



# 2016 Michigan Bridge Conference Workshop

## Inspection Frequency MiSIM Chapter 3



**Rich Kathrens**

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March 22, 2016



## NBIP Metrics Summary

Metric	Description	Baseline CY 2011	Year 1 PY 2013	Year 2 PY 2014	Year 3 PY 2015	Year 4 PY 2016	Comments
1	Bridge Inspection Organization	C	CC	C	C	C	
2	Qualifications of Personnel -Program Manager	C	C	C	C	C	
3	Qualifications of Personnel -Team Leader(s)	C	C	C	C	C	
4	Qualifications of Personnel -Load Rating Engineer	C	C	C	C	C	
5	Qualifications of Personnel -UW Bridge Inspection	C	C	C	C	C	
6	Inspection Frequency - Routine - Lower Risk Bridges	CC	CC	CC	CC	SC	PCA ends 3/31/2016
7	Inspection Frequency - Routine - Higher Risk Bridges	C	CC	SC	CC	SC	PCA ends 3/31/2016
8	Inspection Frequency - Underwater - Lower Risk Bridges	CC	C	C	C	C	
9	Inspection Frequency - Underwater - Higher Risk	C	C	C	SC	C	
10	Inspection Frequency - Fracture Critical Member	CC	CC	CC	CC	SC	PCA ends 3/31/2016
11	Inspection Frequency - Frequency Criteria	CC	CC	CC	C	C	PCA ended 3/31/2014
12	Inspection Procedures - Quality Inspections	C	C	C	C	C	
13	Inspection Procedures - Load Rating	CC	CC	CC	CC	CC	PCA Ends 12/31/2016
14	Inspection Procedures - Post or Restrict	CC	CC	CC	CC	CC	PCA ended 12/1/2014
15	Inspection Procedures - Bridge files	CC	CC	CC	SC	SC	PCA ended 3/31/2014
16	Inspection Procedures - Fracture Critical Members	CC	CC	CC	C	C	PCA ended 3/31/2014
17	Inspection Procedures - Underwater	C	C	C	C	C	
18	Inspection Procedures - Scour Critical Bridges	C	C	C	C	C	
19	Inspection Procedures - Complex Bridges	C	C	C	SC	SC	IP Ends 3/31/2018
20	Inspection Procedures - QC/QA	SC	SC	SC	C	C	PCA ended 3/31/2014
21	Inspection Procedures - Critical Findings	CC	CC	CC	C	C	PCA ended 3/31/2014
22	Inventory - Prepare and Maintain	C	C	C	C	C	
23	Inventory - Timely Updating of Data	C	C	C	C	C	
Compliant:		13	12	13	15	16	
Substantial Compliant:		1	1	2	3	5	
Conditional Compliant:		9	10	8	5	2	

**Timeliness Metrics**



## METRIC 6 Routine, Low Risk

Summary	<=24-mo + <=48-mo	25-mo + 49-mo	26-28-mo + 50-52-mo	>28-mo + >52-mo	Overdue Inspections	Total
Regular + Extended Frequencies						
Number meeting interval criteria	4,424	139	15	0	0	4,578
Metric Criteria Calculation	<=24 + <=48	<=25 + <=49	<=28 + <=52			
Cumulative number meeting interval	4,424	4,563	4,578			
Percentage meeting interval	97%	99.672%	100%			

## METRIC 7 Routine, High Risk

Regular NTE 24-mo category	<=24-mo	25-mo	26-28-mo	>28-mo	Overdue	Total
Number meeting interval criteria	1,608	14	6	1	0	1,629
Metric Criteria Calculation	<=24-mo	<=25-mo	<=28-mo			
Cumulative number meeting interval	1,608	1,622	1,628			
Percentage meeting interval	99%	99.570%	99.939%			

6,032 On time  
6,207 Completed

97.2%

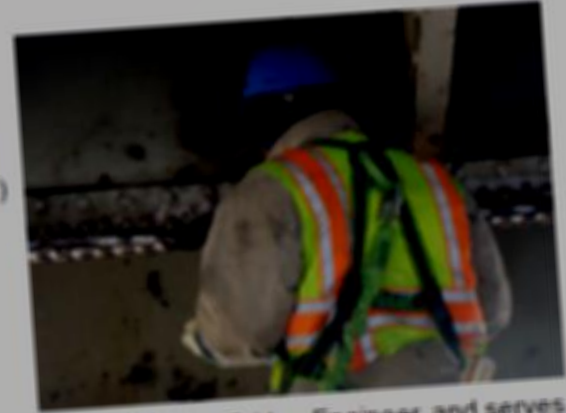






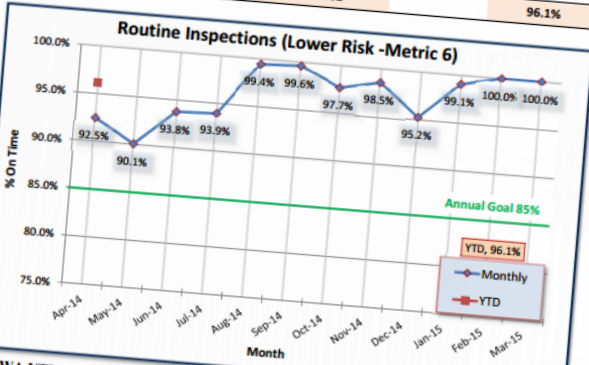
## Safety Inspection

The safety inspection program is managed within the Bridge Field Services Section of the Bridge Field Services Division. The program ensures compliance with the National Bridge Inspection Standards (NBIS) through regular inspections, performance verifications, annual evaluations, inspection reports, and periodic appraisals, and reviews. Bridge Field Services develops inspection procedures and reports directly to the FHWA Michigan Division Bridge Engineer, and serves as a resource for all inspection related inquiries.



