(Note: document was not finalized due to an eastbound stopping site distance design issue that requires more detailed bridge and roadway design considerations. This discussion starts on page 4.)
# ST. CROIX RIVER CROSSING PROJECT
## DESIGN MEMORANDUM

**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKGROUND</td>
<td>2</td>
</tr>
<tr>
<td>TH 36 (TH 5 TO OSGOOD AVENUE)</td>
<td>2</td>
</tr>
<tr>
<td>TH 36 (EAST OF OSGOOD AVENUE)</td>
<td>2</td>
</tr>
<tr>
<td>DESIGN STANDARDS AND DISCUSSION</td>
<td>3</td>
</tr>
<tr>
<td>STATE AID STANDARDS</td>
<td>3</td>
</tr>
<tr>
<td>INTERSTATE/STRAHNET SYSTEM</td>
<td>4</td>
</tr>
<tr>
<td>DESIGN EXCEPTIONS AND JUSTIFICATION</td>
<td>4</td>
</tr>
<tr>
<td>TH 36 EAST OF OSGOOD AVENUE DESIGN EXCEPTION REQUEST</td>
<td>4</td>
</tr>
<tr>
<td>Trunk Highway 36 Partnership Study</td>
<td>5</td>
</tr>
<tr>
<td>Supplemental Draft EIS Alternatives Development and Preliminary Roadway Design</td>
<td>5</td>
</tr>
<tr>
<td>Preliminary Bridge Design</td>
<td>6</td>
</tr>
<tr>
<td>Final Roadway Design</td>
<td>7</td>
</tr>
<tr>
<td>Alternative Layout Development</td>
<td>7</td>
</tr>
<tr>
<td>TH 36 NORTH FRONTAGE ROAD DESIGN EXCEPTION REQUEST</td>
<td>7</td>
</tr>
<tr>
<td>TH 36 SOUTH FRONTAGE ROAD (OAKGREEN AVENUE INTERSECTION) DESIGN EXCEPTION REQUEST</td>
<td>8</td>
</tr>
<tr>
<td>SOUTH FRONTAGE ROAD (EASTERN TERMINUS WITH STAGECOACH TRAIL) DESIGN EXCEPTION REQUEST</td>
<td>9</td>
</tr>
<tr>
<td>BEACH ROAD DESIGN EXCEPTION REQUEST</td>
<td>10</td>
</tr>
</tbody>
</table>
St. Croix River Crossing Project Design Memorandum

LIST OF TABLES AND FIGURES

Attachment A: Geometric Design Tables (Trunk Highway 36 and Trunk Highway 95)

Highway Geometric Design Standards for TH 36 (Washington Avenue/Norell Avenue to Osgood Avenue) ................................................................. A-1
Highway Geometric Design Standards for TH 36 (east of Osgood Avenue) ......................... A-5
Highway Geometric Design Standards for TH 95 ................................................................. A-11

Attachment B: Geometric Design Tables (TH 36/95 Interchange)

TH 36/95 Interchange Ramp Geometric Design Standards ................................................. B-1

Attachment C: Geometric Design Tables (Trunk Highway 36 Frontage Roads and Local Roadways)

North Frontage Road Geometric Design Standards .......................................................... C-1
South Frontage Road Geometric Design Standards .......................................................... C-5
Oakgreen Avenue/Greeley Street Geometric Design Standards ........................................ C-11
Osgood Avenue Geometric Design Standards ................................................................. C-14
Beach Road Geometric Design Standards ................................................................. C-18

Attachment D: Figures

Figure 3-2  Minnesota TH 36 (TH 5 to Osgood Avenue) – Preferred Alternative .............. D-1
Figure 3-3  TH 36 & TH 95 Interchange Area – Preferred Alternative .............................. D-2
Figure 3-5  Minnesota TH 36 – Preferred Alternative Typical Sections .......................... D-3
Figure 3-6  TH 36 & TH 95 Interchange – Preferred Alternative Typical Sections .......... D-4
Figure 3-7  Minnesota TH 95 – Preferred Alternative Typical Sections .......................... D-5
Figure 3-8  River Bridge – Preferred Alternative Typical Sections ............................ D-6
**Department:** MnDOT – Metro District  
**Date:** July 7, 2006  
**To:** Project File  
**From:** Todd Clarkowski, P.E., Area Engineer, Mn/DOT  
Monty Hamri, Design Project Manager, Mn/DOT  
**Phone:** 651/582-1169  
651/582-1606  
**Subject:** Design Memorandum with Design Exceptions  
**TRUNK HIGHWAY 36 AT-GRADE INTERSECTIONS**  
State Project Number(s): SP 8214-114 and SP 8217-12  
Federal Highway Administration: FHWA-MN-EIS-90-02-DS  
TH Number(s): Trunk Highway (TH) 36 and TH 95  
**Cities:** Oak Park Heights, Stillwater, Bayport  
**County:** Washington  
**Type of Work:** Trunk highway reconstruction; Frontage road reconstruction; New frontage road construction; Interchange reconstruction  
**Project Termini:**  
TH 36 from approximately 1,050 feet west of Washington Avenue/Norell Avenue to the TH 36/Osgood Avenue intersection (TH 36 at-grade intersections)  
North frontage road from approximately 1,050 feet west of Washington Avenue/Norell Avenue to the TH 36/Osgood Avenue intersection  
South frontage road from approximately 1,050 feet west of Washington Avenue/Norell Avenue to Stagecoach Trail  
TH 95 from approximately 700 feet north of Lookout Trail to approximately 400 feet south of 10th Avenue North  
This project is scheduled for an anticipated 2009-2012 letting, depending upon project funding.

---

The Design Exceptions described in the attached documentation are recommended for approval by:

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BACKGROUND

TH 36 (TH 5 to Osgood Avenue)

As part of the St. Croix River Crossing Project, associated improvements will be completed on the Trunk Highway (TH) 36 mainline, the TH 36 at-grade intersections, the TH 36 frontage road system and intersecting cross streets to improve traffic operations on TH 36 west of the new river crossing. The proposed improvements were originally developed as part of the St. Croix River Crossing Project and documented with a Preferred Alternative in the 1995 Final EIS. Municipal consent was received from the Cities of Stillwater and Oak Park Heights for the proposed alignment in 1995. Right of way was purchased along the frontage road system prior to project suspension in 1996. The proposed improvements were incorporated into a new Preferred Alternative and documented in the 2006 Supplemental Final EIS (SFEIS).

Resurfacing of TH 36 will begin approximately 1,050 feet east of the Washington/Norell intersection and continue east to Osgood Avenue. Additional turn lanes will be constructed on TH 36 at the at-grade intersections with Oakgreen Avenue/Greeley Avenue and Osgood Avenue. Reconstruction of TH 36 as a four-lane urban roadway section to accommodate a new TH 36/95 standard diamond interchange and river crossing bridge will begin east of Osgood Avenue.

The north and south TH 36 frontage roads will be reconstructed as a three-lane urban section from approximately 1,050 feet east of Washington/Norell to Osgood Avenue. The north and south frontage roads will be pulled back approximately 450 feet and 750 feet, respectively, from the TH 36 mainline at Oakgreen Avenue/Greeley Street. Oakgreen Avenue will be relocated to the east of the existing alignment to accommodate the pulled back south frontage road. The north and south frontage road intersections with Oakgreen/Greeley and Osgood will be expanded to include dedicated right and left turn lanes. A new south frontage road will be constructed east of Osgood Avenue to Stagecoach Trail.

TH 36 (east of Osgood Avenue)

A new bridge over the St. Croix River and associated roadway improvements will be constructed to provide a safe, reliable, and efficient transportation corridor by reducing congestion and improving roadway safety on Trunk Highway 36 (TH 36) and TH 95 in Stillwater and Oak Park Heights, Minnesota. The following summarizes the major design elements of the proposed improvements.
As part of the St. Croix River Crossing Project, improvements will be completed on TH 36 east of Osgood Avenue, Beach Road, and TH 95. TH 36 will be reconstructed as a four-lane urban roadway section to accommodate a new TH 36/95 standard diamond interchange and river crossing bridge As noted above, these improvements will begin east of Osgood Avenue.

A new south frontage road will be constructed from Osgood Avenue east to Stagecoach Trail. The existing Beach Road overpass and ramps to existing TH 36 will be removed. A new two-lane Beach Road overpass over TH 36 will be constructed to the west of the existing Beach Road overpass location. The new Beach Road overpass will intersect with the new south frontage road approximately 700 feet west of the existing Beach Road alignment.

TH 95 will be reconstructed as a two-lane urban roadway section expanding to a four-lane urban roadway section at the intersections with the TH 36/95 interchange ramps. Total length of the TH 95 construction is approximately 7,550 feet. TH 95 will pass under the TH 36 mainline. Dedicated turn lanes will be constructed on TH 95 at the TH 36/95 interchange ramp intersections.

**DESIGN STANDARDS AND DISCUSSION**

Based on the Design Standards Documentation Requirements and the Type of Work, this project will be designed to Mn/DOT's New Construction/Reconstruction Standards.

Geometric design standards are summarized in the attached Geometric Design Tables included as Attachment A.

- Highway Geometric Design Table (TH 36 at-grade intersection design – Washington/Norell Avenue to Osgood Avenue)
- Highway Geometric Design Table (TH 36 east of Osgood Avenue)
- Highway Geometric Design Table (TH 95)

Geometric design standards are summarized in the attached Geometric Design Tables included as Attachment B.

- Ramp Geometric Design Table (TH 36/95 interchange)

**State Aid Standards**

State aid standards are used as the basis for the design of the critical elements of the TH 36 north and south frontage roads as well as with the TH 36 cross streets (i.e., Washington Avenue/Norell Avenue; Oakgreen Avenue/Greeley Street; Osgood Avenue; Beach Road).
Geometric design standards for these elements are summarized in the attached Geometric Design Tables, pursuant to Minnesota Rules 8820.9936 (geometric design standards; urban; new or reconstruction projects), and are included in Attachment C.

- Roadway Geometric Design Table (TH 36 North Frontage Road)
- Roadway Geometric Design Table (TH 36 South Frontage Road)
- Roadway Geometric Design Table (Oakgreen Avenue/Greeley Avenue)
- Roadway Geometric Design Table (Osgood Avenue (Co. Rd. 24))
- Roadway Geometric Design Table (Beach Road)

**INTERSTATE/STRAHNET SYSTEM**

(X) This project does not involve work on the Interstate/STRAHNET system.
( ) This project involves work on the Interstate/STRAHNET system.

