

**MDSHA BOOK OF STANDARD**

**FOR HIGHWAYS, INCIDENTAL STRUCTURES AND TRAFFIC CONTROL APPLICATIONS**

STANDARD NUMBERS	DESCRIPTION	Dates	
		MDSHA	FHWA
	<b><i>CATEGORY "6" SHOULDERS</i></b>		
<i>MD 605.01</i>	<i>TRAFFIC BARRIER W-BEAM BURIED-IN-BACKSLOPE END TREATMENT (TYPE A) WITH BOTTOM RAIL</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.01-01</i>	<i>TRAFFIC BARRIER W-BEAM BURIED-IN-BACKSLOPE END TREATMENT (TYPE A) WITH BOTTOM RAIL</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.01-02</i>	<i>TRAFFIC BARRIER W-BEAM BURIED-IN-BACKSLOPE END TREATMENT (TYPE A) WITH BOTTOM RAIL</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.01-03</i>	<i>TRAFFIC BARRIER W-BEAM BURIED-IN-BACKSLOPE END TREATMENT (TYPE A) - ANCHORAGE</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.03</i>	<i>TRAFFIC BARRIER W-BEAM ONE-SIDED PARALLEL END TREATMENT (TYPE C)</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.04</i>	<i>SHOULDER GRADING ADJUSTMENT FOR TRAFFIC BARRIER END TREATMENTS (3 R TYPE WORK)</i>	<i>09/20/19</i>	<i>08/15/19</i>
<i>MD 605.10</i>	<i>TRAFFIC BARRIER W-BEAM ONE-SIDED DOWNSTREAM END TREATMENT (TYPE K)</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.10-01</i>	<i>TRAFFIC BARRIER W-BEAM ONE-SIDED DOWNSTREAM END TREATMENT (TYPE K) DETAILS</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.12</i>	<i>TRAFFIC BARRIER TWO-SIDED END TREATMENT AND CRASH CUSHION (TYPES D, E, F, AND J)</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.13</i>	<i>TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE (TYPE L)</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.14</i>	<i>TRAFFIC BARRIER END TREATMENT AND CRASH CUSHION DELINEATION</i>	<i>09/20/19</i>	<i>08/15/19</i>
<i>MD 605.21</i>	<i>OFFSET BLOCK</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.22</i>	<i>TRAFFIC BARRIER W-BEAM SINGLE FACE</i>	<i>01/09/20</i>	<i>12/23/19</i>
<i>MD 605.23</i>	<i>TRAFFIC BARRIER W-BEAM, W-BEAM SPLICES AND OFFSET BLOCK</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.23-01</i>	<i>TRAFFIC BARRIER W-BEAM METAL POST</i>	<i>01/09/20</i>	<i>12/23/19</i>
<i>MD 605.26</i>	<i>TRAFFIC BARRIER W-BEAM LONG SPAN SYSTEM</i>	<i>04/09/25</i>	<i>04/03/25</i>

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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
<i>MD 605.27</i>	<i>TRAFFIC BARRIER W BEAM BARRICADE</i>	<i>03/31/20</i>	<i>03/30/20</i>
<i>MD 605.28</i>	<i>TRAFFIC BARRIER W-BEAM DOUBLE FACED MEDIAN BARRIER</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.28-01</i>	<i>TRAFFIC BARRIER W-BEAM DOUBLE FACED MEDIAN BARRIER WITH BOTTOM RAIL</i>	<i>04/09/25</i>	<i>04/03/25</i>
<i>MD 605.29</i>	<i>TRAFFIC BARRIER THRIE-BEAM SINGLE FACE</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.30</i>	<i>TRAFFIC BARRIER THRIE-BEAM DOUBLE FACE</i>	<i>03/31/20</i>	<i>03/30/20</i>
<i>MD 605.31</i>	<i>TRAFFIC BARRIER W-BEAM PLACEMENT DETAILS</i>	<i>01/09/20</i>	<i>12/23/19</i>
<i>MD 605.31-01</i>	<i>TRAFFIC BARRIER W-BEAM STIFFENING DETAILS</i>	<i>01/09/20</i>	<i>12/23/19</i>
<i>MD 605.32</i>	<i>TRAFFIC BARRIER W-BEAM FLARE RATES AND HEIGHT TRANSITION</i>	<i>12/21/17</i>	<i>12/20/17</i>
<i>MD 605.41</i>	<i>TRAFFIC BARRIER THRIE-BEAM ANCHORAGE TO VERTICAL FACE</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.41-01</i>	<i>TRAFFIC BARRIER THRIE-BEAM ANCHORAGE TO VERTICAL FACE AFTER 3" OVERLAY</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.41-02</i>	<i>TRAFFIC BARRIER TERMINAL CONNECTOR AND W- BEAM TO THRIE-BEAM TRANSITION SECTION</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.43</i>	<i>TRAFFIC BARRIER THRIE-BEAM ANCHORAGE TO F-SHAPE OR SINGLE SLOPE</i>	<i>06/27/23</i>	<i>06/21/23</i>
<i>MD 605.44</i>	<i>TRAFFIC BARRIER W-BEAM ANCHORAGE TO TRAIL END OF JERSEY SHAPE OR F SHAPE</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.45</i>	<i>TRAFFIC BARRIER THRIE-BEAM ANCHORAGE TO VERTICAL FACE DOWNSTREAM</i>	<i>03/16/22</i>	<i>02/24/22</i>
<i>MD 605.52</i>	<i>TRAFFIC BARRIER W BEAM, SHORT RADIUS</i>	<i>04/12/16</i>	<i>03/14/16</i>
<i>MD 605.52-01</i>	<i>TRAFFIC BARRIER W BEAM, SHORT RADIUS POST AND SOIL PLATE</i>	<i>04/12/16</i>	<i>03/14/16</i>
<i>MD 605.52-02</i>	<i>TRAFFIC BARRIER W BEAM, SHORT RADIUS HARDWARE AND DETAILS</i>	<i>04/12/16</i>	<i>03/14/16</i>
<i>MD 615.01</i>	<i>STANDARD ASPHALT CURB</i>	<i>06/22/17</i>	<i>06/06/17</i>
<i>MD 620.02</i>	<i>STANDARD TYPES A &amp; B CONCRETE CURB AND COMBINATION CONCRETE CURB &amp; GUTTER</i>	<i>02/25/16</i>	<i>02/23/16</i>

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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
<i>MD 620.02-01</i>	<i>STANDARD TYPES C AND D CONCRETE CURB AND COMBINATION CONCRETE CURB &amp; GUTTER</i>	<i>02/25/16</i>	<i>02/23/16</i>
<i>MD 620.03</i>	<i>DEPRESSED CURB FOR COMBINATION CURB AND GUTTER AND DEPRESSED CURB FOR SIDEWALK RAMPS</i>	<i>02/25/16</i>	<i>02/23/16</i>
<i>MD 630.01</i>	<i>STANDARD ENTRANCE CONSTRUCTION RESIDENTIAL &amp; COMMERCIAL METHOD NO. 1</i>	<i>06/14/16</i>	<i>06/08/16</i>
<i>MD 630.02</i>	<i>STANDARD ENTRANCE CONSTRUCTION RESIDENTIAL &amp; COMMERCIAL METHOD NO. 2</i>	<i>06/14/16</i>	<i>06/08/16</i>
<i>MD 630.03</i>	<i>STANDARD ENTRANCE CONSTRUCTION RESIDENTIAL &amp; COMMERCIAL METHOD NO. 3</i>	<i>06/14/16</i>	<i>06/08/16</i>
<i>MD 634.04</i>	<i>PRECAST CONCRETE WHEEL STOPS</i>	<i>06/20/07</i>	<i>08/01/84</i>
<i>MD 635.01</i>	<i>MAILBOX PLACEMENT DETAILS</i>	<i>02/10/04</i>	<i>03/31/04</i>
<i>MD 635.02</i>	<i>SINGLE AND DOUBLE MAILBOX ASSEMBLIES TYPE A</i>	<i>02/10/04</i>	<i>03/31/04</i>
<i>MD 635.03</i>	<i>SINGLE AND DOUBLE MAILBOX ASSEMBLIES TYPE B</i>	<i>02/10/04</i>	<i>03/31/04</i>
<i>MD 640.01</i>	<i>STANDARD CURB OPENING DETAILS FOR CONCRETE CURB</i>	<i>10/01/01</i>	<i>08/01/84</i>
<i>MD 640.02</i>	<i>STANDARD CURB OPENING DETAILS FOR COMBINATION CURB &amp; GUTTER</i>	<i>10/01/01</i>	<i>08/01/84</i>
<i>MD 645.01</i>	<i>STANDARD MONOLITHIC CONCRETE MEDIAN TYPE 'A'</i>	<i>02/25/16</i>	<i>02/23/16</i>
<i>MD 645.02</i>	<i>STANDARD MONOLITHIC CONCRETE MEDIAN TYPE 'B'</i>	<i>02/25/16</i>	<i>02/23/16</i>
<i>MD 645.03</i>	<i>STANDARD MONOLITHIC CONCRETE MEDIAN TYPE 'C'</i>	<i>02/25/16</i>	<i>02/23/16</i>
<i>MD 648.01</i>	<i>CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 1 (WITH EARTH BACKING IN FILL)</i>	<i>10/01/01</i>	<i>03/28/01</i>
<i>MD 648.02</i>	<i>CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 2 (FREE STANDING IN FILL)</i>	<i>10/01/01</i>	<i>03/28/01</i>
<i>MD 648.03</i>	<i>CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)</i>	<i>02/10/04</i>	<i>03/31/04</i>

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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
MD 648.03-01	<i>PREFABRICATED LONGITUDINAL EDGE DRAIN FOR CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 3</i>	10/01/01	03/28/01
MD 648.04	<i>CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT</i>	10/01/01	03/28/01
MD 648.05	<i>DIAGONAL BAR LOCATION FOR CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE</i>	10/01/01	03/28/01
MD 648.06	<i>CONDUIT AND JUNCTION BOX LOCATION FOR CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE ALL TYPES</i>	10/01/01	03/28/01
MD 648.10	<i>CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE END TRANSITION</i>	10/01/01	03/28/01
MD 648.12	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE A</i>	10/01/01	03/28/01
MD 648.13	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE B</i>	10/01/01	03/28/01
MD 648.14	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE C</i>	10/01/01	03/28/01
MD 648.15	<i>DIAGONAL BAR LOCATION FOR CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER</i>	10/01/01	03/28/01
MD 648.18	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER END TRANSITION</i>	10/01/01	03/28/01
MD 648.20	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE D</i>	10/01/01	03/28/01
MD 648.24	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE E</i>	02/10/04	03/31/04
MD 648.26	<i>CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE E CONTRACTION AND EXPANSION JOINTS</i>	10/01/01	03/28/01
MD 648.33-04	<i>42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER END TRANSITION</i>	11/08/06	10/25/06



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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
MD 648.44	42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.44-01	42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 0 FEET 0 INCH TO 1 FOOT 6 INCHES	06/27/24	05/22/24
MD 648.44-02	42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 1 FOOT 6 INCHES TO 4 FEET 0 INCHES	06/27/24	05/22/24
MD 648.44-03	42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 4 FEET 0 INCHES TO 8 FEET 0 INCHES	02/10/04	03/31/04
MD 648.44-04	DIAGONAL BAR FOR SLIP FORMED DOUBLE FACED CONCRETE MEDIAN TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.44-05	42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 4 FEET 0 INCHES TO 8 FEET 0 INCHES CONTRACTION AND EXPANSION JOINTS	10/01/01	03/28/01
MD 648.45	34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 (WITH EARTH BACKING IN FILL)	06/27/23	06/21/23
MD 648.46	34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 (FREE STANDING IN FILL)	06/27/23	06/21/23
MD 648.47	34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)	06/27/23	06/21/23
MD 648.47-01	ALTERNATE PREFABRICATED LONGITUDINAL EDGE DRAIN FOR CONCRETE TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.48	34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT	06/27/23	06/21/23
MD 648.49	DIAGONAL BAR FOR SLIP FORMED SINGLE FACE CONCRETE TRAFFIC BARRIER	06/27/23	06/21/23

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STANDARD NUMBERS	DESCRIPTION	Dates	
		MDSHA	FHWA
	<b><i>CATEGORY "6" SHOULDERS</i></b>		
MD 648.50	CONDUIT AND JUNCTION BOX LOCATION FOR 34 INCH AND 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE	06/27/23	06/21/23
MD 648.50-01	CONDUIT AND JUNCTION BOX LOCATION FOR 34 INCH AND 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.50-02	CONDUIT AND JUNCTION BOX LOCATION FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE	06/27/23	06/21/23
MD 648.50-03	CONDUIT AND JUNCTION BOX LOCATION FOR 42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.50-04	JUNCTION BOX LOCATION ADDITIONAL REINFORCEMENT DETAIL	06/27/23	06/21/23
MD 648.51	34 INCH AND 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE END TRANSITION	10/01/01	03/28/01
MD 648.52	42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 (WITH EARTH BACKING IN FILL)	06/27/23	06/21/23
MD 648.53	42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 (FREE STANDING IN FILL)	06/27/23	06/21/23
MD 648.54	42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)	06/27/23	06/21/23
MD 648.55	42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT	06/27/23	06/21/23
MD 648.56	42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER	06/27/23	06/21/23
MD 648.56-01	42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 0 FEET 0 INCHES TO 1 FEET 6 INCHES	06/27/24	06/22/24

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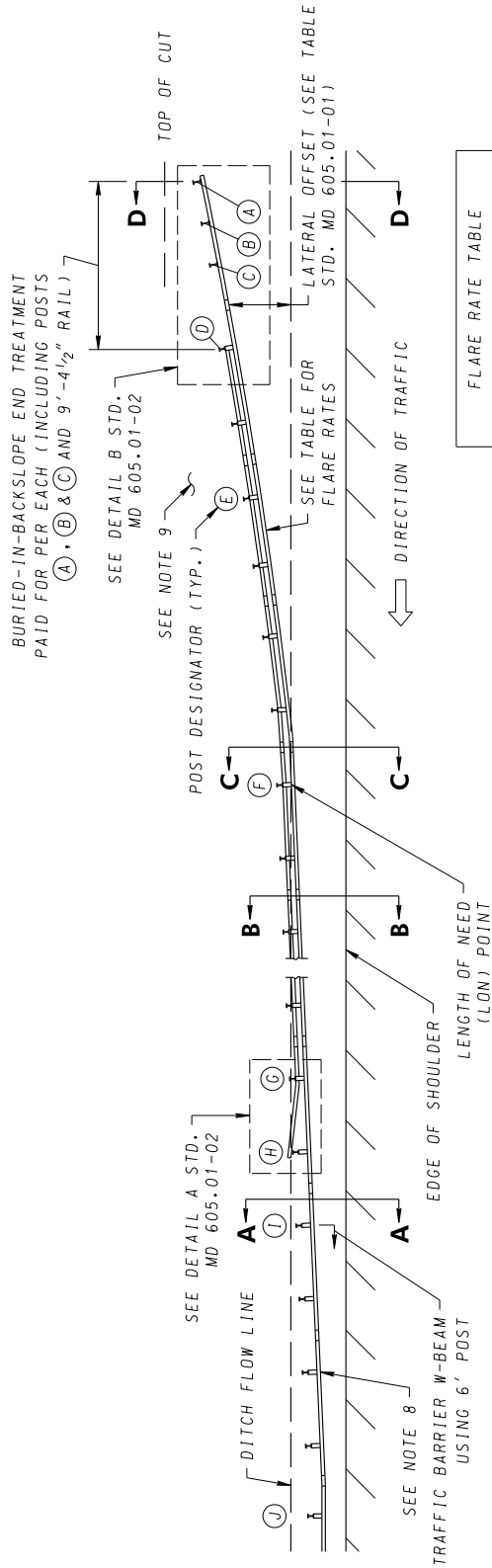
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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
MD 648.56-02	42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 1 FEET 6 INCHES TO 4 FEET 0 INCHES	06/27/24	06/22/24
MD 648.57	42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 (WITH EARTH BACKING IN FILL)	06/27/23	06/21/23
MD 648.58	42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 (FREE STANDING IN FILL)	06/27/23	06/21/23
MD 648.59	42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)	06/27/23	06/21/23
MD 655.01	SIDEWALK EXPANSION JOINTS	10/01/01	06/09/64
MD 655.02	SIDEWALK PASSING ZONES	02/10/04	03/31/04
MD 655.11	SIDEWALK RAMPS PERPENDICULAR	06/02/14	05/20/14
MD 655.12	SIDEWALK RAMPS PARALLEL	06/02/14	05/20/14
MD 655.13	SIDEWALK RAMPS COMBINATION	06/02/14	05/20/14
MD 655.21	CUT-THROUGH MEDIAN AND ISLAND OPENINGS	06/02/14	05/20/14
MD 655.22	RAMPED MEDIAN AND ISLAND OPENINGS	06/02/14	05/20/14
MD 655.30	REST AREA PARKING FOR PERSONS WITH DISABILITIES	08/05/16	08/03/16
MD 655.40	DETECTABLE WARNING SURFACES	04/17/06	04/05/06
MD 657.00	STANDARD STAIRWAYS	09/06/07	02/27/85
MD 665.01	POST MOUNTED DELINEATORS	11/08/06	10/25/06
MD 665.02	BARRIER MARKERS	11/08/06	10/25/06
MD 665.03	PLACEMENT OF DELINEATORS	11/08/06	10/25/06
MD 665.04	PLACEMENT OF DELINEATORS AND MARKERS	08/12/02	09/04/02
MD 665.05	ACCEL/DECEL LANE DELINEATION	11/08/06	10/25/06

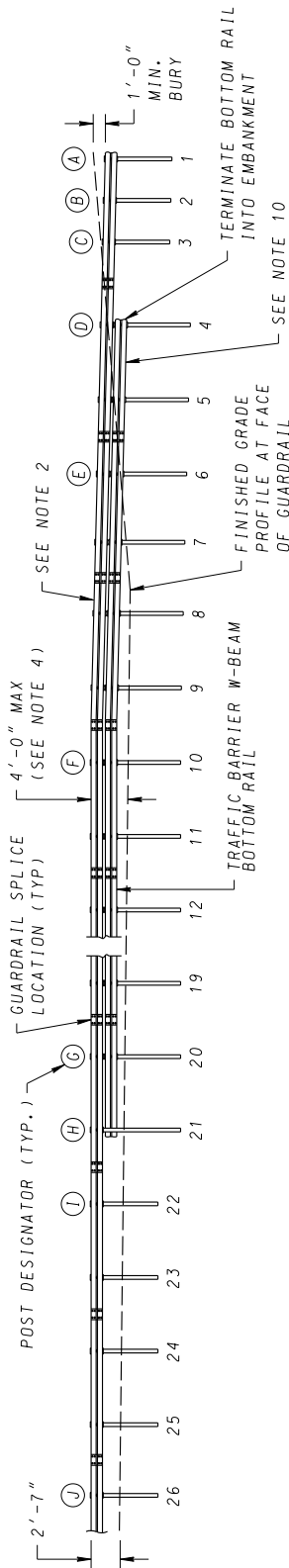
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	<b><i>CATEGORY "6" SHOULDERS</i></b>		
<i>MD 665.06</i>	<i>RAMP DELINEATION</i>	<i>11/08/06</i>	<i>10/25/06</i>
<i>MD 670.00</i>	<i>LOCATION OF SHOULDER RUMBLE STRIPS</i>	<i>05/23/17</i>	<i>04/14/17</i>
<i>MD 670.01</i>	<i>LOCATION OF SHOULDER RUMBLE STRIPS AT CRITICAL LOCATIONS</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 670.02</i>	<i>OUTSIDE SHOULDER RUMBLE STRIP DETAILS TYPICAL LAYOUT</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 670.03</i>	<i>INSIDE SHOULDER RUMBLE STRIP DETAILS TYPICAL LAYOUT</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 670.04</i>	<i>RUMBLE STRIPE DETAILS TYPICAL LAYOUT</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 670.05</i>	<i>SHOULDER RUMBLE STRIP AND RUMBLE STRIPE DETAILS</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 670.06</i>	<i>CENTERLINE RUMBLE STRIP DETAILS AND TYPICAL LAYOUT</i>	<i>05/23/17</i>	<i>03/24/17</i>
<i>MD 690.01</i>	<i>CHAIN LINK FENCE TYPICAL 5 FT. RURAL 6 FT. &amp; 8 FT.</i>	<i>10/01/01</i>	<i>10/10/89</i>
<i>MD 690.02</i>	<i>CHAIN LINK FENCE AT GRADE CHANGES &amp; DEPRESSIONS</i>	<i>10/01/01</i>	<i>04/23/85</i>
<i>MD 690.03</i>	<i>4'-0" FARM TYPE FENCE</i>	<i>08/05/08</i>	<i>07/28/08</i>
<i>MD 690.11</i>	<i>CHAIN LINK FENCE BRACE &amp; ROD ATTACHMENTS-ROUND CONSTRUCTION</i>	<i>10/01/01</i>	<i>08/01/94</i>
<i>MD 690.12</i>	<i>CHAIN LINK FENCE BRACE &amp; ROD ATTACHMENTS-SQUARE CONSTRUCTION</i>	<i>10/01/01</i>	<i>09/14/71</i>
<i>MD 690.21</i>	<i>CHAIN LINK FENCE DRIVE ANCHOR AND POST ATTACHMENT AT BRIDGE</i>	<i>10/01/01</i>	<i>04/23/85</i>
<i>MD 690.23</i>	<i>CHAIN LINK FENCE DOUBLE DRIVE ANCHOR AND DITCH TREATMENT</i>	<i>10/01/01</i>	<i>08/01/84</i>
<i>MD 690.24</i>	<i>CHAIN LINK FENCE DRIVE ANCHOR SHOE ASSEMBLY</i>	<i>10/01/01</i>	<i>08/01/84</i>
<i>MD 692.01</i>	<i>CHAIN LINK FENCE GATE DETAILS</i>	<i>10/01/01</i>	<i>04/03/85</i>



**PLAN VIEW**



**ELEVATION VIEW**

**NOTES**

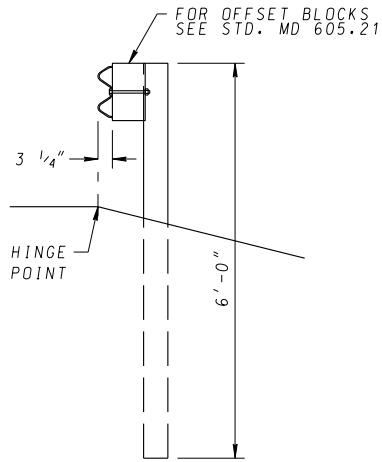
1. POSTS D THROUGH H SHALL BE 8' LONG. POSTS A THROUGH C SHALL BE 6' LONG.
2. TAPER RAIL HEIGHT 16" STARTING AT POST F AND ENDING AT POST A TO ACHIEVE A MINIMUM OF 12" SOIL COVERAGE AT POST A.
3. OFFSET BLOCKS ARE NOT USED FOR THE TRAFFIC BARRIER W-BEAM BOTTOM RAIL.
4. MAINTAIN HEIGHT OF TOP RAIL ON THE FRONT SLOPE RELATIVE TO EDGE OF SHOULDER UNTIL A MAXIMUM HEIGHT OF 48" ABOVE GROUND IS REACHED.
5. THE SLOPE BACK FILL MATERIAL SHALL BE COMPACTED FIRMLY TO THE ESTABLISHED SLOPE AND STABILIZED AS DIRECTED BY THE ENGINEER.
6. LOW SPEED INSTALLATIONS REQUIRE 50 FEET (MINIMUM) LON.
7. TOP RAIL AND POSTS PAID FOR PER LINEAR FOOT OF "TRAFFIC BARRIER W-BEAM USING 8' POST" (FROM POST H TO POST D), BOTTOM RAIL PAID FOR PER LINEAR FOOT OF "TRAFFIC BARRIER W-BEAM PANEL (FROM POST H TO POST D)". THE BURIED-IN-BACKSLOPE END TREATMENT (INCLUDING POSTS A-C AND 9'-4 1/2" RAIL SECTION) PAID FOR PER EACH.
8. EXTEND THE "TRAFFIC BARRIER W-BEAM USING 6' POSTS" AT A 13:1 OR FLATTER FLARE RATE FROM POST I TO POST J, WHERE THE TRAFFIC BARRIER W-BEAM RUN IS PARALLEL TO THE SHOULDER. FIELD BEND THE TRAFFIC BARRIER W-BEAM RAIL ELEMENT TO TRANSITION FROM THE 13:1 FLARE TO PARALLEL TO THE SHOULDER AT POST J.
9. PROVIDE A 20' x 75' OBJECT FREE AREA WHEN BACKSLOPES ARE FLATTER THAN 2:1.
10. THE BOTTOM RAIL MAY BE OMITTED WHEN THE DISTANCE BETWEEN THE GROUND AND THE BOTTOM OF THE UPPER RAIL IS LESS THAN 18 INCHES AND THE SLOPE BETWEEN THE EDGE OF ROAD AND RAIL IS 10:1 OR FLATTER.

SPECIFICATION	CATEGORY CODE ITEMS	
605		
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	SHA	FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	11-10-99	APPROVAL 7-2-99
REVISED	9-20-19	REVISED 8-15-19
REVISED	3-31-20	REVISED 3-30-20
REVISED	4-9-25	REVISED 4-3-25

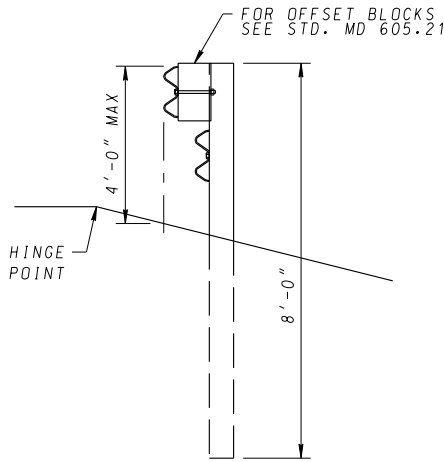
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
BURIED-IN-BACKSLOPE END TREATMENT  
(TYPE A) WITH BOTTOM RAIL**

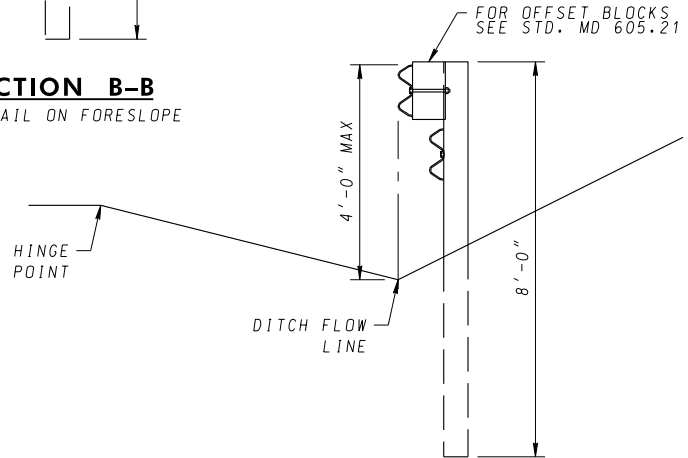
STANDARD NO. **MD 605.01**



**SECTION A-A**  
TYPICAL SECTION AT POST 1.  
FACE OF GUARDRAIL FLUSH WITH  
SHOULDER HINGE POINT



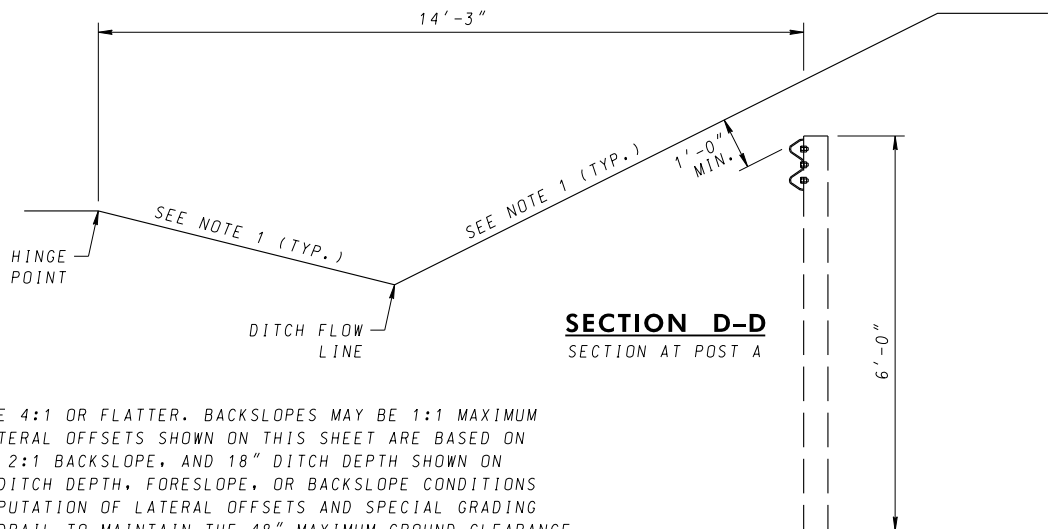
**SECTION B-B**  
GUARDRAIL ON FORESLOPE



**SECTION C-C**  
SECTION AT POST F  
FACE OF GUARDRAIL ALIGNED  
WITH CENTER OF DITCH

LATERAL OFFSET TABLE	
POST DESIGNATOR	OFFSET*
A	14'-3"
D	11'-2 1/4"
E	9'-1 1/2"
F	6'-0 1/4"
I	3 1/4"

\*LATERAL OFFSET IS MEASURED FROM THE DITCH FLOW LINE TO THE BACK OF GUARDRAIL. THESE OFFSETS APPLY ONLY FOR THE FORESLOPE AND BACKSLOPE CONDITIONS SHOWN ON THIS SHEET. FOR OTHER FORESLOPE OR BACKSLOPE CONDITIONS, THESE OFFSETS NEED TO BE RECOMPUTED.



**SECTION D-D**  
SECTION AT POST A

**NOTE**

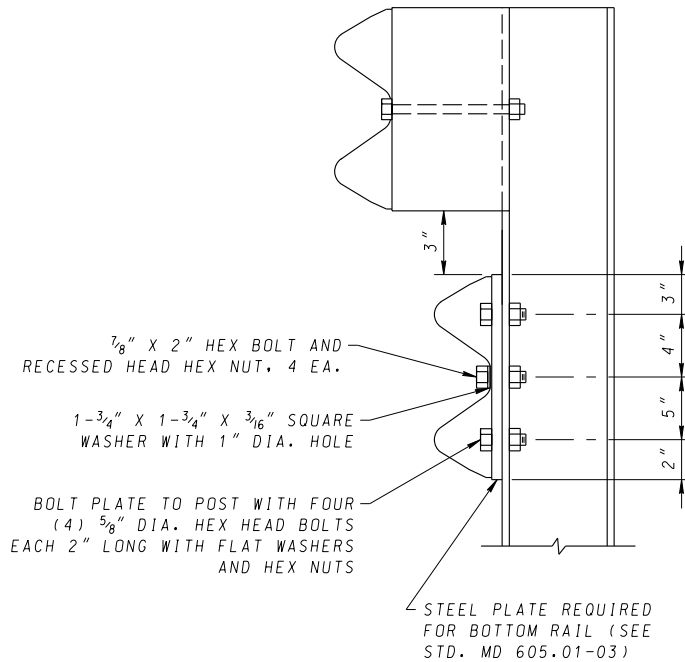
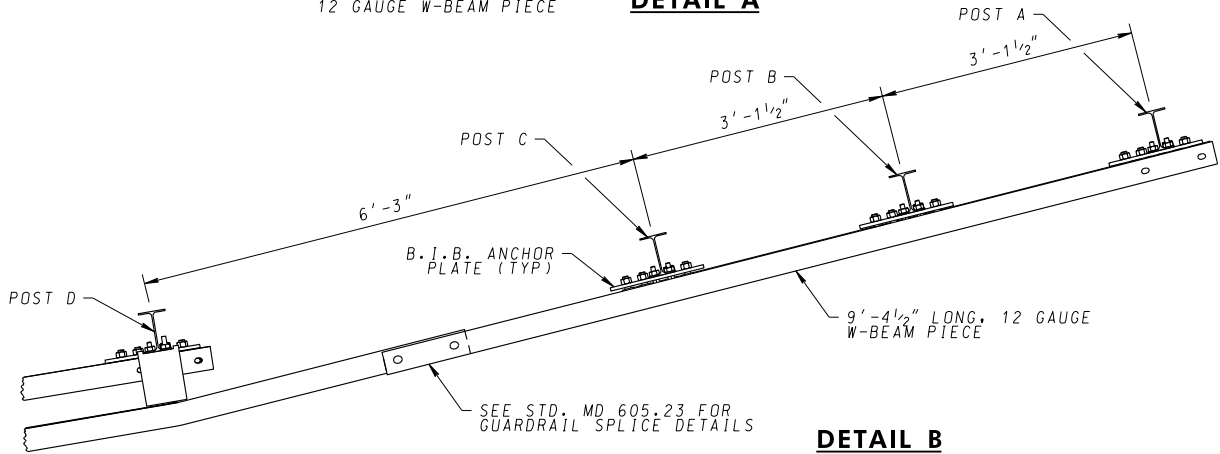
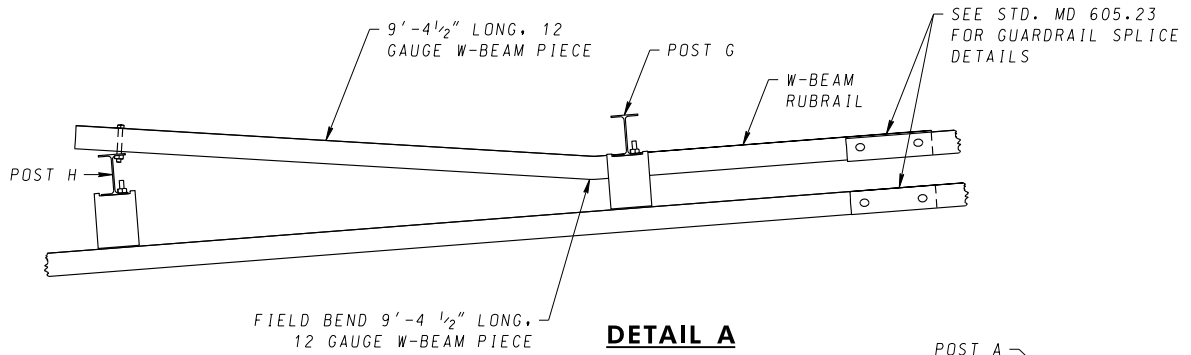
1. FORESLOPES SHALL BE 4:1 OR FLATTER. BACKSLOPES MAY BE 1:1 MAXIMUM TO 3:1 MINIMUM. LATERAL OFFSETS SHOWN ON THIS SHEET ARE BASED ON THE 4:1 FORESLOPE, 2:1 BACKSLOPE, AND 18" DITCH DEPTH SHOWN ON THIS SHEET. OTHER DITCH DEPTH, FORESLOPE, OR BACKSLOPE CONDITIONS WILL REQUIRE RECOMPUTATION OF LATERAL OFFSETS AND SPECIAL GRADING OF THE TOP OF GUARDRAIL TO MAINTAIN THE 48" MAXIMUM GROUND CLEARANCE TO THE TOP OF GUARDRAIL AND 12" MINIMUM BURY AT POST A.

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	SHA	FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	11-10-99	APPROVAL 7-2-99
REVISED	9-20-19	REVISED 8-15-19
REVISED	3-31-20	REVISED 3-30-20
REVISED	4-9-25	REVISED 4-3-25

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
BURIED-IN-BACKSLOPE END TREATMENT  
(TYPE A) WITH BOTTOM RAIL**

**STANDARD NO. MD 605.01-01**



**ELEVATION VIEW (SIDE)  
OF POST (D)**  
(SEE STD. MD 605.01-03 FOR  
STEEL PLATE DETAILS)

**NOTES**

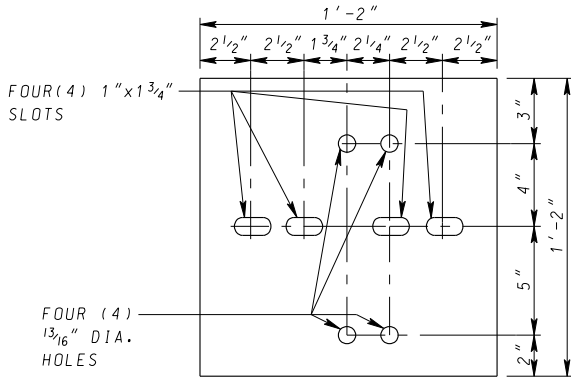
1. THE BOTTOM RAIL SHALL BE TUCKED BEHIND AND BOLTED TO POST H USING A 5/8\"/>

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED	<i>Liam MacLean</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 11-10-99	APPROVAL 7-2-99
REVISED 9-20-19	REVISED 8-15-19
REVISED 3-31-20	REVISED 3-30-20
REVISED 4-9-25	REVISED 4-3-25

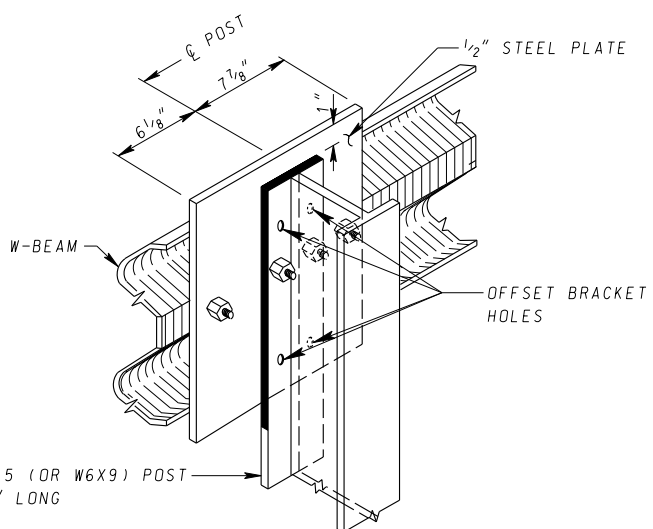
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
BURIED-IN-BACKSLOPE END TREATMENT  
(TYPE A) WITH BOTTOM RAIL**

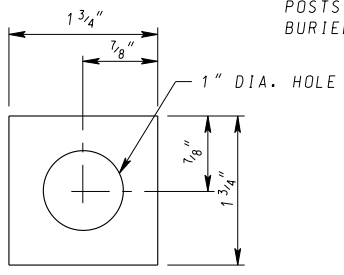
**STANDARD NO. MD 605.01-02**



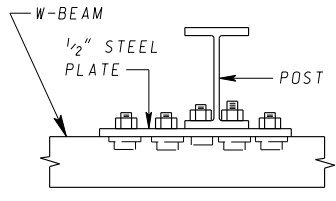
**1/2" STEEL PLATE**  
(GALVANIZED)  
BOLTED TO  
POSTS (A) (B) AND (C)  
BURIED IN BACK SLOPE



**1/2" STEEL PLATE ATTACHED TO POSTS (A) (B) AND (C)**



**SQUARE WASHER**  
(3/16" THICK GALVANIZED)



**PLAN VIEW**

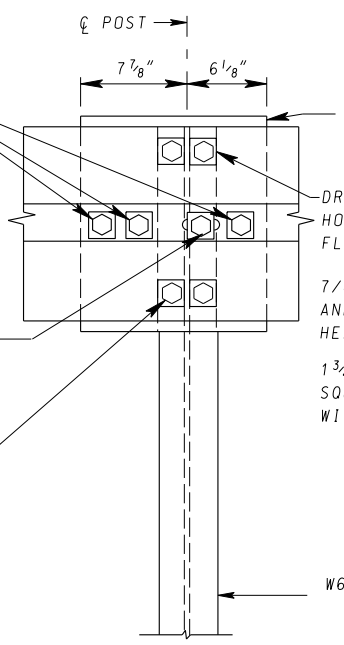
**NOTES**

1. THE 1/2" STEEL PLATE SHALL CONFORM TO THE REQUIREMENTS OF A-36. THE PLATE SHALL BE BOLTED TO POSTS (A), (B) AND (C) BURIED IN THE CUT SLOPE.
2. FIELD DRILLED HOLES SHALL BE COATED WITH ZINC RICH PAINT.

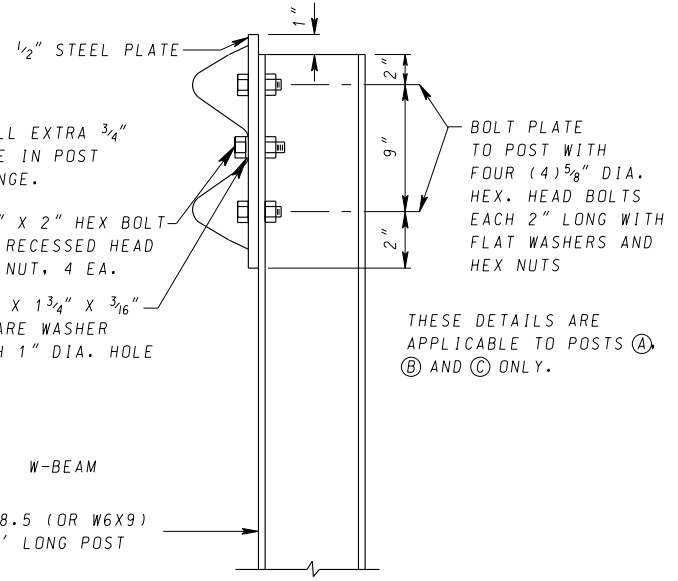
THREE (3) 1" DIA. HOLES TO BE FIELD DRILLED IN W-BEAM ELEMENT AND ATTACHED WITH 7/8" DIA. HEX. HEAD BOLTS 2" LONG EACH WITH ONE SQUARE WASHER AND RECESSED HEAD HEX NUT

1" DIA. HOLE TO BE FIELD DRILLED THROUGH W-BEAM AND THROUGH POST FLANGE. ATTACH W-BEAM WITH 7/8" HEX. HEAD BOLT 2" LONG WITH ONE SQUARE WASHER AND HEX NUT

DRILL EXTRA 3/4" DIA. HOLE IN POST FLANGE.



**ELEVATION VIEW (FRONT)**



**ELEVATION VIEW (SIDE)**

THESE DETAILS ARE APPLICABLE TO POSTS (A), (B) AND (C) ONLY.

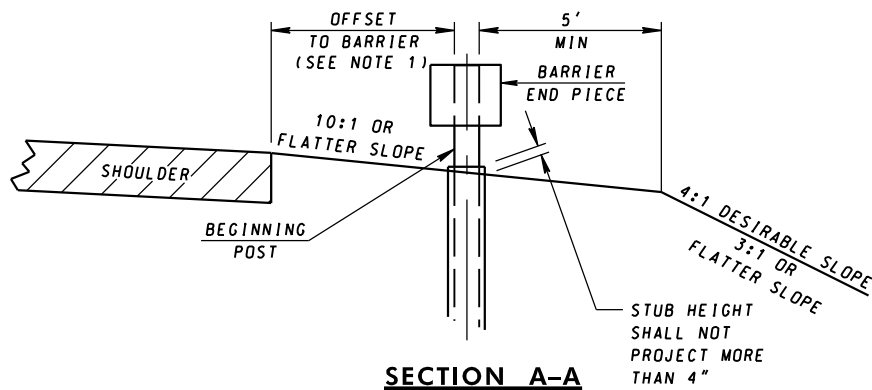
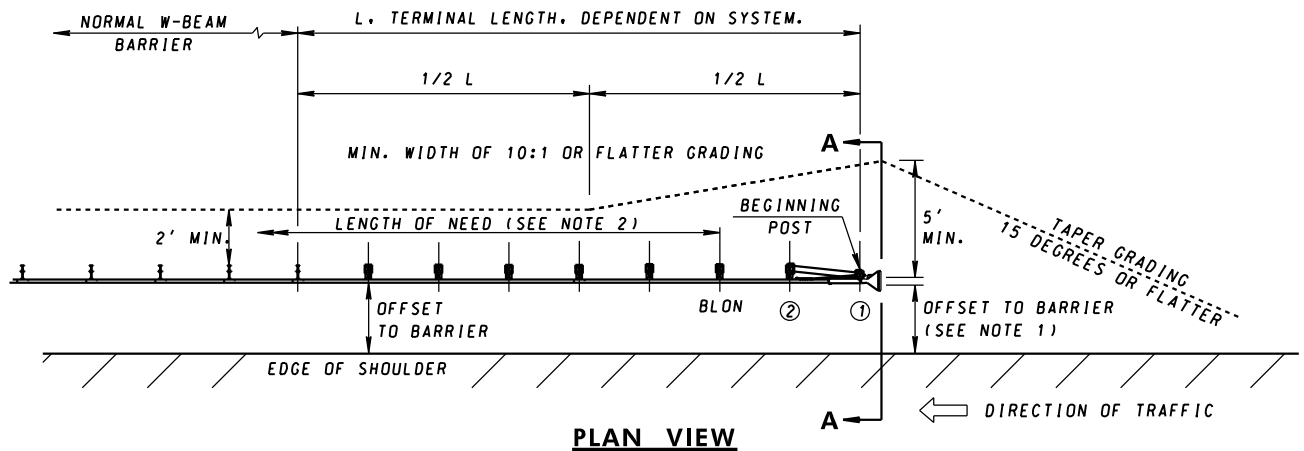
SPECIFICATION <b>606</b>	CATEGORY CODE ITEMS
APPROVED <i>L. J. Marcolin</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 4-6-88	APPROVAL 4-22-90
REVISED 3-15-06	REVISED 4-5-06
REVISED 9-20-19	REVISED 8-15-19
REVISED 4-9-25	REVISED 4-3-25

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
BURIED-IN-BACKSLOPE END TREATMENT  
(TYPE A) - ANCHORAGE**

**STANDARD NO. MD 605.01-03**





**NOTES**

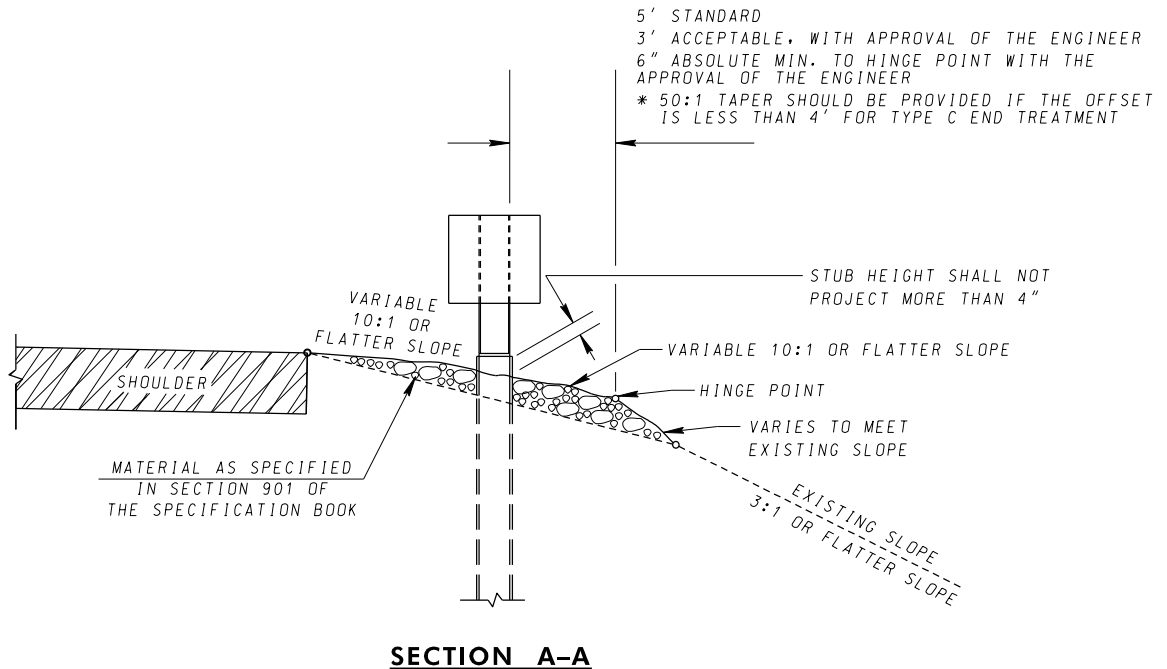
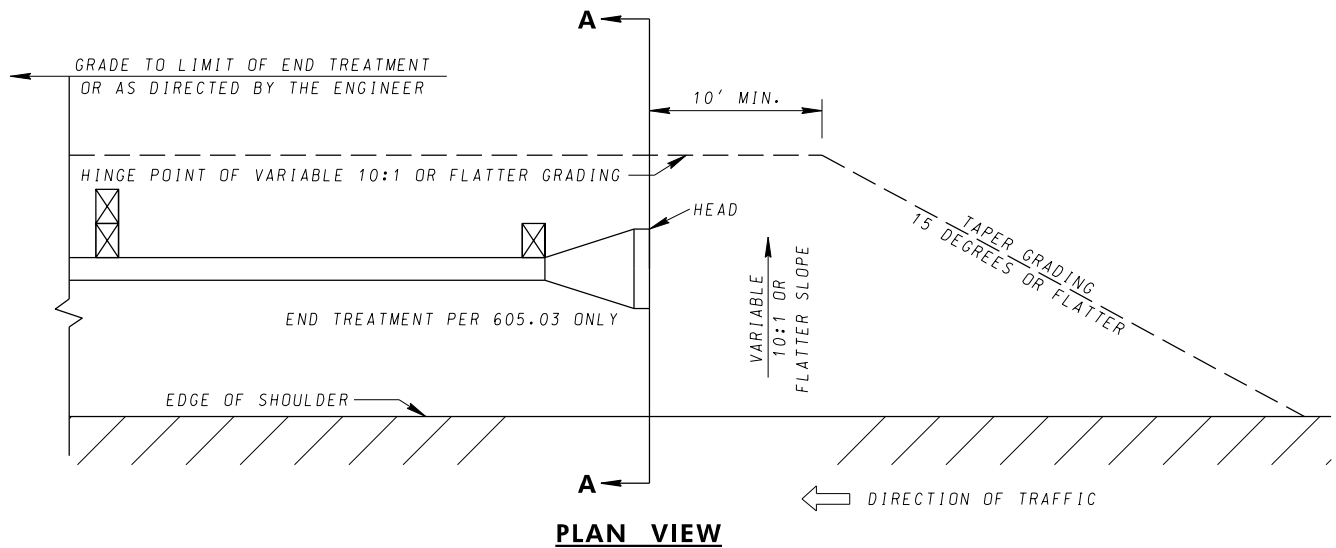
1. WHEN THE TRAFFIC BARRIER POST IS PLACED LESS THAN 4' FROM THE EDGE OF SHOULDER/PAVEMENT, THE END TREATMENT SHALL BE FLARED AT A RATE OF 25:1 OVER THE FULL LENGTH AND ON A STRAIGHT LINE.
2. AN EFFECTIVE LON OF 34' SHALL BE INCLUDED IN THE END TREATMENT PAYMENT.
3. SYSTEM MUST BE INSTALLED AT A HEIGHT OF 31".
4. FOR DELINEATION, SEE STANDARD NO. 605.14.
5. THIS SCHEMATIC DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. SEE MDOT SHA OPL FOR APPROVED SYSTEMS THAT ARE 2016 MASH COMPLIANT.

SPECIFICATION <b>606</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 11-10-99	APPROVAL 7-2-99
REVISED 1-10-17	REVISED 12-1-16
REVISED 9-20-19	REVISED 8-15-19
REVISED 3-16-22	REVISED 2-24-22

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER W-BEAM ONE-SIDED  
END TREATMENT (TYPE C)**

**STANDARD NO. MD 605.03**



**NOTES**

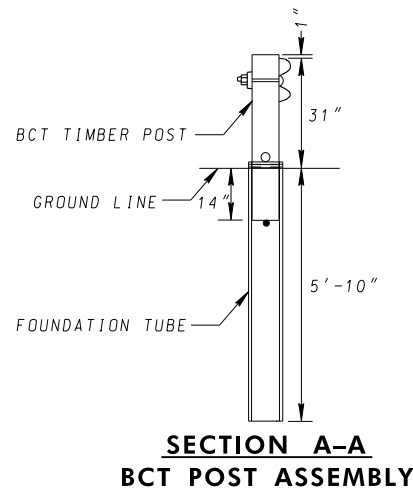
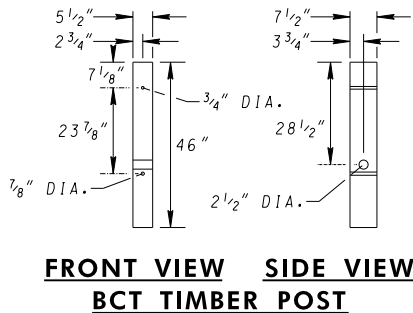
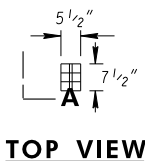
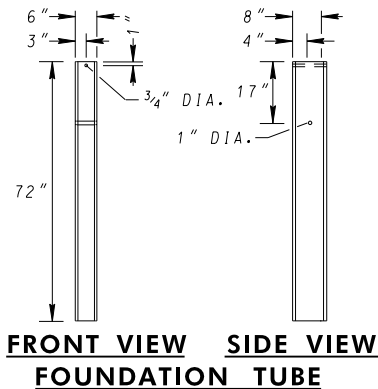
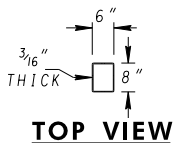
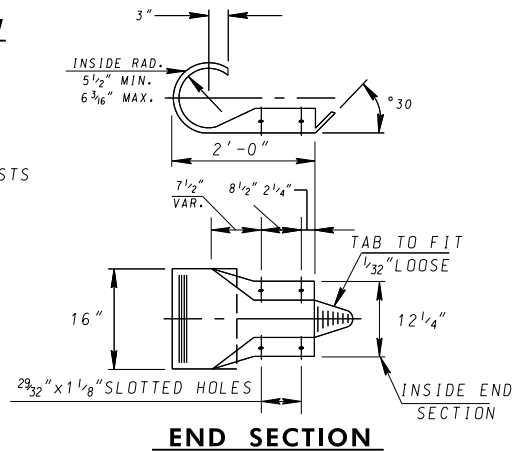
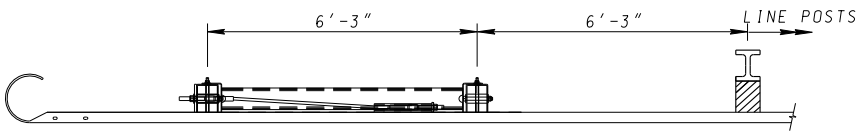
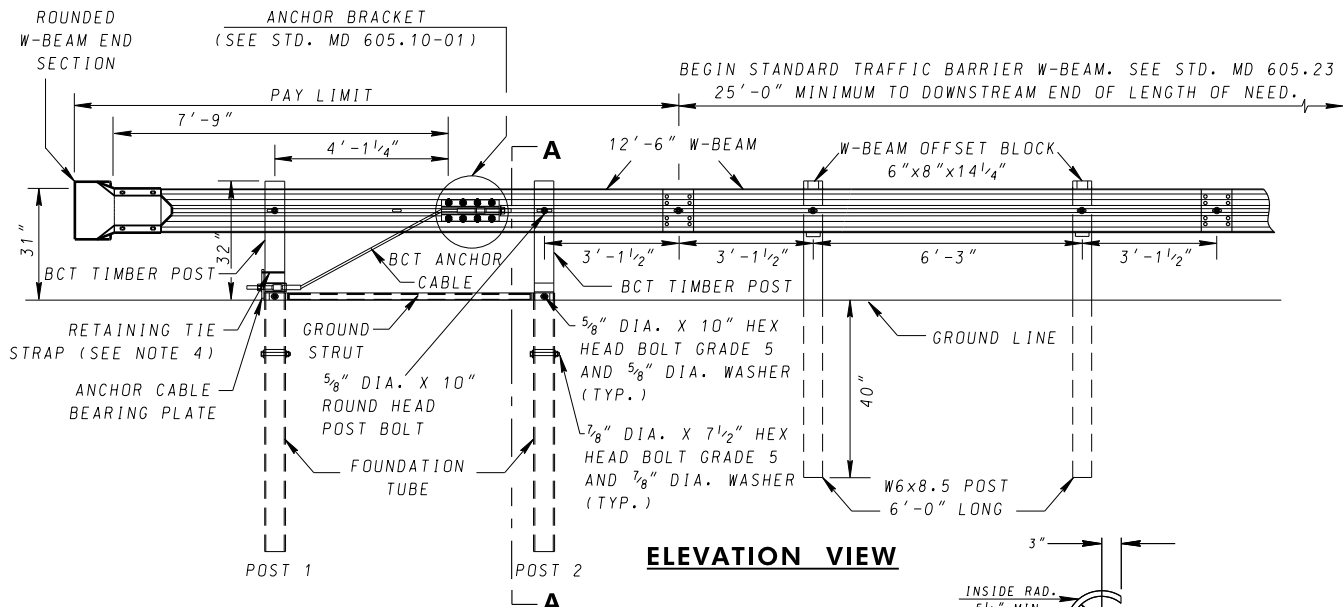
1. SURFACE ADJUSTMENT SHALL BE STABILIZED WITHIN 48 HOURS OR PER STABILIZATION REQUIREMENTS OF CONTRACT DOCUMENTS, WHICHEVER IS LESS.
2. FOR USE ON RESURFACE, REHABILITATION, AND RESTORATION PROJECTS ONLY.

<b>SPECIFICATION</b> 606	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 11-10-99	APPROVAL 7-2-99
REVISED 2-10-04	REVISED 3-31-04
REVISED 9-20-19	REVISED 8-15-19
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
SHOULDER GRADING ADJUSTMENT FOR  
TRAFFIC BARRIER END TREATMENT  
(3 R TYPE WORK)**

**STANDARD NO. MD 605.04**



**NOTES**

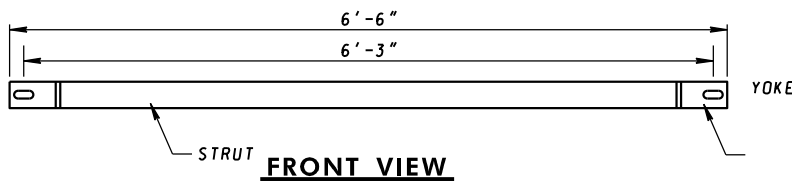
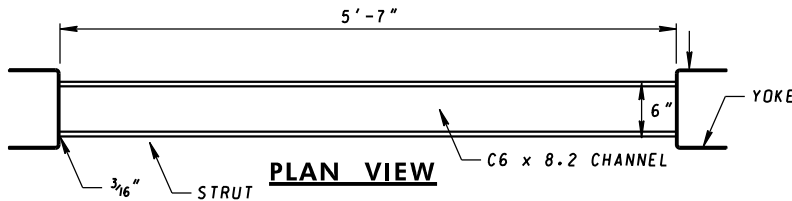
1. ALL W-BEAM AND HARDWARE COMPONENTS ACCORDING TO AASHTO SPEC. M 180.
2. FOUNDATION TUBE SHALL BE MANUFACTURED USING ASTM A500B STEEL AND SHALL CONFORM TO ASTM A500 GRADE B MATERIAL.
3. ONE-SIDED DOWNSTREAM END TREATMENT (TYPE K) NOT TO BE USED WHERE THERE IS OPPOSING TRAFFIC WITHIN 30 FT. OF THE END TREATMENT.
4. PLACE A 3/16" WIDE STAINLESS STEEL RETAINING TIE STRAP AROUND THE SHORT TIMBER BREAKAWAY POST AND ANCHOR CABLE BEARING PLATE. THE RETAINING TIE STRAP WILL ENSURE THE PROPER ORIENTATION OF THE ANCHOR CABLE BEARING PLATE.
5. SEE STD. MD. 605.10-01 FOR ANCHOR CABLE BEARING PLATE, GROUND STRUT, AND CABLE ANCHOR ASSEMBLY DETAILS.

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 1-26-70	APPROVAL 11-5-70
REVISED 1-9-20	REVISED 12-23-19
REVISED 3-31-20	REVISED 3-30-20
REVISED 4-9-25	REVISED 4-3-25

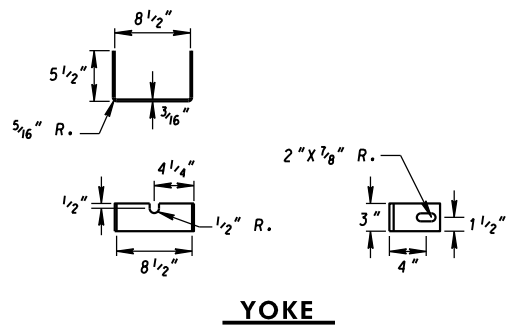
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM ONE-SIDED  
DOWNSTREAM END TREATMENT (TYPE K)**

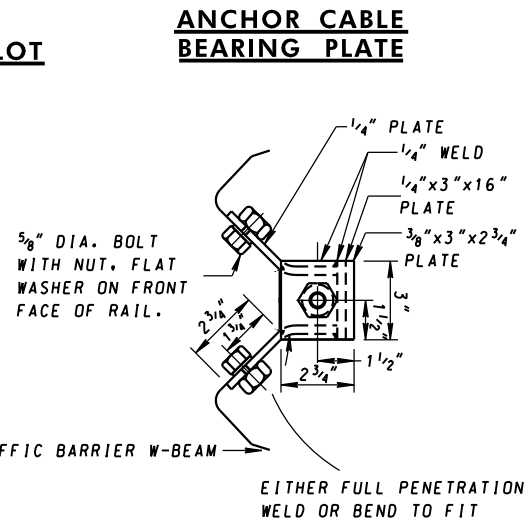
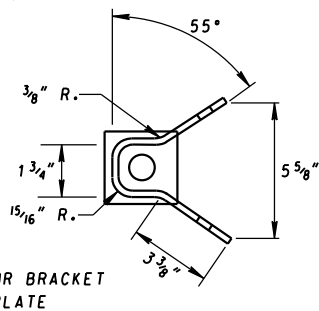
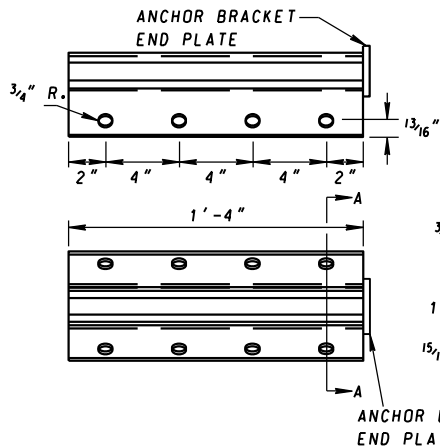
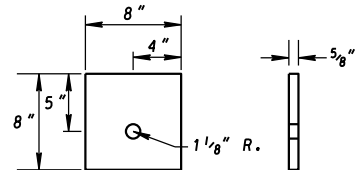
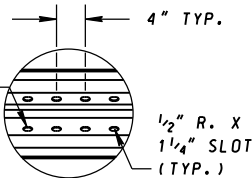
**STANDARD NO. MD 605.10**



**GROUND STRUT**



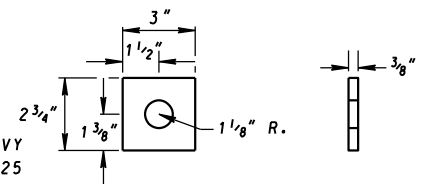
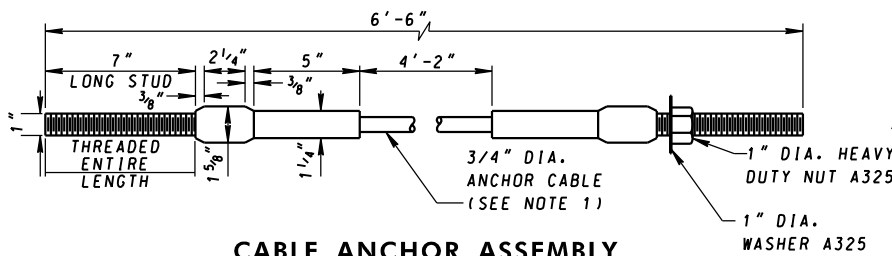
5/8" DIA. X 1 1/2"  
HEX HEAD BOLTS GRADE 5  
AND 5/8" DIA. WASHERS  
TOTAL OF EIGHT (8)



**ANCHOR BRACKET**

**SECTION A-A**

**ANCHOR BRACKET END PLATE**



**NOTES**

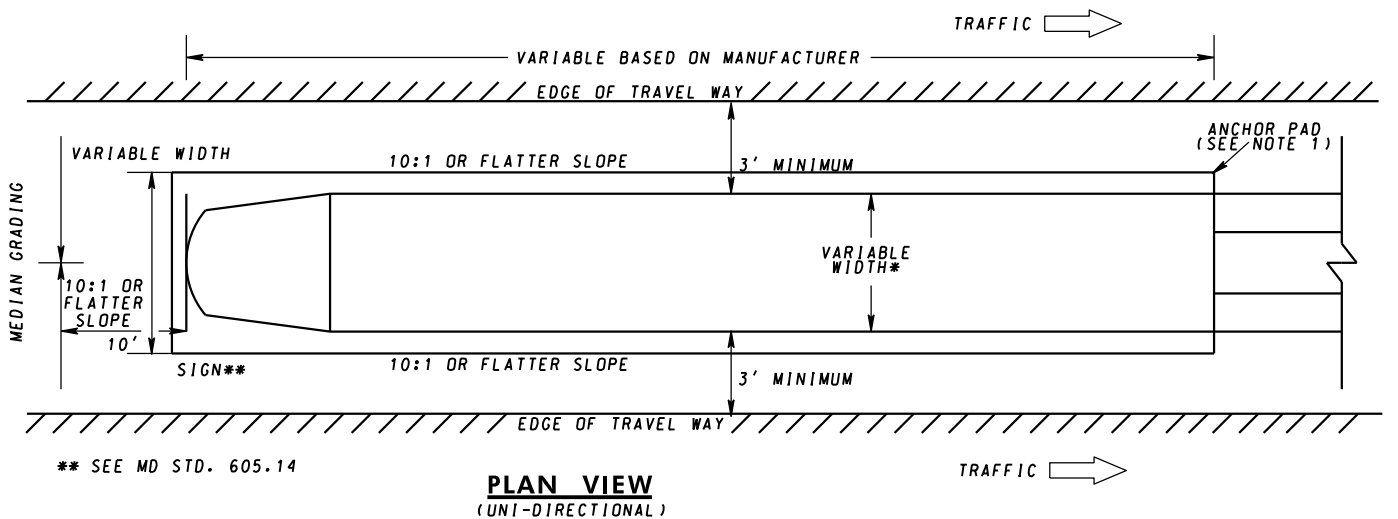
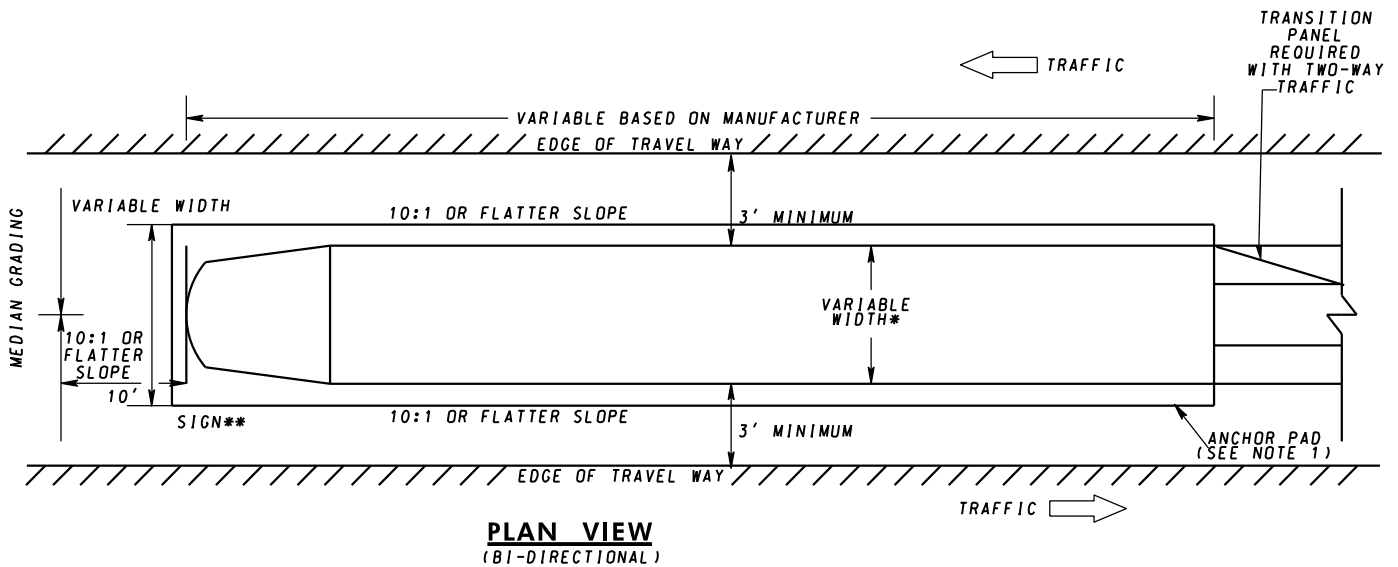
1. BCT ANCHOR CABLE IS A 3/4" DIA. 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED. END FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO ASTM A123. THREADED STUD SHALL CONFORM TO ASTM A325 OR SAE GRADE 5. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 3,000 LB. WIRE ROPE IS TO BE TAUT.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 11-10-99	APPROVAL 7-2-99
REVISED 4-17-06	REVISED 4-5-06
REVISED 1-9-20	REVISED 12-23-19
REVISED 3-16-22	REVISED 2-24-22

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER W-BEAM ONE-SIDED  
DOWNSTREAM END TREATMENT (TYPE K)  
DETAILS**

**STANDARD NO. MD 605.10-01**



\*\* SEE MD STD. 605.14

TYPE D - GATING  
 TYPE E - NON-GATING  
 TYPE J - NON-GATING, SELF-RESTORING

\* THE REQUIRED WIDTH OF THE UNIT VARIES DEPENDING UPON THE SYSTEM AND THE HAZARD TO BE SHIELDED. ATTACH END TREATMENT TO BARRIER ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

**NOTES**

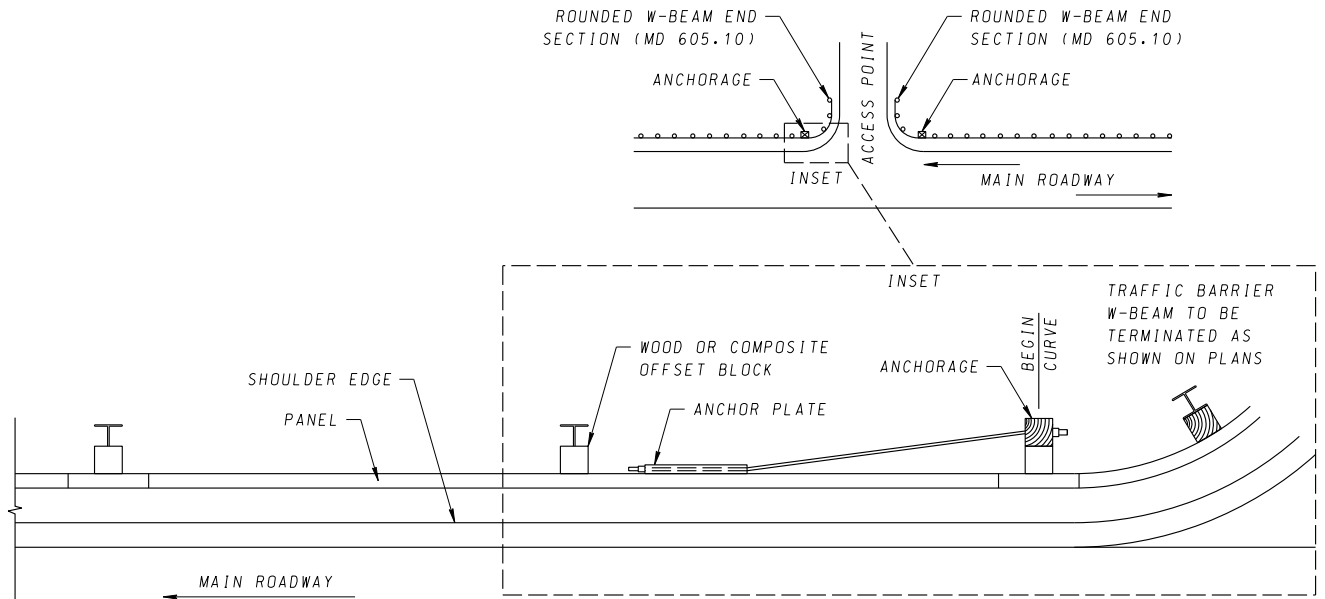
1. ANCHOR PAD MAY BE REQUIRED BASED ON THE SELECTED END TREATMENT, MANUFACTURER'S INSTRUCTIONS, AND THE SITE CONDITIONS. FOR THE ANCHORING PAD DIMENSIONS AND MATERIALS AND TO ANCHOR THE UNIT TO EXISTING PAVEMENT, REFER TO THE MANUFACTURER'S PRODUCT MANUAL OR INSTRUCTIONS.
2. THE COST OF THE ANCHOR PAD, EXCAVATION, DRILLED HOLES, EPOXY, BOLTS, AND ALL LABOR AND MATERIALS NECESSARY TO ANCHOR THE UNIT SHALL BE INCIDENTAL TO TRAFFIC BARRIER END TREATMENT INSTALLATION.
3. FOR DELINEATION, SEE STANDARD NO. 605.14.
4. THIS SCHEMATIC DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. SEE MDOT SHA OPL FOR APPROVED SYSTEMS THAT ARE 2016 MASH COMPLIANT.

<b>SPECIFICATION</b> 606	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 9-20-19	APPROVAL 8-15-19
REVISED 2-25-20	REVISED 2-24-20
REVISED 3-16-22	REVISED 2-24-22
REVISED	REVISED

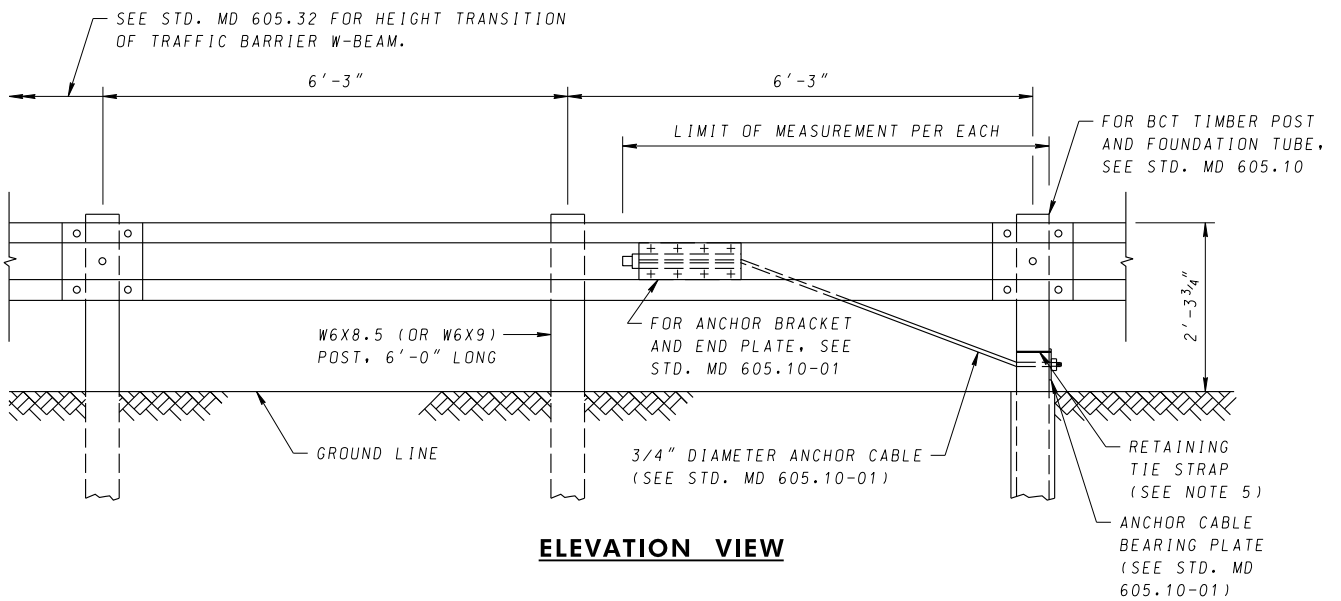
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
 TRAFFIC BARRIER TWO-SIDED END  
 TREATMENT AND CRASH CUSHION  
 (TYPES D, E, AND J)**

**STANDARD NO. MD 605.12**



**PLAN VIEW**



**ELEVATION VIEW**

**NOTES**

1. THE USE OF THIS ANCHORAGE IS LIMITED TO ROADWAYS WITH POSTED SPEEDS OF 40 MPH OR LESS AND AADT LESS THAN 10,000.
2. ALL ITEMS (ANCHOR PLATE, CABLE, ROD, DRILLED HOLES, NUTS, BOLTS, ETC) NECESSARY FOR THE ANCHOR SHALL BE MEASURED AND PAID PER EACH OF "TRAFFIC BARRIER W-BEAM RADIUS ANCHORAGE TYPE L." ROUNDED W-BEAM END SECTION (605.10) SHALL BE INCIDENTAL TO THIS PAY ITEM.
3. THE TYPE L ANCHORAGE IS PERMITTED WITHIN A SINGLE RUN OF TRAFFIC BARRIER AS SHOWN. IF A TYPE L ANCHORAGE IS USED, AN ADDITIONAL END TREATMENT IS REQUIRED ON THE DOWNSTREAM END OF THE TRAFFIC BARRIER ONLY IF WITHIN 30' OF OPPOSITE DIRECTION TRAFFIC.
4. THE GROUND STRUT AS SHOWN IN STD. MD 605.10 AND MD 605.10-01 IS NOT REQUIRED IN THE TYPE L ANCHORAGE.
5. PLACE A 3/16" WIDE STAINLESS STEEL RETAINING TIE STRAP AROUND THE SHORT TIMBER BREAKAWAY POST AND ANCHOR CABLE BEARING PLATE. THE STAINLESS STEEL RETAINING TIE STRAP WILL ENSURE THE PROPER ORIENTATION OF THE ANCHOR CABLE BEARING PLATE.

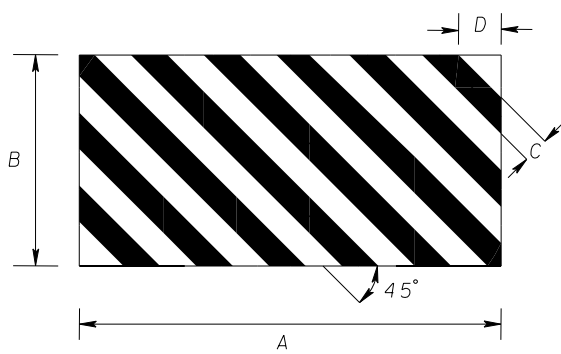
SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-15-06	APPROVAL 4-5-06
REVISED 3-31-20	REVISED 3-30-20
REVISED 3-16-22	REVISED 2-24-22
REVISED 4-9-25	REVISED 4-3-25

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

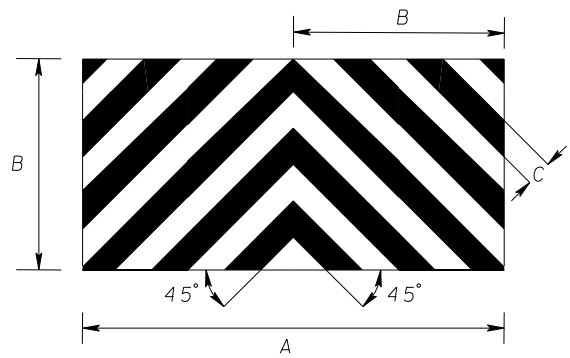
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
RADIUS ANCHORAGE (TYPE L)**

**STANDARD NO.**

**MD 605.13**



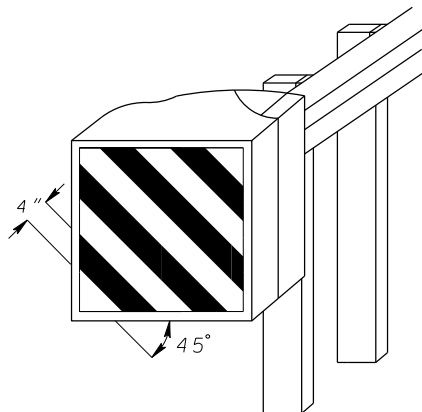
TERMINAL IN MEDIAN



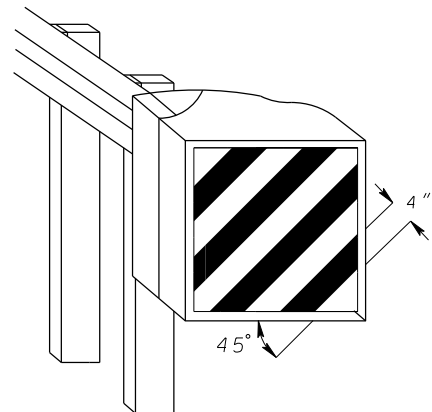
TERMINAL IN GORE

SIGN SIZE	DIMENSIONS (INCHES)			
	A	B	C	D
STD	BASED ON PRODUCT		3	4-1/4

**TWO SIDED END TREATMENTS**



LEFT SIDE OF ROADWAY




RIGHT SIDE OF ROADWAY

**ONE SIDED END TREATMENTS**

**NOTES**

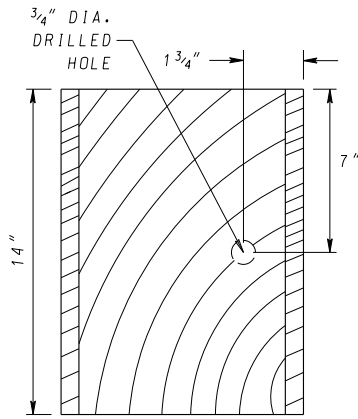
1. DELINEATION MUST MEET THE REQUIREMENTS IN MUTCD SECTIONS 2C.64 AND 2C.65.
2. DELINEATION SHALL BE TYPE IX OR XI REFLECTIVE SHEETING WITH BLACK STRIPES ON FLUORESCENT YELLOW.
3. WHEN PLACING SHEETING ON BARE METAL, METAL SHOULD BE CLEANED AS PER MANUFACTURER'S RECOMMENDATIONS PRIOR TO APPLICATION OF SHEETING.
4. SHEETING SHOULD EXTEND TO TOP AND BOTTOM AND FULL WIDTH OF TERMINAL. SIZE MAY BE ADJUSTED AS NECESSARY TO FIT DIFFERENT MANUFACTURER'S TERMINALS.
5. DELINEATION WILL BE INCIDENTAL TO THE APPROPRIATE TRAFFIC BARRIER END TREATMENT.

