I. COVER SHEET/TITLE PAGE (Provide a cover sheet or title page as illustrated below.)

BRIDGE REHABILITATION REPORT

BRIDGE FILE NUMBER: \_\_\_\_\_

NBI NUMBER: \_\_\_\_\_

DESIGNATION NUMBER: \_\_\_\_\_

ROUTE IDENTIFICATION AND FEATURE CROSSED:

\_\_\_\_\_\_\_\_ over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[Include photo of subject structure]

PROJECT LOCATION: (8 miles southwest of the south junction with State Road 39, in Section 13, T-11-N, R-2-W, Ray Township, Morgan County, Indiana)

REFERENCE POINT: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(INDOT designer name and INDOT District or Central Office,

or Consultant Project Manager name and Consulting Firm)

DATE: \_\_\_\_\_\_

[LPA PROJECTS ONLY] OWNER REPRESENTATIVE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Signature, Title, and Date)

II. TABLE OF CONTENTS

If the magnitude of the Report warrants, provide a Table of Contents segregated by major Report sections, e.g., Existing Structure Data, Recommendations.

III. FIELD INSPECTION DATA

Date of Inspection

Time of Inspection

Attendance (Name, Organization, Unit within Organization)

IV. EXISTING STRUCTURE DATA

A. History

Year Built

Year(s) Repaired and brief description of repair work

If structure is part of a larger project, include brief description of larger project and lead Des No.

B. Structure/Dimensions

Surface Type: (Original concrete deck, asphalt overlay, concrete overlay, or thin overlay)

Out to Out of Copings: (Width, feet-inches)

Out to Out of Bridge Floor: (Length, feet-inches)

Skew: (Angle and Direction; i.e., Left or Right)

Type of Superstructure: (Reinforced Concrete Slab, Prestressed Concrete,Structural Steel, etc.)

Spans: (No. and length of each span, feet-inches)

Type of Substructure/Foundation: (Pier Type & Shape, Abutment/End Bent Type,Piles or Spread Footings, etc.)

Seismic Zone (only if in Zone 2):

C. Geometrics

The geometrics which apply to the bridge rehabilitation project are based on the following:

1. urban or rural location;

2. functional classification; and

3. project scope of work.

Section 40-6.0 describes the project scope of work. Bridge rehabilitation is considered a 3R project on either a freeway or non-freeway. See Chapter Fifty-four or Chapter Fifty-five to determine the applicable geometric-design criteria. If the bridge rehabilitation is considered a reconstruction 4R project on either a freeway or non-freeway, the applicable geometric-design criteria provided in Chapter Fifty-three should be used.

Use the table shown in Figure 40-8B to document the bridge rehabilitation Level One design criteria in the Bridge Scoping Report.

D. Appurtenances

Bridge Railing: (Type, height in inches, measured from roadway surface)

Curbs: (Presence, one or both sides, height in inches, width in inches)

Sidewalks: (Presence, one or both sides, height in inches, width in inches)

Utilities: (Power, telephone, attached or adjacent)

Railroad: (Presence, if affected by project construction or maintenance of traffic)

E. Approaches

Roadway Width (feet-inches)

Surface Type: (Asphalt or Concrete)

Guardrail: (Type and length)

Guardrail Transition: (Type)

Roadway Width (feet-inches)

F. Traffic

Current AADT (year)

Future AADT (year)

Percentage Commercial vehicles

1. ENVIRONMENTAL COMPLIANCE

Document the environmental factors which are likely to be involved, including the following:

1. impact on wetlands (a color photograph of each quadrant should be labeled and included);

2. need for all applicable permits (if no permits are required, state the reasons why not); and

3. historical significance of the bridge, if Select or Non-Select.

See Chapter Seven and Chapter Nine for more information on environmental considerations and permits.

VI. EXISTING CONDITIONS

Provide brief statements on the condition of the structural elements. The following provides guidance on the content of this Report section.

A. Bridge Deck

1. General. Indicate the overall condition of the bridge deck (excellent, fair, poor).

2. Overlay. If applicable, indicate the type, depth, condition, and year installed.

3. Surface Condition. Describe the extent and location of spalling, presence of existing patches, extent and location of cracking, relative indication of available skid resistance, etc.

4. Underside Condition. Describe the overall condition of the deck underside, extent and location of cracking, signs of leakage, etc.

5. Joints. Indicate the type, number, location, and condition.

6. Drainage. Indicate the condition of bridge-deck inlets. Describe the adequacy and condition of the drainage-conveyance system beneath the bridge deck. If known, state deck drainage problems, e.g., excessive ponding.

7. Bridge Railing. Indicate the type, condition, and height of the bridge railing, and provide a statement on whether or not the railing satisfies INDOT’s current performance criteria. If curbs or sidewalks are present, the satisfying INDOT criteria must be evaluated within this context.

8. Curbs or Sidewalks. If present, provide a statement on the overall condition and, for sidewalks, their current level of pedestrian usage. If sidewalks are not present, indicate problems, i.e., unsafe movements by pedestrians.