( ) At the completion of this project, all bridges will meet the 4.9 m (16 ft) standard for vertical clearance over Interstate highways.
( ) At the completion of this project the vertical clearance of the bridge will remain unchanged. The scope of work involves limited repair of the bridge or roadway pavement. The project scope does not provide the opportunity to alter the vertical clearance situation. FHWA will be requested to coordinate with the Department of Defense - MTMCTEA at least three months before letting.

**DESIGN EXCEPTIONS AND JUSTIFICATION**

**TH 36 East of Osgood Avenue Design Exception Request**

A design exception is requested for “Stopping Sight Distance” for TH 36 east of Osgood Avenue to the St. Croix River crossing.

TH 36 has a design speed of 60 miles per hour (mph). The eastbound TH 36 alignment from Sta. 458+00 to Sta. 464+50 provides a stopping sight distance of 495 feet. This stopping sight distance does not meet the required 570-foot horizontal sight distance for a 60 mph design speed.

The eastbound TH 36 horizontal stopping sight distance obstruction is the bridge median barrier. From Sta. 458+00 to Sta. 464+50, the 6-foot left shoulder provides a stopping sight distance of 495 feet. A 495-foot stopping sight distance is adequate for a 55 mph design speed. To obtain a 570-foot horizontal stopping sight distance, the left shoulder would need to be increased an additional 3.8 feet to 9.8 feet.
Trunk Highway 36 Partnership Study

In 2002, the TH 36 Partnership Study was established in to recommendations in the TH 36 Interregional Corridor (IRC) Management Plan (May 2001) to explore design concepts for the segment of TH 36 in Oak Park Heights and Stillwater from TH 5 to TH 95. A committee of representatives from Oak Park Heights, Stillwater, and Washington County, along with business owners and citizens formed a Policy Advisory Committee (PAC) to ensure that the Partnership Study reflected local concerns, to help identify alternatives, evaluate study findings, and make consensus recommendations regarding potential TH 36 designs.

The outcome of this process was the TH 36 Partnership Study Final Report (December 2002). This report documented the Partnership Study process, purpose, and PAC findings and recommendations. One of the recommendations documented in the Final Report was that a grade-separated facility with two interchanges and a maximum design speed of 45 mph should be the ultimate solution for this segment of TH 36 to provide adequate capacity and acceptable levels of operations.¹

Supplemental Draft EIS Alternatives Development and Preliminary Roadway Design

Following re-initiation of the St. Croix River Crossing Project in 2002, a stakeholder panel was identified to help inform the decision-making process of the project proposers. The stakeholder panel, collectively referred to as the “Stakeholders Group”, was comprised of representatives of federal, state, and local governments, as well as other non-governmental groups.

Through the Stakeholder process, four Build Alternatives were developed and documented in a Supplemental Draft EIS (SDEIS). In order to reduce impacts to the environmental, historic, and social resources in the project area, several members of the Stakeholder Group proposed alternatives with structure heights and design speeds that were “lower and slower”. As a result of these concerns, and through negotiations with the Stakeholder Group, the SDEIS Build Alternatives were designed with this concept in mind. Part of the SDEIS Build Alternatives design also included addressing the transition from the higher design speeds at the Wisconsin approach (i.e., 70 mph) to the lower design speeds at the Minnesota approach and TH 36/95 interchange.

Design standards were minimized to the extent possible, where feasible, to reduce impacts, while still fulfilling the project purpose and need. Trunk Highway 36 design speeds for the SDEIS Build Alternatives east of Osgood Avenue (i.e., Minnesota approach) ranged from 30 mph for SDEIS Build Alternative E, ¹ See Recommendation #4 on page 15 of the TH 36 Partnership Study Final Report (December 2002).
45 mph for SDEIS Build Alternatives C and D, and up to 55 mph for SDEIS Build Alternative B-1. Design speeds for the Wisconsin approach ranged from 30 mph on the westbound Wisconsin approach for SDEIS Build Alternative E, 55 mph for Alternative D, and 70 mph for SDEIS Build Alternatives B-1 and C.

SDEIS Alternative B-1 was identified as the Preferred Alternative river crossing in Fall 2004. The identification of Alternative B-1 as the Preferred Alternative included only identification of the Preferred Alternative bridge type; preliminary bridge design had not been completed at this point. In Spring 2005, the Preferred Alternative preliminary design layout was submitted for design review. The layout submitted at that time noted a 55 mph design for sight stopping distance on eastbound TH 36 east of the new river crossing bridge. In Summer 2005, Mn/DOT Geometrics Unit noted in their comments on the Level 1 Preliminary Geometric Layout that the design speed for the project should be increased from 55 mph to 60 mph. Mn/DOT staff approved the layout with a 55 mph design speed in July 2005.

Preliminary Bridge Design

The proposed project may result in a stopping sight distance design exception until this design element can be reviewed further during preliminary bridge design and final roadway design (see discussion on page 7).

During preliminary bridge design, the following analyses will be considered:

1. Adjusting the center median to shift 2 feet from the eastbound TH 36 inside shoulder to the westbound TH 36 inside shoulder, resulting in an 8-foot inside shoulder for eastbound TH 36. Although this would still result in a substandard stopping sight distance for a 60 mph design, an 8-foot inside shoulder meets a stopping sight distance for a 58 mph design.

   This design modification would not result in any changes to the bridge width, and would therefore not increase project costs. Any increases in bridge width to address the stopping sight distance design exception would result in increased project costs;

2. Widening the bridge until the full 10-foot inside shoulder is achieved on eastbound TH 36 would provide a 60 mph design speed, thereby eliminating the stopping sight distance design exception. This will require an economic analysis to document the costs associated with widening the bridge. In addition, in order to complete this analysis, the locations to taper into, and out of, the 10-foot inside shoulder on eastbound TH 36 would also have to be defined. Providing the 10-foot inside shoulder across the entire bridge from Minnesota to Wisconsin would substantially increase project costs; and
3. Construction feasibility for the new river crossing bridge will also be considered and documented with any alterations to the TH 36 alignment, profile, and cross section.

**Final Roadway Design**

The stopping sight distance design exception will also be evaluated during final roadway design. In order to further approach or meet the horizontal stopping sight distance design standard for 60 mph, final roadway designers would have to develop additional alignments, profiles, and cross sections to provide the additional 2 feet to the inside shoulder to meet a 58 mph design speed (see Item #1 on page 6 above), up to the full 10-foot inside shoulder for a 60 mph design speed for eastbound TH 36. Any alignment or profile adjustments to achieve this full 10-foot inside shoulder width must match the TH 36/95 interchange alignment and profile, as well as matching the alignment and profile in Wisconsin. Any subsequent environmental and social impacts as a result of alignment and profile adjustments would also have to be considered and appropriately documented.

**Alternative Layout Development**

The Geometrics Office could also develop an alternative roadway design layout that maintains the 6-foot inside shoulder on westbound TH 36 and includes a full 10-foot inside shoulder on eastbound TH 36 to eliminate the stopping sight distance design exception (see Item #2 above). If developed, this alternative layout could be considered during the preliminary bridge design and final roadway design phases described above.

During both the preliminary bridge design and final roadway design phases, bridge designers, roadway designers, and geometrics staff should work together to address alternatives to the eastbound TH 36 stopping sight distance design exception.

**TH 36 North Frontage Road Design Exception Request**

A design exception is requested for the “Horizontal Alignment Radius” of the TH 36 north frontage road to the east and west of the north frontage road/Greeley Avenue (CSAH 66) intersection.

The north frontage road has a design speed of 30 mph. Urban design criteria are used for the north frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The north frontage road alignment from Sta. 378+49 to Sta. 389+54 provides a four horizontal curve alignment that does not meet the required 300-foot radius
for a roadway section with a normal crown \((e=N.C.)\) and a 30 mph design speed. At full super-elevation \((e=0.06)\) and 30 mph design speed, a 215-foot minimum radius would be required. The tangent length required between curves to match the full super-elevation runoff length at a 30 mph design speed is 230 feet. Under the proposed project, the tangent length between horizontal curves is insufficient to provide this super-elevation runoff length. The geometrics for these four horizontal curves along the north frontage road at Greeley Avenue, from west to east, are described below.

North frontage road curve A (Sta. 378+49 to Sta. 381+18) provides a 25 mph curve \((R=212 \text{ ft}; e=N.C.)\), a 103-foot tangent, followed by north frontage road curve B (Sta. 382+22 to Sta. 384+90) (25 mph curve; \(R=212 \text{ ft}; e=N.C.)\). The north frontage road then intersects with Greeley Avenue.

North frontage road curve C (Sta. 383+65 to Sta. 386+20) provides a 20 mph curve \((R=163 \text{ ft}; e=N.C.)\), an 80-foot tangent, followed by north frontage road curve D (Sta. 387+00 to Sta. 389+54) (20 mph curve; \(R=163 \text{ ft}; e=N.C.)\). The north frontage road then continues east parallel to TH 36.

These curves were used to minimize right of way impacts to commercial property along the north frontage road and to minimize fill impacts to an existing drainage pond along the east side of Greeley Avenue. The horizontal alignment of the north frontage road east of Greeley Avenue and west of Greeley Avenue are interdependent on one another to provide the new signalized intersection with Greeley Avenue.

This design previously received staff approval in May of 1994. The right of way for the north frontage road was secured for construction of the St. Croix River Crossing Project prior to its suspension in 1996. Shifting the horizontal alignment of the north frontage road outside the 1994 planned original alignment would result in right of way and fill impacts as noted above.

**TH 36 South Frontage Road (Oakgreen Avenue Intersection)**

**Design Exception Request**

A design exception is requested for the “Horizontal Alignment Radius” of the TH 36 south frontage road to the east and west of the south frontage road/Oakgreen Avenue intersection.

The south frontage road has a design speed of 30 mph. Urban design criteria are used for the south frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The south frontage road alignment from Sta. 376+91 to Sta. 384+72 and from Sta. 376+01 to Sta. 388+04 provides a four horizontal curve alignment that does
not meet the required 300-foot radius for a roadway section with a normal crown (e=N.C.) and a 30 mph design speed. At full super-elevation (e=0.06) and 30 mph design speed, a 215-foot minimum radius would be required. The tangent length required between curves to provide super-elevation runoff lengths at a 30 mph design speed is 230 feet. Under the proposed project, the tangent length between horizontal curves is insufficient to provide super-elevation runoff lengths. The geometrics for these four horizontal curves along the south frontage road at Oakgreen Avenue, from west to east, are described below.

