

**National Bridge Inspection Standards &
Bridge Maintenance Program Review
Ashtabula County
October 1, 2020**

By: Mark Stockman, PE, PS
CEAO Federal Bridge QA/QC Engineer

IN ATTENDANCE:

Tom Partridge
Randy Anslow
Mark Stockman, CEAO Federal Bridge QA/QC Engineer

SCOPE OF REVIEW:

The review consisted of interviews with Ashtabula County personnel, reviews of inspection and inventory data, and reviews of Ashtabula County bridge records. The office evaluation assessed Ashtabula County's organization, procedures, resources, and documentation regarding the inspection, inventory, and maintenance operations for bridges. In addition, field reviews of six bridges were conducted to determine if ratings were consistent with the ODOT Coding Manual and FHWA Recording and Coding Guide and to determine if inventory items were coded correctly. The bridges checked during the field review were:

SFN	CTY-RTE-SECT	TYPE	Rating	NBIS Rating
0436984	ATB T0543 0196	Concrete Slab	5A	SAME
0430137	ATB C0009 0152	Steel Culvert	5A	SAME
0433004	ATB C0006 0281	Steel Stringer	5A	SAME
0432903	ATB T0096 0193	Concrete Girder	4P	SAME
0430099	ATB C0008 0521	Concrete Slab	4A	SAME
0433128	ATB C0343 0030	Prestr. Box Beam	4A	SAME

FINDINGS AND COMMENTS:

General

Ohio State statutes establish requirements governing the safety inspection of all bridges within the State borders. ODOT with participation of FHWA has developed the ODOT publication Bridge Inspection Manual, hereafter referred to as the Manual, which establishes guidance and requirements regarding bridge inspections within the State. FHWA has determined that ODOT guidance meets or exceeds the FHWA NBIS requirements.

The federal regulations for administering the NBIS are located in the Code of Federal Regulations 23 Highways – Part 650 Subpart C - National Bridge Inspection Standards. The regulations can be found at the following web site:
<http://wwwcf.fhwa.dot.gov/legsregs/directives/fapg/cfr0650c.htm>

Ohio currently rates bridge element conditions with a 1-4 scale. Summary items conform to the definitions and rating scales established by the NBIS. The NBIS do not require element level condition rating for County bridges unless they are on the expanded National Highway System (NHS) beginning October 1, 2014.

Ashtabula County has inspection responsibilities for 358 bridges, 156 of which are longer than 20 feet in length and 202 which are 10 feet to 20 feet long. The NBIS inspection and load rating requirements only pertain to highway bridges in excess of 20' long on public roads. Review of the inventory span lengths showed that all bridges had the NBIS designation Y/N coded correctly.

The office review and the field review demonstrated that County personnel were inspecting and coding bridges in accordance with ODOT's Bridge Inspection Manual ("Manual").

Inspection Procedures

Ashtabula County uses their own staff to do the inspections. Previous inspection reports are available at site for review. Bridge inspections are recorded electronically. Comments are recorded in the comment section on AssetWise. They are brought to the bridge. Bridge plans are not carried to the bridge site for review, but are available for review in the bridge office. Photos are available for every bridge, and photos are taken of defects during inspection.

The County indicated that an average of 10 +/- inspections per day were completed in 2020. Truss (pony/through/deck) takes approximately 1 hour. It takes 30 – 45 minutes for Beam/Girders. For a slab, it takes 30 minutes. For a Culvert, it takes 15 minutes.

The County does not have any bridges that require a snoopers for inspection.

Frequency of Inspections

Ohio State Transportation Laws require all State and local bridges to be inspected annually. Ashtabula County had 361 bridges inspected in 2020. There are approximately 358 inspections scheduled for the current calendar year. The NBIS maximum inspection frequency of two years is met. All Bridges over 10 feet in length are inspected annually. The County Engineer reports determines the need for a routine inspection frequency greater than once a year. There are not any bridges that require inspection more frequently than one year.

Qualification and Duties of Personnel

Mr. Tim Martin is the County Engineer. As such he has overall responsibility for the bridge inspection program. He is a PE and has over 26 years of inspection related experience.

Mr. Tom Partridge is the Program Manger and Reviewer. He has 24 years of inspection related experience. He took the Bridge Inspection Level 1 and Level 2 courses multiple times, with

2014 being the most recent. He has taken many relevant Load Rating courses put on by ODOT. He has taken the Online Bridge inspection Refresher in 2020 . Mr. Partridge is qualified to be a Program Manager and Reviewer.

Mr. Randy Anslow is a Team Leader. He has 23 years of inspection related experience. He took the Bridge Inspection Level 1 and Level 2 courses first in 2000 and then again in 2014. He took a Refresher Courses in 2005 and 2019. He also took the Load Rating Courses. Mr. Anslow is qualified to be a Team Leader.

Mr. Dale McConnell is a Team Member. He has 1 year of precious inspection experience.

Mr. Haden Mendik is a Team Member. He does not have any previous years of inspection experience.

Inspection Reports

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 six 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.

Comments were lacking. Better comments showing the Location, Extent, and Severity are needed when the rating is <6.

