

MICHIGAN DEPARTMENT OF TRANSPORTATION
SCOUR CRITICAL BRIDGE ACTION PLAN

MDOT Bridge ID		Structure Number			Control Section		
34 134062000000B03		4011			B03-34062		
Facility		Federal Struc ID		Last Modified By		Agency Name	
M-21		34134062000B030		VANDRUNENN		MDOT-Grand Region	
Feature		Location		Latitude		Insp Freq	
MAPLE R		1.0 MI E OF MUIR		43 ' 2.62"		GSFK	
Length		Width		Year Built		Yr Recon	
220		46		1929		2005	
Br		Type		Scour Eval		# of Pins	
3		02					

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WaterShed	14C - MAPLE
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Scour Vulnerability Rating	
Item 113 Rating & Description	3 SC - Unstable

ABUTMENT A

Foundation	In Water	Yes	Spread Footing	No	Piles Deep Fdn	No	Unknown	No
Foundation Soil Type	Non Cohesive	No	Cohesive	No	Rock	No	Unknown	No

ABUTMENT B

Foundation	In Water	Yes	Spread Footing	No	Piles Deep Fdn	No	Unknown	No
Foundation Soil Type	Non Cohesive	No	Cohesive	No	Rock	No	Unknown	No

Total Number of Piers	0
Comments	

Piers in water for 100 year event(by footing type) (identify location i.e 1W,2S)	Spread Footing	Piers Deep Fdn	Unknown

Pier Foundation Soil Type	Non Cohesive	No	Cohesive	No	Rock	No	Unknown	No
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OBSERVED SCOUR REPORTED

01/01/0001
 Water too high and swift to check for scour at time of inspection, minor bank slumping (06, 05). Pier 1W footing exposed 6" (05).
 Tree stuck at pier 2W, north end (03).

SCOUR EVALUATION REPORT, EXECUTIVE SUMMARY

Scour Analysis Event Frequency	25 year	50 year	100 year
Anticipated Surface Elevation(ft)			
Distance below bottom chord(ft)			
Anticipated Flow(cubic ft/sec)			

Bridge Inspection Coding Information

Routine Inspection Date	12/02/2008
Under Water Inspeccion Date	01/01/1901

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Pontis Scour Smart Flag	
Pontis Rip-Rap Smart Flag	
Item 71 Water Adequacy	N

Item	Rating (1 to 9)	Comments
Abutment	7	Minor vertical cracks in each abutment. Some cracks with efflorescence in returnwalls. No major problems.
Piers	7	Concrete repairs have been made to all piers. Pier walls submerged at this time and could not observe condition. Tree along east side of pier 2w. No major problems noticed.
Item 61 Channel/Protection	6	Open channel - minor bank slumping. Water approx 8" higher than pier walls. Water to high and current to swift to check pier footings for scour at this time. No problems noticed.
(MDOT) Culvert Scour Rating	N	

Counter Measure Condition & Recommendation	
Existing Counter Measures	

Inspector recommendations	
Counter Measures Not Feasible	No
Priority	Low
Explanation: Place rip-rap around abutments and piers.	

Monitoring Plan	
Routine Inspection Frequency	24
Under Water Inspection Frequency	

Cross Section Elevations	
Date Last Taken	10/07/2005
Frequency(in months)	

Items to Watch	
Cross Sections Elevation Previous Date: 03/24/03. Build up of debris near abutments and piers. Signs of severe bank erosion and slumping near abutments.	

Fixed Monitoring Devices	No
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Type of Instruments
Installation Locations

Agency Responsible For Monitoring During High Flow | MDOT Grand Region Bridge Inspection Unit

Responsible Agency Location	Phone Number	Cell Number
Grand Region	6164514884	6162628791

Flood Monitoring Resources
NoAA Website <http://www.crh.noaa.gov/ahps2/> [Flows are shown in kcfs]
USGS Website http://water.usgs.gov/cgi-bin/waterwatch?map_type=real&state=mi [Flows are shown in cfs]

- Initiate Monitoring when a flood warning is issued and/or when one or more of the following occurs**
1. Structure will experience 25 year peak flow or more.
 2. Structure is expected to have pressure flow.
 3. History of whirlpools upstream or adjacent to sub-structure.
 4. History of debris accumulation.
 5. Known or existing scour holes.

Bridge Closure	
Conditions To Evaluate Bridge Closure	
1. Pressure Flow (water surface above bottom cord)	No
2. Observed whirlpools upstream and adjacent to substructure	No
3. High Debris Accumulation	No
4. Settlement of abutment/piers	No
5. Erosion of Roadway Embankment	No
6. Other	No

Contact People For Bridge Closure		
Name	Phone Number	Cell Number
Nathan VanDrunen	616-451-4884	616-262-8791
Vicki Weerstra	616-451-4646	616-262-1799
Karl Koivisto	231-937-9661	231-250-6375
Curtis Perkins	616-451-4040	616-690-6111

(For NHS bridges, notify FHWA if closure is more than eight hours)

Contact For Re-Opening After Inspection	Phone Number	Cell Number
Nathan VanDrunen - Bridge Engineer	6164514884	6162628791

Detour Route
Possible Detour Route (route number, from, to, etc.)

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EB M-21: Ionia St. south to Bridge St. east to Hubbardston Rd. north back to M-21.
 WB M-21: Hubbardston Rd south to Kimball Rd. west to Tabor St. north back to M-21

Bridges/Culverts on Detour Route				
Detour Bridge Numbers		Water Way	Load Limitations	Scour Rating

Documentation Of High Flow Event				
Date Monitored		12/30/2008	Time Monitored	14 hr 30 min
Storm Duration (hrs)		6	Estimated Total Rainfall (in)	2
High Water Dst from Bottom Chord (ft)		1	Estimated USGS Flow Discharge (cu ft./sec)	

Whirlpools Observed
 None observed

Debris Accumulation
 A tree was struck under Span 1. From what could be seen, a large tree was wedged under beams midspan

Action Taken / Closure
 No closure implemented. Increased inspection frequency after the initial inspection. Ionia County had a maintenance worker checking water elevations at a frequency of 3 hours until the water level receded to about 2-3 feet below bottom chord.

Comments
 Water level was estimated to be 8 inches below the bottom chord. On Dec. 27, it was about 60 degrees and we got about 2" of rain. There was very, very much snow melt along with the rain.