"
N	6	11'-5"	8'-0"	0'-3"	13'-5"	10'-1"	0'-3"	-	-	-	-	-	-	-	4	27'-0"	2	4	24'-3"	2'-0"	3'-7"	2	4	28'-6"
O	6	11'-11"	8'-6"	0'-3 1/8"	13'-11"	10'-6"	0'-3 1/8"	-	-	-	-	-	-	-	4	28'-0"	2	4	27'-6"	2'-9"	3'-6 3/8"	2	4	29'-8"
P	6	12'-5"	8'-9"	0'-3 1/8"	14'-5"	10'-9"	0'-3 1/8"	-	-	-	-	-	-	-	4	29'-6"	2	4	27'-6"	2'-9"	3'-6 1/2"	2	4	31'-3"
Q	7	12'-11"	8'-9"	0'-3 1/8"	15'-0"	10'-10"	0'-3 1/8"	-	-	-	-	-	-	-	4	31'-0"	2	4	27'-8"	2'-9"	3'-6 5/8"	2	4	32'-10"
R	6	11'-1"	7'-8"	0'-3 1/8"	13'-1"	9'-8"	0'-3 1/8"	6	13'-5"	11'-4"	0'-2"	15'-5"	13'-4"	0'-2"	4	32'-6"	2	4	31'-3"	2'-10"	3'-6 5/8"	2	4	34'-4"
S	6	11'-0"	7'-8"	0'-3 1/8"	13'-1"	9'-8"	0'-3 1/8"	6	13'-11"	11'-4"	0'-2"	15'-11"	13'-4"	0'-2"	4	34'-0"	2	4	31'-3"	2'-10"	3'-6 3/4"	2	4	36'-0"
T	6	11'-2"	7'-3"	0'-3 1/8"	13'-3"	9'-4"	0'-3 1/8"	6	14'-5"	11'-6"	0'-2"	16'-5"	13'-6"	0'-2"	4	35'-6"	2	4	35'-0"	2'-10"	3'-6 1/8"	2	4	37'-7"
U	6	11'-10"	7'-4"	0'-3 1/8"	13'-10"	9'-5"	0'-3 1/8"	7	14'-11"	12'-1"	0'-2"	17'-0"	14'-3"	0'-2"	4	36'-6"	2	4	34'-7"	2'-9"	3'-6 3/8"	2	4	38'-9"
V	6	12'-2"	7'-8"	0'-3 1/8"	14'-2"	9'-9"	0'-3 1/8"	7	15'-5"	12'-5"	0'-2"	17'-6"	14'-7"	0'-2"	4	38'-0"	2	4	34'-7"	2'-9"	3'-6 1/2"	2	4	40'-4"
W	6	12'-11"	7'-11"	0'-3 1/8"	14'-11"	9'-11"	0'-3 1/8"	7	16'-2"	13'-2"	0'-2"	18'-3"	15'-4"	0'-2"	4	39'-6"	2	4	38'-3"	2'-10"	3'-6 1/2"	2	4	41'-11"
X	6	13'-4"	8'-10"	0'-3 1/8"	15'-4"	10'-11"	0'-3 1/8"	7	16'-11"	13'-7"	0'-2"	19'-0"	15'-9"	0'-2"	4	41'-0"	2	4	38'-4"	2'-9"	3'-6 5/8"	2	4	43'-6"
Y	7	13'-10"	9'-11"	0'-3 1/8"	15'-11"	12'-0"	0'-3 1/8"	7	17'-5"	14'-1"	0'-2"	19'-6"	16'-3"	0'-2"	4	42'-6"	2	4	42'-0"	2'-9"	3'-6 3/4"	2	4	45'-0"
Z	7	14'-4"	9'-11"	0'-3 1/8"	16'-6"	12'-0"	0'-3 1/8"	7	17'-11"	14'-7"	0'-2"	20'-0"	16'-9"	0'-2"	4	44'-0"	2	4	42'-1"	2'-9"	3'-6 7/8"	2	4	46'-7"
AA	7	14'-8"	9'-7"	0'-3 1/8"	16'-9"	11'-9"	0'-3 1/8"	7	18'-5"	14'-11"	0'-2"	20'-6"	17'-0"	0'-2"	4	45'-0"	2	4	41'-7"	2'-9"	3'-6 3/8"	2	4	47'-9"
BB	7	15'-0"	9'-11"	0'-3 1/8"	17'-1"	12'-1"	0'-3 1/8"	8	18'-11"	15'-3"	0'-2"	21'-1"	17'-5"	0'-2"	4	46'-6"	2	4	45'-3"	2'-9"	3'-6 1/2"	2	4	49'-4"
CC	7	15'-1"	9'-7"	0'-3 1/8"	17'-3"	11'-8"	0'-3 1/8"	8	19'-5"	15'-5"	0'-2"	21'-7"	17'-7"	0'-2"	4	48'-0"	2	4	45'-4"	2'-10"	3'-6 1/2"	2	4	50'-11"
DD	7	15'-3"	9'-3"	0'-3 1/8"	17'-5"	11'-4"	0'-3 1/8"	8	19'-11"	15'-6"	0'-2"	22'-1"	17'-9"	0'-2"	4	49'-6"	2	4	49'-0"	2'-9"	3'-6 5/8"	2	4	52'-6"
EE	7	15'-9"	9'-3"	0'-3 1/8"	17'-11"	11'-4"	0'-3 1/8"	9	20'-5"	16'-0"	0'-2"	22'-10"	18'-6"	0'-2"	4	51'-0"	2	4	49'-1"	2'-9"	3'-6 3/4"	2	4	54'-1"

