

**Quality Assurance Review
National Bridge Inspection Standards &
Bridge Maintenance Program**

Champaign County

August 18, 2022

By: Mark Sherman, PE

CEAO Federal Bridge QA/QC Engineer

The scope of this review is to evaluate the agency's bridge inspection program based upon The Ohio Revised Code, the ODOT Manual of Bridge Inspection (MBI), and the National Bridge Inspection Standards (NBIS). This includes the following checklist, interviews with staff members responsible for the inspection program, review of files and documentation, and field inspection of bridges. Note: the inspection program includes inventory, maintenance and load rating in addition to the field inspections.

Agency: Champaign County Engineer

DATE: August 18, 2022

Questionnaire Completed by: Mark Mowrey

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) 125

2. Bridges >= 10' and <= 20' long (Metric 22) 86

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year

Replacements:(Enter Number): Culverts : Bridges:

Rehabilitations (Enter Number): Culverts : Bridges:

Replacements (Enter Number): Culverts : Bridges:

-List approximate annual budget \$200K to \$500K annually.

Are Credit Bridge funds used? Yes

Are Fed Funds used? Yes

2. In-house repairs and replacements

Replacements:(Enter Number): Culverts: Bridges: 0

Rehabilitations (Enter Number): Culverts: Bridges: 7

Replacements (Enter Number): Culverts: Bridges:

List approximate annual budget: (See budget numbers above)

3. How are projects identified and selected? Check all that apply.

- Inspection reports.
- Sufficiency rating.
- Growth/development.
- Other...explain

4. How are plans developed for emergency repairs? Check all that apply.

- In-house
- Consultant
- Contractor
- Other explain

5. Who does the work of emergency repairs? Check all that apply.

- In house
- Contractor
- Other explain

6. How is repair work documented? (i.e. work record, time card, plans?)

- Work orders
- Time Cards
- Plans

7. Who is empowered to order emergency road closures and how is it done?

- Engineer? Make a call to dispatch to notify of the closure
- Sherriff?
- Commissioners?

II. INSPECTION PROGRAM

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) (Metric 22) 125
2. Between 10' and 20' long (ORC 5501.47, 5543.20) (Metric 22) 86

B. STAFFING

1. Name of individual who is the **Program Manager** (makes FINAL DECISION). List qualifications/yrs. experience (bridge inspection experience) (Metric 1&2)

Name: Stephen McCall P.E., P.S.

- Yrs. Inspection related experience: __31 years__

- List courses attended (& approx. dates) Started inspecting in 1991, most recent Refresher course in 12/11/2020, ODOT 1 & 2 Inspection 4/20/2010, First inspection class in 1992 with Jim Barnhart

2. Name of individual in charge of bridge inspection unit (**Reviewer**). List qualifications/yrs. experience (bridge inspection experience) (Metric 1)

Name: Stephen McCall

- Yrs. Inspection related experience: __31__

- List courses attended (& approx. dates)

3. **Team Leader** - individual in charge of bridge inspection team (INSPECTED BY). List qualifications/yrs. experience (bridge inspection experience) (Metric 1&3)

Name: Mark Mowrey P.E.

- Yrs. Inspection related experience: __15__

- List courses attended (& approx. dates)

ODOT Bridge Level 1 – 3/25/10

ODOT Bridge Level 2 – 4/22/10

Load Rating Using BARS-PC&BRASS – 10/2/08

Load Rating Using AASHTOWare BrR – 2/7/19

Load Rating Hand Calculations – 4/7/09

Element Level Inspection 11/9/15

Online Bridge Inspection Refresher Course 3/21

Indicate the percentage of time spent on the listed duties in the previous year
%TIME on inspections:

___ Bridge/Culvert inspection

___ Bridge Design/Plan prep

- Bridge Construction
- Bridge Maintenance
- Overload/Superloads
- Surveying
- Other – Varies from year to year.
- 100% on Bridges only

4. Load Rating Engineer – Name of individual responsible for load ratings (must be PE) (Metric 4)

a. List Ohio PE # _____ b. Name: Various consultants and in house by Mark or Stephen.

5. Underwater Bridge Inspection Diver – Name person doing dive inspections (Metric 5)

- Name: NA
- Yrs. Inspection related experience: NA
- List courses attended (& approx dates) NA

C. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

- Pickup truck
- Van
- SUV
- Custom vehicle

2. What typical inspection equipment does the inspection team normally carry with them to the inspection site? Check all that apply.

