



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

January 9, 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
802.34	TC-5.01	Revised LS values.
802.35	TC-5.01	Revised radius value.
802.37	TC-5.01	Revised CR value.

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 June 9, 2004.

PAGE	INSERT	STANDARD	REVISION
104.03	A153	DI-2A,2B,2C	Revised details showing approach surface to slot.
104.06	A153	DI-2D,2E,2F	Revised details showing approach surface to slot.

PAGE	INSERT	STANDARD	REVISION
107.00	A151	PB-1	Added Notes Page
107.01	A86	PB-1	Removed requirement for class II backfill
107.02	A86	PB-1	Removed requirement for class II backfill
107.03	A120	PB-1	Removed requirement for class II backfill
107.04	A120	PB-1	Removed requirement for class II backfill
108.06	A81	UD-4	Removed inspection port and modified outlet pipe configuration.
115.01	ISD414.04	ESC-INS	Revised entrance width from 12" to 12'
203.02	A78	CG-9B	Revised Notes.
203.03	A78	CG-9D	Revised Notes
203.05	A59	CG-12	Revised notes and dimensions.
203.06	A59	CG-12	Revised notes and dimensions.
203.07	A59	CG-12	Revised notes and dimensions.
203.08	A108	CG-13	Revised notes and dimensions.

PAGE	INSERT	STANDARD	REVISION
301.14	ISD2623	PR-5	Revised anchor slab detail.
301.17	ISD2724	PR-6	Revised anchor slab detail.
301.20	ISD2761	PR-7	Removed load transfer dowel into bridge (section F-F).Revised anchor slab detail.
301.23	ISD2861	PR-8	Removed load transfer dowel into bridge (section F-F).Revised anchor slab detail.
301.26	ISD2862	PR-9	Removed load transfer dowel into bridge (section F-F).Revised anchor slab detail.
501.15	A91	GR-8,8A,8B,8C	Revised notes referring to limits of item.
501.19	A88	GR-10	Revised note to remove reference to splice plate.
501.20	A88	GR-10	Revised detail changing text from "Clear Zone" to "Dynamic Deflection". Revised note to remove reference to splice plate.
501.39	A93	GR-INS	Added detail for transition from old GR-8 to current standard.
501.41	A94	MB-3	Revised flare rates.
501.44	A98	MB-7D, 7E, 7F	Revised flare rates.
501.45	A103	MB-7D PC	Revised flare rates.
501.47	A98	MB-8A	Revised flare rates

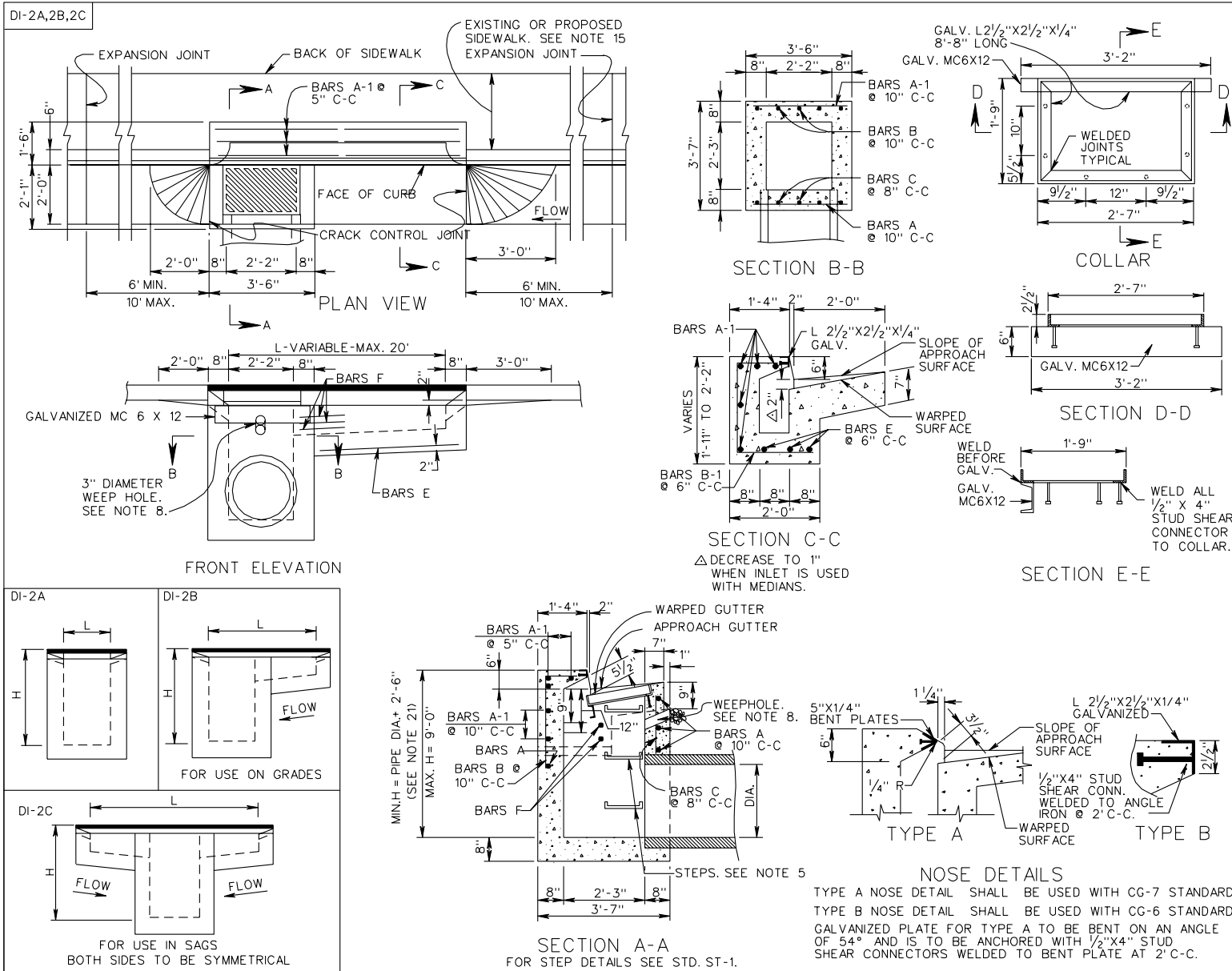
PAGE	INSERT	STANDARD	REVISION
501.56	A96	MB-12A,B,C	Revised flare rates.
501.58	A104	MB-13	Revised flare rates.
502.04	A152	FE-CL	Revised Specification Designation of post sizing.
502.07	A152	FE-6	Revised notes.
603.02	A149	RFD-1	Revised table dimension from Ft. to In.
1301.72	A154	OSS-1	Added Note #6 and revised fixed object offset distance.
1301.73	A154	OSS-1	Deleted catwalks and replaced details with electrical installation details and added a contactor.
1301.74	A155	OSS-1	Replaced details with sign panel erection details and sign lighting details.
1301.75	A155	OSS-1	Replaced details with sign panel erection details and sign lighting details.

If you have any questions or comments regarding the listed revisions to this publication, please contact Mrs. N. E. Berry of the Engineering Services Section at (804) 786-2543.

Sincerely,

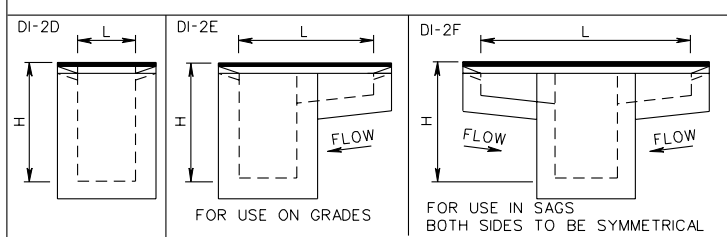
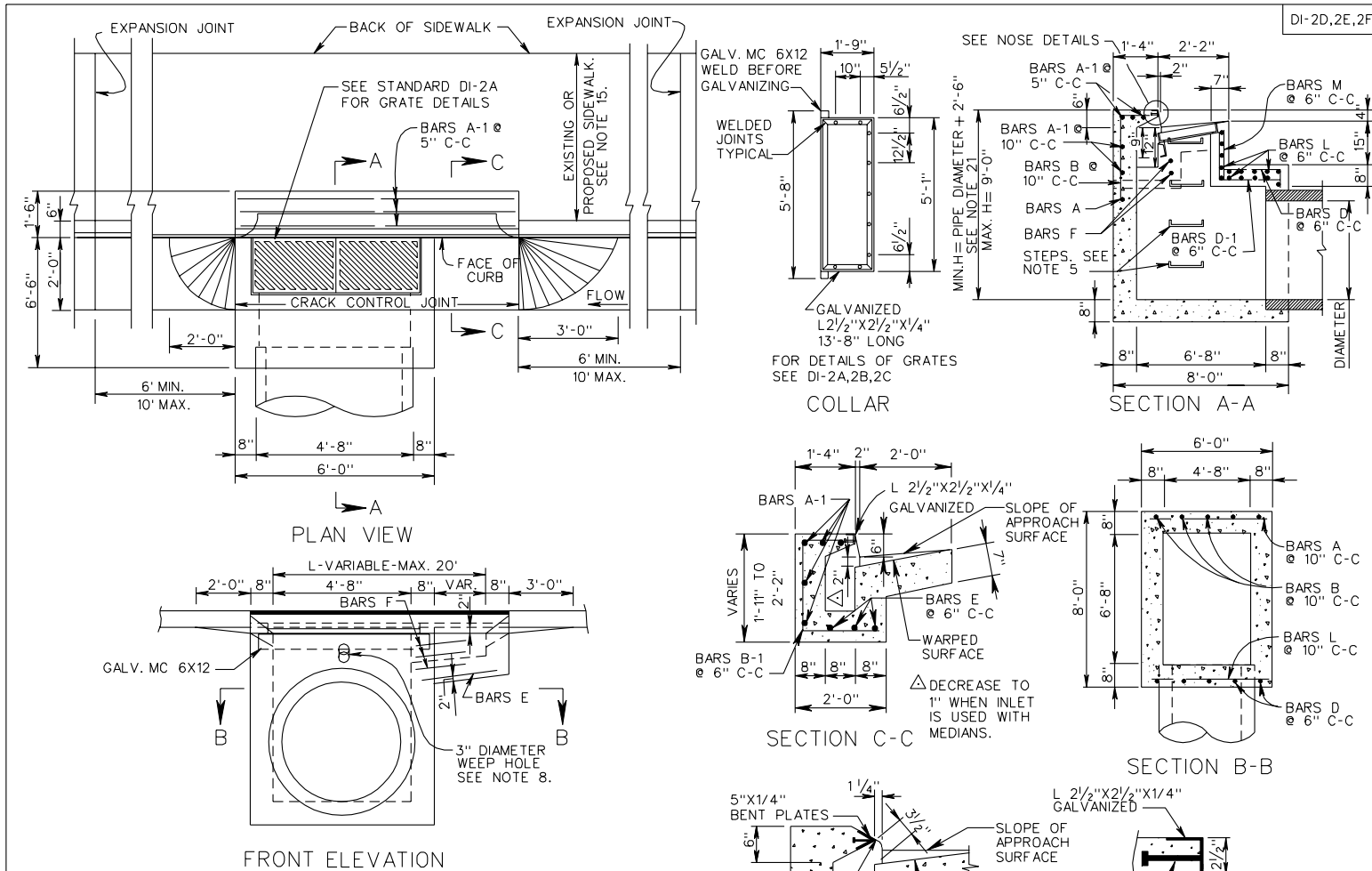
Mohammad Mirshahi, P.E.
State Location and Design Engineer

INSERTABLE SHEET A153



SHEET 1 OF 2	STANDARD CURB DROP INLET	SPECIFICATION REFERENCE
REV. 01/04. 104.03		12" - 24" PIPE: MAXIMUM DEPTH (H) = 9'

INSERTABLE SHEET A153



NOSE DETAILS
 TYPE A NOSE DETAIL SHALL BE USED WITH CG-7 STANDARD.
 TYPE B NOSE DETAIL SHALL BE USED WITH CG-6 STANDARD.
 GALVANIZED PLATE FOR TYPE A TO BE BENT ON AN ANGLE OF 54° AND IS TO BE ANCHORED WITH 1/2" X 4" STUD SHEAR CONNECTORS WELDED TO BENT PLATE AT 2' C-C.

SPECIFICATION REFERENCE 233 302	<h2 style="margin: 0;">STANDARD CURB DROP INLET</h2> <h3 style="margin: 0;">30" - 48" PIPE: MAXIMUM DEPTH (H) = 9'</h3> <p style="font-size: small; margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SHEET 1 OF 2 REV. 1 / 04 104.06
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PB-1

GENERAL

1. METHOD "A" PIPE BEDDING SHALL BE USED FOR ALL TYPES OF PIPE CULVERTS WITHIN THE APPLICABLE HEIGHT OF COVER RANGE NOTED IN THE STANDARD PC-1 TABLES UNLESS OTHERWISE NOTED ON THE PLANS.
2. H = HEIGHT OF COVER MEASURED FROM TOP OF CULVERT TO FINISHED GRADE.
3. b = EXCAVATION DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

CIRCULAR PIPE

1. D = OUTSIDE DIAMETER OF PIPE.
2. d = INSIDE DIAMETER OF PIPE.
3. X = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
 X = 12" WHERE d IS LESS THAN 36".
 X = 18" WHERE d IS 36" AND GREATER.
4. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE (EXCEPT PLASTIC PIPE) 30" AND LESS IN DIAMETER WITH HEIGHT OF COVER 15' OR LESS.
5. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE (EXCEPT PLASTIC PIPE) 30" AND LESS IN DIAMETER WITH HEIGHT OF COVER 15' OR LESS.
6. BEDDING MATERIAL AND CLASS I BACKFILL MATERIAL MAY BE ELIMINATED FOR SHOULDER SLOT INLET (DI-13) OUTLET PIPES INSTALLATIONS.

ELLIPTICAL PIPE

1. S₁ = OUTSIDE SPAN DIMENSION OF PIPE.
2. S₂ = INSIDE SPAN DIMENSION OF PIPE.
3. R = OUTSIDE RISE DIMENSION OF PIPE.
4. X = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
 X = 12" WHERE S₂ IS LESS THAN 36".
 X = 18" WHERE S₂ IS 36" AND GREATER.
5. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE WHERE S₂ IS 38" OR LESS AND HEIGHT OF COVER 15' OR LESS.
6. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE WHERE S₂ IS 38" OR LESS AND HEIGHT OF COVER 15' OR LESS.

PIPE ARCH

1. S = SPAN DIMENSION OF PIPE.
2. R = RISE DIMENSION OF PIPE.
3. B = SEE PC-1 TABLE FOR APPLICABLE PIPE MATERIAL
4. x = WIDTH OF CLASS I BACKFILL MATERIAL BEYOND THE EXTREMITY OF THE PIPE.
 x = 12" WHERE S₂ IS LESS THAN 36".
 x = 18" WHERE S₂ IS 36" AND GREATER.
5. WHERE DIRECTED BY THE ENGINEER, BEDDING MATERIAL MAY BE ELIMINATED FOR NORMAL EARTH FOUNDATIONS UNDER ROUTINE ENTRANCE PIPE WHERE S₂ IS 35" OR LESS AND HEIGHT OF COVER 15' OR LESS.
6. REGULAR BACKFILL MATERIAL MAY BE USED IN LIEU OF CLASS I BACKFILL MATERIAL FOR ALL FOUNDATION TYPES FOR ROUTINE ENTRANCE PIPE WHERE S IS 35" OR LESS AND HEIGHT OF COVER 15' OR LESS.

INSTALLATION OF PIPE CULVERTS AND STORM SEWERS
 GENERAL NOTES

NEW. 1 / 04

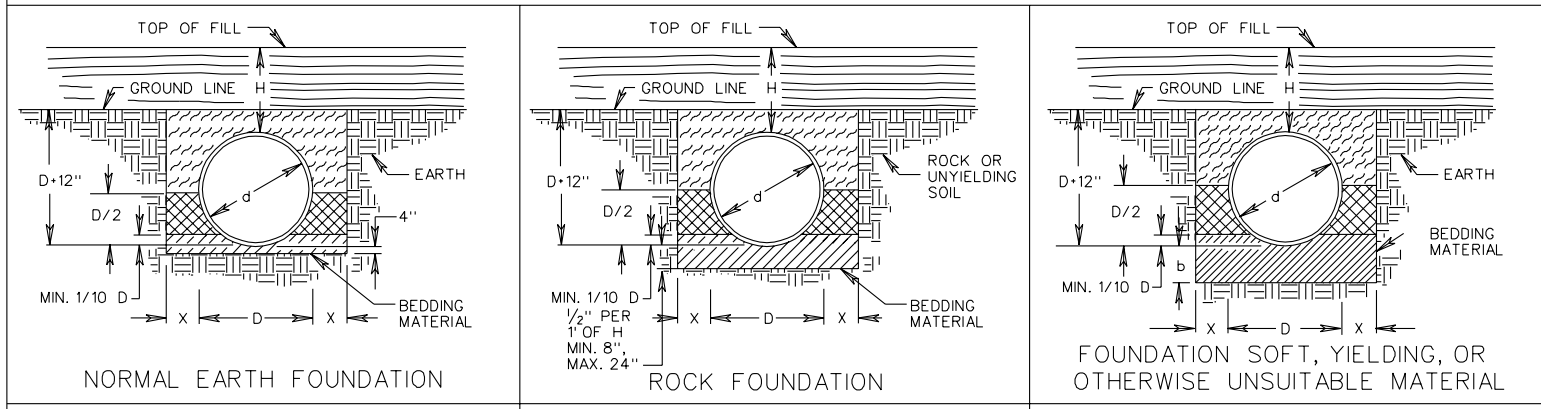
107.00

VIRGINIA DEPARTMENT OF TRANSPORTATION

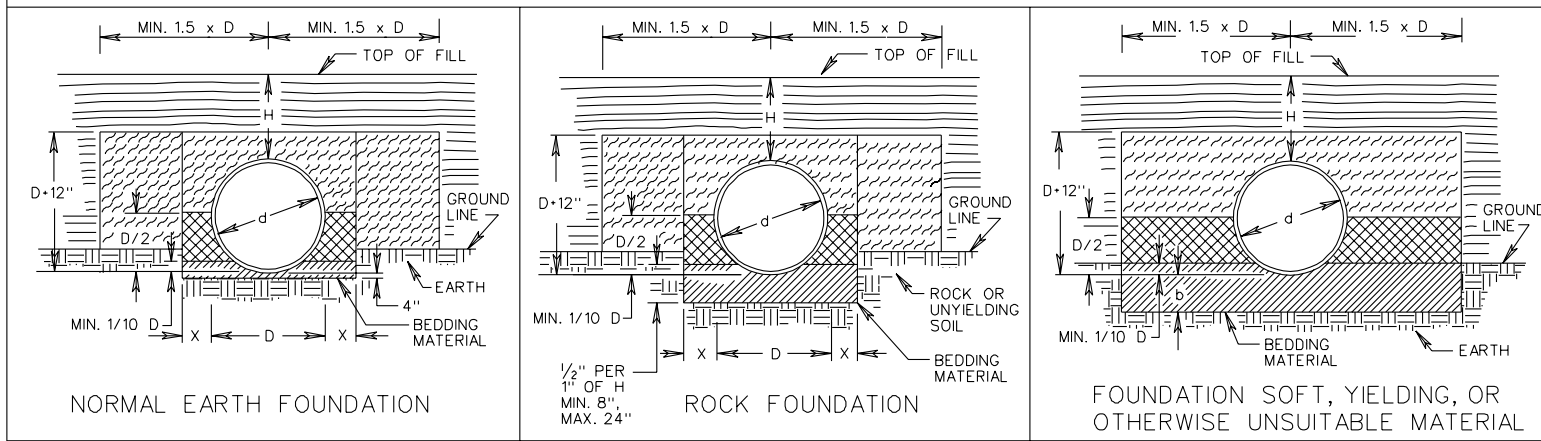
SPECIFICATION
 REFERENCE



302
 303


NO PROJECTION OF PIPE ABOVE GROUND LINE




PIPE PROJECTION ABOVE GROUND LINE



-  BEDDING 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.

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

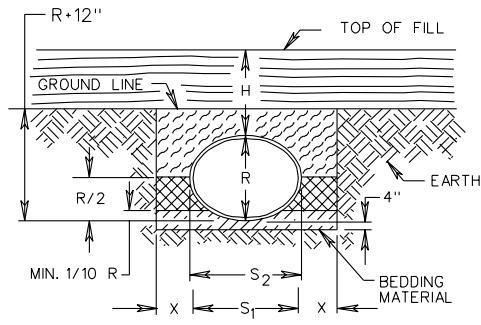
-  EMBANKMENT

NOTE: FOR PLASTIC PIPE, THE LIMITS OF THE CLASS I BACKFILL MATERIAL SHALL BE EXTENDED TO 12" ABOVE THE TOP OF THE PIPE.