<b>SPECIFICATION</b> 606	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 9-20-19	<b>APPROVAL</b> 8-15-19
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

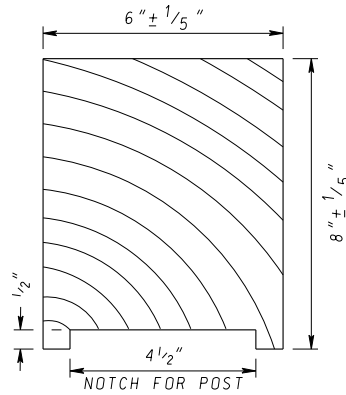
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER END TREATMENT AND  
CRASH CUSHION DELINEATION**

**STANDARD NO. MD 605.14**

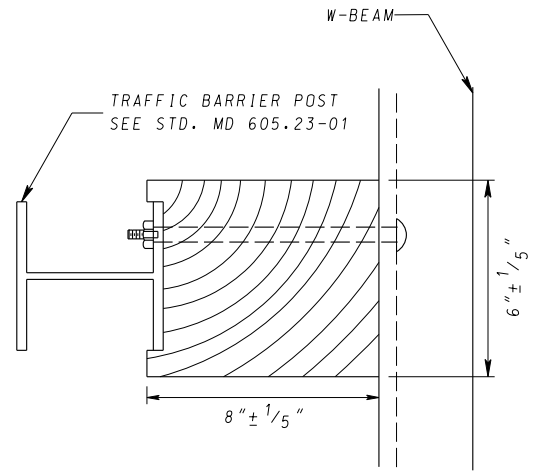


**FRONT VIEW**

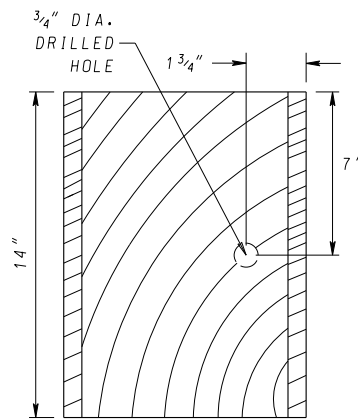


**TOP VIEW**

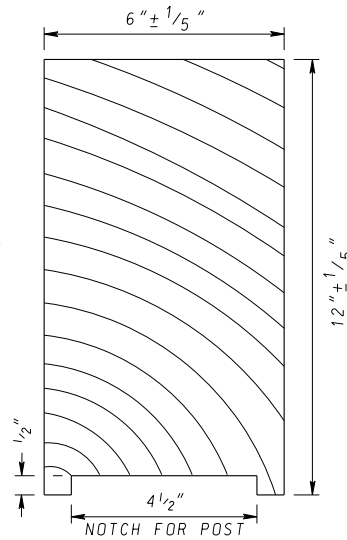
**6"X8"X14" OFFSET BLOCK**



**TOP VIEW  
(TRAFFIC BARRIER POST  
WITH 6"X8"X14" BLOCK)**

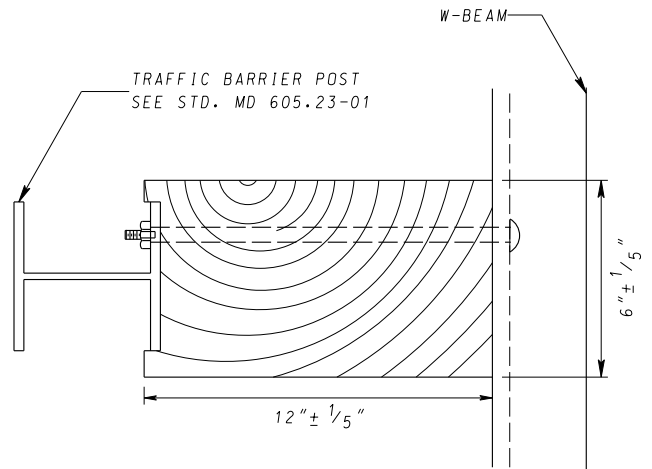


**FRONT VIEW**



**TOP VIEW**

**6"X12"X14" OFFSET BLOCK**



**TOP VIEW  
(TRAFFIC BARRIER POST  
WITH 6"X12"X14" BLOCK)**

**NOTES**

1. OFFSET BLOCKS 6"x8"x14" TO BE USED UNLESS OTHERWISE SPECIFIED OR DIRECTED BY THE ENGINEER.
2. FOR BOLT AND BOLT NUT DETAILS, SEE STD. MD 605.23.
3. COMPOSITE OFFSET BLOCKS THAT ARE APPROVED BY THE ADMINISTRATION MAY BE USED IN LIEU OF WOOD OFFSET BLOCKS (EITHER DUE TO CONTRACTOR'S CHOICE OR WHEN SPECIFIED IN THE CONTRACT DOCUMENTS). REFER TO OPL FOR APPROVED SUBSTITUTES.

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS	
APPROVED	<i>Trimmable</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	SHA	FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	11-10-99	APPROVAL 7-2-99
REVISED	2-25-20	REVISED 2-24-20
REVISED	3-16-22	REVISED 2-24-22
REVISED	4-9-25	REVISED 4-3-25

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

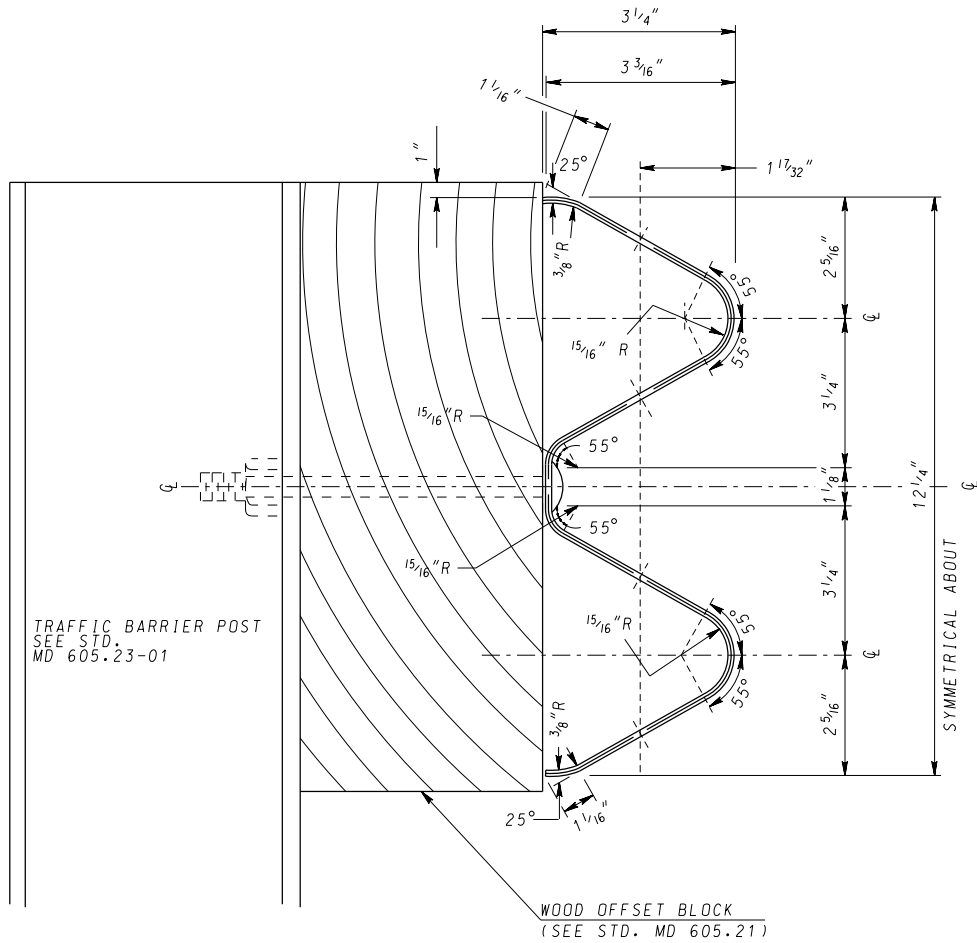
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**OFFSET BLOCK**

**STANDARD NO.**

**MD 605.21**

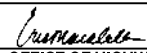




**SIDE VIEW**  
(MATERIAL: 12 GA. STEEL)

**NOTES**

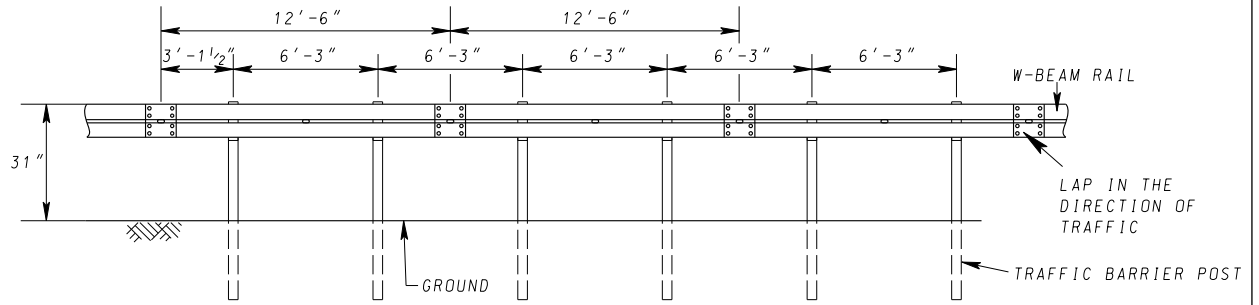
1. W-BEAM RAIL IS FURNISHED SHOP CURVED, CONCAVE OR CONVEX TO RADII BETWEEN 20-150'.
2. W-BEAM RAIL SECTIONS SHALL BE 12'-6" OR 25'-0" LENGTHS UNLESS SPECIFIED OTHERWISE.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-24-69	APPROVAL 3-4-69
REVISED 4-17-06	REVISED 4-5-06
REVISED 1-9-20	REVISED 12-23-19
REVISED	REVISED

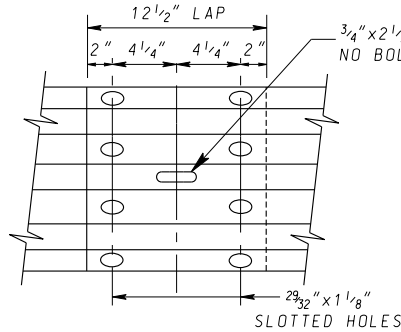
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**TRAFFIC BARRIER W-BEAM**  
**SINGLE FACE**

**STANDARD NO. MD 605.22**

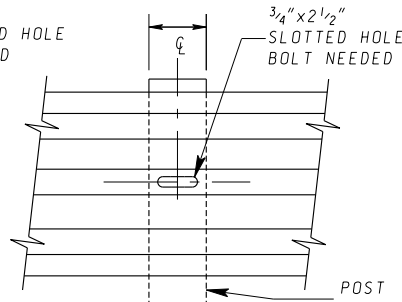


**ELEVATION VIEW**



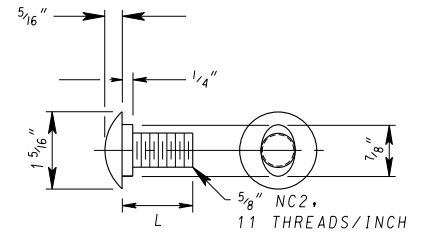
**FRONT VIEW**

SPLICE  
(BOLTS NOT SHOWN)



**FRONT VIEW**

POST WITH W-BEAM RAIL  
(BOLT NOT SHOWN)



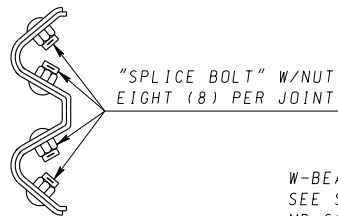
L=1 1/4" FOR SPLICE BOLT  
(FULL LENGTH THREADS)

L=2" FOR SPLICE WITH  
NESTED RAIL BOLT  
(FULL LENGTH THREADS)

L=10" FOR STEEL POST WITH  
8" BLOCKOUT BOLT  
SEE NOTE

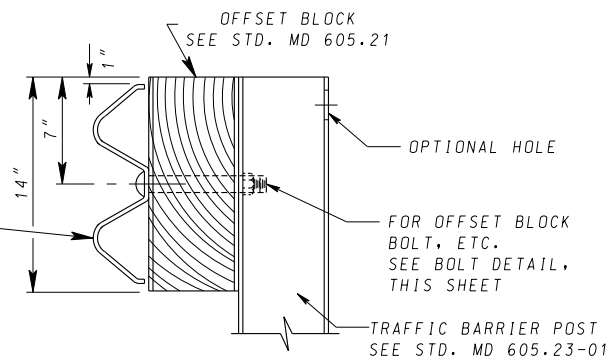
L=14" FOR STEEL POST WITH  
12" BLOCKOUT BOLT

**BOLT**



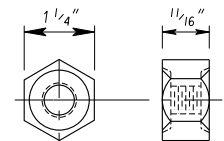
**SIDE VIEW**

SPLICE



**SIDE VIEW**

POST WITH W-BEAM RAIL



ALTERNATE-SINGLE  
RECESS NUTS MAY  
BE SUBSTITUTED

5/8" NC2, 11 THREADS/INCH

1 5/16" DIA. X 3/32"  
DEEP RECESS TWO SIDES

**NUT**

**NOTES**

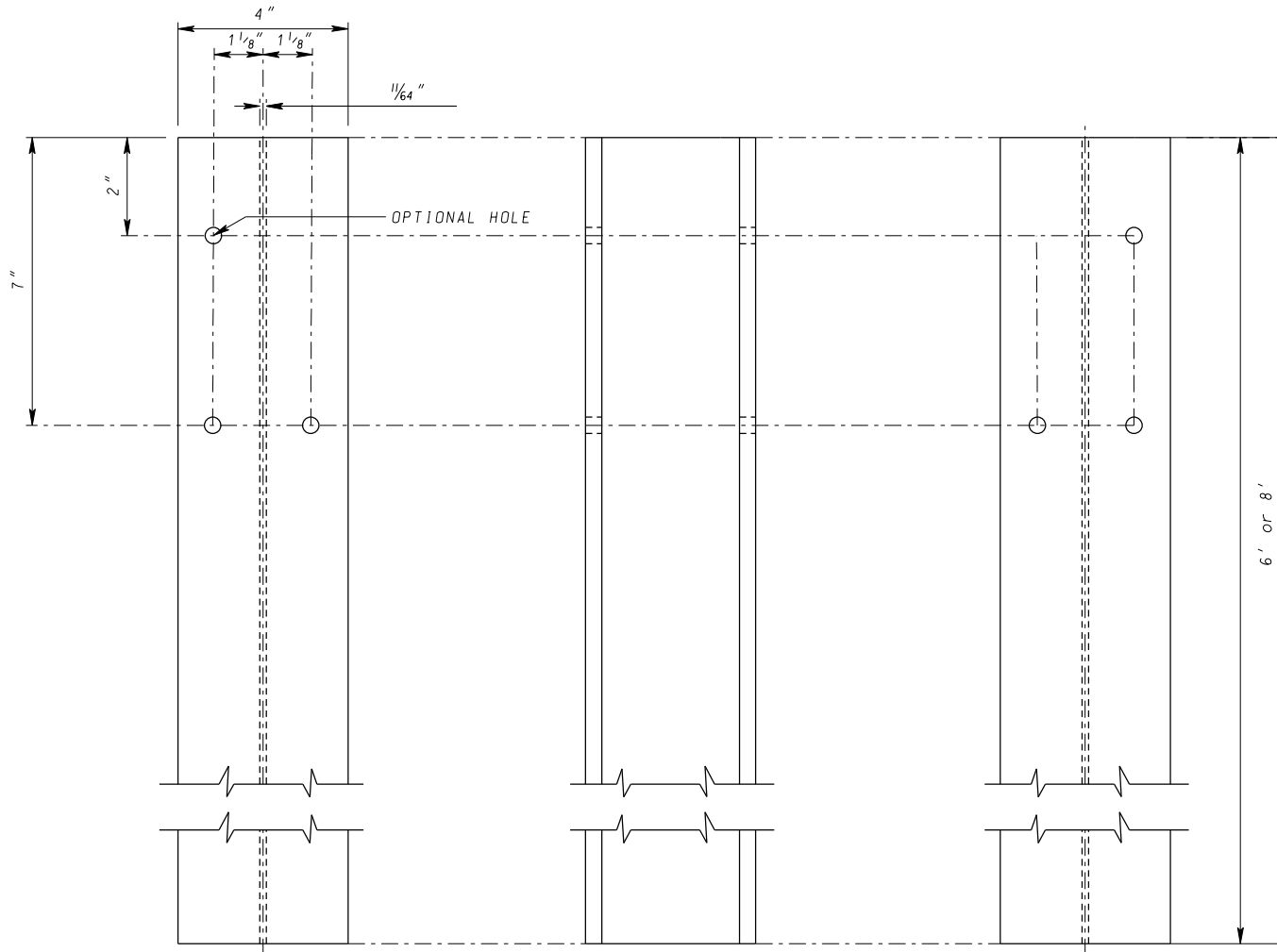
1. FOR COMPOSITE OFFSET BLOCKS SEE NOTE 3 ON STD. MD 605.21.
2. THE CONTRACTOR HAS THE OPTION TO USE SHORTER BOLTS WITH A MINIMUM OF 1/2" PROTRUSION BEYOND NUT.
3. WITH ENGINEER'S APPROVAL, ONE POST CAN BE OMITTED WITHOUT OTHER CHANGES. A MINIMUM OF EIGHT POSTS MUST BE INSTALLED BETWEEN OMITTED POSTS.
4. EMBEDMENT DEPTH OF 6'-0" TRAFFIC BARRIER POST IS 40". EMBEDMENT DEPTH OF 8'-0" TRAFFIC BARRIER POST IS 64".

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 5-6-76	APPROVAL 9-30-76
REVISED 2-25-20	REVISED 2-24-20
REVISED 3-16-22	REVISED 2-24-22
REVISED 4-9-25	REVISED 4-3-25

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM,  
W-BEAM SPLICES AND  
OFFSET BLOCK**

**STANDARD NO. MD 605.23**

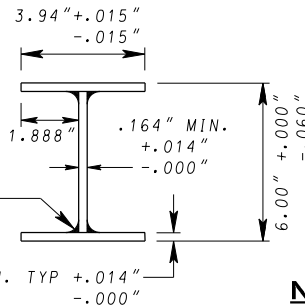


**FRONT VIEW**

**SIDE VIEW**

**BACK VIEW**

A 769  
HIGH FREQUENCY RESISTANCE  
WELD. THE WELD JOINT MUST  
DEVELOP STRENGTH EQUAL TO  
OR EXCEEDING THE FULL  
STRENGTH OF THE WEB MATERIAL  
(MATERIAL GRADE A 36)  
GALVANIZED COATING SHALL BE  
AASHTO M 111.



**TOP VIEW**

**NOTES**

- 1. 8' POST SHALL BE USED ONLY WHEN SPECIFIED.
- 2. W6X9 POSTS ARE OPTIONAL SUBSTITUTE FOR W6X8.5 POST.

**WELDED W6x8.5 STEEL POST**

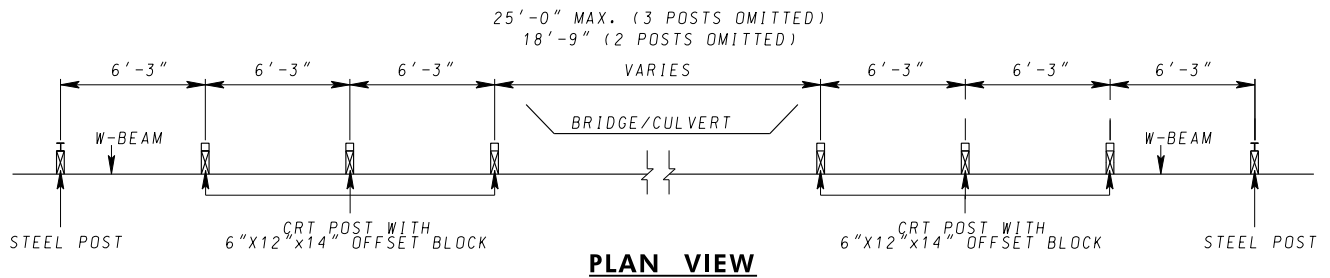
<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>	
<b>APPROVAL</b>	11-10-99	<b>APPROVAL</b> 7-2-99
<b>REVISED</b>	10-1-01	<b>REVISED</b>
<b>REVISED</b>	1-9-20	<b>REVISED</b> 12-23-19
<b>REVISED</b>		<b>REVISED</b>

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

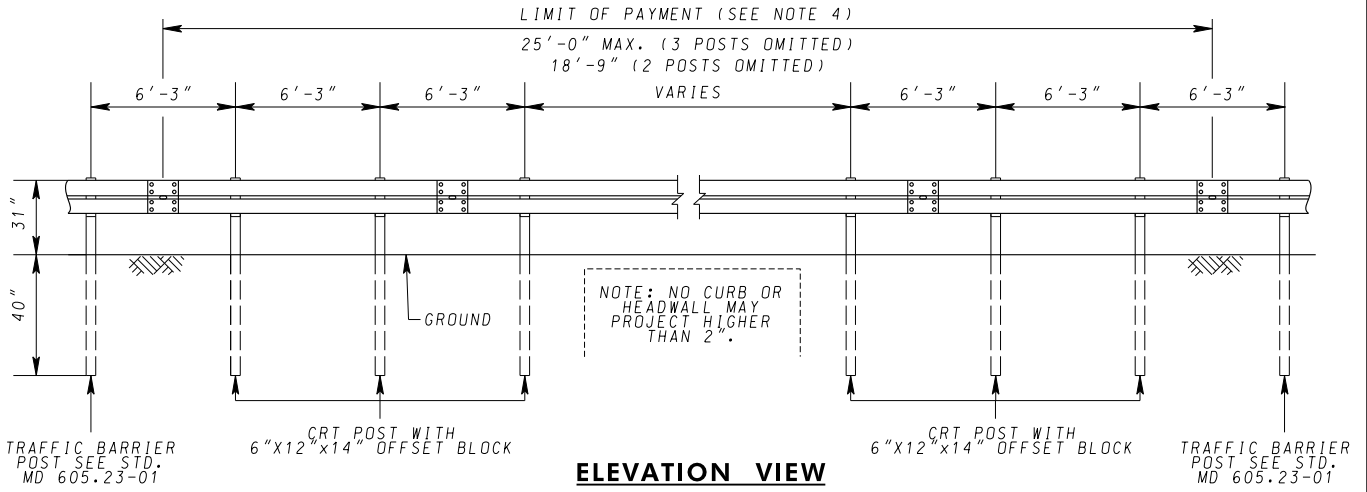
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER W-BEAM  
METAL POST**

**STANDARD NO.**

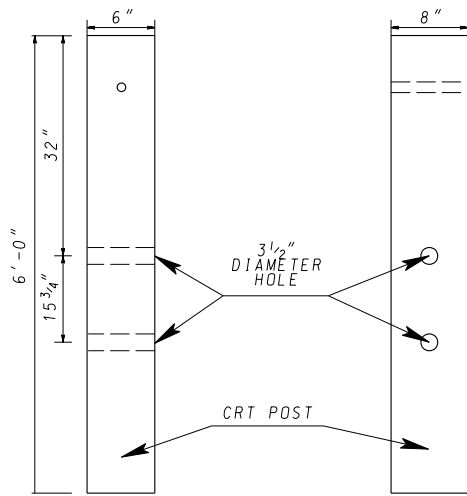
**MD 605.23-01**



**PLAN VIEW**

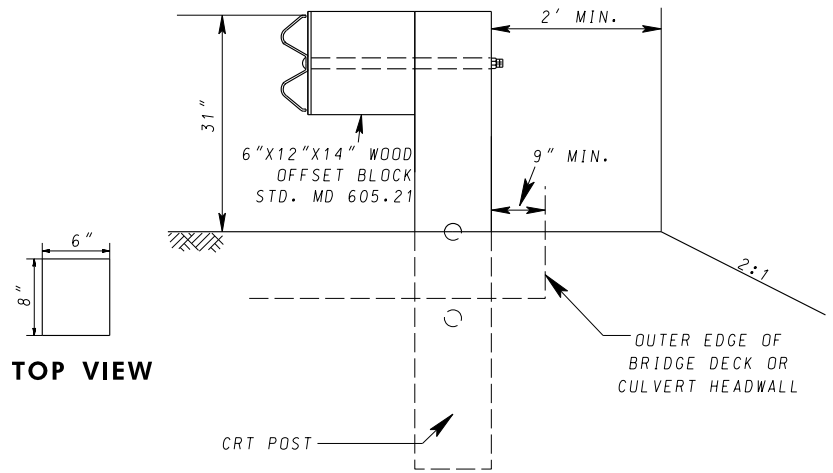


**ELEVATION VIEW**



**FRONT VIEW**

**SIDE VIEW**



**TOP VIEW**

**SECTION VIEW**

**CONTROLLED RELEASE TERMINAL (CRT) WOOD POST**

**NOTES**

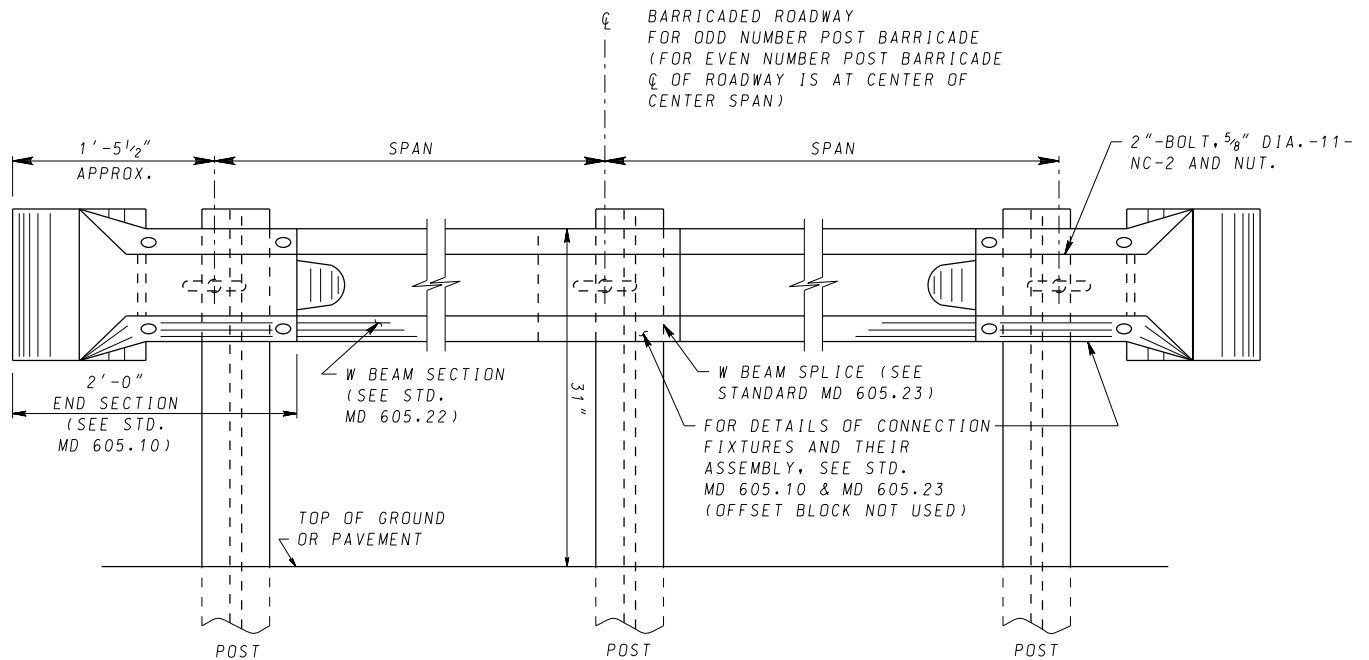
1. THE TRAFFIC BARRIER W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.
2. FOR OMITTING ONE POST, SEE STD. MD 605.23.
3. AT LEAST 62½ FT OF TRAFFIC BARRIER, INCLUDING END ANCHORAGE, SHALL BE INSTALLED BOTH UPSTREAM AND DOWNSTREAM FROM THE CRT POSTS.
4. PAYMENT FOR LONG SPAN TRAFFIC BARRIER W-BEAM SHALL BE AS FOLLOWS:
  - A. 12 INCH WOOD OFFSET BLOCK WILL BE PAID FOR AS "TRAFFIC BARRIER W-BEAM 12 INCH WOOD OFFSET BLOCK".
  - B. CRT POSTS WILL BE PAID FOR AS "CONTROLLED RELEASE TERMINAL (CRT) WOOD POST".
  - C. THE W-BEAM RAIL ELEMENTS WILL BE PAID FOR AS "TRAFFIC BARRIER W-BEAM PANEL".

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED <i>L. J. Marabelli</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 11-10-99	APPROVAL 7-2-97
REVISED 2-25-20	REVISED 2-24-20
REVISED 3-16-22	REVISED 2-24-22
REVISED 4-9-25	REVISED 4-3-25

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
LONG SPAN SYSTEM**

**STANDARD NO. MD 605.26**



MINIMUM NUMBER OF SPANS = 2  
 MINIMUM NUMBER OF POSTS = 3  
 MAXIMUM SPAN: 12'-6"  
 LENGTH OF BARRICADE NOTED ON PLANS: CENTER TO CENTER OF END POSTS  
 ALL SPANS TO BE EQUAL LENGTH.  
 NO. OF POSTS TO BE NOTED ON PLANS.  
 ALL POSTS W6x8.5 (OR W6x9), 6'-0" LONG  
 (SEE STD. MD 605.10)

**NOTES**

1. TRAFFIC BARRIER W BEAM BARRICADE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT. THE CONTRACT PRICE BID SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL POSTS, W BEAM, POST AND SPLICE BOLTS WITH NUTS, END SECTIONS, GALVANIZING, THE COST OF ALL EXCAVATION, BACKFILLING AND TAMPING INCIDENTAL TO SETTING THE POSTS, OR THE COST OF DRIVING THE POSTS, THE COST OF THE REMOVAL OF EXISTING PAVEMENT WHERE NECESSARY, AS WELL AS THE COST OF ALL LABOR, APPROVED TOOLS AND EQUIPMENT INCIDENTAL TO FURNISHING AND INSTALLING THE BARRICADE AT LOCATIONS NOTED ON THE PLANS OR WHERE DIRECTED BY THE ENGINEER. FOR MATERIAL, SEE LATEST MDOT SHA SPECIFICATIONS FOR TRAFFIC BARRIER W BEAM.

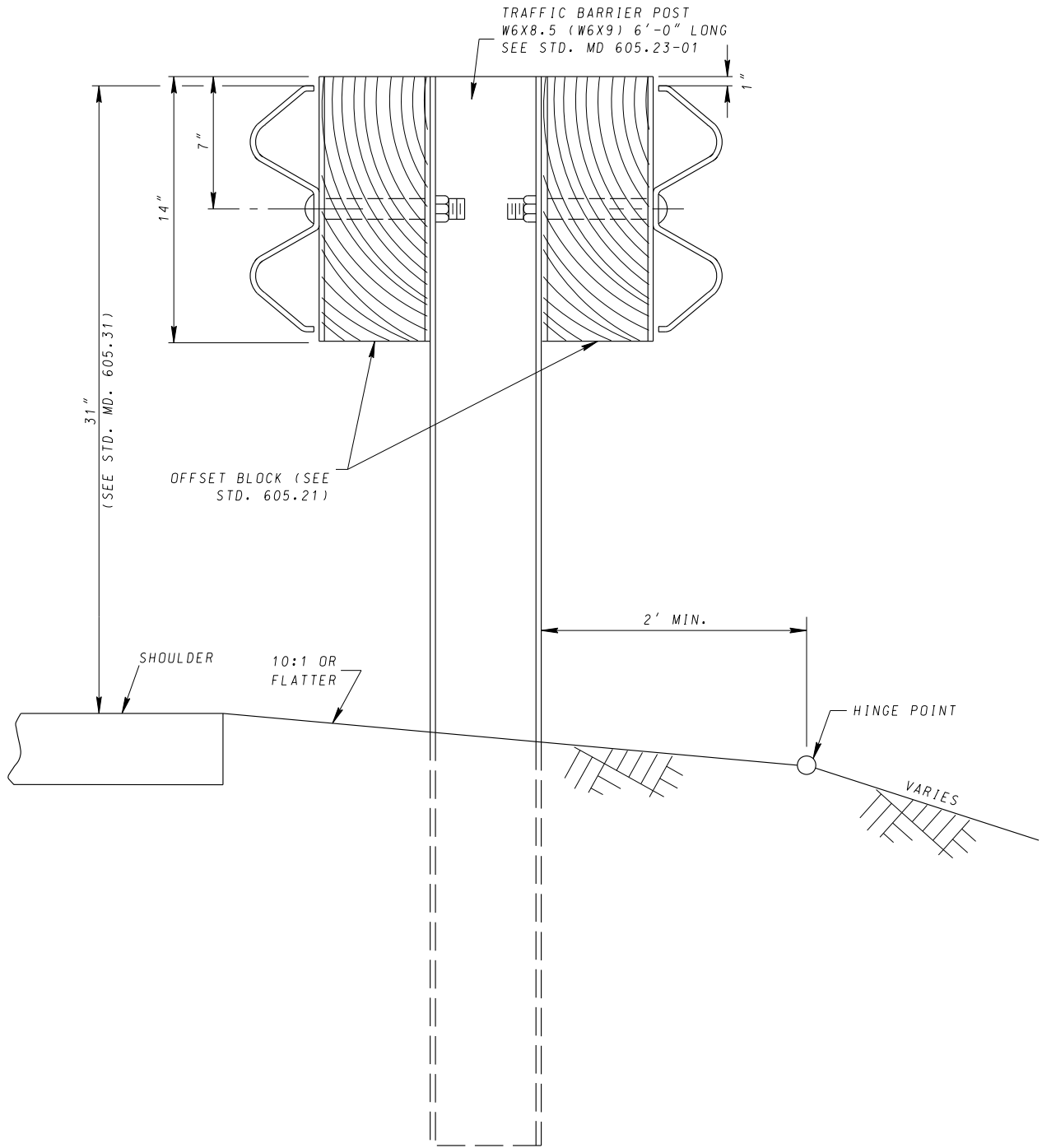
<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-21-61	APPROVAL 7-7-70
REVISED 8-16-12	REVISED 8-13-12
REVISED 12-21-17	REVISED 12-20-17
REVISED 3-31-20	REVISED 3-30-20

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**

**TRAFFIC BARRIER W BEAM BARRICADE**

**STANDARD NO. MD 605.27**



**DOUBLE FACED BARRIER**

**NOTES**

1. FOR SPLICES, SPLICE BOLTS, AND OTHER DETAILS, SEE STD. MD 605.23.
2. FOR TRAFFIC BARRIER W-BEAM RAIL DETAIL, SEE STD. MD 605.22.
3. FOR SLOPES STEEPER THAN 10:1 SEE STD. MD 605.28-01.
4. THE PAYMENT FOR THE SYSTEM, INCLUDING W-BEAM, HARDWARE, DRILLED HOLES, LABOR AND TOOLS, SHALL BE MEASURED AND PAID FOR PER LINEAR FOOT FOR THE ITEM "TRAFFIC BARRIER W-BEAM MEDIAN BARRIER."

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS	
APPROVED	<i>Triumalella</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL REVISIONS	SHA	FEDERAL HIGHWAY ADMINISTRATION
APPROVAL	6-2-75	APPROVAL 9-30-75
REVISED	1-9-20	REVISED 12-23-19
REVISED	3-31-20	REVISED 3-30-20
REVISED	4-9-25	REVISED 4-3-25

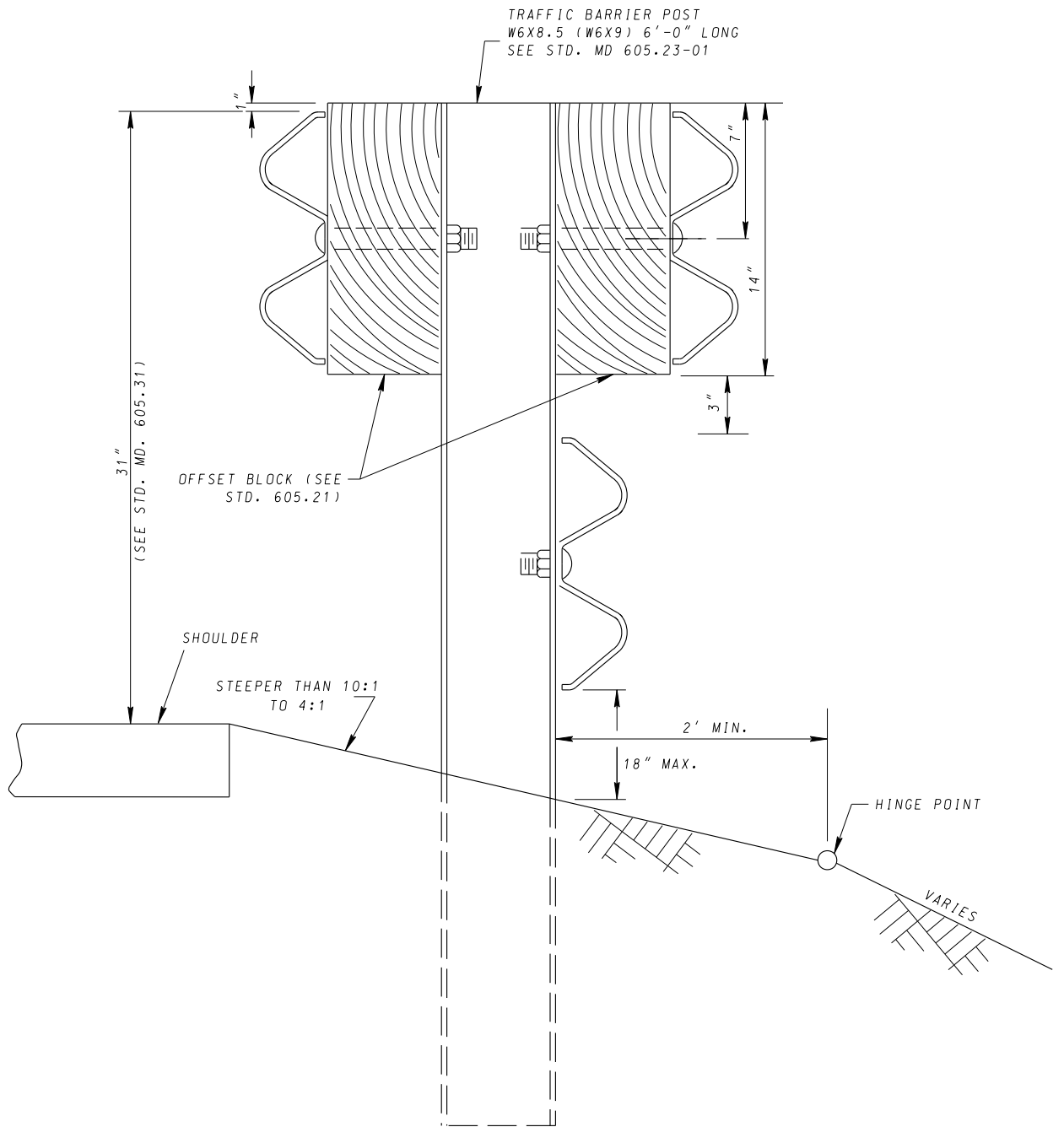
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**TRAFFIC BARRIER W-BEAM  
DOUBLE FACED MEDIAN BARRIER**

**STANDARD NO.**

**MD 605.28**



**ELEVATION VIEW (SIDE)**

**NOTES**

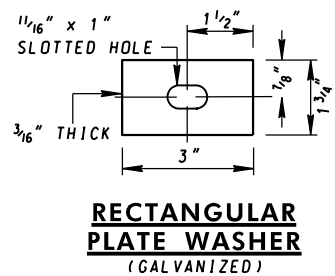
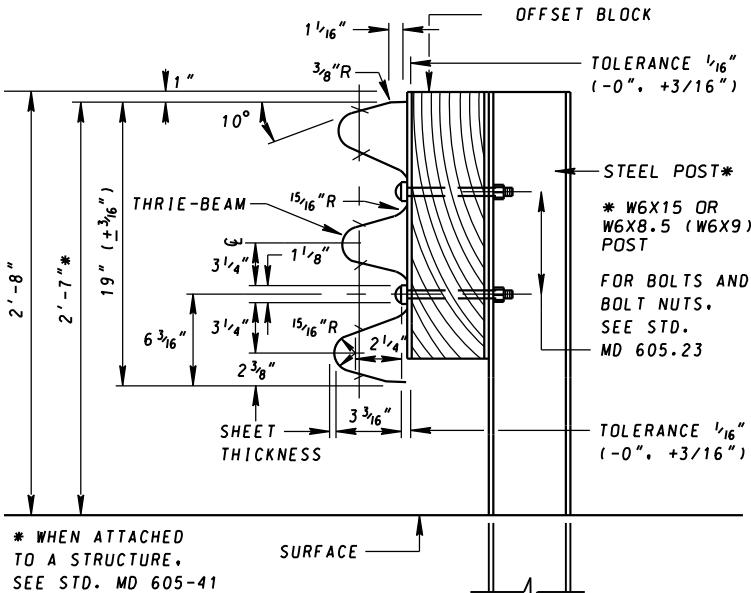
1. FOR SPLICES, SPLICE BOLTS AND OTHER DETAILS, SEE STD. MD 605.23.
2. FOR TRAFFIC BARRIER W-BEAM RAIL DETAIL, SEE STD. MD 605.22.
3. THIS STANDARD IS NOT APPLICABLE WHERE THE BARRIER IS PLACED MORE THAN 10 FEET UP A 2:1 OR STEEPER SLOPE. WHEN THE BARRIER IS POSITIONED BEYOND 10 FEET UP A 2:1 OR STEEPER SLOPE, USE SINGLE FACED W-BEAM TRAFFIC BARRIER. SEE STD. MD 605.22 AND STD. MD 605.23.
4. THE PAYMENT FOR THE SYSTEM, INCLUDING W-BEAM, HARDWARE, DRILLED HOLES, LABOR AND TOOLS, SHALL BE MEASURED AND PAID FOR PER LINEAR FOOT FOR THE ITEM "TRAFFIC BARRIER W-BEAM MEDIAN BARRIER WITH BOTTOM RAIL."

SPECIFICATION <b>605</b>	CATEGORY CODE ITEMS
APPROVED	<i>Triomacalech</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 6-2-75	APPROVAL 9-30-75
REVISED 1-9-20	REVISED 12-23-19
REVISED 3-31-20	REVISED 3-30-20
REVISED 4-9-25	REVISED 4-3-25

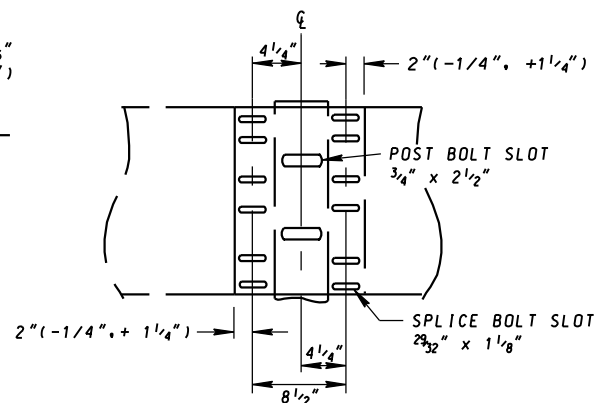
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W-BEAM  
DOUBLE FACED MEDIAN BARRIER  
WITH BOTTOM RAIL**

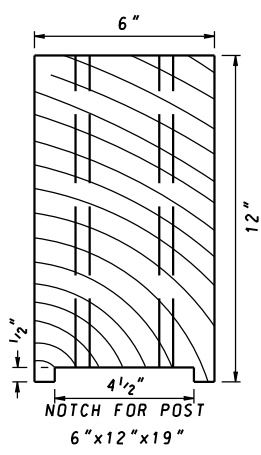
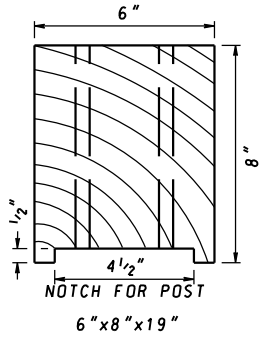
**STANDARD NO. MD 605.28-01**



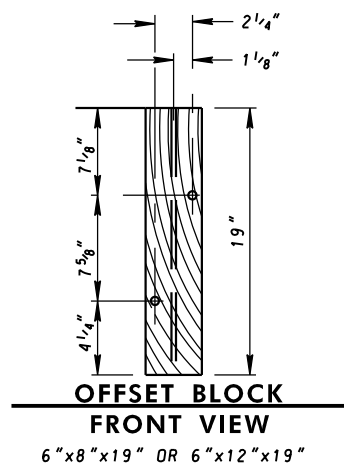
**RECTANGULAR PLATE WASHER**  
 (GALVANIZED)



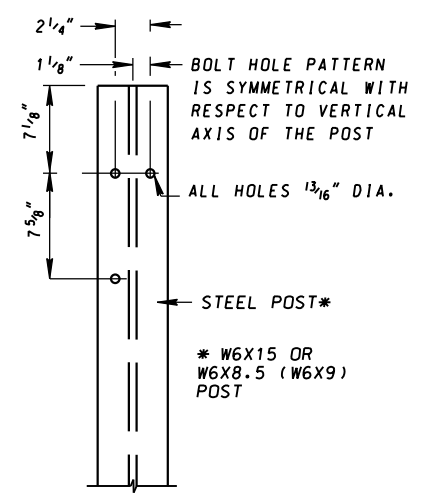
**SPLICE JOINT**



**OFFSET BLOCK TOP VIEW**



**OFFSET BLOCK FRONT VIEW**



**STANDARD POST FRONT VIEW**

**NOTES**

1. STEEL POST SHALL CONFORM TO A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH A123.

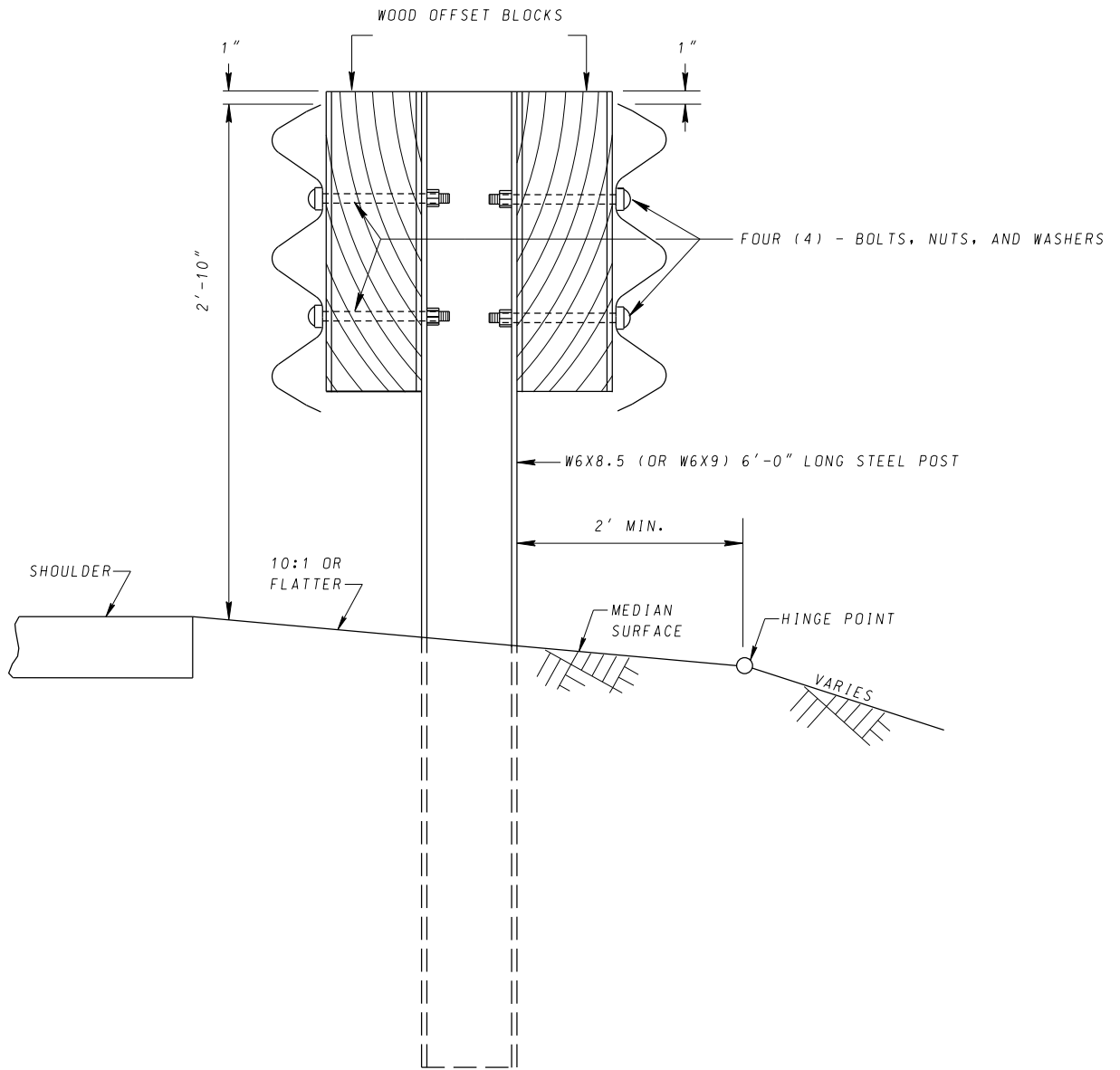
SPECIFICATION 605	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 11-10-99	APPROVAL 7-2-99
REVISED 10-1-01	REVISED 2-24-20
REVISED 2-25-20	REVISED 2-24-22
REVISED 3-16-22	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
 TRAFFIC BARRIER THRIE-BEAM  
 SINGLE FACE**

**STANDARD NO. MD 605.29**





**DOUBLE FACED BARRIER**

**NOTES**

1. FOR STEEL POSTS, WOOD OFFSET BLOCKS, SPLICES, THRIE-BEAM, AND RECTANGULAR PLATE WASHERS, SEE STD. MD 605.29.

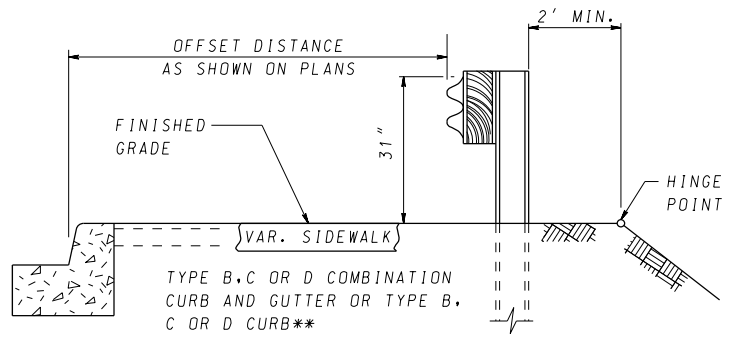
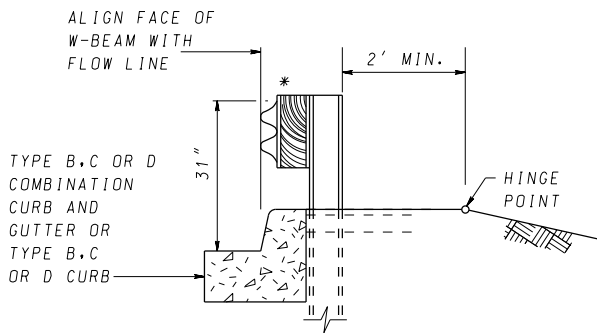
<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>	
<b>APPROVAL</b>	6-26-92	<b>APPROVAL</b> 6-26-92
<b>REVISED</b>	10-1-01	<b>REVISED</b> 7-2-99
<b>REVISED</b>	2-25-20	<b>REVISED</b> 2-24-20
<b>REVISED</b>	3-31-20	<b>REVISED</b> 3-30-20

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER THRIE-BEAM  
DOUBLE FACE**

**STANDARD NO.**

**MD 605.30**

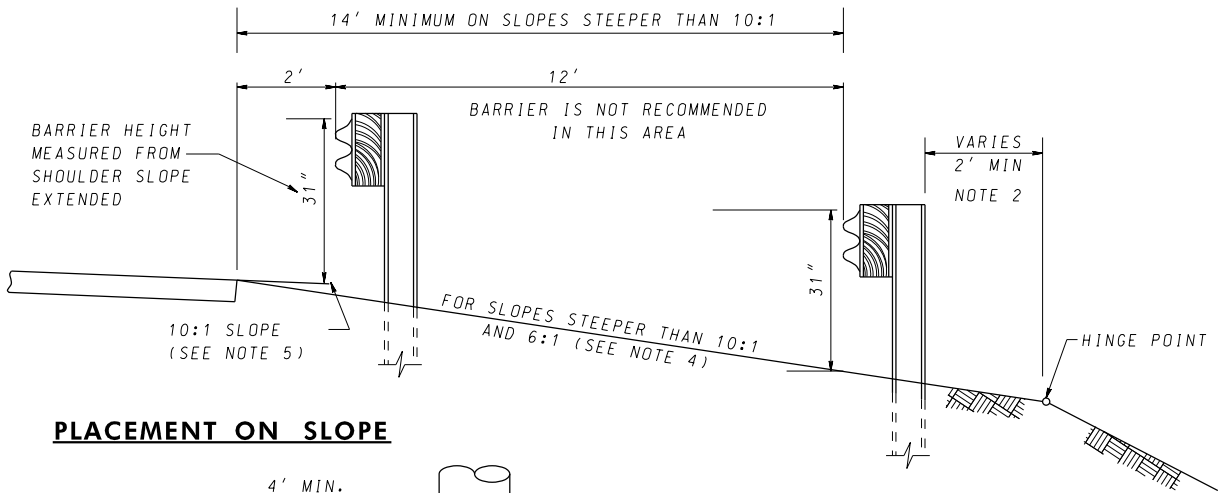


\* FACE OF W-BEAM CAN BE MOVED BACK 6" WITH EITHER 12" OR 8" OFFSET BLOCK WITH ENGINEER'S APPROVAL. WHEN USED WITH TRAFFIC BARRIER END TREATMENT, CURB SHALL BE TAPERED DOWN AND CURB HEIGHT SHALL NOT EXCEED 2".

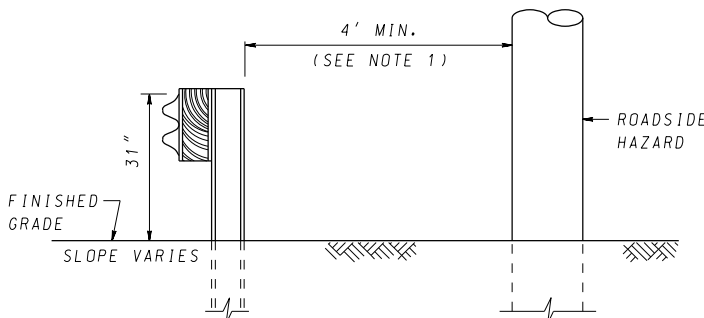
\*\* FOR 45 MPH MAX. SPEED.

**PLACEMENT BEHIND SIDEWALK AREA**

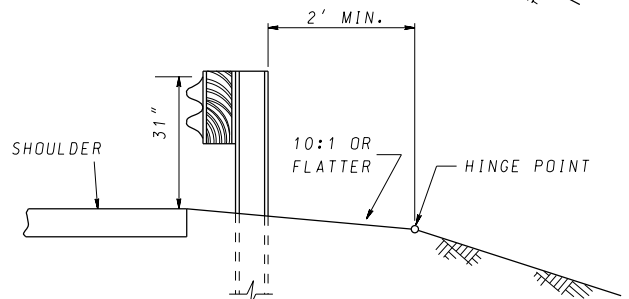
**PLACEMENT AT CURB (WITHOUT SIDEWALK)**



**PLACEMENT ON SLOPE**



**MINIMUM OFFSET TO HAZARD**



**PLACEMENT AT SHOULDER**

**NOTES**

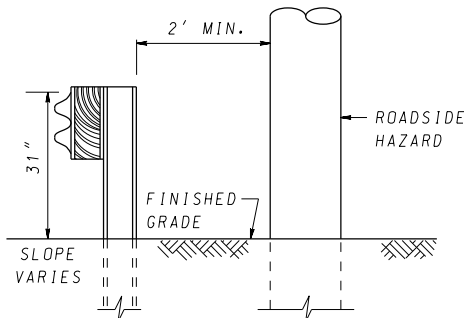
1. THE MINIMUM OFFSET DIMENSION SHOWN CAN BE REDUCED BY STIFFENING THE TRAFFIC BARRIER SYSTEM. SEE STD MD 605.31-01.
2. 8'-0" LONG POSTS ARE TO BE USED WHEN THE DISTANCE FROM THE BACK OF THE W BEAM POST TO THE HINGE POINT IS LESS THAN 2' AND THE SLOPE BEYOND THE HINGE IS STEEPER THAN 4:1.
3. WHEN THE FACE OF THE TRAFFIC BARRIER IS MORE THAN 2' FROM THE SHOULDER EDGE, THE HEIGHT MEASURED FROM THE EXISTING GROUND SHALL BE 31".
4. WHEN SLOPE IS STEEPER THAN 6:1, THE FACE OF THE BARRIER MUST BE ALIGNED WITH THE EDGE OF SHOULDER.
5. SLOPE IN FRONT OF BARRIER INSTALLED 2' OFFSET FROM SHOULDER EDGE MUST BE 10:1 OR SHALLOWER.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>		
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>		
<b>APPROVAL</b>	6-4-84	<b>APPROVAL</b>	8-1-94
<b>REVISED</b>	12-21-17	<b>REVISED</b>	12-20-17
<b>REVISED</b>	6-22-18	<b>REVISED</b>	4-30-18
<b>REVISED</b>	1-9-20	<b>REVISED</b>	12-23-19

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

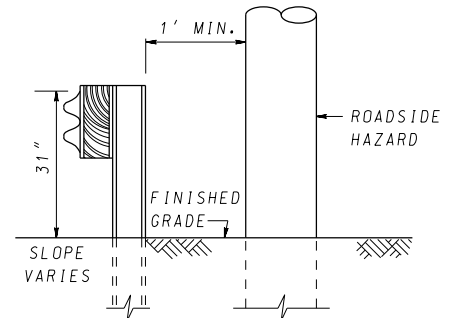
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**TRAFFIC BARRIER W-BEAM**  
**PLACEMENT DETAILS**

**STANDARD NO. MD 605.31**



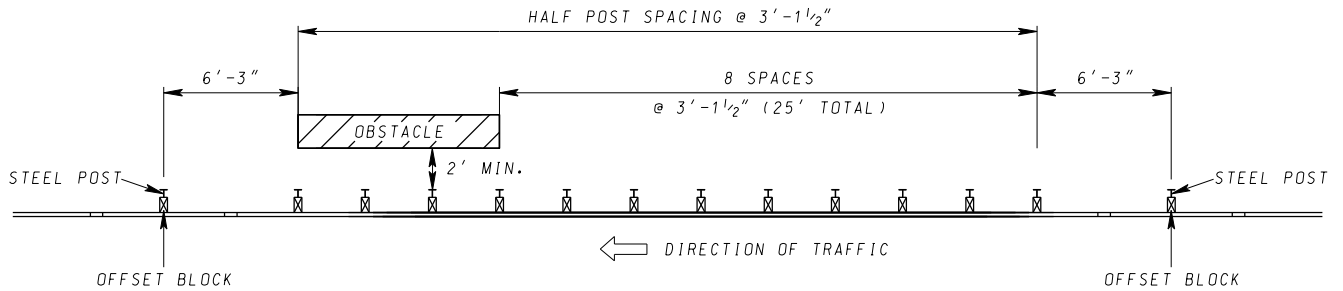
**MINIMUM OFFSET TO HAZARD**

3'-1½" POST SPACING (HALF POST)  
STARTING 25' IN ADVANCE OF THE ROADSIDE HAZARD



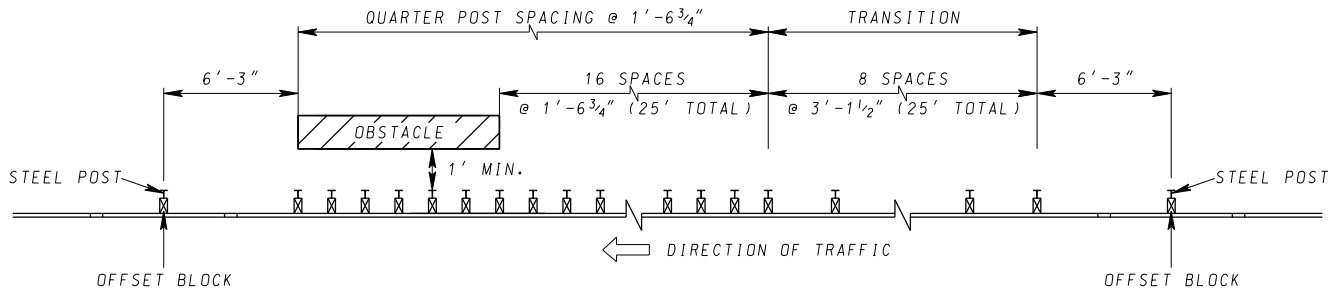
**MINIMUM OFFSET TO HAZARD**

1'-6¾" POST SPACING (QUARTER POST)  
STARTING 50' IN ADVANCE OF THE ROADSIDE HAZARD



**PLAN VIEW**

HALF POST SPACING



**PLAN VIEW**

QUARTER POST SPACING

**NOTES**

1. THE TRAFFIC BARRIER W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 1-9-20	APPROVAL 12-23-19
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

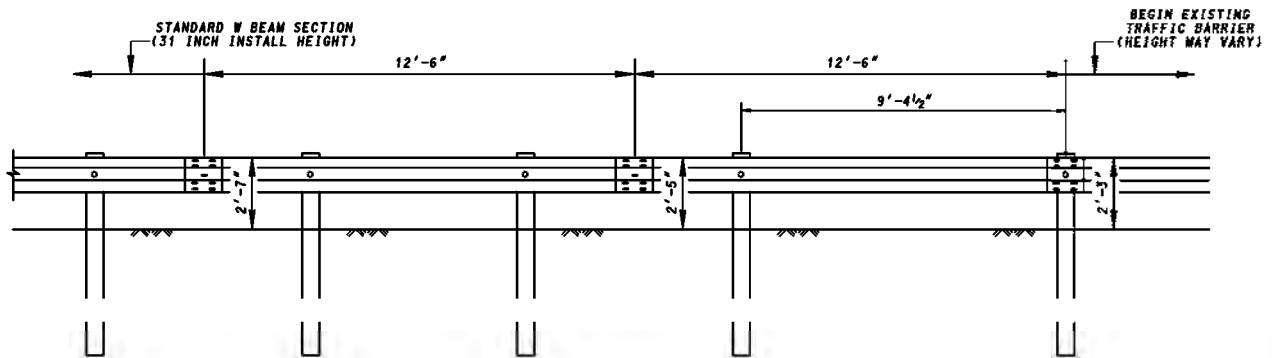
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**TRAFFIC BARRIER W-BEAM**  
**STIFFENING DETAILS**

**STANDARD NO. MD 605.31-01**

FLARE RATES	
DESIGN SPEED (MPH)	W-BEAM
70	15:1
60	14:1
55	12:1
50	11:1
45	10:1
40	8:1
30	7:1

**NOTE**

1. THE ABOVE FLARE RATES FOR W BEAM BARRIER SYSTEMS ARE APPLIED WHEN BARRIER TRANSITIONS TOWARD THE TRAVEL WAY. IF THE BARRIER TRANSITIONS AWAY FROM THE TRAVEL WAY, AND THE SLOPE IS 10:1 OR FLATTER, ANY FLARE RATE 2:1 OR FLATTER IS ACCEPTABLE, IF THE SLOPE IS STEEPER THAN 10:1 (BUT NO STEEPER THAN 6:1), A 2:1 FLARE RATE IS USED.



**ELEVATION VIEW W BEAM  
HEIGHT TRANSITION**

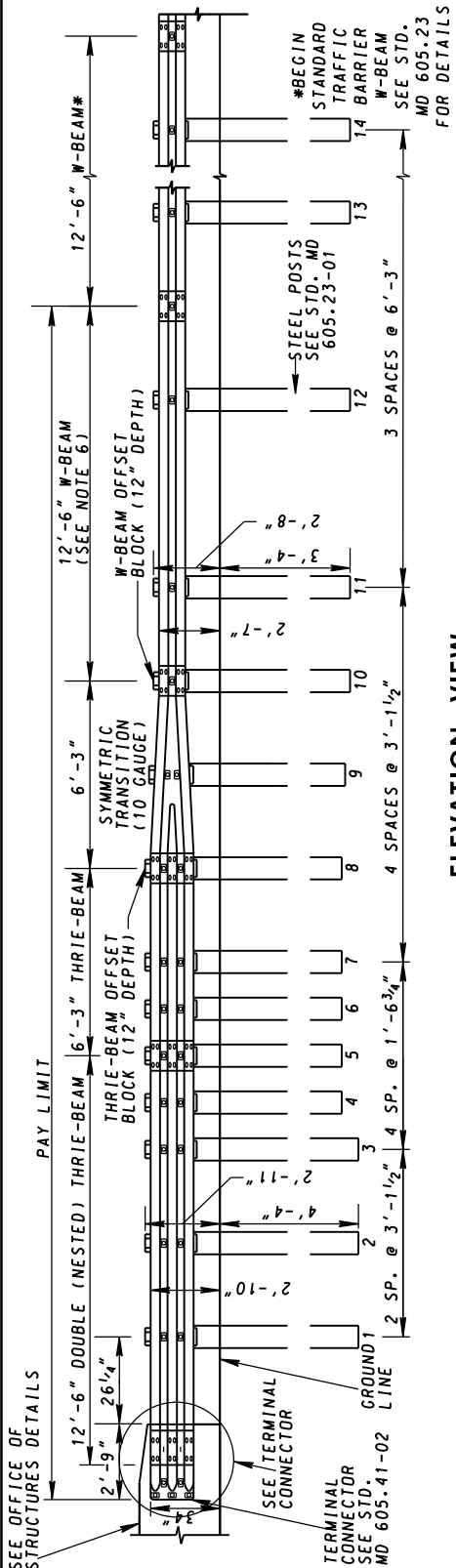
**NOTE**

- FOR CHANGES IN W-BEAM INSTALLATION HEIGHT, WHEN TYING IN TO EXISTING, UNDAMAGED TRAFFIC BARRIER THAT IS NOT BEING REPLACED AS PART OF THE CONTRACT, USE A MAXIMUM TRANSITION OF 2 INCHES IN HEIGHT PER 12' 6" PANEL OF W-BEAM INSTALLED.
- FOR TRANSITIONS TO BARRIER CONFIGURATIONS WITH SPLICES AT THE POST RATHER THAN THE MID-SPAN, DELETE FINAL POST AS SHOWN.

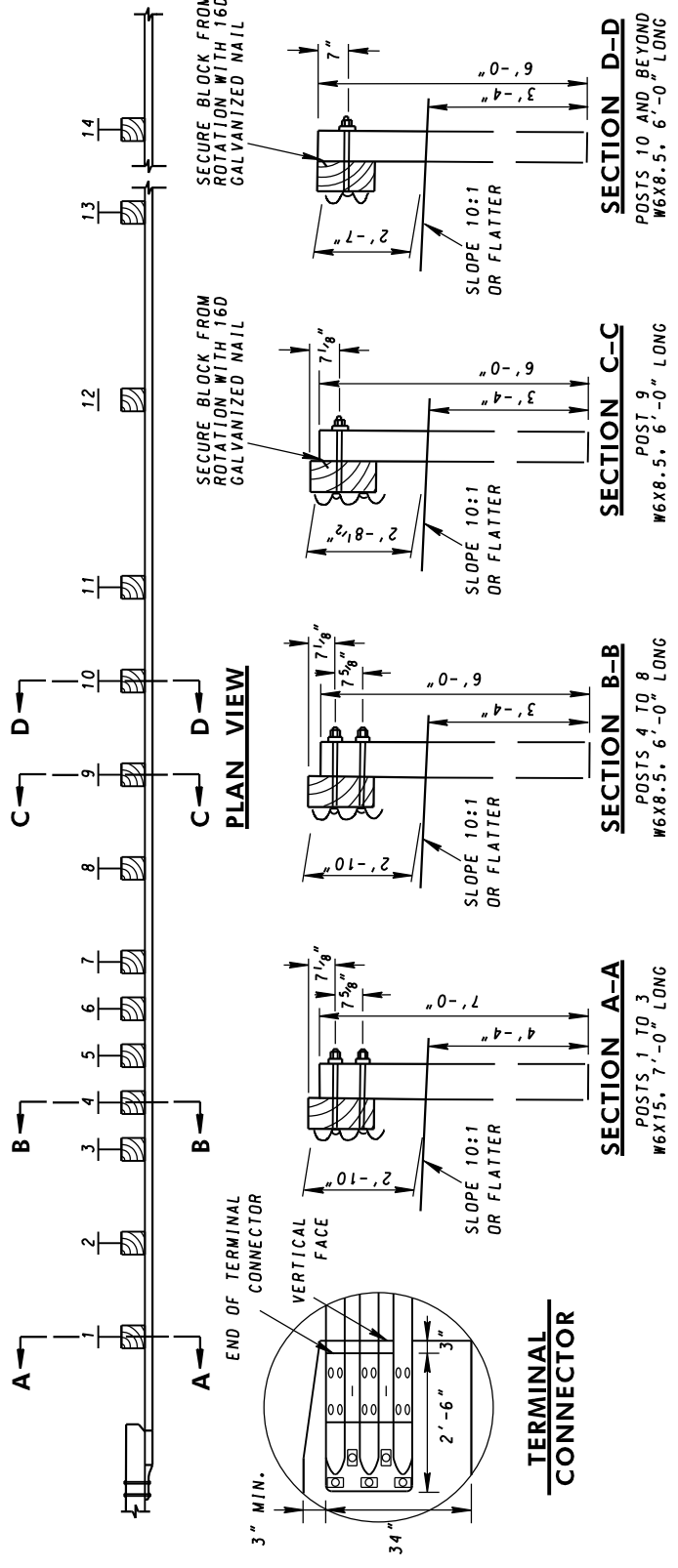
SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 11-08-06	APPROVAL 10-25-06
REVISED 12-21-17	REVISED 12-20-17
REVISED	REVISED
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W BEAM  
FLARE RATES AND HEIGHT TRANSITION**



**ELEVATION VIEW**



**PLAN VIEW**

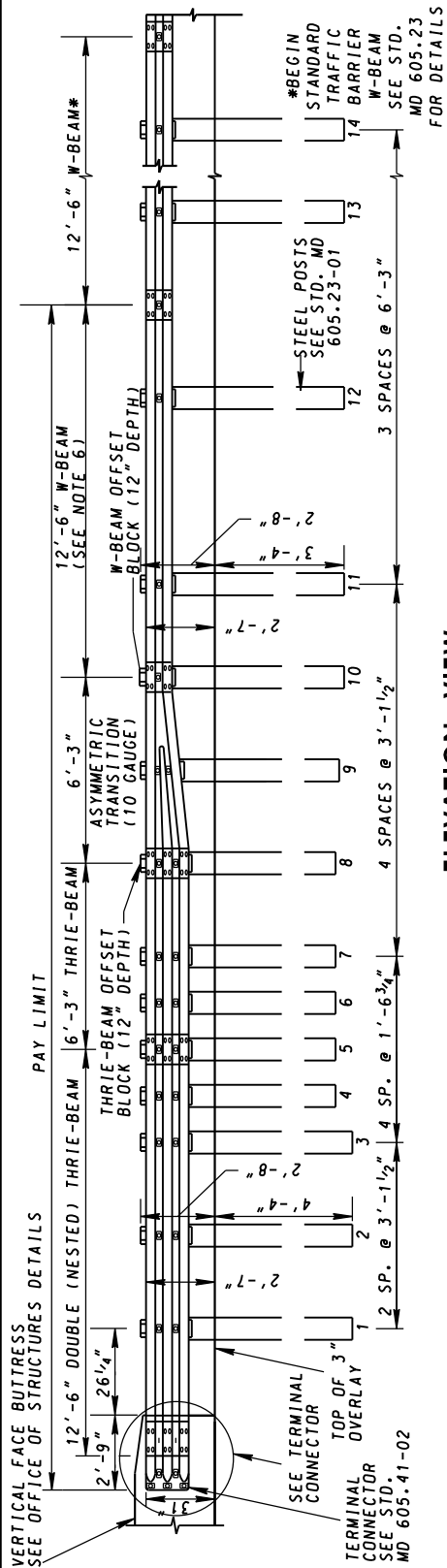
- NOTES**
1. ALL BLOCKOUTS TO BE EITHER 6"x12"x19" (THRIE-BEAM) OR 6"x12"x14" (W-BEAM).
  2. THRIE-BEAM TERMINAL CONNECTOR, THRIE-BEAM SECTIONS, AND W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.
  3. THE TRAFFIC BARRIER THRIE-BEAM ANCHORAGE AT BRIDGE END POSTS SHALL BE PLACED ON SLOPES 10:1 OR FLATTER.
  4. FOR THRIE-BEAM DETAILS, INCLUDING STEEL POSTS, OFFSET BLOCKS, AND SPLICES, SEE STD. MD 605.29.
  5. FOR TERMINAL CONNECTOR AND TRANSITION SECTION, SEE STD. MD 605.41-02.
  6. A 4" CURB MAY BE ADDED BELOW THE TRAFFIC BARRIER THRIE-BEAM SYSTEM, IF A CURB IS USED. PLACE DOUBLE (NESTED) W-BEAM IN THIS SECTION.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 2-25-20	<b>APPROVAL</b> 2-24-20
<b>REVISED</b> 3-16-22	<b>REVISED</b> 2-24-22
<b>REVISED</b>	<b>REVISED</b>
<b>REVISED</b>	<b>REVISED</b>

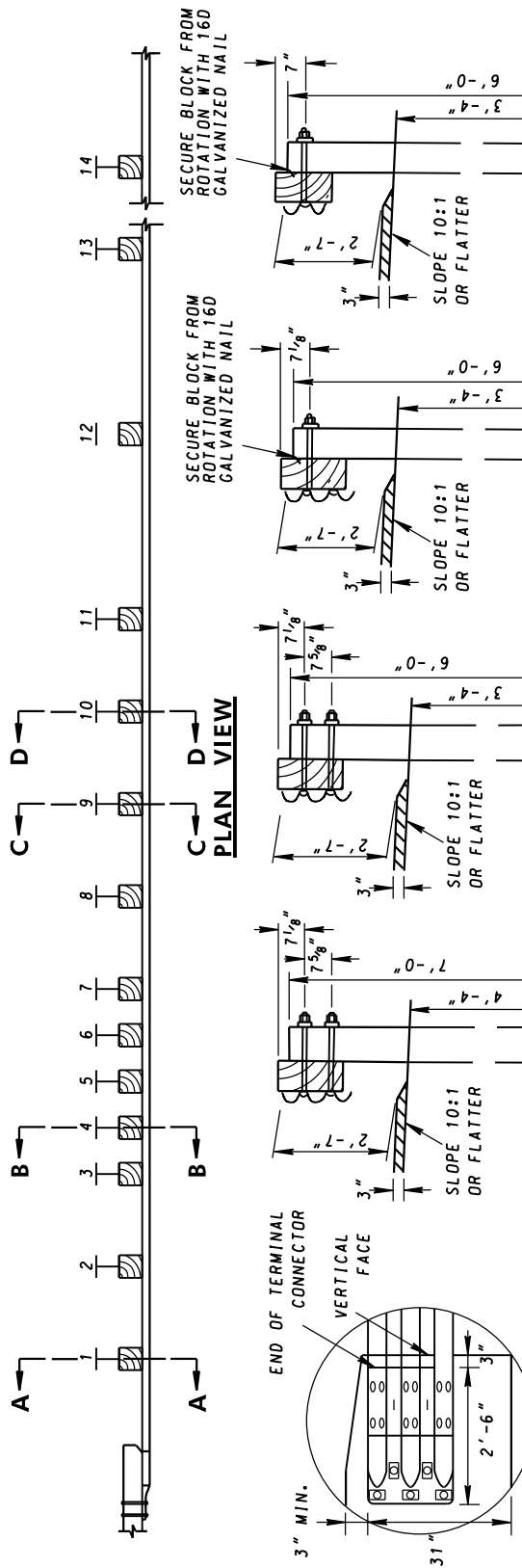
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER THRIE-BEAM  
ANCHORAGE TO VERTICAL FACE**

**STANDARD NO. 605.41**



**ELEVATION VIEW**



**TERMINAL CONNECTOR**

**SECTION A-A**  
POSTS 1 TO 3  
W6X15, 7'-0" LONG

**SECTION B-B**  
POSTS 4 TO 8  
W6X8.5, 6'-0" LONG

**SECTION C-C**  
POST 9  
W6X8.5, 6'-0" LONG

**SECTION D-D**  
POSTS 10 AND BEYOND  
W6X8.5, 6'-0" LONG

**NOTES**

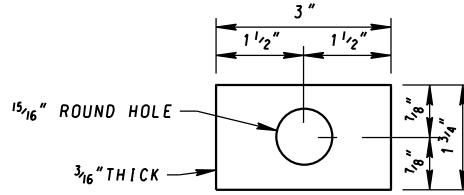
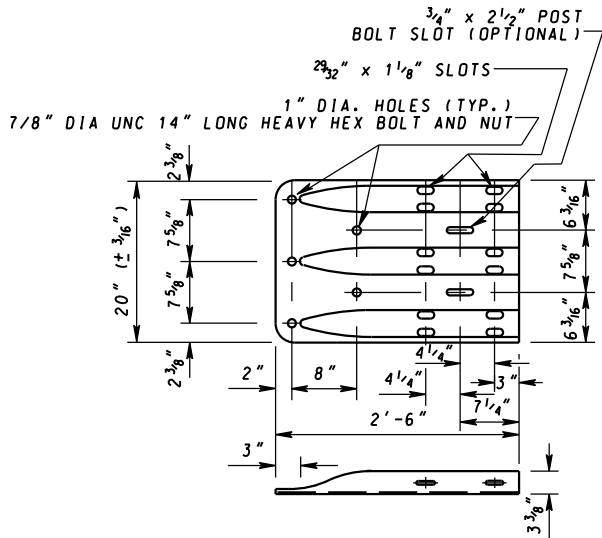
1. ALL BLOCKOUTS TO BE EITHER 6"x12"x19" (THRIE-BEAM) OR 6"x12"x14" (W-BEAM).
2. THRIE-BEAM TERMINAL CONNECTOR, THRIE-BEAM SECTIONS, AND W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.
3. THE TRAFFIC BARRIER THRIE-BEAM ANCHORAGE AT BRIDGE END POSTS SHALL BE PLACED ON SLOPES 10:1 OR FLATTER.
4. FOR THRIE-BEAM DETAILS, INCLUDING STEEL POSTS, OFFSET BLOCKS, AND SPLICES, SEE STD. MD 605.29.
5. FOR TERMINAL CONNECTOR AND TRANSITION SECTION, SEE STD. MD 605.41-02.
6. A 4" CURB MAY BE ADDED BELOW THE TRAFFIC BARRIER THRIE-BEAM SYSTEM, IF A CURB IS USED, PLACE DOUBLE (NESTED) W-BEAM IN THIS SECTION.
7. FOR THIS OVERLAY STANDARD, AN ASYMMETRIC TRANSITION REPLACES THE SYMMETRIC TRANSITION AND THE ADJACENT W-BEAM IS RAISED 3" ON THE POSTS TO MAINTAIN A 31" TOP MOUNTING HEIGHT.
8. OVERLAY SHALL EXTEND Laterally AT LEAST TO THE FACE OF THE RAIL. OVERLAY SHALL NOT EXTEND BEYOND FACE OF POSTS.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 2-25-20	APPROVAL 2-24-20
REVISED 3-16-22	REVISED 2-24-22
REVISED	REVISED
REVISED	REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

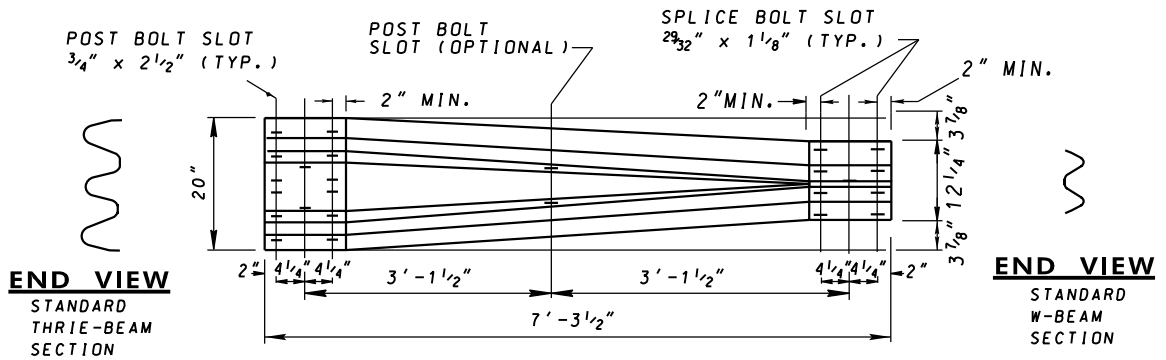
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**TRAFFIC BARRIER THRIE-BEAM**  
**ANCHORAGE TO VERTICAL FACE**  
**AFTER 3" OVERLAY**

**STANDARD NO. 605.41-01**



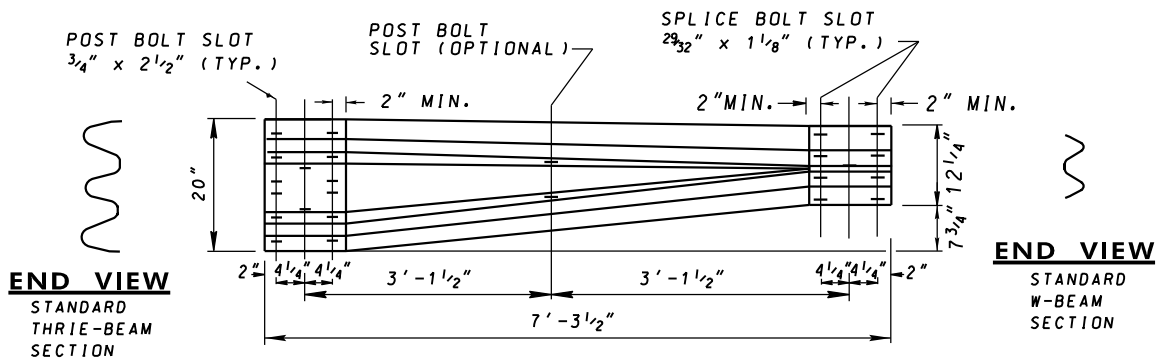
**RECTANGULAR PLATE WASHER**

**THRIE-BEAM TERMINAL CONNECTOR**



**SYMMETRIC**

**W-BEAM - THRIE-BEAM TRANSITION SECTION**



**ASYMMETRIC**

**W-BEAM - THRIE-BEAM TRANSITION SECTION**

**NOTE**

- RECTANGULAR PLATE WASHERS SHALL BE MADE OF STEEL MEETING THE REQUIREMENTS OF ASTM A 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A 123. HOLE MAY BE PUNCHED OR DRILLED.

