

Scour Mitigation Strategies Used in Washington State

Armor, Barbs, and Engineered Log Jams

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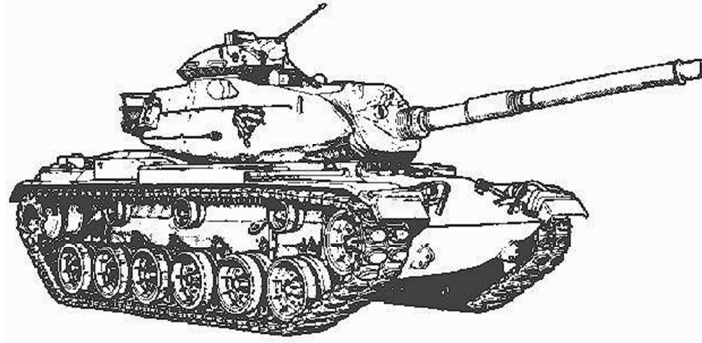


Western Bridge Preservation Partnership
Sacramento, California
November 30, 2010

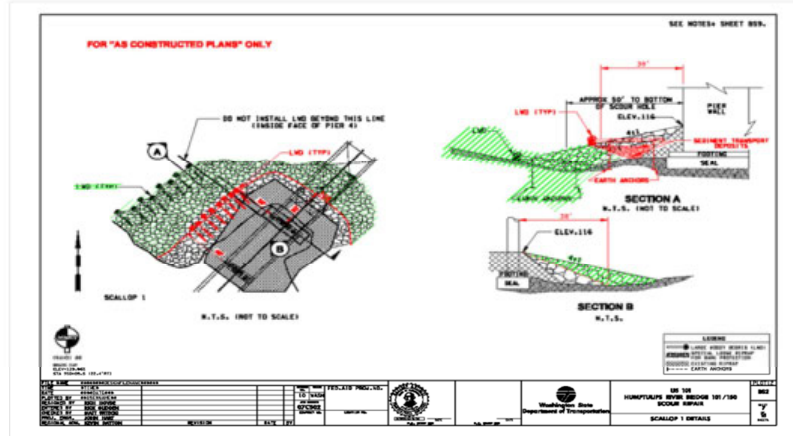
Title slide, optional text version

Washington State Bridge Failures

Armor



Armor



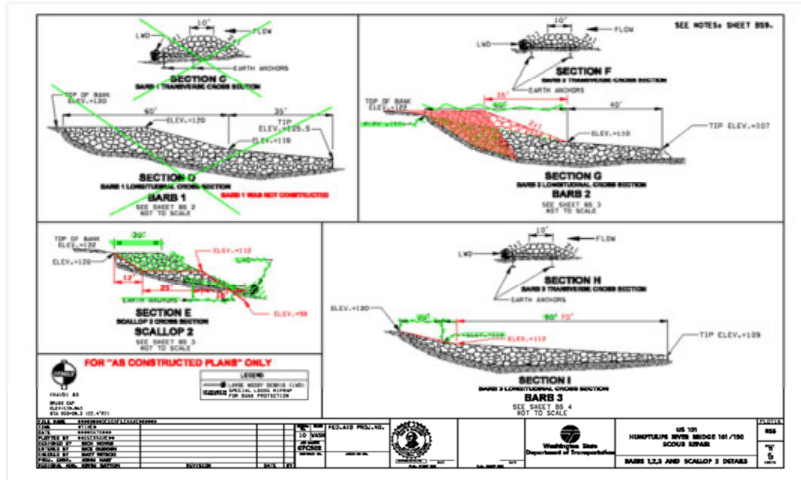
Humptulips River, US 101, Armor around Pier
4. (Spread Footing)



Humptulips River at Flood Stage



Humptulips River Barbs



Humptulips River Upstream Barbs



Mashel River Bridge State Route 161



Upstream of Mashel River Br. Nisqually Tribe's ELJ's



Eroded Abutment



Water Filled Barrier to Isolate the Work Area



Permits, Place BMP's, Remove Trapped Fish



Use Large Angular Rock



Dig down and Key the Rock in Place



Mashel River North Abutment



Mashel River N. E. Corner, (note ELJ) on right



 Washington State
Department of Transportation

Large woody Debris placed upstream at toe of slope. Nisqually Tribes Engineered Log Jam on far right of photograph.

Mashel River South Abutment



Sol Duc River Large Woody Debris



Kayaker killed when caught under logs.

US 101 Hoh River Before ELJ's



US 101 Hoh River Before ELJ's



ELJ's used to Roughen the Bank



ELJ's Bank Roughening Moves River Force Away from Bank



Close Up of ELJ's Along Bank



ELJ Islands Used to Split the Force of the River



View of ELJ Island from US 101



Lessons Learned

- Develop a close working relationship with habitat biologists for Fish & Wildlife & tribes
- Use large rock
- Key in the rock
- Keep the access roads
- Armor, Barbs, and ELJ's require maintenance
- Keep your As-Built plans on file.

Questions?

