



Site investigation and modelling at “La Maina” landslides (Carnian Alps, Italy)

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The Sauris reservoir is a hydroelectric basin dammed downstream by a double arc, 136 m high concrete dam built between 1941 and 1947. Downstream of the dam the valley is narrow and deep, whereas upstream it is wide with a drainage area (about 140 km²) of good capacity. The basin stores about 50 millions m³ of water over a surface of 1.5 km². The dam is firmly anchored to the rock (Dolomia dello Schlern), but the Lower Triassic clayey formations cropping out especially in the lower part of the slopes, have made the whole catchment basin increasingly prone to landslides. In recent years, the “La Maina landslide” has opened up several joints over a surface of about 100,000 m², displacing about 1,500,000 m³ of material. Therefore, a monitoring system consisting of four inclinometer cases, three wire extensometers and ten GPS bench-mark pillars was immediately set up to check on surface and deep displacements. Particular attention is now being given to the evolution of the instability area as the reservoir is located at the foot of the landslide. The Regional Authority for Civil Protection has therefore appointed us to study the numerical modelling simulation in a pseudo-time condition of the slopes in order to understand the risk situations for transport infrastructures and the underlying impoundment. Numerical simulation was carried out using FLAC 4.0 computer code, based on finite difference method (Itasca, 2000). A slope cross-section was divided into finite difference zones and the degree of stress and deformation was calculated for each of them. Elasto-plastic behaviour of the medium was assumed. The reliability of the results was checked by comparing them with the morphological evidence of the movement. One of the comparisons con-

cerned the failure surface location in the inclinometer holes and the depths calculated. The shape of calculated horizontal displacement curves and location of measured slip zones is drawn for boreholes. Qualitative consistency could be seen, even if it is not ideal. This proves the assumptions and modelling procedures to be appropriate, at least on an approximate level and thus the results should be reliable.