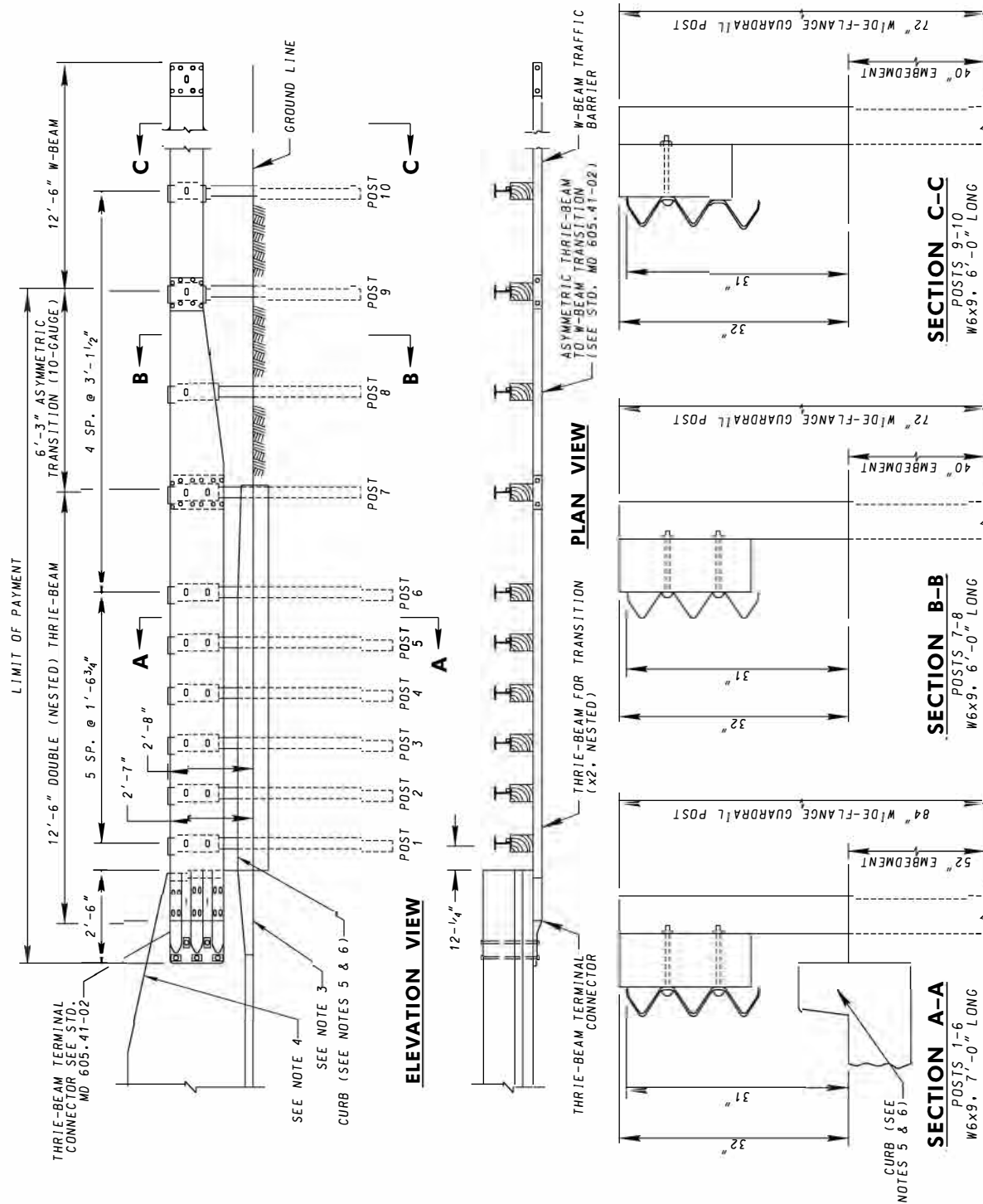
<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>	
<b>APPROVAL</b> 4-27-89	<b>APPROVAL</b> 5-5-89	
<b>REVISED</b> 8-16-12	<b>REVISED</b> 8-13-12	
<b>REVISED</b> 2-25-20	<b>REVISED</b> 2-24-20	
<b>REVISED</b> 3-16-22	<b>REVISED</b> 2-24-22	

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER TERMINAL CONNECTOR  
AND W-BEAM TO THRIE-BEAM  
TRANSITION SECTION**

**STANDARD NO. MD 605.41-02**





**NOTES**

1. BLOCKOUTS FOR POSTS 1-8 SHALL BE 6"x8"x19" (THRIE-BEAM). BLOCKOUTS FOR POSTS 9-10 SHALL BE 6"x8"x14" (W-BEAM).
2. FOR THRIE-BEAM DETAILS, INCLUDING STEEL POSTS, BLOCKOUTS, AND SPLICES, SEE STD. MD 605.29.
3. TOE OF LEADING END OF BARRIER SHALL BE TAPERED AT 12:1 SO THAT TOE DOES NOT CREATE A WHEEL SNAG.
4. A 6:1 VERTICAL TAPER SHALL BE CONSTRUCTED ON THE ENDS OF CONCRETE BARRIER THAT ARE MORE THAN 32" IN HEIGHT.
5. TYPE D CURB (STD. MD 620.02-01) SHALL BE PLACED BELOW THE NESTED THRIE-BEAM SECTION AS SHOWN. TYPE D CURB IS PAID SEPERATELY.
6. IF NO CURB IS INDICATED IN THE PLANS BEYOND THE TRANSITION, TAPER CURB BEGINNING AT POST 6 TO A MAXIMUM HEIGHT OF 4", ENDING AT POST 7.
7. THRIE-BEAM TERMINAL CONNECTOR, THRIE-BEAM SECTIONS, AND W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.

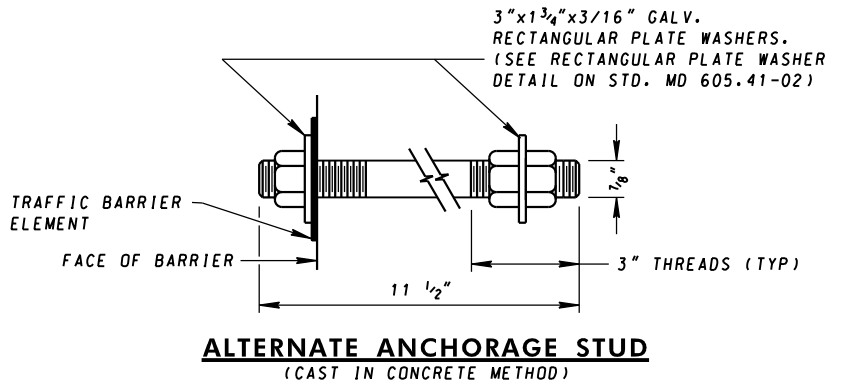
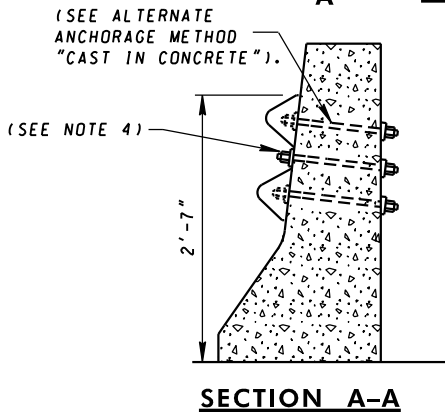
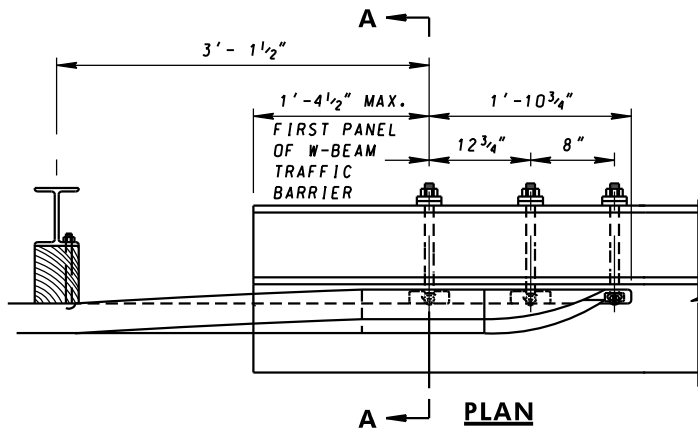
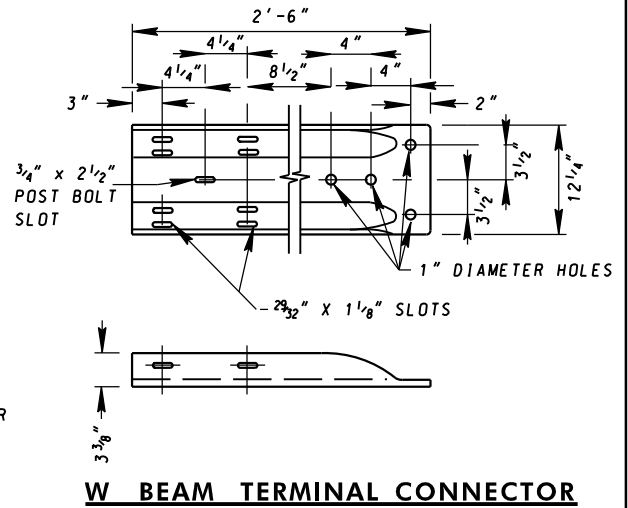
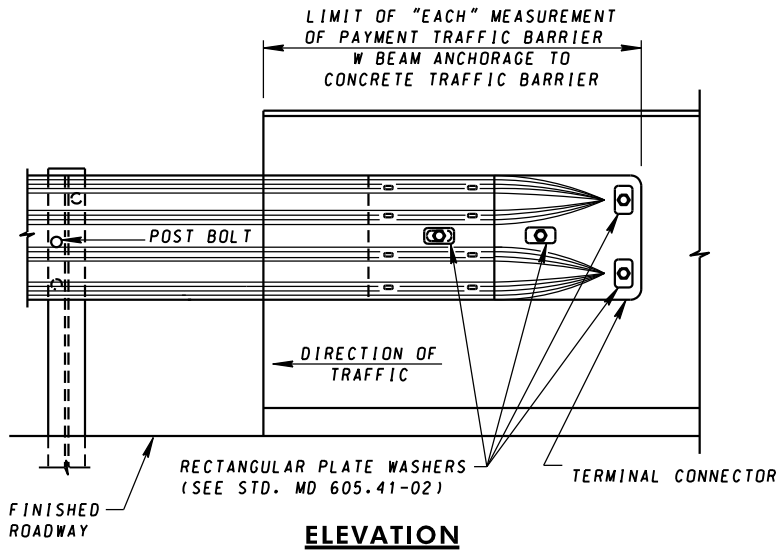
SPECIFICATION	CATEGORY CODE ITEMS		
605			
APPROVED	<i>C. Scott Pomeroy</i> DIRECTOR, OFFICE OF HIGHWAY DEVELOPMENT		
APPROVAL REVISIONS	SHA	FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL	2-9-90	APPROVAL	6-8-90
REVISED	8-16-12	REVISED	8-13-12
REVISED	6-27-23	REVISED	6-21-23
REVISED		REVISED	

**MDT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**TRAFFIC BARRIER THRIE-BEAM**  
**ANCHORAGE TO F-SHAPE OR**  
**SINGLE SLOPE**

**STANDARD NO. MD 605.43**





**NOTES**

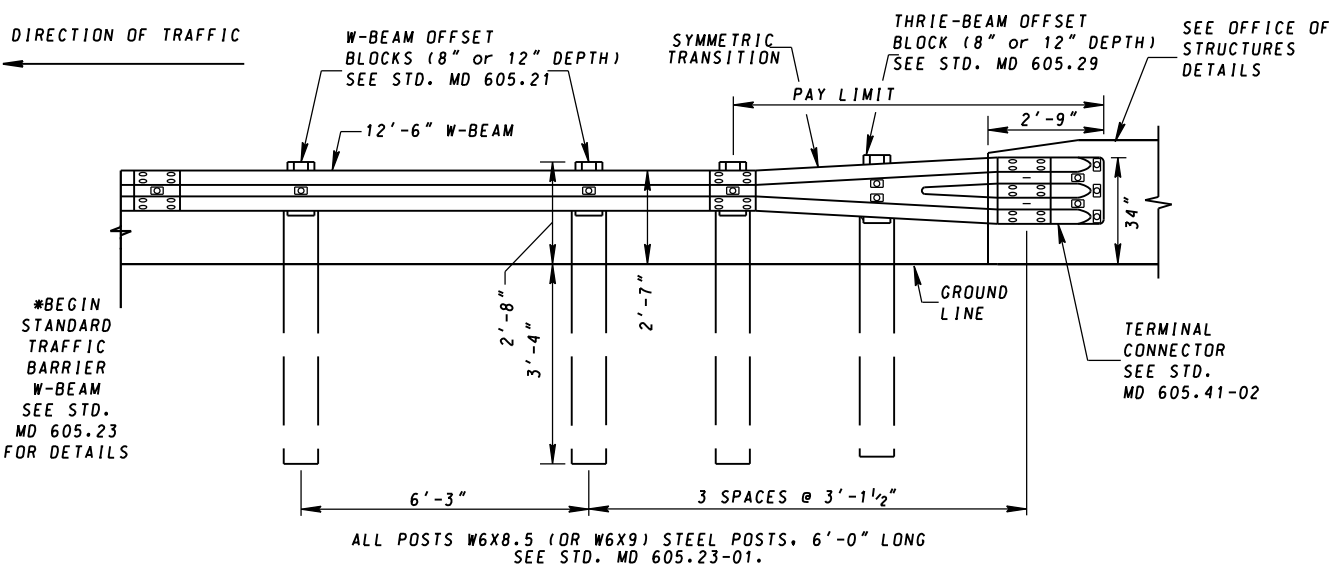
1. THIS TYPE OF ANCHORAGE IS TO BE USED ONLY ON THE TRAILING ENDS OF A STRUCTURE ON A HIGHWAY WITH DIRECTIONAL ONE WAY TRAFFIC.
2. USE NORMAL POST SPACING. WHERE NECESSARY, AN ADDITIONAL OFFSET BLOCK MAY BE INSTALLED TO AVOID CONFLICT WITH DRAINAGE INLETS.
3. ADDITIONAL OFFSET BLOCKS SHALL NOT EXCEED A MAXIMUM OF TWO PER POST IN ALL CASES.
4. THE CONTRACTOR SHALL CORE FOUR (4) 1" DIA. HOLES THROUGH CONCRETE BARRIER, FURNISH AND INSTALL FOUR (4) 7/8" DIA. HEAVY DUTY GALVANIZED HEX BOLTS AND NUTS WITH FOUR (4) RECTANGULAR PLATE WASHERS.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 6-4-84	APPROVAL 4-26-83
REVISED 8-16-12	REVISED 8-13-12
REVISED 3-16-22	REVISED 2-24-22
REVISED	REVISED

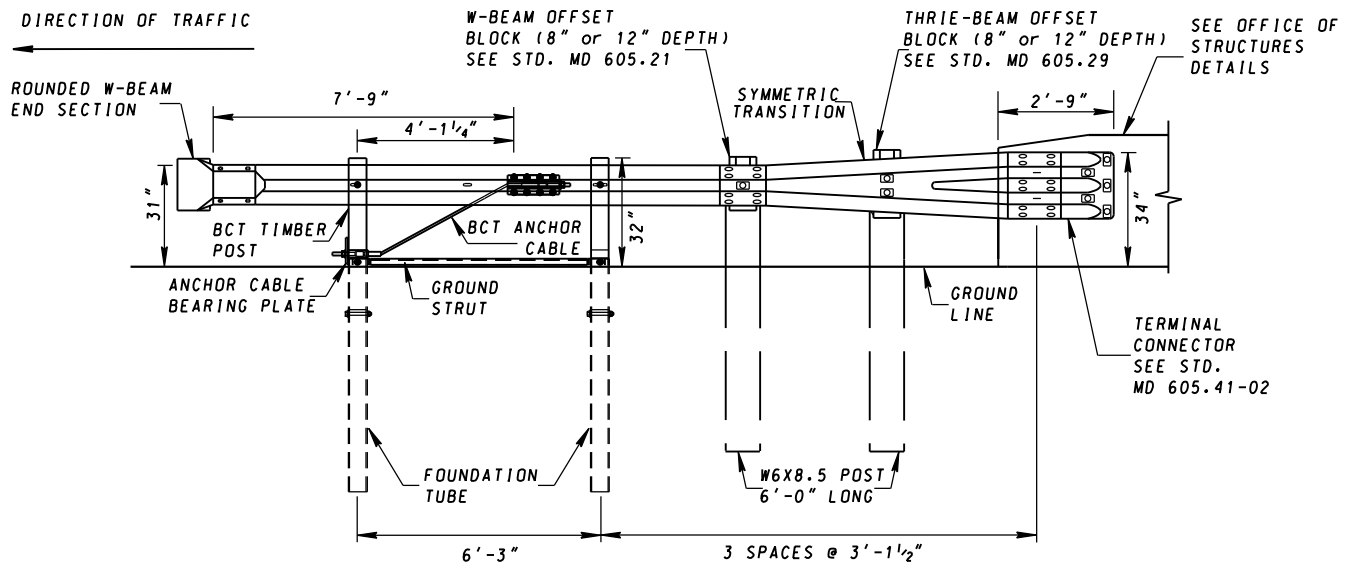
**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
TRAFFIC BARRIER W-BEAM ANCHORAGE  
TO TRAIL END OF JERSEY SHAPE  
OR F SHAPE**

**STANDARD NO. MD 605.44**



**ELEVATION VIEW  
CONNECTING TO W-BEAM**




**ELEVATION VIEW  
CONNECTING TO END TREATMENT**

**NOTES**

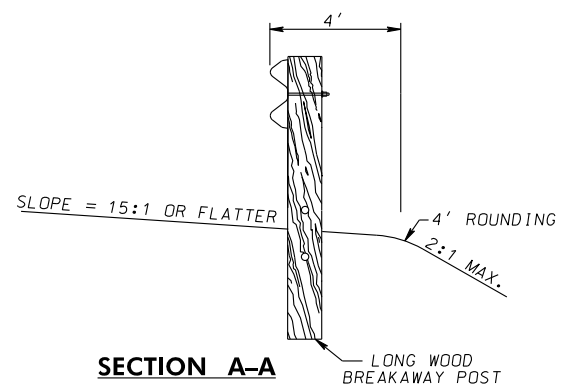
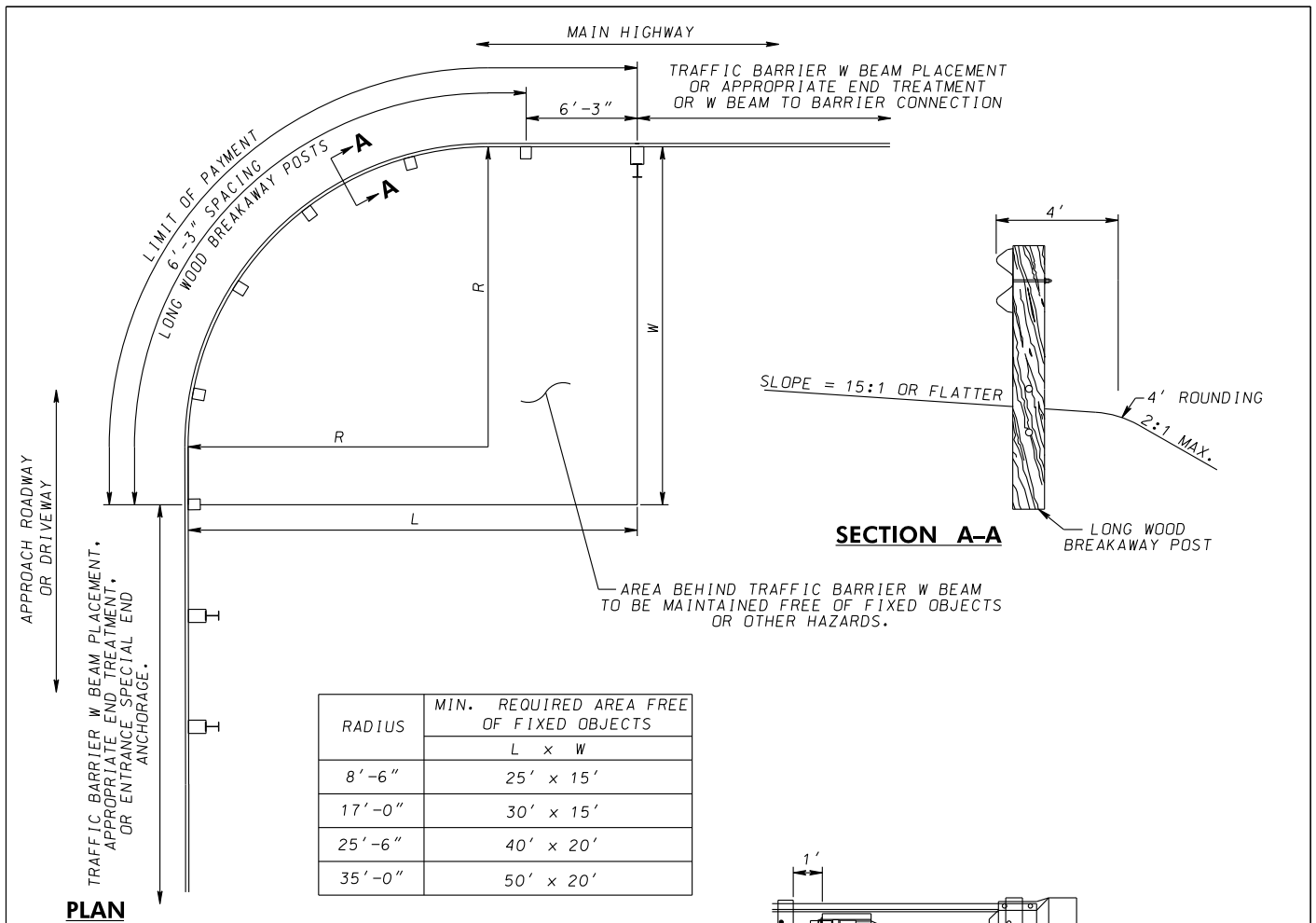
1. THIS TYPE OF ANCHORAGE IS TO BE USED ONLY ON THE TRAILING END OF A STRUCTURE ON A HIGHWAY WITH DIRECTIONAL ONE WAY TRAFFIC.
2. THRIE-BEAM TERMINAL CONNECTOR, SYMMETRIC TRANSITION SECTION, AND W-BEAM SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.
3. THE TRAFFIC BARRIER THRIE-BEAM ANCHORAGE AT BRIDGE END POSTS SHALL BE PLACED ON SLOPES 10:1 OR FLATTER.
4. FOR TERMINAL CONNECTOR AND TRANSITION SECTION, SEE STD. MD 605.41-02.
5. FOR END TREATMENT, SEE STD. MD 605.10.
6. "TRAFFIC BARRIER THRIE-BEAM ANCHORAGE TO VERTICAL FACE DOWNSTREAM" PAID FOR BY EACH. SEE STD. MD 605.10 FOR PAYMENT OF THE END TREATMENT.

<b>SPECIFICATION</b> 605	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 3-16-22	<b>APPROVAL</b> 2-24-22
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED


**MARYLAND DEPARTMENT OF TRANSPORTATION**  
 STATE HIGHWAY ADMINISTRATION

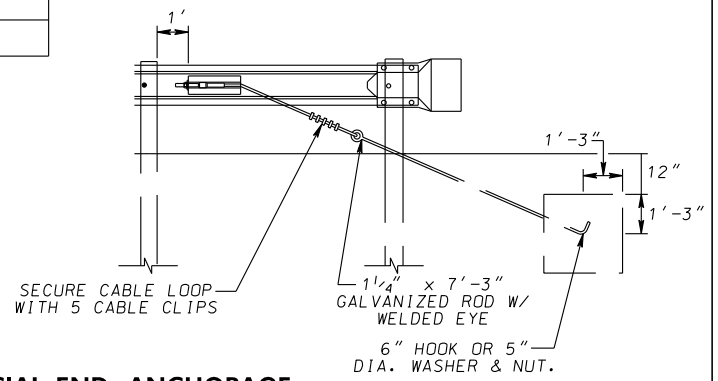
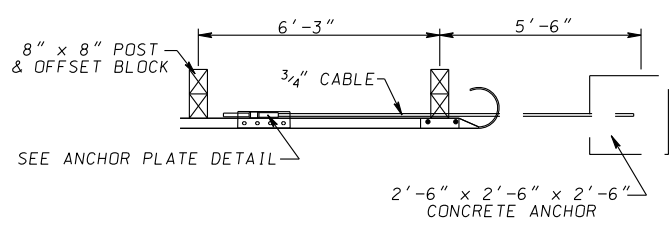
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
 TRAFFIC BARRIER THRIE-BEAM  
 ANCHORAGE TO VERTICAL FACE  
 DOWNSTREAM**

**STANDARD NO. 605.45**



RADIUS	MIN. REQUIRED AREA FREE OF FIXED OBJECTS
	L x W
8'-6"	25' x 15'
17'-0"	30' x 15'
25'-6"	40' x 20'
35'-0"	50' x 20'

**PLAN**



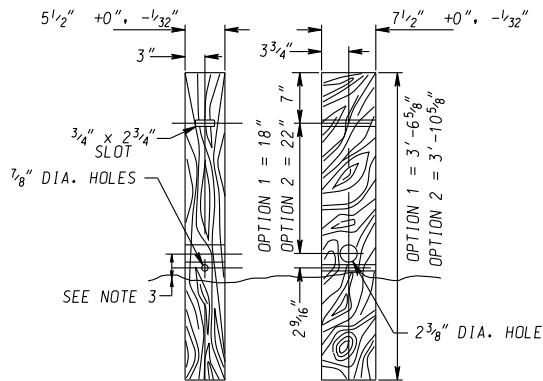
**ENTRANCE SPECIAL END ANCHORAGE**

**NOTES:**

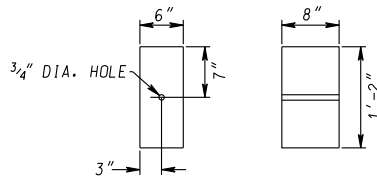
1. NO WASHERS ARE USED ON THE RAIL SIDE OF THE LONG WOOD BREAKAWAY POSTS.
2. THE CURVED TRAFFIC BARRIER W BEAM SECTION SHALL BE SHOP BENT.
3. PLACE TRAFFIC BARRIER W BEAM DELINEATORS AT THE INTERVALS SPECIFIED IN THE MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. IF CURB IS USED IN CONJUNCTION WITH CURVED TRAFFIC BARRIER W BEAM SECTION, THE CURB CANNOT BE HIGHER THAN 2".
5. ON THE 8'6" RADIUS SYSTEM ONLY, THE RAIL IS NOT TO BE BOLTED TO THE CENTER POST.

SPECIFICATION	CATEGORY CODE ITEMS
-	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 4-12-16
	REVISIONS -
	REVISIONS -

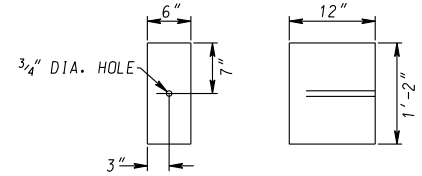
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**TRAFFIC BARRIER W BEAM, SHORT RADIUS**  
**STANDARD NO. MD 605.52**



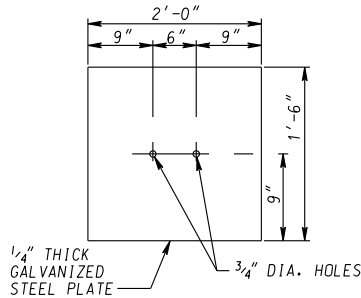
**SHORT WOOD BREAKAWAY POST**



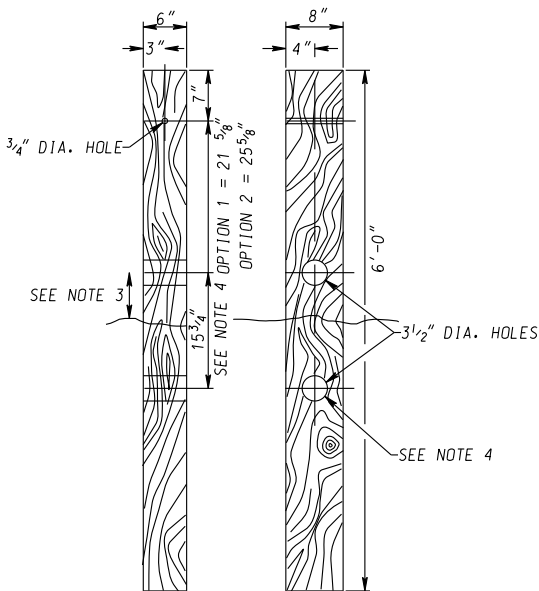
**OFFSET BLOCK, OPTION 1**



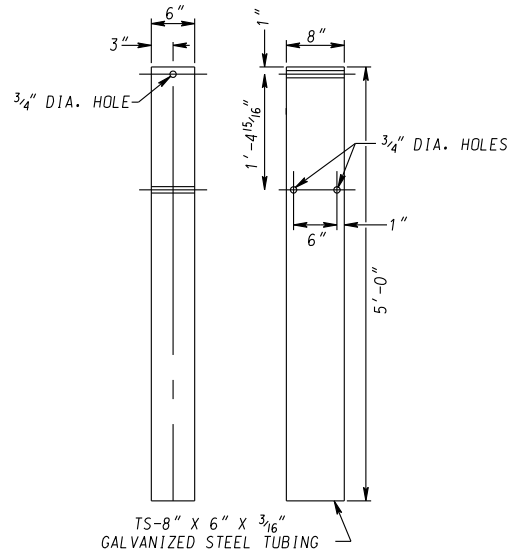
**OFFSET BLOCK, OPTION 2**



**SOIL PLATE**



**LONG WOOD BREAKAWAY POST**



**STEEL TUBE**

**NOTES**

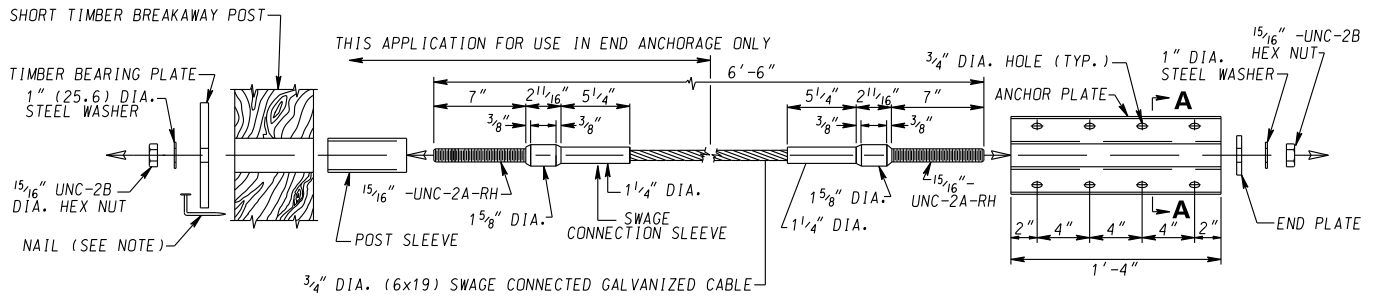
1. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
2. ALL WOOD SIZES ARE NOMINAL DIMENSIONS.
3. POSTS SHOULD BE PLACED SO THE BREAKAWAY HOLES ARE NO LOWER THAN GROUND LEVEL AND NO HIGHER THAN 4" ABOVE GROUND LEVEL.
4. LOWER BREAKAWAY HOLE ONLY NEEDED ON BURIED END SECTION.

SPECIFICATION -	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 4-12-16
	APPROVAL 3-14-16
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

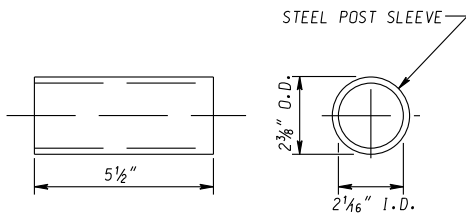
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**TRAFFIC BARRIER W BEAM, SHORT RADIUS POST & SOIL PLATE**

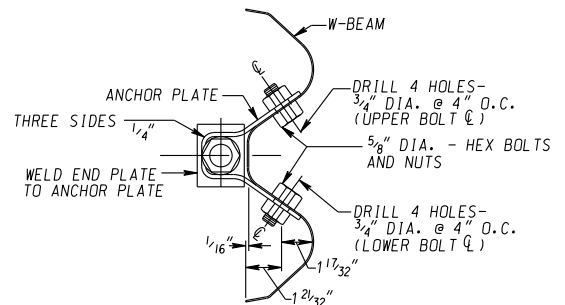
**STANDARD NO. MD 605.52-01**



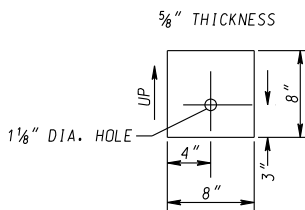
**SWAGED CABLE ASSEMBLY AND RELATED HARDWARE ASSEMBLY**



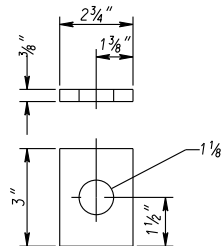
**POST SLEEVE**



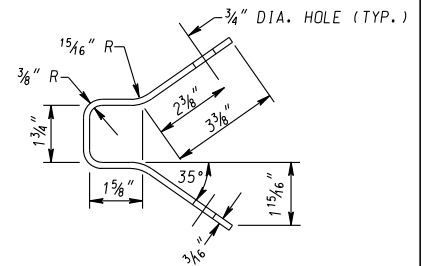
**ANCHOR PLATE TO W-BEAM CONNECTION DETAIL**



**TIMBER BEARING PLATE**



**END PLATE**



**SECTION A-A**

**NOTES**

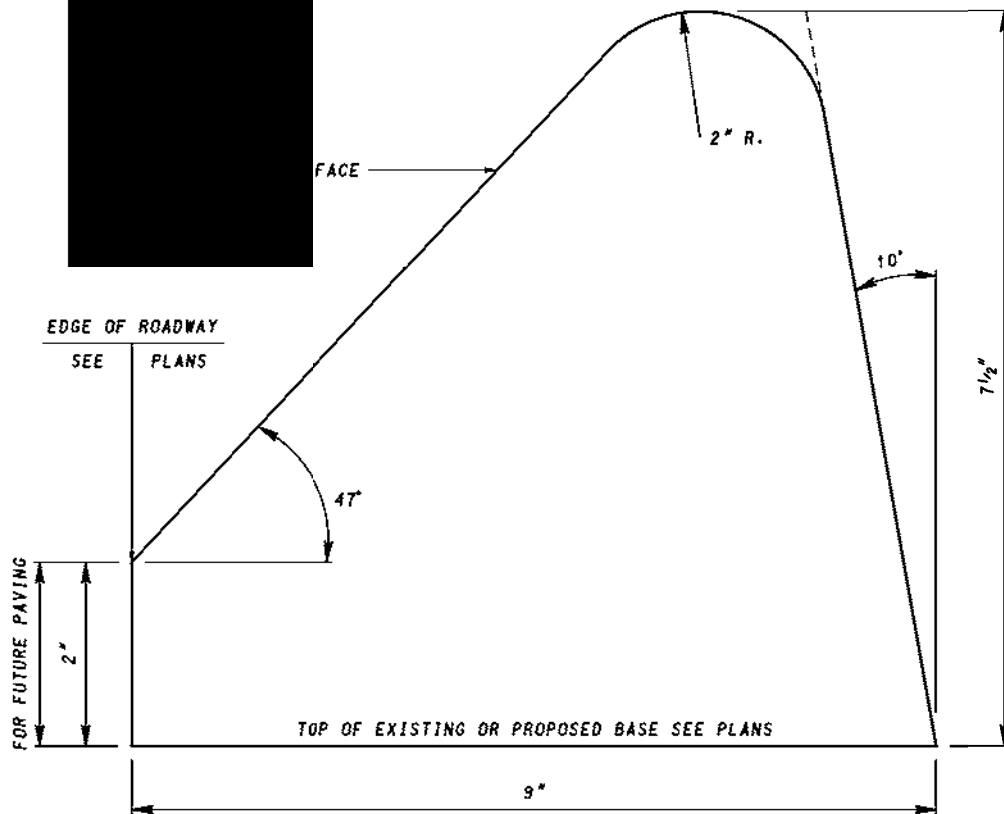
1. TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION, 2-10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY POST, AND BENT OVER BEARING PLATE.
2. TIGHTEN ASSEMBLY UNTIL CABLE IS TAUGHT.
3. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.


SPECIFICATION	CATEGORY CODE ITEMS
-	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 4-12-16
	REVISIONS -

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**TRAFFIC BARRIER W BEAM, SHORT RADIUS HARDWARE & DETAILS**

**STANDARD NO. MD 605.52-02**



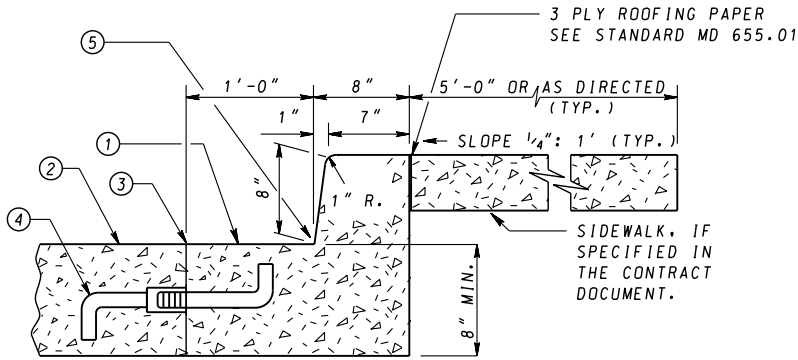
SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-3-59	APPROVAL 7-14-60
	REVISED 6-22-17	REVISED 6-6-17
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

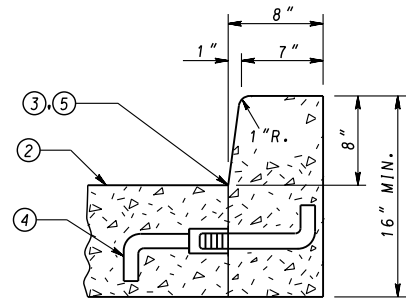
**STANDARD ASPHALT CURB**

**STANDARD NO.**

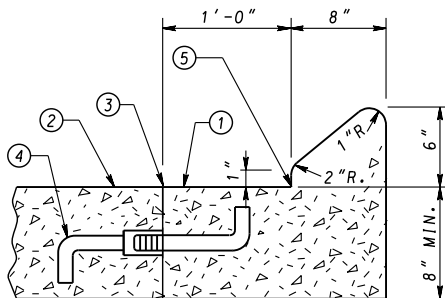
**MD 615.01**



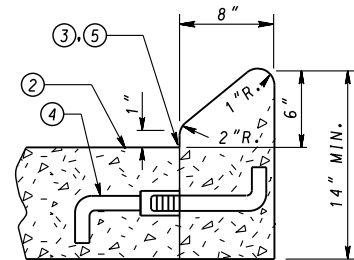
**TYPE 'A'**  
COMBINATION CURB & GUTTER  
DESIGN SPEED ≤ 45 MPH



**TYPE 'A'**  
CURB



**TYPE 'B'**  
COMBINATION CURB & GUTTER  
DESIGN SPEED 50 MPH



**TYPE 'B'**  
CURB

- ① SLOPE GUTTER PAN 1/2" PER FOOT TOWARD FLOW LINE ON ALL ROADWAYS INCLUDING SUPERELEVATED SECTIONS, EXCEPT INTERCHANGE RAMPS.
- ② ROADWAY PAVEMENT SLOPE.
- ③ ROADWAY PAVEMENT CONSTRUCTION JOINT.
- ④ PROVIDE LONGITUDINAL TIE DEVICE "J" BAR MODIFIED. REFER TO STANDARD NO MD 572.61.
- ⑤ FLOW LINE.

**NOTES**

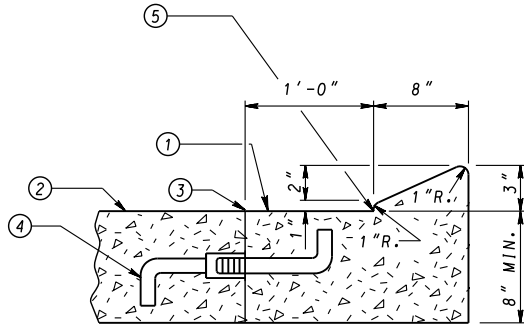
- A. RIGID PAVEMENT ROADWAY ADJACENT TO COMBINATION CURB AND GUTTER AND CLOSED SECTION ROADWAY USING RIGID PAVEMENT WITH COMBINATION CURB AND GUTTER SHALL BE TIED AT THE ROADWAY PAVEMENT CONSTRUCTION JOINT. REFER TO STANDARD MD 572.61 FOR METHOD OF LONGITUDINAL TIE DEVICES. SPACING OF THE TIE BARS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. RIGID PAVEMENT AND CURB SHALL BE CONSTRUCTED AS INDICATED. TIE DEVICES ARE NOT REQUIRED WHEN USING FLEXIBLE PAVEMENT FOR ROADWAY.
- B. MAXIMUM JOINT SPACING FOR CONCRETE CURB AND COMBINATION CURB & GUTTER IS 10'. SEE SPECIFICATION FOR LOCATIONS AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED.
- C. TYPE A OR B COMBINATION CURB AND GUTTER SHALL BE USED FOR ALL APPLICABLE NEW CONSTRUCTION AND IN THOSE AREAS WHERE THE COMBINATION CURB AND GUTTER IS TO BE REPLACED IN KIND.
- D. TYPE A OR B CURB SHALL BE USED FOR THE REPLACEMENT OF LIKE KIND OF CURB ONLY. NOT TO BE USED FOR NEW CONSTRUCTION EXCEPT WHERE INDICATED ON APPROPRIATE INLET STANDARDS.

SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04
	APPROVAL 3-31-04
REVISED 2-25-16	REVISED 2-23-16
REVISED	REVISED
REVISED	REVISED

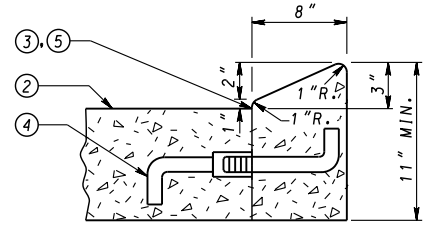
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**STANDARD TYPES A & B CONCRETE CURB AND COMBINATION CONCRETE CURB & GUTTER**

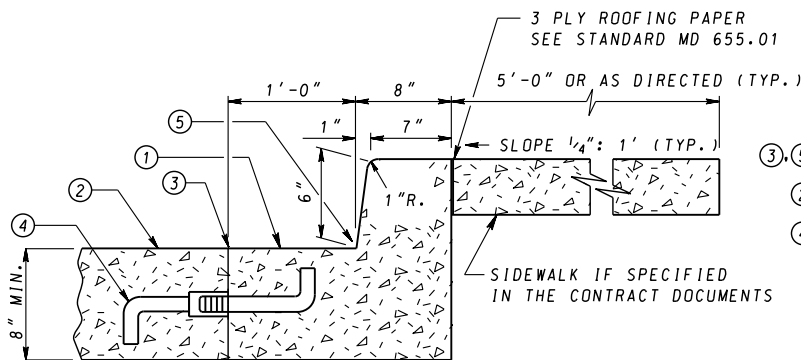
**STANDARD NO. MD 620.02**



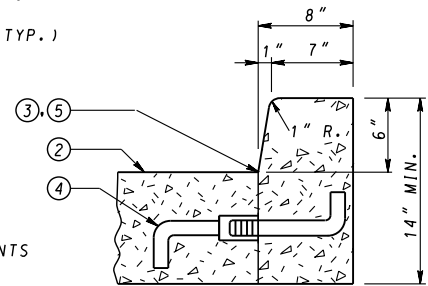
**TYPE 'C'**  
COMBINATION CURB & GUTTER  
TO BE USED FOR DESIGN SPEED 60 MPH



**TYPE 'C'**  
CURB



**TYPE 'D'**  
COMBINATION CURB & GUTTER TO BE USED  
ADJACENT TO PARKING LOCATIONS DESIGNED  
FOR PERSONS WITH DISABILITIES




**TYPE 'D'**  
CURB

- ① SLOPE GUTTER PAN  $\frac{1}{2}$ " PER FOOT TOWARD FLOW LINE ON ALL ROADWAYS INCLUDING SUPERELEVATED SECTIONS, EXCEPT INTERCHANGE RAMPS.
- ② ROADWAY PAVEMENT SLOPE.
- ③ ROADWAY PAVEMENT CONSTRUCTION JOINT.
- ④ PROVIDE LONGITUDINAL TIE DEVICE "J" BAR MODIFIED. REFER TO STANDARD NO MD 572.61.
- ⑤ FLOW LINE.

**NOTES**

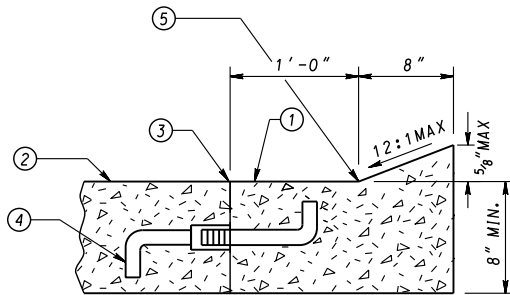
- A. RIGID PAVEMENT ROADWAY ADJACENT TO COMBINATION CURB AND GUTTER AND CLOSED SECTION ROADWAY USING RIGID PAVEMENT WITH COMBINATION CURB AND GUTTER SHALL BE TIED AT THE ROADWAY PAVEMENT CONSTRUCTION JOINT. REFER TO STANDARD MD 572.61 FOR METHOD OF LONGITUDINAL TIE DEVICES. SPACING OF THE TIE BARS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. RIGID PAVEMENT AND CURB SHALL BE CONSTRUCTED AS INDICATED. TIE DEVICES ARE NOT REQUIRED WHEN USING FLEXIBLE PAVEMENT FOR ROADWAY.
- B. MAXIMUM JOINT SPACING FOR CONCRETE CURB AND COMBINATION CURB & GUTTER IS 10'. SEE SPECIFICATION FOR LOCATIONS AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED.
- C. TYPE C OR D COMBINATION CURB AND GUTTER SHALL BE USED FOR ALL APPLICABLE NEW CONSTRUCTION AND IN THOSE AREAS WHERE THE COMBINATION CURB AND GUTTER IS TO BE REPLACED IN KIND.
- D. TYPE C OR D CURB SHALL BE USED FOR THE REPLACEMENT OF LIKE KIND OF CURB ONLY. NOT TO BE USED FOR NEW CONSTRUCTION EXCEPT WHERE INDICATED ON APPROPRIATE INLET STANDARDS.

SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04
	REVISD 2-25-16
	REVISD

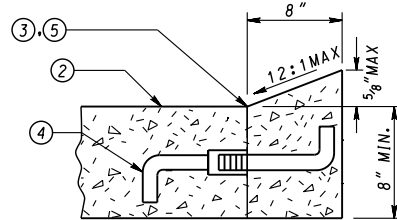
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD TYPES C AND D**  
**CONCRETE CURB AND COMBINATION**  
**CONCRETE CURB & GUTTER**

**STANDARD NO. MD 620.02-01**





**DEPRESSED CURB FOR COMBINATION  
CONCRETE CURB & GUTTER  
FOR SIDEWALK RAMPS**





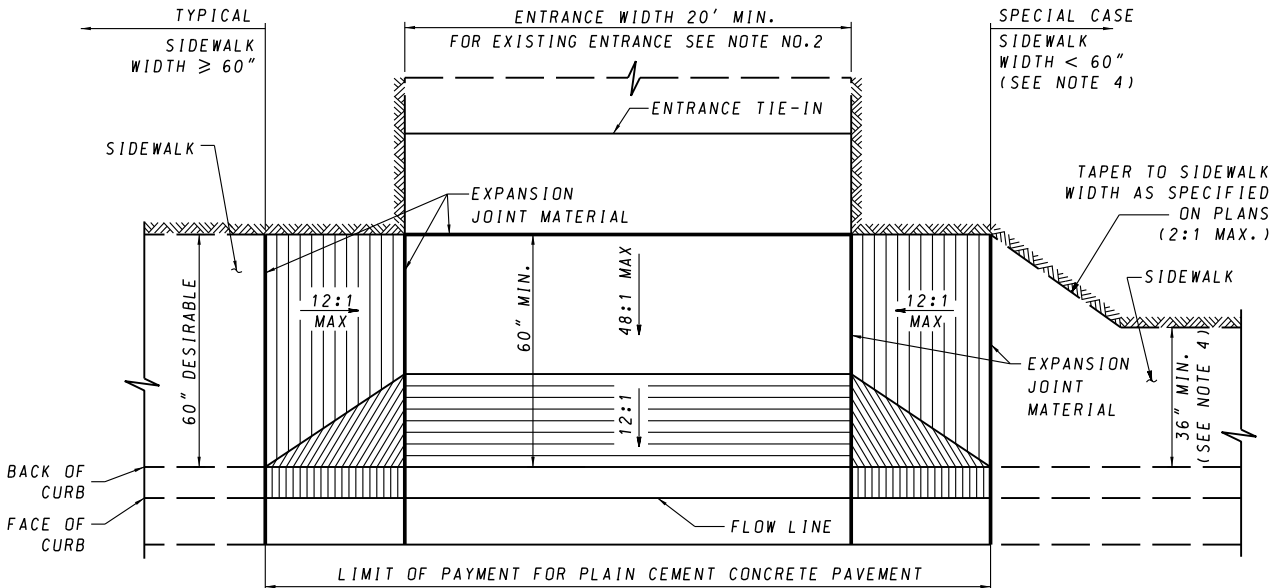
**DEPRESSED  
CONCRETE CURB  
FOR SIDEWALK RAMPS**

- ① SLOPE GUTTER PAN  $\frac{1}{2}$ " PER FOOT TOWARD FLOW LINE ON ALL ROADWAYS INCLUDING SUPERELEVATED SECTIONS, EXCEPT INTERCHANGE RAMPS.
- ② ROADWAY PAVEMENT SLOPE.
- ③ ROADWAY PAVEMENT CONSTRUCTION JOINT.
- ④ PROVIDE LONGITUDINAL TIE DEVICE "J" BAR MODIFIED. REFER TO STANDARD NO MD 572.61.
- ⑤ FLOW LINE.

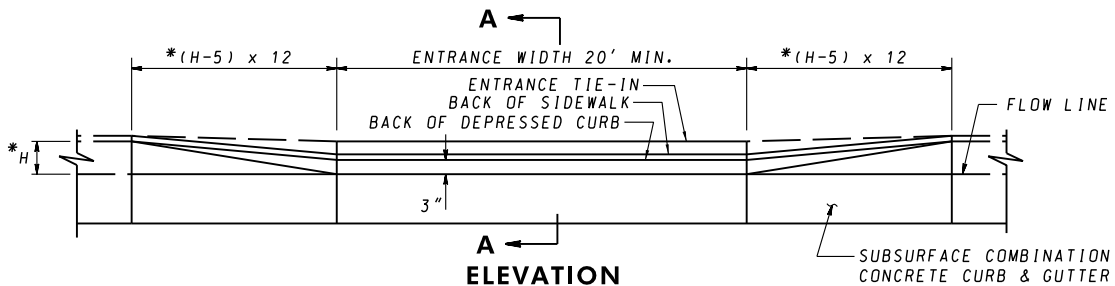
**NOTES**

- A. RIGID PAVEMENT ROADWAY ADJACENT TO COMBINATION CURB AND GUTTER AND CLOSED SECTION ROADWAY USING RIGID PAVEMENT WITH COMBINATION CURB AND GUTTER SHALL BE KEYED AND TIED AT THE ROADWAY PAVEMENT CONSTRUCTION JOINT. REFER TO STANDARD MD 572.61 FOR METHOD OF KEYWAY AND LONGITUDINAL TIE DEVICES. SPACING OF THE TIE BARS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. RIGID PAVEMENT AND CURB SHALL BE CONSTRUCTED AS INDICATED. TIE DEVICES AND KEYS ARE NOT REQUIRED WHEN USING FLEXIBLE PAVEMENT FOR ROADWAY.
- B. MAXIMUM JOINT SPACING FOR CONCRETE CURB AND COMBINATION CURB & GUTTER IS 10'. SEE SPECIFICATION FOR LOCATIONS AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED.
- C. PAYMENT FOR DEPRESSING THE CURB WILL BE INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR THE ITEM CONCRETE CURB OR COMBINATION CONCRETE CURB AND GUTTER, AS SPECIFIED IN THE CONTRACT DOCUMENTS.

SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS	<p><b>Maryland Department of Transportation</b>  <b>STATE HIGHWAY ADMINISTRATION</b>          STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>DEPRESSED CURB FOR COMBINATION CURB AND GUTTER AND DEPRESSED CURB FOR SIDEWALK RAMPS</b></p> <p><b>STANDARD NO. MD 620.03</b></p>	
APPROVED	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
	APPROVAL • SHA REVISIONS		
	APPROVAL 2-10-04	APPROVAL 3-31-04	
	REVISED 2-25-16	REVISED 2-23-16	
	REVISED	REVISED	

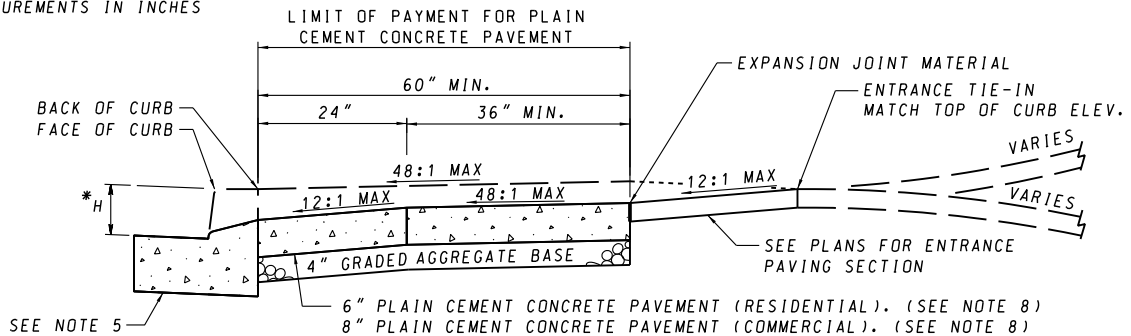


**PLAN**



**ELEVATION**

\* - H = HEIGHT OF CURB  
ALL MEASUREMENTS IN INCHES



**SECTION A-A**

**NOTES**

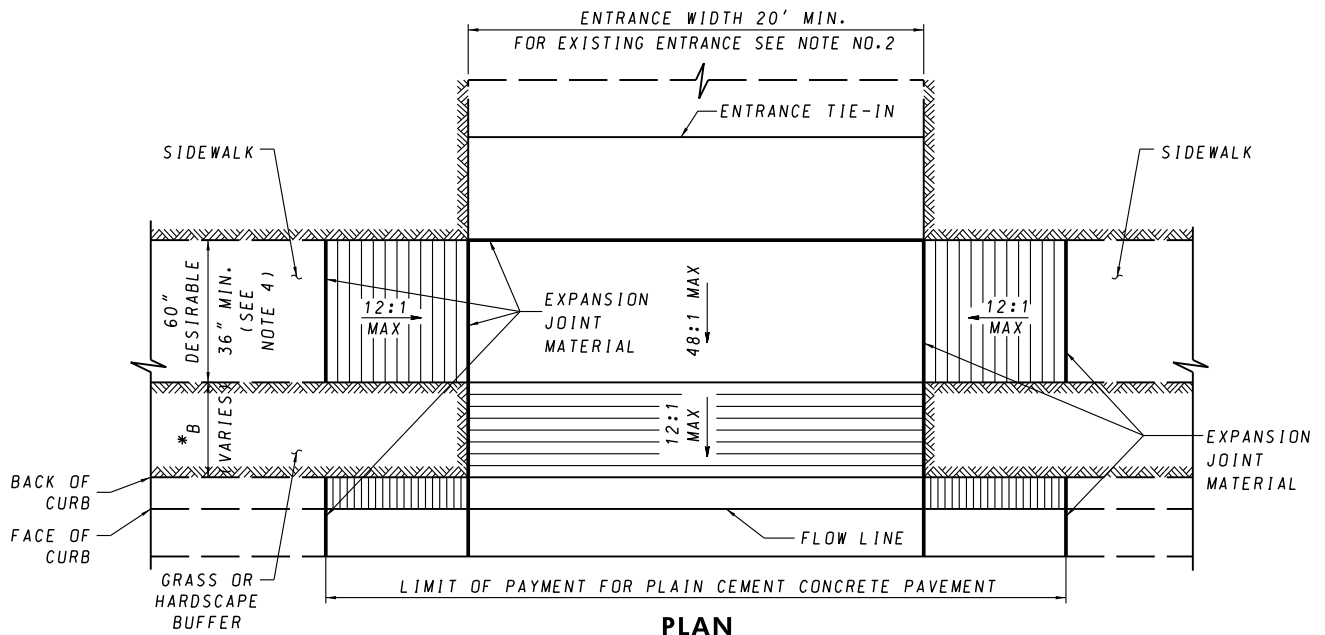
1. FOR USE IN AREAS WHERE THERE IS SIDEWALK ADJACENT TO THE BACK OF CURB OR WHERE IT IS EXPECTED THAT SIDEWALK WILL BE ADDED IN THE FUTURE.
2. WHEN AN EXISTING ENTRANCE IS LESS THAN 20' IN WIDTH A UNIFORM TAPER SHALL BE CONSTRUCTED TO TIE INTO THE EXISTING ENTRANCE AS DIRECTED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL TO BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
4. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, 36" MIN. MAY BE USED AS LONG AS PASSING ZONES ARE PROVIDED IN ACCORDANCE WITH STD. MD-655.02.
5. TYPE A AND B CURB AND THE CURB FOR TYPE A, B, AND D COMBINATION CURB AND GUTTER SHALL BE DEPRESSED AS SHOWN ON STD. 620.02-01 TYPE C. PAYMENT FOR DEPRESSING THE CURB SHALL BE AS SPECIFIED ON STD. 620.03 NOTE C.
6. TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH.
7. RAMP SLOPES MUST BE CALCULATED USING THE HORIZONTAL PLANE. USING ONLY THE RISE-OVER-RUN METHOD IS INSUFFICIENT FOR DETERMINING SLOPE (ANY VARIANCE FROM THE HORIZONTAL PLANE OF THE SURROUNDING ROADWAY FACILITY MUST ALSO BE DETERMINED AND ACCOUNTED FOR).
8. USE MIX 9 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

SPECIFICATION	CATEGORY CODE ITEMS										
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT										
<b>SHA</b> State Highway Administration	<table border="1"> <tr> <td>APPROVAL • SHA REVISIONS</td> <td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td> </tr> <tr> <td>APPROVAL 2-10-04</td> <td>APPROVAL 3-31-04</td> </tr> <tr> <td>REVISED 4-17-07</td> <td>REVISED -</td> </tr> <tr> <td>REVISED 6-2-14</td> <td>REVISED 5-20-14</td> </tr> <tr> <td>REVISED 6-14-16</td> <td>REVISED 6-8-16</td> </tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 2-10-04	APPROVAL 3-31-04	REVISED 4-17-07	REVISED -	REVISED 6-2-14	REVISED 5-20-14	REVISED 6-14-16	REVISED 6-8-16
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL 2-10-04	APPROVAL 3-31-04										
REVISED 4-17-07	REVISED -										
REVISED 6-2-14	REVISED 5-20-14										
REVISED 6-14-16	REVISED 6-8-16										

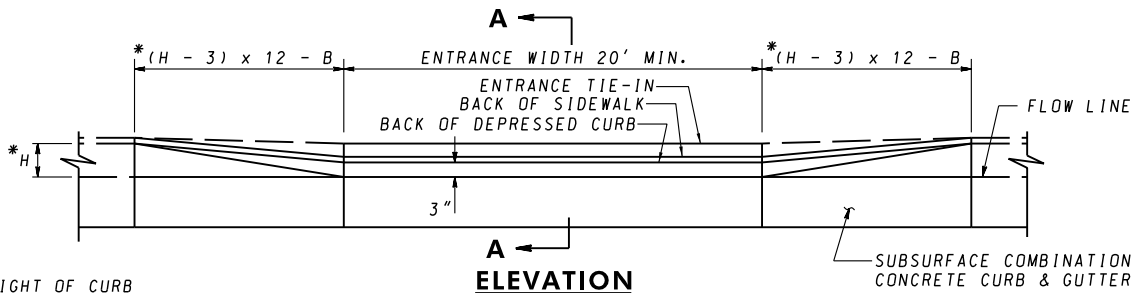
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD ENTRANCE CONSTRUCTION**  
**RESIDENTIAL & COMMERCIAL**  
**METHOD NO.1**

**STANDARD NO.**

**MD 630.01**

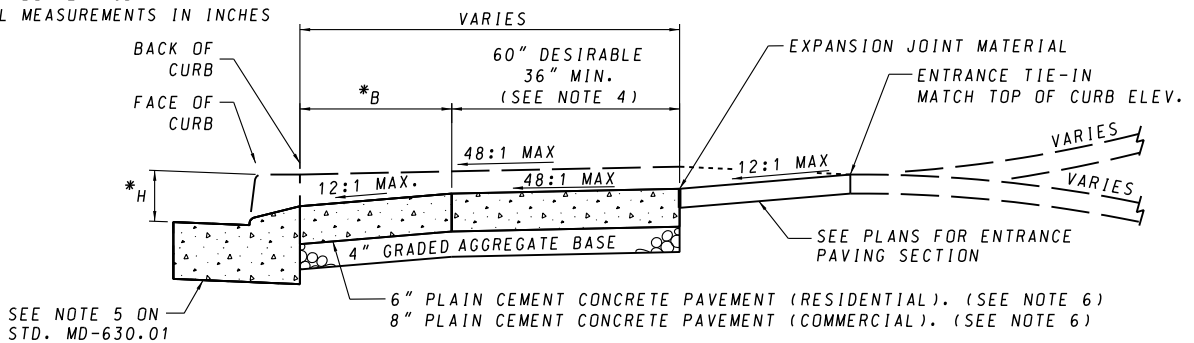


**PLAN**



**ELEVATION**

\* - H = HEIGHT OF CURB  
 B = BUFFER WIDTH  
 ALL MEASUREMENTS IN INCHES



**SECTION A-A**

**NOTES**

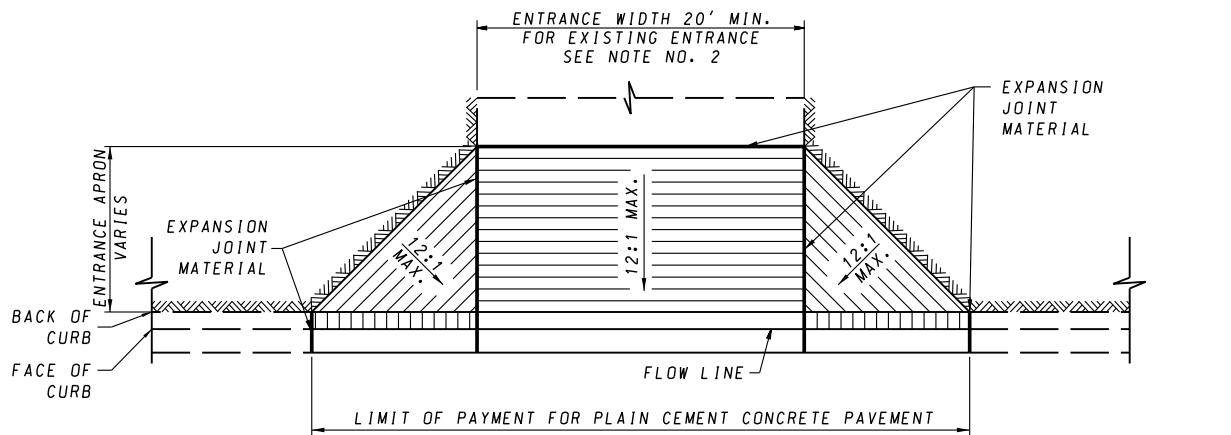
1. FOR USE IN AREAS WHERE THERE IS SIDEWALK SEPARATED FROM THE BACK OF CURB BY 24" OR MORE, OR WHERE IT IS EXPECTED THAT SIDEWALK WILL BE ADDED IN THE FUTURE.
2. WHEN AN EXISTING ENTRANCE IS LESS THAN 20' IN WIDTH A UNIFORM TAPER SHALL BE CONSTRUCTED TO TIE INTO THE EXISTING ENTRANCE AS DIRECTED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL TO BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
4. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, 36" MIN. MAY BE USED AS LONG AS PASSING ZONES ARE PROVIDED IN ACCORDANCE WITH STD. MD-655.02.
5. TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH.
6. USE MIX 9 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. RAMP SLOPES MUST BE CALCULATED USING THE HORIZONTAL PLANE. USING ONLY THE RISE-OVER-RUN METHOD IS INSUFFICIENT FOR DETERMINING SLOPE (ANY VARIANCE FROM THE HORIZONTAL PLANE OF THE SURROUNDING ROADWAY FACILITY MUST ALSO BE DETERMINED AND ACCOUNTED FOR).

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISED 4-17-07
	REVISED 6-2-14
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 3-31-04
REVISED 6-14-16	REVISED 5-20-14
	REVISED 6-8-16

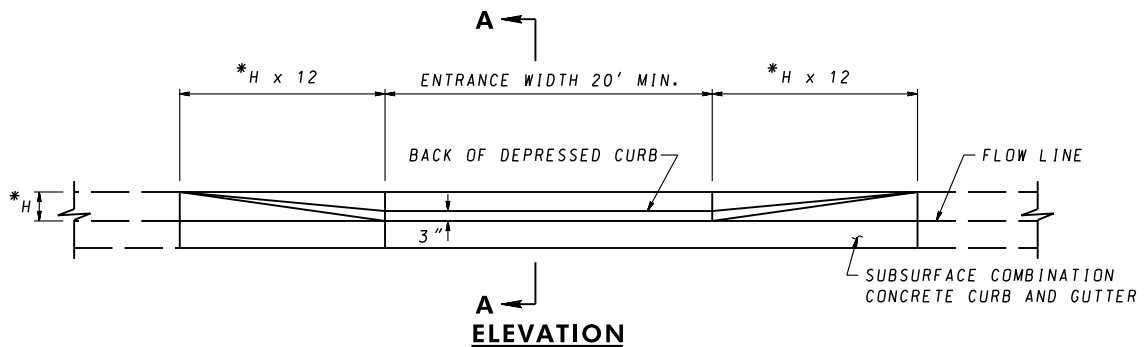
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD ENTRANCE CONSTRUCTION**  
**RESIDENTIAL & COMMERCIAL**  
**METHOD NO.2**

**STANDARD NO.**

**MD 630.02**

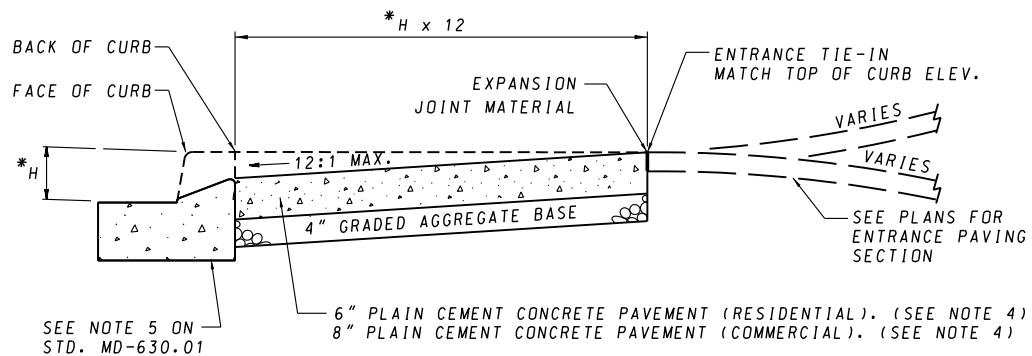


**PLAN**



**ELEVATION**

\* - H = HEIGHT OF CURB  
ALL MEASUREMENTS IN INCHES



**SECTION A-A**

**NOTES**

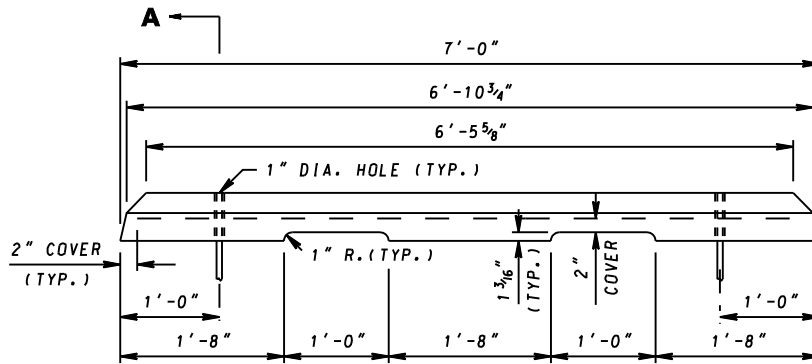
1. FOR USE ONLY WHERE ENTRANCE DOES NOT CROSS SIDEWALK.
2. WHEN AN EXISTING ENTRANCE IS LESS THAN 20' IN WIDTH A UNIFORM TAPER SHALL BE CONSTRUCTED TO TIE INTO THE EXISTING ENTRANCE AS DIRECTED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
4. USE MIX 9 UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. RAMP SLOPES MUST BE CALCULATED USING THE HORIZONTAL PLANE. USING ONLY THE RISE-OVER-RUN METHOD IS INSUFFICIENT FOR DETERMINING SLOPE (ANY VARIANCE FROM THE HORIZONTAL PLANE OF THE SURROUNDING ROADWAY FACILITY MUST ALSO BE DETERMINED AND ACCOUNTED FOR).

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISED 4-17-07
	REVISED 6-14-16
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-31-04
	REVISED
	REVISED 6-8-16
	REVISED

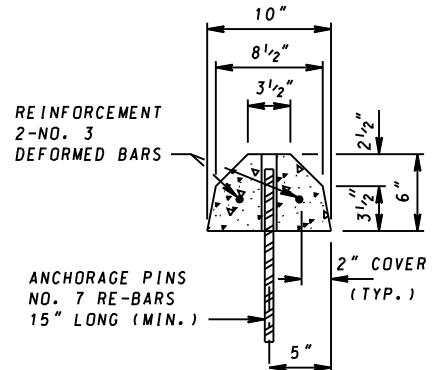
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD ENTRANCE CONSTRUCTION**  
**RESIDENTIAL & COMMERCIAL**  
**METHOD NO.3**

**STANDARD NO.**

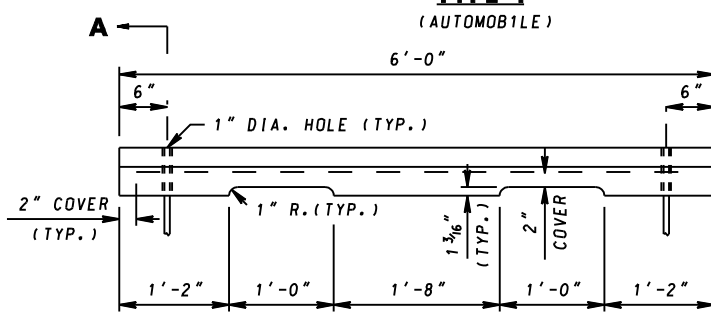
**MD 630.03**



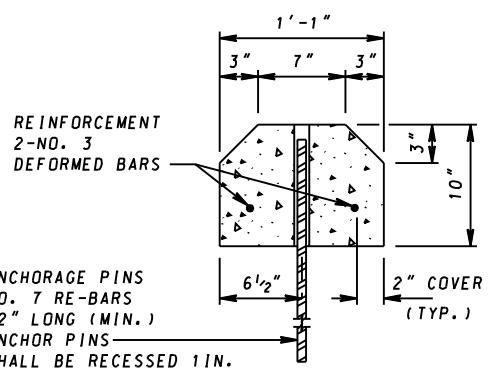
**ELEVATION  
TYPE I  
(AUTOMOBILE)**



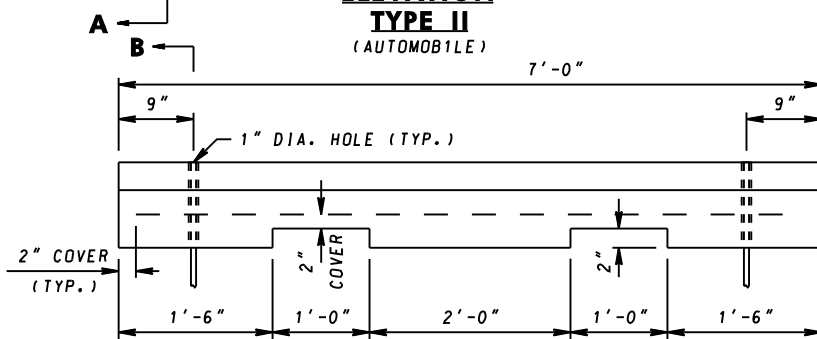
**SECTION A-A  
(TYPICAL-TYPE I & II)**



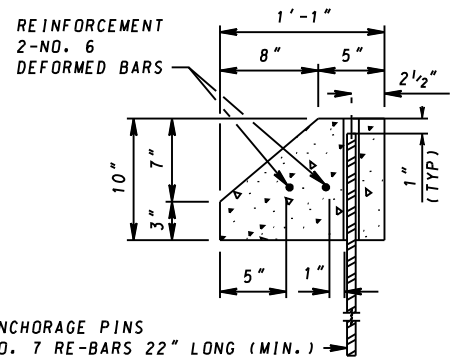
**ELEVATION  
TYPE II  
(AUTOMOBILE)**



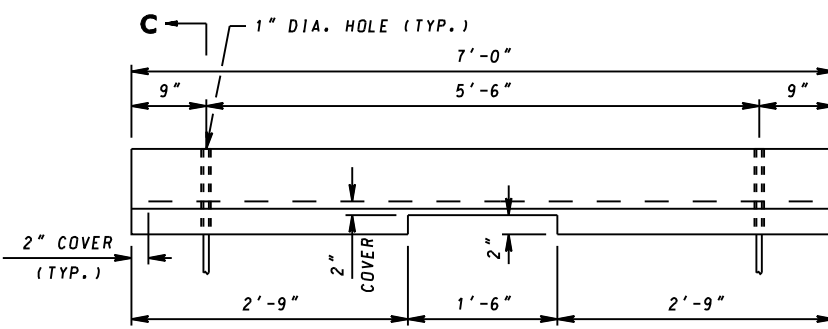
**SECTION B-B**



**ELEVATION  
TYPE III-A  
(TRUCK)**




**SECTION C-C**



**ELEVATION  
TYPE III-B  
(TRUCK)**

**NOTE**

1. PRECAST CONCRETE WHEEL STOPS SHALL BE LOCATED AS SHOWN ON THE PLANS, THEN SECURED IN PLACE WITH TWO (2) NO. 7 REINFORCEMENT BARS PER WHEEL STOP.
2. COST OF THE REINFORCEMENT BARS WILL BE INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER EACH FOR THE WHEEL STOPS.

