

ADOT Bridge Group Program Updates: Plan of Action for Scour Critical Bridges

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Prepared By

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Scour Critical Bridges

A Scour Critical bridge is one with foundation elements that are determined to be unstable for the calculated and/or observed stream stability/scour conditions.

Includes the following categories from the NBI Coding Guide item 113:

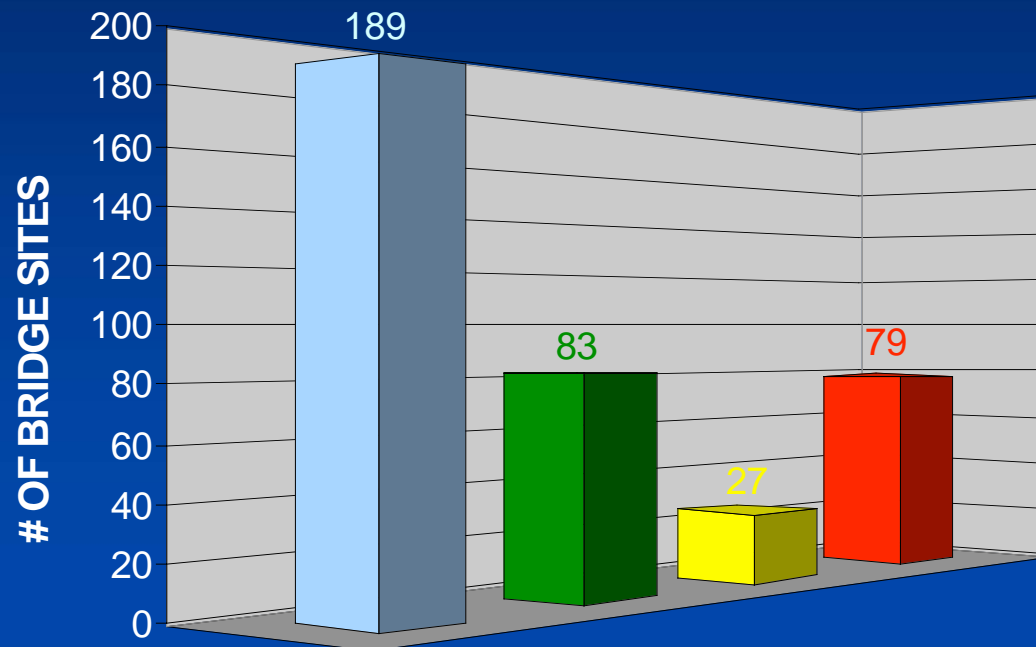
<u>Code</u>	<u>Description</u>
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- | | |
|---|--|
| 3 | Assessed or calculated condition |
| 2 | Comparison of calculated and observed condition |
| 1 | Comparison of calculated and observed; failure is imminent |
| 0 | Bridge failed and is closed |

NBI Coding for Scour Rating N113

ADOT (Arizona)	Literal Definition	NBI Coding for Scour Rating N113 Description
N	NON-WATERWAY	Bridge not over waterway.
U	FOUNDATION UNKNOWN	Scour calculation, evaluation and/or screening has not been made. Bridge on unknown foundations.
0, 1, 2	SERIOUS SCOUR CONCERNS	Bridge is closed to traffic; field review indicates that failure of piers and/or abutments due to scour is imminent or has occurred.
3	SCOUR VULNERABLE	<i>Bridge has been evaluated to be scour critical.</i>
5	LESS SEVERE	Require Geotech confirmation.
6	SITES TO BE EVALUATED	Structure needs to be evaluated for scour based on HEC-18 (2001) Guidelines.
7	SCOUR COUNTERMEASUR E INSTALLED	Countermeasures have been installed to correct a previously existing problem with scour.
8	NOT SCOUR VULNERABLE	New Bridges and those evaluated as not scour vulnerable based on HEC-18 (2001) Guidelines.

