



# EARTH USA 2011

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**Title:**

Innovative and Sustainable Design of Compressed Earth Block (CEB) Building Systems

**Abstract:**

This project considers an ancient building material, earthen construction, and asks how earth blocks can be integrated with mainstream building practices for the U.S. and developed countries as a transformational, sustainable material. Building designers must approach energy, economic, and environmental considerations in a holistic manner in order to meet the challenge of dramatically decreasing energy consumption and material resources compared with conventional building envelopes while doing so at lower construction cost and minimizing ecological impact. The Texas Tech University Whitacre College of Engineering and TTU College of Architecture have been working with EarthCo Building Systems to develop a comprehensive building system for efficient and low-cost manufacture and placement of earthen building envelopes using large-scale compressed earth blocks (CEBs). By scaling up the production and placement of CEBs, manual labor and production time can be minimized, and CEB technology can be made cost competitive with traditional building technologies. This paper presents the development of the equipment for manufacturing the blocks, approaches for materials characterization, simulation of wall system performance, and application of the technology in several case studies.