



CROSSINGS



NEWSLETTER OF THE WOOD IN TRANSPORTATION PROGRAM

Editor - Tira than Cogger

Issue 21

November 1996

PROCEEDINGS AVAILABLE FOR THE "NATIONAL CONFERENCE ON WOOD TRANSPORTATION STRUCTURES"

The Federal Highway Administration and the USDA Forest Service, Forest Products Laboratory, jointly sponsored the National Conference on Wood Transportation Structures, October 23-25, 1996, in Madison, Wisconsin. This was a direct result of five years of cooperation in conducting research related to timber transportation structures. The objective of the conference was to present state-of-the-art information on wood utilization in transportation applications. The conference included a plenary session, reviewing timber bridges throughout the world, followed by concurrent paper sessions on the following topics:

- Emerging Bridge Systems
- Timber Bridge Case Studies
- Timber Bridge Performance and Design
- Non-Bridge Structures
- Material Properties and Grading
- Reinforced Glulam Beams
- Timber Bridge Design Considerations
- Wood Preservatives
- Inspection

Continued on page 3

A REVIEW OF THE USDA FOREST SERVICE'S WOOD IN TRANSPORTATION PROGRAM

THE WOOD IN TRANSPORTATION PROGRAM FACT SHEET

The Wood In Transportation Program, formerly known as the National Timber Bridge Initiative, was funded by the U.S. Congress in 1989. Its purpose is to improve rural transportation networks and revitalize rural economies by using wood for construction of bridges and other transportation structures. Since the beginning of the Program, 359 demonstration vehicular and pedestrian timber bridges, in addition to 66 special projects, have been funded in 48 states. As of June 1996, more than 200 bridges have been built with improved engineered designs and advanced preservative treatment techniques. In the past, the major emphasis of the Program has been on vehicular highway bridges. However, because of increased interest and demand, the Program has broadened into several additional markets. The direction now includes portable bridges for timber harvesting, pedestrian and trail structures, retaining walls, box culverts, sound barriers, and marine and railway structures. The Program continues to emphasize the stewardship of our forestland through the development of additional markets for low-value, under-utilized local timber resources.

Goals and Objectives:

The primary direction of the Program is to diversify local economies by:

- Improving rural transportation networks.
- Expanding the range of markets for wood products.
- Creating service industries for wood in transportation structures.

Continued on page 2



Wood In Transportation Program Fact Sheet

... Continued from page 1

- Commercializing modern timber bridge technology.
- Innovation that leads to cost-saving strategies and improved performance of existing designs.
- Expanding the Program to include other wood in transportation applications, such as sound barriers, portable bridges for harvesting, marine and railway structures, and retaining walls.
- Improving America’s forests through stewardship.

These goals and objectives are being achieved through four distinct, yet interrelated efforts:

Wood In Transportation Demonstration Projects:

These projects improve rural transportation networks, expand the range of markets for wood products, and create service industries for wood in transportation construction. In addition to demonstration bridges and other projects funded by the Program, timber bridges are also being emphasized on National Forest System (NFS) land in an effort separate from the Wood In Transportation Program. Since 1989, more than 250 timber bridges have been constructed on NFS land.

Research: Research is conducted to optimize the balance between existing and developing technology in the use of wood as a construction material. Much of the work is cooperative in nature. The common goal is that the Nation will benefit from newly developed technology.

Technology Transfer and Information Management:

The Timber Bridge Information Resource Center (TBIRC), Morgantown, West Virginia, provides information acquired from demonstration projects and related research to customers. It also administers the demonstration grant program.

Rural Revitalization: All Wood In Transportation projects have the potential to stimulate rural economies. Projects are constructed with locally available timber using local resources.

