Executive Summary

Bridge 6263 was originally constructed in 1899 to carry wagon traffic over the South Branch of the Root River to the settlement of Forestville in Fillmore County. The bridge is owned by Fillmore County and now serves as a trail and pedestrian access over the river into the state park. The bridge is significant for its early use of steel members in its construction and for its association with the Gillette-Herzog Manufacturing Company. Additionally, the bridge is a contributing structure to the Forestville Townsite Historic District.

Bridge 6263 is a single-span, six-panel, pin-connected steel through truss with span length of 97 feet. The bridge deck is comprised of longitudinal timber panels spanning between the steel truss floorbeams. The timber bridge panels along with replacement steel truss floorbeams were installed in 1998 according to plan records. The bridge abutments and wingwalls are comprised of mortared stone masonry.

Bridge 6263 is in fair to poor condition with the truss itself found to be in fair condition and the stone masonry abutments found to be in poor to failing condition. Due to their extensive deterioration, the stone masonry abutments require replacement and presently jeopardize the truss condition. This is due to the potential for localized collapse of the supporting abutment beneath the truss due to the deteriorated stone condition as well as from the potential for loss of abutment stone during an extreme flood event. However, with proper maintenance, stabilization and preservation activities, it is believed Bridge 6263 can be restored and continue to serve in its present capacity for 20 years or longer.

Any work on Bridge 6263 should proceed according to the Secretary of the Interior’s Standards for the Treatment of Historic Properties (Standards) [36 CFR part 67] and The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations, as adapted by the Virginia Transportation Research Council (Guidelines).
Bridge Location

Bridge Location

PROJECT LOCATION
FILLMORE COUNTY
SEC. 13, TO 102NN, R 12W
UTM ZONE: 15 NAD: 27
USGS QUAD NAME: FOUNTAIN
EASTING: 1848161 ft.
NORTHING: 15854305 ft.
Executive Summary

Bridge Location

I. Project Introduction
II. Historic Data
III. Bridge Data
IV. Existing Conditions/Recommendations
V. Projected Costs

Appendices

A. Glossary
B. Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards
C. Documents
I – Project Introduction

This Bridge Report is a product of a comprehensive study performed for approximately 140 historic bridges owned by county, city, township, private and other state agencies besides MnDOT. The study is the second phase of a multi-phased process developed and executed in partnership with representatives from the Federal Highway Administration (FHWA); State Historic Preservation Office (SHPO); MnDOT State Aid; MnDOT Cultural Resources Unit (CRU); the US Army Corps of Engineers (USACE); local public works and county highway departments; county and township boards and city councils; the preservation community and the general public. To perform the study, MnDOT retained the consultant team of LHB Inc., Mead & Hunt Inc., and The 106 Group.

The general goals of the study include:

- Gathering and compiling the existing historic and bridge condition data and other relevant information on the bridges in the study group into bridge reports.
- National Register nominations for a select number of bridges within the study group which the bridge owner may request a nomination to be prepared.
- Updating MnDOT’s *Management Plan for Historic Bridges in Minnesota* based on the study’s findings.
- Producing a narrative for the MnDOT Historic Bridge Website to disseminate information regarding locally owned historic bridges in Minnesota.
- Investigating and preparing a summary regarding how other states have funded historic bridge programs and structured Programmatic Agreements when multiple non-state entities are the owners of historic bridges.

The Bridge Reports compile and summarize the historic and engineering information concerning the structures. The reports also document the existing use and condition of the bridges along with assessments of the maintenance, stabilization and preservation needs of each structure, including cost estimates. The maintenance activities, along with regular structural inspections and anticipated bridge component replacement activities are routine practices directed toward continued structure serviceability. Stabilization activities address immediate needs identified as necessary to maintain a bridge’s structural and historic integrity and serviceability. Preservation activities are near term or long term steps that need to be taken to preserve and in some cases restore a bridge’s structural and historic integrity and serviceability. In assessing preservation activities, a design life of 20 years or longer is typically considered. In addition to general restoration activities and dependent on the severity of deterioration, preservation activities may include spot repair, disassembly and reassembly or replacement of specific bridge components.

Recommendations within the Bridge Reports are consistent with the Secretary of the Interior’s Standards for the Treatment of Historic Properties (Standards). The Standards are basic principles created to help preserve the distinct character of a historic property and its site, while allowing for reasonable change to meet new engineering standards and codes. The Standards recommend repairing, rather than replacing deteriorated features whenever possible. The Standards apply to historic properties of all periods, styles, types, materials and sizes and encompass the property’s location and surrounding environment.
The Standards were developed with historic buildings in mind and cannot be easily applied to historic bridges. The Virginia Transportation Research Council (Council) adapted the Standards to address the special requirements of historic bridges. They were published in the Council’s 2001 Final Report: A Management Plan for Historic Bridges in Virginia, *The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations*, provide useful direction for undertaking maintenance, repair, rehabilitation, and replacement of historic bridges and are included in the Appendix to this report.

Existing bridge data sources typically available for Minnesota bridges were gathered for the study. These sources include:

- PONTIS, a bridge management system formerly used by MnDOT to manage its inventory of bridges statewide, and its replacement system, SIMS (Structure Information Management System)
- The current MnDOT Structure Inventory Report and MnDOT Bridge Inspection Report. Reports are available for the majority of the bridges (not available for bridges in private ownership)
- Database and inventory forms resulting from the 2012 Minnesota Local Historic Bridge Study and other prior historic bridge studies as incorporated into the database
- Existing Minnesota historic contexts studies for bridges in Minnesota, including *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945*, *Minnesota Masonry-Arch Highway Bridges, 1870-1945*, *Iron and Steel Bridges in Minnesota, 1873-1945* and *Minnesota Bridges 1955-1970*
- Field investigations documenting the general structural condition and determining character-defining features

Additional data sources researched and gathered for some of the bridges as available also included:

- Files and records at MnDOT offices
- Original bridge construction plans, rehabilitation plans, and maintenance records of local owners
- Files and documents available at the SHPO office, including previous inventory forms, determinations of eligibility, studies, and compliance documents
- Existing historic and documentary material related to the National Register-eligible bridges

The Appendix contains the following: a Glossary explaining structural and historic preservation terms used in the report, the Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards, a list of engineering and historic documents available for this bridge, and copies of the MnDOT Structure Inventory and Bridge Inspection Reports current at the time of the report preparation.

The Bridge Report will provide the bridge owner and other interested parties with a comprehensive summary of the bridge condition and detailed information related to the historic nature of the bridge. This information will enable historic bridge owners to make informed decisions when planning for their historic properties.
This narrative is drawn from previous documents, as available for the subject bridge, which may include determination of eligibility (also known as Phase II evaluation), Minnesota Architecture/History Inventory Form, National Register nomination, Multiple Property Documentation Form, and/or applicable historic contexts. See Sources for details on which documents were used in compiling this Historic Data section.

Contractor: Unknown

Designer/Engineer: Gillette-Herzog Manufacturing Co.

Description:

Constructed in 1899, Bridge 6263 is a steel, single-span, six-panel, pin-connected Pratt through truss that carries CR 118, now a pedestrian path, over the South Branch of the Root River in the Forestville historic town site. The upper chord consists of paired channels with continuous riveted cover plates on top and batten plates underneath. The main verticals are laced paired channels; hip verticals and diagonals in the 3rd and 4th panels are paired forged eyebars. Diagonals in the 2nd and 5th panels and lower chord are paired punched eyebars. Counter bracing on the Pratt truss is adjusted by turnbuckles. The floor is wood planks on I-beam stringers (with channels on the outside edges), which rest on the upper flanges of the I-beam floor beams, which in turn are suspended by U-bolts from the pin connections. Portal bracing is of paired angle sections; decorative iron cresting is above both portals. Sway bracing is lacing between two sets of paired angles. Top and bottom lateral bracing is of round rods. The substructure consists of a north abutment of coursed, rough-cut stone; the similar south abutment was covered with poured concrete in the mid-1980s. Both abutments have wingwalls. The bridge railing is modern curved steel plate. The northern two panels (one-third of the bridge) are above dry ground, with the north abutment substantially inland. There is no evidence that the bridge was originally located elsewhere.

