SECTION THRU RAIL ELEMENT AND W BEAM BACK-UP PLATE

DETAIL OF STANDARD WASHER
FOR GR-2 AND 2A, MB-3
TO BE USED ON THE LAST 50' OF RUN OFF END ONLY.

NOTES:
ALL HARDWARE IS TO BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.
THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN ARTBA TECHNICAL BULLETIN NUMBER 2648 MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

STANDARD GUARDRAIL HARDWARE
VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTE:
LAP IN DIRECTION OF TRAFFIC AT SPlice JOINT.

25¼" BEND REQ'D.
ONLY FOR USE IN GR-7.

W BEAM TERMINAL CONNECTOR

BEND AND HOLE ONLY
REQ'D. TO MODIFY
CONNECTOR FOR
USE IN GR-7.

THE GUARDRAIL MEDIAN BARRIER COMPONENTS
DEPICTED IN A.R.T.B.A. TECHNICAL BULLETIN
NUMBER 28BB MAY BE SUBSTITUTED IF INTER-
CHANGEABLE WITH THE STANDARDS FOR
GUARDRAIL (GB) OR MEDIAN BARRIER (MB) AND
APPROVED BY THE ENGINEER.

* STANDARD DIMENSIONS OF 12¼", 24" AND 30" ARE SUGGESTED.

W BEAM END SECTION (BUFFER)

W BEAM END SECTION (FLARED)

W BEAM END SECTION (ROUNDED)
SECTION THRU THRIE BEAM RAIL ELEMENT

NOTES:

THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS
DEPICTED IN ARTBA TECHNICAL BULLETIN NUMBER
26BB MAY BE SUBSTITUTED IF INTERCHANGEABLE
WITH THE STANDARDS FOR GUARDRAIL (G3) OR
MEDIAN BARRIER (M3) AND APPROVED BY THE
ENGINEER.

THRIE BEAM TERMINAL CONNECTOR DETAIL

TRANSITION SECTION DETAIL
(W-BEAM TO THRIE BEAM)

DISTANCE BETWEEN POST SLOTS
AND THE SUM OF POST BOLT SLOT
CENTERS TO BE DESIGNATED.

SHEET 3 OF 3

STANDARD GUARDRAIL HARDWARE
THRIE BEAM GUARDRAIL HARDWARE

VIRGINIA DEPARTMENT OF TRANSPORTATION

221
505
GR-2A

(3'-1½" POST SPACING)
MAX DYNAMIC DEFLECTION = 2'  
× HEIGHT TOLERANCE = ½"

GR-2

(6'-3" POST SPACING)
MAX DYNAMIC DEFLECTION = 3’

NOTES:

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

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

FOR DETAILS OF RAIL ELEMENT, RAIL SPlice JOINT, W-BEAM back-up PLATE, AND ASSOCIATED HARDWARE SEE SHEET NOs. 501.01 AND 501.02.

RAIL ELEMENTS ARE FURNISHED SHOP CURVED FOR RADI BETWEEN 5 FEET AND 150 FEET.

ALL GUARDRAIL POSTS SHALL BE SET PLUMB. POST SHALL NOT BE SET WITH A VARIATION OF MORE THAN 1/8” FROM VERTICAL. W-BEAM, BLOCKOUTS, AND POSTS SHALL BE SET AND ALIGNED WITHOUT ALTERATION OR FORCE, AS PER SECTION 505 OF THE SPECIFICATIONS.

ALL GR-2 AND GR-2A RAIL SHALL BE MAINTAINED AT A HEIGHT OF 27⅞" ± ¼" TOLERANCE BASED OFF THE FINISHED GRADE CENTERLINE ELEVATION, PAVEMENT CROSS SLOPE, OR SHOULDER SLOPE.

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

1. FOR ARRANGEMENTS OF SPRING CABLE END ASSEMBLIES (COMPENSATING DEVICES) AND TURNBUCKLE CABLE END ASSEMBLIES, THE FOLLOWING CRITERIA SHALL APPLY:

2. LENGTH OF CABLE RUNS:
   - TO 1000'-USE COMPENSATING DEVICE ON ONE END AND USE TURNBUCKLE ON THE OTHER END OF EACH INDIVIDUAL CABLE.
   - OVER 1000'-OVER 2000'-USE COMPENSATING DEVICE ON EACH END OF EACH INDIVIDUAL CABLE.
   - OVER 2000'-START NEW STRETCH BY INTERLACING AT LAST PARALLEL POST. SEE TYP. INSTALLATION.

3. 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 \( \geq 25,000 \) LBS.
   - THREE CABLE ANCHOR ASSEMBLY: MIN. TENSILE STRENGTH \( \geq 100,000 \) LBS.
   - ALL FITTINGS SHALL BE HOT DIPPED GALVANIZED.

4. THE DYNAMIC DEFLECTION FOR STANDARD GR-3 IS 11 FEET.

5. FOR ROCK INSTALLATION, 8 X 24 X \( V \)'' PLATE SHALL BE ELIMINATED. DRILL OR EXCAVATE HOLE FOR POST AND BACKFILL WITH CRUSHER RUN AGGREGATE TO LEVEL OF ROCK.

6. 3/8'' X 1-1/2'' HEX BACKING NUT OR APPROVED EQUAL BEARING AREA OF 3/8'' STANDARD NUT.

7. 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.

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

CABLE GUARDRAIL

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/04

SHEET 1 OF 3

SPECIFICATION REFERENCE
221-505
BEND LOWER W-BEAM RAIL BEHIND POST AND ATTACH WITH 3/8" BOLT

NOTES:
2. MAXIMUM DISTANCE BETWEEN BOTTOM OF THE LOWER W-BEAM RAIL AND GROUND LINE IS 20" WHEN DOUBLE RAIL IS REQD. TAPER BOTH W-BEAM RAILS TO MAINTAIN THE 20" DISTANCE FROM THE GROUND.
3. TAPER BOTH W-BEAM RAILS FROM HEIGHT AT TOE OF DITCH SLOPES TO 1'-0" BELOW FINISHED GRADE AT POST #1 (8'-0" OFFSET).
4. A 8'-0" LONG POST MUST BE USED WHEN UPPER AND LOWER W-BEAM RAILS ARE REQD. FROM THE BEGINNING OF THE LOWER RAIL TO POST #3.
5. STANDARD GR-6 TERMINAL TREATMENT MAY BE USED AT THE RUN-ON END OF DIVIDED HIGHWAYS LEFT AND RIGHT OF TRAFFIC AND AT THE RUN-ON AND RUN-OFF ENDS ON UNDIVIDED HIGHWAYS.
6. ALL POST SANDING 6'-3" C-C UNLESS OTHERWISE NOTED. THE POST MAY BE W6 X 8.5 STEEL OR 6 X 8 WOOD EXCEPT THE LAST 3 TERMINAL POSTS MUST BE W6 X 8.5 STEEL.
7. FOR SECTIONS D-E AND E-E, AND END ANCHORAGE DETAILS SEE SHEET 501.10.
8. ALL TERMINAL RUN-ON OR RUN-OFF MUST BE INSTALLED WITH LAPPING THE RAILS IN THE DIRECTION THAT THE TERMINALS WERE INSTALLED WHEN TESTED TO NCHRP 350 REQUIREMENTS.
9. IF THE TIER IS 1' OR STEEPER THE W-BEAM MAY BE ANCHORED PER SOLID ROCK CUT INSTALLATION (DETAL F).

SECTION A-A  SECTION B-B  SECTION C-C
1. "H" STEEL PLATE MAY BE WELDED OR BOLTED TO POST. IF PLATE IS WELDED TO POST USE 4 - 3/8" X 1 1/2" LG. HEX HEAD BOLTS W/ HEX NUTS. IF PLATE IS WELDED TO POST DO NOT DRILL ¾" HOLES IN PLATE OR IN POST FLANGES.

2. CONCRETE END ANCHORAGE MAY BE USED IN PLACE OF STEEL POST AT 8'-0" OFFSET.
1. GUARDRAIL TERMINAL, STD, GR-7 IS TO BE SRT 350 (SIMILAR TO AS SHOWN) MANUFACTURED BY TRINITY INDUSTRIES, THE FLEET 350 MANUFACTURED BY ROAD SYSTEMS, INC, OR OTHER VDOT APPROVED EQUAL MEETING NCHRP 350 TESTING CRITERIA.

2. ALL TERMINALS SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE FOLLOWING VDOT REQUIREMENTS:
   A. ALL STANDARD GR-7 TERMINALS SHALL BE INSTALLED WITH A 4 FT OFFSET.
   B. YELLOW 8" X 36" REFLECTIVE SHEeting, IN ACCORDANCE WITH VDOT SPECIFICATIONS, SHOULD BE APPLIED IN TERMINALS EMPLOYING W-BEAM END SECTIONS. FOR TERMINALS EMPLOYING IMPACT EXTRUDER HEADS, AMBER (YELLOW) REFLECTIVE SHEETING WITH BLACK DIAGONAL STRIPES SHOULD BE APPLIED TO THE FULL AREA INSIDE THE IMPACT HEAD WITH THE DIRECTION OF THE BLACK DIAGONAL STRIPES CONFORMING TO CURRENT MUTCD APPLICATION FOR TYPE 3 OBJECT MARKERS (CM-3).
   C. DO NOT CHANGE THE LAPPING OF TERMINAL FOR ANY INSTALLATIONS; INSTALL AS TESTED.

3. IF YOU CANNOT GET THE NECESSARY CLEAR RUNOUT AREA FOR THE GR-7 TERMINAL, CONSIDER ALTERNATIVE TERMINAL OPTIONS.

4. FOR DETAILS OF GUARDRAIL TERMINAL INSTALLATION SITE PREPARATION REQUIREMENTS, SEE STANDARD GR-SP.

5. THIS DRAWING IS REPRESENTATIONAL ONLY. DETAILS, DIMENSIONS, QUANTITIES, AND OTHER INFORMATION NOT SHOWN WILL VARY FOR EACH MANUFACTURER. SEE INDIVIDUAL MANUFACTURER'S PLANS FOR THIS INFORMATION.

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BREAKAWAY CABLE TERMINAL
4' FLARE

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE
221 505
FLARED TERMINAL PLACEMENT
3000 FT. RADIUS OR GREATER

IF THE OFFSET IS LESS THAN THE STANDARD SECTION OFFSET THE OFFSET WILL BE HELD AT THE STANDARD SECTION OFFSET.

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

BREAKAWAY CABLE TERMINAL
4' FLARE

VIRGINIA DEPARTMENT OF TRANSPORTATION
TYPICAL INSTALLATION

2 SQUARE WASHERS

ROUND WASHER

(2) 5/8" NUTS. NUTS TO BE INSTALLED FINGER TIGHT, ENGAGE TOP AND BOTTOM EDGES OF PLATE WITH POST AND TIGHTENED WITH WRENCH ONE FULL TURN, THEN SECURE WITH SECOND NUT.

