Stillwater Lift Bridge Management Plan – 2020 Update

MnDOT Bridge 4654

Report prepared for

Minnesota Department of Transportation

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Minnesota Department of Transportation (MnDOT)

Historic Bridge Management Plan

Bridge Number: 4654

Executive Summary

The Stillwater Lift Bridge (Bridge No. 4654), was completed in 1931 as a 10-span, two-lane highway crossing of the St. Croix River, between Stillwater, Minnesota, on the west and Houlton, Wisconsin, on the east. It is owned by the Minnesota Department of Transportation (MnDOT). The bridge originally carried Minnesota Trunk Highway (TH) 36 and Wisconsin State Trunk Highway (STH) 64, in addition to pedestrian traffic and accommodating boat navigation. The bridge includes a counterweighted, tower-and-cable, vertical-lift span of the Waddell and Harrington type. The total structure length is about 1,050 feet. The bridge has seven, 140-foot, steel, riveted, Parker truss spans, including the vertical lift span. There are two reinforced-concrete approach spans on the west and a rolled-beam jump span on the east. At the west approach to the bridge is a reinforced-concrete circular concourse, about 94 feet in diameter, designed with Classical Revival architectural treatment. The concourse is integrated with the west approach spans in materials and design, including a continuous, open-balustrade railing.

The lift bridge, including the concourse, is listed in the National Register of Historic Places (National Register). The concourse is included in the Stillwater Commercial Historic District (also listed in the National Register). The bridge and concourse are within the Stillwater Cultural Landscape District (determined eligible for the National Register).

In 2006 MnDOT and other agencies signed an *Amended Section 106 Memorandum of Agreement* (MOA) *for the St. Croix River Crossing Project - S.P. 8214-114*, involving the construction of a new St. Croix River bridge that will carry Minnesota TH 36 and Wisconsin STH 64. MOA Stipulation III states that the Stillwater Lift Bridge will continue to be used for Trunk Highway purposes until a new river crossing has been constructed and opened to vehicular traffic, at which time the historic bridge will be converted to pedestrian and bicycle use on a new trail system. Federal authorization for the St. Croix River Crossing Project was secured in 2012 with passage of Public Law 112-100 and construction of the new St. Croix River Crossing commenced in 2013. The new bridge was completed and opened to traffic on August 2, 2017. Stabilization efforts were completed on the Stillwater Lift Bridge in 2013 with a larger rehabilitation/conversion project started once the new bridge was completed. In accordance with the MOA, the rehabilitation would convert the historic structure to pedestrian and bicycle use only. Construction of the conversion project began in 2017 after the opening of the new bridge and was completed in 2020.

The St. Croix Crossing Project's MOA directed MnDOT to develop a Stillwater Lift Bridge Management Plan that "will identify those actions needed to preserve the structural and historical integrity of the Stillwater Lift Bridge for continued safe use," as well as directing the management of the bridge before and after its conversion. The Management Plan is considered integral to the successful implementation of MnDOT's *Management Plan for Historic Bridges in Minnesota*, in which MnDOT commits to preserving the structural integrity of 24 state-owned historic bridges.

Minnesota Department of Transportation (MnDOT)

Historic Bridge Management Plan

Bridge Number: 4654

Executive Summary

The original 2009 Management Plan was updated in 2020 to include work completed in the 2013 stabilization project and the conversion project completed in 2020.

This Stillwater Lift Bridge Management Plan now includes the following sections:

- Section 1.0: Project Introduction – Provides an introduction to the Stillwater Lift Bridge Management Plan.
- Section 2.0: Bridge Data – Lists pertinent information about the bridge and provides a narrative description of the bridge and concourse.
- Section 3.0: Historical Data – Provides narrative history of the bridge and identification of its character-defining features.
- Section 4.0: Engineering Data – Lists engineering data specific to the Stillwater Lift Bridge.
- Section 5.0: Existing Conditions – Details the bridge's existing conditions, including a description of the current structural, mechanical, and electrical conditions.
- Section 6.0: Recommendations – Provides recommendations for the bridge following the 2020 conversion project, primarily including maintenance and operations.
- Section 7.0: Projected Agency Costs – Provides a summary of estimated costs for recommended treatments.
- Section 8.0: Endowment Fund – Summarizes the creation and implementation of the endowment fund for future operation and maintenance costs.
- Section 9.0: Long-Term Considerations – Presents a discussion of long-term considerations for the Stillwater Lift Bridge, including repair and improvement activities and issues that are anticipated and may arise in the future. This section includes emergency situations.

Related documents are in the appendices, including the number of lifts, *Stillwater Lift Bridge Endowment Fund Account Usage – Routine Operations and Maintenance Financing Process Report* and cost details for recommendations with estimates for future work extended to 2040.

As required by the MOA, all work on the lift bridge has been and will be in compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOIS). MnDOT only will continue to own, operate, and maintain the converted bridge according to the recommendations in this Management Plan and in accordance with MnDOT's Historic Bridge Management Program.

The original Lift Bridge Management Plan and any management plan updates can be found on the Historic Bridges Program website at http://www.dot.state.mn.us/historicbridges/4654.html

Minnesota Department of Transportation (MnDOT)
Historic Bridge Management Plan

Bridge Number: 4654

Table of Contents

Page

1.0 Project Introduction 1

1.1 Introduction to the Stillwater Lift Bridge Management Plan 1

1.2 Minnesota's Historic Bridge Management Program 3

2.0 Bridge Data 5

2.1 Data 5

2.2 Narrative description 5

3.0 Historical Data 13

3.1 Contractor 13

3.2 Designer/engineer 13

3.3 National Register status 13

3.4 Statement of significance 13

3.4.1 Stillwater Lift Bridge 13

3.4.2 Stillwater Lift Bridge concourse 17

3.5 Character-defining features 18

3.5.1. Feature 1 – Vertical lift, design and construction 18

3.5.2 Feature 2 – Parker truss, design and construction 20

3.5.3 Feature 3 – Concourse and approach spans 1 and 2, design and construction 21

4.0 Engineering Data 24

5.0 Existing Conditions 27

6.0 Recommendations 29

6.1 Introduction 29

6.2 Guidelines and standards 29

6.2.1 Guidelines, standards, and regulations 29

6.2.2 Guidelines for steel repair and fastener considerations 30

6.2.3 Guidelines for treatment and repair of concrete 32

Table of Contents

6.3 Recommended maintenance activities 33

6.5.1 Structural maintenance 33

6.5.2 Mechanical maintenance 34

6.5.3 Electrical maintenance 37

6.5.4 Pavement markings, lighting and signs 39

6.5.5 Chestnut Street Lease 39

7.0 Projected Agency Costs 40

7.1 Summarized costs 41

7.2 Applicable funding 41

8.0 Endowment Fund ..... Error! Bookmark not defined.

9.0 Long-Term Considerations 45

9.1 Projected life expectancy 45

9.2 Potential component failure and appropriate remedial measures . 45

9.3 Process for addressing emergencies 45

9.4 Future decision-making 46

Table of Contents

Appendices

A Amended Section 106 Memorandum of Agreement for the St. Croix River Crossing Project

B Glossary of Preservation and Engineering Terms

C Stillwater Lift Bridge Maintenance Checklist

D Secretary of the Interior's Standards for the Treatment of Historic Properties, as Adapted for Historic Bridges

E Current MnDOT Structure Inventory Report
Current MnDOT Bridge Inspection Report
Past Maintenance Reports (as available)
Other Reports (as available)

F Applicable Standards

G Cost Details

H Bibliographical References

I Stillwater Lift Bridge Endowment Fund Account Usage – Routine Operations and Maintenance Financing Process Report

J Number of Lifts from 2010 to 2019

K Chestnut Street Right-of-Way

L Fracture Critical Inspection Memo

Table of Contents

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Minnesota Department of Transportation (MnDOT)
Historic Bridge Management Plan

Bridge Number: 4654

Section 1 – Project Introduction

1.0 Project Introduction

1.1 Introduction to the Stillwater Lift Bridge Management Plan

In 2006 the Minnesota Department of Transportation (MnDOT) and other agencies signed an *Amended Section 106 Memorandum of Agreement* (MOA) *for the St. Croix River Crossing Project – S.P.8214-114*. The St. Croix River Crossing Project involved the construction of a new bridge over the St. Croix River between the city of Oak Park Heights in Washington County, Minnesota, and the town of St. Joseph in St. Croix County, Wisconsin. Completed in 2017, the new bridge carries Minnesota Trunk Highway (TH) 36 and Wisconsin State Trunk Highway (STH) 64. The entire project is described in the 2006 *St. Croix River Crossing Project Supplemental Final Environmental Impact Statement (EIS) and in the 2012 Re-Evaluation of the 2006 Supplemental Final EIS*.

Included in the MOA is Stipulation III regarding the future of the historic Stillwater Lift Bridge (MnDOT Bridge No. 4654), located within the vicinity of the St. Croix River Crossing Project. Appendix A contains the entire MOA. The entire MOA can also be found in the original Lift Bridge Management Plan. The Federal Highway Administration (FHWA) determined that the St. Croix River Crossing Project would have an adverse effect on the bridge, which is listed in the National Register of Historic Places (National Register). MOA Stipulation III stated that the historic bridge will continue to be used for Trunk Highway purposes until a new river crossing has been constructed and opened to vehicular traffic. According to MOA Stipulation III.E.1, MnDOT committed to completing a rehabilitation project for the Stillwater Lift Bridge within one year after opening of the new bridge. At that time, the Stillwater Lift Bridge would be converted to pedestrian/bicycle use on a new trail system. The trail system, to be completed by MnDOT and the Wisconsin Department of Transportation (WisDOT), would create a loop joining Minnesota and Wisconsin. The trail system is identified as the Loop Trail in the MOA, EIS, and other project documents. A stipulation also identified establishing an endowment account for operations and routine maintenance of the converted lift bridge.

Federal authorization for the St. Croix River Crossing Project was secured in 2012 with the passage of Public Law 112-100 and construction of the new St. Croix River Crossing commenced in 2013. The new bridge was opened to traffic on August 2, 2017. Stabilization efforts were completed on the Stillwater Lift Bridge in 2013 with a larger rehabilitation project planned once the new bridge was completed. In accordance with the MOA, the rehabilitation would convert the historic structure to a pedestrian and bicycle use only. The conversion project began on August 2, 2017 after the opening of the new bridge and was completed in 2020.

MOA Stipulation III.C directed MnDOT to develop a Stillwater Lift Bridge Management Plan that “will identify those actions needed to preserve the structural and historical integrity of the Stillwater Lift Bridge

for continued safe use." The plan would also "describe how the Stillwater Lift Bridge is to be managed during its interim vehicular use and after its conversion to pedestrian/bicycle use." The stipulation stated that the Management Plan "is integral to the successful implementation" of MnDOT's *Management Plan for Historic Bridges in Minnesota*, in which MnDOT commits to preserving the structural integrity of 24 state-owned historic bridges "beyond its normal practice."

According to the MOA, the plan should have multiple components, including, but not limited to: current analysis of the bridge's condition; maintenance and improvement needs and priorities; a process to establish an endowment fund; a process for response to emergencies; a process to update the Management Plan as appropriate; review of ownership and long-term maintenance of the bridge; and priorities for the capital repair, rehabilitation, and improvement project that will allow the bridge to function as an integral part of the new Loop Trail upon conversion from vehicular to pedestrian/bicycle use.

Finally, the MOA stated that all activities involving the Stillwater Lift Bridge will be in compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (SOIS). This includes "any maintenance, repair, rehabilitation, and treatment proposed by MnDOT" until the new river crossing bridge is opened, as well as all actions identified in the Management Plan.

The Stillwater Lift Bridge was built in 1931 as a 10-span, two-lane crossing of the St. Croix River between Stillwater, Minnesota, and Houlton, Wisconsin. The bridge includes a Waddell & Harrington type, vertical-lift movable span, constructed in a steel Parker through-truss configuration, which allows river navigation access in compliance with federal regulations. The remaining spans are fixed; two are reinforced-concrete slab spans and the others are steel Parker through-trusses. The property includes a reinforced-concrete concourse at the west (Stillwater) approach. The structure was converted to a pedestrian / bicycle trail bridge in 2020 and opened to the public on June 1, 2020.

The original Stillwater Lift Bridge Management Plan is based on information obtained from MnDOT in 2007, field examinations conducted in 2007 and 2008 by professional engineers, historians, and landscape architects, and current bridge design standards and other codes and standards (see Section 6.2 and Appendix F). The Glossary in Appendix B explains historic preservation and engineering terms used in this plan.

Stipulation III.A of the MOA stated that MnDOT will continue to own and operate the Stillwater Lift Bridge with the intent to preserve and protect it beyond the opening of the new St. Croix River Bridge. If, after the repair and conversion project, MnDOT decides to transfer ownership, it must be done pursuant to Stipulation III.F.2 of the MOA.

MnDOT will continue to conduct routine maintenance of the bridge. The City of Stillwater, within their authority and commitments made in MnDOT Agreement #01433 and #1026159, assumed operation and

maintenance responsibilities for the Loop Trail on the lift bridge after the conversion project. It is anticipated that the trail on the Stillwater Lift Bridge will be kept open year-round by the City of Stillwater. Following a snow event, the City of Stillwater anticipates plowing a single path along the lift bridge.

MnDOT owns the area around the concourse in accordance with Right of Way Plat No. 82-121, as shown in Appendix K. Any requests by outside agencies or interests for use of the Lift Bridge or Concourse should be addressed to MnDOT Metro District's Permits Office.

1.2 Minnesota's Historic Bridge Management Program

MnDOT, in cooperation with the Minnesota State Historic Preservation Office (SHPO) and the FHWA, has committed to preserve selected historic bridges in Minnesota that are owned by the state and managed by MnDOT. In consultation with SHPO and the FHWA, MnDOT identified 24 bridges (including the Stillwater Lift Bridge) as candidates for long-term preservation in the *Management Plan for Historic Bridges in Minnesota* (2006). MnDOT's objective is to preserve the structural and historic integrity while maintaining the serviceability of these bridges. All activities will comply with the SOIS [36 CFR Part 68] and their adaptation for historic bridges by the Virginia Transportation Research Council in its *Guidelines for Bridge Maintenance and Rehabilitation Based on the Secretary of the Interior's Standards*.

MnDOT's ongoing efforts to manage historic bridges are intended to comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 4(f) of the U.S. Department of Transportation Act of 1966. MnDOT historic bridge management efforts began in 1985 with Robert M. Frame's study and list of significant and endangered bridges in Minnesota and incorporates Jeffrey A. Hess's 1995 survey and inventory of historic bridges in Minnesota that were built before 1956. Hess's inventory identified Bridge No. 4654 (Stillwater Lift Bridge) and others as eligible for listing in the National Register. Using the results of the 1995 study, MnDOT selected the 24 historic bridges for long-term preservation. In 2009, the Stillwater Lift Bridge was one of the 24 historic bridges identified for long term preservation by MnDOT.

The *Management Plan for Historic Bridges in Minnesota* describes a process for completing individual management plans for historic bridges, including the 24 historic bridges identified by MnDOT. That process has been followed for this Management Plan for the Stillwater Lift Bridge, with some modifications related to the particular circumstances of the St. Croix River Crossing Project. For example, the overall St. Croix River Crossing Project and related MOA already identify a preservation option for the Lift Bridge (conversion to less-demanding pedestrian/bicycle use), eliminating that substantial step in the individual management plan development process. The MOA also adds elements not found in other individual plans, such as the incorporation of an endowment fund component. The remainder of the Stillwater plan essentially follows the process as described in the statewide management plan and

incorporates the key element of collaboration between bridge engineers and bridge historians. In the collaborative process, recommendations for treatment of the historic bridge are developed collaboratively by professional engineers and professional historians.

The original 2009 Management Plan was updated in 2020 to include work completed as part of the stabilization project of 2013 and the conversion project which was begun in 2017 and completed in 2020.

This Stillwater Lift Bridge Management Plan now includes the following components:

1. Introduction to the management plan
2. Bridge data: a narrative description of the bridge
3. Historical data: a narrative history of the bridge that explains its significance and identifies its character-defining features
4. Engineering data: technical information specific to the bridge
5. Existing conditions: a description of the current structural, mechanical, and electrical conditions, as well as the needs of the bridge – not applicable in this updated plan
6. Recommendations: Provides recommendations for the bridge following the 2020 conversion project, primarily including future maintenance and operations activities.
7. Project costs: summary of estimated costs for recommended treatments
8. Endowment fund: summary of endowment fund and its usage by MnDOT
9. Long-term considerations: repair and improvement issues that may arise in the future, including emergency situations

2.0 Bridge Data

2.1 Data

Date of Construction:	1930-1931
SHPO Inventory Number:	WA-SWC-322
Common Name (if any):	Stillwater Lift Bridge
Descriptive Location:	State border between Stillwater, Minnesota, and Houlton, Wisconsin
Feature Carried:	St. Croix Crossing Loop Trail
Feature Crossed:	St. Croix River
UTM Zone:	15
NAD:	1983
Easting:	4989254
Northing:	515529
USGS Quad Name:	Stillwater
Town or City:	Stillwater
County:	Washington
Roadway Function:	Pedestrian/Bike Trail
Ownership:	State
Custodian/Maint. Agency:	State

Structure Data

Main Span Type:	315 (Steel, Movable – Lift)
Total Length:	1,053 feet

2.2 Narrative description

The Stillwater Lift Bridge components contained in this management plan include the seven steel truss spans, two reinforced-concrete approach spans on the west end of the bridge, one metal-beam approach span on the east end, and the concourse. The boundaries extend from the east abutment to the west edge of the concourse. The concourse is a circular, concrete entry area that serves as a transitional element between the bridge and downtown Stillwater.

The bridge structure was built in 1931 as a 10-span, two-lane highway crossing of the St. Croix River, between Stillwater, Minnesota, on the west and Houlton, Wisconsin, on the east. The bridge includes a counterweighted, tower-and-cable, vertical-lift span of the Waddell and Harrington type. Following the 2020 conversion the bridge now carries the Loop Trail's pedestrians and bicyclists, while accommodating boat navigation.

Section 2 – Bridge Data

At the site of the Stillwater Lift Bridge, the St. Croix River is approximately 1,800 feet wide. The total structure length is about 1,050 feet. The remaining distance is covered by an earthen causeway, which was built out from the Wisconsin shore to reduce the grade difference between the opposing banks, as well as to lower the fabrication costs of the bridge. Resting on reinforced-concrete piers and abutments, the bridge superstructure includes, from west to east, the following sequence of spans:

- Spans 1 & 2: Continuous, cast-in-place, reinforced-concrete slab approach spans over Lowell Park Drive
- Span 3: Fixed steel-truss span with west lift tower
- Span 4: Vertical-lift span
- Span 5: Fixed steel-truss span with east lift tower
- Spans 6-9: Fixed steel-truss spans
- Span 10: Rolled-beam jump span

The six fixed truss spans are of similar size and configuration. Each span employs the Parker through-truss design (essentially a Pratt truss with polygonal top chord) that was widely used by the 1930s for larger, longer-span, metal truss bridges. Most Parker trusses used riveted connections. Measuring approximately 140 feet in length, each span is a seven-panel, riveted, Parker through-truss with angle-iron portal, top-lateral, and sway bracing. The webs are further stiffened by horizontal, angle-iron bracing across the four center panels. Except for the top chord, which consists of heavy paired channels tied with cover plate above and X-lacing below, the web members are built of paired, back-to-back angles tied with batten plates (as in the bottom chord and diagonals) or V-lacing (as in the verticals). The truss members were originally painted green but were painted gray in 1942. The gray paint has been used on the bridge from 1942 until the 2020 conversion, when the bridge was repainted its original green. The only exception to green or gray paint is the aluminum paint on the tender house roof and south railing panels, which has been used from original construction to the present.

Spans 3 and 5 each include an 82-foot tower to accommodate the lift span and counterweight. These spans include traffic safety gates to control vehicular and pedestrian traffic approaching the lift span. The gate system has warning lights and bells. The first safety-gate system was installed in 1940 and a replica pedestrian gate was installed during the conversion project.

The vertical-lift span (span 4) is also a 140-foot, seven-panel, Parker through-truss. In its method of operation, the span embodies a design originally developed by John Alexander Low (J.A.L.) Waddell (1854-1938) in 1892 and subsequently refined in partnership with John Lyle Harrington (1868-1942). The general type is customarily known as a “Waddell and Harrington vertical lift.” The span is raised and lowered by up-haul and down-haul steel ropes. To ensure easy movement, the span is counterweighted

by concrete blocks that travel up and down within the tower framework. The span is connected to the counterweights with steel ropes carried on steel sheaves at the tops of the towers. The power for the up- and down-haul ropes was originally supplied by a gasoline engine, which was replaced by a 25-horsepower electric motor in 1980 and subsequently replaced by the present motor in 2005. With the span in raised position, vertical navigational clearance is 57 feet above normal pool elevation. The span itself is engineered for a rise of 48 feet, although an additional three feet of lift are available for emergency situations. The vertical lift span's operation for boat accommodation is regulated by the U.S. Coast Guard under 33 CFR Part 117. The vertical lift span remains in operation generally from May to October each navigation season, with an average of over 1,500 lifts per season, with highs reaching over 2,500 lifts between 2010 and 2019. See Appendix J for details of the 2010 to 2019 bridge span lifts that were required at Stillwater.

The control machinery for lift operations is sheltered in a welded, plate-steel, gable-roofed tender's house. The house is mounted at roadway level on a steel framework at mid-span on the north (upstream) side of span 4. Adjacent to the tender's house is a similar, but slightly larger, electrical house that was built to contain electrical control equipment. Reduction gears and winding drums for the ropes are located beneath span 4.

The bridge's 23-foot-wide concrete deck has an angle-iron rub rail on the north and a cantilevered, concrete sidewalk with an ornamental metal railing on the south. The railing includes original, cast metal, newel posts and curved-lattice panels, which have been replicated to match the original. The railing panels were originally finished with aluminum paint, while the newel posts were originally painted green. Aluminum paint was originally used on the railing panel braces above the sidewalk, and green paint used below the sidewalk. These green areas were later re-painted gray. Original ornamental light standards that matched those on the concourse were removed at an unknown date from their newel posts above each pier along the south sidewalk. Bethel-type luminaire ("cobra head") fixtures that are mounted on truss members were added in the 1980 electrical project to provide roadway lighting.

According to recent engineering studies, the bridge has been repaired and retrofitted several times in its history. The following projects involved changes to physical features:

- 1931 – Lift Bridge is completed and opened to traffic
- 1940 – First traffic gates installed; manually operated
- 1942 – Cable guard rail installed on inside of south trusses

Section 2 – Bridge Data

- 1942 – Original green paint on truss spans changed to gray due to wartime paint shortages
- 1946 – First generation navigation lights installed
- 1954 – Electrical service installed, including remotely-operated traffic gates, warning lights, and controls
- 1973 – Deck replaced
- 1980 – Gasoline engine replaced with electric motor and power distribution system replaced the existing 1954 system (power system included new roadway lighting, conduit mounted on trusses, and festoon cables and cable boxes installed on lift towers)
- 1981 – Span 10 replaced
- 1998 – Sidewalk deck replaced
- 2005 – Major project that included the following:
    - Electrical house added adjacent to tender's house
    - Ornamental sidewalk railing replaced
    - Deck replaced
    - Electrical system largely replaced
- 2013 – Stabilization project that included the following:
    - Concrete repairs to the piers
    - Concrete railing repairs
    - Structural repairs to the steel truss
    - Sidewalk bracket repairs
- 2020 – Conversion project that included the following:
    - Converted from vehicular bridge to pedestrian/bicycle trail bridge
    - Structural repairs to the steel truss
    - Structural steel painting
    - Sidewalk brackets replaced
    - North railing replaced
    - Concourse reconstructed
    - Mechanical items replaced

- New pedestrian gate
- New lighting units
- New PA system and CCTV system
- Electrical control system modification

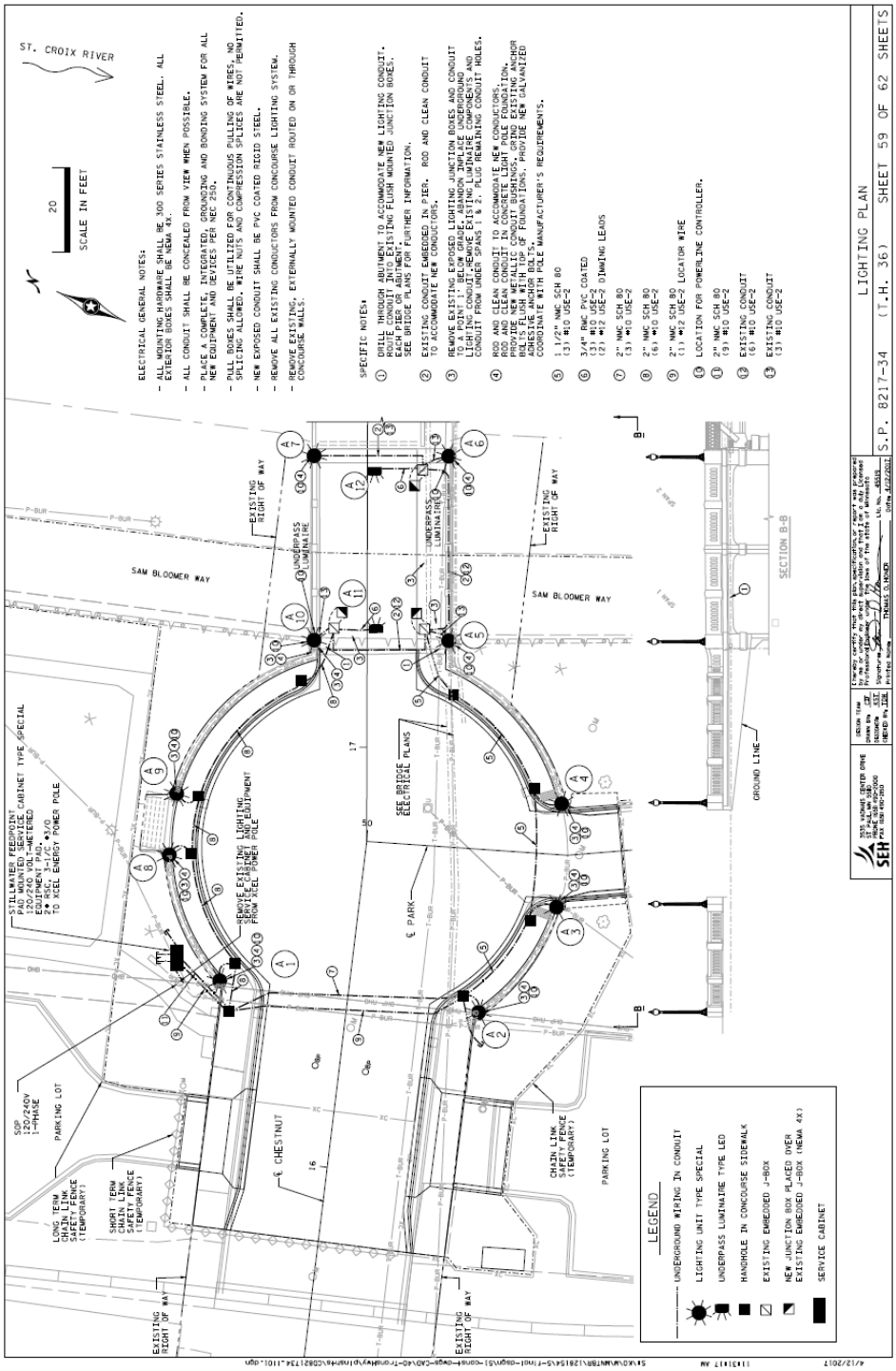
Electronic plans of the lift bridge including repair plans and shop drawings are available at MnDOT Consumer Access eDOCS (Electronic Document Management System) at http://dotapp7.dot.state.mn.us/eDIGS_guest/DMResultSet/. The state neither warrants nor represents that the existing structure conform exactly to the details shown in these plans.

Stillwater Lift Bridge Concourse

Located between span 1 of the bridge and the east end of Chestnut Street is the reinforced-concrete concourse. The materials and Classical Revival architectural treatment of the concourse are integrated with the materials and treatment of approach spans 1 and 2. In fact, the east one-third of the concourse roadway, between the expansion joint and the approach span, is identified on the 1931 plans as "approach slab."

The concourse is approximately 94 feet in outside diameter. Around the outside edge are four reinforced-concrete retaining-wall segments topped with concrete open-balustrade railings, sidewalks, and curbs. Openings between wall and balustrade segments provide roadway access on the east and west for vehicular through-traffic between Chestnut Street and the bridge, on the south for vehicular access to Lowell Park Drive, and steps on the north provide pedestrian access to Lowell Park. The eight concrete endposts flanking the four openings have original metal light standards. Each light consists of a Union Metal Company fluted metal shaft with a scroll-casting base and acanthus-leaf capital, topped with a No. 127 alabaster globe and No. 1127 alabaster rippled canopy. The light standards and globes match those depicted in the original 1930 plan sheet entitled "Bridge Lighting." Two additional light standards, which were originally mounted on the span 2 east endposts adjacent to span 3, were missing prior to the 2020conversion. Replicated light standards are now located on the bridge. The City of Stillwater is responsible for electricity and light levels for the 12 concourse lights according to Agr. #1026159, as shown below:

Section 2 – Bridge Data



The City of Stillwater owns Kolliner Park in Wisconsin and accommodations for access by their emergency vehicles should be provided across the lift bridge to the park.

Festivals and other Events

The City of Stillwater and other agencies or organizations may request the use of the lift bridge for July 4th celebrations, Lumberjack Days, festivals, races, or similar events. Permits are required from MnDOT for use of the lift bridge or concourse and will require details for the maintenance of pedestrian traffic on the lift bridge and/or near the lift span. Boat navigation requirements will also need to be considered. Coordination with MnDOT Permitting Office, Metro Bridge Maintenance and MnDOT's bridge tenders will be required prior to permitting any event.

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3.0 Historical Data

3.1 Contractor

Peppard & Fulton – builder
American Bridge Company (Minneapolis & Gary Plant) – fabricator

3.2 Designer/engineer

Minnesota Department of Highways (fixed span)
Ash, Howard, Needles, and Tammen (vertical-lift span) – engineer

3.3 National Register status

The Stillwater Lift Bridge was listed in the National Register in 1989 under *Criterion C* for engineering. The concourse is included in the Stillwater Commercial Historic District (listed in the National Register in 1992 under *Criterion C*) and is a transitional element between the bridge structure and downtown Stillwater. The entire bridge and concourse is located within the Stillwater Cultural Landscape District, which was determined eligible for the National Register in 1999.

3.4 Statement of significance

3.4.1 Stillwater Lift Bridge

The Stillwater Lift Bridge, featuring a counterweighted, cable-and-tower design, embodies engineering significance as an important example of vertical-lift highway bridge construction of the Waddell and Harrington type in Minnesota and Wisconsin. It is one of two surviving, pre-World War II, vertical-lift, vehicular bridges in Minnesota and Wisconsin, where only six were built between 1913 and 1931.

The significance of the Stillwater Lift Bridge is best understood within the general context of Minnesota and Wisconsin movable highway bridges. Movable bridges, also known as drawbridges, are constructed over navigable waterways when it is impractical or uneconomical to build fixed bridges of sufficient height to permit the passage of vessels. Numerous systems have been devised for lifting, dropping, folding, rotating, and retracting a span to provide temporary clearance. By the early twentieth century, however, engineers had focused their attention on three basic drawbridge categories: swing, bascule, and vertical lift.

Briefly defined, a swing span revolves in a horizontal plane around a vertical axis, a bascule span rotates in a vertical plane around a horizontal axis and a vertical-lift span rises and descends in a

vertical plane. In Minnesota and Wisconsin, as well as elsewhere in the nation, virtually all nineteenth-century movable bridges were of the swing-span variety, and the type continued to be constructed during the early twentieth century. As late as 1935, a total of 51 highway swing spans were in operation in Minnesota and Wisconsin. None of these structures have survived. The demise of the highway swing span was nationwide, reflecting its incompatibility with an urban setting. There were two basic problems with swing spans. First, the central pivot pier increasingly became an obstruction to navigation for the ever-larger vessels of the late nineteenth and early twentieth centuries. Second, the swing span itself squandered valuable space. By requiring a clear turning radius, it prohibited the development of docking facilities adjacent to the bridge site. These shortcomings were especially onerous along highly industrialized urban waterways, where shipping channels tended to be narrow, highway crossings numerous, and real estate prices high. For less crowded sites, the swing span remained a viable form of technology well into the twentieth century. Most surviving swing spans are railroad bridges in rural regions or relatively uncongested urban areas. In the downtown waterfronts of late twentieth-century American cities, however, the swing span was marked for extinction. Its major adversary was the federal government.

No matter how loudly shipping and real-estate interests denounced the swing span, there was no effective means of regulating movable-bridge design until the early 1890s, when Congress authorized the War Department to approve plans for all new bridges over navigable waterways and to seek the alteration of any existing bridge that interfered with "reasonably free, easy and unobstructed" navigation. In 1892 the War Department sent a clear message of future policy by way of Chicago, demanding the removal of a two-year-old swing span from one crossing of the Chicago River and denying permission to build a new swing span at another. The search for an alternate drawbridge technology began in earnest. Not surprisingly, Chicago was in the vanguard. In 1894 the city erected the world's first modern, vertical-lift bridge across the Chicago River at South Halsted Street.

During the middle decades of the nineteenth century, an occasional vertical-lift span was constructed in Europe and the United States. Although their engineering was often ingenious, the bridges themselves were quite modest as they were designed mainly for canals and small navigable streams in cases where it was only necessary to lift the spans a few feet to clear traffic in the channels. The modern, long-span, high-rise, vertical-lift bridge dates from the last decade of the nineteenth century. In 1892 the city of Duluth, Minnesota, hosted a design competition for constructing a drawbridge over the 250-foot-wide ship canal at its harbor entrance on Lake Superior. Under the rules of the competition, the successful design would leave the entire width of the canal open for navigation, which effectively eliminated the traditional, center-pier, swing span.

Most responses to the Duluth competition employed some form of retractable or "sliding draw" mechanism, whereby the span moved back and forth on rollers. A striking exception was a design submitted, and later patented, by Waddell. Waddell was a consulting engineer based in Kansas City, Missouri, who, during the next 40 years, would become one of the best-known bridge engineers in the United States. Waddell proposed to build a vertical-lift bridge consisting of a simple truss span 260 feet long that could be raised 140 feet above the surface of the canal. *The Engineering News*, October 27, 1892, reported on the Waddell entry in the design competition:

> At each end of the movable span is a tower 170 ft. high, carrying at its top built steel pulleys about 15 ft. in diameter. Over these pulleys steel wire ropes, or chain cables, pass. One end of each cable is attached to the end piers of the trusses, and end to counter-weights which exactly balance the dead weight of the span. Therefore, the only work left for the operating machinery is to overcome the weight due to dirt, water, snow, etc. The power for operating the bridge is supplied by two electric motors placed at mid-span; the upward and downward motion being regulated by racks and pinions communicating with the power by means of steel shafting and spur and mitre wheels.

The Duluth authorities selected Waddell's design, but the War Department vetoed the construction of any drawbridge at the site. Nevertheless, Waddell's design was a seemingly practical solution to the drawbridge problem. His vertical-lift span did not obstruct navigation and dockage like a swing span, nor did it clutter the shore approaches like a sliding-draw span. A few months after the cancellation of the Duluth project, the City of Chicago commissioned Waddell to modify his original design for a 130-foot span capable of 150-foot clearance over the Chicago River at South Halsted Street. This structure was completed in 1894 as the world's first modern, vertical-lift bridge.

The South Halsted Street Vertical-Lift Bridge remained the only example of its kind for over a decade. Waddell commented in the May 1924 *Journal of the Western Society of Engineers* that the long delay in constructing another vertical lift was due not to technological issues, but to the corruption of those in charge of subsequent bridge projects, who, as he put it, "demanded boodle...a condition with which [I] never did and never will comply." There were other reasons as well. From 1895 to 1905, engineers in Chicago and Milwaukee perfected several bascule designs that were widely believed to be more economical for narrow waterways than Waddell's vertical lift. The new type received early and strong endorsement from the City of Milwaukee, which built 10 bascule spans between 1902 and 1910. It was subsequently adopted as the preferred movable-bridge type by the Wisconsin State Highway Commission. The greatest obstacle to the initial acceptance of the vertical-lift span, however, was the fact that the South Halstead Street Bridge was expensive to build and operate because of mechanical flaws, giving the vertical-lift design a reputation for high costs.

In 1907 Waddell formed a partnership with Harrington, a skilled civil and mechanical engineer who was largely responsible for reworking Waddell's invention into a rational, well-integrated design. In its essential form and dynamics, the "Waddell and Harrington type" remained true to the original 1892 Duluth design. It was a simple span equipped with machinery for operation, suspended at each end by wire ropes that pass over sheaves on towers and connect to counterweights about equal to the span weight. Before the partnership dissolved in 1914, Waddell and Harrington designed approximately 30 vertical-lift spans for highway and railroad crossings. Both men continued to work in the field after parting company, and Harrington's new office (Harrington, Howard, and Ash) became particularly well known, as did its successor (Ash, Howard, Needles, and Tammen).

Six vertical-lift highway bridges were constructed in Minnesota and Wisconsin before World War II. At least five were designed by Waddell and Harrington or successor firms. All were of the standard Waddell and Harrington type. The 1931 Stillwater Lift Bridge was the last of this group to be completed and is one of two that survive. The other is the Duluth Aerial Lift Bridge, built in 1905 as a transporter bridge and converted to a vertical lift in 1930.

The predecessor to the Stillwater Lift Bridge was a timber bridge, built in 1876, with a pontoon section that swung open for navigation. Owned and maintained by the City of Stillwater, the bridge was taken over by the Minnesota Department of Highways (MHD) in 1925. By that time the structure was deteriorating, prompting calls for a new bridge. When the pontoon bridge was closed to heavy traffic in 1928, MHD prepared preliminary plans for its replacement. The plans called for a series of fixed concrete-slab and steel-truss spans to be designed by MHD engineers, and a single vertical-lift span to be designed by an engineering firm specializing in such work. In November 1929 a design contract for $3,150 was awarded, on a competitive basis, to Ash, Howard, Needles and Tammen of Kansas City, Missouri. Construction on the bridge proper began the following summer, with the Minneapolis firm of Peppard and Fulton serving as general contractor and the American Bridge Company (Minneapolis and Gary plants) serving as fabricator. The project was completed in August 1931 for a total cost of $460,174, shared equally by the states of Minnesota and Wisconsin.

