



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

PHILIP A. SHUCET
COMMISSIONER

MOHAMMAD MIRSHAHI, P.E.
STATE LOCATION AND DESIGN ENGINEER

July 21, 2004

MEMORANDUM

To: All Holders of the Virginia Department of Transportation's 2001 Road and Bridge Standards

The following is a list of standards contained in the 2001 Road and Bridge Standards that have been revised. Please add these pages to your copy of the standards. An insertable sheet will not be required in plan assemblies.

PAGE	STANDARD	REVISION
N/A	N/A	N/A

The following is a list of revised standards to the 2001 Road and Bridge Standards that do require an insertable sheet to be included in your plan assembly until the next edition of the imperial standards is published. Please add these pages to your copy of the standards. The respective insertable sheet number has been placed with the revised standard. An insertable sheet is available for each of these revised standards. The insertable sheets are available on VDOT's web site on the FTP server and in Falcon DMS for VDOT personnel. These insertable sheets will be required in plan assemblies for projects utilizing the standard items listed below that have not been to advertisement prior to January, 26 2005.

PAGE	INSERT	STANDARD	REVISION
101.32	A57	EW-12	Revised note.
104.25	A158	DI-9	Revised riser pipe dimension.
107.02	A86	PB-1	Revised transposed dimensions For S1 and S2 on normal earth foundation no projection.
109.01	ISD570	PG-2A	Revised concrete surface area for TY A1 D=8" from .0759 to 0.0759.

PAGE	INSERT	STANDARD	REVISION
115.01	ISD414.04	ESC-INS	Revised ditch reference notes.
202.02	A159	MS-1	Revised minimum width.
202.03	A159	MS-1A	Revised minimum width.
203.06	A59	CG-12	Added ramp length table.
203.07	A59	CG-12	Added ramp length table.
401.02	A161	RW-3	Revised annotation of porous backfill.
501.06	A133	GR-3	Revised notes.
501.08	A133	GR-3	Clarified anchor dimensions, revised notes.
501.10	A132	GR-6	Revised rail length in detail A.
501.11	A89	GR-7	Revised notes and clarified details.
501.12	A89	GR-7	Deleted page.
501.13	A89	GR-7	Chaged sheet reference.
501.16	A136	GR-SP	Revised notes.
501.18	ISD2390	GR-9	Revised notes and clarified details.
501.55	A96	MB-12A,B,C	Revised references to barrier shapes for transition details.
502.02	A160	FE-W1,W2	Added brace dimensions.
502.03	A160	FE-B	Added brace dimensions.
502.04	A152	FE-CL	Revised references to federal specification for post designations.

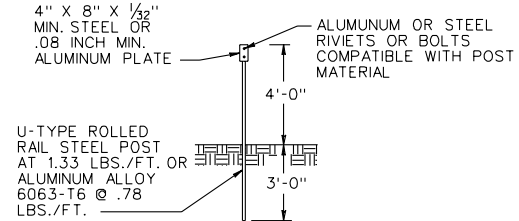
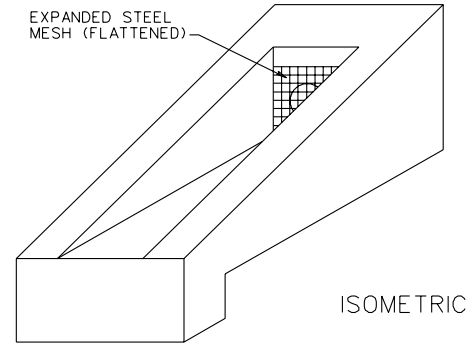
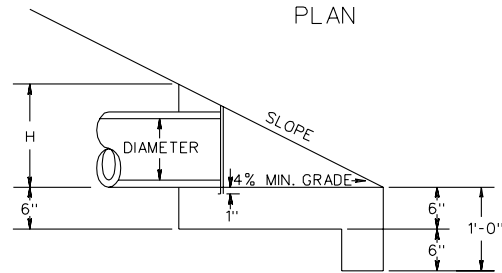
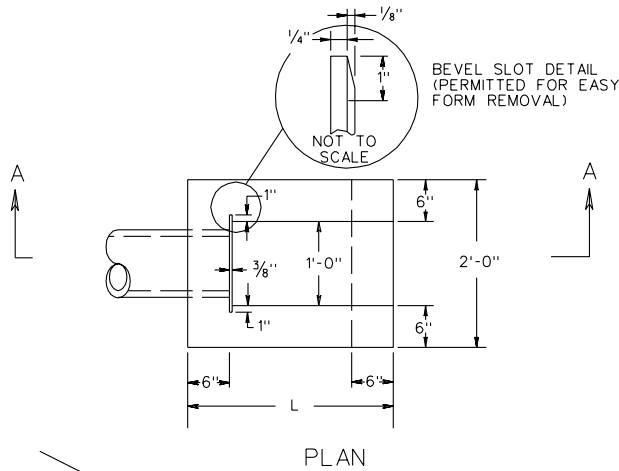
PAGE	INSERT	STANDARD	REVISION
502.07	A152	FE-6	Revised notes. Revised grounding details.
601.05	A68	HR-1	Revised handrail height, added grounding details.
603.01	A149	RFD-1	Revised general notes.
603.02	A149	RFD-1	Revised notes, and table to specify dimensions.
1301.63	A156	SSP-VA	Revised sign panel installation details.
1301.67	A156	SSP-VIA	Revised sign panel installation details.
1301.72	A154	OSS-1	Revised notes, catwalk details, fixed object offset distance, and electrical installation details.
1301.73	A154	OSS-1	Revised notes, catwalk details, fixed object offset distance, and electrical installation details.
1301.74	A155	OSS-1	Revised sign panel erection details and sign lighting details.
1301.75	A155	OSS-1	Revised sign panel erection details and sign lighting details.
1301.76	A157	OSS-1	Revised sign panel installation details.
1301.79	A157	SPD-1	Revised sign panel installation details.

If you have any questions or comments regarding the listed revisions to this publication, please contact Mr. Steve Van Cleef of the Engineering Services Section at (804) 786-2543.

Sincerely,

Mohammad Mirshahi, P.E.
State Location and Design Engineer

EW-12



UNDERDRAIN OUTLET
MARKER DETAIL

NOTES:

1. TYPICAL ENDWALL TO BE PLACED AT THE ENDS OF ALL UNDERDRAIN OUTLETS, BARRING LOCATIONS WHERE UNDERDRAIN IS TIED INTO OTHER DRAINAGE STRUCTURES. ENDWALL TO BE INSTALLED PERPENDICULAR TO ROADWAY AND FLUSH WITH THE SLOPE.
2. OUTLET PIPES SHALL BE RIGID NONPERFORATED, SMOOTH-BORE PIPE, MEETING THE REQUIREMENTS OF 70 PSI TESTED ACCORDING TO ASTM 2412.
3. EXPANDED STEEL MESH (FLATTENED) SHALL HAVE OPENINGS OF APPROX. 1/2" X 1" AND WEIGH APPROX. 0.82 LBS. PER SQ. FT. MESH SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123. THE MESH SHALL EXTEND A MINIMUM OF 1" ABOVE THE O.D. OF THE PIPE, AND IS A BARRIER FOR RODENTS, ETC. THE SLOT FOR THE STEEL MESH IS TO BE CONSTRUCTED SO THAT THE MESH CAN BE REMOVED FOR CLEANOUT PURPOSES.
4. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
5. STEEL POSTS AND PLATES TO BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE ROAD AND BRIDGE SPECIFICATIONS. IF PAINTED THE FINAL COAT SHALL BE NO. 13 ALUMINUM PAINT OR NO. 11 WHITE PAINT.
6. MARKER TO BE PLACED AT ALL EW-12 UNDERDRAIN INSTALLATIONS.
7. MARKER WILL BE PAID FOR IN ACCORDANCE WITH SECTION 501 OF THE ROAD AND BRIDGE SPECIFICATIONS.

PIPE I.D.	SLOPE	DIMENSIONS		CLASS A3 CONCRETE CUBIC YARDS
		L	H	
4"	2:1	2'-5 1/2"	1'-2 3/4"	0.17
4"	4:1	4'-5"	1'-1 1/4"	0.28
6"	2:1	2'-10 1/2"	1'-5 1/4"	0.21
6"	4:1	5'-3"	1'-3 3/4"	0.35

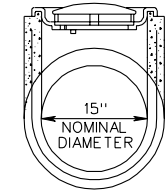
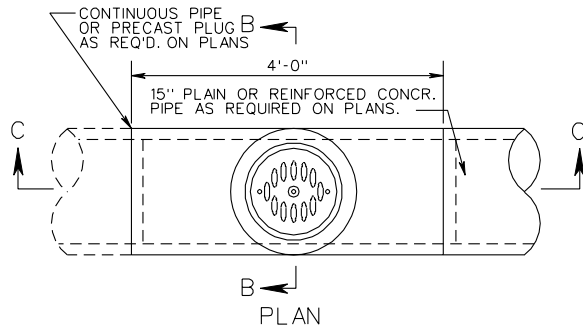
STANDARD ENDWALL FOR PIPE UNDERDRAIN

REV. 7/04
101.32

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
105
233
302
501

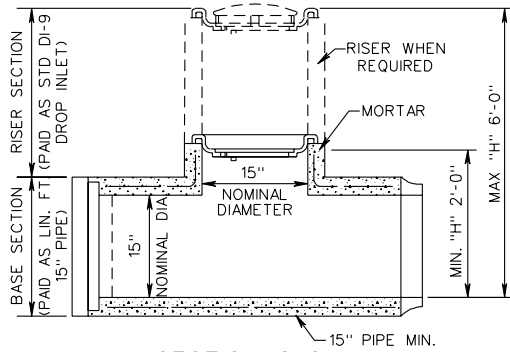
DI-9



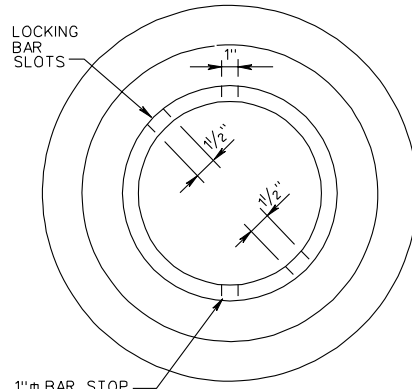
SECTION B-B

NOTES

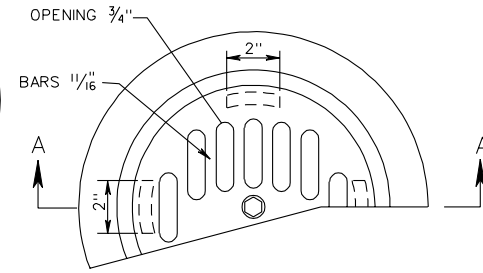
1. PRECAST PIPE PLUG SHALL BE SET IN FRESH MORTAR.
2. PRECAST PLUG SHALL CONFORM TO PIPE MANUFACTURER'S JOINT DESIGN AND SHALL HAVE A MINIMUM THICKNESS NOT LESS THAN PIPE WALL THICKNESS.
3. THIS INLET IS TO BE USED ONLY IN LOCATIONS NOT SUBJECT TO TRAFFIC.
4. FRAME IS TO BE SECURELY MORTARED TO TEE SECTION.
5. FRAME AND GRATE SHALL BE GRAY IRON, ASTM A48, CLASS 30S.
6. THE PRECAST TEE UNIT IS TO CONFORM TO THE REQUIREMENTS OF AASHTO M170 FOR 15" CLASS III REINFORCED CONCRETE PIPE.
7. IF A PRECAST PLUG IS NEEDED, THE COST OF THE PRECAST PLUG SHALL BE INCLUDED IN THE PRICE BID FOR DI-9.



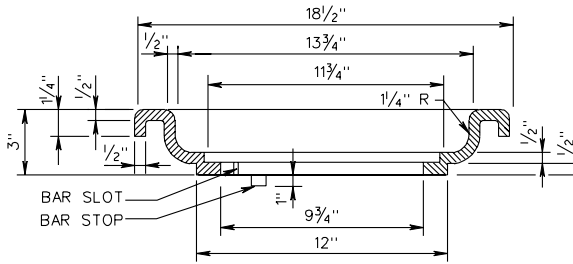
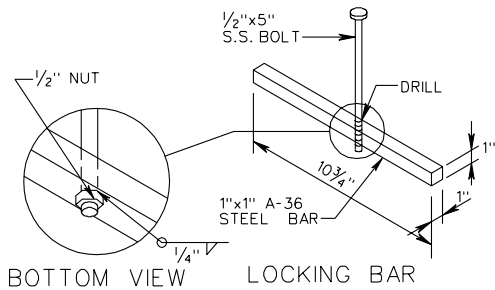
SECTION C-C



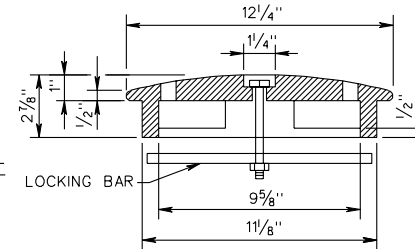
FRAME PLAN



PART PLAN FRAME & GRATE



SECTION A-A FRAME



SECTION A-A GRATE

15" PIPE TEE SECTION DROP INLET

Rev. 7/04
104.25

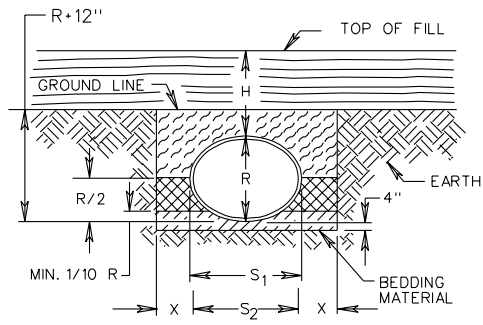
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

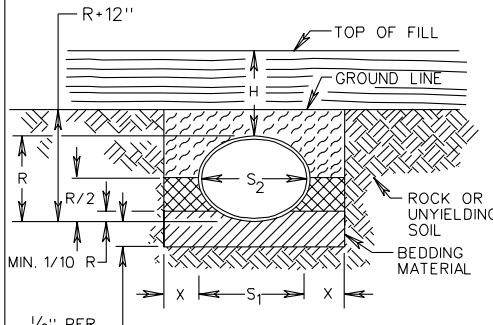
233
302

PB-1

NO PROJECTION OF PIPE ABOVE GROUND LINE

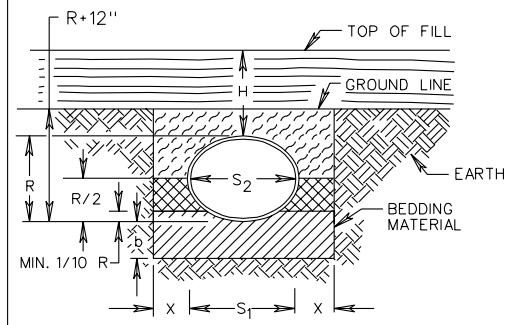


NORMAL EARTH FOUNDATION



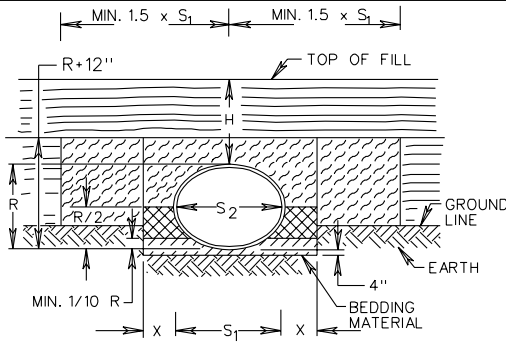
ROCK FOUNDATION

1/2" PER
1" OF H
MIN. 8"
MAX. 24"

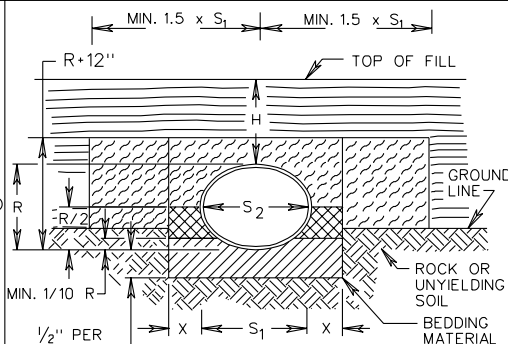


FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL

PIPE PROJECTION ABOVE GROUND LINE

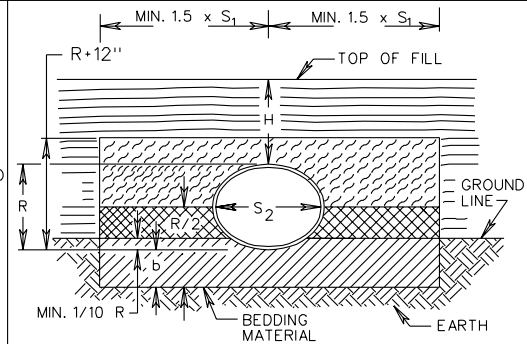


NORMAL EARTH FOUNDATION



ROCK FOUNDATION

1/2" PER
1" OF H
MIN. 8"
MAX. 24"



FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL



BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.



REGULAR BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.



CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.



