Appendix A. Project Narrative & Purpose and Need

Project Narrative & Purpose and Need

Section 404/Section 10 Permit Application

Village of Wrightstown
Fox River Bridge B-05-381
STH 96
Brown County, Wisconsin

WisDOT Construction I.D. 4075-28-71

Project Description

The purpose of the project is to replace the functionally obsolete, non-redundant and fracture critical existing structure B-5-736 which conveys STH 96 traffic across the Fox River in the Village of Wrightstown. The existing bridge is vital to the mobility of the Village of Wrightstown residents and commuters in this region. Currently, the nearest north Fox River bridge crossing is about 10 miles north of Wrightstown in De Pere. The nearest south Fox River bridge crossing is about 7 miles south of Wrightstown in Kaukauna.

The proposed structure is located south of the existing structure to enable the existing structure to remain in service during construction of the new bridge and to reconfigure the roadway for improved traffic flow and safety. Roundabouts are included on both sides of the bridge to improve traffic circulation, intersection safety and to accommodate truck and agricultural vehicle traffic.

This segment of STH 96, located in the Village of Wrightstown in southwestern Brown County, is an urban minor arterial. STH 96 is not part of the National Highway System (NHS). It is designated as a Long-Truck Route (65' Restricted Truck Route – 48' trailer, no double bottoms). The project will consist of the realignment of approximately 2550 feet of STH 96 to the south; construction of a new bridge (B-05-0381) crossing the Fox River approximately 250-feet upstream of the existing bridge; removal of the existing bridge (B-05-0736); construction of roundabouts at each end of the bridge; and reconstruction of local roads adjacent to STH 96 within the project limits.

The project limits will begin just west of the railroad tracks along Broadway Street and extend to the intersection at Turner Street and existing WIS 96 (High Street).

Work under this project includes:

- Construction of the new Fox River bridge, pavement, curb and gutter, and sidewalk
- Construction of roundabouts at the intersection of WIS 96 (Main Street) and CTH DD (Broadway Street) and on a new alignment 100 feet south of the intersection of WIS 96 and Turner Street
- Reconstruction of the intersection at Turner Street and Fair Street
- Reconstruction of High Street from Mueller Street to Turner Street
- Reconstruction of High Street from west of the Fox River to Main Street
- Construction of the new alignment of Cedar Street, moving the connection from Broadway Street to Main Street.

Purpose and Need for the Project

The purpose of the proposed action is to construct a new Fox River bridge and approaches that will provide a safe and efficient crossing of the Fox River for future users while minimizing disturbance to the natural and built environment. The need for a new Fox River bridge and approaches is due to a

combination of factors including deficiencies with the existing bridge, safety, existing roadway conditions, and route importance.

Existing Bridge Deficiencies

The Fox River Bridge in Wrightstown carries WIS 96, High Street, over the Fox River. The bridge was constructed in 1934. Besides routine maintenance, the bridge has undergone significant rehabilitation work in 1977, 1985, 1986, 1999, and 2009. The bridge's former bascule (or movable) span is span 4. In 1999, opening and closing of the bascule span was deemed unnecessary. The bascule span was welded shut, the open steel grid deck in the bascule span was filled with lightweight concrete, and the operator's house was removed. The typical section of the bridge consists of a 24-foot clear roadway width with 6.25-foot sidewalks on either side. On February 24, 2009, a deck failure resulted in a 5- by 10-foot hole in the bridge's eastbound travel lane. The repair required the bridge to be closed for an evening.

Structural Issues

The existing bridge is a two-girder, non-redundant structure. This method of construction is now considered undesirable because failure by damage, overload, or fatigue to one of the girders will result in failure of the entire bridge span without warning. The bridge also contains fracture-critical steel bridge superstructures that are susceptible to failure because of fatigue, cracking, or other damage. Because the Fox River Bridge is fracture-critical, the Wisconsin Department of Transportation (WisDOT) inspects it annually. The most recent bridge inspection showed that although the Fox River Bridge is structurally sound, it is reaching the end of its assumed service life. Key structural deficiencies include:

- The concrete bridge piers exhibit concrete cracking, spalling, and scaling above and below the waterline. The rebar is exposed.
- The sidewalk is scaling and the grid is corroding through its length.
- The weld at the bascule span jaws has cracked.
- The deck in the bascule span (span 4) has a stay-in-place form that is causing rapid deterioration on the underside of the concrete where large areas of rebar are exposed.

