REHABILITATION STRUCTURE SURVEY REPORT

Wisconsin Department of Transportation
DT1696 4/2017

RECEIVED
9/3/2019
BUREAU OF STRUCTURES

☒ **Grade Separation** ☐ **Stream Crossing** ☐ **Culvert**

☐ **Railroad** ☐ **Retaining Wall** ☐ **Noise Barrier**

☐ **Sign Structure** ☐ **Other:** _____

For guidance see: http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/strct/survey.aspx

Design Project ID 1107-00-30	Construction Project ID 1107-00-60	Highway (Project Name) Allenton - Fond Du Lac		
Final Plan Due Date 6/1/2024 (adv 6/1/2020)	Preliminary Plan Due Date 6/1/2019	☒ Town ☐ Village ☐ City Theresa		
PS&E Date 8/1/2024 (adv 8/1/2020)	Letting Date 2/9/2025 (adv 2/9/2021)	County Dodge		
Structure Number B-14-110		Section 11	Town 12N	Range 17E
Station 17+09.78	Latitude: 433212.45 Longitude: 882412.00	☐ YES ☒ NO Structure Located on National Highway System		
For Survey and CADD Files Horizontal Coordinate System: WISCRS Dodge NAD83 (2011) Vertical Datum: NAVD 88 (2012)		**Traffic Forecast Data**		
		Design Year	Average Daily Traffic (ADT)	Roadway Design Speed	Functional Class
Feature On STH 28		Feature On 28	6,600 (2045)	60 MPH	Minor Arterial
Feature Under IH 41		Feature Under IH 41	37,690 (2045)	70 MPH	Principal Arterial
Region Contact: James Buschkopf, PE (Area Code) Telephone Number(s): 608-884-7133 Email: james.buschkopf@dot.wi.gov		Consultant Contact: Vincent DiFrances, PE (Area Code) Telephone Number(s): 262-573-3864 Email: vinced@jt-engineering.com			

Work To Be Performed

Field Information Required
Item Number *(see Pages 2–4)*

- ☐ A. Structural Repair 1–3, 22
- ☒ B. Overlay 1–3, 10–22, 26–28, 32, 34
  - ☐ Concrete Overlay ☐ Asphalt Overlay
  - ☐ Polymer Modified Asphalt Overlay ☒ Thin Bonded Polymer Overlay
  - ☐ Other: _____
- ☐ C. New Bearings 3, 8, 9, 22
- ☐ D. New Railings 15–17, 20–23
- ☐ E. Curb and Sidewalk Repair 2, 3, 16, 22, 23
- ☐ F. Abutment Repair 2, 3, 12, 16
- ☐ G. Pier Repair 2, 3, 12, 16
- ☐ H. New Deck 1–6, 9, 10, 13–28, 32–34
- ☐ I. Widening 1–28, 30, 32–35
- ☒ J. Joint Repair 2, 3, 8, 16, 19, 22
- ☒ K. Surface Repair 2, 3, 22
- ☐ L. Raising Bridge 3, 6, 9, 16, 20–24
- ☐ M. Slope Stabilization 1–3, 30
- ☐ N. Scour Repair ..... 1, 2 or 3, 16, 19, 21, 27, 29, 31–35
- ☒ O. Painting 16, 22, 24
- ☐ P. Other: _____

Field Information Required

If no structure number exists provide the following: Small County Map on which the location of proposed structure is shown in red and any highway relocation in green. In addition, provide Location Map of scale not less than 1" = 2000' showing the structure location and number.

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

☒ 2. Outline deficient areas on existing structure plan or drawing.

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

☐ 4. Provide proposed typical section for roadway and structure showing dimensions and cross slopes.

☐ 5. Survey beam seat or girder elevations at both sides of bridge at all substructure units.

☐ 6. Provide cross-section elevations at 10 foot intervals extending across the structure and a minimum of 100 feet beyond each end. Sections should be normal to centerline and show elevations at centerline roadway and gutter line. Take elevations along joints and at floor drains.

☐ 7. Show and identify starting stationing on bridge.

☒ 8. Record measurement, temperature of the structure, and date taken for each of the following:
(a) Joint opening measured normal to joint at centerline of roadway and both curb lines.
(b) Clearance between girder ends at piers.
(c) Distance from front face of abutment backwall to closest point of girder end measured parallel to girder.
(d) Temperature of structure determined by averaging top and under deck (if accessible) readings.

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

☒ 10. Number and width of proposed pours including construction staging sequence.

