

ROAD BUSINESS



On the Road in New Hampshire *Using Paving Fabric in Keene*

In September 2005, the city of Keene installed a paving fiberglass polyester non-woven geotextile on Edgewood Avenue. The road was severely alligator cracked with an average daily traffic of 250. Bruce Tatro, highway superintendent, managed the project.

According to Bruce, all of the roads in the neighborhood were in a similar condition prior to the treatments. This allowed the city to evaluate the performance of the paving fabric against like roads.

Edgewood Ave was milled and swept. A layer of PG Asphalt (old AC20) @ .20 gallons per square yard was sprayed followed by the fabric and a 1 1/2" hot-mix overlay. Other roads in the neighborhood

received the same treatment minus the fabric.

Bruce was happy with the performance of the product over this past winter. There is less reflective cracking on Edgewood than the similarly treated roads. He points out that one section of the pavement failed. However, he says that the failure was due to structural damage and did not fail due to the fabric. When asked if he'd use the fabric again that he would.

For more information on paving fabrics, see page eight of this newsletter.

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Technology Transfer Center
New Hampshire LTAP at UNH

National Incident Management System (NIMS) Compliance

Readers know that public works personnel are first responders. Now PWD's are getting long overdue recognition for their role in emergency response.

The Department of Homeland Security developed NIMS, a uniform set of processes and procedures, for emergency responders to use in emergency response operations.

There are six components to NIMS:

- Command and Management,
- Preparedness,
- Resource Management,
- Communications and Information Management,
- Support Technologies, and
- On-going Management and Maintenance

NIMS compliance is required for Federal Grant funding. Political and governmental leaders, agency and organization administrators, department heads, and personnel that fill Incident Command Systems (ICS) roles should take the NIMS 700 certification. The deadline for full NIMS compliance is September 30, 2006. NIMS implementation requirements are online in the Secretary's letter to the Governors on the NIMS webpage (see the NIMS Compliance section). Implementation requirements for FY 2006 will be released later this year, although NIMS compliance deadlines have not been extended.

On-line compliance certification is available: "Introduction to NIMS" (IS-700). Or, agencies may contact their local fire departments. ❖

Sources:

http://www.fema.gov/emergency/nims/nims_compliance.shtm
May 1, 2006

New Incident Management Requirements are in Effect,
NIMS, *Country Roads & City Streets*, Vol. 21, No. 1,
Spring 2006, p. 1-3

Public Works Management Software

The UNH T² Center is upgrading SIMS, RSMS and DrainMS. SIMS, RSMS and DrainMS will have a new look and feel, but use the same "tried and true" condition assessment and management algorithms as the older versions.

In the new version, field data collection is easy with a tablet PC or laptop. Users will collect signs, culverts, or catch basins (or other assets) by clicking on the screen's digital map. A drop down form enables one to enter the data. Assets appear on the map as an icon. Users do not need and hold a Global Positioning System (GPS) unit on the asset because the location is entered using a stylus on a map.

Pavement inventory and assessment is similarly collected. Road sections also appear as an icon and data is entered through drop down menus, including physical characteristics (e.g. number of lanes, lane width, etc. and severity). The seven distresses are the same as found in earlier versions of RSMS

Once data is collected, a management analysis is used. Results are seen by changing the shape and/or color of icon, depending upon which condition is selected (e.g. road signs with obstructions, or culverts in need of review). Users may hold the mouse on the icon to view the details for each asset. There are a variety of tabular reports available.

The LTAP Exchange, a private partner, will make GIS software available to map collected data. Additional functions such as GASB34 reporting, cost analysis, and data archiving are available online through the LTAP Exchange.

Release is due this fall. See the fall issue of *Road Business* for training details. ❖

Technology Transfer Center Celebrates its 20th Anniversary

August of 2006 marks the 20th anniversary of the UNH Technology Transfer Center.

1986

- The Technology Transfer Center opens and first issue of *Road Business* is published.
- John A. Anderson, Project Director; Yvonne E. Allen, Administrative Assistant; Charles H. Goodspeed, University Liaison.

1987

- Free publications are available and video loan program established.

1988

- Roads Scholar Program is introduced.
- RSMS issued for paved roads.

1989

- RSMS revised to include unpaved roads.

1990

- Edwin R. Schmeckpeper joins staff and Jennifer Rand replaces Yvonne Allen.

1991

- Dowel and Glulam timber bridge and concrete span bridge erected at Mountain of Demonstrations.