EMBANKMENT

SHEET 2 OF 4

REV. 7/04

107.02

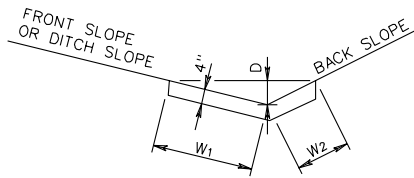
INSTALLATION OF PIPE CULVERTS AND STORM SEWERS
ELLIPTICAL PIPE BEDDING AND BACKFILL - METHOD "A"

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

302
303

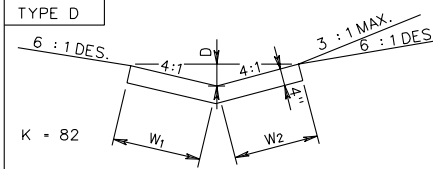
OUTSIDE ROAD DITCHES



TYPE	D	FRONT SLOPE	BACK SLOPE	W1	W2	K	SQ. YDS. SURFACE AREA/LIN. FT.
A1	6"	6:1	4:1	3'-0"	2'-1"	48	0.565
A1	8"	6:1	4:1	4'-1"	2'-9"	104	0.759
A2	6"	6:1	3:1	3'-0"	1'-7"	42	0.509
A2	8"	6:1	3:1	4'-1"	2'-1"	92	0.685
A3	6"	6:1	2:1	3'-0"	1'-2"	38	0.463
A3	8"	6:1	2:1	4'-1"	1'-6"	82	0.620
B1	6"	4:1	4:1	2'-1"	2'-1"	38	0.463
B1	8"	4:1	4:1	2'-9"	2'-9"	82	0.611
B2	8"	4:1	3:1	2'-9"	2'-1"	72	0.537
B2	10"	4:1	3:1	3'-5"	2'-8"	130	0.676
B3	8"	4:1	2:1	2'-9"	1'-6"	60	0.472
B3	10"	4:1	2:1	3'-5"	1'-10"	111	0.583
B4	8"	4:1	1 1/2 : 1	2'-9"	1'-2"	55	0.435
B4	10"	4:1	1 1/2 : 1	3'-5"	1'-6"	101	0.546
C1	8"	3:1	2:1	2'-1"	1'-6"	50	0.398
C1	10"	3:1	2:1	2'-8"	1'-10"	92	0.500
C2	10"	3:1	1 1/2 : 1	2'-8"	1'-6"	80	0.463
C3	10"	3:1	1:1	2'-8"	1'-2"	70	0.426

MEDIAN DITCH

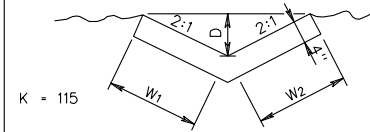
TYPE D



D = DEPTH	W ₁	W ₂	SQ. YDS. SURFACE AREA PER LIN. FT.
8"	2'-9"	2'-9"	0.611

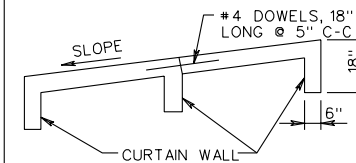
DITCH AT TOE OF FILL OR TOP OF CUT

TYPE E



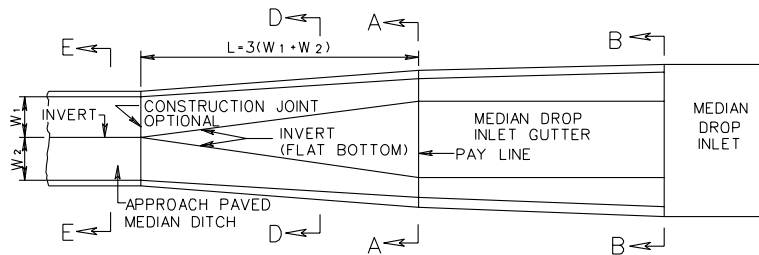
12"	2'-3"	2'-3"	0.500
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CURTAIN WALL DETAIL



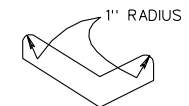
CURTAIN WALL TO BE LOCATED AT BEGINNING AN END OF ALL CHANNELS AND ON THE LOWER END OF EACH EXPANSION JOINT.

PLAN FOR TRANSITION OF PAVED MEDIAN DITCH TO MEDIAN DROP INLET GUTTER



NOTES:
 FOR SECTION A-A AND B-B SEE STANDARDS DI-7, 7A AND 7B.
 TRADITIONAL PORTION OF PAVED DITCH TO BE PAID FOR AT THE SAME PRICE BID PER SQ. YARD FOR APPROACH PAVED MEDIAN DITCH.
 STANDARD PG-2A DITCHES TO BE CLASS A3 CONCRETE.

ALTERNATE METHOD OF FORMING DITCHES



NOTE:
 ALL DITCHES MAY BE CONSTRUCTED WITH VERTICAL SIDES AT THE OPTION OF THE CONTRACTOR.

SPECIFICATION REFERENCE

502

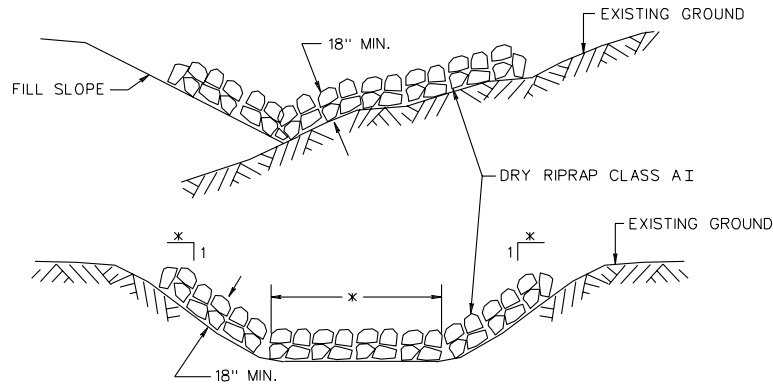
STANDARD PAVED DITCHES

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/04

109.01

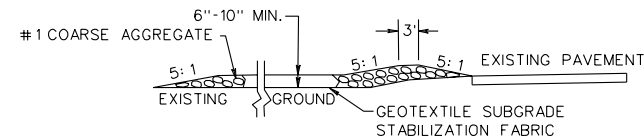
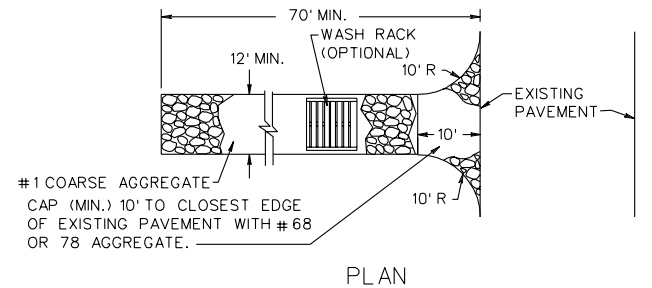
SUGGESTED METHOD OF TEMPORARILY PLACING RIPRAP FOR EROSION CONTROL IN CHANNELS, DITCHES, & AT TOE OF FILL SLOPES



NOTES:

1. THE DEPTH OF PROTECTION WILL DEPEND ON WHATEVER DEPTH IS ATTAINABLE, WITH THE RIPRAP BEING EVENLY SPREAD WITH THE QUANTITY SHOWN ON THESE PLANS. RIPRAP MAY BE ADDED OR DELETED AS FOUND NECESSARY BY THE ENGINEER.
- * SIDE SLOPES AND BOTTOM WIDTH (IF TRAPEZOIDAL) SHOWN IN TYPICAL SECTION OF PROPOSED DITCH OR CHANNEL.

MINIMUM REQUIREMENTS FOR STABILIZED CONSTRUCTION ENTRANCE



1. SURFACE WATER SHALL BE PIPED UNDER THE CONSTRUCTION ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY SHALL BE REMOVED IMMEDIATELY.
3. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER HEAVY USE AND EACH RAIN.

SPECIFICATION REFERENCE

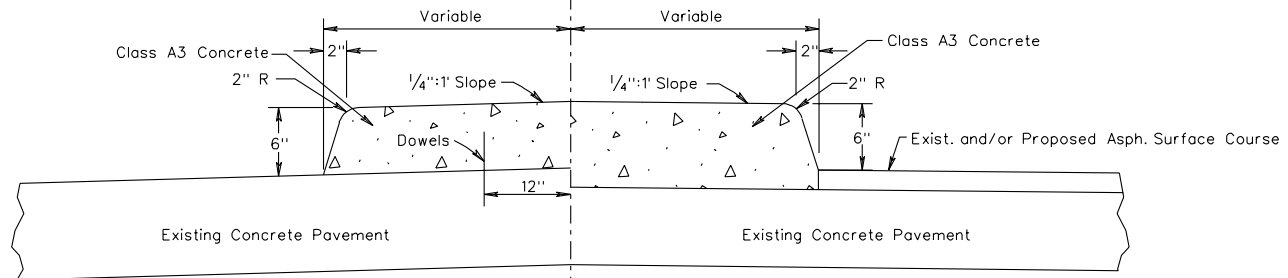
107
303

TEMPORARY EROSION & SILTATION CONTROL

MS-1

HALF SECTION ON EXISTING CONCRETE PAVEMENT

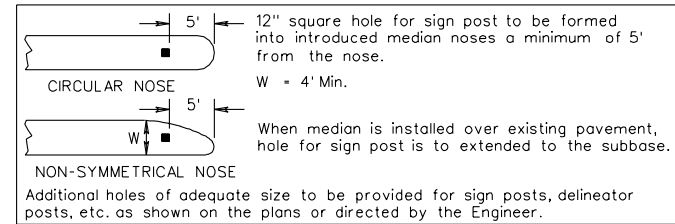
HALF SECTION ON EXISTING CONCRETE PAVEMENT WITH PROPOSED OR EXISTING ASPHALT PAVEMENT



Dowel spacing
Longitudinally at 2'-0"
c-c from nose to first
joint.

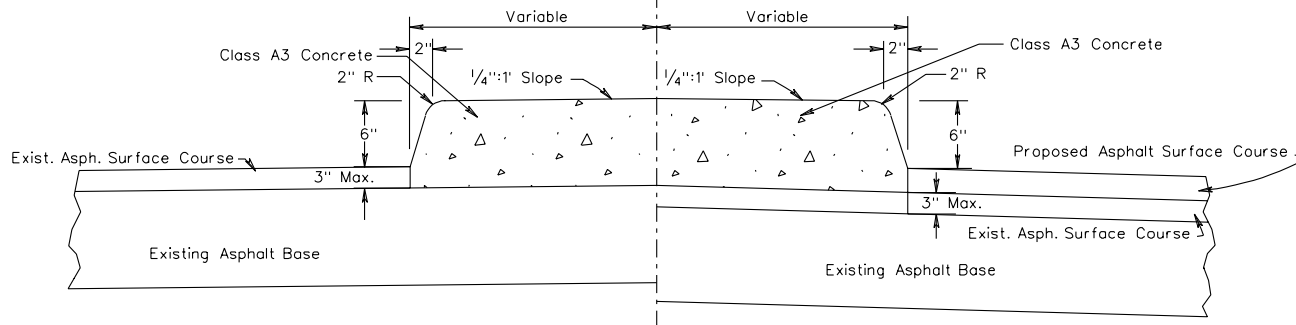
Where design speed is greater than
40 MPH on Rural Highways and 45 MPH
in developed Urban and Suburban areas,
median curb is to be in accordance
with Standard CG-3.

Note: Existing Asphalt Surface Course and Binder Course, if any, to be removed under median strip.



Note: Existing Asphalt Surface Course and Binder Course, if any, to be removed under median strip.

Note: Existing Asphalt Surface Course and Binder Course, if any, to be removed under median strip.



HALF SECTION ON EXISTING FLEXIBLE PAVE.

HALF SECTION ON EXISTING FLEXIBLE PAVE. TO BE RESURFACED

STANDARD SOLID CONCRETE RAISED MEDIAN STRIP

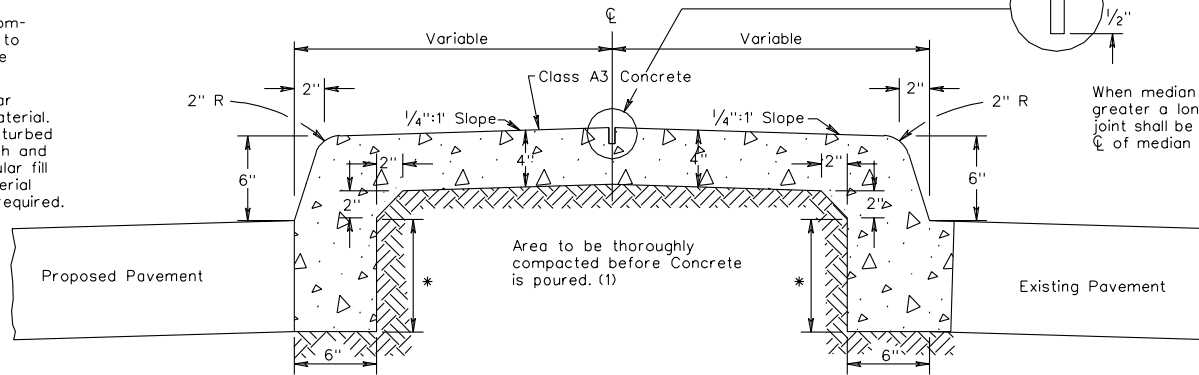
VIRGINIA DEPARTMENT OF TRANSPORTATION

Rev. 7/04
202.02

SPECIFICATION
REFERENCE

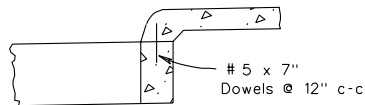
502

(1) Thoroughly compacted area to consist of the following:
 In Fills-Regular fill material.
 In Cuts-Undisturbed earth and regular fill material as required.

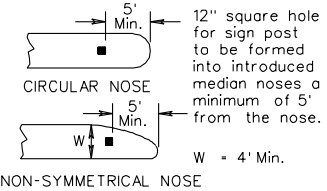
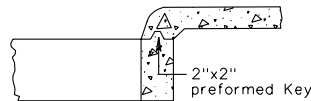


When median width is 3 feet or greater a longitudinal contraction joint shall be provided along \bar{C} of median strip.

SUGGESTED CONSTRUCTION METHOD IF TOP SLAB IS POURED SEPARATELY

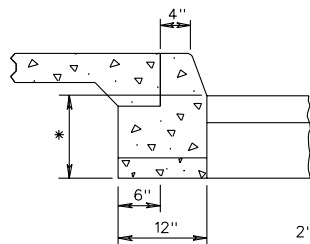


ALTERNATE CONSTRUCTION METHOD IF TOP SLAB IS POURED SEPARATELY

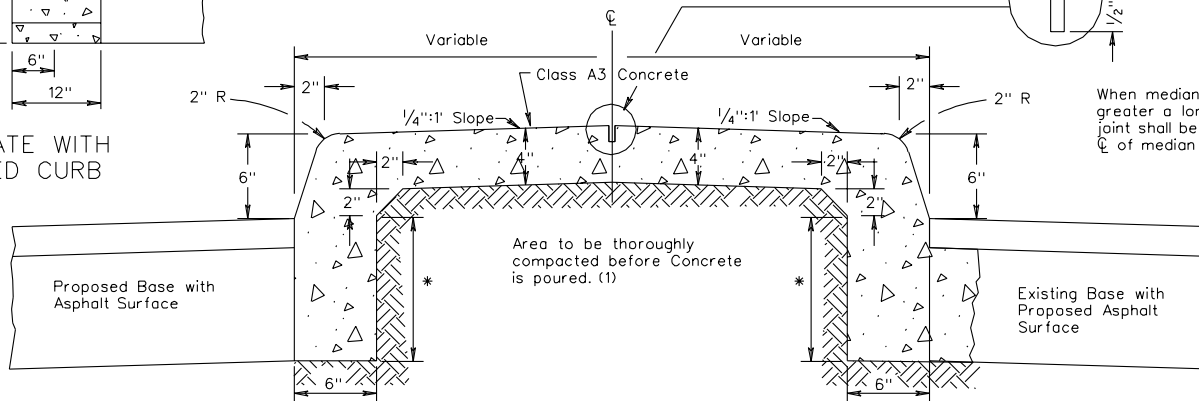


* The depth of curb may be reduced as much as 3" (9" depth) or increased as much as 3" (15" depth) in order that the bottom of curb will coincide with the top of a course of the pavement substructure. Otherwise the depth is to be 12" as shown. No adjustment in the price bid is to be made for a decrease or an increase in depth.

Additional holes of adequate size to be provided for sign posts, delineator posts, etc. as shown on the plans or directed by the Engineer.



ALTERNATE WITH EXTRUDED CURB



When median width is 3 feet or greater a longitudinal contraction joint shall be provided along \bar{C} of median strip.

