

Aesthetic Guardrail Design, SR-20 – Ducken Road to Rosario

Project Description

Location

Deception Pass State Park

SR-20 MP 41.24 to 43.17

Purpose & Need

The purpose of this project is to improve safety and reduce accident frequency and severity. Within this section of SR-20, a primary issue is upgrading it to bike touring standards.

This project has both cultural and historic importance. This includes historic guardrail that does not meet current day design standards and is deteriorating from age. The Civilian Conservation Corps originally built the historic guardrail in 1935 with rock and mortar bollards and logs.

Context

This project is rural and scenic in nature and has high levels of recreational use. This includes the Deception Pass State Park and the nearby marina. There is relatively little development in the area, which has a small gas station and some local stores. A local tavern is also located nearby and safety issues related to this location were identified. Much of the area is environmentally sensitive with wetlands and endangered species elements to consider.

Initial Design Concept

This project will replace historic, outdated guardrail along State Route 20 in Deception Pass State Park with new guardrail that is crash worthy and meets current day design requirements. The new guardrail will retain many of the character-defining features of the old guardrail, including the defining log, rock and mortar bollard appearance. The project will also make minor drainage improvements, upgrade illumination, do some minor paving near guardrail terminals, upgrade signing, and make improvements to the bicycle facilities.

Challenges

A high percentage of run-off-the road accidents occur in this corridor compared to other like locations, and yet the existing historic guardrail is not a crashworthy roadside barrier.

Logs are pin-connected to the bollards and easily split free when struck, allowing vehicles to penetrate the rail system. Also, when a vehicle hits a bollard, it usually breaks apart on impact because the aged mortar that holds the rocks together cannot withstand the impact. The rock and mortar bollards protrude in front of the face of the rail, potentially snagging vehicles. The foundation strength of the existing bollards is variable and inadequate.

It was requested that the system maintain as many of the character-defining features of the old rail as possible, and that the system be aesthetically pleasing. There was a strong desire

Exhibit 1 – Project Vicinity Map



Challenges

- Existing guardrail is not a crashworthy roadside feature
- Run-off-the road accidents
- Guardrail connection problems
- Foundation and bollards
- Match appearance of existing guardrail
- Maintenance and aesthetic

Exhibit 2 – Existing Condition



from the Parks Department to maintain the older rail, even with its disadvantages. After significant discussion and consideration of the potential benefits and disadvantages of leaving the older rail, the Parks Department allowed for new rail placement, as long as most defining characteristics of the new system would mirror the old.

Funding

The design and construction is funded by Washington State Department of Transportation (WSDOT). The project budget is about \$5 million.

Schedule

This project is currently in design. The scoping, project definition, and guardrail development was conducted between 2000 and 2004, including successfully completing three crash tests of a new guardrail design. Construction is scheduled to begin in October 2006 and will be complete in 2007.

Process

Public Participation

Washington State Parks and Recreation (WSPR) and the State Historical Preservation Office (SHPO) were the main participants in the project development process, along with members of the community who participated in open houses and outreach meetings.

WSDOT, WSPR, and SHPO are working together to develop a new guardrail design that will reduce the severity of accidents and still maintain the integrity of the park. The new guardrail system will incorporate visual elements of the existing guardrail system.

Results

Design /Construction Considerations

Solutions

- Record rail with HABR – Level 2 standards
- Preserve 250 ft section of original guardrail
- Remove existing guardrail system along the highway
- Interpretive exhibits restoration
- Install new aesthetic, crashworthy guardrail system including new bollards

The existing historic guardrail system will be recorded in accordance with the Historic American Building Record. Rock from some of the existing bollards will be used in the construction of the new bollards.

The new guardrail will improve safety and reduce the severity of accidents along SR-20. The existing guardrail will be removed and replaced with stone masonry bollards that are reinforced with a concrete core and a steel-backed Douglas fir guardrail between the bollards.

The existing guardrail, along with the original bollards, may be relocated to roads within Deception Pass State Park. Interpretive signs or an interpretive center will be created to showcase the historic guardrail.

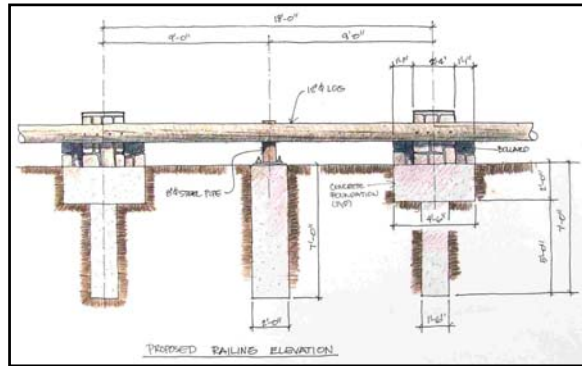
Project Benefits

The new guardrail will improve motorists' safety by helping to reduce the severity of accidents. The new guardrail will look similar to the original guardrail and will maintain the visual integrity of the park.

Exhibit 3 – Proposed Condition



Exhibit 4 – Elevation Detail



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