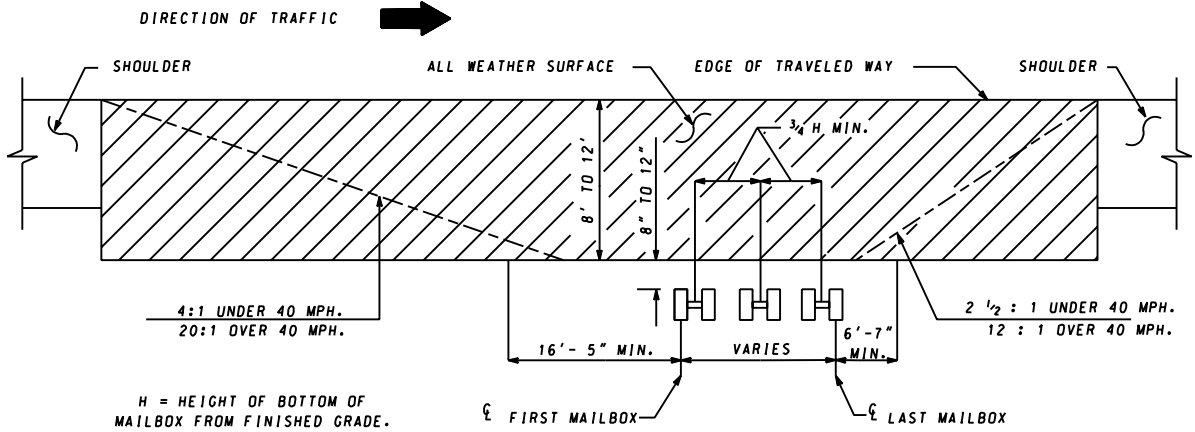
SPECIFICATION <b>608</b>	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 10-26-82	APPROVAL 5-17-83
	REVISED 6-20-07	REVISED 8-1-84
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**PRECAST CONCRETE WHEEL STOPS**

**STANDARD NO. MD 634.04**

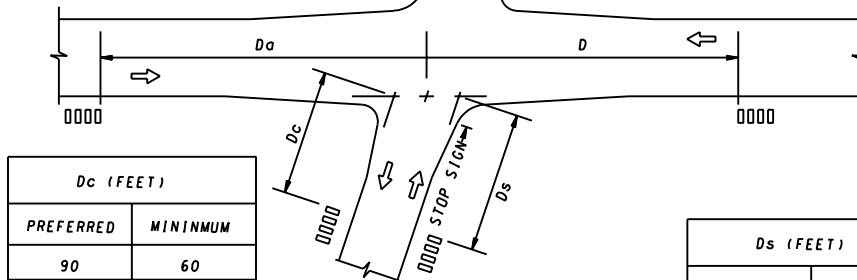


H = HEIGHT OF BOTTOM OF MAILBOX FROM FINISHED GRADE.  
(3'-4" MIN. - 4'-0" MAX)

**MAILBOX TURNOUTS**

THROUGH ROAD SPEED M.P.H.	D <sub>a</sub> (FEET)	
	nV <sub>c</sub> V <sub>m</sub> ≤ 4000	nV <sub>c</sub> V <sub>m</sub> > 4000
40	70	200
≥ 55	70	200

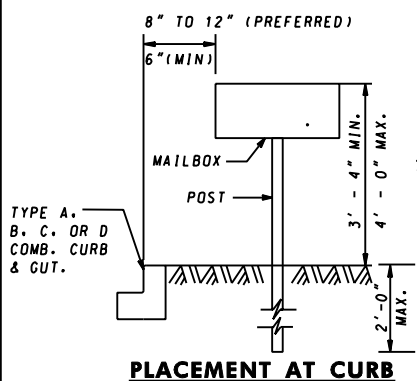
THROUGH ROAD SPEED M.P.H.	D (FEET)		
	V <sub>c</sub> ≤ 50 1.5n - .5	50 - V <sub>c</sub> ≤ 400 1.5n - .5	50 - V <sub>c</sub> > 400 1.5n - .5
40	70	100	100
55	150	150	200



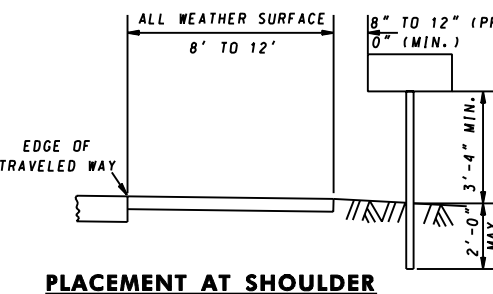
D <sub>c</sub> (FEET)	
PREFERRED	MINIMUM
90	60

D <sub>s</sub> (FEET)	
PREFERRED	MINIMUM
150	90

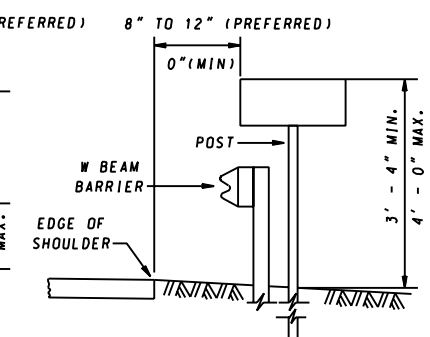
V<sub>c</sub> = AVERAGE DAILY TRAFFIC ON CROSS ROADS  
V<sub>m</sub> = AVERAGE DAILY TRAFFIC ON THROUGH ROAD  
n = NUMBER OF MAILBOXES AT MAIL STOP



**PLACEMENT AT CURB**



**PLACEMENT AT SHOULDER**



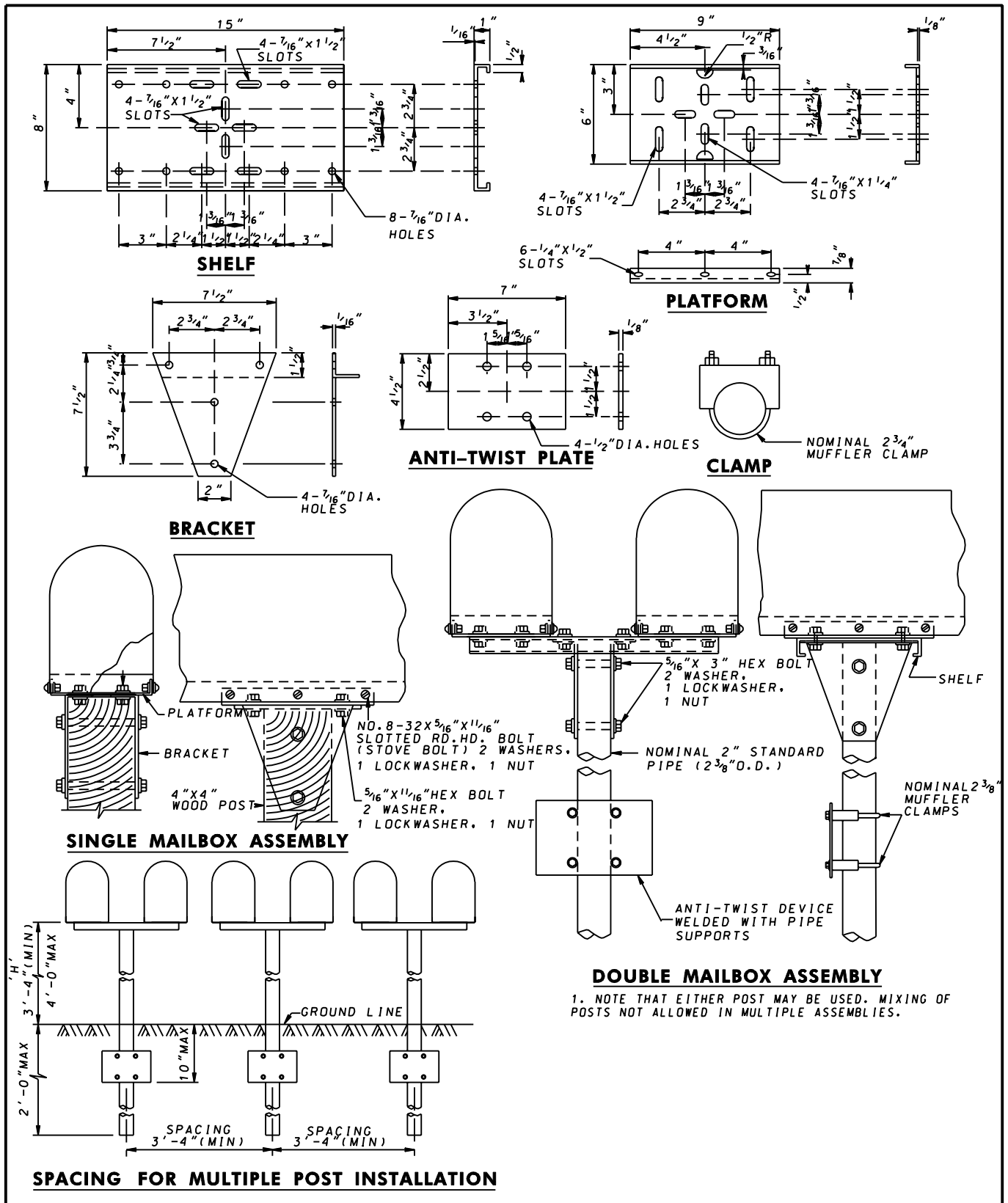
**PLACEMENT BEHIND TRAFFIC BARRIER W BEAM**

SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04	APPROVAL 3-31-04
	REVISED	REVISED
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**MAILBOX PLACEMENT DETAILS**

**STANDARD NO. MD 635.01**



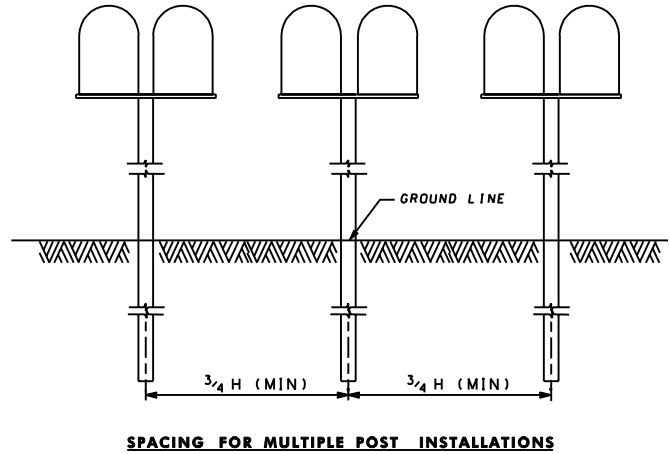
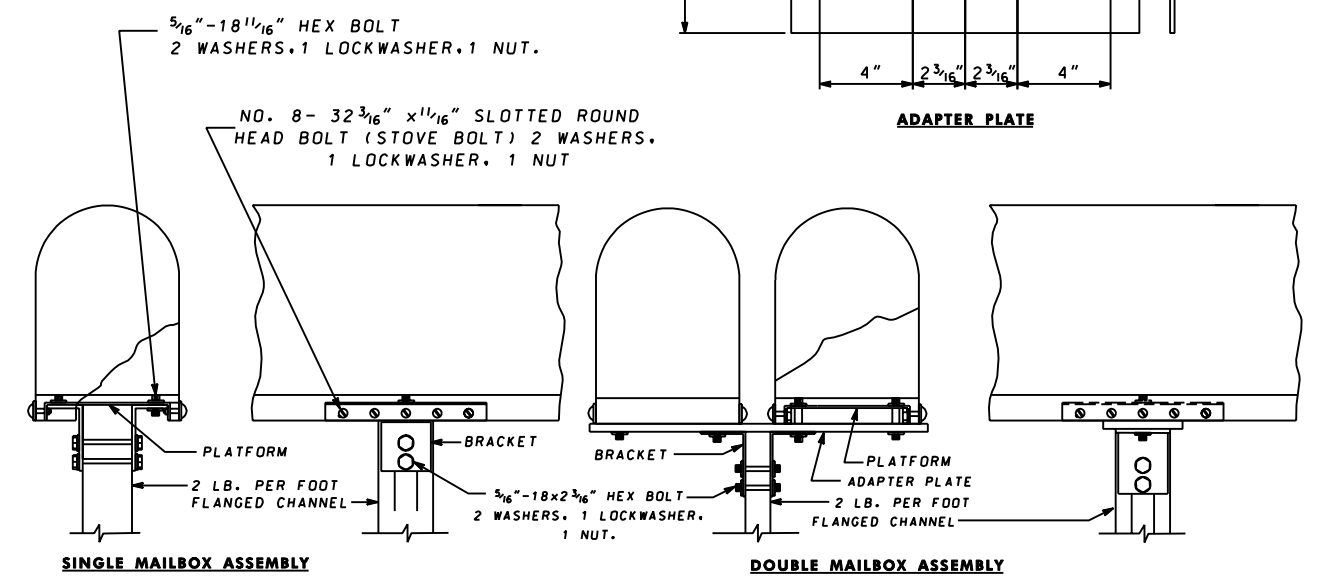
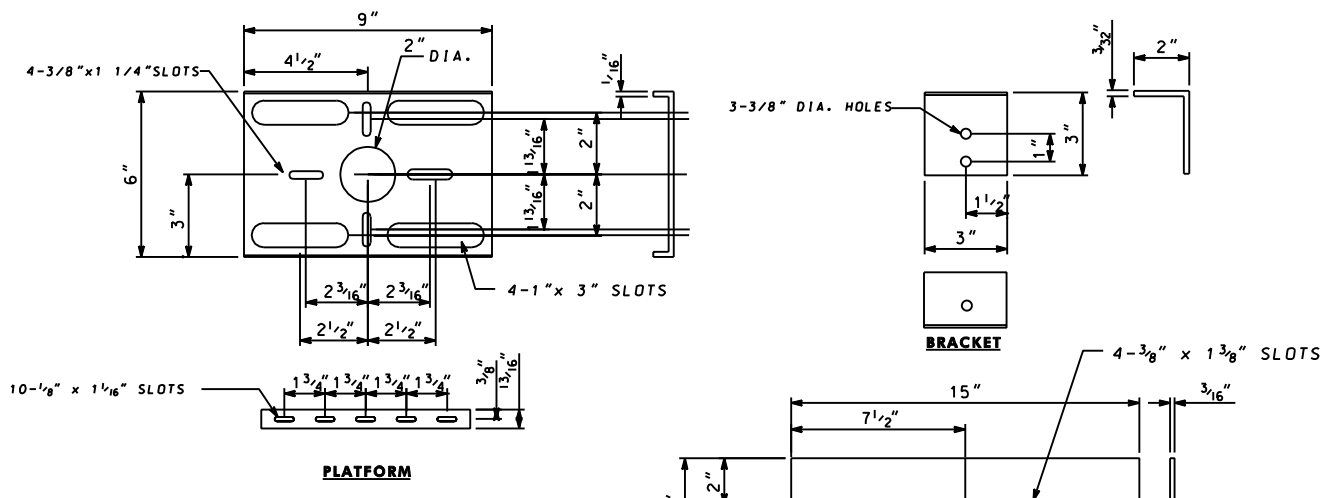
SPECIFICATION CATEGORY CODE ITEMS


APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04	APPROVAL 3-31-04
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**SINGLE AND DOUBLE MAILBOX ASSEMBLIES TYPE A**

**STANDARD NO. MD 635.02**



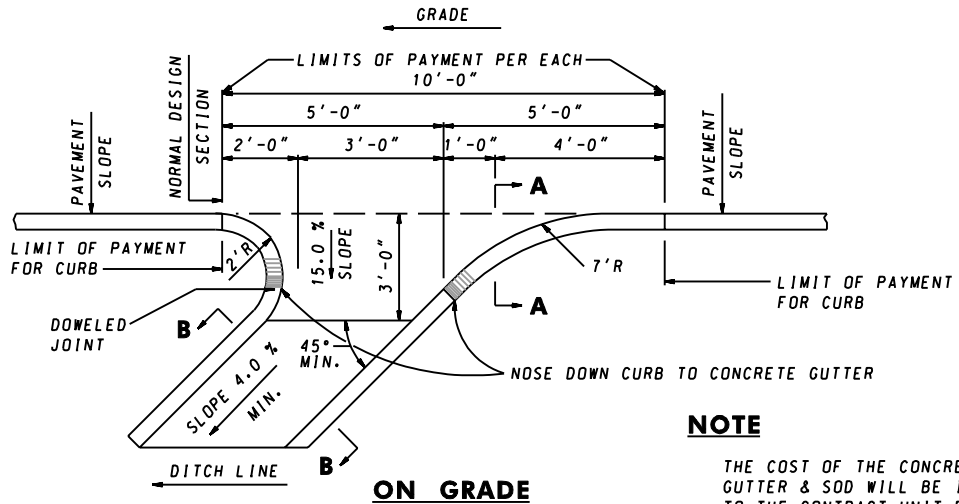
SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04
	APPROVAL 3-31-04
REVISD	REVISD
REVISD	REVISD
REVISD	REVISD

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**SINGLE AND DOUBLE MAILBOX ASSEMBLIES TYPE B**

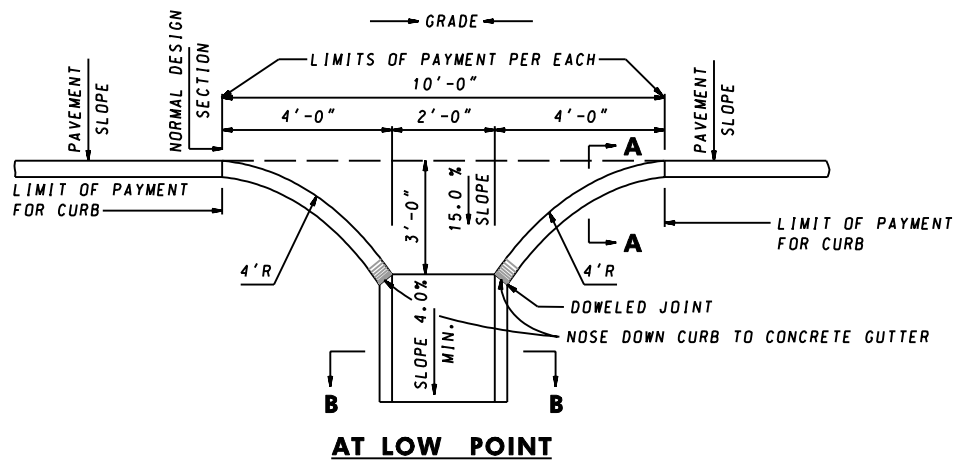
**STANDARD NO. MD 635.03**



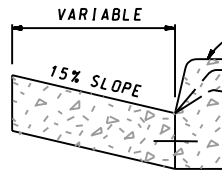


**NOTE**

THE COST OF THE CONCRETE GUTTER & SOD WILL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH STANDARD CURB OPENING

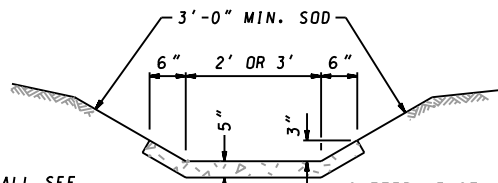


THICKNESS AS DESIGNED OR SAME AS MAIN LINE PAVEMENT.



TYPE A, B, OR C CURB FOR DETAILS SEE STANDARD MD 620.02 AND 620.02-01

**SECTION A-A**



**SECTION B-B**

**NOTE**

FOR DETAILS OF JOINTS & TOE WALL SEE LONGITUDINAL TIE DEVICES STANDARD MD 572.61 AND 389.02, RESPECTIVELY.

SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS
-----------------------------	---------------------

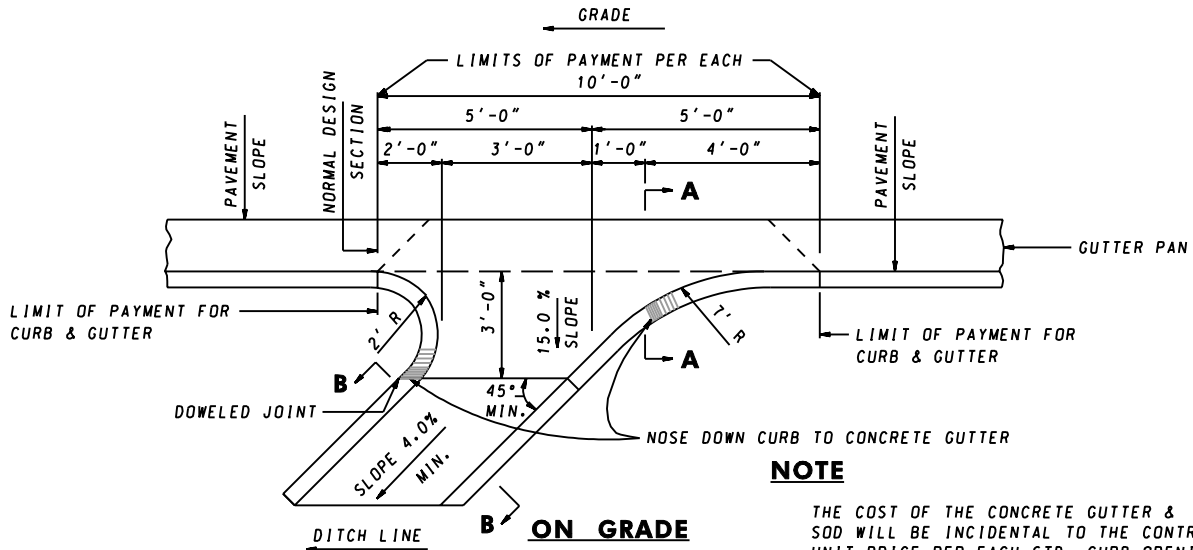
APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL <b>10-17-63</b>	APPROVAL <b>6-9-64</b>
	REVISED <b>10-1-01</b>	REVISED <b>8-1-84</b>
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

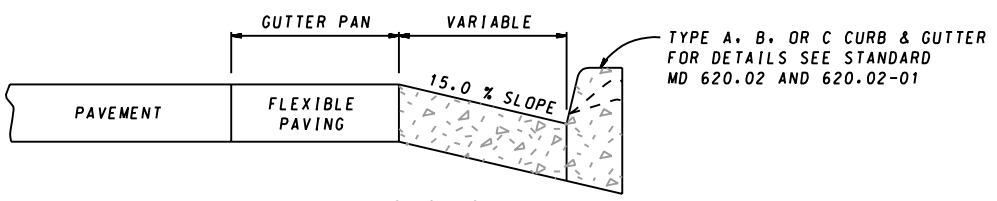
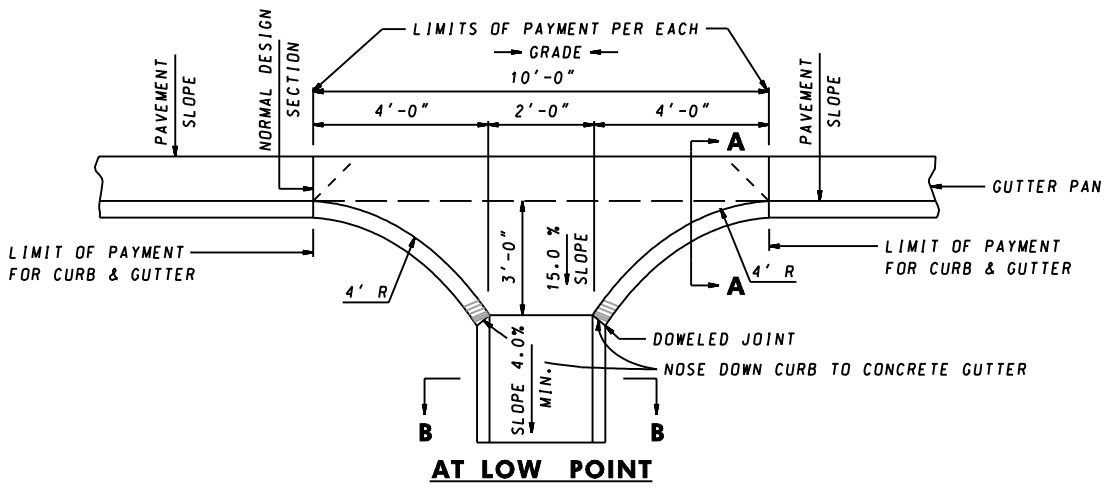
**STANDARD CURB OPENING DETAILS FOR CONCRETE CURB**

**STANDARD NO. MD 640.01**

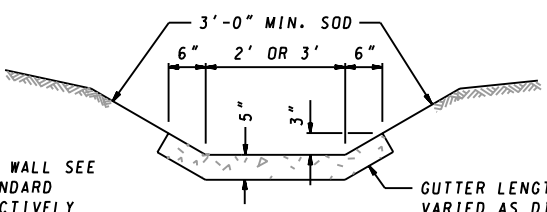


**NOTE**

THE COST OF THE CONCRETE GUTTER & SOD WILL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH STD. CURB OPENING.




**SECTION A-A**



**SECTION B-B**

**NOTE**

FOR DETAIL OF JOINTS AND TOE WALL SEE LONGITUDINAL TIE DEVICES STANDARD MD 572.61 & MD 389.02, RESPECTIVELY

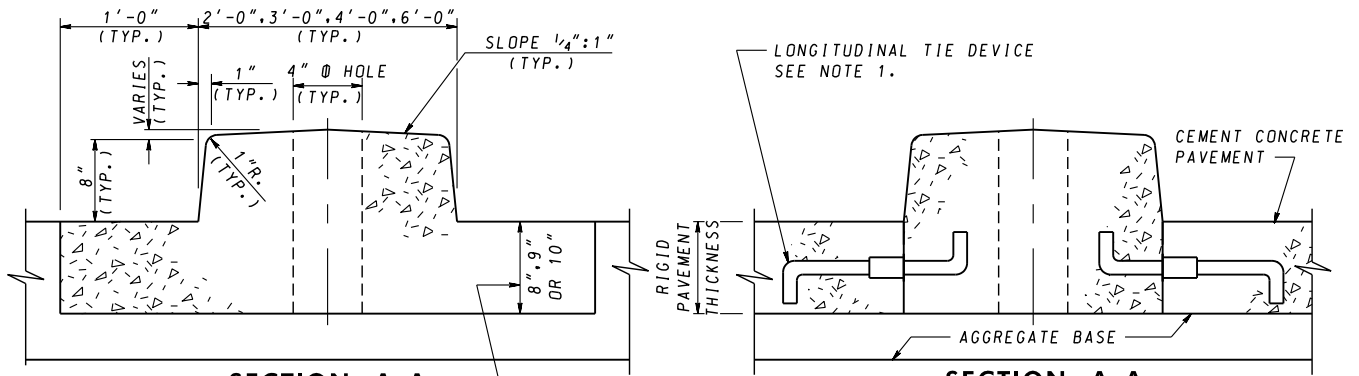
SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS APPROVAL <b>3-15-62</b> REVISED <b>10-1-01</b> REVISED REVISED
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION APPROVAL REVISED <b>8-1-84</b> REVISED REVISED

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**STANDARD CURB OPENING DETAILS  
FOR COMBINATION CURB & GUTTER**

**STANDARD NO. MD 640.02**



**SECTION A-A**

**TYPE A-1**

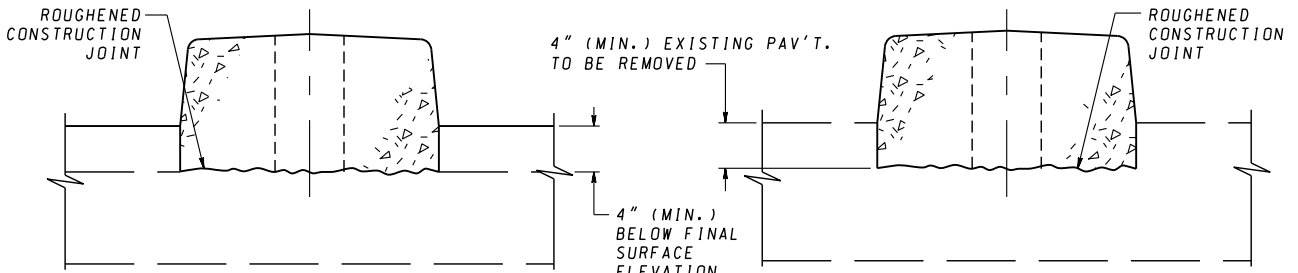
PLACED WITH APPROVED ASPHALT MIX PAVEMENT

DEPTH OF GUTTER PAN TO MATCH LAMINATIONS OF PROPOSED PAVING SECTION AS CLOSELY AS POSSIBLE

**SECTION A-A**

**TYPE A-2**

PLACED WITH CEMENT CONCRETE PAVEMENT



**SECTION A-A**

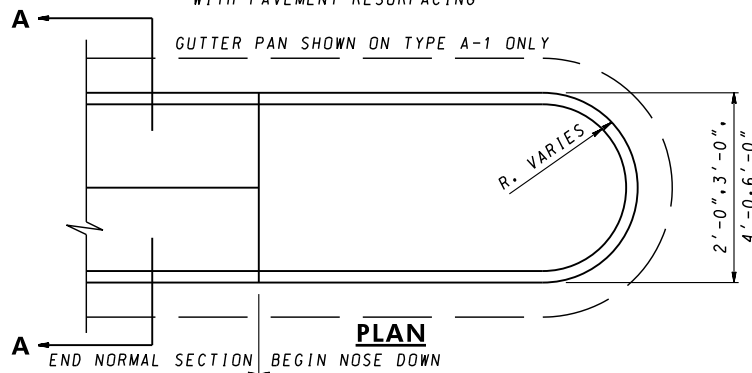
**TYPE A-3**

PLACED IN COMBINATION WITH PAVEMENT RESURFACING

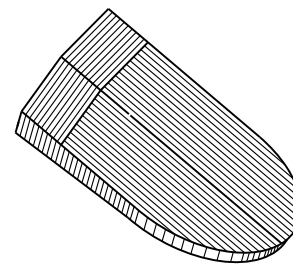
**SECTION A-A**

**TYPE A-4**

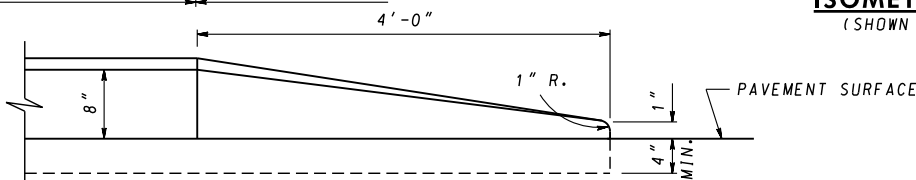
PLACED ON EXISTING PAVEMENT



**PLAN**



**ISOMETRIC-NOSE DOWN**  
(SHOWN WITHOUT GUTTER PAN)



**ELEVATION**

**NOTES NOSE DOWN AT APPROACH END OF MEDIAN**

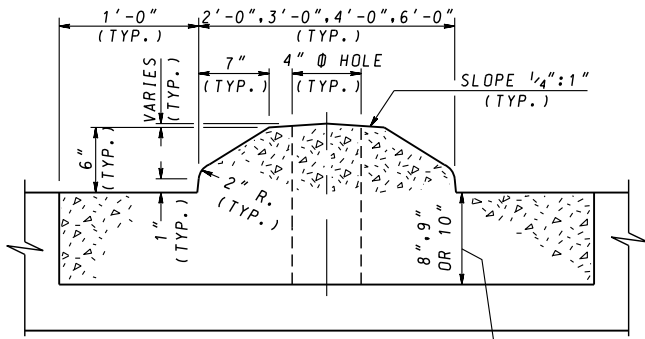
- UNLESS OTHERWISE SPECIFIED, LONGITUDINAL TIE BAR DEVICE, TYPE 'A' OR TYPE 'B', PLACED AT MIDDLE OF KEYWAY & SPACED ACCORDING TO SPECIFICATIONS FOR CONCRETE PAVEMENT SHALL BE USED AT CONSTRUCTION JOINT BETWEEN MONOLITHIC CONCRETE MEDIAN (OR GUTTER PAN) AND CONCRETE PAVEMENT. SEE STANDARD MD 572.61. SOLID BAR AND SLEEVE MAY BE REPLACE BY TUBE WITH INTERNAL THREAD.
- JOINT SPACING WILL BE A MAXIMUM OF 10'-0" APART, SEE SPECIFICATIONS FOR LOCATION AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED. CONCRETE PAVEMENT, JOINTS SHALL MATCH PAVEMENT JOINTS.
- ALLOW 4" Ø HOLES IN MEDIAN FOR SIGNS, SPACED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

SPECIFICATION <b>602</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-15-83
	APPROVAL 4-1-83
	REVISD 2-25-16
REVISD 2-23-16	
REVISD	REVISD
REVISD	REVISD

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD MONOLITHIC CONCRETE MEDIAN**  
**TYPE 'A'**

**STANDARD NO.**

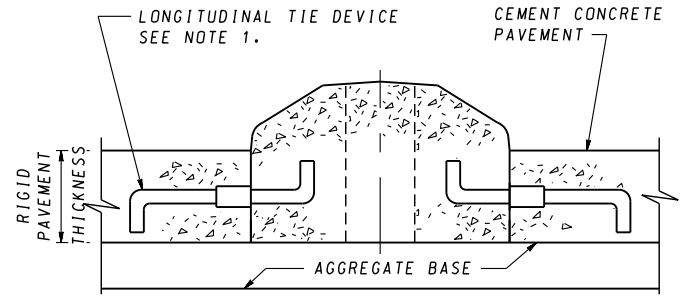
**MD 645.01**



**SECTION A-A**  
**TYPE B-1**

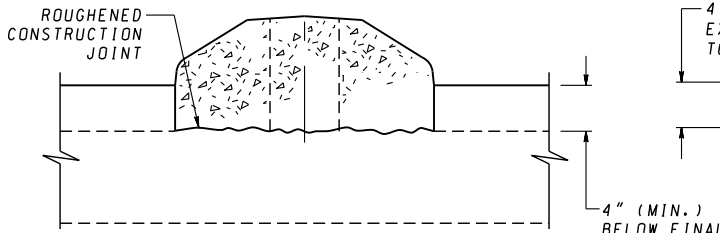
PLACED WITH APPROVED ASPHALT MIX PAVEMENT

DEPTH OF GUTTER PAN TO MATCH LAMINATIONS OF PROPOSED PAVING SECTION AS CLOSELY AS POSSIBLE



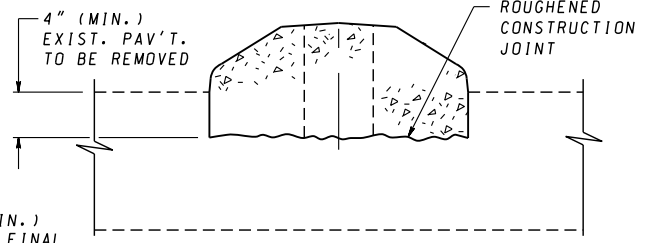
**SECTION A-A**  
**TYPE B-2**

PLACED WITH CEMENT CONCRETE PAVEMENT



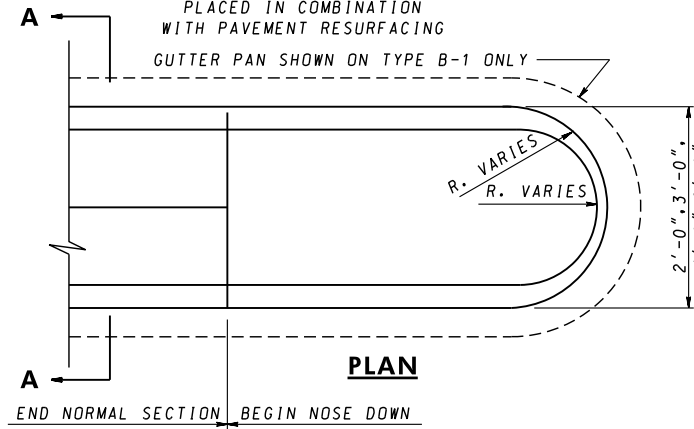
**SECTION A-A**  
**TYPE B-3**

PLACED IN COMBINATION WITH PAVEMENT RESURFACING



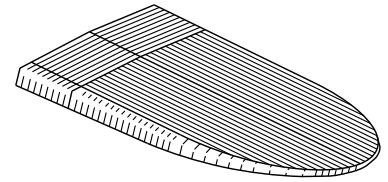
**SECTION A-A**  
**TYPE B-4**

PLACED ON EXISTING PAVEMENT

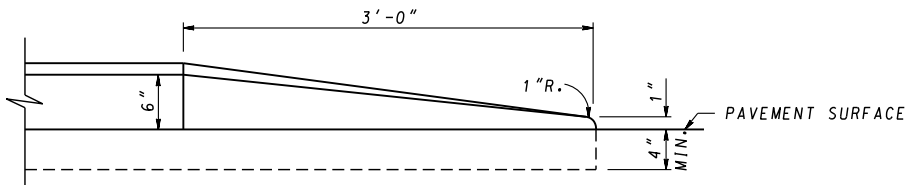


**PLAN**

END NORMAL SECTION BEGIN NOSE DOWN



**ISOMETRIC - NOSE DOWN**  
(SHOWN WITHOUT GUTTER PAN)



**ELEVATION**

**NOSE DOWN AT APPROACH END OF MEDIAN**

**NOTES**

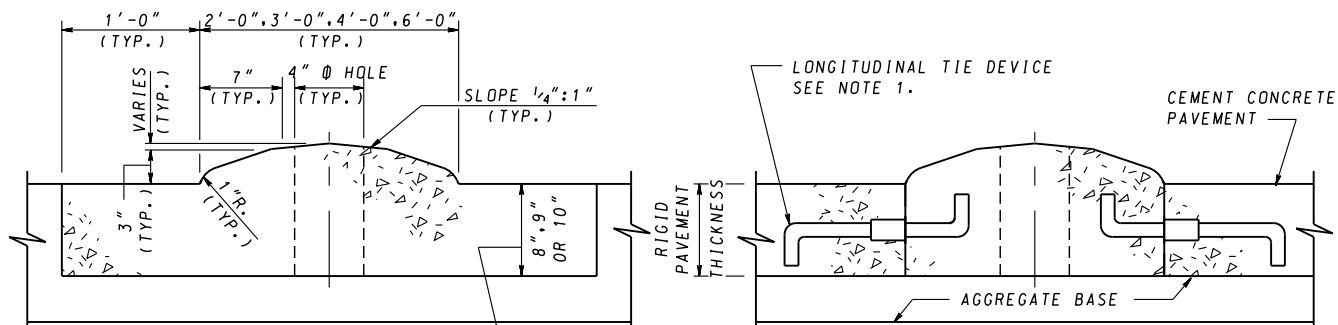
- UNLESS OTHERWISE SPECIFIED, LONGITUDINAL TIE BAR DEVICE, TYPE 'A' OR TYPE 'B', PLACED AT MIDDLE OF KEYWAY & SPACED ACCORDING TO SPECIFICATIONS FOR CONCRETE PAVEMENT SHALL BE USED AT CONSTRUCTION JOINT BETWEEN MONOLITHIC CONCRETE MEDIAN (OR GUTTER PAN) AND CONCRETE PAVEMENT. SEE STANDARD MD 572.61. SOLID BAR AND SLEEVE MAY BE REPLACE BY TUBE WITH INTERNAL THREAD.
- JOINT SPACING WILL BE A MAXIMUM OF 10'-0" APART, SEE SPECIFICATIONS FOR LOCATION AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED. CONCRETE PAVEMENT, JOINTS SHALL MATCH PAVEMENT JOINTS.
- ALLOW 4" Ø HOLES IN MEDIAN FOR SIGNS, SPACED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-15-83
	APPROVAL 4-1-83
	REVISD 2-25-16
REVISD 2-23-16	
REVISD	REVISD
REVISD	REVISD

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD MONOLITHIC CONCRETE MEDIAN**  
**TYPE 'B'**

**STANDARD NO.**

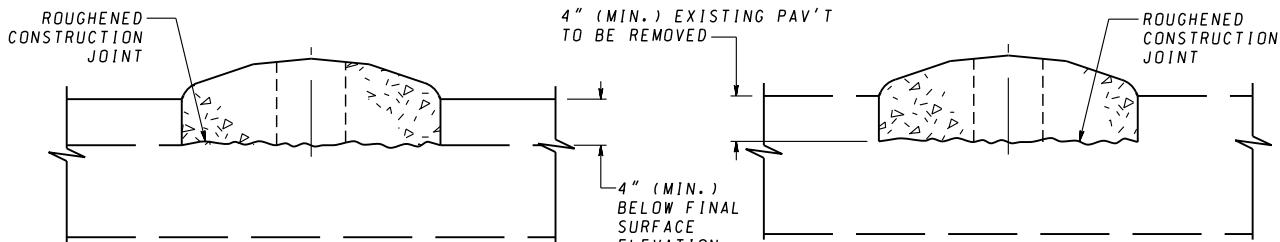
**MD 645.02**



**SECTION A-A**  
**TYPE C-1**  
PLACED WITH APPROVED  
ASPHALT MIX PAVEMENT

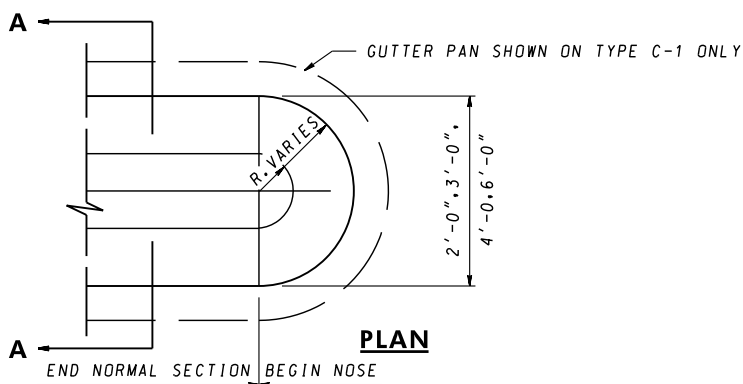
DEPTH OF GUTTER PAN TO  
MATCH LAMINATION OF  
PROPOSED PAVING SECTION  
AS CLOSELY AS POSSIBLE

**SECTION A-A**  
**TYPE C-2**  
PLACED WITH CEMENT  
CONCRETE PAVEMENT

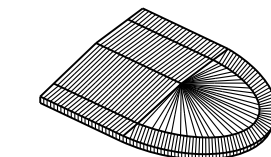


**SECTION A-A**  
**TYPE C-3**  
PLACED IN COMBINATION  
WITH PAVEMENT RESURFACING

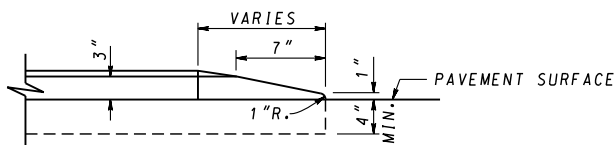
**SECTION A-A**  
**TYPE C-4**  
PLACED ON EXISTING PAVEMENT



**PLAN**



**ISOMETRIC-NOSE DOWN**  
(SHOWN WITHOUT GUTTER PAN)



**ELEVATION**

**NOSE DOWN AT APPROACH END OF MEDIAN**

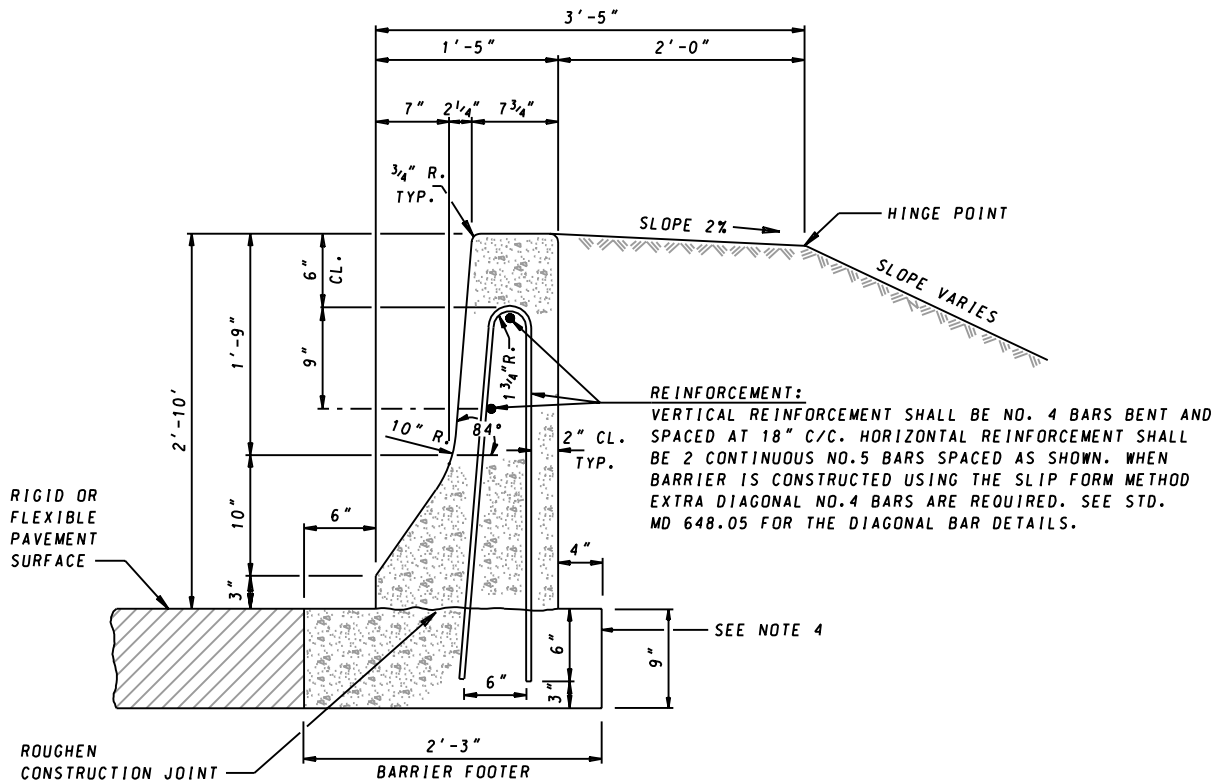
**NOTES**

1. UNLESS OTHERWISE SPECIFIED, LONGITUDINAL TIE BAR DEVICE, TYPE 'A' OR TYPE 'B', PLACED AT MIDDLE OF KEYWAY & SPACED ACCORDING TO SPECIFICATIONS FOR CONCRETE PAVEMENT SHALL BE USED AT CONSTRUCTION JOINT BETWEEN MONOLITHIC CONCRETE MEDIAN (OR GUTTER PAN) AND CONCRETE PAVEMENT. SEE STANDARD MD 572.61. SOLID BAR AND SLEEVE MAY BE REPLACED BY TUBE WITH INTERNAL THREAD.
2. JOINT SPACING WILL BE A MAXIMUM OF 10'-0" APART, SEE SPECIFICATIONS FOR LOCATION AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED. CONCRETE PAVEMENT, JOINTS SHALL MATCH PAVEMENT JOINTS.
3. ALLOW 4" Ø HOLES IN MEDIAN FOR SIGNS, SPACED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-15-83
	REVISD 2-25-16

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**STANDARD MONOLITHIC CONCRETE MEDIAN**  
**TYPE 'C'**

**STANDARD NO. MD 645.03**



**TYPICAL SECTION**

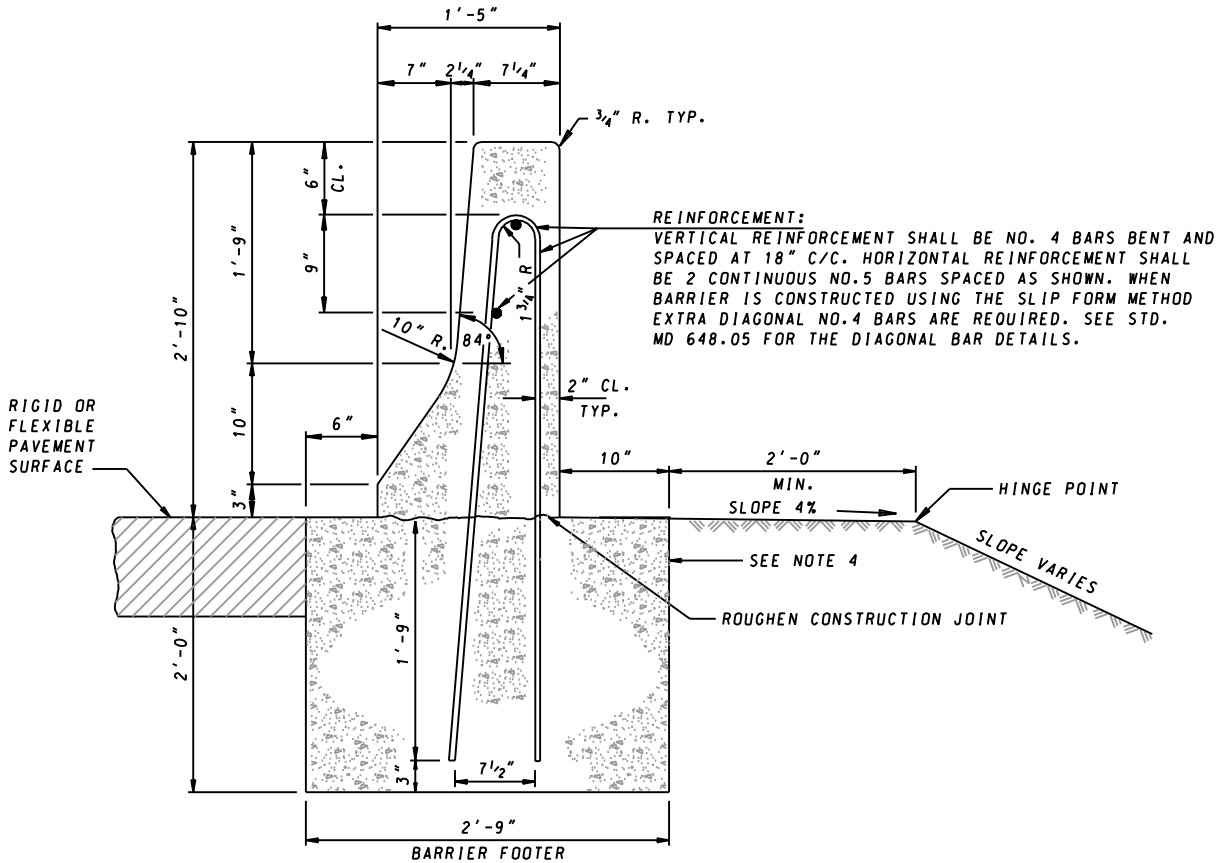
THIS BARRIER TO BE USED WITH EARTH BACKING AT THE TOP OF FILL SLOPES.  
 (SEE STD. MD 648.02 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES)  
 (SEE STD. MD 648.03 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS RETAINING WALL)

**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE THE FOOTER AND THE BARRIER SHALL BE CAST SEPARATELY.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
4. THE VERTICAL WALL FOR THE FOOTER ADJACENT TO THE PAVEMENT SHALL BE FORMED TO PROVIDE A NEAT VERTICAL FACE FOR THE PAVEMENT. THE FOOTER REAR VERTICAL WALL MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH WALL. THE BARRIER FOOTER SHALL HAVE CONSTRUCTION JOINTS TO COINCIDE WITH THE BARRIER JOINTS. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORM AT THE PAVEMENT EDGE SHALL BE REMOVED BEFORE PLACING PAVEMENT.
5. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF CONSTRUCTION METHOD.
6. COST OF THE EXCAVATION AND CONCRETE FOR THE FOOTER (FORMED OR NON-FORMED) AND ALL REINFORCEMENT SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1. FILL MATERIAL IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.06 FOR LOCATION.

**JERSEY SHAPE – FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS	<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES <b>CONCRETE JERSEY SHAPE TRAFFIC BARRIER</b> <b>SINGLE FACE TYPE 1</b> <b>(WITH EARTH BACKING IN FILL)</b> <b>STANDARD NO. MD 648.01</b>	
APPROVED	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
 <b>State Highway Administration</b>	APPROVAL • SHA REVISIONS APPROVAL <b>7-16-90</b> REVISED <b>10-1-01</b> REVISED REVISED		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION APPROVAL <b>7-31-90</b> REVISED <b>3-28-01</b> REVISED REVISED



**TYPICAL SECTION**

THIS BARRIER IS TO BE USED WHEN THE BARRIER IS FREE STANDING (NO BACKING) AT THE TOP OF FILL SLOPES. (SEE STD. MD 648.01 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES) (SEE STD. MD 648.03 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL)

**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE THE FOOTER AND THE BARRIER SHALL BE CAST SEPARATELY.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
4. THE VERTICAL WALL FOR THE FOOTER ADJACENT TO THE PAVEMENT SHALL BE FORMED TO PROVIDE A NEAT VERTICAL FACE FOR THE PAVEMENT. THE FOOTER REAR VERTICAL WALL MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH WALL. THE BARRIER FOOTER SHALL HAVE CONSTRUCTION JOINTS TO COINCIDE WITH THE BARRIER JOINTS. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORM AT THE PAVEMENT EDGE SHALL BE REMOVED BEFORE PLACING PAVEMENT.
5. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF THE CONSTRUCTION METHOD.
6. COST OF THE EXCAVATION AND CONCRETE FOR THE FOOTER (FORMED OR NON-FORMED) AND ALL REINFORCEMENT SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2.
7. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.06 FOR PROPOSED LOCATION.

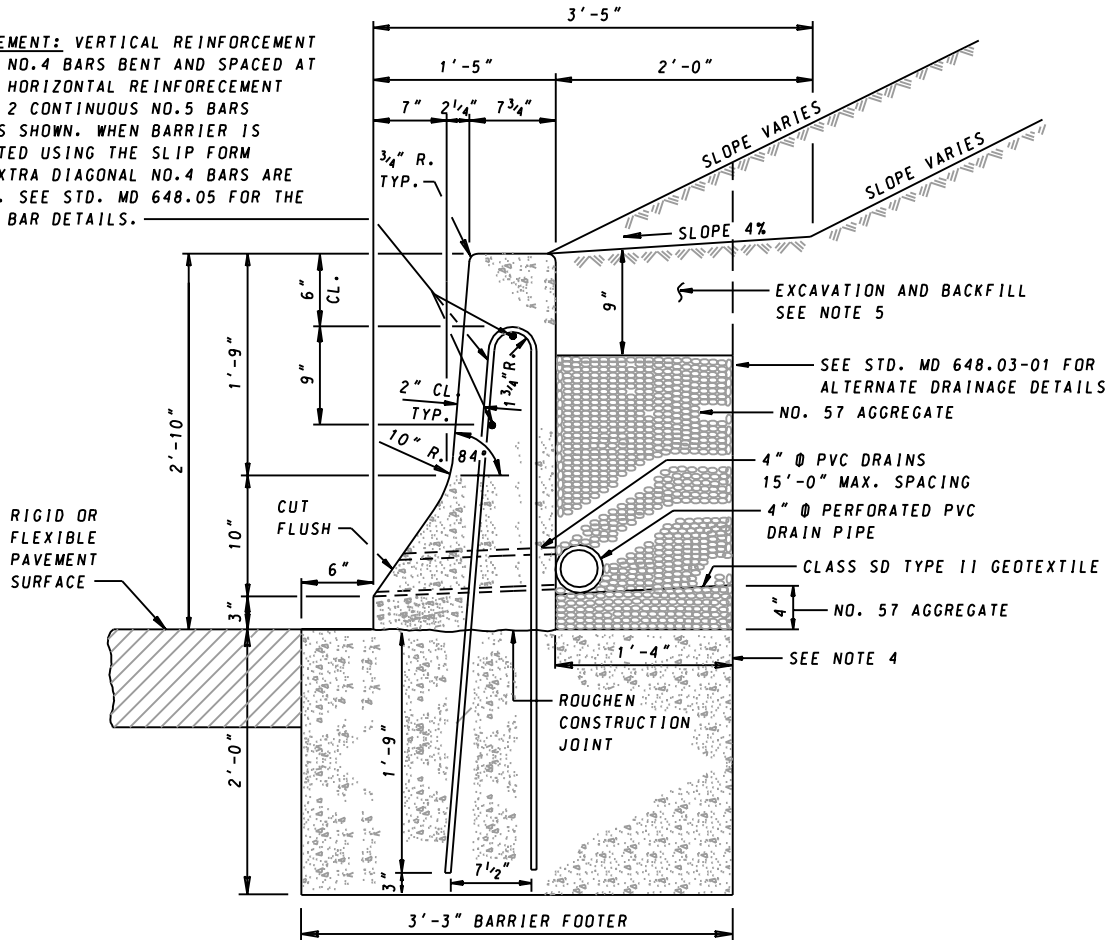
**JERSEY SHAPE – FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 7-31-90
REVISED	REVISED 3-28-01
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 2 (FREE STANDING IN FILL)**

**STANDARD NO. MD 648.02**

**REINFORCEMENT:** VERTICAL REINFORCEMENT SHALL BE NO.4 BARS BENT AND SPACED AT 18" C/C. HORIZONTAL REINFORCEMENT SHALL BE 2 CONTINUOUS NO.5 BARS SPACED AS SHOWN. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD EXTRA DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. MD 648.05 FOR THE DIAGONAL BAR DETAILS.




**TYPICAL SECTION**

THIS BARRIER IS TO BE USED WHEN THE BARRIER IS FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF THE CUT OR THE TOE OF FILL SLOPES. (SEE STD. MD 648.01 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES) (SEE STD. MD 648.02 FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES)

**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE THE FOOTER AND THE BARRIER SHALL BE CAST SEPARATELY.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
4. THE VERTICAL WALL FOR THE FOOTER ADJACENT TO THE PAVEMENT SHALL BE FORMED TO PROVIDE A NEAT VERTICAL FACE FOR THE PAVEMENT. THE FOOTER REAR VERTICAL WALL MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH WALL. THE BARRIER FOOTER SHALL HAVE CONSTRUCTION JOINTS TO COINCIDE WITH THE BARRIER JOINTS. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORM AT THE PAVEMENT EDGE SHALL BE REMOVED BEFORE PLACING PAVEMENT.
5. LIMITS OF EXCAVATION: WHEN THE BARRIER IS AT THE BOTTOM OF A CUT SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER AND A VERTICAL LINE EXTENDING FROM THE HEEL OF THE FOOTER TO ITS INTERSECTION WITH THE CUT SLOPE. WHEN THE BARRIER IS AT THE TOE OF A FILL SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER.
6. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF THE CONSTRUCTION METHOD.
7. COST OF THE CONCRETE FOOTER (FORMED OR NON-FORMED), REINFORCEMENT, DRAINAGE APPURTENACES, EXCAVATION, GEOTEXTILE, AND BACKFILLING USING BORROW EXCAVATION SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3.
8. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
9. CONDUIT: IF REQUIRED REFER TO STD. MD 648.06 FOR PROPOSED LOCATION.

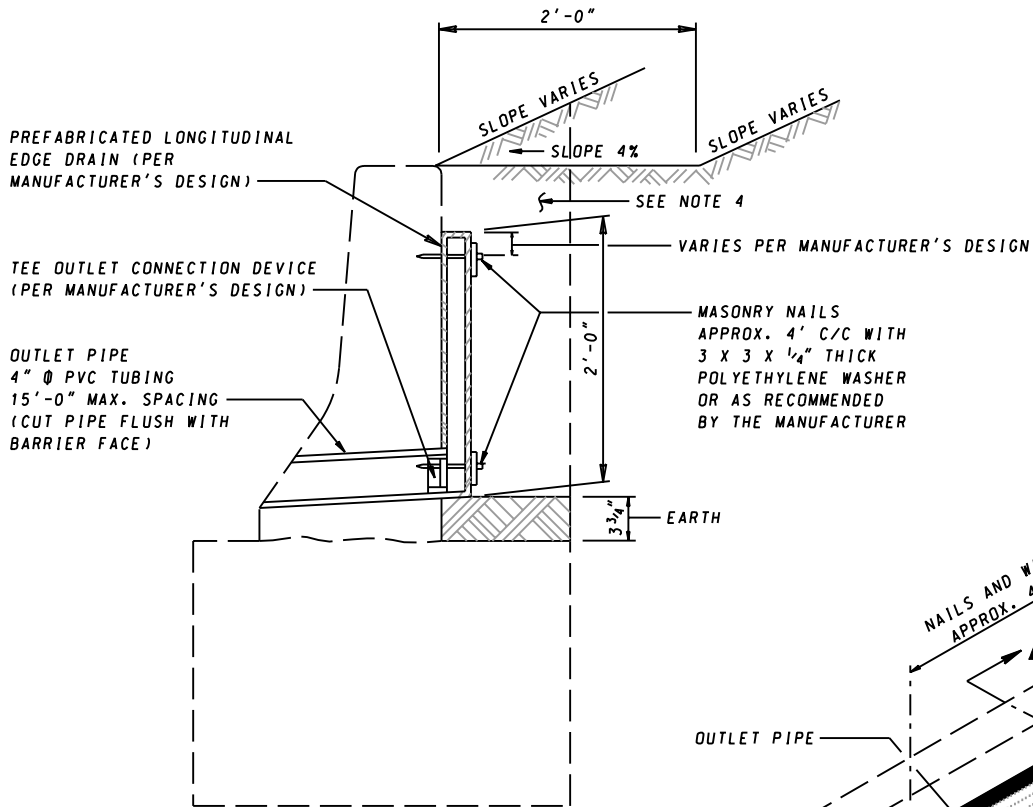
**JERSEY SHAPE – FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 2-10-04
	REVISED
	REVISED

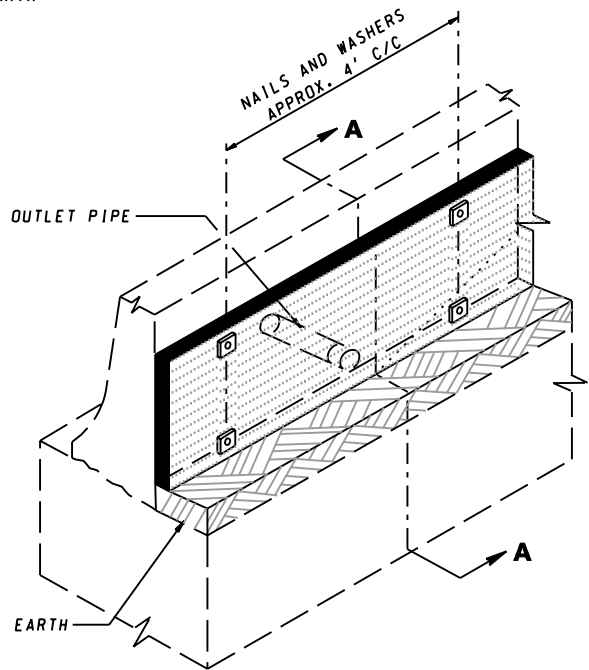
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONCRETE JERSEY SHAPE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)**

**STANDARD NO. MD 648.03**





**SECTION A-A**  
(THROUGH CENTER OF OUTLET PIPE)



**ISOMETRIC**

**NOTES**

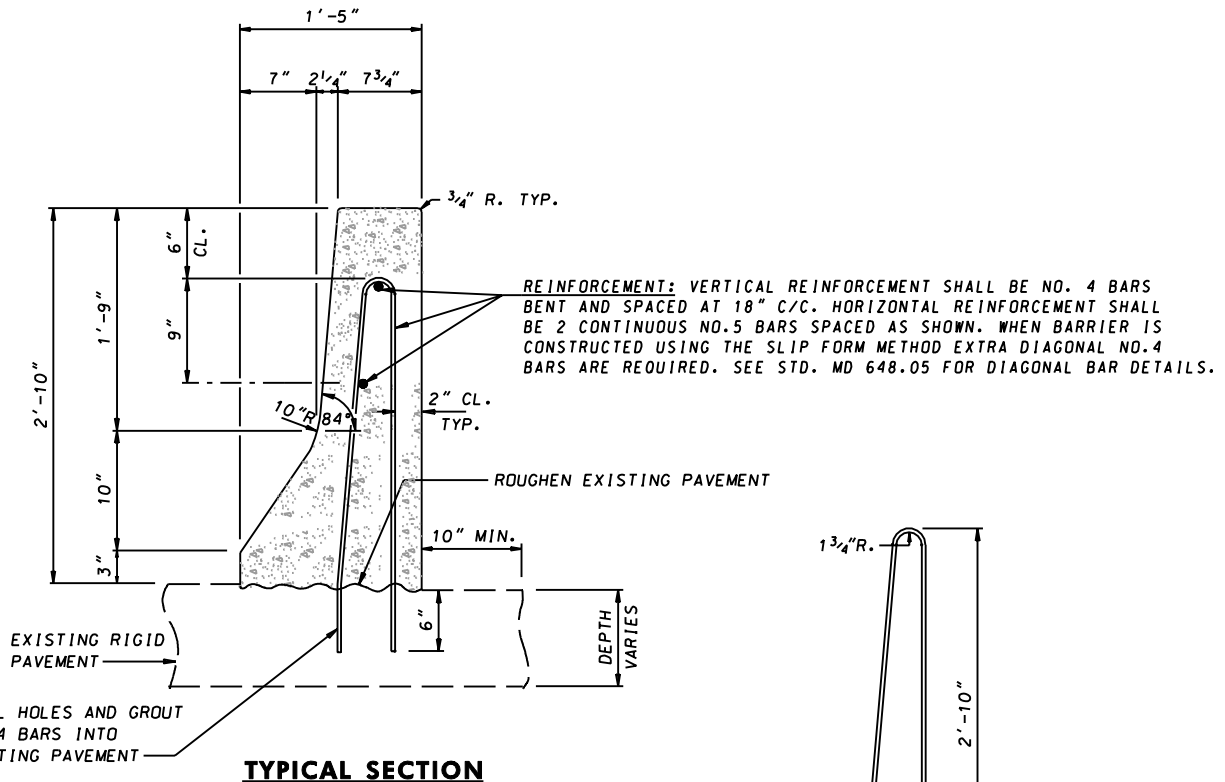
1. THE PREFABRICATED LONGITUDINAL EDGE DRAIN MAY BE USED AS AN ALTERNATE DRAINAGE SYSTEM IN LIEU OF THE DRAINAGE SHOWN ON STD. MD 648.03 CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 (BOTTOM OF CUT OR TOE OF FILL).
2. COST OF THE PREFABRICATED LONGITUDINAL EDGE DRAIN IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3.
3. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
4. FOR LIMITS OF EXCAVATION REFER TO STD. MD 648.03 NOTE 5.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS		
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
	APPROVAL 7-16-90	APPROVAL 7-31-90	
	REVISED 10-1-01	REVISED 3-28-01	
	REVISED	REVISED	
	REVISED	REVISED	

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**PREFABRICATED LONGITUDINAL EDGE DRAIN**  
**FOR CONCRETE JERSEY SHAPE TRAFFIC**  
**BARRIER SINGLE FACE TYPE 3**


**STANDARD NO. MD 648.03-01**

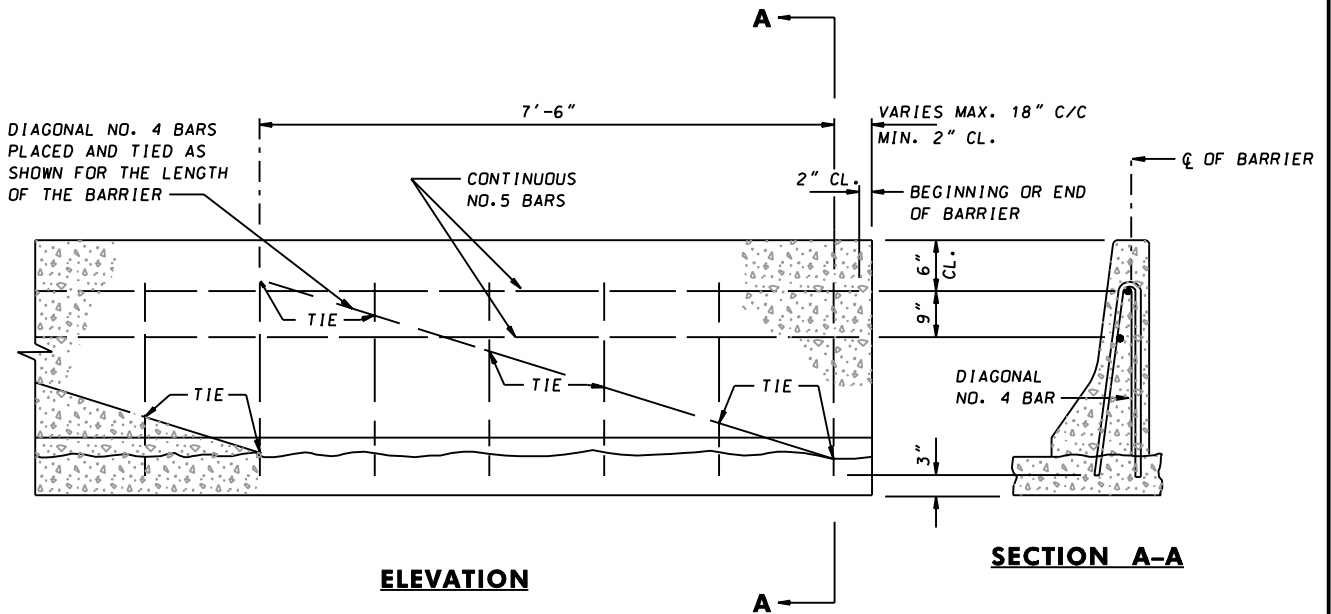


**NOTES**

1. THE BARRIER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 CONTINUOUSLY PLACED.
2. THE BARRIER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL GRADE 40.
4. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF CONSTRUCTION METHOD.
5. COST OF LABOR, ALL REINFORCEMENT, DRILLED HOLES, GROUT, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT.
6. TO BE USED AS FREE STANDING BARRIER ONLY (NO BACKING).
7. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.06 FOR LOCATION.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS	<p><b>Maryland Department of Transportation</b>  <b>STATE HIGHWAY ADMINISTRATION</b>          STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>CONCRETE JERSEY SHAPE TRAFFIC BARRIER</b>  <b>SINGLE FACE CONSTRUCTED ON EXISTING</b>  <b>CONCRETE PAVEMENT</b></p> <p><b>STANDARD NO. MD 648.04</b></p>	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
	APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-16-90		APPROVAL 7-30-90
	REVISED 10-1-01	REVISED 3-28-01	
	REVISED	REVISED	
	REVISED	REVISED	




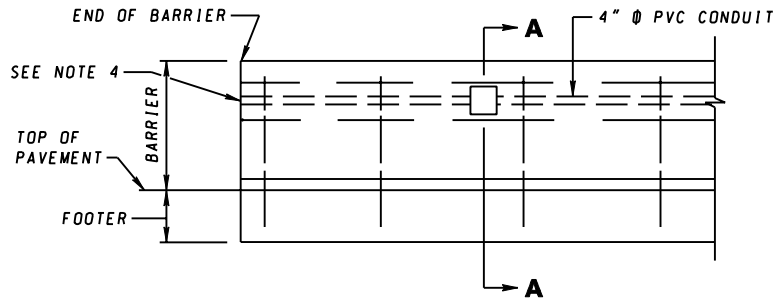
**DIAGONAL BAR DETAILS**

**NOTES**

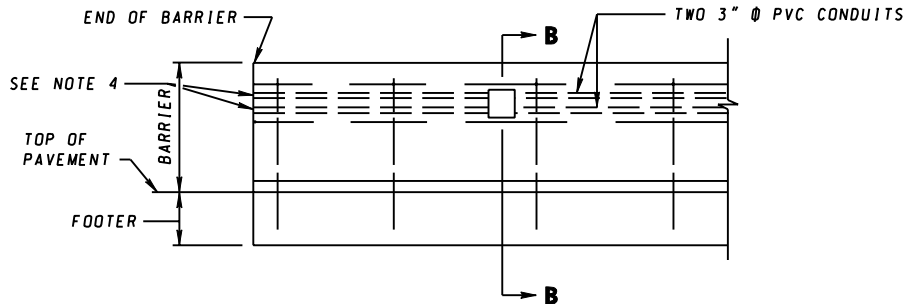
1. APPLICABLE TO SLIP FORM CONSTRUCTION METHOD ONLY.
2. FOR BARRIER TYPES 1, 2, 3 AND BARRIERS CONSTRUCTED ON EXISTING RIGID PAVEMENT.
3. DIAGONAL NO. 4 BARS SHALL BE GRADE 40.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

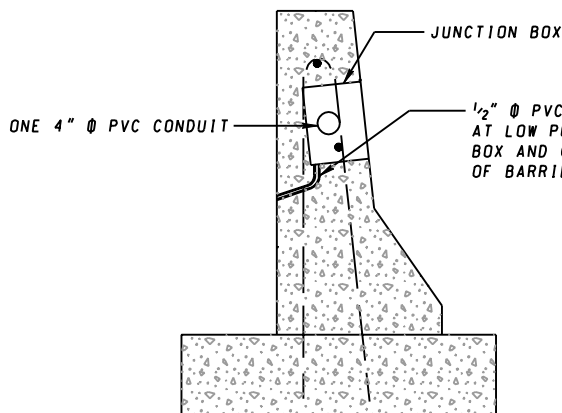
SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS	<p><b>Maryland Department of Transportation</b>  <b>STATE HIGHWAY ADMINISTRATION</b>          STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>DIAGONAL BAR LOCATION FOR</b>  <b>CONCRETE JERSEY SHAPE TRAFFIC</b>  <b>BARRIER SINGLE FACE</b>  <b>STANDARD NO. MD 648.05</b></p>	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
	APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-16-90		APPROVAL 7-31-90
	REVISED 10-1-01	REVISED 3-28-01	
	REVISED	REVISED	
	REVISED	REVISED	



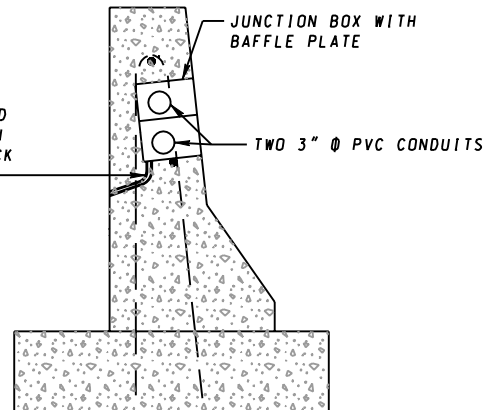
**ELEVATION**  
(SINGLE CONDUIT)



**ELEVATION**  
(DOUBLE CONDUIT)



**SECTION A-A**  
SINGLE CONDUIT




**SECTION B-B**  
DOUBLE CONDUIT

**NOTES**

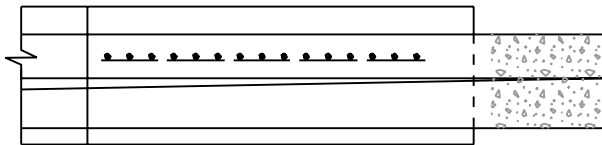
1. THE JUNCTION BOXES SHALL BE LOCATED EVERY 750 FEET OR AS DIRECTED BY THE ENGINEER.
2. THE COST OF THE CONDUITS, JUNCTION BOXS, AND ALL APPURTENANCES SHALL BE INCLUDED IN THE COST OF THE BARRIER UNLESS OTHERWISE SPECIFIED.
3. IN INSTANCES WHERE THE BARRIER CONNECTS TO A BRIDGE PARAPET CONTAINING CONDUIT SHALL ALIGN.
4. CAP CONDUIT, COVER WITH 1" CONCRETE AND MARK FOR FUTURE REFERENCE, OR PROVIDE END TREATMENT AS DIRECTED BY THE ENGINEER OR AS SHOWN ON THE PLANS.
5. REFER TO SECTION 805 FOR CONDUIT, ETC.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

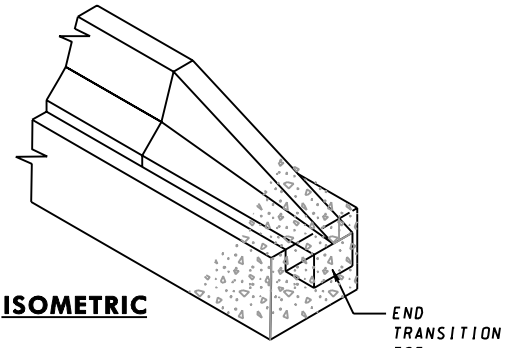
SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-16-90
	APPROVAL 7-31-90
	REVISION 10-1-01
REVISION 3-28-01	
REVISION	REVISION
REVISION	REVISION

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONDUIT AND JUNCTION BOX LOCATION**  
**FOR CONCRETE JERSEY SHAPE TRAFFIC**  
**BARRIER SINGLE FACE - ALL TYPES**

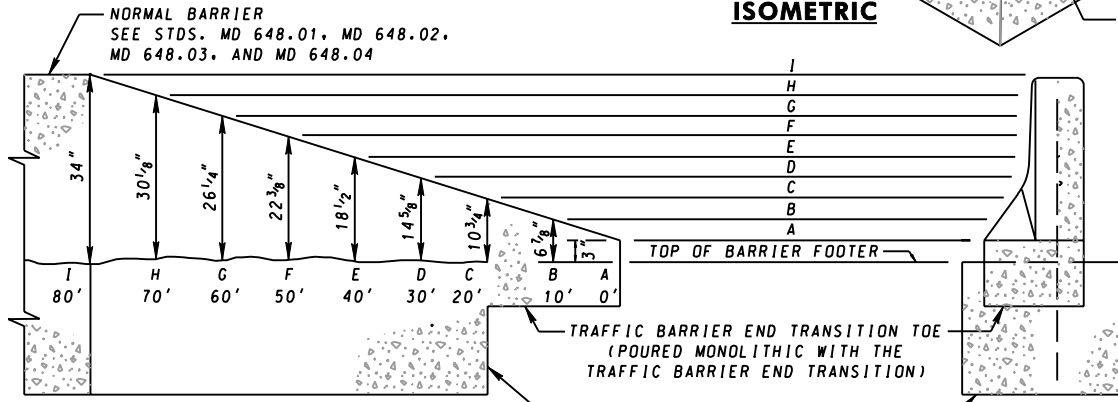
**STANDARD NO. MD 648.06**



**PLAN**

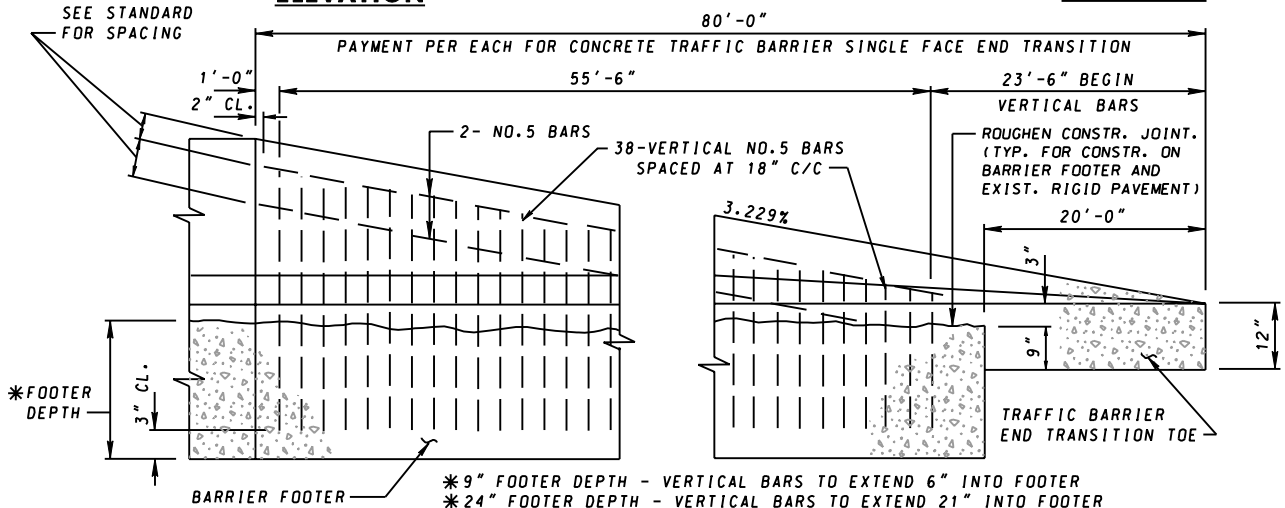


**ISOMETRIC**



**ELEVATION**

**END VIEW**



**REINFORCEMENT STEEL DETAIL**

**NOTES**

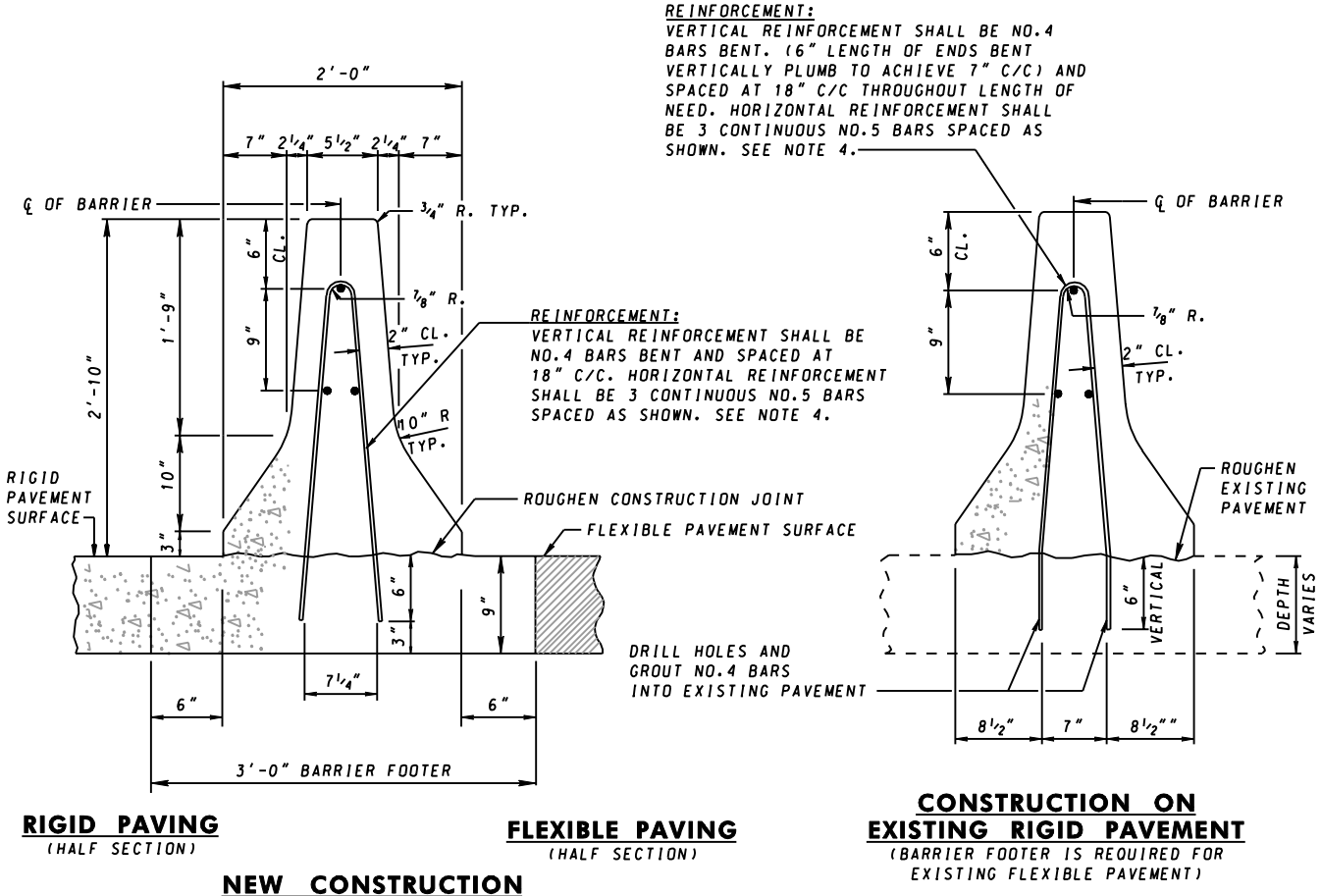
1. THE TRAFFIC BARRIER END TRANSITION AND BARRIER FOOTER SHALL BE CONSTRUCTED USING THE FIXED FORM METHOD. SEE STDS. MD 648.01, MD 648.02, AND MD 648.03 FOR BARRIER FOOTER DETAILS. THE BARRIER AND FOOTER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. THE TRAFFIC BARRIER END TRANSITION AND BARRIER FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI).
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, AND TIES SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER.
4. THIS TRAFFIC BARRIER END TRANSITION IS PROHIBITED WHEN THE DESIGN SPEED IS 45 MPH OR GREATER. THE ENGINEER MUST DETERMINE THE TYPE OF END TREATMENT REQUIRED FOR DESIGN SPEEDS OVER 45 MPH.
5. THE COST OF THE BARRIER END TRANSITION TOE, REINFORCEMENT, DRILLED HOLES, GROUT, LABOR, TOOLS, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR THE CONCRETE TRAFFIC BARRIER SINGLE FACE END TRANSITION.
6. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 7-31-90	
REVISED 3-28-01	
REVISED	
REVISED	

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONCRETE JERSEY SHAPE TRAFFIC BARRIER**  
**SINGLE FACE END TRANSITION**

**STANARD NO. MD 648.10**



**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE THE FOOTER AND BARRIER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORMS, IF REQUIRED, SHALL BE REMOVED BEFORE PLACING PAVEMENT.
4. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD EXTRA DIAGONAL NO.4 REINFORCEMENT BARS ARE REQUIRED. SEE STD. MD 648.15 FOR THE DIAGONAL BAR ARRANGEMENT DETAILS.
5. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 20 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
6. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF CONSTRUCTION METHOD.
7. COST OF THE CONCRETE FOOTER, ALL REINFORCEMENT AND EXCAVATION SHALL BE INCIDENTAL TO BE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE A.
8. WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ALL REINFORCEMENT, DRILLED HOLES, GROUT, LABOR, TOOLS, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE A.
9. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

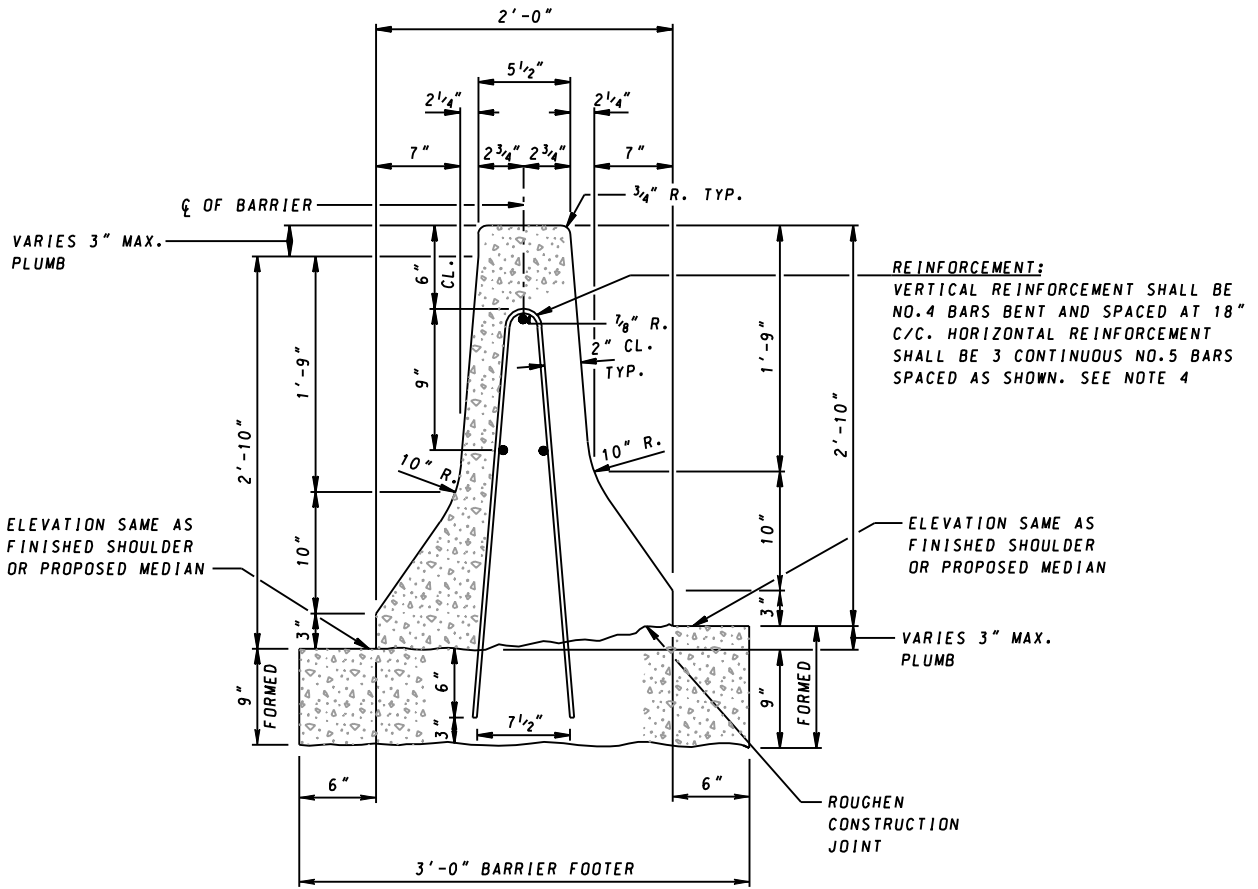
**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE A**

