RESEARCH in Progress

NATIONAL CENTER FOR WOOD TRANSPORTATION STRUCTURES

Guide for In-Place Preservative Treatment of Covered Bridges

Wood that is exposed to moisture is vulnerable to attack by decay fungi and insects. Covered bridges were designed to prevent such biodeterioration by keeping the wood dry. However, protecting all bridge members from moisture is difficult, even in well-designed and well-maintained covered bridges. Members used in the abutments near the ends of bridges are especially vulnerable. Other areas may also be exposed when leaks go undetected or vandals remove cladding that protects the bridge interior. In all these situations, the integrity of critical bridge members can be extended by field application of preservative treatments. In this research project, we are developing a guide that will allow bridge maintenance personnel to select and effectively apply appropriate in-place treatments.

Vandalism exposed this bridge to rainfall

Background

Most wood preservatives are applied at commercial pressure-treatment facilities, but in-place treatments remain an important tool in extending the life of wood structures. For example, field treatment of pressure-treated utility poles and railroad bridge timbers is common. However, use of in-place treatments to extend the life of covered bridges has been limited, in part because conditions for traditional uses differ substantially from those in covered bridges. In most traditional applications, the initial pressure treatment has formed a thick, protected outer shell; field treatments are then needed only to protect untreated wood exposed during fabrication or by checking during service. Because wood used in historic covered bridges does not typically have a treated shell, the volume of wood that needs protection is greater. Appearance is also more important in covered bridges, potentially limiting the use of treatments that dramatically change the color of wood. In traditional applications, members are also more exposed to precipitation than are covered bridge timbers. This is particularly relevant for diffusible treatments—they require moisture to move through the wood but may also be leached out of the wood during prolonged wetting. Because covered bridges present unusual conditions, and because information on applying field treatments to these historic structures is lacking, many covered bridge members are left unprotected. More practical information is needed on the use of in-place treatments to extend the life of covered bridges.

Objective

This project will develop a guide to assist maintenance personnel in selecting and applying in-place treatments for covered bridges.

Approach

Relevant information is being extracted from the existing literature and combined with new information

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Decay at a covered bridge abutment that might have been prevented with field treatment

developed as part of this project. The information will be compiled to produce a guide that will address major topics:

- Locations and conditions within covered bridges where treatment is most likely to be needed
- Types of in-place treatment preservatives available, their properties, and relative advantages and disadvantages
- Criteria for selecting the optimum preservative treatment
- Detailed instructions for application of preservatives

Expected Outcomes

This project will produce a how-to guide that maintenance personnel can use to select and apply in-place treatments for covered bridges. The guide will be available in both electronic and printed formats. Emphasis will be placed on the use of graphics to communicate the information, with combinations of photographs and drawings to represent a range of common applications.

Timeline

The literature review and identification of data gaps will be completed by fall 2009. Additional necessary information and corresponding graphics will be developed during fall and winter 2009. The first draft of the guide is expected by summer 2010, with a final draft planned by December 2010.

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