1992

- Edwin Schmeckpeper leaves and A.R. Van de Meulebroecke added to staff as T² engineer.
- First Municipal Equipment Management System (MEMS) workshop offered.
- Quick Guides are published and distributed.

1993

- John Anderson earns Ph.D. and becomes Director of Pennsylvania T² Center. Dave Fluharty becomes the Director.
- Hilar Varik begins a one year internship.

1994

- CEU's available for Road Scholar Workshops.
- Road Scholar Program revised to provide four levels of recognition.
- Jennifer Rand leaves the T² Center to attend graduate school at Tufts University.
- Kathy DesRoches joins staff.
- RSMS surveys by Civil Engineering students offered.
- First Master Road Scholars are recognized.

1995

- A.R. Van de Meulebroecke retires.
- T² Website goes on-line.

1996

- First annual Road Scholar Directory published. Center receives grant to partially fund Work Zone Traffic Control kits for municipalities.
- 1st High Performance Concrete bridge in the Northeast is constructed on Rte 102 in Bristol, NH.
- Listserv Road.net is created, (renamed PW.NET).

1997

- T² Challenge at the Mountain of Demonstrations.
- Sign Inventory Management System (SIMS).
- Over 200 people attend the High Performance Concrete Bridge Showcase in Waterville Valley.

1998

- The Mutual Aid Program for Public Works is started.
- Windows version of RSMS and SIMS completed and distributed.

1999

- The 200th person achieves Road Scholar status.
- UNH T² Center devotes a webpage devoted to job opportunities

2000

- Interactive Public Works Calendar is established on the website.

2001

- First Fall Roads Scholar Directory published.

2002

- Daryle Lamoureux joins the Center.
- NHPW Mutual Aid Program creates video.

2003

- UNH T² Center co-sponsors Eastern Winter Road Maintenance Expo with NHDOT & FHWA.

2004

- Daryle Lamoureux leaves and Kathryn Claytor joins the Center
- Fast track bridge built in Epping.
- Dave Lent of Merrimack becomes the 100th Master Roads Scholar.

2005

- Last five years of *Road Business* published on CD.
- Select videos from VHS Library are converted into DVD.
- Dave Fluharty retires after 12 years.
- Mutual Aid used for the first time.

2006

- Mutual Aid widely used in flooded areas.

New Hampshire Roads Scholars

We are pleased to recognize those who have achieved the following levels in the UNH T² Center Roads Scholar Program during the Spring of 2006.

Master Roads Scholar. Participated in UNH T² Center training activities which totaled 100 contact hours and covered the range of topics required for Roads Scholar II.

<u>Name</u>	<u>Affiliation</u>
David Almon	NHDOT
Jonathan Champagne	
Reggie Cleveland	Henniker
Bob Eaton	NHDOT
Larry Jackson	Littleton
Jean Marie Kenamer	Nashua
Cal Prussman	Newbury
Glen Smith	NHDOT

Senior Roads Scholar. Participated in UNH T² Center training activities which totaled 70 contact hours and covered the range of topics required for Roads Scholar II.

<u>Name</u>	<u>Affiliation</u>
Brian Bourgoine	Bow
Reagan Clarke	NHDOT
Rob Hatch	Madison
Gary Kitson	NHDOT
Dan Lavoie	Nashua
Karen Welch	New London

Roads Scholar II. Participated in UNH T² Center training activities which totaled 50 contact hours and covered a set of minimum subject areas including road design and construction basics, other technical, tort liability and safety, and supervision or personal development.

<u>Name</u>	<u>Affiliation</u>
Robert Bain	Plymouth
Frank Colyn	NHDOT
Jay Davini	Manchester
Fred Duefield	Grafton
Timothy Elder	Lebanon
David Haskell	Tamworth
Robert Hebert	NHDOT
Calvin Johnson	Madison

Richard Lefavour	NHDOT
Richard Page	Farmington
Charles Perkins	Raymond
James Rostron	NHDOT
Joe Toupin	Bow

Roads Scholar I. Participated in UNH T² Center training activities which totaled 30 contact hours.

