

A Camp in the Desert

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of the requirements for the degree of

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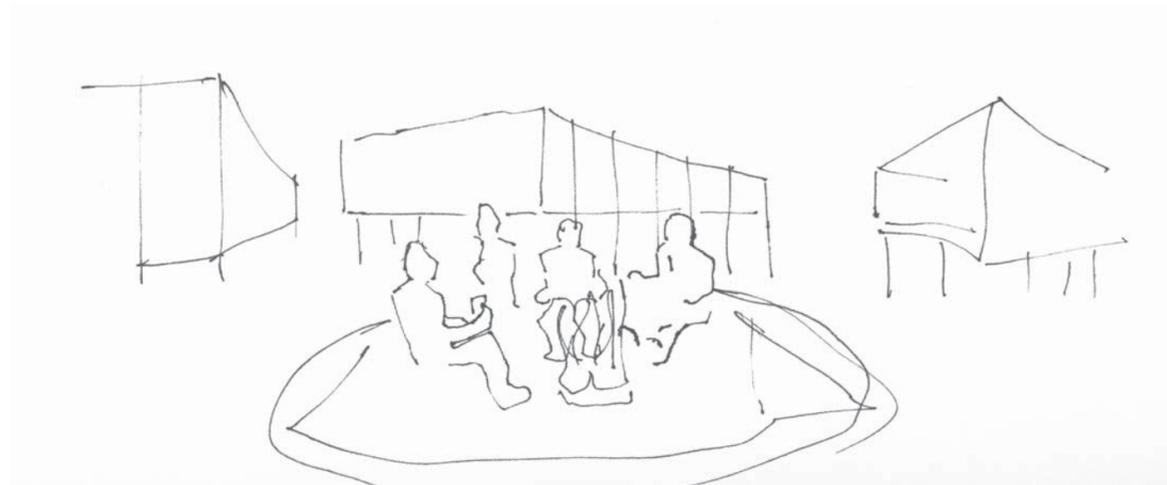
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(ABSTRACT)

A house is pulled apart into its separate rooms and joined in the out-of-doors. This collection of rooms is recognized as a camp. This move is in agreement with the site of the house, which is the foothills of the Rincon Mountains, twenty miles east of Tucson, Arizona, and bordering along Saguaro National Monument. The collection of structures that make up the buildings of the camp are joined by a path that encircles the camp, and also describes the active life of the camp.

The design of the camp is informed by studies in geometry and proportion in a few modern houses, information gathered from the site--particularly as it relates to climate and geography, and studies of the form of architectural elements. Simultaneously, the design of the camp is informed by ideas that evolved in form through the course of the design, namely, a pulling apart of space and material, sitting lightly on the ground, and bringing light into a room between the roof and wall.

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Dedication

This book, my thesis, and my many months of work are dedicated to the enlightenment and enjoyment of all.

Acknowledgements

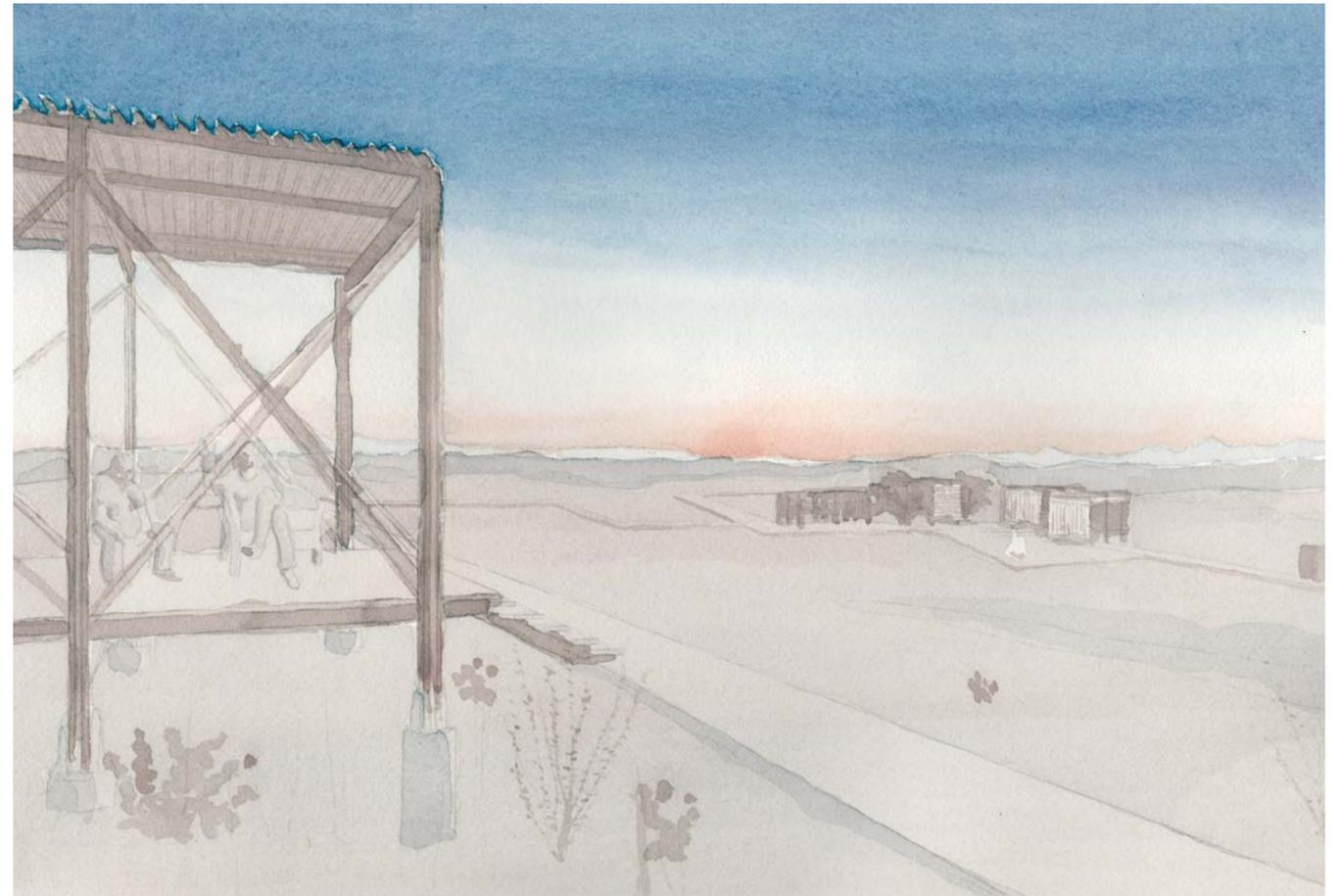
I would like to thank my thesis committee: Jim Jones, Bill Galloway, Hans Rott, and also Steve Thompson, chair of the Graduate Program at the College of Architecture and Urban Studies at Virginia Tech, for all of their advice, criticism, encouragement, and patience. Thank you to all of the architecture graduate students for their comradery in all moments through this endeavor; thanks are due particularly to my classmates: Meredith Barker, Janki Bhatia, Elon Danziger, Sam Dillehay, Aaron Gary, Alan Hamblin, Jon Harrison, David Hogue, Aaron Hörst, Ben Keeney, Kevin Likens, Daron Pardine, Casey Parker, Sara-Lea Phelps, Chris Phillips, Nick Rada, Chris Ressler, Dan Reynolds, Travis Steed, Steve Treser, and Beau Woodrum. Thank you, too, to all of my other teachers at Virginia Tech: Ahmed Ali, Mario Cortes, Kay Edge, Bruce Ferguson, Hugh Munson, Humberto Rodriguez, Heiner Schnoedt, and Frank Weiner; your abilities, attitudes and knowledge will continue to instruct me for the rest of my life. Thank you also to the rest of the faculty and staff at the CAUS, particularly Peggy Moles, for working so hard to provide an environment dedicated to higher learning. Thank you also to my family, particularly my parents, Kent and Jean Heise, and my sister, Rachel Greb, for their undying confidence and support. Lastly, the greatest thanks go to my wife, Lindsey, without whom this undertaking would have proved impossible.

Introduction

To walk in the desert is to feel the weight of the sun and be keenly aware of the absence of water. To walk in the desert is to shield one's eyes from the glare and to try to see the path between the prickly pear and manzanita. One feels the heat of the sun pouring from the sand and stone under one's feet. To walk in the desert is also to see the way by moonlight.

There is life in the desert. Cholla, ocotillo, saguaro, mesquite, prickly pear, tarantula, scorpion, rattlesnake, road runner, jack rabbit, and coyote make homes life here. People too, from the Sinagua and Anasazi to the Hopi, Navajo, Apache and Yaqui, to the Mexicans and Americans and other visitors. They have lived in the deserts of the West, wondering at the brown rocky earth and cerulean sky lit by the most brilliant of suns.

Architecture introduces a place here, an idea wrought in wood, steel, concrete, and stone. There is shelter, and an uplifting of the spirit.



Watercolor study for the view from the pavilion--
the main body of the camp and the valley beyond.

“What can a man do with his life but live it? And what does life consist in, save a vivid relatedness between the man and the living universe that surrounds him?”

D. H. Lawrence, *Pan in America*

A Camp in the Desert

Twenty miles east of Tucson, Arizona, lie the Rincon Mountains, on the eastern edge of the Sonoran Desert. The foothills of the Rincons rise up from the Tucson valley. The Saguaro National Monument begins in these hills and covers an area almost as large as Tucson itself. In the last few years people have been moving onto five and ten acre properties in these foothills, looking for a quieter life outside the city, closer to the wilderness.

What is proposed here is an idea about living in such a place, close to the wilderness, with an integration of the in- and out-of-doors. It is a house, pulled apart into its separate rooms, where the outside becomes the greater room enclosing the whole house. It is a camp.

The camp is comprised of two bodies, divided into seven structures. The main body of the camp includes the hall (1), the two sleeping quarters (2,3), a carport (4), a shower (5), and a latrine (6). The second body is the lone pavilion (7). These are all joined by a path that encircles the camp. The path also describes the life of the camp--it is one of movement through the landscape. When the sun rises, one walks the path to the pavilion on a high point of the site, overlooking the camp below and the Tucson Valley to the West, and looking up to the Rincons to the North and East. When the sun sets, one walks the circle again to watch the bands of color compress the horizon into night.

The buildings of the camp are designed to be built mostly by hand, without the need for large machinery. The buildings are lightly insulated against the heat of the day and the cold of the night, and create shade for themselves by their tapering layers. There is a lightness that pervades these structures--how they sit on the ground, how they are open at ends like tubes to let in light and air, how the corner between the roof and wall is brightened, and how the layered skin captures light and creates shade too, making bands of contrast about the structures.

The quarters and the main hall enclose two sides of a courtyard paved in sandstone; a large trivet sits on the courtyard, marking the place of the fire.

Five mesquite trees are planted to capture the winds and offer shade.



