GENERAL: This barrier may be manufactured with reinforcing steel or with welded wire fabric as shown in the ELEVATION and SECTION A-A details. See CMS 622 for additional information. The minimum design strength of the concrete is 4,000 psi and meets the requirements of CMS 499.

MARKINGS: All barrier segments are to be marked on the Top, as shown, where X3 indicates the year cast. If the barrier is cast using welded wire fabric instead of the rebar, add "WWF" to the end of the notation. Permanently mark any unique identification as to the manufacturer. On each barrier, somewhere permanently mark the day and month the barrier was manufactured.

PORTABLE CONCRETE BARRIER (PCB) Do not use the PCB detailed here on bridge deck edges, or similar drop-offs. PCB, Bridge Mounted, shown on Structural Engineering's Standard Drawing FDB-24, or approved alternative products as shown on the Office of Roadway Engineering's website, shall be used at those locations in accordance with that office's PCB Design Data Sheet.

HINGE AND REINFORCING BARS: Use ASTM A 36 for the 3/8" hinge bars. Use rebars meeting the requirements of CMS 609 (ASTM A 615 Grade 60). Wire mesh shall meet CMS 709.10. Black Steel is permitted.

CONNECTING HARDWARE: Bolts, washers and hex nuts are to be galvanized after fabrication per CMS 710.0, and meet the requirements of CMS 710.0 except that the Relational Capacity Test specified in ASTM A 475 shall be waived.

ALTERNATE BARRIER: Approved Portable Barrier shall be found on the Office of Roadway Engineering's web site. PORTABLE CONCRETE BARRIER (PCB): Do not use the Portable Barrier, Unanchored. Approved Portable Barrier, Anchored, and ITEM 622 - Portable Barrier, Anchored, approved alternatives to the barrier shown on this drawing shall be found on the Office of Roadway Engineering's website.

Barriers meeting this standard and cast before January 1, 2020, may continue to be used until December 31, 2029, provided the barrier remains in conformance with the most current Version of the Quality Standards for Temporary Traffic Control Devices and Acceptable Delineation Methods for Vehicles.

MARKINGS: All barrier segments are to be marked on the Top, as shown, where X3 indicates the year cast. If the barrier is cast using welded wire fabric instead of the rebar, add "WWF" to the end of the notation. Permanently mark any unique identification as to the manufacturer. On each barrier, somewhere permanently mark the day and month the barrier was manufactured.

PORTABLE CONCRETE BARRIER (PCB) Do not use the PCB detailed here on bridge deck edges, or similar drop-offs. PCB, Bridge Mounted, shown on Structural Engineering's Standard Drawing FDB-24, or approved alternative products as shown on the Office of Roadway Engineering's website, shall be used at those locations in accordance with that office's PCB Design Data Sheet.

HINGE AND REINFORCING BARS: Use ASTM A 36 for the 3/8" hinge bars. Use rebars meeting the requirements of CMS 609 (ASTM A 615 Grade 60). Wire mesh shall meet CMS 709.10. Black Steel is permitted.

CONNECTING HARDWARE: Bolts, washers and hex nuts are to be galvanized after fabrication per CMS 710.0, and meet the requirements of CMS 710.0 except that the Relational Capacity Test specified in ASTM A 475 shall be waived.

ALTERNATE BARRIER: Approved Portable Barrier shall be found on the Office of Roadway Engineering's web site. PORTABLE CONCRETE BARRIER (PCB): Do not use the Portable Barrier, Unanchored. Approved Portable Barrier, Anchored, and ITEM 622 - Portable Barrier, Anchored, approved alternatives to the barrier shown on this drawing shall be found on the Office of Roadway Engineering's website.

Barriers meeting this standard and cast before January 1, 2020, may continue to be used until December 31, 2029, provided the barrier remains in conformance with the most current Version of the Quality Standards for Temporary Traffic Control Devices and Acceptable Delineation Methods for Vehicles.
The tapered end section is not a crashworthy terminal and should not be used on the approach end of temporary barrier unless it is fully located beyond the clear zone.

Barrier joints shall be initially placed close together so that bolts can be easily inserted through hinge bar loop.

Barriers shall initially be fully open before the nut is tightened onto bolt.

