

# STRAW BALE ODYSSEY

Jon Haeme

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The first straw bale house built in Illinois (1995) has about 1,500 square feet (139 m<sup>2</sup>) of living space.

**W**e had been renting an old farmhouse, freezing our butts off every winter, when an opportunity to buy a five acre farmstead came our way. It had an old rundown house, which we considered fixing up. But as we tore into it, we realized that we would have to spend a lot of money, and still wouldn't have a very energy-efficient house.



We tore down the 100 year old farmhouse on the site and salvaged the limestone cellar, cistern, and as much of the lumber as possible.

The old house was in much worse shape than it appears in this picture.

The wheat straw was harvested four miles (6.4 km) down the road by a local farmer, and transported directly from the field to the construction site. We used 200 bales at US\$1.40 each.



At about the same time, I read an article in *HP35*, *Straw and Solar*, by Mark Hawes. Something just clicked, and I told my wife June that I wanted to build a straw bale house.

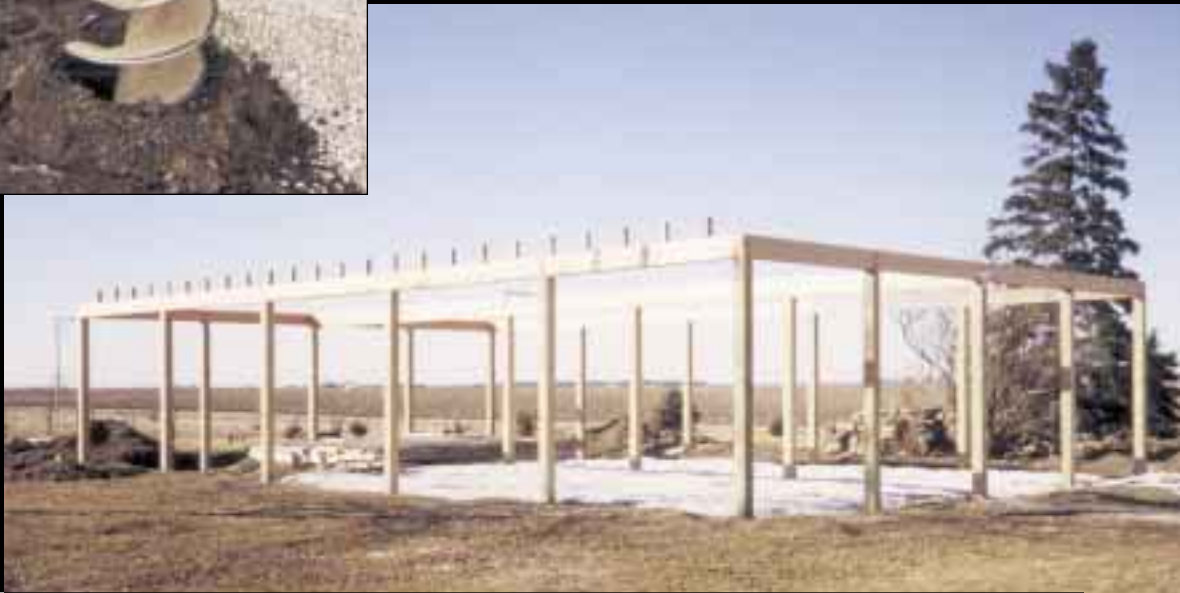
Here the cellar and cistern are being rebuilt using treated lumber sill plates.

The cistern collects rainwater for the garden.



Post auger digging post holes.

Post and beam frame. Built like a pole barn, 6 by 6 treated posts are buried 4 feet (1.2 m) deep on concrete footings and backfilled with gravel.



She thought I was losing my mind. I suggested that we travel to Arizona and see one. We contacted the good folks from Out on Bale in Tucson, and signed up for one of their weekend workshops. After seeing a straw bale house and attending a workshop, we were both convinced that it was a good idea. This photo essay shows the project as it unfolded...

## Straw Bale Construction



The framed hip roof has a 6/12 pitch with 2 foot (0.6 m) overhangs.