W-BEAM RAIL

W-BEAM BACK UP PLATE

S3 X 5.7 POST FLANGE

S 3 X 5.7 STEEL POST

BOLT AND NUT SHALL HAVE 4000 POUNDS MIN. TENSILE STRENGTH

TYPICAL INSTALLATION

* HEIGHT TOLERANCE ± 3/4"
NOTES:


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 UN-SHIELDED ROADSIDE AREAS.

3. FOR NEW CONSTRUCTION, RECONSTRUCTION, AND 3R WORK THE 10:1 SLOPE GRADING MUST EXTEND A MINIMUM OF 5'-0" BEHIND THE END POST.

4. FOR PROPRIETARY GUARDRAIL TERMINALS THE MANUFACTURER'S SITE PREPARATION REQUIREMENTS TAKE PRECEDENCE OVER THIS STANDARD.
NOTES:


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 5'-0" BEHIND THE END POST.

4. FOR 3R WORK THE GRADING SHOULD BE AS CLOSE AS POSSIBLE TO THE NEW CONSTRUCTION WITH SLOPE EXTENDING A MINIMUM OF 2'-0" BEHIND THE BLOCKED OUT POST. FROM THE HINGE POINT, IE, THE GRADED SLOPE INTO THE EXISTING DITCH SLOPE TO COVER THE FOUNDATION TUBES AND SLR PLATES WITHOUT EXTENDING THIS SLOPE BEYOND THE DITCH BOTTOM. USE #2IB AGGREGATE, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER, AT ROADWAY SHOULDERS.


6. FOR PROPRIETARY GUARDRAIL TERMINALS THE MANUFACTURER'S SITE PREPARATION REQUIREMENTS TAKE PRECEDENCE OVER THIS STANDARD.

SITE PREPARATION REQUIREMENTS FOR GR-9
TRANSITION FROM GR-9 TERMINAL TO WEAK POST (STANDARD GR-8) GUARDRAIL

NOTES:

1. ALTERNATE BREAKAWAY CABLE TERMINAL (GR-9) IS TO BE ET-2000 (SIMILAR TO AS SHOWN), OR CAT (STD. MB-3 TERMINAL OPTION) AS MANUFACTURED BY SYRO STEEL COMPANY, BRAKEMASTER (STD. MB-3 TERMINAL OPTION) AS MANUFACTURED BY ENERCON ABSORPTION SYSTEMS, INC. THE SKT-350 AS MANUFACTURED BY ROAD SYSTEMS, INC., OR OTHER VDOT APPROVED EQUAL MEETING NCHRP 350 TESTING CRITERIA.

2. ALL TERMINALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THE FOLLOWING VDOT REQUIREMENTS:
   A. ALL STANDARD GR-9 TERMINALS (SIMILAR TO AS SHOWN ABOVE) SHALL BE INSTALLED WITH A 1 FT. OFFSET ACCOMPANIED WITH A 50° FLARE TO PREVENT THE GUARDRAIL EXTRUDER FROM ENCROACHING ON THE SHOULDER FOR WORK WHERE RIGHT OF WAY IS LIMITED, THE OFFSET CAN BE DECREASED AS DIRECTED BY THE ENGINEER.
   B. DIRECTION OF THE REFLECTIVE TAPE ON THE EXTRUDER SHALL CONFORM TO MUTCD APPLICATION FOR DIAGONAL STRIPES ON OBJECT MARKERS AND BRIDGE END PANELS. COLOR OF TAPE SHALL BE AMBER (YELLOW).
   C. DO NOT CHANGE THE LAPPING OF TERMINAL FOR ANY INSTALLATIONS: INSTALL AS TESTED.

3. IF THE CALCULATED LENGTH OF NEED CANNOT BE MET FOR THE SITES OF RETROFIT, MAINTENANCE, OR UPGRADE OF TERMINALS, PROVIDE AS MUCH DISTANCE AS POSSIBLE TO EXISTING HAZARD.

4. THIS DRAWING IS REPRESENTATIONAL; ONLY DETAILS, DIMENSIONS, QUANTITIES, AND OTHER INFORMATION NOT SHOWN WILL VARY FOR EACH MANUFACTURER. SEE INDIVIDUAL MANUFACTURER'S PLANS FOR THIS INFORMATION.
(2) 12'-6" SECTIONS OF W-BEAM, EA. HAVING A SECTION NESTED INSIDE THE OTHER

DEGREE OF SKEW

DEGREE OF SKEW

PERPENDICULAR WIDTH

BOX CULVERT

ONE POST OMITTED

TOP VIEW

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

2 12'-6" SECTIONS OF W-BEAM, EACH HAVING A SECTION NESTED INSIDE THE OTHER.

TABLE OF MAXIMUM ALLOWABLE STRUCTURE WIDTHS FOR THIS DESIGN

<table>
<thead>
<tr>
<th>Type I - One Post Omitted</th>
<th>Type II - Two Posts Omitted</th>
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<tr>
<td><strong>Skew</strong></td>
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<tr>
<td><strong>A</strong> MAX. PERPENDICULAR WIDTH (FEET)</td>
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\[ A = \text{THE MINIMUM ALLOWABLE DISTANCE BETWEEN CLOSEST POINT OF POST TO STRUCTURE.} \]

ELEVATION

Type I - One Post Omitted

Type II - Two Posts Omitted

NOTES:

1. THIS SHEET IS Applicable WHEN GUARDRAIL IS REQUIRED AND THE DEPTH OF FILL ABOVE THE TOP SLAB OF THE BOX CULVERT IS LESS THAN 4'-0".
2. GUARDRAIL INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 505 OF THE SPECIFICATIONS. MATERIAL REQUIREMENTS FOR COMPONENTS SHALL BE IN ACCORDANCE WITH SECTION 221 OF THE SPECIFICATIONS.
3. GUARDRAIL POST SPACING SHALL BE IN ACCORDANCE WITH STANDARD GR-2.
4. THIS DISTANCE SHALL BE IN ACCORDANCE WITH VDOT POLICY ON DETERMINING THE LENGTH OF NEED FOR GUARDRAIL WITH A MINIMUM DISTANCE AS SHOWN.
5. ALL SPLICES IN NESTED W-BEAM SECTIONS MUST COINCIDE AT A COMMON POINT AND BE BOLTED TOGETHER USING ONE SET OF BOLTS AT EACH SPlice.
PLAN

NOTE: MAINTAIN 6'-3" POST SPACING WHEREVER POSSIBLE. FOR USE WITH 25' STANDARD RAIL SECTION. SYMMETRY OF POST SPACING IS NOT NEEDED.

6'-3" SPACING AS NECESSARY

END OF BOX CULVERT

6'-3"

MINIMUM

6'-3"

6'-3"

9"

MINIMUM

9"

G RAIL POST & PEDESTAL

LONGITUDINAL SECTION

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 CURRENT VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.

RAL 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 7/8" ØA307 (OR A36) THREADED RODS WITH TACK WELDED NUTS (WITH HEX NUTS AND WASHERS AS SHOWN). THREADED RODS MAY BE 0.761 IN DIAMETER WITH ROLLED THREADS. NUTS SHALL CONFORM TO A307 REQUIREMENTS AND SHALL BE TAMPERED OR CHASED AFTER GALVANIZING. BOLTS AND NUTS SHALL HAVE CLASS 2A AND 2B FIT TOLERANCES. BOLTS SHALL BE EMBEDDED 8" INTO THE CONCRETE.

TUBULAR GUARD RAIL SHALL BE FURNISHED AND INSTALLED IN 25 FT 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 25 FT STANDARD SECTIONS. APPROACH GUARDRAIL POSTS SHALL ALL BE SPACED AT 6'-3" ADJACENT TO THE TUBULAR RAIL SINCE ITS FLEXIBILITY IS SIMILAR TO THE STANDARD METAL BEAM GUARDRAIL. DO NOT INSTALL ADDITIONAL POSTS AT 3'-3½" CENTERS. FULLY ANCHORED GUARDRAIL MUST BE ATTACHED AT BOTH ENDS OF TUBULAR RAIL.

TESTS HAVE SHOWN THAT ALTHOUGH THIS RAIL DEFLECTS HORIZONTALLY TWO OR THREE FEET, ADEQUATE VEHICLE CONTAINMENT AND RE-DIRECTION IS ACHIEVED. THE RESULTING MORE GRADUAL DECCELERATION THEN 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 A4) AND REINFORCING STEEL USED IN THE PEDESTALS SHALL BE FIELD VERIFIED AND PAID FOR AT THE UNIT PRICE PER FOR THE CORRESPONDING BOX QUANTITIES. THE RAILING (TEXAS T-6) SHALL BE MEASURED IN 25 FT SECTIONS AND PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT IN ACCORDANCE WITH SECTION 410.04 OF THE SPECIFICATIONS. BR SERIES BARS SHALL BE #5 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 3'-7".

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 3 AND 6 INCHES FROM THE EDGE OF THE PEDESTAL.

PRECAST BOXES SHALL BE TREATED AS AN EXISTING BOX FOR PEDESTAL INSTALLATION.

THIS UNIT IS ONLY TO BE USED WHEN DESIGN SPEED IS 45 MPH OR LESS.
TESTED - NCHRP 350 TEST LEVEL 2

STANDARD BOX CULVERT GUARDRAIL (TEXAS T-6)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 3
NOTES:

1. TUBULAR W-BEAM RAIL MEMBER IS TO BE FABRICATED FROM STANDARD 25' NOM. RAIL SECTIONS. TOP AND BOTTOM SEAMS SHALL BE BUTT WELDED 6" AT 12" SPACING. CONTINUOUS SEAM WELDING IS ALSO ACCEPTABLE. WELDS SHALL BE CHIPED AND CLEANED AND THE COMPLETE 25 FT. TUBULAR MEMBER SHALL BE GALVANIZED AFTER FABRICATION. FOR TUBULAR RAIL SPLICE ADDITIONAL POST MOUNTING SLOTS ARE TO BE MADE IN EACH MEMBER 1'-3" FROM THE STANDARD SLOTS AT 6'-3" CENTERS.

2. 3/4" SPLICE NUTS SHALL BE TACK WELDED TO A BENT SHEET METAL POSITIONER AS SHOWN. OTHER SUITABLE POSITIONING METHODS OR DEVICES MAY BE SUBSTITUTED. THE COMPLETED SPLICE SHALL HAVE 8 BOLTS (16 BOLTS IF A TUBULAR RAIL SPLICE). EACH BOLT WILL INCLUDE A 3/4" X 3" X 3/8" PLATE WASHER OR A 2 INCH DIAMETER WASHER.