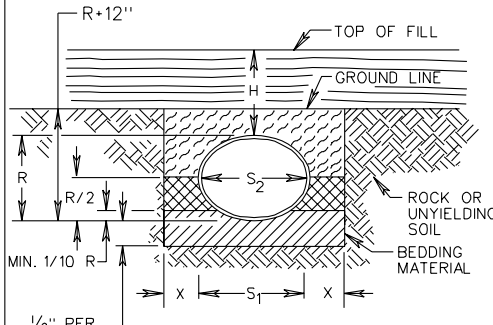
SPECIFICATION REFERENCE	INSTALLATION OF PIPE CULVERTS AND STORM SEWERS CIRCULAR PIPE BEDDING AND BACKFILL - METHOD "A"	
302 303	VIRGINIA DEPARTMENT OF TRANSPORTATION	REV. 1/04 107.01

PB-1

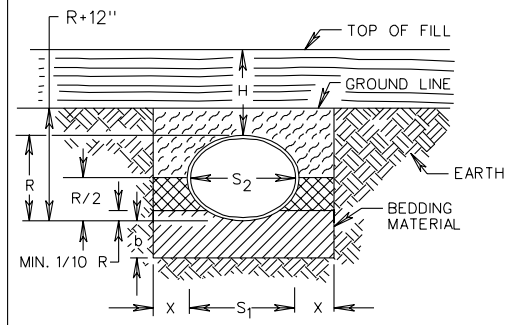
NO PROJECTION OF PIPE ABOVE GROUND LINE



NORMAL EARTH FOUNDATION

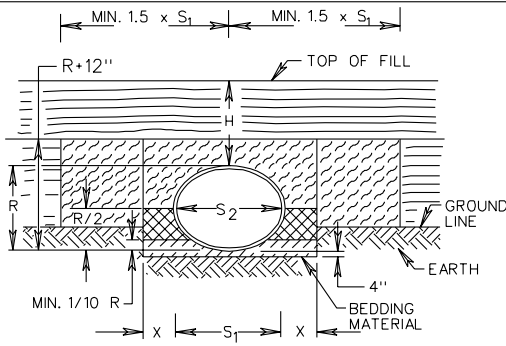


ROCK FOUNDATION
 $\frac{1}{2}$ " PER
 1" OF H
 MIN. 8"
 MAX. 24"

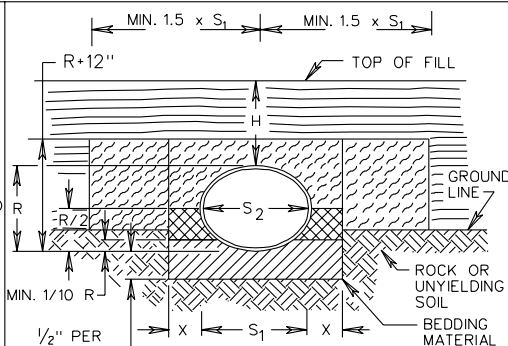


FOUNDATION SOFT, YIELDING, OR
 OTHERWISE UNSUITABLE MATERIAL

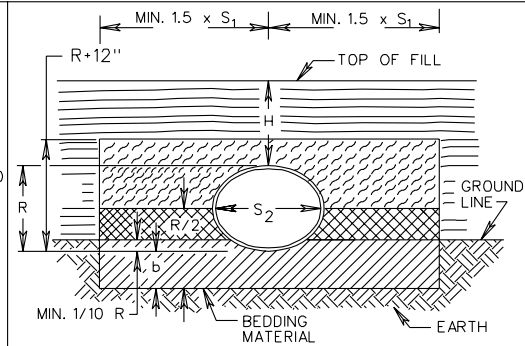
PIPE PROJECTION ABOVE GROUND LINE



NORMAL EARTH FOUNDATION



ROCK FOUNDATION
 $\frac{1}{2}$ " 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. 1 / 04

107.02

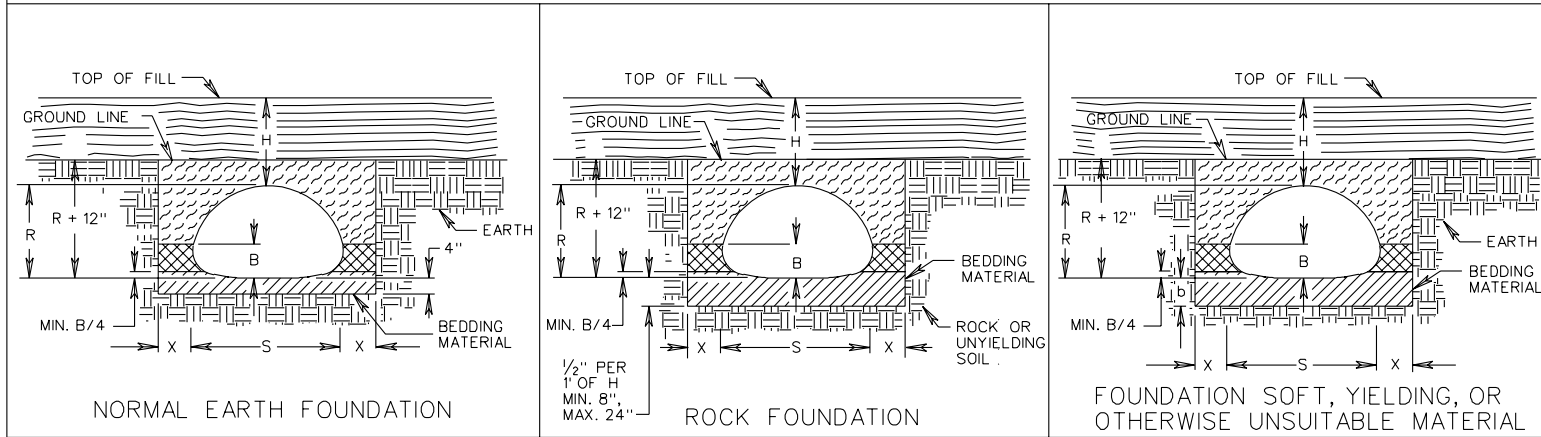
INSTALLATION OF PIPE CULVERTS AND STORM SEWERS
 ELLIPTICAL PIPE BEDDING AND BACKFILL - METHOD "A"

VIRGINIA DEPARTMENT OF TRANSPORTATION

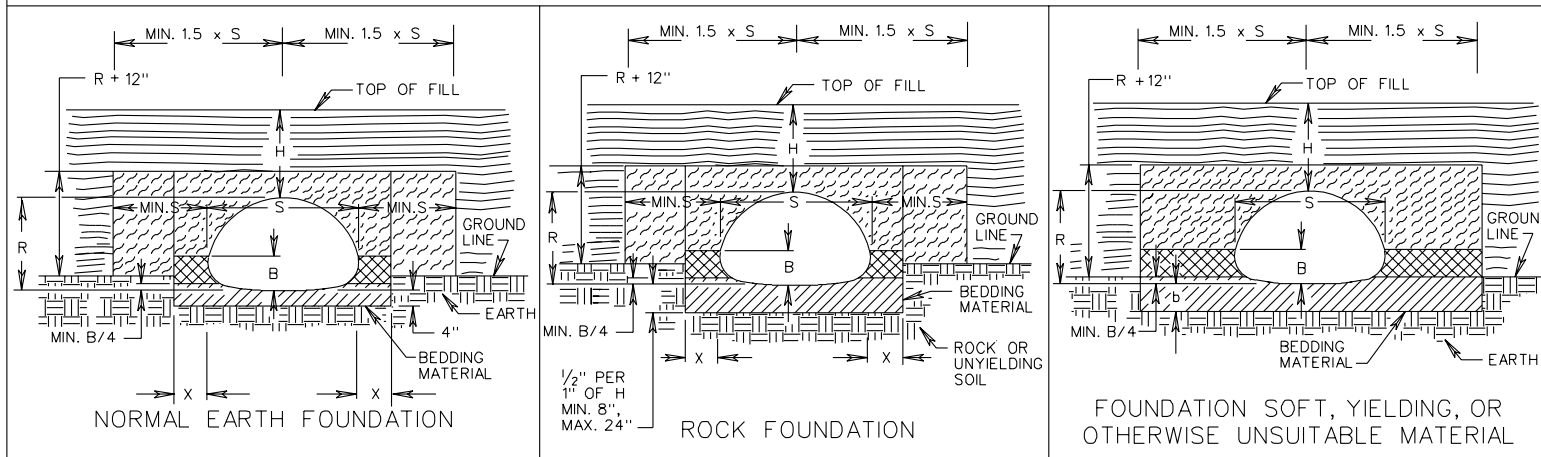
SPECIFICATION
 REFERENCE

302
 303

NO PROJECTION OF PIPE ARCH ABOVE GROUND LINE



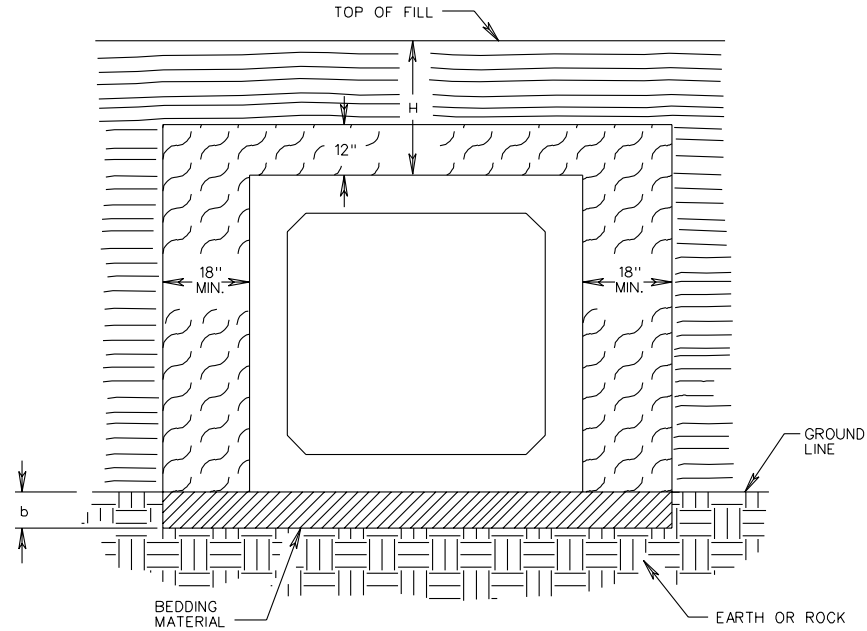
PIPE ARCH PROJECTION ABOVE GROUND LINE



- 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

<p>SPECIFICATION REFERENCE</p> <p>302</p> <p>303</p>	<p>INSTALLATION OF PIPE CULVERTS AND STORM SEWERS</p> <p>PIPE ARCH BEDDING AND BACKFILL</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p>REV. 1/04</p> <p>107.03</p>
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PB-1




H = HEIGHT OF COVER MEASURED FROM TOP OF CULVERT TO FINISHED GRADE.


FOR NORMAL EARTH FOUNDATION:
FOR PRECAST AND CAST IN PLACE BOX CULVERT $b = 6''$


FOR ROCK FOUNDATION:
FOR PRECAST BOX CULVERT $b = \frac{1}{4}''$ PER 12'' OF
H - 8'' MIN., 24'' MAX.

FOR CAST IN PLACE BOX CULVERT $b =$ DEPTH AS SHOWN
ON PLANS OR WHERE NO BEDDING IS SPECIFIED BOTTOM
SLAB TO BE KEYED INTO EXISTING ROCK FOUNDATION.

FOR SOFT, YIELDING OR OTHERWISE UNSUITABLE FOUNDATION:
FOR PRECAST AND CAST IN PLACE BOX CULVERT
 $b =$ DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

 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.

 EMBANKMENT

SHEET 4 OF 4

INSTALLATION OF BOX CULVERTS
BEDDING AND BACKFILL - METHOD "A"

REV. 1/04

107.04

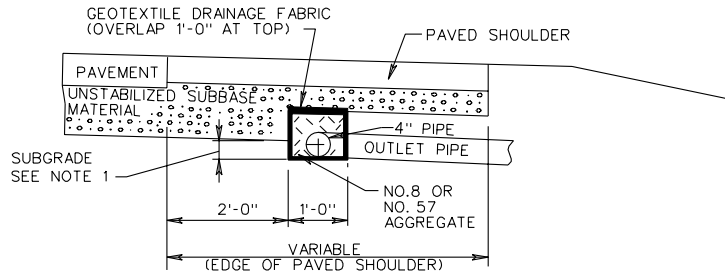
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

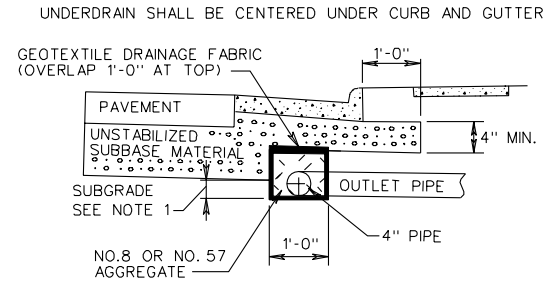
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303

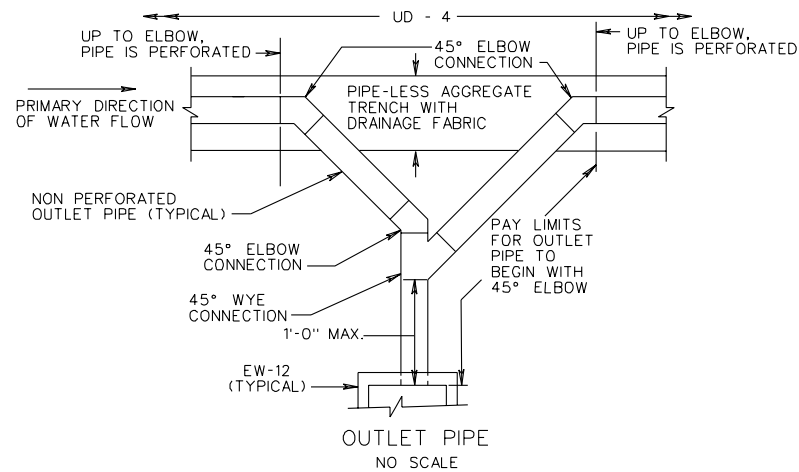
UD-4



PAVED SHOULDER SECTION



CURB AND GUTTER SECTION



SHEET 1 OF 2

STANDARD PAVEMENT EDGEDRAIN

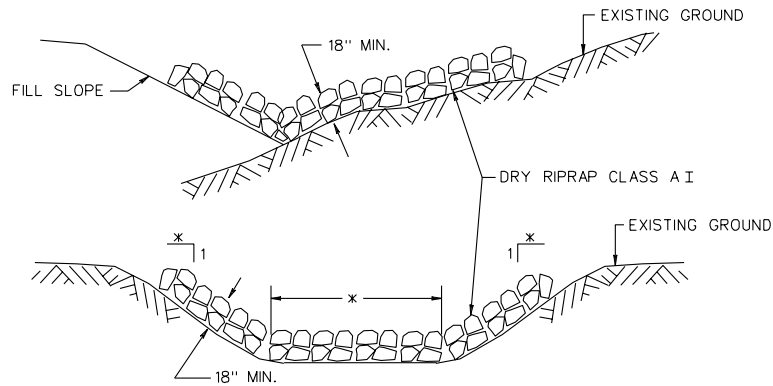
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 1/04
108.06

SPECIFICATION REFERENCE

240
258
501
701

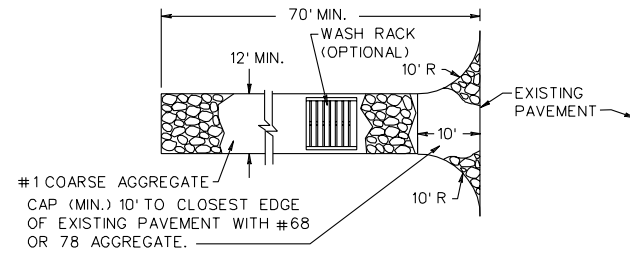
SUGGESTED METHOD OF TEMPORARILY PLACING RIPRAP FOR EROSION CONTROL IN CHANNELS, DITCHES, & AT TOE OF FILL SLOPES



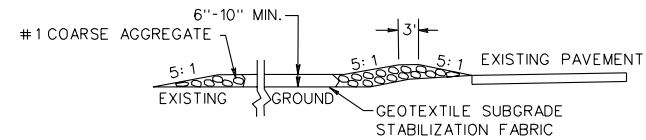
NOTES:

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.

MINIMUM REQUIREMENTS FOR STABILIZED CONSTRUCTION ENTRANCE



PLAN



PROFILE

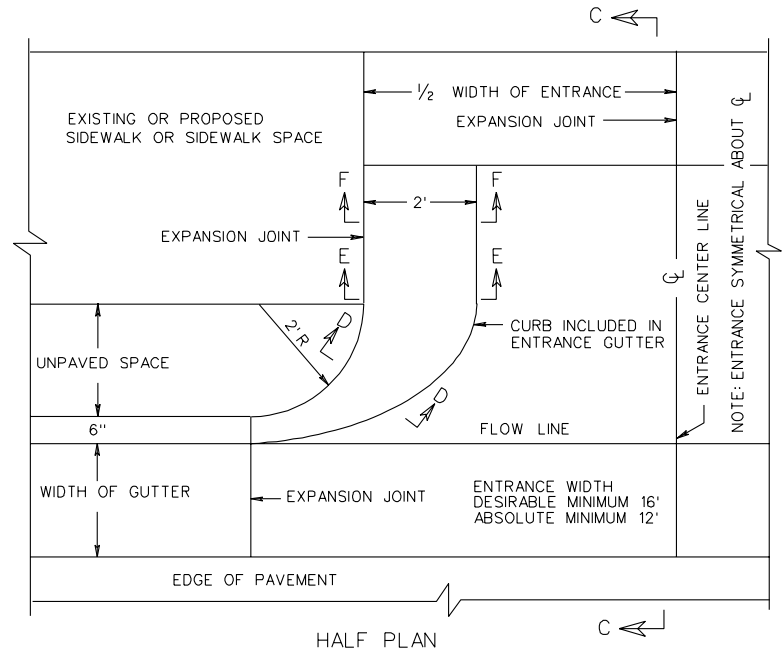
1. SURFACE WATER SHALL BE PIPED UNDER THE CONSTRUCTION ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. THIS MAY REQUIRE PERIODIC TOP 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.

* SIDE SLOPES AND BOTTOM WIDTH (IF TRAPEZOIDAL) SHOWN IN TYPICAL SECTION OF PROPOSED DITCH OR CHANNEL.

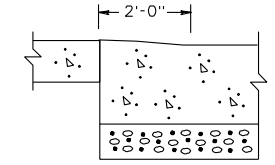
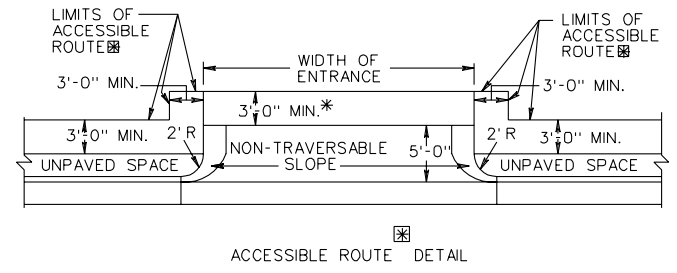
SPECIFICATION REFERENCE

107
303

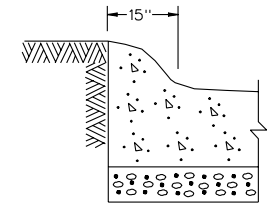
TEMPORARY EROSION & SILTATION CONTROL



ADDITIONAL RIGHT-OF-WAY IS REQUIRED IF THE LIMITS OF ACCESSIBLE ROUTE EXTEND BEYOND EXISTING OR PROPOSED VDOT RIGHT-OF-WAY.



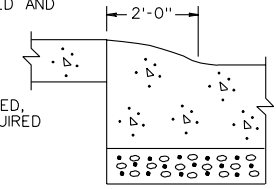
SECTION F-F



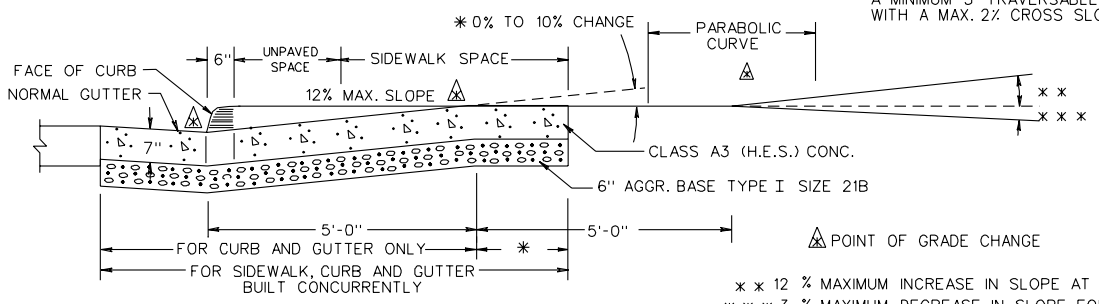
SECTION D-D

ACCESSIBLE ROUTE 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.

* IF ACCESSIBLE ROUTES ARE BEING PROVIDED, A MINIMUM 3' TRAVERSABLE WIDTH IS REQUIRED WITH A MAX. 2% CROSS SLOPE.



SECTION E-E



SECTION C-C

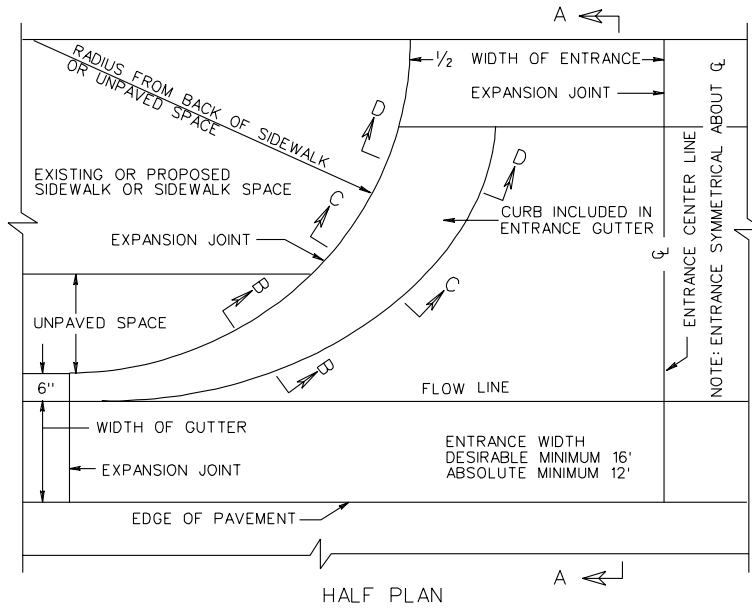
WHEN USED IN CONJUNCTION WITH STANDARD CG-3 OR CG-7, THE CURB FACE ON THIS STANDARD IS TO BE ADJUSTED TO MATCH THE MOUNTABLE CURB CONFIGURATION.

- *** 12% MAXIMUM INCREASE IN SLOPE AT MINIMUM 10' INTERVALS
- *** 3% MAXIMUM DECREASE IN SLOPE FOR FIRST 10' INTERVAL AND
- 8% MAXIMUM DECREASE FOR SUCCEEDING MINIMUM 10' INTERVALS

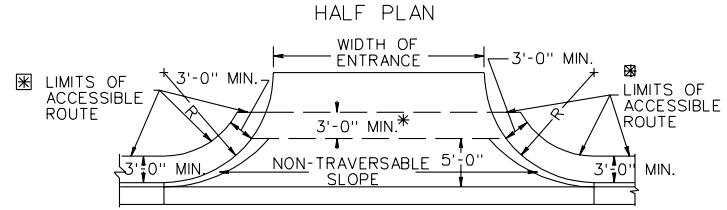
SPECIFICATION REFERENCE
502

STANDARD ENTRANCE GUTTER
FOR USE WITH UNPAVED SPACE BETWEEN CURB & SIDEWALK
VIRGINIA DEPARTMENT OF TRANSPORTATION

CG-9D



HALF PLAN



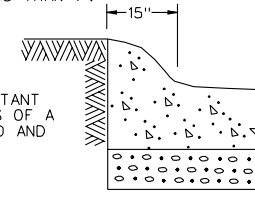
ACCESSIBLE ROUTE DETAIL

ADDITIONAL RIGHT-OF-WAY IS REQUIRED IF THE LIMITS OF ACCESSIBLE ROUTE EXTEND BEYOND EXISTING OR PROPOSED VDOT RIGHT-OF-WAY.

