Quality Assurance Review

National Bridge Inspection Standards &
Bridge Maintenance Program

Clark County

September 19, 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: Clark County Engineer's Office

DATE: 8/22/2022

Questionnaire Completed by: Thomas Bender PE

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) 187
2. Bridges >= 10' and <= 20' long (Metric 22) 48

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year

Replacements:(Enter Number): Culverts : 1 Bridges: 2
Rehabilitations (Enter Number): Culverts : Bridges: 1
Replacements (Enter Number): Culverts : Bridges:
-List approximate annual budget: $1,000,000 including grants
Are Credit Bridge funds used? ☒
Are Federal Funds used? ☒

2. In-house repairs and replacements

Replacements:(Enter Number): Culverts : Bridges: 3
Rehabilitations (Enter Number): Culverts : Bridges: 2
Replacements (Enter Number): Culverts : Bridges:
List approximate annual budget: $750,000

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

- ☒ Inspection reports.
- ☒ Sufficiency rating.
- ☐ Growth/development.
- ☐ Other…explain Click or tap here to enter text.

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

- ☒ In-house
- ☒ Consultant
- ☐ Contractor
- ☐ Other explain Click or tap here to enter text.

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

- ☒ In house
- ☒ Contractor
- ☐ Other explain Click or tap here to enter text.

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?
- ☒ Sheriff?
- ☐ 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) 187

2. Between 10’ and 20' long (ORC 5501.47, 5543.20) (Metric 22) 48

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: Jonathan A Burr, PE, PS

- Yrs. Inspection related experience: _14_____
- List courses attended (& approx. dates) Level 1 Level 2 July 2010, , Bridge Insp Update March 2011, Bridge Insp Refresher July 2017, Bridge Insp Update March 2021

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

Name: Jonathan A Burr, PE, PS

- Yrs. Inspection related experience: _14_____

- List courses attended (& approx. dates) same as above

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

Name: Thomas W Bender, PE

- Yrs. Inspection related experience: __13____

- List courses attended (& approx. dates) Level 1 Level 2 July 2010, Bridge Insp Update March 2011, Bridge Inventory, SMS May 2016, Bridge Insp Refresher July 2017, Bridge Insp Update March 2021

Indicate the percentage of time spent on the listed duties in the previous year

%TIME on inspections:

_20__% Bridge/Culvert inspection
_20__% Bridge Design/Plan prep
_10__% Bridge Construction
__5__% Bridge Maintenance
__5__% Overload/Superloads
_____% Surveying
__40_% Other -
_____% 100% on Bridges only

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

a. List Ohio PE # _Various_____ b. Name: Various Consultants
b. List Ohio PE # _E-70036_____ b. Name: Thomas Bender

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

- Name: Consultant when needed

- Yrs. Inspection related experience:

- List courses attended (& approx.. dates)

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.

- ☒ Extension Ladder Length 15’___
- ☒ 100' Fiberglass Tape
- ☒ Geologist Hammer
- ☒ Inspection Mirror
- ☒ Flashlight
- ☐ Thermometer
- ☒ Plumb Bob
- ☒ Camera
- ☒ 2'-0" Level
- ☐ Brush Hook/Axe
- ☐ Boat
- ☒ First Aid Kit
- ☒ Wire Brush
- ☐ 6’ Folding Rule
- ☒ Scraper
- ☐ Vertical Clearance Rod
- ☒ Probing Rod
- ☒ Paint Stick/Crayon
- ☒ Hip Boots and Waders
- ☒ Sounding Chains
- ☐ Wrenches
- ☐ Pliers
- ☒ Screw Driver
- ☒ Shovel
- ☒ Calipers

Other equipment not listed above: Click or tap here to enter text.

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

☐ Dye penetrant; ☐ Magnetic particle; ☒ Ultrasound;

Other Click or tap here to enter text.

5. What equipment does your team have available for "hands on" access to FCM bridge members? (Metric 16)
Wire brush, tape measure, camera, hammer, ultrasound

6. Use of equipment (Metric 16)

a. How many bridges need a snooper? none

b. How many bridges is it used on? none

c. How often? rarely

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6)
Explain: John Burr, based on the data provided indicating that the bridge is deteriorating more rapidly than considered typical or expected

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 inspection 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)

Team Leader inspects every bridge personally and Program Manager inspects bridges that are identified by team leader personally

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 ☐

Fracture Critical Inspections? Yes ☒ No ☐

D. INSPECTION PROCEDURES

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

235

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

235

3. Average number of inspections per day (Metric 6) 5-10

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

a. Beam/Girder: Simple Span: __0.5____hrs. Multi-span: __1___hrs.

b. Slab bridge: Simple Span: ___0.5___hrs. Multi-span: __1___hrs.

c. Truss (pony): Simple Span: ___2___hrs. Multi-span: __3___hrs.

d. Through/deck): Simple Span: ___1___hrs. Multi-span: __2___hrs.

e. Culvert: Single cell ___0.5____hrs. Multiple Cells: __1__hrs.

