

Minnesota Department of Transportation (MnDOT) Bridge Management Plan Addendum

Bridge Number: 4380

Bridge 4380, an open spandrel arch, carries US 169 over the Mississippi River in Anoka County. The Minnesota Department of Transportation (MnDOT) has committed to preserve certain state-owned historic bridges, including Bridge 4380. As part of this commitment, MnDOT prepared a Historic Bridge Management Plan (Management Plan) for each of the bridges. These plans for state-owned bridges were prepared between 2006 and 2009, and can be found on the MnDOT website (see <http://www.dot.state.mn.us/historicbridges/about.html>). The 2006 Management Plan for Bridge 4380 describes the character-defining features of the bridge and recommends maintenance, stabilization, and preservation efforts for its ongoing use.

MnDOT has planned for an epoxy overlay of the bridge deck in late summer 2014 to Bridge 4380. As part of the review of the project, MnDOT found that the proposed work met the Secretary of the Interior's Standards (Standards) and therefore had no adverse effect to the bridge. The Minnesota State Historic Preservation Office (SHPO) concurred (see Appendix A for correspondence).

The epoxy overlay work was undertaken as a maintenance project and no plans for the repair were available. The original Management Plan recommended sealing the cracks on the top of the bridge deck to minimize the intrusion of salt-laden water, using standard MnDOT crack sealing procedures. This was a recommended stabilization activity. The epoxy chip seal overlay on the concrete deck fulfilled that recommendation. The epoxy overlay work did not change the other recommendations in the original management plan. As such, the original engineering recommendations for preservation, stabilization, and maintenance of the structure will continue to be applicable. Additionally, no field investigation was undertaken as part of the current study for this repair work. Cost estimates provided in the original management plan were not updated as part of this study. Prior to any planned work, new cost estimates should be prepared for the proposed project. The current MnDOT Structure Inventory Report and Bridge Inspection Report are included in Appendix B.

Funding for this bridge in the management plan previously identified the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) as a source for rehabilitation funds. Since the creation of the original Management Plans in 2006, federal transportation funding was reauthorized under a program known as MAP-21, which replaced SAFETEA-LU. The MAP-21 program is in place until September 30, 2014, at which time it is expected to be replaced by another federal transportation reauthorization bill expected to authorize federal funds for transportation projects.

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2005 Photograph

Minnesota Department of Transportation (MnDOT) Bridge Management Plan Addendum

Appendices

Bridge Number: 4380

Appendix A. SHPO and MnDOT Compliance Correspondence



Office of Environmental Services

Mail Stop 620
395 John Ireland Boulevard
St. Paul, MN 55155-1800

Office Tel: 651 366 3604

Fax: (651) 366 3603

February 1, 2013

Mary Ann Heidemann, Manager
Government Programs and Compliance
State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. West
St. Paul, MN 55102-1903

Re: S.P. 8827-471 (application of epoxy chip sealing to the Anoka-Champlin
Mississippi River Bridge [Bridge #4380]), Hennepin and Anoka counties

Dear Dr. Heidemann:

We have reviewed the above-referenced project per the responsibilities given MnDOT under Minnesota statutes 138.661-138.669 (Minnesota Historic Sites Act). This statute requires Mn/DOT to consult with the Minnesota Historical Society (MHS) when its undertakings have the potential to affect historic properties listed in the State or National Registers of Historic Places.

MnDOT is planning a state-funded bridge deck maintenance project on the National Register-listed Anoka-Champlin Mississippi River Bridge (Bridge #4380). The bridge is a continuous arch structure of steel-reinforced concrete built in 1929. In 1996-97, MnDOT completed rehabilitation and widening work that included replacement of all superstructure elements above the arch ribs and enlarging the end of each arch rib with additional concrete to strengthen the structure. The Classical Revival detailing in the ribs, piers, floor beams, railings, and abutments was either restored or reconstructed at that time. The bridge is eligible for the National Register as a major river crossing (Criterion A) and as a representative example of its type (Criterion C). The bridge's character-defining features include its reinforced-concrete rib arches and its Classical Revival style aesthetic treatments.

