DESIGN VALUES ARE PRESENTED IN THIS DOCUMENT IN BOTH METRIC AND U.S. CUSTOMARY UNITS AND WERE DEVELOPED INDEPENDENTLY WITHIN EACH SYSTEM. THE RELATIONSHIP BETWEEN THE METRIC AND U.S. CUSTOMARY VALUES IS NEITHER AN EXACT (SOFT) CONVERSION NOR A COMPLETELY RATIONALIZED (HARD) CONVERSION. THE METRIC VALUES ARE THOSE THAT WOULD HAVE BEEN USED HAD THIS DOCUMENT BEEN PRESENTED EXCLUSIVELY IN METRIC UNITS; THE U.S. CUSTOMARY VALUES ARE THOSE THAT WOULD HAVE BEEN USED IF THIS DOCUMENT HAD BEEN PRESENTED EXCLUSIVELY IN U.S. CUSTOMARY UNITS. THEREFORE, THE USER IS ADVISED TO WORK COMPLETELY IN ONE SYSTEM AND NOT ATTEMPT TO CONVERT DIRECTLY BETWEEN THE TWO.
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B-1 - GUARDRAIL APPLICATIONS

B-2 - GUARDRAIL OVER CULVERTS, TYPE 1

B-3 - GUARDRAIL OVER CULVERTS, TYPE 2

B-4 - CURVED GUARDRAIL SECTION

B-5 - END ANCHORAGE

B-6 - BURIED END SECTION

B-7 - GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1

B-8 - GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2

B-9 - GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE

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B-12 - BRIDGE RAIL RETROFIT, TYPE 3

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C-2  - CURB RAMPS
   2006-1  TYPE 1
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   2006-3  SECTIONS FOR TYPES 2, 3 & 4
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<td>E-13</td>
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<td>E-14</td>
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<td>E-23</td>
<td>TURBIDITY CURTAIN</td>
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<td>PORTABLE SEDIMENT TANK</td>
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<td>TURF REINFORCEMENT MAT APPLICATIONS</td>
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SECTION VI - MISCELLANEOUS

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<td>CONDUIT JUNCTION WELL, TYPES 1, 2, AND 3</td>
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<td>CONDUIT JUNCTION WELL, TYPE 4</td>
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<td>T-3 (2005)</td>
<td>CONDUIT JUNCTION WELL, TYPE 5</td>
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<td>T-4 (2005)</td>
<td>CABINET BASES (TYPES &quot;M&quot; AND &quot;P&quot;)</td>
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<td>ROUND BASE, SQUARE BASE</td>
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<td>TYPICAL SECTION (BASES 1, 2A, 3A, 4, 5, AND 6)</td>
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<td>2005-3</td>
<td>TYPICAL INSTALLATION (BASES 1, 2A, 3A, 4, 5, AND 6)</td>
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<td>T-6 (2005)</td>
<td>SPECIAL POLE BASE</td>
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<td>SIGN FOUNDATION</td>
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<td>T-9 (2005)</td>
<td>TYPE M LOOP DETECTOR</td>
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<td>TYPE M2 LOOP DETECTOR</td>
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<td>T-11</td>
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<td>DEAD END MESSENGER WIRE ATTACHMENT</td>
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<td>TYPE 4</td>
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<td>2006-2</td>
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<td>2006-3</td>
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<td>T-14</td>
<td>EMERGENCY PREEMPTION RECEIVER</td>
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<td>2005-1</td>
<td>UPRIGHT MOUNT</td>
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<tr>
<td>2005-2</td>
<td>INVERTED MOUNT</td>
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<td>ITEM NO.</td>
<td>DESCRIPTION</td>
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<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>W-BEAM</td>
</tr>
<tr>
<td>2</td>
<td>6' X 9 (1W50 x 13.5) STEEL POST</td>
</tr>
<tr>
<td>3</td>
<td>WOOD OFFSET BLOCK</td>
</tr>
<tr>
<td>4</td>
<td>SPLICE - REQUIRES EIGHT (8), 3/8&quot; (16) GUARDRAIL BOLTS (L=6/4&quot; (35)) WITH RECESS NUTS, AND ONE (1) 3/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)) WITH RECESS NUT.</td>
</tr>
<tr>
<td>5</td>
<td>W-BEAM TERMINAL CONNECTOR</td>
</tr>
<tr>
<td>6</td>
<td>3/8&quot; (16) GUARDRAIL BOLT (L=6/4&quot; (35)) AND RECESS NUT</td>
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<tr>
<td>7</td>
<td>3/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)) AND RECESS NUT</td>
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<tr>
<td>8</td>
<td>5/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)), STEEL WASHER, AND RECESS NUT</td>
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<td>9</td>
<td>1/2&quot; (22) HIGH STRENGTH STRUCTURAL HEX BOLT (L=VARIES) AND HEX NUT</td>
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<td>10</td>
<td>5/8&quot; (16) CARRIAGE BOLT (L=VARIES), STEEL WASHER, AND HEX NUT</td>
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<td>11</td>
<td>BEARING PLATE</td>
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**DELAWARE DEPARTMENT OF TRANSPORTATION**