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

6. Bridge inspections are 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 ☐

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

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

2. Number of bridges inspected by probing? Number __Varies as needed___.

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? Click or tap here to enter text.

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) Number ___0___.

6. How are scour evaluations performed? (Metric 18)

Visual or probing

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

Program Manager if too deep or fast moving for waders

F. INVENTORY

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

Who checks? Program Manager reviews, signs, scans, and enters into own database

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
Or as ODOT prompts

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?

1.	Addison New Carlisle Pike Bridge No. 1	1230069
2.	School Road Bridge No. 16	1230328
3.	Fields Road Bridge No. 24	1230468
4.	Knollwood Road Bridge No. 246	1235850
5.	Neer Road Bridge No. 600	1240919
6.	Shrine Road Bridge No. 1003	1245856
7.	Dayton Road Bridge No. 1459	1252070
8.	Pitchin Road Bridge No. 1616	1255770
9.	North River Road Bridge No. 1629	1256114
10.	Garlough Road Bridge No. 1634	1256246

Yes ☒ Number_10____: If, No, Why not? _____ NA ☐

b. Bridges requiring underwater inspections.
Number__1___ NA ☐
Spangler Road Bridge No. 1411 SFN#1252372

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
- Scour Critical POA.
- Fracture Critical Plan.
- UW inspection Procedure

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 Click or tap here to enter text.

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)
Timesheets, photo logs, plans, data entry in Assetwise
Explain if different than procedure in Assetwise Same as in Assetwise

4. If a bridge requires emergency repairs, is this noted as part of the inspection report or as a separate document? (Metric 21)
Noted as a separate document and input into Assetwise

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

H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges. _96__

2. Number of plans for non-NBIS bridges (>= 10’ and <= 20' long) __13__

3. Number of bridges analyzed using the AASHTO Bridge Evaluation (Metric13)__All NBIS Bridges have been analyzed

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 _____ Plan of action for load rating these? Click or tap here to enter text.

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

Number of bridges posted __12__. Number of bridges with posted Signs in the field_12____.

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) __9___

11. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) __9__

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 _24 _ Months

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

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

16. What is the underwater inspection frequency? (Metric 17) _____Every _60 _ Months_____

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: Click or tap here to enter text.

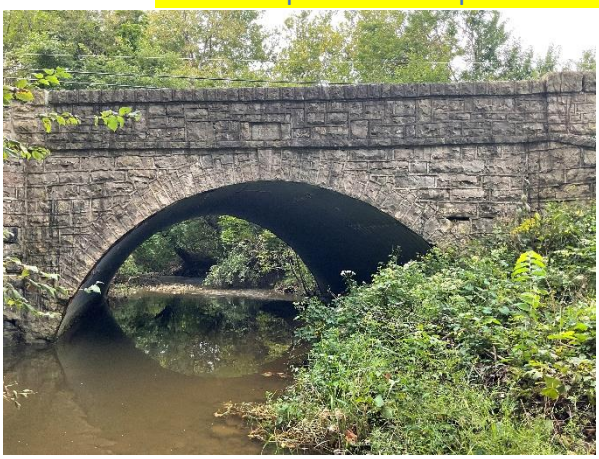
Part II: Field Review **Items Highlighted in Yellow represent action taken by County during the report review period.**

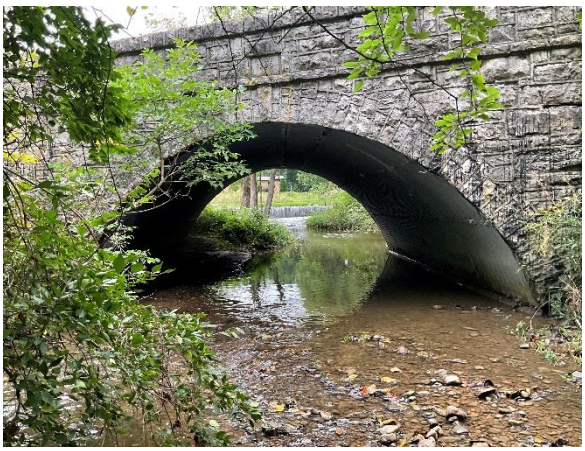
Inspection Reports (metric 12)
As part of this review, six bridges were field reviewed to compare conditions with the most recent inspection report. The individual condition ratings for all of the field sampled bridges properly reflected the field conditions within the tolerance of 1 rating value when compared to the Manual. Summary ratings correspond with the NBIS inspection items.