SPECIFICATION REFERENCE

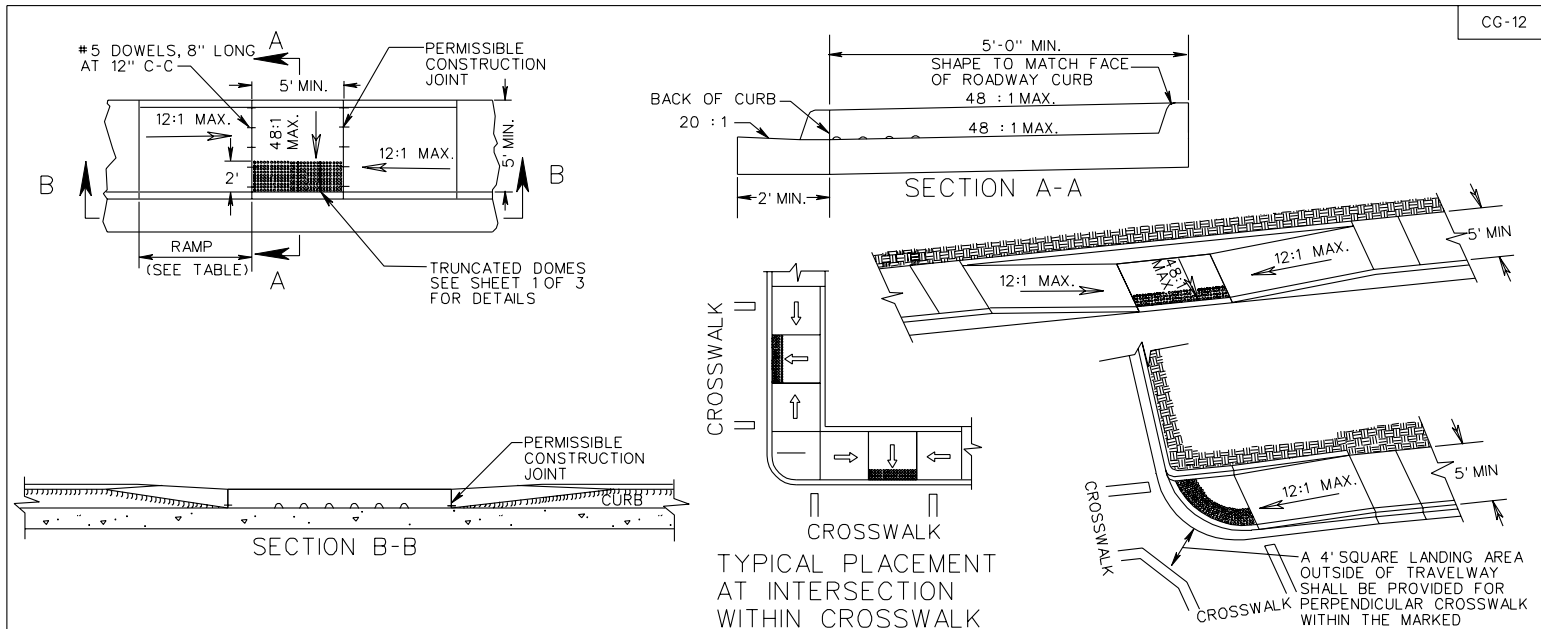
502

STANDARD SOLID CONCRETE RAISED MEDIAN STRIP

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/04

202.03



TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK

NOTES:

1. DETECTABLE WARNING TO BE CLASS A-3 CONCRETE (CLASS A-4 IF PRECAST) WITH SLIP RESISTANT INTEGRAL SURFACE COVERING THE FULL WIDTH OF THE RAMP FLOOR BY 2 FOOT IN LENGTH IN THE DIRECTION OF PEDESTRIAN TRAVEL OTHER TYPES OF MATERIAL WITH THE TRUNCATED DOME DETECTABLE WARNING MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
2. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES. TRUNCATED DOMES TO BE STAMPED IF CAST-IN-PLACE OR PRECAST IN TOP SURFACE. THE COLOR OF THE DETECTABLE WARNING SECTION SHALL BE A CONTRASTING COLOR WITH THE ADJACENT SURFACES (ADJACENT SURFACES INCLUDES FLARED SIDES). OR FEDERAL SAFETY YELLOW.
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. IF RAMP FLOOR IS PRECAST, HOLES MUST BE PROVIDED FOR DOWEL BARS SO THAT ADJOINING FLARED SIDES CAN BE CAST IN PLACE AFTER PLACEMENT OF PRECAST RAMP FLOOR. PRECAST CONCRETE SHALL BE CLASS A-4.
5. REQUIRED BARS ARE TO BE NO. 5 X 8" PLACED 1" CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 1/2".
6. CURB/CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB/CURB AND GUTTER.
7. CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THEY ARE TO BE PROVIDED AT INTERSECTIONS WHEREVER AN ACCESSIBLE ROUTE WITHIN THE RIGHT OF WAY OF A HIGHWAY FACILITY CROSSES A CURB REGARDLESS OF WHETHER SIDEWALK IS EXISTING, PROPOSED, OR NONEXISTENT. THEY MUST BE LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER, AND SHOULD NOT BE LOCATED BEHIND VEHICLE STOP LINES. EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. ACCESSIBLE ROUTES PROVIDE A CONTINUOUS UNOBSTRUCTED, STABLE FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PEDESTRIANS.
8. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
9. TYPICAL CONCRETE SIDEWALK IS 4" THICK. WHEN THE ENTRANCE RADIICANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC THE CONCRETE SIDEWALK DEPTH SHOULD BE INCREASED TO 7".

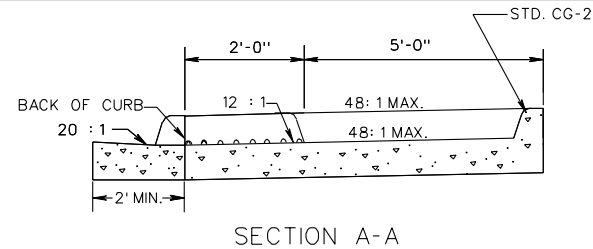
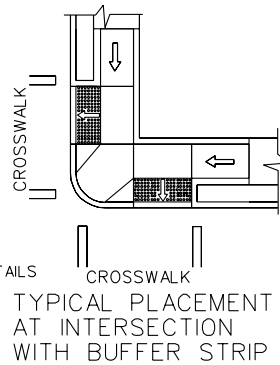
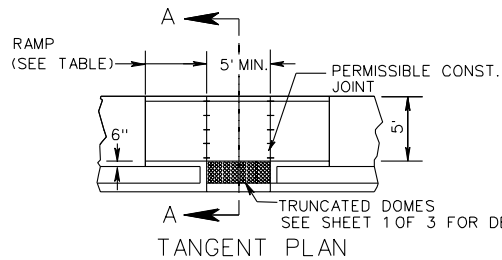
ROADWAY GRADE IN PERCENT	MINIMUM RAMP LENGTH IN FEET, 4" CURB HEIGHT	MINIMUM RAMP LENGTH IN FEET, 6" CURB HEIGHT
0	4	6
1	5	7
2	5	8
3	6	9
4	8	12
5	10	15
6	14	15

NOTES: THE REQUIRED LENGTH OF A PARALLEL RAMP IS LIMITED TO 15 FEET, REGARDLESS OF THE SLOPE.

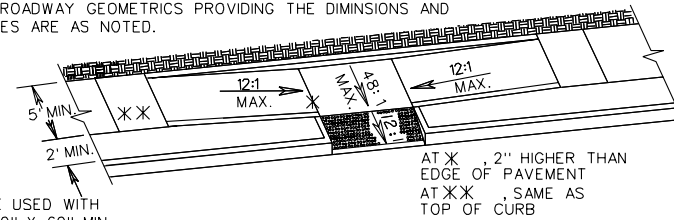
SPECIFICATION REFERENCE
105 502

CG-12 DETECTABLE WARNING SURFACE
TYPE B (PARALLEL) APPLICATION
VIRGINIA DEPARTMENT OF TRANSPORTATION

CG-12



THE SELECTION OF CURB TYPE AND THE CONFIGURATION OF THE UTILITY STRIP MAY VARY TO MEET EXISTING FIELD CONDITIONS AND ROADWAY GEOMETRICS PROVIDING THE DIMENSIONS AND SLOPES ARE AS NOTED.



THIS COMBINED (PARALLEL & PERPENDICULAR) DESIGN FOR ALTERATIONS CAN BE USED WITH ADJOINING BUFFER STRIP. LANDING AT BOTTOM OF TWO SLOPING SIDES WITH 60" X 60" MIN. DIMENSIONS. THE SHORT PERPENDICULAR RUN TO THE STREET CAN BE PROTECTED BY A LANDSCAPED SETBACK OR CONNECTED TO THE SIDEWALK WITH A WARPED SURFACE.

NOTES:

1. DETECTABLE WARNING TO BE CLASS A-3 CONCRETE (CLASS A-4 IF PRECAST) WITH SLIP RESISTANT INTEGRAL SURFACE COVERING THE FULL WIDTH OF THE RAMP FLOOR BY 2 FOOT IN LENGTH IN THE DIRECTION OF PEDESTRIAN TRAVEL OTHER TYPES OF MATERIAL WITH THE TRUNCATED DOME DETECTABLE WARNING MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
2. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES. TRUNCATED DOMES TO BE STAMPED IF CAST-IN-PLACE OR PRECAST IN TOP SURFACE. THE COLOR OF THE DETECTABLE WARNING SECTION SHALL BE A CONTRASTING COLOR WITH THE ADJACENT SURFACES (ADJACENT SURFACES INCLUDES FLARED SIDES). OR FEDERAL SAFETY YELLOW.
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. IF RAMP FLOOR IS PRECAST, HOLES MUST BE PROVIDED FOR DOWEL BARS SO THAT ADJOINING FLARED SIDES CAN BE CAST IN PLACE AFTER PLACEMENT OF PRECAST RAMP FLOOR. PRECAST CONCRETE SHALL BE CLASS A-4.
5. REQUIRED BARS ARE TO BE NO. 5 X 8" PLACED 1' CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 1/2".
6. CURB/CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB/CURB AND GUTTER.
7. CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THEY ARE TO BE PROVIDED AT INTERSECTIONS WHEREVER AN ACCESSIBLE ROUTE WITHIN THE RIGHT OF WAY OF A HIGHWAY FACILITY CROSSES A CURB REGARDLESS OF WHETHER SIDEWALK IS EXISTING, PROPOSED, OR NONEXISTENT. THEY MUST BE LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER, AND SHOULD NOT BE LOCATED BEHIND VEHICLE STOP LINES. EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. ACCESSIBLE ROUTES PROVIDE A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PEDESTRIANS.
8. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
9. TYPICAL CONCRETE SIDEWALK IS 4" THICK. WHEN THE ENTRANCE RADIUS CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC THE CONCRETE SIDEWALK DEPTH SHOULD BE INCREASED TO 7".

ROADWAY GRADE IN PERCENT	MINIMUM RAMP LENGTH IN FEET, 4" CURB HEIGHT	MINIMUM RAMP LENGTH IN FEET, 6" CURB HEIGHT
0	2	4
1	2	5
2	3	5
3	3	6
4	4	8
5	5	10
6	7	14
7	13	15
8	15	15

NOTES: THE REQUIRED LENGTH OF A PARALLEL RAMP IS LIMITED TO 15 FEET, REGARDLESS OF THE SLOPE.

SHEET 3 OF 3

CG-12 DETECTABLE WARNING SURFACE
TYPE C (PARALLEL & PERPENDICULAR) APPLICATION

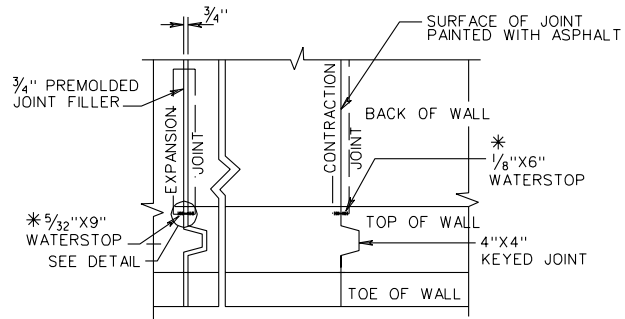
REV. 7/04
203.07

VIRGINIA DEPARTMENT OF TRANSPORTATION

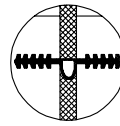
SPECIFICATION
REFERENCE

105
502

RW-3



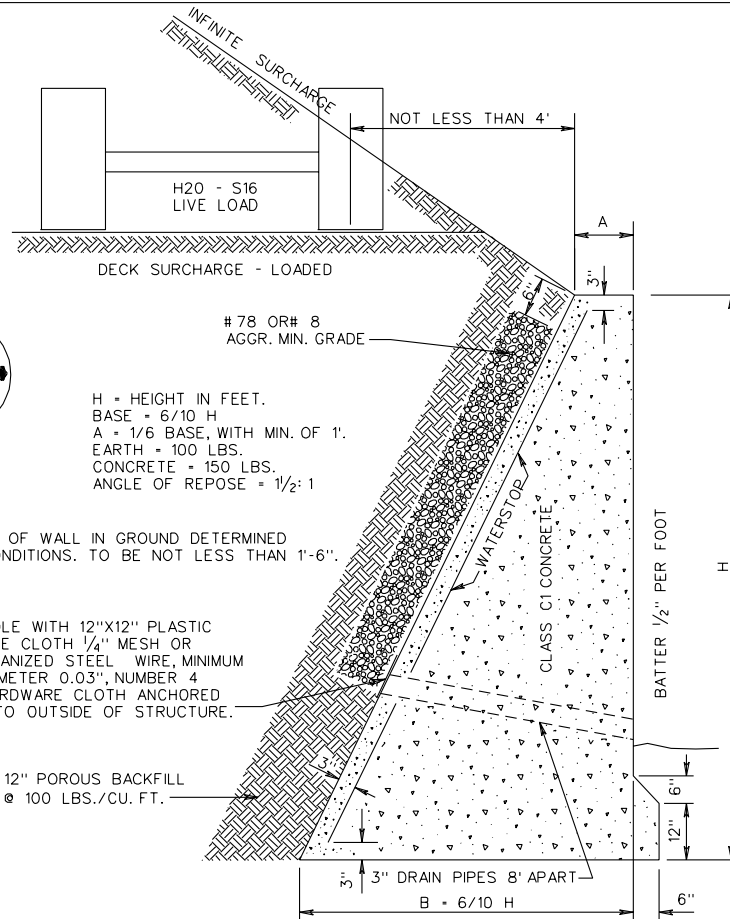
CONTRACTION JOINTS AT INTERVALS NOT EXCEEDING 30'.
 EXPANSION JOINTS AT INTERVALS NOT EXCEEDING 90'.
 * WATER STOPS TO BE ELASTOMERIC OR OTHER APPROVED MATERIAL. DIMENSIONS SHOWN ARE ABSOLUTE MINIMUM.



WATERSTOP
DETAIL

NOTE:
 DEPTH OF WALL IN GROUND DETERMINED
 BY CONDITIONS. TO BE NOT LESS THAN 1'-6".

HEIGHT OF WALL "H" IN FEET	THICKNESS AT TOP "A" IN FEET	THICKNESS AT BASE B=6H	COMPRESSION AT TOE LBS. SQ. FT.	AREA OF SECTION SQ. FT.
3	1'-0"	1'-9 5/8"	856	4.83
4	1'-0"	2'-4 3/4"	1141	7.43
5	1'-0"	3'-0"	1427	10.63
6	1'-0"	3'-7 1/4"	1712	14.43
7	1'-0"	4'-2 3/8"	1997	18.83
8	1'-0"	4'-9 5/8"	2283	23.83
9	1'-0"	5'-4 3/4"	2568	29.43
10	1'-0"	6'-0"	2853	35.63
11	1'-1 1/4 "	6'-7 1/4"	3139	42.98
12	1'-2 3/8 "	7'-2 3/8"	3424	51.03
13	1'-3 5/8 "	7'-9 5/8"	3709	59.78
14	1'-4 3/4 "	8'-4 3/4"	3995	69.23
15	1'-6"	9'-0"	4280	79.38



WEEP HOLE WITH 12"X12" PLASTIC
 HARDWARE CLOTH 1/4" MESH OR
 OR GALVANIZED STEEL WIRE, MINIMUM
 WIRE DIAMETER 0.03", NUMBER 4
 MESH HARDWARE CLOTH ANCHORED
 FIRMLY TO OUTSIDE OF STRUCTURE.

12" POROUS BACKFILL
 @ 100 LBS./CU. FT.

3" DRAIN PIPES 8' APART
 B = 6/10 H

SAFE BEARING CAPACITY OF SOIL	
ROCK MINIMUM	10,000 - 20,000 LBS. SQ. FT.
GRAVEL AND COARSE SAND, WELL CEMENTED.....	16,000 - 20,000 LBS. SQ. FT.
CLAY IN THICK BEDS, ALWAYS DRY.....	12,000 - 16,000 LBS. SQ. FT.
CLAY IN THICK BEDS, MODERATELY DRY.....	8,000 - 12,000 LBS. SQ. FT.
CLAY, SOFT.....	2,000 - 4,000 LBS. SQ. FT.
SAND, DRY, COMPACT, AND WELL CEMENTED	8,000 - 12,000 LBS. SQ. FT.
SAND, CLEAN, DRY.....	4,000 - 8,000 LBS. SQ. FT.
ALLUVIAL SOILS, ETC	1,000 - 2,000 LBS. SQ. FT.

NOTE: IF COMPRESSION AT TOE EXCEEDS SAFE BEARING CAPACITY
 OF SOIL, A SPECIAL FOOTING IS TO BE USED.

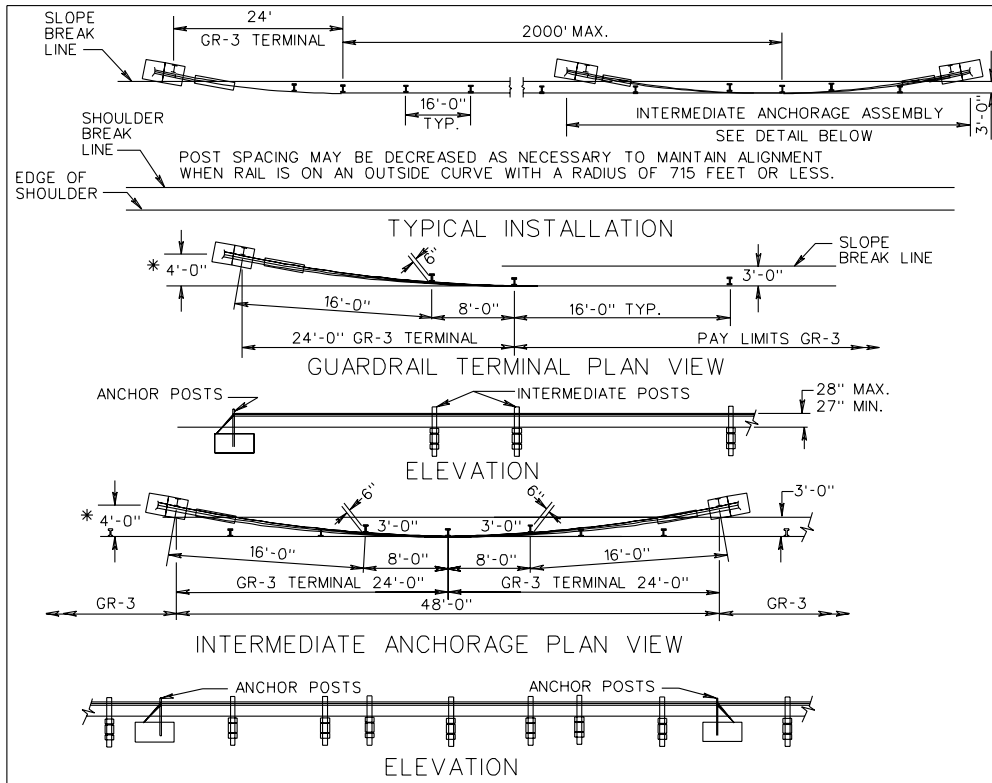
CONCRETE GRAVITY RETAINING WALLS
 INFINITE SURCHARGE AND DECK SURCHARGE - LOADED

REV. 7/04
 401.02

VIRGINIA DEPARTMENT OF TRANSPORTATION

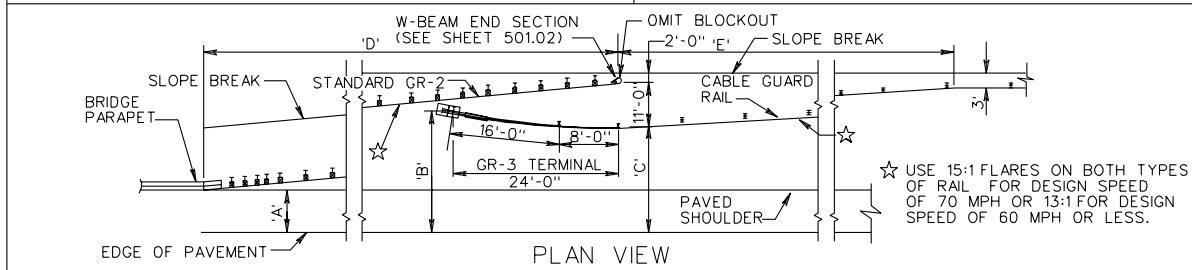
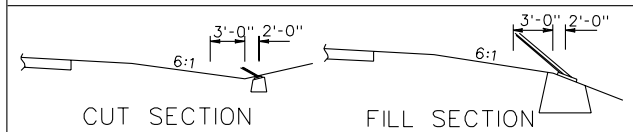
SPECIFICATION
 REFERENCE