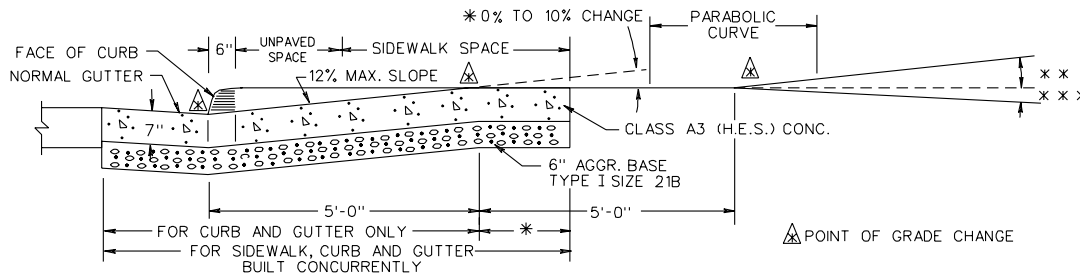
DETAIL TO BE USED WHEN THE COMBINED WIDTH OF UNPAVED SPACE AND SIDEWALK SPACE IS LESS THAN 7'.

ACCESSIBLE ROUTES 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.

IF ACCESSIBLE ROUTES ARE BEING PROVIDED, A MINIMUM 3' TRAVERSABLE WIDTH IS REQUIRED WITH A MAX. 2% CROSS SLOPE.

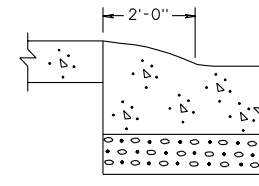


SECTION B-B

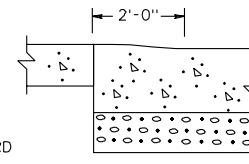


SECTION A-A

* * 12 % MAXIMUM INCREASE IN SLOPE AT MINIMUM 10' INTERVALS
 * * * 3 % MAXIMUM DECREASE IN SLOPE FOR FIRST 10' INTERVAL AND
 8 % MAXIMUM DECREASE FOR SUCCEEDING MINIMUM 10' INTERVALS



SECTION C-C



SECTION D-D

WHEN USED IN CONJUNCTION WITH STANDARD CG-3 OR CG-7, THE CURB FACE ON THIS STANDARD IS TO BE ADJUSTED TO MATCH THE MOUNTABLE CURB CONFIGURATION.

STANDARD ENTRANCE GUTTER

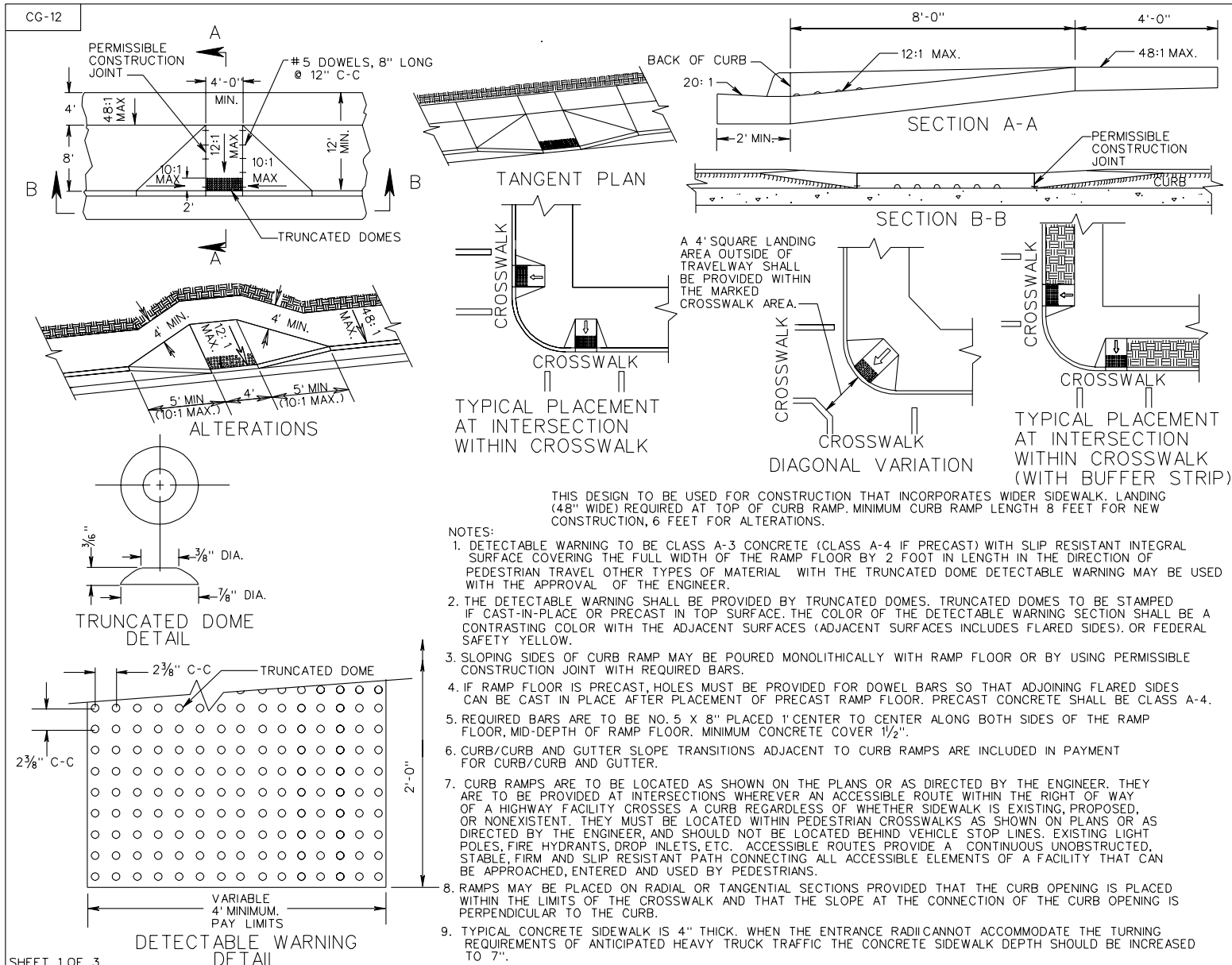
REV. 1/04
203.03

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

502

INSERTABLE SHEET A59



SHEET 1 OF 3

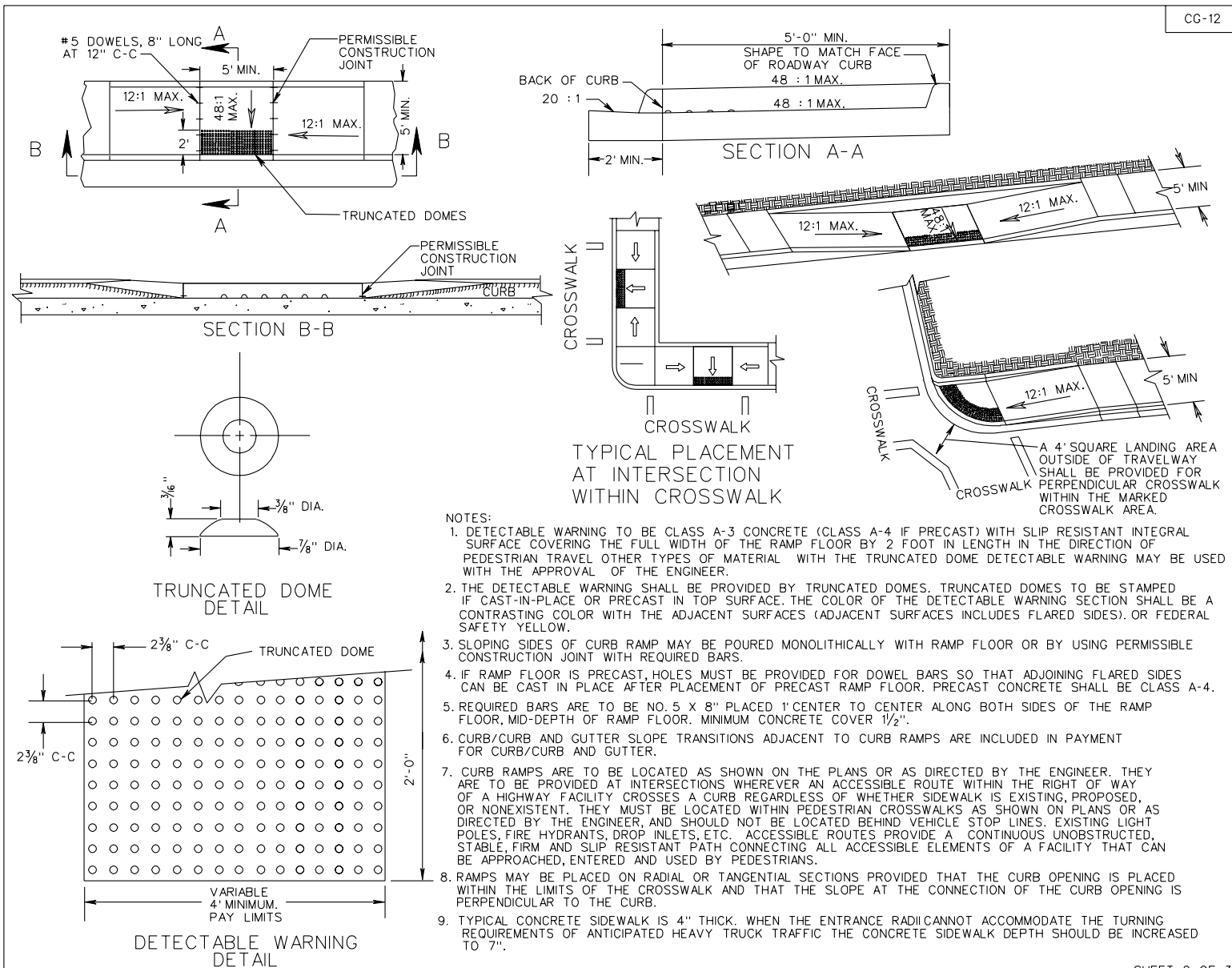
CG-12 DETECTABLE WARNING SURFACE
TYPE A (PERPENDICULAR) APPLICATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

105
502

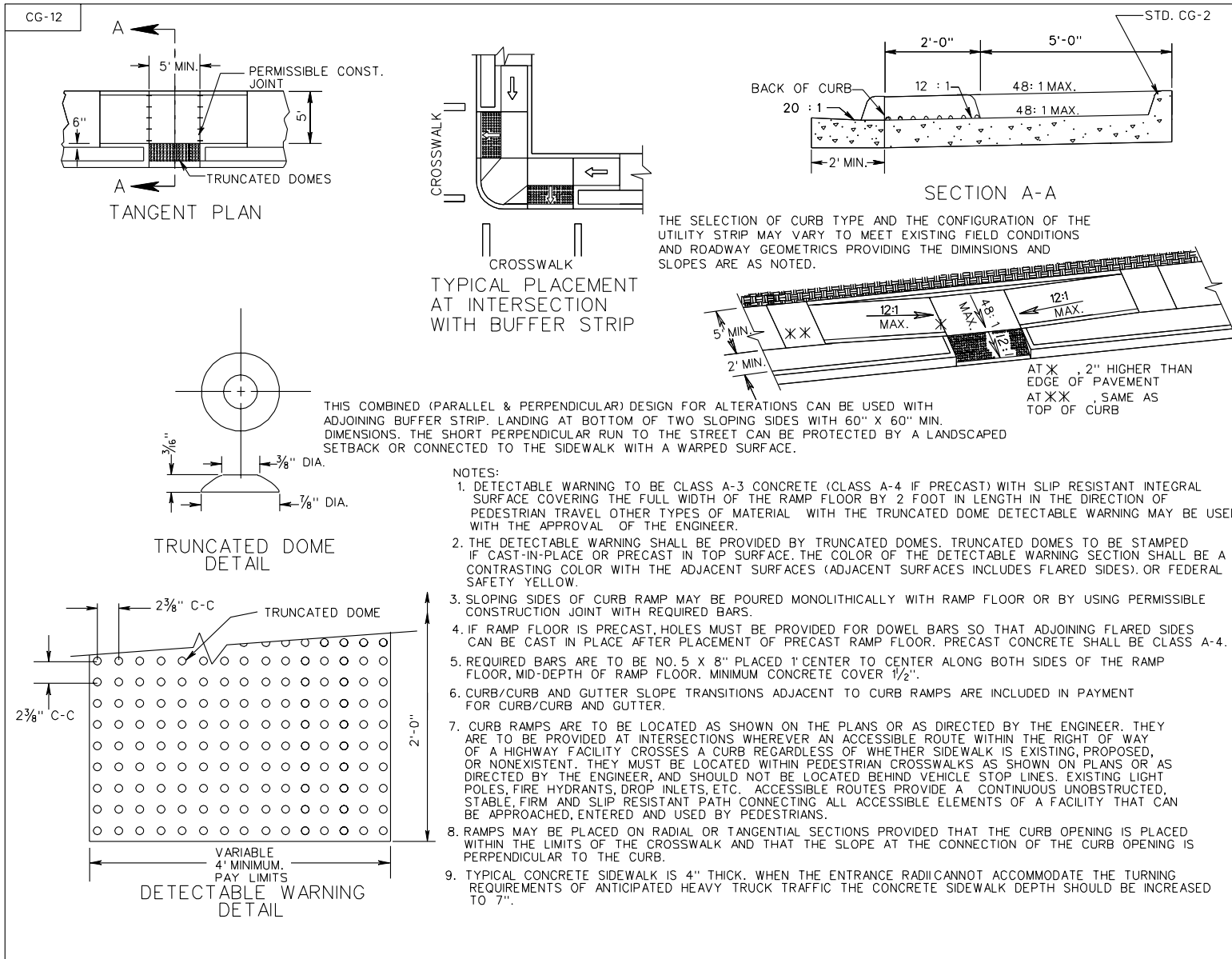
REV. 1/04
203.05



- 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 RADI CANNOT ACCOMMODATE THE TURNING REQUIREMENTS OF ANTICIPATED HEAVY TRUCK TRAFFIC THE CONCRETE SIDEWALK DEPTH SHOULD BE INCREASED TO 7".

SPECIFICATION REFERENCE
105 502

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



SHEET 3 OF 3

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

REV. 1/04
203.07

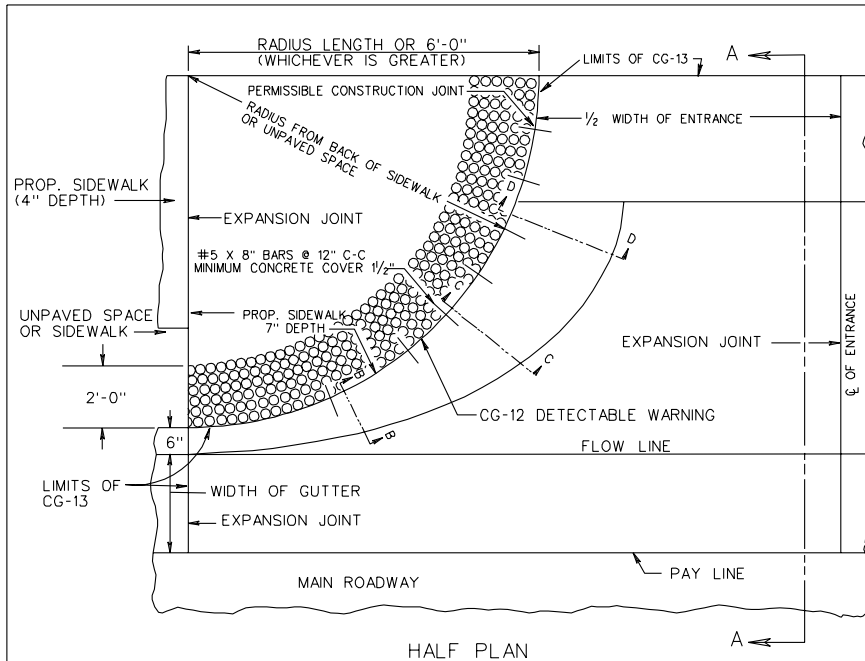
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

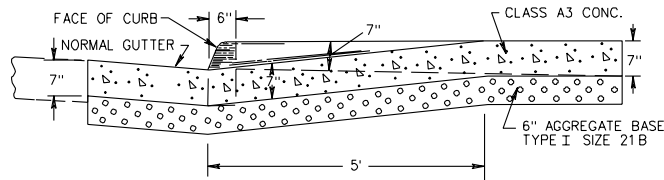
105
502

INSERTABLE SHEET A108

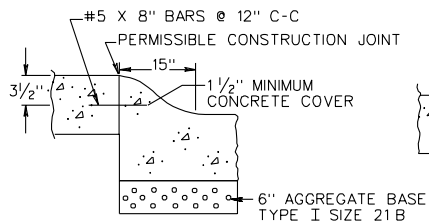
CG-13



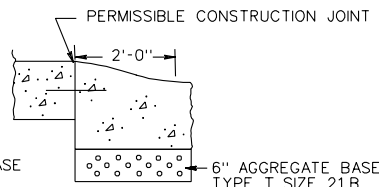
HALF PLAN



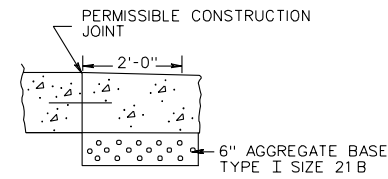
SECTION A-A



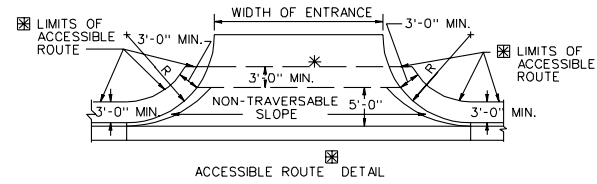
SECTION B-B



SECTION C-C



SECTION D-D



ADDITIONAL RIGHT-OF-WAY IS REQUIRED IF THE LIMITS OF ACCESSIBLE ROUTE EXTEND BEYOND EXISTING OR PROPOSED VDOT RIGHT-OF-WAY.

DETAIL TO BE USED WHEN THE COMBINED WIDTH OF UNPAVED SPACE AND SIDEWALK SPACE IS LESS THAN 7'.

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.

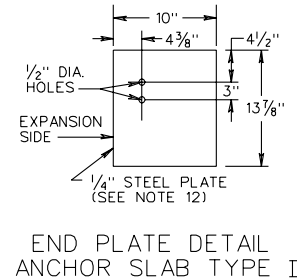
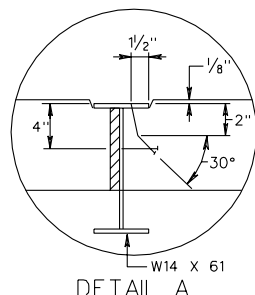
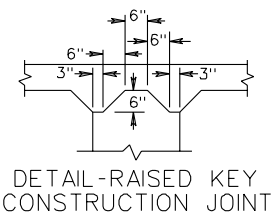
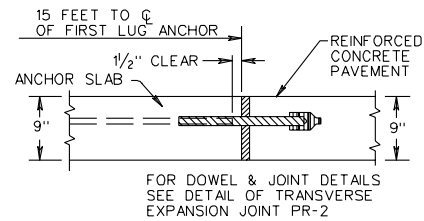
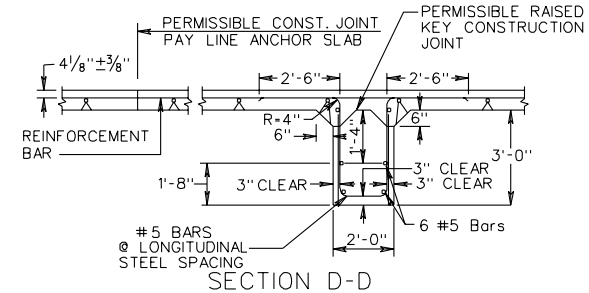
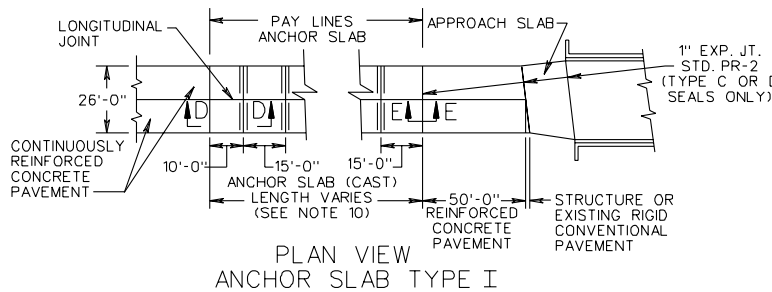
* IF ACCESSIBLE ROUTES ARE BEING PROVIDED, A MINIMUM 3' TRAVERSABLE WIDTH IS REQUIRED WITH MAX. 2% CROSS SLOPE.

NOTES:

1. PROP. 7" SIDEWALK IS TO BE POURED MONOLITHICALLY WITH ENTRANCE OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
2. PROPOSED 7" SIDEWALK TO BE CLASS A-3 CONCRETE.
3. REQUIRED BARS ARE TO BE NO. 5X8" PLACED 1' CENTER TO CENTER ALONG BACK OF CURB, MID-DEPTH OF SIDEWALK. MINIMUM CONCRETE COVER 1/2".
4. ALL DETAILS AND DIMENSIONS NOT SHOWN ARE THE SAME AS STANDARD CG-9D.
5. THIS DESIGN MAY ALSO BE APPLIED TO OTHER ENTRANCE STANDARDS AS THE NEED ARISES.
6. WHEN USED IN CONJUNCTION WITH STANDARD CG-3 OR CG-7, THE CURB FACE ON THIS STANDARD IS TO BE ADJUSTED TO MATCH THE MOUNTABLE CURB CONFIGURATION.
7. SEE INSERTABLE SHEET A59 FOR STANDARD CG-12 DETECTABLE WARNING DETAILS.

