SSR and attached Alternative Analysis Report satisfy Bridge Engineering Study requirements for Local Bridge Program funding

ENGLISH - REHABILITATION STRUCTURE SURVEY REPORT

Wisconsin Department of Transportation

DT1696 1/2006 (Replaces EB24)

Final Plan Due Date	Preliminary Plan Due Date	☐ Town of ☐ Village of ☒ City of Chippewa Falls	
May 1, 2014 PS&E	June 2012		
Old Structure Number	Highway	County	Design Project ID 8996-00-80 Construction Project ID 8996-00-
P-9-711	Spring Street	Chippewa	
Feature On		Feature Under	
Spring Street		Duncan Creek	

Region Contact Person/Area Code with Telephone Number

Karen Richardson - Kjohnson Engineers / 608.829.3858

Consultant Contact Person/Area Code with Telephone Number

Christopher B. McMahon, PE - Ayres Associates / 715.834.3161

Work To Be Performed

Item		Field Information Required (See Pages 2 and 3)
☐	A. Structural Repair	1, 2, 3
☒	B. Concrete Overlay	1-18, 20, 21, 25, 26
☐	C. New Bearings	9
☐	D. New Railings	18, 19, 21
☒	E. Curb and Sidewalk Repair	2, 3, 21
☐	F. Abutment Repair	2, 3, 21
☐	G. Pier Repair	2, 3, 21
☐	H. New Deck	1-5, 9, 10, 13-18, 20-26
☐	I. Widening	1-18, 20-26
☐	J. Joint Repair	2, 3, 8, 17, 21
☒	K. Surface Repair	2, 3
☐	L. Raising Bridge	3, 9, 21-23
☒	M. Other	
☐	N. Asphaltic Overlay	

Concur with Recommendations Subject to Comments on page 2/138
APL
WisDOT Bureau of Structures
6-20-2013

Comments 6-20-13

P-9-711

By APL

We concur with Owners preferred **Alternative No. 2b:** *Repair and Stain the Existing Bridge* subject to the following comments:

Repair and re-use of the existing railing is acceptable for this alternative based on the following factors:

1. Low speeds
2. Stop condition at west end of bridge
3. Straight alignment
4. Conversion to one way traffic
5. Adding 2' of additional setback from curb to south railing

Consider using passive cathoditic protection, active cathoditic protection, chloride extraction, and/or concrete sealers to maximize longevity of the concrete repairs required because of steel corrosion.

The load ratings recorded in HSI were calculated in 1979 and did not assume any loss of steel section. The floor beam was the controlling member. The floor beam to hanger joint was not investigated. As part of final design analyze this joint and determine amount of section loss that can be tolerated. Make provisions in rehabilitation plans to repair this joint if during construction concrete repairs expose section loss exceeding acceptable limits. Also analyze the other members of structural system to determine rehabilitated condition load ratings.

Bridge Manual section 40.4 requires the rehabilitated structure to have a sufficiency number greater than 80 unless it is waived for safety and public interest. It is unlikely the proposed repairs will achieve this and a waiver by the Region will be required.

Page 3 of the report under section **Existing Bridge Conditions** indicates the bearings are severely rusted. I don't see this mentioned in the inspection report and cannot find bearings in the original plans. Is this a cut and paste problem? If not, include repairs in final plans.

The Bridge Inspection Report notes the gas main connected to north ends of the floor beams is causing cracks/spalls in the concrete. Recommend the gas main be removed from this historic bridge.

The report does not address meeting the requirements of Trans 75 for the accommodation of bicycles within bridge roadway width (or sidewalk). Given that the

structure has one wide sidewalk the rehabilitated bridge should be able to meet requirements of Trans 75, but BOS will defer to the Region Contact for acceptability.

During final design please submit a good digital copy of the original structure plans along with proposed plans.

Field Information Required

☒ 1. Most recent inspection report - Brief history of bridge construction date, dates and description of repairs.

☒ 2. Outline deficient areas on existing bridge plan.

☒ 3. Photographs of details requiring repairs or modifications, such as: bearings, x-frames, joints, etc. Photograph all deficient areas. Clearly label all photographs.

☒ 4. X-section slope for bridge and approaches for proposed work (straight).

☐ 5. To tie in girders to new work, determine beam seat or girder elevations at both sides of bridge at all substructure units where possible.

☐ 6. Provide cross-section elevations at 10 foot maximum centers extending for 100 feet beyond the bridge at both ends. Sections should be normal to centerline and show elevations at centerline roadway and gutterline. Take elevations along joints and at floor drains.

☒ 7. Show and identify starting stationing on bridge.

☐ 8. Joint openings measured, temperature and date of measurements recorded. Clearances between girder ends at piers and front face of backwell at abutments for joint openings should be made at the centerline of roadway and at each gutterline. Take on top of deck and under deck - if accessible.

☒ 9. Fixed and expansion bearings - condition and orientation.

☐ 10. Number and width of pours including construction staging sequence.

☒ 11. Location of existing construction joints in the deck.

☒ 12. Estimated Quantities:

Preparation, Decks, Type 1	Sq. Yd.	3 +/-
Preparation, Decks, Type 2	Sq. Yd.	3 +/-
Full Depth Deck Repair	Sq. Yd.	1 +/-
Concrete Surface Repair	Sq. Ft.	505 +/-
Curb Repair	L.F.	8 +/-

☒ 13. Sufficiency Number 47.1 (obtain from bridge file)

☒ 14. Appraisal and Condition Rating

	Deck Condition	Superstructure Condition	Substructure Condition	Load Capacity Appraisal	Structural EVAL Appraisal
Current	5	5	5	5	4

☒ 15. Load Ratings

	Inventory	Operational
Current	HS-11	HS-18
AFTER Completed by Bridge Designer	Determined in Final Design	Determined in Final Design

Field Information Required - Con't.

☒ 16. Drains to be:

☐ Raised ☐ Closed ☐ Downspouted ☐ New

☒ 17. Traffic maintained on bridge during work?

☒ No ☐ Yes - Include sketches

☒ 18. Will guard rail be attached?

☒ No ☐ Yes - Which corners

☒ 19. Is existing bridge railing deficient?

☒ No ☐ Yes - Replacement Rail Type

☒ 20. Will work to be performed eliminate all deficiencies?

☒ Yes ☐ No - Explain

☒ 21. Describe / Locate existing / proposed utilities.

A gas line is attached to the concrete floor beams on the north side of the structure.
A electric conduit is attached to the concrete floor beams on the north side of the structure.
An empty conduit is also attached to the concrete floor beams on the north side of the structure.

☐ 22. Wing location for surface drain anchors.

☒ 23. Painting

☐ No ☒ Yes - explain (all, part, railing, color system, containment, bid items)

All of the existing concrete will be stained white. The existing steel bearings will be cleaned and painted. The gas line will be painted white where it is adjacent to the arch and blue/gray everywhere else.

☐ 24. Desired Roadway Width (New Deck / Widening) Ft.

☐ 25. Maximum increase in grade line elevation In.

☒ 26. Benchmark description to be shown

Chisled Square Top of Parapet @ NE wingwall, Station 10+59, 19' LT, EL. 839.00

☒ 27. Desired final cross slopes on bridge 0.02 Ft./Ft.

Structure History / Work to be Performed

Item #1 – See attached Alternative Analysis Report.

Item #2 – The deck is in fair condition. The concrete arch, concrete hangers, concrete floor beams, and concrete parapet are in fair condition with spalling and cracking concrete. The abutments are in fair condition with some spalling of concrete. (See attached Alternative Analysis Report for Inspection Reports, Photos, and Existing Plans.)

Item #3 – See attached Alternative Analysis Report for Overall Photographs of the site. See attached Photographs for Specific Locations of Deficiencies.

Item #4 – See Cross Section on Preliminary Plans.

Item #7 – See Plan View on Preliminary Plans.

Item #9 – The existing fixed bearings are in fair condition and will not be replaced.

Item #11 – There is no existing construction joint located in the existing deck.

Item #12 – Concrete Surface Repairs are required on the concrete arches, concrete hangers, concrete floor beams, concrete parapet, concrete sidewalk, concrete deck, and concrete abutments.

Item #13 – See attached Alternative Analysis Report for the Sufficiency Rating Calculations.

Item #14 – See attached Alternative Analysis Report for the Fracture Critical and the Routine Inspection Bridge Inspection Reports and the Sufficiency Rating Calculations.

Item #15 - See attached Alternative Analysis Report for the Structure Inventory Data Form and Fracture Critical and the Routine Inspection Bridge Inspection Reports.

Item #16 – There is no existing drain located in the deck.

Item #17 – The existing bridge will be closed during construction.

Item #19 – The existing bridge railing is an ornamental concrete parapet. The existing bridge railing has miscellaneous surface scaling and spalls throughout. Concrete surface repair will be done to the deficient areas of the parapet. The curb on the south side of the bridge will be reconstructed to be two-foot wide to position the existing parapet outside of the clear zone.

Item #21 – The gas line will remain in place but will be painted, see Item # 23. The street lighting conduit will be replaced. The empty conduit will be removed.

Item #23 – All of the existing concrete will be stained white. The gas line will be painted white where it is adjacent to the arch and blue/gray everywhere else.

Work to be performed

*See attached Alternative Analysis Report for this historic structure.

*Concrete surface repair will also be performed on the existing concrete surfaces on the arch, hangers, floor beams, deck, sidewalk, and parapet.

*The curb on the south side of the bridge will be reconstructed two-foot wide.

*The existing overlay and 4-inches of additional concrete that was placed when the original pavers will be removed and a concrete overlay will be placed.

*All of the existing concrete will be stained white. The gas line will be painted white where it is adjacent to the arch and blue/gray everywhere else.

FOR BRIDGE OFFICE USE

Plans Checked By Date

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALL ON INSIDE FACE OF RAILING VERTICAL ON SOUTH SIDE OF BRIDGE

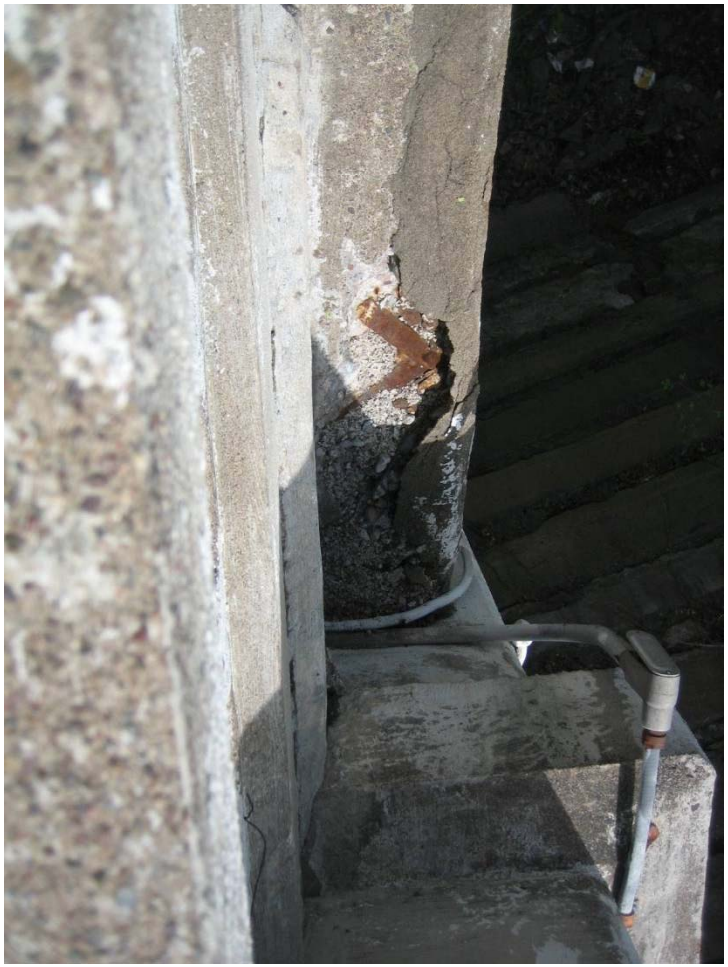
SPALL & CRACK ON FRONT FACE OF RAILING VERTICAL ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON INSIDE FACE OF HANGER ON SOUTH SIDE OF BRIDGE

CRACK ON INSIDE FACE OF HANGER ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY



DETERORIATED CONCRTE WITH EXPOSED STEEL LATICE ON TOP OF ARCH ON SOUTH SIDE OF BRIDGE

SPALL ON TOP OF ARCH ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALLS WITH EXPOSED REBAR ON BOTTOM OF ARCH ON SOUTH SIDE OF BRIDGE

CRACKS ON FRONT OF END BLOCK CONCRETE RAILING ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALL ON BACK OF END BLOCK CONCRETE RAILING ON SOUTH SIDE OF BRIDGE

SPALLED CONCRETE ON BOTTOM OF ARCH ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALLED CONCRETE ON FRONT OF RAILING ON SOUTH SIDE OF BRIDGE

CRACKS ON FRONT OF ARCH TOP AND BOTTOM ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON FRONT OF RAILING VERTICAL ON NORTH SIDE OF BRIDGE

SPALL WITH EXPOSED REBAR ON FRONT OF RAILING VERTICAL ON NORTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON INSIDE FACE OF RAILING VERTICAL ON NORTH SIDE OF BRIDGE

SPALL ON FRONT OF RAILING ON NORTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON TOP OF FRONT OF ARCH ON NORTH SIDE OF BRIDGE

SPALLS AND CRACK ON INSIDE FACE OF SIDEWALK ON NORTHSIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON INSIDE FACE OF HANGER ON NORTH SIDE OF BRIDGE

SPALL AT JOINT OF ARCH AND HANGER ON NORTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALL ON BOTTOM OF ARCH NEAR FLOOR BEAM ON SOUTH SIDE OF BRIDGE

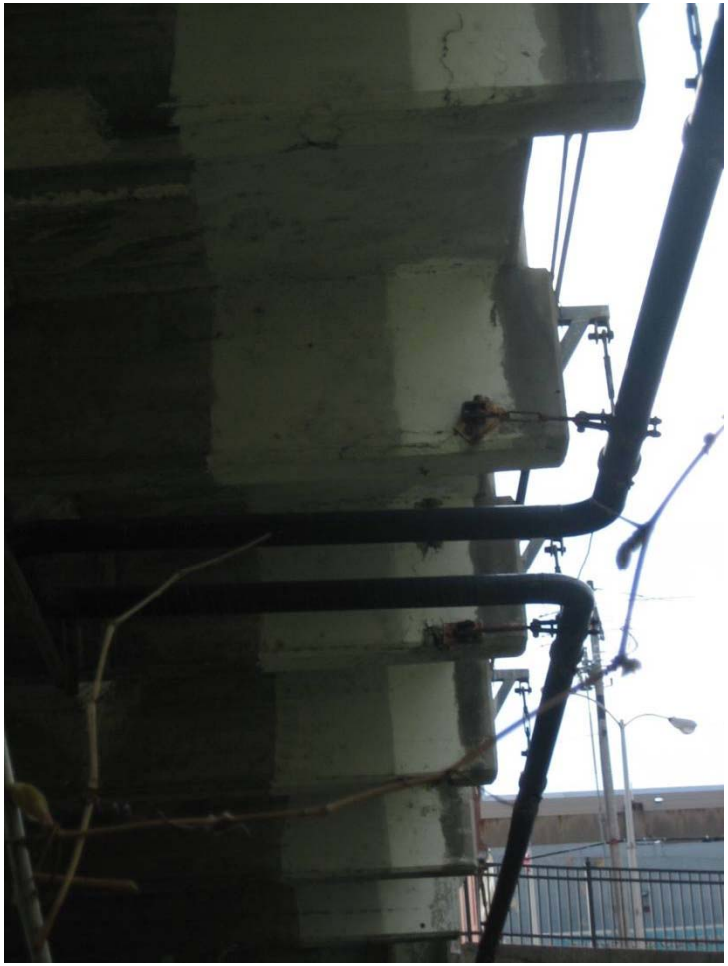
DISTRESSED CONCRETE END OF FLOOR BEAM ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

DISTRESSED CONCRETE END OF FLOOR BEAMS ON SOUTH SIDE OF BRIDGE

DISTRESSED CONCRETE END OF FLOOR BEAM ON SOUTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY



DISTRESSED CONCRETE END OF FLOOR BEAMS ON NORTH SIDE OF BRIDGE

DISTRESSED CONCRETE END OF FLOOR BEAM ON NORTH SIDE OF BRIDGE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

HOLE AND SPALL ON BOTTOM OF DECK

SPALLS AND CRACKS ON THE NORTH EAST ABUTMENT

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

CRACK ON BOTTOM OF FRONT OF ARCH ON SOUTHSIDE OF BRIDGE EAST SIDE

CRACK ON BOTTOM OF FRONT OF ARCH ON SOUTHSIDE OF BRIDGE WEST SIDE

ID: 8996-00-80
SPRING STREET OVER DUNCAN CREEK
CITY OF CHIPPEWA FALLS, CHIPPEWA COUNTY

SPALL WITH EXPOSED LATTICE STEEL ON TOP OF ARCH SOUTH SIDE AT WEST ABUTMENT

SPALL ON TOP OF ARCH SOUTHSIDE AT EAST ABUTMENT

I.D. 8996-00-79
City of Chippewa Falls

Rainbow Arch Bridge
Spring Street over Duncan Creek
Structure P-9-0711
Chippewa County

Alternative Analysis Report

March 2011

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Ayres Associates Project No. 42-0740.00
File: u:\42-0740.00 - city of chippewa falls, spring street over duncan creek\correspondence\r110308a.cbm.doc

Contents

List of Appendices

Introduction

The City of Chippewa Falls, Chippewa County, wants to upgrade the Spring Street crossing of Duncan Creek, commonly referred to as the Rainbow Arch Bridge, while the bridge is still structurally in fair condition. On behalf of the City, Ayres Associates performed a study to determine if replacement or rehabilitation is the best option for the bridge. This report summarizes the findings and recommendations.

The Spring Street (Rainbow Arch) bridge (P-9-0711) is a single-span concrete pony arch bridge.

The bridge is currently open to traffic and has no load postings. The bridge is structurally in fair condition, but it is eligible for replacement funding because of its functional obsolescence.

The bridge is located approximately 0.1 miles east of STH 124 in Section 6, T28N, R08W, Chippewa County, Wisconsin. (See Appendix A – Bridge Location Maps.)

Structure History

The existing bridge's arch consists of a steel arch encased in concrete. The bridge is 93.2 feet long from the center to center of bearings at the abutments, which are vertical concrete abutments supported on timber piling. The bridge has a clear roadway width of 20 feet. There is also an 8-foot-wide sidewalk on the north side of the bridge.

The following lists some of the characteristics of the structure:

Bridge Number:	P-9-0711
Year Built:	1916
Number of Spans:	One (93.2 feet)
Overall Length:	110.9 feet
Clear Roadway Width	20 feet
Sidewalk Width	8 feet
Utilities:	Gas line on north side
Skew:	None
Horizontal Curve:	None
Super-elevation:	No crown
Posted Speed:	25 mph
Overburden:	None
Classification:	Collector
Design Load:	H-11
Inventory Rating:	HS-11
Operating Rating:	HS-18
Sufficiency Rating:	47.1
Posting:	Not load-posted but is posted as narrow bridge
National Register of Historic Places Reference Number:	NRHP 82000642

The design H loading consists of a two-axle truck. The H loading is designated H followed by a number indicating the gross weight in tons of the standard truck. The existing bridge design load is H-11.

The HS loading consists of a tractor truck with semi-trailer. The HS loadings are designated by the letters HS followed by a number indicating the gross weight in tons of the tractor truck. Existing structure is load rated based on an HS-20 loading.

Bridges are rated at two different load levels referred to as “Inventory Rating” and “Operating Rating”. The Inventory Rating is the load that can safely utilize an existing structure for an indefinite period. The Operating Rating is the maximum safe load carrying capacity of the structure.

The bridge was built in 1916. In 1996 the bridge deck was overlaid, concrete surface repairs were made, the railing was repaired, and the concrete arch was stained white.

The bridge is on a straight tangent section with curb and gutter approaches. Spring Street intersects with STH 124 (Rushman Drive) immediately west of the bridge.

Truck traffic is restricted from using the bridge, and no right turns are allowed onto the bridge from STH 124 (Rushman Drive). These traffic restrictions were placed on the bridge to help traffic flow in the area and are not required due to the condition of the bridge.

Environmental Concerns

The Wisconsin Department of Natural Resources (WisDNR) was asked to provide input and describe concerns regarding the project, which are as follows:

- There are no wetlands in the area.
- There are no known endangered species at this site.
- If the structure were to be replaced, the new bridge should be a clear span structure. The width and depth of Duncan Creek must not be altered, and impacted banks must be lined with geotextile fabric and clean heavy riprap.

The existing bridge is historically significant and is embraced by residents as an important landmark.

The Iowa Bridge Company of Des Moines built the existing bridge in 1916. James B. Marsh designed the existing bridge, and his design was patented in 1912. The Spring Street (Rainbow Arch) bridge is Wisconsin’s only remaining example of this type of bridge.

The bridge was placed on the National Register of Historic Places on June 25, 1982.

The Spring Street (Rainbow Arch) bridge is one of 37 sites along the historic Main Street walking tour sponsored by the Chippewa Falls Main Street Association. The bridge has also been incorporated into the Main Street Association’s logo.

In order to do any work on this bridge using federal funding, the effects of the project on all cultural resources must be taken into account. This process is referred to as the Section 106 process and may include input from the public, the Wisconsin State Historic Preservation Office,

the City of Chippewa Falls, the Federal Highway Administration, the Advisory Council of Historic Preservation, and the Wisconsin Department of Transportation. Historical mitigation work may be required.

The navigational use of Duncan Creek in this area is minimal and is limited to recreational use.

Existing Bridge Conditions

The bridge is in fair condition. The main structural problems with the bridge are that the bearings are severely rusted, and the ends of the beams are starting to corrode. (See Appendix B – Bridge Inspection Reports and Site Photographs.)

The bridge has a clear roadway width of 20-feet. Based on the current roadway classification and traffic count, the required clear roadway width should be 34-feet for two-way traffic. Because the existing bridge does not currently meet the required width, the structure is classified as functionally obsolete.

Structural Components

Concrete Arches

The concrete arches are in fair condition. They consist of steel arch built-up box sections that have been covered and filled with concrete. The steel box section, which provides the reinforcement for the concrete arch, is made up of steel angles in the corners that are laced together with steel bars. The steel box section is connected to the steel angles that reinforce the concrete vertical hangers. Numerous concrete cracks are visible throughout the arches. There is also spalling on the top of the arch in the southwest corner.

Concrete Vertical Hangers

The concrete vertical hangers are in fair condition. They consist of steel built-up members that have been covered with concrete. The steel built-up members that provide the reinforcement for the concrete vertical hangers are made up of steel angles in the corners of the hangers. They are connected with steel laced bars. The steel built-up member is shaped like a steel I-beam, with the angles making up the flanges and the steel laced bars making up the web. The steel built-up members that reinforce the vertical concrete hangers are connected to the steel box sections that reinforce the concrete arch, and to the steel angles that reinforce the bottoms of the concrete floor beams. There are numerous concrete cracks visible on the vertical hangers.

Concrete Floor Beams

The concrete floor beams are in fair condition. They have been reinforced on the bottom with steel angles that have been covered with concrete. The steel angles that reinforce the concrete floor beams are connected to the steel built-up sections that reinforce the concrete vertical hangers. There are cracks and spalls throughout on the concrete floor beams.

Concrete Deck

The concrete deck is in fair condition. The original deck surface consisted of an 8-inch concrete deck that spans between the concrete floor beams. The concrete deck was then covered with 4-inch stone pavers. At some point the pavers were removed, and 4 inches of concrete was put in their place. The bridge deck received a concrete overlay in 1996. There are several transverse and longitudinal cracks in the deck, along with some spalls.

Concrete Sidewalk

The concrete sidewalk is in fair condition. It consists of a 6-inch concrete slab that spans between the concrete floor beams. The sidewalk slab was cast higher than the concrete deck by increasing the depth of the floor beams under the sidewalk slab by 12 inches. There are several transverse and longitudinal cracks in the sidewalk, as well as some spalls.

Concrete Railings

The concrete railing system is in fair condition. They consist of concrete ornamental railing elements. The railings have some miscellaneous surface scaling and spalls throughout. The existing railing is not a FHWA crash tested railing.

East Abutment

The east abutment is in fair condition. It is a vertical concrete abutment with a concrete footing supported by timber piling. There are cracks in the abutment at the arch connections and other miscellaneous cracks and spalls throughout. There is a hole in the top of the east abutment near the deck.

West Abutment

The west abutment is in fair condition. It is a vertical concrete abutment with a concrete footing that is supported by timber piling. There are cracks in the abutment at the arch connections and miscellaneous cracks and spalls throughout.

Bridge Approaches

East Approach

The horizontal alignment of the east approach consists of a straight tangent. The vertical profile of the east approach consists of a relatively steep upgrade to the east. The width of Spring Street between the curbs east of the bridge varies from 20 feet at the bridge to approximately 30 feet at the intersection of High Street, which is approximately 325 feet east of the bridge. Concrete retaining walls run along Spring Street east of the bridge; they retain the fill of the roadway from encroaching into adjacent parking lots and buildings on the east side.

West Approach

The horizontal alignment of the west approach consists of a straight tangent. The vertical profile of the west approach is relatively flat with a slight downgrade to the west. The intersection of STH 124 (Rushman Drive) and Spring Street is immediately west of the bridge. The width of Spring Street between the curbs on the east side of the intersection is 20 feet, which matches the roadway width of the structure. As Spring Street continues to the west of the intersection, the roadway width between the curbs is approximately 40 feet.

Traffic Analysis

A traffic engineering study was completed to determine the potential effects on the traffic patterns for four alternatives:

- Existing traffic pattern – two-way traffic on Spring Street east of STH 124 and on bridge. Eastbound turning movement from Spring Street allowed; but northbound right turn onto Spring Street from STH 124 restricted
- One-way traffic on bridge – one-way westbound traffic on Spring Street between North High Street and STH 124
- Bridge closed to vehicles – no vehicular traffic allowed to travel eastbound or westbound across the bridge on Spring Street from STH 124 to the east end of the bridge.
- Bridge upgraded to non-restrictive two-way traffic – allow northbound right turn traffic from STH 124 onto the bridge in addition to the existing traffic movements

(See Appendix F – Traffic Analysis.)

A Level of Service (LOS) ranking was used to rank the existing and proposed traffic movements at this site. The LOS objective for the traffic in the area of the Spring Street bridge is for all traffic movements to operate at LOS 'C' or better during the morning and afternoon peak travel hours. Based on the Wisconsin Department of Transportation's Facility Development Manual (FDM), Chapter 11-5-3 rural and small urban areas should be designed for LOS 'C' on collector routes. The analysis used 20-year traffic forecast volumes.

Existing Traffic Pattern

If the Spring Street traffic patterns at the bridge remain the same as they are today, the LOS during the peak periods is expected to operate at LOS 'B' or better at both the STH 124 (Rushman Drive)/Spring Street intersection and the STH 178 (Grand Avenue)/High Street intersection.

One-Way Traffic on Bridge

If Spring Street were made one-way at the bridge, traffic would be allowed to travel only westbound over the bridge. This determination was made based on current traffic volumes and flow. The existing eastbound traffic would be redirected to High Street, STH 178 (Grand Avenue), and STH 124 (Rushman Drive). If Spring Street were made one-way for westbound traffic only, the LOS during the peak periods is expected to operate at LOS 'B' or better at both the STH 124 (Rushman Drive)/Spring Street intersection and the STH 178 (Grand Avenue)/High Street intersection. [Because of difficult truck turning movements onto the bridge, one-way

traffic in the eastbound direction was not analyzed, but it is anticipated the LOS would be similar to the westbound-only condition.]

Bridge Closed to Vehicles

If the bridge were closed to traffic, motorists would be redirected onto High Street, STH 178 (Grand Avenue), and STH 124 (Rushman Drive). If Spring Street were closed to traffic, the LOS during peak periods is expected to operate at LOS 'B' or better at both the STH 124 (Rushman Drive)/Spring Street intersection and the STH 178 (Grand Avenue)/High Street intersection.

Bridge Upgraded for Two-Way Traffic

If the bridge were widened to accommodate non-restrictive two-way traffic, the LOS during the peak periods is expected to operate at LOS 'B' or better at both the STH 124 (Rushman Drive)/Spring Street intersection and the STH 178 (Grand Avenue)/High Street intersection.

Summary

The traffic related to each of the rehabilitation alternatives is expected to operate at a Level of Service (LOS) of 'B' or better during the peak periods in 2029. Geometric improvements are not needed at the study intersections to maintain traffic operations.

The collector status of Spring Street would remain if the traffic on the bridge is made one-way or if traffic on the bridge is upgraded for unrestricted two-way traffic.

If the bridge is closed, Spring Street loses connectivity between commercial and neighborhood areas. With this being said, and noting the connectivity of East Central Street and STH 178 (Grand Avenue), the closure of the bridge would most likely change the Spring Street designation to the east from a collector to a local street.

From an operations analysis stand point, there are no traffic-related deficiencies for this project for any of the traffic patterns that were studied.

Funding Options

Several bridge funding options are available to the City of Chippewa Falls. The three most logical bridge funding programs are described in detail below. The bridge currently qualifies for Local Bridge Improvement Assistance (Local Bridge Program) Funding under Trans 213.03(2)(b) as long as vehicular traffic is maintained on the bridge. Funding sources that may be available if vehicular traffic is removed from the bridge include the Local Transportation Enhancement Program under State Statute 85.026(2) and the National Preservation Loan Fund.

Local Bridge Program (Wisconsin Department of Transportation)

Under the Local Bridge Program, federal and state funds are provided for replacement or rehabilitation of deficient bridges. These funds will cover 80% of design and construction costs. The remaining 20% would be borne by the City of Chippewa Falls.

To be eligible for the Highway Bridge Replacement and Rehabilitation Program (HBRRP), the bridge must first be classified as deficient. A deficient bridge is either structurally deficient or functionally obsolete.

To be classified as structurally deficient, the bridge deck, superstructure, or substructure must have an NBI rating of (4) or less. The Spring Street (Rainbow Arch) bridge's deck has an NBI rating of (5), the superstructure has an NBI rating of (5), and the substructure has an NBI rating of (5). Therefore the bridge is not structurally deficient.