At the time of the bridge's completion, navigation on the St. Croix River was minimal. Since most of the traffic was small craft, there were few occasions to operate the lift span. As the MHD noted in a 1938 letter: "…for several years not a single request for its opening was received." Contemporary newspaper accounts indicate that there was great interest in having increased highway traffic from a new bridge that would facilitate development and growth of a market for Stillwater businesses across the river in Wisconsin. Governors of both states commented on the

importance of the new interstate bridge at the dedication on July 1, 1931. Then as now, the vehicular use of the bridge was more significant than river navigation for Stillwater residents. Because the St. Croix was (and remains) a navigable waterway, the vertical lift span has been an essential and significant component of the bridge regardless of the amount of river traffic.

3.4.2 Stillwater Lift Bridge concourse

Located at the west end of the bridge, between the west abutment and Chestnut Street, is the circular concrete concourse, as it is named on the bridge plans prepared in 1930 by Minneapolis landscape architects Morell & Nichols, and in 1931 by the MHD. The concourse is a transitional element between the bridge structure and downtown Stillwater. The concourse itself is included within the boundaries of two National Register districts: the Stillwater Commercial Historic District (listed in 1992 under *Criterion C*), and the Stillwater Cultural Landscape District (determined eligible in 1999). The concept of a focal point at the downtown Stillwater end of a St. Croix River bridge was discussed in detail as early as 1888 in a *Stillwater Daily Gazette* article, "Bridge Square: Its Past History and Prospective Greatness" (May 7, 1888). At that time, the location known as Bridge Square at the intersection of Chestnut Street and the bridge had become a commercial and railroad hub for the city, even though, as the article pointed out, there had been no physical "square" there.

In 1916 "Bridge Square" is clearly drawn and named on the map of "Stillwater, Minn., Grading Plan for Sunken Gardens," prepared by Morell & Nichols. In the plan, Bridge Square is in the same location as both the 1888 Bridge Square and the present concourse, and consists of a circle within a diamond-shaped intersection where Chestnut Street meets the bridge. The Sunken Gardens were part of adjacent Lowell Park. Two years later, in 1918, Morell & Nichols published their extensive Plan of Stillwater, which presented a comprehensive City Beautiful design in narrative and map format. Central to the plan is the proposed widening of Chestnut Street into a major east-west civic axis. At the west end, on the hill, would be the public buildings of "Stillwater's civic center," including the city hall, armory, and community hall. The buildings look out from their "commanding situation" on the hill toward the river and bridge at Chestnut's east end. Running north-south along the river are Lowell Park and Park Drive. At the approach to the bridge, where Chestnut crosses Lowell Park and Park Drive, is a circular intersection that is very similar to the Bridge Square on the 1916 map. In this plan, Morell & Nichols write, "Chestnut Street would be transformed into an attractive and important main thoroughfare." The entire arrangement is conceptualized in a symmetrical City Beautiful manner. This element of the 1918 Plan of Stillwater still survived in the two ends of the Chestnut Street axis at the time this report was prepared. On the hill at the west end is the armory, the only one of the three proposed civic buildings to be located there. At the east end are the concourse and the bridge.

In February 1930 Morell & Nichols produced a plan titled "Study for Concourse as Terminal Feature to Chestnut Street & to Proposed New Wisconsin-Minnesota Highway Bridge." Subtitled "Rearrangement of Lowell Park and Park Driveways," the drawing presents the concourse as it would be built in 1930-31, including its relationship with the adjacent areas of Lowell Park, Park Drive, and the bridge. The details of the concourse include the four curved balustrade segments with light standards, north steps, and south entry to Park Drive. Drawn on the plan are both the "center line of Chestnut Street" and the "center line of highway bridge," each on a slightly different alignment. The two meet at the center of the concourse circle. The plan also shows the continuity between the concourse and approach spans 1 and 2.

The Morell & Nichols plan corresponds with the 1930 construction drawings of the MHD, as well as with historic photographs of the new concourse in 1931 and concourse elements extant at the time of this report. The extant concourse exhibits the Classical Revival architectural style in its open balustrade railing and light standards, as well as in its circular design with openings at the four compass points. Functionally, it still serves as a gateway to the city at the bridge and provides pedestrian access to Lowell Park and vehicular access to Park Drive.

Appendix H presents references for the historical sources used to prepare Section 3.4. The sources presented in Appendix H are also included in the National Register documentation of the Stillwater Lift Bridge.

Appendix J represents the number of lifts accommodated from 2010 to 2019, depending on the lift schedule requirements, the flood conditions, or project effects.

Appendix K shows how MnDOT owns the area around the concourse in accordance with Right of Way Plat No. 82-121. Any requests by outside agencies or interests for use of the Lift Bridge or Concourse within this area should be addressed to MnDOT Metro District's Permits Office.

3.5 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. Generally, the character-defining features represent the physical manifestation of the significant elements of the property. Features may include materials, engineering design, and structural and decorative details.

3.5.1. Feature 1 – Vertical lift, design and construction

The Stillwater Lift Bridge is one of two surviving vertical-lift highway bridges in Minnesota and Wisconsin. The Waddell & Harrington-type, vertical-lift configuration is the central character-

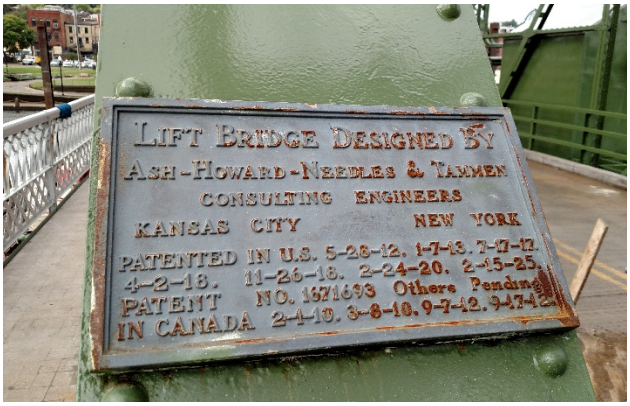
defining feature. This feature includes the general configuration of span 4 for vertical movement and the lift towers on spans 3 and 5, with associated original components (counterweights, sheaves and shafts, rope drums, span guides and counterweight guides, uphaul and downhaul deflector sheaves, original tender's house, and original builder's plate identifying the patents used in the lift design).

Photo CDF-1
Feature 1. General view of span 4, including lift towers of spans 3 and 5.

Photo CDF-2
Feature 1. Detail of sheave on lift tower.

Photo CDF-3
Feature 1. Detail of bridge-tender's house.

Photo CDF-4
Feature 1. Detail of builder's plate with list of patents.



3.5.2 Feature 2 – Parker truss, design and construction

The Parker truss design, with riveted connections, is used in the seven main spans of the bridge (spans 3-9). By 1930 the Parker configuration had become widely used for larger, longer-span trusses. Its polygonal upper chord, repeated in each span, gives the overall appearance of the bridge a distinctive, rhythmic profile. This feature includes the polygonal top chord, built-up members, and riveted connections.

Photo CDF-5
Feature 2. Parker truss span.

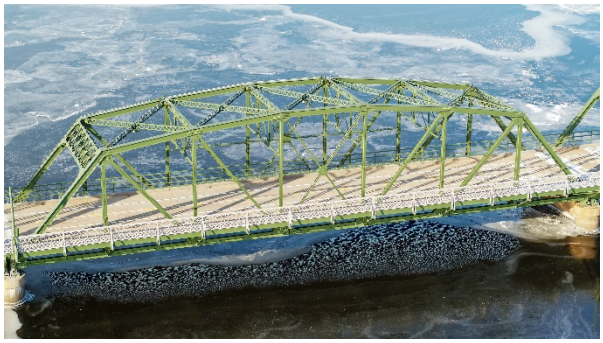
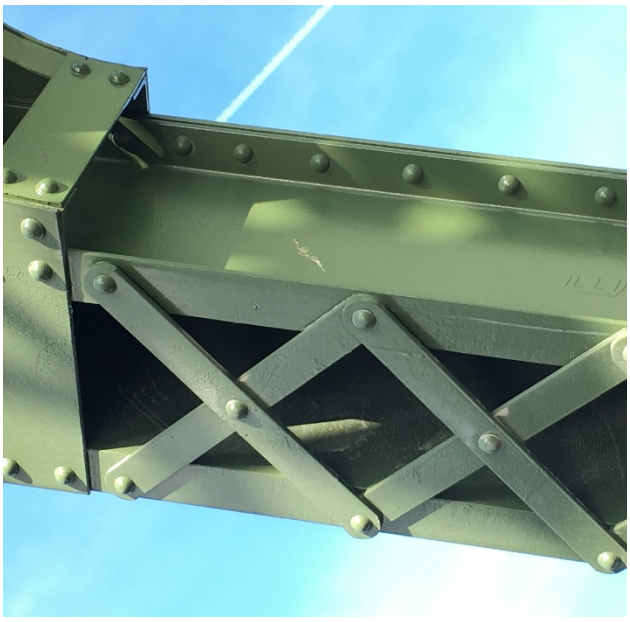


Photo CDF-6
Feature 2. Detail of riveted built-up member.



3.5.3 Feature 3 – Concourse and approach spans 1 and 2, design and construction

The concourse represents the bridge's functional and symbolic connection with downtown Stillwater and the city's cultural and historic landscapes. This feature includes the City Beautiful gateway concept of a circular intersection with its four compass-point openings for the bridge, Chestnut Street, Lowell Park, and Park Drive. It also includes the Classical Revival architectural treatment of the open balustrade, light standards, and other concrete elements, and their seamless integration with the design of the reinforced-concrete approach spans 1 and 2. The concourse's relationship to the surrounding setting of Lowell Park, Park Drive, and the levee is an important extension of this feature.

Photo CDF-7
Feature 3. General view of concourse.

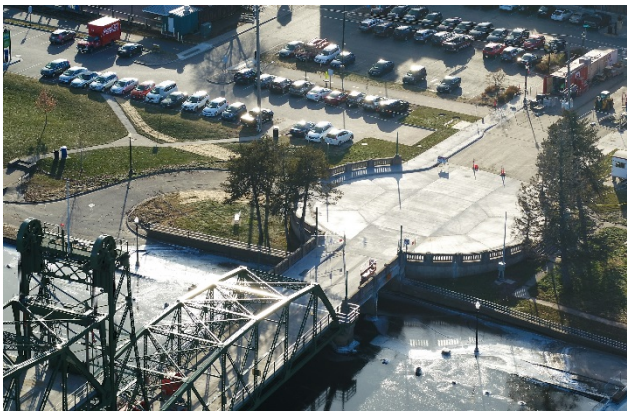


Photo CDF-8
Feature 3. Detail of open balustrade railing.

Photo CDF-9

Feature 3. Detail of light standard.

Photo CDF-10

Feature 3. Continuity of design and construction between concourse and spans 1 and 2.

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4.0 Engineering Data

Inspection Date	07/29/2019
Operating Rating*	0.73
Inventory Rating*	0.95
Design Load*	90 psf (pedestrian), H15 (vehicle)
Deficiency Rating Status	S

Condition Codes

Deck:	7
Superstructure:	6
Substructure:	6
Channel and Prot.:	6
Culvert:	N

Appraisal Ratings

Struct. Eval.:	0
Deck Geometry:	0
Underclearances:	N
Waterway Adequacy:	2
Appr. Alignment:	N

Smart Flag Data	☐ *(A check indicates data items are listed on the Bridge Inspection Report)*
Fracture Critical	N#
Previous Inspection Date	7/21/2016

Waterway Data

Scour Code:	N-STBL; Limited Scour

* LRFR Ratings in terms of pedestrian loading, equates to a 65.7 psf Inventory Load and an 85.5 psf Operating Load. See Appendix B for term definition.

Per MnDOT Inspection Memo dated 8/22/19 the bridge will no longer be designated as fracture critical or complex on the Bridge Inventory due to its change in use. See Appendix L for Inspection Memo.

Section 4 – Engineering Data

Clearances

Pedestrian / Bike Trail Width:	11.0 feet
Deck Width (curb to curb):	23.0 feet
Vert. Clearance Over Trail/Deck:	13.7 feet
Vert. Clearance Under Trail/Deck:	9.5 feet

Geometric Characteristics

Skew:	0
Structure Flared:	0

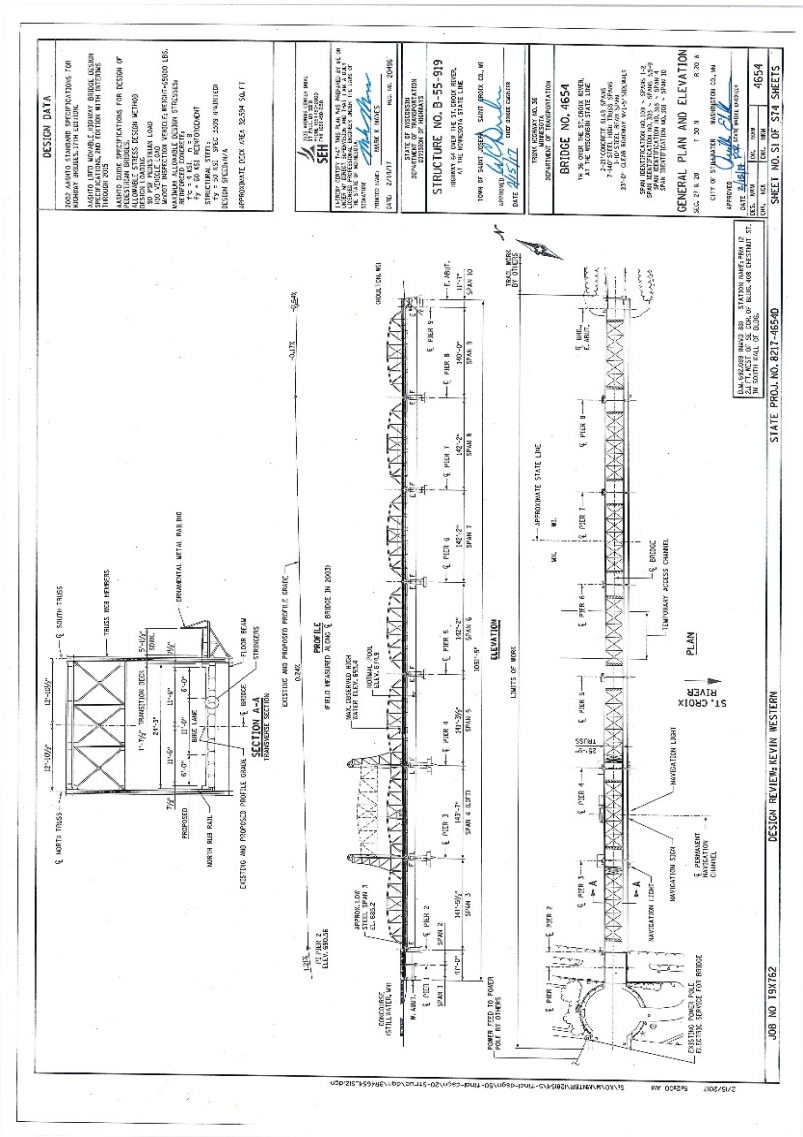
Location of Plans

Minnesota Department of Transportation - Bridge Office, Oakdale, MN

Cooperative Agreements #01433 and #1026159 with the City of Stillwater – located in MnDOT's Contracts Agreements Auditing Tracking System (CAATS)

5.0 Existing Conditions

The bridge was repaired in 2013 as part of a stabilization project and in 2020 as part of the conversion project. The repairs consisted primarily of structural steel repairs to the truss, concrete repairs to the piers and railings, and mechanical and electrical upgrades. Individual items that were repaired or upgraded were prioritized based on conditions previously described in this section in an earlier version of the Stillwater Lift Bridge Management Plan (2009).



Title Sheet from 2020 Lift Bridge Conversion Project – Structural Plans

Existing MnDOT Right of Way along Chestnut Street, the concourse and the Lift Bridge is identified in Appendix K.

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6.0 Recommendations

6.1 Introduction

Previously recommended actions for stabilization and preservation have been implemented as part of yearly routine maintenance, the 2013 stabilization project and the 2020 conversion project. Most, if not all, recommended actions have been implemented by the conclusion of the 2020 conversion project. These recommended stabilization and preservation actions can be found in an earlier version of the Stillwater Lift Bridge Management Plan (2009).

As stated in MOA Stipulation III, the Stillwater Lift Bridge Management Plan will identify those actions needed to preserve the structural and historical integrity of the bridge for continued safe use. This includes the following:

- Maintenance: ongoing maintenance and operations following the conversion project.
- Future Preservation: repair, rehabilitation, and improvements to the bridge following the conversion project.

Recommended actions for maintenance are described below. Discussion of future preservation activities can be found in Section 9.

All recommended actions in this management plan have been reviewed for compliance with the SOIS as required in MOA Stipulation III and in the *Management Plan for Historic Bridges in Minnesota*. In general, the SOIS require maximum retention of historic fabric of the bridge and concourse, with particular attention to character-defining features (see Section 3.6).

Recommended actions have also been reviewed for compliance with other applicable standards, codes, and guidelines (see Section 6.2 and Appendix F).

6.2 Guidelines and standards

6.2.1 Guidelines, standards, and regulations

MnDOT is responsible for providing a safe and accessible structure, and must work to incorporate various standards and guidelines into the repair and conversion plan to the fullest extent possible without compromising the historic integrity of the structure, including the *Revised Draft Guidelines for Accessible Public Rights-of-Way*, and *MnDOT Bikeway Facility Design Manual* (see Appendix F for a comprehensive list of applicable standards).

6.2.2 Guidelines for steel repair and fastener considerations

Over time, steel repairs to the Stillwater Lift Bridge have required the replacement or addition of steel components. As is typical with older riveted structures, these repairs have involved removal of existing rivets and reuse of their holes for new connections using standard, high strength, hex-head bolts. Additionally, some repairs have required additional field drilling for new bolts in existing steel where no rivet holes existed. It has become common engineering practice to utilize high strength bolts when rehabilitating older steel bridges, even when the bridge is considered historic. Field riveting is rarely done due to the lack of riveting technology in the industry, high costs, and the superior strength and performance of high strength bolts.

A more common practice used on historic bridge projects is to utilize button-head bolts where there is a desire to maintain the appearance of rivets in highly visible areas. These fasteners have a threaded shank with a rounded head in lieu of a hex shaped head, but still use a washer and hex shaped nut. When installed, the bolt resembles a rivet on one side and a standard bolt-with-nut on the other. A special installation tool is required that holds the threaded end of the bolt while simultaneously tightening the nut from the same side. Because of the single-side tightening and the use of the special tool, installation requires more clearance than a standard bolt. Due to the restricted installation requirements and the fact that the button-head bolt resembles a rivet on one side only, the use of the button-head bolt to replace and resemble a rivet has a limited range of applications.

Because the treatment of the metal trusses is reviewed for compliance with the SOIS for Rehabilitation, the current approach involves an evaluation of the truss locations and applications involved in rehabilitation recommendations. The compromise also includes the utilization of three types of fastener: hex-head high-strength bolts, button-head bolts with tension control, and button-head bolts with acorn nuts. The evaluation determined which fastener would be appropriate for a particular location. In general, locations with high visibility from the bridge deck will use button-head bolts and areas not visible will use hex-head bolts.
The use of button-head bolts is restricted to locations where an existing original rivet is being replaced. All new connections will use hex-headed bolts.

A matrix indicating the recommended use of specific fasteners in particular locations and applications is presented in *Figure R-1. Connection Matrix*. The matrix is recommended for all work on the bridge to maintain compliance with the SOIS. In the case of unusual circumstances or new information regarding the use of rivets and bolts on a historic bridge, MnDOT will employ the decision-making process outlined in Section 9.4. Emergency repairs do not require use of the matrix.

Figure R-1: Connection Matrix				
Item/Location	**HHB**	**BHB**	**BHB/AN**	**Comment**
Bottom chord repairs and gusset connections	X			All are below the deck
Floorbeam and stringer connections	X			All are below the deck
Top chord member (Shop-riveted with top plate and bottom lacing)		X		Button head facing down
Top chord gusset plate connections	X			
Truss vertical and diagonal members, above deck level (Shop-riveted lacing bars and batten plates to flange angles)		X		
Truss vertical and diagonal members, above deck level, gusset plate connections	X			
Truss verticals and diagonals below deck level	X			All are below deck
Portal diagonals (L0-U1) above deck. (Shop-riveted with top plate and bottom lacing)		X		
Portal diagonals (L0-U1) above deck, gusset plate connections	X			
South pedestrian railing panels			X	In-kind replacement
Sway frames: lower horizontal strut		X		
Sway frames: diagonal members and top struts	X			
Portal frames at ends of truss spans: lower horizontal strut		X		
Portal frames at ends of truss spans: diagonal members and top struts	X			
Top lateral bracing	X			
North bridge railing	X			In-kind replacement
Lifting towers, between deck and top chord		X		
Lifting towers, top chord and above	X			
Sidewalk cantilever brackets, not including top horizontal angles: full bracket replacement or repair	X			
Sidewalk cantilever brackets: replacement of top horizontal angles	X			
Sidewalk cantilever brackets: connection of bracket to truss	X			
Intermediate sidewalk brackets (paired back-to-back angles)	X			

HHB = Hex Head High Strength Bolt
BHB = Button Head Bolt (Tension Control)
BHB/AN = Button Head Bolt with Acorn Nut

6.2.3 Guidelines for treatment and repair of concrete

This section recommends separate treatment guidelines for concrete in two areas of the bridge.

River piers, bridge decks, sidewalks on the truss spans, and the east abutment

Repair work on these components shall conform to the standard MnDOT specifications for concrete surface repair and concrete mortar patch. The recommended repairs require thoroughly removing the deteriorated material down to sound concrete, cleaning or replacing corroded reinforcement bars, and forming for the pouring of a new, high-quality concrete mix.

Concourse and spans 1 and 2

The concourse and spans 1 and 2 are character-defining features and subject to the SOIS for rehabilitation as indicated in Section 6.1. Concrete elements in these areas include the open-balustrade railings, circular retaining walls, pavements, and sidewalks. Rehabilitation work required includes a combination of replacements, patching, and crack repair. It is important that this work be performed in a manner consistent with current best practices for the treatment of historic concrete. To achieve this, specifications based on the current version of the National Park Service's *Preservation Bulletin 15 – Preservation of Historic Concrete* will be used in the design and preparation of plans for new concrete, including the concourse pavement, curbs, and sidewalks, and for the rehabilitation of historic concrete, including the balustrades and retaining walls. Consult MnDOT CRU for current practices. These specifications call attention to, and provide guidance on, the following:

- Concrete mix design requirements
- Quality control
- Qualifications of contractor and workers
- Sampling and testing of existing and new concrete
- Sample panels (mock-ups) for color and texture matching
- Acceptance criteria and approval requirements
- Weather limitations
- Limitations on concrete cleaning methods to avoid damage
- Concrete removal and excavation methods

6.3 Recommended maintenance activities

Routine maintenance is the ongoing work required to prevent and control the deterioration of the bridge components. Because the Stillwater Lift Bridge is movable, and includes complex structural, mechanical, and electrical elements, maintenance is more involved and plays a more critical role than for bridges with fixed spans. Lack of maintenance on moving parts and electrical components can lead to sudden failures in operation, disruption to river navigation, dangerous conditions, and very costly repairs. Routine operations and maintenance activities will be conducted by MnDOT. For the itemized operation and routine maintenance activity listing and costs, see Appendix G.

Maintenance activities are identified as part of a MnDOT Maintenance Implementation Program for selected historic bridges and as part of MnDOT's general program for historic bridges owned by the state. As such, the Maintenance Implementation Program includes any special maintenance requirements for historic bridges, particularly recommendations prepared in compliance with the SOIS. To effectively carry out the MnDOT Maintenance Implementation Program, a maintenance checklist has been prepared for the Stillwater Lift Bridge and is included in Appendix C. This checklist includes the routine maintenance tasks identified below along with the agency responsible for each task, and lists the tasks to be performed in the years following the conversion project.

MnDOT anticipates that the boxes on the checklist will be marked by the MnDOT Bridge Maintenance as tasks are completed and the list submitted to the MnDOT Cultural Resources Unit (CRU) for review. It is anticipated that the maintenance tasks and checklist will be evaluated by MnDOT CRU to assure that the tasks and list are appropriate for the ongoing needs of the bridge.

6.3.1 Structural maintenance

Structural bridge maintenance includes routine maintenance and minor component repairs. Routine maintenance includes activities that are regularly scheduled regardless of bridge condition. Minor component repairs include repairs or replacements of individual components due to normal wear, or from damage caused by normal bridge operations. A routine maintenance schedule that is rigidly adhered to offers the greatest amount of protection over time against any potential component failure.

Structural routine maintenance schedule

Routine maintenance involves all routine bridge inspections and preventive-type, recurring maintenance procedures.

Structural Routine Maintenance Schedule

Item	Frequency
Sweep cleaning bridge decks	Annually

Structural Routine Maintenance Schedule

Item	Frequency
Flushing and power-washing bridge deck, drains, and joints	Annually
Lubricate bearing assemblies	Annually
Routine structure inspection	Every 2nd year
Underwater inspection	Every 4th year
In-depth inspection	Every 6th year
Reactive repairs	Periodically

Reactive repairs include un-anticipated type repairs to the lift bridge or concourse, such as damage from pedestrians, bikes, vehicles or boat collisions. Reactive repairs may require additional reviews and coordination under Section 106 of the Historic Preservation Act with MnDOT's Cultural Resources Unit. Reactive repairs are eligible for use of endowment account funds.

Structural component repair

Component repair involves non-recurring preventive maintenance procedures and potential minor repairs or replacements, such as the following:

- Sealing bridge deck cracks
- Spot cleaning and painting of structural steel components.
- Bridge railing repairs – consult MnDOT CRU
- Settlement adjustment of spans 9 and 10 at east abutment
- Channel debris removal or slope/streambed repairs
- Concrete surface repairs – consult MnDOT CRU
- Miscellaneous structural steel repairs – consult MnDOT CRU
- Replace expansion joint strip seals

6.3.2 Mechanical maintenance

Drive machinery

Frequent preventive maintenance activities for the drive machinery include lubricating the bearings, lubricating the open gearing, and routine cleaning of the operating ropes. Less frequent preventive maintenance activities for the drive machinery include: cleaning, flushing and refilling the speed reducers, cleaning internally and re-lubricating the sleeve bearings, application of wire rope dressing to the operating wire ropes, testing and adjusting the brakes, and maintenance spot painting of the drive machinery components. See Figure M-1 for the Operating Machinery Plan.

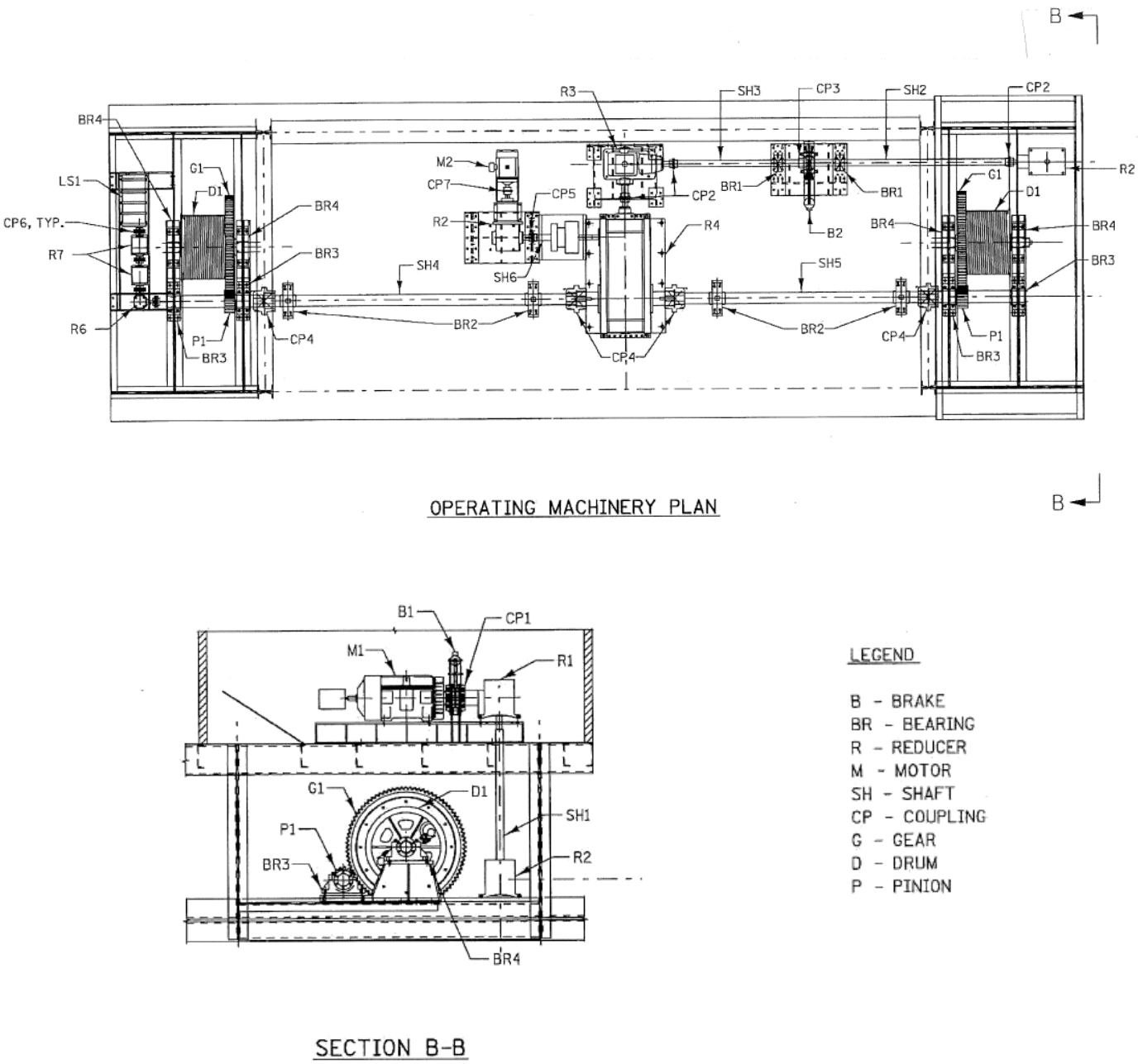


Figure M-1. Operating machinery layout.

Counterweight system

Preventive maintenance activities related to the counterweight system include: exchanging the lubrication in the trunnion bearings, applying lubrication (wire rope dressing) to the counterweight cables, and inspecting the counterweight cables, trunnions, bearings and sheaves, and cable connections for damage.

Mechanical routine maintenance schedule

This involves all routine bridge inspections and preventive type recurring maintenance procedures.

Mechanical Routine Maintenance Schedule

Item	Frequency
Lubricate drive machinery bearings	Monthly
Lubricate open gearing	Monthly
Wipe operating ropes clean to remove debris and apply wire rope dressing/lubricant to operating ropes	Semi-annually
Wipe counterweight cables clean to remove debris and apply wire rope dressing/lubricant to counterweight cables	Semi-annually
Apply protective coatings to haul cable take-ups, free and lubricate as required for use. Maintain the take-up assemblies in a condition where they can be used when needed.	Semi-annually
In-depth inspection (all drive machinery and counterweight system machinery, including operating drums and wire rope connections)	Annually
Open drive machinery sleeve bearings, clean old dried lubricant and re-lubricate.	Annually
Remove all lubricant and debris from open gearing and re-lubricate.	Annually
Lubricate main drive and auxiliary drive motor bearings	Annually
Remove and replace lubricant in counterweight sheave bearings. Clean and remove debris when empty.	Annually
Clean, remove standing water, spot-paint and inspect the general surfaces and potential fracture points of the counterweight sheaves and other machinery components.	Annually
Spot paint machinery where steel surfaces have been exposed.	Annually
Remove coupling covers, wipe clean and replace lubricant	Every 5th year
Flush and replace lubrication in speed reducers	Every 5th year
Replace operating ropes	As-necessary, or predictive every 7+/- years

Mechanical component failure

Operating wire ropes, haul cables, and wear plates should be replaced when they fail or when it is noted that failure is imminent.

6.3.3 Electrical maintenance

Electrical maintenance on a movable bridge is divided into routine maintenance, component failure, and component obsolescence. Routine maintenance is used to identify and predict potential problems and to repair and maintain equipment at regular intervals to extend its life. Component failure occurs when a device fails from a manufacturing defect, age, or a lack of routine maintenance. Much of the electrical equipment used to control a movable bridge requires no maintenance and is not repairable, so it must be replaced. Component obsolescence occurs when a component is no longer available or cannot be maintained or repaired.

Electrical routine maintenance schedule

Most electrical equipment requires little-to-no maintenance. Motors and brakes will require some lubrications and inspection, but most of the other electrical equipment works until failure. The electrical maintenance will consist of predictive maintenance though inspections, testing, and maintaining accurate records. For electrical equipment, maintenance should only be performed by qualified electricians.

Electrical Routine Maintenance Schedule

Item	Frequency
Pedestrian gates - Inspect and check oil levels, brakes, lights, and general condition of the equipment	Monthly during operational season
Warning and navigation lighting – Inspect once a month, re-lamp/repair as needed.	Monthly during operational season
Bridge roadway & sidewalk lighting - Inspect once a month, re-lamp/repair as needed.	Monthly during operational season
Control console & PLC cabinet – Inspect and clean. Inspect wiring and tighten all connections.	Every 3 months during operational season
Megger and record insulation resistances of all motors	Annually
Inspect armature brushes on DC motor and DC tachometer. Replace as needed.	Annually
Inspect festoon cables and sheaves. Lubricate sheaves	Annually
Motor control center – Inspect and clean.	Annually
Main drive controller – Inspect and clean.	Annually
Cameras, CCTV system, internet connections.	Annually

Electrical Routine Maintenance Schedule

Item	Frequency
Spring start-up – Inspect all equipment and test for proper operation. Verify all interlocks are working properly	Annual - Spring, Prior to May 15th
Fall shutdown, near October 15 – Inspect all equipment and test for proper operation. Verify all interlocks are working properly. Prepare equipment for very limited operations prior to winter.	Annual - Every Fall

Note:
Web streaming Camera on Pier 5 pointing upstream is owned and maintained by the U.S Geological Survey (USGS).
Water gage equipment and sensors near Pier 5, on the north side bump out, are also owned and maintained by the USGS.
Water gage equipment near Pier 2, on the north side bump-out, is owned and maintained by the U.S. Army Corps of Engineers.
This USGS and Corp of Engineers equipment is on the bridge by MnDOT permit and should not be maintained by MnDOT.

Electrical component failure

Many electrical components are non-repairable or are not cost effective to repair. When a component fails, it must be replaced. Commercially available electrical devices such as relays and starters are designed for more operations than a movable bridge system would typically require in a 50-year lifetime. However, these components usually fail due to abnormal conditions such as excess loading from lightning, surges, heat, or other defective devices. Electronic devices are very similar in that their operations will more than exceed the life of the bridge, but they are subject to the same abnormal conditions and it is difficult to predict their failure.

Electrical component obsolescence

Motors, brakes, circuit breakers, fuses, starters, and relays are a proven technology required to move, control, and interface to equipment that will likely never become obsolete. Other technologies used on the bridge, such as the programmable logic controller (PLC) and main drive, are subject to change rapidly and could become obsolete in a matter of years. Fortunately, most electrical suppliers continue to support their older technology or provide a migration path for their equipment as it becomes obsolete. Items such as a PLC and a DC motor drive typically become obsolete within 10-30 years and, once spare parts are no longer available, they will require replacement.

6.3.4 Pavement markings, lighting and signs

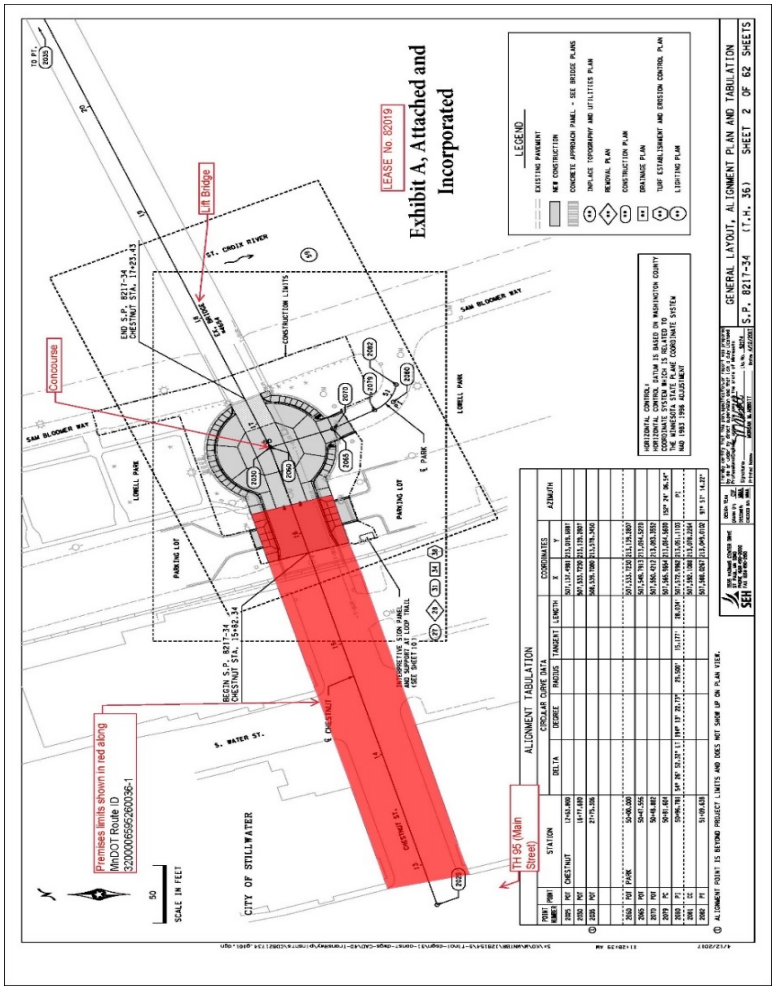
Per Cooperative Agreement #01433, the City of Stillwater will maintain the loop trail related pavement markings and signs on the lift bridge.

Per Cooperative Agreement #1026159, MnDOT and the City of Stillwater will maintain the 12 lights around the concourse and under bridge spans 1 and 2. MnDOT solely will maintain all of the other lights on the Lift Bridge.

MnDOT will maintain all signs on or near the concourse and on the bridge.

6.3.5 Chestnut Street Lease

Per the MnDOT lease agreement # 82019 with the City of Stillwater, the City of Stillwater will use and maintain Chestnut Street from TH 95 up to the west side of the concourse and MnDOT will maintain the concourse and the lift bridge as a structure. MnDOT maintenance vehicles will be allowed to use Chestnut Street to access the concourse and the bridge. See exhibit below for lease area limits on Chestnut Street.



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7.0 Projected Agency Costs

Qualifier statement

The opinions of probable costs for operations, routine maintenance and future preservation provided below are based in 2020 dollars. The costs were developed based on the tasks recommended in Section 6.0 using engineering judgment and/or gross estimates of quantities and historic unit prices, and are intended to provide a programming level of estimated costs (actual costs may vary significantly from those opinions of cost provided herein). For the itemized operation and routine maintenance activity listing and costs, see Appendix G.

