Above: Road Agents, Highway Crews, Selectmen, and other town officials look on as a timber bridge is erected at this year's Mountain of Demonstrations.

On The Road In New Hampshire

Close to 1,000 attended the Mountain of Demonstrations show on June 12 -- they came from New Hampshire, Maine, Vermont, and Connecticut

As promised, this year's demonstration show was bigger and better than ever. What started out five years ago with 120 participants has turned into one of the largest live demonstration shows in the country. Who would have guessed?

The New Hampshire Road Agent Association is a non-profit organization that was formed in 1987. Its mission has always been to foster education and communication among road agents and other local road officials. In 1988 the association started the Mountain of Demonstrations show. It provides town officials and highway crews with live action demos of new and cost effective public works maintenance and construction techniques, materials, and services.

This year over 80 exhibitors came to the mountain to show off the latest in road and bridge technology. Demonstrations included the use of geotextiles in gravel roads, erosion control designs and materials, modern day equipment, design and construction of a parking lot, chip sealing with a dump spreader, crack sealing and patching, boring rig and nuclear densometer, raking gravel roads, grading gravel roads, culvert installation, welding, non-explosive demolition, hydroseeding, bridge load testing, recycled asphalt overlay, shoulder repair and widening, breakaway sign cracking, industrial tub grinders, and the erection of a timber bridge.

A lot of organizations and private companies have cooperated to put this show together. In particular, special mention should go to Stew Sevey of Fairfield, Bill Murch of B&M General Contractors, Pete Hanrahan and Bill Lane of Arthur Whitcomb, Ken Ward and Les Horne of NHMA PLT, Dave Crane of CFPN, Gus Lerandeau of All States Asphalt, Kim Smalley of Pike, Barry Lussier and Sherri Palmieri of HTA, Mike Kanik of Construction Dynamics, Mike Moravack of FHWA, the region one T Center, the UNH Civil Engineering Department faculty and students and the entire Waterville Estates crew. The list goes on and on... The NH Mountain of Demonstrations is a show that happens because of cooperation between academia, private industry, and all levels of government -- bridge photos on p. 8.

Continuing Education Units (CEU's)

On August 24 & 25, the NH T Center awarded CEU'S to 110 participants of the one-day training course on Engineering Fabrics. This is the first time CEU's were awarded under the T Center training program. It was made possible by a new national program sponsored under the auspices of the International Association for Continuing Education and Training (IACET) and administered by the National Highway Institute (NHI).

For the near term, the New Hampshire T Center will award CEU's only for those courses sponsored by the National Highway Institute. We expect to offer one to two more courses in the near future.

continued on p. 4

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Drainage Management

Management planning is first step toward maintaining good roads and streets

Adequate and proper drainage is the most important aspect of maintaining good roads and streets. If drainage facilities do not work, for whatever reason, serious problems lie ahead. Developing a strong drainage management plan is the first step toward reducing the severity and expense of water damage.

A good drainage management plan consists of the following elements:
- an inventory system
- needs assessments
- activities list
- prioritization
- cost estimates for each activity
- work schedule
- strategies for obtaining adequate funding (no funds, no work)

For estimating cost, activities must be well defined and equipment, materials and personnel needs determined. In developing the argument and defense for the budget and request for funds, administrators must also know the consequences of deferring maintenance and the probability of traffic delays, road/street closures, increasing user costs, public dissent and citizen complaints. These are the dictates which govern how much work can be done and possibly the length of time an administrator may remain in office.

Prepare a well thought out presentation, argument, and defense. Work toward three possibilities: (1) a preferred budget covering all needs, (2) a budget covering most needs with some low priority deferrals, and (3) a minimum budget of austerity. If one must continually operate in the latter category, they should hire a lobbyist or a public relations person because the transportation needs of the public and the duties of the office are not being carried out.

A quick overview of maintenance functions includes pulling or cleaning ditches, mowing and/or clearing ditch lines as needed, clearing side drains and cross drains, repairing damaged pipe ends, repairing and replacing damaged pipe sections, cleaning and repairing curb and gutter sections, cleaning and removing debris from catch basins and curb openings, cleaning and repairing storm sewers, repairing damage caused by erosion, installing under drains as needed, and cleaning out sinkholes which receive road/street drainage.