SPECIFICATION REFERENCE	<p>COMMERCIAL ENTRANCE (HEAVY TRUCK TRAFFIC ANTICIPATED)</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	REV. 1/04
502		203.08

PR-5

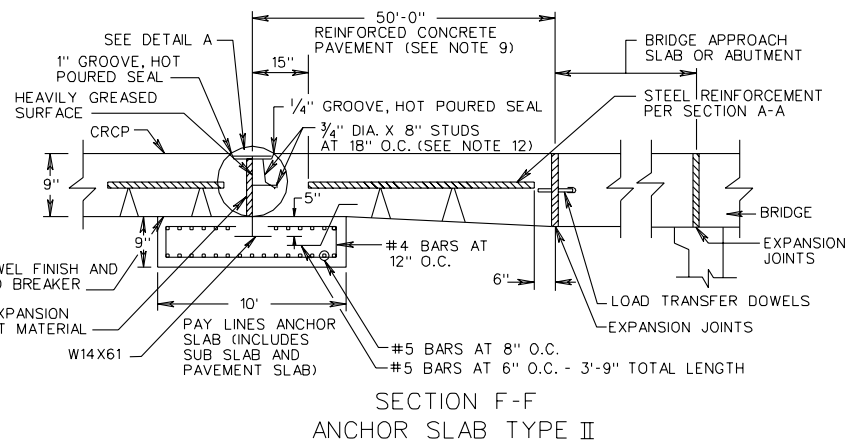
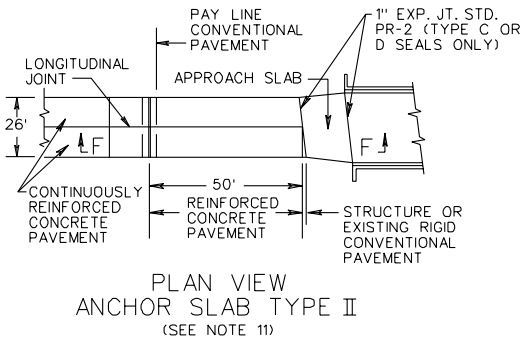


SECTION E-E ANCHOR SLAB TYPE I

DETAIL-RAISED KEY CONSTRUCTION JOINT

DETAIL A

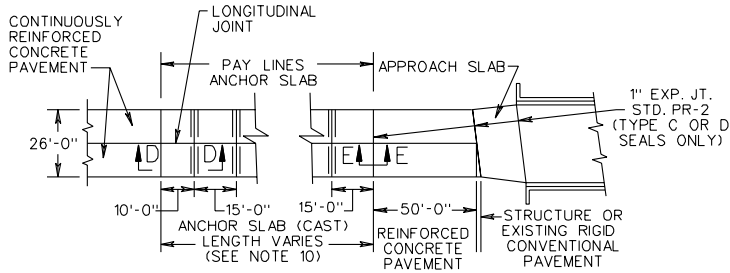
END PLATE DETAIL ANCHOR SLAB TYPE II



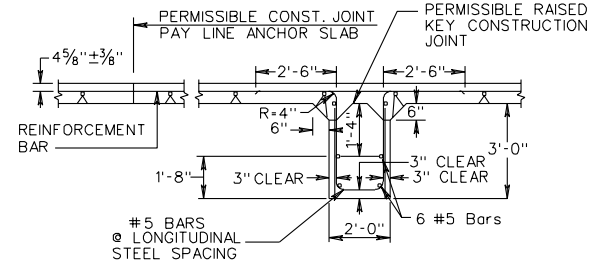
SHEET 2 OF 3

SEE SHEET 3 OF 3 FOR NOTES.

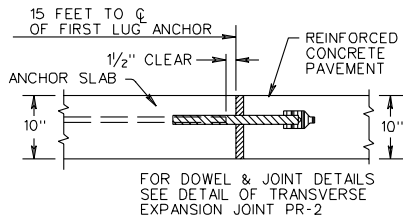
REV. 1/04 301.14	9" THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 14 FOOT TRAVEL LANE	SPECIFICATION REFERENCE
	VIRGINIA DEPARTMENT OF TRANSPORTATION	316



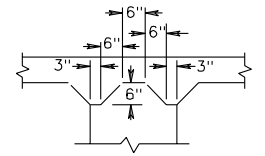
PLAN VIEW ANCHOR SLAB TYPE I



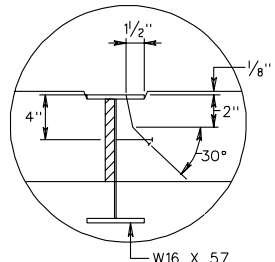
SECTION D-D



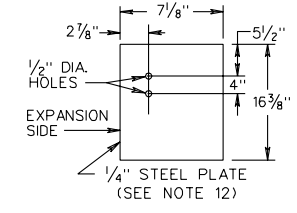
SECTION E-E ANCHOR SLAB TYPE I



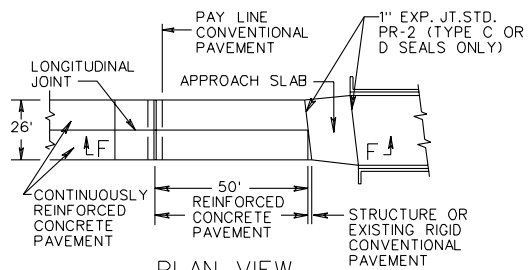
DETAIL-RAISED KEY CONSTRUCTION JOINT



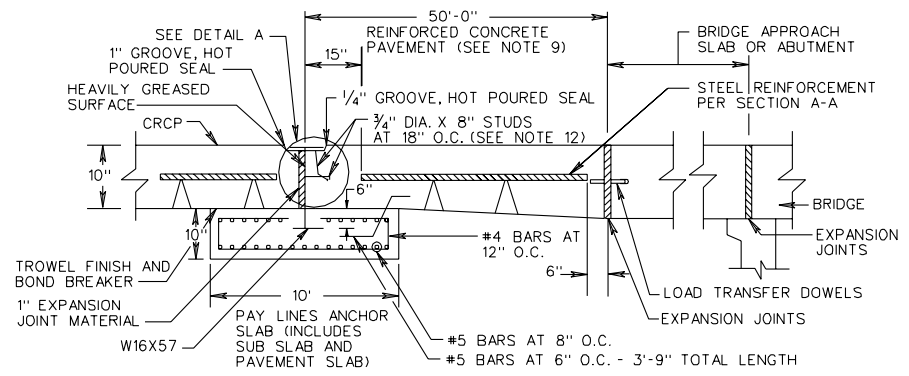
DETAIL A



ANCHOR SLAB TYPE II END PLATE DETAIL



PLAN VIEW ANCHOR SLAB TYPE II (SEE NOTE 11)



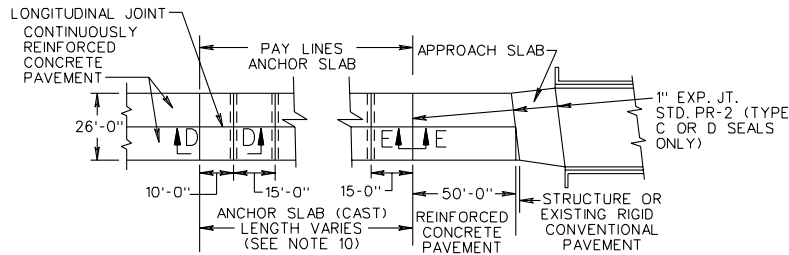
SECTION F-F ANCHOR SLAB TYPE II

SEE SHEET 3 OF 3 FOR NOTES

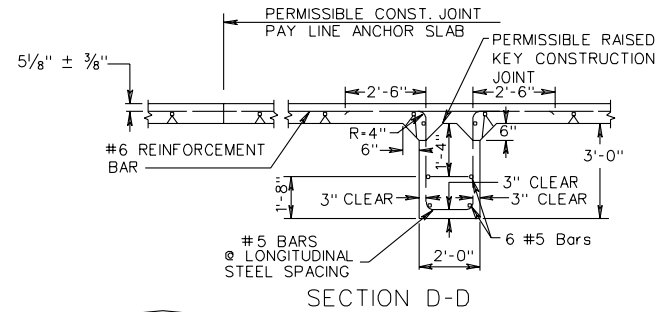
SHEET 2 OF 3

SPECIFICATION REFERENCE	<p>10" THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 14 FOOT TRAVEL LANE</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>
316	
REV. 1/04 301.17	

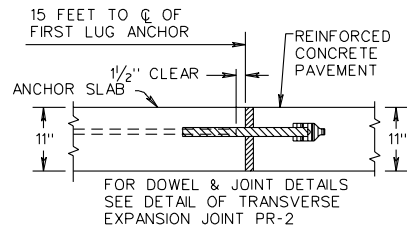
PR-7



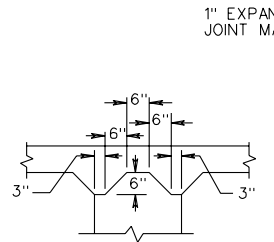
PLAN VIEW
ANCHOR SLAB TYPE I



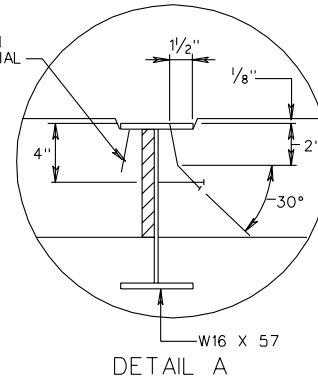
SECTION D-D



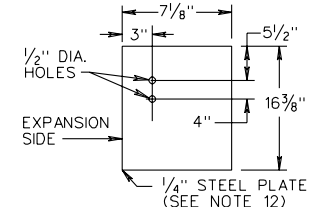
SECTION E-E
ANCHOR SLAB TYPE I



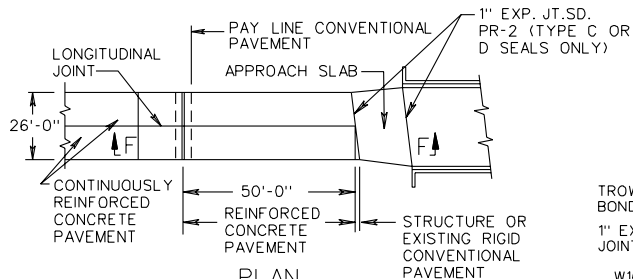
DETAIL-RAISED KEY
CONSTRUCTION JOINT



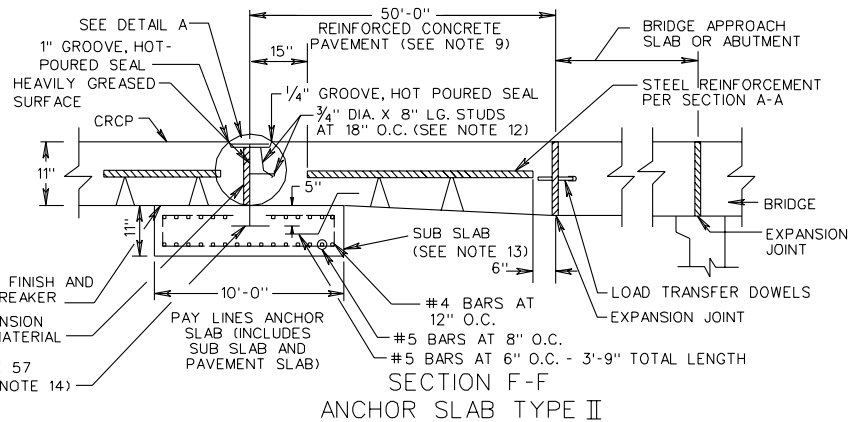
DETAIL A



ANCHOR SLAB TYPE II
END PLATE DETAIL



PLAN
ANCHOR SLAB TYPE II
(SEE NOTE 11)



SECTION F-F
ANCHOR SLAB TYPE II

SHEET 2 OF 3

SEE SHEET 3 OF 3 FOR NOTES

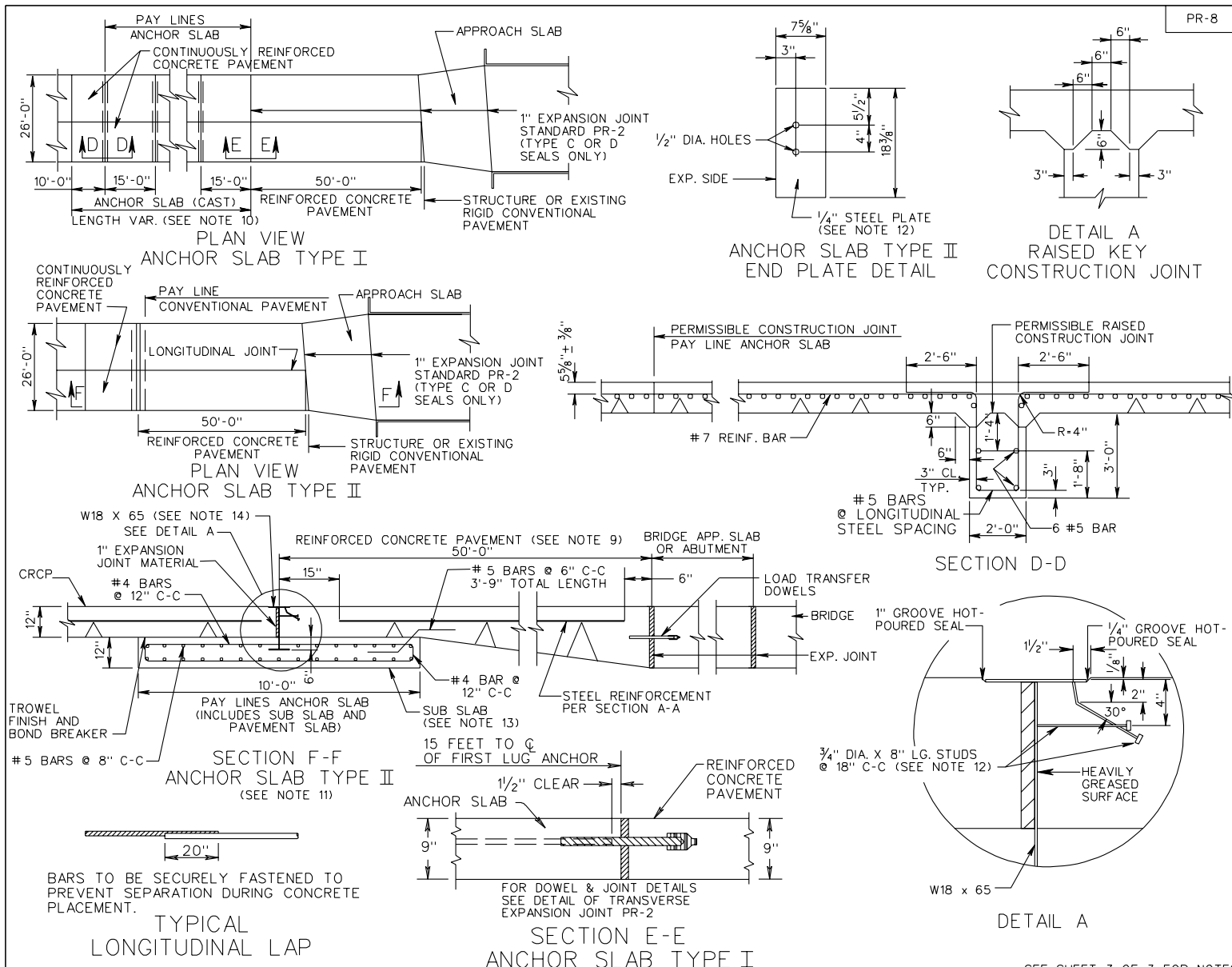
11" THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
14 FOOT TRAVEL LANE

REV. 1/04
301.20

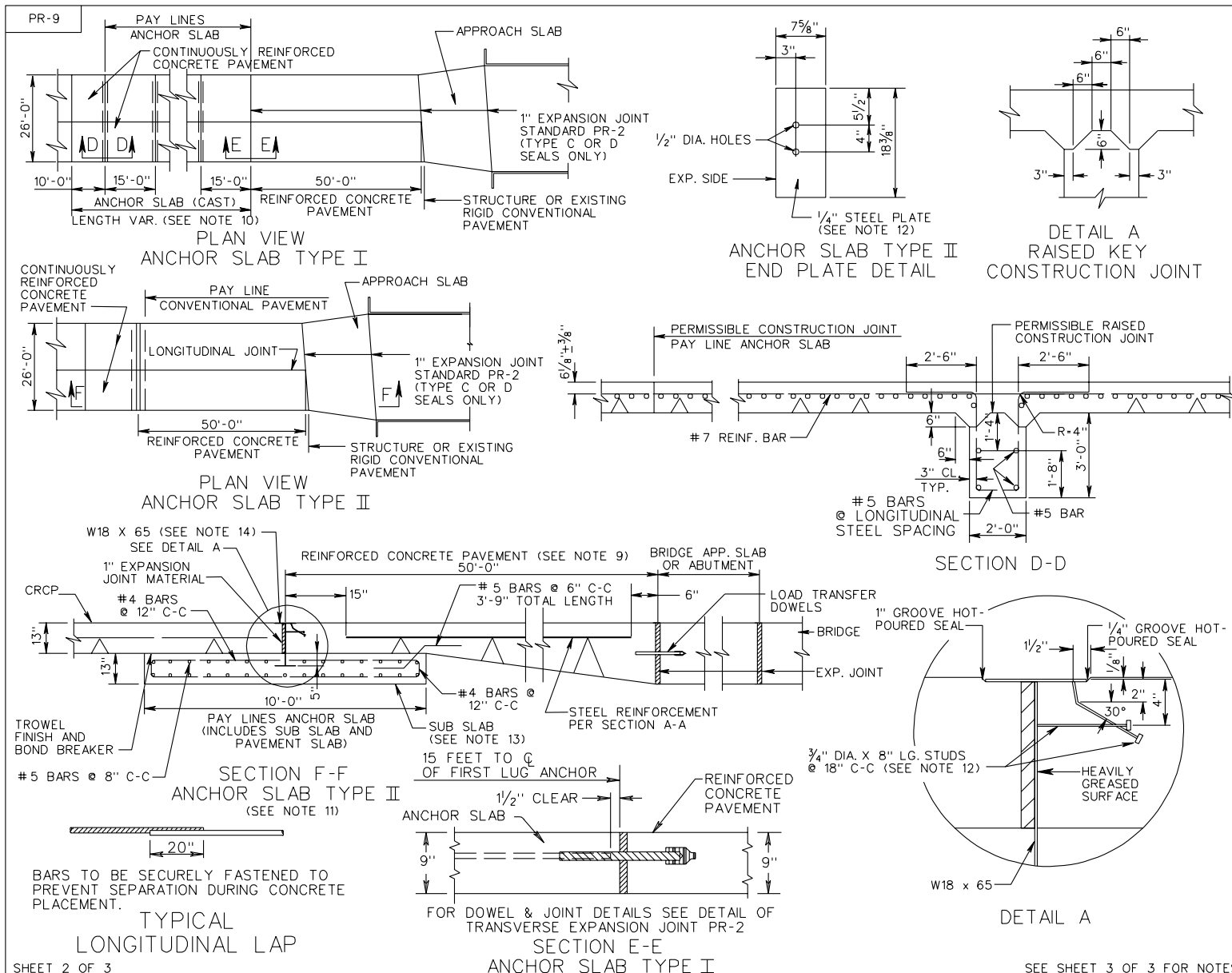
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

316



SHEET 2 OF 3		SEE SHEET 3 OF 3 FOR NOTES	
SPECIFICATION REFERENCE	12" THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 14' TRAVEL LANE		
316	VIRGINIA DEPARTMENT OF TRANSPORTATION		REV. 1/04 301.23



SHEET 2 OF 3

SEE SHEET 3 OF 3 FOR NOTES

13" THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
 14' TRAVEL LANE

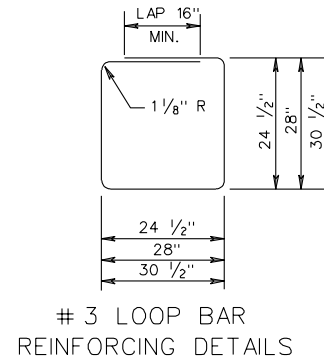
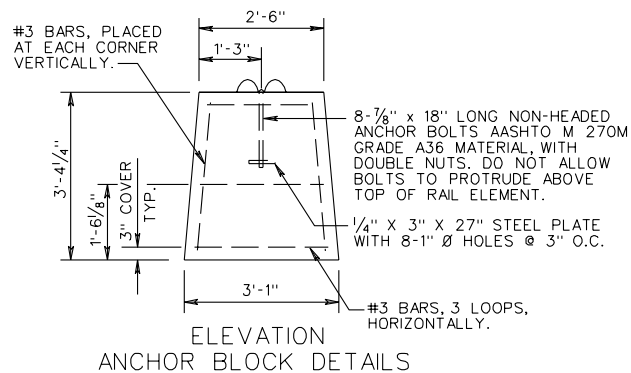
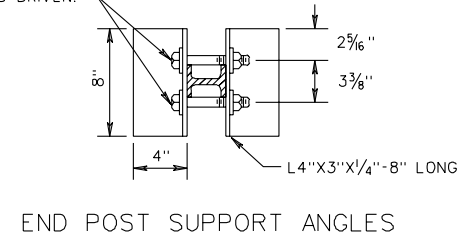
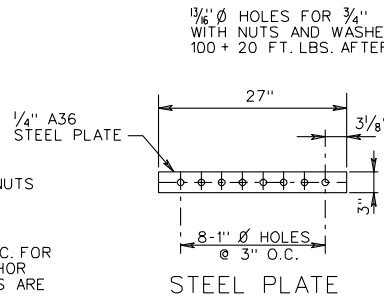
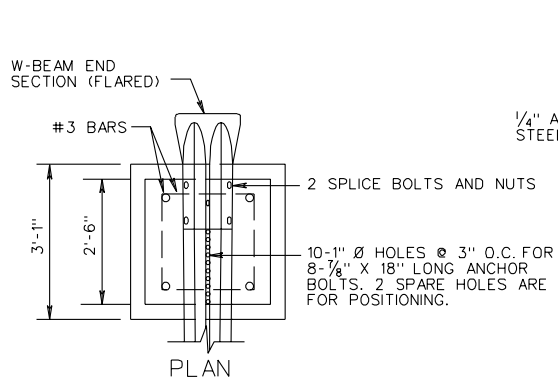
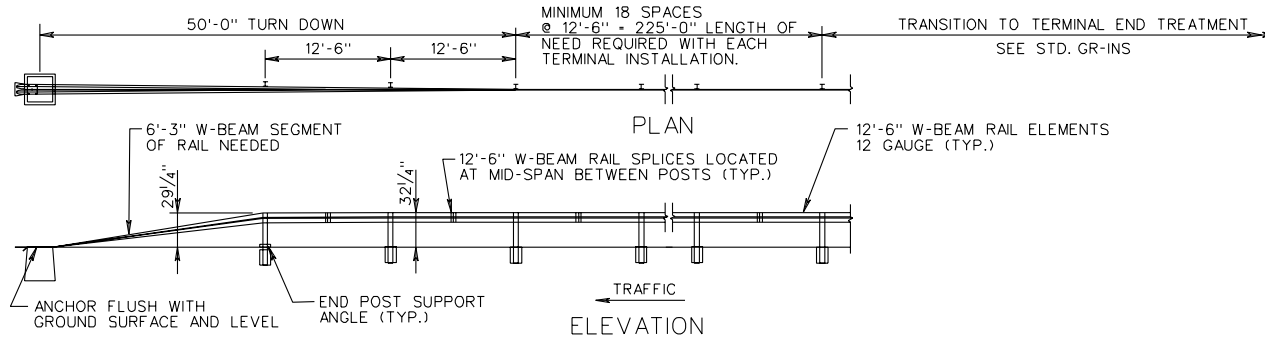
REV. 1/04
 301.26