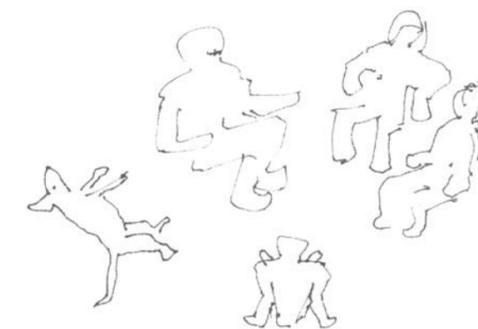
Life in the Camp

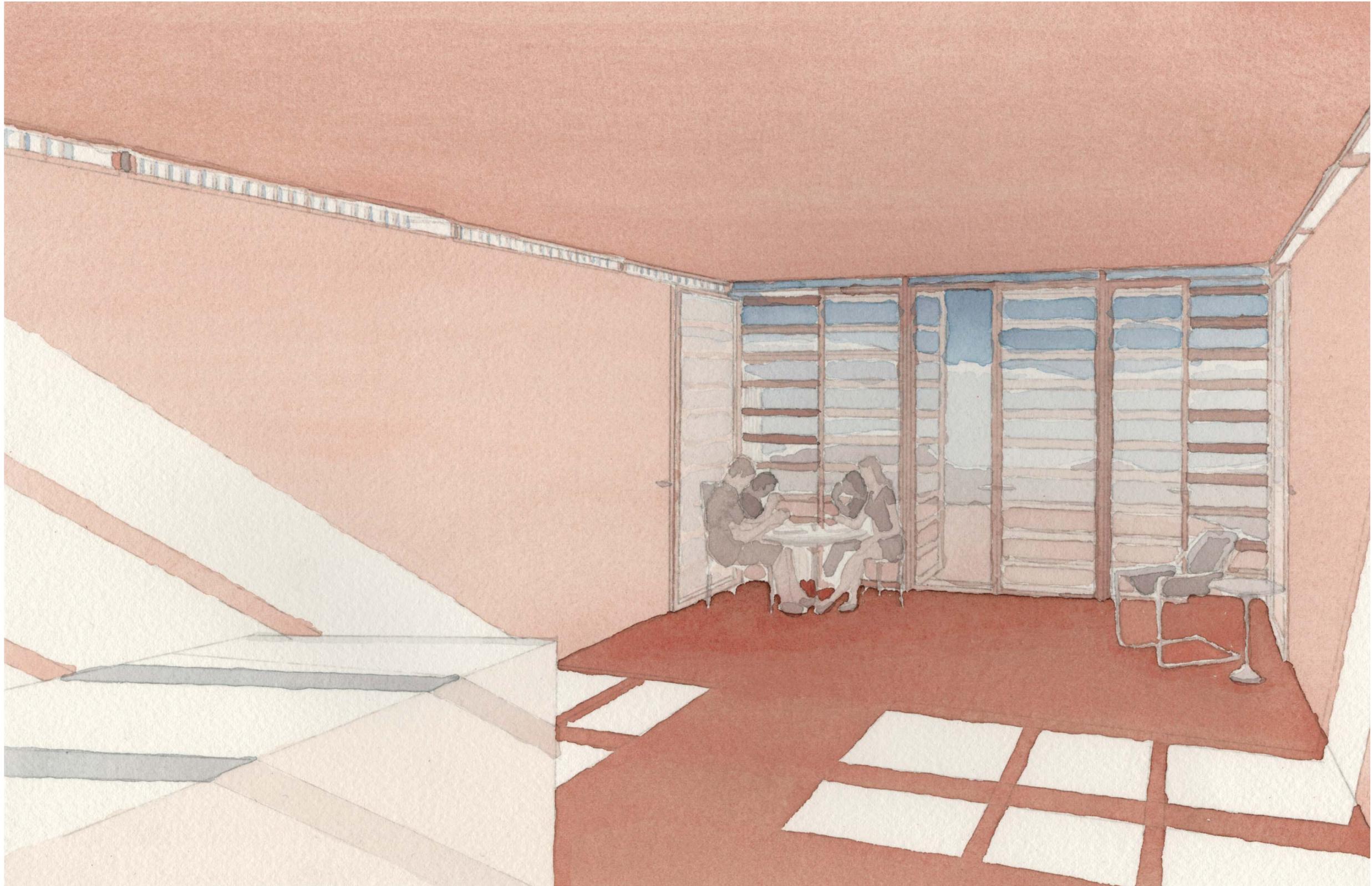
Light pours in through the slatted screen and glazed south end of the main building of the camp, casting vivid patterns of light and shadow. This is the hall, dedicated to cooking and eating food and other activities that are centered around a table.

The hall, like the other buildings of the camp, is a light redwood frame, wrapped on the interior in maple plywood walls and a ceiling and a pine tongue-and-groove floor. Blocks of light run around the perimeter of the ceiling.

The open south and north ends of the little building are open to the light and can be opened to the air. The openings frame the horizon and create a place to live within the landscape.

Opposite: Watercolor study for the interior of the hall, looking north.

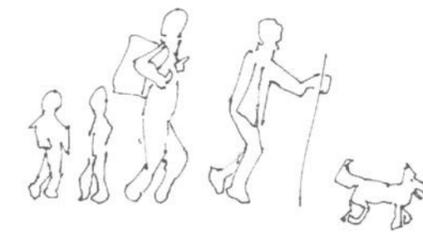


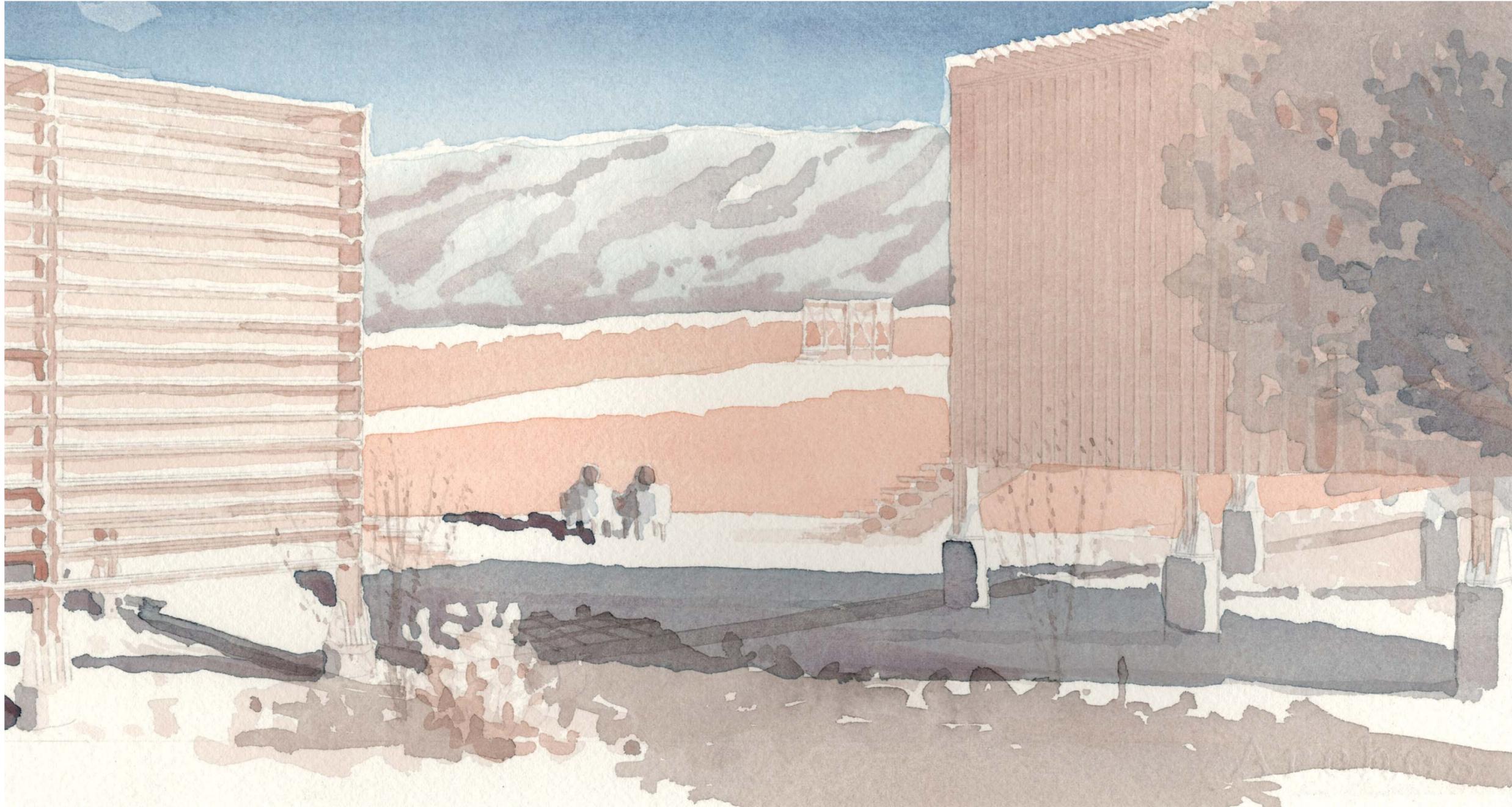


The buildings are lifted up, perching lightly on the ground.

Sitting in the courtyard, one takes in the surroundings, highlighted by a little pavilion on the high point of the site. The placing of the pavilion with respect to the rest of the camp initiates a visual dialogue between the two bodies of the camp.

Opposite: Watercolor study for the view between the hall and the south quarters to the pavilion.

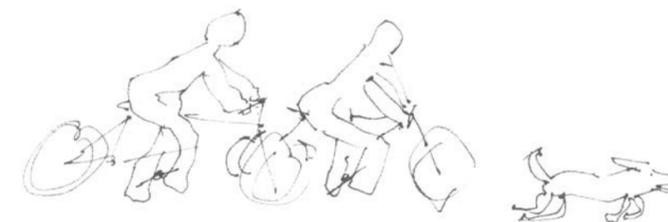




The cluster of camp buildings are the parts of a house pulled apart, bringing the outside into the "house".

All the structures here are wrapped on the exterior in cedar louvers; the finer members enclose and protect the core, like the spines of a cactus protect its flesh.

Opposite: Watercolor study for the main body of the camp.