Functional Issues

The bridge is functionally obsolete because of its inadequate 24-foot clear roadway width compared to current and accepted standards for the volume and type of traffic it carries. The Fox River Bridge serves automobiles, trucks, semi-trucks, tractors and other large farm machinery, snowmobiles, bicycles, and pedestrians.

Six farms in the area use the Fox River Bridge to move equipment with a transport width up to 16 feet from one farm to another. Farm equipment most often must cross the bridge in spring and fall. Large equipment crosses the bridge up to eight times a day at the height of the busy planting and harvesting seasons. The bridge's travel lane width is too narrow to accommodate large farm equipment and an oncoming vehicle. The operator of the farm equipment must wait until the bridge is clear in order to cross it. Once farm equipment is on the bridge, the bridge is too narrow for oncoming traffic to pass, temporarily prohibiting two-way traffic on the bridge and causing traffic to queue as it waits to cross. During busy periods, this can cause traffic operation issues at the WIS 96 intersections with Broadway, High, and Washington Streets. This restriction of two-way traffic and resulting traffic congestion can cause problems if emergency vehicles would have to cross the bridge at the same time as the farm machinery.

With a traffic volume of 10,400 average daily traffic (ADT) (construction year 2015 forecast) and projected 2035 ADT of 13,000, the clear roadway width should be 36 feet. The 24-foot clear roadway width on the bridge is substantially narrower than the 40-foot clear roadway on the approaches to the bridge. Under the existing configuration, the approaches taper as they reach the bridge and drivers must adjust from the wide roadway as they approach the bridge to the narrower roadway on the bridge. The taper also poses inconveniences to larger vehicles.

Safety and Existing Roadway Conditions

This segment of STH 96 has several operational and safety issues. Roadway safety is measured by the frequency and severity of crashes. An important objective of any transportation improvement is to minimize crash potential through roadway mainline and intersection design features and access management. Both the statewide average crash rate and statewide injury crash rate are exceeded for urban streets within this segment of STH 96. The 5-year average crash rate was 111 percent higher than the statewide average, whereas the injury crash rate was 65 percent higher than the statewide average. Crash occurrences within the project limits were predominately at intersections. The approaches to the bridge have several traffic operation problems:

- The current configuration of the STH 96/High Street, STH 96/Broadway Street and STH 96/Washington Street intersections force large vehicles to encroach on the opposing lane of traffic when making turns.
- Stopping patterns at the STH 96/High Street intersection are atypical for a T-intersection and create confusion for drivers.
- Grade changes at the Wisconsin Central Limited railroad crossing on Broadway Street limit sight distance and cause vehicles to "bottom out." In addition, there are horizontal curves on both the highway and railroad at this crossing that limit sight distance and present maintenance problems and poor ride quality for highway traffic because of conflicting super-elevations.

Proposed Activity

The proposed activity is located in the Village of Wrightstown, Brown County, Wisconsin (See Figure 1). The Wisconsin Department of Transportation (WisDOT) proposes to replace the existing 2-lane bridge with a wider 2-lane bridge over the Fox River. The STH 96 Bridge approaches will also be reconstructed. The proposed bridge will also pass over CTH ZZ (Washington Street) and the Plum Creek wetland.

The proposed activities are described as follows.

STH 96 Bridge Replacement

The existing structure (B-5-736) is a 10-span bridge with an overall length of 680 feet. The typical section of the bridge consists of a 24-foot traveled way with 6.25-foot sidewalks on either side. Under WisDOT's bridge inventory and inspection database, the structure has been separated into four segments depending on superstructure type. The four segments consist of a 232.8-foot, three-span steel plate girder bridge segment, a 94.5-foot double leaf bascule bridge segment, a 253.5-foot, three-span steel plate girder bridge segment, and a 103.5-foot, three-span reinforced concrete, haunched slab bridge segment. Segments 1, 2, and 3 are non-redundant, two-girder bridge systems, which require fracture critical bridge inspections. From segments 1 through 4, respectively, the existing bridge is supported by a full retaining concrete abutment, four solid shaft concrete piers, three open bent concrete piers, two round concrete column piers, and one concrete sill abutment. The piers and abutment under segment 1 are supported by spread footings, while the piers and abutment under segments 2 through 4 are supported by cast-in-place concrete or timber piles.