**GUARDRAIL APPLICATIONS**

**STANDARD NO.** B-1 (2004)  |  **SHT.** 1  |  **OF 6**  |  **APPROVED**

**GUARDRAIL FLARE RATES**

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<thead>
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<tr>
<td>70 MPH (112 km/h)</td>
<td>61</td>
</tr>
<tr>
<td>65 MPH (104 km/h)</td>
<td>61</td>
</tr>
<tr>
<td>60 MPH (96 km/h)</td>
<td>61</td>
</tr>
<tr>
<td>55 MPH (88 km/h)</td>
<td>61</td>
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<tr>
<td>50 MPH (80 km/h)</td>
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<td>45 MPH (72 km/h)</td>
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<tr>
<td>40 MPH (64 km/h)</td>
<td>61</td>
</tr>
<tr>
<td>35 MPH (56 km/h)</td>
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**DESIGN SPEED**

- 70 MPH (112 km/h)
- 65 MPH (104 km/h)
- 60 MPH (96 km/h)
- 55 MPH (88 km/h)
- 50 MPH (80 km/h)
- 45 MPH (72 km/h)
- 40 MPH (64 km/h)
- 35 MPH (56 km/h)

**FLARE RATES**

- 7:1
- 10:1
- 12:1
- 14:1
- 15:1

**TYPE 1 GUARDRAIL**

- TYPICAL GUARDRAIL TREATMENT
- WHEN THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL SHOULD BE MAXIMIZED. THIS AREA SHALL BE GRADED 10:1 OR FLATTER.

- POST SPACING 6'-3" (1905)

**TYPE 2 GUARDRAIL**

- TYPICAL GUARDRAIL TREATMENT WHEN A MINIMUM OF 2' (600) MINIMUM IS AVAILABLE FOR MEDIAN
- POST SPACING 3'-6" (1067.5)

**TYPE 3 GUARDRAIL**

- TYPICAL GUARDRAIL TREATMENT WHEN 2' (600) TO 4' (1200) OF CLEARANCE TO OBSTRUCTION IS AVAILABLE

**NOTES:**

1. THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL SHOULD BE MAXIMIZED. THIS AREA SHALL BE GRADED 10:1 OR FLATTER.
2. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
NOTE: OVERLAP W-BEAMS IN DIRECTION OF TRAVEL.
1. Flare the end treatment at 25'/beginning 50' (15 m) from the end of the impact head, unless the construction plans or specifications specify a smaller flare.
2. This detail was solely created to show the grading required for this type of attenuator.
3. The guardrail end treatment attenuator shall be installed as per the manufacturer's and the Department of Transportation's specifications.
4. If curb is present, depress the curb to a maximum height of 2" (50) within the limits of the end treatment and throughout the length of the taper grading.

