

# SENSUAL ARCHITECTURE: Project for Thermal Baths at Warm Springs

Karen Bengel

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This thesis submitted by Karen Bengel to the Faculty and Staff of the Virginia Polytechnic Institute and State University on 1 August 2000 in partial fulfillment of the requirements for the degree of Master of Architecture.

Approved by:

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Hans C. Rott, Chairman

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William U. Galloway

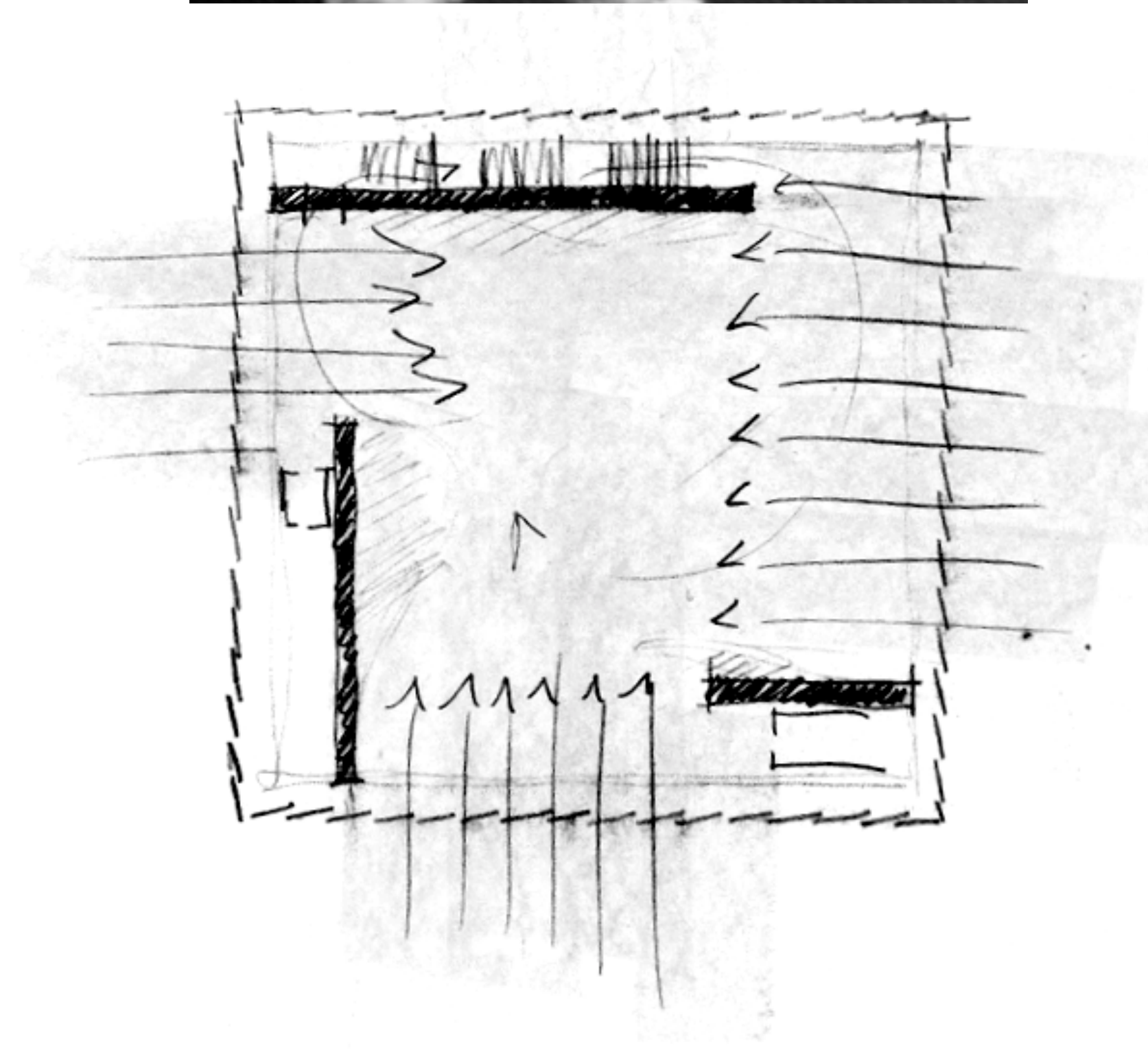
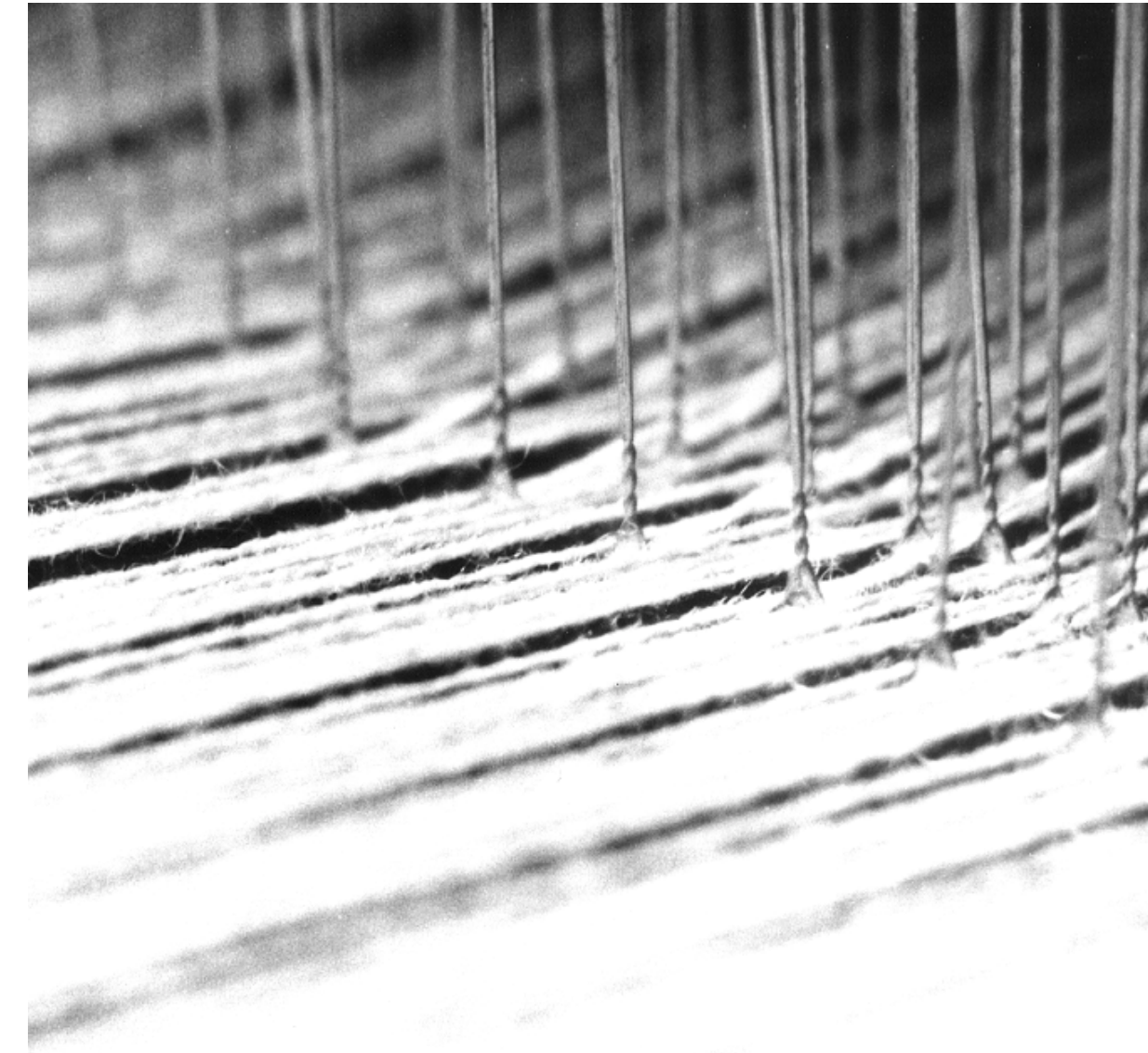
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Michael J. O'Brien

## Abstract

This thesis investigation and project design were driven by the desire to develop an understanding of how architecture addresses the senses. Guided by the practice of a craft, the vestige of art, architectural history and precedent, and the physiology of the five senses, an idea for a thermal bath was expressed through material. This book is a record of that process.

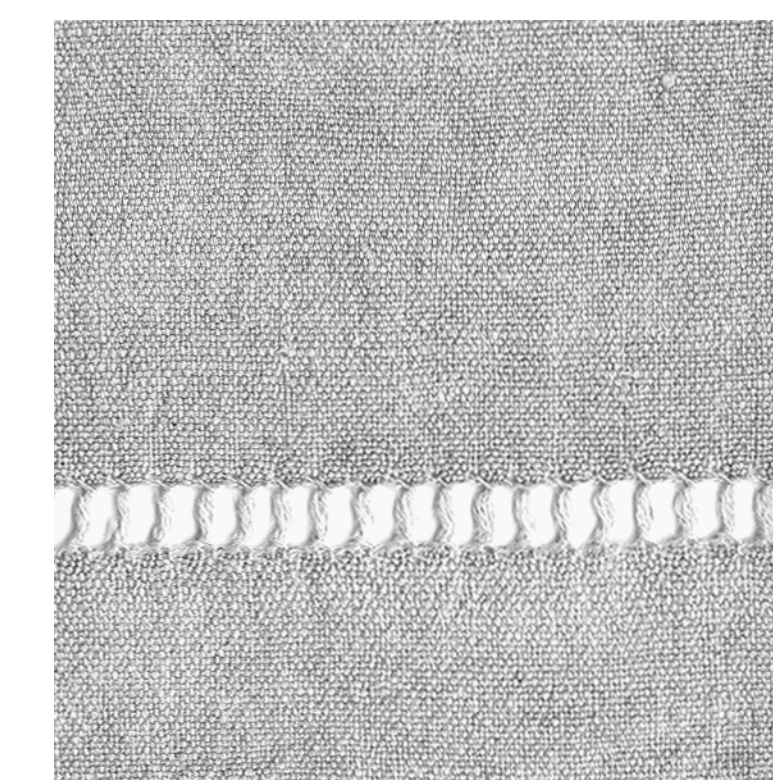
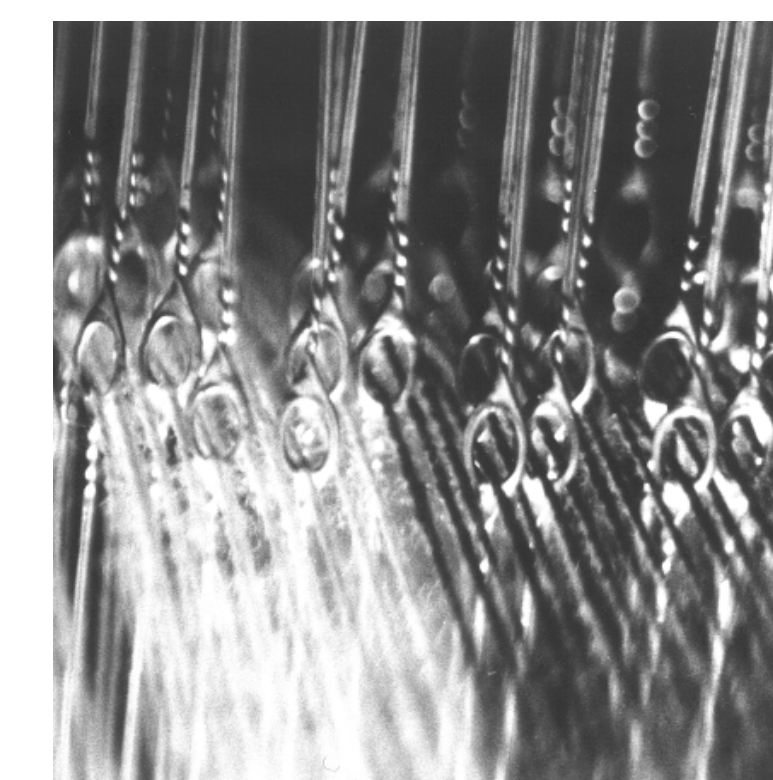
Craft, Art, and Architecture:  
The Sensual