9. Other. See Section 72-2.02(01) for more information on bridge-deck elements which should be considered and reported in the Bridge Inspection Report.

B. Superstructure

1. General. Indicate the overall condition of the superstructure (excellent, fair, poor).

2. Repair/Maintenance Work. If known or if visible, identify prior repair or maintenance work performed. If applicable, indicate date when structure was painted.

3. Specific Deficiencies. Where applicable, identify the extent and location of specific structural deficiencies, e.g., cracking, spalling of concrete, rust on metal components, deformation, loss in concrete or metal components.

4. Fracture-Critical Member or Low-Fatigue-Life Details. Identify fracture-critical or fatigue-prone members.

5. Damage. Identify damage due to collision by vessels, vehicles, etc.

6. Bearings, Pedestals. State the functionality of these elements and indicate deficiencies, including seismic compatibility.

7. Other. See Section 72-2.03(01) for more information on superstructure elements which should be considered and reported in the Bridge Inspection Report.

C. Substructures and Foundations

1. General. Indicate the overall condition of the substructures and foundations and slope protection (excellent, fair, poor). Also indicate the substructure and foundation types and materials.

2. Repair/Maintenance. If known or if visible, identify prior repair or maintenance work performed, e.g., patching of concrete.

3. Specific Deficiencies. Where applicable, identify the extent and location of specific structural deficiencies, e.g., cracking, leaching, deterioration, settlement, rotation, exposed reinforcement.

4. Seismic. Indicate the structure’s ability to satisfy the current INDOT criteria for seismic load-carrying capacity based on the Seismic Zone, e.g., adequate or inadequate support length.

5. Drainage. Indicate overall adequacy of drainage with respect to the substructure and foundation and identify problems, e.g., erosion.

6. Scour. If known for a bridge in a waterway, indicate evidence (or lack of evidence) for scour, either from visual inspection or from an underwater inspection report.

7. Other. See Section 72-2.04(01) for more information on substructure or foundation elements which should be considered and reported in the Bridge Inspection Report.

D. Approaches

1. General. Indicate the overall condition of the approaches (excellent, fair, poor). All features within the project limits should be checked for compliance to the current safety standards.

2. Wedge. If applicable, indicate the type, depth, condition, and year installed.

3. Approach Pavement. Indicate the condition of the original reinforced-concrete bridge approach, pavement relief joints, and the approach pavement immediately adjacent to the bridge.

4. Guardrail. For each quadrant, indicate the type, length(s), and condition of the guardrail, guardrail transition (or the absence of one), and guardrail end treatment, and provide a statement on whether or not the system satisfies the current performance criteria.

5. Drive or Public Road. Indicate the location with respect to the bridge of each drive or public road which intersects the main facility near the bridge or within the traffic-maintenance limits.

6. Traffic-Control Devices. Describe the existing permanent traffic control devices on or approaching the bridge, e.g., signing, pavement markings, raised pavement markers, traffic signals, highway lighting.

7. Roadway Drainage and Pipes. Indicate the location and condition of ditches and pipes within the traffic-maintenance limits. Describe the end sections and whether or not they satisfy the current safety criteria.

8. Miscellaneous. Describe other pertinent features that affect driveability and safety. Mailboxes, trees, vegetation, or other features within the obstruction-free zone for a 3R project, or clear zone for a 4R project, should be identified.

E. Slopewalls. Indicate the overall condition and material of existing slopewalls (excellent, fair, poor).

F. Utilities. Identify all apparent existing utilities which are attached to structural elements, and their locations, e.g., conduits, electrical boxes, gas lines, water lines.

VII. RECOMMENDATIONS

Include a Level One design criteria statement to announce whether the project

will satisfy the INDOT Level One design criteria or require a design exception. If a design exception is required, list the affected criteria here and include the design exception request as a separate document.

A. Additional Condition Surveys and Tests

Section 72-2.0 identifies the more-sophisticated condition surveys and tests. Indicate which of these, should be undertaken before definitive recommendations are made.

B. Bridge Railings and Transitions

All bridge railings and guardrail-to-bridge-railing transitions must be upgraded to satisfy current INDOT criteria. Section 404-4.0 discusses such criteria. Identify the bridge railings and guardrail-to-bridge-railing transitions which will be used.

C. Bridge Deck

Identify the proposed work to the bridge deck. Where applicable, document the following:

1. percentage patching (full or partial depth) or removal of the existing bridge deck;

2. milling, hydro-demolition, and proposed bridge-deck overlay in conjunction with deck patching, ;

3. removal, replacement, or addition of curbs, sidewalks, or median;

4. bridge expansion-joint repair or replacement;

5. elimination of deck expansion joints and reconstruction with integral or semi-integral bent type construction at end bents;

6. drainage improvements; and

7. installing other safety enhancements.

Section 72-3.01 identifies bridge deck rehabilitation techniques and the Department practices for bridge-deck treatment.

D. Superstructure

Identify the proposed work, to the existing superstructure. Where applicable, document the following:

1. removing, replacing, or adding structural members;

2. patching concrete structural members;

3. installing shear studs on structural-steel girders;

4. replacing or repairing bearing assemblies; and

5. cleaning and painting structural-steel beams.

