

State-Aid Bridge News

January 10, 2006

- **Load and Resistance Factor Design (LRFD) of Local Bridges**

As stated in the August, 2005 State-Aid Bridge News Letter, the Mn/DOT Bridge Office intended to hold a one day workshop on LRFD foundations. Unfortunately, efforts to conduct a fall workshop never materialized. In the meantime the Bridge Office has been fielding questions and assisting our Local Bridge Consultants with any LRFD foundation and bridge related enquiries.

Right now there are plans for a one day workshop to be held in April or May of this year. The workshop material will cover foundations, AASHTO code changes, LRFD Mn/DOT Bridge Manual updates, and address any bridge related questions and concerns.

The State Aid Bridge Office will broadcast an invitation to our local bridge consultants upon official notice of a time and date for this important workshop.

Also, we would like to congratulate our hard working Local Bridge Consultants as they're all now producing local bridge plans using the LRFD specifications. They have easily met the October 1, 2007, deadline imposed by the FHWA.

The LRFD Mn/DOT Bridge Design Manual is available online. You will be able to access the manual through the Bridge Office Website at <http://www.dot.state.mn.us/bridge>. Mn/DOT intends to keep the online manual updated and current with the latest AASHTO LRFD Specifications and Mn/DOT Bridge design/detailing practices.

If you have any questions on the LRFD Bridge Design Manual please contact Dave Dahlberg, our LRFD Implementation Engineer, at 651-747-2116.

- **Foundation Boring Locations, Depths, and Analysis**

Every year we seem to encounter a few bridge projects that under estimate the foundation requirements sometimes resulting in costly project over- runs. The under estimate in foundation requirements is almost always directly related to an inadequate subsurface investigation. It's either the soil boring locations were too sparse and/or the soil borings did not extend deep enough. In either case, the soil testing agency, local agency, and local agency's bridge consultant all need to work together to assure an adequate boring plan is developed. A well developed boring plan is one that provides sufficient subsurface information for a more reliable foundation recommendation.

We remind you that if the local bridge project is funded with State Bridge Bond Funds, and/or Federal Funds that are capped, project cost over-runs become the responsibility of the governing local agency. All the more reason to develop a good boring plan especially for larger/higher profile bridge structures which generally require the use of a large number of foundation piles.

In any event, we highly encourage the use and reference to Mn/DOT's Consultant Specification for Subsurface Investigation and Geotechnical Analysis and Design Recommendations when planning your next local bridge project. We especially recommend the use of this specification when developing plans for large/higher profile bridge projects. Also, bridges over major river crossings and the like will require a detailed boring plan to be reviewed and approved by the Mn/DOT Bridge Office.

The consultant specification for subsurface investigation can be found at the following website.
<http://www.mrr.dot.state.mn.us/geotechnical/foundations/tcontract/consultdrillreport.doc>

- **Bridge Hydraulic News**

Scour Update: The FHWA is requiring that all bridges rated G- No Evaluation- Foundation Unknown have some sort of evaluation and be re-rated. The FHWA made Scour Action Plans (SAP) aka Bridge Scour Action Plans or Scour Monitoring Plans a high area of interest during their recent audits of MnDOT's District Offices. We are technically not in compliance with Federal requirements to date due to the Scour Ratings. The Bridge Management Section has set a deadline of March 2007 as our target date to be in full compliance statewide. Expect to be hearing from them about the status of your Scour Program. Please be sure your SAP's are up to date with current information. Also, Bridges rated F- No Evaluation- Foundation Known, or J-Screen- Scour Susceptible should be evaluated and re-rated and all SAPs must be in-place by the 2007 deadline in order for the state to meet the goal of full compliance. If you need any help in this area please contact Petra DeWall @ 651-747-2162.

MnDOT Drainage Manual: The Drainage Manual is now available online. It can be found at: <http://www.dot.state.mn.us/bridge/Hydraulics-Internet-Web-Site/Hydraulics-Internet-DrainageManual.html>. This manual is still being updated, so check back regularly to make sure you have the latest edition.

- **New NBIS Requirements and Training for County & Municipal Engineers**

Definitions:

State Wide Program Manager: The Mn/DOT Bridge Office (Gary Peterson, State Bridge Construction Engineer), who delegates inspection functions to Local Agency.

Program Administrator: A qualified individual (P.E.) that is designated to oversee the local agency's bridge inspection program.

Bridge Inspection Team Leader: A qualified individual that performs the local agency's bridge inspections, reporting, and recording activities. Level N, II, and E are previous Mn/DOT certifications levels for Team Leaders.