There should be, by ordinance, a clear cut limit as to how far back from the edge of the road the governmental agency should maintain driveways and drainage facilities. Responsibilities of adjoining property owners in mowing ditch lines, installing side drains under driveways, and letting debris from their property interfere with drainage should also be clearly stated in ordinances and enforced.

A little money, effort, preparation, and foresight in drainage maintenance can save a lot of expense down the road, reduce the number of public complaints, and improve the serviceability of the road. The adage still holds: If you want a good road, take care of the water, it was there first.

This article was adapted from ROADTALK, Vol. 4, No. 1, the newsletter of the Tennessee Transportation Assistance Program.

Clean Your Ditches

It isn't difficult to find ditches filled with debris on many rural roads. There appears to be more of these clogged water relief facilities than in past years. One factor is the replacement of our gravel surfaces with chip seals and other improved surfaces. It has always been the accepted maintenance practice on gravel surfaced roads to pull the ditches first. This was done to recover surface gravel to be redistributed over the roadway during the shaping operation. And all was well -- recovered materials opened up the ditch for good drainage.

After the surface is sealed and chipped, however, the blade operative is no longer needed. Hence, the grader is not used on the road at the old frequency. There is also the problem of pulling the ditch material onto the road with few resources and equipment to pick up and remove the ditch material from the roadway. In addition to dump trucks, a way to load the material must be available such as a Bob Cat, front end loader, or an elevating belt loader.

None-the-less, ditches must be pulled. A blocked ditch permits water to travel laterally and undermine the pavement leading to base and surface failure. On gravelled roads washboarding, rutting, and surface erosion result.

This article was modified and reprinted from ROADTALK, Vol. 6, No. 2, the newsletter of the Tennessee Transportation Assistance Program.

CEUs... continued from p.1

courses every year. Each course will be held in two locations across the state. Such topics as work zone safety on rural roads, culvert inspections, slope maintenance and slide protection, preparation for claims litigation.

According to the IACET: One Continuing Education Unit (CEU) is ten contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

The CEU serves as a measure of knowledge and accomplishment by private industry and many agencies at the Federal, State and local levels. The concept of CEU's had it's beginning in 1968.

The most common uses of CEU's are to maintain technical certifications and professional licenses, to evaluate employees for job hiring and promotion, and to serve as a standard measure of individual continuing education experiences.

Participants of the NH T' Center's CEU program are encouraged to maintain their own records of CEU credits. You will be issued a Certificate of Training indicating the course title and number of CEU's for this purpose. If your certificate should become lost, stolen or destroyed, the National Highway Institute (6300 Georgetown Pike, McLean, VA 22101) will verify the CEU's earned from their official records upon receipt of your written request. Currently, there is no fee for these services.

IF YOU HAVE ANY QUESTIONS CALL OUR TOLL FREE NUMBER 1-800-423-0060.
Checking for Sign Reflectivity

Reflectorization is an essential attribute of most signs. This is particularly true for stop, yield, regulatory, and warning signs. The MUTCD states that "Regulatory and warning signs, unless excepted in the standards covering a particular sign or group of signs, SHALL be reflectorized or illuminated to show the shape and color both by day and night. All overhead sign installations should be illuminated where an engineering study shows that reflectorization will not perform effectively. Reflectorization, non-reflectorization, or illumination of guide signs shall be as provided in subsequent sections."

Each year we receive a number of questions regarding how to check traffic signs for retroreflectivity. Maybe the following will shed some light on this subject.

One way to check signs for retroreflectivity is to drive the entire system at night and look at every sign. Use a vehicle with less than perfect headlights and, possibly, a slightly older observer, whose night vision isn’t nearly as good as your 19-year-old temporary summer employee. If the observer can see the signs at night, they’re probably okay.

