



ALABAMA DEPARTMENT OF TRANSPORTATION

Bureau of County Transportation

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Robert Bentley
Governor

John R. Cooper
Transportation Director

December 5, 2013

MEMORANDUM FY 2014-05

To: All County Engineers and Division County Transportation Engineers

From: Mr. D.E. Phillips, Jr., P.E.
State County Transportation Engineer

By: Joshua A. Sanford
Joshua A. Sanford, P.E.
County Transportation Design Engineer

RE: **Design Flood Frequencies for Bridge Openings and Scour Evaluations**

Attached is a copy of the new Guidelines for Operation 3-39 concerning design flood frequencies for bridge openings and scour evaluations. This new guideline allows bridges on local and collector roads maintained by counties and municipalities to be designed utilizing lower Q-values based upon site conditions. This in turn will allow bridges to be designed with smaller openings and at lower elevations based upon scour and overtopping, which will provide more cost effective bridge projects for county and city governments.

Please feel free to contact me should you have any questions or comments concerning this matter.

DEP/JAS/lj
Attachment
PC: File

STATE OF ALABAMA
DEPARTMENT OF TRANSPORTATION
GUIDELINES FOR OPERATION

**SUBJECT: DESIGN FLOOD FREQUENCIES FOR BRIDGE OPENINGS
AND SCOUR EVALUATIONS**

The design flood frequencies given in the table below are standard criteria for the design of bridge openings and scour evaluations. The design flood frequency may be based on a smaller or larger flood frequency (less or greater than the Q25 or Q50) if site conditions warrant a lower or higher standard. Selection of the design flood frequency includes consideration of construction cost, possible damages to the highway and surrounding property caused by flooding, potential hazard and inconveniences to the traveling public, alternate routes, emergency and evacuation routes, and economic or budgetary constraints.

Design Flood Frequencies for Bridge Openings and Scour Evaluations

TYPE OF ROAD		FLOOD FREQUENCY FOR DESIGNING BRIDGE OPENING ¹	FLOOD FREQUENCY FOR EVALUATING BRIDGE SCOUR ²	
			Design Flood	Check Flood
Interstate		Q50	Q100	Q500
State Routes		Q50	Q100	Q200
Collector - County/Municipality ³	ADT ⁴			
	1-99	Q1.5 to Q25 ⁵	Q50	Q100
	100-399	Q10 to Q25 ⁵	Q50	Q100
	400-	Q25	Q50	Q100
Local - County/Municipality ³	ADT ⁴			
	1-99	Q1.5 to Q25 ⁵	Q50	Q100
	100-399	Q10 to Q25 ⁵	Q50	Q100
	400-	Q25	Q50	Q100

Note 1: Design flood equal to or greater than the 25-year flood will require at least 2 feet of freeboard when setting low chord or minimum finish grade elevation of Bridge. Freeboard requirement does not apply to bridge culverts.

Note 2: In case of road overtopping less than Q-Design, use worst case scenario for evaluating scour.

Note 3: If County/Municipality requests a bridge opening design using a Q50, the design flood for evaluating bridge scour should be Q100 and Q200 for the check flood or the worst case scenario if road is overtopped.

Note 4: Average Daily Traffic – Projected 20-year volume.

Note 5: Design flood should be commensurate with the type of road and risk the County/Municipality desires.

RECOMMENDED FOR APPROVAL: John F. Clark
STATE BRIDGE ENGINEER

APPROVAL: Ronald Z. Baldwin
CHIEF ENGINEER

APPROVAL: James A. Logan
TRANSPORTATION DIRECTOR

11/18/13
DATE