Budget:

Goal	1992 Final	1993 Final	1994 Final	1995 Final	1996 Final	1997 Planned
..Dollars in thousands..						
Demonstration Projects	\$2,002	\$1,005	\$1,009	\$1,020	\$604	\$427
Research	1,038	1,129	1,093	1,100	770	650
Technology Transfer (TBIRC)	703	770	732	671	596	773
TOTAL	\$3,743	\$2,904	\$2,834	\$2,791	\$1,970	\$1,850

Accomplishments:

Program accomplishments include:

- More than 200 modern bridges have been constructed that demonstrate improved engineering designs and advanced preservative treatment techniques.
- More than 30 special projects have been completed. Many demonstrate the use of timber in other wood in transportation applications, such as retaining walls, portable bridges for timber harvesting, and marine structures.
- Increased awareness among highway officials and bridge engineers about modern timber bridges.
- Informative, easy-to-understand timber bridge manual and related technical information.
- Comprehensive monitoring program.
- Developed designs utilizing local under-utilized timber.
- Certification of hardwood species for structural uses.
- Over 31,000 pieces of information distributed by TBIRC annually.
- “Crossings” newsletter—4,500 distributed quarterly.
- Initiated commercialization projects.

Outlook:

The outlook for the Program is to:

- Commercialize existing, proven technology that has been developed.
- Continue research efforts that will further refine the performance and cost-competitiveness of transportation structures using locally available forest resources.
- Maintain and increase awareness and educational efforts.

Continued on page 3

THE WOOD IN TRANSPORTATION PROGRAM FACT SHEET ... *Continued from page 2*

- enhance comprehensive library
- INTERNET
- Continue to broaden the Program into other areas, such as:
 - railroads
 - portable bridges for timber harvesting
 - pedestrian and trail bridges
 - box culverts
 - noise barriers
 - docks and marine facilities
 - signs and light posts
 - retaining walls

For more information contact:

Wood In Transportation Program
USDA Forest Service
180 Canfield Street
Morgantown, WV 26505
Phone: (304) 285-1591
FAX: (304) 285-1505

NATIONAL TIMBER BRIDGE DESIGN COMPETITION ANNOUNCED

The competition is open to all student chapter of the American Society of Civil Engineers and Forest Products Society in the United States and Canada. Joint and multiple entries from one school will be accepted. Each contestant (team) will be required to design, build, and test a bridge constructed from wood structural members. The wood used in this project must be from a commercially available species. The competition has three major objectives:

1. To promote interest in the use of wood as a competitive bridge construction material,
2. To generate innovative and cost-effective timber bridge design techniques, and

3. To develop an appreciation of the engineering capabilities of wood.

This competition is coordinated by the Southwest Mississippi Resource Conservation and Development (RC&D), Inc. with assistance from the Department of Civil Engineering, Mississippi State University. Partial funding is provided by the USDA Forest Service through its Wood In Transportation Program.

Contestants will be required to submit a VHS color video (maximum of 12 minutes) **and** photographs documenting all phases of bridge construction, weighing, loading, and test results at each loading increment and at 15-minute intervals until the end of the one hour load duration. It is recommended to include within the frame of all photos and video shots a labeling sign stating the significance and sequence of the pictures in the testing procedures. Also, a technical report must be submitted.

On technical points, contact Dr. Ralph Sinno, Department of Civil Engineering, Mississippi State University, Phone 601-325-3737, FAX 601-325-7189.

*To obtain a full-color brochure outlining the description, competition specifications, design criteria, documentation and report, prizes, deadlines, judging, and the Certification and Entry Form, contact: **Bennie Hutchins, Southwest Mississippi RC&D, Inc., 747 Industrial Park Road, NE, Brookhaven, MS 39601, Phone: 601-833-5539; FAX: 601-835-0054 OR the Timber Bridge Information Resource Center, USDA Forest Service, 180 Canfield Street, Morgantown, WV 26505, Phone: 304-285-1591; FAX: 304-285-1505***

NATIONAL CONFERENCE ON WOOD STRUCTURES ... *Continued from page 1*

- Timber Bridge Design
- Timber Bridge Programs
- Standardized Design
- New Wood Treatments
- Load Rating, Maintenance, and Rehabilitation
- Timber Bridge Economics and Perceptions

The proceedings from the conference are available from the Timber Bridge Information Resource Center at 304-285-1591.

