SN: 043-0038

Bridge Condition Report

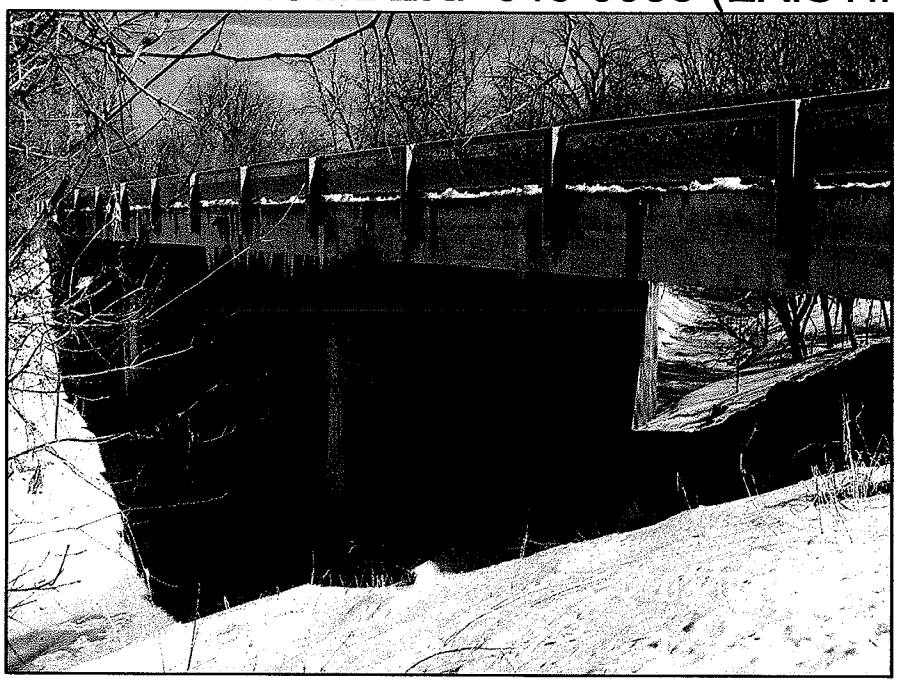
DISTRICT: 2

ROUTE: FA 308 (IL 84)

SECTION: 104-BR

COUNTY: JoDaviess

STRUCTURE NUMBER: 043-0038 (EXISTING)



LOCATION: IL 84 over Apple River Tributary
(2.0 miles South of Hanover)

PREPARED BY: Kenneth S. Couperus

DATE PREPARED: June 2007

PROPOSED LETTING DATE: 2011

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A. Location Map

B. IDOT Master Structure Report

C. Bridge Inspection Report

D. PONTIS Inspection Report

E. Soffitt Survey

F. Structure Photos

G. Abbreviated Existing Plans

H. Cost Estimates

I. Geographical & Administrative Data:

Structure Number: 043-0038
County: JoDaviess
Route Carried: FA 308 (IL. Rte 84)
Feature Crossed: Apple River Tributary
Section: 104-BR
Station: 125+71.00 (center of structure)

Roadway Classification: Other Principal Arterial
Design/Posted Speed: 70 MPH/ 55 MPH
ADT (current/future): 2005 (1800) / 2021 (2900)
ADTT (current/future): 2005 (234) / 2026 (377)
DHV: 180
Inventory Rating HS: 23.3
Operating Rating HS: 37.2
Sufficiency Rating: 59.2

Construction / Reconstruction / Repair History:

Construction: The original structure was built in **1982** as a three span PPC Deck Beam superstructure under FA 308, Section 104-BR with HS 20-44 design loading.

II. Physical Description of Structure:

Structure 043-0038 is a three span Prestressed Concrete Deck Beam superstructure with 11 beam lines sitting on two open stub reinforced concrete abutments founded on vertical and batter steel H piles and two solid wall reinforced concrete piers founded on steel H piles with 30 degree skew angle. The wearing surface consists of approximately 1-3/4 inches of bituminous concrete over a coal tar waterproofing membrane system.