- | | |
|--|--|
| <input type="checkbox"/> Extension Ladder Length ____ | <input checked="" type="checkbox"/> 6' Folding Rule |
| <input checked="" type="checkbox"/> 100' Fiberglass Tape | <input type="checkbox"/> Scraper |
| <input type="checkbox"/> Geologist Hammer | <input checked="" type="checkbox"/> Vertical Clearance Rod |
| <input type="checkbox"/> Inspection Mirror | <input checked="" type="checkbox"/> Probing Rod |
| <input checked="" type="checkbox"/> Flashlight | <input checked="" type="checkbox"/> Paint Stick/Crayon |
| <input type="checkbox"/> Thermometer | <input checked="" type="checkbox"/> Hip Boots and Waders |
| <input checked="" type="checkbox"/> Plumb Bob | <input type="checkbox"/> Sounding Chains |
| <input checked="" type="checkbox"/> Camera | <input checked="" type="checkbox"/> Wrenches |
| <input type="checkbox"/> 2'-0" Level | <input checked="" type="checkbox"/> Pliers |
| <input type="checkbox"/> Brush Hook/Axe | <input checked="" type="checkbox"/> Screw Driver |

- Boat
- First Aid Kit
- Wire Brush
- Shovel
- Calipers

Other equipment not listed above:

3. List types of NDT methods used? Circle all that apply.

- Dye penetrant;
- Magnetic particle;
- Ultrasound;

Other

5. What equipment does your team have available for "hands on" access to FCM bridge members? (Metric 16)

Waders, (see equipment list above).

6. Use of equipment (Metric 16)

a. How many bridges need a snooper? 0

b. How many bridges is it used on?

c. How often?

D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6)

95

2. Approximately how many inspections are scheduled for the current calendar year? (Metric 6)

119

3. Average number of inspections per day (Metric 6) Depends 1-8

4. Approximately how long (hours) does it take to inspect average sized structures

a. Beam/Girder: Simple Span: 0.33 hrs. Multi-span: 0.33 hrs.

b. Slab bridge: Simple Span: 0.33 hrs. Multi-span: 0.33 hrs.

- c. Truss (pony): Simple Span: 0.75 hrs. Multi-span: N/A hrs.
 d. Through/deck): Simple Span: N/A hrs. Multi-span: N/A hrs.
 e. Culvert: Single cell 0.25 hrs. Multiple Cells: 0.33 hrs.

5. Are previous inspection reports available at site for review? (Metric 15) Yes No

6. Are bridge inspections recorded in field on Paper Electronically

7. Are photos available for every bridge? Yes No (If no, you need to start.)

8. Are photos posted in Assetwise? Yes No (If no, you need to start, and be selective.)

9. Are defects photos taken during inspection? Yes No (If no, you need to start.)

10. Are Bridge comments recorded in Assetwise? Yes No (If no, you need to start.)

11. Are previous bridge comments brought to the bridge? Yes No (If no, why not)

12. Are the bridge plans carried to the bridge site for review? (Metric 15)- Yes No

13. Are bridge records available for review in the bridge office? (Metric 15) Yes No

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6)

Explain:

8. Do you have bridges requiring insp. more frequently than 12 MO Yes No

___ Number due to **Damage** Choose an item. List frequency of inspection. (Metric 11)___

___ Number needing **In-depth** Choose an item. List frequency of inspection. (Metric 11)___

___ Number of **Special insp** Choose an item. List frequency of inspection. (Metric 11)

9. Does your inspection team believe it has enough time to do the job?

Yes No

10. List your quality assurance checks made during the inspection process? (Metric 20)

We follow ODOT training procedures.

11. Do you have any bridges that need underwater inspections in less than 60-month intervals?

(Metric 8)

Yes No (Assetwise check)

12. Do any bridges have fracture critical inspections performed more frequently than 24-month intervals? (Metric 10)

Yes No (Assetwise check)

13. Is a Team Leader at the bridge at all times during the following inspections? (Metric 12)

Initial Inspection? Yes No

Routine Annual Inspections? Yes No

Special Inspections? Yes No

Underwater Inspections? Yes No N/A

Fracture Critical Inspections? Yes No

E. SCOUR CRITICAL BRIDGES (Guidance in ODOT Manual of Bridge Inspection)

1. No. of bridges considered scour susceptible? (Service over Water) Number 124

2. Number of bridges inspected by probing? Number 5.

3. Number of Scour Critical bridges (item 113 - 3, 2, 1 or 0)? (Metric 18) Number 0.

4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? (Metric 18) Yes No If no, Why? NA

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) Number 0.

6. How are scour evaluations performed? (Metric 18) 4 – 3 culverts and the Timber beam bridge, by probe.

7. Who determines the need for diving inspections and by what criteria?

County Engineer.

F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)

Who checks?

How Often?... With every inspection Less often than once per year

2. How often is the inventory checked for needed updates? (Metric 22)

How Often?... With every inspection Less often than once per year

3. How is the inventory data input into Assetwise?

Electronically, Direct into Assetwise from collector App. as bridge is inspected

All at once at the end of the year from a paper copy into Assetwise

As each inspection is complete from paper to computer to Assetwise.