### Statewide Inspection Summary (2014) Routine Inspections (Lower Risk - M6)

QTR	Month	No. Late	No. Complete	% On Time	QTR %
1	Apr-14	31	411	92.5%	92.2%
	May-14	48	483	90.1%	
	Jun-14	36	579	93.8%	
2	Jul-14	33	544	93.9%	97.6%
	Aug-14	3	543	99.4%	
	Sep-14	2	526	99.6%	
3	Oct-14	12	514	97.7%	97.6%
	Nov-14	6	413	98.5%	
	Dec-14	9	189	95.2%	
4	Jan-15	1	106	99.1%	99.8%
	Feb-15	0	101	100.0%	
	Mar-15	0	193	100.0%	
YTD		181	4602	96.1%	



### FHWA YTD (4-01-14 to 3-31-15)

Summary	Criteria Result** (cumulative)	STATEWIDE	Total	
Regular Frequencies	<=24	<=25	<=28	
Number meeting interval	4,421	4,582	4,601	4,602
Percent meeting interval	96.1%	99.6%	99.98%	
Number exceeding interval	181	20	1	

Regular Frequency (NTE 24)	Frequency Interval Criteria			Snapshot Key
	Cumulative % bridges not exceeding			
Compliance (C)	<=24	<=25	<=28	
Substantial Compliance (SC)	85%	100%	100%	●
Corrective Action Req. (NC)	50%	90%	100%	○
Does not meet SC criteria				

Printed 4/30/2015

Routine Inspection Summary

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### FHWA Compliance

- Unassigned Safety Inspections
- Inspection Timeliness Reports

Links  
Advisories  
Report  
Training



## PY2016 Year to Date

M6 FHWA YTD (4-01-15 to 2-29-16)				STATEWIDE
Summary	Criteria Result** (cumulative)			Total
	<=24	<=25	<=28	
Regular Frequencies	4,068	4,143	4,159	4,161
Number meeting interval	97.8%	99.6%	99.95%	● Snapshot
Percent meeting interval	93	18	2	
Number exceeding interval				



M7 FHWA YTD (4-01-15 to 2-29-16)				STATEWIDE
Summary	Criteria Result** (cumulative)			Total
	<=24	<=25	<=28	
Regular Frequencies	1,559	1,602	1,607	1,607
Number meeting interval	97.0%	99.7%	100.0%	◐ Snapshot
Percent meeting interval	48	5	0	
Number exceeding interval				



5,627 On time  
5,768 Completed

97.6%



## Automated 3-Month advance notification of upcoming inspections

**From:** MDOT@michigan.gov  
**Sent:** Wednesday, September 30, 2015 7:04 AM  
**To:** Kathrens, Richard (MDOT)  
**Subject:** MiBRIDGE : Inspections due in the next 3 months@TMSPROD

BRIDGE OWNER: Rich Kathrens, MDOT - Bridge Field Services

The number of bridges in your jurisdiction that are scheduled for inspections within the next THREE months are shown below:

MONTH	R	FC	FS	UW	OS
OCTOBER	5	0	0	1	0
NOVEMBER	0	0	0	0	1
DECEMBER	2	1	0	0	0

**LEGEND**  
 R = Routine  
 FC = Fracture Critical  
 FS = Fatigue Sensitive  
 UW = Underwater  
 OS = Other Special



## Unassigned Inspection Notification

**From:** Bouvy, Andrew (MDOT)  
**Sent:** Friday, March 11, 2016 4:59 PM  
**To:** MDOT-BridgeInspection  
**Subject:** April 2016 Unassigned Bridge Inspections

The following list of agencies currently have unassigned NBI inspections in MIBRIDGE that are due earlier. This message is being provided in accordance with Bridge Advisory BA-2014-03. In order to avoid subsequent monthly notifications, bridge owners should assign their inspections to an inspection team leader at least one month prior than the month they are due. This includes local agencies who perform inspections with their own team leaders or bridge owners that perform the work themselves. For questions concerning this notification, please contact [MDOT-BridgeInspection@michigan.gov](mailto:MDOT-BridgeInspection@michigan.gov).

