Chapter 56
Setting Time of Treated Sludge Containing Blended Binder

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Abstract Disposal of sludge from water treatment facilities poses a significant difficulty for the environment and landfills management. Leachate generated by landfill disposal leads to soil and groundwater contamination. Numerous research was published to treat the sludge; however, limited study on the setting time characteristics of sludge after being treated with a blended binder was found. This paper presents the setting time of water treatment sludge in a semi-solid form treated with different types of a blended binder. This paper also examines the effect of various binder types on the consistency index to determine the amount of water needed in the water binder content. Industrial waste materials used in this study are fly ash (FA), waste paper sludge ash (WPSA), and palm oil fuel ash (POFA). Industrial waste was used as replacement materials for ordinary portland cement (OPC) at a ratio of 50:50, 60:40, and 60:40 of OPC: FA, OPC: WPSA, and OPC: POFA blended binders with and without sludge as a comparison. The water/binder ratio of mix proportion without sludge was based on a standard consistency test. In comparison, the sample with sludge is blended binders mixed with WTS only at a mixed proportion of binder: WTS of 1.1. All treated sludge samples were then used to determine their set time. The results show that WTS treated with OPC: FA and OPC: POFA has a longer setting time than OPC. Meanwhile, WTS treated with OPC: WPSA provides a 65% faster setting time than WTS treated with OPC.

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