

State-Aid Bridge News

January 12, 2007

- **Local Bridge Scanning Tour Update**

We're excited to report on our successful tour of several counties in the western region of the State of New York. Dave Conkel of the State Aid Bridge Unit will be presenting the findings of the NY Local Bridge Scanning Tour at the 2007 Minnesota County Engineers Winter Conference. This power point presentation will eventually be posted on the State Aid Bridge Website, along with other tour update information. Until then please contact Dave Conkel if you would like an e-copy of this presentation.

On Friday December 1st, the Local Bridge Scanning Tour Team presented their findings and preliminary recommendations to the Mn/DOT Bridge Office. Both parties agreed that the following bridge systems or components should be evaluated for use on the Minnesota Local Bridge System.

- Side by side prestressed concrete box beams, full depth composite precast concrete deck panels on steel or concrete beams, NY style metal bridge traffic railing, and steel box beam approach guard railing.
- Pre-cast concrete box culverts with spans up to 20 feet, pre-cast concrete culvert end sections with flared wing walls, and the three sided pre-cast concrete box on spread footings.

In fact, Blue Earth County is currently conducting a local bridge type study for the City of Lake Crystal. Blue Earth and their bridge design consultant are investigating the use of the side by side prestressed concrete beam units with a composite concrete deck superstructure supported on a steel sheet pile abutment wall substructure. The consideration for a steel sheet wall substructure on this local bridge project is primarily an attempt to reduce construction time. The cost and life expectancy of the sheet wall system is being investigated. They're also considering using the NY style metal bridge traffic railing.

Other items such as self compacting concrete (SCC), high performance concrete (HPC), and stay in place concrete forms were also discussed with the Bridge Office. To date, Mn/DOT and its precasters are working towards the successful use of SCC in the fabrication of prefabricated concrete beam and structural components. Mn/DOT has also advanced in the area of HPC, and is currently finding good results with the high volume fly ash concrete mix design. In the area of stay in place forms, Mn/DOT is currently trying a new precast concrete panel stay in place form system on a Trunk Highway bridge.

In conjunction with concluding our trip and findings of New York, we're currently in the planning phase of our 2nd local bridge scanning tour, for a scheduled destination to Spokane Washington. Like NY, the State of Washington was highly recommended by our industry bridge experts.

It's our hope that many of these proven bridge technologies as seen across the country can be tried and evaluated for use on the Minnesota Local Bridge System for economy, speed of construction, durability, and efficiency.

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).

- **Bridge Hydraulic News**

Petra DeWall represented Mn/DOT at the Second Annual National Hydraulic Engineering Conference in San Diego, CA from August 29th-September 1, 2006. Below is a list of some things to note from the conference.

- The new Windows version of HY-8 (culvert design software) has now been beta tested. The program has a lot of new features:
 - One data entry screen that allows you to enter data in any order you choose.
 - A tool that allows you to create an aerial photo to use as a background image to manage multiple culverts on a project
 - Being able to save multiple culverts to one project file.They should be issuing the final product sometime early next year. They have not included the Energy Dissipater sub-routine in WIN-HY8 as HEC 14 was in the processes of being rewritten at the time the software was being developed. Hopefully, this will be added by late next year.
- Revised editions of HEC 14- Hydraulic Design of Energy Dissipaters for Culverts & Channels, HEC 15- Design of Roadside Channels with Flexible Linings and HEC 09- Debris Control Structures Evaluation and Countermeasures are now available for download from the FHWA website. (http://www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm). These publications have been extensively rewritten, so if you use them please update your copies.
- Other publications that are currently in review are:
 - NCHRP 24-24 - Guidance for Software Decisions
 - NCHRP 24-23 - Riprap Design, Installation and Maintenance at Bridges
 - NCHRP 24-7 - Countermeasures to Protect Bridge Piers from Scour
 - NCHRP 24-18 – Countermeasures to Protect Bridge Abutments from Scour

A whole segment of the conference was devoted to fish passage. One speaker noted that there is more consideration being given to **all** critters in a creek. They are currently working on a new version of FishXing, a software package that analyzes fish passage through culverts. The web site, <http://www.stream.fs.fed.us/fishxing/> has a lot of data and information on the subject of fish passage. Maine has developed a nice document: Fish Passage Policy and Design Guide. The document can be found at http://mainegov-images.informe.org/mdot/environmental-office-homepage/pdf/Fish_Passage_Policy_Final_2nd_Edition_w_cover2.pdf

If you have any questions regarding the hydraulic information listed above, please contact Petra DeWall at 651-747-2162**

- **State Aid Bridge Costs**

In the 2006 Calendar Year we saw several changes in average unit costs for various bridge types, some quite minor and some more pronounced. Below is a brief unit cost overview of CY 2006 State Aid Local Bridges:

Concrete Slab Span - \$85.75/sf

Pre-cast Concrete Beams - \$98.46/sf

Treated Timber Slab - \$127.02/sf

Concrete Arch - \$669.18/sf

Rigid Frame - \$237.50/sf

Steel (railroad) - \$500.87/sf

Truss (pedestrian) - \$167.44/sf

- **Bridge Rating Class 101 for County Engineers**

We're making headway in the planning for a bridge rating class for county engineers. In fact, at the MCEA Winter Conference we will be meeting with Pipestone, Cass, Crow Wing and Hennepin County to discuss a proposed class agenda with the Mn/DOT Bridge Ratings Unit.

