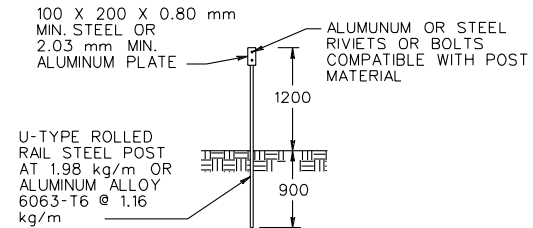
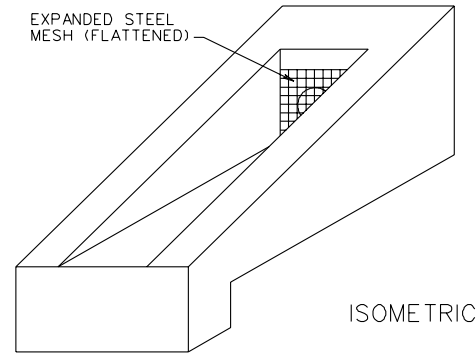
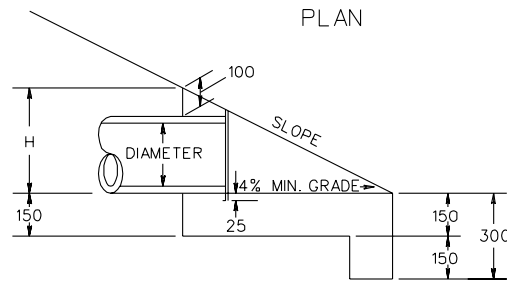
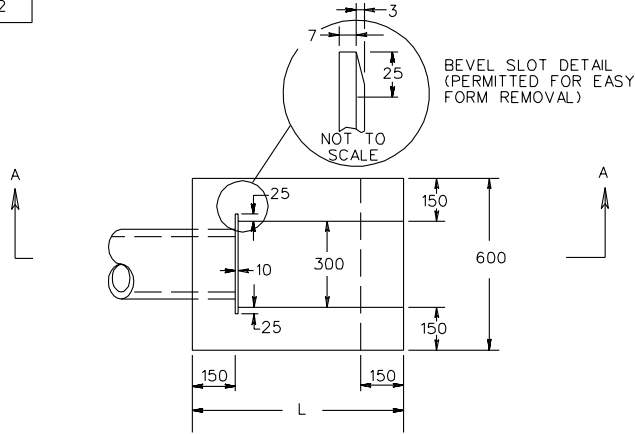


INSERTABLE SHEET MA57

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 480 kPa TESTED ACCORDING TO ASTM 2412.
3. EXPANDED STEEL MESH (FLATTENED) SHALL HAVE OPENINGS OF APPROX. 13 mm X 25 mm AND WEIGH APPROX. 4 kg/m². MESH SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123. THE MESH SHALL EXTEND A MINIMUM OF 25 mm 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 OUTLET END OF ALL UNDERDRAIN INSTALLATIONS BARRING LOCATIONS WHERE UNDERDRAIN IS TIED INTO OTHER DRAINAGE STRUCTURES.
7. MARKER WILL BE PAID FOR IN ACCORDANCE WITH SECTION 501 OF THE ROAD AND BRIDGE SPECIFICATIONS.

PIPE I.D.	SLOPE	DIMENSIONS		CLASS 20 CONCRETE CUBIC METERS
		L	H	
100	2:1	750	375	0.13
100	4:1	1340	335	0.21
150	2:1	870	435	0.16
150	4:1	1600	400	0.27

STANDARD ENDWALL FOR PIPE UNDERDRAIN

REV. 2/01

101.32 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

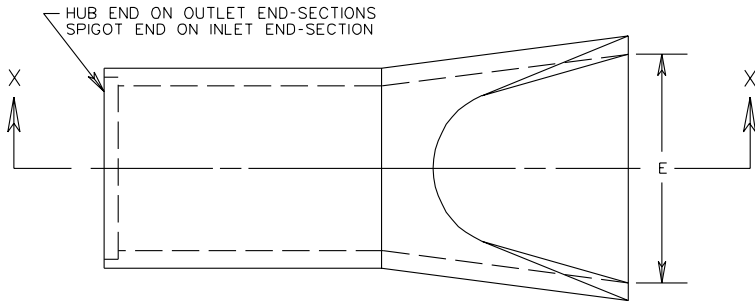
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

105
233
302
501

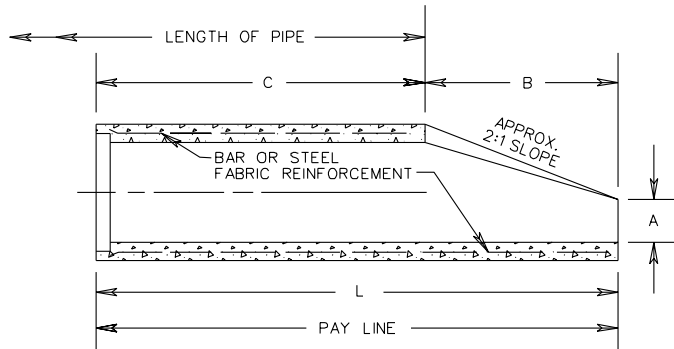
REVISED ON 7/01

ES-1A

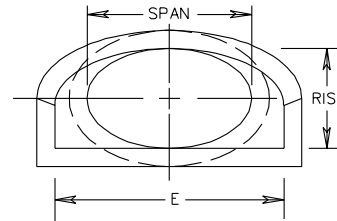


PLAN

END SECTION DIMENSIONS					
SPAN X RISE	A	B	C	L	E
575 mm X 365 mm	150 mm	685 mm	1170 mm	1855 mm	815 mm
770 mm X 490 mm	225 mm	890 mm	965 mm	1855 mm	1070 mm
960 mm X 610 mm	250 mm	1120 mm	765 mm	1880 mm	1220 mm
1055 mm X 670 mm	300 mm	1370 mm	510 mm	1880 mm	1525 mm
1150 mm X 730 mm	330 mm	1500 mm	990 mm	2490 mm	1675 mm
1345 mm X 855 mm	380 mm	1600 mm	890 mm	2490 mm	1830 mm

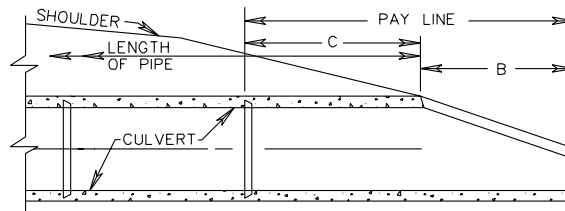


SECTION X-X



END VIEW

CONCRETE TO BE
30 MPa



SLOPE DETAIL

NEW 2/01

FLARED END-SECTION FOR 575 mm X 365 mm TO 1345 mm X 855 mm
ELLIPTICAL CONCRETE PIPE CULVERTS

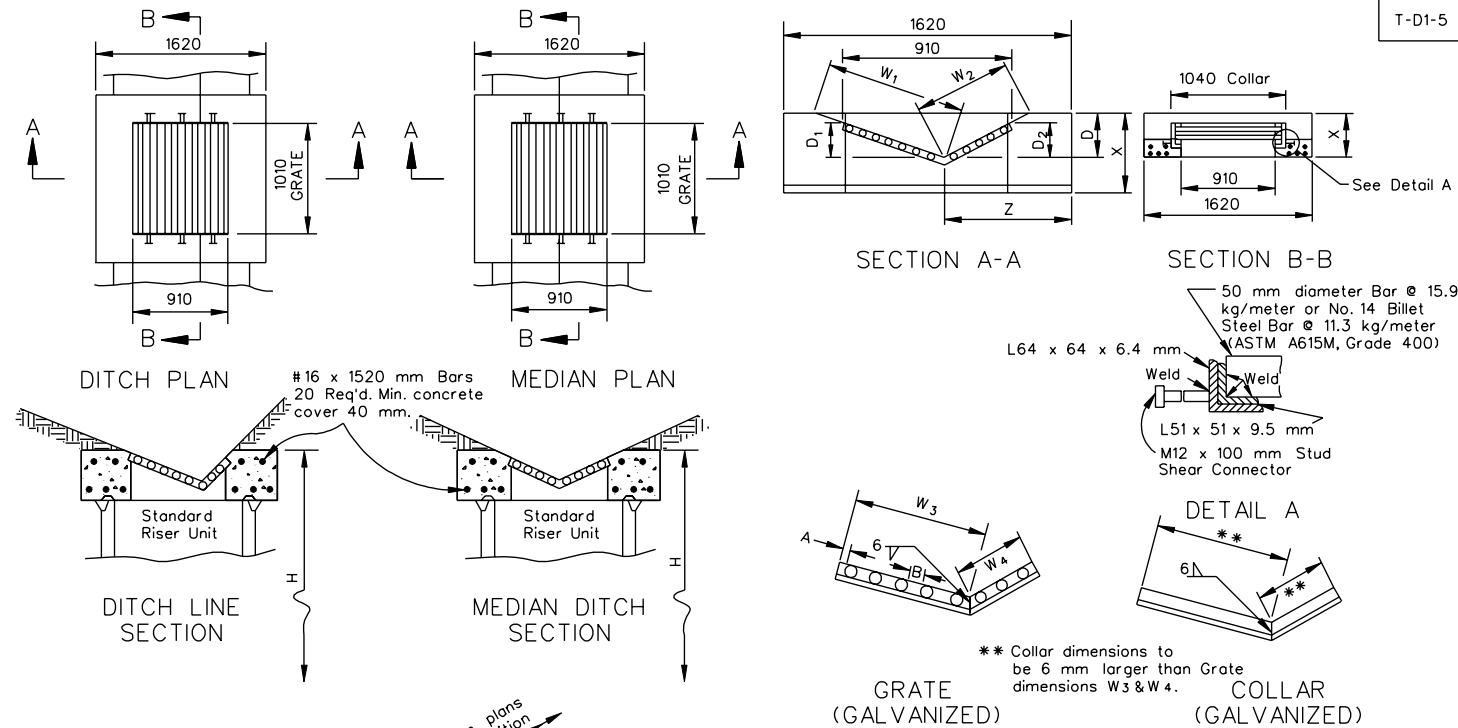
SPECIFICATION
REFERENCE

302

102.01A UNLESS OTHERWISE NOTED, ALL DIMENSIONS
ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

T-D1-5



GRATE (GALVANIZED)
COLLAR (GALVANIZED)

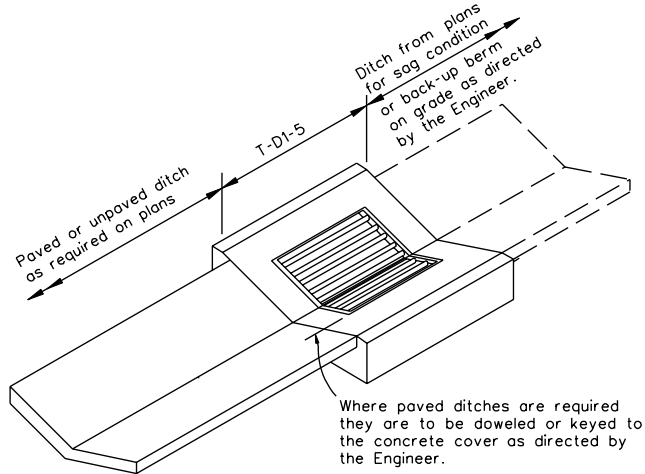
** Collar dimensions to be 6 mm larger than Grate dimensions W3 & W4.

* Tolerance 12 mm ±

ST'D PG-2A TYPE	COVER DIMENSIONS AND QUANTITIES								
	W1	W2	W3	W4	D*	D1	D2	X	Z
A1,A2 A3	930	610	620	315	150	100	75	355	660
B1,B2 B3,B4 C1,C2 C3	840	840	470	470	200	115	115	405	815
E	685	685	510	510	300	225	225	485	815

GRATE BAR SPACING CHART		
GRATE TYPE	MAXIMUM DIMENSION	
	A	B
I	40	75
III	25	25

Notes:
 See General Notes - Precast for additional details
 Concrete to be 30 MPa minimum.
 Reinforcing steel in accordance with ASTM-A615M.
 Concrete cover and grate are to be furnished as a single unit.
 Dimensions shown are minimum. Actual dimensions may vary with manufacturer.
 Grate Bars to be installed so they will be aligned parallel to the ditch flow.



SPECIFICATION REFERENCE
105
233
302

STANDARD PRECAST TOP UNITS

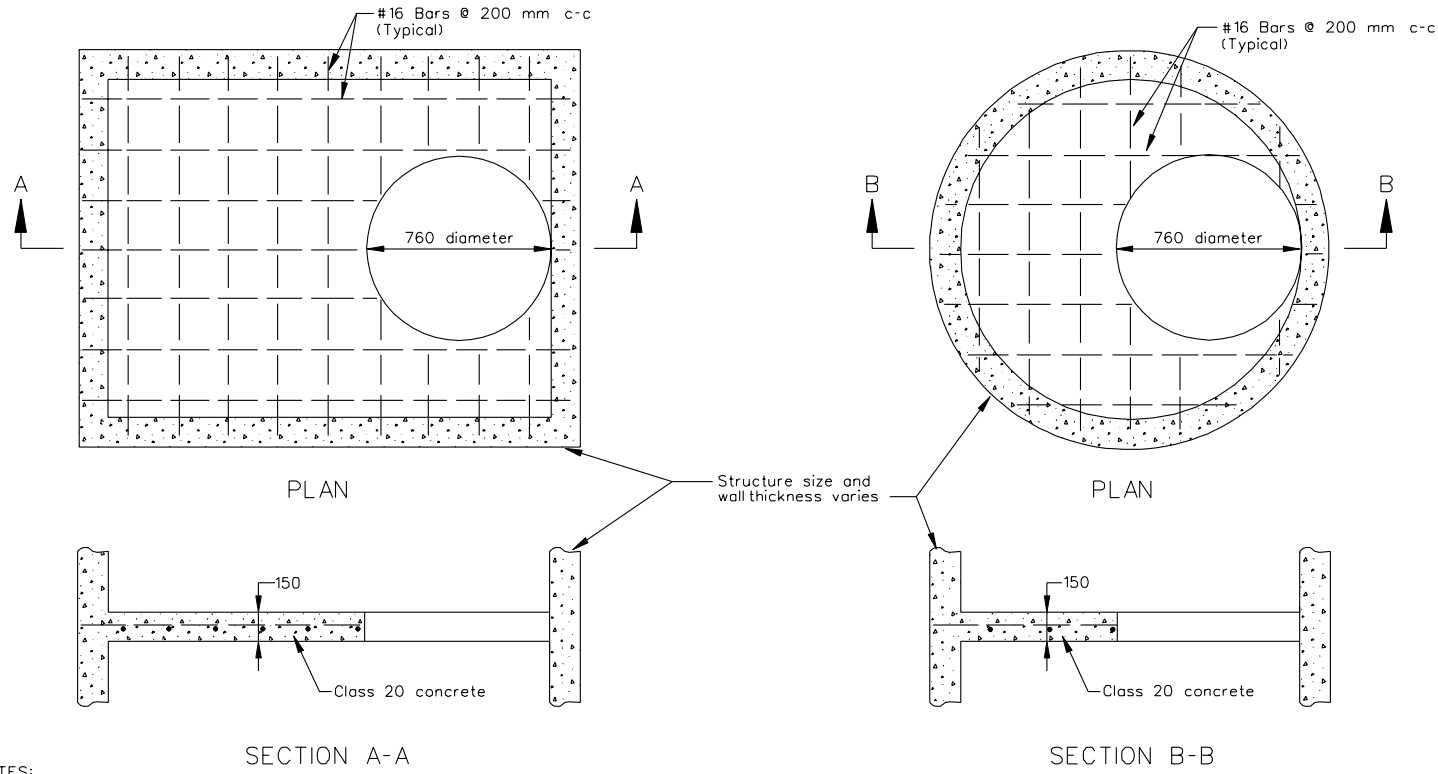
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

103.06

SL-1



NOTES:

Standard SL-1, Manhole Safety Slabs, should be required as part of the drainage design for manholes, junction boxes and drop inlets with heights greater than 3.65 meters. The spacing of adjacent safety slabs should be 2.43 m to 3.65 m with no safety slab located within 1.82 m of the top or bottom of the structure.

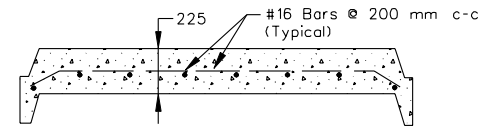
The cost of the SL-1 is included in the structure. The drainage descriptions should be used to specify how many safety slabs are needed for each structure and the quantity should be noted in the remarks column on the Drainage Summary. No additional compensation will be provided for additional safety slabs required when precast structures are substituted for cast-in-place structures.

Access openings are to be staggered from one side of structure to the other where applicable. Steps are to be staggered accordingly.

Safety Slab may be cast-in-place or precast. Cast-in-place concrete to be Class 20 (20 MPa). Precast concrete to be Class 30 (30 MPa). Reinforcing steel to be in accordance with AASHTO M31M.

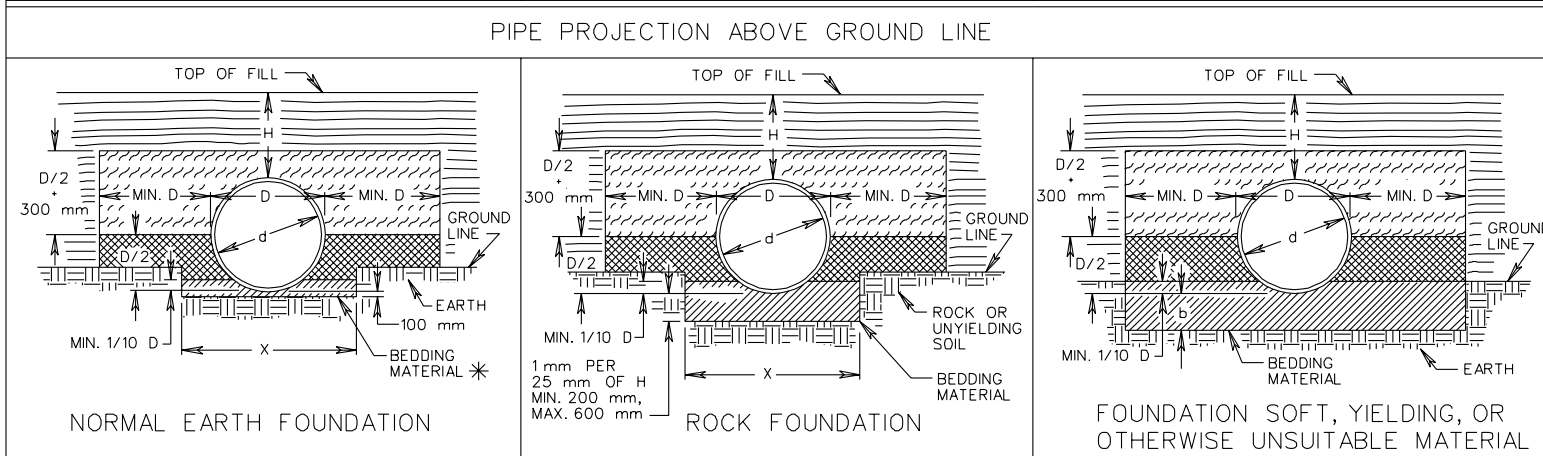
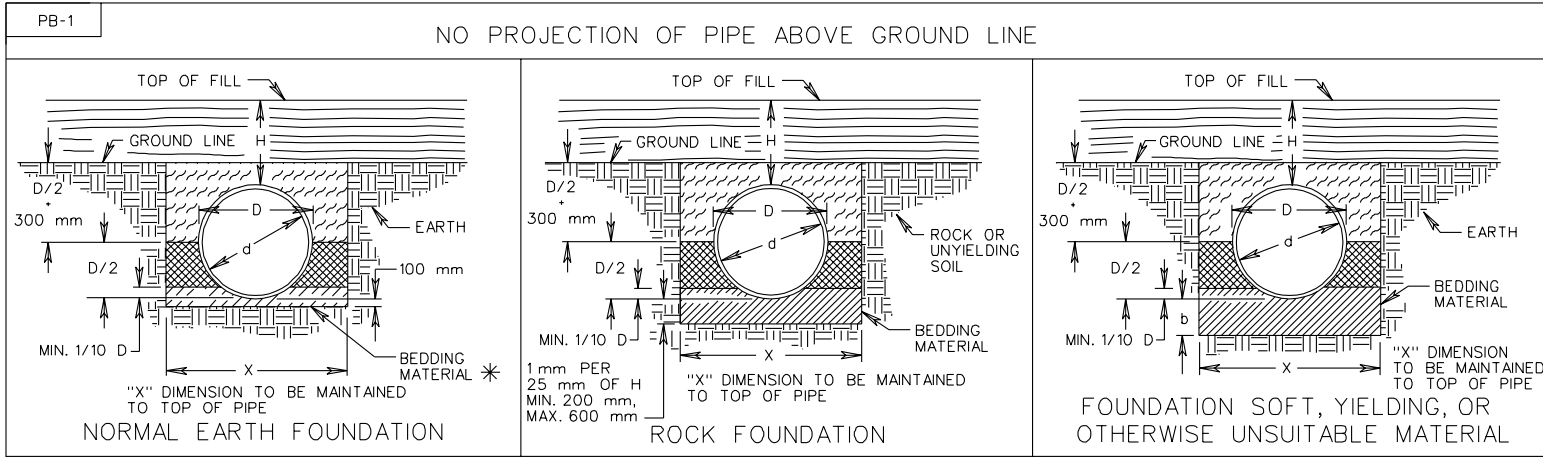
Access openings may be 760 mm diameter or 760 mm square. When structure width is less than 760 mm the access opening shall be rectangular (structure width by 760 mm long).

See cast in place drawings for further details.



TYPICAL PRECAST UNIT

SPECIFICATION REFERENCE	TYPICAL CONCRETE SAFETY SLAB FOR DROP INLETS, MANHOLES AND JUNCTION BOXES		REV. 2/01
302			106.13
VIRGINIA DEPARTMENT OF TRANSPORTATION		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	



CULVERTS LESS THAN $d = 900$ mm
 $X = D + 600$ mm
 CULVERTS WHERE $d = 900$ mm AND OVER
 $X = D + 900$ mm
 METHOD "A" PIPE BEDDING SHALL BE USED AS FOLLOWS UNLESS OTHERWISE NOTED ON PLANS:
RIGID PIPE
 WHEN H IS LESS THAN OR EQUAL TO 9.1 m
FLEXIBLE PIPE
 AS SHOWN ON TABLES

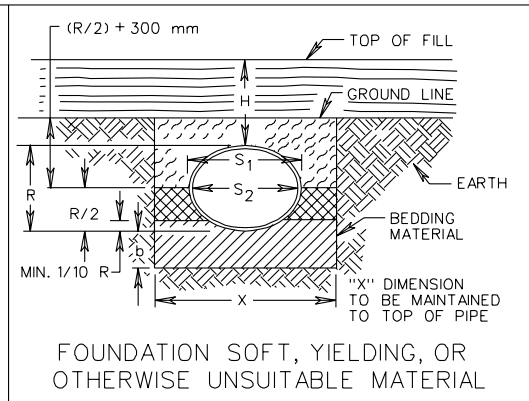
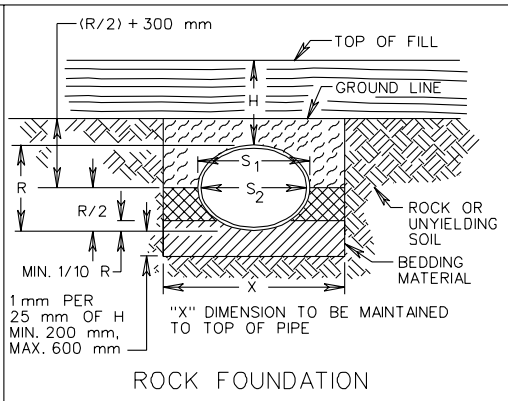
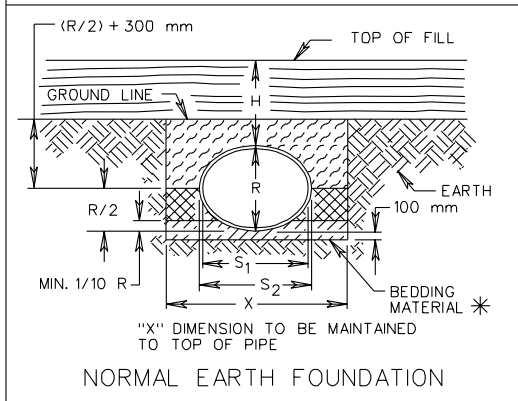
* MAY BE ELIMINATED UNDER ENTRANCE PIPE EXCEPT FOR PLASTIC PIPE INSTALLATIONS WHERE DIRECTED BY THE ENGINEER.

H = HEIGHT OF COVER MEASURED FROM TOP OF DRAINAGE STRUCTURE TO FINISHED GRADE.
 D = OUTSIDE DIAMETER OF PIPE.
 d = INSIDE DIAMETER OF PIPE.
 b = DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

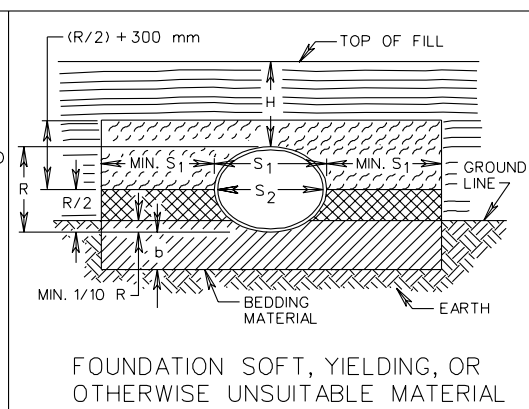
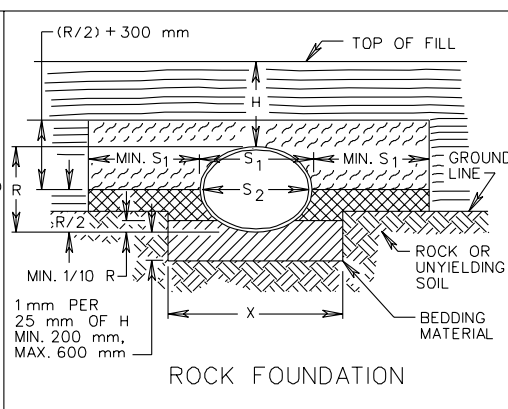
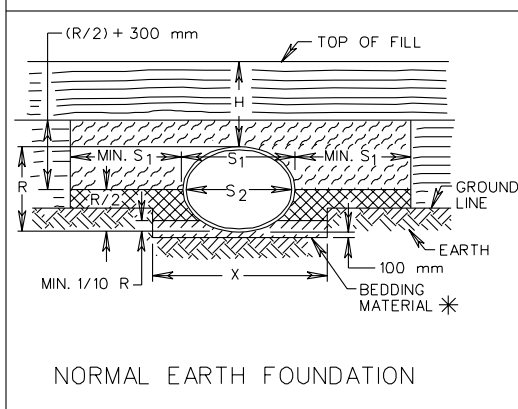
** FOR PLASTIC PIPE INSTALLATIONS, CLASS I BACKFILL MATERIAL SHALL BE USED IN LIEU OF CLASS II.

- 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.
- CLASS II BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS. **
- EMBANKMENT

NO PROJECTION OF PIPE ABOVE GROUND LINE



PIPE PROJECTION ABOVE GROUND LINE



CULVERTS LESS THAN $S_1 = 900$ mm
 $X = S_2 + 600$ mm
 CULVERTS WHERE $S_1 = 900$ mm AND OVER
 $X = S_2 + 900$ mm
 METHOD "A" PIPE BEDDING SHALL BE USED AS FOLLOWS UNLESS OTHERWISE NOTED ON PLANS:
RIGID PIPE
 WHEN H IS LESS THAN OR EQUAL TO 9.1m
FLEXIBLE PIPE
 AS SHOWN ON TABLES

* MAY BE ELIMINATED UNDER ENTRANCE PIPE WHERE DIRECTED BY THE ENGINEER.

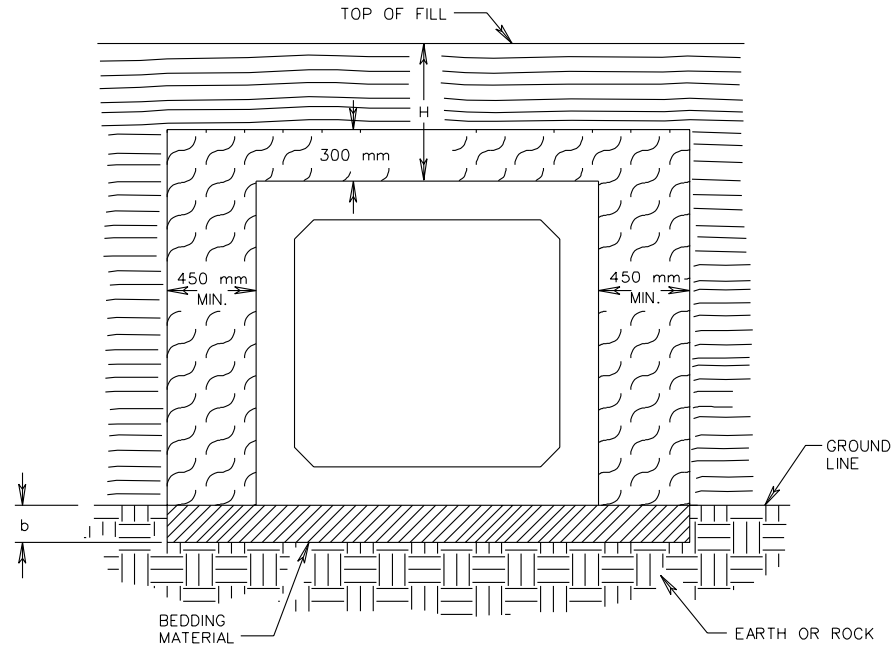
H = HEIGHT OF COVER MEASURED FROM TOP OF DRAINAGE STRUCTURE TO FINISHED GRADE.
 S_1 = OUTSIDE SPAN OF PIPE.
 S_2 = INSIDE SPAN OF PIPE.
 R = OUTSIDE RISE OF PIPE.
 b = DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.

- 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.
- CLASS II BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.
- EMBANKMENT

SPECIFICATION REFERENCE 302 303	INSTALLATION OF PIPE CULVERTS AND STORM SEWERS ELLIPTICAL PIPE BEDDING AND BACKFILL - METHOD "A" VIRGINIA DEPARTMENT OF TRANSPORTATION	REVISED 2/01 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS
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PB-1	NO PROJECTION OF PIPE ARCH ABOVE GROUND LINE		
<p style="text-align: center;">NORMAL EARTH FOUNDATION</p>	<p style="text-align: center;">ROCK FOUNDATION</p>	<p style="text-align: center;">FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL</p>	
PIPE ARCH PROJECTION ABOVE GROUND LINE			
<p style="text-align: center;">NORMAL EARTH FOUNDATION</p>	<p style="text-align: center;">ROCK FOUNDATION</p>	<p style="text-align: center;">FOUNDATION SOFT, YIELDING, OR OTHERWISE UNSUITABLE MATERIAL</p>	
<p>SPANS (S) LESS THAN 875 mm $X = S + 600$ mm SPANS (S) GREATER THAN 875 mm $X = S + 900$ mm</p> <p>* MAY BE ELIMINATED UNDER ENTRANCE PIPE WHERE DIRECTED BY THE ENGINEER.</p>	<p>H = HEIGHT OF COVER MEASURED FROM TOP OF DRAINAGE STRUCTURE TO FINISHED GRADE.</p> <p>S = SPAN</p> <p>R = RISE</p> <p>B = SEE STANDARD PC-1 FOR SPECIFIC PIPE MATERIAL.</p> <p>b = DEPTH AS SHOWN ON PLANS OR TO FIRM BEARING SOIL.</p>	<p> BEDDING MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.</p> <p> CLASS I BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.</p> <p> CLASS II BACKFILL MATERIAL IN ACCORDANCE WITH SECTION 302 OF THE ROAD AND BRIDGE SPECIFICATIONS.</p> <p> EMBANKMENT</p>	
<p>INSTALLATION OF PIPE CULVERTS AND STORM SEWERS PIPE ARCH BEDDING AND BACKFILL</p> <p style="text-align: right;">Sheet 3 of 4</p>			
REVISED 2/01	107.03 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	VIRGINIA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE 302 303

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 = 150 mm

FOR ROCK FOUNDATION:
FOR PRECAST BOX CULVERT b = 1 mm PER 25 mm OF H - 200 mm MIN., 600 mm MAX.
FOR CAST IN PLACE BOX CULVERT NO BEDDING REQUIRED
BOTTOM SLAB TO BE KEYED INTO 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.

 CLASS II 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"

NEW 2/01

107.03A UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

302
303

INSERTABLE SHEET MA121

PC - 1	CONCRETE PIPE CULVERT CRUSHING STRENGTH (kN PER METER ULTIMATE STRENGTH, OR CLASS)					
DIAMETER (mm)	AREA (m ²)	METHOD A BEDDING				
		MAXIMUM HEIGHT OF COVER IN METERS				
		STRENGTH OR CLASS				
		NON REINF.	III	IV	V	
300	0.07	4.2 (26.5)	4.2	5.8	8.8	
375	0.11	4.2 (31.0)	4.2	5.8	8.8	
450	0.16	4.2 (35.0)	4.2	6.1	8.8	
525	0.22	4.0 (39.5)	4.2	6.1	8.8	
600	0.29	4.0 (44.0)	4.2	6.1	8.8	
675	0.37		4.2	6.1	8.8	
750	0.46		4.2	6.1	8.8	
825	0.55		4.2	6.1	8.8	
900	0.66		4.2	6.1	9.1	
1050	0.89		4.2	6.4	9.1	
1200	1.17		4.2	6.4	9.1	
1350	1.48		4.2	6.4	9.1	
1500	1.82		4.2	6.4	9.1	
1650	2.21		4.2	6.4	9.1	
1800	2.63		4.2	6.4	9.1	
1950	3.08		4.2	6.4	9.1	
2100	3.57		4.2	6.4	9.1	
2250	4.10		4.2	6.4	9.1	
2400	4.67		4.2	6.4	9.1	
2550	5.27		4.2	6.4	9.1	
2700	5.91		4.2	6.4	9.1	

Heights of cover shown in table are for finished construction.

To protect pipe during construction, minimum heights of cover prior to allowing construction traffic to cross installation are to be $\frac{Dia}{2}$ or 900 mm whichever is greater. This cover shall extend the full length of the pipe culvert. The approach fill ramp is to extend a minimum of 10(Dia.+900 mm) on each side of the culvert, or to the intersection with a cut.

Minimum finished height of cover to be $\frac{Dia}{2}$ or 600 mm whichever is greater, except pipe under entrances and median crossovers where a 230 mm min. will be permitted.

For Height of Cover greater than that shown in the table for Class V pipe, a special design concrete pipe using Method A bedding and in accordance with section 105 of the specifications is to be utilized.

Sheet 1 of 17

CONCRETE PIPE
CLASS TABLE FOR H-18 LIVE LOAD

REV. 2-2001

107.04

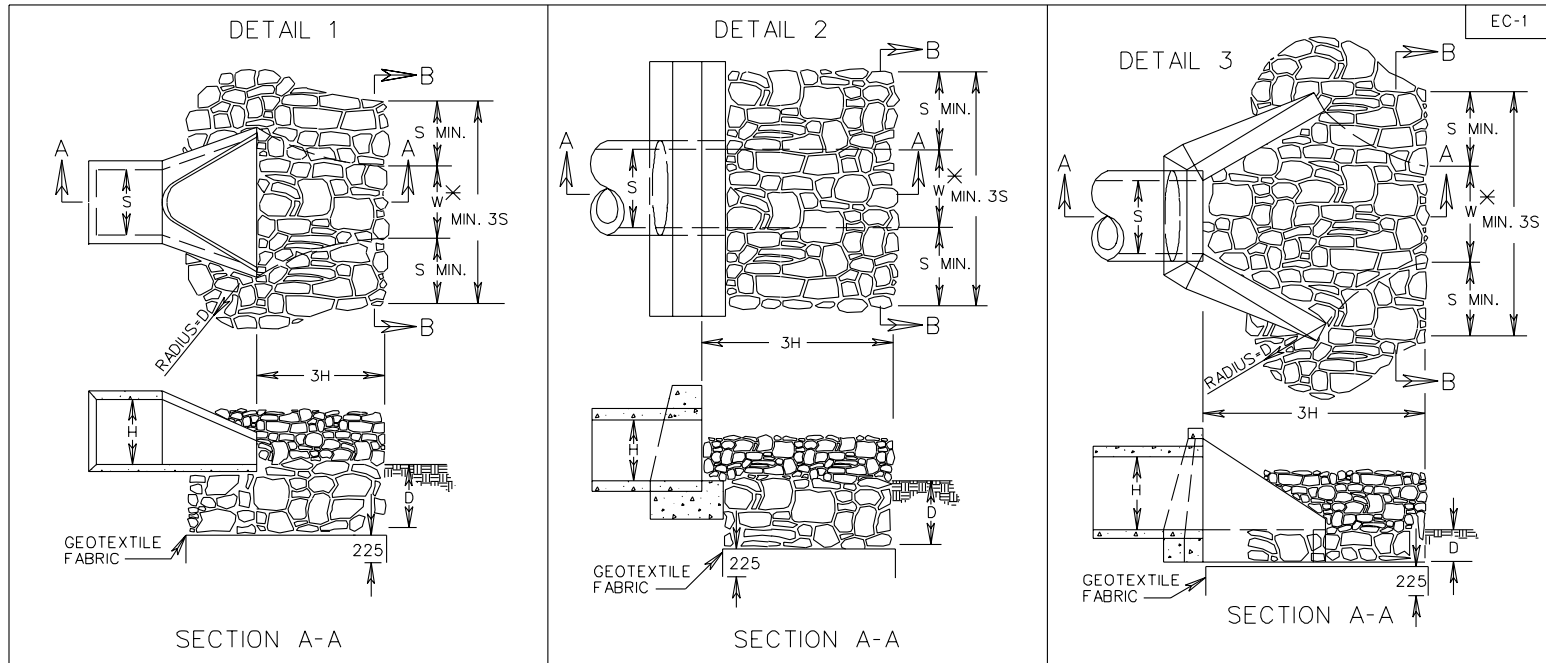
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN METERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

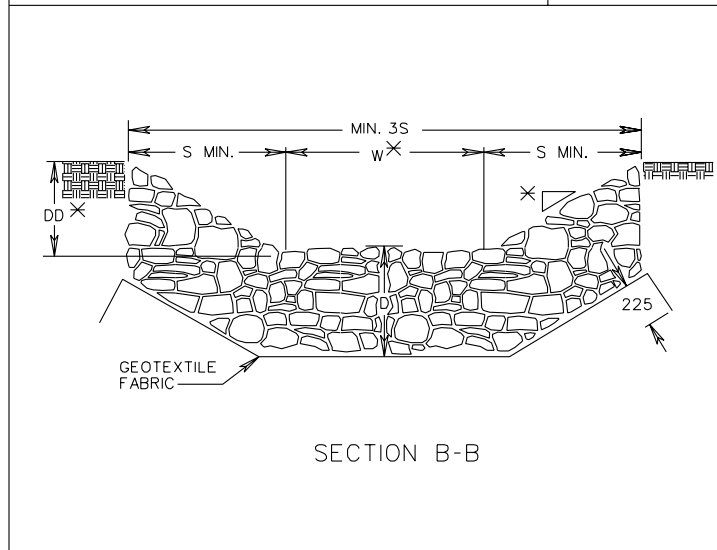
SPECIFICATION REFERENCE

302
232

INSERTABLE SHEET MA69



EC-1



NOTES:

1. FOR MULTIPLE LINE INSTALLATIONS DIMENSION S IS TO GOVERN THE PROTECTION OUTSIDE THE CHANNEL WIDTH (W).
2. ON ANY SECONDARY ROADS INSTALLATION REQUIRING EROSION CONTROL STONE WHERE NO ENDWALL OR ENDSECTION IS SPECIFIED ON PLANS, CONSTRUCTION IS TO BE IN ACCORDANCE WITH DETAIL 2 SHOWN ABOVE.
3. GEOTEXTILE FABRIC TO BE INSTALLED UNDER ALL EROSION CONTROL STONE IN ACCORDANCE WITH THE SPECIFICATIONS.
4. S = DIAMETER OF CIRCULAR CULVERT OR SPAN FOR BOX, ELLIPTICAL OR ARCH CULVERT. H = DIAMETER OF CIRCULAR CULVERT OR RISE/HEIGHT FOR BOX, ELLIPTICAL OR ARCH CULVERT.
5. * USE TYPICAL SECTION SHOWN ON PLANS OR FOR SIDESLOPE, BOTTOM WIDTH AND DEPTH OF CHANNEL, MATCH EXISTING DITCH OR NATURAL GROUND.