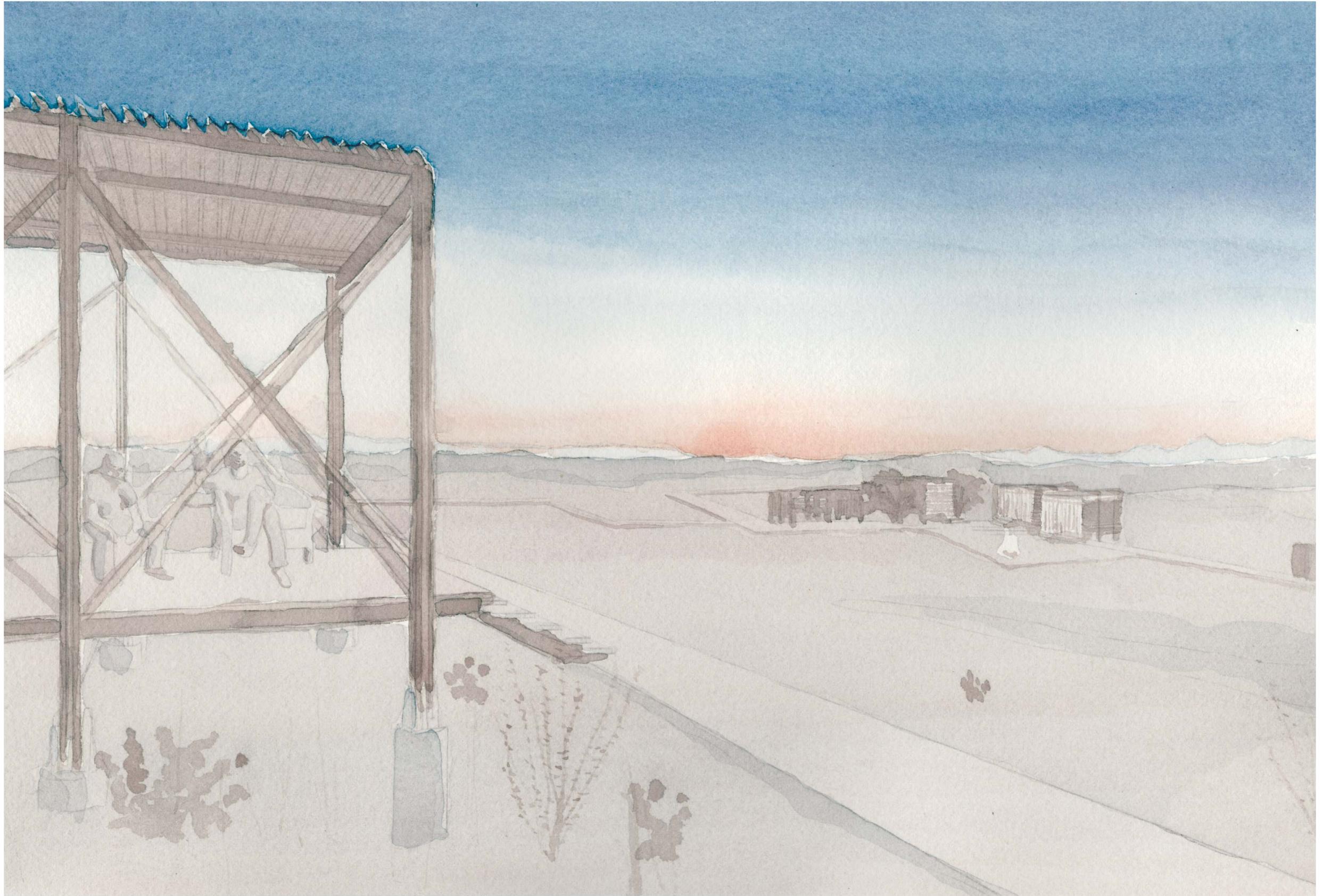




The pavilion is a primary expression of the building language of the camp structures. It is the second center of the camp--the second eye offering perspective on the camp and its surrounds. From here, one can look down from the ridge and see the camp below, with the Tucson valley beyond and Tucson mountains on the horizon. To the North and East are the peaks of the Rincon Mountains.

Opposite: Watercolor study for the view from the pavilion--the main body of the camp and the valley beyond.





The plan of the main cluster of buildings.

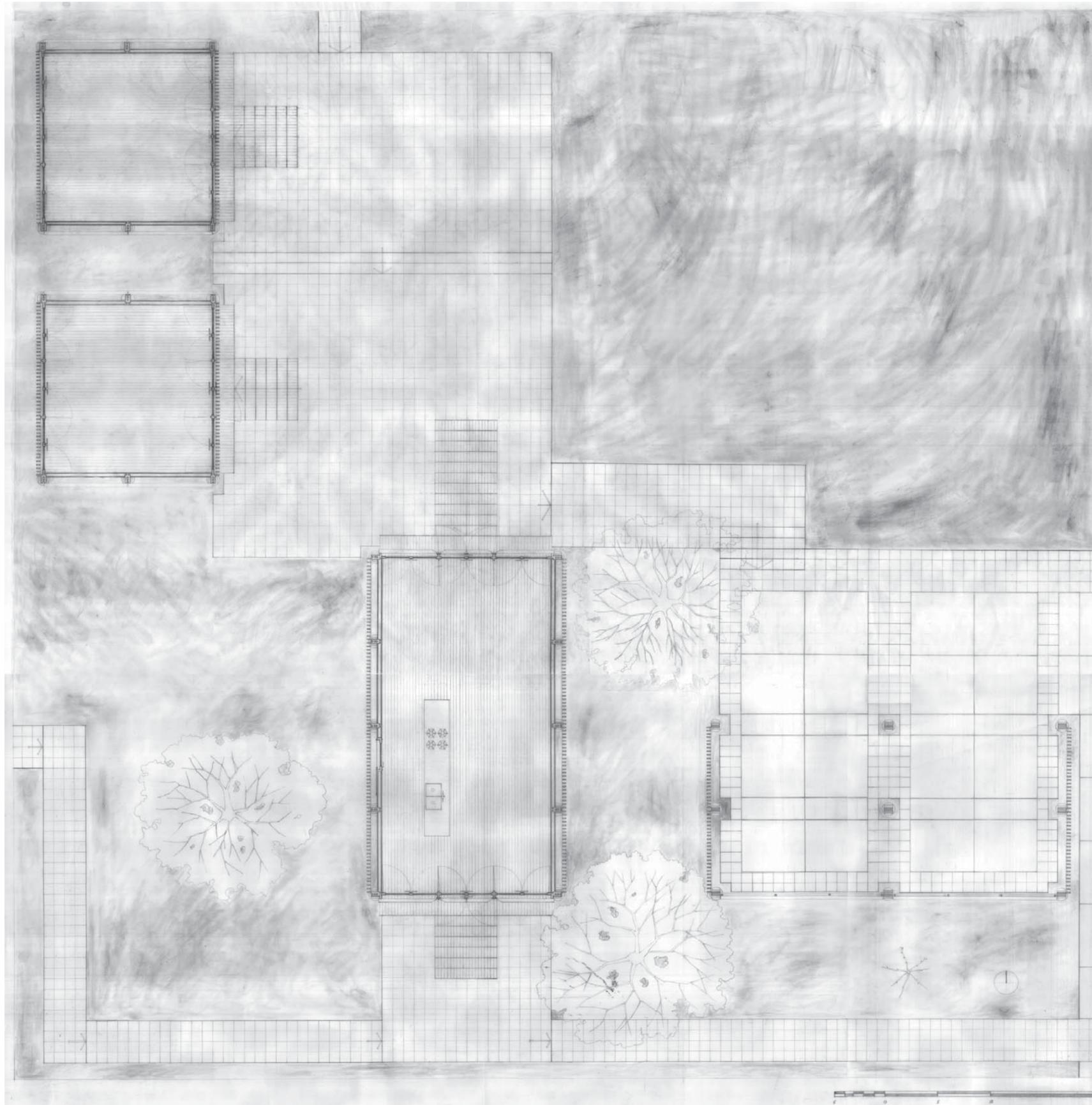
The two sleeping quarters on the left are squares in plan. The bedrooms here are square because they contain a microcosm within themselves, and as figures, they are without orientation; the center is clear. As frame structures, they have a linearity to them, orienting their openings to the morning and evening light.

The hall is the same square of the quarters doubled and the frame structure is rotated, opening to the northern and southern light.

The carport is again the square doubled, and is separated from the sleeping quarters by the hall. The rectangle is rotated again, but the structure retains its orientation from the hall, opening to the North. It is lightly enclosed by cedar louvers on three sides.

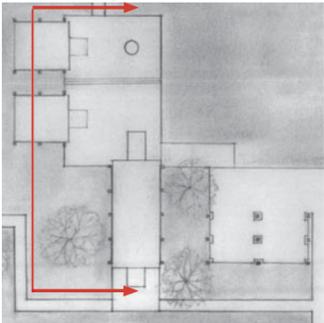
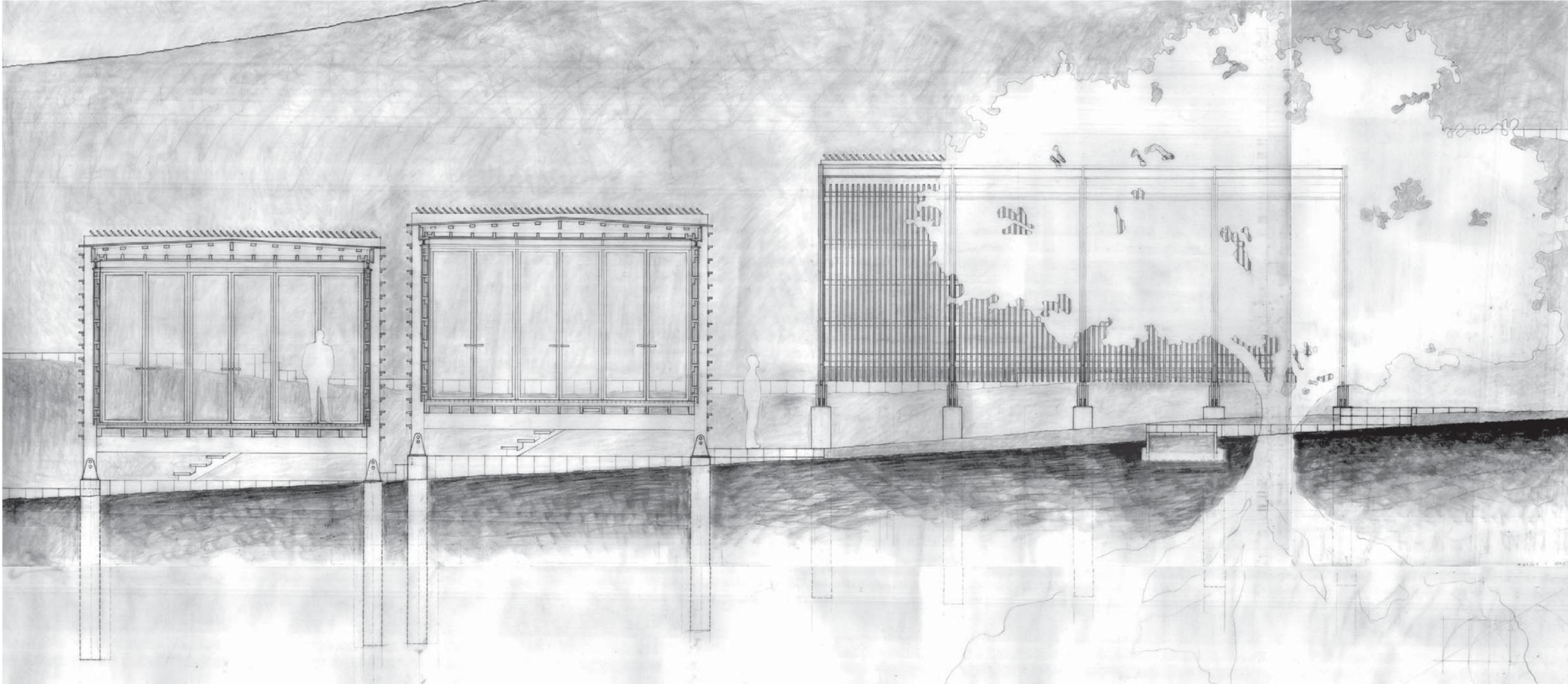
All structures are wrapped in louvers; the western and eastern sides with vertical louvers, the north and south in horizontal louvers.