3. WASHERS (SEE NOTE)

4. USE STANDARD 3/4" W-BEAM SPLICE NUT (TYP.)

5. 16 GA BENT SHEET METAL POSITIONER FOR SPLICE NUTS (1 REQUIRED PER SPLICE)

6. TACK WELD (TYPICAL FOR ALL NUTS)

3/4" PIPE SLEEVE, 3"

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

NOTES:
1. FIXED OBJECTS MAY CONSIST OF BRIDGE RAILS, ABUTMENTS, PEPS, RETAINING WALLS, OR OTHER FLAT SURFACED STRUCTURES WITH VERTICAL FACE.
2. BRIDGE RAIL ENDS AND BRIDGE PARAPETS MUST BE OF ADEQUATE STRENGTH TO ACCEPT FULL IMPACT LOADING.
3. GUARDRAIL COMPONENTS SHALL BE IN ACCORDANCE WITH VDOT RULES AND BRIDGE STANDARDS.
4. POSTS 1, 2, 3, 4, AND 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH 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 5/8" CARRIAGE BOLTS (LENGTH AS REQUIRED).
6. APPROPRIATE LENGTH 5/8" DIAMETER ASTM A325 HEX BOLTS WITH WASHERS MUST BE USED WITH KNUCKLED HOLE WITH A 5/8" BEARING PLATE ON THE BACK SIDE OF THE BRIDGE PARAPET OR TERMINAL WALL.
7. DRIVE NAIL WITHIN 2" OF THE TOP OR BOTTOM OF THE BLOCKOUT AFTER 5/8" X 18 BOLT IS INSTALLED.
8. SEE SHEET 3 OF 3 FOR RUBRAIL BLOCKOUT DETAILS.

ITEM | MATERIAL/SPECIFICATIONS/NOTES
---|---
1 | 5/8" X 18" LONG, GUARDRAIL BOLT AND RECESSED NUT
2 | STANDARD 5" X 8" WOOD POST AND BLOCK
3 | STANDARD W-BEAM TERMINAL CONNECTOR
4 | STANDARD W-BEAM RAIL
5 | 5/8" X 2" LONG GUARDRAIL BOLT & RECESSED NUT (SEE SHEET 3 OF 3)
6 | RECTANGULAR PLATE WASHER (SEE SHEET 3 OF 3)
7 | BENT PLATE RUBRAIL (SEE SHEET 3 OF 3)
8 | 8" X 8" X 7-6" LONG WOOD POST & 8" X 8" X 14" LONG TREATED PINE BLOCK OR RECYCLED MATERIAL
9 | WASHER FOR 5/8" BOLT

50125

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV 9/06
W-BEAM GUARDRAIL-FIXED OBJECT ATTACHMENT
FOR USE BETWEEN VERTICAL FIXED OBJECTS AND GUARDRAIL (STEEL POSTS)

NOTES:
1. FIXED OBJECTS MAY CONSIST OF BRIDGE RAILS, ABUTMENTS, PIERS, RETAINING WALLS, OR OTHER FLAT SUPERFACED STRUCTURES WITH VERTICAL FACE.
2. BRIDGE RAIL ENDS AND BRIDGE PARAPETS MUST BE OF ADEQUATE STRENGTH TO ACCEPT FULL IMPACT LOADING.
3. GUARDRAIL COMPONENTS SHALL BE IN ACCORDANCE WITH VDOT ROAD AND BRIDGE STANDARDS.
4. POSTS 1, 2, 3, 4, AND 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH BLOCKS AND/OR RUBRUAL. RUBRUAL IS NOT BOLTED TO POSTS 2 AND 4.
5. BOTTOM WOOD BLOCKS LOCATED ON POSTS 1 THROUGH 4 ARE CENTER DRILLED AND SECURED WITH 5/8" CARRIAGE BOLTS. (LENGTH AS REQUIRED).
6. APPROPRIATE LENGTH 5/8" DIAMETER ASTM A325 HEX BOLTS WITH WASHERS MUST BE USED WITH THRU DRILLED HOLES WITH A 5/8" BEARING PLATE ON THE BACK SIDE OF THE BRIDGE PARAPET OR TERMINAL WALL.
7. SEE SHEET 3 OF 3 FOR RUBRUAL BLOCKOUT DETAILS.

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<th>ITEM</th>
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<tbody>
<tr>
<td>1</td>
<td>5/8&quot; X 10&quot; LONG HEX BOLT WITH NUT</td>
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<tr>
<td>2</td>
<td>STD. W6X8.5 OR W6X9 STEEL POST STD. 8&quot;X8&quot; LG. TREATED PINE BLOCK OR RECYCLED MATERIAL</td>
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<tr>
<td>3</td>
<td>STANDARD W-BEAM TERMINAL CONNECTOR</td>
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<td>4</td>
<td>STANDARD W-BEAM RAIL</td>
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<tr>
<td>5</td>
<td>5/8&quot; X 2&quot; LONG GUARDRAIL BOLT &amp; RECESSED NUT (SEE STANDARD GR-HOW)</td>
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<td>RECTANGULAR PLATE WASHER (SEE STD. GR-HOW)</td>
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<td>BENT PLATE RUBRUAL (SEE SHEET 3 OF 3)</td>
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<td>C6 X 8.2 RUBRUAL (SEE SHEET 3 OF 3)</td>
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<td>WASHER FOR 5/8&quot; BOLT</td>
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ITEM 7 DETAIL

INDICATES EXTRA POST REQ'D FOR RUN-OFF FIXED OBJECT ATTACHMENT STD. GR-FOA-1 TYPE II

ELEVATION

W BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT
RUBRAIL AND HARDWARE DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

ITEM 8 DETAIL
W-BEAM GUARDRAIL - FIXED OBJECT ATTACHMENT
FOR USE BETWEEN SAFETY SHAPE AND GUARDRAIL (WOOD POSTS)

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 SHALL 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 3/4" CARRIAGE BOLTS. LENGTH AS REQUIRED.
6. 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.
7. APPROPRIATE LENGTH 1/2" ASTM A325 HEX BOLTS WITH WASHERS MUST BE USED IN THRU DRILLED HOLES WITH A 3/4" BEARING PLATE ON THE BACK SIDE OF THE BRIDGE PARAPET OR CONCRETE BARRIER.
8. DRIVE NAIL WITHIN 2" OF THE TOP OR BOTTOM OF BLOCKOUT AFTER 3/4" X 1/8" BOLT IS INSTALLED.
9. SEE SHEET 3 OF 3 FOR RUBRAIL BLOCKOUT DETAILS.

ITEM MATERIAL/SPECIFICATIONS/NOTES
1. 3/4" X 18" LG GUARDRAIL BOLT AND RECESS NUT
2. STANDARD 6" X 8" WOOD POST AND BLOCK
3. STANDARD W-BEAM TERMINAL CONNECTOR
4. STANDARD W-BEAM RAIL
5. 3/4" X 2" LONG GUARDRAIL BOLT AND RECESS NUT (SEE STANDARD GR-HDW)
6. RECTANGULAR PLATE WASHER (SEE STANDARD GR-HDW)
7. BENT PLATE RUBRAIL (SEE SHEET 3 OF 3)
8. 6 X 8 RUBRAIL (SEE SHEET 3 OF 3)
9. 8" X 8" X 7-8" LONG WOOD POST AND 8" X 8" X 14" LONG TREATED PINE BLOCK OR RECYCLED MATERIAL
10. WOOD BLOCKOUT FOR RUBRAIL (SEE SHEET 3 OF 3)
11. WASHER FOR 3/4" BOLT

SEE SHEET 3 OF 3 FOR BEARING PLATE DETAIL
SEE NOTE 7

TWO SECTIONS OF W-BEAM ONE SET INSIDE THE OTHER

NEW BRIDGE - ATTACHMENTS ONE-WAY TRAFFIC-RUN-ON, 2-GR-FOA-2, TYPE 1
TWO-WAY TRAFFIC-RUN-ON, 4-GR-FOA-2, TYPE 1
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.
W-Beam Guardrail - Fixed Object Attachment

For Use With Safety Shape - Steel Posts

Virginia Department of Transportation

See Sheet 3 of 3 for Bearing Plate Detail

Fixed Object Attachment

For Standard GR-FOA-2, Type I (Run-off Details, See Sheet 3 of 3)

Plan

Min. 4 SPA GR-2 or Terminal End Treatment

Elevation

To be compressed at its lower end to make outside of W-Beam align with barrier curb

Steel Spacer Tube
6.0" I.D. x 9.0" long, Schedule 40 Galv. Pipe

Asphalt Cur3 B Required

Three 5/8" Expansion Anchor Bolts 6" long with washers

1/4" x 3" Lag Bolt with Washer

Three Section of W-Beam

Two Sections of W-Beam

Safety Shape Bridge Parapet or Concrete Barrier

Section A-A

Section B-B

Section C-C (W Beam Omitted)

Section D-D

Item

Material/Specifications/Notes

1. Washer for 5/8" Bolt

2. Std. W6 x 8.5 or W8 x 9. Steel Post W/ Std. 6" x 8" x 14" LG. Treated Pine Block or Recycled Material

3. Standard W-Beam Terminal Connector

4. Standard W-Beam Rail

5. 3/8" x 2" Long Guardrail Bolt and Recessed Nut (See Standard GR-HDW)

6. Rectangular Plate Washer (See Standard GR-HDW)

7. Bent Plate Rubrail (See Sheet 3 of 3)

8. C6 x 6.2 Rubrail (See Sheet 3 of 3)

9. 5/8" x 10" LG. Hex Bolt, Nut and Washer

10. Wood Blockout for Rubrail (See Sheet 3 of 3)

11. W8 x 13 x 7"-6" LG. Steel Post with Std. 6" x 8" x 14" LG. Treated Pine Block or Recycled Material

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 shall 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 5/8" carriage bolts. Length as required.

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

7. Appropriate length 5/8" ASTM A325 Hex bolts with washers must be used with thru drilled holes with a 5/8" bearing plate on the back side of the bridge parapet or concrete barrier.

8. See Sheet 3 of 3 for Rubrail Blockout Details.
BLOCKED-OUT W-BEAM MEDIAN BARRIER-FIXED OBJECT ATTACHMENT
FOR USE BETWEEN STANDARD MB-7 AND STANDARD MB-3

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<th>ITEM</th>
<th>MATERIALS/SPECIFICATIONS/NOTES</th>
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<td>5/8&quot; WASHER</td>
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<td>STD. W-6 X 8.5 OR W-6 X 9 STEEL POSTS, STD. 6&quot; X 8&quot; X 4&quot; LONG TREATED PINE BLOCK OR RE-CYCLED MATERIAL</td>
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<td>WOOD BLOCKOUT FOR RUBRAIL (SEE SHEET 2 OF 2)</td>
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<td>9</td>
<td>5/8&quot; X 10&quot; LONG HEX BOLT WITH NUT</td>
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NOTES:
1. CAN BE FIELD CUT AND BENT USING HEAT.
   IF SHOWN CUT AND BENT, RIGHT HAND OR LEFT HAND
   MUST BE SPECIFIED, DEPENDING ON WHICH SIDE OF
   THE ROADWAY THE TRANSITION IS USED.

