Structural Engineers of NH
May 2004

Serving New Hampshire

Next Meeting:

Wednesday

May 19, 2004

HILTI, Inc
Structural Anchors

The Common Man Inn
Plymouth, NH

Inside this issue:

SENH PRESIDENT'S LETTER...

The SENH Annual Meeting will be held on May 19th in beautiful Plymouth, NH at the Common Man Inn. We look forward to seeing everyone at this meeting. The technical presentation that evening will be a live demonstration of various HILTI Fasteners, including power actuated types. Board of Directors elections will also be held at this meeting. Come join us in the North Country to kick-off the summer season!

In Need of a Structural Engineer?

Many firms have been posting advertisements for structural engineering on the SENH website recently. If you wish to post an ad for your firm or are a structural engineer looking for an opportunity, check it out at www.senh.org/employme.html.

STRUCTURE Magazine Topics

SENH member Dennis Tewksbury is now a member of the Editorial Board of STRUCTURE Magazine. The October 2004 issue will feature bridges, and the Editorial Board is soliciting articles on "down to earth" bridge solutions, like many projects in the northeast, as opposed to more glorified cable-stay long span bridges we see written about so often. Contact Dennis at dntewksbury@prodigy.net if you are interested. This is a great opportunity to showcase what we do in New Hampshire to a national audience.

Professional Development Committee (PDC)

By now, most of you (hopefully), have received the SENH Board of Directors e-mail request for PDC members. This is a great opportunity to be involved, make a difference, and provide valuable assistance to the Board. Our technical business meetings are the life-blood of SENH and what separates us from most organizations. We encourage all those interested to get involved and ensure SENH's continued success.

Jeffrey P. Shaw / Geoinsight, Inc. Scholarship

As many of you are aware, Jeffrey P. Shaw, P.E. a graduate of UNH and lifelong NH resident, was posthumously awarded the 2004 Young Engineer of the Year Award by the New Hampshire Joint Committee of Engineering Societies. In his honor, his employer, Geoinsight, Inc. has established a scholarship to be awarded to a UNH environmental engineering masters student to receive $2,000 per semester. If you wish to contribute to this worthy cause, please contact John Gilbert, P.E. of Geoinsight at jagilbert@geoinc.com

Member of

Coffee Mugs

SENH will have SENH Coffee Mugs for sale at the upcoming meeting. The cost of a mug is $5.00. We have had many new members join SENH since these mugs were last available. Show your pride in SENH with a *world famous* SENH Mug!

Engineer/Young Engineer of the Year Nominations

The SENH Board of Directors is soliciting nominees for the 2005 Engineer and Young Engineer of the Year Awards. If you wish to nominate an SENH member for either of these prestigious awards, please write to the Board. Remember, nominees must not be informed of their nomination. The deadline for nominating is preferably no later than October 31, 2004.

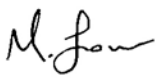
On a Final Note

As this is my final newsletter as President, I wish to offer a few observations and comments. The opportunity that I was able to take advantage of as a Board Member for the past 4-years has been very worthwhile. For me personally, I have had the extreme honor of working with individuals that I highly respect and are respected within our profession. Being able to work with other Board members such as Ray Cowan, Dennis LaBombard, Ben Tirey, Dave Konieczny, Jim Karmozyn, Roger Gayer, Steve Johnson, and Alex Azodi, has been very rewarding to me. Being a Board Member, and particularly President, has allowed me to meet and coordinate activities with members of other societies and professions. We have accomplished a lot, but there is more to do. I would encourage other SENH members to consider what they could offer SENH. I believe each of our members has unique skills which would benefit the group as a whole.

With that being said I wish to thank SENH for the opportunity to serve you. It has been my pleasure to be your President and represent a great organization that I believe strongly in. My time on the Board is an experience that I look fondly on.

See you on May 19th at the Common Man Inn in Plymouth, NH.

Very Truly Yours
Structural Engineers of New Hampshire



Matthew J. Low, P.E.
President

Structural Engineers of New Hampshire
Meeting Attendance

DATE: March 24, 2004
PLACE: The Cat n' Fiddle Restaurant, Concord, NH
RE: Collaboration between Structural and Geotechnical Engineers – Working Together to achieve the Best Solutions (2.0 PDH Assigned)