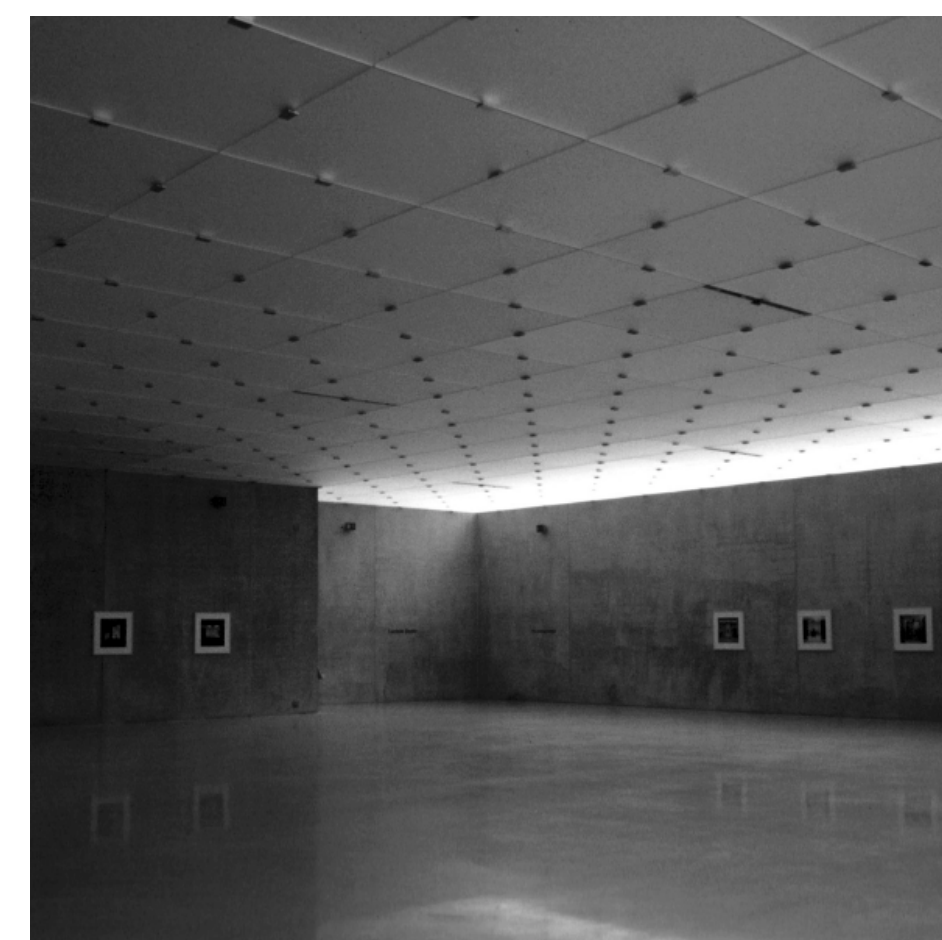
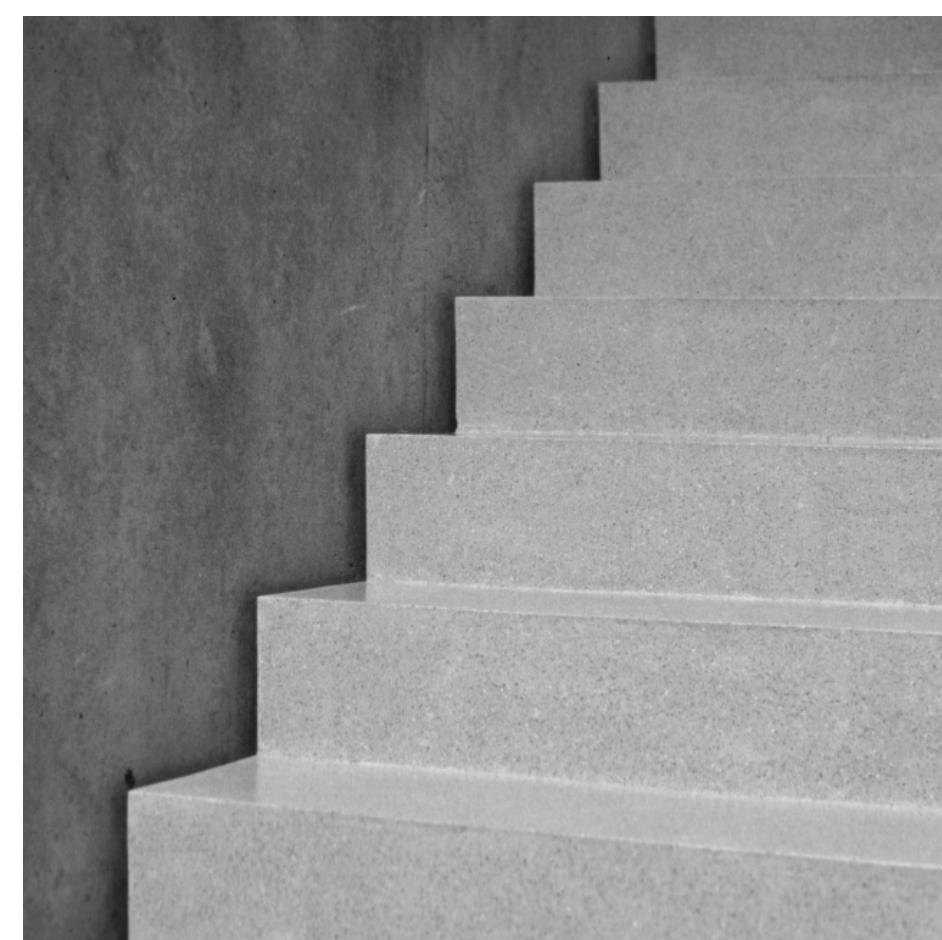
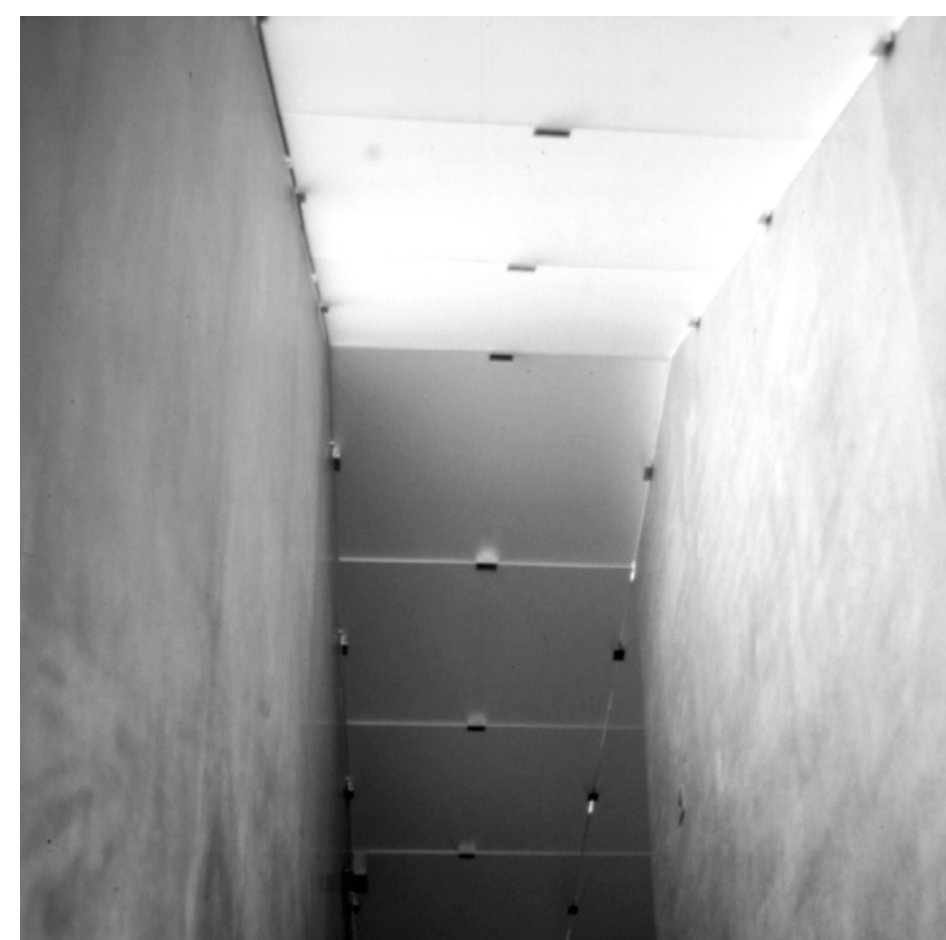
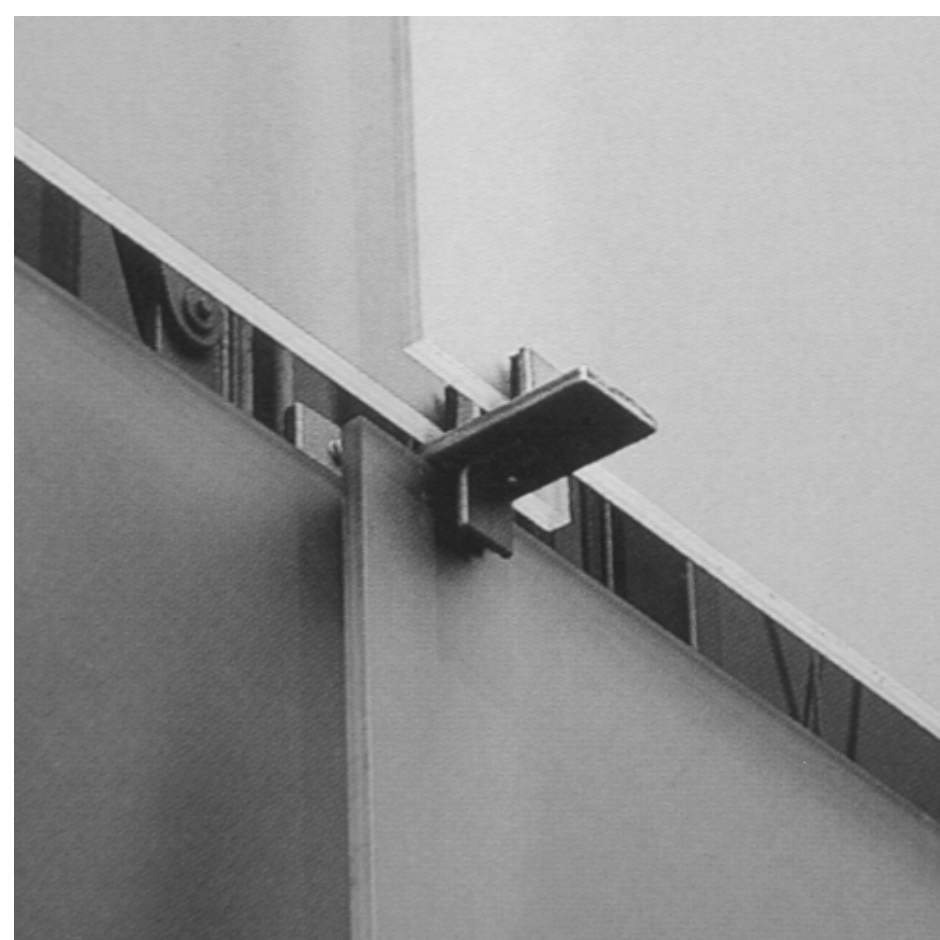
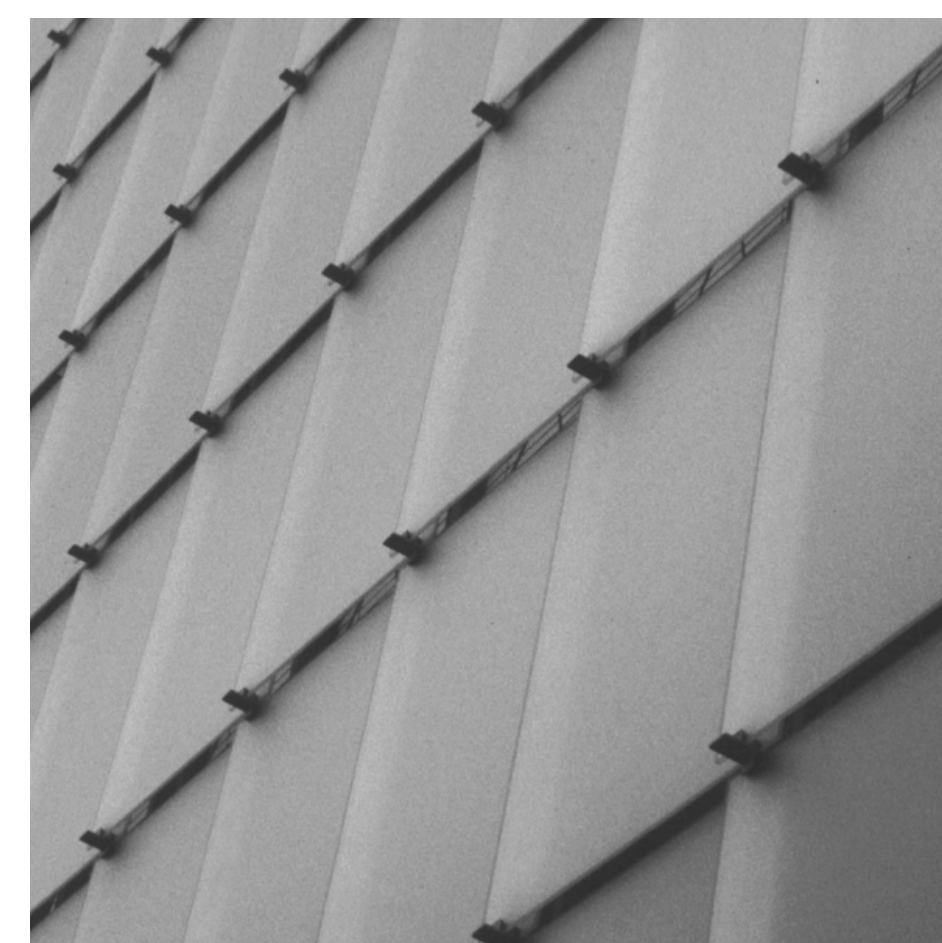
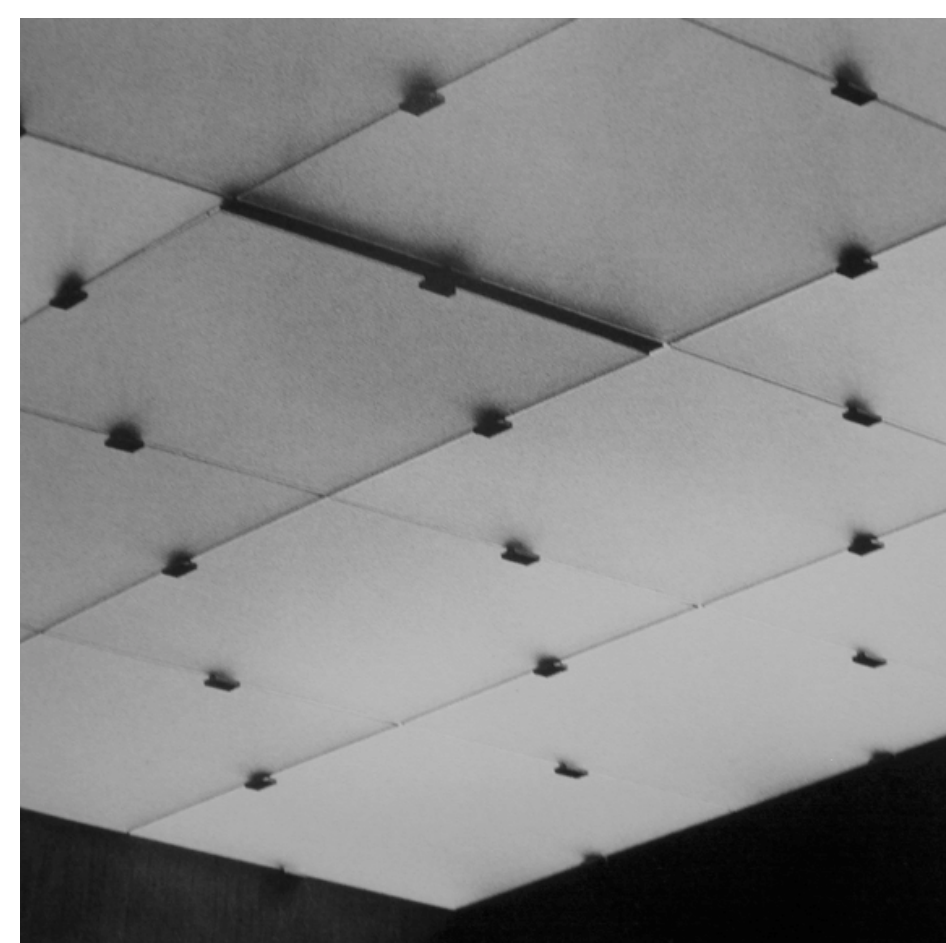
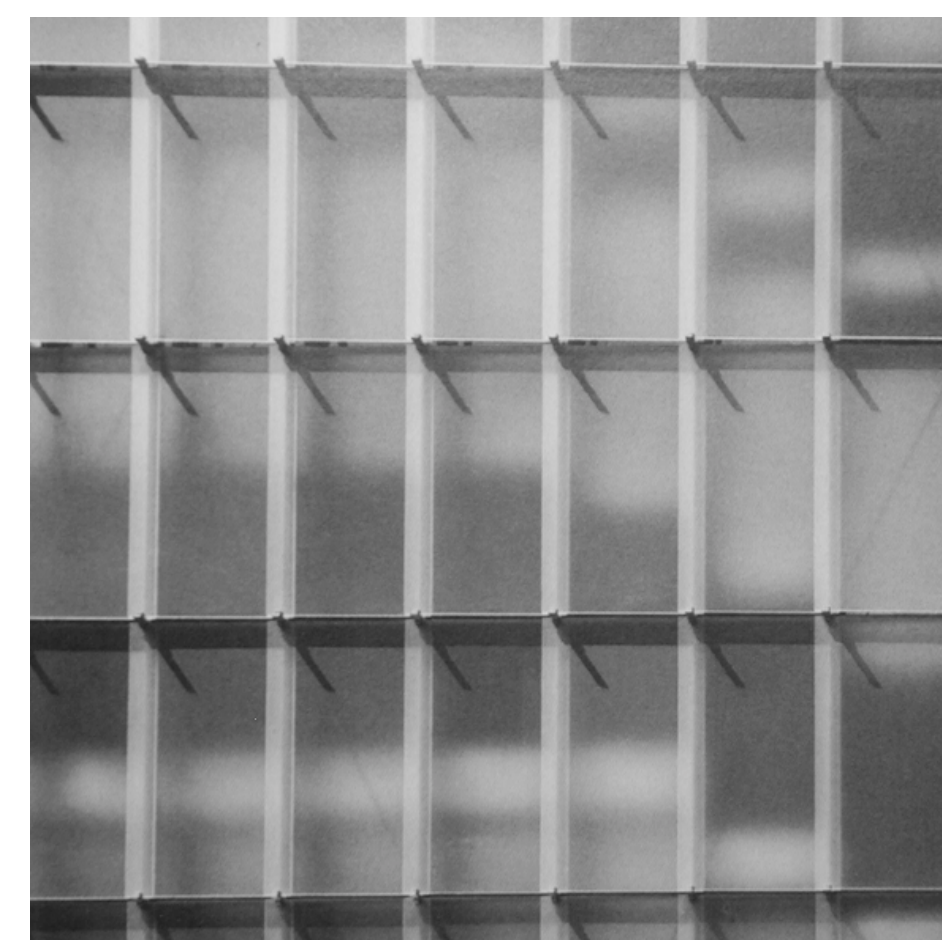
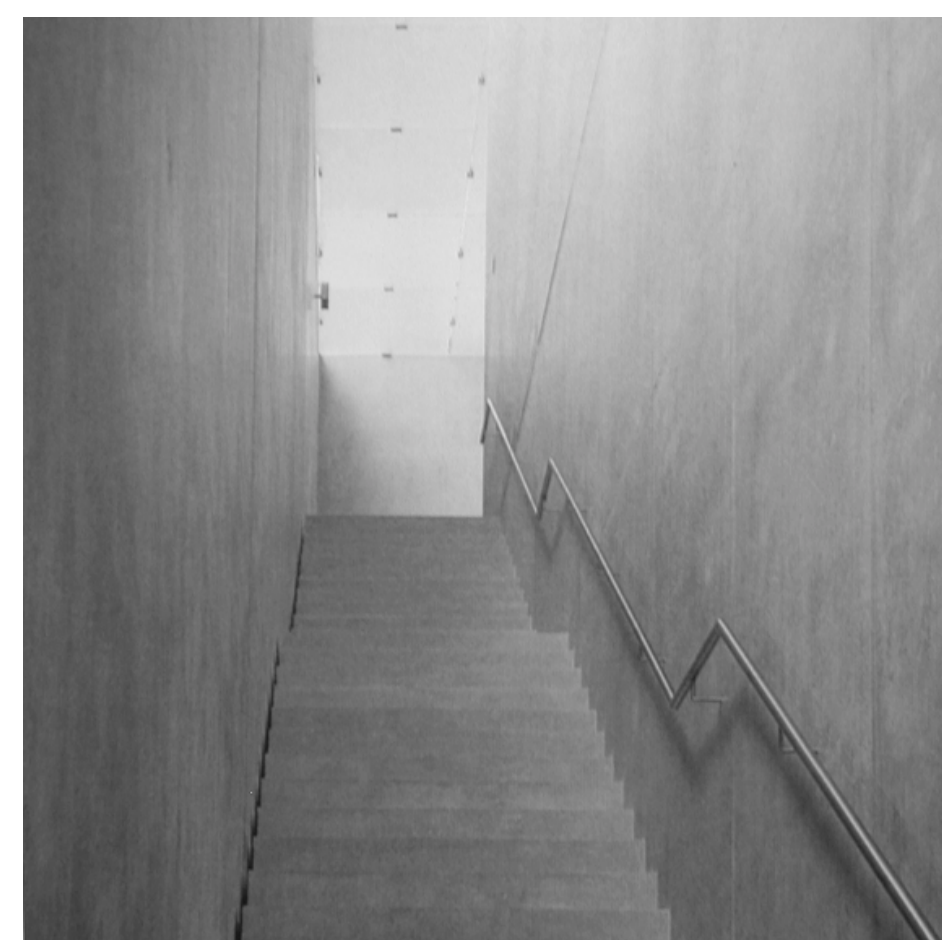
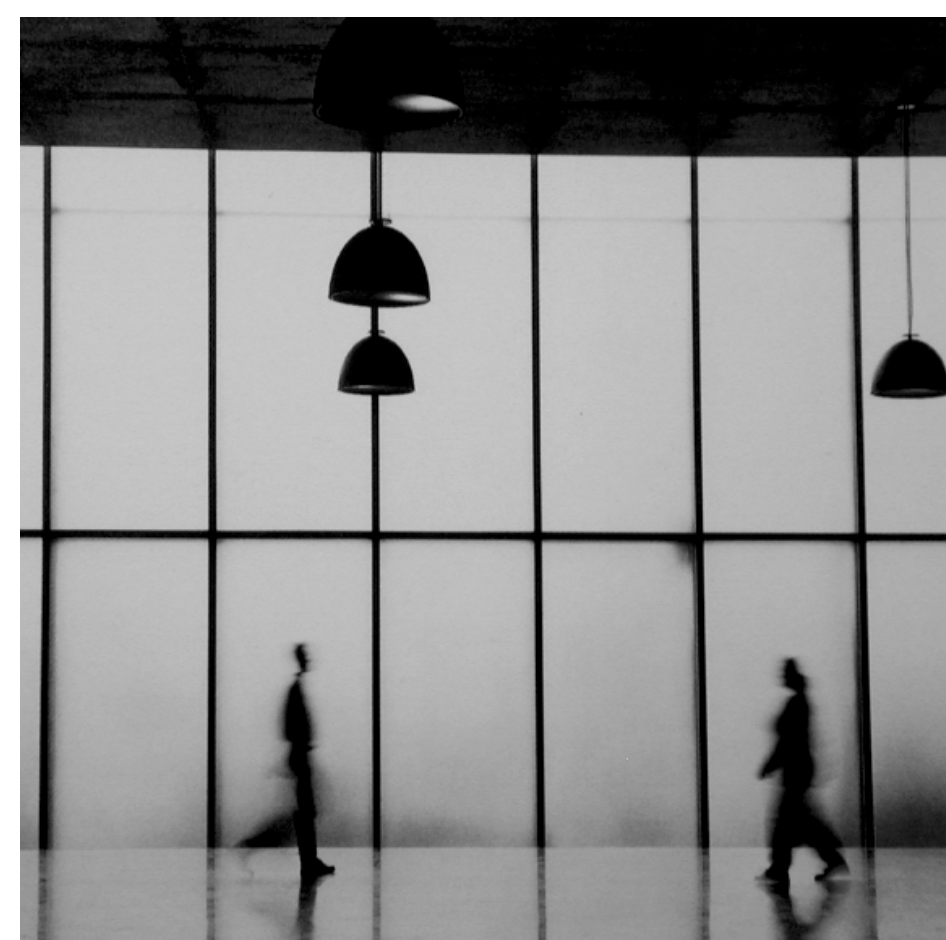
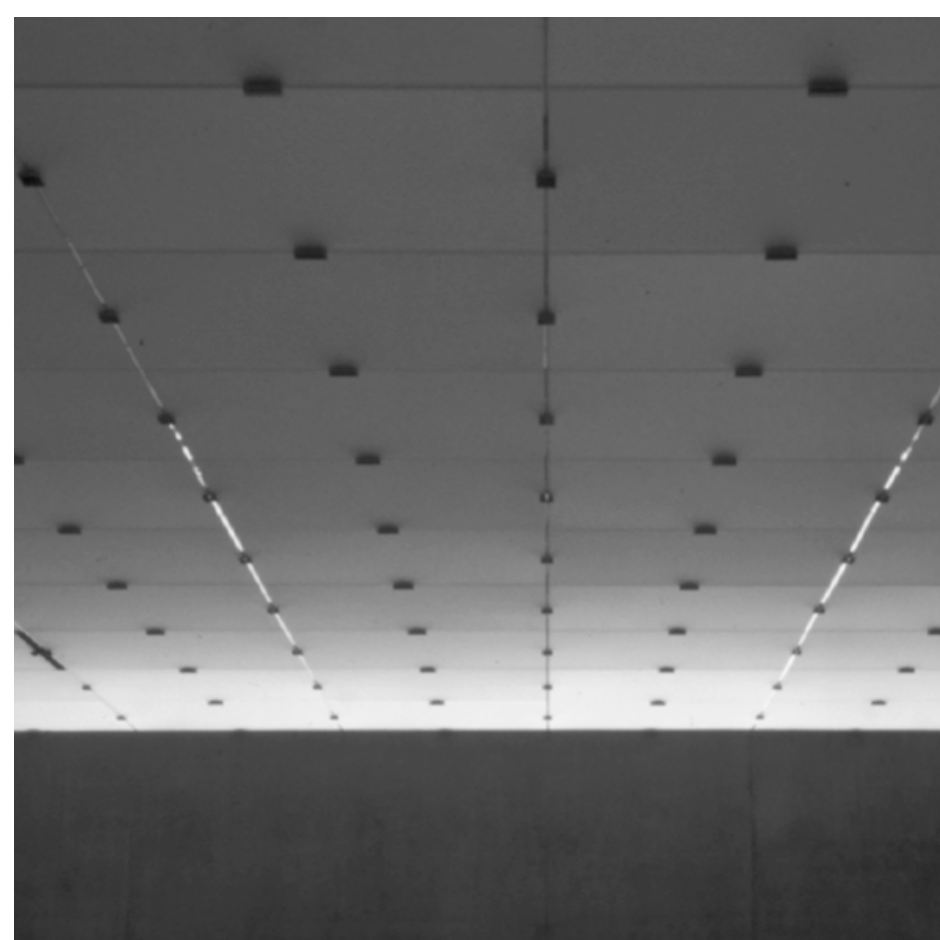
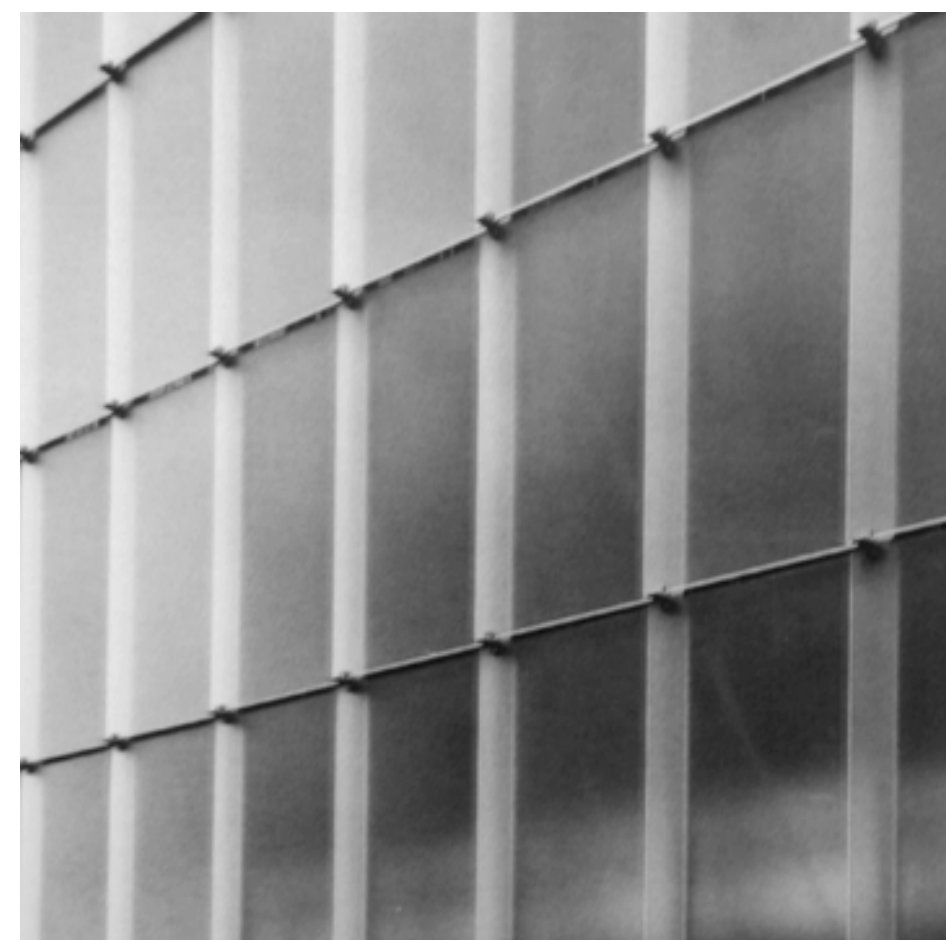
Learning the craft of weaving has played an important role in the development of my thoughts on the sensual qualities of architecture. Although we may not always be aware of it, each of us has a very intimate relationship with woven cloth. Some type of fabric is in direct contact with our skin at almost all times. Whether it is the clothes we wear, the sheets we sleep on, the towels we wrap ourselves in, or the upholstery we recline on, we are in constant touch with a variety of fibers, textures, patterns, and colors.

