

1.1.21.4 Temporary Barriers

FHWA requires that temporary bridge rails meet TL-3 performance criteria using successfully crash tested systems. Temporary bridge rail should ordinarily be constructed from pin and loop median barrier secured against sliding and overturning as shown in Standard Details DET3295 and DET3296. Restraints will not be required if the barrier can be displaced 3' or more away from the traffic side(s) without infringing on a traffic lane, a work area, or beyond the edge of the deck. Check with the Traffic Control Plans designer to determine if reflectorized barrier should be noted on the detail plans.

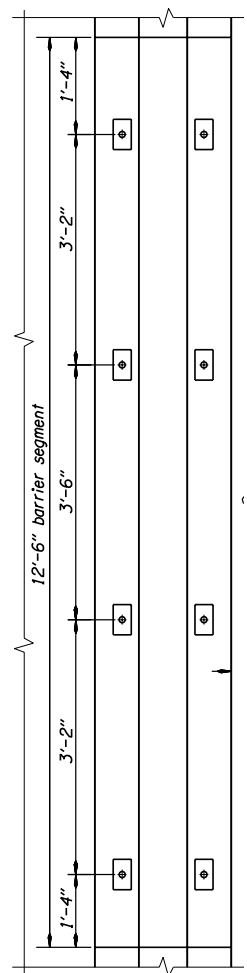
The ODOT anchored barrier is adapted from barrier used in a Lincoln, Nebraska crash test, documented in report TRP-03-134-03 dated August 22, 2003. The goal was to model and develop a barrier having shallower anchors than were used in the crash test, so they could be bonded into typical bridge decks. First, models were run of the crash test barrier to build confidence in the analysis relative to the known testing results. New models were run having 4 or more anchors. In addition to the barrier's own anchors, the system relies on the pin and loop connections to transfer load resistance from adjacent barrier segments. To determine maximum anchor loading, one cannot simply divide the total applied load by the number of anchors. Due to barrier deflection, anchors nearest the loading zone will receive a much higher fraction of the load than those further away. A 3-D finite element model is needed to get a realistic estimate of anchor loads. Support spring constants can be calculated from axial and bending deflections of the exposed anchors themselves, which will aid in distributing reactions to other anchors thus reducing peak loads. Provisions of BDDM 1.1.23.2 were used to estimate resistance of resin bonded anchors for LRFD loads.

Anchor Bolts, Nuts and Washers: Resin bonded anchor bolts shall be fully threaded rods in accordance with ASTM F 1554 Grade 36. Anchor bolts for through bolting shall be in accordance with ASTM A 307 or ASTM F 1554 Grade 36. Nuts shall be in accordance with ASTM A 563 or ASTM A 194. Flat washers shall be in accordance with ASTM F 436 and plate washers shall be in accordance with ASTM A 36 or ASTM A 709 Grade 36.

Install four (4) anchor bolts per barrier on the traffic side as shown. Do not drill into or otherwise damage the tops of supporting beams or girders, bridge deck expansion joints or drains. Install anchor bolts and nuts so that the maximum extension beyond the face of the barrier units is 1/2". Snug tighten the nuts on the anchor bolts. For through bolted installations, snug tighten the double nuts on the underside of the deck against each other to minimize the potential for loosening.

Omit one (1) anchor bolt within a single barrier unit if a conflict exists between the anchor bolt location and a bridge deck expansion joint or drain. The adjacent barrier units must each be installed with the standard four (4) anchor bolts.