Some jurisdictions find it both expensive and hazardous to have employees out on the roadways at night, so they have experiments with flashing a strong spotlight (200,000 candlepower) on the sign during the day. From the flashback, the sign’s retroreflectivity at night can be predicted.

A time consuming but highly precise method of checking retroreflectivity is the use of a retroreflectometer. This device is placed directly on the face of the sign and the amount of reflectivity is read in units of retroreflectivity. Obviously, this method is fairly time consuming, but gives numerical data that can be compared to acceptable or unacceptable values.

Other agencies use a procedure, which was described in the January 1989 issue of Better Roads:

1. With masking tape, affix a 10- by 8-inch sign inspection guide to a clean section of the sign. An inspection guide can be fabricated from old, reflective sheeting in the sign shop. It should be 75 percent as reflective as new sheeting if made from engineer grade, or 50 percent as reflective as new sheeting if made from a higher reflectivity material. If no reflectometer is available, an estimate will have to be used.

2. Step back about 30 feet. Holding a flashlight about two inches from your eyes, shine it at a sign.

3. If the inspection guide is brighter than the sign, the sign should be replaced within a year.

4. If the sign is brighter than the inspection guide, the sign will not have to be replaced for several years.

Scrap Tires Fuel Cement Ovens

Adding tire rubber to our asphalt is a good idea if it enhances the quality of our pavements, but other measures are needed if we are mostly concerned with the environment — “old tires are used in asphalt pavement... but stockpile grows”

New technology on recycling scrap tires by burning them as fuel in cement kilns is being made available free of charge to all cement companies in the U.S. and Canada by Bridgestone/Firestone, Inc.

The technology was developed in Japan by Bridgestone Corporation and Nihon Cement Company. U.S. and Canadian patents were granted to Bridgestone in the early 1980s, and they can now be obtained at no cost from the Scrap Tire Management Council in Washington, D.C.

About 240 million tires are discarded by consumers in the U.S. each year, said Michael Blumenthal, executive director of the Scrap Tire Management Council.

"Reliable estimates indicate that stockpiles across the country contain 2.5 to be a 3 billion tires. These stockpiles can source of damage to the environment in case of fire and can provide breeding grounds for mosquitoes that spread disease... This generous donation by Bridgestone/Firestone and its parent company, Bridgestone Corporation, will help overcome a great deal of these problems," he said.

Many scrap tires end up in landfills, but Blumenthal warns that most landfills now ban or soon will ban scrap tires. Some old tires are used in asphalt pavement, construction of artificial reefs for fishing, and other uses, but the stockpile continues to grow.

The efficiency of kilns, or ovens, used in the manufacture of cement is boosted by the use of scrap tires as fuel because tires have more BTUs and are less expensive than coal, and cement production can use the steel in the tire.

There are 200 cement kilns in the U.S. that could use this process, sources say. A spokesman for the Portland Cement Association said they "wholeheartedly support" the use of tires in cement kilns.

The above article was reprinted from, Mobility Matters, August 1992, a publication of the Highway Users Federation, Automotive Safety Foundation, and Dealers Safety & Mobility Council.

5. If the sign and the inspection guide appear of equal brightness, the sign has from one to two years of useful life.

Cold Recycling

A close look at what may be the best way to reuse pavement material

Recycling of used pavement materials is an idea that has been around since early this century. The processing of used asphalt pavement material and its reuse began as early as 1915, but little development and improvement of the procedure occurred until the mid-1970s. In recent years different approaches have emerged and various techniques have been perfected through the benefits of research, trial and error, and the manufacture of new equipment.

The term "cold recycling" is often confusing. Some people lump the pavement recycling, pulverizing, and tilter types of operations into the same category. Rather, cold recycling primarily refers to the rehabilitation of the pavement only. This is distinctly different than the pulverization and tilter type of operations which are more aptly understood as full depth reclamation. The major distinction is that recycling does not alter the base of a road where as full depth reclamation does.

Cold in-place recycling is growing more popular. It is a cost-effective way for local governments to significantly improve road surfaces. There are several ways to categorize pavement recycling methods, depending on:

1. Where it is done: In-place (at the road site itself) or at a central plant after road material is removed and hauled away;
2. How it is done: Using hot recycling or cold recycling;
3. The condition of the road way: Does it require more surface recycling or base (deep) reclamation?

