

# Quality Assurance Review Bridge Inspection Program

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.

**Instructions for completing form:** Please fill out checklist prior to scheduled review. Brief answers are desired; fill the items out to the best of your ability.

Agency Reviewed: **Sandusky County Engineer's**

Checklist completed by: **Carlos A. Baez Sr. P.E.,P.S.** Date: **03/09/2021**

## ***I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM***

### **A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY**

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) :**175**
2. Bridges >= 10' and <= 20' long (Metric 22) :**86**

### **B. PROCEDURES AND BUDGET**

1. Contract repairs and replacement
  - List typical work items **Concrete Surface Repairs, Replacement (If Necessary), Paving or overlays.**
  - List approximate annual budget **\$155,000.00**
  - Are Fed Funds used? **Sometimes**
  - Are Credit Bridge funds used? **No**
2. In-house repairs and replacements
  - List typical work items **–Bridge Repairs, Replacement, Waterproofing/Sealing, Silt and Brush Removal, Power-washing Trusses, Guardrail Repairs**
  - List approximate annual budget **\$450,000.00**
  - List staffing availability **County has a bridge Foreman and crew, workers added as needed.**

3. How are projects identified and selected? **Projects are selected from information on Bridge Inspections**
4. How are plans developed for emergency repairs? **In General, plans for emergency projects are developed and implemented using in-house personnel**
5. Who does the work of emergency repairs? **It would depend on the type of emergency repair. Generally it would be handled in-house.**
6. How is repair work documented? (i.e. work record, time card) **The county has bridge cards for documentation of repairs.**
7. Who is empowered to order emergency road closures and how is it done? **Sandusky County Engineer through the Board of Commissioners.**

**II. INSPECTION PROGRAM** (ASSET WISE Data will be utilized)

**A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY**

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) (Metric 22) : **175**
2. Between 10' and 20' long (including 10' & 20') (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: **Carlos A. Baez Sr. P.E., P.S.**
- Yrs. Inspection related experience: **20 Years**
- List courses attended (& approx dates) **Level 1 (3-day) 1/8/2001; Bridge Refresher 10/6/2005; Bridge Refresher 3/2/2011; Bridge Refresher 4/15/2014; Bridge Refresher 8/14/2018**

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

(Metric 1)

- Name: **Same as Program Manager**
- Yrs. Inspection related experience: \_\_\_\_\_
- 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: **Rick Villarreal**

- Yrs. Inspection related experience: **21 Years**

- List courses attended (& approx dates) **ODOT Level 1&2 in 2006, ODOT Refresher 2011, SMS 2013, Element Level 2014, Refresher 2018.**

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

%TIME

<u>35</u> Bridge/Culvert inspection	<u>      </u> Surveying
<u>      </u> Bridge Design/Plan prep	<u>55</u> Other -
<u>5</u> Bridge Construction	<u>      </u> 100%
<u>5</u> Bridge Maintenance	
<u>      </u> Overload/Superload	

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

(Metric 1&3)

- Name: \_\_\_\_\_

- Yrs. Inspection related experience: \_\_\_\_\_

- List courses attended (& approx dates) \_\_\_\_\_

\_\_\_\_\_

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

%TIME

<u>      </u> Bridge/Culvert inspection	<u>      </u> Overload/Superload
<u>      </u> Bridge Design/Plan prep	<u>      </u> Surveying
<u>      </u> Bridge Construction	<u>      </u> Other -
<u>      </u> Bridge Maintenance	<u>      </u> 100%

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

(Metric 1&3)

- Name: \_\_\_\_\_

- Yrs. Inspection related experience: \_\_\_\_\_

- List courses attended (& approx dates) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

%TIME

_____ Bridge/Culvert inspection	_____ Overload/Superload
_____ Bridge Design/Plan prep	_____ Surveying
_____ Bridge Construction	_____ Other -
_____ Bridge Maintenance	_____ 100%

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

(Metric 1&3)

- Name: \_\_\_\_\_

- Yrs. Inspection related experience: \_\_\_\_\_

- List courses attended (& approx dates) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

%TIME

_____ Bridge/Culvert inspection	_____ Overload/Superload
_____ Bridge Design/Plan prep	_____ Surveying
_____ Bridge Construction	_____ Other -
_____ Bridge Maintenance	_____ 100%

7. **Team Member** of bridge inspection team ( Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

- Name: \_\_\_\_\_

- Yrs. Inspection related experience: \_\_\_\_\_

- List courses attended (& approx dates) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

