

# STRAWBALE DETAILS



Exterior View of Strawbale and Window

It has been a long time between blog posts, but there will be a few catchup. Catherine has been spending her weekends finishing up all the detailing on the straw bale library interior. We left the exterior finishing to the experts because it has to be waterproof!



Bamboo is tied through the bales to lock them in place, courtesy of "Boa Constructor".

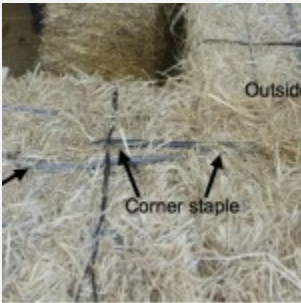
After the bale raising party, there is still plenty of work to be done before you have a finished bale room. The walls of rough bales need to be completely locked into place, and to have their surfaces prepped for the final finishes (stucco on the outside, plaster on the inside).

Locking the bales in place to the foundation starts with the "imbalers" or pieces of rebar that were embedded in the foundation onto which the first row of bales were placed. The sill plates also have 10d nails in them that act like velcro on the underside of the bales. Between the sill plates, the bed for the first row of bales also includes a layer of gravel to allow drainage should

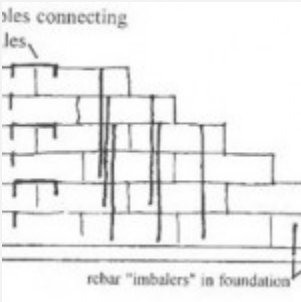
(heaven forbid!) any water ever get inside the bale wall. The key to the longevity and structural integrity of a strawbale construction is keeping the water out!



Underlayment



Lots of details on top of the first course of bales



Side view of bale courses

As the walls were built, the bales were notched into the wooden frame, and the corners were locked together with alternating bales at the corners (like brick laying), and then further locked in with large rebar "staples" that were pounded in on each layer. On the first row of bales, the electrical wiring is also run to electrical boxes for outlets around the room. Old-school strawbale construction has you pounding rebar pins vertically down through the stack of bales to tie them together, but for in-fill construction, this is difficult because you have a roof in place above your walls. Instead, the bale walls are locked together with bamboo poles on the inside and outside that are tied through the wall and tightened to make the bale walls monolithic

structures. The top row of bales are held in place on the outside wall by an exterior beam that runs around the perimeter of the room. The top row of bales is then notched and “persuaded” into place against this beam which prevents them from falling out. These details were all complete on the day of the bale raising, then the process of completing the walls on the interior began.



2x4's for the bookshelves



Deep windows

The final step for locking the walls in to place, is to use a chainsaw to notch the bales at regular intervals around the interior wall so that vertical 2x4s can be installed to lock the bales in on the inside. (Standing on a ladder, cutting straw with a chainsaw is fun for about 10 minutes.) These vertical 2x4s (which visible in the pictures at right with green spray paint on them – all these pictures can be opened to see larger versions) not only help prevent the bale wall from toppling into the room during an earthquake, but they also provide mounting points to help prevent bookshelves from toppling in an earthquake (this is, after all, the library). In addition, they provide the internal framing for attaching the lath needed for completing the window details.



When finished, straw is tightly packed under the lath



Catherine pounding in straw!

Window and interior wall finishing is a bit more like sculpture than carpentry – that is, if your preferred media are straw and expanded metal lath. To take the raw end of strawbales, and make them into a smooth firm surface that can be a finished plastered surface, you need to staple metal lath next to the window opening, then bend it around and staple it to the interior 2×4. You then proceed to ram loose straw into this uneven space with improvised tools until you have a nicely finished curved opening to the window that can be plastered, and won't crack if you then lean against it. This is especially important in the large window seat!



The window area -- ready for plaster



Close-up of the straw packed in

The main interior walls are a bit easier as they are already relatively smooth. Once you have found and filled in all the little chinks and gaps in the straw at the top of the bales and around the edges, you can attach lath over the entire surface. There is some interesting constructs like corner keepers to make out of various types of lath. Several weekends were spent fabricating all the details and installing them with about 2000 staples to keep everything in place. Now the entire room is finally trued up, nicely finished and has a surface ready for plastering. Whew!



Close-up of corner

Source : <http://www.301monroe.com/?p=231>