



Horizontal Forest: A Retreat on the AT

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Acknowledgments

This book is dedicated to my Grandfather who has taught me a respect of the land and the art of curiosity and observation.

This could not have been possible without the support of my family and friends. A special thanks goes out to my Mother whose continued dedication to my pursuits is unparalleled. And to my sister, whose insight has always taken me further.

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Abstract



This is a project about reconciling the rational world of architecture with the empirical world of nature. A small retreat on the Appalachian Trail near Dragon's Tooth, this project employs two elements belonging to each of those entities. The retreat is composed of a double envelope. The exterior envelope is a wooden screen and dry stacked stone wall relating to the natural world. In contrast, the second envelope is a glass and steel box, analogous to the rationality of man. Dimensional 2x4 lumber models are employed to study the light conditions, patterns, and construction of the wooden screen.

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Introduction

Standing atop the Great Sand Dunes of Colorado, I thought to myself, “How could I be entering a career that has the potential to build on every last square inch of land without recognition of natural place?” It seemed at the time that our suburban boundaries were expanding at an alarming rate, infiltrating the places wild. The American landscape was being sacrificed to building. From Alaska to Florida, buildings appear to be unnecessary, profit motivated, and unrooted. These structures do not belong to place; rather they are merely on it.


This thesis is in response to these observations, looking for a sympathetic and respectful relationship between architecture and land.



Architecture and Nature

*Architecture, whether as a town or building,
is the reconciliation of ourselves with the
natural land.*

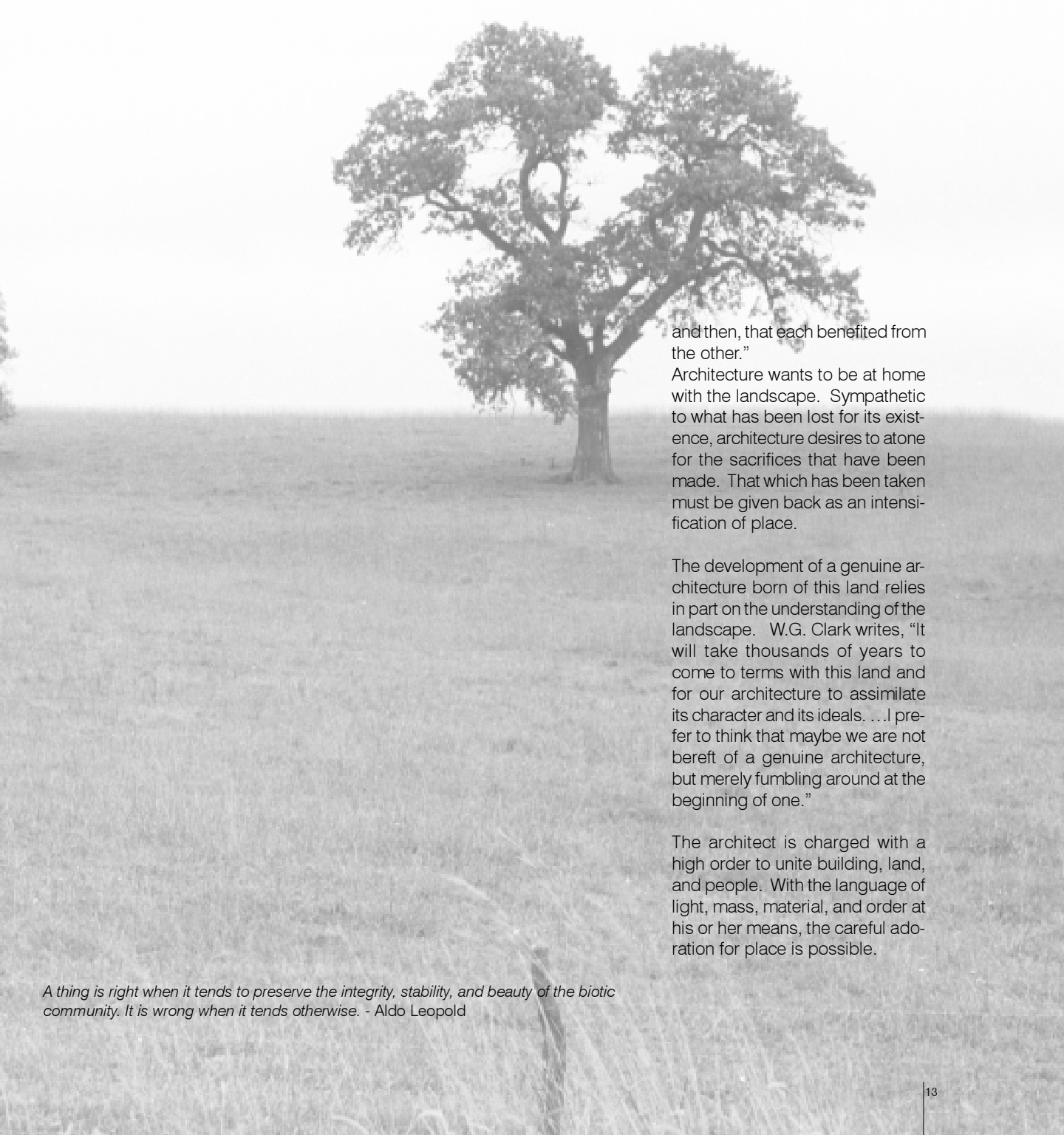
-W.G. Clark



When architecture is made, a boundary between land and building is created. Architecture fails when no attempt is made to engage this distinction. This boundary is the site where humans and nature reconcile their relationship.

The manipulation of this boundary is crucial in attempting to find alignment between land and building. In the urban fabric, architecture relates to the city, and the city relates to the natural land. Often, the city and the building share a rational understanding. Architecture's relationship in the natural landscape is different. Here the empirical world of nature and the rational world of building come into close relation. Man's relationship to nature is expressed in this boundary. As Fay Jones said, "You'd like to have it appear that man and nature planned and carefully arranged everything by mutual agreement,

Modern Architecture - let us now say organic architecture - is a natural architecture - the architecture of nature, for Nature. - Frank Lloyd Wright



and then, that each benefited from the other.”

Architecture wants to be at home with the landscape. Sympathetic to what has been lost for its existence, architecture desires to atone for the sacrifices that have been made. That which has been taken must be given back as an intensification of place.

The development of a genuine architecture born of this land relies in part on the understanding of the landscape. W.G. Clark writes, “It will take thousands of years to come to terms with this land and for our architecture to assimilate its character and its ideals. ... I prefer to think that maybe we are not bereft of a genuine architecture, but merely fumbling around at the beginning of one.”

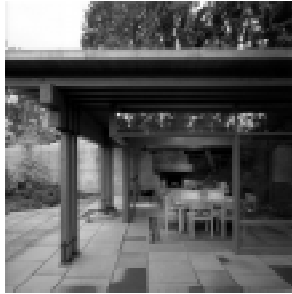
The architect is charged with a high order to unite building, land, and people. With the language of light, mass, material, and order at his or her means, the careful adoration for place is possible.

A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise. - Aldo Leopold



Precedence

Architects include landscape in building compositions by attempting to blur the distinction between architecture and setting. For instance, James Cutler achieves this by extending the threshold of inside and outside (1). To blur the line, Cutler strives to heighten awareness of material through details and, by extension, the natural world (2). Often every wood component (3) is visible in his work. “I decided to find ways to honor the trees that were cut,” Cutler says. He feels architecture’s strength lies in the ability to intimately connect people to place (4). Fay Jones, too, merges building and setting (5). He utilizes outdoor spaces (6), materials, parts and whole relationships, and natural forms (7) to lessen the difference of man made and landscape. Additionally, traditional Japanese architec-



1



2



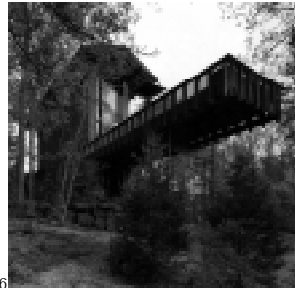
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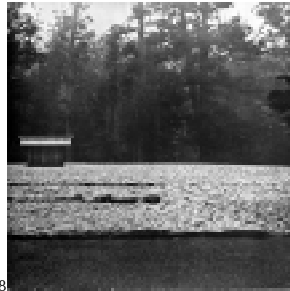
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6



7



8

ture is careful to distinguish natural land from that which has been changed (8). By doing so, the building and forest are in mutual agreement.



9



10

Less often the composition of building and place are in contrast. For example, Richard Meier's Douglas House (9) forms an opposition to the landscape. Its highly articulated white steel and glass construction does not imitate nature, but rather forces the distinction of building and setting. The Farnsworth House (10-11) similarly pronounces the difference of house and land. Likewise, Glenn Murcutt's (12) buildings are in contrast to nature. Unlike Mies van der Rohe and Meier though, Murcutt celebrates the natural elements of wind, sun, fire, and water. His architecture almost becomes a machine specialized for the Australian wilderness.



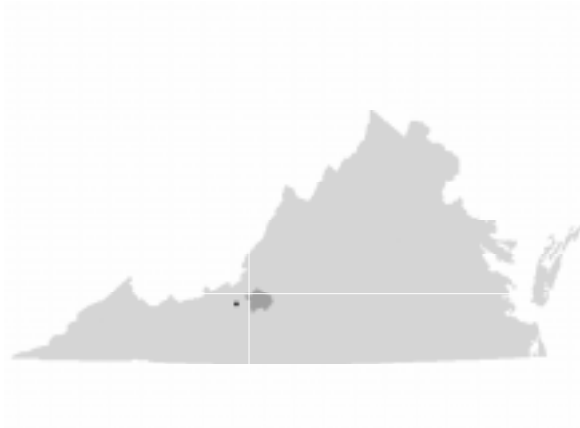
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12



Finding Place

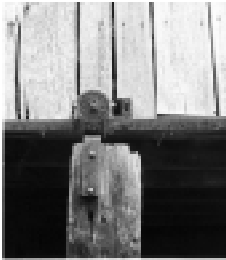
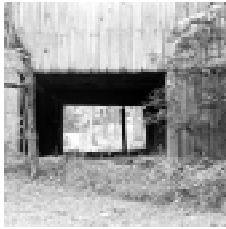


Dragon's Tooth, a popular destination on the Appalachian Trail, is located northeast of Blacksburg, Virginia in northern Roanoke County. The actual tooth itself is a quartzite rock formation located on Cove Mountain in Jefferson National Forest. Juxtaposed to farm land and public forest, the site brings contrast between grassland and forest.





