

Rammed Earth Construction

Why Rammed Earth???

- termite resistant
- fire resistant
- rot/mold resistant
- superior thermal performance & stabilization of indoor temperature/humidity levels
- healthy indoor air quality
- low carbon footprint
- load bearing construction
- beautiful natural aesthetics
- historical rammed earth buildings exist in the southeast



filling the formwork – Johns Island Rammed Earth home

What is it and How Does it Work???

Rammed earth, specifically **stabilized rammed earth**, is a method of combining a clay soil with aggregates and a small amount of Portland cement or lime (5-10%) into a semi-dry mix which is then tamped between formwork to full compression. The soil mix is added layer by layer and compressed (or rammed) so that the resulting wall has horizontal striations. Once the full height is achieved, the formwork is removed and the wall is complete with no need to plaster, paint, or finish in anyway.

Typically, the thickness of the wall varies from 18-24".

In areas with high seismic or hurricane loads, reinforcing is required. The rammed earth walls must sit on top of a fully reinforced footing & stem wall & topped with a bond beam.

What's the Cost & Value of Rammed Earth???



tamping (ramming) the earth mix

The answer depends on a number of factors: is this an owner-build or contractor-build, how simple or complex is the design, where are the materials coming from?

Though these factors will play into the cost, we are finding that rammed earth construction will cost roughly the same, perhaps slightly more, than conventional construction methods. An owner-build scenario will save approximately 60% on the cost of construction.

Although the up-front costs may be slightly higher than with conventional, the long-term lifecycle cost of the building & its performance will be much lower due to low energy/utility costs and very minimal maintenance costs.

Currently, there are few comparables for banks to draw upon, but financial institutions and lenders are starting to accept rammed earth & adobe as 'solid masonry' construction and are assessing their value accordingly.

The History of Rammed Earth & Today

Evidence of the early use of rammed earth has been seen in Neolithic cultures along the Yellow River in China, dating back to 5000 BCE. By 2000 BCE

In the 1800s, rammed earth was popularized in the United States. Buildings of the [Borough House Plantation](#), Stateburg, South Carolina, built in the 1820s. [Church of the Holy Cross \(Episcopal\) Stateburg \(or Holy Cross Episcopal Church\)](#) in Stateburg, South Carolina, built of rammed earth in 1850–1852



Rammed Earth home – Johns Island, SC

The practice accelerated in the 20th century. In 1945 [Clemson Agricultural College of South Carolina](#) published the results of their rammed-earth research in a pamphlet called "Rammed

Earth Building Construction.”

Interest in rammed earth fell after World War II when the [costs of modern building materials](#) dropped.

Today, many residential and commercial structures around the world are being constructed with Rammed Earth. [Dwell Magazine](#) & [Architectural Record](#) often feature complex Rammed Earth projects.

Root Down Designs is working with building departments in both SC & NC to design & permit numerous modern Rammed Earth projects. We have [several projects](#) in process now.