

Experimental soil mechanics - the solution to sustainability engineering problems

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Abstract: Today's cities and infrastructure require designers and engineers to build on soil subgrade, which was previously considered unfavorable. With the increase of waste stream, it is becoming increasingly important to recycle these materials to the point as efficiently as possible. Road and foundation engineering, one of these industries that consumes a lot of soil material, can use construction and demolition materials (C&D) as industrial solid wastes.

Experimental soil mechanics deals with these problems and possibilities, by using laboratory tests to gain a better understanding of the mechanisms at work in soils. Various soil phenomena, such as cyclic and dynamic loading, grain crushability, soil stabilization, and thermal conductivity, need to be addressed to find practical solutions.

This presentation covers the selected range of experimental soil mechanics research methods concerning the above mentioned topics. I will discuss the problems associated with permeability, crushability, and compaction when dealing with waste soil materials. The C&D mechanical behavior of recycled asphalt pavement and recycled concrete aggregate during cyclic loading will also be illustrated.

Soil waste materials are promising replacement of natural aggregates which preserves spoiling of natural resources. Geotechnical engineers need to highlight possible differences between waste soil material and natural soil counterparts in order to fully utilize the advantages of waste soil application.