

Thesis submitted to the
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requirements for the
degree of

Master
of
Architecture

approved:

Michael O'Brien
Chairman

Kay Edge

William Galloway

Focusing the Senses/
Saint Antonio Mausoleum

“What we perceive is the significance of surface in relation to our bodies.”

Dr. Mark Schneider

This thesis studies increasing awareness of the connectedness of the body to architecture. The objective is to explore and investigate the levels of attention required by each sense to summon the corporeal nature of the observers, to call us to a quietness of mind, transcending our western pace and creating awareness that leads our bodies and mind toward a unified perception of place.



Cooper's Rock State Forest, West Virginia

introduction

“The body image...is informed fundamentally from haptic and orienting experiences early in life. Our visual images are developed later on, and depend for their meaning on primal experiences that were acquired haptically.”

Kent C. Bloomer and Charles W. Moore,
“Body, Memory, and Architecture...”

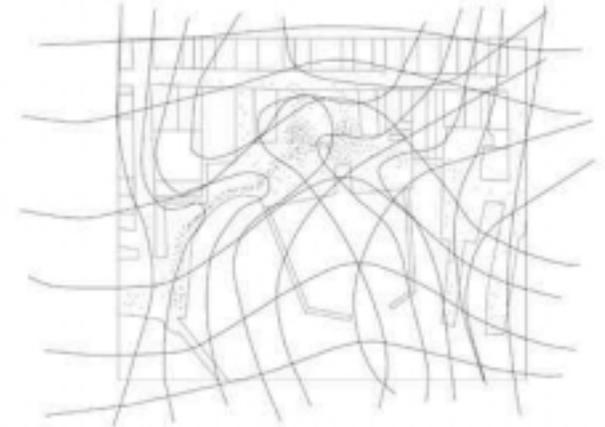
How do we know we are in the presence of architecture? Could it be when we understand a design through its process, or through its symbolism? Or perhaps through a quietness of mind? As I stood in the entry to Fallingwater, my mind became quiet. I felt the damp stone, I saw a strong contrast of light, which revealed texture, I smelled the earth, I heard the sound of a waterfall and I felt the constricted spatial enclosure. All of my senses were being used to interpret this space. I knew nothing of the tartan grid or the translation with which Frank Lloyd Wright had developed this design. I knew nothing of the symbolism of the crystal that may have been present. I was just quiet. I was in the presence of architecture. This presence began my search for understanding this architectural experience. How was the distance separating my body and mind reduced with just material and planes? How did I become so aware of the surfaces around me?

Bloomer and Moore's interpretation of our 'reading' architecture had resonated early in my career. From childhood I sensed an understanding of the woodlands near my home. The rise and fall of the terrain through my feet and lungs, the moisture collecting on my skin from a nearby creek, the richness of possibilities in the damp soil which had been developed by years of decay, the 'spaces' created due by sudden elevation changes of Appalachia and the association of time and processes creating this which, is greater than me.

How does architecture afford these same abilities in a physical reading? I do not believe I shall ever forget the presence found in my childhood in those woodlands. Should not architecture offer the same experience? "To at least some extent every place can be remembered, partly because it is unique, but partly because it has affected our bodies and generated enough associations to hold it in our personal world." (Moore). The entrance to Frank Lloyd Wright's masterpiece Fallingwater, has specifically challenged me to understand this essence of architecture.

“Western architecture theory since Alberti has ...been engaged primarily with questions of visual perception... Alberti’s statement *‘Painting is nothing but the intersection of the visual pyramid following a given distance, a fixed center and a certain lighting’* outlines the perspectival paradigm which also became part of architectural thinking. Both consciously and unconsciously the eye finds its hegemonic role in architectural practice gradually, with the emergence of the bodiless observer. **The observer is detached from an incarnate relation with the environment through the suppression of the other senses.**”

This thesis poses a question. How does the body perceive your presence? The senses of vision, tactility, hearing, tasting, and smell (Pallasmaa would also include skeleton and muscle) are the receptors with which we move through space. In the order of life, the painter is sight, the musician is sound, the chef is taste, the horticulturist is smell and the sculptor is touch. But in the world of architecture the senses of taste and smell prove difficult, but the senses of sight, touch and hearing find little resistance. This is where I will focus for this project while acknowledging the others for future investigation.



Computer generated pedestrian flow pattern used to generate a design by SHoP.

“There is no doubt that our technological culture has ordered and separated the senses even more distinctly. Vision and hearing are now the privileged sociable senses (I would even argue within architecture that hearing has fallen), whereas the other three are considered archaic sensory remnants with a merely private function, and they are usually suppressed by the code of culture. Only sensations such as olfactory enjoyment of a meal, the fragrance of flowers and responses to temperature are allowed to draw collective awareness in our ocularcentric code of culture.”

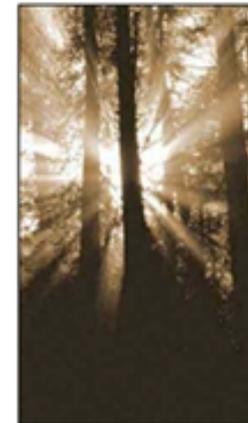
“The current overemphasis on the intellectual and conceptual dimensions of architecture further contributes to the disappearance of the physical, sensual and embodied essence of architecture. Contemporary architecture posing as avant-garde is often more engaged with the architectural discourse itself and mapping the possible marginal territories of the art, than responding to human existential questions.” “The Eyes of the Skin (Page 22)



Richard Meier The Atheneum

Antithesis

Richard Meier is a good example of the type of architecture Pallasmaa critiques. “Meier’s plans call on geometric vocabulary, often based on the circle and square, a rigorous system of grids, ever more the choice of white cladding...” Tom Wolf writes, “I once saw the owners of such a place (a Meier home on Lake Michigan) driven to the edge of sensory deprivation by the whiteness & lightness & leanness and cleanness & bareness & sparseness of it all.” (Page 16; Richard Meier, Jodidio, Philip, 1995 Taschen). Meier has privileged the mind over the body. He creates space, which relies on the visual to read the surfaces surrounding the body. “He (Walter J. Ong) argues that as hearing-dominance has yielded to sight dominance, situational thinking has been replaced by abstract thinking. This fundamental change in the perception and understanding of the world seems irreversible to Ong...” (Juhani Pallasmaa. “The Eyes of the Skin”)



“I believe that there is...some sense of this oneness, of “dark space”. Whenever we experience a disorienting shift in emotional gears or a change in the emotional “direction” or orientation of our life. I also believe that, as we are being emotionally moved, we can experience ourselves as “slipping into a dark, or relatively obscure space of feeling. In this affective space, this space of felt feeling, vision relinquishes its repressive “hold” on proximity and objects are no longer “observed” in restraint, at a distance. They touch us.”

While I am not suggesting an emotional change is needed to experience architecture, I am suggesting that architecture itself can provide this type of experience. When I read Sue Caltaldi’s statement of “vision relinquishes” I make an association with architecture. Architecture has an ability to create pause in our minds, which, in our time, can be interpreted as vision, therefore allowing our other senses to experience these relationships. If architecture can allow for a quietness of mind then our haptic abilities, which are innate, can build a memorable experience.

Sue Caltaldi,
“Emotion, Depth and Flesh”

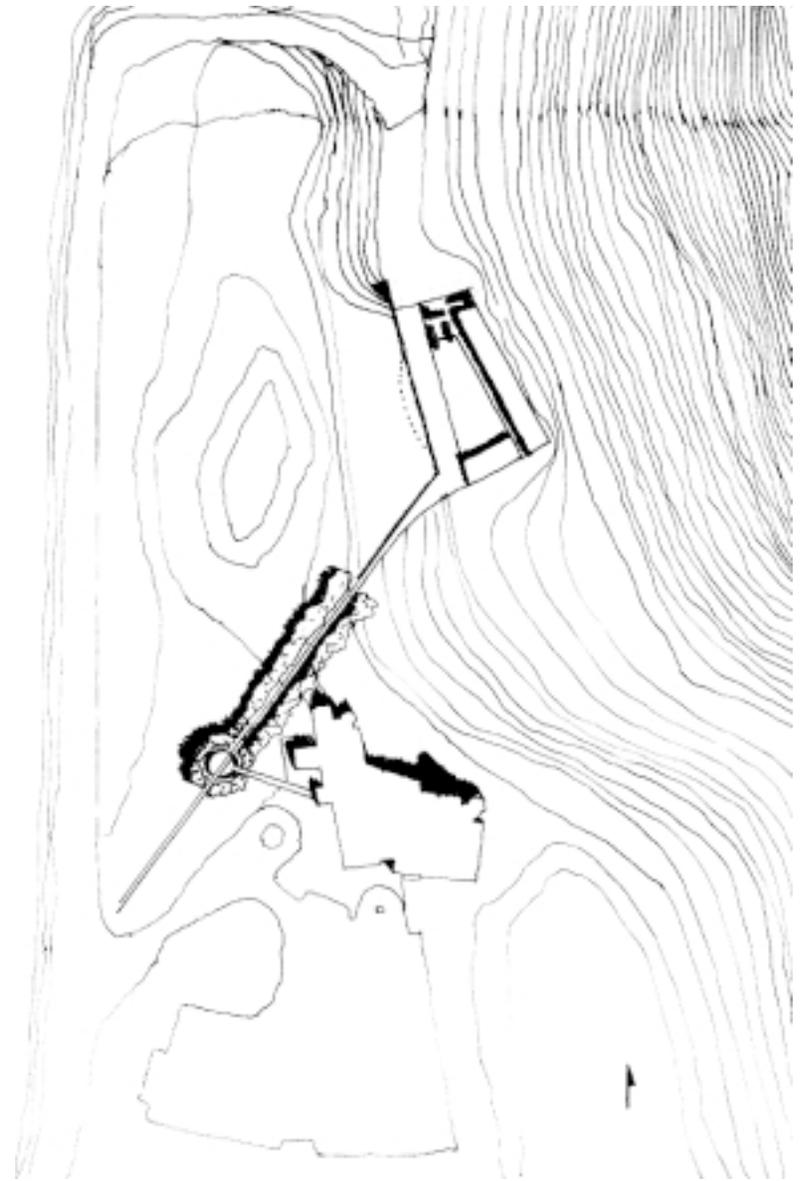


“As the primordial sign of human mortality, the grave domesticates the inhuman transcendence of space and marks human time off from the timelessness of the gods and the eternal returns of nature.”