Field Review:

CLA-C0319-0409 _(1245910) Steel Culvert Arch

Item 58 Deck…….. N
Item 59 Superstructure…..N
Item 60 Substructure……N
Item 61 Channel……..7 Agreed
Item 61.01 Scour……6 Agreed
Item 62 Culvert…….. 6 Agreed
Item 36 Railing…….. N N N N
Item 72 Approach Alignment ……7 Agreed
Comments: None required or needed.
Defect Photos: None
Channel Photos: Upside down in Assetwise. Need better downstream photo from farther away from culvert to get view of channel and banks relative to foundation. Could also use some labels as to which direction the photos were taken. Like that below.
Photos improved and uploaded to Assetwise


Channel looking downstream.


Channel looking upstream.

CLA-T0199-0157 _(1231642) Prestressed Box beams

Item 58 Deck……..7 Agreed

Item 59 Superstructure……7 Agreed

Item 60 Substructure…….6 **(5)** Controlled by Scour (See below) Lowered to a 5

Item 61 Channel……..6 Agreed

Item 61.01 Scour…… 6 (**5**) See scour table below. Scour should be a 5 and it controls the Substructure and General Appraisal. Lowered to a 5

Note: It has been 12 months since last inspection and scour could have developed since that inspection period. The rating given is within the 1 point rule.

Substructure Scour, Spread or Unknown foundations – "ded" CONDITION RATING

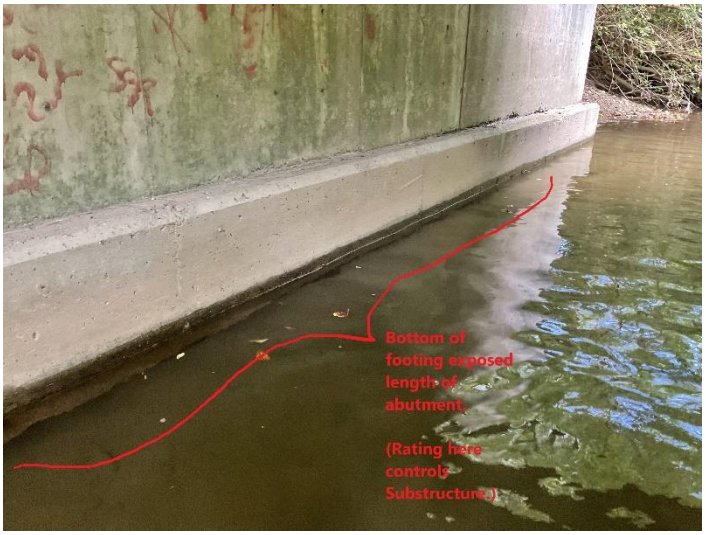
Item - 42. Scour

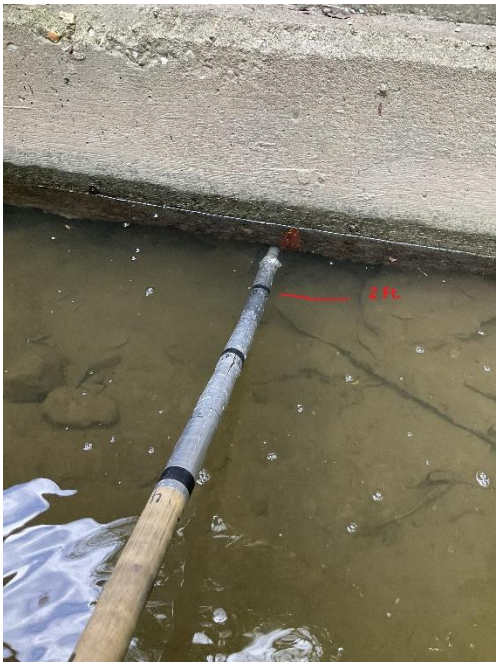
Type – Spread Footing on Soil OR Unknown Foundations

