Archaeological site of Olympia

Engineering geological conditions and problem:

The archaeological site is limited to the north by a steep hill slope, which is crossed by a national road of heavy circulation. The slope (at the level of the archaeological site) consists of fine-grained soil, classified as silty clay to silty clayey sand of low plasticity. According to the grain size analysis of representative specimens, the material is composed of 22-17% clay, 43-80% silt and 35-3% sand. The liquid limit (LL) of the above specimens is 30-32%, the plastic limit (PL) is 22 and the plasticity index (PI) is 8-10%. The material presents low permeability and drainage ability. In dry conditions the material in compact, presenting uniaxial strength of 5-15 MPa. According to the performed UU triaxial tests, the cohesion is 17-23.7 Kpa and the angle of internal friction is 5,2-11^0. In rain conditions the material is sutured rapidly, providing unstable conditions with earth pressures on the old rocky wall. According to our stability analysis, a safety factor of S.F.=0.17 determines the instability of the lower part of the slope, under the road, toward the archaeological site

Protection measures that have to be taken:

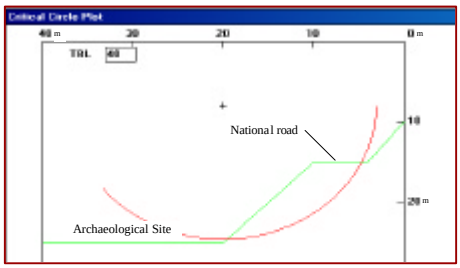
Stabilization of the slope minimizing the earth pressure on the ancient retaining wall:

Drainage of the slope,

Removal of the roots of the trees at the lower part of the slope.

A shallow vegetation retaining system could also improve the stability of the upper parts of the hill-slope.

The methods used for reinforcing the ancient retaining wall should be adapted to the identity of the archaeological site.



Other information:

The archaeological site of Olympia is located in South Greece, in the Western part of Peloponnese (Figure 1). It was one of the most important sanctuaries of the ancient period, where Olympic games were performed from a very early period. With the Olympic Games, the ideal of noble rivalry found its complete expression and for many centuries forged the unity and peace of the Greek world. The archaeological finds show that the area was at least settled from the 3rd millennium B.C.

References on studies already performed:

CHRISTARAS, B., MARIOLAKOS, I., DIMITRIOU, A., MORAITI E. & MARIOLAKOS, D. (2002), Slope Instability at Olympia Archaeological Site, in S. Greece Int. Symp. UNESCO Landslides Risk Mitigation and Protection of Cultural and Natural Heritage Kyoto, pp. 339-342.