

Earth Sciences Department

## Geotechnical behavior of rock mass excavations in road infrastructures

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### Objectives

Given the importance of the technical-economic costs associated with excavations of rock masses at roadworks and the national legal framework, the main goals of this investigation are:

- The development of a new methodology to evaluate the excavability of rock mass and excavation slope stability (Fig.1 to 3);
- Analysis of case studies and validation of methodological proposal in projects, to mitigate the gap between predicted and actual, in maintenance and rehabilitation of slope excavation, and in geotechnical risk analysis in the design, construction and operation phases.

### Methodology

- Analysis of excavability and stability restraints inherent to the terrain and to the equipment used: geological/geotechnical characteristics, fragmentation processes of rock mass, excavation methods and equipment, productivity and associated costs;
- Analysis of case studies in Portugal: selection of lithologies (granite/schist), database for comparison of excavation methods provided in project and actually made, direct observation of existing slope excavation / outcrops of rock masses.
- Design and validation of new methodology: adaptation of empirical classifications already published, analysis of selected national case studies, development and application of the proposed methodology, parameters obtained by back analysis and critical discussion of results.

### Expected Results

Obtaining a useful, reliable and easy to apply tool that will allow a more accurate estimate of excavability conditions and stability of rock masses and the optimization of design solutions facing the conditions of the masses, promoting the improvement of efficient cost control of contracts and the compliance with contractual terms.