Additional data can be found in the following table:

Structure Data B-5-736

Segment	1	2	3	4
Structure No.	B-05-0736-0001	B-05-0736-0002	B-05-0736-0003	B-05-0736-0004
Year Built	1934	1934	1934	1934
Length	232.8	94.5	253.5	103.5
Clear Roadway Width	24	24	24	24

Since its original construction in 1934, the existing bridge has undergone rehabilitation work in 1977, 1985, 1986, and 1999. In 1977, the original timber and asphalt bascule bridge deck (segment 2) was replaced with a metal grid. The metal grid deck was filled with lightweight concrete in 1999. In 1999, the bascule bridge operator's house was removed. The original 5.5-inch reinforced concrete deck within segments 1 and 3 was replaced in 1985 with a 7-inch reinforced concrete deck. The original concrete deck girder superstructure within segment 4 was replaced in 1985 with a reinforced concrete haunched slab. The entire structure was repainted in 1986 and the railings were replaced in 1985.

It is proposed to replace the existing bridge with an approximate 1,816 foot long, 14 span prestressed concrete girder structure. The new bridge will have 13 single shaft piers supported on piling. See preliminary bridge plans (Figure 2, sheets 1-3).

The new bridge deck will be approximately 54.33 feet wide and will consist of the following:

- Two 12-foot driving lanes (2-lane undivided urban roadway)
- 8-foot shoulders to accommodate on-street bicycles
- 6-foot sidewalks on each side for pedestrians
- 1.17-foot parapets on each side

The new bridge alignment will be approximately 250 feet south of the existing bridge. The existing navigational clearance is approximately 11.2 feet. The new bridge will provide a minimum navigational clearance of approximately 37.4 feet.

Aesthetic treatments will include decorative concrete for the bridge parapets, decorative bridge piers, railings and lighting. Lookouts on the bridge are also proposed to provide an opportunity for pedestrians to view the Fox River. The decorative stone finish was selected by a local committee for community sensitive solutions.

STH 96 Bridge Approach Reconstruction

The west approach to the STH 96 Bridge begins approximately 275 feet south of the intersection of existing STH 96 (Main Street) with Broadway Street. Existing STH 96 consists of a two-lane, 44-foot wide urban roadway. The reconstructed west bridge approach will be a two-lane, variable width (41-feet to 47.7-feet) urban roadway with a single-lane roundabout at the intersection with Broadway Street.

The east approach to the STH 96 Bridge begins 400 feet east of the intersection with Turner Street and existing STH 96 (High Street). Existing STH 96 consists of a two-lane, 40-foot wide urban roadway. The reconstructed east bridge approach will include a single-lane roundabout at the intersection with Turner Street just east of the bridge, transitioning to a two-lane, variable width (49.6-feet to 56.8-feet) urban roadway.

Construction Schedule and Sequence

The anticipated summarized construction timeline for the STH 96 Bridge followed by a detailed list of construction stages is as follows:

- Construction start with early fill placement of East abutment embankment: May to July 2014
- Bridge construction start with clearing and grubbing: September 2014
- Construct causeways and temporary access roads for new bridge: September to October 2014
- Construct piers: October, 2014 to March, 2015
- Place girders and bridge deck: March to June 2015
- Remove causeway used for new bridge: July 2015
- Remove temporary access roads: October 2015
- Place erosion mat over impacted wetlands: October 2015

- Construct causeways for removal of existing bridge (only one causeway can be in place at a time): August, December 2015
- Remove existing bridge deck and girders: September 2015 to January 2016
- Remove causeways: November 2015, February 2015
- Place wetland plantings and seed Plum Creek wetlands: March through May 2016.
- Complete construction: July 2016

Traffic Control, Stages

The construction plans for the project will include WisDOT Standard Detail Drawings for advance signing and traffic control. Portable Changeable Message Signs will be placed on each end of the project **7 days** prior to beginning construction along STH 96.

Stages

Early Fill Stage – Anticipated Duration: 3 months – May 2014 to July 2014

- Place wick drains and early fill at east roundabout.

