

Arch 463
ECS
Fall 2004

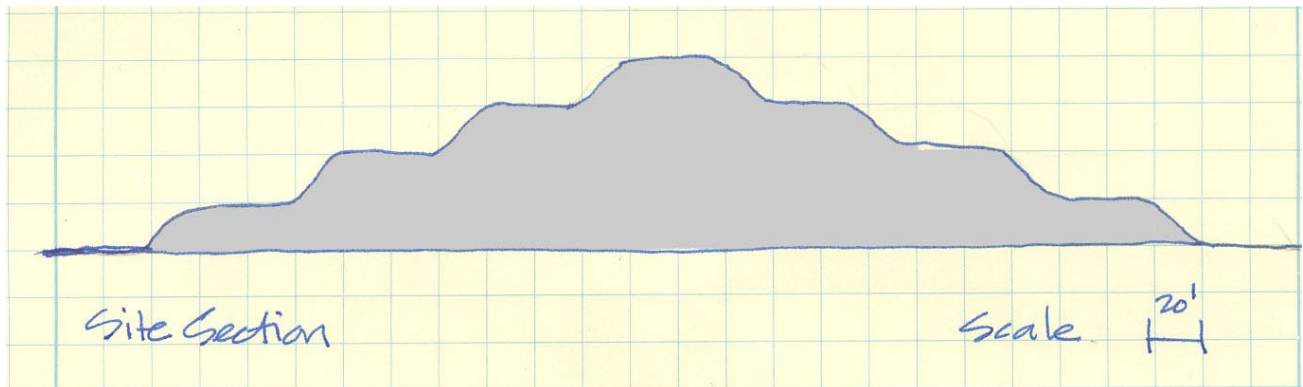
Name _____

Quiz #1

"Stepped Butte Viewing Pavilion"

For this problem you are the designer for the Stepped Butte viewing pavilion. Stepped Butte is a county park located at 29° NL in a temperate climate with hot humid summers. The main feature of the park is a unique landform, a terraced butte that features a flat top, and high, mid, and low terraces which are also quite level. The pavilion will be located on one of these flat places. Your goal is to provide a comfortable place for sunrise or sunset viewing at any time of the year without providing any mechanical heating or cooling systems; pure passive design is required.

Climate Context. The site is located in farmland far from any urban development and is the only significant topographic feature for miles in any direction. The butte has no major vegetation, it's grass covered and rises only 80' above the surrounding countryside.



Modular Design. The pavilion will be based on 8' x 8' modules. The floor plan is an 8 foot square with 9' high columns at each corner. This allows for a one foot open space above each wall panel. The roof module may be ordered as a 10' x 10' panel. The viewing station is a solid granite 2' x 4' bench located in the center of the floor. For your design you must choose 4 different panels from the list below (3 wall panels and a roof panel—one wall must be left open):

1. clear glass blocks
2. concrete blocks with integrated insulation
3. insulating diffusing glazing (like Kalwall)
4. perforated steel
5. precast concrete
6. shoji screens (interior rice paper panels, exterior glass doors)
7. 2 x 4 wood frame with plywood sheathing and cedar shingles
8. woven palm frond panel

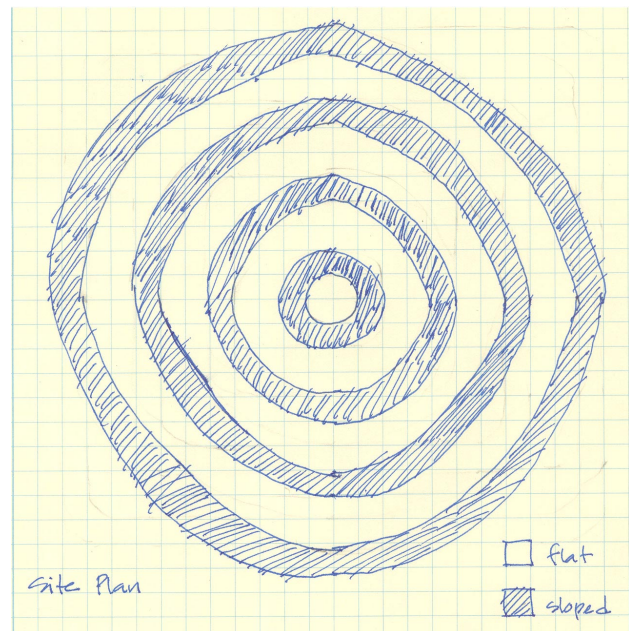
Analysis

Declare your pavilion type (sunrise or sunset) _____

1. What wind patterns do you expect for this site? Explain why

2. What kind of seasonal and diurnal climate differences do you expect? Explain why.

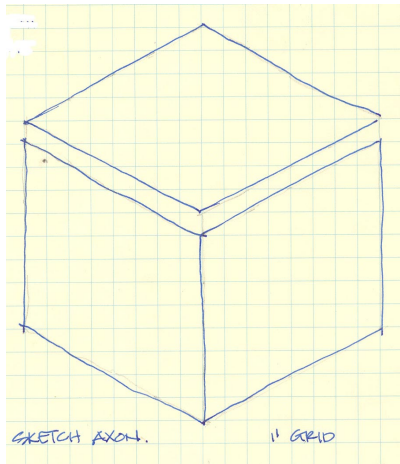
3. What is the best site for your pavilion? Indicate your choice on the site plan. Explain your choice.



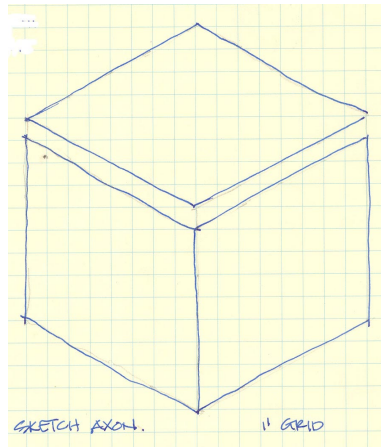
4 points

Preliminary Design

4. Show which panels you'll use in your design and where each is located on the drawings below.



Roof + West and South elevations

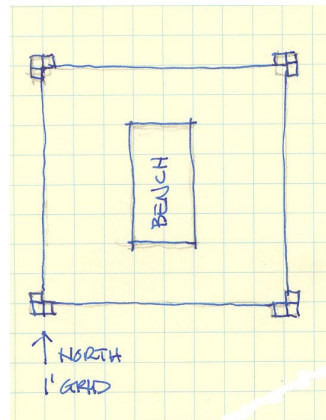


Roof + East and North elevations

1. clear glass blocks
2. concrete blocks with integrated insulation
3. insulating diffusing glazing (like Kalwall)
4. perforated steel
5. precast concrete
6. shoji screens (interior rice paper panels, exterior glass doors)
7. 2 x 4 wood frame with plywood sheathing and cedar shingles
8. woven palm frond panel

5. Explain how the resultant pavilion works to provide comfortable viewing for the human on the bench of the solar phenomena (sunrise or sunset) during the winter and during the summer. Show sun and wind patterns and and discuss thermal comfort.

Summer solstice.



Winter solstice.

