

## PROJECT DESCRIPTIONS

**1. *To discover special shapes, bevels, chamfers, and reveals that can be achieved in the rammed earth.***

This project entails building small forms and experimenting with how subtractions can be made in the surface of rammed earth. Issues will be the angle of repose possible, the tolerance for sharp edges, complexity of shapes, the sequence and difficulty of removing forms.

**2. *To determine pigment additives that will achieve desired colors for earth walls.***

This project involves experimentation with colors that can be achieved in rammed earth mixtures and also how various color layers can be compacted for particular visual effects. Small forms will be necessary to allow many iterations of the mixing and tamping process.

**3. *To discover how objects might be embedded and revealed in surface of earth walls.***

Like the other two, this project necessitates building small forms to enable investigation into the sorts of objects that might be embedded into rammed earth to articulate the surface, create new textures, allow light to pass through, form storage niches, etc. Issues will be the fragility of materials subjected to tamping, the drying time of rammed earth, methods of anchoring objects into the earth mix.

**4. *To determine a soil/cement mix that will achieve the compressive strength required by code.***

This project must happen in cycles, because the building code requires that the earth samples be cured for at least 14 and 28 days before they are crushed to determine compressive strength. Two rounds of earth mixing, tamping and crushing will be necessary to determine a reliable mix to use on the residence to be built next. We will begin with standard mixes purchased from B&R Gravel (adobe mix and engineered fill). From there, we will vary the amounts of cement, and pigment to learn which elements contribute to or detract from the strength of the mix. We will break test cylinders to make sure that we conform to industry standards.

**5. *To invent formwork refinements necessary to allow a discontinuous concrete bond beam to be poured at top of walls.***

The house to be built next will be constructed with an incremental form system. The forms will be used and then moved. One important issue is whether the bond beam will be poured in discontinuous batches (but tied together with rebar) using the forms when they are already in place, or poured as one continuous member at the end, requiring all new formwork. This is critical to the planning of the project but requires the most invention. It will require working in stages to simulate the real construction sequence.

**6. *To investigate methods of forming a bond beam at the top of compressed earth block walls.***

The block walls require a bond beam for lateral support. There may be several ways to form this beam (board forms, partial blocks with a solid cavity, etc.) and several choices for its appearance (exposed, hidden, exposed inside, hidden outside, etc.). Research into known methods will preface experimentation at the top of the walls. Issues will be the ease of construction, the necessity for cutting blocks or forming partial blocks, and the location of load-bearing roof assemblies.

**7. *To investigate connections from compressed block walls to frame walls or glazing assemblies.***

This project necessitates the building of a block wall in order to plan the connections for framed walls or glazing assemblies that connect to it in a perpendicular relationship. Issues will be the placement of connectors, articulation of frame, edge, joint, change of materials, etc. Is it possible to create seamless connections or must a third material be used as a thermal and structural bridge?

**8. *To test the efficacy of load bearing fasteners for the attachment of cabinets, shelves, light fixtures, and other appendages to compressed block walls. To experiment with other embedded objects to enable investigation into the sorts of objects that might be laid into compressed earth block walls to articulate the surface, create new textures, allow light to pass through, form storage niches, etc.*** This project requires the construction of a block wall in order to embed fasteners and other objects. Issues will be the fragility of fasteners and other materials subjected to compressive load, and the methods of anchoring objects into the wall.

**9. *To determine the qualities of various plaster mixes when applied to the surface of a compressed earth block wall.***

This project relies on a large surface area of block wall to accept plaster of two or more types and finishes. Research and practice will preface the final application of plasters to our test wall.

**10.** *To determine the type of joint that will be used between blocks on the future residence.*

The various kinds of tooled joints as well as un-tooled will be explored as the compressed earth block walls are laid up. Issues will include time necessary for accomplishment of various joints, tools needed, expression of joint versus expression of wall, articulation of mortar with color pigment, clean up and efflorescence.

*To document the research of each project team and the summary information, for use by the subsequent design/build class.*

This project results two deliverables – 1) a personal sketch/photo journal kept by each student with daily entries recording design, planning, purchases, working methods, results and conclusions and 2) summary pages for a desktop publication that can be used as an information manual for the spring design/build studio. Each project team will collect journal images and information to be organized into this document.