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
 REFERENCE

316

GR-8,8A,8B,8C



GR-8 TYPE II TERMINAL TREATMENT
(RUN-OFF ANCHORAGE)

SHEET 2 OF 2

STANDARD W BEAM GUARDRAIL (WEAK POST SYSTEM)
TL-3 (>45 MPH)

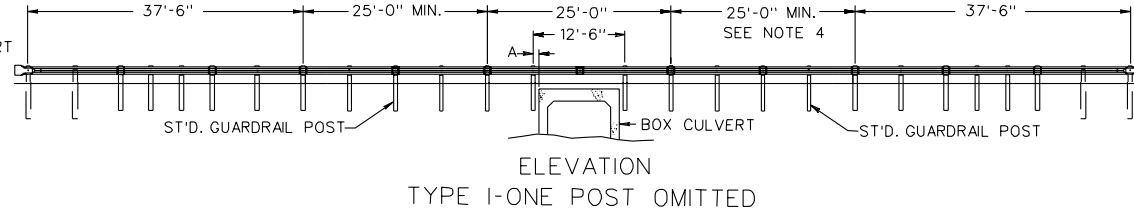
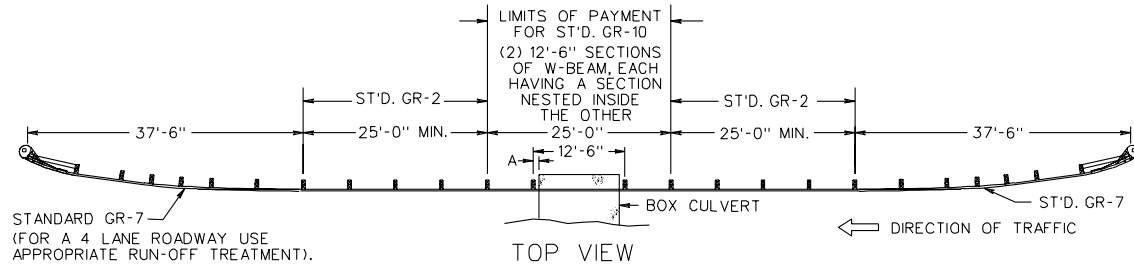
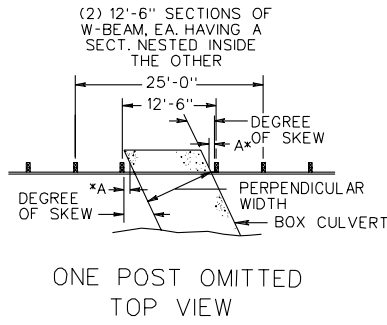
REV. 1/04
501.15

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

221
505

GR-10



FOR DETAILS OF GUARDRAIL POSTS AND BLOCKOUTS, SEE STANDARD GR-2, 2A.

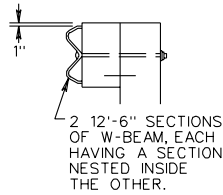
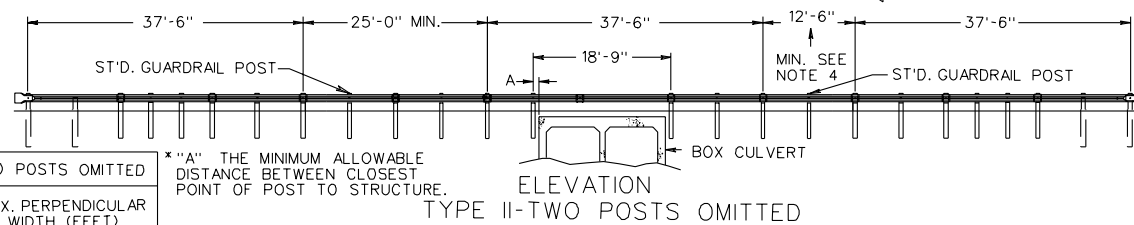
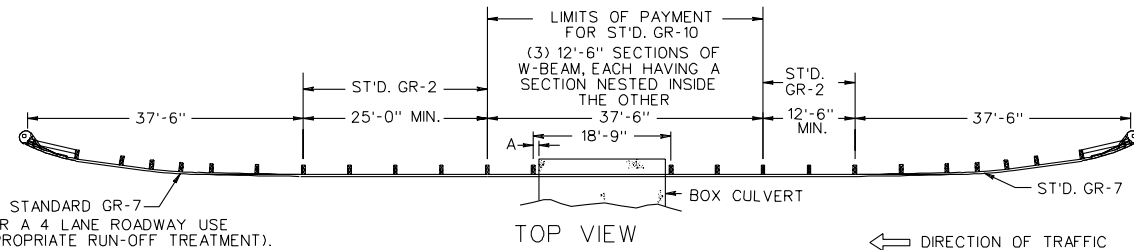


TABLE OF MAXIMUM ALLOWABLE STRUCTURE WIDTHS FOR THIS DESIGN



TYPE I-ONE POST OMITTED			TYPE II-TWO POSTS OMITTED		
SKEW	A*	MAX. PERPENDICULAR WIDTH (FEET)	SKEW	A*	MAX. PERPENDICULAR WIDTH (FEET)
0°	9"	10.5	0°	9"	16.75
5°	9"	10.4	5°	9"	16.6
10°	9"	10.2	10°	9"	16.4
15°	9"	10.0	15°	9"	16.0
20°	9"	9.6	20°	9"	15.5
25°	9"	9.2	25°	9"	14.9
30°	9"	8.8	30°	9"	14.2
35°	9"	8.2	35°	9"	13.2
40°	9"	7.6	40°	9"	12.4
45°	9"	7.0	45°	9"	11.4

* "A" THE MINIMUM ALLOWABLE DISTANCE BETWEEN CLOSEST POINT OF POST TO STRUCTURE.

- NOTES:
1. THIS SHEET IS APPLICABLE WHEN GUARDRAIL IS REQUIRED AND THE DEPTH OF FILL ABOVE THE TOP SLAB OF THE BOX CULVERT IS LESS THAN 3'-7".
 2. GUARDRAIL INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 505 OF THE SPECIFICATIONS. MATERIAL REQUIREMENT FOR COMPONENTS SHALL BE IN ACCORDANCE WITH SECTION 221 OF THE SPECIFICATIONS.
 3. GUARDRAIL POST SPACING SHALL BE IN ACCORDANCE WITH STANDARD GR-2.
 4. THIS DISTANCE SHALL BE IN ACCORDANCE WITH VDOT POLICY ON DETERMINING THE LENGTH OF NEED FOR GUARDRAIL WITH A MINIMUM DISTANCE AS SHOWN.
 5. ALL SPLICES IN NESTED W-BEAM SECTIONS MUST COINCIDE AT A COMMON POINT AND BE BOLTED TOGETHER USING ONE SET OF BOLTS AT EACH SPLICE.

SHEET 1 OF 2

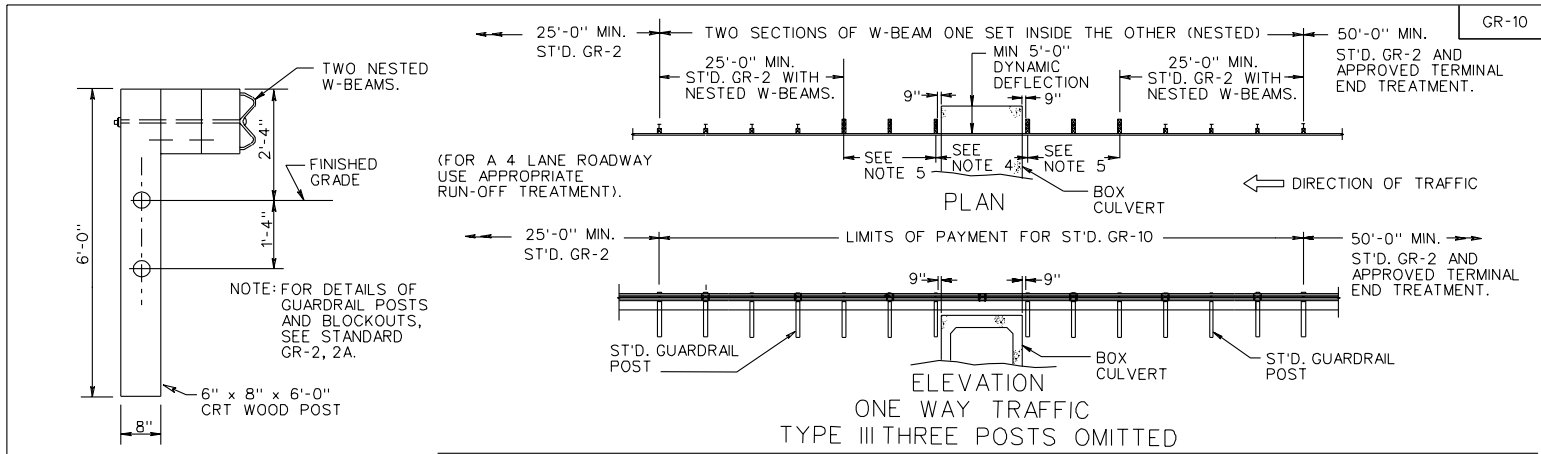
REV 1/04
501.19

GUARDRAIL AT LOW-FILL CULVERTS

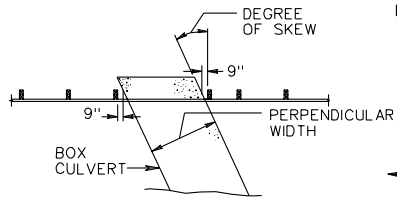
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

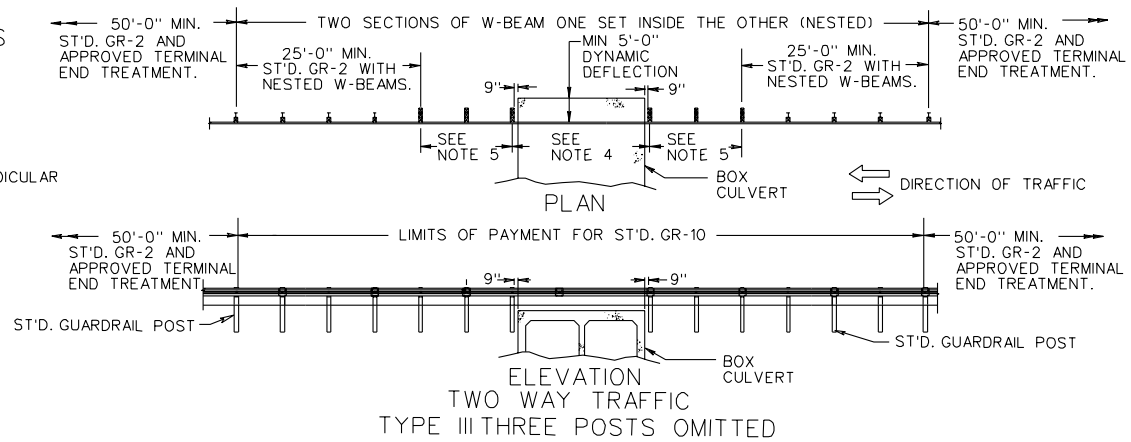
221
505



CRT POST WITH DOUBLE BLOCKOUTS



THREE POSTS OMITTED TOP VIEW



TYPE III-THREE POSTS OMITTED	
SKEW	MAX. PERPENDICULAR WIDTH (FEET)
0°	23.00
5°	22.90
10°	22.60
15°	22.10
20°	21.40
25°	20.60
30°	19.60
35°	18.40
40°	17.10
45°	15.60

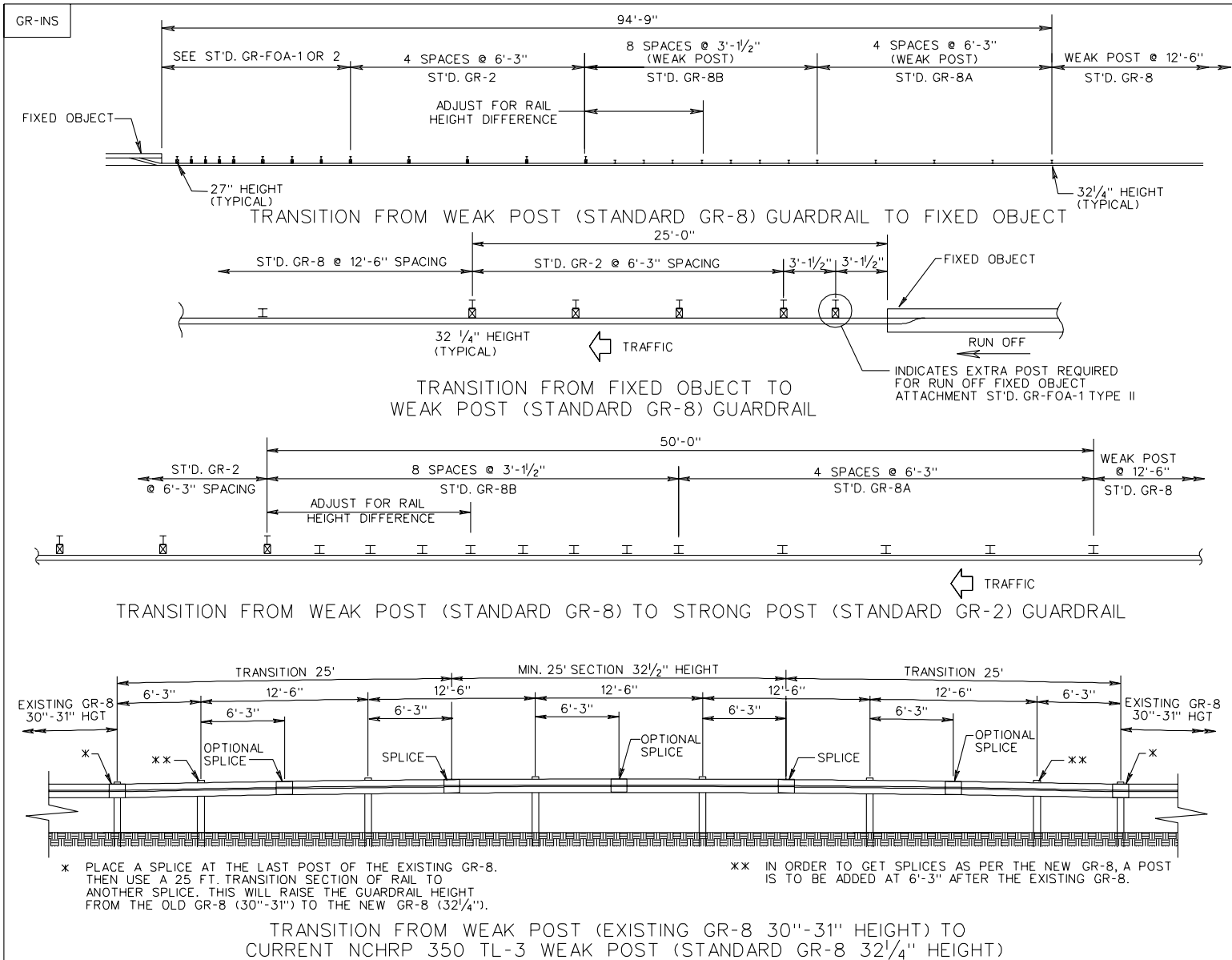
NOTES:

1. THIS SHEET IS APPLICABLE WHEN GUARDRAIL IS REQUIRED AND THE DEPTH OF FILL ABOVE THE TOP SLAB OF THE BOX CULVERT IS LESS THAN 3'-7".
2. GUARDRAIL INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 505 OF THE SPECIFICATIONS. MATERIAL REQUIREMENT FOR COMPONENTS SHALL BE IN ACCORDANCE WITH SECTION 221 OF THE SPECIFICATIONS.
3. GUARDRAIL POST SPACING SHALL BE IN ACCORDANCE WITH STANDARD GR-2.
4. TWO NESTED W-BEAM GUARDRAILS, SEE TABLE FOR ALLOWABLE WIDTHS (25'-0" MAXIMUM).
5. TWO NESTED W-BEAM GUARDRAILS, CRT WOODPOST, 6'-3" SPACING, WITH TWO 6"x8"x14" WOOD OR RECYCLED MATERIAL BLOCKOUTS.
6. ALL SPLICES IN NESTED W-BEAM SECTIONS MUST COINCIDE AT A COMMON POINT AND BE BOLTED TOGETHER USING ONE SET OF BOLTS AT EACH SPLICE.

SPECIFICATION REFERENCE	221 505
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GUARDRAIL AT LOW-FILL CULVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION



SHEET 7 OF 8

REV. 1/ 04

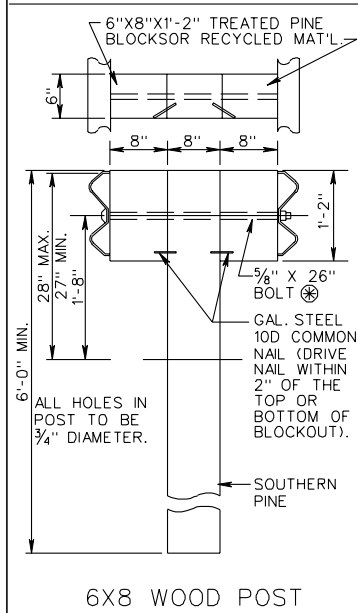
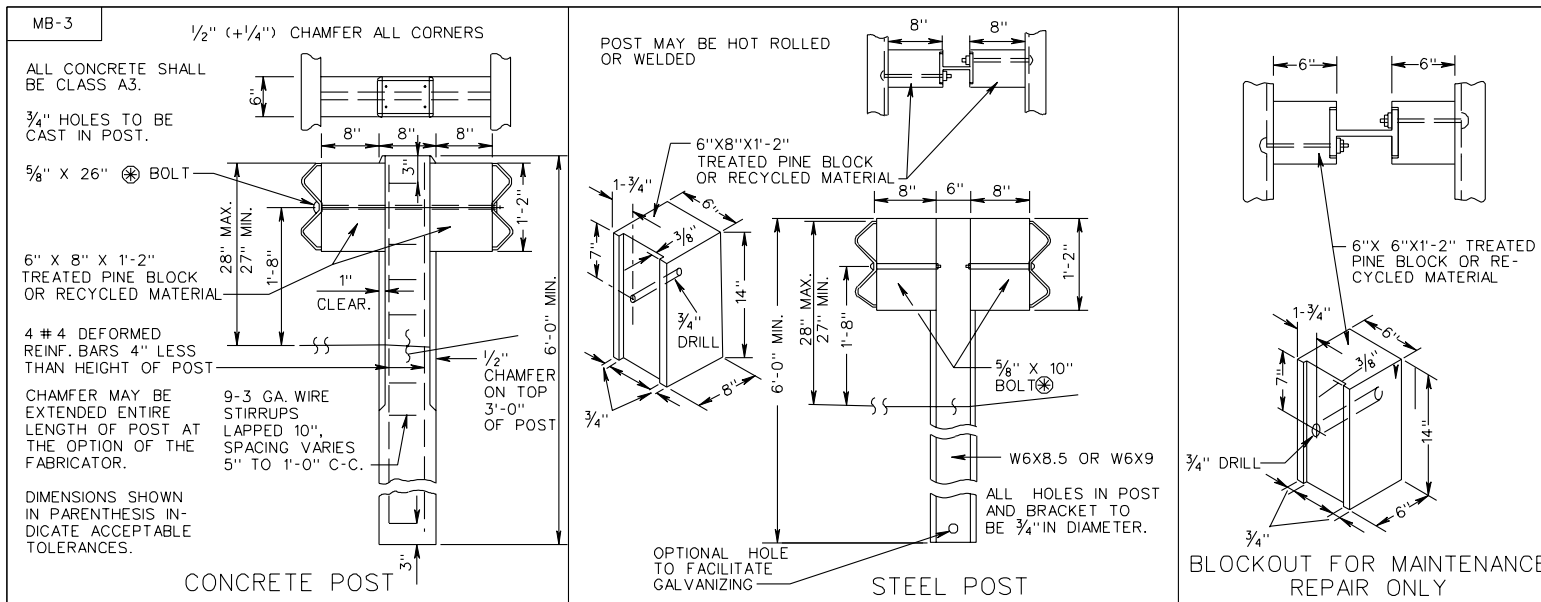
501.39

W BEAM GUARDRAIL INSTALLATION CRITERIA

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

221
505

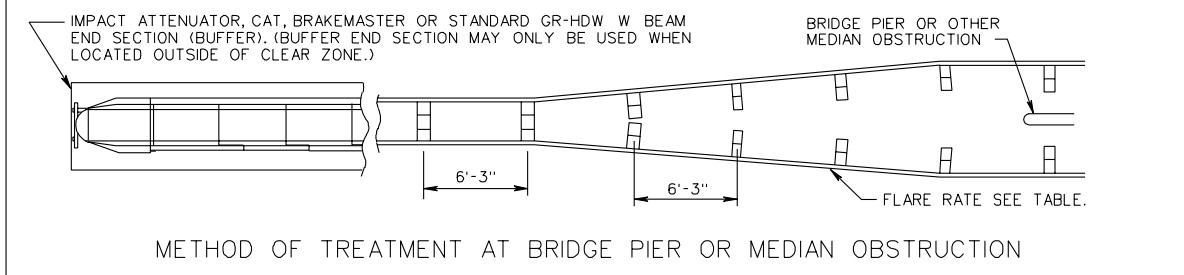


NOTES:
 STANDARD MB-3 POST SPACING IS 6'-3".
 FOR DETAILS OF RAIL ELEMENT, RAIL SPLICE JOINT, W BEAM BACK UP PLATE, AND ASSOCIATED HARDWARE SEE SHEET NO. 501.01.
 ALTERNATE TYPE POSTS AND BLOCKOUTS MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF MEDIAN BARRIER.
 ALL BOLTS, NUTS, WASHERS, STEEL POSTS, BENT PLATE POST, AND BLOCKOUTS ARE TO BE GALVANIZED.

THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN A.R.T.B.A. TECHNICAL BULLETIN NUMBER 268B MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.
 * STANDARD WASHERS ARE TO BE USED ON LAST 50' OF RUN OFF END.

DESIGN SPEED	FLARE RATES		
	INSIDE SHY LINE	BEYOND SHY LINE	
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30:1	15:1 *
60	8'	26:1	14:1 *
50	6.5'	21:1	11:1 *
40	5'	17:1	8:1 *
30	3.5'	13:1	7:1 *

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



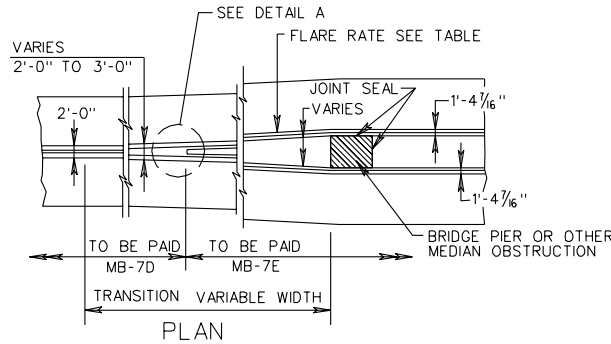
BLOCKED-OUT W BEAM MEDIAN BARRIER

REV. 1/04
 501.41

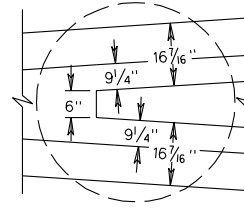
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
 221
 505

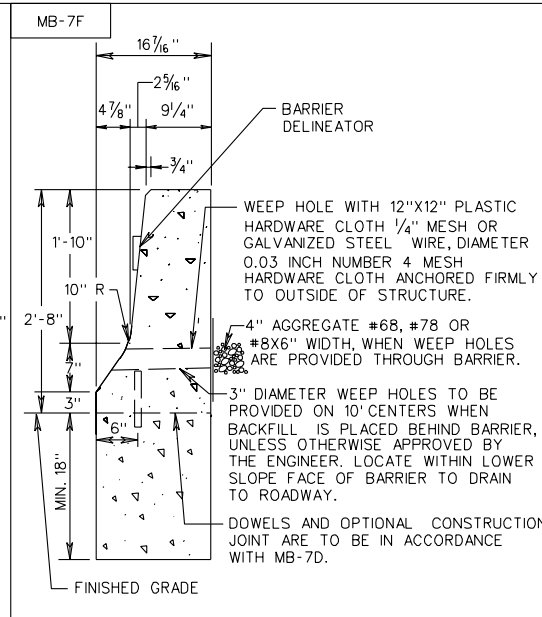
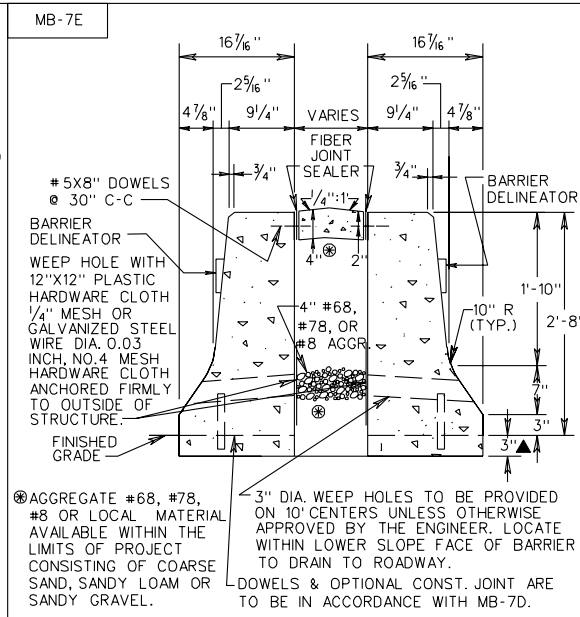
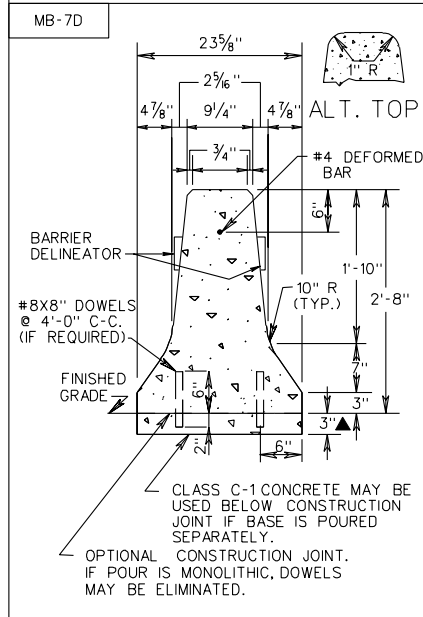
MB-7D,7E,7F



* SUGGESTED MAXIMUM FLARE RATE FOR RIGID BARRIER SYSTEMS.



FLARE RATES			
DESIGN SPEED	INSIDE SHY LINE	BEYOND SHY LINE	
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30:1	20:1 *
60	8'	26:1	18:1 *
50	6.5'	21:1	14:1 *
40	5'	16:1	10:1 *
30	3.5'	13:1	8:1 *



NOTES:
IF THE CONTRACTOR ELECTS TO USE THE OPTIONAL CONSTRUCTION JOINT, TRANSVERSE JOINTS FOR CRACK CONTROL AND EXPANSION JOINTS ARE TO BE PROVIDED IN BOTH FOOTING AND BARRIER AT THE SAME LOCATION.
TRANSVERSE JOINTS ARE TO COINCIDE WITH JOINTS IN ADJACENT PAVEMENT WITH A MAXIMUM SPACING OF 20 FEET C-C.
CONCRETE MEDIAN BARRIER MAY BE PRECAST, CAST IN PLACE OR SLIP-FORMED. FOR PRECAST DESIGN SEE STANDARD MB-7D PC.
HORIZONTAL REINFORCING STEEL BARS ARE TO BE SEPARATED AT ALL EXPANSION AND CONTRACTION JOINTS. A 2" CONCRETE COVER IS REQUIRED OVER THE ENDS OF THE REINFORCING STEEL.

BARRIER DELINEATOR SIZE, COLOR, AND SPACING TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
COST OF DELINEATOR TO BE INCLUDED IN THE PRICE BID FOR MEDIAN BARRIER.
REFLECTIVE SURFACE OF BARRIER DELINEATOR IN ALL INSTANCES, TO BE FACING ONCOMING TRAFFIC.
ALTERNATE TOP DESIGN SHOWN ON MB-7D. MAY ALSO BE APPLIED TO MB-7E AND MB-7F.
CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
▲ 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 FOOT OF BARRIER.

SPECIFICATION REFERENCE
105 502

CONCRETE MEDIAN BARRIER

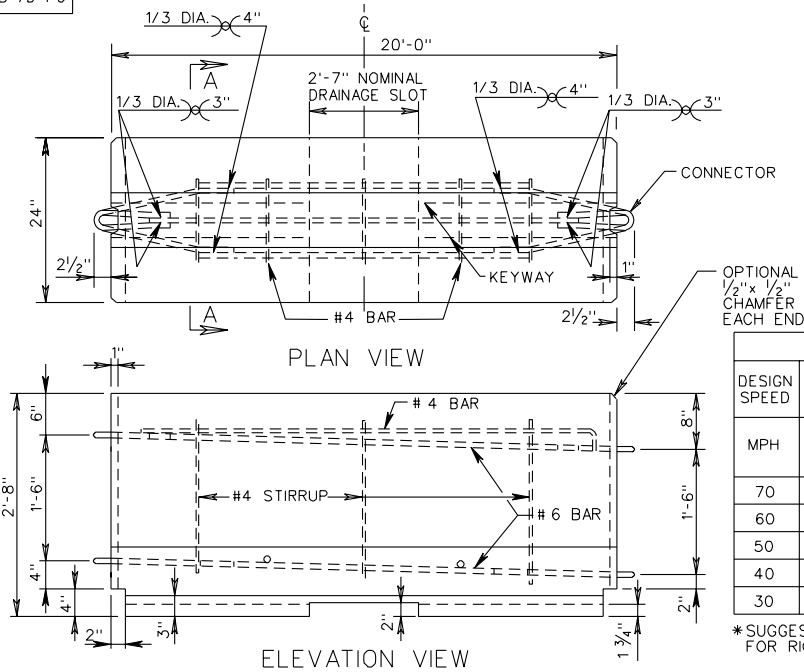
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 1 / 04

501.44

INSERTABLE SHEET A103

MB-7D PC



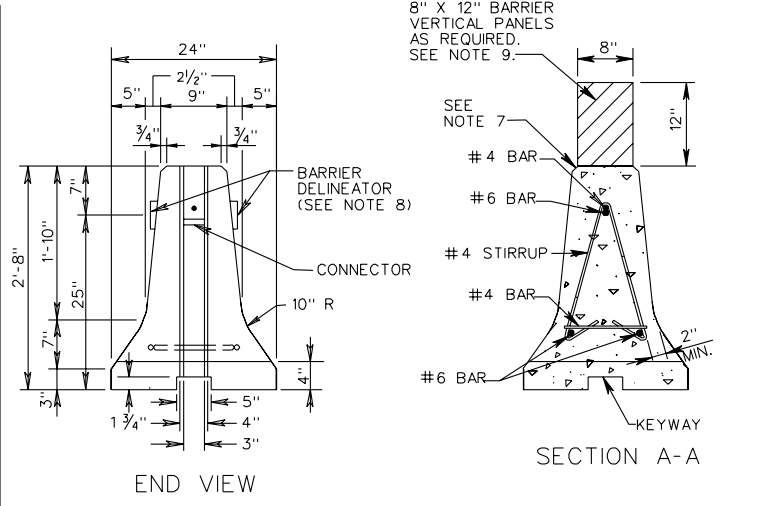
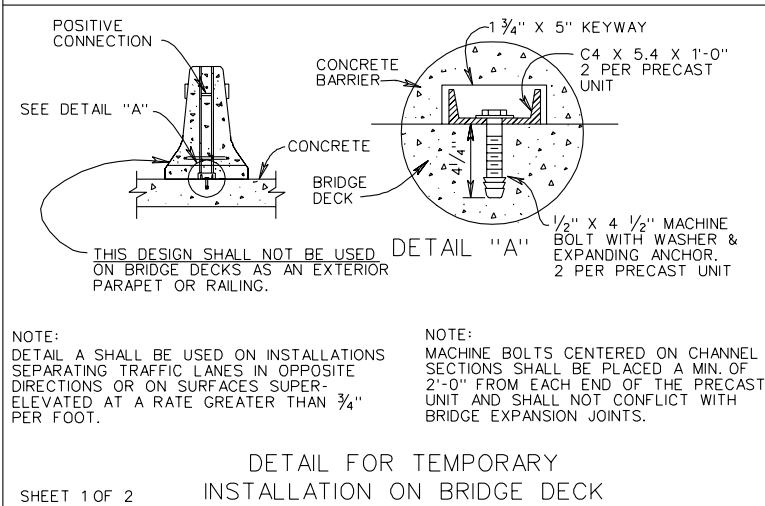
OPTIONAL
1/2" x 1/2"
CHAMFER
EACH END

DESIGN SPEED	FLARE RATES *		
	INSIDE SHY LINE	BEYOND SHY LINE	
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30:1	20:1
60	8'	26:1	18:1
50	6.5'	21:1	14:1
40	5'	16:1	10:1
30	3.5'	13:1	8:1

*SUGGESTED MAXIMUM FLARED RATE FOR RIGID BARRIER SYSTEMS.

NOTES:

- FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE SHEETS 501.59 - 501.61.
- AT THE OPTION OF THE MANUFACTURER, ADDITIONAL REINFORCING MAY BE ADDED TO THE PRECAST CONCRETE BARRIER FOR HANDLING.
- CONCRETE SHALL BE 4000 P.S.I. MINIMUM.
- BARRIER DELINEATOR SIZE, COLOR AND SPACING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- COST OF DELINEATOR SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC BARRIER SERVICE.
- OTHER PRECAST TRAFFIC BARRIER SERVICE CONCRETE DESIGNS THAT MEET NCHRP 350 TEST REQUIREMENTS AND HAVE BEEN ACCEPTED BY VDOT AS AN ACCEPTABLE ALTERNATE TO THE STANDARD DESIGN MAY BE SUBSTITUTED.
- A 1" RADIUS MAY BE USED AS AN ALTERNATE FOR THE 3/4" CHAMFER.
- BARRIER DELINEATOR REFLECTIVE SURFACE IN ALL INSTANCES SHALL BE FACING ONCOMING TRAFFIC.
- BARRIER VERTICAL PANELS SHALL BE SPACED IN ACCORDANCE WITH VIRGINIA WORK AREA PROTECTION MANUAL.



PRECAST TRAFFIC BARRIER SERVICE CONCRETE

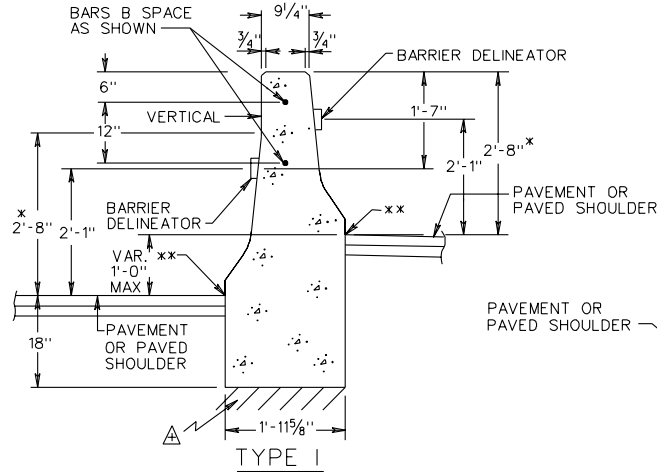
REV.1 /04
501.45

VIRGINIA DEPARTMENT OF TRANSPORTATION

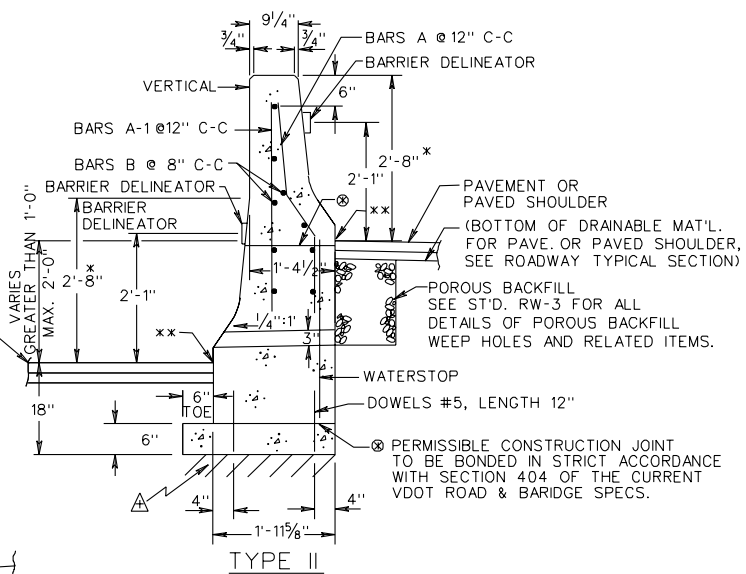
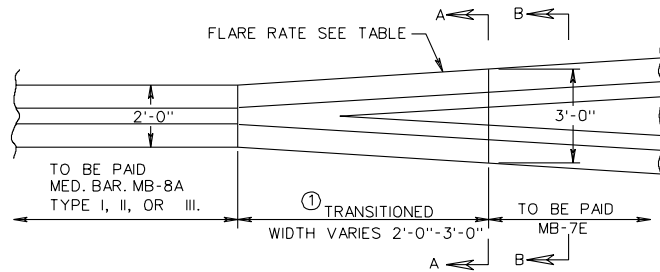
SPECIFICATION REFERENCE

105
512

MB-8A



TYPE I (GREATER THAN 0 HT. DIFF., MAX. 1'-0")

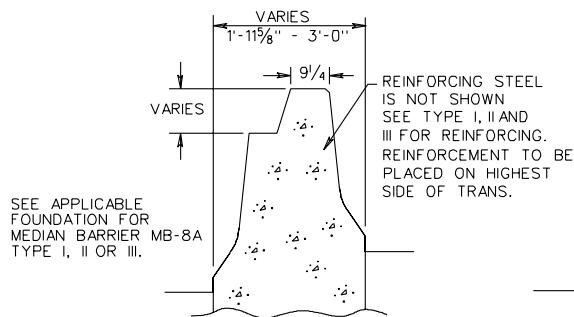


TYPE II (GREATER THAN 1'-0" HT. DIFF., MAX. 2'-0")

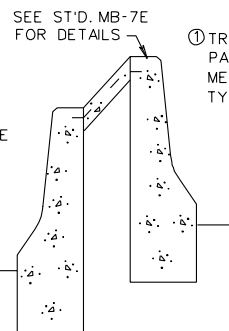
x MB-7D BARRIER FACE

xx DENOTES FINISHED GRADE ELEVATION

△ FOUNDATION MATERIAL UNDER MEDIAN BARRIER IS TO BE COMPACTED.



SECTION A-A
(FOUNDATION NOT SHOWN)



SECTION B-B
(STD. MB-7E)

FLARE RATES

DESIGN SPEED	INSIDE SHY LINE		BEYOND SHY LINE	
	SHY LINE LS	FLARE RATE	FLARE RATE	
70	10'	30 : 1	20 : 1	②
60	8'	26 : 1	18 : 1	②
50	6.5'	21 : 1	14 : 1	②
40	5'	16 : 1	10 : 1	②
30	3.5'	13 : 1	8 : 1	②

② MAXIMUM FLARE RATE FOR RIGID BARRIER SYSTEMS.

CONCRETE MEDIAN BARRIER
TYPE I, II OR III

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 1/04
501.47

SPECIFICATION REFERENCE
105
404
502

NOTES:

IF THE CONTRACTOR ELECTS TO USE THE OPTIONAL CONSTRUCTION JOINTS, TRANSVERSE JOINTS FOR CRACK CONTROL AND EXPANSION JOINTS ARE TO BE PROVIDED IN BOTH FOOTING AND BARRIER AT THE SAME LOCATION.

TRANSVERSE JOINTS ARE TO COINCIDE WITH JOINTS IN ADJACENT PAVEMENT WITH A MAXIMUM SPACING OF 20 FT. C-C.

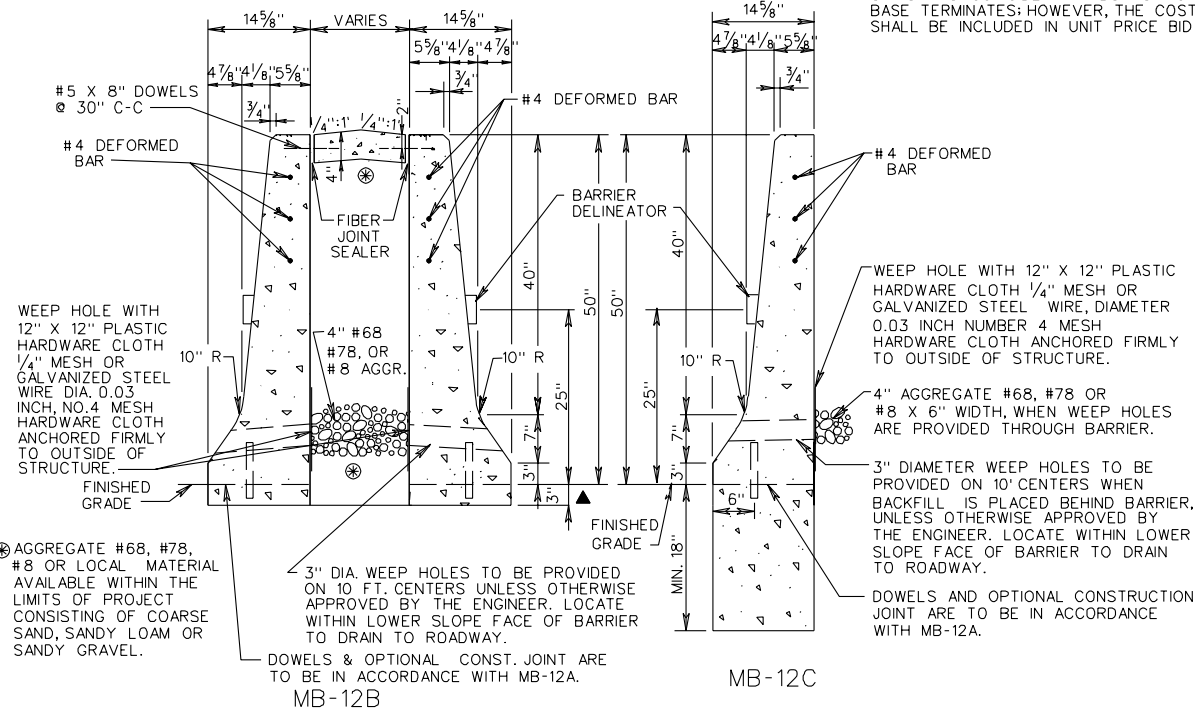
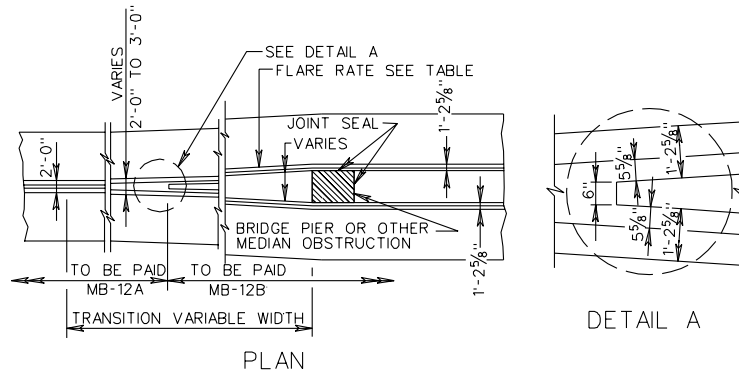
CONCRETE MEDIAN BARRIER MAY BE CAST IN PLACE OR SLIP-FORMED.