W BEAM TERMINAL CONNECTOR (MOD.)
W BEAM GUARDRAIL INSTALLATION CRITERIA

TYPICAL SECTION

GUARDRAIL SHALL BE PLACED SO THAT A HAZARD IS NOT WITHIN THE DEFLECTION LIMIT OF THE GUARDRAIL. THE GUARDRAIL DESIGN AND PLACEMENT SHOWN ABOVE MAY ALSO BE USED FOR SHIELDING AN OVERHEAD SIGN SUPPORT, FIXED OBJECTS OR OTHER TYPES OF ROAD SIDE OBSTRUCTIONS.

X 25° ANGLE OF VEHICLE DEPARTURE.

NOTES:
1. DISTANCE "A" MUST BE GREATER THAN REQ'D CLEAR ZONE.
2. DISTANCE "B" IS LESS THAN REQ'D CLEAR ZONE.
NOTES:

1. IF A CUT SECTION IS CLOSER THAN 200', A STANDARD GR-6 TERMINAL IS PREFERRED.

2. NO GUARDRAIL IS REQUIRED ON RUN-OFF UNLESS NEEDED TO SHIELD A HAZARD WITHIN THE REQUIRED CLEAR ZONE.

3. NO GUARDRAIL IS REQUIRED ON RUN-OFF UNLESS NEEDED TO SHIELD A HAZARD WITHIN THE REQUIRED CLEAR ZONE.

REFER TO SHEET 501.33 IF BACK OF GUARDRAIL FROM THE OPPOSING LANES IS WITHIN THE REQUIRED CLEAR ZONE.
NOTES:
GUARDRAIL INSTALLATION CRITERIA AS SHOWN ON THESE SHEETS IS TO APPLY TO THOSE LOCATIONS WHERE GUARDRAIL HAS TO BE TRANSITIONED FROM THE NORMAL LOCATION.
LENGTH OF TRANSITION LI IS TO BE IN ACCORDANCE WITH TABLE III OR IV FOR APPLICABLE VALUES OF W OR AS DIRECTED BY THE ENGINEER.
RAIL TERMINAL SECTIONS IN ACCORDANCE WITH STANDARD GR-6, GR-7 OR GR-8 ARE TO BE INSTALLED AT EACH TERMINUS OF GUARDRAIL WHERE SPECIFIED ON PLANS.
ALL LENGTHS (L) ARE APPLIED ALONG FACE OF GUARDRAIL.
OFFSETS SHOWN IN TABLES ARE FOR 6'-3" SPACING, FOR 12'-6" SPACING USE EVERY SECOND VALUE FOR Y.
INSTALLATION METHODS SHOWN ON THESE SHEETS ARE APPLICABLE TO STANDARD PLANS GR-2, GR-2A AND GR-8.

### TABLE III
OFFSETS (Y) FOR INTRODUCED GUARDRAIL TRANSITIONS

| LENGTH IN FEET | X      | W-2   | W-3   | W-4   | W-5   | W-6   | W-7   | W-8   | W-9   | W-10  | W-11  | W-12  | W-13  | W-14  | W-15  | W-16  | W-17  | W-18  | W-19  | W-20  |
|----------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|       |
| 37.50          | 6.25   | 0.06  | 0.05  | 0.03  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  | 0.02  |       |
| 50.00          | 4.75   | 2.30  | 1.39  | 0.95  | 0.74  | 0.60  | 0.68  | 0.77  | 0.85  | 0.94  | 1.02  | 1.11  | 1.19  | 1.36  | 1.45  | 1.53  | 1.62  | 1.70  |       |
| 75.00          | 56.25  | 2.25  | 1.58  | 1.22  | 0.98  | 0.91  | 1.12  | 1.41  | 1.55  | 1.59  | 1.62  | 1.62  | 1.67  | 1.78  | 1.89  | 2.00  | 2.11  | 2.22  |       |
| 100.00         | 93.75  | 4.39  | 3.58  | 2.73  | 1.32  | 1.52  | 1.91  | 2.43  | 2.76  | 2.93  | 3.02  | 3.03  | 3.03  | 3.03  | 3.03  | 3.03  | 3.03  | 3.03  |       |
| 125.00         | 150.00 | 6.00  | 4.86  | 5.56  | 6.25  | 6.94  | 7.64  | 8.33  | 9.03  | 9.72  | 10.42 | 11.11 | 11.81 | 12.50 | 13.19 | 13.89 |       |       |       |

W = TOTAL LATERAL TRANSITION OF GUARDRAIL 01-02
O₁ = OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL
O₂ = OFFSET FROM EDGE OF PAVEMENT TO FACE OF GUARDRAIL
X₁ = -Xₙ CUMULATIVE DISTANCE IN INCREMENTS OF 6'-3"
FROM FIRST GUARDRAIL POST MEASURED ALONG FACE OF GUARDRAIL
Y = LATERAL OFFSET FROM FACE OF GUARDRAIL OR POST NEAREST TO PAVEMENT EDGE TO FACE OF GUARDRAIL AT EACH SUCCESSIVE POST.
L = TOTAL LENGTH OF TRANSITIONAL PORTION OF GUARDRAIL.

W Y-WX²/L² TO SOLVE FOR "Y", USE THE MAXIMUM "L" ALLOTTED FOR THE APPROPRIATE "W".

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**W-BEAM GUARDRAIL INSTALLATION CRITERIA**

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

221 505

501.36

SHEET 4 OF 8
TABLE IV
OFFSETS (Y) FOR CONTINUOUS RUN-ON GUARDRAILS AND ALL RUN-OFF TRANSITIONS

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W-BEAM GUARDRAIL INSTALLATION CRITERIA

NOTE: GUARDRAIL INSTALLATION CRITERIA AS SHOWN ON THESE SHEETS IS TO APPLY TO THOSE LOCATIONS WHERE GUARDRAIL HAS TO BE TRANSITIONED FROM THE NORMAL LOCATION.

LENGTH OF TRANSITION (L) IS TO BE IN ACCORDANCE WITH TABLE II OR IV FOR APPROPRIATE VALUES OF W OR AS DIRECTED BY THE ENGINEER.

RAIL TERMINAL SECTIONS IN ACCORDANCE WITH STANDARD GR-6, GR-7 OR GR-8 ARE TO BE INSTALLED AT EACH TERMINUS OF GUARDRAIL WHERE SPECIFIED ON PLANS.

ALL LENGTHS (L) ARE APPLIED ALONG FACE OF GUARDRAIL.

OFFSETS SHOWN IN TABLES ARE FOR 6'-3" SPACING, FOR 12'-6" SPACING (GR-B) USE EVERY SECOND VALUE OF Y.

INSTALLATION METHODS SHOWN ON THESE SHEETS ARE APPLICABLE TO STANDARD PLANS GR-2, GR-2A AND GR-8.

VIRGINIA DEPARTMENT OF TRANSPORTATION
MB-3

CHAMFER ALL CORNERS

ALL CONCRETE SHALL BE CLASS A3.

3/4" HOLES TO BE CAST IN POST.

1/2" X 28" BOLT

6" X 8" X 1-1/2" TREATED PINE BLOCK OR RECYCLED MATERIAL

4 1/4 DEFORMED DENNIS BARS 4" LESS THAN HEIGHT OF POST

CHAMFER MAY BE EXTENDED ENTIRE LENGTH OF POST AT THE OPTION OF THE FABRICATOR.

DIMENSIONS SHOWN IN PARENTHESES INDICATE ACCEPTABLE TOLERANCES.

6/8 X 12" TREATED PINE BLOCK OR RECYCLED MATERIAL

POST MAY BE HOT ROLLED OR WELDED

1-3/4" TREATED PINE BLOCK OR RECYCLED MATERIAL

3/4" X 10" BOLT

W6X8.5 OR W6X9

ALL HOLES IN POST AND BRACKET TO BE 3/4" IN DIAMETER.

BLOCKOUT FOR MAINTENANCE REPAIR ONLY

CONCRETE POST

6" X 8" TREATED PINE BLOCKS OR RECYCLED MATERIAL

NOTES:
STANDARD MB-3 POST SPACING IS 6'-3".

FOR DETAILS OF RAIL ELEMENT, RAIL SPlice JOINT, W BEAM BACK UP PLATE, AND ASSOCIATED HARDWARE SEE SHEET NO. 501.01.

ALTERNATE TYPE POSTS AND BLOCKOUTS MAY BE INTERCHANGED ON ANY ONE PROJECT WITH THE RESTRICTION THAT THE SAME TYPE OF POST AND BLOCKOUT MUST BE USED IN ANY SINGLE RUN OF MEDIAN BARRIER.

ALL BOLTS, NUTS, WASHERS, STEEL POSTS, BENT PLATE POST, AND BLOCKOUTS ARE TO BE GALVANIZED.

6X8 WOOD POST

IMPACT ATTENUATOR, CAT, BRAKEMASTER OR STANDARD GR-104W W BEAM END SECTION (BUFFER) (BUFFER END SECTION MAY ONLY BE USED WHEN LOCATED OUTSIDE OF CLEAR ZONE.)

METHOD OF TREATMENT AT BRIDGE PIER OR MEDIAN OBSTRUCTION

THE GUARDRAIL AND MEDIAN BARRIER COMPONENTS DEPICTED IN A.R.T.B.A. TECHNICAL BULLETIN NUMBER 2680 MAY BE SUBSTITUTED IF INTERCHANGEABLE WITH THE STANDARDS FOR GUARDRAIL (GR) OR MEDIAN BARRIER (MB) AND APPROVED BY THE ENGINEER.

STANDARD WASHERS ARE TO BE USED ON LAST 50' OF RUN OFF END ONLY.

FLARE RATES

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<tr>
<th>DESIGN SPEED</th>
<th>SHY LINE LS</th>
<th>FLARE RATE</th>
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<tr>
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* SUGGESTED MAXIMUM FLARE RATE FOR SEMI-RIGID BARRIER SYSTEMS.

SOUTHERN PACIFIC

BRIDGE PIER OR OTHER MEDIAN OBSTRUCTION

FLARE RATE SEE TABLE.

BLOCKED-OUT W BEAM MEDIAN BARRIER

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

REV. 9/06

501.41

251

505
S3X5.7 STEEL POST

STANDARD W BEAM MEDIAN BARRIER (WEAK POST SYSTEM)

TL-3 (>45 MPH)

Virginia Department of Transportation
TREATMENT FOR MEDIAN BARRIER CROSS-OVER

STANDARD W BEAM MEDIAN BARRIER (WEAK POST SYSTEM)

VIRGINIA DEPARTMENT OF TRANSPORTATION
CONCRETE MEDIAN BARRIER

Virginia Department of Transportation

<table>
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**NOTES:**
- If the contractor elects to use the optional construction joint, transverse joints for crack control and expansion joints are to be provided in both footing and barrier at the same location.
- Transverse joints are to coincide with joints in adjacent pavement with a maximum spacing of 20 feet C-C.
- Concrete median barrier may be precast, cast in place or slip-formed for precast design see standard MB-7D PC.
- Horizontal reinforcing steel bars are to be separated at all expansion and contraction joints. A 2" concrete cover is required over the ends of the reinforcing steel.