1-4	9-0	Description*	Exposed Spread or Unknown 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 exposed
2-Fair	6-Satisfactory	Damage to scour countermeasures, probing indicates soft material in scour hole.	Sides of footings exposed less than 6 inches.
	5-Fair	Minor scour, damage to scour countermeasures, probing indicates soft material in scour hole.	Unprotected footings along the vertical sides are exposed less than 12-inches high, corner of footing may have minor undermining.
3-Poor	4-Poor	Advanced scour.	Unprotected vertical side of footing exposed, full height, less than 1/3 the horizontal length of the footing.
	3-Serious	Scour has seriously affected the primary structural components Local failures are possible.	Undermining exposing the underside less than 1/3 the horizontal length of the footing.
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.	Underside of footing exposed more than 1/3 the horizontal length of the footing.
	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 51 - Condition Rating: Substructure Shallow Foundations Scour

*Condition shall be adjusted based on the **rate of change since the as-built condition**. This item may be rated higher, for example, if the as-built condition had the top face of the spread footing exposed and it has not changed. Also, due to the dynamic nature of the waterway the ratings may be coded lower if a dramatic change occurred since the previous inspection. Unknown foundations on soil shall be rated the same as a spread footing on soil. Those spread footings on rock shall be rated as deep foundations.





Item 62 Culvert…… **N**

Item 36 Railing …….. 1 1 1 1 Should all be 0 (as railing is not compliant with current standards) Changed to all 0

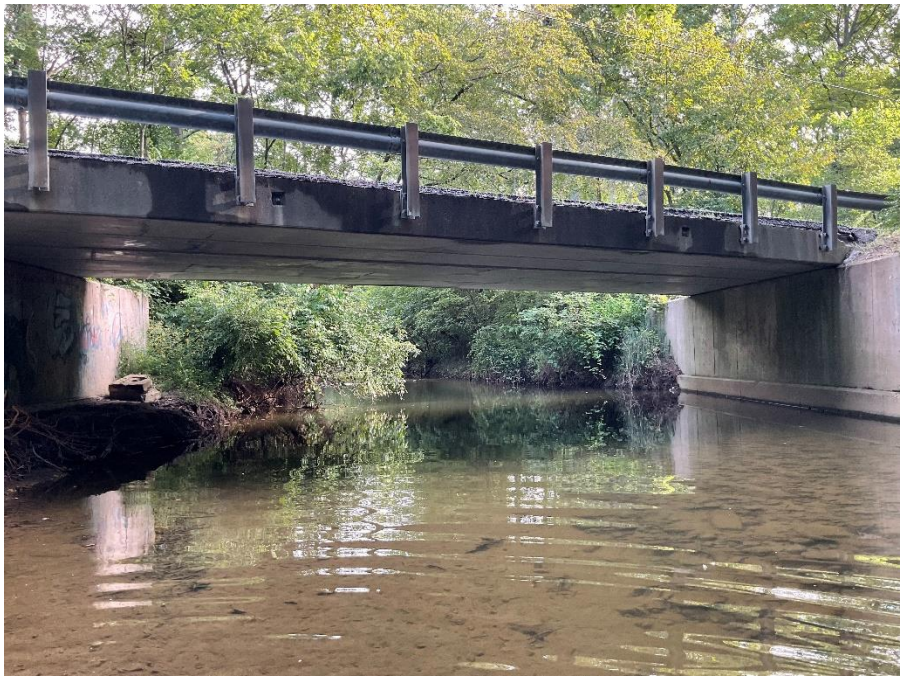
Item 72 Approach Alignment ……..8 Agreed

Comments: Should have comment about undermining of abutment with this year's inspection, if it is a recent development. Added comment concerning scour and plan to repair this winter/spring

Defect Photos: See Comment above.

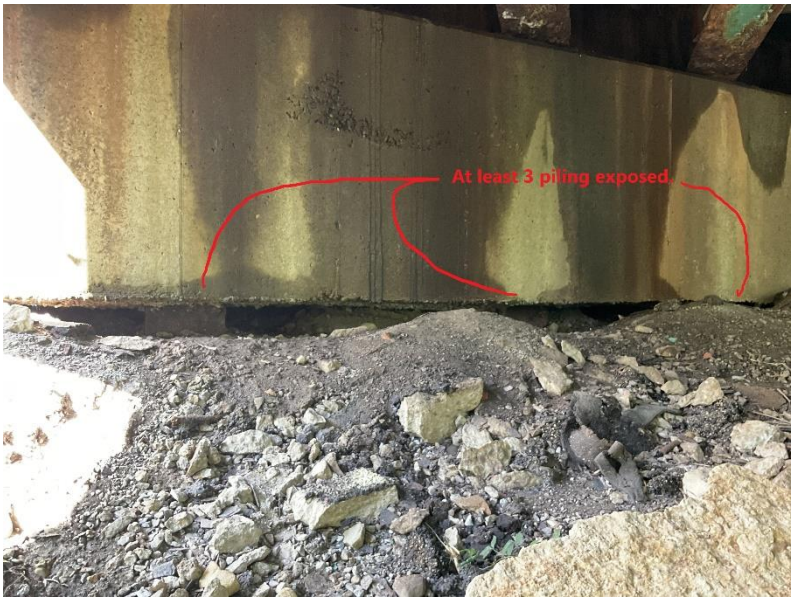
Channel Photos: The two photos in Assetwise are shown below.