Files

Ashtabula County keeps all inspection reports, including old inspections on the computer server, along with photos and sketches. Design calculations, Load Analysis Calculations, Fracture Critical Files, and Load Posting/Closing documents all have separate bridge file folders. Plans are kept in the vault (records room) and scanned.

Load Rating

The inventory shows 154 (100.00%) of the County NBIS bridges have been Load Rated or Load Rating was not applicable. There were 5 bridges evaluated by documented engineering judgement. There were not any that had vehicular traffic and needed load rated. The county already had a BR-100 for some bridges and will be creating BR-100 forms for the remaining bridges.

Load Ratings were checked for SFNs 0430552, 0432091, 0432408, 0432903. The load posting at the bridge matched the load rating on all bridges. Posting matched the load rating and documentation was on all four of the bridges.

Load Posting

Ashtabula County has 9 bridges that are load posted. There is 1 bridge closed for condition ratings (Horton Rd). They use a mix of engineering judgment and analysis. Posting is based on Operating Rating.

Special Features

Ashtabula County does not have any bridges that have special features.

Fracture Critical Bridges

The FC bridge inspection frequency is yearly. FC files for SFN 0432814 and SFN 0431214 were reviewed. They both had FCM's identified. Fatigue Prone details was not applicable for SFN 0432814 and was not shown on SFN 0431214.

Underwater Inspections and Scour

There are 0 bridges require underwater inspections. There are not any structures over waterways considered scour susceptible. There are 0 bridges that are scour critical. Scour evaluations are performed visually and probing when necessary. The bridge reviewer determines the need for diving inspections. If the entire substructure is not able to be seen or probed at least one time during the year, then a dive inspection would need to be done.

QA/QC

The QA/QC section of the 2014 Bridge Inspection Manual meets the FHWA requirement. Quality Assurance checks are reviewed and updated when needed or when any changes are made to inventory. Inventory is checked for needed updates yearly or upon ODOT's request. Inventory data is input into the system in field at time of inventory. Updated inventory data is forwarded to ODOT when it is entered. When changes are discovered during inspection and/or changes from new construction or rehab, the updated inventory data is forwarded to ODOT as soon as the project is completed and/or new inventory is completed.

Critical Findings

The county does have a Critical Findings Procedure in place. Maintenance problems are identified during the bridge inspection. Inspectors inform maintenance personnel of routine bridge maintenance problems written and orally. Inspectors notify the Reviewer, Manager, Maintenance Superintendent, and staff when emergency repairs are necessary. Emergency action is documented in job costing software and work logs. If a bridge requires emergency repairs, emergency work lists will shut down any new construction until complete or the road will be closed until completed. The sign team members are the ones that check proper placement of signs.

Bridge Maintenance

Ashtabula County has maintenance responsibilities for 358 bridges, 156 of which are longer than 20 feet in length and 202 which are 10 feet to 20 feet long. The County does force account bridge work as needed. The work includes total abutment and/or superstructure replacements. The approximate budget is \$500,000. Fed Funds are used. Credit Bridge Funds have been used in the past, but not currently.

The county uses in-house staff that consists of a combination of a 5 man bridge crew, superintendent, bridge engineer, chief deputy county engineer, and 3 design engineers. They

use them to do culvert and small spans, and under \$100,000 force account. The approximate budget is \$500,000.

Projects are identified from the bridge inspection reports and selected based on sufficiency ratings. Plans are developed for emergency repairs in house. County Forces are the ones who do the work of the emergency repairs. Repair work is documented on work records with accounting software. When there are emergency road closures, all staff supervisors and above are empowered to order emergency road closures. The county sign department is notified to close and then they give notice to supporting agencies as soon as possible.

CONCLUSIONS AND RECOMMENDATIONS

- Reminder for inventory, you have 180 days to input data
- Procedure in new bridges – Complete inventory and 1st inspection before requesting that the bridge be made Active.
- Comments need to be improved to show detail of location extent and severity when the rating is <6.
- When GA drops below 5, and every drop below 5, triggers a new load rating. Even if there is no change in the rating, update the load rating date and add a note in the load rating narrative.
- Files are a weak point to FHWA. Consider adding repair history and flood data.
- FC Files contain a statement that there are no risk factors but that is not correct since load limit is a risk factor. Only one bridge FC plan was corrected, all other FC bridges need to be done as well.
- Need Fatigue Prone Detail list, FC Member ID, on al FC bridges, and add Risk Factors to Insp Procedure

The chart on the following page is a review of the 23 Metrics used to measure NBIS compliance and the chart represents a **preliminary, tentative** assessment of the county's level of compliance. Action steps for compliance are listed at the bottom. The actual assessments of NBIS compliance are made by FHWA, based on documentation, and any final determinations of compliance may differ from this preliminary assessment. The Metric 12 & 22 result on the following page is based on the field review of the six bridges visited during the QAR using the NBIP Field Review Checklist - PY 2013, Minimum Level Review Items.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance. Actual “score” by FHWA may differ.

Compliance Codes for the following Metrics:

- (C) Compliant
- (SC) Substantially Compliant
- (CC) Conditionally Compliant
- (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
12	Comments needed when Super, Sub, Deck, Channel, Culvert < 6
16	Need Fat. Prone Detail list, add Risk Factors to Insp Procedure