To be functionally obsolete, the deck geometry, underclearance, approach roadway alignment, structure evaluation, or waterway adequacy must have an NBI rating of (3) or less. The deck geometry rating for the Spring Street (Rainbow Arch) bridge is (2), which makes this structure functionally obsolete.

Since the bridge is functionally obsolete, it is eligible for bridge replacement funding if it has a sufficiency rating of less than 50. It may be eligible for rehabilitation funding if it has a sufficiency rating less than 80. In both cases, vehicular traffic must be maintained on the bridge.

The sufficiency rating is a method of evaluating factors that show a bridge's sufficiency to remain in service. A rating of 100 would represent an entirely sufficient bridge, and zero would represent an entirely insufficient bridge.

The existing Spring Street (Rainbow Arch) bridge has a sufficiency rating of 47.1. Because the sufficiency rating is less than 50 and the bridge is classified as a deficient bridge, it qualifies for replacement funding.

The bridge is also eligible for rehabilitation funding if an engineering study indicates that rehabilitation would be cost effective, would extend the life of the bridge at least 10 years, and would correct all of the deficiencies. If conditions exist that would prevent the completed improvement from correcting all deficiencies, the Department may determine if the proposed project is eligible based on safety and the public interest.

This funding alternative appears to be the best option for this bridge regardless of whether a replacement or rehabilitation option is selected.

Transportation Enhancement Program (WisDOT)

In 1991, Congress created the Transportation Enhancement (TE) Program to address concerns for air quality, open space, and traffic congestion. It is designed to focus on enhancing the travel experience and improving the quality of life in American communities. Communities can use the funds for various activities, including bridge rehabilitation, sidewalks, bike lanes, conversions of abandoned railroad corridors into trails, and many other enhancement or historic preservation projects. These federal funds can provide up to 80 percent of project costs. Applications are typically accepted every other year. This program may cover the costs of doing some bridge repairs if the bridge is closed to vehicular traffic.

National Preservation Loan Fund

The National Trust for Historic Places has loan funds available for rehabilitating historic structures. These National Trust Loan Funds (NTLF) have a 30-year track record of lending to low-income historic districts and to specific endangered historic resources. Funds can be used for funding a variety of preservation projects including acquiring and/or rehabilitating historic buildings, sites, structures, and districts, and preserving National Historic Landmarks. It is possible that this fund would provide funding for rehabilitation of the bridge if vehicular traffic is removed from the bridge and if it is shown to be a prudent expenditure.

Public Involvement

Kick-Off Public Informational Meeting

A Kick-Off Public Informational meeting was held on October 22, 2009, in the City Hall Auditorium. The purpose of the meeting was to gather public input regarding the possible replacement of the Spring Street (Rainbow Arch) bridge over Duncan Creek. (See Appendix E for the Public Informational Meeting Sign-In Sheet, Public Comment Forms Received, Letters Received, and Newspaper Letters to the Editor.)

The meeting was advertised in the local newspaper before the meeting date, and individual letters and press releases were mailed to selected groups on October 5, 2009.

The initial response from the public was generally against replacing the bridge. Many residents feel this historic structure needs to be preserved. The majority who provided their opinions said the existing bridge should be repaired and, if necessary, it should eventually be closed to vehicular traffic. Most of the public feels that there are other ways to cross Duncan Creek in this area.

If traffic restrictions are required for the bridge, public input received suggested that the bridge be load-posted to eliminate heavy trucks and busses from using it.

Some of the public felt that the bridge did not need to be made one-way because “cars are narrower these days.” Other residents felt that the bridge could be made one-way and should probably be one-way for westbound traffic.

Future Meetings

Two more Public Informational meetings along with an Operational Planning meeting will be held regarding this project.

Rehabilitation Alternatives

Four rehabilitation alternatives were considered for the existing structure. The costs shown for these alternatives include all bridge construction, approach work, mobilization costs, removal costs, and a 15% allowance for construction engineering and contingencies unless otherwise noted. (See Appendix D – Cost Estimates.) The alternatives are as follows:

Alternative #1 – Do Nothing

The existing bridge is in fair condition, but the bridge is discolored and is starting to deteriorate. No weight limit posting is required at this time.

The life expectancy of the bridge is estimated at 10 years. After 10 years, major repairs will be required to keep the bridge open to vehicular traffic. The bridge would eventually be weight limit posted and then closed to vehicular traffic.

Traffic patterns at the bridge could remain the same. Bicycles would utilize the existing roadway. The bridge could also be made one-way or closed to vehicular traffic. If the structure maintained two-way traffic, it would continue to be classified as functionally obsolete due to the narrow width. If the bridge were made one-way, it would no longer be classified as functionally obsolete.

The clear roadway width of 20 feet, the structure Inventory Rating of HS-11, and the Sufficiency Rating of 47.1 would remain unchanged.

Cost

There is no initial cost associated with this alternative. There would be costs associated with future maintenance, which are not included at this time.

Alternative #2 – Repair and Stain the Existing Bridge

The existing bridge is in fair condition but is discolored and is starting to deteriorate. No weight limit posting is required at this time.

This alternative would consist of performing concrete surface repairs to repair spalled, cracked, and deteriorated areas. After the concrete surface repairs are completed, the entire bridge would be stained white.

The clear roadway width of 20 feet and the structure Inventory Rating of HS-11 would remain the same.

The existing load ratings of the bridge are marginal, meaning that the bridge is close to being classified as structurally deficient and/or requiring a reduced weight limit posting. As part of the repairs, removing the existing overlay and the 4-inches of additional concrete that was placed when the original pavers were removed will be considered. Removing this weight may increase the load ratings of the bridge.

Three possible traffic patterns could be used with this rehabilitation alternative, and the chosen traffic pattern would affect the available funding as noted here:

- Maintain Two-Way Traffic on Bridge: The 20-foot clear roadway width for two-way traffic would be too narrow to remove the bridge's functionally obsolete classification. Consequently, Federal Local Bridge Funds (WisDOT) could not be used for this alternative. Funding from other sources may be available, but there is no guarantee that funds could be obtained. If this option would be determined to be in the public's best interest, State Funds under TRANS 213 could be used.

- Change to One-Way Traffic on Bridge: Spring Street would need to be signed for one-way westbound traffic over the bridge. The clear roadway width for one-way traffic needs to be at least 18 feet in order to remove the functionally obsolete classification of the bridge, therefore the existing 20-foot width makes the bridge eligible for Local Bridge Funds (WisDOT) for this repair alternative.

- Close the Bridge to Vehicular Traffic: The bridge would be closed to vehicular traffic but would remain open to pedestrian and bicycle traffic. Barricades and signs would be required. Because vehicular traffic is removed from the bridge, Local Bridge Funds (WisDOT) could not be used for this alternative. Funding from other sources may be available, but there would be no guarantee that funds could be obtained.

The life expectancy of the bridge is estimated at 20 years if vehicular traffic is maintained on the bridge. After 20 years, significant maintenance would be required to keep the bridge open to vehicular traffic. The bridge would eventually be weight limit posted and then closed to vehicular traffic.

The life expectancy of the bridge is estimated to be 30 years if vehicular traffic is removed from the bridge.

After repairs, the Sufficiency Rating would increase to approximately 57.3 if two-way traffic were maintained on the bridge. If the bridge were made one-way, the Sufficiency Rating would increase to 71.4. The Sufficiency Rating is not applicable to a pedestrian/bicycle bridge.

Cost

The estimated cost to rehabilitate the bridge varies by which traffic pattern is selected:

- Maintain Two-Way Traffic $200,000
- Modify to One-Way Traffic $210,000
- Close to Vehicular Traffic $220,000

Alternative #3 – Widen Bridge Clear Roadway Width and Eliminate Sidewalk

The existing bridge is in fair condition but is discolored and is starting to deteriorate. No weight limit posting reduction is required at this time. The bridge is currently classified as functionally obsolete because the existing clear roadway width is narrow.

This alternative consists of increasing the clear roadway width in order to remove the functionally obsolete classification. The existing sidewalk and the top portions of the existing deck would be removed. A new concrete deck would then be constructed over the area where the sidewalk was removed, and a concrete overlay would be placed on the original deck surface. The roadway width would be increased to 28 feet. No sidewalk would be provided. Weight limit postings would not be required.

Concrete surface repairs to repair spalled, cracked, and deteriorated areas of the existing structure would also be performed. After the deck repairs and concrete surface repairs are completed, the entire bridge would be stained white.

It is anticipated that this alternative would be funded with Local Bridge Funds (WisDOT). However, based on the recently passed State Budget Bill, removal of the sidewalk may not be acceptable if Local Bridge Program Funds are used. If removal of the sidewalk is unacceptable, different funding sources would be required.

The life expectancy of the bridge under this alternative is estimated at 20 years, after which significant maintenance would be required to keep the bridge open to vehicular traffic. Bicycles and pedestrians would need to utilize the existing roadway. The bridge would eventually be weight limit posted and then closed to vehicular traffic.

The Sufficiency Rating would be increased to 59.7. The Structure Inventory Rating would be less than HS-11.

Cost

The cost to rehabilitate the bridge as described is estimated at $295,000.

Alternative #4 – Widen Bridge Clear Roadway Width and Add Pedestrian Bridge Adjacent to Existing Bridge

The existing bridge is in fair condition but is discolored and is starting to deteriorate. No load weight limit posting is currently required. The bridge is currently classified as functionally obsolete because the existing roadway width is narrow.

This alternative consists of increasing the clear roadway width to remove the functionally obsolete classification. The existing sidewalk and the top portions of the existing deck would be removed. A new concrete deck would then be constructed over the area where the sidewalk was removed, and a concrete overlay would be placed on the original deck surface. The roadway width would be increased to 28 feet, and no sidewalk would be provided.

Concrete surface repairs to repair spalled, cracked, and deteriorated areas of the existing structure would also be performed. After the deck repairs and concrete surface repairs are completed, the entire bridge would be stained white.

A separate prefabricated truss pedestrian bridge would be constructed adjacent to the bridge to accommodate the sidewalk. The new sidewalk structure could be constructed on either side of the bridge. It is estimated that the sidewalk structure would be 100 feet long with a clear sidewalk width of 12 feet. The abutments would be concrete and would be supported by piling.

The roadway portion of the bridge for this alternative would be funded with Local Bridge Funds (WisDOT). The sidewalk structure may not qualify for Local Bridge Funds (WisDOT). Funding from other sources for the sidewalk structure may be available, but there is no guarantee.

The life expectancy of the roadway bridge is estimated to be 20 years, after which major repairs would probably be required to keep the bridge open to vehicular traffic. Bicycles would need to utilize the roadway or the pedestrian bridge. The bridge would eventually be weight limit posted and then closed to vehicular traffic.

The estimated life of the adjacent pedestrian bridge is estimated at 50 years.

The Sufficiency Rating would be increased to 59.7. The structure Inventory Rating would be less than HS-11.

Cost

The costs to rehabilitate the existing bridge as described and add an adjacent prefabricated pedestrian bridge is estimated at $510,000.

Replacement Alternatives

Four alternatives were considered for replacing the existing structure. The costs shown for these alternatives include all bridge construction, approach work, mobilization costs, removal costs, and a 15% allowance for construction engineering and contingencies unless otherwise noted. (See Appendix D – Cost Estimates). These alternatives are as follows:

Alternative #5 – Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder Bridge

The existing bridge would be removed and a new single-span prestressed concrete deck girder bridge would be constructed. This alternative would provide a structure clear roadway width of 34 feet and 8-foot wide sidewalks on the both sides. The 34-foot clear roadway width on the bridge would need to be tapered down to 30-feet in order to match the clear width of the approaches on the east approach. This would minimize impacts to the existing retaining walls on the east side. The life expectancy of the bridge is estimated to be 50 years. Minimal maintenance is anticipated with this type of bridge.

This bridge would have no aesthetic features.

The Sufficiency Rating would be increased to 86.9. The structure Inventory Rating would be greater than HS-25.

Cost

The cost to replace the existing bridge as described is estimated at $840,000.

Alternative #6 – Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder Bridge with Aesthetic Elements

The existing bridge would be removed, and a new 100-foot-long single-span prestressed concrete deck girder bridge would be constructed. This alternative would provide a structure roadway width of 34 feet and 8-foot-wide sidewalks on both sides. The 34-foot clear roadway width would need to be tapered down to 30-feet in order to match the clear width of the approaches on the east approach, minimizing impacts to the existing retaining walls on the east side. The life expectancy of the bridge is estimated to be 50 years. Minimal maintenance is anticipated with this type of bridge.

Aesthetic features would be added to the bridge. The aesthetic features would include using a concrete parapet decorative rail, using form liners on the concrete surfaces, and staining the concrete. Decorative light fixtures would also be added to the bridge.

The Sufficiency Rating would be increased to 86.9. The structure Inventory Rating would be greater than HS-25.

Cost

The cost to replace the existing bridge as described is estimated at $910,000.

Alternative #7 – Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder with Arch Facade

The existing bridge would be removed, and a new 100-foot-long single-span prestressed concrete deck girder bridge would be constructed. This alternative would provide a structure roadway width of 34 feet and 8-foot-wide sidewalks on both sides. The 34-foot roadway width would need to be tapered down to 30-feet in order to match the clear width of the approaches on the east approach, minimizing impacts to the existing retaining walls on the east side. The life expectancy of the bridge is estimated at 50 years. Moderate maintenance is anticipated with this type of bridge because of the concrete arch facades.

A concrete arch façade would be added to each side of the bridge to match the appearance of the old bridge. The concrete arch would provide no structural support.

The Sufficiency Rating would be increased to 86.9. The structure Inventory Rating would be greater than HS-25.

Cost

The cost to replace the existing bridge as described is estimated at $1,255,000.

Alternative #8 – Replace Existing Bridge with Modern Bridge that is Similar to Existing Bridge

The existing bridge would be removed and a new modern single-span concrete pony arch bridge would be constructed. This alternative would provide a structure roadway width of 34 feet and 8-foot-wide sidewalks on both sides. The 34-foot roadway width would need to be tapered down to 30-feet in order to match the width of the approaches on the east approach, minimizing impacts to the existing retaining walls on the east side. The life expectancy of the bridge is estimated to be 50 years. More than moderate maintenance is anticipated with this type of bridge.

Replacing the bridge with a similar bridge would help to maintain the appearance of the site.

The Sufficiency Rating would be increased to 83.9. The Structure Inventory Rating would be greater than HS-25.

Cost

The cost to replace the existing bridge as described is estimated at $1,855,000.

Life Cycle Cost Analysis

Initial costs were developed for the 10 alternatives. The estimated costs shown below include all bridge construction, approach work, mobilization costs, removal costs, and a 15% allowance for construction engineering and contingencies.

A Life Cycle Cost analysis was performed to determine the most cost effective alternative over time. The life cycle cost was determined through an "Equivalent Uniform Annual Cost" (EUAC) analysis. The analysis assumes the rehabilitation alternatives will be replaced with a new prestressed concrete girder bridge (Alternative 5) after its life.

The EUAC method was used instead of the Present Worth method because the cost of each alternative is spread over different time frames. The interest rate was assumed to be 5%.

Alternative		Clear Roadway Width	Inventory Rating	Sufficiency Rating	Initial Estimated Cost	Life (Years)	Equivalent Uniform Annual Cost
#1	Do Nothing	20.0 ft	HS-11	47.1	$0	10*	$27,230* over 60 years
#2A	Repair and Stain the Existing Bridge (Two-Way Traffic)	20.0 ft	HS-11	57.3	$200,000	20*	$26,710* over 70 years
#2B	Repair and Stain the Existing Bridge (One-Way Traffic)	20.0 ft	HS-11	71.4	$210,000	20*	$27,225* over 70 years
#2C	Repair and Stain the Existing Bridge (Remove Traffic)	20.0 ft	HS-11	N/A	$220,000	30*	$21,135* over 80 years
#3	Widen Bridge Clear Roadway Width & Eliminate Sidewalk	28.0 ft	<HS-11	59.7	$295,000	20*	$31,620* over 70 years
#4	Widen Bridge Clear Roadway Width & Add Pedestrian Bridge	28.0 ft	<HS-11	59.7	$510,000	20*	$42,735* over 70 years
#5	Replace Bridge with New Prestressed Concrete Girder Bridge	34.0 ft	>HS-25	86.9	$840,000	50	$46,030 over 50 years
#6	Replace Bridge with New Prestressed Concrete Girder Bridge with Aesthetic Features	34.0 ft	>HS-25	86.9	$910,000	50	$49,870 over 50 years
#7	Replace Bridge with New Prestressed Concrete Girder Bridge with Arch Façade	34.0 ft	>HS-25	86.9	$1,255,000	50	$68,775 over 50 years
#8	Replace with Modern Bridge that is Similar to the Existing	34.0 ft	>HS-25	83.9	$1,855,000	50	$101,655 over 50 years

*Assumes that the alternative will be replaced with Alternative #5 after its life. If a more expensive replacement alternative is used, the Equivalent Uniform Annual Cost would increase proportionately.

Recommendations

It appears that **Alternative #2C - Repair and Stain the Existing Bridge (Remove Traffic)** is the best alternative at the site based on the lowest Equivalent Uniform Annual Cost. However, this alternative would not be funded by WisDOT Local Bridge funds because traffic would not be maintained.

Preferred Alternative: It appears that **Alternative #2B - Repair and Stain the Existing Bridge (One-way Traffic)** is the best alternative at this site based on the relatively low equivalent uniform annual cost and the anticipated availability of funding. One-way traffic would be in the westbound direction, and this alternative should be eligible for WisDOT Local Bridge Funds. This alternative would remove the structure deficiencies that classify the bridge as deficient, would extend the life of the bridge for 20 years, is cost effective, and would preserve the historic structure. After 20 years however, the bridge will need to be replaced.

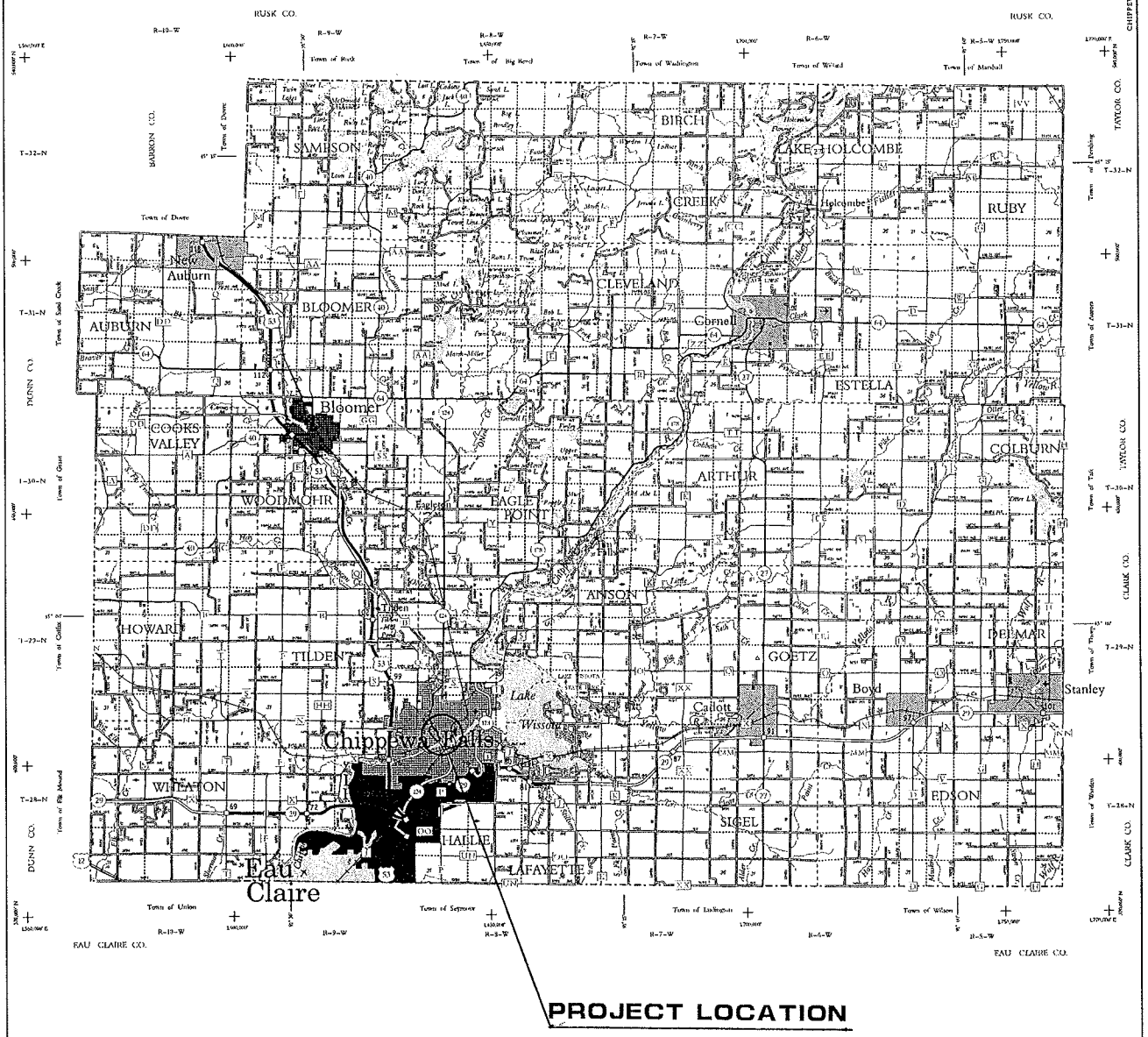
Appendix A

Bridge Location Maps

PROJECT ID: 8996-00-79

SPRING STREET OVER DUNCAN CREEK

CITY OF CHIPPEWA FALLS, CHIPPEWA CO.



PROJECT LOCATION

LEGEND

Freeway
Multilane Divided
U.S. or State Hwy
County Trunk Hwy
Town Road
Firelane
Railroad
State Trail
Interchange
Highway Separation
Interstate Highway No.
U.S. Highway No.
State Highway No.
County Highway Letter
State Boundary
County Boundary
Civil Town Boundary
Section Line

Dam
Hospital
Schools
Airport
County Seat
Unincorporated Village
Fish Hatchery
Game Farm
Public Hunt. or Fish. Grds.
Public Camp & Picnic Grds.
Ranger Station
State Park
County Park ...Fish Facilities ...Wildlife Facilities
Rest Area ...Modern Facilities
Wayside ...Basic Facilities

For boundaries of public hunting and fishing grounds please contact the Department of Natural Resources

Grid based on the state plane coordinate system central zone and the NAD 27

SECTION NUMBERING OF A TOWNSHIP

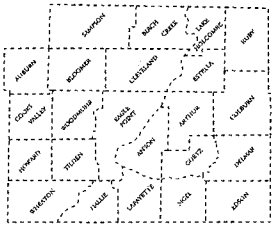
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

MILES OF HIGHWAY as of Dec. 31, 2007

STATE 210
COUNTY 190
LOCAL ROADS 1,187
OTHER ROADS 21
TOTAL FOR COUNTY 2,611

Land Area (2000 Census) — 1,049 sq. mi
Population (2000 Census) 55,195
County Seat ..... Chippewa Falls

CIVIL TOWNS



REGIONS

CHIPPEWA CO.
DEPARTMENT OF TRANSPORTATION
STATE OFFICE BUILDING
Madison, Wisconsin

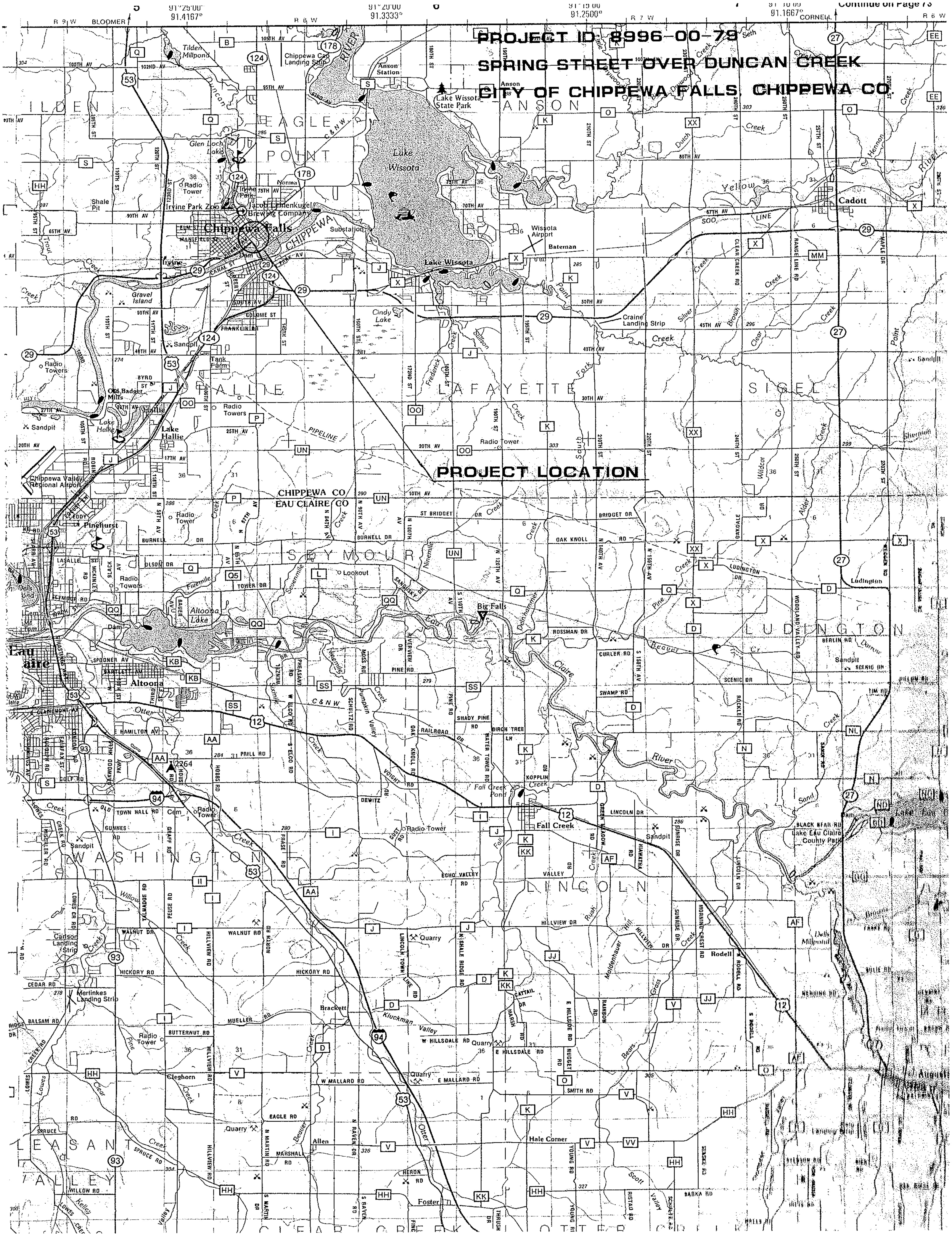
SCALE 0 1 MILES

Created for
JAN. 2009

Base compiled from USGS Quadrangles 1:100,000 Series

CHIPPEWA 9-NW

Continue on Page 73



PROJECT ID: 8996-00-79

SPRING STREET OVER DUNCAN CREEK

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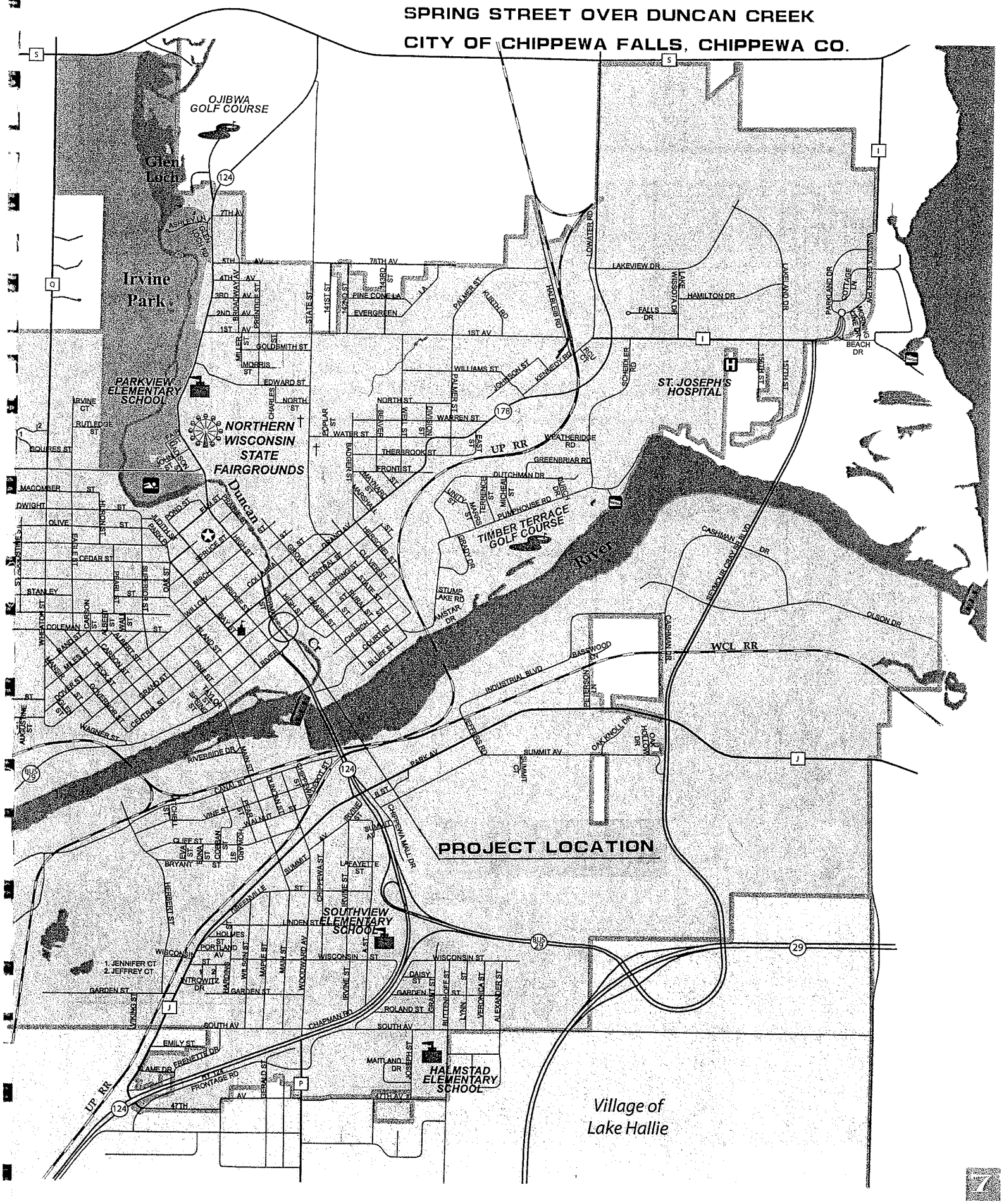

