

Evaluation of Processed Bottom Ash for Use as Lightweight Aggregate in the Production of Concrete Masonry Units

Ben Phillips, Roger Perrone and Jack Groppo

Center for Applied Energy Research
University of Kentucky
Lexington, Kentucky

A series of procedures were developed to evaluate bottom ash for producing lightweight concrete masonry units (CMU's). Bottom ash from three sources were used and initially evaluated to optimize gradation in order to improve compaction.

Test cylinders were then produced using a pneumatic cylinder with vibration to simulate the conditions used in commercial CMU production. Cement ratios were varied as well as the use of increasing proportions of fly ash as aggregate in order to establish a mix design for each aggregate that would provide acceptable results in terms of strength, unit weight and cost. Cylinder specimens were load tested at various time intervals to quantify strength development. Early strength gain with high proportions of fly ash suggests that the beneficial effects of fly ash were due to gradation considerations rather than pozzolanic reactions. The mix designs identified from the test cylinders were then used to produce standard-size CMU's (8"x8"x16") using a batch block machine, which were tested and correlated with results of the test cylinders.

Submitted for consideration in the 2005 World of Coal Ash, April 11-15, 2005,
Lexington, Kentucky, USA.