PERSON
L FOREST



The region near Dragon's Tooth is spotted with sheds and barns. Growing from the local conditions and customs, these buildings seem to fit more profoundly in the landscape. Their necessity and economy of construction puts them at ease with the land.

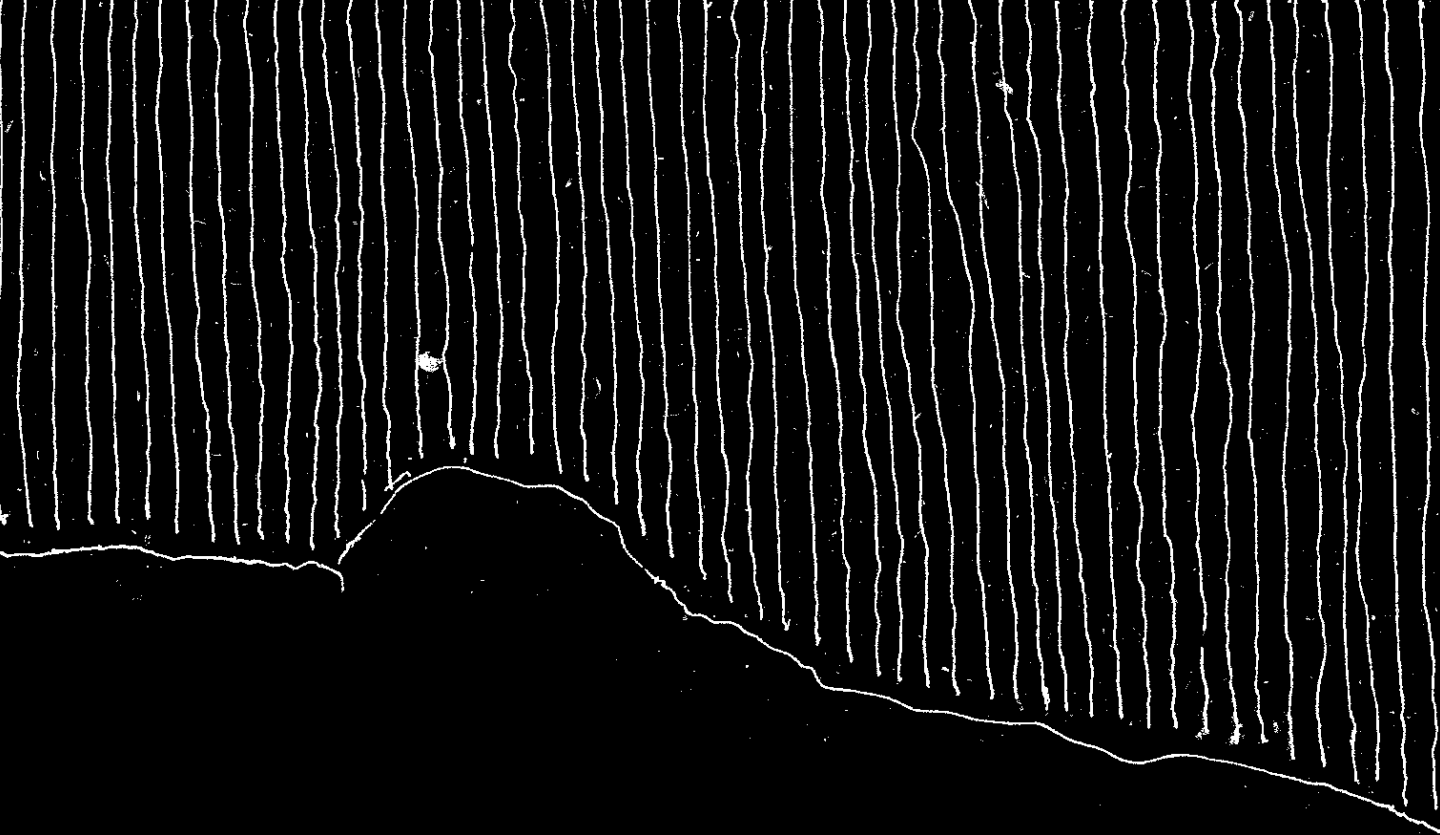






Reaching Dragon's Tooth is a strenuous three-mile hike. Once a hiker reaches the Cove Mountain summit, the trail drops slightly to the outcrop. At the rock, one confronts two massive walls formed by erosion of alternating soft and hard rock. Continuing to ascend Dragon's Tooth, one encounters openings in the rock and nearby valleys come into view. Moving to the peak, the forest screens the view slightly. Finally at the top of Dragon's Tooth, the vistas open to a 360-degree view.





Considering an appropriate building site was an important question. A building placed in close proximity to the rock proved to be unfavorable, for it competed with it. This finding led me to continue searching for a more appropriate site.



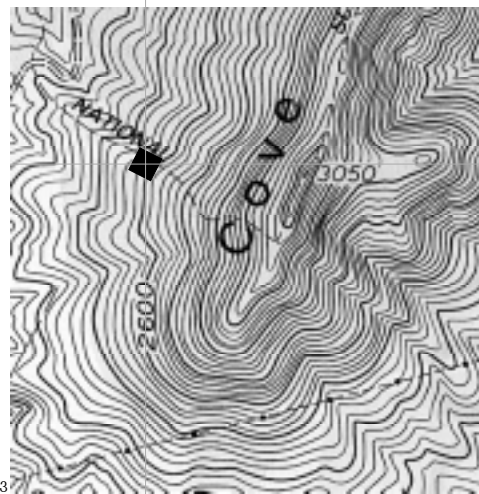


*Places we save from
ourselves.*
- W.G. Clark



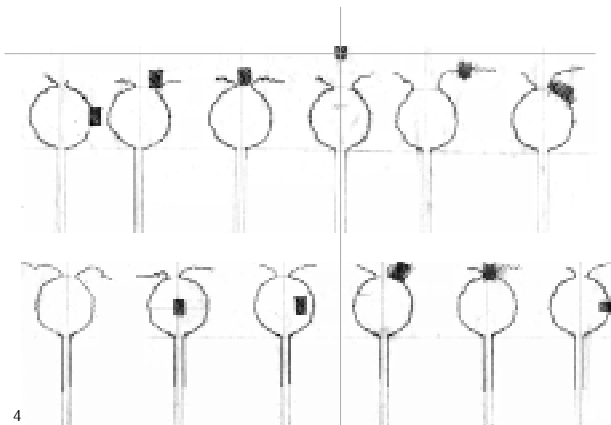


2



3

On the abandoned Appalachian Trail, the chosen site is a tree cove located a quarter of a mile west of Dragon's Tooth. Located at the threshold between forest and grazing land, views of the forest and to Miller's Cove are evident. Several configurations of building and the forest inlet were considered. Occupying the circle of trees, the building replaces the cove. Alternatively, carefully placing it outside the forest positions it as a guardian, ensuring the eyelet's permanence. Here the retreat takes advantage of looking back at the cove and affording views of the valley.



4

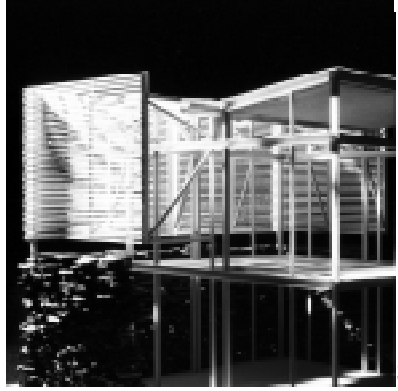


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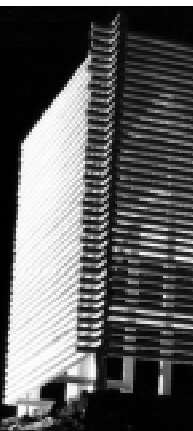




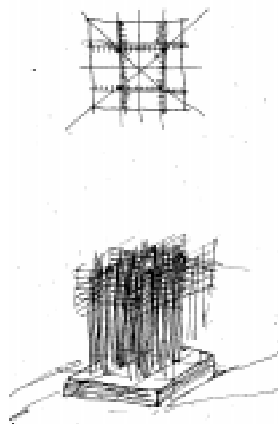
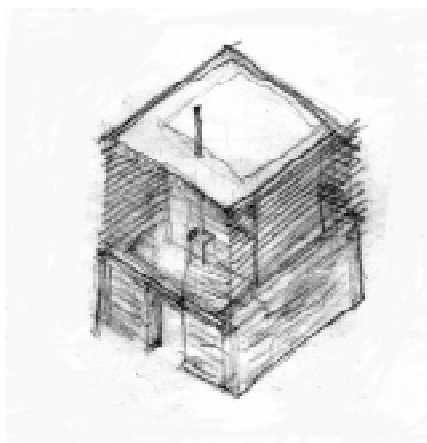
site plan