EC-1	MIN. DEPTH "D"
CLASS I	600
CLASS II	900

SPECIFICATION REFERENCE
204
245
303
414

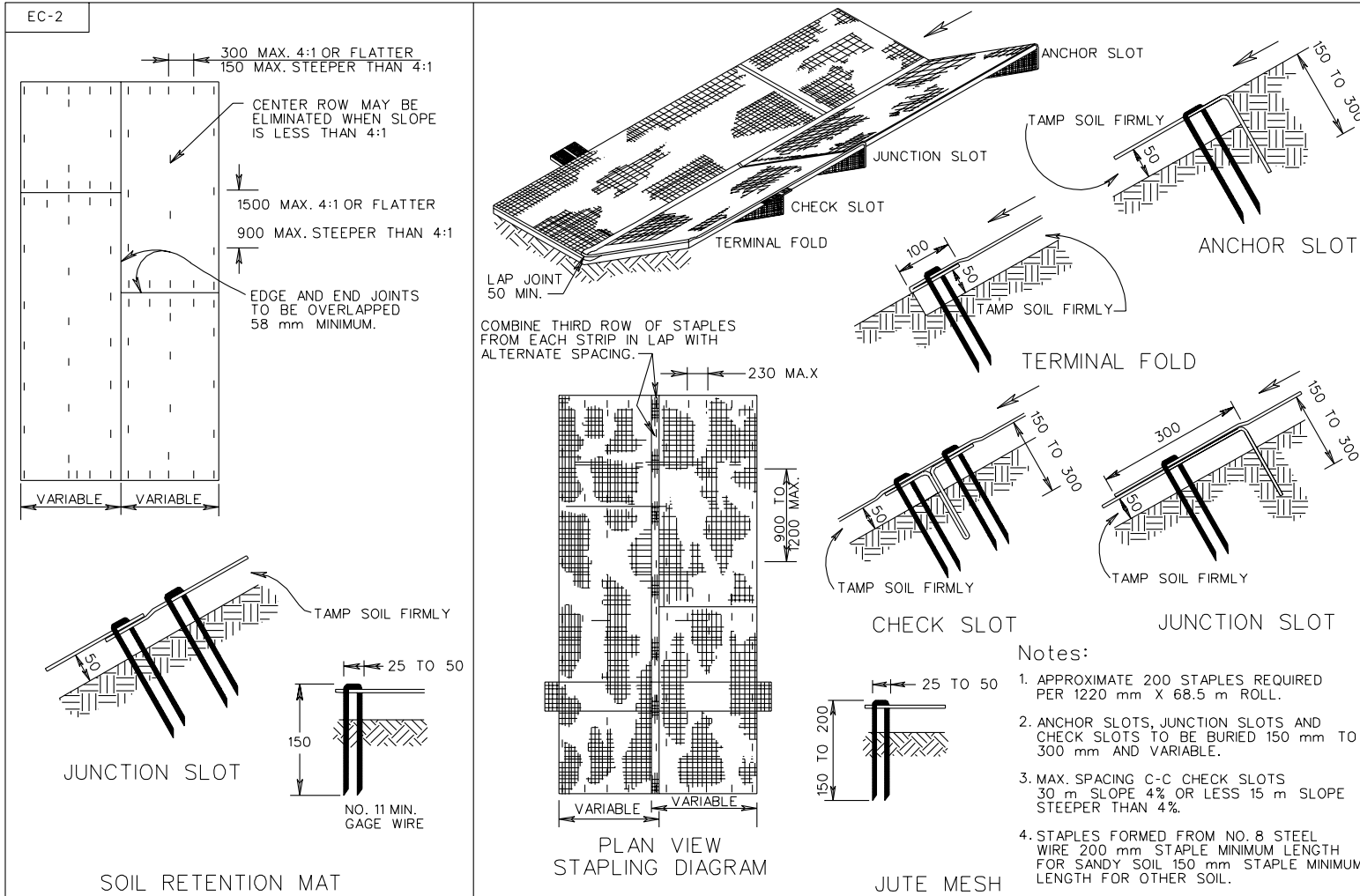
STONE FOR EROSION CONTROL

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

114.01



GENERAL NOTES:

1. BASIS OF PAYMENT TO BE SQUARE METERS OF PROTECTIVE COVERING COMPLETE IN PLACE. PROTECTIVE COVERING IS TO BE LOCATED AS INDICATED ON THE PLANS IN ACCORDANCE WITH THE DIMENSIONS SPECIFIED ON TYPICAL SECTION.
2. "T-TOP" STAPLES OR OTHER MANUFACTURER'S DESIGN APPROVED BY THE ENGINEER MAY BE SUBSTITUTED FOR THE STAPLES SHOWN.
3. JUTE MESH OR SOIL RETENTION MAT IN ACCORDANCE WITH THE SPECIFICATIONS MAY BE USED AT THE OPTION OF THE CONTRACTOR.
4. WIDTH OF MATERIAL MAY VARY FROM MINIMUM DIMENSION BY INCREMENTS OF 1220 OR 1525 mm.
5. FOR SOURCES OF APPROVED MATERIAL SEE VDOT'S APPROVED PRODUCTS LIST FOR ST'D. EC-2 MATERIAL.

PROTECTIVE COVERING INSTALLATION CRITERIA

REV. 2/01

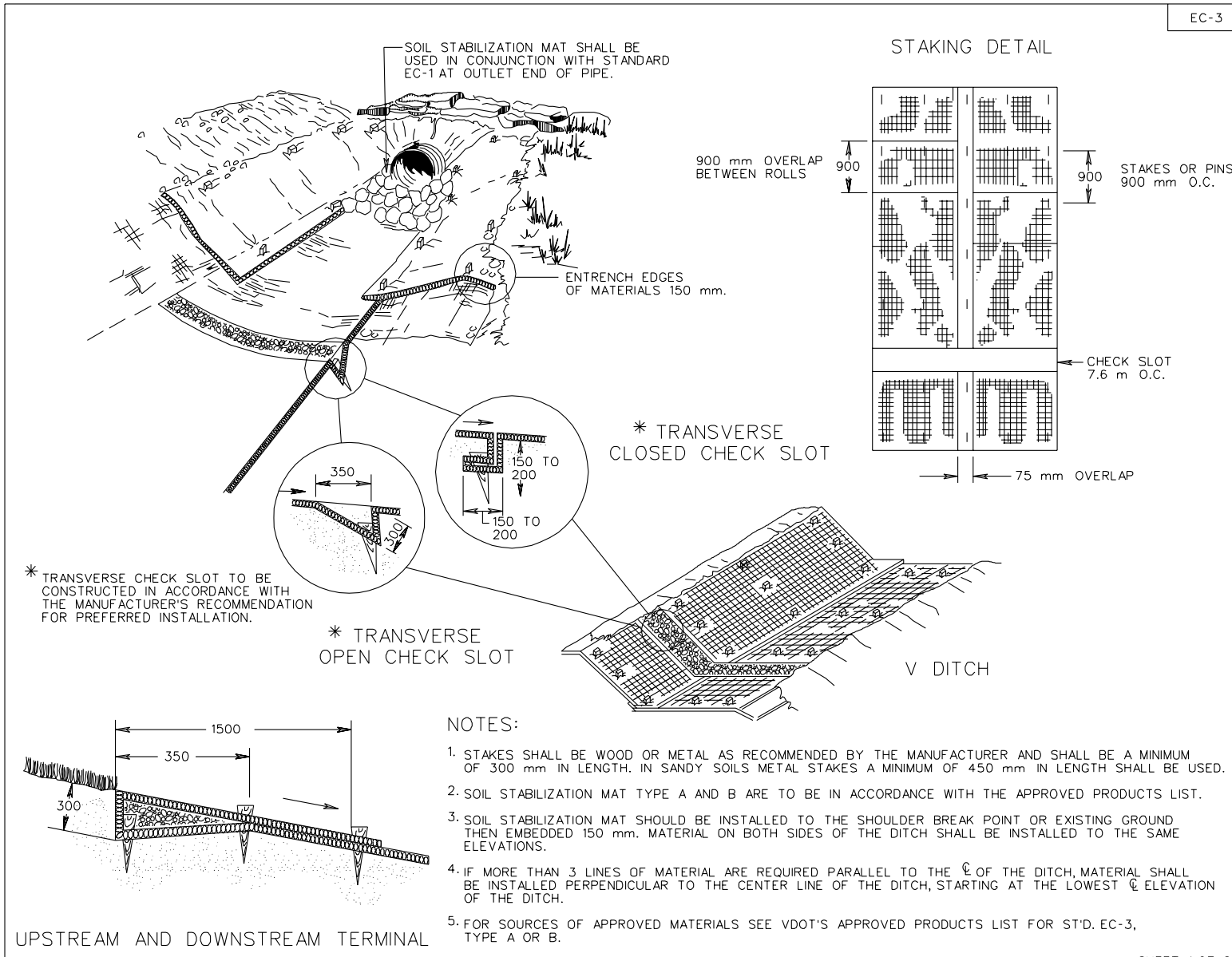
114.02

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

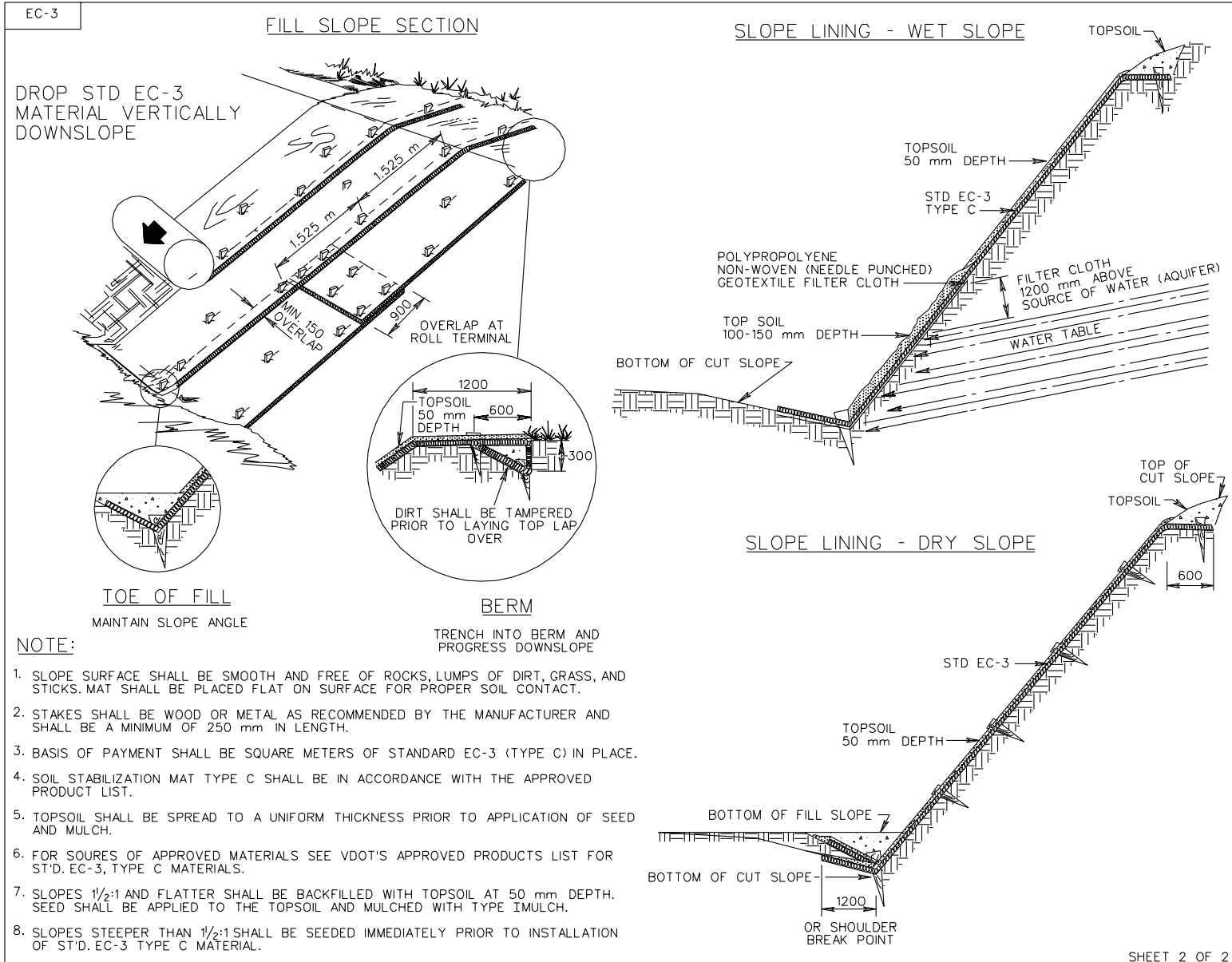
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

244
606



SPECIFICATION REFERENCE	SOIL STABILIZATION MAT DITCH INSTALLATION TYPE A OR B		REV. 2/01
606 244	VIRGINIA DEPARTMENT OF TRANSPORTATION		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS



SHEET 2 OF 2

SOIL STABILIZATION MAT - SLOPE INSTALLATION TYPE C

REV. 2/01

114.04

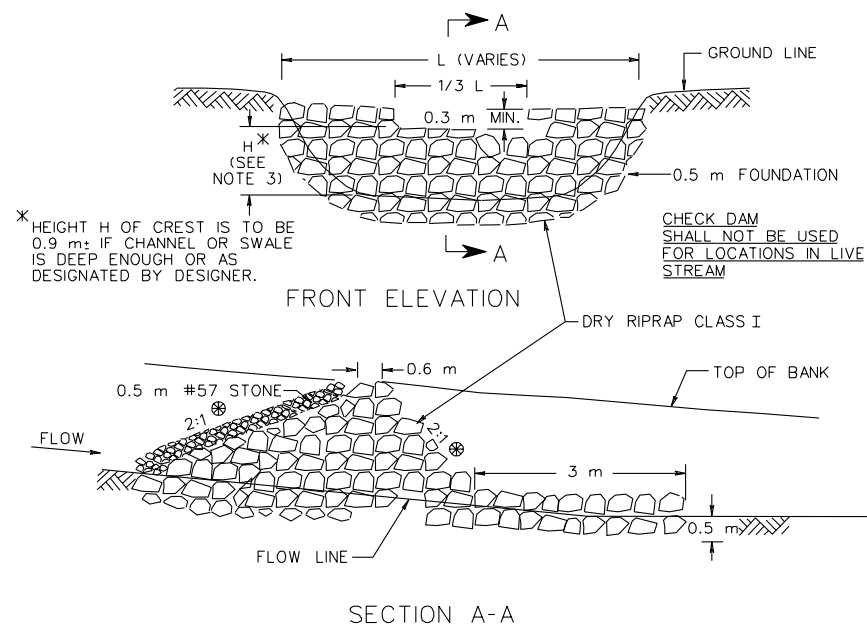
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

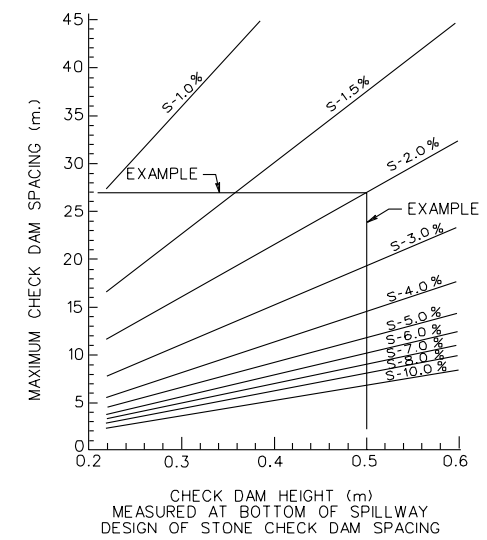
SPECIFICATION REFERENCE

244
606

TYPICAL DETAIL FOR ROCK CHECK DAM TYPE I



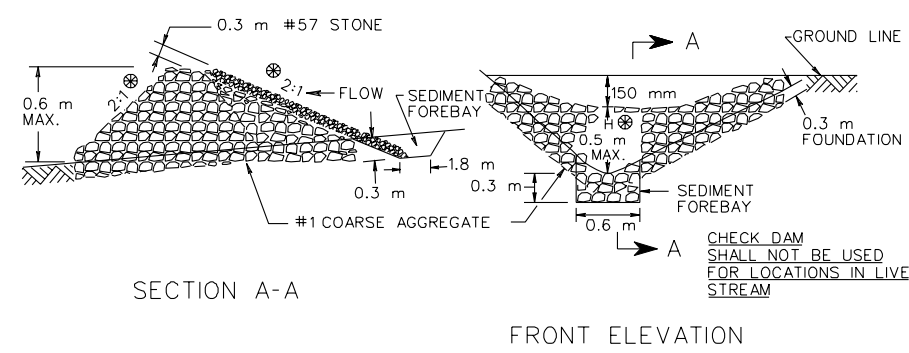
SUGGESTED ROCK CHECK DAM SPACING



EXAMPLE :

HEIGHT OF STRUCTURE 0.5 m
 GRADE 2%
 EXTEND PERPENDICULAR FROM 0.5 m HEIGHT TO INTERSECT 2% GRADE
 EXTEND 90° TO THE LEFT TO DETERMINE SPACING (27 m.)

TYPICAL DETAIL FOR ROCK CHECK DAM TYPE II



NOTES:

- ROCK CHECK DAMS THAT ARE DESIGNATED ON THE PLANS AS A STORMWATER MANAGEMENT (SWM) ITEM ARE TO BE LEFT IN PLACE AS A PERMANENT INSTALLATION.
- WHERE DRAINAGE AREAS EXCEED 0.4 HECTARES OR DITCH GRADE EXCEEDS 3% A TEMPORARY SEDIMENT FOREBAY SHALL BE INSTALLED WITH MINIMUM DIMENSIONS OF 0.3 m DEPTH, 0.6 m WIDTH AND 1.8 m IN LENGTH.
- IF CHECK DAM IS LOCATED INSIDE CLEAR ZONE AND ADJACENT TO A TRAVELWAY, SLOPE FACING ON COMING TRAFFIC IS TO BE 6:1 AND MAXIMUM H IS TO BE 0.3 m.
- ALTERNATIVE MATERIALS ON VDOT'S SPEL LIST MAY BE SUBSTITUTED AT NO ADDITIONAL COST TO THE DEPARTMENT.

SPECIFICATION REFERENCE
107 303

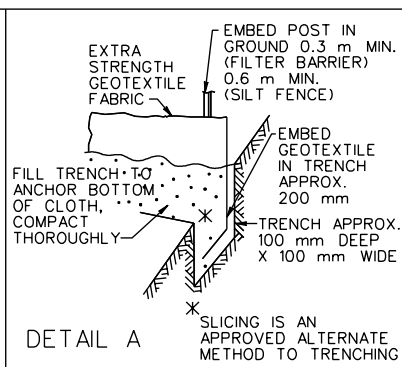
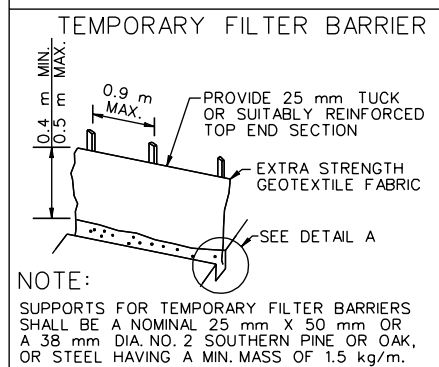
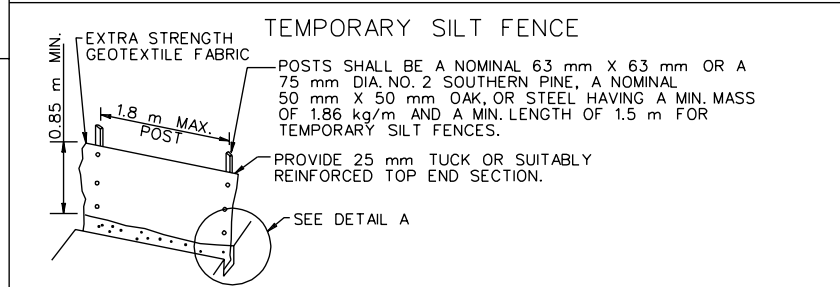
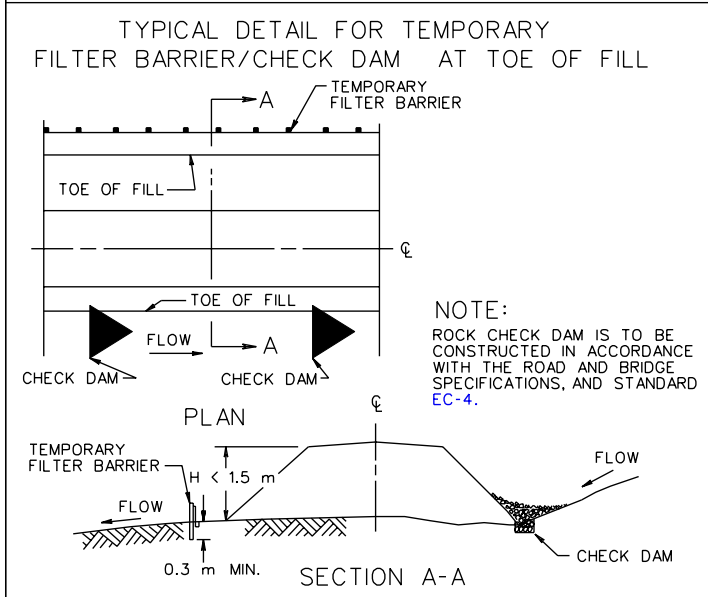
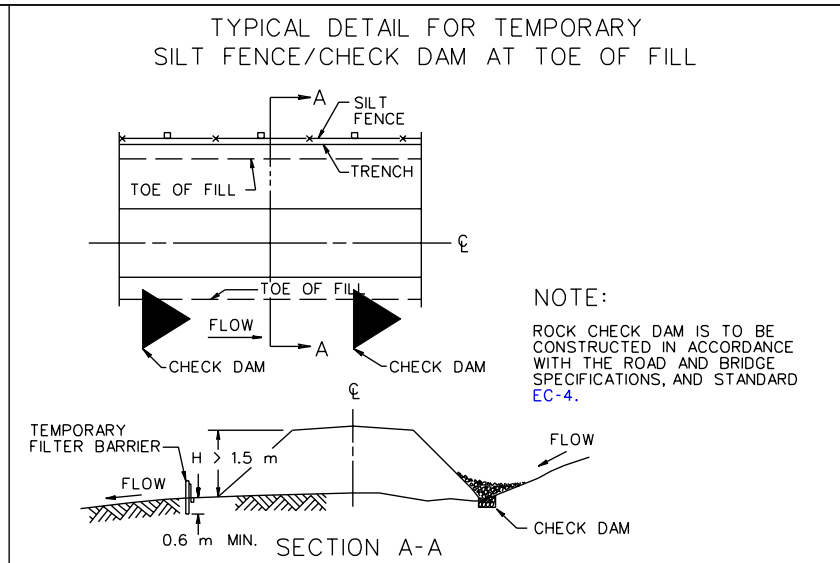
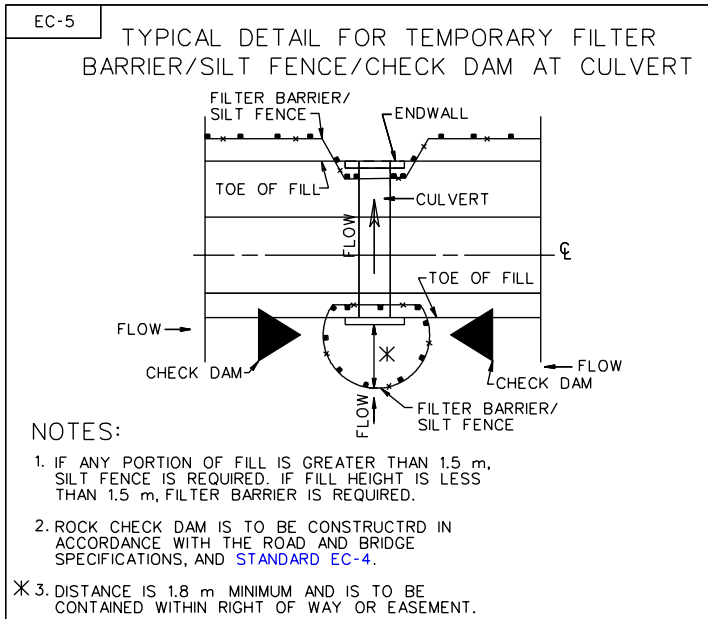
ROCK CHECK DAMS TYPE I & II

VIRGINIA DEPARTMENT OF TRANSPORTATION

NEW 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS 114.05

REVISED ON 3/03



TEMPORARY SILT FENCE AND FILTER BARRIER

NEW 2/01

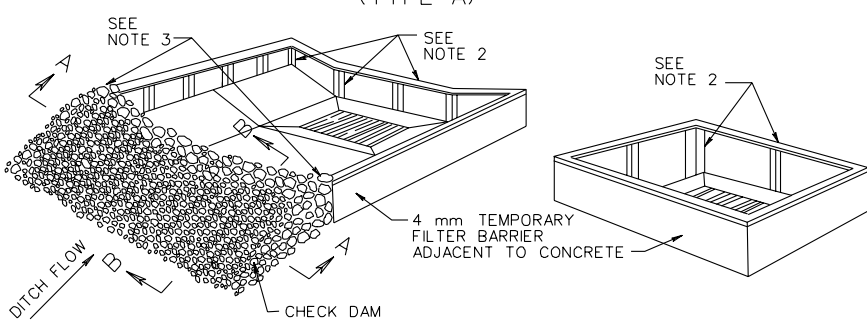
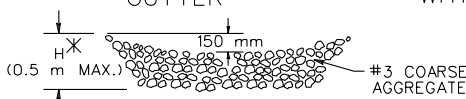
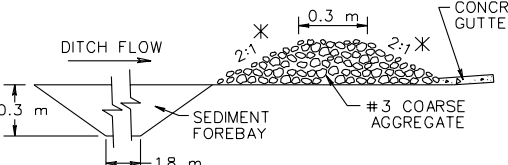
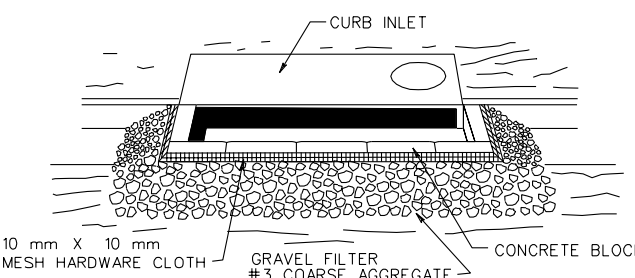
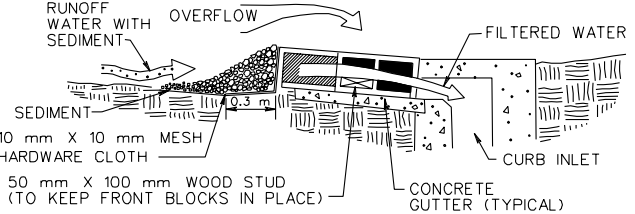
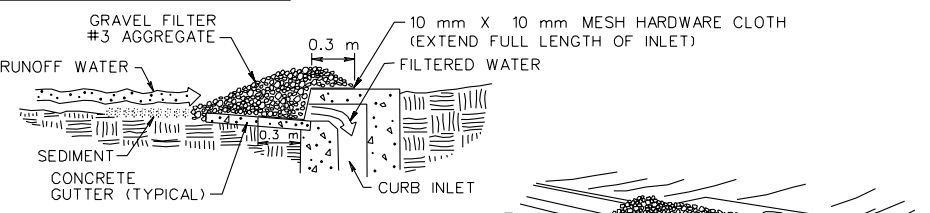
114.06 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

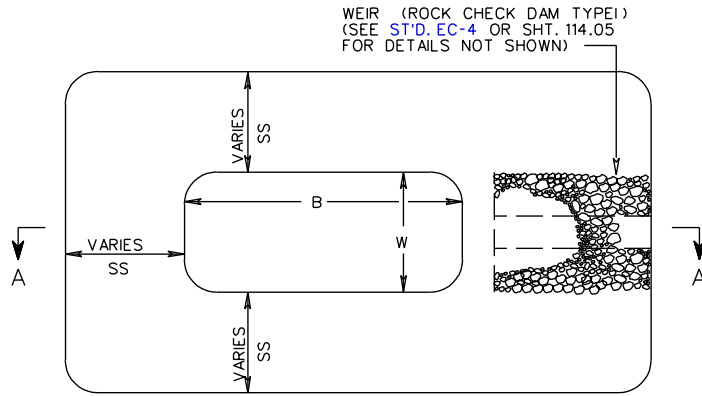
SPECIFICATION REFERENCE

107
242
303

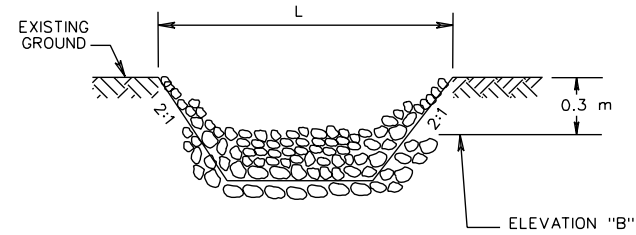
REVISED ON 7/01 REVISED ON 3/03

<p style="text-align: center;">DROP INLET SILT TRAP (TYPE A)</p>  <p style="text-align: center;">TYPICAL TREATMENT FOR DROP INLET WITH CONCRETE GUTTER</p>  <p style="text-align: center;">SECTION A-A</p> <p>* IF CHECK DAM IS LOCATED INSIDE CLEAR ZONE AND ADJACENT TO A TRAVELWAY, SLOPE FACING ON COMING TRAFFIC IS TO BE 6:1 AND MAXIMUM H IS TO BE 0.3 m.</p>  <p style="text-align: center;">SECTION B-B</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. DROP INLET SILT TRAPS WILL BE MEASURED FOR PAYMENT IN METERS OF TEMPORARY FILTER BARRIER. 2. POSTS AND TOP RAIL SHALL BE A NOMINAL 63 mm X 63 mm OR A 75 mm DIA. NO. 2 SOUTHERN PINE, A NOMINAL 50 mm X 50 mm OAK, OR STEEL HAVING A MIN. MASS OF 1.86 kg/m AND A MIN. LENGTH OF 1.5 m FOR TEMPORARY SILT FENCES. 3. END OF FILTER BARRIER TO BE EMBEDDED INTO AGGREGATE. 4. IF A DROP INLET IS LOCATED IN A SAG IN THE DITCH GRADE, A CHECK DAM IS REQUIRED FOR EACH SIDE OF THE INLET THAT RECEIVES DITCH FLOW. 5. WHERE DRAINAGE AREAS EXCEED 0.4 HECTARES OR DITCH GRADE EXCEEDS 3% A TEMPORARY SEDIMENT FOREBAY SHALL BE INSTALLED WITH MINIMUM DIMENSIONS OF 0.3 m DEPTH, 0.6 m WIDTH AND 1.8 m LENGTH. 	<p style="text-align: center;">DROP INLET SILT TRAP TYPE B (BLOCK AND GRAVEL)</p> <p style="text-align: right;">EC-6</p>   <p style="text-align: center;">SECTION VIEW</p> <p>SPECIFIC APPLICATION</p> <p>THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.</p> <p style="text-align: center;">ALTERNATE DROP INLET SILT TRAP TYPE B (GRAVEL)</p>  <p style="text-align: center;">SECTION VIEW</p> <p>SPECIFIC APPLICATION</p> <p>THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.</p>	
<p>SPECIFICATION REFERENCE</p> <p>107 242 303</p>	<p>DROP INLET SILT TRAP (TYPE A AND B)</p> <p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p>NEW 2/01</p> <p>UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS</p> <p>114.07</p>

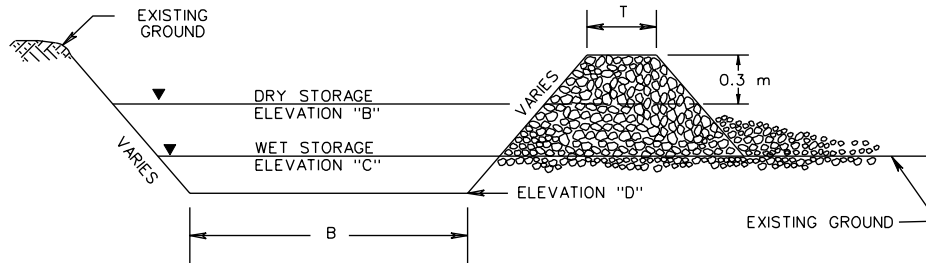
EC-7



PLAN VIEW OF TEMPORARY SEDIMENT TRAP



TYPICAL SECTION THRU WEIR
(ROCK CHECK DAM TYPE 1)



TYPICAL SECTION (A-A) THRU
TEMPORARY SEDIMENT TRAP

NOTES:

1. CHECK DAM IS SHOWN FOR ILLUSTRATION ONLY AND IS NOT INCLUDED IN PAYMENT FOR SEDIMENT TRAP.
2. THE SEDIMENT STORAGE VOLUME SHALL BE 254 m³/ha OF TOTAL CONTRIBUTING DRAINAGE AREA AND SHALL CONSIST OF HALF IN THE FORM OF WET STORAGE AND HALF IN THE FORM OF DRY STORAGE.
3. SEE PLANS FOR DIMENSIONS AND ELEVATIONS.

NEW 2/01

114.08

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TYPICAL SEDIMENT TRAP

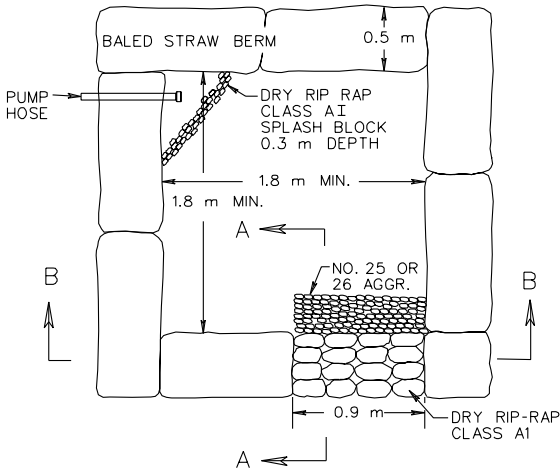
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION
REFERENCE

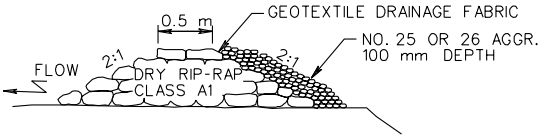
107
303

EC-8

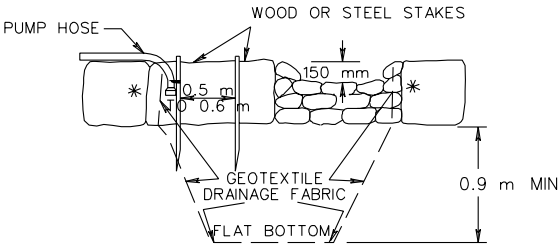
TYPICAL DEWATERING BASIN



PLAN



SECTION A-A



SECTION B-B

* GEOTEXTILE DRAINAGE FABRIC TO COVER INSIDE FACE OF BALED STRAW BERM.

NOTES:

1. DEWATERING BASIN SIZE SHALL BE DETERMINED BY THE FORMULA $0.1 \times \text{LITERS PER MINUTE OF PUMP} = \text{m}^3 \text{ OF STORAGE CAPACITY}$.
2. THIS WORK SHALL CONSIST OF THE CONSTRUCTION OF A DEWATERING BASIN FOR THE PURPOSE OF RECEIVING SEDIMENT-LADENED WATER PUMPED FROM A CONSTRUCTION SITE TO ALLOW FOR FILTRATION BEFORE IT RE-ENTERS THE WATERWAY. PUMPING INTO THESE BASINS SHALL CEASE WHEN THE FLOW FROM THE BASIN BECOMES SEDIMENT-LADENED.
3. SURFACE WATER FLOW SHALL BE DIVERTED AROUND THIS DEVICE.
4. THE OUTFALL FROM THE BASIN(S) SHALL HAVE A STABILIZED CONVEYANCE TO RECEIVING WATERS.
5. ONCE THE DEWATERING BASIN BECOMES FILLED TO HALF OF THE EXCAVATED DEPTH, ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED DISPOSAL AREA OUTSIDE OF THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE APPROVED ON THE PLANS.
6. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED AND THE ENGINEER APPROVES THEIR REMOVAL. GROUND CONTOURS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE ENGINEER.
7. SYNTHETIC PRODUCTS APPROVED BY VDOT'S NEW PRODUCTS COMMITTEE AS A SUBSTITUTE MAY BE USED IN LIEU OF THIS DESIGN. HOWEVER, VDOT WILL ONLY COMPENSATE THE CONTRACTOR UP TO THE BID PRICE PER EACH AT EACH SITE.

SPECIFICATION REFERENCE
107 303

DEWATERING BASIN

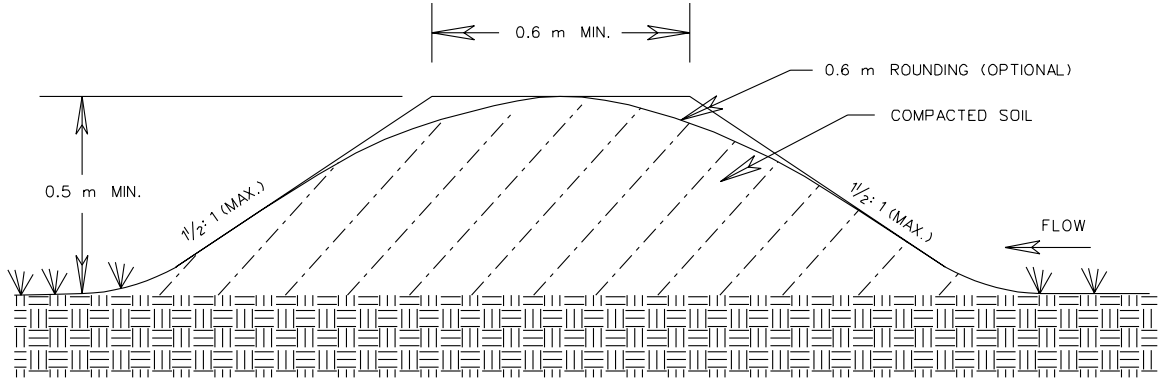
VIRGINIA DEPARTMENT OF TRANSPORTATION

NEW 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

114.09

EC-9



TEMPORARY DIVERSION DIKE

NOTE:

- 1. THE CHANNEL CREATED BEHIND THE DIKE SHALL HAVE A POSITIVE GRADE TO A STABILIZED OUTLET. THE CHANNEL SHALL BE STABILIZED, AS NECESSARY, TO PREVENT EROSION.
- 2. TEMPORARY DIVERSION DIKE WILL BE MEASURED AND PAID FOR IN ACCORDANCE WITH SECTION 303 OF THE SPECIFICATIONS.

TEMPORARY DIVERSION DIKE

NEW 2/01

114.10 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

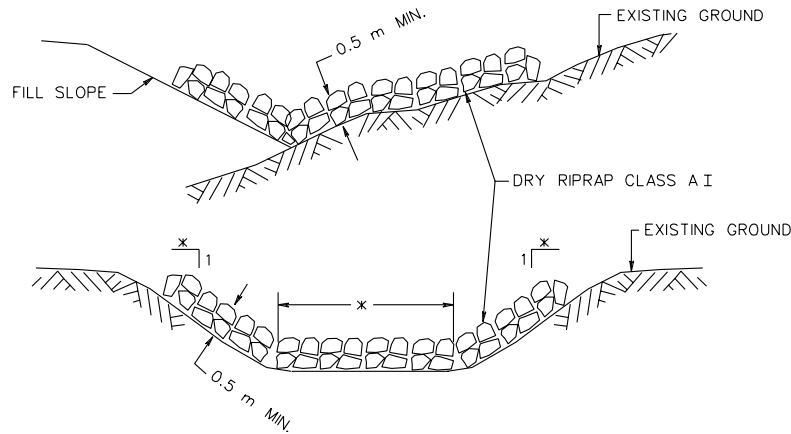
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

303

REVISED ON 3/03

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

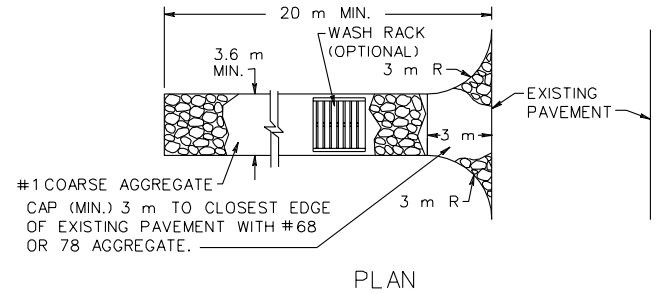


NOTES:

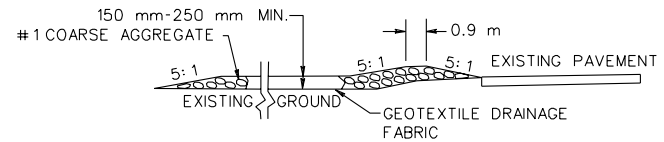
1. THE DEPTH OF PROTECTION WILL DEPEND ON WHATEVER DEPTH IS ATTAINABLE, WITH THE RIPRAP BEING EVENLY SPREAD WITH THE QUANTITY SHOWN ON THESE PLANS. RIPRAP MAY BE ADDED OR DELETED AS FOUND NECESSARY BY THE ENGINEER.
2. *SIDE SLOPES AND BOTTOM WIDTH (IF TRAPEZOIDAL) SHOWN IN TYPICAL SECTION OF PROPOSED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

ESC-INS

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.

SHEET 1 OF 3

SPECIFICATION REFERENCE

107
303

TEMPORARY EROSION & SILTATION CONTROL

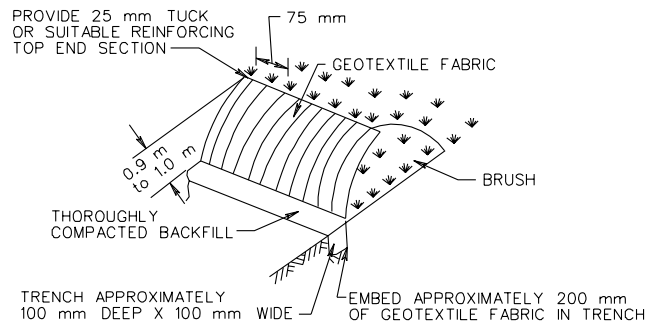
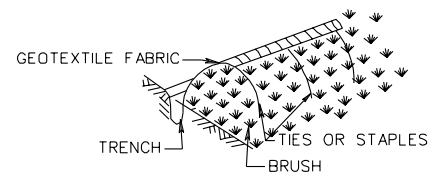
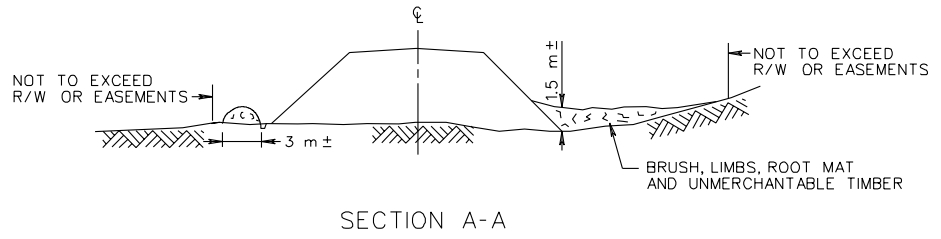
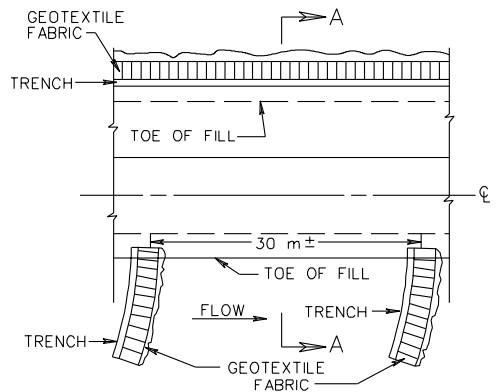
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

115.03

SILT BARRIERS
 TYPICAL DETAIL FOR BRUSH BARRIER
 (TO BE USED AT ALL APPLICABLE LOCATIONS)



FRONT ISOMETRIC

BACK ISOMETRIC

NOTES:

1. BRUSH BARRIERS SHALL BE CONSTRUCTED AT LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. BRUSH SHALL BE PILED AGAINST EXISTING TREES TO PREVENT MOVEMENT OF BARRIER. BRUSH SHALL BE PILED AS TIGHTLY AS POSSIBLE AND WEIGHTED DOWN BY UNMERCHANTABLE LOGS.
2. GEOTEXTILE FABRIC CONFORMING TO THE ROAD AND BRIDGE SPECIFICATIONS SHALL BE INSTALLED AS DETAILED ABOVE. GEOTEXTILE FABRIC MAY ALSO BE ATTACHED TO EXISTING FENCES WHEN SPECIFIED ON THE PLANS OR DIRECTED BY THE ENGINEER.
3. NO BRUSH WILL BE DESTROYED OR REMOVED FROM THE PROJECT UNTIL ALL BRUSH SILT BARRIERS ARE IN PLACE AND HAVE BEEN INSPECTED AND APPROVED BY THE ENGINEER.
4. DIMENSIONS SHOWN ARE APPROXIMATE ONLY.

