

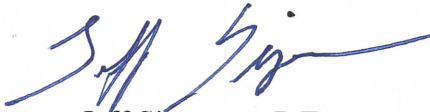
October 26, 2020

**GEOTECHNICAL DESIGN BULLETIN NO. 2020-3**

**SUBJECT:** Revisions to Chapter 12 and Appendix A  
**EFFECTIVE DATE:** Immediately  
**SUPERSEDES:** Indicated Portions of Chapter 12 and Appendix A of the 2019 GDM  
**RE:** None

The Geotechnical Design Support Office is deleting and replacing the following from the 2019 Geotechnical Design Manual:

Section 12.6 – Delete and replace 2<sup>nd</sup> Paragraph  
Section 12.6 – Add new 3<sup>rd</sup> Paragraph  
Appendix A – Delete and replace GDF 002



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Geotechnical Design Support Engineer

JCS:neh

ec:

John Boylston, Director of Preconstruction  
Robert Isgett, Director of Construction  
David Cook, Director of Maintenance  
Robert Perry, Director of Traffic Engineering  
Chris Gaskins, RP Engineer – Design Build  
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Leah Quattlebaum, RP Engineer – Pee Dee  
Philip Sandel, RP Engineer – Midlands  
Julie Barker, RP Engineer – Upstate  
Tad Kitowicz, FHWA



## Section 12.6 SC Seismic Hazard Analysis

The request form (GDF 002) requires that the GEC provide the following information:

- SCDOT Project ID
- County
- RPG
- Route
- Description of Project
- Project latitude and longitude
- Indicate which of the following is also being supplied
  - $V_s$  Profile to B-C Boundary
  - $V_s$  Profile to  $V_s \geq 5,000$  ft/s
  - $V_s$  Profile to  $V_s \geq 11,500$  ft/s

The GEC is required to provide the  $V_s$  profiles indicated above in an Excel<sup>®</sup> format.

## Seismic Information Request

PROJECT INFORMATION			
<b>Project ID:</b>			
<b>County:</b>		<b>RPG<sup>1</sup>:</b>	<b>Route:</b>
<b>Description:</b>			
<b>Latitude (4 decimals):</b>	.	<b>Longitude (4 decimals):</b>	.
SEISMIC REQUEST			
<p>The SCDOT <u>Geotechnical Design Manual</u> (GDM) and <u>Seismic Design Specifications for Highway Bridges</u> (Seismic Specs), latest editions, provide detailed seismic design requirements for transportation structures. The Preconstruction Geotechnical Design Section (PC/GDS) will be generating seismic design information from, SCENARIO_PC, the seismic analysis software. The PC/GDS will provide the completed 3-Point curve based on the information provided on this form in general accordance with the procedures contained in the GDM. The 3-Point curve will be for 5% critical damping and will be based on either the <b>B-C Boundary</b> (Geologically Realistic) or <b>Hard Rock</b> Outcrop for specific project locations within South Carolina. The Site Geologic Condition shall be determined using the guidance contained in the GDM, which is summarized in the following statements. The Geologically Realistic option is for sites in the Coastal Plain with sediment thickness greater than 330 feet to firm sediment (<math>V_s \geq 2,500</math> feet per second (ft/s) or NEHRP B-C Boundary). Geologically Realistic conditions can also be encountered outside of the Coastal Plain where the sediment thickness is 330 feet or less above the basement rock and the <math>V_s = 8,000</math> ft/s. The Hard Rock Outcrop option is for an outcrop of hard rock (<math>V_s \geq 11,500</math> ft/s). The GDM contains a map to assist in determining the Site Geologic Condition. South Carolina has been divided in 2 zones, Zone I – Physiographic Units Outside of the Coastal Plain and Zone II – Physiographic Units of the Coastal Plain. The provided 3-Point curve shall include both the FEE and the SEE events since all bridge embankments are required to be designed for both the FEE and SEE. For ERSs located within the roadway embankment only the SEE will be used; however, if in the opinion of the design team a 2-level design should be performed. The OC and Bridge Seismic Level of Design shall be determined as defined in the Seismic Specs and shall be provided by the design team. The Consultant shall provide the <math>V_s</math> profile to the B-C Boundary (Geologically Realistic) in either the Coastal Plain or the Piedmont Physiographic Provinces where the <math>V_s</math> is greater than or equal to 5,000 ft/s (<math>V_s \geq 5,000</math> ft/s). To facilitate developing <math>V_s</math> Profiles to the appropriate depths, SCDOT has placed on the Geotechnical Webpage of the SCDOT Website a map indicating the location of representative <math>V_s</math> profiles along with the information for each location. If additional information is needed, contact the appropriate PC/GDS. This is the condition that is anticipated being encountered on most project sites. However, if <math>V_s</math> greater than or equal to 11,500 ft/s (<math>V_s \geq 11,500</math> ft/s) is encountered at the ground surface or within 100 feet of the existing ground surface then the Hard Rock Outcrop geologic condition shall be used. All <math>V_s</math> profiles are to be provided digitally in an Excel<sup>®</sup> format to SCDOT. <math>M_w</math> and R shall be determined by the PC/GDS using the procedures outlined in the GDM since this data is now obtained from SCENARIO_PC.</p>			
SITE GEOLOGIC CONDITION			
<b>Geologically Realistic</b> $V_s$ Profile to the B-C Boundary Provided <input type="checkbox"/> $V_s$ Profile to $V_s \geq 5,000$ ft/s Provided <input type="checkbox"/>		<b>Hard Rock Basement Outcrop</b> $V_s$ Profile to $V_s \geq 11,500$ ft/s Provided <input type="checkbox"/>	
REQUESTOR INFORMATION			
<b>Requestor Name:</b>			
<b>Company Name:</b>			
<b>Phone Number:</b>	(     )     -		
<b>Email Address</b>			
<b>Request Date:</b>			

<sup>1</sup>RPG – Regional Production Group

- 1 – Beaufort, Berkeley, Charleston, Colleton, Dorchester, Hampton, Jasper
- 2 – Chesterfield, Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Kershaw, Lee, Marion, Marlboro, Sumter, Williamsburg
- 3 – Aiken, Allendale, Bamberg, Barnwell, Calhoun, Chester, Fairfield, Lancaster, Lexington, Newberry, Orangeburg, Richland, Union, York
- 4 – Abbeville, Anderson, Cherokee, Edgefield, Greenville, Greenwood, Laurens, McCormick, Oconee, Pickens, Saluda, Spartanburg

**Design-Build – D/B**

**Pre-Construction Support – PCS**