



MEMORANDUM

TO: Chad Hanson, MnDOT

FROM: Chris Hiniker, Project Manager

DATE: Revised July 2, 2012

RE: Red Wing Bridge Project - FINAL New Bridge Location Feasibility Assessment
SEH No. MNT06 119112 14.00

Purpose and Background

MnDOT initiated the Red Wing Bridge Project in December 2011. The project includes the US 63 (Eisenhower) Bridge over the Mississippi River and the US 63 Bridge over US 61, as well as the highway connections to US 61, Minnesota TH 58, and approach roadways in the State of Wisconsin. The Eisenhower Bridge carries US 63 across the river from Red Wing and connects to the state of Wisconsin. The bridge provides the only regional crossing of the river for over 30 miles upstream or downstream for several communities on both the Wisconsin and Minnesota sides of the river.

Completed in 1960, the Eisenhower Bridge is a steel truss through-deck bridge that crosses the Mississippi River main channel at Red Wing, Minnesota. The bridge is 1,631 feet long, 35 feet wide, and stands 65 feet above the river. The two lane bridge currently carries an average daily traffic count (ADT) of 13,300 vehicles per day (vpd) (2012 count).

As documented in the project's Purpose and Need Statement, the primary purposes of the project are to provide structurally sound crossings of the Mississippi River and US 61. Secondly, the project will study future capacity needs and the accommodation of pedestrian/bicycle traffic across the bridge. An additional consideration is that within the city of Red Wing US 63 intersects with US 61 and TH 58 and this area experiences circulation and congestion problems.

The river bridge project has been anticipated for many years in the Red Wing community. During the Downtown Red Wing Transportation Study process in 2005, there were discussions about possible river crossing options including the potential for moving the bridge to a different location. Although the focus of the Red Wing Bridge Project now underway is on the current structure and crossing location, given the history of the river bridge subject it is important to address the feasibility of options for moving the river crossing location.

This memorandum documents the identification and assessment of new river crossing locations for US 63 and determines the viability of carrying one or more new location options into the more detailed stages of the alternatives analysis process.

Alternatives Analysis Philosophy and Process

The basic philosophy in conducting an alternatives analysis is to follow a systematic process of defining a broad range of alternatives at a conceptual level and then progressing through an iterative process of assessing and screening at progressively greater levels of detail until a preferred alternative is selected. Key to this process in the early phases when a large number of options are being considered is to keep the analysis at a higher level and focus on identifying obvious fatal flaws. As the number of options is reduced, the level of detail increases and evaluation criteria for decision-making becomes more refined.

For bridge and other transportation corridor projects, the process of identifying alternatives typically begins by grouping potential improvement alternatives into one of two categories:

1. Existing Corridor Alternatives
2. New Corridor Alternatives

In the case of the Red Wing Bridge project the first group includes all alternatives using the existing river crossing location. The second group includes all alternatives that would establish a crossing at a new location. Options within the existing corridor are not addressed further in this memorandum but will be identified and assessed in detail as the study process advances.

The remainder of this memorandum focuses on identifying, assessing, and screening alternatives that involve a new crossing location for the US 63 river crossing. The conclusions from this process will be carried forward into the remainder of the alternatives development and evaluation process.

Identification and Assessment of New River Crossing Alternatives

As noted previously, within the broad context of US 63, connecting Minnesota and Wisconsin, and traffic issues in downtown Red Wing, discussions of new crossing locations have occurred informally for several years. However, no formal assessment has been completed.

In 2011, as part of MnDOT's efforts in developing the purpose and need statement for the river bridge project and proceeding with cultural resource investigations, an area of potential effect (APE) was identified. The APE delineates the area within which the range of improvement alternatives are anticipated to be located. The APE delineated for the Red Wing Bridge project extends from the existing river bridge upstream to approximately Broad Street. Given Barn Bluff, existing land uses, and the existing street network, the APE encompasses the potentially practical and feasible bridge crossing options in the Downtown Red Wing area.

Prior to moving forward with the assessment of new crossing locations within the APE, it is important to address and document the consideration of possible alternatives beyond the scope of the APE.

