

# Caltrans Structures Maintenance & Investigations Local Agency Bridge Hydraulics (SM&I).

SM&I primary focus:

Perform hydraulic evaluations on local agency bridges in California in order to assess scour potential and assign the National Bridge Inventory (NBI) item 113 code.

# Local Bridge Statistics

- Approximately 12000 local agency bridges over water in California.
- 383 bridges have 113 codes of 3, 2, 1 or 0.
- 906 bridges have 113 codes of U.

# Scour Critical Bridges

Scour critical bridges are assigned a 113 code of 3, 2, 1, 0.

Bridges with unknown foundations (113 = U) are also designated as scour critical.

All scour critical bridges require a Plan of Action (POA).

The bridge owner is responsible for the development and implementation of POAs. The owner is also tasked with sending the POAs to SM&I.

SM&I will archive the POAs into our database.

# SM&I Scour Evaluation Process

- Once the bridge inspection and evaluation are complete, SM&I-Hydraulics writes a Bridge Inspection Report (BIR). A copy of the BIR is sent to the bridge owner. The BIR documents any revision to the 113 code and summarizes our evaluation.
- Attached to the BIR is a transmittal letter.
- For bridges that have 113 code revision and become scour critical, the transmittal letter will give an explanation of our coding and instructions on developing and implementing a POA. The letter also contains information and reference material on the selection of adequate scour mitigation.

# Bridge Inspection Report (BIR)

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DEPARTMENT OF TRANSPORTATION  
Structure Maintenance & Investigations

Bridge Number : 39C0184  
Facility Carried: EAST YOSEMITE AVE  
Location : 0.9 MI W ARBOLEDA DR  
City :  
Inspection Date : 11/24/2015

## Bridge Inspection Report

### Inspection Type

Routine  FC  Underwater  Special  Other  Hydraulic

**STRUCTURE NAME:** FAIRFIELD CANAL

### CONSTRUCTION INFORMATION

Year Built : 1950                      Skew (degrees): 0  
Year Widened: N/A                      No. of Joints : 0  
Length (m) : 12.5                      No. of Hinges : 0

Structure Description: 2-span continuous RC slab on RC pier wall and RC diaphragm abutments with monolithic wingwalls. Foundation type is unknown.

Span Configuration : 2 @ 19.5 ft

### INSPECTION COMMENTARY

#### SCOPE AND ACCESS

A hydraulic field review was done on 11-24-2015. The channel had ponded water approximately 6 inches deep but no flow during this investigation. All substructure elements were inspected.

#### BRIDGE ORIENTATION

# BIR cont'd

## REVISIONS

The NBI Item 113 code is revised from U to 3; "Bridge is scour critical; bridge foundations determined to be unstable for assessed scour."

## RECOMMENDATIONS

We recommend that the local agency investigate and provide adequate scour mitigation in accordance with HEC 23. Immediate attention should be given to the undermined Pier 2 foundation as the scour appears to have increased substantially over the past 11 years. However, the investigation should encompass all of the structures foundations.

Furthermore, federal regulations require that the local agency create and implement a Plan of Action (POA) to reflect the change of the 113 code and the existing scour condition at the bridge site. The POA shall include a schedule for the timely design and construction of scour countermeasures needed for the protection of the bridge or, in the event that countermeasures would not provide a viable solution, replacement or rehabilitation.

For guidance in preparing the POA and in choosing and installing appropriate scour countermeasures, we recommend reference to HEC-23, "Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance - 3rd Edition", Publication Nos. FHWA-NHI-09-111 and FHWA-NHI-09-112, September 2009.

The local agency is further required to return the POA to Caltrans within 90 days upon receipt of this report.

# Scour critical transmittal letter

STATE OF CALIFORNIA - CALIFORNIA STATE TRANSPORTATION AGENCY

EDMUND G. BROWN JR., Governor

## DEPARTMENT OF TRANSPORTATION

DIVISION OF MAINTENANCE  
STRUCTURE MAINTENANCE & INVESTIGATIONS  
1801 30th Street  
SACRAMENTO, CA 95816  
PHONE (916) 227-8631  
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*Flex your power!  
Be energy efficient!*

The metric was reviewed at  
Intermediate level in 2013

- In-depth level in 2014  
February 10, 2016

- 5 additional owners interviewed in 2015

Mr. Scott Waite  
Director Of Public Works  
County of Siskiyou  
PO BOX 1127  
Yreka, CA 96097-1127

Dear Mr. Waite:

In accordance with Title 23 of the Code of Federal Regulations (Federal Highway Act), Caltrans Structure Maintenance and Investigations performed a hydraulic inspection for a bridge under your jurisdiction.

Enclosed are copies of the Bridge Inspection Report for the structure noted on the attached transmittal sheet. These reports contain descriptions of physical changes to the structures since the last inspection, recommendations for work to be done, or additional information not recorded in the previous Bridge Reports.

Caltrans has classified the scour code for the attached bridge as Scour Critical.



# Transmittal letter cont'd

Until risk can be determined, a plan of action should be developed and implemented to reduce the risk to users from a bridge failure during and immediately after a flood event.

The new federal regulation, 23 Code of Federal Regulations (CFR) 650 subpart C, requires a Plan of Action (POA) for each scour critical bridge or any bridge with unknown foundations within your jurisdiction.

In order to facilitate the development of a POA, the FHWA has created a "standard" template for bridges that are scour critical. The standard template and instructions for completing a POA are provided in the FHWA Hydraulic Engineer Circular No. 23 (HEC 23), "Bridge Scour and Stream Instability Countermeasures - Experience, Selection and Design Guidance", Third Edition, Volume 1, Appendix B.

All the fields in the template may be modified so that local terminology is employed, unique information may be added regarding local and site-specific scour and stream stability concerns, and local sources of information may be included. The electronic Microsoft Word document template can be downloaded from the FHWA website:

<http://www.fhwa.dot.gov/engineering/hydraulics/bridgehyd/poaform.cfm>



# Transmittal letter cont'd

Hydraulic Engineering Circular No. 23 (HEC-23), "Bridge Scour and Stream Instability Countermeasures - Experience, Selection and Design Guidance" - Chapter 2, outlines management and inspection strategies that should be considered when developing a plan of action for a scour critical bridge or an unknown foundation bridge. Issues related to closing and re-opening a bridge are also discussed. ↴

To facilitate selection of alternatives to be considered in the Plan of Action, a matrix describing the various countermeasures and their attributes has been developed and is presented in HEC-23. HEC-23 also includes general guidance for design of countermeasures, and specific design guidelines for a variety of stream instability and scour countermeasures.

# SM&I support to local agencies

- Provide technical support for bridge hydraulics.
- Provide technical support for developing POAs.
- Provide hydraulic re-evaluations at the request of the local agencies.
- Provide technical support for proposed scour mitigation.
- Provide archived data for local bridge owners.
- SM&I wants to highlight the importance of designing scour mitigation in accordance with HEC 23.