<u>Name</u>	<u>Affiliation</u>
Duane Abbot	Sunapee
Peter Bergeron	Peterborough
Mark Berube	Kingston
Raymond Castor	NHDOT
George Chartier	Littleton
Travis Chick	Bartlett
Robert Clough	NHDOT
Mike Courville	Conway
Jason Dewildt	Rochester
Alan Dews	Dover
Earle Fernald	Bartlett
Terry Hall	NHDOT
Harold Johnston	Lebanon
Dan Ketchie	Merrimack
Tracy Leonard	Gilford
Don Miller	Bartlett
Jack Myers	Nottingham
Eddie Nason	Brookfield
Becky Newton	Lancaster
Richard Nunziato	Raymond
Charles Pease	Northwood
Jennifer Perry	Exeter
Laurie Rauseo	
Tim Redmond	Bedford
Bruce Russell	Walpole
Gary Sakin	Plymouth
Keith Salisbury	Plymouth
Dwayne Searles	NHDOT
Frank Sullivan	Barnstead
Brian Sullivan	Franklin
Gary Turner	NHDOT



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Master Roads Scholars

Ed Chase--Merrimack

Ed Chase is the public works director in the town of Merrimack. Ed earned a B.S. in Civil Engineering from New England College and an M.B.A. from New Hampshire College.

Ed worked at NHDOT and Public Service of New Hampshire. Later, he joined the City of Concord as chief engineer then as operations manager. He worked as the public works director in the town of Peterborough and a consultant.

Ed continues to take classes because he values staying current. He says it is a benefit to take classes through the T² Center because of its affiliation with UNH.

Ed and his wife, Martha, have a son, Erik. Erik a junior at UNH, is studying to be a High School math teacher. Ed likes to travel, snowmobile, fish, and camp.



Robert Eaton--NHDOT



Robert Eaton is the Access and Utility Engineer in the NHDOT, District 2. He has been at the NHDOT for four years. Previously he worked at Cold Regions Research and Engineering Lab in Hanover, NH.

Bob's motivation to take classes is to remain current in new technology and equipment. He says that he learns at least one new thing at every class.

Bob says the NHDOT tries to send several employees to classes because they are practical for everyday work, such as grading and culvert replacement. Bob says he encourages everyone in the profession to attend the UNH T² Center classes.

Bob has been married for 38 years. He lives with his wife in Thetford, Vermont. They have 2 children and 2 grandchildren. Bob enjoys hunting, fishing, and traveling in his leisure time.

Jean Marie Kennamer--Nashua

Jean Marie Kennamer is the traffic engineer in the city of Nashua. She was hired in December 2005. Jean Marie grew up in central Massachusetts. She earned her B.S. in Civil Engineering in 1994 from Worcester Polytechnic Institute. She worked in the private sector until 2000. From August 2000 to December 2005, she worked for the town of Derry in the Engineering Department.

Jean Marie likes to attend training because it refreshes her skills. She also learns from her peers and the other communities. She loves her job with the city of Nashua because they support education and training.

Jean Marie has been married for eight years to David, a computer engineer. They have a five-year old daughter, Christina Elise.



Workspaces can Reveal Clues

You can judge someone's personality by their workspace. People leave deliberate and inadvertent clues about themselves in their personal area. Co-workers are good at judging what these clues mean.

Deliberate clues are like plants, reveal that people intend to stay a while. Candy reveals that the person is an extravert. They want others to drop by and chat. Be careful about clues because one's image is at stake. As anyone can buy a plant but one has to be task oriented to keep it alive. Therefore, the image projected may be more powerful than the work actually done.

When it comes to projecting a positive image, some areas are easier to manage than others. A messy area is tough as people have to change their behavior to clean up their act. It is worth the effort. A clean area says that the person is productive. So, even if a worker can find everything, clean-up to look good. Start with a organizational system and take the last fifteen minutes of every day to maintain it. ❖



Sources:

Boston Globe, November 27, 2005 p. 1-7

Maintenance Management System Schematic, WSDOT, Winter 2002, pg. 13

Color-Blindness Affects Perception of LED Signals

Color-blindness affects the perception of green light-emitting diode (LED) signals. LED signals are becoming more popular and issues have emerged requiring investigation to determine the impact LED has on the driving public.

Color-blindness affects up to eight percent of the male population and 0.5 percent of the female population. There are two main forms of color blindness.

1. Red/green color-blindness is the most common deficiency
2. Blue color-blindness is an inability to distinguish both blue and yellow (they are seen as white or gray).

In 2002 and 2003, MNDOT conducted a green LED preliminary study. The study showed that the best solutions were different for the color-blind versus the non-color blind travelers.

- There is a difference in green LED perceptions between color-blind and non-color-blind people.
- The green-tinted lens is better for the color-blind, but the clear lens was better for the non-color-blind.
- The brand and the design of the head (high LED count verses low LED count) that was best is different for the color-blind versus the non-color blind.

