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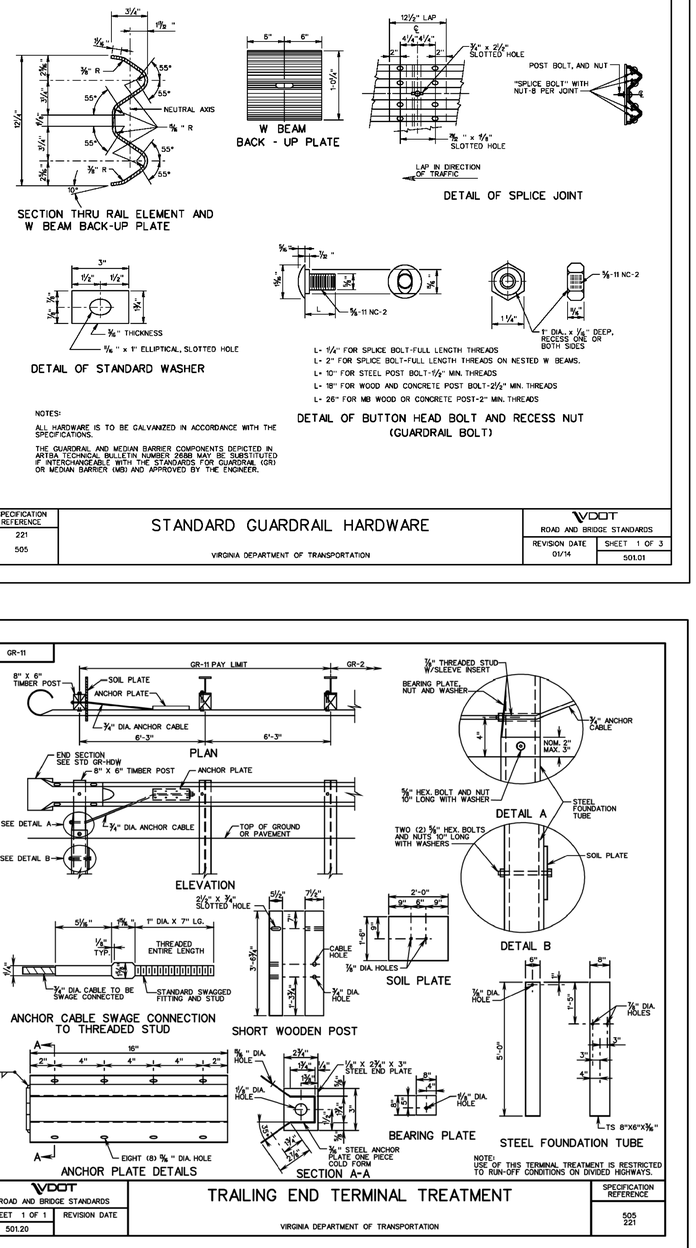
VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(6)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

GR-HDW



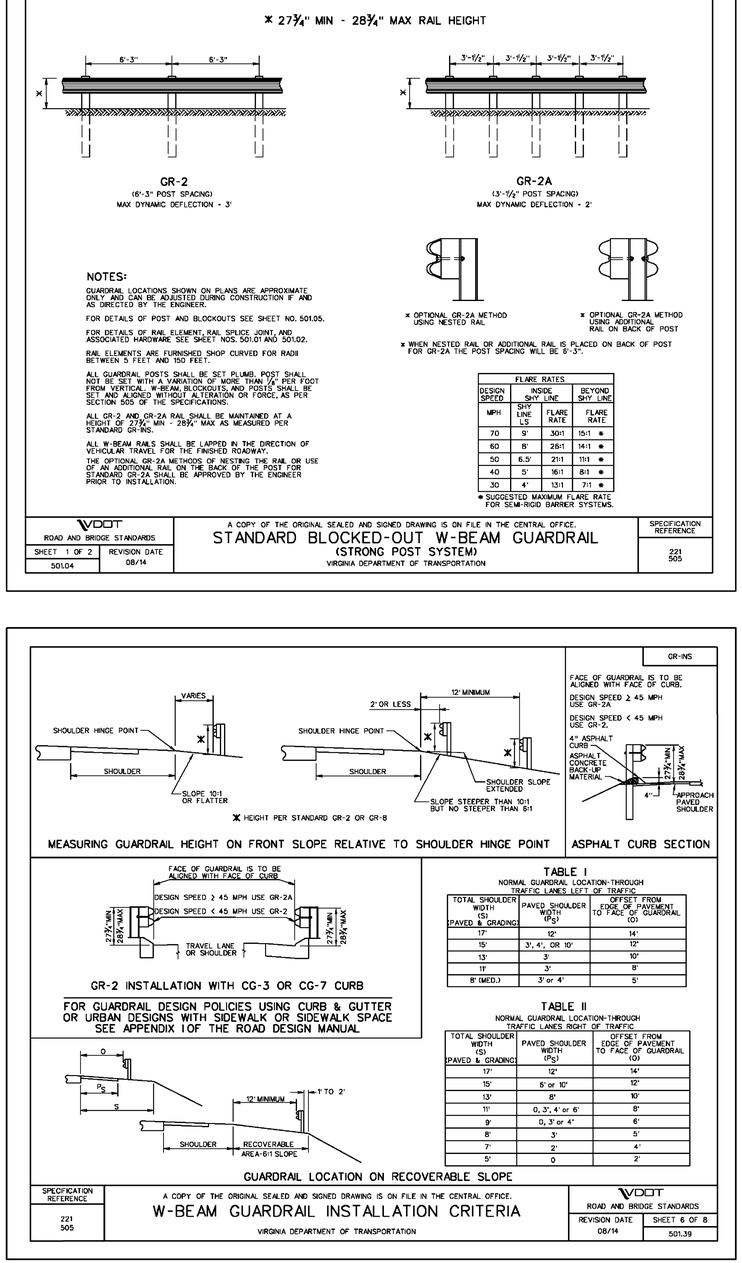
NOTES:

ALL HARDWARE IS TO BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.

THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN ARTBA TECHNICAL BULLETIN NUMBER 2688 MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

SPECIFICATION REFERENCE	STANDARD GUARDRAIL HARDWARE	VDOT ROAD AND BRIDGE STANDARDS	
221 505	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 01/14	SHEET 1 OF 3 501.01

GR-2, 2A



NOTES:

GUARDRAIL LOCATIONS SHOWN ON PLANS ARE APPROXIMATE ONLY AND CAN BE ADJUSTED DURING CONSTRUCTION IF AND AS DIRECTED BY THE ENGINEER.

FOR DETAILS OF POST AND BLOCKOUTS SEE SHEET NO. 501.05.

FOR DETAILS OF RAIL ELEMENT, RAIL SPLICE JOINT, AND ASSOCIATED HARDWARE SEE SHEET NOS. 501.01 AND 501.02.

RAIL ELEMENTS ARE FURNISHED SHOP CURVED FOR RADII BETWEEN 9 FEET AND 150 FEET.

ALL GUARDRAIL POSTS SHALL BE SET PLUMB. POST SHALL NOT BE SET WITH A VARIATION OF MORE THAN ¼" PER FOOT FROM VERTICAL. W-BEAM-BLOCKOUTS, AND POSTS SHALL BE SET AND ALIGNED WITHOUT ALTERATION OR FORCE, AS PER SECTION 505 OF THE SPECIFICATIONS.

ALL GR-2 AND GR-2A RAIL SHALL BE MAINTAINED AT A HEIGHT OF 27¾" MIN - 28¾" MAX AS MEASURED PER STANDARD GR-1NS.

ALL W-BEAM RAILS SHALL BE LAPPED IN THE DIRECTION OF VEHICULAR TRAVEL FOR THE FINISHED ROADWAY.

THE OPTIONAL GR-2A METHODS OF NESTING THE RAIL OR USE OF AN ADDITIONAL RAIL ON THE BACK OF THE POST FOR STANDARD GR-2A SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

* OPTIONAL GR-2A METHOD USING ADDITIONAL RAIL ON BACK OF POST

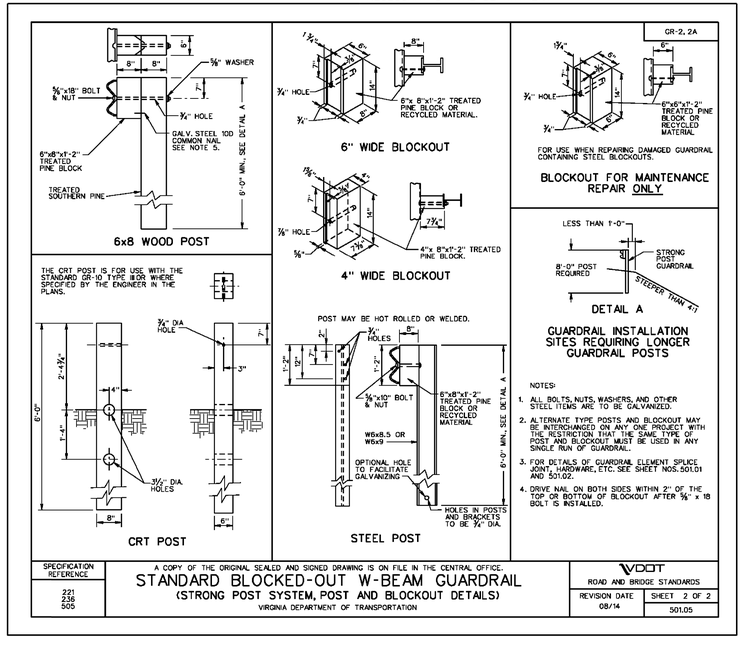
* WHEN NESTED RAIL OR ADDITIONAL RAIL IS PLACED ON BACK OF POST FOR GR-2A THE POST SPACING WILL BE 8'-3".

FLARE RATES

DESIGN SPEED MPH	INSIDE SHY LINE SHY LINE LS	INSIDE SHY LINE FLARE RATE	BEYOND SHY LINE FLARE RATE
70	9'	30:1	15:1 *
60	8'	26:1	14:1 *
50	6.5'	21:1	11:1 *
40	5'	16:1	8:1 *
30	4'	13:1	7:1 *

* SUGGESTED MAXIMUM FLARE RATE FOR SEMI-RIGID BARRIER SYSTEMS.

VDOT ROAD AND BRIDGE STANDARDS	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 1 OF 2 501.04 / REVISION DATE 08/14	STANDARD BLOCKED-OUT W-BEAM GUARDRAIL (STRONG POST SYSTEM) VIRGINIA DEPARTMENT OF TRANSPORTATION	221 505



NOTES:

1. ALL BOLTS, NUTS, WASHERS, AND OTHER STEEL ITEMS ARE TO BE GALVANIZED.
2. ALTERNATE TYPE POSTS AND BLOCKOUT MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF GUARDRAIL.
3. FOR DETAILS OF GUARDRAIL ELEMENT SPLICE JOINT, HARDWARE, ETC. SEE SHEET NOS. 501.01 AND 501.02.
4. DRIVE NAIL ON BOTH SIDES WITHIN 2" OF THE TOP OR BOTTOM OF BLOCKOUT AFTER ⅝" x 18 BOLT IS INSTALLED.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS
221 236 505	STANDARD BLOCKED-OUT W-BEAM GUARDRAIL (STRONG POST SYSTEM, POST AND BLOCKOUT DETAILS) VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 08/14 / SHEET 2 OF 2 501.05

GR-11

VDOT ROAD AND BRIDGE STANDARDS	TRAILING END TERMINAL TREATMENT	SPECIFICATION REFERENCE
SHEET 1 OF 1 501.20 / REVISION DATE	VIRGINIA DEPARTMENT OF TRANSPORTATION	505 221

GR-1NS

TABLE I
NORMAL GUARDRAIL LOCATION-THROUGH TRAFFIC LANES LEFT OF TRAFFIC

TOTAL SHOULDER WIDTH (S) (PAVED & GRADING)	PAVED SHOULDER WIDTH (P_S)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
17'	12'	14'
15'	3', 4', OR 10'	12'
13'	3'	10'
11'	3'	8'
8' (MED.)	3' or 4'	5'

TABLE II
NORMAL GUARDRAIL LOCATION-THROUGH TRAFFIC LANES RIGHT OF TRAFFIC

TOTAL SHOULDER WIDTH (S) (PAVED & GRADING)	PAVED SHOULDER WIDTH (P_S)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
17'	12'	14'
15'	6' or 10'	12'
13'	8'	10'
11'	0, 3', 4' or 6'	8'
9'	0, 3' or 4'	6'
8'	3'	5'
7'	2'	4'
5'	0	2'

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS
221 505	W-BEAM GUARDRAIL INSTALLATION CRITERIA VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 08/14 / SHEET 6 OF 8 501.39

PROJECT	SHEET NO.
0029-151-105	2P(6)

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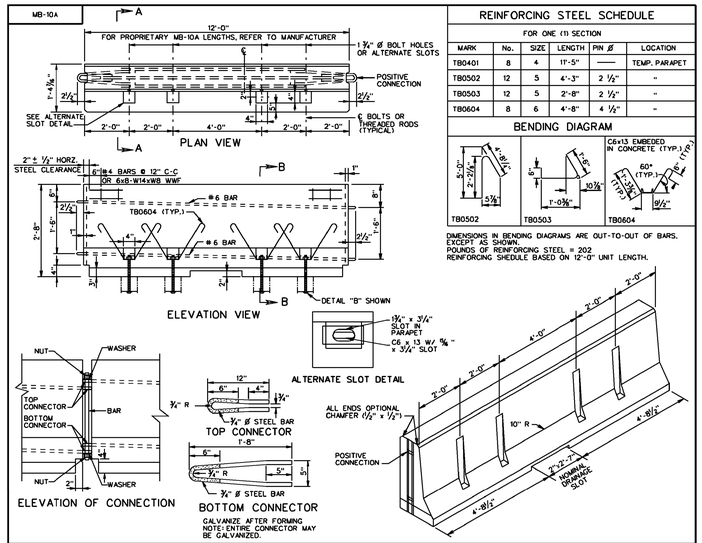
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(7)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

MB-10A



REINFORCING STEEL SCHEDULE

FOR ONE (1) SECTION

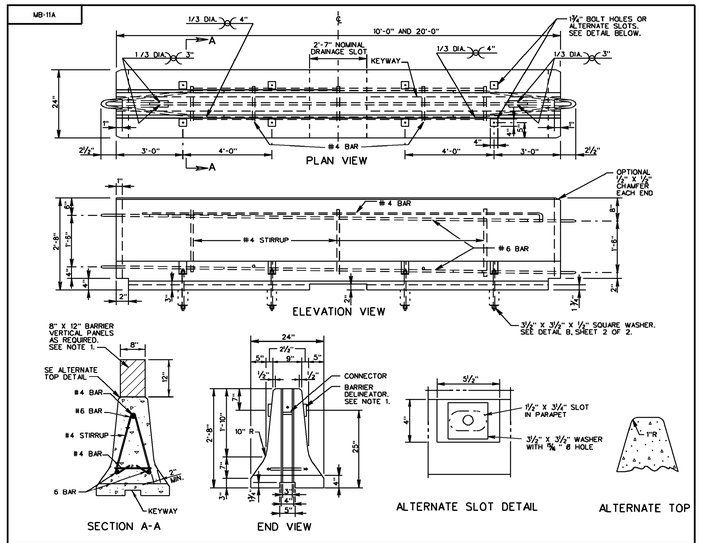
MARK	No.	SIZE	LENGTH	PIN Ø	LOCATION
TB0401	8	4	11'-5"	——	TEMP. PARAPET
TB0502	12	5	4'-3"	2 1/2"	"
TB0503	12	5	2'-8"	2 1/2"	"
TB0604	8	6	4'-8"	4 1/2"	"

BENDING DIAGRAM

DIMENSIONS IN BENDING DIAGRAMS ARE OUT-TO-OUT OF BARS. EXCEPT AS SHOWN. POUNDS OF REINFORCING STEEL = 202. REINFORCING SHEDULE BASED ON 12'-0" UNIT LENGTH.

VDOT ROAD AND BRIDGE STANDARDS		TRAFFIC BARRIER SERVICE CONCRETE PARAPET (SINGLE FACE) (FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR) VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 2	REVISION DATE 01/09		105 502
502.11			

MB-11A

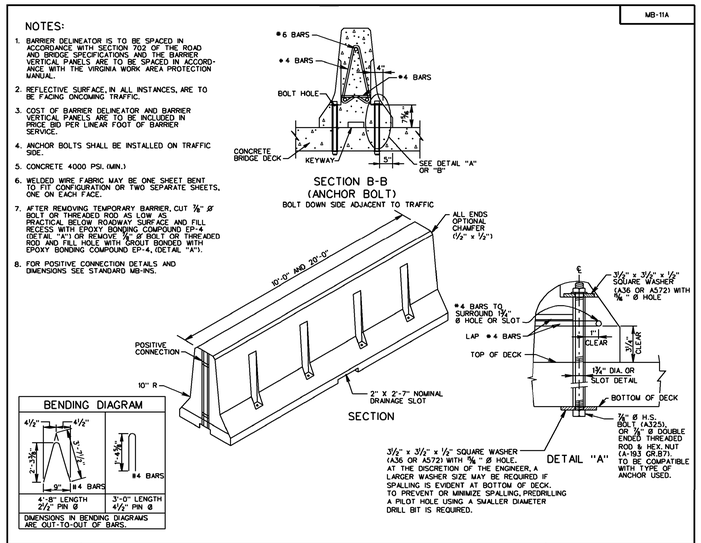


VDOT ROAD AND BRIDGE STANDARDS		TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE) (FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR) VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 3	REVISION DATE 01/09		105 512
502.13			

MB-11A

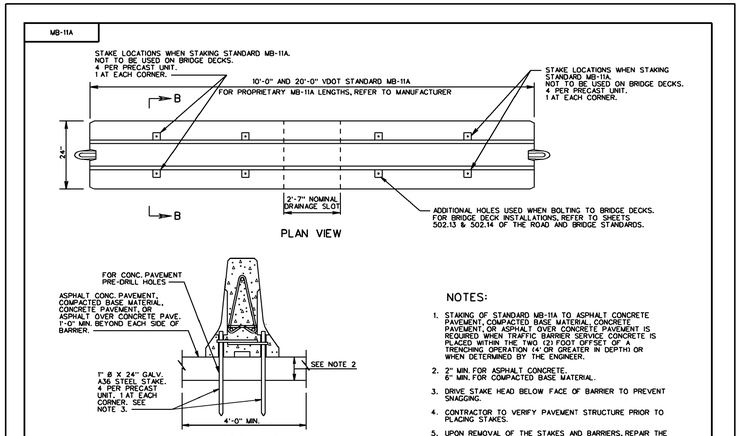
NOTES:

1. BARRIER DELINEATOR IS TO BE SPACED IN ACCORDANCE WITH SECTION 702 OF THE ROAD AND BRIDGE SPECIFICATIONS AND THE BARRIER VERTICAL PANELS ARE TO BE SPACED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL.
2. REFLECTIVE SURFACE, IN ALL INSTANCES, ARE TO BE FACING ONCOMING TRAFFIC.
3. COST OF BARRIER DELINEATOR AND BARRIER VERTICAL PANELS ARE TO BE INCLUDED IN PRICE BID PER LINEAR FOOT OF BARRIER SERVICE.
4. ANCHOR BOLTS SHALL BE INSTALLED ON TRAFFIC SIDE.
5. CONCRETE 4000 PSI. (MIN.)
6. WELDED WIRE FABRIC MAY BE ONE SHEET BENT TO FIT CONFIGURATION OR TWO SEPARATE SHEETS, ONE ON EACH FACE.
7. AFTER REMOVING TEMPORARY BARRIER, CUT 7/8" Ø BOLT OR THREADED ROD AS LOW AS PRACTICAL BELOW ROADWAY SURFACE AND FILL RECESS WITH EPOXY BONDING COMPOUND EP-4 (DETAIL "A") OR REMOVE 7/8" Ø BOLT OR THREADED ROD AND FILL HOLE WITH GROUT BONDED WITH EPOXY BONDING COMPOUND EP-4, (DETAIL "A").
8. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE STANDARD MB-INS.