STATUS FOR POAs – STATE OWNED BRIDGES-8/08



POAs REQUIRED

POAs COMPLETED

POAs IN PROCESS

REMAINING POAs TO BE COMPLETED


Requirement for POAs


1991 - Technical Advisory, TA 5140.23

A Plan of Action (POA) *should* be developed for each existing bridge found to be scour critical

2005 - 23 CFR 650.313 (e) (3)

2008 - Memorandum on NBI Standards –
Scour Evaluations and
Plans of Action



 **Memorandum**

Subject: ACTION: National Bridge Inspection Standards – Scour Evaluations and Plans of Action for Scour Critical Bridges (Final Rule, February 26, 2008)
or Original Signed by: **Tom W. Cow**

Date: January 4, 2008
In Reply Refer To: HSB-20

From: Associate Administrator for Infrastructure

To: Associate Administrator for RDOT
Director of Field Services
Resource Center Director
Division Administrator

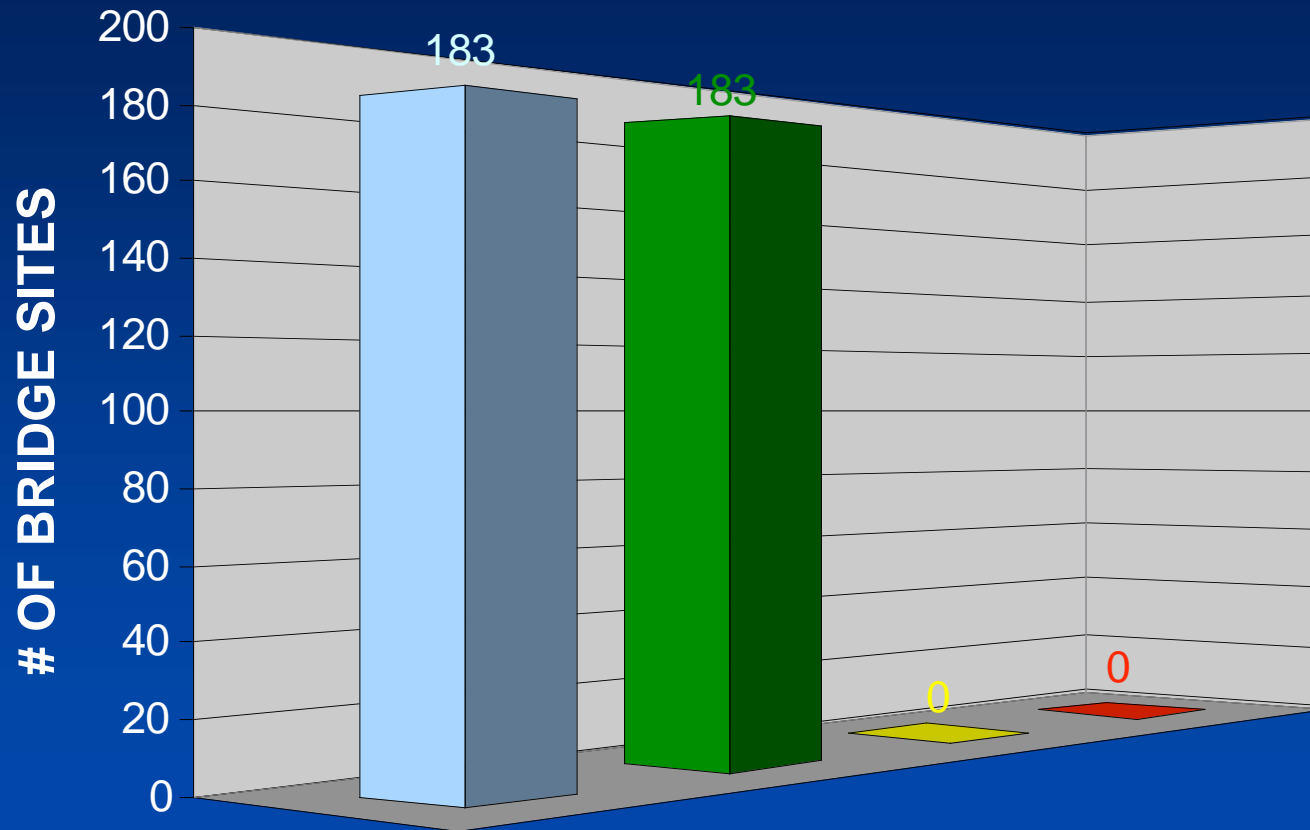
The purpose of this memorandum is to request your assistance towards ensuring that State and local agencies (hereinafter referred to as bridge owners) complete the scour evaluations of their bridges over waterways (streams and rivers). Also, we request your assistance towards ensuring that bridge owners develop and implement a Plan of Action (POA) for each bridge identified as scour critical to meet the requirement set forth in the National Bridge Inspection Standards (NBIS) regulation, [23 CFR 650.313\(e\)\(3\)](#).