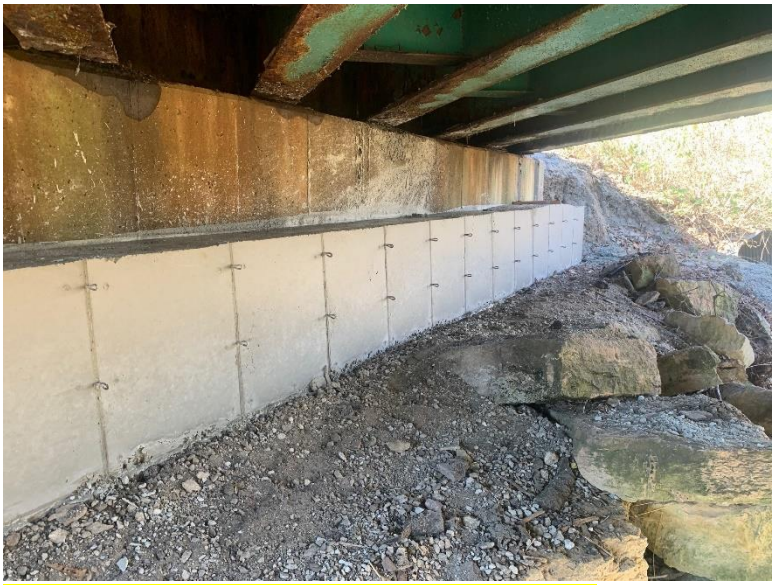
Need better views showing both abutments and channel width under bridge for both upstream and down. Photo below is a good example. Photos improved and uploaded to Assetwise



CLA-C0300-0009 _(1235710) Steel Beam Continuous

Item 58 Deck…… .6 Agreed
Item 59 Superstructure…… 6
Item 60 Substructure……7 (5) Controlled by the scour rating as explained below.
Item 61 Channel…… 7 Agreed
Item 61.01 Scour……7 **(5)**See photo ,table and explanation below. Scour has been remediated, see photo





Scour has been encapsulated and remediated

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

*Condition shall be adjusted based on the **rate of change since the as-built condition**. This item may be rated higher, for example, if the as-built condition had the top face of the spread footing exposed and it has not changed. Also, due to the dynamic nature of the waterway the ratings may be coded lower if a dramatic change occurred since the previous inspection. Unknown foundations on soil shall be rated the same as a spread footing on soil. Those spread footings on rock shall be rated as deep foundations.

**Use 10-foot deep piling when the foundation plans do not exist.

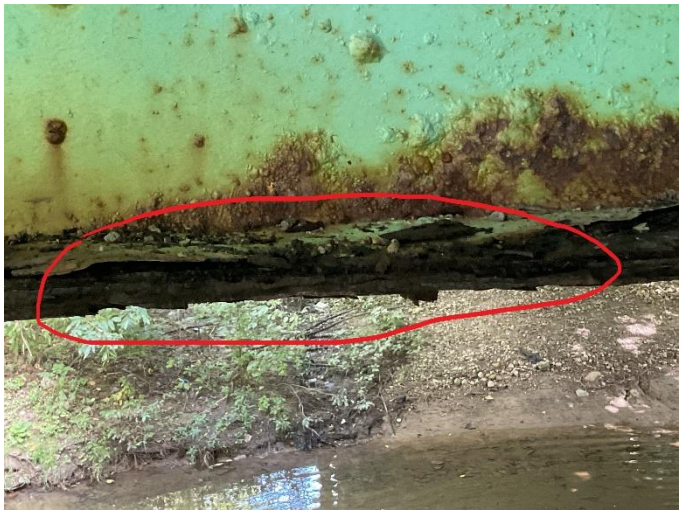
- As a general guideline a bridge may warrant a scour analysis if any of the following occur:
  - Undermining for a spread footing
  - Water flowing beneath a culvert
- Monitoring scour related problems should include periodic stream profile measurements.