The kitchen, living room, and dining room fill one large passive solar room on an insulated slab.

The rest of the house is framed over the cellar and crawlspace.

1/4 inch (6 mm) galvanized hardware cloth is buried in gravel around the perimeter as a rodent shield.

Detail of rebar placement.



I built a frame to support the straw around the perimeter of the slab, to be consistent with the other foundation-to-wall detail.

## Straw Bale Construction



The floor joists were drilled, and rebar was inserted to impale the first course of straw.



The framing finished. Simple 2 by 6 frames were built for doors and windows.



Tar paper was put under the straw as a vapor barrier.

Chicken wire was tacked up, and later pulled over the straw.



## Straw Bale Construction



Stacking bales begins. Some bales were cut and retied to fit between posts and window frames.

Bamboo was used to pin the bales vertically.

Dowel rods were pounded into the straw from the door and window frames.



Interior walls are 2 by 4s, framed 24 inches (61 cm) on center. Both the slab floor area and the wood floor over the cellar are visible.

The loose ends of straw were shaved using a 4 inch (10 cm) grinder with a chainsaw blade.



## Straw Bale Construction

The bales in place.  
People slowed down  
as they drove by  
and asked what we  
were doing.



Window in place in the straw.  
100 square feet (9.3 m<sup>2</sup>) of low-E  
thermal pane glass on the south side  
lets in the sun.

We called on our friends from the nearby community of Stelle for the wallraising. About thirty people came to help, despite temperatures over 100°F (38°C).



Old circular saw blades and threaded rod tie connecting interior walls to the straw.

## Straw Bale Construction



The stucco goes on—three coats, hand troweled. This was the most labor-intensive part of the project.



Tarps keep the stucco from drying too fast in the summer sun, and protect the straw from getting wet in the rain.



# AN RE SYSTEM TOPS IT ALL OFF



I used my solar-powered workshop trailer (see *HP47*) to provide all the power for construction. We tore down the old farmhouse and salvaged as much of the old materials as was practical. We set posts in the late fall of 1994 and started construction in early spring of 1995. We moved into our new house in early spring of 1996 with many details yet to be completed, but it was ours. We are still working on it.

We have installed a 1 KW solar array consisting of sixteen Solarex panels, eight MSX-60s and eight MSX-64s, mounted on the roof of the house, and an AIR 403 wind generator mounted in our son's playground. These combine to charge twelve Concorde 4-D batteries wired for 1,260 amp-hours of capacity at 24 volts. The solar array is controlled by a Trace C-40 charge controller, and the inverter is a Trace SW4024, connected to the batteries through a Trace DC-250 disconnect. An E-Meter is used to monitor the system.

The house also has grid power available. We use it for backup charging of the batteries and to run baseboard electric heaters as needed in the winter.

The passive solar design provides a large portion of our heating needs, and a woodstove does most of the heating during cloudy periods. We have burned one cord of mixed hardwood per winter for the past four winters. Our bills from the electric company run about US\$10 a month in the summer, US\$8 of which is the service charge, and approximately US\$50 a month in the winter months, November through March.

We use propane for hot water, cooking, and a clothes dryer, which costs US\$175 for a year's supply. We use an Aquastar tankless water heater and dry our clothes outside when the weather is good. So our total annual energy costs average approximately US\$650.

## Straw Bale Construction



For wiring in the straw, we used BX cable and metal boxes screwed to wooden stakes. Main wire runs are in the attic.

Plastic and the first sheet of insulation laid over foundation gravel.

A 7 inch (18 cm) thick slab was poured over 2 inches (5 cm) of extruded foam insulation for the thermal mass in the passive solar main room.



The finished home with the RE system.



Winter temperatures can dip well below 0°F (-18°C) in east central Illinois, with strong winds on this flat, open prairie. Our straw bale house has provided us with a very comfortable, energy-efficient home.

After living here for almost five years, we are very happy with our decision to build with straw. It has been our goal to show others through example that we can live comfortably without consuming excessively and polluting our environment.



Efficiency and creature comforts go hand in hand.

Jon, Jared, and June Haeme with their straw bale home.



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