506

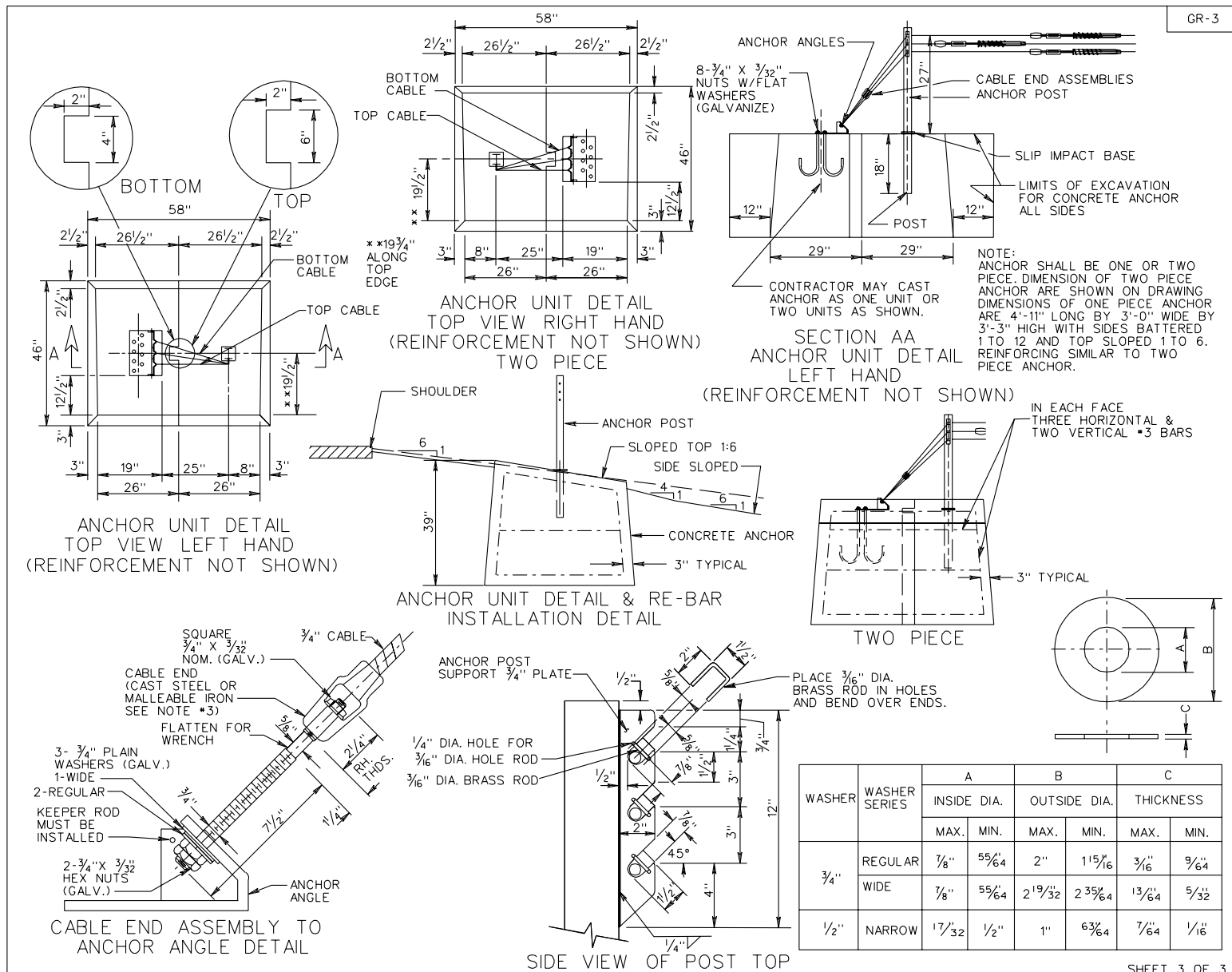


NOTES:

- FOR ARRANGEMENTS OF SPRING CABLE END ASSEMBLIES (COMPENSATING DEVICES) AND TURNBUCKLE CABLE END ASSEMBLIES, THE FOLLOWING CRITERIA SHALL APPLY:
- LENGTH OF CABLE RUNS:
 - TO 1000'-USE COMPENSATING DEVICE ON ONE END AND USE TURNBUCKLE ON THE OTHER END OF EACH INDIVIDUAL CABLE.
 - OVER 1000' TO 2000'-USE COMPENSATING DEVICE ON EACH END OF EACH INDIVIDUAL CABLE.
 - OVER 2000'-START NEW STRETCH BY INTERLACING AT LAST PARALLEL POST. SEE TYP.
- FITTINGS: ALL FITTINGS SHALL BE SO DESIGNED AND BE OF SUCH SECTION AS TO DEVELOP THE FULL STRENGTH OF A SINGLE CABLE OR CABLE ASSEMBLIES, AS THE CASE MAY BE.
 - SINGLE CABLE ANCHOR ASSEMBLY- MIN. TENSILE STRENGTH.....25,000 LBS.
 - THREE CABLE ANCHOR ASSEMBLY- MIN. TENSILE STRENGTH.....100,000 LBS.
 - ALL FITTINGS SHALL BE HOT DIPPED GALVANIZED.
- THE DYNAMIC DEFLECTION FOR STANDARD GR-3 IS 11 FEET.
- FOR ROCK INSTALLATION, 8"x24"x1/4" PLATE SHALL BE ELIMINATED. DRILL OR EXCAVATE HOLE FOR POST AND BACKFILL WITH CRUSHER RUN AGGREGATE TO LEVEL OF ROCK.
- 5/16" ANSIB18.2.2 HEX. BACKING NUT OR APPROVED SHOULDER MUST EQUAL BEARING AREA OF 9/16" STANDARD NUT.
- THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN AASHTO-AGC-ARTBA "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

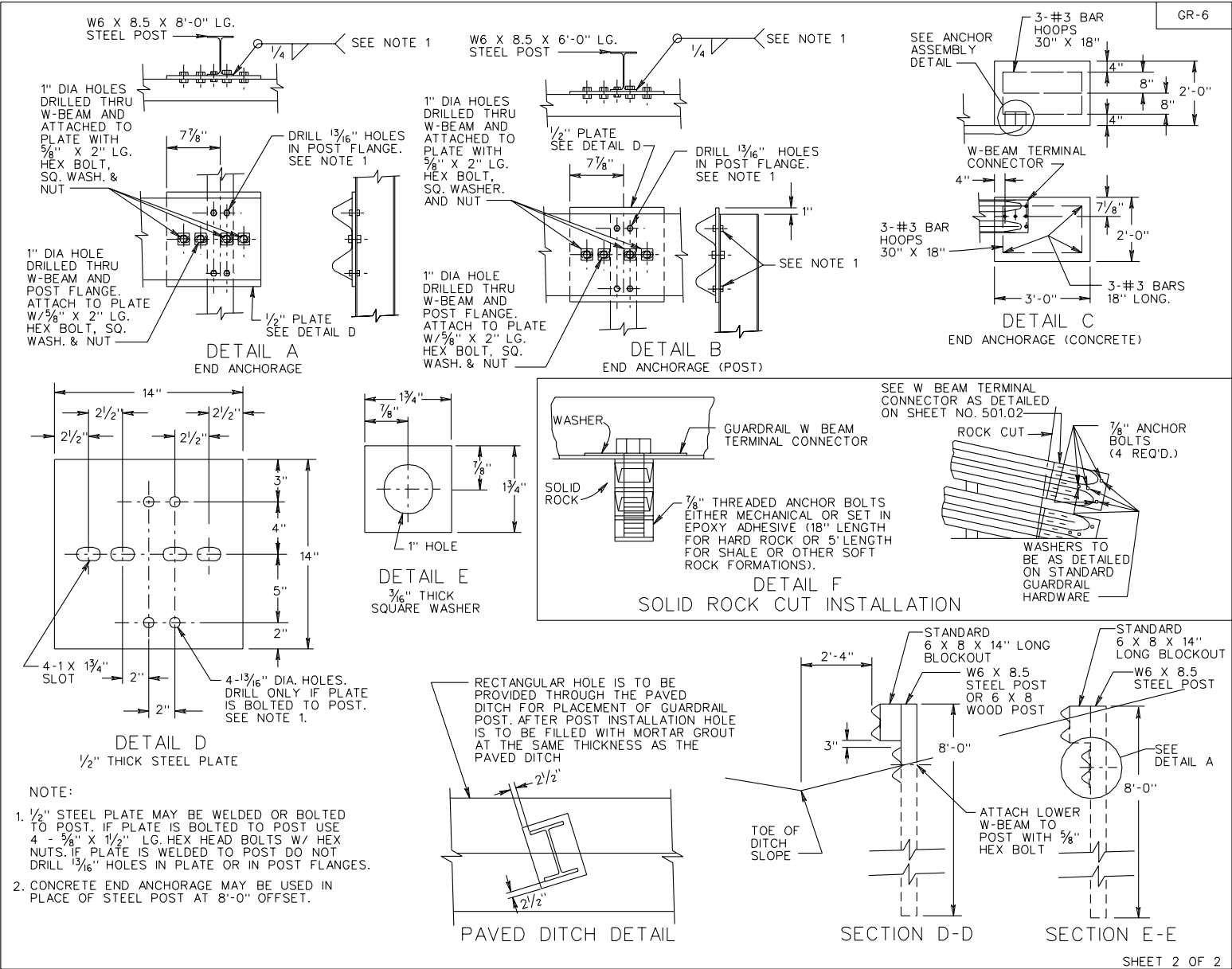


RECOVERABLE AREA WIDTH	LT. OR RT. OF C	70 MPH D.S.				
		A	B	C	D	E
24'	12'	27'	26'	375'	150'	
24'	6'	27'	26'	465'	150'	
21'	12'	24'	23'	330'	150'	
21'	6'	24'	23'	420'	150'	



SPECIFICATION REFERENCE	221 505
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CABLE GUARDRAIL
VIRGINIA DEPARTMENT OF TRANSPORTATION



SPECIFICATION REFERENCE
505 221

TERMINAL TREATMENT FOR W BEAM GUARDRAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

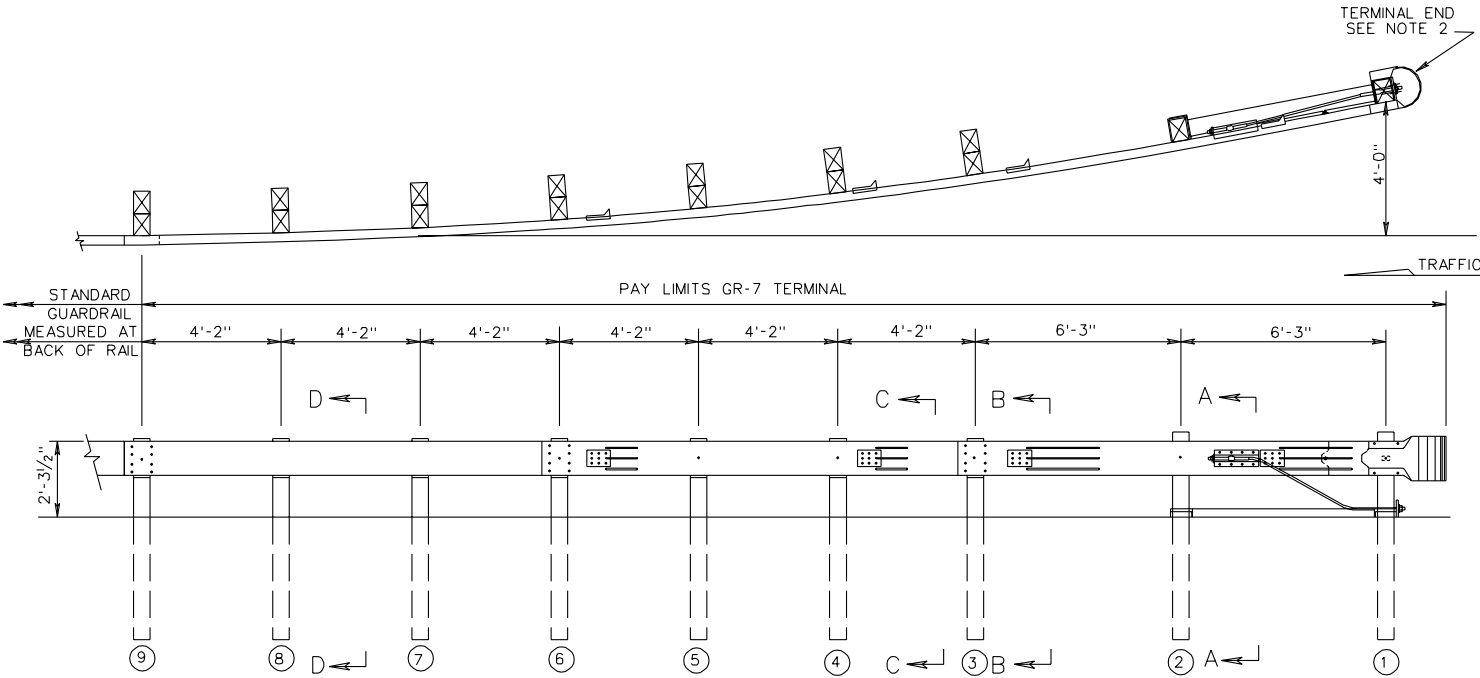
REV. 7/04

501.10

GR-7

NOTES:

1. GUARDRAIL TERMINAL, STD. GR-7 IS TO BE SRT 350 (SIMILAR TO AS SHOWN) MANUFACTURED BY TRINITY INDUSTRIES, THE FLEAT 350 MANUFACTURED BY ROAD SYSTEMS, INC., OR OTHER VDOT APPROVED EQUAL MEETING NCHRP 350 TESTING CRITERIA.
2. ALL TERMINALS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE FOLLOWING VDOT REQUIREMENTS:
 - A. ALL STANDARD GR-7 TERMINALS SHALL BE INSTALLED WITH A 4 FT. OFFSET.
 - B. YELLOW 8" X 36" REFLECTIVE SHEETING, IN ACCORDANCE WITH VDOT SPECIFICATIONS, SHOULD BE APPLIED IN TERMINALS EMPLOYING W-BEAM END SECTIONS. FOR TERMINALS EMPLOYING IMPACT (EXTRUDER) HEADS, AMBER (YELLOW) REFLECTIVE SHEETING WITH BLACK DIAGONAL STRIPES SHOULD BE APPLIED TO THE FULL AREA INSIDE THE IMPACT HEAD WITH THE DIRECTION OF THE BLACK DIAGONAL STRIPES CONFORMING TO CURRENT MUTCD APPLICATION FOR TYPE 3 OBJECT MARKERS (OM-3).
 - C. DO NOT CHANGE THE LAPPING OF TERMINAL FOR ANY INSTALLATIONS; INSTALL AS TESTED.
3. IF YOU CANNOT GET THE NECESSARY CLEAR RUNOUT AREA FOR THE GR-7 TERMINAL, CONSIDER ALTERNATIVE TERMINAL OPTIONS.
4. FOR DETAILS OF GUARDRAIL TERMINAL INSTALLATION SITE PREPARATION REQUIREMENTS, SEE STANDARD GR-SP.
5. THIS DRAWING IS REPRESENTATIONAL ONLY. DETAILS, DIMENSIONS, QUANTITIES, AND OTHER INFORMATION NOT SHOWN WILL VARY FOR EACH MANUFACTURER. SEE INDIVIDUAL MANUFACTURER'S PLANS FOR THIS INFORMATION.