Agency	NBI Inspection		
	Routine	Fracture Critical	Underwater
Arenac County (6)	4	0	0
BALDWIN (0404)	1	0	0
BARODA (0452)	2	0	0
Bay County (9)	33	0	0
Benzie County (10)	3	0	0
Berrien County (11)	22	0	0
BIG RAPIDS (0702)	3	0	0
BOYNE CITY (0846)	2	0	0
CEDAR SPRINGS (1210)	1	0	0
CEMENT CITY (1218)	1	0	0
Eaton County (23)	4	0	0
ELK RAPIDS (2114)	1	0	0
FARMINGTON (2282)	2	0	0
FLINT (2388)	3	0	0

### Safety Inspection

The safety inspection program is managed within the Bridge Field Services Section of the Operations Field Services Division. The program ensures compliance with the National Bridge Inspection Standards (NBIS) through comprehensive performance of inspection timeliness verifications, annual FHWA NBIS Metric evaluations, inspection team leader qualification appraisals, and quality assurance reviews. Bridge Field Services also develops inspection procedures, responds directly to the FHWA Michigan Division Bridge Engineer, and serves as the recognized resource for all inspection related inquiries.



**Contact:**  
 Rich Kathrens  
 517-749-4274  
[MDOT-BridgeInspection@michigan.gov](mailto:MDOT-BridgeInspection@michigan.gov)

### Resource Links

- MDOT Bridge Advisories
- Bridge Safety Report
- NBIS Recurrent Training
- NBI Training

### FHWA Compliance

- Unassigned Safety Inspections
- Inspection Timeliness Reports





## 30 Day Data Entry for Inspections

MICHIGAN STRUCTURE INSPECTION MANUAL  
BRIDGE INSPECTION

CHAPTER 3

INSPECTION FREQUENCY

inspection reporting. The NBIS requires the inspection report to be entered within 90 days from the date of an inspection for state owned bridges, and 180 days for all others. **Effective October 1, 2014 all bridge safety inspections performed shall be entered into MiB<sup>RIDGE</sup> within 30 days of the inspection.** This policy change has been approved by FHWA to strengthen the performance of Michigan's Bridge Inspection Program by allowing timeliness verifications to be conducted 60 days earlier than current regulations require, and will increase compliance during National Bridge Inspection Program reviews.





## Automated Past Due Notifications

**From:** MDOT@michigan.gov  
**Sent:** Wednesday, December 16, 2015 7:00 AM  
**To:** [REDACTED]  
**Cc:** Kathrens, Richard (MDOT)  
**Subject:** PAST DUE BRIDGE INSPECTIONS@TMSPROD

**Categories:** Past Due Inspection

BRIDGE OWNER: [REDACTED]

Your agency currently has bridge inspections that are **PAST DUE**. The number and type of bridge inspections in your jurisdiction that are past due are shown below:

Insp Type	R	FC	FS	UW	OS
PAST DUE	12	0	0	0	0

**LEGEND**  
 R = Routine  
 FC = Fracture Critical  
 FS = Fatigue Sensitive  
 UW = Underwater  
 OS = Other Special



MICHIGAN STRUCTURE INSPECTION MANUAL  
 BRIDGE INSPECTION  
 CHAPTER 3  
 INSPECTION FREQUENCY

## Document reason for Delay

consequence requiring a partial inspection is resolved. The team leader must contact the bridge owner if an inspection cannot be completed by the required due date. **Effective October 1, 2014 the team leader must document the reason why an inspection was not completed in the month it was due. This will be documented in the General Notes field on the inspection report in MiB<sup>RIDGE</sup>.**

Metric 6 – Inspection frequency – Routine – Lower risk bridges									
Owner codes: 1 2 3 4 11 21 12 25 __ 31 32 __		Override Codes: Applied in results below.						Icon Key (hover mouse over metric title)	
Mo/Yr for overdue inspection formula: 05/15		Regular Interval NTE 24 months			Extended Interval >24 & NTE 48 months			Preview & Print Overrides to PDF	
Analyzed (counted): 4,577		Overdue: None			Overdue: None			Select codes in dropdown or dbl-click Instructions The purple cells directly below are to be used to override and document the review of individual bridges. Explanation/Comments can be from pick list or typed.	
Total population: 8,170		Number exceeding interval			Number exceeding interval				
Structure Number	Months (overdue)	154	15	0	0	0	0	Override	Reviewer explanation/comment
3	Interval	<=24	<=25	<=28	<=48	<=49	<=52		
000000000000691	25	✓	✓	✓				A	Reviewed - documented 1 month delay.
000000000000692	25	✓	✓	✓				A	Reviewed - documented 1 month delay.
000000000000696	25	✓	✓	✓				A	Reviewed - documented 1 month delay.
000000000000697	25	✓	✓	✓				A	Reviewed - documented 1 month delay.



## CLOSED for CONSTRUCTION

“I have an inspection coming due, but its going to be closed later in the year for construction, do I still have to do an inspection?”

YES!







## CLOSED for CONSTRUCTION

“The bridge is closed for construction, do I still have an inspection completed?”





## CLOSED for CONSTRUCTION

NBI INSPECTION			KATHRENSR -
Inspector Name	Agency / Company Name	* Insp. Freq.	* Insp. Date
Richard Kathrens	MDOT - Bridge Field Services	7	02/12/2015
GENERAL NOTES			<a href="#">Prev. Comment</a>
<p>Structure was closed on <u>2/12/2015</u> for construction. This report is to document the closure. The previous ratings and comments were carried forward as a field inspection was not completed. The anticipated open to traffic date is <u>Sept. 2015</u></p>			
DECK			
Item	Rating	Comments	
1. Surface (SIA-58A)	7 GOOD CONDITION 10/15 - 8	A thin epoxy overlay has been applied to the decks surface peeling or cracking was observed.	
	<a href="#">Prev. Comment</a>		
2. Expansion Joints	4 POOR CONDITION	Expansion Joints leaking heavily.	