Even though the abutment is a stub abutment perched above the stream bank, it is still susceptible to scour. In this case the stream has undermined the toe of slope in front of the abutment and has caused the embankment in front of the abutment to start slipping, thus exposing the piling. Hence the rating of 5 using the table above.

Item 62 Culvert……N Agreed
Item 36 Railing…… ~~1~~ 0 ~~1~~ 0 1 1 Bridge railing and transition sections are not up to current standards. Changed to 0s
Item 72 Approach Alignment ……7 Agreed
Comments: None required for rating given at 6 and above.
Defect Photos: A shot of the exposed piling would be a good photo with associated comments.
Channel Photos: Channel Photos are very close to being good. Could use a little better angle from a greater distance. May need multiple photos to get it all in, if a shot further away is not possible. Photos improved and uploaded to Assetwise

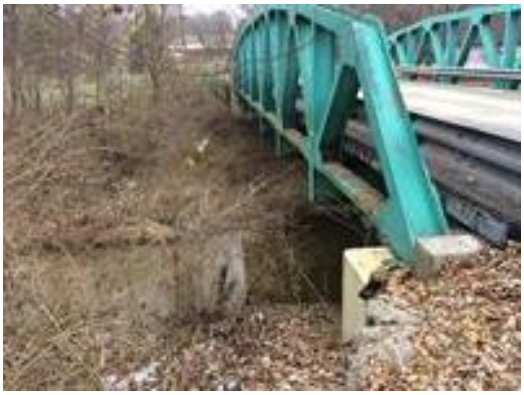
CLA-C0325-00130 _(1235850) Steel Pony Truss

Item 58 Deck……8 Agreed
Item 59 Superstructure……6 Headed toward a 5 with section loss on floor beams and ends of stringers. The 6 is within the 1 point rule.



Item 60 Substructure…… 6 Agreed
Item 61 Channel……7 Agreed
Item 61.01 Scour……7 Agreed

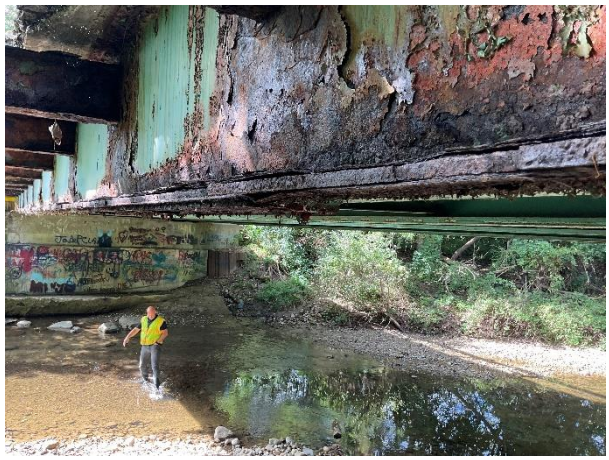
Item 62 Culvert……..N Agreed
Item 36 Railing…….. ~~1~~ **0** 0 1 0 Bridge railing not standard. Changed to 0
Item 72 Approach Alignment …..7 Agreed
Comments: None required
Defect Photos: Should start documenting the condition of the floor beams. Will start 2023
Channel Photos: Need better channel photos in Assetwise. Those below do not show the abutments relative to the channel. Like the previous bridge, multiple photos may be necessary to capture the required information. Photos improved and uploaded to Assetwise

(NOTE: Bridge is scheduled for rehabilitation next year.)

CLA-T0050-00214 _(1236091) Steel beam

Item 58 Deck…….. 6 Agreed
Item 59 Superstructure…….6 Agreed Facia beams are beginning to experience section loss. Have been repaired at the ends. I recommend taking some measurements along the lower flanges of the facia beams. If section loss is great enough, then a lower rating may be warranted.

Section loss above is near end of beam and less critical than out at midspan. I could not reach the midspan area, so the section there is unknown. County will get more detailed flange measurements to analyze section loss

Item 60 Substructure…….6 Agreed
Item 61 Channel……..6 Agreed
Item 61.01 Scour……..6 Agreed
Item 62 Culvert……N Agreed
Item 36 Railing…… ~~1~~ ~~1~~ ~~1~~ ~~1~~ None of the railing meets current standards Changed to 0s
Item 72 Approach Alignment …….. 7 Agreed
Comments: none required, but some might be helpful once section loss is determined.
Defect Photos: Should consider documentation of lower flange sections starting with the next inspection cycle.
Channel Photos: Needs improved. See previous comments. Photos improved and uploaded to Assetwise

CLA-C0308-0330 _(1239686) Concrete Continuous slab
Item 58 Deck……6 Agreed
Item 59 Superstructure……6 Agreed
Item 60 Substructure…….6 Agreed
Item 61 Channel……..6 Agreed
Item 61.01 Scour……..7 Agreed
Item 62 Culvert……N
Item 36 Railing…….. ~~1~~ 0 1 1 1 Bridge railing not up to standard Changed to 0
Item 72 Approach Alignment ….8 Agreed
Comments: None required
Defect Photos: None required
Channel Photos: Great channel photos!