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE

SPECIFICATION REFERENCE	<p>WING DETAILS 2:1 FILL SLOPE - TYPE II</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	 ROAD AND BRIDGE STANDARDS	REVISION DATE	SHEET 8 OF 8
			07/12	1007.16

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ROAD AND BRIDGE STANDARDS

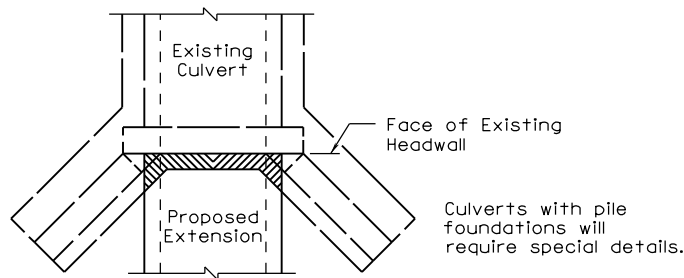
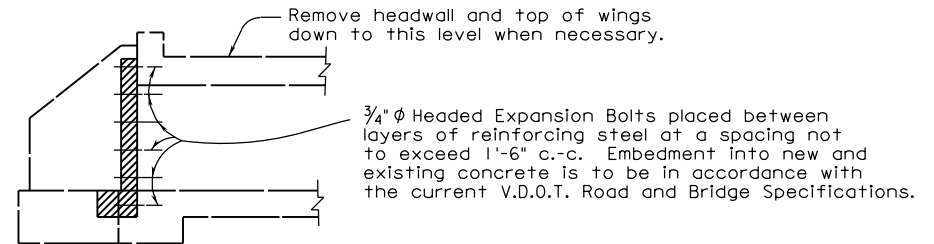
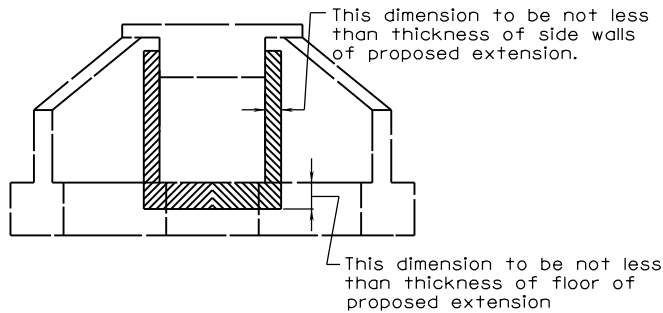
SHEET 1 OF 1

REVISION DATE

07.11

VIRGINIA DEPARTMENT OF TRANSPORTATION

In case of skewed culverts, wingwalls conflicting with barrel of proposed extension are to be removed.



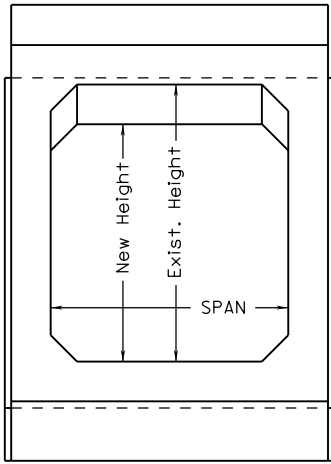
Notes:

Shaded portion indicates existing concrete to be removed, so that all portions of proposed extension will begin in a vertical plane at face of existing headwall. Details of proposed extension including headwall for same can be obtained from box culvert standard. Unit price bid for concrete and reinforcement shall include cost of removal and disposal of old concrete and the furnishing and placing of dowels and expansion bolts required.