The project recommended further study to determine whether any of the designs currently on the market can balance the needs of color-blind and non-color-blind drivers.

Source:

Guan, Rachel MNDOT, Technology Exchange, University of Minnesota, Spring 2005, Vol. 13, No. 2, p. 2.

UNH T² Center Technical Note

Bridge Maintenance Practices



The most effective way to prevent bridge deterioration and keep bridges serviceable is to perform regular, planned bridge maintenance, and maintain a bridge inventory. Any crew can perform the eight bridge maintenance practices summarized in this technical note. These practices are fundamental to ensure the safety and dependability of the bridge, extend its useful life, and save money.

Inspect Bridges

Inspect town bridges yearly to track their performance and maintain a written file. Include pictures in the file.

Control Vegetation and Small Animals

A plant's root system can cause considerable damage to a bridge.

Plants create and expand cracks. Remove small plants from the abutments and other members. To protect the structure and improve driver visibility, cut back brush and small trees on the approaches and the banks near abutments.

Small animals can also pose a problem. Animals may burrow into the banks or close to the abutment which may allow water to enter the fill. If possible, remove all small animals.

Remove Debris

Debris often collects upstream, downstream, and against the bridge. Debris creates waterway restriction. This may result in eroded fill material from the stream bed and banks, a faster current, as well as weaken piers or abutments. Completely remove debris. Do not place it on river banks, where it may be picked up by high water.

Wash Bridges

Sand and salt from winter maintenance attracts moisture, which ponds on the bridge deck and other members. Ponding leaves the bridge susceptible to rust and weakens the concrete. Use a small, portable, high pressure pump to remove accumulated dirt and salt. Sweep the deck before washing to avoid having material fall into the water.

Begin washing the bridge deck at the highest elevation. Remove dirt from drain holes and expansion joints. Dirt also collects under the bridge therefore, wash trusses, panel joints, and bridge seating.

Improve Transitions

A rough transition from the road onto the bridge causes vehicle loads to abruptly hit the bridge deck. Severe jolts can prematurely weaken the bridge.

Gravel road approaches create buildup above the deck elevation, which spills onto the bridge deck. Cut down gravel approaches with a grader to prevent this. Handwork is necessary to remove

dirt in areas where the grader cannot.

Install a bituminous asphalt surface 25' from the bridge prevent problems resulting from gravel road approaches.

Waterproof Concrete Surfaces

To prevent portland cement concrete from spalling, waterproof the bridge deck and areas exposed to chloride every two years.

Use a solution of linseed oil and petroleum mineral spirits or use silane-siloxane. When applying silane-siloxane follow manufacturer's guidelines.

Patch Concrete Decks

Patch cracks to prevent moisture and chemicals from penetrating the reinforcing steel. This stops the steel from rusting. Rust causes expanding and spalling. Seal cracks with an approved sealer.

To patch, remove loose and deteriorated concrete and clean the area with a dry blast before sealing. Coat reinforcing steel with an epoxy bonding compound, unless an epoxy mortar will be used for sealing. While the epoxy coat is still tacky, apply mortar in the patch area, screed, and float even with the deck. When traffic can be restricted for only a few hours, use a fast-setting mortar.

Post Bridges

If the load limit is unknown seek advice of a professional engineer. Check the load limit of the bridge against the state-designated load. The NHDOT rates bridges based on a load limit (see the next section of this tech note). Load limits below state-designated loads must be posted using the Manual on Uniform Traffic Control Devices (MUTCD). Notify the appropriate users of the bridge: schools, police, fire departments, and others affected by the posting. Failure to post may result in unnecessary bridge wear and tear as well as premature failure.

Bridge Rating System

New Hampshire Revised Statutes Annotated (RSA) Chapter 266 relative to truck weight, permits vehicles "certified" by the Department of Safety to

carry additional weight on any way (road) other than the Interstate and Defense Highway System.

The Commissioner of Transportation may restrict at their discretion the crossing of certain bridges, which they determine to have insufficient strength to safely carry "certified" loads by limiting the vehicles to a caution crossing or by prohibiting the crossing. The Commissioner may post standardized warning signs designating these bridges as caution crossing bridges, or as excluded bridges, and publish a list which designates bridges at least annually. For local and privately owned bridges, it is the duty of the authority having jurisdiction to place similar signs.