Significance:

The Forestville Bridge is located within the Forestville Townsite Historic District (FL-FOR-001), a historic town site located in Fillmore County, Minnesota. Forestville was a frontier settlement founded after the Treaty of 1851 opened settlement in the Minnesota Territory north of Iowa and west of the Mississippi River. Felix Meighen, his brother William, and his brother-in-law Robert Foster recognized early in 1853 the suitability for a town at this site. They were seeking an opportunity to invest money made in the California gold fields and in lead mining around Galena, Illinois. They put Robert in charge of their hastily surveyed claims, returning two years later to plat the town and settle permanently as many others were also taking up claims. The Meighens built a store, residence, and the Freemont House hotel in 1856-1867. The brothers also ran a steam sawmill on the north side of the river from 1857-1868. Other settlers of Forestville included Forest Henry, who built a grist mill in 1854, and James Eulette, who ran a chair factory. The town grew and eventually included other establishments, including a schoolhouse, cooper shop, distillery, tavern, and blacksmith and wagon shop. The town soon became a stagecoach crossroads for the Brownsville to Mankato route and the St. Paul to Dubuque route. However, in the 1870s, when the railroad passed through southern Minnesota, it bypassed Forestville, marking the beginning of the town’s decline over the next 40 years.

In 1899 Bridge 6263 was constructed to carry wagon traffic over the South Branch of the Root River in Forestville. The Pratt through truss was designed by the Gillette-Herzog Manufacturing Company. Gillette-Herzog was one of the largest and most important Minnesota-based bridge fabricators in
Minnesota during the late nineteenth century. The company had a large plant in Minneapolis at Seventh Avenue and Second Street Southeast, and fabricated structural steel for industrial buildings and structures throughout a region ranging from Michigan to the Gulf of Mexico to the Pacific coast. Gillette-Herzog also erected many of the bridges for which it fabricated steel. According to the "Iron and Steel Bridges in Minnesota" Multiple Property Documentation Form (Iron and Steel Bridges MPDF), the Forestville Bridge is the most elaborate of the surviving Gillette-Herzog steel trusses in Minnesota, with ornate iron cresting along the top edges of the portal. Prominent Minnesota engineer A.Y. Bayne was the manager of the bridge department for Gillette-Herzog during the construction of the Forestville Bridge. The company was one of the largest in the Twin Cities in the late nineteenth century. Of all the iron, foundry, and machine work firms in the Twin Cities at this time, only the Minneapolis Threshing Machine Company had more employees. Shortly after constructing the bridge, Gillette-Herzog joined U.S. Steel's American Bridge Company in 1901, but remained known as the Gillette-Herzog branch.

After the railroad bypassed Forestville in the 1870s, the town declined until Thomas Meighen closed the store for the last time in 1910, and the town eventually disappeared. In the 1970s the Department of Natural Resources developed the Forestville/Mystery Cave State Park, which encompassed the Forestville town site. The bridge is part of the town site, and serves as trail and pedestrian access over the river into the state park.

Bridge 6263 retains a high degree of integrity. The bridge remains in its original location and continues to carry CR 118 over the South Branch of the Root River in the historic Forestville town site in Fillmore County, Minnesota. Therefore, it retains integrity of location and feeling. Its setting within the historic town site is also retained, though its association with transportation has been diminished, as it now only carries pedestrian traffic. Research did not reveal any substantial alterations since the bridge's construction in 1899. Therefore, it retains integrity of materials, design, and workmanship. The period of significance for the bridge is 1899, the year in which it was constructed.

Bridge 6263 is eligible for the National Register under Criterion C in the area of Engineering as a representative of the early use of steel. Beginning in the 1890s, steel replaced wrought iron as the preferred metal to construct bridges. Under the "Historic Iron and Steel Highway Bridges in Minnesota" Multiple Property Documentation Form (MPDF), bridges constructed in the 1890s represent the early use of steel in bridge construction in Minnesota. Constructed in 1899, Bridge 6263 meets this criteria. Bridge 6263 is also eligible under Criterion C for association with the Gillette-Herzog Manufacturing Company, an important bridge fabricator in Minnesota. Under the Iron and Steel Bridges MPDF, bridges constructed by Gillette Herzog are significant as works of a firm of statewide importance. By the 1890s Gillette-Herzog Manufacturing Company was well established in Minnesota.

Bridge 6263 is also a contributing resource to the Forestville Historic District, which was listed in the National Register of Historic Places (National Register) in 1973. The period of significance for the district is 1853 to 1910.

**Historic Context**
- Historic Iron and Steel Bridges in Minnesota, 1873-1945

**National Register Status**
- Eligible (Individually); Contributing to Listed Historic District
## II – Historic Data

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<thead>
<tr>
<th>Criterion A Significance</th>
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<tr>
<td>Criterion C Significance</td>
<td>Engineering: Work of a master; Engineering: Variation of type</td>
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**Historic District**

Forestville Townsite

**SHPO Inventory Number**

FL-FOR-021

### Sources Used to Compile Section II – Historic Data

Mead & Hunt, Inc. “Bridge 6263 Minnesota Architecture – History Inventory Form.” Prepared for MnDOT (September 2014).


Field investigation by LHB, Inc. and Mead & Hunt, 23 May 2013.
Character-Defining Features

Character-defining features are prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. Features may include materials, engineering design, and structural and decorative details. Often, the character-defining features include important historic fabric. However, historic fabric can also be found on other elements of a bridge that have not been noted as character-defining. For this reason, it is important to consider both character-defining features and the bridge’s historic fabric when planning any work.

Feature 1: Design and construction of steel, pin-connected, Pratt through truss with stone abutments.
II – Historic Data

Feature 2: Ornamental features, including decorative cresting and bridge plate in the bridge portal.

Feature 3: Forestville Townsite historic district setting. The bridge is located in the Forestville Townsite Historic District, which consists of a historic home/general store, barns, and auxiliary buildings.
# Local Historic Bridge Report

## III – Bridge Data

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| Reported Owner Inspection Date  | 5/9/2011   |
| Sufficiency Rating              | 17.1       |
| Operating Rating                | HS 0       |
| Inventory Rating                | HS 0       |
| Structure Status                | K - Bridge closed |

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| Roadway Surfacing:              | Bituminous |
| Fracture Critical               | Yes        |
| Deficient Status                | S.D.       |

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<tr>
<td><strong>Number of Crashes reported in MnMCAT within 500 feet of Bridge Site</strong></td>
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| Location of Plans               | Fillmore County |
| Plans Available                 | 1988 Rehab Plans |

* Non-MnDOT data collected during field survey. All other fields of data collected from MnDOT September of 2013. See Appendix C for MnDOT inventory and inspection report data.

** Unless a significant number of crashes are noted on or near a bridge, the accident data is not detailed in this report.
Existing Conditions
Available information, as detailed in the Project Introduction section concerning Bridge 6263 was reviewed prior to visiting the bridge site. The site visit was conducted to establish the following:

1. General condition of structure
2. Conformation to available extant plans
3. Current use of structure
4. Roadway/pedestrian trail geometry and alignment (as applicable)
5. Bridge geometry, clearances and notable site issues

General Bridge Description
Bridge 6263 is a single-span, steel, through truss with span length of 97 feet. The bridge deck is comprised of longitudinal timber panels spanning between the steel truss floorbeams. The timber bridge panels along with replacement steel truss floorbeams were installed in 1998 according to plan records. The bridge abutments and wingwalls are comprised of mortared stone masonry.

Serviceability Observations
The bridge is currently closed and barricaded to vehicle traffic. This closure is the result of the bridge’s deteriorated condition and a load posting of 0 (zero) tons (closure), which was performed in 2008. The controlling element for the closure is stated to be the deteriorated condition of the bridge abutments. Use of the bridge by pedestrians and four wheel ATV vehicles was observed at the time of the site visit and signs prohibiting such use were not evident.