Stage 1A – Anticipated Duration: September 2014 to November 2014

- Close Hickory Street from Broadway Street to Bridge Street.
- Clear and Grub along proposed bridge alignment from Hickory Street to the west bank and from the east bank to High Street.
- Construct the east and west temporary construction access roads along bridge.
- Construct causeway A and B for construction of B-05-0381.
- Begin construction of B-05-0381.
- Construct railroad crossing.
- Construct the west leg of the west roundabout from STA 99'EB'+81 to STA 107'EB'+60.
- Construct temporary bypass in the northwest quadrant of the Broadway and Main Street intersection.
- Construct temporary access road between Cedar Street and temporary bypass.
- Obliterate Cedar Street from CTH DD to temporary access road for Cedar Street.
- Place permanent and temporary erosion control devices in accordance to winter shutdown of roadway operations. Construction of B-05-0381 anticipated to progress through the winter.

Stage 1B – Anticipated Duration: November 2014 to July 2015

- Complete B-05-0381.
- Construct west roundabout.
- Construct east roundabout.
- Construct pedestrian access abutment (R-05-110).
- Construct pedestrian embankment connection to bridge.
- Remove temporary causeways A and B from the Fox River.
- Remove west temporary access road. The east temporary access road in Plum Creek wetlands to remain in place.

Stage 2 - Anticipated Duration: 4 months - August 2015 to November 2015

- Remove east temporary access road and place erosion control in impacted wetland area.
- Remove temporary bypass in the northwest quadrant of the Broadway and Main Street intersection.
- Construct sidewalk in north quadrant of west roundabout.
- Construct proposed Cedar Street and temporary connection to Main Street to asphaltic binder layer.
- Obliterate existing High Street from Fair Street to proposed STH 96.
- Construct High Court cul de sac.

- Reconstruct High Street from Mueller Street to Turner Street, construct intersections of Mueller Street and High Street and Turner Street and Fair Street.
- Construct temporary causeways C or D along existing Structure B-05-0736. Note: causeways C and D cannot in place within the river concurrently.
- Remove portion of existing Structure B-05-0736.

Stage 3a Anticipate Duration: Begin January 2016

- Remove temporary causeway placed in Stage 2
- Construct remaining temporary causeway along existing Structure B-05-0736.
- Complete removal of existing Structure B-05-0736.

Stage 3b

- Remove temporary causeway placed in Stage 3a.
- Construct Main Street temporary widening along existing northbound lane.
- Construct retaining walls along High Street (R-05-112, R-05-113).
- Construct High Street from Main Street to Hickory Street to asphaltic binder layer.
- Obliterate Hickory Street from proposed Bridge to High Street.
- Construct scenic overlook at east bank of Fox River.
- Reconstruct High Street from east bank of Fox River to CTH ZZ (Washington Street)

Stage 3c

- Construct southbound lanes of Main Street.
- Install temporary widening along southbound lane of Main Street.

Stage 3d

- Construct northbound lanes of Main Street.

Stage 3e Anticipated Duration: End July 1, 2016

- Construct from curb and gutter flange line to slope intercepts for southbound lanes for Main Street.
- Construct northeast splitter island of west roundabout.
- Place asphaltic surface layer for both Cedar and High Street.

All lane and roadway closures will require prior approval and monitoring by the WisDOT staff. Traffic control stage changes and short term closures on STH 96 or local roads will be previously approved and monitored by the WisDOT staff.

The special provision will also provide language for the contractor to follow the Village of Wrightstown noise ordinance. The majority of the construction activities will be completed from 7:00 AM to 9:00 PM on weekdays. However, per the Village ordinance, some night work may be permitted when public welfare and convenience renders it impossible to perform the work during the day. Such activities will need to be approved by the engineer in field.

Traffic Diversion and Traffic Analysis

Based on the existing capacity and projected traffic along both STH 96 and the proposed detour route, no traffic diversion is expected, due to this project.

Both STH 96 and the detour route will operate under capacity. Speeds will not be reduced during construction. No traffic analysis was then, prepared. Delay was estimated simply by calculating the additional travel time incurred by the proposed detour.