The weaver, just as the architect, has to make many careful considerations. An idea for a piece of cloth is refined by purpose, what is possible, and the will. Certain types of fibers lend themselves to particular use by their physical characteristics. The warmth and weight of wool is ideal for blankets and sweaters. The durability and absorbency of linen are put to good use as a towel. The porousness and softness of cotton are desirable for making sheets and undergarments, and the delicacy and suppleness of silk make it well suited for fine clothing. All of these fabrics begin with a single thread whose material qualities become engaged with the specifications of the tool and the will of the weaver once placed in concurrence on the loom. Certainly all of this does not have to be understood to appreciate a piece of cloth that is finely woven and well suited to its purpose, but to the astute, this understanding does enhance the apparent beauty.



Crafts have a place today beyond that of backwoods subsidy or as therapeutic means. Any craft is potentially art... Crafts become problematic when they are hybrids of art and usefulness (once a natural union), not quite reaching the level of art and not quite that of clearly defined usefulness.

Anni Albers



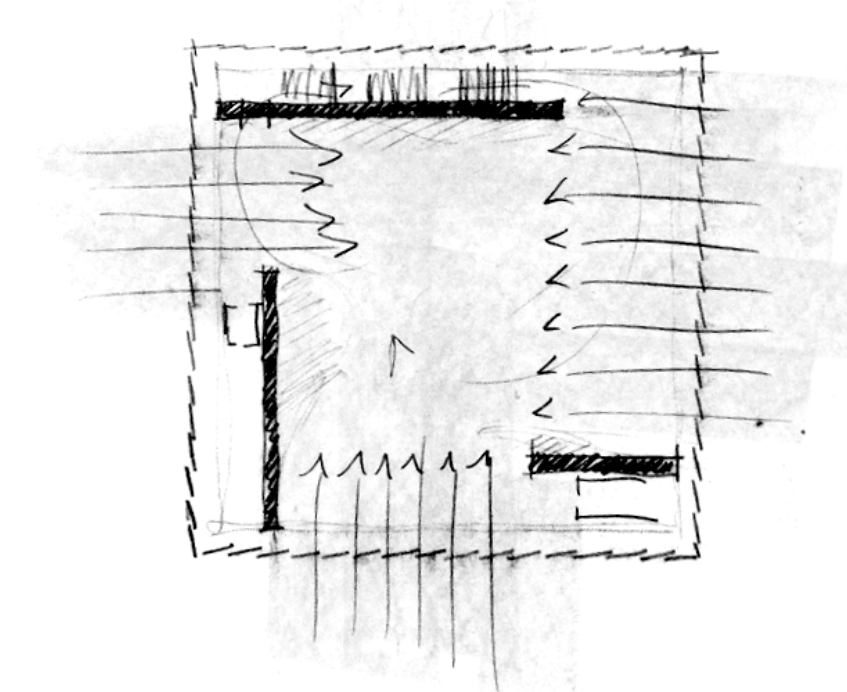
Twelve - thousand years ago a Stone Age man engraved a scene into rock in the Cave of Addaura. Although we know nothing of his intention or the idea that he wished to express, we can still appreciate the beauty of the sinuous lines that form these bodies and the evocativeness of the scene in general.

Although the history of art is profuse with examples from which to choose to further illustrate this point, I admire Georges De La Tour's *Joseph the Carpenter* and have personal experience with the painting on which to draw. I saw this piece for the first time in the galleries of the Louvre in 1999 and was immediately struck, from afar, by the beautiful contrast of light and shadow. As I moved closer, I began to smile as I perceived the details of the candlelight passing through the boy's hand and falling across the folds in the man's shirt. I stood and admired the painting for a moment longer and then stepped to the side to read the artist's name and the title of the work. It was only then that I realized that the boy in the painting was Jesus and was compelled to step back and admire once more the light passing through His hand. I could not only appreciate the skill and beauty with which this scene was painted, but also the way in which the artist used this medium to convey and heighten the perception of an idea.

The architect has a similar opportunity in executing an idea in three dimensions. The sensuousness of the architecture is borne from the material embodiment of the idea in terms of the senses through which it will be perceived.



The Kunsthau in Bregenz, Austria is a strong architectural example of this phenomenon. When I visited this building, I was unfamiliar with the project. However, without prior knowledge or the explanation of the designer, I admired the precise and elegant use of material which seemed to heighten my awareness of each of the architectural elements which form this building. The idea is revealed through this cognizance.



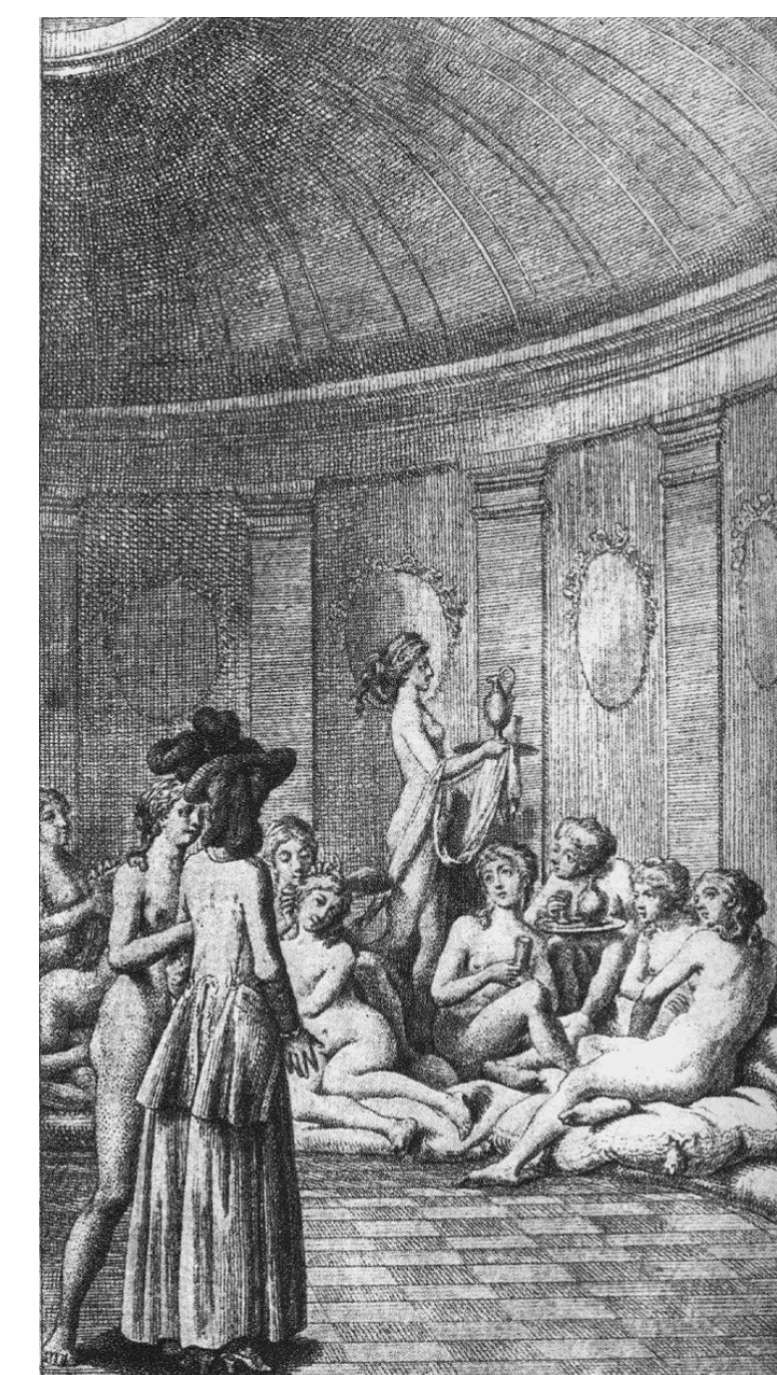
You're looking for something, you start to verbalize what it is that you want, and all of a sudden it's there - this strong initial image, or feeling for an atmosphere, which the place and the task provoke... I like to think of a building as something whole and complete, with no part more or less beautiful or important than the others... The building is exactly what we see and touch, exactly what we feel beneath our feet... The sensuous presence of materials defines the space. Peter Zumthor

The Art of Bathing



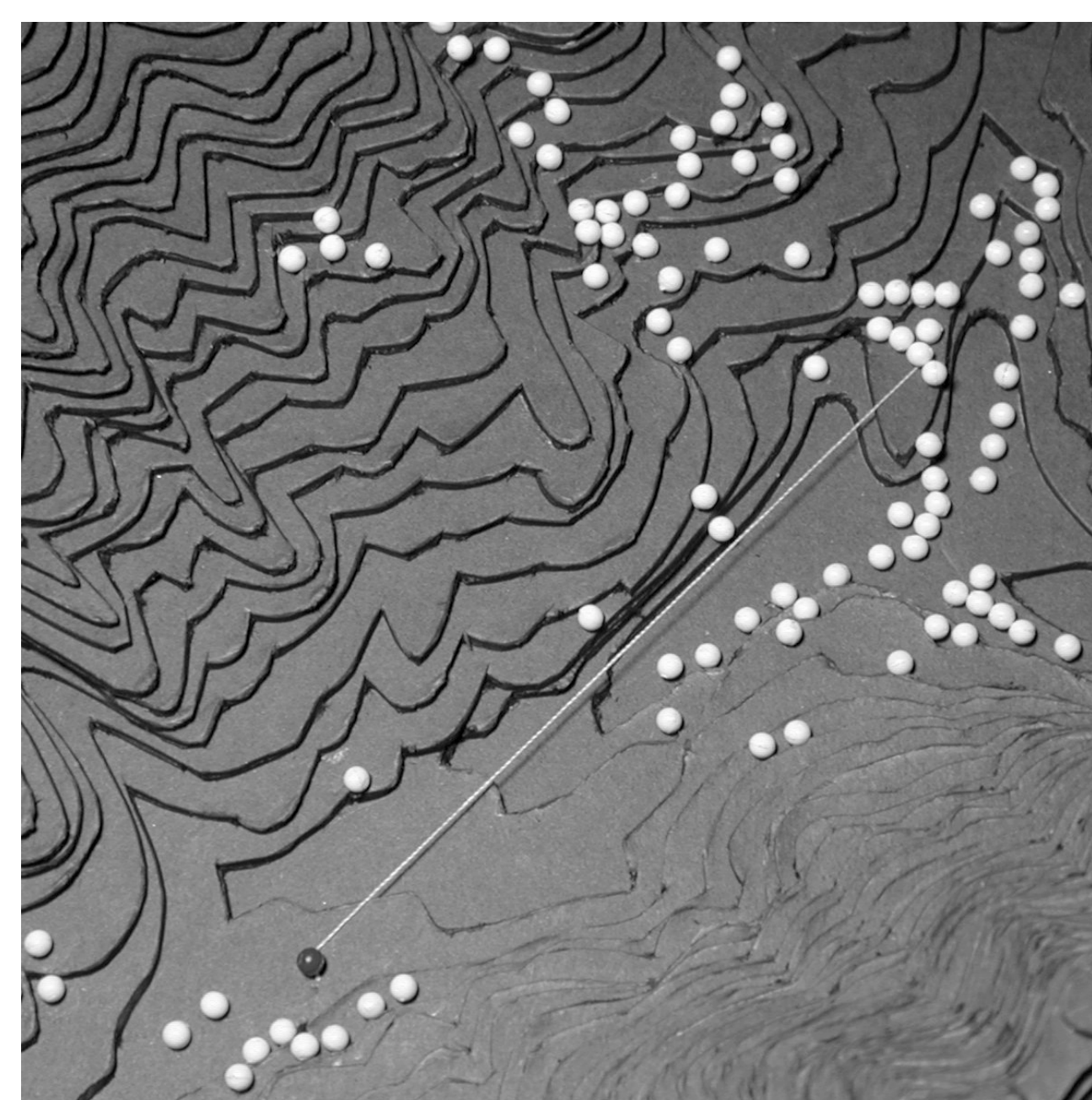
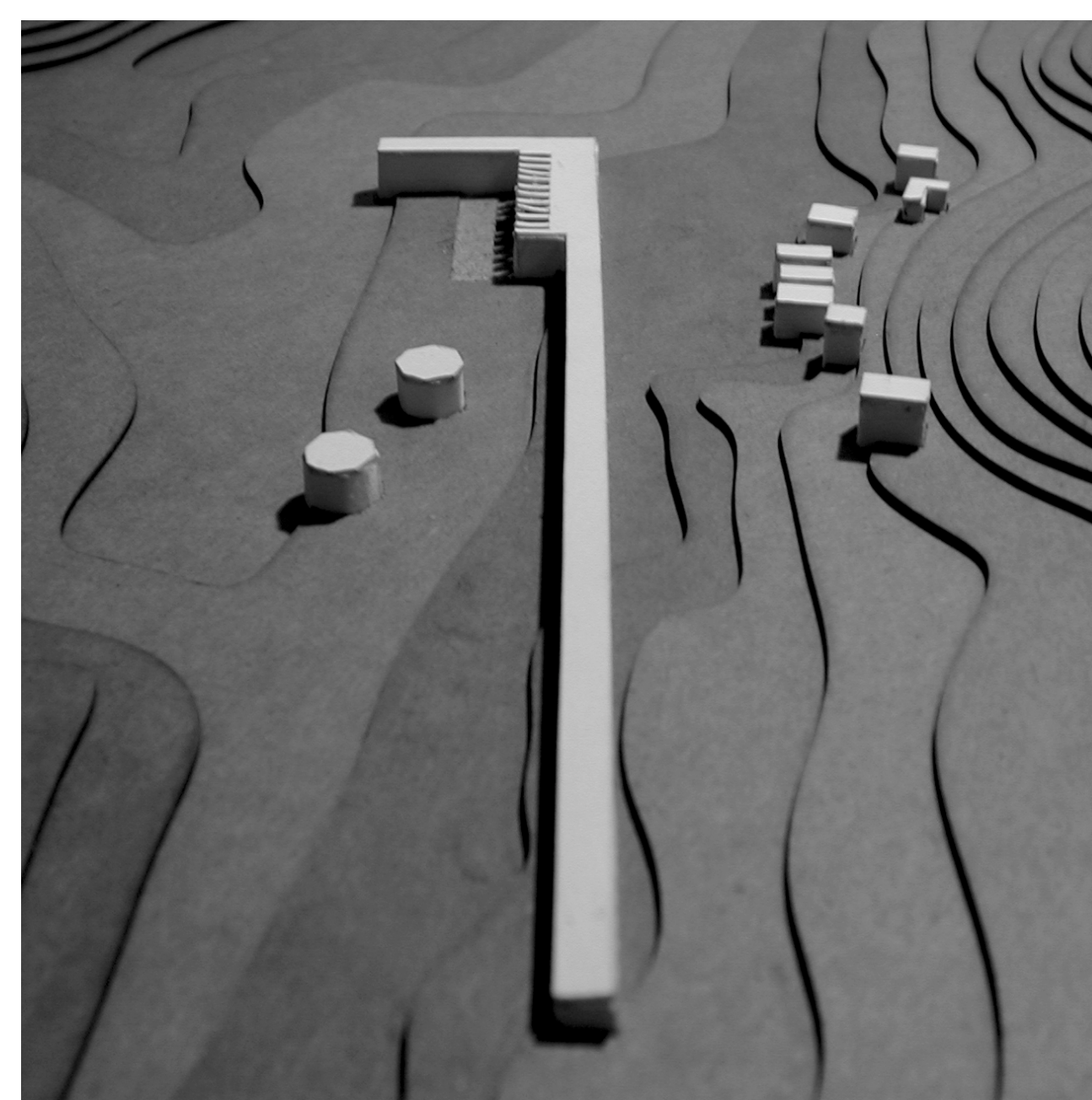
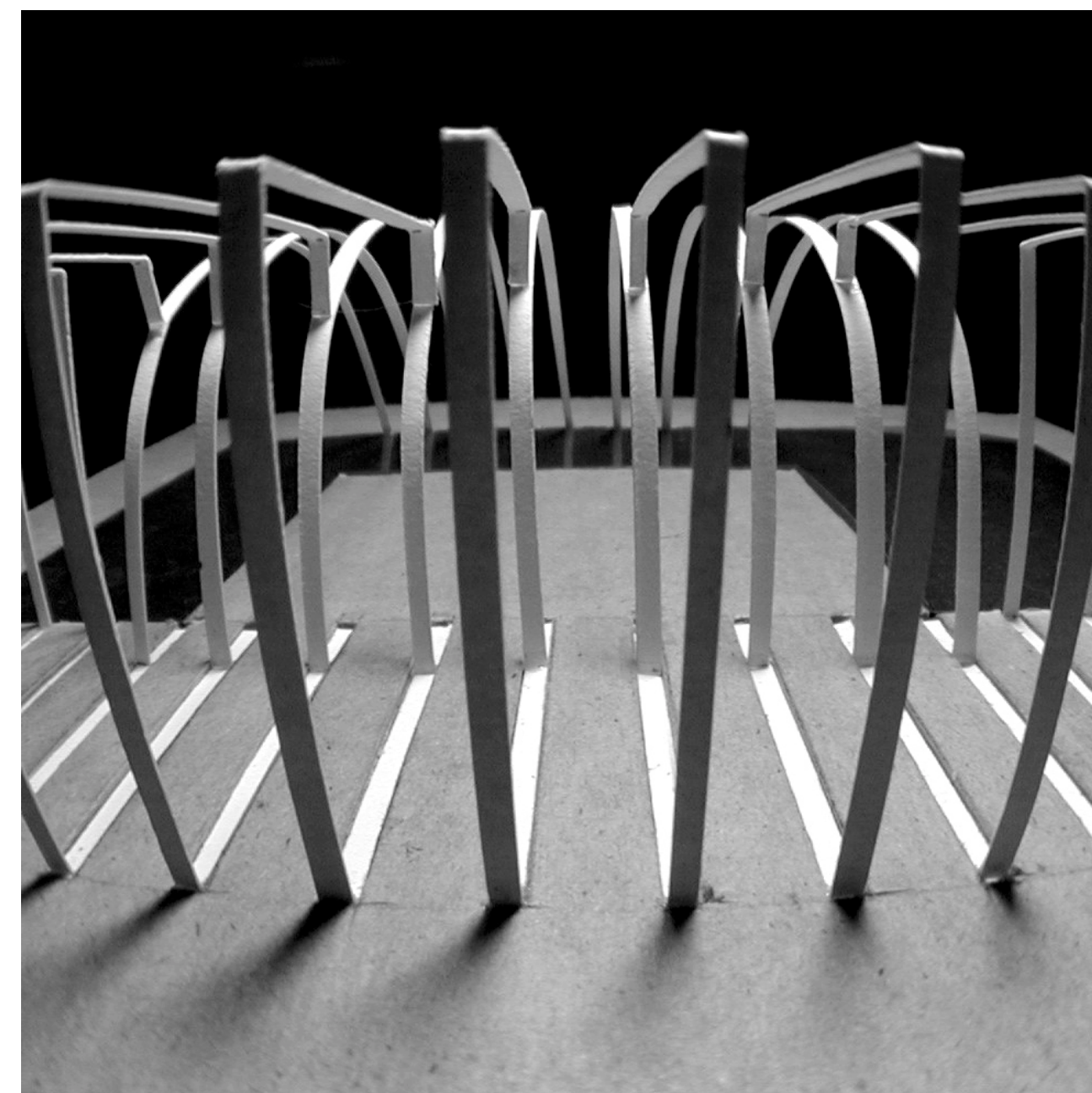


While the idea for the Thermal Bath was being refined and developed, I studied and reflected on the long history of public bathing in art and architecture. What are the material qualities of a space that will come into direct contact with the bare skin of the bathers? How will thermal comfort be maintained? What is the quality of light in the space? What will be heard in the space? How is privacy addressed in a public space? How should the building respond to the site? What is the relationship of the bath to the town of Warm Springs?