**STANDARD NO. MD 648.12**




**TYPICAL SECTION**

**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE THE FOOTER AND BARRIER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORMS, IF REQUIRED, SHALL BE REMOVED BEFORE PLACING PAVEMENT.
4. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD EXTRA DIAGONAL NO. 4 REINFORCEMENT BARS ARE REQUIRED. SEE STD. MD 648.15 FOR THE DIAGONAL BAR ARRANGEMENT DETAILS.
5. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
6. SPACING OF CONTRACTION JOINTS SHALL BE 30 FEET REGARDLESS OF CONSTRUCTION METHOD.
7. COST OF THE CONCRETE FOOTER, ALL REINFORCEMENT AND EXCAVATION SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE B.
8. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

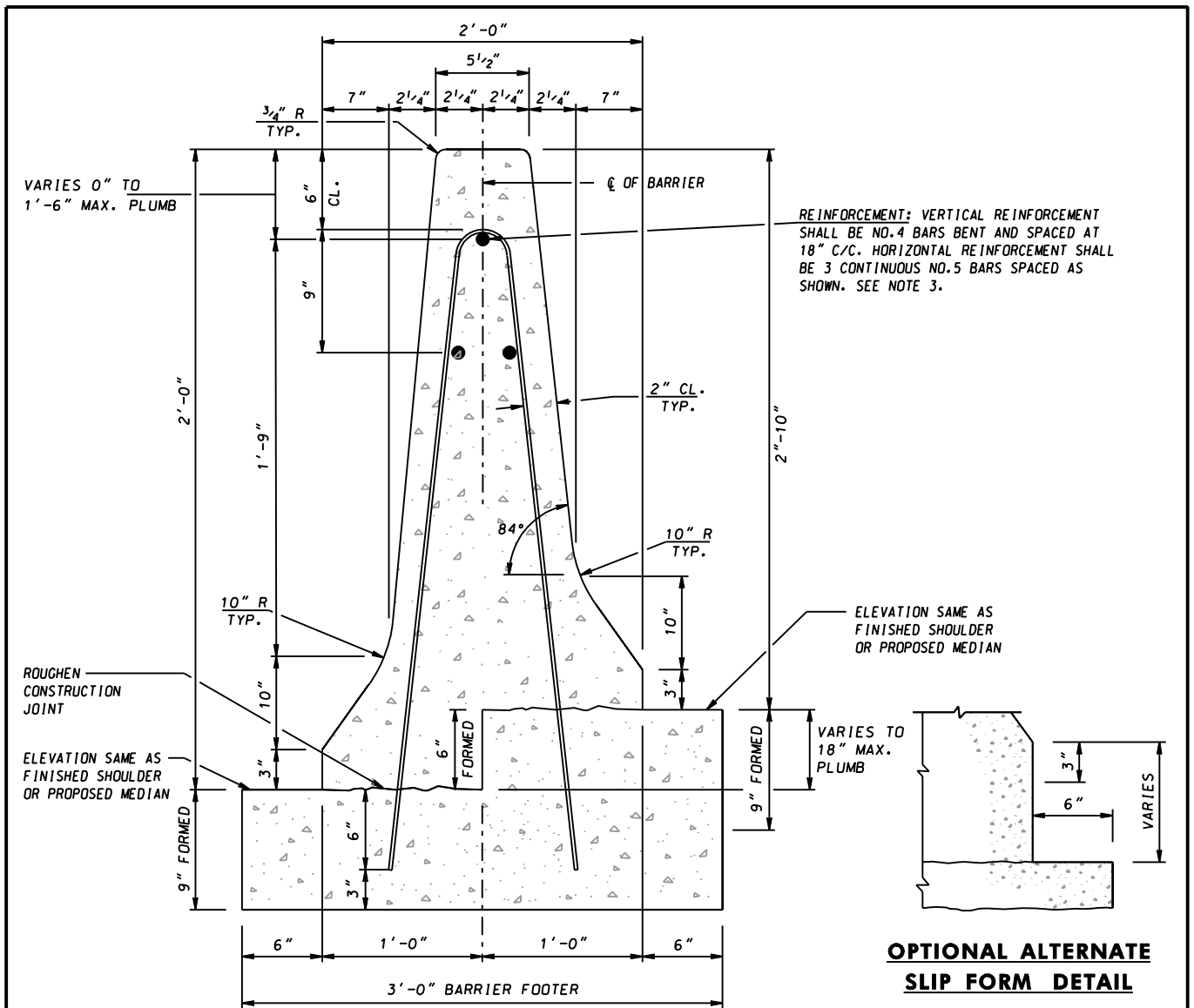
**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CONCRETE JERSEY SHAPE MEDIAN  
 TRAFFIC BARRIER TYPE B**


**STANDARD NO. MD 648.13**



**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST USING THE FIXED FORM OR THE SLIP FORM CONSTRUCTION METHOD. IN EITHER CASE OF THE FOOTER AND BARRIER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. THE BARRIER AND FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) CONTINUOUSLY PLACED.
3. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. THE FOOTER FORMS, IF REQUIRED, SHALL BE REMOVED BEFORE PALCING PAVEMENT.
4. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD EXTRA DIAGONAL NO.4 REINFORCEMENT BARS ARE REQUIRED. SEE STD. MD 648.15 FOR THE DIAGONAL BAR ARRANGEMENT DETAILS.
5. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. VERTICAL NO.4 BARS SHALL BE GRADE 40.
6. SPACING OF CONTRACTION JOINTS SHALL BE 20 FEET REGARDLESS OF CONSTRUCTION METHOD.
7. COST OF THE CONCRETE FOOTER, ALL REINFORCEMENT, AND EXCAVATION SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE C.
8. WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ALL REINFORCEMENT, DRILLED HOLES, GROUT, LABOR, TOOLS, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE C.
9. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4"

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

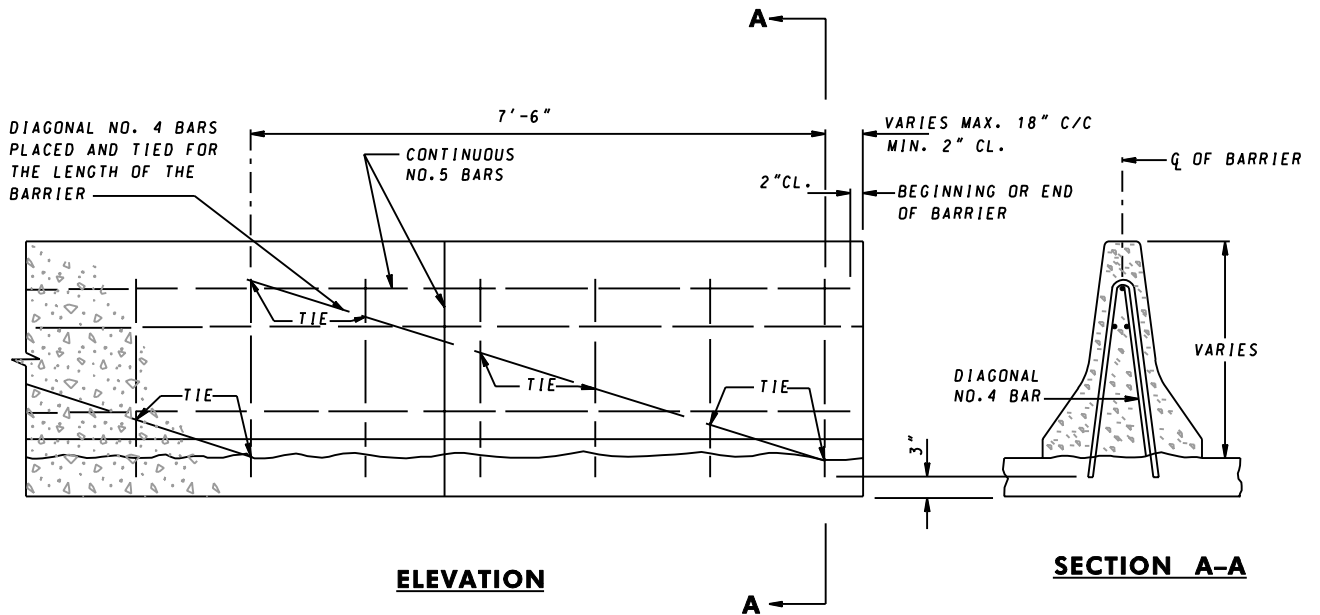
SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 7-31-90	
REVISED 3-28-01	
REVISED	
REVISED	

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE C**

**STANDARD NO. MD 648.14**






**NOTES**

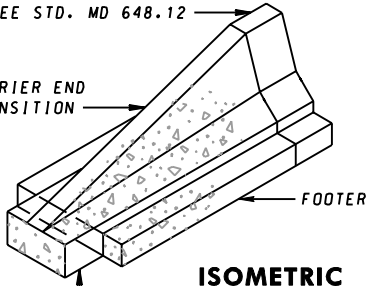
1. APPLICABLE TO SLIP FORM CONSTRUCTION METHOD ONLY.
2. FOR BARRIER TYPES A, B & C AND BARRIERS CONSTRUCTED ON EXISTING RIGID PAVEMENT.
3. DIAGONAL NO. 4 BARS SHALL BE GRADE 40.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS	<p><b>Maryland Department of Transportation</b>  <b>STATE HIGHWAY ADMINISTRATION</b>          STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  <b>DIAGONAL BAR LOCATION</b>  <b>FOR CONCRETE JERSEY SHAPE</b>  <b>MEDIAN TRAFFIC BARRIER</b>  <b>STANDARD NO. MD 648.15</b></p>	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT		
	APPROVAL • SHA REVISIONS		APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-16-90		APPROVAL 7-31-90
	REVISED 10-1-01	REVISED 3-28-01	
	REVISED	REVISED	
	REVISED	REVISED	

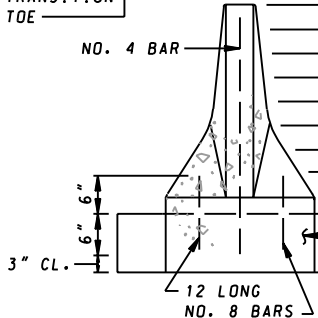
NORMAL MEDIAN BARRIER  
SEE STD. MD 648.12

BARRIER END  
TRANSITION



**ISOMETRIC**

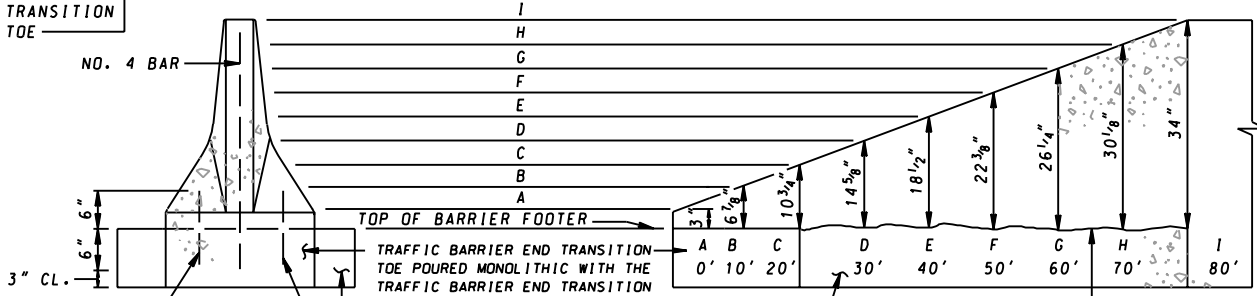
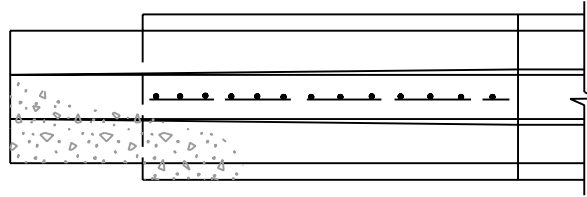
END  
TRANSITION  
TOE



**END VIEW**

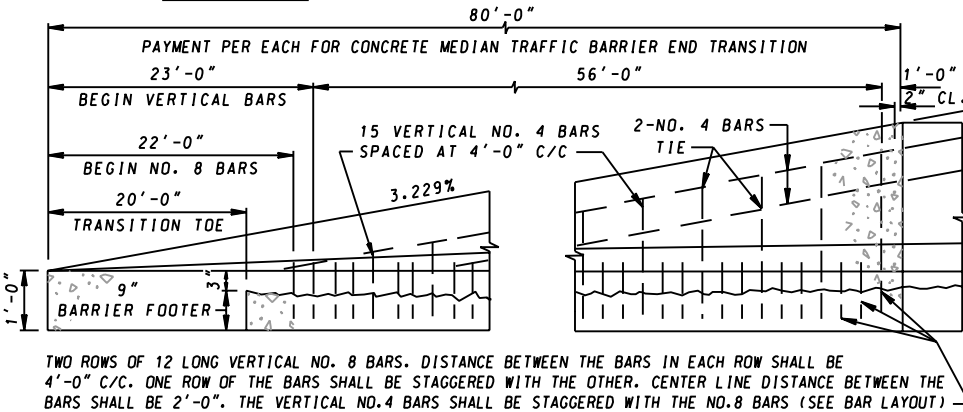
THIS END TRANSITION IS APPLICABLE  
TO ALL MEDIAN BARRIER BEGINNING OR  
ENDING WITH THE 34 INCH CONCRETE  
MEDIAN TRAFFIC BARRIER.

**PLAN**



**ELEVATION**

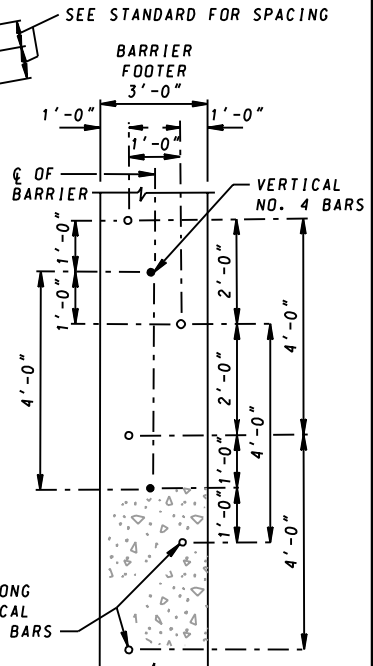
ROUGHEN CONSTR.  
JOINT. (TYPICAL FOR  
CONSTR. ON BARRIER  
FOOTER & EXIST.  
RIGID PAVEMENT)



**REINFORCEMENT STEEL DETAILS**

**NOTES**

1. THE TRAFFIC BARRIER END TRANSITION SHALL BE CONSTRUCTED USING THE FIXED FORM METHOD. NO FOOTER IS REQUIRED WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT. BARRIER AND FOOTER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED. SEE STD. MD 648.13 FOR BARRIER FOOTER DETAILS.
2. THE TRAFFIC BARRIER END TRANSITION AND BARRIER FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI).
3. ALL REINFORCEMENT BARS, INCLUDING ENDS AND TIES, SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER.
4. THIS TRAFFIC BARRIER END TRANSITION IS PROHIBITED WHEN THE DESIGN SPEED IS 45 MPH OR GREATER. THE ENGINEER MUST DETERMINE THE TYPE OF END TREATMENT FOR DESIGN SPEEDS OVER 45 MPH.
5. COST OF THE CONCRETE BARRIER FOOTER (IF REQUIRED) SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR THE CONCRETE MEDIAN TRAFFIC BARRIER END TRANSITION.
6. WHEN THE BARRIER END TRANSITION IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ROUGHENING THE PAVEMENT SURFACE, EXCAVATION FOR TRANSITION TOE, REINFORCEMENT, DRILLED HOLES, GROUT, LABOR, TOOLS, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR THE ITEM SPECIFIED IN NOTE 5.
7. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4". **JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

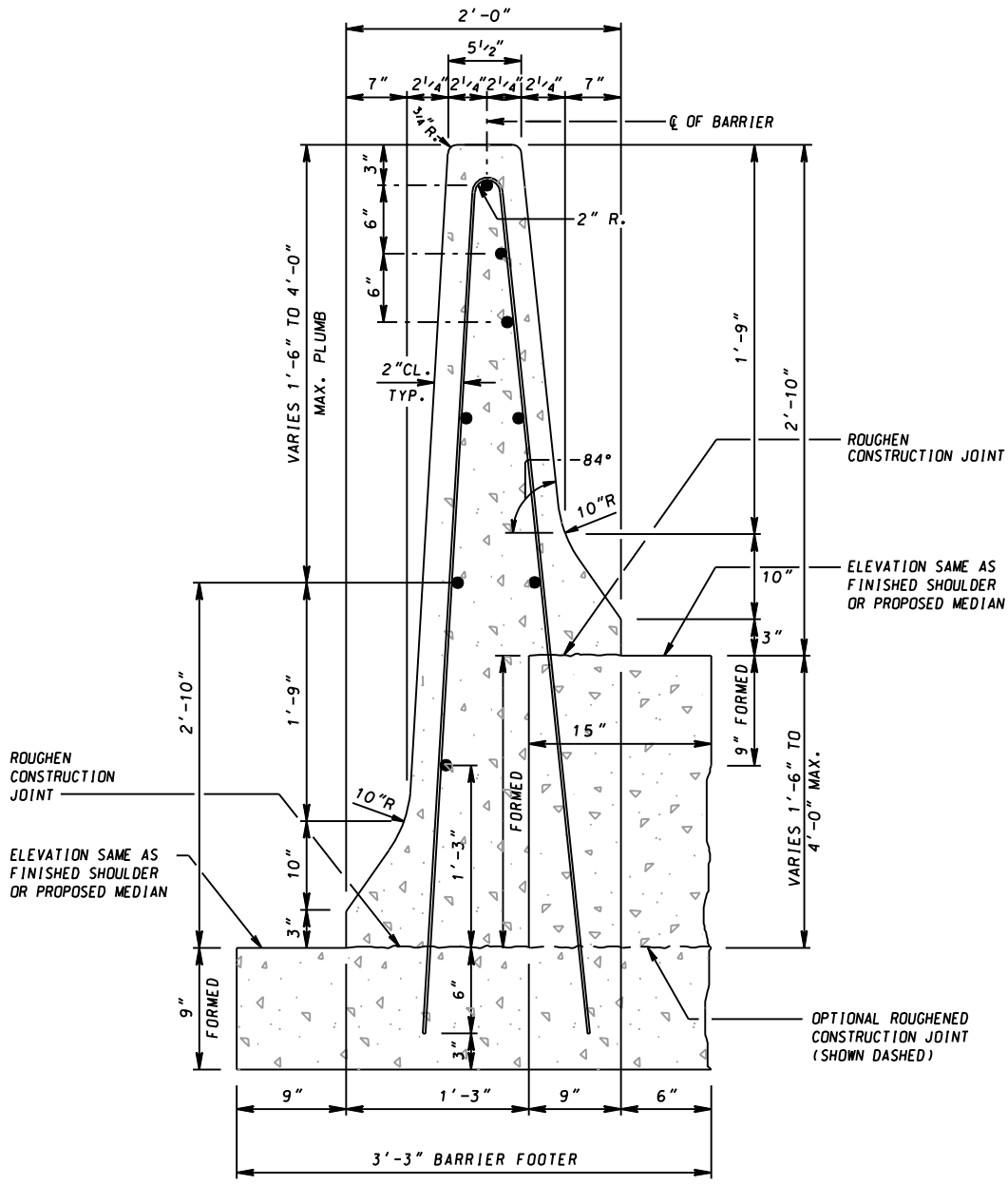


**PLAN VIEW  
END TRANSITION  
BAR LAYOUT**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
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	APPROVAL 7-16-90
	APPROVAL 7-31-90
REVISION 10-1-01	REVISION 3-28-01
REVISION	REVISION
REVISION	REVISION

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC  
BARRIER END TRANSITION**

**STANDARD NO. MD 648.18**




**TYPICAL SECTION**

**NOTES**

1. THE BARRIER AND FOOTER SHALL BE CAST SEPARATELY USING CONCRETE MIX NO.6 (4500 PSI). MONOLITHIC PLACEMENT NOT PERMITTED.
2. THE CONTRACTOR HAS THE OPTION TO CONSTRUCT THE BARRIER FOOTER AND BARRIER AFTER CONSTRUCTION OF THE PAVEMENT. FOOTER FORM SHALL BE REMOVED BEFORE PLACING PAVEMENT.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER.
4. COST OF CONCRETE FOOTER, ALL REINFORCEMENT, AND EXCAVATION SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE D.
5. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

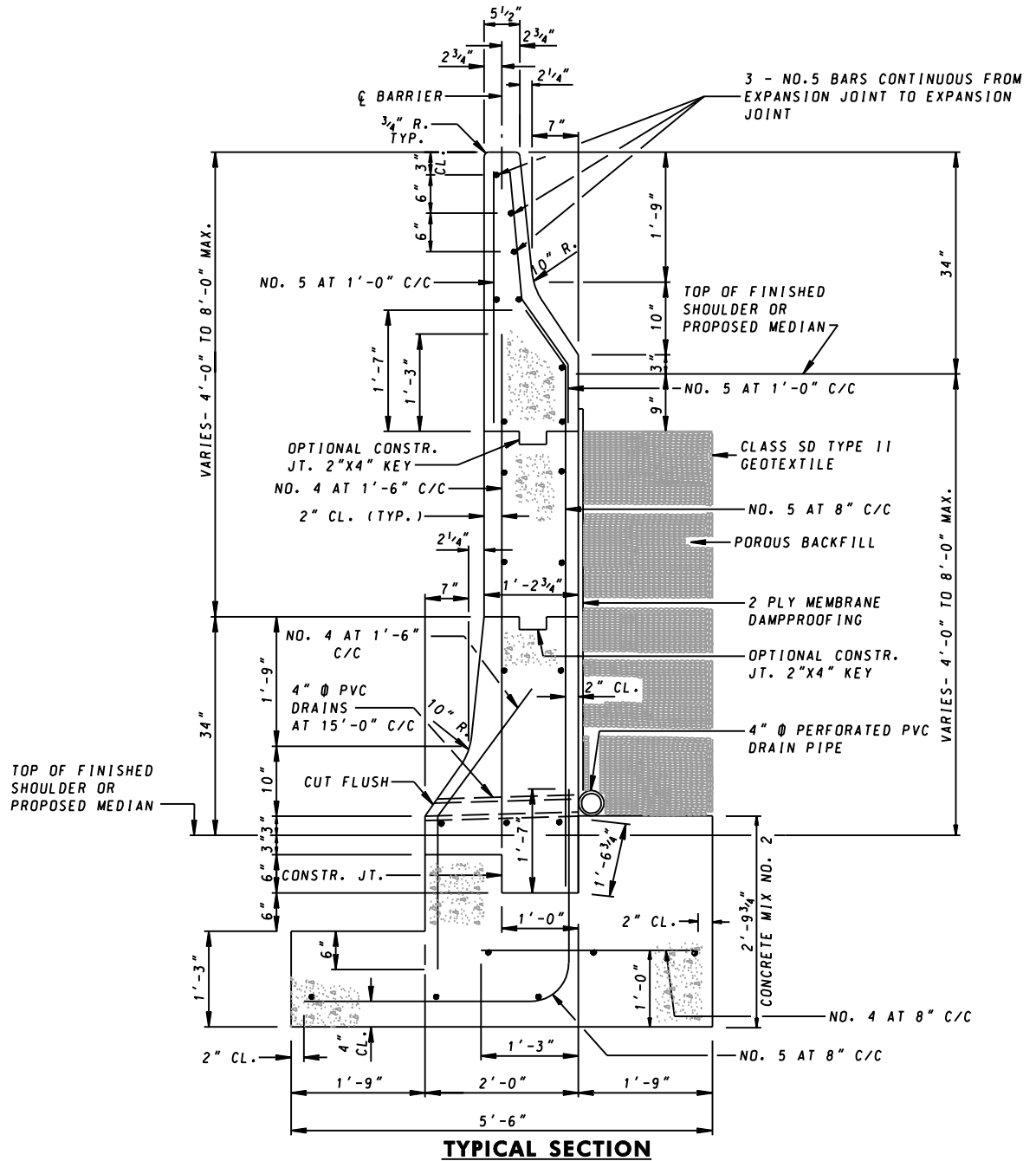
**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
	REVISED
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE D**

**STANDARD NO. MD 648.20**



**NOTES**

1. BARRIER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) AND THE FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.2 (3000 PSI). BARRIER AND FOOTER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. ALL LONGITUDINAL BARS SHOWN WITHOUT SIZE SPECIFIED SHALL BE NO.4 BARS AT 1'-6" C/C.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BARS SHALL BE BENT BEFORE APPLYING EPOXY COATING ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. ALL BARS SHALL BE ASTM A 615, GRADE 60.
4. SEE STANDARD NO. MD 648.26 FOR CONTRACTION AND EXPANSION JOINTS.
5. COST OF THE CONCRETE FOOTER, ALL REINFORCEMENT, DRAINAGE APPURTENANCES, JOINT MATERIAL, EXCAVATION, GEOTEXTILE AND BACKFILLING SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN TRAFFIC BARRIER TYPE E.
6. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

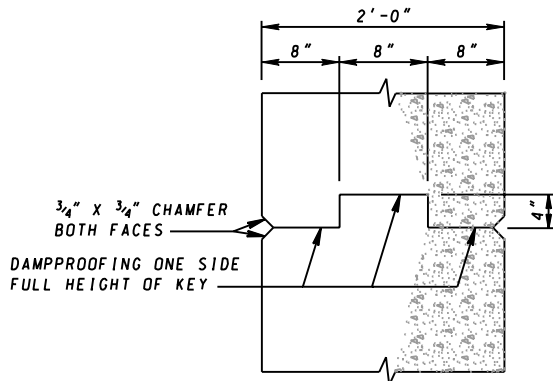
**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-16-90
	REVISIONS 2-10-04

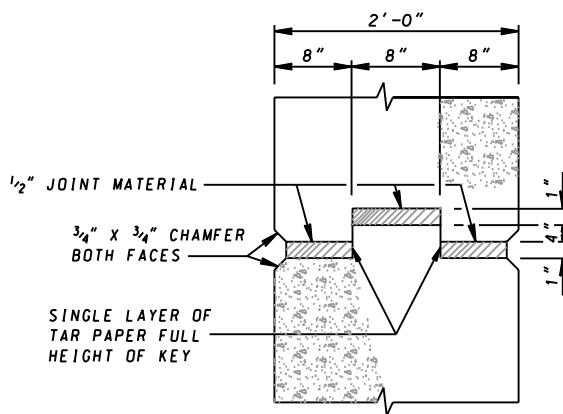
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE E**

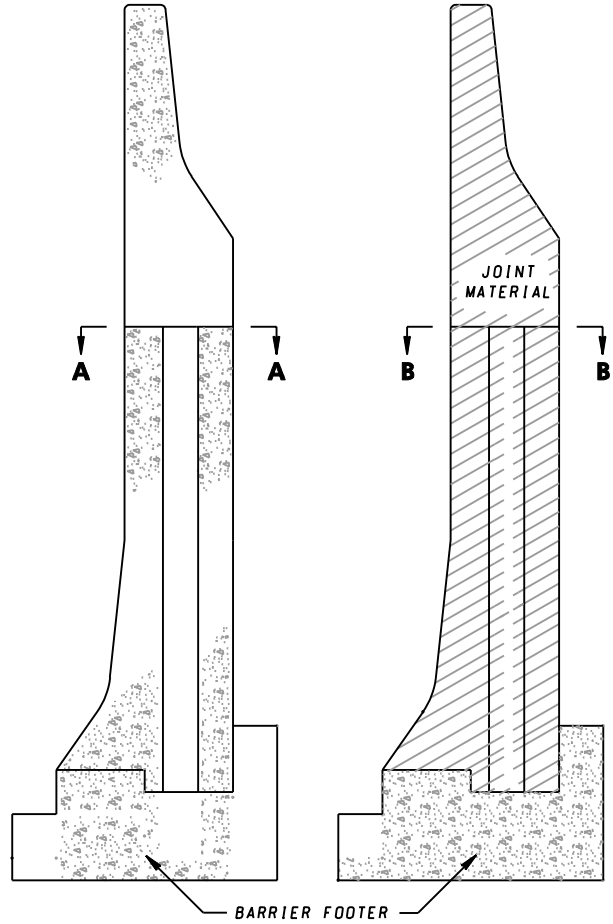
**STANDARD NO. MD 648.24**



**CONTRACTION JOINT**  
PLAN VIEW SECTION A-A



**EXPANSION JOINT**  
PLAN VIEW SECTION B-B




**TYPICAL SECTION**  
CONTRACTION JOINT

**TYPICAL SECTION**  
EXPANSION JOINT

**NOTES**

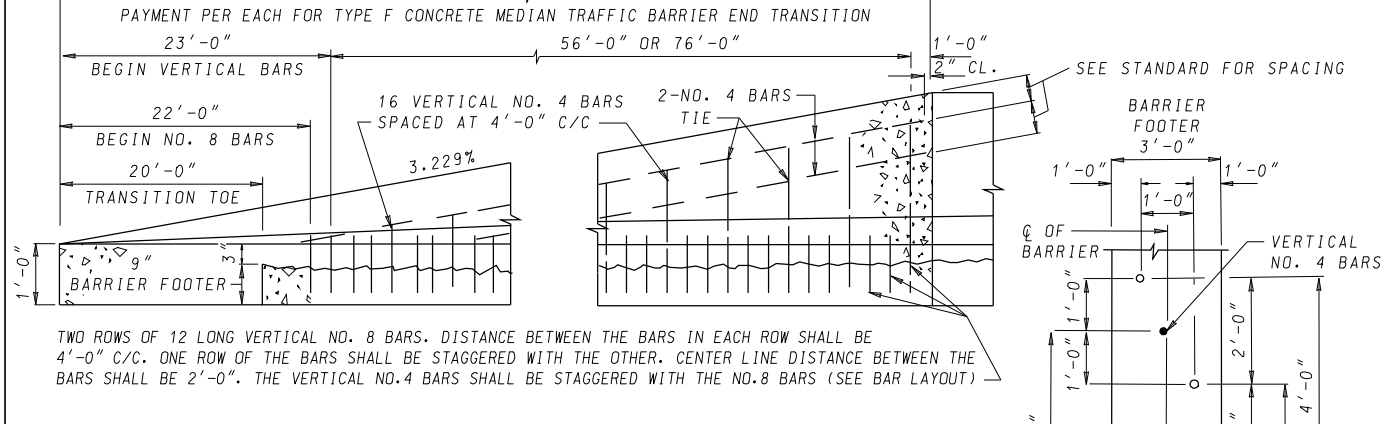
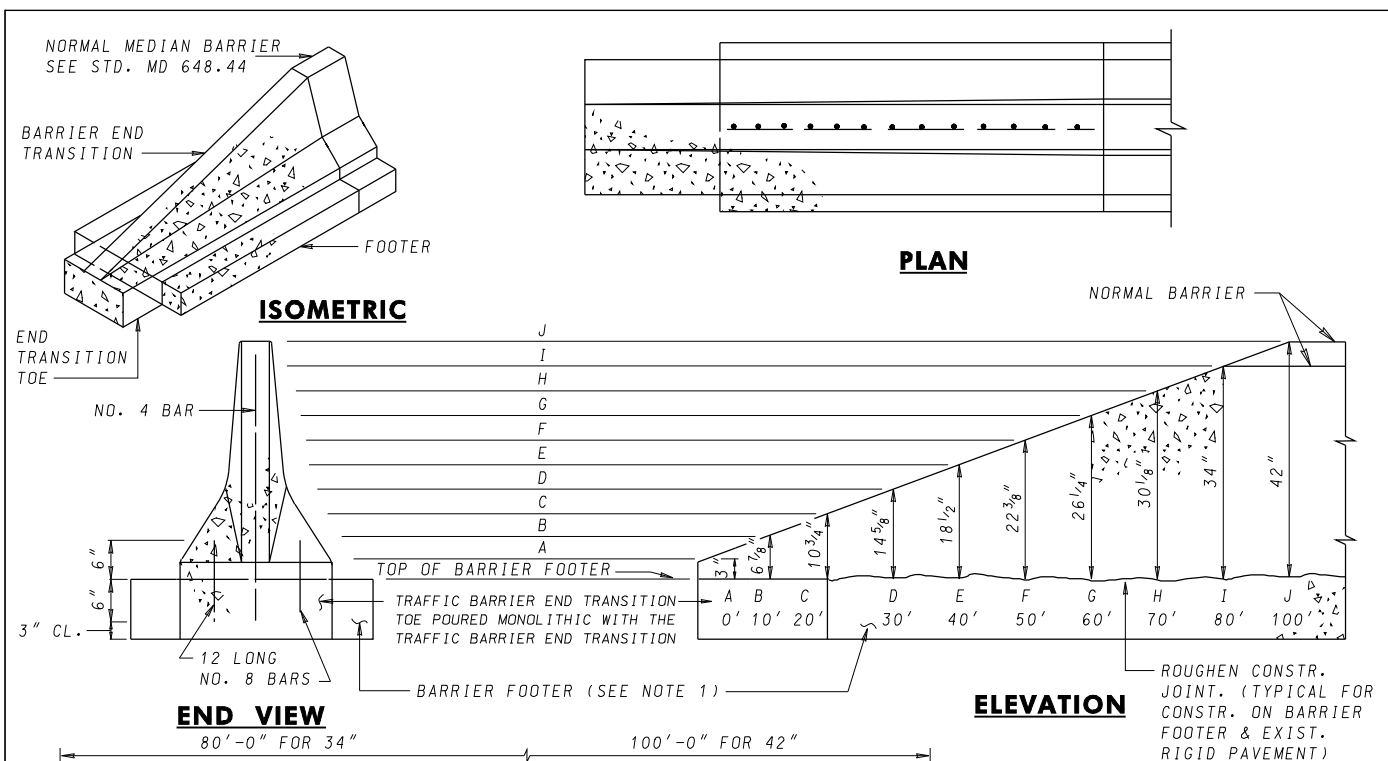
1. EXPANSION JOINTS SHALL BE PLACED AT THE END OF EACH DAYS CONCRETE PLACEMENT REGARDLESS OF LENGTH AND REGARDLESS OF THE CONSTRUCTION METHOD.
2. HORIZONTAL REINFORCEMENT SHALL NOT PASS THROUGH CONTRACTION OR EXPANSION JOINTS.
3. SEE STANDARD NO 648.24 FOR DETAILS OF CONCRETE MEDIAN TRAFFIC BARRIER TYPE E.
4. JOINT MATERIAL SHALL BE HELD IN PLACE BY NAILS, WATERPROOF ADHESIVE OR OTHER MEANS, AS APPROVED BY THE ENGINEER.

**JERSEY SHAPE - FOR REPLACEMENT PURPOSES ONLY**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 7-16-90
	REVISED 10-1-01
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	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 7-31-90
	REVISED 3-28-01
	REVISED
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CONCRETE JERSEY SHAPE MEDIAN TRAFFIC BARRIER TYPE E CONTRACTION AND EXPANSION JOINTS**

**STANDARD NO. MD 648.26**




**NOTES**

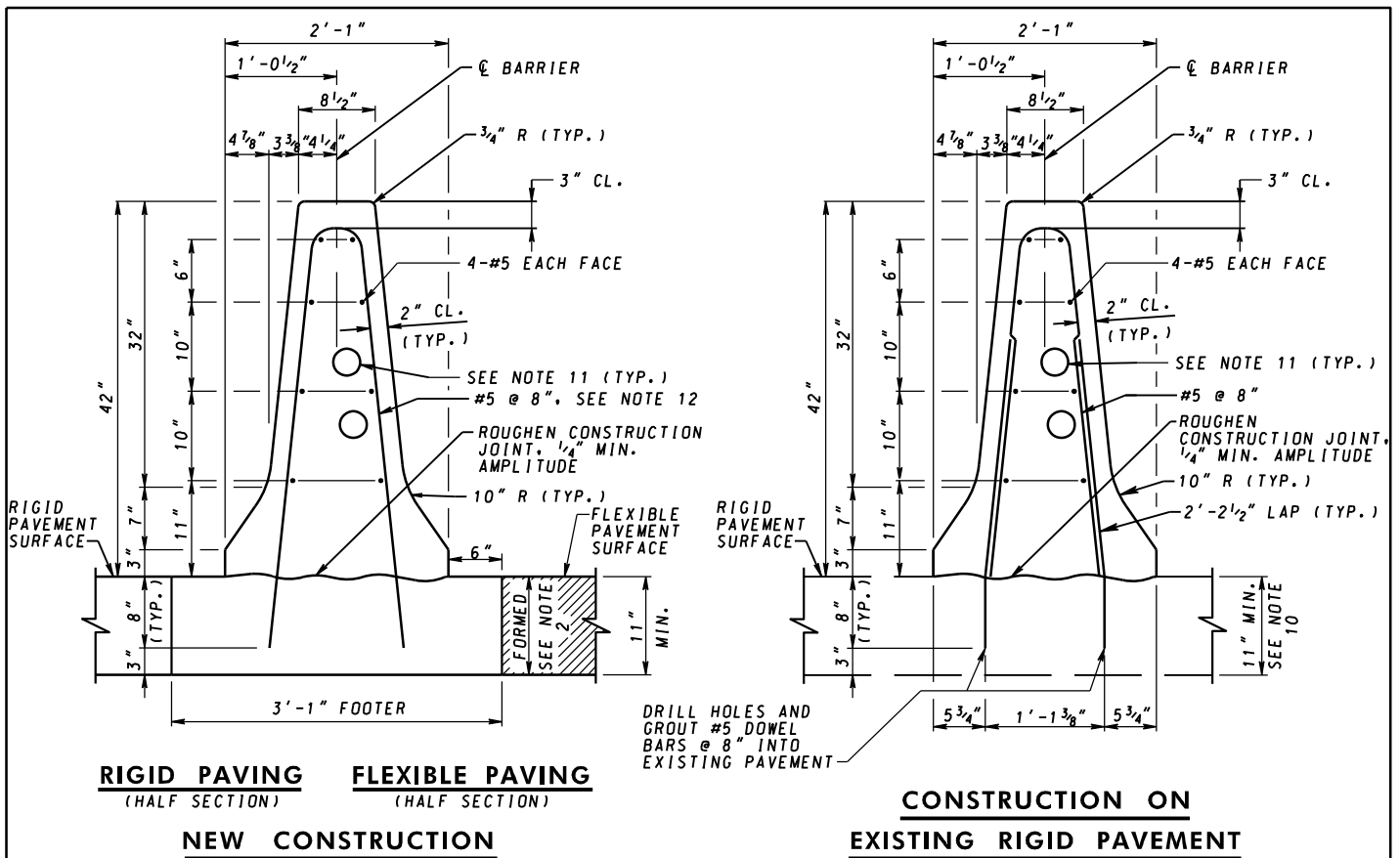
1. THE TRAFFIC BARRIER END TRANSITION SHALL BE CONSTRUCTED USING THE FIXED FORM METHOD. NO FOOTER IS REQUIRED WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT. BARRIER AND FOOTER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED. SEE STD. MD 648.44 FOR BARRIER FOOTER DETAILS.
2. THE TRAFFIC BARRIER END TRANSITION AND BARRIER FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI).
3. ALL REINFORCEMENT BARS, INCLUDING ENDS AND TIES, SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER.
4. THIS TRAFFIC BARRIER END TRANSITION IS PROHIBITED WHEN THE DESIGN SPEED IS 45 MPH OR GREATER. THE ENGINEER MUST DETERMINE THE TYPE OF END TREATMENT FOR DESIGN SPEEDS OVER 45 MPH.
5. COST OF THE CONCRETE BARRIER FOOTER (IF REQUIRED) SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR THE 34 INCH OR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER END TRANSITION.
6. WHEN THE BARRIER END TRANSITION IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ROUGHENING THE PAVEMENT SURFACE, EXCAVATION FOR TRANSITION TOE, REINFORCEMENT, DRILLED HOLES, GROUT, LABOR, TOOLS, EQUIPMENT, ETC., SHALL BE INCIDENTAL TO THE CONTRACT UNIT PRICE PER EACH FOR THE ITEM SPECIFIED IN NOTE 5.
7. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4\".

**REINFORCEMENT STEEL DETAILS**

**PLAN VIEW  
END TRANSITION  
BAR LAYOUT**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-1-01
	APPROVAL 3-28-01
REVISED 11-08-06	REVISED 10-25-06
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER END TRANSITION**  
**STANDARD NO. MD 648.33-04**




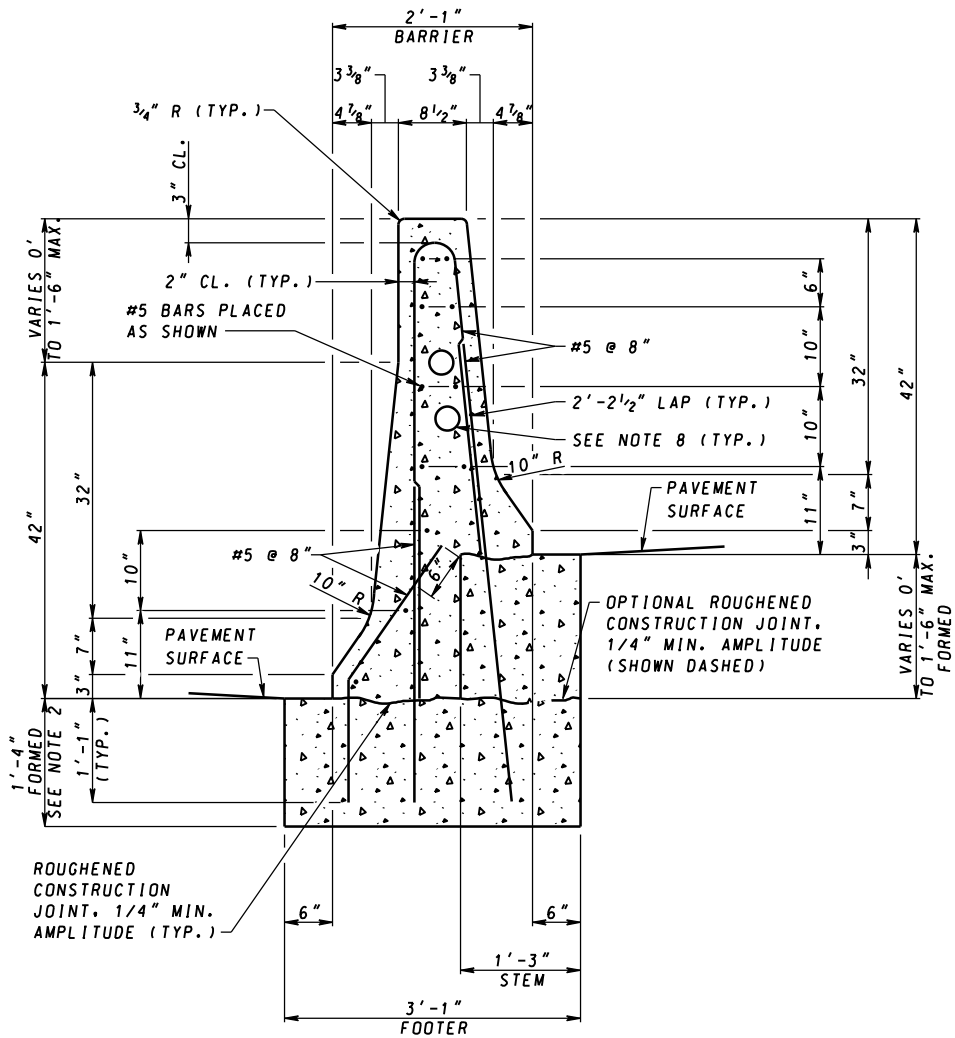
**NOTES**

- CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
- THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
- WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. NO. MD 648.44-04.
- LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
- MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
- COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER.
- WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, DRILLED HOLES, AND GROUT IS INCIDENTAL TO THE PRICE PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
- TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
- WHEN THE BARRIER IS CONSTRUCTED ON EXISTING FLEXIBLE PAVEMENT, SAWCUT PAVEMENT FULL DEPTH AND CONSTRUCT A FOOTER AS SHOWN IN THE NEW CONSTRUCTION DETAIL. THE COST FOR SAWCUTS, PAVEMENT REMOVAL, AND EXCAVATION IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
- IF EXISTING RIGID PAVEMENT IS LESS THAN 11" THICK, SAWCUT PAVEMENT AND CONSTRUCT A FOOTER AS SHOWN IN THE NEW CONSTRUCTION DETAIL. COST OF SAWCUTS, DEMOLITION OF EXISTING PAVEMENT, AND CONSTRUCTION OF FOOTER IS INCIDENTAL TO THE PRICE PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
- CONDUIT IF REQUIRED, REFER TO STD. NO. MD 648.50-01 FOR LOCATION AND DETAILS.
- THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THE NEW CONSTRUCTION DETAIL ABOVE OR USE THE LAP SPLICE METHOD SHOWN ON THE CONSTRUCTION ON EXISTING RIGID PAVEMENT DETAIL ABOVE. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 3-1-01	<b>APPROVAL</b> 3-28-01
<b>REVISED</b> 2-10-04	<b>REVISED</b> 3-31-04
<b>REVISED</b> 6-27-23	<b>REVISED</b> 6-21-23
<b>REVISED</b>	<b>REVISED</b>

 MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION  
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**42 INCH F SHAPE CONCRETE**  
**MEDIAN TRAFFIC BARRIER**  
**STANDARD NO. MD 648.44**



**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO. 6 (4500 PSI).
2. REMOVE THE FOOTER FORMS BEFORE PLACING PAVEMENT.
3. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.44-04.
4. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINTS, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 0 FOOT 0 INCHES TO 1 FOOT 6 INCHES.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT IF REQUIRED, REFER TO STD. MD 648.50-01 FOR LOCATION AND DETAILS.
9. CONTRACTOR HAS THE OPTION OF LAPPING VERTICAL NO. 5 BARS WITH DOWELS AS SHOWN OR EXTENDING THE DOWEL REINFORCEMENT WITH NO SPLICING. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

TL-4

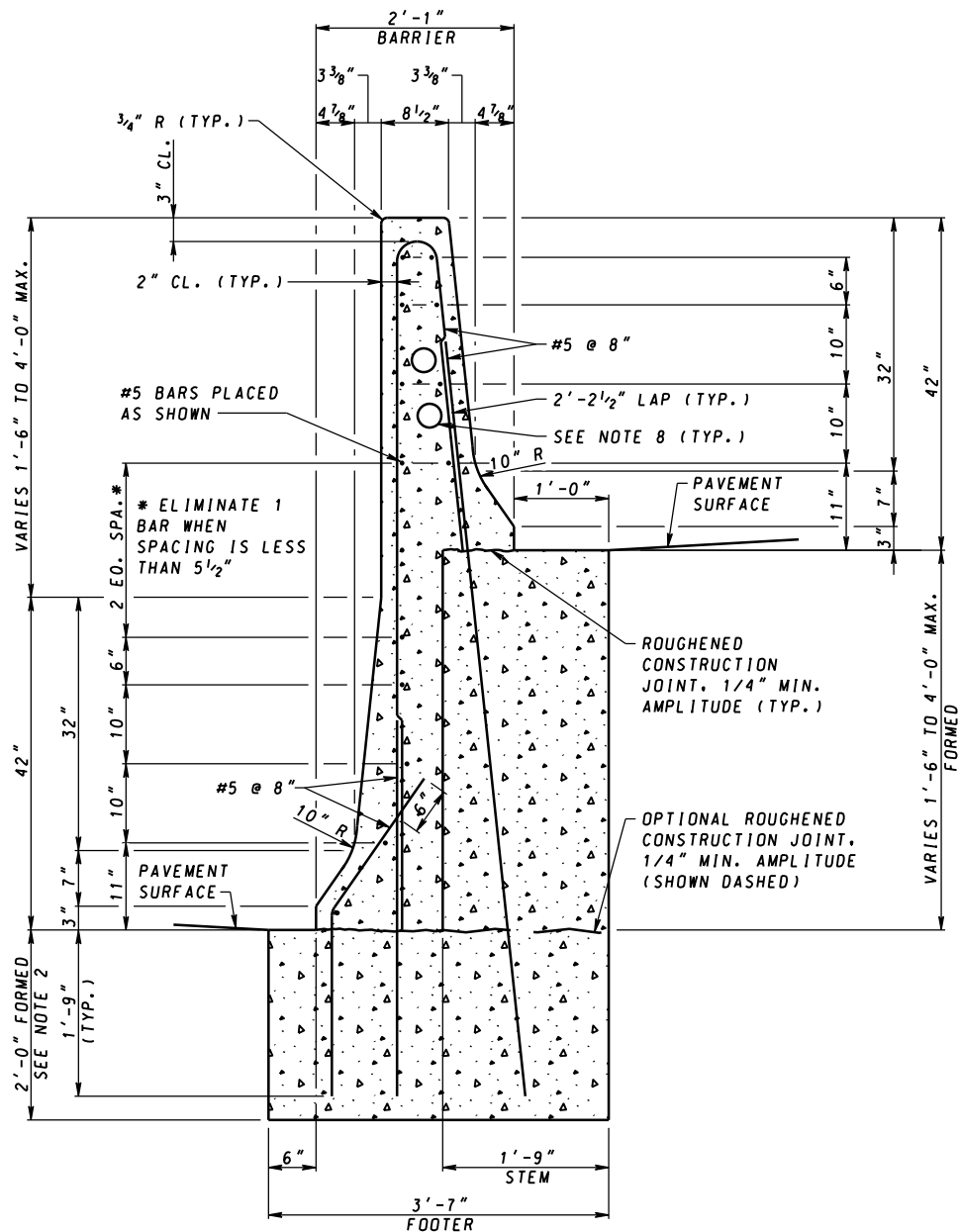
SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 11-20-13	REVISED 3-31-04
REVISED 6-27-24	REVISED 5-22-24
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
42 INCH F SHAPE CONCRETE  
MEDIAN TRAFFIC BARRIER BIFURCATED  
0 FEET 0 INCHES TO 1 FEET 6 INCHES**

**STANDARD NO. MD 648.44-01**





**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO. 6 (4500 PSI).
2. REMOVE THE FOOTER FORMS BEFORE PLACING PAVEMENT.
3. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.44-04.
4. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINTS, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 1 FOOT 6 INCHES TO 4 FEET 0 INCHES.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT IF REQUIRED, REFER TO STD. MD 648.50-01 FOR LOCATION AND DETAILS.
9. CONTRACTOR HAS THE OPTION OF LAPPING VERTICAL NO. 5 BARS WITH DOWELS AS SHOWN OR EXTENDING THE DOWEL REINFORCEMENT WITH NO SPLICING. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

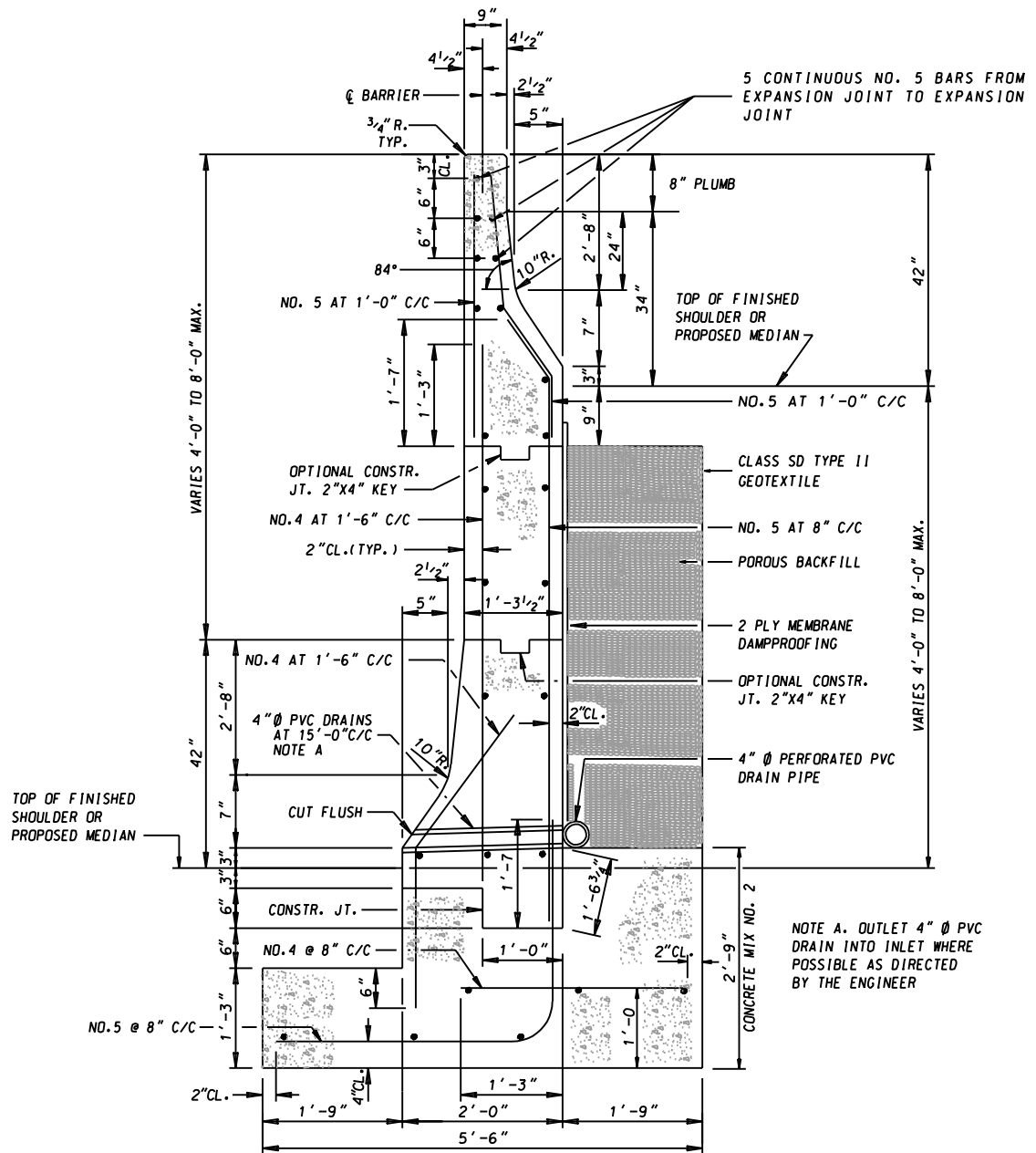
**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>Crommelink</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 2-10-04	REVISED 3-31-04
REVISED 6-27-24	REVISED 5-22-24
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
42 INCH F SHAPE CONCRETE  
MEDIAN TRAFFIC BARRIER BIFURCATED  
1 FEET 6 INCHES TO 4 FEET 0 INCHES**

**STANDARD NO. MD 648.44-02**



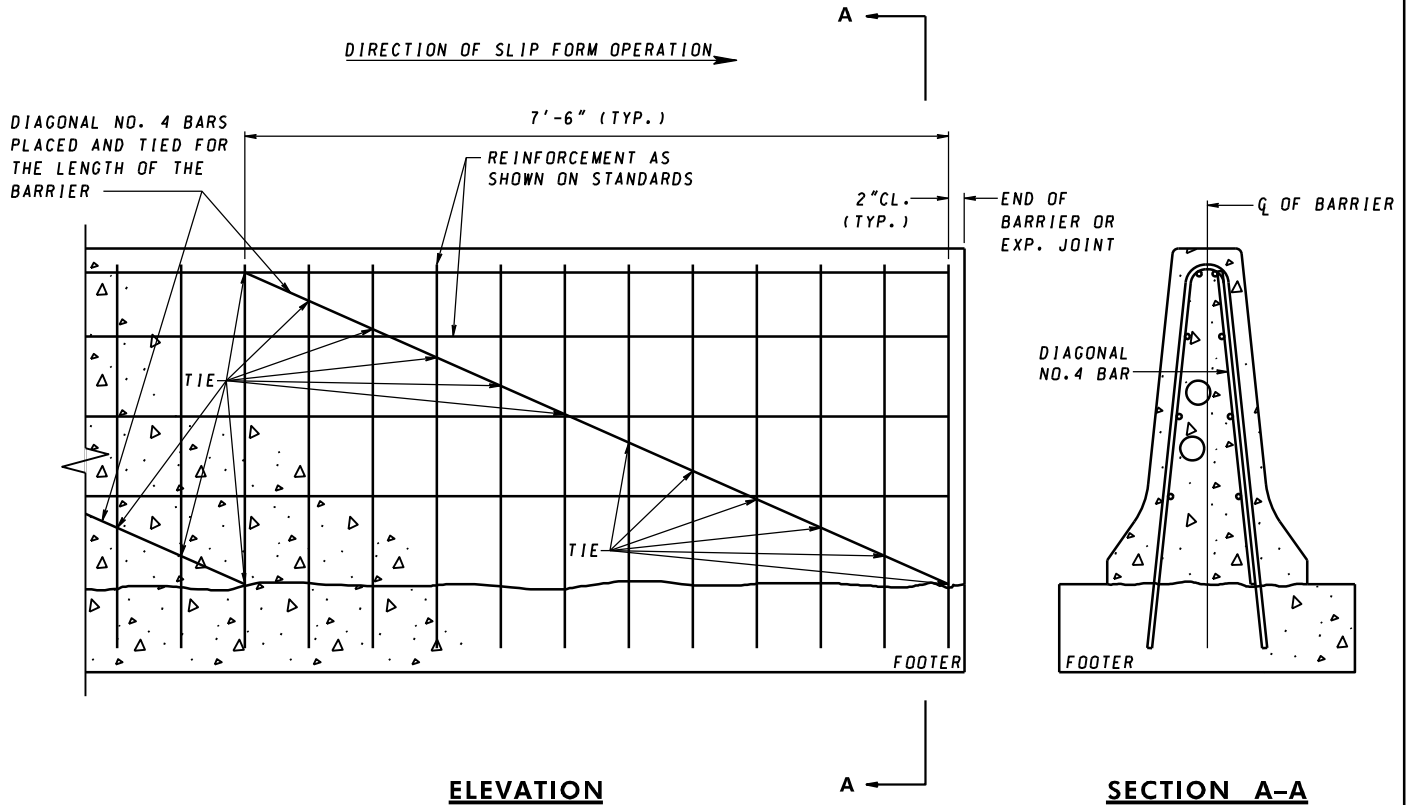
**NOTES**

**TYPICAL SECTION**

1. BARRIER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.6 (4500 PSI) AND THE FOOTER SHALL BE CONSTRUCTED USING CONCRETE MIX NO.2 (3000 PSI). BARRIER AND FOOTER SHALL BE CAST SEPARATELY. MONOLITHIC PLACEMENT NOT PERMITTED.
2. ALL LONGITUDINAL BARS SHOWN WITHOUT SIZE SPECIFIED SHALL BE NO.4 BARS AT 1'-6" C/C.
3. ALL REINFORCEMENT BARS, INCLUDING ENDS, SHALL BE EPOXY COATED. ALL BAR LAPS TO BE 30 BAR DIAMETERS. TIE BARS TOGETHER. ALL BARS SHALL BE ASTM A 615, GRADE 60.
4. SEE STANDARD MD 648.44-05 FOR CONTRACTION AND EXPANSION JOINTS.
5. COST OF THE CONCRETE FOOTER, ALL REINFORCEMENT, DRAINAGE APPURTENANCES, GEOTEXTILE, JOINT MATERIAL, EXCAVATION, BACKFILL, LABOR, TOOLS, EQUIPMENT, ETC., AND ALL INCIDENTALS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 4 FEET 0 INCHES TO 8 FEET 0 INCHES.
6. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 3-1-01
	REVISIONS 2-10-04

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**42 INCH F SHAPE CONCRETE MEDIAN**  
**TRAFFIC BARRIER BIFURCATED**  
**4 FEET 0 INCHES TO 8 FEET 0 INCHES**  
**STANDARD NO. MD 648.44-03**



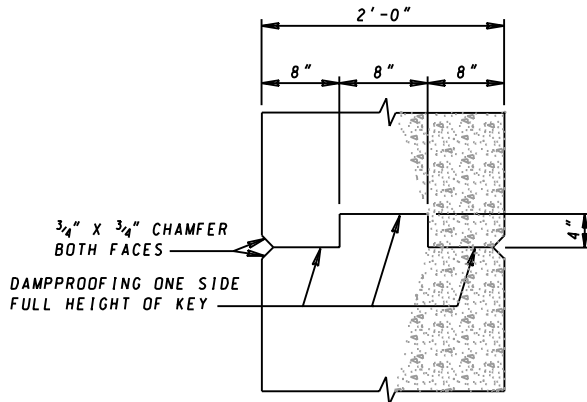
**DIAGONAL BAR DETAILS**

**NOTES**

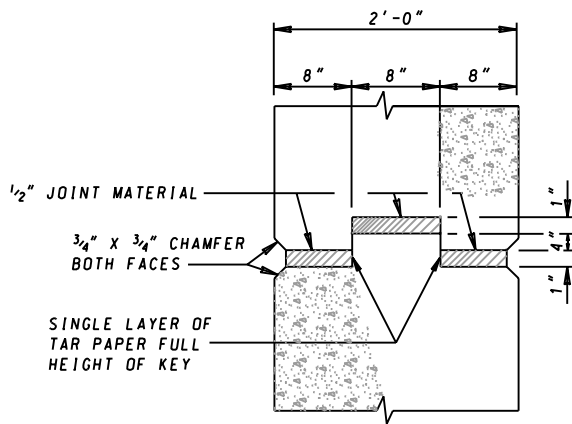
1. DIAGONAL NO. 4 BARS APPLICABLE TO SLIP FORM CONSTRUCTION METHOD ONLY.
2. F-SHAPE TRAFFIC BARRIER DIAGONAL NO. 4 BAR DETAILS SHOWN. SINGLE SLOPE CONCRETE TRAFFIC BARRIER DIAGONAL NO. 4 BAR DETAILS SIMILAR.

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>	
APPROVAL	3-1-01	APPROVAL
REVISED	2-10-04	REVISED
REVISED	6-27-23	REVISED
REVISED		REVISED

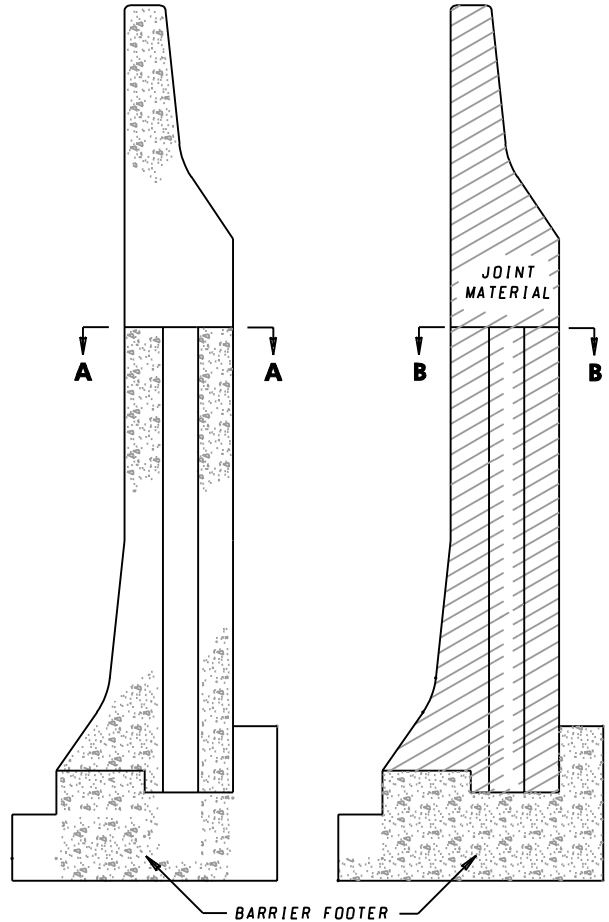
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION  
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**DIAGONAL BAR FOR SLIP FORMED**  
**DOUBLE FACED CONCRETE MEDIAN**  
**TRAFFIC BARRIER**  
**STANDARD NO. MD 648.44-04**



**CONTRACTION JOINT**  
PLAN VIEW SECTION A-A



**EXPANSION JOINT**  
PLAN VIEW SECTION B-B



**TYPICAL SECTION**  
CONTRACTION JOINT

**TYPICAL SECTION**  
EXPANSION JOINT

**NOTES**

1. EXPANSION JOINTS SHALL BE PLACED AT THE END OF EACH DAYS CONCRETE PLACEMENT REGARDLESS OF LENGTH AND REGARDLESS OF THE CONSTRUCTION METHOD.
2. HORIZONTAL REINFORCEMENT SHALL NOT PASS THROUGH CONTRACTION OR EXPANSION JOINTS.
3. SEE STANDARD NO 648.44-03 FOR 42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 4 FEET 0 INCHES TO 8 FEET 0 INCHES.
4. JOINT MATERIAL SHALL BE HELD IN PLACE BY NAILS, WATERPROOF ADHESIVE OR OTHER MEANS, AS APPROVED BY THE ENGINEER.

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
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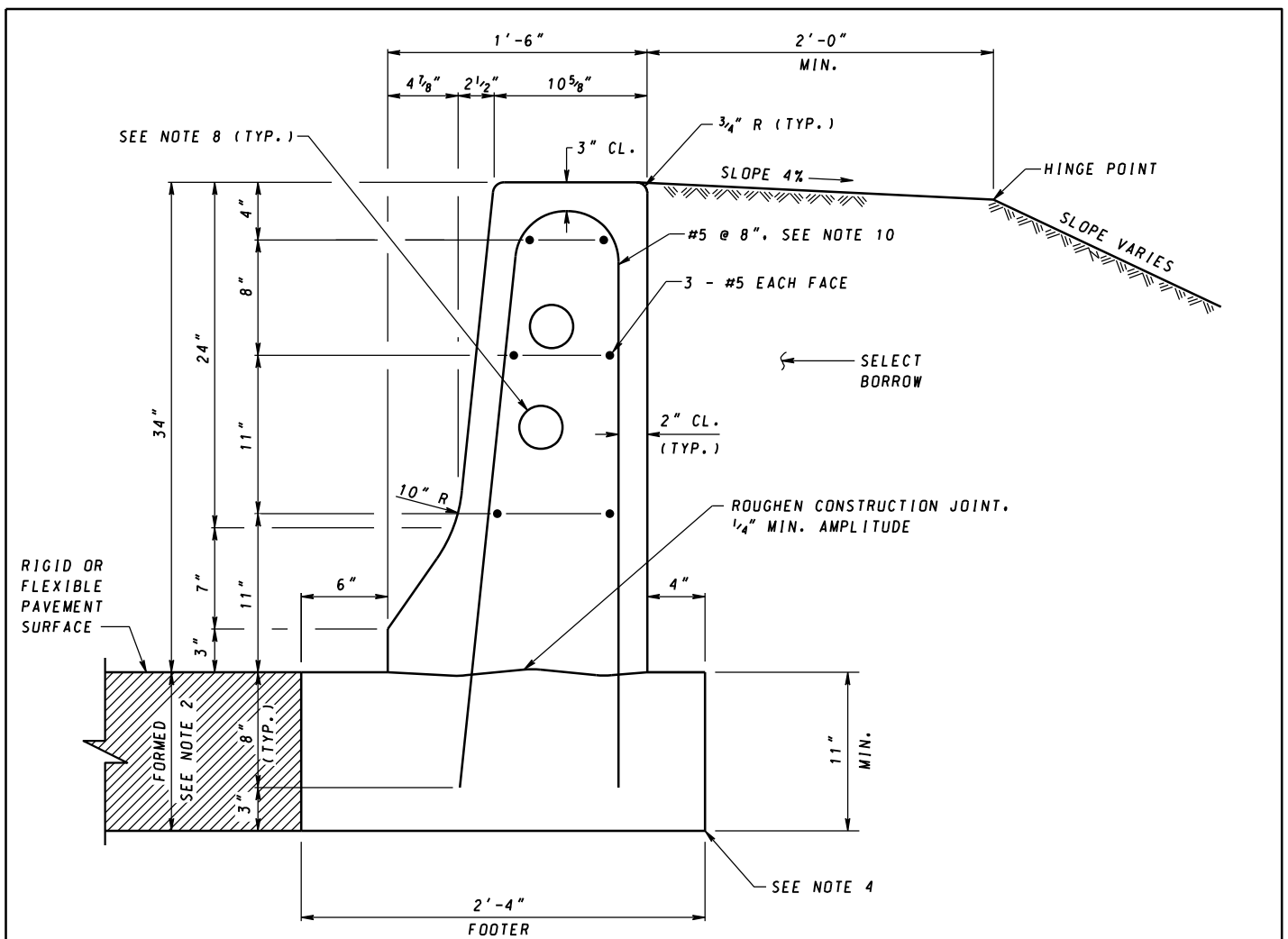
APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT



APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 10-1-01	REVISED
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**42 INCH F SHAPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 4 FEET 0 INCHES TO 8 FEET 0 INCHES CONTRACTION AND EXPANSION JOINTS**

**STANDARD NO. MD 648.44-05**



**TYPICAL SECTION**

TO BE USED WITH EARTH BACKING AT THE TOP OF FILL SLOPES.  
 SEE STD. MD 648.46 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.  
 SEE STD. MD 648.47 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.

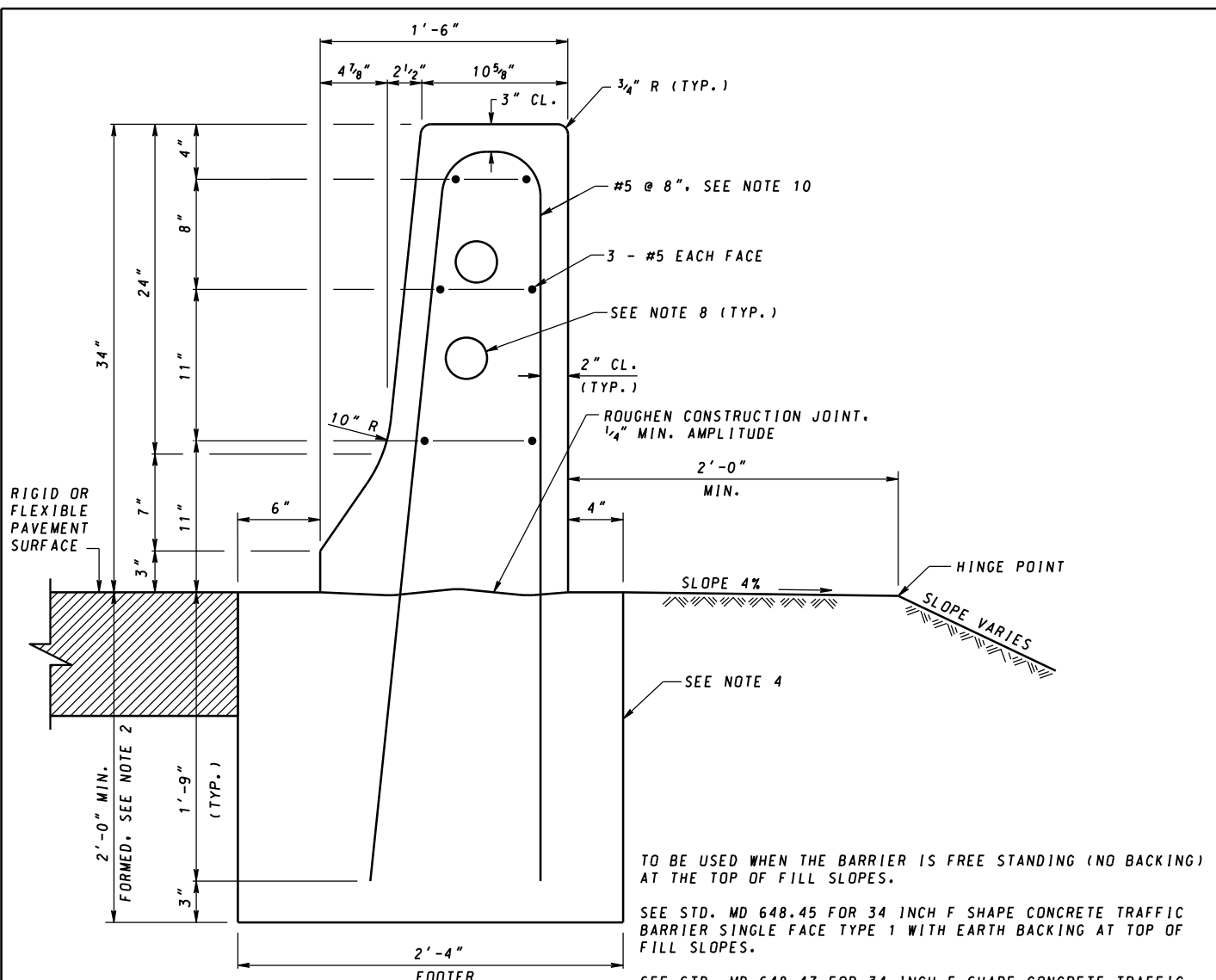
**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1. SELECT BORROW IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.50 FOR LOCATION AND DETAILS.
9. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.48. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

**TL-3**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 3-1-01	<b>APPROVAL</b> 3-28-01
<b>REVISED</b> 8-12-02	<b>REVISED</b>
<b>REVISED</b> 6-27-23	<b>REVISED</b> 6-21-23
<b>REVISED</b>	<b>REVISED</b>

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION  
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**34 INCH F SHAPE**  
**CONCRETE TRAFFIC BARRIER SINGLE FACE**  
**TYPE 1 (WITH EARTH BACKING IN FILL)**  
**STANDARD NO. MD 648.45**



**TYPICAL SECTION**

TO BE USED WHEN THE BARRIER IS FREE STANDING (NO BACKING) AT THE TOP OF FILL SLOPES.

SEE STD. MD 648.45 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES.

SEE STD. MD 648.47 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2. FILL MATERIAL IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.50 FOR LOCATION AND DETAILS.
9. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.48. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

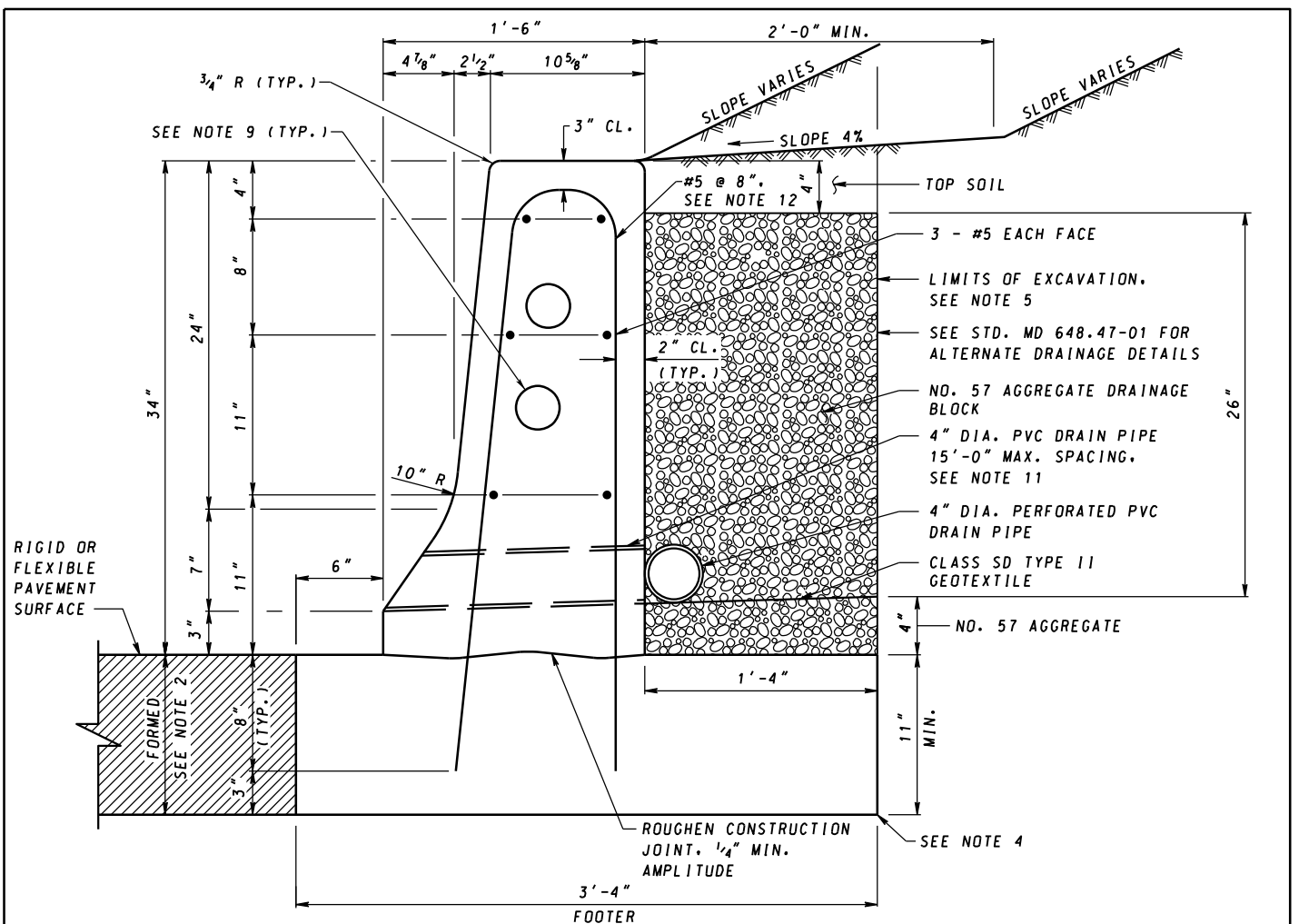
TL-3

SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 8-12-02	REVISED
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**34 INCH F SHAPE**  
**CONCRETE TRAFFIC BARRIER SINGLE FACE**  
**TYPE 2 (FREE STANDING IN FILL)**

**STANDARD NO. MD 648.46**



**TYPICAL SECTION**

TO BE USED WHEN THE BARRIER IS FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES. SEE STD. MD 648.45 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES. SEE STD. MD 648.46 FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. LIMITS OF EXCAVATION: WHEN THE BARRIER IS AT THE BOTTOM OF A CUT SLOPE, THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER AND A VERTICAL LINE EXTENDING FROM THE HEEL OF THE FOOTER TO ITS INTERSECTION WITH THE CUT SLOPE. WHEN THE BARRIER IS AT THE TOE OF A FILL SLOPE, THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER.
6. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
7. COST OF THE CONCRETE FOOTER, REINFORCEMENT, DRAINAGE APPURTENANCES, EXCAVATION, GEOTEXTILE, AND BACKFILL IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3. FILL MATERIAL OUTSIDE THE LIMITS OF EXCAVATION IS INCLUDED IN THE EMBANKMENT QUANTITY.
8. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
9. CONDUIT: IF REQUIRED REFER TO STD. MD 648.50 FOR LOCATION AND DETAILS.
10. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.49.
11. PVC DRAINS AND BARRIER JOINTS SHOULD ALIGN WHERE POSSIBLE. DO NOT DRAIN WEEP HOLE ONTO PEDESTRIAN WALKING SURFACE.
12. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.48. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

**TL-3**

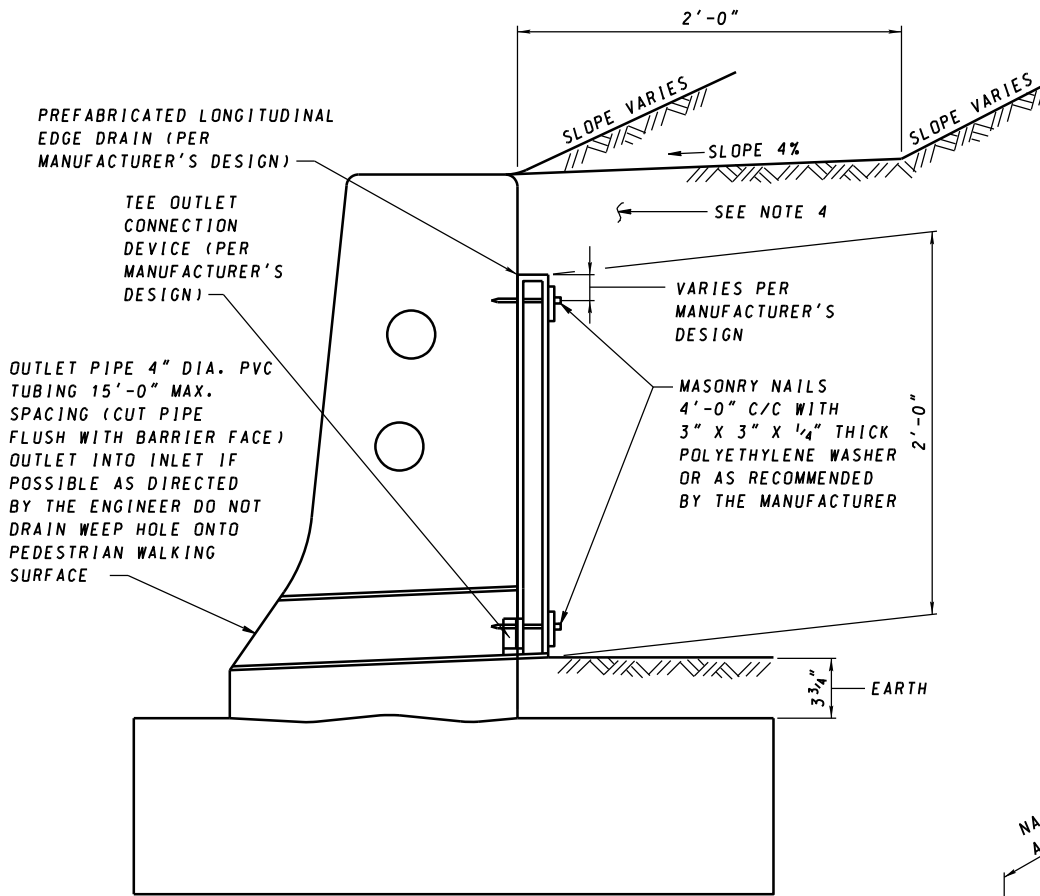
<b>SPECIFICATION</b>	<b>CATEGORY CODE ITEMS</b>
604	
<b>APPROVED</b>	<i>Scott Pomeroy</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 2-10-04	REVISED 3-31-04
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

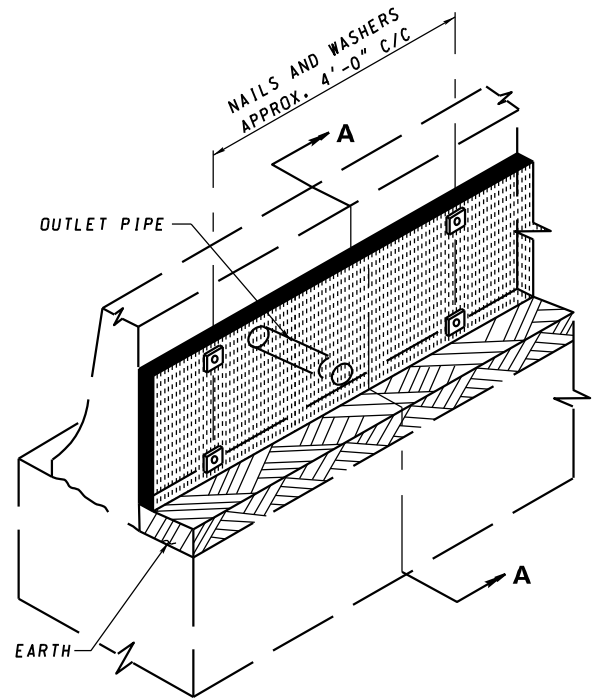
**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
34 INCH F SHAPE  
CONCRETE TRAFFIC BARRIER SINGLE FACE  
TYPE 3 (BOTTOM OF CUT OR TOE OF FILL)**

**STANDARD NO. MD 648.47**





**SECTION A-A**  
(THROUGH CENTER OF OUTLET PIPE)



**ISOMETRIC**

**NOTES**

1. THE PREFABRICATED LONGITUDINAL EDGE DRAIN MAY BE USED AS AN ALTERNATE DRAINAGE SYSTEM IN LIEU OF THE DRAINAGE SHOWN ON THE PERTINENT BARRIER STANDARD.
2. COST OF THE PREFABRICATED LONGITUDINAL EDGE DRAIN IS INCIDENTAL TO THE PRICE PER LINEAR FOOT FOR THE PERTINENT BARRIER PAY ITEM.
3. TOLERANCES IN DIMENSIONS SHOWN SHALL BE WITHIN 1/4".
4. FOR LIMITS OF EXCAVATION REFER TO THE PERTINENT BARRIER STANDARD.
5. F-SHAPE CONCRETE TRAFFIC BARRIER DETAILS SHOWN. SINGLE SLOPE CONCRETE TRAFFIC BARRIER DETAILS SIMILAR.