Definitions

Certified Vehicle – A vehicle certified pursuant to RSA 266:18-D operating in excess of the weight limitation set forth in RSA 266:18-A but not exceeding the weight limitations established by RSA 266:18-B.

E-1 – This bridge shall not be crossed by a certified single unit vehicle. Certified combination vehicles may cross the bridge.

E-2 – This bridge shall not be crossed by any certified vehicle.

C-1 – A certified single unit vehicle may cross the bridge but must not be on the bridge at the same time as any other vehicle weighing over six tons. If a vehicle larger than a pickup truck is approaching the bridge it must stop and allow the other vehicle to clearly cross. Then, the certified vehicle may cross the structure. Certified combination vehicles may cross the bridge at the same time as other certified combination vehicles or other lesser loads.

C-2 – Any certified vehicle may cross the bridge but a certified vehicle must not be on the bridge at the same time as any other vehicle weighing over six tons. If a vehicle larger than a pickup truck is approaching the bridge, the certified vehicle must stop

and allow the other vehicle to clearly cross. Then the certified vehicle may cross the structure.

C-3 – A certified combination vehicle may cross the bridge but must not be on the bridge at the same time as any other vehicle weighing over six tons. If any vehicle larger than a pickup truck is approaching the bridge a certified combination vehicle must stop and allow the other vehicle to clearly cross. Then the certified combination vehicle may cross the structure. ❖

Checklist for Maintenance

1. Inspect Bridges

- Perform inspections annually.
- Update written and photographic files.

2. Control Vegetation and Small Animals

- Remove small plants and brush.
- Look for burrowing small animals.

3. Remove Debris

- Remove debris completely off-site.
- Remove debris up/downstream and against the bridge.

4. Wash the Bridge

- Remove debris from bridge deck.
- Sweep deck to remove accumulated dirt and salt.
- Begin washing at highest elevations.
- Pay attention to underside of bridge as well.

5. Improve the Transition of the Road onto the Bridge

- Cut down gravel at road approaches.
- Hand work may be required at corners.
- Create a bituminous surface on the approach to prevent gravel buildup.

6. Waterproof Concrete

- Waterproof every two years.
- Waterproof surfaces exposed to chloride.
- Waterproof with lineseed oil or silane-siloxane (following manufacturer's instructions).

7. Patch Concrete Decks

- Remove loose and deteriorated concrete.
- Clean area with a dry blast.
- Use slow-setting mortar when traffic can be controlled for long time periods.
- Use fast-setting mortar when traffic can be restricted for a few hours.

8. Post Bridges

- When load limit is unknown, consult the NHDOT for load limit ratings or professional engineer.
- Check bridge load limit against state-designated loads.
- Post signs when bridge load is under state-designated loads.
- Send notices of postings to appropriate bridge users and officials.

References:

- "Administration of Bridge Inspection," Action Guide Volume I-6, National Association of County Engineers, 1990
- "Checklist for Inspecting Bridges," KUTC Newsletter, May 1988
- Standard Specifications for Road and Bridge Construction, NHDOT, 2002



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BRIDGE PREVENTIVE MAINTENANCE CHECKLIST

Structure _____ Date _____

Feature Crossed: _____ Inspected By _____

ITEM	Satisfactory Condition	Needs Repair	Needs Engineering Study	Comments	Date Reported
Signs					
Delineation					
Debris					
Islands or Sand Bars					
Erosion or Scour					
Berms					
Riprap					
Settling or Railing @ Approach					
Abutments					
Pilings					
Bridge Seats					
Spalling (abutment)					
Paint					
Truss Broken/ Bent/Rusted					
Stringers					
Girders					
Bearings					
Expansion Joints					
Deck					
Curbs					
Sidewalk					
Railing					
Cleaning					
Painting/ waterproofing					

Working Safely in the Heat

Working in the heat is a safety hazard. Heat stress makes people tired, hurts their work performance, increases chance of injury, and can be fatal. Road crews often work in high temperatures and humidity, under full sun, with little or no wind, while wearing heavy or restrictive protective gear and under intense physical exertion. This is the perfect combination for heat-related illness.

Heat-Related Illnesses

When working in a hot environment, the body's temperature increases, in an attempt to maintain its normal temperature, it transfers the heat back into the environment through sweat. The hotter it gets, the harder the body must work to stay cool. When it has absorbed more heat than it can dissipate, heat related illnesses can strike. Illnesses range from mild prickly heat, muscle cramps and swelling, to severe heat exhaustion, and heat stroke. The first warning signs of heat stress are sluggishness and a foggy feeling. As the body loses fluid the condition worsens. Cramps, dizziness, and fainting follows, leading to heat exhaustion and heat stroke.