Sections 72-3.02 and 72-3.03 identify rehabilitation techniques for a steel or concrete superstructure.

E. Substructure and Foundation

Identify the proposed work, to the existing substructure and foundation. Where applicable, document the following:

1. widening end bents and interior piers or bents;

2. providing seismic retrofit;

3. removing and replacing pier portions;

4. repairing deteriorated concrete;

5. implementing solutions to hydraulic scour; and

6. constructing or repairing slope protection.

Section 72-3.04 identifies rehabilitation techniques for the substructure and foundation. See Section 72-3.05 for information on seismic retrofit rehabilitation techniques.

F. Approaches

Identify the proposed work to the reinforced-concrete bridge approaches (RCBAs). Where applicable, document the following:

1. patching or removal and replacement of the existing RCBAs;

2. installing pavement relief joints or terminal joints at ends of RCBAs, including any additional length of pavement replacement, if necessary;

3. removal, replacement, or addition of approach guardrail and related end treatments; and

4. installing asphalt wedges at ends of RCBAs.

Section 72-3.06 identifies the Department practices for bridge-approach work as part of a bridge-rehabilitation project.

G. Utilities

Identify known utility adjustments necessitated by the bridge-rehabilitation work. See Chapter Ten for more information on INDOT policies and procedures for utility adjustments.

H. Maintenance and Protection of Traffic During Construction

Identify the proposed strategy for maintaining traffic during construction. This can include alternating one-way traffic with signals, diverting the traffic to a detour route, or use of a temporary runaround. Inclusion of preliminary sketches is recommended for a complex traffic-control scheme. The sketches should be included with other schematics described in Section XII. Detour routes should be approved by the District Traffic Engineer prior to submitting this report.

VIII. PRELIMINARY COST ESTIMATE

Provide a preliminary cost estimate for the proposed bridge rehabilitation work. Minor miscellaneous items= may be combined into one lump-sum item.

The preliminary cost estimate, projected to the scheduled contract letting, should be based on INDOT’s current construction cost-estimating software system.

IX. ECONOMIC COST COMPARISON

The inclusion of this section should be determined at the field check. In general, only a major bridge rehabilitation should include a cost estimate for rehabilitation versus replacement. The graph shown in Figure 72-2C, Evaluating Alternative Improvement Strategies, demonstrates the cost-effective relationship between the bridge rehabilitation cost, the total replacement cost and the extended service life. For example, a bridge rehabilitation project that will extend the structure life by 10 years should not cost more than 43% of the total replacement cost.

X. ESTIMATED REMAINING LIFE

A statement will be included such as the following:

*The estimated remaining life of this structure without additional repairs is \_\_\_ years. After the recommended repairs, the remaining life will be \_\_\_ years.*

The estimated remaining life is the period of time, without additional repairs, which the structure can safely accommodate the anticipated vehicular traffic volume. The critical component may be the driving surface of the deck or another bridge component. The estimated remaining life should not be interpreted as the time to structural failure.

XI. Level One Design Criteria Checklist (Figure 40-8B only. All supporting documentation and calculations should be in the appendix, Section XV)

XII. SCHEMATICS

Provide schematics for the existing bridge cross section and the proposed bridge cross section, each consisting of a single 8 1/2” x 11” sheet. As necessary, provide separate schematics according to spans. The bridge sections should indicate the following:

1. width for:

a. travel lanes;

* 1. shoulders;

c. clear roadway;

d. out-to-out coping; and

e. overhangs;

2. roadway cross slope;

3. height of curb;

1. sidewalk width;

5. bridge railing type and basic dimensions; and

6. girder type and spacing.

Schematics should include header information and continue page numbering from previous sheets.

XIII. PHOTOGRAPHS

Provide color photographs depicting in sufficient detail the overall condition of the structure and its elements. The pictures can then be used in reviewing and evaluating the existing condition and rehabilitation recommendations. The following procedures apply to photographs.

1. Log all photographs as taken.

2. 1 - 2 photographs per page.

3. Beneath each photograph, identify the following:

a. the photo vantage point,

b. the direction the photographer is looking, and

c. the description of the picture.

1. For a project involving an IDNR permit, prepare a plan view of the bridge, to be placed in advance of the photographs, illustrating the photo location by photo number and the direction the photographer is looking.

Photographs should include header information and continue page numbering from previous sheets.

XIV. Figure 72-2C, Evaluating Alternative Improvement Strategies(if applicable, see Section IX)

XV. APPENDIX

Supplemental Documentation to reinforce the designer’s decisions should be included here. Such documents should appear in the order as follows:

1. Field check minutes
2. Correspondence
3. Supporting level one design criteria computations such as
   1. required guardrail lengths
   2. sight distance computations
   3. bridge railing test level requirements
   4. other
4. Quantities Calculations
5. Other supplemental documents such as:
   1. Bridge inspector’s report (include only a single page to document a reference in the body of the report)
   2. Special bridge design details that need a sketch for clarity.
   3. Scoping documents provided by the District.

Last Revised: 03/11/2021