4. When is the updated/new inventory data forwarded to ODOT? (Metric 23)

Changes discovered during inspection? Yes No

Changes from new construction or rehab? Yes No

5. NBIS requires that the inspecting organization maintain master lists of the following:

(Metric 16,17,11)

a. Bridges that contain fracture critical members, including the location and description of such members on the bridge and the inspection procedures of such members (Each individual FCM member on each FCM bridge must be clearly identified in the bridge file) (Where a FCM Identification Plan exists then look for remaining fatigue life). Master List?

Yes Number__1__ : If, No, Why not? _____ NA

b. Bridges requiring underwater inspections.

Number_____ NA

c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)

Number_____ NA

Note: An examination of the files will be performed during the review.

Options: For the files listed below you can email a copy of a typical file or have them on hand for inspection.

- Bridge Files Reviewed
- Scour Critical POA. None needed
- Fracture Critical Plan. 1 bridge (new)
- UW inspection Procedure NA

G. PROCEDURES

1. Are new maintenance problems identified during bridge inspection? (Metric 15)

Yes No

2. How do the inspectors inform maintenance personnel of routine bridge maintenance problems (written, oral, other)? (Metric 15)

- Written work order.
- Electronic Communication.
- Oral direction.
- Other. Explain **Maintenance items not in spreadsheet during inspection**

3. Who do the inspectors notify when emergency repairs, or critical findings are necessary (action required within 1 week)? (Metric 21)

Check all that apply.

- County Engineer Bridge Superintendent
- County bridge Engineer Sherriff

How is this emergency action documented? (Must be entered and tracked in Assetwise)

Explain if different than procedure in Assetwise. **SAME**

4. If a bridge requires emergency repairs. Is this noted as part of the inspection report or as a separate document? (Metric 21)

Both

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? (Metric 15)

Inspection crew

I. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges. 92

2. Number of plans for non-NBIS bridges (>= 10' and <= 20' long) 178

3. Number of bridges analyzed using the *AASHTO Bridge Evaluation* (Metric 13) _____

By Whom (Metric 13)

Load Rating Engineer

County Engineer

Bridge Engineer

Consultant

4. When are bridges load rated, after initial rating. Check all that apply

Every 5 years regardless.

When there is a significant change in condition rating.

When wearing surface thickness increases more than 1-1/2 inches

When permit load is requested

other

5. Methods used (Metric 13)

AAWSHTO BrR

Hand Calculated

Engineering Judgement (BR100)

BARS or other proprietary software program

Other Explain _____

6. Number of NBIS length bridges “not ratable” at all due to lack of data and may have to be field tested. (Metric 13) *(These are bridges that have a coding of 5, not 0 in the method of analysis Item.)*

Number 0 Plan of action for load rating these?

7. Number of NBIS length bridges load posted (Metric 14) (Assetwise Check)

Number of bridges posted 2. Number of bridges with posted Signs in the field 2.

8. List bridges closed due to condition rating (rough check) **0**

9. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution. (Assetwise Check)

0

10. Number of NBIS bridges with Gusset Plates (Metric 13) 1

11. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) 1

12. Describe filing system (where files are kept): (Metric 15)

- Inspection reports, including old inspections:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Design Calculations:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Plans:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Load analysis calculations:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Inventory forms:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Photos and sketches:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Repairs and maintenance history

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Scour evaluation:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Scour POA:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Fracture Critical File:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Load Posting/Closing:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Underwater inspections:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Special inspection eqpt. or procedures:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

- Flood data, waterway adequacy, channel cross sections:

- On paper file in Office
- Electronically
- In Assetwise
- All three
- Other

Note the NBIS Retention period: BR-86 report 10 years, All records 3 years after bridge removed, Load rating calculations 3 years after a new rating is done.

13. What is the FC bridge inspection frequency? (Metric 16) Every _ 12 _ Months

14. Is the FC Plan completed for all FC bridges? (Metric 16) Yes X No

15. Are the FCM Identified in the FC Plan? (Metric 16) Yes X No

16. What is the underwater inspection frequency? (Metric 17) ___ Every _ _ Months (NA)

17. Are the underwater elements identified and located? (Metric 17) Yes No

18. List any complex bridges: (Metric 19) NA

19. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19)

Yes No

Describe:

Other equipment not listed above:

Part II: Field Review

Inspection Reports (metric 12)

As part of this review, **six** bridges were field reviewed to compare conditions with the most recent inspection report. The individual condition ratings for all of the field sampled bridges properly reflected the field conditions within the tolerance of 1 rating value when compared to the Manual, with the exception of CHP-T0080-0242_(1130978) Where the scour rated much lower.

Summary ratings correspond with the NBIS inspection items.

Field Review:

CHP-T0211-0047_(1130412) Prestressed Box beams

Item 58 Deck..... **7** (Prestressed boxes without decks need to have deck rated same as Superstructure.)