South frontage road curve A (Sta. 376+91 to Sta. 380+67) provides a 25 mph curve (R=197 ft; e=N.C.), a 48-foot tangent, followed by south frontage road curve B (Sta. 381+46 to Sta. 384+72) (25 mph curve; R=280 ft; e=N.C.). The south frontage road then intersects with Oakgreen Avenue.

South frontage road curve C (Sta. 376+01 to Sta. 380+26) provides a 25 mph curve (R=216 ft; e=N.C.), a 407-foot tangent, followed by south frontage road curve D (Sta. 384+33 to Sta. 388+04) (25 mph curve; R=280 ft; e=N.C.). The south frontage road continues east parallel to TH 36.

This design was used to minimize right of way impacts to commercial and residential properties along the south side of the south frontage road, to minimize impacts to wetlands along Oakgreen Avenue, and to avoid electrical transmission line towers. A utility line corridor crosses Oakgreen Avenue approximately 500 feet south of the existing Oakgreen Avenue/south frontage road intersection. Under the proposed project, the new Oakgreen Avenue/south frontage road intersection will be located within the utility corridor. Existing electric transmission towers will be located at the northeast quadrant of the Oakgreen Avenue/south frontage road intersection.

This design previously received staff approval in May of 1994. The right of way for the south frontage road was secured for construction of the St. Croix River Crossing Project prior to its suspension in 1996.

**South Frontage Road (Eastern Terminus with Stagecoach Trail) Design Exception Request**

A design exception is requested for “Horizontal Alignment Radius” of the TH 36 south frontage road at its eastern terminus with Stagecoach Trail. This design is included with both the 2006 SFEIS Preferred Alternative and the Concept F Alternative.

The south frontage road has a design speed of 30 mph. Urban design criteria are used for the south frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The south frontage road alignment from Sta. 459+41 to Sta. 461+24 provides a
horizontal curve that does not meet the required 300-foot radius for a roadway section with a normal crown (e=N.C.) designed to a 30 mph design speed. At full super-elevation (e=0.06) and 30 mph design speed, a 215-foot radius would be required.

The south frontage road alignment from Sta. 459+41 to Sta. 461+24 provides a horizontal curve radius of 120 feet with a normal crown (e=N.C.), which corresponds to a 20 mph design speed. This is 180 feet below the 30 mph design standard with a normal crown, or 95 feet below the 30 mph design standard with a super-elevation of e=0.06.

The radius of the existing roadway is approximately 50 feet. Land use south and west of the existing roadway is residential. The proposed design for the south frontage road was used to minimize right of way impacts to residential properties to the south of the south frontage road and west of Stagecoach Trail and to stay within existing right of way to the extent feasible. The proposed design also accommodates a trail connection from the new bridge and also maximizes the amount of land available between the south frontage road and the TH 36/95 ramp for potential stormwater treatment.

**Beach Road Design Exception Request**

A design exception is requested for “Vertical Alignment, Sag K Value” of Beach Road near its intersection with the south frontage road.

Beach Road has a design speed of 30 mph. Urban design criteria are used for Beach Road in conformance with Minnesota State Aid Rule 8820.9936.

The Beach Road alignment from Sta. 10+00 to Sta. 11+35 provides a vertical curve that does not meet the required 37 ft/% minimum vertical alignment, sag K value for a roadway section designed to a 30 mph design speed.

The Beach Road alignment from Sta. 10+00 to Sta. 11+35 provides a vertical curve sag K value of 31 ft/%, which corresponds to a 25 mph design speed. This is 6 ft/% below the 30 mph design standard.

The vertical curve is located adjacent to the Beach Road/south frontage road intersection, with a stop condition for Beach Road at the south frontage road. The vertical curve is currently designed to provide a low-point on Beach Road prior to the intersection. This curve could be lengthened to match the 30 mph design standard, but this may force stormwater runoff into the Beach Road/south frontage road intersection. The Beach Road vertical alignment will be coordinated with the stormwater drainage design during final design to address design standards and ensure that runoff is not collected within the Beach Road/south frontage road intersection.
**Attachments:**

Attachment A – Geometric Design Tables (Trunk Highway 36 and Trunk Highway 95)
- Highway (TH 36 at-grade intersection design – Washington Avenue/Norell Avenue to Osgood Avenue)
- Highway (TH 36 east of Osgood Avenue)
- Highway (TH 95)

Attachment B – Geometric Design Tables (TH 36/95 Interchange)
- Ramps (TH 36/TH 95 Interchange)

Attachment C – Geometric Design Tables (Trunk Highway 36 Frontage Roads and Local Roadways)
- Roadway (North Frontage Road)
- Roadway (South Frontage Road)
- Roadway (Oakgreen Avenue/Greeley Street)
- Roadway (Osgood Avenue)
- Roadway (Beach Road)

Attachment D – Figures
- Final (reduced) Layout
- Proposed Typical Sections
ATTACHMENT A

GEOMETRIC DESIGN STANDARDS/TABLES

TRUNK HIGHWAY 36 AT-GRADE INTERSECTIONS

TRUNK HIGHWAY 95
HIGHWAY
GEOMETRIC DESIGN STANDARDS
FOR TRUNK HIGHWAY 36 (WASHINGTON AVENUE/
NORELL AVENUE TO OSGOOD AVENUE)
Highway Geometric Design Standards for TH 36 (Washington Avenue/Norell Avenue to Osgood Avenue)

Highway Type

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(1) The outside shoulder on proposed TH 36 is an urban section. The inside shoulder is a rural section.

Design Standard:  Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

Design Parameters:

Functional Class:  (X) Principal Arterial  ( ) Minor Arterial  ( ) Collector

Terrain:  ( ) Level  (X) Rolling  ( ) Rough

Traffic Volume:  Current ADT 27,000 veh./day
(based on ( ) actual counts, (X) traffic flow map, dated 2002)
Forecast ADT (2030) - 54,000 veh./day - based on Traffic Forecast # SP 8214.

Posted Speed:  The anticipated posted speed will be 50 mph.

Design Unit:  This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

Critical Design Elements Table

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<td>Bridge Structural Capacity</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>All new bridges to have HS-25 Minimum design load</td>
<td>Chapter 9, Section 9-2.0</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>Stopping Sight Distance</td>
<td>425 ft (1)</td>
<td>620 ft</td>
<td>570 ft min.</td>
<td>Table 2-5.09A</td>
</tr>
<tr>
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<td>11,459 ft</td>
<td>1340 ft min.</td>
<td>Table 3-2.03A or Table 3-2.03B</td>
</tr>
<tr>
<td>Grades, Percent</td>
<td>2.0 % max.</td>
<td>2.57 % max.</td>
<td>6 % max.</td>
<td>Table 3-4.02A</td>
</tr>
<tr>
<td>Vertical Alignment, K value</td>
<td>Crest 84 ft/% min. (1)</td>
<td>172 ft/% min.</td>
<td>151 ft/% min.</td>
<td>Figure 3-4.04A</td>
</tr>
<tr>
<td></td>
<td>Sag 96 ft/% min. (1)</td>
<td>152 ft/% min.</td>
<td>136 ft/% min.</td>
<td>Figure 3-4.04D</td>
</tr>
<tr>
<td>Normal Cross Slope</td>
<td>0.02 (1)</td>
<td>0.02</td>
<td>0.02</td>
<td>Table 4-3.01A</td>
</tr>
<tr>
<td>Superelevation</td>
<td>0.06 (1)</td>
<td>Normal Crown</td>
<td>0.06 max.</td>
<td>Chapter 3, Section 3-3.0</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>16 ft-4 in</td>
<td>Table 9-2.01B</td>
</tr>
<tr>
<td>Highway under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
</tbody>
</table>

Table Notes:

* An asterisk preceding proposed condition indicates a Geometric Design Exception. See Geometric Design Exception Justification below for additional information.

(1) Existing condition critical design elements based on design standards for 50 mph posted speed.

Interstate/STRAHNET system

(X) This project does not involve work on the Interstate/STRAHNET system.

( ) This project involves work on the Interstate/STRAHNET system.

( ) At the completion of this project, all bridges will meet the 16 foot standard for vertical clearance over Interstate highways.

( ) At the completion of this project the vertical clearance of the bridge will remain unchanged. The scope of work involves limited repair of the bridge or roadway pavement. The project scope does not provide the opportunity to alter the vertical clearance situation. FHWA will be requested to coordinate with the Department of Defense – MTMCTEA at least three months before letting.

Geometric Design Exception Justification

Currently there is not any design exception for this section of the project.
Traffic Handling During Construction

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   (X) a. crossing of this roadway by bicycles and pedestrians ( ) will be (X) has been evaluated in the development of this project
   ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians ( ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:

   Mn/DOT Transit Office Bicycle and Pedestrian Section
   Minnesota Department of Natural Resources (MnDNR) Trails and Waterways Division
   Washington County
   City of Stillwater
   City of Oak Park Heights
   City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

Layout Status:

( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
HIGHWAY
GEOMETRIC DESIGN STANDARDS
FOR TRUNK HIGHWAY 36 EAST OF OSGOOD AVENUE
Highway Geometric Design Standards for TH 36 (east of Osgood Avenue)

Highway Type

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Lane Highway, Rural</td>
<td>12 ft</td>
<td>12 ft</td>
<td>12 ft</td>
<td>Table 2-5.07A</td>
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<tr>
<td>Two Lane Highway, Urban</td>
<td>10 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>Table 4-4.01A</td>
</tr>
<tr>
<td>Freeway, Rural</td>
<td>8 ft</td>
<td>10 ft</td>
<td>10 ft</td>
<td>Table 9-2.01A</td>
</tr>
<tr>
<td>Freeway, Urban</td>
<td>4 ft</td>
<td>6 ft</td>
<td>6 ft</td>
<td>Table 9-2.01A</td>
</tr>
<tr>
<td>(X) Proposed Typical Sections are in Attachment D.</td>
<td></td>
<td></td>
<td></td>
<td>Section 4-6.05</td>
</tr>
<tr>
<td>(X) Reduced layout is included in Attachment D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Critical Design Elements Table

- **Design Speed**: Design Speed selected for this project is 60 mph.
- **Traffic Volume**: Current ADT 20,500 veh./day (based on ( ) actual counts, (X) traffic flow map, dated 2002) Forecast ADT (2030) - 57,000 - based on Traffic Forecast # 8214 (Not required for Preservation projects)
- **Posted Speed**: The anticipated posted speed will be 60 mph.
- **Design Unit**: This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.
### Critical Design Element

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Alignment, Radius</td>
<td>1,480 ft</td>
<td>2,584 ft</td>
<td>1,340 ft</td>
<td>Table 3-2.03A or Table 3-2.03B</td>
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<tr>
<td>Grades, Percent</td>
<td>4.8 % max.</td>
<td>4.2 %</td>
<td>6 % max.</td>
<td>Table 3-4.02A</td>
</tr>
<tr>
<td>Vertical Alignment, K value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td>84 ft/% min. (3)</td>
<td>172 ft/% min.</td>
<td>151 ft/% min.</td>
<td>Figure 3-4.04A</td>
</tr>
<tr>
<td>Sag</td>
<td>94 ft/% min. (3)</td>
<td>152 ft/% min.</td>
<td>136 ft/% min.</td>
<td>Figure 3-4.04D</td>
</tr>
<tr>
<td>Normal Cross Slope</td>
<td>0.02 (3)</td>
<td>0.02</td>
<td>0.02</td>
<td>Table 4-3.01A</td>
</tr>
<tr>
<td>Superelevation</td>
<td>0.06 (3)</td>
<td>0.048 (4)</td>
<td>0.06 max.</td>
<td>Chapter 3, Section 3-3.0</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highway under bridge</td>
<td>16 ft-4 in</td>
<td>16.5 ft</td>
<td>16 ft-4 in</td>
<td>Table 9-2.01B</td>
</tr>
<tr>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>58.0 ft</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td>Highway under sign or pedestrian bridge</td>
<td>17 ft-5 in</td>
<td>17 ft-5 in</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
</tbody>
</table>

**Table Notes:**

* An asterisk preceding proposed condition indicates a Geometric Design Exception. See Geometric Design Exception Justification below for additional information.