Carry forward previous Ratings and Comments

Benefits for Documenting Closure in MiBRIDGE:

Timeliness, Accurate Summary of Events, Helps ensure Post Construction



**STR 6718**

**Information Summary and Current Status**



**Facility**  
US-131 NB

**Feature**  
MUSKEGON RIVER

**Location**  
5 MI SOUTH BIG RAPIDS

**Region / County**  
Grand(3) / Mecosta(54)

**Latitude / Longitude**  
43.6088 / -85.493

**Length / Width**  
580 / 46

**Built / Recon. / Paint / Ovly.**  
1982 / / / 2015

**Material / Design**  
6 P/S Conc Continuous / 21 Segmental Box Girder

**Operational Status**  
K Closed to all traffic(K)



- Inventory & Appraisal
- Inspections / Reports
- Load Ratings
- Work Recommendations
- Work History
- Documents

Structure Inventory and Appraisal Data (Note: All items are to be entered in ENGLISH units only)

- [Type & Dims. \(Edit\)](#)
  - [Insp. Data \(Edit\)](#)
  - [Route ON \(Edit\)](#)
  - [Route UNDER \(Edit\)](#)
  - [Misc. data \(Edit\)](#)
  - [Load Rating \(Edit\)](#)
  - [Waterway Data \(Edit\)](#)

i SIA Load Rating data successfully updated.

LOAD RATING AND POSTING		
31	Design of Load	9 HS 25 (MS 22.5)
41	Open, Posted, Closed	K Closed to all traffic <span style="float: right;">▼</span>
63	Oper Rtg Method	8 LRFR in Rating Factor
64F	Fed Oper Rtg (Rating Factor)	1.23
64MA	Mich Oper Rtg Method	8 LRFR in Rating Factor
64MB	Mich Oper Rtg (Rating Factor)	1.24
64MC	Mich Oper Truck	8
65	Inv Rtg Method	8 LRFR in Rating Factor





## POST CONSTRUCTION INSPECTIONS

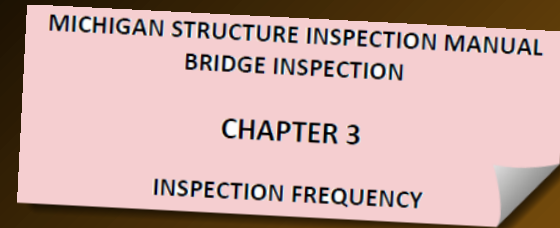
- Scheduled No Later than 90 Days (State Owned) or 180 Days (Local Agency Owned) from the **open to traffic date**.

Michigan Department of Transportation 1120 (01/16)	<b>FINAL INSPECTION/ACCEPTANCE and CERTIFICATION REPORT</b>		Page of  FILE 105
<b>DISTRIBUTION INSTRUCTIONS</b> ( <i>electronic distribution where applicable</i> ): ORIGINAL - Contract Services Division. COPIES - Project File, Region Construction Engineer <i>When applicable:</i> TSC Local Agency Engineer, Development Services Division - Local Agency Programs, Traffic & Safety, Office of Rail			
<b>FINAL INSPECTION/ACCEPTANCE REPORT</b>			
CONTROL SECTION/JOB NUMBERS:	FEDERAL PROJECT NO.	FEDERAL ITEM NO.	
START DATE	<b>ACTUAL OPEN TO TRAFFIC DATE</b>	ALL CONTRACT WORK COMPLETE DATE	
BRIDGE WORK: <input type="checkbox"/> YES <input type="checkbox"/> NO	BRIDGE INSPECTION:	DATE REQUESTED	DATE COMPLETED

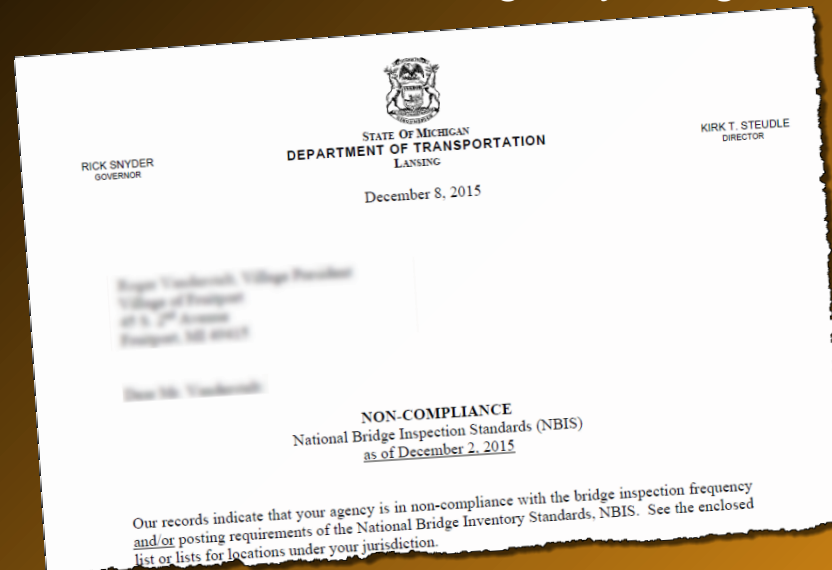
- Inspection Condition, Inventory, and Load Rating Information needs to be reviewed and updated accordingly.



