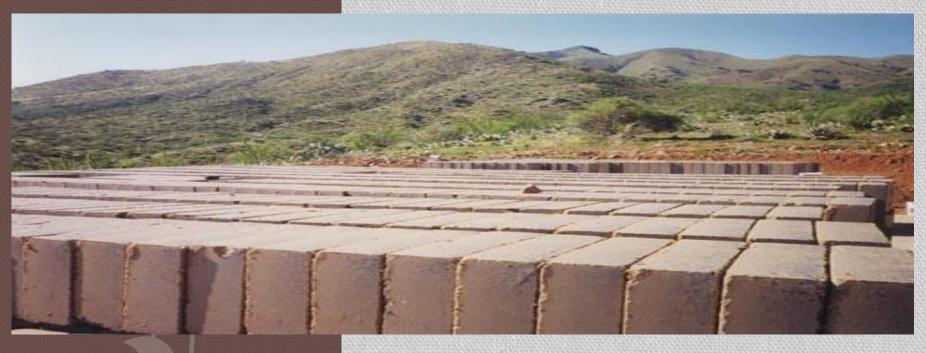
ADOBE BRICK DESIGN



"Civil Engineering Kuwaiti Women"

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Introduction

Project Understanding:

- Adobe Brick is define as a brick that contains cement, soil, and water.
- Suitable adobe bricks will be developed for Northern Arizona through multiple brick testing methods.
- The adobe brick's developed codes and qualifications will be compatible with Northern Arizona's environment.

Adobe Brick Characteristics:

- *Decrease negative impact on the area.
- Provide recreational, educational, and aesthetic benefits.

SEL

Stake Holders

- Private rental marketers.
- *House consumers.
- Clients: Mark Lamer, Thomas Nelson.
- Coconino County.
- *Structural Engineering Institute (SEI).
- City of Flagstaff.

Figure 1: Structural Engineering Institute www.asce.org



Figure 2: City of Flagstaff .www.flagstaff.az.gov



Figure4: Mr. Thomas Nelson www.nau.edu



Figure3: Coconino County www.CoconinoCounty.org



Figure5: Mr. Mark Lamer www.nau.edu

Design Constraints and Criteria

- Soil should be local
- * 100% natural soil
- Strong enough to carry certain amount of load
- Within budget
- Withstand earthquakes, hurricanes, and rain
- Soil will contain clay, sand, and silt
- * Follow International Building Code requirements (IBS)

Task 1: Soil Analysis

- A good amount of local soil will be obtained.
- Large particles or impurities (rocks, plant, etc.) will be taken out of the soil.
- The percentage of soil in the mixture will be determained after trying different percentages randomly.

Task 1.1 Atterberg limit test

Task 1.1.1 Liquid Limit Test

Task 1.2 Efflorescence test

Task 1.3 Sieve Analysis

Task 2: Cement Analysis

- * The type of cement that is going to be used will be chosen depending on constraints and criteria.
- ❖ Cement will be mixed with water and poured into a mold to have a specific shape for the adobe brick.
- * The percentage of cement in the mixture will be obtained after trying different percentages.