Condition Observations
Superstructure
The steel truss is in fair to poor condition. Significant deterioration and loss of section due to rusting and pack rust was noted at isolated regions, primarily in the lower tension chord eyebars. Corrosion in the lower chord truss panel point pin-connectors and deformation in the lower chord tension eyebars, presumably due to flood debris/debris impact, was also noted. The most significant section loss was noted in the lower tension chord eyebars at or near their pin-connection point at the northwest corner. The tension chord in this panel is comprised of two, 2-inch by ½-inch eyebars and the estimated combined section loss to the two bars is approaching 50 percent. While a detailed inspection of the truss pins was not performed, rust deterioration in the range of 25-percent total section loss was noted for some pins. Various degrees of pack rust is also present at the pin-connections. The distortion to the lower chord eyebars, likely from flood debris, is most pronounced at the upstream (west) truss. The outside eyebars, particularly near center span, are distorted out of plane as much as three inches vertically and/or horizontally and are presently loose, indicating they are not carrying significant tension load as designed. The upper regions of the steel truss were found to be in fair condition overall with no substantial deficiencies noted. Ornate lattice work and a manufacturer's plate naming the 1899 bridge contractor (the Gillette Herzog Mfg. Co.) are present across the upper truss portals at each end of the truss. Pack rust within the ornate lattice work, particularly around the piece rivets is causing rivets to fail and pieces to displace and in some locations fall out of the lattice. The steel floorbeams appeared in good condition overall, exhibiting minor section loss due to rust and corrosion. The paint system for the
truss and floorbeams is primarily failed. The timber panel deck is in fair condition overall, though somewhat rutted in the wheel lines.

Bridge Railings
The bridge railings consist of steel vertical angles, an upper horizontal pipe rail spanning end to end and a steel plate guardrail running horizontally below the pipe rail. The pipe rail is unattached in some locations as well as being bowed (potentially from flood debris) at random locations. The plate beam guardrail is galvanized and the other railing components are painted as the truss is, with similar paint failure condition as the truss.

Bearings
The north end truss bearings are fixed bearings and the south end were originally to function as expansion bearings. At this time the south end bearings are frozen and presumably the truss expansion/contraction is taken up through a combination of distortion of the truss, limited movement in the stone abutments, and possible sliding of the bearings where they interface to the abutments.

Substructures
Both abutments and their wingwalls are comprised of what appears to be mortared limestone. The condition of the mortar and the stones is severely deteriorated and the stability and load carrying capacity of the abutments and wingwalls is severely compromised. The stones exhibit severe deterioration and a substantial amount of fracturing. The observed fracturing is to the extent the vast majority of the stones would fracture into numerous smaller pieces as a result of any dis-assembly or repointing work. This condition leads to the concerns for overall abutment stability and load carrying capacity.

Though fairly deteriorated at this point with much of the original geometry missing, it appears the abutment backwalls originally projected up and around the back sides of the truss end bearing pockets thereby protecting the truss bearing ends and preventing soil and debris from accumulating in them. At some point in time timber boxes were built apparently in an effort to provide similar protection; however, a significant amount of debris is accumulating around the truss ends and contributing to its corrosion. The north side of the south abutment has received a shotcrete or mortared facing repair (currently primarily failed) as well an underpinning scour wall repair consisting of an approximately 10 feet long by 5 feet high concrete block. The year of the abutment repair is unknown. The river has presumably shifted south over the years resulting in the southwest corner of the south abutment now projecting into the river which is the likely cause for the above noted scour wall repair. No information concerning the depth below grade for the abutment foundations or abutment foundation types could be found.

Approach and Waterway Observations
As discussed in the Substructures section, it would appear over time the river has moved south resulting in the west end of the abutment being directly exposed to the river flow and the river scouring in behind the south abutment at this corner. Though currently closed and barricaded the approach roadways at each end of the bridge are gravel surfaced and are in fair condition.

Date of Engineering Site Visit by LHB
May 23, 2013
Condition 1: West elevation

Condition 2: Truss deck section, looking south
Condition 3: West elevation, showing lower chord eyebars

Condition 4: East elevation, showing deformations presumably from stream debris to lower chord eyebars
Condition 5: Lower chord eyebars and pin corrosion at northwest corner bearing (note also dirt/debris accumulation and timber cribbing, presumably to help prevent dirt from sloughing into bearing cavity)

Condition 6: Close up view, lower chord eyebars and pin at northwest bearing corner
Condition 7: Floorbeam/eyebar connection pin at panel point

Condition 8: Typical lower chord pin corrosion at panel point
Condition 9: Upper portal lattice work (note loss of rivets securing pieces)

Condition 10: Upper portal, lattice work and contractor name plaque
Condition 11: Upper portal lattice work, note loss of lattice pieces and securing rivets

Condition 12: Typical bridge railing and deck condition, looking north
Condition 13: Bent/failed pipe railing, west elevation

Condition 14: Failing stone/failed mortar, north abutment
Condition 15: Failed stone/mortar, northeast corner at truss bearing seat

Condition 16: Failing stone, mortar and shotcrete coating, south abutment (deformation in lower chord of west truss can also be seen)
Condition 17: Failing stone, mortar and shotcrete coating, south abutment

Condition 18: Stone masonry blockout and timber cribbing at truss corner
**Overall Recommendations**

While the structure would benefit from continued use for pedestrians only, it is unknown whether future plans are for the structure to remain closed to vehicle traffic and open only to pedestrian use or whether future plans would be to rehabilitate and reopen to vehicle use. The structural needs of the bridge, however, are unique in the sense that the structural preservation recommendations are generally similar regardless of the intended future use. This is primarily due to the abutment condition being the controlling structural element and the impending need to replace the abutments due to their severe deterioration and inability to rehabilitate in place. Stabilization and preservation activities will need to consider both the historic attributes of the structure and the attributes of the overall historic district.

**Recommended Stabilization Activities**

1. Remove debris and soil that is accumulating around the truss ends and bearings. Construct suitable temporary wood or similar framing around truss ends at all four corners to help prevent soil and debris accumulation.

2. Access upper portal ornamental lattice work at each end of bridge and stabilize pack rust and connections to ornamental lattice pieces to avoid further loss of the lattice pieces. Pieces are currently disconnected and falling, and as a temporary measure it may be necessary to temporarily bolt pieces in place to avoid their falling to the ground and eventual loss of the artifacts.

3. Monitor condition and scour potential at southwest bridge corner. Future erosion could necessitate riprap or further concrete countermeasure to ensure abutment maintains support of truss corner.

4. Monitor abutment condition to ensure support capacity for truss. Future loss of stone composition may require temporary cribbing to ensure truss does not settle and become damaged.

**Recommended Preservation Activities**

**Superstructure**

Steel Truss - Primary Members

Perform detailed assessment of degree of section loss to lower chord eyebars, lower chord pins and other members connecting at lower chord. Perform similar assessment to other truss members though anticipated degree of section loss is less for those members. It is anticipated a number, if not all, of the lower chord pins will require replacement. Lower chord eyebar repairs will be dependent on specific extent of section loss and future loading requirements for this bridge. It is anticipated that several of the lower chord eyebars will require replacement. While it is preferred to rehabilitate vs. replace a historic component, the advanced section loss to the pins will make repair impractical. Deformed or bent eyebars may be able to be straightened provided they have not stretched through the course of bending. If they have stretched they will require replacement to restore their effectiveness as tension members.
Steel Truss - Portal and Portal Lattice
Miscellaneous structural repairs, particularly to the ornamental lattice work atop the steel end portals, will be necessary. This work may most effectively be performed during the paint removal blasting work for the steel repainting, as much of the ornamental lattice connections have been impacted by pack rust. In most cases it should be plausible to blast clean the pack rust, remove the severely deteriorated rivets and replace the deteriorated and missing rivets. Since both heads of the rivets show, and the rivets are of a relatively small diameter use of rivets for the replacement over dome head or similar bolts should be considered. It will also be necessary to refabricate some of the ornamental lattice plating as some of the components appear to be missing unless they have been salvaged and their location can be determined.

Truss Floorbeams and Deck
The steel truss floorbeams should be further inspected for loss and connection strength (the presence of flame burnt holes at some bolting locations were noted). However, it is likely limited work will be required to them beyond repainting. It should be noted that they are replacement floorbeams which were installed approximately 1988 and they are a W section I-beam, which is of slightly different geometry than would have originally been in place. This type of condition, however, is considered a previous modification to the structure and would not require replacement purely for reasons of matching the original piece shape in accordance with preservation standards. The timber panel deck is presently in a fair, functional condition and is not in need of replacement. However, for truss preservation purposes, repainting, etc. it would be beneficial to remove the deck. Once removed it would be prudent to install a replacement deck and at that time consideration could be made to restoring the deck back as a transverse timber deck plank on steel stringers spanning over the transverse floorbeams, as per bridge records in place prior to the 1988 deck replacement. For purposes of the preservation cost estimate the restoration back to the pre-1988 deck system has been assumed.