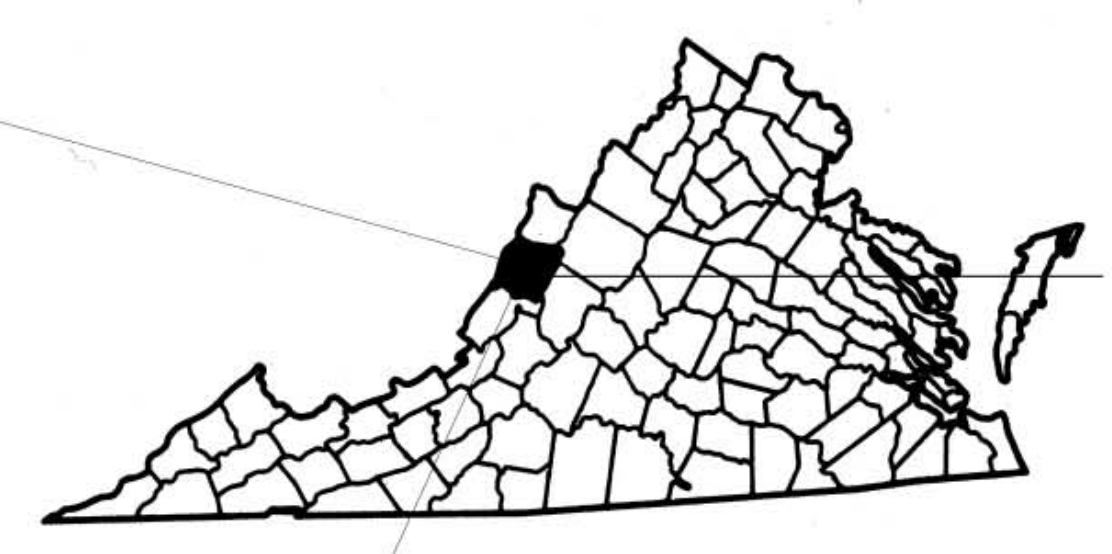
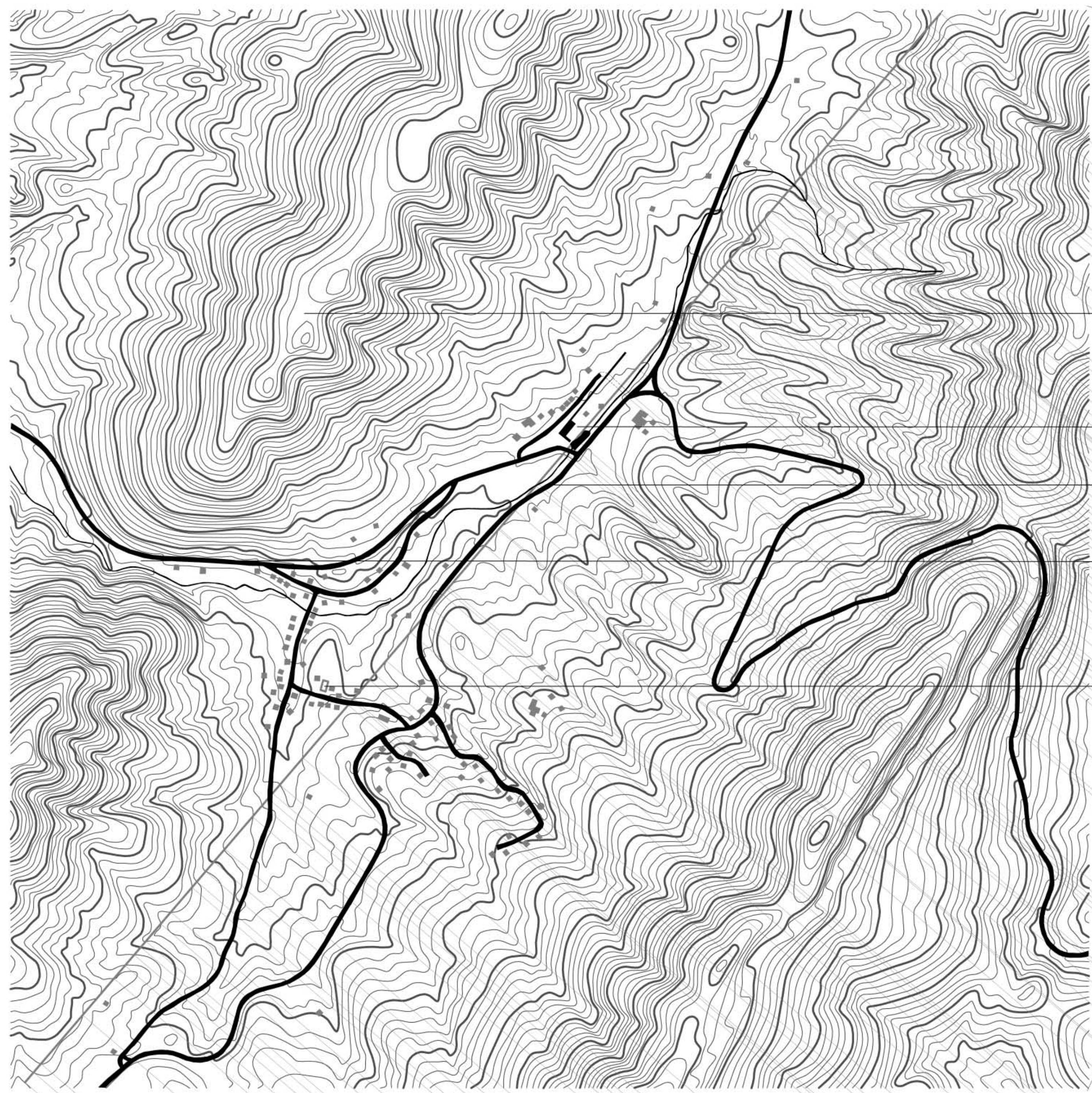


There were at least 200 bathers there. The sofas were covered with cushions and rich tapestries. The women positioned there, with slaves dressing their hair, were all in a natural state: completely nude. However, there were among them neither indecent moments nor lascivious postures. They walked and moved with majestic grace. Several of them were well shaped with dazzling white skin and they were adorned only by their hair which had been combed into tresses that fell to their shoulders and were dressed with pearls and ribbons. Beautiful nude women in different postures, some gossiping, some working, others taking coffee or sorbet, and still others casually reclined on their cushions.  
Lady Montagu

The Project



10230  
10000  
8000  
6000  
4000  
2000  
1000  
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BATH COUNTY

LITTLE MOUNTAIN

THERMAL BATHS

ROUTE 220 N/S

WARM SPRINGS GAP

WARM SPRINGS COURT HOUSE

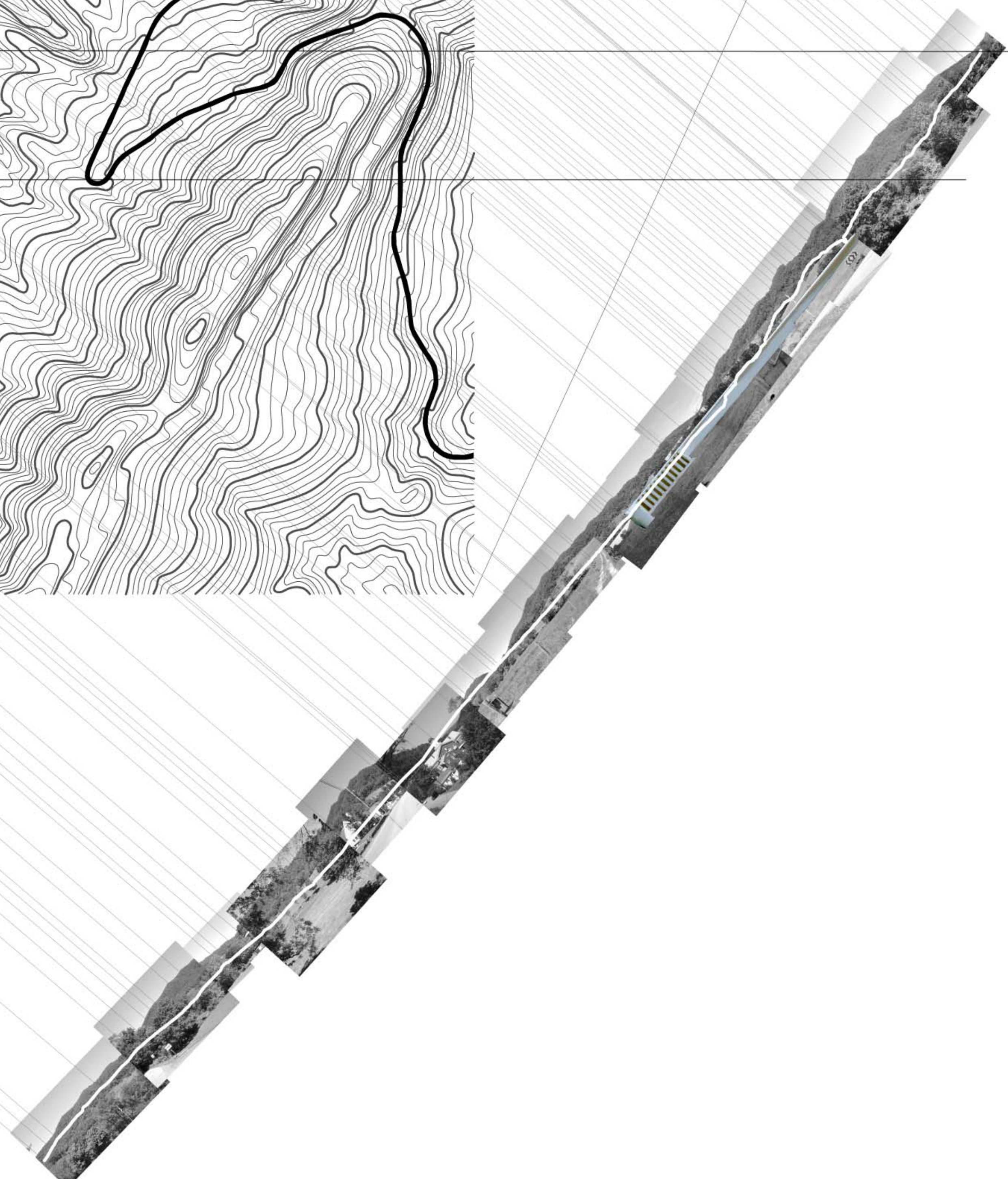


PLATE EIGHT

Warm Springs is a small community of 500 residents located in the western part of Bath County in the Allegheny Mountains of Virginia. The town has grown up around the spring source whose waters are between 96 and 98 degrees Fahrenheit year round. There has been a timber frame bath house on the site since 1761, which is still in use today.

This site analysis shows the position of the site along the axis of the valley floor and it's relationship to the center of town. Three quarters of a mile separates the site and the Bath County Courthouse, whose cupola is clearly visible from the southwest corner of the site. On the following page, a section cut taken perpendicular to the valley shows the site, adjacent to Warm Springs Run and bounded by mountains to the northwest and southeast.

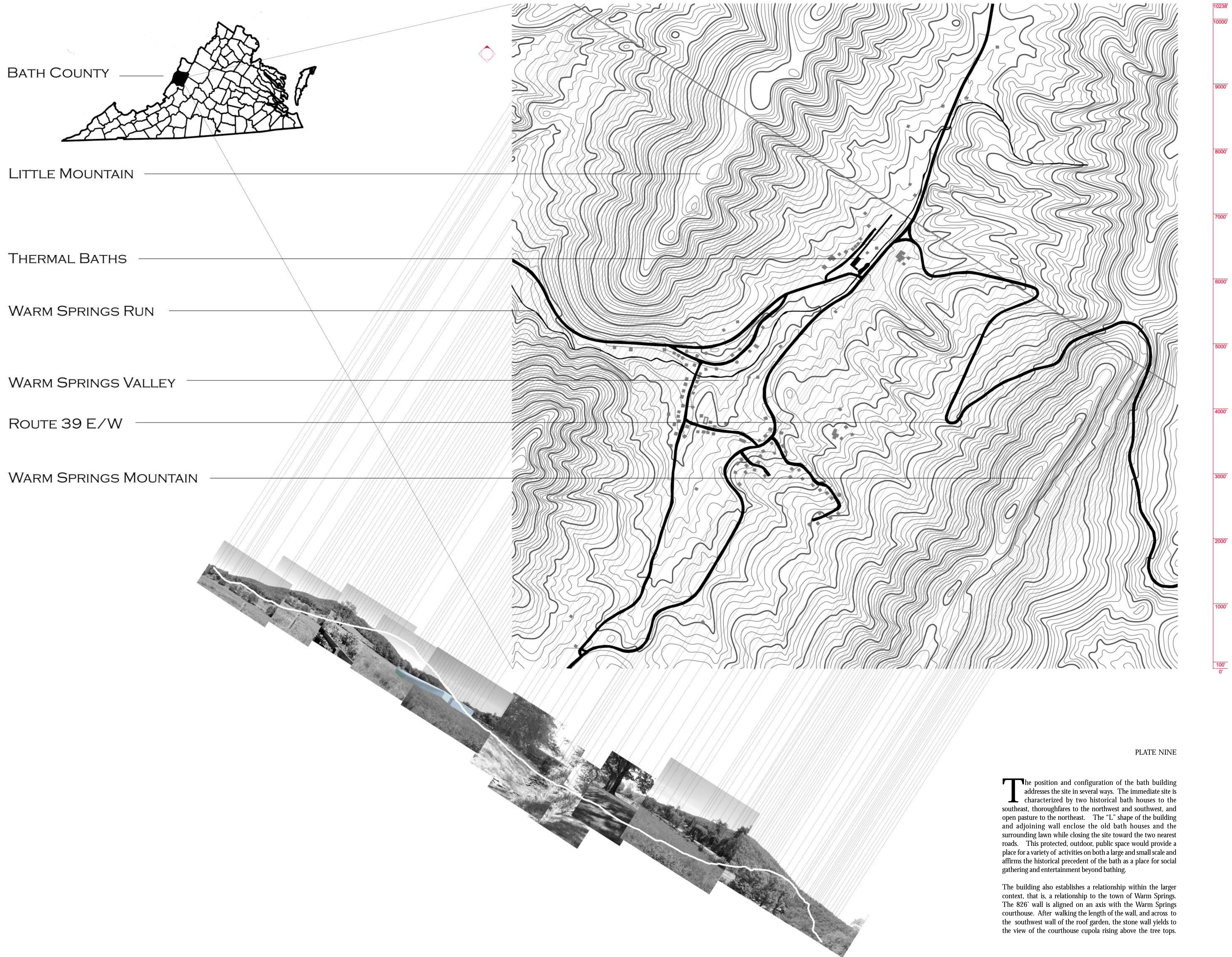
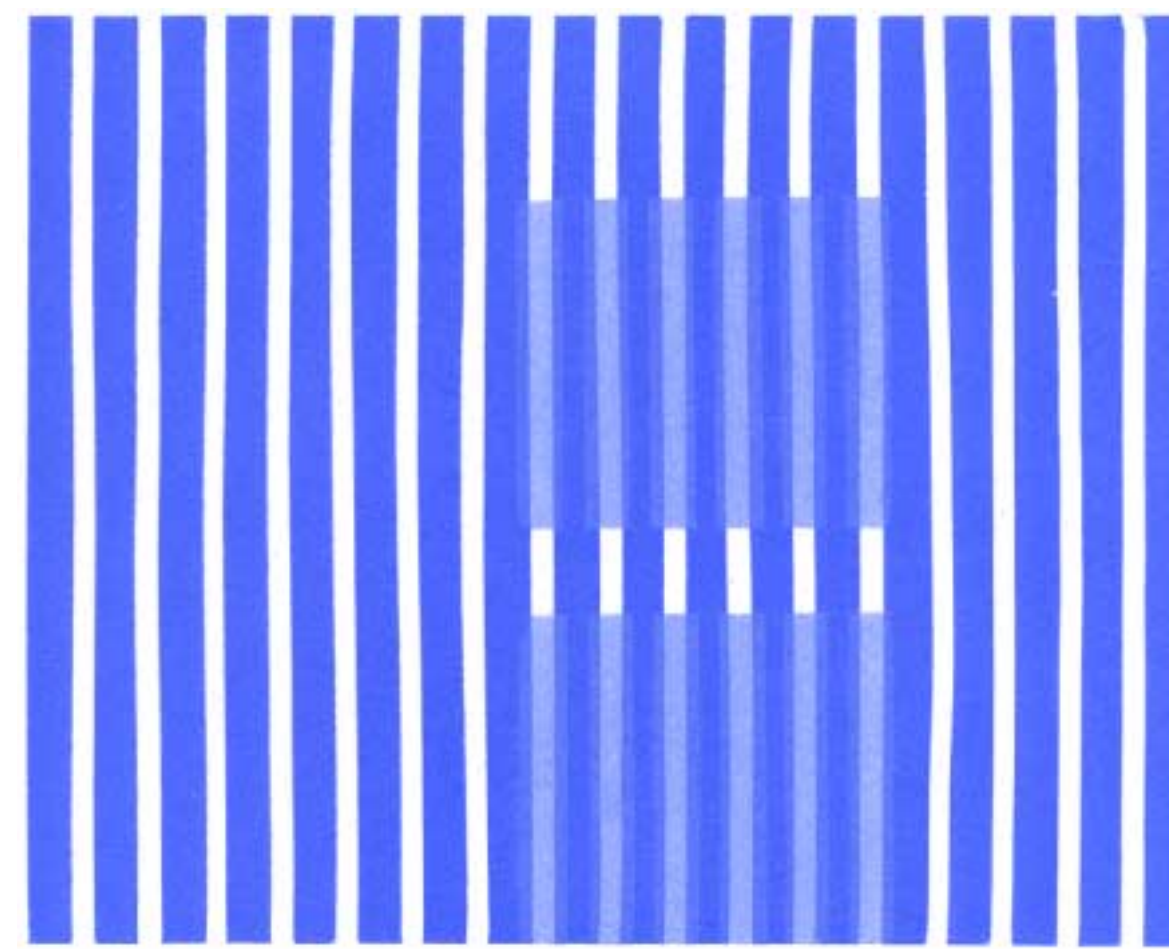
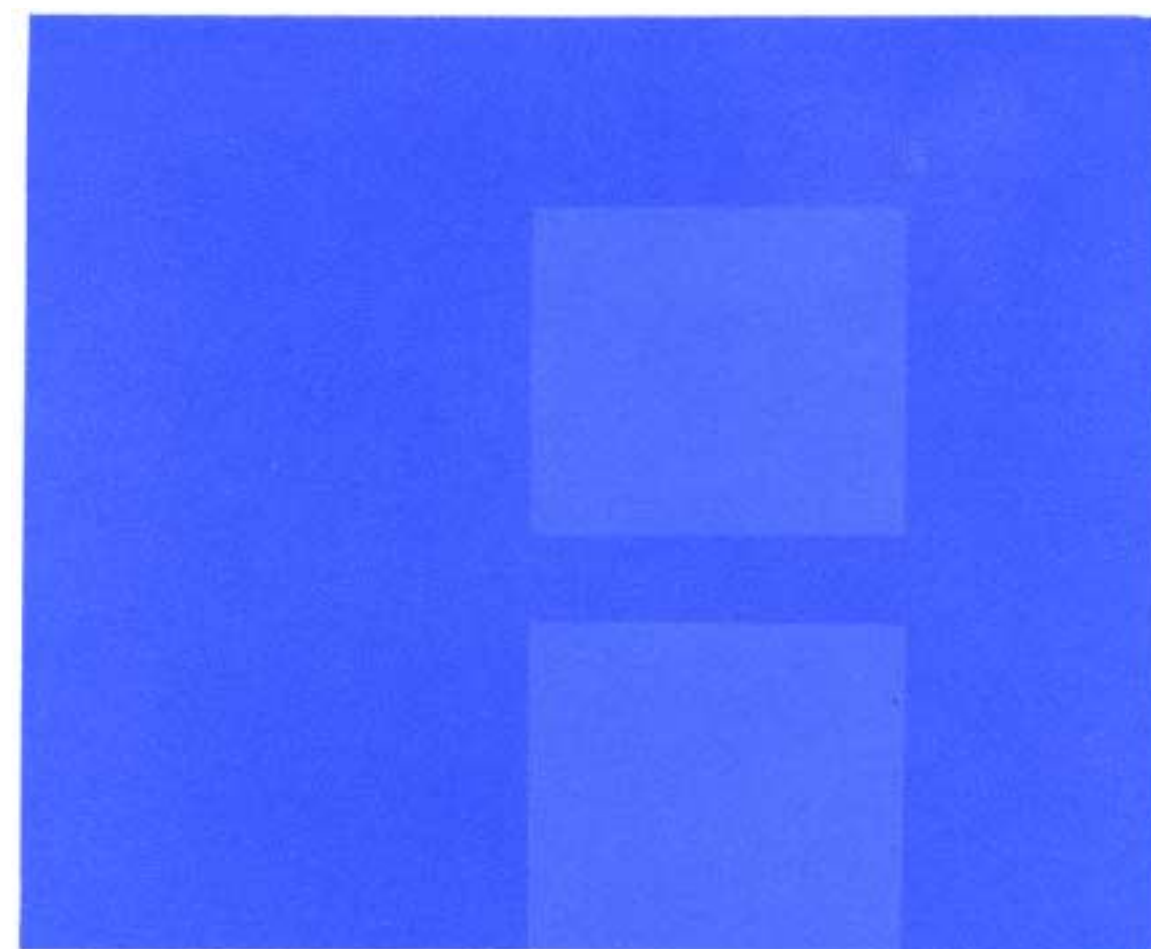
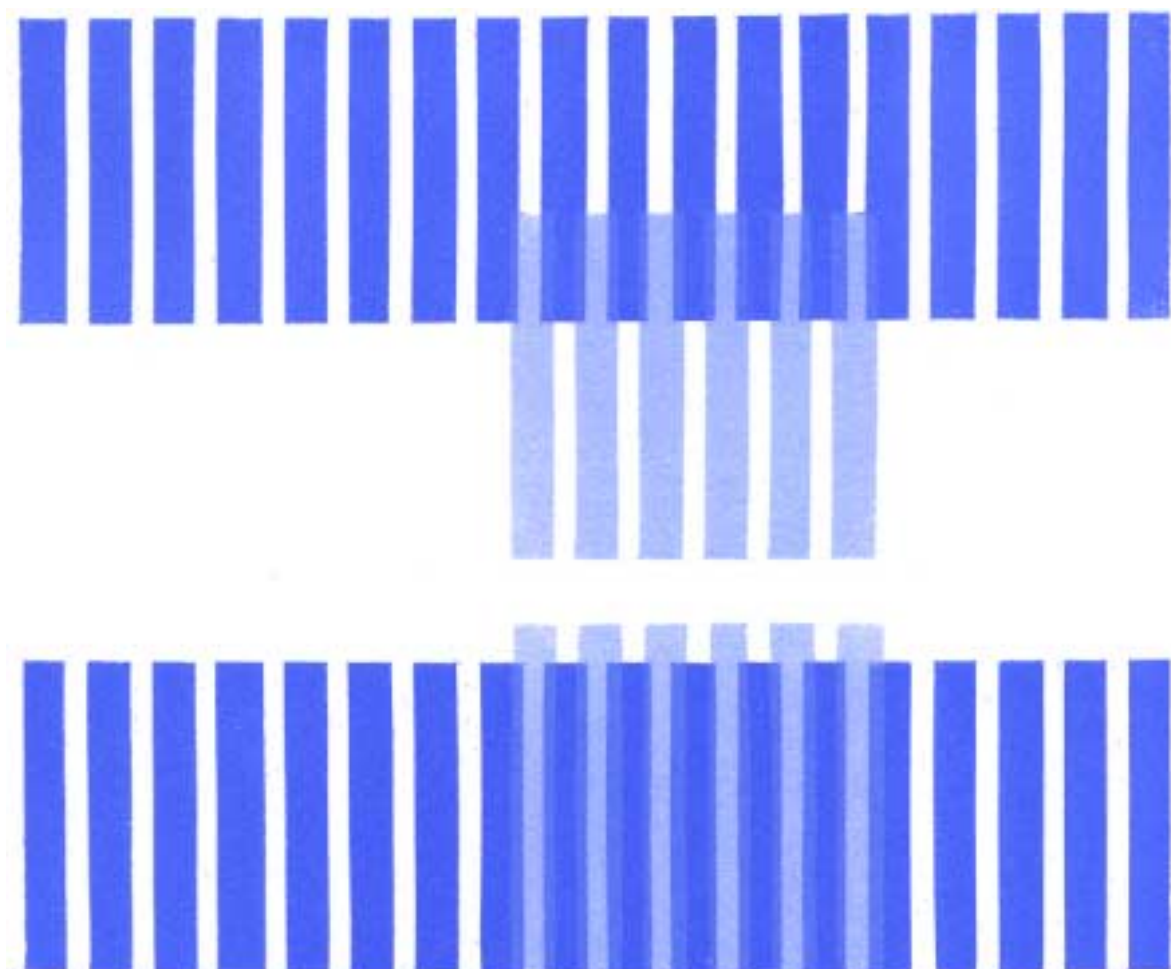