We have developed a history of ignoring death. Rulers erect monolithic burial temples and afford enormous resources to provide a permanent place among the living. Even in our recent history, aristocrats hire our most accomplished architects to construct cemeteries and mausoleums as statements of their permanence.

But what develops from these actions? We create a place, which become hinge pins to many of societies infrastructure. Our communities typically use the death of their founder as a center point for their values. A grave marked by large statues becomes an icon or literally a center for the community's activities. A grave located in a remote location for the human who accidentally encounters it, transforms a remote hill into a place developed by human mortality.

It is in this space that we become aware of our reach. We question all aspects of our life and of the lives that we are reflecting upon. Becoming aware of life when confronted with the topic of death, our senses begin to perceive things as a child. We become aware of things we have relegated to our subconscious.



Site





Ariel view of site

“There’s some discovery you did not expect. The object is not really important; it’s the experience of the event.”

How does one place a structure, which affords an alternate experience of Appalachia? A chance to experience the depth at which this land rises and falls. A chance to physically step upon the time of topography. According to Scarpa, the object for this project is a summit of the Appalachian hills in Morgantown, West Virginia. The discovery came from the mountains change in elevation. An experience comes from vertically moving through this site.

This project uses the presence of sandstone, which is indigenous to the area and has a history of being foundation material for local structures. The stone has a wide range of refinement possibilities to display the level of reverence we hold for this material. Through history stone has been given elevated status due to this characteristic. Because we give hours of time to finish stone we are attaching a character of time and solidity. Characteristics which are necessary for cemetery.

Senses

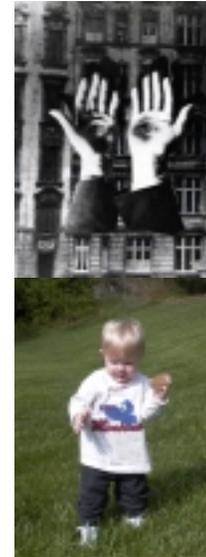
“Natural materials - stone, brick, and wood - allow the gaze to penetrate their surfaces and they enable us to become convinced of the veracity of matter. Natural material expresses its age and history as well as the tale of its birth and human use. The patina of wear adds the enriching experience of time.”

J. Pallasmaa “Retinal Architecture
and The Loss of Plasticity”

Touch

How do our bodies touch the surfaces within our reach? The first reaction of thought is the hands. The hand leads us toward a complete reading of a material. If we can lift an object, we gain an interpretation of its weight, its level of refinement (being smooth or rough) and its shape in a matter of minutes. As suggested by Charles Moore, we develop our initial understanding of the world through our hands. But what about the other parts of our body? Other ways in which we develop a tactile understanding is through our feet. As we walk through our world of smoothly finished concrete, we may have become unaware of this tactile sense. One “rule” we have made, as the designers of sidewalks, is to create a noticeable change when approaching a crosswalk. I found many to be completely unnoticeable other than their color, again privileging vision. We can experience these surfaces in many ways, through sitting, leaning, kneeling and rubbing just to name a few. These are the interactions to which I can give my attention in design to allow for tactile experience.

Vision and Tactility



“How, then, is the transition to physics possible? It becomes possible, Kant now realizes, if we focus our attention on the moving subject, rather than on the object that moves.” (Opus Postumum. Immanuel Kant)

My demonstration of this thesis will occur by a **first person experience** of the project. Throughout this visit I will move from the **first person observer** to an **architectural explanation** of the how and why.



As I stand in a circle of trees and stone in front of my church, I see a path leading to the mausoleum. I find myself standing on smooth level stone surrounded by the trees overhead bearing white flowers with the smell of oranges. At my feet, a single line of rough stone has been placed into the ground and as my eye follows its direction, I notice this line cuts into the earth to maintain the same level.

As I begin to walk toward the complex, I move from above the surface to below, then above again. All the while this rough-stone-line becomes a wall then a line again disappearing into the soil. With each step the wheeled cart and I make rhythmic sounds due to hard rubber hitting the stone blocks.





Horizon line which makes awareness of topography.

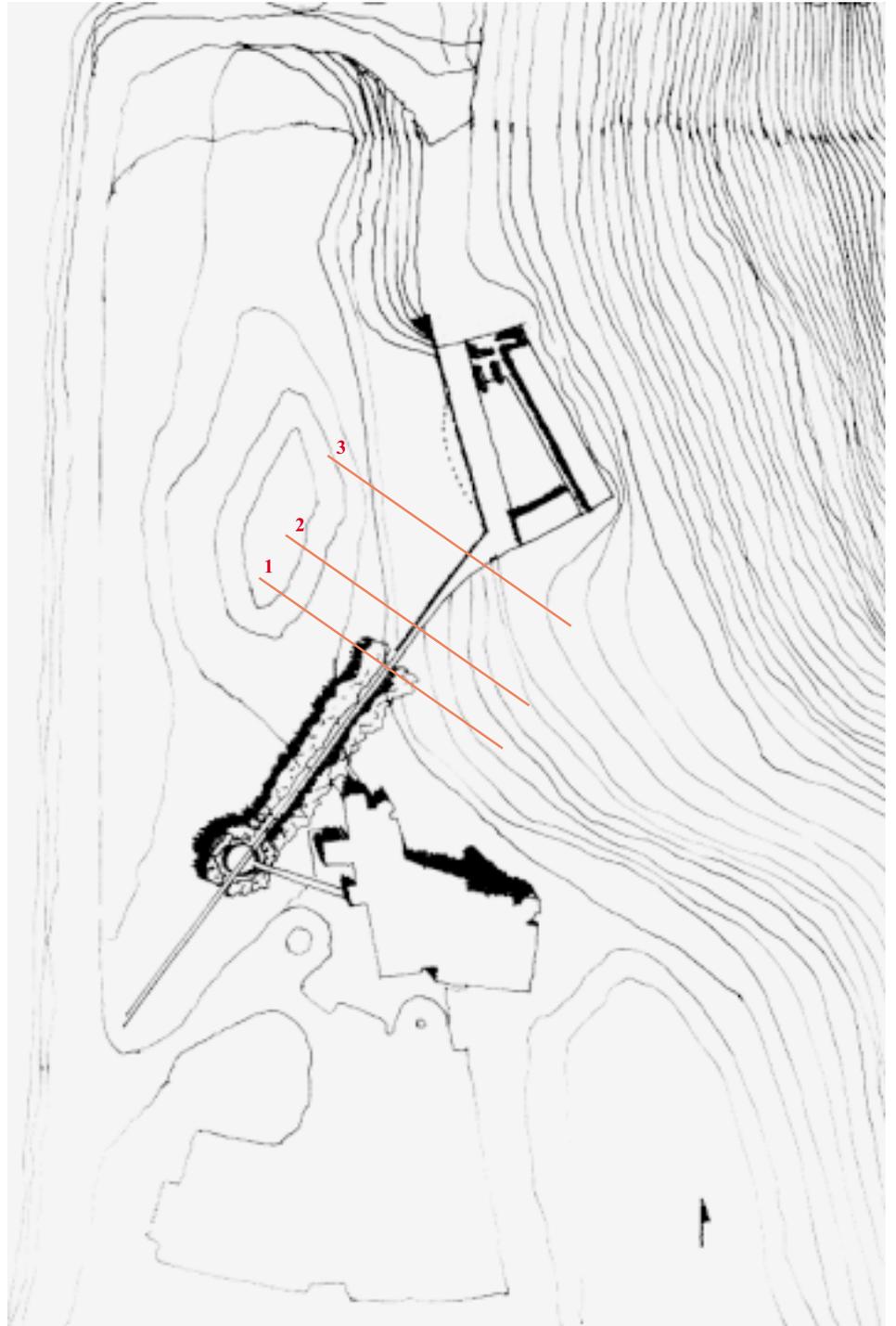
“I augment the land and allow you to perceive it. The whole of the field with the elements in it becomes one (object).”

Richard Serra

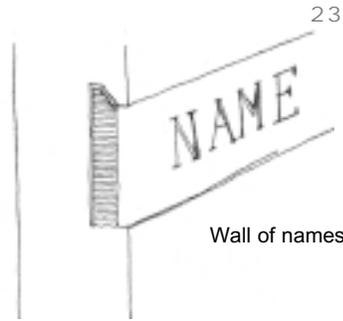
A wall of mortared cut stone creates the circle, which is surrounded by the male species of orange trees. These run along the path until the main retaining wall begins. Slabs of cut stone that are spaced at one-quarter of an inch create the floor. These slabs run the width of the path until the entrance to the mausoleum. A rough stone, which is dry-stacked, creates the single horizon line. This line becomes the level for the main retaining wall which defines the separation between the hands of nature and the hands of man. From this line, a movement from above the earth to completely below it occurs.

Water that breaks its own level creates a sound for an individual experience. Lower in volume and inconsistent in tempo, this sound becomes separate. This intimate sound occurs within the body of water, a nearness to this sound will be for the individual whom scoops water for eternal life.

