ΔΗΜΟΣΙΕΥΣΗ No 105

32nd IGC

32nd Session of the International Geological Congress

August 20-28, 2004

Florence

Congress theme:

From the Mediterranean Area Toward a Global Geological Renaissance Geology, Natural Hazards, and Cultural Heritage

CHRISTARAS, B., MARIOLAKOS, I., FOUNTOULIS, I., DIMITRIOU, A., MORAITI, E. & MARIOLAKOS, D. (2004). Slope stability analysis and proposed measures for the protection for the protection of the archeological site of Olympia, in S. Greece. *32nd International Geological Congress, Florence – Scientific Sessions: Abstracts (part 2) Session* 228-2, p. 1034.

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Session 228-2, p. 1034.

228-2 Invited paper

SLOPE STABILITY ANALYSIS AND PROPOSED MEASURES FOR THE PROTECTION OF THE ARCHAELOGICAL SITE OF OLYMPIA, IN S. GREECE

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Keywords: Landslides; Archaeological sites; Cultural Heritage; Ancient Greece

The archaeological site of Olympia is located in South Greece, in the western part of Peloponnese. It was one of the most important sanctuaries of the ancient period, buil in a valley. At this sanctuary, pan-Hellenic games called Olympic, were performed from a very early period. With the Olympic games, the idea of noble rivalry found it's complete expression and for many centuries forged the unity and peace of the Greek world. 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 consists of Pliocene marls where many landslides occur. This geo-material is 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 about 110.In rain conditions the material is sutured rapidly, loosing strength and providing important earth pressure on the very old rocky retaining wall, which leans downslope, under that pressure. According to our stability analysis, a safety factor lower than "1" determines, for heavy rain conditions (the geo-material almost looses its cohesion and internal friction), the instability of the lower part of the slope, toward the archaeological site (Christaras et al., 2002). For these reason a retaining system, of that lower part of the slope, is under study.

REFERENCES

CHRISTARAS B., MARIOLAKOS I., DIMITRIOU A., MORAITI E., & MARIOLAKOS D. (2002) Slope instability at Olympia Archaeological site, in S. Greece. Int. Symp. UNESCO "Lanslides Risk Migration and Protection of Cultural and Natural Heritage", Kyoto, pp. 339-242.