The Cal-transmogrification of Scenic Bridge Railings
Vince Taylor

Transmogrification (n): to alter greatly, often with grotesque effect.

The Value of Scenic Railings

Bridges provide a unique vantage point for seeing into places of natural beauty. Bridges often offer the best and sometimes the only public unobstructed views of rivers, streams, estuaries, and bays.

Highly “transparent” bridge railings provide wonderful scenic vistas to motorists. Transparent railings are essential to gaining the most public benefit from scenic highways.

Historic California Bridges

From its inception the California Highway Commission (the predecessor of Caltrans) placed great emphasis on bridge design. Harlan Miller became the second State Bridge Engineer in the early 1920’s and became the defining force for concrete bridge design. According to Historic Bridges of California, “He insisted that great attention be paid to those details that, in his view, defined a handsome structure – railings, endposts, spandrel detail, and so forth.”

Miller’s successor, Charles Andrew, added to the tradition of setting high goals for bridge design. He saw special opportunity for such structures along the scenic, remote reaches of the state highways: “It is the hope of the bridge engineer that the finished structure will be durable, pleasing in appearance, conform to the canyon or stream; so that both layman and engineer will gain the impression that bridge construction is being kept abreast with the building of modern highways.”

Bridges of Highway 1

The ideals of Charles Andrew reached perhaps their finest expression in the concrete-arch bridges of Highway 1 along the Big Sur and Mendocino Coasts. The Bixby Creek Bridge is justly famous, but Russian Gulch Bridge and numerous others along the Mendocino Coast represent equally outstanding examples of bridge design.

Historic Railing Designs

Historically, railings were designed to be both aesthetically pleasing and minimally obstructive of views.

Iron railings consisting of vertical rods between top and bottom horizontals were widely used. The Golden Gate Bridge railing exemplifies this type. Pedestrians have complete visibility over the top, and the verticals become virtually transparent to motorists looking through them.

The concrete bridges built during the 1930’s and ’40’s used railings consisting of multiple, connected arches. These were architecturally complementary to the supporting concrete arches of many bridges of that era and provided good downward visibility to passing motorists.

The Post-War Decline in Railing Design

After World War II, the Division of Highways (successor to the Highway Commission, now Caltrans) developed the box girder bridge. It has...
ever since dominated bridge construction in California. Everyone is familiar with it as the ubiquitous freeway overpass. Caltrans uses the same design to span rivers and streams.

The change in bridge design initiated a change in the underlying approach to railing design. Practicality and efficiency increasingly replaced art and beauty as the principal design concerns. This led to railings with solid concrete bottoms topped by horizontal metal rails. Early versions had relatively low concrete walls, as exemplified by the “California Type 9” railing used over the Sacramento River on I-5. Downward visibility was still fairly good because the solid wall was only 15” high.

As safety became more important in designs, the next generation of railings, introduced in the 1960’s, had 27” solid concrete walls, topped by a heavier metal rail. This railing design has an industrial feel appropriate, perhaps, to urban settings but not to scenic rural areas.

Moreover, by shutting off the downward view, it blocks some of the best views along the North Coast, where many bridges are high above the creeks and ocean. Bridges built or retrofitted on Highway 1 in Mendocino after 1960 have this style of railing, including bridges over Big River, Caspar Creek and Jughandle Creek. Motorists passing over these bridges are denied near views of what lies below.

**The Worst Was Yet To Come**

As detrimental as the 1960’s railings were to motorists access to scenic vistas, the worst was yet to come – the replacement of railings with solid concrete barriers at least 32” high. These barriers were originally developed in New Jersey for urban roads. In California they are often used as center barriers between opposing lanes in order to prevent head-on collisions. Caltrans began using these “Type 27” barriers on rural bridges some years ago, but until recently their use was relatively limited.

At some point, Caltrans adopted a policy of installing only concrete traffic barriers as “railings” on all new construction and retrofitting. This policy reflected a Caltrans decision to use only “concrete bridge rails in areas where maintenance workers are exposed to moving vehicular traffic.”

According to Caltrans, there is no bridge railing where maintenance workers would not be exposed to moving traffic.
The Taking of Motorists’ Views

Caltrans’s standardization on concrete “railings” is taking from motorists one cherished view after another as it retrofits and replaces existing bridges. Because I have become acutely aware of Caltrans’s disregard for aesthetics and scenic preservation, I discover fresh examples of their handiwork almost every time I drive to a new destination. If you begin to look at bridges when you drive, you will make the same discovery.