Truss Paint System
The current paint system on the trusses and remaining bridge superstructure is failed and the system should be replaced. It is recommended the in-place paint system be entirely removed to bare metal through abrasive blasting (which through testing is determined will not degrade portions of the steel structure which are to remain). Following removal, the structure should be painted with a zinc-rich primer and a protective overcoat system with color and sheen to be selected based on a study of preservation standards. The in-place system will require testing to determine for the presence of lead. Due to the toxicity of lead the removal of lead paint system requires an intensive encapsulation process. For purposes of cost estimating a lead based system has been presumed.

Bearings
The bearings are presently fairly deteriorated and in the case of the expansion bearing non-functioning. It is likely replacement will be necessary though this will need to be further determined through more detailed inspection and cleanup. If replacement is determined to be necessary, replacement with components of like material and geometry should be considered to the extent possible as they are a visual element of the structure. For purposes of the preservation cost estimate replacement has been assumed.
Substructures
Due to its advanced deteriorated state, the stone comprising the abutments and wingwalls will likely require nearly complete replacement to maintain stability/ support the truss. This work will thus entail reconstruction of the bridge abutments. Consideration to salvage stones where practical for re-use should be of high priority to retain as much of the original fabric as possible. With the extent of deterioration and fracturing displayed by the stones it is however likely the re-useable quantity will be low. To allow for abutment reconstruction it will be necessary to temporarily lift the truss from the abutments. This could be accommodated by driving piling at the ends off either side and placing a support beam beneath the truss end span between the piling while lifting the truss or more appropriately by constructing a temporary abutment sill adjacent to the in-place structure and sliding the structure over onto it. Sliding the structure onto a temporary abutment sill has the added benefit of allowing for the new abutment construction to be performed without having to work directly beneath a lifted truss. It would also be beneficial since it is likely the new abutments will require driven piling for support though it is possible geotechnical borings and a foundation study which should be engaged prior to abutment design may show there is a dense strata present, which could support a spread footing. In any case, the reconstruction of the abutments, for purposes of this report, are anticipated to involve a driven pile foundation with concrete support footing approximately 6 feet below finished grade, above which would be built a mortared stone abutment to the shape and geometry of the original abutments. As quarried stone of the type, color range, shape and crafted texture to the original is still available, its use has been presumed. Since it is unlikely any of the original stone mortar is still present or competent enough for testing the mortar selection and finished tooling will need to be based on the properties of the replacement stone and historic information regarding this and similar structures. To maintain historic integrity it will also be necessary for the project construction details to fully define the tuckpointing requirements including but not limited to such items as joint preparation, mortar finish and tooling, mortar curing, and preparation of repointing test panels.

At the time of the abutment replacement the bridge location should be assessed as it is believed stability of the south bridge embankment could be improved without compromise to the north bridge embankment by shifting the bridge, along the in-place existing road alignment approximately 8 feet to the south. This consideration would be for purposes of better fitting the in-place river channel and minimizing future scour and damage potential at the southwest corner. While a change in the bridge location is not a desired action, further study may indicate it to be a prudent action in terms of creating a stable restoration. This type of shift, along the in-place alignment would also be preferred over a shift transverse or skewed to the in-place alignment.

Consideration could also be made to raising the bridge at the time of abutment reconstruction to attempt to lessen the probability of damage to the bridge during flooding. This type of action would require careful study due to the impacts a grade raise would have to both the original bridge geometry and to the approach roadway which is also a contributing feature to the adjacent historic site. Though the structure has received damage to the lower chord etc. from flooding it also was in service for over 100 years. It would be suggested that a historic study of the river be made to assess whether the flood levels/ frequency has increased in more recent times over what the bridge saw for the majority of its in-service life. If this is the case, then further investigation into the benefits of a grade raise may be warranted.
Railings
It is unknown what, if any, of the current components of the bridge railing may be original except for the galvanized steel plate guardrail which is known to be modern. The determined future use for the structure- pedestrian vs. vehicular - will have a strong influence as to what modifications should be made to the railing. Further research should be performed in an effort to determine what the original railing features were. This research combined with the determined future use, code safety requirements for the future use and potential variances and exceptions from current safety code requirements should be assessed. It is likely that the solution will consist of complete replacement of the railings to a rail type which is responsive to the historic structure and which also reaches an acceptable safety level while not fully meeting current code safety requirements. This is based on solutions reached on other similar structures where a balance between the historic needs and current code requirements were achieved. For purposes of the preservation estimate an allowance for a replacement railing has been included.

Recommended Annual Maintenance Activities

1. Maintain areas around truss ends and bearings free of debris, soil etc. to minimize further rusting/corrosion.

2. Monitor bridge closely during flood periods to remove flood debris and respond to potential flood debris damage.
Summarized Maintenance, Stabilization and Preservation Construction Cost Estimates

It is important to recognize that the work scope and cost estimates presented herein are based on a limited level assessment of the existing structure. In moving forward with future project planning, it will be essential to undertake a detailed structure assessment addressing the proposed work for the structure. It is also important that any future preservation work follow applicable preservation standards with emphasis to rehabilitate and repair in-place structure elements in lieu of replacement. This includes elements which are preliminarily estimated for replacement within the work scope of this report. Only through a thorough review of rehabilitation and repair options and comprehensive structural and historic assessment can a definitive conclusion for replacement of historic fabric be formed.

The opinions of probable construction and administrative costs provided below are presented in 2013 dollars. These costs were developed without benefit of a detailed, thorough bridge inspection, bridge survey or completion of preliminary design for the estimated improvements. The estimated costs represent an opinion based on background knowledge of historic unit prices and comparable work performed on other structures. The opinions of cost are intended to provide a programming level of estimated cost. These costs will require refinement and may require significant adjustments as further analysis is completed in determining the course of action for future structure improvements. A 20 percent contingency and 7 percent mobilization allowance has been included in the construction cost estimates.

Administrative and engineering costs are also presented below. Engineering and administrative costs are also to be interpreted as programming level only. Costs can be highly variable and are dependent on structure condition, intended work scope, project size and level of investigative, testing and documentation work necessary. Additional studies, evaluation, and historic consultation costs not exclusively called out may also be incurred on a case-by-case basis.

Maintenance, Stabilization and Preservation Costs (refer to the work item breakdown on the next page)

Opinion of Annual Cost- Maintenance Activities: $1,920

Opinion of Construction Cost- Stabilization Activities: $10,300

Opinion of Construction Cost- Preservation Activities: $790,800

Estimated Preliminary Design, Final Design, Construction Administration Costs

Preliminary Design and Assessment $16,000

Final Design and Plans $80,000

Construction Administration $96,000
MINNESOTA DEPARTMENT OF TRANSPORTATION (MNDOT)
LOCAL HISTORIC BRIDGE REPORT

V – Projected Costs

Bridge Number: 6263

MAINTENANCE, STABILIZATION & PRESERVATION COST ESTIMATE (2013 DOLLARS)
Bridge No. 6263
June 27, 2013

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SEPTEMBER 2013
Projected Cost V - 25
Minnesota Department of Transportation (MnDOT)
Local Historic Bridge Report

Appendices

Appendix A. Glossary
**Glossary**

**Abutment** – Component of bridge substructure at either end of bridge that transfers load from superstructure to foundation and provides lateral support for the approach roadway embankment.

**Appraisal ratings** – Five National Bridge Inventory (NBI) appraisal ratings (structural evaluation, deck geometry, under-clearances, waterway adequacy, and approach alignment, as defined below), collectively called appraisal ratings, are used to evaluate a bridge’s overall structural condition and load-carrying capacity. The evaluated bridge is compared with a new bridge built to current design standards. Ratings range from a low of 0 (closed bridge) to a high of 9 (superior). Any appraisal item not applicable to a specific bridge is coded N.

**Approach alignment** – One of five NBI inspection ratings. This rating appraises a bridge’s functionality based on the alignment of its approaches. It incorporates a typical motorist’s speed reduction because of the horizontal or vertical alignment of the approach.

**Character-defining features** – Prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. Features may include structural or decorative details and materials.

**Condition, fair** – A bridge or bridge component of which all primary structural elements are sound, but may have minor deterioration, section loss, cracking, spalling, or scour.

**Condition, good** – A bridge or bridge component which may have some minor deficiencies, but all primary structural elements are sound.

**Condition, poor** – A bridge or bridge component that displays advanced section loss, deterioration, cracking, spalling, or scour.