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL</b>	<b>SH A REVISIONS</b>	<b>FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL	3-1-01	APPROVAL 3-28-01
REVISED	10-1-01	REVISED
REVISED	6-27-23	REVISED 6-21-23
REVISED		REVISED

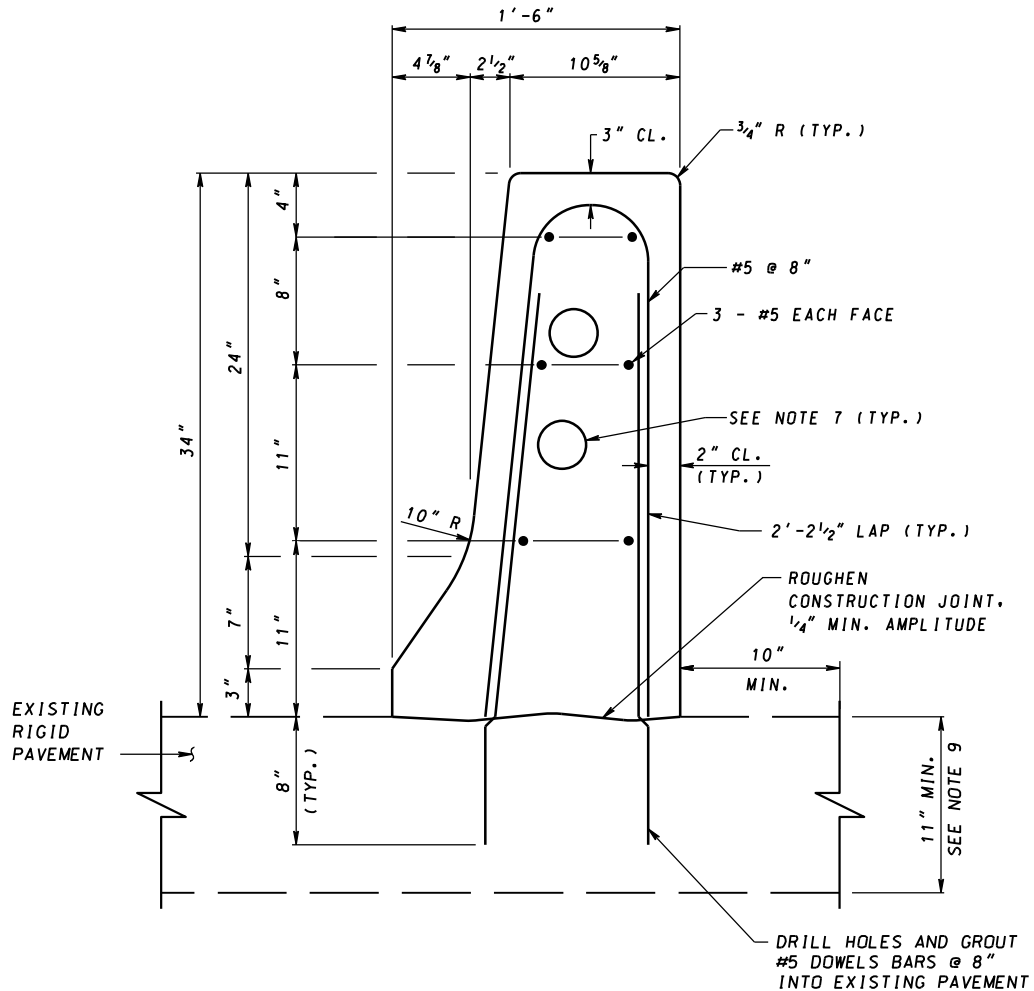
**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**ALTERNATE PREFABRICATED LONGITUDINAL**  
**EDGE DRAIN FOR CONCRETE TRAFFIC BARRIER**

**STANDARD NO.**

**MD 648.47-01**





**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
3. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
4. COST OF ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, DRILLED HOLES, AND GROUT IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 34 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT.
5. TO BE USED AS FREE STANDING BARRIER ONLY (NO BACKING).
6. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
7. CONDUIT: IF REQUIRED REFER TO STD. NO. MD 648.50 FOR LOCATION AND DETAILS.
8. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
9. IF EXISTING RIGID PAVEMENT IS LESS THAN 11" THICK, SAWCUT PAVEMENT AND CONSTRUCT AN 11" DEEP x 2'-10" WIDE FOOTER. THE COST FOR SAWCUTS, PAVEMENT REMOVAL, AND EXCAVATION IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 4.

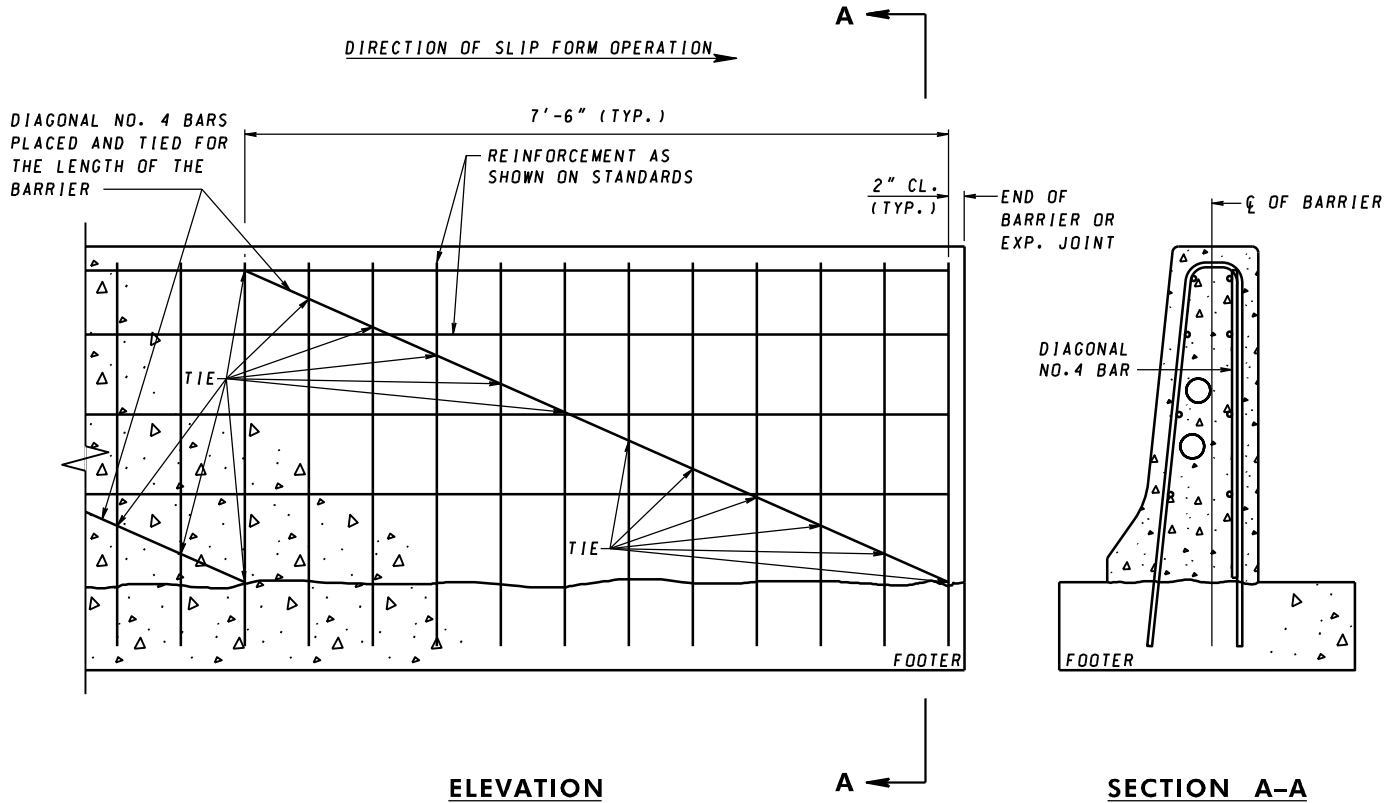
TL-3

SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 8-12-02	REVISED
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
34 INCH F SHAPE CONCRETE  
TRAFFIC BARRIER SINGLE FACE CONSTRUCTED  
ON EXISTING CONCRETE PAVEMENT**

**STANDARD NO. MD 648.48**



**DIAGONAL BAR DETAILS**

**NOTES**

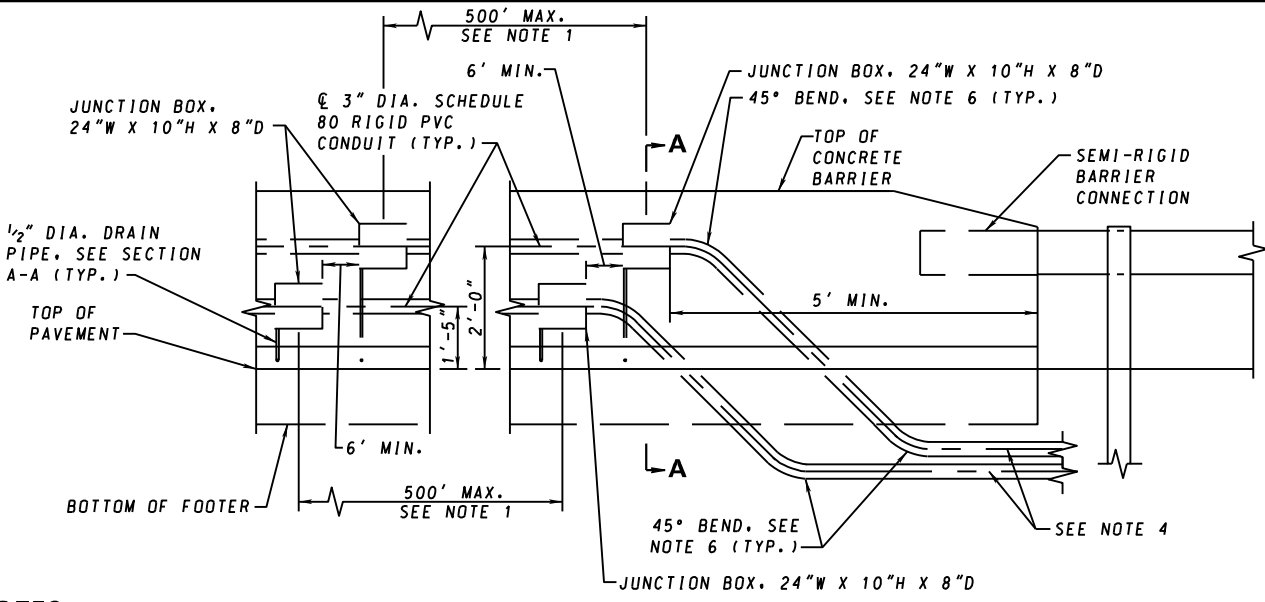
1. DIAGONAL NO. 4 BARS APPLICABLE TO SLIP FORM CONSTRUCTION METHOD ONLY.
2. F-SHAPE TRAFFIC BARRIER DIAGONAL NO. 4 BAR DETAILS SHOWN. SINGLE SLOPE CONCRETE TRAFFIC BARRIER DIAGONAL NO. 4 BAR DETAILS SIMILAR.

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>	
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>	
APPROVAL	3-1-01	APPROVAL 3-28-01
REVISED	10-1-01	REVISED
REVISED	6-27-23	REVISED 6-21-23
REVISED		REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**DIAGONAL BAR FOR SLIP FORMED SINGLE**  
**FACE CONCRETE TRAFFIC BARRIER**

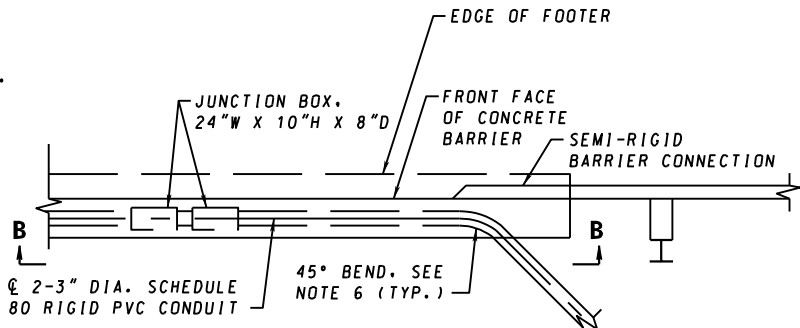
**STANDARD NO. MD 648.49**



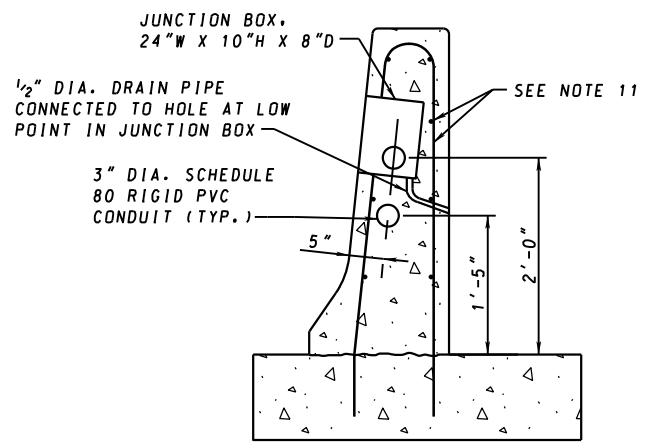
**ELEVATION B-B**

**NOTES**

1. THE JUNCTION BOXES SHALL BE LOCATED EVERY 500 FEET, AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE COST OF THE CONDUITS, JUNCTION BOXES, AND APPURTENANCES SHALL BE INCIDENTAL TO THE COST OF THE BARRIER UNLESS OTHERWISE SPECIFIED.
3. IN INSTANCES WHERE THE BARRIER CONNECTS TO A BRIDGE PARAPET CONTAINING CONDUIT, THE CONDUITS SHALL TRANSITION TO ALIGN WITH THE BRIDGE CONDUITS.
4. CAP CONDUIT FOR FUTURE USE OR CONNECT TO JUNCTION WELL PER LIGHTING PLANS.
5. REFER TO SECTION 805 FOR CONDUIT, ETC.
6. CONDUIT SHALL EXIT CONCRETE BARRIER USING CONDUIT BENDS AND SWEEPS, NOT BY EXITING THROUGH THE BOTTOM OF THE JUNCTION BOX.
7. JUNCTION BOXES SHALL BE GALVANIZED STEEL WITH COVERS MOUNTED IN THE FRONT OF THE CONCRETE BARRIER. FACE OF COVER SHALL BE FLUSH WITH FACE OF CONCRETE BARRIER. COVER SHALL BE 1/4" THICK GALVANIZED STEEL.
8. PIPE AND EXPANSION FITTINGS SHALL BE U.L. APPROVED FOR ENCASEMENT IN CONCRETE.
9. JUNCTION BOXES SHALL HAVE 1/2" DIA. HOLES AT LOW POINT OF JUNCTION BOX. INSTALL 1/2" DIA. DRAIN PIPE AT LOW POINT AND OUTLET AT BACK OF BARRIER.
10. JUNCTION BOX COVERS SHALL INCLUDE TAMPER RESISTANT BOLTS.
11. CUT VERTICAL AND HORIZONTAL BARS IN CONFLICT WITH JUNCTION BOX AND REINFORCE AROUND BOX AS SHOWN ON STANDARD NO. MD 648.50-04. EPOXY TOUCH UP CUT BARS.
12. PLACE PVC EXPANSION COUPLING AT BARRIER EXPANSION JOINTS.



**PARTIAL PLAN**



**SECTION A-A**

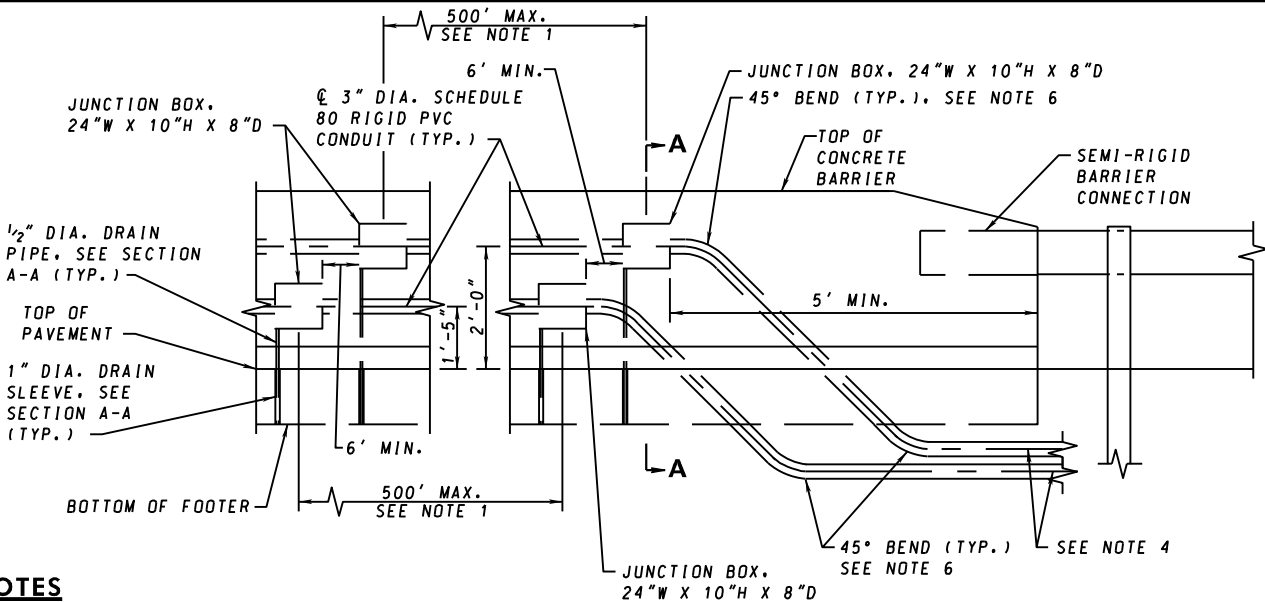
CONDUIT LAYOUT AT UPPER JUNCTION BOX. LAYOUT AT LOWER JUNCTION BOX SIMILAR

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 10-1-01	REVISED
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
CONDUIT AND JUNCTION BOX LOCATION FOR  
34 INCH AND 42 INCH F SHAPE CONCRETE  
TRAFFIC BARRIER SINGLE FACE**

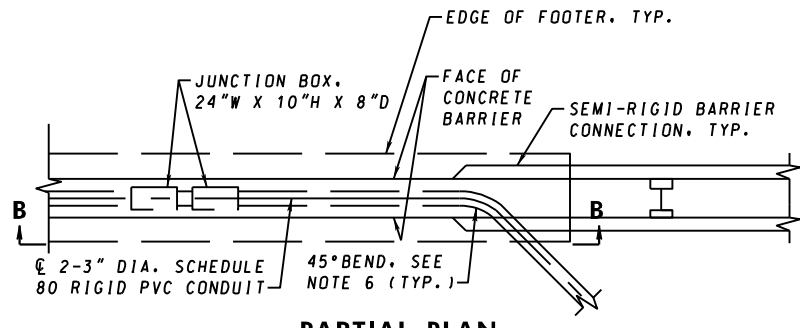
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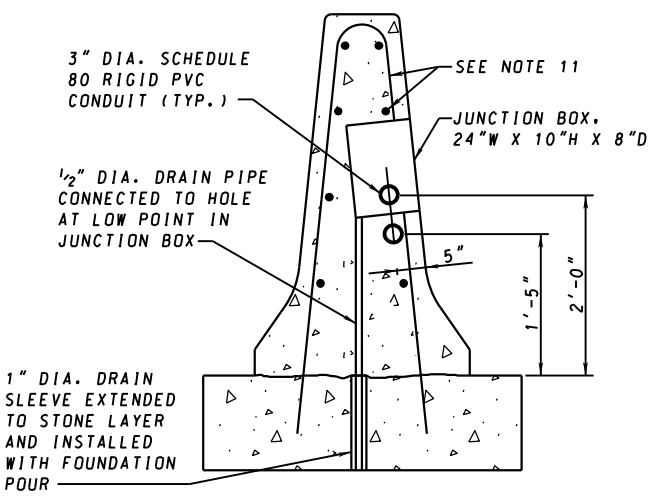
**ELEVATION B-B**

**NOTES**

1. THE JUNCTION BOXES SHALL BE LOCATED EVERY 500 FEET, AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE COST OF THE CONDUITS, JUNCTION BOXES, AND APPURTENANCES SHALL BE INCIDENTAL TO THE COST OF THE BARRIER UNLESS OTHERWISE SPECIFIED.
3. IN INSTANCES WHERE THE BARRIER CONNECTS TO A BRIDGE PARAPET CONTAINING CONDUIT, THE CONDUITS SHALL TRANSITION TO ALIGN WITH THE BRIDGE CONDUITS.
4. CAP CONDUIT FOR FUTURE USE OR CONNECT TO JUNCTION WELL PER LIGHTING PLANS.
5. REFER TO SECTION 805 FOR CONDUIT, ETC.
6. CONDUIT SHALL EXIT CONCRETE BARRIER USING CONDUIT BENDS AND SWEEPS, NOT BY EXITING THROUGH THE BOTTOM OF THE JUNCTION BOX.
7. JUNCTION BOXES SHALL BE GALVANIZED STEEL WITH COVERS MOUNTED IN THE FRONT OF THE CONCRETE BARRIER. FACE OF COVER SHALL BE FLUSH WITH FACE OF CONCRETE BARRIER. COVER SHALL BE 1/4" THICK GALVANIZED STEEL.
8. PIPE AND EXPANSION FITTINGS SHALL BE U.L. APPROVED FOR ENCASEMENT IN CONCRETE.
9. JUNCTION BOXES SHALL HAVE 1/2" DIA. HOLES AT LOW POINT OF JUNCTION BOX. INSTALL 1/2" DIA. DRAIN PIPE AT LOW POINT AND OUTLET TO STONE UNDER FOUNDATION.
10. JUNCTION BOX COVERS SHALL INCLUDE TAMPER RESISTANT BOLTS.
11. CUT VERTICAL AND HORIZONTAL BARS IN CONFLICTS WITH JUNCTION BOX AND REINFORCE AROUND BOX AS SHOWN ON STANDARD NO. MD 648.50-04. EPOXY TOUCH UP CUT BARS.
12. PLACE PVC EXPANSION COUPLING AT BARRIER EXPANSION JOINTS.



**PARTIAL PLAN**



**SECTION A-A**

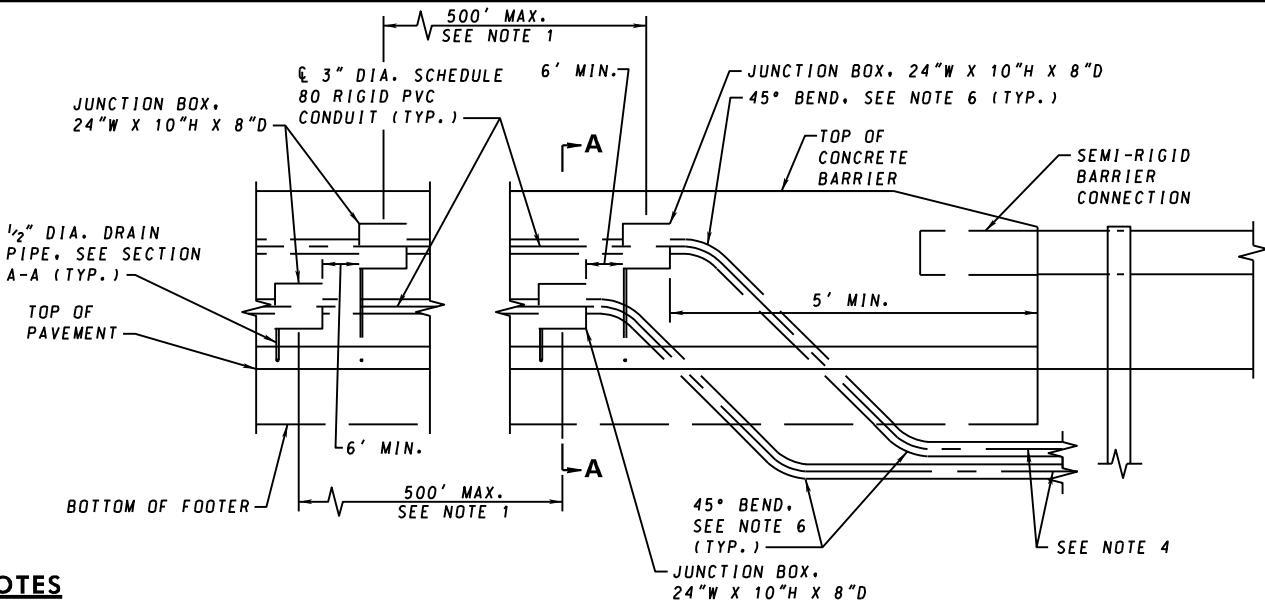
CONDUIT LAYOUT AT UPPER JUNCTION BOX. LAYOUT AT LOWER JUNCTION BOX SIMILAR

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 6-27-23	<b>APPROVAL</b> 6-21-23
<b>REVISED</b>	<b>REVISED</b>
<b>REVISED</b>	<b>REVISED</b>
<b>REVISED</b>	<b>REVISED</b>

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
CONDUIT AND JUNCTION BOX LOCATION FOR  
34 INCH AND 42 INCH F SHAPE CONCRETE  
MEDIAN TRAFFIC BARRIER**

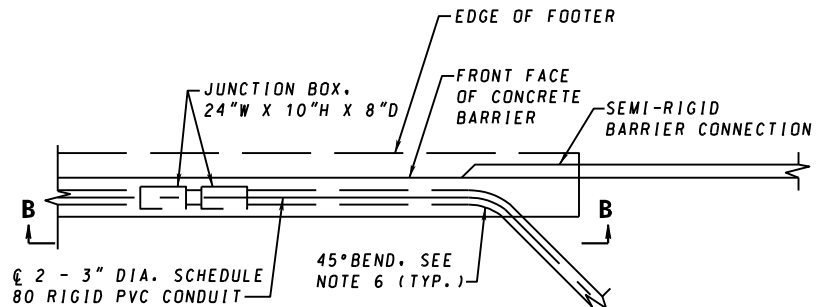
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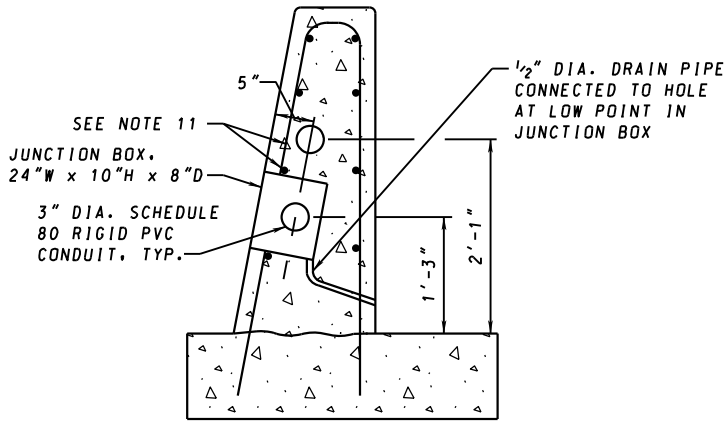
**ELEVATION B-B**

**NOTES**

1. THE JUNCTION BOXES SHALL BE LOCATED EVERY 500 FEET, AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE COST OF THE CONDUITS, JUNCTION BOXES, AND APPURTENANCES SHALL BE INCIDENTAL TO THE COST OF THE BARRIER UNLESS OTHERWISE SPECIFIED.
3. IN INSTANCES WHERE THE BARRIER CONNECTS TO A BRIDGE PARAPET CONTAINING CONDUIT THE CONDUITS SHALL TRANSITION TO ALIGN WITH THE BRIDGE CONDUITS.
4. CAP CONDUIT FOR FUTURE USE OR CONNECT TO JUNCTION WELL PER LIGHTING PLANS.
5. REFER TO SECTION 805 FOR CONDUIT, ETC.
6. CONDUIT SHALL EXIT CONCRETE BARRIER USING CONDUIT BENDS AND SWEEPS, NOT BY EXITING THROUGH THE BOTTOM OF THE JUNCTION BOX.
7. JUNCTION BOXES SHALL BE GALVANIZED STEEL WITH COVERS MOUNTED IN THE FRONT OF THE CONCRETE BARRIER. FACE OF COVER SHALL BE FLUSH WITH FACE OF CONCRETE BARRIER. COVER SHALL BE 1/4" THICK GALVANIZED STEEL.
8. PIPE AND EXPANSION FITTINGS SHALL BE U.L. APPROVED FOR ENCASEMENT IN CONCRETE.
9. JUNCTION BOXES SHALL HAVE 1/2" DIA. HOLES AT LOW POINT OF JUNCTION BOX. INSTALL 1/2" DIA. DRAIN PIPE AT LOW POINT AND OUTLET AT BACK OF BARRIER.
10. JUNCTION BOX COVERS SHALL INCLUDE TAMPER RESISTANT BOLTS.
11. CUT VERTICAL AND HORIZONTAL BARS IN CONFLICT WITH JUNCTION BOX AND REINFORCE AROUND BOX AS SHOWN ON STANDARD NO. MD 648.50-04. EPOXY TOUCH UP CUT BARS.
12. PLACE PVC EXPANSION COUPLING AT BARRIER EXPANSION JOINTS.



**PARTIAL PLAN**



**SECTION A-A**

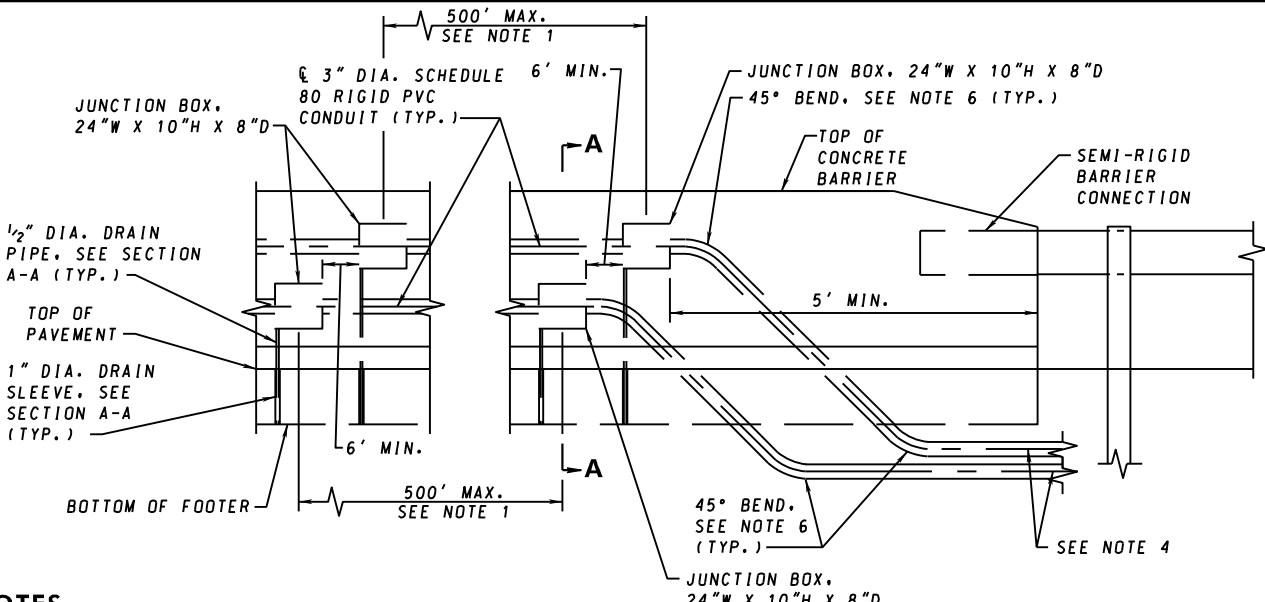
CONDUIT LAYOUT AT LOWER JUNCTION BOX. LAYOUT AT UPPER JUNCTION BOX SIMILAR

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL</b>	6-27-23
<b>REVISIONS</b>	
<b>APPROVAL</b>	6-21-23
<b>REVISIONS</b>	
<b>APPROVAL</b>	
<b>REVISIONS</b>	

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
CONDUIT AND JUNCTION BOX LOCATION FOR  
42 INCH SINGLE SLOPE CONCRETE  
TRAFFIC BARRIER SINGLE FACE**

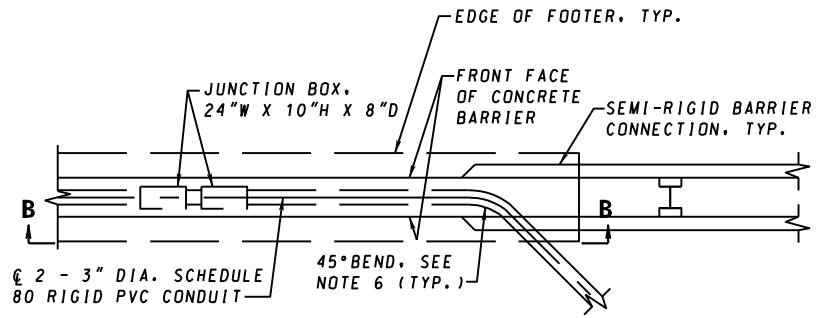
**STANDARD NO. MD 648.50-02**



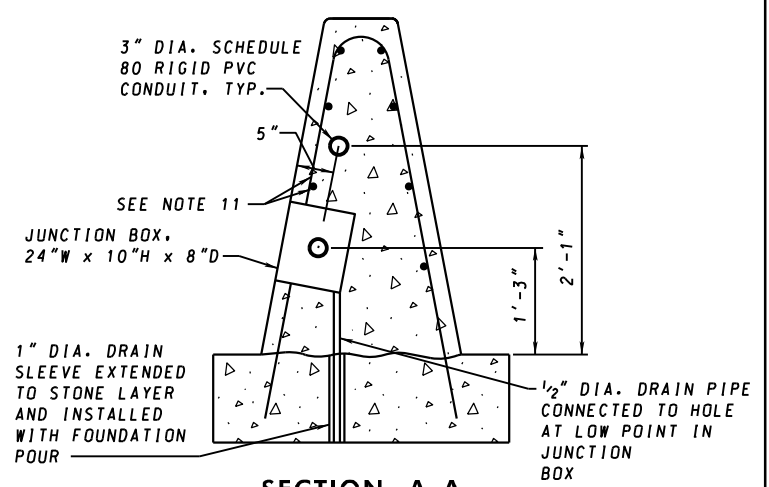
**ELEVATION B-B**

**NOTES**

1. THE JUNCTION BOXES SHALL BE LOCATED EVERY 500 FEET, AS SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
2. THE COST OF THE CONDUITS, JUNCTION BOXES, AND APPURTENANCES SHALL BE INCIDENTAL TO THE COST OF THE BARRIER UNLESS OTHERWISE SPECIFIED.
3. IN INSTANCES WHERE THE BARRIER CONNECTS TO A BRIDGE PARAPET CONTAINING CONDUIT THE CONDUITS SHALL TRANSITION TO ALIGN WITH THE BRIDGE CONDUITS.
4. CAP CONDUIT FOR FUTURE USE OR CONNECT TO JUNCTION WELL PER LIGHTING PLANS.
5. REFER TO SECTION 805 FOR CONDUIT, ETC.
6. CONDUIT SHALL EXIT CONCRETE BARRIER USING CONDUIT BENDS AND SWEEPS, NOT BY EXITING THROUGH THE BOTTOM OF THE JUNCTION BOX.
7. JUNCTION BOXES SHALL BE GALVANIZED STEEL WITH COVERS MOUNTED IN THE FRONT OF THE CONCRETE BARRIER. FACE OF COVER SHALL BE FLUSH WITH FACE OF CONCRETE BARRIER. COVER SHALL BE 1/4" THICK GALVANIZED STEEL.
8. PIPE AND EXPANSION FITTINGS SHALL BE U.L. APPROVED FOR ENCASEMENT IN CONCRETE.
9. JUNCTION BOXES SHALL HAVE 1/2" DIA. HOLES AT LOW POINT OF JUNCTION BOX. INSTALL 1/2" DIA. DRAIN PIPE AT LOW POINT AND OUTLET TO STONE UNDER FOUNDATION.
10. JUNCTION BOX COVERS SHALL INCLUDE TAMPER RESISTANT BOLTS.
11. CUT VERTICAL AND HORIZONTAL BARS IN CONFLICT WITH JUNCTION BOX AND REINFORCE AROUND BOX AS SHOWN ON STANDARD NO. MD 648.50-04. EPOXY TOUCH UP CUT BARS.
12. PLACE PVC EXPANSION COUPLING AT BARRIER EXPANSION JOINTS



**PARTIAL PLAN**



**SECTION A-A**

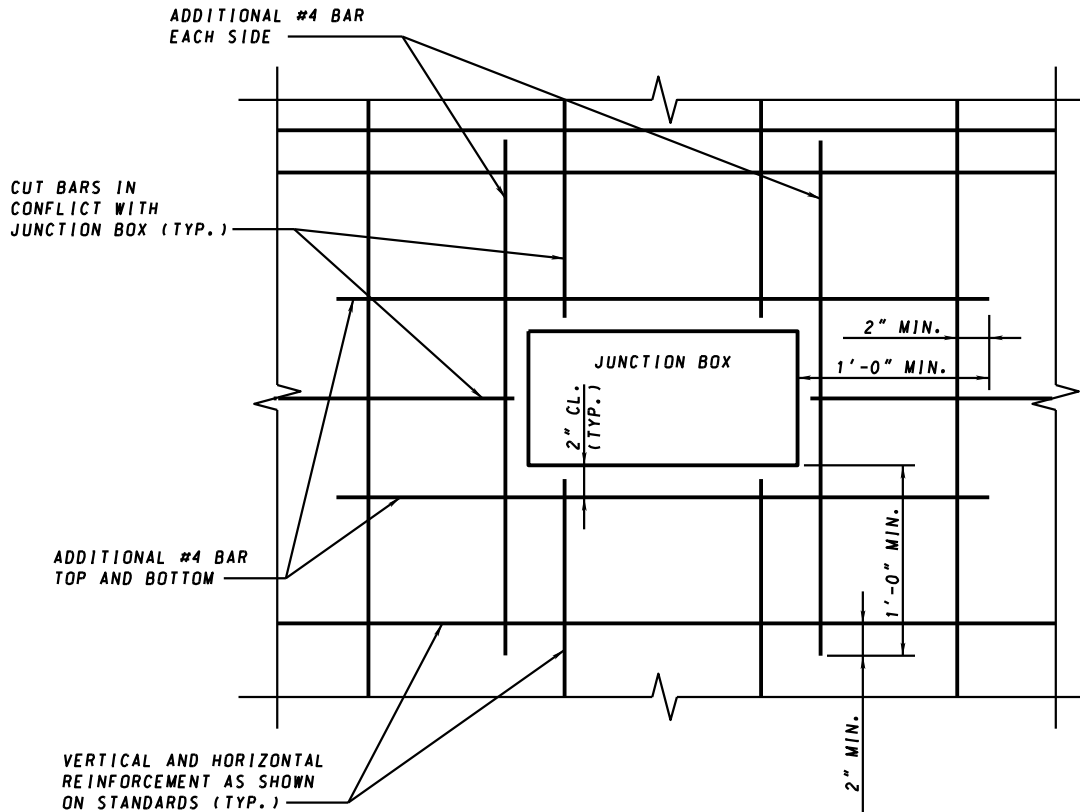
CONDUIT LAYOUT AT LOWER JUNCTION BOX. LAYOUT AT UPPER JUNCTION BOX SIMILAR

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b>	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
<b>APPROVAL</b>	6-27-23
<b>REVISIONS</b>	
<b>APPROVAL</b>	6-21-23
<b>REVISIONS</b>	
<b>REVISIONS</b>	
<b>REVISIONS</b>	

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
CONDUIT AND JUNCTION BOX LOCATION FOR  
42 INCH SINGLE SLOPE CONCRETE  
MEDIAN TRAFFIC BARRIER**

**STANDARD NO. MD 648.50-03**



**JUNCTION BOX REINFORCING STEEL**

**NOTES**

1. USE THIS DETAIL WHEN THE STANDARD VERTICAL OR HORIZONTAL STEEL IS CUT AROUND THE JUNCTION BOX.
2. IF DIAGONAL NO. 4 BARS FOR SLIP FORMING ARE REQUIRED, PLACE NO. 4 BARS ON OPPOSITE FACE FROM JUNCTION BOX. DO NOT CUT DIAGONAL NO. 4 BARS.
3. FOR ADDITIONAL DETAILS SEE STD. NO. 648.50, 648.50-01, 648.50-02, AND 648.50-03.

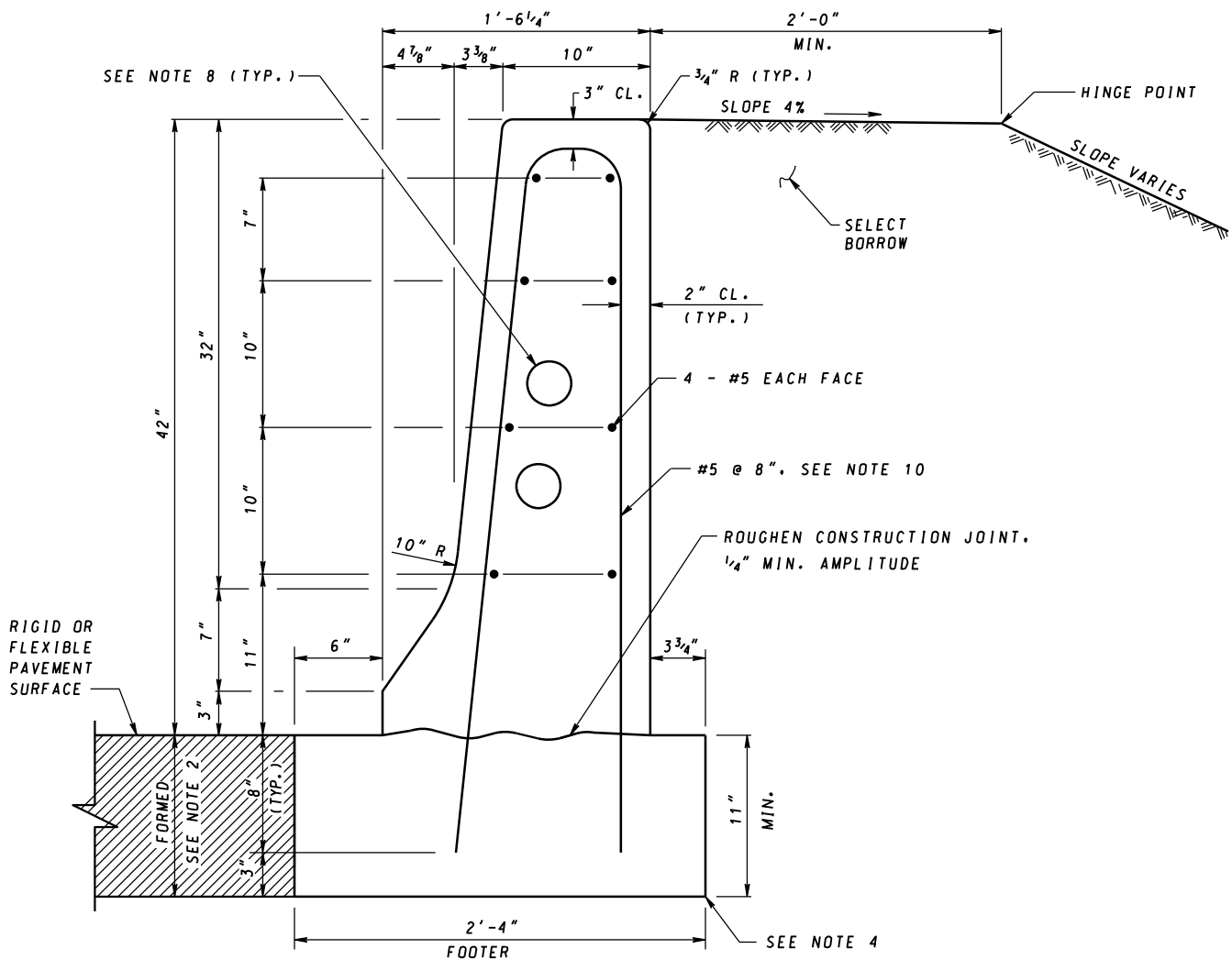
SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 6-27-23	APPROVAL 6-21-23
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
JUNCTION BOX  
ADDITIONAL REINFORCEMENT DETAIL**

**STANDARD NO.**

**MD 648.50-04**



**TYPICAL SECTION**

TO BE USED WITH EARTH BACKING AT THE TOP OF SLOPES.

SEE STD. MD 648.53 FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.

SEE STD. MD 648.54 FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACING BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1. SELECT BORROW IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. NO. MD 648.50 FOR LOCATION AND DETAILS.
9. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

**TL-4**

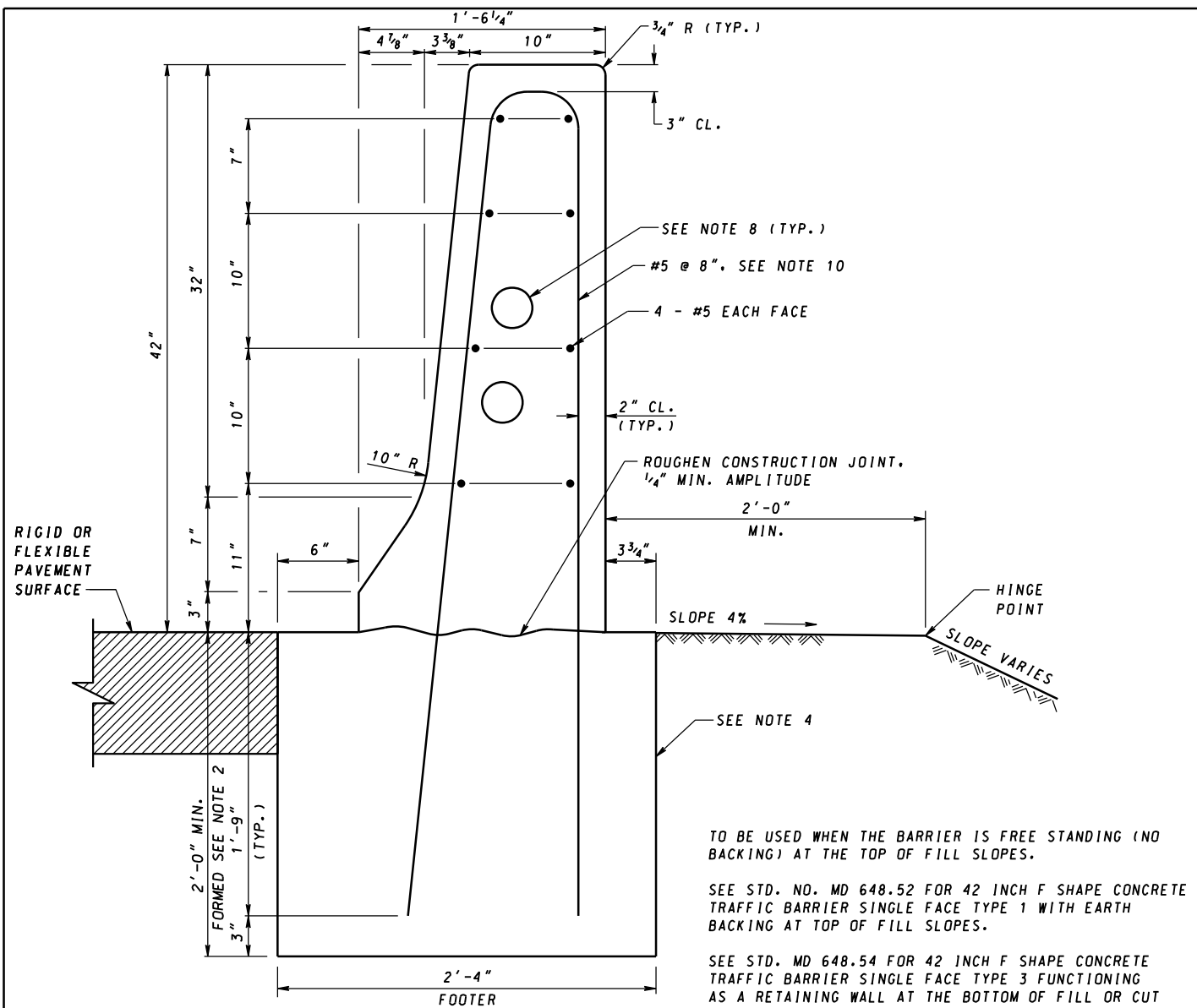
<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 7-16-91	APPROVAL 7-31-90
REVISED 10-1-01	REVISED 3-28-01
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1**  
**(WITH EARTH BACKING IN FILL)**

**STANDARD NO. MD 648.52**






**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. NO. MD 648.50 FOR LOCATION AND DETAILS.
9. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO.4 BARS ARE REQUIRED, SEE STD. NO. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

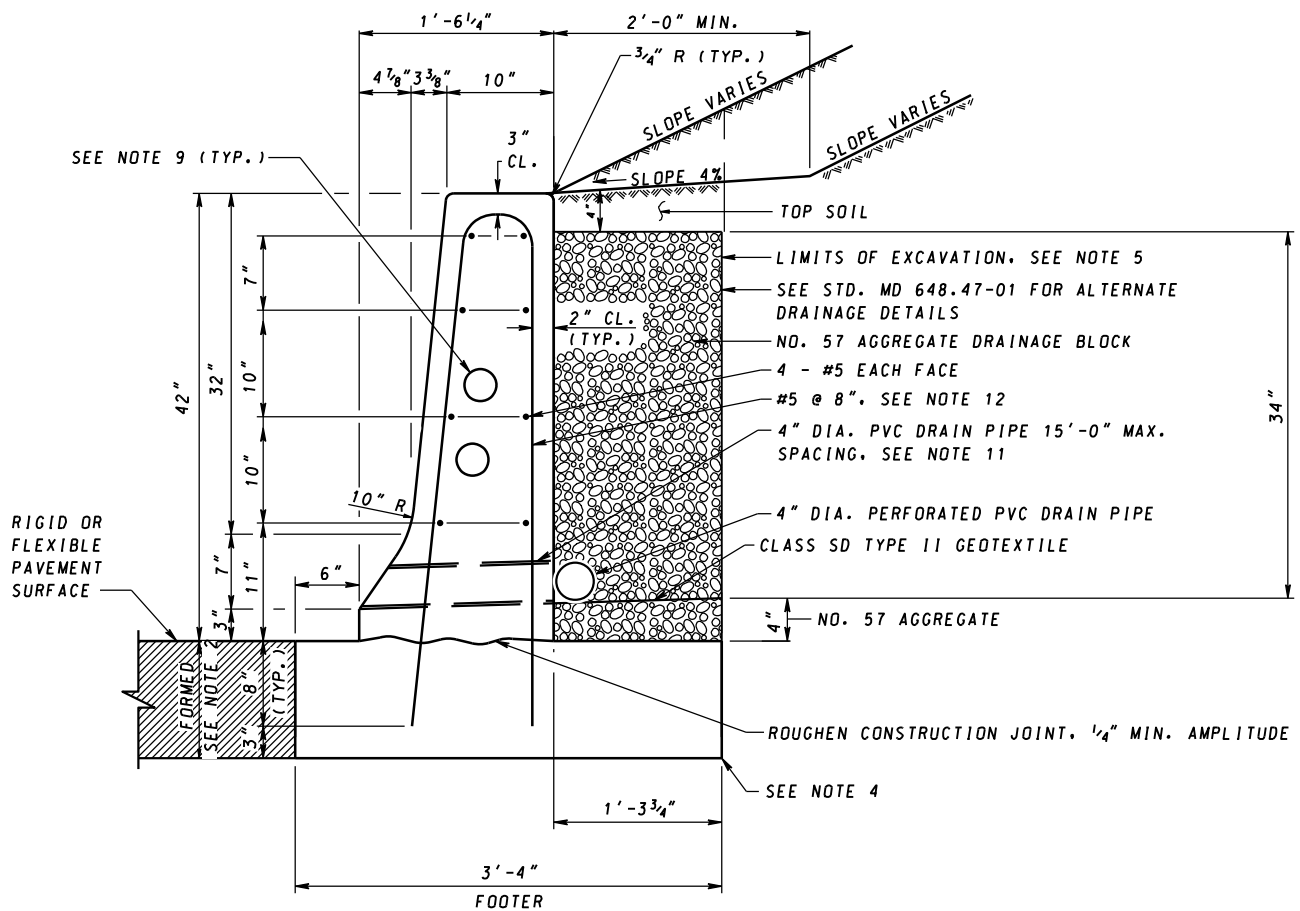
**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 10-1-01	REVISED
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED


**MARYLAND DEPARTMENT OF TRANSPORTATION**  
 STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**42 INCH F SHAPE CONCRETE**  
**TRAFFIC BARRIER SINGLE FACE**  
**TYPE 2 (FREE STANDING IN FILL)**

**STANDARD NO. MD 648.53**



**TYPICAL SECTION**

TO BE USED WHEN THE BARRIER IS FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.  
 SEE STD. MD 648.52 FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES.  
 SEE STD. MD 648.53 FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.

**NOTES**

- CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
- THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
- LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
- THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
- LIMITS OF EXCAVATION: WHEN THE BARRIER IS AT THE BOTTOM OF A CUT SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER AND A VERTICAL LINE EXTENDING FROM THE HEEL OF THE FOOTER TO ITS INTERSECTION WITH THE CUT SLOPE. WHEN THE BARRIER IS AT THE TOE OF A FILL SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER.
- MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS, STRUCTURES. EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
- COST OF THE CONCRETE FOOTER, REINFORCEMENT, DRAINAGE APPURTENANCES, EXCAVATION, GEOTEXTILE, AND BACKFILL IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3. FILL MATERIAL OUTSIDE THE LIMITS OF EXCAVATION IS INCLUDED IN THE EMBANKMENT QUANTITY.
- TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
- CONDUIT: IF REQUIRED REFER TO STD. MD 648.50 FOR LOCATION AND DETAILS.
- WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
- PVC DRAINS AND BARRIER JOINTS SHOULD ALIGN WHERE POSSIBLE. DO NOT DRAIN WEEP HOLE ONTO PEDESTRIAN WALKING SURFACE.
- THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

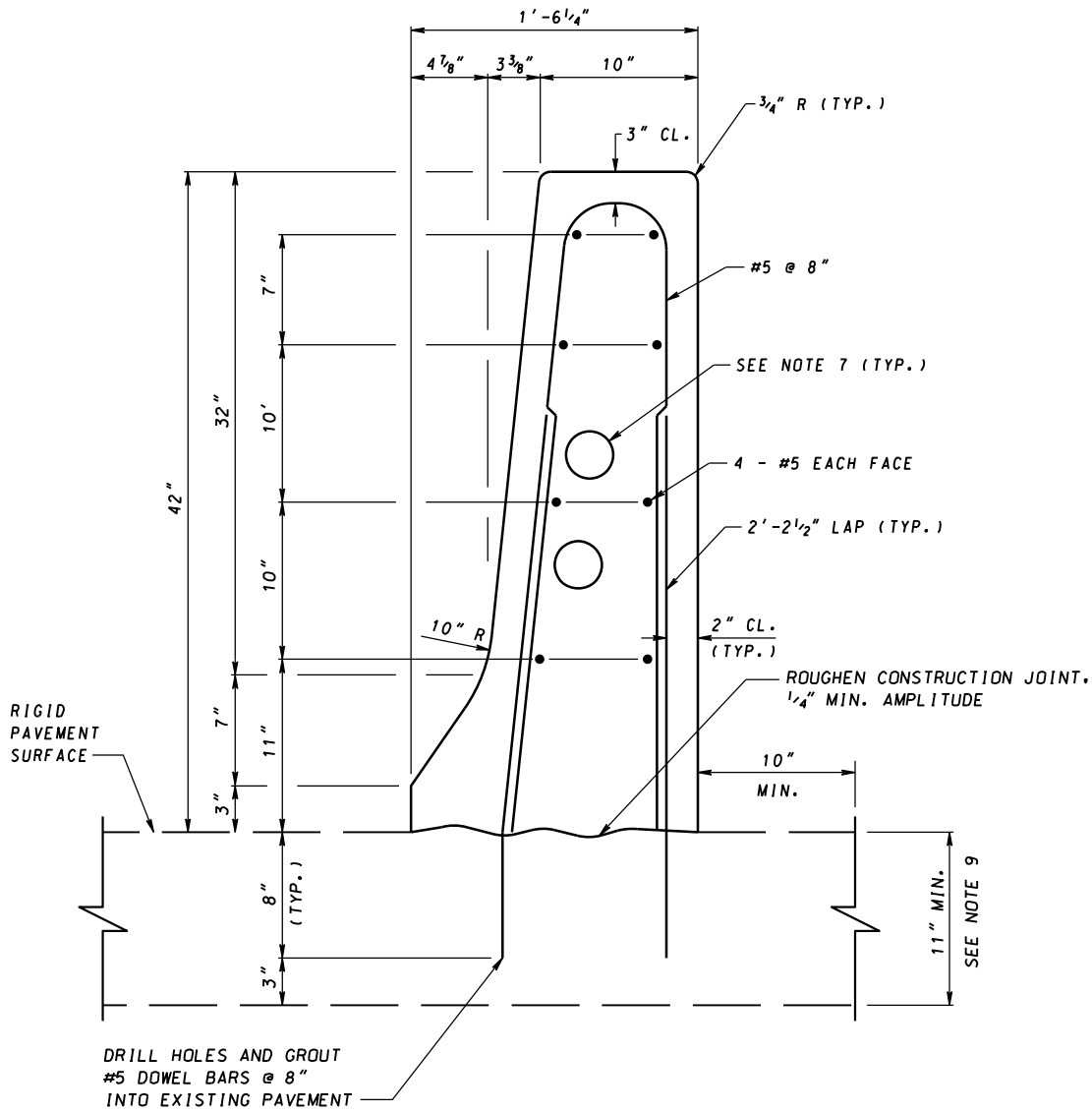
**TL-4**

SPECIFICATION <b>604</b>	CATEGORY CODE ITEMS
APPROVED <i>Scott Pomeroy</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 2-10-04	REVISED 3-31-04
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
 42 INCH F SHAPE CONCRETE TRAFFIC  
 BARRIER SINGLE FACE TYPE 3  
 (BOTTOM OF CUT OR TOE OF FILL)**

**STANDARD NO. MD 648.54**



**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
2. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
3. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
4. COST OF ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, DRILLED HOLES, AND GROUT IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH F SHAPE CONCRETE TRAFFIC BARRIER SINGLE FACE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT.
5. TO BE USED AS FREE STANDING BARRIER ONLY (NO BACKING).
6. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4"
7. CONDUIT: IF REQUIRED REFER TO STD. NO. MD 648.50 FOR LOCATION AND DETAILS.
8. WHEN BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD DIAGONAL NO.4 BARS ARE REQUIRED. SEE STD. NO.MD 648.49.
9. IF EXISTING RIGID PAVEMENT IS LESS THAN 11" THICK, SAWCUT PAVEMENT AND CONSTRUCT AN 11" DEEP x 2'-10" WIDE FOOTER. THE COST FOR SAWCUTS, PAVEMENT REMOVAL, AND EXCAVATION IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 4.

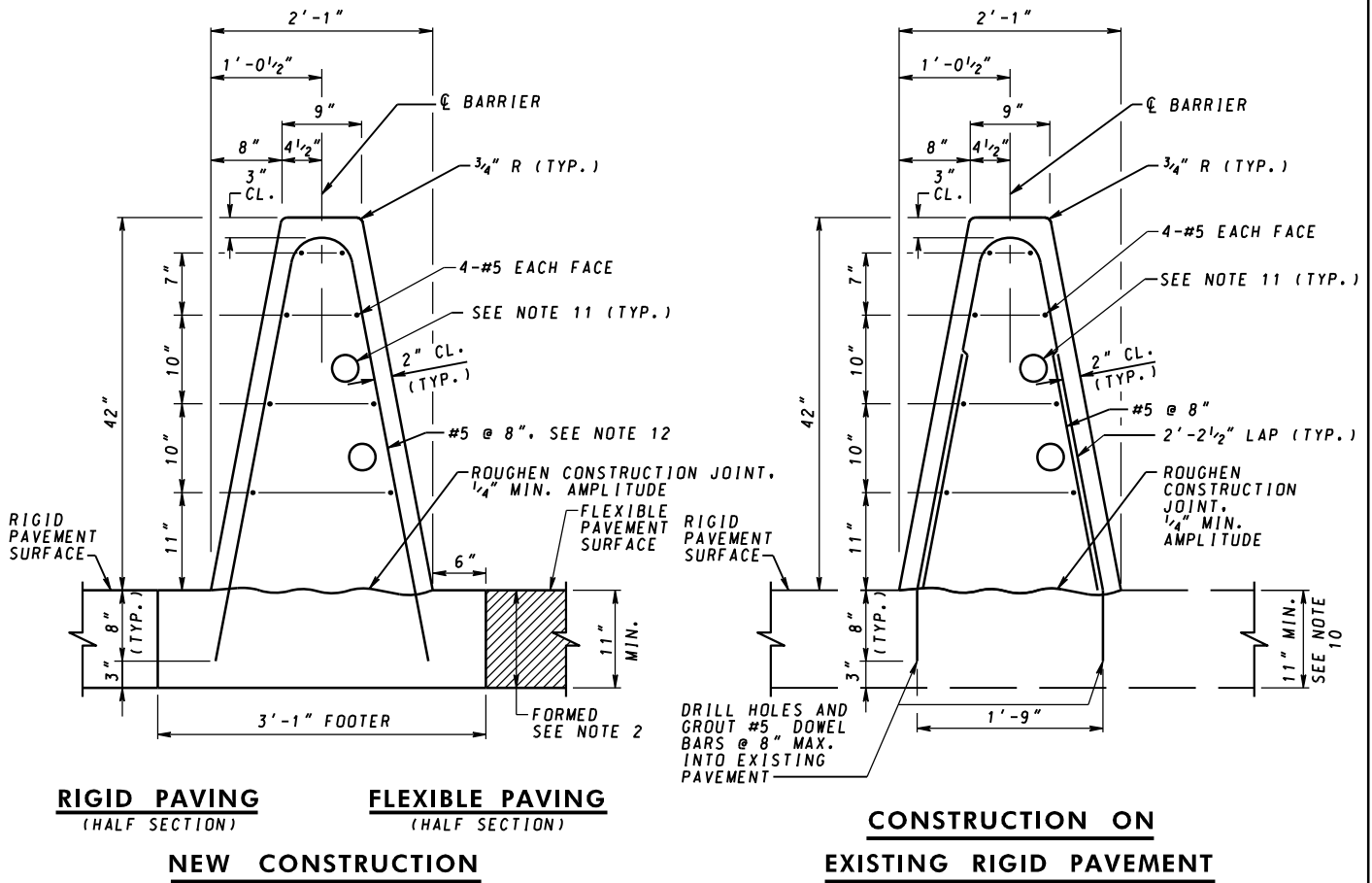
**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>C. Scott Pomeroy</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
APPROVAL 3-1-01	APPROVAL 3-28-01
REVISED 10-1-01	REVISED
REVISED 6-27-23	REVISED 6-21-23
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
42 INCH F SHAPE CONCRETE  
TRAFFIC BARRIER SINGLE FACE CONSTRUCTED  
ON EXISTING CONCRETE PAVEMENT**

**STANDARD NO. MD 648.55**

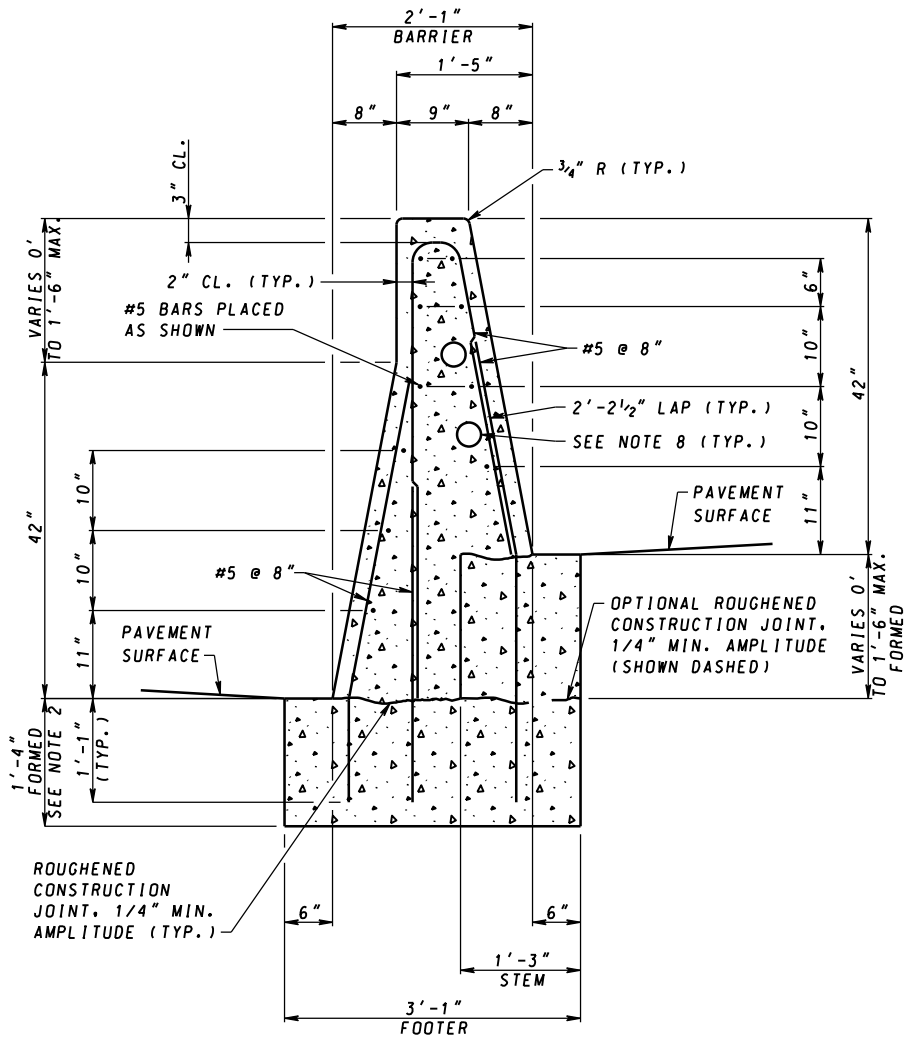


**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. NO. 648.44-04.
4. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER.
7. WHEN THE BARRIER IS CONSTRUCTED ON EXISTING RIGID PAVEMENT THE COST OF ROUGHENED CONSTRUCTION JOINT, REINFORCEMENT, DRILLED HOLES, AND GROUT IS INCIDENTAL TO THE PRICE PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
8. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
9. WHEN THE BARRIER IS TO BE CONSTRUCTED ON EXISTING FLEXIBLE PAVEMENT, SAW CUT PAVEMENT FULL DEPTH AND CONSTRUCT A FOOTER AS SHOWN IN THE NEW CONSTRUCTION DETAIL. THE COST FOR SAWCUTS, PAVEMENT REMOVAL, AND EXCAVATION IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
10. IF EXISTING RIGID PAVEMENT IS LESS THAN 11" THICK, SAW CUT PAVEMENT AND CONSTRUCT A FOOTER AS SHOWN IN THE NEW CONSTRUCTION DETAIL. COST OF SAWCUTS, DEMOLITION OF EXISTING PAVEMENT, AND CONSTRUCTION OF FOOTER IS INCIDENTAL TO THE PRICE PER LINEAR FOOT FOR THE ITEM SPECIFIED IN NOTE 6.
11. CONDUIT: IF REQUIRED, REFER TO STD. NO. MD 648.50-03 FOR LOCATION AND DETAILS.
12. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN IN THE NEW CONSTRUCTION DETAIL ABOVE OR USE THE LAP SPLICE METHOD SHOWN IN THE CONSTRUCTION ON EXISTING RIGID PAVEMENT DETAIL ABOVE. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

TL-4

SPECIFICATION 604	CATEGORY CODE ITEMS	<b>MARYLAND DEPARTMENT OF TRANSPORTATION</b> STATE HIGHWAY ADMINISTRATION  <b>STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES</b>  <b>42 INCH SINGLE SLOPE CONCRETE</b> <b>MEDIAN TRAFFIC BARRIER</b>  <b>STANDARD NO. MD 648.56</b>
APPROVED	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 6-27-23	APPROVAL 6-21-23	
REVISED	REVISED	
REVISED	REVISED	



**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO. 6 (4500 PSI).
2. REMOVE THE FOOTER FORMS BEFORE PLACING PAVEMENT.
3. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.44-04.
4. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
5. MAXIMUM SPACING OF CONSTRUCTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINTS, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 0 FOOT 0 INCHES TO 1 FOOT 6 INCHES.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT IF REQUIRED, REFER TO STD. MD 648.50-03 FOR LOCATION AND DETAILS.
9. CONTRACTOR HAS THE OPTION OF LAPPING VERTICAL NO. 5 BARS WITH DOWELS AS SHOWN OR EXTENDING THE DOWEL REINFORCEMENT WITH NO SPLICING. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

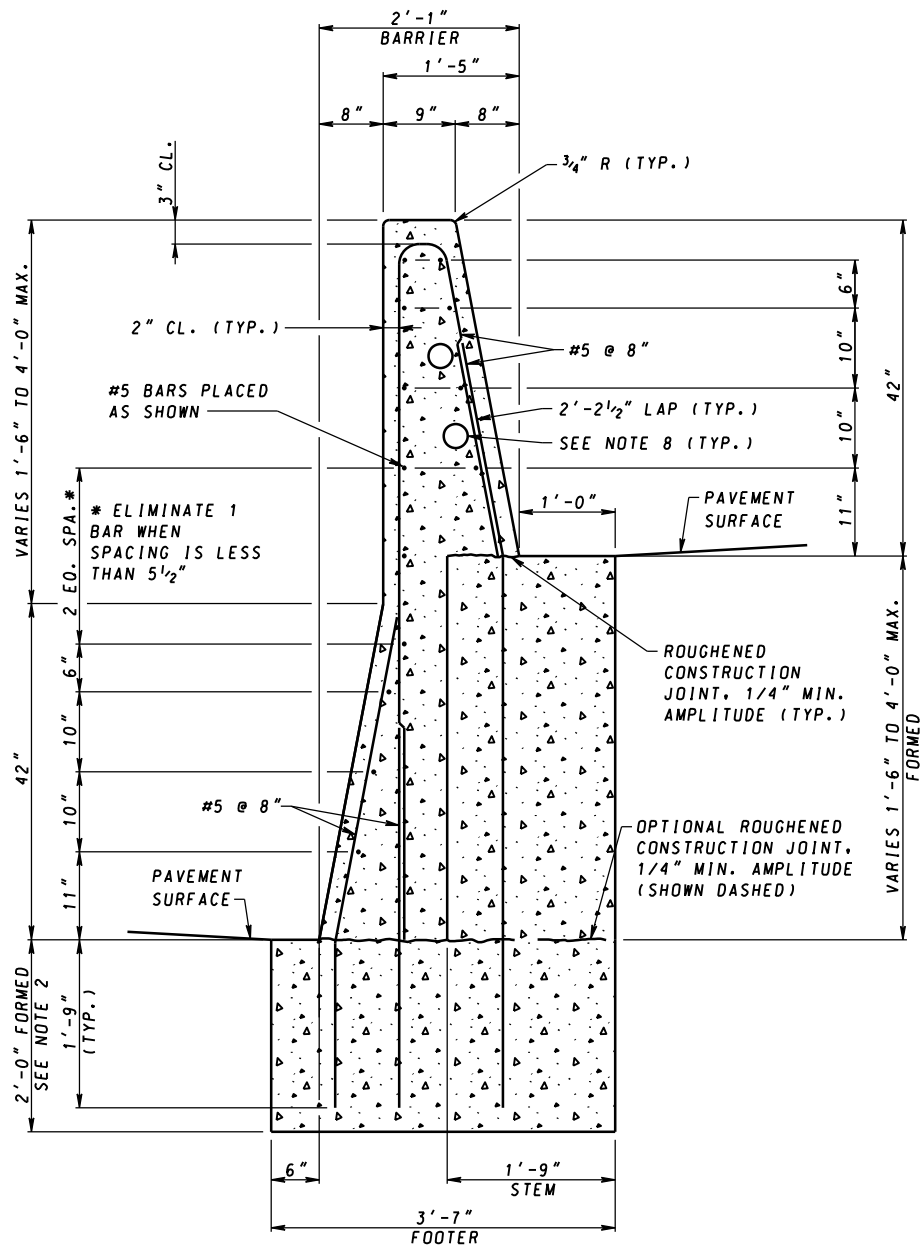
TL-4

SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED <i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 6-27-24	APPROVAL 5-22-24
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MDOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
42 INCH SINGLE SLOPE CONCRETE  
MEDIAN TRAFFIC BARRIER BIFURCATED  
0 FEET 0 INCHES TO 1 FEET 6 INCHES**

**STANDARD NO. MD 648.56-01**



**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO. 6 (4500 PSI).
2. REMOVE THE FOOTER FORMS BEFORE PLACING PAVEMENT.
3. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. MD 648.44-04.
4. LAP BARS 2'-10 1/2" UNLESS NOTED OTHERWISE. TIE BARS TOGETHER.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, SAWCUTS, ROUGHENED CONSTRUCTION JOINTS, REINFORCEMENT, JOINTS, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE MEDIAN TRAFFIC BARRIER BIFURCATED 1 FOOT 6 INCHES TO 4 FEET 0 INCHES.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT IF REQUIRED, REFER TO STD. MD 648.50-03 FOR LOCATION AND DETAILS.
9. CONTRACTOR HAS THE OPTION OF LAPPING VERTICAL NO. 5 BARS WITH DOWELS AS SHOWN OR EXTENDING THE DOWEL REINFORCEMENT WITH NO SPLICING. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

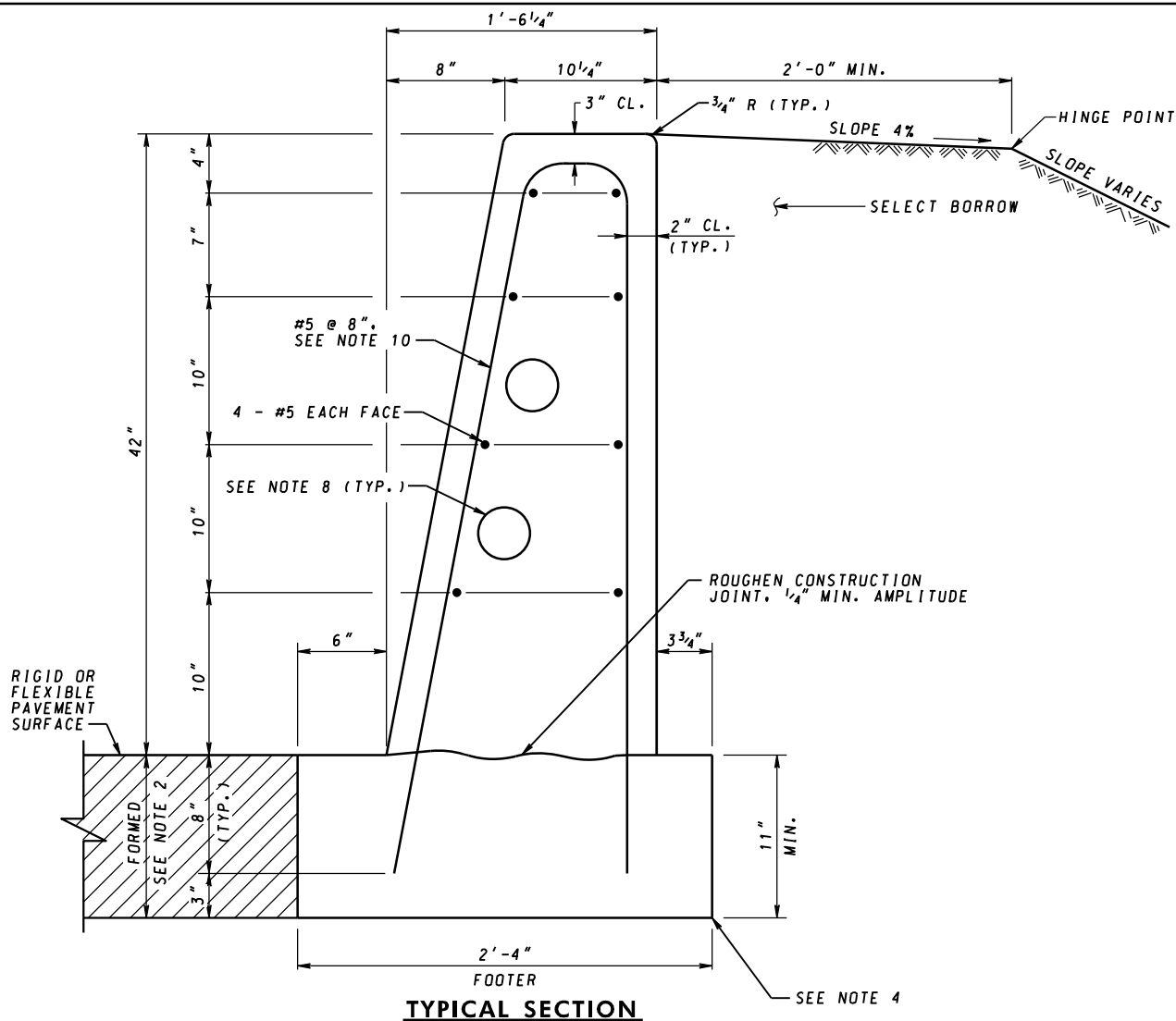
**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>Crommelin</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 6-27-24	<b>APPROVAL</b> 5-22-24
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
42 INCH SINGLE SLOPE CONCRETE  
MEDIAN TRAFFIC BARRIER BIFURCATED  
1 FEET 6 INCHES TO 4 FEET 0 INCHES**

**STANDARD NO. MD 648.56-02**



**TYPICAL SECTION**

TO BE USED WITH EARTH BACKING AT THE TOP OF SLOPES.  
 SEE STD. MD 648.58 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.  
 SEE STD. MD 648.59 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL FACE MAY BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1. FILL MATERIAL IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. MD 648.50-02 FOR LOCATION AND DETAILS.
9. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

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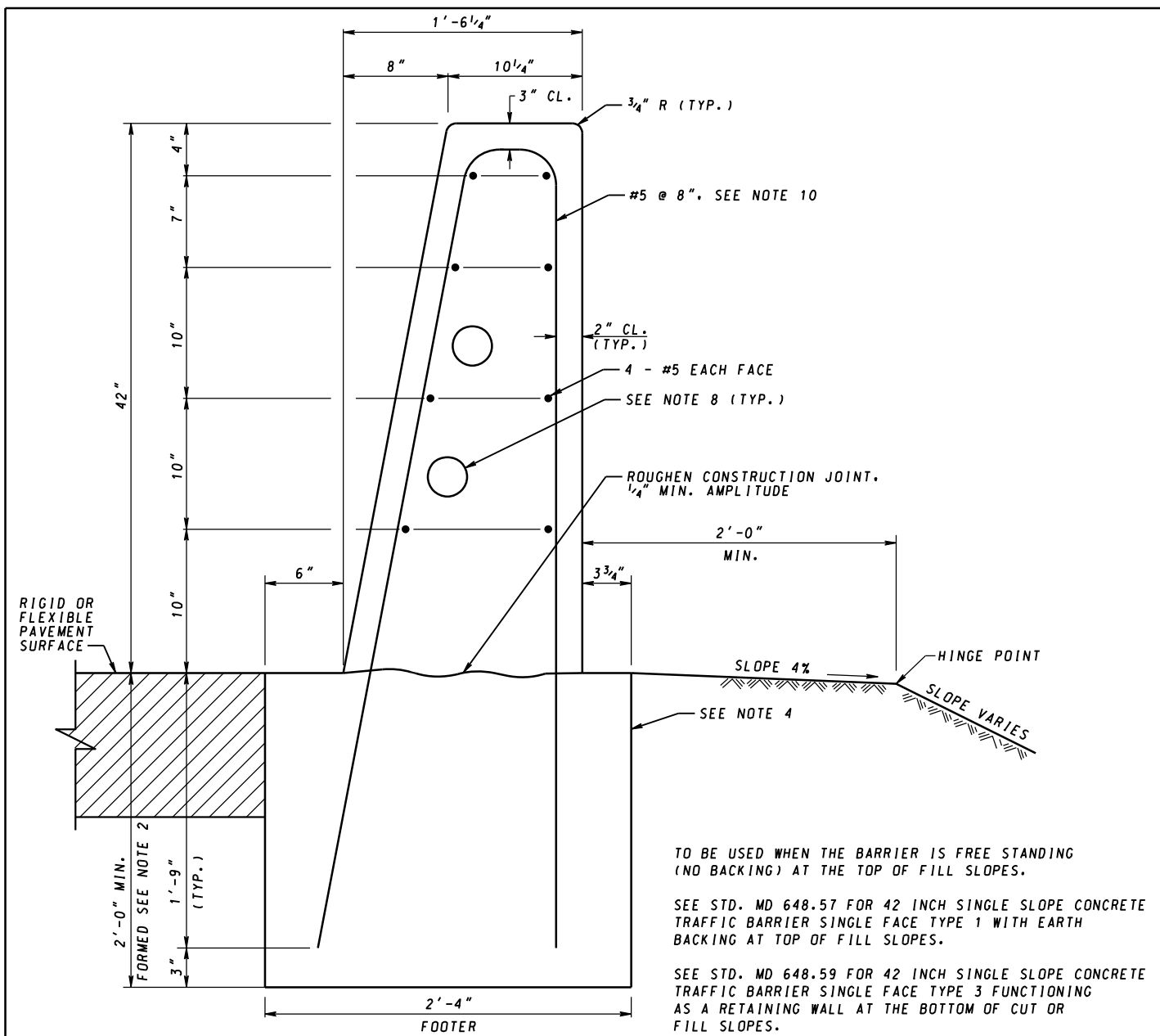
SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED	<i>Charles Poma</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 6-27-23	APPROVAL 6-21-23
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
 STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
 42 INCH SINGLE SLOPE CONCRETE  
 TRAFFIC BARRIER SINGLE FACE TYPE 1  
 (WITH EARTH BACKING IN FILL)**

**STANDARD NO. MD 648.57**





TO BE USED WHEN THE BARRIER IS FREE STANDING (NO BACKING) AT THE TOP OF FILL SLOPES.

