

Thin Polymer Overlays on Bridge Decks

Winters in Oregon are hard on our bridges. Vehicles with studded tires gouge the pavement and abrade the deck surface. This abrasion often leads to reduced skid resistance. As the bridge deck ages, cracks often develop. Deicing chemicals used in winter can penetrate the cracks, reach steel reinforcement and cause corrosion. If corrosion advances and compromises the structure, the entire bridge may need to be replaced.

There are treatment options for pavement that can both increase skid resistance and seal bridge decks. ODOT is currently evaluating eight polymer concrete overlay products designed for these purposes. The overlay consists of a polymer (plastic) resin that is applied to the bridge deck in a liquid form. Aggregate is then broadcast on the resin, and the resin is allowed to cure. Often more than one layer/lift is constructed.

The eight manufacturers that are participating, each with their unique product, installed a single 120-foot test section on both the South Yamhill River Highway 39 Bridge in McMinnville and on the Willamette River Bridge at Newberg in July and August of 2007. These two bridges receive, on average, up to 15,000 vehicles per day.

The manufacturers were responsible for the preparation of the bridge deck and the application of their product. The products included epoxy, methyl methacrylate, polyester, and urethane resins. Each manufacturer specified the aggregate they used.

The test sections will be evaluated based on their overall durability as well as their skid resistance. Skid resistance is assessed using the ASTM E 274

standard test. Just after the test sections were installed, skid testing was performed in order to establish a baseline for later comparison.

Additional skid testing will be performed after three months, six months, and then will occur every six months for three years. In addition to the skid testing, field evaluation will also include delamination testing, using the chain drag method, and

a thorough visual inspection. Both of these evaluative tests will occur at 18 and 36 months after installation.

In addition to field evaluations, lab testing will also be performed. Samples of resin and aggregate were collected from each of the eight manufacturers. Test specimens for specific lab tests are in the process of being prepared. Lab tests will evaluate abrasion, tensile strength and elongation, compressive strength, flexural strength, and



absorption. Additional testing may be conducted as determined relevant.

Damage and wear to bridges drive consequent maintenance expenses; in addition, costs of eventually replacing bridge decks can be profound. Successful and effective treatments to bridge decks

that seal the deck, provide adequate skid resistance and prolong its service life are desirable. Though Oregon has had varying results when thin polymer overlays were used in the past, it is the hope of ODOT personnel that this project will produce a viable list of products that will work for Oregon-specific conditions.



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An interim report for this project will be published in the forth quarter of fiscal year 2009. When the report is published it will be available on the Research Unit web page:

http://www.oregon.gov/ODOT/TD/TP_RES/ResearchReports.shtml