The buildings step down to the sandstone courtyard; the path proceeds from the northern and eastern edges of the courtyard to encircle the camp.



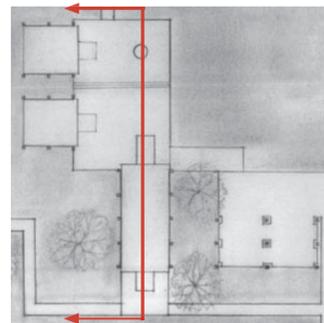
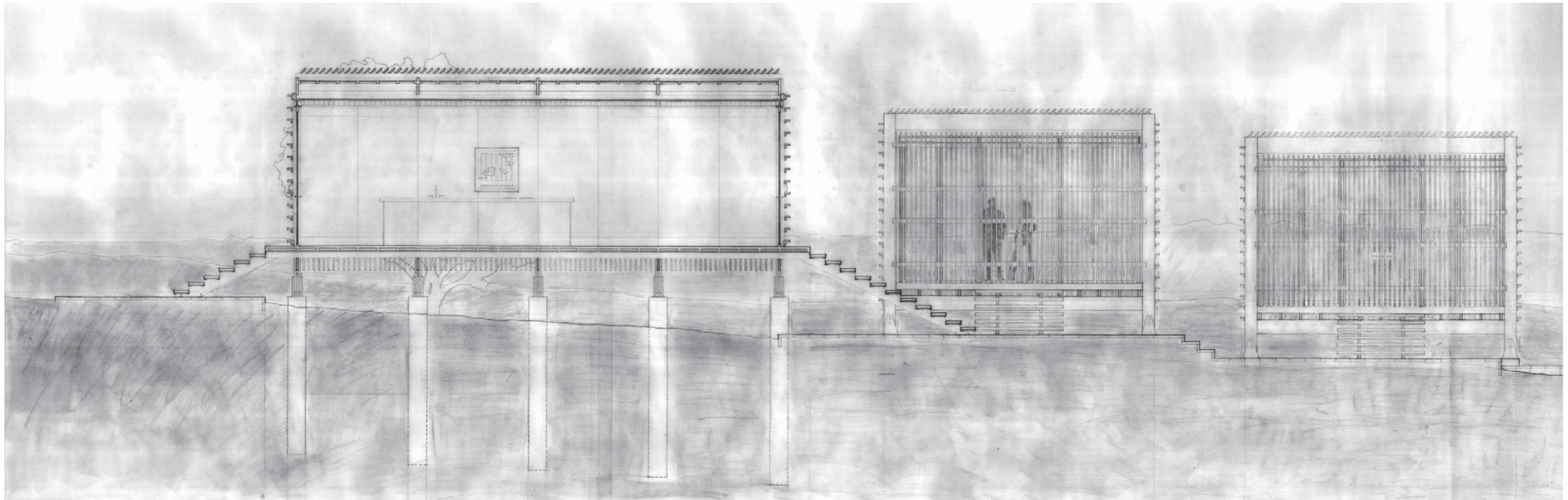
Section through the quarters, looking east to the hall.

Proportions for each wall of a sleeping quarter are based on the golden section. A clerestory runs around the perimeter of the ceiling, between the roof and wall.

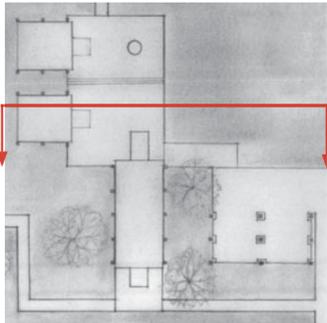
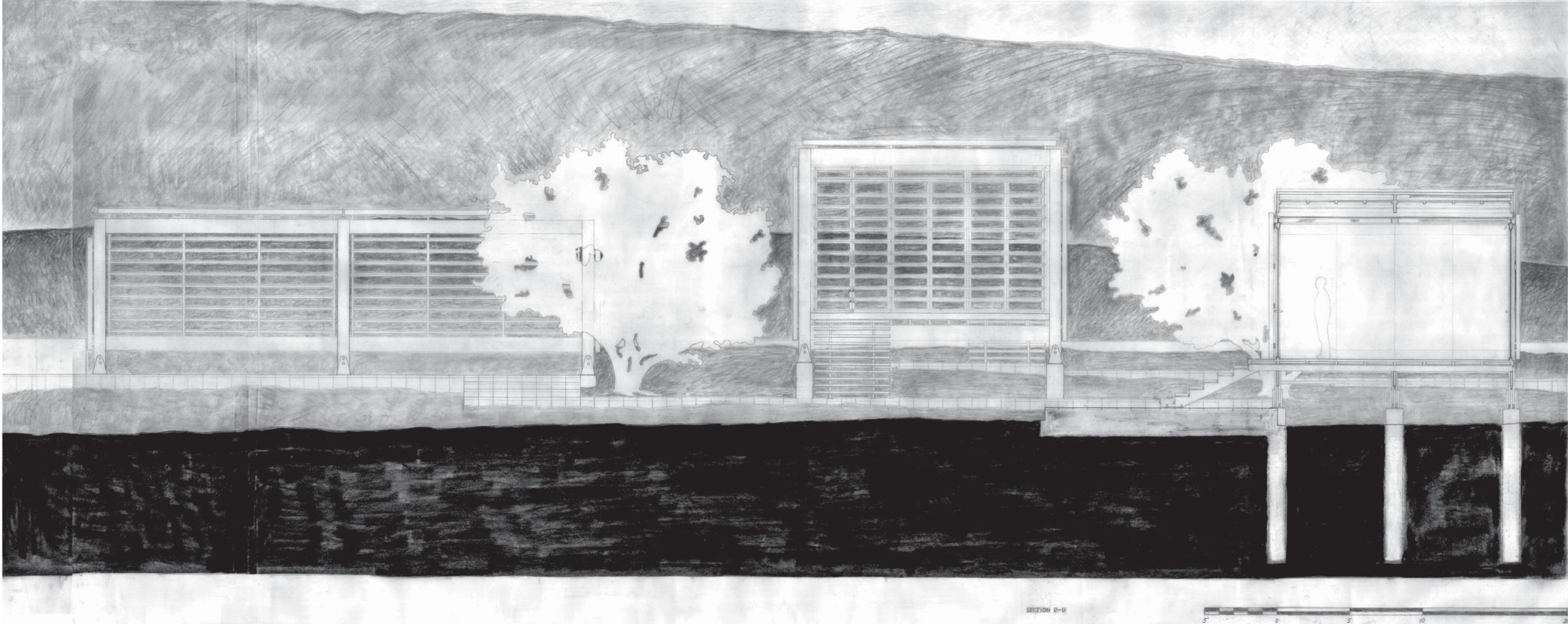


Section through the hall, looking west to the quarters.

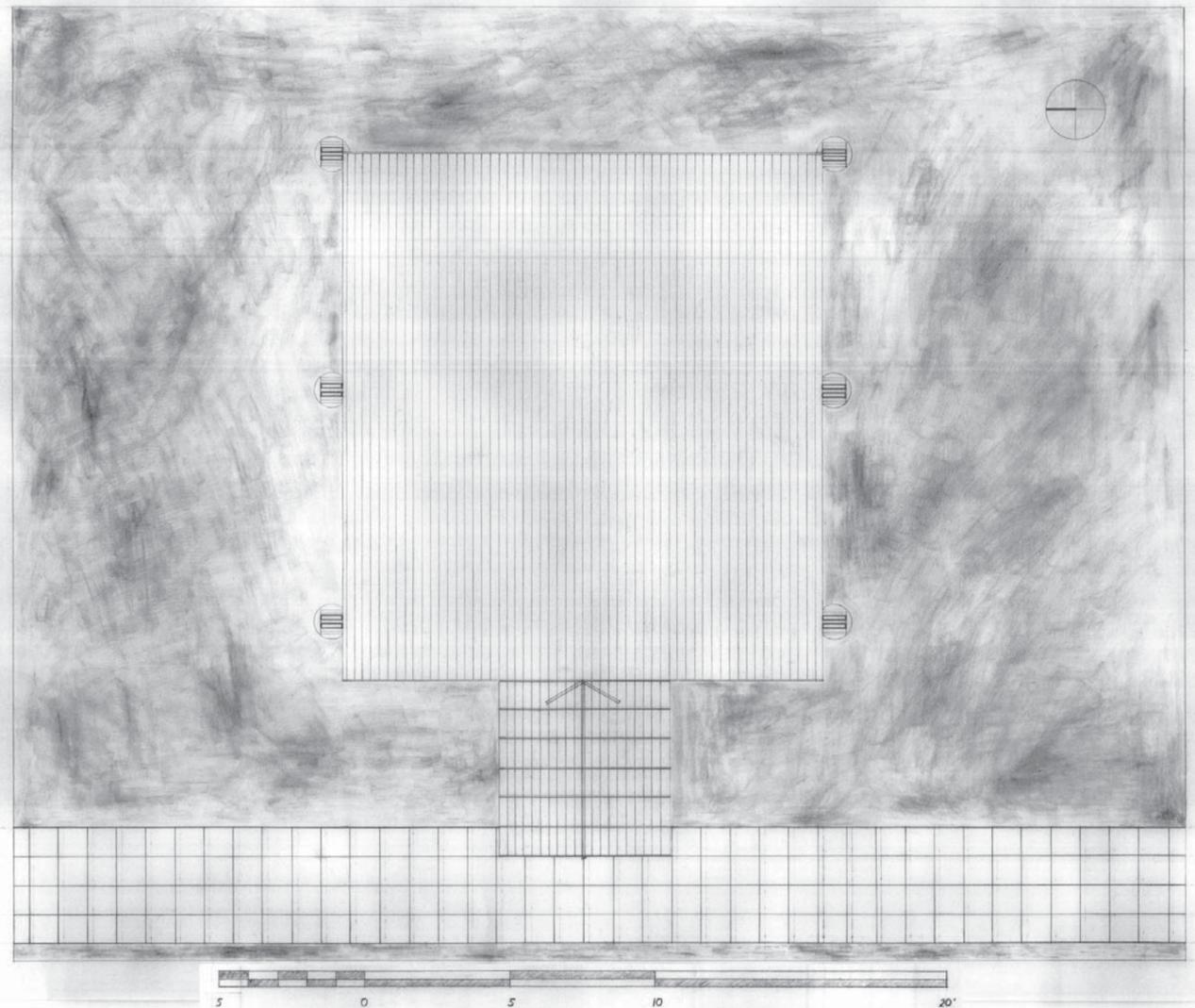
The elevation of the long wall of the hall is a doubled golden section, proportional to the length of the floor. This doubles the structure of one of the sleeping quarters. The square window in the west wall of the hall is the only such exception to the language that is common to all of the structures. Like in the sleeping quarters, there is a clerestory that runs the perimeter of the ceiling.