NAME	ORGANIZATION	NAME	ORGANIZATION
Dana Michael Adams, P.E.	Opechee Construction Corp.	James Karmozyn, P.E.	H.E. Bergeron Engineering
Matthew Allen, P.E.	JSN Associates, Inc.	Roger Keilig	HTE Northeast
Jason M. Ayotte	Hoyle, Tanner & Assoc., Inc.	Paul Kirby, P.E.	TFMoran, Inc.
Roderick D. Bard, P.E.	Stahlman Engineering	Stephen Kiss, P.E.	SAK Engineering
Jeff Benway	SFC Engineering Partnership, Inc.	Dave Konieczny, P.E.	Pyramid Engineering, P.C.
H. Edmond Bergeron, P.E.	HE Bergeron Engineers	Dennis R. LaBombard, P.E.	LaBombard Engineering, LLC
Josif Bicja	Hoyle, Tanner & Assoc., Inc.	Matthew J. LaBrecque, P.E.	PCI Architecture
Jason Blais, P.E.	Opechee Construction Corp.	Steve Long, P.E.	Opechee Construction Corp.
Jay H. Brown, P.E.	Structural Systems, Inc.	Johnathan, M. Longchamp, P.E.	Daigle Engineers, Inc.
Robert S. Busby, P.E.	Kalwall Corporation	Matthew, J. Low, P.E.	Hoyle, Tanner & Assoc., Inc.
John Byatt, P.E.	Louis Berger Group	Josh Lund, P.E.	Vollmer Associates
William A. Capone, P.E.	SFC Engineering Partnership, Inc.	David A. Macolini, P.E.	JSN Associates, Inc.
Mark Colgan, P.E.	Vanasse Hangen Brustlin, Inc.	Kenneth G. Marshall, P.E.	Foley & Buhl Engineering, Inc.
Peter Conti	Golder Associates, Inc.	Lisa M. Martin, P.E.	Quantum Construction Consultants, L
Normand G. Cote, Jr., P.E.	NGC Structural, LLC	Donald F. Mayo, P.E.	Donald F. Mayo, P.E., Inc.
Tony Coviello, P.E.	JSN Associates, Inc.	Kenneth W. Milender	University of NH
Edward F. Decelle	Structural Systems, Inc.	Raymond G. Morin, P.E.	Raymond G. Morin, P.E.
John DiGenova	Haley & Aldrich	Wallace M. Mosher, P.E.	Vanasse Hangen Brustlin, Inc.
Kathy J. Dougherty, P.E.	---	Linda McNair Perry, P.E.	Hexaport International Ltd
Khaldoun Doukmak	JSN Associates, Inc.	Stephen Richard	Steffensen Engineering Assoc., Inc.
Robert H. Durfee, P.E.	Hoyle, Tanner & Assoc., Inc.	Tom Rigg, P.E.	SFC Engineering Partnership, Inc.
Noah Elwood	Appledore Engineering	Richard E. Roberts, P.E.	Foley & Buhl Engineering, Inc.
George Fallet, M.S., P.E.	Consulting Engineer, Inc.	Arthur W. Rose, P.E.	
Joel Fisher, P.E.	Fisher Engineering, P.C.	Bill Saffian	
Roger W. Gayer, P.E,	Structures Unlimited, Inc.	Matthew A. Severson, P.E.	Parsons Transportation Group
Derek J. Gilbert	TFMoran, Inc.	Peter Steffensen, P.E.	Steffensen Engineering Assoc., Inc.
Paul Goldberg, P.E.	PCI Architecture	Eric Teale	HTE Northeast
Martin Gorham, P.E.	JSN Associates, Inc.	Jeffrey L. Tirey, P.E.	Tirey & Associates, P.C.
Timothy L. Grant, P.E.	TL Grant Engineering Consulting	Jeffrey S. Trexler, P.E.	Trexler Engineering
Marcus Hann, P.E.	SFC Engineering Partnership, Inc.	Craig Ward	GEI
Robert S. Hartford, P.E.	Kalwall Corporation	Edward Weingartner, P.E.	McFarland-Johnson, Inc.
Peter Ingraham, P.E.	Golder Associates, Inc.	Andrew D. White	Tirey & Associates, P.C.
Sean James, P.E.	Hoyle, Tanner & Assoc., Inc.	John J. Wilson, P.E.	Edwards & Kelcey
Steve W. Johnson, P.E.	Vanasse Hangen Brustlin, Inc.	Ross S. Wood	McFarland Johnson

SENH March 24th Meeting Minutes

I. BUSINESS MEETING:

The meeting was called to order by President Matt Low at 7:15 pm, after the social time and dinner.