Appendix B

Bridge Inspection Reports and Site Photographs

BRIDGE INSPECTION REPORT
Wisconsin Dept. of Transportion
DT2007 2003 s.84.17 Wis. Stats. Type = ROUTINE INSPECTION

Inventory Data

Feature On: SPRING ST		Maintainer: CITY		Structure No: P-09-0711
Feature Under: DUNCAN CREEK		Sect/Twn/Rng: S06 T28N R08W		
Location: 0.1 M E STH 124		County: CHIPPEWA	Municipality: CITY-CHIPPEWA FALLS(09211)	
Inv Rating: HS11	Rdwy Width (ft): 20.0	Deck Width (ft): 29.2	Existing Posting: NARROW BRIDGE	
Oper Rating: HS18	Total Length (ft): 111.0	Deck Area(ft2): 3241	ADT On: 2160 Yr: 2003	ADT Under: Yr:

Inspection Type (* = Supplemental Form Required)

	Routine Visual	Fracture Critical*	In-Depth*	UW-Dive*	UW-Surv*	UW-Probe/Visual*	Movable*
Last Insp.	2008-10-20	2008-10-20				2008-10-20	
Frequency	24	24				24	
Recom. Freq.							
	Initial*	Damage	Interim	Load Posted	SI & A Field Review*		
Last Insp.							
Frequency	N/A						
Recom. Freq.	N/A				Item No. Needing Change		

Load Rating Information

Overburden	Measurement (in): 4.0	Date:	Deck Surface Type: CONCRETE	
Section Loss	File Meas. (%):	File Insp. Date:	Insp. Measurement (%):	Describe:
Re-rate for load capacity?		Reason:		Date Last Rated:

Expansion Joints

Location	Type	Temp: File Insp. Date	File Insp. (in)	New Insp. (in)

Signing Condition

Type of Marker	File	Y/N	Comments
Bridge Markers	N	N	
Narrow Bridge			
One Lane Road			
Vertical Clearance			
Weight Limit Post		Y	40 TON
Other(Addl. Sign)			

Clearances(Cardinal = N or E)	File Meas. (ft.)	File Date	New Meas. (ft.)
Min. Vertical Clearance Under (Cardinal)			
Min. Veritcal Clearance Under (non-Cardinal)			
Min. Vertical Clearance On			

Structure Type

Material	Configuration	# of Spans	Overall Length (ft)
CONCRETE	OTHER ARCH	1	93.2

Construction/Rehabilitation History

Year	Work Performmed	Plan	Shop
1916	NEW STRUCTURE		

Inspection Information

Special Requirements	Y/N	Comments
Traffic Control	Y	Flagman & signs
Access Equipment	Y	snooper truck
Other		

Inspector Information

Team Leader Name and No. Printed: Krejci, Wayne J (6504)	Team Member(s) Name(s) Printed: Dennis Lynch	
Team Leader Signature:	Inspection Date: 2008-10-20	Inspection Agency: COUNTY (2)
District/Local Manager and No. Printed:	District/Local Manager Signature:	Review Date:

Structure No.:P-09-0711

Element Inspection (X) Check Elements Inspected

Ck	Elem./Env.	Description	Unit	Total QTY.	Quantity in Condition States 1	2	3	4	5
X	22 / 4	Conc Deck/Conc Ov	SF	3241				3241	
	Trans and Longit cracks, spalls, cracks bottom of deck to sidewalk								
X	144 / 2	R/Conc Arch	LF	219			219		
	Cracks on arch and verticals, Spall SW corner top								
X	155 / 2	R/Conc Floor Beam	LF	337		272	65		
	spalls to floor beam encasement 2 4 5 6 7 10, cracks to floor beam encasement 1 2 4 5 6 7 8 9								
X	215 / 2	R/Conc Abutment	LF	65			65		
	cracks @ arch connections, spalls cracks, Hole in east abut by deck								
X	322 / 4	Bituminous Approach	EA	2		2			
X	331 / 4	Conc Bridge Railing	LF	226		226			
X	342 / 2	RipRap Slope Protect	EA	2		1	1		
	W end gone								
X	400 / 2	Concrete Wingwall	EA	4	2	2			
	Cracks NE + SE corners								
X	415 / 4	Sidewalk/Median	LF	111		111			

General Inspection/Maintenance Notes

Gas main connected to north ends of floor beams, causing cracks/spalls to encasement

Maintenance Recommendations (See standard code items & numbers)

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

NBI Ratings

NBI	File	New	NBI	File	New
Deck	5	5	Culvert	N	N
Superstructure	5	5	Channel	7	7
Substructure	5	5	Waterway	8	8

BRIDGE INSPECTION REPORT
Wisconsin Dept. of Transportion
DT2007 2003 s.84.17 Wis. Stats. Type = ROUTINE INSPECTION

page 1

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Frequency	24	24				24	
Recom. Freq.							
	Initial*	Damage	Interim	Load Posted	SI & A Field Review*		
Last Insp.							
Frequency	N/A						
Recom. Freq.	N/A				Item No. Needing Change		

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Expansion Joints

Location	Type	Temp: File Insp. Date	File Insp. (In)	New Insp. (In)

Signing Condition

Type of Marker	File	Y/N	Comments
Bridge Markers	N	N	
Narrow Bridge			
One Lane Road			
Vertical Clearance			
Weight Limit Post		Y	40 TON
Other(Addl. Sign)			

Clearances(Cardinal = N or E)	File Meas. (ft.)	File Date	New Meas. (ft.)
Min. Vertical Clearance Under (Cardinal)			
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Min. Vertical Clearance On			

Structure Type

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Other		

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X	155 / 2	R/Conc Floor Beam	LF	337		272	65		
	spalls to floor beam encasement 2 4 5 6 7 10, cracks to floor beam encasement 1 2 4 5 6 7 8 9								
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	cracks @ arch connections, spalls cracks, Hole in east abut by deck								
X	322 / 4	Bituminous Approach	EA	2		2			
X	331 / 4	Conc Bridge Railing	LF	226		226			
X	342 / 2	RipRap Slope Protect	EA	2		1	1		
	W end gone								
X	400 / 2	Concrete Wingwall	EA	4	2	2			
	Cracks NE + SE corners								
X	415 / 4	Sidewalk/Median	LF	111		111			

General Inspection/Maintenance Notes

Gas main connected to north ends of floor beams, causing cracks/spalls to encasement

Maintenance Recommendations (See standard code items & numbers)

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance Item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance Item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance Item comment:

NBI Ratings

NBI	File	New	NBI	File	New
Deck	5	5	Culvert	N	N
Superstructure	5	5	Channel	7	7
Substructure	5	5	Waterway	8	8

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

DT 1273 95

Structure Number	County	Owner
P-09-711	Chippewa	City of Chippewa Falls
Feature On	Feature Under	Maintaining Agency
Spring Street	Duncan Creek	City of Chippewa Falls
SPAN CONFIGURATION	Through Arch	PLANS AVAILABLE Y/N

FRACTURE CRITICAL MEMBERS/COMPONENTS	PLANS AVAILABLE	Y/N
Arches	Original Design	Y
	"As-Built" Plans	N
	Original Shop	N
	Rehabilitation	Y
	Maintenance	N
	Other	Y

CONSTRUCTION HISTORY	
DATE	Work Performed
1916	New Structure

REHABILITATION HISTORY	
DATE	Work Performed
1996	Deck overlay, Masonry repairs to railing
	and arch

MAINTENANCE HISTORY	
DATE	Work Performed

ACCESS EQUIPMENT
WISDOT "Reach All" Truck

INSPECTION EQUIPMENT REQUIRED

TRAFFIC CONTROL REQUIRED	EST INSP. TIME	3-4 Hrs.
Street closed by City of Chippewa Falls		

Conclusion:

Cracks along verticals on North and South arches getting longer. Encasement spalls appearing to South arch

Floor beam encasement cracking at North end along utility hangers getting worse.

Spalls to encasement starting to appear on floor beams at the North ends.

Recommendations:

INSPECTING AGENCY	Chippewa County Highway Department	Inspection Frequency	Months 24
Inspector (Team Leader) X	Wayne J. Krejci	Date	10/20/08
Program Manager X	Bruce Stelzner	Date	

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

Structure Number		Span Number
P-09-711		North Arch
LOCATION	PANEL PT./PANEL #	INSPECTION COMMENTS
North Arch Lower Floor Beam		
Connections to hangers and		
abutments		
	NL0	Crack east side floor beam
	NL1	OK
	NL2	OK
	NL3	Crack east side floor beam with spall
	NL4	Cracks both sides floor beam
	NL5	Cracks both sides floor beam with spall
	NL6	Crack west side floor beam with spall
	NL7	OK
	NL8	Crack east side floor beam
	NL9	Spall
North Arch Hangers		
	NAH1	OK
	NAH2	Cracks on west and east sides/south side of hanger
	NAH3	Cracks on west and east sides/south side of hanger
	NAH4	Cracks on west and east sides/north side of hanger
	NAH5	Cracks on west and east sides/north side of hanger
	NAH6	OK
	NAH7	Cracks on west and east sides/south side of hanger
	NAH8	OK

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

Structure Number		Span Number
P-09-711		**North Arch and South Arch**
LOCATION	PANEL PT./PANEL #	INSPECTION COMMENTS
North Arch Upper Hanger		
Connections to Arch		
	NU1	Crack above south side
	NU2	OK
	NU3	OK
	NU4	OK
	NU5	OK
	NU6	OK
	NU7	OK
	NU8	Crack above south side
South Arch Upper Hanger		
Connections to Arch	SU1	OK
	SU2	OK
	SU3	OK
	SU4	Crack above north side
	SU5	OK
	SU6	OK
	SU7	OK
	SU8	OK

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

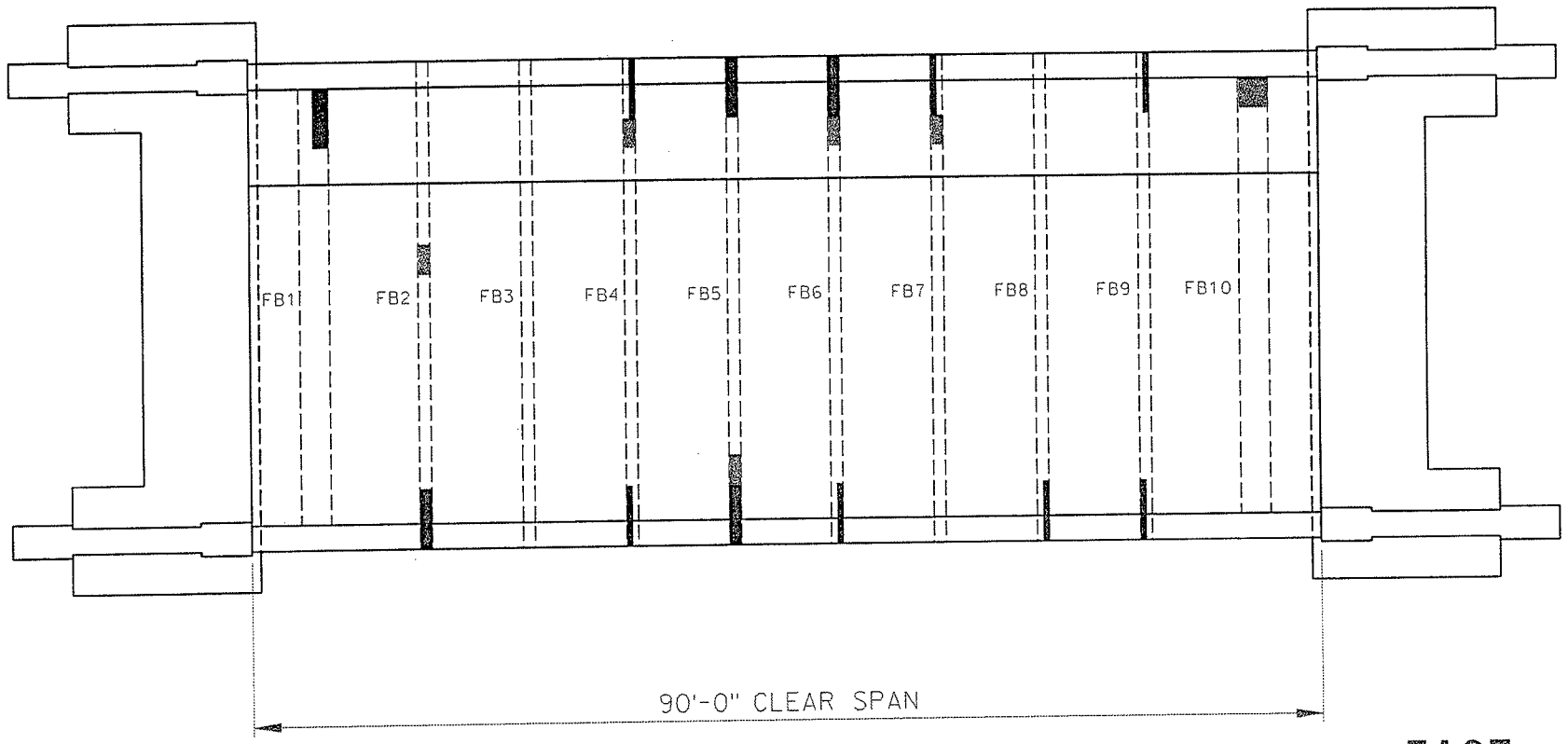
Wisconsin Department of Transportation

Structure Number		Span Number
P-09-711		South Arch
LOCATION	PANEL PT./PANEL #	INSPECTION COMMENTS
South Arch Lower Floor Beam		
Connections to hangers and		
abutments		
	SL0	OK
	SL1	Cracks both sides floor beam
	SL2	OK
	SL3	Crack west side floor beam
	SL4	Cracks both sides floor beam with spall
	SL5	Crack east side floor beam
	SL6	OK
	SL7	Crack east side floor beam
	SL8	Crack west side floor beam
	SL9	OK
South Arch Hangers		
	SAH1	OK
	SAH2	Cracks on west and east sides/south side of hanger
	SAH3	Cracks on west and east sides/south side of hanger
	SAH4	OK
	SAH5	Cracks on west and east sides/north side of hanger
	SAH6	Cracks on west and east sides/north side of hanger
	SAH7	Cracks on west and east sides/south side of hanger
	SAH8	OK

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

DIAGRAM SHOWING FRACTURE CRITICAL AND TENSION MEMBERS



PLAN VIEW

RED = CRACKS
GREEN = SPALL

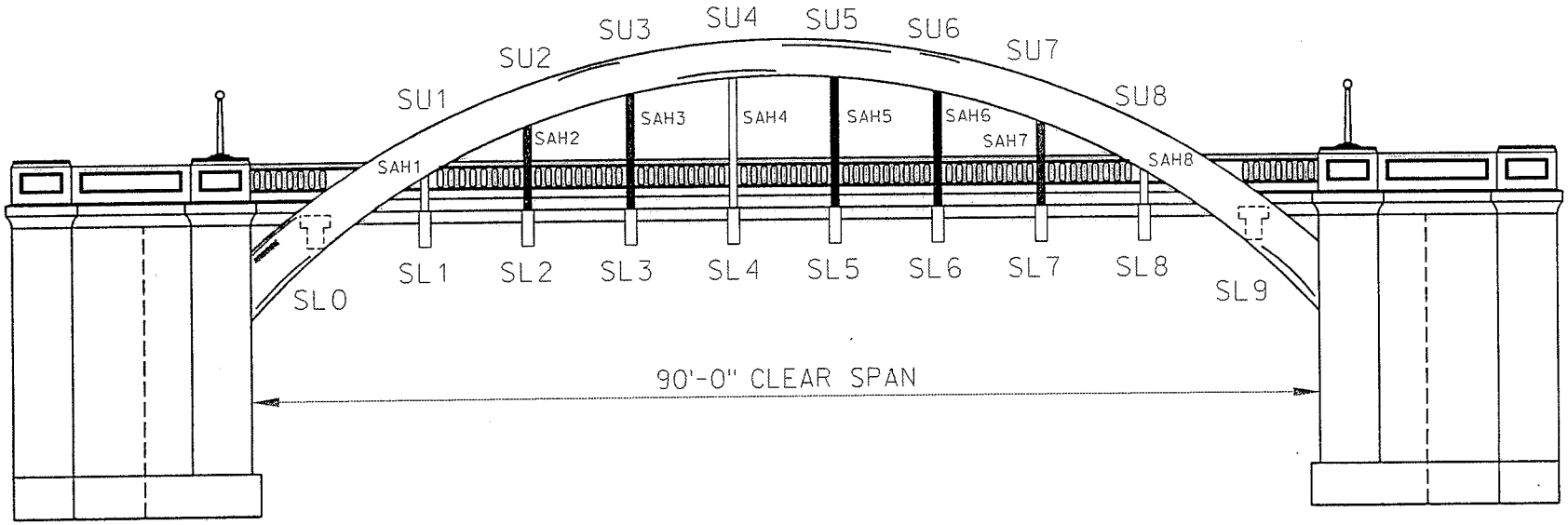
Structure No.	P-09-711
Span Length	90'-0"

Wisconsin County Highway Association

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

DIAGRAM SHOWING FRACTURE CRITICAL AND TENSION MEMBERS



WEST ABUTMENT

EAST ABUTMENT

SOUTH TRUSS

LOOKING NORTH

RED = CRACK SOUTH SIDE OF ARCH/HANGER

BLUE = CRACK NORTH SIDE OF ARCH/HANGER

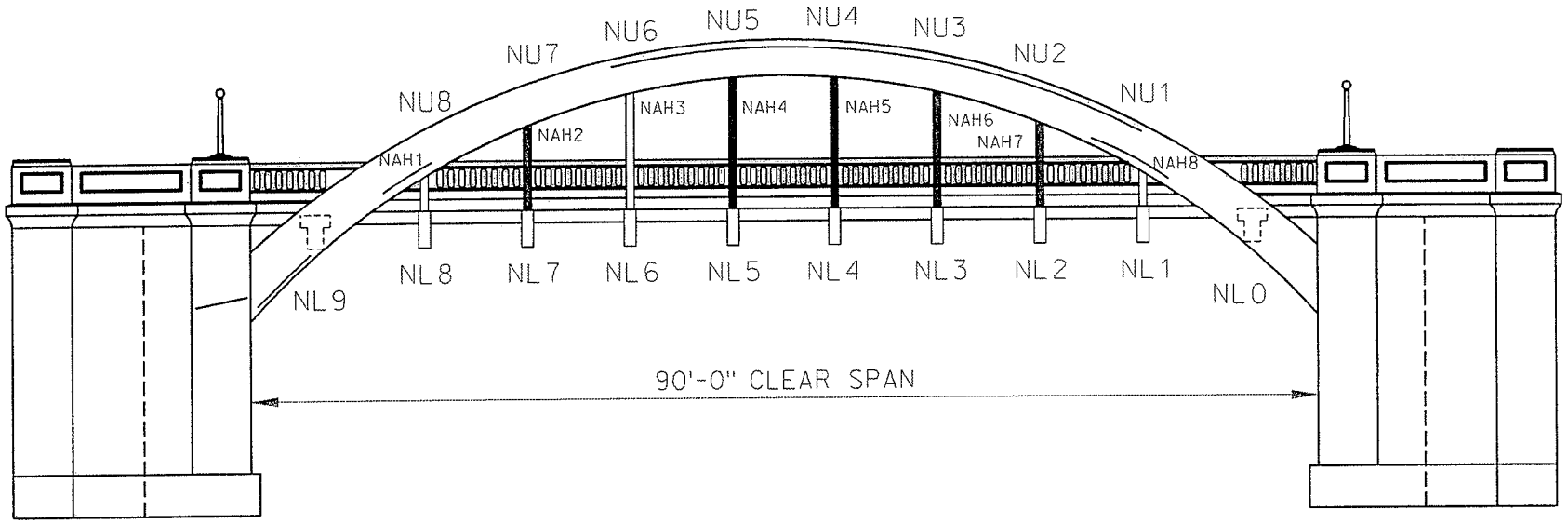
GREEN = SPALL

Structure No.	P-09-711
Span Length	90'-0"

FRACTURE CRITICAL BRIDGE INSPECTION REPORT

Wisconsin Department of Transportation

DIAGRAM SHOWING FRACTURE CRITICAL AND TENSION MEMBERS



EAST ABUTMENT

WEST ABUTMENT

NORTH TRUSS

LOOKING SOUTH

RED = CRACK SOUTH SIDE OF ARCH/HANGER

BLUE = CRACK NORTH SIDE OF ARCH/HANGER

Structure No.	P-09-711
Span Length	90'-0"

BRIDGE INSPECTION REPORT
Wisconsin Dept. of Transportion
DT2007 2003 s.84.17 Wis. Stats. Type = UNDERWATER V. PROBE INSPECTION

Inventory Data

Feature On: SPRING ST		Maintainer: CITY		Structure No: P-09-0711
Feature Under: DUNCAN CREEK		Sect/Twn/Rng: S06 T28N R08W		
Location: 0.1 M E STH 124		County: CHIPPEWA	Municipality: CITY-CHIPPEWA FALLS(09211)	
Inv Rating: HS11	Rdwy Width (ft): 20.0	Deck Width (ft): 29.2	Existing Posting: NARROW BRIDGE	
Oper Rating: HS18	Total Length (ft): 111.0	Deck Area(ft2): 3241	ADT On: 2160 Yr: 2003	ADT Under: Yr:

Inspection Type (* = Supplemental Form Required)

	Routine Visual	Fracture Critical*	In-Depth*	UW-Dive*	UW-Surv*	UW-Probe/Visual*	Movable*
Last Insp.	2006-10-23	2006-10-23				2006-10-23	
Frequency	24	24				24	
Recom. Freq.							
	Initial*	Damage	Interim	Load Posted	SI & A Field Review*		
Last Insp.							
Frequency	N/A						
Recom. Freq.	N/A				Item No. Needing Change		

Load Rating Information

Overburden	Measurement (in): 4.0	Date:	Deck Surface Type: CONCRETE	
Section Loss	File Meas. (%):	File Insp. Date:	Insp. Measurement (%):	Describe:
Re-rate for load capacity?		Reason:		Date Last Rated:

Expansion Joints

Location	Type	Temp: File Insp. Date	File Insp. (in)	New Insp. (in)

Signing Condition

Type of Marker	File	Y/N	Comments
Bridge Markers	N	N	
Narrow Bridge			
One Lane Road			
Vertical Clearance			
Weight Limit Post			
Other(Addl. Sign)			

Clearances(Cardinal = N or E)	File Meas. (ft.)	File Date	New Meas. (ft.)
Min. Vertical Clearance Under (Cardinal)			
Min. Veritcal Clearance Under (non-Cardinal)			
Min. Vertical Clearance On			

Structure Type

Material	Configuration	# of Spans	Overall Length (ft)
CONCRETE	OTHER ARCH	1	93.2

Construction/Rehabilitation History

Year	Work Performmed	Plan	Shop
1916	NEW STRUCTURE		

Inspection Information

Special Requirements	Y/N	Comments
Traffic Control	Y	Flagman & signs
Access Equipment	Y	snooper truck
Other		

Inspector Information

Team Leader Name and No. Printed: Krejci, Wayne J (6504)	Team Member(s) Name(s) Printed:	
Team Leader Signature:	Inspection Date: 2006-10-23	Inspection Agency: COUNTY (2)
District/Local Manager and No. Printed:	District/Local Manager Signature:	Review Date:

Element Inspection (X) Check Elements Inspected

Ck	Elem./Env.	Description	Unit	Total QTY.	Quantity in Condition States 1	2	3	4	5
X	22 / 4	Conc Deck/Conc Ov	SF	3241				3241	
	Trans and Longit cracks, spalls								
X	144 / 2	R/Conc Arch	LF	219			219		
	Cracks on arch and verticals								
X	155 / 2	R/Conc Floor Beam	LF	337		272	65		
	Floor beam 1 and 2 spalls								
X	215 / 2	R/Conc Abutment	LF	65			65		
	cracks @ arch connections, spalls cracks								
X	322 / 4	Bituminous Approach	EA	2		2			
X	331 / 4	Conc Bridge Railing	LF	226		226			
X	342 / 2	RipRap Slope Protect	EA	2		1	1		
	W end gone								
X	400 / 2	Concrete Wingwall	EA	4	2	2			
	Cracks NE + SE corners								
X	415 / 4	Sidewalk/Median	LF	111		111			

General Inspection/Maintenance Notes

fix #1 and 2 floor beam encasement Items are rated only for visible portions of structure - condition of superstructure tension members cannot be determined visually

S arch V3,V4,V6 cracked down thru floor beam

Cracked bottom and top of arch

N arch Floor beams cracked & spalled @ ends

Gas main N. end not connected, E. end bearing on bridge floor beams

Maintenance Recommendations (See standard code items & numbers)

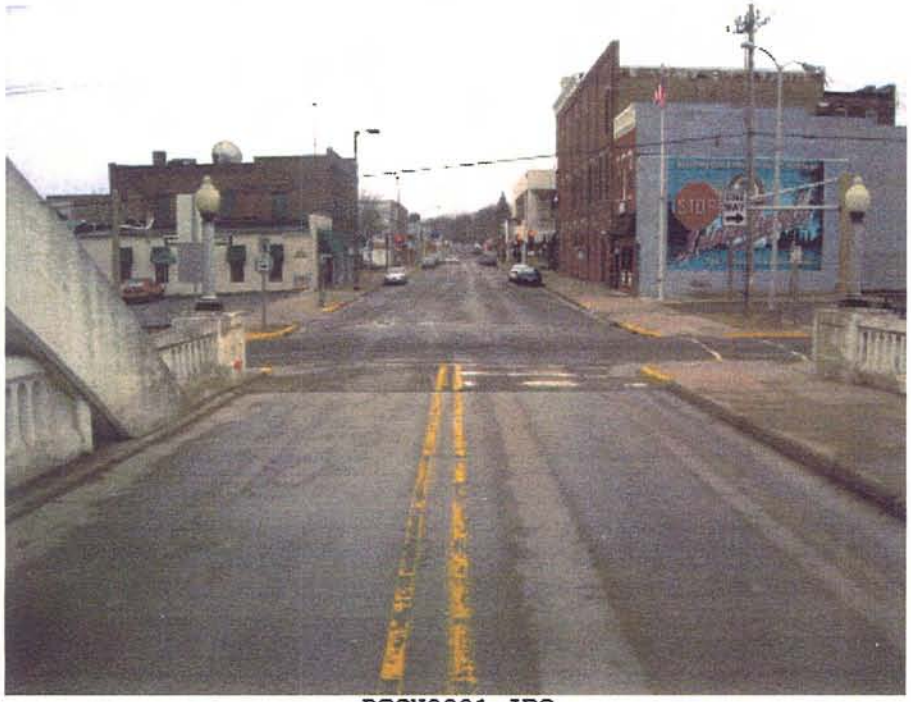
Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

Maintenance Item:
Amount: Date(YYYY-MM-DD):
Maintenance item comment:

NBI Ratings

NBI	File	New	NBI	File	New
Deck	5	5	Culvert	N	N
Superstructure	5	5	Channel	7	7
Substructure	5	5	Waterway	8	8



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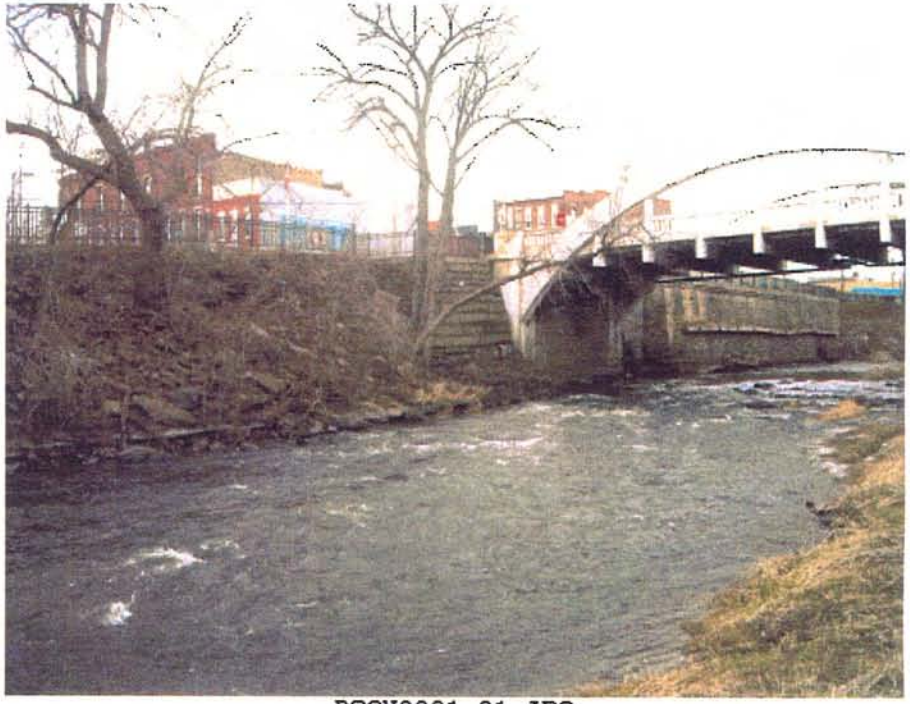