SPECIFICATION REFERENCE	TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE) (FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR) VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
105 512		REVISION DATE 01/09	SHEET 2 OF 3
			502.14

MB-11A



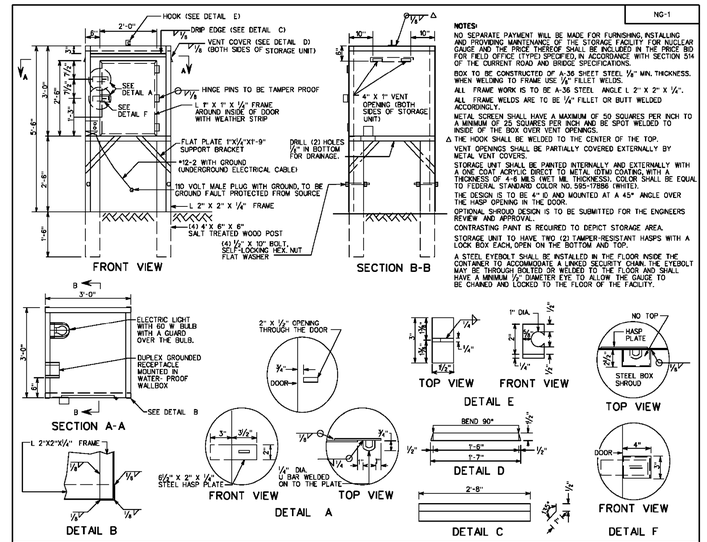
TEMPORARY INSTALLATION ON ASPHALT CONCRETE PAVEMENT, COMPACTED BASE MATERIAL, CONCRETE PAVEMENT, OR ASPHALT OVER CONCRETE PAVEMENT (NOT TO BE USED ON BRIDGE DECKS)

NOTES:

1. STAKING OF STANDARD MB-11A TO ASPHALT CONCRETE PAVEMENT, COMPACTED BASE MATERIAL, CONCRETE PAVEMENT, OR ASPHALT OVER CONCRETE PAVEMENT IS REQUIRED WHEN TRAFFIC BARRIER SERVICE CONCRETE IS PLACED WITHIN THE TWO (2) FOOT OFFSET OF A TRENCHING OPERATION (4' OR GREATER IN DEPTH) OR WHEN DETERMINED BY THE ENGINEER.
2. 2" MIN. FOR ASPHALT CONCRETE. 6" MIN. FOR COMPACTED BASE MATERIAL.
3. DRIVE STAKE HEAD BELOW FACE OF BARRIER TO PREVENT SNAGGING.
4. CONTRACTOR TO VERIFY PAVEMENT STRUCTURE PRIOR TO PLACING STAKES.
5. UPON REMOVAL OF THE STAKES AND BARRIERS, REPAIR THE RESULTING HOLES AS FOLLOWS OR AS DIRECTED BY THE ENGINEER. CLEAN AND FILL WITH TYPE EP-4 OR EP-5 EPOXY MORTAR CONFORMING TO THE REQUIREMENTS OF SECTION 243 FOR HYDRAULIC CEMENT CONCRETE PAVEMENT AND ASPHALT CONCRETE PAVEMENT. CARE SHALL BE TAKEN NOT TO TRAP AIR WITHIN OR AT THE BOTTOM OF THE EPOXY MORTAR.

VDOT ROAD AND BRIDGE STANDARDS		TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE) (FOR TEMPORARY INSTALLATION ON ROADWAYS) VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 3 OF 3	REVISION DATE 01/09		105 512
502.15			

NG-1



NOTES:

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING, INSTALLING AND PROVIDING MAINTENANCE OF THE STORAGE FACILITY FOR NUCLEAR GAUGE AND THE PRICE THEREOF SHALL BE INCLUDED IN THE PRICE BID FOR FIELD OFFICE (TYPE) SPECIFIED, IN ACCORDANCE WITH SECTION 314 OF THE CURRENT ROAD AND BRIDGE SPECIFICATIONS.

BOX TO BE CONSTRUCTED OF A-36 SHEET STEEL 1/4" MIN. THICKNESS. WHEN WELDING TO FRAME USE 3/16" FILLET WELDS.

ALL FRAME WORK IS TO BE A-36 STEEL ANGLE L 2" X 2" X 1/4".

ALL FRAME WELDS ARE TO BE 1/4" FILLET OR BUTT WELDED ACCORDINGLY.

METAL SCREEN SHALL HAVE A MAXIMUM OF 50 SQUARES PER INCH TO A MINIMUM OF 25 SQUARES PER INCH AND BE SPOT WELDED TO INSIDE OF THE BOX OVER VENT OPENINGS.

Δ THE HOOK SHALL BE WELDED TO THE CENTER OF THE TOP.

VENT OPENINGS SHALL BE PARTIALLY COVERED EXTERNALLY BY METAL VENT COVERS.

STORAGE UNIT SHALL BE PAINTED INTERNALLY AND EXTERNALLY WITH A ONE COAT ACRYLIC DIRECT TO METAL (DTM) COATING, WITH A THICKNESS OF 4-6 MILS (WET MIL THICKNESS). COLOR SHALL BE EQUAL TO FEDERAL STANDARD COLOR NO. 595-17886 (WHITE).

THE DESIGN IS TO BE 4' ID AND MOUNTED AT A 45° ANGLE OVER THE HASP OPENING IN THE DOOR.

OPTIONAL SHROUD DESIGN IS TO BE SUBMITTED FOR THE ENGINEERS REVIEW AND APPROVAL.

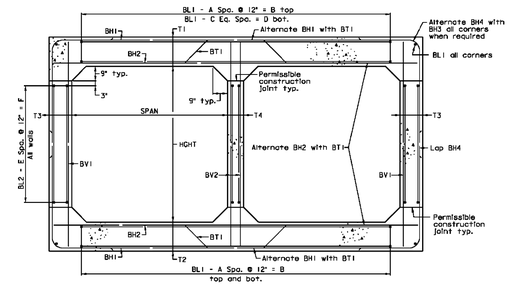
CONTRASTING PAINT IS REQUIRED TO DEPICT STORAGE AREA.

STORAGE UNIT TO HAVE TWO (2) TAMPER-RESISTANT HASPS WITH A LOCK BOX EACH, OPEN ON THE BOTTOM AND TOP.

A STEEL EYEBOLT SHALL BE INSTALLED IN THE FLOOR INSIDE THE CONTAINER TO ACCOMMODATE A LINKED SECURITY CHAIN. THE EYEBOLT MAY BE THROUGH BOLTED OR WELDED TO THE FLOOR AND SHALL HAVE A MINIMUM 1/2" DIAMETER EYE TO ALLOW THE GAUGE TO BE CHAINED AND LOCKED TO THE FLOOR OF THE FACILITY.

SPECIFICATION REFERENCE	STORAGE FACILITY FOR NUCLEAR GAUGE VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
		REVISION DATE 01/13	SHEET 1 OF 1
			605.01

BCD-DT



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

VDOT ROAD AND BRIDGE STANDARDS		DOUBLE BOX CULVERTS STANDARD DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 3	REVISION DATE 07/11		
1003.01			

PROJECT	SHEET NO.
0029-151-105	2P(7)

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VDOT Insertable Sheets

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(8)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

BCD-DT

GENERAL NOTE

Capacity: AASHTO H-93 Loading.

Specifications:

Construction - Va. Department of Transportation Road and Bridge Specifications 2007.

Design - AASHTO LRFD Bridge Design Specifications, 5th Edition 2010; 2011 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 2½" 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.

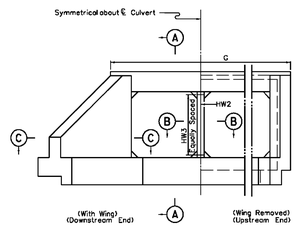
A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

SPECIFICATION REFERENCE

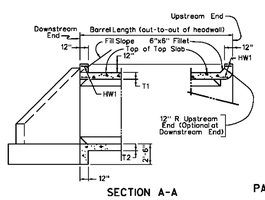
DOUBLE BOX CULVERTS
STANDARD DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS
REVISION DATE 07/12 | SHEET 2 OF 3 | 1003.02

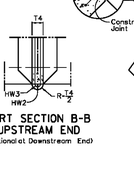
BCD-DT



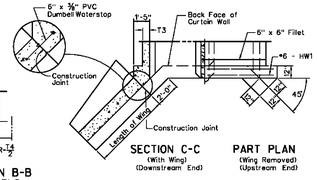
END ELEVATION



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)

REINFORCING BAR DIAGRAMS

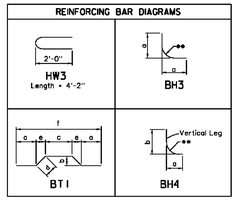


TABLE A	
Bar Size	Pin Dia.
#3	2 1/4"
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"
#9	9"

ROAD AND BRIDGE STANDARDS
SHEET 3 OF 3 | REVISION DATE 07/11 | 1003.03

DOUBLE BOX CULVERTS
STANDARD DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

BCD-05

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

DIMENSIONS												REINFORCING STEEL																											
SPAN (FT.)	HGHT (FT.)	T1 TOP SLAB SIZE	T2 BOTTOM SLAB SIZE	T3 EXTERIOR WALL SIZE	T4 INTERIOR WALL SIZE	A	B	C	D	E	F	BH1 SIZE	BH1 SPACING O-O	BH1 LENGTH	BH2 SIZE	BH2 SPACING O-O	BH2 LENGTH	BH3 SIZE	BH3 SPACING O-O	a	BH3 LENGTH	BH4 SIZE	BH4 SPACING O-O	a	b	BH4 LENGTH	BV1 SIZE	BV1 SPACING O-O	BV1 LENGTH	BV2 SIZE	BV2 SPACING O-O	BV2 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'-1¼"	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'-1¼"	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'-3½"	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'-3½"	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'-3½"	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'-3½"	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'-8½"	5'-2"	4	12"	2'-8½"	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'-8½"	5'-2"	4	12"	2'-8½"	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'-8½"	5'-2"	4	12"	2'-8½"	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'-8½"	5'-2"	4	12"	2'-8½"	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"	4	12"	2'-8½"	5'-2"	4	12"	2'-8½"	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	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10¾"	3'-2"	5'-2"	4	12"	5'-0"	4	12"	5'-0"
7	5	8"	8"	8"	8"	14	14'-0"	14	14'-0"	3	3'-0"	4	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10¾"	3'-8"	5'-8"	4	12"	6'-0"	4	12"	6'-0"
7	6	8"	8"	8"	8"	14	14'-0"	14	14'-0"	4	4'-0"	4	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10¾"	4'-2"	6'-10"	4	12"	7'-0"	4	12"	7'-0"
7	7	8"	8"	8"	8"	14	14'-0"	14	14'-0"	5	5'-0"	4	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10¾"	4'-8"	7'-10"	4	12"	8'-0"	4	12"	8'-0"
7	8	8"	8"	8"	8"	14	14'-0"	14	14'-0"	6	6'-0"	4	11"	14'-7"	4	11"	15'-8"	--	---	-----	-----	5	11"	2'-10¾"	5'-2"	8'-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	9"	14'-7"	4	9"	15'-8"	4	9"	3'-6"	6'-9"	4	9"	2'-10¾"	6'-2"	8'-10"	5	12"	11'-0"	4	12"	11'-0"
8	4	8"	8"	8"	8"	16	16'-0"	16	16'-0"	2	2'-0"	4	8"	16'-4"	4	8"	17'-8"	4	8"	3'-1¼"	5'-11"	4	8"	3'-1¼"	5'-2"	6'-0"	4	12"	5'-0"	4	10"	5'-0"
8	6	8"	8"	8"	8"	16	16'-0"	16	16'-0"	4	4'-0"	5	11"	16'-4"	5	11"	17'-8"	4	11"	3'-1¼"	5'-11"	5	11"	3'-1¼"	4'-2"	6'-11"	4	12"	7'-0"	4	10"	7'-0"
8	8	8"	8"	8"	8"	16	16'-0"	16	16'-0"	6	6'-0"	5	11"	16'-4"	5	11"	17'-8"	4	11"	3'-1¼"	5'-11"	5	11"	3'-1¼"	5'-2"	7'-11"	4	12"	9'-0"	4	10"	9'-0"
8	10	8"	8"	8"	8"	16	16'-0"	16	16'-0"	8	8'-0"	5	10"	16'-4"	5	10"	17'-8"	4	10"	3'-6"	6'-9"	5	10"	3'-1¼"	6'-2"	8'-11"	5	12"	11'-0"	4	10½"	11'-0"
9	4	8"	8"	8"	8"	18	18'-0"	18	18'-0"	2	2'-0"	5	9"	18'-4"	5	9"	19'-8"	4	9"	3'-3⅝"	6'-4"	5	9"	3'-3⅝"	4'-2½"	7'-2"	4	12"	5'-0"	4	9"	5'-0"
9	6	8½"	8¼"	8"	8"	18	18'-0"	18	18'-0"	4	4'-0"	5	10"	18'-4"	5	10"	19'-8"	4	10"	3'-3⅝"	6'-4"	5	10"	3'-3⅝"	4'-2½"	7'-2"	4	12"	7'-0"	4	10"	7'-0"
9	8	8½"	8¼"	8"	8"	18	18'-0"	18	18'-0"	6	6'-0"	5	9"	18'-4"	5	9"	19'-8"	4	9"	3'-3⅝"	6'-4"	5	9"	3'-3⅝"	5'-2½"	8'-2"	4	12"	9'-1"	4	10"	9'-1"
9	10	9"	9"	8"	8"	18	18'-0"	18	18'-0"	8	8'-0"	6	12"	18'-4"	5	12"	19'-8"	4	12"	3'-7"	6'-10"	6	12"	3'-10"	6'-7"	10'-0"	5	12"	11'-2"	4	10"	11'-2"
9	12	9"	9"	8"	8"	18	18'-0"	18	18'-0"	10	10'-0"	6	8"	18'-4"	5	8"	19'-8"	4	8"	4'-0"	7'-9"	5	8"	3'-3⅝"	7'-3"	10'-3"	5	8"	13'-2"	4	11"	13'-2"
10	4	8½"	8½"	8"	8"	20	20'-0"	20	20'-0"	2	2'-0"	5	9"	20'-4"	5	9"	21'-8"	--	---	-----	-----	6	9"	3'-7"	5'-2"	8'-2"	4	12"	5'-1"	4	8"	5'-1"
10	6	8½"	8½"	8"	8"	20	20'-0"	20	20'-0"	4	4'-0"	5	9"	20'-4"	5	9"	21'-8"	4	9"	3'-3"	6'-9"	5	9"	3'-7"	6'-2"	9'-2"	4	12"	7'-2"	4	9"	7'-2"
10	8	9"	9"	8"	8"	20	20'-0"	20	20'-0"	6	6'-0"	6	12"	20'-4"	6	12"	21'-8"	4	12"	3'-6"	6'-9"	6	12"	4'-0"	5'-7"	9'-2"	4	12"	9'-2"	4	10"	9'-2"
10	10	9½"	9¼"	8"	8"	20	20'-0"	20	20'-0"	8	8'-0"	5	8"	20'-4"	5	8"	21'-8"	4	8"	3'-1¼"	6'-11"	5	8"	3'-6"	5'-6"	9'-5"	4	10"	11'-2"	4	10"	11'-2"
10	12	9½"	9¼"	8"	8"	20	20'-0"	20	20'-0"	10	10'-0"	6	10"	20'-4"	5	10"	21'-8"	4	10"	4'-1"	7'-11"	5	10"	3'-6"	7'-1"	10'-1"	5	10"	13'-5"	4	10"	13'-5"
12	6	9½"	9½"	8"	8"	24	24'-0"	24	24'-0"	4	4'-0"	5	8"	24'-4"	5	8"	25'-8"	4	8"	3'-10¾"	7'-6"	5	8"	3'-10¾"	6'-4½"	10'-1"	5	8"	13'-5"	4	10"	13'-5"
12	8	9½"	9½"	8"	8"	24	24'-0"	24	24'-0"	6	6'-0"	6	11"	24'-4"	6	11"	25'-8"	4	11"	3'-10¾"	7'-6"	6	11"	4'-5"	5'-7½"	9'-8"	4	12"	9'-3"	4	8"	9'-3"
12	10	10"	10¼"	8"	8"	24	24'-0"	24	24'-0"	8	8'-0"	6	9"	24'-4"	6	9"	25'-8"	4	9"	3'-10¾"	7'-6"	6	9"	4'-5"	6'-1¾"	10'-8"	4	10"	11'-5"	4	10"	11'-5"
12	12	10"	10¼"	8"	8"	24	24'-0"	24	24'-0"	10	10'-0"	7	12"	24'-4"	7	12"	25'-8"	5	12"	4'-1"	7'-11"	7	12"	4'-10"	7'-11½"	12'-3"	5	10"	13'-5"	4	10"	13'-5"

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 07/11 | 1003.07

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

SPECIFICATION REFERENCE

BCD-05

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

| REINFORCING STEEL | | | | | | | | | | | | | | | | | | |

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PROJECT MANAGER Wendy Block Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(9)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

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 or 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) 2½" 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 20° 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: Concrete CY	Reinforcement LB	$q_{r,min}$ ksf High End	$q_{r,min}$ ksf Low End
A	2.3	289	0.91	0.46
B	2.8	245	1.05	0.46
C	3.2	273	1.21	0.49
D	4.0	386	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	2.78	0.65
M	10.3	870	2.76	0.71
N	10.7	950	3.05	0.65
O	11.7	1014	3.10	0.65
P	13.2	1172	3.17	0.68
Q	14.0	1337	3.45	0.68
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	2483	4.07	1.11
X	27.8	2884	4.28	1.27
Y	31.7	3334	4.36	1.38
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	41.8	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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VDOT ROAD AND BRIDGE STANDARDS | SHEET 1 OF 8 | REVISION DATE 07/12 | 1007.01
WING DETAIL
2:1 FILL SLOPE - TYPE I
VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIFICATION REFERENCE

BCW-21

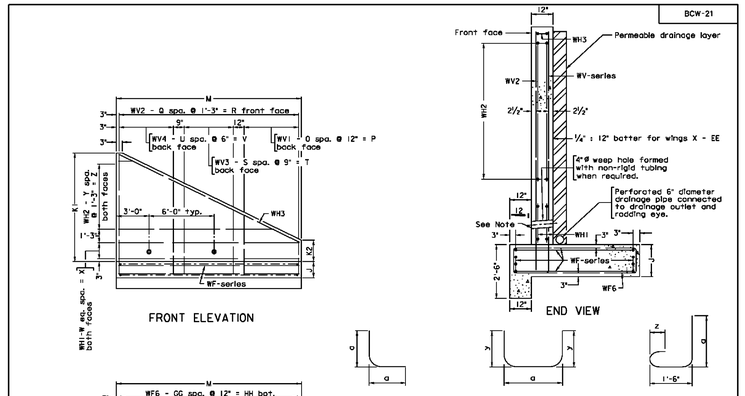

TABLE A	
Wall	y
A-W	9½"
X	1'-0½"
Y-CC	1'-3½"
DD-EE	1'-9½"

TABLE B		
Bar Size	Pin Dia.	Z
#3	2¼"	4"
#4	3"	4½"
#5	3¾"	5"
#6	4½"	6"
#7	5¼"	7"
#8	6"	8"
#9	9"	10¼"

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 | VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/12 | SHEET 2 OF 8 | 1007.02

BCW-21

WING	WALL DIMENSIONS: J	K1	K2	L1	L2	M	N1	N2	No. WEEP HOLES	FOOTING BAR SPACINGS: WF1 LL	WF1 MM	WF2 AA	WF2 BB	WF3 CC	WF3 DD	WF4, WF8 NN	WF4, WF8 DD	WF5 EE	WF5 FF	WF6 GG	WF6 HH	WF7 JJ	WF7 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'-8"	1'-0"	1'-0"	10'-0"	4'-0"	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'-0"	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'-0"	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'-0"	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'-0"	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'-0"	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'-0"	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'-3¾"	1'-1⅞"	29'-0"	11'-0"	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'-1⅞"	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'-4½"	1'-1½"	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'-4½"	1'-1½"	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'-4⅝"	1'-1½"	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'-4½"	1'-1¼"	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'-4⅝"	1'-1⅜"	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'-4¾"	1'-1⅜"	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