1. Treasurer, Jim Karmozyn, reported that the SENH account had a balance of $10,639. Dues have been paid by 136 members and associate members.
2. Matt Low noted that our current membership was 180; we have had good growth in the last 6 months.
3. SENH approved applications for two new members: William Capone and Jesse Kendall and one new associate member: David Langlais.
4. The national conference for NCSEA will be held in New Orleans this year. A new NCSEA board will be elected at the conference. SENH will sponsor applications for the outstanding project awards presented at the conference. A project write-up and photos are required with the application; see the NCSEA website for more information on requirements and categories.
5. The Joint Committee of Engineering Societies recently presented the "Engineer of the Year" and "Young Engineer of the Year" awards at the Engineers Week banquet. The nominations come from within the various engineering societies. In the past there hasn't been enough time to put together nominations; therefore, the applications are due earlier this year. The dates will be posted in the next newsletter.
6. Various upcoming seminars were announced:
   NCMA Masonry Specifications – March 30th.
   Structural Engineers of Maine Floor Vibration Seminar - April 16th in Augusta
   PCI Accelerated Bridge Construction Program cosponsored by SENH - May 5 in Concord
   Structural Steel Fabricators of New England Annual Meeting – May 15th
   IBC 2003 Seminar cosponsored by SENH – May 18th. SENH members receive a discount.

II. TECHNICAL PRESENTATION

The presentation included panel discussion with three geotechnical engineers: Eric Teale with HTE Northeast; Craig Ward with GEI; and John DiGenova with Haley and Aldrich. Steve Johnson, from SENH moderated the panel discussion. Questions and a synopsis of the answers from the panel discussion are as follows:

Where does structural engineering stop and geotechnical engineering begin?

There is overlap between the two professions; the line between the two depends upon the project and the expertise of the geotechnical engineer and the structural engineer. Projects with simple foundations and good foundation conditions may end with geotechnical report. Other projects require an integrated approach where the geotechnical and structural engineers work closely to optimize a foundation design (examples - raft foundations, drilled shafts with lateral loads).

When is a geotechnical program warranted (garage, house, one-story 5000 sf commercial building, high rise building)?

The consensus of the panel was that the need for a geotechnical program was related to both the size of the project and the soil conditions. Large projects require a geotechnical program to optimize the foundations and avoid problems during and after construction, but small projects with poor soils can cause significant problems later. Each of the panel members had been called in to look at foundation problems on small buildings/homes to correct foundation problems after construction. For small projects, one suggestion was to call a geotechnical engineer that you work with regularly and determine the level of involvement needed. The geotechnical effort may be as simple as a site visit by the geotechnical engineer.

Where do you draw the line between using test pits, borings, and additional testing?

Test pits can be used for smaller structures in areas where there is till or ledge since there shouldn't be a looser or softer layer below. Test pits need to be located carefully; the backfill for a test pit is generally not adequately compacted which could lead to localized settlement under a slab or foundation. Test pits will not give the density of the soil. Density information is used to determine the allowable bearing pressures; therefore, allowable bearing values may be conservatively low if test pits are used.

Why wouldn't an engineer specify on the plans that the "Contractor shall be responsible founding the structure on soils capable of supporting 3000 psf?"

Specifying that the Contractor verify the soil capacity means that the Contractor should include the cost of the geotechnical program in his price, which would then paid by the owner. If the contractor does have this work done, and poor soils or problems are encountered, you are faced with a change during construction rather than knowing about it during design. However; often, this language means that no one performs a geotechnical investigation and if there is a problem, the note will not necessarily relieve the engineer of liability. If you are going to shift the responsibility to the Contractor, you should have a submittal requirement to ensure that it is done. It was suggested by another member of the audience that the engineer should explain the pros and cons of a geotechnical program to the owners so they are aware of the risk they are assuming by not having any geotechnical investigation.

What are the pitfalls with using presumptive bearing values for foundation design?

The presumptive bearing pressures are not as conservative as you might think. Allowable bearing pressures are usually based on settlement, not soil capacity. Presumptive values don't work well for the side of a slope, sites with variable soil conditions, or layered soils. Using the presumptive bearing values can lead to a more costly foundation design since the soil may actually have a higher capacity which could reduce the footing size. The foundation design should also include other considerations such as high water table or potential liquefaction which aren't addressed by the presumptive values.

SENH March 24th Meeting Minutes (continued)

What is the rule of thumb for estimating the number of borings for a 1 or 2 story building? How do you compare apples and apples when you receive two geotechnical proposals with a different number of borings?

The consensus of the panel was that there is no overriding rule of thumb for the number of borings required. The number of required borings is based on experience and the familiarity with the soil conditions at the particular site. The only way to compare apples and apples is to send RFP's only to geotechnical engineers that you trust their judgment and you are comfortable with. The old BOCA code essentially had a rule of thumb for borings, but this was not carried forward into the IBC code.

Why don't more residential foundations/walls fail?

Residential foundations are usually over designed for the applied soil loads. They are generally buttressed with intersecting walls and supported at the top of the wall by the floor system. Most foundations also have subdrainage so there is no hydrostatic pressure and the walls generally support less than 6' of soil and the friction angle for soil is much higher when there is little overburden. Most residential foundation wall failures are due to contractor errors or poor backfill.