%TIME

\_\_\_\_\_ Bridge/Culvert inspection  
\_\_\_\_\_ Bridge Design/Plan prep  
\_\_\_\_\_ Bridge Construction  
\_\_\_\_\_ Bridge Maintenance

\_\_\_\_\_ Overload/Superload  
\_\_\_\_\_ Surveying  
\_\_\_\_\_ Other -  
\_\_\_\_\_ 100%

8. **Team Member** of bridge inspection team (Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

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

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

%TIME

\_\_\_\_\_ Bridge/Culvert inspection  
\_\_\_\_\_ Bridge Design/Plan prep  
\_\_\_\_\_ Bridge Construction  
\_\_\_\_\_ Bridge Maintenance

9. **Team Member** of bridge inspection team ( Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

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

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

%TIME

\_\_\_\_\_ Bridge/Culvert inspection  
\_\_\_\_\_ Bridge Design/Plan prep  
\_\_\_\_\_ Bridge Construction  
\_\_\_\_\_ Bridge Maintenance

10. **Load Rating Engineer** – Name of individual responsible for load ratings (must be PE) (Metric 4): **Carlos A. Baez Sr. P.E, P.S.**

a. List Ohio PE # **70340**

11. **Underwater Bridge Inspection Diver** – Name person doing dive inspections (Metric 5): **N/A**

- Name: \_\_\_\_\_

- Yrs. Inspection related experience: \_\_\_\_\_

- List courses attended (& approx dates) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### C. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

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

	Yes/No		
Extension Ladder	<u>Y</u>	First Aid Kit	<u>Y</u>
what length?	<u>12'</u>	Wire Brush	<u>Y</u>
6' Folding Rule	<u>Y</u>	Calipers	<u>Y</u>
100' Fiberglass Tape	<u>Y</u>	Shovel	<u>Y</u>
Geologist Hammer	<u>Y</u>	Screw Driver	<u>Y</u>
Inspection Mirror	<u>Y</u>	Pliers	<u>Y</u>
Flashlight	<u>Y</u>	Wrenches	<u>Y</u>
Thermometer	<u>N</u>	Sounding Chains	<u>Y</u>
Plumb Bob	<u>Y</u>	Hip Boots and Waders	<u>Y</u>
Camera	<u>Y</u>	Paint Stick/Crayon	<u>Y</u>
2'-0" Level	<u>Y</u>	Scraper	<u>Y</u>
Brush Hook/Axe	<u>N</u>	Probing Rod	<u>Y</u>
Boat	<u>Y</u>	Vertical Clearance Rod	<u>N</u>

3. List types of NDT methods used ( IE. dye penetrant, magnetic particle, ultrasound)  
**N/A**

4. How is usage determined?

5. List additional items

6. What equipment does your team have available for "hands on" access to FCM bridge members? (Metric 16): **Extension Ladder. All FCM Bridges except one are small enough that we have "hands on" access without needing a ladder.**

7. Use of equipment (Metric 16)
- a. How many bridges need a snooper?
  - 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)  
**261**
2. Approximately how many inspections are scheduled for the current calendar year?  
(Metric 6)  
**261**
3. Average number of inspections per day (Metric 6)  
**10-12**
4. Approximately how long (hours) does it take to inspect average sized structures
- a. Beam/Girder **1/2Hr**
  - b. Slab **1/4Hr**
  - c. Truss (pony/through/deck) **1/2Hr-1Hr**
  - d. Culvert **1/4 Hr**

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

Are bridge inspections recorded in field on paper or electronically? Please describe: **We record them on paper and input the information into AssetWise once we get back to the office.**

Are photos available for every bridge? (Yes  X  No  \_\_\_  )

Are photographs taken of defects during inspection? (Yes  \_\_\_  No  \_\_\_  )  
**Sometimes**

Are Bridge comments recorded? (Yes  X  No  \_\_\_  ) Where? **Either on inspection report or we also have a maintenance list we develop every year and record what each bridge needs.**

Are bridge comments brought to the bridge? (Yes  X  No  \_\_\_  )

6. Are the bridge plans carried to the bridge site for review if necessary or are they readily available for review in the bridge office? (Metric 15)
- a. Bridge site (Yes  \_\_\_  No  X  )

b. Bridge office (Yes X No \_\_\_ )

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6) : **Carlos Baez, it would depend on the condition of the bridge.**

8. List bridges requiring inspection more frequently than one year intervals (DAMAGE, IN-DEPTH, SPECIAL INSPECTIONS). List frequency of inspection. (Metric 11)  
**None.**