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

BCW-21

WING	WF1 SIZE	a	LENGTH	▪ Ea	WF2 SIZE	a FROM	a TO	a VARY BY	LENGTH FROM	LENGTH TO	LENGTH VARY BY	▪ Ea	WF3 SIZE	a FROM	a TO	a VARY BY	LENGTH FROM	LENGTH TO	LENGTH 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'-1¾"	4'-9"	3'-11"	0'-1¾"
B	4	7'-5"	8'-9"	2	4	1'-5"	9'-5"	-	2'-9"	10'-9"	-	2	4	3'-5"	2'-6"	0'-1½"	4'-9"	3'-11"	0'-1½"
C	4	8'-5"	9'-9"	2	4	1'-8"	10'-8"	-	3'-2"	12'-2"	-	2	4	3'-5"	2'-6"	0'-1¼"	4'-9"	3'-11"	0'-1¼"
D	4	9'-5"	10'-9"	2	4	4'-5"	4'-5"	-	5'-9"	5'-9"	-	2	4	3'-11"	2'-6"	0'-1¾"	5'-3"	3'-11"	0'-1¾"
E	4	10'-5"	11'-5"	2	4	4'-11"	4'-11"	-	6'-3"	6'-3"	-	2	4	3'-11"	2'-6"	0'-1¾"	5'-3"	3'-11"	0'-1¾"
F	4	11'-5"	12'-5"	2	4	5'-5"	5'-5"	-	6'-9"	6'-9"	-	2	4	3'-11"	2'-6"	0'-1½"	5'-3"	3'-11"	0'-1½"
G	4	12'-5"	13'-5"	2	4	7'-6"	7'-6"	-	8'-11"	8'-11"	-	2	4	4'-5"	2'-6"	0'-1¾"	5'-9"	3'-11"	0'-1¾"
H	4	13'-5"	14'-5"	2	4	8'-2"	8'-2"	-	9'-6"	9'-6"	-	2	4	4'-5"	2'-6"	0'-1¾"	5'-9"	3'-11"	0'-1¾"
I	4	14'-5"	15'-5"	2	4	9'-11"	3'-11"	5'-0"	11'-3"	5'-3"	5'-0"	2	4	4'-8"	2'-6"	0'-2"	5'-44"	3'-10"	0'-2"
J	4	15'-5"	16'-9"	2	4	10'-7"	4'-2"	6'-4⅜"	11'-11"	5'-7"	6'-4⅜"	2	4	3'-11"	2'-6"	0'-1⅞"	5'-3"	3'-10"	0'-1⅞"
K	4	16'-5"	17'-5"	2	4	12'-2"	6'-6"	5'-8"	13'-6"	7'-10"	5'-8"	2	4	4'-3"	2'-6"	0'-2¼"	5'-8"	3'-11"	0'-2¼"
L	4	17'-5"	18'-5"	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'-5"	2	4	14'-4"	3'-5"	5'-5⅛"	15'-8"	4'-10"	5'-5⅛"	2	4	4'-7"	2'-7"	0'-2⅛"	5'-11"	3'-11"	0'-2⅛"
N	4	18'-5"	19'-5"	2	4	14'-4"	3'-5"	5'-5⅛"	15'-8"	4'-10"	5'-5⅛"	2	4	4'-7"	2'-7"	0'-2⅛"	5'-11"	3'-11"	0'-2⅛"
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'-2⅜"	6'-4"	3'-11"	0'-2⅜"
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'-2⅜"	6'-8"	4'-4"	0'-2⅜"
Q	4	21'-5"	22'-9"	2	4	20'-8"	3'-6"	5'-6"	21'-5"	4'-11"	5'-6"	2	4	5'-4"	3'-0"	0'-2⅛"	6'-8"	4'-4"	0'-2⅛"
R	4	22'-5"	23'-9"	2	4	21'-1"	5'-9"	5'-1½"	22'-6"	7'-2"	5'-1½"	2	4	4'-11"	3'-0"	0'-2½"	6'-4"	4'-4"	0'-2½"
S	4	23'-5"	24'-9"	2	4	22'-2"	3'-0"	4'-9½"	23'-7"	4'-4"	4'-9½"	2	4	5'-4"	3'-0"	0'-2⅜"	6'-8"	4'-4"	0'-2⅜"
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'-2½"	6'-9"	4'-4"	0'-2½"
U	4	25'-5"	26'-9"	2	4	24'-2"	5'-3"	4'-8¾"	25'-7"	6'-9"	4'-8¾"	2	4	5'-6"	3'-0"	0'-2⅜"	6'-11"	4'-4"	0'-2⅜"
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'-2¾"	6'-7"	4'-4"	0'-2¾"
W	4	27'-5"	28'-9"	2	4	26'-4"	4'-9"	4'-3¾"	27'-8"	6'-2"	4'-3¾"	2	4	5'-6"	3'-0"	0'-2⅜"	6'-11"	4'-4"	0'-2⅜"
X	4	28'-5"	30'-3"	2	5	26'-0"	5'-3"	4'-1¾"	27'-9"	7'-1"	4'-1¾"	2	5	6'-2"	3'-6"	0'-3"	8'-8"	5'-4"	0'-3"
Y	4	29'-5"	31'-3"	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'-10½"	32'-5"	5'-3"	3'-10½"	2	5	6'-7"	4'-0"	0'-3½"	9'-1"	6'-4"	0'-3½"
AA	4	31'-5"	33'-9"	2	5	31'-1"	4'-9"	3'-11⅝"	33'-5"	7'-0"	3'-11⅝"	2	5	6'-11"	4'-0"	0'-3½"	9'-3"	6'-4"	0'-3½"
BB	4	32'-5"	34'-9"	2	5	32'-1"	4'-4"	3'-8⅝"	34'-5"	6'-7"	3'-8⅝"	2	5	7'-5"	4'-0"	0'-3½"	9'-9"	6'-4"	0'-3½"
CC	4	33'-5"	35'-9"	2	5	33'-1"	2'-6"	3'-4¾"	35'-5"	4'-10"	3'-4¾"	2	5	7'-10"	4'-0"	0'-3½"	10'-2"	6'-4"	0'-3½"
DD	5	34'-5"	37'-6"	2	5	32'-11"	4'-11"	3'-6"	36'-3"	8'-3"	3'-6"	2	5	7'-11"	4'-6"	0'-3½"	11'-3"	7'-10"	0'-3½"
EE	5	35'-5"	38'-6"	2	5	33'-11"	3'-1"	3'-5⅛"	37'-3"	6'-5"	3'-5⅛"	2	5	8'-0"	4'-6"	0'-3½"	11'-4"	7'-10"	0'-3½"

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

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

BCW-21

WING	WF4 SIZE	LENGTH	SIZE	a FROM	a TO	a VARY BY	LENGTH FROM	LENGTH TO	LENGTH VARY BY	SIZE	a FROM	a TO	a VARY BY	LENGTH FROM	LENGTH TO	LENGTH VARY BY
A	4	6'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'- 1⅝"	4'-9"	3'-10"	0'- 1⅝"
B	4	7'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'- 1½"	4'-9"	3'-10"	0'- 1½"
C	4	8'-2"	-	-	-	-	-	-	-	4	3'-4"	2'-6"	0'- 1½"	4'-9"	3'-10"	0'- 1¾"
D	4	9'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'- 1¾"	5'-3"	3'-10"	0'- 1¾"
E	4	10'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'- 1⅝"	5'-3"	3'-10"	0'- 1⅝"
F	4	11'-3"	-	-	-	-	-	-	-	4	3'-10"	2'-6"	0'- 1½"	5'-3"	3'-10"	0'- 1½"
G	4	12'-3"	-	-	-	-	-	-	-	4	4'-4"	2'-6"	0'- 1¾"	5'-9"	3'-10"	0'- 1¾"
H	4	13'-3"	-	-	-	-	-	-	-	4	4'-4"	2'-6"	0'- 1⅝"	5'-9"	3'-10"	0'- 1⅝"
I	4	14'-4"	4	4'-11"	4'-2"	0'- 1½"	6'-3"	5'-6"	0'- 1½"	4	4'-10"	2'-6"	0'- 2"	6'-3"	3'-11"	0'- 2"
J	4	15'-4"	4	4'-11"	4'-1"	0'- 1⅜"	6'-3"	5'-5"	0'- 1⅜"	4	4'-10"	2'-6"	0'- 1⅞"	6'-3"	3'-10"	0'- 1⅞"
K	4	16'-5"	4	5'-5"	4'-5"	0'- 1½"	6'-9"	5'-10"	0'- 1½"	4	5'-4"	2'-6"	0'- 2"	6'-9"	3'-11"	0'- 2"
L	4	17'-5"	4	5'-5"	4'-5"	0'- 1½"	6'-9"	5'-9"	0'- 1½"	4	5'-4"	2'-6"	0'- 2"	6'-9"	3'-11"	0'- 2"
M	4	18'-5"	5	5'-11"	4'-9"	0'- 1⅝"	7'-2"	6'-1"	0'- 1⅝"	4	5'-10"	2'-6"	0'- 2⅛"	7'-2"	3'-11"	0'- 2⅛"
N	4	18'-5"	5	5'-11"	4'-9"	0'- 1⅝"	7'-2"	6'-1"	0'- 1⅝"	4	5'-10"	2'-6"	0'- 2⅛"	7'-2"	3'-11"	0'- 2⅛"
O	4	19'-6"	5	6'-4"	5'-2"	0'- 1¾"	7'-8"	6'-6"	0'- 1¾"	4	6'-4"	2'-6"	0'- 2⅜"	7'-8"	3'-11"	0'- 2⅜"
P	4	20'-6"	6	6'-11"	5'-5"	0'- 1⅝"	8'-2"	6'-9"	0'- 1⅝"	4	6'-10"	3'-0"	0'- 2¼"	8'-2"	4'-5"	0'- 2¼"
Q	4	21'-6"	6	6'-11"	5'-5"	0'- 1⅝"	8'-2"	6'-9"	0'- 1⅝"	4	6'-10"	3'-0"	0'- 2½"	8'-2"	4'-5"	0'- 2½"
R	4	22'-7"	5	6'-5"	5'-1"	0'- 1¾"	7'-9"	6'-5"	0'- 1¾"	4	7'-4"	3'-0"	0'- 2¼"	8'-8"	4'-5"	0'- 2¼"
S	4	23'-7"	5	6'-11"	5'-6"	0'- 1⅞"	8'-2"	6'-10"	0'- 1⅞"	4	7'-10"	3'-0"	0'- 2½"	9'-2"	4'-5"	0'- 2½"
T	4	24'-7"	6	6'-11"	5'-7"	0'- 1⅝"	8'-2"	6'-10"	0'- 1⅝"	4	7'-10"	3'-0"	0'- 2⅜"	9'-2"	4'-5"	0'- 2⅜"
U	4	25'-7"	6	7'-2"	5'-9"	0'- 1⅞"	8'-5"	7'-0"	0'- 1⅞"	4	8'-4"	3'-0"	0'- 2½"	9'-8"	4'-5"	0'- 2½"
V	4	26'-10"	6	7'-7"	5'-5"	0'- 2"	8'-10"	6'-8"	0'- 2"	4	8'-10"	3'-1"	0'- 2⅝"	10'-2"	4'-5"	0'- 2⅝"
W	4	27'-11"	7	8'-0"	5'-9"	0'- 2"	9'-2"	7'-0"	0'- 2"	4	9'-4"	3'-1"	0'- 2⅝"	10'-8"	4'-5"	0'- 2⅝"
X	4	29'-8"	6	8'-9"	6'-4"	0'- 2½"	10'-6"	8'-2"	0'- 2½"	5	10'-4"	3'-7"	0'- 2⅞"	12'-2"	5'-5"	0'- 2⅞"
Y	4	30'-11"	6	9'-11"	6'-9"	0'- 1¼"	12'-2"	9'-0"	0'- 1¼"	5	11'-4"	4'-1"	0'- 3"	12'-8"	6'-5"	0'- 3"
Z	4	31'-2"	6	10'-1"	6'-10"	0'- 2¼"	12'-5"	9'-1"	0'- 2¼"	5	11'-10"	4'-1"	0'- 3"	14'-2"	6'-5"	0'- 3"
AA	4	32'-3"	7	10'-7"	7'-2"	0'- 2⅜"	12'-9"	9'-5"	0'- 2⅜"	5	12'-4"	4'-1"	0'- 3½"	14'-8"	6'-5"	0'- 3½"
BB	4	33'-6"	7	11'-5"	7'-9"	0'- 2½"	13'-7"	9'-11"	0'- 2½"	5	13'-4"	4'-1"	0'- 3⅜"	15'-8"	6'-5"	0'- 3⅜"
CC	4	34'-7"	7	11'-10"	8'-1"	0'- 2⅝"	14'-1"	10'-4"	0'- 2⅝"	5	13'-10"	4'-1"	0'- 3½"	16'-2"	6'-5"	0'- 3½"
DD	5	35'-7"	7	11'-10"	8'-2"	0'- 2½"	15'-1"	11'-5"	0'- 2½"	5	14'-4"	4'-7"	0'-

PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 PI01, PI02, R201, C501	2P(10)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

BCW-21

STEM BAR SPACINGS

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

WV1

WING	SIZE	a LENGTH FROM	TO	VARY BY	FROM	TO	VARY BY
A	4	4'-11"	2'-9"	8'-4½"	6'-12"	4'-8	8'-4½"
B	4	5'-5"	2'-9"	0'-4½"	7'-4"	4'-8"	0'-4½"
C	4	5'-11"	3'-0"	8'-4⅜"	7'-10"	4'-11"	8'-4⅜"
D	4	6'-11"	3'-3"	8'-4⅜"	8'-10"	5'-2"	8'-4⅜"
E	4	6'-11"	3'-3"	8'-4⅜"	8'-10"	5'-2"	0'-4⅜"
F	4	7'-5"	3'-3"	0'-4½"	9'-4"	5'-2"	0'-4½"
G	4	7'-11"	3'-6"	0'-4⅜"	9'-10"	5'-5"	0'-4⅜"
H	4	8'-5"	3'-6"	0'-4½"	10'-4"	5'-5"	0'-4½"
I	4	6'-11"	3'-7"	0'-4⅜"	8'-9"	5'-6"	0'-4⅜"
J	4	7'-1"	3'-8"	0'-4½"	8'-11"	5'-7"	0'-4½"
K	4	7'-7"	3'-11"	0'-4⅜"	9'-6"	5'-10"	0'-4⅜"
L	4	7'-9"	4'-0"	0'-4½"	9'-8"	5'-11"	0'-4½"
M	4	8'-4"	4'-3"	0'-4⅜"	10'-3"	6'-2"	0'-4⅜"
N	4	8'-10"	4'-9"	0'-4⅜"	10'-9"	6'-8"	0'-4⅜"
O	4	11'-11"	9'-8"	0'-3⅜"	13'-11"	11'-8"	0'-3⅜"
P	4	12'-5"	9'-8"	0'-3½"	14'-5"	11'-8"	0'-3½"
Q	4	12'-11"	10'-1"	0'-3⅜"	15'-0"	12'-3"	0'-3⅜"
R	4	8'-9"	5'-1"	0'-4⅜"	10'-9"	7'-0"	0'-4⅜"
S	4	9'-3"	5'-1"	0'-4½"	11'-2"	7'-0"	0'-4½"
T	4	9'-9"	5'-4"	0'-4⅜"	11'-9"	7'-3"	0'-4⅜"
U	4	9'-10"	5'-4"	0'-4½"	11'-9"	7'-3"	0'-4½"
V	4	9'-3"	5'-7"	0'-4⅜"	11'-3"	7'-6"	0'-4⅜"
W	4	9'-9"	5'-7"	0'-4½"	11'-8"	7'-6"	0'-4½"
X	4	10'-2"	5'-1"	0'-4⅜"	12'-1"	8'-0"	0'-4⅜"
Y	4	10'-1"	6'-4"	0'-4½"	12'-0"	8'-3"	0'-4½"
Z	4	10'-4"	6'-7"	0'-4⅜"	12'-3"	8'-6"	0'-4⅜"
AA	4	10'-9"	6'-7"	0'-4½"	12'-8"	8'-6"	0'-4½"
BB	4	11'-3"	6'-10"	0'-4⅜"	13'-4"	8'-10"	0'-4⅜"
CC	4	11'-9"	6'-10"	0'-4½"	13'-9"	8'-10"	0'-4½"
DD	4	12'-1"	7'-7"	0'-4⅜"	14'-1"	9'-7"	0'-4⅜"
EE	4	12'-1"	7'-7"	0'-4½"	14'-1"	9'-7"	0'-4½"

WV2

WING	SIZE	LENGTH FROM	TO	VARY BY
A	4	4'-11"	2'-8"	0'-5⅜"
B	4	5'-5"	2'-7"	0'-5⅝"
C	4	5'-11"	3'-2"	0'-5⅜"
D	4	6'-11"	3'-5"	0'-6"
E	4	6'-11"	3'-3"	0'-5⅜"
F	4	7'-5"	3'-2"	0'-5⅝"
G	4	7'-11"	3'-4"	0'-5½"
H	4	8'-5"	3'-8"	0'-5⅝"
I	4	8'-11"	3'-10"	0'-5½"
J	4	9'-5"	3'-9"	0'-5⅝"
K	4	9'-11"	3'-11"	0'-5½"
L	4	10'-5"	3'-10"	0'-5⅝"
M	4	10'-11"	4'-5"	0'-5½"
N	4	11'-5"	4'-11"	0'-5½"
O	4	11'-11"	4'-10"	0'-5⅝"
P	4	12'-5"	5'-0"	0'-5½"
Q	4	12'-11"	4'-11"	0'-5⅝"
R	4	13'-5"	5'-1"	0'-5½"
S	4	13'-11"	5'-5"	0'-5⅝"
T	4	14'-5"	5'-7"	0'-5½"
U	4	14'-11"	5'-6"	0'-5⅝"
V	4	15'-5"	5'-8"	0'-5½"
W	4	15'-11"	5'-7"	0'-5⅝"
X	4	16'-8"	6'-5"	0'-5½"
Y	4	17'-5"	6'-7"	0'-5⅝"
Z	4	17'-11"	6'-9"	0'-5½"
AA	4	18'-5"	6'-8"	0'-5⅝"
BB	4	18'-11"	6'-10"	0'-5½"
CC	4	19'-5"	7'-2"	0'-5⅝"
DD	4	20'-5"	7'-10"	0'-5½"
EE	4	20'-11"	7'-9"	0'-5⅝"

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VDOT ROAD AND BRIDGE STANDARDS | SHEET 7 OF 8 | REVISION DATE 07/12 | 1007.07

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

SPECIFICATION REFERENCE

BCW-21

WING	SIZE	WV3 a LENGTH FROM	TO	VARY BY	FROM	TO	VARY BY
A	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-
F	-	-	-	-	-	-	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
I	4	8'-11"	7'-5"	0'-3½"	10'-10"	9'-2"	0'-3½"
J	4	9'-5"	7'-5"	0'-3⅜"	11'-4"	9'-4"	0'-3⅜"
K	5	9'-11"	8'-0"	0'-3½"	11'-10"	9'-11"	0'-3½"
L	5	10'-5"	8'-2"	0'-3⅜"	12'-4"	10'-1"	0'-3⅜"
M	6	10'-11"	8'-8"	0'-3½"	12'-11"	10'-9"	0'-3½"
N	6	11'-5"	9'-2"	0'-3½"	13'-5"	11'-3"	0'-3½"
O	6	11'-11"	9'-8"	0'-3⅜"	13'-11"	11'-8"	0'-3⅜"
P	6	12'-5"	9'-8"	0'-3½"	14'-5"	11'-8"	0'-3½"
Q	7	12'-11"	10'-1"	0'-3⅜"	15'-0"	12'-3"	0'-3⅜"
R	6	11'-8"	9'-2"	0'-3½"	13'-8"	11'-2"	0'-3½"
S	6	12'-2"	9'-7"	0'-3⅜"	14'-2"	11'-7"	0'-3⅜"
T	6	12'-8"	10'-2"	0'-3½"	14'-8"	12'-2"	0'-3½"
U	7	12'-9"	10'-3"	0'-3⅜"	14'-10"	12'-4"	0'-3⅜"
V	7	13'-3"	9'-8"	0'-3½"	15'-5"	11'-9"	0'-3½"
W	7	13'-9"	10'-1"	0'-3⅜"	15'-10"	12'-2"	0'-3⅜"
X	7	14'-2"	10'-6"	0'-3½"	16'-3"	12'-8"	0'-3½"
Y	7	15'-3"	10'-6"	0'-3⅜"	17'-4"	12'-7"	0'-3⅜"
Z	7	15'-5"	10'-8"	0'-3½"	17'-6"	12'-9"	0'-3½"
AA	7	15'-11"	11'-1"	0'-3⅜"	18'-0"	13'-2"	0'-3⅜"
BB	8	16'-5"	11'-8"	0'-3½"	18'-7"	13'-10"	0'-3½"
CC	8	16'-11"	12'-1"	0'-3⅜"	19'-1"	14'-4"	0'-3⅜"
DD	8	17'-2"	12'-5"	0'-3½"	19'-4"	14'-7"	0'-3½"
EE	8	17'-3"	12'-6"	0'-3⅜"	19'-6"	14'-8"	0'-3⅜"