Temporary and Permanent Erosion Control Measures

Erosion control and storm water management will be done in accordance with WisDOT *Facilities Development Manual, Chapter 10, Erosion Control and Storm Water Quality*; Wisconsin Administrative Code Chapter TRANS 401, *Construction Site Erosion Control and Storm Water Management Procedures for Department Actions*; and the WisDOT/WisDNR Cooperative Agreement Amendment, *Memorandum of Understanding on Erosion Control and Storm Water Management*. Best management practices under these guidelines and regulations include the following:

- The size of exposed areas at any one time and the duration of exposure will be minimized.
- Disturbed areas will be protected from off-site runoff and sediment will be prevented from leaving the construction site.
- Disturbed areas will be stabilized as soon as practicable (temporary vegetation, mulch, stabilizing emulsions).
- Stabilized slopes, soil, and stream banks will be left undisturbed where possible.
- Trees and shrubs will be preserved, and over-clearing will be prevented or minimized.
- The soil surface will be protected by using permanent and temporary erosion control measures such as seeding and sodding, mulch, erosion mat, and riprap.
- Protect storm water inlets during construction.

The construction contractor is required to prepare an Erosion Control Implementation Plan that includes all erosion control commitments made in the project's engineering design phase. The construction plans and contract special provisions must include the specific erosion control measures agreed on by WisDOT in consultation with DNR who reviews the Erosion Control Implementation Plan.

The contractor will be required to not disturb nor store materials or topsoil within the wetlands except in areas designated to be filled or impacted as permitted in the project's U.S. Army Corps of Engineers Section 404 Permit. The wetlands are shown on the erosion control sheets to clearly identify the wetlands. The work area will be separated from the wetlands by silt fence, as shown on the plans, to avoid siltation and inadvertent fill into the wetland areas.

Construction operations will be performed in a timely and diligent manner, continuing all construction operations methodically from the initial topsoil stripping operation through the subsequent grading and finishing to minimize the period of exposure to erosion. The contractor will be required to immediately re-topsoil graded areas, as designated by the engineer, after grading is completed within those areas. Within five working days all topsoiled areas will be seeded, fertilized and mulched or covered with erosion mat.

At the end of each construction season disturbed areas will be restored with topsoil, seeding, fertilizer, and mulching or erosion mat to minimize erosion due to spring melt. Erosion mat will be placed in the impacted wetland in the fall and planted and seeded the following spring. This will be done to avoid having the seed washed away by flooding in the early spring.

Sealed cofferdams or similar containments will be used to minimize siltation during construction of the new pier footings and shafts.

Disposal of Excavated Materials

The construction contractor will be required to place material an adequate distance from and not within any waterway, wetland or floodway for all selected sites identified for disposal of excavated material. The construction contractor will also be required to place erosion control measures at all selected sites to protect the natural resources.

Fill Material and Proposed Construction Methods

STH 96 Bridge

The estimated Ordinary High Water (OHW) elevation for the Fox River channel at the STH 96 Bridge crossing is 597.808 NGVD. The elevation was determined by the Wisconsin Department of Natural Resources (WDNR) in consultation with WisDOT.

Construction of the pier footings and shafts for the STH 96 Bridge will require placing approximately 1,920 cubic yards of poured concrete below Ordinary High Water (OHW). The Fox River bottom generally consists of a 50-foot layer of clay over a 30-foot layer of silty clay over limestone bedrock at a depth of approximately 80-feet. The new bridge piers will be constructed on deep pile foundations with reinforced concrete pile caps and unreinforced concrete seals. The new pier pile caps and seals will be constructed within cofferdams. The abutments at each end of the new bridge are located above OHW.

Fill for the east abutment, consisting of granular material, will be placed into the Plum Creek Wetlands. This area is above the OHW elevation. The volume of fill material placed into the wetland is approximately 15,700 CY.

Temporary Construction Causeway

The Fox River is too shallow outside the river channel at the STH 96 crossing to float a barge for constructing the new bridge piers, therefore a temporary causeway will be required to provide construction access. In order to develop a reasonable scenario for constructing the temporary causeway, and to allow flexibility for construction contractors, WisDOT held two meetings with bridge contractors to obtain input on possible construction methods. Discussions included causeway width, length and depth of girders for the causeway spans, and methods of operation for cranes and other equipment.

WisDOT also conducted a hydraulic analysis to determine the effect of a temporary causeway on flood flows and backwater, and to provide guidance for construction contractors for the sequence of installing and removing the temporary causeways. Information on the hydraulic analysis is provided in the Appendix A.

Based on discussions with bridge contractors and the hydraulic analysis, the following temporary causeway scenario has been developed for purposes of this permit application.

- Access to a causeways will be from each bank from temporary access roads.