SPECIFICATION REFERENCE	<p>DETAILS FOR WIDENING EXISTING BOX CULVERTS</p> <p>MODIFICATIONS TO EXISTING BOX</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p>ROAD AND BRIDGE STANDARDS</p>	
		<p>REVISION DATE</p> <p>07/11</p>	<p>SHEET 1 OF 4</p> <p>1008.01</p>

BCE-01

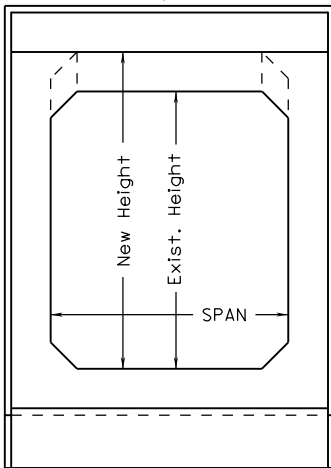
A



A

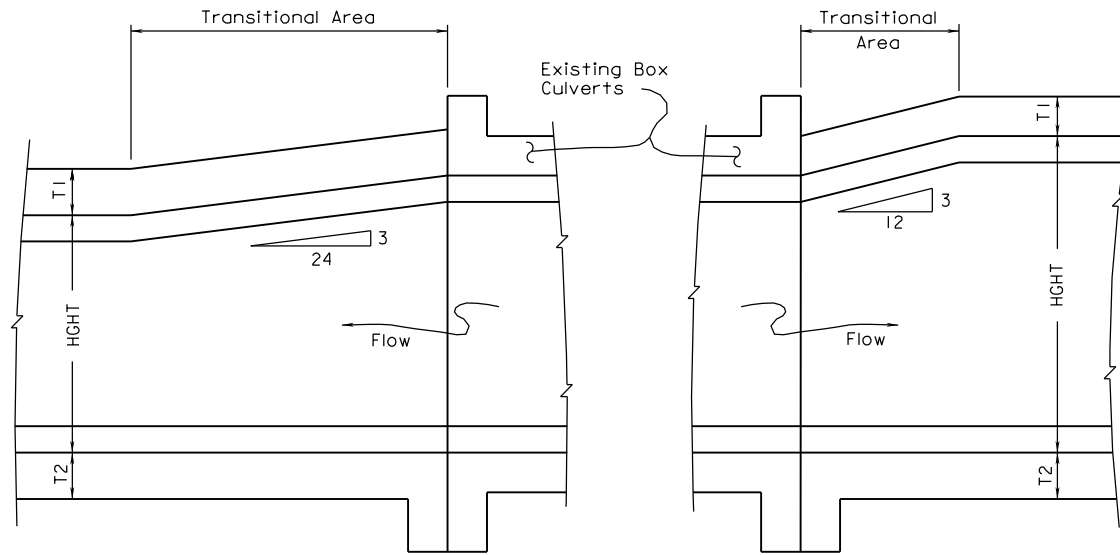
SECTION THRU CULVERT

B



B

SECTION THRU CULVERT



SECTION A-A

SECTION B-B

Notes:

Adjustments in quantities will be required when a change in height exists as shown in Sections A & B. Quantities of concrete and reinforcing steel shall be increased or decreased accordingly. For cases where only wall thickness changes, there shall be no quantity adjustments.

For SPAN, HGHT, & T dimensions, refer to appropriate Box Culvert Standard. This standard is to be used only when a change in height or wall thickness occurs. It does not apply to changes in SPAN.