**Section A-A**

**Grading for Guardrail End Treatment Attenuator Type 1**

**Notes:**
- **Edge of Pavement**
- **Direction of Traffic**
- **Plan View**
- **Normal W Beam Guardrail**
- **Depress Curb**
- **Hinge Point**
- **Normal W Beam Guardrail**
- **Offset to Barrier** (see Note 1)
- **Taper Grading 15:1**
- **Taper Maintenance Pavement 10:1**
- **Impact Head**
- **Shoulder**
- **3'-3" (1000) MIN**
- **50' (15m) LIMIT OF PAYMENT**
- **50' (15m) MIN**
- **DATE: 08/01/2007**
- **DATE: 10/23/67**

**Diagram Details:**
- **Normal W Beam Guardrail**
- **Depress Curb**
- **Hinge Point**
- **Offset to Barrier**
- **Taper Grading 15:1**
- **Taper Maintenance Pavement 10:1**
- **Impact Head**
- **Shoulder**
- **3'-3" (1000) MIN**
- **50' (15m) LIMIT OF PAYMENT**
- **50' (15m) MIN**

**Delaware Department of Transportation**

**Guardrail Applications**

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<td>B-1 (2007)</td>
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</tbody>
</table>

**Approved**

**Recommended**

**Date:** 08/01/2007
1. Flare shall be 4' (1200) unless the construction plans or specifications specify a smaller flare. Flare may be parabolic or straight based on manufacturer's specifications.

2. This detail was solely created to show the grading required for this type of attenuator. The guardrail end treatment attenuator shall be installed as per the manufacturer's and the Department of Transportation's specifications.

3. If curb is present, depress the curb to a maximum height of 2" (50) within the limits of the end treatment and throughout the length of the taper grading.

NOTES:

PLAN VIEW

SECTION A-A

GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2
1. This detail was solely created to show the grading required for this type of attenuator.
2. 6:1 or flatter grading is allowable when the barrier is located 12' (3650 mm) or more from the outside edge of the shoulder.
3. This end treatment can also be used in ramp gores or other areas where 2 rails of W-beam come together and terminate with one end treatment.
4. When opposing roadways have equal elevations the traffic barrier system should be placed on the opposite side of the ditch line from approaching traffic.
5. The guardrail end treatment attenuator shall be installed as per the manufacturer's and the department of transportation's specifications.
6. If curb is present, depress the curb to a maximum height of 2" (50) within the limits of the end treatment and throughout the length of the taper grading.
TWO SECTIONS OF W-BEAM, ONE NESTED INSIDE THE OTHER

NOTES:
1. ALL W-BEAMS ARE 12'-6" (3810) IN LENGTH.
2. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
**NOTES:**

1. All W-beams are 0'-6" (1905) in length.
2. Place guardrail reflector every fifth post.
NOTES:
1. No washers are used on the rail side of the long wood breakaway posts.
2. The curved guardrail section shall be shop bent.
3. Place guardrail reflector every fifth post.
4. If curb is used in conjunction with curved guardrail section, the curb cannot be higher than 2" (50).
5. On the 8'-6" (2600) radius system only, the rail is not to be bolted to the center post.

AREA BEHIND GUARDRAIL TO BE MAINTAINED FREE OF FIXED OBJECTS OR OTHER HAZARDS.

AREA FREE OF FIXED OBJECTS

<table>
<thead>
<tr>
<th>RADIUS</th>
<th>MN. REQUIRED AREA FREE OF FIXED OBJECTS</th>
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<tbody>
<tr>
<td>6'-3&quot; (1905)</td>
<td>25' x 5' (7600 x 4600)</td>
</tr>
<tr>
<td>17'-0&quot; (5200)</td>
<td>40' x 20' (1200 x 6000)</td>
</tr>
<tr>
<td>25'-6&quot; (7800)</td>
<td>50' x 20' (15200 x 6000)</td>
</tr>
<tr>
<td>35'-0&quot; (10700)</td>
<td>60' x 20' (18000 x 6000)</td>
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</table>

SEE ANCHOR PLATE DETAIL, SHEET B-13, 8 OF 13

LONG WOOD BREAKAWAY POST
FLARE RATES

<table>
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<th>DESIGN SPEED</th>
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<td>15 MPH (24 km/h)</td>
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<tr>
<td>20 MPH (32 km/h)</td>
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<td>25 MPH (40 km/h)</td>
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<tr>
<td>30 MPH (48 km/h)</td>
<td>10d</td>
</tr>
<tr>
<td>40 MPH (64 km/h)</td>
<td>7.5d</td>
</tr>
<tr>
<td>50 MPH (80 km/h)</td>
<td>5d</td>
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</table>

NOTE: 1. BURIED END SECTION PAYMNT INCLUDES THE CONCRETE OR POST ANCHORAGE, EXCAVATION, BACKFILL, AND ALL APPLICABLE ITEMS, INCLUDING LABOR NECESSARY TO COMPLETE END ANCHORAGE.