SHEET 1 OF 2

REV. 7/04
501.11

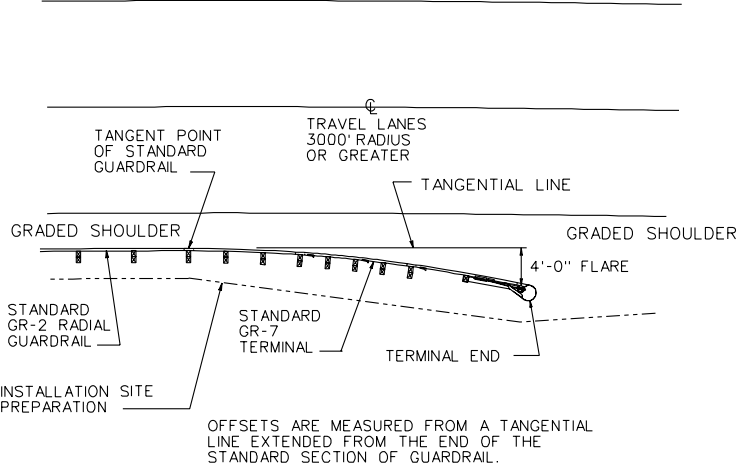
BREAKAWAY CABLE TERMINAL
4' FLARE
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
221 505

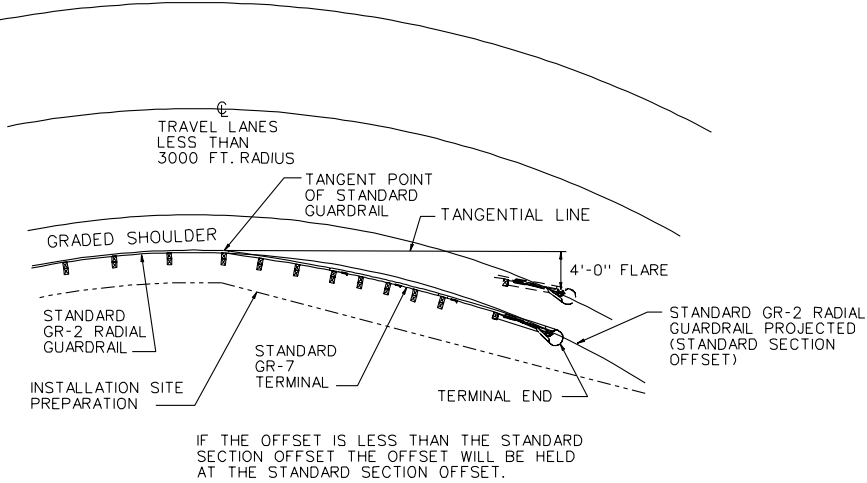
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SPECIFICATION REFERENCE	
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GR-7



FLARED TERMINAL PLACEMENT
3000 FT. RADIUS OR GREATER



FLARED TERMINAL PLACEMENT ON
INSIDE OF CURVE - LESS THAN
3000 FT. RADIUS

SHEET 2 OF 2

BREAKAWAY CABLE TERMINAL 4' FLARE

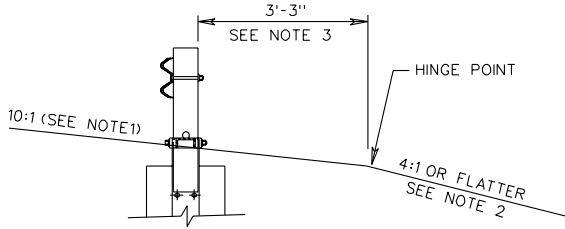
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/04

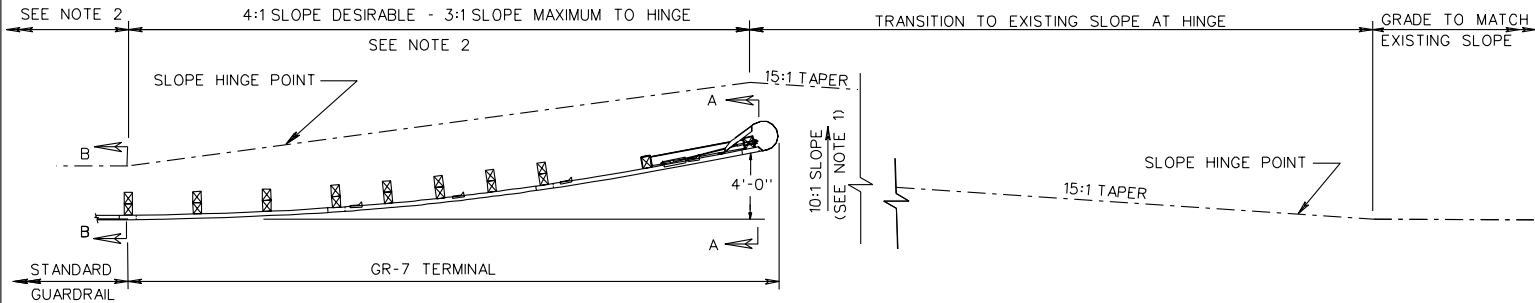
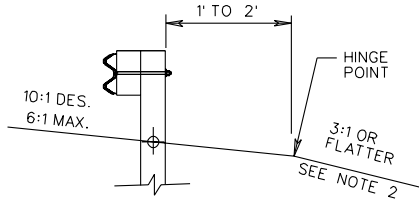
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SPECIFICATION
REFERENCE

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505



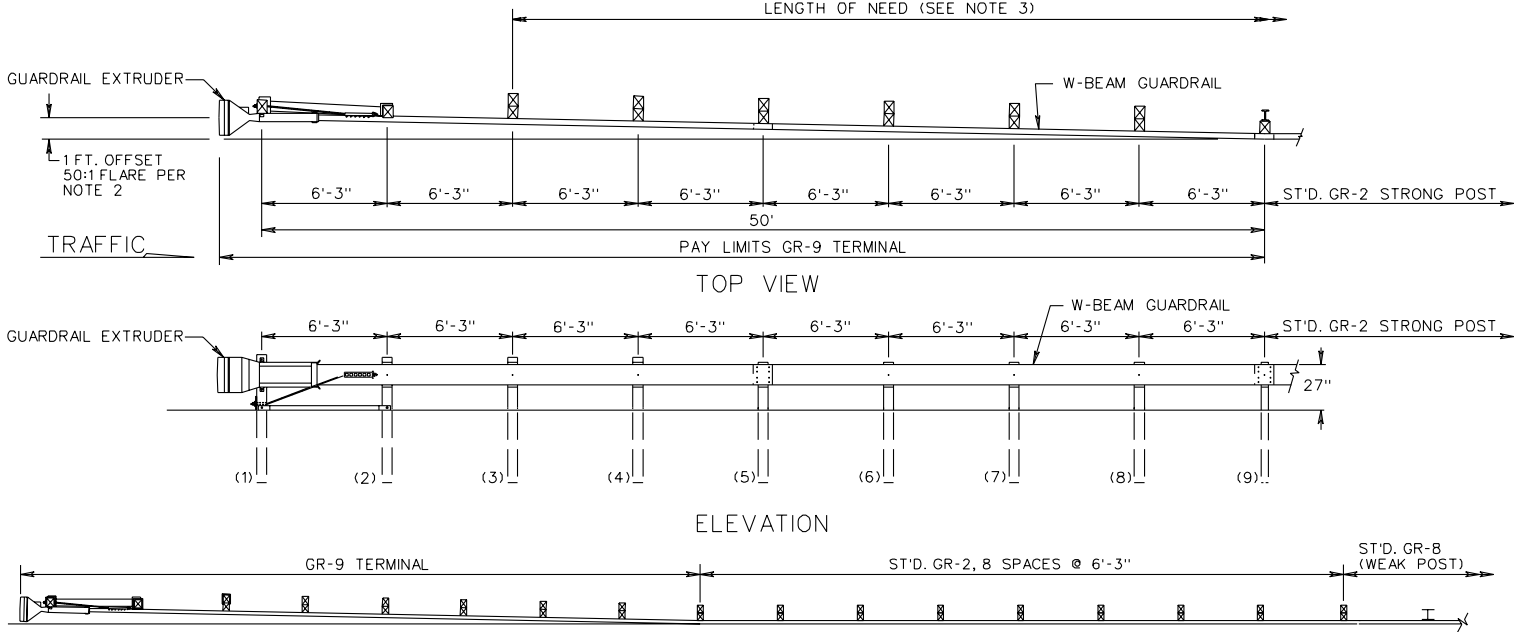
- NOTES:
1. THE CROSS SLOPE OF THE GRADE APPROACHING THE GUARDRAIL TERMINAL, AND ADJACENT TO FOR ITS FULL LENGTH, MUST BE 10:1. IF THE EXISTING GRADE IS FLAT OR IS A POSITIVE SLOPE DUE TO THE SUPERELEVATION OF THE ROADWAY PAVEMENT, THE MIN. OFFSET FROM BEHIND THE POST TO THE HINGE POINT, AS SHOWN, IS REQUIRED.
 2. THE AREA IMMEDIATELY BEHIND AND BEYOND THE TERMINAL SHOULD BE TRAVERSABLE AND FREE FROM FIXED OBJECTS. IF A CLEAR RUN OUT IS NOT ATTAINABLE THIS AREA SHOULD AT LEAST BE SIMILAR IN CHARACTER TO THE UPSTREAM UNSHIELDED ROADSIDE AREAS.
 3. FOR NEW CONSTRUCTION, RECONSTRUCTION, AND 3R WORK THE 10:1 SLOPE GRADING MUST EXTEND A MINIMUM OF 3'-3" BEHIND THE END POST.



SPECIFICATION REFERENCE

GUARDRAIL TERMINAL INSTALLATION SITE PREPARATION REQUIREMENTS FOR GR-7

GR-9



TRANSITION FROM GR-9 TERMINAL TO WEAK POST (STANDARD GR-8) GUARDRAIL

NOTES:

1. ALTERNATE BREAKAWAY CABLE TERMINAL (GR-9) IS TO BE ET-2000 (SIMILAR TO AS SHOWN) OR CAT (ST'D. MB-3 TERMINAL OPTION) AS MANUFACTURED BY SYRO STEEL COMPANY, BRAKEMASTER (ST'D. MB-3 TERMINAL OPTION) AS MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC., THE SKT-350 AS MANUFACTURED BY ROAD SYSTEMS, INC., OR OTHER VDOT APPROVED EQUAL MEETING NCHRP 350 TESTING CRITERIA.
2. ALL TERMINALS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURE'S INSTALLATION INSTRUCTIONS AND THE FOLLOWING VDOT REQUIREMENTS:
 - A. ALL STANDARD GR-9 TERMINALS (SIMILAR TO AS SHOWN ABOVE) SHALL BE INSTALLED WITH A 1 FT. OFFSET ACCOMPLISHED WITH A 50:1 FLARE TO PREVENT THE GUARDRAIL EXTRUDER FROM ENCRANCHING ON THE SHOULDER FOR 3R WORK WHERE RIGHT OF WAY IS LIMITED, THE OFFSET CAN BE DECREASED AS DIRECTED BY THE ENGINEER.
 - B. DIRECTION OF THE REFLECTIVE TAPE ON THE EXTRUDER SHALL CONFORM TO MUTCD APPLICATION FOR DIAGONAL STRIPES ON OBJECT MARKERS AND BRIDGE END PANELS. COLOR OF TAPE SHALL BE AMBER (YELLOW).
 - C. DO NOT CHANGE THE LAPPING OF TERMINAL FOR ANY INSTALLATIONS; INSTALL AS TESTED.
3. IF THE CALCULATED LENGTH OF NEED CANNOT BE MET FOR THE SITES OF RETROFIT, MAINTENANCE, OR UPGRADE OF TERMINALS, PROVIDE AS MUCH DISTANCE AS POSSIBLE TO THE HAZARD.
4. THIS DRAWING IS REPRESENTATIONAL ONLY. DETAILS, DIMENSIONS, QUANTITIES, AND OTHER INFORMATION NOT SHOWN WILL VARY FOR EACH MANUFACTURER. SEE INDIVIDUAL MANUFACTURER'S PLANS FOR THIS INFORMATION.

SPECIFICATION REFERENCE
505

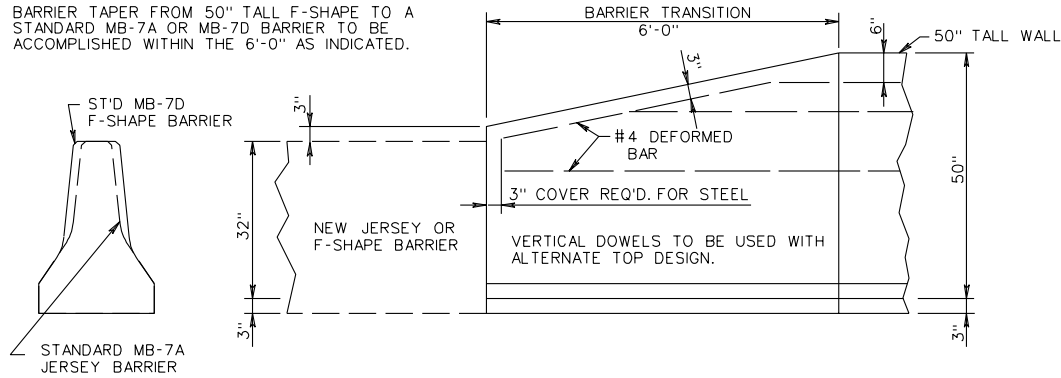
ALTERNATE BREAKAWAY CABLE TERMINAL
NO FLARE

VIRGINIA DEPARTMENT OF TRANSPORTATION

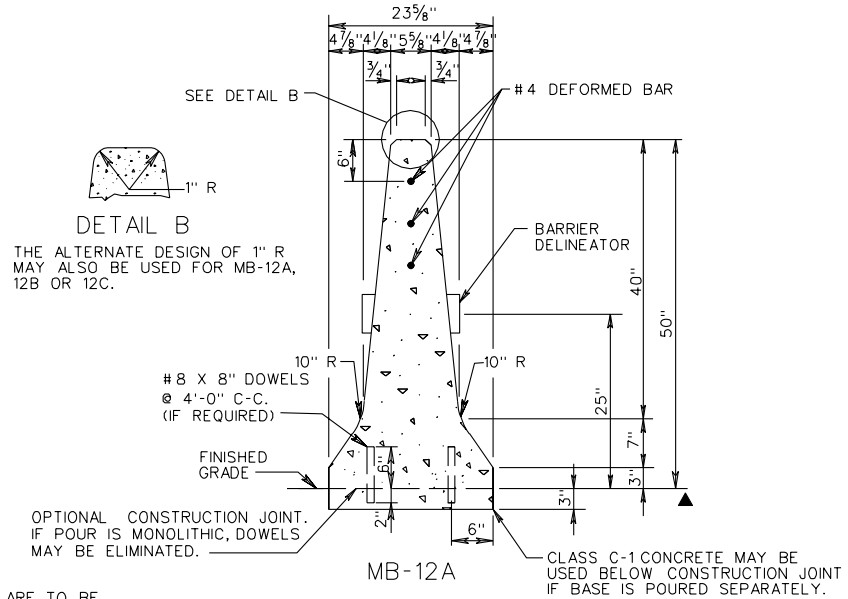
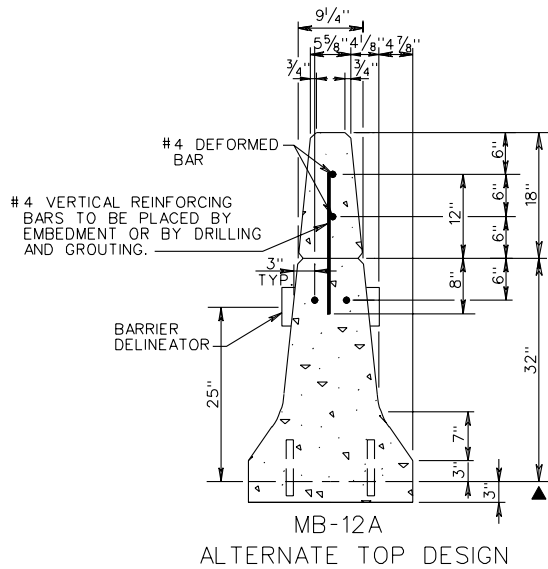
REV. 7/04
501.18

MB-12A, B, C

BARRIER TAPER FROM 50" TALL F-SHAPE TO A STANDARD MB-7A OR MB-7D BARRIER TO BE ACCOMPLISHED WITHIN THE 6'-0" AS INDICATED.



TRANSITION FROM 50" TALL WALL TO 32" JERSEY OR F-SHAPE BARRIER



IF BARRIER EXTENSION IS CONSTRUCTED AS A SEPARATE ITEM, ALL JOINTS ARE TO BE CONSTRUCTED AT THE SAME INTERVAL AS CONCRETE BARRIER. ALL VERTICAL BARS ARE #4 AT 24" MAX. SPACING. LENGTH OF DOWELS SHALL BE 20". VERTICAL BARS MAY BE PLACED IN THE CONCRETE OR BONDED INTO DRILLED HOLES IN HARDENED CONCRETE. WHEN HOLES ARE DRILLED NON-SHRINK GROUT SHALL BE USED TO BOND THE BARS IN PLACE.

▲ DEPTH OF CONCRETE BASE MAY BE EXTENDED AT THE CONTRACTOR'S OPTION TO COINCIDE WITH BOTTOM OF PAVEMENT COURSE IN WHICH BASE TERMINATES; HOWEVER, THE COST OF ADDITIONAL CONCRETE SHALL BE INCLUDED IN UNIT PRICE BID PER LINEAR FT. OF BARRIER.

SHEET 1 OF 2

CONCRETE MEDIAN BARRIER (TALL WALL)

REV. 7/04
501.55

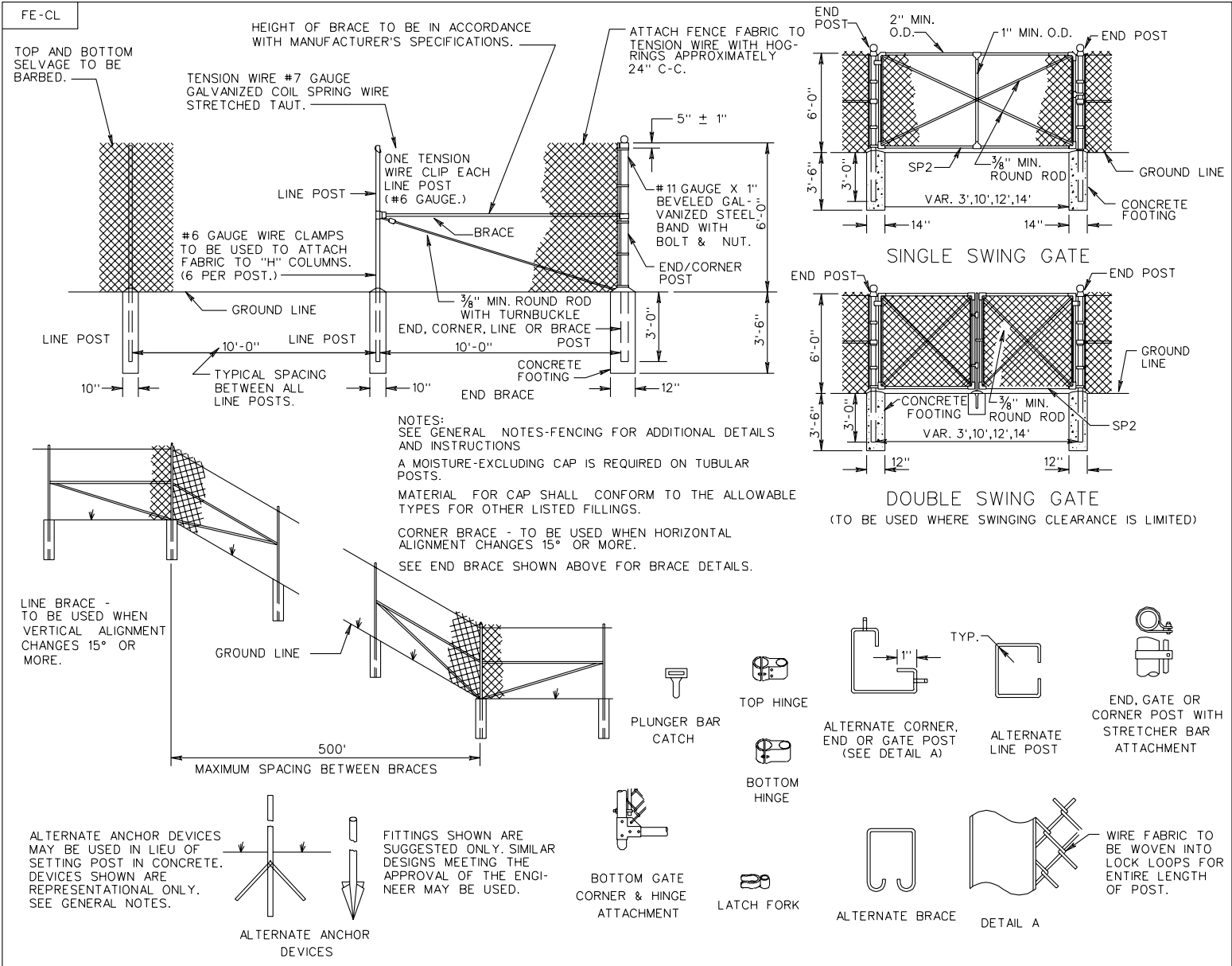
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