(1) Based on urban approach cross section.

(2) Structural capacity studied for deck replacement options for the Lift Bridge as part of the 2005 Lift Bridge Repair Project (*Deck Replacement Study – Report of Findings. Stillwater Lift Bridge. March 21, 2005*).

(3) Existing condition critical design elements based on design standards for 50 mph posted speed.

(4) Based on 60 mph design speed.

**Interstate/STRAHNET system**

(X) This project does not involve work on the Interstate/STRAHNET system.

( ) This project involves work on the Interstate/STRAHNET system.

( ) At the completion of this project, all bridges will meet the 16 foot standard for vertical clearance over Interstate highways.

( ) At the completion of this project the vertical clearance of the bridge will remain unchanged. The scope of work involves limited repair of the bridge or roadway pavement. The project scope does not provide the opportunity to alter the vertical clearance situation. FHWA will be requested to coordinate with the Department of Defense – MTMCTEA at least three months before letting.

**Preservation projects where proposed Critical Elements are less than the New Construction Reconstruction standard:**

Not Applicable.
Geometric Design Exception Justification

A design exception is requested for “Stopping Sight Distance” for TH 36 east of Osgood Avenue to the St. Croix River crossing.

TH 36 has a design speed of 60 miles per hour (mph). The eastbound TH 36 alignment from Sta. 458+00 to Sta. 464+50 provides a stopping sight distance of 495 feet. This provided stopping sight distance of 495 feet does not meet the required 570-foot horizontal sight distance for a 60 mph design speed.

The eastbound TH 36 horizontal stopping sight distance obstruction is the bridge median barrier. As noted above, from Sta. 458+00 to Sta. 464+50, the 6-foot left shoulder provides a stopping sight distance of 495 feet. A 495-foot stopping sight distance is adequate for a 55 mph design speed. To obtain a 570-foot horizontal stopping sight distance, the left shoulder would need to be increased an additional 3.8 feet to 9.8 feet.

Trunk Highway 36 Partnership Study

In 2002, the TH 36 Partnership Study was established in to recommendations in the TH 36 Interregional Corridor (IRC) Management Plan (May 2001) to explore design concepts for the segment of TH 36 in Oak Park Heights and Stillwater from TH 5 to TH 95. A committee of representatives from Oak Park Heights, Stillwater, and Washington County, along with business owners and citizens formed a Policy Advisory Committee (PAC) to ensure that the Partnership Study reflected local concerns, to help identify alternatives, evaluate study findings, and make consensus recommendations regarding potential TH 36 designs.

The outcome of this process was the TH 36 Partnership Study Final Report (December 2002). This report documented the Partnership Study process, purpose, and PAC findings and recommendations. One of the recommendations documented in the Final Report was that a grade-separated facility with two interchanges and a maximum design speed of 45 mph should be the ultimate solution for this segment of TH 36 to provide adequate capacity and acceptable levels of operations.²

Supplemental Draft EIS Alternatives Development and Preliminary Roadway Design

Following re-initiation of the St. Croix River Crossing Project in 2002, a stakeholder panel was identified to help inform the decision-making process of the project proposers. The stakeholder panel, collectively referred to as the “Stakeholders Group”, was comprised of representatives of federal, state, and local governments, as well as other non-governmental groups.

Through the Stakeholder process, four Build Alternatives were developed and documented in a Supplemental Draft EIS (SDEIS). In order to reduce impacts to the environmental, historic, and social resources in the project area, several members of the Stakeholder Group proposed alternatives with structure heights and design speeds that were “lower and slower”. As a result of these concerns, and through negotiations with the Stakeholder Group, the SDEIS Build Alternatives were designed with this concept in mind. Part of the SDEIS Build Alternatives design also included addressing the transition from the higher design speeds at the Wisconsin approach (i.e., 70 mph) to the lower design speeds at the Minnesota approach and TH 36/95 interchange.

Design standards were minimized to the extent possible, where feasible, to reduce impacts, while still fulfilling the project purpose and need. Trunk Highway 36 design speeds for the SDEIS Build Alternatives east of Osgood Avenue (i.e., Minnesota approach) ranged from 30 mph for SDEIS Build Alternative E, 45 mph for SDEIS Build Alternatives C and D, and up to 55 mph for SDEIS Build Alternative B-1. Design speeds for the Wisconsin approach ranged from 30 mph on the westbound Wisconsin approach for SDEIS Build Alternative E, 55 mph for Alternative D, and 70 mph for SDEIS Build Alternatives B-1 and C.

SDEIS Alternative B-1 was identified as the Preferred Alternative river crossing in Fall 2004. The identification of

² See Recommendation #4 on page 15 of the TH 36 Partnership Study Final Report (December 2002).
Alternative B-1 as the Preferred Alternative included only identification of the Preferred Alternative bridge type; preliminary bridge design had not been completed at this point. In Spring 2005, the Preferred Alternative preliminary design layout was submitted for design review. The layout submitted at that time noted a 55 mph design for sight stopping distance on eastbound TH 36 east of the new river crossing bridge. In Summer 2005, Mn/DOT Geometrics Unit noted in their comments on the Level 1 Preliminary Geometric Layout that the design speed for the project should be increased from 55 mph to 60 mph. Mn/DOT staff approved the layout with a 55 mph design speed in July 2005.

Preliminary Bridge Design

The proposed project may require a stopping sight distance design exception. This design element will be reviewed further during preliminary bridge design and final roadway design (see discussion on page 7 of this Design Memorandum).

During preliminary bridge design, the following analyses will be considered:

1. Adjusting the center median to shift 2 feet from the TH 36 eastbound inside shoulder into the TH 36 westbound inside shoulder, resulting in an 8-foot inside shoulder for eastbound TH 36. Although this would still result in a substandard stopping sight distance for a 60 mph design, an 8-foot inside shoulder meets a stopping sight distance for a 58 mph design.

   This design modification would not result in any changes to the bridge width, and would therefore not increase project costs. Any increases in bridge width to address the stopping sight distance design exception would result in increased project costs;

2. Widening the bridge until the full 10-foot inside shoulder is achieved on eastbound TH 36 would provide a design speed of 60 mph, thereby eliminating the stopping sight distance design exception. This will require an economic analysis to document the costs associated with widening the bridge. In addition, in order to complete this analysis, the locations to taper into, and out of, the 10-foot inside shoulder on eastbound TH 36 would also have to be defined. Providing the 10-foot inside shoulder across the entire bridge from Minnesota to Wisconsin would substantially increase project costs; and

3. Construction feasibility for the new river crossing bridge will also be considered and documented with any alterations to the TH 36 alignment, profile, and cross section.

Final Roadway Design

The stopping sight distance design exception will also be evaluated during final roadway design. In order to further approach or meet the horizontal stopping sight distance design standard for 60 mph, final roadway designers would have to develop additional alignments, profiles, and cross sections to provide the additional 2 feet to the inside shoulder to meet a 58 mph design speed (see Item #1 on page 6), up to the full 10-foot inside shoulder for a 60 mph design speed for eastbound TH 36. Any alignment or profile adjustments to achieve this full 10-foot inside shoulder width must match the TH 36/95 interchange alignment and profile, as well as matching the alignment and profile in Wisconsin. Any subsequent environmental and social impacts as a result of alignment and profile adjustments would also have to be considered and appropriately documented.

Alternative Layout Development

The Geometrics Office could also develop an alternative roadway design layout that maintains the 6-foot inside shoulder on westbound TH 36 and includes a full 10-foot inside shoulder on eastbound TH 36 to eliminate the stopping sight distance design exception (see Item #2 above). If developed, this alternative layout could be considered during the preliminary bridge design and final roadway design phases described above.
During both the preliminary bridge design and final roadway design phases, bridge designers, roadway designers, and geometrics staff should work together to address alternatives to the eastbound TH 36 stopping sight distance design exception.

Traffic Handling During Construction
(explain how traffic will be handled during construction; attach detour map if applicable)

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   ( ) a. crossing of this roadway by bicycles and pedestrians ( ) will be ( ) has been evaluated in the development of this project
   ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians ( ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:

Mn/DOT Transit Office Bicycle and Pedestrian Section
MnDNR Trails and Waterways Division
Washington County
City of Stillwater
City of Oak Park Heights
City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

Layout Status:
 ( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
HIGHWAY
GEOMETRIC DESIGN STANDARDS
FOR TRUNK HIGHWAY 95
Highway Geometric Design Standards for TH 95

Highway Type

<table>
<thead>
<tr>
<th></th>
<th>Two Lane Highway, Rural</th>
<th>Multi-lane Divided Highway, Rural (High Speed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Lane Highway, Urban</td>
<td>Multi-lane Divided Highway, Urban (High Speed)</td>
<td></td>
</tr>
<tr>
<td>Freeway, Rural</td>
<td>X Multi-lane Divided Highway, Urban (Low Speed)</td>
<td></td>
</tr>
<tr>
<td>Freeway, Urban</td>
<td>Multi-lane Undivided Highway, Urban (Low Speed)</td>
<td></td>
</tr>
</tbody>
</table>

**Design Standard:** Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

**Design Parameters:**

**Functional Class:** ( ) Principal Arterial (X) Minor Arterial ( ) Collector

**Terrain:** ( ) Level (X) Rolling ( ) Rough

**Traffic Volume:**

Current ADT 13,400 veh./day

(based on ( ) actual counts, (X) traffic flow map, dated 2002)

Forecast ADT (2030) - 23,000 - based on Traffic Forecast # SP# 8214.

