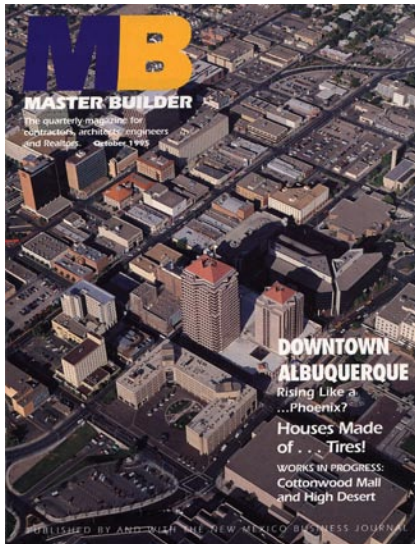


Houses Made of ... Tires



Twenty-five years ago Michael Reynolds, of Solar Survival Architecture in Taos, started building houses made of garbage. He is now world famous for his Earthships®—tire houses bermed into the earth and designed to function off the utility grids. He was, and is, a true revolutionary and the outward appearances of his houses reflect that. To make a difference long-term, to move toward true sustainability, these ideas and processes must, however, be adopted by the mainstream.

Another New Mexico builder, Ed Paschich, of Passage Construction in Corrales, started building traditional adobe houses, but wanted to be more environmentally responsible while staying mainstream. For several years he, too, has been building tire houses—conventional homes in conventional neighborhoods. Now, of course, more and more builders are building structures with tires.

Every year we throw away more than two hundred fifty million tires, and they go directly to our landfills—where they sit. They don't disintegrate. They don't stay buried. They float to the top of the dump. This is a horrific problem. As building materials, however, the fact they don't disintegrate is a plus. And tires are a locally available "natural" resource in every community—tire houses can be built anywhere.

The first conventional tire house was built in Corrales, on compacted earth, without a foundation. Once the earth was adequately compacted, there was no need for a foundation. As an extra measure of safety (as requested by Construction Industries), a footing is now used. It has the added benefit of making potential owners more comfortable. No stem wall is needed, as the tires themselves can be used below grade. The footing portion of the wall is about 26% of a standard foundation, representing a significant decrease in the use of concrete, a material of high-embodied-energy.

In both types of homes, dirt is packed into the tires, usually by hand—which comes close to 100% compaction. They are laid like bricks, one course at a time, to build the wall. When filled, each tire weighs about 300 lbs. A 2700 square foot house uses approximately 1500 tires.



The houses are very solid and the walls vary in thickness from about 22" to 36". Placing the larger tires on bottom makes a self-buttressing wall, which is inherently stable. Techniques were developed to accommodate spacing needs (using half tires) and to make compaction easier and more consistent (removing the

top sidewall).

"It is not much different from traditional adobe building," August Mosimann, an engineer with Engineering Associates in Albuquerque, said. "Tires are more like adobes, modular units, than rammed earth—but have properties of both. From an engineering standpoint, the big advantage of tires over adobes is quality control over compaction and density of material that goes into the wall. People still mix adobes by rule of thumb... With tire houses, there is greater quality control. The walls are more evenly compacted." Mosimann went on to say that these buildings could go up fifteen to twenty feet, and could be used for commercial as well as residential purposes. "A building is a building. The structural strength is from the mass."

When asked if these buildings could be standing 3-4,000 years from now, he replied, "I don't see why not."

In February 1995 code language regarding homes such as these was revised from "Experimental" to "Alternative". The "Experimental" terminology caused difficulties with lending institutions, insurance companies, and buyers because the term communicated potentially unsound materials and/or methods, and possible structural failure. "Alternative" is defined in the UBC (Unified Building Code, a national code adopted by New Mexico) as "of equal or better quality." The current policy continues to require certification of plans and materials by a licensed professional engineer.

The costs of these tire homes is hard to estimate because so often the owners are involved in the building process, which saves money. However, the average runs about the same as a frame house—between \$70 and \$85 per square foot. These tire buildings are not high tech—you can build them yourself as they are so labor intensive. Standard insurance (based on the lower rate for adobe/ fire retardation) and standard financing can be obtained.

The biggest disadvantage of a house like this is the exact thing that is its biggest advantage—the mass of the walls. While a builder counts square footage from the outside, a home-owner often counts it on the inside—and there is a loss of internal living space with a tire house. The thickness of a standard frame wall runs about 5-6" and a single adobe wall is about 10", while a tire wall will average 30".



Bob and Paula Burrill bought a tire house in Corrales and they love the hand-troweled walls, the lack of straight lines everywhere, the imperfections. The most striking thing about these homes, however, is how substantial they feel, how quiet they are. They are most like homes made with double adobe walls. "I don't know how I'd go back to living in a frame house," said Bob Burrill. "I feel I could punch my fist through the walls. But, here, no way." The Burrills love the quiet—not only do they get little noise from the outside, but sound doesn't travel from one end of the house to the other.

For many, the advantages outweigh the disadvantages—whether living in an Earthship® or a more conventional home, they get a gracious, substantial, quiet home with thick walls built in an environmentally responsible way.

Earthship® is a registered trademark of Solar Survival Architecture (Taos, NM).

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