SPECIFICATION REFERENCE
107 303

TEMPORARY EROSION & SILTATION CONTROL

VIRGINIA DEPARTMENT OF TRANSPORTATION

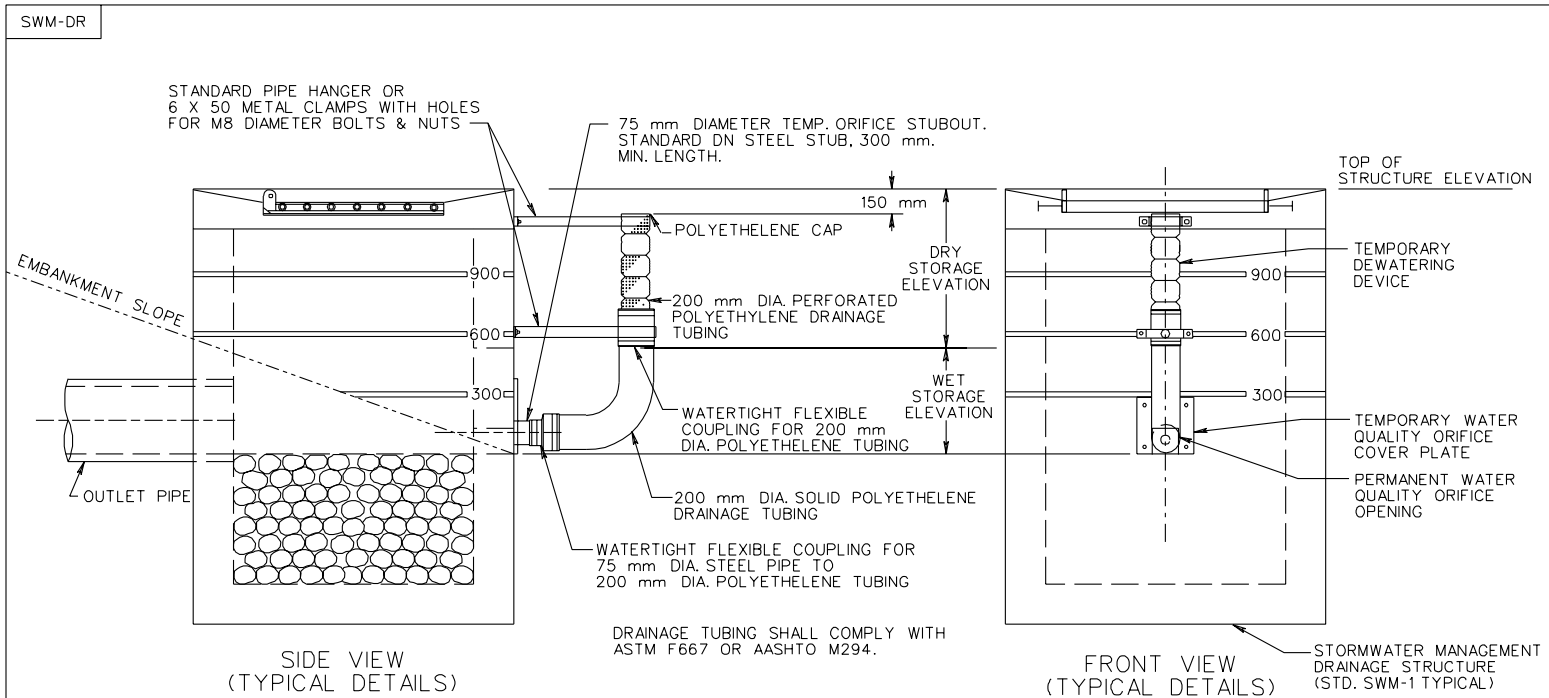
REV. 2/01

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

115.05

REVISED ON 11/02

REVISED ON 3/03



NOTE:

1. THESE DETAILS ARE TO BE USED TO MODIFY THE PERMANENT STORMWATER MANAGEMENT DRAINAGE STRUCTURE WHERE THE STORMWATER MANAGEMENT BASIN IS TO BE USED FOR A TEMPORARY SEDIMENT BASIN DURING PROJECT CONSTRUCTION.
2. GRADE STORMWATER MANAGEMENT BASIN AS SHOWN IN PLANS.
3. ALL OPENINGS (IF ANY) IN SIDE OF STRUCTURE (OTHER THAN PERMANENT WATER QUALITY ORIFICE) ARE TO BE COVERED WITH SOLID METAL PLATES WHILE THE BASIN IS BEING USED FOR SEDIMENT CONTROL.
4. DEWATERING DEVICE AND COMPONENTS AND TEMPORARY METAL PLATES (IF ANY), AS SHOWN IN THE DETAIL, ARE TO BE REMOVED AND PERMANENT STEEL PLATE WITH WATER QUALITY ORIFICE IS TO BE INSTALLED WHEN BASIN IS NO LONGER NEEDED FOR SEDIMENT CONTROL.
5. SIMILAR DEVICE MAY ALSO BE USED ON OTHER STORMWATER MANAGEMENT DRAINAGE STRUCTURES.
6. COST OF TEMPORARY DEWATERING DEVICE AND TEMPORARY METAL PLATES (IF ANY) SHALL BE INCLUDED IN THE BID PRICE FOR STORMWATER MANAGEMENT DRAINAGE STRUCTURE.
7. THE TEMPORARY 200 mm DIA. POLYETHYLENE DRAINAGE TUBING IS TO BE SOLID FOR THE LENGTH BELOW WET STORAGE ELEVATION AND IS TO BE PERFORATED ABOVE THE WET STORAGE ELEVATION. THE COUPLING IS TO BE WATERTIGHT.

STORMWATER MANAGEMENT (SWM) DETAILS

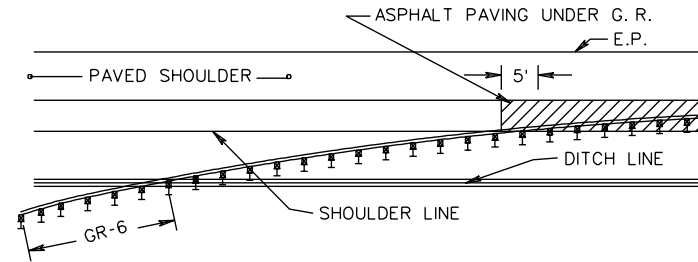
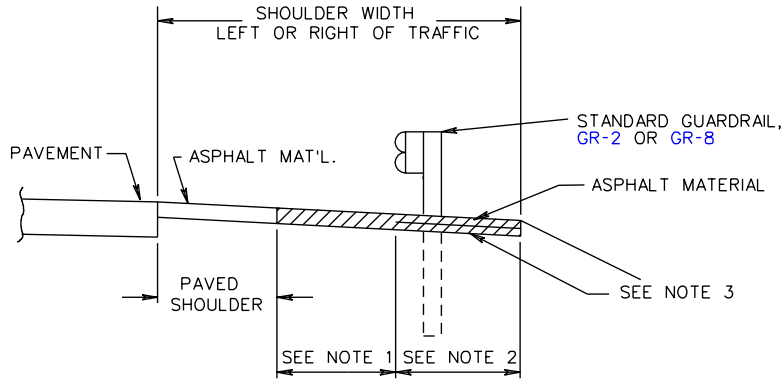
REV. 2/01

116.05 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

302



GR-6 TERMINAL

ASPHALT PAVING UNDER GUARDRAIL
(FOR USE WHERE ASPHALT CURB IS NOT REQUIRED)

NOTES:

1. TO BE CONSTRUCTED WITH THE SAME MATERIAL AND TO THE SAME DEPTH AS THE PAVED SHOULDER.
2. TO BE CONSTRUCTED WITH THE SAME ASPHALT MATERIALS AS THE PAVED SHOULDER TO THE FOLLOWING DEPTHS:

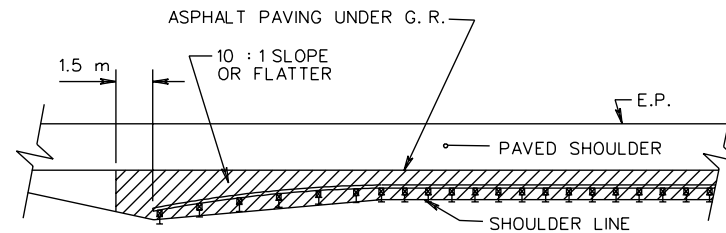
ALLOWABLE DEPTHS OF ASPHALT MATERIAL

IM-19.0A OR IM-19.0D	50 mm MIN.
BM-25.0	75 mm MIN.
BM-37.5	100 mm MIN.

3. DEPTH OF ASPHALT MATERIAL MAY BE EXTENDED AT THE CONTRACTOR'S OPTION TO COINCIDE WITH THE BOTTOM OF THE PAVED SHOULDER COURSE AT NO INCREASE IN THE QUANTITY OF ASPHALT MATERIAL COMPUTED USING THE ABOVE SPECIFIED DEPTH.

ADDITIONAL 1.5 METERS ASPHALT PAVING BEYOND POINT WHERE GUARDRAIL CROSSES SHOULDER LINE.

FOR ADDITIONAL DESIGN AND PLACEMENT INFORMATION SEE SHEET 1 OF 2.

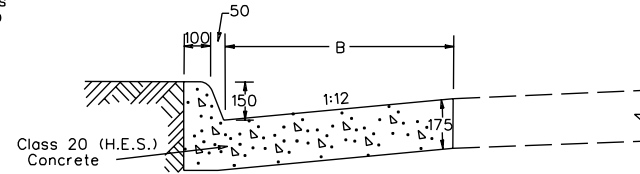
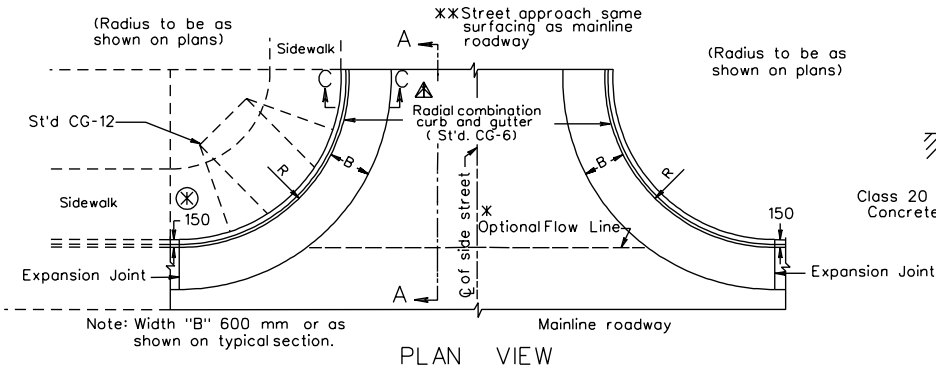


GR-7 & GR-9 TERMINALS

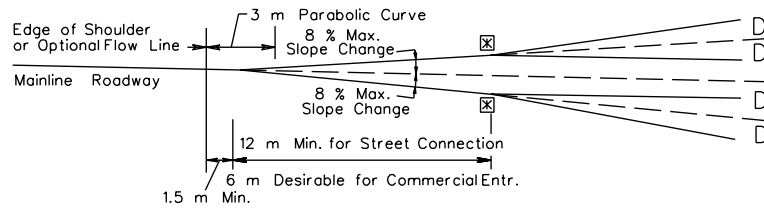
METHODS FOR BEGINNING & ENDING ASPHALT PAVING UNDER GUARDRAIL AND GUARDRAIL INSTALLATION SITE PREPARATION REQUIREMENTS FOR GR-7 AND GR-9, SEE [STANDARD GR-SP](#) FOR SPECIFIC SITE PREPARATION REQUIREMENTS.

SPECIFICATION REFERENCE 105 502	<h2 style="margin: 0;">ASPHALT CURB AND GUTTER & ASPHALT PAVING UNDER GUARDRAIL</h2>	VIRGINIA DEPARTMENT OF TRANSPORTATION	REV. 2/01	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	201.08
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CG-11



☒ Construct Grade changes with a parabolic curve.



SECTION A - A
Guidelines for Grade Change D

Entrance Volume	Desirable	Maximum
High (more than 1500 VPD)	0 %	3 %
Medium (500-1500 VPD)	≤ 3 %	6 %
Low (less than 500 VPD)	≤ 6 %	8 %

⊗ When the entrance radii cannot accommodate the turning requirements of anticipated heavy truck traffic, the depth for sidewalk & curb ramps within the limits of the radii should be increased to 175 mm.

When St'd. CG-11 is used for entrances built in conjunction with VDOT projects, please note the following:

⊗ Mainline pavement shall be constructed to the R/W line (except any subgrade stabilization required for mainline pavement which can be omitted in the entrance.)

⚠ Radial curb or combination curb and gutter shall not be constructed beyond the R/W line except for replacement purposes.

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.

See Standard CG-12 for Curb Ramp design to be used with this Standard.

⊗ Plans are to indicate when construction of a flow line is required to provide positive drainage across the entrance.

Optional flowline may require warping of a portion of gutter to preclude ponding of water.

METHOD OF TREATMENT-
CONNECTION FOR STREET INTERSECTIONS
AND COMMERCIAL ENTRANCES

REV. 2/01

203.04 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

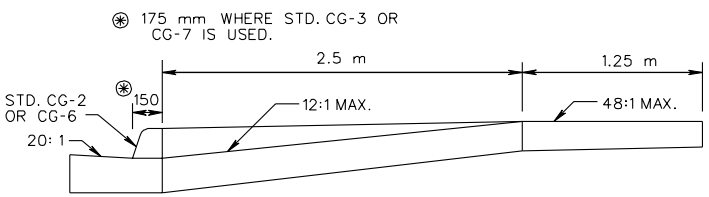
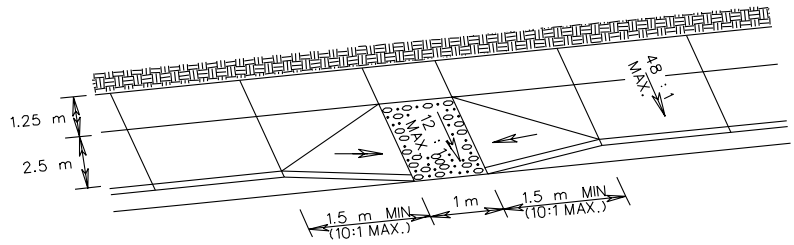
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

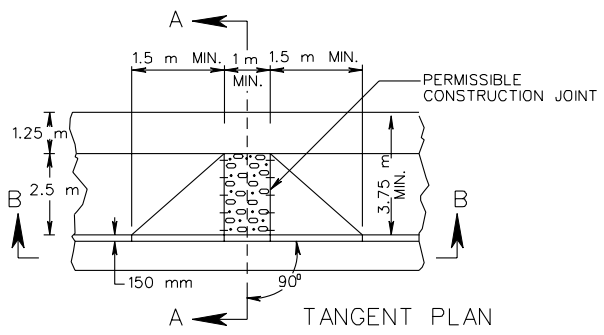
502

REVISED ON 11/02 REVISED ON 3/03

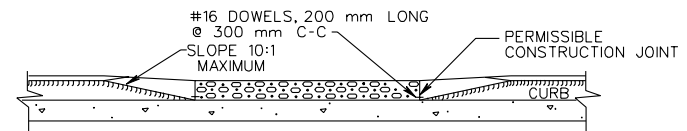
CG-12A



SECTION A-A



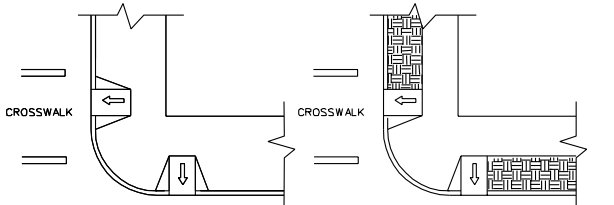
TANGENT PLAN



SECTION B-B

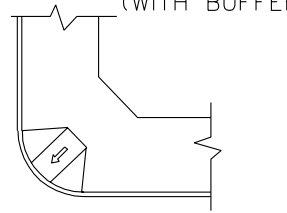


ACCESSIBLE ROUTE IS DEFINED AS A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PERSONS WITH MOBILITY IMPAIRMENTS.



TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK

TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK (WITH BUFFER STRIP)



DIAGONAL VARIATION

NOTES :

THIS DESIGN TO BE USED FOR CONSTRUCTION THAT INCORPORATES WIDER SIDEWALK. LANDING (1.2 m WIDE) REQUIRED AT TOP OF CURB RAMP. MINIMUM CURB RAMP LENGTH 2.5 m FOR NEW CONSTRUCTION, 1.8 m FOR ALTERATIONS.

CURB RAMP FLOOR TO BE CLASS 20 CONCRETE (CLASS 30 IF PRECAST) WITH SLIP RESISTANT INTEGRAL DETECTABLE WARNING SURFACE COVERING THE ENTIRE WIDTH OF THE RAMP FLOOR (RAMP FLOOR MAY BE PRECAST OR CAST IN PLACE). THE DETECTABLE WARNING SHALL BE PROVIDED BY AN EXPOSED AGGREGATE FINISH. RAMP SHALL NOT EXCEED A MAXIMUM SLOPE OF 12:1.

SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.

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 30.

REQUIRED BARS ARE TO BE NO. 16 X 200 mm PLACED 300 mm CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 40 mm.

CURB RAMPS WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICES FOR HYDRAULIC CEMENT CONCRETE SIDEWALK AND EXPOSED AGGREGATE SIDEWALK, COMPLETE-IN-PLACE.

CURB/CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB/CURB AND GUTTER.

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 AND CONFIGURATION.

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 (A) 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. WILL ALSO AFFECT PLACEMENT.

SPECIFICATION REFERENCE
105 502

PERPENDICULAR CURB RAMP (ACCESS FOR MOBILITY IMPAIRMENTS)

VIRGINIA DEPARTMENT OF TRANSPORTATION

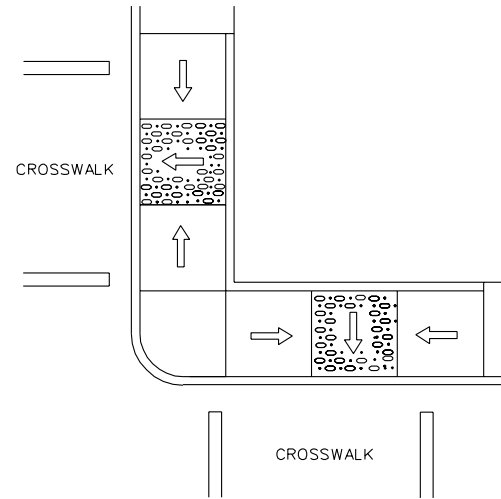
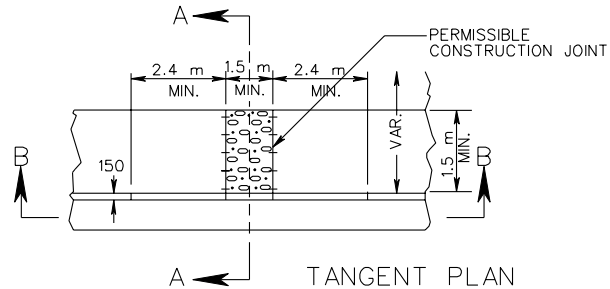
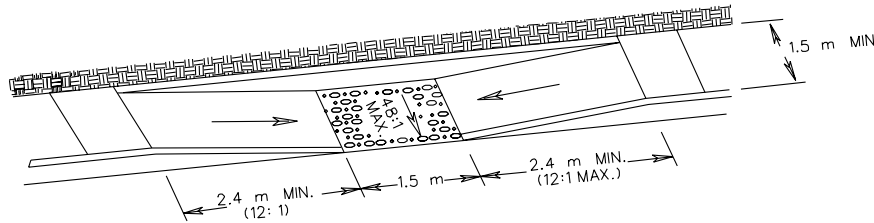
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REV. 2/01

REVISED ON 11/02

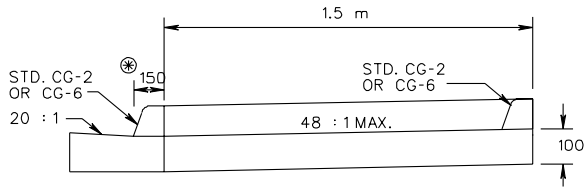
REVISED ON 3/03

CG-12B

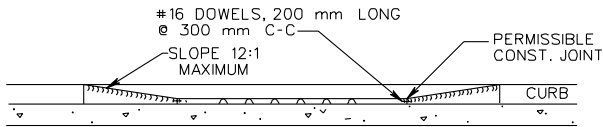


TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK

⊗ 175 mm WHERE STD. CG-3 CG-7 IS USED.



SECTION A-A



SECTION B-B



LIMITS OF EXPOSED AGGREGATE SIDEWALK

⊠ ACCESSIBLE ROUTE IS DEFINED AS A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PERSONS WITH MOBILITY IMPAIRMENTS.

NOTES :

- THIS DESIGN INCORPORATES A RAMP FLOOR AT BOTTOM OF TWO SLOPING SIDES WITH 1.5 m X 1.5 m MIN. DIMENSIONS. PLACEMENT OF DRAINAGE STRUCTURES IS CRITICAL.
- CURB RAMP FLOOR TO BE CLASS 20 CONCRETE (CLASS 30 IF PRECAST) WITH SLIP RESISTANT INTEGRAL DETECTABLE WARNING SURFACE COVERING THE ENTIRE WIDTH OF THE RAMP FLOOR (RAMP FLOOR MAY BE PRECAST OR CAST IN PLACE). THE DETECTABLE WARNING SHALL BE PROVIDED BY AN EXPOSED AGGREGATE FINISH. RAMP SHALL NOT EXCEED A MAXIMUM SLOPE OF 12:1.
- SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
- 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 30.
- REQUIRED BARS ARE TO BE NO. 16 X 200 mm PLACED 300 mm CENTER TO CENTER ALONG BOTH SIDES OF THE RAMP FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 40 mm.
- CURB RAMP FLOOR TO BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICES FOR HYDRAULIC CEMENT CONCRETE SIDEWALK AND EXPOSED AGGREGATE SIDEWALK, COMPLETE-IN-PLACE.
- CURB/CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMP FLOOR ARE INCLUDED IN PAYMENT FOR CURB/CURB AND GUTTER.
- 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 AND CONFIGURATION.
- CURB RAMP FLOOR 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. WILL ALSO AFFECT PLACEMENT.

NEW. 2/01

PARALLEL CURB RAMP
(ACCESS FOR MOBILITY IMPAIRMENTS)

SPECIFICATION REFERENCE

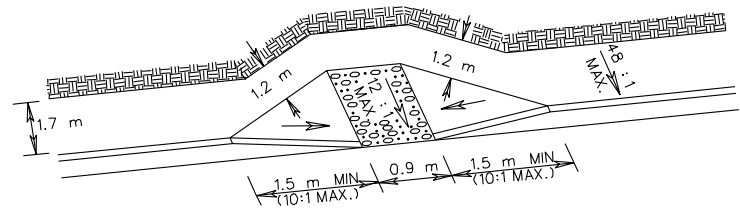
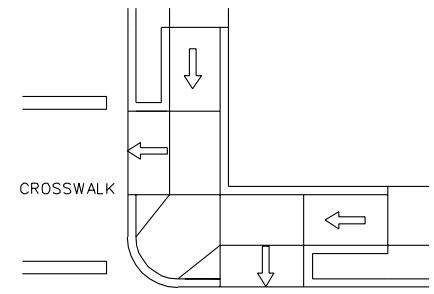
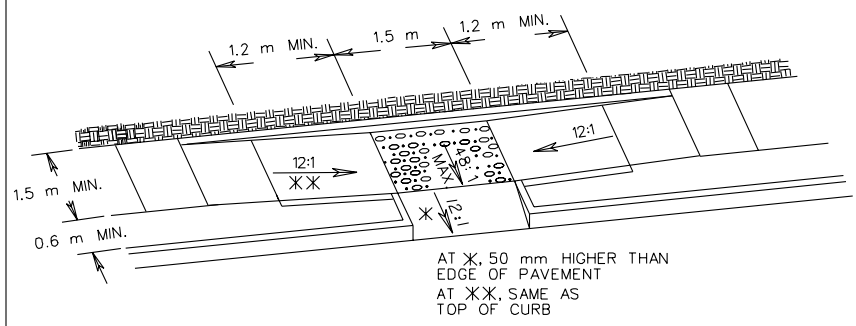
105
502

203.05A UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS.

VIRGINIA DEPARTMENT OF TRANSPORTATION

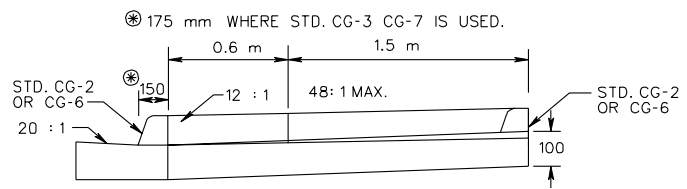
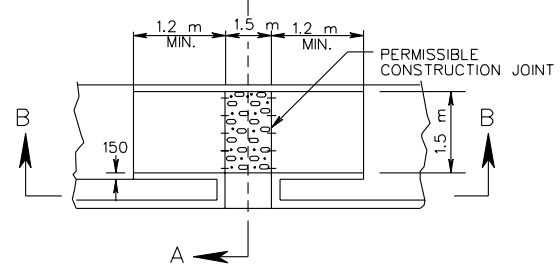
REVISED ON 11/02 REVISED ON 3/03

CG-12C



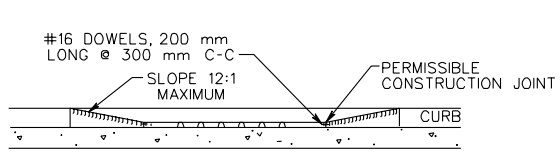
TYPICAL PLACEMENT AT INTERSECTION WITH BUFFER STRIP

ALTERATIONS



SECTION A-A

TANGENT PLAN



SECTION B-B

ACCESSIBLE ROUTE IS DEFINED AS A CONTINUOUS UNOBSTRUCTED, STABLE, FIRM AND SLIP RESISTANT PATH CONNECTING ALL ACCESSIBLE ELEMENTS OF A FACILITY THAT CAN BE APPROACHED, ENTERED AND USED BY PERSONS WITH MOBILITY IMPAIRMENTS.

NOTES :

THIS COMBINED (PARALLEL & PERPENDICULAR) DESIGN FOR ALTERATIONS CAN BE USED WITH ADJOINING BUFFER STRIP. LANDING AT BOTTOM OF TWO SLOPING SIDES WITH 1.5 m X 1.5 m 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.

CURB RAMP FLOOR TO BE CLASS A-3 CONCRETE (CLASS A-4 IF PRECAST) WITH SLIP RESISTANT INTEGRAL DETECTABLE WARNING SURFACE COVERING THE ENTIRE WIDTH OF THE RAMP FLOOR (RAMP FLOOR MAY BE PRECAST OR CAST IN PLACE). THE DETECTABLE WARNING SHALL BE PROVIDED BY AN EXPOSED AGGREGATE FINISH. RAMP SHALL NOT EXCEED A MAXIMUM SLOPE OF 12:1.

SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP FLOOR OR BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.

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. REQUIRED BARS ARE TO BE NO. 16 X 200 mm PLACED 300 mm CENTER TO CENTER ALONG BOTH SIDES OF THE FLOOR, MID-DEPTH OF RAMP FLOOR. MINIMUM CONCRETE COVER 40 mm.

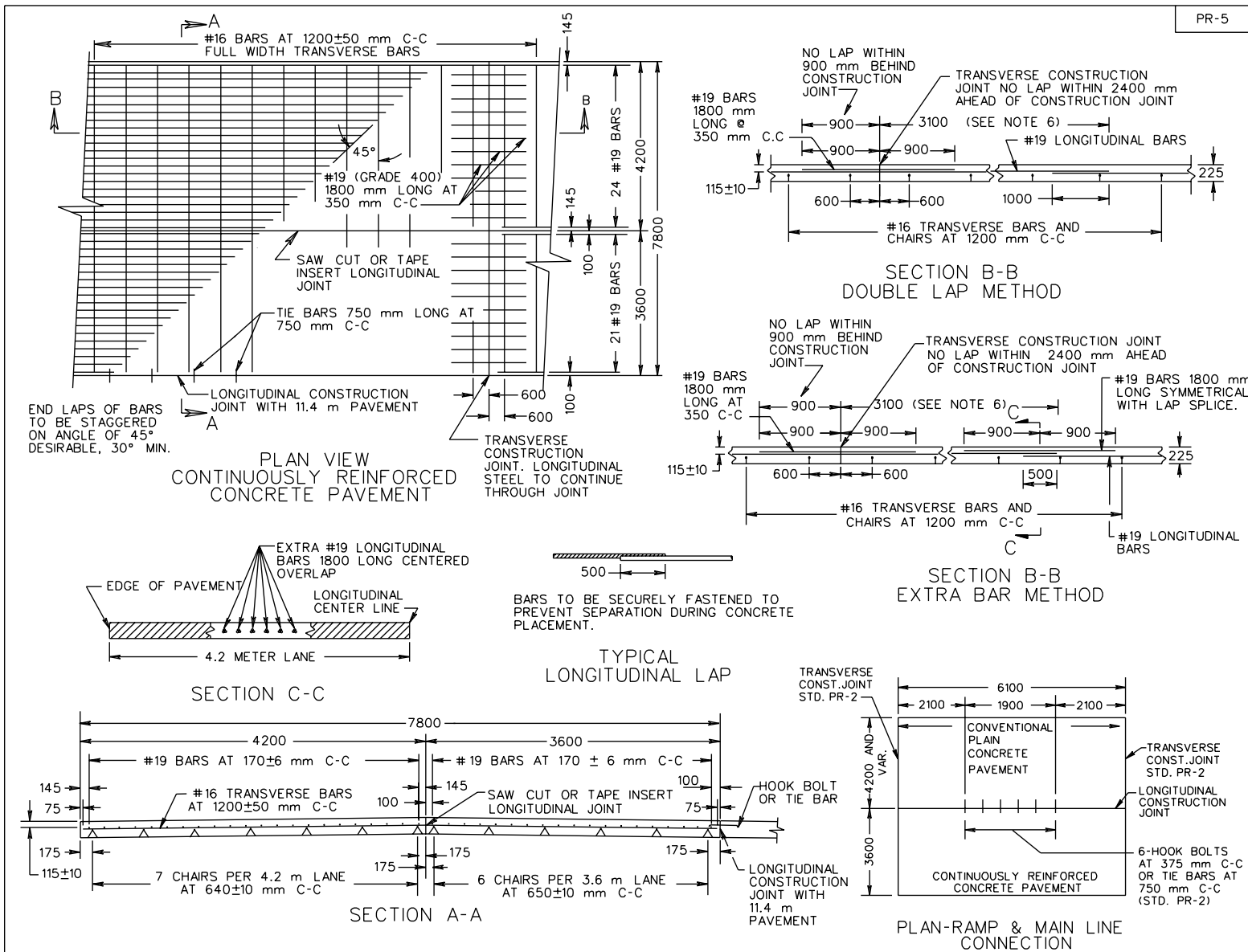
RAMP CURB RAMPERS WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICES FOR HYDRAULIC CEMENT CONCRETE SIDEWALK AND EXPOSED AGGREGATE SIDEWALK, COMPLETE-IN-PLACE.

CURB/CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO TO CURB RAMPERS ARE INCLUDED IN PAYMENT FOR CURB/CURB AND GUTTER.

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 AND CONFIGURATION.

CURB RAMPERS 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 (X) 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. WILL ALSO AFFECT PLACEMENT.

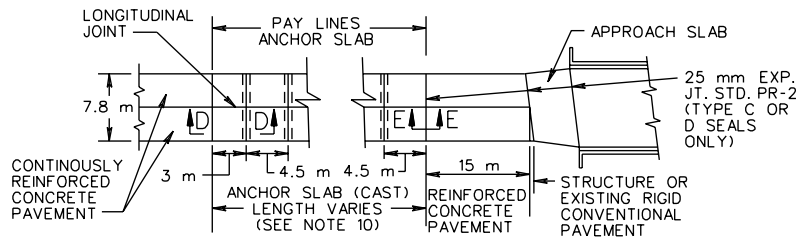
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105 502	VIRGINIA DEPARTMENT OF TRANSPORTATION	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS. 203.05B



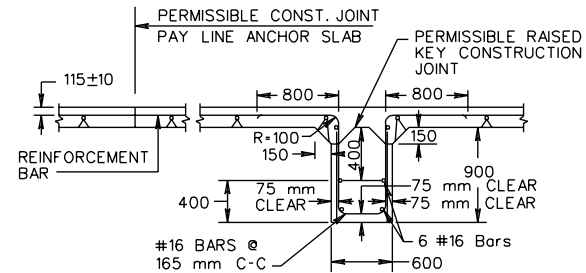
SEE SHEET 3 OF 3 FOR NOTES

SPECIFICATION REFERENCE	225 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 4.2 m TRAVEL LANE		REV. 2/01
316	VIRGINIA DEPARTMENT OF TRANSPORTATION		301.11
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS			

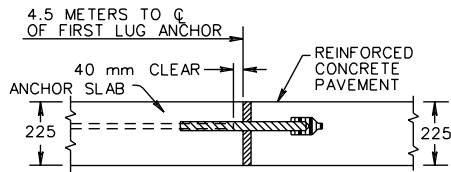
PR-5



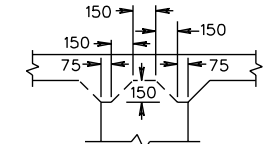
PLAN VIEW
ANCHOR SLAB TYPE I



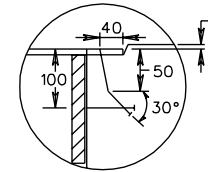
SECTION D-D



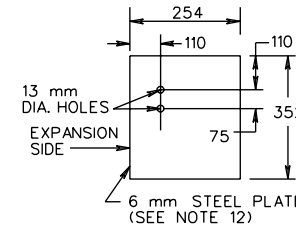
SECTION E-E
ANCHOR SLAB TYPE I



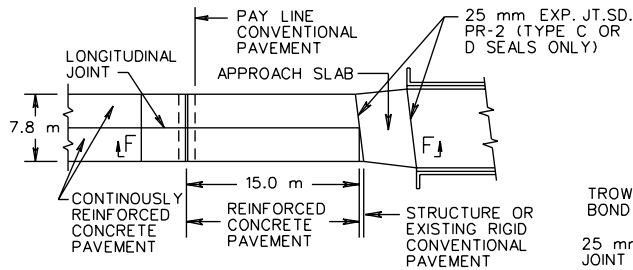
DETAIL-RAISED KEY
CONSTRUCTION JOINT



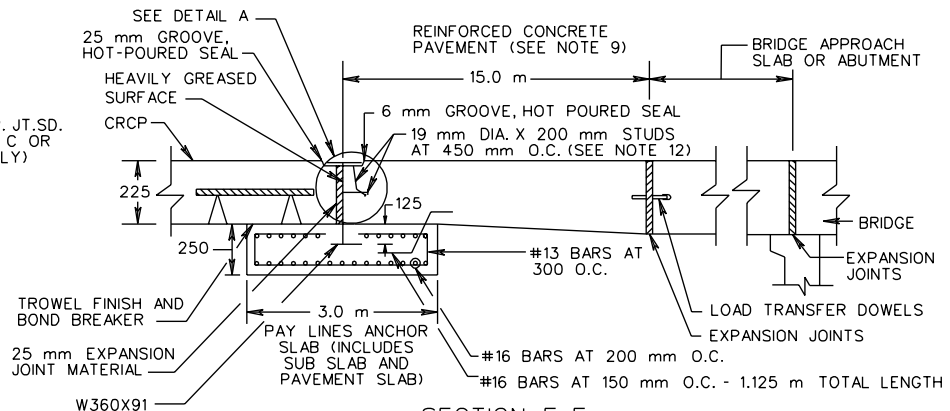
DETAIL A



END PLATE DETAIL
ANCHOR SLAB TYPE II



PLAN
ANCHOR SLAB TYPE II



SECTION F-F
ANCHOR SLAB TYPE II

SHEET 2 OF 3

SEE SHEET 3 OF 3
FOR NOTES

225 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
4.2 m TRAVEL LANE

SPECIFICATION
REFERENCE

REV. 2/01

301.12

UNLESS OTHERWISE NOTED, ALL DIMENSIONS
ON THIS SHEET ARE IN MILLIMETERS

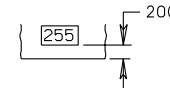
VIRGINIA DEPARTMENT OF TRANSPORTATION

316

NOTE:

1. HOOK BOLTS OR TIE BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #16 TRANSVERSE BARS. WHERE NECESSARY, ADJUST THE LOCATION OF THE HOOK BOLTS OR TIE BARS TO A 70 mm MINIMUM CLEARANCE BETWEEN HOOK BOLTS OR TIE BARS AND TRANSVERSE BARS.
2. TRANSVERSE CONSTRUCTION JOINT BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #19 LONGITUDINAL BARS.
3. #19 LONGITUDINAL BARS ARE TO BE LAPPED AND TIED IN THE SAME HORIZONTAL PLANE.
4. FOR THE 11.4 METER WIDTH PAVEMENT USE SINGLE 3.6 METER LANES WITH TWO LONGITUDINAL CONSTRUCTION JOINTS OR 3.6 METER AND 4.2 METER LANES WITH ONE LONGITUDINAL CONSTRUCTION JOINT AND ONE SAW CUT OR TAPE INSERT LONGITUDINAL JOINT. TRANSVERSE BARS SHALL NOT EXTEND THROUGH LONGITUDINAL CONSTRUCTION JOINTS, BUT SHALL EXTEND FULL LENGTH (7.55 m) FOR SAW CUT OR TAPE INSERT LONGITUDINAL JOINT.

5. SMOOTH SURFACE TO BE STEEL TROWELED 200 mm IN FROM EDGE OF PAVEMENT EVERY 150 m, AND THE STATION NUMBER STAMPED INTO IT AS SHOWN BELOW. THE DATE IS TO BE SHOWN IN A SIMILAR MANNER AT THE BEGINNING OF EACH DAYS POUR. BOTH OUTSIDE EDGES OF DIVIDED HIGHWAY IS TO BE STAMPED. ONE EDGE OF UNDIVIDED HIGHWAY WHERE FEASIBLE (TRAVEL LANE).



6. DOUBLE LAP REQUIREMENT (1000 mm) AND THE EXTRA BAR METHOD APPLY ONLY TO LAPS FALLING WITHIN AN AREA OF 3.00 m BEYOND THE CONSTRUCTION JOINT.

7. CONCRETE FOR LUG ANCHORS SHALL BE POURED AGAINST COMPACTED SUBGRADE. CONCRETE FOR LUGS AND ANCHOR SLAB MAY BE POURED MONOLITHICALLY OR POURED USING RAISED KEY CONSTRUCTION JOINT METHOD. ADEQUATE CONSOLIDATION OF CONCRETE IN LUGS WILL BE OBTAINED WITHOUT DISPLACING LONGITUDINAL CONTINUOUS STEEL, BY THE USE OF INTERNAL VIBRATION. WHEN LESS THAN FULL WIDTH LUG AND PAVEMENT SLAB IS PLACED, THE #16 TRANSVERSE STEEL IN THE LUGS SHALL BE EXTENDED, LAPPED AND SPLICED AT LEAST 25 DIAMETERS.

8. LONGITUDINAL STEEL TO CONTINUE THROUGH JOINT. EXTRA #19 BARS 6.0 m LONG SHALL BE SPACED AT 340 mm C-C.

9. CONCRETE SHOULD BE ADEQUATELY VIBRATED UNDER BEAM FLANGE TO ELIMINATE HONEYCOMBS.

10. ANCHOR SLAB TYPE I IS TO BE USED IN FIRM SOILS ONLY. FOR AASHTO CLASSIFICATION SOILS A-1 THROUGH A-4, 3 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 55' (17m)). FOR AASHTO CLASSIFICATION SOILS A-5 THROUGH A-7, 5 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 85' (26m)). USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TY. I IS USED TO RESTRICT MOVEMENT AGAINST THE STRUCTURE.

11. ANCHOR SLAB TYPE II MUST BE USED WHEN COHESIONLESS OR SOFT CLAY SOILS ARE ENCOUNTERED. USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TY. II ACCOMODATES MOVEMENT OF THE CONTINUOUS PAVEMENT.

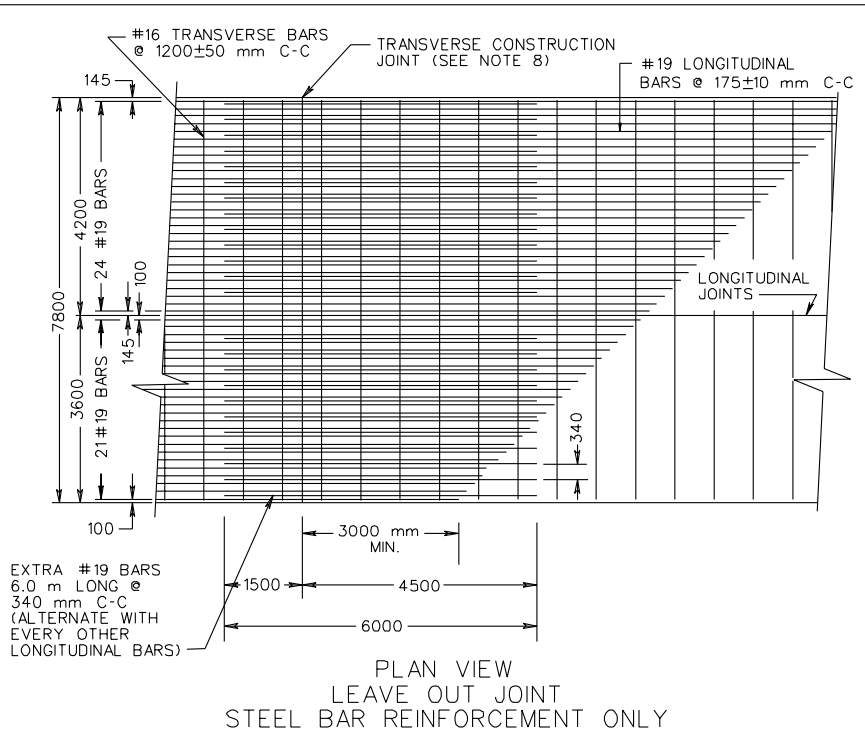
12. WELD STEEL END PLATE TO BOTH ENDS OF WF BEAM TO SEAL ENDS. WELD SHEAR CONNECTORS TO WEB AND FLANGE OF WF BEAM.

13. 50 mm MINIMUM CONCRETE COVER FOR STEEL IN SUB-SLABS.