**Condition rating** – Level of deterioration of bridge components and elements expressed on a numerical scale according to the NBI system. Components include the substructure, superstructure, deck, channel, and culvert. Elements are subsets of components, e.g., piers and abutments are elements of the component substructure. The evaluated bridge is compared with a new bridge built to current design standards. Component ratings range from 0 (failure) to 9 (new) or N for (not applicable); elements are rated on a scale of 1-3, 1-4 or 1-5 (depending on the element type and material). In all cases condition state 1 is the best condition with condition state 3, 4 or 5 being the worst condition. In rating a bridge’s condition, MnDOT pairs the NBI system with the newer and more sophisticated Pontis element inspection information, which quantifies bridge elements in different condition states and is the basis for subsequent economic analysis.

**Corrosion** – The general disentegration of metal through oxidation.

**Cutwater** – The wedge-shaped end of a bridge pier, designed to divide the current and break up ice.
**Decay** – Deterioration of wood as a result of fungi feeding on its cell walls.

**Delamination** – Surface separation of concrete, steel, glue laminated timber plies etc. into layers.

**Deck geometry** – One of five NBI appraisal ratings. This rating appraises the functionality of a bridge’s roadway width and vertical clearance, taking into account the type of roadway, number of lanes, and ADT.

**Deficiency** – The inadequacy of a bridge in terms of structure, serviceability, and/or function. Structural deficiency is determined through periodic inspections and is reflected in the ratings that are assigned to a bridge. Service deficiency is determined by comparing the facilities a bridge provides for vehicular, bicycle, and pedestrian traffic with those that are desired. Functional deficiency is another term for functionally obsolete (see below). Remedial activities may be needed to address any or all of these deficiencies.

**Deficiency rating** – A nonnumeric code indicating a bridge’s status as structurally deficient (SD) or functionally obsolete (FO). See below for the definitions of SD and FO. The deficiency rating status may be used as a basis for establishing a bridge’s eligibility and priority for replacement or rehabilitation.

**Design exception** – A deviation from federal design and geometric standards that takes into account environmental, scenic, aesthetic, historic, and community factors that may have bearing upon a transportation project. A design exception is used for federally funded projects where federal standards are not met. Approval requires appropriate justification and documentation that concerns for safety, durability, and economy of maintenance have been met.

**Design load** – The usable live-load capacity that a bridge was designed to carry, expressed in tons according to the AASHTO allowable stress, load factor, or load resistance factor rating methods. An additional code was recently added to assess design load by a rating factor instead of tons. This code is used to determine if a bridge has sufficient strength to accommodate traffic load demands. A bridge that is posted for load restrictions is not adequate to accommodate present or expected legal truck traffic.

**Deterioration** – Decline in condition of surfaces or structure over a period of time due to chemical or physical degradation.

**Efflorescence** – A deposit on concrete or brick caused by crystallization of carbonates brought to the surface by moisture in the masonry or concrete.

**Extant** – Currently or actually existing.

**Extrados** – The upper or outer surfaces of the voussoirs which compose the arch ring. Often contrasted with intrados.
**Footing** – The enlarged, lower portion of a substructure which distributes the structure load either to the earth or to supporting piles.

**Fracture Critical Members** – Tension members or tension components of bending members (including those subject to reversal of stress) whose failure would be expected to result in collapse of the bridge.

**Functionally obsolete** – The Federal Highway Administration (FHWA) classification of a bridge that does not meet current or projected traffic needs because of inadequate horizontal or vertical clearance, inadequate load-carrying capacity, and/or insufficient opening to accommodate water flow under the bridge. An appraisal rating of 3 or less for deck geometry, underclearance, approach alignment, structural evaluation or waterway adequacy will designate a bridge as functionally obsolete.

**Gusset plate** – A plate that connects the horizontal and vertical members of a truss structure and holds them in correct position at a joint.

**Helicoidal** – Arranged in or having the approximate shape of a flattened coil or spiral.

**Historic fabric** – The material in a bridge that was part of original construction or a subsequent alteration within the historic period of the bridge (i.e., more than 50 years old). Historic fabric is an important part of the character of the historic bridge and the removal, concealment, or alteration of any historic material or distinctive engineering or architectural feature should be avoided if possible. Often, the character-defining features include important historic fabric. However, historic fabric can also be found on other elements of a bridge that have not been noted as character-defining.

**Historic bridge** – A bridge that is listed in, or eligible for listing in, the National Register of Historic Places.

**Historic integrity** – The authenticity of a bridge’s historic identity, evidenced by the survival and/or restoration of physical characteristics that existed during the bridge’s historic period. A bridge may have integrity of location, design, setting, materials, workmanship, feeling, and association.

**Inspections** – Periodic field assessments and subsequent consideration of the fitness of a structure and the associated approaches and amenities to continue to function safely.

**Intrados** – The inner or lower surface of an arch. Often contrasted with extrados.

**Inventory rating** – The load level a bridge can safely carry for an indefinite amount of time expressed in tons or by the rating factor described in design load (see above). Inventory rating values typically correspond to the original design load for a bridge without deterioration.

**Keystone** – Wedge-shaped stone, or voussoir, at the crown of an arch.
**Load Rating** – The determination of the live load carrying capacity of a bridge using bridge plans and supplemented by field inspection.

**Maintenance** – Work of a routine nature to prevent or control the process of deterioration of a bridge.

**Minnesota Historical Property Record** – A documentary record of an important architectural, engineering, or industrial site, maintained by the Minnesota Historical Society as part of the state’s commitment to historic preservation. MHPR typically includes large-format photographs and written history, and may also include historic photographs, drawings, and/or plans. This state-level documentation program is modeled after a federal program known as the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER).

**National Bridge Inventory** – Bridge inventory and appraisal data collected by the FHWA to fulfill the requirements of the National Bridge Inspection Standards (NBIS). Each state maintains an inventory of its bridges subject to NBIS and sends an annual update to the FHWA.

**National Bridge Inspection Standards** – Federal requirements for procedures and frequency of inspections, qualifications of personnel, inspection reports, and preparation and maintenance of state bridge inventories. NBIS applies to bridges located on public roads.

**National Register of Historic Places** – The official inventory of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, which is maintained by the Secretary of the Interior under the authority of the National Historic Preservation Act of 1966 (as amended).

**Non-vehicular traffic** – Pedestrians, non-motorized recreational vehicles, and small motorized recreational vehicles moving along a transportation route that does not serve automobiles and trucks. Includes bicycles and snowmobiles.

**Operating rating** – Maximum permissible load level to which a bridge may be subjected based on a specific truck type, expressed in tons or by the rating factor described in design load (see above).

**Pack rust** – Rust forming between adjacent steel surfaces in contact which tends to force the surfaces apart due to the increase in steel volume.

**Pier** – A substructure unit that supports the spans of a multi-span superstructure at an intermediate location between its abutments.

**Pointing** – The compaction of mortar into the outermost portion of a joint and the troweling of its exposed surface to secure water tightness and/or desired architectural effect (when replacing deteriorated mortar).
**Pony truss** – A through bridge with parallel chords and having no top lateral bracing over the deck between the top chords.

**Posted load** – Legal live-load capacity for a bridge which is associated with the operating rating. A bridge posted for load restrictions is inadequate for legal truck traffic.

**Pontis** – Computer-based bridge management system to store inventory and inspection data and assist in other bridge data management tasks.

**Preservation** – Preservation, as used in this report, refers to historic preservation that is consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*. Historic preservation means saving from destruction or deterioration old and historic buildings, sites, structures, and objects, and providing for their continued use by means of restoration, rehabilitation, or adaptive reuse. It is the act or process of applying measures to sustain the existing form, integrity, and material of a historic building or structure, and its site and setting. MnDOT’s *Bridge Preservation, Improvement and Replacement Guidelines* describe preservation differently, focusing on repairing or delaying the deterioration of a bridge without significantly improving its function and without considerations for its historic integrity.

**Preventive maintenance** – The planned strategy of cost-effective treatments that preserve a bridge, slow future deterioration, and maintain or improve its functional condition without increasing structural capacity.

**Reconstruction** – The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location. Activities should be consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*.

