



U.S. Department
of Transportation
Federal Highway
Administration

Memorandum

Subject: **ACTION**: Distribution of FHWA
Hydraulic Engineering Circular 23

Date: December 16, 2009

From: */S/ Original Signed by Thomas Everett for*
M. Myint Lwin, P.E., S.E.
Director, Office of Bridge Technology

In Reply Refer To:
HIBT-20

To: Directors of Field Services
Federal Lands Highway Division Engineers
Division Administrators

The FHWA Office of Bridge Technology, Resource Center, and National Highway Institute would like to announce the completion of Hydraulic Engineering Circular (HEC) 23 “Bridge Scour and Stream Instability Countermeasures; Experience, Selection, and Design Guidance – Third Edition” which consists of two volumes. The first volume provide significantly expanded guidance on:

- The development of Plans of Actions (POAs) for scour critical bridges,
- An updated scour selection matrix that includes hydraulic countermeasures, structural countermeasures, biotechnical countermeasures, and monitoring,
- An updated section on riprap design, filters, failure modes, and alternatives,
- A new section on biotechnical engineering, and
- A revised section on scour monitoring and instrumentation.

The second volume presents 19 design guidelines broken into six sections. A number of the design guidelines have been significantly updated and there are four completely new procedures.

- Section 1 - Countermeasures For Stream Instability
 - Design Guideline 1 – Bendway Weirs/Stream Barbs
 - Design Guideline 2 – Spurs
 - Design Guideline 3 – Check Dams/Drop Structures
- Section 2 - Countermeasures For Streambank And Roadway - Embankment Protection
 - Design Guideline 4 – Riprap Revetment
 - Design Guideline 5 – Riprap Design for Embankment Overtopping



- Design Guideline 6 – Wire Enclosed Riprap Mattress
- Design Guideline 7 – Soil Cement
- Design Guideline 8 – Articulating Concrete Block Systems
- Design Guideline 9 – Grout-Filled Mattresses
- Design Guideline 10 – Gabion Mattresses
- Section 3 - Countermeasures For Bridge Pier Protection
 - Design Guideline 8 – Articulating Concrete Block Systems at Bridge Piers
 - Design Guideline 9 – Grout-Filled Mattresses at Bridge Piers
 - Design Guideline 10 – Gabion Mattresses at Bridge Piers
 - Design Guideline 11 – Rock Riprap at Bridge Piers
 - Design Guideline 12 – Partially Grouted Riprap at Bridge Piers
- Section 4 - Countermeasures For Abutment Protection
 - Design Guideline 13 – Grout/Cement Filled Bags
 - Design Guideline 14 – Rock Riprap at Bridge Abutments
 - Design Guideline 15 – Guide Banks
- Section 5 - Filter Design
 - Design Guideline 16 – Filter Design
- Section 6 – Special Applications
 - Design Guideline 17 – Riprap Design for Wave Attack
 - Design Guideline 18 – Riprap Protection for Bottomless Culverts
 - Design Guideline 19 – Concrete Armor Units

This edition of HEC-23 is available from the Office of Bridge Technology's Web site and is now available for downloading at www.fhwa.dot.gov/engineering/hydraulics/pubs/09111/index.cfm.

HEC-23 is the primary reference material for the NHI Course NHI 135048 – “Countermeasure Design for Bridge Scour and Stream Instability” which has been updated to incorporate the HEC-23 enhancements. A description of the course, information on scheduling, and information on how to obtain hard copies of HEC-23 from the NHI store can be found at the following internet location <http://www.nhi.fhwa.dot.gov>

If you have any questions, please contact Dr. Larry Arneson at the FHWA Resource Center at (720) 963-3200 or Mr. Joe Krolak at the Office of Bridge Technology at (202) 366-4611.

cc:

Larry Arneson-RCM-LKWD