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Geophysical tests on shallow landslides Case study Telega, Romania

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Telega village, separated by Campina (town) through Doftana River, is situated at 5 km from it, in the West part of Prahova County. The village covers a medium altitude relief (550 m), characterized by irregularities of ground, many valleys and swales crossed by streams.

Its surface is crossed by the 45º55' North latitude parallel and 260 East longitude meridians. These elements determine the temperate-continental climate aspect.

For a profound knowledge (as much as detailed possible) of dynamic geological processes there must be take in account the existent hydro geological conditions as well as the rocks characteristics.

The water's circulation is made through the gritty and sandy horizons (layers), with a relatively large development. The permeability and the porosity of these rocks vary depending on the lithologic constitution of the respectively stratigraphc layer. The spring's debits (discharges) are generally constant.

On the left bank of Telega valley, the landslides' effects have a large extension, in some places being catastrophic. Among these, the one called at "Butoi" area presents a huge interest according of their produced destructions and because of the influence on Telega Spa, main communal road etc. The slope is affected on a 0,4 square kilometers, the morphology presenting a lots of scars, sometimes with escarpment aspect, landwaves of different amplitudes and counter-slope surfaces, in which there are small lakes, swamps, longitudinal and cross fissures (with various depths and widths).

The seismic tests offer information concerning low depth section litho-stratigraphic limits, data of which geological interpretation leads to consideration about occurrence and dynamic of slopes local instability phenomena.

Thus were mainly revealed few seismic boundaries on the shallow cross section and have been constructed both contour and isopach maps (Cristea et al., 2005; Maftei et al., 2004).

Field data will be acquired with advanced equipment, GEOMETRICS, and complementary by DATA LOG (ABEM seismograph with 24 seismic channels up-dated with additionally device to in-real time stacking; selectable sample rate for 1 or 0,5 or 0,25 ms).

Data processing will be realized by applying the Romanian software PROREFRACT (Cristea et al., 2002).

Therefore, being the Telega landslide (from the left bank of the valley) seismic tests were made in this area. There were made data registrations on 1, 5 km seismic profile, using 150 seismic waves generating locations, 700 seismograms on solid memory.

Seismic low depth section shows the superficial layer presence up to 1- 2, 5 meters and high weathering zone development on 10 meters in depth.

Refraction seismic line Pr. L Telega (NE Campina) – displayed along landslide extension

$a-$travel time-distance curves; b - correspondent seismic section

Legend: *Slide rock masses: 1- loose Quaternary material, 2- Miocene debris;*

3- Miocene bedrock

The geoelectric investigation outlines horizontally the sliding area, and vertically the elements of the landslide surface – position, depth, shape, and the bedrock's relief. The quantitative interpretation of the resistivity geoelectrical vertical soundings, and the correlation with the geological structure identified 3 sliding surfaces, from which only the upper one (2-6m depth) was known before the stability works. There were localized the rainfall waters circulation and accumulation zones, areas with high sliding risk

Same results were obtained in sliding zones, been localized the principal elements of the landslides, with practical implications in land instability and estimation of the evolution of the destructive phenomena mechanisms.