9. Does the inspection team believe it has enough time to do the job?  
(Yes X No \_\_\_ )

10. What kinds of quality assurance checks are made of the inspection process? (Metric 20)  
**Rick inspects all 9, 8, and 7 bridges. Carlos & Rick look at all 6 and lower bridges together.**

11. Do any bridges have underwater inspections done in less than 60 month intervals? (Metric 8)  
**No**

12. Have all bridges requiring underwater inspections been inspected in 60 month intervals?  
(Metric 8)

13. Do any bridges have fracture critical inspections done in less than 24 month intervals? (Metric 10)  
**We actually do the fracture critical inspections as part of our regular 12 month inspections.**

14. Have all bridges requiring fracture critical inspections been inspected in 24 month intervals?  
(Metric 10)  
**Yes**

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

Initial Inspection? (Yes X No \_\_\_ )

Routine Annual Inspections? (Yes X No \_\_\_ )

Special Inspections? (Yes X No \_\_\_ )

Underwater Inspections? (Yes \_\_\_ No \_\_\_ )

Fracture Critical Inspections? (Yes X No \_\_\_ )

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



1. How many bridges are considered scour susceptible? (Type of Service over Water)  
**Probably the majority of the bridges**
2. How many bridges are inspected by probing?  
**None**
3. How many structures are Scour Critical (item 113 - 3, 2, 1 or 0)? (Metric 18)  
**None**
4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? (Metric 18)
5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18)
6. How are scour evaluations performed? (Metric 18)
7. Who determines the need for diving inspections and by what criteria?

## F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)  
**Two sets of eyes are looking at the inspection reports every year.**
2. How often is the inventory checked for needed updates? (Metric 22)  
**As needed**
3. How is the inventory data input into the system?  
**AssetWise**
4. When is the updated inventory data forwarded to ODOT? (Metric 23)

Changes discovered during inspection? **Inspection, once/year**

Changes from new construction or rehab? **As needed**

5. NBIS requires that the inspecting organization maintain master lists of the following: (Provide a list of these bridges) (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) **All Truss Bridges**

b. Bridges requiring underwater inspections

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

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

**- Bridge Files**

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

## G. PROCEDURES

1. Are new maintenance problems identified during bridge inspection?  
( Y X N \_\_\_ ) (Metric 15)

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

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

How is this emergency action documented? **Plans and Bridge files**

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) **County Engineer, Highway Superintendent, Sign Shop Manager**

## H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges **-175**

2. Number of plans for non-NBIS bridges ( $\geq 10'$  and  $\leq 20'$  long) **-70**

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* (Metric 13) **Not Sure?**

4. By Whom (Metric 13) **There were several raters and different consultants**

5. When **2008 - 2020**

6. Methods used (Metric 13) **Several different methods**

7. When are bridges rerated and how do load raters keep up with overlays and other changes? (Metric 13) : **Bridges are rerated if conditions change, we try to mill the bridges and waterproof them rather than overlay.**

8. Number of NBIS length bridges not load rated (Metric 13): **0**
9. List the NBIS length bridges considered “not ratable” including reason for being considered “not ratable” (Metric 13) **Not enough information (#5) 7240430**
10. Number of NBIS length bridges load posted (Metric 14) : **15**
11. How determined (engineering judgment, analysis, mix): **Analysis**
12. List bridges closed due to condition rating (rough check) **0**
13. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution :**0**
14. Number of NBIS bridges with Gusset Plates (Metric 13) : **7**
15. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) :**7**
16. Describe filing system (where files are kept): (Metric 15)

- Inspection reports, including old inspections **Basement**
- Design Calculations **Basement**
- Plans **Basement and Scanned files**
- Load analysis calculations **Basement**
- Inventory forms **Basement**
- Photos and sketches **Basement and Computer Files**
- Repairs and maintenance history **Basement**
- Scour evaluation **Basement**
- Scour POA
- Fracture Critical File **Basement**
- Load Posting/Closing **Basement**
- Underwater inspections
- Special inspection eqpt. or procedures
- Flood data, waterway adequacy, channel cross sections **Basement or Drainage Files**

**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.

17. What is the FC bridge inspection frequency? (Metric 16)  
**12 Month**
18. Is the FC Plan completed for all FC bridges? (Metric 16) (Yes X No \_\_\_)

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

20. What is the underwater inspection frequency? (Metric 17)

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

22. List any complex bridges: (Metric 19)

23. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19) (Yes  No )

Describe:

## **I. RECOMMENDED PRACTICES**

This area of the report should list any innovative ideas that provide valuable support and process improvement for offices across the State. For example: It creates a safer work environment, deploys resources efficiently, maximizes available resources, is measurable etc.