Potential New River Crossing Alternatives Outside the Area of Potential Effect

During the 2005 Transportation Study, the option of connecting at Bench Street west of the downtown area was discussed. However the feasibility of this option, see Figure 1, was not assessed during that process because it was beyond the study's scope.

The primary rationale to consider moving the river crossing to Bench Street from the current location includes the following:

- Bench Street is a major county arterial roadway (County State Aid Highway 1) that extends southwest across Goodhue County connecting with Highway 52.
- Bench Street provides a more direct access from Wisconsin to some of the larger retail centers as well as the Red Wing Medical Center.

Furthermore, in considering a new river crossing outside the immediate downtown area, it is practical to conclude that the only potentially feasible location is at Bench Street given the following factors:

- The course of the Mississippi River;
- Prominent topographical features such as Barn Bluff;

- A limited arterial and collector road network to connect with a new river crossing;
- Existing land uses;
- Extensive wetlands and floodplain;
- Extensive parkland and conservation lands, historic resources, and wildlife areas.

However, moving the river crossing to Bench Street introduces many impacts and challenges including:

- Substantial additional wetland and floodplain impacts (in Minnesota and Wisconsin);
- Removes the established crossing in the downtown area;
- Introduces additional travel and roadway length for traffic on TH 63;
- Removes more direct connection to Trunk Highway 58;
- Introduces significantly greater roadway construction costs as compared to any river crossing option in the downtown area;
- New crossing in a major bend of the navigable Mississippi River waterway;
- Requires additional and longer bridges;
- Impacts to the Upper Harbor conservation lands including Bay Point Park which is both a Section 4(f) and LAWCON/Section 6(f) resource;
- Probable need to conduct an Environmental Impact Statement (EIS);

Given these issues and impacts, it is reasonable to conclude it is more logical to pursue alternatives in the already established APE. Furthermore, the option of a new crossing at Bench Street will not be revisited unless all options within the APE are found to result in impacts approaching those associated with a relocated crossing connecting at Bench Street.

Potential New River Crossing Alternatives within the Area of Potential Effect

The area within which additional river bridge alternative corridors will be considered includes locations immediately upstream, but still within Downtown Red Wing.

Given existing land uses and the established street network, the number of alternatives for new river crossing locations is limited to three, as illustrated on Figure 2. The three alternatives include:

- Plum Street
- Bush Street
- Broad Street

None of these options have been formally addressed as part of previous studies such as the 2005 Transportation Study. The primary characteristics and trade-offs associated with each alternative are presented below.

Plum Street Alternative

- Closest to the existing river crossing;
- Provides direct connection to Trunk Highway 58;
- Furthest of the three new location alternatives from the Mississippi River bend;
- Introduces lower speed reverse curve on the Wisconsin approach to the bridge;

- Crosses Levee Park;
- Least encroachment into the downtown area historic districts of the three new location alternatives;
- Establishing an at-grade connection at US 61 results in:
 - steep approach roadway grades
 - substantial impacts to ADM access
 - closing only access to upper level of the LaGrange municipal parking garage
 - substantial visual/sightline impacts to adjacent buildings, including several historic structures
- Impacts the Marina campground area operations greater than the Broad Street Alternative.

Bush Street Alternative

- Provides direct connection to Bush Street requiring heavier turning movements to access regional roadways;
- Closer to the Mississippi River bend as compared to the existing crossing and the Plum Street alternative;
- Introduces lower speed reverse curve on the Wisconsin approach to the bridge;
- Requires greater bridge length compared to the existing crossing and Plum Street Alternative;
- Crosses Levee Park;
- Impacts Levee Street approach to TH 61;
- Along with the Broad Street alternative, introduces the greatest encroachment into the downtown area historic districts, including the St. James Hotel;
- Establishing an at-grade connection at US 61 results in:
 - steep approach roadway grades
 - substantial impacts to St. James Hotel historic district;
 - impacts access to lower level of the LaGrange municipal parking garage
 - substantial visual/sightline impacts to adjacent buildings
- Impacts the Marina campground area operations greater than the Broad Street Alternative.