The two end spans are 37' 8-3/4" long and the center span is 35' 9-1/2" long.

The back-to-back of abutment length is 111'-0" and the out-to-out deck width is 34'-0".

The structure provides for one 12' traffic lane both North and Southbound with 3' bituminous shoulders on each side. The structure is 33'-6" wide face to face of bridge rail. There are no sidewalks. The railing consists of steel rail type T-1 mounted on W6X25 steel posts bolted to the fascia on 9ft centers.

The existing structure is located on tangent horizontally and is near the sag of a vertical curve. The approach roadway template at both ends is a 24ft roadway with 3ft aggregate shoulders on each side.

III. Field Inspection & Physical Evaluation:

Wearing Surface: The 1-3/4" bituminous wearing surface is 25 years old and in **fair** condition. There are several longitudinal reflective keyway cracks especially in span 1 (South span). There is a coal tar waterproofing membrane system in place.

The bridge rail and guardrail ends are substandard.

There is a 4" PJS joint at the North abutment that is in good condition and still has a positive seal.

Superstructure: The superstructure is 25 years old and in **poor** condition. Beams 8, 9 and 10 in span 1 (center half) and beam 10 in span 2 (end quarter) and beams 10 and 11 in span 3 (center half) have spalls with exposed reinforcing steel. Numerous keyways leak heavily (especially the fascias) and there is evidence that several beams are acting independently especially in the South span due to the reflective cracking observed in the bituminous overlay. (See photos and soffitt survey in the attachments).

Substructure: The substructure is 25 years old and is in **satisfactory** condition. The South abutment has rust staining, discoloration due to leaking water and medium and large horizontal cracks in the cap. The piers have rust staining and discoloration due to leaking water. Pier 1 has a large spall on the North face at the West end on the cap. Pier 2 has a large spall on the East end on the cap. The concrete in the substructure is generally sound. If the substructure is reused repairs will have to be made to the abutment and pier caps.

Inspection History (NBIS Ratings):

Year	Deck (58)	Super (59)	Sub (60)
2007	4	4	6
2006	4	4	6
11/2005	5	5	6
02/2005	6	6	7
2004	6	6	7
2003	6	6	6

Geometric/Hydraulic Data:

The Bridge Deck Geometry rating (Item 68) is rated a 5 based on current ADT, number of lanes and deck width which is classified as better than adequate to be left in place.

There are no documented incidences of overtopping or flooding at this structure.

IV. Potential Scope of Work Determination & Analysis:

Option 1: Remove and replace the 6 beams with spalls and all fascia beams (11 total), perform formed concrete repairs to abutment and pier caps.

Option 2: Replace entire superstructure in-kind, perform formed concrete repairs to abutment and pier caps and place 5 inch thick rigid overlay.

Option 3: Replace the entire structure with new type of bridge.

V. Discussion and Recommended Scope of Work:

Due to the well documented rapid deterioration of deck beam superstructures, the poor condition rating of 4, the leaking keyways and reflective keyway cracks which indicate independent beam movement the superstructure will have to be replaced. Option 1 is physically difficult due to the formed concrete repairs to the caps of abutments and piers. The beams will have to be jacked up at both ends over the repair areas. Option 2 is in opposition to I.D.O.T. policy at this time so it is recommended that Option 3-structure replacement is the scope of work at an estimated cost of $437,000.00.

Traffic Control: Because this is a deck beam superstructure, the traffic control during construction should be evaluated during Phase I in programming using TMA-Traffic Management Analysis. (Final recommendation to be approved by Traffic Management) Note: for staging purposes-the South bound lane is in better condition.

Note: The Damage inspection report for this structure was not completed at the time this BCR was prepared.

ATTACHMENTS:

Attachment A:	Location map
Attachment B:	IDOT Master Structure Report
Attachment C:	Bridge Inspection Report
Attachment D:	PONTIS Inspection Report
Attachment E:	Soffitt Survey
Attachment F:	Structure Photos
Attachment G:	Abbreviated Existing Plans
Attachment H:	Cost Estimates