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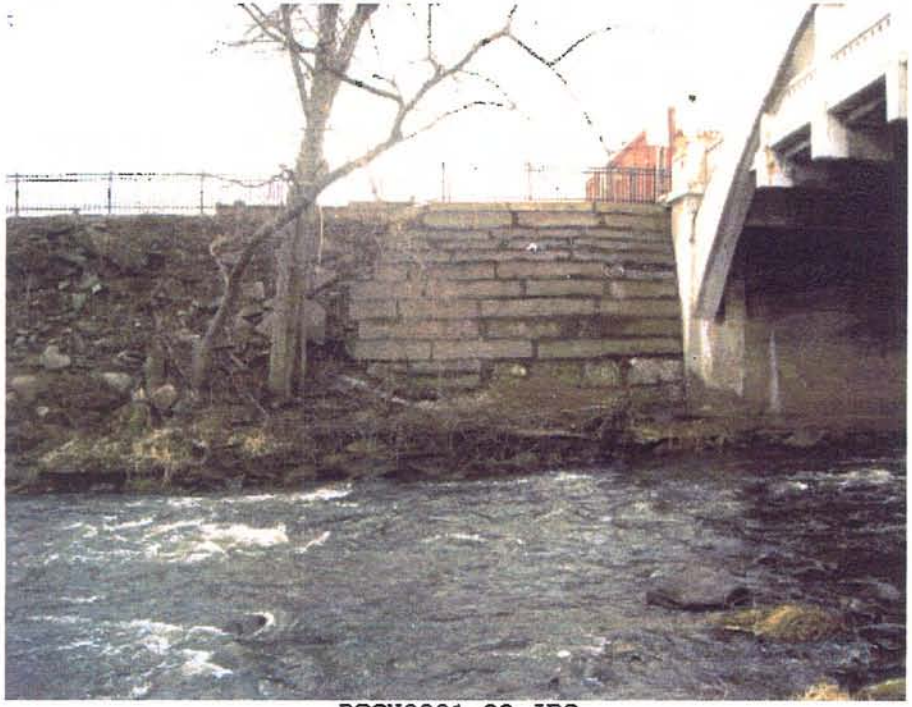

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DSCN0001_03.JPG

DSCN0001_04.JPG

DSCN0002.JPG

DSCN0002_01.JPG

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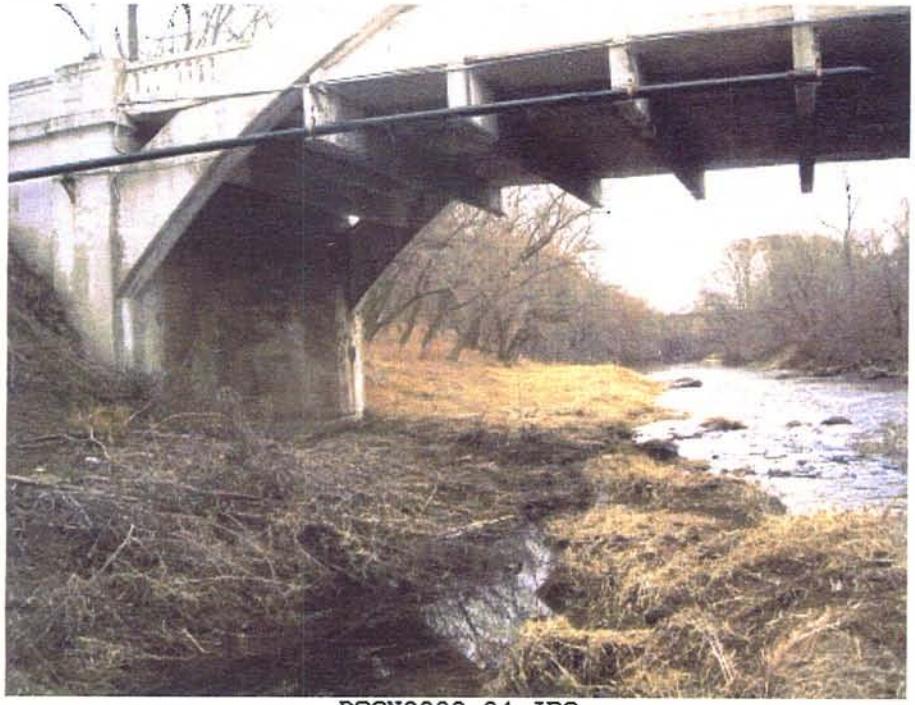

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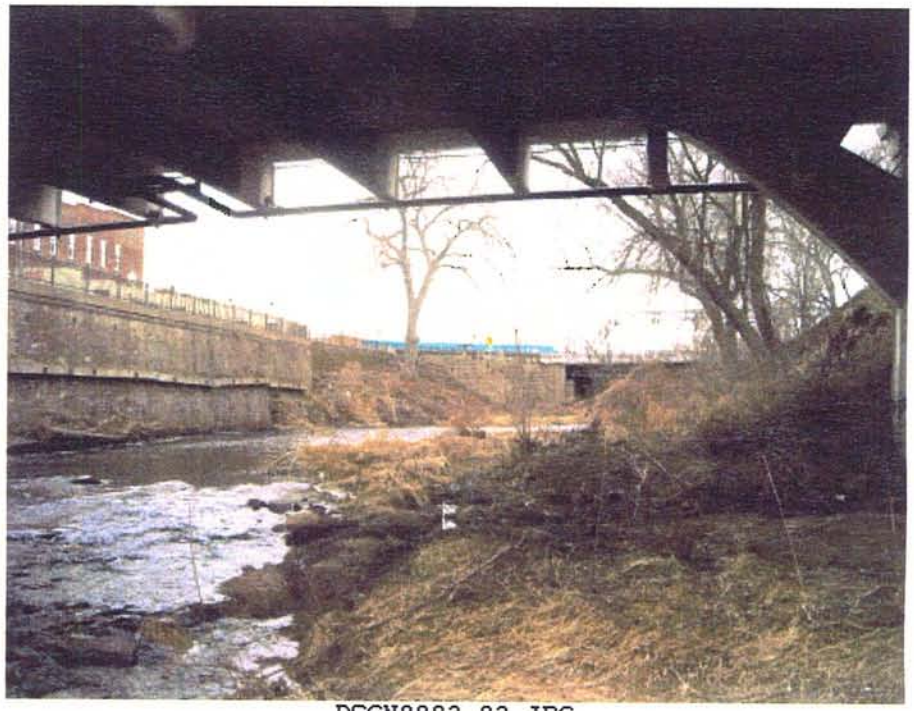

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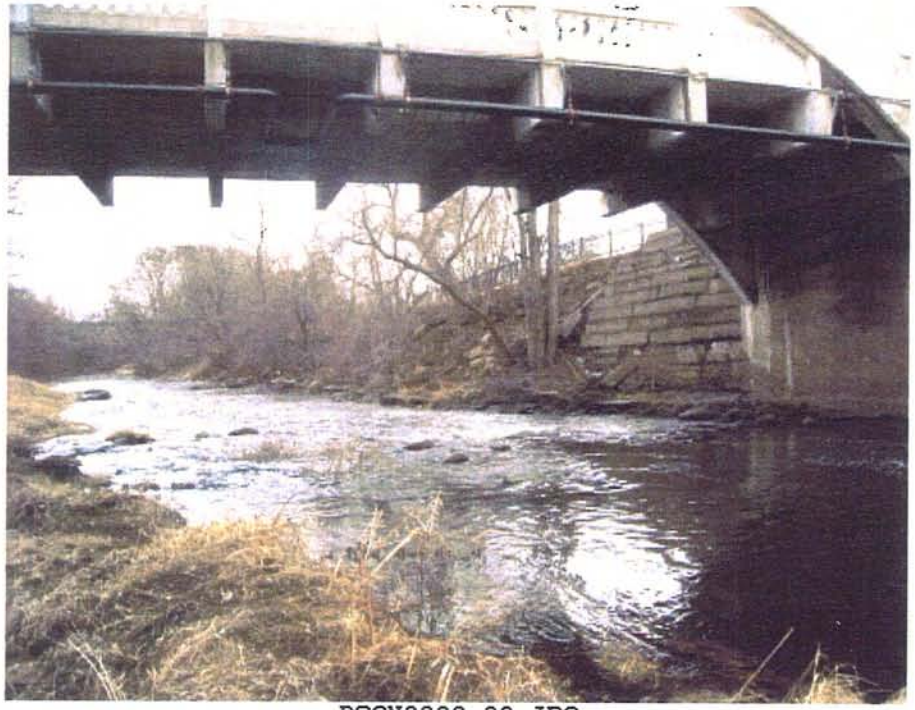

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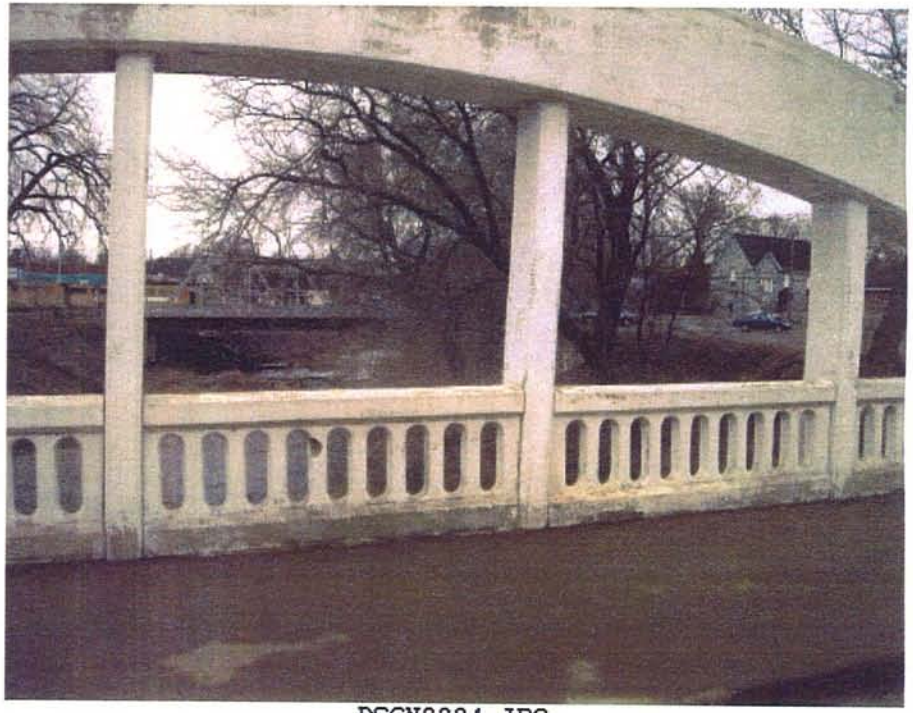

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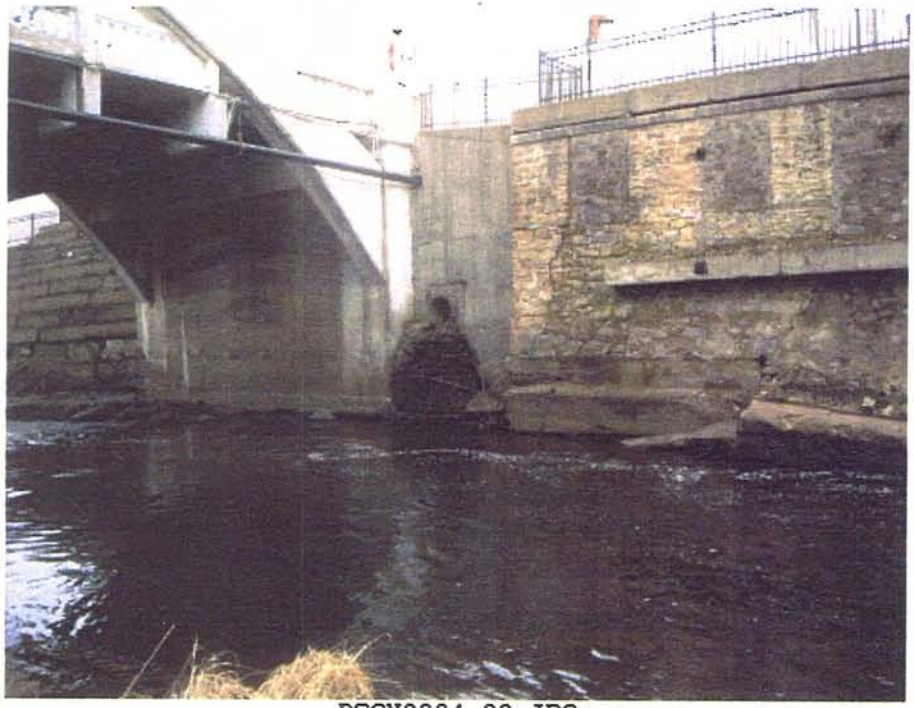

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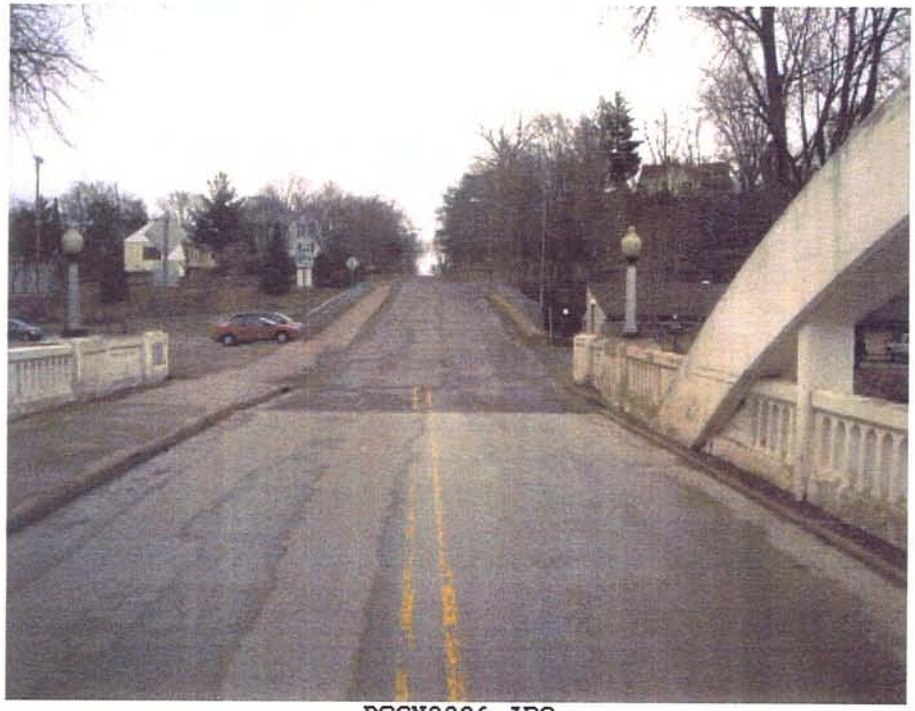
DSCN0005.JPG



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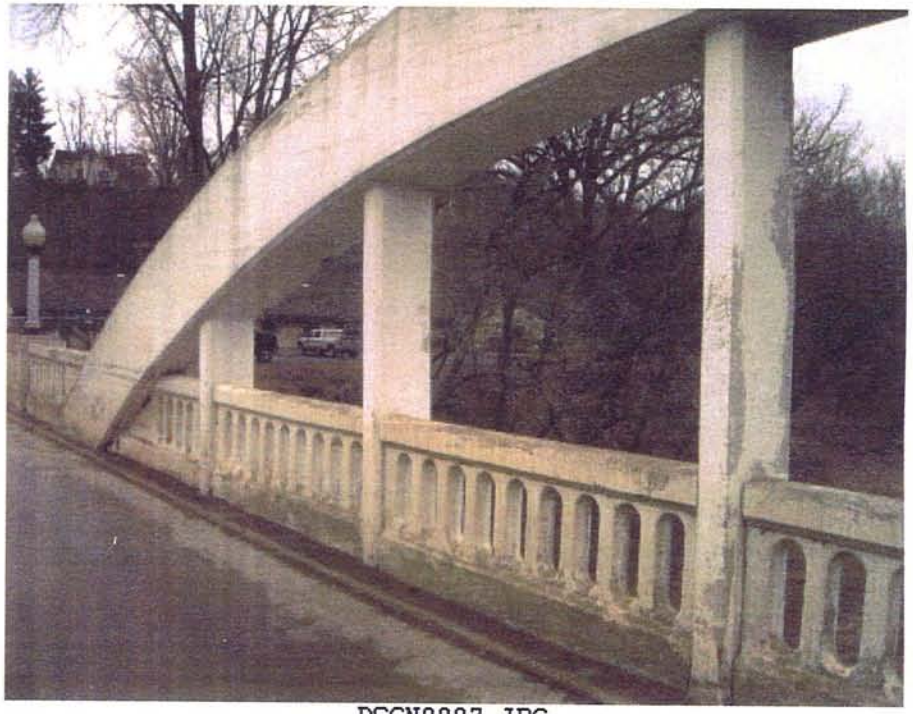

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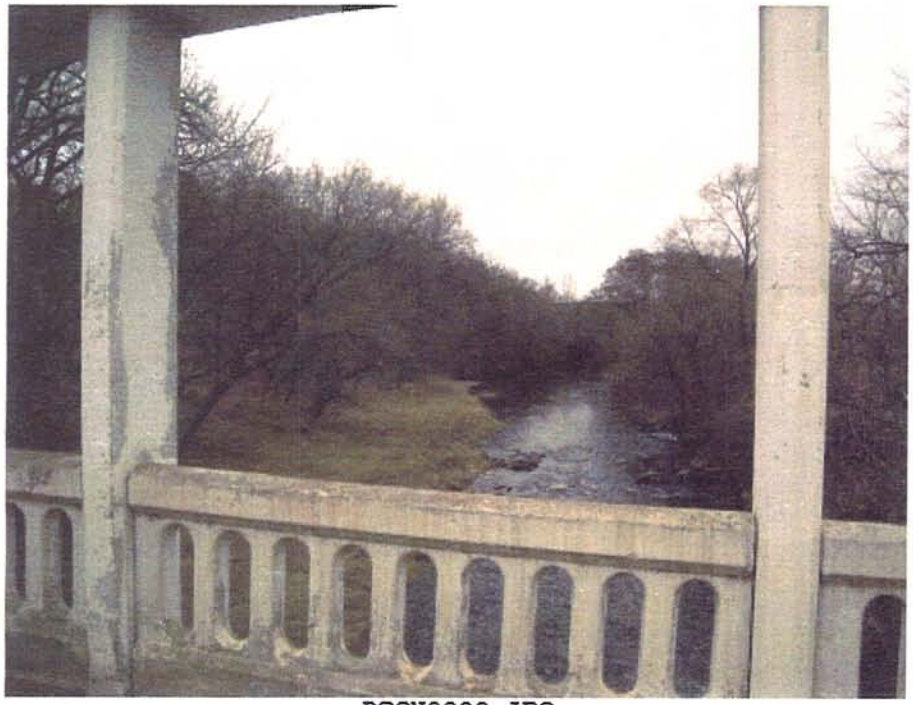

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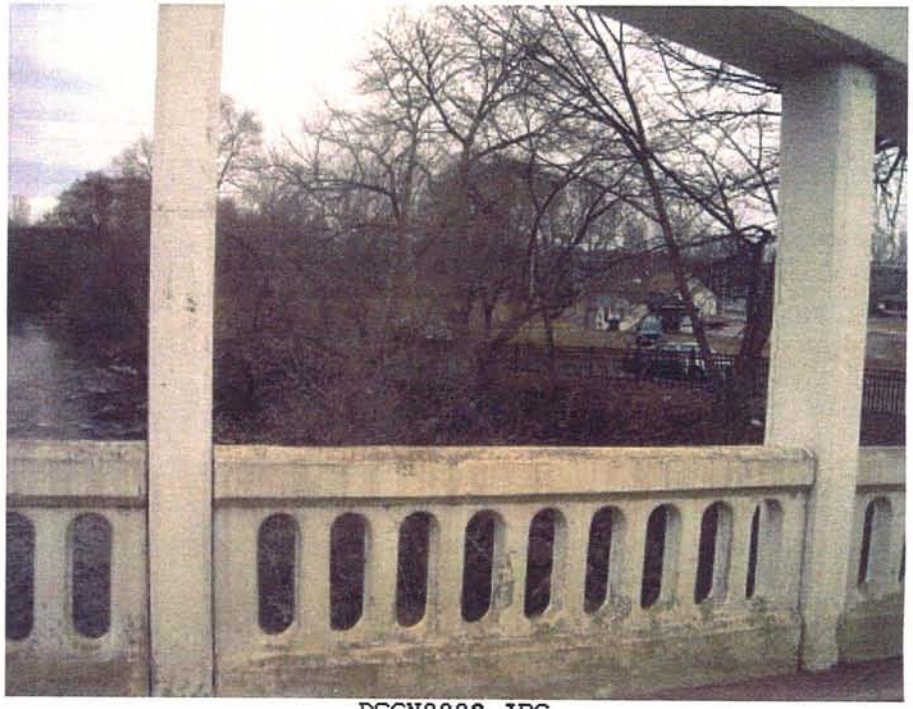

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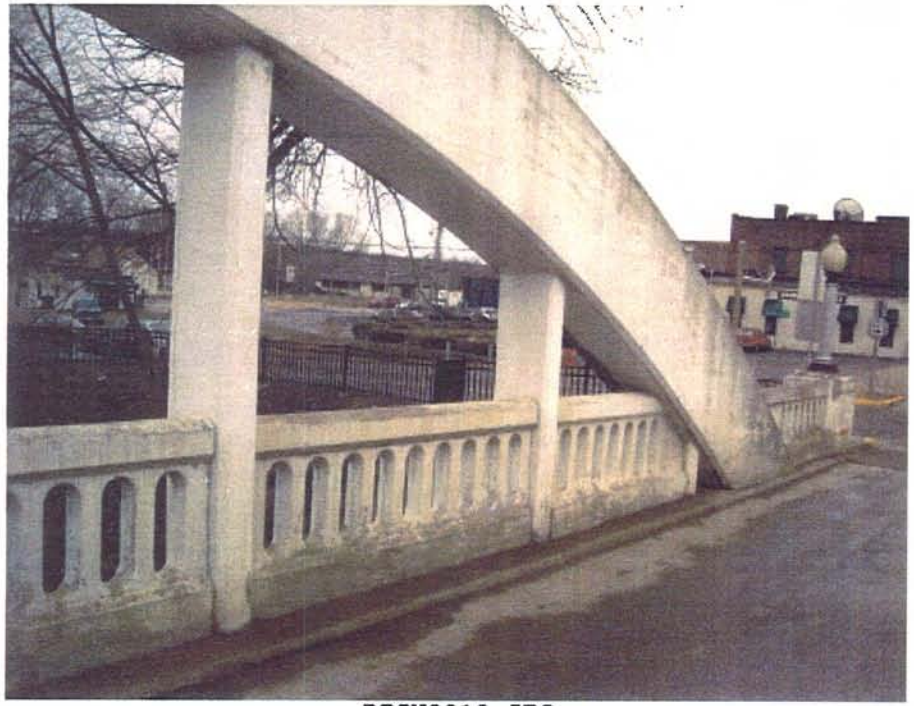

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DSCN0038.JPG

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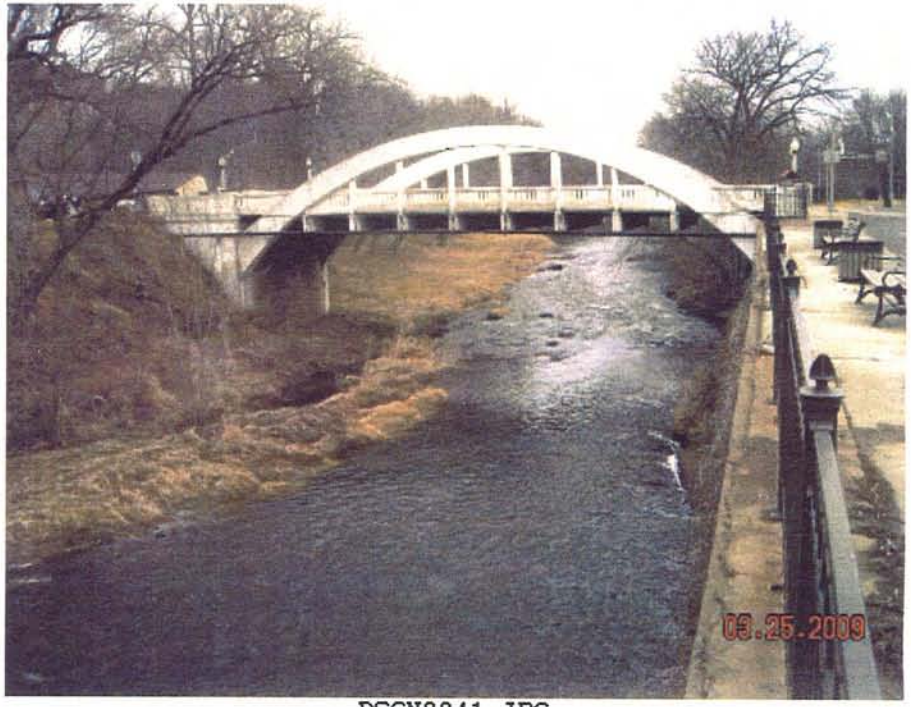

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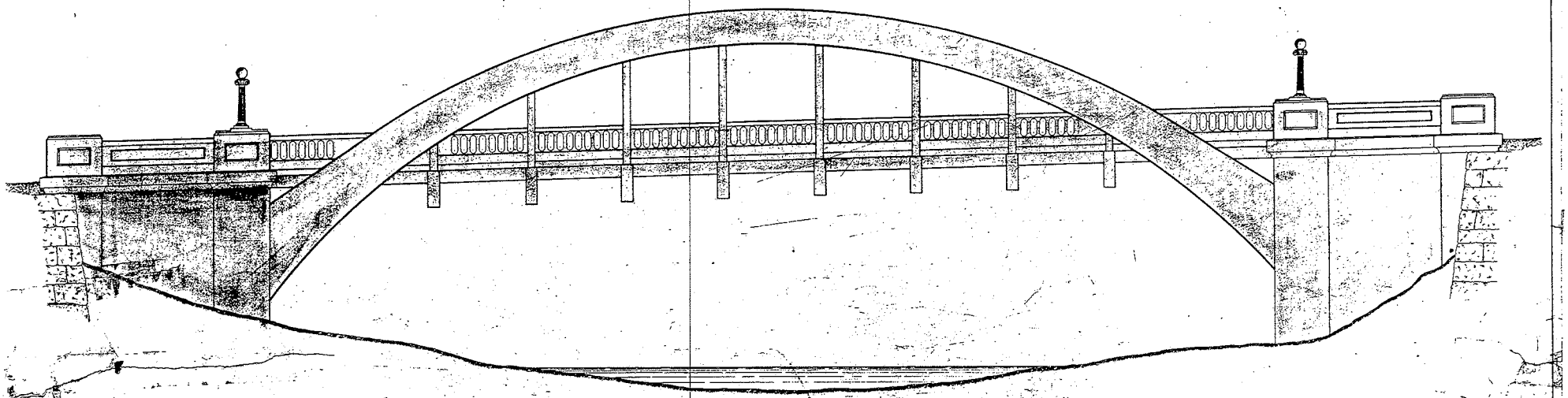
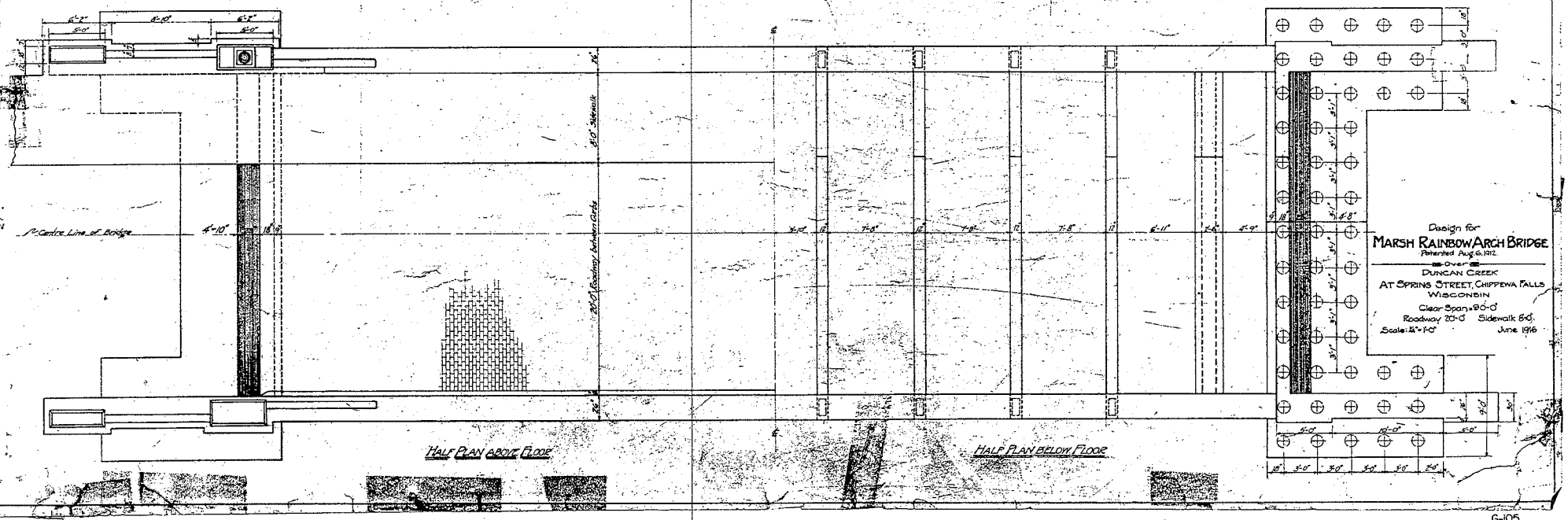
Appendix C

Existing Plans

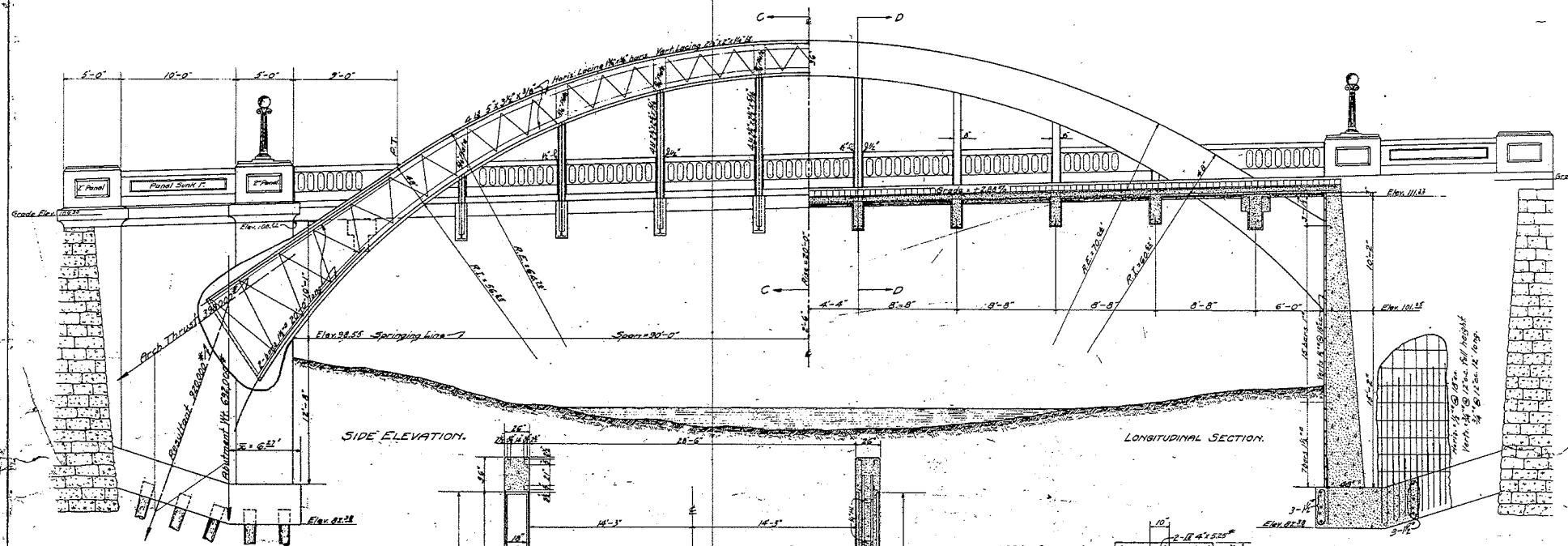


ELEVATION



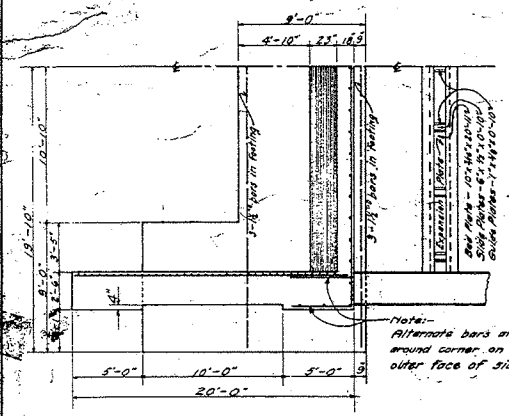
Design for
MARSH RAINBOW ARCH BRIDGE
Patented Aug. 6, 1912.
Over
DUNCAN CREEK
AT SPRING STREET, CHIPPEWA FALLS
WISCONSIN
Clear Span 90'-0"
Roadway 20'-0" Sidewalk 5'-0"
Scale: 1/4" = 1'-0" June 1916

G-105

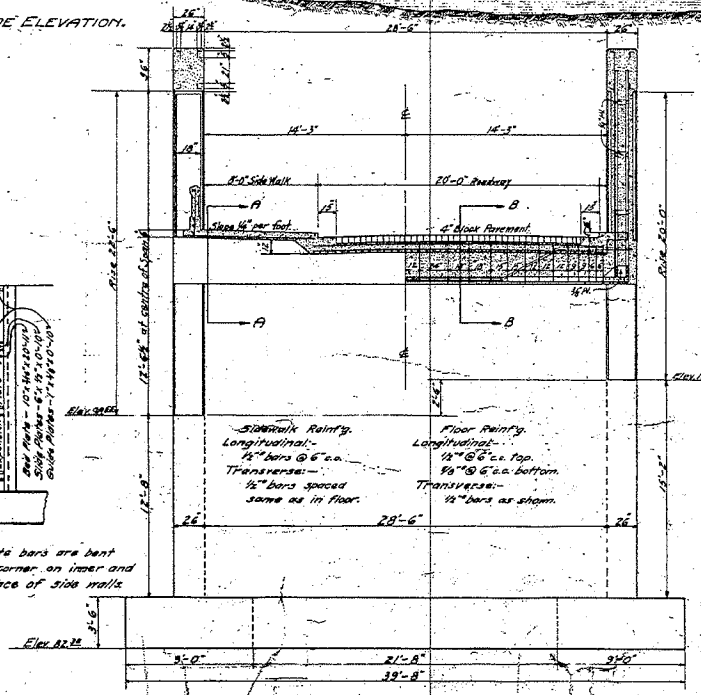


SIDE ELEVATION.