States of Bridge Scour Evaluations and POAs for Scour Critical Bridges:

Bridge owners have been working for several years towards the evaluation of their bridge over waterways to determine foundation vulnerability against stream incision and scour. To date, about 25 percent of these bridges have been evaluated. We would, however, like to see that all bridges over waterways are evaluated for their vulnerability to stream incision and scour. As of August 2007, bridge owners reported on their National Bridge Inventory (NBI) data submitted a total of 14,000 bridges over waterways that still remain to be evaluated as for their scour vulnerability. There are bridges that have been coded 6, 7, or 2045 de Base 112 of the NBI. The FHWA established a target date of January 1997 for completing all scour evaluations by memorandum dated July 11, 2007. However, as the NBI data shows, we still have work to do to complete this important component of the NBI. Table 1 presents the number of bridges over waterways on the National Bridge Inventory (NBI) and the number that still need a scour evaluation. About 6,000 bridges over waterways identified by bridge owners as having unknown foundation results to be evaluated for their scour vulnerability as of August 2007. We will address the impact of unknown foundations, including a process developed by the FHWA's Office of Bridge Technology to identify bridge foundation characteristics under a separate memorandum.

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STATUS FOR POAs – STATE OWNED BRIDGES



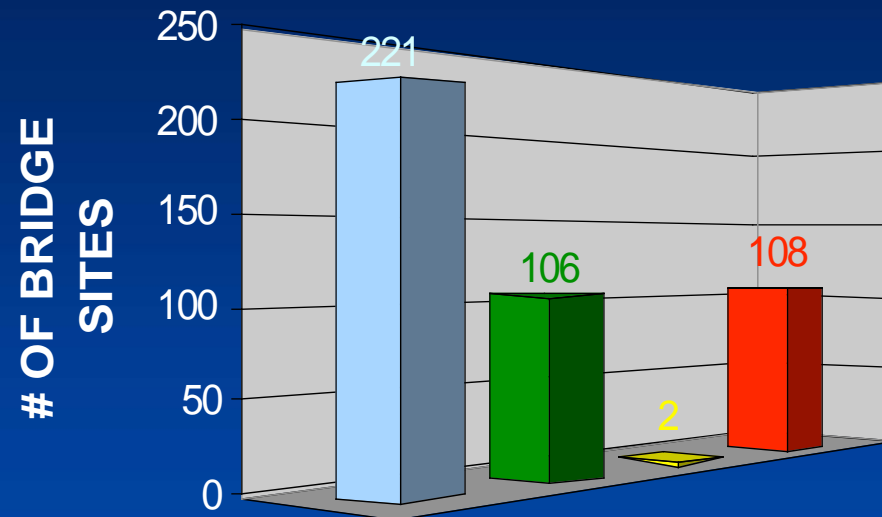
POAs REQUIRED

POAs COMPLETED

POAs IN PROCESS

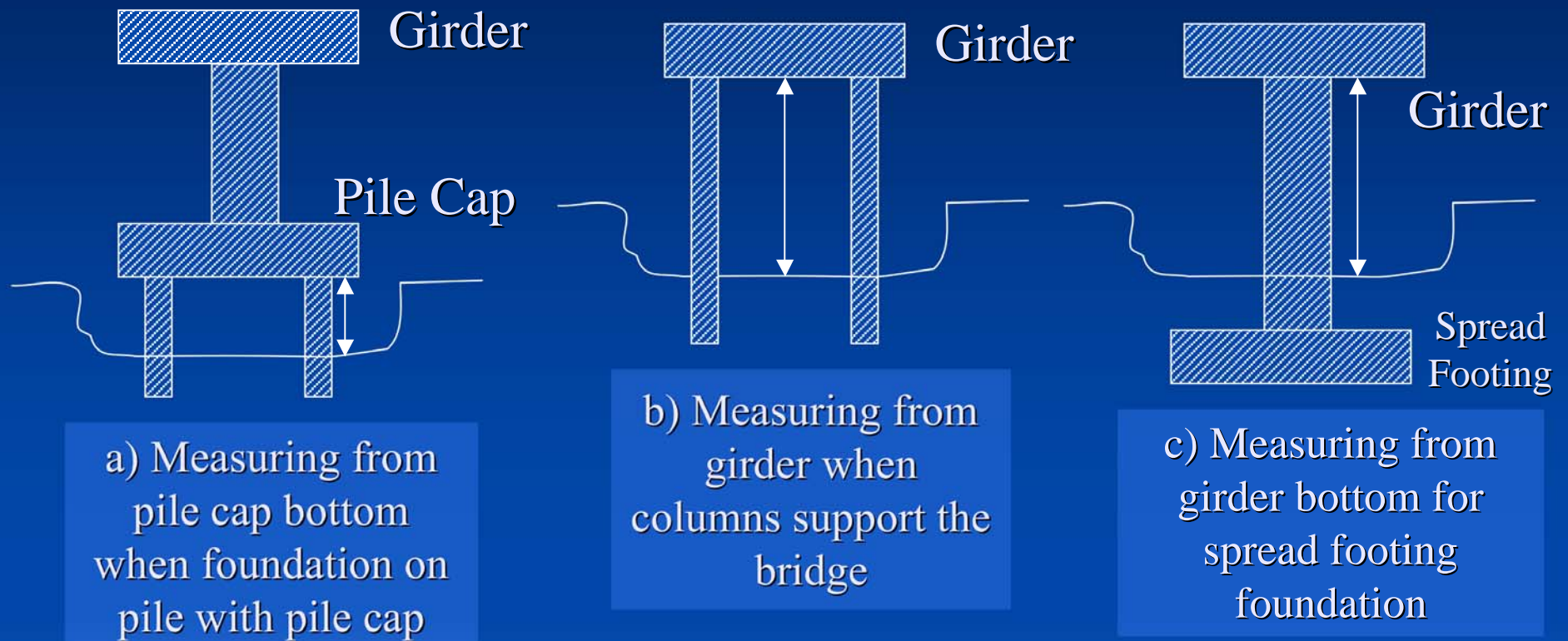
REMAINING POAs TO BE COMPLETED

STATUS OF LOCAL GOVERNMENT BRIDGES



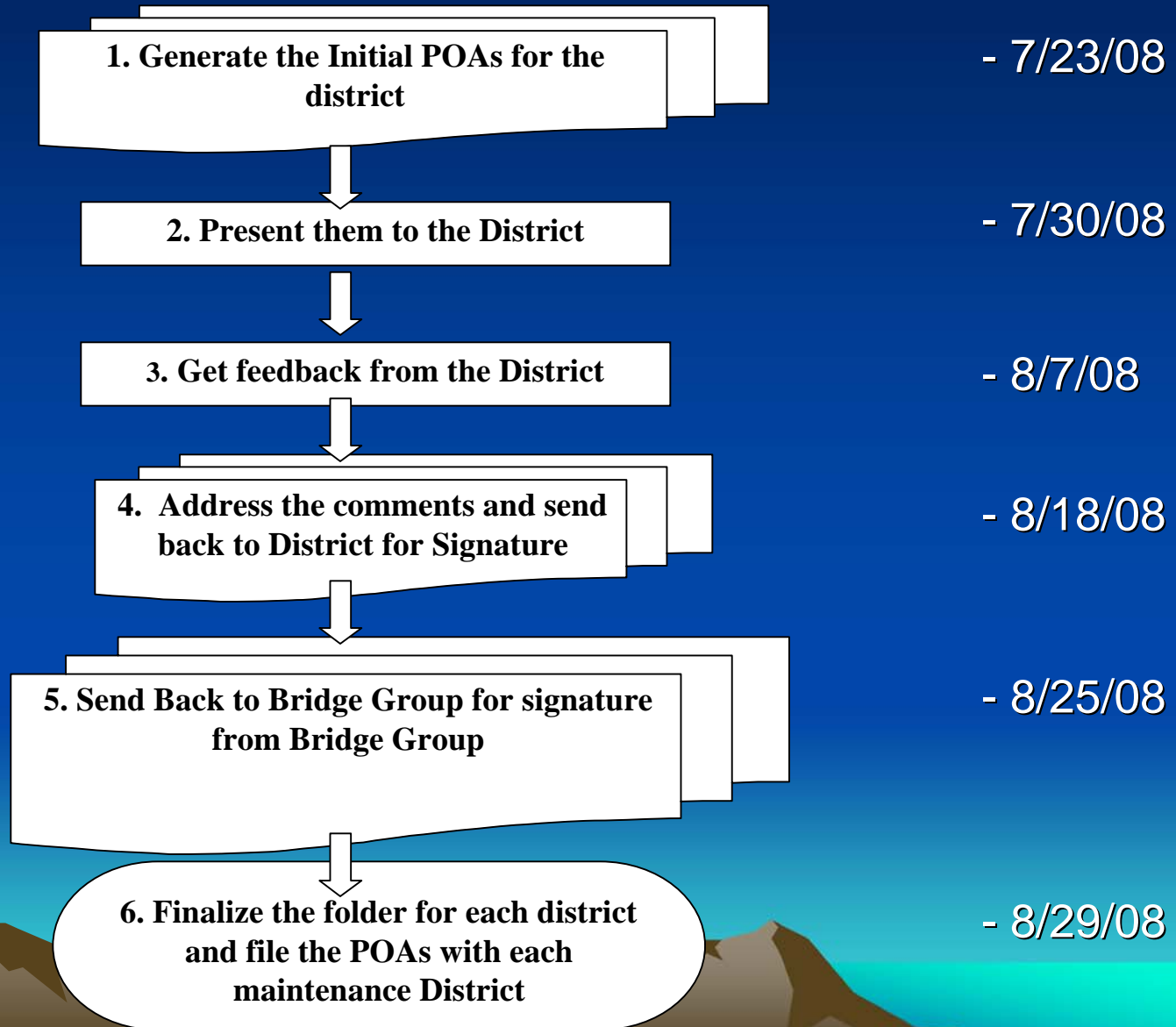
- LOCAL STATUES TO BE EVALUATED FOR SCOUR VULNERABILITY
- BASED ON JAN. 2009 LIST SCOUR VULNERABILITY
- UNKNOWN FOUNDATIONS
- TENATIVE # FOR POA'S REQUIRED W/O INCLUDING THE SITES THE EVALUATION