105
502

FE-W1,W2	CORNER BRACE	LINE BRACE	LINE BRACE AT END LOCATION	
WOOD POST			<p>THE BRACE WIRE TO BE PLACED AROUND POSTS WITH ONE WIRE ON EACH SIDE OF BRACE. WIRE TO BE DRAWN TAUT BY TWISTING BETWEEN BRACE AND EACH POST. THIS APPLIES TO ALL BRACE WIRES.</p> <p>DIAGONAL 4" BRACES TO BE PLACED IN DIRECTION OF PULL. POST TO BE NOTCHED FOR DIAGONAL 4" BRACES. ALL 4" DIAGONAL BRACES TO HAVE TWO GALVANIZED 12D NAILS AT EACH END.</p>	
METAL POST	<p>* L2/2X2/2X1/4 POST WITH 2X2X3/6X7'-0" BRACES OR 2 1/2" O.D. POST @ 3.65 ± 5% LBS./FT. WITH 1 5/8" O.D. BRACES @ 2.27 ± 5% LBS./FT.</p>	<p>IF NOT OTHERWISE NOTED DIMENSIONS AND DESCRIPTIONS SHOWN ON ONE DRAWING APPLY TO OTHER DETAILS WITH THE SAME POST TYPE.</p>		
<p>NOTES:</p> <p>SEE GENERAL NOTES-FENCING FOR ADDITIONAL DETAILS AND INSTRUCTIONS.</p>	<p>LINE POSTS ARE TO BE OF THE TYPES SHOWN OR EQUIVALENT MEETING THE APPROVAL OF THE ENGINEER.</p> <p>ALL POSTS ARE TO HAVE A MINIMUM WEIGHT OF 1.25 LBS./FT.</p> <p>A MINIMUM OF FIVE CLAMPS FOR ATTACHING FABRIC TO POST ARE TO BE INCLUDED IN COST OF EACH LINE POST.</p> <p>FLANGED "U" TYPE "T" TYPE</p> <p>METAL LINE POST</p>	<p>FOR USE IN LIEU OF SETTING POSTS IN CONCRETE. DEVICES SHOWN ARE REPRESENTATIONAL ONLY, SEE GENERAL NOTES.</p> <p>ALTERNATE ANCHOR DEVICES</p>	<p>L2X2X3/6 TO BE CUT TO FIT AROUND L2 1/2 X 2 1/2 X 1/4 STRETCHER POST.</p> <p>L2 1/2 X 2 1/2 X 1/4, 2" LONG BRACKET BOLTED TO STRETCHER POST.</p> <p>METHOD OF ATTACHING ANGLE BRACES TO STRETCHER POSTS</p>	
<p>Rev. 7/04</p> <p>502.02</p>	<p>STANDARD FENCE WOVEN WIRE FABRIC VIRGINIA DEPARTMENT OF TRANSPORTATION</p>			<p>SPECIFICATION REFERENCE</p> <p>242 507 236</p>

		CORNER BRACE	LINE BRACE	LINE BRACE AT END LOCATION	FE-B
WOOD POST		<p>PAY LINES (EXCLUSIVE OF WIRE) $\frac{3}{8}$"x4" GALVANIZED STEEL DOWEL (ALL ENDS) MIN. 4" BRACE 4'-6" 3'-0" 6"x6" 8'-0" 8'-0" 6"x6" CORNER POST #9 WIRE TWISTED</p>	<p>DIAGONAL 4" BRACE TO BE PLACED IN DIRECTION OF PULL. POST TO BE NOTCHED FOR DIAGONAL 4" BRACES. ALL DIAGONAL 4" BRACES TO HAVE TWO GALVANIZED 12D NAILS AT EACH END.</p> <p>6" 4'-6" 10" 10" 16" 3'-0" 8'-0" PAY LINES (EXCLUSIVE OF FABRIC) #9 WIRE TWISTED GROUND LINE</p>	<p>THE BRACE WIRE TO BE PLACED AROUND POSTS WITH ONE WIRE ON EACH SIDE OF BRACE. WIRE TO BE DRAWN TAUT BY TWISTING BETWEEN BRACE AND EACH POST. THIS APPLIES TO ALL BRACE WIRES.</p> <p>4" 4'-6" 2'-6" 12'-0" (TYP. SPACING BETWEEN ALL LINE POSTS) LINE POST BRACE POST 3/8"x4" GALVANIZED STEEL DOWELS 6" 6" 8'-0" PAY LINES (EXCLUSIVE OF FABRIC)</p>	
	METAL POST	<p>* L2½x2½x¼ POST WITH L2x2x¾x7'-0" BRACES OR 2½" O.D. POST @ 3.65±5% LBS./FT. WITH 1½" O.D. BRACES @ 2.27±5% LBS./FT.</p> <p>4'-6" 2'-6" 12'-0" 6'-0" 12'-0" 6'-0" 3'-0" CORNER POST CONCRETE FOOTING</p>	<p>IF NOT OTHERWISE NOTED DIMENSIONS AND DESCRIPTIONS SHOWN ON ONE DRAWING APPLY TO OTHER DETAILS WITH THE SAME POST TYPE.</p> <p>1'-6" 4" 4" 10" 10" 16" 6'-0" 6'-0" 12" 12"x12"x12" CONCRETE BLOCK STRETCHER POST 4 POINT BARBED WIRE</p>	<p>4'-6" 2'-6" 4'-6" 3'-0" 12'-0" (TYPICAL SPACING BETWEEN ALL LINE POSTS) LINE POST (SEE DETAIL BELOW) 12"x12"x12" CONCRETE BLOCK</p>	
NOTES: SEE GENERAL NOTES- FENCING FOR ADDITIONAL DETAILS AND INSTRUCTIONS.	<p>LINE POSTS ARE TO BE OF THE TYPES SHOWN OR EQUIVALENT MEETING THE APPROVAL OF THE ENGINEER. ALL POSTS ARE TO HAVE A MINIMUM WEIGHT OF 1.25 LBS./FT. A MINIMUM OF FIVE CLAMPS FOR ATTACHING FABRIC TO POST ARE TO BE INCLUDED IN COST OF EACH LINE POST.</p> <p>FLANGED "U" TYPE "T" TYPE</p>	<p>L2x2x¾ TO BE CUT TO FIT AROUND L2½x2½x¼ STRETCHER POST.</p> <p>L2½x2½x¼, 2" LONG BRACKET BOLTED TO STRETCHER POST</p> <p>ALTERNATE</p>	<p>FOR USE IN LIEU OF SETTING POSTS IN CONCRETE. DEVICES SHOWN ARE REPRESENTATIONAL ONLY. SEE GENERAL NOTES.</p>		
SPECIFICATION REFERENCE	STANDARD FENCE BARBED WIRE				
242 507 236	VIRGINIA DEPARTMENT OF TRANSPORTATION				Rev. 7/04 502.03

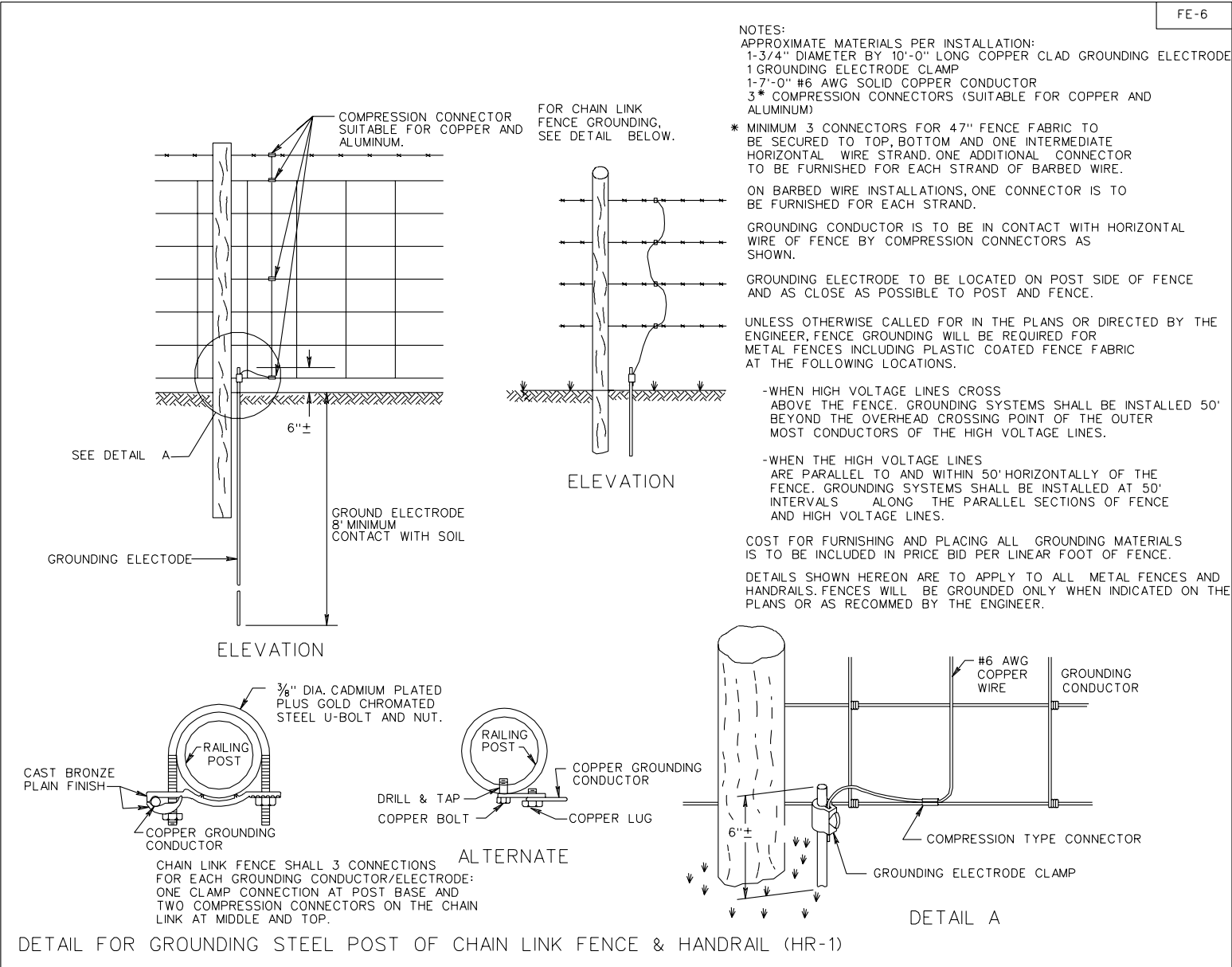


STANDARD FENCE
CHAIN LINK

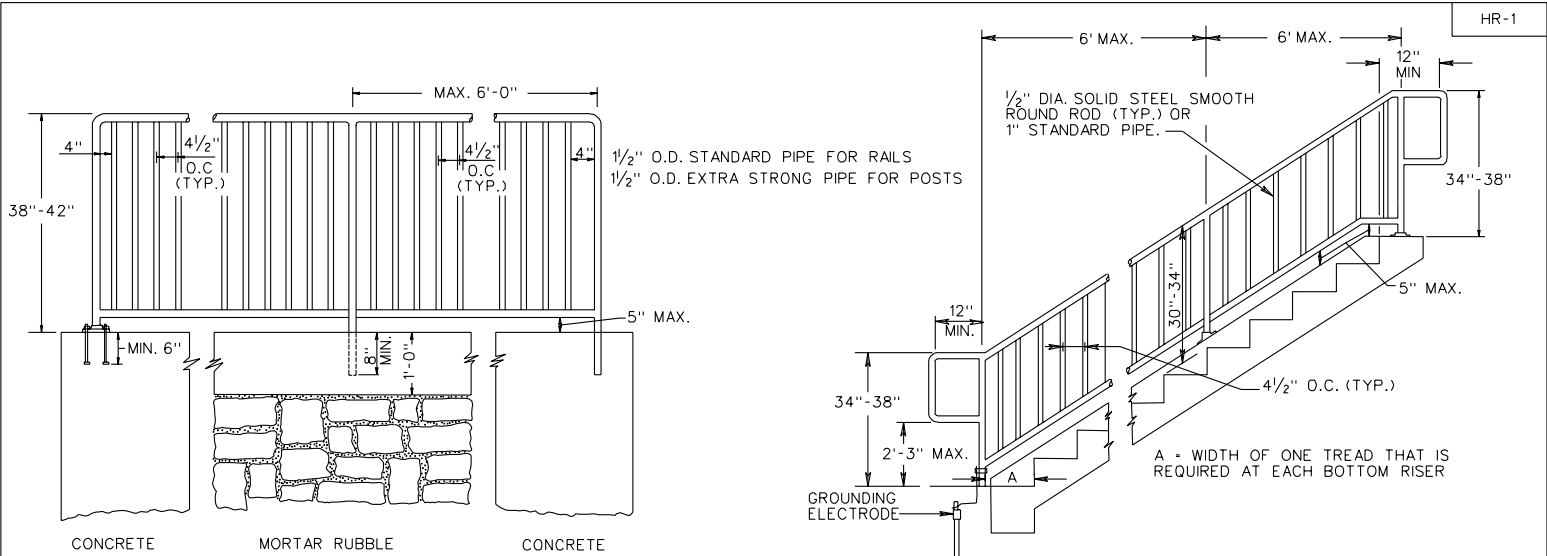
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/04
502.04

SPECIFICATION REFERENCE
242 507

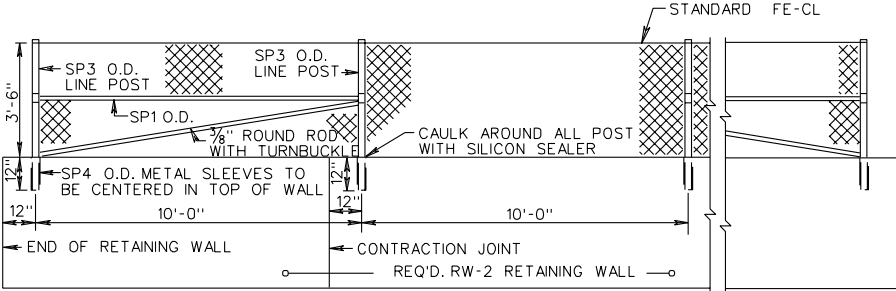
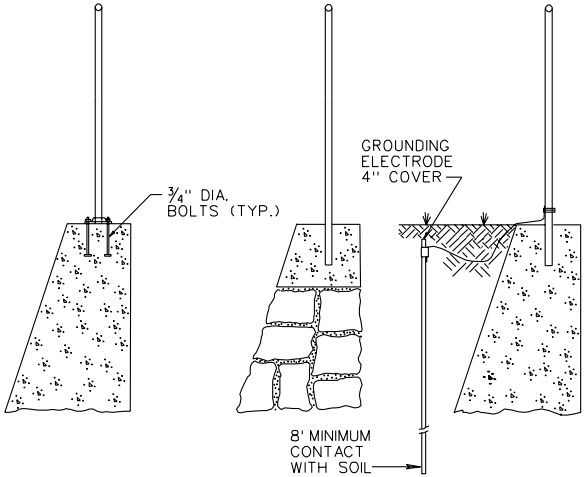


SPECIFICATION REFERENCE	STANDARD METHOD OF FENCE & HANDRAIL GROUNDING	
507 238	VIRGINIA DEPARTMENT OF TRANSPORTATION	REV 7/04 502.07



HANDRAIL INSTALLATION
 HANDRAILS SHALL BE GROUNDED AND EFFECTIVELY BONDED.
 GROUNING MATERIALS INSTALLATION TO BE IN ACCORDANCE WITH ST'D. FE-6.

FOR ALL DETAILS AND DIMENSIONS NOT SHOWN SEE ST'D. FE-CL.

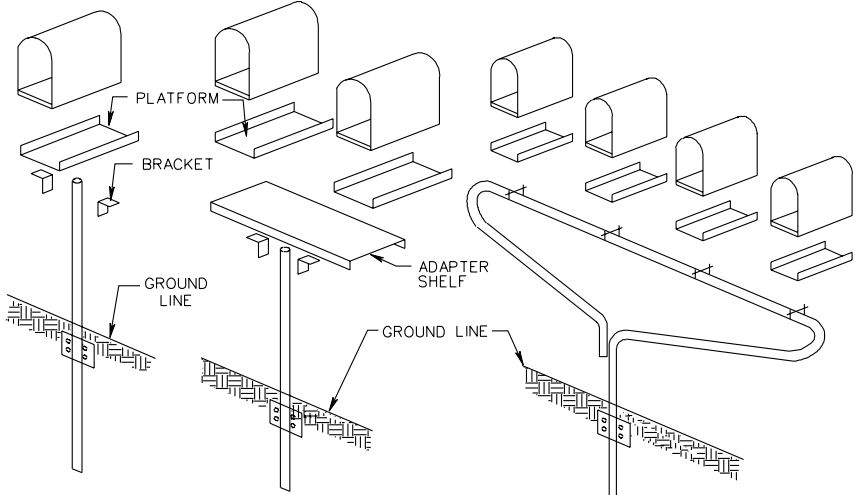


ALTERNATE INSTALLATION ON WALLS

NOTES:
 THIS HANDRAIL IS TO BE USED ONLY AS A PROTECTION FOR PEDESTRIANS AND SHOULD NOT BE PLACED IN ANY LOCATION WHERE IT MIGHT BE SUBJECT TO ANY VEHICULAR IMPACT FOR VEHICULAR PROTECTION STANDARD GUARDRAIL SHOULD BE USED.
 HANDRAIL TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE.

