

Structural Engineers of NH

March 2005



Serving New Hampshire

Next Meeting

Wednesday
March 16, 2004

**DESIGN OF
STRUCTURES IN THE
COASTAL
ENVIRONMENT**

CR Sparks
Bedford, NH

SENH PRESIDENT'S LETTER...

As discussed at our January meeting, three legislators introduced House Bill 72 in an attempt to eliminate the requirement for continuing education for engineers. Due to short notice, we polled the membership via email to ascertain the position of our organization. Almost 90% of the members who responded said that they wanted to retain this requirement. Given this strong support, the Board provided oral and written testimony at a hearing on the bill. We are happy to report that the House ED&A committee voted unanimously against recommending passage of this legislation and it was later defeated on the House floor.

Legislative Liaison

House Bill 72 has highlighted the need to keep abreast of legislative actions. To achieve this, the Board is looking for a volunteer to serve as a Legislative Liaison. The liaison would review proposed bill titles in December, establish contacts in the NH House and Senate, and keep our membership informed of upcoming legislation that affects engineers. If you feel that you could serve the organization in this manner, please contact a member of the Board.

March Meeting

The March Meeting will focus on Coastal Engineering. For those who are not aware, FEMA has produced a number of publications outlining requirements for buildings constructed in coastal zones. Some of the requirements that concern our profession are the design for wave action and the design of break-away walls.

May Meeting

Details for the May meeting are still being finalized; however, we do know that the Vicki Arbitrio, Vice President of NCSEA will attend and give a brief description of NCSEA activities. There will also be a technical presentation following her presentation.

SENH Board of Director Nominees

The May meeting is also the General Membership Meeting. The Board of Director terms of Steve Johnson, Alex Azodi, and Robert Busby will expire in May. Steve and Alex have both served one 2 year term and Bob has been on the Board since January, filling the remainder of Roger Gayer' term. For the openings, the Board of Directors nominates Steve Johnson, Alex Azodi, and Robert Busby to refill these positions. According to Article VII, Section I, other nominations signed by three (3) or more members may also be submitted. These must received by the Board of Directors by March 31, 2005.



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Member of

Young Engineer of the Year

In recognition of his contribution to the engineering profession and to his community, Thomas French, P.E., an SENH member, has been named Young Engineer of the Year. Congratulations to Tom on this well deserved honor.

NH Building Code Review Board

The New Hampshire State Building Code Review Board has been meeting monthly to review proposed amendments, hear appeals, and consider the adoption of new or more recent versions of the current codes in force. Currently under consideration is the adoption of the International Existing Building Code. A committee has been formed to study the Code and make recommendations to the Board. The Code expands on the information in the IBC by addressing additions and renovations of existing buildings. You can view all the current State building Codes, amendments, and meeting minutes by visiting the Board's website <http://www.nh.gov/safety/bldgcode>. You may also contact Joel Fisher at Fisher Engineering, 528-7641 or Fisher@metrocast.net, if you have any questions or comments regarding the Board's activities

New Members

Please join us in welcoming the following new members:

Roger Keilig – member
Noah Elwood - member
Sarah Zoni – associate member

Other Meetings and Seminars

The Boston Wood Solutions Fair will be held Thursday, March 31st at the Sheraton Ferncroft Resort (Danvers, MA). This is a full day event with seminars on heavy timber, NDS 2005, engineered wood products, wood connections, and timber piling and pole construction. This is a way to obtain PDH's at no cost. Register at www.woodsolutionsfair.com.

The North American Steel Construction Conference will be held April 6-8 in Montreal, The conference will include short courses on Steel Design after College, Connections, and Seismic Braced Frames. More information can be found at www.aisc.org/nascc.

The ACI Spring Convention will be held April 17-21 in New York City. More information can be found at www.concrete.org.

The SEI Structures Congress is April 20-24 in New York City. More information can be found at www.seinstitute.org.

An AISC Bolting and Welding Primer seminar will be held March 1st in Boston. For more information, go to http://www.aisc.org/Content/NavigationMenu/Learning_Opportunities/Seminars/Seminars.htm.

As always, if you have any questions regarding SENH, what's planned for the future, or suggestions on how to improve our organization, please don't hesitate to contact any member of the Board of Directors.