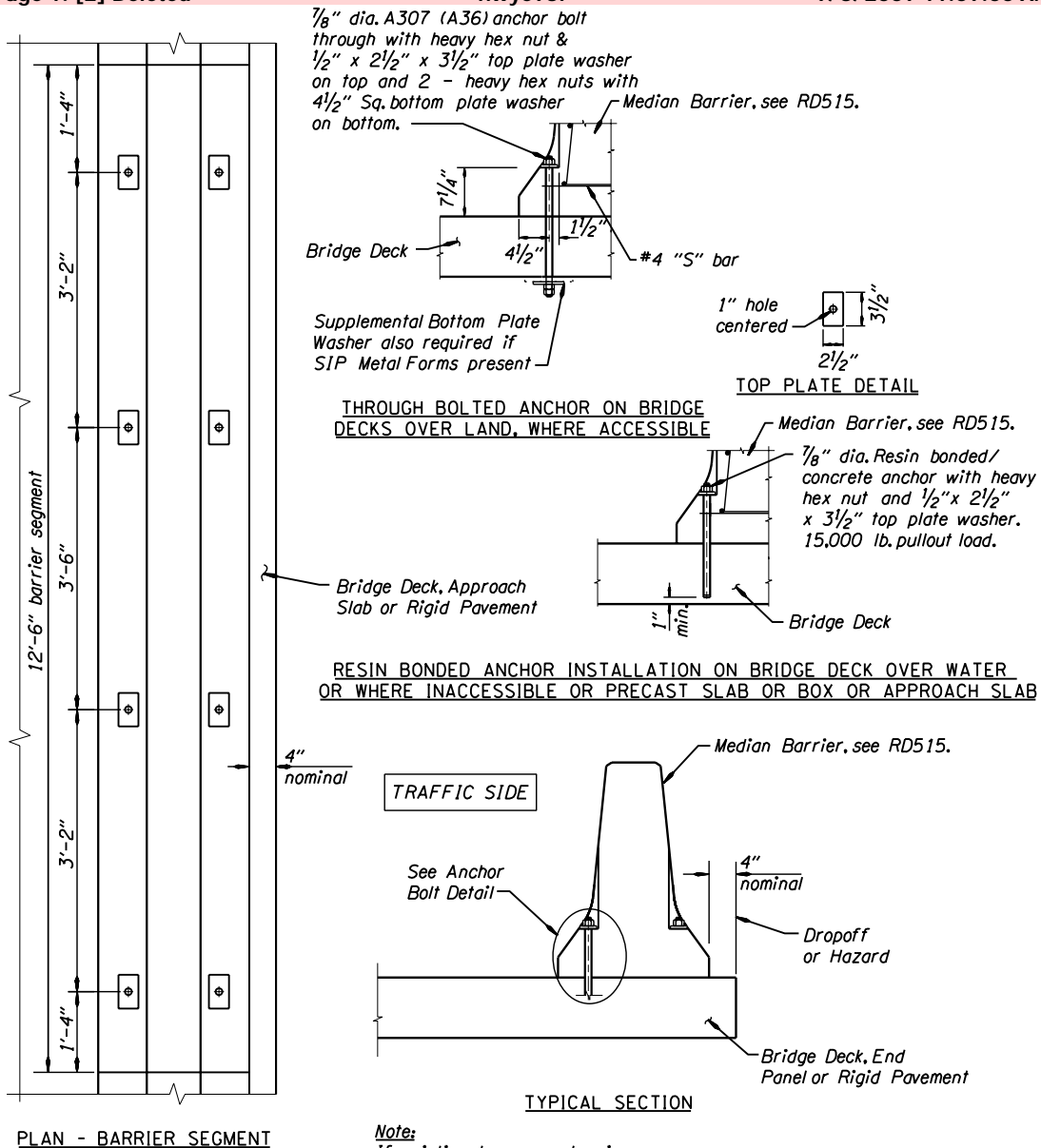
Removal of Anchor Bolts: Upon removal or relocation of barrier units, remove all anchor bolts and completely fill the remaining holes in bridge decks, and approach slabs with an approved patching material from the QPL. If ACWS overlay is present and is to remain, completely fill the remaining holes with hot or cold patch asphalt material.



PLAN - BARRIER SEGMENT

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Note:
If existing temporary barriers are used, drill the hole vertically as shown. Grind/saw the hole to provide full contact with the washer and nut as shown.

Figure 1.1.21.4A

1.1.21.4 Temporary Barriers, - (continued)

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