Item 59 Superstructure.....**6** (While the beam joints have leaked, it has been waterproofed and there is no salt residue and no delamination with every beam sounding solid. This could easily be a 7 for those reasons, even if the manual suggests otherwise.) The fascia condition is a low 6 or even a 5, but that is not a governing factor for the overall condition rating of the superstructure. The 1 point over/under rule applies, so there is no need to change the rating, but both the deck and super need to match.

Item 60 Substructure.....**7** Agreed (This could go to a 6, if the delaminated areas make up a significant percentage of the abutment face from the fascia inward, not the wingwalls. I quickly made a rough estimate of about 96 Sq. Ft. total, evenly split between abutments.)

Reinforced Concrete – Condition Rating Definitions

1-4	9-0 Summary	% Spalling, % Pothole or % Asphalt Patch	% Saturation or % Delamination and Cracking
1-Good	9-Excellent	No signs of distress, no discoloration	
	8-Very Good	Isolate, Minor	Minor, no rust staining
	7-Good	Up to 1% *	Up to 5%, Minor, no rust staining Minor problems, hairline cracking with isolated leaking, isolated efflorescence.
2-Fair	6-Satisfactory	Up to 5% *, <u>Stub Abutments</u> : up to 4" deep spalling for less than 1/2 of the bridge width	Up to 10% Minor cracking with leaking, efflorescence and isolated rust staining. Map cracking combined with areas of saturation. Minor differential settlement
	5-Fair	Up to 10% with exposed steel, <u>Stub Abutments</u> : may have up to 4" deep spall for more than 1/2 of bridge width.	Up to 20%, <u>Stub Abutments</u> : may have 100% saturation with full width delaminations with a few exposed vertical bars Cracking with moderate leaking and buildup of efflorescence and widespread rust staining. Structural cracking with moderate, stable rotation or settlement
3-Poor	4-Poor	More than 10% Areas should include Advanced section loss to reinforcing	More than 20% Advanced cracking with heavy buildup, leaking, efflorescence and rust staining.
	3-Serious	4-Poor. . . And Local Failures Possible (ex. precursor to through-hole	
4-Critical	2-Critical	3-Serious. . . And Unless closely monitored it may be necessary to close the bridge or lane(s) until corrective action is taken	
	1-Imm Failure	2-Critical. . . And Major deterioration is affecting stability. Bridge or lane(s) shall be closed to traffic but corrective action may put bridge back into light service	
	0-Failed	. . . And Out of service - beyond corrective action	



*Slab-Type Superstructures with one transverse section of more than 1/3 of the bridge width or primary bars exposed shall be coded no better than a "5-Fair".

Table 35 - Condition Rating Material: Concrete

- Item 61 Channel.....7 Agreed
- Item 61.01 Scour.....7 Agreed
- Item 62 Culvert..... N
- Item 36 Railing..... 0 0 0 0 Agreed (posts and anchorages missing)
- Item 72 Approach Alignment6 (Could be higher with good visibility and no curves.)



Comments: One of the oldest prestressed boxes in Ohio (1954) very good comments in Assetwise.
 Defect Photos: None in Assetwise, but good defect photos on file.
 Channel Photos: Great Channel Photos in Assetwise

CHP-T0149-0019_(1131222) Concrete Tee-beams (check item 43? It is coded 103. Should be 104)

- Item 58 Deck.....7 (Technically the deck is a structural part of the Tee-beam and should be rated the same as the superstructure. 5)
- Item 59 Superstructure.....5 Agreed (Facia beams are bad, but the interior beams are fair.)
- Item 60 Substructure.....6 Agreed (This could go lower with some measurements on the delamination areas on the abutments and the check for scour on the rear abutment footing. I could not access that area during my review, due to deep silt).



- Item 61 Channel.....8 Agreed
 - Item 61.01 Scour..... 7 Agreed (May be lower after probing.)
- Item 62 Culvert..... N
- Item 36 Railing 0 0 0 0 (Railing Failed. Needs to be retrofitted sooner than later.)



Item 72 Approach Alignment8 Agreed

Comments: Very good comments in Assetwise.

Defect Photos: Good photos in bridge file, but could use a few broader angled shots to put the defects into the context of the larger member and bridge in general. That gives the needed extent and location added clarity.

Channel Photos: Good channel photos given the restrictive site conditions.

(Follow up Comment: Safety Barrier installed within 4 weeks after the field review.)



CHP-C0025-0152_(1130641)

Prestressed Box-beams

Item 58 Deck.....8 Remember non-composite prestressed boxes have no real deck, so the deck condition must be the same as the superstructure (6).

Item 59 Superstructure..... 6 Agreed Joints have leaked in the past, but are dry now. Concrete areas at the joints are distressed, but no loss of concrete yet.