The cold recycling process

With cold in-place recycling (also called on-site or in-situ), all work takes place at the site of the existing pavement surface and requires no transportation of material. Central plant processing requires that road material be dug up, hauled to a plant, processed there, then hauled back to the work site. This is more costly but can result in better quality control.

The cold in-place recycling procedure consists of a few basic processes: milling or pulverizing, mixing, and laying down or placing the pavement material. First, the existing pavement material is milled or broken up and crushed into pieces roughly the size of your thumb (about 2 to 3-

inch minus). Next, the crushed material is mixed with an asphalt emulsion so that it is rejuvenated to a suitable condition for reuse. The emulsion process requires careful monitoring to control the proper rate of mix and the desirable proportions of emulsion and aggregate. New aggregate is sometimes added before mixing in the emulsion. After mixing the new material it is placed on the road, and finally rolled or compacted.

Important decisions

As with any choice or set of options, there are many important decisions to make before rehabilitating a road. What are the advantages and disadvantages of cold in-place recycling compared to other methods of road construction? Is there enough asphalt surface on the road to warrant recycling? Should the existing material be analyzed before deciding on the method? What does the process involve in time and cost? How will the decision affect traffic, safety, equipment? Is weather a factor? What will be the resulting condition of the new road if cold in-place recycling is used? How long will the new roadway last?

Certain road conditions lend themselves nicely to cold in-place recycling. Generally, recycling is sufficient for low-traffic-volume roads unless there is extensive base failure or deep ruts. However, cold in-place recycling is often used on high speed roadways as well. The process will eliminate the reflection cracking that would accompany an ordinary overlay and will improve certain conditions such as wheel path rutting, raveling, and corrugations. If there is extensive base failure, then you must stabilize the base material (using full depth reclamation or some other construction method) or install sub-surface drains, or both.

Before deciding on cold in-place recycling, you need to determine whether the condition of your road can benefit from its application. Sampling and analyzing representative portions of the pavement can be important in the decision-making process. Tests will show what effect certain additives will have on the recycled pavement material, what percentage of residual asphalt is in the aged pavement, the moisture content, whether to add new aggregate, and the stability of the final recycled mix.

Comparing the costs

Perhaps the most important consideration is cost. Can your city or town afford to use cold in-place recycling as a method of rehabilitating road surfaces? Most cost analyses show that cold in-place recycling compares favorably to other methods, especially off site recycling of material. Specific costs will vary from one area to another. Cold in-place recycling can produce a stable road for 30 percent to 50 percent less money than cold central plant or hot recycling.

In its December 1989 issue, Better Roads magazine published the results of a questionnaire directed to state departments of transportation. The questionnaire asked which rehabilitation and maintenance methods they preferred, the average life of each method, and the

continued on p. 5

Comparing Three Methods of Recycling/Reclaiming

Average Cost Per Mile Based on 24 foot Wide Road
All Pavements are Three Inches in Depth to Keep Them Equal

<table>
<thead>
<tr>
<th>Method/Description</th>
<th>Cost/Mile</th>
<th>Cost/Mile/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Full Depth Reclamation -- Bomag or Tiller Method 6&quot; in Depth 5280 ft. X 24 ft. = 14080 sq. yds. at $1.35/sq. yd. complete ready to pave -- three inches of Modified Binder = 2,323 tons at $26.00 per ton.</td>
<td>$79,406</td>
<td>$5,293 Est. Ave Life 15 Yrs</td>
</tr>
<tr>
<td>2. Cold In-Place recycling -- Train Method 3&quot; in Depth 5280 ft. X 24 ft. = 14080 sq. yds.; 2,323 tons at $14.00 per ton requires a 1&quot; overlay at 775 tons at $26.00 per ton (projects require minimum of 3 mi)</td>
<td>$52,672</td>
<td>$5,267 Est. Ave Life 15 Yrs</td>
</tr>
<tr>
<td>3. Hot Central Plant Recycling -- 3&quot; in Depth 40% Rap (Recycled Asphalt Pavement) 5280 ft. X 24 ft. = 14080 sq. yds.; 2,323 tons at $14.00 per ton requires a 1&quot; overlay at 775 tons at $26.00 per ton (individual projects are more competitive when hot top is readily available)</td>
<td>$66,610</td>
<td>$9,515 Est. Ave Life 7 Yrs</td>
</tr>
</tbody>
</table>
Recycling... continued from p. 4