Field Review Summary:

Overall, the county is doing a 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. The only issue that came up is forgetting that scour controls substructure. Most of the channel section photos on some of their bridges need improvement in order to capture all that is needed. The last field reviewed bridge, CLA-C0308-0330 _(1239686), had very good channel photos in Assetwise. The County has many good defect and channel photos in

their files and should consider posting the most meaningful ones in Assetwise. It has been 12 months since last inspections many of the deficiencies observed during this QAR could have developed during that time frame. The county noted the defects and will note them in their upcoming inspections and are proactively scheduling repairs. The Steel beam bridge CLA-C0300-0009 _(1235710) needs re-evaluated with respect to scour criteria. 1235710 has been remediated

PART III Office file Review

Fracture critical bridges. **10**

Fracture Critical Member and Fatigue Prone Connection ID Plan.

CLA-CR313-3.27 (1249607)

CLA-C0319-0396 (1245856)

CLA-C0325-01321 (1235850)

Bridge Load Rating Report, including Gusset plate analysis.

CLA-CR313-3.27 (1249607)

CLA-C0325-01321 (1235850)

CLA-C0319-0396 (1245856)

Underwater inspections

Spangler Road Bridge No. 1411 SFN#1252372

POA for Scour none

Scour susceptible bridges Everything over a stream with shallow foundations

Critical findings 0

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

PART IV Snapshot DATA Summary of Program

CLARK County 2022

INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

12/21/2022

Inventory Data - NBIS Bridges Only

	NBIS COUNT
NBIS Bridges > 20'	179
Bridges 10'-20'	55
All Bridges	234

Item 221	Inspection Responsibility	CODE	#NBIS	#ALL
Data Tab Col BV,BW	County	2	179	234

Item 21	Maintenance responsibility	CODE	#NBIS	#ALL
Data Tab	County	2	179	234
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	0	0
			179	234

Item 42A	Type service on bridge	CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col Q	Highway	1	179	234
	Railroad	2	0	0
	Ped/Bikeway	3	0	0
	Hwy/RR	4	0	0
	Hwy/Ped	5	0	0
			179	234

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	2	2
	Ped/Bkwy	3	0	0
	Hwy w/ RR	4	0	0
	Waterway	5	177	232
	Hwy/Waterway	6	0	0
	RR/Waterway	7	0	0
	Hwy/Waterway/RR	8	0	0
	Relief (for waterways)	9	0	0
			179	234

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	3	6
Concrete Tee Beam		104	21	27
Concrete Box Beam/Girder Multiple		105	22	22
Concrete Frame		107	9	9
Concrete Culvert (incl frame culverts)		119	7	27
Concrete Continuous Slab		201	7	7
Steel Beam or Girder		302	35	41
Steel Girder w/ Floor System		303	1	1
Steel Thru Truss (inlcudes Pony)		310	9	9
Steel Culvert (incl frame culverts)		319	5	20
Steel Continuous Beam or Girder		402	10	10
Prestressed Concrete Thru Arch		502	5	5
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	41	41
Prestressed Concrete Continuous Thru Arch		602	1	1
Prestr. Conc. Cont. Box Beam/Girder Multiple		605	1	1
Timber Culvert (incl frame culverts)		819	0	1
Aluminum or Iron Culvert (incl frame culverts)		919	2	6
			179	234

Item 92A Fracture Critical		CODE	#NBIS	#ALL
Data Tab	Requires FC Inspection	Y	**10**	n/a
Col U,V,Y	Requires FC Inspection	N	**169**	n/a
			179	n/a
	FC Switch Y/N is Blank		0	n/a

Item 113 Scour			#NBIS	#ALL
Data Tab	Bridge not over waterway	N	**2**	2
Col AA	unknown foundation	U	**0**	0
	over tidal waters	T	**0**	0
	foundations on dry land	9	**41**	48
	stable above footing	8	**89**	124
	countermeasures installed	7	**0**	0
	no scour evaluation made	6	**0**	0
	stable within footer limits	5	**45**	58
	stable action needed	4	**2**	2
	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
			179	234

All data is complete and correct in this section.