PLATE NINE

The position and configuration of the bath building addresses the site in several ways. The immediate site is characterized by two historical bath houses to the southeast, thoroughfares to the northwest and southwest, and open pasture to the northeast. The "L" shape of the building and adjoining wall enclose the old bath houses and the surrounding lawn while closing the site toward the two nearest roads. This protected, outdoor, public space would provide a place for a variety of activities on both a large and small scale and affirms the historical precedent of the bath as a place for social gathering and entertainment beyond bathing.

The building also establishes a relationship within the larger context, that is, a relationship to the town of Warm Springs. The 826' wall is aligned on an axis with the Warm Springs courthouse. After walking the length of the wall, and across to the southwest wall of the roof garden, the stone wall yields to the view of the courthouse cupola rising above the tree tops.



The design for the Thermal Bath began with a diagrammatic study of spatial relationships. Two dimensional ink prints and a three dimensional paper model were made as thoughts on the function and use of the space were developed together with the configuration of the architectural elements. The way in which the function of the space is united with the design concept through the materialization of architectural elements is critical to the sensuality, the eroticized expression, of the architecture. This study raised many questions for consideration:

What is the relationship between the design concept and it's functionally purposive concrete realization?

Can the functionality of the space be enhanced by the architectural elements and the materiality of those elements?

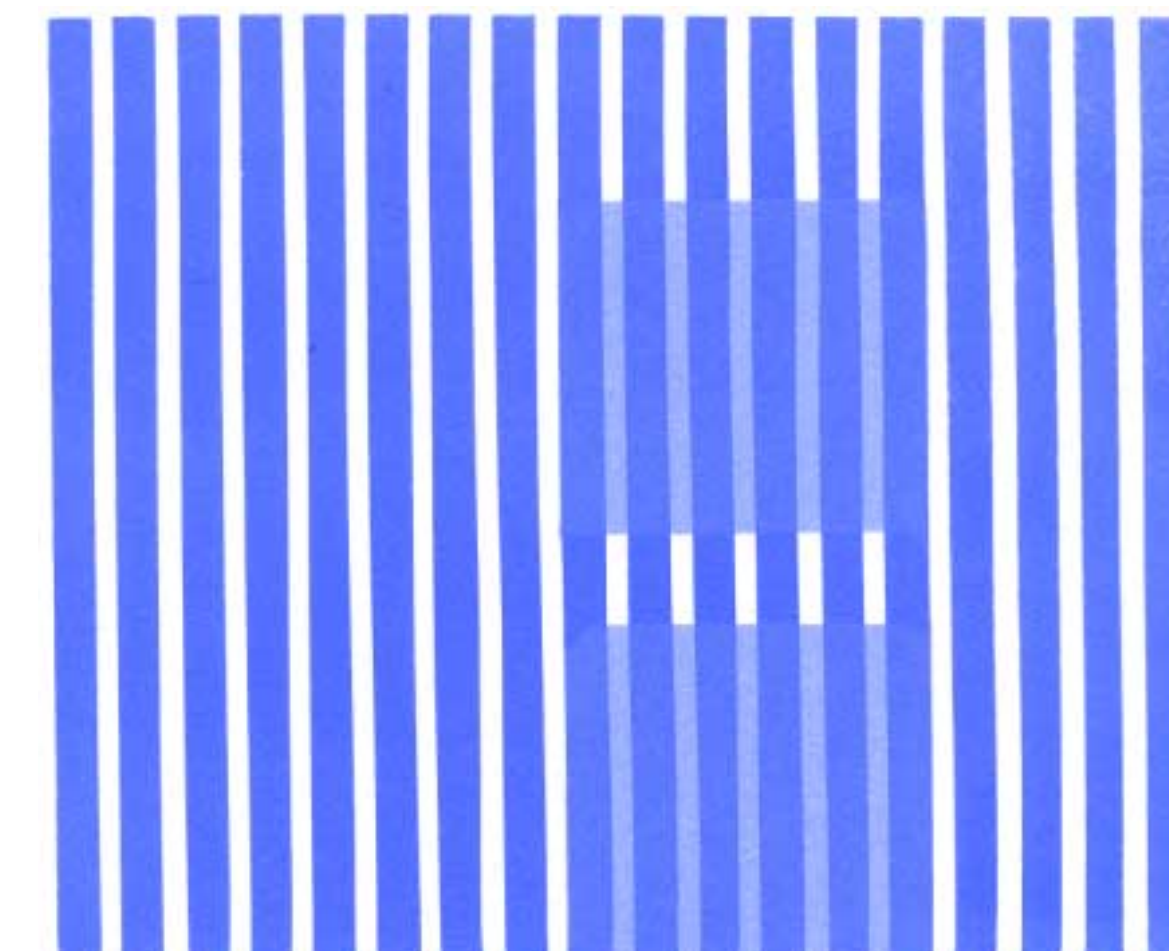
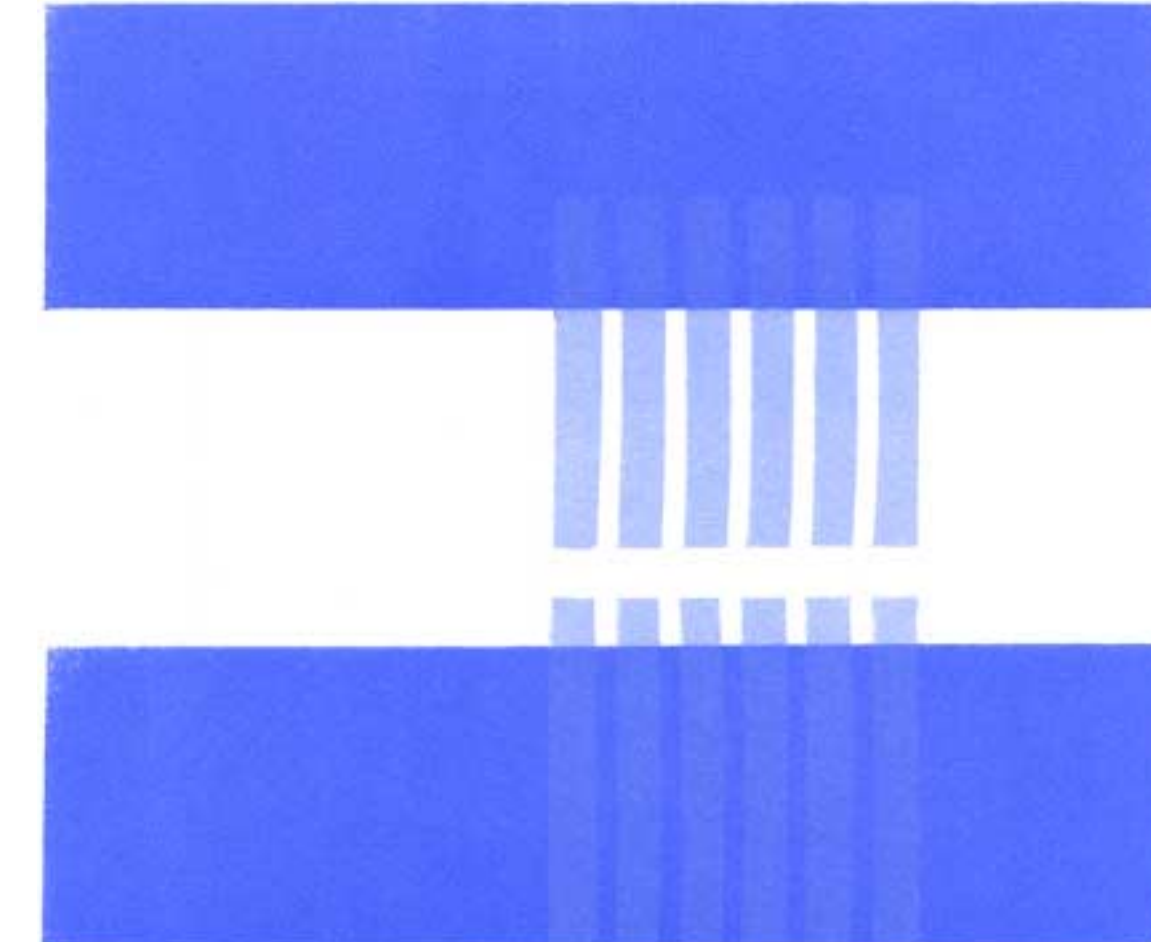
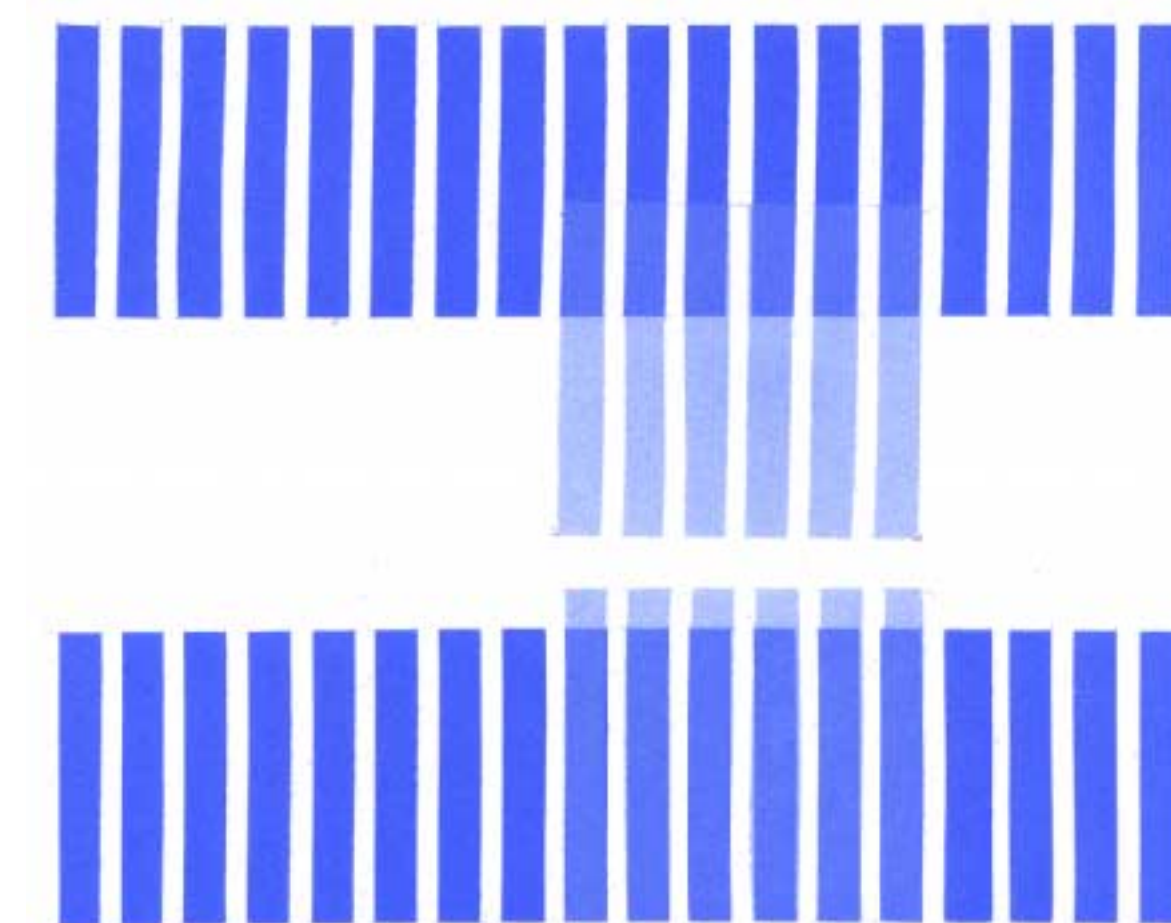
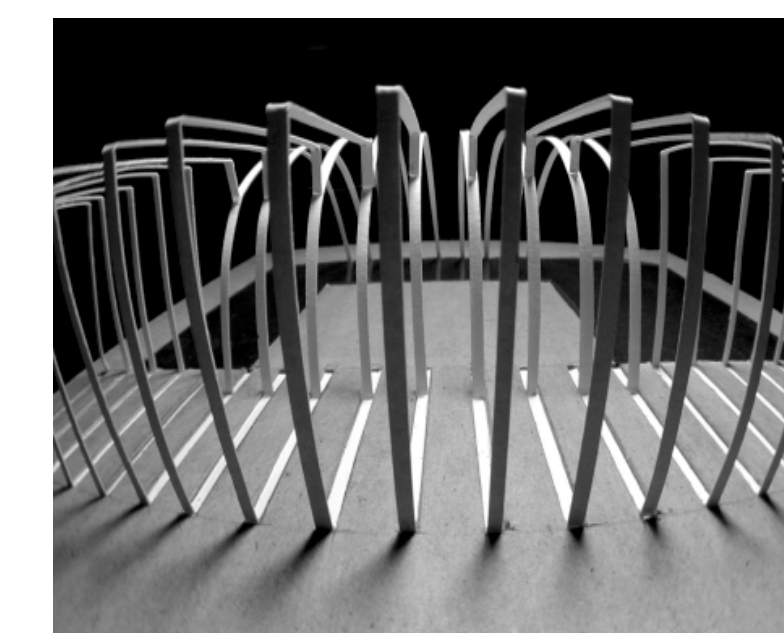
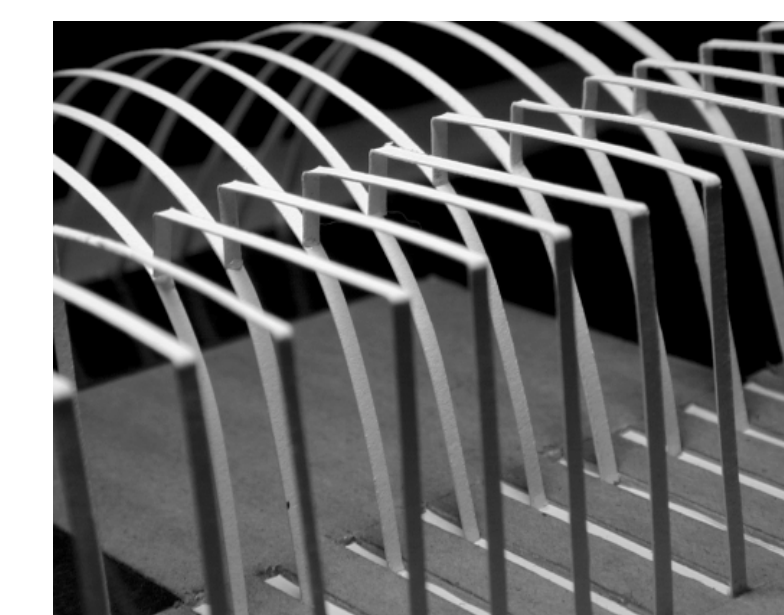
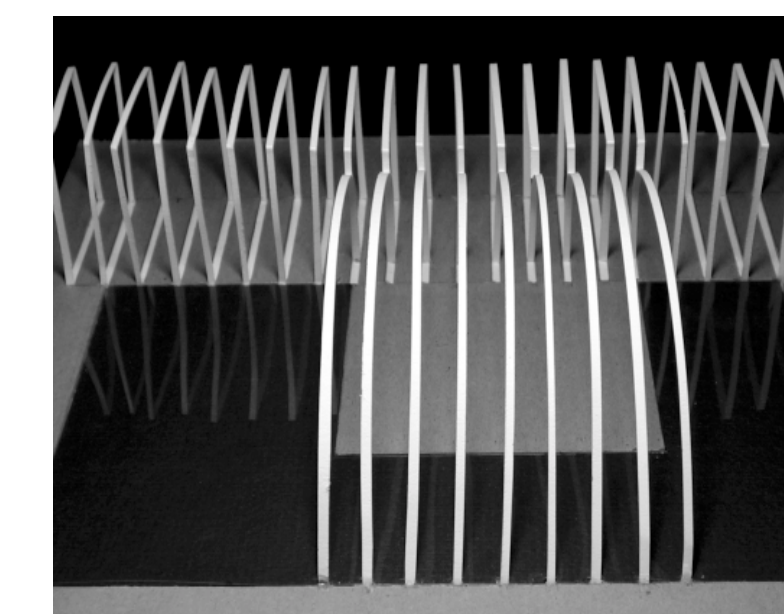
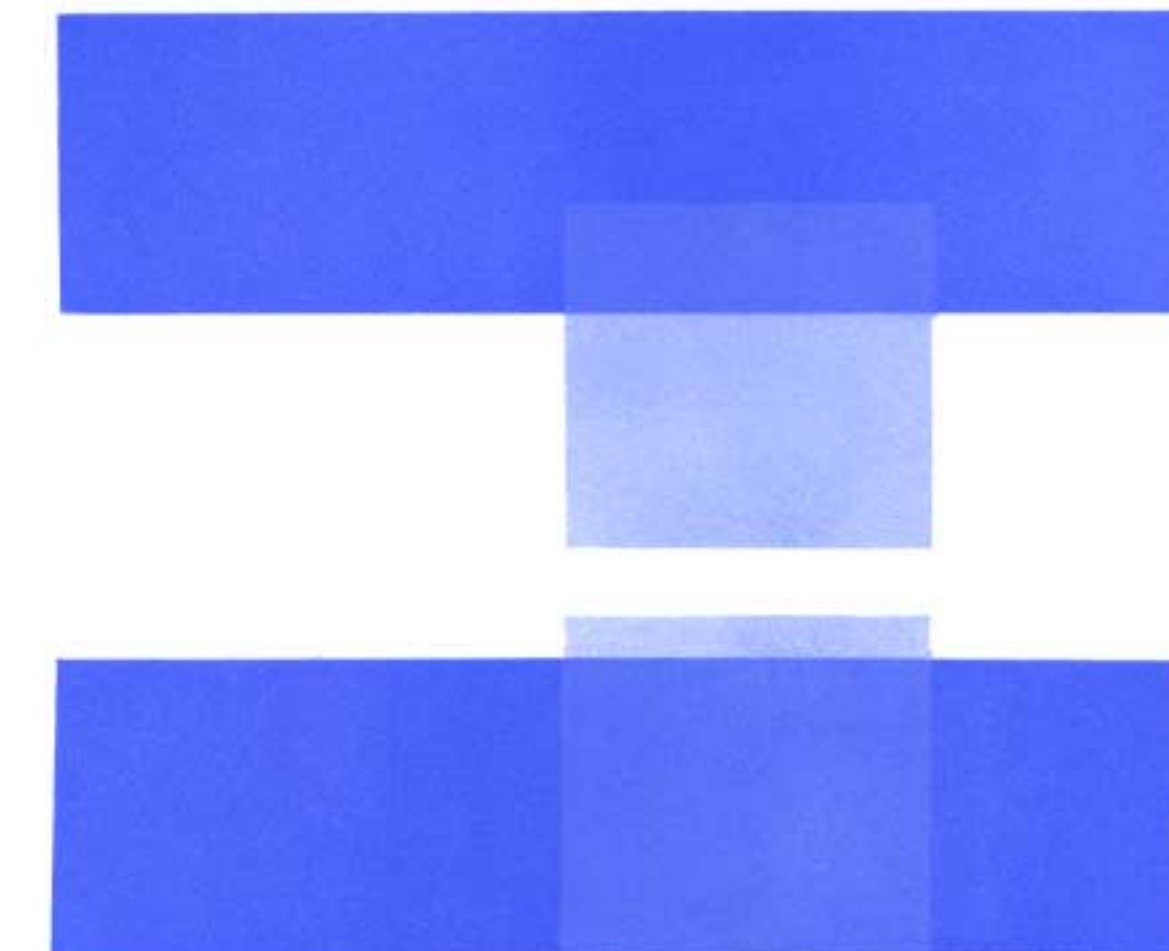
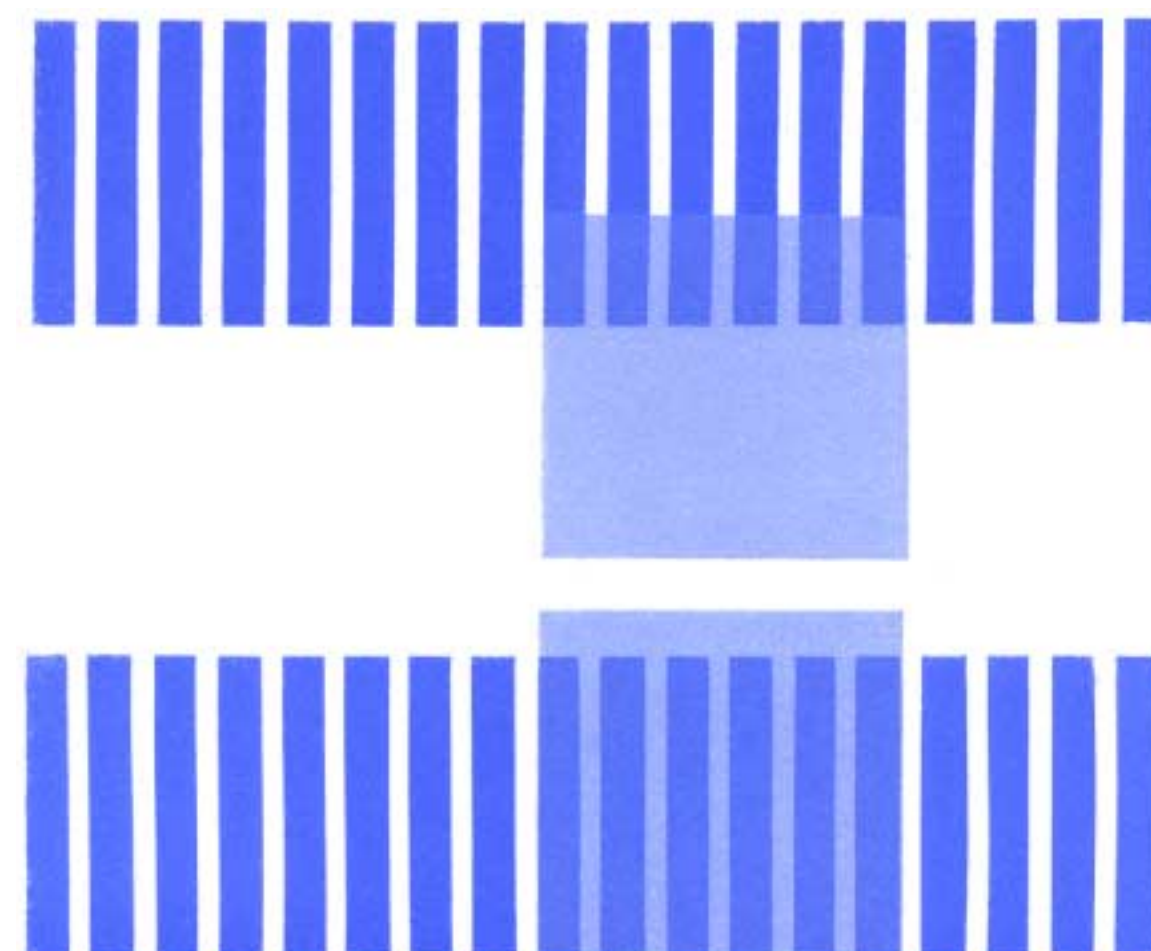
How do we perceive these relationships?

