

Arch 463
ECS
Fall 2003

Name _____

Quiz #2

"Suwannee Summer Camp"

For this problem you are the designer of a summer camp dining hall in a temperate climate with hot humid summers. The building will contain a 15' x 15' kitchen and a 15' x 15' dining room. Additional seating will be available on the 30' x 15' deck adjacent to kitchen and dining. The hall will be built on one of three 15' x 30' uninsulated concrete shells (floor and retaining walls) built into a small hill. The dining hall will serve breakfast, lunch, and dinner seven days a week from June 1 through August 30. Your client wants a totally passive building that affords comfort to even the people who insist on eating indoors.

Site and Climate Context. The site is in a rural area in Suwannee County (30° NL). The possible building sites A, B, or C are on the west, south, and east flanks of a small hill. Summer winds on the site shift diurnally from SW in the morning to SE in the evening. Calm times occur daily at sunrise and sunset for an hour or two.

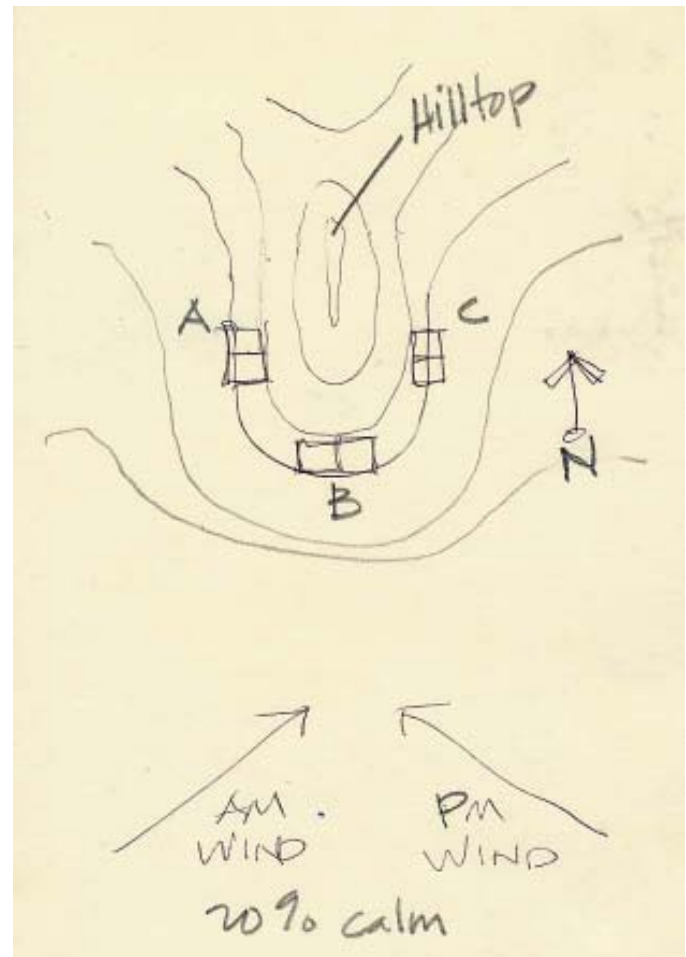
Modular Design. The dining hall will be based on 15' x 15' modules. The two-module interior (15' x 30') will contain a kitchen module and a dining module. Each of the modules will have a unique roof type (pick two from five choices). Outdoors will be comprised of 2 modules of deck adjacent to the dining hall.

Only four apertures will be installed in the building:

- 1 @ 10' x 10' glass garage door
- 1 @ 5' x 10' operable window
- 1 @ 2.5' x 5' operable window
- 1 @ 2.5' x 2.5' fixed glass window.

Each of the apertures will be allowed one of four external shading device choices:

- 1 @ horizontal device
- 1 @ vertical device
- 1 @ egg-crate device
- 1 @ no device.