Item 60 Substructure.....8 Agreed

Item 61 Channel..... 8 Agreed

Item 61.01 Scour.....7 Agreed

Item 62 Culvert.....N Agreed

Item 36 Railing..... 1 0 0 0 Agreed

Item 72 Approach Alignment8 Agreed

Comments: Good Comments

Defect Photos: Good photos

Channel Photos: Great Channel Photos

CHP-C0017-0593_(1130587)

Concrete Slab

- Item 58 Deck.....8 Slab is the superstructure, so it has to agree with the superstructure rating.
- Item 59 Superstructure.....6 Agreed
- Item 60 Substructure..... 8 Maybe a little lower. The Gunnite is masking the real condition, so it is hard to tell. However, the Gunnite is there because there was a problem and I suspect it is still there. So, I would put it at a 7 or lower for that reason. (See Scour as well)



- Item 61 Channel.....8 Agreed
 - Item 61.01 Scour.....7 Agreed Scour control Substructure, so if scour is lower than Substructure, you have to rate the substructure that same as scour. It also appears that the stream bed is lowering and perhaps it is the top of the looting that we are seeing, given the irregularity of the face. That may, or may not put to scour rating a tad lower as well, depending on the size of the footing.
- Item 62 Culvert.....N Agreed
- Item 36 Railing..... 0 0 0 0 Agreed
- Item 72 Approach Alignment6 Agreed, only due to the reason of traffic slowing due to intersection proximity.

Comments: Good comments in Assetwise.

Defect Photos: Great defect photos in bridge file, but should post some of them in Assetwise.

Channel Photos: Need channel photos from both up and downstream in Assetwise. You have good ones from downstream. Upstream photo needs to have more visible.

CHP-T0080-0242_(1130978)

Timber Beams Check Structure type coding Item 43. Should be a 702 not 703 as there are no floor beams, or floor beam systems, only girders/beams.

- Item 58 Deck..... 7 Agreed
- Item 59 Superstructure.....7 Agreed
- Item 60 Substructure.....7 Agreed on initial appearance. However, it looks like the channel has some scouring issues that will impact the substructure rating. See Scour below and the Manual’s table 52.



Item 61 Channel.....8 Agreed

Item 61.01 Scour.....7 According to the manual this should be a 4. Fortunately, it is an easy fix and does not warrant drastic measures. This should be fixed soon, to bring everything back up to a 7 or better. Comparing today's photos with the 2021 photos, it appears to be stable. The 2003 photos look like it might be just the initial stages of scour.

Substructure Scour, deep foundations – "ded" CONDITION RATING

Item - 42. Scour

Type - Deep Foundations: Piles, Drilled Shafts, including Spread Footing on Rock

1-4	9-0 Total Bridge	Description*	Exposed Deep Foundation*
1-Good	9-Excellent	No Problems noted.	
	8-Very Good	Minor scour holes developing, scour protection placed.	
	7-Good	Some minor problems. Minor scour holes exist; probing indicated soft material in scour hole.	top of footing and first 6-inches exposed
2-Fair	6-Satisfactory	Damage to scour countermeasures, probing indicates soft material in scour hole.	Full height side of footing exposed
	5-Fair	Minor scour, damage to scour countermeasures, probing indicates soft material in scour hole.	One or two pilings are visible less than 10% of piling height**
3-Poor	4-Poor	Advanced scour.	1/3 of the front row of piling exposed less 10% of piling height**
	3-Serious	Scour has seriously affected the primary structural components Local failures are possible.	Any one piling exposed above or below water more than 3-feet high, more than 1/3 of the front row of piling exposed less than 10% of piling height**
4-Critical	2-Critical	Scour may have removed substructure support. Local failures are possible	Any substructure unit with more than 20% of bearing capacity removed.
	1-Imminent Failure	Obvious vertical or horizontal movement due to scour that is affecting the structure stability. Bridge is closed to traffic but corrective action may put bridge back in to light service.	
	0-Failed	Out of service - beyond corrective action.	

Table 52 - Condition Rating: Substructure Deep Foundations Scour

Item 62 Culvert.....N Agreed

Item 36 Railing..... 0 0 0 0 Agreed

Item 72 Approach Alignment 7 Agreed

Comments: The comments are good. It appears that the scour issue was addressed in 2018, but has returned and is in need of a more permanent solution.

Defect Photos: Good photos in Assetwise

Channel Photos: Great channel photos. Remember to post them in the channel section for ease of viewing and access.

