BRIDGE DESIGN MEMORANDUM – DM0410

TO: RPG Structural Engineers
Design Consultants

DATE: July 22, 2010

RE: *SCDOT Bridge Design Manual*
Revisions to Chapter 6

Figures 6.3-5, 6.3-6, and 6.3-7 of the *SCDOT Bridge Design Manual* shall be deleted and replaced with the attached figures.

Please note these revisions in your copy of the *Manual.*

Original Signed by Barry W. Bowers on July 22, 2010 for
Preconstruction Support

BWB:afg
Attachment
ec: Bridge Construction Engineer Preconstruction Support Managers
    Bridge Maintenance Engineer Regional Production Engineers
    FHWA Structural Engineer RPG Design Managers
File: PC/BWB

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AN EQUAL OPPORTUNITY
AFFIRMATIVE ACTION EMPLOYER

Pile Bearing	
	One Pile
Factored Design Load	70 tons
Geotechnical Resistance Factor	0.40
Nominal Resistance	175 tons
Estimated loss of Resistance due to Scour	20 tons
Estimated loss of Resistance due to Downdrag	10 tons
Required Driving Resistance	205 tons

Note: Method of controlling installation of piles and verifying their capacity: Pile Installation Chart from Wave Equation analysis without stress measurements during driving.

Drivability Analysis	
Skin Quake (QS)	0.10 in
Toe Quake (QT)	0.08 in
Skin Damping (SD)	0.20 s/ft
Toe Damping (TD)	0.15 s/ft
% Skin Friction	80%
Distribution Shape No.	1
Bearing Graph	Proportional
Toe No. 2 Quake	0.15 in
Toe No. 2 Damping	0.15 s/ft
End Bearing Fraction (Toe No. 2)	0.95
Pile Penetration	80%
Hammer Energy Range	25 – 60 ft-kips

PILE LOAD AND RESISTANCE TABLES

Figure 6.3-5

Drilled Shaft Bearing	
Factored Design Load	370 tons
Factored Resistance – Side	370 tons
Factored Resistance – End	0
Geotechnical Resistance Factor – Side	0.50
Geotechnical Resistance Factor – End	0.50
Total Nominal Resistance	740 tons

DRILLED SHAFT BEARING

Figure 6.3-6

Maximum Footing Reaction	
Factored Design Load (includes 3 ft of backfill)	295 kips
Factored Net Bearing	4.6 ksf
Geotechnical Resistance Factor	0.45
Required Net Nominal Bearing Resistance	10.2 ksf

Note: If footings of different types are used in the design, include a load table for each type of footing.

MAXIMUM FOOTING REACTIONS

Figure 6.3-7