The proposed work is very similar to that performed on the historic Fort Snelling-Mendota Bridge in 2011. The work will begin by shot-blasting the deck and the shot-blasted material will be swept off the pavement. Then a two-part epoxy will be mixed to create a resin and applied to the bridge deck. Small aggregate will be broadcast in the epoxy while wet. The epoxy fills large deck cracks and spans over small cracks. The first pass will be about 1/8-inch thick and will cure in about four hours. After that, the deck will be swept again. A second pass of epoxy will be applied that builds the thickness up to about 3/8 inches. Deck crack sealing is one of the preservation measures recommended in the MnDOT Historic Bridge Management Plan for this structure. The work is limited to the roadway pavement and will not affect any of the character-defining features of the bridge and nor will it change the appearance of the pavement.

It is the determination of this office that the project as proposed will have **no adverse impacts** on the Anoka-Champlin Mississippi River Bridge (Bridge #4380). We would appreciate your comments regarding our determination within 30 days of receipt of this letter. If you have any questions, please call me at (651) 366-3604 or email me at elizabeth.abel@state.mn.us.

Sincerely,

Elizabeth J. Abel
State Programs Administrator Coordinator
Cultural Resources Unit

cc: Rick Dalton, MnDOT Metro
MnDOT CRU Project File

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Bridge Management Plan Addendum**

Appendices

Bridge Number: 4380

**Appendix B. Current MnDOT Bridge Inspection Report and
Structure Inventory Report**

Crew Number: 7627

Mn/DOT BRIDGE INSPECTION REPORT

Inspected by: METRO DISTRICT

BRIDGE 4380 US 169 OVER MISSISSIPPI RIVER

INSP. DATE: 06-25-2013

County: ANOKA	Location: AT NORTH COUNTY LINE	Length: 995.1 ft
City: ANOKA	Route: USTH 169 Ref. Pt.: 145+00.911	Deck Width: 79.6 ft
Township:	Control Section: 09 Maint. Area: 5F	Rdwy. Area / Pct. Unsd: 55,725 sq ft 2 %
Section: 12 Township: 031NN Range: 25W	Local Agency Bridge Nbr:	Paint Area/ Pct. Unsd:
Span Type: CONC ARCH		Culvert N/A

NBI Deck: 7 Super: 7 Sub: 7 Chan: 7 Culv: N
 Open, Posted, Closed: OPEN
 Appraisal Ratings - Approach: 7 Waterway: 9 MN Scour Code: P-STBL;PROT INPL Def. Stat: ADEQ Suff. Rate: 84.0
 Required Bridge Signs - Load Posting: NOT REQUIRED Traffic: NOT REQUIRED
 Horizontal: OBJECT MARKERS Vertical: NOT APPLICABLE