7.1 Summarized costs

Operations costs:	$134,100 annualized, through 2040
Routine maintenance costs:	$59,322 annualized, through 2040
Inspections:	$32,075 annualized, through 2040
Reactive Repairs:	$80,618 annualized, through 2040

Future preservation activities (annualized, through 2040)

Substructure	$4,750
Superstructure – truss spans	$14,400
Sidewalk support system	$2,070
Deck	$2,130
Railing	$3,300
Support system	$2,000
Balance system	$14,100
Distribution/control system	$13,645
Traffic control system	$800
Machinery/tender's house	$840
Bridge lighting	$690

7.2 Applicable funding

Funding for operations and routine maintenance will be provided through the endowment fund (see MOA Stipulation III.D. and Section 8) and other MnDOT Maintenance funding sources as needed.

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8.0 Endowment Fund

St Croix Crossing Project's 2006 Supplemental Final EIS, including the Section 106 Amended Memorandum of Agreement, committed that the Stillwater Lift Bridge will be preserved and that "MnDOT and WisDOT will deposit no less than $3 million in the endowment fund" as one of the historic property mitigation items for building the St. Croix Crossing Project.

In 2009, the Stillwater Lift Bridge Endowment Account was established by Minnesota Statute 165.15. MnDOT then provided $3M to endowment account in June 2014 and WisDOT provided $1.5M in October 2014 to meet Stipulation III.D.3 of the 2006 Amended Section 106 Memorandum of Agreement. MnDOT provided an additional $3M in February 2015, bringing the total amount of the endowment up to $7.5M.

Minnesota State Board of Investment invests those funds as required by Minnesota Statute 165.15, with MnDOT's Office of Financial Management tracking the fund value. As of January 2019, the endowment fund balance of AppropID T791187 & T791188 held $7.5M principal and $354K in interest. By October of 2019, the endowment was then being stored in Fund 2001, AppropID T791477 with only $426K in interest earnings estimated, as shown in Appendix I.

The Stillwater Lift Bridge Management Plan, completed in 2009, described how the Stillwater Lift Bridge is to be managed during the interim for vehicular use and after its conversion to pedestrian/bicycle use. Now with its conversion, "routine maintenance" means activities that are predictable and repetitive, but not activities that would constitute major repairs or rehabilitation. The most critical operational need that must be addressed is the legal requirement to raise the lift span according to the Coast Guard established schedule.

In 2014, Minnesota Statute 165.15 was amended for the use of the Endowment's funds to "including bridge safety inspections and reactive repairs" activities.

The current activities list eligible for endowment funding shown below and in Appendix G details the activities to be performed, estimated costs and the timing of the activities. Section 6.5 also provides the narrative for the recommended maintenance activities.

Specific routine maintenance activities include:

- Operations (operate bridge, communications or for records maintenance) -
  - Bridge Tender
  - Electricity and phone
  - Administration, coordination, training & misc.
- Routine Maintenance (Clean, inspect, document, replace, lubricate or adjust) -
  - Flush Deck, drains, exp. joints, sub-structure
  - Graffiti removal & vandalism repair
  - Structural inspections

- In-depth structural inspection
- Structural analysis & rating
- Mechanical & electrical inspections
- Underwater inspections
- Lamp replacements – NAV LED
- Lamp replacements – Roadway LED
- Lamp replacements – Walkway LED
- Sweep clean deck
- Counterweight wire ropes
- Gears/bearings/shaft
- Couplings
- Operating wire ropes & take-up devices
- Operating wire ropes
- Operating rope wear plates
- Main drive motor
- Gear reducers
- Auxiliary drive motor
- Control system maintenance
- Pedestrian barriers (gates)
- Aerial festoon cables (festoon cables)
- Reactive repairs

Internal MnDOT process to use Endowment Account Funds

The Stillwater Lift Bridge Endowment Account Usage - Routine Operations and Maintenance Financing Process Report describing the internal MnDOT financing process, is attached as Appendix I. It is to be used to fund, in perpetuity, the routine operations and maintenance costs of the Stillwater Lift Bridge after it is converted to a bike/pedestrian/boat facility. And the principal of the fund is not to be reduced over time, with only the accrued interest to be used for the routine operations and maintenance costs.

MnDOT's Office of Financial Management, will report as requested or at a minimum on June 30th each year, to the Maintenance Operations Engineer showing the remaining balance of the endowment account's interest only Fund/Appropriation. This information will be used by the Metro District Maintenance Operations Engineer to assist in prioritizing future needs on the Lift Bridge.

Any costs each fiscal year beyond what is being planned from the Endowment Account will be covered by the Metro District Maintenance Operating budget. Appendix I shows that as of October 2, 2019, the estimated interest earnings would support only approximately $175,000 for SFY 2021 from the endowment fund.

9.0 Long-Term Considerations

9.1 Projected life expectancy

The recommendations for routine maintenance of the bridge include varying life expectancies and life cycles for components and service (see Cost Details in Appendix G). Items not included in routine maintenance involve non-routine repairs whose frequency is unpredictable, but which are not emergencies. This would include such work items as concrete abutment and pier repairs, structural steel repairs, spot painting of the steel, railing repairs, deck repairs, joint repairs, counterweight rope replacement, electrical system upgrades, pedestrian gate repairs, lighting repairs, and repairs to the bridge tender's house.

To estimate the costs of these items, the spreadsheet of Future Preservation Costs considers a 20-year timeframe from the 2020 conversion project to the year 2040. This period of time was used to better align with the funding programs of the State Transportation Improvement Program (STIP), the Capital Highway Improvement Program (CHIP) and the long range planning for the endowment account. The 20 years between 2020 and 2040 are organized in four, 10 and 20-year increments for purposes of projecting routine maintenance and preservation activities and their associated costs.

9.2 Potential component failure and appropriate remedial measures

The Component Failure subsection of Future Preservation Costs (Appendix G) identifies major components that may require repair or replacement at some point before 2040. The estimate of costs for these major work items is necessary for long-term planning for funding purposes. Included in the category of Component Failure are: east abutment foundation stabilization, pier replacement (two estimated), bearing replacement, lower chord gusset plate replacement, bridge deck replacement, and south sidewalk deck replacement.

9.3 Process for addressing emergencies

Emergency situations with the bridge will be addressed with standard MnDOT procedures, with the stipulation that Section 106 requirements, as well as applicable MOA requirements, remain in effect. Depending on the nature and urgency of the emergency, the MnDOT Metro Engineer, Bridge Office, and MnDOT Metro Maintenance will assess the situation and determine whether the bridge needs to be closed. The MnDOT CRU will participate in the review and assessment of the work required to meet the emergency situation. At that point, or as soon as is feasible, the decision-making process outlined in Section 9.4 will be in effect.

9.4 Future decision-making

Because the Stillwater Lift Bridge Management Plan is intended to provide guidance many years into the future, it is expected that new situations will emerge, new information will become available, and unanticipated decisions will need to be made. Un-anticipated type, or reactive, repairs to the lift bridge or concourse, such as damage from pedestrians, bikes, vehicles or boat collisions, may require additional reviews and coordination under Section 106 of the Historic Preservation Act with MnDOT's CRU. To accommodate future decision making, the following process is recommended. This process parallels the one used to prepare this management plan.

1. An issue is identified that is not covered by the management plan, conflicts with the management plan, or cannot be resolved by information in the management plan.

2. If a recommendation from an engineer or other professional is required to resolve the issue, that recommendation is requested from the appropriate party and brought to the MnDOT Cultural Resource Unit (CRU) and MnDOT Bridge Office for review and comment. If the issue requires review under the SOIS, that review will be part of the recommendation.

3. The MnDOT CRU will consult with SHPO for review and comment as necessary.

4. MnDOT will make a decision on the issue following the above review and comment, and will then implement that decision.

Appendix A. Amended Section 106 Memorandum of Agreement for the St. Croix River Crossing Project

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AMENDED SECTION 106 MEMORANDUM OF AGREEMENT BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION, THE U.S. ARMY CORPS OF ENGINEERS, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND THE MINNESOTA AND WISCONSIN STATE HISTORIC PRESERVATION OFFICERS REGARDING THE ST. CROIX RIVER CROSSING PROJECT WASHINGTON COUNTY, MINNESOTA AND ST. CROIX COUNTY, WISCONSIN

WHEREAS, the Minnesota Department of Transportation (Mn/DOT) and Wisconsin Department of Transportation (WisDOT) plan to construct a new crossing of the St. Croix River between the City of Oak Park Heights in Washington County, Minnesota and the Town of St. Joseph in St. Croix County, Wisconsin, along Trunk Highway (TH) 36 and State TH (STH) 64 on Alignment B-1, the Preferred Alternative (Project), as described in the 2006 St. Croix River Crossing Supplemental Final Environmental Impact Statement (EIS). The Project also includes construction in the Cities of Stillwater and Bayport; and

WHEREAS, the Federal Highway Administration (FHWA) plans to provide assistance to the Project pursuant to the Federal Aid Highway Program, 23 U.S.C., thereby making the Project an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulations, 36 C.F.R. Part 800; and

WHEREAS, the United States Army Corps of Engineers (Corps) has determined that this Project, due to its authorization under Section 10 and Section 404 permits, is an undertaking that requires review in accordance with 36 CFR Part 800; and

WHEREAS, in accordance with 36 CFR § 800.2(a)(2), FHWA and the Corps have agreed that FHWA is the lead Federal agency for the purposes of Section 106 review; and

WHEREAS, on December 8, 1994, FHWA, the Advisory Council on Historic Preservation (ACHP), the Minnesota and Wisconsin State Historic Preservation Offices (SHPOs), Mn/DOT and WisDOT executed a Memorandum of Agreement (MOA) (Attachment A) for a new crossing of the St. Croix River; and

WHEREAS, in compliance with Stipulation I of the 1994 MOA, FHWA completed an historical documentation study of the Bergstein House and Shoddy Mill prior to demolishing the Bergstein House; and

WHEREAS, FHWA and the Minnesota SHPO agree that the Shoddy Mill is individually eligible for listing in the National Register of Historic Places (NRHP); and

WHEREAS, in 1996 consideration of a new crossing of the St. Croix River did not proceed because the National Park Service (NPS) determined, pursuant to Section 7(a) of the Wild and Scenic Rivers Act, that the proposed new crossing would have a direct and adverse effect on the scenic and recreational values for which the Lower St. Croix River was designated a Wild and Scenic River; and

WHEREAS, FHWA suspended the proposed new crossing of the St. Croix River and implemented none of the remaining stipulations of the 1994 MOA; and

WHEREAS, in February 1999, FHWA resumed consideration of a new crossing of the St. Croix River when it began development of a Supplemental Draft EIS; and

WHEREAS, in January 2001, FHWA again suspended consideration of a new crossing of the St. Croix River because the consulting parties could not agree on the future of the Stillwater Lift Bridge, a property that is listed on the NRHP; and on appropriate and fundable mitigation for the project; and

WHEREAS, in June 2003, FHWA initiated a facilitated stakeholder process to identify and analyze a new set of alternatives for a new crossing of the St. Croix River; and

WHEREAS, changes in the nature and scope of the proposed new crossing of the St. Croix River and its effects, and the passage of time dictate amendment of the 1994 MOA; and

WHEREAS, execution and implementation of this Amended MOA satisfies the responsibilities of FHWA and the Corps under Section 106 of NHPA and 36 CFR Part 800; and

WHEREAS, FHWA has determined that the Project may have an adverse effect on the Stillwater Lift Bridge, Log Cabin Restaurant (Club Tara), Bergstein Shoddy Mill and Warehouse, St. Croix Overlook-South, Stillwater Commercial Historic District, Stillwater Cultural Landscape District, South Main Archaeological District, Nicholas Thelen Farmstead, and Louis Kriesel Farmstead, all of which are properties included in or eligible for inclusion in the NRHP, and has consulted with the ACHP and the Minnesota and Wisconsin SHPOs, pursuant to 36 CFR Part 800, the regulations implementing Section 106 of the NHPA, 16 U.S.C. 470f; and

WHEREAS, the Project's area of potential effects (APE), as determined by FHWA pursuant to 36 CFR § 800.4(a)(1), is described in Attachment B; and

WHEREAS, FHWA, the Minnesota and Wisconsin SHPOs, the Corps and the ACHP as signatories have sole authority to execute, amend or terminate this Amended MOA in accordance with 36 CFR § 800.6(c)(1); and

WHEREAS, FHWA has consulted with Mn/DOT and WisDOT, and has invited those State agencies to execute this Amended MOA as invited signatories; and

WHEREAS, in accordance with 36 CFR § 800.6(c)(2)(i) invited signatories have the same rights with regard to seeking amendment or termination of the Amended MOA as the signatories; and

WHEREAS, FHWA has consulted with the United States Environmental Protection Agency, the U.S. Fish and Wildlife Service, the NPS, United States Coast Guard, the Minnesota and Wisconsin Departments of Natural Resources (DNR's), City of Oak Park Heights, Town of St. Joseph, City of Stillwater (a "Preserve America Community"), Preservation Alliance of Minnesota, Stillwater Heritage Preservation Commission (HPC), Friends of the St. Croix, New St. Croix Bridge Coalition, Stillwater Area Chamber of Commerce, Sierra Club, St. Croix Alliance for an Interstate Bridge, St. Croix County, St. Croix River Association, Stillwater Lift Bridge Association, Western Wisconsin Realtors Association, Minnesota Center for Environmental Advocacy, and the National Trust for Historic Preservation, and has invited them to concur in this Amended MOA; and

WHEREAS, in accordance with 36 CFR § 800.6(c)(3) concurring parties may elect to concur in the Amended MOA but their refusal to sign does not invalidate this Amended MOA; and

WHEREAS, FHWA has invited the Lower Sioux Indian Community, Mille Lacs Band of Ojibwe, Upper Sioux Indian Community, Prairie Island Indian Community (Welch, Minnesota), Shakopee Mdewakanton Sioux Community, Leech Lake Band of Ojibwe, Prairie Island Indian Community (Tama, Iowa), White Earth Reservation, Red Cliff Band of Lake Superior Chippewa Indians, Sac and Fox Nation of Oklahoma, Sokaogon Chippewa Community Mole Lake Band, St. Croix Chippewa Indians of Wisconsin, Stockbridge Munsee Community of Wisconsin, Sac and Fox Nation of Missouri, Bad River Band of Lake Superior Chippewa Indians of Wisconsin, Forest County Potawatomi, Ho-Chunk Nation, Iowa Tribe of Oklahoma, Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin, Lac Du Flambeau Band of Lake Superior Chippewa Indians of Wisconsin, Menominee Indian Tribe of Wisconsin, Oneida Nation, Great Lake Inter-Tribal Council, Inc., Prairie Band Potawatomi Nation, Sac and Fox Nation of Missouri in Kansas and Nebraska, and Sac and Fox of the Mississippi in Iowa to participate in consultation; and

WHEREAS, the terms used in this Amended MOA are defined in 36 CFR § 800.16; and

NOW, THEREFORE, FHWA, ACHP, Corps, Minnesota and Wisconsin DOT's, and the Minnesota and Wisconsin SHPOs agree that the Project will be implemented in accordance with the following stipulations in order to take into account the effect of the Project on historic properties.

STIPULATIONS

FHWA will ensure that the following stipulations (I – XV) are carried out:

I. OVERSIGHT AND COORDINATION

A. FHWA authorizes Mn/DOT and WisDOT to carryout the terms of this Amended MOA on its behalf.

B. FHWA will ensure that all historic preservation work carried out pursuant to the terms of this Amended MOA is conducted by or under the direct supervision of a person or persons meeting the *Secretary of the Interior's (SOI) Professional Qualification Standards* (62 Fed. Reg. 33,719).

C. Mn/DOT and WisDOT will maintain the professional staff (as defined in Stipulation I.B) needed to implement the terms of this Amended MOA.

D. In carrying out the terms of this Amended MOA, FHWA will utilize the comprehensive educational and interpretive information on the Lower St. Croix Riverway's natural, cultural and historic resources as recommended in the *Lower St. Croix Cooperative Management Plan* (NPS, 2002) and coordinate with the NPS in implementing mutual interpretive goals.

E. FHWA will implement the terms of this Amended MOA in a manner that is consistent with the principles established by the *ACHP's Policy Statement on Balancing Cultural and Natural Values on Federal Land* (2001), a document that has been endorsed by the Chairman of the ACHP and the Director of the NPS.

II. PROJECT DESIGN DEVELOPMENT

A. Context Sensitive Design: FHWA recognizes the significance and inter-relatedness of natural resources and historic properties to the outstanding scenic and recreational qualities of the Lower St. Croix National Scenic Riverway. The importance of these resources is affirmed in the *Lower St. Croix Cooperative Management Plan* (NPS, 2002). In developing the Project design, FHWA will ensure that the DOT's apply context sensitive design principles in order to protect these defining natural and historic qualities.

B. Design Principles: FHWA will develop the overall Project design - including the new bridge structure, approach roadways, and aesthetic treatments to surfaces, structures, portals, appurtenances, and land contours and landscaping - and a Visual Quality Manual (VQM) consistent with the following principles:

1. A controlling vision, developed as part of the VQM process (Stipulation II.C), which identifies and reinforces the links between the historic properties and natural resources that make up the landscape of the Lower St. Croix National Scenic Riverway, will guide the Project design development and implementation.

2. The Project design will effectively meet the Project purpose and need, as defined in the Supplemental Final EIS, while avoiding, minimizing, and/or mitigating adverse impacts to the environment, including adverse effects to historic properties. Avoidance of adverse effects is preferable.

3. The Project design will minimize the impact of the new bridge on the Lower St. Croix National Scenic Riverway and, in particular, on vistas from the St. Croix Overlook-South and the Stillwater Cultural Landscape District. The overall scale of the new bridge structure and the number of its piers in the river will be minimized to the maximum extent possible. Where appropriate, the new bridge design will incorporate opportunities to enhance scenic and historic vistas for pedestrians, bicyclists, and river and vehicle travelers.

4. The Project design will minimize the impact of Project lighting on the St. Croix Valley and on historic properties. Roadway and navigational lighting will be designed and constructed to minimize the dispersion of light ("spillover") beyond the roadway right-of-way and the Lower St. Croix National Scenic Riverway.

5. The Project design will minimize the visual impact of signage on the Lower St. Croix Valley and on historic properties. Roadway signage in the Lower St. Croix National Scenic Riverway area will be strategically located to minimize impacts to important vistas.

6. The Project design will incorporate opportunities to provide comprehensive educational and interpretive information about the Lower St. Croix National Scenic Riverway's natural resources and historic properties, consistent with the *Lower St. Croix Cooperative Management Plan* (NPS, 2002).

C. Visual Quality Manual

1. **Prior to commencing Project design**, Mn/DOT and WisDOT are developing a VQM to provide for corridor continuity in all aspects of the Project design, while enhancing the diverse environments within the limits of the overall Project. The Final VQM will be consistent with the design principles identified in Stipulations II.A and II.B.

2. The VQM Project consultant team includes professionals who meet the *Secretary of the Interior's Professional Qualification Standards* (62 Fed. Reg. 33,719) for architectural historians, historical architects, or historians.

3. Mn/DOT established a Design Review Committee to work with the consultant team throughout the development of the VQM. The Design Review Committee includes the SHPOs, and Mn/DOT and WisDOT historic preservation professionals. Mn/DOT invited the City of Stillwater, the Stillwater HPC and other consulting parties to become members of the Design Review Committee.

4. All Project design elements presented in the VQM - include, but are not limited to, bridge and ramp design, loop trail (including the Stillwater Lift Bridge), landscape alteration, landscape design, surface treatments, lighting, signage, corridor enhancements, and permanent erosion control - will be:

   a. consistent with FHWA's Context Sensitive Design principles, the *Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties* (SOI *Standards*) and the *Lower St. Croix Cooperative Management Plan* (NPS, 2002), and

   b. compatible with the historic qualities of the Stillwater Lift Bridge, Log Cabin Restaurant (Club Tara), Bergstein Shoddy Mill and Warehouse, St. Croix Overlook-South, Stillwater Commercial Historic District, Stillwater Cultural Landscape District, South Main Archaeological District, Nicholas Thelen Farmstead, and Louis Kriesel Farmstead.

5. Mn/DOT held public informational meetings in both Minnesota and Wisconsin during the Fall of 2005 to gather public comments on the draft VQM.

6. Mn/DOT has submitted a copy of the draft VQM to the SHPOs and the Visual Quality Review Committee for review. The SHPOs and the Visual Quality Review Committee had thirty (30) days from receipt of the draft to submit their respective reviews. Mn/DOT will take into account the SHPOs' and Visual Quality Review Committee's review comments in the preparation of the final draft VQM.

7. Mn/DOT will submit a copy of the final draft VQM to the SHPOs for review and concurrence. The SHPOs will have thirty (30) days from receipt of the final draft VQM to provide their review and concurrence. Mn/DOT will take into account the review comments in the preparation of the final VQM. If Mn/DOT and the SHPOs cannot reach concurrence on the final VQM, Mn/DOT will submit the matter to FHWA for resolution in accordance with Stipulation XIII.

8. Mn/DOT will hold a public open house to disseminate the information contained in the final VQM to the general public.

D. Design Review: Mn/DOT and WisDOT will submit the preliminary bridge plan for the new bridge structure to the SHPOs for review and concurrence. The SHPOs will have thirty (30) days from the date of receipt of the preliminary bridge plan to provide their review and concurrence. Design plans for other sections of the Project are subject to SHPO review pursuant to Stipulation IV of this Amended MOA.

E. Construction Review

1. **Before Project construction begins,** Mn/DOT and WisDOT will meet with the construction contractor to ensure that construction plans are consistent with the VQM and the Project design as approved by the SHPOs.

2. **During construction,** Mn/DOT and WisDOT will monitor Project construction and will provide a record of those monitoring activities in the Annual Report prepared pursuant to Stipulation IX.

3. Mn/DOT and WisDOT will identify a point of contact who will be responsible for responding to inquiries and complaints from the public regarding historic preservation issues that arise during the implementation of the terms of this Amended MOA.

III. STILLWATER LIFT BRIDGE

A. Interim Vehicular Use of the Stillwater Lift Bridge – The historic Stillwater Lift Bridge will be used for Trunk Highway purposes in accordance with Federal, State and local law, and safety standards until a new river crossing has been constructed and opened to vehicular traffic. Mn/DOT will continue to own and operate the Stillwater Lift Bridge with the intent to preserve and protect it beyond the opening of the new bridge for conversion to pedestrian/bicycle use.

Mn/DOT will continue to conduct annual structural inspections, perform routine maintenance, perform necessary repairs, and perform appropriate emergency measures, as it has done in the past, in a manner that will minimize the structural deterioration of the historic bridge, to the extent practicable, until such time as the new bridge is open for vehicular use.

B. Stillwater Lift Bridge Advisory Committee - **Following approval of the Record of Decision (ROD),** Mn/DOT will invite the U.S. Coast Guard, SHPOs, the NPS, MnDNR, WisDNR, the City of Stillwater, the Stillwater HPC, the Stillwater Lift Bridge Association, the Minnesota Historical Society, St. Croix County, and the Town of St. Joseph and others who seek to participate to serve on the Stillwater Lift Bridge Advisory Committee (SLBAC).

1. The SLBAC will provide Mn/DOT with advice and recommendations regarding the maintenance, repair, rehabilitation, treatment and management of the Stillwater Lift Bridge during its interim vehicular use and will oversee development of the Stillwater Lift Bridge Management Plan prepared in accordance with Stipulation III.C.

2. The recommendations of the SLBAC will support Mn/DOT's efforts to incorporate Riverway, historical/cultural, and local perspectives in its decision-making process regarding planning and repair decisions for the Stillwater Lift Bridge.

3. Mn/DOT will seek the advice of the SLBAC until the final Stillwater Lift Bridge Management Plan has been approved by the SHPOs in accordance with Stipulation III.C.

4. Mn/DOT will convene meetings of the SLBAC, including the first meeting, and provide staff support to the SLBAC, as appropriate. The SLBAC will establish the procedures through which it will operate and develop its recommendations for Mn/DOT.

5. Until the new bridge opens, when Mn/DOT, the SHPOs and the SLBAC agree that any maintenance, repair, rehabilitation, and treatment proposed by Mn/DOT meets the SOI's *Standards,* then Mn/DOT may implement the proposed work. If they do not agree and FHWA will provide assistance for the proposed work, then the matter will be resolved by FHWA in accordance with 36 CFR §§800.5, 800.6 and 800.7.

C. Stillwater Lift Bridge Management Plan - The Stillwater Lift Bridge Management Plan, which will be consistent with Mn/DOT's Statewide Historic Bridge Management Plan, will identify those actions needed to preserve the structural and historical integrity of the Stillwater Lift Bridge for continued safe use. All actions identified will be consistent with the SOI's *Standards*.

After completion of the Stillwater Lift Bridge Repair Project, Mn/DOT and WisDOT, in consultation with the SLBAC, will update the existing condition assessment of the Stillwater Lift Bridge that was developed from the reports listed in Attachment C using information obtained during the Stillwater Lift Bridge rehabilitation project in 2005. In consultation with the SHPOs and SLBAC, Mn/DOT will use this information as the basis for developing an Operations and Maintenance Manual for the Stillwater Lift Bridge that includes estimated funding needs. Mn/DOT will submit the Manual to the SHPOs and SLBAC for review. The SHPOs and SLBAC will have thirty (30) days from receipt of the draft Manual to submit their review comments. In preparing the final draft Manual, Mn/DOT will take into account timely comments received on the draft Manual. Mn/DOT will submit the final draft Manual to the SHPOs for their review and concurrence. The SHPOs will have thirty (30) days from receipt of the final draft

Manual to provide their review and concurrence. Mn/DOT will then use the approved Operations and Maintenance Manual to develop the Stillwater Lift Bridge Management Plan.

The Stillwater Lift Bridge Management Plan will describe how the Stillwater Lift Bridge is to be managed during its interim vehicular use and after its conversion to pedestrian/bicycle use, but the latter use will receive primary emphasis.

In consultation with the MnSHPO, Mn/DOT is developing a Statewide Historic Bridge Management Plan, including individual plans, for twenty-four (24) historic bridges, including the Stillwater Lift Bridge. The long-term preservation of the Stillwater Lift Bridge is integral to the successful implementation of this Statewide Plan. In accepting statewide planning for historic bridges, Mn/DOT committed to preserving the structural integrity of the twenty-four (24) historic bridges beyond its normal practice.

The Stillwater Lift Bridge Management Plan will include but is not limited to, components that establish a process and procedures:

- to update and analyze the condition of the Stillwater Lift Bridge;
- to establish maintenance and improvement needs and priorities;
- to identify criteria for decision-making and priority setting;
- to use and expand the endowment fund;
- to acquire capital improvement funding predictably and when needed;
- to respond to emergencies;
- to involve other parties in an advisory capacity in decision-making;
- to revise and update the Stillwater Lift Bridge Management Plan, as appropriate;
- to integrate with the development, ownership and operation of the Loop Trail; and
- for ownership and long-term maintenance of the Stillwater Lift Bridge.

Mn/DOT will submit a draft of the Stillwater Lift Bridge Management Plan to the SHPOs and the SLBAC for their review. The SHPOs and the SLBAC will have thirty (30) days from receipt of the draft Stillwater Lift Bridge Management Plan to submit their review comments. In preparing the final draft Stillwater Lift Bridge Management Plan, Mn/DOT will take into account timely comments received on the draft Stillwater Lift Bridge Management Plan. Mn/DOT will submit the final draft Stillwater Lift Bridge Management Plan to the SHPOs and SLBAC for their review and concurrence. The SHPOs and SLBAC will have thirty (30) days from receipt of the final draft Stillwater Lift Bridge Management Plan to provide their review and concurrence.

When the SHPOs and the SLBAC have concurred pursuant to Stipulation III.C., Mn/DOT will implement the Stillwater Lift Bridge Management Plan. Mn/DOT will provide a copy of the final Stillwater Lift Bridge Management Plan to

FHWA, the SHPOs and the SLBAC. The Plan will be incorporated as part of the Statewide Bridge Management Plan. **FHWA will not obligate funding for the Project until it is in receipt of the final Stillwater Lift Bridge Management Plan from Mn/DOT.**

D. Endowment Fund - The establishment of an endowment fund account by Mn/DOT will generate revenue to support the operation and routine maintenance of the Stillwater Lift Bridge after it is converted to pedestrian/bicycle use.

1. **Upon approval of the ROD by FHWA and the appropriation of funding for the Project,** Mn/DOT, in cooperation with the State of Minnesota, will establish an endowment account for the Stillwater Lift Bridge.

2. In setting up this fund, Mn/DOT will

   a. Support any enabling legislation that may be determined by the State of Minnesota to be necessary for the establishment of such an account, and develop and execute agreements, as needed, with other elements of the State, including the MnSHPO, **prior to the opening of the new river crossing;**

   b. Consult with the SHPOs to develop the structure of the fund; and

   c. Consult with a person or persons with established credentials in establishing and managing endowment funds.

3. **Prior to the opening of the new river crossing,** Mn/DOT and WisDOT will deposit no less than $3 million in the endowment fund.

4. Mn/DOT will set up an operations and maintenance account that will be funded from the investment revenues derived from the endowment fund. This account may be used only to support Stillwater Lift Bridge operation and routine maintenance from abutment to abutment because these activities are usually predictable, repetitive, and conducive to the establishment of reasonable and accurate annual budget projections. Revenues from the operations and maintenance account are not eligible for use in major repairs/ rehabilitation or other capital improvements to the Stillwater Lift Bridge.

5. Mn/DOT will establish the endowment fund in order to receive funds and disburse revenues sufficient to support the operation and routine maintenance of the Stillwater Lift Bridge. Mn/DOT will ensure that adequate legal controls are in place to ensure that the endowment, and operations and maintenance funds are managed effectively, in the public interest and to support the protection and preservation of the Stillwater Lift Bridge.

E. Capital Improvement Upon Conversion - **Upon approval of the ROD and appropriation of funding for the Project,** Mn/DOT will convene the SLBAC to advise Mn/DOT regarding the proper scope of the Stillwater Lift Bridge capital improvement/repair work that will be pursued by Mn/DOT when the Stillwater Lift Bridge is to be converted to a pedestrian/bicycle use in conjunction with the new Loop Trail.

1. As part of the Statewide Historic Bridge Management Plan (III. C.), Mn/DOT commits to completing a rehabilitation project for the Stillwater Lift Bridge, **within one year after opening of the new bridge**. The Stillwater Lift Bridge Management Plan will establish the priorities for the rehabilitation project in order to allow the Stillwater Lift Bridge to function with the Loop Trail. Mn/DOT will cover the cost of rehabilitation up to $7 million. Mn/DOT expects to secure funding for this rehabilitation project from a combination of eligible state and federal funding sources. If rehabilitation costs exceed $7 million, Mn/DOT, in consultation with the SLBAC, will seek the additional funds required.

2. Mn/DOT will submit the draft design plan for the rehabilitation of the Stillwater Lift Bridge to the SHPOs and SLBAC for review. The SHPOs and SLBAC will have thirty (30) days from receipt of the draft design plan to submit their review comments. Mn/DOT will take into account any timely comments submitted in preparing the final design plan. Mn/DOT will submit the final design plan to the SHPOs for their review and concurrence. The SHPOs will have thirty (30) days from receipt of the final plan to provide their review and concurrence. Mn/DOT will implement the approved design plan for the rehabilitation of the Stillwater Lift Bridge.

3. If Mn/DOT and the SHPOs agree that the rehabilitation project meets the SOI's *Standards*, then Mn/DOT may implement the work. If they do not agree and FHWA or another federal agency will provide assistance for the proposed work, then the matter will be resolved by the federal agency in accordance with 36 CFR §§800.5, 800.6 and 800.7.

F. Conversion of the Lift Bridge to Pedestrian/Bicycle Use - **Once the Project has been constructed and opened to traffic,** Mn/DOT will remove the Stillwater Lift Bridge from the Trunk Highway system and close it to vehicular traffic.

1. Mn/DOT will retain ownership and maintenance of the Stillwater Lift Bridge, unless Mn/DOT decides to transfer the historic property pursuant to Stipulation III.F.2.

2. If Mn/DOT proposes to transfer ownership of the Stillwater Lift Bridge, Mn/DOT will consult with the SHPOs, the ACHP, the City of Stillwater, Town of St. Joseph, Preservation Alliance of Minnesota, Stillwater HPC, NPS, Stillwater Area Chamber of Commerce, Stillwater Lift Bridge

Association, National Trust for Historic Preservation, SLBAC, and other consulting parties regarding the proposed transfer.

a. Mn/DOT will ensure that the transferee will conform to the terms of the Stillwater Lift Bridge Management Plan and any additional legal restrictions deemed appropriate by Mn/DOT to ensure its continued protection and preservation.

b. Mn/DOT will take into account the recommendations of the consulting parties identified in Stipulation III. F. 2. in reaching a final decision about any proposed transfer.

c. If they cannot agree on legal restrictions, Mn/DOT will seek the advice of the ACHP. Mn/DOT will notify FHWA and all consulting parties that it is seeking the advice of the ACHP. Upon receipt of adequate documentation, the ACHP will review and advise Mn/DOT on the resolution of the dispute within thirty (30) days.

d. Prior to reaching a final decision on the dispute, Mn/DOT will prepare a written response that takes into account any timely advice from the ACHP and provide all consulting parties with a copy of this written response. Mn/DOT may then proceed according to its final decision.

e. If the ACHP does not respond within thirty (30) days after receipt of adequate documentation, Mn/DOT may render a decision regarding the dispute.

3. Mn/DOT may, at its discretion and in consultation with the SHPOs, the City of Stillwater and the Stillwater HPC enter into an agreement with a federal, state or local agency for management of the operation and routine maintenance of the Stillwater Lift Bridge. Mn/DOT will ensure that management of the Stillwater Lift Bridge by the other agency adheres to the final Stillwater Lift Bridge Management Plan developed pursuant to Stipulation III.C.

IV. SITE SPECIFIC MITIGATION MEASURES

A. Log Cabin Restaurant (Club Tara)

1. Design: In consultation with the MnSHPO and the owner of this historic property, Mn/DOT will design Project elements, including the frontage road, access, landscaping, and other site improvements in the vicinity of this historic property, to be compatible with the qualifying characteristics and setting of the Log Cabin Restaurant. The design will be consistent with the design principles listed in Stipulations II.A and B and the VQM. Mn/DOT will submit design plans to the MnSHPO for review and concurrence **prior to**

FHWA authorization to obligate funds for the Project.

2. Parking: In consultation with the MnSHPO and the owner of this historic property, Mn/DOT has developed a design plan to provide adequate parking for the Log Cabin Restaurant. In the plan, Mn/DOT has specified that the existing lot will remain gravel and that an additional lot will be constructed, east and adjacent to the Log Cabin Restaurant property. The design plan will comply with municipal standards and will not diminish the qualifying characteristics of the historic property. Mn/DOT will implement the design plan in cooperation with the City of Oak Park Heights and Xcel Energy. Mn/DOT will submit the design plan to the MnSHPO for review and concurrence **prior to FHWA authorization to obligate funds for the Project.**

3. Construction: Mn/DOT will ensure access and temporary directional signage to the Log Cabin Restaurant during construction.

4. City of Oak Park Heights Memorandum of Understanding (MOU): Mn/DOT will ensure that the terms of the MOU that will be executed with the City of Oak Park Heights will be consistent with this Amended MOA. The function of the MOU is to document the terms of municipal consent from the City which is required under Minnesota statutes.

B. **Bergstein Shoddy Mill and Warehouse**

1. **Prior to letting the Project for construction,** Mn/DOT will complete photo documentation of the Shoddy Mill and Warehouse in accordance with the standards and guidelines of the MnSHPO. Mn/DOT will submit two (2) copies of the completed documentation to the MnSHPO and one (1) copy each to the City of Oak Park Heights and City of Stillwater.

   In consultation with the MnSHPO, Mn/DOT has determined that it is cost effective to move and stabilize the Shoddy Mill and the Warehouse, and upon identification of a suitable site, Mn/DOT will move and secure the buildings on a new foundation at the new location.

2. Mn/DOT has consulted with the MnSHPO; Cities of Oak Park Heights, Stillwater, and Bayport; Washington County Historical Society; Stillwater HPC; the Jewish Historical Society of the Upper Midwest; and other parties to identify a new owner, a new site and a suitable use for this historic property. The new site and use for the buildings must maintain, and not detract from the National Register character-defining features of the property and will include an appropriate setting.

3. Mn/DOT marketed the historic property for two (2) months during the spring of 2005. Two interest offers were received during that period and one party

remains interested. Review of a potential site is occurring in consultation with the MnSHPO and other consulting parties.

4. If Mn/DOT and the MnSHPO agree on an acceptable site and use, Mn/DOT will move the historic property to its new site and then transfer it with a legal restriction that ensures it will be maintained in accordance with the SOI's *Standards*.

5. If Mn/DOT determines, in consultation with MnSHPO, that there is no acceptable offer (that is, a new owner, new site, and a suitable use for the historic property have not been identified and approved by agencies with jurisdiction over the new site), Mn/DOT may authorize its demolition. In the event that Mn/DOT determines that it should proceed with demolition, Mn/DOT will consult with the MnSHPO to determine if any further mitigation is needed prior to demolition. If Mn/DOT and the MnSHPO cannot agree, Mn/DOT will submit the matter to FHWA for resolution in accordance with Stipulation XIII.

6. City of Oak Park Heights and City of Stillwater MOU's: Mn/DOT will ensure that the terms of the MOU's that will be executed with the City of Oak Park Heights and City of Stillwater will be consistent with this Amended MOA. The function of the MOU's is to document the terms of municipal consent from the Cities which are required under Minnesota statutes.

C. **St Croix Overlook-South**

1. Design: Mn/DOT will design the Project within the viewshed of the St. Croix Overlook-South, including the new bridge and other improvements, in accordance with the design principles found in Stipulations II.A and B, and the VQM. The Project design will take into account the setting, feeling and viewshed of the St. Croix Overlook-South.

2. Restoration: Mn/DOT will restore the St. Croix Overlook-South in accordance with the *Mn/DOT Historic Roadside Development Structures Preservation and Restoration Report* (2005) **during construction of the proposed Project.** Despite diminished vehicular access, the scenic and historic view from this site has high value and the restoration of this property provides viewing opportunities described within II.B.3 of this Amended MOA. Providing access from the Loop Trail and other city streets to the St. Croix Overlook-South is being studied.

3. Management: Mn/DOT will develop a Management Plan for the St. Croix Overlook-South that addresses the maintenance and rehabilitation of structural and landscape elements of the historic property **prior to restoration.** Mn/DOT will submit the Plan to the MnSHPO for review and concurrence. Mn/DOT will continue ownership of the St. Croix Overlook-South, unless

Mn/DOT elects to transfer ownership to a federal, state or local agency with appropriate restrictions developed in consultation with the MnSHPO.

