SCOUR EVALUATION, INSPECTION, & PLAN OF ACTION

LESSON 18
LEARNING OUTCOMES

- List the general steps in a typical scour evaluation process
- Describe the main objectives of a bridge inspection program
- List the hydraulic and scour related coding items of the Recording and Coding Guide
- Outline the primary components of a POA for a scour critical bridge
EVALUATING SCOUR AT BRIDGES

Technical Advisory T 5140.23
SCOUR EVALUATION PROCEDURES

- Screening of bridges over waterways
- All existing bridges should be evaluated for scour
- Scour-critical bridges are rated as unstable due to:
  - observed scour
  - predicted scour
SCOUR EVALUATIONS

• Bridge inspectors should receive appropriate training and instruction in inspecting bridges for scour

• Results of evaluation coded in Item 113

• A Plan of Action (POA) should be developed for scour-critical bridges
BRIDGE INSPECTORS

• Should accurately record the present condition of the bridge, including cross section measurements
HATCHIE RIVER
CHANNEL MIGRATION
BRIDGE INSPECTORS

• Should identify conditions indicative of potential problems with scour and stream stability

• Effective notification procedures should be available to permit proper communication of scour findings
SCOUR EVALUATIONS

- Low risk bridges
- Scour critical bridges
- Other codes
GUIDANCE FOR CODING BRIDGES OVER WATERWAYS

• Observed and assessed scour conditions
• Scour and stream instability countermeasures
OBJECTIVES

• Make coding of Items 60 (Substructure) and 113 (Scour Critical) consistent when a rating of 2 or below is determined for Item 113

• Expand description of Item 113 codes 1, 2, 3, 4, 5, 7, 8, T and U
HIGHLIGHTS OF CHANGES TO ITEM 60

• Description changed to emphasize that rating factor given to Item 60 should be consistent with the one given to Item 113 when:
  - Rating factor of 2 or below is determined for Item 113
HIGHLIGHTS OF CHANGES TO ITEM 113

• Description changed to emphasize that:
  - Rating factor of 2 or below requires revising Item 60 and other affected items (load ratings and superstructure rating)
  - Plan of Action should be developed for each scour critical bridge
  - Coding is based on an engineering evaluation, which includes consideration of NBIS field inspection findings
SPECIFIC CHANGES TO RATING FACTORS (CODES U AND T)

- **Code “U”** – Plan of Action should be developed to reduce the risk to the public during and immediately after a flood event

- **Code “T”** – Tidal bridges should be monitored until an evaluation is performed
CODE 8

• Expanded guidance for a bridge foundation determined to be stable:
  - Assessment - *bridge foundations on rock formations determined to resist scour within the service life of the bridge*
  - Calculations
  - *Installation of properly designed countermeasures*
• Countermeasures installed to *mitigate* an existing scour problem and to *reduce the risk* of bridge failure during a flood event

• Instructions in a *Plan of Action* have been *implemented* to reduce the risk to users from a bridge failure during or immediately after a flood event
CODE 5

• Foundation determined to be stable for the *assessed* or calculated scour condition

• Scour within the limits of footings or piles based on an *assessment*, calculation, or *installation of properly designed countermeasures*
CODE 4

• Bridge foundation stable for the *assessed* or calculated scour condition
• Bridge foundation unstable for the **assessed** or calculated scour condition
• Field review indicates that extensive scour has occurred at bridge foundations, which are determined to be *unstable* by:
  
  - Comparison of calculated and observed scour during bridge inspection
  
  - Engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60
Field review indicates that failure of bridge foundations is *imminent* based on:

- Comparison of calculated and observed scour during bridge inspection
- Engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60
PLAN OF ACTION (POA) FOR SCOUR CRITICAL BRIDGES

- Should be developed for each existing bridge found to be scour critical
  - Provide guidance for Inspectors and Engineers that can be implemented before, during, and after flood events to protect the traveling public.
ELEMENTS OF THE POA

• Management strategies
• Inspection strategies
• Closure instructions
• Countermeasure alternatives and schedule
• Other information
LEARNING OUTCOMES

• List the general steps in a typical scour evaluation process

• Describe the main objectives of a bridge inspection program

• List hydraulic and scour related coding items of the Recording and Coding Guide

• Outline the primary components of a POA for a scour critical bridge