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

☒ 12. Estimated Quantities:

Preparation, Decks, Type 1	Sq. Yd. 235	
Preparation, Decks, Type 2	Sq. Yd. 120	
Full Depth Deck Repair	Sq. Yd. 25	Galvanic Anodes? No
Concrete Surface Repair Superstructure	Sq. Ft. N/A	Galvanic Anodes? N/A
Concrete Surface Repair Substructure	Sq. Ft. 180	Galvanic Anodes? No
Curb Repair	LF. N/A	Galvanic Anodes? N/A

☒ 13. Sufficiency number: 99.0 (obtain from HSI Bridge Inventory System)

☒ 14. Appraisal and Condition Rating

	Deck Condition	Superstructure Condition	Substructure Condition	Load Capacity Appraisal	Structural EVAL Appraisal
Current	7 - Good	7 - Good	7 - Good	5 - Legal Load Stress Not Exceeded	7 - Cond Better Than Min Criteria

☒ 15. Load Ratings

	Inventory	Operational
Current Calculated Date: 2/15/1994	HS-26	HS-44
After Completed by Bridge Designer	HS-21 (Preliminary)	HS-35 (Preliminary)

☒ 16. Utilities on/near Structure. (WisDOT policy is to avoid placing utilities on the structure.)
☒ Yes ☐ No

Type	Owner and Contact Information	Size	Opening at Abutment	Weight	Pressure
Elec (Weather Sta.)	WisDOT	1"	No (Box at SW Outside Wing)	N/A	N/A

☒ 17. Is existing bridge railing deficient?
☐ Yes ☒ No If Yes – Replacement Rail Type:

☒ 18. Drains to be:
☐ Raised ☐ Closed ☐ Downspouted ☐ New

☒ 19. Traffic maintained on bridge during work?
☒ Yes ☐ No If Yes – Include sketches

☒ 20. Will guard rail be attached?
☒ Yes ☐ No If Yes – Which corners? All

☒ 21. Will work to be performed eliminate all deficiencies?
☐ Yes ☒ No If No – Explain: See discussion in "Additional Information" below.

☒ 22. Hazardous waste (asbestos) to be removed?
☐ Yes ☒ No If Yes – Explain:

☐ 23. Wing location(s) for surface drain anchors:

☒ 24. Painting?
☒ Yes ☐ No If Yes – Explain on Page 4
(all, part, railing, color system, containment, bid items)

☐ 25. Desired roadway width: *(new deck / widening)* _____ Ft.
Desired sidewalk clear width: Left: _____ Ft. Right: _____ Ft.

☒ 26. Maximum increase in grade line elevation 1/4 (nominal overlay thickness) In.

☒ 27. Benchmark description to be shown

☒ 28. Desired final cross slopes on bridge 0.02 (existing) Ft./Ft.

☐ 29. Underwater Inspection Report including:
- Streambed Cross Section With Pier, Footing and Seal Elevations
- Pier Elevation Drawings
- Pier Layout
- Hydrographic Survey

☐ 30. Slope stabilization, provide:
Type: _____ Quantity: _____ CY.
Slope: _____ Ft./Ft. Fill: _____ CY.

☐ 31. Preliminary layout of grout bags or proposed scour repair.
C.I.P. Articulated Mats (for Scour) _____ CY.
Grout Bags (for Scour) _____ CY.

Heavy Riprap _____ CY.
Extra Heavy Riprap _____ CY.

☒ 32. Report submitted with Preliminary Plan requires **no** CADD file submittal *(See ESubmittal instructions)*.

☐ 33. Report submitted for development of Preliminary Plan to structure design engineer requires CADD file (if available) submittal and Report submittal to Soils Engineer if project involves foundation modifications.

☒ 34. Coordinate with structure design engineer **before** going into the field if existing structure has no available plans, if staged construction is planned, or if there are adjoining/adjacent structures that will remain in place.

☐ 35. If project involves substructure widening coordinate with structure and/or hydraulic design engineer to determine if information on the separation and/or stream crossing SSR will be required.

Additional Information

Elaborate on other concerns such as: DNR, Local, Utility Conflicts, Aesthetics, Railing Type and Staged Construction.
Please be as detailed and specific as possible.

