Flowable Fills Developed With High Volumes of Fly Ash

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ABSTRACT

Flowable fill, also known as Controlled Low Strength Material (CLSM), is used in place of ordinary geotechnical fill in construction applications. Fly ash playDue to the addition of air quality controls on coal-fired power plants, fly ash characteristics have an increasing amount of free carbon, ammonia, and/or lime residue. This results in more fly ash being disposed in landfills than being beneficially used.

This paper presents the results of a laboratory study to 1) produce excavatable flowable fill with maximum ash incorporation (i.e., maximum amount of variable quality fly ash, minimum amount of Portland cement, and no sand) and 2) determine the effect of different types of fly ash on the engineering properties of the flowable fills. The fly ashes evaluated for this project differ based on carbon, ammonia, and lime content. The flowable fill mixes were tested for plastic state characteristics, unconfined compressive strength, and confined compressive strength in triaxial compression. Overall, the results indicate that high volumes of coal ash can be successfully used in flowable fill applications.

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