VDOT
ROAD AND BRIDGE STANDARDS

DETAILS FOR WIDENING EXISTING BOX CULVERTS
HEIGHT TRANSITIONS

SPECIFICATION
REFERENCE

SHEET 2 OF 4

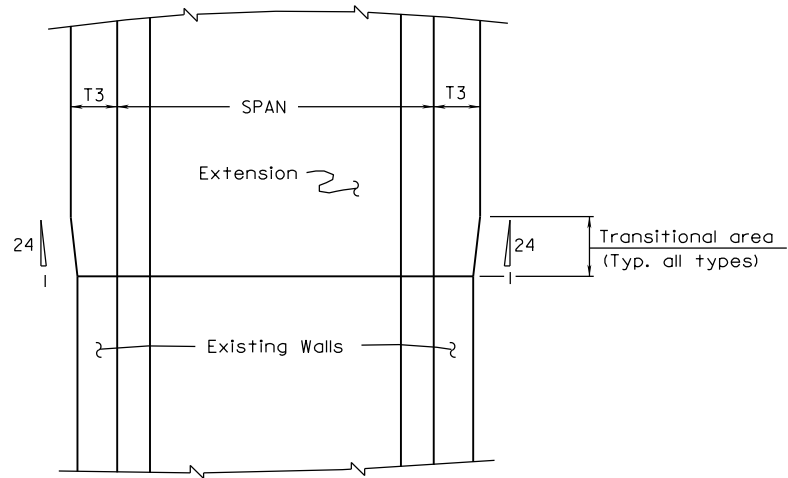
REVISION DATE

1008.02

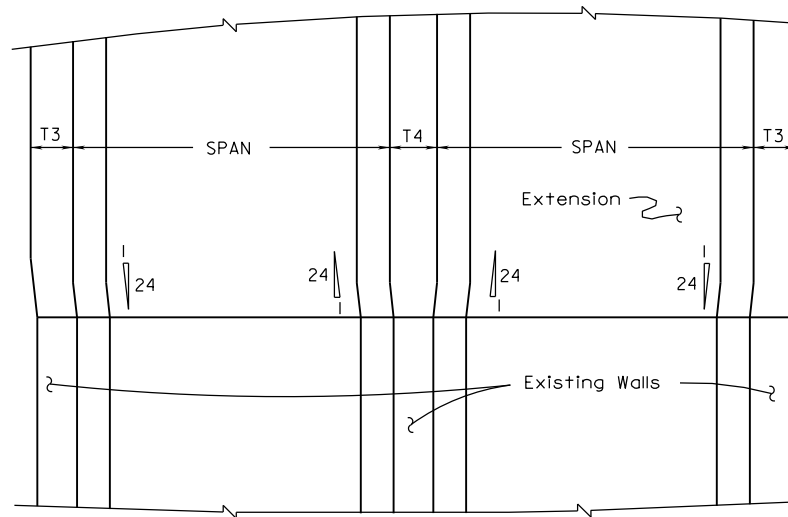
07/11

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For SPAN, HGHT. & T dimensions, refer to appropriate Box Culvert Standard. This standard is to be used only when a change in height or wall thickness occurs. It does not apply to changes in SPAN.