2. THE CONTRACTOR HAS THE OPTION OF USING EITHER CONCRETE BLOCK ANCHOR OR A POST ANCHOR TO TERMINATE THE BURIED END SECTION.

3. THE TOP OF THE "E" BEAM SHALL BE HELD CONSTANT RELATIVE TO THE ROADWAY PROFILE GRADE UNTIL IT CROSSES THE DITCH FLOW LINE. A SECOND "E" BEAM IS REQUIRED WHEN THE DISTANCE BETWEEN THE BORROW AND THE BOTTOM OF THE TOP RAIL EXCEEDS 10M (400'). THE MAXIMUM HEIGHT OF THE DOUBLE RAIL SYSTEM IS 45° (150°) IF NECESSARY, TAPER BOTH RAILS DOWN TO MAINTAIN MAXIMUM HEIGHT. SECOND RAIL SHALL BE PAID FOR AS ADDITIONAL LINEAR FEET (LINEAR METERS) OF TYPE I GUARDRAIL.

4. WHEN USING A SECOND RAIL, IF 12' (3800) LONG POSTS ARE REQUIRED, BEHIND THE DITCHLINE, POSTS MUST PROVIDE 4' (1200) MINIMUM EMBEDMENT (20' (50)) WHEN ROCK IS ENCOUNTERED. POSTS FOR THE POST ANCHOR SHALL BE 4' (1200) LONG.

5. WHEN USING THE BURIED END SECTION, THE DESIGN MUST PROVIDE A MINIMUM OF 75' (23 m) FROM WHERE THE GUARDRAIL CROSSES THE DITCHLINE TO THE BEGINNING OF THE HAZARD.

6. MAINTAIN THE FLARE OF THE GUARDRAIL UNTIL THE 12' (3600) COVER HAS BEEN ATTAINED, IF THE 12' (3600) COVER CANNOT BE ATTAINED BEFORE THE RAIL IS 7' (2100) BEHIND THE BOTTOM OF THE DITCH, THEN SLIDE THE GUARDRAIL FROM THE POINT WHERE IT CROSSES THE DITCH TO WHERE IT IS 7' (2100) BEHIND THE DITCH, SO THAT IT HAS 12' (3600) OF COVER.
1. **Threaded Insert for 1/8" (22) High Strength Hex Bolt (23,300 Lb 30,750 Kgf) Ultimate Adhesive Bond Strength 0" (250) Minimum Embedment**

2. **Concrete Block Anchor**
   - Bolt Plate to Post with 3 - 5/8" (16) Hex Bolts 2" (50) Long with Hex Nuts.
   - 1/8" (3) Steel Plate
   - Guardrail

3. **RUB Rail Anchor Attachment**
   - Bolt Plate to Post with 3 - 5/8" (16) Hex Bolts 2" (50) Long with Hex Nuts.
   - 1/8" (3) Steel Plate
   - Guardrail

---

**Post Anchor Detail**

**Elevation**

- 1/8" (3) Steel Plate
- Guardrail
- Extra 1/8" (3) Steel Plate in Post Flange Each Side.

**Plan**

- 1/8" (3) O.D. Holes in Rail and Through Post Flange for 3/8" Bolt, Attached to Steel Plate with 1/8" (3) O.D. Hex Bolts 2" (50) Long with Square Washer.

---

**Delaware Department of Transportation**

**Buried End Section**

**Approved by**

**Standard No.** B-6 (2002) **Sht. 3 Of 3**

**Recommended by**

**07/31/2002**
NOTES:
1. W BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4.
2. RUB RAIL IS NOT BOLTED AT POSTS 2 AND 4.
3. POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER WOOD BLOCKS AND/OR RUBRAIL AND WOOD BLOCK.
4. USE APPROPRIATE EPOXY BOLT ANCHORS TO REDUCE THE CHANCE OF SPLITTING THE CONCRETE.
5. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
7. APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
**RUB RAIL WOOD BLOCKS**