- The causeways for the new bridge construction will consist of varying sizes of clean rock placed in the Fox River at piers 2 through 6. It will be approximately 30 feet wide allowing one-way traffic for large equipment, and will have perpendicular “fingers” extending on each side of the causeway centerline. The causeway fingers will allow access to the bridge piers and provide room for crane maneuvers. The navigation channel will remain open throughout construction. Navigation lights will be placed on the causeway to alert river traffic to the presence of the causeway.

- The causeways for the removal of the existing bridge will also consist of varying sizes of clean rock placed in the Fox River at piers extending from each bank. It will be approximately 30 feet wide allowing one-way traffic for large equipment, and will have perpendicular “fingers” extending on each side of the causeway centerline. The causeway fingers will allow access to the bridge piers and provide room for crane maneuvers. Only one causeway will be allowed in the river for the removal of the existing bridge based on the hydraulic analysis. The navigation channel will remain open throughout construction. Navigation lights will be placed on the causeway to alert river traffic to the presence of the causeway.

- Openings will be placed between the causeway fingers to create spans that will accommodate river flow, avoid creating an increase in backwater elevation, and allow for fish passage. Openings will consist of culverts or steel beams with wood decking.

The amount of rock fill that will be placed below OHW for the temporary causeways will depend on contractor options for constructing the causeways. For purposes of this permit application, it is assumed that rock fill for the temporary causeways for the new bridge will not exceed a maximum of 10,220 cubic yards and temporary rock fill for the temporary causeways used to remove the existing bridge will not exceed a maximum of 12,300 cubic yards.

Summary

The fill material impacts to the wetlands and the Fox River for the proposed project are summarized in Table 1.

Table 1 – Summary of Wetland and River Impacts

Temporary Impacts			
Map Designation	Feature	Area of Impact at Slope Intercepts	Comment
A	Causeway A	31,100 square feet	Temporary fill for bridge construction – Left bank (looking downstream)
B	Causeway B	52,200 square feet	Temporary fill for bridge construction – Right bank (looking downstream)
C	Causeway C	23,000 square feet	Temporary fill for bridge removal – Left bank (looking downstream)
D	Causeway D	28,500 square feet	Temporary fill for bridge removal – Right bank (looking downstream)
G	Construction Access Road	1.277 acres	Temporary fill for bridge construction
Permanent Impacts			
Map Designation	Feature	Area of Impact at Slope Intercepts	Comment
H	Piers 2-6	3,920 square feet	Concrete bridge piers and footings
J	Piers 11-13	2,352 square feet	Concrete bridge piers and footings
N	Riprap Treatment	100 square feet	Bridge drain outfall
O	East Bridge Abutment Embankment	0.580 acres	Permanent fill for east bridge abutment earth embankment

Adjoining Riparian Owners

Neighboring waterfront property owners, those who own land under the STH 96 Bridge, and other interests having jurisdictional authority are listed below.

Wisconsin Department of Transportation 944 Vanderperren Way Green Bay, WI 54304-5344 Contact: Andrew Fulcer	U.S. Army Corps of Engineers Old Fort Square 211 N. Broadway, Suite 221 Green Bay, WI 54303 Contact: Mr. Joey Shoemaker
Village of Wrightstown Department of Public Works 101 Washington Street Wrightstown, WI 54180 Contact: Travis Coenen	Wisconsin Department of Natural Resources 2984 Shawano Avenue Green Bay, WI 54313-6727 Contact: James Doperalski
Fox River Navigational System Authority 1008 Augustine Street Kaukauna, WI 54130 Contact: Harlan Kiesow	Chief, Bridge Branch-Ninth Coast Guard District 1240 E Ninth Street Room 2047 Cleveland, OH 44199-2060 Contact: Scot M. Striffler
John J Verhasselt Revocable Trust 535 Hickory Street Wrightstown, WI 54180	John Verhasselt 531 Hickory Street Wrightstown, WI 54180

Hydraulic calculations indicate that the proposed bridge does not increase the 100-year flood elevation at the proposed crossing. The temporary causeway construction will be staged in order to not raise the backwater for the 100-year flood elevation more than 0.5 feet. Therefore the Wisconsin Department of Transportation will not be required to notify the adjacent landowners and the Brown County Floodplain Zoning Administrator of any backwater increases of the 100-year flood elevation in accordance with Wisconsin Administrative Code Chapter NR 116, *Wisconsin's Floodplain Management Program*, and procedures established under the WisDOT/WisDNR Cooperative Agreement.