estimated cost per lane mile. The average cost of cold in-place asphalt recycling
was estimated at $28,555 per mile (and $2,596 per lane mile per year of life)
compared with $45,400 per mile (and $4,639) for cold control plant recycling.
For hot central plant recycling, the average cost for one mile was estimated at
$42,829 (and $3,629).

You also must consider the average life of the new roadway. The same
survey estimated the average life with cold in-place recycling to be 11 years,
with cold plant methods, 9.8 years, and with hot recycling, 11.8 years. The
lowest cost per year may not be the choice that will last the longest.

To help compare costs in New Hampshire we have constructed a chart
(see page 4) outlining the differences between full depth reclamation, cold in-place
recycling (recycling train method) and hot central plant recycling. It should
be noted that a minimum of three miles is usually necessary when considering the
use of the cold in-place recycling train. Also, the figures printed here are only
“ballpark” and should be used with extreme caution. Actual costs can only
be calculated on a case-by-case basis and may deviate radically from those shown.

Specifications for cold recycling and reclamation

Cold mix construction should be performed at temperatures over 50
degrees Fahrenheit and in good, dry weather. If the material is too cold or too
wet, there will be problems mixing, curing, and compacting.

There is a variety of equipment that can be used for cold in-place recycling
and reclamation. Your equipment selection will depend on budget, the type
and length of road to be recycled or reclaimed, and the contractor chosen.

One approach to cold in-place recycling, is the portable asphalt
recycling train, which performs all functions on-site by mixing, crushing,
and sizing the asphalt pavement, mixing the additive, and placing the mixture
on the road surface. The recycling train provides improved quality control over
other cold in-place recycling methods and better road durability.

When reclaiming a road the surface
is broken up and mixed into the base.
After ripping the old road surface,
crushing can be done with a portable
hammer-mill that pulverizes the road
materials as it moves along. The mixing
process can be done with a motor grader.
During this process an emulsified asphalt can
be applied directly to the crushed material
with an asphalt distributor at a predeter-
mined rate. A rotary mixer, which mixes the
aggregate and the emulsified asphalt with
rotating tiller blades can also be used.

A common practice during full depth
reclamation is to stabilize the soil with
Calcium Chloride (CaCl₂). The CaCl₂ is
applied during the mixing process. It helps
during the compaction process and creates a
hard tightly bound reclaimed base. Another
favorable property of CaCl₂ is that it inhibits
frost action during freeze thaw periods.

Other advantages and disadvantages

In addition to being cost effective
compared with other road rehabilitation
methods, cold in-place recycling and
reclamation have other advantages. They
obviously save time by eliminating the
removal and hauling of road material to and
from a plant facility. Disruption to traffic is
reduced because the roadway can remain
open in the mornings and evenings. During
the day, work can be limited to one lane,
thereby permitting traffic to travel in the
other lane. Environmental effects are
minimized because dust, fumes, and smoke
are less severe than with other processes.
Further, all existing material is reused,
putting less strain on natural resources and
eliminating the need to dispose of used
asphalt material. Last, but not least, old
roads are restored to practically new
condition.

Cold in-place recycling and reclamation
may result in lesser quality control of
material compared with the central plant
process. Also, the nature of traffic flow and
control in certain areas may not lend itself to
this method.

Before choosing a method for rehab-
ilitating or reconstructing your roads,
consider their condition, age, and location.
If your road has a weak base, recycling the
surface will not cure the main problem. Full
depth reclamation, on the other hand, may be
a viable alternative to conventional recon-
struction. Talk with your colleagues about
the choices they have made, why they made
them, and the results over the short and long
term. Read articles and studies and contact
your T² center at 1-800-423-0060.