**Rehabilitation** – The act or process of returning a historic property to a state of utility through repair or alteration which makes possible an efficient contemporary use, while preserving those portions or features of the property that are significant to its historical, architectural, and cultural values. Historic rehabilitation, as used in this report, refers to implementing activities that are consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*. As such, rehabilitation retains historic fabric and is different from replacement. MnDOT’s *Bridge Preservation, Improvement and Replacement Guidelines* describe rehabilitation and replacement in similar terms.

**Restoration** – The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time. Activities should be consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*.

**Ring stone** – One of the separate stones of an arch that shows on the face of the headwall, or end of the arch. Also known as a voussoir.
**Scaling** – The gradual distentegration of a concrete surface due to the failure of the cement surface caused by chemical attack or freeze-thaw cycles or rebar too close to the surface and oxidizing from exposure to chlorides.

**Scour** – Removal of material from a river’s bed or bank by flowing water, compromising the strength, stability, and serviceability of a bridge.

**Scour critical rating** – A measure of a bridge’s vulnerability to scour (see above). MnDOT utilizes letter designations to represent specific descriptions of a bridge's susceptibility and/or present condition in regards to scour. Range in condition and scour susceptibility does not necessarily correlate alpha numerically to the MnDOT scour code letters so it is important to understand the specific scour description for each MnDOT scour code. The scour codes and descriptions can be found in the “MNDOT Bridge Inspection Field Manual”.

**Section loss** – Loss of a member's cross sectional area and resulting strength usually by corrosion or decay.

**Serviceability** – Level of facilities a bridge provides for vehicular, bicycle, and pedestrian traffic, compared with current design standards.

**Smart flag** – Special Pontis inspection element used to report the condition assessment of a deficiency that cannot be modeled, such as cracks, section loss, and steel fatigue.

**Spall** – Depression in concrete caused by a separation of a portion of the surface concrete, revealing a fracture parallel with or slightly inclined to the surface.

**Spring line** – The imaginary horizontal line at which an arch or vault begins to curve. As example, the point of transition from the vertical face of an abutment to the start of arch curvature extending from abutment face.

**Stabilization** – The act or process of stopping or slowing further deterioration of a bridge by means of making minor repairs until a more permanent repair or rehabilitation can be completed.

**Stringcourse** – A horizontal band of masonry, generally narrower than other courses and sometimes projecting, that extends across the structure’s horizontal face as an architectural accent. Also known as belt course.

**Structural evaluation** – Condition rating of a bridge designed to carry vehicular loads, expressed as a numeric value and based on the condition of the superstructure and substructure, the inventory load rating, and the ADT.
**Structurally deficient** – Classification indicating NBI condition rating of 4 or less for any of the following: deck condition, superstructure condition, substructure condition, or culvert condition. A bridge is also classified as structurally deficient if it has an appraisal rating of 2 or less for its structural evaluation or waterway adequacy. A structurally deficient bridge is restricted to lightweight vehicles; requires immediate rehabilitation to remain open to traffic; or requires maintenance, rehabilitation, or replacement.

**Sufficiency rating** – Rating of a bridge’s structural adequacy and safety for public use, and its serviceability and function, expressed on a numeric scale ranging from a low of 0 to a high of 100. It is a relative measure of a bridge’s deterioration, load capacity deficiency, or functional obsolescence. MnDOT may use the rating as a basis for establishing eligibility and priority for replacement or rehabilitation. Typically, bridges which are structurally deficient and have sufficiency ratings between 50 and 80 are eligible for federal rehabilitation funds and those which are structurally deficient with sufficiency ratings of 50 and below are eligible for replacement.

**Through truss** – A bridge with parallel top and bottom chords and top lateral bracing with the deck generally near the bottom chord.

**Under-clearances** – One of five NBI appraisal ratings. This rating appraises the suitability of the horizontal and vertical clearances of a grade-separation structure, taking into account whether traffic beneath the structure is one- or two-way.

**Variance** – A deviation from State Aid Operations Statute Rules that takes into account environmental, scenic, aesthetic, historic, and community factors that may have bearing upon a transportation project. A design variance is used for projects using state aid funds. Approval requires appropriate justification and documentation that concerns for safety, durability and economy of maintenance have been met.

**Vehicular traffic** – The passage of automobiles and trucks along a transportation route.

**Vousoir** – One of the separate stones forming an arch ring; also known as a ring stone.

**Waterway adequacy** – One of five NBI appraisal ratings. This rating appraises a bridge’s waterway opening and passage of flow under or through the bridge, frequency of roadway overtopping, and typical duration of an overtopping event.
Appendix B. Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards
The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations

Adapted from:

The Secretary of the Interior's Standards for the Treatment of Historic Properties, first codified in 1979 and revised in 1992, have been interpreted and applied largely to buildings rather than engineering structures. In this document, the differences between buildings and structures are recognized and the language of the Standards has been adapted to the special requirements of historic bridges.

1. Every reasonable effort shall be made to continue an historic bridge in useful transportation service. Primary consideration shall be given to rehabilitation of the bridge on site. Only when this option has been fully exhausted shall other alternatives be explored.

2. The original character-defining qualities or elements of a bridge, its site, and its environment should be respected. The removal, concealment, or alteration of any historic material or distinctive engineering or architectural feature should be avoided.

3. All bridges shall be recognized as products of their own time. Alterations that have no historical basis and that seek to create a false historic appearance shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive engineering and stylistic features, finishes, and construction techniques or examples of craftsmanship that characterize an historic property shall be preserved.

6. Deteriorated structural members and architectural features shall be retained and repaired, rather than replaced. Where the severity of deterioration requires replacement of a distinctive element, the new element should match the old in design, texture, and other visual qualities and where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical and physical treatments that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the most environmentally sensitive means possible.
8. Significant archaeological and cultural resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, structural reinforcements, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
Appendix C. Documents
Additional Electronic Data
Bridge 6263

Historic Data
- Research

Local Data
- No information

MnDOT Reports
- 2004 Fracture Critical Report
- 2008 Critical Finding
- Accident Report (none reported)
- 6263 Inspection 05-09-11
- 6263 Inventory 04-19-13
- 6263 Load Rating
- 2007 Fracture Critical Report
- 2011 Condition Sheet

Photos
- 2000 Photos
- 2005 Photos
- 2006 Photos
- 2008 Photos
- 6263 LHB Photos 05-23-13
- 6263 M&H Photos 5-23-2013
- Historic Photos
- Report Photos

Plans
- Bridge 6263, 1988 Plans
Mn/DOT BRIDGE INSPECTION REPORT

INSPECTED BY: FILLMORE COUNTY

BRIDGE 6263  CR 118 OVER S BR. ROOT RIVER

Date: 05-09-2011

County: FILLMORE  Location: 0.1 Mi N OF JCT CSAH 12  Length: 101.2 ft
City:   

Township: FORESTVILLE  Control Section: 102N Range: 12W  Mgmt. Areas: Rdwy. Area / Pvt. Unsld: 1,528 sq ft
Section: 13  Local Agency Bridge Nbr:  Paint Area/ Pvt. Unsld: 

Span Type: STEEL HIGH TRUSS  Culvert: N/A

NBI Deck: 6  Super: 4  Sub: 2  Chan: 5  Culv: N

Appraisal Ratings - Approach: 4  Waterway: 5

Required Bridge Signs - Load Postings: BRIDGE CLOSED  Traffic: NOT REQUIRED

Horizontal: OBJECT MARKERS  Vertical: NOT REQUIRED

STRUCTURE UNIT: 0

<table>
<thead>
<tr>
<th>ELM NBR</th>
<th>ELEMENT NAME</th>
<th>ENV INSPE. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
<th>QTY CS 5</th>
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<tbody>
<tr>
<td>54</td>
<td>TIMBER SLAB</td>
<td>05-09-2011</td>
<td>1,604 SF</td>
<td>0</td>
<td>1,604</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1,604 SF</td>
<td>0</td>
<td>1,604</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Notes: [2006] - The top of the timber deck shows wear. Several of the planks on the north end of the deck at the joint are lower than the adjacent planks. Several of the hold down bolts are starting to rise up. 2009 - The first set of deck strips from the north end of the deck, the east side second strip is loose on the north end.


| 320     | CONC APPR SLAB-BITOL | 05-09-2011 | 2 EA | 0 | 2 | 0 | 0 | N/A |
|         |                    | 06-14-2010 | 2 EA | 0 | 2 | 0 | 0 | N/A |

Notes: [2006] - South approach - the approach is higher than the deck. Bituminous has been added to the deck to transition the bump. Potholes are starting to form in the bituminous.