Small sound volume (click to play)

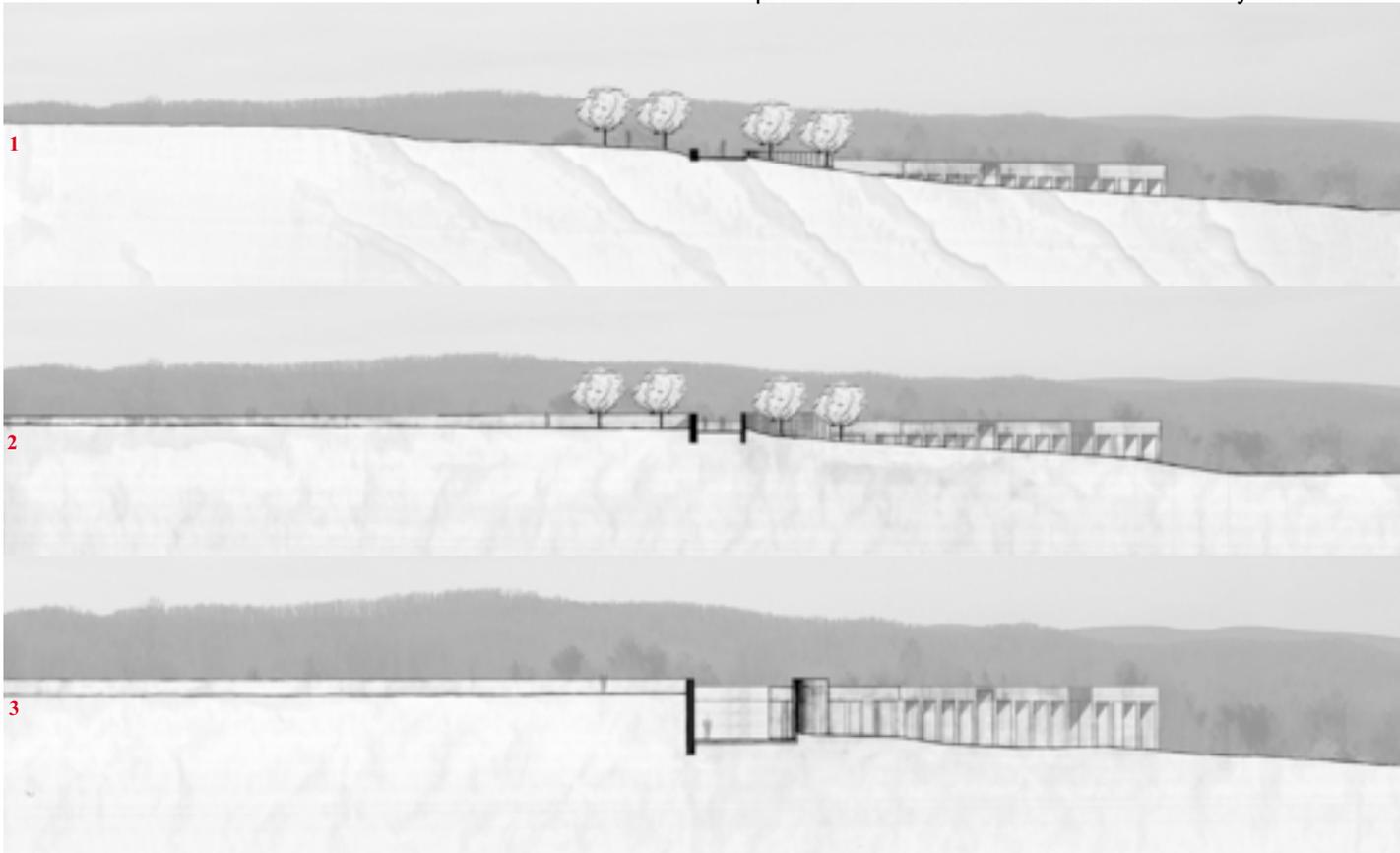


The wall is composed of rough, dry stacked stone and is used as the retaining wall for the complex. At the obtuse corner, the wall has been interrupted with a waterfall whose source is from the collection of ground water from above. This design is a recessed waterfall, which directs sound forward with a small amount of spread. This makes the sound stronger at its source, which marks the entrance to the complex. The concrete wall opposite the stonewall will become the directory of names. As the mausoleum fills so does the wall.

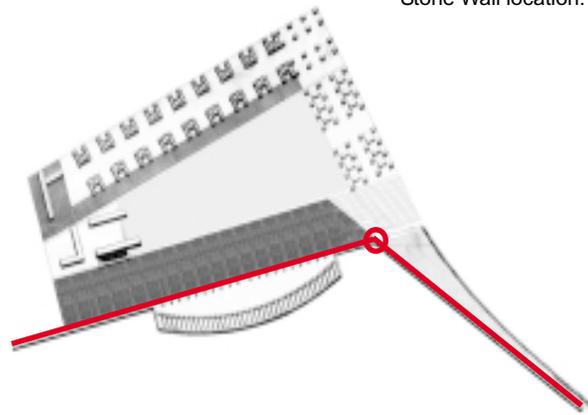


Wall of names.

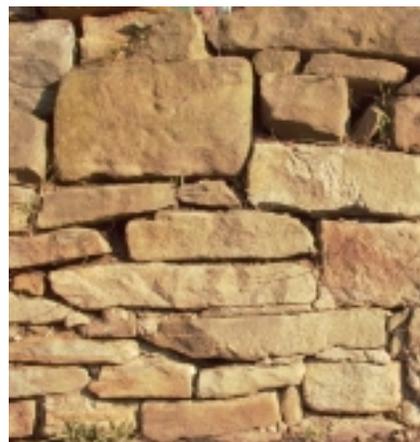
Continuing, I begin to descend below the surface for the final time. The line of stone becomes a wall towering twenty feet high. The sounds of my steps begin to grow in volume to the point of muting the cart. Further ahead a stream of falling water can be heard, faint at first then growing as I walk closer to its source. I look ahead and see the stream of water that stops this wall of stone. I have reached the end of the smooth stone path and rough wall. Opposite this is presented the names to which I will one day be added.



Stone Wall location.

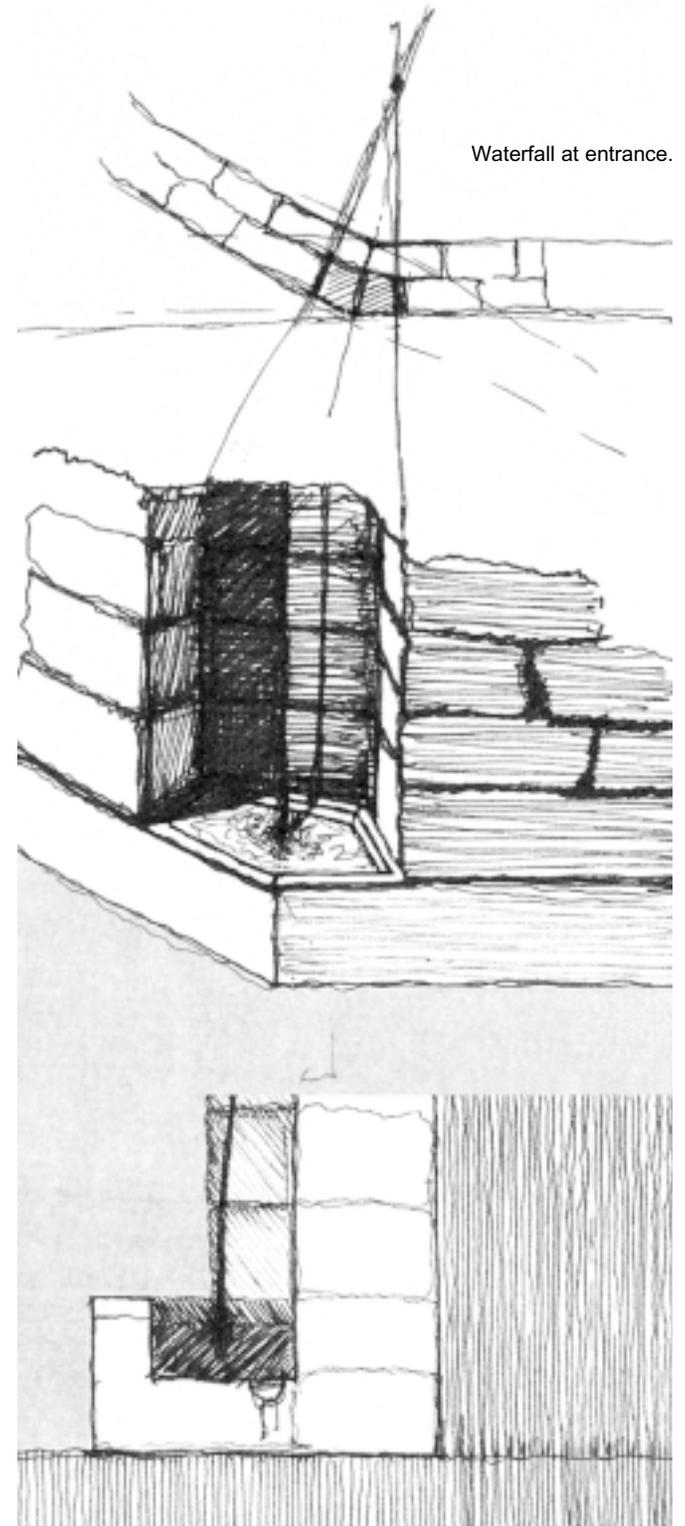


The first level of refinement does not call our touch. Being a stone which requires the least involvement of man, this rough stone maintains its innate characteristics of heaviness, lack of refinement and of being from the earth. It occurs as the main retaining wall for the structure.