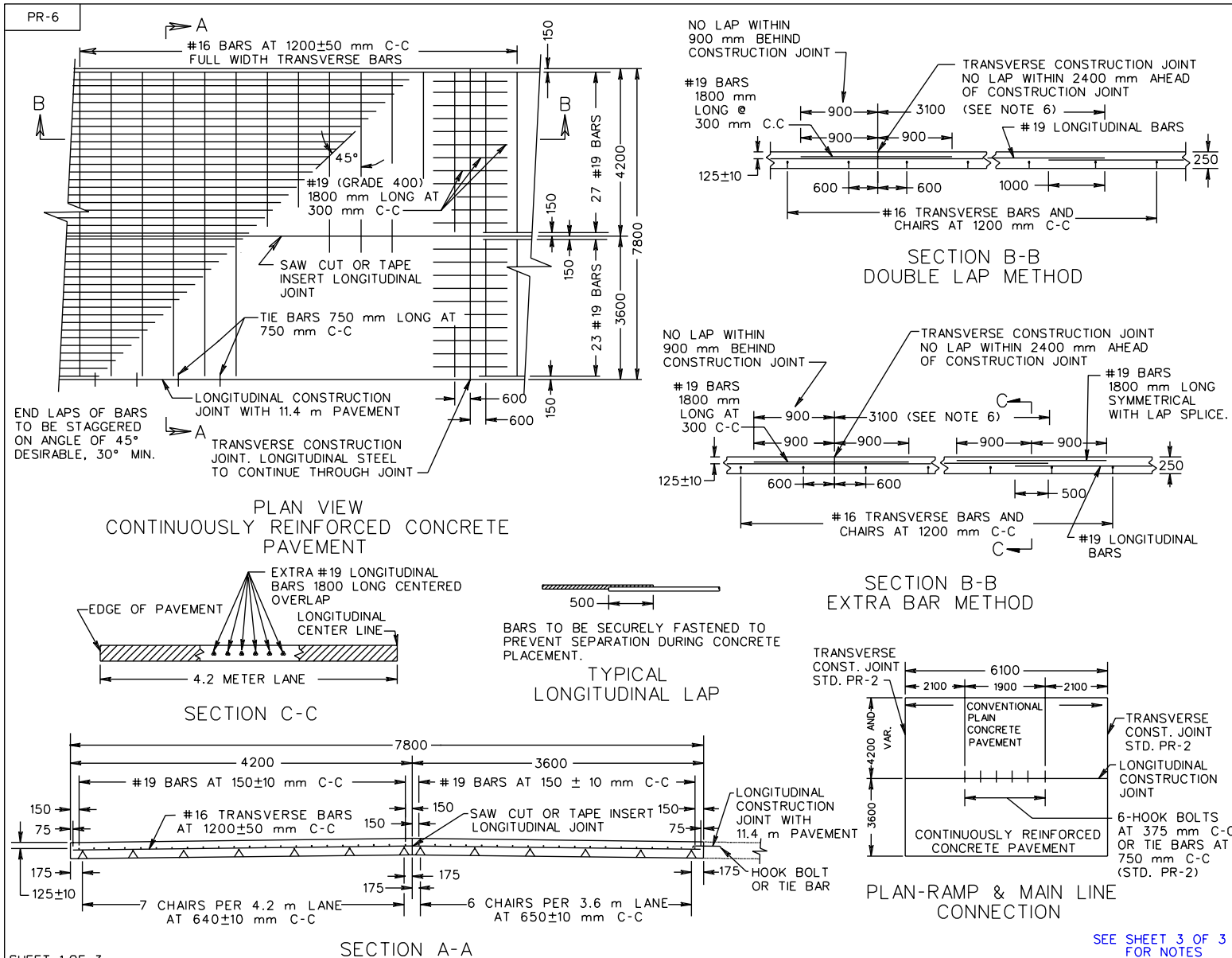
14. WIDE FLANGE BEAM TO BE TREATED WITH CORROSION INHIBITOR PER SECTION 407 OF THE ROAD AND BRIDGE SPECIFICATIONS.

15. ALL REINFORCING BARS SHALL BE GRADE 400 STEEL.

16. THE USE OF TUBE FEEDING TO PLACE REINFORCEMENT IN THE PLASTIC CONCRETE WILL NOT BE ALLOWED.



SPECIFICATION REFERENCE	225 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT	
316	4.2 m TRAVEL LANE	
	VIRGINIA DEPARTMENT OF TRANSPORTATION	REV. 2/01
	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	301.13



SHEET 1 OF 3

SEE SHEET 3 OF 3 FOR NOTES

250 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
4.2 m TRAVEL LANE

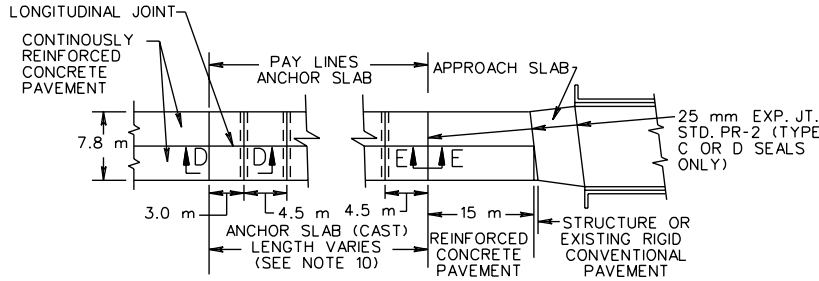
REV. 2/01

SPECIFICATION REFERENCE

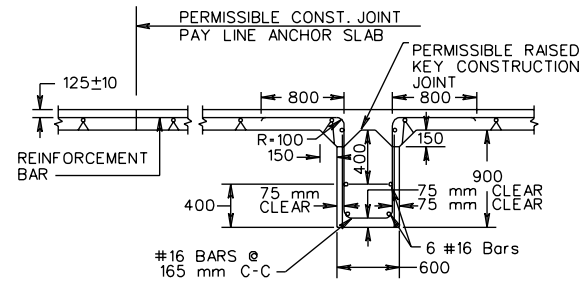
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VIRGINIA DEPARTMENT OF TRANSPORTATION

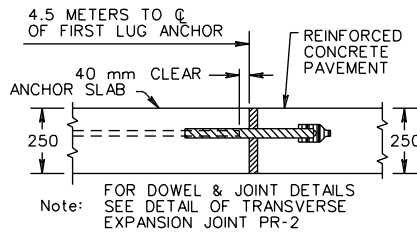
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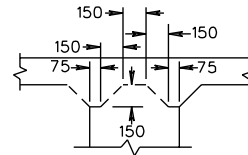
PLAN VIEW
ANCHOR SLAB TYPE I



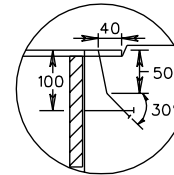
SECTION D-D



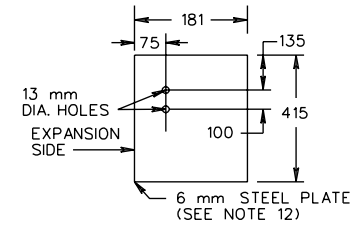
SECTION E-E
ANCHOR SLAB TYPE I



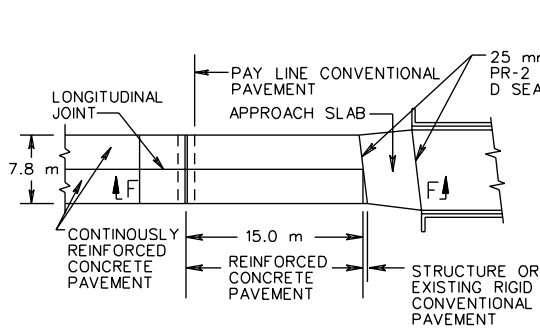
DETAIL-RAISED KEY
CONSTRUCTION JOINT



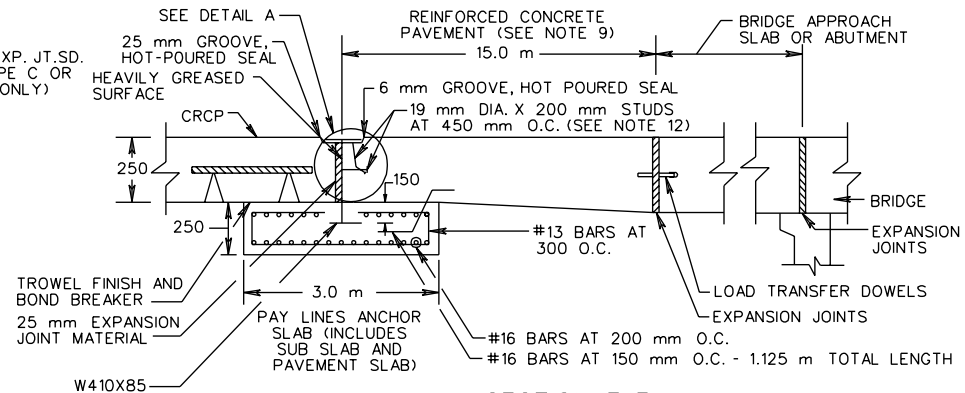
DETAIL A



ANCHOR SLAB TYPE II
END PLATE DETAIL



PLAN
ANCHOR SLAB TYPE II



SECTION F-F
ANCHOR SLAB TYPE II

SEE SHEET 3 OF 3
FOR NOTES

SHEET 2 OF 3

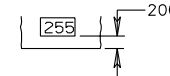
SPECIFICATION REFERENCE	250 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT	
	4.2 m TRAVEL LANE	
316	REV. 2/01	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS
	VIRGINIA DEPARTMENT OF TRANSPORTATION	301.15

PR-6

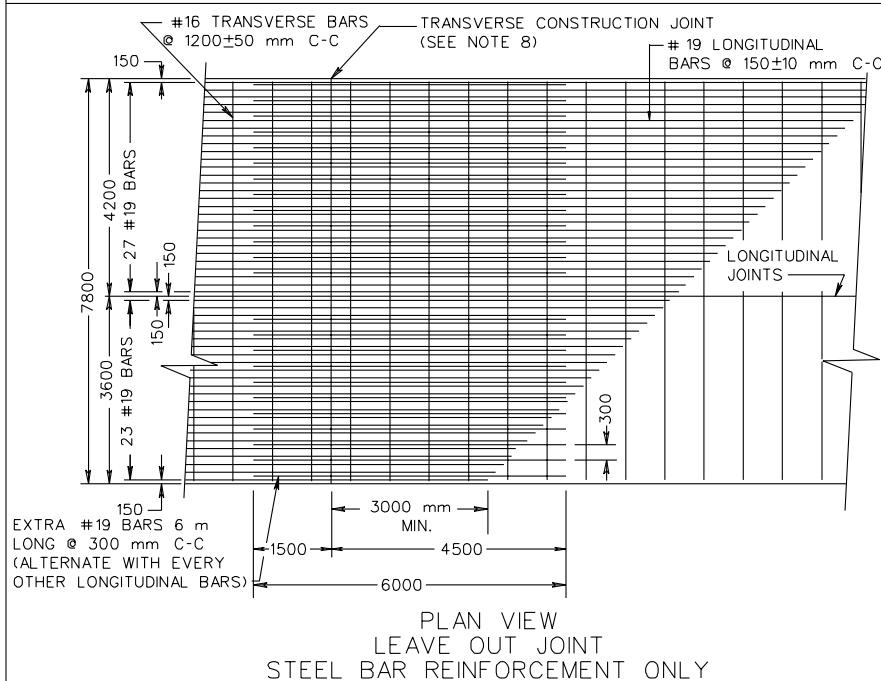
NOTE:

1. HOOK BOLTS OR TIE BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #16 TRANSVERSE BARS. WHERE NECESSARY, ADJUST THE LOCATION OF THE HOOK BOLTS OR TIE BARS TO A 70 mm MINIMUM CLEARANCE BETWEEN HOOK BOLTS OR TIE BARS AND TRANSVERSE BARS.
2. TRANSVERSE CONSTRUCTION JOINT BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #19 LONGITUDINAL BARS.
3. #19 LONGITUDINAL BARS ARE TO BE LAPPED AND TIED IN THE SAME HORIZONTAL PLANE.
4. FOR THE 11.4 METER WIDTH PAVEMENT USE SINGLE 3.6 METER LANES WITH TWO LONGITUDINAL CONSTRUCTION JOINTS OR 3.6 METER AND 4.2 METER LANES WITH ONE LONGITUDINAL CONSTRUCTION JOINT AND ONE SAW CUT OR TAPE INSERT LONGITUDINAL JOINT. TRANSVERSE BARS SHALL NOT EXTEND THROUGH LONGITUDINAL CONSTRUCTION JOINTS, BUT SHALL EXTEND FULL LENGTH (7.55 m) FOR SAW CUT OR TAPE INSERT LONGITUDINAL JOINT.

5. SMOOTH SURFACE TO BE STEEL TROWELED 200 mm IN FROM EDGE OF PAVEMENT EVERY 150 m, AND THE STATION NUMBER STAMPED INTO IT AS SHOWN BELOW. THE DATE IS TO BE SHOWN IN A SIMILAR MANNER AT THE BEGINNING OF EACH DAYS POUR. BOTH OUTSIDE EDGES OF DIVIDED HIGHWAY IS TO BE STAMPED. ONE EDGE OF UNDIVIDED HIGHWAY WHERE FEASIBLE (TRAVEL LANE).



6. DOUBLE LAP REQUIREMENT (1000 mm) AND THE EXTRA BAR METHOD APPLY ONLY TO LAPS FALLING WITHIN AN AREA OF 3.00 m BEYOND THE CONSTRUCTION JOINT.
7. CONCRETE FOR LUG ANCHORS SHALL BE POURED AGAINST COMPACTED SUBGRADE. CONCRETE FOR LUGS AND ANCHOR SLAB MAY BE POURED MONOLITHICALLY OR POURED USING RAISED KEY CONSTRUCTION JOINT METHOD. ADEQUATE CONSOLIDATION OF CONCRETE IN LUGS WILL BE OBTAINED WITHOUT DISPLACING LONGITUDINAL CONTINUOUS STEEL, BY THE USE OF INTERNAL VIBRATION. WHEN LESS THAN FULL WIDTH LUG AND PAVEMENT SLAB IS PLACED, THE #16 TRANSVERSE STEEL IN THE LUGS SHALL BE EXTENDED, LAPPED AND SPLICED AT LEAST 25 DIAMETERS.
8. LONGITUDINAL STEEL TO CONTINUE THROUGH JOINT. EXTRA #19 BARS 6 m LONG SHALL BE SPACED AT 300 mm C-C.
9. CONCRETE SHOULD BE ADEQUATELY VIBRATED UNDER BEAM FLANGE TO ELIMINATE HONEYCOMBS.
10. ANCHOR SLAB TYPE I IS TO BE USED IN FIRM SOILS ONLY. FOR AASHTO CLASSIFICATION SOILS A-1 THROUGH A-4, 3 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH - 17 m. FOR AASHTO CLASSIFICATION SOILS A-5 THROUGH A-7, 5 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH - 26 m). USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE I IS USED TO RESTRICT MOVEMENT AGAINST THE STRUCTURE.
11. ANCHOR SLAB TYPE TYPE II MUST BE USED WHEN COHESIONLESS OR SOFT CLAY SOILS ARE ENCOUNTERED. USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE II ACCOMODATES MOVEMENT OF THE CONTINUOUS PAVEMENT.
12. WELD STEEL END PLATE TO BOTH ENDS OF WF BEAM TO SEAL ENDS. WELD SHEAR CONNECTORS TO WEB AND FLANGE OF WF BEAM.
13. 50 mm MINIMUM CONCRETE COVER FOR STEEL IN SUB-SLABS.
14. WIDE FLANGE BEAM TO TREATED WITH CORROSION INHIBITOR PER SECTION 407 OF THE ROAD AND BRIDGE SPECIFICATIONS.
15. ALL REINFORCING STEEL SHALL BE GRADE 400 STEEL.
16. THE USE OF TUBE FEEDING TO PLACE REINFORCEMENT IN THE PLASTIC CONCRETE WILL NOT BE ALLOWED.



SHEET 3 OF 3

250 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
4.2 m TRAVEL LANE

REV. 2/01

301.16

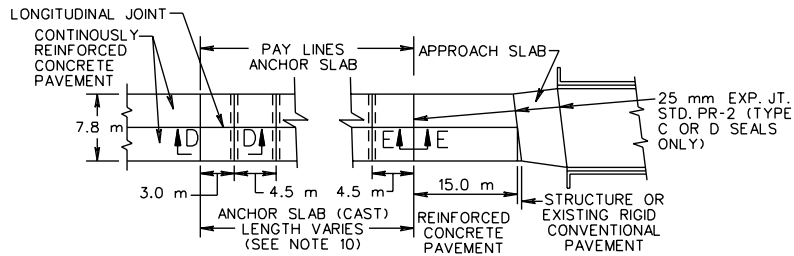
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VIRGINIA DEPARTMENT OF TRANSPORTATION

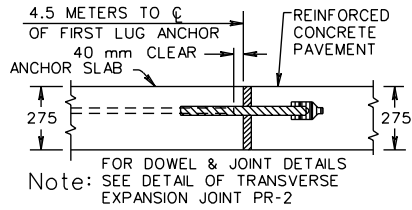
SPECIFICATION REFERENCE

316

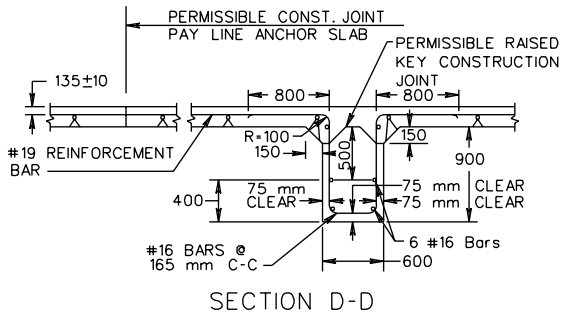
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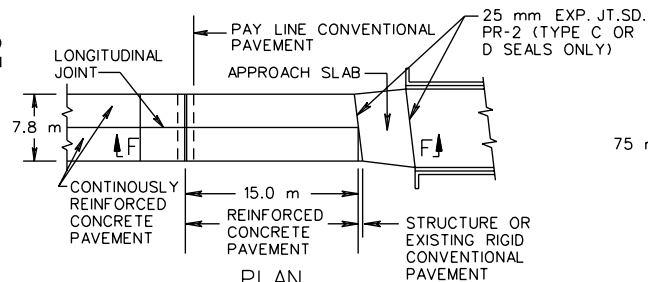
PLAN VIEW
ANCHOR SLAB TYPE I



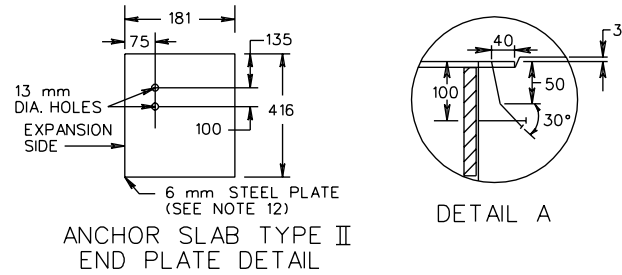
SECTION E-E
ANCHOR SLAB TYPE I



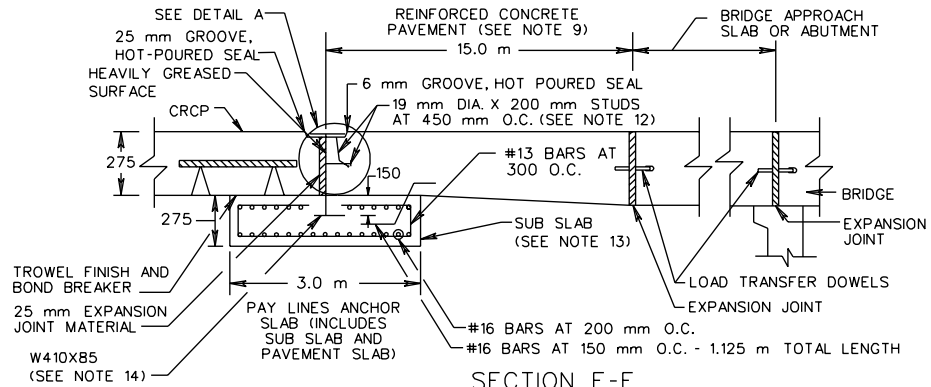
SECTION D-D



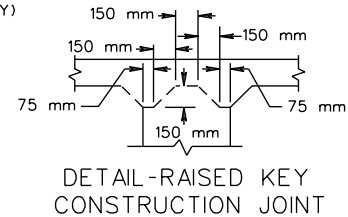
PLAN
ANCHOR SLAB TYPE II



DETAIL A



SECTION F-F
ANCHOR SLAB TYPE II
(SEE NOTE 11)



DETAIL-RAISED KEY
CONSTRUCTION JOINT

SHEET 2 OF 3

SEE SHEET 3 OF 3
FOR NOTES

275 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
4.2 m TRAVEL LANE

SPECIFICATION
REFERENCE

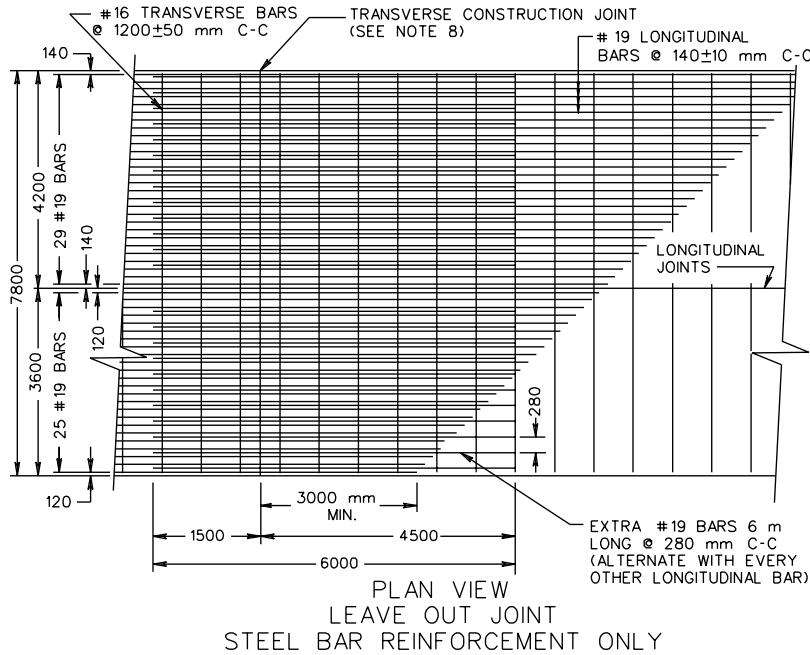
REV. 2/01

301.18

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ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

316

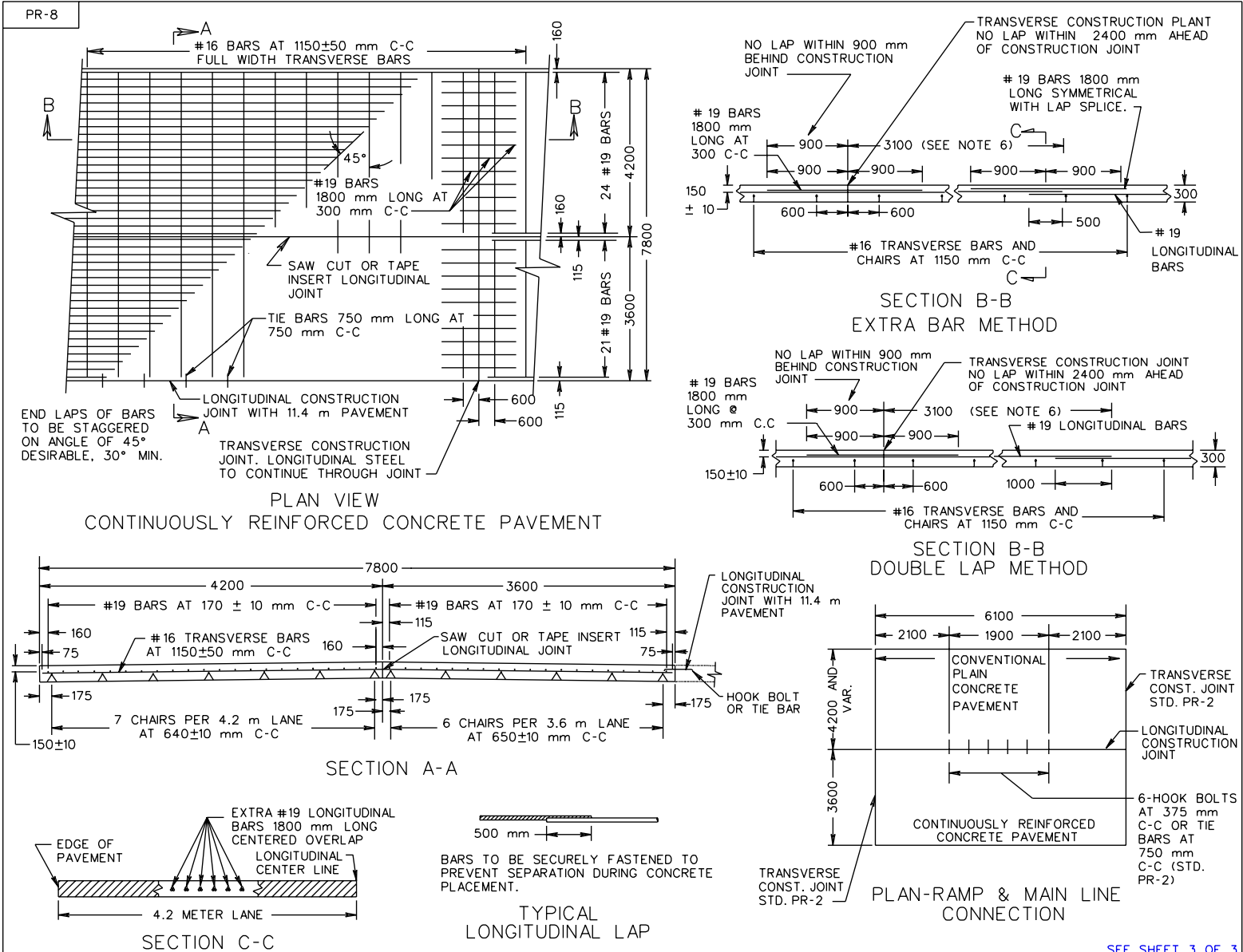


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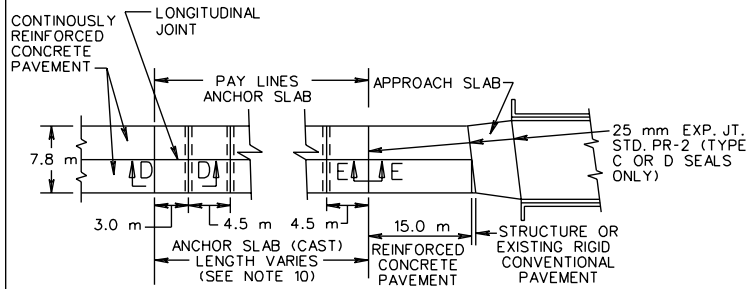
1. HOOK BOLTS OR TIE BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #16 TRANSVERSE BARS. WHERE NECESSARY, ADJUST THE LOCATION OF THE HOOK BOLTS OR TIE BARS TO A 70 mm MINIMUM CLEARANCE BETWEEN HOOK BOLTS OR TIE BARS AND TRANSVERSE BARS.
 2. TRANSVERSE CONSTRUCTION JOINT BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #19 LONGITUDINAL BARS.
 3. #19 LONGITUDINAL BARS ARE TO BE LAPPED AND TIED IN THE SAME HORIZONTAL PLANE.
 4. FOR THE 11.4 METER WIDTH PAVEMENT USE SINGLE 3.6 METER LANES WITH TWO LONGITUDINAL CONSTRUCTION JOINTS OR 3.6 METER AND 4.2 METER LANES WITH ONE LONGITUDINAL CONSTRUCTION JOINT AND ONE SAW CUT OR TAPE INSERT LONGITUDINAL JOINT. TRANSVERSE BARS SHALL NOT EXTEND THROUGH LONGITUDINAL CONSTRUCTION JOINTS, BUT SHALL EXTEND FULL LENGTH (7.55 m) FOR SAW CUT OR TAPE INSERT LONGITUDINAL JOINT.
 5. SMOOTH SURFACE TO BE STEEL TROWELED 200 mm IN FROM EDGE OF PAVEMENT EVERY 150 m, AND THE STATION NUMBER STAMPED INTO IT AS SHOWN BELOW. THE DATE IS TO BE SHOWN IN A SIMILIAR MANNER AT THE BEGINNING OF EACH DAYS POUR. BOTH OUTSIDE EDGES OF DIVIDED HIGHWAY ARE TO BE STAMPED. ONE EDGE OF UNDIVIDED HIGHWAY WHERE FEASIBLE (TRAVEL LANE).
-
6. DOUBLE LAP REQUIREMENT (1000 mm) AND THE EXTRA BAR METHOD APPLY ONLY TO LAPS FALLING WITHIN AN AREA OF 3.00 m BEYOND THE CONSTRUCTION JOINT.
 7. CONCRETE FOR LUG ANCHORS SHALL BE POURED AGAINST COMPACTED SUBGRADE. CONCRETE FOR LUGS AND ANCHOR SLAB MAY BE POURED MONOLITHICALLY OR POURED USING RAISED KEY CONSTRUCTION JOINT METHOD. ADEQUATE CONSOLIDATION OF CONCRETE IN LUGS WILL BE OBTAINED WITHOUT DISPLACING LONGITUDINAL CONTINUOUS STEEL. BY THE USE OF INTERNAL VIBRATION. WHEN LESS THAN FULL WIDTH LUG AND PAVEMENT SLAB IS PLACED, THE #16 TRANSVERSE STEEL IN THE LUGS SHALL BE EXTENDED, LAPPED AND SPLICED AT LEAST 25 DIAMETERS.
 8. LONGITUDINAL STEEL TO CONTINUE THROUGH JOINT. EXTRA #19 BARS 6.0 m LONG SHALL BE SPACED AT 280 mm C-C.
 9. CONCRETE SHOULD BE ADEQUATELY VIBRATED UNDER BEAM FLANGE TO ELIMINATE HONEYCOMBS.
 10. ANCHOR SLAB TYPE I IS TO BE USED IN FIRM SOILS ONLY. FOR AASHTO CLASSIFICATION SOILS A-1 THROUGH A-4, 3 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 17 m. FOR AASHTO CLASSIFICATION SOILS A-5 THROUGH A-7, 5 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 26 m). USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE I IS USED TO RESTRICT MOVEMENT AGAINST THE STRUCTURE.
 11. ANCHOR SLAB TYPE TYPE II MUST BE USED WHEN COHESIONLESS OR SOFT CLAY SOILS ARE ENCOUNTERED. USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE II ACCOMODATES MOVEMENT OF THE CONTINUOUS PAVEMENT.
 12. WELD STEEL END PLATE TO BOTH ENDS OF WF BEAM TO SEAL ENDS. WELD SHEAR CONNECTORS TO WEB AND FLANGE OF WF BEAM.
 13. 50 mm MINIMUM CONCRETE COVER FOR STEEL IN SUB-SLABS.
 14. WIDE FLANGE BEAM TO BE GALVANIZED PER SECTION 233 OF THE ROAD AND BRIDGE SPECIFICATIONS.
 15. ALL REINFORCING BARS SHALL BE GRADE 400 STEEL.
 16. THE USE OF TUBE FEEDING TO PLACE REINFORCEMENT IN THE PLASTIC CONCRETE WILL NOT BE ALLOWED.

SHEET 3 OF 3

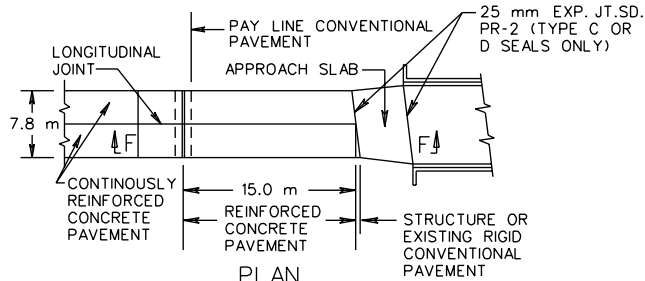
SPECIFICATION REFERENCE	275 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 4.2 m TRAVEL LANE	REV. 2/01
316	VIRGINIA DEPARTMENT OF TRANSPORTATION	UNLESS OTHERWISE NOTED ALL DIMENSIONS ONB THIS SHEET ARE IN MILLIMETERS 301.19



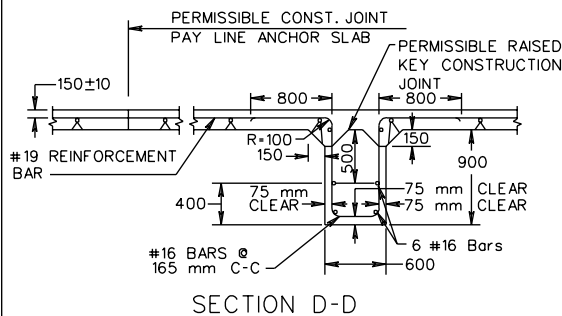
SHEET 1 OF 3		SEE SHEET 3 OF 3 FOR NOTES	
<p>300 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</p> <p>4.2 m TRAVEL LANE</p>			SPECIFICATION REFERENCE
NEW 2/01	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	VIRGINIA DEPARTMENT OF TRANSPORTATION	
301.20		316	



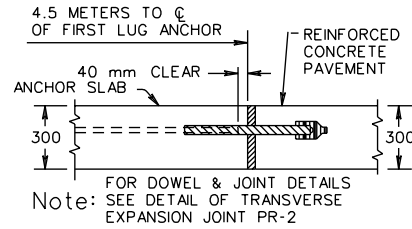
PLAN VIEW
ANCHOR SLAB TYPE I



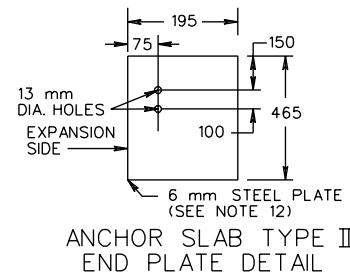
PLAN
ANCHOR SLAB TYPE II



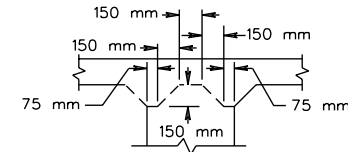
SECTION D-D



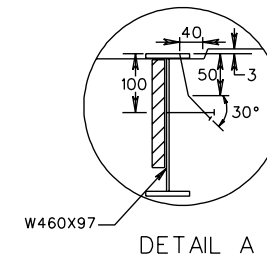
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ANCHOR SLAB TYPE I



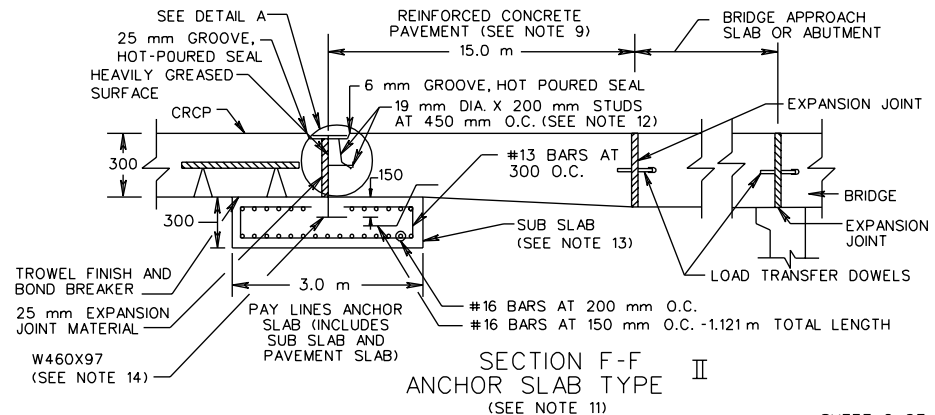
ANCHOR SLAB TYPE II
END PLATE DETAIL



DETAIL-RAISED KEY
CONSTRUCTION JOINT



DETAIL A



SECTION F-F
ANCHOR SLAB TYPE II
(SEE NOTE 11)

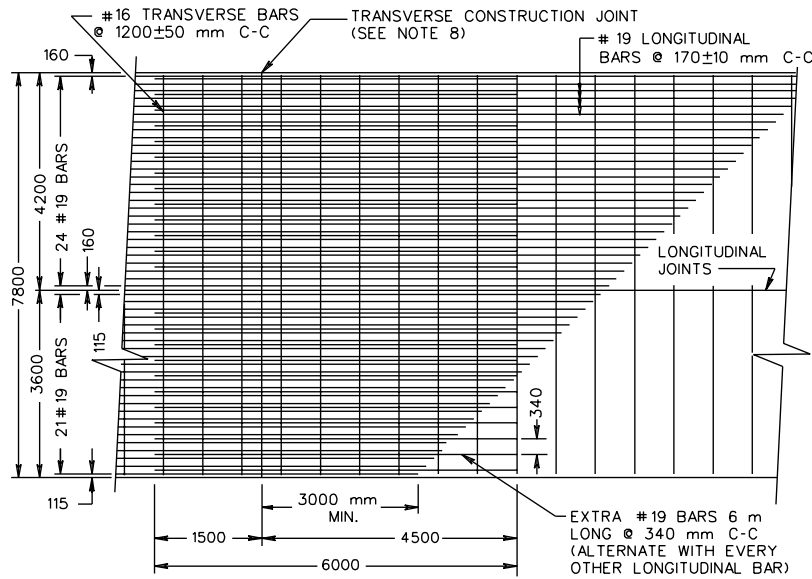
SEE SHEET 3 OF 3
FOR NOTES

SHEET 2 OF 3

SPECIFICATION REFERENCE	300 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 4.2 m TRAVEL LANE	
316	VIRGINIA DEPARTMENT OF TRANSPORTATION	NEW 2/01 301.21
		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

REVISED ON 7/01

PR-8



PLAN VIEW
LEAVE OUT JOINT
STEEL BAR REINFORCEMENT ONLY

NOTES:

1. HOOK BOLTS OR TIE BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #16 TRANSVERSE BARS. WHERE NECESSARY, ADJUST THE LOCATION OF THE HOOK BOLTS OR TIE BARS TO A 70 mm MINIMUM CLEARANCE BETWEEN HOOK BOLTS OR TIE BARS AND TRANSVERSE BARS.
2. TRANSVERSE CONSTRUCTION JOINT BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #19 LONGITUDINAL BARS.
3. #19 LONGITUDINAL BARS ARE TO BE LAPPED AND TIED IN THE SAME HORIZONTAL PLANE.
4. FOR THE 11.4 METER WIDTH PAVEMENT USE SINGLE 3.6 METER LANES WITH TWO LONGITUDINAL CONSTRUCTION JOINTS OR 3.6 METER AND 4.2 METER LANES WITH ONE LONGITUDINAL CONSTRUCTION JOINT AND ONE SAW CUT OR TAPE INSERT LONGITUDINAL JOINT. TRANSVERSE BARS SHALL NOT EXTEND THROUGH LONGITUDINAL CONSTRUCTION JOINTS, BUT SHALL EXTEND FULL LENGTH (7.55 m) FOR SAW CUT OR TAPE INSERT LONGITUDINAL JOINT.
5. SMOOTH SURFACE TO BE STEEL TROWELED 200 mm IN FROM EDGE OF PAVEMENT EVERY 150 m, AND THE STATION NUMBER STAMPED INTO IT AS SHOWN BELOW. THE DATE IS TO BE SHOWN IN A SIMILAR MANNER AT THE BEGINNING OF EACH DAYS POUR. BOTH OUTSIDE EDGES OF DIVIDED HIGHWAY ARE TO BE STAMPED. ONE EDGE OF UNDIVIDED HIGHWAY WHERE FEASIBLE (TRAVEL LANE).
6. DOUBLE LAP REQUIREMENT (1000 mm) AND THE EXTRA BAR METHOD APPLY ONLY TO LAPS FALLING WITHIN AN AREA OF 3.00 m BEYOND THE CONSTRUCTION JOINT.
7. CONCRETE FOR LUG ANCHORS SHALL BE POURED AGAINST COMPACTED SUBGRADE. CONCRETE FOR LUGS AND ANCHOR SLAB MAY BE POURED MONOLITHICALLY OR POURED USING RAISED KEY CONSTRUCTION JOINT METHOD. ADEQUATE CONSOLIDATION OF CONCRETE IN LUGS WILL BE OBTAINED WITHOUT DISPLACING LONGITUDINAL CONTINUOUS STEEL. BY THE USE OF INTERNAL VIBRATION. WHEN LESS THAN FULL WIDTH LUG AND PAVEMENT SLAB IS PLACED, THE #16 TRANSVERSE STEEL IN THE LUGS SHALL BE EXTENDED, LAPPED AND SPLICED AT LEAST 21 DIAMETERS.
8. LONGITUDINAL STEEL TO CONTINUE THROUGH JOINT. EXTRA #19 BARS 6.0 m LONG SHALL BE SPACED AT 340 mm C-C.
9. CONCRETE SHOULD BE ADEQUATELY VIBRATED UNDER BEAM FLANGE TO ELIMINATE HONEYCOMBS.
10. ANCHOR SLAB TYPE I IS TO BE USED IN FIRM SOILS ONLY. FOR AASHTO CLASSIFICATION SOILS A-1 THROUGH A-4, 3 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 17 m). FOR AASHTO CLASSIFICATION SOILS A-5 THROUGH A-7, 5 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 26 m). USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE I IS USED TO RESTRICT MOVEMENT AGAINST THE STRUCTURE.
11. ANCHOR SLAB TYPE TYPE II MUST BE USED WHEN COHESIONLESS OR SOFT CLAY SOILS ARE ENCOUNTERED. USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE II ACCOMODATES MOVEMENT OF THE CONTINUOUS PAVEMENT.
12. WELD STEEL END PLATE TO BOTH ENDS OF WF BEAM TO SEAL ENDS. WELD SHEAR CONNECTORS TO WEB AND FLANGE OF WF BEAM.
13. 50 mm MINIMUM CONCRETE COVER FOR STEEL IN SUB-SLABS.
14. WIDE FLANGE BEAM TO BE TREATED WITH CORROSION INHIBITOR PER SECTION 407 OF THE ROAD AND BRIDGE SPECIFICATIONS.
15. ALL REINFORCING BARS SHALL BE GRADE 400 STEEL.
16. THE USE OF TUBE FEEDING TO PLACE REINFORCEMENT IN THE PLASTIC CONCRETE WILL NOT BE ALLOWED.