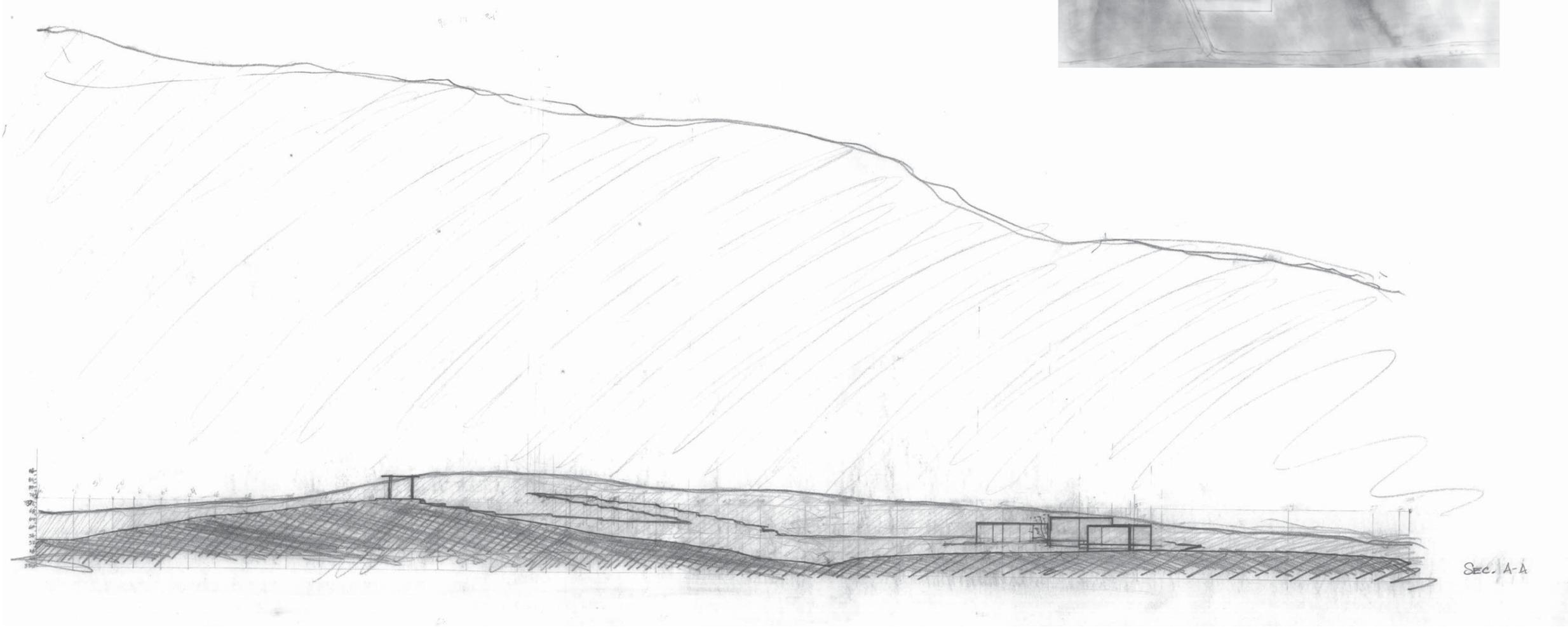
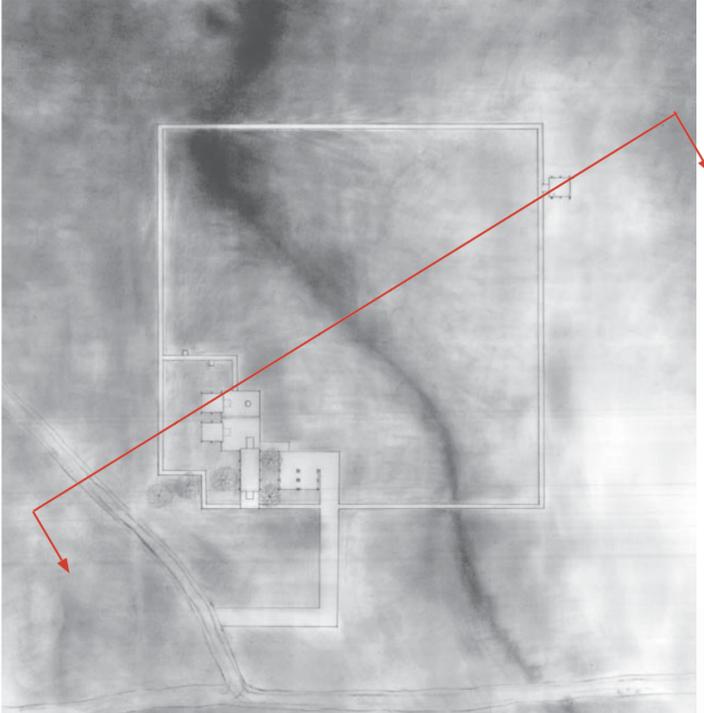
Transverse section through the quarters, looking south to the hall and carport.



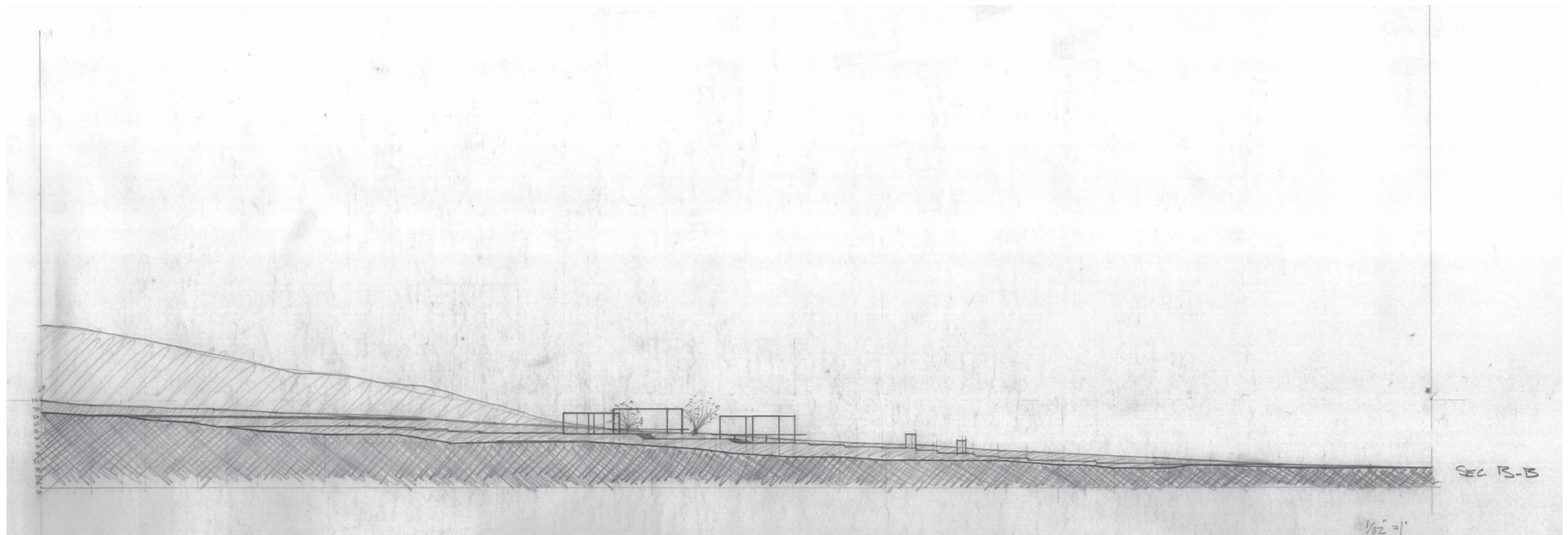
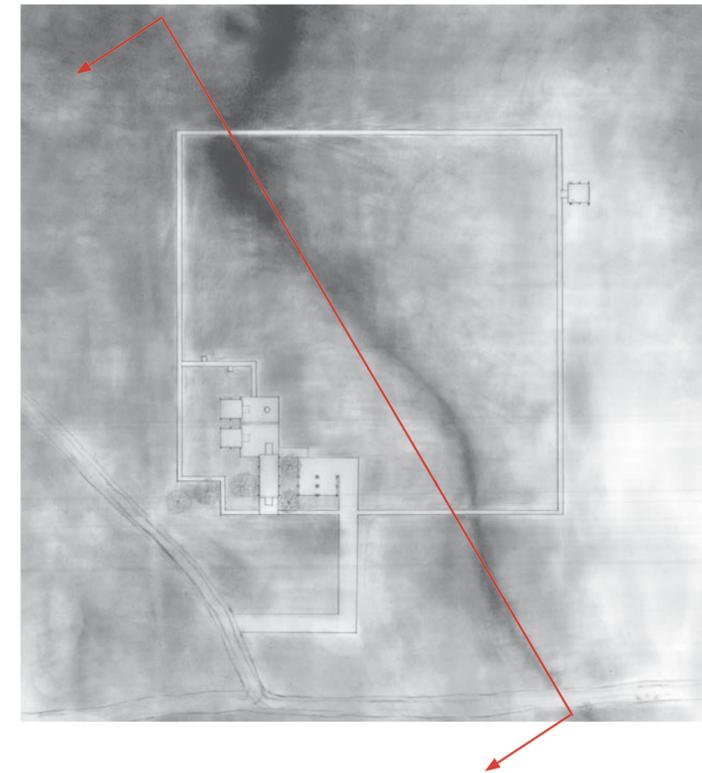
The Pavilion in plan. It is the distilled form of the building structure.



Section through the site and camp, looking South-East. While the pavilion is perched on one of the highest points of the site, the camp overall is integrated with the site, rather than dominating it.



Transverse section through the site, now looking South-West.





Informing Studies

A number of studies informed this project. What follow are summaries of these.