NEW PUBLICATIONS

FIELD PERFORMANCE OF TIMBER BRIDGES — 8. Lynches Woods Park Stress-Laminated Deck Bridge



The Lynches Woods Park bridge was constructed during the summer of 1990 in Newberry, South Carolina. It is a single-span, single-lane, stress-laminated deck superstructure that measures approximately 30 ft. long, 16 ft. wide, and 14 in. deep. The bridge is unique in that it is one of the first known stress-laminated deck bridges to be constructed of Southern Pine lumber treated with chromated copper arsenate. The performance of the bridge was continuously monitored for approximately 3 years, beginning 10 months after installation. Performance monitoring involved gathering and analyzing data relative to the wood moisture content, force level in the stressing bars, and behavior under static-load conditions. In addition, comprehensive visual inspections were conducted to assess the overall structure condition. Based on the field evaluations, the bridge is performing well with no structural or serviceability deficiencies.

This report was published by the USDA Forest Service, Forest Products Laboratory. The study was a cooperative effort among the Newberry County Highway Department, the Francis Marion and Sumter National Forests engineering staff, and the Forest Products Laboratory Timber Bridge staff.

For a copy of this report, please contact the Timber Bridge Information Resource Center at 304-285-1591.

User Friendly Guide to Timber Bridges

This guide was developed as a cooperative effort among the University of Maine, the University of Vermont, and the USDA Cooperative Extension program. The primary author is Chris Donnelly, Old Post Consulting. The guide provides a brief overview of the information necessary to become acquainted with timber bridges. Its goal is to help a wide audience of builders, designers, town officials and other decision makers as they become conversant in this sometimes simple, sometimes complex subject. The 56-page publication is divided into the following chapters:

- Timber Bridges - Parts and Types
- Types of Wood Construction Materials
- Wood as a Building Material
- Design Standards Associated with Timber Bridges
- Lumber Grading
- Native Lumber
- Preservative Treatment of Wood
- Additional Bridge Elements
- Financial Considerations
- Useful Lumber Information
- Steps in Choosing to Build a Timber Bridge

Following the chapters are three case studies of timber bridges and several lists of useful references.

For a copy of the guide, please contact: Sarah Smith, University of New Hampshire, 108 Pettee Hall, Durham, NH 03824, Phone: 603-862-2647; FAX: 603-862-1585 or the Timber Bridge Information Resource Center at 304-285-1591.



Article contributions, questions or comments may be sent to Ed Cesa, Acting Program Director, Timber Bridge Information Resource Center or Ms. Tinathan A. Coger, Information Assistant; USDA Forest Service; 180 Canfield Street; Morgantown, WV 26505; Phone: 304-285-1591 or 304-285-1596; or FAX: 304-285-1505; DG: S24L08A.

Crossings is a service of the USDA Forest Service, Northeastern Area, State and Private Forestry, and is distributed quarterly to individuals and organizations without fee. Products, designs, and treatments mentioned by contributors from outside the USDA are not necessarily endorsed by the USDA, nor do statements made herein reflect the policy of the USDA. In all cases, consult with appropriate professional and state or local regulatory agencies for conformance to applicable laws and regulations.

The United States Department of Agriculture (USDA) Forest Service is a diverse organization committed to equal opportunity in employment and program delivery. USDA prohibits discrimination on the basis of race, color, national origin, sex, religion, age, disability, political affiliation and familial status. Persons believing they have been discriminated against should contact the Secretary, U.S. Department of Agriculture, Washington, D.C. 20250, or call 202-720-7327 (voice), or 202-720-1127 (TTY).