

State-Aid Bridge News

January 14, 2011

Bridge Management Update

2010 Bridge Inspection Data

If you are using web-based Pontis data entry (Citrix): When all bridge inspections have been entered into Pontis, notify Lisa Hartfiel in the Mn/DOT Bridge Office, 651-366-4557 or lisa.hartfiel@state.mn.us.

If you are using a standalone Pontis dataset: Please send your updated data file to Lisa. Those agencies owning 10 or less structures should email, mail, or fax a copy of their completed inspections with markups to Lisa no later than February 15, 2011. All Citrix user IDs will expire on February 28, 2011. SIMS will be available on April 4, 2011. Instructions and information on how to obtain a SIMS user ID will become available on the SIMS webpage (see below).

All inspection data must be entered or sent to Lisa no later than February 15, 2011. If you do not meet the February 15, 2011 deadline, you will be out of compliance with Minnesota Statute 165.03, Subd. 3. Please contact Lisa if you will not be able to meet the deadline.

2010 Certification of Inspection Form

All agency Bridge Inspection Program Administrators must submit a "Certification of Bridge Safety Inspection" form upon completion of all bridge inspections. The form is located at: <http://www.dot.state.mn.us/bridge/documents/formslinks/inspection/certofbridgeinsp.pdf>

Submit the completed and signed form to Lisa no later than February 15, 2011.

48-month Culvert Inspections

Some culverts that were approved for 48 month frequency last year may have been put back on 24 month frequency due to additional criteria added by FHWA.

Please run the Inspection Frequency Report on the website.

<http://dotapp7.dot.state.mn.us/Bridge/logon/logonform.asp>

SIMS Implementation

See website for latest information.

<http://www.dot.state.mn.us/bridge/sims/index.html>

Featured Articles:

- Bridge Management Update (pg 1)
- New Structure Information Management System (SIMS) (pg 2)
- Bridge Inspection Update (pg 2)
- Local Timber Bridges (pg 2)
- Construction Loads on Local Bridges (pg 3)
- State Aid Local Bridge Load Rating Engineer (pg 3)
- Completion of Local Bridge Gusset Plate Checks (pg 4)
- Local Bridge Load Rating Update for Special Hauling Vehicles (pg 4)
- Educating Local Agency Engineers on the NBIS, the FHWA Audit/Review Process, and Local Bridge Load Rating and Posting (pg 5)
- NBIS and FHWA Oversight on Load Rating of Local Bridges (pg 5)
- Roles and Responsibilities in the QC/QA of the State's Bridge Inspection Program (pg 6)
- Local Historic Bridge Preservation Update (pg 7)
- Bridge Spacing Rule (pg 7)
- Innovative Local Bridge Construction Update (pg 8)
- Bridge Hydraulic News (pg 8)
- 3D Laser Scan Technology (pg 10)
- Local Bridge Replacement Program Update (pg 10)
- Mn/DOT Bridge Standards Unit Update (pg 10)
- Bridge Costs Update (pg 11)
- State-Aid Bridge Contacts (pg 11)

New Structure Information Management System (SIMS)

The Minnesota Department of Transportation will be implementing a new Structure Information Management System (SIMS) in April 2011. It will replace the current Pontis on-line application. Use of SIMS will be required for entering, submitting and managing all bridge inspection information. To assist in the implementation of the new System, the DOT will be offering 6 days of 3 hour training sessions both in the morning and in the afternoon, via Adobe Connect.

The current SI&A application (Pontis) will be disabled at midnight on February 28, 2011. SIMS will be available on Monday, April 4, 2011 for use. Inspection data will still be available between February 28 and April 4, 2011 on the Bridge Office website.

All SIMS users will be notified about final implementation details, training sessions, webinars and access to the SIMS User Manual at a later date via email, inspection seminar registration mailings, and updates posted on the SIMS web site. If you have any questions, please contact the Mn/DOT Bridge Management Engineer, Jim Pierce, Mn/DOT Phone (651) 366-4555

Bridge Inspection Update

2011 Bridge Safety Inspection Seminars

Feb 10	Mankato
Feb 15	Arden Hills
Feb 24	Carlton
March 3	Rochester
March 10	Detroit Lakes
March 17	St. Paul

To maintain Mn/DOT certification as a Bridge Safety Inspection “Program Administrator” or “Team Leader”, attendance is required at a minimum of two bridge inspection seminars during each 4-year re-certification period. However, those who are not required to attend are welcome and encouraged to do so.