**Barrier Delineator**
- Size, color, and spacing to be in accordance with the specifications.
- Cost of delineator to be included in the price bid for median barrier.
- Reflective surface of barrier delineator in all instances, to be facing oncoming traffic.
- Alternate top design shown on MB-7D may also be applied to MB-7E and MB-7F.
- Concrete to be class A3 if cast in place, 4000 psi if precast.
- Depth of concrete base may be extended at the contractor's option to coincide with bottom of pavement course in which base terminates; however, the cost of additional concrete shall be included in unit price bid per linear foot of barrier.

**Specifications**
- Reference 105 502
- Rev B 07 501.44
NOTES:
1. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE SHEETS 501.60 - 501.61.
2. AT THE OPTION OF THE MANUFACTURER, ADDITIONAL REINFORCING MAY BE ADDED TO THE PRECAST CONCRETE BARRIER FOR HANDLING.
3. CONCRETE SHALL BE 4000 P.S.I. MINIMUM.
4. BARRIER DELINEATOR SIZE, COLOR AND SPACING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
5. COST OF DELINEATOR SHALL BE INCLUDED IN THE PRICE BID FOR TRAFFIC BARRIER SERVICE.
6. OTHER PRECAST TRAFFIC BARRIER SERVICE CONCRETE DESIGNS THAT MEET NCHRP 350 TEST REQUIREMENTS AND HAVE BEEN ACCEPTED BY VDOT AS AN ACCEPTABLE ALTERNATE TO THE STANDARD DESIGN MAY BE SUBSTITUTED.
7. A 1" RADIUS MAY BE USED AS AN ALTERNATE FOR THE \( \frac{3}{8} " \) CHAMFER.
8. BARRIER DELINEATOR REFLECTIVE SURFACE IN ALL INSTANCES SHALL BE FACING ONCOMING TRAFFIC.
9. BARRIER VERTICAL PANELS SHALL BE SPACED IN ACCORDANCE WITH VIRGINIA WORK AREA PROTECTION MANUAL.

WHEN USING VDOT STANDARD MB-7D PC WITH THE PIN AND LOOP POSITIVE CONNECTION, ALLOW FOR A 6'-0" DYNAMIC DEFLECTION. PROVIDE MIN 60" OF BARRIER UPSTREAM AND DOWNSTREAM OF WORK ZONE FOR ANCHORAGE. FOR APPROVED NON VDOT DESIGNS, REFER TO MANUFACTURER’S INSTALLATION INSTRUCTIONS FOR DEFLECTIONS AND ANCHORAGE.

**FLARE RATES**

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* SUGGESTED MAXIMUM FLARED RATE FOR RIGID BARRIER SYSTEMS.
NOTES:

1. HIGH STRENGTH GROUT OR MORTAR SHALL BE IN ACCORDANCE WITH SECTION 218 OF THE SPECIFICATIONS.

2. 4" MIN. OR VARIABLE TO CONFORM WITH SUBGRADE COURSE.

3. WHEN USED AS MEDIAN BARRIER IN A PERMANENT LOCATION, DRAINAGE SLOTS WILL BE COMPLETELY FILLED AND SEALED WITH MORTAR OR GROUT UNLESS UNIT WILL BE LOCATED OVER MEDIAN DRAINAGE STRUCTURE.

4. BARRIER DELINEATOR SIZE, COLOR, AND SPACING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

5. COST OF DELINEATOR TO BE INCLUDED IN THE PRICE BID FOR MEDIAN BARRIER.

6. REFLECTIVE SURFACE OF BARRIER DELINEATOR IN ALL INSTANCES SHALL BE FACING ONCOMING TRAFFIC.

7. PIN AND CONNECTORS SHALL BE ASTM A36, REINFORCING STEEL BARS SHALL BE ASTM A 615 GRADE 60. ONE CONNECTOR PIN ASSEMBLY WITH EACH BARRIER SECTION.

**PRECAST TRAFFIC BARRIER SERVICE CONCRETE**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
**Concrete Median Barrier**

**Type I, II or III**

Virginia Department of Transportation

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**Specification Reference**

- 105
- 404
- 502

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**FLARE RATES**

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\[2\] MAXIMUM FLARE RATE FOR RIDD BARRIER SYSTEMS.

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**Notes**

- MB-7D BARRIER FACE
- XX DENOTES FINISHED GRADE ELEVATION
- FOUNDATION MATERIAL UNDER MEDIATE BARRIER IS TO BE COMPACTED.

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**Section A-A**

FOUNDATION NOT SHOWN

**Section B-B**

(Std. MB-7E)
NOTE:
REINFORCING STEEL BARS SHOWN ARE BASED ON A 20' PANEL LENGTH.
ALL REINFORCING BARS ARE TO BE #4 GRADE 60 STEEL WITH A MINIMUM 1 1/2" CONCRETE COVER.

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

FOR DETAILS OF HOW JOINTS ARE TO BE FORMED & WATER STOP DETAILS SEE STD. RW-3.

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

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

MEASUREMENT AND PAYMENT
MEDIAN BARRIER MB-8A TYPE I, II OR III WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LIN. FOOT, WHICH SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING CLASS A3 CONCRETE, REINFORCING STEEL, POROUS 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 90 FOR THE CONCRETE MEDIAN BARRIER.

REINFORCING STEEL SCHEDULE

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<tr>
<td>TYPE III</td>
<td>20</td>
<td>4'-0&quot;</td>
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CONCRETE MEDIAN BARRIER
TYPE I, II OR III
VIRGINIA DEPARTMENT OF TRANSPORTATION
Basis of Payment: Concrete Median Barrier
12' Terminal Section is to be measured and paid for in lin. ft. std. MB-7D, or lin. ft. of traffic barrier service concrete.

Notes:
Concrete to be Class A3.
For use where the operating speed is 40 m.p.h. or less.
Location of the barrier end sections to be as noted on plans or as approved by the Engineer.
For positive connection details and dimensions see standard MB-NS.
Only for use outside of clear zone.

Cast in Place Concrete Median Barrier
12' FT. Terminal Section
Virginia Department of Transportation
PRECAST CONCRETE MEDIAN BARRIER
12 FT. TERMINAL SECTION
VIRGINIA DEPARTMENT OF TRANSPORTATION

BASIS OF PAYMENT: CONCRETE MEDIAN BARRIER
12' TERMINAL SECTION IS TO BE MEASURED AND
PAID FOR IN LIN. FT. ST'd. MB-7D, OR LIN. FT.
OF TRAFFIC BARRIER SERVICE CONCRETE.

NOTES:
CONCRETE TO BE 4000 P.S.I.
REINFORCING STEEL TO BE GRADE 60.
ALL REINFORCING IS TO HAVE A MINIMUM
CONCRETE COVER OF 1/2".
FOR USE WHERE THE OPERATING SPEED IS
40 M.P.H. OR LESS.
LOCATION OF THE BARRIER END SECTIONS TO
BE AS NOTED ON PLANS OR AS APPROVED
BY THE ENGINEER.
FOR POSITIVE CONNECTION DETAILS AND
DIMENSIONS SEE STANDARD MB-INS.
ONLY FOR USE OUTSIDE OF CLEAR ZONE.
TRAFFIC BARRIER SERVICE CONCRETE PARAPET (SINGLE FACE)  
(FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR)
NOTE:

1. BARRIER DELINEATOR TO BE SPACED IN ACCORDANCE WITH SECTION 702, OF THE ROAD AND BRIDGE SPECIFICATIONS AND THE BARRIER VERTICAL PANELS TO BE SPACED IN ACCORDANCE WITH VIRGINIA WORK AREA PROTECTION MANUAL REFLECTIVE SURFACE, IN ALL INSTANCES, TO BE FACING ONGOING TRAFFIC.

2. CONCRETE 4000 PSI (MIN.), REINFORCING STEEL GRADE 60.


4. ANCHOR SYSTEM SHOWN IN DETAIL "A" SHALL BE TESTED TO PROVIDE A MINIMUM FULLLOAD OF 32,000 LBS. AND INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

5. COST OF BARRIER DELINEATOR AND BARRIER VERTICAL PANELS TO BE INCLUDED IN PRICE BID PER LINEAR FOOT OF BARRIER SERVICE.

6. WHEN BARRIER IS LOCATED ON VERTICAL AND/OR HORIZONTAL CURVES, THE OPENING AT THE JOINT IS NOT TO EXCEED 1".

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

TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE)
(FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR)

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. BARRIER DELINEATOR IS TO BE SPACED IN ACCORDANCE WITH SECTION 702 OF THE ROAD AND BRIDGE SPECIFICATIONS AND THE BARRIER VERTICAL PANELS ARE TO BE SPACED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL.

2. REFLECTIVE SURFACE, IN ALL INSTANCES, ARE TO BE FACING ONCOMING TRAFFIC.

3. COST OF BARRIER DELINEATOR AND BARRIER VERTICAL PANELS ARE TO BE INCLUDED IN PRICE BID PER LINEAR "FOOT" OF BARRIER SERVICE.

4. ANCHOR BOLTS SHALL BE INSTALLED ON TRAFFIC SIDE.

5. CONCRETE 4000 PSI (MIN.)

6. WELDED WIRE FABRIC MAY BE ONE SHEET BENT TO FIT CONFIGURATION OR TWO SEPARATE SHEETS, ONE ON EACH FACE.

7. ANCHOR SYSTEM SHOWN IN DETAIL "A" SHALL BE TESTED TO PROVIDE A MINIMUM PULLOUT OF 32,000 (320) AND INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.


9. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE STANDARD MB-INS.

SECTION B-B
(ANCHOR BOLT)
BOLT DOWN SIDE ADJACENT TO TRAFFIC

SECTION

BENDING DIAGRAM

DIMENSIONS IN BENDING DIAGRAMS ARE OUT-TO-OUT OF BARS.

TRAFFIC BARRIER SERVICE CONCRETE PARAPET (DOUBLE FACE)
(FOR TEMPORARY INSTALLATION ON BRIDGE DECK EXTERIOR)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

105 512

REV. 9/06

501.54
STAKE LOCATIONS WHEN STAKING STANDARD MB-11A.
NOT TO BE USED ON BRIDGE DECKS.
4 PER PRECAST UNIT.
1 AT EACH CORNER.

20'-0" VDOT STANDARD MB-11A
FOR PROPRIETARY MB-11A LENGTHS, REFER TO MANUFACTURER

STAKE LOCATIONS WHEN STAKING
STANDARD MB-11A.
NOT TO BE USED ON BRIDGE DECKS.
4 PER PRECAST UNIT.
1 AT EACH CORNER.

2'-7" NOMINAL
DRAINAGE SLOT

ADDITIONAL HOLES USED WHEN BOLTING TO BRIDGE DECKS.
FOR BRIDGE DECK INSTALLATIONS, REFER TO SHEETS
S01.53 & S01.54 OF THE ROAD AND BRIDGE STANDARDS.