SPECIFICATION REFERENCE
504

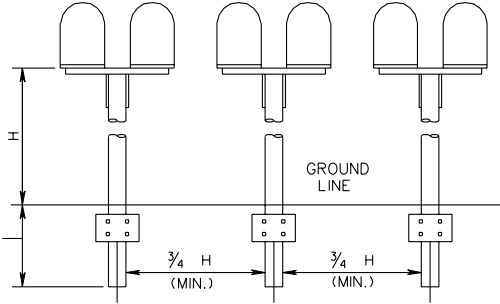
STANDARD HANDRAIL
 METHOD OF LOCATING AND ERECTING



SINGLE

DOUBLE

MULTIPLE
(MAX. 4 BOXES)



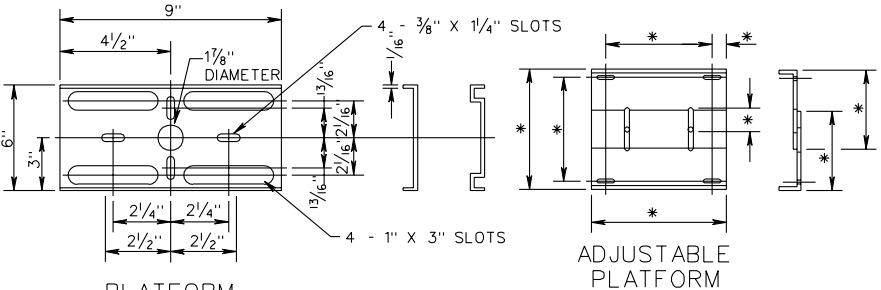
GROUPED

24" MAXIMUM DEPTH (FOR METAL POSTS)

NOTES:

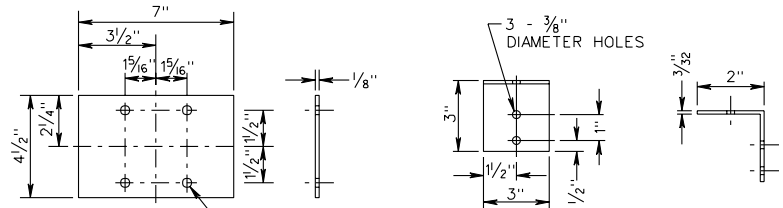
1. MAILBOXES SHALL BE OF LIGHT SHEET METAL OR PLASTIC CONSTR. CONFORMING TO THE REQUIREMENTS OF THE U.S. POSTAL SERVICE.
2. MAILBOX SUPPORTS SHALL NOT BE SET IN CONCRETE UNLESS THE SUPPORT DESIGN HAS BEEN SHOWN TO BE SAFE BY CRASH TESTS WHEN SO INSTALLED.
3. POSTS MAY BE 4" X 4" OR 4 1/2" DIAMETER WOOD POST, 2" DIAMETER STANDARD STRENGTH STEEL PIPE, OR OTHER STEEL OR ALUMINUM POST SHAPES OF EQUAL STRENGTHS.
4. THE POST-TO-BOX ATTACHMENT DETAILS SHOULD BE OF SUFFICIENT STRENGTH TO PREVENT THE BOX FROM SEPARATING FROM THE POST TOP IF THE INSTALLATION IS STRUCK BY A VEHICLE. HARDWARE SHOWN IS SUGGESTED ONLY, ALL GUIDELINES AS REQ'D. BY THE U.S. POSTAL SERVICE MUST BE FOLLOWED.

* DIMENSIONS VARY ACCORDING TO THE SIZE OF THE MAIL BOX.



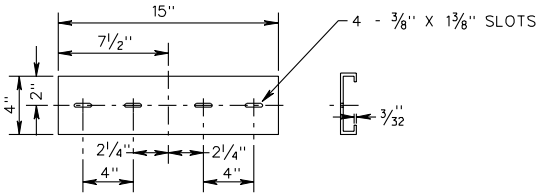
PLATFORM

ADJUSTABLE PLATFORM



ANTI-TWIST PLATE

BRACKET

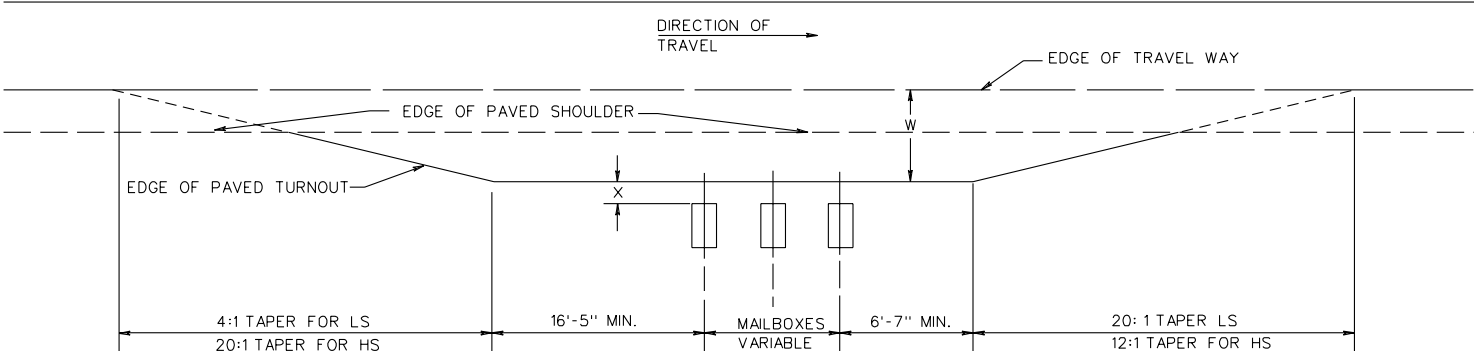


ADAPTER SHELF

SPECIFICATION REFERENCE	
NONE	

STANDARD MAILBOX

VIRGINIA DEPARTMENT OF TRANSPORTATION



LS = A MINIMUM DESIGN FOR ROADS CARRYING LOW-SPEED TRAFFIC AND FOR LOCAL AND COLLECTOR ROADS.
 HS = FOR ROADS CARRYING HIGH-SPEED TRAFFIC.
 W = FOR SUGGESTED WIDTHS, SEE TABLE.
 MAILBOXES = FOR MAILBOX SPACING AND VARIABLE LENGTH, SEE SHEET 603.01
 X = 0" - 12" MAILBOX FACE OFFSET. SEE TABLE.

HIGHWAY TYPE AND ADT, (vpd)	WIDTH (W) OF ALL-WEATHER SURFACE TURNOUT OR AVAILABLE SHOULDER AT MAILBOX, (FT.) (SEE NOTE 1)		DISTANCE (X) FROM FACE OF MAILBOX IS TO BE OFFSET FROM EDGE OF TURNOUT OR USEABLE SHOULDER, (IN.)	
	PREFERRED	MINIMUM	PREFERRED	MINIMUM
RURAL HIGHWAY OVER 10,000	12	8	8 TO 12	0
RURAL HIGHWAY OVER 1,500 to 10,000	12	8		
RURAL HIGHWAY 400 to 1,500	10	8		
RURAL HIGHWAY UNDER 400	8	6 (SEE NOTE 2)		10 (SEE NOTE 3)
RESIDENTIAL STREET WITHOUT CURB OR ALL-WEATHER SHOULDER	6	0.00		
CURBED RESIDENTIAL STREET	NOT APPLICABLE		8 TO 12 (SEE NOTE 4)	6 (SEE NOTE 4)

ADT-AVERAGE DAILY TRAFFIC
 vpd-VEHICLES PER DAY

NOTES:

- IF THERE IS A NEED TO PROVIDE FOR INCREASED ACCESS, THE FOLLOWING MAY BE CONSIDERED IN CONJUNCTION WITH THE LOCAL POSTMASTER
 - PROVIDE A LEVEL CLEAR FLOOR SPACE 30" X 48" CENTERED ON THE BOX FOR EITHER SIDE OR FORWARD APPROACH.
 - PROVIDE AN ACCESSIBLE PASSAGE TO AND FROM THE MAILBOX AND PROJECTION INTO A CIRCULATION ROUTE (NO MORE THAN 4" IF BETWEEN 28" AND 80" AFF) SO THAT THE MAILBOX DOES NOT BECOME A PROTRUDING OBJECT FOR PEDESTRIANS WITH IMPAIRED VISION.
- STRIVE FOR A 6 FEET MIN.; HOWEVER, IN SOME SITUATIONS THIS MAY NOT BE PRACTICAL. IN THOSE CASES, PROVIDE AS MUCH AS POSSIBLE.
- IF A TURNOUT IS PROVIDED, THIS MAY REDUCE TO ZERO.
- BEHIND TRAFFIC-FACE OF CURB.

SPECIFICATION REFERENCE
302

TURNOUT DETAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

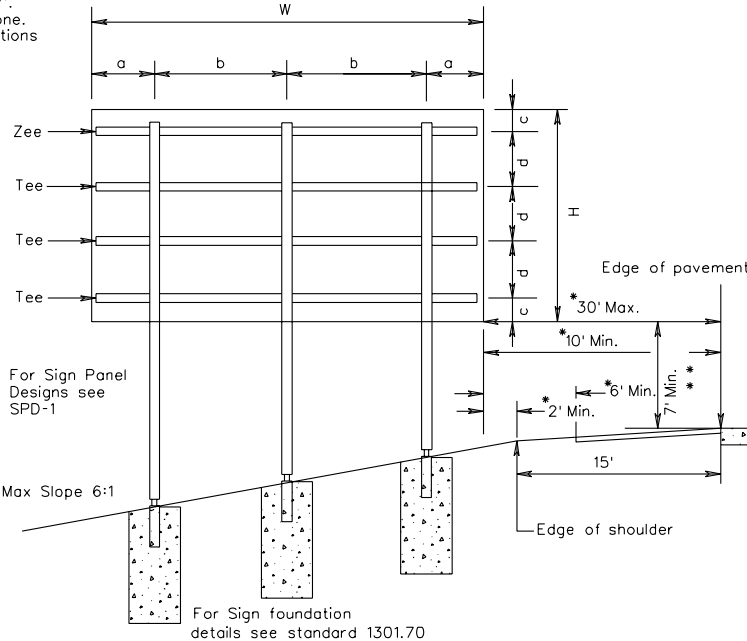
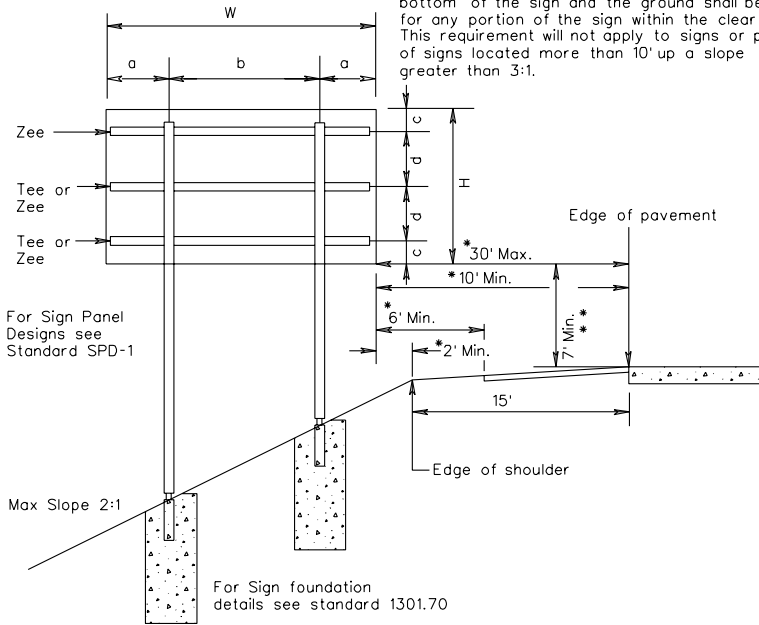
REV. 7/04

603.02

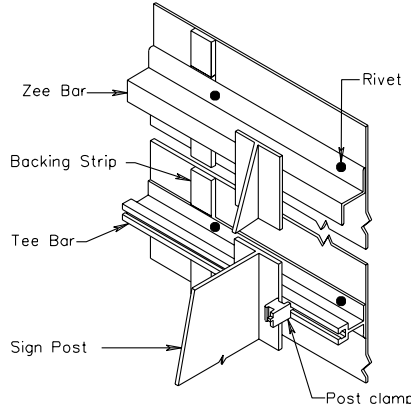
The spacing between sign posts shall be a minimum of 8' center to center.

* Signs shall be located to provide optimum viewing and safety within the indicated view limits for lateral placement.

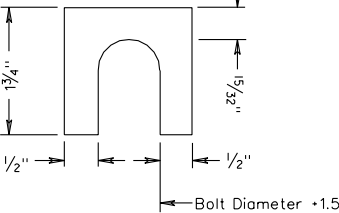
** In cut slopes, the minimum clearance between the bottom of the sign and the ground shall be 7' for any portion of the sign within the clear zone. This requirement will not apply to signs or portions of signs located more than 10' up a slope greater than 3:1.



ISOMETRIC VIEW

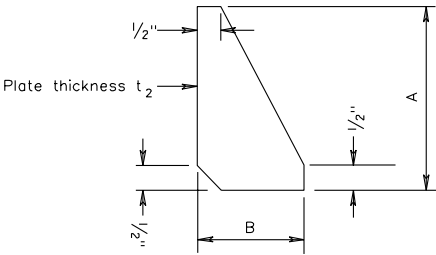


SHIM DETAIL

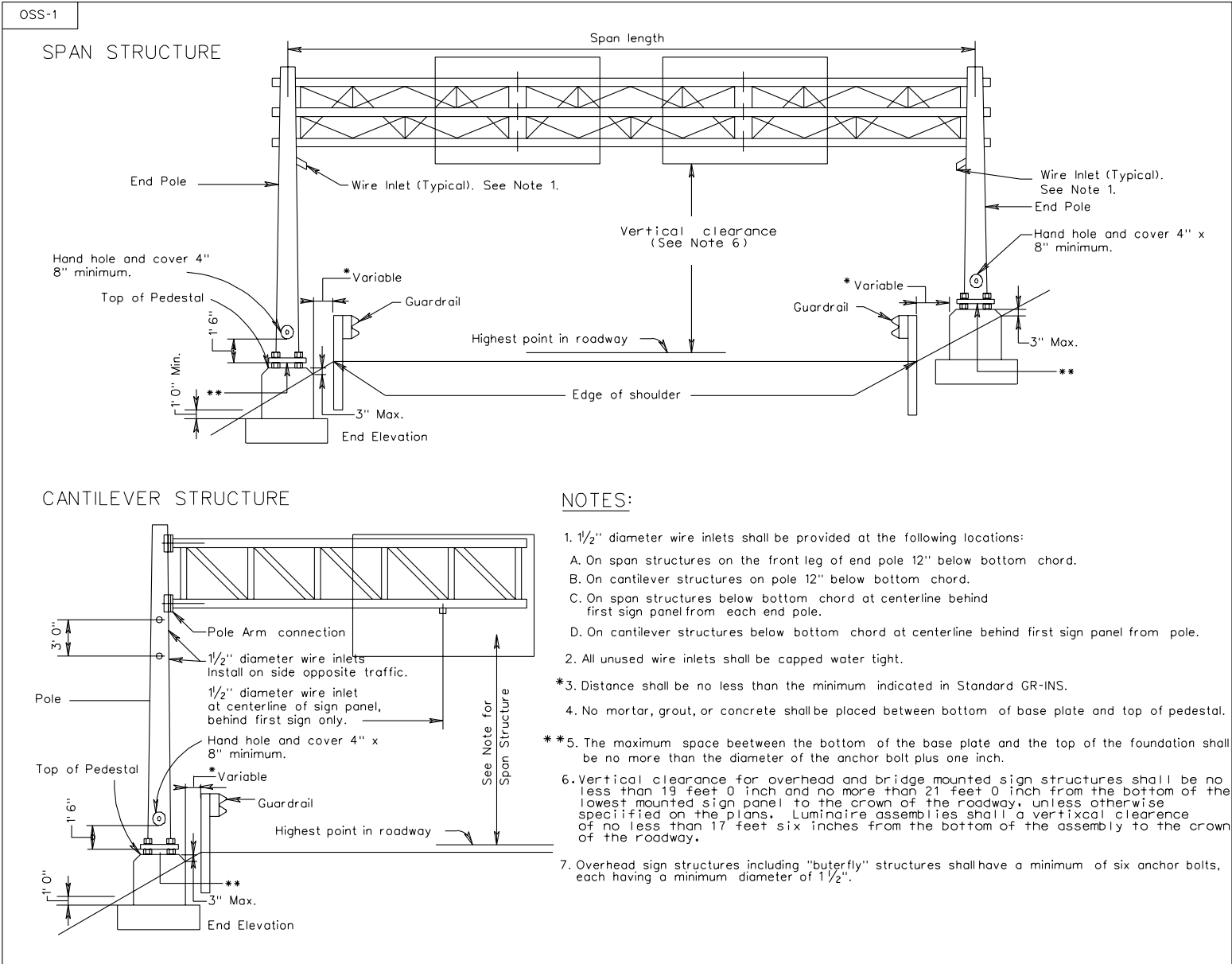


Furnish 2 each .063"± and 2 each .032± mm thick shims per pole. Shims shall be fabricated from brass conforming to ASTM B36 or from stainless steel with a minimum chromium content of 11.50%. No more than 2 shims shall be used per bolt with a maximum of 4 shims per pole.