We highly encourage all Local Agency Program Administrators and Team Leaders to attend one of the scheduled 2011 bridge safety inspection seminars listed above. This year’s seminar will cover many of the important changes and ongoing efforts to improve Minnesota’s local bridge inspection program.

The seminar will feature topics on the new NBIS compliance review process, the new structure information management system that will replace the current Pontis application, SHV load ratings update, and important information on advanced timber inspection techniques, and the importance of load rating and posting timber bridges.

Brian Brashaw, Director of the Wood Materials and Manufacturing Program at the Natural Resources Research Institute, University of Minnesota Duluth, and Tom Styrbicki, Mn/DOT State Bridge Construction Engineer will deliver the seminar topic on timber bridges.

Registration questions – Norm Plasch, Mn/DOT Phone (651) 366-3301, Cell (651) 336-1621

Questions about seminar content – Jennifer Zink, Mn/DOT Phone (651) 366-4573

Local Timber Bridges

We currently have approximately 600 local bridges on the inventory that are structurally deficient and are not load posted. Of the 600 approximately 30% are timber bridges. A majority of these deficient timber bridges without load postings reside in Districts 7 & 8.

To compound the problem, these timber bridges are very susceptible to overstress from the heavy single trucks such as the SHV. To even further exasperate the problem, these vintage timber bridges are typically founded on timber piling probably not treated properly and that have splits and decay.

In fact, approximately 50% of these timber bridges are deficient due to poor condition of the timber piling. We're seeing approximately 10-20% are deficient due to poor condition of the timber pile caps, and a very small percentage are deficient due to poor condition of the laminated timber decks.

Existing timber bridges supported on steel piling rarely need to be posted due to poor pile condition. Our new local timber bridges require all timber substructures to be founded on steel piling for this very reason, and to help protect against debris damage. Also the new timber bridges are designed to accommodate the SHV.

We encourage all local bridge owners to continue to evaluate their inventory of deficient bridges without load postings and to schedule them for a new load rating and posting analysis. Please visit the load posting and load rating report on the Bridge Office Website <http://dotapp7.dot.state.mn.us/Bridge/logon/logonform.asp>. This list should be prioritized based on bridge operating rating, condition, ADT, knowledge of truck traffic crossing the bridge, etc... With that extra care and attention should be given to timber bridges, and timber bridge substructures that are in poor condition as noted in the inspection reports.

Please feel free to consult the Mn/DOT Bridge Office Load Ratings Unit or any of our local bridge consultants to help answer questions, and to identify your load rating needs.

Construction Loads on Local Bridges

On Tuesday October 19th, 2010 a nail- laminated timber bridge over Elk Creek in Nobles County partially collapsed when a milling machine was on the bridge for a roadway resurfacing project.

Preliminary investigations appear to indicate that the milling machine overloaded a weakened exterior timber pile which led to the partial collapse. If the pile was not deteriorated or the milling machine was lighter weight, the failure most likely would not have occurred.

Due to this unfortunate incident, we would like to strongly remind all local bridge owners who are engaged in or contemplating any construction operations on their bridges to ensure that any construction loading on the bridge does not overload its members.

For more discussion on this issue, please refer to the AASHTO Standard Specifications for Highway Bridges, 17th Edition, Division II, Section 8.15 or the AASHTO Load Resistance and Factor Design Bridge Design Specifications, 4th Edition, Section 3, and Appendix B of the Mn/DOT Bridge Inspection Manual version 1.8.

State Aid Local Bridge Load Rating Engineer

This position was developed in July of 2009 to support our county and city engineers and their consultants with local bridge load rating and permitting inquiries.

The position has also served to facilitate the state wide SHV's load rating contracts, technical support for local bridge consultants in the use of Virtis (AASHTO load rating and posting software), implementation of load resistance factor rating methods, and many other assigned related duties. The engineer, Moises Dimaculangan, who serves in this role, spends 50% of his time on TH bridges and 50% on local bridges, he is funded 50% by State Aid and 50% by Mn/DOT Trunk Highway.