How will materials be used to address the design, the function, and the senses?

How will one experience the bath?

How does architecture enhance this experience?

Is it possible to give erotic sensuality to stone, glass, and water?



Form as an end inevitably results in mere formalism. This effort is directed only to the exterior. But only what has life on the inside has a living exterior. Only what has intensity of life can have intensity of form. Every "how" is based on a "what." The un-formed is no worse than the over-formed. The former is nothing; the latter is mere appearance. Real form presupposes real life. This is our criterion: we should judge not so much by the results as by the creative process. For it is just this that reveals whether the form is derived from life or invented for its own sake. That is why the creative process is so essential. Life is what is decisive for us. In all its plenitude and in its spiritual and material relations.

Mies van der Rohe

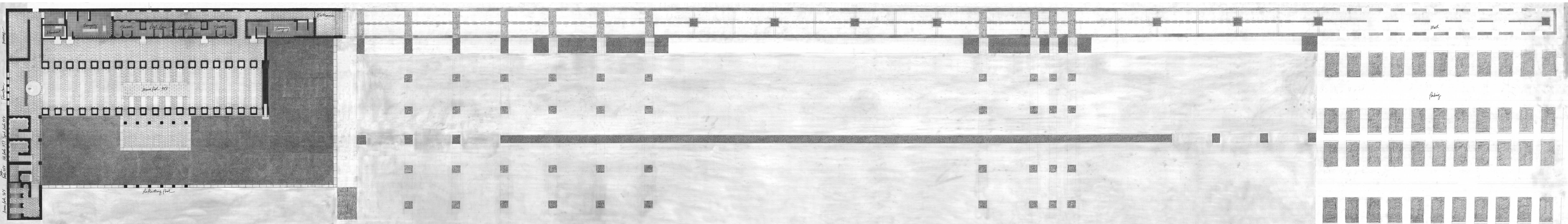
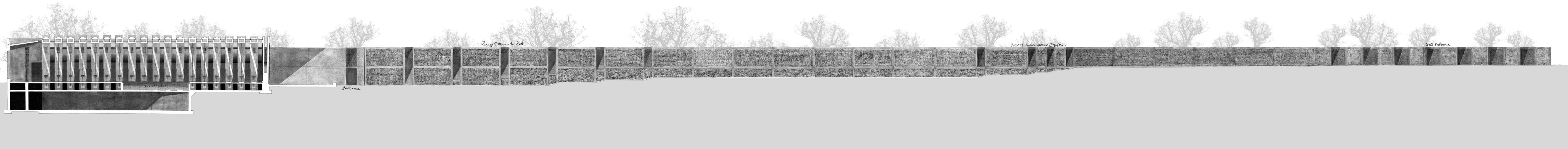
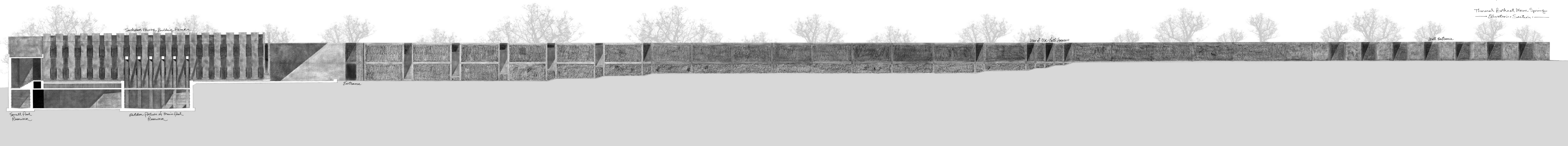
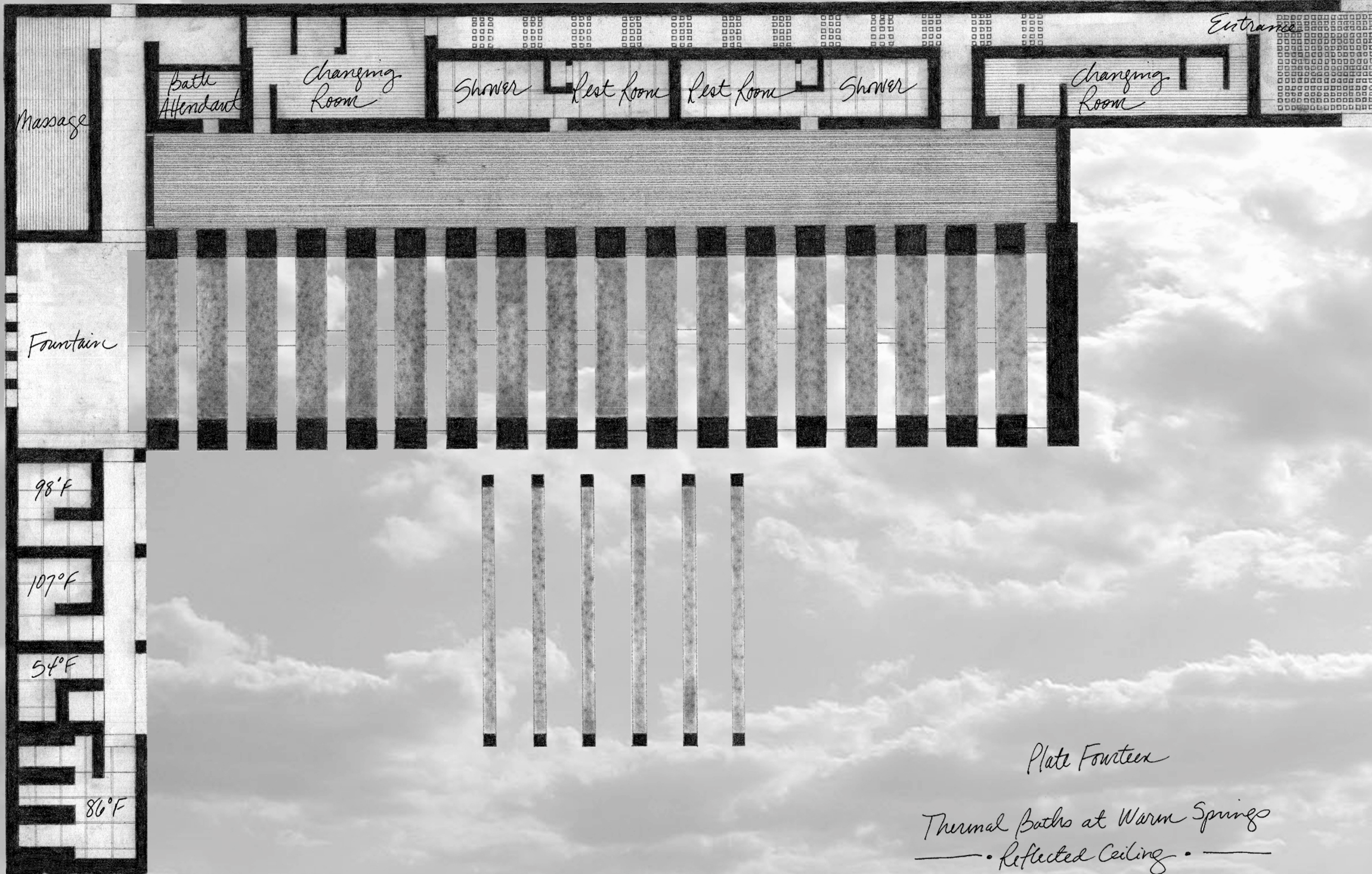


Plate Eleven  
 Thermal Baths at Warm Springs  
 Plan



Thermal Baths at Warm Springs  
— Section —





Massage

Bath Attendant

Changing Room

Shower

Rest Room

Rest Room

Shower

Changing Room

Entrance

Fountain

98°F

107°F

54°F

86°F

Plate Fourteen

Thermal Baths at Warm Springs  
— • Reflected Ceiling • —



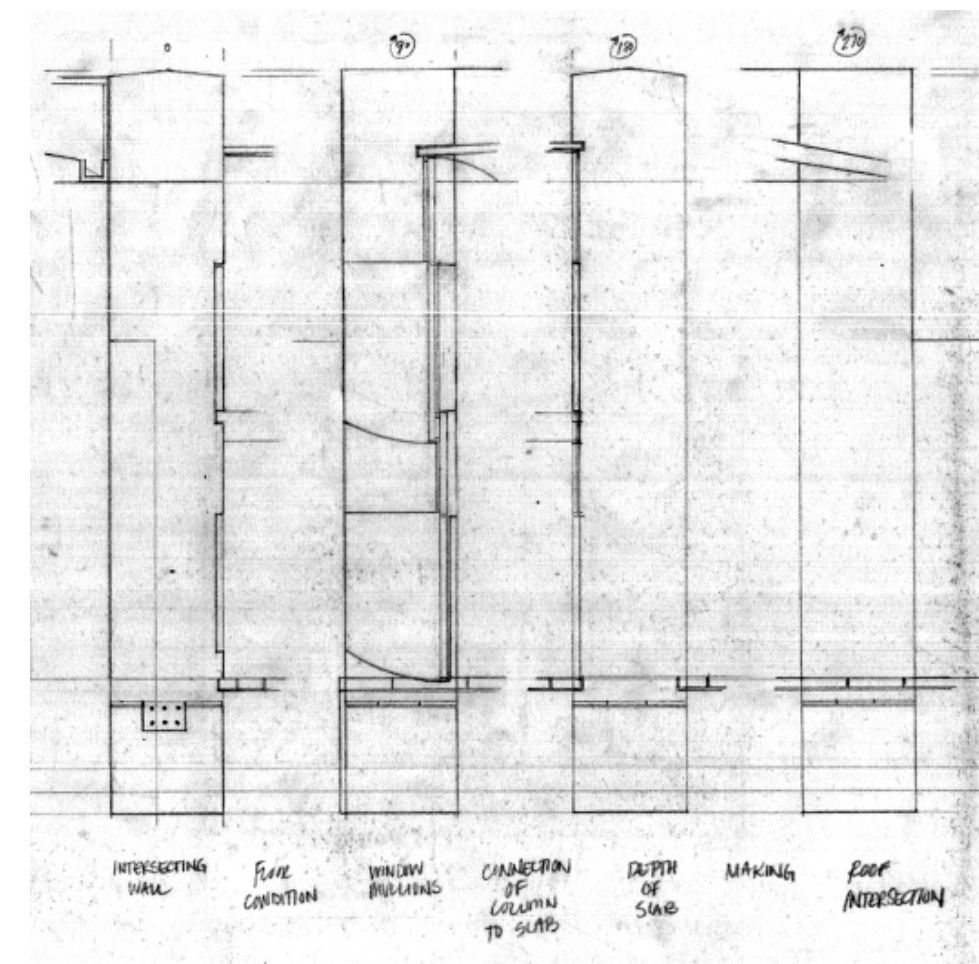
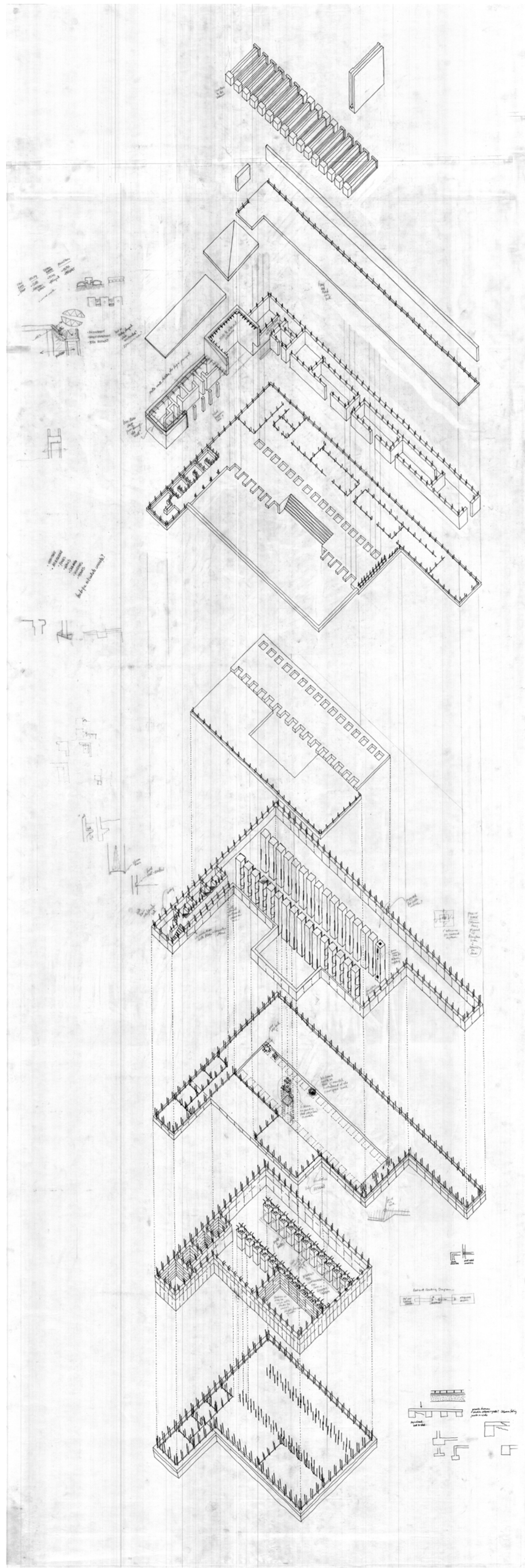