4. Construction Access: Mn/DOT will ensure access to the St. Croix Overlook-South during construction.

5. City of Oak Park Heights MOU: Mn/DOT will ensure that the terms of the MOU that will be executed with the City of Oak Park Heights will be consistent with this Amended MOA. The function of the MOU is to document the terms of municipal consent from the City which is required under Minnesota statutes.

D. **Stillwater Commercial Historic District**

1. Signage:

   a. According to standard practice, primary guide signs for STILLWATER will be installed, **as part of the project,** in both westbound and eastbound directions on TH 36 approaching the TH 36/TH 95 interchange. **Provided that adequate signing space is available,** as determined by Mn/DOT, a supplemental guide sign for "Downtown Stillwater" (white lettering on green background) will be installed, as part of the project, on both eastbound and westbound approaches to the TH 36/TH 95 interchange. **If it is determined that not enough space is available for this supplemental guide sign, FHWA and Mn/DOT will consult with the signatories and other consulting parties, including the downtown Stillwater business owners, to develop additional mitigation for the Stillwater Commercial Historic District.**

   b. **Provided that adequate space is available,** as determined by Mn/DOT, the City of Stillwater will install a municipal identification entrance sign for the City on northbound TH 95 at the Stillwater city limit in accordance with the VQM. The municipal identification entrance sign will include a reference to the Stillwater Commercial Historic District. Mn/DOT will determine if sufficient property is available outside the clear zone for installation and maintenance of the municipal identification entrance sign by the City.

      As an alternative, Mn/DOT will consider, **during the development of the Project's signing plan** and if allowable by policy, a "recreational and cultural interest area sign" (white lettering on brown background) for the Stillwater Commercial Historic District.

2. Construction Communication Plan:

   As part of its overall Project design process, Mn/DOT will develop a plan to ensure access to the Stillwater Commercial Historic District during Project construction.The plan will be developed in consultation with MnSHPO, the City of Stillwater, and the Stillwater Area Chamber of Commerce. The plan will consider the sequencing of Project construction, the location of construction staging areas, street closures, parking changes and the traffic flow during construction. Mn/DOT and WisDOT will provide signage and public notice for efficient access to the Stillwater Commercial Historic District during construction.

3. Mn/DOT will work with the City of Stillwater to give full consideration to maximizing parking on Chestnut Street from Main Street to the Stillwater Lift Bridge.

4. **As part of the Project,** WisDOT will provide parking in the immediate vicinity of the Loop Trail in Wisconsin at the connection of the Loop Trail and existing STH 64 with a direct pedestrian access to the Stillwater Lift Bridge and the Commercial Historic District. And, a trailhead parking area will be provided at the new interchange of STH 64 and STH35/CTH E in Wisconsin.

E. **Stillwater Cultural Landscape District (SCLD)**

1. Design: In consultation with the MnSHPO, Mn/DOT will design the Project elements within the viewshed of the SCLD, including the new bridge structure, the Loop Trail, Chestnut St. from Main St. to the Stillwater Lift Bridge, landscaping and other improvements, in accordance with Stipulations II.A and B and the VQM, taking into account the historic property's qualifying characteristics, setting and feeling. Mn/DOT will submit the draft design plans to the MnSHPO for review. MnSHPO will have thirty (30) days from receipt of the draft design plans to submit their review comments. Mn/DOT will take into account any timely comments submitted in preparing the final design plan. Mn/DOT will submit the final design plan to the MnSHPO for their review and concurrence **prior to FHWA authorization to obligate funds for the Project**. The MnSHPO will have thirty (30) days from receipt of the final plan to provide their review and concurrence.

2. Study: Mn/DOT will complete a study of the SCLD, in consultation with the SHPOs, Stillwater HPC and NPS (St. Croix National Scenic Riverway Office) to illustrate the significant features and essential characteristics of the SCLD and its setting, as described in *Cultural Resource Investigation St. Croix River Bridge* (by Barbara Henning for Rivercrest Associates, Inc., August 1999). The study is intended to reinforce an understanding of the historic relationship

between the natural and built features in the SCLD, identify and illustrate important views to, from and within the SCLD, and promote understanding of the SCLD and its significant features to a wide audience. **The study will begin at the time of FHWA authorization of funding for the Project.**

a. The study will utilize historic and contemporary images, maps, and text to illustrate the defining characteristics and features of the landscape, their interrelationships, and the associated viewsheds. This product will include existing pre-construction views of the Riverway from the SCLD and views from the Riverway to the district **prior to construction.**

b. Mn/DOT will submit a draft study to the SHPOs, NPS and Stillwater HPC for review and comment. The parties will have thirty (30) days from the date of receipt of the draft to provide their review comments. Mn/DOT will take into account the comments received in developing the final study.

c. Mn/DOT will submit the final study to the SHPOs for review and concurrence. Mn/DOT will ensure that the approved final study is completed **prior to opening of the new bridge**.

d. The final study documentation will be formatted for easy reference and use, and for Internet application. Mn/DOT will present the completed final study to the public at a meeting of the Stillwater HPC.

F. **South Main Archaeological District**

1. **Prior to initiating Project construction,** Mn/DOT, in consultation with the MnSHPO, the Stillwater HPC, and the City of Stillwater, will complete a condition and stabilization report identifying those measures needed to stabilize and protect the Hersey and Bean Saw Mill and Hersey and Bean Planing Mill archeological sites in such a way as to avoid adversely affecting the historic properties' above and below-ground qualifying characteristics. Mn/DOT will use the report to develop the stabilization needed in order to construct the Loop Trail. The report will be made available to the City of Stillwater for future park planning. Mn/DOT will ensure that the protective measures that have been identified are implemented by **inclusion in the Project special provisions and plans.**

2. If Mn/DOT determines that an adverse effect to this historic property cannot be avoided, then Mn/DOT will consult with the MnSHPO, Stillwater HPC and City of Stillwater to develop mitigation measures. If the parties can reach agreement on mitigation, Mn/DOT will record those measures through a letter agreement with the MnSHPO and then implement the measures. If the parties cannot agree, Mn/DOT will submit the matter to FHWA for resolution in accordance with Stipulation XIII.

3. If Mn/DOT proposes to use any area of the Hersey and Bean Archaeological Site as a staging area, Mn/DOT will consult with the MnSHPO to ensure that the use will not result in adverse effects to the historic archaeological site and its setting.

4. City of Stillwater MOU: Mn/DOT will ensure that the terms of the MOU that will be executed with the City of Stillwater will be consistent with this Amended MOA. The function of the MOU is to document the terms of municipal consent from the City which is required under Minnesota statutes.

G. **Louis Kriesel Farmstead**

1. WisDOT will construct a berm on land currently owned by Dennis and Georgeann Kilbane in order to screen the Kriesel Farmstead from the Project. WisDOT will design this berm in consultation with Dennis and Georgeann Kilbane. But it will accommodate, to the maximum extent possible, the continued use for agricultural purposes, the land to the south of the Kriesel Farmstead farm buildings. This berm will be based on the concepts presented in "Highway Profile Options at Kriesel Farm" in the VQM.

2. **Before completion of the final Project design in Wisconsin,** WisDOT will submit a draft plan for applying the general concepts set forth in the VQM (see Stipulation II. C.) to the WisSHPO for review and concurrence. As part of the plan, WisDOT will consider installing landscape elements along a line near the south boundary, within 500 feet on either side of the current driveway access to the Kriesel Farmstead, and roughly parallel to the centerline of the proposed new frontage road as shown for Alternative B1 in the Supplemental Final EIS for the Project. WisDOT will use text, photographs and other exhibits, as appropriate, to develop this plan. WisDOT will consider the cost effectiveness in reaching a final decision on any proposed landscaping.

V. NATIONAL REGISTER NOMINATIONS

A. Minnesota Properties: In consultation with the MnSHPO, Mn/DOT will prepare National Register nomination forms for the Log Cabin Restaurant; the Bergstein Shoddy Mill and Warehouse, if it is not demolished pursuant to Stipulation IV.B.5 and if it remains eligible on its new site per concurrence from the MnSHPO; the St. Croix Overlook - South and the South Main Archaeological District **prior to authorization of funding by FHWA for the Project.**

B. Wisconsin Properties: **Within one year of the signing of the Record of Decision for the Project**, WisDOT will submit the required completed National Register nomination forms to the WisSHPO for final nomination of the Nicholas Thelen Farmstead and Louis Kriesel Farmstead to the NRHP.

VI. INTERPRETATION AND PUBLIC EDUCATION

A. Stillwater Lift Bridge Publication: Mn/DOT will contract with the Washington County Historical Society (WCHS) or another responsible party if the WCHS declines, in consultation with the SHPOs, to publish an illustrated book tracing the history of the Stillwater Lift Bridge in narrative and photographs. The narrative will include the complete story of the Stillwater Lift Bridge, and its relationship to the community and the cultural landscape. Mn/DOT and WisDOT will provide a total of $50,000 for publication of the book. The book will be completed **following authorization of funding by FHWA but prior to opening of the new bridge.**

B. Field Guide: In consultation with the SHPOs, Mn/DOT will develop an educational Field Guide to direct visitors, students and others to locations where they may experience and understand the relationships between the cultural, natural and physical features in and adjacent to the SCLD.

1. The Field Guide will be based on the SCLD study, produced pursuant to Stipulation IV.E.2., and information related to the Boom Site and St. Croix Overlook-South. The Field Guide will highlight the role of historic properties within the SCLD, including the St. Croix Overlook - South, in the development of nearby roadways.

2. The Field Guide will include a map showing the scope and significant features of the SCLD, the St. Croix Overlook-South, and the Boom Site.

3. The Field Guide also will include a map that clearly shows how to access the St. Croix Overlook-South and other affected historic properties identified in this Amended MOA.

4. Mn/DOT will make the Field Guide widely available in rest areas, tourism distribution centers and local businesses along the Lower St. Croix National Scenic Riverway, and through the Greater Stillwater Area Chamber of Commerce.

5. Mn/DOT will complete the Field Guide **prior to the opening of the new bridge.**

6. Mn/DOT will submit the draft Field Guide to the SHPOs and Stillwater HPC for review. The SHPOs and Stillwater HPC will have thirty (30) days from the receipt of the draft Field Guide to submit their review comments. Mn/DOT will take into account any timely comments submitted in preparing the final Field Guide. Mn/DOT will submit the final Field Guide to the SHPOs for their review and concurrence. The SHPOs will have thirty (30) days from receipt of the final Field Guide to provide their review and concurrence. The completed Field Guide will be presented to the SHPOs and Stillwater HPC in

both hard copy and electronic format. The Field Guide will also be posted on Mn/DOT's Project website.

C. Riverway Research and Interpretation: In developing the Riverway interpretation mitigation measure described in the Supplemental Final EIS, NPS will consult with the SHPOs to ensure that pertinent information about historic properties and their relationship to the Lower St. Croix National Scenic Riverway is incorporated into interpretative efforts, including signage, kiosk and mobile outreach. These agencies should also consult on the broad Riverway research carried out by NPS on archaeological sites and National Register nomination preparation.

In particular, in accordance with the St. Croix National Scenic Riverway mitigation measures identified in the Supplemental Final EIS, in order to raise awareness among river users and researchers of how man has changed the river in the past, the NPS, in consultation with the SHPOs, will document the river changes implemented by Corps activities (i.e., decisions; proposed and implemented plans; photographs and drawings). The NPS will also document, including photographs, the history of the Boomsite and its effect on the Riverway and the logging industry. The results of these efforts will be a scholarly document and an overview of the research on the NPS website.

VII. GROWTH MANAGEMENT

A. The WisDNR will invite the WisSHPO to participate as a member of the Wisconsin Growth Management Advisory Team. This Team will be created to promote natural, cultural and historic resource protection by providing advice and guidance in the administration of the "St. Croix River Crossing Project Growth Management Fund" as described in the Supplemental Final EIS.

B. In accordance with the growth management mitigation measures identified in the Supplemental Final EIS, funds will be provided ($200,000 to the Town of St. Joseph and $750,000 to St. Croix County) to hire or contract for staff and consultant services to assist in revising and/or developing local comprehensive plans, neighborhood plans, ordinances and other planning tools that will result in natural resource enhancement, pollution prevention, protection for historic properties, or other environmental protection.

C. In accordance with the growth management mitigation measures identified in the Supplemental Final EIS, funds ($50,000) will be provided to the University of Wisconsin (UW) - River Falls to help establish and implement natural resources and historic properties protection efforts of the Western Wisconsin Intergovernmental Collaborative (WWIC). The funding will supplement, but not replace, local government member financial support for the WWIC. The purpose of this organization is to enhance the quality of life in Pierce, Polk and St. Croix Counties of Wisconsin by providing a long-term collaborative forum for its governmental jurisdictions, including villages, towns, cities and counties.

WWIC will share information, experiences and best practices on key issues and problems; serve as an "Issues Clearinghouse"; engage in regional problem-solving; develop a more visible regional identity; serve as a voice for the three-county region to influence public policy; help to provide advice and sharing of technical expertise from resources available at UW-River Falls, UW-Extension and other sources; and explore opportunities for potential governmental cost-savings through shared resources.

WWIC planned actions include organizing and sponsoring quarterly programs/workshops used to bring in experts, facilitate focused problem solving and to disseminate targeted and region-specific educational materials on water quality, natural resources, historic properties, and other issues.

WWIC will share information with the Wisconsin SHPO and invite their participation in efforts related to historic preservation.

VIII. ADDITIONAL HISTORIC PROPERTIES AND EFFECTS TO BE CONSIDERED

A. Before granting approval of sites for construction staging, wetland mitigation, borrow or waste, dredge disposal, or other construction activities associated with the Project or bluffland restoration, the DOT's will consult with FHWA, the SHPOs, and other consulting parties, including Indian tribes, as appropriate, in accordance with 36 CFR §§ 800.3 - 800.5 to determine if historic properties will be affected by the Project.

B. In accordance with the St. Croix Riverway mitigation measures identified in the Supplemental Final EIS, the Riverway agencies (NPS, MnDNR, WisDNR) have proposed to restore native vegetation and develop campsites along the Lower St. Croix National Scenic Riverway in order to enhance the camping experience while protecting the Riverway's resources. Prior to implementing any management activities to remove exotic species and restore natural species (e.g., burning or other treatment plans) or prior to any campsite expansion, the NPS will comply with Section 106 requirements.

C. In accordance with the St. Croix Riverway mitigation measures identified in the Supplemental Final EIS, funding in the amount of $2.0 million will be provided to WisDNR and $2.5 million will be provided to St. Croix County for the protection of replacement lands to offset the impacts of a new crossing on the Wisconsin bluff. Protection could include the purchase of fee title, the purchase or transfer of development rights or the purchase of conservation easements from willing sellers of land located in St. Croix County, Wisconsin. Protected lands would be perpetually maintained for land and water conservation purposes, scenic protection and other compatible uses, including low-impact public recreation.

1. For any property purchased under this mitigation item, WisDNR, St. Croix County and the Town of St. Joseph will consult with WisSHPO, MnSHPO, and other consulting parties, including Indian tribes as appropriate, in accordance with 36 CFR §§ 800.3 - 800.5 to determine if historic properties in addition to those identified in Stipulation II.C.4.b. will be affected.

2. The WisDNR, St. Croix County and the Town of St. Joseph will confer with the WisSHPO on possible sites to acquire in order to provide protection for historic properties in conjunction with land and water conservation goals.

D. Pursuant to 36 CFR § 800.5(a), if FHWA determines that the proposed activity will adversely affect a historic property, then FHWA will consult with Mn/DOT, and/or WisDOT, the respective SHPO, and other consulting parties, including Indian tribes, to seek ways to avoid, minimize or mitigate the adverse effect.

E. If the parties can agree on measures to mitigate the adverse effect, FHWA will ensure that those measures are recorded in a letter agreement and then implemented. If the parties cannot agree, FHWA will resolve the dispute in accordance with Stipulation XIII.

IX. MONITORING AND REPORTING

A. **On March 1 of every year beginning after issuance of the ROD**, Mn/DOT will submit a summary annual report to the signatories describing the measures carried out pursuant to the terms of this Amended MOA. The annual report will describe all actions taken by FHWA, Mn/DOT and WisDOT during the preceding year to implement the terms of this Amended MOA, identifying any problems or unexpected issues encountered during the year, any disputes and objections submitted or resolved, any changes recommended in implementation of this Amended MOA, and any scheduling changes. The annual report will also include a timetable of activities proposed for implementation within the following year. Attachment D portrays a summary of specific actions with their scheduled implementation based on Project milestones.

B. The signatories will review the annual report and provide their written comments to Mn/DOT within thirty (30) days of receipt of the report. At the same time, Mn/DOT will also make the annual report available to concurring parties and the public for their inspection and review. Mn/DOT will share with the signatories any comments it receives from concurring parties and the public.

C. At its own discretion or at the request of any signatory to this Amended MOA, Mn/DOT will convene a meeting to facilitate review and comment of the annual report, to address any questions about its content, and to resolve adverse comments.

D. The signatories may use the annual report as a basis for recommendations prepared pursuant to Stipulations XII, XIII, XIV and XV.

E. Mn/DOT will submit an annual report every year until this Amended MOA expires pursuant to Stipulation XV or is terminated pursuant to Stipulation XIV.

X. POST-REVIEW DISCOVERIES

A. In the event that historic properties are discovered or unanticipated effects on historic properties found **during Project construction,** the DOTs shall ensure that the following steps are carried out.

1. During Project construction, the contractor shall cease all ground-disturbing activities in the area where any unidentified archeological resources are discovered as well as in the immediately adjacent area.

2. The contractor shall notify the respective DOT of the discovery within twenty-four (24) hours.

3. Within forty-eight (48 hours) from receipt of the notice in Stipulation X.A.2, the respective DOT shall notify FHWA, the respective SHPO and other parties, as appropriate, of the discovery. The notice shall describe the archeological resources encountered, the circumstances of their discovery, make an assessment of NRHP eligibility, and propose actions to resolve the adverse effect.

4. In accordance with 36 CFR § 800.13(c), the respective DOT, in consultation with FHWA, and the respective SHPO, may assume the archeological property to be eligible for listing in the NRHP.

5. FHWA, SHPO and other consulting parties shall have forty-eight (48) hours from receipt of the notice, to provide their recommendations to the DOT on the proposed actions contained in the notice. The DOT shall take into account these recommendations before implementing appropriate actions to resolve the adverse effect.

B. The DOTs shall ensure that if any human remains are encountered **during the Project,** all ground-disturbing activities will cease in the area where such remains are discovered as well as in the immediately adjacent area. The contractor is legally required within twenty-four (24) hours to notify the respective DOT of this discovery of human remains. Upon receipt of this notice from the contractor, the responsible DOT shall notify FHWA within twenty-four (24) hours.

1. In Minnesota, if human remains are encountered during the Project, all ground-disturbing activities will cease in the area where any site is discovered as well as in the immediately adjacent area. The contractor will immediately

notify local law enforcement authorities and the Mn/DOT Cultural Resources Unit (CRU) of the discovery. FHWA (with the assistance of the Mn/DOT CRU) will work with the Office of the State Archaeologist (OSA) to perform any necessary tribal consultation in order to meet FHWA's responsibilities under Section 106. The Mn/DOT CRU will develop a reburial plan in consultation with the FHWA, the OSA, the SHPO, and, if appropriate, the Minnesota Indian Affairs Council (MIAC), prior to ground-disturbing work being allowed to proceed in the area of discovery. The FHWA will ensure that the terms of any reburial plan are fully implemented. The Mn/DOT CRU will record, document and evaluate the National Register eligibility of sites in accordance with 36 CFR 800. If eligible sites are identified, the Mn/DOT CRU, in consultation with the SHPO and the FHWA, will design a plan for avoiding or mitigating any adverse effects prior to resuming ground-disturbing work in the area of discovery.

2. In Wisconsin, if human bone is discovered during any activities directly associated with the construction of this project, work will stop immediately and the SHPO, Burial Sites Preservation Office (BSPO), WisDOT Bureau of Equity and Environmental Services (BEES), and Consulting Tribes will be notified immediately in accordance with Wis. Stats. 157.70. Work may proceed only after authorization from the BSPO.

   The WisDOT will ensure that protective steps are taken to safeguard the human remains after working hours. Measures will include one or more of the following--fencing, signage, temporary hand backfilling of the area to conceal the location, and notification of local authorities to include the area in their patrol. If, in the opinion of the archaeologist, human remains may be in jeopardy and cannot be protected, WisDOT will consult with the Consulting Tribes, and the BSPO. Permission of the Director of the Wisconsin Historical Society (WHS) will be obtained prior to moving remains to a safe location.

   Burials

   WisDOT will ensure that all construction activity will be stopped immediately in the area of the discovery of human remains. The project construction manager will notify BEES immediately. BEES will notify BSPO, SHPO, and Consulting Tribes.

   The WisDOT shall ensure that construction in areas adjacent to the archaeological site and/or mortuary areas where human remains are located during construction activity are monitored by a qualified archaeologist, as defined in HS2, 157.70(1)(I)(1991) Wis.Stats.

   WisDOT shall ensure that one Tribal Monitor will be available on site if requested by consulting tribes. The Tribal Monitor will work directly with and under the supervision of the WisDOT archaeologist in those areas to be

monitored. WisDOT will reimburse the tribe at the state per diem rate for travel, food and lodging for services rendered.

WisDOT will comply with 157.70, Wis.Stats., regarding treatment of human remains and final disposition protocol, if necessary, when human remains are encountered.

WisDOT will ensure that encountered human remains (and associated grave goods) undergo analysis by a qualified skeletal analyst in compliance with 157.70 Wis.Stats. and as defined in Chapter HS2.02 (12) and .04(6).

WisDOT will take into account the requests of Consulting Tribes on treatment of human remains in accordance with provisions reached between WisDOT and the Wisconsin Intertribal Repatriation Committee on burial treatment.

WisDOT will ensure that when possible, human remains will remain in the same place as discovery. When it is not possible to leave human remains in situ, WisDOT will consult on a case-by-case basis with the Consulting Tribes, the SHPO, and the BSPO, on the disturbance of a burial site. In compliance with 157.70 Wis.Stats. burials will not be disturbed until permission from the Director of the WHS is obtained.

The reinterment of human remains at a different location will be as near as possible to the original location. Human remains that must be removed and reinterred in accordance with 157.70 Wis. Stats. will be placed in an agreed upon plot established by Consulting Tribes, WisDOT, and FHWA. WisDOT will provide land, or a cemetery plot, for reburial if requested by the descendants or consulting parties.

WisDOT will ensure that the location(s) of reinterment, if needed, is surveyed by a registered Land Surveyor to provide a metes and bounds description to the BSPO who will file the necessary forms to ensure that the site is catalogued.

XI. EMERGENCIES

A. If **during Project construction,** Mn/DOT or WisDOT propose an action in response to an immediate threat to life or property, the responsible DOT will notify the signatories to this Amended MOA with a description of the proposed action and its likely affects on historic properties. The DOT will invite the signatories to provide their views within the time available.

B. To the extent practicable given the circumstances of the threat, the responsible DOT will document any adverse effect to a historic property and provide that documentation to the signatories.

C. In the event that Mn/DOT decides to demolish and remove the Stillwater Lift Bridge in response to an immediate threat to life or property, the expenses incurred from that demolition and removal may be charged to the Stillwater Lift Bridge endowment fund established in accordance with Stipulation III. D. Mn/DOT, in consultation with the SHPOs, will consider using any remaining funds in this account to support implementation of the Statewide Historic Bridge Management Plan.

D. This section applies only to actions taken in response to an immediate threat to life or property that will be implemented within thirty (30) days or less of a formal designation of the threat to life or property.

E. Closure of the Stillwater Lift Bridge to conduct repairs does not, in and of itself, constitute a threat to life and property.

XII. AMENDMENT

A. If any signatory to this Amended MOA, including any invited signatory, determines that its terms will not or cannot be carried out or that an amendment to its terms must be made, that party will immediately consult with the signatories and concurring parties to develop an amendment. The amendment will be effective on the date a copy signed by all of the original signatories is filed with the ACHP.

B. If the signatories cannot agree to appropriate terms to amend the Amended MOA, any signatory, including any invited signatory, may terminate the agreement in accordance with Stipulation XIV, below.

XIII. DISPUTE RESOLUTION

A. Should any signatory, including any invited signatory, to this Amended MOA object at any time to any actions proposed or the manner in which the terms of this Amended MOA are implemented, FHWA will consult with the objecting party(ies) to resolve the objection. If FHWA determines that such objection(s) cannot be resolved, FHWA will:

1. Forward all documentation, including the FHWA's proposed resolution, relevant to the dispute to the ACHP in accordance with 36 CFR § 800.2(b)(2). Upon receipt of adequate documentation, the ACHP will review and advise FHWA on the resolution of the objection within thirty (30) days. Prior to reaching a final decision on the dispute, FHWA will prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. FHWA will then proceed according to its final decision.

2. If the ACHP does not provide comments regarding the dispute within thirty (30) days after receipt of adequate documentation, FHWA may implement its proposed resolution or render a decision regarding the dispute. In reaching its decision, FHWA will take into account all comments regarding the dispute from the parties to the Amended MOA.

B. FHWA's responsibility to carry out all other actions subject to the terms of this Amended MOA that are not the subject of the dispute remain unchanged.

C. FHWA will notify all parties of its decision in writing before implementing that portion of the Project subject to dispute under this stipulation. FHWA's decision will be final.

XIV. TERMINATION

A. If the Amended MOA is not amended following the consultation set out in Stipulation XII, it may be terminated by any signatory or invited signatory. The ACHP may be asked by any signatory, including any invited signatory, to the Amended MOA to review the terms of the agreement and its implementation by the FHWA. If the ACHP determines that the terms of the Amended MOA are not being carried out, the Amended MOA will be terminated.

B. If the Amended MOA is terminated for any reason, FHWA will either develop a new agreement in accordance with 36 CFR § 800.6 or seek the comments of the ACHP in accordance with 36 CFR § 800.7.

XV. DURATION

This Amended MOA will terminate twenty (20) years from the date of its execution or upon mutual agreement of the signatories. Prior to such time, FHWA may consult with the other signatories to reconsider the terms of this Amended MOA and revise or amend it in accordance with Stipulation XII.

EXECUTION of this Amended MOA by FHWA, the ACHP, the Corps, the Minnesota and Wisconsin SHPOs, the Minnesota and Wisconsin DOTs, and implementation of its terms evidence that FHWA has taken into account the effects of the undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

_____ **Date** 5/11/06
Thomas K. Sorel, Division Administrator

U.S. Army Corps of Engineers

_____ **Date** 5/10/06
Col. Michael F. Pfenning, District Engineer and Commander

Advisory Council on Historic Preservation

_____ **Date** 5/15/06
(for) **John M. Fowler, Executive Director**

Minnesota State Historic Preservation Officer

_____ **Date** 5/11/06
Dr. Nina Archabal, State Historic Preservation Officer

Wisconsin State Historic Preservation Officer

_____ **Date** 4/28/06
Dr. Michael Stevens, State Historic Preservation Officer

INVITED SIGNATORIES:

Minnesota Department of Transportation

for _____ Date 5-11-06
Carol Molnau, Lt. Governor/Commissioner of Transportation

Wisconsin Department of Transportation

_____ Date 5/8/06
Frank Busalacchi, Secretary of Transportation

CONCURRING PARTIES:

National Park Service

Tom Bradley _____ Date 4/19/06
Tom Bradley, Superintendent
St. Croix National Scenic Riverway

City of Stillwater

_____ Date 4-19-06
Jay Kimble, Mayor

U.S. Fish and Wildlife Service

_____ Date 4/19/06
Sean Marsan, Acting Field Supervisor

St. Croix County

_____ **Date** 04/19/06
Tim Ramberg, St. Croix County Highway Commissioner

St. Croix County

_____ **Date** 4/19/06
Clarence W. "Buck" Malick, St. Croix County

Town of St. Joseph

_____ **Date** 4/19/06
Theresa Johnson, Chair Town of St. Joseph

Stillwater Heritage Preservation Commission

_____ **Date** 4/21/06
Howard Lieberman, Chair

Greater Stillwater Area Chamber of Commerce

_____ 4/19/06 **Date**
James Laskin

St. Croix Alliance for an Interstate Bridge

_____ **Date** 4/18/06
John D. Soderberg, Chairman

St. Croix River Association

Larry Kennedy 4/19/06 **Date**
Larry Kennedy, Past President

Stillwater Lift Bridge Association

Donald Empson 4/19/06 **Date**
Donald Empson, Director

Western Wisconsin Realtors Association

William F. Berndt **Date** 4/21/06
William F. Berndt, Government Affairs Director

National Trust for Historic Preservation

Royce Yeater 4-26-06 **Date**
Royce Yeater, Director, Midwest Office

MEMORANDUM OF AGREEMENT

WHEREAS, the Federal Highway Administration (FHWA) has determined that the Trunk Highway 36/State Trunk Highway 64 New St. Croix River Crossing Project will have an effect on the Bergstein House and Shoddy Mill, the Log Cabin, and the Stillwater Overlook, Minnesota properties which are eligible for the National Register of Historic Places, and has consulted with the Minnesota State Historic Preservation Officer (MnSHPO), the Wisconsin State Historic Preservation Officer (WisSHPO), and the Advisory Council on Historic Preservation (COUNCIL) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the Minnesota Department of Transportation (MnDOT) and the Wisconsin Department of Transportation (WisDOT) participated in the consultation and have been invited to concur in this Memorandum of Agreement;

WHEREAS, MnDOT and WisDOT have indicated that the Stillwater Lift Bridge, a property listed on the National Register of Historic Places and located in both Minnesota and Wisconsin, will remain on the states' respective trunk highway systems, will not be affected by this project, and will be subject to further review pursuant to 36 CFR 800 for future changes in jurisdiction or disposition;

NOW, THEREFORE, FHWA, MnSHPO, WisSHPO, and the COUNCIL agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA will ensure that the following measures are carried out:

1. MnDOT will complete a historical documentation study on the Bergstein House and Shoddy Mill, in accordance with the Secretary of the Interior's Standards for Historical Documentation. The Research Design will be developed in consultation with and be approved by the

Attachment A

MnSHPO, and a draft of the documentation will be submitted to MnSHPO for review and comment before final submittal to MnSHPO. While the emphasis of this documentation should be historical, historic archaeology and architecture/engineering documentation will be considered for incorporation into the research design, as appropriate. No alteration or demolition of the property will occur until MnSHPO has approved the final documentation.

2. MnDOT will develop design plans for project elements in the vicinity of the Log Cabin in consultation with MnSHPO and will submit these design plans to MnSHPO for review and concurrence. This review will include the frontage road, access points to parking areas, landscaping, and any other project-related changes to the setting of the Log Cabin.

3. MnDOT will develop and implement a plan for the Stillwater Overlook in consultation with MnSHPO, and will submit this plan to MnSHPO for review and concurrence. This plan will address identity and access for the area, rehabilitation of the structural and landscape elements of the overlook, interpretation at the site, and a long range maintenance program.

4. The design for the new bridge will be developed in consultation with MnSHPO, and will be submitted to MnSHPO for review and concurrence. The design will take into account the qualities of the historic vista of the St. Croix Valley as seen from the Stillwater Overlook.

5. Should the MnSHPO object within 45 days to any plans, designs, or specifications provided pursuant to this agreement, FHWA shall consult with the MnSHPO to resolve the objection. If the FHWA determines that the objection cannot be resolved, FHWA shall request the further comments of the Council pursuant to 36 CFR 800.6(b). Any Council comment provided in response to such a request will be taken into account by FHWA in accordance with 36 CFR 800.6(c)(2) with reference only to the subject of the dispute; FHWA's responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

Execution of this Memorandum of Agreement and implementation of its terms evidence the FHWA has afforded the COUNCIL an opportunity to comment on the Trunk Highway 36/State Trunk Highway 64 New St. Croix River Crossing Project and its effects on historic properties, and that FHWA has taken into account the effects of the undertaking on historic properties.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Robert D. Bush Date: 12/8/94
Name and Title of Signer: Executive Director

FEDERAL HIGHWAY ADMINISTRATION

By: Alan Friesen Date: ~~11/20/94~~ 11/29/94
Name and Title of Signer: Alan Friesen
Program Operations Engineer

MINNESOTA STATE HISTORIC PRESERVATION OFFICER

By: Nina M. Archabal Date: 11/23/94
Name and Title of Signer:

WISCONSIN STATE HISTORIC PRESERVATION OFFICER

By: [illegible] Date: 11/18/94

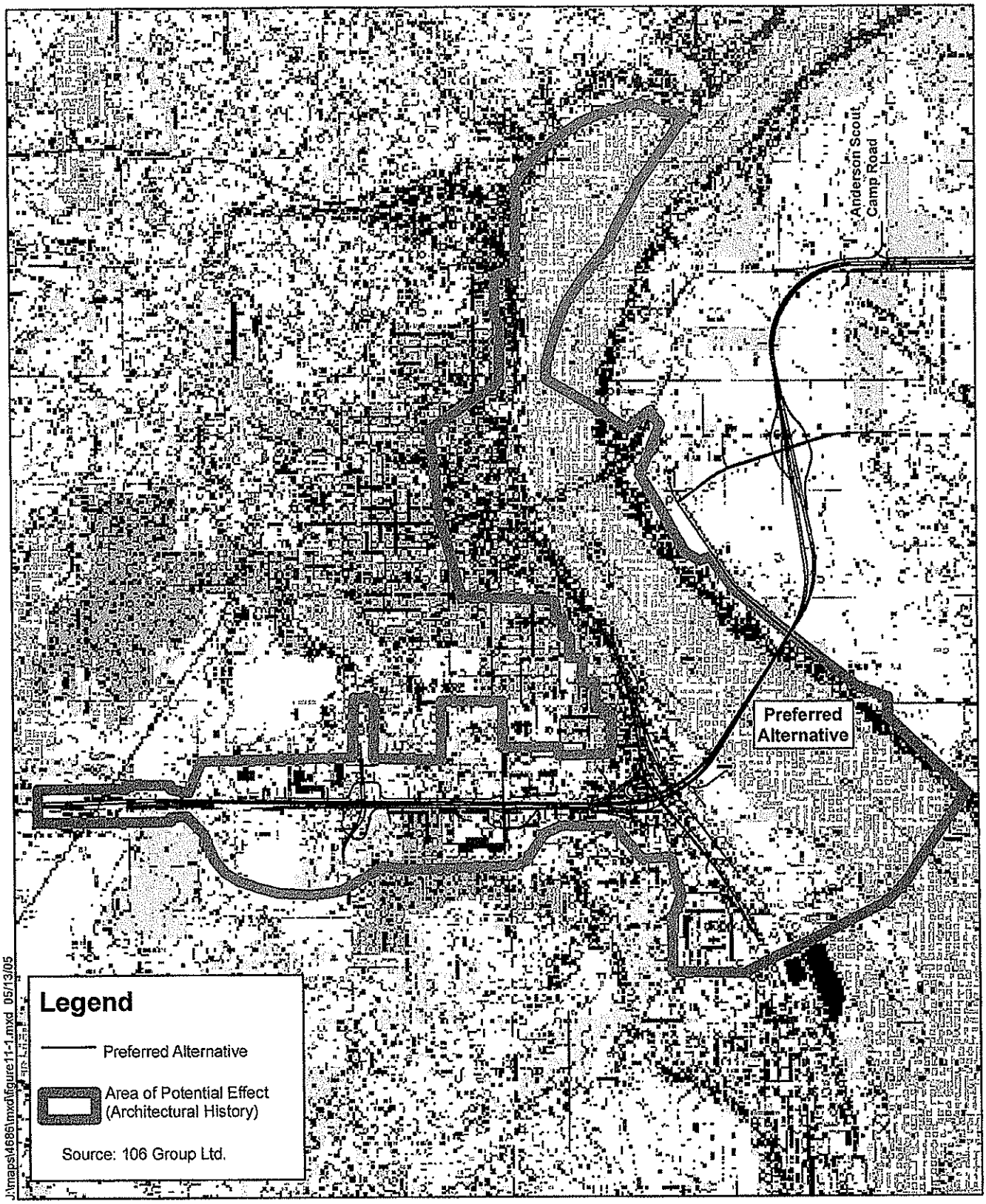
Concur:

MINNESOTA DEPARTMENT OF TRANSPORTATION

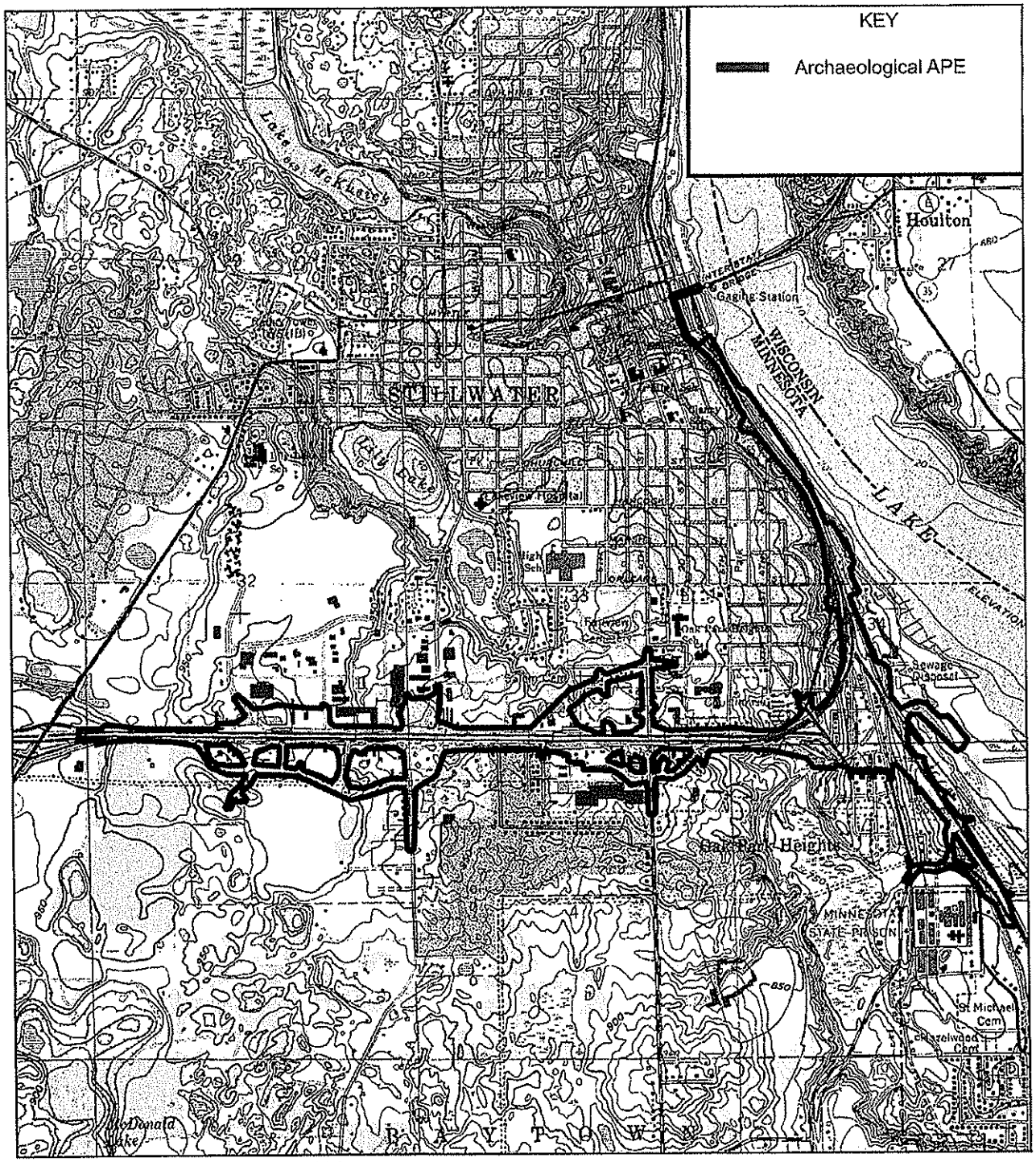
By: Dep Commissioner/chief Engr. Date: 11/16/94
Name and Title of Signer:

WISCONSIN DEPARTMENT OF TRANSPORTATION

By: Date 11/17/94
Name and Title of Signer:



Area of Potential Effect - Minnesota *Figure 11-1*



Source: Two Pines Resource Group, LLC

0 miles 0.5

Minnesota Archaeological APE *Figure 11-3*

St. Croix River Crossing Project *2005 Supplemental Final Environmental Impact Statement*

CORRESPONDENCE/MEMORANDUM ---------- **State of Wisconsin**
Bureau of Equity and Environmental Services/Division of Transportation Infrastructure Development

Date: March 25, 2004

To: File

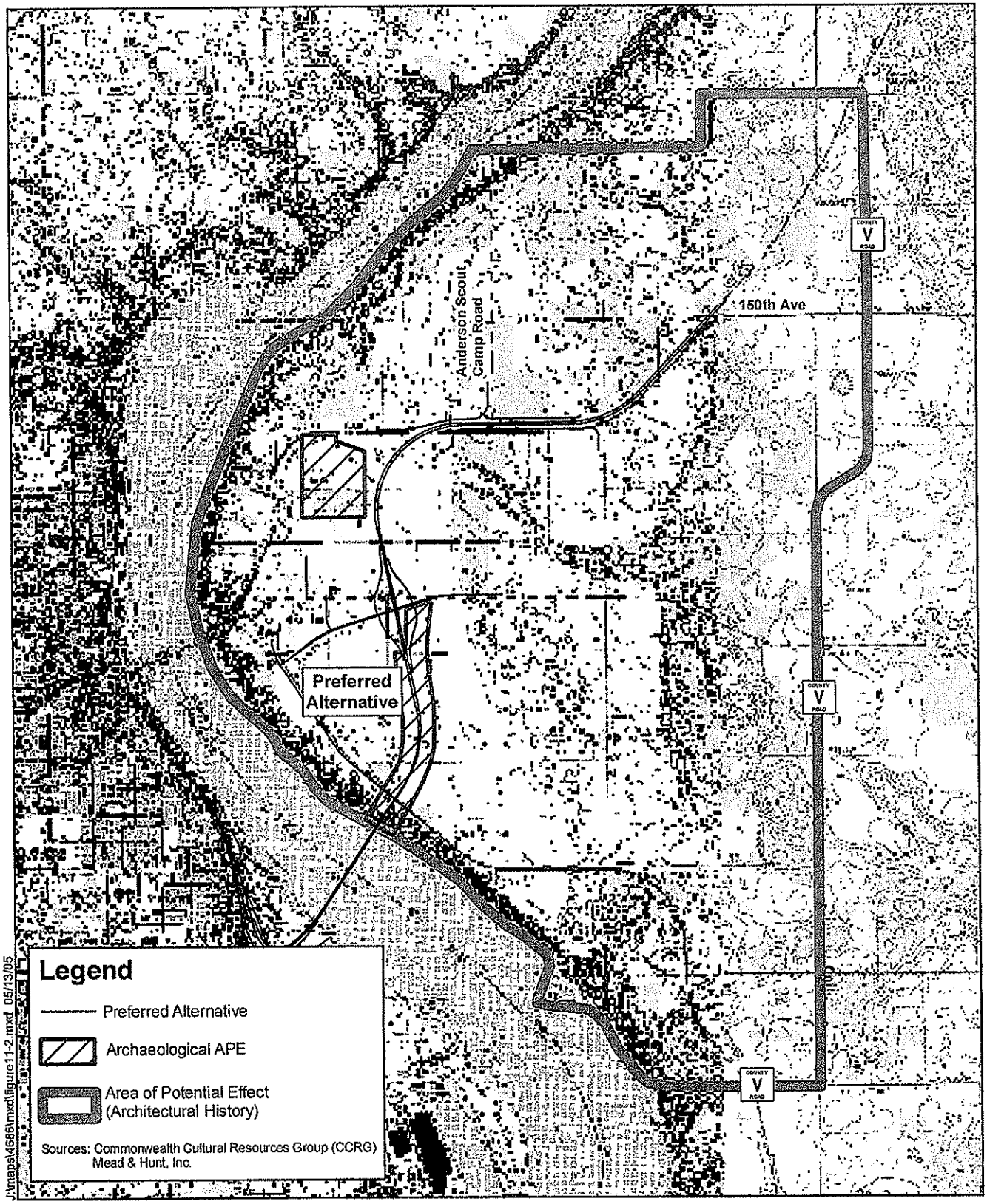
From: Robert S. Newbery
Bureau of Environment (ENVIRONMENT)
Rm. 451 HFSTB

Subject: Project ID 1550-00-02
Stillwater Bridge
Washington County, MN to St. Croix County, WI

I have reviewed the previous windshield study and reconnaissance survey for this project and recently drove from the St. Croix River along STH 64 to CTH "V" and from STH 35 along CTH "E" to CTH "V" and then (south) along CTH "V" to STH 35. I believe a useful Area of Potential Effects for historical structures on the Wisconsin side of the river for this project would be roughly CTH "V" to the St. Croix River, with the addition of the strip north of STH 35/64 to the town line for the Town of St. Joseph. On the south, just extend CTH "V" westerly from its intersection with STH 35 to the St. Croix River. The total area encompassed may be excessive but it yields a simple and easy delineation of an area within which to begin a windshield search. The following concerns should be well within this area and justify the determination to establish this area as the starting APE:

1. What will be the differential impacts of one build alternative versus another?
2. What indirect commercial and retail effects might be related to this project?
3. Where will one be most likely be able to attribute the secondary effects of the increase in the intensity of development pressure to this project?
4. Where are noise impacts likely to occur?
5. Where will light impacts occur? (Except for cloudy, night time, general light pollution.)
6. Where will visual impacts be noticeable? (Note the topography here: a hill or line of several hills obscure the proposed approaches to the Stillwater Bridge from any house near CTH "V".

I believe that it is not necessary to construct or conduct elaborate methodologies to determine more precise boundaries because doing a windshield survey of CTH "V" to the River will not be that onerous. It is likely to cost less and take less time than to develop more precise measures to use to estimate the APE, which is, after all, an intermediate step in the conduct of the identification step of the Section 106 process.



Area of Potential Effect - Wisconsin *Figure 11-2*

Attachment C
St. Croix River Crossing Project --- Amended Section 106 MOA

Stillwater Lift Bridge over the St. Croix River: HNTB Corporation's Condition Assessment/Needs Reports:

1) **Tender's House Repair Report**, dated January 21, 2003 found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/tenderhouse-repair.pdf

2) **Structural Inspection and Preliminary Condition Evaluation, Volume 1 of 2**, dated March 17, 2003 found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/struct-report-v1r1.pdf

3) **Structural Inspection and Preliminary Condition Evaluation, Volume 2 of 2**, dated March 17, 2003 found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/struct-report-v2r1.pdf

4) **Mechanical and Electrical Inspection and Evaluation, Volume 1 of 2**, dated March 18, 2003, found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/mechanical-elec-v1r1.pdf

5) **Mechanical and Electrical Inspection and Evaluation, Volume 2 of 2**, dated March 18, 2003, found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/mechanical-elec-v2r1.pdf

6) **Pedestrian Railing Repair Study**, dated March 20,2003 found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/railing-repair-study.pdf

7) **Deck Replacement Study**, dated March 21, 2003 found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/deck-replace-study.pdf

8) **Maintenance Projections and Annualized Costs**, dated August 6, 2003, found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/maintenance-projections.pdf

9) **Stillwater Lift Bridge Repair Needs**, dated September 3, 2003, found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/repair-needs-rev1.pdf

10) **Repair Methods, Schedules, and Probable Repair Costs**, dated December 2, 2003, found at
http://www.dot.state.mn.us/metro/projects/liftbridge/pdfs/Fin%20Rep%20Meth.pdf

Attachment C

ST. CROIX RIVER CROSSING PROJECT

SECTION 106 MEMORANDUM OF AGREEMENT

Summary Of Specific Properties Info
With Implementation Based on Project Milestones

	Record Of Decision July 2006	Lift Bridge Repair Project Ends Summer 2006	FHWA Authorization Of Funding	Letting Of Project	Begin Construction	End Construction	One Year After Construction
Visual Quality Manual, Section II	Overall Project Design w/Controlling Vision	Implement Overall Vision-Roadway & Bridge					Implement Overall Vision-Landscaping
Stillwater Lift Bridge, Section III	Stillwater Lift Bridge Advisory Committee	Condition Assessment for Operations & Maintenance Manual; Lift Bridge Management Plan					
	Minnesota Legislation for Endowment Fund, setting up Endowment Fund, Depositing $3M into Endowment Fund					$7M Capital Improvement Repair Project	Conversion to Bike/Ped Facility
Log Cabin, Section IV. A		Parking Design Plan To SHPO			Construct Parking Lot		
Bergstein Shaddy Mill & Warehouse, Section IV. B			Photo Documentation		Relocation or Demolition		
St. Croix Overlook -South, Section IV. C			Overlook Management Plan	Restoration: Design & Construction			
Stillwater Commercial Historic District, Section IV. D		Supplemental Signing in Plans			Communication Plan	Parking Opportunities On Chestnut	
Stillwater Cultural Landscape District, Section IV. E		Design of Project Elements within Viewshed to SHPO	Illustrative Study - Preconstruction Views	- Defining Characteristics	- HPC Presentation		
South Main Archaeological District, Section IV. F		Avoidance Protective Measures in Plans & Special Provisions; Develop Condition and Stabilization Report for Hersey & Bean Archaeological Site					
Louis Kriesel Farmstead, Section IV. G		Berm design in plans with Landscaping			Construct Berm		
National Register Documentation/ Nominations, Section V - Log Cabin - Shaddy Mill & Warehouse - Overlook - South - South Main Archaeological District - Thelen Farmstead - Kriesel Farmstead	Documentation/Prepare Nominations for Minnesota Properties; Documentation/Prepare Nominations for Wisconsin Properties						
Lift Bridge Publication, Section VI. A			Develop & Publish Book				
Field Guide of Stillwater Cultural Landscape District, Section VI. B					Field Guide w/Maps, HPC Presentation & Distribution		
Riverway Research, Section VI. C					Interpretation & Research by NPS		
Growth Management	Planning, Protection, Support						
Annual Report, Section IX	Report & Presentation On March 1st	Report & Presentation On March 1st	Report & Presentation On March 1st	Report & Presentation On March 1st	Report & Presentation On March 1st	Report & Presentation On March 1st	

TIME LINE DEFINITIONS
Record Of Decision: *FHWA's Environmental Decision Document*
FHWA Authorization: *Normally 5 weeks prior to letting*
LETTING: *DOT's Advertise for bids, hiring construction contractors, typically 4-6 weeks prior to construction*

03/16/06

Attachment D

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Appendix B. Glossary of Preservation and Engineering Terms

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Glossary of Preservation and Engineering Terms

Appraisal ratings – Five National Bridge Inventory (NBI) inspection 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 it 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 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); element ratings range from 1 (poor) to 3 (good). 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.

Deck geometry – One of five NBI inspection 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 Average Daily Traffic (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 standard bridge design practices 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 showing 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 metric tons according to the 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 demands. A bridge that is posted for load restrictions may not be adequate to accommodate present or expected truck traffic.

Fracture critical – Classification of a bridge having primary superstructure or substructure components subject to tension stresses and which are non-redundant. A failure of one of these components could lead to collapse of a span or the bridge. Tension members of truss bridges are often fracture critical. The associated inspection date is a numerical code that includes frequency of inspection in months, followed by year, and month of last inspection.

Functionally obsolete (FO) – The FHWA classification of a bridge that cannot 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.

Historic fabric – The material in a bridge that was part of original construction or a subsequent alteration within the historic period (e.g. more than 50 years old) that has significance in and of itself. Historic fabric includes both character-defining and minor features. Minor features have less importance and may be replaced more readily.

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.

Inventory rating – The load level a bridge can safely carry for an indefinite amount of time expressed in metric 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.

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

Minnesota Historical Property Record (MHPR) – A documentary record of an important architectural, engineering, or industrial site, maintained by the MHS 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 (NBIS) – 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 vehicle type, expressed in metric tons or by the rating factor described in design load (see above).

Posted load – Legal live-load capacity for a bridge usually associated with the operating or inventory ratings as determined by a state transportation agency. A bridge posted for load restrictions may be inadequate for 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* (BPIRG) 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, retard 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 that 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. However, MnDOT's *Bridge Preservation, Improvement and Replacement Guidelines* (BPIRG) 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.*

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 bridge's vulnerability to scour (see above), ranging from 0 (scour critical, failed, and closed to traffic) to 9 (foundations are on dry land well above flood water elevations). This code can also be expressed as U (unknown), N (bridge is not over a waterway), or T (bridge is over tidal waters and considered low risk).

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.

Stabilization – The act or process of sustaining a bridge by means of making minor repairs until a more permanent repair or rehabilitation can be completed.

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 structurally deficient bridge is restricted to lightweight vehicles; requires immediate rehabilitation to remain open to traffic; or requires maintenance, rehabilitation, or replacement.

Structural evaluation – Condition 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.

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 rated between 50 and 80 are eligible for rehabilitation and those rated 50 and below are eligible for replacement.

Under-clearances – One of five NBI inspection 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 standard bridge design practices 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.

Waterway adequacy – One of five NBI inspection ratings. This rating appraises a bridge's waterway opening and passage of flow through the bridge, frequency of roadway overtopping, and typical duration of an overtopping event.

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Appendix C. Stillwater Lift Bridge Maintenance Checklist

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Maintenance Implementation Program
Bridge No. 4654 (Stillwater Lift Bridge)

TO: MnDOT Maintenance Staff Date: 2020
RE: Special maintenance requirements for historic bridges

MnDOT has prepared individual management plans and updates for selected historic bridges that are listed in the National Register of Historic Places. These plans are the result of historical and engineering evaluations. Each plan includes recommended activities, customized for that bridge, that comply with state and federal laws and regulations for historic preservation. In particular, the recommendations are prepared in compliance with the Secretary of Interior's Standards for Rehabilitation [36 CFR Part 67] and Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior's Standards.

Each plan includes a list of Recommended Maintenance Activities. The Historic Bridge Management Plan for Bridge 4654 (Stillwater Lift Bridge) includes the Recommended Maintenance Activities listed on the maintenance checklist on the follow pages. The checklist provides maintenance activities for the Stillwater Lift Bridge for the first four years, which make up the first maintenance cycle while also looking out into the future years.

MnDOT anticipates that the boxes on the checklist will be marked by the appropriate Metro Bridge Maintenance personnel as tasks are completed. The Bridge Office will submit the Historic Bridge Maintenance Report to the MnDOT Cultural Resources Unit (CRU) annually. It is anticipated that the maintenance tasks and checklist will be evaluated by MnDOT CRU at the end of the first four-year cycle to assure that the tasks and list are appropriate for the ongoing needs of the bridge. Subsequent cycles will be 6 and 10 years and will be developed by Metro Bridge Maintenance.

The Lift Bridge Management Plan, including the Recommended Maintenance Activities, is subject to periodic review and revision by MnDOT.

In addition to MnDOT, the responsibilities agreed to by the City of Stillwater are found in Cooperative Agreements #01433 and #1026159 and are reflected in the chart below.

In the future, the City of Stillwater and other agencies or organizations may request the use of the bridge for July 4th celebrations, Lumberjack Days, festivals, races, or similar events. Permits are required from MnDOT for any use of the lift bridge or concourse and will require details for the maintenance of pedestrian/boat traffic on the bridge and/or near the lift span. Coordination with MnDOT's Permit Office, Metro Bridge Maintenance and MnDOT's bridge tenders will be required.

Maintenance Activity	Responsible Party	2020	2021	2022	2023	Comments (reference year)
Flush deck, drains, exp. joints, sub structure	MnDOT	☐	☐	☐	☐	
Graffiti removal and vandalism repair (if found)	MnDOT	☐	☐	☐	☐	
Structural Inspection – Base inspection	MnDOT	☐	☐	☐		
In-depth structural inspection – 4-year inspection	MnDOT	☐				
Mechanical and electrical inspection	MnDOT		☐		☐	
Underwater inspection – 5-year inspection	MnDOT					
Sweep clean deck	City of Stillwater	☐	☐	☐	☐	Per Cooperative Agr#01433
Clean and lubricate counterweight wire ropes	MnDOT	☐	☐	☐	☐	
Clean and lubricate gears/bearing/shaft	MnDOT	☐	☐	☐	☐	
Clean and lubricate couplings	MnDOT					
Clean, lubricate, and adjust operating wire ropes and take-up devices (2x per year)	MnDOT	☐☐	☐☐	☐☐	☐☐	
Inspect, clean, and lubricate main drive motor	MnDOT	☐	☐	☐	☐	
Clean and lubricate gear reducers	MnDOT					

Maintenance Activity	Responsible Party	2020	2021	2022	2023	Comments (reference year)
Inspect, clean, and lubricate auxiliary drive motor	MnDOT	☐	☐	☐	☐	
General annual control system maintenance	MnDOT	☐	☐	☐	☐	
Clean and lubricate pedestrian barriers (gates)	MnDOT	☐	☐	☐	☐	
Replace aerial cables (festoon cables), every 5 years	MnDOT					
Maintain pavement markings/signage for loop trail	City of Stillwater					Per Cooperative Agr#01433
Maintain cameras, internet connection, electrical conduit and conductors	MnDOT					
*Maintain concourse lighting electricity and light levels - 12 lights	MnDOT & City of Stillwater					Per Cooperative Agr#1026159

*Concourse Lighting – 12 Lights

1. The State will maintain the newell posts, lights, electrical service lines and switches on both the lift bridge and the concourse.
2. The City will provide for electrical energy of the 12 new lights around and under the concourse.
3. If the City desires any adjustments to the light levels on the 12 lights around and under the concourse, the City will contact MnDOT and request any lighting level changes.

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Appendix D. Secretary of the Interior's Standards for the Treatment of Historic Properties, as Adapted for Historic Bridges

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Secretary of the Interior's Standards for the Treatment of Historic Properties, as Adapted for Historic Bridges

Adapted from:

Clark, Kenneth M., Grimes, Mathew C., and Ann B. Miller, *Final Report, A Management Plan for Historic Bridges in Virginia*, Virginia Transportation Research Council, 2001.

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 historical 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 E.

[Appendix E includes copies of current and past MnDOT inspection reports, as available, and selected other reports and documents on the bridge.]

Current MnDOT Structure Inventory Report

Current MnDOT Bridge Inspection Report

Past Maintenance Reports (as available)

Other Reports (as available)

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MINNESOTA STRUCTURE INVENTORY REPORT

Bridge ID: 4654 **PED (OLD TH 36) over ST CROIX RIVER; PED** Date: 12/03/2019

+ GENERAL +

Agency Br. No. **Crew** 7648
District METRO **Maint. Area**
County 82 - WASHINGTON
City STILLWATER
Township
Desc. Loc. AT WISONSIN STATE LINE
Sect., Twp., Range 27 - 030N - 20W
Latitude 45d 03m 24.68s
Longitude 92d 48m 06.74s
Custodian STATE HWY
Owner STATE HWY
Insp Responsibility METRO DISTRICT
Year Built 1930
Date Opened to Traffic 07-01-1931
MN Year Remodeled 2005
FHWA Year Reconstructed
Bridge Plan Location CENTRAL
Potential ABC N.A.

+ STRUCTURE +

Service On PED-BICYCLE
Service Under OTHER
Main Span Type STEEL MOVEABLE
Main Span Detail PARKER
Appr. Span Type STEEL HIGH TRUSS
Appr. Span Detail PARKER
Skew
Culvert Type
Barrel Length

Number of Spans

MAIN: 1 APPR: 9 TOTAL: 10

Main Span Length 143.6 ft
Structure Length 1,051.4 ft
Deck Width 24.3 ft
Deck Material C-I-P CONCRETE
Wear Surf Type MONOLITHIC CONC
Wear Surf Install Year
Wear Course/Fill Depth
Deck Membrane NONE
Deck Rebars EPOXY COATED REBAR
Deck Rebars Install Year 2005
Structure Area 25,596 sq ft
Roadway Area 24,182 sq ft
Sidewalk Width - L/R 5.0 ft
Curb Height - L/R 0.75 ft 0.75 ft
Rail Codes - L/R 32 40

+ ROADWAY ON BRIDGE +

Road Name PED (OLD TH 36)
Functional Class.
ADT (YEAR) 17,100 (2015)
HCADT
National Highway System N
Route Sys/Nbr
Ref. Point (TIS)
Detour Length
Lanes
Control Section (TH Only)
Function N/A
Type NOT APPLI
Bridge Match ID 1
Roadway Key 1-ON

+ RDWY DIMENSIONS ON BRIDGE +

If Divided	NB-EB	SB-WB
Roadway Width	23.0 ft	
Vertical Clearance	13.1 ft	
Max. Vert. Clear.	13.7 ft	
Horizontal Clear.	22.9 ft	
Appr. Surface Width	31.0 ft	
Bridge Roadway Width	23.0 ft	
Median Width on Bridge	NA	

+ MISC. BRIDGE DATA +

Structure Flared NO
Parallel Structure NONE
Field Conn. ID RIVETED
Cantilever ID

Foundations

Abut. CONC - FTG PILE
Pier CONC - FTG PILE
Historic Status ON REGISTER
On - Off System OFF

+ PAINT +

Year Painted 2012
Painted Area 36,100 sf
Primer Type ORGANIC ZINC
Finish Type VINYL

+ BRIDGE SIGNS +

Posted Load VEHICLE & SEMI
Traffic NOT REQUIRED
Horizontal NOT REQUIRED
Vertical ROADWAY RESTRICTION

+ INSPECTION +

Deficient Status S.D.
Sufficiency Rating
Last Routine Insp Date 07-29-2019
Routine Insp Frequency 12
Inspector Name METRO DISTRICT
Status K-CLOSED

+ NBI CONDITION RATINGS +

Deck 7
Superstructure 6
Substructure 6
Channel 6
Culvert N

+ NBI APPRAISAL RATINGS +

Structure Evaluation 0
Deck Geometry 0
Underclearances N
Waterway Adequacy 2
Approach Alignment N

+ SAFETY FEATURES +

Bridge Railing N-NOT REQUIRED
GR Transition N-NOT REQUIRED
Appr. Guardrail N-NOT REQUIRED
GR Termini N-NOT REQUIRED

+ SPECIAL INSPECTIONS +

Frac. Critical Y 24 mo 07/2016
Underwater Y 60 mo 10/2016
Pinned Asbly. N

+ WATERWAY +

Drainage Area 6,730.0 sq mi
Waterway Opening 25000 sq ft
Navigation Control PERMIT REQD
Pier Protection NOT REQUIRED
Nav. Vert./Horz. Clr. 63 ft 98.0 ft
Nav. Vert. Lift Bridge Clear. 14.9 ft
MN Scour Code N-STBL;LIM SCOUR
Scour Evaluation Year 1996

+ CAPACITY RATINGS +

Design Load H 15
Operating Rating HS 20.00
Inventory Rating HS 13.00
Posting VEH: 28 SEMI: 40 DBL: 40
Rating Date 08-01-2008

Overweight Permit Codes

A: X B: X C: X

12/03/2019
Crew: 7648
Insp Responsibility: METRO DISTRICT

MINNESOTA BRIDGE INSPECTION REPORT

BRIDGE 4654 PED (OLD TH 36) OVER ST CROIX RIVER; PED INSP. DATE: 07-29-2019

County:WASHINGTON
City: STILLWATER
Township:
Section: 27 Township: 030N Range: 20W
Main Span Type: STEEL MOVEABLE

Location: AT WISONSIN STATE LINE
Route: Ref Pt (TIS)
Control Section: Maint. Area: 5C
Local Agency Bridge Nbr:

Length: 1,051.4 ft
Deck Width: 24.3 ft
Rdwy. Area 24,182 sq ft
Paint Area 36,100 sq ft
Culvert : N/A

NBI Deck: 7 Super: 6 Sub: 6 Chan: 6 Culv: N Open, Posted, Closed: CLOSED Postings: 28 - 40 - 40

Appraisal Ratings - Approach: N Waterway: 2 MN Scour Code: N-STBL;LIM SCOUR Def. Stat: S.D. Suff. Rate:
Required Bridge Signs - Load Posting: VEHICLE & SEMI Traffic: NOT REQUIRED
Horizontal: NOT REQUIRED Vertical: ROADWAY RESTRICTION

ELEM NBR	ELEMENT NAME	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4
800	CRITICAL DEFS OR SAFETY HAZARDS	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	0	1	0	0

Notes: [2019] Structural reinforcement: see Files in this report. No critical findings. 1=CS 1.

12	REINFORCED CONCRETE DECK	07-29-2019	24,357 SF	23,885	462	10	0
		07-20-2016	26,170 SF	25,432	728	10	0

Notes: 24.25 FT x 1004.42 FT = 24,357 SF
Roadway deck on the truss spans (span 3-9), and the full width of span 10.
[2005] Truss spans re-decked (5-3/8" monolithic concrete with a single layer of epoxy-coated rebar).
[2016] The underside of the deck in the truss spans have transverse cracks with light leaching and water saturation (typically two transverse cracks on each truss panel). There is a longitudinal crack (with water saturation) along the centerline. There is a band of water/salt saturation (full width of deck) below every poured joint at the floor beams. For spans 3-9: 3,640 LF of transverse cracks and 980 LF of longitudinal cracks (462 SF CS 2).
[2016] The bottom of span 10 deck has spalling around the beam top flanges in isolated locations. South deck edge has spalling at the east end. 10 SF (CS 3).
[2019] 23885=CS 1; 462=CS 2; 10=CS 3

510	*WEARING SURFACE*	*07-29-2019*	*23,102 SF*	*22,444*	*658*	*0*	*0*
		07-20-2016	*26,100 SF*	*25,422*	*654*	*24*	*0*

Notes: 23 FT x 1004.42 FT = 23,102 SF
Wearing surface on spans 3-10. The truss spans (3-9) have a bare deck (no additional wearing surface).
[2005] Span 10 has a 2" low slump concrete overlay.
[2016] Wearing surface in spans 3-9 has 4,255 LF of transverse cracks and 2,280 LF of longitudinal cracks (most of the crack sealant has failed). Span 10 has 40 LF of longitudinal cracks (seal has failed), the center of the eastbound lane has a band of map cracking/staining.
[2019] 22444=CS 1; 658=CS 2.

38	REINFORCED CONCRETE SLAB	07-29-2019	1,460 SF	0	1,220	240	0
		07-20-2016	1,460 SF	0	1,210	240	10

Notes: Concrete slabs in span 1 & 2 (original 1931 construction, 16" deep with two layers of uncoated rebar).
[2016] Span 1: underside of slab has 65 LF of longitudinal cracks with water saturation, rust stains, and extensive leaching - approximately 120 SF of deterioration. (CS 2).
[2016] Span 2: underside of slab has a longitudinal crack at the center, with water saturation, rust stains, and extensive leaching - approximately 120 SF of deterioration. (CS 2).

[2019] PA Response: Repaired previously in CS4, moved to CS2. Verify CS3 quantity during the next inspection after repairs are finalized.

510	*WEARING SURFACE*	*07-29-2019*	*1,140 SF*	*1,110*	*30*	*0*	*0*
		07-20-2016	*1,175 SF*	*1,045*	*30*	*100*	*0*

Notes: 24.25 FT x 47 FT = 1,140 SF
Roadway wearing surface on spans 1 & 2.
[2005] Low slump concrete overlay added to original (1930) slab spans.
[2016] Overlay has 300 LF of transverse and longitudinal cracks (most of the crack seal has failed). (CS 2)
[2019] 1110=CS 1; 30=CS 2.

29	STEEL GRID DECK CONCRETE FILLED	07-29-2019	5,083 SF	4,583	500	0	0
		07-20-2016	5,220 SF	4,670	500	50	0

Notes: 5.12 FT x 992.84 FT = 5,083 SF
Sidewalk deck in the truss: (spans 3-9).

[1998] Sidewalk deck on truss spans replaced – steel grid deck panels with concrete fill.
[2016] Underside of steel panels have scattered areas of surface corrosion.

[2019] PA Response: Areas of sidewalk reconstructed, verify CS2 quantity during the next inspection after repairs are finalized.

810	CONC WEAR SURF-CRACKING SEALING	07-29-2019	6,835 LF	0	1,335	5,500	0
		07-20-2016	6,835 LF	0	1,335	5,500	0

Notes: [2016] Wearing surface has a total of 6,835 transverse and longitudinal cracks (most of the crack sealant has failed).
[2019] 0=CS 1; 1335=CS 2; 5500=CS 3.

300	STRIP SEAL DECK JOINT	07-29-2019	153 LF	153	0	0	0
		07-20-2016	156 LF	0	156	0	0

Notes: [2019] Type 4 strip expansion joints installed at piers 2, 5, 6, 7, 8 & 9. The strip seals are only below the roadway. 153=CS 1.

301	POURED SEAL JOINT	07-29-2019	966 LF	966	0	0	0
		07-20-2016	966 LF	0	230	736	0

Notes: [2005] Transverse poured joints installed above floorbeams (6 in each truss span).
[2019] 966=CS 1.

305	ASSEMBLY DECK JOINT	07-29-2019	86 LF	0	0	86	0
		07-20-2016	86 LF	0	0	86	0

Notes: This element refers to the sliding plate joints (roadway) at piers #3 & 4 (installed in 2005), as well as the sliding plate joints in the sidewalk at Piers #2-9 (installed in 1998).
[2014/2016] While all of the expansion plates are secure and in good condition, there is leakage through all of the joints that is causing corrosion of the steel superstructure below.
[2016] The Pier #6 sidewalk plate is welded instead of bolted.

[2019] PA Response: Assembly joint kept in previous condition state. Verify CS3 quantity during the next inspection.

330	METAL BRIDGE RAILING	07-29-2019	2,165 LF	2,165	0	0	0
		07-20-2016	2,186 LF	679	801	636	70

Notes: There is 1,011 LF of ornamental steel lattice railing (MnDOT Code 40) along the south sidewalk (spans 3-10), 992 LF 3-line steel angle railing (MnDOT Code 32) along inside face of north truss (spans 3-9), and an additional 162 LF of ornamental steel rail on the retaining walls below span 1.
[2005] South ornamental metal railings removed, refurbished in shop, and reset on bridge.
[2019] North rail replaced. Additional south wire rail installed along the exterior face of the south truss.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*16,561 SF*	*16,561*	*0*	*0*	*0*
		07-20-2016	*14,500 SF*	*5,100*	*5,100*	*1,300*	*3,000*

Notes: 1011 LF x 4.87 FT = 4,924 SF (south ornamental rail); 992 LF x 5.58 FT = 5,535 SF (north angle rail); 162 LF x 3.5 FT = 567 SF (metal rail west retaining wall).
[2019] Wire railing area includes rub rail similar to north rail, and additional stainless steel wire cable. Additional 5,535 SF added.
[2019] Organic zinc-rich paint system, north rail green; south & retaining wall rail aluminum. 11026=CS 1.

331	REINFORCED CONC BRIDGE RAILING	07-29-2019	284 LF	0	284	0	0
		07-20-2016	284 LF	0	281	3	0

Notes: There is open balustrade concrete railing (MnDOT Code 41) on spans 1 & 2 (both sides), span 10 (north side), and on the west approach circle (total of 284 LF).
[2005] Span 10: north metal railing replaced with concrete (11 ft. section), patching on existing railing.
[2019] Concrete repair contract, 284=CS 1.

[2019] PA Response: Previously noted areas in CS3 repaired, moved to CS2.

321	CONCRETE APPROACH SLAB	07-29-2019	621 SF	621	0	0	0

Notes: 23 FT x 27 FT = 621 SF
[2019] West concrete approach added. 621=CS 1.

[2019] PA Response: East approach slab installed during different project by WisDOT. Verify slab installation and update element quantity during next inspection in 2020. Only the west concrete approach slab area is accounted for.

107	STEEL GIRDER OR BEAM	07-29-2019	63 LF	53	0	10	0
		07-20-2016	66 LF	0	56	10	0

Notes: 10.46 FT x 6 = 63 FT
[1975] Six W14 x 22 rolled steel beams installed (10'-5-1/2" long) - they are bolted directly to a steel cap at the west end, and bear upon a continuous elastomeric pad at the east end (the beam ends are encased in a concrete end block at the east end).

[2019] PA Response: Painted over section loss and flaking rust kept in CS3. Areas with minor CS2 surface deficiencies moved to CS1. Verify CS3 quantity during the next inspection after repairs are finalized.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*230 SF*	*230*	*0*	*0*	*0*
		07-20-2016	*230 SF*	*200*	*10*	*0*	*20*

Notes: Painted area on steel beams (span 10) calculated to be 230 SF.
[2019] Organic zinc-rich paint system, green. 230=CS 1.

113	STEEL STRINGER	07-29-2019	13,720 LF	11,480	0	2,232	8
		07-20-2016	13,720 LF	2,520	8,960	2,232	8

Notes: Quantity includes the 12" deep roadway stringers (11 x 140 x 7 = 10,780 LF) and the 10" sidewalk stringers (3 x 140 x 7 =2,940 LF). Total of 13,720 LF.
[2005] New fascia sidewalk stringers installed, all 11 roadway stringers replaced in end panels of each truss span (L0-L1 & L1'-L0').
[2004] Span #7: South fascia roadway stringer L3-L3' has a ¾" x ½" hole in the web at Floorbeam L3'.
[2011] Span #8: North fascia roadway stringer L3-L3' at Floorbeam 3' has 50% section loss on the bottom flange, crushing of the web, and a crack in web running parallel with bottom flange.
[2012] Span #8: North fascia roadway stringer L1'-L2' has a 1-5/8" longitudinal crack in the web at Floorbeam 2'.
[2013] Span #6: North fascia roadway stringer L1'-L2' has two holes rusted through the bottom flange near the center of the panel.
[2016] Span #5: North fascia roadway stringer L2-L3 has a hole rusted through the web with a crack at Floorbeam L3
[2016] Span #7: North fascia roadway stringer L1'-L2' has pitting with a 1" x ½" hole in the bottom flange Floorbeam L2'.
[2016] Span #9: North fascia roadway stringers L3-L3' & L3'-L2' have holes in the web at Floorbeam 3'
[2016] The original roadway stringers have scattered surface corrosion throughout, with more extensive corrosion (some flaking rust & pitting). 196=CS 2

[2019] PA Response: Painted over section loss and flaking rust kept in CS3. Areas with minor CS2 surface deficiencies moved to CS1. Verify CS3 and CS4 quantities during the next inspection after repairs are finalized.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*37,750 SF*	*37,750*	*0*	*0*	*0*
		07-20-2016	*37,750 SF*	*7,250*	*23,800*	*4,700*	*2,000*

Notes: [2016] Painted area on stringers calculated to be 37,750 SF
[2019] Organic zinc-rich paint system, green. 37750=CS 1.

120	STEEL TRUSS	07-29-2019	1,960 LF	406	67	1,414	73
		07-20-2016	1,960 LF	0	406	1,414	140

Notes: Truss quantity is 140 x 2 x 7 = 1960 LF

Truss Bottom Chord:
[1997] Span #6 (South Truss) bottom chord reinforced (bolted plates) at L2 (west side).
[2005] Bottom chord reinforced (bolted plates at 18 locations (contract).
[2011] Three bottom chord locations were reinforced as part of a "Critical Deficiency" (Span #4: South Truss L0-L1 at L0: Span #4: North Truss L0'-L1' at L0' and Span #5: North Truss L0-L1 at L0).
[2012] Additional bottom chord reinforcement (contract) - spot painting within 7 ft. of panel point connections.
[2008/2013] The bottom chord has surface corrosion with areas of flaking rust along the horizontal surfaces. There is pack rust (up to ½") with severe section loss (pitting up to 3/16" deep) at some gusset plate connections and at some batten plate connections. Some reinforcement plates have surface corrosion and section loss. Some lacing bars, especially in Span #4, are completely corroded through.
[2014/2016] The truss bottom chord has been reinforced at 32 of the 114 panel points due to section loss along the edge of the gusset plates. Bottom chord has surface corrosion (with some flaking rust) in the center sections that were not painted in 2012. The most significant active corrosion is in Span #4 near panel point L3.5 (both trusses). There are 26 locations where the bottom chord angles have significant pitting (15% - 29% section loss) and/or through corrosion – these may eventually need reinforcement…
Span #3 - Panel Points L0-N, L3'-S, and L1'-S
Span #4 - Panel Points L1-S, L1-N, L2-N, L3-N, and L2'-N
Span #5 - Panel Points L2-N, L3'-S, and L1'-S
Span #6 - Panel Points L1-S, L2-N, L3-S & L2'-N
Span #7 - Panel Points L0-N, L3-S, L3'-S, L2'-N, and L0'-S
Span #8 - Panel Points L0-N, L2-S, L2-N, L3'-N, L2'-S, and L2'-N

Truss End Diagonals:
[2011] Span #5 (South Truss) end diagonal L0'-U1' reinforced (by bridge crew) as part of a "Critical Deficiency".
[2012] Several truss end diagonals reinforced (contract). End diagonals spot painted (from the bottom chord to 10 ft. above deck).
[2014] Span #5 (North Truss) end diagonal L0'-U1' reinforced (by bridge crew).
[2014/2016] 11 of the 28 truss end diagonals have been reinforced (due to section loss at the deck level). The end diagonals on the south truss typically have section loss at the deck level at the bottom chord gusset plates. The end diagonals on the north truss typically have section loss at the railing connections and at the bottom chord gusset plates.

There are 13 locations with significant section loss (pitting and/or through corrosion) that may eventually need reinforcement…
Span #3 - North Truss L0-U1
Span #4 - South Truss L0-U1 & L0'-U1'
Span #5 - South Truss L0-U1
Span #6 - South Truss L0-U1; North Truss L0'-U1'
Span #7 - South Truss L0-U1 & L0'-U1'; North Truss L0-U1 & L0'-U1'
Span #8 - South Truss L0'-U1'; North Truss L0-U1
Span #9 - South Truss L0'-U1'

Truss Top Chord:
[2014] Minor paint failure and surface corrosion.