Sincerely,
Structural Engineers of New Hampshire
Steve W. Johnson, P.E.
President



Structural Engineers of New Hampshire Meeting Attendance

DATE: January 19, 2005

PLACE: Chen Yang Li Restaurant, Bow, NH

RE: NHDOT Rapid Bridge Construction & Recent Changes to NHDOT Bridge Standards
(2.0 PDH Assigned)

NAME	ORGANIZATION	NAME	ORGANIZATION
Dana Michael Adams, P.E.	Opechee Construction Corp.	Thomas, P Levins, P.E.	Holden Transportation Engineer
Matthew Allen, P.E.	JSN Associates, Inc.	Steve Long, P.E.	Opechee Construction Corp.
Chris Baker	Vanasse Hangen Brustlin, Inc.	Matthew J. Low, P.E.	Hoyle, Tanner & Assoc., Inc.
Paul M. Becht, P.E.	H. L. Turner Group	Josh Lund, P.E.	Vollmer Associates
Jason Blais, P.E.	Opechee Construction Corp.	David A. Macolini, P.E.	JSN Associates, Inc.
Jay H. Brown, P.E.	Structural Systems, Inc.	Robert D. Madore	WR Grace & Co.
Robert S. Busby, P.E.	Kalwall Corporation	Lisa M. Martin, P.E.	Quantum Construction Consult
John Byatt, P.E.	CLD Consulting Engineers, Inc.	Donald F. Mayo, P.E.	Donald F. Mayo, P.E., Inc.
Mark Colgan, P.E.	Vanasse Hangen Brustlin, Inc.	Mark McLeod	H. L. Turner Group
Michael Coon	Sandford Surveying & Engineering, Inc.	Kenneth W. Milender	Miller Engineering & Testing, In
Edward F. Decelle	Structural Systems, Inc.	Wallace M. Mosher, P.E.	Vanasse Hangen Brustlin, Inc.
Kathy J. Dougherty, P.E.		Heather Okolo	CLD Consulting Engineers, Inc.
Robert H. Durfee, P.E.	Hoyle, Tanner & Assoc., Inc.	Joseph W. Patusky, P.E.	NHDOT
JoAnn Fryer, P.E.	CLD Consulting Engineers, Inc.	Linda McNair Perry, P.E.	GV Engineering, LLC
Jason L. Gallant, P.E.	Parsons Transportation Group	Rob Ricard	CLD Consulting Engineers, Inc.
Paul Goldberg, P.E.	PCI Architecture	Mark Richardson	NHDOT
John Goudreault	FST	Richard E. Roberts, P.E.	Foley & Buhl Engineering, Inc.
Timothy L. Grant, P.E.	TL Grant Engineering Consulting	Richard M. Rooney, P.E.	McFarland Johnson
Sally Gunn	Vanasse Hangen Brustlin, Inc.	Arthur W. Rose, P.E.	Arthur W. Rose, P.E., PLLC
Marcus Hann, P.E.	SFC Engineering Partnership, Inc.	Bill Saffian	
Robert S. Hartford, P.E.	Kalwall Corporation	Earl J. Sandford, P.E.	Sandford Surveying & Engineer
Steven M. Hodgdon, P.E.	Vanasse Hangen Brustlin, Inc.	Pete Stamnas	NHDOT
Sean James, P.E.	Hoyle, Tanner & Assoc., Inc.	John G. Stockton, P.E.	Louis Berger Group
Steve W. Johnson, P.E.	Vanasse Hangen Brustlin, Inc.	Jeffrey S. Trexler, P.E.	Trexler Engineering
James Karmozyn, P.E.	H.E. Bergeron Engineering	Edward Weingartner, P.E.	McFarland-Johnson, Inc.
Thomas T. Kendrick, P.E.	Parsons Transportation Group	Bryson T. Welch, P.E.	CLD Consulting Engineers, Inc.
Stephen Kiss, P.E.	SAK Engineering	Keith Wentworth	Vanasse Hangen Brustlin, Inc.
Jeffrey T. Klein	Vanasse Hangen Brustlin, Inc.	Mark Whittimore	NHDOT
Matthew J. LaBrecque, P.E.	PCI Architecture	Lori Wixson	McFarland Johnson
Aaron Lachance	Vollmer Associates	Ross S. Wood	McFarland Johnson
Andy Lawrence	H. L. Turner Group		

SENH January 19th Meeting Minutes

I. BUSINESS PORTION OF MEETING:

The meeting was called to order by President Steve W. Johnson, PE, at 7:15 pm, after the social time and dinner.