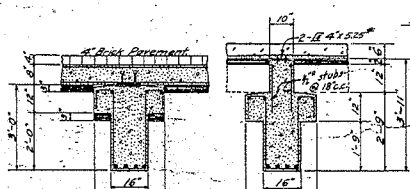
LONGITUDINAL SECTION.



ABUTMENT PLAN.



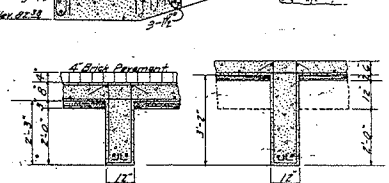
CROSS SECTION "C-C". CROSS SECTION "D-D".



Section "B-B". Section "A-A".

DETAILS OF END BEAMS.
Scale: 1/2" = 1'-0"

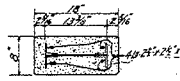
End Beam Reinf'g
4 bars 1 1/2" bottom.
4 bars 1 1/2" top.
Stirrups 1/2".



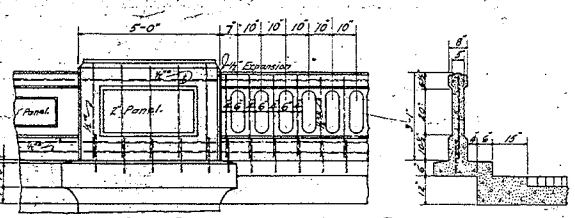
Section "B-B". Section "A-A".

DETAILS OF INTERMEDIATE BEAMS.
Scale: 1/2" = 1'-0"

Int. Beam Reinf'g.
2-15 5"x5.45#
2 bars 1" r.
Stirrups 1/2" r.



CROSS SECTION HANGER.
Scale: 1" = 1'-0"



DETAILS OF HAND RAIL.
Scale: 1/2" = 1'-0"

Design for
MARSH RAINBOW ARCH BRIDGE
Patented Aug. 6, 1912.
over
DUNCAN CREEK
AT SPRING STREET, CHIPPEWA FALLS
WISCONSIN.
Clear Span - 90'-0"
Roadway 20'-0" Sidewalk 8'-0"
Scale: 1/4" = 1'-0" June, 1916

G-105 A

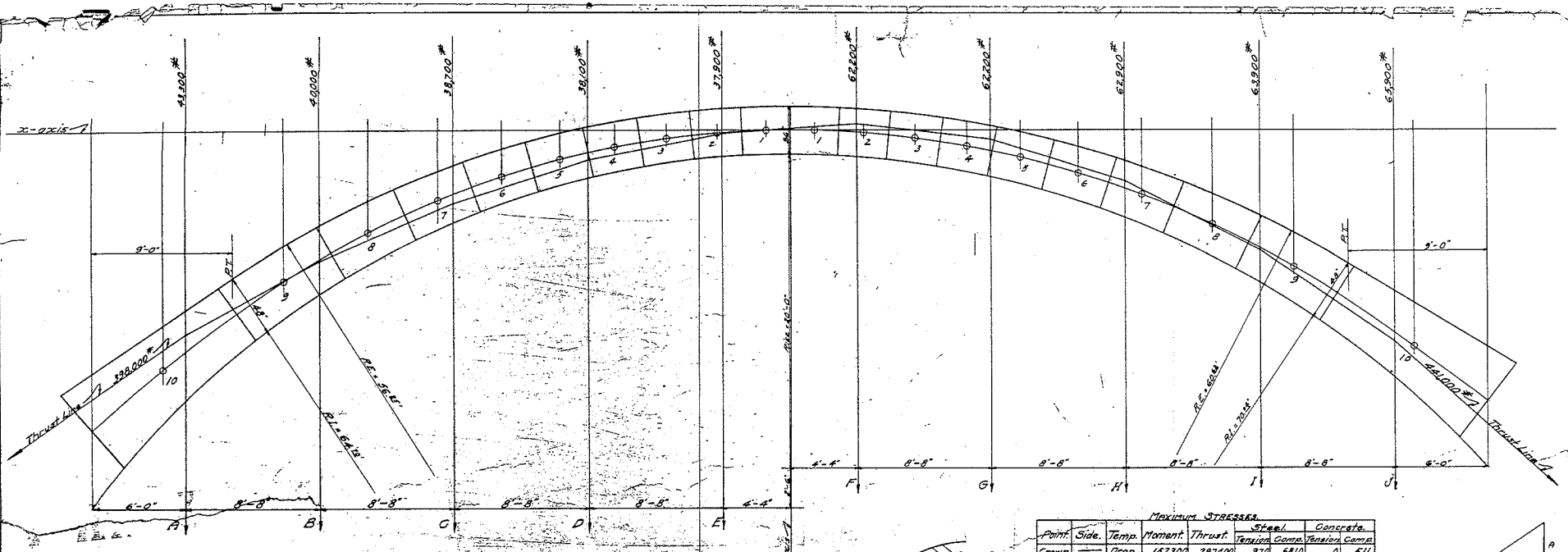


TABLE "A".

Pt.	x		y		x²		y²		m.		mx.		my.		xy		my	
	Right	Left.	Right	Left.	Right.	Left.	Right	Left.	Right.	Left.	Right.	Left.	Right.	Left.	Right.	Left.	Right.	Left.
1	1.55	1.55	.02	.02	2.40	2.40	0	0	0	0	0	0	.03	.03	0	0	0	0
2	4.72	4.72	.21	.21	22.28	22.28	.04	.04	31100	10200	146800	48100	.99	.99	6900	2100		
3	8.04	8.00	.54	.54	64.64	64.00	.29	.29	237600	134500	1910400	1076000	4.35	4.32	128900	72600		
4	11.38	11.35	1.06	1.08	129.50	128.82	1.12	1.17	445400	261500	5069100	2968000	12.06	12.25	472900	282400		
5	14.86	14.90	1.80	1.84	220.82	222.01	3.24	3.39	785000	483500	11666000	6906100	26.74	27.43	1413700	852800		
6	18.60	18.64	2.78	2.90	345.96	347.45	7.73	8.41	1250300	741700	23257500	13937100	51.62	54.07	3476700	2168300		
7	22.66	22.78	4.16	4.58	513.48	518.93	17.31	19.18	1823300	1101000	41317800	25080800	94.35	99.68	7585200	4822300		
8	27.18	27.32	6.00	6.40	738.75	746.38	36.00	40.96	2669900	1621800	72567200	44307600	163.08	174.75	14078400	10377600		
9	32.42	32.74	8.70	9.50	1051.06	1071.91	75.69	90.25	3790700	2338500	122894500	76464300	282.12	311.11	32979100	22187300		
10	40.10	40.50	13.74	15.10	1608.01	1640.25	188.79	228.01	5801000	3598100	232620100	145783100	515.97	611.55	79705700	54331300		
E	181.51	182.50	39.01	41.97	4699.69	4764.43	330.21	391.70	16834300	10273800	511643400	316511200	1186.31	1296.18	141785900	95098600		
Sp.L.	44.84	45.16	17.30	18.98					7304100	4520800								

$$(\Sigma x_L - \Sigma x_R)\,M_o + (\Sigma xy_L - \Sigma xy_R)\,H_o + (\Sigma x^2)\,V_o = (\Sigma mx_R - \Sigma mx_L)$$

$$(\Sigma y)\,M_o + (\Sigma y^2)\,H_o + (\Sigma xy_L - \Sigma xy_R)\,V_o = -(\Sigma my)$$

$$2n\,M_o + (\Sigma y)\,H_o + (\Sigma x_L - \Sigma x_R)\,V_o = -(\Sigma m)$$

$H_o = +329200^{\#}$

$V_o = -24430^{\#}$

$M_o = +23685^{\#}$

TABLE "B".

Pt.	Right Side. Hor.	Ver.	Moment	Thrust	Ecc. Dist	Pt.	Left Side. Hor.	Ver.	Moment	Thrust	Ecc. Dist
1	6600	37900	68200	330000	+ .21	1	6600	37900	− 7600	330000	− .02
2	69100	115300	177000	331000	+ .53	2	69100	115300	− 32700	335000	− .10
3	177800	196400	260300	331000	+ .78	3	177800	195400	−128400	335000	− .38
4	349000	278000	205300	331000	+ .62	4	355600	277300	−159500	335000	− .48
5	592600	363100	194400	344000	+ .56	5	605800	364000	−198000	344000	− .58
6	915200	454400	143000	344000	+ .42	6	954700	455400	−224700	344000	− .65
7	1369500	553600	123300	367000	+ .34	7	1441800	556500	−191900	357000	− .54
8	1975200	664000	7000	367000	− .02	8	2106700	667400	−156800	357000	− .44
9	2864100	792000	110900	400000	− .28	9	3127500	799900	+ 15800	375000	+ .04
10	4523400	979700	274200	441000	− .62	10	4971200	989400	+407400	398000	+ 1.02
Sp.L.	5695300	1093600	489500	441000	− 1.11	Sp.L.	6248000	1103300	+647600	398000	+ 1.62

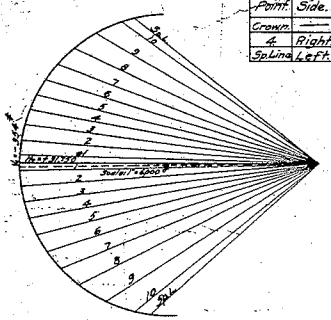
$H_o = +31750^{\#}$

$V_o = -354^{\#}$

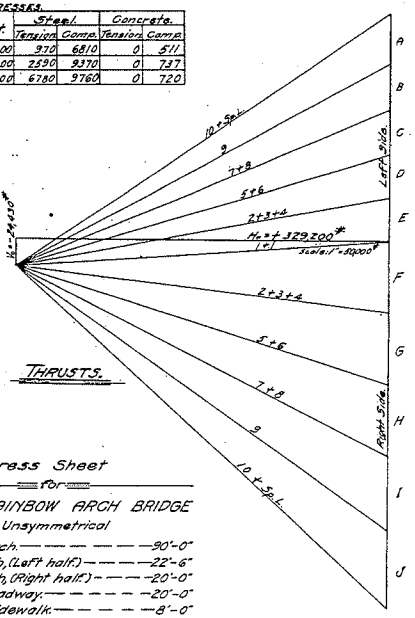
$M_o = -128632^{\#}$

Maximum Stresses.

Point.	Side.	Temp.	Moment.	Thrust.	Steel. Tension.	Steel. Comp.	Concrete. Tension.	Concrete. Comp.
Crown.	——	Drop.	152300	297400	970	6810	0	511
4.	Right.	Rise	296200	300000	2590	9370	0	737
Sp.Line.	Left.	Rise.	1205600	422000	6780	9760	0	720



TEMPERATURE THRUSTS.



THRUSTS.

Temperature Table.

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1	+ 500	+ 600	−127500	31700	1	− 500	+ 600	−128500	31700
2	+ 1700	+ 6700	−120200	31500	2	− 1700	+ 6700	−123500	31600
3	+ 2800	+ 17100	−108700	31300	3	− 2800	+ 17100	−114300	31400
4	+ 4000	+ 35700	− 90900	31000	4	− 4000	+ 34300	− 98300	31200
5	+ 5300	+ 57100	− 66200	30600	5	− 5300	+ 58400	− 75500	30800
6	+ 6600	+ 82300	− 33700	30200	6	− 6600	+ 92100	− 43100	30300
7	+ 8000	+113100	+ 11500	29500	7	− 8100	+139100	+ 2400	29500
8	+ 9600	+190500	+ 71500	28500	8	− 9700	+203200	+ 64900	28500
9	+ 11400	+276200	+161500	27000	9	− 11600	+301600	+161400	26900
10	+ 14200	+436300	+321900	25600	10	− 14300	+479400	+336300	25000
Sp.L.	+ 15900	+549200	+436500	24600	Sp.L.	− 16000	+602600	+558000	24000

Stress Sheet

for

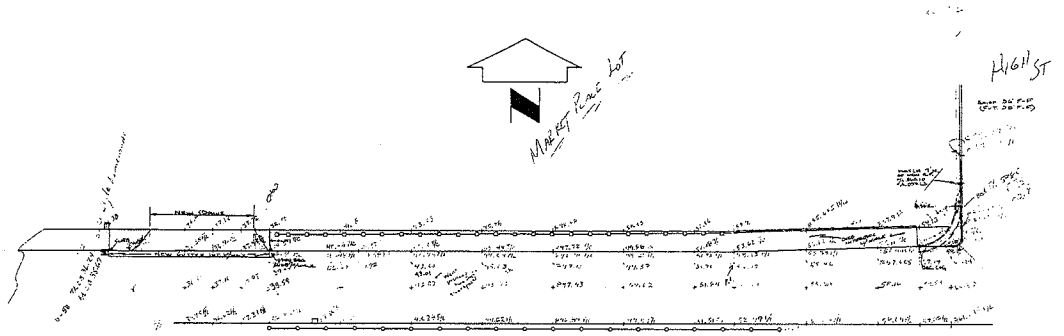
MARSH RAINBOW ARCH BRIDGE

Unsymmetrical

Span of Arch. —— 90'-0"
Rise of Arch, (Left half) —— 22'-6"
Rise of Arch, (Right half.) —— 20'-0"
Width of Roadway. —— 20'-0"
Width of Sidewalk. —— 8'-0"
Crown Section of Rib. —— 26"x36"
Rib Reinforcing. —— 4-1⅛"x3½"x⅜"

Scale: 1"=3'-0" June 1916.

G-105 B

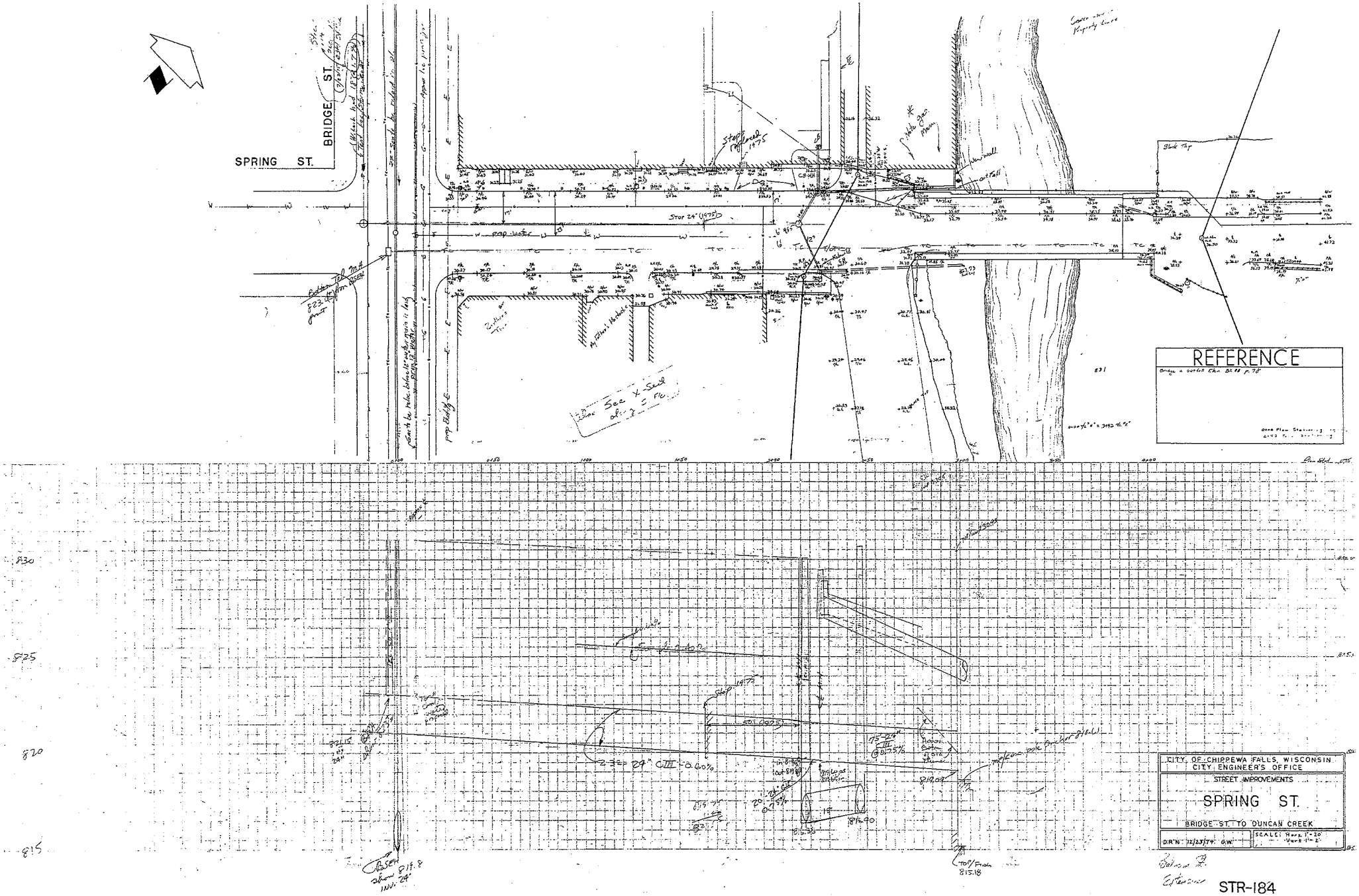


REFERENCES

TOPO BOOK 55 PAGE 34-38

CITY OF CHIPPEWA FALLS, WIS.
CITY ENGINEER'S OFFICE
STREET IMPROVEMENT
SPRING ST.
DUNCAN CREEK BRIDGE TO HIGH ST.
MAY 1, 71
DR'N G.W.
SCALE HORZ. 1" = 20'
VERT. 1" = 4'

STR-133


SPRING ST.
BRIDGE ST.
REFERENCE
CITY OF CHIPPEWA FALLS, WISCONSIN
CITY ENGINEER'S OFFICE
STREET IMPROVEMENTS
SPRING ST.
BRIDGE ST. TO DUNCAN CREEK

STR-184

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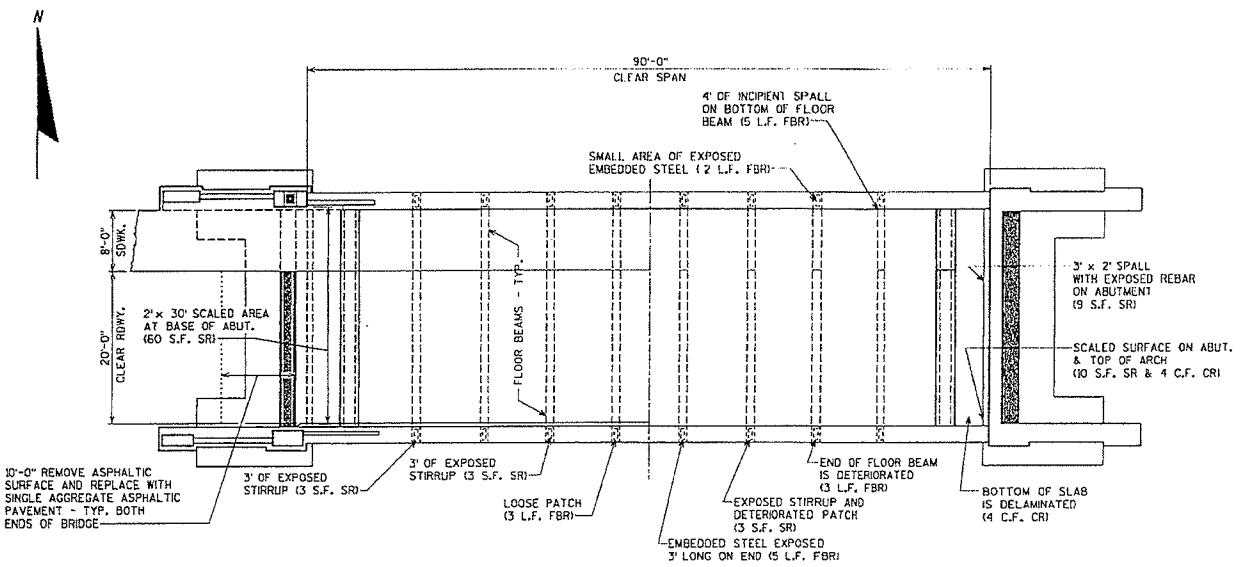

PLAN

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.
BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.
THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE.
THE CONTRACTOR IS TO VERIFY DIMENSIONS IN THE FIELD.
ALL CONCRETE REMOVAL SHALL BE DEFINED BY A 1" DEEP SAW CUT.

LIST OF DRAWINGS

1. GENERAL PLAN
2. ARCH ELEVATIONS
3. REPAIR DETAILS

QUANTITY KEY

FBR - FLOOR BEAM REPAIR L.F.
SR - SURFACE REPAIR S.F.
CR - CONCRETE REPLACEMENT C.F.
SB - SURFACE BONDING S.F.

TOTAL ESTIMATED QUANTITIES

BID ITEMS	AMOUNT
REMOVING OLD BRIDGE, STA. 10+00	1 L.S.
REMOVE ASPHALTIC SURFACE	45 C.Y.
SINGLE AGGREGATE ASPHALTIC PAVEMENT	6 TON
PROTECTIVE SURFACE TREATMENT	13 GAL.
PREPARATION, DECKS	30 S.Y.
CLEANING, DECKS	200 S.Y.
CURB REPAIR	8 L.F.
FULL DEPTH DECK REPAIR	20 S.Y.
CONCRETE MASONRY OVERLAY	10 C.Y.
FLOOR BEAM REPAIR	18 L.F.
SURFACE REPAIR	108 S.F.
CONCRETE REPLACEMENT	8 C.F.
SURFACE BONDING	57 S.F.
RAIL REPAIR	5 L.F.
SURFACE COATING	1 L.S.
RAIL POST REPAIR	17 EACH

DESIGN DATA

RATINGS: OPERATING = HS-14

No.	Date	Revision	By

PLANS PREPARED BY
AYRES ASSOCIATES
Engineers/Architects
Scientists/Surveyors
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

SPRING STREET
OVER
DUNCAN CREEK

County: CHIPPEWA		Town/City/Village: CHIPPEWA FALLS	
Design Spec.: A.A.S.H.T.O. '95		Load: HS-20	Const. Spec.: 1989
Designed By: JAC	Design Checked:	Drawn By: GLD	Plans Checked:

GENERAL PLAN

SHEET 1 OF 3

DATE:
DATE:
DATE:
CHECKED BY:
BACK CHECKED BY:
CORRECTED BY:

REFERENCE FILES

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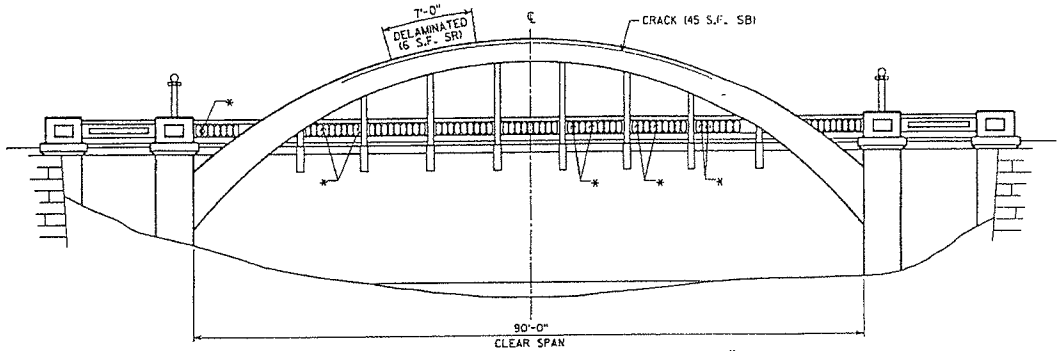
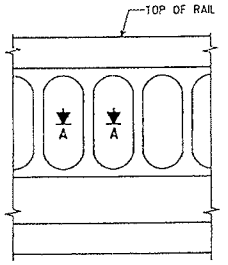
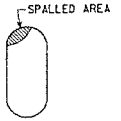


ELEVATION
NORTH SIDE LOOKING NORTH



RAIL POST REPAIR



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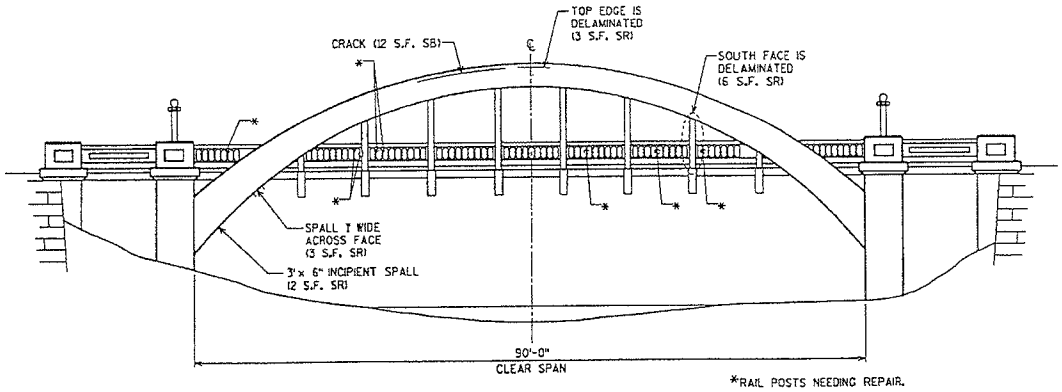


ELEVATION
SOUTH SIDE LOOKING SOUTH

QUANTITY KEY

FBR - FLOOR BEAM REPAIR L.F.
SR - SURFACE REPAIR S.F.
CR - CONCRETE REPLACEMENT C.F.
SB - SURFACE BONDING S.F.