Truss Diagonal Members:
[2013/2016] The truss diagonals have extensive surface corrosion (with flaking rust and pack rust) extending from the deck level up about 10 ft. Some diagonals have pitting at the bottom chord gusset plates. On the north truss, the rail posts are contacting most of the truss diagonals, resulting in minor wear on the inside angles. Some diagonals have minor impact damage (mainly on the south truss). On some diagonals, angle members have been replaced due to previous impact damage.
Four truss diagonal members have significant section loss (pitting or holes rusted through) and may eventually need reinforcement.
Span #5: South truss diagonal U1-L2 (pitting at deck level)
Span #6: South truss diagonal L3'-U2' (pitting & hole at L3')
Span #7: South truss diagonal U1-L2 (pitting and hole just below deck)
Span #9: North truss diagonal U1-L2 (pitting and hole at deck level)

Truss Vertical Members:
[2012] Truss verticals L1/U1 & L1'/U1' were retrofit at the floorbeam connections, and spot painted up to the top rail.
[2013/2016] The truss verticals have extensive surface corrosion (with flaking rust and pack rust) extending from the deck level up about 10 ft.
The verticals have section loss at the bottom chord gusset plates, at the railing connections (north truss), and at other locations. Five truss verticals have significant section loss and may eventually need reinforcement.
Span #3 - South Truss L0'-U0' (pitting at deck)
Span #4 - South Truss L1/U1 (pitting and holes at L1)
Span #4 - South Truss L3.5/U3.5 (pitting an holes at L3.5)
Span #4 - South Truss L1'/U1' (pitting and hole at L1)
Span #8 - South Truss L1'/U1' (pitting and holes 6 ft. above deck)

[2003/2014] 20 truss members have been heat-straightened due to vehicular impact damage. Span 4 (South Vertical L2-U2 & South Vertical L2'-U2'): Span #6 (North Vertical L2-U2, South Vertical L3-U3 & South Diagonal U2-L3): Span #8 (North Vertical L2-U2, North Vertical L2-U2, South Vertical L3-U3, South Vertical L3'U3', North Vertical L3/-U3', South Vertical L2'-U2' & North Vertical L2'-U2'): Span #9 (South Vertical L2-U2, North Vertical L2-U2, South Vertical L3-U3, North Vertical L3-U3, South Vertical L3'-U3', North Vertical L3'-U3', South Vertical L2'/U2', & North Vertical L2'-U2').

[2019} PA Response: Based on the 2017 repair plans, many of areas recommended for repair in CS4 noted above have been made. Painted over section loss kept in the same condition state. Verify CS3 and CS4 quantities during the next inspection after repairs are finalized.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*65,000 SF*	*65,000*	*0*	*0*	*0*
		07-20-2016	*65,000 SF*	*3,250*	*16,250*	*32,500*	*13,000*

Notes: [2016] Painted area on steel truss (including bracing members) estimated at 65,000 SF
[2019] Organic zinc-rich paint system, green. 65000=CS 1.

152	STEEL FLOORBEAM	07-29-2019	1,828 LF	0	1,367	461	0
		07-20-2016	1,828 LF	0	1,297	461	70

Notes: Element quantity (1,828 LF) includes roadway floorbeams, lift girders (Span #4), sidewalk support brackets (south side), as well as supports for the lift house, electric house, traffic gate platforms, and lift shaft platform.

Roadway Floorbeams: (30" C.B. @ 115#) - 8 in each span.
[2001] Span #4: Floorbeam 0 - web reinforced due to through corrosion (both ends).
[2002] Span #6: Floorbeam 0' – web reinforced due to through corrosion (south end).
[2005] Bottom flanges on all roadway floorbeams reinforced with a bolted & welded cover plate (¾" x 12-1/4" x 22'-3"). New bent plate connections angles installed at some floorbeam/truss connections (19 locations).
[2008/2011] Roadway floorbeams webs and bottom flanges have pitting (up to 1/8" deep) at the truss connections.
[2012] Roadway floorbeam ends spot-painted. New truss connection angles installed on Floorbeams 1 & 1' (all 7 truss spans).
[2013/2016] The floorbeams have surface corrosion along top and bottom flanges and truss connections, along with

chalking paint. Isolated areas of severe pitting (painted over) are typical in the web and flanges at the truss connections. The center sections of the floorbeams (not spot painted in 2012) have surface corrosion. The end floorbeams typically have pitting throughout (due to past joint leakage). The end floorbeams adjacent to the lift span have extensive flaking rust, with extensive old pitting.
[2013] Span #6: Floorbeam 0' has a 2” horizontal crack in the top of the web at the North truss connections (monitor) - this appears to be due to loss of section at the cope (not fatigue).
[2016] Small cracks (or tears) in the top corner of the floorbeam webs (just above the truss connection angles) are now present at most of the truss end floorbeams (L0 and L0’).

Lift Girders (overhead at each end of Span #4) - end sections with counterweight cable connections are cast steel.
[2014] The lift girders have surface corrosion.

Sidewalk Support Brackets (there are a total of 57 overhang brackets supporting the sidewalk on the south side of the bridge)
[2012] Ten sidewalk support brackets repaired or replaced.
[2016] The sidewalk support brackets have severe corrosion and section loss, particularly on the top horizontal angles (located just below sliding plate joints in the sidewalk). The vast majority of these support brackets have holes rusted through the top horizontal angles and should be repaired or replaced.

Traffic Gate Supports (North side in Spans #3 & 5)
[2013/2016] The support beams for the Span #3 traffic gate platform have severe section loss (holes rusted through the web) at the truss connection. The Span #5 traffic gate platform was not re-installed properly after the 2005 re-decking. Approximately half of the curb connection bolts were not installed or were left loose. The platform is not level, and is partly supported by a temporary steel angle brace. The brace runes form the west end of the platform down to the truss bottom chord, and is not attached (bolted or welded) at either end. Both traffic gate platforms will be removed as part of the upcoming conversion to a pedestrian bridge.
[2019] PA Response: Sidewalk brackets in CS4 repaired. All the floorbeams have been previously repaired//strengthened and kept in CS2. Painted over section loss/pitting and noted cracked areas kept in CS3. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*17,060 SF*	*17,060*	*0*	*0*	*0*
		07-20-2016	*17,060 SF*	*1,530*	*7,800*	*2,650*	*5,080*

Notes: [2016] Painted area on steel floorbeams calculated to be 17,060 SF
[2019] Organic zinc-rich paint system, green. 17060=CS 1.

162	STEEL GUSSET PLATE	07-29-2019	252 EA	92	38	122	0
		07-20-2016	252 EA	0	127	122	3

Notes: Salt film, bubbled/peeled paint, flaking & surface rust, section loss: 1/8" pitting.

[2016] Gusset plate quantity of 252 includes the top chord, bottom chord, and mid-panel (M 3.5) truss connections. The gusset plates for the lift towers (Spans #3 & 5), lift girders (Span #4), and L3.5 connections (Span #4) are also included.
[2011/2016] The top chord gusset plates have chalking paint, with some paint failure and surface corrosion. They have little or no pack rust or pitting, and are generally rated as CS 2.
[2014/2016] The mid-panel (M 3.5) gusset plates have more extensive paint failure and surface corrosion, with some pack rust, flaking rust, and pitting. They are generally rated as CS 2 or CS 3.

Bottom Chord Gusset Plates
[2012] Truss bottom chord panel points spot-painted (excluding the L3.5 connections in Span #4). The L1 & L1' connections were retrofit (the interior connection plates were replaced, eliminating some of the most severe pack rust).
[2014/2016] The bottom chord gusset plates have extensive pitting (mostly painted over) the pitting is moderate to severe, with isolated areas of through corrosion. There are some areas of active flaking rust. UT thickness readings were taken on numerous bottom chord gusset plates during the 2011 & 2013 inspections. The bottom chord gusset plates have pack rust along the truss bottom chord - the pack rust spreading is typically 1/4" to 1/2", and has resulted distortion of most bottom chord gusset plates (typically up to 3/16"). The bottom chord gusset plates are generally rated as CS3. Three bottom chord gusset plate connections are of high concern (rated as CS 4), and will be reinforced during the upcoming repair project.

Span #3 - South Truss - L0’ (West Lift Tower): Interior gusset plate has a 5” x 3” hole (just above the truss end diagonal).
Span #4 - South Truss - L0’ (Lift Span): Both gusset plates have pitting (and small holes) just above the bottom chord and around the end diagonal. UT readings were taken in 2011 and in 2013. The above deck portions of the gusset plates (below the top cover plate) have extensive flaking rust.
Span #5 - South Truss - L0 (East Lift Tower): The interior gusset plate has a 10” x 5” hole (just above the truss end diagonal).

The following truss connections have significant pitting and/or active corrosion on the gusset plates, but are not yet rated as condition state 4. Most of these locations are on the south truss.

Span #3 South Truss L2
Span #3 South Truss L3
Span #3 South Truss L3'
Span #3 North Truss L3'
Span #3 North Truss L0'
Span #4 South Truss L0
Span #4 South Truss L3
Span #4 South Truss L3.5
Span #5 South Truss L3
Span #5 South Truss L3'
Span #5 North Truss L0
Span #5 North Truss M3.5
Span #6 South Truss L3
Span #6 South Truss L3'
Span #7 South Truss L3
Span #8 South Truss L2'
Span #8 South Truss M3.5
Span #8 North Truss L3'
Span #8 North Truss M3.5
Span #9 South Truss L3
Span #9 South Truss L3'
[2019] PA Response: Gusset plates in CS4 repaired and moved to CS2. Upper joints in CS2 had minor surface rust and moved to CS1. Remaining CS2 gusset plates kept in CS2. Painted over flaking rust, pitting, pack rust kept in CS3. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*10,000 SF*	*10,000*	*0*	*0*	*0*
		07-20-2016	*10,000 SF*	*500*	*2,500*	*5,500*	*1,500*

Notes: [2016] Painted area on steel gusset plates estimated to be 10,000 SF.
[2019] Organic zinc-rich paint system, green. 10000=CS 1.

207	STEEL COLUMN TOWER (TRESTLE)	07-29-2019	2 LF	0	2	0	0
		07-20-2016	2 LF	0	2	0	0

Notes: Two lift towers (integral with truss in spans 3 & 5).
[2019] PA Response: Painted over pack rust and pitting kept in CS2.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*16,000 SF*	*16,000*	*0*	*0*	*0*
		07-20-2016	*16,000 SF*	*0*	*11,200*	*4,000*	*800*

Notes: [2016] Painted area on lift towers roughly estimated as 16,000 SF.
[2019] Organic zinc-rich paint system, green. 16000=CS 1.

231	STEEL PIER CAP	07-29-2019	27 LF	27	0	0	0
		07-20-2016	27 LF	21	6	0	0

Notes: [1981] Steel cap installed at the west end of span 10 - W30 x 108 rolled steel beam (26'-9" long) supported by two small concrete columns.
[2019] PA Response: Minor corrosion noted during the previous inspection, and moved to CS1 after being repainted.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*226 SF*	*226*	*0*	*0*	*0*
		07-20-2016	*226 SF*	*0*	*196*	*20*	*10*

Notes: [2016] Painted area on steel pier cap calculated to be 226 SF.
[2019] Organic zinc-rich paint system, green. 226=CS 1.

205	REINFORCED CONCRETE COLUMN	07-29-2019	26 EA	1	22	3	0
		07-20-2016	26 EA	1	22	3	0

Notes: Pier 1 has 4 columns with a cap. Pier 2 is a solid pier with 4 "columns" on the west face, and 2 "columns" on the east face. Piers 3-8 consist of two "columns" connected by a "pier wall". East Abutment: the truss bearing pedestals are "columns", and there are two stub columns (added in 1975), supporting the steel cap.
[2005/12] Concrete repairs (by contract): above & below waterline.

East Abutment/Pier #9: [1935] Truss bearing seats leveled with concrete due to settlement. Both bearings seats have subsequently been raised due to continued long-term settlement (additional concrete layer and steel masonry plates).

[2019] PA Response: Concrete columns kept in previous condition state. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

210	REINFORCED CONCRETE PIER WALL	07-29-2019	170 LF	0	140	30	0
		07-20-2016	170 LF	0	140	30	0

Notes: This element includes the web walls between the columns on Pier #2-9. (30 LF on Pier #2 and 20 LF on Piers #3-9).
[2005] Patching (by contract) on columns (above waterline).
[2012] Concrete repairs (by contract) - below waterline.

[2013] Underwater inspection found sound concrete on submerged portions (no heavy scale or spall).
[2014] Inspection limited due to high water. Moderate surface scale on visible portions, with some scattered leaching cracks and rust stains.
[2016] Pier #3: Some patched areas on the east face have leaching map cracks. Pier #4: The patched areas along the top west face have leaching map cracks.

[2019] PA Response: Concrete pier wall kept in previous condition state. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

215	REINFORCED CONCRETE ABUTMENT	07-29-2019	76 LF	0	70	6	0
		07-20-2016	76 LF	0	64	12	0

Notes: The East Abutment was originally constructed as a hollow U-type abutment with a 30 ft. span. Settlement issues began shortly after construction, and repairs were required in 1935 due to the abutment tipping westward and northward. The East Abutment was reconstructed in 1981 - the hollow abutment was replaced with an 11 ft. steel beam span (supported by a steel pier cap), and the east parapet was reconstructed. [2013/2016] The entire abutment is visibly tilted to the north (and tilted to the west) due to past settlement. The truss bearing alignment indicates that there has been some westward movement of the abutment since the elastomeric pads were installed in 2002. While there appears to be no significant settlement since 1981, this should be verified with a survey.
[2005] Concrete repairs on East Abutment.
[2012] Concrete repairs on East Abutment.
[2011/2016] East abutment parapet has cracking on the east end. The south end of the east abutment parapet is completely undermined – voided area extends up to 18” behind wingwall. The south end also has staining (charred from fire), with minor cracking, moderate scale, and minor spalling along the edges. The top edge of the parapet has spalling below the sidewalk, and there is spalling along the top edge of the bearing seat for the Span #10 beams. Graffiti is heavy.
[2011/2014] West abutment has three vertical leaching cracks, extending down from the parapet about halfway down the abutment face. These cracks were sealed at some point, but the repair is now deteriorating. The abutment has minor surface scale throughout.

[2019] PA Response: East abutment was repaired, with 6 LF moved to CS2 from CS3. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

220	REINFORCED CONCRETE FOOTING	07-29-2019	140 LF	0	140	0	0
		07-20-2016	140 LF	0	140	0	0

Notes: [2013 Underwater inspection report. The footings and/or seals were exposed at piers 5-8, with a minor undermining cavity at pier 8.
[2016] Underwater Inspection: The footing of pier 5 was fully exposed around the entire perimeter of the pier with vertical seal exposure observed intermittently, ranging up to 2.5 feet at the upstream end. The footing of pier 6 was fully exposed around the entire perimeter of the pier with vertical seal exposure observed intermittently, ranging up to 3 feet at the upstream end. The footing of pier 7 was fully exposed around the entire perimeter of the pier with vertical footing exposure ranging up to 4-feet (full footing height) . Intermittent top of seal exposure of pier 7 was observed. The footing of pier 8 was fully exposed around the entire perimeter of the pier with 4 feet of, or full, vertical exposure. The seal of pier 8 was exposed along the upstream face where undermining was observed, with a cavity measuring up to 6 inches high and up to 1 foot of maximum horizontal penetration. The concrete seal of pier 8 was also partially exposed at the southeast corner with 6 inches of maximum vertical exposure. 0=CS 1; 140=CS 2

234	REINFORCED CONCRETE PIER CAP	07-29-2019	70 LF	0	56	14	0
		07-20-2016	70 LF	0	56	14	0

Notes: Piers 1 & 2 only.
[2011/2014] Both caps have light scale and some vertical leaching cracks. These cracks were sealed at some point, but the repair is now deteriorating. Pier #2 has a 1 LF section of exposed rebar on the west face (south "arch"). The Pier #2 parapet has a 2 SF spall (exposed rebar rusted through) on the east face behind the north truss bearing.
[2019] PA Response: Concrete pier caps kept in previous condition state. Verify CS2 and CS3 quantities during the next inspection after repairs are finalized.

310	ELASTOMERIC EXPANSION BEARING	07-29-2019	12 EA	0	0	12	0
		07-20-2016	12 EA	0	0	12	0

Notes: [2002] Original truss rollernest expansion bearings replaced with elastomeric pads - original sole plate assemblies, rotation pins, and masonry plates left in place. These are located at the expansion end of Spans 3, 5, 6, 7, 8 & 9 (total of 12 elastomeric expansion bearings).
[2005] Anchorage angle (with 8” expansion slot) installed on east truss expansion bearing.
[2013] The anchor nuts on the many of the anchorage angles (installed in 2005) were not fully tightened.
[2011/2016] The original steel components of the truss bearings have surface corrosion, flaking rust, and pitting (CS 3). The coverings on the elastomeric pads have minor wear.
[2014/2016] Some of the truss bearings have expanded beyond the design limits. At the East Abutment, the south truss bearing is 4-1/2” in expansion (measured from upper plate to masonry plate), 2” beyond design original limits. The elastomeric pad is tilted east in expansion, but is still on the masonry plate (no loss of bearing area). At Pier #2, the North truss bearing is 2-1/2” in expansion (near limits) at 80° F. - the gap at the parapet is only ½” .

[2019] PA Response: Elastomeric bearings kept in previous condition state. Verify CS3 quantity during the next inspection.

311	EXPANSION BEARING	07-29-2019	4 EA	0	0	4	0
		07-20-2016	4 EA	0	0	4	0

Notes: 4 bearings supporting the lift span (span 4) - they consist of a curved plate bearing upon a masonry plate (upper section is free to slide).
[2014/2016] Masonry plates have extensive surface corrosion and flaking rust (CS 3).

[2019] PA Response: Movable bearings kept in previous condition state. Verify CS3 quantity during the next inspection.

313	FIXED BEARING	07-29-2019	12 EA	0	8	4	0
		07-20-2016	12 EA	0	0	12	0

Notes: Fixed end of truss spans #3, 5, 6, 7, 8 & 9 (total of 12). The upper assembly has a pin to allow for rotation, the truss sits on a 5" high cast iron (voided) masonry plate.
[2011/2016] Fixed bearings have paint failure, surface corrosion, flaking rust, and pitting (CS 3).

[2019] PA Response: Fixed bearings repaired at Spans 6, 7, 8 and 9 (8 total). Remaining fixed bearings kept in CS3. Verify CS3 quantity during next inspection.

148	STEEL SECONDARY CABLE	07-29-2019	40 EA	40	0	0	0
		07-20-2016	40 EA	0	40	0	0

Notes: The lift span is supported by 32 counterweight cables (1 1/2" diameter) and 8 "uphaul/downhaul" cables (3/4" diameter).
[2019] Counterweight ropes replaced, see mechanical plan. 40=CS 1.

515	*STEEL PROTECTIVE COATING*	*07-29-2019*	*1,376 SF*	*1,376*	*0*	*0*	*0*

Notes: 32 x 87 ft x 1.5" cables @ 34 SF each
2 x 164 ft x 7/8" cables @ 37 SF each
2 x 175 ft x 7/8" cables @ 40 SF each
2 x 140 ft x 7/8" cables @ 32 SF each
2 x 151 ft x 7/8" cables @ 35 SF each

Total = 1376 SF

855	SECONDARY MEMBERS (SUPER)	07-29-2019	1 EA	0	0	1	0
		07-20-2016	1 EA	0	0	1	0

Notes: Secondary structural elements include truss portal bracing, sway bracing, upper lateral bracing, and lower lateral bracing (span 4 only). Lift span components (tower sheaves, deflection sheaves, and counterweights) are also included in this element (until the new "complex" bridge elements are introduced).
[2005] Lower lateral bracing removed from truss spans 3, 5, 6, 7, 8 & 9.

[2019] PA Response: Secondary members kept in previous condition state. Verify CS3 quantity during the next inspection.

861	NON-INTEGRAL RETAINING WALL	07-29-2019	4 EA	4	0	0	0
		07-20-2016	4 EA	2	0	2	0

Notes: The west abutment has 4 adjacent retaining walls, two upper curved retaining walls and two lower retaining walls (running along the roadway below span 1).
[2019] Concrete repair contract, 4=CS 1.

880	IMPACT DAMAGE	07-29-2019	1 EA	0	0	1	0
		07-20-2016	1 EA	0	0	1	0

Notes: [2019] Heat straightening & structural reinforcement, see Files in this report. 0=CS 1; 1=CS 2.

[2019] PA Response: Numerous impact locations noted throughout this bridges history with heat straighten and strengthening efforts used to repair. See previous inspection for locations. It is generally typical on the upper lateral bracing of the truss spans. Condition kept at CS3 due to member bent out of plane, but remain intact.

881	STEEL SECTION LOSS	07-29-2019	1 EA	0	0	0	1
		07-20-2016	1 EA	0	0	0	1

Notes: [2019] PA Response: This CS4 element quantity was reviewed by the Program Administrator and currently does not impact the bridge's structural integrity. A load rating was performed on this bridge by a consultant prior to the planned 2017 repairs. Areas with more than 10% section loss (CS4) were evaluated and repaired if the load capacity requirements were not met. Some areas with CS4 section loss met capacity demands and were not included in the current rehab project.

882	STEEL CRACKING	07-29-2019	1 EA	0	0	1	0
		07-20-2016	1 EA	0	0	1	0

Notes: [2019] Structural reinforcement, see Files in this report. 0=CS 1;1=CS 2.

[2019] PA Response: Cracking exists and has not been arrested. A load rating was performed on the bridge by a consultant, and areas which did not meet load capacity requirements were identified for repair in the current 2017 rehab project.

884	SUBSTRUCTURE SETTLEMENT & MVMT	07-29-2019	1 EA	0	0	1	0
		07-20-2016	1 EA	0	0	1	0

Notes: [1935] Truss bearing seats on east abutment leveled with concrete due to tipping and settlement.
[1958] Additional repairs to east abutment bearing seats (concrete layer and steel masonry plates).
[1981] East abutment significantly modified (original hollow abutment replaced with shorter steel beam span).
[2011/2016] The riprap under the south end of the east abutment parapet has settled, leaving a gap on the underside of the parapet wall.

[2019] PA Response: Substructure settlement kept in previous condition state. Verify CS3 quantity during the next inspection.

885	SCOUR	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	1	0	0	0

Notes: The Saint Croix River channel is constricted at the bridge due to the 700 FT causeway which forms the Wisconsin approach. The area below the west approach spans is frequently flooded. High water in 1997, 2001, & 2014 caused the bridge to be closed for an extended period.
[1974] Scour protection (riprap) placed around piers 6, 7, & 8.
[1991] Underwater inspection found minor scour on piers 6 & 7 (2 FT of the footing face was exposed).
[1994] Sonar readings found minor scour at piers 6, 7, & 8.
[1996] Scour evaluation - MnDOT scour Code "N". Scour calculations indicate that piers would become unstable if more that 16 FT of piling were exposed.
[2004] Underwater inspection found exposed footings at piers 3, 5, 6, 7, & 8, and exposed seals at piers 5, 7, & 8.
[2008] Underwater inspection found minor scour depressions around the upstream nose of piers 3-5 and footing exposure at piers 3, 5, 6, 7, and 8. The footing exposure was consistent with previous inspection findings, except for pier 8, where up to 6" of vertical undermining was noted around the upstream end of the pier.
[2013] Underwater inspection found some footing and seal exposure at piers 5-8, with a minor undermining cavity under the seal at pier 8. The report noted that this was not currently a significant structural concern given the current extent and the fact that piers are pile supported. Continued monitoring during future underwater inspections was recommended.

890	LOAD PST OR VERTICAL CLR SIGNING	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	1	0	0	0

Notes: [1994] Bridge posted with weight restrictions (28/40/40). Signs at both ends, and well in advance on approaches.
The vertical clearance on the bridge is posted at 13'-2" (signs at both ends, and well in advance on approaches), the vertical clearance below span 1 (park road) is posted at 9'-6".
[2016] All load posting and vertical clearance signs are in place and in good condition.
[2019] Pedestrian trail, 1=CS 1.

891	OTHER BRIDGE SIGNING	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	1	0	0	0

Notes: [2019] Pedestrian trail, 1=CS 1, note additional signing on next inspection.

892	SLOPES & SLOPE PROTECTION	07-29-2019	1 EA	0	1	0	0
		07-20-2016	1 EA	0	1	0	0

Notes: There is loose riprap slope protection around the east abutment and along the east approach causeway.
[2014] The riprap along the east approach causeway is overgrown with trees.
[2019] 0=CS 1; 1=CS 2.

894	DECK & APPROACH DRAINAGE	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	1	0	0	0

Notes: The deck drains directly into the St. Croix River. Deck drains are located along the curb - 14 drains in each truss span and 2 drains in span 2.
[2005] Drain downspouts in the truss spans extend below the stringer bottom flanges.
[2019] 1=CS 1.

895	SIDEWALK, CURB, & MEDIAN	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	0	1	0	0

Notes: [1998] Sidewalk replaced on truss spans (concrete-filled steel grid panels).
[2019] Concrete repair contract, 1=CS 1.

899	MISCELLANEOUS ITEMS	07-29-2019	1 EA	1	0	0	0
		07-20-2016	1 EA	0	0	0	1

Notes: [2005] Tender house repaired, electrical house constructed, lift tower lateral bracing modified, mechanical improvements (all in span 4). Lower St. Croix National Scenic Riverway.
[2012] A number of repairs/modifications were made to the tender house, lifting mechanism of span 4, and some electrical work.
[2016] There is a USGS monitoring device (with a solar panel) mounted on the south railing at pier 5.
[2019] Structural reinforcement, see Files in this report. Two pedestrian gates, 5 each Bollard (pier), Lighting system A; CCTV system; Control system, PA system, Power system & Signal system. Concrete circle pavement replaced. 1=CS 1.

900	PROTECTED SPECIES	07-29-2019	1 EA	0	0	1	0
		07-20-2016	1 EA	0	1	0	0

Notes: [2019] Numerous cliff swallow and barn swallow nests are present on the underside of the truss spans. No bats have ever been observed during bridge inspections. 0=CS 1; 0=CS 2; 1=CS 3.

General Notes: Bridge 4654 Year 2019
Stillwater Vertical Lift Bridge constructed in 1930-31.

MnDOT is considered the "Lead Agency" for scheduled contract work, inspections and maintenance of this bridge. The Wisconsin bridge number is B-55-0919.

[2019] PA Note: At the time of the inspection on July 29, 2019, major bridge improvements were ongoing. The inspection performed was a routine inspection, and did not include hands-on access to all elements. Rehab efforts included painting of all steel elements, and repairs on the superstructure, substructure and sidewalk. Span 6 was not in place and temporarily moved to a different work site location downstream of bridge. The NBI ratings were assessed based on the condition at the time of this routine inspection. Bridge element condition state quantities were based on the 2017 contract plans for repair. As-built plans to be used to evaluate the final repaired condition during the next inspection cycle in 2020.

[1930] Original construction contract
[1935] East Abutment repaired (settlement issues)
[1953] Bridge repainted by contract (lead system)
[1954] Electric Warning Lights & Gate System Installed (contract)
[1958] East Abutment repaired (settlement issues)
[1971] Lift span counterweight cables replaced
[1973] Bridge re-decked (4-1/2" bare concrete deck) by contract
[1974] Scour protection (riprap) placed at Piers #6, 7, & 8
[1979] Lighting & signal contract (lift motor & navigation lights replaced)
[1981] Short span at East Abutment reconstructed (Wisconsin contract)
[1982] Bridge repainted by contract (Organic Zinc/Vinyl system)
[1994] Bridge posted with weight restrictions (28/40/40) - overweight permits no longer being issued.
[1998] Sidewalk on truss spans replaced, 2 sidewalk stringers added, ornamental steel railing repairs.
[2002] Truss bearings replaced, spot painting on bottom chord panel points, ornamental steel railing repairs.
[2003] Additional structural repairs completed by the Forest Lake bridge crew.
[2005] Repair contract - Truss spans re-decked, Low slump overlay on approach spans, some stringers replaced, floorbeams reinforced, structural repairs on truss members, ornamental railings rehabilitated (shop painted) lift mechanism & lift house rehabilitation (new electric house added).
[2012] Repair contract - Structural repairs, Retrofit at L1 & L1' connections, spot painting at bottom chord panel points. See supplemental plan sheets for additional structural repairs not included on original plans.
[2019] Repair contract: see Files in this report.

1994 Inspectors: T Moravec /K Fuhrman /P Wilson
1995 Inspectors: T Moravec /M Lacy /P Wilson
1996 Inspectors: T Moravec /K Fuhrman /P Wilson
1997 Inspectors: K Fuhrman /P Wilson
1998 Inspectors: K Fuhrman /P Wilson
1999 Inspectors: M Pribula /K Fuhrman /P Wilson
2000 Inspectors: P Wilson /G Morelli /R Lane
2001 Inspectors: P Wilson /K Fuhrman /T Nowaczyk
2002 Inspectors: P Wilson /K Fuhrman /M Pribula /V Desens
2003 Inspectors: P Wilson /K Fuhrman /M Pribula /V Desens /J Flannigan /B Nelson /K Rand
2004 Inspectors: K Fuhrman /M Pribula /V Desens /M Hamri
2005 Inspectors: No inspection - bridge closed (under reconstruction)
2006 Inspectors: K Fuhrman /V Desens
2007 Inspectors: K Fuhrman /V Desens
2008 Inspectors: K Fuhrman /V Desens /M Pribula
2009 Inspectors: K Fuhrman /V Desens /M Pribula /C Hoberg
2010 Inspectors: K Fuhrman /C Hoberg
2011 Inspectors: J Zink /K Rand /M Pribula /C Hoberg /J Fishbein /D Hedeen /R Rohne /K Fuhrman /V Desens /S Theisen
2012 Inspectors: M Pribula /C Hoberg
2013 Inspectors: P Wilson /K Fuhrman /M Pribula /J Zink /B Nelson /K Rand /F Potter /C Hoberg
2014 Inspectors: J Lundeen /P Wilson /J Zink /B Nelson /K Rand /S Theisen /M Pribula /J Johnson
2015 Inspectors: K Fuhrman/J Lundeen
2016 Inspectors: P Wilson /J Fishbein /B Nelson /K Rand /F Potter/S Theisen/ R Carter/ K Fuhrman/J Lundeen
2019 Inspectors: K Fuhrman/ J Lundeen (under construction until October)

Deck: [7] [2005] Truss spans re-decked, low slump overlay installed on spans 1, 2 & 10.
[2019] Leaching cracks bottom span 1 & 2.

[2019] PA Response: NBI rating of 7 reviewed and confirmed. Repairs to the deck were ongoing at the time of the inspection. The NBI deck value for this bridge was evaluated based on the condition at time of the inspection (July 29, 2019).

Brdg Railings: [N] [2019] PA Response: Structure is a pedestrian bridge no longer open to vehicular traffic, re-coded to "N" per BSIPM.

Transitions: [N] [2019] PA Response: Structure is a pedestrian bridge no longer open to vehicular traffic, re-coded to "N" per BSIPM.

Appr Guardraill: [N] [2019] PA Response: Structure is a pedestrian bridge no longer open to vehicular traffic, re-coded to "N" per BSIPM.

Appr Guardrail Terminal : [N] [2019] PA Response: Structure is a pedestrian bridge no longer open to vehicular traffic, re-coded to "N" per BSIPM.

Superstructure: [6] [2005/12] Rehabilitation project includes replacement of some stringers and structural reinforcement at various locations.
[2019] Organic zinc-rich paint system, structural reinforcement: see files in this report.
[2019] PA Response: NBI rating raised to 6 from 4 and has been reviewed and confirmed. Major improvements to the superstructure were ongoing at the time of the inspection. The bridge is the process of being converted from a highway bridge to a pedestrian bridge; some areas which exhibited deterioration/section loss did not require strengthening due to lower load capacity demand. The truss was strengthened based on load rating calculations performed by a consultant. The NBI superstructure value for this bridge was evaluated based on the condition at time of the inspection (July 29, 2019) and should be evaluated again in 2020 after the repair contract and as-built plans are finalized.

Substructure: [6] [2005/12] Concrete patching (by contract) on substructure areas above & below the waterline.
[2019] Substructure has minor deterioration.
[2019] PA Response: NBI rating of 6 reviewed and confirmed. Major improvements to the substructure were ongoing at the time of the inspection. The NBI substructure value for this bridge was evaluated based on the condition at time of the inspection (July 29, 2019).

Channel: [6] [2009] Channel rating lowered from 7 to 6 based upon 2008 Underwater Inspection report.
[2013] Underwater Inspection found some footing and seal exposure at Piers #5-8, with a minor undermining cavity under the seal at Pier #8. The underwater inspection report noted that this is not a significant structural concern, given the current extent and the fact the piers are pile supported. Next underwater inspection scheduled for 2016.
[2016] Underwater Inspection - Overall, comparison of the existing channel bottom configuration with the previous underwater inspection findings in 2013 revealed no significant changes to the streambed. Minor scour depressions noted during previous inspection around the upstream nose of Piers 3 through 5 did not increase in extent and continue to be of no significant concern. Pier footing exposure was noted at Piers 5, 6, 7, and 8. Generally, the footing and seal exposures were comparable to the findings of the previous underwater inspection and have not increased appreciably in the extent.
[2019] NBI rating of 6 reviewed and confirmed.

Waterway Adeq: [2] Spring flooding often necessitates the closure of the bridge as floodwaters encroach upon the approach roadway, the lower chord, and the sensitive electronic equipment located in the lift span. High water in 1997, 2001, & 2014 caused the bridge to be closed for an extended period. During flooding events the lift span is raised to a safe level and temporary concrete "Jersey" barrier is used as ballast on the stationary spans. The park roadway below Span #1 is frequently closed due to high water.

Appr Roadway Alignment: [N] [2019] PA Response: Structure is a pedestrian bridge no longer open to vehicular traffic, re-coded to "N" per BSIPM. Previously coded as 2 when operating as a roadway bridge.