Portions of the above article were taken
from Nuggets and Nibbles, April 1990, a
publication of the Cornell Local Roads
Program.
LIFTING BASICS:

Techniques For Safe Lifting

Safe lifting is always important - but it's critical when lifting is a part of your job or everyday activities. If you've ever "thrown out" your back while doing a seemingly simple lift - moving a crate, lifting a piece of furniture, carrying a file box to the office - you know firsthand the importance of safe lifting. Safe lifting means keeping your back aligned while you lift, maintaining your center of balance, and letting the strong muscles in your legs do the actual lifting. By using the following techniques, you can learn how to lift safely and save your back from accidental strain and injury.

The Safe Way to Lift

Before you lift anything, think about the load you'll be lifting. Ask yourself: "Can I lift it alone?" "Do I need mechanical help?" "Is it too awkward for one person to handle, or should I ask a co-worker for help?" If the load is manageable, follow these tips for safe lifting:

1. Tuck Your Pelvis
   By tightening your stomach muscles you can tuck your pelvis which will help your back stay in balance while you lift.

2. Bend Your Knees
   Bend at your knees instead of at your waist. This helps you keep your center of balance and lets the strong muscles in your legs do the lifting.

3. "Hug" The Load
   Try to hold the object you're lifting as close to your body as possible, as you gradually straighten your legs to a standing position.

4. Avoid Twisting
   Twisting can overload your spine and lead to serious injury. Make sure your feet, knees, and torso are pointed in the same direction when lifting.

Tips To Remember

In addition to these techniques, remember to make sure that your footing is firm when lifting and that your path is clear. And be sure to use the same safe techniques when you set your load down. It takes no more time to do a safe lift than it does to do an unsafe lift, so why not play it safe and lift it right?

The above information was reprinted from Interchange, Winter 1991, a publication of the Nebraska P Center.
Wood Preservatives: Their Use and Application in Timber Bridges

Creosote has been banned.
On the contrary. In 1985 the Environmental Protection Agency (EPA) concluded an eight-year review for all three of the major wood preservatives - creosote, pentachlorophenol (penta) and the waterborne arsenicals (which include ACZA and CCA). It was determined after EPA’s extensive review process that the benefits of these wood preservative chemicals far outweigh any potential risks.

Why is it not possible to find creosote and penta solutions in local hardware stores?
In the past, small containers (quart and gallon units) could be purchased by an individual for home use. As a result of the reregistration process, the three major wood preservatives cited above are restricted use and thus, can only be sold to a licensed applicator. The minimum quantity of creosote available in a packaged container is 10 gallons (two five-gallon units can be purchased together). Penta, ACZA and CCA solutions are not generally available for “field-use” application.

Restricted Use.
A further explanation concerning restricted use is important. In accordance with the EPA reregistration process for the three major wood preservatives, label modifications were mandated addressing the application, use and handling of the wood preserving chemicals. Thus, creosote, penta and the waterborne arsenicals can only be applied by an individual who has been properly trained which constitutes the restriction of the use of these wood preservatives.

Who is a licensed applicator?
This is an individual who has completed a two to three day State (i.e., New York, Pennsylvania, etc.) training program. This program is an extensive review of the proper methods for applying the wood preservatives to the wood product.

Application of wood preservatives to wood (pressure and non-pressure methods).
With respect to lumber and timbers that are used as a bridge material, initially the wood must be pressure treated in accordance with the American Wood-Preservers’ Association (AWPA) Standards C2 and C14 for pressure processes. During the erection of the bridge when bore holes and fresh cut areas may expose untreated wood and addition “brush” application of preservative must be made. During the pressure treating process, a licensed applicator must be involved in the treatment process for the wood.