PLAN VIEW

FOR CONC. PAVEMENT
PRE-DRILL HOLES

ASPHALT CONCRETE PAVEMENT,
COMPACTED BASE MATERIAL,
CONCRETE PAVEMENT, OR
ASPHALT OVER CONCRETE PAVEMENT.
1'-0" MIN. BEYOND EACH SIDE OF
BARRIER.

1" Ø X 24" GALV.
A36 STEEL STAKE.
4 PER PRECAST
UNIT. 1 AT EACH CORNER. SEE
NOTE 3.

SECTION B-B

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

SEE NOTE 2

NOTES:

1. STAKING OF STANDARD MB-11A TO ASPHALT CONCRETE
PAVEMENT, COMPACTED BASE MATERIAL, CONCRETE
PAVEMENT, OR ASPHALT OVER CONCRETE PAVEMENT IS
REQUIRED WHEN TRAFFIC BARRIER SERVICE CONCRETE IS
PLACED WITHIN THE 20'-0" (1 FOOT) OFFSET OF A
TRENCHING OPERATION (4' OR GREATER IN DEPTH) OR
WHEN DETERMINED BY THE ENGINEER.

2. 2" MIN. FOR ASPHALT CONCRETE.
6" MIN. FOR COMPACTED BASE MATERIAL.

3. DRIVE STAKE HEAD BELOW FACE OF BARRIER TO PREVENT
SNAGGING.

4. CONTRACTOR TO VERIFY PAVEMENT STRUCTURE PRIOR TO
PLACING STAKES.

5. UPON REMOVAL OF THE STAKES AND BARRIERS, REPAIR THE
RESULTING HOLES AS FOLLOWS OR AS DIRECTED BY THE
ENGINEER. CLEAN AND FILL WITH TYPE LP-4 OR LP-5
EPoxy Mortar Confirming to the Requirements of
Section 243 for Hydraulic Cement Concrete Pavement
and Asphalt Concrete Pavement. Care shall be taken
not to trap air within or at the bottom of the
EPoxy Mortar.
TRANSITION FROM 50" TALL WALL TO 32" JERSEY OR F-SHAPE BARRIER

#4 VERTICAL REINFORCING BARS TO BE PLACED BY EMBEDEDMENT OR BY DRILLING AND GROUTING.

THE ALTERNATE DESIGN OF 1" R MAY ALSO BE USED FOR MB-12A, 12B OR 12C.

#8 X 8" DOWELS @ 4'-0" C.C. OF REQUIRED.

OPTIONAL CONSTRUCTION JOINT, IF POUR IS MONOLITHIC, DOWELS MAY BE ELIMINATED.

CLASS C-1 CONCRETE MAY BE USED BELOW CONSTRUCTION JOINT IF BASE IS POURRED 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 LINEAR FT. OF BARRIER.
NOTES:

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

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

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

HORIZONTAL REINFORCING STEEL BARS ARE TO BE SEPARATE AT ALL EXPANSION AND CONTRACTION JOINTS. A 3" CONCRETE COVER IS REQUIRED OVER THE ENDS OF THE REINFORCING STEEL.

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

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

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

WEEP HOLE WITH 12" X 12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE, DIAMETER 0.03 INCH, NO. 4 MESH HARDWARE CLOTHanchored firmly to outSide of structure.

3" DIAM. WEEP HOLES TO BE PROVIDED ON 10' CENTERS UNLESS OTHERWISE APPROVED BY THE ENGINEER. LOCATE WITHIN LOWER SLOPE FACE OF BARRIER TO DRAIN TO ROADWAY.

DOWELS & OPTIONAL CONST. JOINT ARE TO BE IN ACCORDANCE WITH MB-12A.

3" AGGREGATE #68, #78, OR #8 OR CRUSHED GLASS MEETING #78 OR #8 GRADATION X 8" WIDTH, WHEN WEEP HOLES ARE PROVIDED.

4" AGGREGATE #68, #78, OR #8 CRUSHED GLASS MEETING #78 OR #8 GRADATION X 8" WIDTH, WHEN WEEP HOLES ARE PROVIDED.
MEASUREMENT AND PAYMENT

MEDIAN BARRIER MB-13 TYPE I, II OR III WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LIN. FOOT, WHICH SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING CLASS A3 CONCRETE, REINFORCING STEEL, POROUS 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 I (GREATER THAN 0' H.T. DIFF., MAX. 1'-0")

BENDING DIAGRAM

BARS A  
DO NOT USE BENT BARS A  
WITHIN LIMITS OF DROP INLETS.

TYPE II (GREATER THAN 1'-0" H.T. DIFF., MAX. 2'-0")

TYPE III (GREATER THAN 2'-0" H.T. DIFF., MAX. 3'-0")

* FOR DETAILS OF BARRIER FACE SEE STANDARD MB-12A.

** DENOTES FINISHED GRADE ELEVATION

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

O PERMISSIBLE CONSTRUCTION JOINT TO BE BONDED IN STRICT ACCORDANCE WITH SEC. 404 OF THE CURRENT VDOT ROAD AND BRIDGE SPECIFICATIONS.

REINFORCING STEEL SCHEDULE

<table>
<thead>
<tr>
<th>PANEL</th>
<th>NO.</th>
<th>LENGTH</th>
<th>NO.</th>
<th>LENGTH</th>
<th>NO.</th>
<th>LENGTH</th>
<th>NO.</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE I</td>
<td>2</td>
<td>19'-8&quot;</td>
<td>20</td>
<td>5'-0&quot;</td>
<td>11</td>
<td>19'-8&quot;</td>
<td>40</td>
<td>1'-0&quot;</td>
</tr>
<tr>
<td>TYPE II</td>
<td>20</td>
<td>5'-10'/4&quot;</td>
<td>20</td>
<td>5'-8&quot;</td>
<td>11</td>
<td>19'-8&quot;</td>
<td>40</td>
<td>1'-0&quot;</td>
</tr>
<tr>
<td>TYPE III</td>
<td>20</td>
<td>5'-10'/4&quot;</td>
<td>20</td>
<td>5'-6&quot;</td>
<td>11</td>
<td>19'-8&quot;</td>
<td>40</td>
<td>1'-0&quot;</td>
</tr>
</tbody>
</table>

CONCRETE MEDIAN BARRIER

TYPE I, II OR III

VIRGINIA DEPARTMENT OF TRANSPORTATION

501.57
NOTE:
REINFORCING STEEL BARS SHOWN ARE BASED ON A 20' PANEL LENGTH.
ALL REINFORCING BARS ARE TO BE SIZE #4 AND GRADE 60 STEEL WITH A MINIMUM 1 1/2" CONCRETE COVER.

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

FOR DETAILS OF HOW JOINTS ARE TO BE FORMED & WATER STOPS SEE STD. RW-3.
TRANSVERSE JOINTS FOR TYPE I BARRIERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ROAD AND BRIDGE SPECIFICATIONS EXCEPT NO SCORING OR SAWING WILL BE ALLOWED.
HORIZONTAL REINFORCING STEEL BARS B ARE TO BE SEPARATED AT ALL EXPANSION & CONTRACTION JOINTS. A 2" CONCRETE COVER IS REQUIRED OVER THE ENDS OF REINFORCING STEEL.

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

PLAN VIEW

SECTION A-A
(Foundation not shown)

SECTION B-B
(STD. MB-12B)

REINFORCING STEEL IS NOT SHOWN. SEE TYPE II AND III FOR REINFORCING REINFORCEMENT TO BE PLACED ON HIGHEST SIDE OF TRANS.

SEE APPlicable FOUNDATION FOR MEDIAN BARRIER MB-13 TYPE II OR III.

FLARE RATES

<table>
<thead>
<tr>
<th>DESIGN SPEED</th>
<th>INSIDE SHY LINE</th>
<th>BEYOND SHY LINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPH</td>
<td>FLARE RATE</td>
<td>FLARE RATE</td>
</tr>
<tr>
<td>70</td>
<td>10'</td>
<td>30 : 1</td>
</tr>
<tr>
<td>60</td>
<td>8</td>
<td>26 : 1</td>
</tr>
<tr>
<td>50</td>
<td>6.5'</td>
<td>21 : 1</td>
</tr>
<tr>
<td>40</td>
<td>5'</td>
<td>16 : 1</td>
</tr>
<tr>
<td>30</td>
<td>3.5'</td>
<td>13 : 1</td>
</tr>
</tbody>
</table>

SPECIFICATION REFERENCE
105
40A
502

CONCRETE MEDIAN BARRIER
TYPE I, II OR III

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. PIN AND CONNECTORS ARE TO BE ASTM A-36 REINFORCING STEEL BARS TO BE ASTM A 615, GRADE 60. ONE CONNECTOR PIN ASSEMBLY WITH EACH BARRIER SECTION.

2. THE CONNECTION PIN, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-111.

3. BEGINNING WITH THE JANUARY 2000 ADVERTISEMENT, ALL POSITIVE CONNECTIONS MUST BE APPROVED BY THE FHWA IN ACCORDANCE WITH NCHRP 350 TEST REQUIREMENTS.

WHEN USING VDOT STANDARD MB-7D PC WITH THE PIN AND LOOP POSITIVE CONNECTION, ALLOW FOR A 6'-0" DYNAMIC DEFLECTION. PROVIDE MIN. 60' OF BARRIER UPSTREAM AND DOWNSTREAM OF WORK ZONE FOR AND/ORAGE. FOR APPROVED NON-VDOT DESIGNS, REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR DEFLECTIONS AND ANCHORAGE.

PLAIN GALVANIZED STEEL WASHER FOR 1 1/4" PIN

PIN AND LOOP DETAILS

PRECAST CONCRETE MEDIAN BARRIER
POSITIVE CONNECTION OPTIONS

VIRGINIA DEPARTMENT OF TRANSPORTATION
NOTES:

1. MINIMUM COMpressive STRength of CONcrete AT tHe AGE OF 28 DAYS SHALL BE 4000 PSI.

2. All REinforcement SHalL CONform tO tO ASTM A615, Grade 60.

3. STANDard BARRIER SECTIONS SHall BE 12'-0" AS SHOWN OR 18'-0" SHORter SECTIONS SHall BE CAsed IN REquired LENGTHS AS tHE tOtAL LENGTH, tOGETHER WITH tHemmER SECTIONS SHall BE CAsed TO REquired DIMENSIONS IN tWO SEGments.

4. All EXPosed METAL SHall BE GALvANIZED FOR PERmanEnt LOCATIONS.

5. All EXPosed METAL SHall BE GALvANIZED FOR tEmPorary LOCATIONS.

6. t-LOk AS MANUfACTURED BY ROCKINGHAM PRECAST

7. BEginning wITH JAnuARY 2000, ADVERTISEMENT tHE tHelXiNg OF tHe tEI能把 tHE ReQuIRED tESTS wITH tHE tEI能把 tESt REQuIReMENTS.