WV4

WING	SIZE	a LENGTH FROM	TO	VARY BY	FROM	TO	VARY BY
A	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-
F	-	-	-	-	-	-	-
G	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-
I	4	8'-5"	3'-8"	0'-5½"	-	-	-
J	4	8'-11"	3'-10"	0'-5½"	-	-	-
K	4	9'-5"	3'-9"	0'-5½"	-	-	-
L	4	9'-11"	3'-11"	0'-5½"	-	-	-
M	4	10'-5"	3'-10"	0'-5⅝"	-	-	-
N	4	10'-11"	4'-5"	0'-5½"	-	-	-
O	4	11'-5"	4'-11"	0'-5½"	-	-	-
P	4	11'-11"	4'-10"	0'-5⅝"	-	-	-
Q	4	12'-5"	5'-0"	0'-5½"	-	-	-
R	4	13'-5"	5'-1"	0'-5½"	6	13'-5"	11'-11"
S	4	13'-11"	5'-5"	0'-5⅝"	6	13'-11"	12'-5"
T	4	14'-5"	5'-7"	0'-5½"	6	14'-5"	12'-11"
U	4	14'-11"	5'-6"	0'-5⅝"	7	14'-11"	13'-0"
V	4	15'-5"	5'-8"	0'-5½"	7	15'-5"	13'-7"
W	4	15'-11"	5'-7"	0'-5⅝"	7	15'-11"	14'-0"
X	4	16'-8"	6'-5"	0'-5½"	7	16'-8"	14'-5"
Y	4	17'-5"	6'-7"	0'-5⅝"	7	17'-5"	15'-6"
Z	4	17'-11"	6'-9"	0'-5½"	7	17'-11"	15'-8"
AA	4	18'-5"	6'-8"	0'-5⅝"	8	18'-5"	16'-2"
BB	4	18'-11"	6'-8"	0'-5½"	8	18'-11"	16'-8"
CC	4	19'-5"	7'-2"	0'-5⅝"	8	19'-5"	17'-2"
DD	4	20'-5"	7'-5"	0'-5½"	8	20'-5"	17'-5"
EE	4	20'-11"	7'-6"	0'-5⅝"	9	20'-11"	17'-6"

WH1

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

WH2

WING	SIZE	LENGTH FROM	TO	VARY BY	* EA
A	4	6'-0"	2'-7"	3'-4½"	2
B	4	5'-9"	2'-6"	3'-2½"	2
C	4	6'-0"	2'-7"	3'-4½"	2
D	4	9'-6"	2'-6"	3'-3½"	2
E	4	9'-4"	2'-7"	3'-4½"	2
F	4	9'-1"	2'-6"	3'-3½"	2
G	4	9'-4"	2'-7"	3'-4½"	2
H	4	12'-4"	2'-6"	3'-3⅜"	2
I	4	12'-7"	2'-7"	3'-4½"	2
J	4	12'-4"	2'-6"	3'-3⅜"	2
K	4	16'-0"	2'-7"	3'-4½"	2
L	4	15'-9"	2'-7"	3'-3½"	2
M	4	16'-0"	2'-7"	3'-4½"	2
N	4	16'-0"	2'-7"	3'-4½"	2
O	4	19'-0"	2'-6"	3'-3⅜"	2
P	4	19'-3"	2'-7"	3'-4½"	2
Q	4	19'-0"	2'-6"	3'-3⅜"	2
R	4	19'-3"	2'-7"	3'-4½"	2
S	4	22'-5"	2'-7"	3'-3⅝"	2
T	4	22'-8"	2'-7"	3'-4½"	2
U	4	22'-5"	2'-7"	3'-3⅝"	2
V	4	26'-0"	2'-7"	3'-4½"	2
W	4	25'-9"	2'-6"	3'-3⅜"	2
X	4	26'-0"	2'-7"	3'-4½"	2
Y	4	29'-0"	2'-7"	3'-3⅜"	2
Z	4	29'-3"	2'-7"	3'-4½"	2
AA	4	29'-0"	2'-7"	3'-3⅜"	2
BB	4	29'-3"	2'-7"	3'-4½"	2
CC	4	32'-4"	2'-7"	3'-3⅜"	2
DD	4	32'-7"	2'-8"	3'-4"	2
EE	4	32'-4"	2'-7"	3'-3⅜"	2

WH3

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

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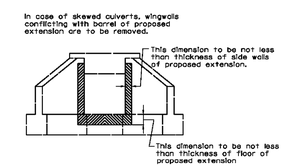
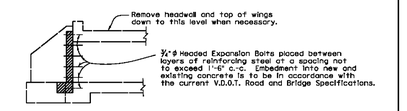
SPECIFICATION REFERENCE

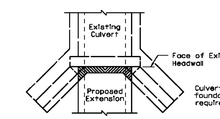
WING DETAILS
2:1 FILL SLOPE - TYPE I
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/12 | SHEET 8 OF 8 | 1007.08

BCE-01







Notes:

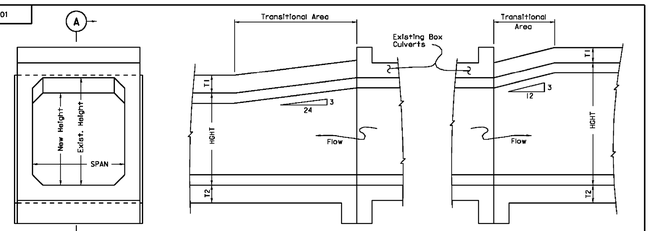
Shaded portion indicates existing concrete to be removed, so that all portions of proposed extension will begin in a vertical plane at face of existing headwall.
Details of proposed extension including headwall for same can be obtained from box culvert standard.
Unit price bid for concrete and reinforcement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

SPECIFICATION REFERENCE

DETAILS FOR WIDENING EXISTING BOX CULVERTS
MODIFICATIONS TO EXISTING BOX
VIRGINIA DEPARTMENT OF TRANSPORTATION

VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/11 | SHEET 1 OF 4 | 1008.01

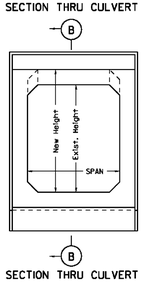
BCE-01



SECTION THRU CULVERT

SECTION A-A

SECTION B-B



SECTION THRU CULVERT

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.

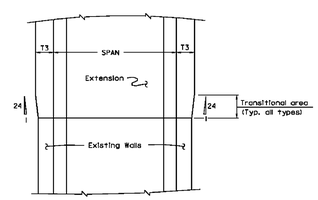
VDOT ROAD AND BRIDGE STANDARDS | SHEET 2 OF 4 | REVISION DATE 07/11 | 1008.02

DETAILS FOR WIDENING EXISTING BOX CULVERTS
HEIGHT TRANSITIONS
VIRGINIA DEPARTMENT OF TRANSPORTATION

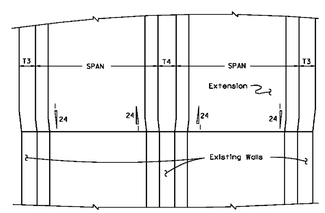
SPECIFICATION REFERENCE

BCE-01

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



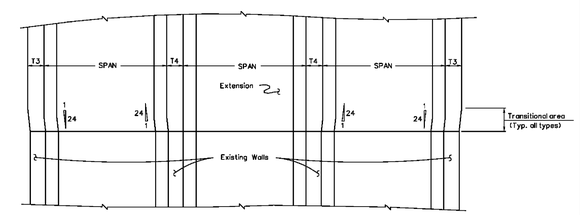
DOUBLE BOX CULVERT

SPECIFICATION REFERENCE

DETAILS FOR WIDENING EXISTING BOX CULVERTS
WALL TRANSITIONS
VIRGINIA DEPARTMENT OF TRANSPORTATION

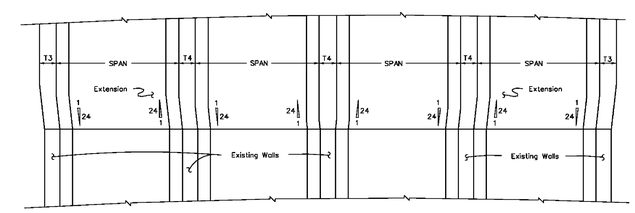
VDOT ROAD AND BRIDGE STANDARDS | REVISION DATE 07/11 | SHEET 3 OF 4 | 1008.03

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

VDOT ROAD AND BRIDGE STANDARDS | SHEET 4 OF 4 | REVISION DATE 07/11 | 1008.04

DETAILS FOR WIDENING EXISTING BOX CULVERTS
WALL TRANSITIONS
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

PROJECT	SHEET NO.
0029-151-105	2P(10)

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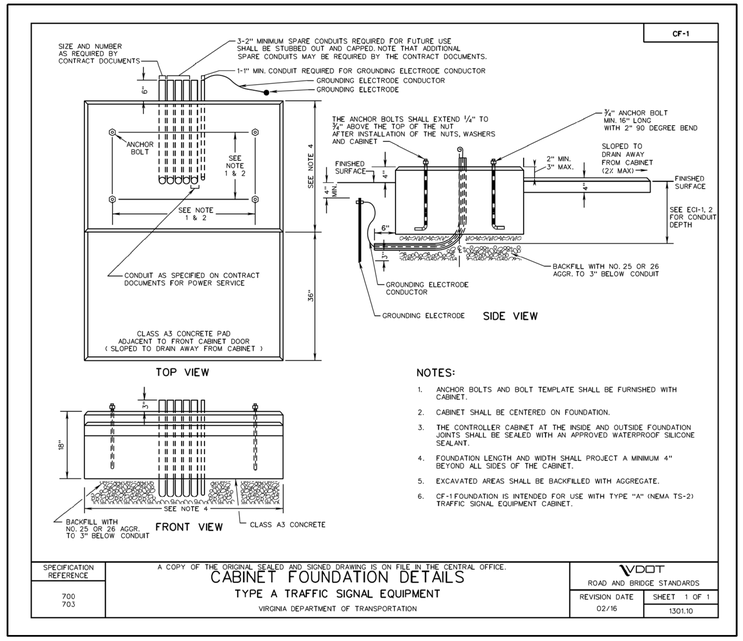
4/20/2016

PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(11)

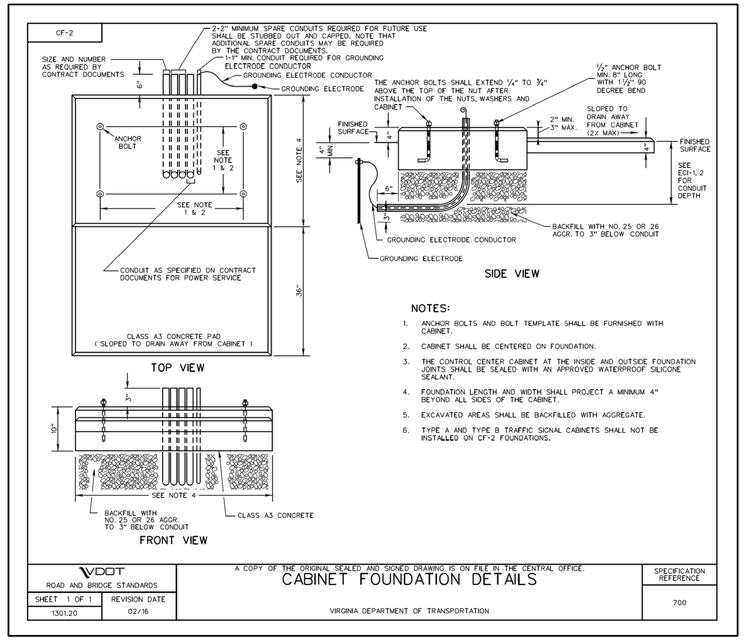
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



NOTES:

1. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED WITH CABINET.
2. CABINET SHALL BE CENTERED ON FOUNDATION.
3. THE CONTROLLER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH AN APPROVED WATERPROOF SILICONE SEALANT.
4. FOUNDATION LENGTH AND WIDTH SHALL PROJECT A MINIMUM 4" BEYOND ALL SIDES OF THE CABINET.
5. EXCAVATED AREAS SHALL BE BACKFILLED WITH AGGREGATE.
6. CF-1 FOUNDATION IS INTENDED FOR USE WITH TYPE "A" (NEMA TS-2) TRAFFIC SIGNAL EQUIPMENT CABINET.

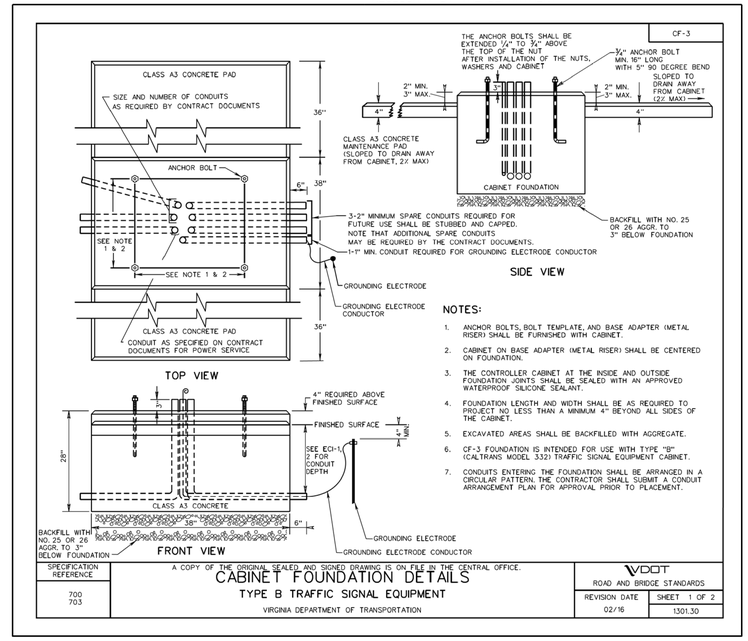
SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS	
700 703	CABINET FOUNDATION DETAILS TYPE A TRAFFIC SIGNAL EQUIPMENT VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 02/16	SHEET 1 OF 1 1301.10



NOTES:

1. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED WITH CABINET.
2. CABINET SHALL BE CENTERED ON FOUNDATION.
3. THE CONTROL CENTER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH AN APPROVED WATERPROOF SILICONE SEALANT.
4. FOUNDATION LENGTH AND WIDTH SHALL PROJECT A MINIMUM 4" BEYOND ALL SIDES OF THE CABINET.
5. EXCAVATED AREAS SHALL BE BACKFILLED WITH AGGREGATE.
6. TYPE A AND TYPE B TRAFFIC SIGNAL CABINETS SHALL NOT BE INSTALLED ON CF-2 FOUNDATIONS.

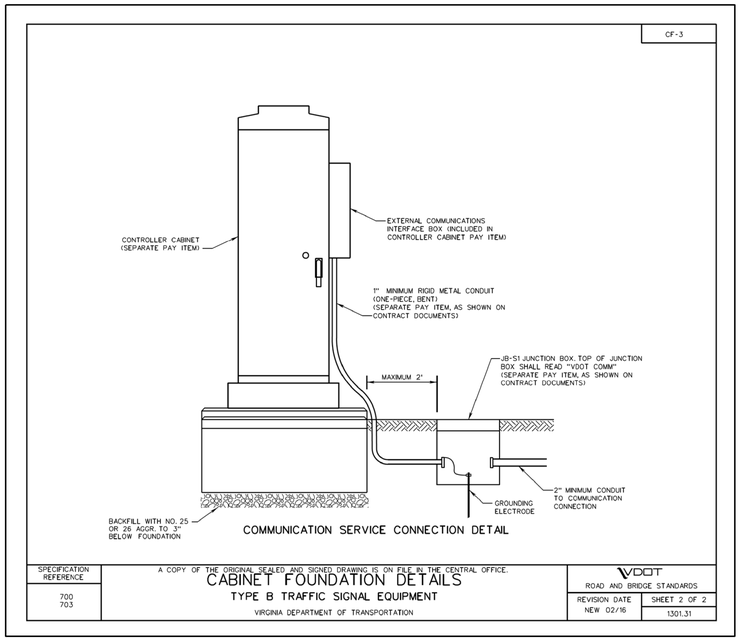
VDOT ROAD AND BRIDGE STANDARDS	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 1 OF 1 1301.20 / REVISION DATE 02/16	CABINET FOUNDATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	700



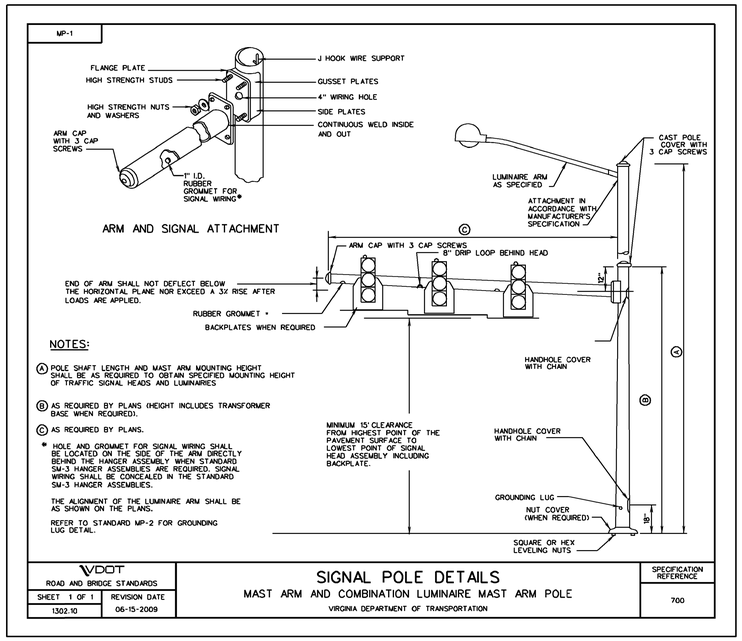
NOTES:

1. ANCHOR BOLTS, BOLT TEMPLATE, AND BASE ADAPTER (METAL RISER) SHALL BE FURNISHED WITH CABINET.
2. CABINET ON BASE ADAPTER (METAL RISER) SHALL BE CENTERED ON FOUNDATION.
3. THE CONTROLLER CABINET AT THE INSIDE AND OUTSIDE FOUNDATION JOINTS SHALL BE SEALED WITH AN APPROVED WATERPROOF SILICONE SEALANT.
4. FOUNDATION LENGTH AND WIDTH SHALL BE AS REQUIRED TO PROJECT NO LESS THAN A MINIMUM 4" BEYOND ALL SIDES OF THE CABINET.
5. EXCAVATED AREAS SHALL BE BACKFILLED WITH AGGREGATE.
6. CF-3 FOUNDATION IS INTENDED FOR USE WITH TYPE "B" (CALTRANS MODEL 332) TRAFFIC SIGNAL EQUIPMENT CABINET.
7. CONDUITS ENTERING THE FOUNDATION SHALL BE ARRANGED IN A CIRCULAR PATTERN; THE CONTRACTOR SHALL SUBMIT A CONDUIT ARRANGEMENT PLAN FOR APPROVAL PRIOR TO PLACEMENT.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS	
700 703	CABINET FOUNDATION DETAILS TYPE B TRAFFIC SIGNAL EQUIPMENT VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 02/16	SHEET 1 OF 2 1301.30



SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS	
700 703	CABINET FOUNDATION DETAILS TYPE B TRAFFIC SIGNAL EQUIPMENT VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE NEW 02/16	SHEET 2 OF 2 1301.31



NOTES:

(A) POLE SHAFT LENGTH AND MAST ARM MOUNTING HEIGHT SHALL BE AS REQUIRED TO OBTAIN SPECIFIED MOUNTING HEIGHT OF TRAFFIC SIGNAL HEADS AND LUMINAIRES

(B) AS REQUIRED BY PLANS (HEIGHT INCLUDES TRANSFORMER BASE WHEN REQUIRED).

