

Rammed Earth

Poster created by Dillon Dise



Tschudi Palace, Chan Chan Peru

A Brief History...

"Archaeological evidence can date entire cities constructed of earth back over 10,000 years. All of the great civilisations of the Middle East were constructed with mud brick and rammed earth - Assyria, Babylon, Persia, and Sumeria. Rammed earth construction was used to construct countless monuments, temples, ziggurats, churches, and mosques. Many of these structures (the Great Wall of China being one) have stood the test of time and are still standing today."

-Christopher Cornwell

In the first century, A.D, the Romans brought the technique of rammed earth construction to Europe. From this time until the dawn of the industrial revolution, earthen construction saw increased use. The industrial revolution and development of production techniques for timber and wood saw the decline of earth construction, accompanied with the creation of mass-produced manufactured materials, capable of being assembled in less time saving money. It wasn't until the middle of the 20th century that public awareness of environmental issues emerged in regards to the importance of constructing environmentally responsible houses. This has brought rammed earth construction for modern houses back into the spot light.



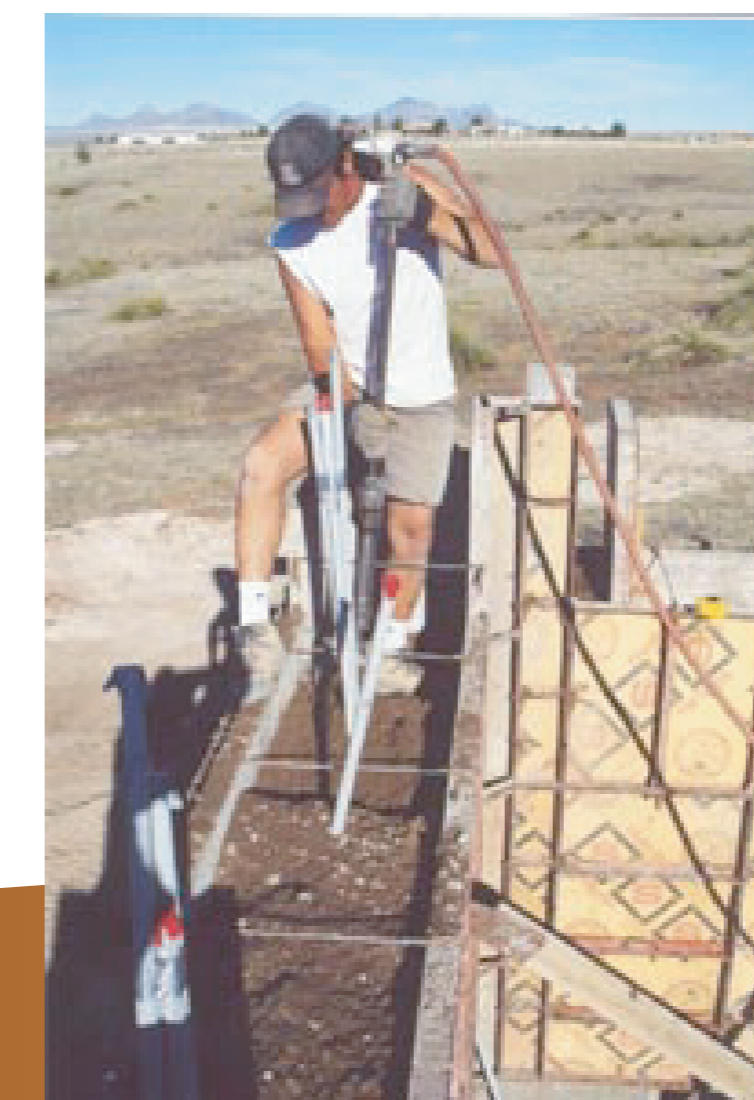
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Why build with rammed earth?

- **“The Thermal Flywheel Effect”** - During the day, the compacted earth has the ability to gather and retain solar warmth, while keeping the inside cool and arid. It then releases the solar energy into the cool night, keeping the shelter cool in the day, and warm at night. If properly designed this can significantly reduce heating and cooling bills.
- **Indoor air quality** - Unlike wood-frame buildings, packed earth does not emit and hazardous fumes. When covered with natural and organic finishing, no toxins are off-gassed, providing superior air quality inside the building/
- **Longevity, durability, and low maintenance** - The Tschudi Palace in Chan Chan, Peru has been in existence for over 2,000 years. While still having to be minimally maintained, the durability of the construction is impressive. With the addition of modern stabilizers, concrete foundations, and steel reinforcing, it is entirely possible for rammed earth housing to last for many centuries.
- **Fire and insect resistance** - Two important reasons for choosing to build with solid earth walls are that they are fireproof and resistant to damage from termites and other insects. This also helps with maintaining and the longevity of the buildings.
- **Environmental responsibility** - Since an earth walled building saves construction and energy resources, doesn't pollute, and lasts practically forever is a wise investment in the future of the planet.

Issues encountered with rammed earth

Rammed earth walls are constructed by ramming a mixture of selected aggregates, including gravel, sand, silt and clay, into a structural arrangement called a form. One problem encountered with rammed earth construction has occurred when the earth is not mixed in the proper proportions, and when too much water is added causing cracking and decreased longevity.

To some, cost is an important issue. Rammed earth housing may cost 15-20% more than conventional stick-frame housing, but the benefits of building with the earth and living in a healthy and quality environment far outweigh the costs. The low heating and cooling bills, as well as low maintenance very quickly make up the difference in cost, making the rammed earth housing a very worthy investment.

As French builder, Francois Cointeraux, once observed,

“Earth building is a means by which the common man could vastly improve the quality of his life.”