Screen

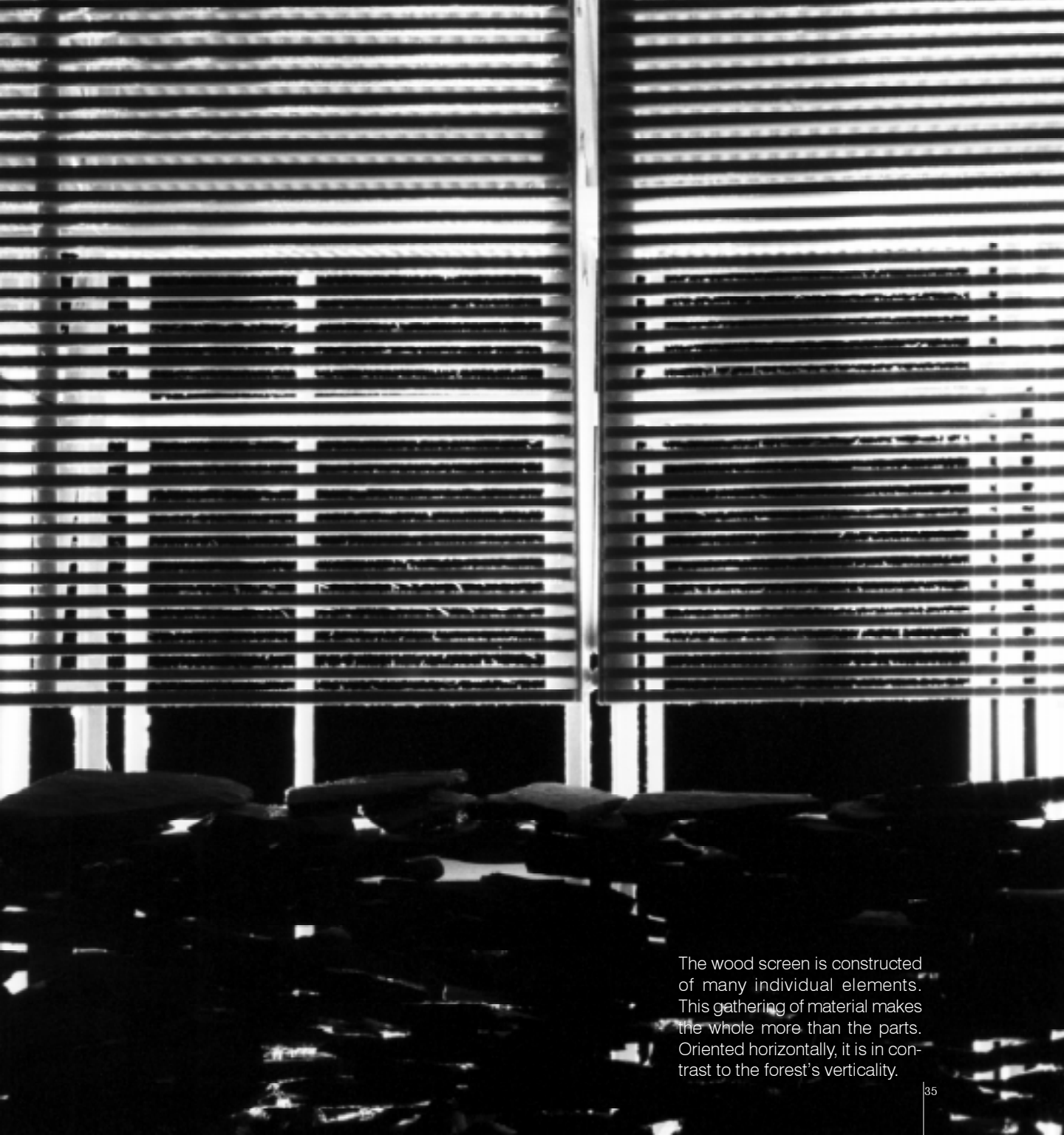


The retreat comprises two main elements: the screen and the glass box. The screen is paramount. It is in the realm of observation. It modulates the view and the light. Made of wood and stone it readies itself for nature's reclamation. The screen was developed out of a study of several physical models, including simple structures of dimensional lumber.



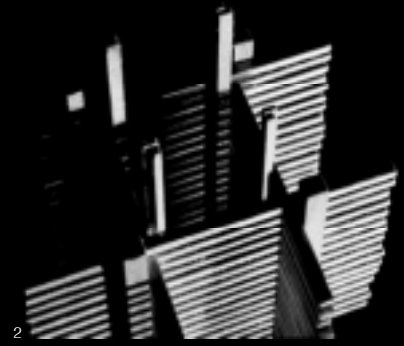
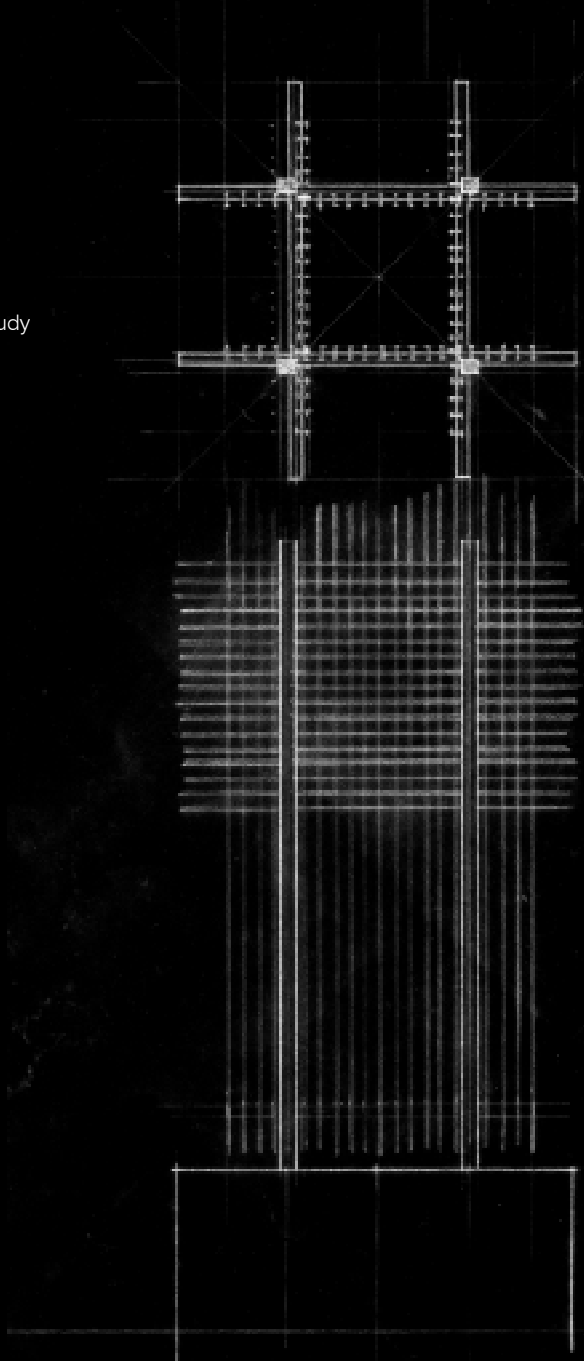
Natural materials - stone, brick, and wood, allow the gaze to penetrate their surfaces and they enable us to become convinced of the veracity of matter.

- Juhani Pallasmaa

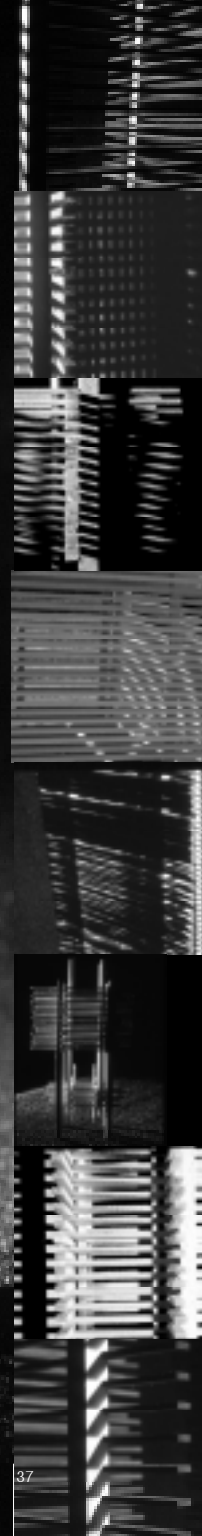
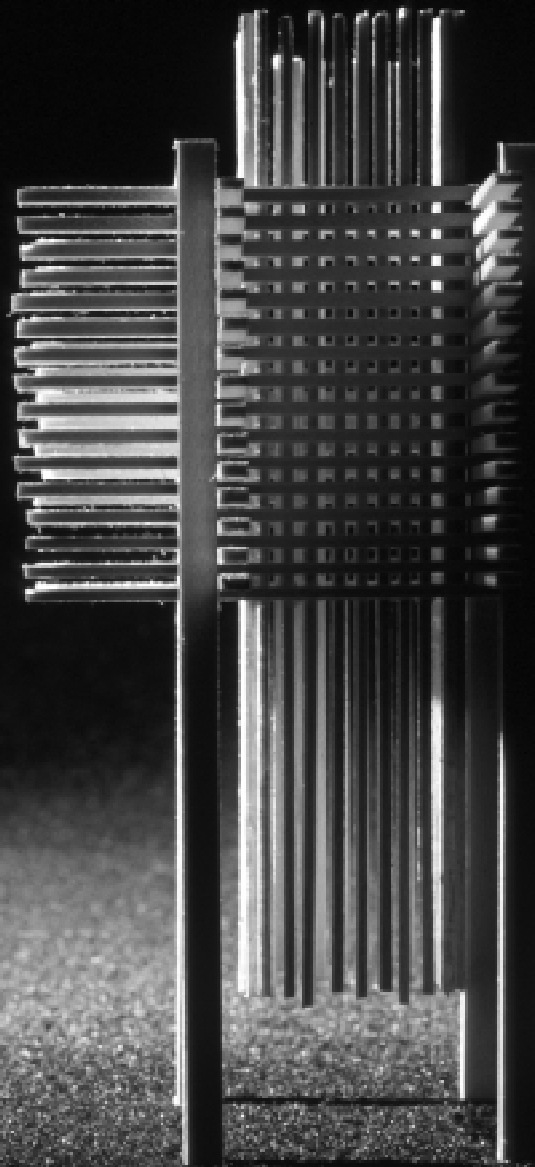


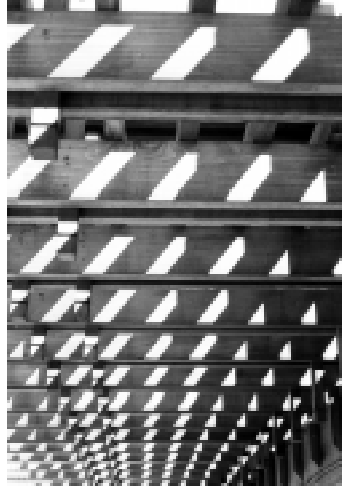
The wood screen is constructed of many individual elements. This gathering of material makes the whole more than the parts. Oriented horizontally, it is in contrast to the forest's verticality.

screen study



The screen has many qualities. It has variable transparency and mass, rhythm of light and shadow. Its structure is expressed clearly. Animated by light, it provides a place for the phenomena of sunlight.