How do we determine when is it worthwhile to perform an environmental/hazardous waste evaluation program in addition to a geotechnical analysis?

Generally, hazardous waste evaluations are needed in an urban environment or if the site is near an existing or previous gas station. Often these conditions are identified in the "due diligence" reports prepared prior to the purchase of a property. Manchester and Boston have significant fills in the urban areas which can be a problem and it was noted that Nashua has areas with asbestos in the fill. Abatement costs can be very significant. An integrated solution is often needed for these problems, ideally, the geotechnical and environmental work would be performed by the same firm. As an example, moving and disposing of coal ash off site can be costly, it may be more cost effective to utilize a different foundation scheme than to remove the material to obtain a higher bearing pressure.

What ways can Geotechnical and Structural Engineers communicate better?

A thorough briefing during scoping of the project is essential. During the scoping you should discuss the goals of the project, possible foundation types, loads, and how the building will be used (e.g. will the building have extraordinary settlement issues due to equipment used in the building, vibrating equipment, or will the façade material not accommodate settlement). There should also be interim discussion after the borings are complete so the engineer is aware of the site conditions and there is discussion on what foundation type to use based on the borings. Prior to bidding, the geotechnical engineer should review the plans and specifications to ensure that the recommendations were interpreted correctly and included in the contract documents. The geotechnical engineer should also be involved with the special inspections. When asked how often the geotechnical engineer is involved during construction, the answers varied from "always on dam projects or very complicated projects" to "never on DOT projects". However, in general, the answer was slightly less than half the time. A caution was noted about having testing companies providing geotechnical recommendations during construction. It was also pointed out that the Special Inspection document prepared by the Engineer of Record stipulates who conducts the special inspections during construction. The structural engineer can specify that the geotechnical engineer provide construction observation.

What, in your experience, leads to the most cost-effective retaining wall systems?

The most cost effective system will depend upon the site conditions and whether the wall will retain a cut or fill. The structural engineer should carefully look at what loads can be concurrent, sometimes overly conservative live loads are specified (e.g. full live load with full snow load). MSE walls can be economical in fill sections; however there are locations where the reinforcing strips won't fit. Soil nail walls can be economical in cut sections.

What are some interesting soils/geological features in the northeast that we should be aware of (e.g. exposed ledge on one side of a river and 100' away on the opposite bank, 100 foot piles required)?

Varved clay deposits against a rock interface, particularly in the Ashuelot River system, marine clays intermixed with bedrock outcrops along the coast, glacial lake deposits along the Merrimack River, Some clays are sensitive to displacement piles, an example of a driven pile being lifted 6' after driving was noted.

What is Lateral squeeze?

It was noted that this was likely a lateral load caused by swelling clays.

How do you arrive at Load Factor allowable foundation loads when most service load allowable loads are based on relative settlement?

Generally, the load factor allowable bearing pressures are based on service load allowable pressures for settlement factored up for load factor design.

Can a Class E or F soil condition be improved for Seismic Classification?

It was noted that some improvements may be possible with in-situ densification or geopiers; however upgrading a class F condition to better than class E was unlikely.

Meeting adjourned at 9:00 pm.
Respectfully submitted, Steve W. Johnson, P.E., Secretary, SENH

MAY MEETING ANNOUNCEMENT

NEXT MEETING: Wednesday, May 19, 2004

SUBJECT: Mark Cunningham and David Amara of HILTI, Inc. will be presenting the following topics for discussion:

- Anchor working principles
- Anchor code changes in ACI 318, Appendix D
- New anchor products
- Sample anchor calculations
- Demonstrations and testing
- Powder Actuated fastening systems for the attachment of steel deck
- Questions and answer session

PLACE: The Common Man Inn, Plymouth, NH

DIRECTIONS: From I-93 North or South: Take exit 26 and at the bottom of the ramp take your first right, to Rt.3, and follow to the stop sign. Take a right onto Rt 3 south. The Common Man is 2/10 mile on the left.

AGENDA: 5:30 pm-6:30 pm Social Hour
6:30 pm-7:00 pm Dinner
7:00 pm-7:15 pm Business Meeting
7:15 pm-8:15 pm Presentation

DINNER: Buffet to include: Garden Salad with House Dressing, Roasted Vegetable Salad, Roast NY Sirloin with Garlic Demi Glace and Horseradish Sauce, Oven Roasted Salmon with Garlic Vinaigrette, Garlic Mashed Potato, Seasonal Vegetable, Rolls & Butter, Chef's Choice Desert and Coffee & Tea

.

COST: Member: $35.00 Non-Member: $35.00 Full Time Student: $25.00

RSVP: May 12, 2004
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 PDH's 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.