It's our hope that the class materials and content will be tailored to best suit the Minnesota County Engineer. We appreciate the counties listed above in helping us in the development of this class. The class will probably be held in three different central locations across the state to accommodate all 87 counties.

The Mn/DOT Bridge Ratings and State Aid Units will keep you informed on the specifics of this exciting class. Once we finalize the class agenda we will move forward in developing times, locations, and etc... Hopefully in the end we will all know a little more about rating, posting, and permitting for local bridges.

- **Bridge Management Update**

A CD containing bridge inspection data and a Pontis version 4.4.2 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 Thursday, February 15, 2007. 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.

The CD also contained several reports. 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, 2007. 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.

- **Pre-Qualified Trunk Highway Bridge Designers:**

Although not required to prepare plans and construction documents for local bridges, Mn/DOT keeps a list of pre-qualified design firms allowed to prepare plans and construction documents for Trunk Highway bridges. The list identifies the firm name and the level of bridge design that they are approved for. You can access the pre-qualified list at <http://www.dot.state.mn.us/consult/files/prequal/prequal.html> .

Also at the above web address you can pull down a list of definitions for the various levels of bride design. The levels range from level 1 to level 3 bridge designs with level 1 for average bridge designs and level 3 for specialty bridge designs.

Level 1 would include bridges with multiple spans, steel or pre-stressed concrete beams, and substructures on piles or spread footings. Level 1 represents bridge designs that are similar to the level/complexity of design necessary for the typical local bridge. For level 3 bridge designs the qualified firm will have proven capabilities with major river crossings using bridge types such as the steel or concrete box girder bridge, truss, arch, and etc...

We know there are several qualified design firms doing great work at all levels of design for local bridges. Several of these firms may or may not show up on the approved list, if not on the list it simply means they're not approved through the Mn/DOT pre-qualification process to prepare Trunk Highway Bridges. However, if your bridge project is over a Trunk Highway or Interstate, we will typically require your bridge consultant to be on the pre-qualified list and approved for the appropriate level of bridge design.

- **State Aid Bridge Web Site**

We're in process of updating our State Aid Bridge Website. Over the years we have added new pieces of information such as the section on Rating Bridges, Bridge Utilities and etc. However, with this update we intend to revise the format to be consistent with other Mn/DOT websites and links, and to revise the content of the website to reflect the new bridge design method of Load Resistance Factor Design.

Other new sections will be added as well, such as recommended policies and practices for geotechnical investigation of local bridges, local bridge scanning tour updates and information, revised cost reports, and etc

- **Design-Build Pedestrian Bridge Update**

As we have reported in past newsletters, the Technical Memorandum for "Design-Build Pedestrian/Bicycle Bridges", No. 99-20-B-03, has expired and needs to be updated. The goal with this update has been to clarify and simplify the whole approval process. At the same time, we are updating the current Special Provision Boiler Plate for "Design-Build Pedestrian Bridges" to incorporate the changes made to the Tech Memo.

The wording of the Tech Memo has gone through several revisions and re-revisions due to various reasons, delaying its completion. However, we are nearing the end of the tunnel and have gotten the final draft ready to be sent through MN/DOT routing for review and approval.

In an attempt to get a better idea of where MN/DOT stands in comparison to other states with regards to pedestrian bridge projects, we sent out a survey to 8 surrounding states, soliciting any information that they might have. The responses that we received indicated that MN/DOT's process for handling these types of projects was far more thorough and extensive than most other states. Also, the level of review and approval responsibility taken on by MN/DOT seems, in general, to be greater. Many states relied more heavily on the owner and his consultant to assure that the pedestrian bridge was per plans and specifications, and that it fit properly onto the substructure. This has all been taken into account in updating and simplifying the new Tech Memo.

Another issue affecting the wording of the Tech Memo has to do with the term "Design Build". Since the type of projects addressed by the Tech Memo are not viewed by many as true "Design Build" projects, but more like those containing "Pre-engineered Pedestrian/Bicycle Bridges" designed to performance specifications. This terminology is reflected in the updated Tech Memo.

We hope to have this updated Tech Memo available within the upcoming months.

- **Local Bridge Replacement Program**

In 2006, the legislature approved \$55 million in state bond funds for the replacement of local bridges. Approximately 200 township, city, and county bridges will be or have been replaced with these bridge bond funds. This includes the 2007/2008 local federal bridge projects identified in the STIP. To date, all of the 2006 bond funds have been accounted for, either on planned projects or projects already approved for letting and in construction.

Bridge projects approved now and in the future will be placed on a bridge priority waiting list. When additional bridge funds become available they will be approved on a first come/first serve basis. If you have changes to your 5-year bridge replacement program, submit a resolution to the State Aid Programs Engineer (Patti Loken) identifying your replacement bridges, program year and estimated cost. The bridge replacement priority master list is used to demonstrate need to the legislature to continue to fund the bridge program.

- **State Aid Bridge Contacts:**

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