STRUCTURE UNIT: 0

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
378	LS O/L(CONCSLAB-EPX)	2	06-25-2013 07-26-2011	78,964 SF 78,964 SF	0 0	78,964 78,964	0 0	0 0	0 0
Notes: [Two lanes NB & SB each. [1998] Slab & low slump overlay replaced. Span 2 has some full depth patches due to improper concrete mix (prior to overlay). [2010] 1 SF spall rt lane NB C/L br.]									
300	STRIP SEAL JOINT	2	06-25-2013 07-26-2011	825 LF 825 LF	825 825	0 0	0 0	N/A N/A	N/A N/A
Notes: [[1998] Type 4 strip seal at abutments & over each pier.]									
301	POURED DECK JOINT	2	06-25-2013 07-26-2011	300 LF 300 LF	36 36	264 264	0 0	N/A N/A	N/A N/A
Notes: [Pourable joints at approaches & end blocks. [2003] Several small areas of joint failure. [2010] Jts all need hot rubber sealing 320 LF. [2011] Approx. 88% of joints have missing sealant or the sealant is not bonded to the adjacent concrete.]									
321	CONC APPROACH SLAB	2	06-25-2013 07-26-2011	2 EA 2 EA	2 2	0 0	0 0	0 0	N/A N/A
Notes: [[1997] Approaches received a low slump overlay. [2008] Asphalt roadway north & south. North approach has 100 LF of longitudinal cracks. [2011] Approaches cracks sealed.]									
331	CONCRETE RAILING	2	06-25-2013 07-26-2011	3,687 LF 3,687 LF	3,411 3,411	276 276	0 0	0 0	N/A N/A
Notes: [[1998] Rail code 22, Type "J" 1990 LF at the roadway. Rail code 41, Type "Special" 1697 LF at the sidewalks. [2000] Numerous cracks throughout outside rails. [2003/08] Railings have 2985 LF of vertical cracks. [2011] 276 LF of the bridge railing is affected by cracking.]									
110	CONCRETE GIRDER	2	06-25-2013 07-26-2011	315 LF 315 LF	315 315	0 0	0 0	0 0	N/A N/A
Notes: [Approach spans 1 & 10 have 51" deep concrete "T" beams. [1997] CIP beams have been reconstructed.]									
144	CONCRETE ARCH	2	06-25-2013 07-26-2011	1,876 LF 1,876 LF	1,859 1,859	17 17	0 0	0 0	N/A N/A
Notes: [Original arches remain. [1997] Arch rib bases reinforced. [2011] Minor spalling on east & west arch totalling 17 LF.]									
155	CONCRETE FLOORBEAM	2	06-25-2013 07-26-2011	5,418 LF 5,418 LF	5,414 5,414	4 4	0 0	0 0	N/A N/A
Notes: [40" deep floorbeams. [1997] Floorbeams reconstructed. [2003] Floorbeam 6, span 3, north side, has 6 SF of delamination. [2011] 4 LF of minor delamination total on bridge. Span 2, FB1 has 1 LF delam on east end.]									
385	CONC SPANDREL COLUMN	2	06-25-2013 07-26-2011	148 EA 148 EA	148 148	0 0	0 0	0 0	N/A N/A
Notes: [[1997] Spandrel columns reconstructed.]									
310	ELASTOMERIC BEARING	2	06-25-2013 07-26-2011	198 EA 198 EA	198 198	0 0	0 0	N/A N/A	N/A N/A
Notes: [Abutments have eight bearings each. Piers 1 & 9 have 21 bearings each. Piers 2 thru 8 have 20 bearings each.]									
313	FIXED BEARING	2	06-25-2013 07-26-2011	6 EA 6 EA	6 6	0 0	0 0	N/A N/A	N/A N/A
Notes: [Abutments have fixed bearings under beams 3, 6 & 9.]									

Crew Number: 7627

Mn/DOT BRIDGE INSPECTION REPORT

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BRIDGE 4380 US 169 OVER MISSISSIPPI RIVER