Broad Street Alternative

- Provides direct connection to Broad Street requiring heavier turning movements to access regional roadways;
- Closest of the three new location alternatives to the Mississippi River bend.
- Introduces lower speed reverse curve on the Wisconsin approach to the bridge;
- Requires greater bridge length compared to the existing crossing and Plum Street Alternative;
- Closest of the three new location alternatives to the historic depot;
- Impacts Levee Street approach to TH 61;
- Along with the Bush Street alternative, introduces the greatest encroachment into the downtown area historic districts, including the St. James Hotel;
- Establishing an at-grade connection at US 61 results in:
 - steep approach roadway grades
 - substantial impacts to St. James Hotel historic district;
 - substantial visual/sightline impacts to adjacent buildings

A plan and profile was developed for the Plum Street alternative to provide additional details to determine the technical feasibility of the new location alternatives. The Plum Street alternative was recommended for more detailed assessment over the other two alternatives because it is furthest from the river bend, avoids direct impacts to the St. James Hotel historic district, and provides a direct connection to TH 58. Furthermore the Plum Street alternative is representative of the other alternatives, since each has similar horizontal and vertical characteristics relative to grade changes and distance between the river and US 61.

The conceptual plan and profile for a new river crossing at Plum Street is illustrated in Figure 3. The profile was developed assuming a river crossing with the same horizontal and vertical clearance characteristics as the existing river bridge which are 421 feet horizontal clearance and a minimum of 64 feet vertical clearance. The profile indicates that with approach roadway grades exceeding five percent on the Minnesota side and potentially the Wisconsin side, the vertical clearance specifications of the existing bridge are not met. As a result, the approach roadways will need to be designed with steeper grades than shown on the graphic. The combination of steep approach grades as well as the reverse curves in the Wisconsin approach raise safety concerns given the function and purpose of Highway 63. The alignment depicted on Figure 3 creates an approach roadway on the Minnesota side that is approximately nine feet higher than the existing grade of Plum Street at the current access to ADM and the upper level of the LaGrange parking ramp. Any increase in grades for the approach roadway will increase the difference between existing and proposed grades at these locations.

In conclusion, each of the three new locations has very substantial design challenges given the close proximity and vertical grade differences between the river and US 61. In addition, each alternative would introduce substantial impacts to parklands, historic resources, commercial and industrial land uses, and the existing visual setting and sightlines in Downtown Red Wing. Furthermore, a May 14, 2012 letter from the Coast Guard states that the three alternatives are not acceptable from a navigational standpoint due to the proximity of the river bend.

Findings

- The assessment of new river crossing locations concluded that Bench Street was the only potentially viable option outside the Downtown Red Wing area. However, given a range of impacts and/or challenges the Bench Street alternative should not be revisited unless all alternatives in the downtown area are found to result in impacts and/or challenges approaching or exceeding those associated with the Bench Street option.
- The assessment of new river crossing locations within Downtown Red Wing concluded there are very substantial technical issues as well as substantial social, economic, and cultural impacts associated with new river crossing location alternatives in the downtown area. As a result, these options are not recommended for further study at this time.
- Given the substantial issues associated with the range of new river crossing alternatives assessed in this memorandum, it is reasonable to conclude the Red Wing Bridge Project should focus on identifying and evaluating all potentially viable bridge rehabilitation or replacement options within the existing river crossing location. If the analysis of alternatives at the existing crossing location concludes there are no reasonable and feasible options, then the study process may revisit potential new location alternatives. Furthermore, if any alternative at the existing crossing location results in Section 4(f) or Section 106 impacts then consideration of avoidance alternatives, potentially including new location options, will be required.

