

# CROSSINGS



NEWSLETTER OF THE NATIONAL TIMBER BRIDGE INITIATIVE

Editor Tinathan Royce

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## Field Treatment using Creosote and Plastic Pitch

**P**ressure treatment after bridge fabrication creates a protective envelope that repels insects and decay causing organisms. Occasionally, treated timber bridges may be damaged or require field modification during installation. This can expose untreated wood that must be field treated to protect the member from future decay and deterioration. Field treatment procedures are outlined in AWWA Standard M-84, which requires that all cuts, holes and injuries to treated wood be protected by brushing, spraying, dipping or soaking in an approved preservative. Field application is not nearly as effective as pressure treating and should be kept at a minimum. Most timber bridges are treated with oil-type preservatives such as creosote, creosote solutions, pentachlorophenol and occasionally waterborne salts.<sup>(1)</sup> As is the case with other major wood preservatives, the EPA has regulated the use and availability of creosote. Some suppliers have made creosote available for field treatment as a "General Use" versus "Restricted Use" pesticide. To purchase this "General Use" pesticide, the applicator must be a commercial user and

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## Preservative Treatments for Timber Bridges

**T**he use of wood as a bridge material has existed for many years. However, it was not until the latter part of the 19th century that preservative chemicals were commercially developed to protect wood. Naturally durable wood species had been used for timber bridges during these earlier years.

The untreated heartwood of these durable timbers performed very satisfactorily. When the supply and availability of these timbers became limited, there was a need to treat nondurable wood species. Essentially, these woods, whether they be hardwoods (oaks and maples), or softwoods (Douglas-fir and southern pine), were more readily available and economical for timber bridge construction.

The preservatives used to protect wood as a construction material in timber bridges are chemicals that must penetrate and remain in the wood. These preservatives for the most part should be used as a pressure treatment, although there are other means such as the use of thermal and dip diffusion processes that can be used to achieve the same penetration and retention of the wood preservative. The latter two non-pressure processes have limited use for timber bridge material. All these processes are described in the American Wood Preserver's Association (AWPA) Book of Standards and specifically in the section pertaining to the commodity standards. When applied properly, wood preservatives will significantly increase the life of wood structures from a minimum number of three to five years to 30 to 40 years. The use of wood preservatives to increase service life of timber structures is a wise use of a renewable resource — wood. There are two broad classifications of wood preservative chemicals, and these are the oil-type and waterborne preservatives. The "oil-type" preservatives are derived from coal tar distillate and petroleum solutions. Creosote as distilled from coal tar is almost 100% active

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**Timber Bridge Design Awards Announced — Page 2**



## Timber Bridge Design Awards Announced

**T**he National Forest Products Association (NFPA) special task group on timber bridges have announced the winners of the nation's first Timber Bridge Design Award Competition. Awards were presented to thirteen innovative timber bridges. Listed below are the categories and the respective winners.

### Long Span Vehicular Bridge

- First Place: Hansen Creek Bridge, Humptulips, WA  
Awards of Merit: Barlow Drive Bridge  
Charleston, WV  
Columbia Road Bridge  
Ada County, ID

### Rehabilitation of an Existing Bridge

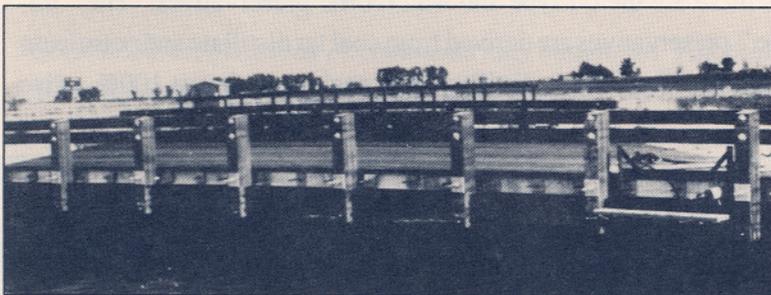
- First Place: Kuskulana River Bridge  
Edgerton Highway/McCarthy Road, AK  
Awards of Merit: Roebling Bridge - Delaware Aqueduct  
Lackawaxen, PA-Minisink Ford, NY  
Cornish Windsor Bridge  
Cornish, NH - Windsor, VT  
Pleasant Township Bridge  
Cass County, ND