[2008] - North approach - the approach is higher than the deck. Bituminous has been added to the approach.

[2011] - no change 2008

| 354     | METAL RAIL-COATED | 05-09-2011 | 203 LF | 0 | 0 | 203 | 0 | 0 |
|         |                    | 06-14-2010 | 203 LF | 0 | 0 | 203 | 0 | 0 |

Notes: [2009] - The paint system on the railing is failing. The west side rail south end round bar is disconnected from the post. The west side rail round bar is pushed in towards the deck between panel points L2 and L3 and has broken away from the connection at L2. There is galvanized plate beam through the bridge on both sides of the deck.

[2011] - no change 2009

| 121     | PISTL THRU TRUSS/BOT | 05-09-2011 | 200 LF | 0 | 0 | 100 | 100 | 0 |
|         |                    | 06-14-2010 | 200 LF | 0 | 0 | 102 | 102 | 0 |

Notes: [2006] - A spring flood of 2000 damaged the upstream lower chord between panel point L0 to L1. The lower chord was distorted from being impinged from timber debris. The exterior eye bar between L0 to L4 is not in tension. This condition should be considered 50% LOS. The truss was analyzed in 2000 with this condition and is acceptable at the current load posting. No cracks were detected in the impacted areas. The paint system has failed on the lower chords and active corrosion is present. [2007] - There is minor LOS around the I bars at the abutments.

[2011] - no change 2006

| 126     | PISTL THRU TRUSS/TOP | 05-09-2011 | 200 LF | 0 | 80 | 120 | 0 | 0 |
|         |                    | 06-14-2010 | 200 LF | 0 | 79 | 121 | 0 | 0 |

Notes: [2006] - The paint system on the remainder of the truss is starting to fail and there are scattered areas of active corrosion.

[2011] - no change 2006

| 152     | PAINT STL FLOORBEAM | 05-09-2011 | 86 LF | 0 | 0 | 62 | 27 | 0 |
|         |                    | 06-14-2010 | 86 LF | 0 | 0 | 62 | 26 | 0 |

Notes: [2006] - The paint system on the floorbeams has failed with minor loss of section along the top and bottom flanges.

[2011] - no change 2006

| 425     | PINNED CONN (PAINT) | 05-09-2011 | 24 EA | 0 | 0 | 24 | 0 | 0 |
|         |                     | 06-14-2010 | 24 EA | 0 | 0 | 24 | 0 | 0 |

Notes: [2009] - Failed paint with active corrosion with minor deck rust forming.

[2011] - no change 2009
## Mn/DOT Bridge Inspection Report

**Bridge 6283**

**CR 118 Over S Br Root River**

**Inspection Date**: 05-09-2011

### Structure Unit: 0

<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>ENV INSPECTION DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
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<th>QTY CS 4</th>
<th>QTY CS 5</th>
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<tbody>
<tr>
<td>311</td>
<td>EXPANSION BEARING</td>
<td>2 05-09-2011</td>
<td>2 EA</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>2 EA</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Notes**: [2006] - The moveable bearings are located at the south end of the bridge. The bearings are frozen in the expanded position and are not functioning as designed.

[2011] - no notes

| 313      | FIXED BEARING | 2 05-09-2011 | 2 EA | 0 | 2 | 0 | N/A | N/A |
|          |               | 06-14-2010 | 2 EA | 0 | 2 | 0 | N/A | N/A |

**Notes**: [2006] - The paint system on the bearings has failed and active corrosion is present.

[2011] - no notes

| 217      | ABUTMENT - OTHER | 2 05-09-2011 | 39 LF | 0 | 0 | 0 | 39 | N/A |
|          |               | 06-14-2010 | 39 LF | 0 | 0 | 0 | 39 | N/A |

**Notes**: [2006] - South Abutment - the lower southwest corner of the abutment was repaired with gunite. The east side of the abutment has areas of advanced deterioration with missing blocks.

North Abutment - there is a 30" long x 6" deep area of failed block under the northeast bearing. The block and mortar are deteriorated across the entire face of the abutment. [2007] - The Condition State rating of the abutments has changed due to the 2006 revision to Mn/DOT's Bridge Inspection Manual.

2005 - Both abutments were damaged from a flood in June of 2005. The bridge was closed to vehicular traffic due to concern for the stability of the abutments. The bridge will remain closed until the abutments are stabilized.

2010 - No change from 2008. Bridge to remain closed and be utilized as a pedestrian bridge only until the abutments are stabilized.

[2011] - South Abutment - the lower southwest corner of the abutment was repaired with gunite. The east side of the abutment has areas of advanced deterioration with missing blocks.

North Abutment - There is a 34" long x 10" deep area of failed block under the northeast bearing. The block and mortar are deteriorated across the entire face of the abutment.

Both abutments were damaged from a flood in June of 2005. The bridge was closed to vehicular traffic due to concern for the stability of the abutments. The bridge will remain closed and be utilized as a pedestrian bridge only until the abutments are stabilized.

| 387      | CONCRETE WINGWALL | 2 05-09-2011 | 4 EA | 0 | 4 | 0 | 0 | N/A |
|          |               | 06-14-2010 | 4 EA | 0 | 4 | 0 | 0 | N/A |

**Notes**: [2006] - Deteriorated block and mortar at all wingwalls.


| 357      | PACK RUST | 2 05-09-2011 | 1 EA | 0 | 1 | 0 | 0 | N/A |
|          |           | 06-14-2010 | 1 EA | 0 | 1 | 0 | 0 | N/A |

**Notes**: [2006] - Minor areas of pack rust at the lower chord non-sealed faying surfaces.


| 301      | SCOUR | 2 05-09-2011 | 1 EA | 0 | 1 | 0 | 0 | N/A |
|          |       | 06-14-2010 | 1 EA | 0 | 1 | 0 | 0 | N/A |


[2011] - There is no significant scour in front of the south abutment.

| 303      | SECTION LOSS | 2 05-09-2011 | 1 EA | 0 | 1 | 0 | 0 | N/A |
|          |             | 06-14-2010 | 1 EA | 0 | 1 | 0 | 0 | N/A |

**Notes**: [2006] - Areas of loss of section will not require analysis at this time.

<table>
<thead>
<tr>
<th>ELEMENT NBR</th>
<th>ELEMENT NAME</th>
<th>ENV. INSPECT.</th>
<th>QUANTITY</th>
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<tbody>
<tr>
<td>964</td>
<td>CRITICAL FINDING</td>
<td>05-06-2011</td>
<td>1 EA 1 0 N/A N/A N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA 1 N/A N/A N/A N/A</td>
</tr>
<tr>
<td>Notes:</td>
<td>[2009]: Bridge to remain closed after exhibiting abutment instability issues from flood damage. Engineering analysis and new load rating should be completed before re-opening the bridge to traffic (ULF).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2011]: In the spring of 2008 the bridge flooded. At this time the main concern for the stability of the bridge was the abutments. The bridge was closed in June of 2008. Engineering analysis of the bridge was completed by Erickson Engineering in 2008. The bridge remains closed until the abutments are stabilized.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2011]: no change 2009.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>966</td>
<td>FRACTURE CRITICAL</td>
<td>05-09-2011</td>
<td>1 EA 1 0 0 N/A N/A N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA 1 N/A N/A N/A N/A</td>
</tr>
<tr>
<td>Notes:</td>
<td>[2008]: An in-depth fracture critical inspection was completed in November 2007. [2009]: Since the bridge is no longer open to vehicular traffic, the bridge will not require a fracture critical inspection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2010]: The bridge is currently a pedestrian bridge only.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2011]: An in-depth fracture critical inspection was completed in November of 2007. Since the bridge is no longer open to vehicular traffic, the bridge will not require a fracture critical inspection. The bridge is blocked from vehicular traffic use on both ends. The bridge is currently a pedestrian bridge only.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>981</td>
<td>SIGNING</td>
<td>05-09-2011</td>
<td>1 EA 1 0 0 0 0 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA 1 N/A N/A N/A N/A</td>
</tr>
<tr>
<td>Notes:</td>
<td>[[2008]]: All signs are in place. The SW delineator is bent at the top and is slightly twisted. 2008: All signs are in place.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[[2011]]: All signs are in place.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>985</td>
<td>SLOPES</td>
<td>05-09-2011</td>
<td>1 EA 1 0 N/A N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA 1 N/A N/A N/A</td>
</tr>
<tr>
<td>Notes:</td>
<td>[[2008]]: There is erosion to the SE and SW wingwall slopes. There is an erosion hole in front of the north abutment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[[2009]]: the erosion hole in front of the north abutment has deepened and was full of water.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>986</td>
<td>CURB &amp; SIDEWALK</td>
<td>05-09-2011</td>
<td>1 EA 1 0 0 N/A N/A N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA 1 N/A N/A N/A N/A</td>
</tr>
<tr>
<td>Notes:</td>
<td>[[2006]]: All curb sections are intact.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[[2011]]: no change 2006.</td>
<td></td>
<td></td>
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</tbody>
</table>
Mn/DOT BRIDGE INSPECTION REPORT