STIFFENER PLATE DETAIL



TYPICAL DETAILS FOR TYPE VIA INTERSTATE SIGN STRUCTURE

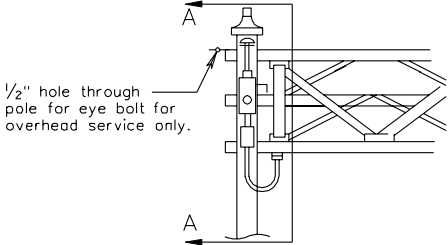


TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

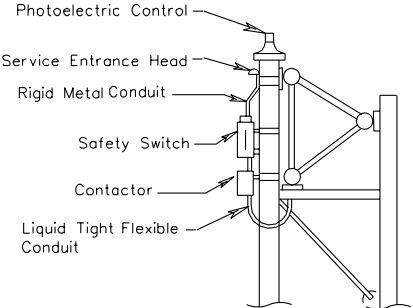
ELECTRIC DETAILS FOR SIGN LIGHTING

SPAN SIGN STRUCTURE

FRONT VIEW

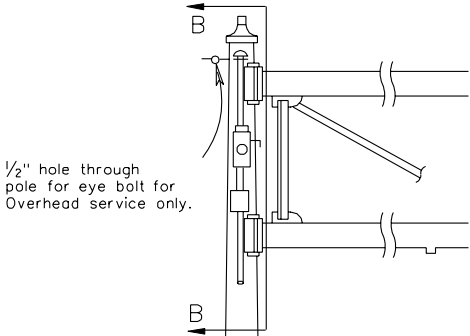


SECTION A-A

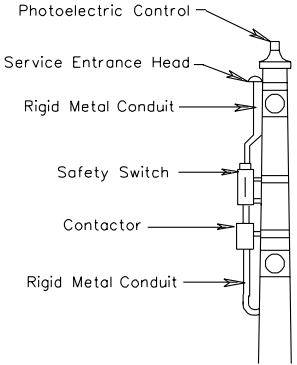


CANTILEVER SIGN STRUCTURE

FRONT VIEW



SECTION B-B



Note:

A safety switch shall be installed on all sign structures requiring electrical power. Electrical service for sign structures not controlled by a control center shall have a photocell and a photocell controlled contactor to control the electrical power to luminaires. The contactor shall be in a NEMA 3R enclosure within 24 inches of the safety switch.

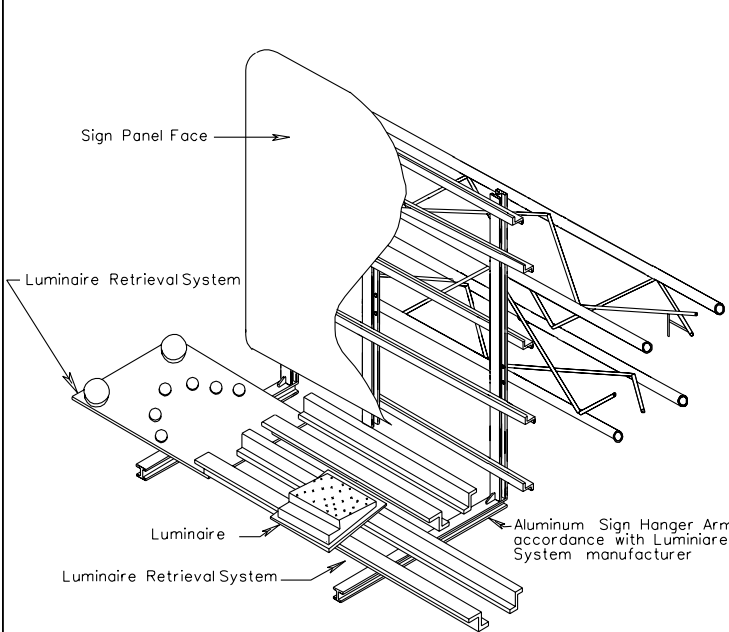
All conduit located in or on overhead sign structure shall be 3/4" minimum.

TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION

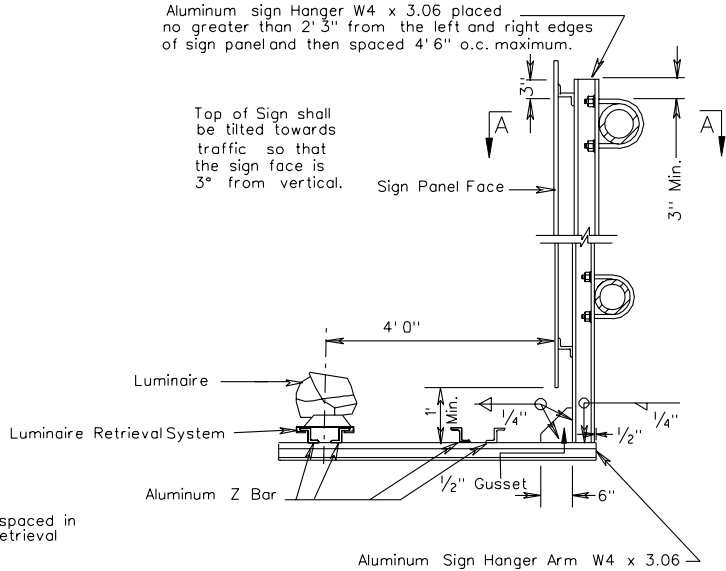
OSS-1

SIGN HANGER ERECTION DETAIL WITH LUMINAIRE RETRIEVAL SYSTEM



Aluminum sign Hanger W4 x 3.06 placed no greater than 2' 3" from the left and right edges of sign panel and then spaced 4' 6" o.c. maximum.

Top of Sign shall be tilted towards traffic so that the sign face is 3° from vertical.

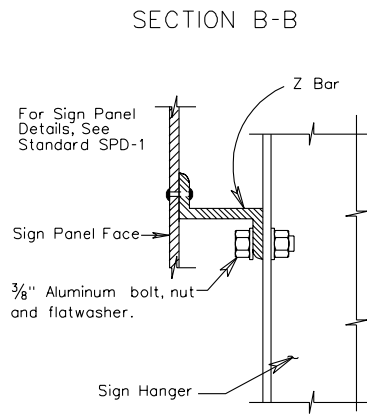
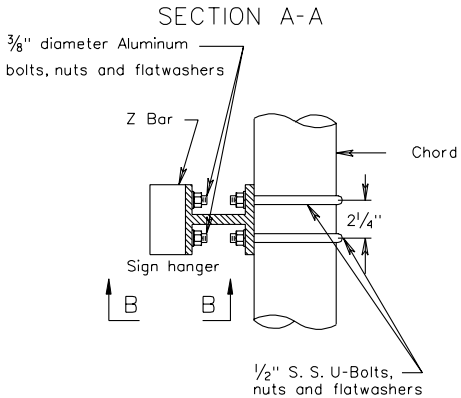


Note:

Luminaire Retrieval System including electrical system shall be equal to "LUMI-TRAK" and designed for the number of luminaires indicated on the plans. Spacing of hangers used to support the retrieval system shall be in accordance with manufacturer's recommendations. Turntable end shall be of sufficient length to align with the vertical edge of the outside paved shoulder (±6") or shall be extended 5 feet beyond the vertical edge (±6") of the outermost sign luminaire whichever is greater. The opposite end of retrieval system shall extend a minimum of 6 inches past the outermost vertical edge of the sign hanger arm.

Luminaires and Luminaire Retrieval System required only where indicated on the plans.

Signs fabricated using the SPD-1 Alternate Sign Panel Design shall be attached to the sign hangers in accordance with the method shown for Alternate Details For Type VIA Interstate Sign Structures except post clamps will not be allowed for attachment of the top and bottom stiffeners. Post clamp bolts shall be inserted through holes drilled into the sign hangers and secured using a stainless steel flatwasher and nut for these stiffeners.

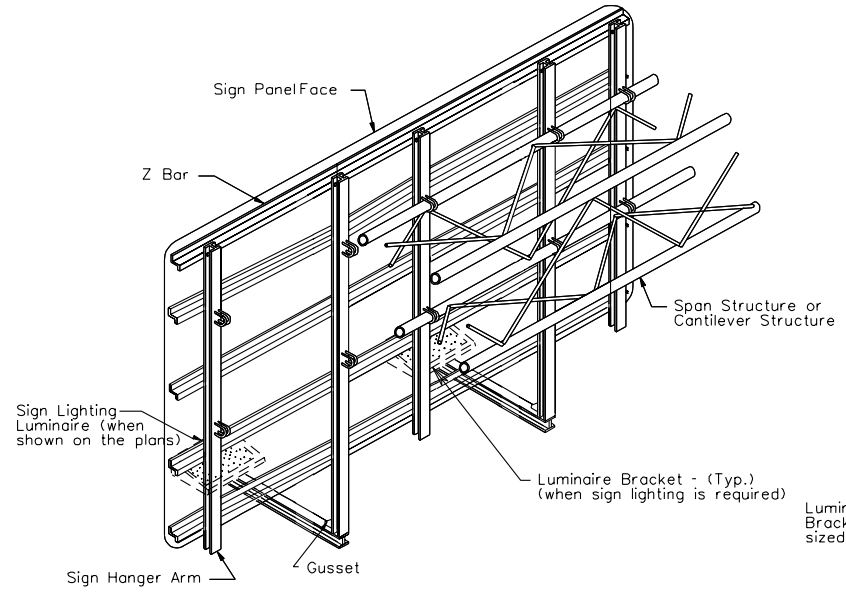


TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION

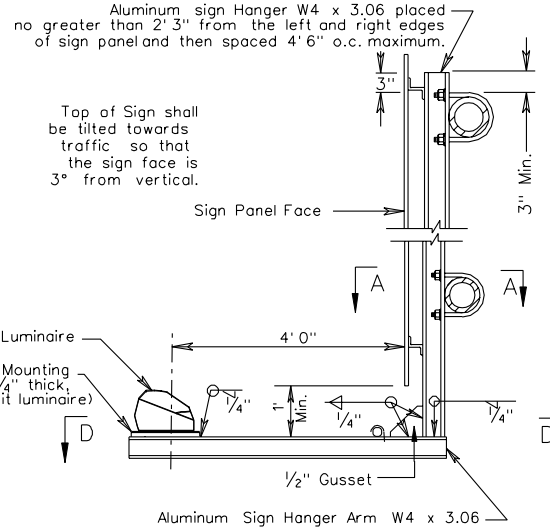
REV. 4/04

1301.74

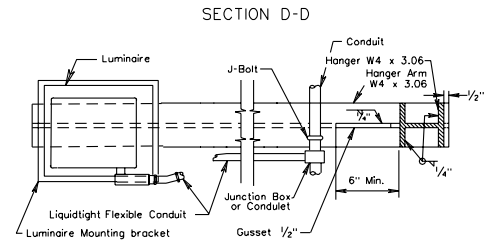
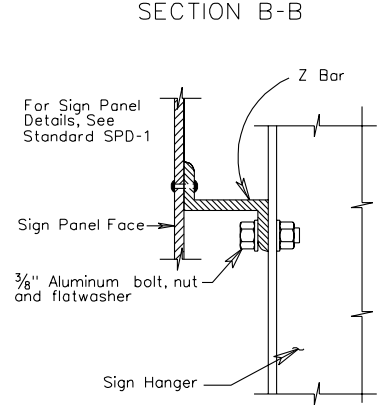
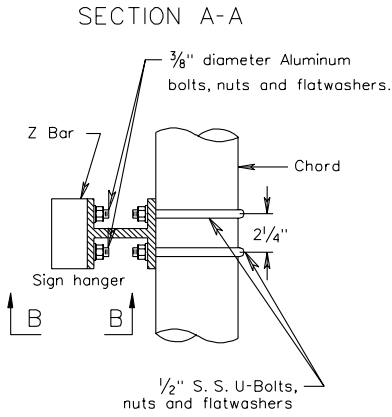


SIGN ATTACHMENT TO TRUSS-TYPE STRUCTURES

SIGN HANGER ERECTION DETAIL WITH LUMINAIRE
(WHEN NO LUMINAIRE RETRIEVAL SYSTEM IS REQUIRED)



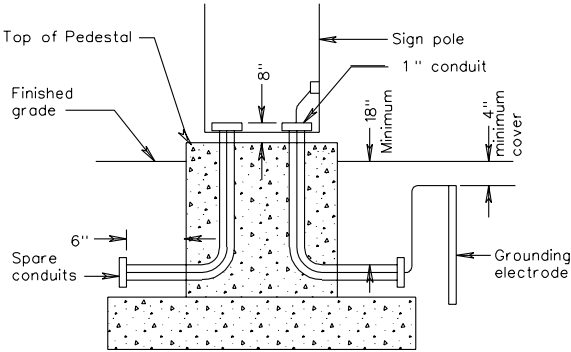
Note
Luminaires required only where indicated on the plans.
Luminaire to be attached to mounting bracket with 4, 3/8" Dia. galvanized cap screws, lockwashers and nuts.
Signs fabricated using the SPD-1 Alternate Sign Panel Design shall be attached to the sign hangers in accordance with the method shown for Alternate Details For Type VIA Interstate Sign Structures except post clamps will not be allowed for attachment of the top and bottom stiffeners. Post clamp bolts shall be inserted through holes drilled into the sign hangers and secured using a stainless steel flatwasher and nut for these stiffeners.



TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES
VIRGINIA DEPARTMENT OF TRANSPORTATION

OSS-1

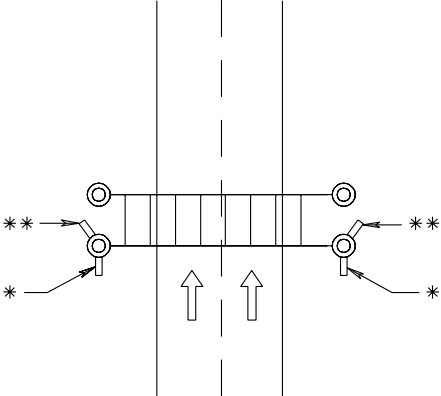
TYPICAL SIGN FOOTING DETAIL WITH CONDUIT



NOTES:

- The type, size, number and orientation of conduits entering and exiting footings may vary per sign location.
- In addition to the conduits specified on the plans, one - 1" conduit required for ground wire and two - 2" pvc heavy wall conduits required for future use. Future use conduits shall be stubbed out and capped. Future use conduits shall be oriented to run parallel to the roadway. For location of future use conduits in foundations for double end pole structures, see drawing at right.
- 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 mark.
- Foundations above finished grade shall be chamfered 3/4" on all edges.
- Grounding bushings shall be installed on each end of metal conduits.
- Bell ends shall be installed on each end of PVC conduits.
- Bell ends & bushings of empty conduits shall be plugged to prevent moisture and rodent entry.
- Voids remaining after conductors exit or enter bell ends or bushings of conduits shall be sealed with silicone to prevent moisture and rodent entry.
- No mortar, grout, or concrete shall be placed between bottom of base plate and top of pedestal.

LOCATION OF FUTURE USE CONDUITS FOR DOUBLE END POLE STRUCTURES



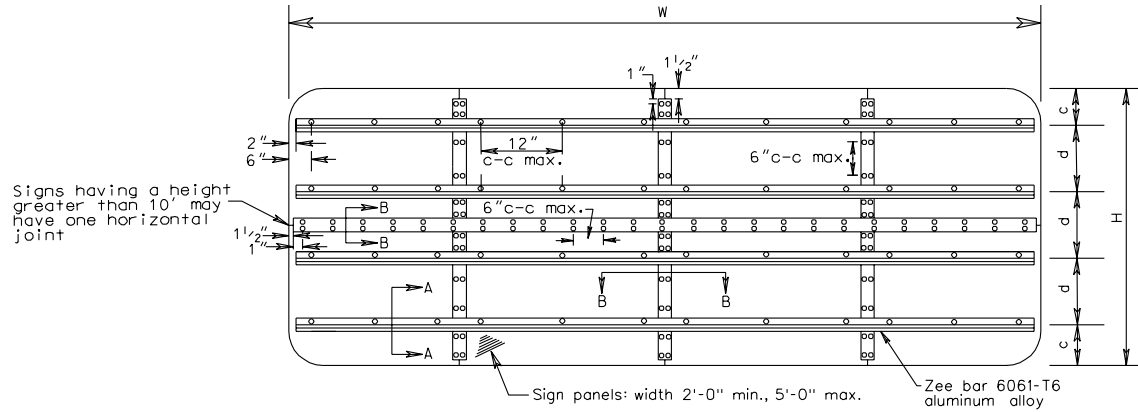
- * Future use conduits placed parallel to the roadway
- ** Future use conduits placed at an angle to miss the back foundation or anchor bolts in a spread footing foundation.

The maximum space between the bottom of the base plate and the top of the foundation shall be no greater than the diameter of the anchor bolt plus one inch.

Overhead sign structures including "butterfly" structures shall have a minimum of six anchor bolts, each having a minimum diameter of 1/2".

TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

REV. 4/04
1301.76



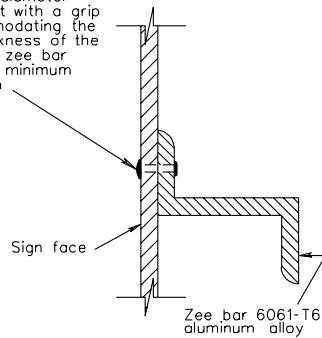
SECTION A-A

SECTION B-B

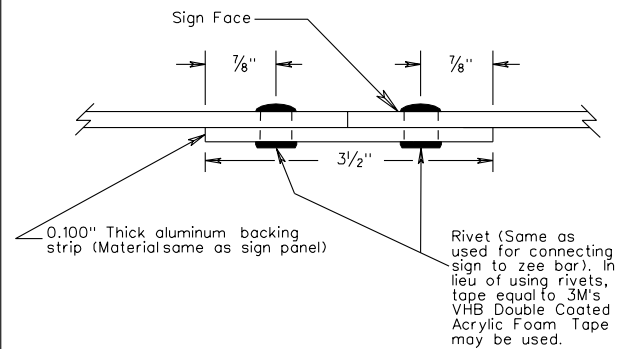
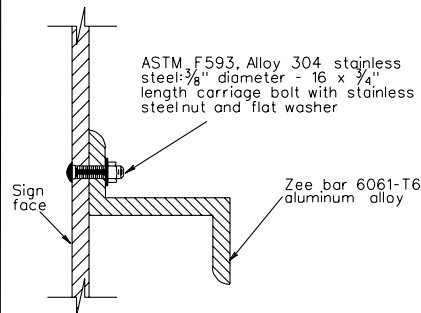
ALL INSTALLATIONS EXCEPT TOP AND BOTTOM ZEE BARS ON OVERHEAD SIGNS

TOP AND BOTTOM ZEE BAR INSTALLATION ON OVERHEAD SIGNS

3/16" Minimum diameter aluminum rivet with a grip range accommodating the combined thickness of the sign panel and zee bar and a 460 lb. minimum shear strength



ASTM F593, Alloy 304 stainless steel: 3/8" diameter - 16 x 7/4" length carriage bolt with stainless steelnut and flat washer



SIGN PANEL DESIGN