Completion of Local Bridge Gusset Plate Checks

This important work was born in the aftermath of the 35W bridge collapse to make sure our state's truss bridges are safe and to restore public confidence in our state system of bridges.

In 2007 we identified 27 high truss and 60 low truss local bridges for gusset plate checks. Of the 87 total local truss bridges identified, 31 trusses have been removed from the list through a screening tool developed by the bridge office and implemented by the county engineers, and 32 trusses have been removed, replaced, or scheduled for replacement.

We had 10 on-system high truss evaluations completed in 2009 and 14 off-system low truss evaluations completed in 2010 through consultant contracts. Of the truss bridges evaluated to date, we have not discovered any serious issues with the load capacity of the gusset plates. However, several of the truss bridges did receive a lower load rating and recommendations for posting based on the condition and load rating analysis of the truss floor beams and/or stringers.

Local Bridge Load Rating Update for the Special Hauling Vehicles (SHV's)

The Bridge Office has identified approximately 1,000 local bridges susceptible to the SHV. Note the SHV is a legal 5-7 axle unit with up to 78,000 lbs gross vehicle weight. The SHV when fully loaded and with all axles down can produce significantly more stress in bridges than our legal semi trucks.

We have prioritized the list of over 1,000 bridges based on ADT and are engaged in the first set of consultant contracts which includes the evaluation of 581 bridges. The consultants performing this work include Bonestroo, LHB, HDR Inc. and WSN.

To date 302 bridges have been load rated out of the 581 bridges under contract. Of the 302 bridges, 109 (36%) did not require posting and 193 bridges (64%) did require posting. The bridge types evaluated included 115 (38%) timber, 125 (41%) steel and the rest concrete.

As anticipated, there were a high percentage of timber and steel bridges that required posting. Approximately 83% of the timber bridges evaluated required a posting, and of the steel bridges evaluated, approximately 57% of them also required a posting.

Irrelevant to the effects of SHV, our team of consultants discovered a significant amount of bridges to be in poor condition and without any load posting. For the most part, the existing local agency inspection reports used and validated to conduct the load ratings were adequately noting areas of significant section loss, deterioration, etc.... Unfortunately over time these inspection findings somehow were never followed up on with an updated load rating and appropriate posting.

Note, a load posting generally means the structural condition of the bridge has been compromised and it can no longer safely carry the state legal loads. When the condition of the bridge deteriorates over time we continue to fall below the desired safety factor to carry legal loads. Eventually the safety factor to carry legal loads can drop to a factor of 1.0 or lower, and without a proper posting can result in a high risk situation for the bridge owner, especially if legal loads continue to cross the bridge unabated.

Along with continuing this state wide SHV load rating effort, we realize the need to continue the education process and assistance in helping local agencies update load ratings and postings of their bridge inventory.

The first set of consultant contracts are scheduled to be completed in early May. The Bridge Office is currently refining the list of remaining bridges to be evaluated for SHV and is developing the next set of consultant contracts to continue this effort for our system of local bridges.

Educating Local Agency Engineers on the National Bridge Inspection Standards (NBIS), the FHWA Audit/Review Process and Local Bridge Load Rating and Posting

In recognition of the upcoming changes in the FHWA national bridge inspection program oversight process, the heightened emphasis on load rating and posting local bridges, and the importance of local agency compliance with the NBIS, we see the immediate and ongoing need to deliver the necessary information and education on these important issues.

We know we have several new local agency engineers, and support staff that could benefit from information and training on this subject matter. To start the educational process we have listed several important links below. Also throughout the year, State Aid Bridge and the Bridge Office will be attending State Aid District meetings and other local agency meetings to discuss, train and give updates.

