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SEISMIC BEHAVIOR OF AN ANISOTROPIC EMBANKMENT

Purpose(s): Seismic slope-stability analysis of an embankment characterized by a ubiquitous joint model

Client: INGEMA

Date: 2005

Location: Morocco

Partners: None

Project executive manager: Céline BOURDEAU

Code(s) used: *FLAC*

Within the framework of the design of a new stadium in Morocco, INGEMA was concerned about the **seismic behavior of an anisotropic embankment** on which terraces were to be built. Itasca Consultants SAS was asked to assess, by means of numerical simulations using *FLAC*, the stability of this embankment under seismic loading representative of the regional seismicity.

The embankment is characterized by a **ubiquitous joint model** that reproduces the behavior of a thinly laminated material exhibiting strength anisotropy (Figure 1). Forces were introduced in the model to simulate the effect of structures. After seismic shaking, we looked for possible concentrations of displacements and the amplitude of these displacements to judge slope stability (Figure 2).

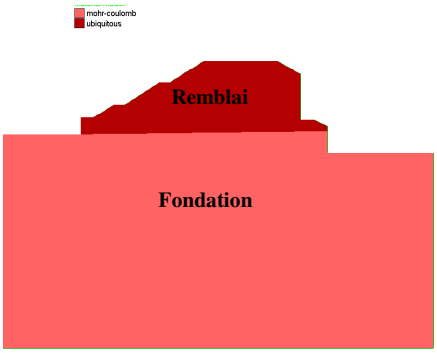

Figure 1: ***Constitutive models*** *used for the homogeneous foundation (Mohr-Coulomb) and the anisotropic embankment (ubiquitous joint model).*

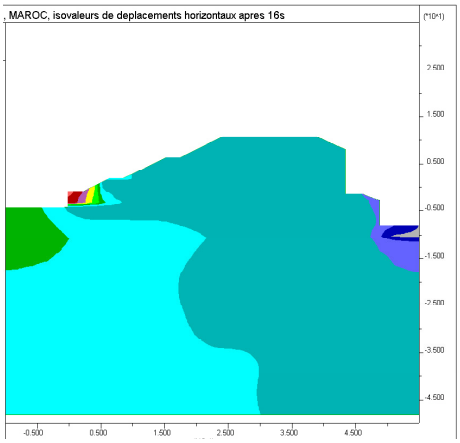

Figure 2: ***Horizontal displacement*** *contours at the end of seismic shaking. They are smaller than 3.5cm.*

KEYWORDS:
- Seismic shaking
- Ubiquitous joint model
- Punctual loads

⇨*RESULTS* :

- The displacements that develop during timesteps due to the formation of localized plasticity in the horizontal joints are smaller than a few centimeters in the lowest part of the embankment (Figure 2).
- Considering the parameters used in this study, the embankment is stable in dynamic conditions.

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