

MARCH 19, 2003 - Unsaturated Soils and VOFLO Demonstration of the software for determining PTI design parameters

Speaker: [Kirby Meyer, P.E.](#), MLAW, Austin, Texas.

Mr. Meyer, president and owner of MLAW Consultants and Engineers in Austin, a company active in structural and GeoStructural design, pavement engineering and forensic engineering reviewed the background and theory of unsaturated soil analysis and suction, and then demonstrated the use of his computer program VOLFLO. Mr. Meyer has bachelor's and master's degrees in civil engineering from Texas A&M, and has published numerous papers on expansive soils in his 44-year career. In addition to MLAW, he owns GeoStructural Tool Kit, Inc., a software development company that markets such software as PTISlab and VOFLO, the software that Mr. Meyer presented at this meeting.

PRESENTATION SUMMARY

Mr. Meyer spoke about the three methods currently allowed by the Post-Tension Institute for determining PTI design parameters: 1) the PTI Chart Method, 2) the Modified PTI Method (approved, but not yet published) and 3) his VOFLO Method. The VOFLO method is a program his company markets for \$550 for geotechnical engineers to easily determine Y_m and E_m values in their reports. More information and a demo may be found at: <http://www.gtksoft.com/volflo.htm>

He said VOFLO has already incorporated the modified PTI method. Mr. Meyer noted that hydrometer testing is required to determine percent fine clay in the modified PTI method, and in fact, it is required if following the current PTI procedure as well, though many geotechnical engineers do not do this.

He further said that VOFLO is much more versatile than the other two methods because it allows the modelling of trees and moisture barriers, both vertical and horizontal. He showed about a dozen examples of output from the program. In one case, he showed how adding a 3 ft deep moisture barrier next to a foundation decreased the Y_m for that particular soil from 3.93" to 1.73". He also demonstrated that changing the 3 ft vertical barrier to a 3 ft horizontal barrier also reduced Y_m , though not as much. It did however reduce E_m by the width of the barrier (3 ft) in that case.

Mr. Meyer stressed the importance of picking the correct anticipated suction trumpet-shaped profile for the site and noted that the engineer needs to be able to conservatively predict the suction at the time of construction to accurately predict the parameters. He also noted that equilibrium suction values for Austin and Houston are $pF = 3.6$ and 3.4 , respectively.

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