The Site

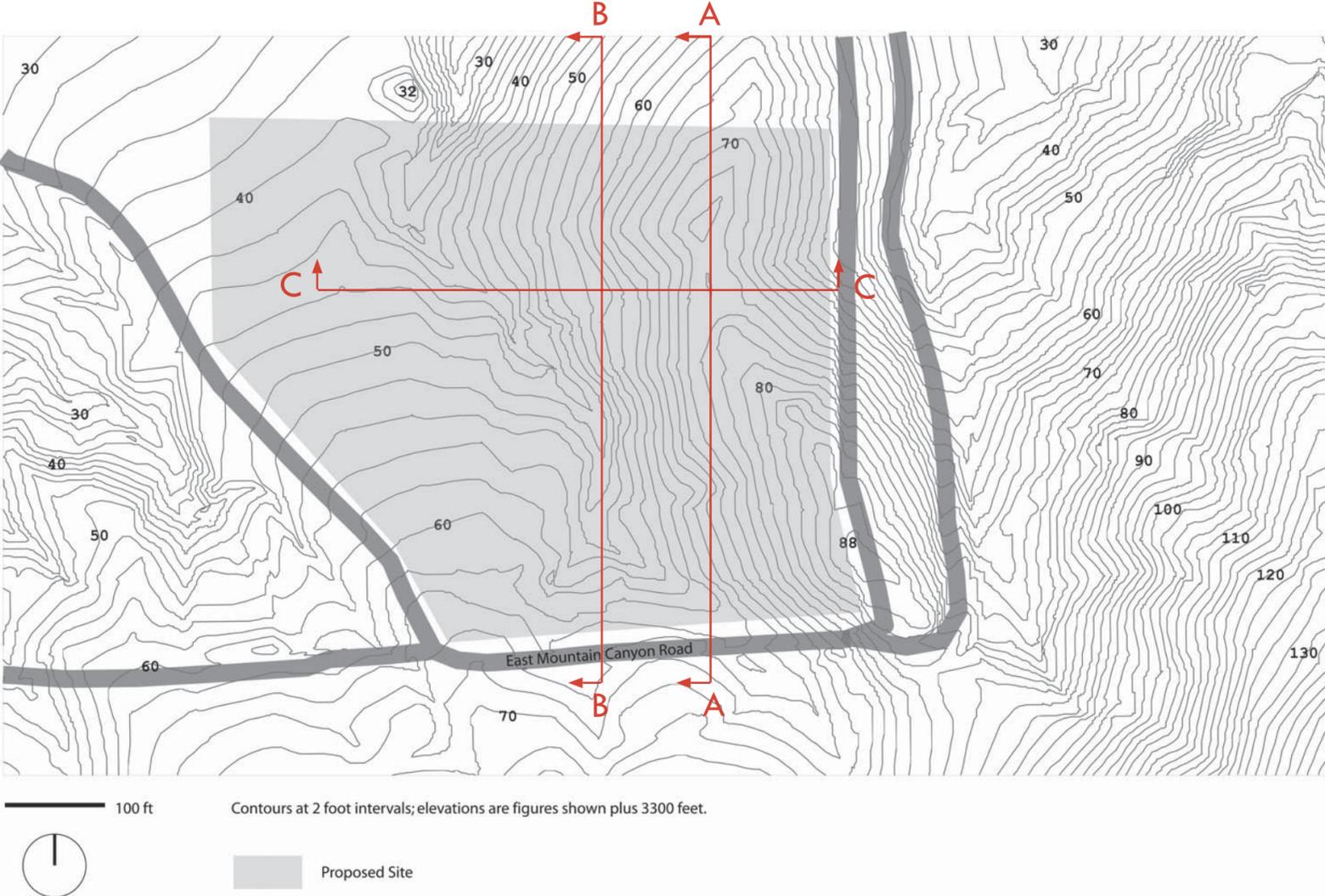
The site for the project is a plot of land about five acres in size, with a great degree of undulation in the lay of the land. The earth is gravelly and full of sand and clay. Plants cover the ground--each ekes out their own prickly existence.

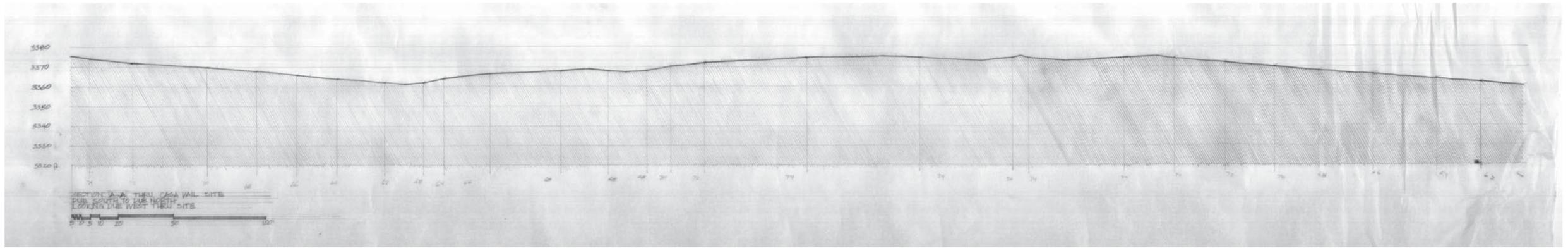
Questions regarding how the camp should interact with the site became important, particularly *where* and *how* the buildings should sit.



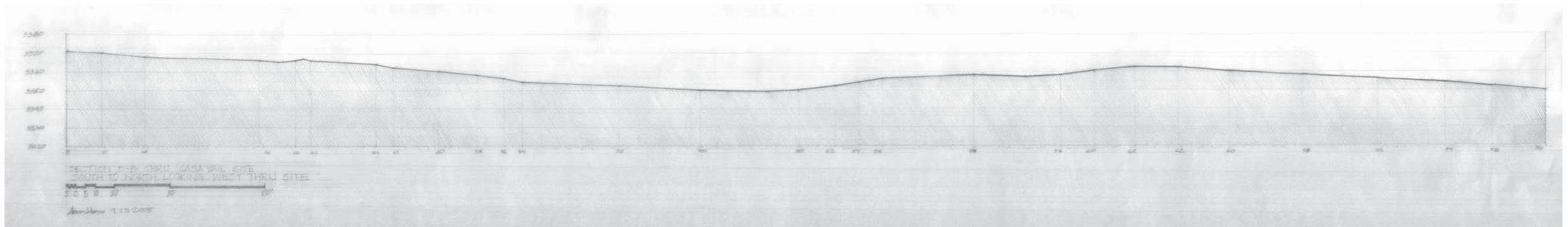
A panorama from the site, looking North-West to East.

At the beginning of the project, the center of the camp was placed on the spine of a ridge that runs through the site. It seemed right to choose the highest spot for the main body of the camp. Upon reflection of the appropriate relationship of the buildings to the site, the decision was made to move the center of the camp from one of the highest and steeply sloped spots to one of the lower and flatter spots. The decision then followed that the buildings should be light in construction and perch on the site.

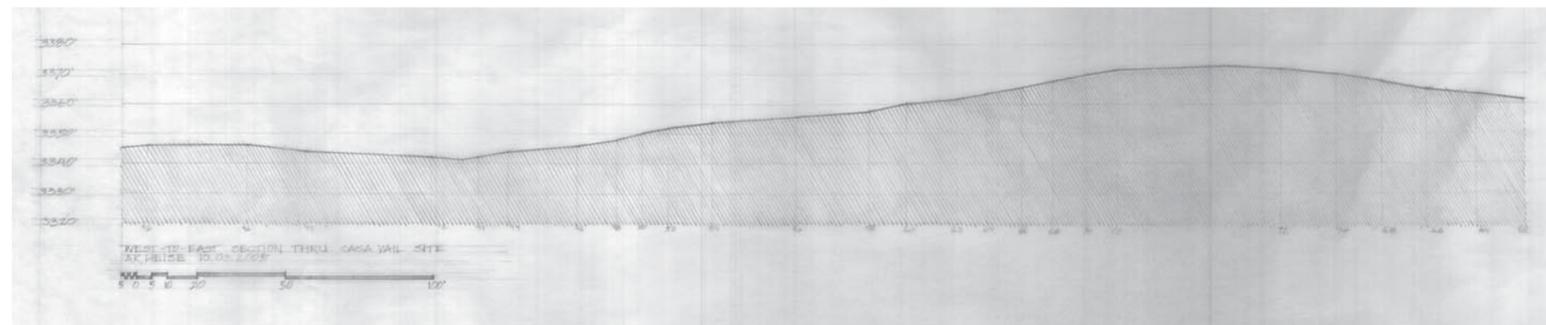




Section A-A



Section B-B



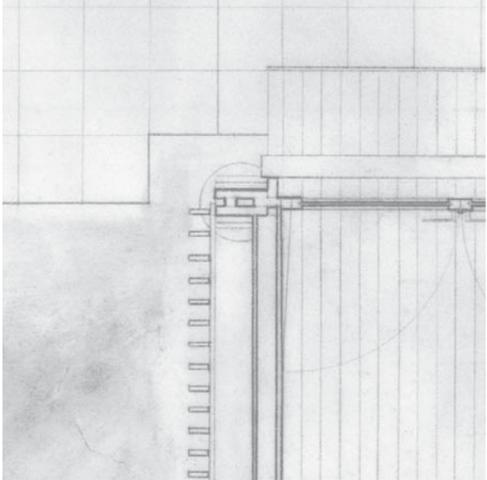
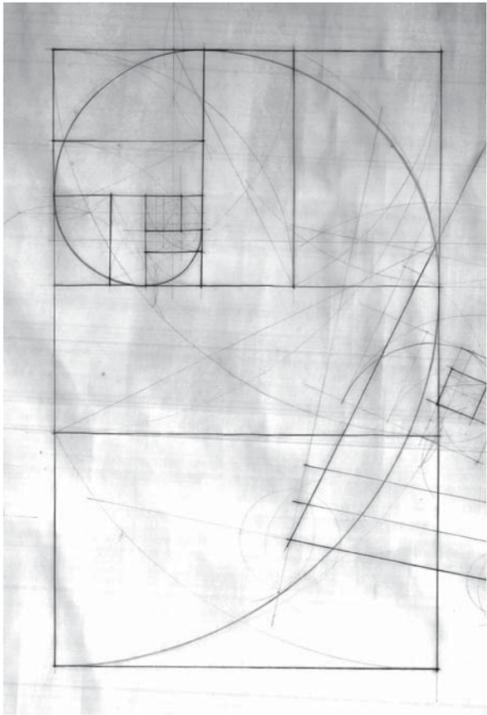
Section C-C

Order, Proportion, and Geometry

This study involved the geometric description of four modern houses in order to understand the importance of the classical concepts of order, proportion, and geometry in modern architecture. The houses were Jorn Utzon's Can Feliz, Rick Joy's Tucson Mountain House and his Catalina House, and Glenn Murcutt's Simpson-Lee House.