Assistant Bridge Inspector: A qualified individual that assists the Team Leader with bridge inspections. They do not inspect bridges alone.

Recertification Class: A one day refresher training class offered bi-annually at a cost of approximately \$50 to attend. Class locations will be offered at regional locations. Pre-registration is required, and forms with full details and instructions will be mailed out within the next few weeks. The recertification classes will take place from 9:00 am- 3:00 pm. Dates and locations listed below:

Date	City	Location	Address
February 22	Marshall	Best Western	1500 East College Drive
March 7	Bemidji	Hampton Inn & Suites	1019 Paul Bunyon Drive South
March 23	Maplewood (Metro)	Best Western	1780 County Road D
March 29	Brainerd	Craguns Resort and Hotel	11000 Craguns Drive

Comprehensive Bridge Inspection Training (ie Bridge Safety II): Two weeks of training with a practical test. This is a National Highway sponsored class conducted at the Mn/DOT Arden Hills Training Center. The cost of this training class is approximately \$1,400.

A prerequisite for this class is successful completion of Bridge Safety I (a one week training class) with an approximate cost of \$350. The Bridge Safety I class is conducted at the Mn/DOT Arden Hills Training Center as well. This class is typically waived for graduate Engineers.

Go to <http://www.dot.state.mn.us/const/tcp/index.html> for more information on Inspector Certification Training (ie Bridge Safety classes). The Bridge Safety I class is being offered March 13-17, and the Bridge Safety II class is being offered March 13-24.

Summary of NBIS Qualifications

Depending on the size and structure of the County or Municipality, the Engineers may serve one or both the Program Administrator and the Team Leader functions. Each function has its own qualification requirements.

- **Program Administrator**
 - Registration as P.E. in Minnesota
 - Participate in two recertification classes every four years.

- **Team Leader**
 - Previous valid certification as Mn/DOT Bridge Inspector Level N or II and participate in two recertification classes every four years.
 - Previous valid certification as Mn/DOT Bridge Inspector Level E including three years inspection experience and participate in two recertification classes every four years.
 - New Team Leader Certification – requires;
 1. P.E. or F.E. with two years bridge inspection experience, Graduate Engineer with four years bridge inspection experience or Non Engineer with five years experience and
 2. Successful completion of Bridge Safety II class and
 3. Successful completion of field proficiency test and
 4. Participate in two recertification classes every four years.

- **Assistant Inspector**
 - No minimum qualification – cannot inspect bridges alone.

If you have any questions please contact Todd Niemann, State Bridge Inspection Engineer, at 651-747-2132.

- **Local Bridge Scanning Tour Update**

We held a Local Bridge Scanning Tour Kick off Meeting in mid December. The meeting was productive and included new team members Larry Erickson of SRF Consulting Group, and Kent Rohr of WSN. We discussed topic selections for the tour, location and duration of the tour, role and responsibilities, and tour follow up activities.

During the meeting we decided to take a step back prior to finalizing specific locations to tour. It was suggested that we first visit with industry experts in the design and construction of local bridges to seek their recommendations for possible tour topics and locations. With that, we're currently planning to have an expert from the various industries, concrete, steel, and timber to come in and give the tour team a brief presentation on local bridges.

Along with seeking out new and worthy local bridge types, other suggestions for the tour included, exploring improved construction techniques for cast in-place concrete bridges, design-build local bridge construction, procedures used for the assessment/disposal of asbestos and hazardous waste materials, the operation of other local bridge programs, and to visit local bridge sites under construction, in-service or being rehabilitated. Within the next few months we should be well into planning the tour and setting firm dates and locations to visit.

Several of the suggested topics may prove to be more applicable to a desk search. As we continue to plan the tour, we will try our best to select topics that will produce informative results and hopefully benefit our local agencies. We're currently looking at 2-3 shorter trips to cover a broader area of the country as opposed to one longer trip covering only a few localized areas.

The members of the Local Bridge Scanning Tour Team are Dave Conkel (State Aid Bridge Engineer), Patti Simmons (State Aid Programs Engineer), Romeo Garcia (Minnesota FHWA Bridge Engineer), Alan Forsberg (Blue Earth County Engineer), Gary Bruggeman (Steele County Engineer), Ron Benson (Erickson Engineering), Larry Erickson (SRF Consulting Group) and Kent Rohr (WSN).

- **Mn/DOT's New Inverted Tee Beam for Local Bridges**

In September the Mn/DOT Bridge Office hosted a one day workshop on precast concrete slab systems and the new inverted tee beam bridge. The workshop included nationwide participation with representatives from 8 DOT's, 15 counties, consultants, industry and academia. The workshop included 9 presentations on rapid construction, and a site visit to an inverted tee beam bridge being constructed in Center City. As a result of the workshop, a number of participants are planning to implement prefabricated bridge systems in their states.

