

Inspection Exercise

Example # 1

Bridge – John Doe over John Doe River

- Overview: built in 1950, 3 span steel stringer bridge over water



06/27/2007 Previous Inspection Report

- Superstructure, deck, and surface were rated a 4
- Expansion joints were rated a 3
- Posted at 42T/67T/75T
- On a 24 month inspection frequency



06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

- Upon inspection noted full depth hole in deck at expansion joint and heavy scale at steel beam ends – limited access to beam ends due to water
- Requested a detailed inspection via phone with bridge owner followed up with an email request
- Authorized by the bridge owner to perform D.I.



- Detailed Inspection Findings – Holes in end diaphragms at piers



- Detailed Inspection Findings – After removing scale, holes in beam webs and H-bearings



- Detailed Inspection Findings –



06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

06/22/2009 Detailed Inspection

- Observed corrosion and loss of section at beam ends in the webs and bottom flanges; Holes in the web of beam ends
- Documented holes at the end diaphragms at the piers. End diaphragm at bay 3s rotted off completely, Holes in H-bearings
- Compiled an RFA to the bridge owner with findings from the detailed inspection and requested a load rating

06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

06/22/2009 Detailed Inspection

- Heavy corrosion and loss of section at beam ends in the webs and bottom flanges; Holes in the web of beam ends
- Holes at end diaphragms at piers. End diaphragm at bay 3s rotted off completely, Holes in H-bearings
- Compiled an RFA to bridge owner with findings and a request for load rating
- Updated my 06/18/2009 BSIR to include the detailed inspection findings
- Increased the inspection frequency from 24 to 6 months
- Coded the SI&A Item 41. Changed from a "P" to a "B" for Bridge Load Rating Requested

06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

06/22/2009 Detailed Inspection

07/13/2009 Load Rating

- Reduced Load Posting from 42T/67T/75T to 14T/17T/18T

- Load Rating Results –



06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

06/22/2009 Detailed Inspection

07/13/2009 Load Rating

08/2009 – 11/2009 Emergency Repairs

- The bridge owner used an in house maintenance crew to install several beam end repairs, diaphragm replacements and h-bearing repairs

- Emergency Repairs –



- Emergency Repairs –



06/27/2007 Previous Routine Inspection

06/18/2009 Routine Safety Inspection

06/22/2009 Detailed Inspection

07/13/2009 Load Rating

08/2009 – 11/2009 Emergency Repairs

11/09/2009 Increased Bridge Inspection

- Changed the inspection frequency from 6 months to 12 months based upon the steel repairs
- Requested another load rating to account for the repairs

11/09/2009 Load Rating

- Load Posting after Emergency Repairs were performed—



Inspection Exercise

Example # 2

Bridge – Willoughby Road over the Sycamore Creek

- Overview: built in 1939, 3 span steel stringer bridge over water



06/21/2007 Previous Inspection Report

- Superstructure, deck, and substructure were all rated a 3
- Posted at 19T/22T/30T
- Reduced to a single lane
- On a 24 month inspection frequency



06/21/2007 Previous Routine Inspection

05/27/2009 Routine Safety Inspection

- Confirmed heavy scale at steel beam ends
- Due to high water levels there was limited access and limited visibility of the steel pier pile bents
- Completed the inspection with a comment that we would return in July to inspect the pier units at lower water levels



- Upon returning to the bridge on 7/16/2009 after water went down 2 feet

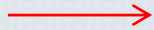
Holes and section loss in web

Paper thin flanges



- Detailed Inspection Findings – at another location.....more of the same

Holes in web



Holes in the flange



- Detailed Inspection Findings – more of the same at yet another location

Holes in web

Holes in the flange



- Detailed Inspection Findings – Get the heck out of here, the bridge is going to fall!



06/21/2007 Previous Routine Inspection

05/27/2009 Routine Safety Inspection

07/16/2009 Follow Up Inspection

- Discovered extensive holes in the webs and flanges of several pier pile bents at both piers
- Called bridge owner from site to recommend immediate closure of the bridge

06/21/2007 Previous Routine Inspection

05/27/2009 Routine Safety Inspection

07/16/2009 Follow Up Inspection

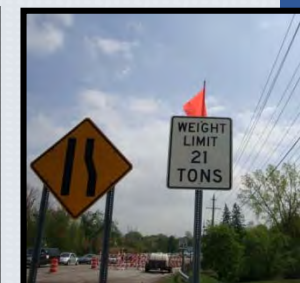
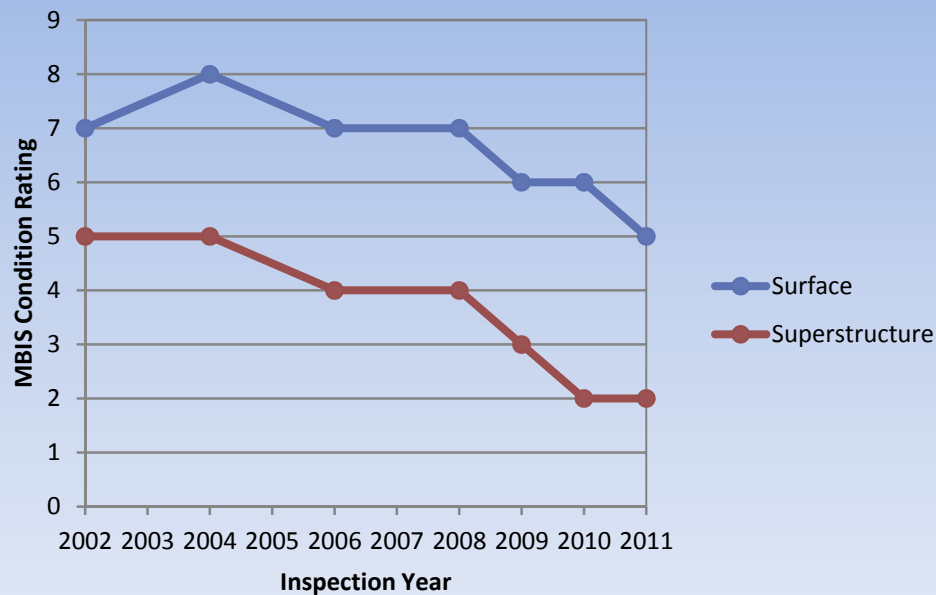
07/16/2009 Closed Bridge

- Updated the BSIR to incorporate the follow up inspection comments
- Updated the SI&A to reflect the bridge was closed
- Notified MDOT of the Critical Finding

How do you know when to close a bridge?

Facility	Year Built	Wearing Surface	Surface Rating							Superstructure Rating							Load Posting
			02	04	06	08	09	10	11	02	04	06	08	09	10	11	
LIVERNOIS ROAD	1972	Bituminous	7	8	7	7	6	6	5	5	5	4	4	3	2	2	21 Tons

Livernois Road over Clinton River



Bridge Inspection Process

Routine Bridge
Safety Inspection

*Qualified Engineers
with Recurrent Training*

Detailed Inspections



Underwater
Inspections/FC



Hydraulic Analysis,
Scour Plans of Action



Load Rating
Calculations



Bridge Management

Follow-up with
Documentation

Thank you for your time.....