<table>
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<th>WIDTH</th>
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<td>1</td>
<td>4&quot; (102)</td>
<td>6&quot; (150)</td>
</tr>
<tr>
<td>2</td>
<td>3/4&quot; (19)</td>
<td>4&quot; (100)</td>
</tr>
<tr>
<td>3</td>
<td>2&quot; (50)</td>
<td>4&quot; (100)</td>
</tr>
<tr>
<td>4</td>
<td>1&quot; (25)</td>
<td>2&quot; (50)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. THE RUB RAIL TO BARRIER CONNECTION END MUST BE ATTACHED FLUSH WITH THE SLOPED TONGUE OF THE SAFETY BARRIER. INSTALLATION CAN BE SIMPLIFIED BY FABRICATING OR SHOP BENDING THE RUB RAIL END TO BE CONSISTENT WITH THE SLOPE OF THE BARRIER, HOWEVER, FIELD BENDING USING HEAT IS NOT PERMITTED.

2. STEEL SPACER TUBE IS SCHEDULE 40 GALVANIZED PIPE, 6" (152) OD x 3" (76) ID.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

**GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1**

**STANDARD NO.** B-7 (2001) **|** SHT. 2 OF 3 **|** APPROVED **|** RECOMMENDED
NOTES:
1. CURB SHALL NOT BE USED AT THE FACE OF RAIL WITHIN THE LIMITS OF THIS INSTALLATION.
2. POSTS 1, 2, 3, 4, AND 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH WOOD BLOCKS AND/OR BENT RAIL.
3. DO NOT ATTACH RAILS TO POSTS 1, 2, 3, 5, OR 7.
4. FOUR OR FLATTER
5. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6. BENT RAIL MAY BE SHOP BENT TO FACILITATE INSTALLATION OR MAY BE FIELD BENT USING HEAT.
7. APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTORS TO PARAPET.
8. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
9. WHEN PLACED OVER CURB (MIN 8" (200) HIGH), BOTTOM RAIL CAN BE ELIMINATED.
10. BENT RAIL WOOD BLOCK
11. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
BENT RAIL WOOD BLOCKS

1' - 2" (360) x 4 1/2" (115)

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>WIDTH</th>
<th>BOLT LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5&quot; (125)</td>
<td>8&quot; (200)</td>
</tr>
<tr>
<td>2</td>
<td>4&quot; (100)</td>
<td>6&quot; (150)</td>
</tr>
<tr>
<td>3</td>
<td>3&quot; (75)</td>
<td>6&quot; (150)</td>
</tr>
<tr>
<td>4</td>
<td>2&quot; (50)</td>
<td>4&quot; (100)</td>
</tr>
</tbody>
</table>

NOTE: BOTTOM WOOD BLOCKS LOCATED ON POSTS 1-4 ARE OFFSET DRILLED TO SIT SQUARELY ON THE POST FLANGE AND SECURED WITH 5/16" CARRIAGE BOLTS. WIDTH VARIES; SEE BENT RAIL WOOD BLOCKS TABLE.
DELWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE

STANDARD NO. B-9 (2002) SHT. 1 OF 1 RECOMMENDED

NOTES:
6. CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
7. GUARDRAIL SECTION AND TERMINAL CONNECTORS SHALL BE OVERLAPPED IN THE DIRECTION OF TRAVEL.
8. INSTALLATION SHOWN ABOVE WITH AN 'F'-TYPE BARRIER FACE. GUARDRAIL SECTION OF BARRIER CONNECTION SHALL BE ADJUSTED HORIZONTALLY IN ORDER TO MEET FLUSH AGAINST VARIOUS TYPES OF WALLS AND BARRIERS.

04/23/2002
THREE BEAM GUARDRAIL WITH WOOD POSTS SPACED AT 6'-3" (1905)

SEE NOTE

1. THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SİDEWALK IS 6'-3" (1905) OR LESS.
2. USE A THREE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.
3. PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THREE BEAM EVERY FIFTH POST.
4. TIMBER BLOCK THICKNESS SHALL BE ADJUSTED TO ALLOW FACE OF THE THREE BEAM TO BE FLUSH WITH BOTTOM OF CURB. MINIMUM THICKNESS SHALL BE 4" (100).
5. THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.
6. SPACING OF WOOD POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.
THREE BEAM GUARDRAIL WITH STEEL POSTS SPACED AT 6'-3" (1905) CENTER TO CENTER