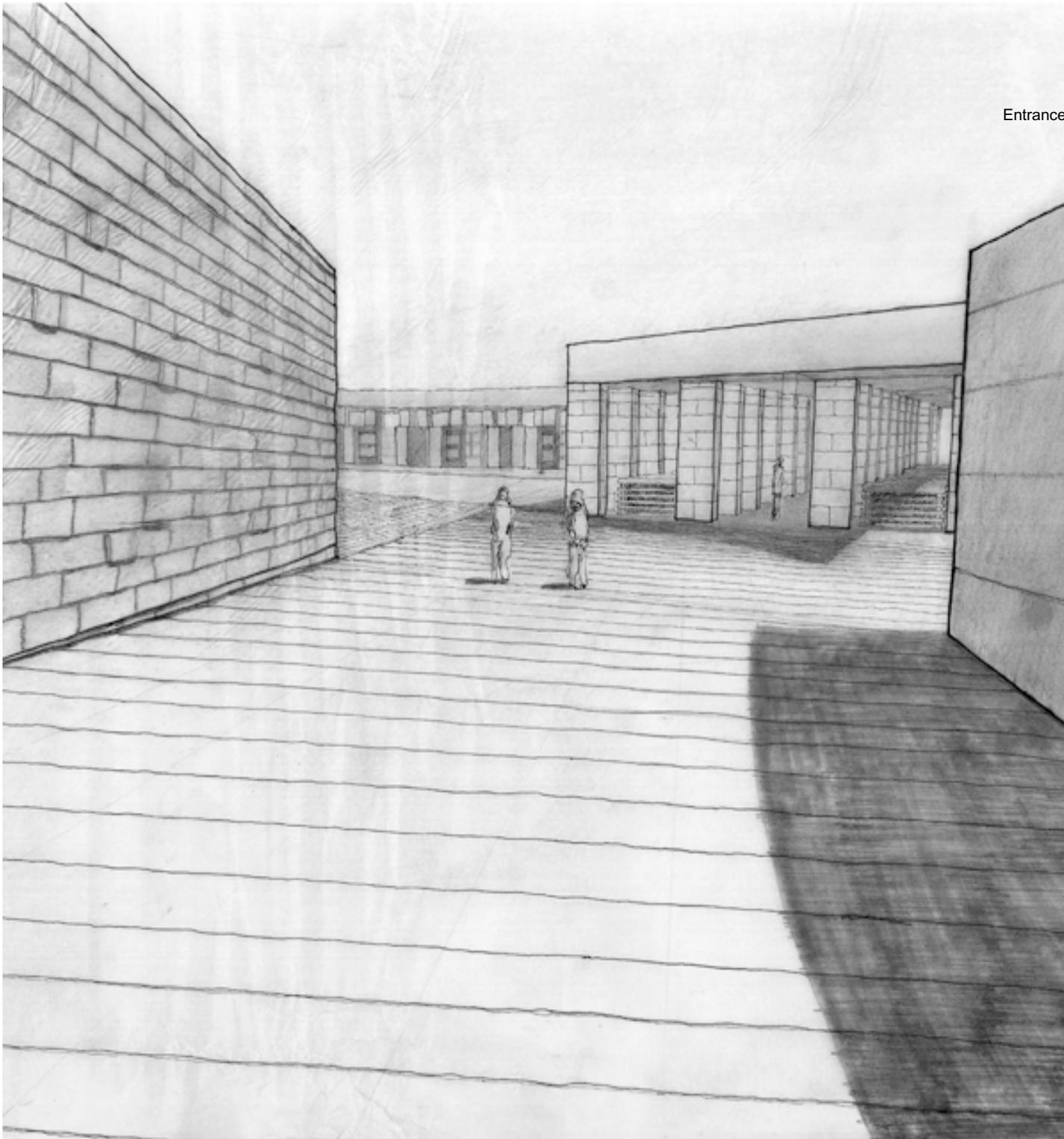


Dry stacked stone.

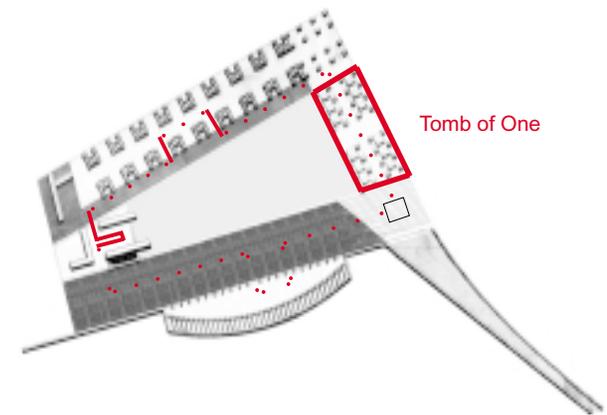
Waterfall at entrance.



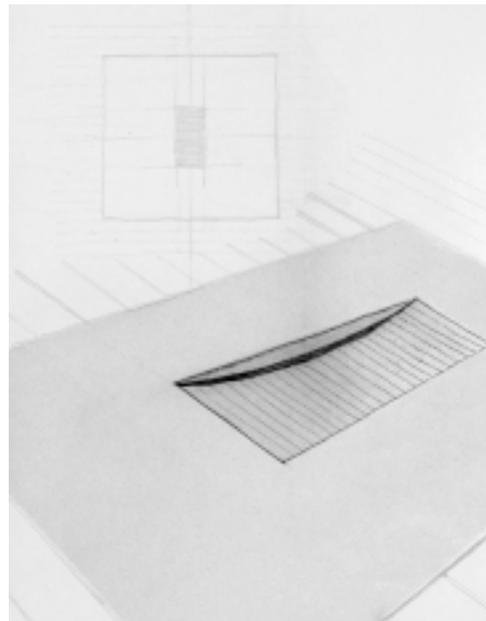
Entrance.



The sound of a water falling both near and far can be heard under the prayers being said as the cart rolls into grooves carved into the floor. As the wind shifts bringing the distant water closer, I see a group of rough-cut columns that form shelter by holding a large roof. Their matte finish contrasts with the smooth, shiny stone floor, which becomes unnoticeable under my foot. Having no barrier, the air moves across my skin with the heaviness of water and the sounds of my steps fade in and out as I pass each column.



Place for transition from cart



Standing at the entrance, you are open to the air on all sides. This allows for the sounds of the site to be present. Two waterfalls are directed toward this position that allow a comprehension of the size of the complex. Grooves made into a contrasting large stone slab marks the end of the cart's necessity.

There are two paths that can be taken. By the flip of a coin I move counter clockwise for the experiential walk.

The *Tomb of One* is created by a rhythm of columns made from cut stone. It uses the areas between these columns to provide individual place for these people. The columns rest on a honed stone floor that rests on a concrete slab. This is done to prevent the stone from losing its smooth level. The roof is made of cast-in-place concrete with a beam above the roof to allow the columns to penetrate the ceiling. This allows for the appearance of light to hold the roof. This is an example of allowing sight to be elevated when elements are out of arms reach. They evoke the tactile sense.



Cut stone blocks



Tomb of One



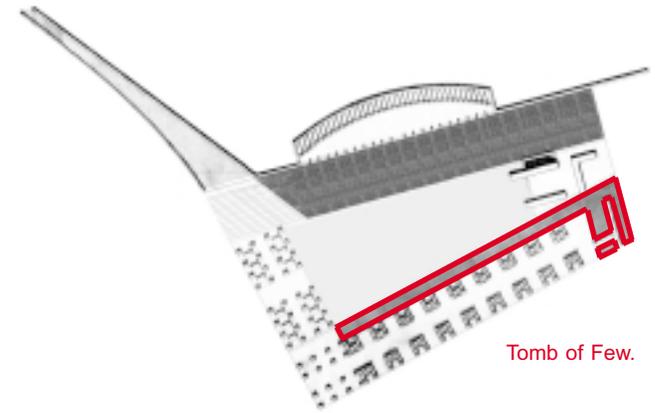
Night View Tomb of One.

“We trace the density of the ground with our soles. Standing barefoot on a glacial rock by the sea at sunset and sensing through one’s soles the warmth of the stone heated by the sun is a healing experience; it makes one part of the eternal cycle of nature. One senses the slow breath of the earth.”

Juhani Pallasmaa

As I continue to walk, the sky becomes the ceiling and the sensation of a rough, uneven surface runs under my feet. The stone from the rough wall has become a path, which runs to the water’s edge and meets a line made of smooth stone. My eyes strain to see the matte finish on each column I pass as they go from light to dark. A distant sound of water is increasing its presence with each step. Then I feel the floor become smooth just before I walk under a hovering roof.

The sound of water becomes distinctly distant with that one step. The shiny floor quiets my feet, which allows my hand to stroke the rough letters chiseled into the smooth surface containing the person within. The shadow mimics the coolness of the stone and blurs those who are near; only their singing of hymns can be heard over my steps. I walk forward through the alternating volumes of light and sound as I see soft light framing the tops of columns then washing down their matte faces until it reaches the floor with a soft glow.



Tomb of Few.



Water edge.

The path is made from a cut stone turned on edge and placed with a half-inch reveal of earth mortar. The earth mortar becomes level with the face of the stone at the entrance of each opening into the *Tomb of Few*. This is an example of the quiet visual details that define places of transition. A contrasting honed stone defines the edge of the water creating a boundary to allow only hands to dip water for flowers.

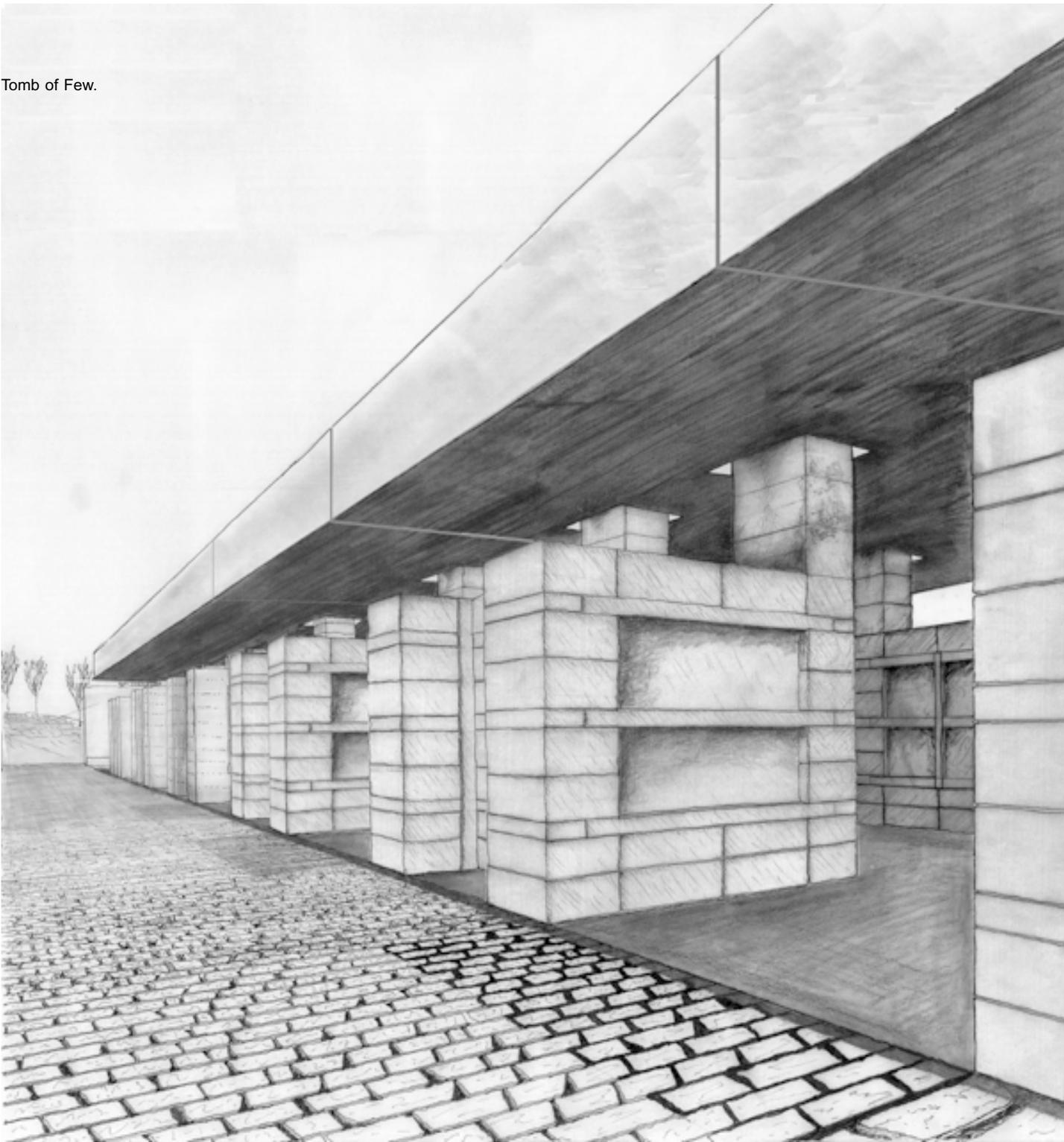
Cut Matte finish.