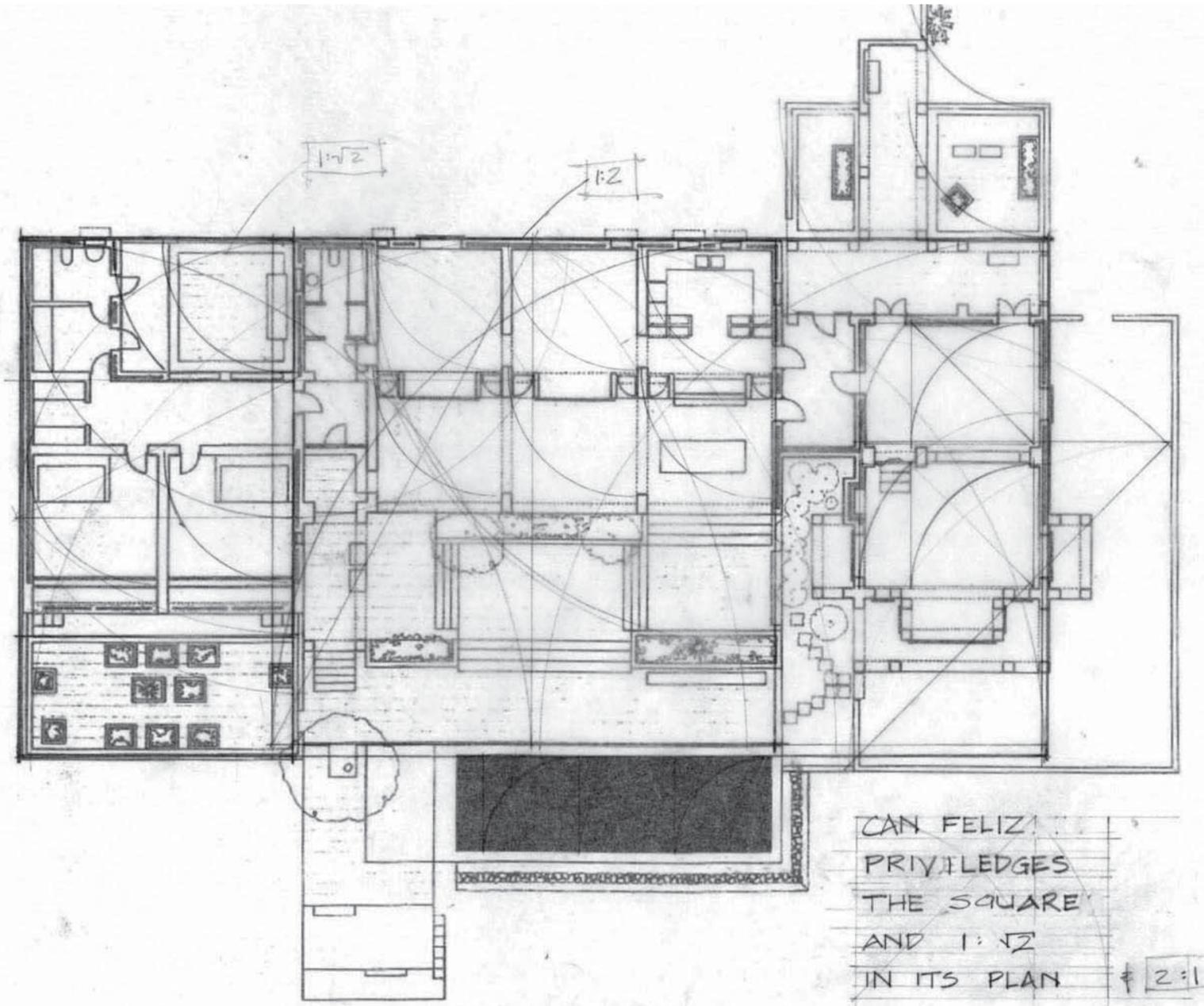
It is consistent among the four houses that the plans of the bedrooms are square; it is only clear in Can Feliz that the measure of plan and section are simultaneously conceived with the proportion of the room in mind.

While the simplest expression of the plan of the elemental camp structure is the figure of a square, the building language is that of a linear frame that therefore has a particular orientation. This had its advantages in the ability to play the sides of the structure against each other, in the opposition of the closed and open sides of each little building, and also in the buildings' relationships to each other, as buildings were rotated. The consequent disadvantage of the use of the linear frame is the rather clumsy fashion in which the structures turn the corner.



Top to bottom: Construction of the Golden Section; a corner of the main hall in plan.

Opposite: Proportional Analysis of Can Feliz in Plan;

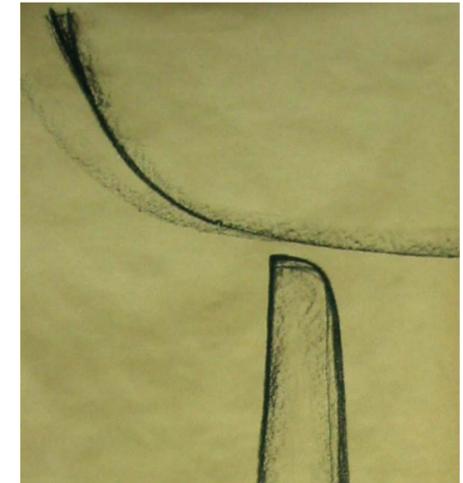


Form

This series of studies were undertaken in order to bring an understanding of the existence of architectural elements as things-in-themselves to the project. It specifically sought to address the questions “What is a wall?”, “What is a roof?”, “What is a floor?”, “How should a floor and a wall meet?”, and “How should a roof and wall meet?”

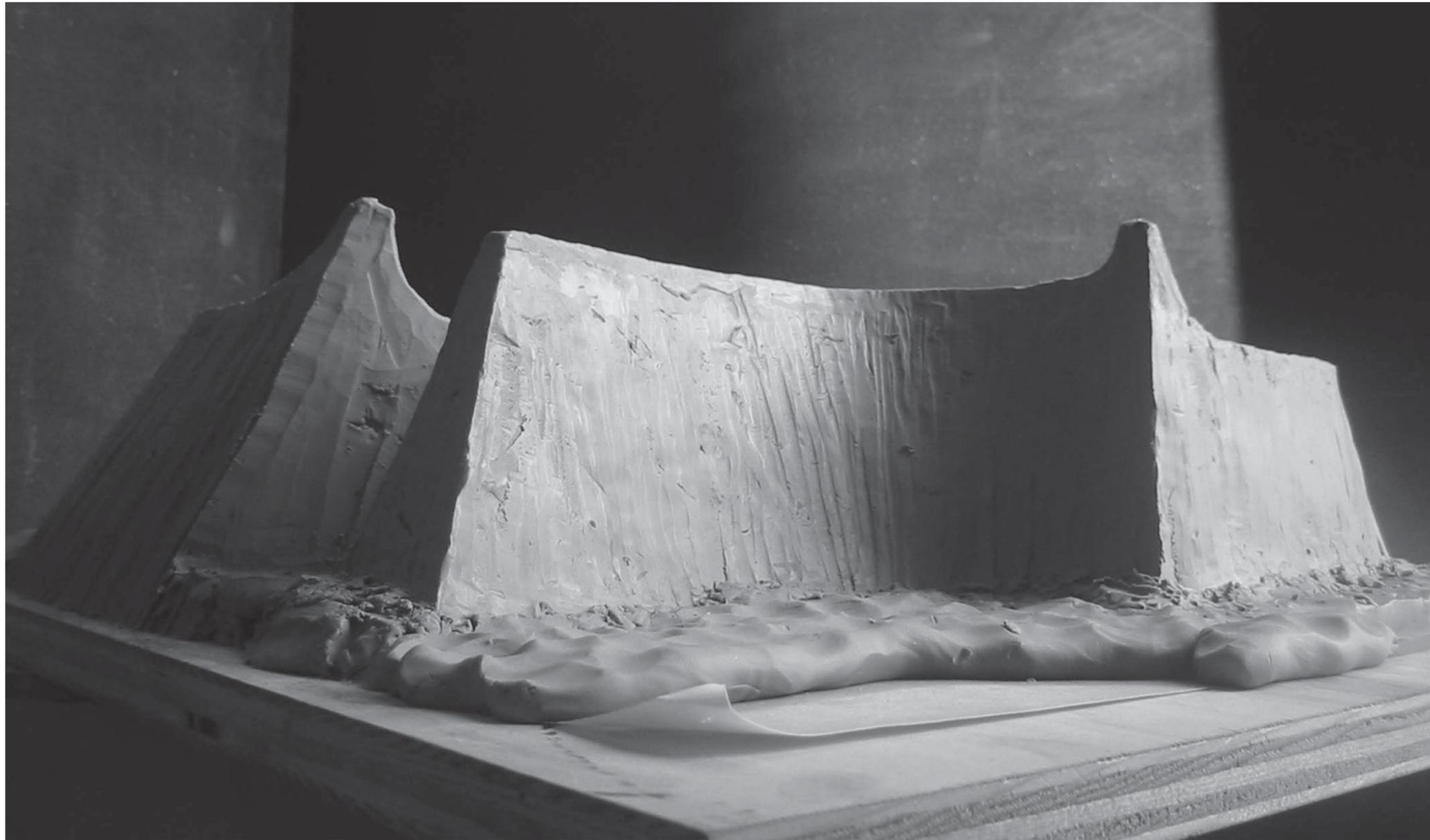
Developing the clay model awakened a sensible knowledge of material and form. The process of making also informed ideas that had been in the project but whose forms were as of yet undefined.

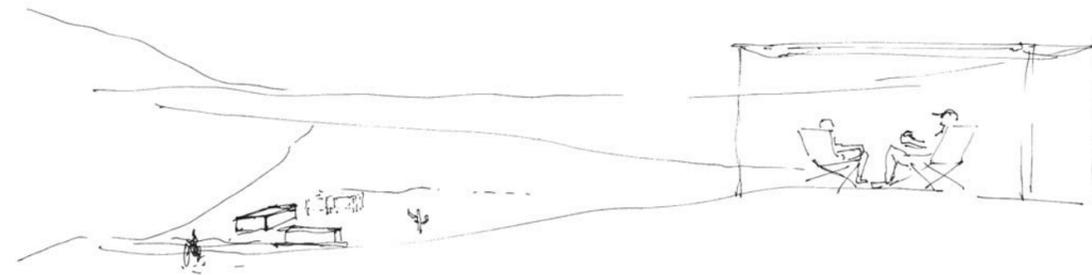
These studies also raised other questions, particularly about the belonging of the building to the site. As sketches and modeling progressed, it became clear that while the developing form was clearly *of the earth*, it had yet to be *of the site*.



Above: The relationship between the roof and the wall was approached by sketching large sections in charcoal. The sections developed as the curves within each section reacted to each other.

Opposite: What was most interesting about the making of the clay model was discovering relationships between sections within the form. The highest points of the wall became moments where the wall turns in plan and in section.