SEE STD. MD 648.57 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES.

SEE STD. MD 648.59 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 3 FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES.

**TYPICAL SECTION**

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL WALL SHALL BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR, AT PC AND PT LOCATIONS, STRUCTURES, EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE. LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
6. COST OF THE CONCRETE FOOTER, REINFORCEMENT, AND EXCAVATION IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2. FILL MATERIAL IN BACK OF THE BARRIER IS INCLUDED IN THE EMBANKMENT QUANTITY.
7. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
8. CONDUIT: IF REQUIRED REFER TO STD. NO. MD 648.50-02 FOR LOCATION AND DETAILS.
9. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
10. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

TL-4

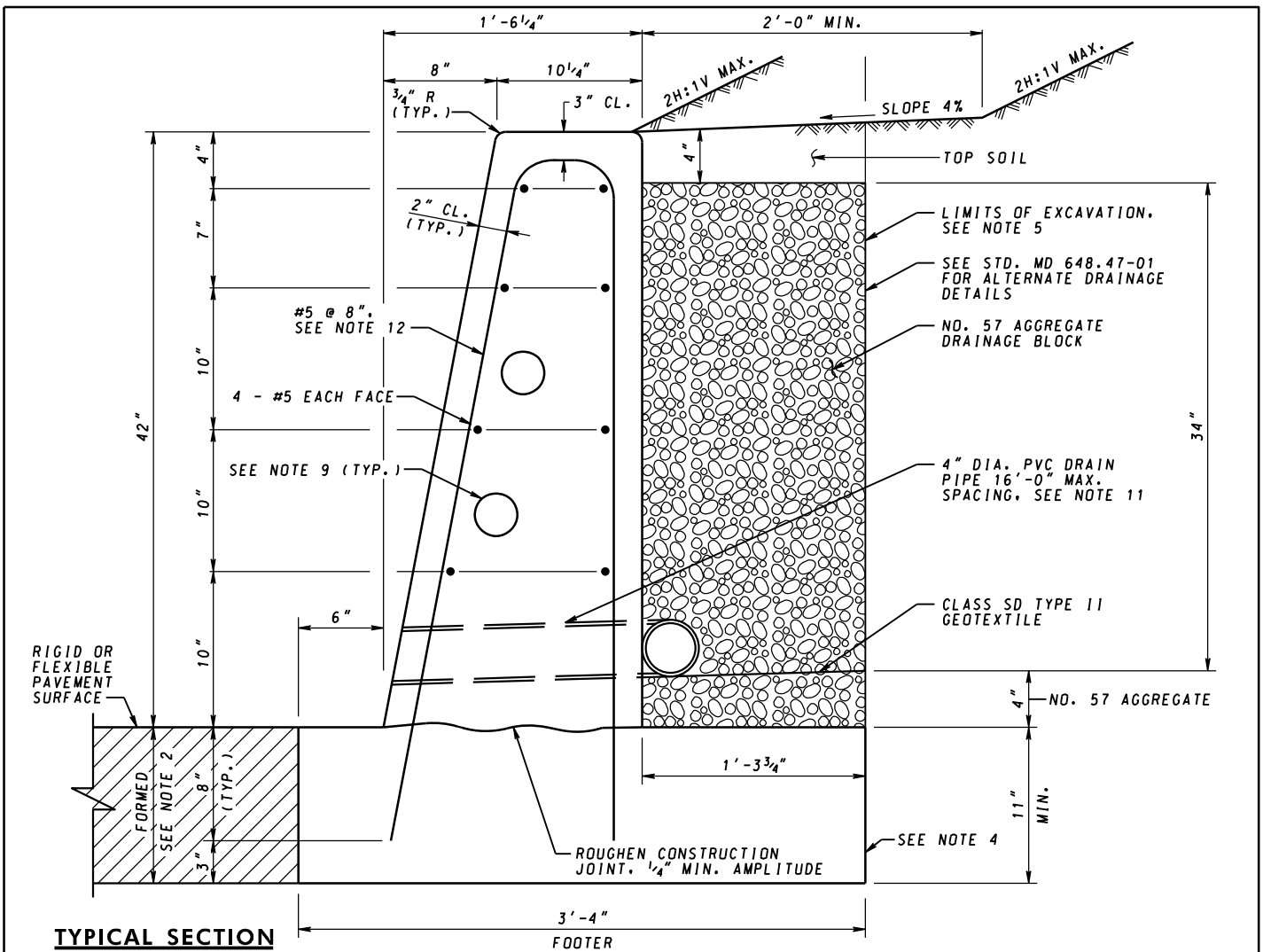
SPECIFICATION 604	CATEGORY CODE ITEMS
APPROVED	<i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
APPROVAL SHA REVISIONS	APPROVAL FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 6-27-23	APPROVAL 6-21-23
REVISED	REVISED
REVISED	REVISED
REVISED	REVISED

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**42 INCH SINGLE SLOPE CONCRETE**  
**TRAFFIC BARRIER SINGLE FACE**  
**TYPE 2 (FREE STANDING IN FILL)**

**STANDARD NO. MD 648.58**





**TYPICAL SECTION**

**FOOTER**

TO BE USED WHEN THE BARRIER IS FUNCTIONING AS A RETAINING WALL AT THE BOTTOM OF CUT OR FILL SLOPES. SEE STD. MD 648.57 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 1 WITH EARTH BACKING AT TOP OF FILL SLOPES. SEE STD. MD 648.58 FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER SINGLE FACE TYPE 2 FREE STANDING AT TOP OF FILL SLOPES.

**NOTES**

1. CAST THE BARRIER AND FOOTER SEPARATELY USING FIXED FORM OR SLIP FORM CONSTRUCTION WITH CONCRETE MIX NO.6 (4,500 PSI).
2. THE BARRIER FOOTER MAY BE CONSTRUCTED AFTER CONSTRUCTION OF THE PAVEMENT. IF FLEXIBLE PAVEMENT IS CONSTRUCTED BEFORE THE FOOTER, SAWCUT THE PAVEMENT TO PROVIDE A CLEAN EDGE. REMOVE FOOTER FORMS IF THE FOOTER IS CONSTRUCTED BEFORE THE PAVEMENT.
3. LAP BARS 2'-10 1/2". TIE BARS TOGETHER.
4. THE FOOTER REAR VERTICAL WALL SHALL BE FORMED OR THE CONCRETE PLACED AGAINST THE VERTICAL EARTH SIDE IF APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION FOR ADDITIONAL CONCRETE WILL BE PAID IF CONCRETE IS PLACED AGAINST THE EARTH. THE BARRIER FOOTER SHALL HAVE CONSTRUCTION JOINTS TO COINCIDE WITH THE BARRIER JOINTS.
5. LIMITS OF EXCAVATION: WHEN THE BARRIER IS AT THE BOTTOM OF A CUT SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER AND VERTICAL LINE EXTENDING FROM THE HEEL OF THE FOOTER TO ITS INTERSECTION WITH THE CUT SLOPE. WHEN THE BARRIER IS AT THE TOE OF A FILL SLOPE THE EXCAVATION LIMITS SHALL BE THE LINES INDICATING THE BARRIER FOOTER.
6. MAXIMUM SPACING OF CONTRACTION JOINTS IS 20 FEET. PLACE EXPANSION JOINTS IN THE BARRIER AND FOOTER AT THE END OF POUR. AT PC AND PT LOCATIONS. STRUCTURES. EXPANSION JOINTS IN ABUTTING CONCRETE AND UNDERLYING CONCRETE, LOCATIONS AS SHOWN ON THE PLANS, AND AS DIRECTED BY THE ENGINEER. AT EXPANSION JOINTS, SPACE BARRIER SECTIONS 3/4" APART AND FILL THE OPENING WITH 3/4" PREFORMED JOINT FILLER. RECESS THE FILLER 1/4" FROM THE FACE OF BARRIER.
7. COST OF THE CONCRETE FOOTER, REINFORCEMENT, DRAINAGE APPURTENANCES, EXCAVATION, GEOTEXTILE, AND BACKFILL IS INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR 42 INCH SINGLE SLOPE CONCRETE TRAFFIC BARRIER TYPE 3. FILL MATERIAL OUTSIDE THE LIMITS OF EXCAVATION IS INCLUDED IN THE EMBANKMENT QUANTITY.
8. TOLERANCES IN DIMENSIONS SHOWN ARE WITHIN 1/4".
9. CONDUIT: IF REQUIRED REFER TO STD. MD 648.50-02 FOR LOCATION AND DETAILS.
10. WHEN THE BARRIER IS CONSTRUCTED USING THE SLIP FORM METHOD, DIAGONAL NO. 4 BARS ARE REQUIRED. SEE STD. NO. MD 648.49.
11. PVC DRAINS AND BARRIER JOINTS SHOULD ALIGN WHERE POSSIBLE. DO NOT DRAIN WEEP HOLE ONTO PEDESTRIAN WALKING SURFACE.
12. THE CONTRACTOR MAY CONSTRUCT THE VERTICAL NO. 5 BARS AS SHOWN ON THIS STANDARD OR USE THE LAP SPLICE SHOWN ON STD. NO. MD 648.55. NO ADDITIONAL COMPENSATION WILL BE MADE FOR WHICHEVER OPTION IS CONSTRUCTED.

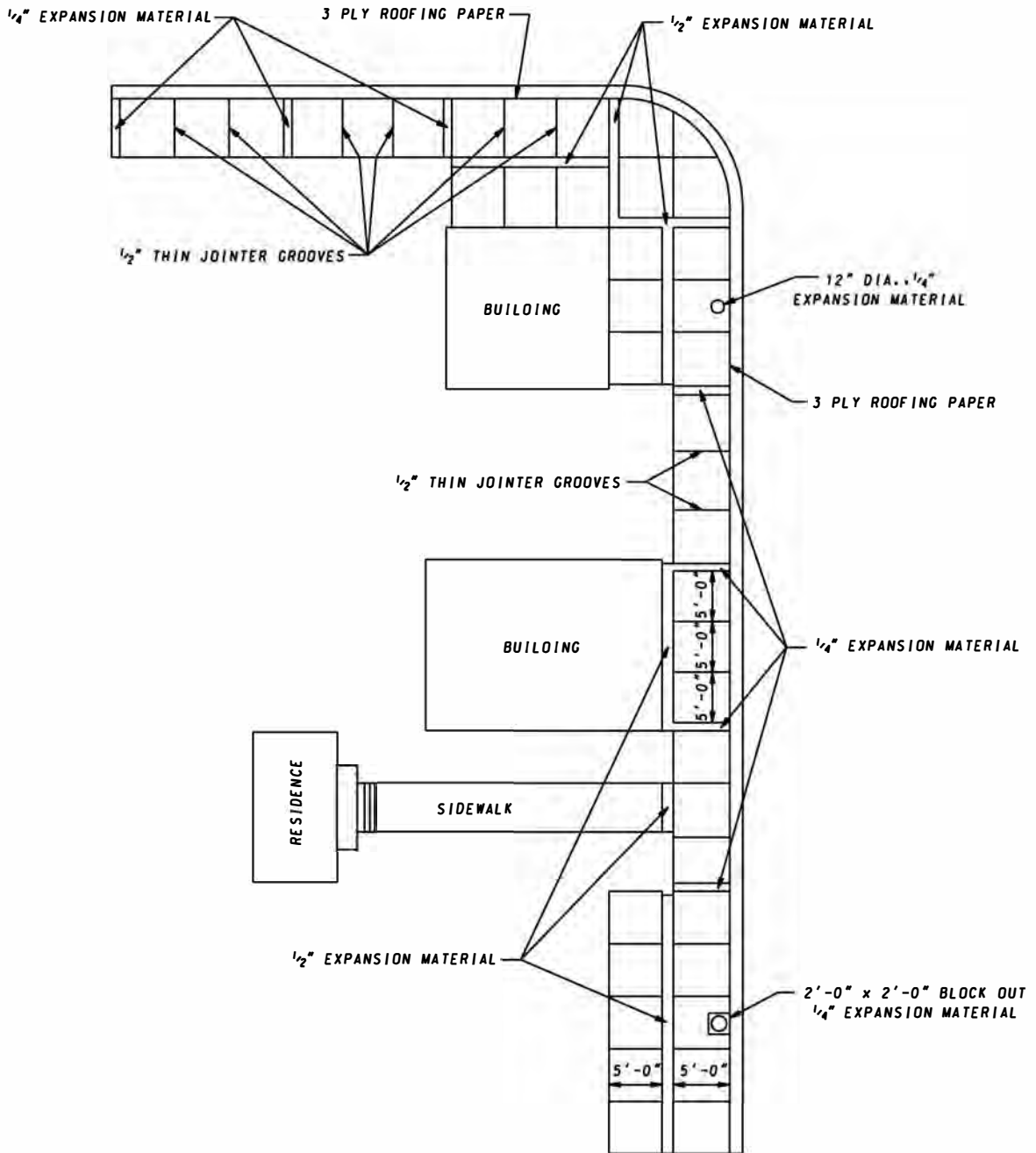
**TL-4**

<b>SPECIFICATION</b> 604	<b>CATEGORY CODE ITEMS</b>
<b>APPROVED</b> <i>Charles P. ...</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>APPROVAL SHA REVISIONS</b>	<b>APPROVAL FEDERAL HIGHWAY ADMINISTRATION</b>
<b>APPROVAL</b> 6-27-23	<b>APPROVAL</b> 6-21-23
<b>REVISED</b>	<b>REVISED</b>
<b>REVISED</b>	<b>REVISED</b>
<b>REVISED</b>	<b>REVISED</b>

**MOT** MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

**STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES**  
**42 INCH SINGLE SLOPE CONCRETE**  
**TRAFFIC BARRIER SINGLE FACE TYPE 3**  
**(BOTTOM OF CUT OR TOE OF FILL)**

**STANDARD NO. MD 648.59**



SPECIFICATION	CATEGORY CODE ITEMS
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APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

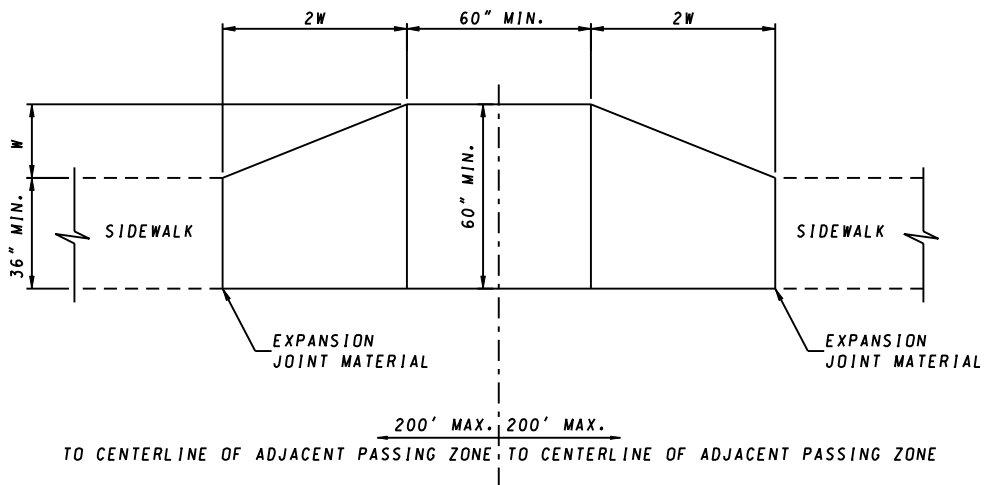


APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 3-11-64	APPROVAL 6-9-64
REVISED 10-1-01	REVISED
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**SIDEWALK EXPANSION JOINTS**



**STANDARD NO. MD 655.01**

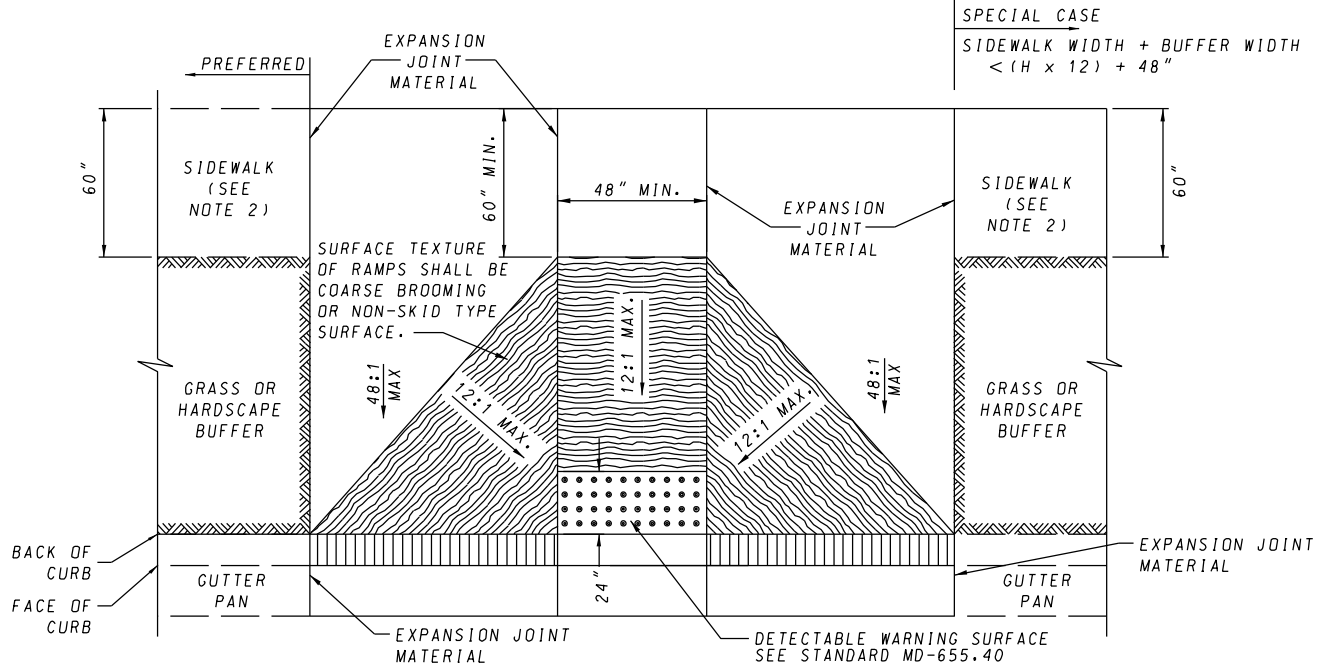


**PLAN**

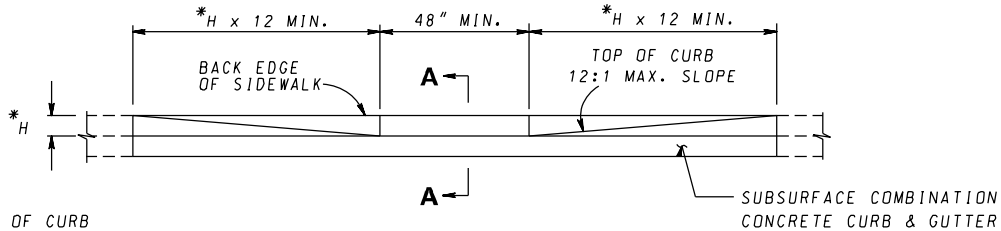
**NOTES**

1. WHERE THE CONTINUOUS WIDTH FOR TRAVEL IS LESS THAN 60", SIDEWALK PASSING ZONES SHALL BE PROVIDED AT AN INTERVAL NOT TO EXCEED 200'. USE OF ENTRANCES AND LEADER WALKS AS PASSING ZONES IS ACCEPTABLE PROVIDED THAT THE GEOMETRY MEETS THE REQUIREMENTS OF THIS STANDARD.
2. SIDEWALK PASSING ZONES SHALL BE LOCATED AS INDICATED ON DRAWINGS, HOWEVER EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. MAY AFFECT PLACEMENT.
3. SIDEWALK TRANSVERSE SLOPE SHALL BE MAINTAINED ACROSS THE ENTIRE WIDTH OF THE PASSING ZONE (48:1 MAX.).

SPECIFICATION <b>603</b>	CATEGORY CODE ITEMS	<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
APPROVED	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA	APPROVAL • FEDERAL
	REVISIONS	HIGHWAY ADMINISTRATION
	APPROVAL <b>2-10-04</b>	APPROVAL <b>3-31-04</b>
	REVISED	REVISED
	REVISED	
	REVISED	
	REVISED	
<b>STANDARD NO. MD 655.02</b>		<b>SIDEWALK</b> <b>PASSING ZONES</b>

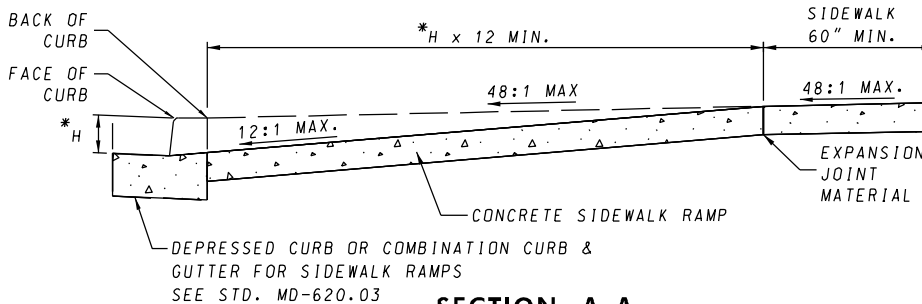


**PLAN**



**ELEVATION**

\* - H = HEIGHT OF CURB  
ALL MEASUREMENTS IN INCHES



**SECTION A-A**

**NOTES**

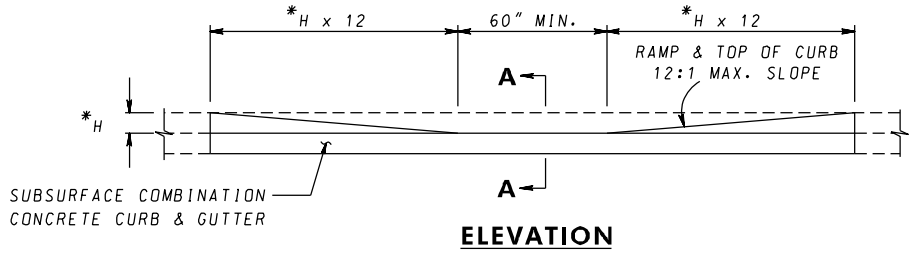
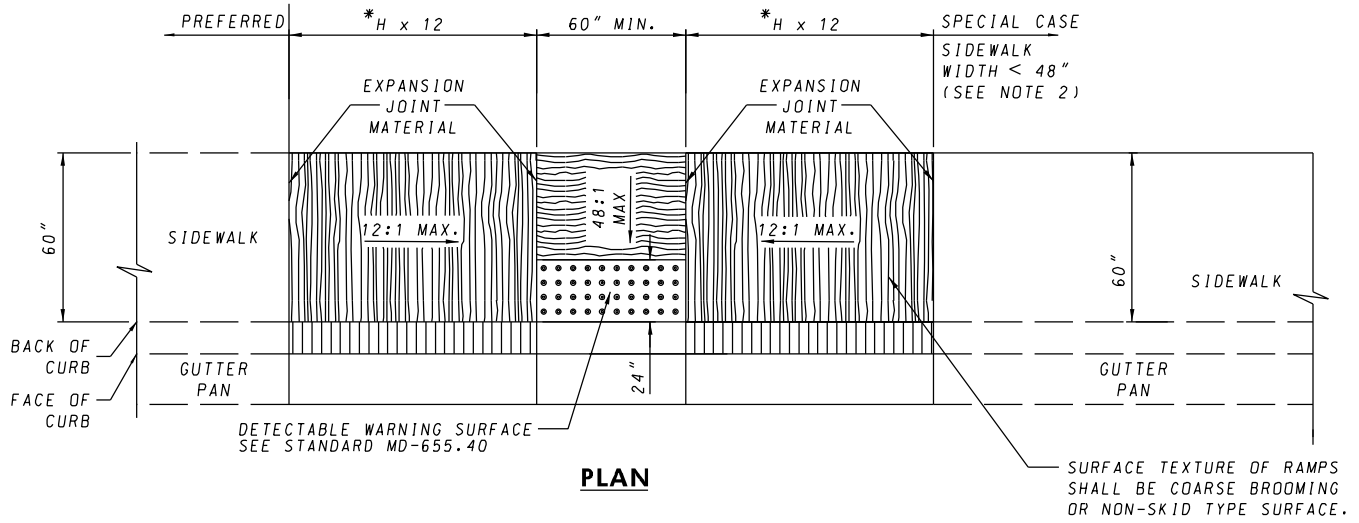
1. TO BE USED ON WIDE SIDEWALKS OR SIDEWALKS WITH SIGNIFICANT SEPARATION FROM THE ROADWAY WHERE THE GEOMETRY SPECIFIED IN THE DETAILS ABOVE CAN BE SATISFIED. MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
5. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.
6. TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH.

SPECIFICATION <b>603 &amp; 611</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL <b>2-10-04</b>
	REVISED <b>3-25-08</b>
	REVISED <b>6-2-14</b>
	REVISED

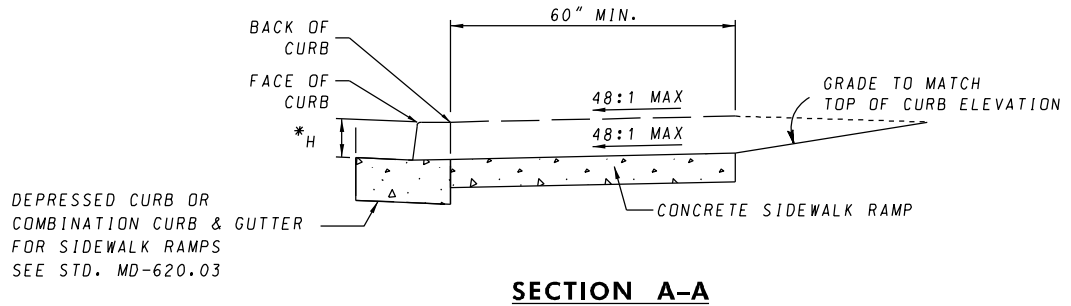
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**SIDEWALK RAMPS**  
**PERPENDICULAR**

**STANDARD NO. MD 655.11**



\* - H = HEIGHT OF CURB  
ALL MEASUREMENTS IN INCHES

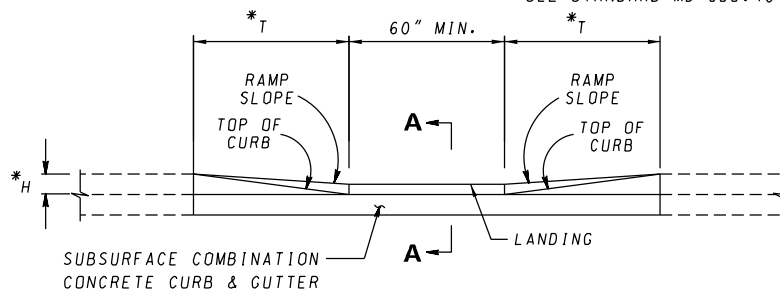
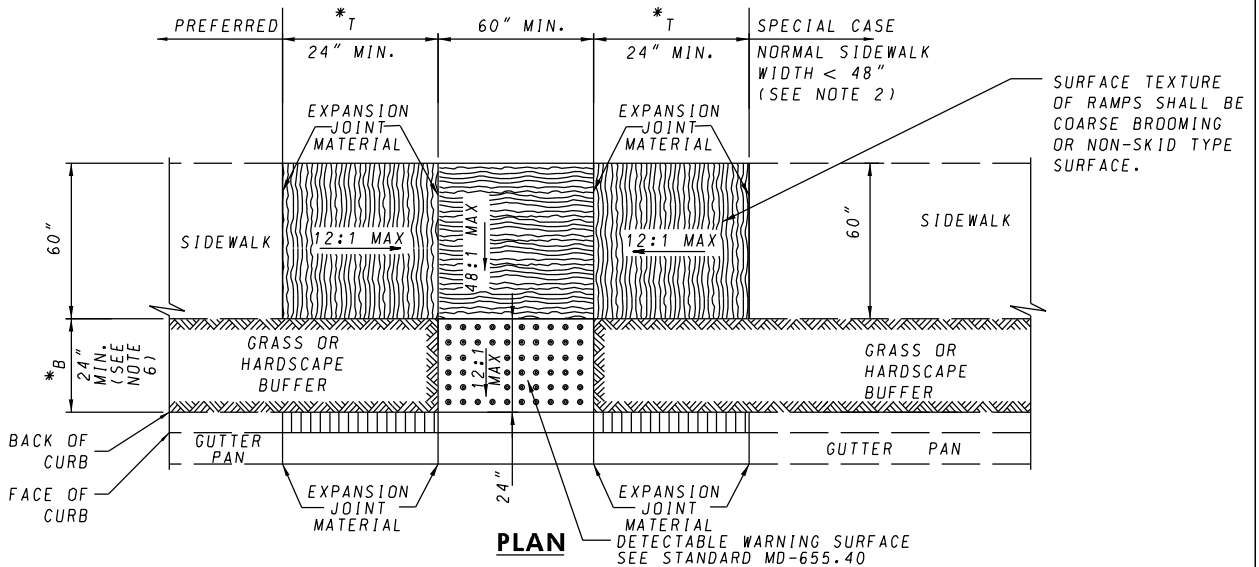


**NOTES**

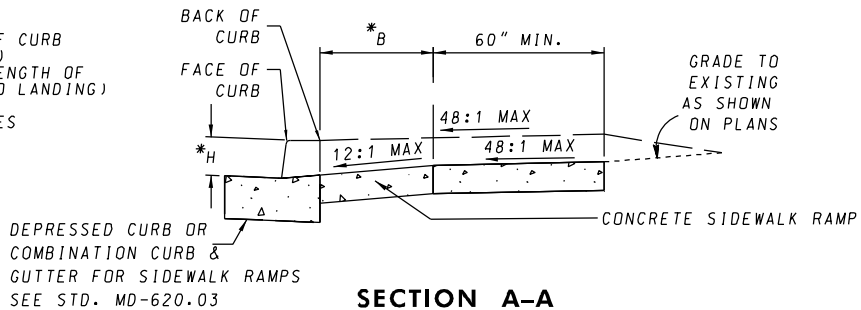
1. TO BE USED WHERE SIDEWALK IS ADJACENT TO THE CURB. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED.
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL. THE CROSS-SLOPE OF THE LANDING AREA CANNOT EXCEED GRADE OF ROADWAY
4. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
5. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.
6. TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH

SPECIFICATION <b>603 &amp; 611</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISED 3-25-08
	REVISED 6-2-14
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**SIDEWALK RAMPS**  
**PARALLEL**  
**STANDARD NO. MD 655.12**



- \* - H = HEIGHT OF CURB
- B = BUFFER WIDTH (BACK OF CURB TO FRONT OF SIDEWALK)
- T = TRANSITION LENGTH (LENGTH OF RAMP FROM SIDEWALK TO LANDING)
- $T = (12 \times H) - B$
- ALL MEASUREMENTS IN INCHES



**NOTES**

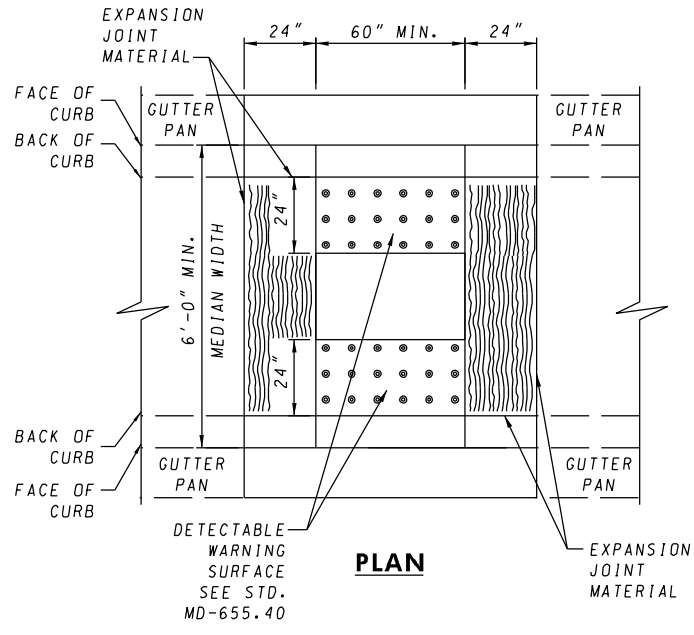
1. TO BE USED WHERE AT LEAST 7'-0" EXISTS BETWEEN THE BACK OF CURB AND THE BACK OF SIDEWALK. THIS STANDARD MAY BE MODIFIED TO SUIT A PARTICULAR LOCATION.
2. WHERE 60" SIDEWALK CAN NOT BE PROVIDED, A DESIGN WAIVER MUST BE REQUESTED.
3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01.
5. SIDEWALK RAMPS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE RAMP ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED RAMP VARIES FROM STANDARD CASES.
6. FOR BUFFER WIDTHS LESS THAN 24", WIDEN SIDEWALK TO BACK OF CURB AS SHOWN FOR THE SPECIAL CASE, THEN BUILD PARALLEL RAMP USING STANDARD MD-655.12.
7. TRANSITION PANELS TO TIE INTO EXISTING SIDEWALK MUST BE A MINIMUM OF 5' IN LENGTH
8. IF THE BUFFER AREA IS GREATER THAN OR EQUAL TO 4' THE LANDING AREA MUST BE 2% X 2%. IF THE BUFFER AREA IS LESS THAN 4' THE LANDING AREA CROSS-SLOPE CANNOT EXCEED THE GRADE OF THE ROAD.

SPECIFICATION <b>603 &amp; 611</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISED 8-25-08
	REVISED 6-2-14
	REVISED

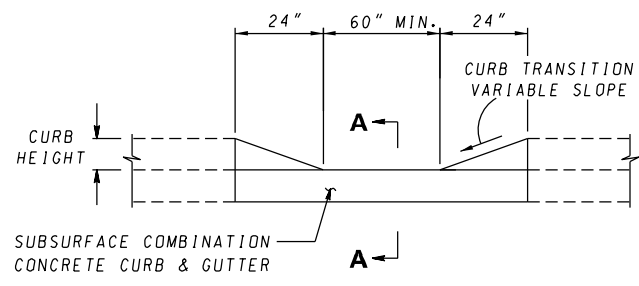
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**SIDEWALK RAMPS COMBINATION**

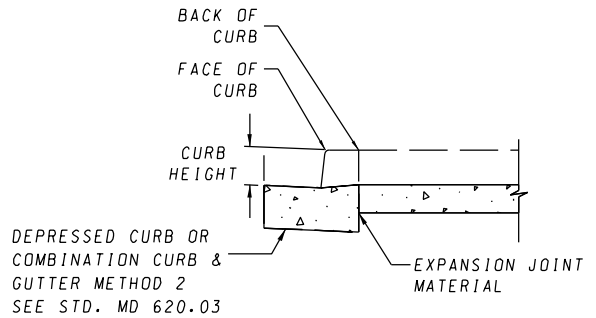
**STANDARD NO. MD 655.13**



**PLAN**



**ELEVATION**



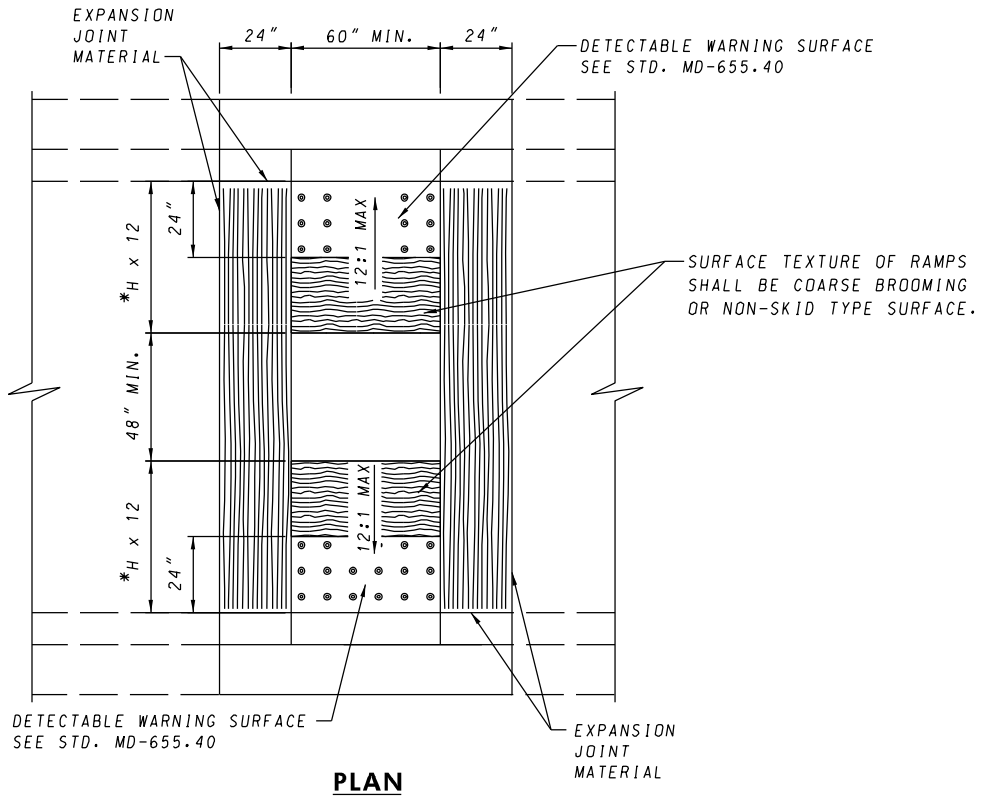
**SECTION A-A**

**NOTES**

1. TO BE USED WHERE A STREET-LEVEL PEDESTRIAN CROSSING IS REQUIRED THROUGH RAISED MEDIANS OR RAISED ISLANDS AND THERE IS INSUFFICIENT WIDTH TO PROVIDE A RAMPED MEDIAN OR ISLAND OPENING (STD. MD-655.22).
2. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD MD-655.01.
3. CUT-THROUGH MEDIAN AND ISLAND OPENINGS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE OPENING ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED OPENING VARIES FROM STANDARD METHODS.
4. WHERE 60" CUT THROUGHS CAN NOT BE PROVIDED A DESIGN WAIVER MUST BE REQUESTED.

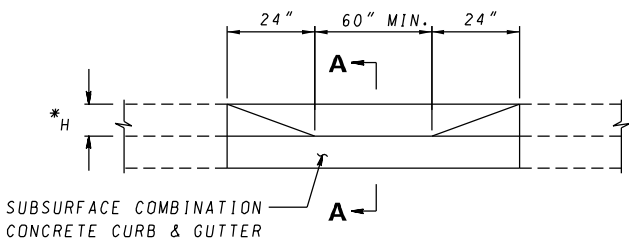
SPECIFICATION <b>603 &amp; 611</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISIONS 6-2-14
	REVISIONS
	REVISIONS

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
  
**CUT-THROUGH**  
**MEDIAN AND ISLAND OPENINGS**  
  
**STANDARD NO. MD 655.21**

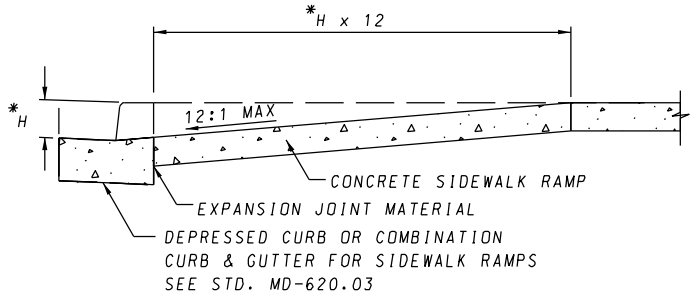


**PLAN**

\* - H = HEIGHT OF CURB  
ALL MEASUREMENTS IN INCHES



**ELEVATION**



**SECTION A-A**

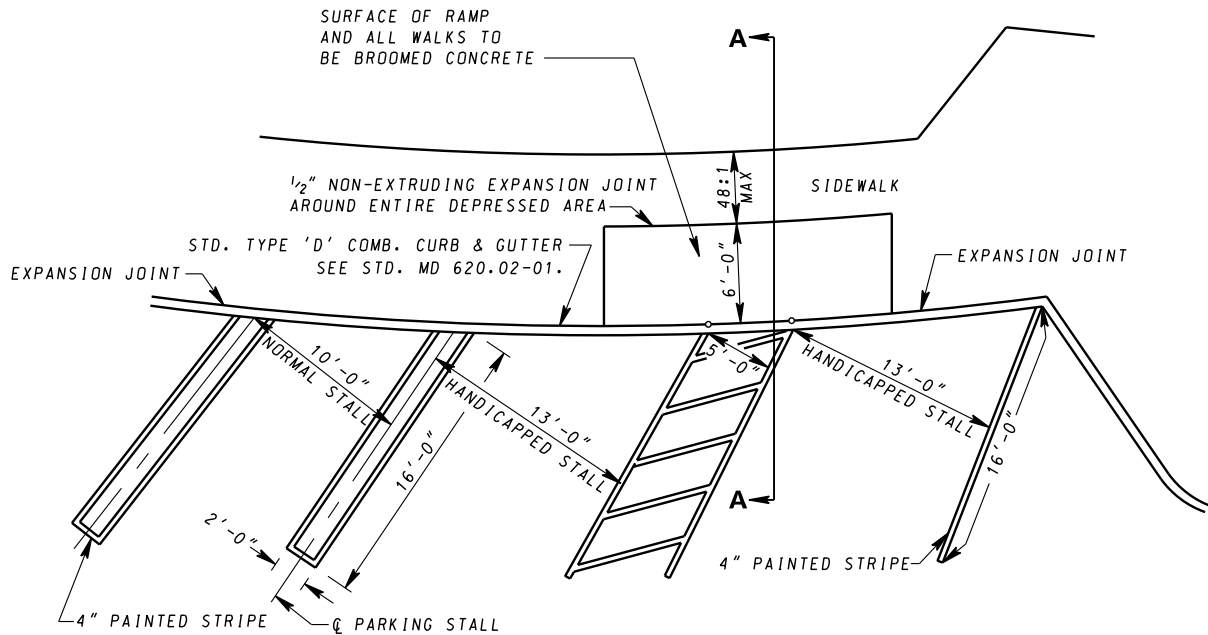
**NOTES**

1. TO BE USED WHERE A PEDESTRIAN ACCESS ROUTE CROSSES RAISED MEDIANS OR RAISED ISLANDS AND THERE IS SUFFICIENT WIDTH TO SATISFY THE GEOMETRY OUTLINED IN THIS STANDARD.
2. EXPANSION JOINT MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD MD-655.01.
3. RAMPED MEDIAN AND ISLAND OPENINGS TO BE SHOWN ON PLANS SYMBOLICALLY AND REFERENCED WITH THE CENTER OF THE OPENING ALIGNED TO A STATION ON THE CONSTRUCTION CENTERLINE. SEPARATE DETAILS SHALL BE SHOWN WHERE PROPOSED OPENING VARIES FROM STANDARD METHODS.
4. WHERE 60" OPENINGS CAN NOT BE USED A DESIGN WAIVER MUST BE REQUESTED.

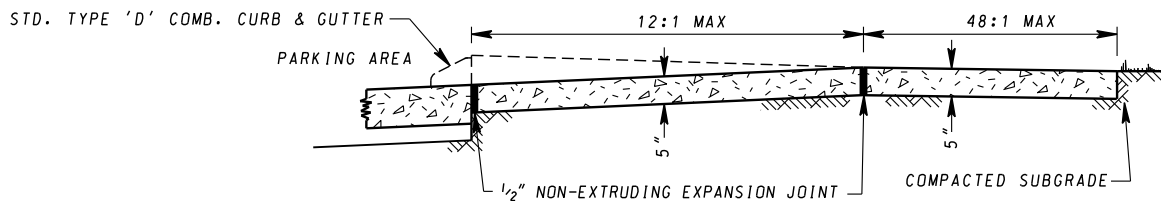
SPECIFICATION <b>603 &amp; 611</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL <b>2-10-04</b>
	REVISED <b>6-2-14</b>
	REVISED
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
  
**RAMPED**  
**MEDIAN AND ISLAND OPENINGS**  
  
**STANDARD NO. MD 655.22**

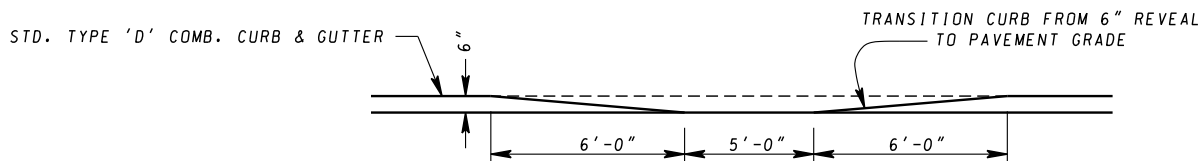




**PLAN**



**SECTION A-A**



**ELEVATION**

**NOTES**

- RAMP SLOPES MUST BE CALCULATED USING THE HORIZONTAL PLANE. USING ONLY THE RISE-OVER-RUN METHOD IS INSUFFICIENT FOR DETERMINING SLOPE (ANY VARIANCE FROM THE HORIZONTAL PLANE OF THE SURROUNDING FACILITY MUST ALSO BE DETERMINED AND ACCOUNTED FOR).

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>Raff</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-13-73
	REVISIONS 8-5-16

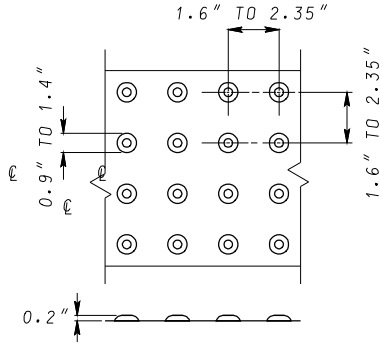
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**REST AREA PARKING FOR PERSONS WITH DISABILITIES**

**STANDARD NO.**

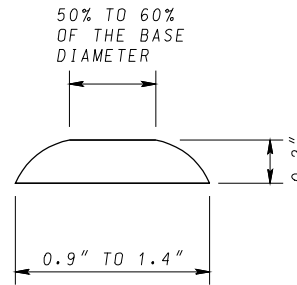
**MD 655.30**

## MAT DETAILS

SEE PLACEMENT GUIDELINES BELOW

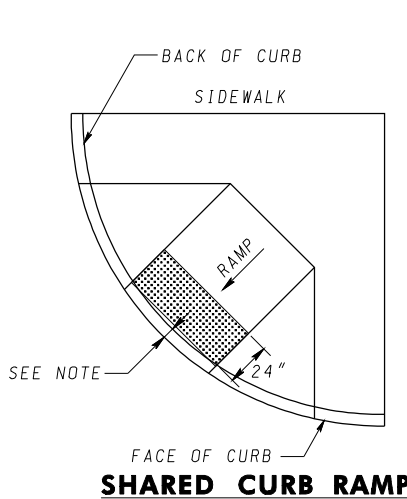


**DOME SPACING**

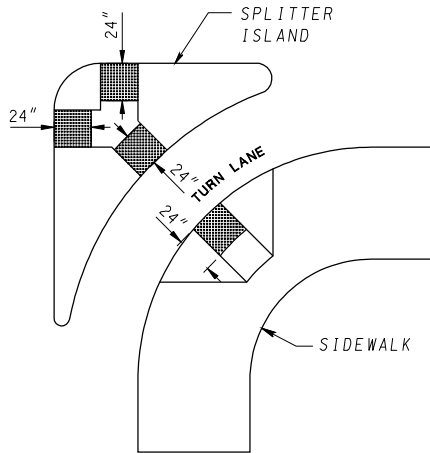


**DOME SECTION**

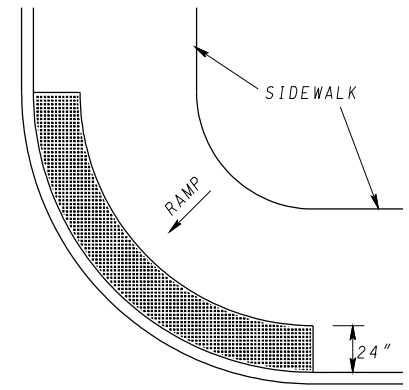
## PLACEMENT GUIDELINES



**SHARED CURB RAMP**



**REFUGE ISLAND**



**BLENDED CURB**

WHERE ISLANDS OR MEDIANS ARE LESS THAN 6 FEET WIDE, THE DETECTABLE WARNING SHOULD EXTEND ACROSS THE FULL LENGTH OF THE CUT THROUGH THE ISLAND OR MEDIAN

### NOTES

1. THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6 TO 8 INCHES FROM THE FACE OF CURB.
2. FOR SKEWED APPLICATIONS DETECTABLE WARNING SHALL BE PLACED SUCH THAT THE DOMES CLOSEST TO THE BACK OF CURB ARE NO LESS THAN 0.5" AND NO MORE THAN 3.0" FROM THE BACK OF CURB. TRUNCATED DOME SURFACES SHALL BE FABRICATED TO PROVIDE FULL DOMES ONLY.
3. DETECTABLE WARNING SURFACE SHALL BE PAID FOR IN ACCORDANCE WITH SECTION 611 OF THE SPECIFICATIONS.
4. DETECTABLE WARNING SURFACES ARE REQUIRED AT STREET CROSSING & SIGNALIZED INTERSECTIONS.

SPECIFICATION <b>611</b>	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
 State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL <b>2-10-04</b>	APPROVAL <b>3-31-04</b>
	REVISED <b>3-15-06</b>	REVISED <b>4-5-06</b>
	REVISED	REVISED
	REVISED	REVISED

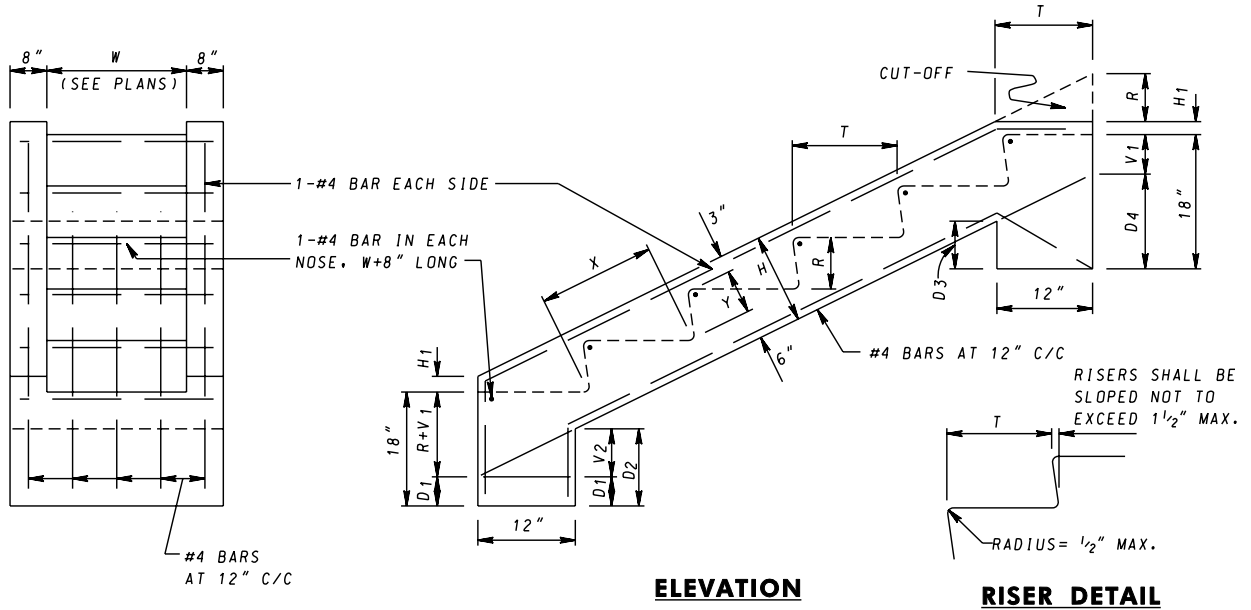
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

## DETECTABLE WARNING SURFACES

**STANDARD NO.**

**MD 655.40**

NOTE: ALL REINFORCING TO BE #4 BARS, CONFORMING TO A.S.T.M. DESIGNATION A-615 GRADE 40. 1" COVER. (TYP)



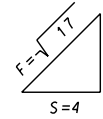
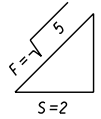
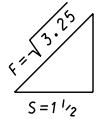
**FRONT VIEW**

**ELEVATION**

**RISER DETAIL**

**STANDARD SLOPES, DIMENSIONS & FORMULAS**

SLOPE RATIO S:1 VALUES OF S	R	T	F	H <sub>1</sub>	X	Y	H	V <sub>1</sub>	V <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>
1 1/2	7"	11"	$\sqrt{3.25}$	3.61"	13.04"	5.91"	14.91"	7.21"	8"	3.79"	11.79"	2.79"	10.79"
2	6"	12"	$\sqrt{5}$	3.36"	13.44"	5.36"	14.36"	6.72"	6"	5.28"	11.28"	5.28"	11.28"
4	3 1/2"	14"	$\sqrt{17}$	3.09"	14.44"	3.39"	12.39"	6.19"	3"	8.31"	11.31"	8.81"	11.81"



**CONCRETE REQUIRED FOR STANDARD STAIRWAYS  
TABLE OF UNIT QUANTITIES**

ITEM - UNIT OF STAIRWAY	SLOPE RATIO & T:R			VOLUMES PER STAIRWAY
	1 1/2 : 1	2 : 1	4 : 1	
	11 : 7	12 : 6	14 : 3 1/2	
VOL. OF 1 STEP + BOTTOM SLAB PER 1" WIDTH OF W	= .0651	.0675	.0643	MULTIPLIED BY (NW) =A
VOL. OF 2 SIDEWALLS PER STEP OR TREAD	= 1.7317	1.7870	1.6566	MULTIPLIED BY (N) =B
VOL. OF UPPER & LOWER FOOTINGS PER 1" OF TOTAL WIDTH	= .1012	.1150	.1397	MULTIPLIED BY (W+16)=C
VOL. OF 2 UPPER SIDE WALL CUT-OFFS TO DEDUCT	= -.3403	.3333	-.2269	MULTIPLIED BY 1 =D

CONCRETE=MIX NO. 2 (VOLUMES SHOWN IN TABLE ABOVE ARE IN CUBIC FEET) NUMBER OF STEPS OR TREADS=N  
 TOTAL VOLUME IN CUBIC YARDS/STAIRWAY=  $\frac{A+B+C-D}{27}$  TREAD WIDTH (IN INCHES)=W

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCallum</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-7-51
	REVISD 09-06-07

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**STANDARD STAIRWAYS**

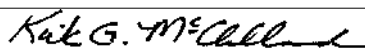

**STANDARD NO. MD 657.00**

## POST MOUNTED DELINEATORS

- REFER TO SHA "ROADWAY DELINEATION POLICY" FOR APPLICATION AND PLACEMENT GUIDELINES.
- PLASTIC POSTS SHOULD BE USED AT ALL NEW INSTALLATIONS. WOOD POSTS SHOULD BE USED ONLY AS SNOW STAKES.
- PLASTIC POSTS ARE GRAY IN COLOR; WOOD POSTS ARE HIGHWAY YELLOW IN COLOR. BLUE DELINEATOR POSTS, WITH 3" x 9" BLUE REFLECTIVE SHEETING MOUNTED BACK TO BACK ON THE POST, MAY BE USED TO IDENTIFY HYDRANT CONNECTIONS IN NOISE BARRIERS.
- REFLECTORIZATION IS HIGH INTENSITY WHITE, YELLOW, BLUE OR GREEN REFLECTIVE SHEETING APPLIED TO CENTER-MOUNT DELINEATORS FOR WOOD POSTS; AND APPLIED DIRECTLY TO THE PLASTIC POSTS.
- CENTER-MOUNT DELINEATORS ARE ROUND HAVING A 4" DIAMETER (0.063" THICK ALUMINUM) AND ARE PLACED SINGLY OR DOUBLY (VERTICALLY).
- REFLECTIVE SHEETING APPLIED TO PLASTIC POSTS, FOR A SINGLE REFLECTIVE UNIT, CONSISTS OF A PATTERN THAT IS 3" WIDE BY 4" HIGH; AND FOR A DOUBLE REFLECTIVE UNIT, CONSISTS OF TWO PATTERNS 3" WIDE BY 4" HIGH, PLACED VERTICALLY WITH A 2" SPACE BETWEEN THEM.
- WOOD POSTS ARE DRIVEN INTO THE GROUND WHILE PLASTIC POSTS ARE INSERTED INTO A FOOTING THAT IS DRIVEN INTO THE GROUND, FLUSH WITH THE SURFACE. FOOTING SHOULD BE AS PER MANUFACTURERS SPECIFICATIONS.
- REFER TO THE SHA OFFICE OF TRAFFIC AND SAFETY APPROVED PRODUCT LIST FOR ACCEPTABLE MODELS.
- REFER TO STANDARDS 665.02 THROUGH 665.06 THAT FOLLOW REGARDING LOCATION AND INSTALLATION OF POST MOUNTED DELINEATORS.
- UTILITY IDENTIFICATION MARKERS (UIM's):  
UIM's ARE THE SAME SIZE AS DELINEATORS AND ARE USED TO IDENTIFY EXISTING FACILITIES AS FOLLOWS:
  - 1) BLUE - TO IDENTIFY WATER SOURCES (FIRE HYDRANTS, STREAMS, PONDS, ETC.)
  - 2) GREEN - TO IDENTIFY DRAINAGE INLETS, DRAINAGE PIPES AND CULVERT CROSSINGS
- MULTIPLE DELINEATORS LOCATED ON THE SAME POST SHALL BE POSITIONED FROM TOP TO BOTTOM AS FOLLOWS:
  - 1) COLOR OF ADJACENT PAVING MARKER
  - 2) BLUE (AS NECESSARY)
  - 3) GREEN (AS NECESSARY)

### NOTES

1. SKETCHES ARE DESCRIPTIVE ONLY, NOT TO SCALE. INDICATED HEIGHTS ARE GENERAL. SEE STD. 665.04 FOR SPECIFIC HEIGHT INFORMATION.
2. DELINEATOR COLOR IS TO BE THE SAME AS THE ADJACENT EDGE LINE (YELLOW ON THE LEFT AND WHITE ON THE RIGHT).

SPECIFICATION <b>604, 605</b>	CATEGORY CODE ITEMS	
APPROVED	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL	APPROVAL <b>7-1-94</b>
	REVISED <b>11-08-06</b>	REVISED <b>10-25-06</b>
	REVISED	REVISED
	REVISED	REVISED

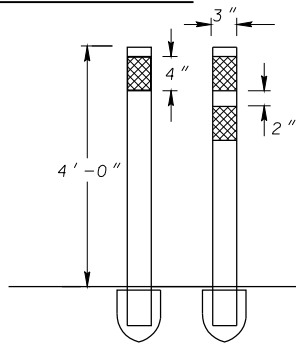
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

### **POST MOUNTED DELINEATORS**

**STANDARD NO.**

**MD 665.01**

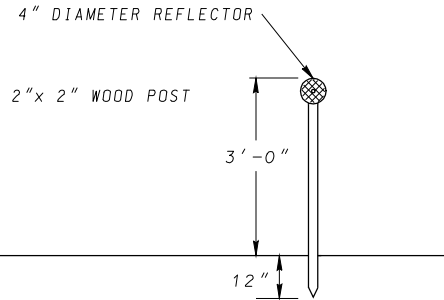
**PLASTIC POSTS**



- SEE SHA LIST FOR APPROVED MODELS AND NEEDED PARTS

\* TOP OF REFLECTING HEAD IS 4'-0" ABOVE NEAR ROADWAY EDGE.

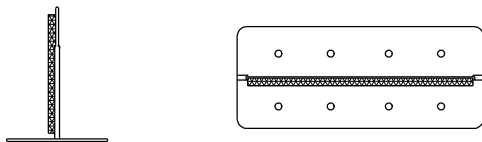
**WOOD SNOW GUIDE STAKE**



- WOOD SNOW STAKE  
- HIGHWAY YELLOW

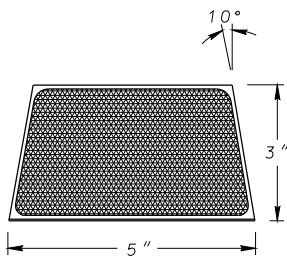
**BARRIER WALL AND W-BEAM BARRIER MARKERS**

**BARRIER WALL MARKER (TYPICAL)**



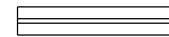
**SIDE VIEW**

**TOP VIEW**

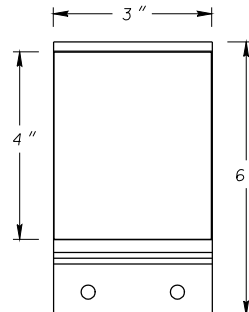


**FRONT VIEW**

**W-BEAM MARKER (TYPICAL)**



**TOP VIEW**



**FRONT VIEW**



**SIDE VIEW**

**NOTES**

1. BARRIER MARKERS SHALL BE YELLOW IN COLOR WHEN PLACED ON LEFT MEDIAN-SIDE BARRIER, WHITE WHEN PLACED ON RIGHT SHOULDER-SIDE BARRIER.
2. SEE S.H.A. LIST FOR APPROVED MODELS AND NEEDED PARTS.
3. REFER TO STDS. 665.03 THRU 665.06 FOR PLACEMENT, SPACING AND MOUNTING HEIGHT.

SPECIFICATION <b>604, 605</b>	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 11-08-06
	APPROVAL 7-1-94
REVISOR	REVISOR
REVISOR	REVISOR
REVISOR	REVISOR

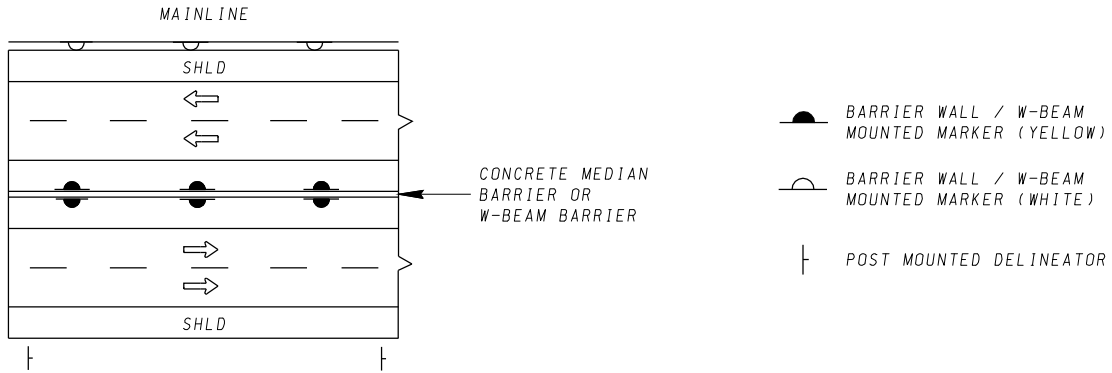
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**BARRIER MARKERS**

**STANDARD NO.**

**MD 665.02**

## DELINEATION PLACEMENT



### TYPICAL SPACING FOR POST MOUNTED DELINEATORS

MAINLINE - 264'  
 ACCEL/DECEL AND C/D ROADS - 100' (DOUBLE DELINEATORS) REFER TO STD. MD 665.05  
 RAMPS - REFER TO STD. MD 665.06

### TYPICAL SPACING FOR PERMANENT BARRIER WALL MOUNTED MARKERS

(FOR ALL BARRIER WALLS WITHIN 15' OF THE TRAVEL LANE)  
 MAINLINE - 100' **NOTE** SPACING SHOULD BE REDUCED TO 75' IN CURVES WITH A RADIUS LESS THAN 1000' AND 50' IN CURVES WITH A RADIUS LESS THAN 300'.  
 ACCEL/DECEL AND C/D ROADS - 100' (DOUBLE DELINEATORS) REFER TO STD. MD 665.05  
 RAMPS - REFER TO STD. MD 665.06

### TYPICAL SPACING FOR W-BEAM MOUNTED DELINEATORS

(FOR ALL W-BEAM BARRIERS WITHIN 6' OF THE SHOULDER)  
 MAINLINE - 100' **NOTE** SPACING SHOULD BE REDUCED TO 50' IN CURVES WITH A RADIUS LESS THAN 1000' AND IN TANGENT SECTIONS LESS THAN 500' IN LENGTH.  
 ACCEL/DECEL AND C/D ROADS - 100' (DOUBLE DELINEATORS) REFER TO STD. MD 665.05  
 RAMPS - REFER TO STD. MD 665.06

### **NOTE**

DELINEATORS LOCATED WITHIN 50' OF A UTILITY SHOULD BE INSTALLED AT THE UTILITY AND COMBINED WITH THE APPROPRIATE UIM(S).

SPECIFICATION <b>604, 605</b>	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL	APPROVAL <b>7-1-94</b>
	REVISED <b>11-08-06</b>	REVISED <b>10-25-06</b>
	REVISED	REVISED
	REVISED	REVISED

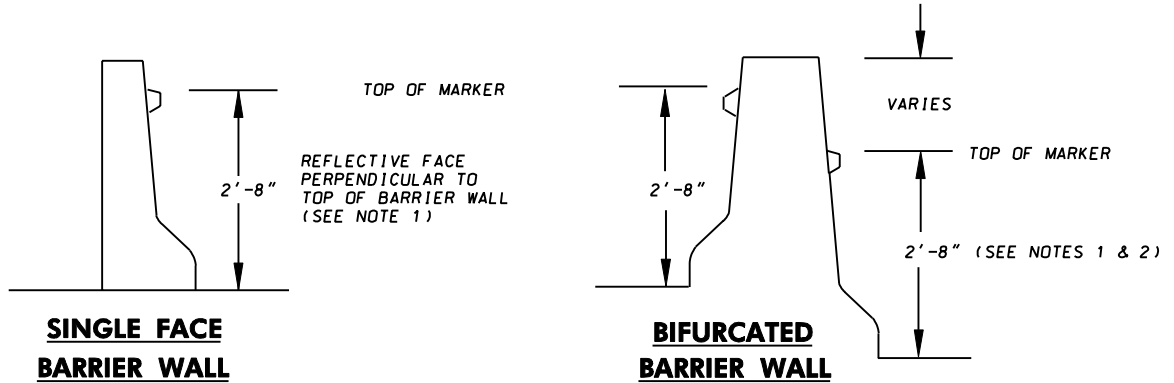
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

### **PLACEMENT OF DELINEATORS**

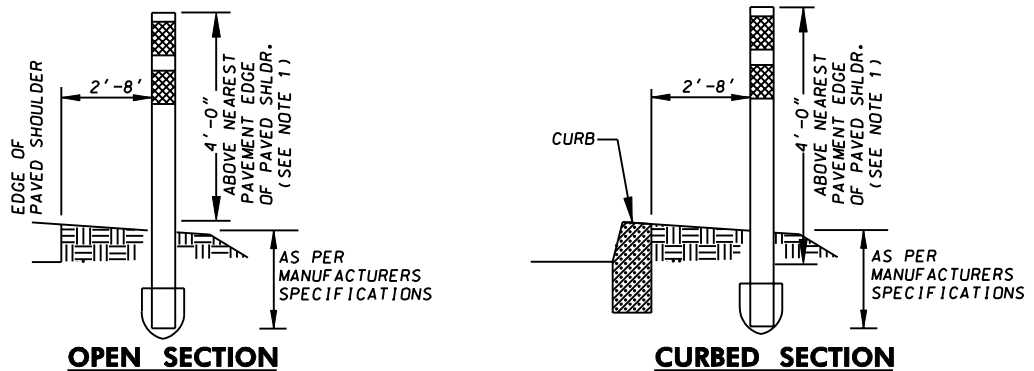
**STANDARD NO.**

**MD 665.03**

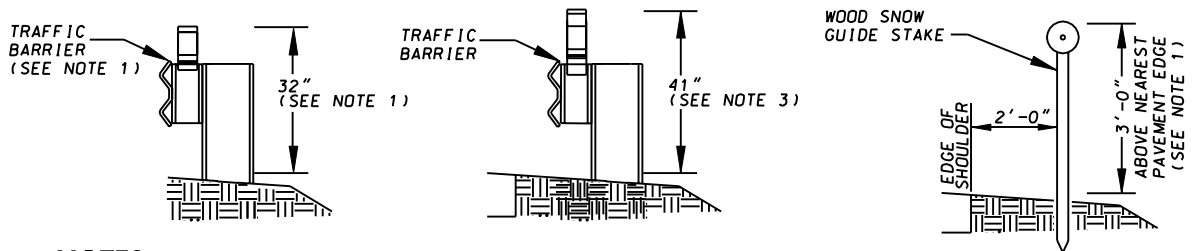
**PLACEMENT OF BARRIER WALL MOUNTED MARKERS**



**PLACEMENT OF POST MOUNTED DELINEATORS**





**PLACEMENT OF W-BEAM & WOOD POST DELINEATORS**



**NOTES:**

1. THE HEIGHT OF THE DELINEATOR SHOULD BE WITHIN 2 INCHES OF THE DIMENSIONS SHOWN.
2. BARRIER MARKERS SHOULD BE TOP AND SIDE MOUNTED IN CONSTRUCTION ZONES. PERMANENT INSTALLATIONS SHOULD BE SIDE MOUNTED ONLY.
3. HEIGHT OF DELINEATOR MAY BE INCREASED AS NECESSARY IN AREAS HAVING EXCESSIVE PLOWED SNOW STORAGE.
4. W-BEAM MARKERS SHALL BE FASTENED TO WOOD OFFSET BLOCKS BY GALVANIZED 6 PENNY NAILS.

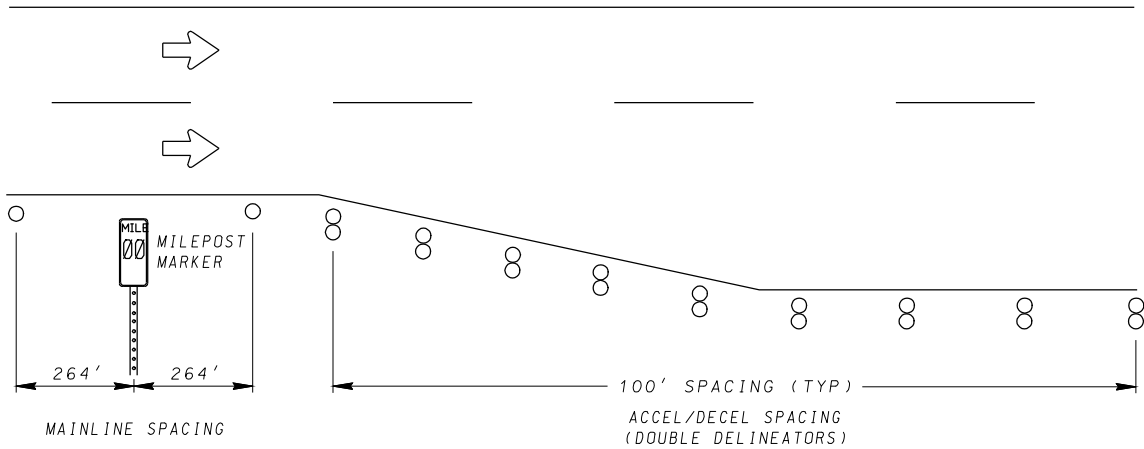
SPECIFICATION	CATEGORY CODE ITEMS										
APPROVED	 DIRECTOR - OFFICE OF TRAFFIC AND SAFETY										
	<table border="1"> <tr> <td>APPROVAL • SHA REVISIONS</td> <td>APPROVAL • FEDERAL HIGHWAY ADMINISTRATION</td> </tr> <tr> <td>APPROVAL 7-1-94</td> <td>APPROVAL 7-1-94</td> </tr> <tr> <td>REVISED 8-12-02</td> <td>REVISED 9-4-02</td> </tr> <tr> <td>REVISED</td> <td>REVISED</td> </tr> <tr> <td>REVISED</td> <td>REVISED</td> </tr> </table>	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	APPROVAL 7-1-94	APPROVAL 7-1-94	REVISED 8-12-02	REVISED 9-4-02	REVISED	REVISED	REVISED	REVISED
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION										
APPROVAL 7-1-94	APPROVAL 7-1-94										
REVISED 8-12-02	REVISED 9-4-02										
REVISED	REVISED										
REVISED	REVISED										

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

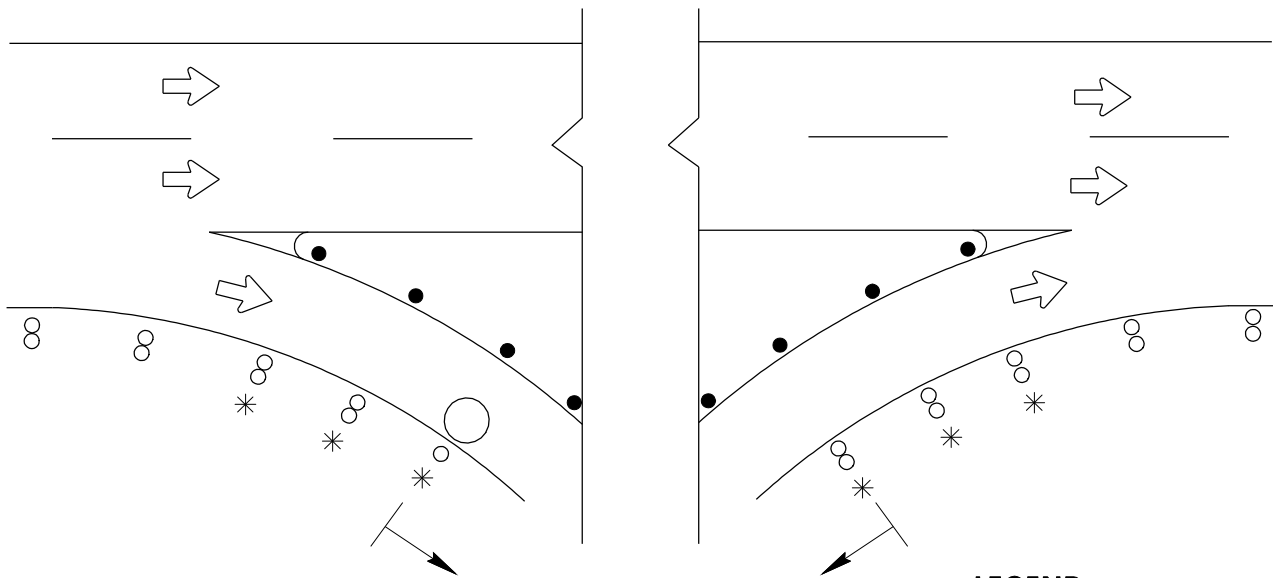
**PLACEMENT OF DELINEATORS AND MARKERS**

**STANDARD NO. MD 665.04**

## ACCEL / DECEL LANE DELINEATION



**NOTE** MILEPOST MARKERS ARE SUBSTITUTED FOR DELINEATORS IN TYPICAL SPACING.



**SPACING** MAINLINE - 264'  
ACCEL/DECEL - 100'

REFER TO STD MD 665.06 FOR SPACING AND CONTINUATION

**LEGEND**

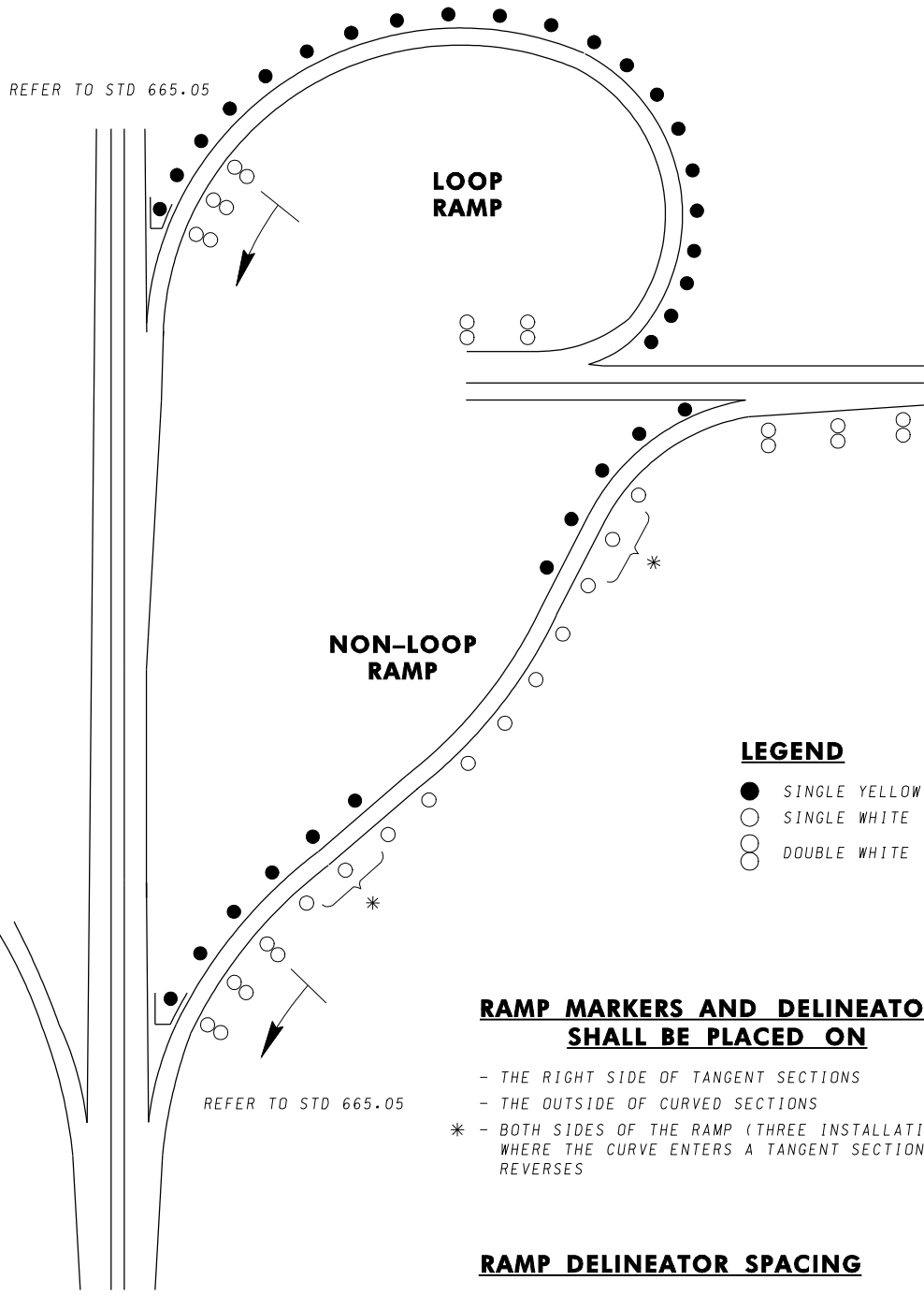
- - SINGLE WHITE
- - DOUBLE WHITE
- - SINGLE YELLOW

\* **NOTE** DOUBLE DELINEATOR INSTALLATIONS CONTINUE THREE INSTALLATIONS BEYOND PHYSICAL GORE.

<b>SPECIFICATION</b> 604, 605	<b>CATEGORY CODE ITEMS</b>	<b>Maryland Department of Transportation</b> <b>STATE HIGHWAY ADMINISTRATION</b> STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES	
<b>APPROVED</b>	 DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	<b>ACCEL / DECEL LANE DELINEATION</b>  <b>STANDARD NO. MD 665.05</b>	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
	APPROVAL	APPROVAL	
	REVISED 11-08-06	REVISED 10-25-06	
	REVISED	REVISED	
	REVISED	REVISED	



**RAMP DELINEATION**



**LOOP RAMP**

**NON-LOOP RAMP**


- LEGEND**
- SINGLE YELLOW
  - SINGLE WHITE
  - DOUBLE WHITE

**RAMP MARKERS AND DELINEATORS SHALL BE PLACED ON**

- THE RIGHT SIDE OF TANGENT SECTIONS
- THE OUTSIDE OF CURVED SECTIONS
- \* - BOTH SIDES OF THE RAMP (THREE INSTALLATIONS) WHERE THE CURVE ENTERS A TANGENT SECTION OR REVERSES

**RAMP DELINEATOR SPACING**

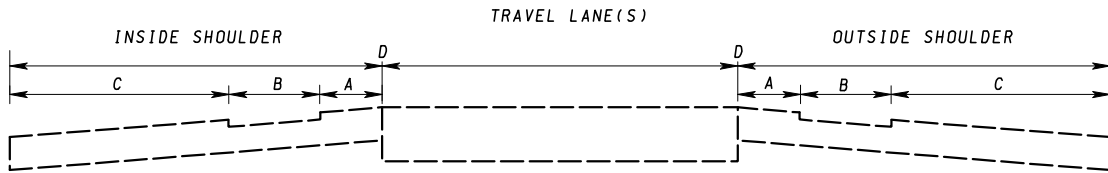
- SPACING SHOULD BE AS SPECIFIED IN MUTCD TABLE 111-1.