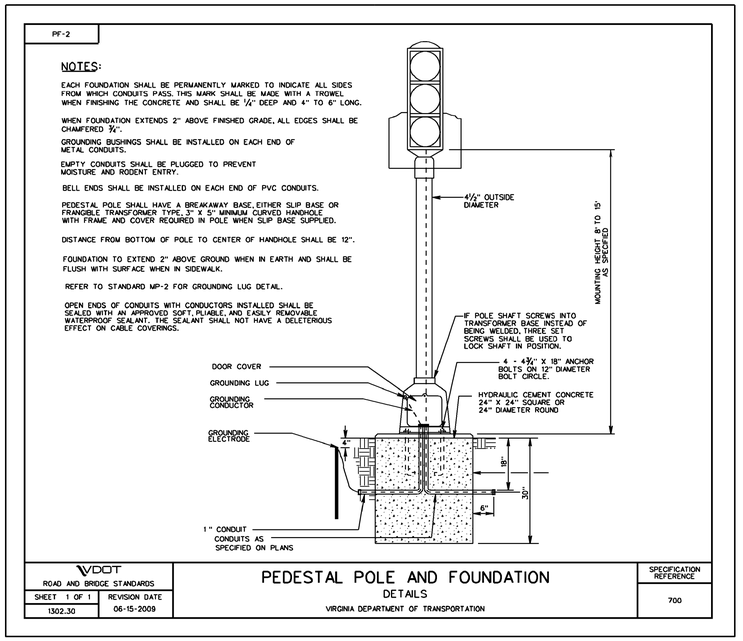
(C) AS REQUIRED BY PLANS.

* HOLE AND GROMMET FOR SIGNAL WIRING SHALL BE LOCATED ON THE SIDE OF THE ARM DIRECTLY BEHIND THE HANGER ASSEMBLY WHEN STANDARD SM-3 HANGER ASSEMBLIES ARE REQUIRED. SIGNAL WIRING SHALL BE CONCEALED IN THE STANDARD SM-3 HANGER ASSEMBLIES.

THE ALIGNMENT OF THE LUMINAIRE ARM SHALL BE AS SHOWN ON THE PLANS.

REFER TO STANDARD MP-2 FOR GROUNDING LUG DETAIL.

VDOT ROAD AND BRIDGE STANDARDS		SIGNAL POLE DETAILS	SPECIFICATION REFERENCE
SHEET 1 OF 1 1302.10	REVISION DATE 06-15-2009	MAST ARM AND COMBINATION LUMINAIRE MAST ARM POLE VIRGINIA DEPARTMENT OF TRANSPORTATION	700



VDOT ROAD AND BRIDGE STANDARDS		PEDESTAL POLE AND FOUNDATION DETAILS	SPECIFICATION REFERENCE
SHEET 1 OF 1 1302.30	REVISION DATE 06-15-2009	VIRGINIA DEPARTMENT OF TRANSPORTATION	700

PROJECT	SHEET NO.
0029-151-105	2P(11)

Rinker Design Associates, P.C.
Civil Engineering - Surveying - Land Planning
Transportation - Environmental
Right of Way Services
Office Locations
4/20/2016

Rinker Design Associates, P.C.
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9500 Harvard Boulevard, Suite 100, Manassas, VA 20110, Tel: (703) 257-5000, Fax: (540) 373-4371

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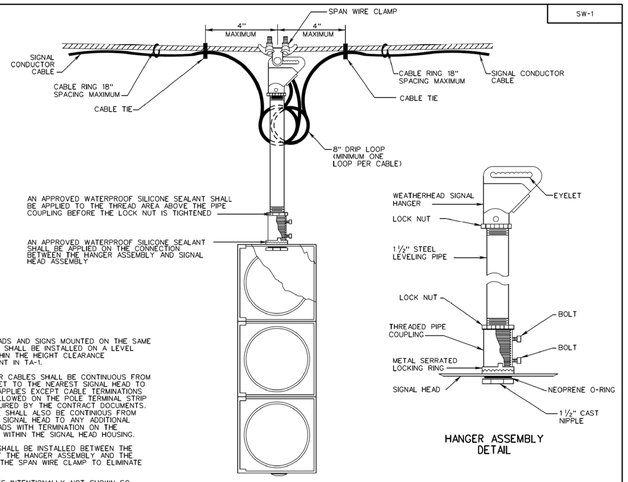
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(12)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

SW-1



HANGER ASSEMBLY DETAIL

NOTES:

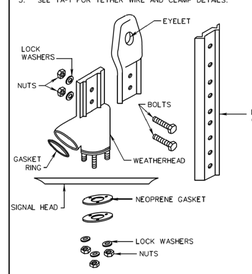
1. SIGNAL HEADS AND SIGNS MOUNTED ON THE SAME SPAN WIRE SHALL BE INSTALLED ON A LEVEL PLANE WITHIN THE HEIGHT CLEARANCE REQUIREMENT IN TA-1.
2. CONDUCTOR CABLES SHALL BE CONTINUOUS FROM THE CABINET TO THE NEAREST SIGNAL HEAD TO WHICH IT APPLIES EXCEPT CABLE TERMINATIONS MAY BE ALLOWED ON THE POLE TERMINAL STRIP WHEN REQUIRED BY THE CONTRACT DOCUMENTS. THE CABLE SHALL ALSO BE CONTINUOUS FROM THE FIRST SIGNAL HEAD TO ANY ADDITIONAL SIGNAL HEADS WITH TERMINATION ON THE TERMINALS WITHIN THE SIGNAL HEAD HOUSING.
3. SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE HANGER ASSEMBLY AND THE INSIDE OF THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.
4. BACKPLATES INTENTIONALLY NOT SHOWN SO EQUIPMENT DETAIL COULD BE SHOWN MORE CLEARLY.
5. SEE TA-1 FOR TETHER WIRE AND CLAMP DETAILS.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL HEAD MOUNTING DETAILS SPAN WIRE VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
703		REVISION DATE 02/16	SHEET 1 OF 1 1303.10

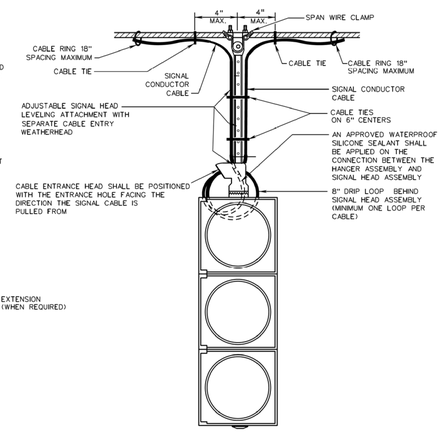
SW-2

NOTES:

1. SIGNAL HEADS AND SIGNS MOUNTED ON THE SAME SPAN WIRE SHALL BE INSTALLED ON A LEVEL PLANE WITHIN THE HEIGHT CLEARANCE REQUIREMENT IN TA-1.
2. CONDUCTOR CABLES SHALL BE CONTINUOUS FROM THE CABINET TO THE NEAREST SIGNAL HEAD TO WHICH IT APPLIES EXCEPT CABLE TERMINATIONS MAY BE ALLOWED ON THE POLE TERMINAL STRIP WHEN REQUIRED BY THE CONTRACT DOCUMENTS. THE CABLE SHALL ALSO BE CONTINUOUS FROM THE FIRST SIGNAL HEAD TO ANY ADDITIONAL SIGNAL HEADS WITH TERMINATION ON THE TERMINALS WITHIN THE SIGNAL HEAD HOUSING.
3. SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE HANGER ASSEMBLY AND THE INSIDE OF THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.
4. BACKPLATES INTENTIONALLY NOT SHOWN SO EQUIPMENT DETAIL COULD BE SHOWN MORE CLEARLY.
5. SEE TA-1 FOR TETHER WIRE AND CLAMP DETAILS.

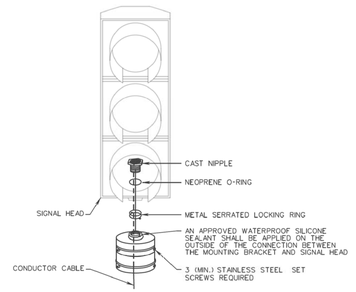


HANGER ASSEMBLY DETAILS

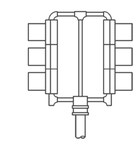


VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL HEAD MOUNTING DETAILS SPAN WIRE VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		703
1303.20	02/16		

SMB-1



POLE TOP MOUNTING CAST ALUMINUM SIGNAL HEADS ONLY



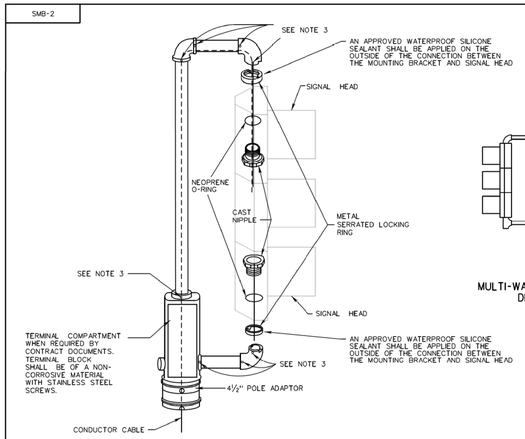
MULTI-WAY MOUNTING DETAIL

NOTES:

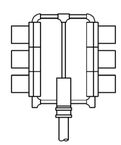
1. IF PEDESTRIAN SIGNAL HEADS ARE BEING INSTALLED, THE MOUNTING ATTACHMENTS SHALL BE A TYPE SPECIFICALLY MANUFACTURED FOR THAT PURPOSE.
2. MOUNTING BRACKETS SHOWN ARE TYPICAL AND FOR ONE-WAY AND MULTI-WAY SIGNAL DISPLAYS.
3. BACKPLATES INTENTIONALLY NOT SHOWN SO EQUIPMENT DETAIL COULD BE SHOWN MORE CLEARLY.
4. SIGNAL HEADS MAY BE MOUNTED USING TRI-STUD ASSEMBLIES INSTEAD OF THE CAST NIPPLE ASSEMBLIES.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL HEAD MOUNTING DETAILS POLE TOP VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		703
1303.40	02/16		

SMB-2



POLE TOP MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS



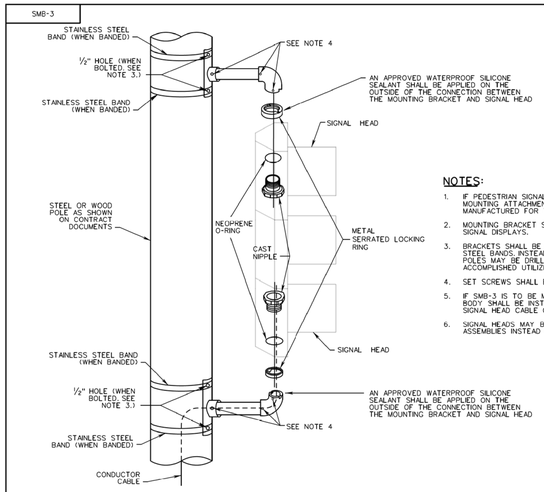
MULTI-WAY MOUNTING DETAIL

NOTES:

1. IF PEDESTRIAN SIGNAL HEADS ARE BEING INSTALLED, THE MOUNTING ATTACHMENTS SHALL BE A TYPE SPECIFICALLY MANUFACTURED FOR THAT PURPOSE.
2. MOUNTING BRACKETS SHOWN ARE TYPICAL AND FOR ONE-WAY AND MULTI-WAY SIGNAL DISPLAYS.
3. SET SCREWS SHALL BE STAINLESS STEEL.
4. SIGNAL HEADS MAY BE MOUNTED USING TRI-STUD ASSEMBLIES INSTEAD OF THE CAST NIPPLE ASSEMBLIES.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL HEAD MOUNTING DETAILS POLE TOP WITH TERMINAL COMPARTMENT AND BRACKET VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		703
1303.41	NEW 02/16		

SMB-3



POLE BRACKET MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS

NOTES:

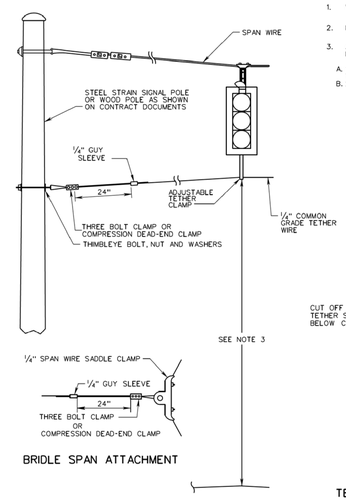
1. IF PEDESTRIAN SIGNAL HEADS ARE BEING INSTALLED, THE MOUNTING ATTACHMENTS SHALL BE A TYPE SPECIFICALLY MANUFACTURED FOR THAT PURPOSE.
2. MOUNTING BRACKET SHOWN IS TYPICAL AND FOR ONE-WAY SIGNAL DISPLAYS.
3. BRACKETS SHALL BE MOUNTED TO POLE WITH STAINLESS STEEL BANDS INSTEAD OF STAINLESS STEEL BANDS. STEEL POLES MAY BE DRILLED AND TAPPED AND MOUNTING ACCOMPLISHED UTILIZING 1/2" STAINLESS STEEL BOLTS.
4. SET SCREWS SHALL BE STAINLESS STEEL.
5. IF SMB-3 IS TO BE MOUNTED ON WOOD POLE A CONDUIT BODY SHALL BE INSTALLED IN BRACKET ARM TO CONNECT SIGNAL HEAD CABLE CONDUIT.
6. SIGNAL HEADS MAY BE MOUNTED USING TRI-STUD ASSEMBLIES INSTEAD OF THE CAST NIPPLE ASSEMBLIES.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL HEAD MOUNTING DETAILS POLE SIDE MOUNTING BRACKET VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE		703
1303.42	NEW 02/16		

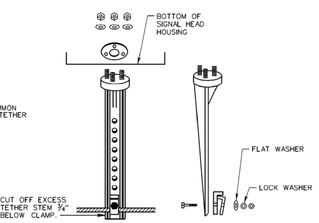
TA-1

NOTES:

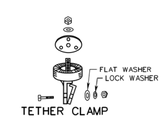
1. WIRING AND RIGGING SHALL BE IN ACCORDANCE WITH STANDARD WD-1 AND WD-2.
2. REFER TO STANDARD SMD-1 FOR SIGN PANEL ATTACHMENT DETAIL.
3. AFTER THE LOADS ARE APPLIED, THE VERTICAL CLEARANCE FROM THE HIGHEST POINT OF THE PAVEMENT SURFACE SHALL BE:
   A. 16' MINIMUM (15' MINIMUM FOR MAINTENANCE ACTIVITIES) TO THE LOWEST POINT OF THE SIGNAL HEAD ASSEMBLY (INCLUDING BACKPLATE) AND SIGNS.
   B. 25' MAXIMUM TO THE TOP OF THE SIGNAL HOUSING.



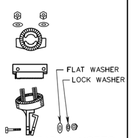
BRIDLE SPAN ATTACHMENT



FRONT VIEW SIDE VIEW
ADJUSTABLE TETHER CLAMP



TETHER CLAMP



FIVE-SECTION HEAD CLUSTER TETHER CLAMP

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TETHER WIRE DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
703		REVISION DATE 02/16	SHEET 1 OF 1 1304.10

	PROJECT	SHEET NO.
	0029-151-105	2P(12)

PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
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DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	-	0029-151-105 PI01, PI02, R201, C501	2P(13)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

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Transportation - Environmental
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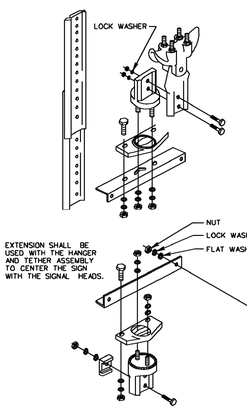
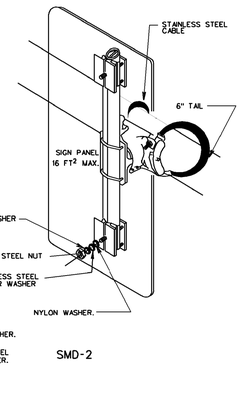
Fax: (703) 370-0500
5104 Harvest Hill Road
Suite 225
Dallas, TX 75230
Phone: (214) 373-1179
Fax: (214) 373-1183

SMD-1,2

SPAN WIRE INSTALLATION



MAST ARM INSTALLATION



NOTES:

NUTS AND BOLTS USED FOR ATTACHMENT OF SIGN PANEL SHALL BE STAINLESS STEEL AND 3/4" IN DIAMETER.

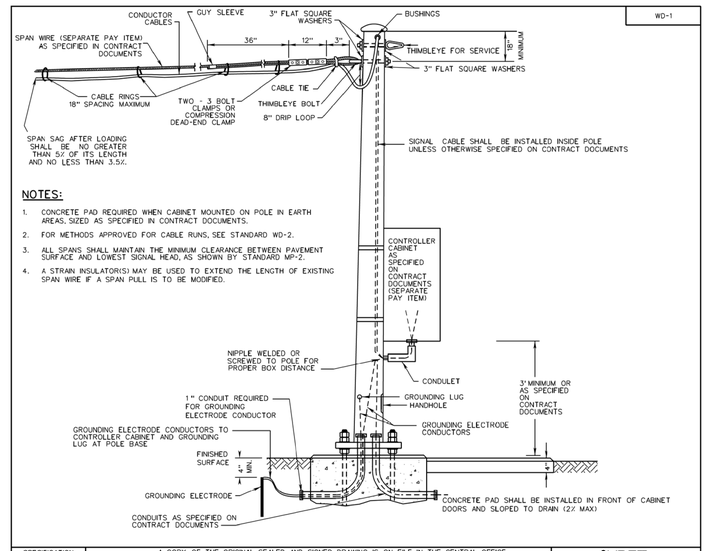
A 1 1/2" NYLON AND STAINLESS STEEL FENDER WASHER SHALL BE USED ON THE FRONT OF SIGN PANEL WHERE BOLT PASSES THROUGH SIGN PANEL.

ALL NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL OR GALVANIZED STEEL UNLESS OTHERWISE INDICATED

SPACERS SHALL BE INSTALLED BETWEEN THE EYELET OF THE SIGN HANGAR AND THE SPAN WIRE CLAMP TO ELIMINATE ANY GAP.

