GENERAL NOTES

Specifications:

AASHTO LRFD Bridge Design Specifications 4th Edition 2007; 2008 and 2009 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 $\Phi^{\rm i}$ 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 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 Concrete CY Reinforcement LB A 2.5 210 B 3.1 260 C 3.7 300 D 4.5 340 E 5.4 410 F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130		Wall Quantities				
B 3.1 260 C 3.7 300 D 4.5 340 E 5.4 410 F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030	WING		Reinforcement LB			
C 3.7 300 D 4.5 340 E 5.4 410 F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 Q 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480	A	2.5	210			
D 4.5 340 E 5.4 410 F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030	В	3.1	260			
E 5.4 410 F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 <	С	3.7	300			
F 6.2 450 G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430 </td <td>D</td> <td>4.5</td> <td>340</td>	D	4.5	340			
G 7.0 520 H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	E	5.4	410			
H 7.7 550 I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	F	6.2	450			
I 8.9 660 J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	G	7.0	520			
J 9.9 710 K 10.9 810 L 11.8 880 M 12.9 1030 N 13.8 1140 O 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Н	7.7	550			
K I0.9 810 L I1.8 880 M I2.9 I030 N I3.8 I140 O I5.0 I210 P I6.6 I410 Q I7.6 I580 R I9.1 I700 S 20.4 I870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	1	8.9	660			
L II.8 880 M I2.9 I030 N I3.8 II40 O I5.0 I210 P I6.6 I410 Q I7.6 I580 R I9.1 I700 S 20.4 I870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	J	9.9	710			
M I2.9 I030 N I3.8 I140 O I5.0 I210 P I6.6 I410 Q I7.6 I580 R I9.1 I700 S 20.4 I870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	к	10.9	810			
N I 3.8 I 140 0 I 5.0 I 210 P I 6.6 I 410 Q I 7.6 I 580 R I 9.1 I 700 S 20.4 I 870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	L	11.8	880			
0 15.0 1210 P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	м	12.9	1030			
P 16.6 1410 Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	N	13.8	1140			
Q 17.6 1580 R 19.1 1700 S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	0	15.0	1210			
R I 9.1 I 700 S 20.4 I870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Р	16.6	1410			
S 20.4 1870 T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Q	17.6	1580			
T 22.0 2020 U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	R	19.1	1700			
U 23.5 2350 V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	S	20.4	1870			
V 25.1 2600 W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Т	22.0	2020			
W 27.1 2830 X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	U	23.5	2350			
X 33.0 3350 Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	V	25.1	2600			
Y 38.9 3850 Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	W	27.1	2830			
Z 41.9 4130 AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	х	33.0	3350			
AA 44.2 4480 BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Y	38.9	3850			
BB 46.1 5030 CC 48.5 5260 DD 60.4 6430	Z	41.9	4130			
CC 48.5 5260 DD 60.4 6430	AA	44.2	4480			
DD 60.4 6430	BB	46.1	5030			
	сс	48.5	5260			
EE 63.4 7070	DD	60.4	6430			
	EE	63.4	7070			

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

VDOT								
ROAD	AND	BRID	GE	STANDA	RDS			
SHEET	1 OF	8	F	REVISION	DA			

1007.01

VISION DATE

WING DETAIL 2:1 FILL SLOPE - TYPE I

SPECIFICATION REFERENCE

VIRGINIA DEPARTMENT OF TRANSPORTATION