



Ohio Department of Transportation
Division of Production Management
Office of Geotechnical Engineering

GB 9

Geotechnical Bulletin

GEOTECHNICAL SOFTWARE

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Geotechnical Bulletin GB 9 was developed by the Office of Geotechnical Engineering. The first edition of GB9 was dated March 25, 2008. This edition supersedes all previous editions.

This Geotechnical Bulletin presents a list of the geotechnical computer programs used by the Department. An agency may want to consider these programs, or other programs that provide similar analyses. The agency is responsible for obtaining any of these programs. It is the choice of the agency as to which computer programs it uses.

Table 1 provides a list of the geotechnical software along with a general description of its capabilities. Note that the version numbers listed below are what ODOT possesses as of the publishing date of this bulletin and later versions may now be available.

Table 1 Geotechnical Program Descriptions	
Software	Description
FoSSA 2.0	Computes the lateral and vertical stresses and the magnitude and time rate of settlement resulting from roadway loading conditions. Stage construction and prefabricated vertical drains can also be accounted for in the calculations.
ReSSA 3.0	Reinforced soil slope design. Follows guidelines and recommendations as presented in the NHI course and manual on the subject project. Simple and complex slope configurations are accommodated.
MSEW 3.0	Program for the design and analysis of mechanically stabilized earth walls. Focuses on internal stability, and can interact with ReSSA for global analyses. Now can do LRFD.
UA Slope 2.1	Analyzes slope stability with drilled shafts. Lateral loads and shaft responses are computed. Soil arching can be utilized. This is a very common landslide remediation used by ODOT, and this program allows for consistency and reliability of design.
CRSP 4.0	Colorado Rockfall Simulation Program. Two dimensional model of rockfall based on slope geometry and rock properties. Analyzes rock slope designs and capture zones to prevent rocks from entering highways.
DRIVEN 1.2	Program that is used to determine pile capacities and estimated pile lengths of driven piles for bridge foundations. Not compatible with Windows 7 or later.
APILE v.2014	Program that is used to determine pile capacities and estimated pile lengths of driven piles for bridge foundations. Replaces Driven for computers running Windows 7 and later.
SHAFT v.6	SHAFT is used to analyze and design axially loaded drilled shafts.
LPile v.6	Program that is used to estimate the load-displacement behavior of a laterally loaded pile or drilled shaft during the design of bridge foundations or slide remediation. Computes deflection, shear, bending moment, and soil response with respect to depth in nonlinear soils. Used in combination with Akron Drilled Shaft.
SPW911 V2.38	Program for the design and analysis of sheet pile retaining walls and soldier pile and lagging retaining walls.

Table 1 Geotechnical Program Descriptions	
Software	Description
GRLWEAP 2010	GRLWEAP is a one-dimensional Wave Equation Analysis program that simulates the pile response to pile driving equipment.
SNAILZ v.6.01	Program for the design and analysis of soil nail walls. These walls are used to support steep cut slopes and widening under bridges.
GSTABL7 w/ Stedwin 2.005	Slope stability analysis software. Calculate the factor of safety for embankment slopes, including piles, tiebacks, soil nails and reinforced soil masses.

Many of these programs are only available from a single commercial source. The remaining programs are available from other States' agencies or FHWA. Costs are dependent on the entity purchased from and the quantity of licenses desired. Table 2 provides the name of the software distributors along with the associated web address.

Table 2 Geotechnical Program Distributors	
Software	Distributor
FoSSA 2.0	ADAMA Engineering www.geoprograms.com
ReSSA 3.0	
MSEW 3.0	
UA Slope 2.1	ODOT Office of Geotechnical Engineering Contact directly
CRSP 4.0	Colorado Geological Survey http://dnr.state.co.us/geostore/ProductInfo.aspx?productid=MI-66
DRIVEN 1.2	FHWA http://www.fhwa.dot.gov/engineering/geotech/software/softwaredetail.cfm#driven
APILE v.2014	Ensoft Incorporated http://www.ensoftinc.com/
SHAFT v.6	
LPile v.6	
SPW911 V2.38	Pile Buck http://www.pilebuckinternational.com/store/product_info.php?products_id=45
GRLWEAP 2010	Pile Dynamics, Inc. http://www.pile.com/pdi/products/grlweap/
SNAILZ v.6.01	California DOT http://www.dot.ca.gov/hq/esc/geotech/request.htm
GSTABL7 w/ Stedwin 2.005	Gregory Geotechnical http://gregeo.com/software.html