SHEET 3 OF 3

300 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
4.2 m TRAVEL LANE

NEW 2/01

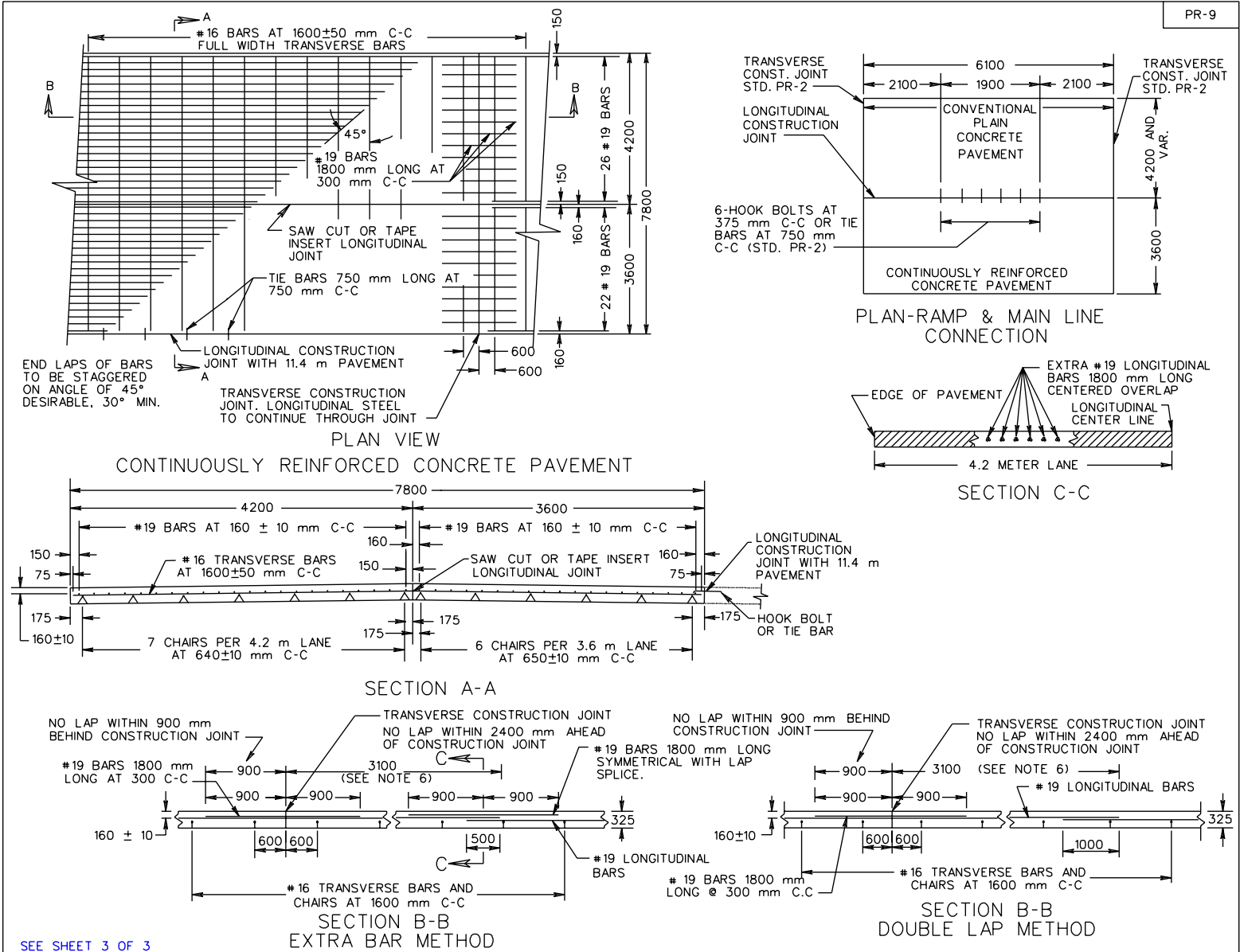
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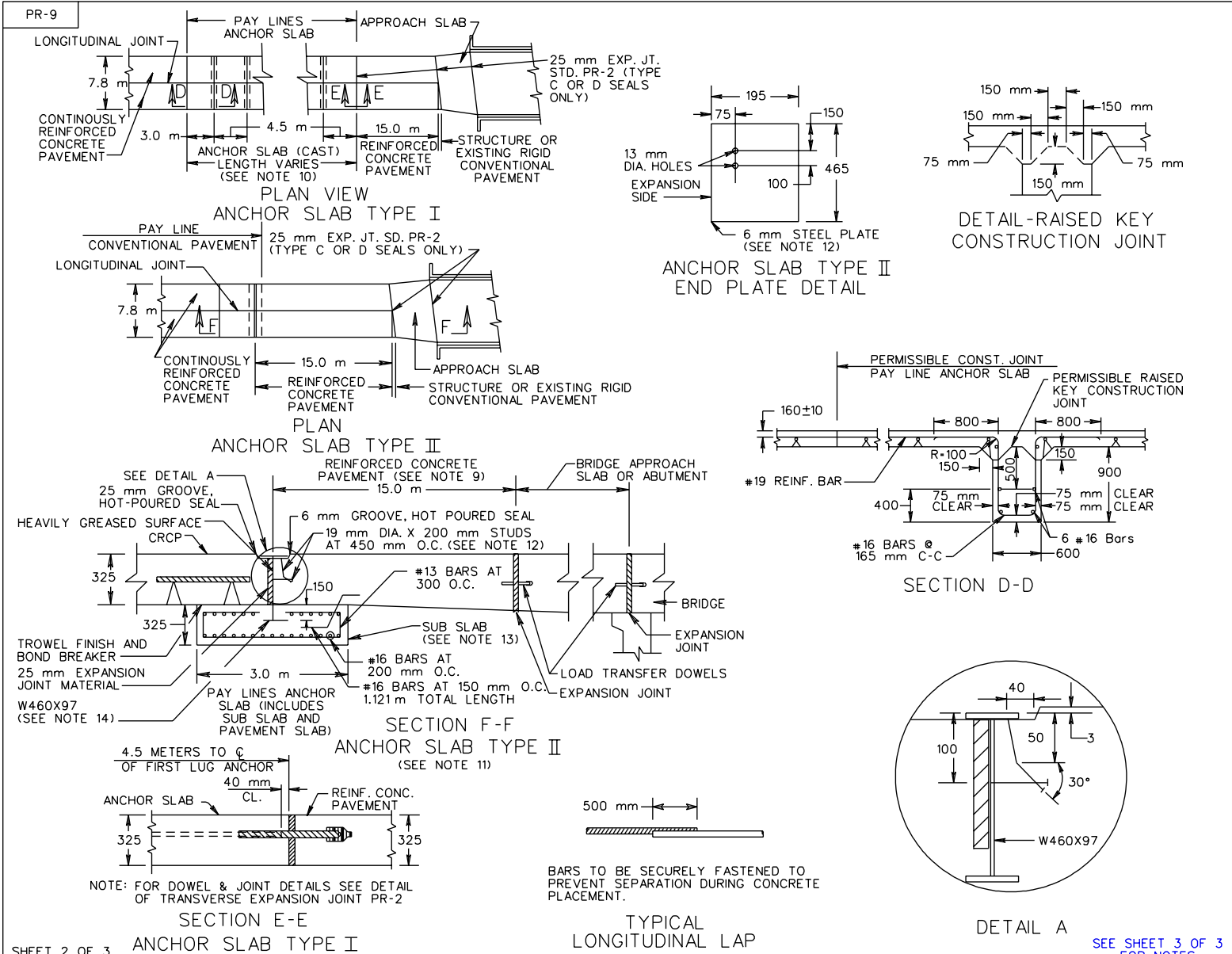
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

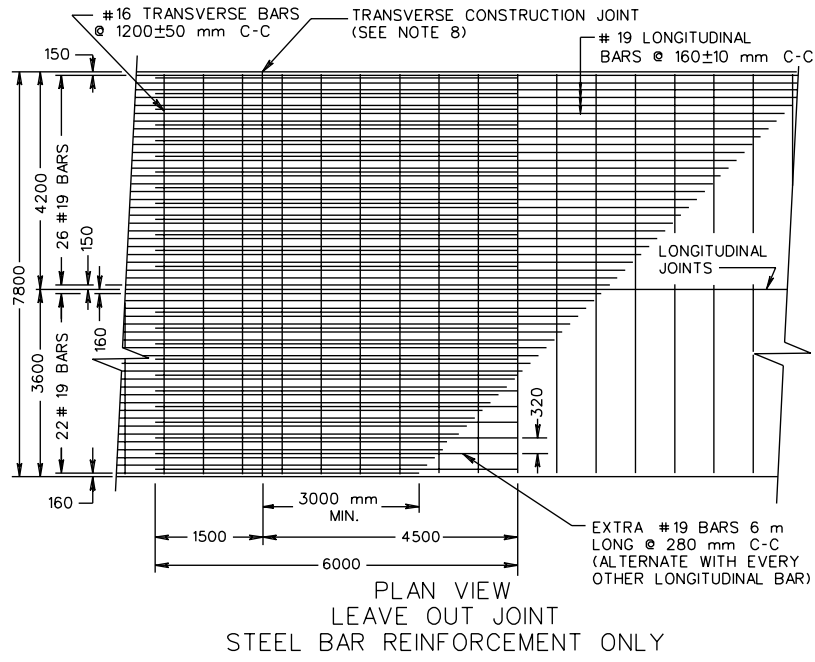
316



<p>SPECIFICATION REFERENCE</p> <p>316</p>	<p>325 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</p> <p>4.2 m TRAVEL LANE</p>	<p>NEW 2/01</p> <p>301.23</p>
<p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>		
<p>UNLESS OTHERWISE NOTED ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS</p>		



<p>325 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 4.2 m TRAVEL LANE</p>		<p>SPECIFICATION REFERENCE</p> <p>316</p>
<p>NEW 2/01</p>	<p>UNLESS OTHERWISE NOTED ALL DIMENSIONS ONB THIS SHEET ARE IN MILLIMETERS</p>	
<p>301.24</p>	<p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	

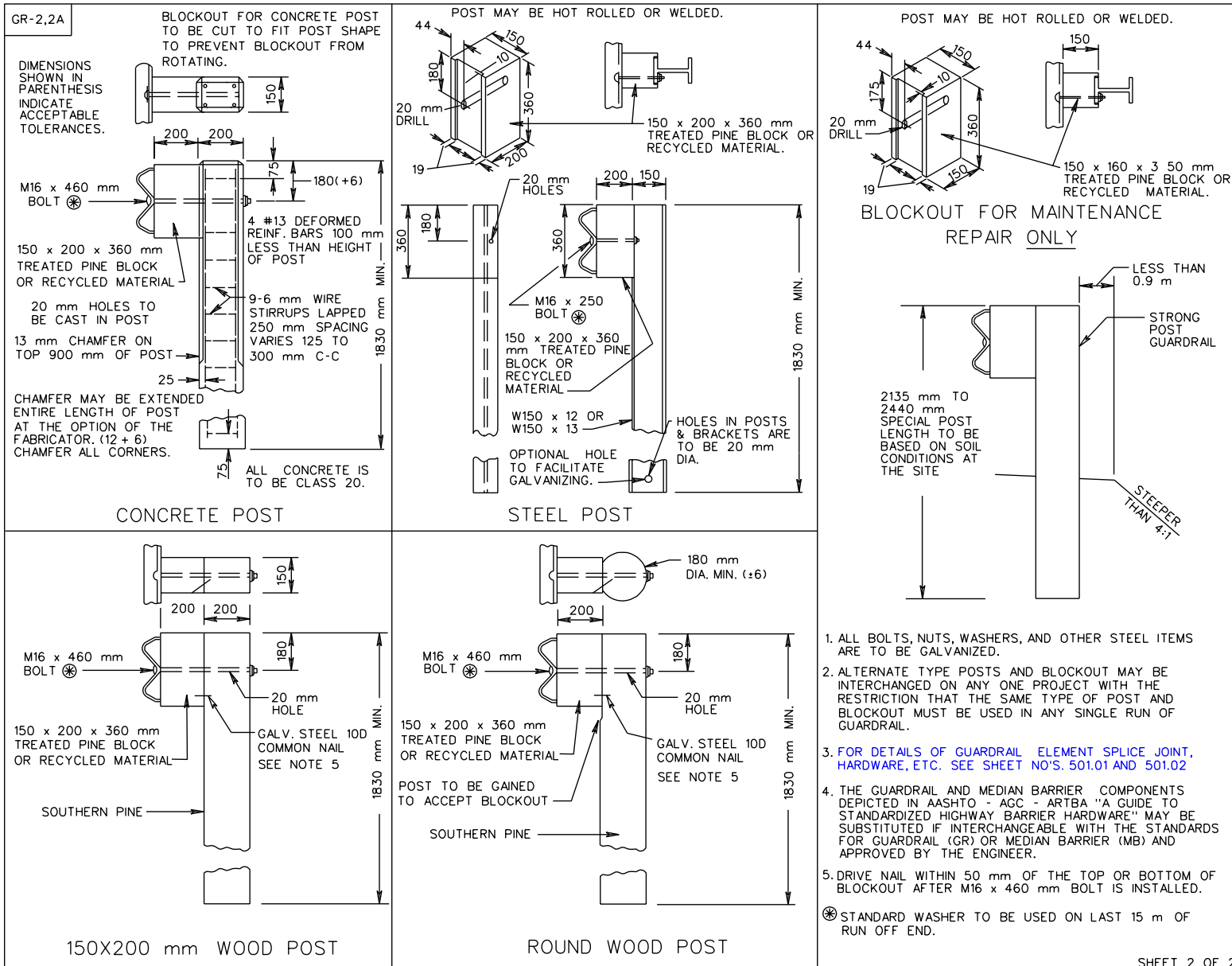


NOTES:

1. HOOK BOLTS OR TIE BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #16 TRANSVERSE BARS. WHERE NECESSARY, ADJUST THE LOCATION OF THE HOOK BOLTS OR TIE BARS TO A 70 mm MINIMUM CLEARANCE BETWEEN HOOK BOLTS OR TIE BARS AND TRANSVERSE BARS.
 2. TRANSVERSE CONSTRUCTION JOINT BARS ARE TO BE PLACED IN THE SAME HORIZONTAL PLANE AS THE #19 LONGITUDINAL BARS.
 3. #19 LONGITUDINAL BARS ARE TO BE LAPPED AND TIED IN THE SAME HORIZONTAL PLANE.
 4. FOR THE 11.4 METER WIDTH PAVEMENT USE SINGLE 3.6 METER LANES WITH TWO LONGITUDINAL CONSTRUCTION JOINTS OR 3.6 METER AND 4.2 METER LANES WITH ONE LONGITUDINAL CONSTRUCTION JOINT AND ONE SAW CUT OR TAPE INSERT LONGITUDINAL JOINT. TRANSVERSE BARS SHALL NOT EXTEND THROUGH LONGITUDINAL CONSTRUCTION JOINTS, BUT SHALL EXTEND FULL LENGTH (7.55 m) FOR SAW CUT OR TAPE INSERT LONGITUDINAL JOINT.
 5. SMOOTH SURFACE TO BE STEEL TROWELED 200 mm IN FROM EDGE OF PAVEMENT EVERY 150 m, AND THE STATION NUMBER STAMPED INTO IT AS SHOWN BELOW. THE DATE IS TO BE SHOWN IN A SIMILAR MANNER AT THE BEGINNING OF EACH DAYS POUR. BOTH OUTSIDE EDGES OF DIVIDED HIGHWAY ARE TO BE STAMPED. ONE EDGE OF UNDIVIDED HIGHWAY WHERE FEASIBLE (TRAVEL LANE).
-
6. DOUBLE LAP REQUIREMENT (1000 mm) AND THE EXTRA BAR METHOD APPLY ONLY TO LAPS FALLING WITHIN AN AREA OF 3.00 m BEYOND THE CONSTRUCTION JOINT.
 7. CONCRETE FOR LUG ANCHORS SHALL BE POURED AGAINST COMPACTED SUBGRADE. CONCRETE FOR LUGS AND ANCHOR SLAB MAY BE POURED MONOLITHICALLY OR POURED USING RAISED KEY CONSTRUCTION JOINT METHOD. ADEQUATE CONSOLIDATION OF CONCRETE IN LUGS WILL BE OBTAINED WITHOUT DISPLACING LONGITUDINAL CONTINUOUS STEEL, BY THE USE OF INTERNAL VIBRATION. WHEN LESS THAN FULL WIDTH LUG AND PAVEMENT SLAB IS PLACED, THE #16 TRANSVERSE STEEL IN THE LUGS SHALL BE EXTENDED, LAPPED AND SPLICED AT LEAST 21 DIAMETERS.
 8. LONGITUDINAL STEEL TO CONTINUE THROUGH JOINT. EXTRA #19 BARS 6.0 m LONG SHALL BE SPACED AT 320 mm C-C.
 9. CONCRETE SHOULD BE ADEQUATELY VIBRATED UNDER BEAM FLANGE TO ELIMINATE HONEYCOMBS.
 10. ANCHOR SLAB TYPE I IS TO BE USED IN FIRM SOILS ONLY. FOR AASHTO CLASSIFICATION SOILS A-1 THROUGH A-4, 3 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 17 m). FOR AASHTO CLASSIFICATION SOILS A-5 THROUGH A-7, 5 ANCHOR LUGS ARE REQUIRED (ANCHOR SLAB LENGTH = 26 m). USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE I IS USED TO RESTRICT MOVEMENT AGAINST THE STRUCTURE.
 11. ANCHOR SLAB TYPE TYPE II MUST BE USED WHEN COHESIONLESS OR SOFT CLAY SOILS ARE ENCOUNTERED. USE SAME REINFORCEMENT SIZE AND SPACING AS IN CONTINUOUS PAVEMENT. ANCHOR SLAB TYPE II ACCOMODATES MOVEMENT OF THE CONTINUOUS PAVEMENT.
 12. WELD STEEL END PLATE TO BOTH ENDS OF WF BEAM TO SEAL ENDS. WELD SHEAR CONNECTORS TO WEB AND FLANGE OF WF BEAM.
 13. 50 mm MINIMUM CONCRETE COVER FOR STEEL IN SUB-SLABS.
 14. WIDE FLANGE BEAM TO BE TREATED WITH CORROSION INHIBITOR PER SECTION 407 OF THE ROAD AND BRIDGE SPECIFICATIONS.
 15. ALL REINFORCING BARS SHALL BE GRADE 400 STEEL.
 16. THE USE OF TUBE FEEDING TO PLACE REINFORCEMENT IN THE PLASTIC CONCRETE WILL NOT BE ALLOWED.

SPECIFICATION REFERENCE	325 mm THICK CONTINUOUSLY REINFORCED CONCRETE PAVEMENT 4.2 m TRAVEL LANE	NEW 2/01
316	VIRGINIA DEPARTMENT OF TRANSPORTATION	UNLESS OTHERWISE NOTED ALL DIMENSIONS ONB THIS SHEET ARE IN MILLIMETERS
		301.25

REVISED ON 7/01



1. ALL BOLTS, NUTS, WASHERS, AND OTHER STEEL ITEMS ARE TO BE GALVANIZED.
 2. ALTERNATE TYPE POSTS AND BLOCKOUT MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF GUARDRAIL.
 3. FOR DETAILS OF GUARDRAIL ELEMENT SPLICE JOINT, HARDWARE, ETC. SEE SHEET NO'S. 501.01 AND 501.02
 4. 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.
 5. DRIVE NAIL WITHIN 50 mm OF THE TOP OR BOTTOM OF BLOCKOUT AFTER M16 x 460 mm BOLT IS INSTALLED.
- ⊗ STANDARD WASHER TO BE USED ON LAST 15 m OF RUN OFF END.

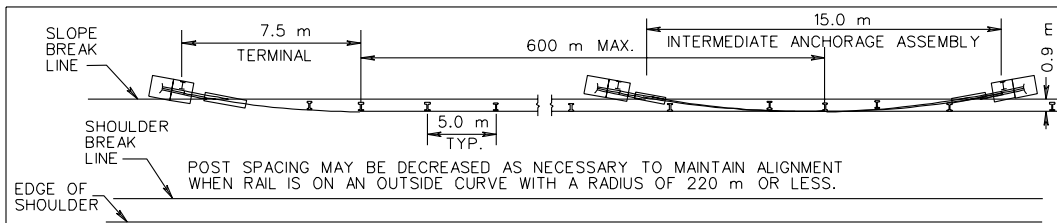
STANDARD BLOCKED-OUT W BEAM GUARDRAIL (STRONG POST SYSTEM)
POST AND BLOCKOUT DETAILS

REV. 2/2001
501.05 UNLESS AND OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

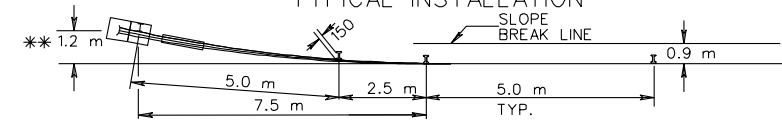
VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 2
SPECIFICATION REFERENCE
221
236
505

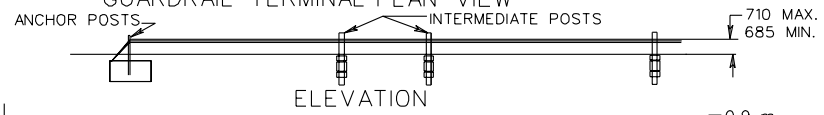
GR-3



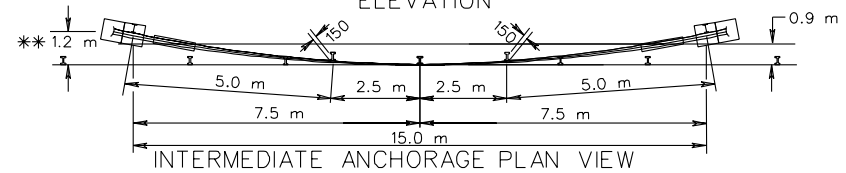
TYPICAL INSTALLATION



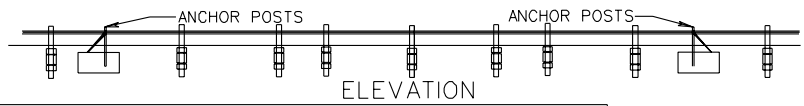
GUARDRAIL TERMINAL PLAN VIEW



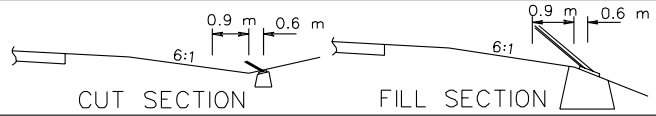
ELEVATION



INTERMEDIATE ANCHORAGE PLAN VIEW



ELEVATION



CUT SECTION

FILL SECTION

* THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN AASHTO AGC-A.R.T.B.A. "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.

** WHEN BURYING GR-3 CABLE GUARDRAIL IN THE BACKSLOPE, THE CONCRETE ANCHOR ASSEMBLY MUST BE PLACED AT A HEIGHT ON THE BACKSLOPE TO MAINTAIN THE 685 mm MIN./710 mm MAX. CABLE HEIGHT AT THE ANCHORAGE.

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 150 m-USE COMPENSATING DEVICE ON EACH END OF EACH INDIVIDUAL CABLE.

-OVER 150 m TO 600 m-USE COMPENSATING DEVICE ON EACH END OF EACH INDIVIDUAL CABLE.

-OVER 600 m-START NEW STRETCH BY INTERLACING AT LAST PARALLEL POST. SEE TYP. INSTALLATION.

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.....111.25 KN.
- THREE CABLE ANCHOR ASSEMBLY-
MIN. TENSILE STRENGTH.....445.0 KN.

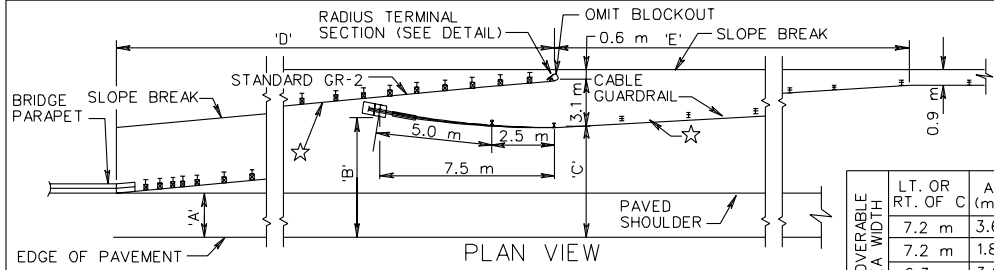
ALL FITTINGS SHALL BE HOT DIPPED GALVANIZED.

THE DYNAMIC DEFLECTION FOR STANDARD GR-3 IS 3.3 m.

⊗ THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED 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.

FOR ROCK INSTALLATION, 200 x 600 x 6.4 mm PLATE SHALL BE ELIMINATED. DRILL OR EXCAVATE HOLE FOR POST AND BACKFILL WITH CRUSHER RUN AGGREGATE TO LEVEL OF ROCK.

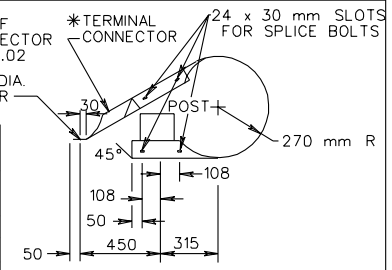
M8 ANSIB18.2.4.1M HEX. BACKING NUT OR APPROVED SHOULDER MUST EQUAL BEARING AREA OF M8 STANDARD NUT.



PLAN VIEW

☆ USE 15:1 FLARES ON BOTH TYPES OF RAIL FOR DESIGN SPEED OF 110 km/h OR 13:1 FOR DESIGN SPEED OF 100 km/h OR LESS.

* FOR DETAILS OF TERMINAL CONNECTOR SEE SHEET 501.02
DRILL 20 mm DIA. HOLE IN CENTER



RADIUS TERMINAL SECTION DETAIL

RECOVERABLE AREA WIDTH	110 km/h D.S.					
	LT. OR RT. OF C	A (m)	B (m)	C (m)	D (m)	E (m)
7.2 m	3.6	8.1	7.8	115	45	
7.2 m	1.8	8.1	7.8	140	45	
6.3 m	3.6	7.2	6.9	100	45	
6.3 m	1.8	7.2	6.9	128	45	

SHEET 1 OF 3

METHOD OF TRANSITION FROM CABLE GUARDRAIL TO W-BEAM GUARDRAIL AT BRIDGE APPROACHES

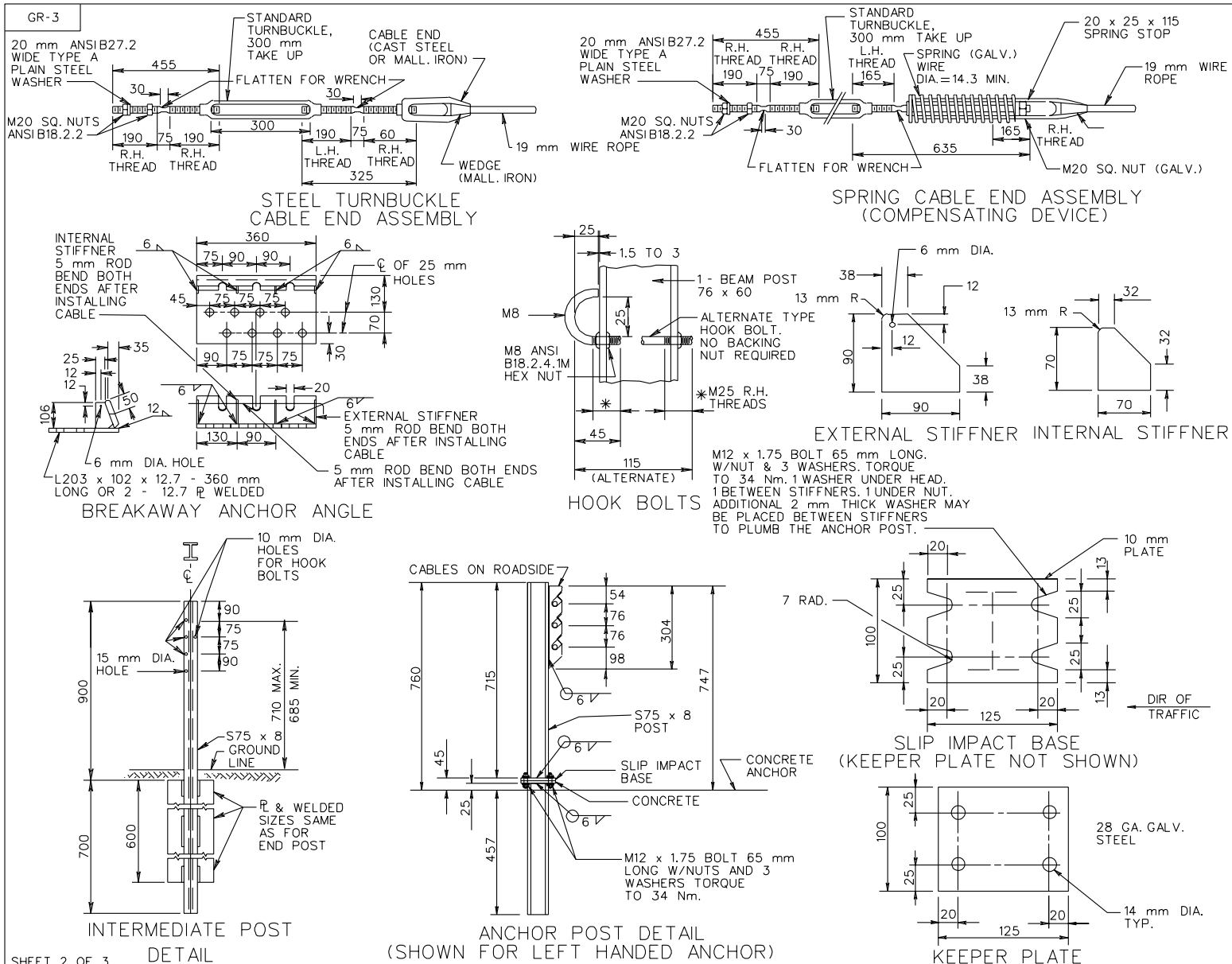
SPECIFICATION REFERENCE
221
505

CABLE GUARDRAIL
VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/2001

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS 501.06

INSERTABLE SHEET MA133



SHEET 2 OF 3

CABLE GUARDRAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/2001

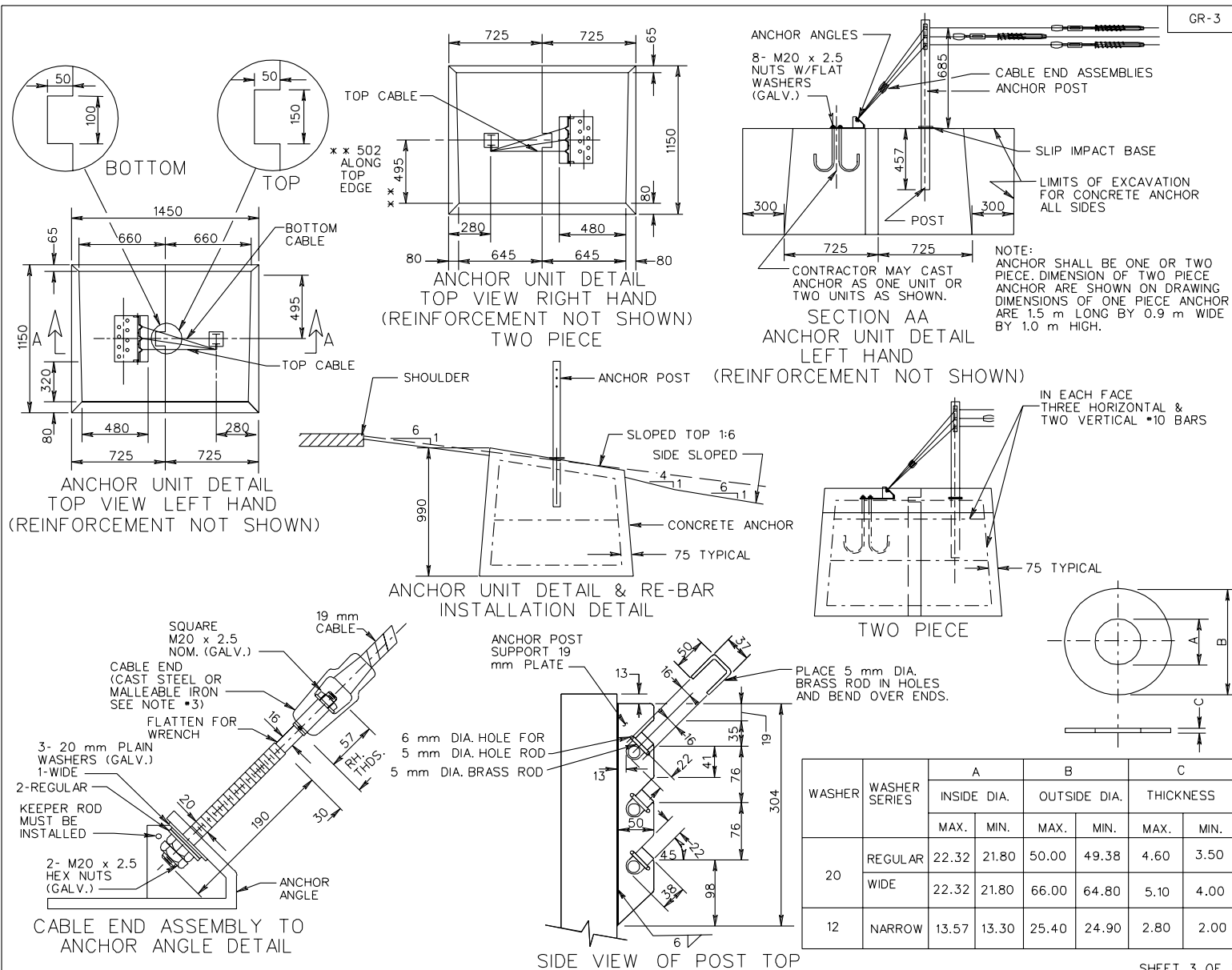
501.07 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

SPECIFICATION REFERENCE

221
505

INSERTABLE SHEET MA133

GR-3



SPECIFICATION REFERENCE
221 505

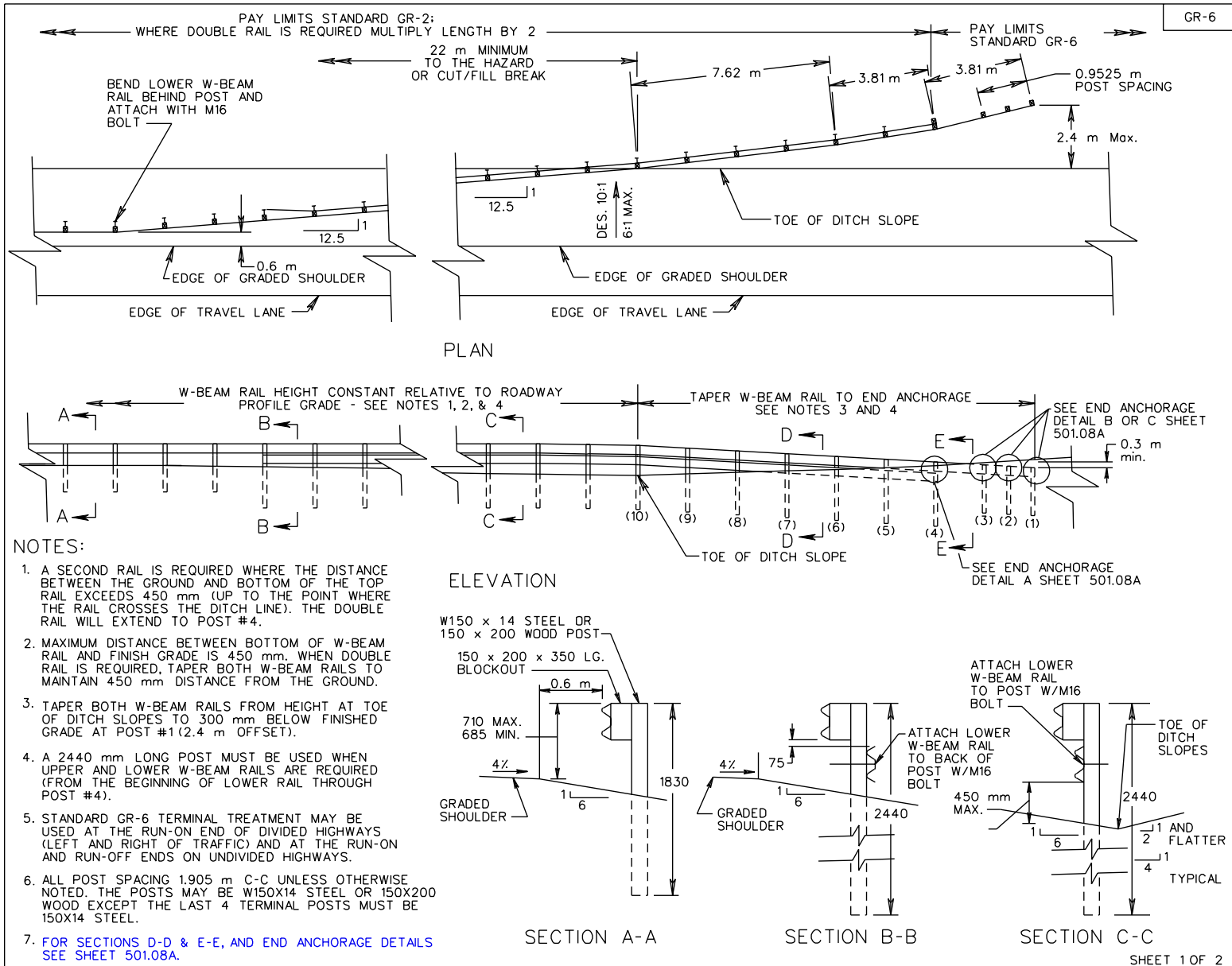
CABLE GUARDRAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/2001

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS 501.07A

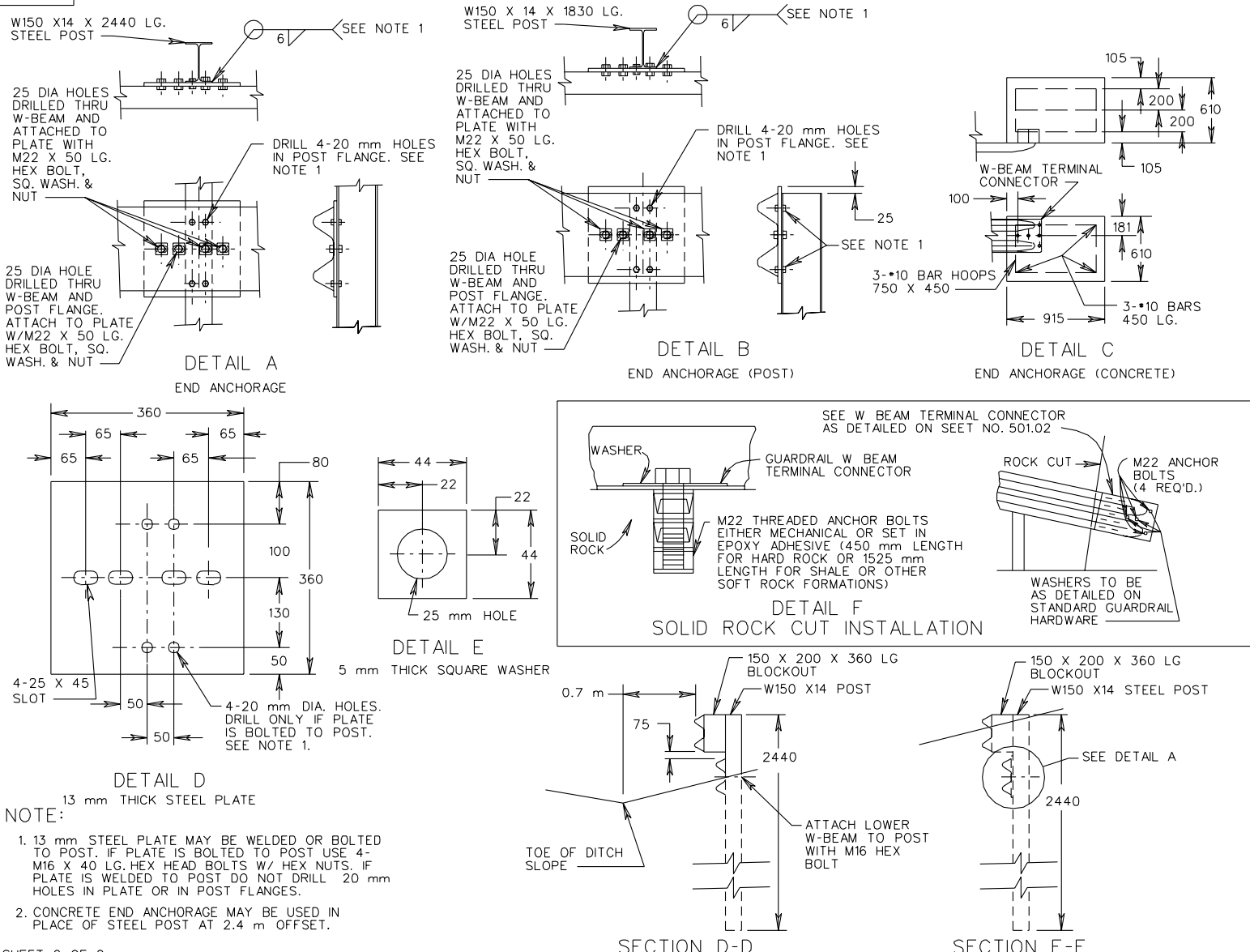
REVISED ON 7/01 REVISED ON 7/02



SPECIFICATION REFERENCE	<h1 style="margin: 0;">TERMINAL TREATMENT FOR W BEAM GUARDRAIL</h1>		
505 221		VIRGINIA DEPARTMENT OF TRANSPORTATION	REV. 2/2001
		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS	501.08

