Evaluation of the subsidence and risk of collapse in the Estació neighbourhood of Sallent City, Catalonia (Spain)

F. LÓPEZ¹, P. BUXÓ¹, J. PALAU¹, J. MARTURIÀ², A. CONCHA² & P. MARTÍNEZ²

1 Geocat Gestió de Proyectes SA, Tarradellas 34-36, 08029 Barcelona, Spain
flopez@ggp.cat
2 Institut Geològic de Catalunya, Balmes 209-211, 08006 Barcelona, Spain

Abstract The effects of underground evaporitic potassium salt mining, along with evolution of natural large karst cavities below the Estació neighbourhood at the city of Sallent (Barcelona), were theoretically evaluated. The vertical movement response, at the ground surface and at depth, was evaluated by finite element modelling. The numerical model considered the simple constitutive Mohr-Coulomb plasticity law, the different existing geological layers and different calculation stages for different depths of the natural cavity roof. Comparisons were made between theoretical calculated deformations and those resulting from topographic surveying and extensometer-monitoring at depth. It was found that the cavity void can potentially reach to the surface through collapse

Key words subsidence; monitoring; extensometer; Midas GTS