



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Isaac Y. Trotta	Project Number J1528
Project Title Strength of Earth for Earthbag Construction	
Abstract Objectives/Goals The objective is to determine the strongest combination of fill materials for an earthbag structure to be used for a medical clinic and homes in Tonj, Sudan. Methods/Materials Different combinations of fill material were compacted into samples to determine the strongest ratio. The fill materials used were portland cement, lime, all purpose sand, soil and water. Thirty combinations were compacted into core samples, allowed to cure for 16 days and then were tested for strength using an Istron testing machine. Results The results showed that the sample with 10 parts sand and 2 parts cement proved to be the strongest ratio. The strongest samples were the samples with cement and a high percentage of sand. Conclusions/Discussion In conclusion, a fill ratio with a high sand content and cement produces the strongest samples. I would also like to find if I could lower the cement content and still be strong enough for construction in order to reduce the cost of materials.	
Summary Statement This project determines the best combination of fill material to use for earthbag construction.	
Help Received Mother helped with board layout. Father helped type report. Ted Miyake provided Istron testing machine, Trey West helped test the core samples, Galyn Thompson provided advice and direct application of finding.	