

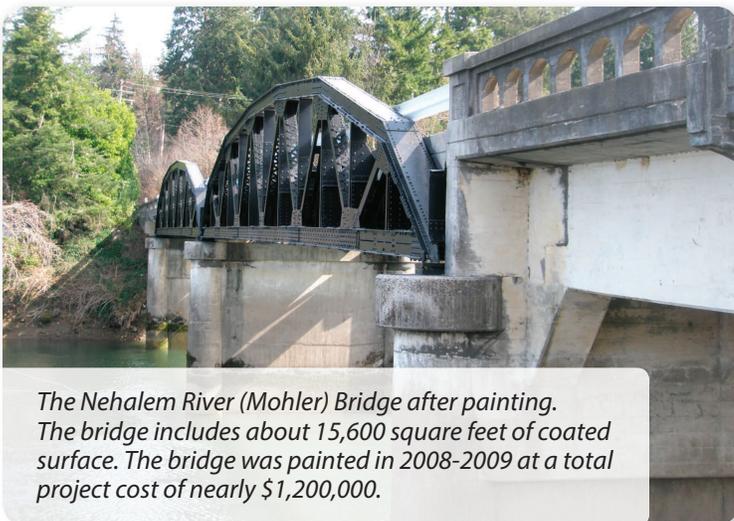


# Bridge Notes

## Steel Painting: Coastal Bridge Needs

**Steel** rusts. Add in salt and moisture associated with Oregon's coast and without proper protection, steel corrodes rapidly which on a bridge can lead to structural issues. Bridge painting is the primary tool to prevent deterioration of coastal steel bridges.

**ODOT** has 23 steel bridges in the coastal area, containing approximately 4,000,000 square feet of coated surface. Many coastal bridges are in such corrosive locations that they should be stripped to bare steel and recoated every 15-20 Years to avoid excessive metal loss from corrosion. ODOT's Bridge Preservation Unit monitors bridge conditions to identify needs, develop designs, and ensure timely treatment to maintain the integrity of the bridges.



*The Nehalem River (Mohler) Bridge after painting. The bridge includes about 15,600 square feet of coated surface. The bridge was painted in 2008-2009 at a total project cost of nearly \$1,200,000.*

### Q | Why coat our bridges?

**A |** The primary reason is that coating preserves the integrity of the steel structure, keeping it sound and extending its service life. An added benefit is aesthetics. A newly painted bridge highlights the artistic elements of bridges designed by engineers like Conde McCullough.



*Nehalem River (Mohler) Bridge prior to painting. Corrosion not visible until after the bridge was stripped resulted in additional steel and rivet repairs and replacements at a cost increase of about 10%.*

### Q | How do we determine when to paint a bridge?

**A |** Bridges are inspected a minimum of every two years to monitor their condition and to identify any maintenance issues. The inspections include evaluating the coating conditions and estimating the effectiveness. The information is reviewed by the Corrosion Protection Engineer to identify bridge coating needs. Recoating is not necessary until the rust that has initiated on edges, crevices, and fasteners spreads to adjacent areas, and should be performed before the rust causes pitting and loss of metal. For a coastal bridge the ideal "window" for recoating can be as short as a few years.

## Q | Why is it so expensive?

**A |** Bridge painting is very labor-intensive, with the cost of coating materials accounting for just 2-3% of project cost. Work access platforms and containment together account for approximately 30% of project cost, surface preparation (abrasive blasting) accounts for approximately 35% of project cost, and the labor to apply paint accounts for approximately 15% of project cost. The remaining 17-18% of project cost is related to temporary traffic control, mobilization, and waste disposal. Average total project cost for the past several years equates to approximately \$50-\$60 per square foot of coated surface.

## Q | If it is so expensive to paint our steel bridges why don't we just replace them with bridges that are less expensive to maintain?

**A |** At the time many of these bridges were designed, steel structures provided longer span lengths needed for many coastal locations, and the lighter superstructure necessary for movable bridges which are common in coastal locations. Longer concrete spans are now possible, although it would still be difficult to span the navigation channel in the Columbia River at Astoria with anything but steel. The costs of replacing bridges far outstrip the cost of keeping the existing bridges coated. For example, the Astoria/Megler Bridge replacement cost would approach \$1B but its coatings can be kept up for \$3M per year. A prime reason to keep our steel bridges, however, is that they are essentially priceless. Oregon is known for its beautiful coastal bridges and these iconic bridges are the centerpiece and symbol of many coastal communities.

## Q | What if it's delayed?

**A |** Timing is everything as there is a direct relationship between the timing of the coating project to steel repair quantities. Even a couple of years in a project delay may result in up to 20% additional costs to repair or replace the corroded bridge components. Besides cost increases, delays could lead to a compromised structure resulting in the need to load post the bridge.

## Q | Are we keeping up with bridge coating?

**A |** By spending about \$6M per year the coating needs of Oregon's 23 coastal steel bridges can be met as well as the needs of some non-coastal steel bridges. The annualized cost to keep the Astoria-Megler Bridge properly coated is approximately \$3M per year with half of the cost (\$1.5M) borne by Washington DOT. Actual coating expenses for recent projects have exceeded \$6M per year so that a back log of coastal bridges could be painted. Once the back log is addressed, the program should be able to "keep up", at least for coastal bridges. Unfortunately, Oregon still has a back log of coating needs for non-coastal bridges.

*US 101 -- Astoria/Megler Bridge Painting Project. The south section painting started in 2012, included over a million square feet of coating at a total project cost of \$21.9M. The project should be completed later this year.*



### Resources

- [ODOT 2014 Bridge Cost Data Report](#)
- [ODOT Bridge Section BrM April 2015 Snapshot](#)
- [ODOT Bridge Section 2015 Bridge Condition Report](#)

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