The Noyo Bridge Replacement Project

A particularly egregious case of Caltrans’s disregard for scenic values is their pending bridge replacement over the Noyo River on Highway 1 in Mendocino County. Caltrans has received all necessary approvals to replace the existing historic steel-truss bridge with a concrete box-girder bridge. The bridge is located at the entrance to Fort Bragg, the largest town on the coast of Mendocino, with a fishing harbor on the inland side and spectacular views of the ocean and coastal bluffs to the west.

The open design of the railings on the existing bridge give motorists clear views into the harbor and out to the river’s entrance framed by the coastal bluffs. As originally proposed by Caltrans, the replacement bridge would have used railings incorporating solid concrete barriers 42” high, blocking all view of the harbor and its entrance.

The Final Transmogrification

In response to an outpouring of protest when the public became aware of the proposed railing design (near the very end of the approval process), Caltrans responded by hurriedly approving a new, supposedly “see-through” railing that had been under development for six years. Caltrans has made a mockery of the term “see-through” by applying it to this “Type 80SW” railing. The 80SW would be more appropriately termed a “see-little” railing.

The Type 80SW railing is Caltrans’s ultimate achievement in ugliness and disfunctionality – the final stage of its transmogrification of bridge railings. Made of massive rectangles of concrete, it looks more like a tank trap than a scenic railing. From the road surface to the top of the concrete rail measures 40 inches, broken by a single view slit 11 inches tall.

Given the dimensions of the proposed Noyo Bridge (86’ wide with 12’ shoulders and 5’ sidewalks) use of the 80SW railing, will make scenic Noyo Harbor invisible to motorists.
Dharma Cloud Foundation

Destruction Unnecessary

What is particularly dismaying about Caltrans’s determination to use massive concrete barriers in scenic areas is the absence of any defensible reason for doing so.

Caltrans acknowledges that it uses exactly the same criteria as the Federal Highway Administration. The Federal Highway Administration has accepted several railings that provide better motorist visibility than the 80SW railing, but Caltrans rejects their use on the grounds that they “do not meet Caltrans policy regarding the use of concrete barrier rails.”

Caltrans argues that safety of maintenance workers precludes use of metal railings, but Caltrans own actions contradict this argument. First and most importantly, bridge maintenance workers can be protected from traffic, as they are today, by placing concrete barriers in the shoulder between the traffic and the railings. All new bridges will have at least 4-foot shoulders, providing ample room for placement of the 1-foot wide “K rails” that Caltrans currently uses for worker protection. Second, the 80SW railing incorporates metal within it and thus does not eliminate the need for maintenance. Third, metal railings can be constructed of special steel that uses rust as a protective coating, eliminating all need for painting and maintenance.

A Superior Railing is Available Today

As compared to Caltrans 80SW, a metal railing developed by the Wyoming Highway Department provides much better (excellent) motorist visibility, meets higher crash-test standards, and fits far better into natural scenery. There is absolutely no valid reason to use the 80SW railing in scenic areas. The only obstacle to preserving the wonderful views that bridges offer is Caltrans bureaucratic obstinacy.

A Special Plea for the Noyo Bridge

There is still plenty of time for Caltrans to change the railing design on the new Noyo Bridge. Preliminary construction work will not begin until June 2000, and construction of the roadway of the bridge will not begin until after March 2001 – over 15 months from now. This is more than enough time to make the engineering changes needed to use the Wyoming Rail as a barrier on the inner edge of the sidewalk, allowing an open pedestrian railing on the outside of the bridge.

The views from Noyo Bridge can be preserved – if Caltrans cares at all about either the public or its obligations to live up to the Coastal Act.

Endnotes
1 Historic Bridges of California, California Department of Transportation, 1990.
2 Ibid.
3 I don’t know the exact date of first use, but I have seen such barriers on inland bridges in Mendocino County where the concrete is highly weathered.
4 Letter from Tony Anziano, Caltrans Deputy Attorney, to Steven Scholl, Coastal Commission Deputy Director, June 22, 1999, p.2. Mr. Anziano wrote this letter to counter arguments made by me to the Coastal Commission that Caltrans could meet all of its own current safety standards with a federally-approved metal railing: Grounds for Revocation of Coastal Commission Permit 1-98-100 for Replacement of the Noyo Bridge, Vince Taylor, May 31, 1999.
5 In his letter of June 29, 1999, Mr. Anziano goes on to say, “even sidewalk mounted rails are exposed to moving traffic as a vehicle can mount the curb.” Ibid., p. 2.
6 Grounds for Revocation, op. cit.
7 Letter from Tony Anziano, Caltrans Deputy Attorney, to Steven Scholl, Coastal Commission Deputy Director, July 14, 1999.