Lessons from the Past:

Re-Examining Earthen Design and Construction as an Abundant, Innovative, Acoustical, and Energy Efficient Ingredient of Sustainable Architecture

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Environmental doom and gloom stories seem to circulate the news and stimulate media on a daily basis, but there is hope. Architecture has the ability to span time, assimilating past and present methods of design into hybrid assemblies per particular sites and occupancies. As architects, engineers, and contractors move rapidly toward more sustainable building practices, educators, students, and design professionals must experiment and continue to research the built environment while being mindful of the past. Earthen design and construction is a method preceding modern day technology still able to equip architects through historical relevancy. A new enthusiasm for architecture literally based on the earth can support a return to an early and basic form of sustainability, which existed merely as a regional development decades if not centuries before it was considered necessary or trendy. People simply managed local resources and developed labor skills that correlated to the local environment and readily available pallette of materials. There was a personal connection that defined and related to function, occupancy, and lifestyle - ultimately steering design and construction. This lesson from the past is the heart of modern day sustainability.

Typically known as the three R's - reuse, reduce, and recycle - a forth and equally important factor is "regional." Earth is one such material capable of addressing and fulfilling all four R's. Soils from footings, basements, swimming pools, general site cut, and utilities are sometimes spoils and hauled off-site for a fee. At minimum, the embodied energy of transporting soil off-site and transporting other materials to the site can be minimized by using existing soil to produce a portion of construction materials for the proposed building as a method of preserving natural resources. Furthermore, since CEB (Compressed Earth Block) units do not require heat to cure, they are not absorbing that additional embodied energy prior to installation. Embodied energy is a compound equation, so one must also consider differences between on-site and factory production. The carbon footprint and total embodied energy associated with building a factory, transporting the raw materials, manufacturing the product, and transporting the final goods to the construction site represents more environmental impact when compared to making the CEB on site from typical spoils.

History has proven that diverse nationalities from various climatic locations have successfully constructed earthen structures that outlast most other construction types while having minimal impact on the environment. The design profession can learn a great deal from re-examining these structures, assimilating traditional and modern approaches, and allowing a hybrid of technologies to emerge. The materials and design need to be sustainable at the macro level of the environment, macro level of the site, and for the buildings's entire life span. This poster explores Compressed Earth Block as a viable alternative for residential construction through a collaborative multidisciplinary research project including students of various education levels and a partnership with Habitat for Humanity comparing two adjacent and simultaneously constructed residences of equal interior volume -- one CEB residence and one wood-framed residence.