Measures to Minimize Adverse Effects

The following measures to minimize adverse effects have been identified at this time. Others may be identified during the project's preconstruction conference in consultation with WisDNR, WisDOT, and the bridge contractor.

Sealed cofferdams or similar containments will be used to minimize siltation during construction of the new pier footings and shafts.

No in-stream work in the Fox River main channel will take place from March 1st to June 15th to avoid fish spawning activity. Work on the causeway is not expected to take place during this time period, however, if work on the causeway does occur, no materials will placed in the Fox River or removed from the Fox River.

Swallow nests are present in the existing STH 96 Bridge deck girders. Therefore, the contract special provisions will include the following language:

> The nesting season for swallows has been established as May 15 through August 15 (per DNR for this project). Work which may disturb or destroy occupied nests during the nesting period will require the contractor to apply for a depredation permit from the U.S. Fish and Wildlife Service. The need for a permit may be avoided by removing the existing bridge superstructure prior to nest occupation by swallows, and clearing the nests from and installing a suitable netting device on the remaining existing superstructure prior to nesting activity to prevent the swallows from nesting. The cost for preventing nesting shall be included in the cost of Removing Old Bridge.

Erosion control and storm water management will be done in accordance with WisDOT *Facilities Development Manual, Chapter 10, Erosion Control and Storm Water Quality*; Wisconsin Administrative Code Chapter TRANS 401, *Construction Site Erosion Control and Storm Water Management Procedures for Department Actions*; and the WisDOT/WisDNR Cooperative Agreement Amendment, *Memorandum of Understanding on Erosion Control and Storm Water Management*. Best management practices under these guidelines and regulations include the following:

- The size of exposed areas at any one time and the duration of exposure will be minimized.
- Disturbed areas will be protected from off-site runoff and sediment will be prevented from leaving the construction site.
- Disturbed areas will be stabilized as soon as practicable (temporary vegetation, mulch, stabilizing emulsions).
- Stabilized slopes, soil, and stream banks will be left undisturbed where possible.
- Trees and shrubs will be preserved, and over-clearing will be prevented or minimized.
- The soil surface will be protected by using permanent and temporary erosion control measures such as seeding and sodding, mulch, erosion mat, and riprap.
- Protect storm water inlets during construction.

The construction contractor is required to prepare an Erosion Control Implementation Plan that includes all erosion control commitments that are made. The plan is approved by WisDOT in consultation with WisDNR prior to the start of construction.

The contract special provision will require the construction contractor to clean the equipment before entering and leaving the construction area in the wetlands to prohibit the transfer of invasive species.

Filter fabric will be placed in the temporary access roads between the breaker run base and the driving surface. Drainage openings will be utilized to allow water to flow through the causeways and the temporary access road in the wetland area. The temporary loss of wetlands during construction will be mitigated through a wetland bank since the wetlands would not be restored during the same growing season. The mitigation ratio will be 0.5:1 for the temporary impacts.

A grading plan will be included in the construction documents to restore the impacted Plum Creek wetland. Only the area disturbed during construction will be restored. The location of the existing and proposed vernal pools will be reviewed by the DNR. The recommended locations of the restored vernal pools will be included in the grading plan. Grading tolerances will be included in the project specifications.

Planting and seeding quantities and specifications will be included in the construction documents. The location of wetland plantings and the arrangement of wildlife structures will be as directed by the field engineer.

STH 96 Bridge Temporary Construction Causeway Hydraulic Analysis

The Fox River is too shallow at the STH 96 crossing to float a barge for constructing the new bridge piers, therefore a temporary causeway will be required to provide construction access. In order to develop a reasonable scenario for constructing the temporary causeway, and to allow flexibility for construction contractors, WisDOT held two meetings with bridge contractors to obtain input on possible construction methods. Discussions included causeway width, length and depth of girders for the causeway spans, and methods of operation for cranes and other equipment.

