



## Adobe and Our Visitor Center



As you wander through the White Sands National Monument visitor center, take a moment to look at the structure. This historic building may seem familiar. The Pueblo-style architecture that surrounds you is found in many parts of the Southwest and is iconic of New Mexico.

### White Sands Visitor Center

The monument's visitor center, as well as three of the living quarters to the east of it, and the adobe fence between the visitor center and the living quarters are all considered historical. These buildings are an excellent example of the Pueblo Revival architecture modeled after the Pueblos and Spanish missions in early New Mexico.

Lyle Bennett, who is considered the master of the Pueblo-Revival style, designed and worked on these buildings. Work began in 1936 and was completed in 1938. Various government agencies, including the Works Progress Administration (WPA), cooperated in the construction.

The WPA was the largest of the New Deal agencies created by President Roosevelt during his time in the White House, employing millions of workers via public works projects during the Great Depression. Projects included constructing public buildings and roads and operating literacy programs.

The photographs above are historic images of the construction of the adobe buildings at White Sands National Monument that took place from 1936 to 1938. Additional buildings, such as the gift shop and administrative were added years later.

Adobe is an excellent building material at White Sands because annual rainfall here averages about eight inches, which is well below the 20 inches of annual rainfall that will endanger an adobe structure. The sand, straw, and water necessary for construction is readily available, and the architecture is regionally appropriate.

Additional examples of Pueblo-Revival architecture by Lyle Bennett include the Painted Desert Inn at Petrified Forest National Park, the historic district at Bandelier National Monument, and buildings at Carlsbad Caverns and Mesa Verde National Parks.

### The History of Adobe

“Adobe” is a Spanish word that originally comes from the Arabic word “al-tub,” meaning “the brick” or “mud-brick.” It was introduced to the Spanish when Spain was ruled by the Moors from 800 and 1500 C.E. The Spanish then brought the word “adobe” with them to America in the 1500s, using it to describe buildings constructed by the Pueblo people of the Southwest.

Adobe construction has been used for thousands of years in dry parts of the world, including the Middle East,

Africa, China, Peru, Spain and southwestern North America. The Bam Citadel in Iran is the largest adobe building ever built. The tallest is Huaca del Sol in Peru, which used more than one million bricks. The most famous adobe buildings in the United States are in Taos Pueblo, New Mexico. Taos Pueblo is considered by many to be the oldest continually inhabited town in the United States and is a UNESCO World Heritage site.

## How Do You Build with Adobe?

The first step in building an adobe home or structure is to lay out the floor plan and then determine how many bricks will be needed. For example, a wall that is eight feet high and 10 feet long will require about 200 bricks. A single room could take 1,000 bricks or more, and a small two-bedroom house may take more than 5,000.

Once bricks have been made and dried, other features of the home need to be planned. These include the placement of doors and windows, as well as any special features like adobe benches, recessed shelves for books and display items built into the walls, or corner even fireplaces!

After all that planning and brick making, the walls of the home are then

constructed. Once they are completed, the wooden roof is laid on top and supported by large beams or “vigas.”

These vigas are the logs often seen sticking out of the sides of adobe buildings. They are topped by wooden cross pieces called “latillas.” Then, a mesh of twigs or fabric is laid down. Finally, six inches or more of adobe is packed on top. Although adobe roofs are virtually flat, they do slope downwards towards drains called canales to allow for water runoff.

The final step of adobe construction is to cover the entire structure in a layer of adobe plaster to protect the bricks and make the walls smooth.

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## The Advantages of Adobe

One of adobe’s biggest advantages is that it is all natural and contains nothing toxic. It also is made from materials that can be found anywhere and lasts a long time with relatively minimal maintenance.

Adobe is also very inexpensive, as costly construction equipment is not needed. And thanks to its thickness and strength,

it provides excellent protection from both fire and noise. Adobe is also an excellent insulator, so indoor temperatures remain fairly constant.

Due to the widespread availability of the materials, adobe construction is environmentally friendly and requires very few resources.

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## What Do You Need to Make Adobe?

The basic materials and tools to make adobe include:

- Sand
- Mud with clay
- Straw (or animal manure)
- Water
- Mixing tools: stick, hoe, rake, pitchfork
- Wooden molds to shape bricks

Once all the materials are gathered, the clay, sand, and straw (or manure) are mixed together. It takes a bit of experience to know exactly how much of each component to add to the mixture, but a formula of roughly three parts clay, seven parts sand, and one part straw produces the best bricks. Adding too much of any one item will affect the quality of the adobe. Too much sand will make the bricks crumble easily, and too much clay will make them crack when they dry. The amount of water needed varies, but the mixture should have the consistency of bread dough.

Adobe bricks can be any size. It all depends on the size of the wooden form or mold. The most common size is about four inches high, 10 inches wide, and 14 inches long. Brick makers often use molds that make four or five bricks at a time.

A wide, level outdoor area for laying and drying the adobe bricks is essential. This area should be sprinkled with sand or straw to keep the bricks from sticking to the ground during the drying process.

Once the adobe is mixed, brick production is simple. Lay the mold on the prepared ground, pack the mold full, and pull off the mold. Clean the mold with water and repeat. After three or four days, the bricks will be safe to handle. Turn each brick on its edge to continue drying. After about six weeks, the bricks will be ready to use in your project.

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## More Information

The following websites provide more information about adobe:

- *Preservation of Historic Adobe Buildings*  
<http://www.cr.nps.gov/hps/briefs/brief05.htm>
- *Pueblo de Taos, New Mexico, USA*  
<http://www.cr.nps.gov/worldheritage/taos.htm>
- *The Bam Citadel, Kerman, Iran*  
<http://whc.unesco.org/en/list/1208>

- *Green Home Building*  
<http://www.greenhomebuilding.com/adobe.htm>
- *Adobe Builder*  
<http://www.adobebuilder.com/>
- *Save With Green*  
<http://www.savewithgreen.com/greenhome.html>
- *Hybrid Adobe*  
<http://www.hybridadobe.com/>