National Bridge Inspection Standards (NBIS), Title 23, Code of Federal Regulations, Highways
<http://www.fhwa.dot.gov/bridge/nbis.htm>

Questions and Answers on the National Bridge Inspection Standards 23 CFR 650
<http://www.fhwa.dot.gov/bridge/nbis/index.htm>

Oversight of Bridge Load Ratings and Postings
<http://www.fhwa.dot.gov/bridge/070222.cfm>

2008 Bridge Load Rating Class 101
<http://www.dot.state.mn.us/stateaid/LoadRatingClass101.html>

LRFD Bridge Design Manual, Bridge Load Rating
<http://www.dot.state.mn.us/bridge/manuals/LRFD/pdf/section15.pdf>

Bridge Inspection Manual, Appendix B, Section B.8 “Load Rating References and Laws
<http://www.dot.state.mn.us/bridge/docsdown.html#insp>

Minnesota Statutes, Section 165.03 Strength of Bridge; Inspection
<https://www.revisor.mn.gov/statutes/?id=165.03>

National Bridge Inspection Standards (NBIS) and FHWA Oversight on Load Rating of Local Bridges

Note, the National Bridge Inspection Standards (NBIS) are federal regulations that set the national standards for the proper safety inspection and evaluation of all public highway bridges. The FHWA with the assistance of the Mn/DOT Bridge Office currently conducts local agency compliance reviews at least once every 5 years to evaluate their bridge inspection program to assure policies, procedures, and practices fulfill the requirements of the NBIS.

The current compliance process includes the review of regulation items specific to the NBIS, (link <http://www.dot.state.mn.us/bridge/documentsformslinks/inspection/Quality%20Assurance-Quality%20Control%20Procedures.pdf>), and to Mn/DOT’s bridge inspection QC/QA program document. See pages 10 & 11 of the QC/QA document for the complete list of review items. The items include the review of inspector roster, critical findings, fracture critical bridges, inventory reports, underwater inspections, scour list, inspection reports, load rating and posting data, etc..... After the compliance review, the agency is given an overall assessment of NBIS compliance or non-compliance. In the case of non-compliance, the agency is given specific directions to rectify any deficiencies to bring the agency back into NBIS compliance.

Based on federal reviews following the I-35W collapse and strong direction from Congress to have the FHWA improve its oversight of our nation’s bridges, the FHWA has now developed a new and more detailed oversight process for NBIS compliance reviews. This new oversight process will be implemented across the nation for consistency.

In lieu of the current Minnesota compliance review with a single overall assessment of compliance or non-compliance, they will now be judging for compliance (based on consistent criteria) of each of the 23 regulations found in (23 CFR 650.307 thru 650.315) in the NBIS. Please note, new NBIS regulations are not being created. This is a new oversight process for the FHWA to better assess, monitor and determine NBIS compliance with greater consistency. This new FHWA oversight process is risk-based and data-driven.

For example, under this new oversight process for NBIS regulation CFR 650.313, on Load Rating, the local agency is in full compliance if all local agency bridges have been correctly load rated. The local agency is in substantial compliance if 100% of all bridges with an NBI condition rating of 4 (poor) or less for deck, superstructure, or substructure have an accurate load rating. The local agency is in non-compliance if less than 100% of all bridges with an NBI condition rating of 4 (poor) or less for deck, superstructure, or substructure has an accurate load rating.

This new FHWA oversight process will be implemented beginning January 2011 for all state and local bridges. As you can see, it will be important for our local agencies to continue the work of updating their bridge load ratings. This continued effort of updating load ratings at least affords us a status of conditional compliance with the FHWA.

Note: The State of Minnesota or Mn/DOT is ultimately responsible to assure our local agencies are in compliance with NBIS regulations. If any one of our local agencies are found to be non-compliant with the NBIS and proactive steps are not taken to fulfill NBIS regulations, the FHWA could withhold Federal-aid highway funds from the state. The above is simply to remind our local agencies, consultants, State Aid Bridge, Mn/DOT and others responsible in the process to stay diligent in maintaining our state's bridge inspection program and compliance with NBIS. In general, our local agencies have very efficient and effective bridge inspection programs with an opportunity for improvement.