VDOT ROAD AND BRIDGE STANDARDS		SIGN MOUNTING DETAILS	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE 06-15-2009	VIRGINIA DEPARTMENT OF TRANSPORTATION	703
1305.10			

WD-1

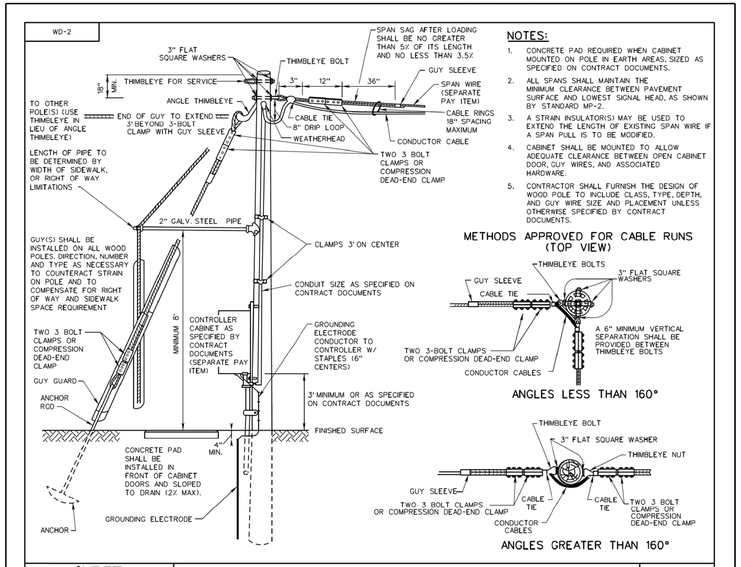


NOTES:

1. CONCRETE PAD REQUIRED WHEN CABINET MOUNTED ON POLE IN EARTH AREAS, SIZED AS SPECIFIED IN CONTRACT DOCUMENTS.
2. FOR METHODS APPROVED FOR CABLE RUNS, SEE STANDARD WD-2.
3. ALL SPANS SHALL MAINTAIN THE MINIMUM CLEARANCE BETWEEN PAVEMENT SURFACE AND LOWEST SIGNAL HEAD, AS SHOWN BY STANDARD MP-2.
4. A STRAIN INSULATOR(S) MAY BE USED TO EXTEND THE LENGTH OF EXISTING SPAN WIRE IF A SPAN PULL IS TO BE MODIFIED.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. STEEL STRAIN SIGNAL POLE WIRING AND RIGGING DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
700		REVISION DATE 02/16	SHEET 1 OF 1
			1306.10

WD-2



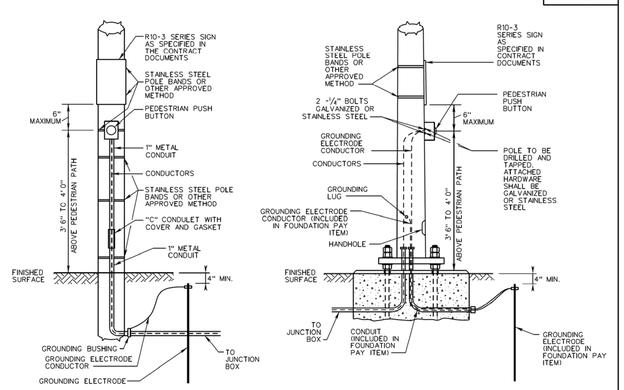
NOTES:

1. CONCRETE PAD REQUIRED WHEN CABINET MOUNTED ON POLE IN EARTH AREAS, SIZED AS SPECIFIED ON CONTRACT DOCUMENTS.
2. ALL SPANS SHALL MAINTAIN THE MINIMUM CLEARANCE BETWEEN PAVEMENT SURFACE AND LOWEST SIGNAL HEAD, AS SHOWN BY STANDARD MP-2.
3. A STRAIN INSULATOR(S) MAY BE USED TO EXTEND THE LENGTH OF EXISTING SPAN WIRE IF A SPAN PULL IS TO BE MODIFIED.
4. CABINET SHALL BE MOUNTED TO ALLOW ADEQUATE CLEARANCE BETWEEN OPEN CABINET DOOR, GUY WIRES, AND ASSOCIATED HARDWARE.
5. CONTRACTOR SHALL FURNISH THE DESIGN OF WOOD POLE TO INCLUDE CLASS, TYPE, DEPTH, AND GUY WIRE SIZE AND PLACEMENT UNLESS OTHERWISE SPECIFIED BY CONTRACT DOCUMENTS.

METHODS APPROVED FOR CABLE RUNS (TOP VIEW)

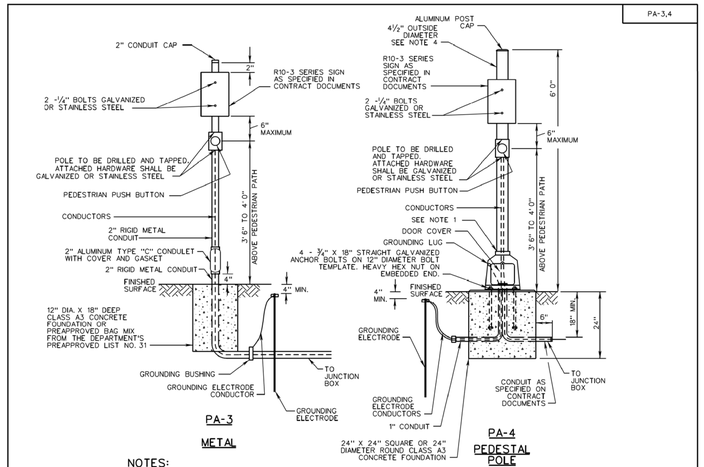
VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. WOOD POLE WIRING AND RIGGING DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE 02/16		700 703
1306.20			

PA-1,2



SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. PEDESTRIAN ACTUATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
700 703		REVISION DATE 02/16	SHEET 1 OF 2
			1307.10

PA-3,4



NOTES:

1. IF POLE SHAFT SCREWS INTO TRANSFORMER BASE INSTEAD OF BEING WELDED, THREE SET SCREWS OR OTHER APPROVED METHOD SHALL BE USED TO LOCK SHAFT IN POSITION.
2. PEDESTAL POLE SHALL HAVE A BREAKAWAY TRANSFORMER TYPE BASE. THE TRANSFORMER BASE SHALL BE INSTALLED PER THE MANUFACTURER'S SPECIFICATIONS.
3. SEE PEDESTAL POLE STANDARDS (PF-2) FOR INSTALLATION DETAILS.
4. STRUCTURAL TUBE MATERIAL SHALL BE ALUMINUM 6061-T6 WITH MINIMUM 0.337" WALL THICKNESS.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. PEDESTRIAN ACTUATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
700 703		REVISION DATE NEW 02/16	SHEET 2 OF 2
			1307.11

PROJECT	SHEET NO.
0029-151-105	2P(13)

4/20/2016

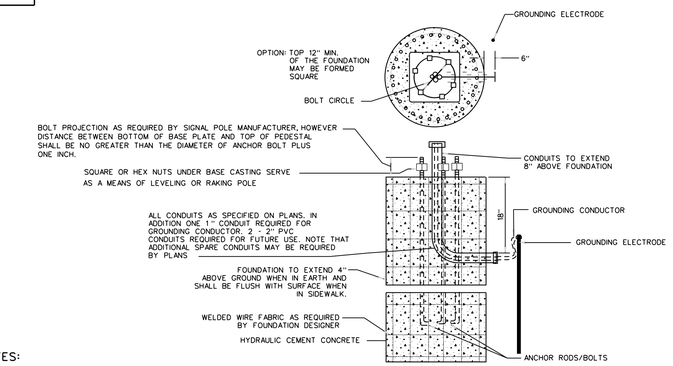
PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	-	0029-151-105 PI01, PI02, R201, C501	2P(14)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

PF-1



NOTES:

ANCHOR BOLTS AND BOLT PATTERN SHALL BE FURNISHED WITH POLE. POLE SHALL BE CENTERED ON FOUNDATION.

EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE 1/4" DEEP AND 4" TO 6" LONG. LOCATIONS OF EMPTY CONDUITS SHALL HAVE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARKING.

WHEN FOUNDATION EXTENDS 4" ABOVE FINISHED GRADE ALL EDGES SHALL BE CHAMFERED 3/4" AND FOR SIDEWALKS SHALL BE FLUSH.

GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.

EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.

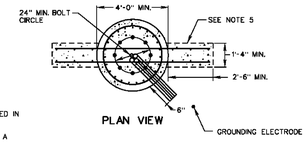
OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.

NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.

HEIGHT, WIDTH, AND DEPTH OF FOUNDATION SHALL BE AS REQUIRED BY FOUNDATION DESIGNER

VDOT ROAD AND BRIDGE STANDARDS		SIGNAL POLE FOUNDATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE 06-15-2009	VIRGINIA DEPARTMENT OF TRANSPORTATION	700
1310.10			

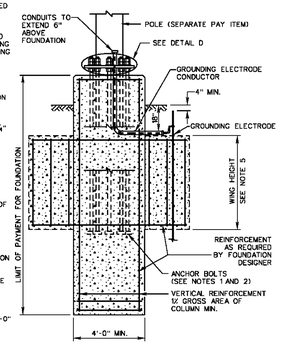
PF-8



PLAN VIEW

NOTES:

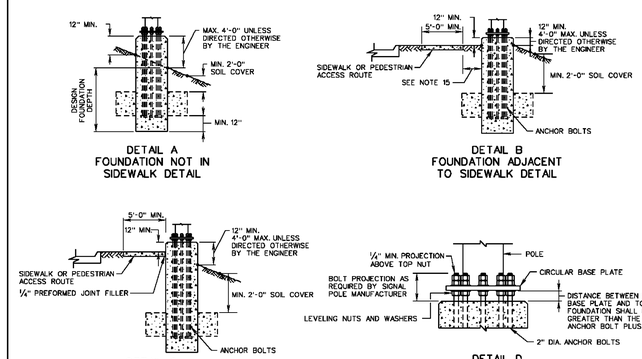
1. ANCHOR BOLTS SHALL HAVE A RING OR NUTS AND WASHERS ON THE ENDS OF BOLTS EMBEDDED IN FOUNDATION.
2. ANCHOR BOLT LAYOUT SHALL BE CHECKED AGAINST LATEST APPROVED STRUCTURE DRAWINGS. A MINIMUM OF EIGHT 2" DIAMETER ANCHOR BOLTS ARE REQUIRED.
3. ALL CONDUITS AS SPECIFIED IN THE CONTRACT DOCUMENTS, IN ADDITION 1 - 1" MIN. CONDUIT REQUIRED FOR GROUNDING ELECTRODE CONDUCTOR. 2 - 2" PVC CONDUITS REQUIRED FOR FUTURE USE. NOTE THAT ADDITIONAL SPARE CONDUITS MAY BE REQUIRED BY THE CONTRACT DOCUMENTS.
4. IF NEEDED IN SLOPED CONDITIONS TO MAINTAIN POSITIVE DRAINAGE AROUND THE FOUNDATION AND TO PROVIDE THE CLEARANCES SHOWN IN DETAIL A, THE CONTRACTOR SHALL RE-GRADE AND ADD RETAINING CURB OR MATERIAL ON THE UP SLOPE WHEN APPROVED BY THE ENGINEER. RE-GRADING AND RETAINING CURB SHALL BE INCLUDED IN THE PRICE BID FOR FOUNDATION.
5. FOUNDATION SHALL BE DESIGNED FOR TORSION. WINGS MAY BE USED FOR TORSIONAL RESISTANCE IF REQUIRED.
6. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED WITH POLE. POLE SHALL BE CENTERED ON FOUNDATION.
7. EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE 1/4" DEEP AND 4" TO 6" LONG. LOCATIONS OF EMPTY CONDUITS SHALL HAVE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARKING.
8. GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.
9. EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.
10. BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.
11. NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.
12. HEIGHT, WIDTH, DEPTH, AND REINFORCEMENT OF FOUNDATION SHALL BE AS REQUIRED BY FOUNDATION DESIGNER.
13. OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED OUTDOOR, WATERPROOF, SILICONE SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.
14. FOUNDATIONS SHALL NOT BE INSTALLED IN THE CENTER OF A DRAINAGE DITCH. IF APPROVED BY THE ENGINEER, FOUNDATIONS MAY BE INSTALLED IN THE SLOPE OF A DRAINAGE DITCH AT AN APPROVED HEIGHT ABOVE GRADE. THE FOUNDATION SHALL NOT BE PLACED IN THE FRONT SLOPE UNLESS THE ENGINEER DETERMINES THAT BACK SLOPE PLACEMENT IS NOT FEASIBLE.
15. THE EDGE OF THE FOUNDATION SHALL BE 1'-0" MIN. FROM THE EDGE OF A PEDESTRIAN PATH, OR 3'-0" MIN. FROM THE EDGE OF A SHARED USE PATH (SEE DETAIL B). IF APPROVED BY THE ENGINEER, FOUNDATIONS MAY BE PLACED IMMEDIATELY ADJACENT TO PEDESTRIAN PATH.
16. SPREAD FOOTING MAY BE USED IF APPROVED BY THE ENGINEER.



SIDE VIEW

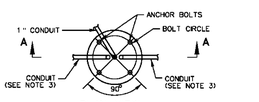
VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL POLE FOUNDATION INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 2	REVISION DATE 07/15		700
1310.12			

PF-8



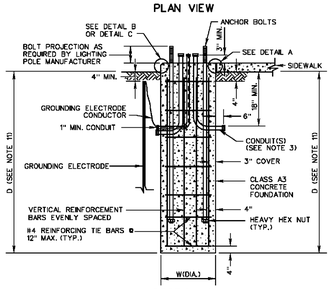
SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. SIGNAL POLE FOUNDATION INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
700		REVISION DATE 07/15	SHEET 2 OF 2
			1310. 13

LF-1

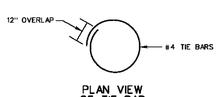


PLAN VIEW

TYPE	W	D	VERTICAL BARS
A	2'6"	8'	6 - #8



SECTION A-A



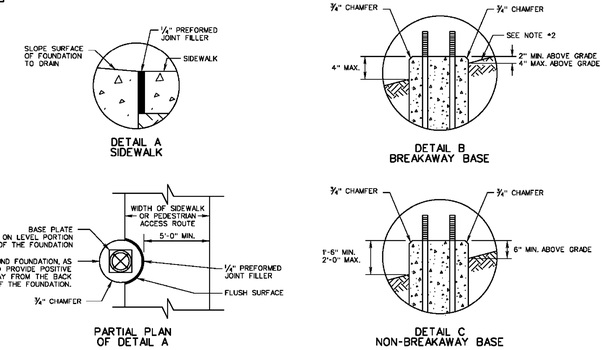
PLAN VIEW OF TIE BAR

NOTES:

1. CONDUIT ELBOWS SHALL HAVE A 90° BEND. THE BEND RADIUS SHALL BE IN ACCORDANCE WITH THE N.E.C.
2. THE BOLT TEMPLATE SHALL BE FURNISHED BY THE LIGHTING POLE MANUFACTURER. POLE SHALL BE CENTERED ON FOUNDATION.
3. THE NUMBER, ORIENTATION AND SIZE OF CONDUITS ENTERING AND EXITING FOUNDATIONS SHALL BE AS SHOWN IN THE CONTRACT DOCUMENTS. EACH FOUNDATION SHALL BE PERMANENTLY MARKED TO INDICATE ALL SIDES FROM WHICH CONDUITS PASS. THIS MARK SHALL BE MADE WITH A TROWEL WHEN FINISHING THE CONCRETE AND SHALL BE 1/4" DEEP AND 4" TO 6" LONG. LOCATIONS OF EMPTY CONDUITS SHALL HAVE AN ADDITIONAL 2" LONG MARK MADE PERPENDICULAR TO AND CENTERED ON THIS MARKING.
4. NO MORTAR, GROUT, OR CONCRETE SHALL BE PLACED BETWEEN BOTTOM OF BASE PLATE AND TOP OF FOUNDATION.
5. GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF METAL CONDUITS.
6. EMPTY CONDUITS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.
7. BELL ENDS SHALL BE INSTALLED ON EACH END OF PVC CONDUITS.
8. OPEN ENDS OF CONDUITS WITH CONDUCTORS INSTALLED SHALL BE SEALED WITH AN APPROVED SOFT, PLIABLE, AND EASILY REMOVABLE WATERPROOF SEALANT. THE SEALANT SHALL NOT HAVE A DELETERIOUS EFFECT ON CABLE COVERINGS.
9. ANCHOR BOLTS SHALL BE STRAIGHT. THREADED REINFORCING STEEL IS NOT ALLOWED.
10. FOUNDATIONS SHALL NOT BE INSTALLED IN THE CENTER OF A DRAINAGE DITCH. FOUNDATIONS MAY BE INSTALLED IN THE FRONT OR BACK SLOPE OF A DRAINAGE DITCH, BUT SHALL NOT IMPEDE THE DRAINAGE FLOWS. TOPS OF FOUNDATIONS ADJACENT TO ANY DITCH SHALL BE ABOVE GRADE AND ABOVE THE ANTICIPATED WATER LEVELS.
11. D IS THE MINIMUM DISTANCE FROM THE BOTTOM OF THE POLE FOUNDATION TO THE BOTTOM OF THE SIDEWALK OR THE POINT OF LOWEST GRADED ELEVATION ADJACENT TO THE FOUNDATION.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. LIGHTING POLE FOUNDATION INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
700		REVISION DATE 08/14	SHEET 1 OF 2
			1310.20

LF-1

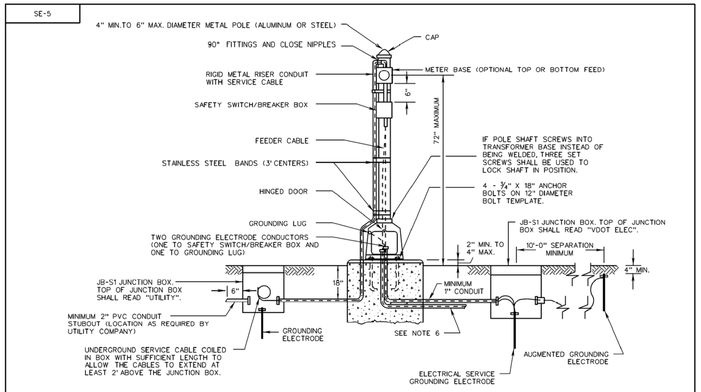


NOTES:

1. WHERE THE FOUNDATION EXTENDS INTO THE SIDEWALK, THE EDGES OF THE FOUNDATION SHALL BE FLUSH WITH THE SIDEWALK (DETAIL A). WHERE THE FOUNDATION IS OUTSIDE OF THE SIDEWALK, THE EDGES OF THE FOUNDATION SHALL HAVE A 3/4" CHAMFER (DETAIL B AND C). UNDER ALL CIRCUMSTANCES THE CONCRETE SHALL BE SLOPED TO ENSURE THE FOUNDATION SURFACE IS NOT AN AREA OF PONDING WATER.
2. IF NEEDED IN SLOPED CONDITIONS TO MAINTAIN POSITIVE DRAINAGE AROUND THE FOUNDATION AND TO PROVIDE THE CLEARANCES SHOWN IN DETAIL B, THE CONTRACTOR SHALL RE-GRADE AND ADD RETAINING CURB OR MATERIAL ON THE UP SLOPE WHEN APPROVED BY THE ENGINEER. RE-GRADING AND RETAINING CURB SHALL BE INCLUDED IN THE PRICE BID FOR FOUNDATION.
3. WHEN FOUNDATION IS ADJACENT TO THE BACK EDGE OF SIDEWALK BUT NOT WITHIN THE SIDEWALK, AND A BREAKAWAY BASE IS REQUIRED, THE TOP OF THE FOUNDATION SHALL BE ELEVATED 2 INCHES MINMUM ABOVE THE SIDEWALK GRADE.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. LIGHTING POLE FOUNDATION INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 2 OF 2	REVISION DATE 08/14		700
1310.21			

SE-5



NOTES:

1. LOCAL POWER UTILITY COMPANY WILL INSTALL SERVICE CABLE FROM THEIR POWER SOURCE TO THE JUNCTION BOX AND MAKE REQUIRED SPLICES TO THE CABLES PROVIDED.
2. THIS STANDARD IS APPLICABLE FOR ALL ELECTRICAL SERVICES OTHER THAN 480Y/277.
3. FOR ROADWAY LIGHTING SYSTEMS, ONLY SAFETY SWITCH SHALL BE USED.
4. ALL ELECTRICAL CONNECTIONS AND SPLICES SHALL BE TESTED FOR ELECTRICAL CONTINUITY.
5. FOUNDATION SHALL BE CLASS A3 CONCRETE, 24X24 SQUARE OR 24" DIAMETER AND 24" DEEP, AND COST OF FOUNDATION SHALL BE INCLUDED WITH THE PAY ITEM FOR ELECTRICAL SERVICE.
6. CONDUIT AND CONDUCTOR SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.
7. RIGID METAL RISER CONDUIT AND SERVICE CABLE SIZE SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS SPECIFIED BY THE LOCAL POWER COMPANY.
8. WHEN REQUIRED BY THE CONTRACT DOCUMENTS, AN ELECTRICAL SERVICE WORK PAD SHALL BE PLACED IN FRONT OF THE SAFETY SWITCH/BREAKER BOX. ELECTRICAL SERVICE WORK PAD SHALL BE A SEPARATE PAY ITEM.
9. STAINLESS STEEL BANDS REQUIRED FOR METER BASE AND SAFETY SWITCH/BREAKER BOX.
10. ANCHOR BOLTS AND BOLT TEMPLATE SHALL BE FURNISHED BY POLE MANUFACTURER, AND POLE SHALL BE CENTERED ON FOUNDATION.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. ELECTRICAL SERVICE INSTALLATION DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE 02/16		700
1312.50			

PROJECT	SHEET NO.
0029-151-105	2P(14)

Rinker Design Associates, P.C. Civil Engineering · Surveying · Land Planning Transportation · Environmental Right of Way Services
Office Locations
4/20/2016

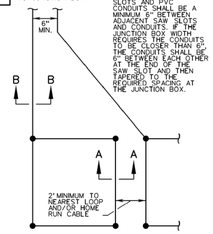
PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(15)

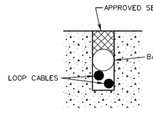
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

TD-1A, B, C

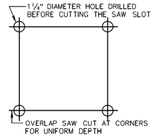


TYPICAL LOOP WIRE PLAN

SECTION B-B SAW SLOTS AND PVC CONDUITS SHALL BE A MINIMUM 6" BETWEEN ADJACENT SAW SLOTS AND CONDUITS. IF THE JUNCTION BOX WIDTH REQUIRES THE CONDUITS TO BE LESS THAN 6" APART, THE CONDUITS SHALL BE 6" BETWEEN EACH OTHER AT THE END OF THE SAW SLOT AND THEN TAPERED TO THE REQUIRED SPACING AT THE JUNCTION BOX.