HORIZONTAL REINFORCING STEEL BARS ARE TO BE SEPARATE AT ALL EXPANSION AND CONTRACTION JOINTS. A 2" CONCRETE COVER IS REQUIRED OVER THE ENDS OF THE REINFORCING STEEL.

BARRIER DELINEATOR SIZE, COLOR AND SPACING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. COST OF DELINEATOR SHALL BE INCLUDED IN THE PRICE BID FOR MEDIAN BARRIER. REFLECTIVE SURFACE OF BARRIER DELINEATOR, IN ALL INSTANCES, SHALL BE FACING THE ONCOMING TRAFFIC.

CONCRETE SHALL BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.

▲ 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.



DESIGN SPEED	FLARE RATES		
	INSIDE SHY LINE	BEYOND SHY LINE	
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30:1	20:1 *
60	8'	26:1	18:1 *
50	6.5'	21:1	14:1 *
40	5'	16:1	10:1 *
30	3.5'	13:1	8:1 *

* SUGGESTED MAXIMUM FLARE RATE FOR RIGID BARRIER SYSTEMS.

SHEET 2 OF 2

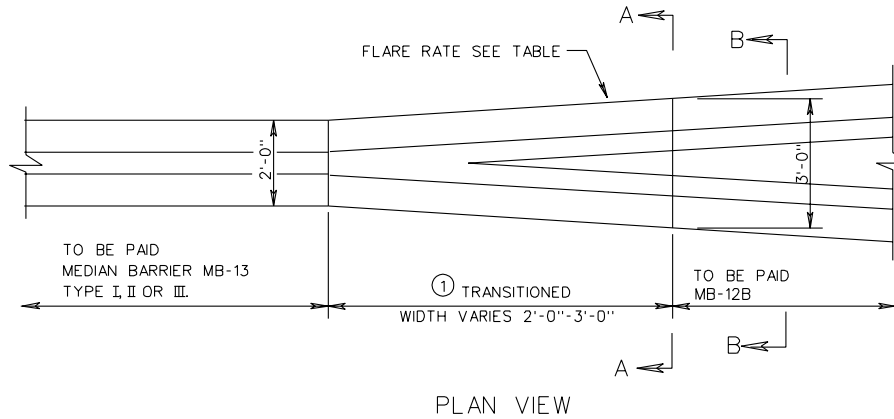
SPECIFICATION REFERENCE
105 502

CONCRETE MEDIAN BARRIER (TALL WALL)

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 1 / 04

501.56



NOTE:
REINFORCING STEEL BARS SHOWN ARE BASED ON A 20' PANEL LENGTH.

ALL REINFORCING BARS ARE TO BE SIZE #4 GRADE 60 STEEL WITH A MINIMUM 1 1/2" CONCRETE COVER.

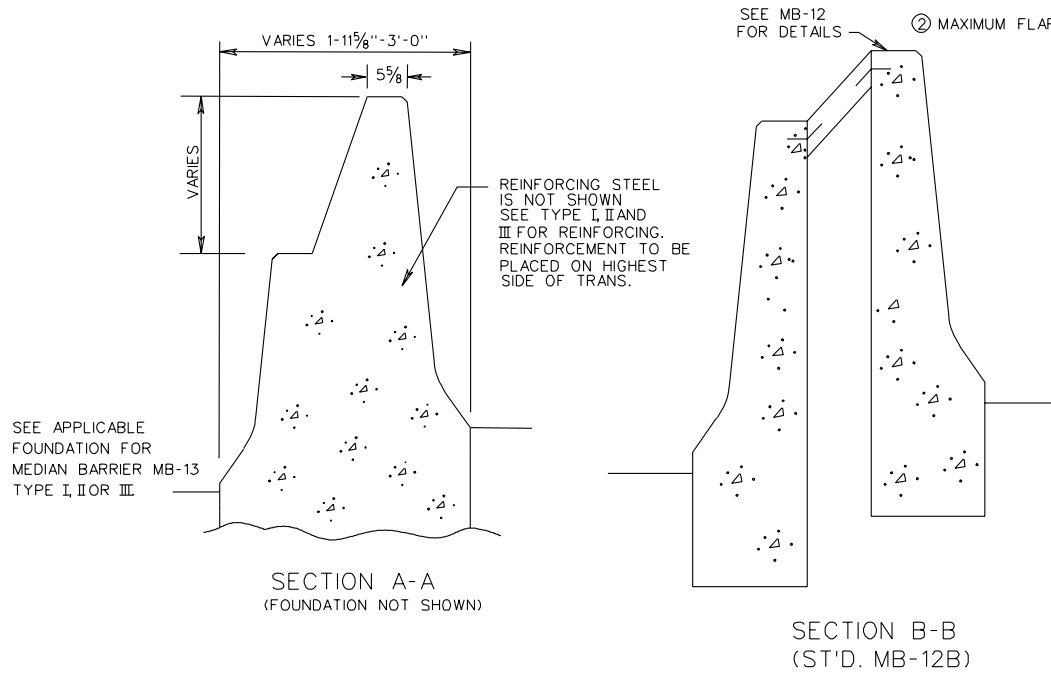
THE TYPICAL JOINT SPACING FOR CONSTRUCTION JOINTS IS 20' AND 80' FOR EXPANSION JOINTS FOR TYPE II AND III BARRIERS.

FOR DETAILS OF HOW JOINTS ARE TO BE FORMED & WATER STOPS SEE ST'D. RW-3.

TRANSVERSE JOINTS FOR TYPE I BARRIERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ROAD AND BRIDGE SPECIFICATIONS EXCEPT NO SCORING OR SAWING WILL BE ALLOWED.

HORIZONTAL REINFORCING STEEL BARS B ARE TO BE SEPARATED AT ALL EXPANSION & CONTRACTION JOINTS. A 2" CONCRETE COVER IS REQUIRED OVER THE ENDS OF REINFORCING STEEL.

- ① TRANSITIONED TO BE PAID FOR AS MEDIAN BARRIER MB-13 TYPE I, II OR III.
- ② MAXIMUM FLARE RATE FOR RIGID BARRIER SYSTEMS.



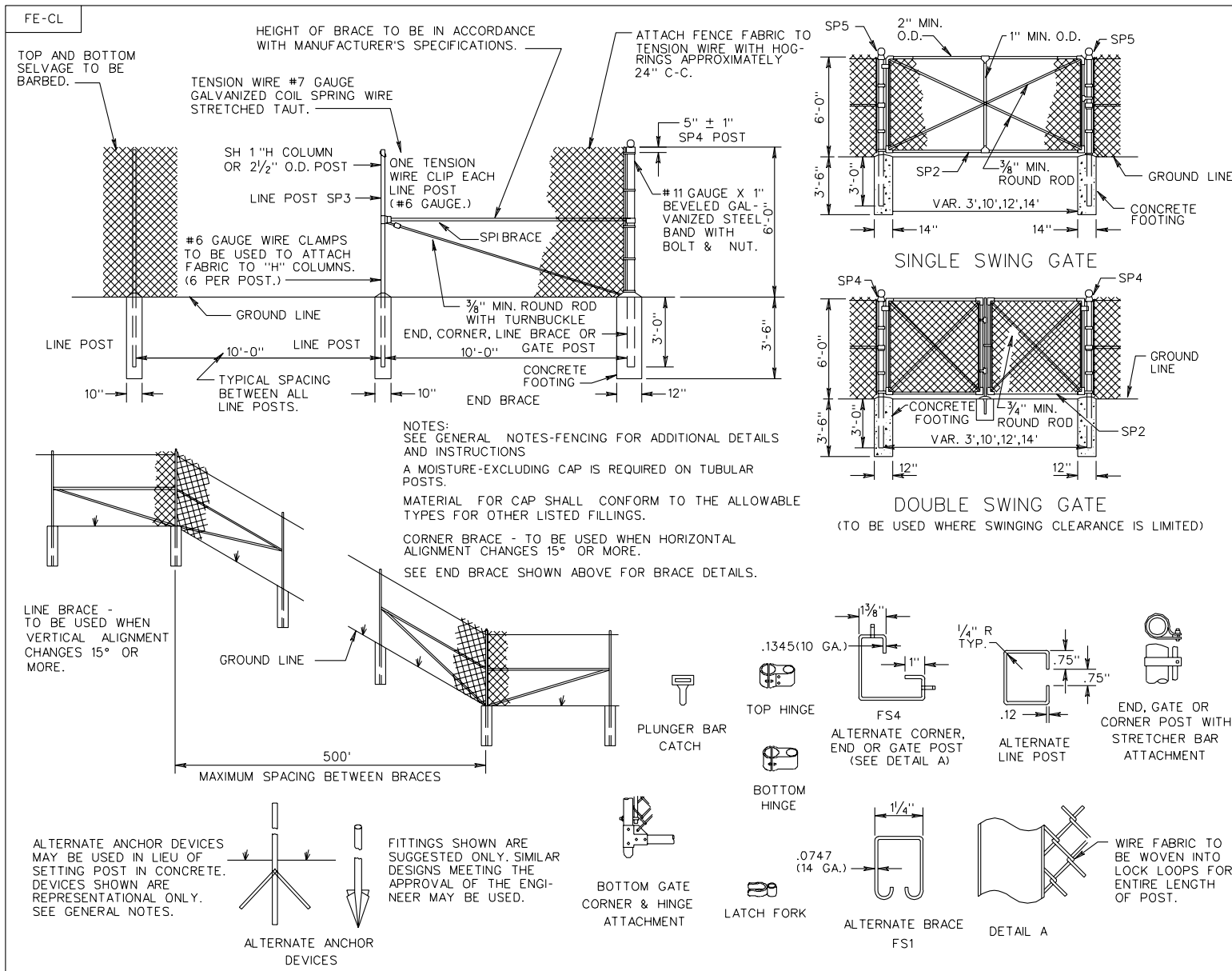
SEE APPLICABLE FOUNDATION FOR MEDIAN BARRIER MB-13 TYPE I, II OR III

FLARE RATES			
DESIGN SPEED	INSIDE SHY LINE	BEYOND SHY LINE	
MPH	SHY LINE LS	FLARE RATE	FLARE RATE
70	10'	30 : 1	20 : 1 ②
60	8'	26 : 1	18 : 1 ②
50	6.5'	21 : 1	14 : 1 ②
40	5'	16 : 1	10 : 1 ②
30	3.5'	13 : 1	8 : 1 ②

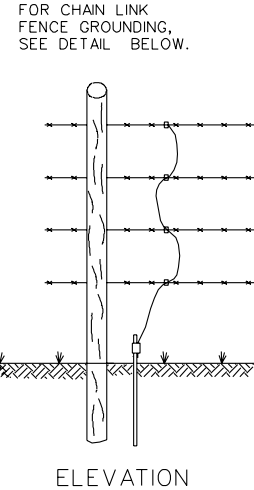
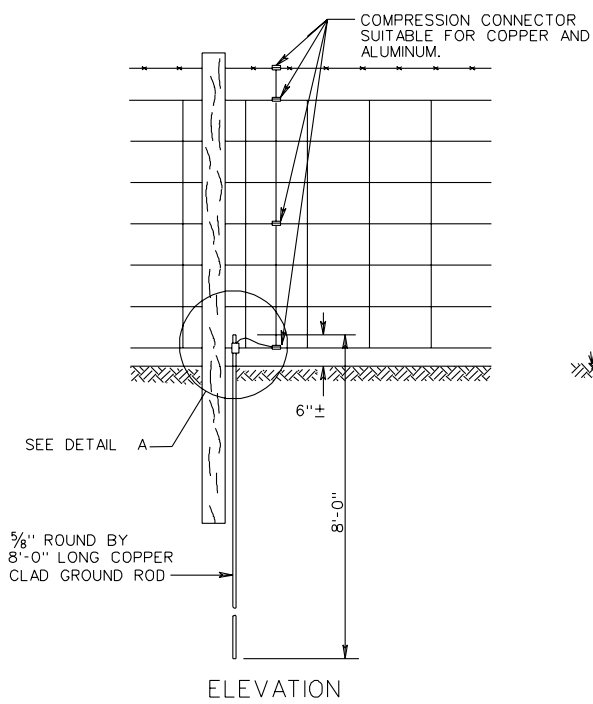
SPECIFICATION REFERENCE
105
404
502

CONCRETE MEDIAN BARRIER
TYPE I, II OR III
VIRGINIA DEPARTMENT OF TRANSPORTATION

INSERTABLE SHEET A152

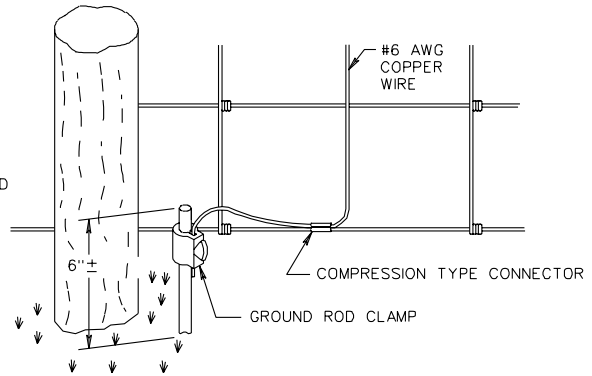
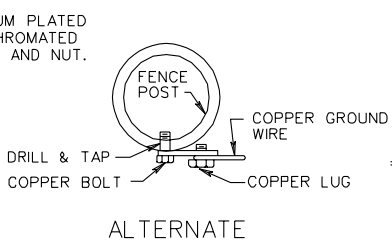
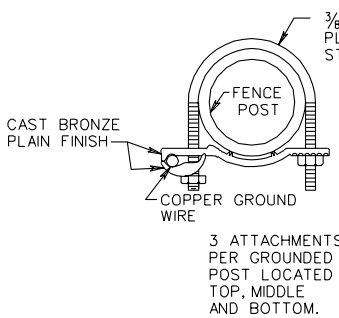


REV. 1 / 04 502.04	<p>STANDARD FENCE CHAIN LINK</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	SPECIFICATION REFERENCE
		242 507



NOTES:
 APPROXIMATE MATERIALS PER INSTALLATION:
 1-5/8" ROUND BY 8'-0" LONG COPPER CLAD GROUND ROD.
 1 GROUND ROD CLAMP
 1-7'-0" #6 AWG SOLID COPPER WIRE
 3* COMPRESSION CONNECTORS (SUITABLE FOR COPPER AND ALUMINUM)
 * MINIMUM 3 CONNECTORS FOR 47" FENCE FABRIC TO BE SECURED TO TOP, BOTTOM AND ONE INTERMEDIATE HORIZONTAL WIRE STRAND. ONE ADDITIONAL CONNECTOR TO BE FURNISHED FOR EACH STRAND OF BARBED WIRE.
 ON BARBED WIRE INSTALLATIONS, ONE CONNECTOR IS TO BE FURNISHED FOR EACH STRAND.
 GROUND WIRE IS TO BE IN CONTACT WITH HORIZONTAL WIRE OF FENCE BY COMPRESSION CONNECTORS AS SHOWN.
 GROUND RODS TO BE LOCATED ON POST SIDE OF FENCE AND AS CLOSE AS POSSIBLE TO POST AND FENCE.
 UNLESS CALLED FOR IN THE PLANS OR DIRECTED BY THE ENGINEER, FENCE GROUNDING WILL BE REQUIRED FOR METAL FENCES INCLUDING PLASTIC COATED FENCE FABRIC AT THE FOLLOWING LOCATIONS.

-WHEN HIGH VOLTAGE LINES (500 kv AND ABOVE) CROSS ABOVE THE FENCE. GROUNDS SHALL BE INSTALLED 50' BEYOND THE OVERHEAD CROSSING POINT OF THE OUTER MOST CONDUCTORS OF THE HIGH VOLTAGE LINES.
 -WHEN THE HIGH VOLTAGE LINES (500 kv AND ABOVE) THAT ARE PARALLEL TO AND WITHIN 40' HORIZONTALLY OF THE FENCE. GROUNDS SHALL BE INSTALLED AT 50' INTERVALS ALONG THE FENCE FOR THE PARALLEL SECTION OF FENCE AND HIGH VOLTAGE LINES.
 COST FOR FURNISHING AND PLACING ALL GROUNDING MATERIALS IS TO BE INCLUDED IN PRICE BID PER LINEAR METER OF FENCE.
 DETAILS SHOWN HEREON ARE TO APPLY TO ALL FENCE TYPES. LAWN FENCES WILL BE GROUNDED ONLY WHEN RECOMMENDED BY THE ENGINEER.

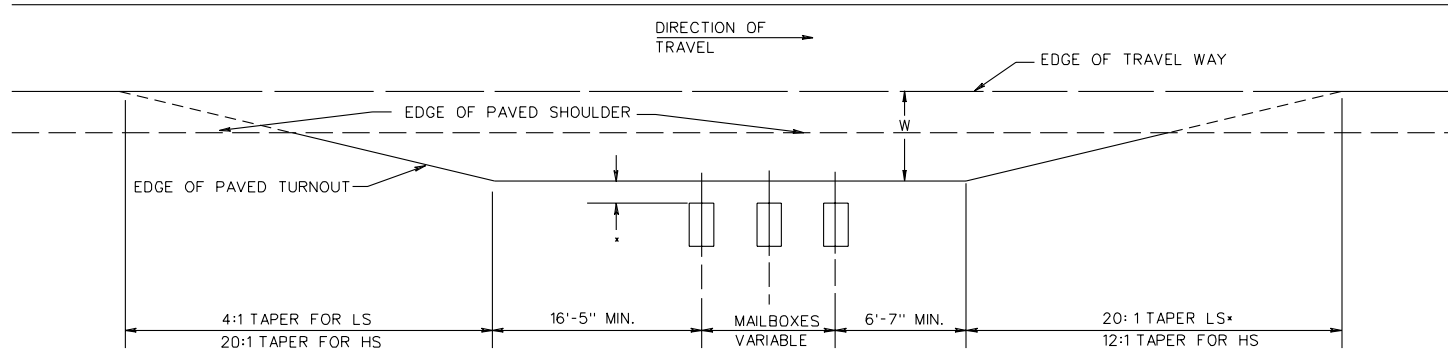


DETAIL FOR GROUNDING STEEL POST OF CHAIN LINK FENCE

DETAIL A

SPECIFICATION REFERENCE
507 236

STANDARD METHOD OF FENCE GROUNDING



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 SECTION 11.2.4, MAILBOX SUPPORT AND ATTACHMENT DESIGN.
 * = A MINIMUM DESIGN FOR ROADS CARRYING LOW-SPEED TRAFFIC AND FOR LOCAL AND COLLECTOR ROADS.

HIGHWAY TYPE AND ADT, (vpd)	WIDTH OF ALL-WEATHER SURFACE TURNOUT OR AVAILABLE SHOULDER AT MAILBOX, 1' (FT.)		DISTANCE ROADSIDE FACE OF MAILBOX IS TO BE OFFSET BEHIND 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) ²		(10) ³
RESIDENTIAL STREET WITHOUT CURB OR ALL-WEATHER SHOULDER	6	0.00		
CURBED RESIDENTIAL STREET	NOT APPLICABLE		(8 TO 12) ⁴	(6) 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 in. x 48 in. 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 in. IF BETWEEN 28 in. AND 80 in. AFF) SO THAT THE MAILBOX DOES NOT BECOME A PROTRUDING OBJECT FOR PEDESTRIANS WITH IMPAIRED VISION.
- STRIVE FOR A 6 ft. MINIMUM; 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. 1 / 04
 603.02

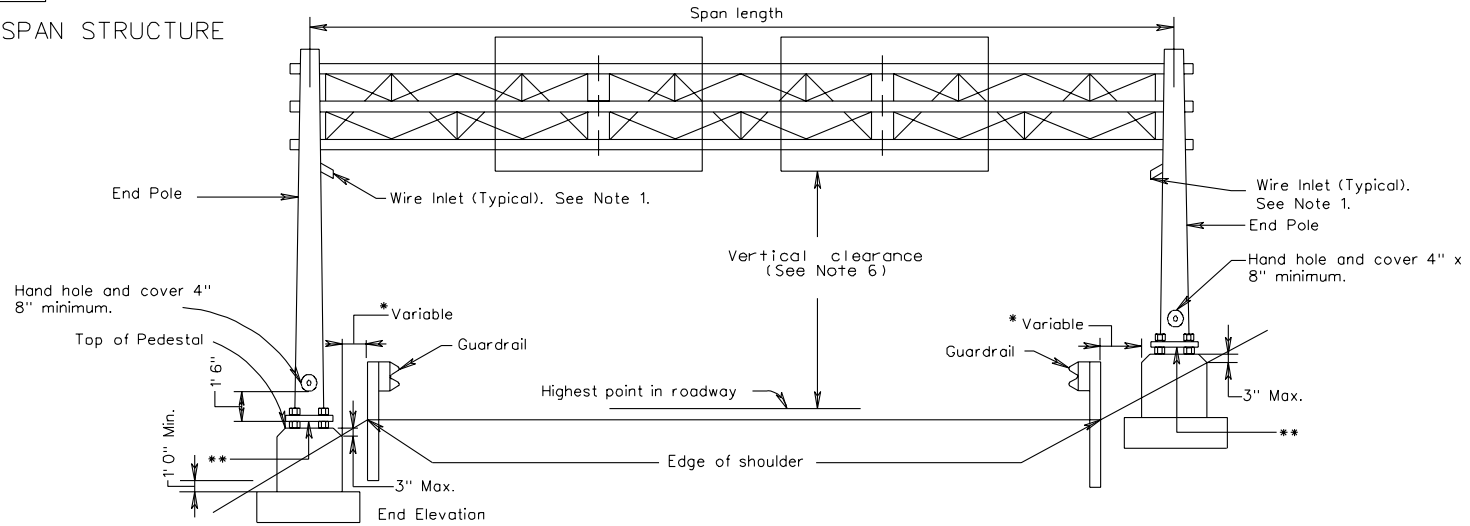
DESIGN FACTORS FOR A DESIGN SPEED OF 20 MPH (RURAL) USING E = 8% MAX.