Plate Sixteen  
 Thermal Baths at Warm Springs  
 • Construction •

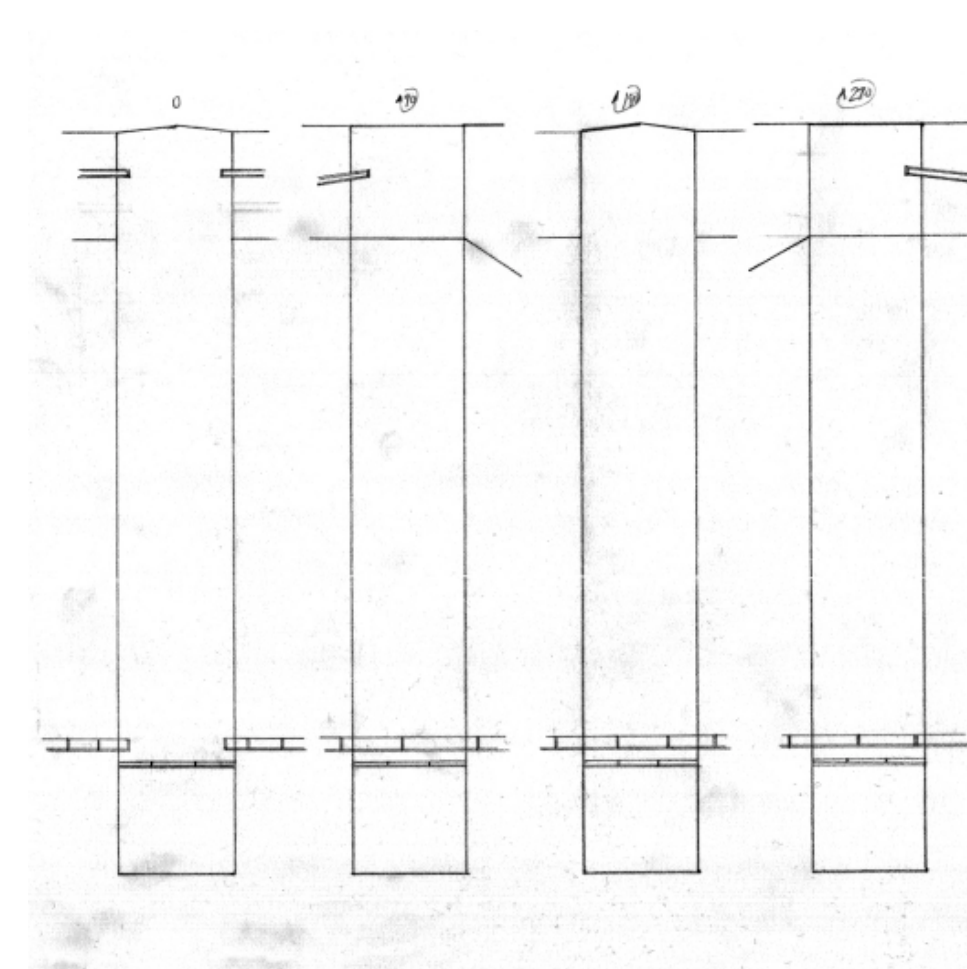
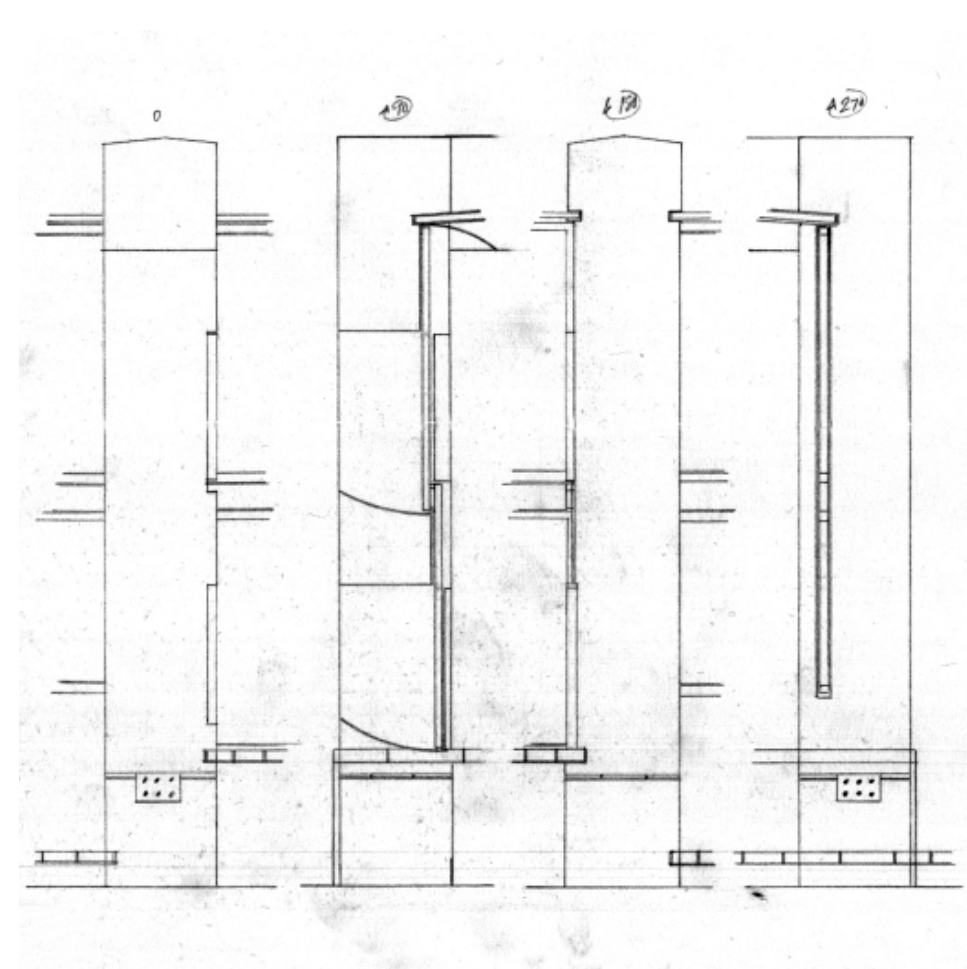
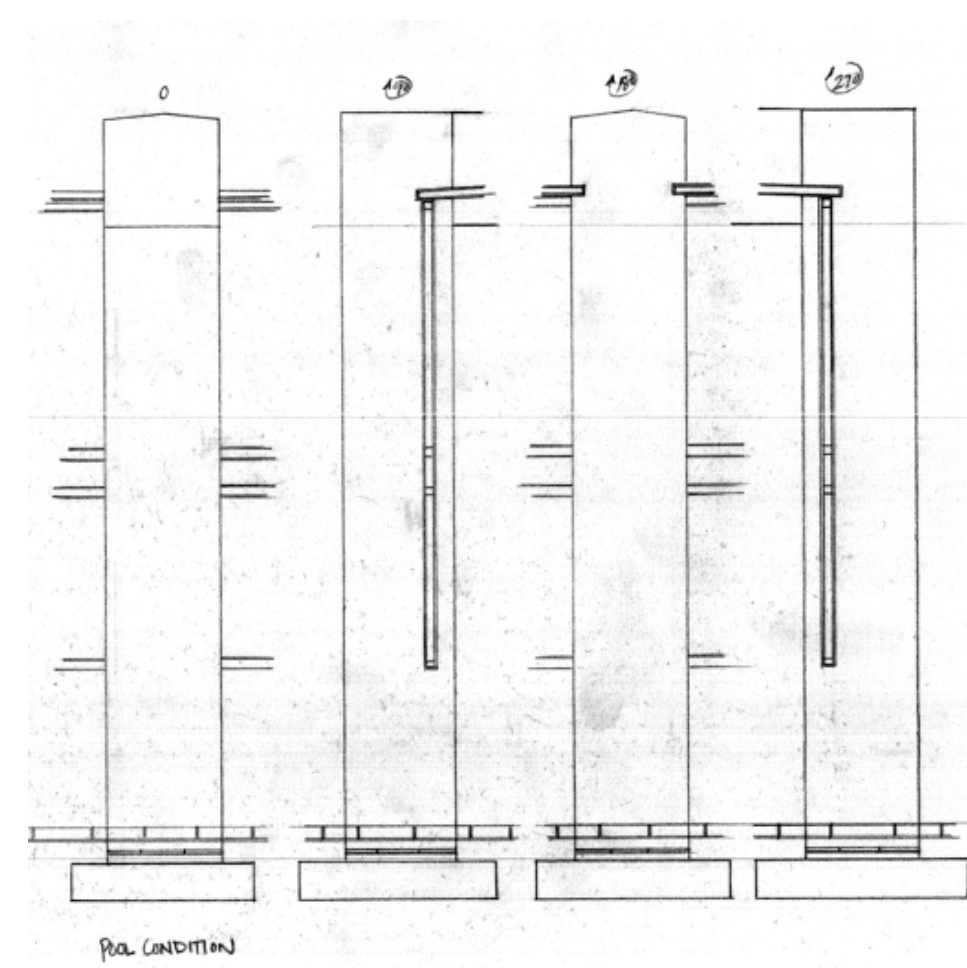
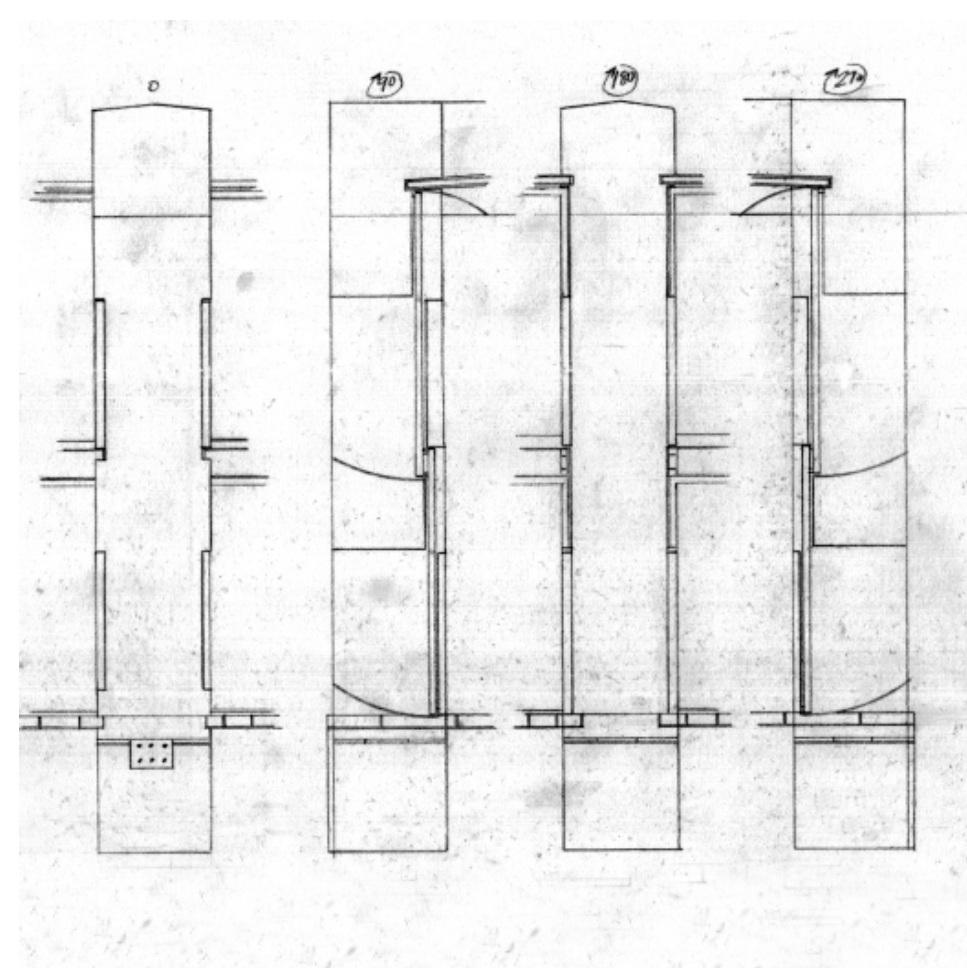
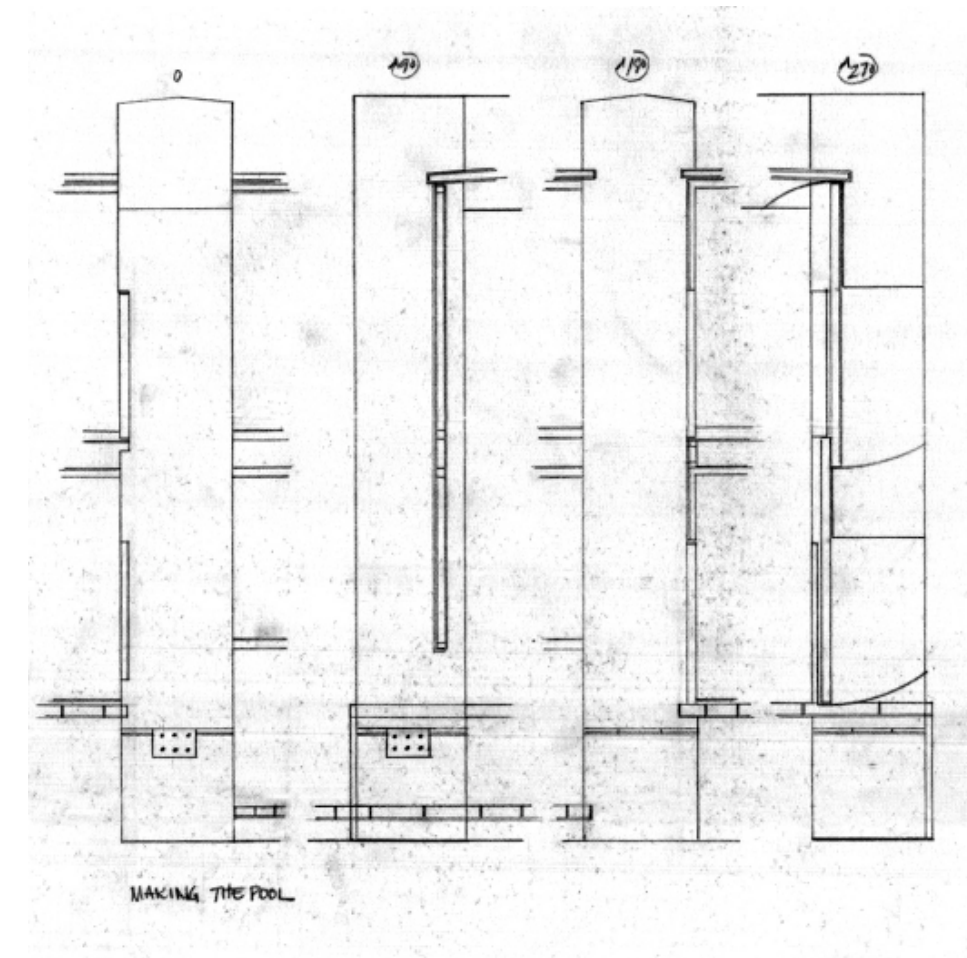
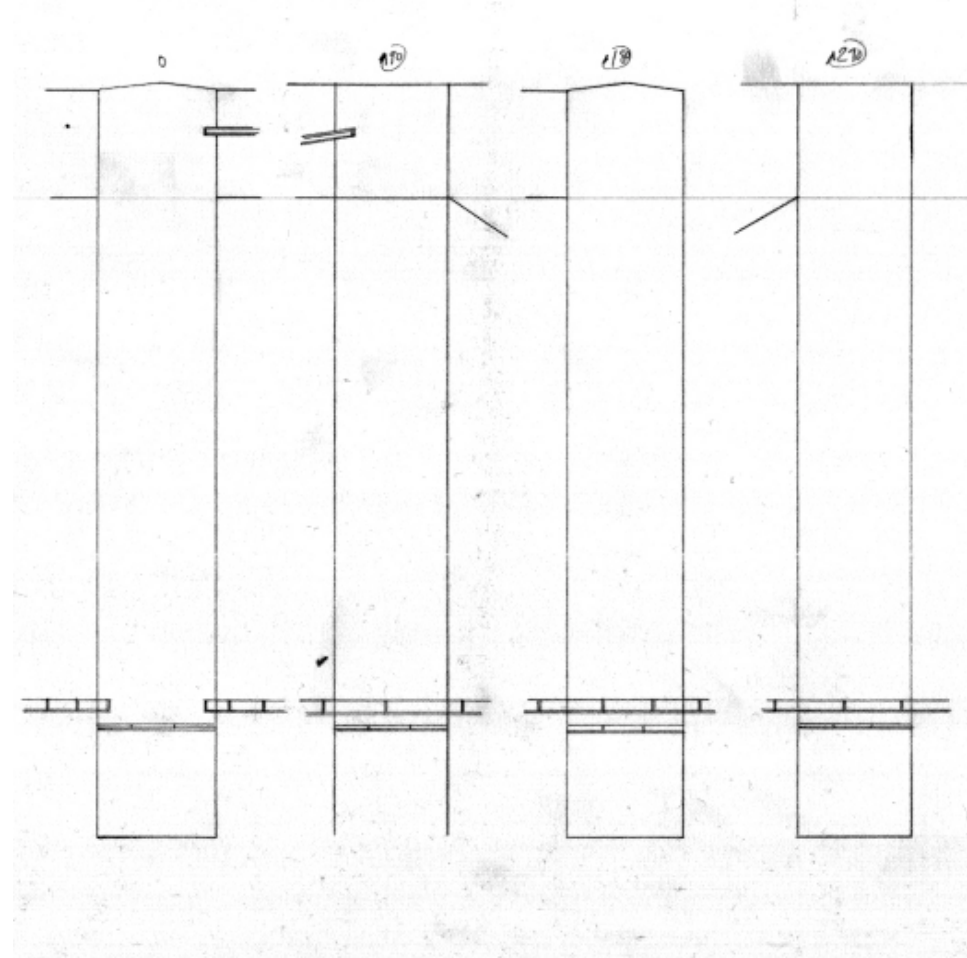




Plate Seventeen  
Thermal Baths at Warm Springs



Plate Eighteen  
Thermal Baths at Warm Springs

The main bath space is defined by the massive columns and their corresponding beams which create an alternating pattern of light and shadow. Light slices into the space from the southeast and from overhead, dancing through the steam rising from the water in the large pool. This spacious, dramatically lit room is bound to the northwest and to the southwest by spaces of contrasting character. On the northwest side of the building support areas, such as the changing rooms, rest rooms, and showers are contained in spaces with half the ceiling height and soft, even artificial light. A massage room and a series of four smaller, more intimate pools bound the southwest side of the building. These pools have water temperatures of 98 degrees, 107 degrees, and 54 degrees Fahrenheit, respectively, as one moves down the hall toward the aroma bath. The water in this pool, which has a temperature of 86 degrees Fahrenheit, is infused with flower petals that gently circulate and fill the air with subtle fragrance.

After entering the building and changing clothes, one moves into the main bath through a transition space differentiated by a curved ceiling of wood dowels that reaches up and anticipates the height of the adjoining space. The delicate grit of warm limestone is beneath one's feet and the sound of splashing water becomes audible as steps are taken toward the next room. The size and position of the columns permit only glimpses of the space beyond them. The smooth, rounded corners of these massive concrete columns ask to be touched as one passes between them and into the main bath.