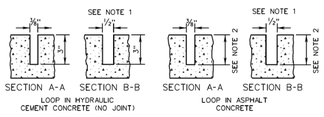
CROSS SECTION TYPICAL SEALED SLOT



TYPICAL SAW CUT DIAGRAM

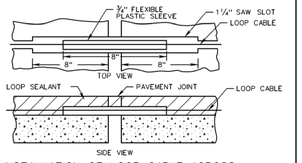
NOTES:

1. SAW SLOT SHALL BE 3/4" WHEN LOOP DETECTOR CABLE ENCLOSED IN TUBING IS INSTALLED.
2. IN NEW ASPHALT CONCRETE ROADWAYS, SAW SLOTS SHALL BE CUT INTO THE BASE COURSE TO A DEPTH OF 3".
   IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE PLANED SURFACE TO A DEPTH OF 3" PRIOR TO THE OVERLAY. LOOP DETECTORS MAY BE INSTALLED THROUGH FINISHED RIDING SURFACE AS SPECIFIED IN CONTRACT DOCUMENTS. SAW SLOTS IN FINAL RIDING SURFACE SHALL HAVE A 4" MINIMUM AND 4.5" MAXIMUM DEPTH.
   IN EXISTING ASPHALT CONCRETE ROADWAYS WHICH ARE NOT TO BE RESURFACED AS PART OF THE PROJECT, SAW SLOTS SHALL BE CUT INTO THE EXISTING SURFACE TO A DEPTH OF 4".



DEPTH OF SAW SLOT SHALL BE MEASURED FROM PAVEMENT SURFACE AT TIME OF INSTALLATION. NOT NECESSARILY FINISHED GRADE.

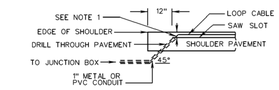
TYPICAL SAW SLOT DETAIL



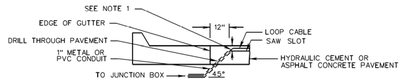
INSTALLATION OF LOOP CABLE ACROSS HYDRAULIC CEMENT CONCRETE PAVEMENT JOINTS

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 1 OF 3	REVISION DATE	LOOP DETECTOR INSTALLATION DETAIL	703
1315.10	02/16	VIRGINIA DEPARTMENT OF TRANSPORTATION	

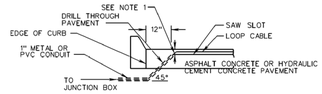
TD-1A, B, C



SHOULDER SECTION



CURB AND GUTTER SECTION



CURB SECTION (NO GUTTER)

NOTES:

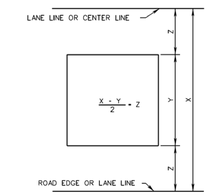
1. THE TOP OF 1" CONDUITS SHALL BE INSTALLED 1" BELOW THE BOTTOM OF THE SAW SLOT.
2. PLASTIC BUSHINGS SHALL BE INSTALLED ON THE ENDS OF THE CONDUITS IN THE PAVEMENT. DUCT SEAL SHALL BE APPLIED TO THE OPEN END OF THE BUSHING.
3. SAW SLOTS SHALL INTERSECT WITH THE HOLES DRILLED FOR INSTALLATION OF THE CONDUITS AND LOOP CABLES.
4. DRILLED HOLES SHALL BE NO LARGER THAN REQUIRED FOR INSTALLATION OF THE CONDUIT AND PLASTIC BUSHING.
5. REMOVAL OF LARGE SECTIONS OF PAVEMENT TO PERFORM THIS WORK WILL NOT BE ALLOWED.
6. ONE CONDUIT SHALL BE PROVIDED FOR EACH SAW SLOT.
7. ALL DIMENSIONS NOT SHOWN SHALL BE AS SPECIFIED ON THE CONTRACT DOCUMENTS.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	VDOT ROAD AND BRIDGE STANDARDS	
703	LOOP DETECTOR INSTALLATION DETAIL	REVISION DATE 02/16	SHEET 2 OF 3
	VIRGINIA DEPARTMENT OF TRANSPORTATION		1315.11

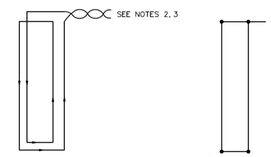
TD-1A, B, C

NOTES:

1. ALL DIMENSIONS NOT SHOWN SHALL BE AS SPECIFIED ON THE CONTRACT DOCUMENTS.
2. LOOP WIRE TWISTED TOGETHER WITH A MINIMUM OF THREE TURNS PER RUNNING FOOT.
3. BASED ON THE LENGTH OF LEAD-IN CABLE, ADDITIONAL WIRE TURNS PER LOOP MAY BE REQUIRED AS SPECIFIED BY THE CONTRACT DOCUMENTS.



TYPICAL LANE COVERAGE DIAGRAM

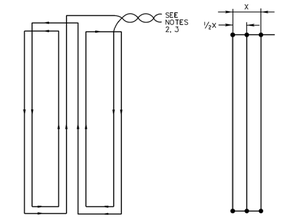


LOOP CABLE INSTALLATION — PLAN VIEW

TD-1A

LOOP CABLE INSTALLATION — PLAN VIEW

TD-1B

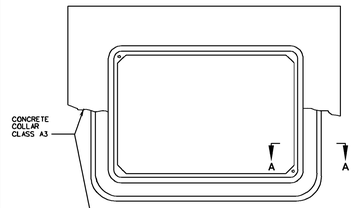


LOOP CABLE INSTALLATION — PLAN VIEW

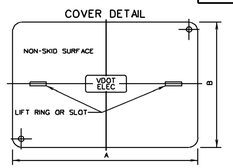
TD-1C

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 3 OF 3	REVISION DATE	LOOP DETECTOR INSTALLATION DETAIL	703
1315.12	NEW 02/16	VIRGINIA DEPARTMENT OF TRANSPORTATION	

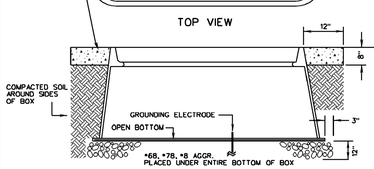
JB-S1, S2, S3



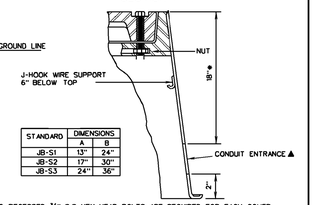
TOP VIEW



COVER DETAIL



SECTION VIEW



SECTION A-A

STANDARD	DIMENSIONS A	DIMENSIONS B
JB-S1	13"	24"
JB-S2	17"	30"
JB-S3	24"	36"

NOTES:

JUNCTION BOXES MAY BE STRAIGHT OR FLARED WALL IN DESIGN. MATERIALS SHALL CONFORM TO SECTION 238 OF THE ROAD & BRIDGE SPECIFICATIONS.

BELL ENDS SHALL BE INSTALLED ON THE ENDS OF PVC CONDUITS.

GROUNDING BUSHINGS SHALL BE INSTALLED ON THE ENDS OF METAL CONDUITS.

BELL ENDS AND BUSHINGS SHALL BE PLUGGED TO PREVENT MOISTURE AND RODENT ENTRY.

*DEPTH OF CONDUIT ENTRANCE FOR USE OF MAGNETIC DETECTORS SHALL BE IN ACCORDANCE WITH STANDARD TD-2.

CONDUIT ENTRANCES SHALL BE LOCATED AS SHOWN ON THE PLANS.

THE COVER SHALL HAVE A NON-SKID SURFACE WITH LETTERS CAST IN THE DEPRESSION ON TOP. THE LETTERS "VDOT ELEC", "VDOT TRAF", "VDOT COMM" OR UTILITY AS APPLICABLE ARE TO BE 1" WIDE. COVERS USED FOR JUNCTION BOXES INSTALLED WITHIN MUNICIPALITIES AND NOT MAINTAINED BY VDOT SHALL NOT REQUIRE THE VDOT REFERENCE.

ALL JUNCTION BOXES SHALL BE INSTALLED WITH A GROUNDING ELECTRODE

TWO RECESSED 3/8" S.S. HEX HEAD BOLTS ARE REQUIRED FOR EACH COVER.

▲ A MINIMUM 2" DIAMETER CONDUIT ENTRANCE IS REQUIRED, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

J-HOOK WIRE SUPPORTS SHALL BE SECURELY ATTACHED TO THE JUNCTION BOX WITH A BOLT AND NUT WITH A NEOPRENE WASHER OR AN EXPANSION FITTING.

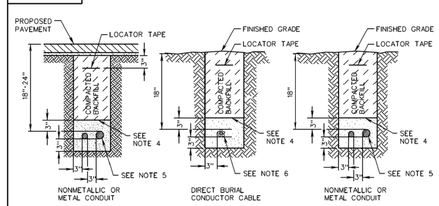
CONDUITS SHALL EXTEND 2" TO 3" MAX. INTO THE INSIDE WALL OF THE JUNCTION BOX.

THE JUNCTION BOX MAY BE A TWO PIECE DESIGN WITH THE TOP SECTION NO LESS THAN 17" IN DEPTH.

VOIDS RESULTING FROM ENTRANCE OF CONDUITS INTO JUNCTION BOXES SHALL BE COMPLETELY FILLED WITH AN APPROVED MATERIAL.

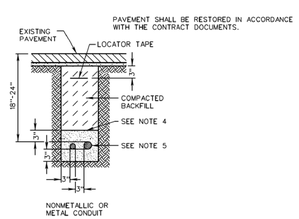
SPECIFICATION REFERENCE		VDOT ROAD AND BRIDGE STANDARDS	
700 238	JUNCTION BOX FOR NON-DELIBERATE TRAFFIC USE	REVISION DATE 6-15-09	SHEET 1 OF 1
	VIRGINIA DEPARTMENT OF TRANSPORTATION		1317.20

ECI-1



NON - PAVEMENT AND PROPOSED PAVEMENT AREA INSTALLATION

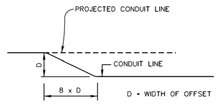
ECI-2



EXISTING PAVEMENT AREA INSTALLATION

NOTES:

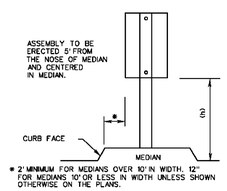
1. CONTRACTOR SHALL INSTALL A 4" MINIMUM TO 6" MAXIMUM WIDE RED PLASTIC LOCATOR TAPE 6" TO 8" BELOW FINISHED GRADE AND DIRECTLY ABOVE BURIED CONDUIT OR CONDUCTOR CABLES.
2. CONDUIT INSTALLED UNDER EXISTING OR PROPOSED ROADWAYS OR SIDEWALK FOR DIRECT BURIED CABLES SHALL EXTEND 24" BEYOND THE PAVED SURFACE AND/OR SIDEWALK.
3. WHERE CONDUIT FOR POWER AND CONDUIT FOR COMMUNICATION ARE TO BE INSTALLED IN CLOSE PROXIMITY TO EACH OTHER, CONDUITS SHALL BE PLACED PARALLEL IN A COMMON TRENCH WITH NO LESS THAN 6" OF SEPARATION BETWEEN CONDUIT SYSTEMS.
4. BACKFILL MATERIAL BELOW THIS LEVEL SHALL BE SANDY FILL (FREE OF ANY STONES, CINDERS, WOOD, ROOTS, DEBRIS, ETC.).
5. ONE OR MORE CONDUITS AS REQUIRED.
6. ONE OR MORE CONDUCTOR CABLES AS REQUIRED.
7. OFFSETTING OF CONDUIT MAY BE USED FOR TYING INTO EXISTING CONDUIT SYSTEMS OR BYPASSING OBSTRUCTIONS AS DIRECTED BY THE ENGINEER.
8. WHEN OFFSETTING CONDUIT TO BYPASS AN OBSTRUCTION, THE CONDUIT SHALL MAINTAIN A MINIMUM CLEARANCE OF 12" FROM THE CLOSEST POINT OF THE OBSTRUCTION.



METHOD OF OFFSETTING CONDUIT

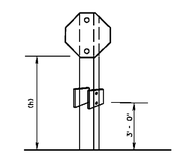
VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.	SPECIFICATION REFERENCE
SHEET 1 OF 1	REVISION DATE	ELECTRICAL CONDUIT AND CONDUCTOR CABLE UNDERGROUND INSTALLATION	700 302
1318.10	02/16	VIRGINIA DEPARTMENT OF TRANSPORTATION	

STP-1

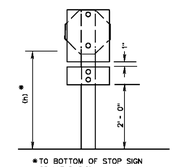


* 2' MINIMUM FOR MEDIANS OVER 10' IN WIDTH. 12" FOR MEDIANS 10' OR LESS IN WIDTH UNLESS SHOWN OTHERWISE ON THE PLANS.

SINGLE POST MEDIAN INSTALLATIONS

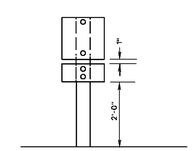


ONE WAY SIGNS ON EXIT RAMPS WITH STOP SIGN

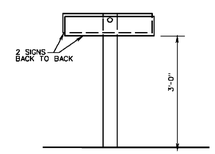


* TO BOTTOM OF STOP SIGN OR YIELD SIGN

STOP OR YIELD SIGNS AND DO NOT ENTER SIGN AT EXIT RAMPS



WRONG WAY SIGN AND DO NOT ENTER SIGN ON EXIT RAMPS



ONE WAY SIGNS ON EXIT RAMPS

SPECIFICATION REFERENCE		VDOT ROAD AND BRIDGE STANDARDS	
700	SQUARE TUBE SIGN POST	REVISION DATE 6-15-09	SHEET 3 OF 3
	VIRGINIA DEPARTMENT OF TRANSPORTATION		1321.12

PROJECT	SHEET NO.
0029-151-105	2P(15)

Rinker Design Associates, P.C. Civil Engineering · Surveying · Land Planning Transportation · Environmental Right of Way Services
Office Locations
Main Office: 4101 Cox Road, Glen Allen, VA 23060 Phone: (804) 747-1758 Fax: (804) 747-5960
Northern Office: 8270 Greensboro Drive, Suite 850, McLean, VA 22102 Phone: (703) 556-9222 Fax: (703) 556-9291
Southern Office: 4525 Main Street, Suite 1, Virginia Beach, VA 23462 Phone: (757) 490-9283 Fax: (757) 490-9282
Western Office: 901 Enterprise Drive, Suite 201, Forest, VA 24551 Phone: (434) 525-4713 Fax: (434) 525-4714
DESIGN DATA ON FILE

4/20/2016

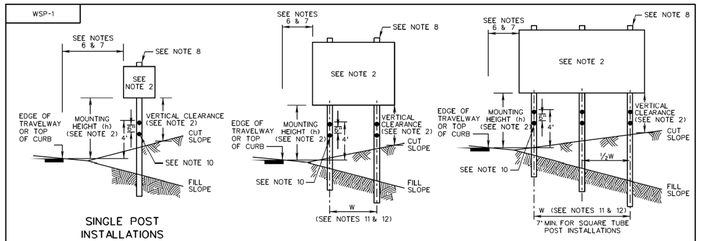
PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach, P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 PI01, PI02, R201, C501	2PI(16)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

WSP-1



SINGLE POST INSTALLATIONS — TWO POST INSTALLATIONS — THREE POST INSTALLATIONS

GENERAL NOTES:

1. WSP STANDARDS SHALL ONLY BE USED FOR TEMPORARY SIGN INSTALLATIONS THAT WILL BE IN PLACE FOR A MAXIMUM OF 36 MONTHS.
2. FOR ALL SIGNS EXCEPT STREET NAME SIGNS:
   A. MINIMUM MOUNTING HEIGHT (h) SHALL BE 7 FEET FOR TEMPORARY SIGNS AND 6 FEET FOR SECONDARY SIGNS (SEE NOTE 4).
   B. MAXIMUM MOUNTING HEIGHT (h) FOR THE BOTTOM-MOST SIGN(S) SHALL BE 8 FEET, EXCEPT WHEN NECESSARY TO ACHIEVE MINIMUM VERTICAL CLEARANCE BENEATH SIGN AS PER NOTE 2C.
   C. MINIMUM VERTICAL CLEARANCE (DISTANCE BETWEEN BOTTOM OF SIGN AND FINISHED GRADE BENEATH THE SIGN) SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS MINIMUM VERTICAL CLEARANCE MAY BE REDUCED TO 5 FEET FOR EITHER OF THE FOLLOWING CONDITIONS:
      - WHEN SIGNS OR PORTIONS OF SIGNS ARE LOCATED MORE THAN 10 FEET UP A CUT SLOPE GREATER THAN 3:1, OR
      - WHEN THE SIGN IS LOCATED AT LEAST THE MINIMUM DISTANCE BEHIND CURB, BARRIER, OR GUARDRAIL AS PER NOTES 6 AND 7.
3. MOUNTING HEIGHT (h) FOR STREET NAME SIGNS SHALL BE BETWEEN 8'-6" AND 9'-0".
4. A SECONDARY SIGN IS CONSIDERED TO BE A SIGN MOUNTED BELOW ANOTHER SIGN, EXCEPT A ROUTE MARKING ASSEMBLY (CONSISTING OF A ROUTE MARKER WITH AN AUXILIARY PLATE) IS CONSIDERED TO BE A SINGLE SIGN. A SECONDARY SIGN SHALL NOT BE MOUNTED LOWER THAN 7 FEET ABOVE A PEDESTRIAN SIDEWALK OR PATHWAY IF IT WILL PROJECT MORE THAN 4" INTO THE PEDESTRIAN FACILITY.
5. FOR SIGNS LOCATED IN AREAS WHERE PEDESTRIAN MOVEMENTS ARE LIKELY TO OCCUR OR ON-STREET PARKING IS PERMITTED, THE HEIGHT (h) FROM THE LOWEST PORTION OF THE SIGN TO THE FINISHED SURFACE SHALL HAVE A CLEARANCE OF 7 FEET.
6. THE LATERAL CLEARANCE TO THE SIGN EDGE SHALL BE A MINIMUM OF 2 FEET FROM THE FACE OF CURB OR 4 FEET FROM FACE OF PERMANENT CONCRETE BARRIER, IF PRESENT. THE EDGE OF SIGN SHALL BE OUTSIDE THE DEFLECTION ZONE FOR TRAFFIC BARRIER SERVICE.
7. UNLESS OTHERWISE APPROVED BY THE ENGINEER, SIGNS PLACED BEHIND GUARDRAIL SHALL BE LOCATED SUCH THAT THE NEAR SIDE EDGE OF THE SIGN PANEL IS OUTSIDE OF THE GUARDRAIL DEFLECTION DISTANCE.
8. THE TOP OF THE SIGN POST MAY EXTEND NO MORE THAN 2 FEET ABOVE THE TOP OF THE SIGN.
9. THE SIGN POST SHALL BE PLUMB AT INSTALLATION AND SHALL NOT LEAN OR TWIST DURING USE. IN THE EVENT THE POST LEANS OR TWISTS OUT OF POSITION THE CONTRACTOR SHALL TAKE IMMEDIATE CORRECTIVE ACTION.
10. ED-3 TYPE 2 DELINEATORS SHALL BE PLACED ON ALL POSTS DURING ALL TIMES THAT THE SIGN IS COVERED. THE COLOR OF THE ED-3 DELINEATORS SHALL MATCH THE COLOR OF THE ADJACENT EDGE LINE MARKING.