SINGLE BOX CULVERT



DOUBLE BOX CULVERT

SPECIFICATION REFERENCE

DETAILS FOR WIDENING EXISTING BOX CULVERTS
WALL TRANSITIONS

VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT

ROAD AND BRIDGE STANDARDS

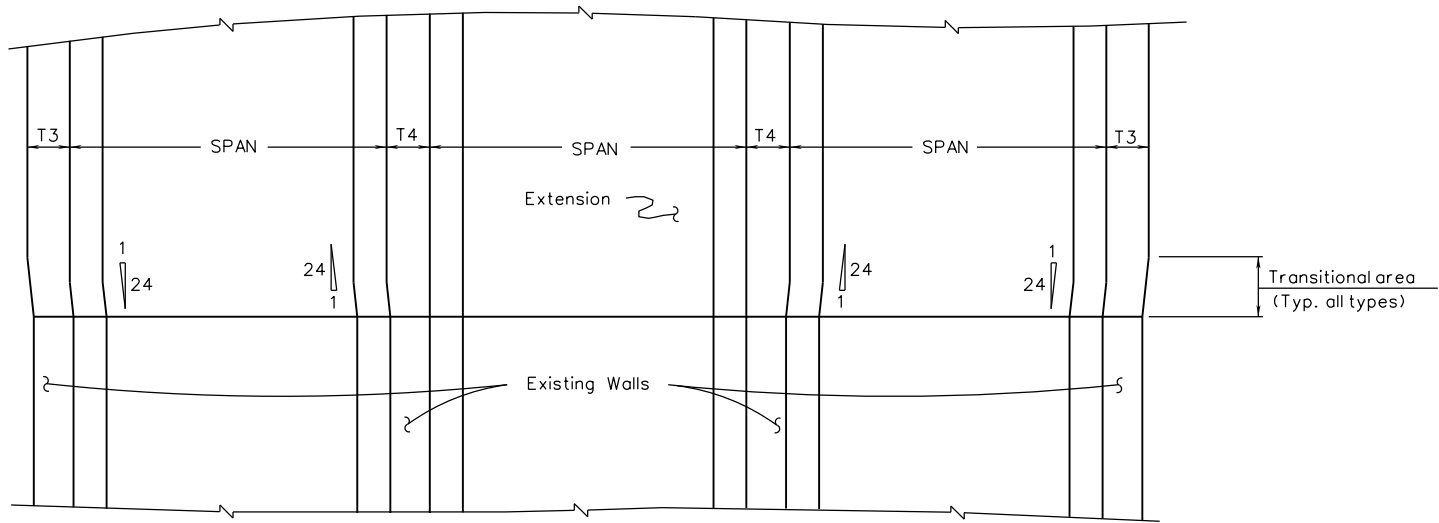
REVISION DATE

07/11

SHEET 3 OF 4

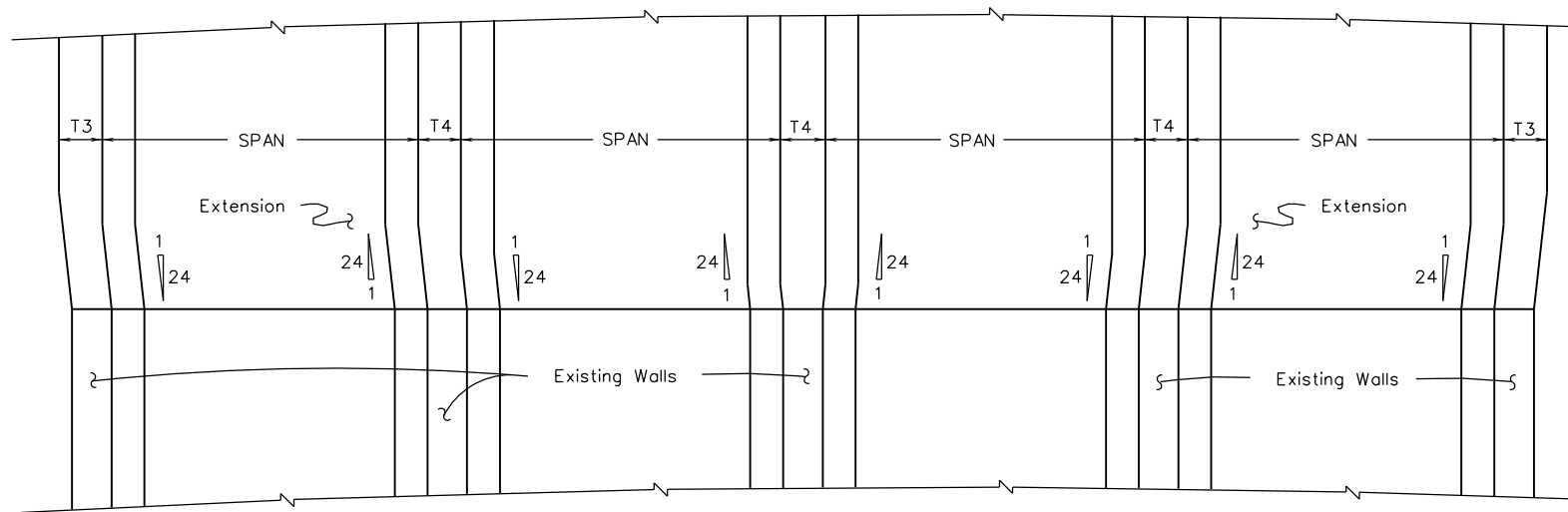
1008.03

BCE-01



TRIPLE BOX CULVERT

For SPAN, HGHT, & T dimensions, refer to appropriate Box Culvert Standard. This standard is to be used only when a change in height or wall thickness occurs. It does not apply to changes in SPAN.



QUADRUPLE BOX CULVERT



ROAD AND BRIDGE STANDARDS

DETAILS FOR WIDENING EXISTING BOX CULVERTS
WALL TRANSITIONS

SPECIFICATION REFERENCE

SHEET 4 OF 4

REVISION DATE

VIRGINIA DEPARTMENT OF TRANSPORTATION

1008.04

07/11