

Raising the Walls for a Strawbale House

All owner building is a challenge, and each house design has its own peculiar challenges. In this first of a three-part series Alan and Fiona describe getting started, and what they would do differently if they built again.

by Alan Burdon and Fiona Kotvojs

Narooma, New South Wales

OUR home is more complex than many others. For a range of reasons it is a combination of strawbale and rammed earth with a pole frame. It is two-storey, with a split-level ground floor. All these factors created some complexities with the strawbale wall raising.

We completed the rammed earth walls and put on the roof before we started to raise the straw bale walls. We chose to use rice rather than wheat bales because they produce firmer bales and are less interesting to vermin. We sourced the bales from Trent Gardiner and they were very high quality. We had allowed a 10 per cent wastage factor; in reality out of 618 there were only four wasted — and these hadn't been charged for as Trent had noticed that they weren't great when he delivered them. Even better, not one

bale fell apart while being handled.

We had organised to raise the walls through a workshop with Frank Thomas of Yesterday–Today–Tomorrow–Strawbale Construction as the facilitator. We met with him before the workshop to discuss it, but it would have been more effective if we had organised for Frank to come to the site.

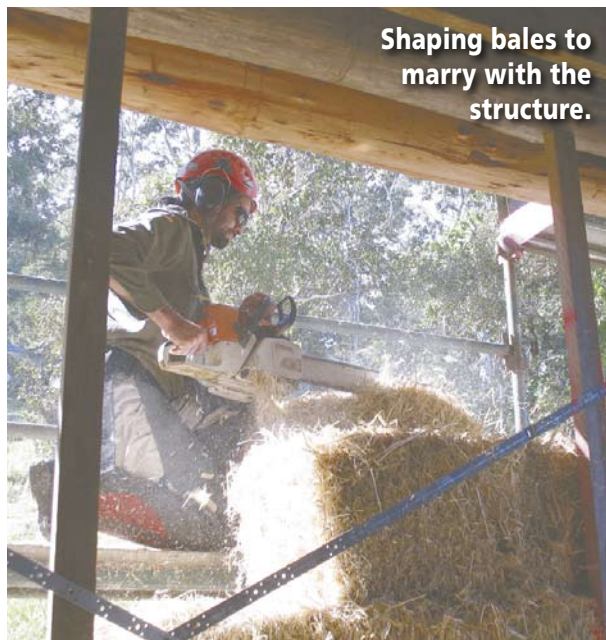
Frank advertised the workshop and we had more applicants than could effectively and safely work on the site, so we limited it to 20 per day giving priority to those who could participate for the four days. With one exception, the participants were all thinking about building strawbale homes for themselves.

We trimmed the ends of the bales more square, making packing them closely together easier. An electric hedge trimmer was effective and was cleaner and quieter than the petrol model. If we were doing this again and had more time we would do it before the workshop.

The hedge trimmer did a better job of squaring bale ends.



Shaping bales to marry with the structure.



Bales were shortened to needed sizes by retying using special needles.



Bales should be aligned before tying down.



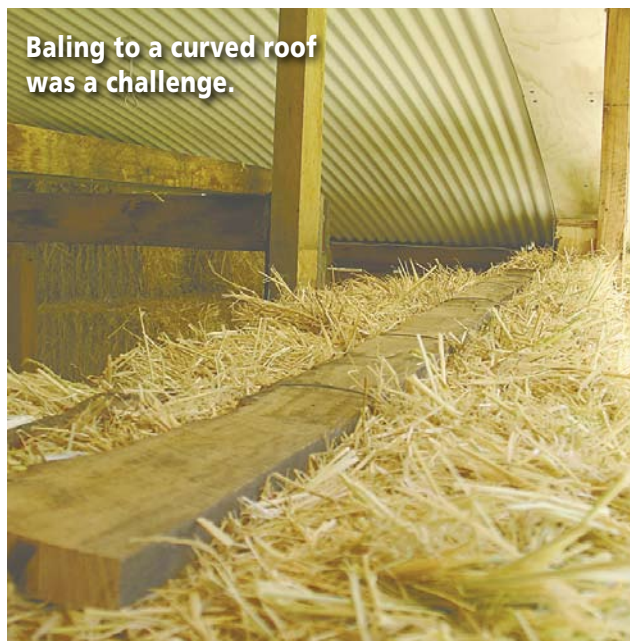
The base was a timber plate with gravel fill. Where tie wires couldn't be easily passed beneath, we made holes in the sides to pass the wire through. We placed pieces of conduit between the holes so that the wire wouldn't be obstructed by the gravel. We then stacked the trimmed bales onto this. We had base-plates at both floor levels.

Joining the bales to a pole required a special technique. We cut into the bale so that it fitted around the internal frame (for lined areas), or a timber against the structure. One of the workshop participants was an expert with a chainsaw, which helped here, but took a lot of time.