## Timeliness Compliance




- Bridge Field Services will contact the agencies with inspections that are one month past due and provide notification that non-compliance proceedings will occur during the subsequent month if corrective action is not taken.
- Bridge Field Services will provide the names of agencies with inspections that are two months past due and supporting documentation to the Development Services Division Local Agency Programs Section.






## GUIDELINES FOR BRIDGE INSPECTION FREQUENCIES



### GUIDELINES FOR BRIDGE INSPECTION FREQUENCIES

Bridge Field Services, Structures Management Section



The NBIS sets the maximum frequencies for Routine, Fracture Critical, and Underwater Inspections. Typically maximum frequencies are used for bridges in fair to good condition. Evaluation of the conditions encountered during the inspection for each bridge will require engineering judgment to verify the appropriate frequency for future inspections. These guidelines are to be used as reference for bridge inspectors to maintain consistency statewide. It is recognized that the conditions encountered are unique for each bridge.

Reduced frequencies are set to verify and ensure stability of the deficient element and to make sure there are no significant changes in the primary elements between inspections.

COMPONENT OR BRIDGE TYPE	FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
	≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>DECK (SI&amp;A Item 58)</b>						
<b>ROUTINE</b>						
Item 58 or 58B NBI rating = 4				X		Notify maintenance (MDOT Owned) or Bridge Owner (Local Agency Owned) to monitor deck soffit. Schedule an in-depth inspection.
Item 58 or 58B NBI rating = 3			X			Schedule an in-depth inspection.
Decks containing false decking						Review the in-depth inspection guidelines.
Item 58 or 58B NBI rating = 6					X	Schedule the initial in-depth inspection within 24 months. Perform as-needed to assess condition.
<b>IN-DEPTH</b>						
Item 58 or 58B						Schedule the initial in-depth inspection within 12 months.
False decking						Schedule the initial in-depth inspection as-needed when engineering judgment
False decking						
<b>SUPERSTRUCTURE</b>						
CONCRETE P						
Main rebar						

### Metric #11: Inspection frequency – Frequency criteria rev 4/1/13

**NBIS Reference:** 23 CFR 650.311 (a)(2), (b)(2), (c)2, (d) – Frequency criteria

- Criteria is established to determine level of inspection, and frequency for all of the following inspection types where appropriate:
- Routine inspections – for less than 24-month intervals
  - FCM inspections – for less than 24-month intervals
  - Underwater inspections – for less than 60-month intervals
  - Damage inspections
  - In-depth inspections
  - Special inspections





COMPONENT OR BRIDGE TYPE		FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
		≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>DECK (SI&amp;A Item 58)</b>							
ROUTINE	Item 58 or 58B NBI rating = 4			X			Notify maintenance (MDOT Owned) or Bridge Owner (Local Agency Owned) to monitor deck soffit. Schedule an in-depth inspection.
	Item 58 or 58B NBI rating = 3		X				Schedule an in-depth inspection.
	Decks containing false decking						Review the in-depth inspection guidelines.
IN-DEPTH	Item 58 or 58B NBI rating = 6						Schedule the initial in-depth inspection within 24 months. Perform as-needed to assess condition.
	Item 58 or 58B NBI rating = 4				X		Schedule the initial in-depth inspection within 12 months.
	False decking protects < 75% of span						Perform an in-depth inspection as-needed when engineering judgment warrants.
	False decking protects ≥ 75% of span					X	Schedule the initial in-depth within 12 months. Review MiSIM Chapter 5 for removal requirements.
<b>SUPERSTRUCTURE (SI&amp;A Item 59)</b>							
<b>CONCRETE PRIMARY MEMBERS</b>							
	Main rebar or prestressing strands exposed with section loss			X			Complete structural analysis. Set frequency based on analysis.
	Spall on beam end with loss of bearing		X				Schedule a special inspection to monitor beam and bearing until repairs are complete.
	Longitudinal cracks in beam		X				Schedule a special inspection to monitor until analysis or repairs have been completed.

## Components: Deck, Superstructure, Substructure, Culvert Frequency Recommendation based on Condition



## In-Depth Inspections

- In-depth recommended while deck is in Fair condition
- Repetitive condition based in-depth inspections once Poor
- False decking requires action when 75% or more of the span is protected



COMPONENT OR BRIDGE TYPE		FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
		≤ 6	≤ 12	< 24	≤ 36	≤ 48	
IN-DEPTH	Item 58 or 58B NBI rating = 6						Schedule the initial in-depth inspection within 24 months. Perform as-needed to assess condition.
	Item 58 or 58B NBI rating = 4					X	Schedule the initial in-depth inspection within 12 months.
	False decking protects < 75% of span						Perform an in-depth inspection as-needed when engineering judgment warrants.
	False decking protects ≥ 75% of span						X Schedule the initial in-depth within 12 months. Review MiSIM Chapter 5 for removal requirements.



