

Arch 464
ECS
Spring 99

Name _____

Quiz #1

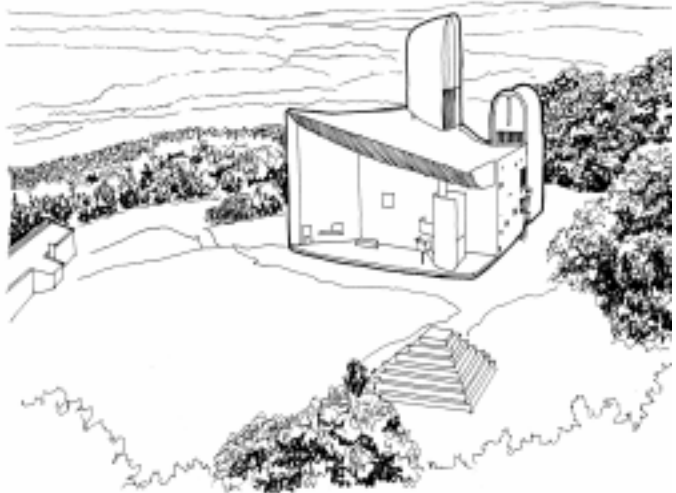
"Et Tu, Corbu?"

For this problem you are the HVAC consultant for the retrofit and integration of a mechanical system into the passively heated and cooled Notre-Dame-du-Haut, Ronchamp, France, designed by Le Corbusier. The original forced-air heating and cooling system, installed in 1952 has gone belly-up. A new system that meets the programmatic needs of the Dominicans must be installed. Moreover, the building has attained the status of architectural treasure and its spatial and aesthetic integrity must be maintained.

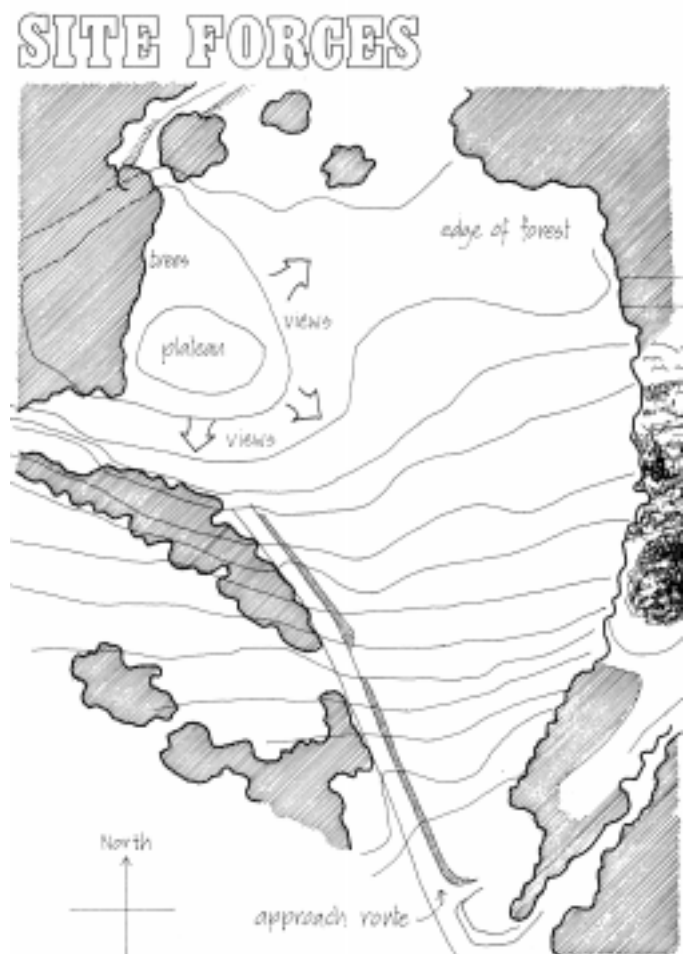
In a letter to Le Corbusier the Reverend Father Couturier, on behalf of the Provincial Chapter of the Dominicans of Lyons, outlined important requirements: "the bareness of the building must be very severe, without any superfluous luxury, and yet all the vital common necessities must be respected: silence, a temperature warm enough to permit continuous intellectual work, a distance for the goings to and from reduced to the minimum. . . Remember ours is a completely communal life and as a result requires no personal differentiations within the groups."