INSP. DATE: 06-25-2013

STRUCTURE UNIT: 0

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
205	CONCRETE COLUMN	2	06-25-2013 07-26-2011	27 EA 27 EA	20 20	7 7	0 0	0 0	N/A N/A
Notes: Original pier columns remain. [2003] North side of the center column at pier 8 has 1 SF of spall. [2011] Columns listed as CS2: Pier 5 Center & West, Pier 6 West, Pier 7 Center, Pier 8 East, and Pier 9 Center.									
210	CONCRETE PIER WALL	2	06-25-2013 07-26-2011	492 LF 492 LF	398 398	94 94	0 0	0 0	N/A N/A
Notes: Original pier bases remain. [1996] Underwater inspection found band of moderate scale 1" deep around all the piers. [2004] Underwater inspection found scaling 1" deep, from waterline to 2 FT below & some local areas are 5" deep & vertical hairline cracks on pier faces. [2008] Underwater inspection found the concrete of the piers was generally in sound condition and exhibited minor scaling with ¼" to ½" typical and 1" maximum penetrations in and around the waterline and around the entire perimeter of the piers. [2011] Minor spall below east column pier 8, below center & west column pier 5. [2013] The 2012 underwater inspection report lists Concrete of inspected piers exhibited scaling with 1/4 to 1/2 inch typical to 1 inch maximum penetrations, extending around the entire perimeter of the piers from 6 inches above the waterline to the channel bottom. See attached report in element 361 scour smart flag									
215	CONCRETE ABUTMENT	2	06-25-2013 07-26-2011	160 LF 160 LF	80 80	80 80	0 0	0 0	N/A N/A
Notes: [1997] Top portion of abutments reconstructed. [2009] South abutment deck surface has 120 LF of longitudinal cracks. North abutment deck surface has 300 LF of longitudinal cracks. [2011] Abutment deck cracks sealed.									
234	CONCRETE CAP	2	06-25-2013 07-26-2011	738 LF 738 LF	714 714	24 24	0 0	0 0	N/A N/A
Notes: [1997] Pier caps reconstructed. [2003] Pier caps have 48 LF of vertical cracks.									
358	CONC DECK CRACKING	2	06-25-2013 07-26-2011	1 EA 1 EA	0 0	1 1	0 0	0 0	N/A N/A
Notes: [2001/08] Deck surface has 8000 LF of random, transverse & longitudinal cracks. [2011] There is evidence that the deck cracks were recently sealed (in the past 3 yrs), however the sealant has worn off, especially in the wheel paths and in some places there appears to be no sealant in the cracks. [2013] The condition of the cracks appears to be the same as in 2011. Approximately 50% of the cracks in the wearing surface have sealant present in the crack.									
359	CONC DECK UNDERSIDE	2	06-25-2013 07-26-2011	1 EA 1 EA	0 0	1 1	0 0	0 0	0 0
Notes: [1998/09] Underside of the deck has 5340 LF of longitudinal leaching cracks. Full depth deck repair at span 2.									
361	SCOUR	2	06-25-2013 07-26-2011	1 EA 1 EA	1 0	0 1	0 0	N/A N/A	N/A N/A
Notes: [1996] Underwater inspection found minor scour 1 FT deep, on the upstream ends of piers 6, 7, & 8. [2004] Underwater inspection by "Ayres Associates" found pier 5 has local scour at the downstream nose. No change at pier 8. Underwater inspection recommends adding riprap to toe of the slope at pier 1. [2008] Underwater inspection of the substructure units inspected at Piers 2 through 8, were found to be generally in good condition with no defects of structural concern at this time noted. The concrete of the piers was generally in sound condition and exhibited minor scaling with ¼" to ½" typical and 1" maximum penetrations in and around the waterline and around the entire perimeter of the piers. The channel bottom material typically consisted of up to 1 foot in diameter stones and gravel. Comparisons of the existing channel bottom configuration with the previous underwater inspection findings in 2004 revealed no significant changes. Minor scour depression was noted around the upstream nose of Pier 8, and is a deficiency of no concern to the structural integrity of the pier. Light to moderate timber debris accumulations were observed at the upstream noses of Piers 2, 7, and 8. [2009] Snooper Inspection found moderate to severe timber debris at Pier #7. This should be removed. [2013] The 2012 underwater inspection report lists The channel bottom material typically consisted of up to 1 foot in diameter stones and gravel. Comparisons of the existing channel bottom configuration with the previous underwater inspection findings in 2008 revealed no significant changes. A minor scour depression was noted around the upstream nose of Pier 8. Light to moderate timber debris accumulations were observed at the upstream noses of Piers 2, 5, 6, and 8. Condition state adjusted from CS 2 to CS 1 to reflect the recommendations of the underwater inspection report. See attached report.									
964	CRITICAL FINDING	2	06-25-2013 07-26-2011	1 EA 1 EA	1 1	0 0	N/A N/A	N/A N/A	N/A N/A
Notes: Do not delete this critical finding smart flag.									