Inspected by: FILLMORE COUNTY
BRIDGE 6263 CR 118 OVER S BR ROOT RIVER INSP. DATE: 05-09-2011

STRUCTURE UNIT: 0

<table>
<thead>
<tr>
<th>ELEM NBR</th>
<th>ELEMENT NAME</th>
<th>ENV INSPE. DATE</th>
<th>QUANTITY</th>
<th>QTY CS 1</th>
<th>QTY CS 2</th>
<th>QTY CS 3</th>
<th>QTY CS 4</th>
<th>QTY CS 5</th>
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<tbody>
<tr>
<td>988</td>
<td>MISCELLANEOUS</td>
<td>05-09-2011</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>06-14-2010</td>
<td>1 EA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Notes: [2008] - There are no swallow nests on the bridge.
[2011] - no notes.

General Notes:
An in-depth fracture critical inspection was completed on the bridge in 1999. In the spring of 2000, floodwater overflowed the bridge deck and damaged the upstream lower chord. The bridge was temporarily closed due to this damage. On June 2, 2000, Mn/DOT personnel reviewed the damage to the bridge and recommended that the county reopen the bridge in 2006.

In the spring of 2000, floodwater overflowed the bridge deck and damaged the upstream lower chord. The bridge was temporarily closed due to this damage. On June 2, 2000, Mn/DOT personnel reviewed the damage to the bridge and recommended that the county reopen the bridge. An in-depth fracture critical inspection was completed on the bridge in November of 2007. In June of 2008, the bridge was flooded and damaged the abutments. Due to concern for the stability of the abutments, the bridge was closed and remains closed to vehicular traffic. Slope erosion on both sides of the bridge. There are trees with exposed roots at the edges of the banks. The upstream banks are experiencing significant erosion.

[2009] - inspected by Eric Evens
In the spring of 2000, floodwater overflowed the bridge deck and damaged the upstream lower chord. The bridge was temporarily closed due to this damage. On June 2, 2000, Mn/DOT personnel reviewed the damage to the bridge and recommended that the county reopen the bridge. An in-depth fracture critical inspection was completed on the bridge in November of 2007. In June of 2008, the bridge was flooded and damaged the abutments. Due to concern for the stability of the abutments, the bridge was closed and remains closed to vehicular traffic. This bridge will only be opened to pedestrian traffic. Slope erosion on both sides of the bridge. There are trees with exposed roots at the edges of the banks. The upstream banks are experiencing significant erosion.

2010 - inspected by Eric Evens
no change from 2009

[2011] - inspected by Eri

Inspector's Signature

Reviewer's Signature / Date
**Mn/DOT Structure Inventory Report**

**Bridge ID:** 6263  
**CR 118 over S BR ROOT RIVER**  
**Date:** 04/19/2013

### GENERAL
- **Agency Br. No.:**  
- **District:** 6  
- **Maint. Area:**  
- **County:** 23 - FILLMORE  
- **City:**  
- **Township:** FORESTVILLE  
- **Desc. Loc.:** 0.1 MI N OF JCT CSAH 12  
- **Sect., Twp., Range:** 13 - 102NN - 12W  
- **Latitude:** 43° 38' 30.90"  
- **Longitude:** 92° 12' 53.71"  
- **Custodian:** COUNTY  
- **Owner:** COUNTY  
- **Inspection By:** FILLMORE COUNTY  
- **BMU Agreement:** DISTRICT 6  
- **Year Built:** 1899  
- **Year Fed Rehab:**  
- **Year Remodeled:**  
- **Temp:**  
- **Plan Avail.:** NO PLAN  

### ROADWAY
- **Bridge Match ID (TIS):** 1  
- **Roadway O/U Key:** 1-ON  
- **Route Sys/Nbr:** CNTY 118  
- **Roadway Name or Description:** CNTY 118  
- **Roadway Function:** MAINLINE  
- **Roadway Type:** 1 LN/2 WAY  
- **Control Section (TH Only):**  
- **Ref. Point (TH Only):**  
- **Date Opened to Traffic:** 01-01-1900  
- **Detour Length:** 7 mi.  
- **Lanes:** 1 Lane ON Bridge  
- **ADT (YEAR):** 170 (2005)  

### ROW DIMENTIONS
- **If Divided:** NB-EB SB-WB  
- **Roadway Width:** 15.1 ft  
- **Vertical Clearance:** 14.5 ft  
- **Max. Vert. Clear.:** 14.5 ft  
- **Horizontal Clear.:**  
- **Lateral Clr. - Lft:**  
- **Appr. Surface Width:** 26.0 ft  
- **Roadway Width:** 15.1 ft  
- **Median Width:**  

### INSPECTION
- **Deficient Status:** S.D.  
- **Sufficiency Rating:** 17.1  
- **Last Inspection Date:** 05-09-2011  
- **Inspection Frequency:** 12  
- **Inspector Name:** FILLMORE  
- **Structure:** K-CLOSED  

### NSI CONDITION RATINGS
- **Deck:** 8  
- **Superstructure:** 4  
- **Substructure:** 2  
- **Channel:** 5  
- **Culvert:** N  

### NSI APPRAISAL RATINGS
- **Structure Evaluation:** 2  
- **Deck Geometry:** 0  
- **Underclearances:** N  
- **Waterway Adequacy:** 5  
- **Approach Alignment:** 4  

### SAFETY FEATURES
- **Bridge Railings:** 0-SUBSTANDARD  
- **GR Transition:** 0-SUBSTANDARD  
- **Appr. Guardrail:** 0-SUBSTANDARD  
- **GR Termini:** 0-SUBSTANDARD  

**IN DEPTH INSPECT:**  
- **Frac. Critical:** Y  
- **Drainage Area:** 24 mo 11/2007  
- **Underwater:**  
- **Pinned Asbly.:**  
- **Spec.Feat.:**  

### WATERWAY
- **Drainage Area:**  
- **Waterway Opening:** 970 sq ft  
- **Navigation Control:** NO PRMT REGD  
- **Pier Protection:** NOT APPL  
- **Nav. Vert./Horiz. Clr.:**  
- **Nav. Vert. Lift Bridge Clear.:**  
- **MN Scour Code:** K-LIMITED RISK  
- **Scour Evaluation Year:** 2010  

### CAPACITY RATINGS
- **Design Load:** UNKN  
- **Operating Rating:** HS 0.00  
- **Inventory Rating:** HS 0.00  
- **Posting:** VEH: 00 SEMI: DBL:  
- **Rating Date:** 07-07-2008  

### BRIDGE SIGNS
- **Posted Load:** BRIDGE CLOSED  
- **Traffic:** NOT REQUIRED  
- **Horizontal:** OBJECT MARKERS  
- **Vertical:** NOT REQUIRED  
- **Mn/DOT Permit Codes:** A N B N C N

---

**Number of Spans**
- **MAIN:** 1  
- **APPR:** 0  
- **TOTAL:** 1  

**Structure Length:** 101.2 ft  
**Main Span Length:** 07.0 ft  
**Deck Width:** 15.9 ft  
**Deck Material:** TIMBER  
**Wear Surf Type:** TIMBER  
**Wear Surf Install Year:**  
**Wear Course/Fill Depth:** 0.25 ft  
**Deck Membrane:** NONE  
**Deck Protect.:** N/A  
**Deck Install Year:**  
**Structure Area:** 1,600 sq ft  
**Roadway Area:** 1,526 sq ft  
**Sidewalk Width - L/R:**  
**Curb Height - L/R:** 0.25 ft  
**Rail Codes - L/R:** 02 02