

# Customer Model Template

On the following pages, you will find a standard example set from our SVFlux Examples Manual. Please use this as a template to write your own model up as an example model. Feel free to group related models together in one chapter; simply list one per sub-section. Make sure the model name matches the filename of the model file you are submitting!

## Canals

### NARROW CANAL LATERAL FLOW (PIPEFILL)

The Pipe Fill example demonstrates the use of SVFLUX in analyzing the situation of a narrow canal. This canal contains two concrete sidewalls of very low hydraulic conductivity. There is a berm on either side against the concrete sidewalls. The flow through the canal and the resulting flow patterns underneath the bottom of the concrete sidewalls are of importance in the seepage modeling.

#### Purpose

The purpose of the seepage model is to ensure that the gradients at the bottom of the concrete sidewalls do not get high.

#### Geometry and Boundary Conditions

The model is set up with the geometry shown below and the material regions are entered. It should be noted at this time that the flux head boundary conditions are placed in the numerical model.

The boundary condition is assigned at the bottom of the canal and head boundary conditions are also applied at the left and right sides of the model. A head boundary condition is also applied at the base of the canal representing the elevation of the water in the canal.

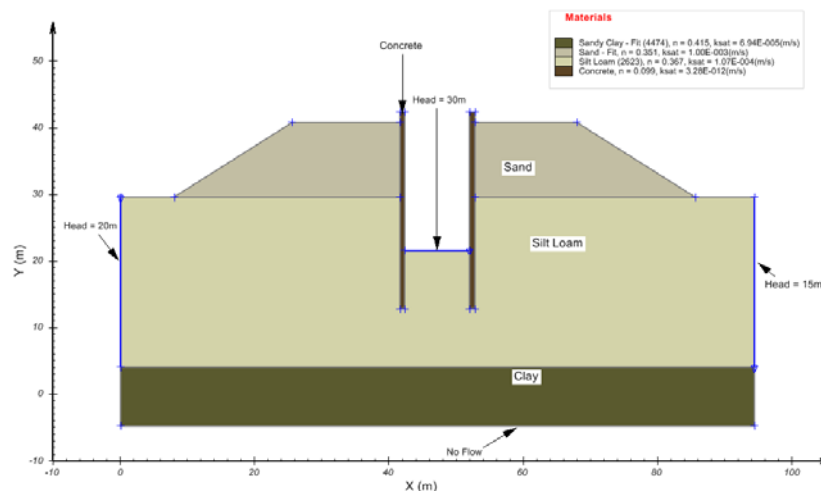


Figure 1 Example geometry of the PipeFill

## Material Properties

The concrete is given a very low hydraulic conductivity of  $3.28 \times 10^{-12}$  m/s. This hydraulic conductivity corresponds approximately to the conductivity of the concrete in a very dense state. Saturated and unsaturated material properties are assigned to each material type.

When the model is run it is important to select plots of head, pore-water pressures, and gradients. The gradients in the  $X$  and  $Y$  direction may be plotted with the use of the *Plot Manager*. It is recommended that these plots be specified both in the finite element solver as well as output to an ACUMESH model so the model variables can be visualized. The Sand, Silt Loam and Clay regions are given average hydraulic properties consistent with their soil type.

## Results and Discussions

Once the model is solved, plotting the gradients will allow a better view at where the maximum gradient lies. In this case, the  $x$ -gradient has the highest value. A contour plot of the  $x$ -gradient values can be seen below.

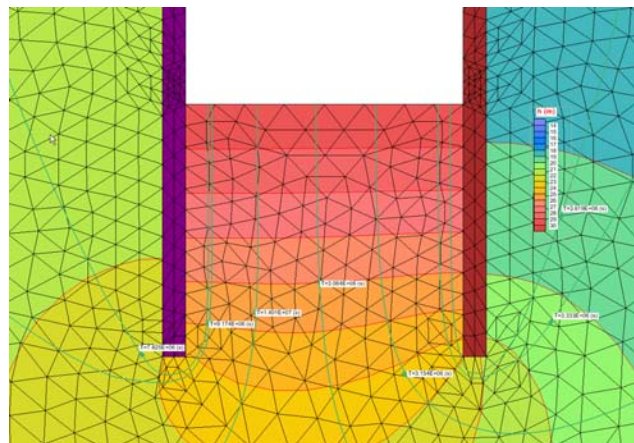


Figure 2 Contour plots for the PipeFill example model