No.	Date	Revision	By

PLANS PREPARED BY
AYRES ASSOCIATES
Engineers/Architects
Scientists/Surveyors
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

SPRING STREET
OVER
DUNCAN CREEK

Const. Spec. 1989 | Drawn By G.L.D. | Phase Checked

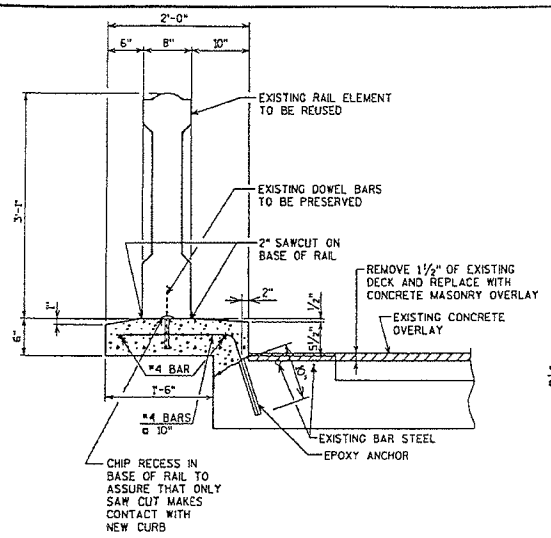
ARCH ELEVATIONS

SHEET 2 OF 3

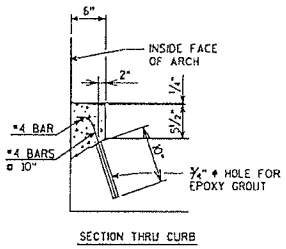
DATE:
DATE:
DATE:

CHECKED BY:
BACK CHECKED BY:
CORRECTED BY:

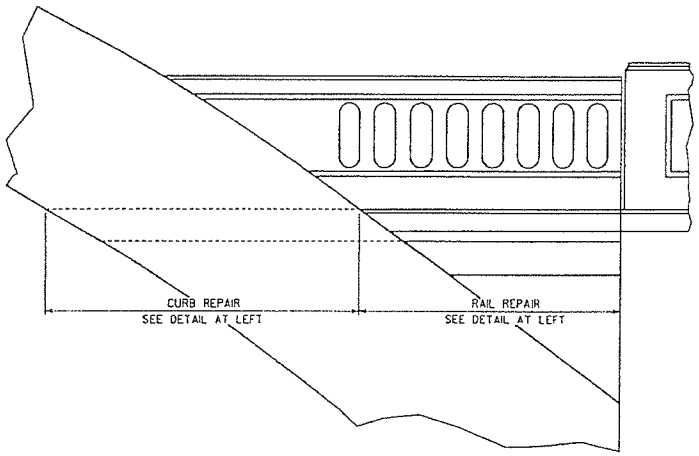
REFERENCE FILES



SECTION THRU RAIL AT SOUTH EAST CORNER

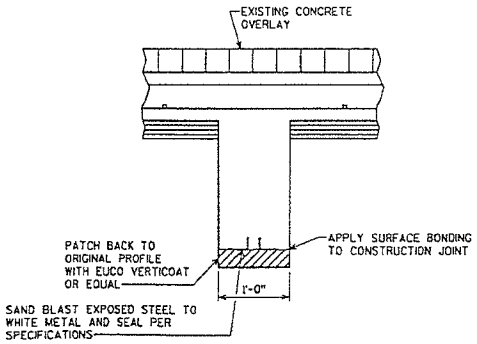


SECTION THRU CURB



SOUTH EAST RAIL SECTION ELEVATION

PROPOSED RAIL REPAIR



FLOOR BEAM REPAIR

PROPOSED FLOOR BEAM REPAIR

No.	Date	Revision	By

PLANS PREPARED BY
AYRES ASSOCIATES
Engineers/Architects
Scientists/Surveyors
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

SPRING STREET
OVER
DUNCAN CREEK

Const. Spec. 1989 | Drawn By G.L.D. | Plans Checked

REPAIR DETAILS

SHEET 3 OF 3

CHECKED BY: DATE:
BACK CHECKED BY: DATE:
CORRECTED BY: DATE:

Appendix D

Cost Estimates

Alternative #2

Cost to Repair and Stain Existing Bridge

Mobilization	$20,000
Concrete Surface Repair	$110,000
Concrete Staining	$25,000
Approaches	$10,000
Miscellaneous	$10,000
	$175,000
15% CE & C	$25,000
	Total $200,000 (Two-Way Traffic)
Additional Cost for One-Way Traffic Signs	$10,000
	Total $210,000 (One-Way Traffic)
Additional Cost to Close Road to Traffic (Barricades and Signs)	$20,000
	Total $220,000 (Closed to Traffic)

Alternative #3

Cost to Widen Bridge Clear Roadway Width and Eliminate Sidewalk

Mobilization	$30,000
Structure Removals	$35,000
New Deck Portion and Overlay	$20,000
Concrete Surface Repair	$110,000
Concrete Staining	$25,000
Approaches	$20,000
Miscellaneous	$15,000
	$255,000
15% CE & C	$40,000
	Total $295,000

Alternative #4

Cost to Widen Bridge Clear Roadway Width and Add Pedestrian Bridge Adjacent to Existing Bridge

Mobilization	$40,000
Structure Removals	$35,000
New Deck Portion and Overlay	$25,000
Concrete Surface Repair	$110,000
Concrete Staining	$25,000
Sidewalk Bridge	$150,000
Sidewalk Bridge Approaches	$20,000
Approaches	$20,000
Miscellaneous	$20,000
	$445,000
15% CE & C	$65,000
	Total $510,000

Alternative #5

Cost to Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder Bridge

Mobilization	$30,000
Remove Structure	$30,000
New Bridge	$595,000
Approaches	$60,000
Miscellaneous	$15,000
	$730,000
15% CE & C	$110,000
	Total $840,000

Alternative #6

Cost to Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder Bridge with Aesthetic Elements

Mobilization	$30,000
Remove Structure	$30,000
New Bridge	$655,000
Approaches	$60,000
Miscellaneous	$15,000
	$790,000
15% CE & C	$120,000
	Total $910,000

Alternative #7

Cost to Replace Existing Bridge with Single-Span Prestressed Concrete Deck Girder Bridge with Arch Facade

Mobilization	$30,000
Remove Structure	$30,000
New Bridge	$955,000
Approaches	$60,000
Miscellaneous	$15,000
	$1,090,000
15% CE & C	$165,000
	Total $1,255,000

Alternative #8

Cost to Replace Existing Bridge with a Modern Bridge that is Similar to the Existing Bridge

Mobilization	$70,000
Remove Structure	$30,000
New Bridge	$1,420,000
Approaches	$60,000
Miscellaneous	$30,000
	$1,610,000
15% CE & C	$245,000
	Total $1,855,000

Appendix E

Public Informational Meeting Sign-In Sheet, Public Comment Forms Received, Letters Received, and Newspaper Letters to the Editor

AYRES ASSOCIATES

Public Information Meeting

Sign-In Sheet

October 22, 2009 - 6 P.M.

Project I.D. 8996-00-79
Spring Street
(Duncan Creek Bridge & Approaches)
City of Chippewa Falls
Chippewa County

Please sign meeting attendance form.

Name	Representing	Address and Phone (if not on file)
Rod Stetzer	Chippewa Herald	738-1609
Wilf Hebert	Self	720-0321
Carla Klein Heintz	Self	723-2183
Dave Pautzlaff	Ayres Assoc	831-7580
James M Campbell	Self	723-5495
Chris McMahon	Ayres Associates	831-7574
Jason Krista	Self	720-2315
Rich Bourget	Bourget Ins. Agency	723-0313
Mary Bourget	Self	723-6272
Charles Webb	"	"
Greg Hoffman	Chippewa Falls	723-5425

Name	Representing	Address and Phone (if not on file)
Mike Jordan	Chamber	
Dan Varga	Self / Plan Commission	
Rick Rubenzer	City of Chippewa Falls	DPW/City Eng./Utilities Manager

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

AREA HISTORY CENTER, 123 ALLEN STREET, CHIPPEWA FALLS, WI, USA 54729-2898
Telephone: 715-723-4399, Website: www.ChippewaCountyWIHistoricalSociety.org

October 22, 2009

Richard Rubenzer, PE
Director of Public Works/City Engineer
Utilities Manager
City of Chippewa Falls
30 West Central Street
Chippewa Falls, WI 54729

Chris McMahon, PE – Project Engineer
Ayres Associates, Inc.
2433 Oakwood Hills Parkway
Eau Claire, WI 54701-7698
715-834-3161
mcmahonc@AyresAssociates.com

Dear Gentlemen:

Thank you for your letter notifying the Chippewa County Historical Society (CCHS) about the informational meeting scheduled for this evening. CCHS President, Dave Gordon requested me to attend this meeting because he was scheduled to be out of town. I recently had a scheduling conflict arise and therefore I cannot attend this meeting. Please accept this letter as a formal request from the CCHS Board of Directors. A letter was submitted approximately two years ago stating the board's preference to preserve this important bridge.

We request that the City of Chippewa Falls maintain and preserve the circa 1916 Marsh Rainbow Arch Bridge. Please select the option of limiting vehicle access and preserving this highly visible historic structure.

The CCHS Board strongly encourages the city to save this bridge from demolition. The bridge is architecturally significant and is a local landmark. It was listed on the National Register of Historic Places in 1982. The Chippewa County Historical Society has recognized the importance of the bridge with a historic marker that is located next to the bridge along the Duncan Creek Bicycle and Pedestrian Trail.

The image of the bridge appears on Downtown Chippewa Falls welcome signs and in many community promotional publications. Building and business owners in the downtown have invested millions of dollars in historic building restorations and architecturally compatible in-fill construction that compliment the early 1900s building stock located in the Bridge Street Commercial Historic District that is also listed on the National Register of Historic Places.

Your October 5th letter states that this is the first of several meetings intended to gather information and concerns regarding options to be considered. Please continue to notify us about upcoming meetings. Thank you.

Sincerely,

Jim Schuh, Vice President

AYRES ASSOCIATES

PUBLIC INFORMATIONAL MEETING

COMMENT SHEET

I.D. 8996-00-79
Spring Street
(Duncan Creek Bridge & Approaches)
City of Chippewa Falls
Chippewa County

October 22, 2009

NAME	ADDRESS	PHONE NUMBER
Charles Webb	310 North Grove CF	723-6272

COMMENT: Leave as is. Make as just foot bridge.

Please return this form to the sign-in sheet table prior to leaving or return to the following address by January 1, 2010.

Chris McMahon, PE
Ayres Associates
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

AYRES ASSOCIATES

PUBLIC INFORMATIONAL MEETING

COMMENT SHEET

I.D. 8996-00-79
Spring Street
(Duncan Creek Bridge & Approaches)
City of Chippewa Falls
Chippewa County

October 22, 2009

NAME	ADDRESS	PHONE NUMBER
WILF HEBERT	214 4TH AVE CF	(715) 720-0321

COMMENT:

Need to get weight limit to 10 ton?
Eliminate large vehicles — Casino & Tour busses
off the Bridge — Plenty of room to turn
around in Parking Lot.
See no need to make one way — Cars are considerably
narrower than in past.
Plenty of History — hate to see another landmark
go the way of wrecking Ball!

Please return this form to the sign-in sheet table prior to leaving or return to the following address by January 1, 2010.

Chris McMahon, PE
Ayres Associates
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

AYRES ASSOCIATES

PUBLIC INFORMATIONAL MEETING

COMMENT SHEET

I.D. 8996-00-79
Spring Street
(Duncan Creek Bridge & Approaches)
City of Chippewa Falls
Chippewa County

October 22, 2009

NAME	ADDRESS	PHONE NUMBER
DAN VARGA	23 N HIGH ST CHIPPEWA FALLS WI 54729	(715) 723-3307

COMMENT:

For the past 37 years I have lived at the corner of E. Spring Street and N. High Street, just one block east of the Spring Street bridge. I drive across this bridge in both directions almost everyday going to or from down town. I would absolutely prefer that this bridge remain as it has always been. If the bridge was changed to one-way vehicle traffic, it must be for westbound traffic, coming down from the East Hill. If the bridge has to be replaced, it should be with a structure similar to Grand Ave.

Please return this form to the sign-in sheet table prior to leaving or return to the following address by January 1, 2010.

Thank you
Dan Varga

Chris McMahon, PE
Ayres Associates
3433 Oakwood Hills Parkway
Eau Claire, WI 54701

YOUR VIEWS 10/28/09

No new bridge now

The city has already agreed to pay Ayres Associates $96,000 to explore public opinion on five options for the fate of the Spring Street "Marsh Rainbow" bridge.

It is too late to do anything about that waste of money, but hopefully common sense will prevail and not another penny will get spent on this ridiculous non-issue.

I don't know how the buckets of money get distributed to the various departments, or if there is earmarked money that is "use it or lose it." It doesn't matter because wasting money is ... well, a waste, and it is wrong.

Ayres Associates is spending our $96,000 by holding last-minute meetings that only a few people attend. For a few thousand dollars the city could have mailed out a poll or set up a voting website or call-in number to get our opinion.

I'm very skeptical of the whole process because it only makes sense to spend $96,000 on a study if you already plan on spending millions. If you were thinking about buying a car, would you spend $5,000 on a consultant to tell you that you don't need a new car?

The proposed options for the fate of the bridge range in cost from $0 (do nothing) to over $1,000,000 (replace bridge with a modern look-a-like).

It will cost $400,000 to replace the bridge with a conventional bridge, but that estimate could double if the city has to fight the bridge lovers and historians in court.

Many projects run over budget. You can't stop when you run out of money; you have to spend to finish the project because nobody wants a bridge that goes halfway across the creek.

Right now there are six different ways to get down from the East Hill.

A few summers ago, the city spent hundreds of thousands of dollars on another bridge only two blocks away from the Rainbow bridge. Why are we even considering replacing a bridge that is not necessary?

The only solution that makes any sense in these economic times is to do nothing until it is deemed unsafe for vehicular traffic. If it is unsafe now or when it becomes unsafe, then we can spend a few thousand dollars on a concrete barricade and signs to close it to cars and trucks and make it walk or bike only.

I understand there are a hundred or so residents that use it regularly, but I bet they are willing to drive an extra block to the Central Street bridge.

The assessment to pay for a new bridge will probably be around $100-$200 per household. That is one heck of an expensive toll bridge for those of us who would rarely, if ever, use it.

Chris Kranich
Chippewa Falls

Save Chippewa's Rainbow arch bridge

I was reading about the future of the Rainbow arch bridge in Chippewa Falls. It's full of history.

I was born the year the bridge was built in 1916. I walked on it many times as I went to Notre Dame School and I had to walk almost the length of the city to the old senior high school to take manual training.

Some of those days were 10 below zero or better, so not much time was spent downtown. Sometimes we even walked over the arch.

I would hate to see this old bridge torn down. Glen Zwiefelhofer has a good head on his shoulders. He needs to take a look at the bridge. He would probably do as good a job as Ayres Associates and save the city money.

This bridge brings back many memories, as I recall Hank Bresina, Tim Jennings, Norb Smola, Bernie Thorton, Chuck Butler, Uclid Therou and Ed Harling and myself as we walked over this bridge, getting our education.

Let's keep the bridge.

Robert Loew
Bloomer

11-4-09

McMahon, Chris

From: Jim Schuh [jamespaulschuh@gmail.com]
Sent: Wednesday, February 03, 2010 11:07 AM
To: info@wipreservation.org
Cc: christieweb@hotmail.com; Joe Lawniczak; Chip Brown; Richard J. Rubenzer; McMahon, Chris
Subject: Rainbow Arch Bridge in Chippewa Falls
Attachments: 88 Chippewa Printery 1934 .jpg; 223 Chuck Card & Judy Ganzer 2004.jpg

Good morning Anne,

Thank you for sending the letter of support for saving our bridge! I also appreciate your offer to include some photos of our unique bridge on the WI Trust for Historic Preservation website.

Today Chip Brown of the WI Historical Society said that this is the last remaining Marsh Rainbow Arch Bridge in WI. He said that Bob Newberry with WI-DOT confirmed this fact. Chip also told me WI Statutes 44.42, Sec. 66.111 require notification to his department for this project.

Two photos are attached. I will send two more photos in a separate email.

Here are portions of captions from a publication we produced titled Images of America - Chippewa Falls Main Street - copyright 2005

1. "On April 3, 1934, Duncan Creek went on a rampage, sweeping away bridges and buildings..."
2. "One of the founding fathers of Chippewa Falls Main Street, Chuck Card and downtown business owner and resident Judy Ganzer paddle upstream in Duncan Creek after portaging from the Chippewa River above the hydro-electric dam."

Please let me know if these photos are not what you had in mind or if I can be of any further assistance.

Jim Schuh, Vice President
Chippewa County Historical Society

---------- Forwarded message ----------
From: <andvgordon@aol.com>
Date: Wed, Feb 3, 2010 at 9:44 AM
Subject: Re: Rainbow Arch Bridge Pics?
To: jamespaulschuh@gmail.com

Hi Jim,

Attached are the two photos from the book. I sent you the legion bridge photo yesterday.

Dave

-----Original Message-----
From: Jim Schuh <jamespaulschuh@gmail.com>
To: Ann & Dave Gordon <andvgordon@aol.com>

Sent: Tue, Feb 2, 2010 7:13 pm
Subject: Fwd: Rainbow Arch Bridge Pics?

Dave,

This email from the WI Trust for Historic Preservation wants a historic photo of the bridge. There were a few photos, old and new, in the 2nd Main Street book of the bridge. Could you send them to me when you have time please. Thank you!

Jim

---------- Forwarded message ----------
From: <info@wipreservation.org>
Date: Tue, Feb 2, 2010 at 1:33 PM
Subject: Rainbow Arch Bridge Pics?
To: jamespaulschuh@gmail.com
Cc: christie weber <christieweb@hotmail.com>

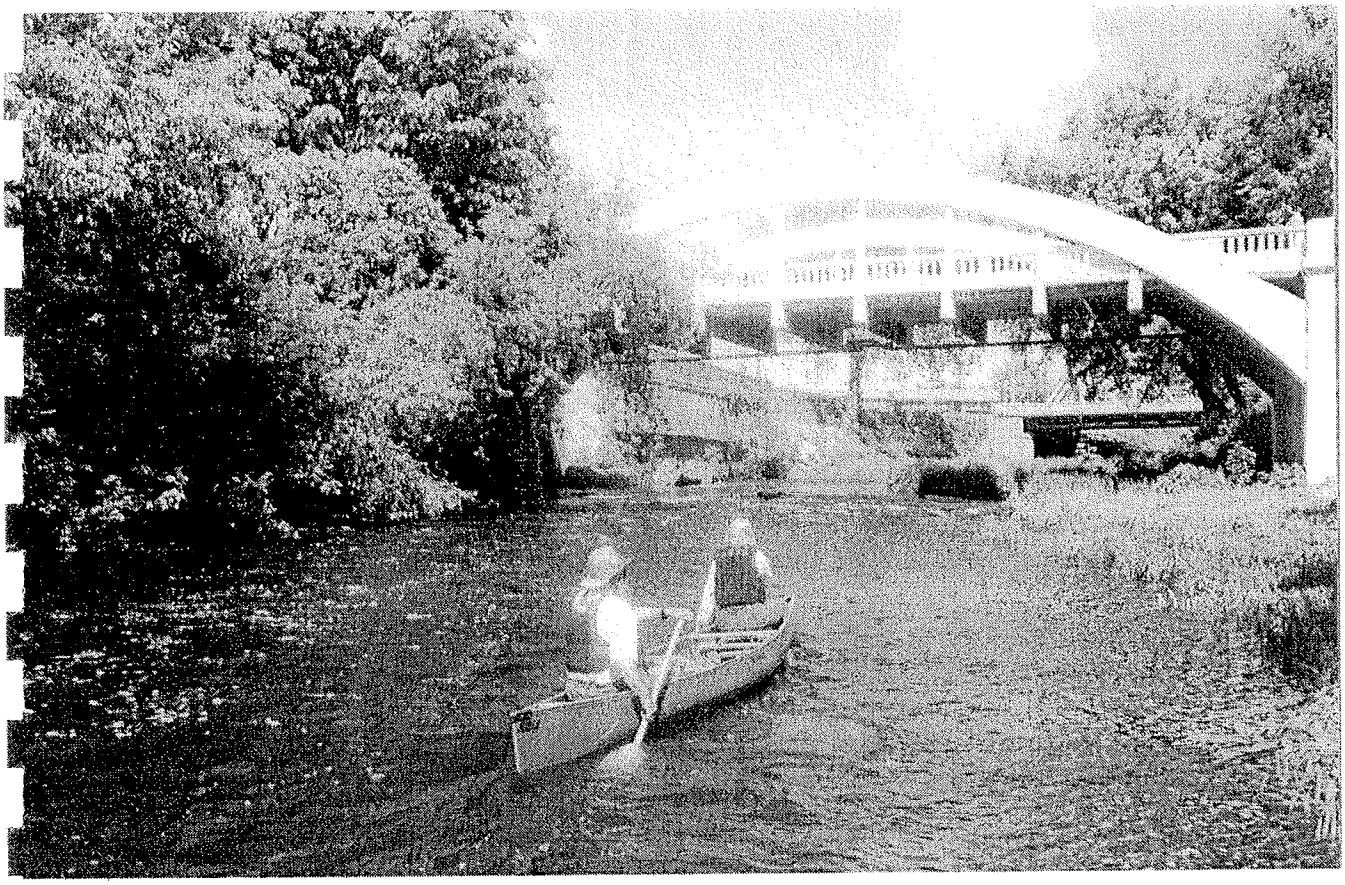
Hi Jim--

I'm wondering if you have a nice photo (or 2) of the Rainbow Arch Bridge that we could use in helping to bring attention to your cause. I'd like to post the image(s) on our flickr site, minimally, and possibly write an entry for our blog. It would be ideal if you could provide a historic, along with a contemporary, shot

Thanks,

Anne Biebel
WTHP


CHIPPEWA PRINTER



THE EAGLE SPEAKS

CHIPPEWA COUNTY HISTORICAL SOCIETY

FEBRUARY 2010

www.chippewacountywihistoricalsociety.org

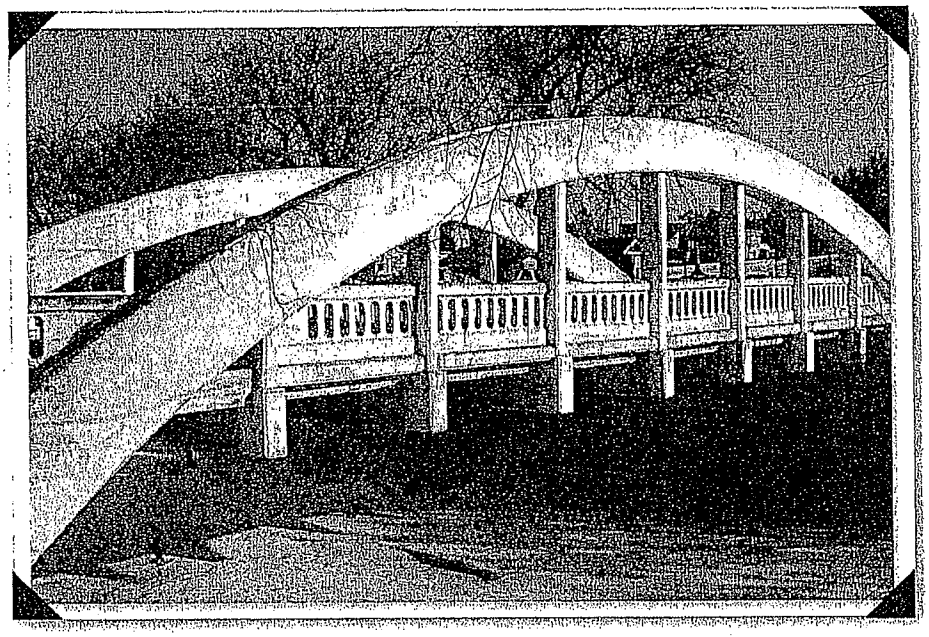
"OLD ABE"

Inside this Issue:

CCHS Semi Annual Membership Meeting

Monday, February 15 • 7:00 p.m.
Area History Center

- President's Progress Report and Hall of Fame Inductions
- Anne Keller's 2009 European Tour slide show including a special ceremony on Omaha Beach on June 6, the 65th Anniversary of the D-Day Invasion



Marsh Rainbow Arch Bridge was built In 1916 by the Iowa Bridge Company at a cost of $13,950.

Please help us save the last Marsh Rainbow Arch Bridge in Wisconsin!

JIM SCHUH

The Chippewa County Historical Society Board of Director's encourages everyone to show his or her support for saving the bridge by writing a letter and attending the March City Public Information Meeting. The City is studying replacement of the bridge because it is considered "functionally obsolete". Community input will impact the outcome. For more information see our letter on page 5 of our November 2009 newsletter.

The City must hear our message: "Restore this bridge to Good Condition" by repairing the concrete so water cannot penetrate, removing rust, repainting and limiting traffic if needed. We must ensure that it remains for future generations.

The low traffic counts and minimal safety concerns allow the city to pick "Restore" as the most prudent option. There is no increase in traffic projected for this bridge. We must all take this opportunity to really look at what is best for our community. Federal funds are available for 80% of the restoration costs.

Send letters to: City Engineer, 30 W. Central St., Chippewa Falls, WI 54729.

FILE

City Engineer
30 N. Central St.
Chippewa Falls, Wi 54729
February 15, 2010

I am writing in regards to the Rainbow Arch Bridge. I have lived all my life in Chippewa Falls, and have always admired the Rainbow Bridge. It is a land mark to our city, like many other landmarks that used to be here and are no longer here, like the Soo Line Depot, Northwestern Depot, the old Freight House. Please keep and restore the Rainbow Arch Bridge. It's a beautiful Bridge and part of Chippewa Falls. Why does everything have to be New & Modern?

Lorraine Contois
1113 Weatherridge Dr.

Spring St. Bridge Fan

Dear Sir:

This is a letter I have been sending out to my e-mail friends. I just wanted to add my name to the list of people that doesn't want the bridge torn down.
The Letter:
Hi: I am hoping that you will help save the Rainbow Bridge. This is a Historical Bridge which the City Council has been trying to tear down for quite some time. They don't seem to be satisfied until all the old historical buildings etc. are gone. We need the bridge for the sake of Chippewa Falls because it is our landmark. It is the only bridge like it in Wisconsin and very few in the United States. Rumor has it that the City is planning a big expensive entrance into Chippewa Falls and the bridge doesn't fit into their plans. Please write the City Engineer, 30 West Central Street, Chippewa Falls, WI. 54729 to rescue the bridge. There are others options besides tearing it down and they will get financing to fix the bridge.. Sometimes it helps to complain but other times they do as they please no matter what the people want done.
Thanks.
Henrietta G. Campbell
James M. Campbell

110 Chippewa St.
C.F. WI 54729

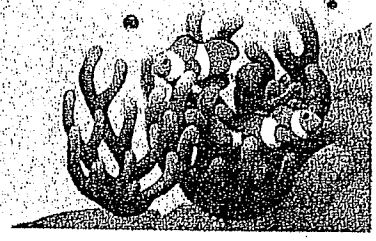
Delores Woodford
2848 119th ST E
Chippewa Falls, Wi

Please! repair, restore, keep, the Marsh Rainbow Arch bridge. It is part of Chippewa Falls. Nothing could replace it. Confine it to a walking bridge if the repair cost is the current problem. Don't distroy our Marsh Rainbow arch bridge - now or ever.

I walked across it twice a day during my High school years, leaving our Lafayette school bus at Mugga Drug Store corner or returning after school to the bus barn, which was located just west of the bridge on Spring St. So many of these special places are "my Home Town."

Thank you

Delores Woodford



P120-1582

February 19, 2010

Sally Verhoeven
97 NW Spagnuolo Loop
College Place, WA 99324

Dear City Engineer:

I am writing this letter from the state of WA, as you can see by my address.

I was born and raised in Chippewa Falls, WI. It is rich in history. I am writing about one particular historical landmark and that is the Marsh Rainbow Bridge over Duncan Creek. It is my understanding that they are considering tearing it down. You have a choice as to whether to fix it or tear it down. My vote is to fix it. Why not get the funding to keep history alive? I believe the historical buildings etc., are what draws people to the city. It's the "old look" and feel of the place. I've walked across this bridge and it brings back a lot of memories. It's great to just stand there and watch the water go by...

Why does everything in today's world have to be "new and improved". Is nothing spared to keep memories alive?

This is a great bridge-please keep the bridge!

Sincerely,

Sally Verhoeven

Sally Verhoeven

2/28/10

YOUR VIEWS

Save Rainbow Bridge

I love Chippewa Falls. I was born there. My four kids were born there. My grandparents, aunts, uncles, and cousins all live there. I have many fond memories of growing up there.

I love that, to this point, it has remained a fantastic historic place. One of the great pieces of its history is the Rainbow Bridge. I love that this bridge was the only one to withstand the flood of 1934, a flood where my grandfather lost his home. What a great piece of history.

Now I hear that the city of Chippewa Falls wants to remove the Rainbow Bridge. I understand that the city administration is anxious to take necessary means to move toward progress and to draw more people to the city in order to increase revenue.

I believe that maintaining this wonderful portion of history is more important than the city's bottom line. I also believe that saving the bridge could aid in attracting more people to the area.

I understand the bridge needs repairs, but I have also heard that money is available to fund the majority of the repairs. I ask that the city take advantage of this opportunity to include this bridge in the package of wonderful historic sites within Chippewa Falls.

Shelley Pearson
Stillwater, Minn.

Shelley Pearson
913 William St N
Stillwater, MN 50082

February 19, 2010

City Engineer
30 W Central Street
Chippewa Falls, WI 54729

Dear City Engineer:

I love Chippewa Falls. I was born there. My four kids were born there. My grandparents, aunts, uncles, and cousins all live there. I have many fond memories of Chippewa Falls growing up. I love that, to this point, it has remained a fantastic historic place. One of the great pieces of history in Chippewa Falls is the Rainbow Bridge. I love that this bridge was the only one to withstand the flood of 1934, a flood where my grandfather lost his home. What a great piece of history!

Now I hear that the City wants to remove the Rainbow Bridge. I understand that the city administration is anxious to take necessary means to move toward progress and to draw more people to the city in order to increase revenue. I believe that maintaining that wonderful portion of history is more important than the city's bottom line. I also believe that saving the bridge could aid in attracting more people to the area.

I understand the bridge needs repairs, but I have also heard that money is available to fund the majority of the repairs. I ask that you take advantage of this opportunity to include this bridge in the package of wonderful historic sites within the City of Chippewa Falls.

Thank you for your consideration.

Sincerely,

Shelley Pearson

Shelley Pearson

Feb 27, 2010

6046 188th St.
Chippewa Falls, WI 54729

City Engineer
30 W. Central St.
Chippewa Falls, WI 54729

Dear Sir:

I wish to urge you to use your influence to Restore rather than demolish and replace the Marsh Rainbow Arch Bridge on Spring St.

It is part of the reason that we can call our downtown "Historic".