REVISED ON 11/02

GR-6



SHEET 2 OF 2

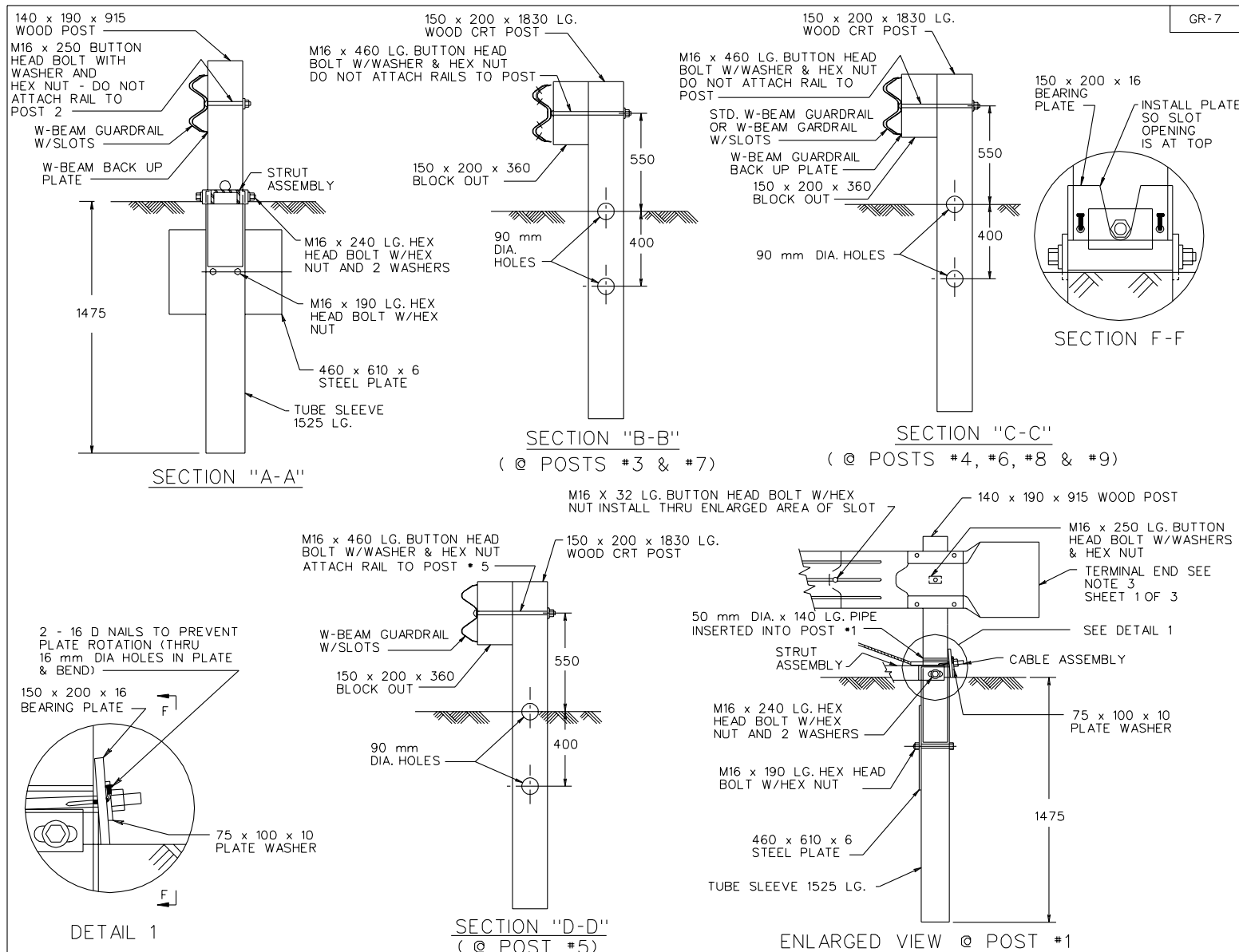
TERMINAL TREATMENT FOR W BEAM GUARDRAIL

REV. 2/2001
501.08A UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
505
221

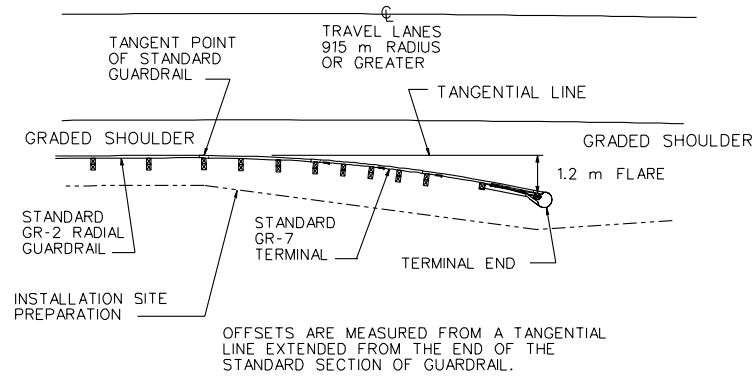
REVISED ON 7/02



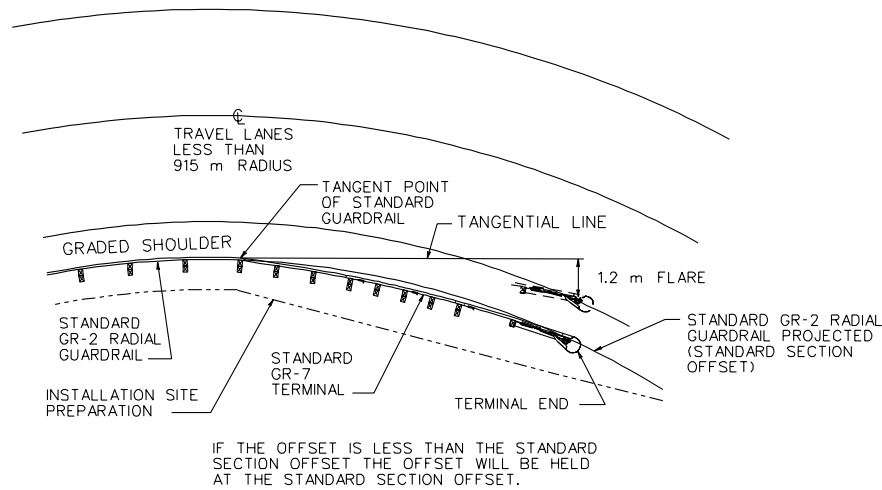
Sheet 2 of 3

SPECIFICATION REFERENCE	BREAKAWAY CABLE TERMINAL		REV. 2/2001
221 505	1.2 m FLARE		501.10
	VIRGINIA DEPARTMENT OF TRANSPORTATION		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

GR-7



FLARED TERMINAL PLACEMENT
915 m RADIUS OR GREATER



FLARED TERMINAL PLACEMENT ON
INSIDE OF CURVE - LESS THAN
915 m RADIUS

SHEET 3 OF 3

BREAKAWAY CABLE TERMINAL
1.2 m FLARE

VIRGINIA DEPARTMENT OF TRANSPORTATION

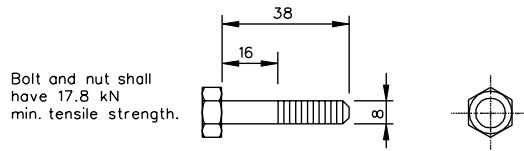
SPECIFICATION
REFERENCE

221
505

501.11 UNLESS OTHERWISE NOTED, ALL DIMENSIONS
ON THIS SHEET ARE IN MILLIMETERS

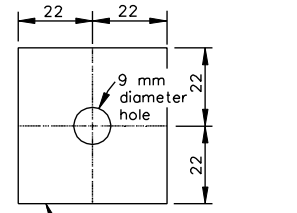
REVISED ON 7/01

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

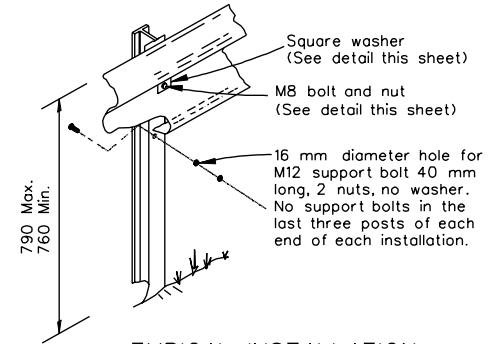


Bolt and nut shall have 17.8 kN min. tensile strength.

M8 HEX BOLT AND NUT



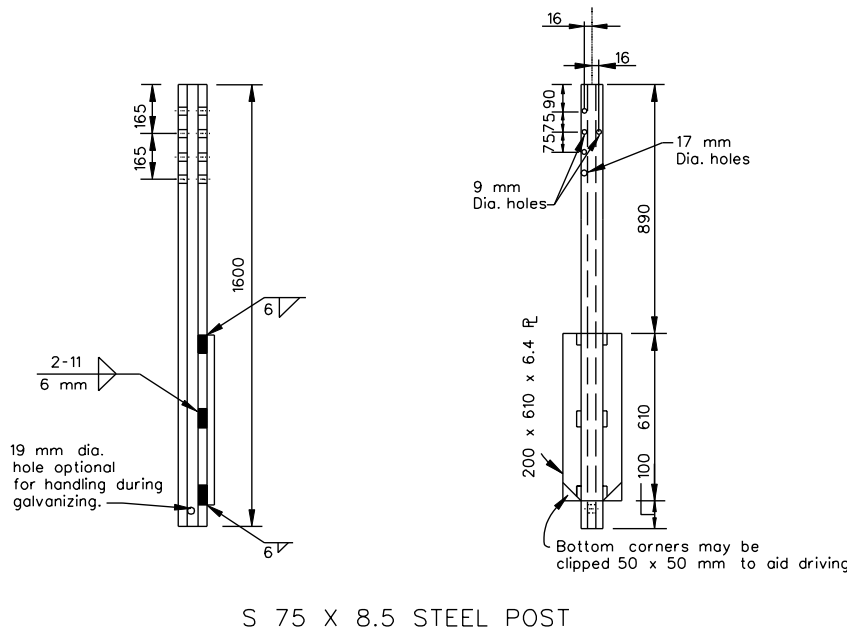
SQUARE WASHER



TYPICAL INSTALLATION

THIS UNIT IS ONLY TO BE USED WHEN DESIGN SPEED IS 70 km/h OR LESS.

STANDARD	POST SPACING	DEFLECTION
GR-8	3.8 m	2.15 m
GR-8A	1.9 m	1.525 m
GR-8B	0.95 m	1.20 m
GR-8C	1.27 m	1.375 m



S 75 X 8.5 STEEL POST

For rock installation, 200 x 610 x 6.4 mm plate is to be eliminated. Drill or excavate hole for post, place post and backfill with crusher run aggregate to level of rock.

All posts, bolts, nuts and washers are to be galvanized. Bent plate post or S75 x 8.5 post may be interchanged on any one project with the restriction that the same type of post must be used in any single run of guardrail.

For details of guardrail element, splice joint, hardware, etc. see Sheet No. 501.01.

⊗ 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.

POST SPACING ON CURVES	
Pavement \mathcal{Q} Radius	Post Spacing
26° > 67 m R	3.8 m
66.9 m - 33.6 m	1.9 m
33.5 m - 23.1 m	1.27 m
23.0 m - 15.0 m	0.95 m
< 15.0 m	Use not recommended

Sheet 1 of 3

SPECIFICATION REFERENCE

221
505

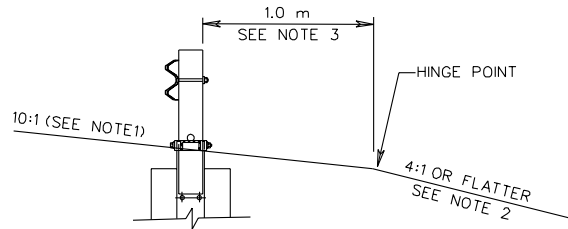
STANDARD W BEAM GUARDRAIL (WEAK POST SYSTEM)

VIRGINIA DEPARTMENT OF TRANSPORTATION

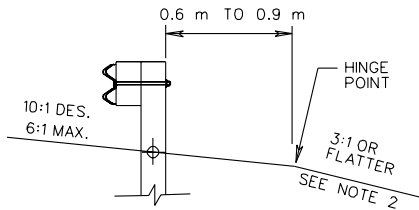
REV. 2/2001

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

501.12



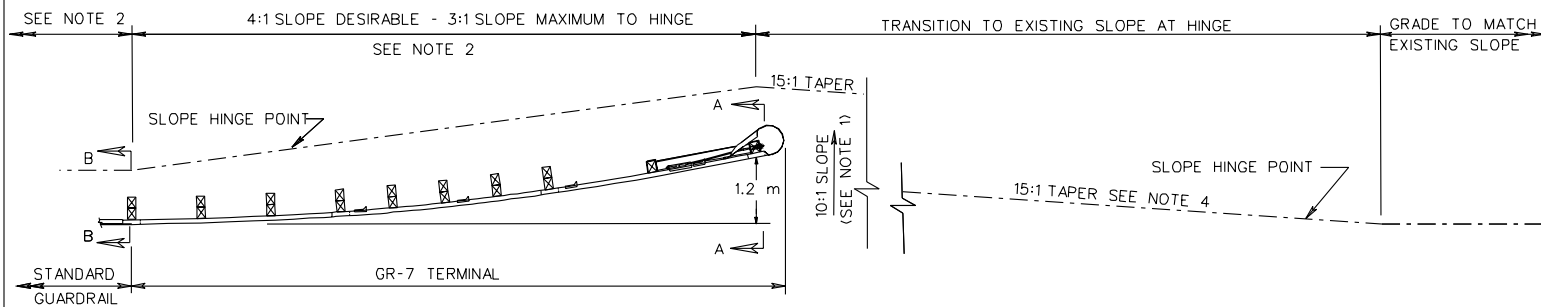
SECTION A-A



SECTION B-B

NOTES:

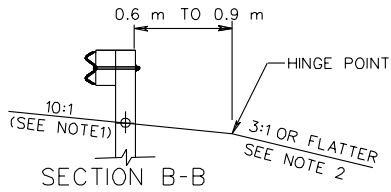
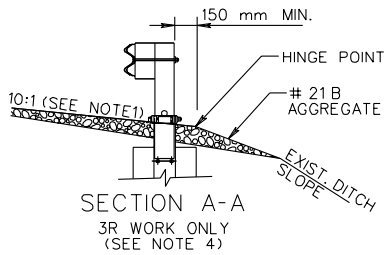
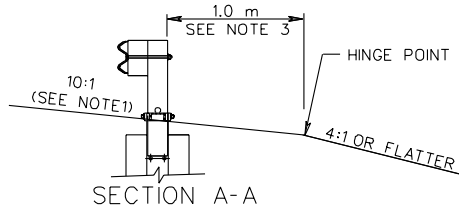
1. DESIRABLY, THE CROSS SLOPE OF THE GRADE APPROACHING THE GUARDRAIL TERMINAL, AND ADJACENT TO FOR ITS FULL LENGTH, MUST BE 10:1. IF THE EXISTING GRADE IS FLAT OR IS A POSITIVE SLOPE DUE TO THE SUPERELEVATION OF THE ROADWAY PAVEMENT, THE MINIMUM OFFSET FROM BEHIND THE POST TO THE HINGE POINT, AS SHOWN, 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 AND RECONSTRUCTION THE 10:1 SLOPE GRADING MUST EXTEND A MINIMUM OF 1.0 m BEHIND THE END POST.
4. FOR PROPRIETARY GUARDRAIL TERMINALS THE MANUFACTURE'S SITE PREPARATION REQUIREMENTS TAKE PRECEDENCE OVER THIS STANDARD.



<p>SPECIFICATION REFERENCE</p>	<h2 style="margin: 0;">GUARDRAIL TERMINAL INSTALLATION SITE PREPARATION REQUIREMENTS FOR GR-7</h2> <p style="margin: 0;">VIRGINIA DEPARTMENT OF TRANSPORTATION</p>	<p style="margin: 0;">REV. 2/2001</p> <p style="margin: 0;">UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS</p>	<p style="margin: 0;">501.15</p>
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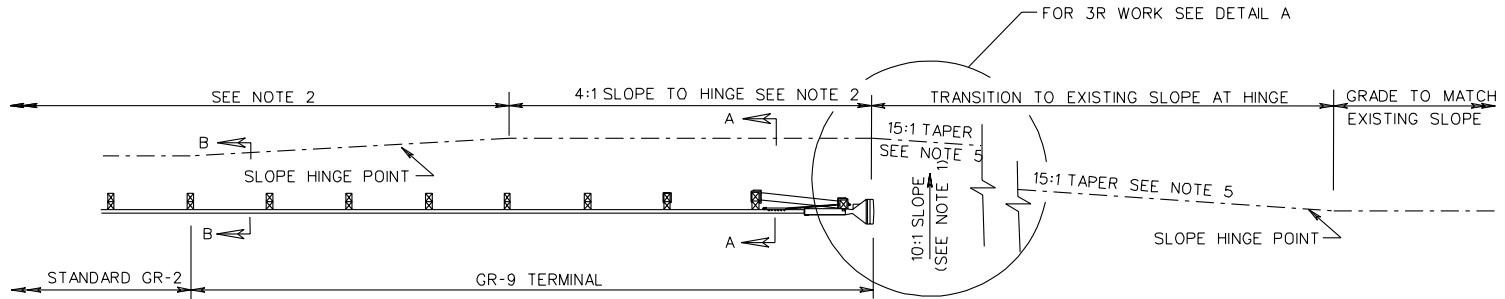
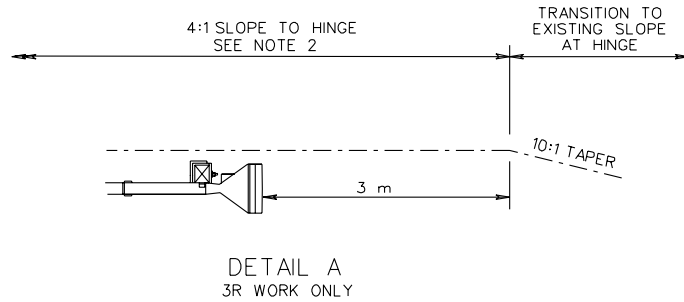
REVISED ON 11/02

GR-SP



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 MINIMUM 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 AND RECONSTRUCTION THE 10:1 SLOPE GRADING MUST EXTEND A MINIMUM OF 1.0 m BEHIND THE END POST.
4. FOR 3R WORK, THE GRADING SHOULD BE AS CLOSE TO RECONSTRUCTION WORK AS POSSIBLE WITH A MINIMUM OF 10:1 SLOPE EXTENDED 150 mm BEYOND THE POST. FROM THE HINGE POINT, TIE THE 10:1 SLOPE INTO THE EXISTING DITCH SLOPE TO COVER THE FOUNDATION TUBES AND SOIL PLATES WITHOUT EXTENDING THIS SLOPE BEYOND THE DITCH BOTTOM. USE #21B AGGREGATE, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER, AT ROADWAY SHOULDERS.
5. THE TAPER FOR NEW CONSTRUCTION WILL BE 15:1. FOR 3R WORK THE MINIMUM ALLOWABLE TAPER IS 10:1.
6. FOR PROPRIETARY GUARDRAIL TERMINALS THE MANUFACTURER'S SITE PREPARATION REQUIREMENTS TAKE PRECEDENCE OVER THIS STANDARD.



SHEET 2 OF 2

SITE PREPARATION REQUIREMENTS FOR GR-9

GUARDRAIL TERMINAL INSTALLATION SITE PREPARATION REQUIREMENTS FOR GR-9

REV. 2/2001

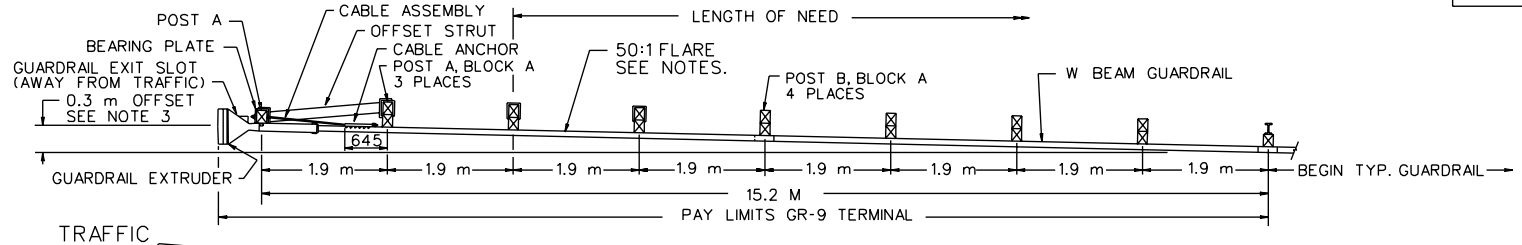
501.15A UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

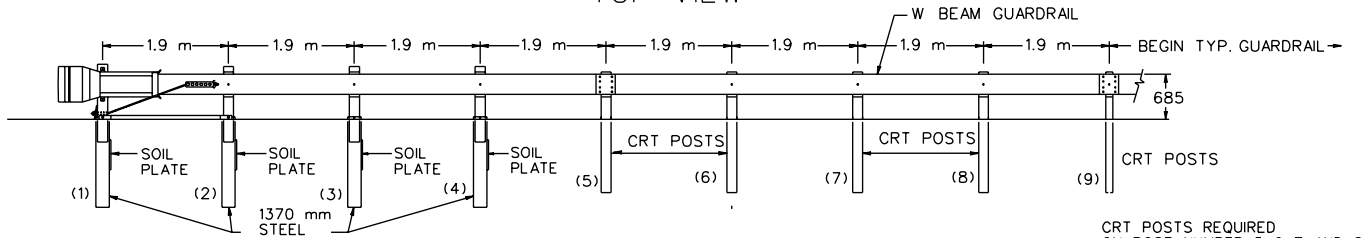
SPECIFICATION REFERENCE

REVISED ON 7/02

GR-9

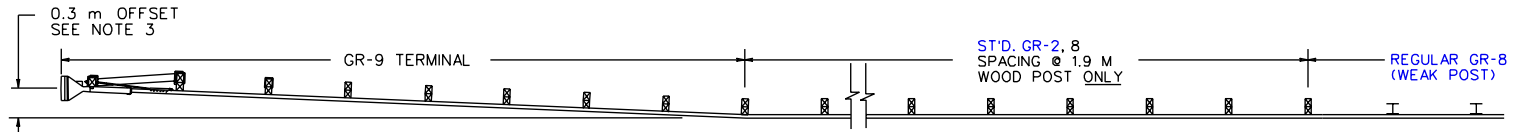


TOP VIEW



ELEVATION

CRT POSTS REQUIRED ON POST NUMBER 5, 6, 7 AND 8.



TRANSITION FROM GR-9 TERMINAL TO WEAK POST GUARDRAIL

NOTES:

1. THIS DESIGN SHALL ONLY BE USED AFTER AN ANALYSIS INDICATES IT IS MORE COST EFFECTIVE THAN PROVIDING THE FLARE FOR A ST'D. GR-7 OR EXTENDING THE GUARDRAIL TO PROVIDE A ST'D. GR-6 TERMINAL.
2. ALTERNATE BREAKAWAY CABLE TERMINAL (GR-9) IS TO BE ET-2000 (AS SHOWN) MANUFACTURED BY SYRO STEEL COMPANY, BRAKEMASTER AS MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC., THE BEST SYSTEM AS MANUFACTURED BY INTERSTATE STEEL CORPORATION, THE SKT-350 AS MANUFACTURED BY ROAD SYSTEMS INC., OR OTHER VDOT APPROVED EQUAL MEETING NCHRP 350 TESTING CRITERIA. ALL TERMINALS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL STANDARD GR-9 TERMINALS WILL BE INSTALLED WITH AN OFFSET TO PREVENT THE GUARDRAIL EXTRUDER FROM ENCROACHING ON THE SHOULDER. PLEASE REFER TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR SPECIFIC INFORMATION ON THEIR TERMINAL SYSTEM'S RECOMMENDED OFFSET AND STRAIGHT LINE FLARE RATES.
4. FOR DETAILS, DIMENSIONS, QUANTITIES AND OTHER INFORMATION NOT SHOWN HEREON, SEE INDIVIDUAL MANUFACTURER'S PLANS.
5. 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.
6. CRT POSTS REQUIRED ON POST NUMBER 5, 6, 7 AND 8.
7. DIRECTION OF TAPE SHALL CONFORM TO MUTCD APPLICATION FOR DIAGONAL STRIPS ON OBJECT MARKERS AND BRIDGE END PANELS. COLOR OF TAPE SHALL BE AMBER (YELLOW).

SPECIFICATION REFERENCE
505.01

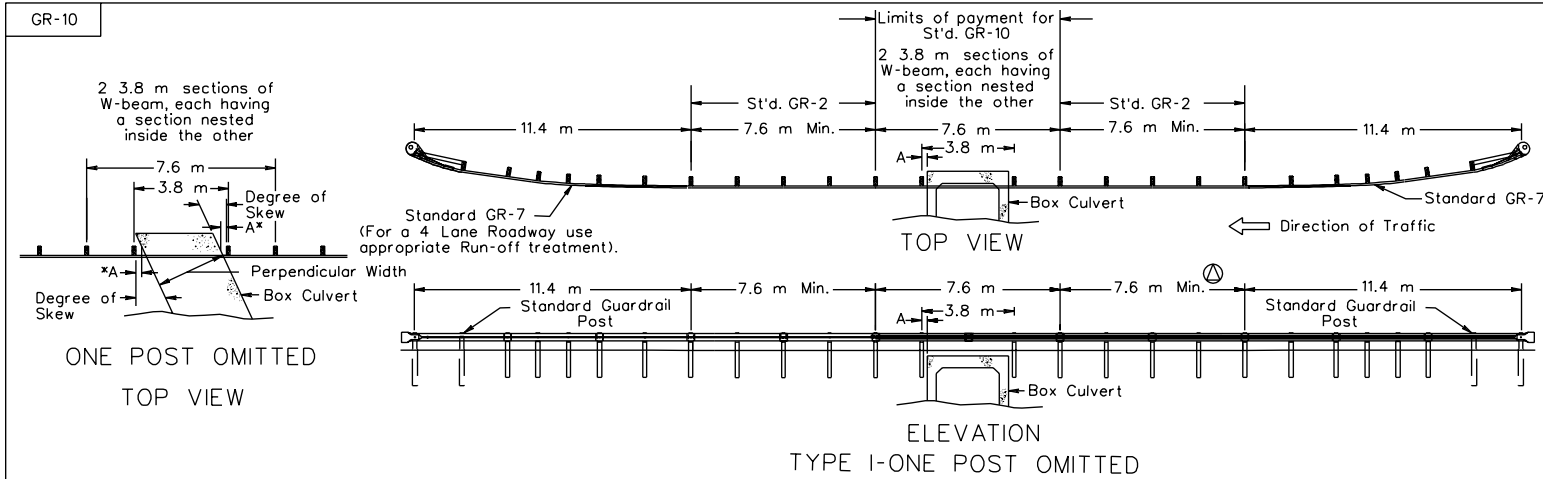
ALTERNATE BREAKAWAY CABLE TERMINAL
NO FLARE

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/2001

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

501.16



For details of guardrail posts and blockouts, see Standard GR-2, 2A.

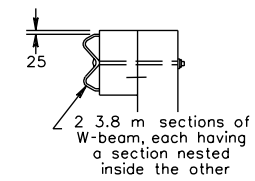
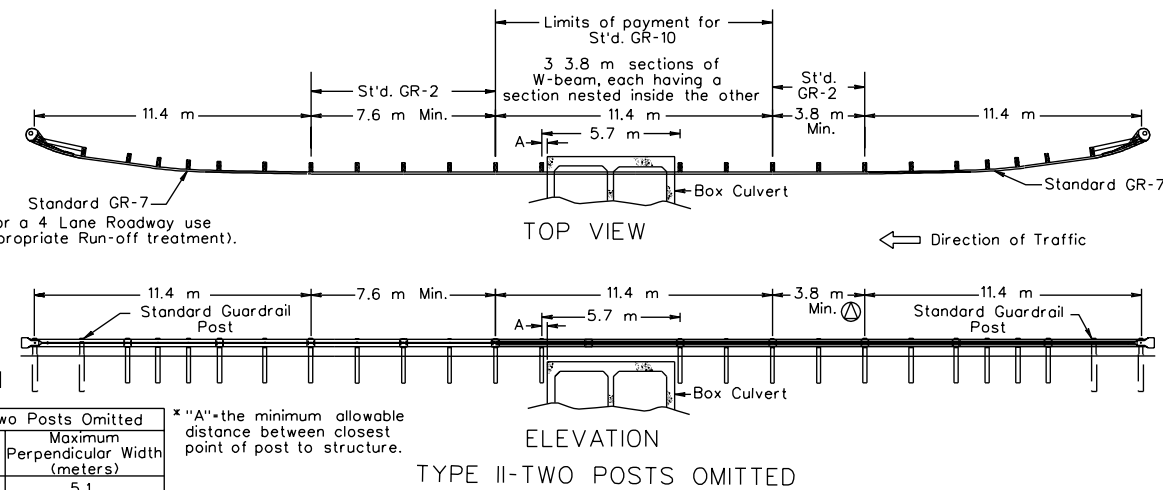


TABLE OF MAXIMUM ALLOWABLE STRUCTURE WIDTHS FOR THIS DESIGN

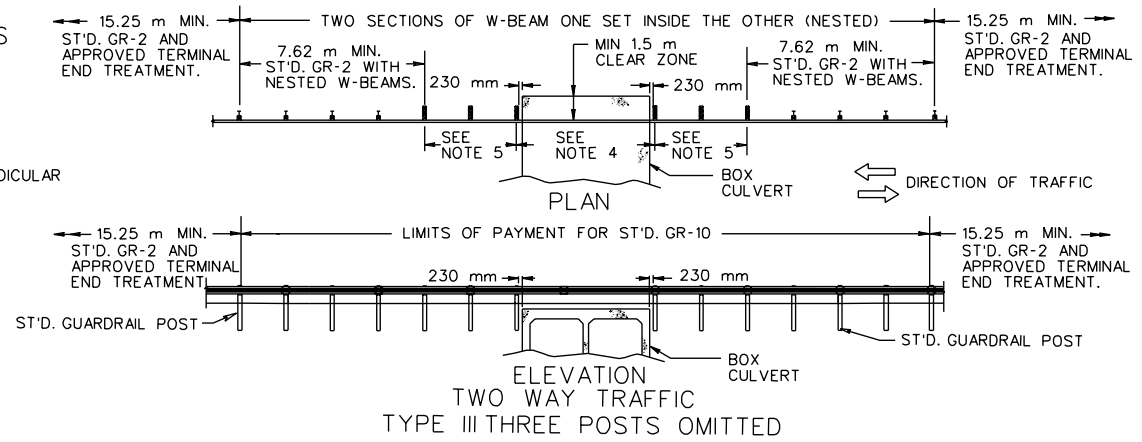
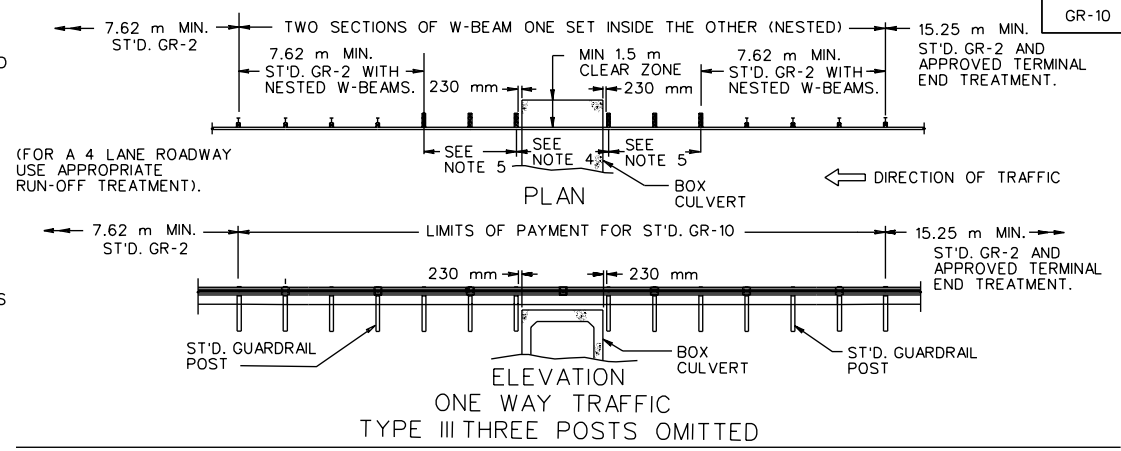
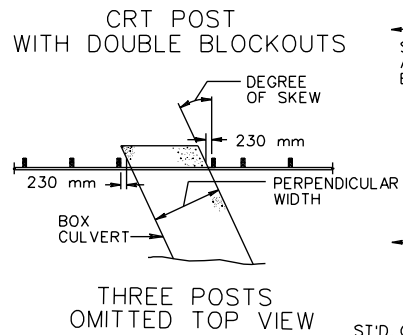
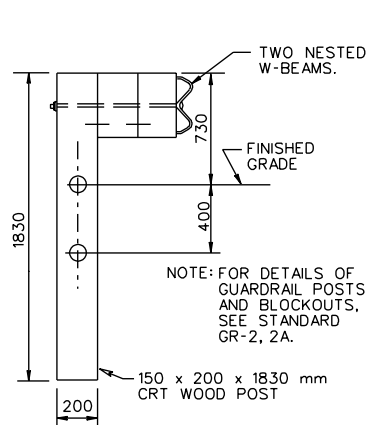
Type I-One Post Omitted			Type II-Two Posts Omitted		
Skew	A* (m)	Maximum Perpendicular Width (meters)	Skew	A* (m)	Maximum Perpendicular Width (meters)
0°	.230	3.2	0°	.230	5.1
5°	.230	3.2	5°	.230	5.1
10°	.230	3.1	10°	.230	5.0
15°	.230	3.0	15°	.230	4.9
20°	.230	2.9	20°	.230	4.7
25°	.230	2.8	25°	.230	4.5
30°	.230	2.7	30°	.230	4.3
35°	.230	2.5	35°	.230	4.0
40°	.230	2.4	40°	.230	3.8
45°	.230	2.1	45°	.230	3.5

* "A" = the minimum allowable distance between closest point of post to structure.



NOTES:

- This sheet is applicable when guardrail is required and the depth of fill above the top slab of the box culvert is less than 1090 mm.
- Guardrail installation to be in accordance with section 505 of the Specifications. Material requirement for components shall be in accordance with section 221 of the Specifications.
- Guardrail post spacing to be in accordance with Standard GR-2.
- Ⓐ This distance to be in accordance with VDOT policy on determining the length of need for guardrail with a minimum distance as shown.



TYPE III-THREE POSTS OMITTED	
SKIEW	MAX. PERPENDICULAR WIDTH (METER)
0°	7.01
5°	6.98
10°	6.89
15°	6.74
20°	6.52
25°	6.29
30°	5.97
35°	5.61
40°	5.21
45°	4.75

NOTES:

- THIS SHEET IS APPLICABLE WHEN GUARDRAIL IS REQUIRED AND THE DEPTH OF FILL ABOVE THE TOP SLAB OF THE BOX CULVERT IS LESS THAN 1090 mm.
- 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.
- GUARDRAIL POST SPACING SHALL BE IN ACCORDANCE WITH STANDARD GR-2.
- TWO NESTED W-BEAM GUARDRAILS, SEE TABLE FOR ALLOWABLE WIDTHS (7.62 m MAXIMUM).
- TWO NESTED W-BEAM GUARDRAILS, CRT WOOD POST, 1.905 m SPACING, WITH TWO 150 x 200 x 360 WOOD OR RECYCLED MATERIAL BLOCKOUTS.
- ALL SPLICES IN NESTED W-BEAM SECTIONS MUST COINCIDE AT A COMMON POINT AND BE BOLTED TOGETHER USING ONE SPLICE PLATE AND ONE SET OF BOLTS AT EACH SPLICE.

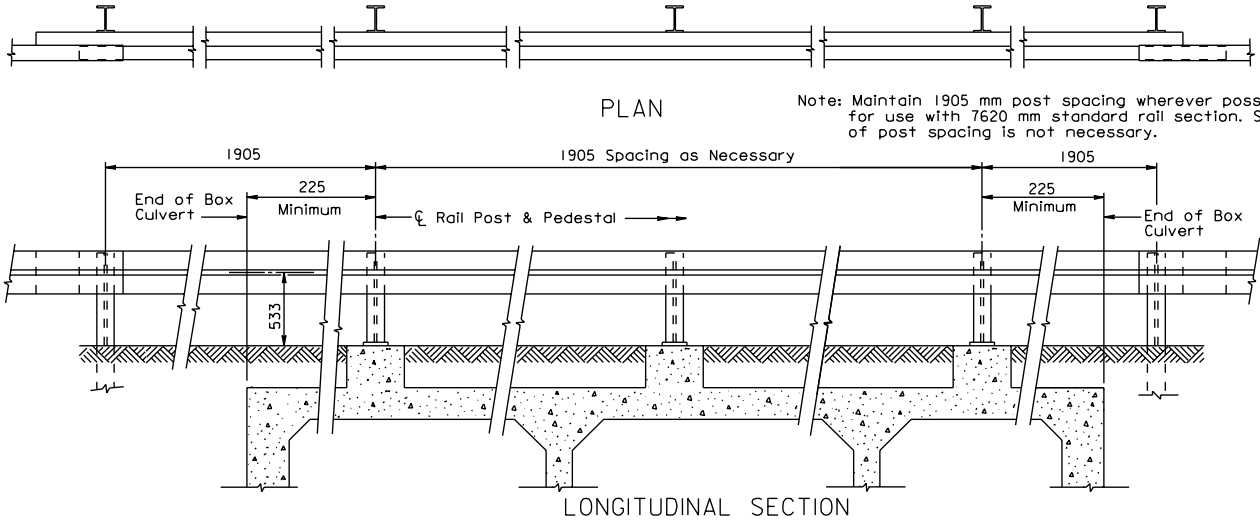
SPECIFICATION REFERENCE
221 505

GUARDRAIL AT LOW-FILL CULVERTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS 501.17A

BGR-01



THIS UNIT ONLY TO BE USED WHEN
 DESIGN SPEED IS 70 km/h OR LESS.
 TESTED NCHRP 350-TEST LEVEL 2

GENERAL NOTE

All structural steel, including bolts, nuts, and washers shall be galvanized.

For details of guardrail, see GR-2 of the Road and Bridge Standards.

The guardrail installation shall conform with Section 505 of the Virginia Department of Transportation Road and Bridge Specifications, 1995.

Rail posts may be vertical or perpendicular to adjacent roadway grade and cross slope. Top of pedestal shall be sloped as necessary for perpendicular installation.

Details on this sheet are to be used for both straight and skewed boxes.

Anchor bolts shall be 22 mm ϕ ASTM A307 (or ASTM A709 Grade 250 threaded rods with tack welded nuts) with hex nuts and washers as shown. Threaded rods may be 20 mm min. diameter with rolled threads. Nuts shall conform to ASTM A307 requirements and shall be tapped or chased after galvanizing. Bolts and nuts shall have Class 2A and 2B fit tolerances. Bolts shall be embedded 200 mm into the concrete.

This rail has been successfully evaluated by full scale impact tests conducted in accordance with NCHRP Report 153. Test documentation may be found in Research Report 230-1, "Tubular W-Beam Bridge Rail", of Research Study 2-5-78-230 "Bridge Rail to Contain Heavy Trucks and Buses", Texas Transportation Institute, October 1978.

All dimensions are shown in millimeters (mm) unless otherwise noted. Symbol ϕ = diameter.

Note: Maintain 1905 mm post spacing wherever possible for use with 7620 mm standard rail section. Symmetry of post spacing is not necessary.

Tubular guard rail shall be furnished and installed in 7620 mm sections. Tubular rail member shall be extended and connected to at least the first soil embedded post at each end of the structure. More such posts shall be used to utilize 7620 mm standard sections. Approach guardrail posts shall be spaced at 1905 mm adjacent to the tubular rail since its flexibility is similar to the standard metal beam guardrail. Do not install additional posts at 953 mm centers. Fully anchored guardrail must be attached at both ends of tubular rail.

Tests have shown that although this rail deflects horizontally 600 to 900 mm, adequate vehicle containment and re-direction is achieved. The resulting more gradual deceleration thus produces a safer condition than afforded by other bridge railings.

The Contractor shall determine the number of pedestals required for guardrail installation across the box, pedestal height and dimensions of the BR Series reinforcing bars. The quantity of concrete (Class 30) and reinforcing steel used in the pedestals shall be field verified and paid for at the unit price bid for the corresponding box quantities. The railing (Texas T-6) shall be measured in 7620 mm sections and paid for at the contract unit price per meter in accordance with Section 410.04 of the Specifications. BR Series bars shall be #16 in size.

For details of box culverts, see the Box Culvert Standards.

This sheet is applicable when guardrail is required and the depth of fill above the top slab of the box culvert is less than 1100 mm.

Details shown are for installation on new box culverts. Installation of pedestals on existing box culverts shall be in accordance with Sec. 412.03 of the Specifications except that dowels shall be placed between 75 and 150 mm from the edge of the pedestal.

Precast boxes shall be treated as an existing box for pedestal installation.

Sheet 1 of 3

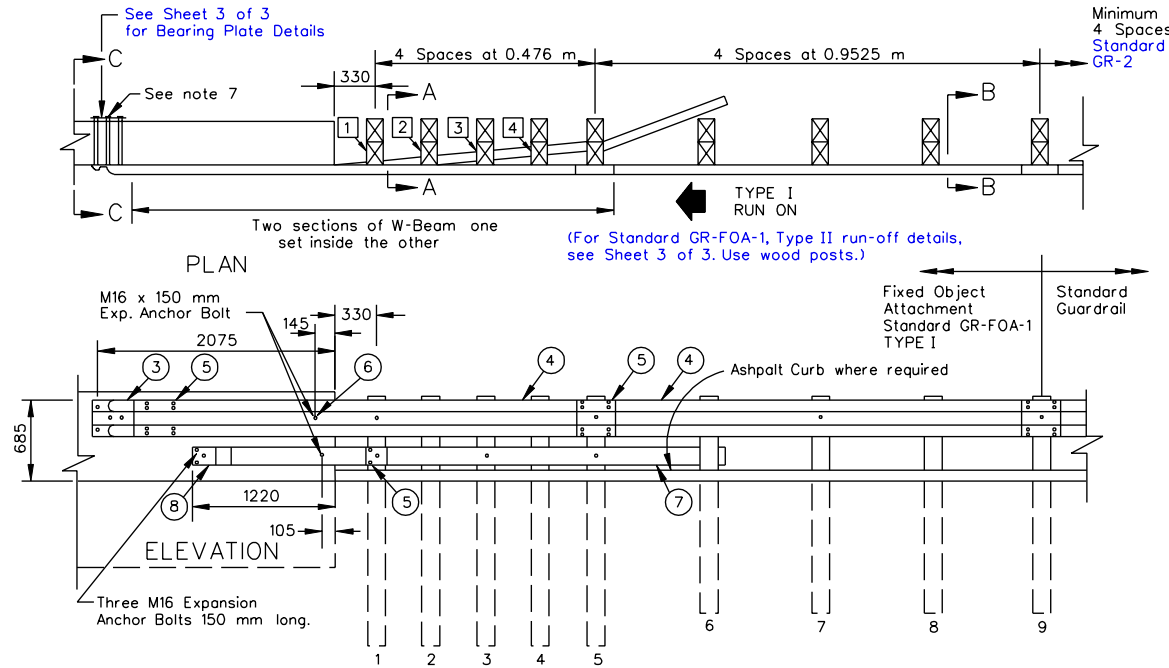
STANDARD BOX CULVERT GUARDRAIL (TEXAS T-6)

REV. 2/01

501.19

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION



Notes:

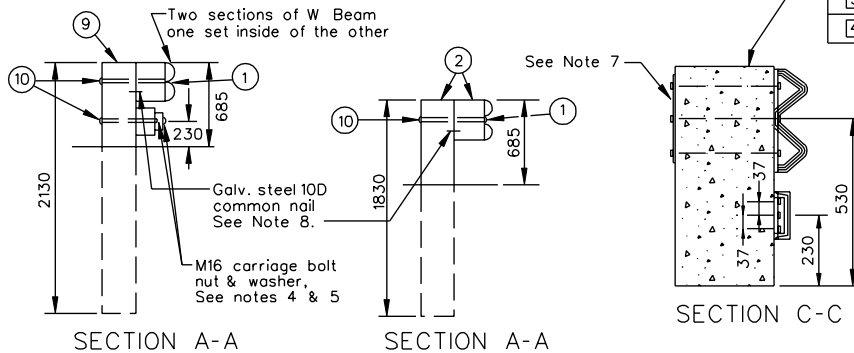
1. Fixed objects may consist of bridge rails, abutments, piers, retaining walls, or other flat surfaced structures with a vertical face.
2. Bridge rail ends and bridge parapets must be of adequate strength to accept full impact loading.
3. Guardrail components to be in accordance with VDOT Road and Bridge Standards.
4. Posts 1,2,3,4 and 5 require an additional hole to attach lower blocks and/or rubrail. Rubrail is not bolted to post 2 and 4.
5. Bottom wood blocks located on posts 1 through 4 are center drilled and secured with M16 carriage bolts. (Length as required.)
6. W-beam is not bolted to posts 2,3,4,6 and 8: Bolt block directly to post.
7. Appropriate length M22 diameter ASTM A325 hex bolts must be used with hru drilled holes with a 16 mm bearing plate on the back side of the bridge parapet or Terminal wall.
8. Drive nail within 50 mm of the top or bottom of the blockout after M16 x 460 bolt is installed.

