Beautiful, Healthy House Built of Natural Materials on a Modest Budget

This beautiful house is built of natural materials in the southwestern style for a man with severe chemical and electrical sensitivities. The owners saved a lot of money by using materials found on the land, recycled materials and by living frugally.

Keywords: *natural home building, non-toxic house, construction, chemical sensitivity, MCS, electrical sensitivity, financing, stucco, adobe brick, stone house, insulation, kitchen cabinets, off-grid*

The basic story

Jeff and Corinne (not their real names) bought forty acres (16 hectares) in a remote part of the desert. The nearest town is Rodeo, New Mexico.

Jeff's severe chemical and electrical sensitivities made the couple flee the city and come to an area that has attracted others with these illnesses. They used their savings to buy the land, a modified travel trailer and put in a well and electricity. The house had to be built as they were able to gather money from their modest incomes. The money they would have spent on rent or mortgage payments was used to buy materials.

The couple lived in an old Airstream travel trailer that was modified to be less toxic, but Jeff was still not able to be inside for longer periods, so he slept outside in an old car.

Jeff did most of the construction work himself. He had never built a house before and had to learn as he went. He was too sick to work much, which matched the couple's ability to afford buying materials. It took seven years before they were able to sleep inside their house — Jeff was really glad to stop living in the car.

The living room with a ladder to the loft.
The blue shutters provide ventilation to the bedroom.

The adjacent forty-acre lot came up for sale at a good price so Jeff and Corinne were able to buy it to prevent development there.

It is now four years since they moved into their house and a number of projects still remain.

Starting on the house

Jeff and Corinne bought their land in spring 2004 and moved there with their Airstream trailer in July. They initially got water from a neighbor but by the end of 2004 they had a well drilled and power extended to the corner of the property. The well and the trailer are both in the same corner as the power pole.

The next spring Jeff started on the house, which is located at the center of the property. He was too sensitive to use any power tools, so he dug the 3x3 ft (1x1 m) trenches for the walls by hand and filled them with rubble he gathered from the land.

He could not be around concrete at all, so he hired laborers to cast the footings and build up the walls using rocks and concrete. All the rocks were gathered on the land.

All that concrete really bothered Jeff, so once the outer walls were finished, he had to stop constructic ve money to continue construct

The rock on the in the windows.

There is an inner and an outer wall, with a cavity that is filled with insulating perlite. The inner wall is made of kiln fired adobe bricks that Jeff was able to get cheaply in nearby Mexico. Sun-hardened adobe bricks were not used, since they

are less durable and can grow mold. The top of the wall is covered by a cast-in-place bond beam of concrete.

Jeff didn't tolerate wood or air conditioners. This determined the roof construction. They needed a cathedral ceiling to help cool the house in the hot summer, and Jeff needed to avoid wood because of the terpenes.

Two steel posts on the center axis of the house each hold up two heavy steel rafters. A steel rafter goes from the top of one wall up to the top of the post. Another rafter goes from the post down to the top of the opposite wall.

Steel purlins (horizontal beams) were then placed on top of the rafters and stretching the full length of the house. That made the house look like it had a giant ladder on top. The steel plates of the roof were then bolted onto the purlins.

The windows had aluminum frames and the doors were made of steel. The house was now closed in, which took more than two years since the start. The couple was then able to use the house for some functions, but not yet live in it. The floor was still just dirt.

The inside

The ceiling in the house was at this point the underside of the roofing plates. The next step was to insulate the roof with a sprayed-on Isonene insulation foam. It was installed by a company that drove there from Phoenix and sprayed it on within a few hours. The foam attached itself to the underside of the roof plates and in between the purlins in a layer about six inches (15 cm) thick. It took five days for the foam to cure. During this time, it smelled strongly like alcohol. Once cured it was odorless.

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The insulatio from Phoenix. Jeff had to wait several months before they had time for the long trip, which was all done in one long day.

Jeff attached chicken wire to the underside of the purlins with bamboo to support it under the peak and give it a rounded shape. He used chicken wire instead of lath because he got an old roll cheaply and the old roll no longer had any manufacturing oil left on it. He plastered the ceiling with a mixture of clay and grass stalks he gathered for free from his own land. He avoided doing any plastering during the winter, as the house was too cold for the plaster to dry fast enough. He did not want it to get moldy.

The only part of the ceiling that wasn't plastered was above the loft area. Here he installed pieces of corrugated steel to provide more headspace.

The floor was then installed. He buried PEX tubing under the floor for heating and mounted fired clay bricks in the sand on top. He didn't use any mortar or sealer.

The interior walls

The house is one big high ceilinged room with just the bedroom and bathroom sectioned off and covered with a lower ceiling.

The interior walls are mostly built of steel studs. The lower part of some walls is covered with weathered galvanized steel plates that Jeff got from a recycler. Other parts have fired adobe bricks for the lower walls. The upper part of the walls is the same clay and grass stalk stucco as on the ceiling, but here using regular lath that was washed in soapy water to remove the manufacturing oils.

