Abstract Submitted
for the TSS16 Meeting of
The American Physical Society

Optimal Proportioning, Tempering, and Testing of Adobe Brick, Compressed Stabilized Earthen Block, and Rammed Earth for Low-Cost, Sustainable Construction: A Literature Review LADONNA M. WATERS, M. WATERS, MIEN JAO, Lamar University — Soil bricks have been used for building and construction for thousands of years. They are environmental friendly and 20 - 30The research goal is to develop a next generation masonry construction bricks utilizing advanced materials (polymers and nanotubes) that are energy efficient, have low cost of production and are more environmentally sustainable than traditional soil bricks. As a step toward the ultimate research goal, this study investigates different types of soil brick construction, and examines the optimal proportions of clay, sand, and tempering material that results in the highest strength for each type. The brick types examined are adobe, compressed stabilized earthen block (CSEB), and rammed earth. Natural and synthetic tempering materials are compared, and optimal dimensions of temper material are examined. Preferred testing methods to determine compressive strength and optimum moisture content are also investigated in this study. Based on the results of the study, types of stabilization agent, percentage of sand, silt, and clay content, dimensions of fibers, and testing method for strength and durability are recommended to obtain the optimum results for future study.

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Date submitted: 29 Mar 2016 Electronic form version 1.4