Appendix F. Applicable Standards

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Applicable Standards

Bridge Specifications and Standards

- AASHTO Standard Specifications for Moveable Bridges, 2007 (2nd Edition with Interims)
- AASHTO Standard Specifications for Highway Bridges, 2002 (17th Edition)
- MnDOT LRFD Bridge Design Manual
- Bridge Preservation, Improvement, and Replacement Guidelines

Mechanical Specifications and Standards

- AGMA 2001 – C95 and AGMA 390.03

Electrical Specifications and Standards

- National Electric Code (NFPA 70)
- Electrical Standard for Industry Machinery (NFPA 79)
- Manual on Uniform Traffic Control Devices (MUTCD)
- National Electrical Manufacturers Association (NEMA)
- Institute for Electrical and Electronic Engineers (IEEE)
- Underwriters Laboratories

Pedestrian/Bicycle Specifications, Standards, and Guidelines

- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, July 2004
- AASHTO Policy on Geometric Design of Highways and Streets, 2018
- The ADA Standards for Accessible Design, 2010
- FHWA Designing Sidewalks and Trails, Part II, Best Practices Design Guide, September 2001
- MnDOT Bikeway Facility Design Manual, 2007
- Revised Draft Guidelines for Accessible Public Rights-of-Way 2005
- Public Rights-of-Way ADA Guidelines, 2005

Section 106 Standards for Historic Properties

- Secretary of the Interior's Standards for the Treatment of Historic Properties

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Appendix G. Cost Details

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MnDOT Historic Bridge Management Plan

Bridge No. 4654 Maintenance Activity Listing and Costs

UPDATED *12/3/2019*

OPERATIONS

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)
1	Bridge Tender	Operate Br.	$120,000	4	6	10	$2,400,000
2	Electricity & Phone	Provide Service	$6,800	4	6	10	$136,000
3	Admin, Coord, Training, & Misc	Main. Records	$7,300	4	6	10	$146,000
			Projected Costs:	$536,400	$804,600	$1,341,000	$2,682,000
			Annualized Cost:	$134,100			

ROUTINE MAINTENANCE

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)
4	Remove Flood Water Debris	Remove & Discard	$12,300	1	2	3	$73,800
5	Flush Deck, drains, exp. joints, sub-struct.	Wash, Clean & Flush	$3,600	4	6	10	$72,000
6	Seal Cracks w/ Epoxy by Chase Method	Crack Sealing	$13,575		1	2	$40,725
7	Silane 100 Percent	Apply to Deck	$32,593		1	2	$97,779
8	Grease Bearings	Brg Maintenance	$10,800		1	1	$21,600
9	Steel Truss - Caulk Steel Seams	Caulk	$93,150		1	1	$186,300
10	Concrete Surface - Remove Loose Concrete	Concrete Repair	$2,916		1	1	$5,832
11	Counterweight Wire Ropes	Clean & lubricate	$11,400	4	6	10	$228,000
12	Gears/Bearing/Shaft	Clean & lubricate	$6,400	4	6	10	$128,000
13	Couplings	Clean & lubricate	$3,200	1	1	2	$12,800
14	Operating Wire Ropes & Take-Up Devices	Clean / Lub / Adj.	$3,800	4	6	10	$76,000
15	Main Drive Motor	Insp/clean/Lub	$900	4	6	10	$18,000
16	Gear Reducers	Clean & lubricate	$5,900	1	1	2	$23,600
17	Auxiliary Drive Motor	Insp/clean/Lub	$600	4	6	10	$12,000
18	General annual control syst maintenance	Clean, test adjust	$6,900	4	6	10	$138,000
19	Pedestrain Barriers (Gates)	Clean & lubricate	$2,200	4	6	10	$44,000
20	Trail Signs	Repair Signs	$400	4	6	10	$8,000
	City of Stillwater Items						
21	Sweep Clean Deck	Sweep	$0	4	6	10	$0
22	Trail Snow Plowing	Plow	$0	4	6	10	$0
23	Trail Striping	Repair Striping	$0	4	6	10	$0
			Projected Costs:	$166,200	$403,934	$616,302	$1,186,436
			Annualized Cost:	$59,322			

Inspections

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)
24	Mech. & Elect. Inspection	Annual Inspection	$7,200	4	6	10	$144,000
25	Structural Inspection (Safety Inspection)	2-Year Inspection	$19,400	2	3	5	$194,000
26	Underwater Inspection	4-year Inspection	$24,300	1	2	2	$121,500
27	In-Depth Structural Inspection (FC Inspection)	6-Year Inspection	$36,400	1	2	2	$182,000
			Projected Costs:	$128,300	$222,800	$290,400	$641,500
			Annualized Cost:	$32,075			

Reactive Repairs

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)
28	Scour Repair	Add Riprap	$7,300	1	1	1	$21,900
29	Graffiti Removal & Vandalism Repair	Clean & Repair	$1,000	4	6	10	$20,000
30	Structural Analysis & Rating	Struct. Rating	$72,800		1		$72,800
31	Remove & Patch Deck - Type D	Repair Deck	$7,335		1		$7,335
32	Remove & Patch Deck - Type E	Repair Deck	$97,780		1		$97,780
33	Remove & Patch Deck - Type F	Repair Deck	$13,852		1		$13,852
34	Replace Exp Joint Gland	Joint Maintenance	$27,300		1		$27,300
35	Steel Truss - Spot Painting	Truss Steel Painting	$680,400			1	$680,400
36	Concrete Surface Repair - Historic Slab Spans 1 & 2	Concrete Repair	$50,000		1	1	$100,000
37	Concrete Surface Repair - Historic Ballustrade	Concrete Repair	$12,500		1	1	$25,000
38	Concrete Surface Repair - Pier Top Repair Form & Pour	Concrete Repair	$94,500		1	1	$189,000
39	Lamp Replacement - NAV LED (10 each, 10 yr life)	Replace Lamps	$4,900		1	1	$9,800
40	Lamp Replacement - Rdwy LED (25 each, 10yr)	Replace Lamps	$24,300		1	1	$48,600
41	Lamp Replacement - Orn Walkway LED (8 each, 10 yr)	Replace Lamps	$6,800		1	1	$13,600
42	Operating Wire Ropes	Replace	$24,300		1	1	$48,600
43	Operating Rope Wear Plates	Replace	$9,100	1	1	2	$36,400
44	Aerial Cables (Festoon Cables)	Replace	$35,000	1	1	2	$140,000
45	Reactive Repairs (Replace/Repair items damaged from pedestrian, bike, vehicle or boating incidents)	Repair, Replace	$3,000	4	6	10	$60,000
	City of Stillwater Items						
46	Lamp Replacement - Orn Concourse LED (10 each, 10 yr)	Replace Lamps	$0		1	1	$0
47	Lamp Replacement - Rdwy under Spans 1&2 LED (2 each, 10 yr)	Replace Lamps	$0		1	1	$0
			Projected Costs:	$67,400	$511,767	$1,033,200	$1,612,367
			Annualized Cost:	$80,618			

MnDOT Historic Bridge Management Plan

Bridge No. 4654 Future Preservation Activity Listing and Costs

UPDATED *12/3/2019*

FUTURE PRESERVATION

See next section for Description of Repairs

Future Preservation - Substructure

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
1	W. Concourse Concrete Patching & Surf. Treat.	Repair	$18,000			1	$18,000	
2	West Abut. Concrete Patching & Surf. Treat.	Repair	$12,000			1	$12,000	
3	Pier 1 Concrete Surface Repairs	Repair (20 + years)	$12,000				$0	$12,000
4	Piers 2 to 8 Concrete Surface Repairs	Repair (20 + years)	$1,110,000				$0	$1,110,000
5	E. Abut Concrete Surface Repair	Repair	$33,000			1	$33,000	
6	E. Abut Settlement Adjustments	Jack & Fill Pedestal	$28,000			1	$28,000	
7	E. Abut. Slope Protection	Add Riprap	$4,000			1	$4,000	
8	Substruct. E. Abut. Foundation Stabilization	Repair	$425,000				$0	$425,000
			Projected Costs:	$0	$0	$95,000	$95,000	$1,547,000
			Annualized Cost:	$4,750				

Future Preservation - Superstructure - Truss Spans

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
9	Superstructure Bearings	Replace (20 + years)	$70,000				$0	$70,000
10	Stringers	Struct. Repair	$24,000			1	$24,000	
11	Floor Beams	Struct. Repair	$64,000			1	$64,000	
12	Lower Chord Members	Struct. Repair	$80,000			1	$80,000	
13	Truss Webs (Vertical & Diagonals)	Struct. Repair	$4,000			1	$4,000	
14	Gusset Plate Repairs	Struct. Repair	$38,000			1	$38,000	
15	Truss End Posts	Struct. Repair	$12,000			1	$12,000	
16	Truss Lower Lateral Bracing	Lft. Span Only	$6,000			1	$6,000	
17	Truss - Portal Frames	Misc. Repair	$30,000			1	$30,000	
18	Truss - Interior Sway Bracing	Misc. Repair	$30,000			1	$30,000	
			Projected Costs:	$0	$0	$288,000	$288,000	$70,000
			Annualized Cost:	$14,400				

Future Preservation - Sidewalk Support System

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
19	Standard Support Brackets	Repair (20+ years)	$9,700				$0	$9,700
20	Lift-Span Support Brackets	Repair (20+ years)	$9,700				$0	$9,700
21	Fascia Stringer	Repair	$19,400			1	$19,400	
22	Stringers	Repair	$22,000			1	$22,000	
			Projected Costs:	$0	$0	$41,400	$41,400	$19,400
			Annualized Cost:	$2,070				

Future Preservation - Deck

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
23	Drainage System	Repair	$1,800		1	1	$3,600	
24	Sidewalk Deck	Seal	$5,000		2	2	$20,000	
25	Sidewalk Deck	Patch	$5,500		1	1	$11,000	
26	Deck Expansion Joints	Clean & Adjust	$2,000		2	2	$8,000	
27	Deck Expansion Joints	Replace (20 + years)	$140,000				$0	$140,000
28	Ped/Bike Deck Spans 3-9	Replace (20 + years)	$770,000				$0	$770,000
29	South Sidewalk Deck	Replace (20 + years)	$92,000				$0	$92,000
			Projected Costs:	$0	$21,300	$21,300	$42,600	$1,002,000
			Annualized Cost:	$2,130				

Future Preservation - Railing

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
30	South Sidewalk Railing	Spot Paint	$4,000		2	2	$16,000	
31	North Cable Railing	Spot Repair	$7,500		2	2	$30,000	
32	South Sidewalk Railing	Spot Repair	$5,000		2	2	$20,000	
			Projected Costs:	$0	$33,000	$33,000	$66,000	$0
			Annualized Cost:	$3,300				

Future Preservation - Support System

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
33	Strike Plates & Live Load Shoes	Clean & adjust	$4,000		1	1	$8,000	
34	Span & Counterweight Guides	Repair	$27,000			1	$27,000	
35	Ladders/ Platforms	Repair	$5,000			1	$5,000	
			Projected Costs:	$0	$4,000	$36,000	$40,000	$0
			Annualized Cost:	$2,000				

Future Preservation - Balance System

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
36	Counterweight Wire Ropes	Replace	$260,000			1	$260,000	
37	Counterweights	Concrete Repair	$5,000			1	$5,000	
38	Operating Drums Replacement	Replace (20 + years)	$75,000				$0	$75,000
			Projected Costs:	$0	$0	$260,000	$265,000	$75,000
			Annualized Cost:	$13,250				

Future Preservation - Distribution/Control System

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
39	DC Drive	Replace	$60,600			1	$60,600	
40	PLC Control System	Replace	$212,300			1	$212,300	
			Projected Costs:	$0	$0	$272,900	$272,900	$0
			Annualized Cost:	$13,645				

Future Preservation - Traffic Control System

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
41	Pedestrian Barriers (Gate)	Misc. Repair	$4,000		2	2	$16,000	
			Projected Costs:	$0	$8,000	$8,000	$16,000	$0
			Annualized Cost:	$800				

Future Preservation - Machinery/Tender's House

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
42	Deck & Grating	Misc. Repair	$2,000		1	1	$4,000	
43	Windows / Door / Lock Set	Misc. Repair	$1,000		1	1	$2,000	
44	Sheathing & Roof	Misc. Repair	$4,000		1	1	$8,000	
45	AC / Heating / Telephone / Detection / Suppres.	Misc. Repair	$700		2	2	$2,800	
			Projected Costs:	$0	$8,400	$8,400	$16,800	$0
			Annualized Cost:	$840				

Future Preservation - Bridge Lighting

Ref. No.	Item	Action	Cost Per Event (2020 US$)	Occurrences Years 2021 to 2024	Occurrences Years 2025 to 2030	Occurrences Years 2031 to 2040	20 Yr. Cost (2020 US $)	Occurrences Beyond 2040
46	Roadway Lighting	Misc. Repair	$3,200		1	1	$6,400	
47	Ornamental Lighting	Misc. Repair	$3,700		1	1	$7,400	
			Projected Costs:	$0	$6,900	$6,900	$13,800	$0
			Annualized Cost:	$690				

MnDOT Historic Bridge Management Plan

Bridge No. 4654 Future Preservation Activity Listing and Costs

UPDATED *12/3/2019*

FUTURE PRESERVATION - Description of Repairs

Future Preservation - Substructure

Ref. No.	Item	Repair Notes
1	W. Concourse Concrete Patching & Surf. Treat.	New Concourse, patching should not be extensive, Costs are for year 20
2	West Abut. Concrete Patching & Surf. Treat.	Minor patching of spalled concrete, Costs are for year 20
3	Pier 1 Concrete Surface Repairs	Major patching of pier concrete, Costs include dewatering below water line, Costs are for year 40
4	Piers 2 to 8 Concrete Surface Repairs	Major patching of pier concrete, Costs include dewatering below water line, Costs are for year 40
5	E. Abut Concrete Surface Repair	Minor patching of spalled concrete, Costs are for year 20
6	E. Abut Settlement Adjustments	Costs are for year 20, if any settling occurs
7	E. Abut. Slope Protection	Costs are for misc. riprap that may be needed at waterline, Costs are for year 20
8	Substruct. E. Abut. Foundation Stabilization	Repairs to the East Abutment to stabilize it

Future Preservation - Superstructure - Truss Spans

Ref. No.	Item	Repair Notes
9	Superstructure Bearings	Replace all bridge bearings
10	Stringers	Costs are for the repair of two (2) stringers at year 20
11	Floor Beams	Costs are for the repair of two (2) floor beams at year 20
12	Lower Chord Members	Costs are for the repair of four (4) nodes on a lower chord member at year 20
13	Truss Webs (Vertical & Diagonals)	Costs are for the repair of one (1) vertical or diagonal member at year 20
14	Gusset Plate Repairs	Costs are for the repair of one (1) gusset plate typically at L0 or L0' at year 20
15	Truss End Posts	Costs are for the repair of one (1) end post at year 20
16	Truss Lower Lateral Bracing	Costs are for the repair of one (1) lower bracing at the Lift Span at year 20
17	Truss - Portal Frames	Costs are for the repair of miscellaneous damage to any of the portal frames (combined costs)
18	Truss - Interior Sway Bracing	Costs are for the repair of miscellaneous damage to any of the interior sway bracing (combined costs)

Future Preservation - Sidewalk Support System

Ref. No.	Item	Repair Notes
19	Standard Support Brackets	Due to the replacement of all the brackets, repair work will be minimal, Costs are for year 40
20	Lift-Span Support Brackets	Due to the replacement of all the brackets, repair work will be minimal, Costs are for year 40
21	Fascia Stringer	Costs are for the repair of two (2) facia stringer at year 20
22	Stringers	Costs are for the repair of two (2) stringers at year 20

Future Preservation - Deck

Ref. No.	Item	Repair Notes
23	Drainage System	Repairs are to drainage system at year 20
24	Sidewalk Deck	Seal sidewalk deck using epoxy chase method every 5 years
25	Sidewalk Deck	Misc sidewalk deck patching, every 20 years
26	Sidewalk Deck Expansion Joints	Clean and adjust joints, costs are every 5 years
27	Sidewalk Deck Expansion Joints	Reconstruct all joints, Costs are for year 30
28	Ped/Bike Deck Spans 3-9	Replace entire bridge/trail deck, curb to curb
29	South Sidewalk Deck	Replace entire south sidewalk deck

Future Preservation - Railing

Ref. No.	Item	Repair Notes
30	South Sidewalk Railing	Spot painting every 5 years
31	North Cable Railing	Re-adjust tension, spot repairs every 5 years
32	South Sidewalk Railing	Spot repairs every 5 years

Future Preservation - Support System

Ref. No.	Item	Repair Notes
33	Strike Plates & Live Load Shoes	Repairs, every 10 years
34	Span & Counterweight Guides	Repairs, every 20 years
35	Ladders/ Platforms	Repairs, every 20 years

Future Preservation - Balance System

Ref. No.	Item	Repair Notes
36	Counterweight Wire Ropes	Costs are for rope replacement at year 20
37	Counterweights	Concrete repairs, Costs are for year 20
38	Operating Drums Replacement	Costs are for replacement of drums after year 20, note: drums were replaced in 2020

Future Preservation - Distribution/Control System

Ref. No.	Item	Repair Notes
38	DC Drive	Costs are for replacement of DLC drive at year 20
39	PLC Control System	Costs are for replacement of PLC Control System at year 20

Future Preservation - Traffic Control System

Ref. No.	Item	Repair Notes
40	Pedestrian Barriers (Gate)	Misc repair costs, includes both gates, costs are for every 5 years

Future Preservation - Machinery/Tender's House

Ref. No.	Item	Repair Notes
41	Deck & Grating	Misc repair costs, for every 10 years
42	Windows / Door / Lock Set	Misc repair costs, for every 10 years
43	Sheathing & Roof	Misc repair costs, for every 10 years
44	AC / Heating / Telephone / Detection / Suppres.	Misc repair costs, for every 5 years

Future Preservation - Bridge Lighting

Ref. No.	Item	Repair Notes
45	Roadway Lighting	Misc repair costs, for every 10 years
46	Ornamental Lighting	Misc repair costs, for every 10 years

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Appendix H. Bibliographical References

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Bibliographical References

The following references are the historical sources used to prepare Section 3.4 of the Stillwater Lift Bridge Management Plan and are included in the National Register documentation of the Stillwater Lift Bridge.

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Appendix I. Stillwater Lift Bridge Endowment Account Usage - Routine Operations and Maintenance Financing Process Report

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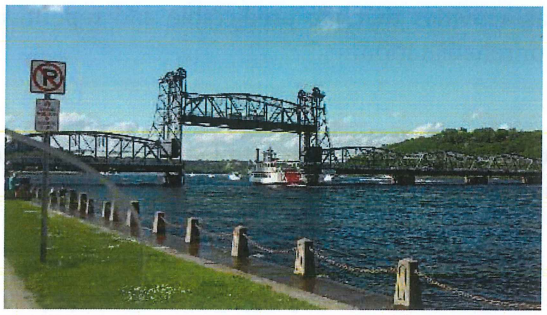
Appendix I

Stillwater Lift Bridge Endowment Account 4-15-19

Routine Operations and Maintenance financing process



The Stillwater Lift Bridge Endowment Account is described by Minnesota Statute 165.15, as attached. It is to be used to fund, in perpetuity, the routine operations and maintenance costs of the Stillwater Lift Bridge after it is converted to a bike/pedestrian/boat facility. And the principal of the fund is not to be reduced over time, with only the accrued interest to be used for the routine operations and maintenance costs.

Background:

St Croix Crossing Project's 2006 Supplemental Final EIS, including the Section 106 Amended Memorandum of Agreement, committed that the Stillwater Lift Bridge will be preserved and that "Mn/DOT and WisDOT will deposit no less than $3 million in the endowment fund" as one of the historic property mitigation items for building the St. Croix Crossing Project.

In 2009, the Stillwater Lift Bridge Endowment Account was established by Minnesota Statute 165.15. MnDOT then provided $3M to endowment account in June 2014 and WisDOT provided $1.5M in October 2014 to meet the Stipulation of the 2006 Amended Section 106 Memorandum of Agreement. MnDOT provided an additional $3M in February 2015.

Minnesota State Board of Investment invested those funds as required by Minnesota Statute 165.15, with MnDOT's Office of Financial Management tracking the fund. As of January 2019, the fund balance of AppropID T791187 & T791188 held $7.5M principal and $354K in interest.

The Stillwater Lift Bridge Management Plan, completed in 2009, describes how the Stillwater Lift Bridge is to be managed during the interim for vehicular use and after its conversion to pedestrian/bicycle use. "Routine maintenance" means activities that are predictable and repetitive, but not activities that would constitute major repairs or rehabilitation. The most critical operational need that must be addressed is the legal requirement to raise the lift span according to the Coast Guard established schedule. Routine operations and maintenance activities described in the Lift Bridge Management Plan can be found at: http://www.dot.state.mn.us/metro/projects/liftbridge/pdf/stillwaterliftbrmgmtplan.pdf The current list as attached, with activities to be performed, estimated costs and the timing of the activities is found in Appendix G - pages 192-194 of 316 of the Stillwater Lift Bridge Management Plan. Section 6.5 also provides the narrative for the recommended maintenance activities.

Appendix I

The current 2009 Lift Bridge Management Plan identifies specific routine operations and maintenance activities. The Endowment Account can only be used for routine operation and maintenance activities. Anything outside of those activities defined in the management plan as routine would be considered capital improvements and not funded by the endowment fund. Minnesota Statute 165.15 describes "routine maintenance" as activities that are predictable and repetitive, but not activities that would constitute major repairs or rehabilitation.

This listing of specific routine operations and maintenance activities will be modified with each update to the Lift Bridge Management Plan.

Specific routine maintenance activities in the 2009 Lift Bridge Management Plan include:

- Operations (operate bridge, communications or for records maintenance) -
  - Bridge Tender
  - Electricity and phone
  - Admin, Coord, Training & Misc.
- Routine Maintenance (Clean, inspect, document, replace, lubricate or adjust) -
  - Flush Deck, drains, exp. Joints, sub-structure
  - Graffiti removal & Vandalism Repair
  - Structural inspections
  - In-depth structural inspection
  - Structural analysis & rating
  - Mech. & Electrical inspections
  - Underwater inspections
  - Lamp Replacements – NAV LED
  - Lamp Replacements – Rdwy LED
  - Lamp Replacements – Walkway LED
  - Sweep Clean Deck
  - Counterweight Wire Ropes
  - Gears/Bearings/Shaft
  - Couplings
  - Operating Wire Ropes & Take-up Devices
  - Operating Wire Ropes
  - Operating Rope Wear Plates
  - Main Drive Motor
  - Gear reducers
  - Auxiliary Drive Motor
  - Control System Maintenance
  - Pedestrian Barriers (gates)
  - Aerial festoon cables (festoon cables)

In 2014, Minnesota Statute 165.15 amended the use of the Endowment's funds to "including bridge safety inspections and reactive repairs" activities. See attached.

In August of 2014, MnDOT Chief Counsel considered the Stillwater Lift Bridge (SLB) issues, interpreted Minnesota Statutes and provided the opinion that:
"...the SLB will continue to be part of the trunk highway system once it has been closed to vehicular traffic and is used as a bicycle and pedestrian trail." And that "trunk highway funds can be spent on the SLB if it no longer carries vehicular traffic, but rather only bike and pedestrian traffic." See attached.

Status of the Lift Bridge Conversion Project – S.P. 8217-34:

MnDOT's Contractor is currently converting the lift bridge to bicycle/pedestrian/boat use. Work is on-going over these winter months. The project is expected to be substantially completed in June 2019 and be opened to those uses. Following the conversion project, MnDOT will solely own and operate the Lift Bridge in to perpetuity.

For the converted Lift Bridge, an updated Operations & Maintenance Manual is also being prepared thru MnDOT consultant agreement #1000125WO4 with SEH, Inc. The updated Operations & Maintenance Manual is expected before the opening of the Lift Bridge and substantial completion in summer/fall of 2019.

Additionally, the management plan for the lift bridge will be updated following the conversion project. The updated management plan will include narrative on the conversion, the new operations and maintenance manual, as well as an update to the table of recommended maintenance and operations activities. The updated Lift Bridge Management Plan is expected to be drafted by June and completed by the fall of 2019.

Process to Use Endowment Account:

Per Minnesota Statute 165.15, The Commissioner of Transportation has authority to approve or deny expenditures of funds in the Endowment Account. To implement this, this process framework is proposed:

1. Endowment Account ownership/management responsibility would be with Metro District, Maintenance Operations. The Metro District assigned designated contact would be the Maintenance Operations Engineer – Structures, currently Duane Green.
2. The most current Stillwater Lift Bridge Management Plan will be followed for any maintenance activities. Currently the 2009 Management Plan is in place, but it is planned to be updated by the fall of 2019. This updated Management Plan will be developed in cooperation between Metro District, Electrical Services Section and the Office of Environmental Stewardship/Cultural Resources Unit to include the routine operations and maintenance activities, anticipated costs and occurrences of upcoming work.
3. Routine operations and maintenance work by Metro Maintenance and Electrical Services Section will follow the Lift Bridge Management Plan. Routine maintenance activities determined between MnDOT Cultural Resources Unit and Metro District that do not warrant review will not require formal Section 106 review. Work outside of normal maintenance activities and operations that have not been previously reviewed and approved by MnDOT Cultural Resources Unit will need to

be reviewed for compliance with the Secretary of the Interior's Standards under the Section 106 process. Additional consultation between Metro District, Electrical Services Section and the Cultural Resources Unit will occur prior to any work being done.

4. Metro District Maintenance Operations will propose an annual State Fiscal Year budget using the Endowment Account, with the intent as to preserve the Endowment Account into perpetuity. Monthly meetings with Metro District/Finance will review any charges to the Endowment Account to ensure costs are within the annual budget. Current estimates to perpetuate the Endowment Account are approximately $250,000 maximum per fiscal year, as shown in the attached. Any costs each fiscal year beyond what is being planned from the Endowment Account will be covered by the Metro District Maintenance Operating budget.
5. Electrical Services Section will provide a quarterly report on actual costs to Metro Maintenance Operations Engineer. Metro Finance then to provide reimbursement to Electrical Services Section for services rendered. Metro Maintenance Operations Engineer must approve charges prior to payment/transfer by Metro Finance.
6. Finance:
   - Metro District Finance: As necessary, describe Fund/AppropID/FinDeptID/SRCType/ProjectID/ActivityID/ codes for timesheet codes for work being done that will ultimately use Endowment Account funding.
     - Attend periodic meetings with the Maintenance Operations Engineer to review charges to the Endowment Account to ensure costs are within the annual budget.
   - MnDOT's Office of Financial Management, Josh Knatterud-Hubinger will report to the Maintenance Operations Engineer annually on June 30th showing the remaining balance of the endowment account's interest only Approp.ID:T791188. This information will be used by the Maintenance Operations Engineer to assist in prioritizing future needs on the Lift Bridge.
     - Cash flow analysis for the Endowment Account may also be provided as necessary by MnDOT's Office of Financial Management.
   - Financial compliance and audit requirements for the Endowment Account are as defined in Minnesota Statute 165.15.

Attachments:

1) Minnesota Statute 165.15, as amended in 2014
2) Maintenance Activities, Costs and Occurrences from Lift Bridge Management Plan, pages 192-194
3) Chief Counsel Memo dated August 20, 2014 for Stillwater Lift Bridge – part of TH and TH funding applicability
4) Stillwater Lift Bridge Endowment Account Cashflow, dated 1-30-19

For questions concerning the background, conversion project or above-detailed process please contact:

Duane Green, Metro District Maintenance Operations Engineer – Structures, (651) 234-7948

Linda Heath, Section Manager, Electrical Services Section, 651-366-5735

Todd Clarkowski, St. Croix Crossing Project Coordinator, (651)366-4576

Katherine Haun Schuring, Office of Environmental Stewardship, Cultural Resources Unit, (651)366-3603

For Endowment Fund financial questions please contact:

Josh Knatterud-Hubinger, Budget Director, Office of Financial Management, (651) 366-4913

Neal Younghans, Economic and Financial Analyst, Office of Financial Management, (651) 366-4904

Susan Larson, Metro District Finance Director, (651) 234-7440

Brandon Gfrerer, Metro District Business Manager, (651) 234-7441

Concurrence of Stillwater Lift Bridge Endowment Account Usage process as described above:

Bryan Dodds Digitally signed by Bryan Dodds
Date: 2019.04.25 15:06:31 -05'00'

Bryan Dodds, Metro District, Office Director for Operations & Maintenance Date

Josh Knatterud-Hubinger Digitally signed by Josh Knatterud-Hubinger
Date: 2019.04.22 08:15:45 -05'00'

Josh Knatterud-Hubinger, Office of Financial Management, Budget Director Date

Linda Heath Digitally signed by Linda Heath
Date: 2019.04.15 10:45:34 -05'00'

Linda Heath, Electrical Services Section, Section Manager Date

Appendix I

2018 Minnesota Statutes

Authenticate

165.15 STILLWATER LIFT BRIDGE ENDOWMENT ACCOUNT.

Subdivision 1. **Account established.** The Stillwater lift bridge endowment account is established in the state treasury. The account may consist of appropriations made by the state of Minnesota or Wisconsin and may include federal funds. The account may also receive private contributions, gifts, or grants under section 16A.013. Any interest or profit accruing from investment of these sums is credited to the account.

Subd. 2. **Use of funds.** (a) Income derived from the investment of principal in the account may be used by the commissioner of transportation for operations and routine maintenance of the Stillwater lift bridge, including bridge safety inspections and reactive repairs. No money from this account may be used for any purposes except those described in this section, and no money from this account may be transferred to any other account in the state treasury without specific legislative authorization. Any money transferred from the trunk highway fund may only be used for trunk highway purposes. For the purposes of this section:

(1) "Income" is the amount of interest on debt securities and dividends on equity securities. Any gains or losses from the sale of securities must be added to the principal of the account.

(2) "Routine maintenance" means activities that are predictable and repetitive, but not activities that would constitute major repairs or rehabilitation.

(b) Investment management fees incurred by the State Board of Investment are eligible expenses for reimbursement from the account.

(c) The commissioner of transportation has authority to approve or deny expenditures of funds in the account.

Subd. 3. **Appropriation.** Income derived from the investment of principal in the account is appropriated annually to the commissioner of transportation for the purposes described in this section.

Subd. 4. **Financial compliance.** The commissioner of transportation shall ensure that the account complies with the regulations in OMB circulars A87, Cost Principles for State, Local and Indian Tribal Governments, and A122, Cost Principles for Non-Profit Organizations, of the United States Office of Management and Budget (OMB).

Subd. 5. **Investment.** The State Board of Investment, in consultation with the commissioner of transportation, shall invest money in the account under section 11A.24.

Subd. 6. **Demolition.** If the commissioner determines, in consultation with the State Historic Preservation Office, that it is necessary to demolish the Stillwater lift bridge, the principal in the account may be spent to pay for demolition of the bridge, and is appropriated to the commissioner of transportation only for that purpose, except that only funds originally contributed by the state or federal government can be used to pay for demolition. Any money remaining in the account after demolition must be used to pay for the preservation of other historic bridges in consultation with the State Historic Preservation Office.

Subd. 7. **Audits.** The account is subject to audit by the legislative auditor.

Subd. 8. MS 2016 [Repealed, 1Sp2017 c 3 art 3 s 144]

History: *2009 c 36 art 3 s 5; 2014 c 312 art 11 s 2*

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Appendix I

Sec. 2. Minnesota Statutes 2012, section 165.15, subdivision 2, is amended to read:

Subd. 2. **Use of funds.** (a) Income derived from the investment of principal in the account may be used by the commissioner of transportation for operations and routine maintenance of the Stillwater lift bridge, including bridge safety inspections and reactive repairs. No money from this account may be used for any purposes except those described in this section, and no money from this account may be transferred to any other account in the state treasury without specific legislative authorization. Any money transferred from the trunk highway fund may only be used for trunk highway purposes. For the purposes of this section:

(1) "Income" is the amount of interest on debt securities and dividends on equity securities. Any gains or losses from the sale of securities must be added to the principal of the account.

(2) "Routine maintenance" means activities that are predictable and repetitive, but not activities that would constitute major repairs or rehabilitation.

(b) Investment management fees incurred by the State Board of Investment are eligible expenses for reimbursement from the account.

(c) The commissioner of transportation has authority to approve or deny expenditures of funds in the account.

Appendix I

Costs below are for Appendix I only and are costs as of 4/15/19. Updated future costs can be found in Appendix G.

Mn/DOT Historic Bridge Management Plan

BRIDGE No. 4654 MAINTENANCE/STABILIZATION/PRESERVATION Activity Listing and Costs

OPERATIONS

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
1	Bridge Tender	Operate Br.	$84,000	14	14	14	$3,528,000
2	Electricity & Phone	Provide Service	$5,600	14	14	14	$235,200
3	Admin, Coord, Training, & Misc	Main. Records	$6,000	14	14	14	$252,000
4	Not Used		$0				$0
			Projected Costs:	$1,338,400	$1,338,400	$1,338,400	$4,015,200
			Annualized Cost:	$95,600			

ROUTINE MAINTENANCE

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
5	Flush Deck, drains, exp. Joints, sub-struct.	Power Wash	$3,000	14	14	14	$126,000
6	Graffiti Removal & Vandalism Repair	Clean & Repair	$800	14	14	14	$33,600
7	Structural Inspection	Base Inspection	$16,000	11	10	10	$496,000
8	In-Depth Structural Inspection	4-Year Inspection	$30,000	3	4	4	$330,000
9	Structural Analysis & Rating	Struct. Rating	$60,000		1		$60,000
10	Mech. & Elect. Inspection	Base Inspection	$5,900	6	7	7	$118,000
11	Underwater Inspection	5-year Inspection	$20,000	2	3	3	$160,000
12	Lamp Replacement - NAV LED (10 each, 10 yr life)	Replace Lamps	$4,000	1	1	1	$12,000
13	Lamp Replacement - Rdwy LED (25 each, 10yr life)	Replace Lamps	$20,000	1	1	1	$60,000
14	Lamp Replacement - Om Walkway LED (16 each, 10 yr)	Replace Lamps	$11,200	1	1	2	$44,800
15	Sweep Clean Deck	Sweep	$700	14	14	14	$29,400
16	Counterweight Wire Ropes	Clean & lubricate	$9,400	14	14	14	$394,800
17	Gears/Bearing/Shaft	Clean & lubricate	$5,300	14	14	14	$222,600
18	Couplings	Clean & lubricate	$2,650	2	3	3	$21,200
19	Operating Wire Ropes & Take-Up Devices	Clean / Lub / Adj.	$3,150	14	14	14	$132,300
20	Operating Wire Ropes	Replace	$20,000	1	2	2	$100,000
21	Operating Rope Wear Plates	Replace	$7,500	2	3	2	$52,500
22	Main Drive Motor	Insp/clean/Lub	$780	14	14	14	$32,760
23	Gear Reducers	Clean & lubricate	$4,900	2	3	3	$39,200
24	Auxiliary Drive Motor	Insp/clean/Lub	$465	14	14	14	$19,530
25	General annual control syst maintenance	Clean, test adjust	$5,700	14	14	14	$239,400
26	Pedestrain Barriers (Gates)	Clean & lubricate	$1,850	14	14	14	$77,700
27	Aerial Cables (Festoon Cables)	Replace	$23,200	2	3	3	$185,600
28	Not Used		$0				$0
29	Not Used		$0				$0
			Projected Costs:	$882,930	$1,033,580	$984,780	$2,987,390
			Annualized Cost:	$71,128			

Appendix I

Costs below are for Appendix I only and are costs as of 4/15/19. Updated future costs can be found in Appendix G.

Mn/DOT Historic Bridge Management Plan

BRIDGE No. 4654 MAINTENANCE/STABILIZATION/PRESERVATION Activity Listing and Costs

Future Preservation - Substructure

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
1	Scour Repair	Aggregate on ice	$6,000	2	2	2	$36,000
2	W. Concourse Concrete Patching & Surf. Treat.	Repair	$30,000		1		$30,000
3	West Abut. Concrete Patching & Surf. Treat.	Repair	$10,000		1		$10,000
4	Piers 3 to 7 Concrete Repair Above Waterline	Sup Br. - Repl	$400,000			1	$400,000
5	Pier 8 Concrete Repair Above Waterline	Sup Br. - Repl	$80,000			1	$80,000
6	Pier 1 to 7 Concrete Repair Below Waterline	Repair	$480,000			1	$480,000
7	Pier 8 Concrete Repair Below Waterline	Repair	$80,000			1	$80,000
8	E. Abut Concrete Surface Repair	Repair	$27,000		1		$27,000
9	E. Abut Settlement Adjustments	Jack & Fill Pedestal	$23,000		1		$23,000
10	E. Abut. Slope Protection	Repair	$3,500		1		$3,500
			Projected Costs:	$12,000	$105,500	$1,052,000	$1,169,500
			Annualized Cost:	$27,845			

Future Preservation - Superstructure - Truss Spans

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
11	Remove Flood Water Debris	Remove & Discard	$10,100	3	3	3	$90,900
12	Bridge Painting - Below Deck Spot	Paint Bridge	$20,000	2	2	1	$100,000
13	Bridge Painting - Full Structure	Paint Bridge	$2,300,000			1	$2,300,000
14	Bridge Painting - Above Deck Spot	Paint Bridge	$15,000		1		$15,000
15	Bearings	Clean & lubricate	$3,000	2	2	2	$18,000
16	Stringers	Struct. Repair	$28,500		1		$28,500
17	Floor Beams	Struct. Repair	$46,800		1		$46,800
18	Lower Chord Members	Struct. Repair	$140,000		1		$140,000
19	Truss Webs (Vertical & Diagonals)	Repair	$300,000		1		$300,000
20	Truss Lower Lateral Bracing	Lft. Span Only	$5,000		1		$5,000
21	Truss - Portal Frames	Misc. Repair	$25,000		1		$25,000
22	Truss - Interior Sway Bracing	Misc. Repair	$25,000		1		$25,000
							$0
			Projected Costs:	$76,300	$661,600	$2,356,300	$3,094,200
			Annualized Cost:	$73,671			

Future Preservation - Superstructure - Span 10

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
23	Deck	Patch/Crack Rep.	$6,500		1		$6,500
24	Strip Seal	Rem. & Replace	$4,300		1		$4,300
			Projected Costs:	$0	$10,800	$0	$10,800
			Annualized Cost:	$257			

Future Preservation - Sidewalk Support System

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
25	Standard Support Brackets	Repair	$8,000			1	$8,000
26	Lift-Span Support Brackets	Repair	$8,000			1	$8,000
27	Fascia Stringer	Repair	$8,000			1	$8,000
28	Stringers	Repair	$9,000			1	$9,000
			Projected Costs:	$0	$0	$33,000	$33,000
			Annualized Cost:	$786			

Future Preservation - Deck

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
29	Roadway & Transition Deck	Patch	$13,000		1	2	$39,000
30	Roadway & Transition Deck	Sealing	$207,000		1		$207,000
31	Span 9 to 10 Expansion Joints	Replace Gland	$9,000	1	1	1	$27,000
32	Drainage System	Repair	$1,500		1		$1,500
33	Sidewalk Deck	Seal	$52,000		1		$52,000
34	Sidewalk Deck	Patch	$4,500		1	1	$9,000
35	Sidewalk Deck Expansion Joints	Clean & Adjust	$1,700	1	1	1	$5,100
36	Sidewalk Deck Expansion Joints	Replace	$12,000		1		$12,000
			Projected Costs:	$10,700	$300,700	$41,200	$352,600
			Annualized Cost:	$8,395			

Design Engineering and Construction Administration Costs are not included

Appendix I

Costs below are for Appendix I only and are costs as of 4/15/19. Updated future costs can be found in Appendix G.

Future Preservation - Railing

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
37	Concrete Railing (Balastrade)	Minor Repair	$3,000	2	2	4	$24,000
38	South Pedestrian Railing	Spot Paint	$3,000	2	2	3	$21,000
39	North Cable Railing	Spot Repair	$6,000	2	2	2	$36,000
40	Pedestrian Railing at South Side	Spot Repair	$9,000		1	2	$27,000
			Projected Costs:	$12,000	$21,000	$39,000	$108,000
			Annualized Cost:	$2,571			

Future Preservation - Support System

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
41	Strike Plates & Live Load Shoes	Clean & adjust	$2,800	1	1	1	$8,400
42	Span & Counterweight Guides	Repair	$22,000			1	$22,000
43	Ladders/ Platforms	Repair	$5,000		1		$5,000
			Projected Costs:	$2,800	$7,800	$24,800	$35,400
			Annualized Cost:	$843			

Future Preservation - Balance System

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
44	Counterweight Wire Ropes	Replace	$445,000			1	$445,000
45	Counterweights	Concrete Repair	$18,000			1	$18,000
			Projected Costs:	$0	$0	$463,000	$463,000
			Annualized Cost:	$11,024			

Future Preservation - Distribution/Control System

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
46	DC Drive	Replace	$50,000		1		$50,000
47	PLC Control System	Replace	$175,000		1		$175,000
48	Not Used		$0				$0
			Projected Costs:	$0	$225,000	$0	$225,000
			Annualized Cost:	$5,357			

Future Preservation - Traffic Control System

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
49	Pedestrian Barriers (Gate)	Misc. Repair	$3,000	1	1	1	$9,000
50	Not Used		$0	1	1		$0
51	Not Used		$0				$0
			Projected Costs:	$3,000	$3,000	$3,000	$9,000
			Annualized Cost:	$214			

Future Preservation - Machinery/Tender's House

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
52	Deck & Grating	Misc. Repair	$1,500		1	1	$3,000
53	Windows / Door / Lock Set	Misc. Repair	$600		1	1	$1,200
54	Sheathing & Roof	Misc. Repair	$3,000			1	$3,000
55	AC / Heating / Telephone / Detection / Suppres.	Misc. Repair	$500	1	2	3	$3,000
			Projected Costs:	$500	$3,100	$6,600	$10,200
			Annualized Cost:	$243			

Future Preservation - Bridge Lighting

Ref. No.	Item	Action	Cost Per Event (2008 US$)	Occurrences Years 2014 to 2027	Occurrences Years 2028 to 2041	Occurrences Years 2042 to 2055	42 Yr. Cost (2008 US $)
56	Roadway Lighting	Misc. Repair	$2,600	1	1	1	$7,800
53	Ornamental Lighting	Misc. Repair	$3,000	1	1	1	$9,000
			Projected Costs:	$5,600	$5,600	$5,600	$16,800
			Annualized Cost:	$400			

Component Failure

Ref. No.	Item	Action	Cost Per Event (2003 US$)				42 Yr. Cost (2008 US $)
54	Substruct. E. Abut. Foundation Stabilization	Repair	$350,000				$350,000
55	Substructure - Pier Replacement (2 each)	Demo. & Replace	$450,000				$450,000
56	Superstructure Bearings	Rehab.	$48,500				$48,500
57	Low. Chrd. Gusset Plate Repair	Replace	$650,000				$650,000
58	Vehicular & Transition Deck	Replace	$402,000				$402,000
59	Pedestrian Deck	Replace	$200,000				$200,000
60	Operating Drums Replacement (2 each)	Replace	$62,000				$62,000
61							$0
			Annualized Cost:	$51,488			$2,162,500

Design Engineering and Construction Administration Costs are not included

Appendix I

Minnesota Department of Transportation

Memo

Office of the Chief Counsel
395 John Ireland Boulevard
St. Paul, MN 55155

TO: Traci Hatch
Jon Chiglo
Duane Leurquin
Betsy Parker

FROM: Dave Seykora

DATE: August 20, 2014

SUBJECT: Stillwater Lift Bridge

This memo addresses questions relating to the funding of work on the Stillwater lift bridge (SLB) after the St. Croix River Crossing project is complete. Some of the questions relate to whether the SLB will continue to be part of the trunk highway system, and other questions relate to the creation of the SLB endowment fund, and use of money in that endowment fund.

