

DEVELOPMENT OF CLSM USING COAL ASH AND WOOD ASH, A SOURCE OF NEW POZZOLANIC MATERIALS

By Tarun R. Naik, Rudolph N. Kraus, Shiw S. Singh, and Parisha P. Chanodia

Report No. CBU-2000-36

ABSTRACT

Significant amount of ash is generated from burning wood with supplementary fuels such as coal, oil, natural gas, and coke by pulp and paper mills and wood-products manufacturers. Thus, the ash generated from such facilities is a mixture of wood ash and other ashes generated from such supplemental fuels. In this investigation, such wood ash is referred to as a combined-fuel ash (CFA). This investigation was carried out to develop Controlled Low-Strength Materials (CLSM) mixtures using various sources of CFAs. Three different series of CLSM mixtures were manufactured using five sources of CFAs. Each series of CLSM mixtures was designed for a different long-term compressive strength, <0.7 MPa (<100 psi), 0.7 to 3.4 MPa (100 to 500 psi), and 3.4 to 8.3 MPa (500 to 1,200 psi). All CLSM mixtures were tested for flow, bleedwater, settlement, shrinkage and cracking, setting characteristics, density, compressive strength, and permeability. The results revealed that CLSM, meeting ACI 229 requirements, can be manufactured using substantial amounts of CFAs.