4

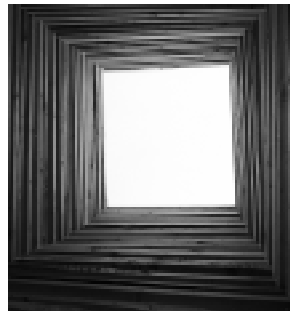
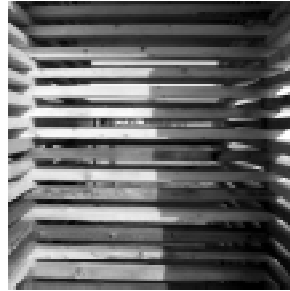


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A common trait among these wooden screens is a simple complexity. The construction is simple, but the conditions they make arrive at a complexity of relationship through changing light and shadow.

the 2x4

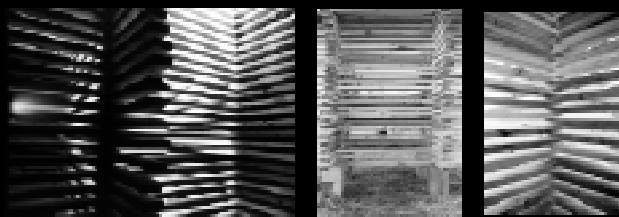
The wooden screen is constructed of dimensional 2x4 lumber. Manipulation of stacking and lighting tested the idea of inhabiting such a structure. When ordered, what was once an insignificant 2x4, becomes a spectacular display of light and shadow; perhaps, bringing more dignity to lumber.







2x4 wood screen study at night

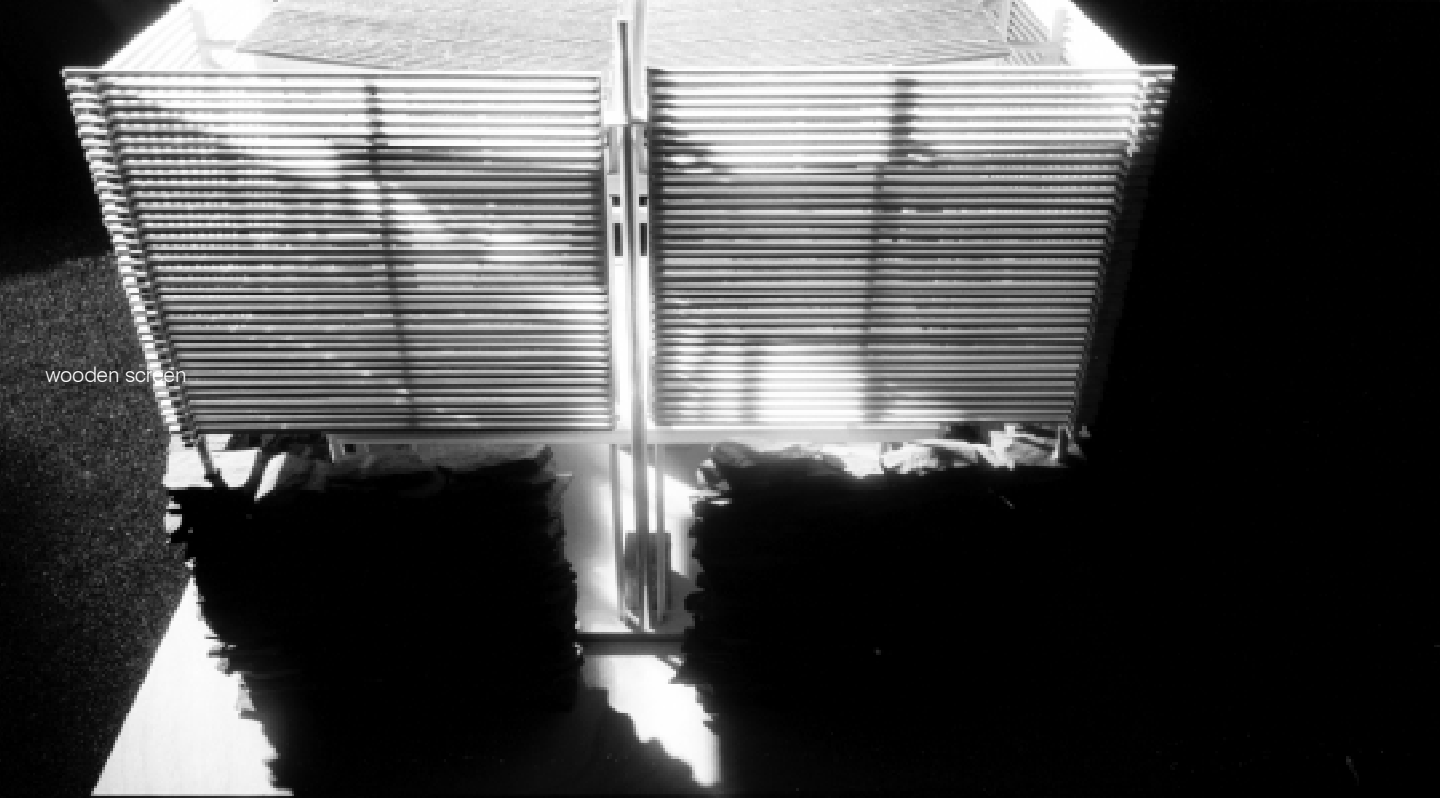


Variations of light and shadow throughout the day and night produced by the screen are endless. At night the members of the screen are in shadow while the openings are sources of light. This pattern is inverted during the day.

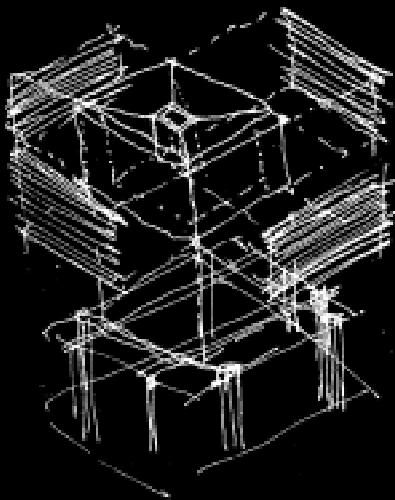






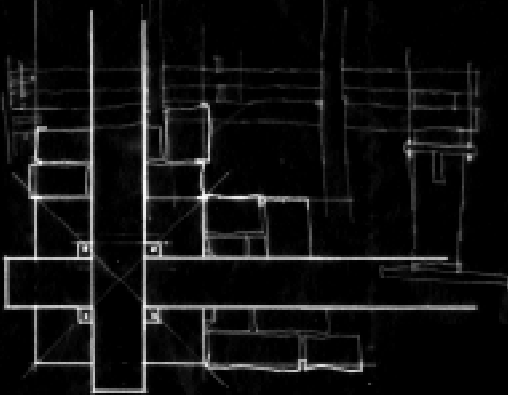
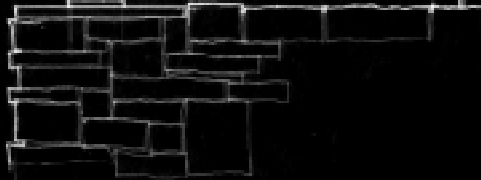
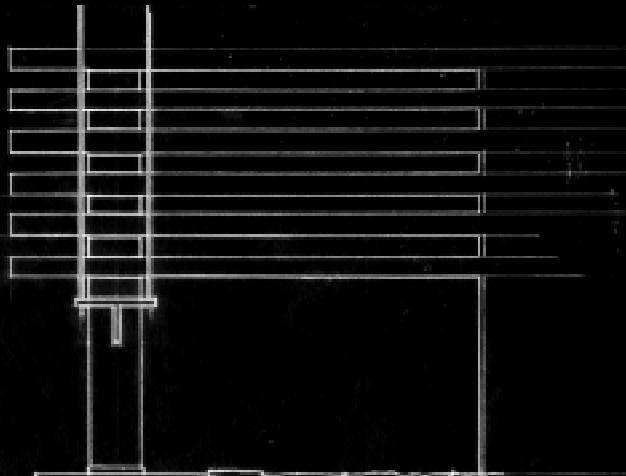


wooden screen

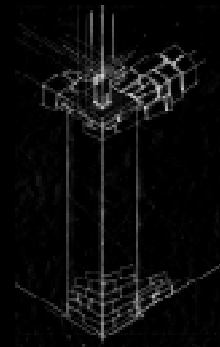
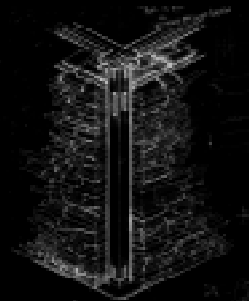


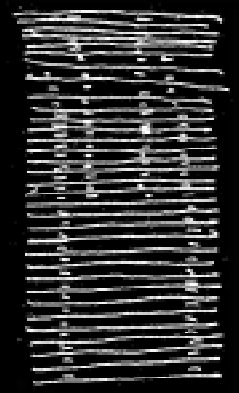
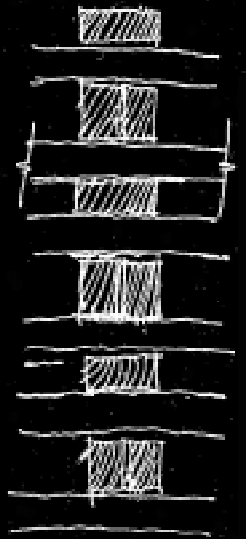
Many of the qualities of light and construction learned from the studies are transferred to the retreat. Stacked dimensional lumber spanning just over 20 feet makes the screen. To resist deflection in the span, the screen is supported every five feet

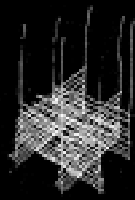




Making the corner: the two sides of the screen come together in a compressive connection. Dry stacked, like the 2x4 models, the whole corner is compressed with four rods tied into a steel plate that connects to the wooden column.



