

# Potential Use of FGD as a Flowable-Fill

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## ABSTRACT

Flowable fills are an effective and practical alternative to commonly used compacted earth backfills. Flowable fill is a cementitious material, commonly a blend of cement, fly ash, sand and water, that is self-leveling at time of placement, does not require compaction, may harden quickly within a few hours and can be readily excavated in the future if need be. Many FGD materials have low unit weight and good shear strength characteristics and thus hold promise for flowable fill applications. This paper focuses on the potential of using two types of FGD materials (spray dryer and wet fixated FGD) in flowable fill as a replacement for conventional fly ash. Several design mixes were considered. The design mixes consisted of varying amounts of FGD, cement, lime, and water. The mixes were tested in the laboratory for flowability, unit weight, moisture content, unconfined compressive strength, erodibility, set-time, penetration, and long-term strength characteristics. Tests were conducted for up to 90 days of curing. The FGD flowable fill without any additives was observed to be as good as a regular (normal set) flowable fill in terms of placeability, unconfined compressive strength, and diggability. FGD flowable fill with additives and admixtures compares favorably with the characteristics of conventional quick set-flowable fills. Some of the potential concerns dealing with anchoring of pipes, confinement prior to initial set of material, and potential for corrosion of pipes are discussed and procedures to alleviate these concerns are suggested.