



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Christina L. Hill	Project Number J1812
Project Title Structural Design of Adobe Brick	
Abstract Objectives/Goals My project was to determine how materials in the design of Adobe bricks effect how much weight a structure could hold. Methods/Materials A tray to mold the bricks was built with wood and nails. Dirt, which contained natural clay, was sifted. Equal amounts of sifted dirt and sand were mixed in a large bucket with enough water to hold together. This was then spread 1 inch thick in the tray and dried slightly. Rectangles were cut 3 inches by 1 inch and separated to dry completely in the sun. Then the procedure was repeated with equal amounts of sifted dirt, straw and enough water to hold that mixture together. A fish weighing scale was tied from a ladder and various weights (cement bags, full water barrel) were weighed and recorded. Two other weights used were my dad, Skip and our Honda Accord. A four-walled structure was built on top of a piece of plywood, 4 layers of brick vertical and 9 horizontal, one with sand Adobe bricks and one with straw Adobe bricks. Plywood was placed on top of each of the structures and the weights were put on top until the structure failed. Results The straw Adobe bricks never failed, they only cracked slightly. The straw Adobe structure cracked slightly at 781 lbs (without the estimated weight of the car). The sand Adobe bricks showed signs of failure at 262 lbs and failed at 678 lbs. Conclusions/Discussion Adobe materials have been used for thousands of years. Many ancient Adobe structures are still around today. My own Navajo Great-Great Grandmother lived in an Adobe Hut in the Arizona desert. The time will come when natural resources used today in building materials such as oil for plastics, wood from our forests and metals from Mother Earth will be gone. We may need to revert to how our ancestors built structures and Adobe bricks could be the answer. The conclusion of my project is that straw fibers, as opposed to sand, in Adobe brick design will make them stronger resulting in a more durable structure.	
Summary Statement The materials used in the design of Adobe bricks, such as straw or sand, will determine how strong and durable a structure will be.	
Help Received Father helped with supplies and weight placement. Mother helped edit report.	