Crew Number: 7627

Mn/DOT BRIDGE INSPECTION REPORT

Inspected by: METRO DISTRICT

BRIDGE 4380 US 169 OVER MISSISSIPPI RIVER

INSP. DATE: 06-25-2013

STRUCTURE UNIT: 0

ELEM NBR	ELEMENT NAME	ENV	INSP. DATE	QUANTITY	QTY CS 1	QTY CS 2	QTY CS 3	QTY CS 4	QTY CS 5
981	SIGNING	2	06-25-2013	1 EA	1	0	0	0	0
			07-26-2011	1 EA	1	0	0	0	0
Notes:									
982	GUARDRAIL	2	06-25-2013	1 EA	1	0	0	N/A	N/A
			07-26-2011	1 EA	1	0	0	N/A	N/A
Notes: [1997] Quadguard Type I & II crash attenuators at SE & NW rail ends.]									
984	DRAINAGE	2	06-25-2013	1 EA	1	0	0	N/A	N/A
			07-26-2011	1 EA	1	0	0	N/A	N/A
Notes: 2 Drop inlet: base each curb north & south roadway. [1998] Containment pond constructed on NE shore. Deck no longer drains into the river. [2009] Drop Inlets were cleaned out today.									
985	SLOPES	2	06-25-2013	1 EA	1	0	0	N/A	N/A
			07-26-2011	1 EA	1	0	0	N/A	N/A
Notes: [1998] Grouted rirap slopes at both ends.									
986	CURB & SIDEWALK	2	06-25-2013	1 EA	0	0	1	N/A	N/A
			07-26-2011	1 EA	0	0	1	N/A	N/A
Notes: Both sidewalks are 8 FT wide. [2000] Map cracking on both walks throughout. [2003/08] Sidewalks have 4000 LF of transverse cracks. [2005] 2 SF spall south end of east walk. [2010] Cracks epoxy sealed 8/2009. [2011] Spall west sidewalk pier 1, sidewalk cracks sealed.)									
988	MISCELLANEOUS	2	06-25-2013	1 EA	0	1	0	N/A	N/A
			07-26-2011	1 EA	0	1	0	N/A	N/A
Notes: Ornamental lighting on sidewalk rail. [1998] Recreation trail constructed below south span. 4 conduits at east coping. [2001] 75' Snooper doesn' t work on this bridge. [2003/09] Moderate to severe log jam at pier 7 upstream side. Trees need cutting NE & SE corners. Stairs SW corner. [2011] Tree caught (west) pier 2.)									

General Notes: Bridge #4380, Year 2013 Bridge constructed in 1929. Major reconstruction 1996-98. (original arches remain). [2001] Photos. Snooper

- 1999 Inspectors: K Fuhrman /P Wilson /M Palmer
- 2001 Inspectors: K Fuhrman /M Beucler
- 2003 Inspectors: V Desens /J Oldeen
- 2005 Inspectors: M Palmer /J Bergmann
- 2006 Inspectors: M Palmer /M Koffski
- 2007 Inspectors: V Desens /K Fuhrman
- 2008 Inspectors: K Fuhrman
- 2009 Inspectors: V Desens /K Fuhrman
- 2010 Inspectors: J Knevel /B Dumbeck
- 2011 Inspectors: K Fuhrman /C Hoberg
- 2013 Inspectors: C Hoberg /C Ramberg