Item 92B	Underwater	CODE	#NBIS	#ALL
Data Tab	requires dive inspection	N	178	n/a
Col W,X,Z	requires dive inspection	Y	1	n/a
			179	

Item 709	Plan Information	CODE	#NBIS	#ALL
Data Tab	plans not avail	0	10	13
Col. AW	plan avail	1	141	193
	field measured	2	27	27
	Field Testing	3	0	0
	not applicable	N	1	1
			179	234

Item 63	Method of Analysis	CODE	#NBIS	#ALL
Data Tab	Field Eval & Doc. Engr Judgment	0	10	12
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	19
	LFR	6	101	104
	AS	7	13	39
	LRFR	8	55	60
	Assigned LFR HS20	D	0	0
	Assigned LRFR HL93	F	0	0
	not appl (RR, etc)	X	0	0
			179	234

REMINDER:

Load Factor required for bridges built after 1993 **(exceptions: timber, etc,)**

LRFR required for bridges built after 2010

All data is complete and correct in this section.

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.

Inspection Condition Data - NBIS Bridges Only

Item 41	Operating Status	CODE	# NBIS	# ALL
Data Tab	Open, No restriction	A	**168**	223
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 struture not yet open	G	**0**	0
	closed for load cap. reason	K	**0**	0
	Posted for load capacity	P	**11**	11
	Posted for other than load	R	**0**	0
	Closed for other than load	X	**0**	0
			179	234

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?	0
Col. AP	"0" used instead of blank	0
Col. AT	% legal <> lowest RF	1
Col.A V	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?	0

CLA-C0352-0167 _(1241575) Lowest LF is EV3 Item 734 should be 145%

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 Qualificatio	(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	0	100.0%	(C)
Col. AB	ORC -	Calendar Year	0	100.0%	(C)
Col. AB	All	Routine insp.	0		
	BIM -	18 months	0	100.0%	(C)

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

METRIC 10 - Insp. Frequency FC Member					
FC Inspections Overdue		# OVERDUE	# FC	% PASS	COMPLIANCE
Data Tab Col. Y	24 months	0	10	100.0%	(C)

The rest of the data is complete and correct in this section.

METRIC 12 - Routine Inspection		(** from field review)			
Field Ratings		# > +/-1	# Ratings	% PASS	COMPLIANCE
	field ratings**	0	24	100.0%	(C)
Comments		Missing	# < 6	% PASS	
Tab	Comments when Rating < 6	1	179	99.4%	(C)
	Adequacy comments **	0	30	100.0%	(C)
		Error	Total Scour	% PASS	
Comment:	Rating should be = Scour	1	169	99.4%	within tolerance +/- 1
Tab	Noncompliant Scour Rating Err	0	169	100.0%	(C)

CLA-C331A-0051 _(1253662) Comment missing for Superstructure

CLA-C0335-0039 _(1252372) Scour controls GA, Sub, and Culvert when Scour rating is lower.

METRIC 14 - Posting	Load rating data tab			
From Files review	# errors	#sampled	% PASS	COMPLIANCE
Op RF < 3 tons but not closed	0	179	100.0%	(C)
Op RF = 0 but not closed	0	179	100.0%	(C)
% Legal < 100 but not posted	0	179	100.0%	(C)
Item 41 = B	0	179	100.0%	(C)

METRIC 16 - Fracture Critical Inspection	(from files examination)			
From Files review	Missing	# FC	% PASS	COMPLIANCE
Fract Critical Member ID	0	2	100.0%	(C)
Fatigue Prone Detail	0	2	100.0%	(C)
Gusset Plate Calculations	0	2	100.0%	(C)
FC Inspection Procedure	0	2	100.0%	(C)

METRIC 17 - Underwater Inspection	(from files examination)			
From Files review	Missing	# UW	% PASS	COMPLIANCE
UW Inspection Procedure	0	1	100.0%	(C)
Location of UW elements	0	1	100.0%	(C)
UW frequency identified	0	1	100.0%	(C)

There were no errors found with respect to bridge postings.

There were no bridges requiring Fracture critical inspections or underwater inspections.

All data is complete and correct in this section.

QAR Metric Summary Table

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

*Based on Questionnaire and office file review

Metric	Action Needed

Clark County's bridge inspection program is compliant for all 23 metrics. Improvements could be made in the Channel photos and labeling of photos in general. The condition ratings are within the one-point rule and comply with the inspection manual. The comments are more than adequate and the load rating factors complete within current policy. The bridge files are complete and in compliance, is the adequacy of the staffing.