Climatically, the site experiences cold winters with frequent snowfall and hot summers, so both heating and cooling are required in skin dominated load buildings.

Programmatically, the building is essentially one big open space enclosing three chapel areas—with an outdoor chapel available for warm weather and/or mass pilgrimage services. The floor is slab-on-grade configuration, while the apparently massive walls and roof are wood-frame construction with a stucco/plaster finish.

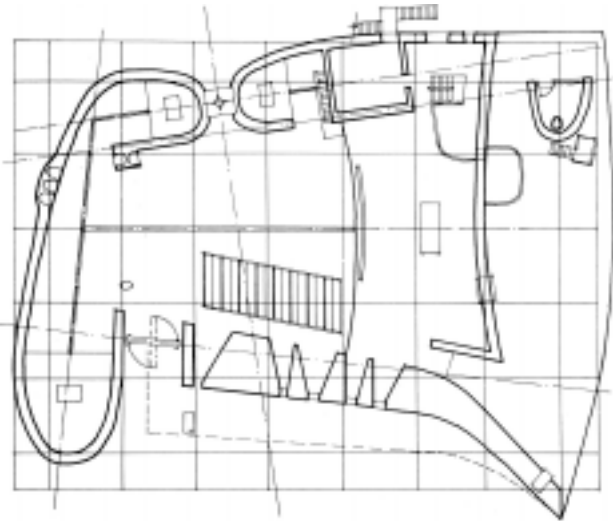


Sketch of the chapel showing the outdoor pulpit beneath the east eave.



The chapel is sited on the plateau.

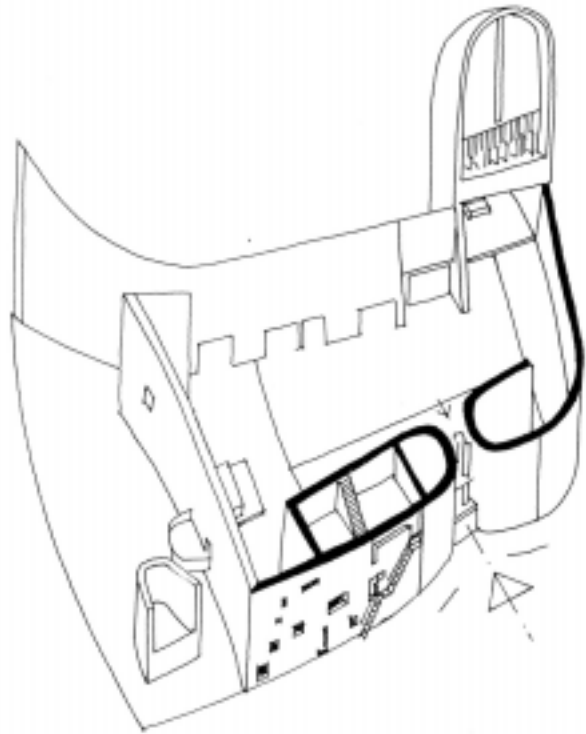
1. Explain how you interpret the thermal and HVAC system implications of the design criteria given by Father Coutourier. Discuss whether you would choose a water-based system or an air-based system for integration into the fabric of the building. Explain why your choice is appropriate for the thermal needs of the building and the configuration of the space.



Building plan. North is up.

5 pts

2. Name the major components of the HVAC system you chose and explain where you would place each component in order to attain the best integration with the building and site, while retaining its architectural character. You may use sketches to illustrate your ideas.



Cut-away axonometric of the chapel showing the interconnected spaces of the interior chapels.