## Fracture Critical Routine Frequency

- Fracture critical member frequency may not impact routine frequency
- Findings require communication
- Include additional details within inspection procedures section



COMPONENT OR BRIDGE TYPE		FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
		≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>SUPERSTRUCTURE (SI&amp;A Item 59)</b>							
<b>FRACTURE CRITICAL</b>	Extensive loss of section		X				Perform a fracture critical inspection until deterioration is mitigated. Provide detailed measurements when increased LOS is identified.
	Severe distortion of built-up members induced by pack rust		X				Perform a fracture critical inspection until deterioration is mitigated or bridge is closed.
	Fatigue cracks identified within previous 4 Years		X				Perform a fracture critical inspection until deterioration is mitigated. Continue to monitor similar fatigue sensitive details and locations where cracks have been arrested to detect further propagation.
	Gusset plates exhibiting out-of-plane distortion	X					Record detailed measurements and continue increased frequency until structural analysis is complete. Set frequency based on analysis.
	Elements rated in poor condition	X					Perform a fracture critical inspection until deterioration is mitigated or bridge is closed.





## Reduced Diver Inspection Recommendations

COMPONENT OR BRIDGE TYPE		FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
		≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>SUBSTRUCTURE (SI&amp;A Item 60)</b>							
UNDERWATER DIVING	Item 60 NBI rating = 5 and deterioration causing reduced rating is located on submerged surfaces					X	Ensure Level II inspection intensity is performed on at least 10% of the submerged surface area.
	Item 60 NBI rating = 4 and deterioration causing reduced rating is located on submerged surfaces				X		Consider increasing Level III inspection intensity to greater than 10% of the submerged surface area. Perform Level III inspection intensity when necessary.
	Item 60 NBI rating = 3 and deterioration causing reduced rating is located on submerged surfaces			X			Consider increasing Level III inspection intensity to greater than 10% of submerged surface area. Perform Level III inspection intensity when necessary.

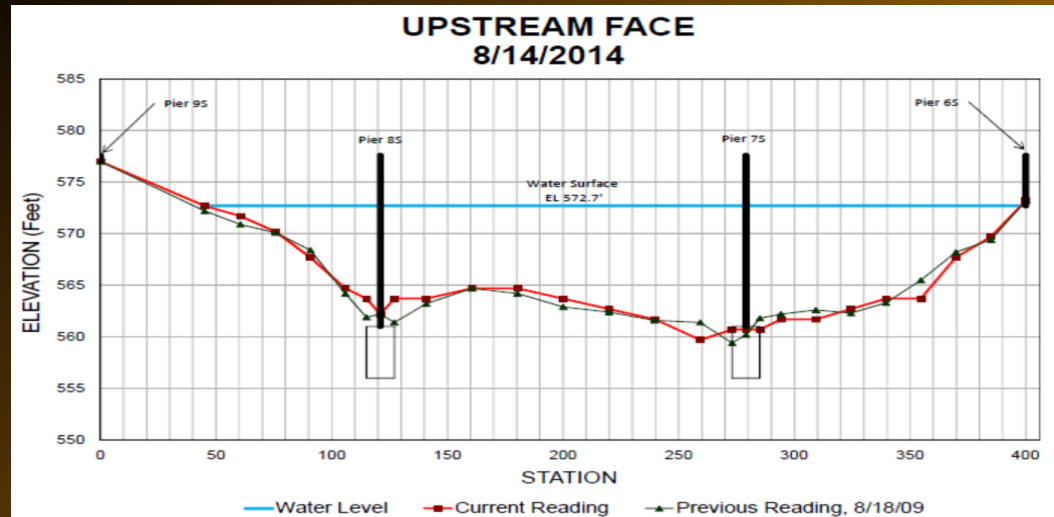
**Reminder:** Substructures having water depths of 10' or greater need to be inspected by a diver.





## Stream Bed Cross Sections

- When cross-sections are not taken at the frequency described document the reason on the BSIR/CSIR



COMPONENT OR BRIDGE TYPE	FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
	≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>STREAM BED CROSS-SECTIONS</b>						
<b>ROUTINE / DIVING</b>	Scour critical bridges with active erosion or observed scour			X		Minimum every two years or after flood event where the scour POA was reviewed and monitoring occurred (Item 113 = U, 0-3).
	Scour critical bridges with no active erosion or observed scour				X	Minimum every four years or after flood event where the scour POA was reviewed and monitoring occurred (Item 113 = U, 0-3).
	Structures with minor observed scour or erosion					Minimum of one cross section must be in the bridge file. Record additional cross-sections as changes in the channel are observed and every 60 months for locations requiring underwater diving.
	Structures over water with no substructures in the water and no channel erosion					Minimum of one cross section must be in the bridge file for each structure over water. Record additional cross-sections as changes in the channel are observed.



## Channel Routine Frequency



COMPONENT OR BRIDGE TYPE		FREQUENCY <sup>(1)</sup> (Months)					COMMENTS <sup>(2)(3)</sup>
		≤ 6	≤ 12	< 24	≤ 36	≤ 48	
<b>CHANNEL (SI&amp;A Item 61)</b>							
ROUTINE	Item 61 NBI rating = 5 and Item 113 = U, 0-3			X			Remove debris that restricts the channel or consult a hydraulics engineer for recommendations to improve scour countermeasures.
	Item 61 NBI rating = 4			X			Remove debris that restricts the channel or consult a hydraulics engineer for recommendations to improve scour countermeasures.
	Item 61 NBI rating = 3		X				Remove debris that restricts the channel or consult a hydraulics engineer for recommendations to improve scour countermeasures.