Roles and Responsibilities in the Quality Control/Quality Assurance of the State's Bridge Inspection Program

If you had a chance to review Mn/DOT's bridge inspection QC/QA program document <http://www.dot.state.mn.us/bridge/documents/formslinks/inspection/Quality%20Assurance-Quality%20Control%20Procedures.pdf>, you will see the roles and responsibilities of the FHWA and Mn/DOT. The FHWA conducts an annual review of the states bridge inspection program with Mn/DOT to discuss policies, procedures, practices, etc, to fulfill the requirements of the NBIS. They propose recommendations for program improvements and help to identify local agencies for review. The Mn/DOT Bridge Office conducts the compliance reviews with the determination of compliance or non-compliance. They will offer recommendations for improvement and in the case of being non-compliant, they will identify proactive steps and follow up action items to be addressed.

The follow up action items may include the request to complete late bridge inspections, inspections for scour, load ratings, etc.... Depending on the follow up action item, the Bridge Office may request that the local agency address the item immediately such as a late bridge inspection, up to 3 months for a scour inspection, and up to 6 months for a new load rating. ***Regardless, FHWA and Mn/DOT need to have our local agencies follow up on these items in a timely manner to keep our state in good standing with the NBIS.***

In general, our local agencies do a great job addressing the items that need corrective action for NBIS compliance; however, we do occasionally have a few stragglers that make the follow up effort more cumbersome for Mn/DOT. Unfortunately, this keeps our entire state in non-compliance with the NBIS. Note, if the state is non-compliant with the NBIS, the FHWA could forfeit all federal aid funding to the state.

As you recall from last year's State Aid Bridge News Letter we had an article on late bridge inspections. In essence, the article stated if a local agency does not respond or fails to send the information to Mn/DOT in a timely manner, the District State Aid Engineer will contact and work with the local agency for the information. If the local agency still fails to provide the information, the State Aid Office will notify the local agency by a letter that they're out of compliance with the NBIS regulations and may be ineligible for Federal Bridge Funds and payment of State Aid Funds for maintenance.

To address other follow up NBIS compliance items in a similar manner, which could include any of the NBIS regulations such as load rating and posting, etc....the Bridge Office, State Aid and the District State Aid Engineers will develop a protocol or procedure to add to Mn/DOT's bridge inspection QC/QA program document. The protocol or procedure will also be reviewed and approved by the County Engineer's Bridge Committee. Again, the protocol will be developed to assist Mn/DOT with timely follow up action from our local agencies when and if needed, and will help keep our state NBIS compliant.

In accordance with Minnesota State Statutes, it's important for county highway engineers to know they have bridge inspection and inventory responsibilities (includes correct legal posting of load limits on any bridge that is found to be deficient or unsafe) for all bridges within or over the right-of-way of any county or town road, or any street within a municipality without a city engineer regularly employed. Also by Minnesota State Statues, it's important for city engineers to know they have bridge inspection and inventory responsibilities (includes correct legal posting of load limits on any bridge that is found to be deficient or unsafe) for all bridges within or over the right-of-way of any street within a municipality.

Local Historic Bridge Preservation Update

Mn/DOT's Historic Bridge Website and Programmatic Agreement

Mn/DOT's Cultural Resources Unit (CRU) recently launched the Historic Bridges of Minnesota website. The site can be found at <http://www.dot.state.mn.us/historicbridges/>.

The website provides links to the Programmatic Agreement (PA), signed in 2008. The PA contains numerous stipulations, most of which have been completed over the last several months. The PA includes the list of bridges built before 1956 that are eligible for or listed on the National Register. This list was developed through comprehensive field studies and only identified roughly 5 percent of the bridges from this era to be historic. Effectively 95 percent of the bridges can now be cleared of historic review, equating into significant cost savings to both state and local agencies. The list identifies approximately 170 local historic bridges as either eligible or listed for the National Register of Historic Places (NRHP).

The PA also committed Mn/DOT to preserve 24 premier state-owned bridges. Since 2007 when the bridge list was finalized for attachment to the PA, 28 bridges have been rehabilitated or have had rehab plans developed and will be rehabbed in the next 6 years. Twelve of these bridges are on the local system. We commend those local agencies who have undertaken these rehabilitation projects on these important resources of our engineering heritage.

Stipulation 3.F deals with preservation efforts for locally owned historic bridges. Last year's newsletter provided a status of local historic bridge preservation efforts. The article detailed a study meant to address many of the problems that had been encountered on various bridge projects from the preceding few years. Mn/DOT's Office of State Aid is in the process of performing this study which should commence in early 2011. The study will identify the local key bridges and develop maintenance plans and address funding. The study will coordinate with local agency partners throughout the year.