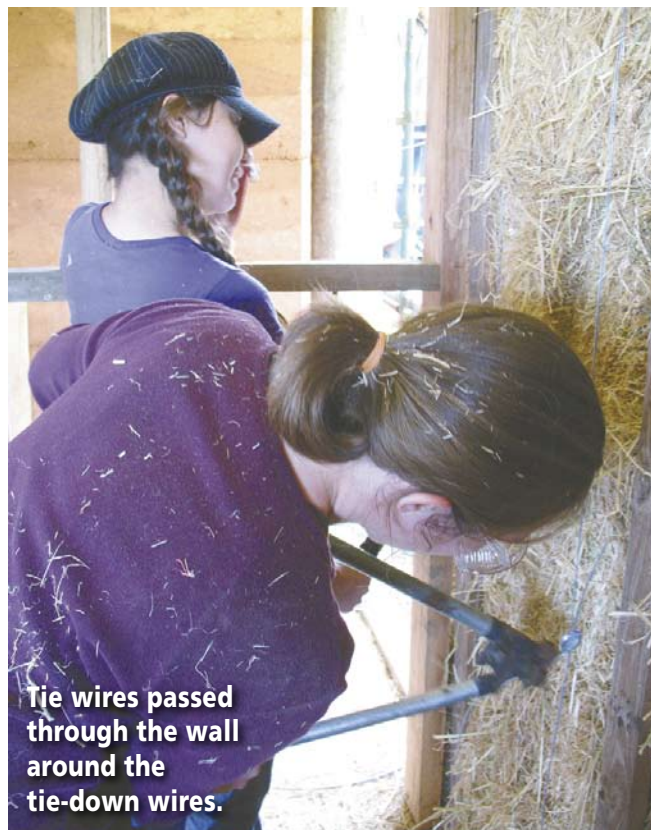
Next time we would design it so that the need for cutting to fit was kept to a minimum. We would also ensure that cutting did not need to go beyond any string. While the strings can be moved, it is difficult and bales are likely to come apart.

We created short bales as required using a two-pronged needle. The baler twine was a different colour to that on the original bale to make identifying old and new twine easier and avoid cutting the wrong strings. The twine we bought (from our local farming supplier) wasn't strong and broke easily so we doubled it up. Next time we would order in stronger twine.

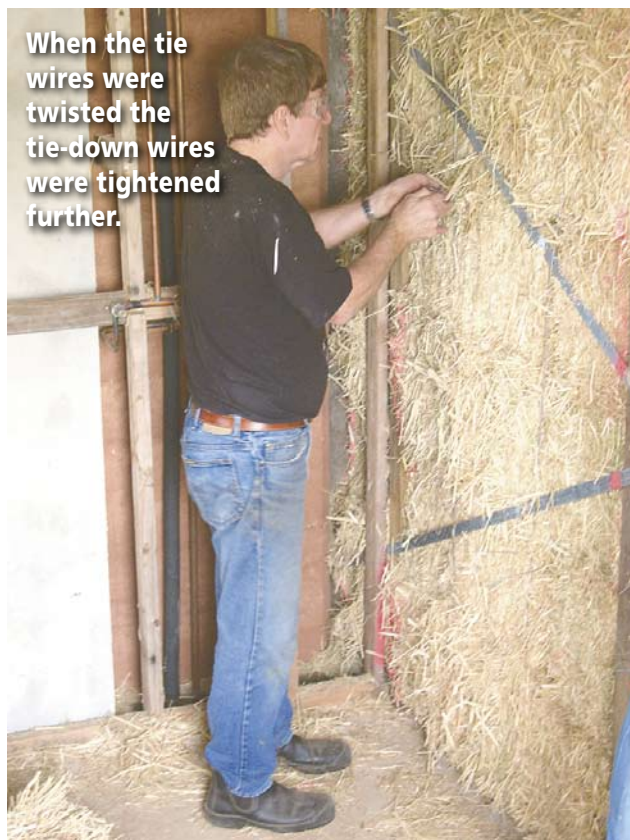
A wooden mallet (one very large and a smaller one pictured) was used to bash the bales to improve their alignment. The bales didn't move easily and we didn't do this enough before we tied the bales down. You really need to ensure the faces of all bales are aligned with each other (no bulges or dips). This caused lots of problems when we got to the render stage. We placed the 150 mm x 20 mm top