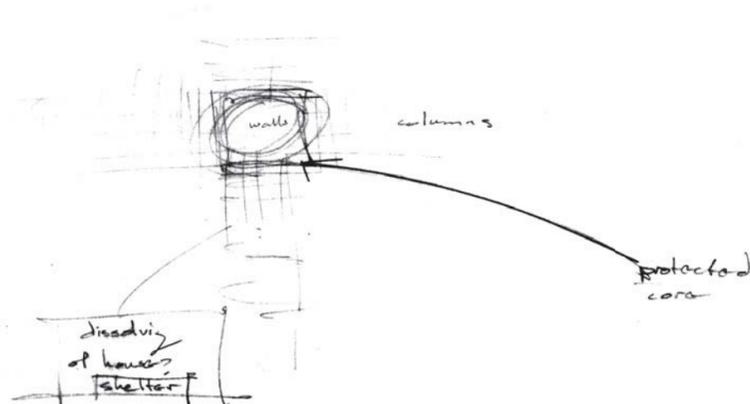
Lines of Ideas

There were a number of ideas that arose with the beginnings of this project, and made appearances through the many iterations to emerge in the final form.

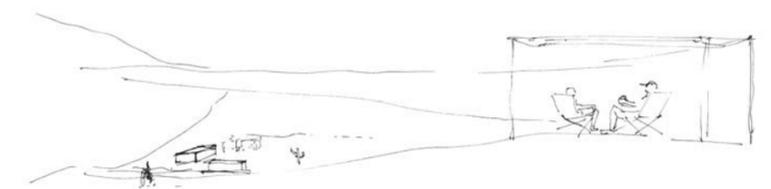
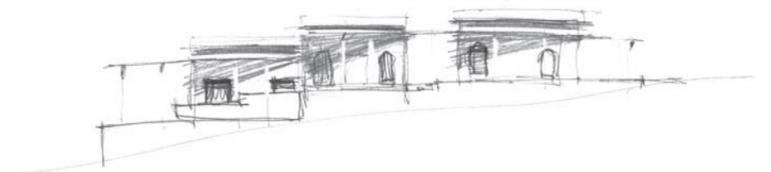
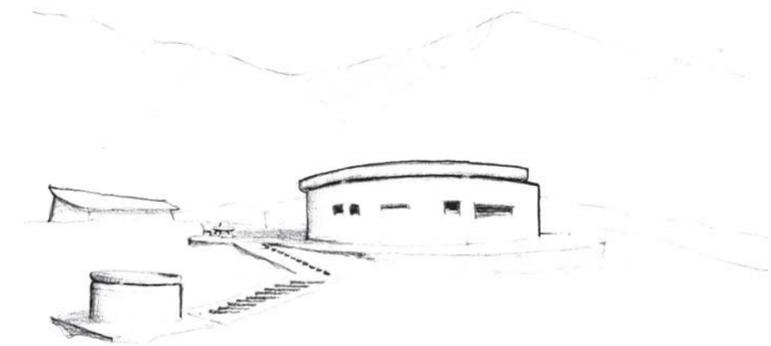
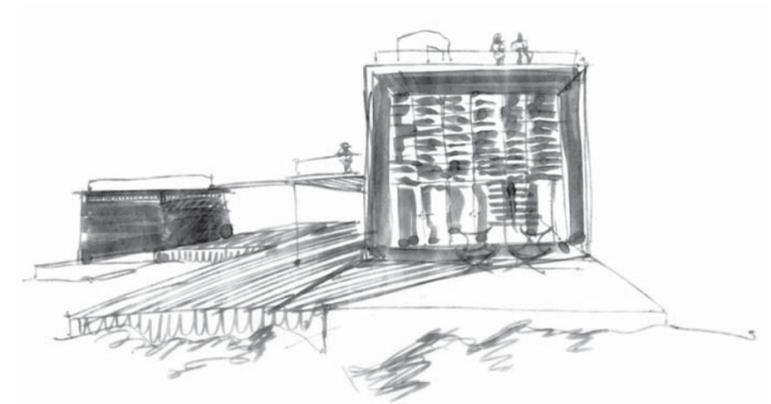
A Pulling Apart

In the beginning there were ideas concerning the dissolving of structure and the consequential dissolving of shelter. The first manifestations of this idea appeared as a group of buildings dominated by a central building with so many vestigial outbuildings. Later the order and role of each structure in the camp became clear.

Below: Diagram of dissolving shelter.

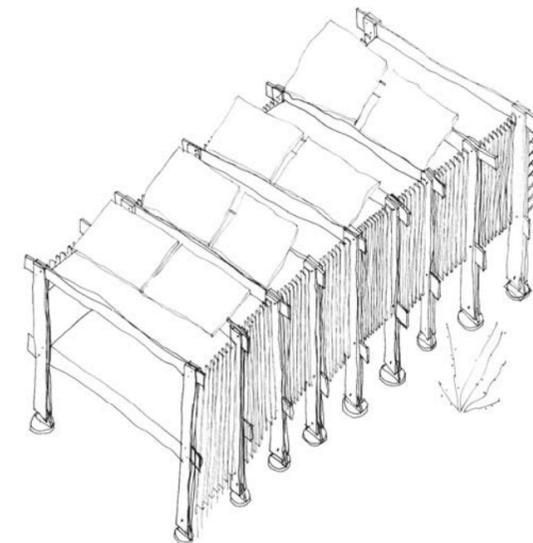
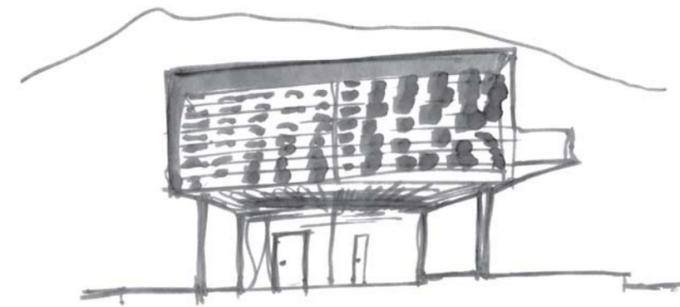
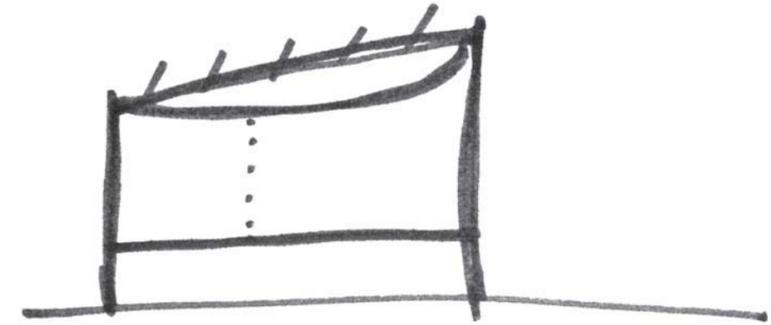


Right, The pulling apart of the house into a compound of structures, in four progressive iterations. Top to bottom: The cantilever house and its meditation room; the formal house with its meditation room and machine shed; the house of walls and columns marked a point where each room starts to become an individual structure; a sketch for the camp, where the pulling apart of the house into individual structures becomes fully realized.



Sitting Lightly on the Ground

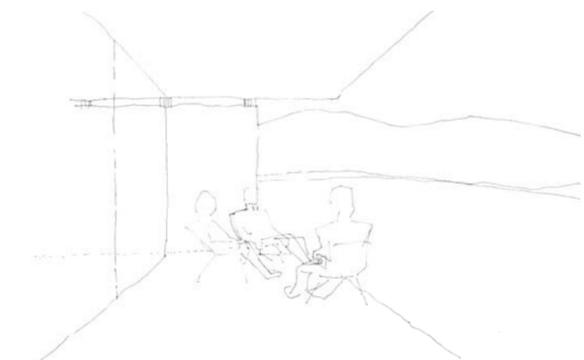
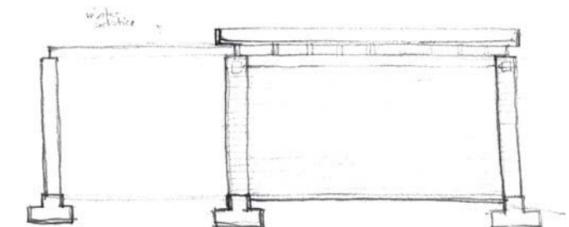
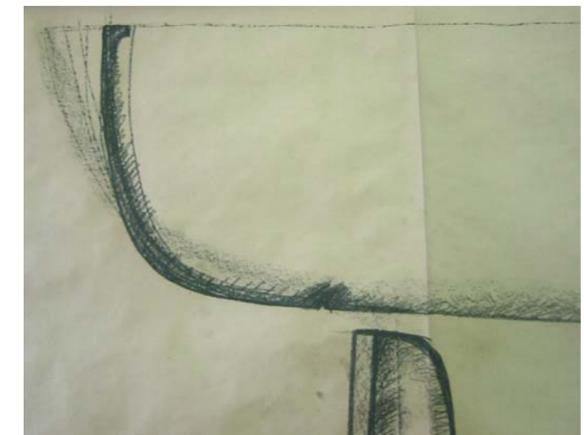
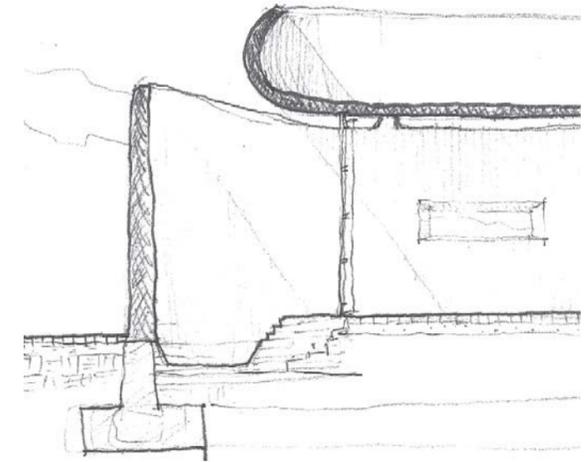
The question of how the buildings should sit on the ground brought into question their overall form. The fragile nature of the earth at the site informed a decision to make the buildings sit lightly on the ground. While this decision was forgone in the formal studies, it reemerged in the final design, once materials and structure were brought to the idea.



Top to bottom: An early concept sketch of a structure section; the cantilevered design raised the bulk of the house off the ground; the stick house on stilts that resolved the form of the design.

Light Between the Roof and Wall

Light coming into a room between the roof and wall is an unexpected thing. The idea of bringing the sky into a room was persistent through the many designs for this project.



Top to bottom: The beginnings of the floating roof in sketches for the formal model; a later articulation of the same; a section of the the house of walls and columns with its clerestory; the roof that floats.

Summary

The goal of this project was to create architecture in the desert of the American Southwest. Studies were undertaken to inform the ensuing design, yet in themselves did not yield a resolution to this goal. However, these studies were able to provide information about the truth of the design and the truth of the forms for the ideas that arose at the onset of the project.

The site studies informed the decision to have the camp perch lightly on the ground, and yet to sit *within* and not *on top* of the lay of the land. The studies in order, proportion, and geometry informed the decisions to make the buildings proportional to each other in a way that gave the camp order. The studies in pure form informed decisions about the how the buildings should be, how their parts should relate to each other, and how they should be made.

In conclusion, architecture is made for a specific place. The place for this thesis project is the land in the foothills of the Rincon Mountains in southeastern Arizona. This Camp in the Desert is offered as that architecture.

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