### Maintenance Advisory

**From Mark Geib, Engineer of Transportation Systems Management and Operations Division**

<table>
<thead>
<tr>
<th>MDOT Transportation Systems Management and Operations Division</th>
<th>Discontinued Use of Breakaway Cable Terminals (BCTs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6333 Lansing Road Lansing, MI 48917</td>
<td>All BCTs that are damaged are to be replaced with one of the endings shown on the historical standard plan R-61-H (i.e., SRT or FLEAT) or the steel post version of the FLEAT (i.e., FLEAT-SP). Please disregard any X-Lite information on the plans as they are also discontinued.</td>
</tr>
</tbody>
</table>

MASH-compliant, tangent guardrail terminal (i.e., Type 2M guardrail approach terminals) may be used to replace a damaged BCT under certain conditions. In order to use a Type 2M terminal, it would be necessary to construct a transition section between the existing guardrail (Type B or Type T) and the Type 2M guardrail terminal. The transition sections required for attaching a Type 2M guardrail terminal to Type B or Type T guardrail are depicted in the current R-60 Standard Plans. It will also be necessary to ensure the guardrail length of need is satisfied with the proposed Type 2M guardrail approach terminal. Please consult with the Region/TSC road design staff for assistance with determining the guardrail length of need, current R-60 Standard Plans, or other guardrail design questions.

Attached are the following:

- Historical Standard Plan R-61-H (SRT and FLEAT)
- FLEAT-SP manufacturer’s drawing (for reference when using the steel post version of the FLEAT)

---

For questions regarding this advisory contact:

Carlos Torres  
Crash Barrier Engineer  
517-335-2852  
torresc@michigan.gov
POSTS ARE TO BE SET APPROXIMATELY TANGENT TO THE BEAM ELEMENT AT EACH POST LOCATION.

** FOR LAYOUT ON CURVES SEE DETAIL ON SHEET 19. **

- See end anchorage assembly, sheet 3
- Tangent line projected from the face of the last two offset blocks of the standard guardrail section. (A flare is illustrated)

**plan view**

- See standard plan R-60-series for post spacing and guardrail layout to transition from guardrail, type MG5-8 to guardrail approach terminal type 1b

**Elevation**

Guardrail approach terminal type 1b

"SRT"
**GUARDRAIL APPROACH TERMINAL TYPES 1B & 1T**

**MICHIGAN DEPARTMENT OF TRANSPORTATION**

**BUREAU OF DEVELOPMENT**

**STANDARD PLAN FOR**

**R-61-H**

**F.H.W.A. APPROVAL**

**5-2-2017**

---

**POST**

**OFFSET DISTANCE (FROM TANGENT LINE TO CENTER OF POST)**

1. 52"  
2. 37'-6"  
3. 33'-6"  
4. 26'-6"  
5. 21'-6"  
6. 17'-6"  
7. 14'-6"  
8. 12'-6"  

---

**NOTE:**

- For layout on curves see detail on Sheet 19.

- Do not attach the beam element to posts 7 and 8.

- See end anchorage assembly, Sheet 5.

---

**PLAN VIEW**

- Shoulder hinge point
- Outside edge of traveled lane
- Direction of traffic

---

**ELEVATION**

**GUARDRAIL APPROACH TERMINAL TYPE 1T**

**"SRT"**

---

**MICHIGAN DEPARTMENT OF TRANSPORTATION**

**BUREAU OF DEVELOPMENT STANDARD PLAN FOR**

**R-61-H**

**F.H.W.A. APPROVAL**

**5-2-2017**
END ANCHORAGE ASSEMBLY
(SRT)

NOTES:

1. After the cable assembly is taut, a second nut shall be installed on each end of the cable so that the cable will not loosen.

2. Asphalt roofing cement shall be used to seal the perimeter area between the steel sleeve (soil tube) and the wood breakaway post.
NOTES:

TWO 3" long, 160 hot-dip zinc coated nails shall be driven into the wood post through the holes in the slotted bearing plate on post 1 of the "SRT" to keep the plate from rotating.

After the cable assembly is taut, a second nut shall be installed on each end of the cable so that the cable will not loosen.