**Posted Speed:** The anticipated posted speed will be 30 mph.

**Design Unit:** This project will be designed in ( ) metric units (X) English units.

( ) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

**Critical Design Elements Table**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Speed</td>
<td>Design Speed selected for this project is 40 mph.</td>
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<tr>
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<td>12 ft</td>
<td>Chapter 2, Section 2-7.0</td>
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<tr>
<td>Shoulder Width Right</td>
<td>2 ft</td>
<td>6 ft</td>
<td>6 ft</td>
<td>Table 4-4.01A</td>
</tr>
<tr>
<td>Left</td>
<td>2 ft</td>
<td>2 ft</td>
<td>2 ft</td>
<td>Section 4-5.02.03</td>
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<tr>
<td>Bridge Shoulder Width</td>
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<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Table 9-2.01A</td>
</tr>
<tr>
<td>Right</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Table 9-2.01A</td>
</tr>
<tr>
<td>Left</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>Horizontal Clearance to Obstructions</td>
<td>1.5 ft</td>
<td>2 ft</td>
<td>1.5 ft</td>
<td>Section 4-6.05</td>
</tr>
<tr>
<td>Bridge Structural Capacity</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>All new bridges to have HS-25 Minimum design load</td>
<td>Chapter 9, Section 9-2.0</td>
</tr>
<tr>
<td>Stopping Sight Distance</td>
<td>425 ft</td>
<td>464 ft</td>
<td>305 ft min.</td>
<td>Table 2-5.09A</td>
</tr>
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</table>

Design Memorandum A-11 July 2006

With Design Exceptions

SP 8214-114 and SP 8217-12

TH 36 At-Grade Intersections
## Critical Design Elements

<table>
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<tr>
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<tbody>
<tr>
<td>Horizontal Alignment, Radius</td>
<td>1,600 ft</td>
<td>1,637 ft</td>
<td>450 ft min.</td>
<td>Table 3-2.03A or Table 3-2.03B</td>
</tr>
<tr>
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<td>4.5 % max.</td>
<td>9 % max.</td>
<td>Table 3-4.02A</td>
</tr>
<tr>
<td>Vertical Alignment, K value</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td>84 ft/% min.</td>
<td>133 ft/% min.</td>
<td>44 ft/% min.</td>
<td>Figure 3-4.04A</td>
</tr>
<tr>
<td>Sag</td>
<td>96 ft/% min.</td>
<td>100 ft/% min.</td>
<td>64 ft/% min.</td>
<td>Figure 3-4.04D</td>
</tr>
<tr>
<td>Normal Cross Slope</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>Table 4-3.01A</td>
</tr>
<tr>
<td>Superelevation</td>
<td>0.06</td>
<td>Normal Crown</td>
<td>0.06 max.</td>
<td>Chapter 3, Section 3-3.0</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highway under bridge</td>
<td>16 ft-4 in</td>
<td>16.7 ft</td>
<td>16 ft-4 in</td>
<td>Table 9-2.01B</td>
</tr>
<tr>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
</tbody>
</table>

### Table Notes:

* An asterisk preceding proposed condition indicates a Geometric Design Exception. See Geometric Design Exception Justification below for additional information.

### Interstate/STRAHNET system

(X) This project does not involve work on the Interstate/STRAHNET system.

( ) This project involves work on the Interstate/STRAHNET system.

( ) At the completion of this project, all bridges will meet the 16 foot standard for vertical clearance over Interstate highways.

( ) At the completion of this project the vertical clearance of the bridge will remain unchanged. The scope of work involves limited repair of the bridge or roadway pavement. The project scope does not provide the opportunity to alter the vertical clearance situation. FHWA will be requested to coordinate with the Department of Defense – MTMCTEA at least three months before letting.

### Geometric Design Exception Justification

Currently there is not any design exception for the section of the project.

### Traffic Handling During Construction

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.
Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   ( ) a. crossing of this roadway by bicycles and pedestrians ( ) will be ( ) has been evaluated in the
development of this project
   ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not
required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and
   pedestrians ( ) will be (X) has been evaluated.

   A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop
   trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph,
   Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles
   and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for
   information to coordinate this project with existing and proposed bikeways:

   Mn/DOT Transit Office Bicycle and Pedestrian Section
   MnDNR Trails and Waterways Division
   Washington County
   City of Oak Park Heights
   City of Stillwater
   City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian
   Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see

Layout Status:

( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006
ATTACHMENT B

GEOMETRIC DESIGN STANDARDS/TABLES

TRUNK HIGHWAY 36/95 INTERCHANGE
RAMP
GEOMETRIC DESIGN STANDARDS
FOR THE
TH 36/TH 95 INTERCHANGE
TH 36/95 Interchange Ramp Geometric Design Standards

<table>
<thead>
<tr>
<th>Ramp Locations</th>
<th>Ramp Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>R.P.</td>
</tr>
<tr>
<td>TH 36</td>
<td>STA 438+96</td>
</tr>
<tr>
<td>TH 36</td>
<td>STA 476+33</td>
</tr>
<tr>
<td>TH 36</td>
<td>STA 441+78</td>
</tr>
<tr>
<td>TH 36</td>
<td>STA 470+74</td>
</tr>
</tbody>
</table>

**Design Standard:** Design of this project will follow Mn/DOT’s New Construction/Reconstruction standards.

**Design Parameters:**

Drainage Type: (X) Urban (curb and gutter) (NW, NE, SE ramps) (X) Rural (ditches) (SW ramp only)

Mainline Design Speed: The Design Speed selected for this project is 55 mph.

Traffic Control: ( ) Metered ( ) Metered with HOV Bypass (X) Traffic Signal at ramp terminal ( ) none

Design Unit: This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

**Critical Design Elements Table**

Critical design elements table for TH 36/95 interchange ramps is located on following page.
## Critical Design Elements Table

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NW TH 36/95 Ramp Type 1</td>
<td>NE TH 36/95 Ramp Type 1</td>
<td>SW TH 36/95 Ramp Type 1</td>
</tr>
<tr>
<td><strong>Ramp Design Speed (At the Terminal) (At the Nose)</strong></td>
<td>YES (25 mph)</td>
<td>YES (25 mph)</td>
<td>YES (25 mph)</td>
</tr>
<tr>
<td><strong>Ramp Pavement Width (Single Lane)</strong></td>
<td>YES (16 ft)</td>
<td>YES (26 ft)</td>
<td>YES (16 ft)</td>
</tr>
<tr>
<td><strong>Ramp Length Acceleration Length</strong></td>
<td>YES (590 ft)</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Deceleration Length</strong></td>
<td>Not Applicable</td>
<td>YES (371 ft)</td>
<td>YES (376 ft)</td>
</tr>
<tr>
<td><strong>Horizontal Clearance to Obstruction</strong></td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Stopping Sight Distance</strong></td>
<td>YES (1,898 ft)</td>
<td>YES (1,118 ft)</td>
<td>YES (2,315 ft)</td>
</tr>
<tr>
<td><strong>Horizontal Alignment Radius</strong></td>
<td>YES (5,729 ft)</td>
<td>YES (954 ft)</td>
<td>YES (572 ft)</td>
</tr>
<tr>
<td><strong>Grades, Percent</strong></td>
<td>YES (4.40 %)</td>
<td>YES (1.25 %)</td>
<td>YES (4.00 %)</td>
</tr>
<tr>
<td><strong>Vertical Alignment, K value</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td>YES (333 ft/%)</td>
<td>YES (416 ft/%)</td>
<td>YES (666 ft/%)</td>
</tr>
<tr>
<td>Sag</td>
<td>YES (77 ft/%)</td>
<td>YES (266 ft/%)</td>
<td>YES (85 ft/%)</td>
</tr>
<tr>
<td><strong>Cross Slope</strong></td>
<td>YES (0.02)</td>
<td>YES (0.02)</td>
<td>YES (0.02)</td>
</tr>
</tbody>
</table>

**Table Notes:**
A ‘No’ answer indicates a Geometric Design Exception. See Geometric Design Exception Justification below for additional information.
### Critical Design Elements Table

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NW TH 36/95 Ramp Type 1</td>
<td>NE TH 36/95 Ramp Type 1</td>
<td>SW TH 36/95 Ramp Type 1</td>
</tr>
<tr>
<td>Superelevation</td>
<td>YES (0.06)</td>
<td>YES (0.06)</td>
<td>YES (0.06)</td>
</tr>
<tr>
<td>Bridge Width</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Bridge Structural Capacity</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td>Highway under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

**Table Notes:**
A ‘No’ answer indicates a Geometric Design Exception. See Geometric Design Exception Justification below for additional information.

**Geometric Design Exception Justification**
Within these sections there are no design exceptions in the Critical Design Elements table above.
ATTACHMENT C

GEOMETRIC DESIGN STANDARDS/TABLES

TRUNK HIGHWAY 36 FRONTAGE ROADS AND LOCAL ROADWAYS
Mn/DOT STATE AID
GEOMETRIC DESIGN STANDARDS
FOR TRUNK HIGHWAY 36 NORTH FRONTAGE ROAD
AND SOUTH FRONTAGE ROAD
North Frontage Road Geometric Design Standards

Design Standard: Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

Design Parameters:

Functional Class: ( ) Principal Arterial ( ) Minor Arterial (X) Collector

Terrain: ( ) Level (X) Rolling ( ) Rough

Traffic Volume: Current ADT____ veh./day (see below)

Heavy Commercial ADT____ veh/day (see below)

(based on ( ) actual counts, (X) traffic flow map, dated 2002)

<table>
<thead>
<tr>
<th>Existing (2002)</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,950&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>


<sup>(2)</sup> Existing ADT calculated under the assumption that year 2002 peak hour volumes were 10 percent of year 2002 ADT (i.e., year 2002 p.m. peak hour volumes = 0.10 x year 2002 ADT). North frontage road p.m. peak hour volume between Greeley Street and Osgood Avenue is shown above.


<sup>(4)</sup> Forecast ADT calculated under the assumption that year 2030 p.m. peak hour volumes were 10 percent of year 2030 ADT (i.e., year 2030 p.m. peak hour volumes = 0.10 x year 2030 ADT). North frontage road p.m. peak hour volume between Greeley Street and Osgood Avenue is shown above.