WOOD POST NOTES:

11. MINIMUM SPACING (CENTER TO CENTER) BETWEEN TWO 4" x 4" WOOD POSTS SHALL BE 3 FEET. MINIMUM SPACING (CENTER TO CENTER) BETWEEN TWO WOOD POSTS OF ANY OTHER SIZE SHALL BE 8 FEET.

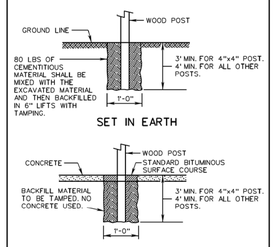
SQUARE TUBE POST NOTES:

12. W = (0.60) X (SIGN WIDTH)

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) WOOD POST AND SQUARE TUBE POST SIGN STRUCTURES VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 1 OF 6	REVISION DATE 02/16		512 700
1320.10			

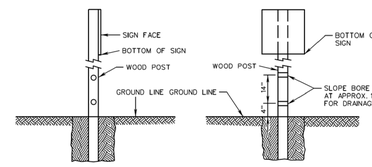
WSP-1

INSTALLATION DETAILS



SET IN EARTH — SET IN CONCRETE

METHOD OF POST DRILLING

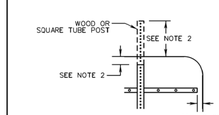


SIDE VIEW — FRONT VIEW

NOTES:

1. 6" X 6" WOOD POST REQUIRES TWO 2" BORE HOLES.
2. 6" X 8" WOOD POST REQUIRES TWO 3" BORE HOLES.
3. POSTS LESS THAN 6" X 6" DO NOT REQUIRE BORE HOLES.

BRACING AND POST TOLERANCE DETAIL



NOTES:

1. SIGN WIDTHS GREATER THAN 48" SHALL REQUIRE SIGN BRACING CONFORMING TO STANDARD STP-1.
2. THE TOP OF POST SHALL BE NO MORE THAN 2" BELOW AND NO MORE THAN 2 FEET ABOVE THE TOP OF THE SIGN.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) WOOD OR SQUARE TUBE STEEL POST SIGN STRUCTURES VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
512 700		REVISION DATE 02/16	SHEET 2 OF 6
		1320.11	

WSP-1

DESIGN TABLE FOR WOOD POST

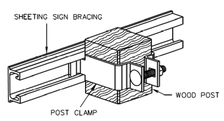
SIZE OF POST	CENTROID (FT)	MAXIMUM AREA (TOTAL OF SIGNS) (FT²) SINGLE-POST	TWO-POST	THREE-POST	COMMENTS
4" X 4"	8	7	13	20	SEE NOTE 1
	9	6	12	18	
	10	5	11	16	
	11	5	10	15	
	12	4	9	13	
4" X 6" (SEE NOTE 2)	8	18	37	55	
	9	16	33	49	
	10	15	29	44	
	11	13	27	40	
	12	12	25	37	
5" X 5"	8	15	31	46	
	9	14	27	41	
	10	12	24	37	
	11	11	22	33	
	12	10	20	31	
6" X 6"	8	29	58	87	
	9	26	51	77	
	10	23	46	69	
	11	21	42	63	
	12	19	39	58	
	13	18	36	53	
6" X 8" (SEE NOTE 2)	8	52	103	155	
	9	46	92	138	
	10	41	83	124	
	11	38	75	113	
	12	34	69	103	
	13	32	64	95	
	14	22	44	66	

NOTES:

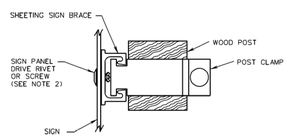
1. FOR A SINGLE 4" X 4" POST THE MAXIMUM TOTAL SIGN CAN BE INCREASED TO 16 SQUARE FEET PROVIDED:
   A. THE MAXIMUM VERTICAL CLEARANCE BETWEEN THE GROUND LEVEL AND BOTTOM OF THE SIGN DOES NOT EXCEED 7'-6" WHILE MAINTAINING A 7'-0" MINIMUM MOUNTING HEIGHT (h) BETWEEN BOTTOM OF SIGN AND TOP OF ROADWAY SURFACE AT THE EDGE OF TRAVEL LANE.
   B. CONTRACTOR SUPPLIES DEPARTMENT WITH MATERIALS CERTIFICATION FOR WOOD POSTS TO ENSURE CONFORMANCE WITH SECTION 236 OF THE SPECIFICATIONS.
2. LARGER DIMENSION OF WOOD POST SHALL BE IN DIRECTION OF (PARALLEL TO) TRAFFIC.
3. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH STANDARD PCS-1.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) WOOD POST SIGN STRUCTURES VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 3 OF 6	REVISION DATE 02/16		512 700
1320.12			

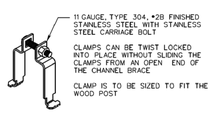
WSP-1



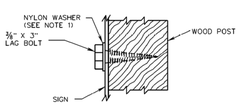
WOOD POST & BRACE (CONNECTING JUNCTION)

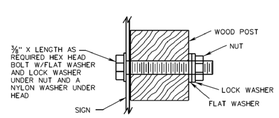


SIGN PANEL ATTACHMENT DETAILS FOR WOOD POST REQUIRING BRACING



CLAMP DETAIL





SIGN ATTACHMENT DETAILS WOOD POST WITHOUT BRACING

NOTES:

1. NYLON WASHER SHALL BE 1/16" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF 1" AND AN INSIDE DIAMETER OF 7/16".
2. DRIVE RIVET SHALL BE 3/16" OR 3/8" ALUMINUM FLAT HEAD RIVET WITH NYLON OR RUBBER WASHER.
3. SIGN PANEL ATTACHMENTS TO SQUARE TUBE POSTS SHALL BE AS PER STANDARD STP-1.
4. THE HEADS OF ALL DRIVE RIVETS AND BOLTS PROTRUDING FROM TEMPORARY SIGNS MAY BE UNCOATED. IF POWDER COATED, THE HEADS SHALL MATCH THE COLOR OF THE SIGN SHEETING.
5. BOLTS, NUTS, AND LOCK WASHERS SHALL BE GALVANIZED OR STAINLESS STEEL.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) WOOD POST SIGN STRUCTURES - ATTACHMENT DETAILS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
512 700		REVISION DATE NEW 02/16	SHEET 4 OF 6
		1320.13	

WSP-1

DESIGN TABLE FOR SQUARE TUBE POST

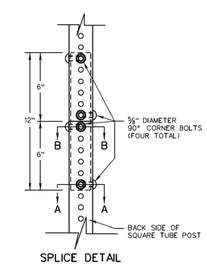
SIZE OF POST	CENTROID (FT)	MAXIMUM AREA (TOTAL OF SIGNS) (FT²) SINGLE-POST	TWO-POST	THREE-POST	COMMENTS
2 INCH 14 GA.	8	10.7	21.4		TYPE A, TYPE D, OR TYPE F FOUNDATION (SEE NOTE 4)
	9	9.5	19.0		
	10	8.5	17.0		
	11	7.7	15.4		
	12	7.1	14.2		
	13	6.5	13.0		
	14	6.1	12.2		
2½ INCH 12 GA.	8	21.5			TYPE A OR TYPE E FOUNDATION (SEE NOTE 4)
	9	19.1			
	10	17.2			
	11	15.6			
	12	14.3			
	13	13.2			
	14	12.3			
2½ INCH 10 GA.	8	24.8	49.6	74.4	TYPE B OR TYPE C FOUNDATION (SEE NOTE 4)
	9	22.0	44.0	66.0	
	10	19.8	39.6	59.4	
	11	18.0	36.0	54.0	
	12	16.5	33.0	49.5	
	13	15.2	30.4	45.6	
	14	14.1	28.2	42.3	
2½ INCH 10 GA. WITH 2 3/16 INCH 10 GA. INNER POST (SEE NOTE 1)	8	43.4	86.8	130.2	TYPE B OR TYPE C FOUNDATION (SEE NOTE 4)
	9	38.6	77.2	115.8	
	10	34.7	69.4	104.1	
	11	31.6	63.2	94.8	
	12	28.9	57.8	86.7	
	13	26.7	53.4	80.1	
	14	24.8	49.6	74.4	

NOTES:

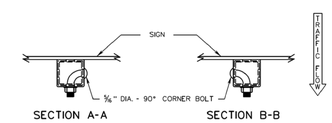
1. THE INNER POST SHALL BE 6 FEET IN LENGTH.
2. CENTROID SHALL BE DETERMINED IN ACCORDANCE WITH PCS-1.
3. MINIMUM COLD FORMED YIELD STRENGTH SHALL BE: 14 GA. AND 12 GA. = 60 KSI; 10 GA. = 55 KSI
4. TYPE A, B, C, D, E, AND F FOUNDATIONS SHALL BE IN ACCORDANCE WITH STANDARD STP-1.

VDOT ROAD AND BRIDGE STANDARDS		A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) SQUARE TUBE POST SIGN STRUCTURES VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE
SHEET 5 OF 6	REVISION DATE NEW 02/16		512 700
1320.14			

WSP-1



SPLICE DETAIL



SECTION A-A — SECTION B-B

CORNER BOLT DETAIL

SPLICE SIZE TABLE

POST SIZE	SPLICE POST SIZE
2 INCH, 14 GAUGE	1¾ INCH, 14 GAUGE
2½ INCH, 12 GAUGE	2¼ INCH, 12 GAUGE
2½ INCH, 10 GAUGE	2 3/16 INCH, 10 GAUGE

NOTES:

1. ONLY ONE SPLICE PER POST WILL BE ALLOWED.
2. SPLICES SHALL BE A MINIMUM OF 24" ABOVE GROUND LINE.
3. SPLICES SHALL ONLY BE PERMITTED FOR TEMPORARY INSTALLATIONS.
4. CORNER BOLTS SHALL BE INSTALLED SO THE BOLT HEADS ALTERNATE SIDES PER EACH CORNER BOLT. THE BOLT HEAD SHALL BE ON THE LEFT OR RIGHT SIDE OF THE POST. THE NUT SHALL BE ON THE BACK OF THE POST. SEE SPLICE DETAIL.

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TEMPORARY SIGNS (FOR CONSTRUCTION, MAINTENANCE, PERMIT AND UTILITY ACTIVITIES) SQUARE TUBE POST SIGN STRUCTURES VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
512 700		REVISION DATE NEW 02/16	SHEET 6 OF 6
		1320.15	

	PROJECT	SHEET NO.
	0029-151-105	2PI(16)

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4/20/2016

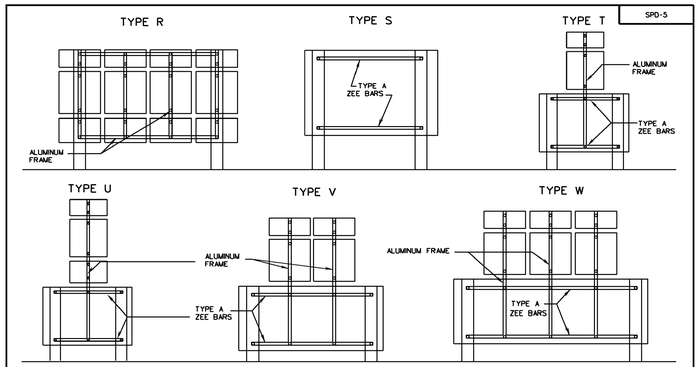
PROJECT MANAGER Wendy Black Sanford, City of Fairfax (703) 385-7889
SURVEYED BY Rinker Design Assoc., P.C. (703) 368-7373 (2011)
DESIGNED BY Adam D. Weischenbach P.E., Rinker Design Assoc., P.C. (703) 368-7373
SUBSURFACE UTILITY PROVIDED BY Accumark (2011)

VDOT Insertable Sheets

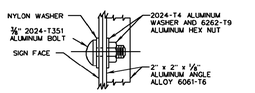
REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	-	0029-151-105 P101, P102, R201, C501	2P(17)

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

SPD-5



ALUMINUM FRAMING
SIGN PANEL ATTACHMENT DETAILS
(FOR SIGN PANEL ATTACHMENT TO 2 BARS, SEE STANDARD SPD-1)



NOTES

NYLON WASHER SHALL BE 1/8" THICK MINIMUM WITH AN OUTSIDE DIAMETER OF 1" AND AN INSIDE DIAMETER OF 3/16".

TO OBTAIN A FLUSH MOUNTING SURFACE FOR SIGNS, ALL WOOD POST SHALL BE MORTISED WHERE NECESSARY TO RECESS THE FLANGE OF ALUMINUM ANGLE.

THE TYPE A ZEE BARS SHALL BE 2 3/8" x 1 1/4" x 3/16".

ALL VERTICAL AND HORIZONTAL SPACING BETWEEN SIGNS IN AN ASSEMBLY SHALL BE ONE INCH UNLESS SPECIFIED.

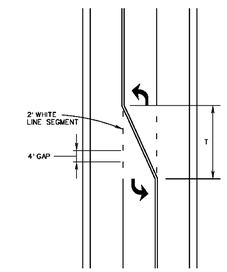
THESE ARE TYPICAL SIGN PANEL ASSEMBLIES; ALL ASSEMBLIES SHALL BE IN ACCORDANCE WITH PLAN DETAILS.

SPECIFICATION REFERENCE	SIGN PANEL DESIGN	VDOT ROAD AND BRIDGE STANDARDS	
701	VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISION DATE 6-15-09	SHEET 2 OF 2
			1325.51

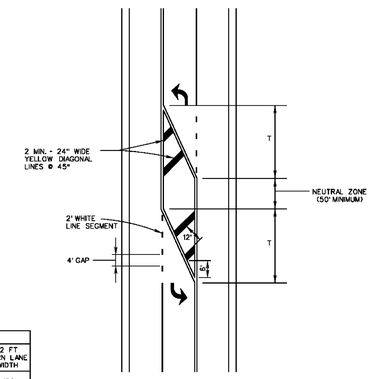
PM-5

NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THESE STANDARDS, THE MUTCD, AND THE VIRGINIA SUPPLEMENT TO THE MUTCD, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
2. TAPER LENGTH SHALL BE PER THESE STANDARDS UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
3. TAPERS MORE THAN 100': USE DOTTED EXTENSION (2' LINE SEGMENTS / 4' GAPS). TAPERS 100' OR LESS: DO NOT USE DOTTED EXTENSION UNLESS SPECIFIED IN THE CONTRACT DOCUMENTS.
4. TURN ARROWS SHALL BE IN ACCORDANCE WITH PM-3.
5. THE PAVEMENT MARKINGS SHALL BE 4" WIDE UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS.



WITHOUT NEUTRAL ZONE



WITH NEUTRAL ZONE

TAPER LENGTH (T) TABLE

SPEED	TAPER RATIO	T: 10 FT TURN LANE WIDTH	T: 11 FT TURN LANE WIDTH	T: 12 FT TURN LANE WIDTH
≤ 30 MPH	8:1	80'	90'	100'
> 30 MPH	15:1	150'	175'	200'

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. TYPICAL PAVEMENT MARKING LEFT TURN PAVEMENT MARKED MEDIAN VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
704		REVISION DATE 01/15	SHEET 1 OF 2
			1330.50

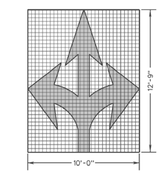
PM-10

SQUARE FOOT AREAS OF SYMBOLS AND ARROWS

SYMBOL	DESCRIPTION	PAINT APPLICATION	ERADICATION
	THRU ARROW	12.0	32.0
OR	SINGLE TURN ARROW (LEFT OR RIGHT)	17.5	51.0
OR	DOUBLE TURN ARROW (LEFT/THROUGH OR RIGHT/THROUGH)	28.5	96.0
	TRIPLE TURN ARROW (LEFT/THROUGH/RIGHT)	37.5	127.5
	DOUBLE TURN ARROW ARROW (LEFT/RIGHT)	27.0	80.0
OR	LANE-REDUCTION ARROW (LEFT OR RIGHT)	44.0	99.0
	WRONG-WAY ARROW	24.0	133.5
	FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS (LEFT)	20.5	81.0
	FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS (LEFT/THROUGH)	31.0	114.5
	FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS (LEFT/THROUGH/RIGHT)	39.5	195.0
	FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS (THROUGH/RIGHT)	31.5	142.0
	OPTIONAL OVAL FOR FISH-HOOK LANE-USE ARROW FOR ROUNDABOUTS	3.5	4.5
	HOV DIAMOND SYMBOL (ASPHALT SURFACE)	11.5	39.0
	HOV DIAMOND CONTRAST SYMBOL (CONCRETE SURFACE)	35.5	70.0
	YIELD LINE TRIANGLE (1' x 1.5')	0.75 (EACH)	1.5 (EACH)
	YIELD LINE TRIANGLE (2' x 3')	3.0 (EACH)	6.0 (EACH)

SQUARE FOOT AREAS OF SYMBOLS AND ARROWS

SYMBOL	DESCRIPTION	PAINT APPLICATION	ERADICATION
	BICYCLIST THRU ARROW	5.0	12.0
OR	BICYCLIST TURN ARROW (LEFT OR RIGHT)	9.5	29.0
	HELMETED BICYCLIST SYMBOL	6.5	20.0
	SHARED LANE MARKING SYMBOL	10.0	31.5
	SMALL YIELD AHEAD TRIANGLE	26.0	78.0
	LARGE YIELD AHEAD TRIANGLE	37.0	120.0
	RAILROAD CROSSING SYMBOL	60.0	160.0
	INTERNATIONAL SYMBOL OF ACCESSIBILITY - SPECIAL SIZED	22.0	22.5

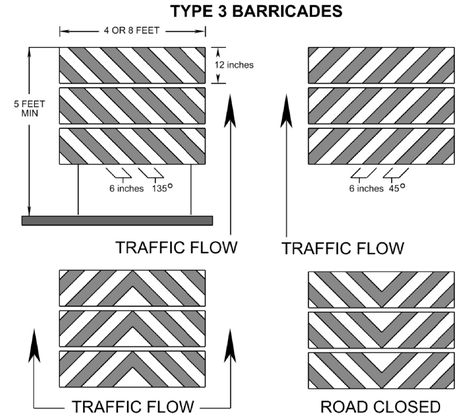


ERADICATION AREA = 12'-9" x 10'-0" = 127.5 SQ.FT.

THEORETICAL BOX ERADICATION AREA EXAMPLE (TRIPLE TURN ARROW)

SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. PAVEMENT WORD, SYMBOL, AND ARROW MARKINGS SQUARE FOOT AREAS OF SYMBOLS AND ARROWS VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS	
704		REVISION DATE 02/16	SHEET 3 OF 15
			1340.12

TYPE 3 BARRICADES



THE SIDES OF BARRICADES FACING TRAFFIC SHALL BE 6 INCH ORANGE & WHITE FLUORESCENT PRISMATIC (HIGH OBSERVATION ANGLE) LENS STRIPES REQUIRED

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	PROJECT	SHEET NO.
	0029-151-105	2P(17)