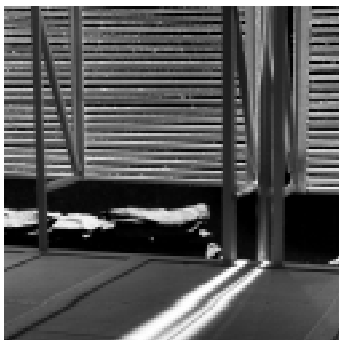




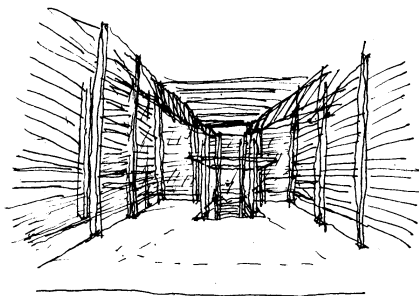
Screen Casting Shadows






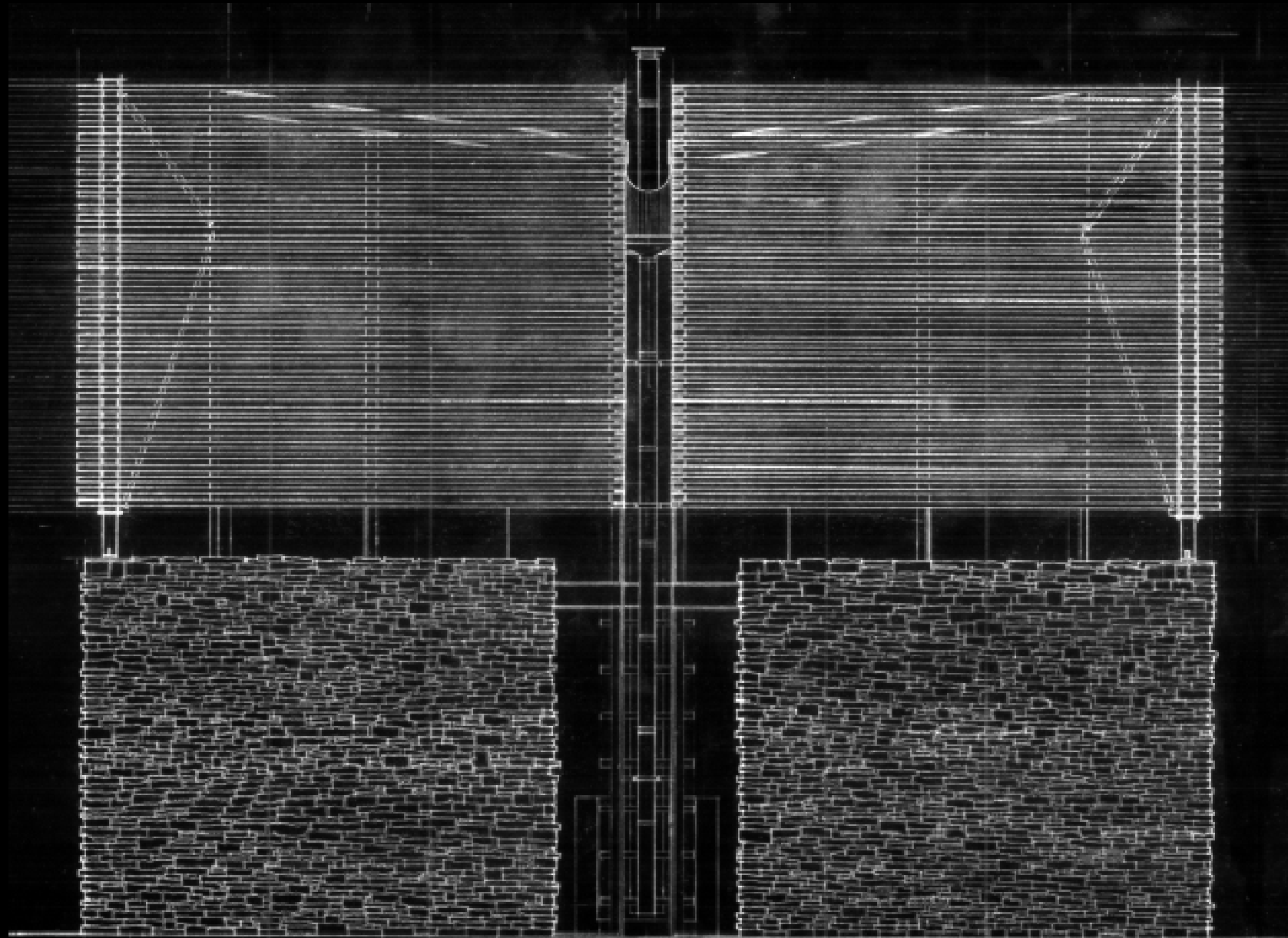


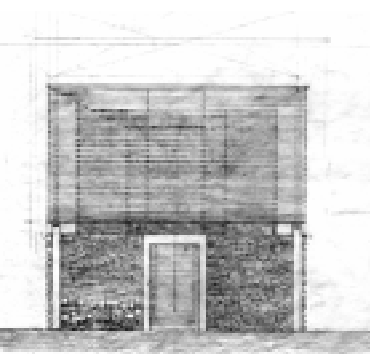
The screen becomes a transistor for light and a canvas for images of mountains and grassland to unite.





Elevation 



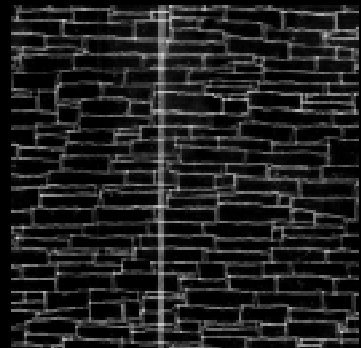




Stone Wall



Constructed of dry stacked stone, the wall allows a play of light to pass through.







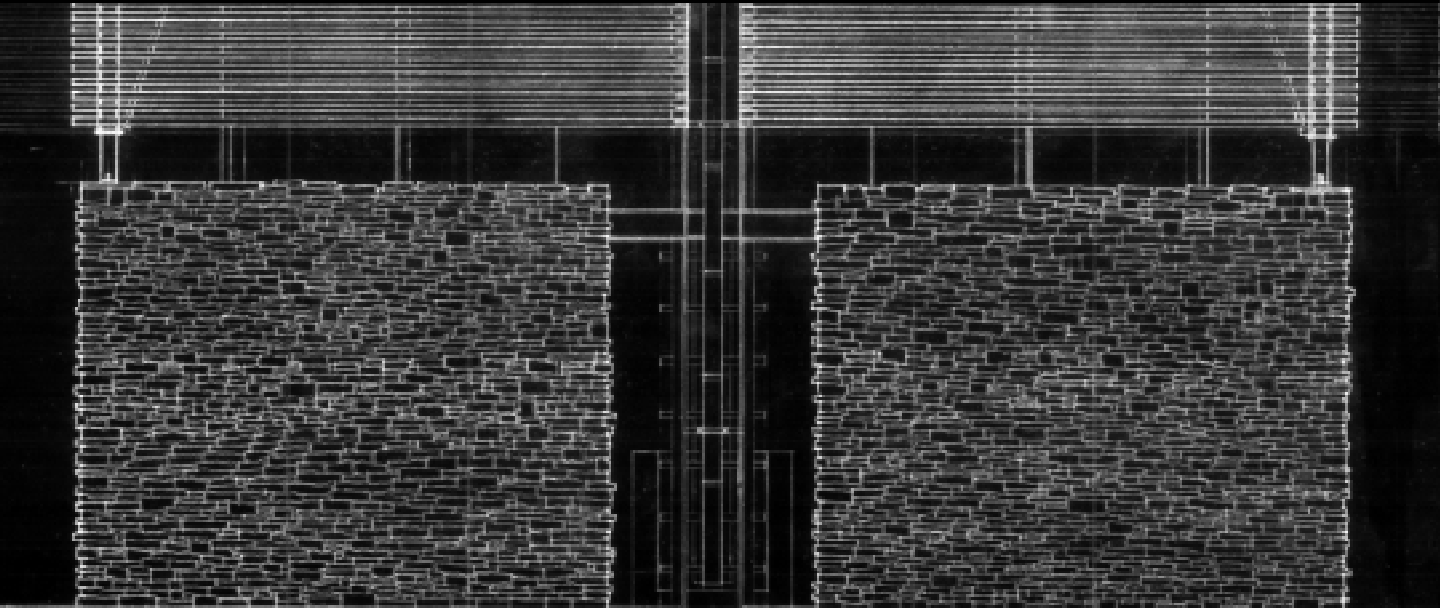


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The stonewall rises out of inspiration from Dragon's Tooth (2) and other stonewalls. Like stone ruins (5) found in the woods, the wall is the site for nature's reclamation.



High sun conditions grace the rough textured wall, emphasizing the contrast between the rock wall and the precise steel box.

