

Earth Bag House Construction Guide

ECHO Asia Impact Center

Provided below are the key steps we used to build an Earth Bag Seed Storage House on the new ECHO Asia Small Farm Resource Center in Thailand.

Dimensions were as follows:

Circumference - 11.60m

Wall Height (including cement foundation) - 1.65m

Diameter ~ 3.5m



1. Built foundation using cinder block and cement to keep facility out of any standing water during monsoon season Also for a nice flat working surface. Door Frame was constructed at this stage.



2. Bags were filled with soil mix (see next photo) about 2/3 full to provide loose workable bag that can be shaped/flatted slightly. Barbed wire is used to keep bags in place and held together. Bags were tamped into place manually.



3. Soil used for filling bags AND mixing plaster. Soil is a loamy clay by my estimation, maybe 50% clay with fine sand. Soil was sifted to remove larger aggregates.



4. Note: No pillar or roof construction was added at this point.



5. We originally constructed a 'floating' bamboo roof, but later decided to go with a more permanent frame (see later).



6. Mixing final plaster/finish.
Soil mixture for filling bags AND mixing plaster was roughly the same. Approximately 60% soil : 40% rice hulls. Nothing else was added except for water.



7. More sturdy metal frame was added. Frame is 'fixed' to rebar pylons sunken into the earthabag walls.

8. Ceiling was added to improve insulation and cooling. A layer of plastic was laid on ply wood and rices hulls were added on top for insulation.



9. We used a locally available grass thatching for our roof.

10. Intentional gap left between walls and roof for air flow and warm air escape.



11. Rebar pylons were hammered into the earth bag walls (note additional cross piece) and roofing frame was welded to it.



12. Inside finished earthbag house with ceiling. No photo available but small 'v-shaped' pieces of wire were fixed into the bags at regular intervals. These extruding pieces (perpendicular to the wall) helped to hold the mudding up as the plaster was being applied. Appropriate clay content and/or manure will improve stickiness.





13. Note: Bags were cut away before applying plaster.



14. Final Earthbag Seed Storage House!

*Our research has shown that these facilities stay cool and stable relative to ambient conditions, but humidity can be high! Seed must sealed for adequate storage!



This is the Earthbag House that was built by our partners in the Delta Region of Myanmar. They went with a square design.

Happy building!!

Compiled by Patrick Trail. Contact ptrail@echonet.org for questions.