Field Applications.
There is an exception to the licensed applicator rule with respect to creosote when it is being applied (non-pressure) at the construction site. Creosote may be applied by an individual who has reviewed an EPA training film which can be obtained from a creosote producer. In addition a non-restricted wood preservative, such as copper naphthenate (2% solution), can be used. This field application is performed in accordance with AWPA Standard M4, “Standard for the Care of Preservative-Treated Wood Products.” In addition, or as an alternative, the wood surfaces may have applied to them a heavy application of a coal tar roofing cement meeting the ASTM D-4022 specification.

Is it necessary to be a licensed applicator to install treated wood products?
The answer is no. Treated wood is not “a pesticide” and; therefore, installation of a timber bridge can be performed as a routine construction practice. However, there are certain precautions for the use and handling of treated wood. These are given in the Consumer Information Sheets (CIS) which can be obtained from the treated wood supplier.

Does the installation of treated wood products in direct contact with water (streams, lakes, etc.) present a concern for their effect on the environment?
The answer is no. EPA specifically has indicated that the “incidental contact” of treated wood with water should be allowed and does not constitute environmental concern. Wood preservatives do not bi-accumulate, and there is not a significant potential risk to man, animals, fish or the environment when exposed to treated wood products.

Why use treated timber as a material in bridges?
Using preservative chemicals significantly extends the service life of wood. Treated wood products such as those utilized in a timber bridge can be used safely and without adverse effects. It is a wise use of a construction material because wood is a renewable resource. As a structural product this material - wood - can be harvested and replanted.

References
- Consumer Information Sheets

The above information was reprinted from Crossings, No. 8, May 1992, a newsletter of the National Timber Bridge Initiative.
Left: Prestressed concrete was used to set up the abutments and a timber support structure.

In order to erect the 40 foot pedestrian timber bridge during the demonstration show it was necessary to do some site preparation and some initial assembly of the superstructure. This involved bolting the deck together and excavating for the abutments and footings.

Right: The superstructure was lifted and set into place with a crane.

With a lot of cooperation from vendors such as Construction Dynamics, Newstress, and the engineering firm of Hoyle & Tanner the entire timber bridge was erection on the day of the show.

Left: By 3:00 PM a new 40' timber pedestrian bridge was in place connecting the newly constructed parking lot (another of the many demos at the show) to the second story of the village center. The bridge will be used for loading and unloading supplies as well as a handicap access ramp.

Anyone interested in timber bridges is encouraged to go see this particular structure at any time. It was made possible in part through the U.S. Forest Service's National Timber Bridge Initiative funding program. The bridge was constructed of 70% native wood species and is a good example of timber being used as a viable alternative to other bridge materials.
VIEWPOINT: Using Common Sense with Treated Wood

Is it environmentally safe?
by John Culp

The wood treating industry has undergone changes in the past two decades. Alternative methods of construction have posed competition, economic recessions have threatened, and controversies have arisen regarding access to adequate supplies of timber to treat.

The most significant wood treating event during the past 20 years, has been the growth of the environmental movement and the sweeping (and often uncritical) application of its commendable tenets throughout commerce and industry. As I travel throughout parts of the United States, consulting with architects and engineers, the question I most often encounter regarding treated wood is, "But is it environmentally safe?" This is a rational and worthy question, but all too often the information-seeker has already reached the conclusion that it is not. Additionally, some of the architects and engineers I speak with regarding treated wood have unwittingly developed the preconceived notion that any wood impregnated with chemicals becomes a hazardous substance.

Our chemical-conscious society often fails to make the distinction between the chemical itself, which is admittedly developed with the aim of eliminating fungi, insects, marine borers, and other undesirable inhabitants, and the wood that is infused with the chemical. Pressure treated "fixes" the chemical into the very fibers of the wood and becomes a safety issue only when the wood is machined or burned. Simple, safe, and common-sense handling precautions should then be taken, in accordance with well established U.S. Environmental Protection Agency (EPA) guidelines.