SEE NOTE

END OF SIDEWALK

EXIT END APPLICATION

SEE NOTE

END OF CURB LINE BOTTOM OF CURB

THREE BEAM GUARDRAIL WITH STEEL POSTS SPACED AT 6'-3" (1905) CENTER TO CENTER

SEE NOTE

W-THREE BEAM TRANSITION SECTION

PLAN

SECTION A-A

NOTES:
1. THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SIDEWALK IS 18" (450) OR WIDER, AND DEAD LOAD CONSIDERATIONS ARE A CONCERN WHEN USING BRIDGE RAIL RETROFIT, TYPE 3.
2. ADHESIVE ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND SHALL BE GALVANIZED.
3. USE A THREE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.
4. PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THRE BEAM EVERY FIFTH POST.
5. THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.
6. SPACING OF STEEL POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.

THREE BEAM GUARDRAIL WITH STEEL POSTS SPACED AT 6'-3" (1905) CENTER TO CENTER

SEE NOTE

END OF SIDEWALK

EXIT END APPLICATION

SEE NOTE

SECTION A-A

NOTES:
1. THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SIDEWALK IS 18" (450) OR WIDER, AND DEAD LOAD CONSIDERATIONS ARE A CONCERN WHEN USING BRIDGE RAIL RETROFIT, TYPE 3.
2. ADHESIVE ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND SHALL BE GALVANIZED.
3. USE A THREE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.
4. PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THRE BEAM EVERY FIFTH POST.
5. THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.
6. SPACING OF STEEL POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.
W6 x 15 (W150 x 22) STEEL GUARDRAIL POST

WELO ALL AROUND INCLUDING EXTERIOR FLANGE SURFACE

POST 10'-0" (3050)

W6 x 15 (W150 x 22)

1/4" x 1201 D.W.

1/4" x 351 D.W.

1/2" x 301 D.W.

BASE PLATE DETAIL
**PLAN**

- **LIMIT OF PAYMENT**
  - **GUARDRAIL TO BARRIER CONNECTION**
  - **EXISTING BRIDGE RAIL**
  - **TAPER END OF WALL TO TOP OF GUARDRAIL AT A SLOPE OF 4% OR FLATTER**
  - **CONTRACTION JOINTS**
  - **BRIDGE BARRIER**
  - **DIRECTION OF TRAVEL**

- **SECTION A-A**
  - **EXISTING RAIL - DO NOT DISTURB**
  - **NOTE:**
    - Standard guardrail to barrier connections shall be connected to the ends of the new bridge barrier and transitioned to the existing guardrail.

**SECTION A-A**

- **NOTES:**
  - Drill 1/2" dia. hole, fill with high strength, non-sagging grout.
  - #6 @ 21" O.C. spacing 5/16" O.C. longitudinally, front and back rows shall be staggered.

**SCALE:** 1" = 1'-0"

**DELAWARE DEPARTMENT OF TRANSPORTATION**

**BRIDGE RAIL RETROFIT, TYPE 3**

**STANDARD NO.** B-12 (2001) **SHT. 1 OF 1** **APPROVED**

**RECOMMENDED**

05/02/2003
W-BEAM ELEVATION

W-BEAM SECTION

NOTES:
1. TWO ADDITIONAL $\frac{1}{2}$\textsuperscript{1/4} (20) x 2\textsuperscript{1/4} (65) POST BOLT SLOTS SHALL BE PROVIDED AT 6'-3" (1905) SPACING FOR BEAM LENGTH OF 26'-3" (7940).
W-BEAM STEEL POST AND WOOD OFFSET BLOCK

NOTE: WHERE CONDITIONS REQUIRE, ALTERNATE LENGTHS IN INCREMENTS OF 6" (150) MAY BE USED.

WHERE RUB RAIL IS USED.

ALL HOLES SHALL BE 3/8" (10) BOLT. HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.

NOTE: WHERE CONDITIONS REQUIRE, ALTERNATE LENGTHS IN INCREMENTS OF 6" (150) MAY BE USED.
NOTE: WHERE CONDITIONS REQUIRE, USE ALTERNATE LENGTHS IN INCREMENTS OF 6" (150).

THREE BEAM STEEL POST AND WOOD OFFSET BLOCK

NOTE: ALL HOLES SHALL BE 5/8" (20) 0.1W BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXIS OF THE POST.