Asphalt roofing cement shall be used to seal the perimeter area between the steel sleeve (soil tube) and the wood breakaway post.
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT
STANDARD PLAN FOR
GUARDRAIL APPROACH
TERMINAL TYPES 1B & 1T
(SRT, FLEAT & XLITE-FLARED)

POST 3 AND 6 DETAIL
(SRT)

POST 4 AND 5 DETAIL
(SRT)

POST 7 AND 8 DETAIL
(SRT)

NOTE:
POST 9 IS A STANDARD LINE POST.
SLOTTED RAIL BEAM ELEMENT *1 *

BEAM ELEMENT *3

SLOTTED RAIL BEAM ELEMENT *2 *

SLOT GUARD DETAILS

SLOT GUARD ASSEMBLY DETAIL **

SLOTTED BEARING PLATE

PLATE WASHER

CABLE ANCHOR PLATE

CABLE ANCHOR PLATE DETAILS

NOTES:

ALL "SRT" ITEMS ILLUSTRATED WITHOUT DIMENSIONS SHALL BE ACCORDING TO THE MANUFACTURER’S SPECIFICATIONS.
VERN H. R  
5/8'  
8 1/4'  
1/4'  
1/2'  

YOKE DETAIL

1/4' X 2' SLOT

2'

2'

C6 X 8.2 CHANNEL SECTION

6'

1' R

TYP.

2'

5'-7'

1/4' X 2' SLOT

2'

2'

STRUT DETAIL

ASSEMBLY DETAIL

STRUT AND YOKE ASSEMBLY

(YOKE)

(STRUT)

(YOKE)

(YOKE)

20 2-2-2017

R-61-H
**POST** | **OFFSET DISTANCE**
---|---
1 | 52"  
2 | 44"  
3 | 44"  
4 | 38 1/2"  
5 | 33 1/2"  
6 | 28"  
7 | 20"  
8 | 12"

Posts are to be set approximately tangent to the beam element at each post location. **For layout on curves see detail on Sheet 19.**

- **Shoulder hinge point**
- **Tangent line**

**PLAN VIEW**

- *See Standard Plan R-60-Series for Post Spacing and Guardrail Layout to Transition from Guardrail, Type MG-S-8 to Guardrail Approach Terminal Type 1B*

- **Guardrail, Type B**
- **Guardrail, Type MG-S-8**
- **Guardrail Approach Terminal Type 1B (Fleet)**

- **31'-6" straight flare**
- **20° Type B** (See Standard Plan R-60-Series for Type MG-S-8 Guardrail Height Information)
- **2 Post spaces at 6'-3"**
- **3 Post spaces at 4'-2"**
- **2 Post spaces at 6'-3"**

**ELEVATION**

**Guardrail Approach Terminal Type 1B**

"Fleet"
**Guardrail Approach Terminal Type 1T (FLEAT)**

**Plan View**

- **Guardrail Type T**
- **Guardrail Approach Terminal Type 1T (FLEAT)**

**Elevation**

**Guardrail Approach Terminal Type 1T**

"FLEAT"

**Post Offset Distance**

<table>
<thead>
<tr>
<th>POST</th>
<th>Offset Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>52&quot;</td>
</tr>
<tr>
<td>2</td>
<td>44&quot;</td>
</tr>
<tr>
<td>3</td>
<td>44&quot;</td>
</tr>
<tr>
<td>4</td>
<td>38½&quot;</td>
</tr>
<tr>
<td>5</td>
<td>35½&quot;</td>
</tr>
<tr>
<td>6</td>
<td>28&quot;</td>
</tr>
<tr>
<td>7</td>
<td>20&quot;</td>
</tr>
<tr>
<td>8</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

**Notes:**
- Posts are to be set approximately tangent to the beam element at each post location.
- **For layout on curves see detail on sheet 19.**
- Tangent line projected from the face of the last two offset blocks of the standard guardrail section. (A flare is illustrated)

**Direction of Traffic**

- **Left Direction**
- **Outside Edge of Traveled Lane**
- **Right Direction**

**Variable**

110° Slope

**Beam Element**

- At each post location.
- Posts are to be set approximately tangent to the tangent line at each offset point.

**Post to Center of Post**

- 2'-6"
- 52"
- 44"
- 44"
- 38½"
- 35½"
- 28"
- 20"
- 12"

**Areas of Concern**

- For details of posts 1 through 8 see sheets 10 and 11.
NOTES:

1) After the cable assembly is taut, a second nut shall be installed on each end of the cable so that the cable will not loosen.