Posted Speed: The anticipated posted speed will be 25 mph.

Design Unit: This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

Critical Design Elements Table

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Speed</td>
<td>Design Speed selected for this project is 30 mph.</td>
<td></td>
<td></td>
<td>8820.9936</td>
</tr>
<tr>
<td>Surface Type</td>
<td>Bituminous</td>
<td>Bituminous</td>
<td>Paved</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Surface Structural Capacity</td>
<td>9 ton</td>
<td>10 ton</td>
<td>10 ton</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Lane Width</td>
<td>12 ft</td>
<td>12 ft</td>
<td>12 ft</td>
<td>8820.9936</td>
</tr>
</tbody>
</table>

Design Memorandum C-1 July 2006

With Design Exceptions
SP 8214-114 and SP 8217-12
TH 36 At-Grade Intersections
### Critical Design Element

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder Width</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>2 ft</td>
<td>6 ft</td>
<td>2 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Left</td>
<td>2 ft</td>
<td>6 ft</td>
<td>2 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Inslope Ratio</td>
<td>1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td>Road Design Manual Section 4-6.01</td>
</tr>
<tr>
<td>Main Roadway</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crossroads &amp; Drives</td>
<td>1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td></td>
</tr>
<tr>
<td>Recovery Area</td>
<td>1.5 ft (1)</td>
<td>6 ft</td>
<td>1.5 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Proposed Right of Way Width</td>
<td>Not Applicable</td>
<td>Varies</td>
<td>60 ft</td>
<td>8820.2500</td>
</tr>
<tr>
<td>Stopping Sight Distance</td>
<td>200 ft (1)</td>
<td>305 ft</td>
<td>200 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Horizontal Alignment, Radius</td>
<td>235 ft</td>
<td>163 ft</td>
<td>300 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Grades, Percent</td>
<td>2.0 % (±)</td>
<td>2.15 %</td>
<td>8.0 %</td>
<td>Road Design Manual Section 3-4.02.01</td>
</tr>
<tr>
<td>Vertical Alignment, K value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td>19 ft/% min. (1)</td>
<td>145 ft/% min.</td>
<td>19 ft/% min.</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Sag</td>
<td>37 ft/% min. (1)</td>
<td>45 ft/% min.</td>
<td>37 ft/% min.</td>
<td></td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highway under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>16 ft-4 in</td>
<td>8820.9956</td>
</tr>
<tr>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Locations</td>
<td>None</td>
<td>Greeley Street (2)</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Trail Width</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>8 ft</td>
<td>8820.9995</td>
</tr>
<tr>
<td>Curb Ramps for Handicapped</td>
<td>Not Applicable</td>
<td>Provided</td>
<td>Provide</td>
<td>ADA</td>
</tr>
<tr>
<td>Project Length</td>
<td>Not Applicable</td>
<td>1.05 miles</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

(1) Existing condition critical design elements based on design standards for 30 mph design speed.

(2) If warranted.

### Geometric Design Exception Justification

A design exception is requested for the “Horizontal Alignment Radius” of the TH 36 north frontage road to the east and west of the north frontage road/Greeley Avenue (CSAH 66) intersection.

The north frontage road has a design speed of 30 miles per hour (mph). Urban design criteria are used for the north frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The north frontage road alignment from Sta. 378+49 to Sta. 389+54 provides a four horizontal curve alignment that does not meet the required 300-foot radius for a roadway section with a normal crown (e=N.C.) and a 30 mph design speed. At full super-elevation (e=0.06) and 30 mph design speed, a 215-foot minimum radius would be required. The tangent length required between curves to match the full super-elevation runoff length at a 30 mph design speed is 230 feet. Under the proposed project, the tangent length between horizontal curves is insufficient to provide this super-elevation runoff length. The geometrics for these four horizontal curves along the north frontage road at...
Greeley Avenue, from west to east, are described below.

North frontage road curve A (Sta. 378+49 to Sta. 381+18) provides a 25 mph curve (R=212 ft; e=N.C.), a 103-foot tangent, followed by north frontage road curve B (Sta. 382+22 to Sta. 384+90) (25 mph curve; R=212 ft; e=N.C.). The north frontage road then intersects with Greeley Avenue.

North frontage road curve C (Sta. 383+65 to Sta. 386+20) provides a 20 mph curve (R=163 ft; e=N.C.), an 80-foot tangent, followed by north frontage road curve D (Sta. 387+00 to Sta. 389+54) (20 mph curve; R=163 ft; e=N.C.). The north frontage road then continues east parallel to TH 36.

These curves were used to minimize right of way impacts to commercial property along the north frontage road and to minimize fill impacts to an existing drainage pond along the east side of Greeley Avenue. The horizontal alignment of the north frontage road east of Greeley Avenue and west of Greeley Avenue are interdependent on one another to provide the new signalized intersection with Greeley Avenue.

This design previously received staff approval in May of 1994. The right of way for the north frontage road was secured for construction of the St. Croix River Crossing Project prior to its suspension in 1996. Shifting the horizontal alignment of the north frontage road outside the 1994 planned original alignment would result in right of way and fill impacts as noted above.

Environmental Mitigations

Mitigation for the St. Croix River Crossing Project Preferred Alternative is discussed in Chapter 15 of the 2006 SFEIS.

Future Improvements

Currently there are not any future proposed improvements planned for this highway section.

Estimated cost of Project

The estimated cost for the Preferred Alternative is between $306 million and $322 million (2004 dollars). Refer to Chapter 3 of the 2006 SFEIS for additional project cost information.

Miscellaneous

Typical sections of the proposed north frontage road are included in Attachment D.

Traffic Handling During Construction
(explain how traffic will be handled during construction; attach detour map if applicable)

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   (   ) a. crossing of this roadway by bicycles and pedestrians (   ) will be (   ) has been evaluated in the development of this project
   (   ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).
2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians ( ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:

Mn/DOT Transit Office Bicycle and Pedestrian Section
MnDNR Trails and Waterways Division
Washington County
City of Stillwater
City of Oak Park Heights
City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

Layout Status:

( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
South Frontage Road Geometric Design Standards

**Design Standard:** Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

**Design Parameters:**

**Functional Class:**

( ) Principal Arterial  ( ) Minor Arterial  (X) Collector

**Terrain:**

( ) Level  (X) Rolling  ( ) Rough

**Traffic Volume:**

Current ADT _____ veh./day (see below)

Heavy Commercial ADT _____ veh/day (see below)

(based on ( ) actual counts, (X) traffic flow map, dated 2002)

<table>
<thead>
<tr>
<th>ADTs</th>
<th>Existing (2002) (1)</th>
<th>2030 (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Traffic Vol.</td>
<td>6,150 (1)</td>
<td>9,550 (2)</td>
</tr>
<tr>
<td>Heavy Commercial</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>


(2) Existing ADT calculated under the assumption that year 2002 peak hour volumes were 10 percent of year 2002 ADT (i.e., year 2002 p.m. peak hour volumes = 0.10 x year 2002 ADT). North frontage road p.m. peak hour volume between Greeley Street and Osgood Avenue is shown above.


(4) Forecast ADT calculated under the assumption that year 2030 p.m. peak hour volumes were 10 percent of year 2030 ADT (i.e., year 2030 p.m. peak hour volumes = 0.10 x year 2030 ADT). North frontage road p.m. peak hour volume between Greeley Street and Osgood Avenue is shown above.

**Posted Speed:** The anticipated posted speed will be 25 mph.

**Design Unit:** This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

**Critical Design Elements Table**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Speed</td>
<td>Design Speed selected for this project is 30 mph.</td>
<td></td>
<td></td>
<td>8820.9936</td>
</tr>
<tr>
<td>Surface Type</td>
<td>Bituminous</td>
<td>Bituminous</td>
<td>Paved</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Surface Structural Capacity</td>
<td>9 ton</td>
<td>10 ton</td>
<td>10 ton</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Lane Width</td>
<td>12 ft</td>
<td>12 ft</td>
<td>12 ft</td>
<td>8820.9936</td>
</tr>
</tbody>
</table>
### Geometric Design Exception Justification

#### South Frontage Road (Oakgreen Avenue Intersection)

A design exception is requested for the “Horizontal Alignment Radius” of the TH 36 south frontage road to the east and west of the south frontage road/Oakgreen Avenue intersection.

The south frontage road has a design speed of 30 mph. Urban design criteria are used for the south frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The south frontage road alignment from Sta. 376+91 to Sta. 384+72 and from Sta. 376+01 to Sta. 388+04 provides a four horizontal curve alignment that does not meet the required 300-foot radius for a roadway section with a normal

---

**Critical Design Element** | **Existing Condition, Minimum** | **Proposed Condition, Minimum** | **Standard for New Construction/Reconstruction** | **Reference State Aid Rules**
--- | --- | --- | --- | ---
**Shoulder Width** | Right 2 ft | 6 ft | 2 ft | 8820.9936
| Left 2 ft | 6 ft | 2 ft | 8820.9936
**Inslope Ratio** | Main Roadway 1:3 | 1:3 or Flatter | 1:3 | Road Design Manual Section 4-6.01
| Crossroads & Drives 1:3 | 1:3 or Flatter | 1:3 | 8820.9936
**Recovery Area** | 1.5 ft (1) | 6 ft | 1.5 ft | 8820.9936
**Proposed Right of Way Width** | Not Applicable | Varies | 60 ft | 8820.2500
**Stopping Sight Distance** | 200 ft (1) | 305 ft | 200 ft | 8820.9936
**Horizontal Alignment, Radius** | 65 ft | 120 ft | 300 ft | 8820.9936
**Grades, Percent** | 5.3 % (±) | 6.0 % | 8.0 % | Road Design Manual Section 3-4.02.01
**Vertical Alignment, K value** | Crest 19 ft/% min. (1) | 63.6 ft/% min. | 19 ft/% min. | 8820.9936
| Sag 37 ft/% min. (1) | 60.0 ft/% min. | 37 ft/% min. | 8820.9936
**Vertical Clearance** | Highway under bridge Not Applicable | Not Applicable | 16 ft-4 in | 8820.9956
| Railroad under bridge Not Applicable | Not Applicable | 23 ft-0 in | 8820.9956
| Highway under sign or pedestrian bridge Not Applicable | Not Applicable | 17 ft-5 in | 8820.9956
**Traffic Signal Locations** | None | Oakgreen Avenue (2) | Not Applicable | Not Applicable
**Trail Width (3)** | 10 ft | 10 ft | 8 ft | 8820.9995
**Curb Ramps for Handicapped** | Not Applicable | Provided | Provide | ADA
**Project Length** | Not Applicable | 2.03 miles | Not Applicable | Not Applicable

(1) Existing condition critical design elements based on design standards for 30 mph design speed.
(2) If warranted.
(3) West of Washington Avenue/Norell Avenue.