### Pedestrian/Light Vehicular Bridge

- First Place: John Balshaw Bridge  
Petaluma, CA  
Awards of Merit: Discovery Bridge  
Boise, ID  
Pleasure Island  
Lake Buena, Vista, FL  
Oak Creek  
Red Rock State Park, AZ

### Short Span Vehicular

- First Place: Teal River  
Sawyer County, WI  
Awards of Merit: Sedwick County  
Sedgwick County, KS



*Columbia Road Bridge*

The Timber Bridge Awards Program in FY91 was sponsored by four major wood products trade associations and the USDA Forest Service. The associations are the American Institute of Timber Construction, National Forest Products Association, Southern Pine Marketing Council and the Western Wood Products Association. Other companies and organizations providing financial support were Alamco Wood Products; Georgia Pacific Corporation; Hickson Corporation; Permapost Products Company; Shelton Structures; Southeast Lumber Manufacturers Association; Trus Joist Corporation; Unit Structures, Inc.; Western Wood Structures; Wheeler Consolidated, Inc.; and the Wyckoff Company.

The sponsors have produced a full color, eight page brochure entitled "Award Winning Bridges." The brochure highlights each of the award winning bridges. To receive your copy contact: Tinathan Royce, USDA-Forest Service, 180 Canfield Street, Morgantown, WV 26505. Phone: 304-285-1596.

If you are an owner, designer, contractor or developer of a timber bridge opened to traffic in 1989, 1990, or 1991 and want to receive an entry form for the next awards program, please contact: American Institute of Timber Construction, 11818 Mill Plain Blvd., Suite #415, Vancouver, WA 98684.  
Phone : 206-254-9132

— *Tinathan A. Royce*  
*USDA-Forest Service*  
*Morgantown, WV*

*The above article is condensed from the brochure  
"Award Winning Bridges, September 1991"*

## Preservative Treatments for Timber Bridges

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ingredient, while pentachlorophenol and copper naphthenate are active ingredients in a solvent inert petroleum carrier.

These preservative chemicals are in a one to nine percent solution as the active ingredient. The waterborne preservatives are products soluble in water and utilize the water as a carrier to place the preservative within the wood. There are advantages and disadvantages for each of these two systems.

To provide acceptable protection to wood, the preservatives must be toxic to fungi, insects and other organisms which will attack and deteriorate the wood. The major three wood preservatives — creosote, pentachlorophenol and the waterborne arsenicals, which include chromated copper arsenate (CCA) and ammoniacal copper zinc arsenate (ACZA) — are restricted-use pesticides.

This restricted-use registration of these products means they must be applied by a licensed applicator. However, it is extremely important to note that the treated wood which has been preserved with these chemicals does not have restricted-use applications. However, there are specific use and handling instructions for the various treated products. Guidelines for these are described in the Consumer Information Sheet which is a pamphlet available from suppliers of treated wood products.

There are other wood preservatives which have a somewhat limited use. These are copper naphthenate and the waterborne borate solutions. These products are not restricted-use pesticides. However, their use application must be considered when specifying these chemicals. It is recommended that when treatment of wood with any of these preservatives is to be performed, it must be in accordance with the AWWA Standards. The oilborne preservatives, creosote and pentachlorophenol, can be used for most all of the hardwood and softwood species cited in the AWWA Book of Standards. The waterborne arsenicals (CCA and ACZA) should only be used to treat softwood

species and should only be used in the nonstructural components of the timber bridge (i.e., walkways and handrails, posts, etc.). An exception to this general rule for waterborne preservatives could apply to the use of deck panels when an overlayment of asphalt will be made to the bridge surface.