Treasurer, Jim Karmozyn, PE, reported that the SENH account had balance of \$8899 before tonight's meeting.

Steve Johnson, P.E. offered a summary of the *amicus* brief that was filed in December. It concerns the appeal of a NH trial judge ruling that the statute of repose violates the NH Constitution. That statute bars claims against contractors, subcontractors and design professionals from claims arising more than 8 years after the date of substantial completion. The brief describes the interest that architects, engineers and contractors have in maintaining the statute of repose as it provides needed protection to the design and construction professions. As such, the SENH Board agreed to participate as in this so called 'friend of the court' filing, along with other professional organizations

Steve J. reported that SENH offered testimony in support of keeping NH Continuing Education Requirement the before the New Hampshire Legislature Executive Departments and Administration (ED&A) Committee re: House Bill 72 that would eliminate the requirement for CE requirements for PE renewal if passed. 88% of the respondents to the membership e-mail survey supported keeping CE requirements.

Upcoming SENH March 16 meeting planned to be in Manchester (TBD) will be on Coastal Engineering. Plans for May meeting includes possible topic on tilt up construction.

National Engineers Week Awards Banquet – Feb 24 at which SENH's nominee for Young Engineer of the Year, Thomas A. French, P.E., will be honored as the award recipient. ACEC Breakfast Meeting – Feb 8: NCSEA Winter Institute Feb 18-19.

Bob Durfee, PE, our NCSEA delegate, is looking for a few more volunteers to work with local high schools to display the NCSEA Advocacy Committee's Structural Engineering posters.

The board is looking for volunteers for following positions: Legislative Liaison to replace the inactive Legislative Committee and a new webmaster.

Membership needs to be reminded to keep their e-mail addresses updated with SENH if they wish to receive Newsletters via e-mail and be informed of fast breaking events such as the recent continuing education matter.

Steve J. introduced the speakers.

II. TECHNICAL PRESENTATIONS

Pete Stamnas, P.E. with the NHDOT Bureau of Bridge Design presented Rapid Bridge Construction Project: a case study of NHDOT's first Rapid Bridge Replacement Project. The existing 120 ft two simple span bridge located on Mill Street in Epping was replaced with a 115 ft single span precast box beam bridge. The bridge over the Lamprey River, which is designated wild and scenic, had a history of major flooding. After 6 weeks of site preparation, the replacement project started August 19 and was completed in 8 days by the contractor R.M. Piper, Inc. of Plymouth, NH.

The goal of the rapid construction approach is to construct quickly using simple and versatile solutions. The key to rapid construction is the substructure that emulates cast in place concrete using precast elements. This allows for minimal traffic disruption, improves work zone safety, improves constructability, and limits the foot print (especially if temporary bridges can be avoided) which reduces impact with realized cost savings. Improved quality that comes with prefabricating in a controlled environment lowers life cycle costs.

With all things considered the cost comparisons using unit prices for conventional construction resulted in an estimated 10% premium for the Epping Rapid Construction project--- after re-bidding to allow additional time for site preparation. The NHDOT plans to try this approach on several more projects in the near future. Pete shared what worked and what didn't during the design, development and construction of the demonstration project.

What worked: The masonry was detailed completely with the reinforcing shown only in section. This allowed the contractor to choose the element sizes appropriate to their assembly approach which was then submitted on plans stamped by one engineer for approval. The footing key, leveling screws, flowable (redi-mix with no aggregate) grout bed with 5 foot port spacing, and grout sleeves were all deemed a success.

What could be improved: The 1" gaps in the footing/stem key were too small. Cork joints do not work because they do not allow for fit up tolerances. The stem shear key will be eliminated and the gap increased to 1 1/2". Fill with closed cell material. Provide a minimum of 2 ft between footing grouted splice joints and stem grouted splice joints. Attention should be given to lead time, providing construction access, and surcharge loads on abutment grouted zones.

Mark Whittemore, P.E. with the NHDOT Bureau of Bridge Design spoke regarding Recent Changes to NHDOT Bridge Standards: Issues of Common Concern between design, construction and maintenance bureaus and resulting changes to NHDOT bridge design standards. NOTE: DETAIL SHEETS ARE AVAILABLE FOR DOWNLOAD FROM www.senh.org

ISSUES OF COMMON CONCERN MEETINGS: The meetings started in 1992 with the purpose to provide a forum for expression of concerns with bridges; engineering, plan issues, construction issues, maintenance; and most importantly to **make decisions**. The participants include Bridge Design, Bridge Maintenance, Construction – DCEs & CAs, M&R, FHWA, Maintenance, Consultants (DOT offering opportunity for 1-2 people to attend each meeting with selection through ACEC). Example of issues discussed: seal size, plug joints, and stabilizing girders during erection.