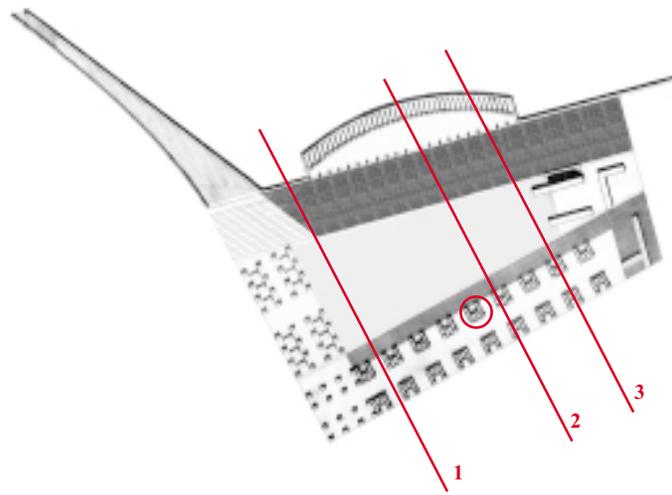


Cut stone floor. (Antonio Eddy Pictured)

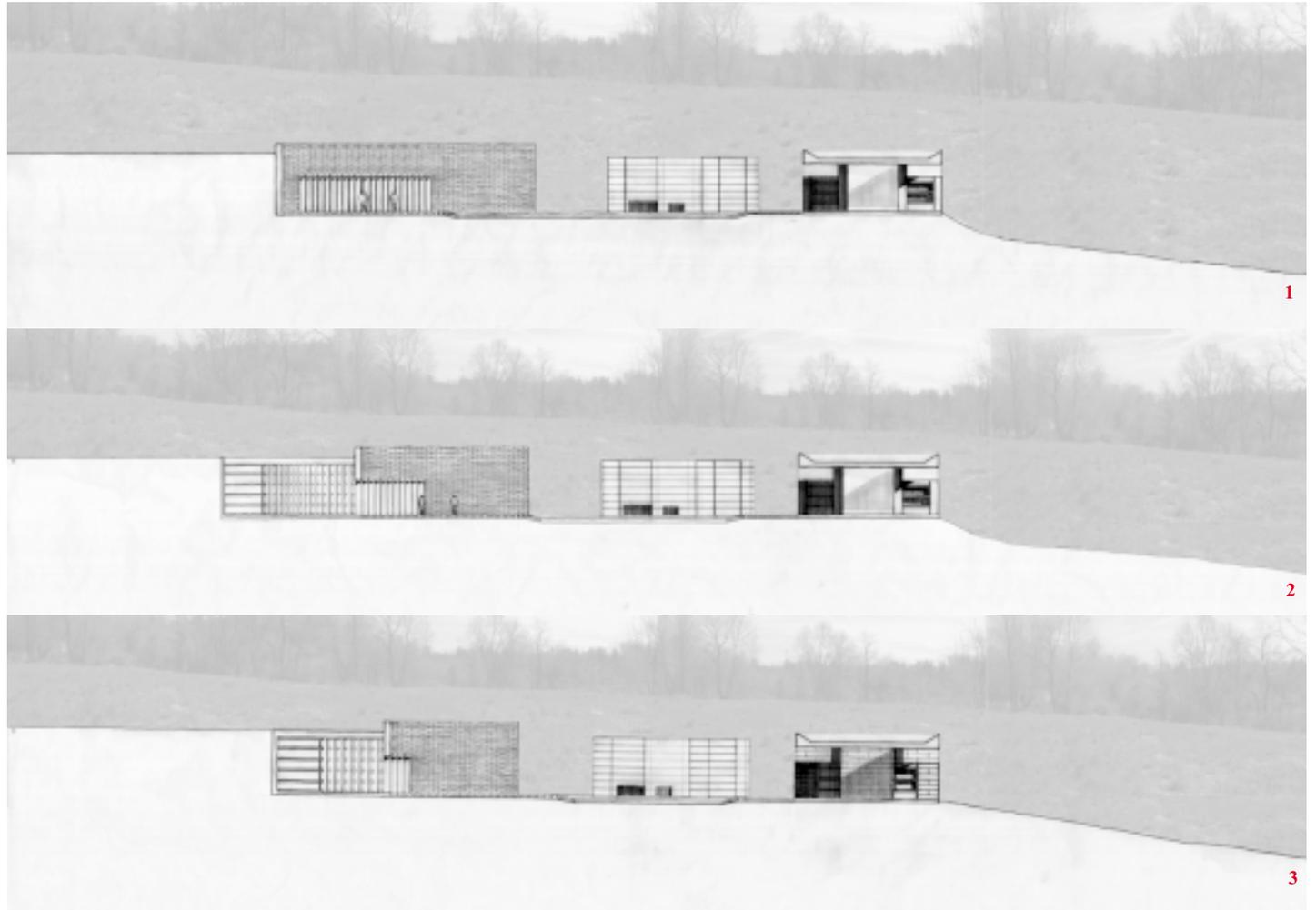


Tomb of Few.



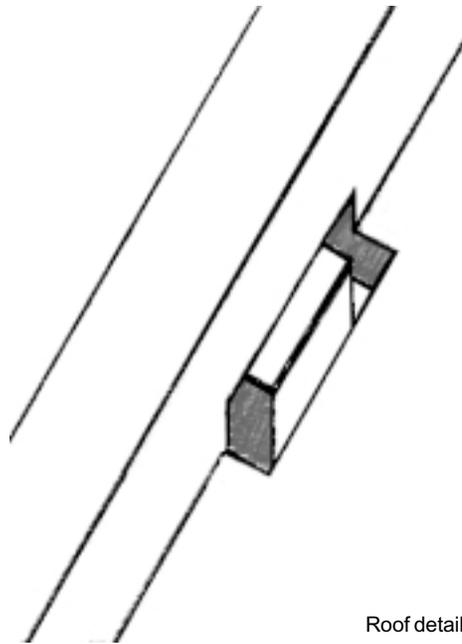


The assembly of these tombs demonstrates the position of the visual in the structure. The construction is one which can easily be understood by the eye. This develops a sense of familiarity. We have haptically learned that a stone presents an innate resistance to compressive forces, therefore, compression directs all stone throughout this project, resisting gravity. Perhaps the only instance which breaks this rule occurs in the roof structure, which, being out of arms reach, is developed for the eye.

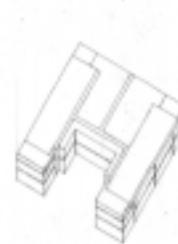
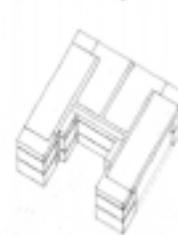
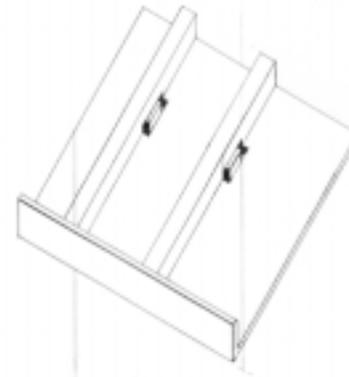


The floor for the Tomb of Few is polished concrete. This also defines the transition from the path to the tombs. The stone used to make the columns in this area is of a honed level of finish, allowing for human comfort when leaning for support. It also demonstrates the elevated involvement of the thought of man. The roof is made of cast in place concrete. Again, allowing the visual to be elevated due to the distance from arms reach.

The spatial enclosure made from the cubic tombs allows for the separation from other humans necessary to visit with the dead. By reducing the number of facing names, the possibility of human interaction is reduced. The spatial nature also allows for the reduction of penetrating sounds from water and humans and of a reduced level of light.

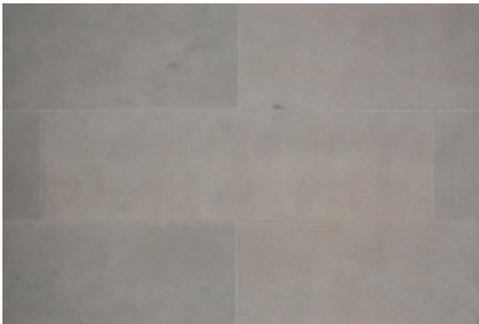


Roof detail.