New Bridges - Attachments
 One Way Traffic - Run-on, 2-GR-FOA-1, Type I
 - Run-off, 2-GR-FOA-1, Type II
 Two Way Traffic - Run On, 4-GR-FOA-1, Type I
 Existing bridge attachments as shown on plans.

RUBRAIL WOOD BLOCKS
 180 mm x 150 mm x THICKNESS

Post	Thickness
1	170
2	130
3	90
4	50

Vertical Bridge Terminal Wall or other Flat Surface Structure.

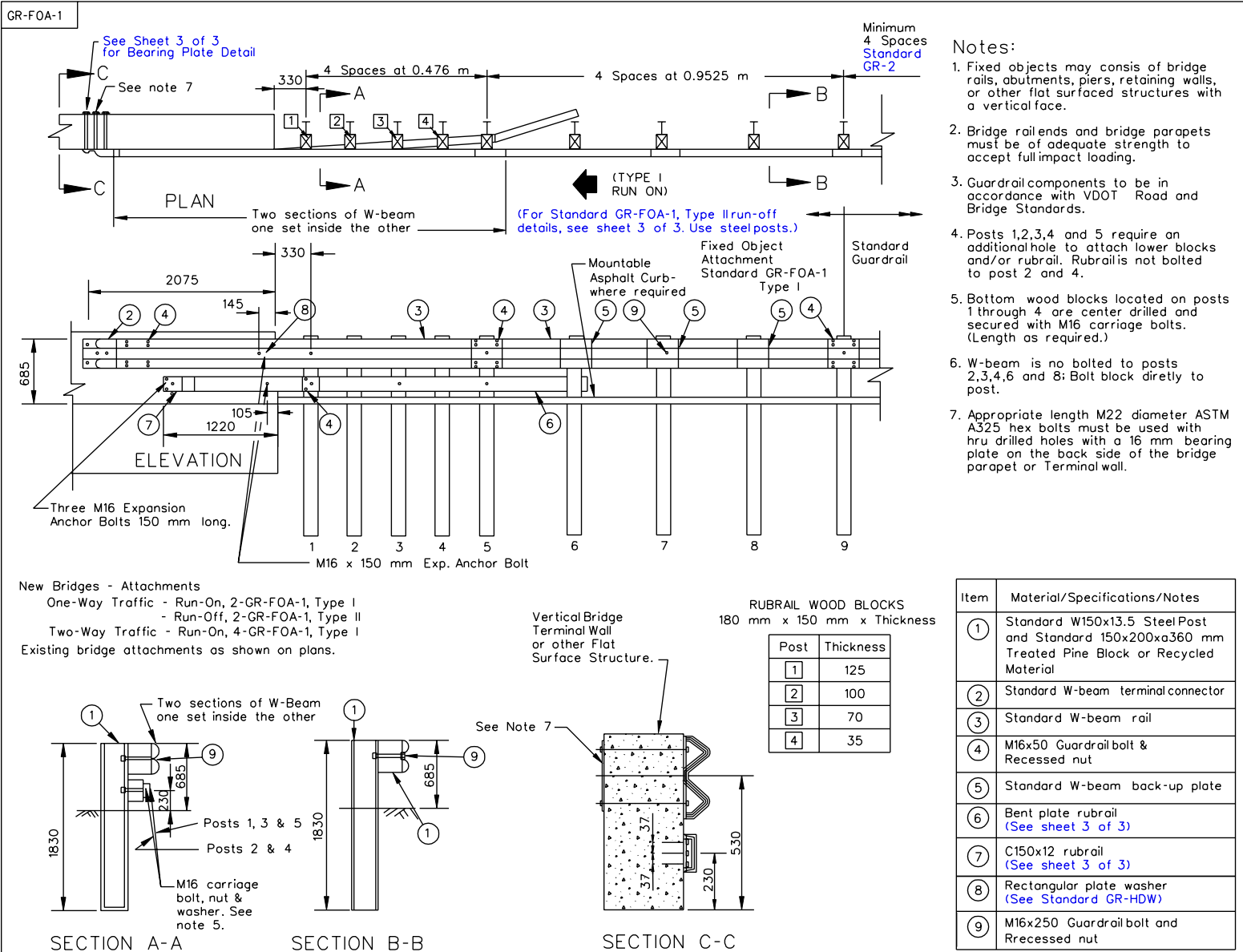


Item	Material/Specifications/Notes
1	M16 x 460 mm Guardrail bolt & Recessed nut
2	Standard 150 x 200 mm Wood post & Block
3	Standard W-beam terminal connector
4	Standard W-beam rail
5	M16 x 50 mm Guardrail bolt & Recessed nut (See Standard GR-HDW)
6	Rectangular Plate Washer (See Standard GR-HDW)
7	Bent plate rubrail (See sheet 3 of 3)
8	C150 x 12 rubrail (See sheet 3 of 3)
9	Mod. 150 x 200 mm Wood post & Standard block (2130 mm length post)
10	Washer for M16 bolt

SPECIFICATION REFERENCE
505

W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT
 FOR USE BETWEEN VERTICAL FIXED OBJECTS AND GUARDRAIL (WOOD POSTS)

REVISED ON 7/01



Sheet 2 of 3

W-BEAM GUARDRAIL-FIXED OBJECT ATTACHMENT
FOR USE BETWEEN VERTICAL FIXED OBJECTS AND GUARDRAIL (STEEL POSTS)

REV. 2/2001

501.23

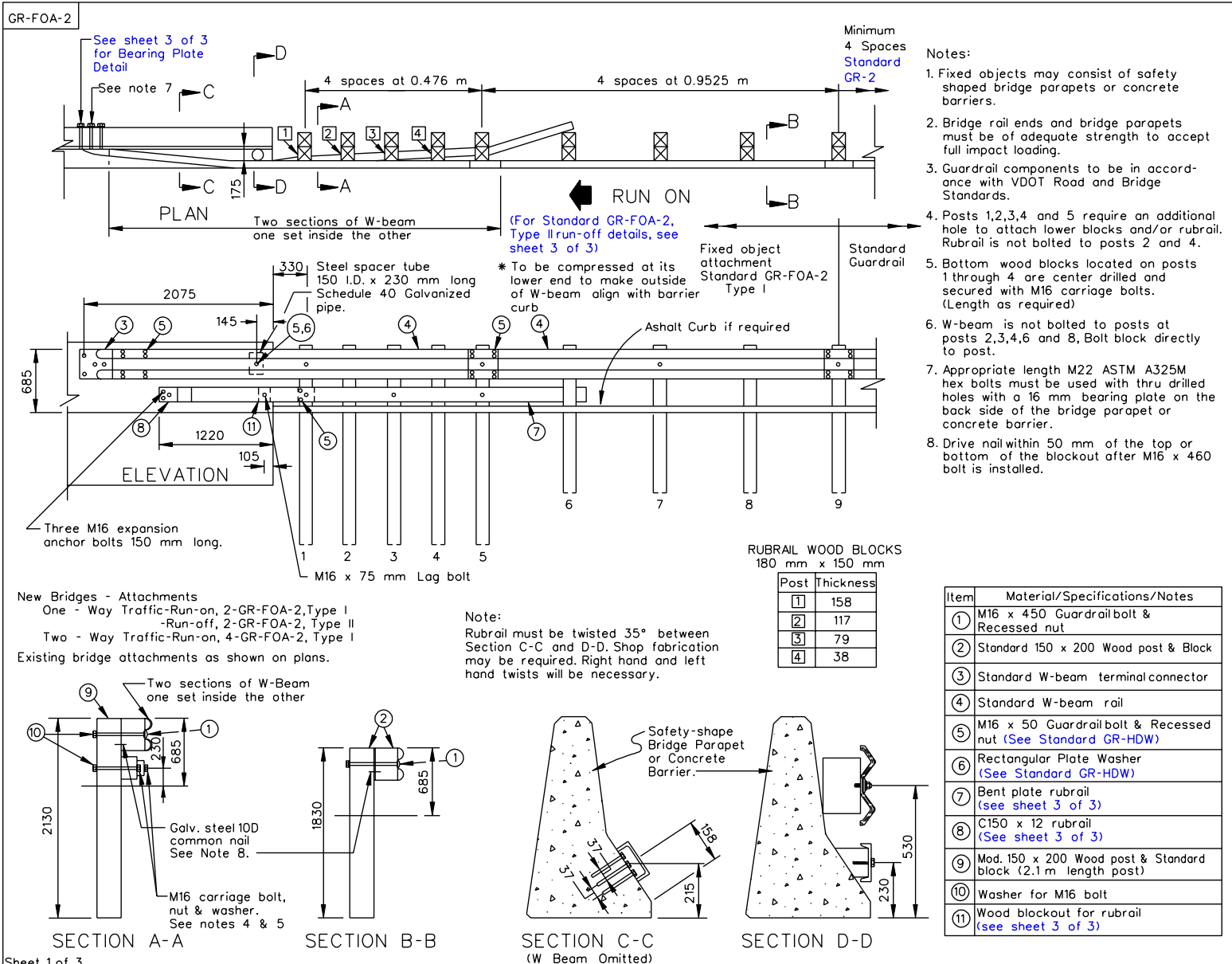
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VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

505

REVISED ON 7/01



- Notes:
1. Fixed objects may consist of safety shaped bridge parapets or concrete barriers.
 2. Bridge rail ends and bridge parapets must be of adequate strength to accept full impact loading.
 3. Guardrail components to be in accordance with VDOT Road and Bridge Standards.
 4. Posts 1,2,3,4 and 5 require an additional hole to attach lower blocks and/or rubrail. Rubrail is not bolted to posts 2 and 4.
 5. Bottom wood blocks located on posts 1 through 4 are center drilled and secured with M16 carriage bolts. (Length as required)
 6. W-beam is not bolted to posts at posts 2,3,4,6 and 8, Bolt block directly to post.
 7. Appropriate length M22 ASTM A325M hex bolts must be used with thru drilled holes with a 16 mm bearing plate on the back side of the bridge parapet or concrete barrier.
 8. Drive nail within 50 mm of the top or bottom of the blockout after M16 x 460 bolt is installed.

New Bridges - Attachments
 One - Way Traffic-Run-on, 2-GR-FOA-2, Type I
 -Run-off, 2-GR-FOA-2, Type II
 Two - Way Traffic-Run-on, 4-GR-FOA-2, Type I
 Existing bridge attachments as shown on plans.

Note:
 Rubrail must be twisted 35° between Section C-C and D-D. Shop fabrication may be required. Right hand and left hand twists will be necessary.

RUBRAIL WOOD BLOCKS
 180 mm x 150 mm

Post	Thickness
1	158
2	117
3	79
4	38

Item	Material/Specifications/Notes
1	M16 x 450 Guardrail bolt & Recessed nut
2	Standard 150 x 200 Wood post & Block
3	Standard W-beam terminal connector
4	Standard W-beam rail
5	M16 x 50 Guardrail bolt & Recessed nut (See Standard GR-HDW)
6	Rectangular Plate Washer (See Standard GR-HDW)
7	Bent plate rubrail (see sheet 3 of 3)
8	C150 x 12 rubrail (See sheet 3 of 3)
9	Mod. 150 x 200 Wood post & Standard block (2.1 m length post)
10	Washer for M16 bolt
11	Wood blockout for rubrail (see sheet 3 of 3)

Sheet 1 of 3
 REV. 2/2001

W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT FOR USE BETWEEN SAFETY SHAPE AND GUARDRAIL (WOOD POSTS)

SPECIFICATION REFERENCE

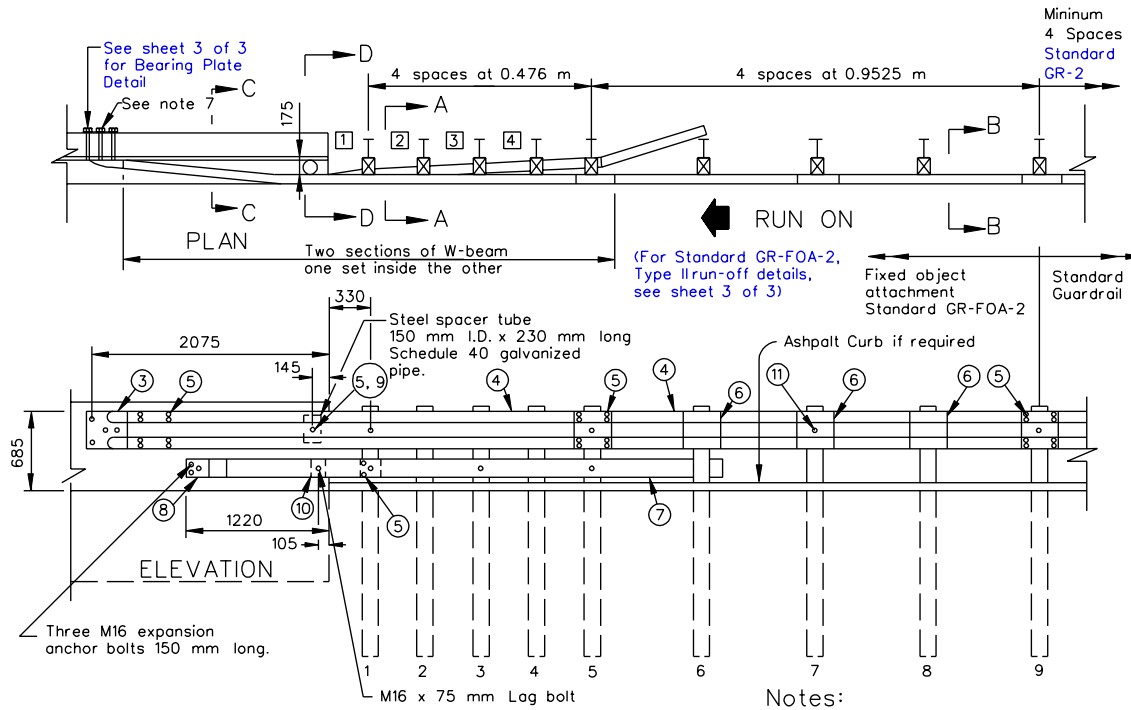
506

501.25 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

REVISED ON 7/01

GR-FOA-2



Notes:

1. Fixed objects may consist of safety shaped bridge parapets or concrete barriers.
2. Bridge rail ends and bridge parapets must be of adequate strength to accept full impact loading.
3. Guardrail components to be in accordance with VDOT Road and Bridge Standards.
4. Posts 1,2,3,4 and 5 require an additional hole to attach lower blocks and/or rubrail. Rubrail is not bolted to posts 2 and 4.
5. Bottom wood blocks located on posts 1 through 4 are center drilled and secured with M16 carriage bolts. (Length as required)
6. W-beam is not bolted to posts at posts 2,3,4,6 and 8. Bolt block directly to post.
7. Appropriate length M22 ASTM A325M hex bolts must be used with thru drilled holes with a M16 bearing plate on the back side of the bridge parapet or concrete barrier.

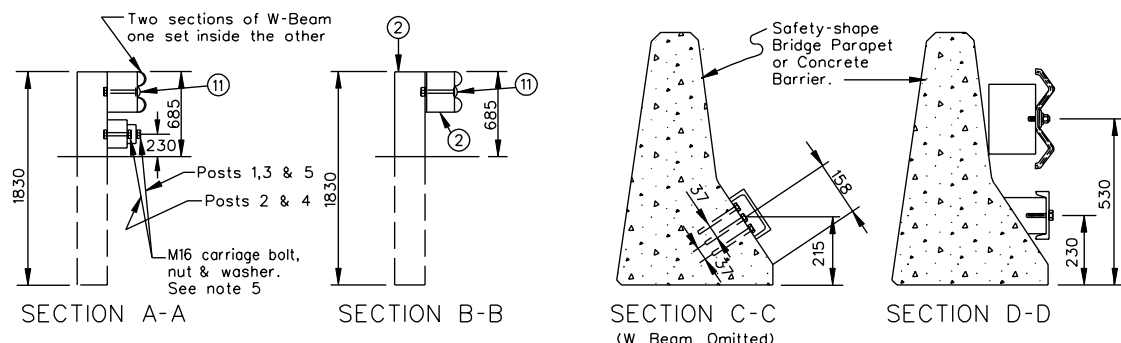
RUBRAIL WOOD BLOCKS
180 x 100

Post	Thickness
1	108
2	82
3	50
4	25

New Bridges - Attachments
 One - Way Traffic-Run-on, 2-GR-FOA-2, Type I
 -Run-off, 2-GR-FOA-2, Type II
 Two - Way Traffic-Run-on, 4-GR-FOA-2, Type I
 Existing bridge attachments as shown on plans.

Notes:

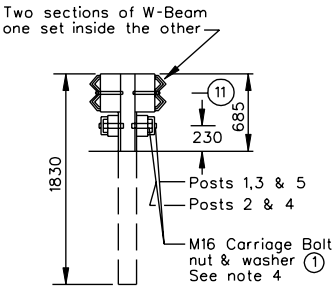
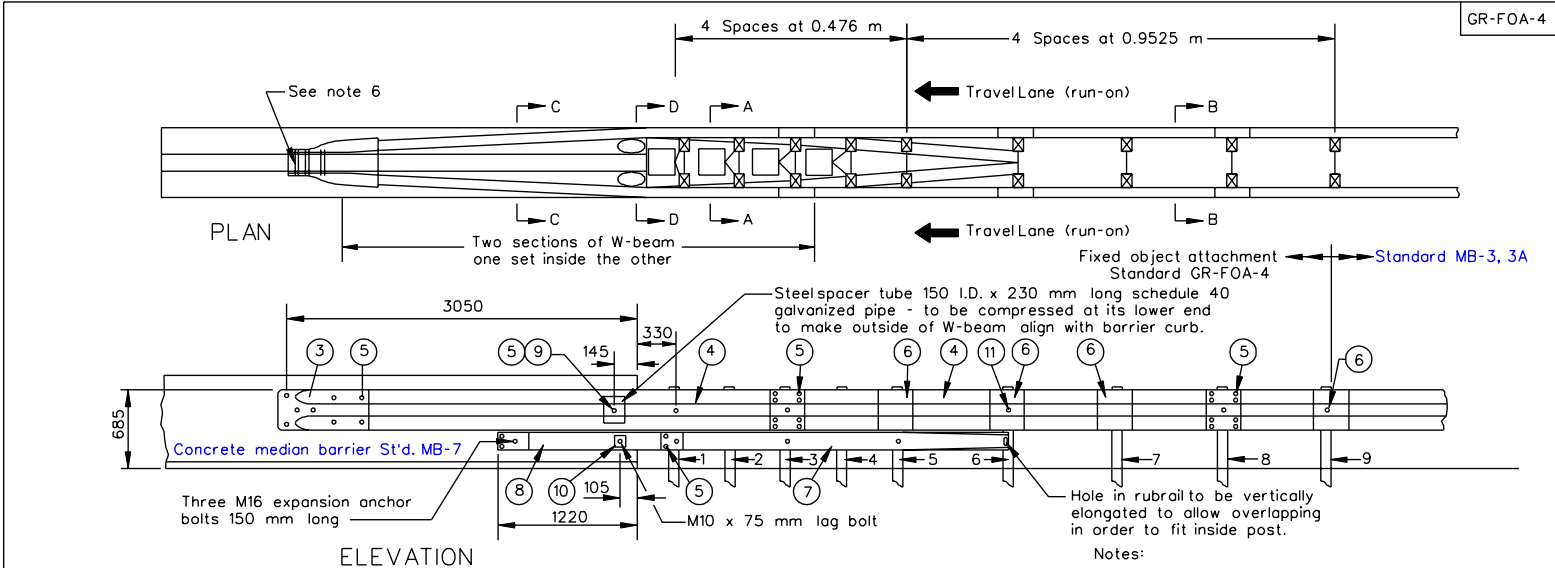
Rubrail must be twisted 35° between Section C-C and D-D. Shop fabrication may be required. Right hand and left hand twists will be necessary.



Item	Material/Specifications/Notes
1	M16 washer
2	Standard W150x13.5 Steel Post and Standard 150x200x360 mm Treated Pine Block or Recycled Material
3	St'd W-beam terminal connector
4	Standard W-beam rail
5	M16 x 50 Guardrail bolt and Recessed nut
6	Standard W-beam back-up plate
7	Bent plate rubrail (see sheet 3 of 3)
8	C150 x 12 rubrail (See sheet 3 of 3)
9	Rectangular plate washer (see Standard GR-HDW)
10	Wood blockout for rubrail (see sheet 3 of 3)
11	M16 x 250 Guardrail bolt and Recessed nut

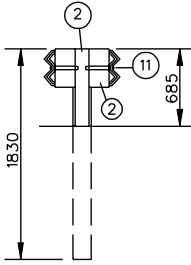
Sheet 2 of 3

SPECIFICATION REFERENCE 506	<h2 style="margin: 0;">W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT</h2> <h3 style="margin: 0;">FOR USE WITH SAFETY SHAPE - STEEL POSTS</h3>	Rev. 2/01 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS
VIRGINIA DEPARTMENT OF TRANSPORTATION		501.26

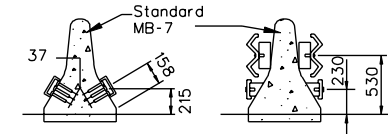


SECTION A-A
(One rail omitted)

- TYPE I Two run-on sections (with two rubrails as shown)
- TYPE II One run-on section (with one rubrail retained)
One run-off section (with one rubrail removed)
- TYPE III Two run-off sections (with both rubrails removed)



SECTION B-B
(One rail omitted)



SECTION C-C (W-Beam omitted) SECTION D-D

Note:
Rubrail must be twisted 35° between Sections C-C and D-D. Shop fabrication may be required. Right and left hand twists will be required.

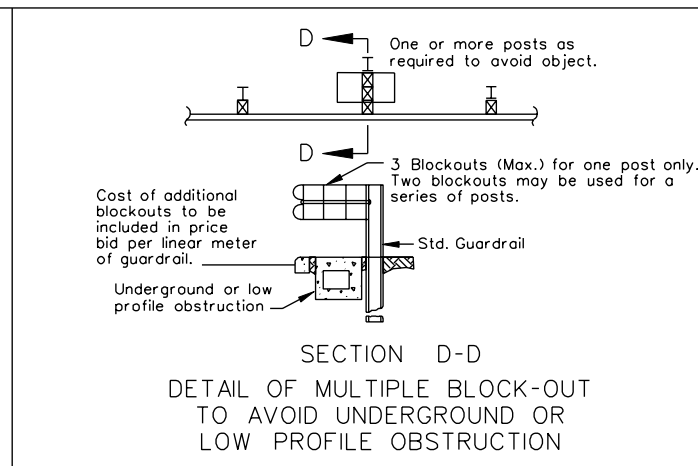
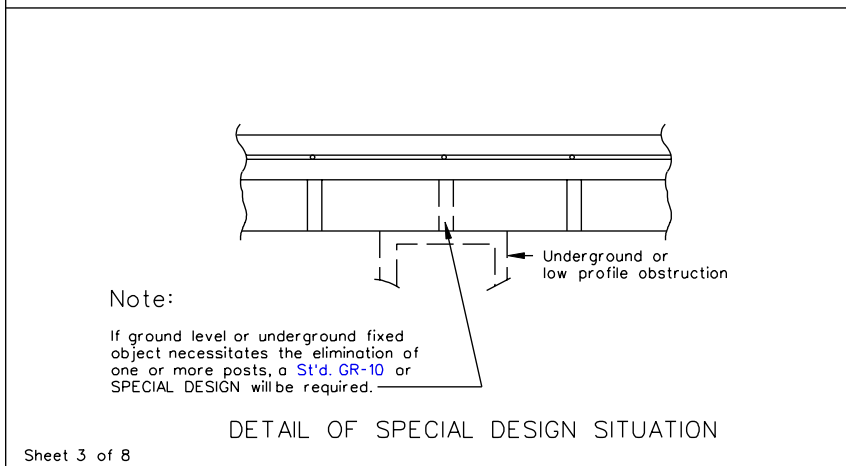
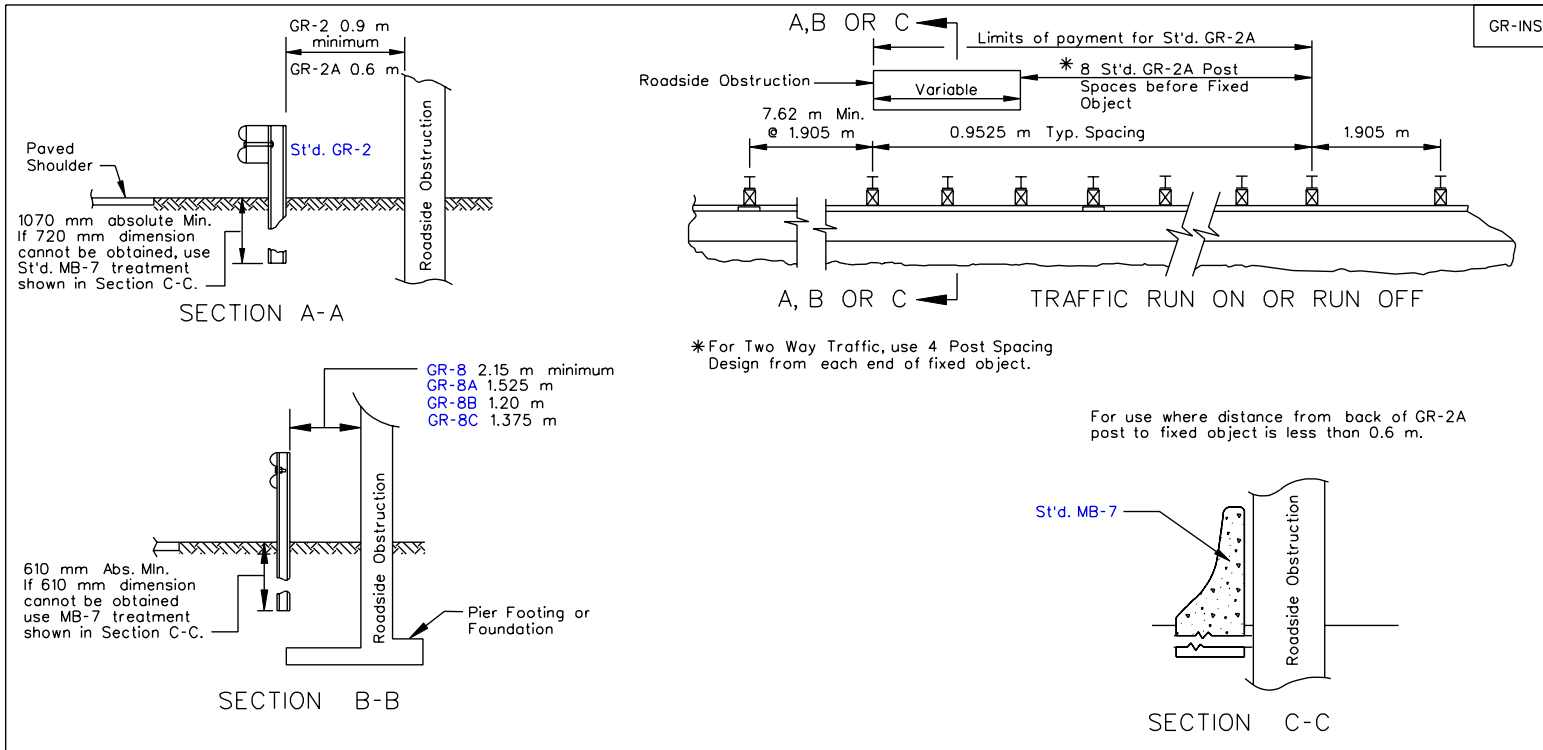
- Notes:
1. All guardrail posts are to be steel.
 2. All guardrail components are to be in accordance with VDOT Road and Bridge Standards.
 3. Posts 1,2,3,4 and 5 require an additional hole to attach lower blocks and/or rubrail. Rubrail is not bolted to posts 2 and 4.
 4. Bottom wood blocks located on posts 1 through 4 are to be drilled and secured with M16 carriage bolts (length as required).
 5. W-beam is not bolted to posts 2,4,5 and 7. These blocks are to be bolted directly to posts.
 6. Appropriate length M22 ASTM A325M hex bolts are to be used with holes drilled through the concrete median barrier, attaching the W-beam terminal connectors on each side.

Rubrail Wood Blocks 175 x 100	
Post	Thickness
1	108
2	83
3	51
4	25

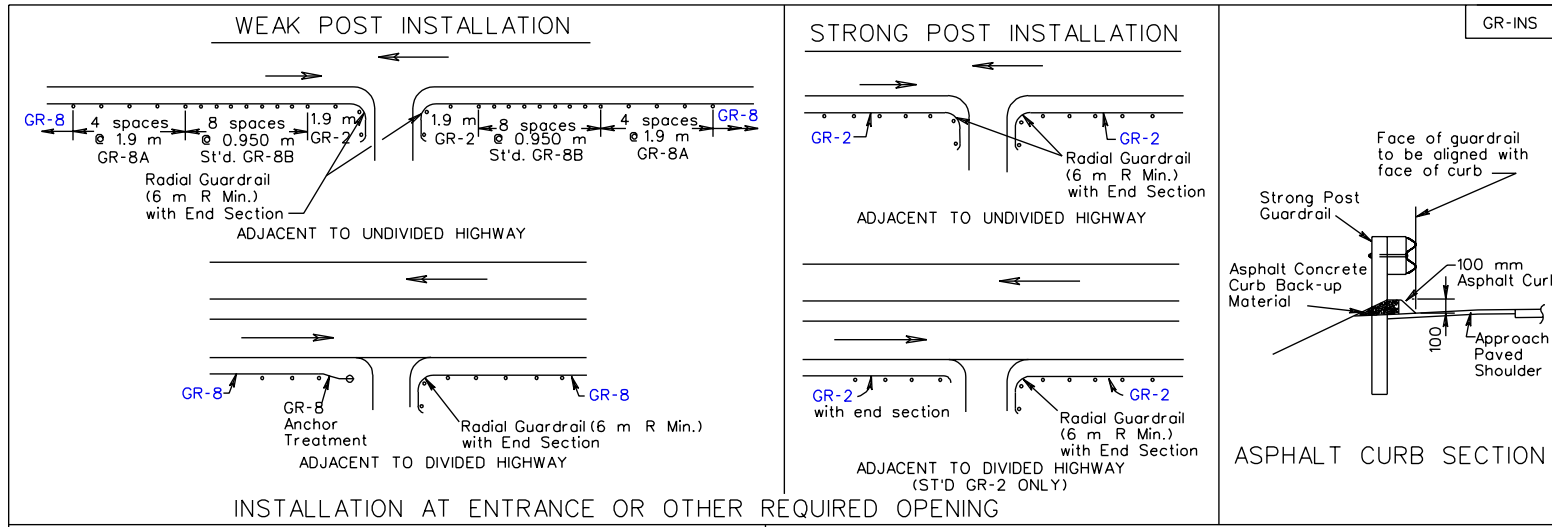
Item	Material / Specifications / Notes	Item	Material / Specifications / Notes
1	M16 washer	7	Bent plate rubrail (See sheet 2 of 2)
2	Standard W150x13.5 Steel Post and Standard 150x200x360 mm Treated Pine Block or Recycled Material	8	C150x12 rubrail (See sheet 2 of 2)
3	St'd. W-Beam terminal connector (Mod.)	9	Rectangular plate washer (See Standard GR-HDW)
4	Standard W-Beam rail	10	Wood blockout for rubrail (See sheet 2 of 2)
5	M16x50 guardrail bolt & recessed nut	11	M16x250 guardrail bolt & recessed nut
6	Standard W-Beam backup plate		

Sheet 1 of 2

<p>SPECIFICATION REFERENCE</p> <p>505</p>	<h2 style="margin: 0;">BLOCKED-OUT W-BEAM MEDIAN BARRIER-FIXED OBJECT ATTACHMENT</h2> <h3 style="margin: 0;">FOR USE BETWEEN STANDARD MB-7 AND STANDARD MB-3</h3>	<p>Rev. 2/01</p> <p>501.28</p>
<p>VIRGINIA DEPARTMENT OF TRANSPORTATION</p> <p>UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS</p>		



Sheet 3 of 8	W BEAM GUARDRAIL INSTALLATION CRITERIA		Rev. 2/01
SPECIFICATION REFERENCE	VIRGINIA DEPARTMENT OF TRANSPORTATION		UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS
221 505			501.32



INSTALLATION AT ENTRANCE OR OTHER REQUIRED OPENING

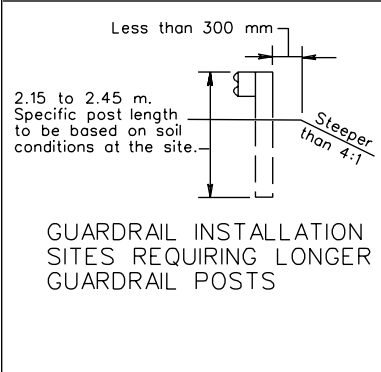
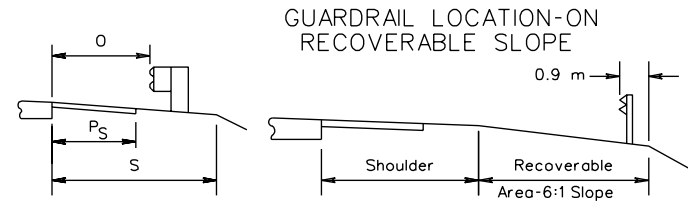
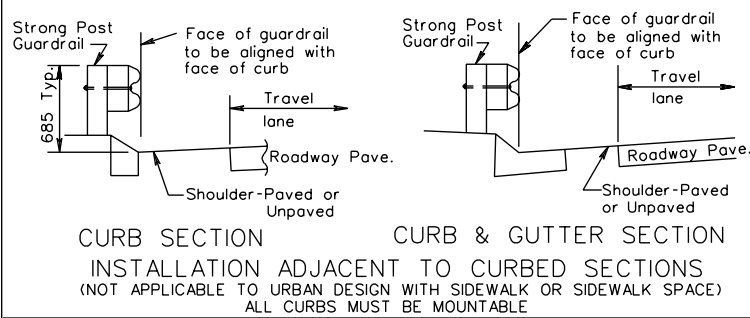


TABLE I
NORMAL GUARDRAIL LOCATION
THROUGH TRAFFIC LANES
LEFT OF TRAFFIC

SHOULDER WIDTH (S)	PAVED SHOULDER WIDTH (P _s)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
4.5 m	0.9, 1.2, 3.0 or 3.6 m	3.6 m
3.9 m	0.9 m	3.0 m
3.6 m (Med. 6 lane)	3.0 m	3.0 m
3.3 m	0.9 m	2.4 m
2.4 m (Med.)	0.9 m or 1.2 m	1.5 m

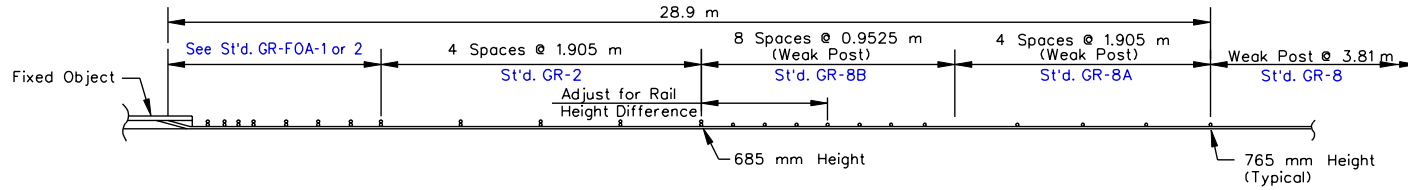
TABLE II
NORMAL GUARDRAIL LOCATION
THROUGH TRAFFIC LANES
RIGHT OF TRAFFIC

SHOULDER WIDTH (S)	PAVED SHOULDER WIDTH (P _s)	OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL (O)
4.5 m	1.8, 3.0 or 3.6 m	3.6 m
3.9 m	2.4 m	3.0 m
3.3 m	0, 0.9, 1.2 or 1.8 m	2.4 m
2.7 m	0, 0.9 or 1.2 m	1.8 m
2.1 m	0 or .09 m	1.2 m
1.5 m	0 or .09 m	0.6 m

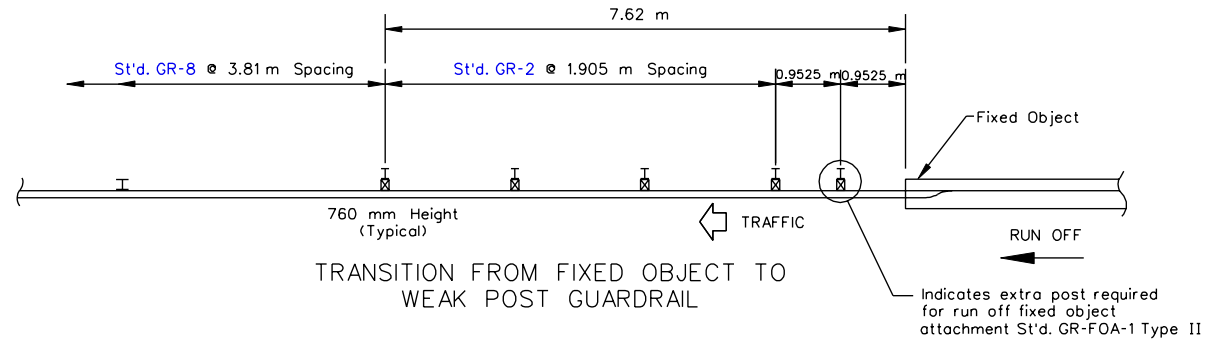
Sheet 6 of 8

REVISED ON 7/01

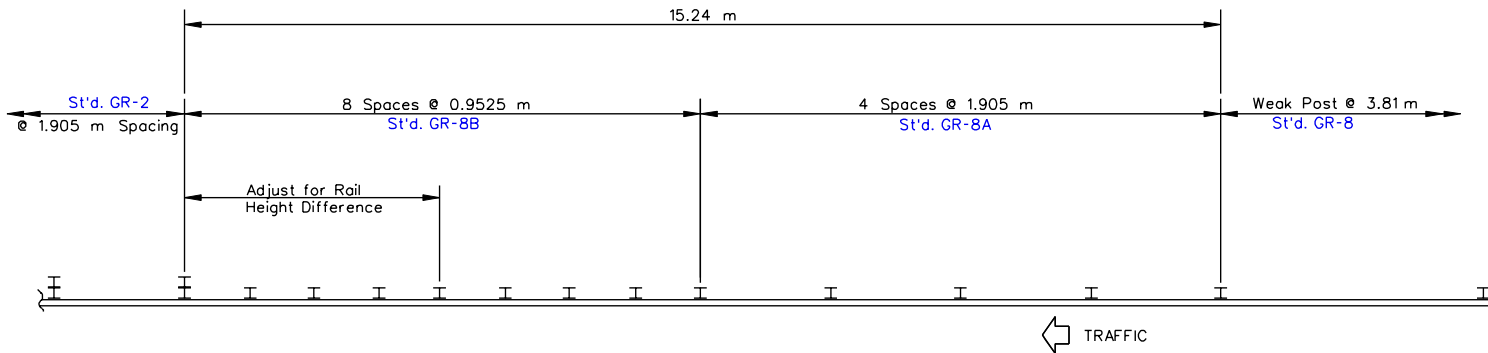
GR-INS



TRANSITION FROM WEAK POST GUARDRAIL TO FIXED OBJECT



TRANSITION FROM FIXED OBJECT TO WEAK POST GUARDRAIL



TRANSITION FROM WEAK POST TO STRONG POST GUARDRAIL

Sheet 7 of 8

W BEAM GUARDRAIL INSTALLATION CRITERIA

Rev. 2/01

501.36

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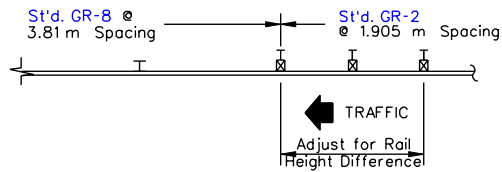
VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

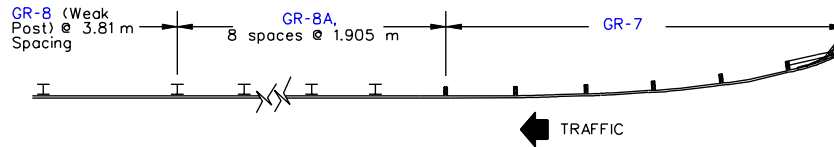
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505

REVISED ON 7/01

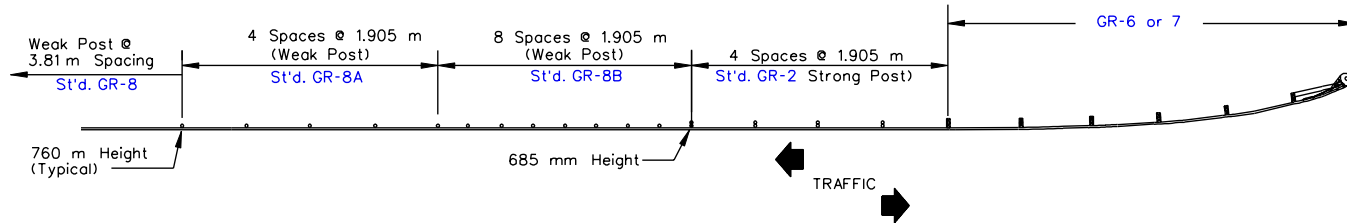
GR-INS



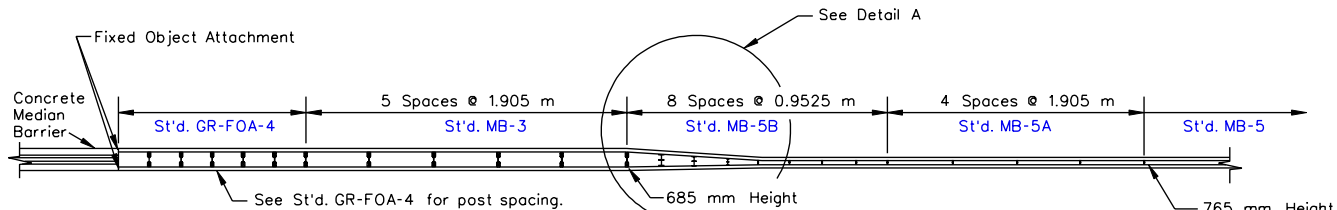
TRANSITION FROM STRONG POST TO WEAK POST GUARDRAIL



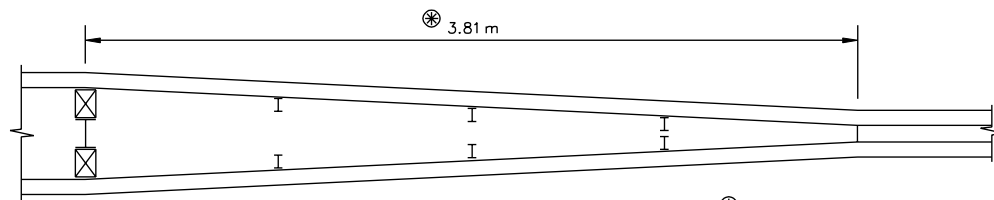
TRANSITION FROM GR-7 TERMINAL TO WEAK POST GUARDRAIL



TRANSITION FROM GR-6 OR 7 TERMINAL TO WEAK POST GUARDRAIL



TRANSITION FROM WEAK POST MEDIAN BARRIER TO CONCRETE MEDIAN BARRIER



DETAIL A

⊗ Cost of transition to be included in price bid for St'd. MB-5B Median Barrier.