(Follow up Comments: Repairs installed shortly after the field review, bringing Scour back up to 7)



CHP-C0167-0056_(1130366) Concrete Arch

- Item 58 Deck.....N Agreed
- Item 59 Superstructure.....6 Agreed
- Item 60 Substructure.....8 Agreed
- Item 61 Channel.....8 Agreed
 - Item 61.01 Scour.....7 Agreed
- Item 62 Culvert.....N
- Item 36 Railing..... 0 0 0 0 Agreed
- Item 72 Approach Alignment7 Agreed
- Comments: [Good comments.](#)
- Defect Photos: [Good photos in bridge file.](#)
- Channel Photos: [Great channel photos](#)

Field Review Summary:

Overall, the county is doing a very good job with their bridge inspection program. Their records are complete and organized. I found the vast majority of their condition ratings to be within the parameters set by the inspection manual. Only a couple bridges were found where the county forgot that scour controls substructure. Also that and decks are rated the same as superstructure in the case of slabs and non-composite prestressed boxes. The comments could use a little more elaboration at times, with corresponding photos to show the location, extent and severity. Otherwise, the comments are good. The nearly all of the channel section photos are good. They have many good defect and channel photos in their files and should consider posting the most meaningful ones in Assetwise.

NOTE: Resolution of deficiencies for both **CHP-T0149-0019_(1131222)** & **CHP-T0080-0242_(1130978)** were undertaken in a short time period subsequent to field review.

PART III Office file Review

Bridge files reviewed: CHP-C0017-0593_(1130587)_Runkle; CHP-C0025-0152_(1130641)_Hanna; CHP-C0167-0056_(1130366)_Mutual Union; CHP-T0080-0242_(1130978)_Coffin Station; CHP-T0126-0230_(1131117)_Clark; CHP-T0149-0019_(1131222)_Gilbert; CHP-T0211-0047_(1130412)_Middleburg.

Fracture critical bridges. 1

Fracture Critical Member and Fatigue Prone Connection ID Plan.

One file reviewed. **CHP 126-0230_(1131117)**

Bridge Load Rating Report, including Gusset plate analysis.

One file reviewed **CHP 126-0230_(1131117)**

Underwater inspections None

POA for Scour: All scour repairs undertaken as they are discovered, eliminating the need for a POA.

Scour susceptible bridges Everything over a stream with shallow foundations

Critical findings 0

All files are complete with all documentation concerning load rating, channel photos and defect photos, along with previous inspection reports. Their files are complete and comprehensive, documenting the history of every bridge through reports, plans and photographs.

PART IV Snapshot DATA Summary of Program

CHAMPAIGN County 2022				
INVENTORY, APPRAISAL & INSPECTION SNAPSHOT				
11/7/2022				
Inventory Data - NBIS Bridges Only				
				<u>NBIS COUNT</u>
NBIS Bridges > 20'				125
Bridges 10'-20'				86
All Bridges				211
Item 221 Inspection Responsibility		CODE	# NBIS	# ALL
Data Tab	Col BV, BW County	2	125	211
Item 21 Maintenance responsibility		CODE	# NBIS	# ALL
Data Tab	County	2	124	210
Col D	City or other local	4	0	0
	Railroad	27	0	0
	Private (tohter than RR)	26	0	0
	State Park	11	0	0
	Local Park	23	0	0
	State Agency	1	0	0
	Township	3	1	1
			125	211
Item 42A Type service on bridge		CODE	# NBIS	# ALL
Data Tab	Other	0	0	0
Col Q	Highway	1	125	211
	Railroad	2	0	0
	Ped/Bikeway	3	0	0
	Hwy/RR	4	0	0
	Hwy/Ped	5	0	0
			125	211
Item 42B Type service under bridge		CODE	# NBIS	# ALL
Data Tab	Other	0	0	0
Col R	Hwy w/ or w/o Ped	1	0	0
	Railroad	2	0	0
	Ped/Bkwy	3	0	0
	Hwy w/ RR	4	0	0
	Waterway	5	125	211
	Hwy/Waterway	6	0	0
	RR/Waterway	7	0	0
	Hwy/Waterway/RR	8	0	0
	Relief (for waterways)	9	0	0
			125	211

All data is complete and correct in this section.

ITEMS 43A,B,C Structure Type	Data (Col M,N,O)	CODE	#NBIS	#ALL
Concrete Slab		101	1	11
Concrete Girder		103	2	2
Concrete Box Beam/Girder Multiple		105	1	1
Concrete Deck Arch		111	1	1
Concrete Culvert (incl frame culverts)		119	10	67
Concrete Continuous Slab		201	1	1
Steel Beam or Girder		302	1	1
Steel Thru Truss (includes Pony)		310	1	1
Steel Culvert (incl frame culverts)		319	1	14
Steel Continuous Beam or Girder		402	1	1
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	104	110
Timber Girder w/ Floor System		703	1	1
			125	211

Item 92A Fracture Critical		CODE	#NBIS	#ALL
Data Tab	Requires FC Inspection	Y	1	n/a
Col U,V,Y	Requires FC Inspection	N	124	n/a
			125	n/a
	FC Switch Y/N is Blank		0	n/a