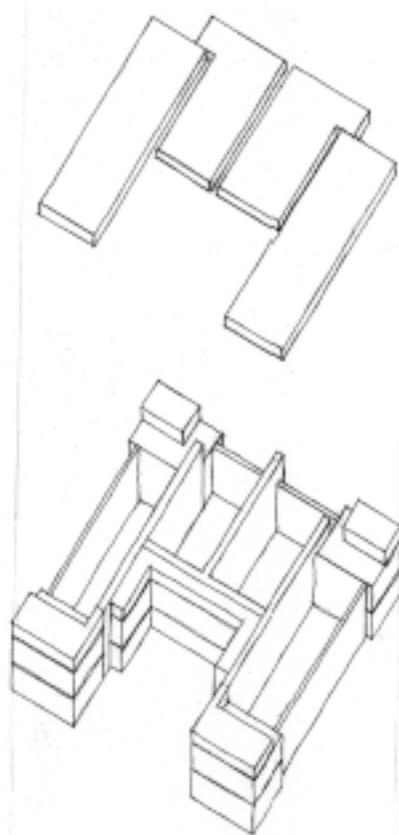


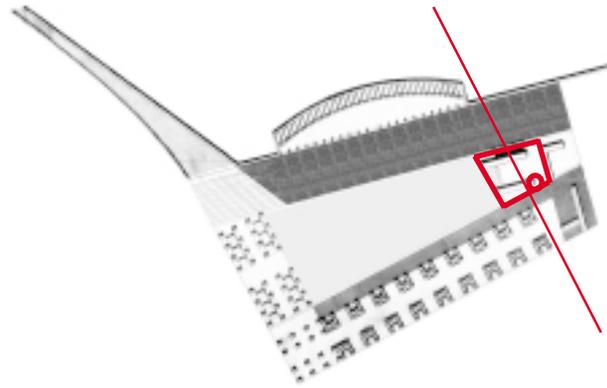
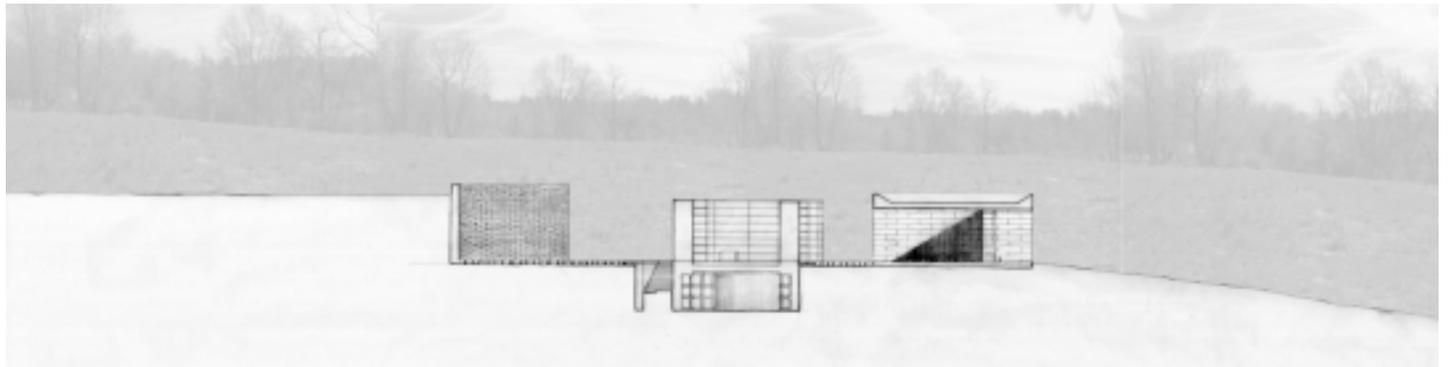
Exploded isometric Tomb of Few.

Sawn stone blocks



A stone worn smooth by water movement becomes one with the skin when held. This third level of refinement occurs where our emotions quiet our vision making depth nonexistent. The materials come upon us, our senses feel those surfaces which are near.





I step onto the rough stone path again moving toward the increasing sound of falling water. As I walk past the shiny stone wall the near water escapes my ear. I hear only the wind moving through the open structure and a distant waterfall. As I turn the corner of the wall, my feet feel the matte stone, which lies in front of the small waterfall I now see. The bowl made of shiny stone receives water that calls my fingers. The water is much cooler than the stone, which has been warming from the morning sun.

Recessed Waterfall (click to play)



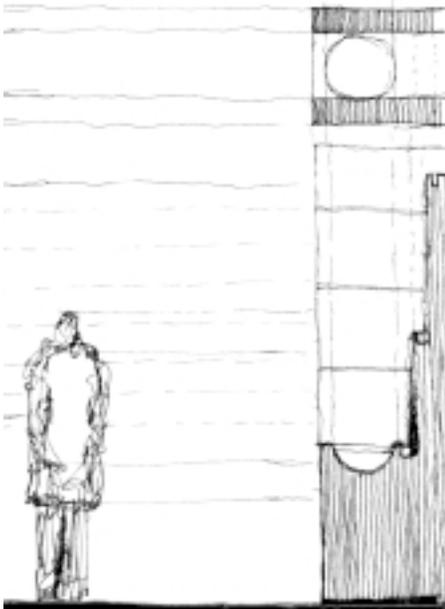
Water in a recess provides a uniform volume and consistency of sound. If it can be detected, the sound level of this structure of water stays nearly constant. This structure of water is employed as the source at the mausoleum's chapel. This presence of water will become the sound for all to experience, becoming sound from structure.



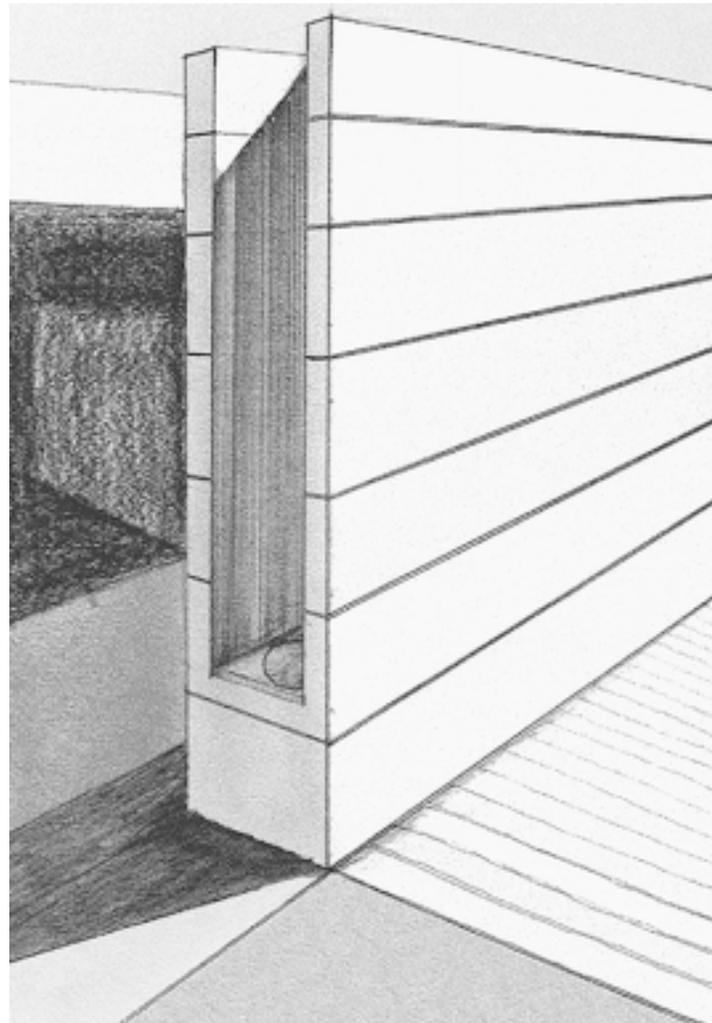
A one-foot high drop by four-teen-foot long sheet of water drops into the pool to create the sound of the waterfall. This is the sound of water that is heard from all places in the complex. The volume of water that is dropped can control the amount of sound. For example if the volume is lowered then the sheet breaks into smaller currents, which creates a lower volume of sound.

The matte floor is one large block of sawn stone that extends the length and width of this threshold. The waterfall, which can now be seen, falls from the top of the chapel wall hugging a sloped stone wall until it reaches the polished stone bowl. Over time this bowl will develop grooves from the fingers, which cleans the soul. The water will maintain a cool temperature due to its northern facing location.

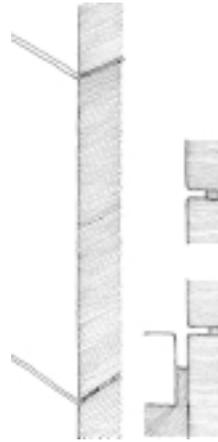
Font



Font transition

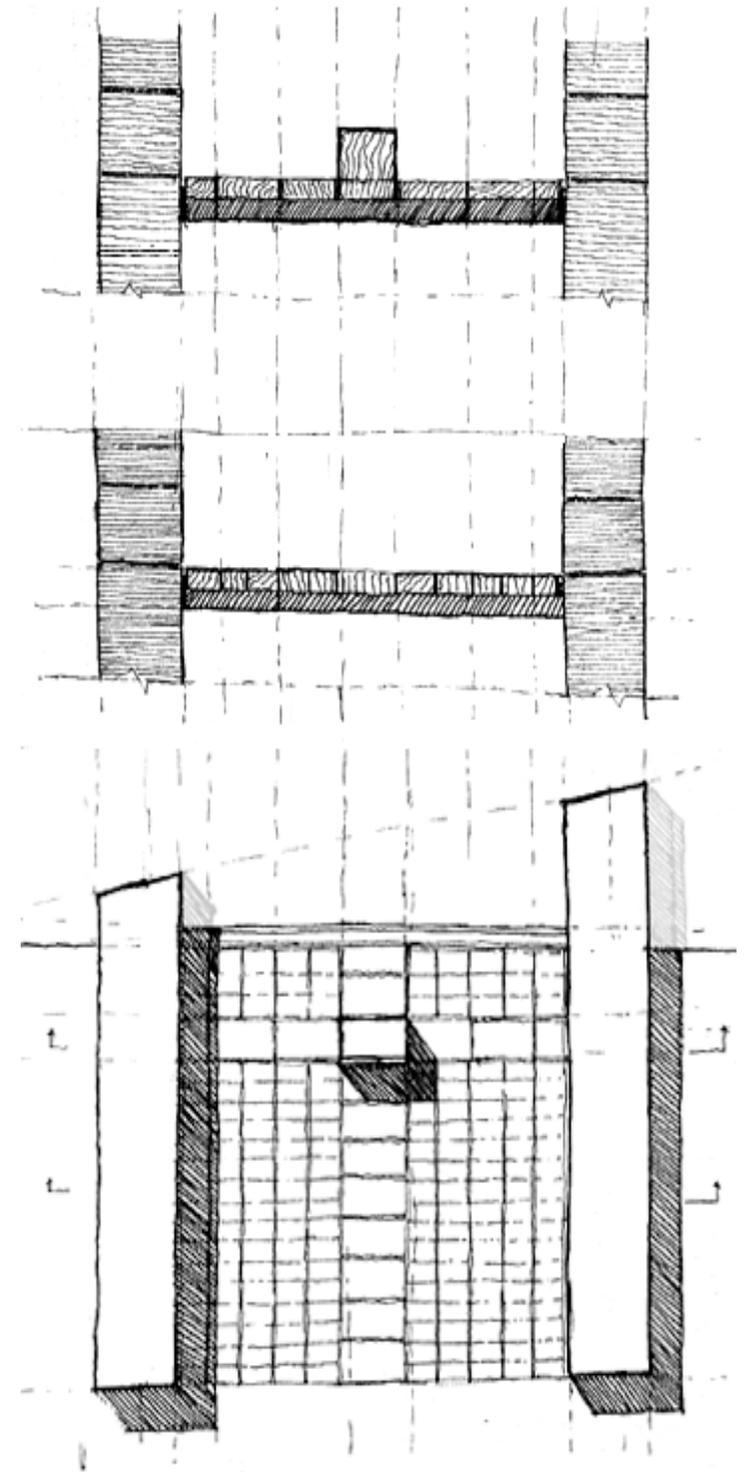


I am in the chapel, and I move toward the polished altar which holds the center of my view; a faint presence of the waterfall can be heard but quickly becomes muted by words. Each stone has a crispness that shows the level of thought given to this space. My steps feel the smooth stone, which holds procession toward an altar, and as I move to stand I feel the floor become coarse and uneven. My foot steps move quickly from the shiny walls to my ear as we begin to walk again.