8. REfER tO MANUfACTURER FOR tEmPorary iNSTALLATION tEinS.

WHEN USING t-LOk BARRIER, ALLOW FOR A 3'-0" DYNAmic DEFlection. PROVIDE tHeMMER 60' OF BARRIER uPSTREAM AND DOWNSWEEP OF tHE tHERMAL ZONE FOR ANCHORAGE.
NOTES:
1. MINIMUM COMpressive STRENGTH OF CONCRETE
   AT THE AGE OF 28 DAYS SHALL BE 4000 PSI
2. ALL REINFORCEMENT SHALL CONFORM TO
   TO ASTM A615, GRADE 60.
3. ALL EXPOSED METAL TO BE GALVANIZED FOR
   PERMANENT LOCATIONS.
4. ALL EXPOSED METAL SHALL BE GALVANIZED FOR
   TEMPORARY LOCATIONS.
5. J-J HOOK AS MANUFACTURED BY SMITH-MIDLAND.

J-J HOOK DETAILS
PRECAST CONCRETE MEDIAN BARRIER
POSITIVE CONNECTION OPTIONS

WHEN USING J-J HOOK BARRIER, ALLOW FOR A
4"-4" DYNAMIC DEFLECTION, PROVIDE A MIN.
69'-7" OF BARRIER UPSTREAM AND DOWN-
STREAM OF WORK ZONE FOR ANCHORAGE.
NOTES:

1. BASIS OF PAYMENT: TRAFFIC BARRIER SERVICE LATERAL SUPPORT WILL BE MEASURED AND PAID FOR IN UNITS OF EACH COMPLETE IN PLACE AND SHALL INCLUDE FURNISHING AND PLACING PRECAST CONCRETE BARRIERS (TBS CONCRETE) AND SAND BAGS, MAINTENANCE, REMOVAL WHEN NO LONGER NECESSARY, AND ALL MATERIALS, LABOR, TOOLS, EQUIPMENTS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

2. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE STANDARD MB-INS, SHEETS 501.59 - 501.61

3. FOR DIMENSIONS NOT SHOWN, REFER TO STD. MB-7D AND MB-10A

PLAN VIEW
METHOD A

PLAN OF POSITIVE CONNECTION

ELEVATION OF POSITIVE CONNECTION

BUTTING TRAFFIC BARRIER SERVICE TO SINGLE FACE PARAPET SERVICE

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/02
501.52
NOTES:

1. BASIS OF PAYMENT:
   TRAFFIC BARRIER SERVICE LATERAL SUPPORT WILL BE MEASURED AND PAID FOR IN UNITS OF EACH COMPLETE IN PLACE AND SHALL INCLUDE FURNISHING AND PLACING PRECAST CONCRETE BARRIERS (TBSC CONCRETE) AND SAND BAGS, MAINTENANCE, REMOVAL WHEN NO LONGER NECESSARY, AND ALL MATERIALS, LABOR, TOOLS, EQUIPMENTS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

2. FOR POSITIVE CONNECTION DETAILS AND DIMENSIONS SEE STANDARD MB INS, SHEETS 501.62 - 501.64.

3. FOR DIMENSIONS NOT SHOWN, REFER TO ST&D MB-70 AND MB-10A.
1. Holes, where shown, shall be formed with sleeves of 1/2" diameter nominal pipe.

2. Bolt lengths are to be established by the contractor and approved by the engineer. All bolts are to be 7/8" dia. hex head machine bolts with beveled washers and self-locking nuts.

3. For two-way traffic design, use run-on end transition (type I).

4. Run off (type II) guardrail to be used only when required for other reasons.

5. Cost of transition to be included in price bid per foot of traffic barrier service concrete.

6. These instructions applicable for temporary installation in construction zones only. Refer to standard SR-00A for instructions on permanent installation.
GENERAL NOTES - FENCING

FARM FENCE

BARBED WIRE

BARBED WIRE IS TO CONFORM TO ONE OF THE TYPES ALLOWED BY THE SPECIFICATIONS.

UNLESS OTHERWISE NOTED ON PLANS FOUR STRANDS WILL BE PROVIDED.

SPACING OF STRANDS SHOWN IS SUGGESTED ONLY. ANY OTHER SPACING APPROVED BY THE ENGINEER MAY BE USED.

WOOD POSTS

WOOD POSTS TO BE SQUARE CUT OR ROUND TO THE DIMENSIONS SHOWN ON THE DRAWINGS.

POSTS TOPS MAY BE FLAT OR CUT AT A 30° ANGLE.

FOR WOVEN WIRE FABRIC, STAPLES ARE TO BE USED AT TOP AND BOTTOM STRANDS AND AT A MINIMUM OF THREE INTERMEDIATE STRANDS PER POST.

ONE STAPLE PER STRAND IS TO BE USED FOR BARBED WIRE FENCE.

WHERE GATE, CORNER, OR BRACE POSTS FALL IN ROCK OR MARSHY AREAS THEY SHALL BE SET IN CLASS A3 OR CT CONCRETE.

METAL POSTS

METAL POSTS ARE TO BE ONE OF THE TYPES SHOWN ON THE STANDARD DRAWINGS AND CONFORMING TO THE SPECIFICATIONS.

AT EACH CORNER AND STRETCHER POST WIRE FABRIC IS TO BE CUT AND ALL HORIZONTAL STRANDS SECURELY WRAPPED AROUND POST.

BRACES ON CORNER, STRETCHER AND END POSTS ARE TO BE SECURED 1/8" FROM TOP OF POST WITH 1/2" BOLTS.

IN LIEU OF SETTING POSTS IN CONCRETE, MANUFACTURER'S ANCHORING DEVICES MEETING THE SPECIFICATION REQUIREMENTS MAY BE USED WHEN APPROVED BY THE ENGINEER.

BRACES

MAXIMUM SPACING BETWEEN BRACES TO BE 500'.

CORNER BRACES TO BE PROVIDED WHERE CORNER ANGLE IS 15° OR OVER.

LINE BRACES TO BE PROVIDED WHERE VERTICAL ALIGNMENT CHANGES 15° OR MORE AND WHERE SPACING REACHES 500'.

MISCELLANEOUS

FENCE IS TO BE LOCATED AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.

THE SIDE OF THE POST TO WHICH FABRIC IS TO BE ATTACHED WILL BE DETERMINED BY THE ENGINEER.

FENCE TO BE GROUNDED IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD FE-6 WHERE REQUIRED.

UNLESS SPECIFIED ON PLANS, THE CONTRACTOR WILL HAVE THE OPTION OF FURNISHING EITHER METAL OR WOOD POSTS. POSTS TYPES ARE NOT TO BE INTERMIXED ON ANY ONE INSTALLATION.

CHAIN LINK FENCE

WIRE FABRIC

WIRE FABRIC SHALL HAVE A 2" MESH.

MISCELLANEOUS

IN LIEU OF SETTING POSTS IN CONCRETE, MANUFACTURER'S ANCHORING DEVICES MEETING THE SPECIFICATION REQUIREMENTS MAY BE USED WHEN APPROVED BY THE ENGINEER.

FOR GATES EXCEEDING 6'-0" IN WIDTH ROLLED FORGED STEEL POST WILL NOT BE ALLOWED.

CHAIN LINK FENCE TO BE GROUNDED IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD FE-6, WHERE REQUIRED.
CORNER BRACE

LINE BRACE

LINE BRACE AT END LOCATION

WOOD POST

- 6"x6" CORNER POST
- 8'-0" WIRE TWISTED

#9 WIRE

- 6'-0" FE-W1
- 12'-0" FE-W2
- 6'-0" F6-W1

PAY LINES

(Exclusive of Fabric)

6'-0"

PAY LINES

(Exclusive of Fabric)

LINE POST

CONCRETE FOOTING

METAL POST

- 12'x2'x2' CONCRETE BLOCK
- 6'-0" STRETCHER POST

4 POINT BARBED WIRE

- 12'-0"
- 8'-0"

PAY LINES

(Exclusive of Fabric)

8'-0"

PAY LINES

(Exclusive of Fabric)

LINE POST

(See Detail Below)

If not otherwise noted dimensions and descriptions shown on one drawing apply to other details with the same post type.

NOTES:

- Line posts are to be of the types shown or equivalent meeting the approval of the engineer.
- All posts are to have a minimum weight of 125 lbs./ft.
- A minimum of five clamps for attaching fabric to post are to be included in cost of each line post.
- For use in lieu of setting posts in concrete, devices shown are representational only. See general notes.

METAL LINE POST

ALTERNATE ANCHOR DEVICES

STANDARD FENCE

WOVEN WIRE FABRIC

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

242
507
236
HEIGHT OF BRACE TO BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

TENSION WIRE #7 GAUGE GALVANIZED COIL SPRING WIRE STRETCHED TAUT.

ONE TENSION WIRE CLIP EACH LINE POST (#6 GAUGE).

ATTACH FENCE FABRIC TO TENSION WIRE WITH HOOP RINGS APPROPRIATELY.

END POST

2" MIN. 0.0
1" MIN. 0.0
GROUND LINE
CONCRETE FOOTING

#6 GAUGE WIRE CLAMPS TO BE USED TO ATTACH FABRIC TO "H" COLUMNS (6 PER POST.)

END/CORNER POST WITH TURNBUCKLE.
END, CORNER LINE OR BRACE POST.

3'-6"
3'-3"
3'-6"
3'-3"

CONCRETE FOOTING

1/2" MIN. ROUND ROD
VAR 3', 10', 12', 14'

GROUND LINE

LINE POST 10'-0"
LINE POST
TYPICAL SPACING BETWEEN ALL LINE POSTS.

10"
12"

END BRACE

5'-0"
5'-0"

MAXIMUM SPACING BETWEEN BRACES

ALTERNATE ANCHOR DEVICES MAY BE USED IN LIEU OF SETTING POST IN CONCRETE. DEVICES SHOWN ARE REPRESENTATIONAL ONLY. SEE GENERAL NOTES.

TYPICAL ATTACHMENT

PLUNGER BAR CATCH

TOP HINGE

ALTERNATE CORNER, END OR GATE POST (SEE DETAIL A)

ALTERNATE LINE POST

END, GATE OR CORNER POST WITH STRETCHER BAR ATTACHMENT

WIRE FABRIC TO BE WOVEN INTO LOCK LOOPS FOR ENTIRE LENGTH OF POST.

Fittings shown are suggested only. similar designs meeting the approval of the engineer may be used.

BOTTOM GATE CORNER & HINGE ATTACHMENT

LATCH FORK

ALTERNATE BRACE DETAIL A

NOTES:

GENERAL NOTES: FENCING FOR ADDITIONAL DETAILS AND INSTRUCTIONS.

A MOISTURE-EXCLUDING CAP IS REQUIRED ON TUBULAR POSTS.

MATERIAL FOR CAP SHALL CONFORM TO THE ALLOWABLE TYPES FOR OTHER LISTED FILINGS.