For those agencies considering a rehabilitation of a historic bridge on their system, the general historic bridge management plan is a key resource for your planning. The document provides guidance on prioritization, funding, resources, education/outreach, relevant standards and regulations, Secretary of the Interior's Standards for bridge rehabilitation, and alternate design standards. A link to the management plan can be found on the main page of the Historic Bridge Website, toward the bottom left-hand side.

We look forward to working with you all in the New Year on continuing preservation efforts for Minnesota's locally owned bridges.

Bridge Spacing Rule

The 2010 session required the commissioner of Mn/DOT, in consultation with local road authorities, to establish a minimum distance between any two bridges that cross the same river, stream, or waterway, so that only one of the

bridges is eligible for a grant under this section. As appropriate, the commissioner may establish exceptions from the minimum distance requirement or procedures for obtaining a variance.

A one mile distance between bridges was proposed to meet the intent of this session law on what is an eligible use for State Transportation Funds. To date, language proposed for the State Aid Manual:

Bridges located within one mile of each other on the same stream (up or down) or on a road within a one mile radius may not be eligible for State Transportation Funds if any of the bridges were previously replaced using State Transportation Funds.

Innovative Local Bridge Construction Update

Back in August of 2010, the State Aid Bridge Unit, Mn/DOT Bridge Office, and Rock County collaborated to complete an application to request special funds from the FHWA Innovative Bridge Research and Deployment (IBRD) Program. The application is for a new local bridge construction project over a short line railroad in Rock County that will demonstrate the use of geosynthetic reinforced soil (GRS) abutments with an adjacent precast box beam superstructure.

Instead of a conventional bridge supported on a pile cap abutment, GRS abutments use alternating layers of compacted fill and sheets of geotextile reinforcement to provide support for the bridge. This technology is well suited for single span bridges of less than 120 ft. They're not advisable for water crossings where the potential for scour is critical.

GRS abutments can be built with readily available material using common construction equipment. The FHWA has built and tested several full-scale GRS structures at its Turner-Fairbank Highway Research Center in McLean, Virginia. The state of Indiana has successfully used GRS abutments for replacement bridges over stream crossings. The GRS abutments have been shown to be cost-effective, durable, and with long-term performance characteristics.

The proposed GRS abutments for Rock County will be designed and constructed according to the new FHWA GRS Design and Construction Manual. Also long-term performance monitoring of the abutments will be incorporated into the project. Monitoring will include instrumentation to gather data on settlement, wall movement, and the effects of temperature. The schedule for start of construction is anticipated to be May/2012.

Bridge Hydraulic News

Scour Code Updates

Last year, we completed our efforts to screen all the bridges in the state for scour, nice job everyone! These were codes "F- no screening done" and "J-bridge screened-determined to be scour susceptible". ***Please remember that a scour code must appear on all new bridge plans to continue in this effort.***

Please see the [January 2010 newsletter](#) for an excellent summary of all of the bridges that require a Scour Plan of Action (POA). Completion of the POAs for these bridges is required by April 30, 2011. During the FHWA NBIS Annual Program Review last year, there were some concerns about the completeness and content of the POAs. Please use the new Bridge POA Check Sheet to help you with this effort at: <http://www.dot.state.mn.us/bridge/docsdown.html#hyd>

The next task on our list is to finish recoding bridges with "G- Unknown Foundations". This is very important as a November 2010 deadline was set by FHWA (and already passed) for elimination of all unknown foundation fated bridge codes from the National Bridge Inventory (NBI). We all need to make progress to get these G bridges recoded!

We have updated our Bridge Scour Evaluation Procedure Manual to include all of the guidance for "G" rated bridges. Please contact Nicole Danielson-Bartelt (phone 651-366-4474 or email nicole.danielson-

bartelt@state.mn.us), or Petra DeWall (petra.dewall@state.mn.us) for more information. The new Procedure Manual can be found at:

<http://www.dot.state.mn.us/bridge/docsdown.html#hyd>

Partially Grouted Riprap

There is a new riprap protection alternative that is starting to get more attention around the State. In many parts of Minnesota, adequately sized or shaped riprap is not readily available, or is very expensive. Proper size and shape (angularity) is essential for sufficient riprap protection, especially on abutment slopes. Partially Grouted Riprap is basically individual riprap rocks “glued” together with a special grout mix to produce larger riprap pieces.

