

ing and size. The wood posts are 10-inches x 10-inches x 8 feet long with 8-inch x 8-inch blocks. The alternate steel posts are a W6x15 section and the block-outs are 8-inch x 8-inch wood or plastic blocks. All steel parts are to be galvanized. Details of the “Strengthened Railing Section for Fixed Objects” are shown in the Standard Plans.

- d. *Adjusting Rail Height:* All standard posts have holes for adjusting the rail-height for an overlay to be placed on the shoulder. The adjustable post had three predrilled holes per the 1995, 1997 and 1999 Standard Plans and has two holes per the 2004, 2006 and 2010 Standard Plans, which allow the rail element and block to be raised when an overlay is placed on the shoulder. Details of the components are shown in the Standard Plans. See Figures 7-11a and 7-11b for installation details. **Pavement overlays that impact the effective height of rail elements shall include the required action from Table 7-4 for metal beam guardrail.**
- e. *Adjusting Rail Curvature:* Guardrail can be installed on curving alignment without special fabrication where the radius of curvature is more than 150 feet. Where the

radius of curvature is 150 feet or less, down to a minimum radius of 5 feet, the rail elements require shop rolling to the required radius. Installations of guardrail with specially fabricated components should be held to a minimum to reduce the need to stockpile special components for maintenance. Also, where special components are not stockpiled, the delay in ordering and receiving replacements unnecessarily extends the exposure for traffic. The rail elements for guardrail are available in two lengths: 12.5 feet and 25 feet. The longer elements create problems for later maintenance work because trucks with longer beds are required to haul the rail elements.

- f. *Guardrail Delineation:* Galvanized steel guardrail provides some supplemental value as a delineation device. Where necessary, this delineation ability can be enhanced with reflective delineation devices as described in the California MUTCD. Reflective delineation devices used on guardrail installations should provide optimum visibility. Guardrail located more than 12 feet from the roadbed should not have reflective delineation devices

Table 7-4: Railing and Barrier Restoration Practice

| Existing Railing or Barrier | Standard Height (in) | Tolerance (in) | Required Action |
|-----------------------------|----------------------|----------------|--|
| Metal Beam Guardrail | 29 | +1 -1¼ | Raise block and rail using additional hole(s) in post. If out of tolerance: - Add rub rail if top of rail is above 30” - Reconstruct if top of rail is below 27-¾” |
| Metal Beam Barrier | 30 | N/A | Should be upgraded per policy to current standards. If not, contact the Headquarters Traffic Operations Liaison. |
| Thrie Beam | 32 | -3 | Reconstruct if top rail is below 29” |
| Type 50 | 32 | -3 | Remove and install Type 60 Barrier if height, not including glare extension or cap, is below 29”. |
| Type 60 | 36 | -7 | Remove and install new Type 60 Barrier. |
| All Other Barriers | N/A | N/A | Consult Bridge Barrier & Railing Specialist – Division of Engineering Services. |
| Crash Cushions | N/A | N/A | Remove, raise pad to grade and replace cushion all per manufacturer. |