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Attachments

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Legend

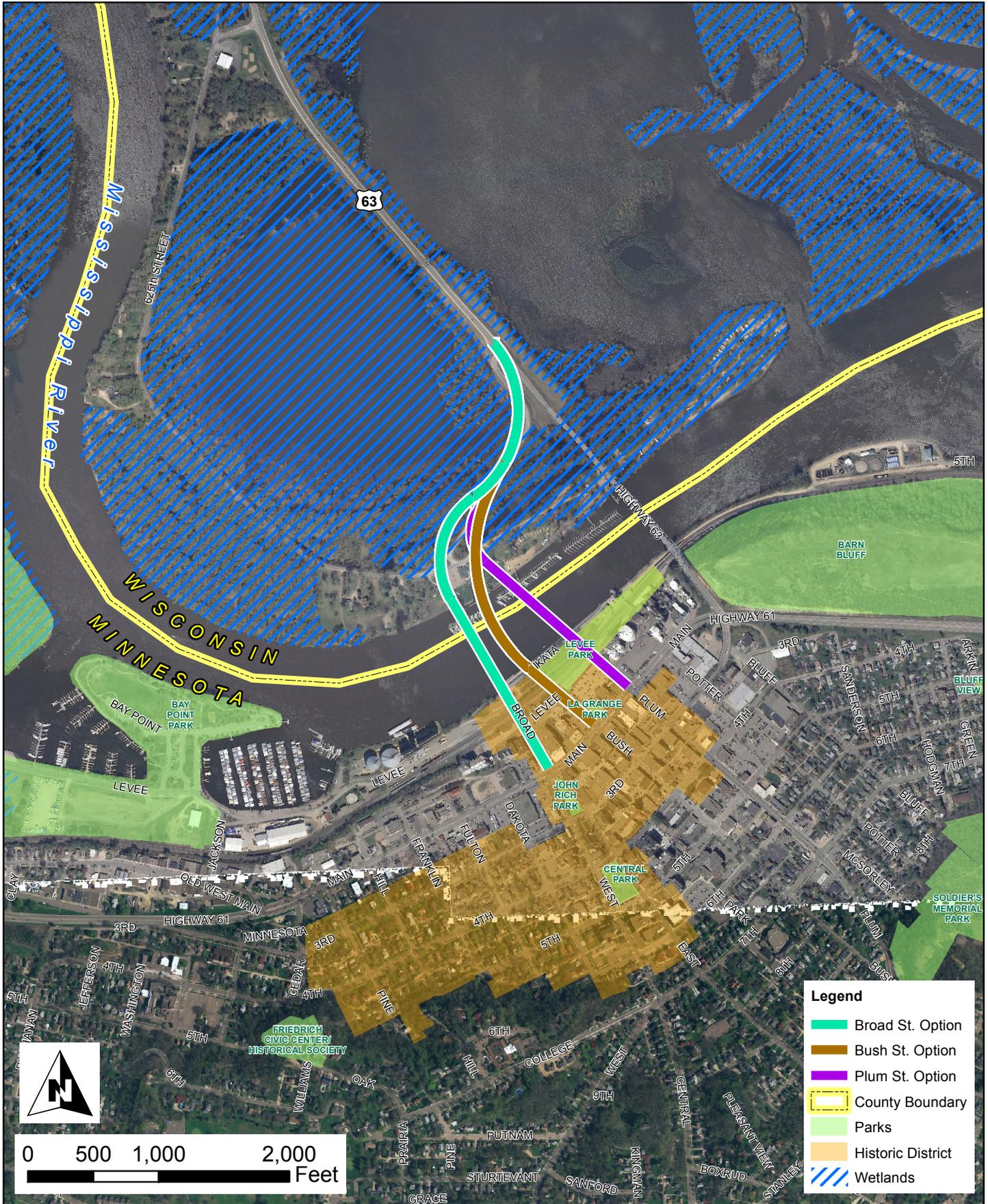
- Bench St. Option
- County Boundary
- Parks
- Historic District
- Wetlands



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Feet

	Project: MNT06 119112 Print Date: 5/15/2012 Map by: SrH Projection: Goodhue HARN NAD83 Ft Source: City of Red Wing, MnDOT, Goodhue County, and SEH.	<h2 style="margin: 0;">RED WING BRIDGE PROJECT</h2> <h3 style="margin: 0;">Bench Street Option</h3>	<h1 style="margin: 0;">Figure 1</h1>
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This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.



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- Legend**
- Broad St. Option
 - Bush St. Option
 - Plum St. Option
 - County Boundary
 - Parks
 - Historic District
 - Wetlands



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 Print Date: 5/15/2012
 Map by: SrH
 Projection: Goodhue HARN NAD83 Ft
 Source: City of Red Wing, MnDOT,
 Goodhue County, and SEH.