Scour Monitoring Length



**FLOWCHART FOR THE DEVELOPMENT OF PLAN OF ACTION (POA)
FOR SCOUR VULNERABLE BRIDGES**

Kingman Dist
27



POA Template for ADOT

PLAN OF ACTION FOR SCOUR VULNERABLE BRIDGES-
BRIDGE HYDRAULICS SECTION

Prepared By: Approved By: Date.....

Approved By: Date.....

1. Bridge Identification: **Name: Str. No.** **District:** **Route:**
Mile Post: **Year Built:** **ADT/Year:**

2a. Foundation Type:

2b. Foundation Soils:

3. Sources of Scour Rating:

4. Comments about Rating:

5. Inspecting Details:

Continued.....

6a. Monitoring if any:

6b. Criteria for Inspecting:

7a. Closure Plan: .

7b. Criteria for Closure:

8. Flooding Potential:

9. Detour Details:

10 Criteria for Reopening:

11a. Follow up Action:

11b. Str. Replacement Plans:



POA- An Example

Management Strategies

1. Bridge Identification:

**Name: Natural Corral Br Str. No: 639 District: Kingman Route: 93
Mile Post: 121.48 Year Built: 1961 ADT/Year: 6100/2005**

**2a. Foundation Type: 5 piers: concrete walls, on type 10 BP 42
steel H-piles.**

2b. Foundation Soils: Foundation Material is silt sand with clay. - Erodible

**3. Sources of Scour Rating: Scour calculation was prepared by ADOT
Bridge Drainage Section September 07, 1994. It is based on the 50 year
storm.**

**4. Comments about Rating: For the discharge of 8237 cfs based on the 50
year discharge, the water surface elevation is 2036.2 ft and the scour
elevation is 2011.8 ft.**

Continued.....

Inspection Strategies

5. Inspecting Details: Stream bed level in main channel is about 0.5' lower than the level previously recorded. (Insp. Report #20 12-13-06)

6a. Monitoring if any: No scour monitor is installed

6b. Criteria for Inspecting: If any Item in 7b is noticeable during a storm event by District Maintenance personnel, report to Bridge Management Section-602 712 8605 or Bridge Group office 602 712 7481.



Closure Instructions

7a. Closure Plan: The Bridge must be closed following proper Traffic Control Guidelines by ADOT or DPS personnel notices the cases listed in item 7b and must report to the District Engineer.

