

SITE INVESTIGATION DURING CONSTRUCTION ON THE KARSTIFIED LIMESTONE TUFFS OF CONDEIXA, CENTRAL PORTUGAL.

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During the excavations for the foundations of a three stories building it was found a large dissolution fissure and smaller dissolution voids. As no previous geotechnical prospection was made, it was decided to evaluate the risk that the karstified limestone tuffs could cause to the building under construction.

The geotechnical study started with a detailed geological reconnaissance, revealing three main units: black cover soils (0.4m to 3.3m); limestone tuffs mixed with cover soils (0.0m to 4.6m) and limestone tuffs (more than 30.0m).

After discussing the time required for execution and the cost/benefit relationship of several prospection techniques it was decided to do a large number of destructive soundings, mainly in the footings location. The results revealed three important karstified cavities with serious problems for the building foundation and structure, and many smaller dissolution cavities, sometimes filled with soils. These limestone tuffs were formed on a continental environment by the precipitation of calcite carried in solution by water coming from a large limestone body at east. As the precipitated calcite mixed with terrigenous materials, a very heterogeneous body was created, turning difficult to understand the cementation distribution and thus the geotechnical properties of the limestone tuffs.

The treatment solutions choose included an accurate mapping of all excavated surfaces, dental cleaning and filling with concrete of every dissolution void in the foundation and the reinforcement of the building structure using continuous foundation beams connecting all footings. Till present the building behaved in perfect conditions.