Title: *Tests of laboratory on materials coming from test embankments. Dam of l´Albagés (Lleida)*

Author: Esteban Campillo i Navarro
Tutors: Enrique Romero Morales & Eduardo Alonso Pérez de Ágreda

ABSTRACT

The future earth and rockfill dam of l'Albagés, placed in the region of Les Garrigues, will be formed by approximately 5 millions of m^3, with dimensions of 85 m height by approximately 750 m of length of coronation.

Due to this great volume of earth, the geological and geotechnical study of the present materials in the surroundings of the future dam was considered of great importance, in order to obtain these materials in the own valley of the dam. From this idea of study, besides of bore holes and pits for later geotechnical study in laboratory, two test embankments were constructed, one with clayey silt and the other basically with a rough material, product of the mixing between sandstone and argillite in the process of excavation. Besides the use of the material, it was studied the more suitable way of extraction and compaction. Once realized the embankments several tests were done inside (basically permeability and deformation tests) and were retired several samples block from both embankments to test in laboratory.

The present study tries to analyse the material of a global form from the samples extracted from the test embankments, testing in equipments to superior scales than habitual in laboratory. In this way it is tried to avoid the study of individualized material (matrice), obtaining results more appeared to the reality of the project.

For this purpose, a whole methodology was developed using experimental not conventional procedures. The tests are divided in mechanical tests, like direct shear, triaxial and the oedometer, from which we will extract the resistant parameters, compressibility and collapse of the material, and in hydraulic test like the test in oedometric cell and psychrometric test, from which we will extract basically the parameters of permeability and retention curve of water respectively. Also a distinction is realized in the description and utilization of the devices used depending on the material to test (rough material or clayey silt), due to the difference of scale as for the granulometry. In the rough material, a direct shear device is used of 300x300x150 mm, a triaxial of 250 mm of diameter by 500 mm of height and an oedometric equipment of 152 mm of diameter. On the other hand, in the clayey silt, due to a thin granulometry of the material, the determination of parameters is realized by means of conventional tests, that is to say, to a minor scale.

A comparative of the obtained results has been tried to realize using the tests contained in the report " Ensayos de laboratorio sobre materiales del cuerpo y cimentación de la presa de l´Albagés " (Romero et al. (2003)), and with the field tests, in order to study the influence of the scale effect and the typology of the material.

Besides, the above mentioned study tries to provide the whole experimental base of information of geotechnical parameters, that allows a hydraulic and mechanic analysis of the dam, as well as more sophisticated models to incorporate in the elasto-plastic type analysis for soils partially saturated.