Inspector's Signature

Reviewer's Signature / Date

Mn/DOT Structure Inventory Report

Bridge ID: 4380

US 169 over MISSISSIPPI RIVER

Date: 12/16/2013

+ GENERAL +	+ ROADWAY +	+ INSPECTION +
Agency Br. No. Crew 7627	Bridge Match ID (TIS) 1	Deficient Status ADEQ
District METRO Maint. Area 5F	Roadway O/U Key 1-ON	Sufficiency Rating 84.0
County 02 - ANOKA	Route Sys/Nbr USTH 169	Last Inspection Date 06-25-2013
City ANOKA	Roadway Name or Description	Inspection Frequency 24
Township	US 169	Inspector Name METRO
Desc. Loc. AT NORTH COUNTY LINE	Roadway Function MAINLINE	Structure A-OPEN
Sect., Twp., Range 12 - 031NN - 25W	Roadway Type 2 WAY TRAF	+ NBI CONDITION RATINGS +
Latitude 45d 11m 29.97s	Control Section (TH Only) 09	Deck 2 % UNSOUND 7
Longitude 93d 23m 43.10s	Ref. Point (TH Only) 145+00.911	Superstructure 7
Custodian STATE HWY	Date Opened to Traffic 11-01-1998	Substructure 7
Owner STATE HWY	Detour Length 16 mi.	Channel 7
Inspection By METRO DISTRICT	Lanes 4 Lanes ON Bridge	Culvert N
BMU Agreement	ADT (YEAR) 46,000 (2008)	+ NBI APPRAISAL RATINGS +
Year Built 1929	HCADT 1,380	Structure Evaluation 7
Year Fed Rehab	Functional Class. URB/OTH PR ART	Deck Geometry 5
Year Remodeled 1996	+ RDWY DIMENSIONS +	Underclearances N
Temp	If Divided NB-EB SB-WB	Waterway Adequacy 9
Plan Avail. CENTRAL	Roadway Width 56.0 ft	Approach Alignment 7
+ STRUCTURE +	Vertical Clearance	+ SAFETY FEATURES +
Service On HWY;PED	Max. Vert. Clear.	Bridge Railing 1-MEETS STANDARDS
Service Under STREAM	Horizontal Clear. 55.9 ft	GR Transition 1-MEETS STANDARDS
Main Span Type CONC ARCH	Lateral Clr. - Lt/Rt	Appr. Guardrail 1-MEETS STANDARDS
Main Span Detail OPEN SPANDREL ARCH	Appr. Surface Width 56.0 ft	GR Termini 1-MEETS STANDARDS
Appr. Span Type	Roadway Width 56.0 ft	+ IN DEPTH INSP. +
Appr. Span Detail	Median Width	Frac. Critical
Skew	+ MISC. BRIDGE DATA +	Underwater Y 60 mo 10/2012
Culvert Type	Structure Flared NO	Pinned Asbly.
Barrel Length	Parallel Structure NONE	Spec. Feat.
Number of Spans	Field Conn. ID	+ WATERWAY +
MAIN: 10 APPR: 0 TOTAL: 10	Cantilever ID	Drainage Area 17,280.1 sq mi
Main Span Length 108.0 ft	Foundations	Waterway Opening 22000 sq ft
Structure Length 995.1 ft	Abut. CONC - FTG PILE	Navigation Control NO PRMT REQD
Deck Width 79.6 ft	Pier CONC - FTG PILE	Pier Protection
Deck Material C-I-P CONCRETE	Historic Status ON REGISTER	Nav. Vert./Horz. Clr.
Wear Surf Type LOW SLUMP CONC	On - Off System ON	Nav. Vert. Lift Bridge Clear.
Wear Surf Install Year 1996	+ PAINT +	MN Scour Code P-STBL;PROT INPL
Wear Course/Fill Depth 0.17 ft	Year Painted Pct. Unsound	Scour Evaluation Year 1992
Deck Membrane NONE	Painted Area	+ CAPACITY RATINGS +
Deck Protect. EPOXY COATED REBAR	Primer Type	Design Load HS25
Deck Install Year 1996	Finish Type	Operating Rating HS 64.80
Structure Area 79,210 sq ft	+ BRIDGE SIGNS +	Inventory Rating HS 38.90
Roadway Area 55,725 sq ft	Posted Load NOT REQUIRED	Posting
Sidewalk Width - L/R 8.0 ft 8.0 ft	Traffic NOT REQUIRED	Rating Date 03-01-1996
Curb Height - L/R	Horizontal OBJECT MARKERS	Mn/DOT Permit Codes
Rail Codes - L/R 22 22	Vertical NOT APPLICABLE	A: 1 B: 1 C: 1