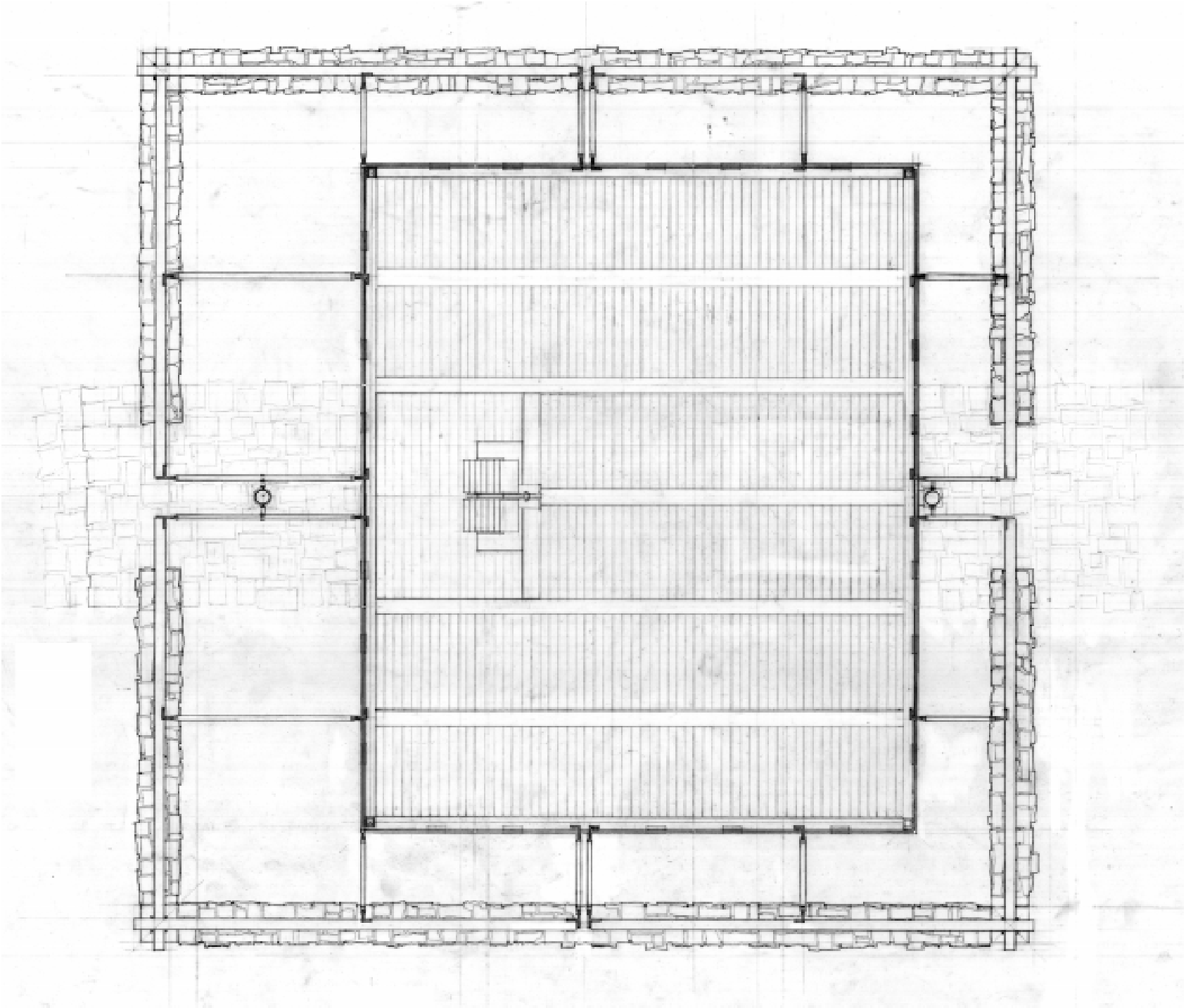


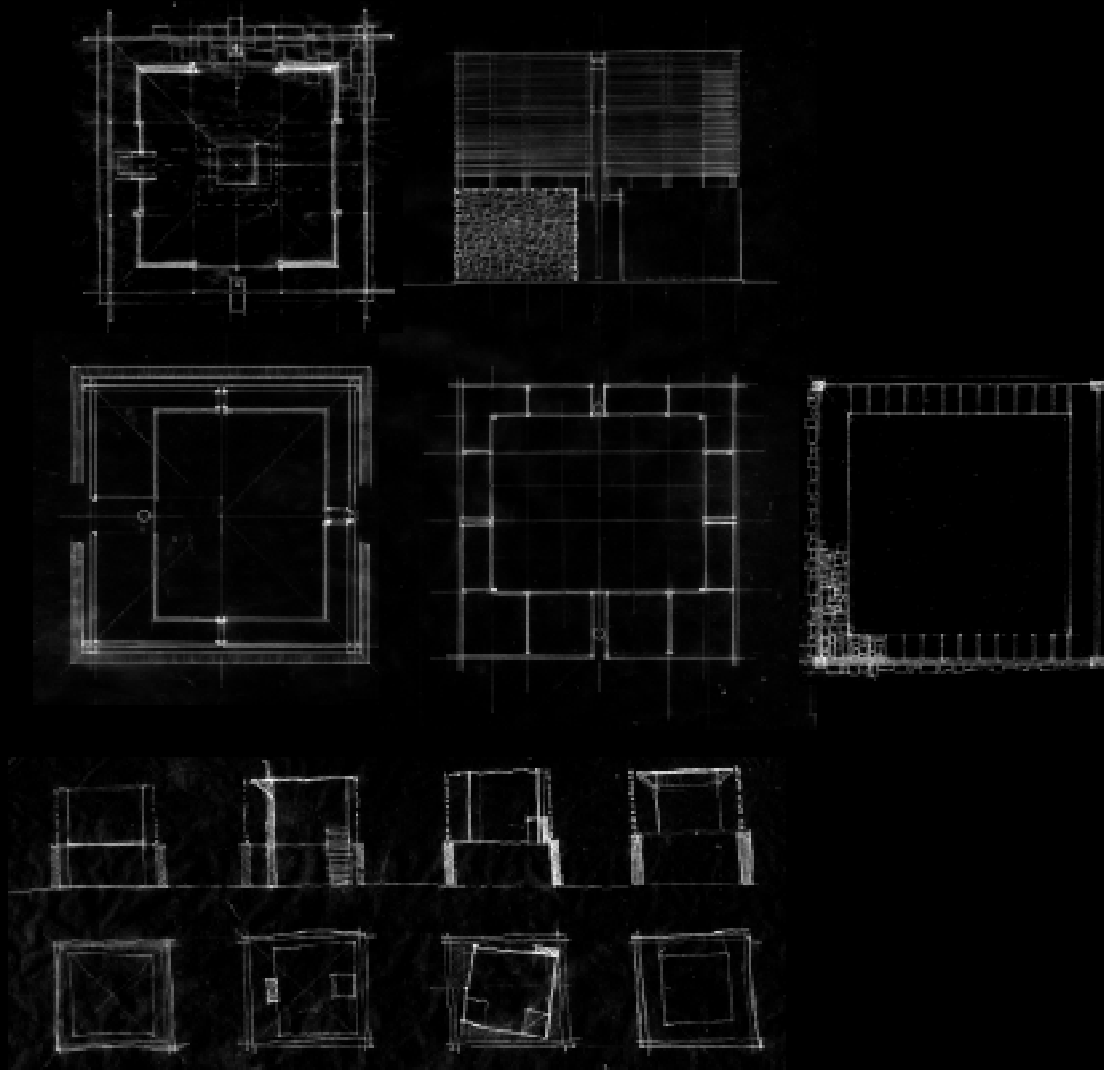
Openings in the rock wall correspond to the axis of the abandoned Appalachian Trail and makes access to the interior glass box.



The views out of the stone wall mimic the view from the gaps in Dragon's Tooth.

Plan



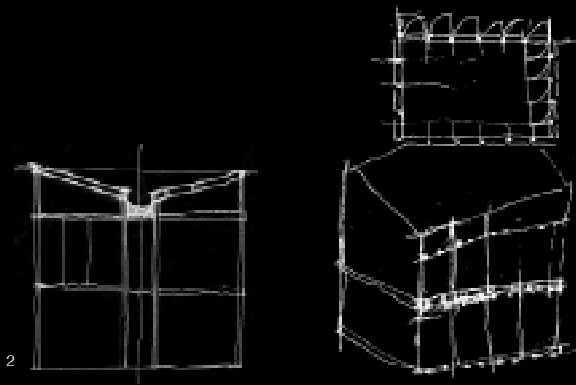




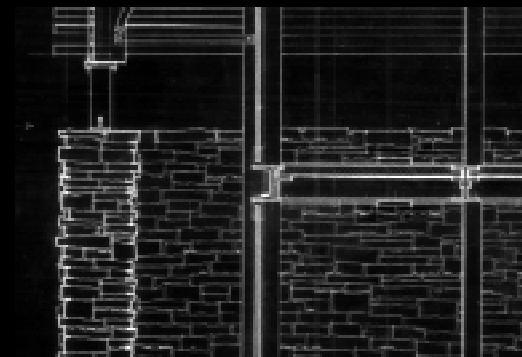
Glass Box



Subservient to the experience of the screen wall, the glass box is of the rational world of the man made. The steel frame, constructed mainly of sections and angles, corresponds to a three foot grid. Corrugated and stainless steel make the roof and water vein. Glass doors operate from the steel frame.