Sheet 8 of 8

SPECIFICATION REFERENCE
221 505

W BEAM GUARDRAIL AND MEDIAN BARRIER INSTALLATION CRITERIA

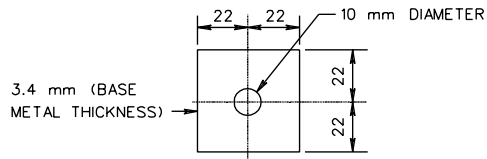
VIRGINIA DEPARTMENT OF TRANSPORTATION

Rev. 2/01

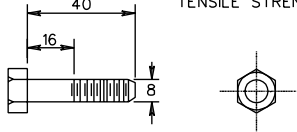
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

501.37

⊗ THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN AASHTO - AGC - ARTBA "A GUIDE TO STANDARDIZE HIGHWAY BARRIER HARDWARE MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.



SQUARE WASHER

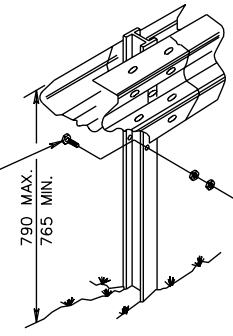


8 mm HEX BOLT AND NUT

BOLT AND NUT SHALL HAVE 17.8 KN MIN. TENSILE STRENGTH.

16 mm DIAMETER HOLE FOR M14 SUPPORT BOLT 40 mm LONG, 2 NUTS, NO WASHER. NO SUPPORT BOLTS IN THE LAST THREE POSTS OF EACH END OF EACH INSTALLATION.

* SUPPORT BOLT TO BE LOCATED UNDER BOTH RAIL BEAMS.



TYPICAL INSTALLATION

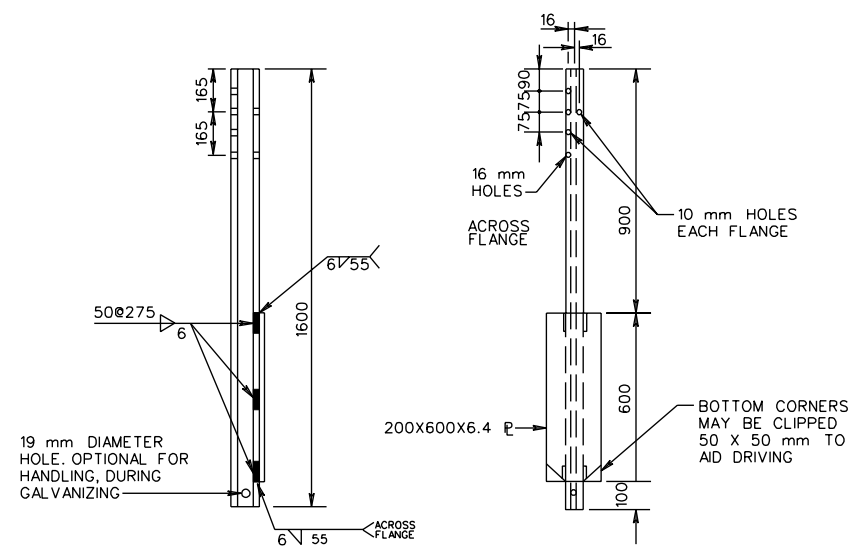
NOTES:

- STANDARD MB-5 POST SPACING IS 3.810 m
- STANDARD MB-5A POST SPACING IS 1.905 m
- STANDARD MB-5B POST SPACING IS 0.9525 m
- STANDARD MB-5 DEFLECTION IS 2.15 m.

ALL POSTS, BOLTS, NUTS AND WASHERS ARE TO BE GALVANIZED.

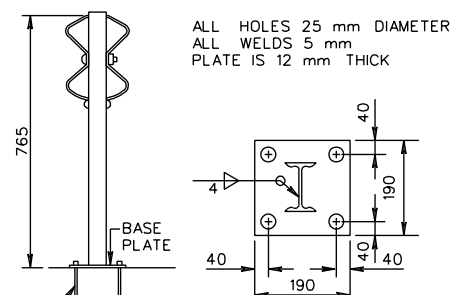
BENT PLATE POST OR S75 X 8.5 POST MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST MUST BE USED IN ANY SINGLE RUN OF GUARDRAIL.

FOR DETAILS OF GUARDRAIL ELEMENT, SPLICE JOINT, HARDWARE, ETC. SEE SHEET NO. 501.01.



FOR ROCK INSTALLATION, 200X610X6.4 mm PLATE IS TO BE ELIMINATED. DRILL OR EXCAVATE HOLE FOR POST, PLACE AND BACKFILL WITH CRUSHER RUN AGGREGATE TO LEVEL OF ROCK.

S75 X 8.5 mm STEEL POST



ALL HOLES 25 mm DIAMETER
ALL WELDS 5 mm
PLATE IS 12 mm THICK

M22 ANCHOR BOLTS 200 mm LONG

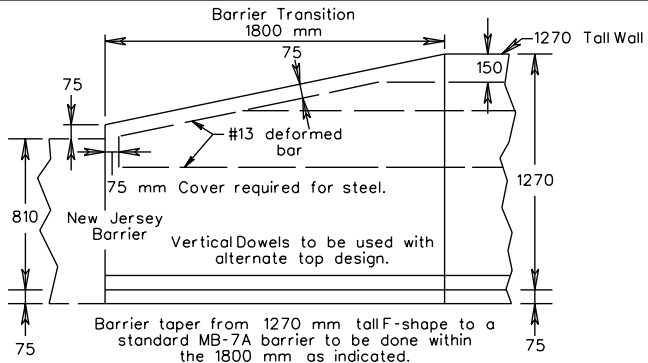
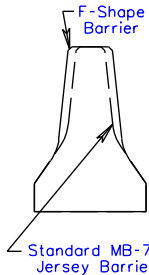
BASE PLATE

STRUCTURE MOUNTED BARRIER

SPECIFICATION REFERENCE	221 505
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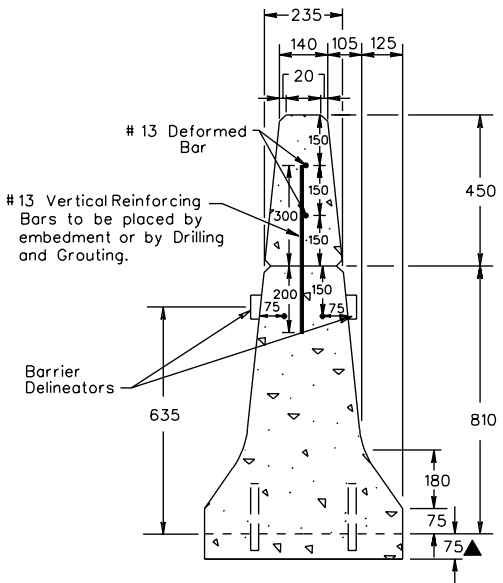
STANDARD W BEAM MEDIAN BARRIER (WEAK POST SYSTEM)

MB-12A,12B,12C



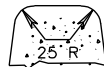
TRANSITION FROM 1270 mm TALL WALL TO 810 mm JERSEY BARRIER

MB-12A



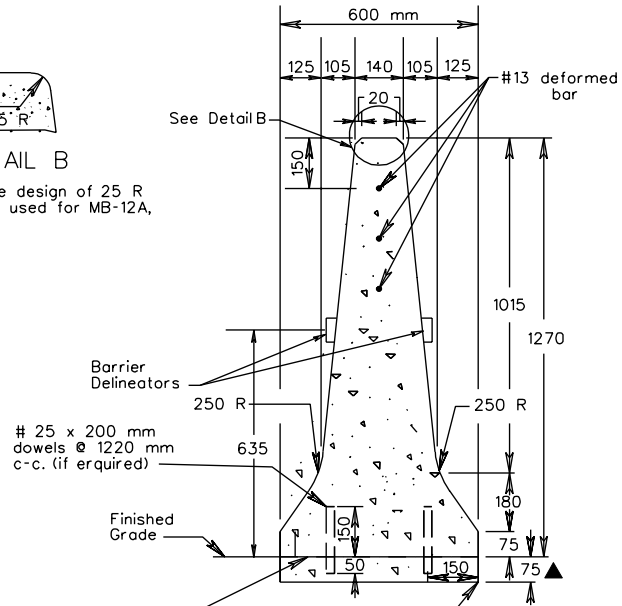
ALTERNATE TOP DESIGN

If barrier extension is constructed as a separate item, all joints are to be constructed at the same intervals as concrete barrier. All vertical bars are #13 at 600 mm max. spacing. Length of dowels shall be 500 mm. Vertical bars may be placed in the concrete 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.



DETAIL B

The alternate design of 25 R may also be used for MB-12A, 12B or 12C.



Optional construction joint. If pour is monolithic, dowels may be eliminated.

Class 10 concrete may be used below construction joint if base is poured separately.

▲ 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 meter of barrier.

Sheet 1 of 2

CONCRETE MEDIAN BARRIER (TALL WALL)

SPECIFICATION REFERENCE

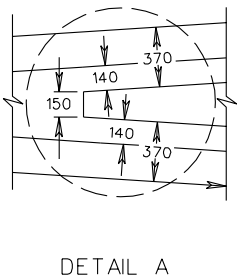
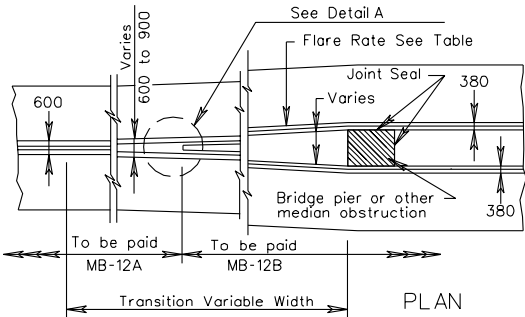
REV. 2/01

501.64 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

VIRGINIA DEPARTMENT OF TRANSPORTATION

105
502

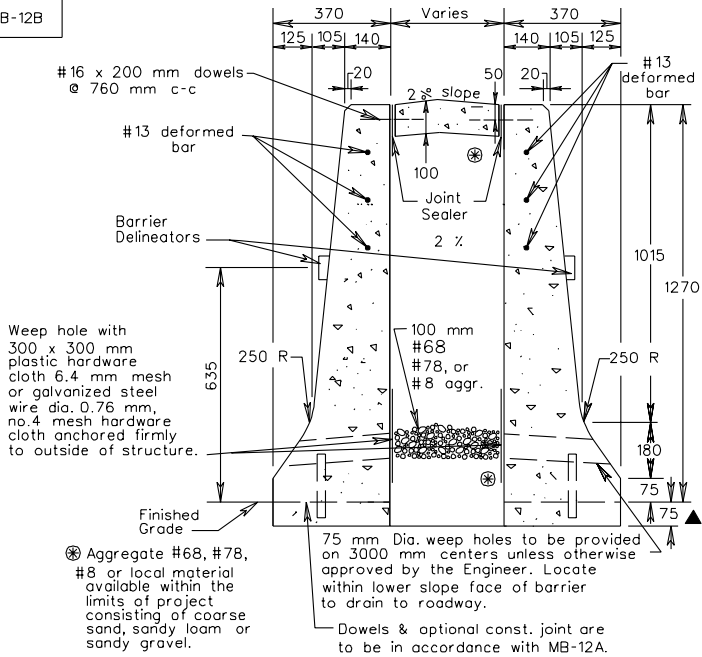
MB-12A,12B,12C



DESIGN SPEED	FLARE RATES		
	INSIDE SHY LINE	BEYOND SHY LINE	
km/h	SHY LINE m	FLARE RATE	FLARE RATE
110	2.8	30:1	20:1*
100	2.4	26:1	18:1*
80	2.0	21:1	14:1*
60	1.4	16:1	10:1*
50	1.1	13:1	8:1*

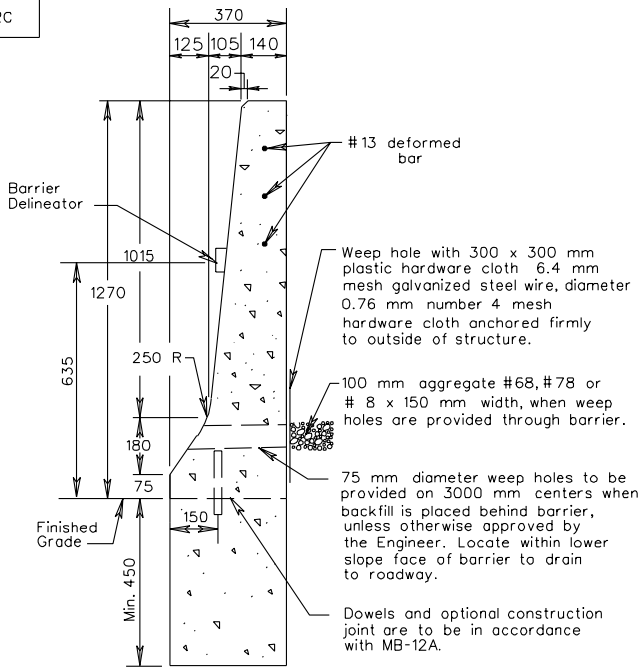
* Suggested maximum flare rate for rigid barrier systems.

MB-12B



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 6 meters c-c.
Concrete median barrier may be precast, cast in place or slip-formed.
Horizontal reinforcing steel bars are to be separated at all expansion and contraction joints. A 50 mm concrete cover is required over the ends of the reinforcing steel.

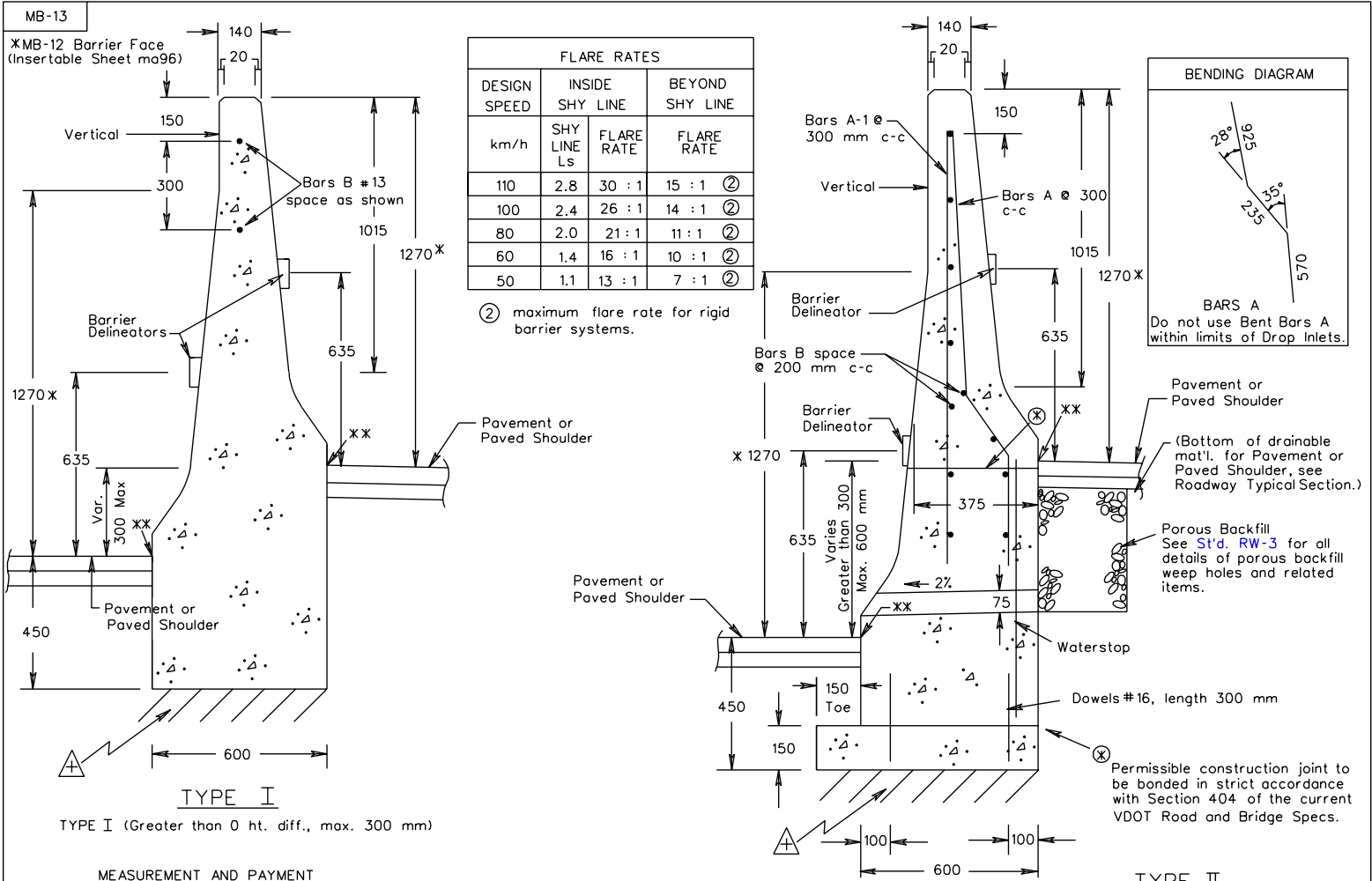
MB-12C



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.
Concrete to be Class 20 if cast in place, 30 MPa 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 meter of barrier.

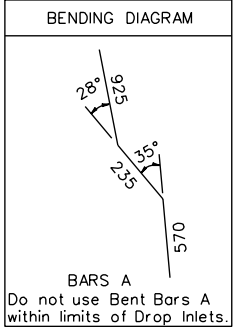
SPECIFICATION REFERENCE
105 502

CONCRETE MEDIAN BARRIER (TALL WALL)



FLARE RATES			
DESIGN SPEED	INSIDE SHY LINE	BEYOND SHY LINE	
km/h	SHY LINE Ls	FLARE RATE	FLARE RATE
110	2.8	30 : 1	15 : 1 ②
100	2.4	26 : 1	14 : 1 ②
80	2.0	21 : 1	11 : 1 ②
60	1.4	16 : 1	10 : 1 ②
50	1.1	13 : 1	7 : 1 ②

② maximum flare rate for rigid barrier systems.



BARS A
Do not use Bent Bars A within limits of Drop Inlets.

REINFORCING STEEL SCHEDULE							
Panel	Bars "A"		Bars A-1		Bars "B"		Dowels
	No.	Length	No.	Length	No.	Length	No. Length
TYPE I					2	6000	
TYPE II	20	1780	20	1675	9	6000	40 300
TYPE III	20	1780	20	1675	9	6000	40 300

MEASUREMENT AND PAYMENT

Median Barrier MB-13 Type I, II or III will be

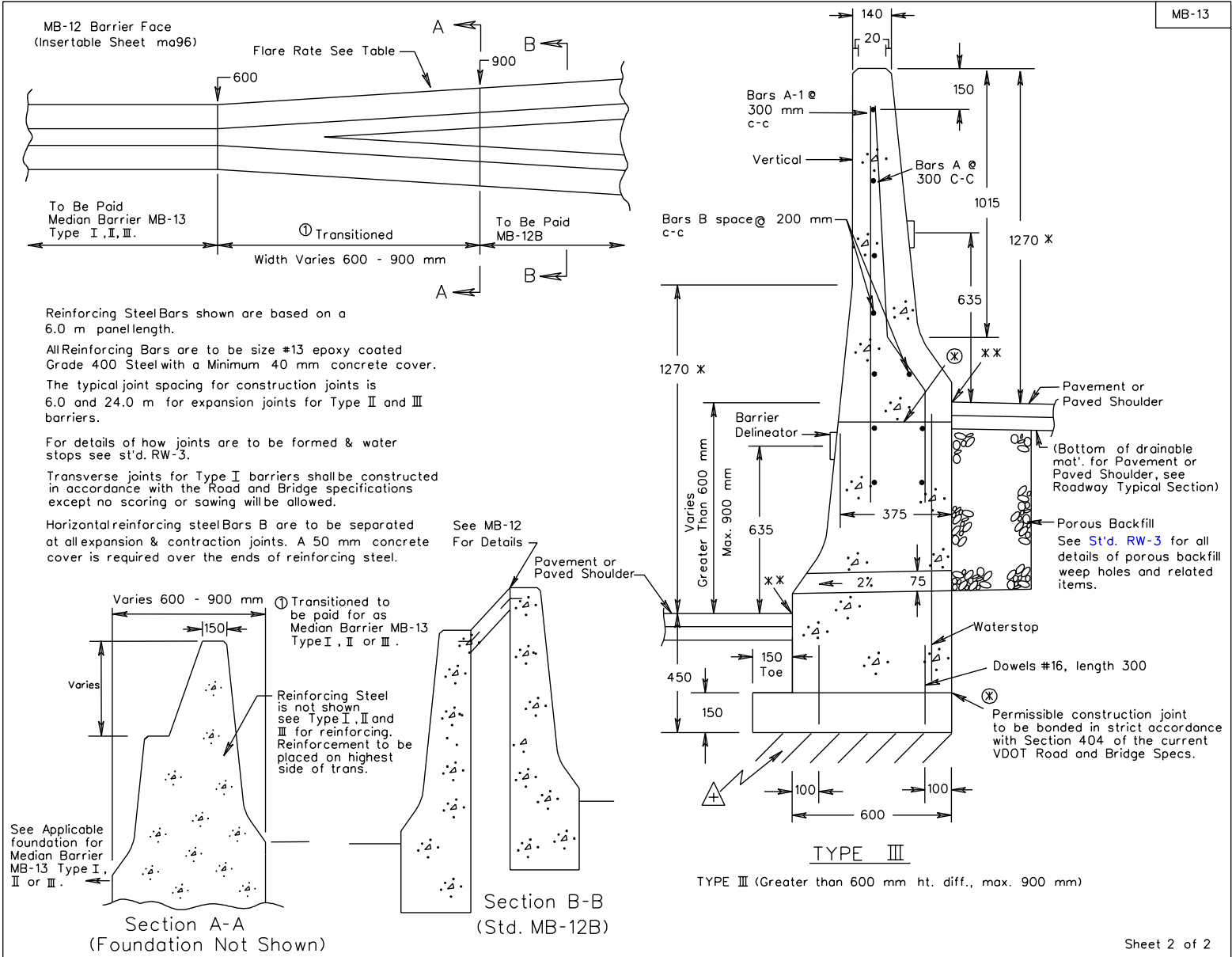
paid for at the Contract Unit Price per meter, which shall be full compensation for furnishing and installing Class 20 Conc., Reinforcing Steel, Porus Backfill and all tools, labor, equipment and incidentals necessary to complete the work. Any additional excavation, backfill with suitable material and compaction work necessary for the Concrete Median Barrier installation is to be considered incidental in the price bid for the concrete median barrier.

TYPE II (Greater than 300 mm, max. 600 mm)

XX DENOTES FINISHED GRADE ELEVATION

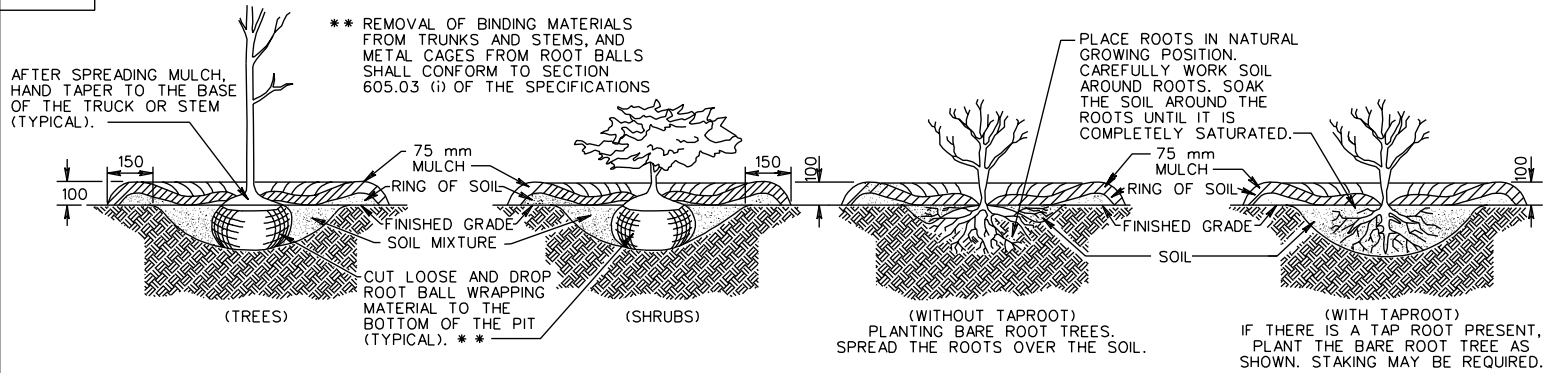
△ FOUNDATION MATERIAL UNDER CONCRETE MEDIAN BARRIER IS TO BE COMPACTED.

CONCRETE MEDIAN BARRIER (TALL WALL)
TYPE I, II or III
MB-13

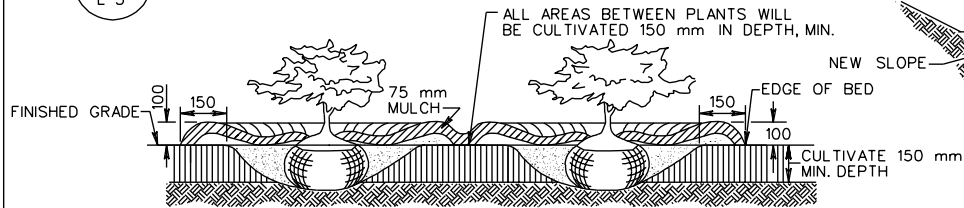


SPECIFICATION REFERENCE	CONCRETE MEDIAN BARRIER (TALL WALL) TYPE I, II or III		Rev. 2/01
105 404 502	MB-13 VIRGINIA DEPARTMENT OF TRANSPORTATION		501.67
UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS			

L-5



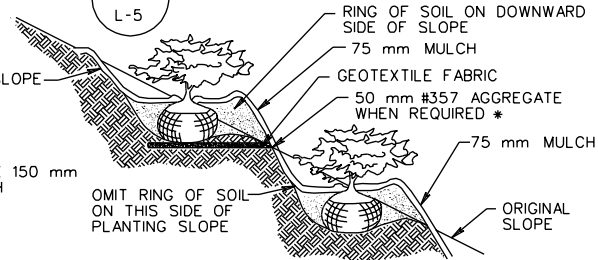
1 BALLED & BURLAPPED, & CONTAINER PLANTS



3 BED PLANTING

- WHEN A PORTION OF A PLANT BED EXTENDS INTO AN AREA STEEPER THAN 4:1, CULTIVATION OF THAT PORTION SHALL BE OMITTED AND THE ENTIRE AREA BETWEEN PLANTS SHALL BE MULCHED TO BLEND IN WITH THE CULTIVATED BED.
- PLANTING BEDS (CULTIVATED AND NON-CULTIVATED) SHALL BE CUT TO A MAXIMUM 100 mm IN HEIGHT BY MOWING, AND SHALL AFTERWARDS BE TREATED WITH HERBICIDE AS APPROVED AND DIRECTED BY THE ENGINEER AT LEAST 2 WEEKS PRIOR TO CULTIVATION, PLANTING, OR MULCHING.
- WHEN BARE ROOT PLANTS ARE USED IN BEDS, SHRUB AND ROOT PLACEMENT SHALL CONFORM TO DETAIL 2
L-5.
- SMM FOLLOWING BED DESIGNATION STANDS FOR SQUARE METERS OF MULCH AT THE INDICATED QUANTITY.

2 BARE ROOT PLANTS



4 SLOPE PLANTING

- WHEN BARE ROOT PLANTS ARE USED ON SLOPE, SHRUB AND ROOT PLACEMENT SHALL CONFORM TO DETAIL 2
L-5.
- ON SLOPES STEEPER THAN 3:1, THE FRONT CENTER OF THE PIT SHALL BE MODIFIED WHEN REQUIRED * TO INCLUDE A "V" CUT THE FULL DEPTH OF THE PIT. THE PIT SHALL BE DUG 50 mm DEEPER THAN SHOWN ON THE SUMMARY SHEET AND BACKFILLED WITH 50 mm OF #357 AGGREGATE, DAYLIGHTED TO THE SLOPE FACE, AND COVERED WITH GEOTEXTILE FABRIC PRIOR TO BACKFILLING WITH SOIL MIXTURE.

* SEE NOTE FOR PIT DRAINAGE MODIFICATION FOR SLOPE PLANTING SHEET 1201.06.

GENERAL NOTES:

- SEE LANDSCAPE SUMMARY SHEET FOR PIT SIZES.
- ROOT BALL SHALL BE POSITIONED LEVEL WITH FINISHED GRADE. SOIL MIXTURE SHALL TAPER ONTO BUT NOT OVER TOP OF THE ROOT BALL. MULCH SHALL EXTEND AT THE PROPER DEPTH OVER THE ENTIRE ROOT BALL AND PLANTING PIT, AND SHALL BE HAND TAPERED TO THE BASE OF ALL TRUNKS AND STEMS AFTER SPREADING.
- THIS RULE SHALL GOVERN WITH THE FOLLOWING EXCEPTIONS:
 - SLOPE PLANTINGS - SEE SLOPE PLANTING DETAILS.
 - INCLUSION OF PIT DRAINAGE SYSTEM - POSITION TOP OF ROOT BALL THE SAME AS FINISHED GRADE.
 - TREE GRATE PLANTING - SEE TREE GRATE PLANTING DETAILS IN PLANS.

PLANTING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

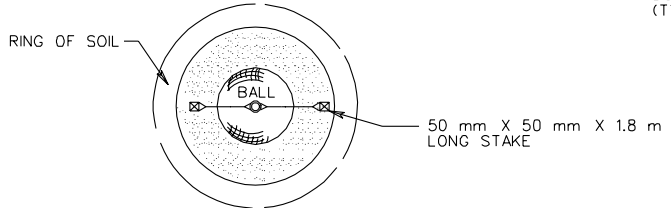
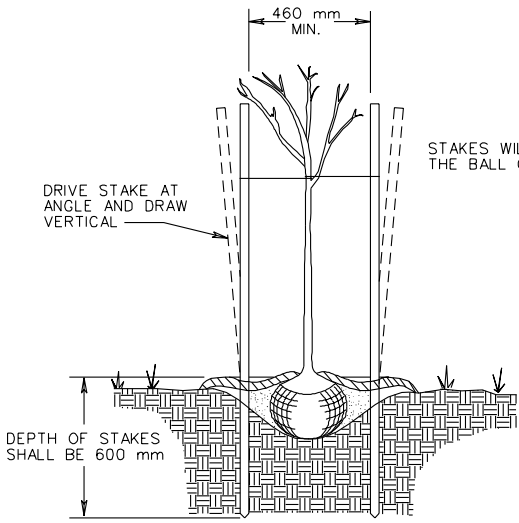
SPECIFICATION REFERENCE

605
245
203

REV. 2/01

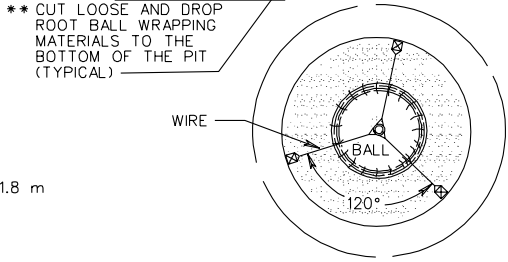
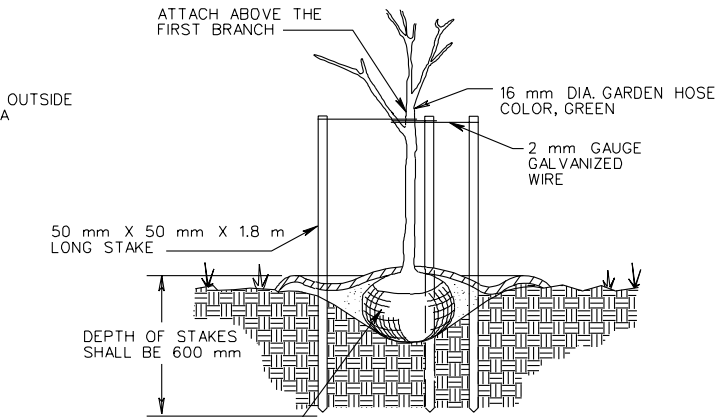
1201.04 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS

STAKING, GUYING



5
L-5 DOUBLE STAKING & STAKE PLACEMENT

DECIDUOUS TREES LESS THAN 50 mm IN CALIPER
 EVERGREEN TREES LESS THAN 1.2 m IN HEIGHT
 SHRUBS 1.2 m OR MORE IN HEIGHT.



6
L-5 TRIPLE - GUYING

DECIDUOUS TREES 50 mm IN CALIPER OR GREATER
 EVERGREEN TREES 1.2 m IN HEIGHT OR GREATER

GENERAL NOTES

- ALL DECIDUOUS TREES OVER 1.2 m IN HEIGHT AND ALL EVERGREEN TREES OVER 1.2 m IN HEIGHT OR TALLER SHALL BE STAKED AND GUYED WITH 3 STAKES AS SHOWN.
- MULTIPLE STEMMED DECIDUOUS TREES 1.2 m IN HEIGHT SHALL BE STAKED WITH 3 STAKES IN SUCH A MANNER AS TO STABILIZE 3 MAINSTEMS.
- THE WOOD STAKES SHALL BE 50 mm X 50 mm X 1.8 m LONG DRESSED HARDWOOD AND DECAY RESISTANT.
- THE WIRE TIES SHALL BE 2 mm GAUGE GALVANIZED WIRE, AND BE PROVIDED WITH A ONE FOOT PIECE OF GREEN RUBBER HOSE PLACED TO PREVENT INJURY TO THE BARK. THERE SHOULD BE A 25 - 75 mm SWAY IN THE TREE (THE WIRES SHOULD NOT BE PULLED TIGHT) FOR BEST ESTABLISHMENT. OTHER ANCHORING METHODS AND MATERIALS MAY BE APPROVED FOR USE BY THE ENGINEER.
- ** REMOVAL OF BINDING MATERIALS FROM TRUNKS AND STEMS, AND METAL CAGES FROM ROOT BALLS SHALL CONFORM TO THE CURRENT ROAD & BRIDGE SPECS.

SPECIFICATION REFERENCE
605 244

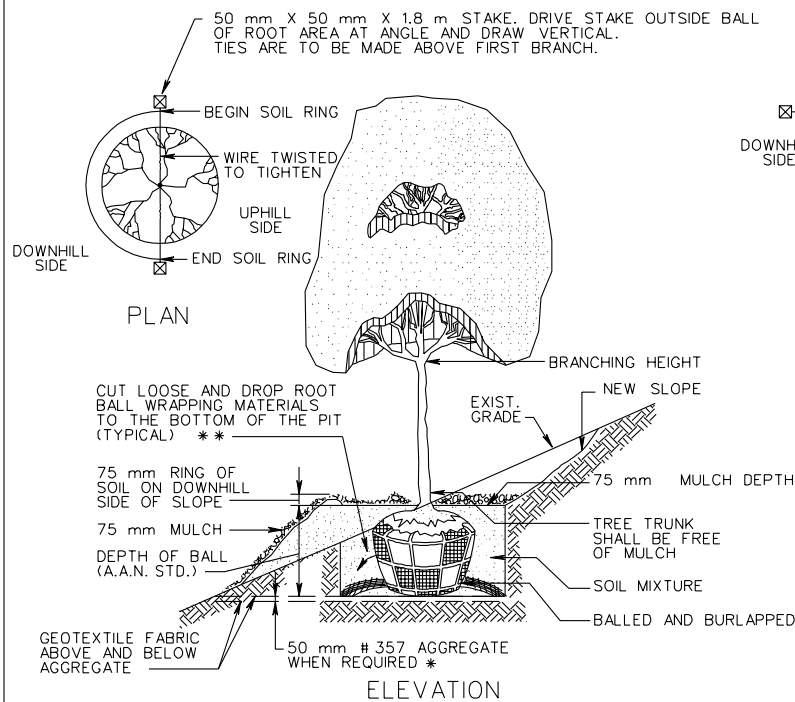
PLANTING DETAILS
 VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/01

UNLESS OTHERWISE SHOWN, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS. 1201.05

L-5

PLANTING, STAKING, GUYING



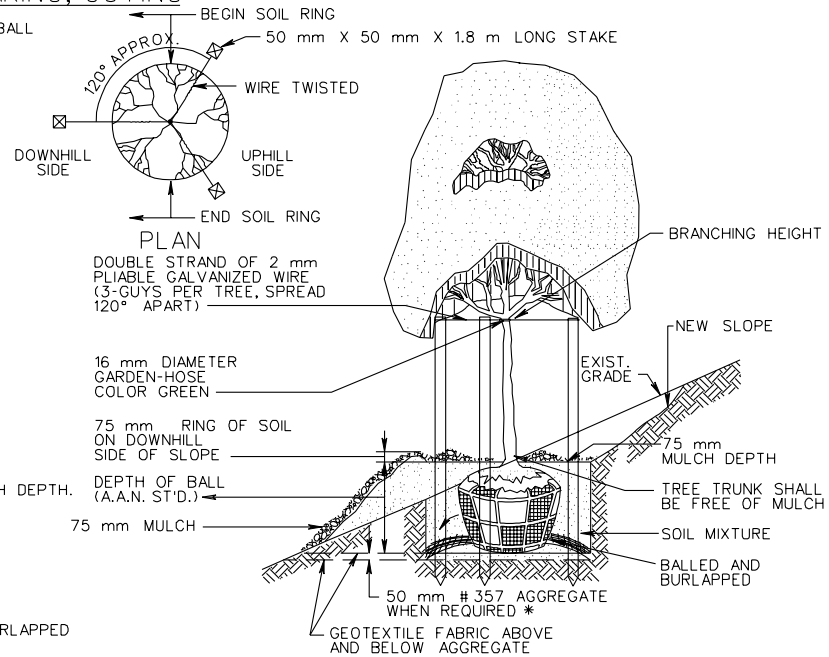
8 DOUBLE STAKING & STAKE PLACEMENT

L-5

DECIDUOUS TREES LESS THAN 50 mm IN CALIPER
EVERGREEN TREES LESS THAN 1.2 m IN HEIGHT
AND SHRUBS 1.2 m OR MORE IN HEIGHT

GENERAL NOTES

1. ALL DECIDUOUS TREES 50 mm IN CALIPER OR MORE AND ALL EVERGREEN TREES OVER 1.2 m IN HEIGHT SHALL BE STAKED OR GUYED AS SHOWN.
2. MULTIPLE STEMED DECIDUOUS TREES OVER 1.2 m IN HEIGHT SHALL BE STAKED WITH 3 STAKES IN SUCH A MANNER AS TO STABILIZE 3 MAINSTEMS
3. THE WOOD STAKES SHALL BE CONSTRUCTION GRADE, ROUGH OR DRESSED, OF SOUND HARDWOOD, DECAY RESISTANT, AND OF THE SIZE INDICATED IN THE DETAILS.
4. THE WIRE TIES SHALL BE 2 mm GALVANIZED WIRE OR OTHER APPROVED MATERIAL AND BE PROVIDED WITH A 300 mm PIECE OF GREEN RUBBER HOSE PLACED TO PREVENT INJURY TO THE BARK. THERE SHOULD BE A 25 - 75 mm SWAY IN THE TREE (THE WIRES SHOULD NOT BE PULLED TIGHT) FOR BEST ESTABLISHMENT. OTHER ANCHORING METHODS AND MATERIALS MAY BE APPROVED FOR USED BY THE ENGINEER.
5. ON SLOPES STEEPER THAN 3:1 THE FRONT CENTER OF THE PIT SHALL BE MODIFIED WHEN REQUIRED * TO INCLUDE A "V" CUT THE FULL DEPTH OF THE PIT. THE PIT SHALL BE DUG 50 mm DEEPER THAN SHOWN IN THE SUMMARY SHEET AND BACKFILLED WITH 50 mm OF #357 AGGREGATE DAYLIGHTED TO THE SLOPE FACE, AND COVERED WITH GEOTEXTILE FABRIC PRIOR TO BACK-FILLING WITH SOIL MIXTURE.



9 TRIPLE GUYING

L-5

DECIDUOUS TREES 50 mm IN CALIPER OR GREATER
EVERGREEN TREES 1.2 m IN HEIGHT OR GREATER

- * PIT DRAINAGE MODIFICATION FOR SLOPE PLANTING (WHEN REQUIRED)
- ** REMOVAL OF BINDING MATERIALS FROM TRUNK AND STEMS, AND METAL CAGES FROM ROOT BALLS SHALL CONFORM TO SECTION 605.03 (I) OF THE SPECS.
- A. PRIOR TO THE PLANTING ON A SLOPE THE CONTRACTOR SHALL TEST NO MORE THAN 3 PITS FOR PERCOLATION.
- B. PERCOLATION TEST SHALL CONSIST OF FILLING THE PIT WITH APPROXIMATELY 150 mm OF WATER. THE ENGINEER SHALL DETERMINE IF PIT DRAINAGE IS REQUIRED.
- C. PAYMENT FOR AGGREGATE, GEOTEXTILE FABRIC, AND PIT MODIFICATION WILL BE MADE IN ACCORDANCE WITH THE ROAD AND BRIDGE SPECS.

SLOPE PLANTING DETAILS

REV. 2/01

VIRGINIA DEPARTMENT OF TRANSPORTATION

1201.06 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ON THIS SHEET ARE IN MILLIMETERS.

SPECIFICATION REFERENCE

203
245
605