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Project Summary

Organization
Deep Foundations Institute

Solution
Geotechnical Engineering

Project Objectives

- To conduct a 2D/3D slope stability analysis as part of a modeling challenge.
- To obtain a minimum geotechnical factor of safety and associated potential failure surface results.

Products Used

SVSLOPE[®], SVFLUX[™]

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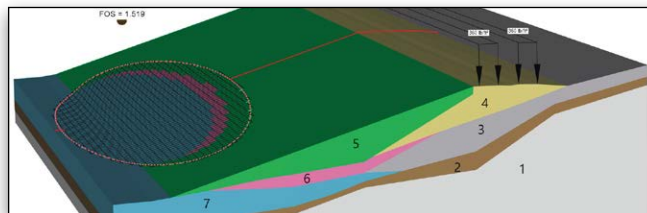
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SVSLOPE[®] and SVFLUX[™] Applied to Slope Stability Analysis for International Institute

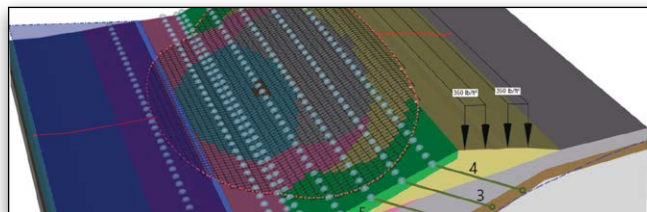
DFI Used Bentley's SoilVision Applications for Summary of Factor Safety Numbers

Deep Foundations Institute (DFI) is an international association of contractors, engineers, manufacturers, suppliers, academics, and owners in the deep foundation industry. Their mission is to bring together multidiscipline individuals and organizations to find common ground and create a shared vision for continual advancement in the deep foundations industry. With more than 3,300 members worldwide, DFI recently used Bentley's SVSLOPE and SVFLUX software to carry out a 2D/3D limit equilibrium slope stability analysis as part of a modeling challenge. The organization wanted to create a model, model geometry, and materials, specifying the analysis settings. Then, the project team created, defined, and assigned several parameters, including the water-table and piezometric line, distributed loads, and supports. Finally, the team analyzed the models to obtain a minimum geotechnical factor of safety and associated potential failure surface results.

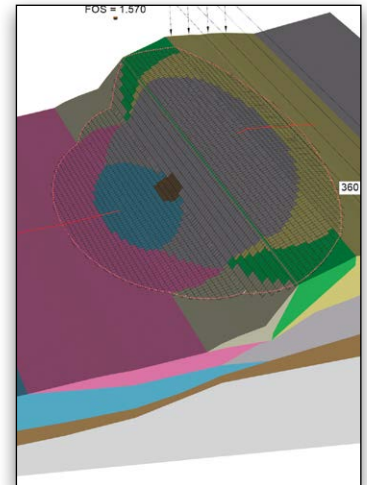
By using these applications, DFI received summary of factor safety numbers of 2D and 3D slope stability models for clay and silt material types, both drained and undrained. The organization also realized that 2D or 3D analysis can be performed in LEM or seepage analysis and that it can consider unsaturated material properties, anchor supports, grouted tiebacks, micropiles, geomembranes, and rockpiles when analyzing. The LEM analysis was quick and simple to set up using these applications, as well as setting up the material parameters. SVFLUX allowed DFI to incorporate a coupled seepage analysis to better consider the drains. Moving forward, DFI would like to examine the influence of 3D drainage configurations, 3D effects on groups of piles, cost analysis of different solutions, and the potential influence of non-ellipsoidal 3D slip surfaces.



Stability analysis for berm added



Stability analysis for drain, micropiles, and anchors



Stability analysis for concrete buttress

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