There are two research projects in the pipeline to study Partially Grouted Riprap (PGR) on abutment slopes. One is an implementation project being funded by Mn/DOT to retrofit an existing site with PGR. We hope to gain experience with the grout mix design and placement, train maintenance and construction personnel, and produce guidelines for placement, special provisions and details. Completion is expected in Fall 2011.

The other is a flume study being conducted by the Saint Anthony Falls Laboratory. Many thanks to the Local Road Research Board (LRRB) and Mn/DOT TRIG for funding this project! We hope to determine velocity and flow limitations of PGR, failure modes and mechanisms, material design criteria, all focused on spill-through abutment protection. This study will be starting in Summer 2011, and is expected to last 2 years.

Please contact Nicole Danielson-Bartelt (phone 651-366-4474 or email nicole.danielson-bartelt@state.mn.us) for information.

Helpful Websites

Below are some helpful Hydraulics/Hydrology websites you may be interested in:

StreamStats:

<http://water.usgs.gov/osw/streamstats/minnesota.html>

StreamStats is a Web-based Geographic Information Systems (GIS) application, developed to compute streamflow statistics for an ungaged stream site using the USGS Regression Equations. It is very user-friendly and has excellent User Instructions on the website.

Mn/DOT Interactive BaseMap:

<http://gisservices.dot.state.mn.us/mndot-basemap/>

This web site provides statewide coverage depicting Mn/DOT BaseMap information, including all public roads in Minnesota, and allows you to view, save and print maps through this on-line application. It is a great tool to view aerial photos, quad maps, and other useful map coverages.

BrHydInfo:

<http://www.dot.state.mn.us/stateaid/sa-downloads-passwd/BridgeInfo2-PROD.ica>

This site provides a GIS-based map with all of the bridges in the State, and links to hydraulic information (if available), inventory reports, and inspection reports.

Note: Citrix client and password are required, contact the State Aid Bridge office for access.

North Central River Forecast Center:

<http://www.crh.noaa.gov/ncrfc/content/water/esp/espminor.php?espLevel=minor&fg=>

This site provides flooding forecasts for gages sites around MN, WI, IA, IL, and parts of ND.

DNR General Permit and Best Practices Manual

The DNR General Permit was extended through November 2013, and the Best Practices Manual was updated in September 2010 by Peter Leete. The manual is available online so that continual updates can be made as necessary.

General Permit: http://files.dnr.state.mn.us/waters/watermgmt_section/pwpermits/General_Permit_2004-0001.pdf

Mn/DOT Study of Oversized Culverts and Fish Design

The current Oversized Culvert Research Project, funded by LRRB and Mn/DOT is in the evaluation phase. The research team finished their field work and presented that work at the December TAP meeting. The draft report with their findings and recommendations is due at the end of March. More to come after the report is submitted!

3D Laser Scan Technology Used to Assess Flood Damaged River Pier and Beyond

Southern Minnesota's late-September 2010 flood, which nearly reached the record flood of 1965, caused significant structural damage to the Red Jacket Trail trestle bridge over the Le Sueur River. The flood damaged a stone masonry pier column, the county hoped to repair the flood-damaged pier, but laser imaging of the pier showed it at approximately one-third of its normal size.

The laser imaging setup and 3d model was provided by Mn/DOT to assist the county and the county's consultant by providing cross sections, dimensions and displacements of the bridge to allow them to estimate the remaining structural capacity and stability of the pier.

The laser collected thousands of survey data points instantaneously at a safe distance from the damaged pier. Several "scan" setups to gather multiple points of view were combined to make a complete 3D model of the existing conditions which could be viewed and measured in any direction in CAD. This CAD model will facilitate getting measurements of existing structures, etc....

The 3d laser scanner has also been successfully used on local historic bridge projects, structural rehabilitation projects, and local truss bridge evaluation projects that have very limited as built plan information.

