[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-GE Geological & Soil Environment

[A-GE30]Energy-Environment-Water Nexus and Sustainable Development

convener:Ming Zhang(Institute for Geo-Resources and Environment, Geological Survey of Japan, AIST), Ken Kawamoto(Graduate School of Science and Engineering, Saitama University), Xue Qiang(中国科学院武漢岩土力学研究所, 共同), Jet-Chau Wen(National Yunlin University)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session provides a broad platform for discussion and presentation of fundamental and up-to-date scientific results related to clean energy production, environmental remediation and restoration, waste management, water cycle, monitoring of water quality, management of water resources and interconnections among them for sustainable development. Presentations on the topics associated with social science that enhance public awareness, stakeholder empowerment and involvement, and policy decisions regarding the management of water, energy and the environment are also encouraged.

[AGE30-P11]Effects of mixing proportion on compaction and California bearing ratio properties of a crushed concrete blended with drinking water sludge and incineration ash

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Keywords:crushed concrete, drinking water sludge, incineration ash, compaction, California Bearing Ratio (CBR)

Solid waste materials are highly heterogeneous, depending on waste composition makes it difficult to understand their engineering characteristics. The research work was undertaken to determine the velarisation of construction and industrial wastes as an alternative for the road subgrade. Three different waste and recycled materials, crushed concrete (2.0mm<D<9.5mm), drinking water sludge (D<2mm), and incineration ash (D<2.0mm), and their various mixed proportion on dry mass basis were used to evaluate the California Bearing Ratio (CBR) and acceptability as per standard guidelines. Compaction tests were conducted to determine the maximum dry bulk densities to achieve the required density more than 98% of maximum dry bulk density, for the CBR test of road subgrade. CBR depends on the compaction energy, initial moisture contents and material. Compaction test results showed that compaction of the drinking water sludge is dependent on the compactive effort and initial moisture contents while crushed concrete and incineration ash being non-cohesive material depend on the compactive efforts and slightly on initial moisture contents. Experimental results showed that mixing proportion play a vital role in the load bearing capacity of the waste materials. Compaction of the three mixed samples being a well graded sample helps to fill the voids efficiently and improves its load taking properties. In case of three mixed sample with dry mass ratio of 5-2-3 of (sludge, crushed concrete and incineration ash) showed 10, 2 and 1.67 times more CBR as compared to sludge, crushed concrete and incineration as respectively.