

## Guardrail Repair Checklist

A checklist is an important and helpful tool to use when guardrail maintenance and repair work is being done. This checklist can be used to ensure that you have addressed all of the important repair items that should be considered.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

### Sections

- **Completed Work on Standard Sections and Transitions**
- **Completed Work on End Treatments**
- **Repair or Replacement of W-beams**
- **Repair or Replacement of Transitions**
- **Repair or Replacement of End Treatments**

### Completed Work on Standard Sections and Transitions

- Do all splices have eight bolts; have all bolts—both splice and rail-to-post—been checked to see that each is tightened and snug?**
- Is a blockout used on each post?**
- Was the guardrail height checked to ensure that it is correct and did not shift up or down out of tolerance during the final assembly?**
- Was the deflection distance provided from any vertical, rigid objects or was the w-beam system appropriately stiffened?**
- Is adequate soil backing provided behind the posts; if not, are longer posts used?**

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- Is a nail(s) driven in each wood blockout on wood posts to toenail the block to the post to prevent rotation?
- If steel blockouts are retained, does each steel post between the splices have a back-up plate behind the rail element?
- Were all washers between the bolt head and the rail element removed (unless required) from the repaired w-beam length?
- Is the lap of the rail elements correct?
- Are guardrail-mounted delineators located properly on the guardrail?

### Completed Work on End Treatments

- 1. Is the anchor cable properly attached to the rail element?
- 2. Is the grading correct under the appropriate standard (including 4-in. stub height requirement for post foundations and for struts)?
- 3. Will post 1 separate from its base on end-on impacts?
- 4. Has the length of need (LON) been reviewed for appropriateness?
- 5. For energy-absorbing end treatments, is the rail element inserted deeply inside the head, and is there NO bolt connecting the rail to post 1?
- 6. Is the bearing plate properly oriented and restrained from turning?
- 7. Are all rail-to-post bolts located according to the manufacturer's drawings?
- 8. Is the anchor cable taut?
- 9. Are all wood blockouts on wood posts properly toenailed to prevent rotation?

### Repair or Replacement of W-beams

- 1. Tension capability is intact:**
  - No tears
  - Eight 5/8-in. splice bolts in each rail connection
  - No rail subjected to a cutting torch is reused; any new holes are drilled
- 2. Height is according to standard**
- 3. Posts are intact and firmly bedded in the ground**
  - Use a longer post (7 ft.+) in front of a fill slope when there is less than 1 ft. of relatively flat ground behind the post
- 4. There should be no washers under rail-to-post bolt head**
- 5. Available deflection distance in back of w-beam to a rigid vertical object (w-beam deflects as it develops tension—3 ft. is the standard distance provided; if 3 ft. is not available, then add posts and/or nest rail to stiffen the system)**
- 6. Lap rail elements in the direction of traffic (upstream/approach rail is in front of downstream/leave rail)**
- 7. For wood blocks on wood posts, use toenails to restrain blocks from rotating, preferably one on each side of the block, 2 in. from the top or bottom**
- 8. Guardrail-mounted delineators in damaged section replaced**
  - If no guardrail-mounted delineators previously existed, install delineators per Manual on Uniform Traffic Control Devices and/or highway agency policy

Note that items 3 and 5 are most applicable for high-speed facilities and could be less restrictive for lower-speed facilities.

### Repair or Replacement of Transitions

- 1. Tension capability is intact:**
  - No tears in rail elements
  - Minimum of four  $\frac{7}{8}$ -in. high strength bolts/threaded rods in connection to rigid object—ensure that the bolt heads or nuts on the threaded rods protrude no more than  $\frac{3}{4}$  inches from the face of the connection plate
  - All splices are intact (eight splice bolts in each rail connection)
  - No rail subjected to a cutting torch
- 2. Extra/larger posts—the last post spacing in advance of the rigid object should be 1 ft., 6 $\frac{3}{4}$  in**
- 3. Nested last rail element**
- 4. Rub rail or curb to prevent wheel snagging**
- 5. Bridge shoe lapped in the direction of the near-side traffic**
- 6. Damaged or knocked-down object (hazard) marker (if any) replaced on or adjacent to bridge parapet**

### Repair or Replacement of End Treatments

- 1. Use no interchanged parts from different manufacturer's systems for parts unique to the particular end treatment being repaired**
- 2. For energy-absorbing systems, place the head completely onto the rail element**
- 3. For energy-absorbing systems, the cable anchorage to the rail element allows the cable to release from the rail if the head slides**
- 4. Post 1's top part will separate from its foundation for end-on impacts**

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- 5. Replace any damaged posts within the end treatment that were originally breakaway or yielding posts with breakaway or yielding posts approved by the system's manufacturer
- 6. Grading provides no more than 4 in. above ground to the strut or to what will remain as a stub
- 7. Bearing plate is properly oriented
- 8. Cable is tightened to a taut condition; cannot lift up on the cable more than 1 in.
- 9. Retroreflective object (hazard) marker in place on non-buried end treatments per highway agency policy