CORNER BRACE - TO BE USED WHEN HORIZONTAL ALIGNMENT CHANGES 15° OR MORE.

SEE END BRACE SHOWN ABOVE FOR BRACE DETAILS.
SUGGESTED HINGE ASSEMBLY

WOOD GATE
BRACES ARE TO BE BOLTED AT EXTREMITIES AND INTERSECTIONS WITH A MINIMUM OF (2) ¼" DIA. GALVANIZED BOLTS, NUTS, AND WASHERS. ALL OTHER POINTS OF CONTACT ARE TO BE NAILED FROM BOTH SIDES WITH A MINIMUM OF 3-100 GALVANIZED NAILS.

LUMBER FOR GATE IS TO BE ANY DRESSED, TRUE TYPE MEETING THE APPROVAL OF THE ENGINEER IT IS TO BE TREATED WITH PRESERVATIVES OTHER THAN CREOSOTE.

WOOD GATE IS TO HAVE 2 COATS OF EXTERIOR WHITE PAINT UNLESS OTHERWISE DIRECTED BY THE ENGINEER. PAINT IS TO MEET THE REQUIREMENTS OF T-E CURRENT ROAD AND BRIDGE SPECIFICATIONS.

METAL GATE

GATE FRAME AND CENTER BRACE TO BE TO THE DIMENSIONS SHOWN ON THE DRAWING EXCEPT THAT A 3'-6" WIDTH GATE CAN HAVE A MINIMUM 1' FRAME WITH NO CENTER BRACE.

GATE IS TO BE HOT DIPPED GALVANIZED OR ELECTROPLATE GALVANIZED IN ACCORDANCE WITH ASTM A-164 TYPE GS.

GATE FABRIC IS TO BE ALL #11 GAUGE EXCEPT TOP AND BOTTOM STRANDS WHICH ARE TO BE #9 VERTICAL STRANDS ARE TO BE SPACED 6" APART.

MISCELLANEOUS

IF LOCATIONS OF GATES ARE NOT SPECIFIED ON PLANS, THEY ARE TO BE ERECTED AT THE SITES DESIGNATED BY THE ENGINEER.

GATE HINGE AND LATCH ASSEMBLIES MAY BE OF ANY TYPE MEETING THE APPROVAL OF THE ENGINEER, EXCEPT THAT ALL HINGES ARE TO BE OF A BOLT-THROUGH TYPE. ALL FITTINGS ARE TO BE HOT DIPPED GALVANIZED.

ANY COMBINATION OF GATE AND FENCE TYPES MEETING THE APPROVAL OF THE ENGINEER WILL BE ACCEPTABLE AND IS NOT LIMITED TO THE EXAMPLES SHOWN HEREBAL.

WHERE WOOD GATE POSTS FALL IN ROCK OR MARSHY AREAS THEY ARE TO BE SET IN CLASS A3 OR C1 CONCRETE.

SPECIFICATION REFERENCE
242
507
236

STANDARD FENCE GATES
VIRGINIA DEPARTMENT OF TRANSPORTATION 502.05
METHOD OF FASTENING FILLER BOARDS TO ANGLE IRON FRAME (TYPE I, TYPE II & TYPE III)

2 BOLT ASSEMBLIES TO BE USED AT EACH INTERSECTION POINT OF FILLER BOARDS AND ANGLE IRON FRAME.

NOTES:
- WATER GATES MAY BE USED WITH STANDARD FF-W1, FF-W2 OR FF-B FENCE.
- GATE IS TO BE FABRICATED TO CONFORM TO INDIVIDUAL CHANNEL REQUIREMENTS.
- WOOD FILLER BOARDS TO BE 1 TREATED PINE BOLTED TO FRAME. SMOOTH WOOD SIDE TO FACE UPSTREAM.
- TYPE I GATE IS TO HAVE TWO 6" END POSTS AS SPECIFIED FOR THE TYPE OF FENCE USED. THE ADJACENT TO END POST AND BRACING MAY BE ELIMINATED.
- TYPE III GATE IS TO HAVE TWO 6" END POSTS, ADJACENT TO END POSTS, BRACING, ETC. AS SPECIFIED FOR THE TYPE OF FENCE USED.

WATER GATES IN FENCE LINES

502.06

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

242
507
236
NOTES:
APPROXIMATE MATERIALS PER INSTALLATION:
1-3/4" DIAMETER 9 FT. 0" LONG COPPER CLAD GROUNDING ELECTRODE,
1 GROUNDING ELECTRODE CLAMP
1-7/0' #6 AWG SOLID COPPER CONDUCTOR
3* COMPRESSION CONNECTORS (SUITABLE FOR COPPER AND ALUMINUM)

* MINIMUM 3 CONNECTORS FOR 47" FENCE FABRIC TO BE SECURED TO TOP, BOTTOM AND ONE INTERMEDIATE HORIZONTAL WIRE STRAND. ONE ADDITIONAL CONNECTOR TO BE FURNISHED FOR EACH STRAND OF BARBED WIRE.

ON BARBED WIRE INSTALLATIONS, ONE CONNECTOR IS TO BE FURNISHED FOR EACH STRAND.

GROUNDING CONDUCTOR IS TO BE IN CONTACT WITH HORIZONTAL WIRE OF FENCE BY COMPRESSION CONNECTORS AS SHOWN.

GROUNDING ELECTRODE TO BE LOCATED ON POST SIDE OF FENCE AND AS CLOSE AS POSSIBLE TO POST AND FENCE.

UNLESS OTHERWISE CALLED FOR IN THE PLANS OR DIRECTED BY THE ENGINEER, FENCE GROUNDING WILL BE REQUIRED FOR METAL FENCES INCLUDING PLASTIC COATED FENCE FABRIC AT THE FOLLOWING LOCATIONS:

- WHEN HIGH VOLTAGE LINES CROSS ABOVE THE FENCE, GROUNDING SYSTEMS SHALL BE INSTALLED 50' BEYOND THE OVERHEAD CROSSING POINT OF THE OUTER MOST CONDUCTORS OF THE HIGH VOLTAGE LINES.

- WHEN THE HIGH VOLTAGE LINES ARE PARALLEL TO AND WITHIN 50' HORIZONTALLY OF THE FENCE, GROUNDING SYSTEMS SHALL BE INSTALLED AT 50' INTERVALS ALONG THE PARALLEL SECTIONS OF FENCE AND HIGH VOLTAGE LINES.

COST FOR FURNISHING AND PLACING ALL GROUNDING MATERIALS IS TO BE INCLUDED IN PRICE PER LINEAR FOOT OF FENCE.

DETAILS SHOWN HEREIN ARE TO APPLY TO ALL METAL FENCES AND HANDRAILS. FENCES WILL BE GROUNDED ONLY WHEN INDICATED ON THE PLANS OR AS RECOMMEND BY THE ENGINEER.

DETAIL FOR GROUNDING STEEL POST OF CHAIN LINK FENCE & HANDRAIL (HR-1)

STANDARD METHOD OF FENCE & HANDRAIL GROUNDING

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV 7/04

502.07
4 #3 STEEL RODS 1/2" LONG
3-0" LONG

MINIMUM CLEARANCE 1" GROUND LINE

REINFORCEMENT TO BE #3 STEEL RODS, SECURELY HELD IN CAGES BY SPOT WELDED W 9 WIRES ATTACHED TO ALL BARS APPROXIMATELY 8" FROM EACH END TO INSURE PROPER PLACING.

CENTER OF BACK OF MONUMENT TO BE CORRECT FOR STATION AND ALIGNMENT.

NOTES:
THE LETTERS "VDOT" ARE TO BE INDENTED IN THE TOP OF EACH RIGHT-OF-WAY MONUMENT, IN ENTRANCES AND YARDS WHERE THE MONUMENT WOULD BE UNSIGHTLY, THEY MAY BE SET WITH THE TOP FLUSH WITH THE GROUND.

ALTERNATE METHODS OF PLACING WIRES

- WIRES ON ALL 4 SIDES WELDED TO ALL 4 BARS.
- WIRES ON 3 SIDES WELDED TO ALL 4 BARS.

ALL LETTERING TO BE 1/2" STANDARD FOUNDRY LETTERS.

GUARD STAKE

HUB TO BE ACCURATELY SET BY SURVEY PARTY.

BEFORE HUB IS DISTURBED IN SETTING MONUMENTS FOUR LINER STAKES ARE TO BE SET SO THAT TWO LINES STRETCHED BETWEEN STAKES WILL INTERSECT EXACTLY OVER TACK IN HUB TOPS OF STAKES TO BE MORE THAN 9" ABOVE GROUND AT MONUMENT.

RIGHT-OF-WAY MONUMENTS

NOTES:
RIGHT-OF-WAY MONUMENTS ARE TO BE PLACED AT ALL P.G.'S AND P.T.'S AND AT INTERVALS ON TANGENTS SO AS TO BE VISIBLE FROM EACH, BUT NOT MORE THAN 2500' APART, AND AT ALL BREAKS IN THE RIGHT-OF-WAY LINE. IN THE CASE OF SLOPES ACQUIRED AS EASEMENT, THE MONUMENTS ARE TO BE SET ON NORMAL RIGHT-OF-WAY LINES.

RIGHT-OF-WAY MONUMENTS ARE TO BE SET PLUMB.

STANDARD PLAN AND METHOD OF SETTING RIGHT-OF-WAY MONUMENTS

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE

503.01
CAP TO BE SET FLUSH WITH GROUND LINE

1 1/8" OR 1 1/8"

STEEL PIN OR REINFORCING BAR
3/8" DIAMETER FOR USE WITH METAL CAPS.
3/4" DIAMETER FOR USE WITH PLASTIC CAPS.

LANDOWNER SIDE

R/W LINE

HIGHWAY SIDE

NOTES:

LOCATOR POST TO BE U-TYPE ROLLED
CHAR STEEL @ 2 LBS./FT., OR ALUMINUM
ALLOY 6063-T6 @ 0.78 LBS./FT., IN
ACCORDANCE WITH THE SPECIFICATIONS.

STEEL POSTS TO BE GALVANIZED IN
ACCORDANCE WITH ASTM A123.

LOCATOR POST AND PIN TO BE SET BY THE
SURVEY PARTY AT THE TIME OF ORIGINAL STAKING.

PIN TO BE ACCURATELY SET BY SURVEY PARTY
AND CAP PUNCHED TO INDICATE R/W LINE.

NOTES:

RIGHT-OF-WAY MONUMENTS ARE TO BE PLACED AT ALL P.O.'S
AND P.T.'S AND AT INTERVALS ON TANGENTS SO AS TO BE
VISIBLE FROM EACH, BUT NOT MORE THAN 2500' APART, AND
AT ALL BREAKS IN THE RIGHT-OF-WAY LINES. IN THE CASE OF
SLOPES ACQUIRED AS EASEMENT, THE MONUMENTS ARE
TO BE SET ON NORMAL RIGHT-OF-WAY LINES.

RIGHT-OF-WAY MONUMENTS ARE TO BE SET PLUMB.