## FINDING

### 3. Inspection Frequencies for Structurally Deficient Bridges

MDOT had not instituted a sufficient process to ensure that inspectors consistently increased the bridge inspection frequency for each structurally deficient bridge or documented an acceptable rationale for not doing so. As a result, some bridges may not have been inspected as frequently as necessary. Ensuring that structurally deficient bridges are inspected with sufficient frequency is important for maintaining the safety and confidence of the traveling public and for effectively managing the condition of the valuable assets.




## OAG Audit Updates: Frequency Justification, Structurally Deficient Structures

### MICHIGAN DEPARTMENT OF TRANSPORTATION

**STR 10294**

### BRIDGE SAFETY INSPECTION REPORT

<b>Facility</b>	<b>Latitude / Longitude</b>	<b>MDOT Structure ID</b>	<b>Structure Condition</b>	
DEAN STREET	41.9311 / -85.5268	78200025000B010	Poor Condition(4)	
<b>Feature</b>	<b>Length / Width</b>	<b>Owner</b>		
PRAIRIE RIVER	65.91 / 31.82	County: St. Joseph(78)		
<b>Location</b>	<b>Built / Recon. / Paint / Ovly.</b>	<b>TSC</b>	<b>Operational Status</b>	
0.1 MI N OF CENTREVILLE	1967 / / /	Kalamazoo(5B)	P Posted for load(P)	
<b>Region / County</b>	<b>Material / Design</b>	<b>Last NBI Inspection</b>	<b>Scour Evaluation</b>	
Southwest(5) / St. Joseph(78)	7 Wood or Timber / 01 Slab	11/28/2015 / GXFY	5 Stable w/in footing	

### NBI INSPECTION

**GXFY**

<b>Inspector Name</b>	<b>Agency / Company Name</b>	<b>Insp. Freq.</b>	<b>Insp. Date</b>
Ryan Worden	Scott Civil Engineering	24	11/28/2015

### GENERAL NOTES

Fair/Poor. Posted at 32/56/70. Void forming behind south abutment SB Lane.

**Posting Signs in Place** YES

### Frequency Justification Comments (required when Poor Condition and frequency is equal to 24 months)

deck condition has remained consistent over several inspection cycles.

### DECK



## FINDING

### 4. Inspection Timeliness

MDOT had not implemented sufficient measures to ensure that local bridge owners and MDOT regional offices completed all routine inspections, inspections of the underwater structural elements of bridges, and fracture critical member inspections in accordance with time frames established in State statute and NBIS. Also, MDOT did not sufficiently document some of its follow-up actions related to late or potentially late bridge inspections. Timely inspections help to ensure the preservation of assets and the safety of the traveling public.



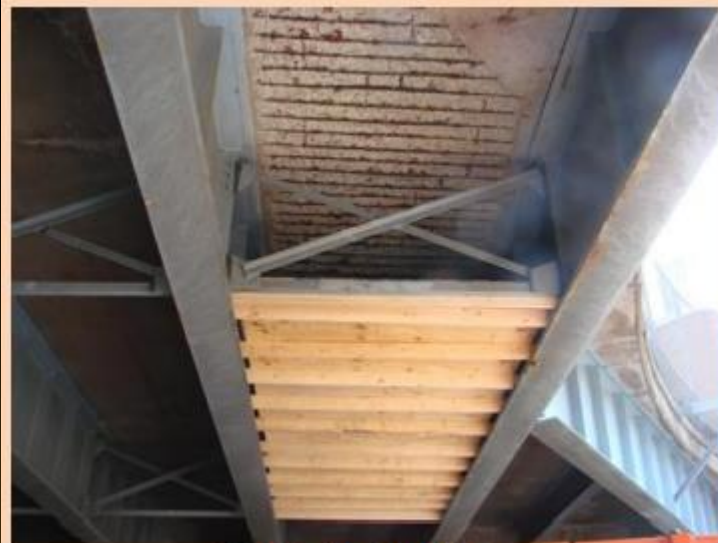




## FINDING

### 5. False Decking

MDOT did not provide consistent guidance to inspectors regarding the inspection of bridges with plywood false decking. Also, MDOT did not ensure that all bridges with false decking were correctly identified in BMS. In addition, MDOT did not adequately inspect the underside of bridges with plywood false decking. As a result of these conditions, MDOT did not consistently comply with NBIS, which was developed to help ensure the safety of the traveling public.