RED WING BRIDGE PROJECT
 Downtown New Location Options

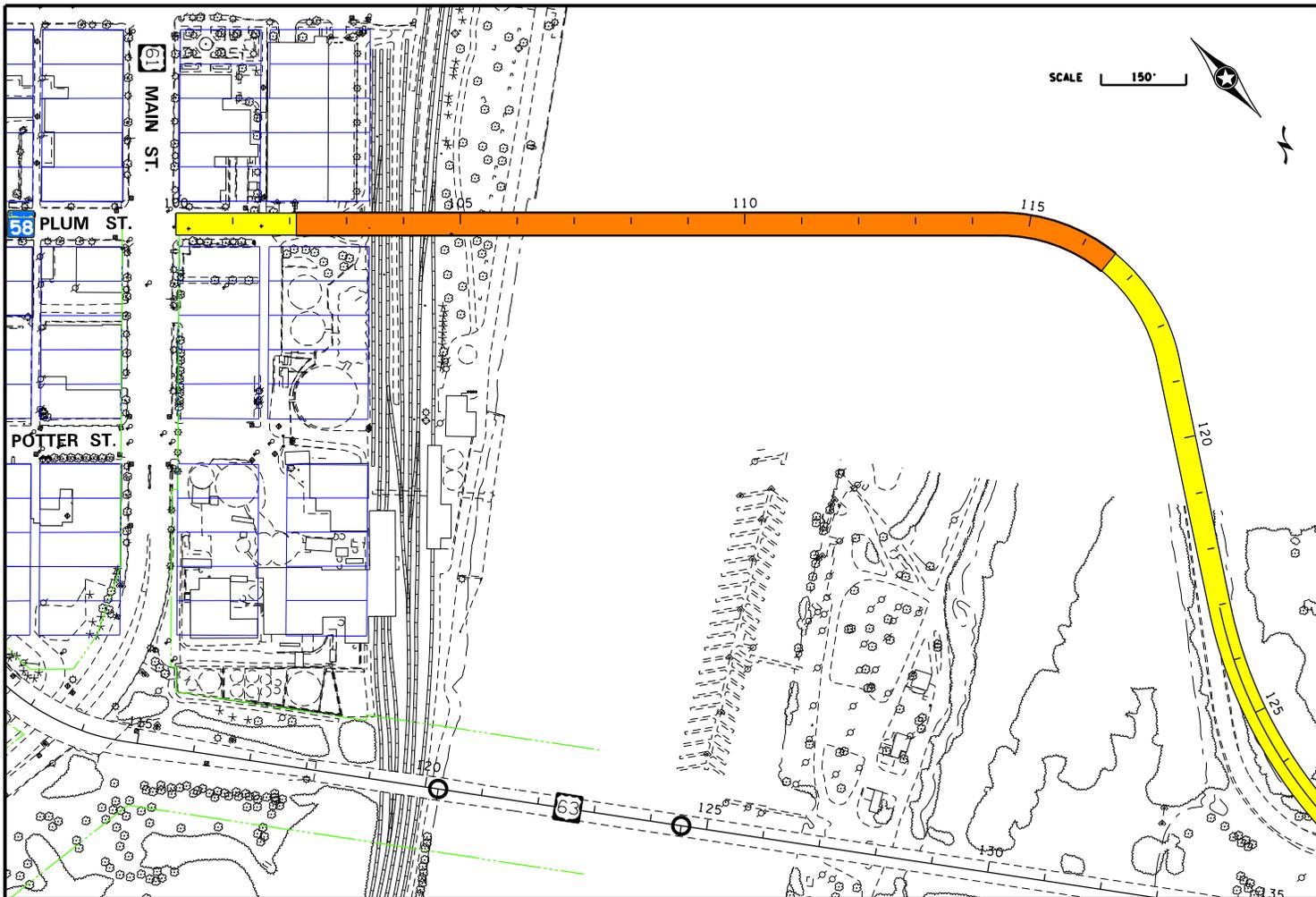
Figure
 2

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

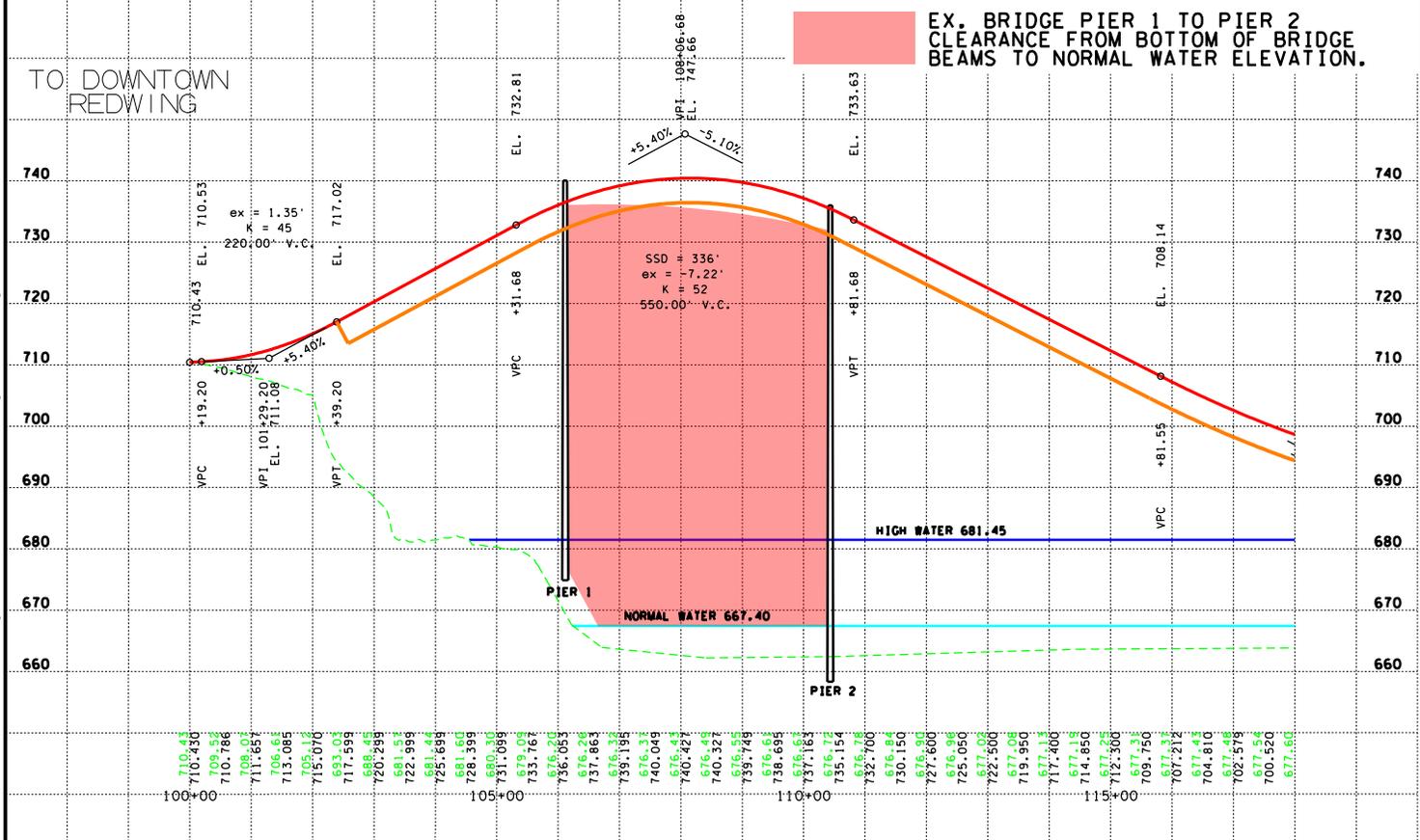
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SCALE 150'



EX. BRIDGE PIER 1 TO PIER 2
CLEARANCE FROM BOTTOM OF BRIDGE
BEAMS TO NORMAL WATER ELEVATION.



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5/14/2012



TH 63 / TH 61
RED WING, MINNESOTA

PLUM STREET
ALTERNATIVE
NEW BRIDGE LOCATION
PLAN & PROFILE

FIGURE
3