

Mesa Grande Plateau Slope Stability Agencia Nacional Infraestructura

Location: Bogotá, Colombia

Date: 2022 - Present

Structure: Road Tunnel

Length: 678m (0.42mi)

Cross-Section: ~ 10m (33ft) height x 12m (39ft) width

Geology: Terrace deposit layers and phyllite layer. The terrace deposit is composed of a sequence of grain-supported and matrix-supported sub-horizontal layers.

Client: COVIANDES S.A.S.

Owner: Agencia Nacional Infraestructura



Figure 1. Landslide at the southern sector of the Mesa Grande Plateau (Courtesy of COVIANDES S.A.S.).

Development of 3D Finite Element Analysis:

The Bogotá-Villavicencio road is about 28 km long with dual carriageway. It constitutes a main economical corridor that improve the connection of the central part of Columbia with the Eastern plains. This infrastructure includes ten bridges and four tunnels stretching through several rural areas. During heavy rain season, the southern sector of the Mesa Grande plateau several local slope instabilities were observed which have developed into a large landslide. This has affected the existing road at kilometer 58, portals 26 and 27 and the last 200m of tunnel 13.

Gall Zeidler Consultants (GZ) was retained by COVIANDES S.A.S. as an objective arbitrator and independent expert reviewer to review the performed simulation for the assessment of the cause of K58 slope and Tunnel 13 instability. Gall Zeidler Consultants reviewed the existing information, evaluated the geological conditions and input parameters, and validated the numerical approaches and models. As part of the expert review, GZ developed an independent 3D Finite Element analysis to support the validation of the conducted numerical assessment.

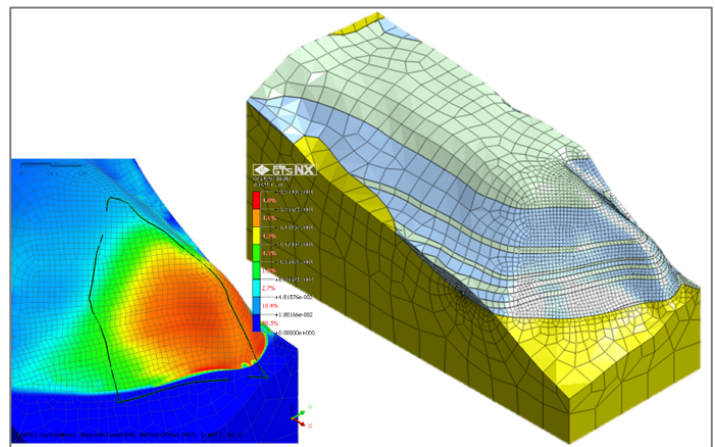


Figure 2. 3D Finite Element Model to assess slope stability and large landslide.