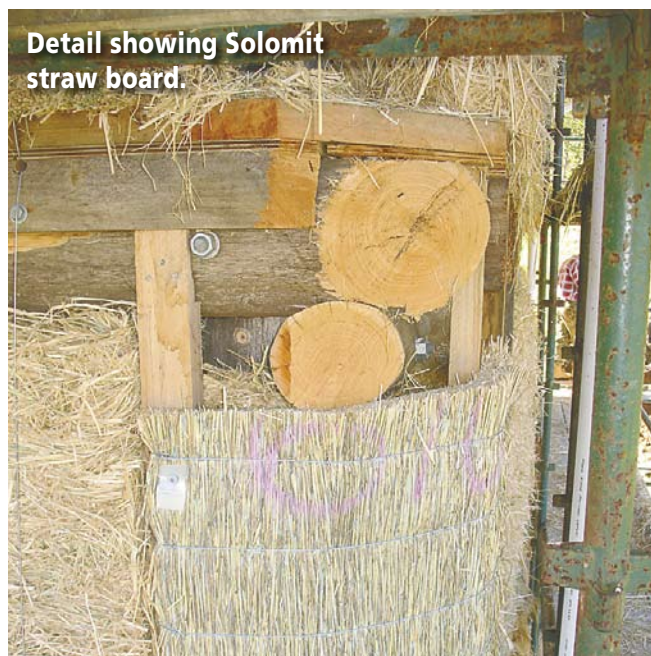
Baling to a curved roof was a challenge.



Tie wires passed through the wall around the tie-down wires.



When the tie wires were twisted the tie-down wires were tightened further.



Detail showing Solomit straw board.

plates along all walls and then tied them down with 2.5 mm medium high-tensile fencing wire, passing it under the base plates or through the conduits. Our curved roof left space that was difficult to infill. Plywood was screwed to the roof to prevent condensation problems.

The ends of the wire were joined with gripples and then tightened. In theory these should be on alternate sides

to balance the pull but this didn't always happen. We tried to whack some of the bales into a better position, but at this stage it was virtually impossible to move them. We tried using the chainsaw and trimmer to cut off the protruding sections but this didn't work well as they tended to pull out whole chunks and cut the wires. Lesson learnt is to make sure that the walls are straight before you tie down, and definitely before you



Another piece of Solomit straw board is secured.



More straw board covering the gaps.



Installing window frames.

tighten them.

In taller walls we put a top plate in after four layers and then compressed the bales below. Once compressed the top plate was screwed to the pole frame. This gave each section stability.

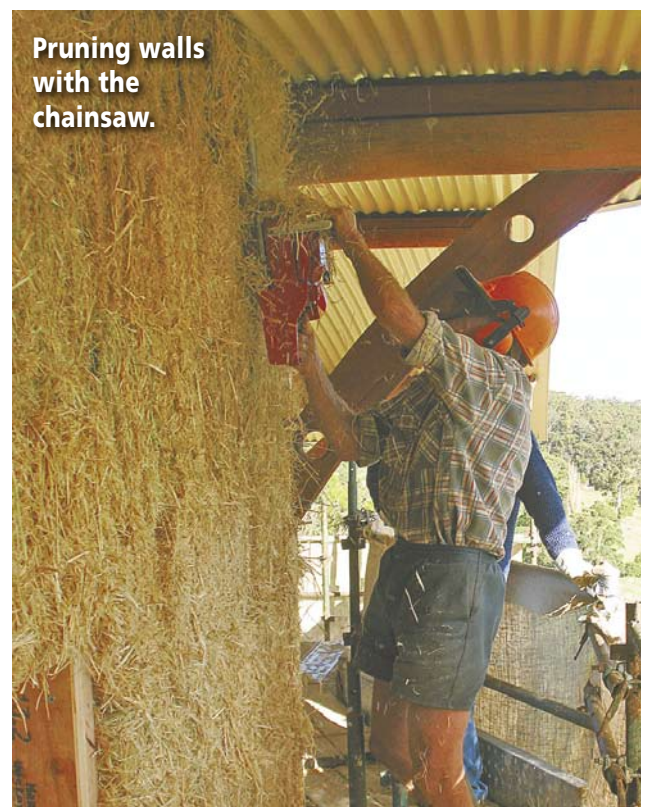
A piece of 2.5 mm tie-wire was passed around the wire on the outside and inside of the wall making a loop. This loop was then twisted to make it shorter, drawing the vertical wires together, tightening them further.

We had a number of difficult spots because of the pole frame. We hadn't really worked out what to do with these sections before we started raising the walls. We used a strawboard called Solomit in many of these locations. It can be cut to size, and bent into a smooth curve (with the straw running along the curve rather than across the curve) and screwed in place. We then packed behind it with straw.

Windows boxes were of 200 mm x 50 mm Hyspan and were attached to 100 mm x 50 mm verticals screwed to the ceiling and floor beams to ensure rigidity. We should have done this in advance but through a misunderstanding it had to be done during the workshop taking people away from the baling.

The wall was then built around the box and the section above and below the window filled separately.

Once completed, the walls were pruned with a chainsaw and a hedge trimmer. We found the trimmer to be easier and more effective. At this time we also shaped the window reveals.



Pruning walls with the chainsaw.



At the completion of the four-day workshop, the walls had all been raised and we were ready to start the render.

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