Prevention

Most heat-related illnesses are preventable by keeping the body cool and well-hydrated.

- Before work begins, drink water until feeling full. Drink water, fruit juice, or sports drink (5 to 7 ounces) as often as every 15 minutes. Keep drinking all day.
- If work allows, wear light-colored, loose-fitting, breathable clothing. Sweat soaked clothes are cooler than bare skin. Choose and use the hard-hat with the widest brim. Don't forget sunscreen.
- Cool down by resting in a cool, shady spot or, if possible, in air conditioning. Encourage the supervisor to plan work so the heaviest work is done during the coolest time of day. Work in the shade whenever possible.
- Get sufficient sleep and good nutrition. Eat smaller meals before work activity. Avoid caffeine, alcohol and large amounts of sugar and salt.

Source:

Staying Healthy in the Work zone: working in the Heat, Oregon Roads, Spring 2005, Number 78, p 7-8

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UNH T² Center Staff
Charles Goodspeed, TRCG Director
Kathy L. DesRoches, Director of Educational Programs & *Road Business* Editor
Katy Claytor, Program Assistant
Kristen Gallup, Project Assistant

Federal Highway Administration (FHWA), the New Hampshire Department of Transportation (NHDOT), and UNH support the Technology Transfer Center. Any opinions, findings, conclusions, or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of FHWA, NHDOT, or UNH. Any product mentioned in the *Road Business* is for information only and should not be considered a product endorsement.

Using Geotextiles in Pavements



Good drainage is crucial to a road's performance. Water softens the subgrade and reduces its structural capacity. To control water infiltration into the sub-base, agencies often use subsurface drainage and ditches or pavement seals. Although an overlay seals the pavement, overtime, reflective cracks will reappear. This article discusses the use of paving fabrics.

The placement of a paving fabric creates an interlayer system of a nonwoven geotextile installed over a PG Asphalt and then overlaid or chip-sealed. The system creates a water barrier and absorbs pavement stresses thereby reducing reflective and fatigue cracking. The system also restricts freeze-thaw damage due to saturation.

A pavement fabric system with an overlay is a viable alternative to an overlay or seal alone. The costs of the systems vary, so a cost-benefit analysis is necessary to decide which system agencies may use.

The Problem

Moisture weakens the subbase and damages the pavement structure. A saturated base results in progressive pavement failure. A base saturated by as little as ten percent reduces the useful life of the pavement by 50 percent.

Water jetting from cracks or joints moves the subgrade material to the road surface. This creates voids under the pavement and eventual pavement failure.

Water enters the base through the groundwater from drainage ditches or from subsurface flow. Usually, these sources are secondary to rainwater entering through the pavement surface.

Paving Fabric Research

Field and laboratory research evaluated the effectiveness of paving fabric interlayer systems in minimizing surface water infiltration through the pavement.

In the lab, a paving fabric interlayer provides improved moisture barrier properties compared to asphalt alone. Studies show that the pavements with paving fabric are less permeable than without a paving fabric. Research showed variations due to the amount and uniformity of the PG Asphalt. When using paving fabric ensure that the fabric is installed with sufficient PG Asphalt to become impermeable.

Caltrans performed extensive research on paving fabrics. Their findings show that fabric provides an increased service life equivalent to an extra 1.2 inches of overlay. This is due to the stress-absorbing function, which retards reflective cracking, and the waterproofing function.

Field studies are general agreement with those in the lab. Lower moisture levels in the pavement structure were seen as well as increased pavement strength.

Construction Procedures

1. Prepare old pavement. Fill cracks larger than ¼" and potholes. Remove dirt, debris, and vegeta-



- tion. Shim or mill roads in poor condition.
2. Apply PG Asphalt. Air temperatures should be at least 50 degrees and rising. Do not apply PG asphalt in the rain, as it will not bond to the pavement.
 3. Install paving fabric over wet PG asphalt. Overlap the edges 1-3". Broom or roll to avoid air bubbles and large wrinkles.
 4. Apply an overlay or chip seal over pavement fabric.

