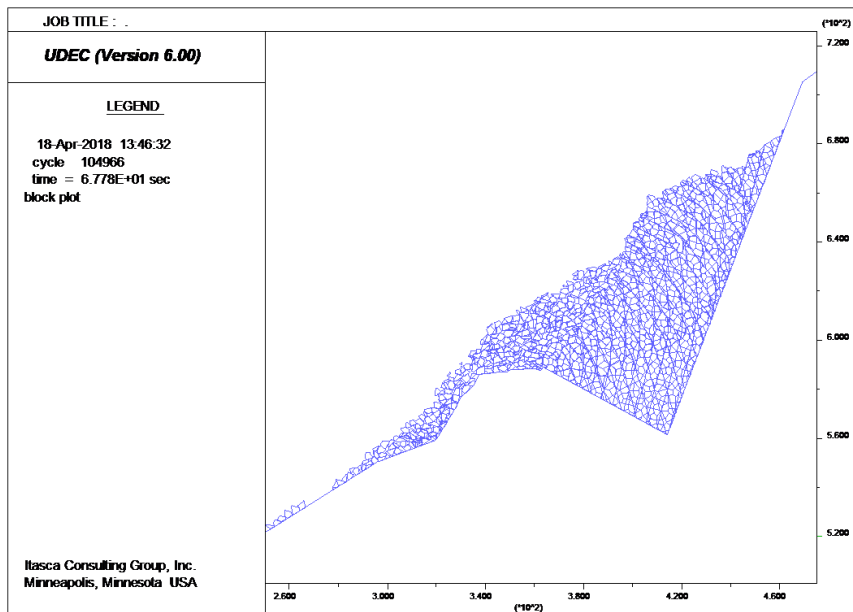


Rockslide Runout Prediction

The Checkerboard Creek Rock Slope is located 1.5 km upstream of the Revelstoke Dam, which impounds the Columbia River in British Columbia, Canada. A detailed investigation completed in 2004 indicated that 2 to 3 million m³ of a rock slope was moving toward the reservoir at rate of approximately 10 mm/year. There was concern that a portion of the slow-moving rockslide could accelerate rapidly into the reservoir, producing a wave that could overtop the dam.

This example presents a *UDEC* analysis to assess potential rockslide run-out characteristics (time histories of rock volume, thickness, and velocity). A Voronoi tessellation scheme is used to create a rock fabric that allows the moving rock slope to disaggregate. The model is described in Lorig et al. (2009). In the paper, the range of slide behaviors is investigated by varying the following four factors: (1) type and amount of damping used to simulate the coefficient of restitution and, consequently, energy loss during run-out; (2) friction angle of contacts during movement; (3) reservoir effects; and (4) rock fragment sizes. The results from these analyses were used as input to a physical wave model study.

The example presented here shows how to create and run one of these models that resulted in unstable sliding. An example plot is shown below.



Reference:

Lorig, L.J., Watson, A.D., Martin, C.D., Moore, D.P., 2009. "Rockslide Run-out Prediction from Distinct Element Analysis," *Geomechanics and Geoengineering*, 4(1), 17-25.