---

**Design Memorandum** C-6 July 2006

With Design Exceptions
SP 8214-114 and SP 8217-12
TH 36 At-Grade Intersections
crown (e=N.C.) and a 30 mph design speed. At full super-elevation (e=0.06) and 30 mph design speed, a 215-foot minimum radius would be required. The tangent length required between curves to provide super-elevation runoff lengths at a 30 mph design speed is 230 feet. Under the proposed project, the tangent length between horizontal curves is insufficient to provide super-elevation runoff lengths. The geometrics for these four horizontal curves along the south frontage road at Oakgreen Avenue, from west to east, are described below.

South frontage road curve A (Sta. 376+91 to Sta. 380+67) provides a 25 mph curve (R=197 ft; e=N.C.), a 48-foot tangent, followed by south frontage road curve B (Sta. 381+46 to Sta. 384+72) (25 mph curve; R=280 ft; e=N.C.). The south frontage road then intersects with Oakgreen Avenue.

South frontage road curve C (Sta. 376+01 to Sta. 380+26) provides a 25 mph curve (R=216 ft; e=N.C.), a 407-foot tangent, followed by south frontage road curve D (Sta. 384+33 to Sta. 388+04) (25 mph curve; R=280 ft; e=N.C.). The south frontage road continues east parallel to TH 36.

This design was used to minimize right of way impacts to commercial and residential properties along the south side of the south frontage road, to minimize impacts to wetlands along Oakgreen Avenue, and to avoid electrical transmission line towers. A utility line corridor crosses Oakgreen Avenue approximately 500 feet south of the existing Oakgreen Avenue/south frontage road intersection. Under the proposed project, the new Oakgreen Avenue/south frontage road intersection will be located within the utility corridor. Existing electric transmission towers will be located at the northeast quadrant of the Oakgreen Avenue/south frontage road intersection.

This design previously received staff approval in May of 1994. The right of way for the south frontage road was secured for construction of the St. Croix River Crossing Project prior to its suspension in 1996.

South Frontage Road (Eastern Terminus with Stagecoach Trail)

A design exception is requested for “Horizontal Alignment Radius” of the TH 36 south frontage road at its eastern terminus with Stagecoach Trail. This design is included with both the 2006 SFEIS Preferred Alternative and the Concept F Alternative.

The south frontage road has a design speed of 30 mph. Urban design criteria are used for the south frontage road in conformance with Minnesota State Aid Rule 8820.9936.

The south frontage road alignment from Sta. 459+41 to Sta. 461+24 provides a horizontal curve that does not meet the required 300-foot radius for a roadway section with a normal crown (e=N.C.) designed to a 30 mph design speed. At full super-elevation (e=0.06) and 30 mph design speed, a 215-foot radius would be required.

The south frontage road alignment from Sta. 459+41 to Sta. 461+24 provides a horizontal curve radius of 120 feet with a normal crown (e=N.C.), which corresponds to a 20 mph design speed. This is 180 feet below the 30 mph design standard with a normal crown, or 95 feet below the 30 mph design standard with a super-elevation of e=0.06.

The radius of the existing roadway is approximately 50 feet. Land use south and west of the existing roadway is residential. The proposed design for the south frontage road was used to minimize right of way impacts to residential properties to the south of the south frontage road and west of Stagecoach Trail and to stay within existing right of way to the extent feasible. The proposed design also accommodates a trail connection from the new bridge and also maximizes the amount of land available between the south frontage road and the TH 36/95 ramp for potential stormwater treatment.

Environmental Mitigations

Mitigation for the St. Croix River Crossing Project Preferred Alternative is discussed in Chapter 15 of the 2006 SFEIS.
**Future Improvements**

Currently there are not any future proposed improvements planned for this highway section.

**Estimated cost of Project**

The estimated cost for the Preferred Alternative is between $305 million and $373 million (2004 dollars). Refer to Chapter 3 of the 2006 SFEIS for additional project cost information.

**Miscellaneous**

Typical sections of the proposed south frontage road are included in Attachment D.

**Traffic Handling During Construction**

(explain how traffic will be handled during construction; attach detour map if applicable)

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

**Bicycle and Pedestrian Considerations**

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   - ( ) a. crossing of this roadway by bicycles and pedestrians ( ) will be ( ) has been evaluated in the development of this project
   - ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians ( ) will be (X) has been evaluated.

   A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:
   - Mn/DOT Transit Office Bicycle and Pedestrian Division
   - MnDNR Trails and Waterways Division
   - Washington County
   - City of Stillwater
   - City of Oak Park Heights
   - City of Bayport
5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

Layout Status:
( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
Mn/DOT STATE AID
GEOMETRIC DESIGN STANDARDS
FOR OAKGREEN AVENUE/GREELEY STREET AND
OSGOOD AVENUE
Oakgreen Avenue/Greeley Street Geometric Design Standards

Design Standard: Design of this project will follow Mn/DOT’s ( ) Preservation
(X) New Construction/Reconstruction standards for the above referenced highway type.

Design Parameters:

- **Functional Class:** ( ) Principal Arterial (X) Minor Arterial ( ) Collector
- **Terrain:** ( ) Level (X) Rolling ( ) Rough

**Traffic Volume:**
- Current ADT ____ veh./day (see below)
- Heavy Commercial ADT ____ veh/day (see below)
(based on ( ) actual counts, (X) traffic flow map, dated 2002)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>10,000 (2)</td>
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<td>12,900 (2)</td>
</tr>
</tbody>
</table>

(2) Greeley Street ADT, between north frontage road and Shelton Drive.

**Posted Speed:** The anticipated posted speed will be 30 mph.
**Design Unit:** This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.
(X) Reduced layout is included in Attachment D.

**Critical Design Elements Table**

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Surface Structural Capacity</td>
<td>9 ton</td>
<td>10 ton</td>
<td>10 ton</td>
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<tr>
<td>Lane Width</td>
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<td>12 ft</td>
<td>12 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Shoulder Width</td>
<td>Right 2 ft</td>
<td>2 ft</td>
<td>2 ft</td>
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</tr>
<tr>
<td></td>
<td>Left 2 ft</td>
<td>2 ft</td>
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<td>Inslope Ratio</td>
<td>Main Roadway 1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td>Road Design Manual Section 4-6.01</td>
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<td></td>
<td>Crossroads &amp; Drives 1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td></td>
</tr>
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<td>Recovery Area</td>
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<td>1.5 ft</td>
<td>8820.9936</td>
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<td>Proposed Right of Way Width</td>
<td>Not Applicable</td>
<td>Varies</td>
<td>60 ft</td>
<td>8820.2500</td>
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</tbody>
</table>

Design Memorandum C-11 July 2006
With Design Exceptions
SP 8214-114 and SP 8217-12
TH 36 At-Grade Intersections
### Geometric Design Exception Justification

Currently there is not any design exception for this section of the project.

### Environmental Mitigations

Mitigation for the St. Croix River Crossing Project Preferred Alternative is discussed in Chapter 15 of the 2006 SFEIS.

### Future Improvements

Currently there are not any future proposed improvements planned for this highway section.

### Estimated cost of Project

The estimated cost for the Preferred Alternative is between $305 million and $373 million (2004 dollars). Refer to Chapter 3 of the 2006 SFEIS for additional project cost information.

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<table>
<thead>
<tr>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
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<td>37 ft/% min.</td>
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<td>16 ft-4 in</td>
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<tr>
<td></td>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Locations</td>
<td>At TH 36</td>
<td>At TH 36</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Trail Width</td>
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<td>8 ft</td>
<td>8820.9995</td>
</tr>
<tr>
<td>Curb Ramps for Handicapped</td>
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<td>Provided</td>
<td>Provide</td>
<td>ADA</td>
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<td>Project Length</td>
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<td>0.51 miles</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
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</table>

(1) Existing condition critical design elements based on design standard for 30 mph design speed.
Miscellaneous

Typical sections of the proposed Oakgreen Avenue/Greeley Street are included on the staff approved layout.

Traffic Handling During Construction
(explain how traffic will be handled during construction; attach detour map if applicable)

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   (  ) a. crossing of this roadway by bicycles and pedestrians (  ) will be (  ) has been evaluated in the development of this project
   (  ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians (  ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. (  ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that (  ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:
   Mn/DOT Transit Office Bicycle and Pedestrian Section
   MnDNR Trails and Waterways Division
   Washington County
   City of Stillwater
   City of Oak Park Heights
   City of Bayport

5. (X) Preliminary layouts and/or draft layouts (  ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

Layout Status:
(  ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) (  ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
Osgood Avenue Geometric Design Standards

Design Standard: Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

Design Parameters:

**Functional Class:** ( ) Principal Arterial (X) Minor Arterial ( ) Collector

**Terrain:** ( ) Level (X) Rolling ( ) Rough

**Traffic Volume:** Current ADT _____ veh./day (see below)

Heavy Commercial ADT _____ veh/day (see below)

(based on ( ) actual counts, (X) traffic flow map, dated 2002)

<table>
<thead>
<tr>
<th>ADTs</th>
<th>Existing (2002)</th>
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</thead>
<tbody>
<tr>
<td>12,000 (2)</td>
<td>Not Applicable</td>
<td>22,000 (2)</td>
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</tbody>
</table>


(2) Osgood Avenue ADT, between south frontage road and 58th Street North.

**Posted Speed:** The anticipated posted speed will be 25 mph.

**Design Unit:** This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

Critical Design Elements Table

<table>
<thead>
<tr>
<th></th>
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<tbody>
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<td>Bituminous</td>
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<tr>
<td>Surface Structural Capacity</td>
<td>9 ton</td>
<td>10 ton</td>
<td>10 ton</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Lane Width</td>
<td>12 ft</td>
<td>12 ft</td>
<td>12 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Shoulder Width Right</td>
<td>2 ft</td>
<td>2 ft</td>
<td>2 ft</td>
<td>8820.9936</td>
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<td>Left</td>
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<td>2 ft</td>
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<td>8820.9936</td>
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<tr>
<td>Inslope Ratio Main Roadway</td>
<td>1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td>Road Design Manual Section 4-6.01</td>
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<tr>
<td>Crossroads &amp; Drives</td>
<td>1:3</td>
<td>1:3 or Flatter</td>
<td>1:3</td>
<td></td>
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<tr>
<td>Recovery Area</td>
<td>1.5 ft(1)</td>
<td>2 ft</td>
<td>1.5 ft</td>
<td>8820.9936</td>
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<td>Proposed Right of Way Width</td>
<td>Not Applicable</td>
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(1) Not Applicable

Design Memorandum C-14 July 2006
With Design Exceptions
SP 8214-114 and SP 8217-12
TH 36 At-Grade Intersections
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<td>Stopping Sight Distance</td>
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<td>200 ft</td>
<td>8820.9936</td>
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<td>5730 ft</td>
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<tr>
<td>Vertical Clearance</td>
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<tr>
<td>Highway under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>16 ft-4 in</td>
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<td>Railroad under bridge</td>
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<td>23 ft-0 in</td>
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<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
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<tr>
<td>Traffic Signal Locations</td>
<td>At TH 36</td>
<td>At TH 36</td>
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<td>Not Applicable</td>
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<tr>
<td>Trail Width</td>
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<td>8 ft</td>
<td>8820.9995</td>
</tr>
<tr>
<td>Curb Ramps for Handicapped</td>
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(1) Existing condition critical design elements based on design standard for 30 mph design speed.