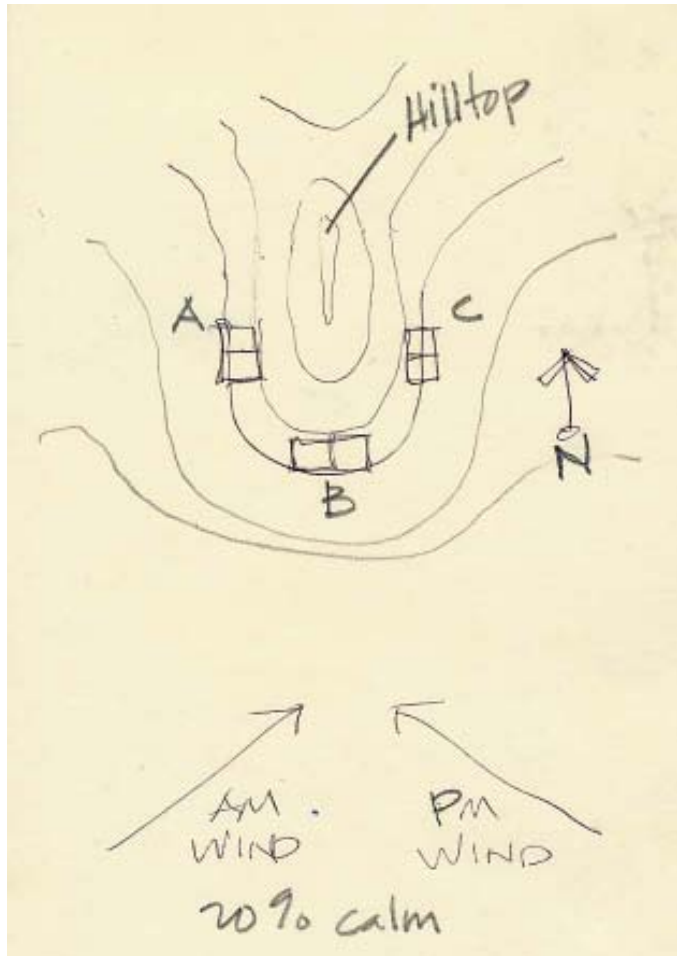
Sketch site plan. North is up. Wind data from on-site observation and client interview is noted.

2 points

1. Site Selection

Indicate on the sketch site plan below which of the concrete shell building sites you intend to build on. Show where the deck will be located.

Explain why your choice is favorable for a passively cooled building in terms of climate and microclimate influences as well as human comfort.



Sketch site plan. North is up. Wind data from on-site observation and client interview is noted.

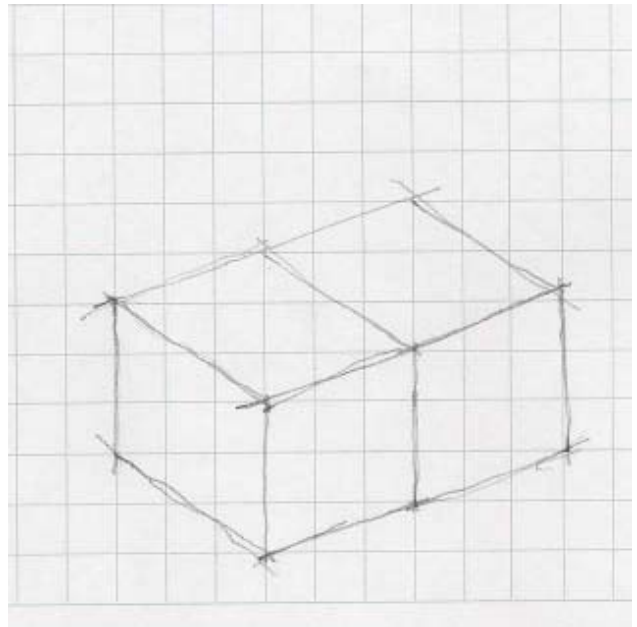
2 points

2. Roof Type Selection

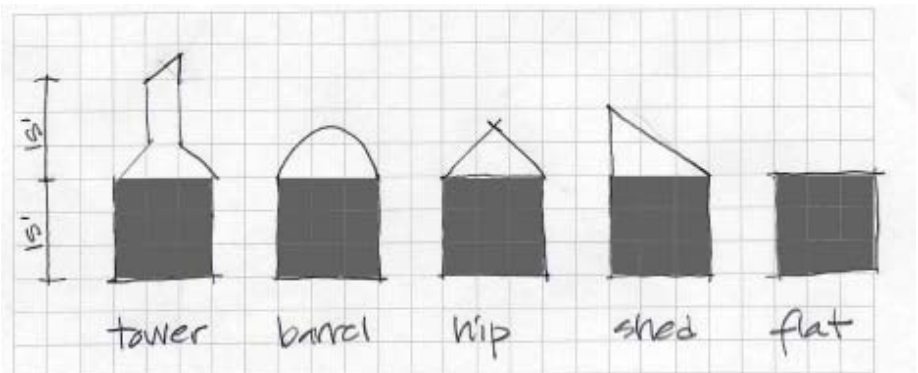
Specify your choice for the two different roofs (kitchen & dining) on the drawing below.