Supplemental Notes to "Field Information Required"
1.) For most recent inspection report, see B-14-0110_oth. The bridge carring STH 28 Road over IH 41 was originally constructed in 1994. No repairs have been completed on the structure per information available on HSI. The deck is found to have extensive epoxy sealed cracks and the expansion joints are failing as witnessed by water seepage observed on the abutment backwalls beneath the bridge. The abutment concrete is found to the spalled and delaminating. The steel girders are exhibiting corrosion and the SW Region has scoped this as a complete repainting (see #24).
2.) See B-14-0110_oth for a schematic showing deficiencies.
3.) See B-14-0010_pic for photographs of the structure, including deficient areas.
4.) Not Applicable
5.) Not Applicable
6.) Not Applicable
7.) Not Applicable
8.) A worksheet containing pertinent data and field measurements on the existing expansion joint is included in B-14-0110_oth.
9.) Not Applicable
10.) For polymer overlay, the pours are considered to be placement of polymer overlay and concrete pours required to replace the expansion joints.. Joint repair and polymer placement will be completed across four stages;
Stage 1: Roadway/Approach Prep
Stage 2: Traffic will be on the existing WB lanes to construct the south half of the deck at joint repair and place a 24' wide polymer overlay (see B-14-0110_pln). Temporary barrier wall will be pinned to the deck and pinned to avoid tipping as it will be placed adjacent to the median curb.
Stage 3: Traffic will be on the existing EB lanes, travelling over the southern half of the joint repair and overlay constructed in Stage 2. The north half of the deck will be constructed at joint repair and a 24' wide polymer overlay placed (see B-14-0110_pln). Temporary barrier wall will be pinned to the deck and pinned to avoid tipping as it will be placed adjacent to the median curb
Stage 4: Traffic lanes will be shifted to the outside of the bridge in their respective EB/WB directions. Traffic may be drummed as the deck will have been completely placed at the joint repairs and traffic will run on the new polymer placed in Stages 2 and 3. The raised median will be adhesive anchored into the slab at joint repair and polymer will be placed in the turn lanes and atop the median.
11.) The original construction plans indicate a longitudinal construction joint along CL STH 28. This was subsequently covered by the median which was placed after the deck. A single transverse joint was observed in the median near the pier. The staging concept for this project is intended to match the longitudinal joint in the existing deck and will further adhesive anchor the median slab into the deck within the limit of joint repair.
12.) Estimated quantities only. JT Engineering is not scoped to sound the deck, and the Region has not expressed that it will be sounded prior to letting. It will therefore be placed on the contractor to verify in the field. Prep 1 is estimated as 10% of deck area, Prep 2 = 5%, and Full Depth = 1%. The concrete surface repair item will be used on the substructure, where abutment corners are spalled and the abutment front face and beam seats are visibly delaminated.
13.) No additional notes.
14.) No additional notes.
15.) Preliminary rating indicates an HS-21 rating, a decrease of 5. The current rating is controlled by positive moment in the long span where the bottom flange plate is shown to be spliced in the original plans (1 5/8" to 7/8" thickness) which matches the controlling location previously reported. Resulting from the 9'-3" girder spacing, a larger amount of load from the overlay (425 plf) is also added to each girder compositely. Rating to be verified in final design.

16.) There are no utilities in close proximity to the bridge on the approaches. There is an existing weather station at the SW corner that connects to the bridge which will be left exposed. There is an electrical box attached the abutment at the SW corner and the 1" conduit runs along the front face and into the deck where a sensor is located. The electrical box will not be disturbed.
17.) Sloped Face Parapet "B" is established on the bridge and will be re-established in the area of joint repair. This railing is sufficient.
18.) There are no existing drains in the bridge deck. Existing drop inlets are located on the west approach and are off the bridge.
19.) Construction will be staged. Deck work will be completed by staging on STH 28, while girder painting will be staged on IH 41 following lane closure standard detail drawings (SDD). See B-14-0110_rod for additional staging details. The construction sequence is discussed in #10 above. Also refer to B-14-0110_pln for the staging cross sections on the bridge.
20.) Guard rail is to be replaced at all quadrants of the bridge (wings 1 thru 4). Steel thrie at the approach will be replaced and then transitioned to MGS. Existing anchor assemblies are the correct dimension for new thrie beam terminal connector.
21.) The project scope has been defined by the Region to include polymer overlay, deck repair (if needed), joint repair, concrete surface repair to substructure, and girder painting. This resolves the major dificiencies of deck cracking, spalling and delaminations on the abutments, corrosion of the girder and diaphragm steel, and failure of the expansion joints. It does not address the corroded expansion bearings noted to be in Condition State 3. The Region discussed replacing bearing but ultimately omitted it from the project scope.
22.) The asbestos report is included in B-14-0110_oth. No ACM was found on this structure and therefore there is no abatement required. STSP 107-127 will be included in the contract documents.
23.) Not Applicable
24.) All steel components are to be blast cleaned and repainted Brown AMS Standard Color Number 20059. Bid items to complete this work include;
517.1800.S Structure Repainting Recycled Abrasive B-14-110
517.4500.S Negative Pressure Containment and Collection of Waste Materials, B-14-110
517.6001.S Portable Decontamination Facility
25.) Not Applicable
26.) The increase in grade line elevation will be limited to the existing plus the nominal polymer overlay thickness of 1/4".
27.) Benchmark is shown on the preliminary bridge plans. See B-14-0110_pln.
28.) The desired final cross slope shall match the existing of 0.02 ft/ft in travelled way and varying in the median per the original construction plans.

Additional Preliminary Design Notes;
a.) Pigmented Surface Sealer bid item is intended for the entire length of both parapets.
b.) In addition to the parapet cover plates, cover plates will also be included on the median curbs. Given the existing shape and geometry of the curb, it does not seem practical for the joint to be flush with concrete. The strip seal will be elevated beneath the median cover plates to match median grade.
c.) Traffic forecasting has not been completed for this project per the SW Region. The volumes reported for both IH 41 and STH 28 were furnished by the Region in the project scoping document.
d.) WDNR provided their intial project review on 7/24/19. The initial review letter can be found in B-14-0110_oth.