The use of copper naphthenate in a petroleum solution and a waterborne solution of borates has specific end-use recommendations. The AWWA Book of Standards allows the use of copper naphthenate in only softwood timber.

There is no application within the timber bridge where borates should be used. This water preservative solution of borate chemicals is specifically restricted for use by the AWWA Book of Standards. The 1991 issue of the Book of Standards specifically quotes the only use allowed for borate treatments as follows: "Lumber used out of contact with the ground and continuously protected from liquid water." Borate treated products should only be used for the interior house and commercial construction (window sills and door plates, etc.).

With respect to the oil-type preservatives and their application in timber bridges, they are recommended for the structural components such as beams and decks. These preservatives provide excellent protection against the deteriorating elements. In addition, they give a wood surface, which has resistance to moisture movement and weathering. The oil-type preservatives should not be used in those applications such as handrails, etc., where there will be repeated contact from the public.

When properly applied, wood preservatives will give long lasting protection to timber bridge products. In subsequent articles, discussions will occur with regard to each of the types of preservatives — creosote, pentachlorophenol, copper naphthenate and the waterborne preservatives.

— *David A. Webb*  
*Technical Director*  
*Koppers Industries, Inc.*  
*Pittsburgh, Pennsylvania*

## Field Treatment using Creosote and Plastic Pitch

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must have completed an EPA approved training program to use this product. The American Wood Preservers Institute has produced and has available an EPA approved video training tape using creosote for field treatment as a "General Use" pesticide rather than a "Restricted Use" pesticide. It should be noted that appropriate state regulatory environmental authorities should be consulted prior to use of wood preservatives as each state has the authority to impose more stringent regulations than the EPA.

An effective non-regulated field treatment pesticide is now available, "C-4 Brand Plastic Pitch." This product meets the new requirements of American Wood Preservers Standard M4-90 for coal tar roofing cement. It is a heavy-bodied plastic product of trowling consistency containing coal tar pitch resins, selected fibers, and a multi-purpose silicon. It is resistant to bacterial and corrosive acids and creates a water-proof seal.

Additional information is available from Allied-Signal, Telephone: 800-221-6490 or FAX: 201-455-5722.

1. Timber Bridges: Design, Construction, Inspection and Maintenance Manual. U.S. Department of Agriculture, Forest Service June 1990, EM 7700-B

— *Donald G. Terkula*  
*Allied-Signal Inc.*  
*Tar Products Dept.*  
*Morristown, New Jersey*

## Video Available "The Modern Timber Bridge"

This video introduces the modern timber bridge as an alternative for bridge construction in Mississippi. Illustrated from a County Engineer's perspective, this presentation highlights a demonstration modern timber bridge that was constructed in Tallahatchie County, Mississippi. Also discussed are modern timber bridge designs, new forest products, and timber preservative treatments. Viewing is suitable for audiences from teens to adults. Copies may be purchased by check or purchase order at \$10.00 each.

Contact Tim Allison, Information Services, P. O. Box 5446, Mississippi State, MS 39762.

## Apologies to Decker Incorporated

The August 1991, Issue 5, of Crossings incorrectly credited Burke-Parsons-Bowlby Corporation with the on-site construction of the Leon A. Shook bridge in Clarion County, Pennsylvania. The bridge was actually constructed on-site by the crew from Decker Incorporated. The bridge materials were treated by Burke-Parsons-Bowlby Corporation in Dubois, Pennsylvania.

— *Editor*

*Contributions, questions or comments may be sent to: Tinathan A. Royce; USDA-Forest Service; 180 Canfield Street; Morgantown, WV 26505; Phone: 304-291-4905; FTS: 923-4905 or FAX: 304-599-7041; DG: S24L08A.*

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