

SCOUR CRITICAL BRIDGE - PLAN OF ACTION

1. GENERAL INFORMATION

Structure number: <u>05C06</u>	City, County, State: <u>Milwaukie, Clackamas County, Oregon</u>	Waterway: <u>Johnson Creek</u>
Structure name: <u>Johnson Creek, Millport Slough Rd</u>	State highway or facility carried: <u>Millport Slough Road</u>	Owner: <u>City of Milwaukie</u>
Year built: <u>1963</u>	Year rebuilt: _____	Bridge replacement plans (if scheduled): _____ Anticipated opening date: _____
Structure type: <input checked="" type="checkbox"/> Bridge <input type="checkbox"/> Culvert		
Structure size and description: <u>70 ft., 01 Slab, 5 Prestressed Concrete</u>		
Foundations: <input type="checkbox"/> Known, type: _____ Depth: _____ <input checked="" type="checkbox"/> Unknown		
Subsurface soil information (check all that apply): <input type="checkbox"/> Non-cohesive <input type="checkbox"/> Cohesive <input type="checkbox"/> Rock		
Bridge ADT: <u>5655</u>	Year/ADT: <u>2007</u>	% Trucks: <u>10</u>
Does the bridge provide service to emergency facilities and/or an evacuation route (Y/N)? <u>N</u> If so, describe: _____		

2. RESPONSIBILITY FOR POA

Author(s) of POA (name, title, agency/organization, telephone, pager, email):

Date: _____

Concurrences on POA (name, title, agency/organization, telephone, pager, email):

POA updated by (name, title, agency, organization): _____ **Date of update:** ____
Items update: _____

POA to be updated every 24 months by (name, title, agency/organization): _____
Date of next update: 5/30/2011

3. SCOUR VULNERABILITY

a. Current Item 113 Code: 3 2 1 Other: U

b. Source of Scour Critical Code: Observed Assessment Calculated Other: _____

c. Scour Evaluation Summary: _____

Scour History: _____

4. RECOMMENDED ACTION(S) (see Sections 6 and 7)

	<u>Recommended</u>		<u>Implemented</u>	
a. Increased Inspection Frequency	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
b. Fixed Monitoring Device(s)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
c. Flood Monitoring Program	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
d. Hydraulic/Structural Countermeasures	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

5. NBI CODING INFORMATION

	<u>Current</u>	<u>Previous</u>
Inspection date	09/28/10	05/26/09
Item 113 Scour Critical	7	U
Item 60 Substructure	7	7
Item 61 Channel & Channel Protection	5	5
Item 71 Waterway Adequacy	7	8
Comments: (drift, scour holes, etc. - depict in sketches in Section 10)		

6. MONITORING PROGRAM

- Regular Inspection Program** w/surveyed cross sections
Items to Watch: _____
- Increased Inspection Frequency of ___ mo.** w/surveyed cross sections
Items to Watch: _____
- Underwater Inspection Required**
Items to Watch: _____
- Increased Underwater Inspection Frequency of ___ mo.**
Items to Watch: _____
- Fixed Monitoring Device(s)**
Type of Instrument: _____
Installation location(s): _____
Sample Interval: 30 min. 1 hr. 6 hrs. 12 hrs. Other: _____
Frequency of data download and review: Daily Weekly Monthly Other _____
Scour alert criteria for each pier/abutment: _____
Scour critical criteria for each pier/abutment: _____
Survey ties: _____
Criteria of termination for fixed monitoring: _____

Flood Monitoring Program

Type: Visual inspection
 Instrument (*check all that apply*):
 Portable Geophysical Sonar Other: Soundings at piers and abutments

Flood monitoring required: Yes No

Flood monitoring event defined by (*check all that apply*):

- Discharge _____ Stage At or above bank full discharge
 Elev. measured from _____ Rainfall _____ (in/mm) per _____ (hour)
 Flood forecasting information: _____
 Flood warning system: _____

Frequency of flood monitoring: 1 hr. 3 hrs. 6 hrs. Other: _____

Post-flood monitoring required: No Yes, within _____ days

Frequency of post-flood monitoring: Daily Weekly Monthly Other: _____

Criteria for termination of flood monitoring: Active scouring no longer measured

Criteria for termination of post-flood monitoring: _____

Scour alert criteria for each pier/abutment: _____

Scour critical criteria for each pier/abutment: _____

Note: Additional details for action(s) required may be included in Section 8.

Action(s) required if scour alert criteria detected (*include notification and closure procedures*): _____

Action(s) required if scour critical criteria detected (*include notification and closure procedures*): _____

Agency and department responsible for monitoring: _____

Contact person (*include name, title, telephone, pager, e-mail*): _____

7. COUNTERMEASURE RECOMMENDATIONS

Prioritize alternatives below. Include information on any hydraulic, structural or monitoring countermeasures.