Item 113 Scour			#NBIS	#ALL
Data Tab	Bridge not over waterway	N	0	0
Col AA	unknown foundation	U	0	0
	over tidal waters	T	0	0
	foundations on dry land	9	1	1
	stable above footing	8	33	48
	countermeasures installed	7	14	43
	no scour evaluation made	6	0	0
	stable within footer limits	5	77	115
	stable action needed	4	0	4
	scour critical - unstable	3	0	0
	scour critical - scour present	2	0	0
	scour critical - failure imminent	1	0	0
	scour critical - bridge failed	0	0	0
			125	211

CHP-C0025-0167 _(1133519)

CHP-T0028-0130 _(1133527)

CHP-T0118-0221 _(1133705)

CHP-T0143-0017 _(1133489)

The bridges above have a non-critical finding scour rating that requires corrective measures. Once the measures are implemented the scour rating should move to a 7.

All data is complete and correct in this section.

Item 63 Documented Engineering Judgment				# NBIS	# ALL
	Field Eval & Doc EJ			2	n/a
BR_100 for these bridges?					
Item 92B Underwater			CODE	# NBIS	# ALL
Data Tab	requires dive inspection		N	125	n/a
Col W,X,Z	requires dive inspection		Y	0	n/a
				125	
Item 709 Plan Information			CODE	# NBIS	# ALL
Data Tab	plans not avail		0	30	30
Col. AW	plan avail		1	92	178
	field measured		2	2	2
	Field Testing		3	0	0
	not applicable		N	0	0
				124	210

CHP-T0088-0040_(1134094) Data TAB column AW is blank missing code.

Item 63 Method of Analysis			CODE	# NBIS	# ALL
Data Tab	Field Eval & Doc. Engr Judgment		0	2	2
Col. AV	Work Stress		1	0	0
	LFR		2	0	0
	LRFR		3	0	0
	load test		4	0	0
	No rating done		5	0	81
	LFR		6	113	115
	AS		7	1	1
	LRFR		8	9	12
	Assigned LFR HS20		D	0	0
	Assigned LRFR HL93		F	0	0
	not appl (RR, etc)		X	0	0
				125	211
REMINDER:					
Load Factor required for bridges built after 1993			(exceptions: timber, etc,)		
LRFR required for bridges built after 2010					

Given the changes coming in 2023 and the now required shear analysis, please make sure your load rating documentations are complete and include a BR100 with complete statements of assumptions, measurements and methodologies for anything using engineering judgement

All data is complete and correct in this section.

Inspection Condition Data - NBIS Bridges Only

Item 41	Operating Status	CODE	#NBIS	#ALL
Data Tab	Open, No restriction	A	123	209
Col. AM	Open, posting recommended	B	0	0
	Open, Half width constr.	C	0	0
	Open because of temp. fix	D	0	0
	Open using temp. structure	E	0	0
	New structure not yet open	G	0	0
	closed for load cap. reason	K	0	0
	Posted for load capacity	P	2	2
	Posted for other than load	R	0	0
	Closed for other than load	X	0	0
			125	211

Metric 13	Load Rating Data	
Load Rating Tab		# OF ERRORS
Col. AN	Op RF greater than Inv RF?	0
Col. AO	Posting and % Legal OK?	1
Col. AP	"0" used instead of blank	0
Col. AT	% legal < lowest RF	5
Col. AV	Item 70 correct?	0
Col. AW	Method of Rating Alike?	0
Col. AX	Op & Inv RF in Tons as req'd?	0
Col. AY	Item 575 correct?	0
Col. AZ	Depth of fill completed?	1

CHP-T0126-0230_(1131117) Item 734 is 125% yet item 41 and all of your load rating factors agree that it is posted.

CHP-T0244-0015_(1134108) CHP-T0150-0111_(1134086) CHP-T0126-0230_(1131117)
 CHP-T0080-0103_(1132768) CHP-C0130-0279_(1134019)

CHP-C0193-0572_(1134116) Item 580 is blank. Need depth of fill entered.

All data is complete and correct in this section.