Conclusions

The following conclusions are based on the laboratory and field evaluations of the waterproofing effectiveness of a paving fabric interlayer system:

- ☞ Laboratory and field pavement cores indicate that a properly installed paving fabric interlayer system reduces the permeability of pavement. It reduces water infiltration and becomes an efficient moisture barrier and enhances pavement performance.
- ☞ Moisture levels beneath the pavement layers are lower with paving fabric. It maintains the strength of the subgrade, subbase, and base layers, and limit damage due to saturation.
- ☞ To provide a continuous moisture barrier, use sufficient PG Asphalt to saturate the paving fabric and bond the interlayer system. Lesser amounts of asphalt cement diminish the waterproofing effect. Evenly apply the PG Asphalt. Inspections and quality control are important.
- ☞ Consider using a paving fabric as a moisture barrier when drainage installation is not an option. ❖

Sources:

Marienfeld, Mark, and Baker, Thomas, [Paving Fabric Interlayer As A Pavement Moisture Barrier](http://onlinepubs.trb.org/onlinepubs/circulars/ec006.html) <http://onlinepubs.trb.org/onlinepubs/circulars/ec006.html> June 1, 2006

Petromat Intallation Guide

Trupave Engineered Paving Mat

Thank you to All States Asphalt for their assistance with this article.

Mutual Aid Update

New Hampshire
Public Works



Mutual Aid
Program

May 2006 flooding affected all but one NH county. Some areas broke long-standing records with rainfall in excess of 13 inches. Mutual aid was enacted

by five municipalities and 12 responded. Towns that were helped in October 2005, reciprocated during this recent storm.

In addition to public works personnel and equipment, building inspectors were requested in Allenstown, Goffstown, and Hillsborough.

Currently, 94 municipalities are members of the New Hampshire Public Works Mutual Aid program. There are over 700 trucks, 50 graders, and 1,100 people available. To enact mutual aid, one may page a board member for assistance (376-4453), broadcast their need on pw.net, or contact municipalities themselves using the database maintained by the UNH T² and published on the web www.t2.unh.edu/ma

At the Mutual Aid orientation held May 25, 2006 during the Mountain of Demonstrations, people came as far away as Worcester County, Massachusetts to learn about the program. Massachusetts requires enabling legislation to begin a program. Other states have seen the benefit of NH's program and many are interested in adopting a program. ❖



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Publications

UNH Technology Transfer Center



These publications are available from the UNH T² Center. See www.t2.unh.edu/video_pub/publist.html for a complete list and to access some publications online. To request publications, complete form and mail or fax to 603-862-0620.

___ **Installing the Correct Traffic Signs.** Presents basic guidelines for installing traffic signs.

___ **Cath Basin Cleaning.** Describes the function of catch basins and best practices for cleaning.

___ **Culvert Inspection and Repairs.** Covers culvert inspections to determine needed cleaning, repair or replacement, and methods to minimize erosion.

___ **Interviewing.** Includes sample interview questions for the organization that is hiring.

___ **Hiring New Personnel.** Explains the new employee selection process and provides tips to do before, during, and after the interview.

___ **Permitting for the Wetlands.** Provides information on wetlands pertaining to municipalities.

___ **Gravel Road Maintenance.** Discusses basic information about gravel roads, including grading procedures and grader operation.

___ **Recommended Technical Standards for New Roads Provides New Hampshire cities and towns.** Provides a set of minimum technical standards for governing new roads.

___ **Chainsaw Safety, ST-235, 21 min.—DVD** Demonstrates the do's and don'ts of chainsaw operation. Oregon Saw: Chain Division.

___ **Common Maintenance Problems and Causes, M-236, 21 min.—DVD** Discusses problems with gravel roads, paved and unpaved shoulders, and drainage and presents typical causes of these problems.

___ **Work Zone Safety for Rural Local Agencies, ST-234, 102 min.—DVD** Presents information on traffic control devices, zones, applications, flagging techniques, and legal liability.

___ **Preventive Maintenance: Project Selection, M-284, 30 min.—DVD** Explains the advantages of preventive maintenance and the importance of preserving the life of the road, rather than restoring it.

___ **The Importance of Road Drainage, DC-251, 19 min.—DVD** Emphasizes the importance of drainage, including surface and subsurface drainage, drainage systems, and procedures for their inspection and repair.

Material Request Form

Name: _____

Title: _____

Affiliation: _____

Mailing address: _____

Town/City: _____

State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Milestones:

The towns of *Kingston*, *Madison* and *Marlow* have joined New Hampshire Public Works Mutual Aid.

Alan Bolduc, Meredith, has filled the position on the NHPWA Board created by *Mike Faller*.

