Pamela Jerome, AIA, LEED™ AP  
Spring Semester 2014  
Mondays: 11:00 AM-1:00 (or 2:00) PM  
Mini Course #: A6309  

CONSERVATION OF EARTHEN ARCHITECTURAL HERITAGE

Course Description

From ancient to modern times, building with soil has been one of the oldest and most widely used construction methods next to stone and wood. Earthen construction materials are considered sustainable, because of their local availability, insulative properties, and low carbon footprint. Approximately 50% of the world’s population lives in some form of earthen architecture. Earthen architectural heritage is also recognized in over one hundred of the World Heritage Sites that are cultural or mixed sites.

Construction technologies vary from place to place depending on the quality of the local soil. From the dugouts of Tunisia to the high-rises of Yemen, earthen architecture comes in many shapes and forms. Students will learn about the major construction technologies, including hand-shaped or molded sun-baked bricks (adobe), rammed earth (pisé de terre), and puddled earth (cob). Students will learn about the different types of clays and their effect on the long-term stability of earthen structures. Some laboratory-analysis methods will be reviewed. The class will look at a multitude of case studies from around the world, from archaeological to living heritage, and various methods of conservation.

In addition to the lecture readings, the course requirements will require each student to pick a site and explore issues confronted by the site’s team in terms of preservation of earthen architectural heritage.

Syllabus

Class 1: Earthen architectural heritage: variety and locations.  
1/27/14  
Overview of the variety of earthen architectural heritage. From vernacular to architect-designed structures, the typologies of earthen architecture throughout the world.  
Case studies: Shibam, Yemen; New Gourna, Egypt; Dogan territory, Mali; and Trujillo, Peru.

Class 2: Appropriate technologies: construction using soil.  
2/3/14  
Main methodologies for earthen construction – use of mud brick, rammed earth and puddled earth. Use of wood and stone for framing and foundations. Types of roofs.  
Wadi Do’an and Marib, Yemen; al-Diri’yah, Saudi Arabia; Alter do Chao, Portugal; and Exeter, UK.

Class 3: Soils: understanding the materials used in construction.  
2/10/14  
Case studies: Palaikastro, Crete.

**Class 4:**  
**Earthen architectural heritage: causes of deterioration.**  
2/17/14  
Moisture, basal erosion, disaggregation, sandblasting, burrowing animals, insect damage, vegetation growth, inappropriate repairs, etc.

**Class 5:**  
**Archaeology: stabilization and protection of earthen ruins.**  
2/24/14  
(3-hour class)  
Case studies: Huaca de la Luna and Chan Chan, Trujillo, Peru; and Mallia, Crete.

**Class 6:**  
**Living heritage: maintenance and reconstruction. Final report due.**  
3/3/14  
(3-hour class)  
Case studies: Tarim, Yemen and Timbuktu, Mali.

**Bibliography of Class Readings**

**Class 1:**  
**Earthen architectural heritage: variety and locations.**


**Class 2:**  
**Appropriate technologies: construction using soil.**


Jerome, Pamela, “After the flood: devastation of the traditional earthen architectural landscape in the Hadhramaut Valley of Yemen; can mudbrick buildings be made more resistant to climate change?” in Maria Fernandes, Mariana Correia and Filipe Jorge (eds.) *Terra em Seminario 2010. 6º Seminario Arquitectura de Terra em Portugal/9º Seminario Ibero-American de Arquitectura e Construcao com Terra* (Lisbon: Argumentum, 2010), 53-55


**Class 3:** Soils: understanding the materials used in construction.


**Class 4:** Earthen architectural heritage: causes of deterioration.


**Class 5:** Archaeology: stabilization and protection of earthen ruins.


**Class 6: Living heritage: maintenance and reconstruction.**