SPECIFICATION <b>604, 605</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 7-1-94
	REVISED 11-08-06
	REVISED 10-25-06

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

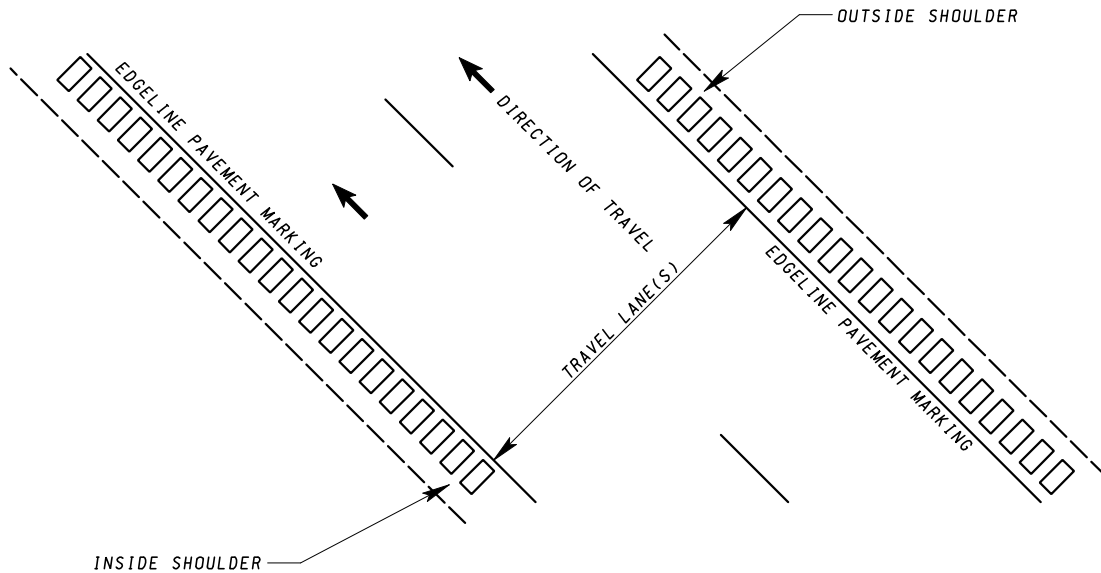
**RAMP DELINEATION**

**STANDARD NO. MD 665.06**



**CROSS-SECTION VIEW - INTERSTATES AND EXPRESSWAYS**

- A. 6" TO 12". OFFSET FROM PAVEMENT MARKING OR PAVEMENT JOINT TO EDGE OF RUMBLE STRIP. REFER TO STANDARDS FOR DETAILS.
- B. RUMBLE STRIP WIDTH. REFER TO STANDARDS FOR DETAILS.
- C. OFFSET FROM RUMBLE STRIP TO EDGE OF SHOULDER/PAVEMENT. REFER TO STANDARDS FOR DETAILS.
- D. EDGELINE OR PAVEMENT JOINT.



**PLAN VIEW - INTERSTATES AND EXPRESSWAYS**

**NOTES**

1. THE RUMBLE STRIPS ARE FOR USE ON NEW OR EXISTING ASPHALT OR CONCRETE SHOULDERS. THE PATTERN IS DESIGNED SO THAT IT CAN BE MILLED OR GROUND INTO THE SHOULDER. SEE SPECIFICATIONS.
2. THE LEADING EDGE OF A RUMBLE STRIP SHOULD NOT BE CLOSER THAN 6" TO ANY JOINT, TRANSVERSE OR LONGITUDINAL, IN CONCRETE SHOULDERS.

SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISD 5-23-17
	REVISD
	REVISD
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 3-31-04	
REVISD 4-14-17	
REVISD	
REVISD	

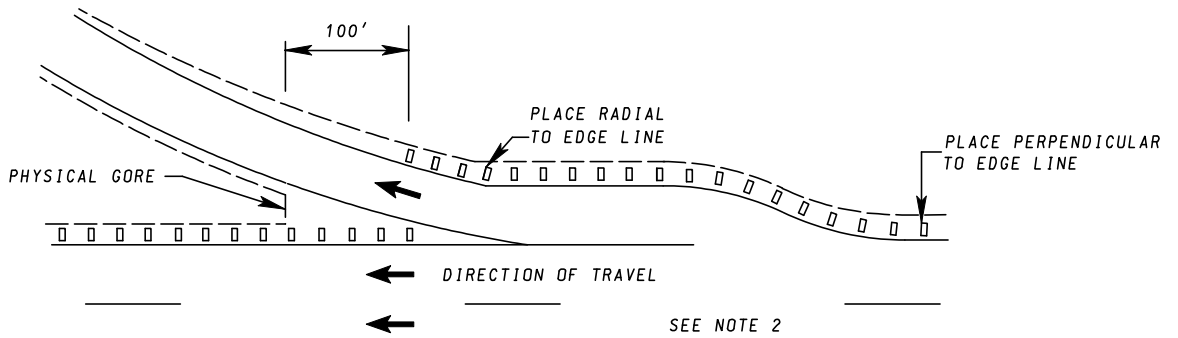
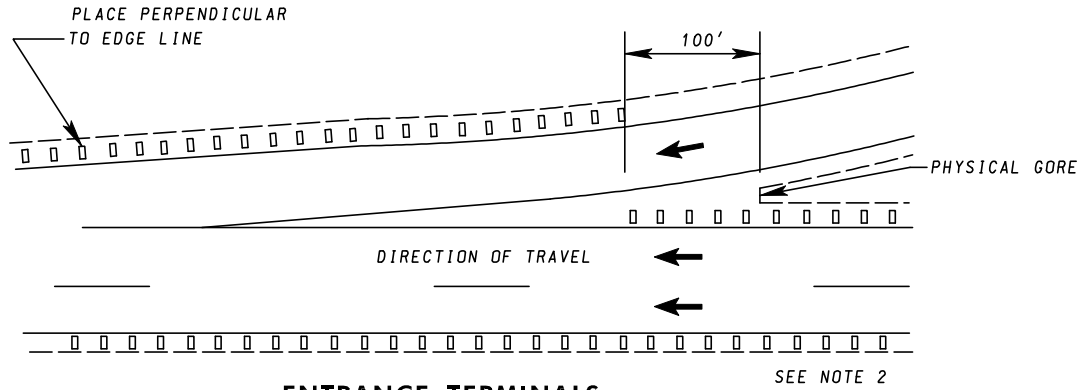
**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**

STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

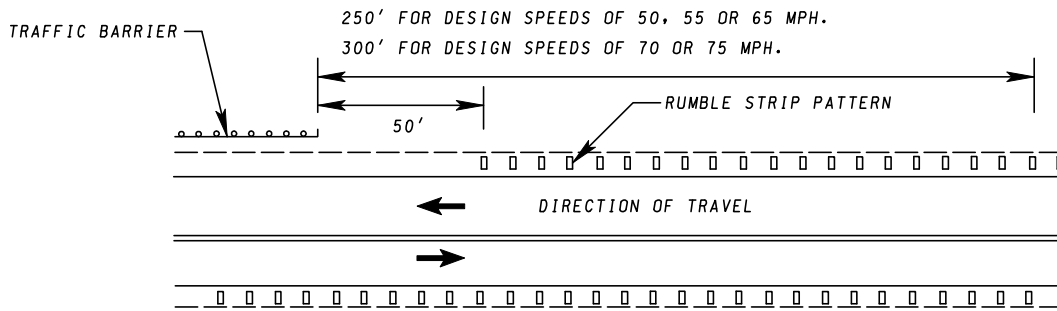
**LOCATION OF SHOULDER  
RUMBLE STRIPS**

**STANDARD NO.**

**MD 670.00**



**EXIT TERMINALS**



SEE NOTE 3

**RUMBLE STRIPS IN ADVANCE OF CRITICAL LOCATIONS**

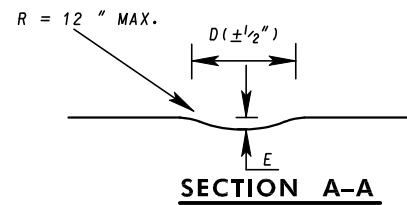
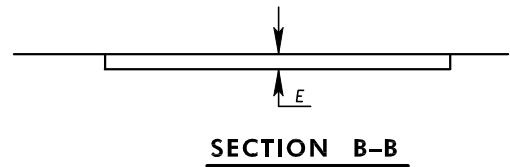
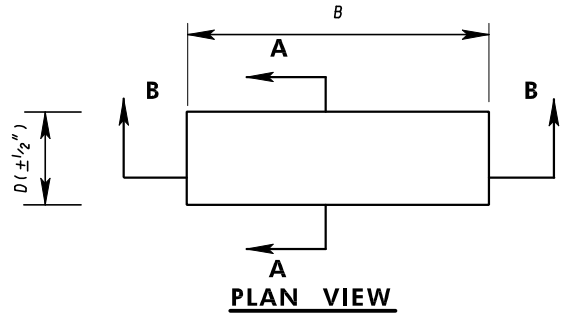
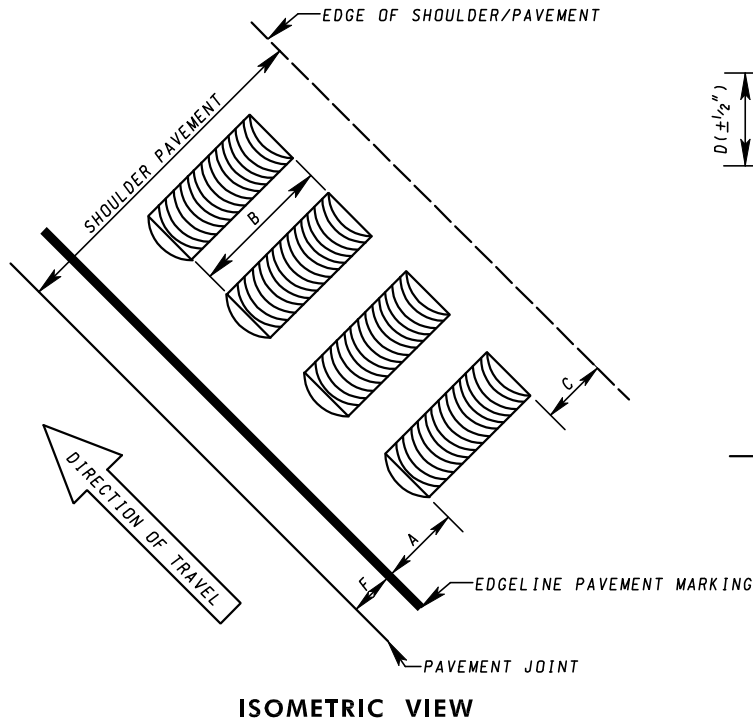
**NOTES**

1. SEE STANDARDS FOR RUMBLE STRIP DETAILS.
2. AT ENTRANCE AND EXIT TERMINALS, THE OUTSIDE SHOULDER PATTERN SHOULD BE EXTENDED TOWARD THE RAMP JUNCTURE AS FAR AS POSSIBLE, AND THEN SHIFTED OVER TO THE OUTSIDE SHOULDER OF THE TERMINAL AREA. THE PHYSICAL GORE OF AN ENTRANCE OR EXIT TERMINAL IS A LOGICAL REFERENCE POINT. ON EITHER TERMINAL EXTEND THE PATTERN 100' INTO THE TERMINAL AREA AND THEN TRANSFER TO THE OUTSIDE SHOULDER.
3. RUMBLE STRIPS, WHEN USED IN ADVANCE OF CRITICAL LOCATIONS, SUCH AS APPROACHES TO NARROW BRIDGES, IN GORE AREAS, AND AHEAD OF TRAFFIC BARRIER END TREATMENTS, SHOULD BE PLACED AS SHOWN.

SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 2-10-04
	REVISED 5-23-17
	REVISED
	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 3-31-04	
REVISED 3-24-17	
REVISED	
REVISED	

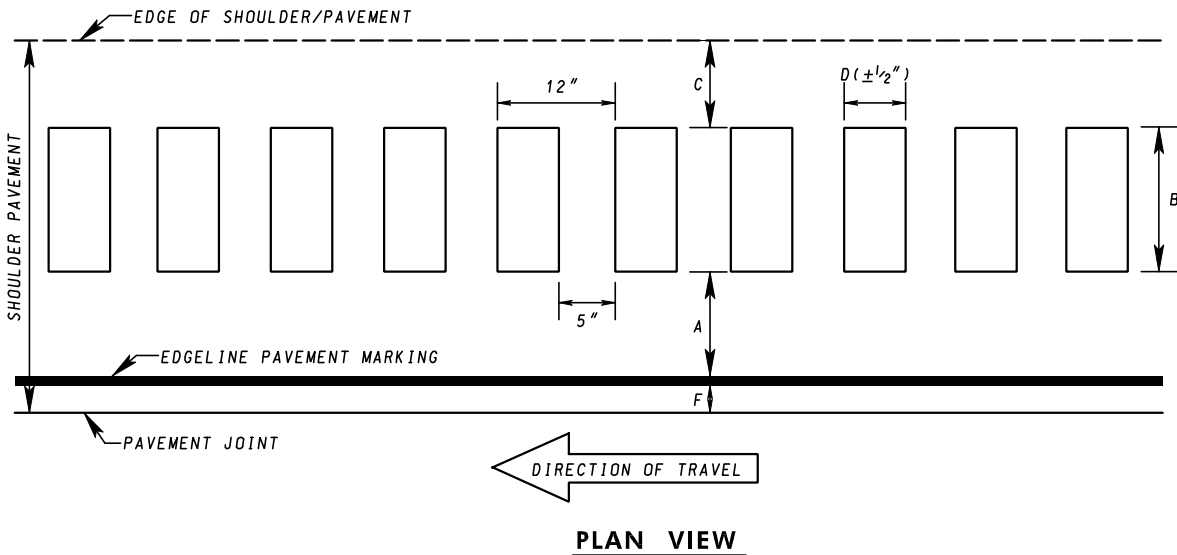
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**LOCATION OF SHOULDER RUMBLE STRIPS AT CRITICAL LOCATIONS**

**STANDARD NO. MD 670.01**



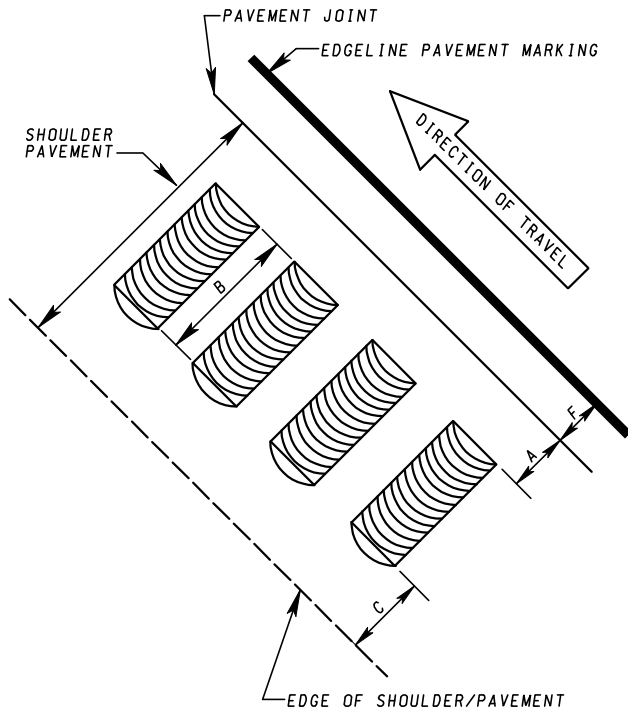
**NOTES**

1. SEE SHOULDER RUMBLE STRIP AND RUMBLE STRIPE STANDARDS FOR MORE INFORMATION.



SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-10-04	APPROVAL 3-31-04
	REVISED 5-23-17	REVISED 3-24-17
	REVISED	REVISED
	REVISED	REVISED

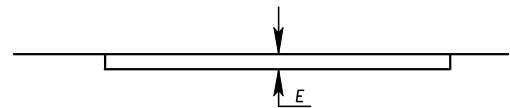
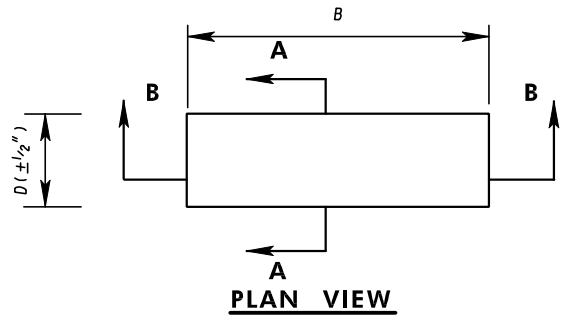
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**OUTSIDE SHOULDER RUMBLE STRIP DETAILS**  
**TYPICAL LAYOUT**  
 STANDARD NO. MD 670.02



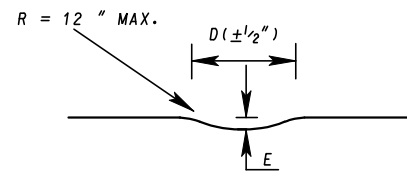
**ISOMETRIC VIEW**

**NOTES**

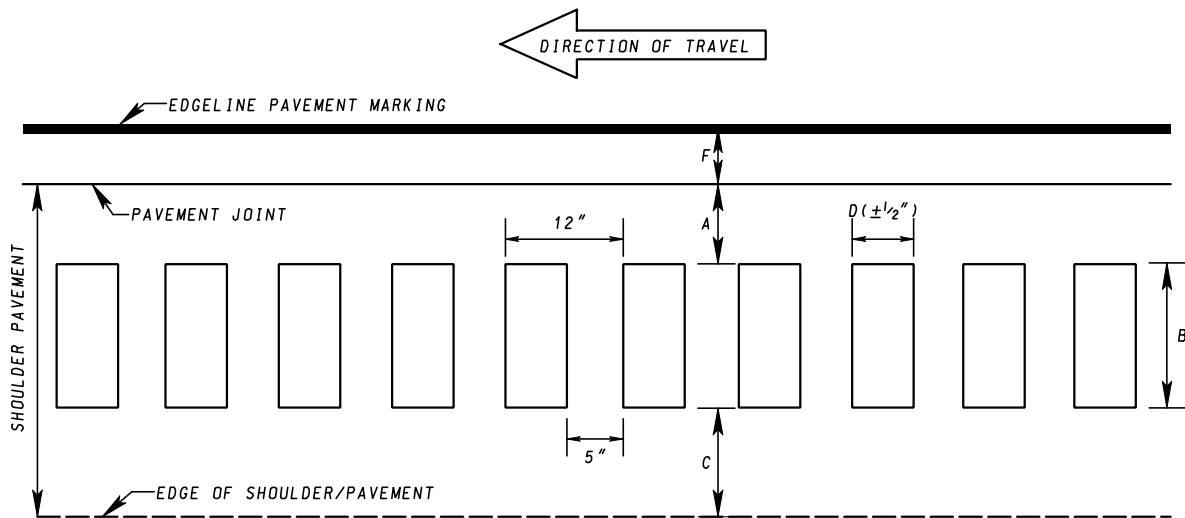
1. SEE SHOULDER RUMBLE STRIP AND RUMBLE STRIPE STANDARDS FOR MORE INFORMATION.



**SECTION B-B**



**SECTION A-A**



**PLAN VIEW**

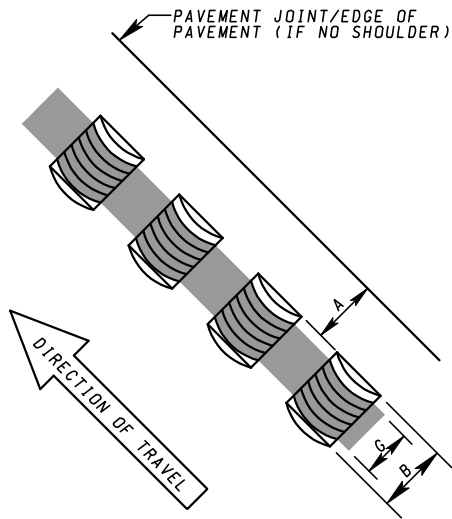
SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 5-23-17	APPROVAL 3-24-17
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**INSIDE SHOULDER  
RUMBLE STRIP DETAILS  
TYPICAL LAYOUT**

**STANDARD NO.**

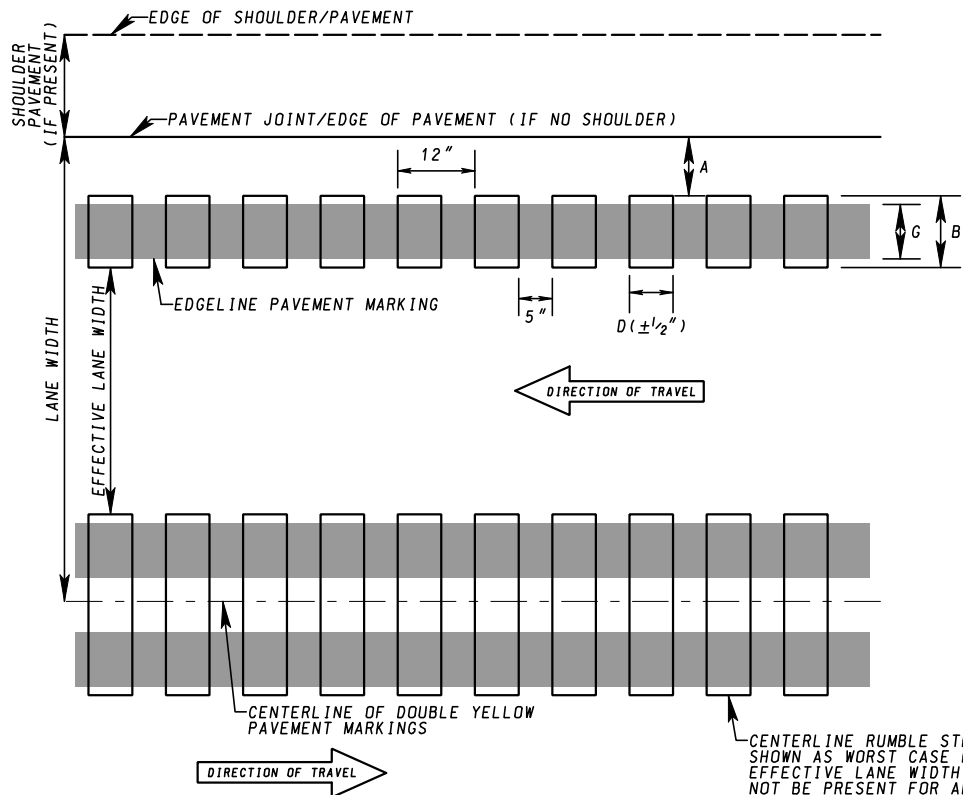
**MD 670.03**



**NOTES**

1. REFER TO INSIDE/OUTSIDE SHOULDER RUMBLE STRIP DETAILS TYPICAL LAYOUT FOR RUMBLE STRIP DEPTH AND SECTION DETAILS.
2. EFFECTIVE LANE WIDTH IS MEASURED AS CLEAR DISTANCE BETWEEN OUTSIDE RUMBLE STRIP (TRAFFIC SIDE EDGE) AND INSIDE PAVEMENT MARKING (TRAFFIC SIDE EDGE) OR RUMBLE STRIP (TRAFFIC SIDE EDGE).
3. G = PAVEMENT MARKING WIDTH (TYPICALLY 5" OR 10"). RUMBLE STRIP WIDTH (B) VARIES ACCORDINGLY (6" FOR 5" MARKINGS, 12" FOR 10" MARKINGS). SEE SHOULDER RUMBLE STRIP AND RUMBLE STRIPE DETAILS FOR MORE INFORMATION.
4. SEE SHOULDER RUMBLE STRIP AND RUMBLE STRIPE DETAILS FOR MORE INFORMATION.

**ISOMETRIC VIEW**



**PLAN VIEW**

CENTERLINE RUMBLE STRIPS SHOWN AS WORST CASE FOR EFFECTIVE LANE WIDTH, MAY NOT BE PRESENT FOR ALL CASES

SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS	
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 5-23-17	APPROVAL 3-24-17
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**RUMBLE STRIPE DETAILS**  
**TYPICAL LAYOUT**

**STANDARD NO.**

**MD 670.04**

**OUTSIDE SHOULDER RUMBLE STRIP APPLICATION**

ROADWAY TYPE * SEE NOTES BELOW	OFFSET FROM PAVEMENT MARKING TO RUMBLE STRIP	RUMBLE STRIP WIDTH	OFFSET FROM RUMBLE STRIP TO EDGE OF SHOULDER/PAVEMENT	RUMBLE STRIP LENGTH	RUMBLE STRIP DEPTH	OFFSET FROM PAVEMENT JOINT TO PAVEMENT MARKING	MINIMUM SHOULDER PAVEMENT WIDTH
	A	B	C	D	E	F	
INTERSTATES OR EXPRESSWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" MIN. 12" MAX.	12" MIN. 16" STD.	6" ABSOLUTE MIN. 12" PREF. MIN.	7"	1/2" MIN. 5/8" MAX.	1" MIN. 2" STD.	25"
ALL OTHER HIGHWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" MIN. 12" MAX.	6" MIN. 12" STD.	<b>48" MIN. REQUIRED</b>	5" MIN. 7" STD.	3/8" MIN. FOR 5" LENGTH 1/2" MIN. - 5/8" MAX. FOR 7" LENGTH	1" MIN. 2" STD.	61"

**INSIDE SHOULDER RUMBLE STRIP APPLICATION**


ROADWAY TYPE * SEE NOTES BELOW	OFFSET FROM PAVEMENT JOINT TO RUMBLE STRIP	RUMBLE STRIP WIDTH	OFFSET FROM RUMBLE STRIP TO EDGE OF SHOULDER/PAVEMENT	RUMBLE STRIP LENGTH	RUMBLE STRIP DEPTH	OFFSET FROM PAVEMENT JOINT TO PAVEMENT MARKING	MINIMUM SHOULDER PAVEMENT WIDTH
	A	B	C	D	E	F	
INTERSTATES OR EXPRESSWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" MIN. 12" MAX.	12" MIN. 16" STD.	6" ABSOLUTE MIN. 12" PREF. MIN.	7"	1/2" MIN. 5/8" MAX.	1" MIN. 2" STD.	30"
ALL OTHER HIGHWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" MIN. 12" MAX.	6" MIN. 12" STD.	6" ABSOLUTE MIN. 12" PREF. MIN.	5" MIN. 7" STD.	3/8" MIN. FOR 5" LENGTH 1/2" MIN. - 5/8" MAX. FOR 7" LENGTH	1" MIN. 2" STD.	24"

**RUMBLE STRIPE APPLICATION**

ROADWAY TYPE * SEE NOTES BELOW	OFFSET FROM PAVEMENT JOINT TO RUMBLE STRIP	RUMBLE STRIP WIDTH	RUMBLE STRIP LENGTH	RUMBLE STRIP DEPTH	PAVEMENT MARKING WIDTH	MINIMUM EFFECTIVE LANE WIDTH
	A	B	D	E	G	
INTERSTATES OR EXPRESSWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" STD.	6" FOR MARKINGS 12" FOR 10" MARKINGS	7"	1/2" MIN. 5/8" MAX.	TYPICALLY 5" OR 10"	<b>9'-4" MIN. REQUIRED</b>
ALL OTHER HIGHWAYS * (POSTED SPEED 40 MPH OR GREATER)	6" STD.	6" FOR MARKINGS 12" FOR 10" MARKINGS	5" MIN. 7" STD.	3/8" MIN. FOR 5" LENGTH 1/2" MIN. - 5/8" MAX. FOR 7" LENGTH	TYPICALLY 5" OR 10"	<b>9'-4" MIN. REQUIRED</b>

**NOTES**

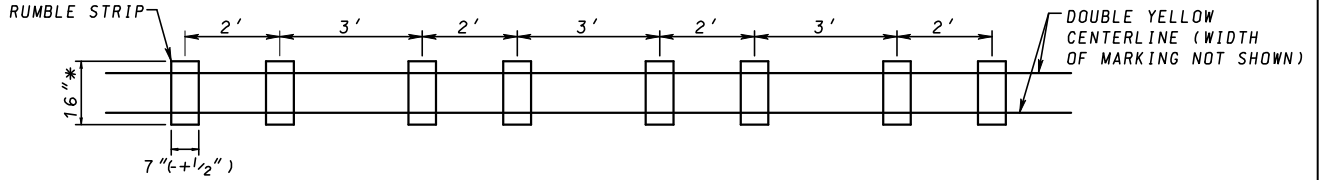
- BICYCLES ARE ASSUMED TO BE PROHIBITED FROM ALL INTERSTATE AND EXPRESSWAYS AS PER MD VEHICLE LAW.
- IF BICYCLES ARE PERMITTED ON SEGMENTS OF INTERSTATES AND EXPRESSWAYS, REGARDLESS OF POSTED SPEED, RUMBLE STRIPS SHALL BE INSTALLED AS PER THE 'ALL OTHER HIGHWAYS' REQUIREMENTS.

SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS
APPROVED	<i>[Signature]</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 5-23-17
	APPROVAL 3-24-17
REVISD	REVISD
REVISD	REVISD
REVISD	REVISD

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**SHOULDER RUMBLE STRIP**  
**AND RUMBLE STRIPE**  
**DETAILS**

**STANDARD NO.**

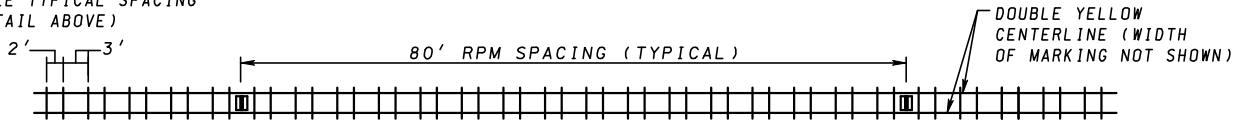
**MD 670.05**



\* - RUMBLE STRIP WIDTH MAY BE REDUCED TO 12" FOR ROADWAYS THAT HAVE ADJACENT TRAVEL LANES THAT ARE LESS THAN 12' IN WIDTH TO PROVIDE MORE EFFECTIVE LANE WIDTH

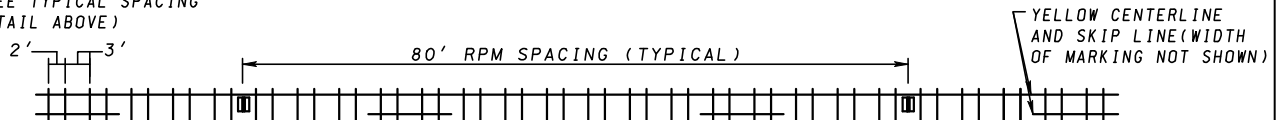
**TYPICAL SPACING DETAIL  
(PLAN VIEW)**

RUMBLE STRIP LENGTH NOT SHOWN FOR CLARITY (SEE TYPICAL SPACING DETAIL ABOVE)



**NON-PASSING LAYOUT WITH RPM SPACING**

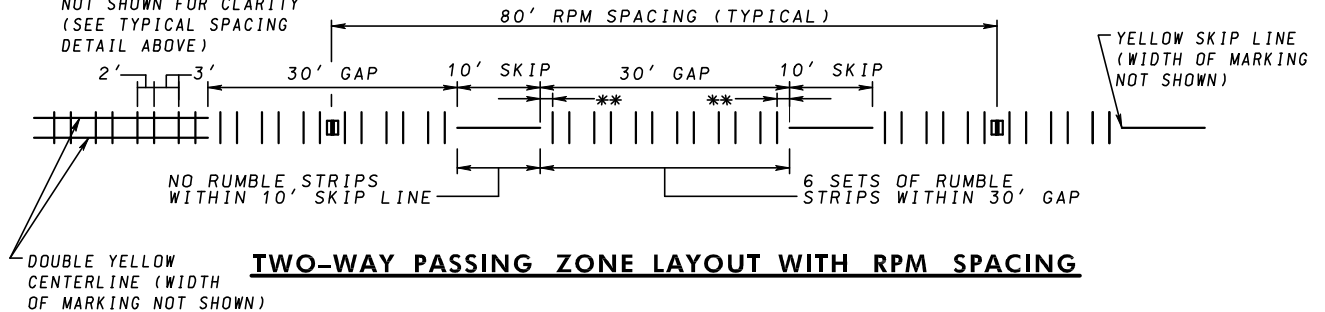
RUMBLE STRIP LENGTH NOT SHOWN FOR CLARITY (SEE TYPICAL SPACING DETAIL ABOVE)



**SINGLE DIRECTION PASSING ZONE LAYOUT WITH RPM SPACING**

RUMBLE STRIP LENGTH NOT SHOWN FOR CLARITY (SEE TYPICAL SPACING DETAIL ABOVE)

\*\* - 18" FROM EDGE OF SKIP TO CENTERLINE OF FIRST RUMBLE STRIP (TYPICAL)



**TWO-WAY PASSING ZONE LAYOUT WITH RPM SPACING**

SPECIFICATION <b>610</b>	CATEGORY CODE ITEMS
APPROVED	DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 5-23-17
	APPROVAL 3-24-17
	REVISIONS

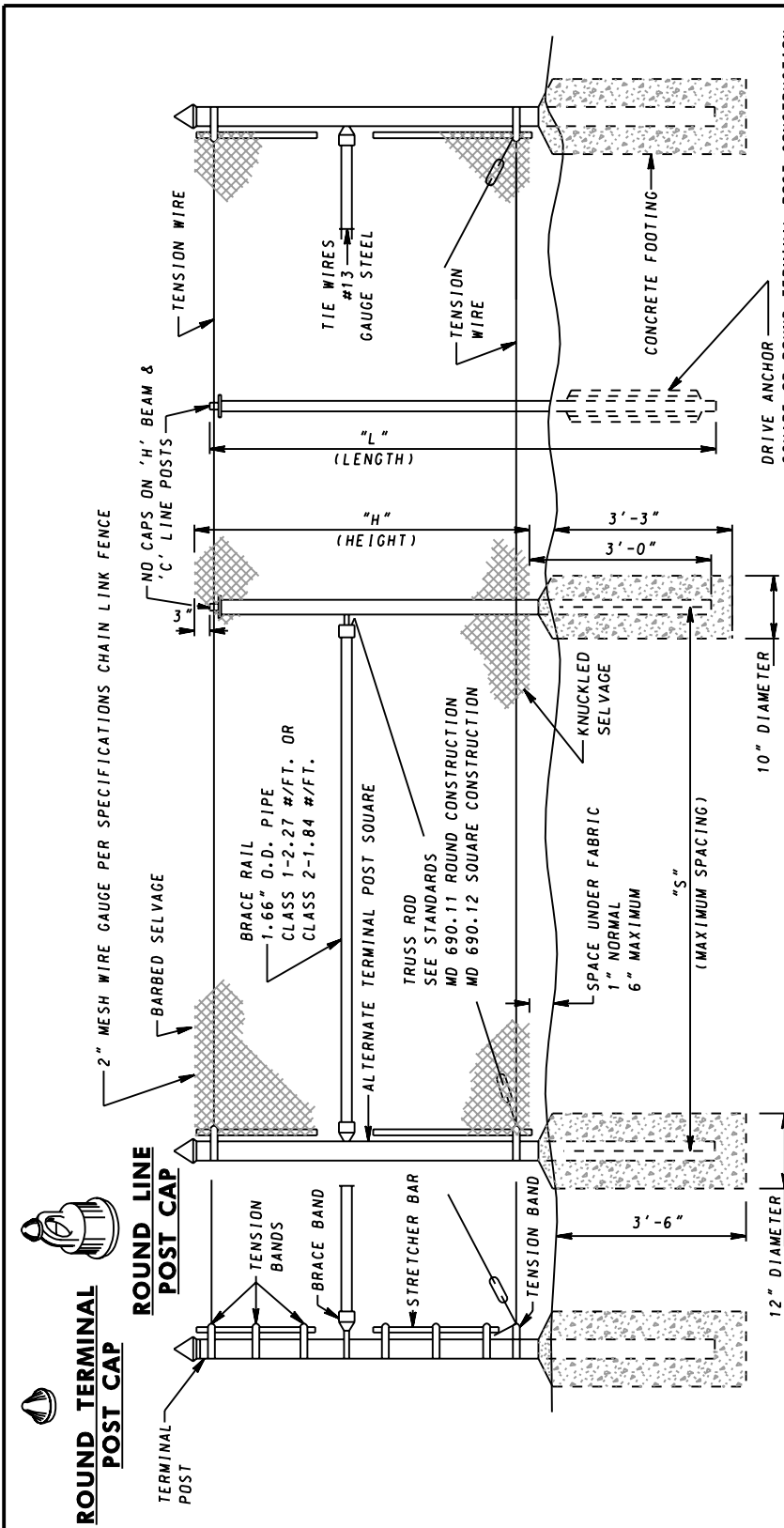
**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CENTERLINE RUMBLE STRIP DETAILS  
AND TYPICAL LAYOUT**

STANDARD NO.

MD 670.06





DRIVE ANCHOR  
 SQUARE OR ROUND TERMINAL POST CONSTRUCTION  
 ALTERNATE TO CONCRETE FOOTING  
 SEE DETAIL STANDARD MD 690.21,  
 MD 690.23, MD 690.24, OR MD 690.25.

**NOTES**

1. ALL ROUND LINE POSTS TO BE CAPPED WITH LOOP CAPS. TENSION WIRE TO RUN THROUGH LOOPS. CAPS TO BE FASTENED TO ALL TERMINAL POSTS WITH TENSION BANDS.
2. FASTEN FABRIC TO TENSION WIRE WITH HOG RINGS @18" ± C/C. HOG RINGS TO BE 12 1/2 GAUGE GALVANIZED STEEL WIRE.
3. MATERIALS TO MEET REQUIREMENTS OF AASHTO M 181.
4. REFER TO SPECIFICATION 914.01 WHEN VINYL IS SPECIFIED.
5. THE COLOR OF THE COATING SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

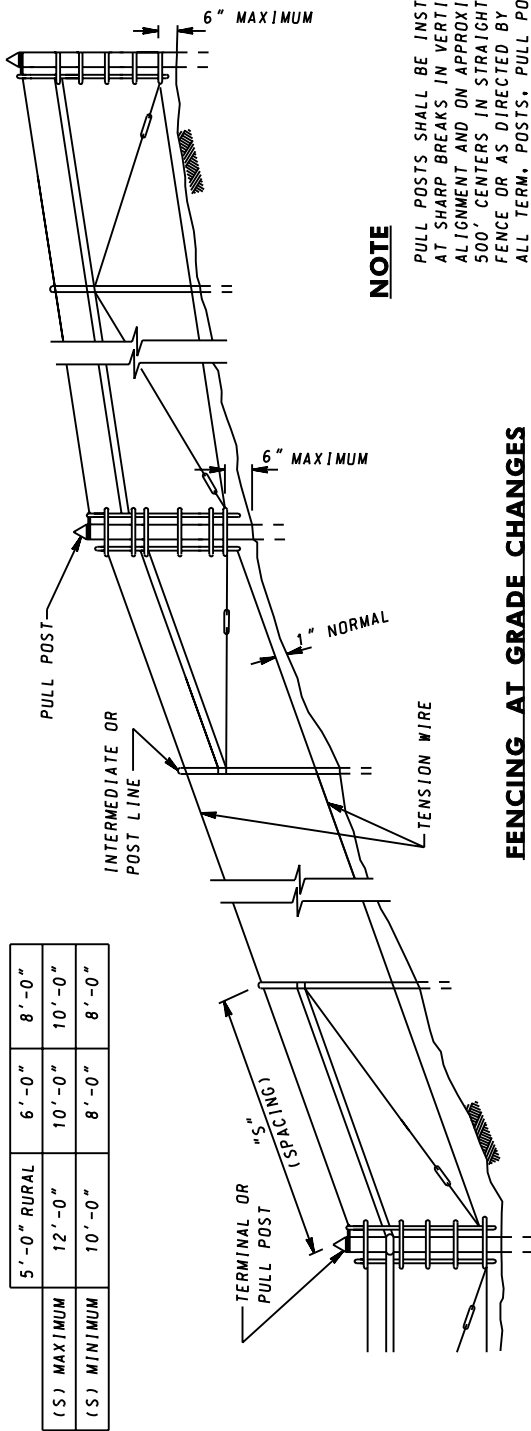
"H" HEIGHT OF FENCE	5' - 0" RURAL	6' - 0"	8' - 0"
"S" POST SPACING-MAX. CAP	12' - 0"	10' - 0"	10' - 0"
"L" LENGTH INCL. CAP	7' - 8" MIN.	8' - 8" MIN.	10' - 8"
LINE POSTS			
ROUND-CLASS 1	1.90" 0.0. @2.72 #/FT	2.375" 0.0. @3.65 #/FT	2.375" 0.0. @3.65 #/FT
ROUND-CLASS 2	1.90" 0.0. @2.28 #/FT	2.375" 0.0. @3.12 #/FT	2.375" 0.0. @3.12 #/FT
H-BEAM-STEEL	2.25" x1.17" @3.26 #/FT	2.25" x1.17" @3.26 #/FT	2.25" x1.17" @3.26 #/FT
H-BEAM-ALUM.	2.25" x1.95" @1.25 #/FT	2.25" x1.95" @1.25 #/FT	2.25" x1.95" @1.25 #/FT
C-POST-STEEL	2.25" x1.70" @2.73 #/FT	2.25" x1.70" @2.73 #/FT	2.25" x1.70" @2.73 #/FT
TERM. POSTS			
ROUND-CLASS 1	2.375" 0.0. @3.65 #/FT	2.875" 0.0. @5.79 #/FT	2.875" 0.0. @5.79 #/FT
ROUND-CLASS 2	2.375" 0.0. @3.12 #/FT	2.875" 0.0. @4.64 #/FT	2.875" 0.0. @4.64 #/FT
SQUARE-ALT.	2.00" SO. @3.60 #/FT	2.50" SO. @5.70 #/FT	2.50" SO. @5.70 #/FT

SPECIFICATION <b>607</b>	CATEGORY CODE ITEMS
APPROVED <i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
<b>SHA</b> State Highway Administration	APPROVAL • SHA REVISIONS APPROVAL 6-4-84 REVISED 10-1-01
	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION APPROVAL 8-1-84 REVISED 10-10-89
	REVISED
	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CHAIN LINK FENCE**  
**TYPICAL 5 FT. RURAL 6 FT. & 8 FT**

**STANDARD NO. MD 690.01**

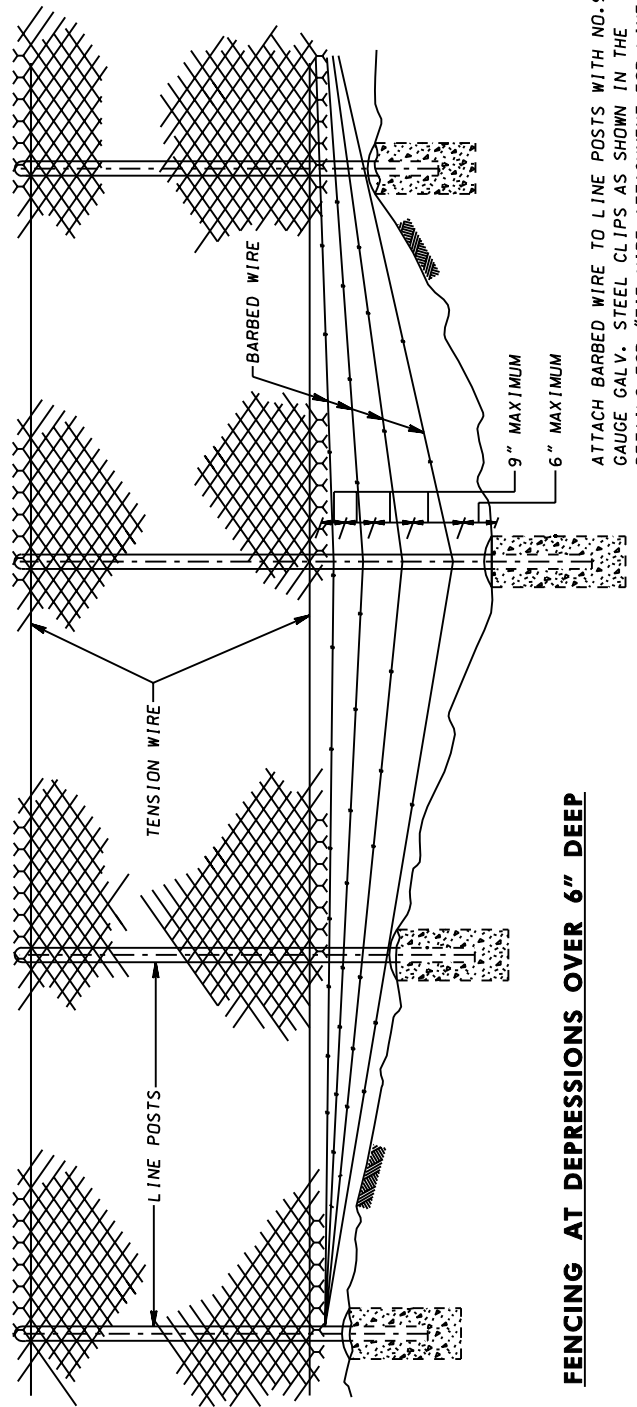


	5'-0" RURAL	6'-0"	8'-0"
(S) MAXIMUM	12'-0"	10'-0"	10'-0"
(S) MINIMUM	10'-0"	8'-0"	8'-0"

**NOTE**

PULL POSTS SHALL BE INSTALLED AT SHARP BREAKS IN VERTICAL ALIGNMENT AND ON APPROXIMATE 500' CENTERS IN STRAIGHT RUNS OF FENCE OR AS DIRECTED BY THE ENGINEER. ALL TERM, POSTS, PULL POSTS & CORNER POSTS SHALL BE BRACED AS SHOWN.

**FENCING AT GRADE CHANGES**



**FENCING AT DEPRESSIONS OVER 6" DEEP**

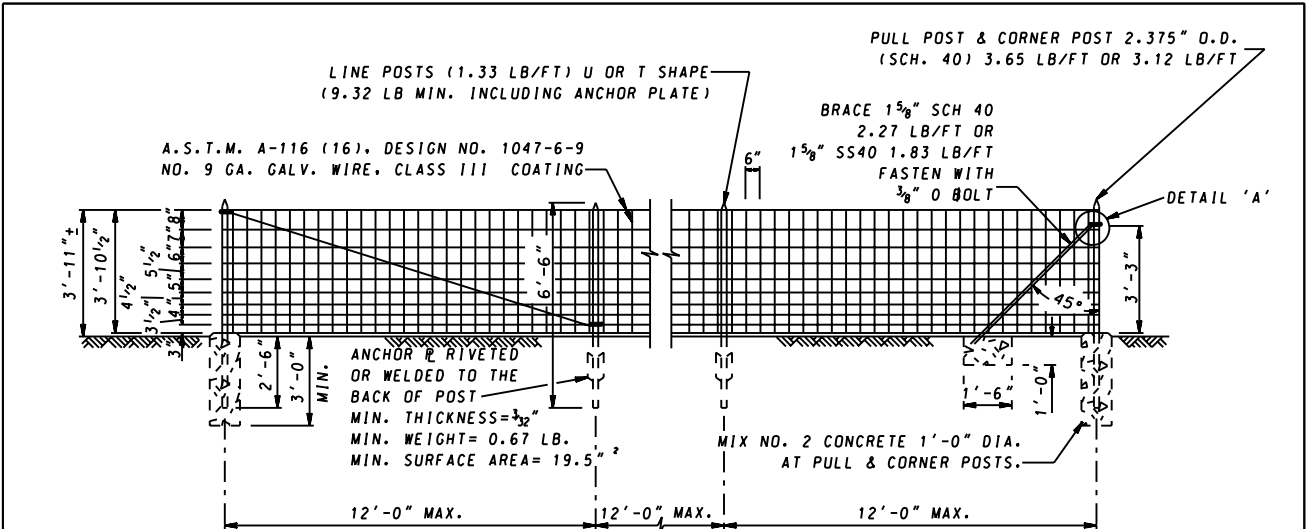
ATTACH BARBED WIRE TO LINE POSTS WITH NO. 9 GAUGE GALV. STEEL CLIPS AS SHOWN IN THE DETAILS FOR "TIE WIRE ATTACHMENT FOR LINE POST" ON STANDARD MD 690.21.

SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 12-1-70	APPROVAL 9-14-71
	REVISED 10-1-01	REVISED 4-23-85
	REVISED	REVISED
	REVISED	REVISED

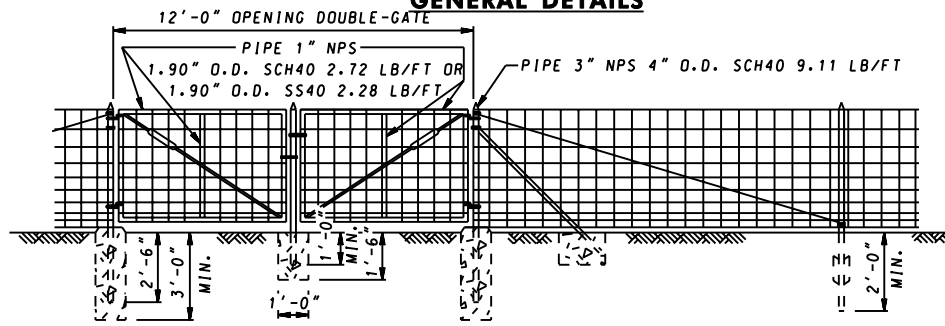
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CHAIN LINK FENCE**  
**AT GRADE CHANGES & DEPRESSIONS**

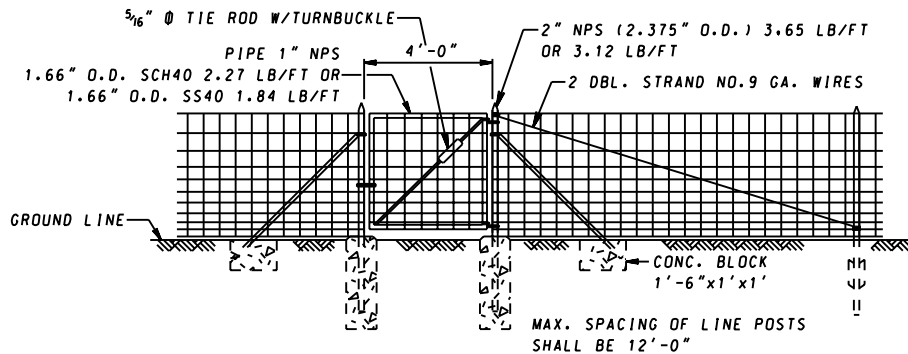
**STANDARD NO. MD 690.02**



**GENERAL DETAILS**



**DOUBLE SWING GATE**

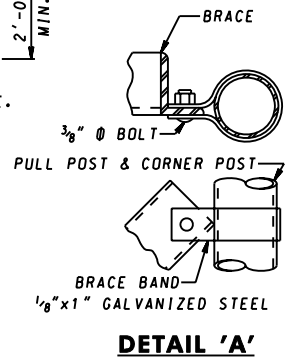


**SINGLE GATE**

NOMINAL PIPE SIZE (NPS)

**NOTE**

POSTS IN ROCK—WHERE SUBSTANTIAL ROCK IS ENCOUNTERED A HOLE ONE (1") INCH LARGER IN DIAMETER THAN THE POST AND OF 12" MINIMUM DEPTH FOR LINE POSTS AN 18" MINIMUM DEPTH FOR TERMINAL POSTS, SHALL BE MADE AFTER INSERTING THE POSTS. THE HOLES SHALL BE BACK FILLED WITH A HAND MIXED 1:2 MORTAR CONSISTING OF ONE PART PORTLAND CEMENT AND TWO PARTS FINE AGGREGATES MIXED TO A PLASTIC CONSISTENCY SHOWING NO SIGNS OF FREE WATER. THE HAND MIXING AND CONSOLIDATION OF THE MORTAR SHALL BE PERFORMED IN A MANNER APPROVED BY THE ENGINEER. THE WEIGHT OF STEEL PIPE CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN-5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT. THE WEIGHT OF STEEL SHAPES CALLED FOR ON THIS STANDARD SHALL NOT VARY MORE THAN-2.5% FROM THE INDICATED WEIGHT, BUT MAY EXCEED SUCH INDICATED WEIGHT.



**DETAIL 'A'**

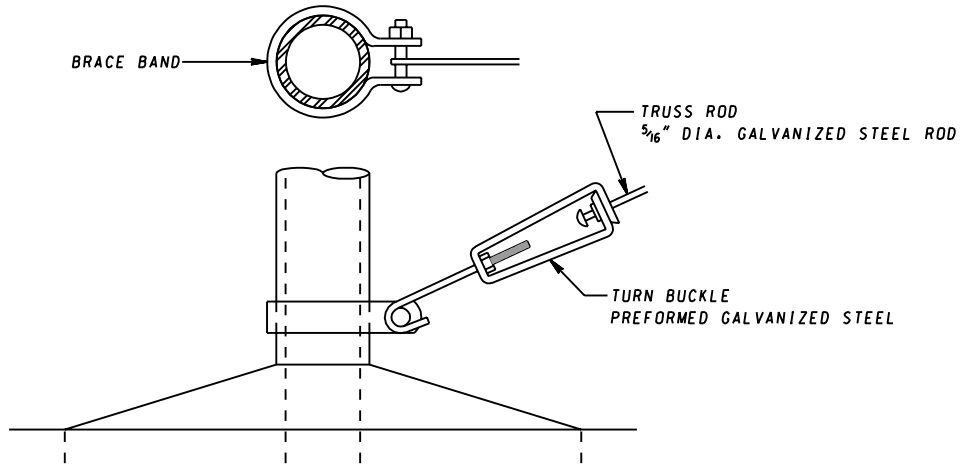
SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kat G. McCallum</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 10-21-76	APPROVAL
	REVISED 8-05-08	REVISED 7-28-08
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

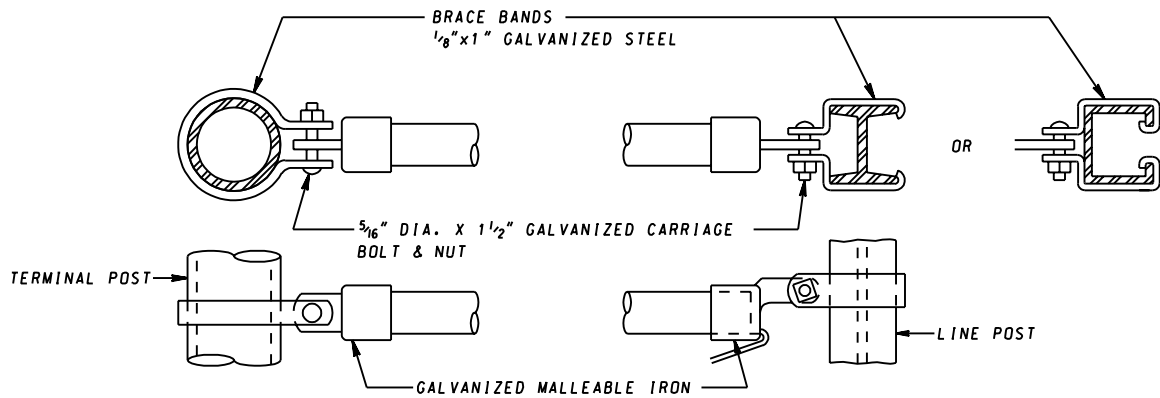
**4'-0" FARM TYPE FENCE**

**STANDARD NO.**

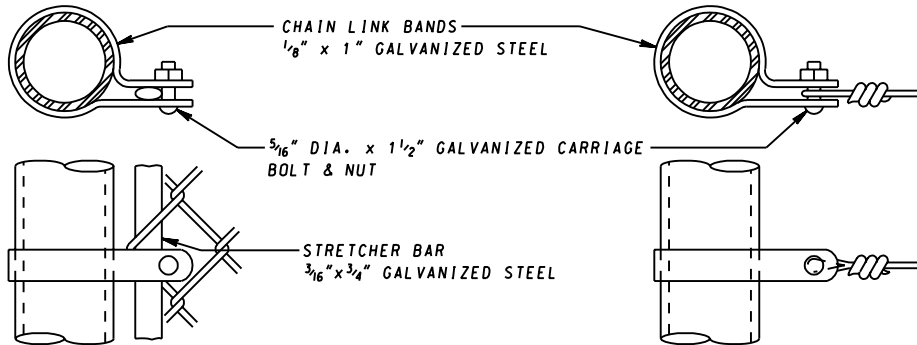
**MD 690.03**



**TRUSS BRACE ATTACHMENT FOR ROUND CONSTRUCTION**




**BRACE RAIL ATTACHMENT FOR ROUND CONSTRUCTION**



**STRETCHER ROD ATTACHMENT**

**ATTACHMENT FOR BARB WIRE OR TENSION WIRE**

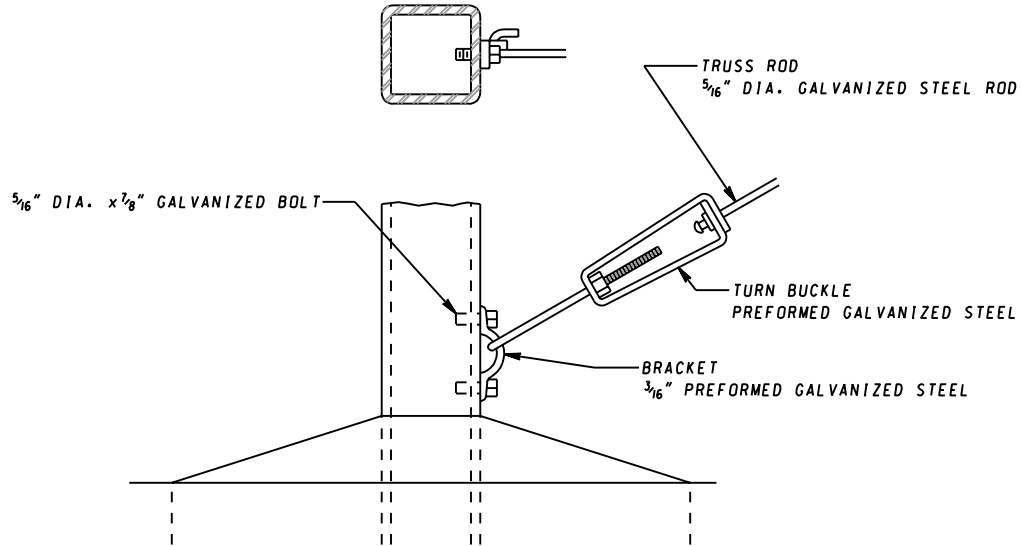
SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 12-1-70	APPROVAL 9-14-71
	REVISED 10-1-01	REVISED 8-1-94
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION**

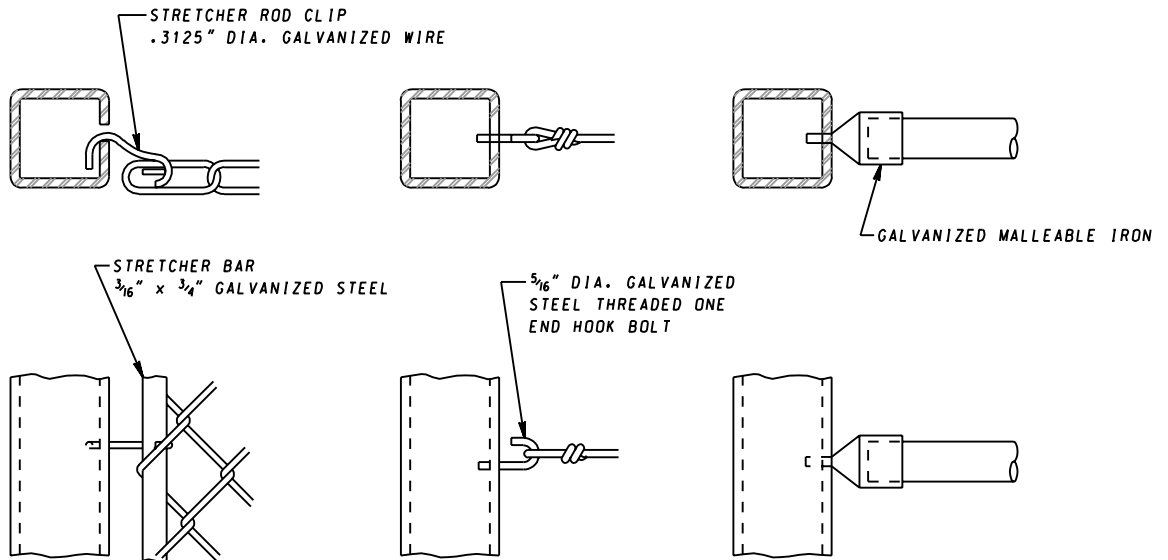
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

**CHAIN LINK FENCE  
BRACE & ROD ATTACHMENTS-  
ROUND CONSTRUCTION**

**STANDARD NO. MD 690.11**




**ALTERNATE TRUSS BRACE ATTACHMENT FOR SQUARE CONSTRUCTION**



**ALTERNATE STRETCHER ROD ATTACHMENT**

**ALTERNATE ATTACHMENT FOR BARB WIRE OR TENSION WIRE**

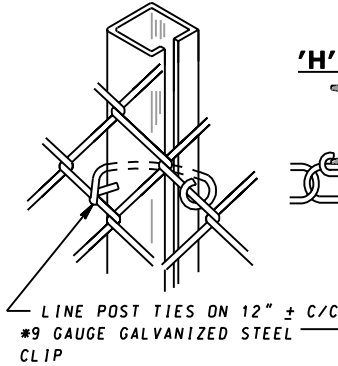
**ALTERNATE BRACE RAIL ATTACHMENT FOR SQUARE CONSTRUCTION**

SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 12-1-70	APPROVAL 9-14-71
	REVISED 10-1-01	REVISED
	REVISED	REVISED

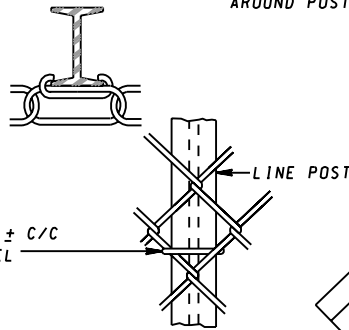
**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CHAIN LINK FENCE**  
**BRACE & ROD ATTACHMENTS-SQUARE CONSTRUCTION**

**STANDARD NO. MD 690.12**

**'C' POST OR 'ROUND' POST**



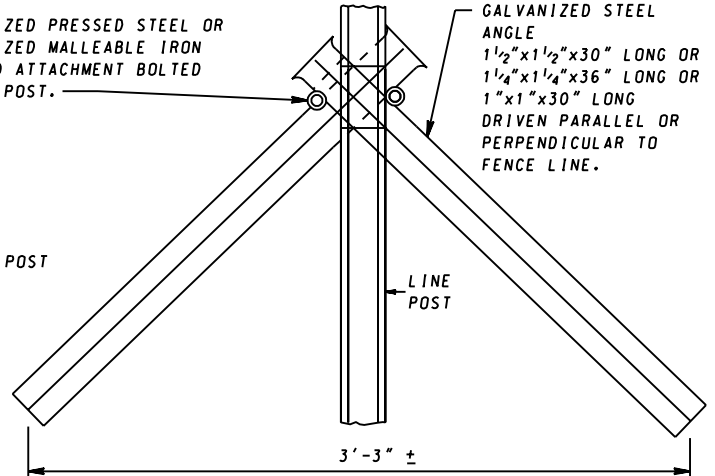
**'H' POST**



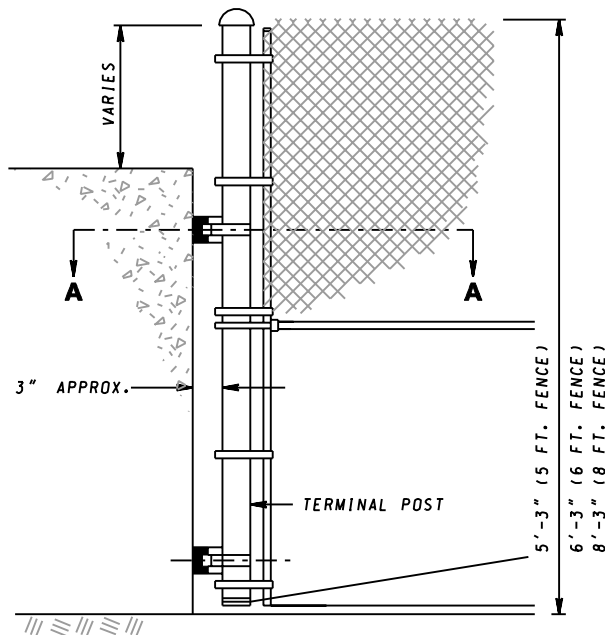
**TIE WIRE ATTACHMENT FOR LINE POST**

GALVANIZED PRESSED STEEL OR GALVANIZED MALLEABLE IRON SLOTTED ATTACHMENT BOLTED AROUND POST.

DRIVE ANCHOR BLADE GALVANIZED STEEL ANGLE 1 1/2" x 1 1/2" x 30" LONG OR 1 1/4" x 1 1/4" x 36" LONG OR 1" x 1" x 30" LONG DRIVEN PARALLEL OR PERPENDICULAR TO FENCE LINE.

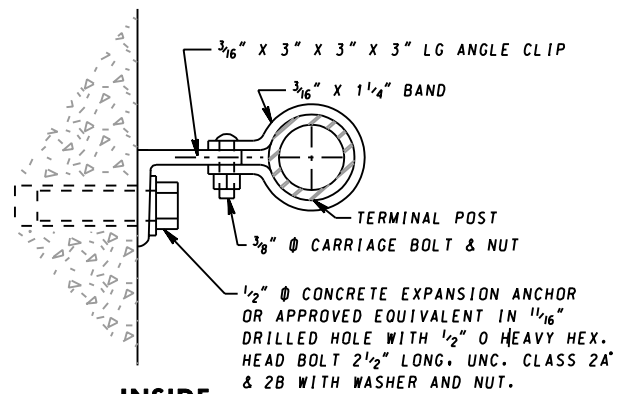


**DRIVE ANCHOR FOR LINE POST ALTERNATE TO CONCRETE FOOTING**



**ALTERNATE POST ATTACHMENT AT BRIDGE END**

**OUTSIDE**



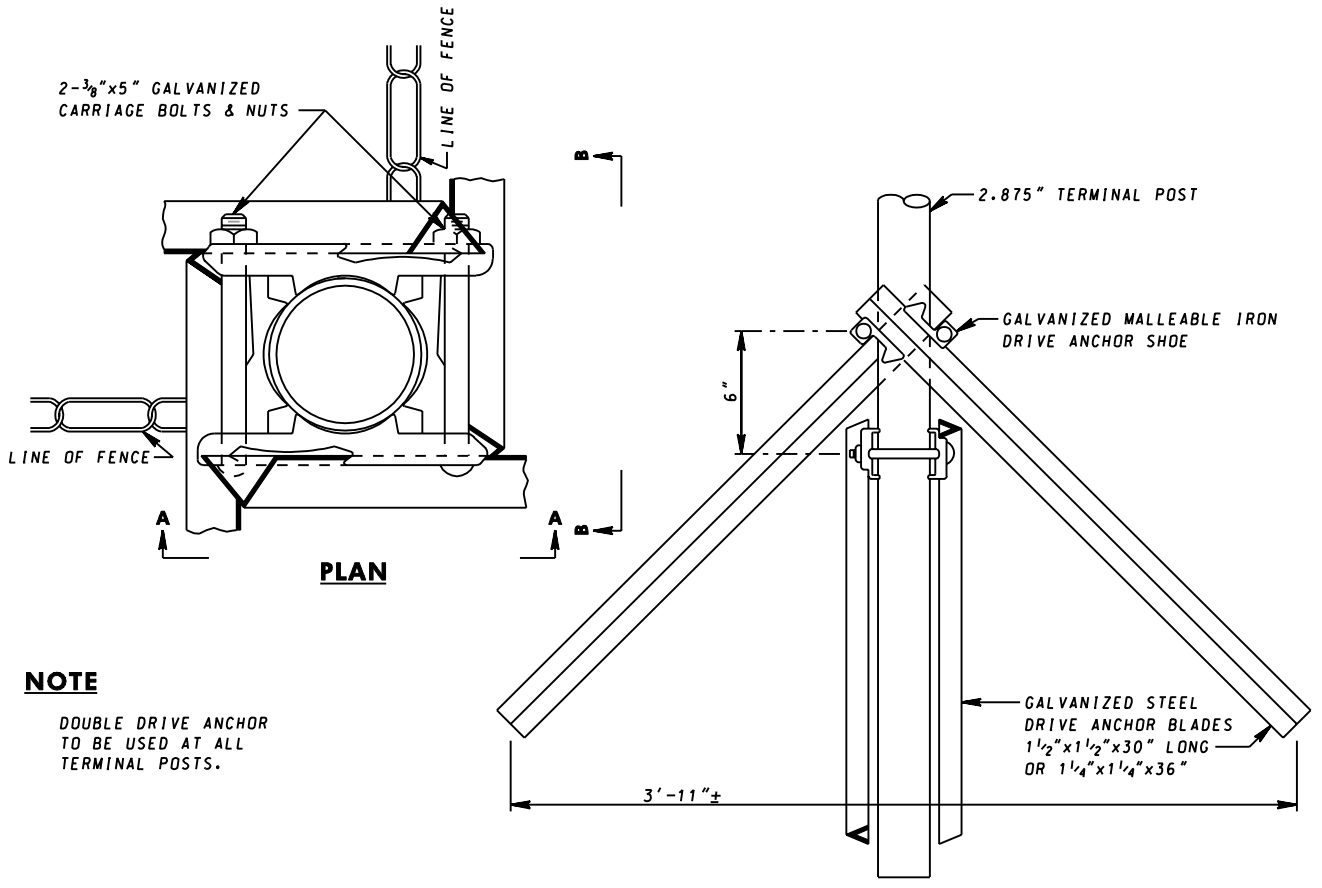
**INSIDE**

**SECTION A-A**

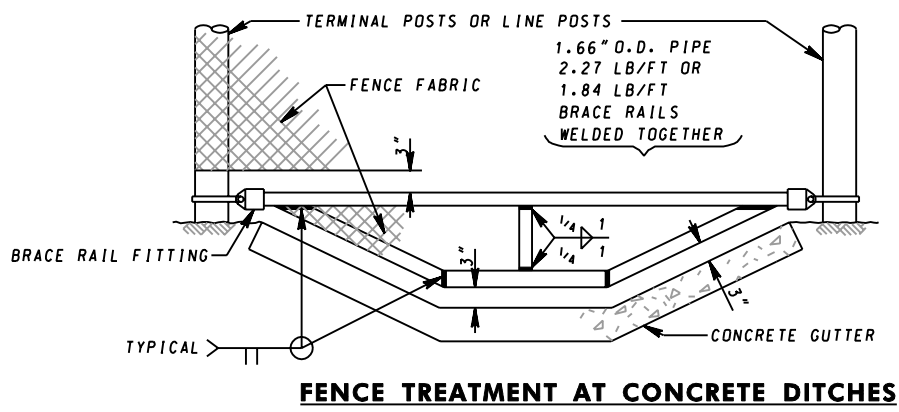
SPECIFICATION	CATEGORY CODE ITEMS	
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT	
	APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
	APPROVAL 2-1-70	APPROVAL 9-14-71
	REVISED 10-1-01	REVISED 4-23-85
	REVISED	REVISED
	REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
**CHAIN LINK FENCE**  
**DRIVE ANCHOR & POST ATTACHMENT**  
**AT BRIDGE**

**STANDARD NO. MD 690.21**



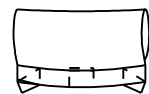
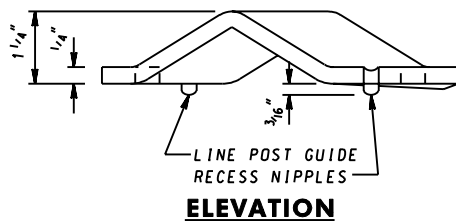
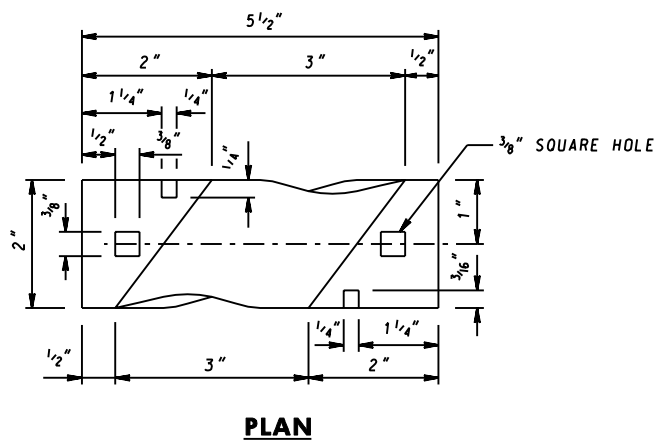
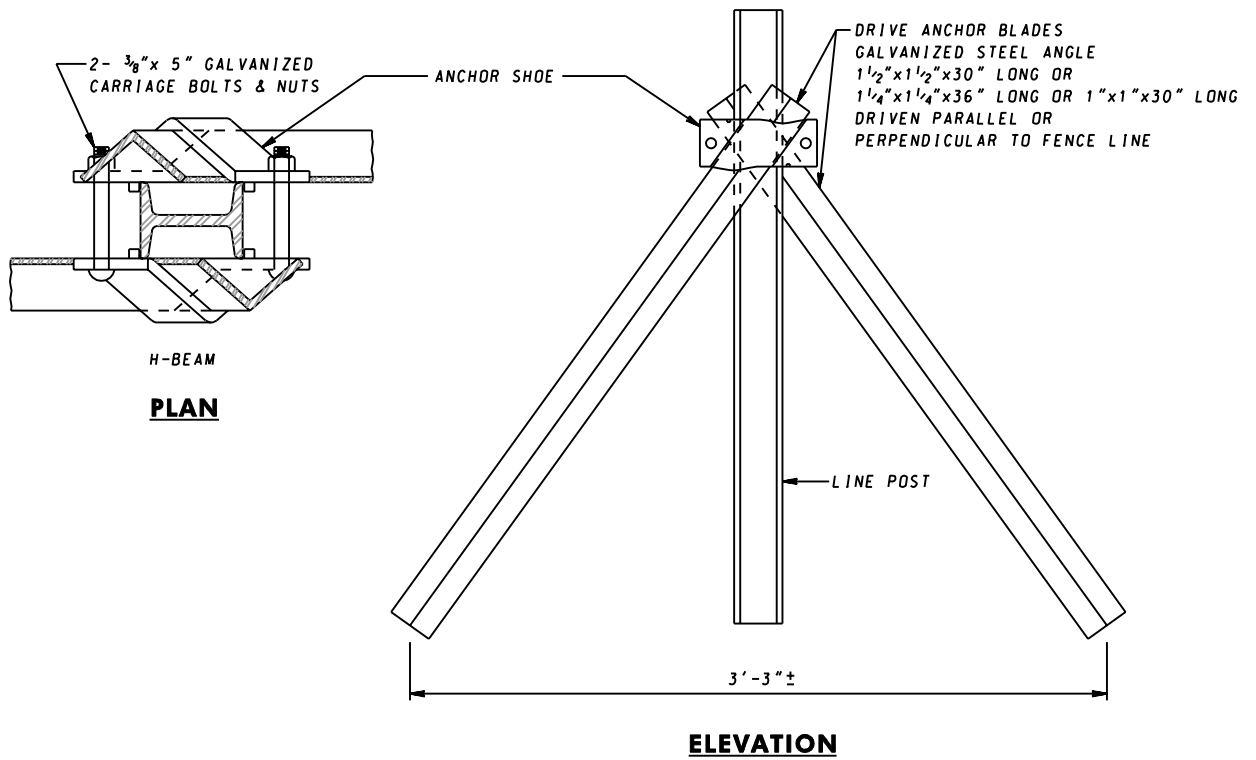
**SECTION A-A & SECTION B-B SIMILAR ELEVATION**



**FENCE TREATMENT AT CONCRETE DITCHES**

SPECIFICATION	CATEGORY CODE ITEMS
APPROVED	<i>Kirk G. McCall</i> DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT
	APPROVAL • SHA REVISIONS
	APPROVAL 8-20-71
	REVISED 10-1-01
	REVISED
APPROVAL • FEDERAL HIGHWAY ADMINISTRATION	
APPROVAL 9-14-71	
REVISED 8-1-84	
REVISED	
REVISED	

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
 STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
  
**CHAIN LINK FENCE**  
**DOUBLE DRIVE ANCHOR & DITCH TREATMENT**  
  
**STANDARD NO. MD 690.23**



**END ELEVATION**

**NOTE**

THIS SHOE ASSEMBLY MAY BE USED IN PLACE OF THE ASSEMBLY SHOWN ON STANDARD PLATE MD-690.21

**ANCHOR SHOE DETAILS**

SPECIFICATION	CATEGORY CODE ITEMS
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APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT



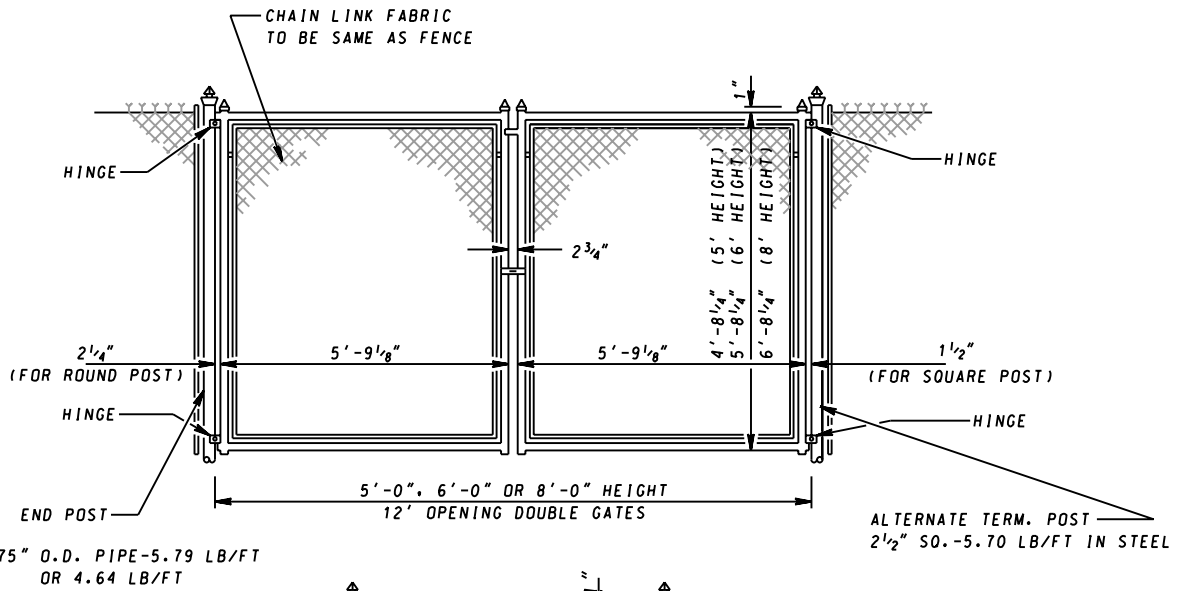
APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 9-30-75	APPROVAL 11-11-75
REVISED 10-1-01	REVISED 8-1-84
REVISED	REVISED
REVISED	REVISED

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

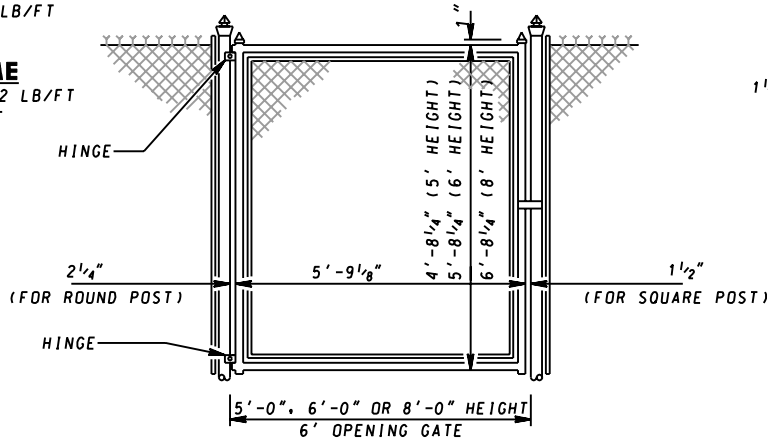
**CHAIN LINK FENCE**  
**DRIVE ANCHOR SHOE ASSEMBLY**

**STANDARD NO. MD 690.24**

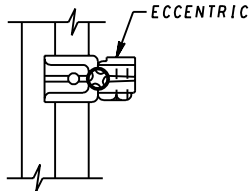
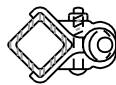




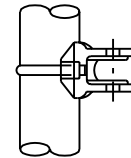
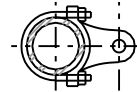
**GATE FRAME**  
1.90" O.D. PIPE-2.72 LB/FT OR 2.28 LB/FT



**GATE FRAME**  
1 1/2" SQ. FRAME-2.03 LB/FT



**SQUARE POST HINGE**



**ROUND POST HINGE**

SPECIFICATION <b>615</b>	CATEGORY CODE ITEMS
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APPROVED *Kirk G. McCall*  
DIRECTOR - OFFICE OF HIGHWAY DEVELOPMENT

**Maryland Department of Transportation**  
**STATE HIGHWAY ADMINISTRATION**  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES



APPROVAL • SHA REVISIONS	APPROVAL • FEDERAL HIGHWAY ADMINISTRATION
APPROVAL 12-1-70	APPROVAL 9-14-71
REVISED 10-1-01	REVISED 4-3-85
REVISED	REVISED
REVISED	REVISED

**CHAIN LINK FENCE**  
**GATE DETAILS**

**STANDARD NO. MD 692.01**