Wayne Elliott has joined Sanbornton as the operations manager

The New Hampshire Standards and Training Council elected new officers. Chair: *Dave Foster*, Somersworth, Vice-chair: *Kathy DesRoches*, UNH T² Center, Secretary: *Kevin Sheppard*, Manchester, and Treasurer: *Jim Brown*, Somersworth. *Dave Danielson*, SEA was appointed chair of the Accreditation Committee.

Bruce Temple is the new public works director in Claremont.

Jim Terrell, Walpole, joined the Mutual Aid board. *Chum Cleverly*, Bow, founder of the program stepped down after declaring it a success.

Websites:

Calibrating spreaders: www.saltinstitute.org/snowfighting/6-calib.html

Geotech at a Glance www.fhwa.dot.gov/engineering/geotech

National Incident Management System (NIMS) http://www.fema.gov/emergency/nims/nims_compliance.shtm

New Hampshire Standards and Training Council www.t2.unh.edu/nhpwstc

Updated Workzone rule www.ops.fhwa.dot.gov/wz/resources/final_rule.htm



Listservs

A listserv is a free way to use email to exchange information. To subscribe send an email to ListProc@lists.unh.edu. Leave the subject line blank, in the body of your message type:

Subscribe listname your name

For instance:

Subscribe pw.net John Doe

PW.NET

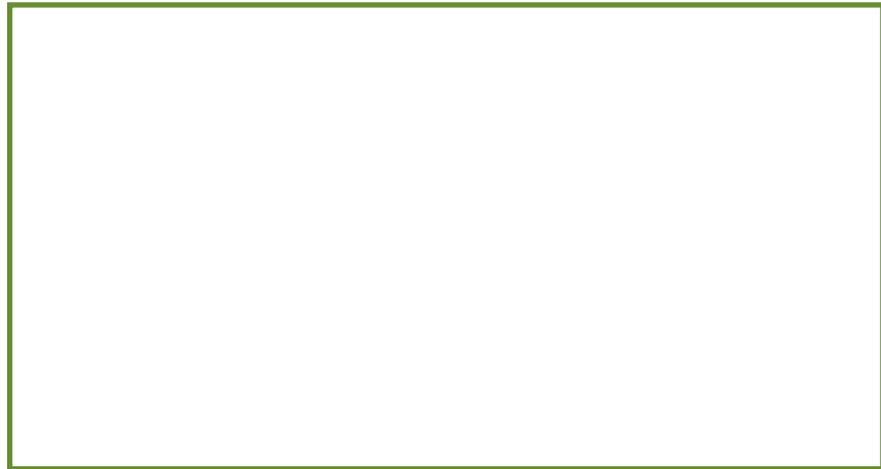
Want to know what is happening in other towns? Or, learn the very latest in regulations? Need a place to ask questions of other public works officials? Want to be the first to receive notifications of UNH T² Center workshops? Sign up for pw.net

RunOff.Talk

Want to discuss NPDES II issues and concerns? This list enables a dialog to clarify federal permits, and determine the best technical management for compliance. Use it to announce meetings and conferences. ❖

Road Business

Technology Transfer Center
University of New Hampshire
33 College Road
Durham NH 03824-3591
603-862-2826 or
800-423-0060 (NH)
Fax: 603-862-0620
t2.center@unh.edu
<http://www.t2.unh.edu>



Technology Transfer Center
New Hampshire LTAP at UNH

Fall Workshop Calendar

Date	Workshop	Location	Cost
Supervisory or Personal Development			
August 17	Performance Evaluations	Somersworth	\$45
September 7	PR for Public Works	Lebanon	\$45
Technical Aspect of Road Maintenance or Repair			
August 23-24	Road Safety Audits & Low Cost Safety Improvements	Rochester	\$75
September 12	Lines, Levels, & Slopes	TBA	\$60
September 14	Lines, Levels, & Slopes	Hancock	\$60
October 17	Municipal Road Standards	Concord	\$45
October 19	Culvert Maintenance	Lebanon	\$60
October 26	Winter Operations	TBA	\$60
October 27	Winter Operations	Manchester	\$60
November 2	Culvert Maintenance	Concord	\$60
Basics			
October 24	Basics of a Good Road	Lincoln	\$60
October 31	Basics of a Good Road	Concord	\$45
Tort Liability or Safety			
November 3	MUTCD, Sign Rules	Lincoln	\$60
TBA	Tort Liability	Manchester	\$45

Workshops not yet scheduled

Gravel Road Maintenance, Pavement Markings, Project Planning, and others.