Slope Stability

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Exercise 8a

DESIGN OF A MITIGATION WORK
GEOSTUDIO™ SLOPE/W

The goal of this exercise is to perform a stability analysis with the commercial software GeoStudio™ 2018 SLOPE/W. Furthermore, a modification of the slope geometry must be proposed in order to improve the stability of the slope.

Exercise

Consider the slope reported in Figure 1. Geometry and soil properties are given in Table 1. The slope is considered completely dry.

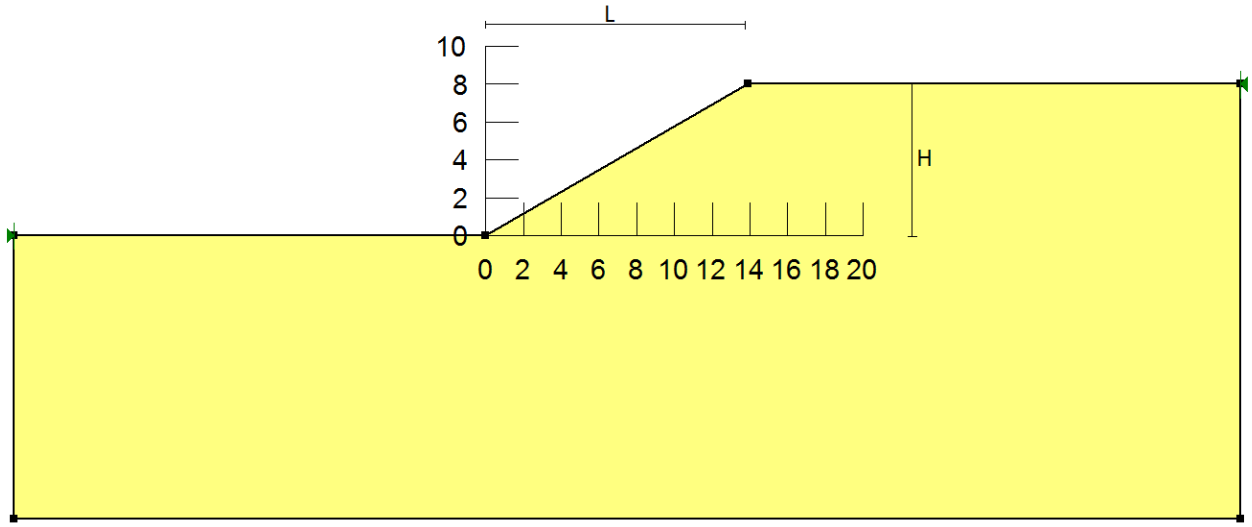

Figure 1: slope geometry.

Table 1: geometry and soil properties of the slope reported in Figure 1.

	γ_{dry} (kN/m^3)	α (°)	H (m)	L (m)	φ' (°)	c' (kPa)
Clayey silt	18.0	30.0	8.0	14	22.0	3.0

a) Evaluate the factor of safety of the slope $F = min_i \{ F(s_i) \}$ - adopting GeoStudio™ SLOPE/W with a slice division of the domain n=20. Consider the simplified Bishop method and run the analysis according to the *Grid and Radius* mode.

b) Compute the Neutral line and comment on its position.

c) Propose two possible corrective measures consisting in the modification of the slope geometry in order to increase the factor of safety to at least a value of 1.3. When possible (at least in one of the two requested options), try to maintain the same initial volume of the slope material (*cut and fill*). Report the results in the table below.

Table 2: summary of computations with GeoStudio™ SLOPE/W.

Initial case	*Corrective measure 1*	*Corrective measure 2*
F =	F =	F =
(x_C ; y_C) =	(x_C ; y_C) =	(x_C ; y_C) =
r =	r =	r =