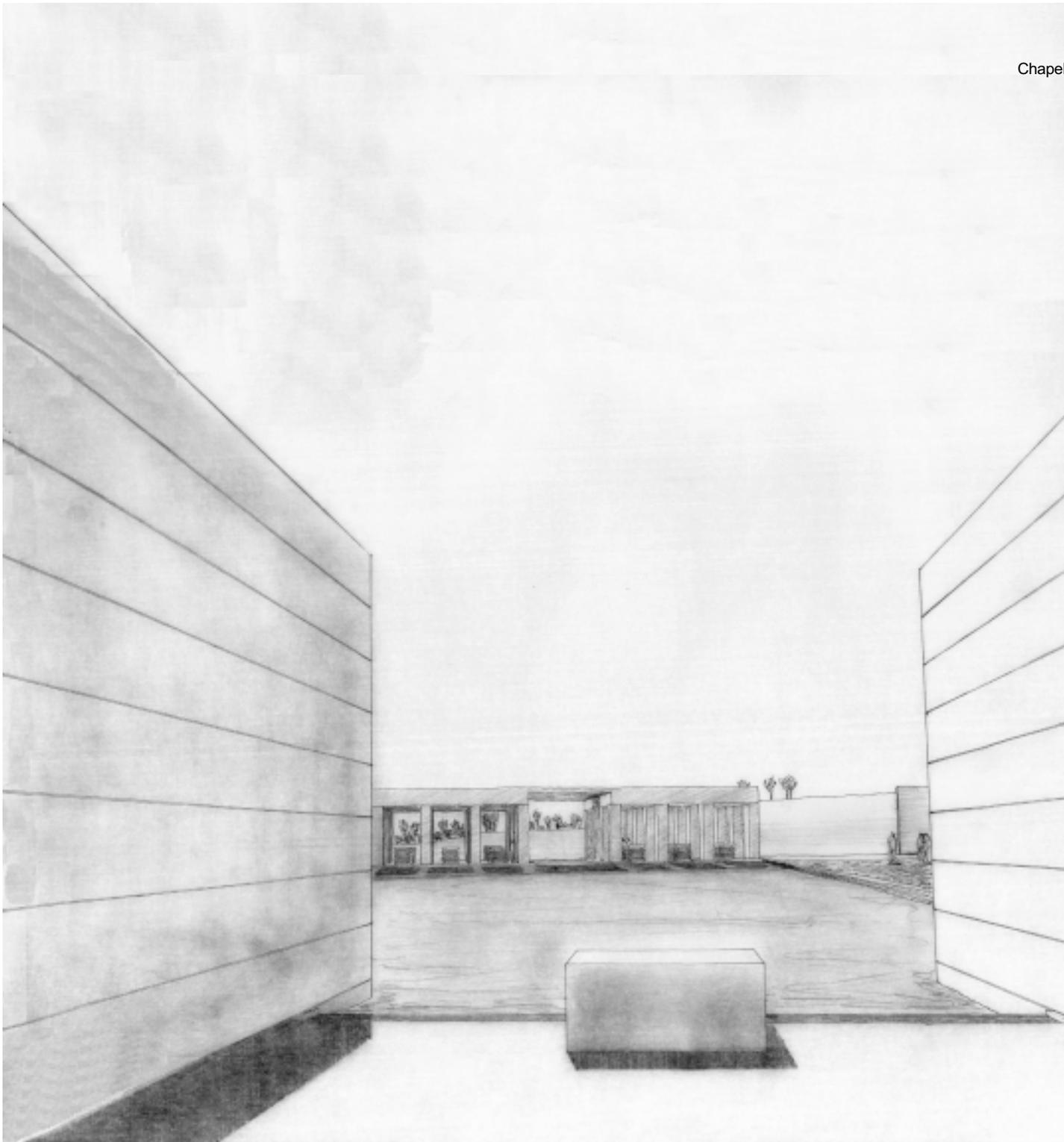
Refinement details at chapel

The walls of the chapel are made of a highly polished stone. The reverence that we hold for religion is presented due to a large amount of human investment. This is also the moment where we share time with those who have come before us by rubbing the sharp corners and the smooth faces. By reflecting our words back to our ears, the walls increase the level of the spoken word. The waterfall volume of sound is reduced by its location. Its sound acts as a recessed sound, which travels forward with little spill in the direction of the spoken words. The floor of this space uses the two different levels of rustication to designate the functions of the space. A sawn faced stone is placed in the line of procession while a cut stone marks a place to stand.



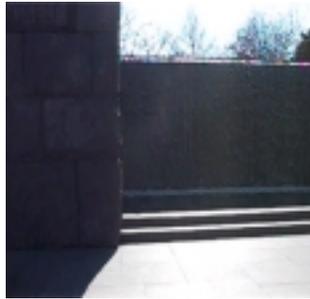
Chapel floor

Chapel



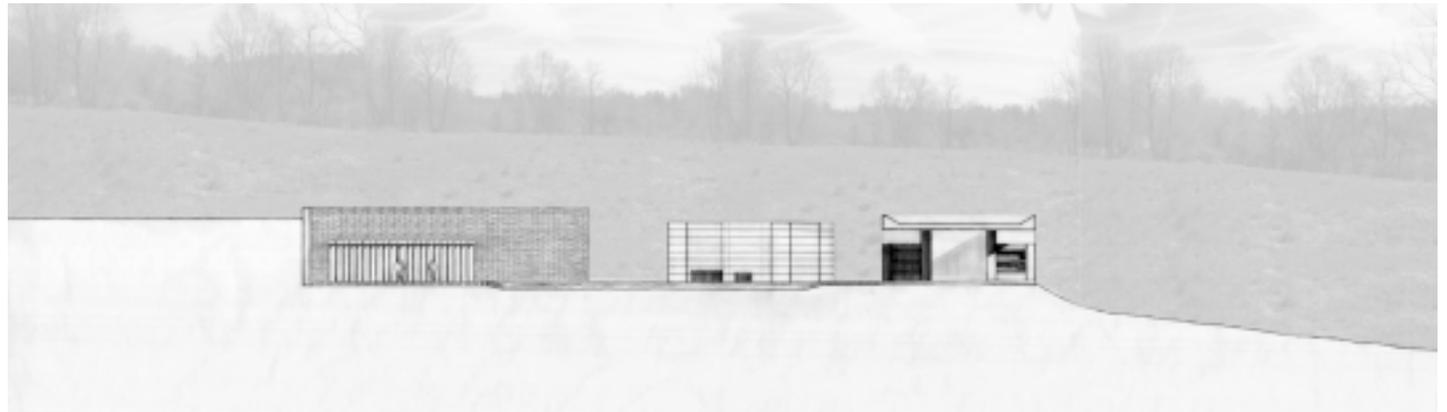
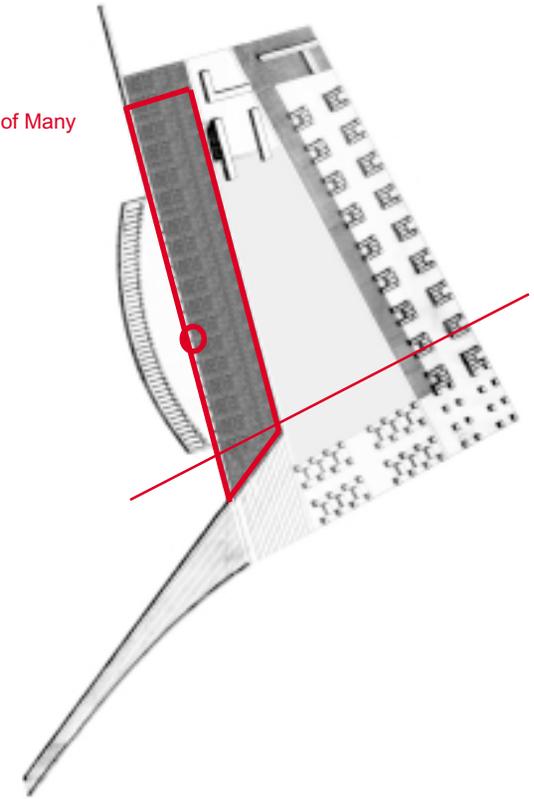
Once again I step onto a rough, uneven stone path. My step is returned back to my ear from the large, rough wall, and as I reach the end of the smooth, shiny wall, the sounds of the waterfall become instant. I can hear the water from both sides, its source on my left and from the hard stonewall on my right. As we walk I see a dark cave within the stonewall contained behind matte columns. As my hand reaches out to grab a smooth, rounded corner, I enter through the widest opening between columns. After a few soft steps, I am faced with a large wall of matte columns and shiny squares.