2) Asphalt roofing cement shall be used to seal the perimeter area between the steel sleeve (soil tube) and the wood breakaway post.
NOTES:

POST 8 IS A STANDARD LINE POST.

ALL "FLEAT" ITEMS ILLUSTRATED WITHOUT DIMENSIONS SHALL BE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
ASSEMBLY DETAIL

STRUT DETAILS

(FLEAT)

CABLE ASSEMBLY

(SRT, FLEAT, X-LITE-FLARED)
MICHIGAN DEPARTMENT OF TRANSPORTATION

WOOD BREAKAWAY POST

STEEL SLEEVE

SOIL PLATE

CRT POST

CABLE SLEEVE

TERMINAL TYPES 1B & 1T
(SRT, FLEAT & X-LITE-FLARED)

NOTES:
DETAILS ON THIS SHEET APPLY TO THE "SRT" AND "FLEAT" UNLESS OTHERWISE NOTED.
ALL 1:10 SLOPES SHALL BE GRADED TO CLASS A SLOPE TOLERANCES.

THE RIGHT SIDE TRAFFIC PASSING ON THE LEFT SIDE TRAFFIC PASSING ON BOTH SIDES TRAFFIC PASSING ON

(NOTE: ALTERNATE 3" BLACK AND 3" YELLOW STRIPES ON A 45° ANGLE)

USE REFLECTIVE SHEETING ACCORDING TO THE FOLLOWING TRAFFIC CONDITIONS:

TRAFFIC PASSING ON THE LEFT SIDE TRAFFIC PASSING ON BOTH SIDES TRAFFIC PASSING ON THE RIGHT SIDE

ON THE "SRT", THE CURVED PORTION OF THE TERMINAL END SHOE FACING TRAFFIC (HALF CIRCLE) SHALL BE COMPLETELY COVERED WITH HIGH INTENSITY ADHESIVE REFLECTIVE SHEETING.

ON THE "FLEAT" AND "X-LITE-FLARED", THE PORTION OF THE IMPACT HEAD ASSEMBLY FACING TRAFFIC SHALL BE COMPLETELY COVERED WITH HIGH INTENSITY ADHESIVE REFLECTIVE SHEETING.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

GUARDRAIL APPROACH TERMINAL TYPES 1B & 1T
(SRT, FLEAT & X-LITE-FLARED)
TRAFFIC

K, o(8), p(8), q(8)

Do Not Attach Post to Rail at Post #3

PLAN

A

B

Soil Plate on Downstream Side of Post

Hinge Bolt on Downstream Side of Post

37"-6" Straight Flare

6'-3"

6'-3"

6'-3"

6'-3"

6'-3"

30" to 48"

Length of Need

H, M, f, h

ELEVATION

d(8), h(8)

Post #1 Connection Detail

Impact Head Connection Detail

SECTION A-A

Post #2

SECTION C-C

Anchor Bracket

Hardware (All Dimensions in Inches)

- 2 5/16 x 1 Hex Bolt Grd 5 B5160104A
- 4 5/16 Washer WN516
- 2 5/16 Hex Nut WN516
- 17 5/8 x 1 1/4 Spuce Bolt B580122
- 1 5/8 x 9 Hex Bolt Grd 5 B586904A
- 3 5/8 x 10 Hdg Bolt B581002
- 3 5/8 Washer WN50
- 22 5/8 Hdg Nut WN55
- 1 5/8 Nut WN55
- 8 3/4 x 9 1/2 Hex Bolt Grd M49 B3439854A
- 3 3/4 Hex Nut WN30
- 2 1" Anchor Cable Hex Nut WN10
- 2 1" Anchor Cable Washer WN100
- 8 1/2 Rss Shoulder Bolt W/Washer SB12A
- 8 1/2 Structural Nut WN12A
- 8 1/2 Structural Washer WN12A
- 1 Bearing Plate Retainer TE CT-1005T

General Notes:
1. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
2. The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5° cord). Site grading may be necessary to meet this requirement.
3. The lower sections of the hinged posts should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
4. When competent rock is encountered, a 12" Ø post hole, 20 in. deep bored into the rock surface may be used if approved by the engineer for post 1. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
5. The breakaway cable assembly must be taut. A locking device (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.