

## PLOTTING WHILE SOLVING WITH SVOFFICE 2009

---

Presented by: Dr. Murray Fredlund, President of SoilVision Systems Ltd.

### Introduction

Hi, my name is Murray Fredlund. Welcome to the session Plotting While Solving within the *SVOoffice 2009 Next Generation* geotechnical software suite. The purpose of this session is to show the user how to apply supports in a slope stability model.

Plotting variables in a finite element solution during the solution process is one of the very unique features of our software because you can actually plot the solution variables during the solution. This creates a lot of unique opportunities such as understanding how the model is performing during the solution process, whether it is stable, etc. We've tried to be transparent during the solution process.

### Getting Started

In the example used, we will be exploring how to add more detail during the solution process. Everything during the solution process is controlled under the **Model>Reporting>Plot Manager** menu (which can also be reached by clicking the **Plot Manager Dialog** icon on the toolbar). Selecting this brings up the **Plot Manager** dialog shows all the list of plots displayed in the FlexPDE solver during the solution process. You can see that there are various tabs available (Plots, Points, Piezometer, Area/Volume, Min/Max, Flux Sections, Boundary Flux, Climate, Review Boundary, Tunnels, Wells and Other). Drawing attention to the **Plot** section, there are a number of plots that are defined. Most of the time, the user does not need to touch this section because the default plots that most people look at for this type of analysis are already added (such as PWP, Head, Pressure Head).

### Creating & Contouring Plots

The overall types of plots that the user can add are contour plots (contour any particular variable), elevation plots (to graph the change in a value across a certain distance), vector, surface and grid plots. So let's just add a few more plots here. In our current example we want to add some definition. We want to have more contours (naming it Plot 1). I'm going to plot, in this case, saturation and I'm going to plot it in region R7. So that might be one plot that I want to create. Then I might want to contour a different plot. Let's say I want to contour Pore Water Pressure. Instead of restricting it to a region, I want to select it and zoom in to plot that pore water pressure in a particular region of interest. I can select that. I can also plot the GroundWater gradients, in terms of fluxes or gradients. What I'm going to do is zoom to approximately the same location in the model to plot those gradients. This gives me a few extra plot by which I can get a fairly accurate picture of what is happening in the model. If I feel that the mesh might be refining in a certain area, I can add mesh to a certain area. I can select zoom area for that plot and put that in there. This allows a certain amount of flexibility.

### Running the Model

Once I define these plots, I'm going to save this as a new model so that I don't override the old one. You'll notice I can click "play" to run the model or I can click Solve/Analyze. And it told me that in this steady state model we don't have enough defined to plot saturation. So I'm going to go back and I'm going to remove the plot of saturation out of the mix and then I'm going to



save the model again and run it. What you're going to see as it grids up, it goes through the meshing process (which it solves pretty quickly). There you're going to see the different plots that I defined. Pore water pressure zoomed in here. Just double clicking on these graphs to highlight them. Then there are the Fluxes. There is heightened flux up over the core of this EarthDam (so this is interesting to see). Then the mesh, which is zoomed around here, you can see how the mesh division process works in this particular area. So this gives you a little bit of an idea of how to control the plotting during the solution process. If this is a transient model then the plots are updated at specified time levels, such as every 5 minutes, every hour or every day. Or, you can have them updated at every finite element cycle.

*<End of transcript>*

For more information on SVOOffice 2009 products, feel free to contact us directly at (306) 477-3324, or download our student version from [www.soilvision.com](http://www.soilvision.com) and try it out for yourself!