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MEMBRANE FAILURES ON APPROACH SLABS: Moisture/evaporation is the obvious contributor to the membrane failures. This may be the result of the moisture content being too high in the approach slab due to the pour occurring late in the schedule combined with the pressure of project schedule and getting the bridge membrane and pavement placed. Or the moisture is potentially being absorbed from below the approach slab. A trial solution of heavy duty poly over a 6" layer of sand has been decided upon. This approach has been used on several bridges in the summer of 2003 and all bridges in 2004. The Department will monitor installations for future decision. Currently they have had mixed success with this solution. Contractors have expressed concerns with the difficulty of adjusting reinforcing chairs to the proper elevations on the poly. The Department is also looking at the performance of spray applied vs. torch applied membranes. An option item will not be pursued until further research is done to evaluate materials. Machine applied is better than hand method (torch applied) due to operator variability. Department is hoping to lower the limits where machine applied should be specified.

REBAR ORIENTATION IN APPROACH SLABS: revised orientation of reinforcing in the top layer as shown in the detail will result in accurate radar reading for rebar placements. **SEE DETAIL SHEETS on www.senh.org**

BRIDGE CURB RECOMMENDATIONS:

Notch: Notch not required – followed up with manufacturers

Sawn ends: Prefer split (not sawn) ends – following up with manufacturers

Granite curb vs. Concrete curb: Need to work out issues with concrete scaling. Applying concrete sealer to concrete curbs results in a significant improvement in scaling performance; pay measurement has been changed to Per Gallon as opposed to Per Sq. Ft. Specification requires water repellent to be applied before cold weather. Specification changes include the requirement for thoroughly soaking granite and proper finishing and curing of concrete (full 7 day wet cure) with no steel trowel finishing (which overworks the surface); light broom finish is specified.

CURB DETAILS: All details now call for 2'-0" curb width and elimination of the curb shear key. (In the past Bridge rail anchor plates have had problems fitting within hoop steel.) Welding anchor assemblies to hoops or longitudinal steel not permitted. Solutions for holding the anchor plate assembly in place include providing additional reinforcing steel or other support jigs. **SEE DETAIL SHEETS on www.senh.org**

GIRDER HAUNCH DETAILS: Revised detail to raise the underside of the deck haunch to the top of the top flange to the underside of the deck haunch and reduce distance from edge of flange to edge of haunch to 2 1/2". **SEE DETAIL SHEETS on www.senh.org**

EXPANSION JOINT DETAILS: CLOSED CELL EXPANSION MATERIAL VERSUS FILLER MATERIAL:

THE ELASTOMERIC PLUG JOINT WITH APPROACH SLAB AT GRADE detail addresses movement, material and leaking. There has been inconsistent/incorrect use of these materials in plan notes and details. Closed cell expansion material should only be used in the top of joints where expansion is occurring. Note top of gap between backwall/deck and approach slab. **SEE DETAIL SHEETS on www.senh.org**

FIXED END DETAIL: SAWN/ROUTED JOINT: The Department wants "properly located sawn and sealed joints. To help alleviate the problems with aligning the sawn joint, the Department has new notes as shown on the FIXED END BRIDGE JOINT DETAIL. **SEE DETAIL SHEETS on www.senh.org**

EXPANSION JOINT HOPPER: (finger joints) Department is working on developing revised details and /or materials to facilitate placement of hoppers and downspouts during construction.

TEMPORARY BRIDGES: COORDINATION OF SUBMITTALS; OVERLOADS: Due to submittals from multiple engineers the Department now requires that the temporary bridge submittals be coordinated through one Engineer and be submitted as one package. Design for overloads should be considered for temporary bridges located on NETC routes.

PRECAST CONCRETE DECK SLAB ALTERNATIVE: NHDOT has developed an implementation plan for the use of precast concrete deck panels using a step-by-step approach.