So many people have lamented the demolition of the Carnegie library. It could have housed the Chippewa Senior Center, or the the Chippewa County Historical Society. Replacing the Rainbow Bridge with a modern more functional bridge will erase some Chippewa's charm and history. It is my understanding that present traffic flow does not demand a newer larger bridge.

Everyone I know is so proud of the gem that the old McDonnell high School has become, our Arts and Culture Center., most of those people who attend events at the Heyde will cross the Rainbow Bridge which will be another possibly unique experince, and add to their enjoyment.

Very respectfully yours,

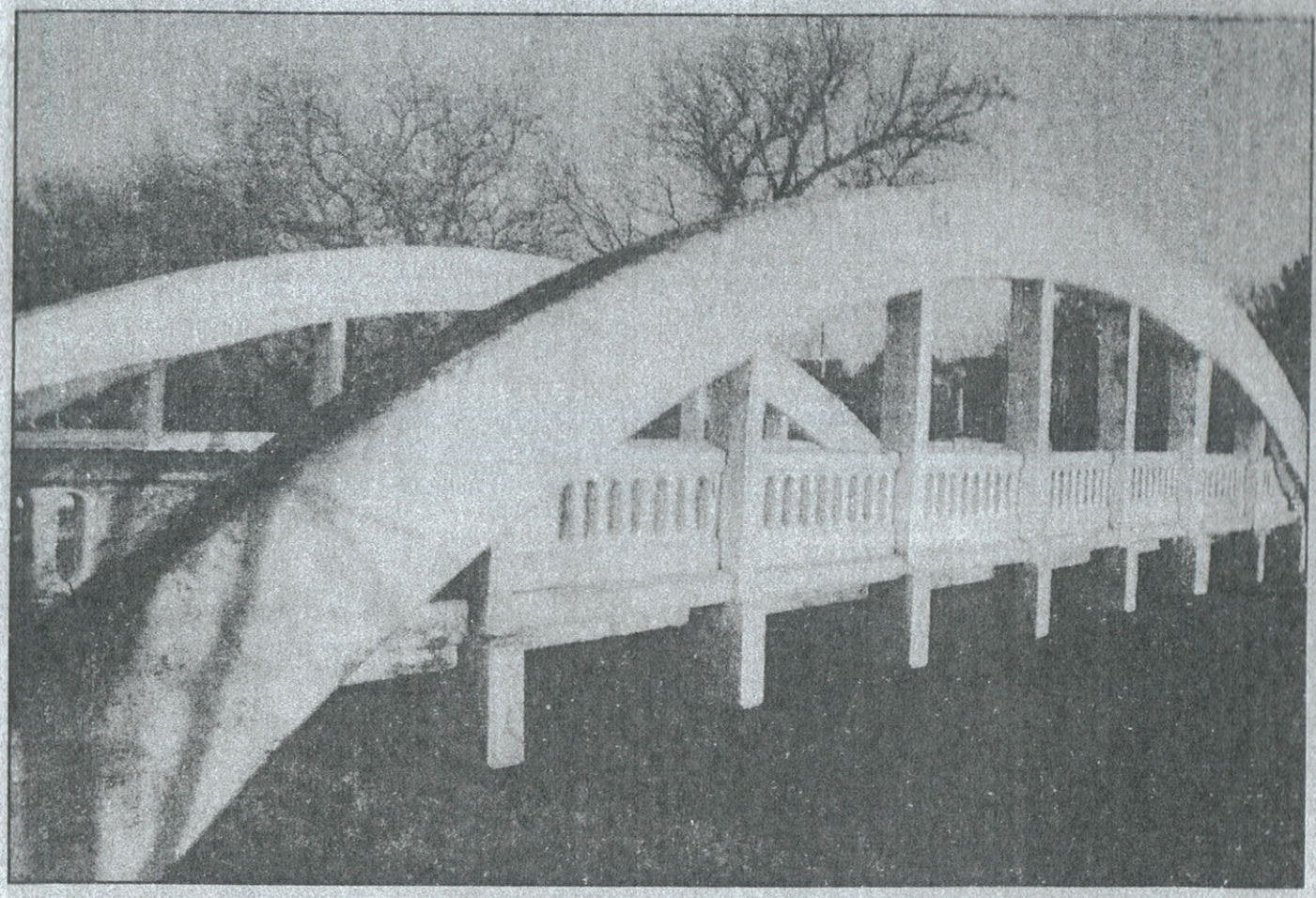
Joan La Rue

Joan H. LaRue

CBM — fyi

GILMAN. B1.

50¢ www.chippewa.com WEDNESDAY, NOVEMBER 17, 2010



MARK GUNDERMAN / The Herald

The Chippewa Falls City Council plans another informational meeting early next year on the future of the Marsh Rainbow Bridge.

Rainbow heading one way?

Cheapest way to upgrade bridge is to make it one way

BY ROD STETZER
rod.stetzer@lee.net

Determining if the historic Marsh Rainbow Bridge should be limited to one-way traffic is still a two-way street for the city of Chippewa Falls.

The city plans on another informational meeting early next year and yet another later to hear what the public wants done with the historic bridge, built in 1916.

"We're still considering all of the alternatives," City Engineer Rick Rubenzer said at Tuesday's City Council meeting. He added it's not likely any action the city decides to take will happen before 2012.

While an icon in Chippewa Falls, the 20-foot wide bridge is not wide enough to meet modern state standards for two-way traffic. To do that, the bridge needs to be 34-feet wide.

As such, it's classified as "functionally obsolete," making it eligible for federal funding.

"The bridge is in fair condition. The main structural problems are that the bearings are severely rusted, and the ends of the beams are starting to corrode," a study conducted for the city by consultant Ayres Associates of Eau Claire said.

The bridge is historically significant, the Ayres study says.

"The Iowa Bridge Company of Des Moines (Iowa) built the existing bridge in 1916. James B. Marsh designed the existing bridge, and his design was patented in 1912.

The Spring Street (Rainbow Arch) bridge is Wisconsin's only remaining example of this type of bridge," the study said.

The bridge was placed on the National Register of Historic Places on June 25, 1982. It is featured on the Chippewa Falls Main Street logo of the city.

The 111-foot long bridge on Spring Street crosses Duncan Creek, and intersects with Rushman Drive (Highway 124).

Ayres looked at 10 options. Its preferred one would make the bridge open to only westbound traffic.

See RAINBOW, Page A2

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Chippewa Falls
Administration

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Chippewa Falls
Administration

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as the regulator
's sewer service
at the PSC office,
y Way, Madison.

v.chippewa.com
Vol. 141
No. 271

Falls, WI 54729
y-Friday

EWSROOM
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ewa.com 738-1606
Candice White
a.com 738-1610
David Bossick
ewa.com 738-1640
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$106.00
$193.50

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Chippewa Falls, WI
Chippewa Herald.

Now the details: William, Kate plan royal wedding

LONDON — Now it's all about the details: The dress, the date, the venue — and who's going to pay.

Prince William and Kate Middleton were sitting down with advisers Wednesday to begin planning the royal wedding that some Britons have waited years to see — as the media settled in for months of juicy speculation.

The second in line to the throne and his long-term girlfriend will marry next spring or summer, but they haven't announced a date — some say May is likely, others August — or a venue.

that the wedding would be held in London. It was too early to estimate its cost or how much the taxpayer will have to stump up — a touchy issue at a time of widespread budget cuts and austerity measures across Britain.

"I don't think it's going to be as big, because of constraints, financial constraints, around the country now. I don't think

cian Jim Babjak (The Smithereens) is 53. Actress Mary Elizabeth Mastrantonio is 52. Actor William Moses is 51. Entertainer RuPaul is 50. Actor Dylan Walsh is 47. U.S. Ambassador to the United Nations Susan Rice is 46. Actress Sophie Marceau is 44. Actress-model Daisy Fuentes is 44. Rhythm-and-blues singer Ronnie DeVoe (New Edition; Bell Biv DeVoe) is 43. Rock musician Ben Wilson (Blues Traveler) is 43.

RAINBOW

From Page A1

Fixing up the bridge and putting a stain on its exterior would cost $220,000, the study said.

That would extend the life of the bridge for 20 years.

"After 20 years, however, the bridge will need to be replaced," the study said. Rubenzer said substantial repairs would be needed to keep the bridge operational after that.

Closing the bridge to all vehicle traffic would make it usable for 30 years, the study said.

Other alternatives looked at range in cost from zero (that's doing nothing) to $1.85 million, the cost of replacing it with a modern structure.

"In 1996, the bridge deck was overlaid, concrete surface repairs were made, the railing was repaired and the concrete arch was stained white," the report said.

An informational meeting on the bridge was held in October 2009, Rubenzer said.

The city paid $74,258 for the Ayres study.

There is a lot of emotional attachment to the Rainbow Bridge, Mayor Greg Hoffman said.

In action taken by the council on Tuesday:

- Extending a contract for two years for the the Chippewa Falls Chamber of Commerce to receive the bulk of the city room tax funds was approved on a 4-2 vote.

Voting in favor were council members Bill Hicks, Mike Dahlby, Chuck Hull and George Adrian. Voting against were CW King and Jane Lardahl.

The chamber will receive 92 percent of the room tax while the city will get 8 percent for the next two years.

"I think it should be one year," King said.

Lardahl objected to the agreement because the city would not be allowed to have a non-voting member on the chamber's board of directors to monitor to how the chamber was spending the city's money.

"Our presence there, I can't see is any kind of deterrent," she said.

- Mayor Greg Hoffman declared Thursday to be Arbor Day.

"I don't know if November is a very good time to plant trees," he said, adding he encourages city residents to plant trees in the spring.

OPINION

EDITORIAL 11/20/10 Chippewa Herald

Bridge already heading one way: downhill

The idea of Chippewa Falls' historic Rainbow Bridge heading one way was presented to the Chippewa Falls Common Council and the public this past week, as deliberation continues on the future of the structure.

What is most disturbing about information presented so far is not the idea of a single direction of travel across the bridge, but the inescapable fact that the one direction the bridge is clearly heading now is downhill.

In other words, its days are numbered. It's not a matter of whether the bridge can remain as a permanent part of the character of downtown Chippewa Falls, but how much longer the community can enjoy it and how much it will cost to squeeze some more years out of it.

Unfortunately, it's time to put a dollar value on nostalgia and historical significance, and that's not an easy or popular thing to do.

Now, there's a lot to love about the bridge. Its beautifully simple arch design is architecturally significant. The Rainbow Bridge is indeed a beautiful bridge to look at. It's the only bridge of its kind remaining in the state, and is on the National Register of Historic Places. It is fitting that it is represented on the Chippewa Falls Main Street logo.

But the bridge is 94 years old, and although it is said to be in fair shape, it is showing its age. At only 20 feet wide, it is obsolete by modern traffic standards.

From a transportation standpoint, the city doesn't really need the bridge. One block over is the Central Street bridge, with the Grand Avenue bridge one block further, and the Columbia Street crossing after that. Not having a crossing at all at Spring Street creates a fairly meaningless one-block detour.

So any effort or expenditure to save the Rainbow Bridge would be undertaken more for an esthetic or historical interest reason than a transportation one.

What the consulting engineering company Ayres Associates outlined do not on the surface look like good options.

Replacing it with a $1.85 million structure is absurd, as that throws out the esthetics and historical interest in favor of an unneeded modern bridge.

Ayres engineers said fixing up the bridge, giving it a paint job and making it one-way only would cost $220,000 and extend the life of the bridge 20 years. But is that price worth it if the real value is esthetics and historical significance?

Closing the bridge and just making it a walking or biking structure would allow the city to keep it around another 30 years or so. But even that would no doubt have some cost, since it would still need a paint job every now and then.

The city already has $74,000 into the Rainbow Bridge for Ayres' consulting fee. It will be difficult to justify a great deal more expenditures since there is little need for it from a transportation standpoint.

The city must treat the Rainbow Bridge as a project with historical and esthetic significance, and budget and prioritize accordingly.

Appendix F

Traffic Analysis

TECHNICAL MEMORANDUM

AYRES ASSOCIATES

To: File

From: Leah Ness, P.E.

Date: March 8, 2010 Project No.: 42-0740.00

Re: Traffic Analysis for Spring Street Structure Over Duncan Creek

Project Background

The Ayres Associates Traffic Group has been asked to review traffic issues related to the following four alternatives associated to the rehabilitation project of the existing structure on Spring Street over Duncan Creek, located in the City of Chippewa Falls, Wisconsin:

- Alternative 1 – Do Nothing
- Alternative 2 – One-Way Traffic on Structure
- Alternative 3 – Close Structure to Vehicles
- Alternative 4 – Structure Improvements to Maintain Two-Way Traffic

Ayres Associates, with the help of the City of Chippewa Falls, collected manual traffic turning movement counts for the AM and PM peak hours at three intersections:

- STH 124 (Rushman Drive)/Spring Street
- STH 178 (Grand Avenue)/High Street
- Spring Street/High Street

Based on the traffic data collected, twenty year traffic projections were prepared by the Wisconsin Department of Transportation Traffic Forecasting Section. The traffic projections were then used by Ayres Associates to analyze the AM and PM peak hour traffic for the existing condition (Alternative 1 – Do Nothing) and traffic forecast volumes were distributed to complete analysis for the remaining three Alternatives as shown in Attachment A.

The remainder of this technical memorandum provides intersection operation information for each of the four Alternatives. Level of Service (LOS) and the 95th percentile queue length are two measures of effectiveness (MOE's) used in the intersection analysis. The LOS in this report will reference the alphabetical ranking system of 'A' through 'F' and is graded according to the amount of delay per vehicle. The design LOS objective for this project is for all movements on to operate at LOS 'C' or better during the AM and PM peak travel hours. The 95th percentile queue length accounts for fluctuation in vehicle arrival patterns and represents the maximum distance that vehicles backup during a traffic signal cycle. The following is a description of the HCM LOS definitions:

Table 1 - Level of Service (LOS) Descriptions

ALPHA LOS	NUMERIC LOS	SIGNALIZED DELAY (seconds/vehicle)	UNSIGNALIZED DELAY (seconds/vehicle)	DESCRIPTION
A	1.01 to 2.00	< 10	< 10	No Congestion, Minimal Delay
B	2.01 to 3.00	> 10 to 20	> 10 to 15	No Congestion
C	3.01 to 4.00	> 20 to 35	> 15 to 25	Minimal Congestion
D	4.01 to 5.00	> 35 to 55	> 25 to 35	Moderate Congestion
E	5.01 to 6.00	> 55 to 80	> 35 to 50	Severe Congestion
F	> 6.00	> 80	> 50	Extreme Congestion

Alternative 1 – Do Nothing

Alternative 1 – Do Nothing, maintains the existing intersection geometries surrounding the Spring Street structure over Duncan Creek.

The STH 124 (BUS 29)/Spring Street intersection operates using stop sign control on the Spring Street approaches. The STH 178 (Grand Avenue)/High Street intersection operates using stop sign control on the northbound High Street approach. The existing geometry and control is located in Attachment B.

During the AM and PM peak periods, the 20 year traffic forecast volumes are expected to operate at LOS B or better at the STH 124 (Rushman Drive)/Spring Street and STH 178 (Grand Avenue)/High Street intersections, as shown in the table below:

Table 2: 2029 HCS2000 Delay, Level of Service and Queue Results for Alternative 1

	Northbound		Westbound	Eastbound
	STH 124(BUS 29)		Spring Street	
STH 124(BUS 29) / Spring St	LT	TR	TR	LT
Delay (seconds)	7.3 (7.2)	0 (0)	12.8 (12.4)	12.4 (12.3)
Level of Service	A (A)	A (A)	B (B)	B (B)
95th % Queue Length (feet)	25 (0)	0 (0)	25 (25)	25 (25)
	Northbound		Westbound	Eastbound
	High Street		STH 178 (Grand Avenue)	
STH 178 (Grand Ave) / High St	LR		LTR	LTR
Delay (seconds)	0 (12.8)		7.6 (7.9)	0 (0)
Level of Service	A (B)		A (A)	A (A)
Queue Length (feet)	0 (25)		25 (25)	0 (0)

2029 AM Peak Period (2029 PM Peak Period)

The detailed analysis output sheets are located in Attachment C.

Alternative 2 – One-Way Traffic on Structure
Based on the existing traffic volumes and flow, the Alternative 2 – One-Way Traffic on Structure limits traffic on Spring Street to traveling westbound. The existing eastbound traffic has been redirected from Spring Street to High Street, STH 178 (Grand Avenue) and STH 124 (Rushman Drive).

The STH 124 (BUS 29)/Spring Street intersection operates using stop sign control on the eastbound Spring Street approach. The STH 178 (Grand Avenue)/High Street intersection operates using stop sign control on the northbound High Street approach. The geometry and control related to Alternative 2 is located in Attachment D.

During the AM and PM peak periods, the 20 year traffic forecast volumes are expected to operate at LOS B or better at the STH 124 (Rushman Drive)/Spring Street and STH 178 (Grand Avenue)/High Street intersections, as shown in the table below:

Table 3: HCS2000 Delay, Level of Service and Queue Results for Alternative 2

	Northbound		Westbound	Eastbound
	STH 124(BUS 29)		Spring Street	
STH 124(BUS 29) / Spring St	LT	TR	TR	LT
Delay (seconds)	7.3 (7.2)	0 (0)	12.3 (12.4)	11.1 (11.2)
Level of Service	A (A)	A (A)	B (B)	B (B)
95th % Queue Length (feet)	25 (0)	0 (0)	25 (25)	25 (25)
	Northbound		Westbound	Eastbound
	High Street		STH 178 (Grand Avenue)	
STH 178 (Grand Ave) / High St	LR		LTR	LTR
Delay (seconds)	0 (13.0)		7.7 (8.0)	0 (0)
Level of Service	A (B)		A (A)	A (A)
Queue Length (feet)	0 (25)		25 (25)	0 (0)

2029 AM Peak Period (2029 PM Peak Period)

The detailed analysis output sheets are located in Attachment E.

Alternative 3 –Close Structure to Vehicles
Alternative 3 – Close Structure to Vehicles eliminates the northbound right turn from STH 124 (Rushman Drive), the eastbound through and westbound movements on Spring Street. By allowing only pedestrian and bicycle traffic on the Structure, vehicular traffic is redirected onto High Street, STH 178 (Grand Avenue) and STH 124 (Rushman Drive).

The STH 124 (BUS 29)/Spring Street intersection operates using stop sign control on the eastbound Spring Street approach. The STH 178 (Grand Avenue)/High Street intersection operates using stop sign control on the northbound High Street approach, and the Spring Street/High Street intersection operates with stop sign control on High Street. The geometry and control related to Alternative 3 is located in Attachment F.

During the AM and PM peak periods, the 20 year traffic forecast volumes are expected to operate at LOS B or better at the STH 124 (Rushman Drive)/Spring Street, the STH 178 (Grand Avenue)/High Street, and the Spring Street/High Street intersections, as shown in the following table:

Table 4: HCS2000 Delay, Level of Service and Queue Results for Alternative 3

	Northbound		Eastbound	
	STH 124(BUS 29)		Spring Street	
STH 124(BUS 29) / Spring St	LT		L	
Delay (seconds)	7.3 (7.2)		10.3 (10.2)	
Level of Service	A (A)		B (B)	
95th % Queue Length (feet)	25 (0)		25 (25)	
	Northbound		Westbound	Eastbound
	High Street		STH 178 (Grand Avenue)	
STH 178 (Grand Ave) / High St	LR		LT	TR
Delay (seconds)	11.2 (14.3)		7.7 (8.0)	0 (0)
Level of Service	B (B)		A (A)	A (A)
Queue Length (feet)	25 (25)		25 (25)	0 (0)
	Northbound	Southbound	Westbound	Eastbound
	High Street		Spring Street	
Spring Street/High Street	LTR	LTR	LTR	LTR
Delay (seconds)	0 (9.4)	9.0 (8.7)	7.3 (7.2)	7.3 (7.3)
Level of Service	A (A)	A (A)	A (A)	A (A)
Queue Length (feet)	0 (25)	25 (25)	0 (0)	0 (25)

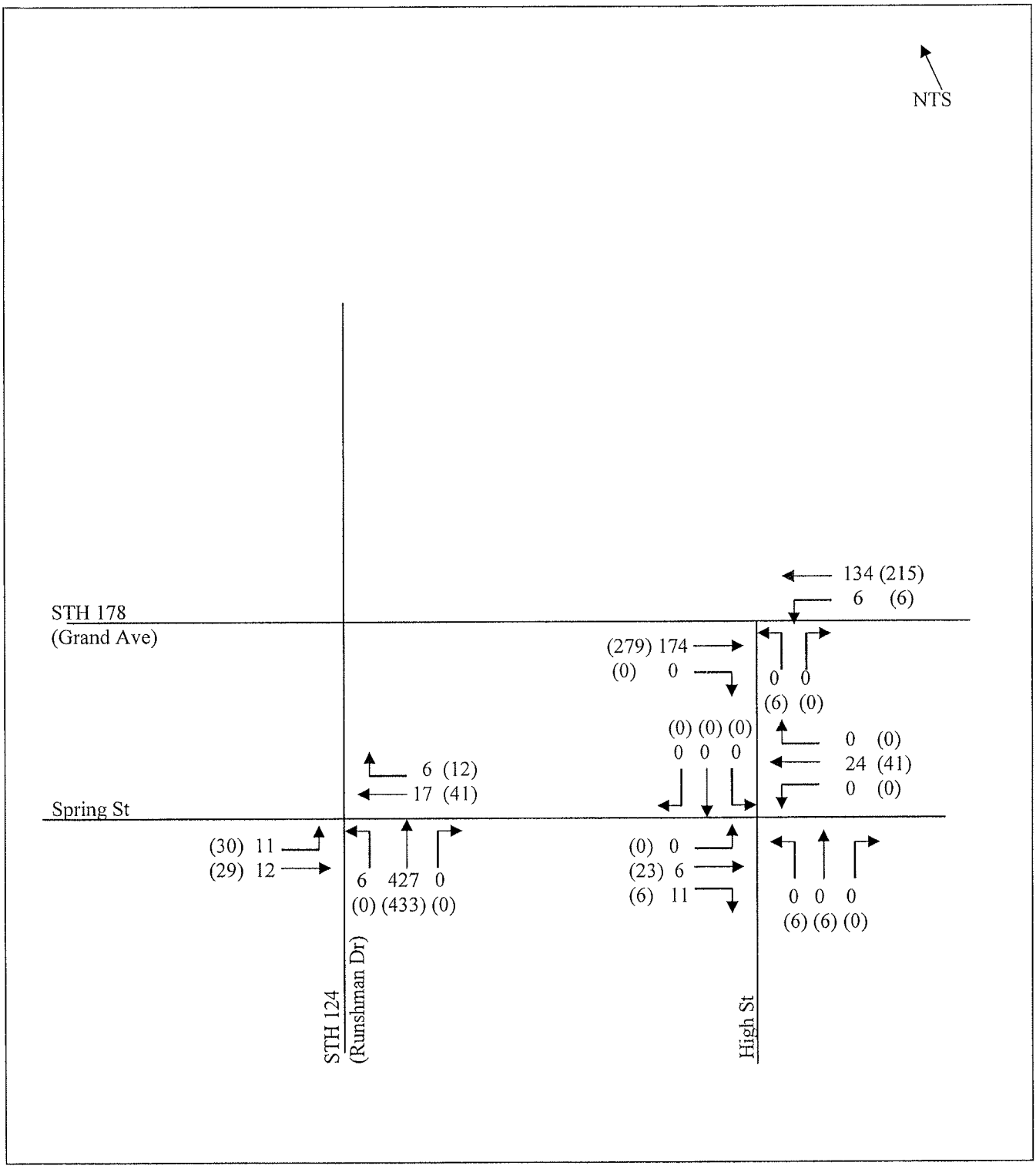
2029 AM Peak Period (2029 PM Peak Period)

The detailed analysis output sheets are located in Attachment G.

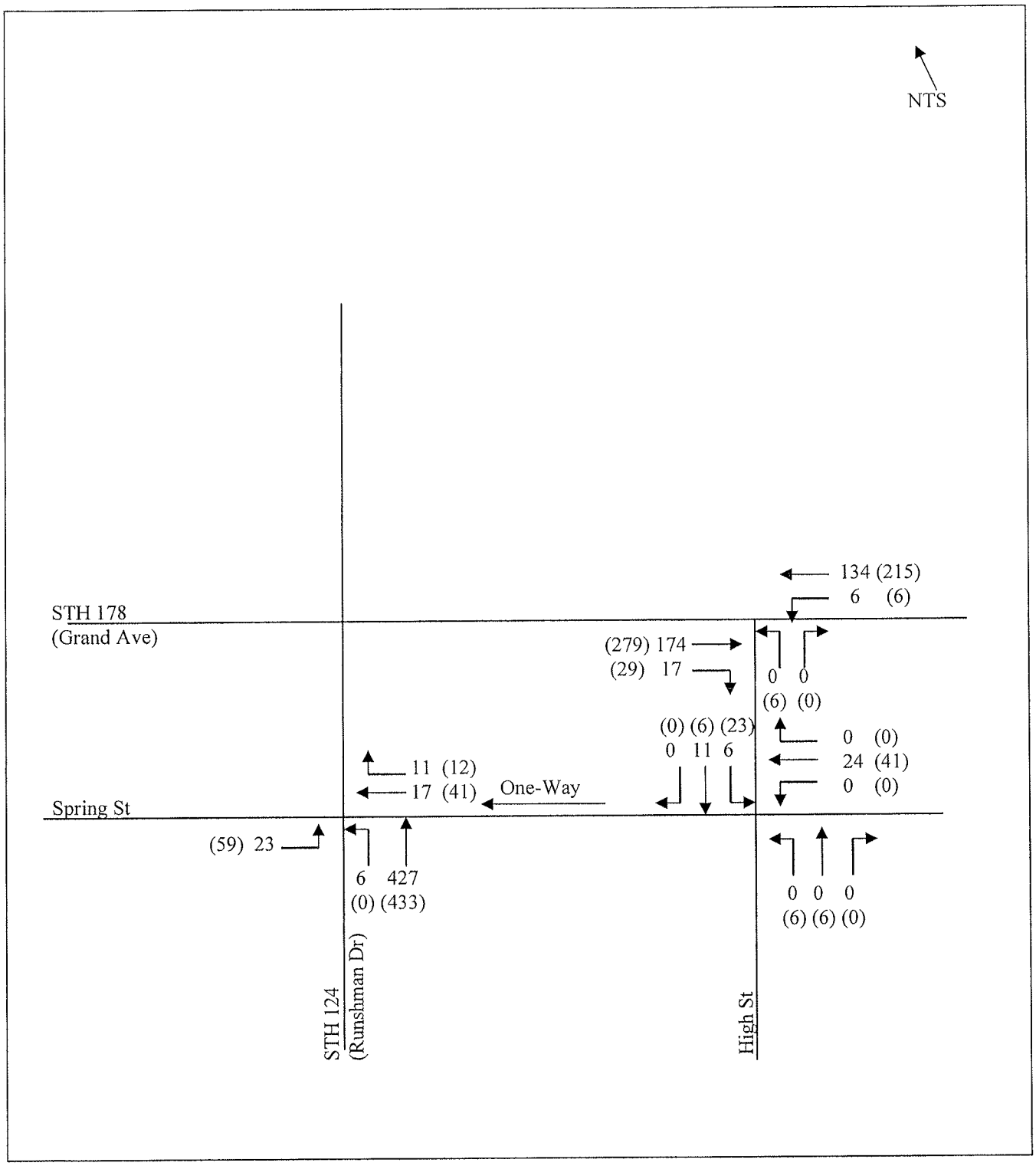
Alternative 4 –Structure Improvements to Maintain Two-Way Traffic
Traffic for the Alternative 4 – Structure Improvements to Maintain Two-Way Traffic is similar to traffic modeled in Alternative 1 – Do Nothing for the 20 year forecast. When looking at the detour route needed to complete the construction work on the structure, the traffic would be routed similar to Alternative 3 – Close Structure to Vehicles. The analysis in both Alternative 1 and Alternative 3 show expected operations at LOS B or better for all movements at the related intersections.

Conclusion
Each of the four Alternatives is expected to operate at a Levels of Service B or better during the peak periods of 2029.

