

Chapter 26
GEOTECHNICAL SOFTWARE

GEOTECHNICAL DESIGN MANUAL

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CHAPTER 26

GEOTECHNICAL SOFTWARE

26.1 INTRODUCTION

This Chapter provides a general overview of software used in geotechnical engineering and analysis. Software is used in geotechnical engineering to speed computations and to perform complex analyses. There are 2 types of software used by SCDOT: 1) software packages developed and marketed by universities and software development firms, 2) spreadsheets and customized software packages developed by individuals or companies. Typically the first type of software is commercially available and used by multiple government agencies and private entities. The second type typically is only used by a single agency or entity and is developed locally by the user. SCDOT recognizes that both types of software are used; however, the individually developed software requires QA/QC verification prior to being used on SCDOT projects.

Prior to the use of any software, it is incumbent upon the engineer to understand how the software determines the results and any limitations that are inherent to the software. For example, the SHAKE program becomes unreliable if the strains exceed 3 percent (3%). SCDOT recommends that prior to using a new software program, the user should run at least 1 example and check the results against a set of hand calculations.

Appendix G provides a list of software that is currently used by SCDOT. Consultants are not required to obtain the same software as SCDOT, but all software shall use the models permitted in this Manual.

26.2 COMMERCIAL SOFTWARE

As indicated previously, commercially available software packages are typically produced by either a university or software development firm and are sold for profit. Software developed in this manner normally goes through extensive QA/QC prior to being sold. Therefore, the only documentation SCDOT requires for these software packages is the contact information for the developer. Software obtained from the FHWA website requires no additional information.

26.3 NON-COMMERCIAL SOFTWARE

Non-commercial software packages are those packages that are developed by and used internally in a single agency or entity. Included in this category are spreadsheets, MathCAD programs or software developed using computer language, such as FORTRAN, C++ or similar. Because these types of packages may not get the same level of review as commercially developed software, additional information and supporting documentation may be required prior to their acceptance by SCDOT. The supporting documentation may include, but is not limited to; an example prepared using the software and a set of hand calculations for the same example. In addition to the example, a QA/QC plan for the development of software packages shall also be prepared, indicating the person or persons who reviewed the software. For software developed internally by the Department, the software should be reviewed by the OES/GDS.