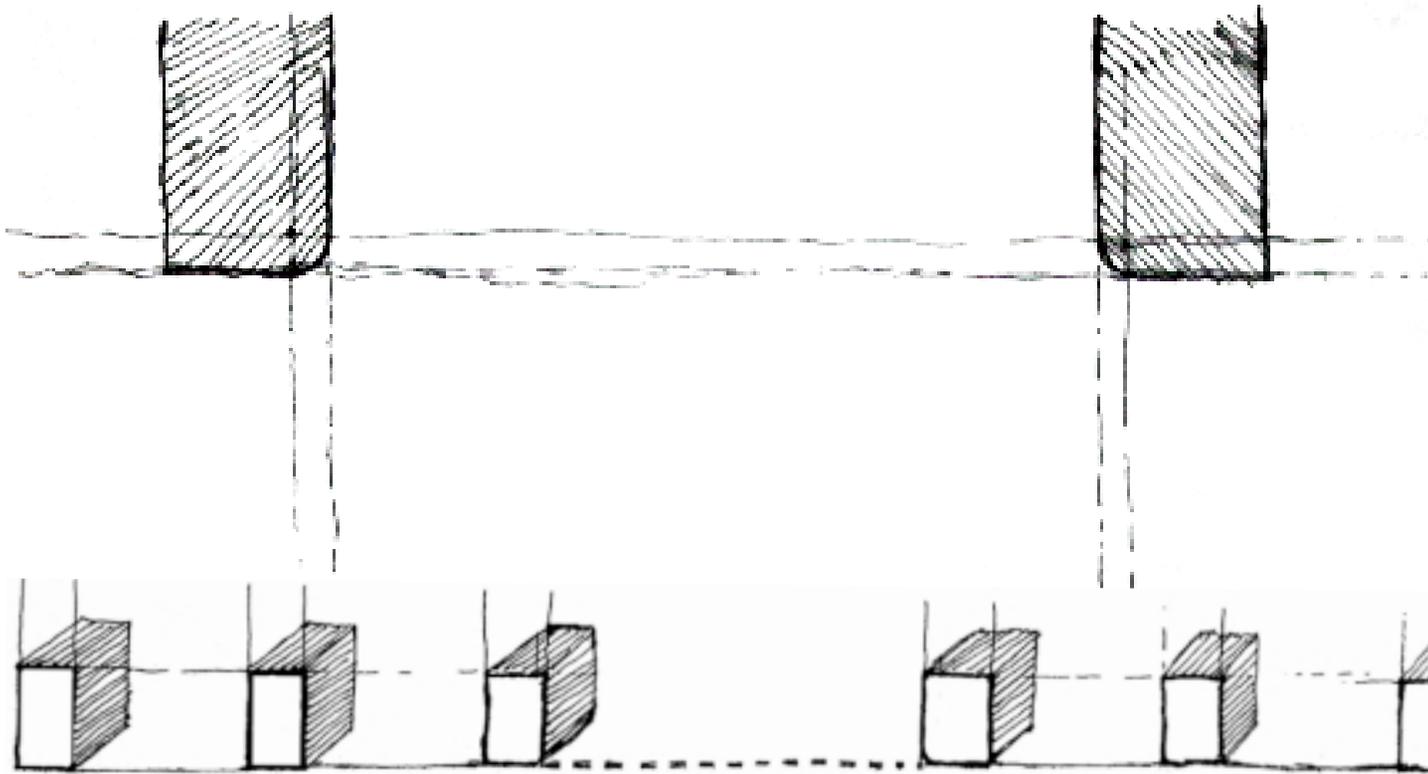
Directed Waterfall (click to play)



The sound of water can be directed or limited by a harder surface. We do not always want the presence of water when speaking, therefore walls need to be constructed. At the chapel, we want sound to come from within, so the absence of sound will contribute to elevating our spirit.

Tomb of Many





Refinement details at Tomb of Many

Cut stone blocks



Cut stone pavers

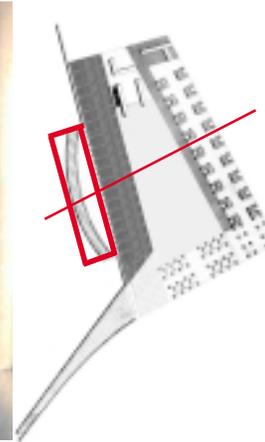


My attention to the visual sense has developed with an awareness of its privileged position in our culture. Therefore, my intent is to allow the visual to support all other senses when in direct adjacency but to become stronger when at a greater distance than arms reach.

My belief is one of visual "clues" which do not become the "intellect" of the design but become a part of the experienced whole.



Entrance Fallingwater



17th century Dutch Home

Section through Tomb of Many

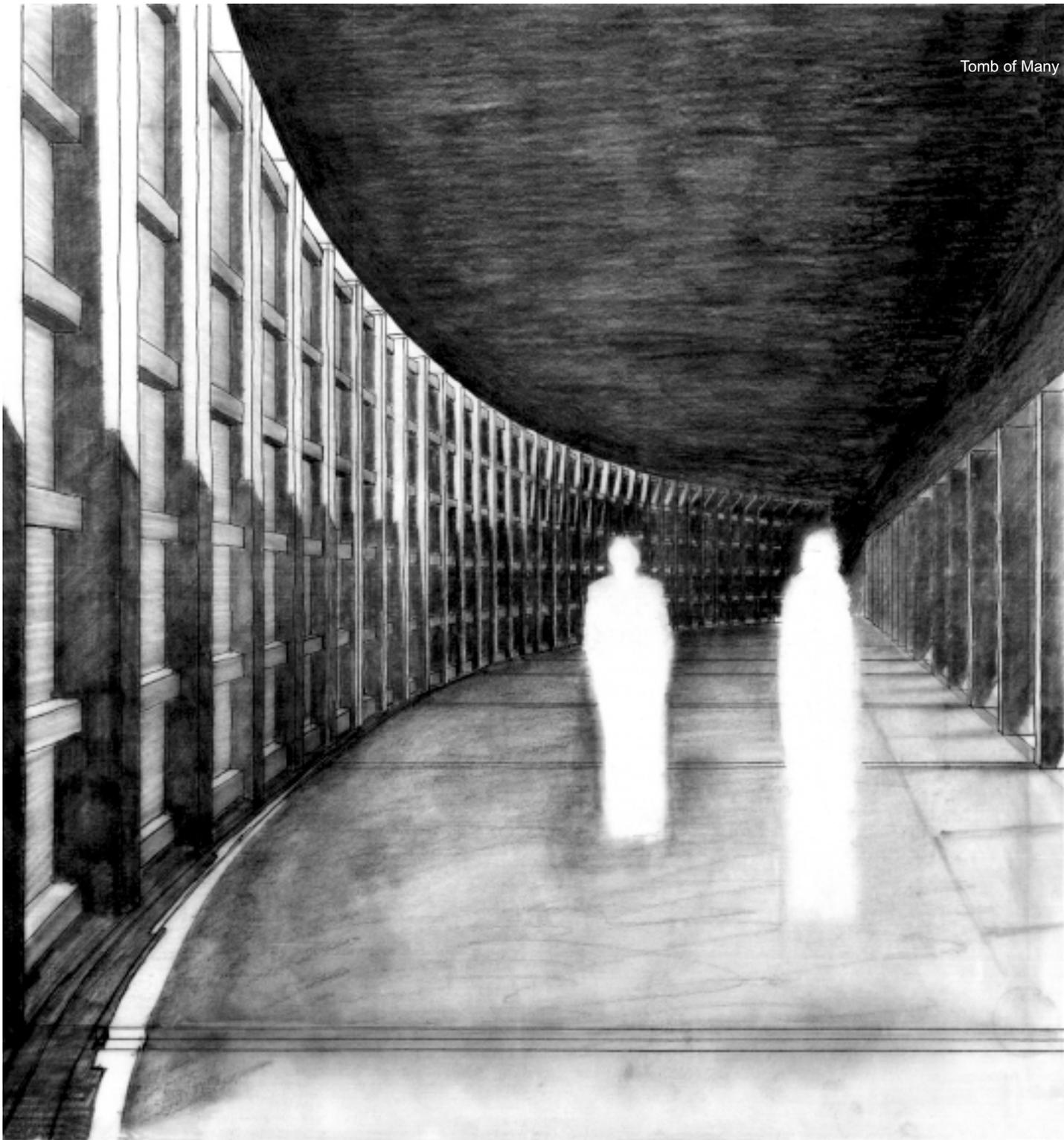


Steen E. Rasmussen suggested that through the presence of deep shadow (in Dutch Architecture), the experience of architecture is elevated. He is suggesting that if our sense of vision is diminished our other senses are heightened, making for a better experience. As I look to Frank Lloyd Wright's Falling Water for a personal experience of this thought, I find that his design creates this same type of deep shadows that Rasmussen suggests. Although Wright uses his material choice to help in this capacity, I also notice that he uses texture, temperature and smell to create this masterpiece.

With these things coming to presence, it becomes apparent that a diminished visual sense is not something easily achieved nor would it be a correct direction. A better way would be to elevate our other senses to equal vision. This has required a careful study into the abilities of surfaces to be experienced through those other senses. For this mausoleum project, I have chosen sandstone has the material of investigation.

I am in the tomb of many. The contrast of light and dark is strong; because their details are in shadow I only see the outline of those around me. Their words bounce off the walls making their source imperceptible and when combined with the sound of the near water, I can hear nothing. The strong light source that comes from above the wall of names makes it even harder to see anything but the wall. The light follows the columns until it spills to the floor where it shimmers from a small collection of moisture. Its presence makes me feel the coolness of the cave.

Tomb of Many



Conclusion

Continuing to search for an understanding of my architectural experience at Fallingwater, I thankfully crossed paths with Dr. Mark Schneider (a professor at Virginia Tech). He presented me with a summation of my research, which stated is; "What we perceive is the significance of the surfaces in relation to our bodies." With this thought in mind this project evolved as a focusing of the senses (perceptions), which became a measure for all future decisions. As I continued to research this direction, other significances began to reveal themselves. Those which present history, time, social character and many more are also called upon to enrich the experiences of architecture. These presences will be more difficult to capture due to their non-universal character, which will have to be investigate with each future project. Also, through this investigation a constant reduction in the development of detail, though only occurring in the sheer number of details and not in their support of touch and sound, became apparent. Therefore a future question will be to understand the significance of development or complexity. Can a large number of material details allow for the elevation of our other senses? Do they present a level of development which can assist spatial enclosure? Can they awaken our feet and hands through their textural qualities? Can light reveal their material depth and texture? And can all of this be done to create a memorable place?

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With sincere gratitude, I wish to thank those people whose support and friendship made this experience greatly rewarding.

My thesis committee (Mike O'Brien, Kay Edge, Bill Galloway):
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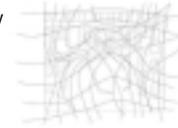
My Cowgill colleagues (Kevin, Jim, Mike, Paul, and others)
For the sense of kinship that developed and the experiences of discovery.

My wife and son (Teresa and Antonio Eddy):
For their love and support, and for the many sacrifices made during these years in Virginia.

My family and friends:
For their continuing support in willing me to this important goal.

Thank you for helping me realize my potential.

Greenport traffic flow pattern. SHoP.



Entrance to Frank Lloyd Wright's Falling Water

Antheneum. Richard Meier.



Coopers Rock State Park West Virginia



Entrance to Frank Lloyd Wright's Falling Water

Vision and Tactility Herbert Bayer 1932



Dutch Home



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