- Monitoring Countermeasure (see Section 6 and Section 10 – Attachment F)**
Estimated cost \$ _____

- Structural/hydraulic countermeasures considered (see Section 10, Attachment F):**

Priority Ranking

Estimated cost

(1) _____	\$ _____
(2) _____	\$ _____
(3) _____	\$ _____
(4) _____	\$ _____
(5) _____	\$ _____

Basis for the selection of the preferred scour countermeasure: _____

Countermeasure implementation project type:

- Proposed Construction Project Maintenance Project
 Programmed Construction - Project Lead Agency:
 Bridge Bureau Road Design Other _____

Agency and department responsible for countermeasure program (if different from Section 6 contact for monitoring): _____

Contact person (include name, title, telephone, pager, e-mail): _____

Target design completion date: _____

Target construction completion date: _____

Countermeasures already completed: _____

8. BRIDGE CLOSURE PLAN

Scour monitoring criteria for consideration of bridge closure:

- Water surface elevation reaches _____ at _____
- Overtopping road or structure
- Scour measurement results / Monitoring device (See Section 6)
- Observed structure movement / Settlement
- Discharge: _____ cfs/cms
- Flood forecast: _____
- Other: Debris accumulation Movement of riprap/other armor protection
 Loss of road embankment

Emergency repair plans (include source(s), contact(s), cost, installation directions): _____

Agency and department responsible for closure: _____

Contact persons (name, title, agency/organization, telephone, pager, email): _____

Criteria for re-opening the bridge: _____

Agency and person responsible for re-opening the bridge after inspection: _____

9. DETOUR ROUTE

Detour route description (route number, from/to, distance from bridge, etc.) - Include map in Section 10, Attachment E.

Bridges on Detour Route:

Bridge Number	Waterway	Sufficiency Rating/ Load Limitations	Item 113 Code

Traffic control equipment (detour signing and barriers) and location(s): _____

Additional considerations or critical issues (susceptibility to overtopping, limited waterway adequacy, lane restrictions, etc.) : _____

News release, other public notice (include authorized person(s), information to be provided and limitations): _____

10. ATTACHMENTS

Please indicate which materials are being submitted with this POA:

- Attachment A: Boring logs and/or other subsurface information**
- Attachment B: Cross sections from current and previous inspection reports**
- Attachment C: Bridge elevation showing existing streambed, foundation depth(s) and observed and/or calculated scour depths**
- Attachment D: Plan view showing location of scour holes, debris, etc.**
- Attachment E: Map showing detour route(s)**
- Attachment F: Supporting documentation, calculations, estimates and conceptual designs for scour countermeasures.**
- Attachment G: Photos**
- Attachment H: Other information:** _____

Kellogg Creek Bridge #22142

On October 1, 2014, a field investigation was conducted of Kellogg Creek Bridge #22142 to gather data for a preliminary hydraulic analysis and recommend countermeasures.

Bridge #22242 abutments are connected against the downstream wingwalls of Kellogg Lake Outlet Bridge #01949. Bridge #01949 is just upstream of #22142 and controls the flow from Kellogg Lake through both bridges. The outflow from #09149 crosses over a concrete slab into the channel below. A fish ladder carries some flow through the opening.

Both bridges outflow to the Willamette River approximately 150 feet downstream.

Bent 2 footing is undermined exposing several piles supporting the Bent. Bent 2 is set at approximately a 45 degree skew to stream flow. This misalignment causes significant scour to occur.

Information supplied by county personnel stated that the bridge was constructed in the 1970's and that scouring started immediately. A man involved in the construction of the bridge said that at the time of construction it was felt that scour problems could be addressed by maintenance practices they were using at the time.

Riprap was added but has scoured away by high flows. Concrete countermeasures were installed and then undermined causing a deeper scour hole. A large amount of debris has been reported. An eyewitness stated that the bridge was choked with debris from the channel to the roadway at the upstream face of the bridge during the 1996 flood. Roadway overtopping could not be verified. If the roadway was overtopped then scour could be from 2 to 3 times deeper than the calculated scour depth depending on the conditions at the time the overtopping occurs.

A preliminary hydraulics analysis determined that during the 500 yr. flooding event the scour would be approximately 25 feet. At this calculated scour bridge damage and possible failure could occur.

All past countermeasures have failed. The footings at Bents 1 and 3 are exposed and undermined in some places. Bent 2 has been undermined to expose the underlying piles. It is recommended that #113 stays a 2. In its present condition the bridge will be in great danger of failure during the scour design flood.