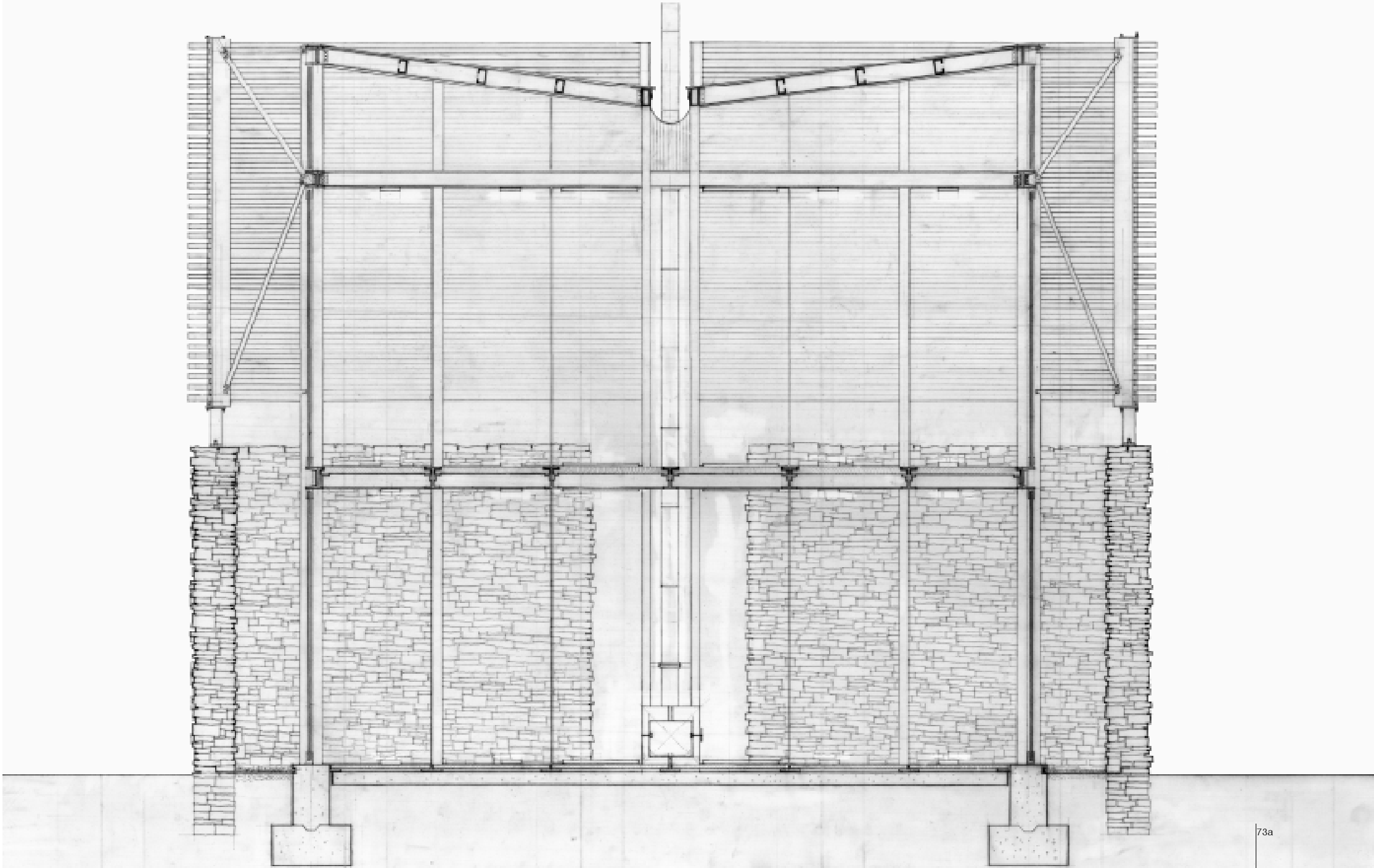


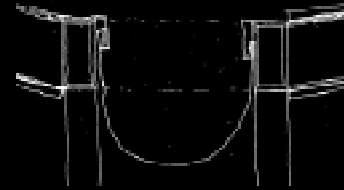
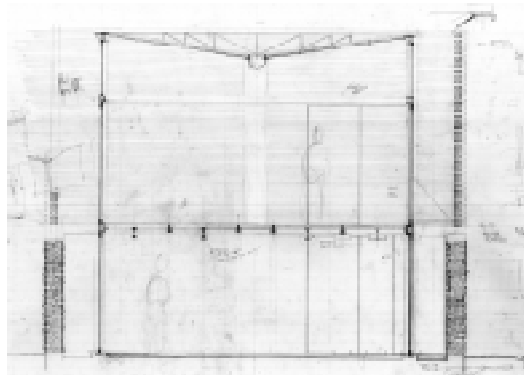
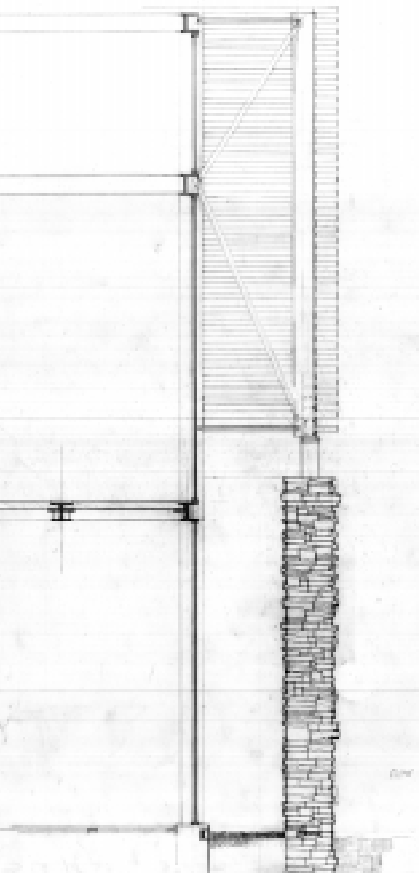
To aid in maintaining a small profile, the depth of the floor is kept to a minimum. Wooden planks contained in the depth of the steel sections make the floor. Consequently, the floor beams are exposed.



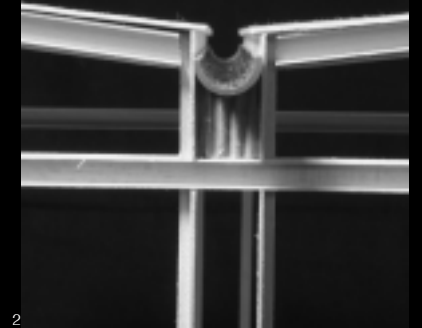
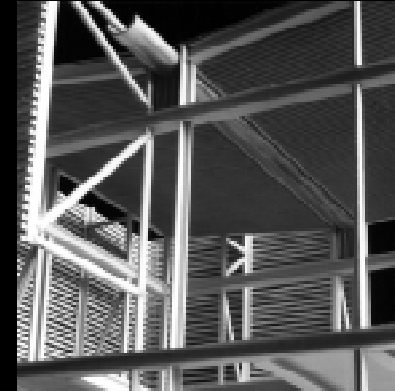


Longitudinal
Section



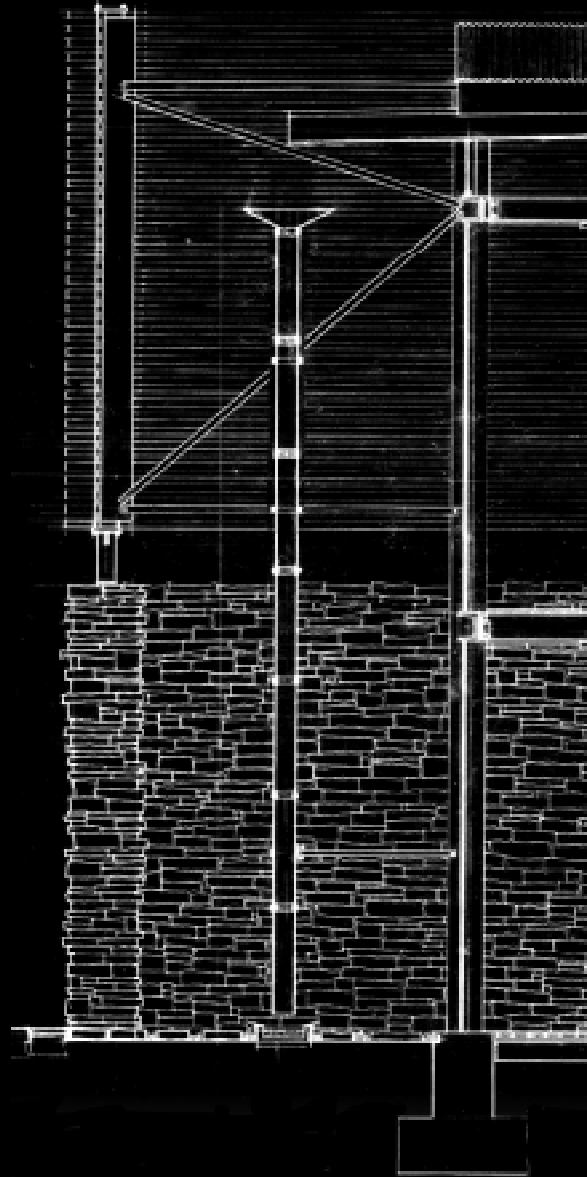


Without nearby resources, water is carefully collected. This is expressed with the glass box. Rain falling on the corrugated roof is directed to the central water vein and is moved further down the stainless steel downspout where it is pooled in a cistern.



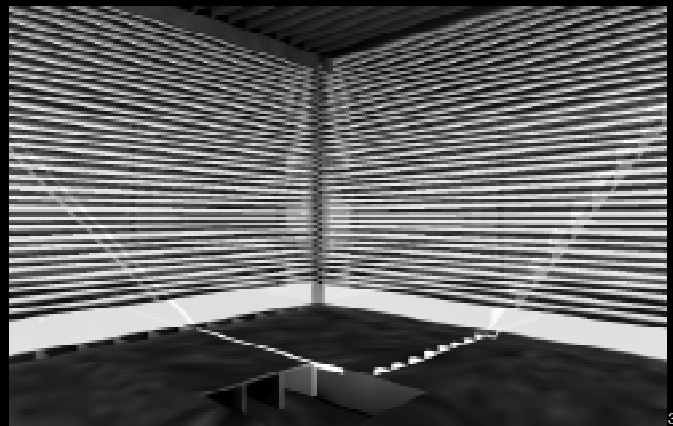
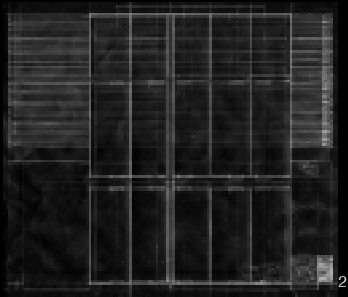
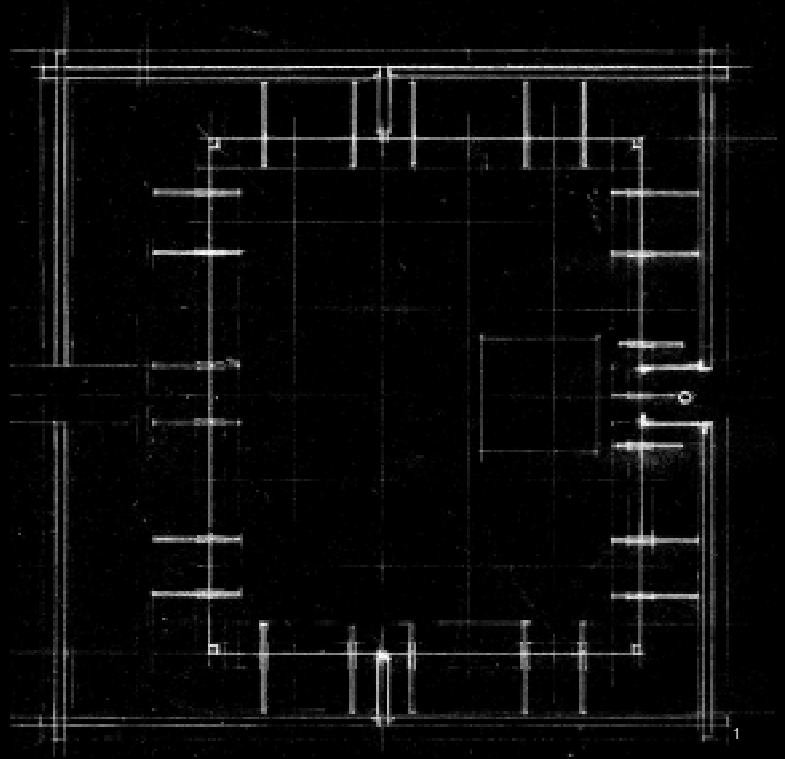