DESIGN VELOCITY -20	DESIGN SOFTWARE EQUIVALENTS (NUMBER OF LANES AT LAKE WIDTH)												INTERCHANGE RAMP							
	WIDTH= 18 FT			WIDTH=20 FT			WIDTH=22 FT			WIDTH=24 FT			WIDTH=48 FT							
	1 @ 9'			1 @ 10'			1 @ 11'			1 @ 12'			2 @ 12'		16 FT		18 FT			
RADIUS(FT)	E(%)	CR	LS	w	CR	LS	w	CR	LS	w	CR	LS	w	CR	LS	w	CR	LS	CR	LS
1800	NC	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0	0
1213	2.0	59	59	2.0	28	28	0.0	30	30	0.0	33	33	0.0	49	49	0.0	39	39	41	41
1148	2.1	59	59	2.1	28	29	0.0	30	32	0.0	33	35	0.0	49	52	0.0	39	40	41	43
1090	2.2	54	59	2.1	28	30	0.0	30	33	0.0	33	36	0.0	49	54	0.0	39	42	41	45
1036	2.3	52	59	2.1	28	32	0.0	30	35	0.0	33	38	0.0	49	56	0.0	39	44	41	47
987	2.4	50	59	2.2	28	33	0.0	30	36	0.0	33	39	0.0	49	59	0.0	39	46	41	49
941	2.5	48	59	2.2	28	34	0.0	30	38	0.0	33	41	0.0	49	61	0.0	39	48	41	51
899	2.6	46	59	2.3	28	36	0.0	30	39	0.0	33	43	0.0	49	64	0.0	39	50	41	53
860	2.7	44	59	2.3	28	37	0.0	30	41	0.0	33	44	0.0	49	66	0.0	39	52	41	55
824	2.8	43	59	2.3	28	38	0.0	30	42	0.0	33	46	0.0	49	69	0.0	39	54	41	57
790	2.9	41	59	2.4	28	40	0.0	30	44	0.0	33	48	0.0	49	71	0.0	39	56	41	59
759	3.0	40	59	2.4	28	41	0.0	30	45	0.0	33	49	0.0	49	73	0.0	39	58	41	61
729	3.1	39	59	2.5	28	42	0.0	30	47	0.0	33	51	0.0	49	76	0.0	39	60	41	63
701	3.2	37	59	2.5	28	44	0.0	30	48	0.0	33	52	0.0	49	78	0.0	39	61	41	65
674	3.3	36	59	2.5	28	45	0.0	30	50	0.0	33	54	0.0	49	81	0.0	39	63	41	67
650	3.4	35	59	2.6	28	46	0.0	30	51	0.0	33	56	0.0	49	83	0.0	39	65	41	69
626	3.5	34	59	2.6	28	48	0.0	30	53	0.0	33	57	0.0	49	86	0.0	39	67	41	71
604	3.6	33	59	2.7	28	49	0.0	30	54	0.0	33	59	0.0	49	88	0.0	39	69	41	73
582	3.7	32	59	2.7	28	50	0.0	30	55	0.0	33	60	0.0	49	90	0.0	39	71	41	75
562	3.8	32	59	2.8	28	52	0.0	30	57	0.0	33	62	0.0	49	93	0.0	39	73	41	77
543	3.9	31	59	2.8	28	53	0.0	30	58	0.0	33	64	0.0	49	95	0.0	39	75	41	79
524	4.0	30	59	2.9	28	55	0.0	30	60	0.0	33	66	0.0	49	98	0.0	39	77	41	81
506	4.1	29	59	2.9	28	56	0.0	30	61	0.0	33	67	0.0	49	100	0.0	39	79	41	83
489	4.2	29	60	3.0	30	63	2.0	30	63	0.0	33	69	0.0	49	103	0.0	39	80	41	85
473	4.3	29	62	3.0	30	64	2.0	30	64	0.0	33	70	0.0	49	105	0.0	39	82	41	87
457	4.4	29	63	3.0	30	66	2.0	30	66	0.0	33	72	0.0	49	108	0.0	39	84	41	89
442	4.5	29	65	3.1	31	68	2.1	30	67	0.0	33	73	0.0	49	110	0.0	39	86	41	92
427	4.6	29	66	3.2	31	71	2.2	30	70	0.0	33	75	0.0	49	112	0.0	39	88	41	94
413	4.7	29	68	3.2	31	71	2.2	30	70	0.0	33	77	0.0	49	115	0.0	39	90	41	96
399	4.8	30	70	3.3	31	73	2.3	30	72	0.0	33	78	0.0	49	117	0.0	39	92	41	98
385	4.9	29	71	3.3	31	74	2.3	30	73	0.0	33	80	0.0	49	120	0.0	39	94	41	100
372	5.0	30	73	3.4	31	76	2.4	30	75	0.0	33	82	0.0	49	122	0.0	39	96	41	102
358	5.1	30	75	3.5	31	78	2.5	30	76	0.0	33	83	0.0	49	125	0.0	39	98	41	104
345	5.2	30	76	3.5	31	80	2.5	30	78	0.0	33	85	0.0	49	127	0.0	39	100	41	106
332	5.3	30	78	3.6	31	81	2.6	30	79	0.0	33	86	0.0	49	129	0.0	39	101	41	108
320	5.4	30	80	3.7	31	83	2.7	30	81	0.0	33	88	0.0	49	132	0.0	39	103	41	110
308	5.5	30	82	3.8	31	85	2.8	30	82	0.0	33	90	0.0	49	134	0.0	39	105	41	112
297	5.6	30	83	3.9	32	87	2.9	30	84	0.0	33	91	0.0	49	137	0.0	39	107	41	114
286	5.7	30	85	3.9	32	89	2.9	30	85	0.0	33	93	0.0	49	139	0.0	39	109	41	116
276	5.8	30	87	4.0	32	91	3.0	33	95	2.0	33	95	0.0	53	153	2.0	39	111	41	118
266	5.9	31	89	4.1	32	93	3.1	33	97	2.1	33	96	0.0	54	157	2.2	39	113	41	120
258	6.0	30	90	4.2	32	95	3.2	33	99	2.2	33	98	0.0	54	161	2.4	39	115	41	122
248	6.1	31	92	4.3	32	97	3.3	34	101	2.3	33	99	0.0	55	165	2.6	39	117	41	124
240	6.2	31	94	4.4	32	99	3.4	34	103	2.4	33	101	0.0	55	169	2.8	39	119	41	126
232	6.3	31	96	4.5	33	101	3.5	34	105	2.5	33	103	0.0	55	173	3.0	39	120	41	128
225	6.4	31	98	4.6	33	103	3.6	34	107	2.6	33	104	0.0	56	177	3.2	39	122	41	130
217	6.5	31	100	4.7	33	105	3.7	34	109	2.7	33	106	0.0	56	181	3.4	39	124	41	132
209	6.6	31	102	4.8	33	107	3.8	34	111	2.8	33	108	0.0	57	185	3.6	39	126	41	134
202	6.7	32	104	4.9	33	109	3.9	34	113	2.9	33	109	0.0	57	189	3.8	39	128	41	136
196	6.8	32	106	5.0	33	111	4.0	34	115	3.0	36	120	2.0	57	193	4.0	39	130	41	138
189	6.9	32	108	5.1	33	113	4.1	35	118	3.1	36	122	2.1	58	198	4.2	39	132	41	140
183	7.0	32	110	5.2	33	115	4.2	35	120	3.2	36	124	2.2	58	202	4.4	39	134	41	142
176	7.1	32	112	5.3	33	117	4.3	35	122	3.3	36	127	2.3	59	206	4.6	39	136	41	144
170	7.2	32	115	5.5	34	120	4.5	35	125	3.5	36	129	2.5	59	212	5.0	39	138	41	146
164	7.3	33	117	5.6	34	122	4.6	35	127	3.6	37	132	2.6	60	217	5.2	39	140	41	148
158	7.4	33	119	5.8	34	124	4.8	35	129	3.8	37	134	2.8	60	222	5.6	39	141	41	150
152	7.5	33	122	5.9	34	127	4.9	36	132	3.9	37	137	2.9	61	227	5.8	39	143	41	152
146	7.6	33	124	6.1	34	129	5.1	36	135	4.1	37	140	3.1	62	233	6.2	39	145	41	154
139	7.7	33	127	6.3	35	132	5.3	36	137	4.3	38	143	3.3	63	239	6.6	39	147	41	156
132	7.8	34	130	6.5	35	135	5.5	36	140	4.5	38	145	3.5	64	246	7.0	39	149	41	158
124	7.9	34	133	6.8	35	138	5.8	37	144	4.8	38	149	3.8	65	254	7.6	39	151	41	160
108	8.0	35	139	7.6	36	144	6.6	38	150	5.6	39	155	4.6	68	270	9.2	39	153	41	162

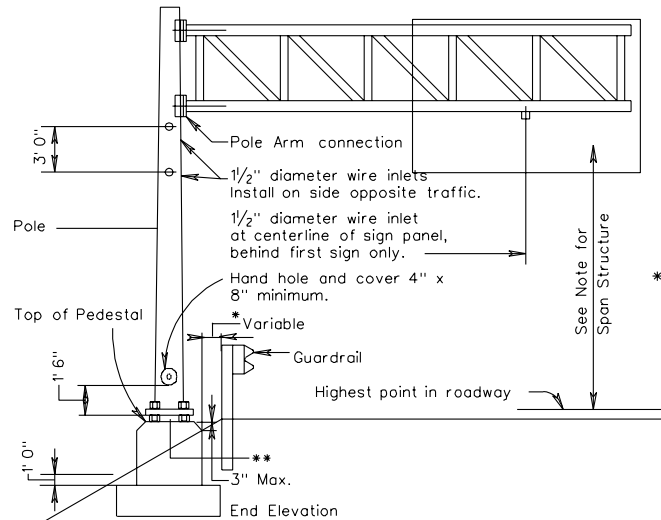
NOTE: CR, LS & w VALUES IN FEET. LISTED RADIUS IS THE MINIMUM ALLOWABLE RADIUS FOR THE CORRESPONDING E, CR, LS, AND w VALUES.

OSS-1

SPAN STRUCTURE



CANTILEVER STRUCTURE



NOTES:

1. 1/2" diameter wire inlets shall be provided at the following locations:
 - A. On span structures on the front leg of end pole 12" below bottom chord.
 - B. On cantilever structures on pole 12" below bottom chord.
 - C. On span structures below bottom chord at centerline behind first sign panel from each end pole.
 - D. On cantilever structures below bottom chord at centerline behind first sign panel from pole.
2. All unused wire inlets shall be capped water tight.
- *3. Distance shall be no less than the minimum indicated in Standard GR-INS.
4. No mortar, grout, or concrete shall be placed between bottom of base plate and top of pedestal.
- **5. Distance between bottom of base plate and top of pedestal shall be less than or equal to twice the diameter of anchor bolt but shall not be greater than 3".
6. Vertical clearance for overhead and bridge mounted sign structures shall be no less than 19 feet 0 inch and no more than 21 feet 0 inch from the bottom of the lowest mounted sign panel to the crown of the roadway, unless otherwise specified on the plans. Luminaire assemblies shall have a vertical clearance of no less than 17 feet six inches from the bottom of the assembly to the crown of the roadway.

TYPICAL DETAILS FOR OVERHEAD
SIGN STRUCTURES

REV. 1/04

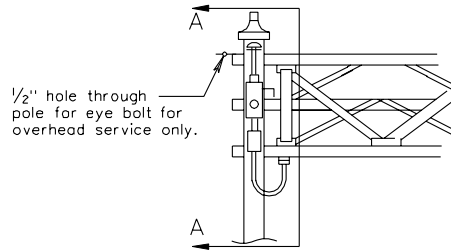
1301.72

VIRGINIA DEPARTMENT OF TRANSPORTATION

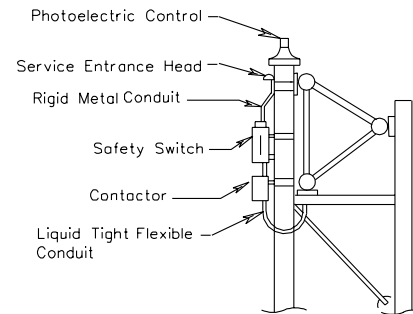
ELECTRIC DETAILS FOR SIGN LIGHTING

SPAN SIGN STRUCTURE

FRONT VIEW

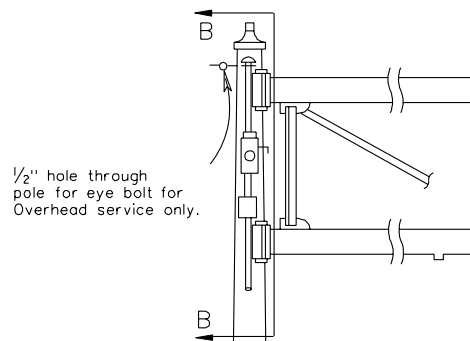


SECTION A-A

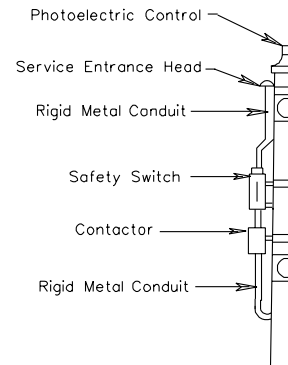


CANTILEVER SIGN STRUCTURE

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.

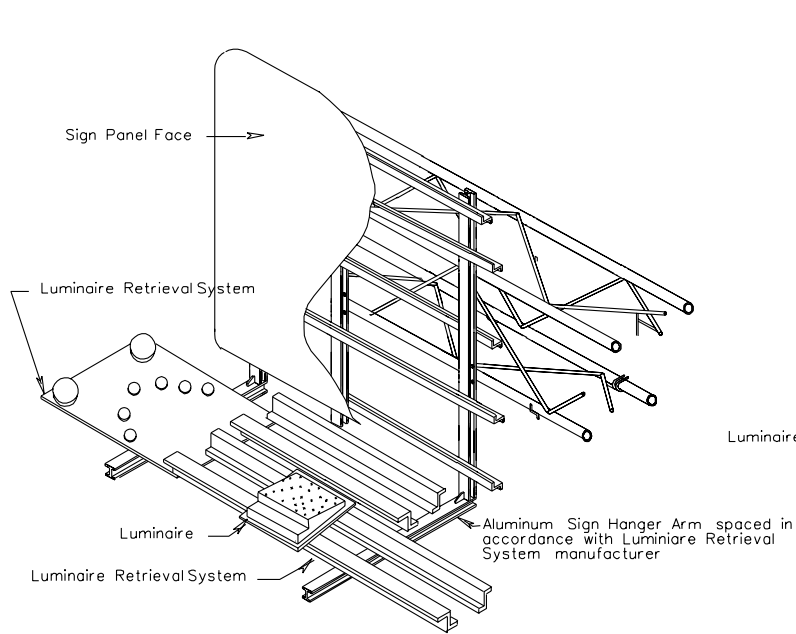
All conduit located in or on overhead sign structure shall be 3/4" minimum.

TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION

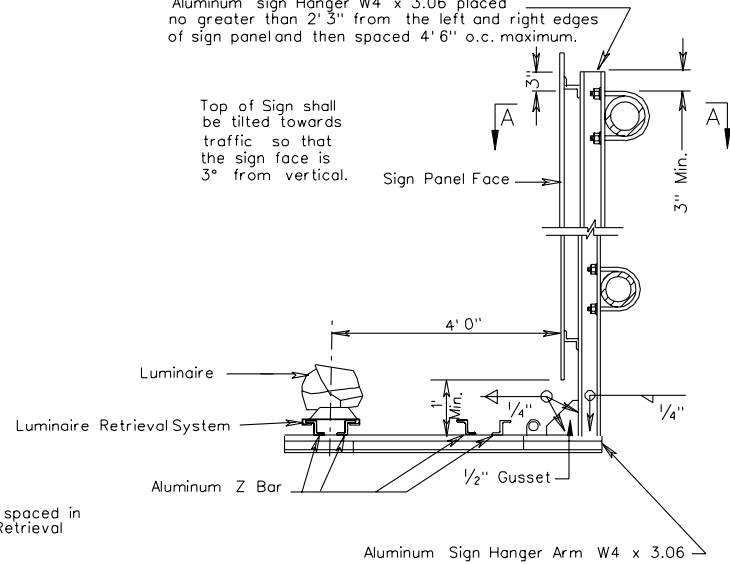
OSS-1

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.

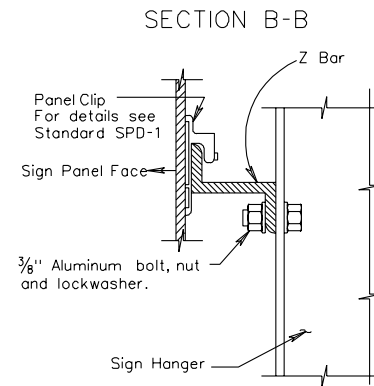
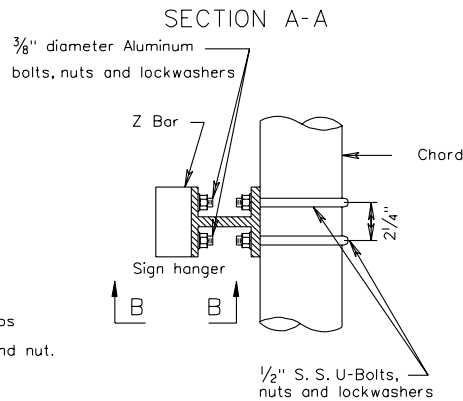


Note:

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 manufacturers recommendations. Turntable end shall be of sufficient length to align with the vertical edge of the outside paved shoulder ($\pm 6'$) or shall be extended 5 feet beyond the vertical edge ($\pm 6'$) 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 SSP-VIA "Alternate Details for Type VIA Interstate Sign Structures", except that post clamps shall not be used. Post clamp bolts shall be inserted through holes drilled into the sign hangers and secured using a stainless steel lockwasher and nut.

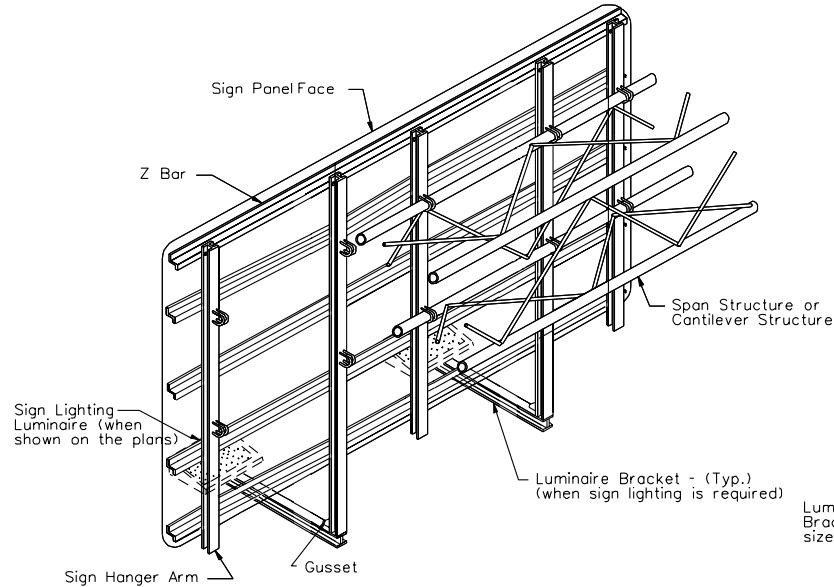


TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 1/04

1301.74



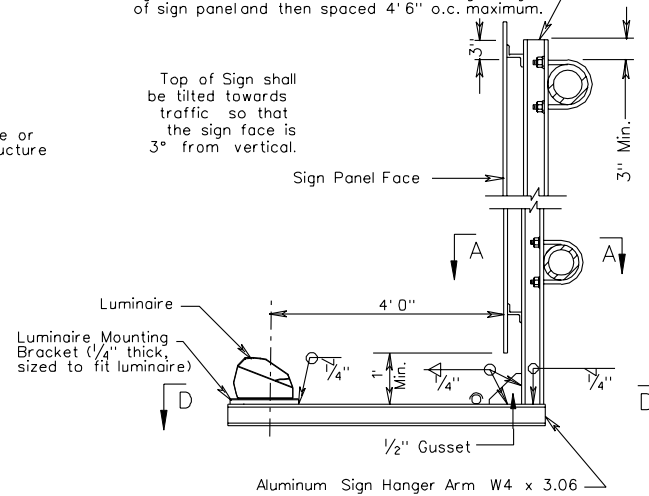
SIGN ATTACHMENT TO TRUSS-TYPE STRUCTURES

SIGN HANGER ERECTION DETAIL WITH LUMINAIRE

(WHEN NO LUMINAIRE RETRIEVAL SYSTEM IS REQUIRED)

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.



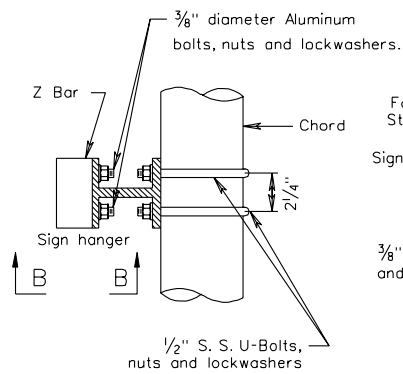
Note

Luminaires required only where indicated on the plans.

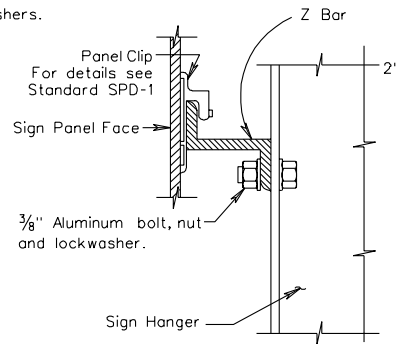
Luminaire to be attached to mounting bracket with 4, 3/8" Dia. galvanized cap screws and spring nuts.

Signs fabricated using the SPD-1 "Alternate Sign Panel Design" shall be attached to the sign hangers in accordance with SSP-VIA "Alternate Details for Type VIA Interstate Sign Structures", except that post clamps shall not be used. Post clamp bolts shall be inserted through holes drilled into the sign hangers and secured using a stainless steel lockwasher and nut.

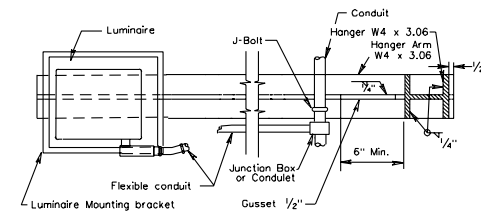
SECTION A-A



SECTION B-B



SECTION D-D



TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION