STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.la.gov
225-379-1321

BOBBY JINDAL
GOVERNOR

SHERRI H. LEBAS, P.E.
SECRETARY

MEMORANDUM

TO: ALL BRIDGE DESIGNERS
ALL CONSULTANTS

FROM: HOSSEIN GHARA, P.E.
BRIDGE DESIGN ADMINISTRATOR

SUBJECT: BRIDGE DESIGN TECHNICAL MEMORANDUM NO. 21 (BDTM.21)
DOTD POLICY FOR PREDICTING THE SCOUR ELEVATION FOR BRIDGES

DATE: SEPTEMBER 27, 2010

Effective immediately the attached "DOTD Policy for Predicting the Scour Elevations for Bridges", approved by DOTD Chief Engineer on November 12, 2009, shall be implemented for all projects to be let. Exceptions must be approved by DOTD Chief Engineer.

This technical memorandum is posted on the Bridge Design Website under Technical Memoranda (http://www.dotd.la.gov/highways/project_devel/design/home.asp?ID=BRIDGE).

Please contact Ms. ZhengZheng "Jenny" Fu (225-379-1321, ZhengZheng.Fu@la.gov) if you have any questions or comments.

HG/zzf

Cc: Richard Savoie (Chief Engineer)
Janice Williams (Chief, Project Development Division)
Art Aguirre (FHWA)

Copy Steve Lee
Original Subj File

REFERRED TO

_____ REFERRED FOR ACTION
_____ ANSWER FOR MY SIGNATURE
_____ FOR FILE
_____ FOR YOUR INFORMATION
_____ FOR SIGNATURE
_____ RETURN TO ME
_____ PLEASE SEE ME
_____ PLEASE TELEPHONE ME
_____ FOR APPROVAL
_____ PLEASE ADVISE ME

BY _____ DATE _____
BY _____ DATE _____
BY _____ DATE _____

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

INTRADEPARTMENTAL CORRESPONDENCE

IN REPLY REFER TO FILE NO.

MEMORANDUM

TO: Mr. William H. Temple, P.E.
Chief Engineer

FROM: Mr. Lloyd E. Porta, P.E.
Road Design Engineer Administrator

Mr. Steven C. Lee, P.E.
Hydraulics Engineer Administrator

DATE: November 2, 2009

SUBJECT: **DOTD POLICY FOR PREDICTING THE SCOUR ELEVATION FOR BRIDGES**

The attached policy and guidelines have been prepared for predicting the scour elevation for bridges. This elevation is designed to withstand the worst case scour depths, calculated according to FHWA's guidance, as stated in HEC-18, *Evaluating Scour at Bridges.* This procedure shall be used for "On-System" and "Off-System" bridges.

Your approval of the attached DOTD policy for predicting the scour elevation for bridges, dated 11/09 is requested. Comments that were received from FHWA have been incorporated into these guidelines.

By copy of this memorandum, we are advising FHWA of this proposed action.

Attachments
C: Richard L. Savoie
Vincent G. Russo
Buddy Porta
Hossein Ghara
Kim Garlington
Brian D. Buckel
Gill M. Gautreau

RECOMMENDED FOR APPROVAL DATE

RECOMMENDED FOR APPROVAL DATE
11-12-09

DOTD POLICY FOR PREDICTING THE SCOUR ELEVATION FOR BRIDGES

Below is the established LADOTD guidelines and policy for predicting the scour elevation for bridges. This elevation is designed to withstand the worst case scour depths, calculated according to FHWA's recommendations, as stated in HEC-18, *Evaluating Scour at Bridges.* This procedure shall be used for "On-System" and "Off-System" bridges.

1) The Predicted Bridge Scour Elevation is based on contraction scour and local scour at piers.

   The Predicted Bridge Scour Elevation determined by subtracting the combined contraction scour depth and local scour depth from the lowest point in the channel below the proposed bridge. See sketch on Page 2 showing *Plot of Total Scour.*

2) The Predicted Bridge Scour Elevation applies to all piers including the end bents in the main channel section. Refer to Sections 2.3.2 and 8.11 in HEC-18.

   Reasons: Louisiana streams have a great potential for flooding and migrating. Retrofits, scour countermeasures and bridge replacements are costly and disrupt road service to the traveling public.

3) The Predicated Scour Elevation for the main bridge and relief bridge(s) is to be the same.

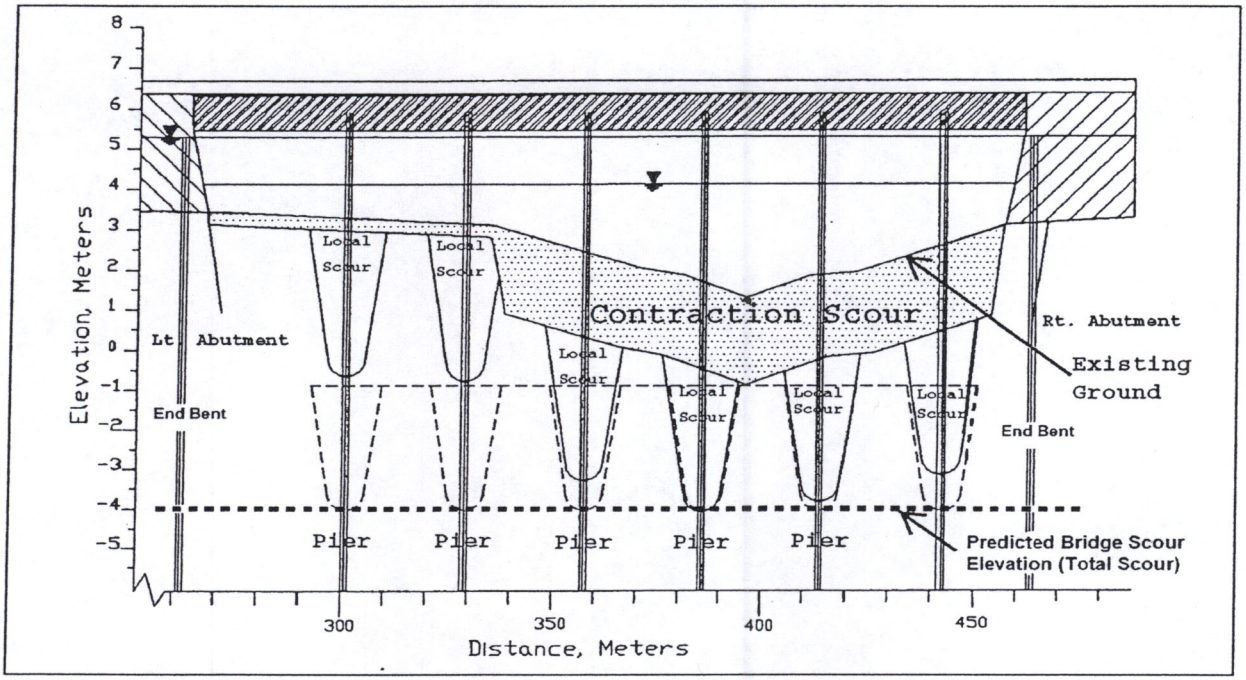
   Reason: Louisiana has a history of relief structures having greater scour problems than the structure(s) in the main channel. Even if there is no stream under the relief structure, flooding can cause severe erosion and scour.

4) Abutment scour is not usually calculated. Instead, as per FHWA's recommendations in HEC-18, abutments are protected with some type of revetment or rip rap.

   (a.) Abutment scour protection should be designed and installed to account for any long term degradation and contraction scour at the abutment toe.
   (b.) When revetment or rip rap cannot be used, the abutment scour must be determined in order to design the abutment foundation.

5) Long term degradation should be considered in situations where the stream bed may be affected by upstream gravel/sand mining operations or in upland areas where there is a potential for headcutting.

PLOT OF TOTAL SCOUR



APPROVED LA DOTD _____ DATE _____

APPROVED FHWA _____ DATE _____

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{put your office/section's telephone number here}

BOBBY JINDAL
GOVERNOR

WILLIAM D. ANKNER, Ph.D.
SECRETARY

November 2, 2009

DOTD POLICY FOR PREDICTING THE SCOUR ELEVATION FOR BRIDGES

Mr. Charles W. Bolinger
Division Administrator
Federal Highway Administration
5304 Flanders Drive, Suite A
Baton Rouge, LA 70808

Attention: Ms. Mary M. Stringfellow

Dear Mr. Bolinger:

The attached DOTD Policy for Predicting the Scour Elevation for Bridges has been prepared with your suggested modifications and additions.

The Chief Engineer has approved the attached DOTD Policy, dated 11/09. Your approval is requested.

LLOYD E. PORTA, P.E.
ROAD DESIGN ENGINEER ADMINISTRATOR

Steven C. Lee
STEVEN C. LEE, P.E.
HYDRAULICS ENGINEER ADMINISTRATOR

Cc: Mr. William Temple
Mr. Richard L. Savoie

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