WisDOT also conducted a hydraulic analysis to determine the effect of a temporary causeway on flood flows and backwater, and to provide guidance for construction contractors on the sequence of placement and removal of the causeways. The following provides scenarios and associated backwater effects of the temporary construction causeways:

a. Stage 1 construction includes the existing bridge, the proposed bridge, and the causeway for the construction of the new bridge piers. The top of causeway elevation of 596.9 was assumed. Also both the east and west sections of the causeway were assumed to be in the waterway concurrently. This scenario would result in about 0.2' of backwater relative to existing conditions during the 100-yr flood event.

b. Stage 2 construction includes the existing bridge, the proposed bridge, and the causeway for the removal of existing bridge piers. The top of causeway elevation of 596.9 was also assumed. In this case, the east and west sections of the causeway will be placed in the waterway consecutively and not concurrently. This scenario would result in approximately 0.3' of backwater relative to existing conditions during the 100-yr flood event. If the west and east sections of this causeway are allowed to be placed in the waterway concurrently, then the resultant backwater increase during the 100-yr flood event will be in excess of 1 foot. Due to this, the contract special provisions will require the contractor to remove the existing bridge in stages and the sections of the causeway not be placed in the waterway concurrently.

2

STUCTURE B-05-0736

OLD BRIDGE

HICKORY ST.

CAUSEWAY C

TEMPORARY CAUSEWAY FILL FOR BRIDGE REMOVAL AREA = 23,000 SF

SLOPE INTERCEPT

PIER 1

C

PIER 2

STH 96

CAUSEWAY A

PIER 3

CAUSEWAY D

OLD BRIDGE

SLOPE INTERCEPT

D TEMPORARY CAUSEWAY FILL FOR BRIDGE REMOVAL AREA = 28,500 SF

R/W

TLE

TLE

R/W

TLE

HIGH ST.

A TEMPORARY CAUSEWAY FILL FOR BRIDGE CONSTRUCTION AREA = 31,100 SF

H PERMANENT BRIDGE PIER FILL PIERS 2-6 AREA = 3920 SF

PIER 4

STH 96

PIER 5

STRUCTURE B-05-0381

FOX RIVER

PIER 6

CAUSEWAY B

R/W

R/W

PIER 7

PIE

B TEMPORARY CAUSEWAY FILL FOR BRIDGE CONSTRUCTION AREA = 52,200 SF

SLOPE INTERCEPT

TLE

PLUM CREEK

R/W

TLE

N

0 50 100

PROJECT NO: 4075-28-71	HWY: STH 96	COUNTY: BROWN	TRAFFIC CONTROL: PERMITTED CONSTRUCTION AREAS	SHEET _____	E

FILE NAME : X:\3230500\113689.01\TECH\DSGN\CIVIL\CIVIL3D\40752800\SHEETSPLAN\40752871_0250XX_TC_CD_PERMIT.DWG PLOT DATE : 11/1/2013 10:32 AM PLOT BY : ANDREA BONELL PLOT NAME : _____ PLOT SCALE : *********

WISDOT/CADDS SHEET 42

2

WASHINGTON STREET

MUELLER ST.

HIGH ST.

HIGH ST.

TURN

R/W

TLE

PIER 7

PIER 8

PIER 9

PIER 10

PIER 11

PIER 12

PIER 13

SLOPE INTERCEPT

TEMPORARY CONSTRUCTION ACCESS ROAD

WETLAND

WETLANDS

(G) TEMPORARY FILL FOR CONSTRUCTION ACCESS ROAD FOR BRIDGE CONSTRUCTION
AREA = 1.277 ACRES

(O) PERMANENT FILL LIMITS FOR PROPOSED EAST ABUTMENT
AREA = 0.580 ACRES

(J) PERMANENT WETLAND IMPACT FOR BRIDGE PIERS
PIERS 11-13
AREA = 2352 SF

(N) PERMANENT WETLAND IMPACT FOR RIPRAP TREATMENT AT BRIDGE DRAIN OUTFALL
AREA = 100 SF

N

0 50 100

PROJECT NO: 4075-28-71	HWY: STH 96	COUNTY: BROWN	TRAFFIC CONTROL: PERMITTED CONSTRUCTION AREAS	SHEET _____	E

FILE NAME : X:\3230500\113689.01\TECH\DSGN\CIVIL\CIVIL3D\40752800\SHEETSPLAN\40752871_0250XX_TC_CD_PERMIT.DWG PLOT DATE : 11/1/2013 1:58 PM PLOT BY : ANDREA BONELL PLOT NAME : _____ PLOT SCALE : **********

WISDOT/CADDS SHEET 42