Pin & Loop joint connection details

Connecting pin assembly 1 1/4" dia. high-strength bolt with plate washers (2) and high-strength heavy hex nut, fully threaded.

Strength bolt with plate washers (2)

Bending diagram

Reinforcing bar list

<table>
<thead>
<tr>
<th>Mark</th>
<th>Bar</th>
<th>Bar Length</th>
<th>Shape</th>
<th>Quantity per typ. length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10'</td>
</tr>
<tr>
<td>Hinge Bar</td>
<td>X501</td>
<td>#5</td>
<td>9'-4&quot;</td>
<td>Str.</td>
</tr>
<tr>
<td>Hinge Bar</td>
<td>Y301</td>
<td>#5</td>
<td>9'-4&quot;</td>
<td>Str.</td>
</tr>
<tr>
<td>Hinge Bar</td>
<td>X502</td>
<td>#5</td>
<td>9'-6&quot;</td>
<td>Str.</td>
</tr>
<tr>
<td>Hinge Bar</td>
<td>X501</td>
<td>#3</td>
<td>5'-5&quot;</td>
<td>Bent</td>
</tr>
<tr>
<td>Tapered END</td>
<td>X501</td>
<td>#5</td>
<td>9'-4&quot;</td>
<td>Str.</td>
</tr>
<tr>
<td>Tapered END</td>
<td>X502</td>
<td>#5</td>
<td>9'-6&quot;</td>
<td>Str.</td>
</tr>
</tbody>
</table>
1. Use this standard for the anchoring of precast concrete barrier on asphalt or portland cement concrete pavement including bridge decks.

2. After removing anchoring pins, clean the pin holes and fill them with non-shrink mortar conforming to CMS 705.22.

3. Refer to the Plans for locations of anchored barrier.

**CONCRETE BARRIER F-SHAPE - ANCHORING PIN LOCATIONS**

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 3/4" (IN) DIAMETER x 48" (IN) LONG GALVANIZED STEEL ANCHORING PIN (TYP.)

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER x 21 1/2" (IN) LONG GALVANIZED STEEL ANCHORING PIN (TYP.)

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER (ASTM A36), COLD ROLL HOT DIP GALVANIZE

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER x 48" (IN) LONG GALVANIZED STEEL ANCHORING PIN (TYP.). DRILL 1 1/2" (IN) DIAMETER PILOT HOLE USING SLOTS AS GUIDE.

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER (ASTM A36) COLD ROLL HOT DIP GALVANIZE AFTER FABRICATION ACCORDING TO CMS 711.02

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER (ASTM A36) COLD ROLL HOT DIP GALVANIZE AFTER FABRICATION ACCORDING TO CMS 711.02

**PLATE WASHER DETAIL**

**ANCHORING PIN ASSEMBLY DETAIL**

1 1/2" (IN) DIAMETER (ASTM A572, GRADE 50)
GENERAL: This barrier may be manufactured with reinforcing steel or welded wire fabric as shown in the ELEVATION and SECTION A-A details. See CMS Plan 622 for additional information.

Provide class GE3 concrete with a minimum compressive strength of 5,000 psi and permeability of 2,000 soluble. Provide uncoated reinforcing steel or welded wire fabric in accordance with CMS Plan 509.

Barrier types New Jersey Shape and i-Shapel in the same run shall not be mixed. See MT-101.80 for transitions.

MARKINGS: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.

MARKINGS: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to safely handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

HANDLING DEVICES: Such devices may be used in lieu of the lifting slot for moving the barrier. They may be of any design sufficient to safely handle the weight of the section being lifted. No handling devices shall protrude from the surface of the barrier when in place.

REFERENCES: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.

REFERENCES: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.

MARKINGS: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.

MARKINGS: All barrier segments are to be marked in accordance with the Office of Roadway Engineering's website. Barrier can be found on the Office of Roadway Engineering's Website. Approved Alternate Portable Barrier can be found on the Office of Roadway Engineering's Website. Payments: This barrier is paid for in feet as ITEM 622 - Portable Barrier, Unanchored. Approved Awwalt forms and the Toobar shown on this drawing can be found on the Office of Roadway Engineering's website.