Illinois PCC Dry Bottom Ash in Construction of Precast and Prestressed Concrete Piles

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ABSTRACT

Precast and prestressed concrete piles, approximately 12 to 18 inch diameter are frequently used to support heavy building and bridge structures. Fly ash has long been recognized as a construction material used frequently in several Portland cement and concrete products, structural fills, embankments, and road bases/subbases. However, use of Illinois PCC dry bottom ash in construction of precast concrete piles so far has been very limited, if any, mainly due to the lack of technical data to convince the engineering community that bottom ash could be used in precast and prestressed concrete piles without jeopardizing their performance and the structural integrity to resist the anticipated loads. The main objectives of this investigation were to develop scientific data to demonstrate the effective use of bottom ash from burning of coal in Illinois in precast and prestressed concrete piles, and to develop suitable composites that could be used to construct precast and prestressed concrete piles. The goals of this investigation were accomplished by performing a series of laboratory tests on various concrete composites, and field tests on full size piles made with concrete composites containing Illinois PCC dry bottom ash. The proposed paper will present testing procedures used in the investigation, and detailed results obtained from laboratory tests performed on concrete composites and an equivalent conventional concrete.