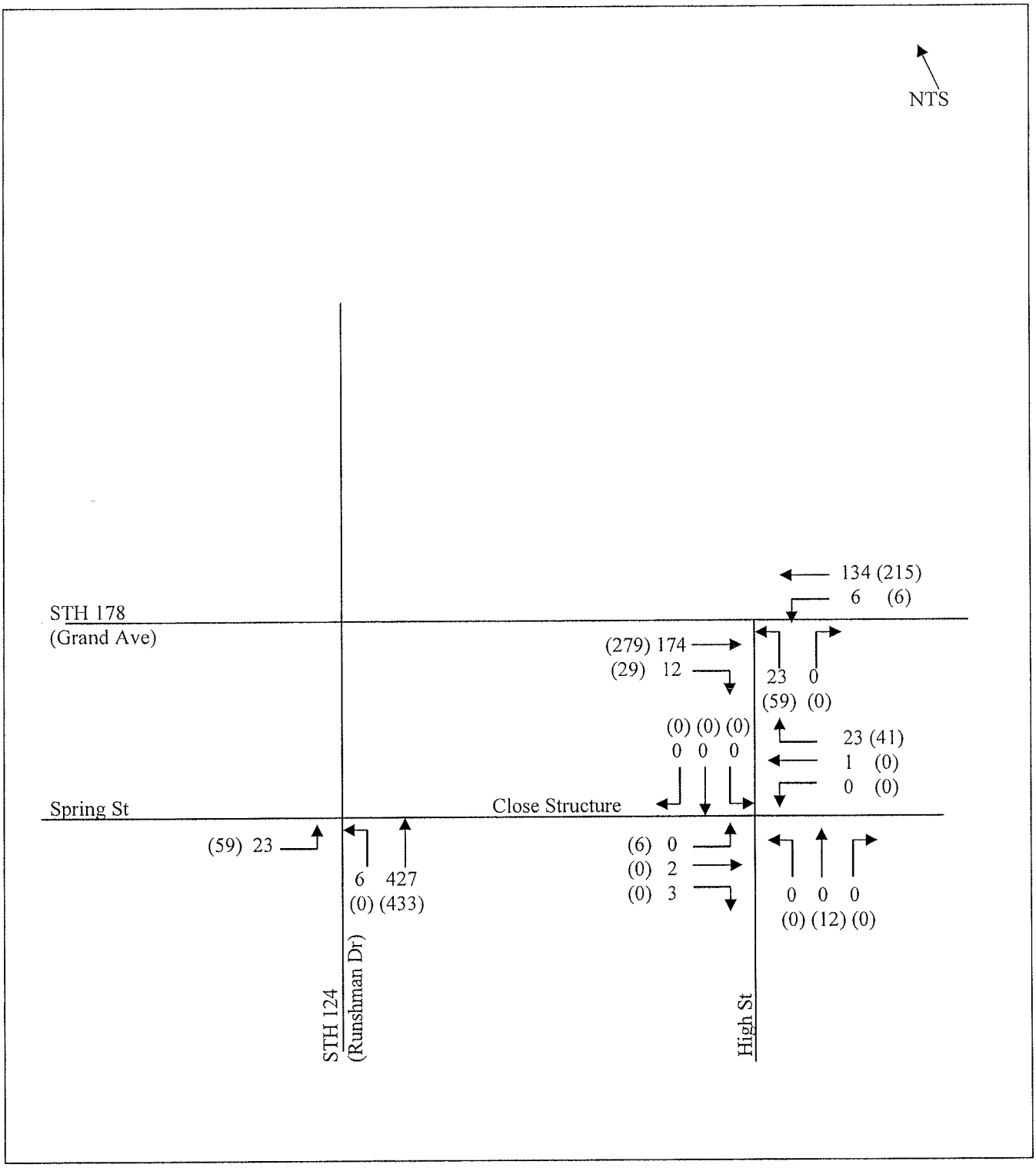
ATTACHMENT A
TRAFFIC VOLUMES



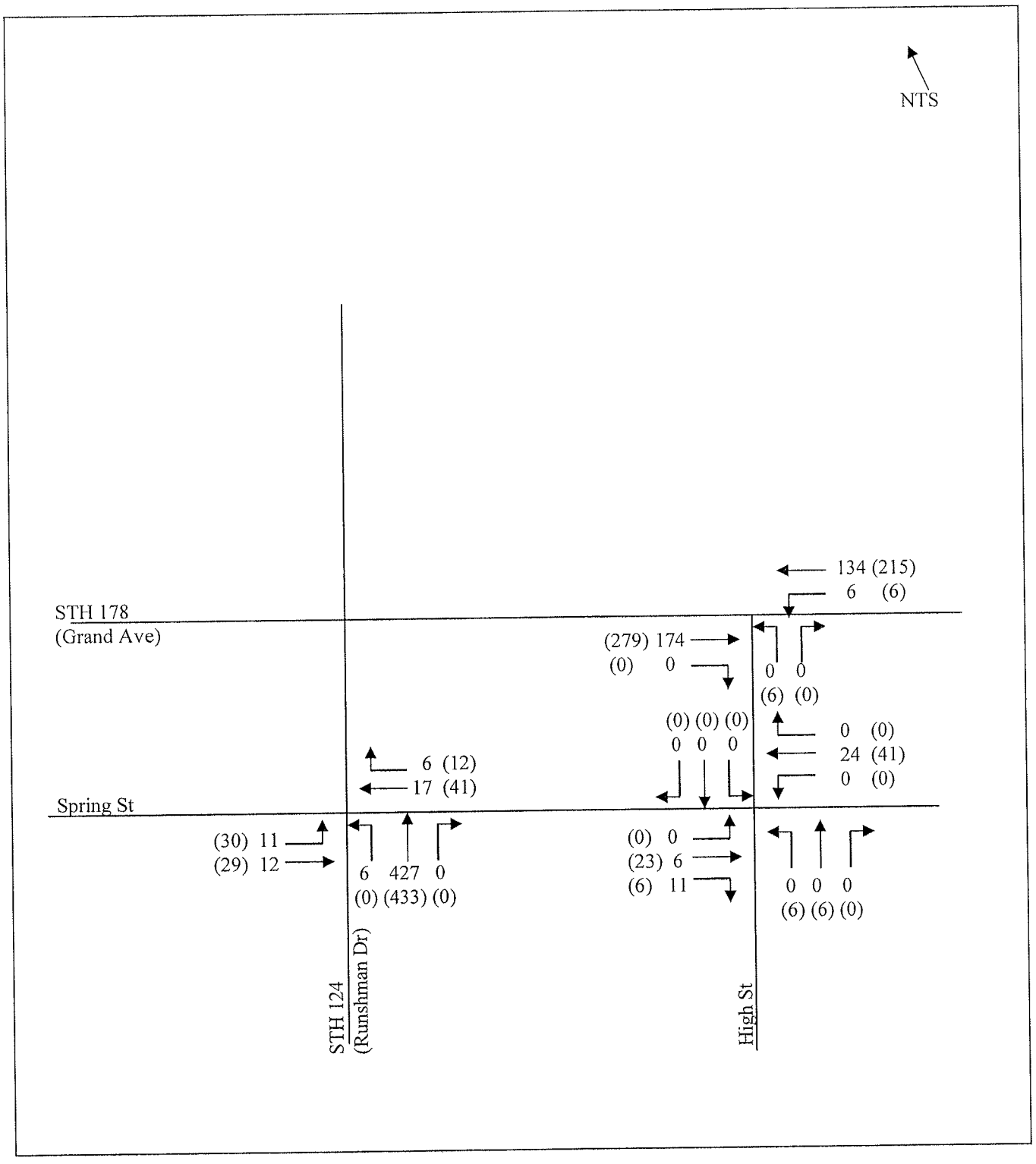
Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure A-1 Alternative 1 – Do Nothing 2029 Traffic Volumes	AYRES ASSOCIATES



Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure A-2 Alternative 2 – One-Way Traffic on Structure 2029 Traffic Volumes	AYRES ASSOCIATES

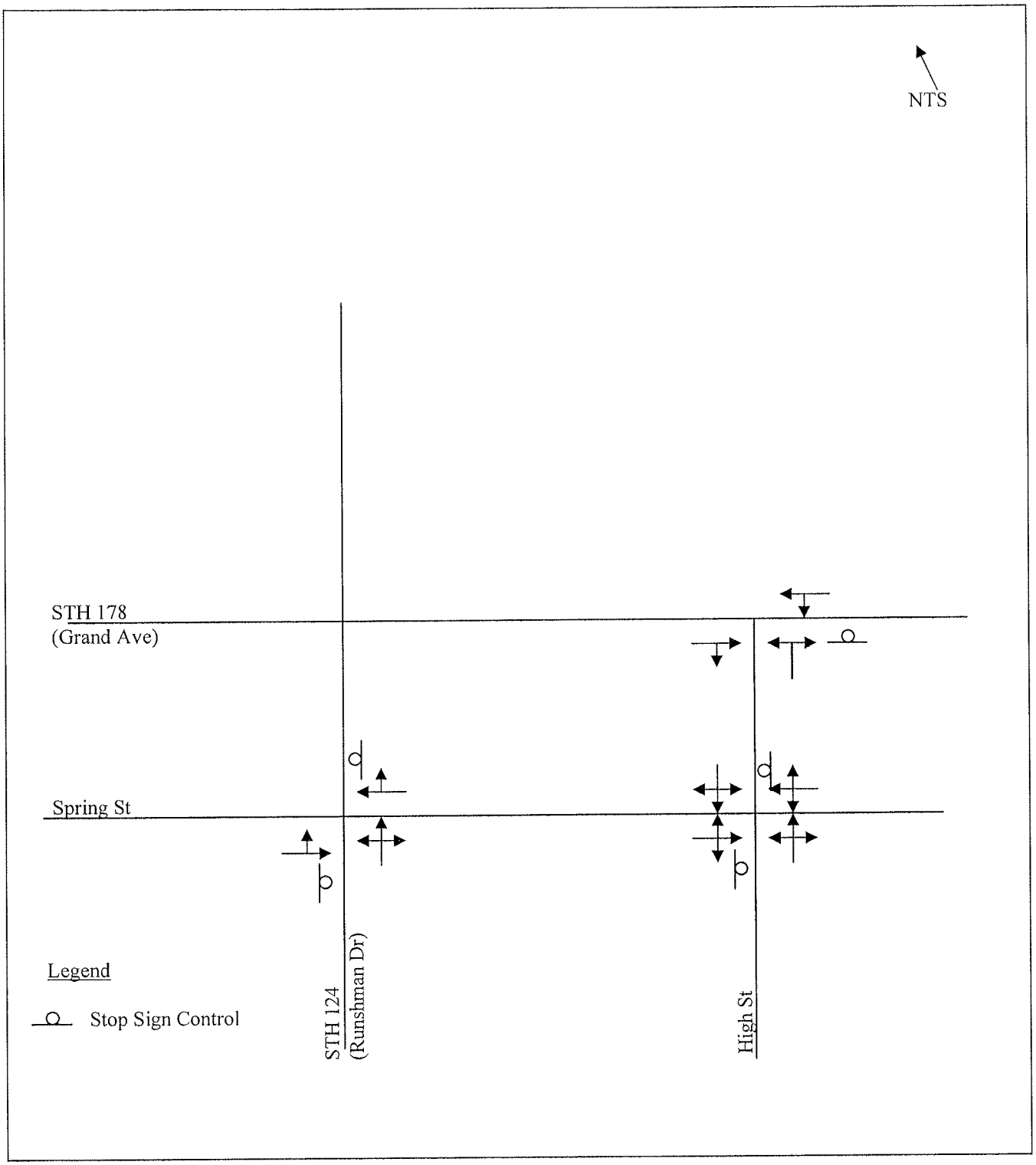


Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure A-3 Alternative 3 – Close Structure to Vehicles 2029 Traffic Volumes	AYRES ASSOCIATES



Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure A-4 Alternative 4 – Structure Improvements to Maintain Two-Way Traffic 2029 Traffic Volumes	AYRES ASSOCIATES

ATTACHMENT B
ALTERNATIVE 1 - DO NOTHING
GEOMETRY AND CONTROL



Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure B-1 Alternative 1 – Do Nothing Geometry and Control	AYRES ASSOCIATES

ATTACHMENT C
ALTERNATIVE 1 - DO NOTHING
HCS OUTPUT

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79*

East/West Street: *STH 178 (Grand Avenue)* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*174*	*0*	*6*	*134*	
Peak-Hour Factor, PHF	*0.80*	*0.82*	*0.82*	*0.82*	*0.82*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*212*	*0*	*7*	*163*	*0*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*0*				
C (m) (veh/h)		*1370*						
v/c		*0.01*						
95% queue length		*0.02*						
Control Delay (s/veh)		*7.6*						
LOS		*A*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 124 (BUS 29)/Spring Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79*

East/West Street: *Spring Street* | North/South Street: *STH 124 (BUS 29)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*6*	*427*	*0*			
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*7*	*533*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*5*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*0*	*0*
Configuration	*LT*		*TR*			
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*11*	*12*			*17*	*6*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*1.00*	*1.00*	*0.80*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*13*	*14*	*0*	*0*	*21*	*7*
Percent Heavy Vehicles	*4*	*5*	*0*	*0*	*5*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*				*TR*	*LT*		
v (veh/h)	*7*				*28*	*27*		
C (m) (veh/h)	*1604*				*491*	*512*		
v/c	*0.00*				*0.06*	*0.05*		
95% queue length	*0.01*				*0.18*	*0.17*		
Control Delay (s/veh)	*7.3*				*12.8*	*12.4*		
LOS	*A*				*B*	*B*		
Approach Delay (s/veh)	--	--	*12.8*			*12.4*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79*

East/West Street: *STH 178 (Grand Avenue)* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*279*	*0*	*6*	*215*	
Peak-Hour Factor, PHF	*0.80*	*0.85*	*0.85*	*0.85*	*0.85*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*328*	*0*	*7*	*252*	*0*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*6*	*0*	*0*			
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*7*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*7*				
C (m) (veh/h)		*1243*		*466*				
v/c		*0.01*		*0.02*				
95% queue length		*0.02*		*0.05*				
Control Delay (s/veh)		*7.9*		*12.8*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*12.8*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	Leah Ness
Agency/Co.	Ayres Associates Inc.
Date Performed	3/1/2010
Analysis Time Period	2029 PM Peak Period

Site Information

Intersection	STH 124 (BUS 29)/Spring Street
Jurisdiction	City of Chippewa Falls
Analysis Year	2029

Project Description 8996-00-79

East/West Street: Spring Street | North/South Street: STH 124 (BUS 29)

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	433	0			
Peak-Hour Factor, PHF	0.92	0.92	0.92	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	470	0	0	0	0
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	0	0
Configuration	LT		TR			
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	30	29			41	12
Peak-Hour Factor, PHF	0.92	0.92	1.00	1.00	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	32	31	0	0	44	13
Percent Heavy Vehicles	1	1	0	0	1	1
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT				TR	LT		
v (veh/h)	0				57	63		
C (m) (veh/h)	1630				541	558		
v/c	0.00				0.11	0.11		
95% queue length	0.00				0.35	0.38		
Control Delay (s/veh)	7.2				12.4	12.3		
LOS	A				B	B		
Approach Delay (s/veh)	--	--	12.4			12.3		
Approach LOS	--	--	B			B		

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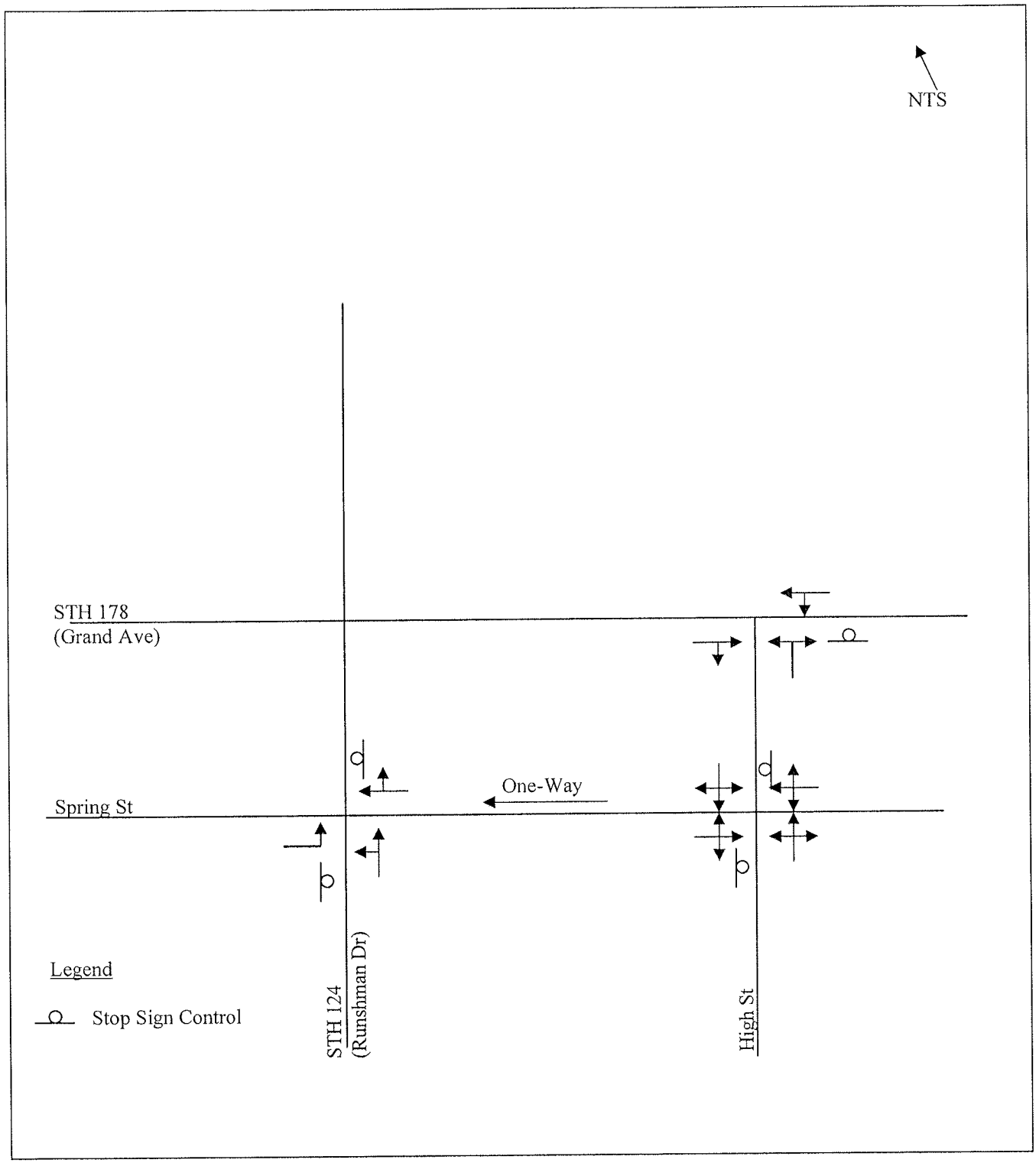
ATTACHMENT D
ALTERNATIVE 2 – ONE-WAY TRAFFIC ON STRUCTURE
GEOMETRY AND CONTROL



Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure D-1 Alternative 2 – One-Way Traffic on Structure Geometry and Control	AYRES ASSOCIATES

ATTACHMENT E
ALTERNATIVE 2 - ONE-WAY TRAFFIC ON STRUCTURE
HCS OUTPUT

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 2 One-Way Traffic on Structure*

East/West Street: *STH 178 (Grand Avenue)* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*174*	*17*	*6*	*134*	
Peak-Hour Factor, PHF	*0.80*	*0.82*	*0.82*	*0.82*	*0.82*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*212*	*20*	*7*	*163*	*0*
Percent Heavy Vehicles	*4*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*0*				
C (m) (veh/h)		*1324*						
v/c		*0.01*						
95% queue length		*0.02*						
Control Delay (s/veh)		*7.7*						
LOS		*A*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 124 (BUS 29)/Spring Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 2 One-Way Traffic on Structure*

East/West Street: *Spring Street* | North/South Street: *STH 124 (BUS 29)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*6*	*427*				
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*7*	*533*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*5*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*0*	*0*
Configuration	*LT*	*T*				
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*23*				*17*	*11*
Peak-Hour Factor, PHF	*0.80*	*0.80*	*1.00*	*1.00*	*0.80*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*28*	*0*	*0*	*0*	*21*	*13*
Percent Heavy Vehicles	*4*	*5*	*0*	*0*	*5*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*0*	*0*	*1*	*0*
Configuration	*L*					*TR*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*				*TR*	*L*		
v (veh/h)	*7*				*34*	*28*		
C (m) (veh/h)	*1604*				*524*	*621*		
v/c	*0.00*				*0.06*	*0.05*		
95% queue length	*0.01*				*0.21*	*0.14*		
Control Delay (s/veh)	*7.3*				*12.3*	*11.1*		
LOS	*A*				*B*	*B*		
Approach Delay (s/veh)	--	--	*12.3*			*11.1*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 Alternative 2 One-Way Traffic on Structure*

East/West Street: *STH 178 (Grand Avenue)* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*279*	*29*	*6*	*215*	
Peak-Hour Factor, PHF	*0.80*	*0.85*	*0.85*	*0.85*	*0.85*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*328*	*34*	*7*	*252*	*0*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*6*	*0*	*0*			
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*7*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*7*				
C (m) (veh/h)		*1208*		*456*				
v/c		*0.01*		*0.02*				
95% queue length		*0.02*		*0.05*				
Control Delay (s/veh)		*8.0*		*13.0*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*13.0*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*STH 124 (BUS 29)/Spring Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 2 One-Way Traffic on Structure*

East/West Street: *Spring Street* | North/South Street: *STH 124 (BUS 29)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*433*				
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*470*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*0*	*0*
Configuration	*LT*	*T*				
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*59*				*41*	*12*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*1.00*	*1.00*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*64*	*0*	*0*	*0*	*44*	*13*
Percent Heavy Vehicles	*1*	*1*	*0*	*0*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*0*	*0*	*1*	*0*
Configuration	*L*					*TR*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*				*TR*	*L*		
v (veh/h)	*0*				*57*	*64*		
C (m) (veh/h)	*1630*				*541*	*640*		
v/c	*0.00*				*0.11*	*0.10*		
95% queue length	*0.00*				*0.35*	*0.33*		
Control Delay (s/veh)	*7.2*				*12.4*	*11.2*		
LOS	*A*				*B*	*B*		
Approach Delay (s/veh)	--	--	*12.4*			*11.2*		
Approach LOS	--	--	*B*			*B*		

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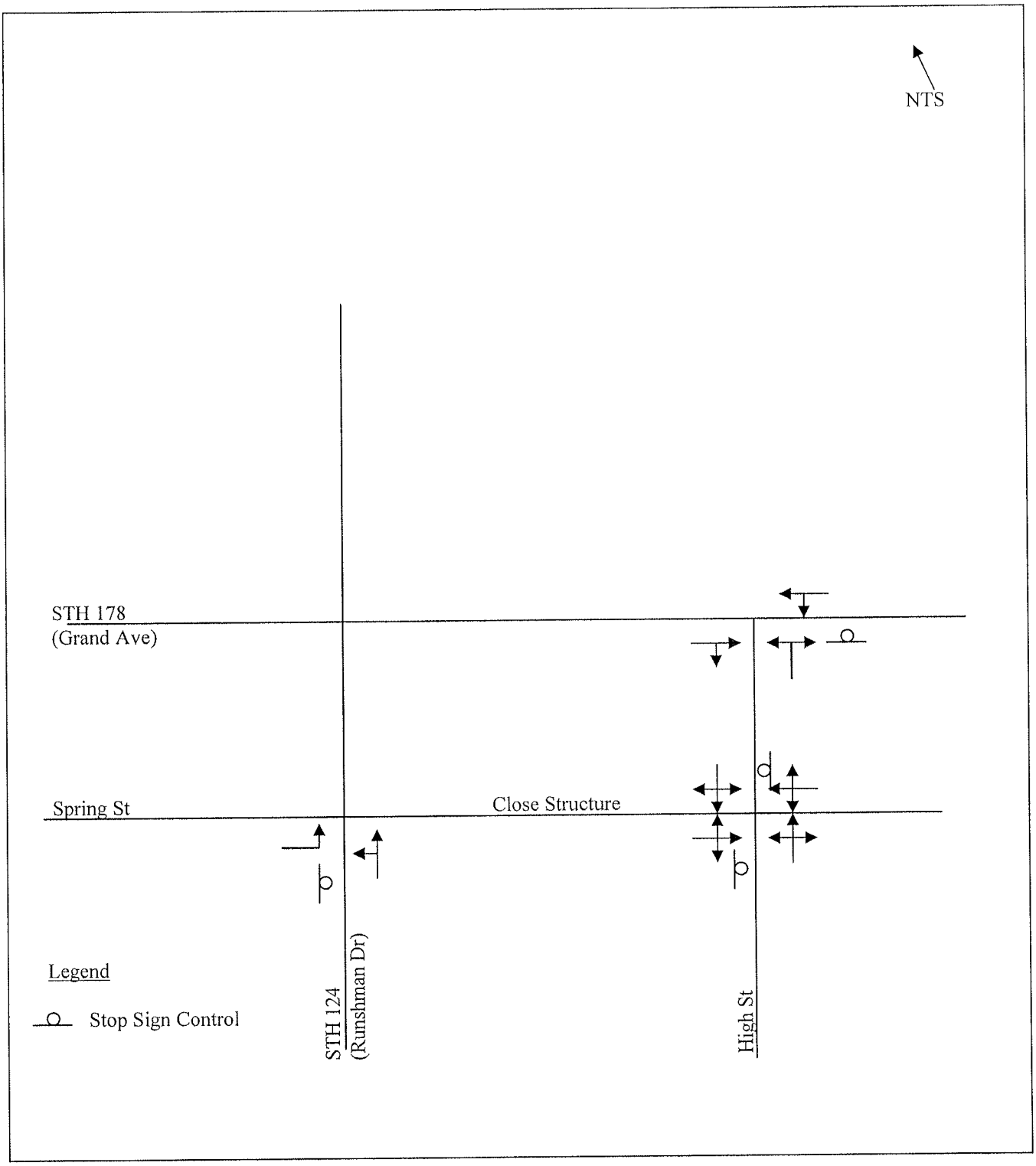
ATTACHMENT F
ALTERNATIVE 3 – CLOSE STRUCTURE TO VEHICLES
GEOMETRY AND CONTROL



Spring Street Structure Over Duncan Creek City of Chippewa Falls, WI Project ID 8996-00-79 March 2010	Figure F-1 Alternative 3 – Close Structure to Vehicles Geometry and Control	AYRES ASSOCIATES

ATTACHMENT G
ALTERNATIVE 3 - CLOSE STRUCTURE TO VEHICLES
HCS OUTPUT

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 3 Close Structure to Traffic*

East/West Street: *STH 178 (Grand Avenue)* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*174*	*12*	*6*	*134*	
Peak-Hour Factor, PHF	*0.80*	*0.82*	*0.82*	*0.82*	*0.82*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*212*	*14*	*7*	*163*	*0*
Percent Heavy Vehicles	*4*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*23*	*0*	*0*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*28*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*28*				
C (m) (veh/h)		*1331*		*604*				
v/c		*0.01*		*0.05*				
95% queue length		*0.02*		*0.15*				
Control Delay (s/veh)		*7.7*		*11.2*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*11.2*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*STH 124 (BUS 29)/Spring Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 3 Close Structure to Traffic*

East/West Street: *Spring Street* | North/South Street: *STH 124 (BUS 29)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*6*	*427*				
Peak-Hour Factor, PHF	*0.80*	*0.80*	*0.80*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*7*	*533*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*5*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*0*	*0*
Configuration	*LT*	*T*				
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*23*					
Peak-Hour Factor, PHF	*0.80*	*0.80*	*1.00*	*1.00*	*0.80*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*28*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*5*	*0*	*0*	*5*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*0*	*0*	*0*	*0*
Configuration	*L*					

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*					*L*		
v (veh/h)	*7*					*28*		
C (m) (veh/h)	*1604*					*703*		
v/c	*0.00*					*0.04*		
95% queue length	*0.01*					*0.12*		
Control Delay (s/veh)	*7.3*					*10.3*		
LOS	*A*					*B*		
Approach Delay (s/veh)	--	--				*10.3*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 AM Peak Period*

Site Information

Intersection	*Spring Street/High Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alt 3 Close Structure to Traffic*

East/West Street: *Spring Street* | North/South Street: *High Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*2*	*3*	*0*	*1*	*23*
Peak-Hour Factor, PHF	*0.68*	*0.68*	*0.68*	*0.68*	*0.68*	*0.68*
Hourly Flow Rate, HFR (veh/h)	*0*	*2*	*4*	*0*	*1*	*33*
Percent Heavy Vehicles	*5*	--	--	*5*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*0*	*8*	*4*
Peak-Hour Factor, PHF	*0.68*	*0.68*	*0.68*	*0.68*	*0.68*	*0.68*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*11*	*5*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*0*		*0*			*16*	
C (m) (veh/h)	*1558*	*1595*					*925*	
v/c	*0.00*	*0.00*					*0.02*	
95% queue length	*0.00*	*0.00*					*0.05*	
Control Delay (s/veh)	*7.3*	*7.3*					*9.0*	
LOS	*A*	*A*					*A*	
Approach Delay (s/veh)	--	--					*9.0*	
Approach LOS	--	--					*A*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*STH 178 (Grand Ave)/High St*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 Alternative 3 Close Structure to Traffic*

East/West Street: *STH 178 (Grand Avenue)* North/South Street: *High Street*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*279*	*29*	*6*	*215*	
Peak-Hour Factor, PHF	*0.80*	*0.85*	*0.85*	*0.85*	*0.85*	*0.80*
Hourly Flow Rate, HFR (veh/h)	*0*	*328*	*34*	*7*	*252*	*0*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*59*	*0*	*0*			
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*69*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LTR*				
v (veh/h)		*7*		*69*				
C (m) (veh/h)		*1208*		*456*				
v/c		*0.01*		*0.15*				
95% queue length		*0.02*		*0.53*				
Control Delay (s/veh)		*8.0*		*14.3*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*14.3*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*STH 124 (BUS 29)/Spring Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alternative 3 Close Structure to Traffic*

East/West Street: *Spring Street* | North/South Street: *STH 124 (BUS 29)*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*433*				
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*470*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*0*	*0*
Configuration	*LT*	*T*				
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*59*					
Peak-Hour Factor, PHF	*0.92*	*0.92*	*1.00*	*1.00*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*64*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*1*	*1*	*0*	*0*	*1*	*1*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*0*	*0*	*0*	*0*
Configuration	*L*					

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*					*L*		
v (veh/h)	*0*					*64*		
C (m) (veh/h)	*1630*					*755*		
v/c	*0.00*					*0.08*		
95% queue length	*0.00*					*0.28*		
Control Delay (s/veh)	*7.2*					*10.2*		
LOS	*A*					*B*		
Approach Delay (s/veh)	--	--				*10.2*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Leah Ness*
Agency/Co.	*Ayres Associates Inc.*
Date Performed	*3/1/2010*
Analysis Time Period	*2029 PM Peak Period*

Site Information

Intersection	*Spring Street/High Street*
Jurisdiction	*City of Chippewa Falls*
Analysis Year	*2029*

Project Description *8996-00-79 - Alt 3 Close Structure to Traffic*

East/West Street: *Spring Street*

North/South Street: *High Street*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*6*	*0*	*0*	*0*	*1*	*23*
Peak-Hour Factor, PHF	*0.74*	*0.74*	*0.74*	*0.74*	*0.74*	*0.74*
Hourly Flow Rate, HFR (veh/h)	*8*	*0*	*0*	*0*	*1*	*31*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*12*	*0*	*0*	*6*	*23*
Peak-Hour Factor, PHF	*0.74*	*0.74*	*0.74*	*0.74*	*0.74*	*0.74*
Hourly Flow Rate, HFR (veh/h)	*0*	*16*	*0*	*0*	*8*	*31*
Percent Heavy Vehicles	*0*	*0*	*0*	*10*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*8*	*0*		*16*			*39*	
C (m) (veh/h)	*1593*	*1636*		*843*			*1019*	
v/c	*0.01*	*0.00*		*0.02*			*0.04*	
95% queue length	*0.02*	*0.00*		*0.06*			*0.12*	
Control Delay (s/veh)	*7.3*	*7.2*		*9.4*			*8.7*	
LOS	*A*	*A*		*A*			*A*	
Approach Delay (s/veh)	--	--	*9.4*			*8.7*		
Approach LOS	--	--	*A*			*A*		

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