820 False Decking



821 Maintenance Sheeting



## OAG Audit Updates: False Decking Removal during Inspection

False Decking (Timber) Removed to Complete Inspection  N/A  **No False Decking  
Metal Mesh Panels in Place**

**OR**

False Decking (Timber) Removed to Complete Inspection  No  **Removal Does Not Impact Ratings  
To Be Scheduled**

**OR**

False Decking (Timber) Removed to Complete Inspection  Yes

### MICHIGAN STRUCTURE INSPECTION MANUAL BRIDGE INSPECTION – ROUTINE and CONDITION BASED IN-DEPTH INSPECTION

Table 5.10.07 Required In-Depth Inspection for Deck Bottom Surfaces Containing Plywood False Decking

Surface Area of Protected Span	Schedule Initial In-depth Within	In-Depth Frequency	Removal Requirements	
			≤ 8 Bays	≥ 9 Bays
< 75%	N/A	As-Needed	As-Needed	As-Needed
≥ 75%	12 Months	48 Months	Every Other Bay (24 sft. Each)	Every Third Bay (24 sft. Each)



## OAG Extended Frequencies

1. Risk-Based Bridge Inspection Frequencies  
MDOT should consider seeking amendatory legislation to establish risk-based bridge inspection frequencies. Also, MDOT should consider seeking FHWA approval to lengthen the inspection intervals for State-owned and locally owned bridges or categories of bridges that warrant longer intervals, as determined through analysis of available inspection and other data.





## OAG Extended Frequencies

INSPECTION OF BRIDGES

H.B. 4455:  
SUMMARY OF BILL  
REPORTED FROM COMMITTEE



Senate Fiscal Agency  
P. O. Box 30036  
Lansing, Michigan 48909-7536

BILL



ANALYSIS

Telephone

Sec. 19a. The state transportation department shall institute **AND IMPLEMENT** a systematic **FEDERALLY COMPLIANT AND RISK-BASED INSPECTION** plan of biennial inspection of **FOR** all bridges under its jurisdiction.

The bill would amend Public Act 354 of 1925, which regulates the construction, improvement, repair, and maintenance of bridges, to require the Department of Transportation to **institute and implement a federally compliant and risk-based inspection plan for all bridges under its jurisdiction**. Currently, the Department must institute a systematic plan of biennial inspection of all bridges under its jurisdiction.

The bill would take effect 90 days after it was enacted.

MCL 254.19a

Legislative Analyst: Drew Krogulecki

**FISCAL IMPACT**



## Technical Advisory 5140.21

- FHWA Required Criteria
  - Structure type and description
  - Structure age
  - Structure load rating
  - Structure condition and appraisal ratings
  - Volume of traffic carried
  - ADTT
  - Major maintenance or structural repairs performed within the last 2 years



STATE OF MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
LANSING

KIRK T. STEUDLE  
DIRECTOR

RICK SNYDER  
GOVERNOR

XXXX XX, 2016

Mark G. Lewis, P.E.  
Bridge Program Team Lead  
U.S. Department of Transportation  
Federal Highway Administration  
315 W. Allegan Street,  
Lansing, MI 48933

Dear Mr. Lewis:

Subject: National Bridge Inventory  
Extended Functionality

The Michigan Department of Transportation  
implementation of the National Bridge Inventory  
Technical Advisory Committee

SI&A	DESCRIPTION	REQUIRED CRITERIA
Item 27	Year Built	$4 \leq \text{Item 27} < 50$ years
Item 109	Average Daily Truck Traffic	$\text{Item 109} \leq 25\%$
Item 41	Structure Open, Posted, or Closed	$\text{Item 41} = A$
Item 43A	Structure Type, Material	$\text{Item 43A} = 1, 2, 3, 4, 5, \text{ or } 6$
Item 43B	Structure Type, Design	$\text{Item 43B} = 02, 04, 22, 32, 42, 52, 62, 72, 82, 19$
Item 48	Length of maximum span	$\text{Item 48} < 100$ feet
Item 54	Minimum Vertical Underclearance	$\text{Item 54} > 14' 6"$
Item 58	Deck	$\text{Item 58} \geq 7$
Item 59	Superstructure	$\text{Item 59} \geq 7$
Item 60	Substructure	$\text{Item 60} \geq 7$
Item 62	Culvert	$\text{Item 62} \geq 6$
Item 113	Scour Critical Bridge	$\text{Item 113} = 5, 8, 9, \text{ or } N$





	<b>LOCAL AGENCIES</b>
<b>No. of Structures*</b>	6579
4 ≤ Item 27 ≤ 75 years	5325
Item 41 = A	5467
Item 48 < 100 feet	6428
Item 54 >14.5 feet	6556
Item 58 ≥ 7	3001
Item 59 ≥ 7	2990
Item 60 ≥ 7	3080
Item 62 ≥ 6	1190
Item 113 = 5,8,9, or N	5080

<b>Bridges</b>	304
Bridges (NBI)	304
Bridges (Non-NBI)	0
<b>Culverts</b>	925
Culverts (NBI)	925
Culverts (Non-NBI)	0
<b>No. of Extended</b>	1229
<b>Applicable Inventory (%)</b>	18.68



## OAG Extended Frequencies

- Step 1: Finalize criteria
- Step 2: FHWA approval
- Step 3: MiBRIDGE enhancements
- Step 4: Implement

Continued use of extended frequencies is contingent upon:

- Maintaining compliance requirements specified in the 23 Metrics
- Successful performance of quality control and quality assurance
- Performance of routine and detailed inspections for poor structures in accordance with the MDOT *Guidelines for Bridge Inspection Frequencies*



*Thank you, are there any QUESTIONS?*