Local Bridge Replacement Program Update

As of December 8, 2010 the Local Bridge Replacement Program funded 205 bridges in 2010. Priority was given to STIP projects, waiting list projects, and fracture critical bridges. The local bridge replacement program had another stellar year for replacing bridges on the local system.

The waiting list for bridge bonds or town bridge funds currently has 30 projects requesting approximately \$9 million in state bridge bonds and town bridge funding. These are projects with approved plans. Currently on the master priority bridge replacement list, there are approximately 822 unfunded projects identified for 2011/2012 with a total replacement cost of \$324 million. The Mn/DOT supported legislative bond request for the local bridge replacement program for the last biennium in the amount of \$75 million, and received \$66 million including \$18.8 million in designated projects.

Counties and cities who have not yet updated their 5-year bridge program should, and send it in to Merry Daher with the updated resolutions if they are adding new bridges to their program. The master list can be updated for costs or additional projects at anytime.

Mn/DOT Bridge Standards Unit Update

New Load Resistance and Factor Design (LRFD) precast concrete box culvert standards up to 16 foot spans will be available by January 2011 at <http://www.dot.state.mn.us/bridge/cadd/culverts.html> . Special designs up to 20 foot spans will be available upon request.

Note, all local culvert projects under preliminary design after December 1, 2010 should implement the new (LRFD) precast concrete box culvert standards into the final construction plans. If you have any questions

regarding the content or implementation of these new culvert standards, please feel free to contact Joe Nietfeld, Mn/DOT Bridge Standards, phone 651-366-4477.

Also the Bridge Standards Unit is making great progress in converting our cast-in-place concrete retaining wall standards to the LRFD format as well. These new wall standards will be available by May, 2011 or sooner.

We look forward to working with you all in the New Year on continuing preservation efforts for Minnesota's locally owned bridges.

Bridge Costs Update

Calendar year 2010 saw a moderate decrease in unit costs for PCB and C-SLAB type structures which account for the majority of local bridges. There was a pronounced increase in unit costs for the pedestrian TRUSS type structures, but the unit costs for that bridge type seem to jump around quite a bit. The percentage increases/decreases are shown below.

The American Recovery and Reinvestment Act of 2009 (ARRA) made for a dramatic up-tick in both the number of bridges and the total dollar amount of bridges let in CY 2009. There were 14 local ARRA bridges that did not make letting in CY 2009, so they are accounted for in the CY 2010 cost report.

It was another busy year for the SALT Bridge Office. In CY 2010 we processed approximately 66 local bridges totaling \$51M. We let \$14.8M in ARRA bridges, which accounted for approximately 29% of the total dollar amount of all bridges let in CY 2010. ARRA bridges accounted for 14 of the 66 bridges let in CY 2010.

- PCB structures were down 5% (\$102.52/sf in CY 2009 vs. \$97.08/sf in CY 2010)
- C-SLAB (Concrete Slab Span) structures were down 6% (\$97.82/sf in CY 2009 vs. \$92.06/sf in CY 2010)
- Pedestrian TRUSS structures were up 27% (\$133.30/sf in CY 2009 vs. \$168.81/sf in CY 2010)

State Aid Bridge Contacts

▪ <u>Dave Conkel</u> State Aid Bridge Engineer E-mail Dave.Conkel@state.mn.us	651-366-4493
◦ <u>Girma Feyissa</u> State Aid Bridge Plans Engineer E-mail Girma.Feyissa@state.mn.us	651-366-4572
▪ <u>Steve Brown</u> State Aid Bridge Senior Bridge Plans Specialist E-mail Steve.Brown@state.mn.us	651-366-4495
◦ <u>Petra DeWall</u> State Aid Bridge Hydraulics Engineer E-mail Petra.Dewall@state.mn.us	651-366-4473
◦ <u>Moises Dimaculangan</u> State Aid Bridge Load Rating Engineer E-mail Moises.Dimaculangan@state.mn.us	651-366-4522
◦ <u>Anthony Schrempp</u> Graduate Engineer E-mail Anthony.Schrempp@state.mn.us	651-366-4494

▪ *Duties full time* ◦ *Duties part time* ◦ *Duties temporary*