

Adobe Engineering Challenge

Post-trip Project (Option A)



Build a Mission

You saw many structures at the Tumacácori mission. A residence, a large church, a two-story storeroom, and more. Now is your chance to try building one of your own.

The requirements:

1. Must be made of comparable materials and techniques. (No cardboard or sandwich board!)

If you're building an adobe brick structure like the church, use objects that replicate bricks, mortar, and plaster.

Example bricks: sugar cubes, Starburst candy, wooden blocks, etc.

Example mortar: frosting, peanut butter, white glue

Example plaster: frosting, peanut butter, tempura paint, mashed potato

If you're building a wattle-and-daub structure like the ki, use rigid objects for the interior structure and soft material for the fill.

Example octotillo and mesquite: pretzel sticks, popsicle sticks, dry pasta noodles

Example mud fill: peanut butter, mashed potato

2. Must include a window, an arched doorway, and at least one other architectural feature from the following list.

buttress

viga

niche

dome

3. Answer and document with photos the following questions.

a. How do the properties of your materials differ from the original? How are they similar?

b. What was the trickiest part of your process or trickiest feature to build? How did you solve the problem?

c. What do you see as the biggest problem if you were to scale your model up to full size?

Adobe Engineering Challenge

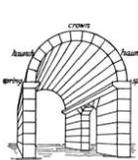
Post-trip Project (Option B)



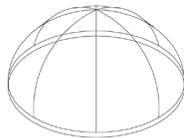
Architectural Photo Tour

The architectural features you saw at Tumacácori aren't necessarily unique to old mission buildings. You may see many of them employed in buildings in your own neighborhood, or even your own house. Photograph examples of **at least five** of the architectural features depicted below. Print your images and for each one, answer the following questions:

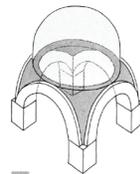
- What feature is this?
- Why do you think this feature was used in this particular place? What function does it have?
- What function did this feature have at Tumacácori? Was it the same or different?



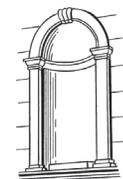
A. barrel vault
ceiling made from a series of arches



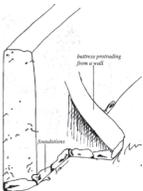
B. dome
hemispherical roof or ceiling



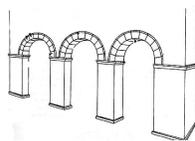
C. pendentive
sloped triangular shape that turns a square corner into a dome



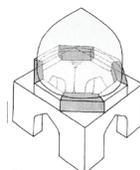
D. niche
recessed area in the wall used to store a valuable object or statue



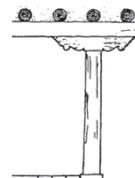
E. buttress
external support used to hold up walls



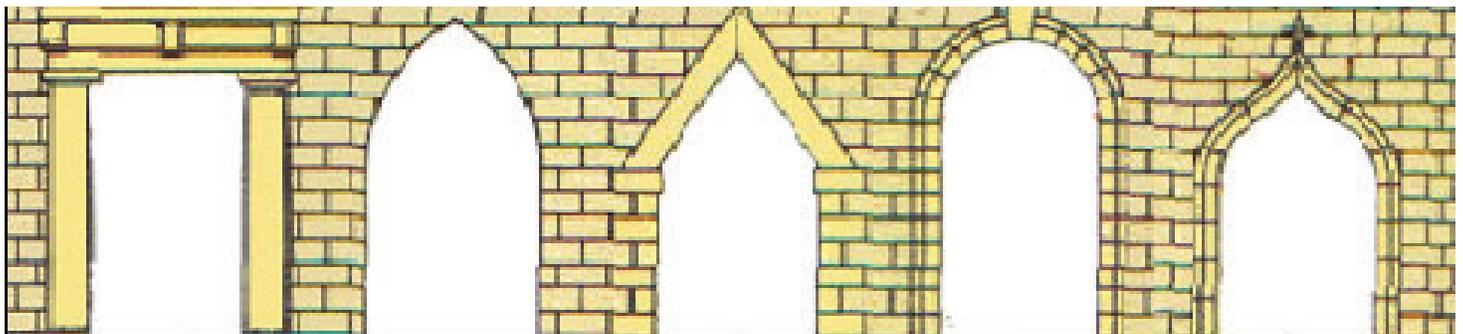
F. arcade
covered walkway lined with arches



G. squinch
usually blocks of wood or bricks that form the base of a dome sitting on a square room



H. viga
wooden support beam that goes all the way through a wall (the original wood may be gone; look for the holes)



I. post and lintel J. corbel (false) arch K. triangular arch L. semi-circular arch M. ogee arch

Adobe Engineering Challenge

Post-trip Project (Option C)



Be the Preservation Specialist

The passage of time has left its mark on the structures of Tumacácori. You saw damage from weathering, from vandalism, and from past preservation efforts. Read the park's webpages on preservation at <http://www.nps.gov/tuma/learn/historyculture/preservation.htm> and answer the following questions:

“Tumacacori’s preservation will always depend more on a respect and knowledge of the building’s materials and for the place itself, than on a new technological breakthrough. This is the nature of the place and that is the nature of adobe.”

- Historic Architect Anthony Crosby

1. Would you replace the plaster that has fallen off the walls inside the church? Why or why not?

2. Would you repair or cover the graffiti on the inside of the church? Why or why not?

3. Would you rebuild structures of the mission that have melted back into earth and are missing today such as the kitchens, the blacksmith’s shop, the school, or the priest’s quarters? Why or why not?

4. Would you use modern materials or technology to strengthen a historic structure against more damage?