Geometric Design Exception Justification

Currently there is not any design exception for the section of the project.

Environmental Mitigations

Mitigation for the St. Croix River Crossing Project Preferred Alternative is discussed in Chapter 15 of the 2006 SFEIS.

Future Improvements

Currently there are not any future proposed improvements planned for this highway section.

Estimated cost of Project

The estimated cost for the Preferred Alternative is between $305 million and $373 million (2004 dollars). Refer to Chapter 3 of the 2006 SFEIS for additional project cost information.
**Miscellaneous**

Typical sections of the proposed Osgood Avenue are included on the staff approved layout.

**Traffic Handling During Construction**
*(explain how traffic will be handled during construction; attach detour map if applicable)*

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

**Bicycle and Pedestrian Considerations**

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   
   ( ) a. crossing of this roadway by bicycles and pedestrians ( ) will be ( ) has been evaluated in the development of this project
   ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and pedestrians ( ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph, Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles and pedestrians must be provided).

4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:

   Mn/DOT Transit Office Bicycle and Pedestrian Section
   MnDNR Trails and Waterways Division
   Washington County
   City of Stillwater
   City of Oak Park Heights
   City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

**Layout Status:**

( ) A geometric layout is not required for this project.

(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.

(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
Mn/DOT STATE AID
GEOMETRIC DESIGN STANDARDS
FOR BEACH ROAD
Beach Road Geometric Design Standards

Design Standard:  Design of this project will follow Mn/DOT’s

( ) Preservation

(X) New Construction/Reconstruction standards for the above referenced highway type.

Design Parameters:

**Functional Class:**  
( ) Principal Arterial  ( ) Minor Arterial  (X) Collector

**Terrain:**  
( ) Level  (X) Rolling  ( ) Rough

**Traffic Volume:**  
Current ADT ___ veh./day (see below)

Heavy Commercial ADT ___ veh/day (see below)

(based on ( ) actual counts, (X) traffic flow map, dated 2002)

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<thead>
<tr>
<th>ADTs</th>
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<tbody>
<tr>
<td></td>
<td>9,000</td>
<td>Not Applicable</td>
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</table>


**Posted Speed:**  
The anticipated posted speed will be 25 mph.

**Design Unit:**  This project will be designed in ( ) metric units (X) English units.

(X) Proposed Typical Sections are in Attachment D.

(X) Reduced layout is included in Attachment D.

Critical Design Elements Table

<table>
<thead>
<tr>
<th></th>
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<tbody>
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<td>12 ft</td>
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<tr>
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<td>Shoulder Width Left</td>
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<tr>
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<td>Road Design Manual Section 4-6.01</td>
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<td>Crossroads &amp; Drives</td>
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<tr>
<td>Recovery Area</td>
<td>1.5 ft (1)</td>
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<td>1.5 ft</td>
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<tr>
<td>Proposed Right of Way Width</td>
<td>Not Applicable</td>
<td>Varies</td>
<td>60 ft</td>
<td>8820.2500</td>
</tr>
</tbody>
</table>

(1) Roadway Width

Design Memorandum  C-18  July 2006

With Design Exceptions

SP 8214-114 and SP 8217-12

TH 36 At-Grade Intersections
### Geometric Design Exception Justification

A design exception is requested for “Vertical Alignment, Sag K Value” of Beach Road near its intersection with the south frontage road.

Beach Road has a design speed of 30 mph. Urban design criteria are used for Beach Road in conformance with Minnesota State Aid Rule 8820.9936.

The Beach Road alignment from Sta. 10+00 to Sta. 11+35 provides a vertical curve that does not meet the required 37 ft/% minimum vertical alignment, sag K value for a roadway section designed to a 30 mph design speed.

The Beach Road alignment from Sta. 10+00 to Sta. 11+35 provides a vertical curve sag K value of 31 ft %, which corresponds to a 25 mph design speed. This is 6 ft % below the 30 mph design standard.

The vertical curve is located adjacent to the Beach Road/south frontage road intersection, with a stop condition for Beach Road at the south frontage road. The vertical curve is currently designed to provide a low-point on Beach

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**Design Memorandum C-19**

**With Design Exceptions**

SP 8214-114 and SP 8217-12

TH 36 At-Grade Intersections

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**Critical Design Element**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopping Sight Distance</td>
<td>200 ft (1)</td>
<td>425 ft</td>
<td>200 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Horizontal Alignment, Radius</td>
<td>110 ft</td>
<td>818 ft</td>
<td>300 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Grades, Percent</td>
<td>5.7 % (±)</td>
<td>3.9 %</td>
<td>8.0 %</td>
<td>Road Design Manual Section 3-4.02.01</td>
</tr>
<tr>
<td>Vertical Alignment, K value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crest</td>
<td>19 ft/% (1)</td>
<td>290.9 ft/%</td>
<td>19 ft/%</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Sag</td>
<td>37 ft/% (1)</td>
<td>31 ft/%</td>
<td>37 ft/%</td>
<td></td>
</tr>
<tr>
<td>Bridge Lane Width</td>
<td>12 ft</td>
<td>12 ft</td>
<td>12 ft</td>
<td>8820.9922</td>
</tr>
<tr>
<td>Bridge Shoulder Width</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>4 ft</td>
<td>4 ft</td>
<td>2 ft</td>
<td>8820.9936</td>
</tr>
<tr>
<td>Left</td>
<td>4 ft</td>
<td>4 ft</td>
<td>4 ft</td>
<td></td>
</tr>
<tr>
<td>Bridge Structural Capacity (2)</td>
<td>Existing design load not known</td>
<td>Will meet HS-25 Min. design Load</td>
<td>All new bridges to have HS-25 Minimum design load</td>
<td>Road Design Manual Section 9-2.0</td>
</tr>
<tr>
<td>Vertical Clearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highway under bridge</td>
<td>16 ft-4 in</td>
<td>16.5 ft</td>
<td>16 ft-4 in</td>
<td>8820.9956</td>
</tr>
<tr>
<td>Railroad under bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>23 ft-0 in</td>
<td></td>
</tr>
<tr>
<td>Highway under sign or pedestrian bridge</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>17 ft-5 in</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Locations</td>
<td>None</td>
<td>None</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Trail Width</td>
<td>4 ft</td>
<td>10 ft</td>
<td>8 ft</td>
<td>8820.9995</td>
</tr>
<tr>
<td>Curb Ramps for Handicapped</td>
<td>Not Applicable</td>
<td>Provided</td>
<td>Provide</td>
<td>ADA</td>
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<tr>
<td>Project Length</td>
<td>Not Applicable</td>
<td>0.20 miles</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

(1) Existing condition critical design elements based on design standard for 30 mph design speed.
(2) Subject to approval of Mn/DOT Bridge Engineer when plans are submitted.
Road prior to the intersection. This curve could be lengthened to match the 30 mph design standard, but this may force stormwater runoff into the Beach Road/south frontage road intersection. The Beach Road vertical alignment will be coordinated with the stormwater drainage design during final design to address design standards and ensure that runoff is not collected within the Beach Road/south frontage road intersection.

Environmental Mitigations

Mitigation for the St. Croix River Crossing Project Preferred Alternative is discussed in Chapter 15 of the 2006 SFEIS.

Future Improvements

Currently there are not any future proposed improvements planned for this highway section.

Estimated cost of Project

The estimated cost for the Preferred Alternative is between $305 million and $373 million (2004 dollars). Refer to Chapter 3 of the 2006 SFEIS for additional project cost information.

Miscellaneous

Typical sections of the proposed Beach Road are included on the staff approved layout.

Traffic Handling During Construction
(explain how traffic will be handled during construction; attach detour map if applicable)

To be determined in final design. See Chapter 12 of the 2006 SFEIS for the preliminary staging concept.

Bicycle and Pedestrian Considerations

1. Select one of the following (a or b) if bicycles and pedestrians will not be allowed on this roadway:
   ( ) a. crossing of this roadway by bicycles and pedestrians ( ) will be ( ) has been evaluated in the
development of this project
   ( ) b. accommodation for crossing of bicycles and pedestrians has been evaluated and found to be not
required for this project (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

2. (X) Bicycles and pedestrians are not prohibited from this roadway, and accommodation of bicycles and
pedestrians ( ) will be (X) has been evaluated.

A separate trail system will be provided along the TH 36 frontage road system and along TH 95. A 4.8-mile loop
trail system will be also provided, connecting Stillwater and Oak Park Heights with the Town of St. Joseph,
Wisconsin using the Lift Bridge and a trail along the north side of the new river crossing.

3. ( ) Existing access for bicycles or pedestrians will be eliminated by this project (an alternative route for bicycles
and pedestrians must be provided).
4. If 1(a), 2 or 3 is checked, list the local units of government that ( ) will be (X) have been contacted for information to coordinate this project with existing and proposed bikeways:

Mn/DOT Transit Office Bicycle and Pedestrian Section
MnDNR Trails and Waterways Division
Washington County
City of Stillwater
City of Oak Park Heights
City of Bayport

5. (X) Preliminary layouts and/or draft layouts ( ) will be (X) have been provided to the Bicycle and Pedestrian Section of the Transit Office for advisory comment in accordance with the HPDP project review guidelines (see HPDP Bikeways and Pedestrians Guidance – Threshold Criteria).

**Layout Status:**
( ) A geometric layout is not required for this project.
(X) A level 1 Geometric Layout (and profile) ( ) will be (X) has been prepared for this project.
(X) Municipal approval is required. Municipal approval anticipated for Summer/Fall 2006.
ATTACHMENT D

- Final (reduced) Layout
- Proposed Typical Sections