GEOLOGICAL AND GEOMECHANICAL CHARACTERISTICS OF THE PLIO-PLEISTOCENE SEDIMENTS OF THE ACHAIA REGION

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The Plio-pleistocene formations of the Achaia region have been developed in three basins and are characterized by a variety of lithological horizons. In the lower ones the fine-grained facies (alternations of clayey marls, marls, silty sands and sandstones prevail, with a progressive transition upwards to the coarser facies, which at least in the Corinthian basin give coherent conglomerates of great thickness.

For the exemination of the physical and mechanical properties of these sediments, representative sempling procedures and deteiled laboretory testing were carried out with the following results.

a) Fine-grained sediments

They contain a high proportion of silt and present low to medium plasticity, while their porosity renges from 16-50%.

The values of the unconfined compressive strength, ranging from 0.4 to 24.7 Kg/cm^2, characterize very stiff to hard soil formations. Also, the coefficient of consolidation, C_c, values for the soft horizons (clayey marls of the Patraikos basin) are 0.160-0.240, showing that serious problems due to consolidation settlement should not be expected.

Finally, concerning the shear strength perameters, a progressive reduction of the cohesion and a corresponding increase of the angle of friction are observed from the clayey marls to silty sands and sandstones (c = 290 - 20 KPa and φ = 7° - 40°).

b) Coarse-grained sediments

The porosity ranges from 1.1% in the overlying conglomerates of the Corinthian basin to 7.9% in the conglomeratic lense-like beds of the fine-grained sediments of the same basin, while intermediate values, 2.3-3.8%, were found for the conglomerates of the Leondion basin, a fact which underlines the increased coherence of the former.

The unconfined compressive strength, as it is found from point load tests, ranges from 42 MPa (overlying conglomerates of the Corinthian basin) to 12 MPa for the conglomeratic lense-like beds in the fine facies of the same basin. Also the values of the shear strength parameters, show an analogous variation (c = 10.0 - 3.0 MPa and φ = 44° - 37°).

Concerning their rock-mass behaviour, determination of the maximum (φ_p) and residual (φ_r) angle of friction for characteristic discontinuites gave the following results: φ_p = 52° - 61° and φ_r = 46° - 47°.