KEY METRICS					
(C)	Compliant	(CC)	Conditionally Compliant		
(SC)	Substantially Compliant	(NC)	Non- Compliant		
		(NC)	(SC) If corrected within 6/12 months		
			Refresher=6 mo, Comprehensive=12 mo		
METRIC 2 - Program Manager Qualification (from files examination)					
From Files review		Missing	#sampled	% PASS	COMPLIANCE
PE /Experience		0	1	100.0%	(C)
Comprehensive		0	1	100.0%	(C)
Refresher		0	1	100.0%	(C)
METRIC 3 - Team Leader Qualification (from files examination)					
From Files review		Missing	#sampled	% PASS	COMPLIANCE
Degree /Experience		0	3	100.0%	(C)
Comprehensive		0	3	100.0%	(C)
Refresher		0	3	100.0%	(C)
METRIC 6 Insp. Frequency Routine					
Bridge Inspections Overdue		# OVERDUE		% PASS	COMPLIANCE
Data Tab	NBIS - 24 months	1		99.2%	(SC)
Col. AB	ORC - Calendar Year	2		98.4%	(SC)
Col. AB	All Routine insp.	4			
	BIM - 18 months	0		100.0%	(C)

CHP-T0212-0106_(1132598)
 CHP-T0080-0242_(1130978) CHP-T0126-0230_(1131117)
 CHP-C0021-1143_(1133586) plus the 3 above

METRIC 8 - Insp. Frequency Underwater					
Dive Inspections Overdue		# OVERDUE	# UW	% PASS	COMPLIANCE
Data Tab	Col. Z 60 months	0	0	100.0%	(C)
METRIC 10 - Insp. Frequency FC Member					
FC Inspections Overdue		# OVERDUE	# FC	% PASS	COMPLIANCE
Data Tab	Col. Y 24 months	0	1	100.0%	(C)

METRIC 12 - Routine Inspection		(** from field review)				
Field Ratings		# > +/-1	# Ratings	% PASS	COMPLIANCE	
	field ratings**	1	24	95.8%	(C)	
Comments		Missing	# < 6	% PASS		
Tab	Comments when Rating < 6	2	125	98.4%	(C)	
	Adequacy comments **	0	30	100.0%	(C)	
		Error	Total Scour	% PASS		
Comments	Rating should be = Scour	2	118	98.3%	within tolerance +/- 1	
Tab	Noncompliant Scour Rating Er	2	118	98.3%	(C)	

CHP-C0193-1064 _(1130072) missing deck comments

CHP-T0211-0047 _(1130412) missing deck comments

(CHP-T0080-0242 _(1130978) Scour rating control from field review, not caught in data query)

CHP-C0006-0028 _(1130528)

CHP-C0167-0193 _(1130463)

CHP-C0006-0028 _(1130528)

CHP-C0167-0193 _(1130463)

All other data is complete and correct in this section.

METRIC 14 - Posting		Load rating data tab				
From Files review		# errors	#sampled	% PASS	COMPLIANCE	
	Op RF < 3 tons but not closed	0	125	100.0%	(C)	
	Op RF = 0 but not closed	0	125	100.0%	(C)	
	% Legal < 100 but not posted	0	125	100.0%	(C)	
	Item 41 = B	0	125	100.0%	(C)	
METRIC 16 - Fracture Critical Inspection		(from files examination)				
From Files review		Missing	#FC	% PASS	COMPLIANCE	
	Fract Critical Member ID	0	1	100.0%	(C)	
	Fatigue Prone Detail	0	1	100.0%	(C)	
	Gusset Plate Calculations	0	1	100.0%	(C)	
	FC Inspection Procedure	0	1	100.0%	(C)	
METRIC 17 - Underwater Inspection		(from files examination)				
From Files review		Missing	#UW	% PASS	COMPLIANCE	
	UW Inspection Procedure	0	0	100%	(C)	
	Location of UW elements	0	0	100%	(C)	
	UW frequency identified	0	0	100%	(C)	

All data is complete and correct in this section.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance

Compliance Codes for the following Metrics:

(C)	Compliant
(SC)	Substantially Compliant
(CC)	Conditionally Compliant (Adhering to approved PCA)
(NC)	Not Compliant

Metric	Description	(C)	(SC)	(CC)	(NC)
1	State Bridge Inspection Organization				
2	Program Manager Qualification				
3	Team Leader Qualification				
4	Load Rating Engineer Qualification				
5	UW Bridge Inspection Diver Qualification				
6	Routine Inspection Frequency - Low Risk				
7	Routine Inspection Frequency - High Risk				
8	UW Inspection Frequency - Low Risk				
9	UW Inspection Frequency - High Risk				
10	FC Inspection Frequency				
11	Frequency Criteria				
12	Inspection Quality **				
13	Load Rating				
14	Posted or Restricted Bridges				
15	Bridge Files				
16	FC Bridges				
17	UW inspection procedures				
18	Scour Critical Bridges				
19	Complex Bridges				
20	QC/QA				
21	Critical Findings				
22	Inventory **				
23	Updating of Data				

** based on results of Field Review

Metric	Action Needed

Summary:

Champaign County is within compliance of all metrics, except the routine inspection cycles on a couple of bridges. Otherwise, they are doing a very good job managing their bridge program. Prompt corrective measures were taken for CHP-T0149-0019_(1131222) & CHP-T0080-0242_(1130978) subsequent to the field review. The load rating data needs some error checking and minor corrections, but other than that, it doesn't get much better than this.