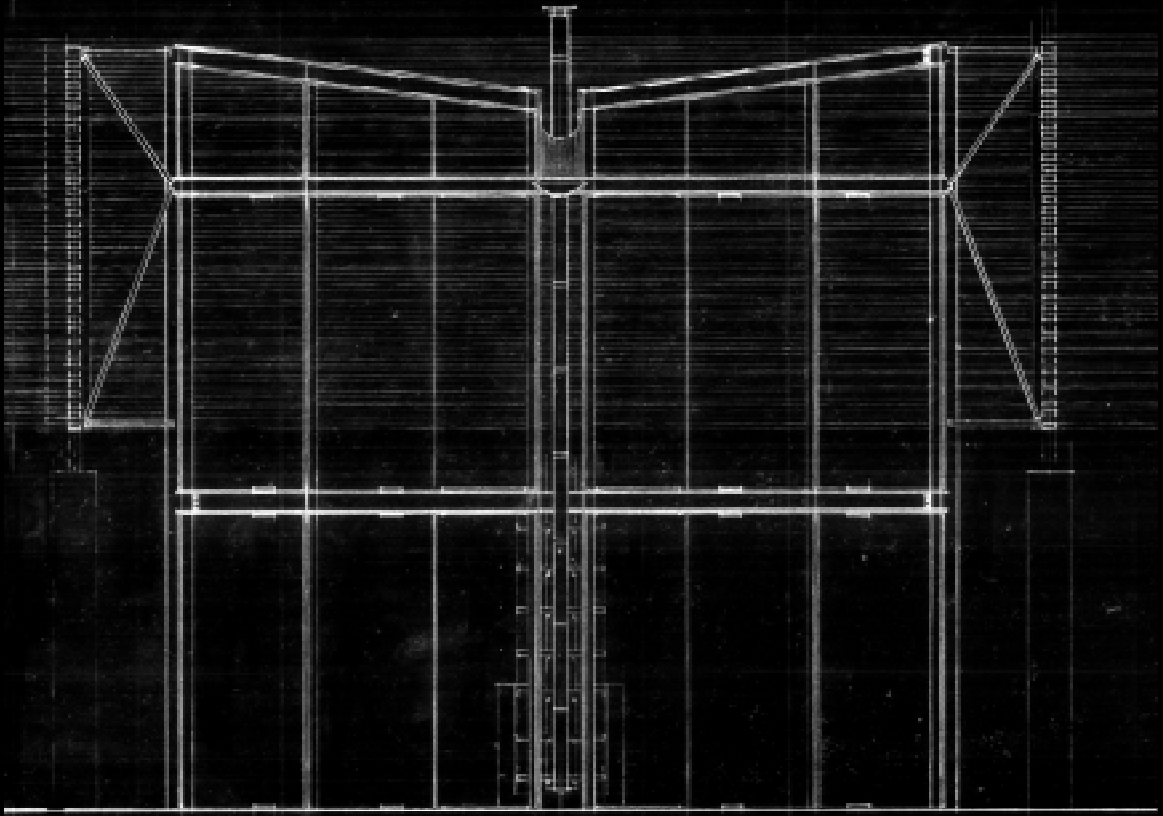
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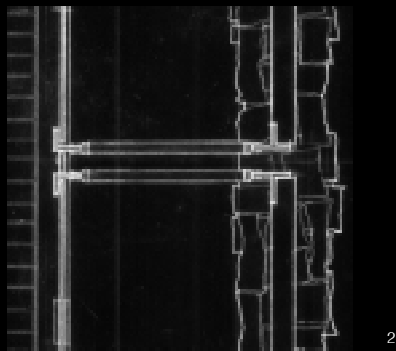
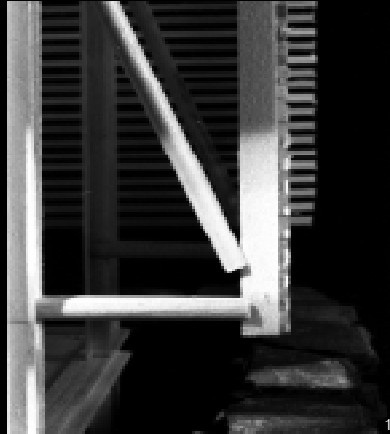
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Three quarter inch glass doors on pivot hinges make the enclosure. Opened, the doors are in a close relation to the screen. Like the wooden screen, light is captured on the surface of the glass.



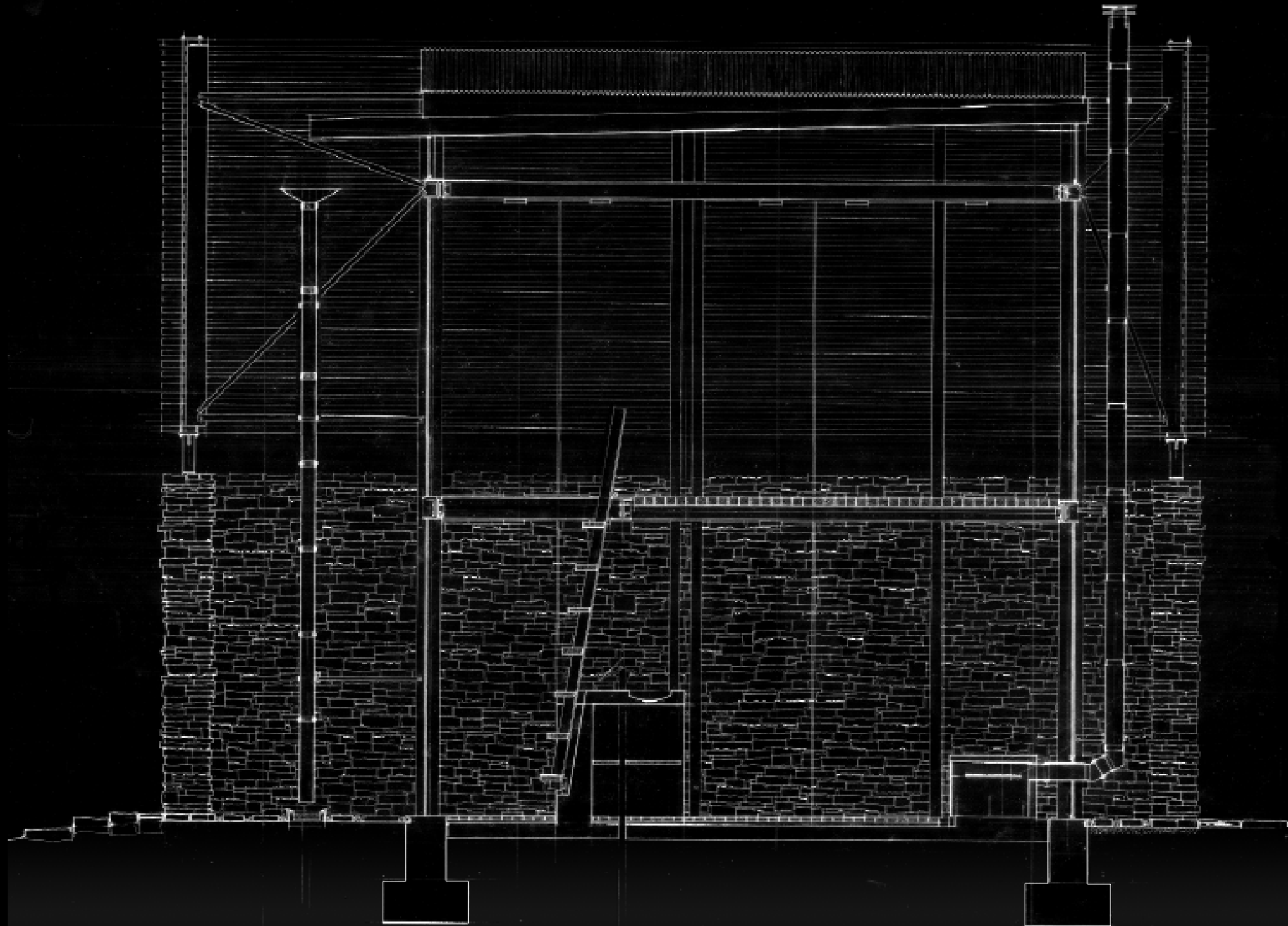


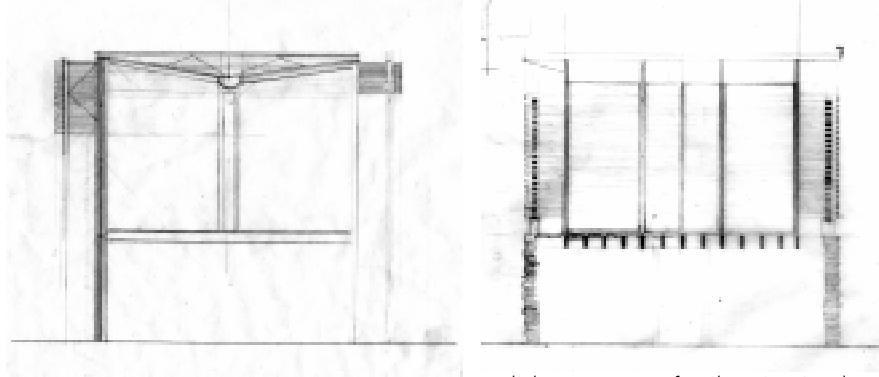
Resisting deflection of the wooden screen, a space frame like system spans the two entities. Connection between the two is made by aluminum tubes fitted with steel fingers pinned to angles of box and steel tees/angles engaging the screen.





Section





It is necessary for the structural frame of the glass box to be of steel. Not only does this reinforce the contrast between natural materials and man made materials, but also allows for a small profile. Connections between steel members are detailed to support this.



Reflections



Reflecting on the project, it seems that the building is universal. Just outside the tree cove on the Appalachian Trail, or in the midst of a dense city, or perhaps on the plains of the Midwest, the retreat could exist in a number of places. It gains its universality from several aspects. First, the retreat creates environs for itself. The wooden screen and stone wall provide a datum that serves as a transitional element to its place. Secondly, the retreat acts as a transistor to our senses. The most impressive of which is light. The phenomena of light is marked by the retreat wherever it stands. More importantly though, the relationship of the parts to whole seem to have an even greater impact on the building. The clear understanding of how the pieces relate to the whole intensifies an understanding of place. Here it seems appropriate and at home with the Jefferson National Forest, for nature makes part and whole relationships apparent. Perhaps all these characteristics are what make the adoration of place possible for where it was intended.

The part is to the whole as whole is to the part, which is the condition of life in anything.
- Frank Lloyd Wright



I had once feared that architecture and nature were at odds with each other, watching the boundaries of cities and their suburbs take over parcels of land with little care of what once existed. Unique places were being replaced with the same condition found in any suburb or city found across the nation. I have not yet extinguished this fear. However, I have gained hope. Architecture has the capacity and necessity to be the steward of the land. Architecture's measure of success can in part be found in how well it accomplishes reconciliation with nature. To make a place worthy of our existence, architecture must intensify place.

The poet, the painter, the sculptor, the musician, the architect, seek each other to concentrate this radiance of the world on one point, and each in his several work to satisfy the love of beauty which stimulates him to produce. Thus is art, a nature passed through the alembic of man. - Ralph Waldo Emerson



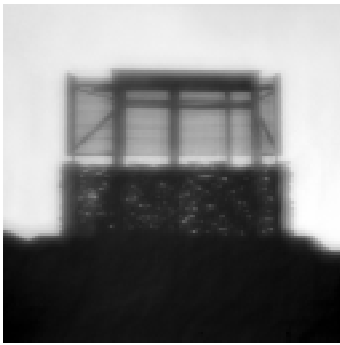


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