INGEOLAC

CASE STUDY

Landslide monitoring in a small village with additional control during bored micropiles' execution, Ambite (Madrid, Spain)

CLIENT: GEO3TEC

THE CHALLENGE

Grupo TRAGSA identified a landslide at Ambite (Madrid, Spain), affecting the middle section of Calle del Olivo. The west sidewalk detachment from the road and the cracks in the concrete, all visible to the naked eye, made it advisable to take emergency action to stabilize the ground.

During Christmas 2022, Geo3Tec - InGeoRED contacted InGeoLAC in relation to the supply and installation of a wireless system to monitor the land sliding area. As this was an emergency action, InGeoLAC staff immediately travelled to Ambite to install the monitoring systems. Reference values obtained were reliable because these dates are low in traffic and Calle del Olivo was closed.

THE SOLUTION

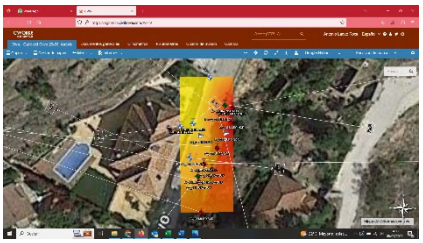
InGeoLAC proposes to Geo3Tec - InGeoRED to use a set of monitoring systems based on triaxial tiltmeters, without or with a distance meter, as well as crack meters and a static imagery camera. Data were recorded every ten minutes and transmitted immediately for display on CivilWorks compared to the reference values, together with rate of change, 2D vectors and a deformation map. Data management includes contrasting with set thresholds and producing warning messages, whenever applicable.

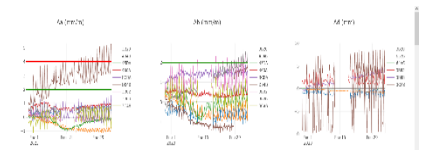
Flexibility was a must to the installed monitoring devices, with no cables, adapting to split project control into three phases: 1) Behaviour of the slope; 2) Start of stabilization works; 3) Integrity of the existing stone wall during micropiling.

THE OUTCOME

The information obtained was used to optimize the stabilization design, applying the "observational method" (Peck, R., 1969), with the corresponding cost savings.

Additionally, the use of this automatic and real-time wireless monitoring system allowed: 1) Working safely whilst using an 18.5 t drill rig in an area with cracks abounding in the concrete slab and in the ground; 2) Check that the existing houses and infrastructures did not develop deformation compromising their integrity or service.





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