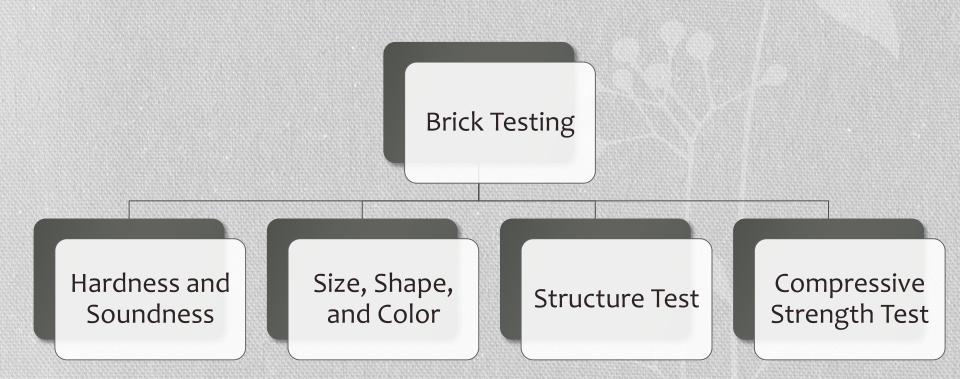
Figure 1: Dry Cement
www.feminiya.com

Figure 2: Water www.greenlivingideas.com

Figure 3: Wet Cement

www.thumbs.dreamstime.com

Task 3: Brick Testing

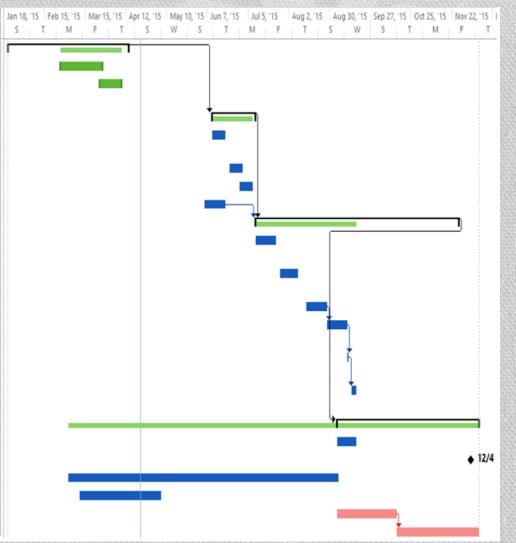


Exclusions

- Multiple sites for soil content
- Load Path
- Earthquake Testing
- Constructing a building out of the designed adobe brick

Gantt Chart

Task Mode ▼	Task Name ▼	Duration ▼	Start →	Finish
*	△ 1 Preparatory Research	59 days	Wed 1/21/15	Mon 4/13/15
*	1.1 Background Research	21 days	Thu 2/26/15	Thu 3/26/15
*	1.2 Proffesional consntlation	11 days	Wed 3/25/15	Wed 4/8/15
*	■ 2 Soil Analysis	22 days	Wed 6/10/15	Thu 7/9/15
5	2.1 Atterberg limit test	7 days	Wed 6/10/15	Thu 6/18/15
5)	2.2 Efflorencence test	7 days	Mon 6/22/15	Tue 6/30/15
5)	2.3 Sieves test	7 days	Mon 6/29/15	Tue 7/7/15
- 5	3 Cement analysis	10 days	Fri 6/5/15	Thu 6/18/15
*	■ 4 Brick testing	100 days	Fri 7/10/15	Thu 11/26/15
-5	4.1 Hardness and soundness test	10 days	Fri 7/10/15	Thu 7/23/15
-5	4.2 Size ,shape ,and color testing	10 days	Mon 7/27/15	Fri 8/7/15
- 5)	4.3 Structure test	10 days	Fri 8/14/15	Thu 8/27/15
-5	4.4 Compressive strength test	10 days	Fri 8/28/15	Thu 9/10/15
	4.5 Uniform building code requirment	1 day	Fri 9/11/15	Fri 9/11/15
-	4.6 Brick development process	3 days	Mon 9/14/15	Wed 9/16/15
*	■ 5 Project Management	70 days	Fri 9/4/15	Thu 12/10/15
-	5.1 Development process	9 days	Fri 9/4/15	Wed 9/16/15
-	5.2 Team meeting	0 days	Fri 12/4/15	Fri 12/4/15
-5	5.3 Project schedule	134 days	Tue 3/3/15	Fri 9/4/15
-5	5.4 project website	40 days	Wed 3/11/15	Tue 5/5/15
*	5.5 final report	29 days	Fri 9/4/15	Wed 10/14/1
*	5.6 Final presentation	41 days	Thu 10/15/15	Thu 12/10/15



Staff Hourly Budget

Table 1: Staff Classification			
Classification	Code		
Senior Engineer	SE		
Engineer	Е		
Lab Technician	I.T		
Administrative Assistance	A.A		

Table 2: Staff Time Calculations						CONTRACTOR OF THE PROPERTY OF
Task No.	Task	S.E Hours	E Hours	L.T Hours	A.A Hours	Total Staff Hours
1	Preparatory Research	20	20	0	0	40
1.1	Background Research	20	20	0	0	40
2	Professional Consultation	16	10	7	0	33
3	Soil analysis	16	20	45	17	98
4	Cement Analysis	10	20	17	20	67
5	Soil And Brick Testing	14	15	45	32	106
6	Project Management	30	35	32	35	132
6.1	Construction Process	20	25	26	30	101
6.2	Team Meetings	10	10	6	5	31
	Total Hours	106	120	146	104	

Total Cost For The Project

Table 3: Equipment Cost		
Equipment	Total Cost	
Wood Forms	2800	
Soil Series	490	
Mixing Tool	1680	
Lab Rent	9800	
Soil Testing	1610	
Total	16380	

Table 4: Adobe Brick Project Cost		
Project Requirements	Cost	
Staff	\$45,656	
Equipment	\$16,380	
Total	\$62,036	