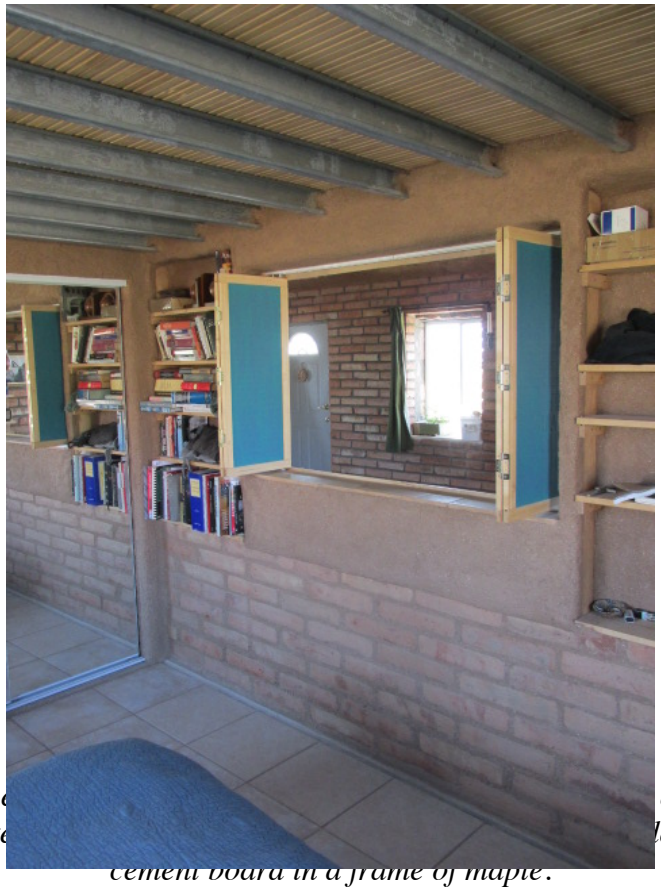
Stucco could not be used on the lower parts of the walls because it is not durable enough to withsta

Building *n a wall.*

Stucco would be a mold risk in the bathroom. Here the interior walls are made of HardieBacker cement boards and tile mounted with an additive-free mortar. The exterior walls are the fired adobe bricks.

The bathroom ceiling is made of painted cement boards that are suspended on steel tracks. The bathroom floor is rock tile mounted on a concrete slab.

The bathroom door is a pocket door made of pine that was offgassed and then sealed with shellac. The door came with a lot of wooden fittings that were discarded.



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ceiling of ste *le of painted*
cement board in a frame of maple.

The bedroom has a separate ceiling with a loft above. This ceiling is made of heavy-duty steel studs with a floor of maple floor planks. Maple was chosen because it is the least odorous wood. Maple is expensive but Jeff was able to get a great deal on some maple flooring, which he also used for several other projects.

He avoided installing a subfloor/ceiling by making sure each of the maple planks ended on top of a steel ceiling support.

The kitchen

The kitchen is large with a counter against the outside wall and an island in the middle. The cabinets are built of steel studs, cement boards and tile. The countertops are either granite or tile on top of cement board. The cabinet doors are painted cement board in a frame of maple flooring. It is all handmade.

Electricity

The electrical grid ends at the corner of the property, where it powers the well and the appliances in the Airstream travel. The trailer continues to be their kitchen and laundry.

The house is not connected to the grid, since Jeff needs to avoid EMF exposures. Battery-powered lanterns are used to light up the house at night.

Special design features

The bathroom has a door directly to the outside so Corinne can arrive from work with stinky clothes and take a shower and put on clean clothes before entering the rest of the house.

The house is designed with maximum airspace to dilute any pollutants. This is accomplished with the cathedral ceiling and the open floor plan. The three doors and several windows can also help airing out the house when needed, especially during construction.

The house has a lot of thermal mass in the walls and the floor, that helps even out the daily temperature swing. In this area there can be a difference of forty degrees (20º C) between night and day. To help manage the heating and cooling of the house, the owners open the many doors and windows to let outside air in when needed. There is a set of ventilation shutters to allow air to move between the bedroom and the living room to help with the ventilation (see bedroom picture).

Saving money

Saving money was hugely important for making this project possible. Living on the land saved a lot of money from not paying rent.

Jeff did much of the work himself, when he was able. His energy and the need to buy materials as money came in were the two factors that made the project take so long.

Jeff had to hire help for parts that he could not tolerate, such as the masonry work and whenever power tools were needed. He did use hand saws and hand drills for small projects, but that is a hard way to build a whole house.

A lot of the materials were gathered for free on the land, such as all the rocks, clay and grass stalks. Building over such a long time also helped in finding recycled or discounted materials when available, such as the tile, granite countertop, galvanized steel, chicken wire, maple flooring, etc. It was just necessary to be careful to check if the recycled materials were contaminated, as some of them were.

It was also a lot cheaper to cover some of the interior walls with recycled steel plates rather than using adobe bricks.

The result

The house is beautiful, as the pictures bear out. It is also one of the safest houses this author has visited. There is still some work to be done, but the owners live in the house and Jeff has become less environmentally sensitive since they moved in.

More information

This website has additional case stories and articles about housing for extremely environmentally sensitive people at www.eiwellspring.org/saferhousing.html.

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