Wood-treating chemicals themselves have a long and relatively innocuous history. Creosote, for example, is really nothing more than the liquid portion of coal, and its coal tar derivatives are found in unregulated abundance throughout the marketplace - in the buttons on your shirt and in the dandruff shampoos you buy at the drugstore. Koppers Company experiments have found creosote to have a moderately low toxicity; about half again as toxic as common table salt. The city of Seattle has received much of its drinking water for many decades through two wood-staved aqueducts treated with creosote. Waterborne preservative, or arsenicals, cannot help but bring to mind images of murderous octogenarians clad in equally old lace. But I am told that arsenic is ubiquitous in the environment. It is found in seawater and in the seafood that we consume, particularly shrimp and cod. All soils have some concentration of indigenous arsenic; the state of Alaska has the highest levels.

All chemicals used in wood-preservative treatment have been exhaustively tested by the EPA, which has issued a set of useful and appropriate guidelines for the use of treated wood. These guidelines are available from the EPA or the Western Wood Preservers Institute upon request. Any prudent discussion of treated wood should include some consideration of its alternatives, and the environmental price we pay for using them. There is no energy source that is free of environmental hazard, whether it is air-polluting fossil fuels or wild-life endangering hydroelectric power. Timber, on the other hand, is a primary and renewable resource. Extending its life through pressure treatment is a responsible act of conservation. For those who advocate the use of non-treated, so-called "naturally resistant," species of cedar and redwood, I would encourage reading Bjorn Hanson's Woods Injurious to Human Health: A Manual. You might be surprised to discover that the confirmed health problems associated with exposures to Western red cedar and redwood sawdust and shavings.

In closing, many scientific sources of information on the environment compatibility of treated wood are available through the Western Wood Preservers Institute and other sources. I see my advocacy role for the use of pressure-treated wood products as carrying an equal responsibility of education. The best advice I can offer a prospective customer is the application of liberal amounts of an expensive yet often overlooked commodity: common sense.

The above article was reprinted from Crossings, No. 7, February 1992, a newsletter published by the National Timber Bridge Initiative.
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<tr>
<th>November 2, 1992</th>
<th>Did You Know?</th>
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<tr>
<td><strong>Winter Snow &amp; Ice Workshop</strong></td>
<td><strong>Local governments looking for ways to stretch their tax dollars have discovered what commercial truckers have known for more than two decades: retreading tires saves big dollars without sacrificing quality, dependability, or length of service.</strong></td>
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<tr>
<td><strong>Location:</strong> The New England Center, Durham, NH</td>
<td><strong>- A retreaded tire costs about half as much as a new tire.</strong></td>
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<td><strong>Cost:</strong> $50.00 per person</td>
<td><strong>- A quality truck tire can be retreaded up to four times.</strong></td>
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<td><strong>Agenda:</strong> Case Studies, Policy Setting, GIS, Anti-Corrosion Deicer, Impact of Pavement Conditions, SHRP Products, Dealing with Budget Constraints, and much more!</td>
<td><strong>- It takes 22 gallons of oil to make a new tire. Retreading that tire will save about 15 gallons.</strong></td>
</tr>
<tr>
<td><strong>Contact:</strong> S. Robert Przybylo NE Chapter APWA 34 Hawthorne Mead Drive Glastonbury, CT 06033</td>
<td><strong>- Retreading saves the nation more than 400 million gallons of oil annually.</strong></td>
</tr>
<tr>
<td><strong>Sponsored by: The New England Chapter APWA</strong> for more information call 1-800-423-0060</td>
<td><strong>- It also saves space in the nation’s landfills.</strong></td>
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<tr>
<th>November 12, 1992</th>
<th>How to Address Underground Storage Tanks</th>
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<td><strong>Location:</strong> NHMA Annual Conference at the Center of NH, Manchester</td>
<td><strong>- Liabilities, compliance issues, leaking, funds, when to call a consultant, procedures for a Tank Pull (bids, notifications, engineering, documentation, etc), &amp; case history</strong></td>
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<tr>
<td><strong>Agenda:</strong></td>
<td><strong>Contact:</strong> NHMA @ 1-800-852-3358</td>
</tr>
<tr>
<td><strong>Technology Transfer Center (T3C)</strong></td>
<td><strong>Sponsored by: The New Hampshire Municipal Engineers Council</strong> for more information call 1-800-423-0060</td>
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