Sketch the roofs on the axonometric diagram below and **indicate** which room is beneath which roof; where the deck is is; and which way is north.

Explain, how your roof scheme and room placement can be helpful in a passive cooling scheme for the kitchen workers and indoor diners at breakfast, lunch, and dinner.



Two module axonometric.



Sketch of roof type choices. The gray squares indicate the 15' cubic room below the roofs. The hip roof is pyramidal with its peak above the center of the floor plan.

2 points

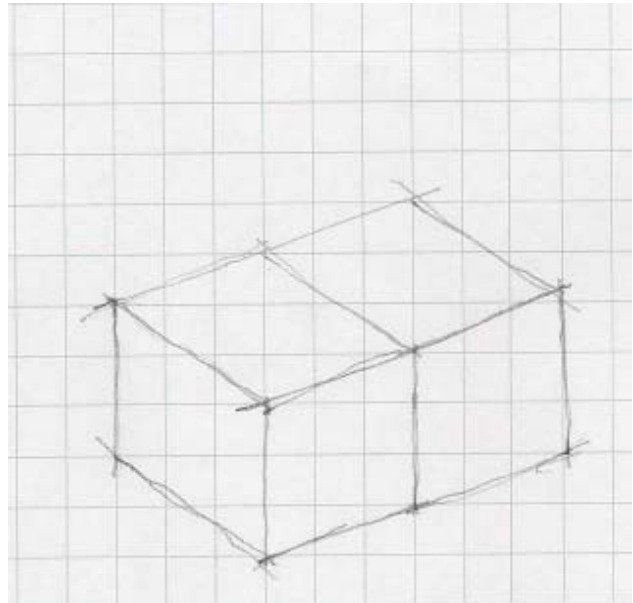
3. Aperture Choice and Placement

Show the locations of the four apertures in the sketches below (you finish them) or in your own sketches. **Indicate** which direction is north and where the deck is.

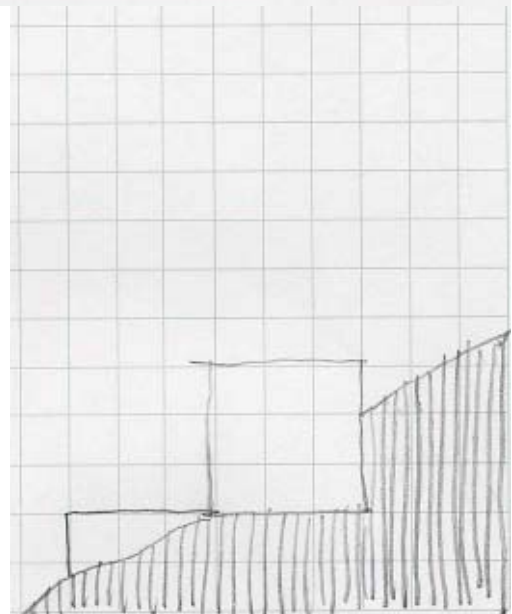
Explain the role your aperture choices play in your passive cooling design.

Only four apertures will be installed in the building:

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- 1 @ 5' x 10' operable window
- 1 @ 2.5' x 5' operable window
- 1 @ 2.5' x 2.5' fixed glass window.



Two module axonometric.



Sketch section through deck, module, and hill.

4 points

4. Window Shading

Sketch your design of the device for each aperture. **Indicate** which direction the aperture faces. **Explain** the role your shading device design will play in your passive cooling design.

Each of the apertures will be allowed one of four external shading device choices:

1 @ horizontal device

1 @ vertical device

1 @ egg-crate device

1 @ no device.

You **must** use each of the four choices.