7b. Criteria for Closure: 1) Any distress of the deck or barrier at the pier location is visually noticeable to the naked eye, or
2) If the H piles are exposed more than 31 ft, the distance between the bottom of the girder and the lowest ground elevation in the channel.

8. Flooding Potential: Overtopping of this bridge is not anticipated during the design flood ($Q_{50}=8237$ cfs).



Closure Instructions (cont.)

9. Detour Details: Detour through SR 89, I-40 and US 93 can be used. Approximate distance is 210 miles.

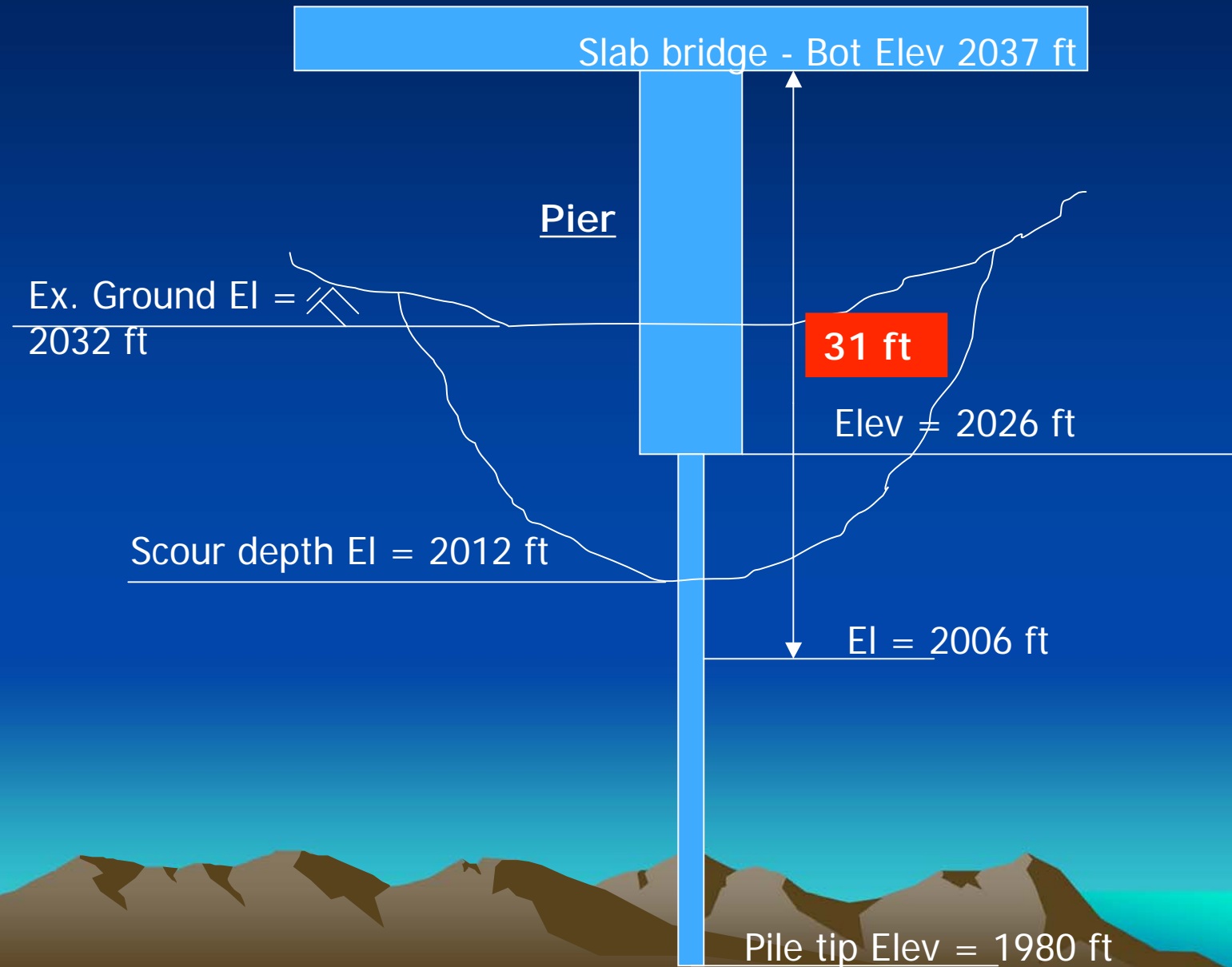
10. Criteria for Reopening: The District Engineer (DE) or his representative must be convinced that items listed under 7b are no longer a concern or have been rectified.

11a. Follow up Action: Temporary wire-tied riprap can be used as protection against further scour. Concrete floor or articulated block mat can be used for more durable protection.

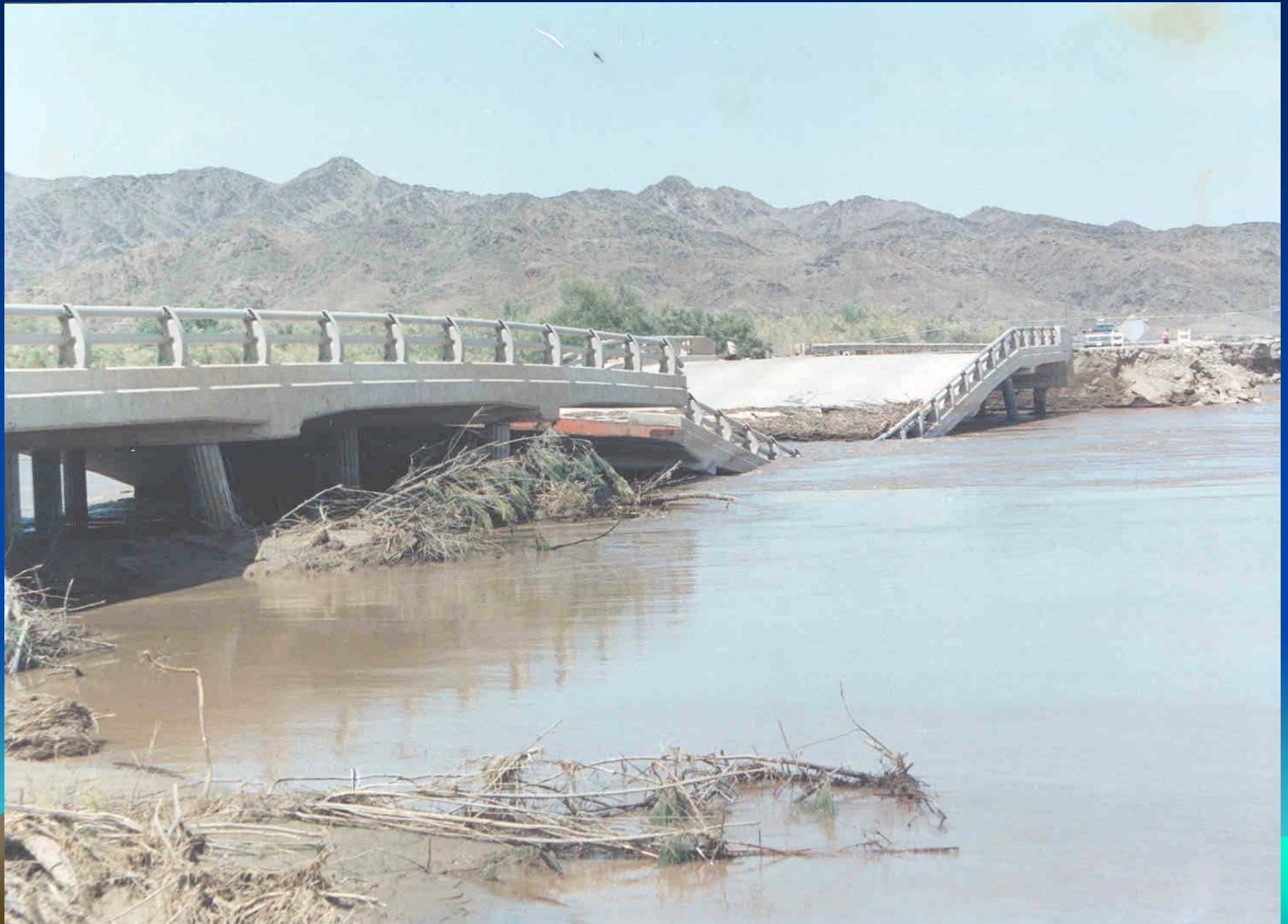
11b. Replacement Plan: No replacement plan at this time.



Struc # 639 – Schematic Diagram



**1993 - Gila River Br., US 95
Yuma**





Historic Photograph Number fairbankbr-2 - no date given - Fairbank Bridge Upstream view, bridge showing drift and wash out of approach

Thank You