Currently, the Bridge Manual lists guidelines for determining under what circumstances precast concrete deck panels may be considered for use. Note:

- The Department makes the decision during design if the alternative of precast concrete deck panels will be included in the plans and thus allowed for use. CIP design/details will be detailed in the plans and the standard deck panel detail sheet will also be included.
- If precast concrete deck panels are allowed as an alternate, the project's Special Provisions must include the specification that gives the Contractor the choice of providing either the CIP deck or the precast deck panels with overlay.
- If precast deck panels are allowed as an alternate, the standard detail sheet providing all the deck panel details needs to be included in the contract plans.

If the deck panel alternate is permitted, the CIP details shown in the plans need to provide an additional 1/2" of haunch height in order to accommodate the 1/2" extra deck thickness with the deck panel option.

Recently, the department has run tests on several bridge projects, including one carrying I-393 over the Merrimack River. There was no reflective cracking visible in the negative moment regions of the multi-span bridge and the bond between the deck panels and the CIP overlay was not affected by either the heavy traffic or the tensile forces in the negative moment region. With this new information the department will be expanding the deck panel guidelines to include multi-span bridges and bridges with higher ADTs.

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DEFLECTION CRITERIA: In October 2004, the Department changed the deflection criteria to a less restrictive L/1000 using HS-25 live load; further investigations being pursued by the Department. Difference in dead load deflection of interior girders vs. exterior girders must be accounted for when establishing Dead Load Deflection and Bottom of Slab Elevation tables.

AASHTO SPECIFICATIONS:

LRFD (Third Edition): The Department has three in house designs underway that will help to identify issues and highlight areas that may require additional design guidance for NHDOT design practice. The NHDOT is planning to completely implement the LRFD Third Edition, including consultants, in 6 to 12 months.

“NEW” 2001 Standard Specifications for Structural Support for Highway Spans, Luminaries, and Traffic Signals has a rigorous fatigue design. See revised NHDOT 615 and 616 specifications where Fatigue Category and design loads are defined.

REVISED PRECAST DETAILS: Shear Key and Box Beam Details have been revised. **SEE DETAIL SHEETS on www.senh.org**

Mark Richardson, P.E., Administrator, NHDOT Bureau of Bridge Design acknowledged the cooperative efforts of many organizations in making the Epping Rapid Bridge Replacement Project a success and spoke of the benefits to keeping and open mind when considering innovative materials He highlighted some of the innovative materials being used or considered by NHDOT at this time including:

- High Performance self-consolidating Concrete: tricky getting air entrainment in high strength mixes.
- High Performance Steel: with recent reduction in deflection criteria there is more opportunity for exploring HPS
- MMX Reinforcing: it is too new and has weldability issues.
- Stainless vs. epoxy coated vs. galvanized reinforcing (note with galvanized rebar, ties must also be galvanized)
- Carbon-fiber reinforced concrete is too costly at this time.

2.0 PDHs for the technical presentation were earned by attendees.

Respectfully submitted, Linda K. McNair-Perry, P.E., Secretary, SENH

MARCH MEETING ANNOUNCEMENT

NEXT MEETING: Wednesday March 16, 2005

SUBJECT: **“Design of Structures in the Coastal Environment”**, Mr. Dean Savramis,
Federal Emergency Management Agency (FEMA).

PLACE: The Event Center at C.R. Sparks, 18 Kilton Road, Bedford, NH.
603-666-5880

DIRECTIONS: Manchester I-293 to Exit 3, Route 101 West, and exit immediately
onto Route 3 (South River Road). Proceed north on South River Road
to second traffic light (opposite Bedford Mall). Left at that light onto
Kilton Road.

AGENDA: 5:30 pm-6:30 pm Social Hour
6:30 pm-7:15 pm Dinner
7:15 pm-7:30 pm Business Meeting
7:30 pm-8:50 pm Presentation

DINNER: Clam chowder, salad, choice of entrée (Stuffed Chicken or Salmon),
cheesecake.

COST: Member: \$40.00 Non-Member: \$45.00 Full Time Student: \$30.00

RSVP: by Wednesday, March 9, 2005
Please indicate dinner preference (Chicken or Salmon)!

Please send check payable to “Structural Engineers of New Hampshire” with list of
attendees to:

SENH
P.O. Box 226
Manchester, NH 03105-0226
Contact: Deb Coon, Administrative Assistant, (603) 669-5555

NOTE: 2.0 PDHs have been assigned for attendance to this program.
Attendees are responsible for ensuring their check-in on the
attendance list upon arrival at the meeting.



**STRUCTURAL ENGINEERS
OF NEW HAMPSHIRE**

P.O. Box 226
Manchester, NH 03105-0226

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