1. Trunk Highway Status

The threshold question is whether the SLB will continue to be part of the trunk highway system once it has been closed to vehicular traffic and is used as a bicycle and pedestrian trail. My legal opinion is that it will remain a part of the trunk highway system.

The Minnesota Constitution creates the trunk highway system and designates 70 specific routes. One of these routes describes the trunk highway known in the Stillwater area as TH 36. The description of this route states:

> "Route No. 45. Beginning at a point on the west bank of the St. Croix River at Stillwater and thence extending in a southwesterly direction to a point on the easterly limits of the city of St. Paul, affording Stillwater, Lake Elmo, St. Paul and intervening and adjacent communities a reasonable means of communication, each with the other and other places within the state."

Minn. Stat. §161.114, subd. 2 (emphasis added). The Constitution gives the legislature only limited ability to change the location of this route. Article XIV, Sec. 2, states in part:

> "The definite location of trunk highways numbered 1 through 70 may be relocated as provided by law but no relocation shall cause deviation from the starting points or terminals nor cause any deviation from the various villages and cities through which the routes are to pass under the constitutional amendment adopted November 2, 1920."

(Emphasis added.) Therefore, the state Constitution requires that the starting point of TH 36 must remain at the west bank of the St. Croix River at Stillwater. From that point, the definite location of TH 36 follows Chestnut Street East to St. Croix Trail and then follows St. Croix Trail to the south, and then to Lake Elmo and St. Paul.

Minn. Stat. §165.07 contains guidance on how the Minnesota highway system connects with the highway systems of other states by means of interstate bridges. Subd. 2 of this section defines how interstate bridges are to be classified in the Minnesota highway system. It provides:

> "When any trunk highway, county state-aid highway, or municipal state-aid street leads to or connects with an interstate bridge, other than an interstate bridge owned privately or operated as a toll bridge, the bridge or so much thereof as lies within the boundaries of this state shall be part of the highway or street leading to it."

(Emphasis added.) By virtue of this statute, the portion of the SLB in Minnesota is required to be classified as part of Constitutional Route No. 45 (also known as TH 36) and is therefore part of the trunk highway system.

Jon has asked a related question – whether MnDOT can relinquish ownership of the bridge to the City of Stillwater. Since both TH 36 and the SLB are part of a Constitutional route, neither the bridge nor any part of TH 36 can be turned back to the City, nor to any other local road authority such as Washington County.

Another aspect of this issue involves whether trunk highway funds can be spent on the SLB if it no longer carries vehicular traffic, but rather only bike and pedestrian traffic. The previous discussion about how the bridge is deemed part of the trunk highway system strongly indicates that the answer is yes. This conclusion is bolstered by Minn. Stat. §161.44, which governs sale of surplus trunk highway land. Subd. 1a(b) of this section prohibits the sale of trunk highway property unless an analysis demonstrates that the property is not reasonably suitable for a bicycle or pedestrian facility, or that use of the property for bicycle or pedestrian use is preserved as part of the sale. If the property is suitable for use as a bicycle or pedestrian facility, MnDOT must keep it as part of the trunk highway system if its use as a trail cannot be preserved in a sale of the property. In this section, the legislature has recognized that bicycle and pedestrian uses are to be considered appropriate uses of trunk highway property.

While I conclude that MnDOT must continue to own the SLB and treat it as part of the trunk highway system after it is closed to vehicular traffic, there are two documents that contain language that might be construed as contrary to this conclusion.

First, MnDOT is one of the parties that signed the Amended Section 106 Memorandum of Agreement for the St. Croix River Crossing Project (the "Amended Section 106 MOA").[1] At pages 11-12, that MOU says:

> F. Conversion of the Lift Bridge to Pedestrian/Bicycle Use – Once the Project has been constructed and opened to traffic, Mn/DOT will remove the Stillwater Lift Bridge from the Trunk Highway system and close it to vehicular traffic.
> 1. Mn/DOT will retain ownership and maintenance of the Stillwater Lift Bridge, unless Mn/DOT decides to transfer the historic property pursuant to Stipulation III.F.2.

While MnDOT can close the SLB to vehicular traffic and retain ownership and maintenance of the bridge, under the analysis above it cannot remove the SLB from the trunk highway system. However, the phrase about removing the SLB from the trunk highway system appears to be simply a description of an internal MnDOT process rather than a commitment that somehow provides a tangible benefit to the other parties to the Amended Section 106 MOA. The language about deciding to transfer the SLB to another party appears to be surplusage based on a faulty assumption and therefor has no consequence.

The second document with potentially contrary language is the cooperative construction agreement between MnDOT and the City of Stillwater relating to construction of the new St. Croix River Crossing bridge. This agreement includes a provision stating that the city will provide maintenance on certain roadways constructed by MnDOT as part of the trunk highway system, including "Chestnut Street from Trunk Highway 95 to the lift bridge." Since this addresses only maintenance responsibility and not ownership of this segment of highway, it is consistent with the analysis described above. The agreement goes on to say that the City "shall maintain, operate and own . . . the Loop trail from the State line at the existing lift bridge (full bridge width) along Trunk Highway 95 to the State line at the new St. Croix bridge." An expansive interpretation of this statement could lead to a conclusion that the City would own the SLB. However, the better interpretation would recognize that the bicycle and pedestrian trail is a separate entity from the bridge. Under this interpretation, the City would own and be responsible for just the surface of the trail and related trail facilities such as signage, but MnDOT would still own the structural aspects of the bridge.

2. SLB Endowment Fund

The SLB endowment fund has its origin in the Amended Section 106 MOA. Pursuant to that agreement, MnDOT formulated a SLB Advisory Committee, drafted a SLB Management Plan, committed to spend up to $7 Million to complete a rehabilitation project for the SLB within one year after opening of the new bridge, and committed to the conversion of the SLB to pedestrian/bicycle use after the new bridge was opened. In addition, MnDOT committed to

[1] The MOA can be accessed at this hyperlink: http://www.dot.state.mn.us/metro/projects/stcroix/pdfs/fhwa112006/St.%20Croix%20Amended%20Section%20106%20MOA.pdf

seek legislation that would create an endowment fund, the proceeds of which would be used for operations and maintenance of the SLB but not major repairs, rehabilitation, or other capital improvements. The Amended Section 106 MOA also called for MnDOT and WisDOT to deposit no less than $3 Million in the endowment fund.

In 2009, the Minnesota legislature enacted a law creating the SLB endowment account in the State treasury. Minn. Stat. §165.15. The statute, as amended in 2014, says:

> "Income derived from the investment of principal in the account may be used by the commissioner of transportation for operations and routine maintenance of the Stillwater lift bridge, including bridge safety inspections and reactive repairs. No money from this account may be used for any purposes except those described in this section, and no money from this account may be transferred to any other account in the state treasury without specific legislative authorization. Any money transferred from the trunk highway fund may only be used for trunk highway purposes."

Minn. Stat. §165.15, subd 2(a). The statute also provides that the Commissioner has authority to approve or deny expenditures from the endowment account, and that the investment income is appropriated annually to the Commissioner for purposes described in this section.

The provision in this statute that money transferred from the trunk highway fund can only be used for trunk highway purposes is potentially troublesome if one were to conclude that the SLB would no longer be a trunk highway facility once it is closed to vehicular traffic. However, as described above, Minnesota law still considers the SLB to be part of the trunk highway system.

Initially, both the Minnesota and Wisconsin DOTs planned to contribute $1.5 Million to the endowment fund. The work done in creating the SLB Management Plan, however, revealed that a larger fund would be needed to generate sufficient income to maintain the property. Recently WisDOT declined to increase their contribution to greater than $1.5 Million, but they did commit to make their $1.5 Million contribution in August of 2014. In the 2014 legislative session, the Minnesota legislature authorized the Commissioner to transfer up to $6 Million from the trunk highway fund to the SLB endowment fund. The transfer should occur during FY 2014. In this bill, the legislature specifically authorized this transfer "notwithstanding . . . the restrictions on the use of trunk highway funds in Minnesota Statutes, section 165.15." Thus, there should be no concern about using the SLB endowment fund proceeds to maintain property that is used for pedestrian and bicycle purposes.

Appendix I

Stillwater Lift Bridge Endowment Account Cashflow

Princ	7,500,000			
FY	Beg	Int	Spend	End
2020	**447,330**	262,480	(228,150)	481,660
2021	481,660	282,752	(234,995)	529,417
2022	529,417	284,749	(242,044)	572,121
2023	572,121	286,263	(249,306)	609,079
2024	609,079	287,574	(256,785)	639,868
2025	639,868	288,666	(264,488)	664,045
2026	664,045	289,523	(272,423)	681,144
2027	681,144	290,129	(280,596)	690,678
2028	690,678	290,467	(289,014)	692,132
2029	692,132	290,519	(297,684)	684,967
2030	684,967	290,265	(306,615)	668,617
2031	668,617	289,685	(315,813)	642,489
2032	642,489	288,759	(325,287)	605,960
2033	605,960	287,463	(335,046)	558,377
2034	558,377	285,776	(345,097)	499,055
2035	499,055	283,672	(355,450)	427,277
2036	427,277	281,126	(366,114)	342,289
2037	342,289	278,112	(377,097)	243,304
2038	243,304	274,602	(388,410)	129,496
2039	129,496	270,566	(400,063)	(0)

Current Balance	**354,252**
Current Actual Rate	**2.37%**

Interest Rates (MMB)	
2019	2.4%
2020	3.3%
2021	3.5%
2022	3.5%

Annual Spend Base	**228,150**
Spend Inflation	**3.0%**

If FY22+ interest rate	3.0%
Annual Spend Base	198,743
If FY22+ interest rate	2.0%
Annual Spend Base	144,858

Notes:

All forecast data as of November 2018 forecast

All actual data as of 1/29/2019

Appropriation T791188

MS 165.15

Appendix I

Appendix J. Number of Lifts from 2010 to 2019

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2010-2019 Stillwater Lift Bridge -- Lifts

Year	First Lift Date	Last Lift Date	Number of Lifts
2019	____	____	0****
2018 **	4-30-18	7-27-18	1719***
2017 from Oct.15 to last lift	____	10-31-17	85
2017 from August 25-Oct.15 test deviation	____	____	626
2017 from first lift to test deviation start on August 24, 2017	4-7-17	____	1309
2016	4-13-16	11-3-16	2531
2015	4-09-15	11-13-15	1064
2014	4-26-14	10-30-14	635*
2013	4-23-13	7-14-13	1022
2012	3-27-12	11-03-12	1610
2011	4-27-11	10-31-11	1836
2010	5-01-10	11-01-10	1844

*Excessively high water in 2014 (elevation > 683 from mid April thru mid July) caused Minnesota and Wisconsin's DNRs to invoke the no-wake zone on the river, thereby limiting boat navigation.
** Coast Guard modified lift schedule effective May 15, 2018 to lift daily, every half hour, from May 15th to October 15th. And from October 16th to May 14th, on a 24 hour notice.
*** Lift Span #4 being repaired as part of the Lift Bridge Conversion Project--S.P.8217-34, so Span 6 was floated out beginning on 7-27-18 to accommodate the passage of boats. Lifts no longer occurred.
****Lift Bridge Conversion Project-S.P. 8217-34: on-going work on spans, so Lift Span #4 was fully raised on 3-26-19 to accommodate boats. Then Span 6 was removed and floated out on 6-19-19 to accommodate boats while Lift Span #4 was being worked on. Span #6 opening provided the boat accommodations until October 15th, when a fully raised Lift Span #4 accommodated the boats until freeze up.

Data from Michele Brunner, MnDOT Maintenance-Oakdale Subarea

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Appendix K. Chestnut Street Right-of-Way

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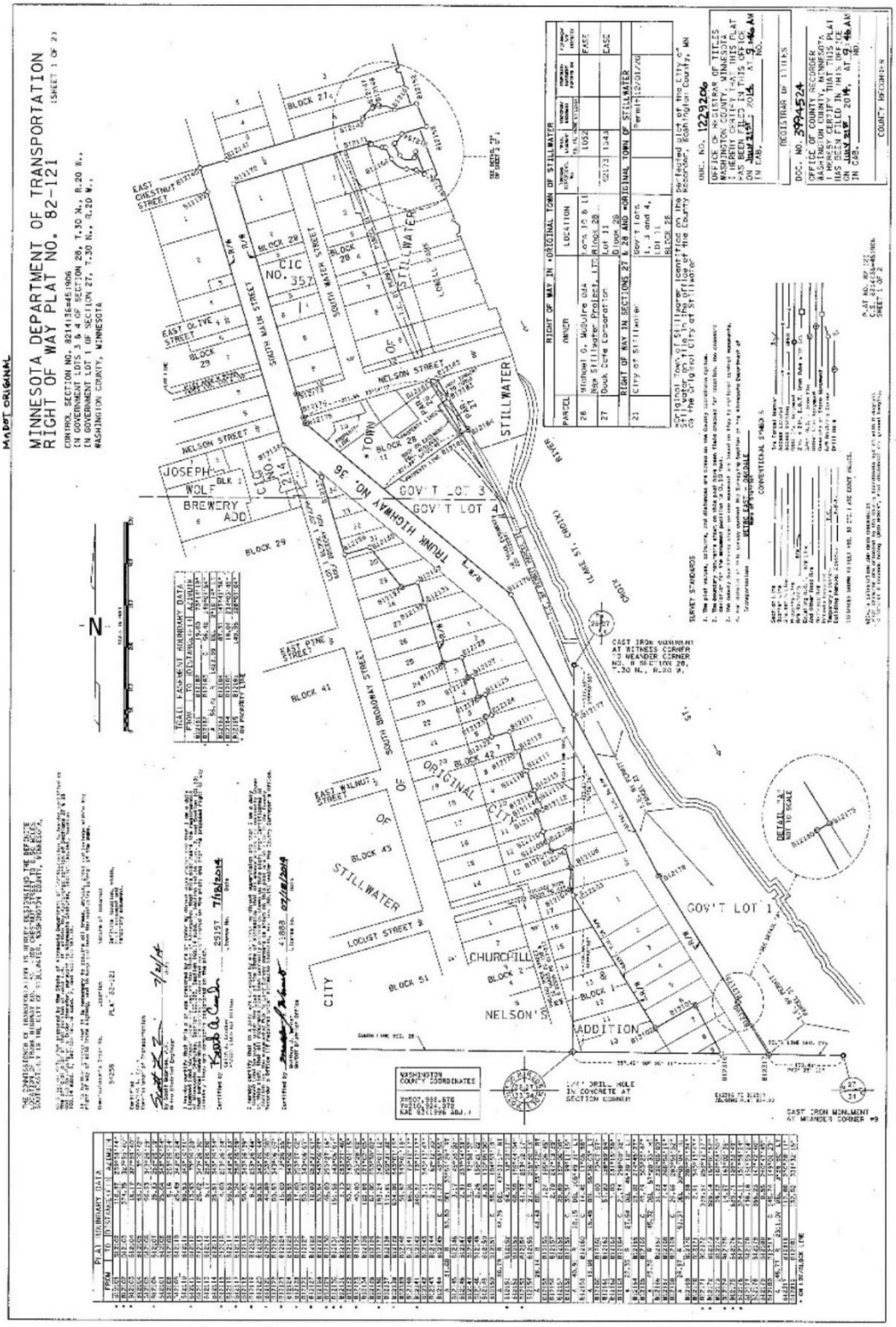

MINNESOTA DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY PLAT NO. 82-121
(SHEET 1 OF 2)
CONTROL SECTION NO. 8214136-45190G
IN GOVERNMENT LOTS 3 & 4 OF SECTION 28, T.30 N., R.20 W.,
IN GOVERNMENT LOT 1 OF SECTION 27, T.30 N., R.20 W.,
WASHINGTON COUNTY, MINNESOTA
MADOT ORIGINAL
TRUNK HIGHWAY NO. 36
STILLWATER
ORIGINAL CITY OF STILLWATER
CHURCHILL
NELSON'S ADDITION
GOV'T LOT 1
GOV'T LOT 3
GOV'T LOT 4
JOSEPH WOLF BREWERY ADD
NELSON STREET
SOUTH MAIN STREET
SOUTH WATER STREET
SOUTH BROADWAY STREET
EAST CHESTNUT STREET
EAST OLIVE STREET
EAST PINE STREET
EAST WALNUT STREET
LOCUST STREET
CIC NO. 357
CIC NO. 214
CAST IRON MONUMENT AT WITNESS CORNER TO MEANDER CORNER NO. 8 SECTION 28, T.30 N., R.20 W.
CAST IRON MONUMENT AT MEANDER CORNER #9
WASHINGTON COUNTY COORDINATES
RIGHT OF WAY IN ORIGINAL TOWN OF STILLWATER
RIGHT OF WAY IN SECTIONS 27 & 28 AND ORIGINAL TOWN OF STILLWATER
DOC. NO. 1229206
OFFICE OF REGISTRAR OF TITLES WASHINGTON COUNTY, MINNESOTA
I HEREBY CERTIFY THAT THIS PLAT HAS BEEN FILED IN THIS OFFICE ON JULY 21ST, 2014, AT 9:46 AM IN CAB.
REGISTRAR OF TITLES
DOC. NO. 3994524
OFFICE OF COUNTY RECORDER WASHINGTON COUNTY, MINNESOTA
I HEREBY CERTIFY THAT THIS PLAT HAS BEEN FILED IN THIS OFFICE ON JULY 21ST, 2014, AT 9:46 AM IN CAB.
COUNTY RECORDER
PLAT BOUNDARY DATA
TRAIL EASEMENT BOUNDARY DATA
SURVEY STANDARDS
CONVENTIONAL SYMBOLS
DETAIL "A" NOT TO SCALE
N

MnDOT ORIGINAL

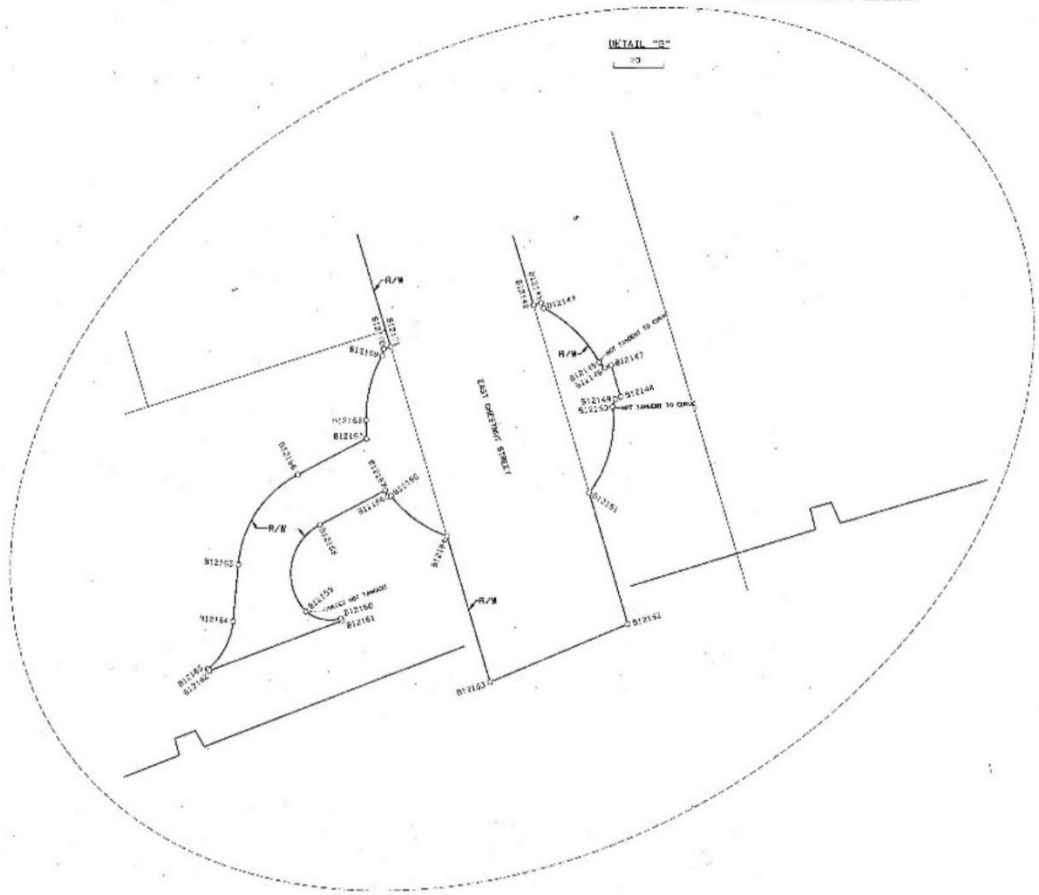
MINNESOTA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY PLAT NO. 82-121 (SHEET 2 OF 2)

CONTROL SECTION NO. 8214136=451906
IN GOVERNMENT LOTS 3 & 4 OF SECTION 26, T.30 N., R.20 W.,
IN GOVERNMENT LOT 1 OF SECTION 27, T.30 N., R.20 W.,
WASHINGTON COUNTY, MINNESOTA

**DETAIL OF PLAT BOUNDARY DATA

FROM	TO	DISTANCE(FT)	AZIMUTH
812142	812143	5.11	349°13'47"
812143	812144	2.27	52°12'00"
812144	812145	C 21.22	43°50'05"
L 11.24	R 55.00	PG 55°16'28" RT	
812145	812146	2.11	45°38'02"
812146	812147	2.31	337°14'38"
812147	812148	15.16	72°06'31"
812148	812149	2.26	196°21'20"
812149	812150	3.35	118°05'08"
812150	812151	C 26.51	104°45'16"
L 56.79	R 28.54	CE 123°33'17" RT	
* 812151	812152	56.91	224°13'13"
812152	812153	68.18	150°43'02"
* 812153	812154	61.57	159°12'15"
812154	812155	27.74	215°30'13"
L 39.14	R 48.48	BL 124°15'33" RT	
812155	812156	1.74	105°08'26"
812156	812157	2.70	219°13'30"
812157	812158	29.82	132°08'00"
812158	812159	25.34	99°11'15"
L 40.31	R 28.75	BL 100°46'51" LT	
812159	812160	C 14.42	117°05'55"
L 15.08	R 19.45	BL 55°50'05" LT	
812160	812161	1.00	79°07'15"
812161	812162	57.83	158°52'54"
812162	812163	1.82	237°15'38"
812163	812164	C 21.74	298°03'53"
L 32.35	R 27.74	BL 46°30'12" LT	
812164	812165	23.92	224°50'23"
812165	812166	C 43.43	289°55'44"
L 45.26	R 48.52	BL 53°23'55" RT	
812166	812167	57.21	353°06'03"
812167	812168	1.44	265°58'11"
812168	812169	C 28.86	289°58'53"
L 36.91	R 51.27	BL 53°51'04" RT	
812169	812170	7.63	89°02'34"
812170	812171	2.01	345°17'41"

* ON LOT/BLOCK LINE
** 812142 TO 12171 AND 812154 TO 812171 DEPICTS RIGHT OF WAY OF PRESCRIPTIVE EASEMENT



DOC. NO. 1229206
OFFICE OF REGISTRAR OF TITLES
WASHINGTON COUNTY, MINNESOTA
I HEREBY CERTIFY THAT THIS PLAT HAS BEEN FILED IN THIS OFFICE ON JULY 21ST, 2014, AT 9:46 AM IN CAB. ____ NO. ____
REGISTRAR OF TITLES

DOC. NO. 3994524
OFFICE OF COUNTY RECORDER
WASHINGTON COUNTY, MINNESOTA
I HEREBY CERTIFY THAT THIS PLAT HAS BEEN FILED IN THIS OFFICE ON JULY 21ST, 2014, AT 9:46 AM IN CAB. ____ NO. ____
COUNTY RECORDER

PLAT NO. 82-121
C.S. 8214136=451906
SHEET 2 OF 2

Appendix L. Fracture Critical Inspection Memo

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DEPARTMENT OF TRANSPORTATION

Memo

Date: 8/22/2019

From: Edward Lutgen, P.E. – State Program Manager

RE: Bridge 4654 (Stillwater Lift Bridge, Stillwater, MN)

Description:

Bridge 4654, the Stillwater Lift Bridge, carries MNTH 36 (Wisconsin Hwy 64) over the St. Croix River between the cities of Stillwater, Minnesota and Houlton, Wisconsin. The bridge also crosses over a Park Road and pedestrian walkway on the Stillwater side of the river. Constructed in 1930-1931, Bridge 4654 has 10 spans, with a total length of 1,151.4 ft. The Wisconsin bridge number is B-55-0919. It is jointly owned by Minnesota and Wisconsin.

The main river span (Span 4) is a 140 ft. long vertical lift span (steel "Parker" through truss). Spans 3 and 5-9 are 140 ft. steel "Parker" through truss spans. All of the truss spans are categorized as fracture critical. Spans 1 & 2 (over a Park road and walkway) are cast-in-place concrete slab spans. Both are 19 ft. clear spans. The lift span is supported by two 81 ft. high towers built into the trusses of Spans 3 & 5. The tower sheaves are 9 ft. in diameter. The lift span is balanced by two concrete counterweights (located within the lift towers). There are a total of 32 counterweight cables. The lift mechanism has been modified several times since the original construction (most recently in 2012). A lift operator house and electric house are attached to the north side of the lift span.

Construction of the new MNTH crossing of the St. Croix River (Br. 82045) was completed in 2018. After traffic shifted to the new St. Croix River crossing, the Stillwater Lift Bridge began a project conversion to pedestrian/bicycle use. This project includes a number of structural repairs and is scheduled to end in November 2019. The bridge will still allow emergency vehicles to cross the bridge. The bridge will also be solely owned, maintained, and inspected by Minnesota.

Background:

The Stillwater Lift Bridge has been tracked and inspected as a fracture critical bridge by the MnDOT Bridge Office Inspection Unit since 2009 and also as a complex bridge since 2017. However, since this bridge will be converted to pedestrian/bicycle, it is no longer considered a "bridge" under the National Bridge Inspection Standards or Minnesota State Statute 165. However, since this is a historic bridge with much investment spent to preserve the structure, the MnDOT Bridge Office and Metro District have elected to continue inspecting this bridge on a routine and in-depth basis. It will no longer be designated as fracture critical or complex on the Bridge Inventory.

Work completed as part of the bridge conversion project includes new mechanical systems (lift gears and drums), steal truss repairs, electrical repairs/upgrades, ADA compliance with the sidewalks, audio/visual systems, and concourse, rail, and lighting restoration to 1931 design.

Discussion: The MnDOT Bridge Office met on 8/5/2019 to discuss the process of determining the status and inspection frequency of Bridge 4654. It was elected to designate Bridge 4565 to an in-depth inspection cycle of 6 years and routine inspection every 2 years. The next routine and in-depth inspection will be performed by the MnDOT Bridge Office Inspection Unit, along with Metro District assistance, in 2020. As a result of this decision, Bridge 4654 will be removed from the fracture critical bridge list. Metro District has agreed with this decision.

The inspection frequencies will be subject to reduction based on condition decline. If any NBI (National Bridge Inventory item) drops to a 4 or less, the inspection frequencies will drop to yearly for routine and 3 years for in-depth. Other alterations to the inspection frequency may be determined at any time if deemed necessary by the MnDOT Bridge Office and Metro District.

The Metro District will also establish that the mechanical and electrical systems maintain an inspection frequency as noted in the Complex Inspection Plan (Operational Manual – SEH?).

Fracture Critical Members (FCM):

Spans #3-9 are riveted steel through truss spans (Span #4 is also a vertical lift span). The fracture critical members on this bridge include the truss bottom chord, truss vertical and diagonal members subjected to tension of reversal, the truss connection gusset plates, and the floorbeams. The lift girders at each end of Span #4 and the steel pier cap supporting Span #10 are also fracture critical members.

Fracture Critical members are shown in red in Figures 1 & 2:

Figure 1: Span #4 Truss Diagram & Framing Plan
(Panel Point Numbering & Fracture Critical Members)

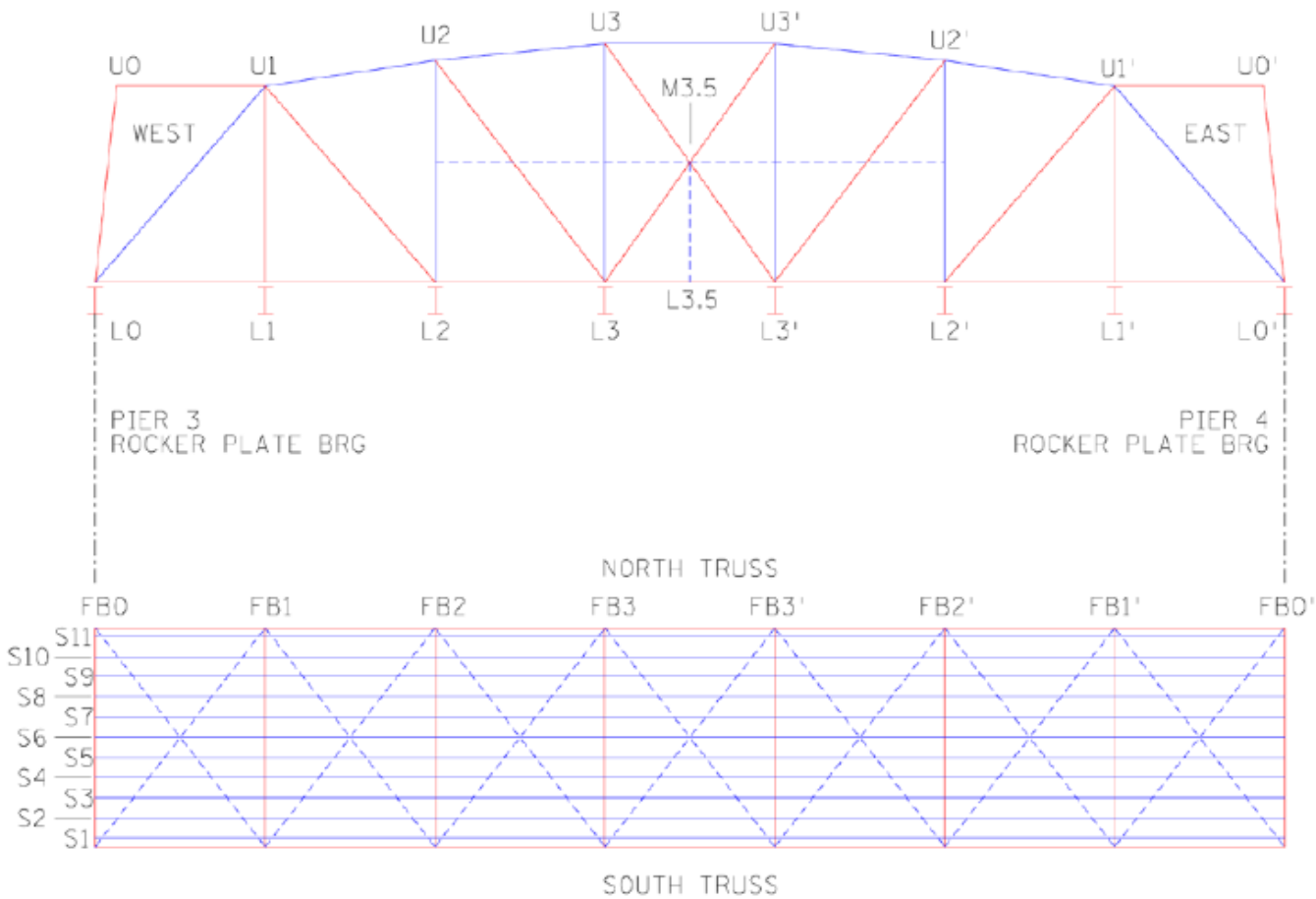
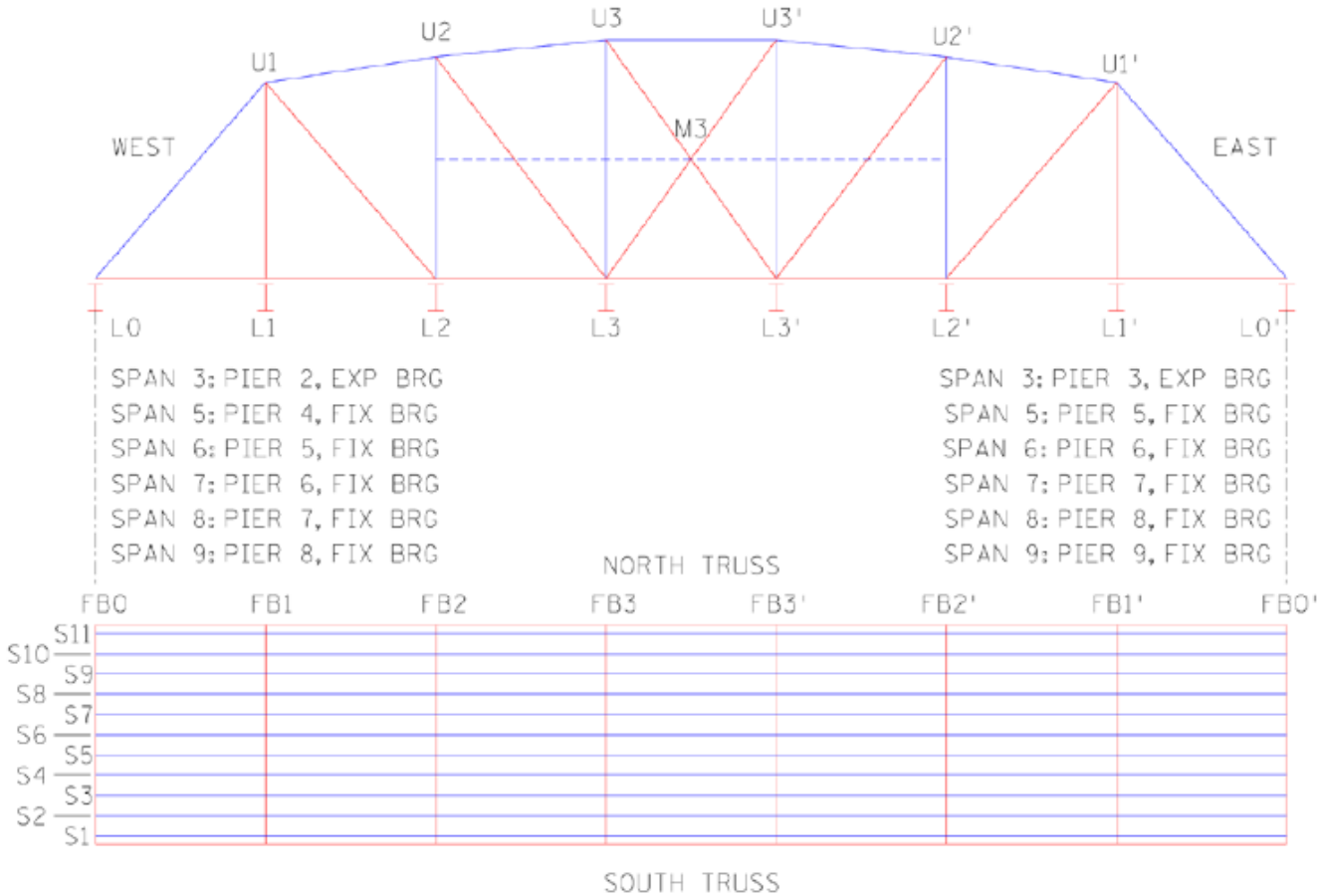


Figure 2: Spans #3 & #5-9 Truss Diagram & Framing Plan
(Panel Point Numbering & Fracture Critical Members)



Detailed Element Inspection Procedures:
*In-depth inspections - 6 years within arms-reach of noted elements.

1. Fracture Critical Members: Truss Spans #3-9 - this includes the truss bottom chord, truss tension and reversal members, truss connection gusset plates, and floorbeams. The lift girders at each end of Span #4 and the steel pier cap supporting Span #10 are also fracture critical members.

a. Visual inspection (within arm's length) of the fracture critical truss members, concentrating on fatigue prone details, connections, section loss and distortion. Ultrasonic (UT) Thickness readings and Magnetic Particle (MT) testing performed in selected locations (as needed).

b. Visual inspection (within arm's length) of the floorbeams, lift girders, and steel pier cap concentrating on fatigue prone details, connections, section loss and distortion.

c. Visual inspection (within arm's length) of the truss connection gusset plates, concentrating on fatigue prone details, connections, section loss and distortion.

2. Fatigue Prone Details: Steel members in Spans #3-10

a. Examine fatigue prone details on the truss superstructure for evidence of fatigue cracking or other distress. Focus mainly on AASHTO C, C', & D categories (see Fatigue Prone Details table in the most recent MnDOT Fracture Critical Report for specific locations).

3. All other members of the bridge shall be visually inspected for corrosion, section loss, alignment, and impact damage.

*Underwater Inspection Recommendation: These inspections do not include any submerged portions of the substructure, and channel cross-sections are not performed. These items are to be addressed during the 60 month underwater inspection cycle.

Routine Inspection Definition:

Routine inspection of the structural, mechanical, and electrical systems should include visual and operational examination of primary components without major disassembly and evaluation of the function of each primary component and system.

In-Depth Inspection Definition:

In-depth inspections should include all of the scope of a routine inspection and, in addition, should include measurement examinations and disassembly of selected components for internal inspection within arms-reach.

Reporting:

The reports shall be entered in the bridge file in SIMS on a 2 year cycle for routine inspections and a 6 year cycle for in-depth inspections.

The in-depth inspection report will contain an inspection summary, general information page, inspection results for the various structural elements, color photographs, a table identifying structural element deficiencies, a layout drawing showing the location of the deficient structural items, and the completed structural checklist. The structural elements that will be inspected are listed in the Complex Bridge Inspection Plan Appendix A.

Personnel Qualifications and Training:

The structural inspection of this movable bridge shall be performed by or under the supervision of personnel qualified as a Bridge Inspection Team Leader in the State of Minnesota. The electrical and mechanical inspection shall be performed by personnel qualified in the electrical and mechanical disciplines, under the supervision of a Professional Engineer licensed in the State of Minnesota. The lead person for each technical discipline shall possess the appropriate education, experience, and/or professional license to perform as discipline leader for the complex bridge inspection.

Access:

The structural members of the lift span inspected during the in-depth inspection of the bridge will be accessed with an Aspen Aerials A62 Under Bridge Inspection Unit (or equivalent) or barge and a telescoping or articulating boom lift with a vertical reach of at least 30'. Other structural components of the lift span can be accessed on foot from the deck, sidewalk, or catwalks. A lane closure is required and will be provided by MnDOT Metro District.

During the Complex Electrical and Mechanical Inspections, MnDOT will provide the inspectors or consultants with access to the areas where the various components are housed.