Mn/DOT has already started their implementation process by constructing two new inverted tee beam bridges this past summer. The first bridge is T.H. 8 over the Center Lake Channel near Center City. The three span bridge (22ft-27ft-22ft) replaced an existing culvert. The second bridge is T.H. 72 over the Tamarac River near Waskish in Beltrami County. The three span bridge (45ft-45ft-45ft) replaced a deteriorated voided slab built in 1962.

To date the two new inverted team beam bridges appear to be performing quite well, as there is no evidence of reflective cracking in the deck. In early spring Mn/DOT will re-exam the bridges to confirm that they do indeed meet performance requirements. Also the University of Minnesota is monitoring the Center City Bridge. One year of test data will be assimilated to validate the original design assumptions, confirm bridge durability and performance. If necessary, the test data will also be used as a basis for further design/detailing improvements.

The Mn/DOT Bridge Office is already refining minor design, fabrication, and erection procedures as part of the lessons learned from Center Lake and Waskish bridges. The bridge contractors gave favorable comments regarding construction. They thought the beams went into place very quickly, and the elimination of falsework over the water was beneficial. However, the cost of the bridges was higher than a comparable cast-in-place concrete slab span bridge. The higher initial costs are to be expected as this is a completely new superstructure system.

We would anticipate the new inverted tee beam bridge to eventually be cost competitive with the conventional cast in-place concrete slab span bridge as the designers, fabricators and contractors become more familiar with this technology. The Mn/DOT Bridge Office intends to further educate our local bridge consultants in the design of the inverted tee beam bridge. In mid March we plan to issue an inverted tee beam design spreadsheet and other helpful materials to assist our local bridge designers with inverted tee beam technology.

As the Mn/DOT Bridge Office continues to implement the inverted tee beam technology, we would encourage the counties, and county's consultants to consider the use of the inverted tee beam bridge when planning their future bridge projects. Also there may be FHWA IBRC (Innovative Bridge Research & Construction) funds to help a county incorporate this technology. IBRC funding of \$100-150K may be available for an inverted tee beam bridge project with a letting date as early as September 2006 or as late as September 2007. If you have any questions regarding IBRC funding availability, please contact Erik Wolhowe (Mn/DOT Bridge Research Engineer) at 651-747-2147.

It should be known that the national trend for local bridge construction is to incorporate innovative materials and technologies to reduce congestion, enhance safety and increase productivity by lowering the life cycle costs. The new inverted tee beam bridge and other prefabricated bridge systems across the country appear to be the trend and the way of the future.

- **Asbestos on Bridges Update**

Hat's off to the Minnesota County Engineers, the Minnesota Pollution Control Agency, and Alan Forsberg (Blue Earth County Engineer) in the successful development of a local bridge replacement asbestos screening tool. All of the counties should have received an e-mail copy on 12/8/2005 of the MPCA letter stating the acceptance of the new screening tool, and an e-mail copy of the local bridge replacement program screening tool. Please contact Alan Forsberg if you have not received a copy of these important documents.

The Mn/DOT Bridge Office is very interested in how well the screening tool works for those Counties choosing to implement it. We will report any feedback or findings on the use of the new screening tool in the next edition of the State Aid Bridge News.

- **Bridge Management Update**

A CD containing bridge inspection data and a new version of Pontis has been mailed to local agencies with more than 10 bridges. Follow the instructions on the CD to install the new version of Pontis. When all inspections have been entered, the data should be sent to Thomas Martin in the Mn/DOT Bridge Office no later than February 15, 2006. If you will not be able to meet the deadline, please contact Thomas Martin to make arrangements. Those agencies with a small number of bridges should mail or fax a copy of their completed inspections with markups to Thomas Martin.

An email containing several reports was also sent to most agencies. Please review the reports and note any corrections and send them to Thomas Martin.

Once you have completed all inspections and the inspection data has been submitted to the Bridge Office and entered into the database, the report INSPECTION REPORT - INSPECTIONS PERFORMED (located at <http://cereports.dot.state.mn.us/Bridge/brlogonform.csp>), can be run to print all of the completed inspection reports for your bridge files. This report should be run before April 1, 2006. Local agencies are required to have a signed inspection report for each bridge in their files.

If you have any questions regarding bridge inspection, contact Thomas Martin at 651-747-2121 or Jim Pierce at 651-747-2119. Also if your agency has any fracture critical bridges, please contact Thomas Martin for information on entering them into Pontis.

- **State Aid Bridge Contacts:**

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