

Arch 463
ECS
Fall 98

Name _____

Quiz #2

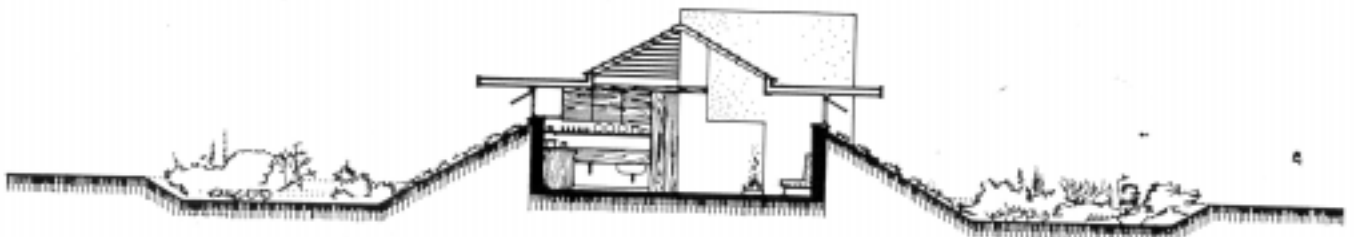
"Transplanting Wright"

For this problem you are the passive design consultant for a ceramicist who has purchased the plans for a typical house in Frank Lloyd Wright's Cooperative Homesteads project and one acre in a remote area of New Mexico. The site is essentially flat and is without trees. The artist wants to live and work in the house. Her studio will be equipped with a small wood-fired kiln for firing clay and porcelain works. Since the site is remote, no electric and gas utilities nor water and sewer service is available. The artist wants the building to employ passive techniques for heating and cooling. Because the building was designed for a different era and a different climate, your role is to analyze it for suitability for today's technologies and its new climate and to recommend appropriate changes.

Building Program History. The Cooperative Homesteads project for autoworkers near Detroit, Michigan, was designed in 1942. For this project Wright designed a bermed house where earth was excavated from a surrounding sunken garden and rammed against the house to form grassy banks. These berms deflected winds and provided low cost, heavy insulation. Each house was to stand on one acre of land. The plan is economical, with grouped services, generous livingroom, and no wasted circulation space. Bedrooms and a bath are on the west end. Kitchen and dining are integral to the generous livingroom. The livingroom leads past the only floor to ceiling glazing to the entrance and carport, which doubles as a porch. Beyond this, at a lower level (four steps down), is the workshop and storage area.

Building Features. The building is slab-on-grade with poured-in-place concrete walls to window height. The windows are all operable and the combination flat/hipped roof has 4-foot overhangs. Sill height is five feet and the flat ceiling is at seven feet. Several large, tall concrete masses anchor the corners of the carport and form the guest closet and hearth.

Climate Context. The designed-for site near Detroit is in a temperate climate typified by cold, cloudy winters and hot, humid summers. The new climate in New Mexico is a temperate climate typified by cold, sunny winters and hot, arid summers. Winters are dry and sunny with short periods of snow cover. Summer afternoon highs are usually in the nineties with low humidity and continual breezes.



Building section looking west.

rights

So:
Use

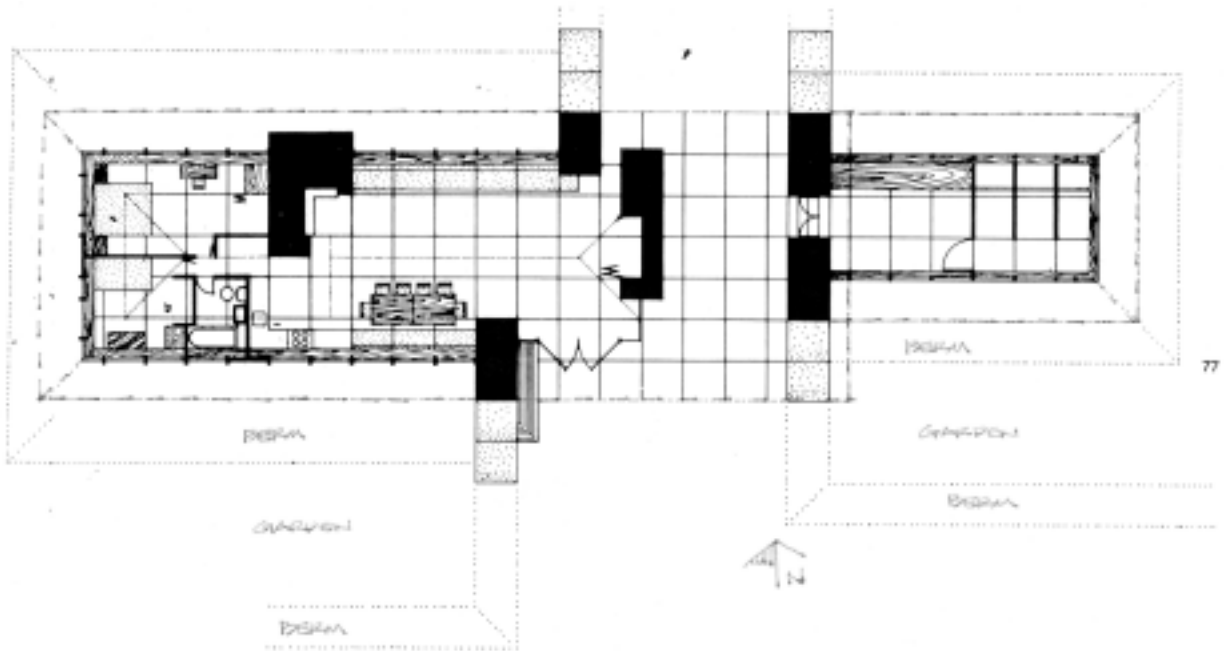
1. Analysis

Explain which passive heating and cooling features of Wright's design are suitable for the new client and climate and which ones are not. Illuminate your explanations with appropriate references to vernacular precedents, climate response, internal loads, balance point temperature, radiant temperature, human comfort, and/or technology and code changes.

2. Design Changes

Show on the plan and in sketched sections and/or details what changes you would recommend.

Explain how each of these changes responds to the new climate, satisfies the program, and provides comfort to the occupant.



Building plan—floor grid is 4' x 4'.