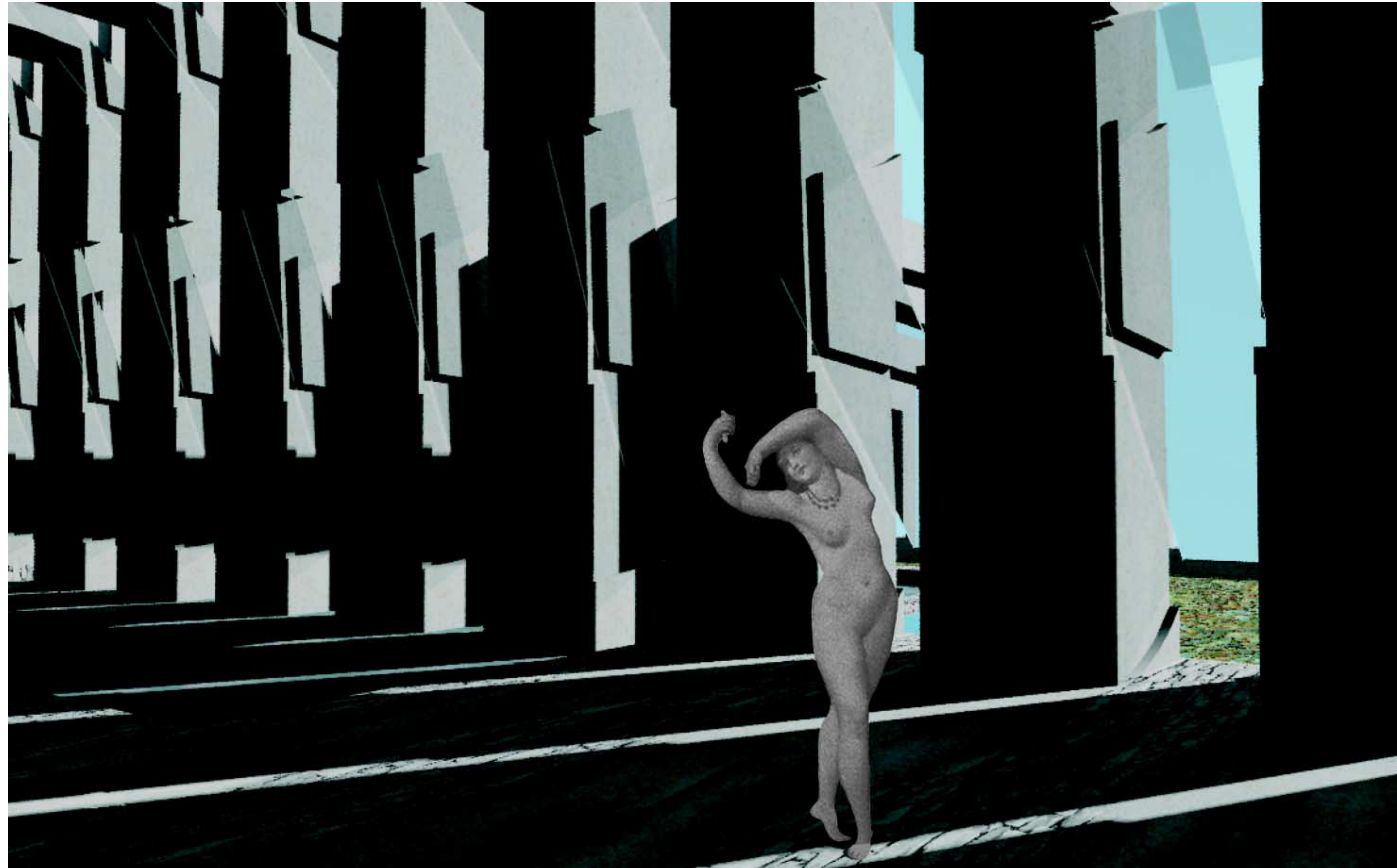


Plate Nineteen  
Thermal Baths at Warm Springs

Once inside the main bath, one can place his towel on one of the towel bars which are set into a smooth, curved subtraction on the face of each column. The towel is gently warmed by the radiant system from within the thickness of the column face. The floor, which is also warm to the touch from the radiant system beneath, is now patterned to reinforce the configuration of the architectural elements that form the space. Lightly textured concrete marks the space on the floor that corresponds with the two columns it lies between. Limestone fills the alternate floor area, reaching out from the central space, between the columns and toward the reflecting pool.

When the weather is pleasant the windows at the front and back of the space, which are held in place successively between columns, may be opened to circulate the air within the space. The track, as a trace of the window's motion, allows anticipation of the window's movement and operation. In inclement weather air is exchanged through a uniform, low velocity system whose ducts are contained beneath the floor and within the columns. The air movement is gentle and quiet, almost imperceptible.

Ten limestone steps lead down into the four feet-six inch deep water of the main pool. The regulated variation of the floor texture can still be felt beneath one's feet. Glimpses of the outdoor portion of the pool and the mountains beyond can be seen between the columns. A third column, which supports one end of a concrete trellis, is met as one passes to the outside.





Plate Twenty  
Thermal Baths at Warm Springs

The outdoor portion of the main bathing pool is surrounded on three sides by a shallow reflecting pool. The warm water of the bathing pool teems with effervescence as one looks out over the rounded limestone pool edge, across the placid embrace of the reflecting pool and up to the top of Warm Springs Mountain in the distance. In winter, the placidity of this pool is replaced by the texture and color of thousands of rounded cobblestones. The view to the sky is ever mediated by the concrete trellis which poetically contains the quiescence of bathing.

Returning back inside, one's eyes must readjust to the changing light. Passing, again, between the columns only a small area of the large room is visible. Once beyond them, and with one's eyes just above the level of the floor, the magnitude of the space is heightened. After ascending the ten limestone steps, one moves across the room to retrieve his towel and is surrounded in its soft warmth.



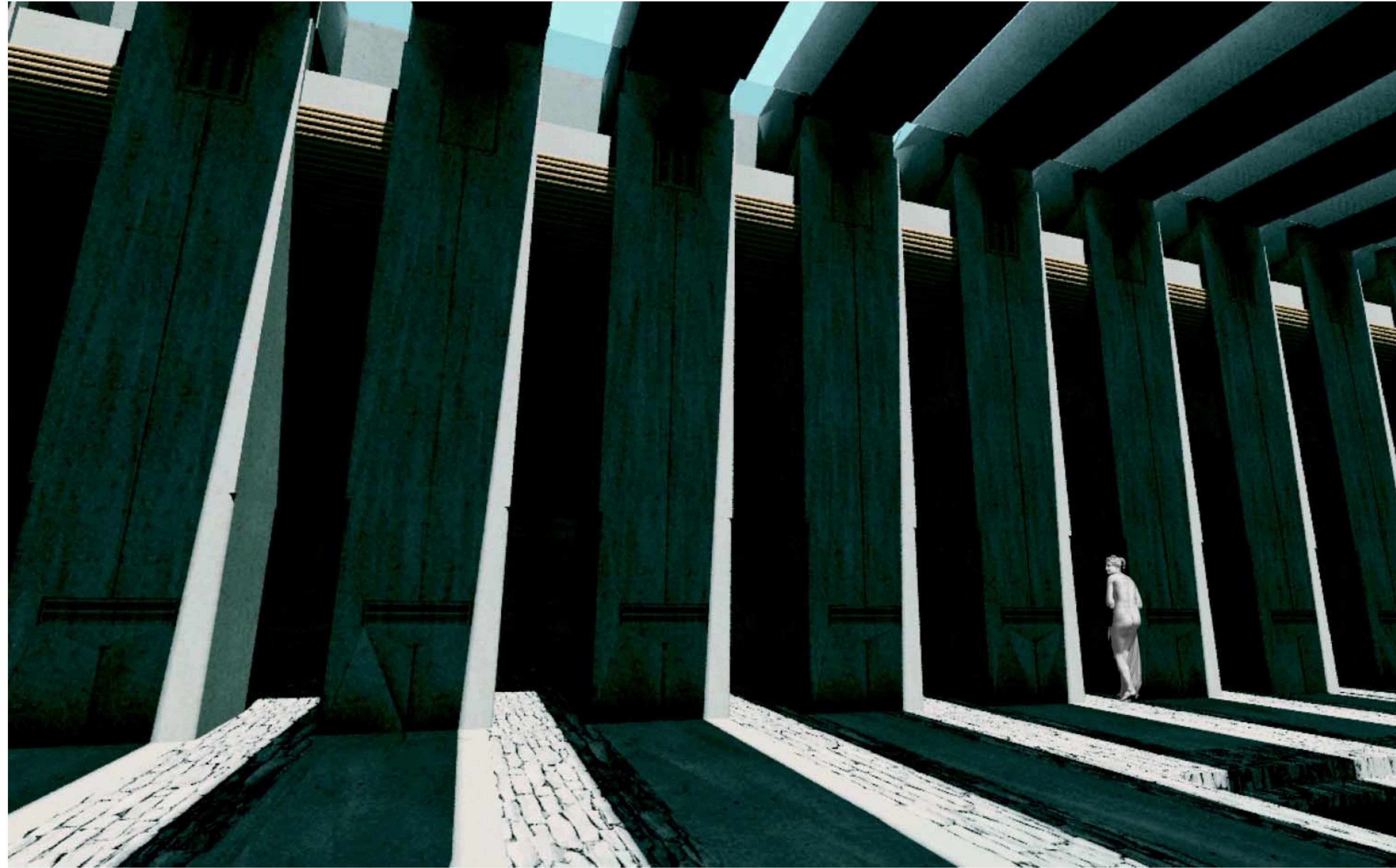


Plate Twenty One  
Thermal Baths at Warm Springs

## Image Index

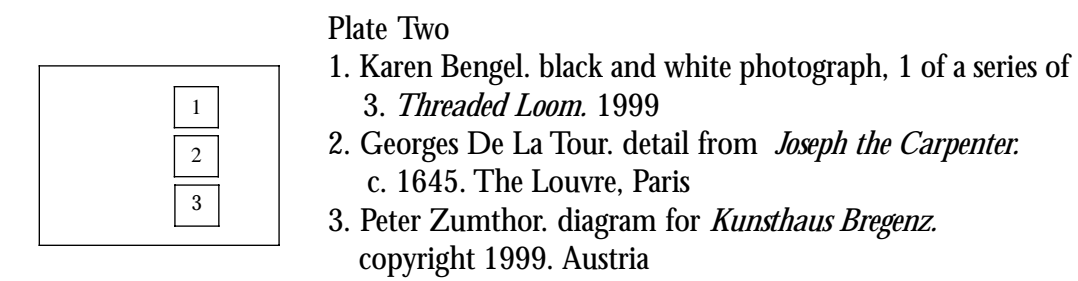


Plate Two  
1. Karen Bengel, black and white photograph, 1 of a series of 3. *Threaded Loom*. 1999  
2. Georges De La Tour, detail from *Joseph the Carpenter*. c. 1645. The Louvre, Paris  
3. Peter Zumthor, diagram for *Kunsthau Bregenz*. copyright 1999. Austria

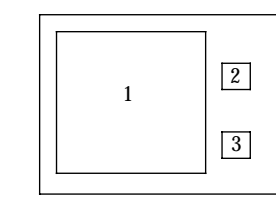


Plate Three  
1. Karen Bengel, color scan of original *Handwoven Wool Study*. 1999  
2. Karen Bengel, black and white photograph, 2 of a series of 3. *Threaded Loom*. 1999  
3. Karen Bengel, black and white scan of original *Linen Towel with Hemstitch*. 1999

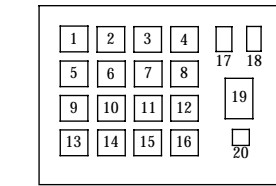


Plate Four  
1-3,6-12. Peter Zumthor, color and black and white photographs of *Kunsthau Bregenz*. copyright 1999. Austria  
4,5,13-16. Karen Bengel, black and white photographs of *Kunsthau Bregenz*. 1999  
17. Rock Engraving, c. 10,000 B.C. *Cave of Addaura*, Monte Pellegrino, Italy  
18. Georges De La Tour, *Joseph the Carpenter*. c. 1645. The Louvre, Paris  
19. Marc-Antoine Laugier, engraving from *An Essay on Architecture*. 1753. Paris  
20. Peter Zumthor, diagram for *Kunsthau Bregenz*. copyright 1999. Austria

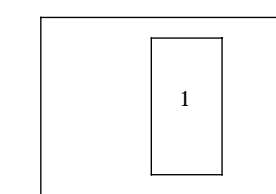


Plate Five  
1. Jean-Auguste-Dominique Ingres. *Bather of Valpinçon*. c.1808. The Louvre, Paris

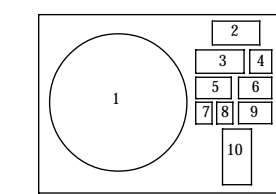


Plate Six  
1. Jean-Auguste-Dominique Ingres. *The Turkish Bath*. c.1863. The Louvre, Paris  
2. Pablo Picasso. *The Bathers*. c. 1918. Fogg Art Museum, Cambridge, Massachusetts  
3. School of Fontainebleau. *The Tepidarium*. c. 16th century. Collection of Wildenstein & Co., Inc.  
4. Kokei Kobayashi. The Hot Spring. c. 1918. Tokyo National Museum, Tokyo  
5. Theodore Chasseriau. *The Tepidarium*. c. 1853. The Louvre, Paris  
6. Jean-Leon Gerome. *Women's Bath at Brusa*. Salon of 1885. The Hermitage, St. Petersburg  
7. Peter Zumthor. *Thermal Baths at Vals*. copyright 1996. London  
8. *Baths of Caracalla*. c. 216 A.D. Rome. photograph on-line at [www.ancientsites.com/er/baths/caracalla.html](http://www.ancientsites.com/er/baths/caracalla.html)  
9. Thomas Johnson. *King's Bath*. Bath, England. 1675  
10. Daniel Chodowiecki. *Lady Montagu Visiting Women's Bath in Sofia*. c. 1781. Berlin

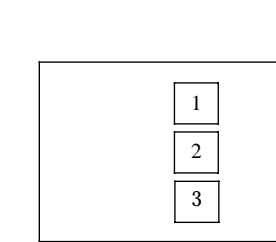


Plate Seven  
1. Karen Bengel, model for *Thermal Baths at Warm Springs*. 1999  
2. Karen Bengel, site model for *Thermal Baths at Warm Springs*. 1999  
3. Karen Bengel, site model for *Thermal Baths at Warm Springs*. 1999

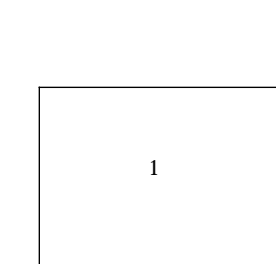


Plate Eight and Plate Nine  
1. Karen Bengel, site analysis for *Thermal Baths at Warm Springs*. 2000

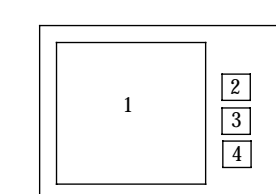


Plate Ten  
1. Karen Bengel, ink print diagrams for *Thermal Baths at Warm Springs*. 1999  
2-4. Karen Bengel, model for *Thermal Baths at Warm Springs*. 1999

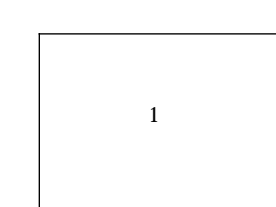


Plate Eleven  
1. Karen Bengel, graphite on vellum plan. *Thermal Baths at Warm Springs*. 2000

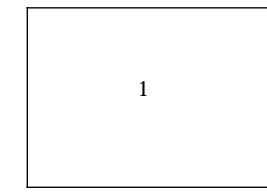


Plate Twelve  
1. Karen Bengel, graphite on vellum section/elevation. *Thermal Baths at Warm Springs*. 2000

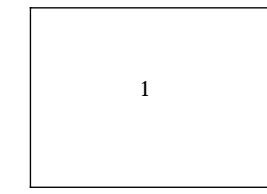


Plate Thirteen  
1. Karen Bengel, graphite on vellum section/elevation. *Thermal Baths at Warm Springs*. 2000

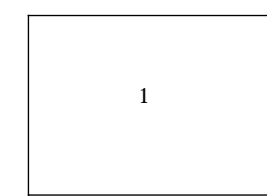


Plate Fourteen  
1. Karen Bengel, graphite on vellum reflected ceiling plan. *Thermal Baths at Warm Springs*. 2000

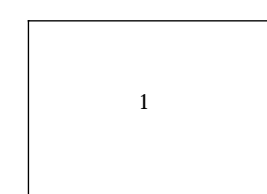


Plate Fifteen  
1. Karen Bengel, graphite on vellum drawings with dimensions. *Thermal Baths at Warm Springs*. 2000

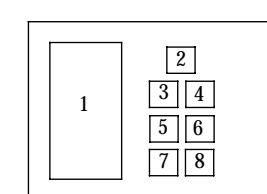


Plate Sixteen  
1. Karen Bengel, ink on vellum exploded axonometric. *Thermal Baths at Warm Springs*. 1999  
2-8. Karen Bengel, graphite on vellum column condition study. *Thermal Baths at Warm Springs*. 1999

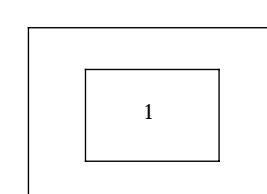


Plate Seventeen  
1. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Jean-Auguste-Dominique Ingres, Studies of a Man and Woman for the Golden Age. c. 1842. Fogg Art Museum, Cambridge, Massachusetts

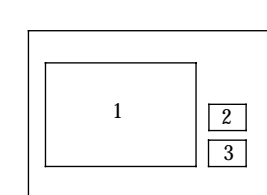


Plate Eighteen  
1-2. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Antonio Canova. *Venus Italica*. c. 1812. Pitti Palace, Florence  
3. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Jean-Auguste-Dominique Ingres, dancing woman from *The Turkish Bath*. c. 1863. The Louvre, Paris

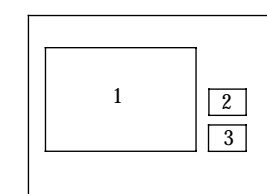


Plate Nineteen  
1. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Jean-Auguste-Dominique Ingres, dancing woman from *The Turkish Bath*. c. 1863. The Louvre, Paris  
2. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Theodore Chasseriau. *Venus Anadyomene*. c. 1838. The Louvre, Paris  
3. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Jean-Auguste-Dominique Ingres, Studies of a Man and Woman for the Golden Age. c. 1842. Fogg Art Museum, Cambridge, Massachusetts

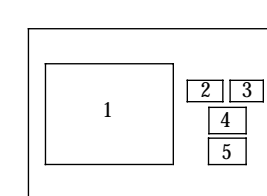


Plate Twenty  
1. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Jean-Auguste-Dominique Ingres, Studies of a Man and Woman for the Golden Age. c. 1842. Fogg Art Museum, Cambridge, Massachusetts  
2,3,5. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Antonio Canova. *Venus Italica*. c. 1812. Pitti Palace, Florence  
4. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Theodore Chasseriau. *Venus Anadyomene*. c. 1838. The Louvre, Paris

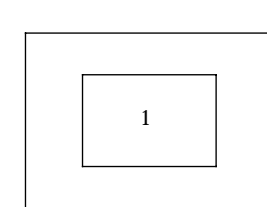


Plate Twenty One  
1. Karen Bengel, Lightscape rendering. *Thermal Baths at Warm Springs*. 2000  
Antonio Canova. *Venus Italica*. c. 1812. Pitti Palace, Florence

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# Curriculum Vitae Karen Bengel

Born in Erie, Pennsylvania	1970
Bachelor of Arts, University of Pittsburgh, Pittsburgh, Pennsylvania	1992
Master of Architecture, Virginia Polytechnic Institute and State University, Blacksburg, Virginia	2000

## Supporting Design Work

Three Dimensional Light Filter; Glass Block and 1x4 Cut, Sanded, and Perforated Oak	1997
Object for a Template; Milled and Sandblasted Aluminum	1997
Geometric Object; Polycarbonate turned on a Lathe and wet sanded	1997
Column with an Idea; Stacked and Rotated 2x10 Pine Boards Cut, Sanded and Painted White	1998
Light; Stained Glass	1998
Project for a Town Forum, Blacksburg, Virginia	1998
Model of Santa Croce Dome, Riva San Vitale, Switzerland	1999
Project for a Tower, Rome, Italy	1999
Urban Design Project for Riva San Vitale, Switzerland	1999
Project for a County Library, New Castle, Virginia	1999
Handwoven Wool Study; Various Sizes and Colors of 100% wool	1999
Handwoven Towels; 44/2 Natural Linen	1999
Handwoven Blanket; 100% Cotton Sage Green Chenille	2000
Thesis Exhibit: Thermal Baths at Warm Springs	2000

