

THE ENERGY OF WATER: AN EMPIRICAL STUDY INTO THE HUMAN CONNECTION TO WATER

DESIGN THESIS . STEPHANIE FRANZEN . 5.11.2011



TITLE PAGE

AN ARCHITECTURAL EXPLORATION OF WATER
AS A SUSTAINABLE LIFESTYLE

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture of
North Dakota State University

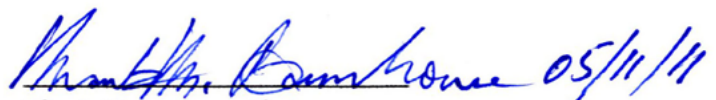
By

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In Partial Fulfillment of the Requirements
for the Degree of Master of Architecture



Primary Thesis Advisor



Thesis Committee Chair

May 2011
Fargo, ND

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ABSTRACT

This book is an exploration into how our thoughts and emotions can change our built environment. It will focus on water as the bridge connecting our experiences with our physical environment. By focussing on our earth's water and how its mysterious properties have left us entranced for thousands of years, this book will seek to explore those mysteries more deeply.

What draws a small child to walk to the edge of a lake and proceed to throw a stone into it? What is it about the sound of rushing water, or waves crashing along a beach that relaxes us into a calm and tranquil state? What is it about moving water that catches our attention the same way that gazing at a dancing flame does? These are all questions that I intend to explore more deeply through the science behind what we are seeing and feeling when encountered by water.

TPOLOGY

Baths designed to explore the cleansing, strengthening and therapeutic properties of water.

KEYWORDS

WATER, ENERGY, ENVIRONMENT, PERCEPTION



THE PROBLEM STATEMENT



PROBLEM STATEMENT

How can our thoughts and emotions alter our physical environment?



STATEMENT OF INTENT

SOI

TYPOLOGY

Baths built to explore the cleansing, strengthening and therapeutic properties of water

CLAIM

By being physically and emotionally healthy, we create a healthy environment around us.

PREMISES

As humans we are greatly affected by the emotions spread by those around us.

Driven by our emotions and experiences, we create a perception of our built environment uniquely our own.

Our environment can encompass everything human, built, natural and supernatural.

Health can be associated with the mind, body, and soul.



THEORETICAL PREMISE/ UNIFYING IDEA

Our built environment is created within our own perceptions, through our thoughts and experiences. By creating a healthy environment within ourselves, we are able to affect the feelings of everyone around us. There are similarities throughout the human race, water being one of the most mysterious.

PROJECT JUSTIFICATION

For thousands of years, our earth's water has been a source of energy, spirituality and life. It has been the main connection between all of the world's religions, the focus of scientific theories as well as aiding in the development of many technological advances.

In a world where everyone seems to be focused on themselves, it is easy to forget how in sync we all are with each other. How connected we are with not only each other, but our natural environment as well. In this project I plan to further explore the theories that we are not only connected through our thoughts and beliefs, but also the idea that we are connected through our physical beings as well. There is much to be learned from the science of the natural human form as well as the natural environment. There is also much that can be accomplished with a simple dose of humility and self awareness.







PROPOSAL



THE NARRATIVE

You can hear it in the distance. The sound of a steady stream, spilling over rocks and fallen trees, collapsing into itself. Desperately you make your way through the brush, down a broken path and come to a clearing in the crisp amber leaves that surround you. There, 35 feet below, where the fire red rock plummets into the creek bed, is a deep pool of cool hard water as still as the midnight sky. As you sit on the ledge of this rock, falling into the pool, you can't help feel as though there is no where else in the world you'd rather be.

The water that has brought us to this serene pool is the same element able to connect us to all other living things. Is it possible that our thoughts and emotions can be transferred through the water in our own bodies, much like sound waves being transferred through a large body of water? Could this be an explanation to why our moods change with those surrounding us? If so, is it possible to create a healthier environment through our own thoughts and emotions?



Exploring the possibility that the water in and around us may be the connecting component between human interaction will not only enhance architectural design opportunities, but such things as landscape design, site development and interior design decisions as well. This design thesis will explore the possibility of our built environment as an interactive tool for promoting physical, as well as emotional health throughout our society.

THE NARRATIVE



USER/CLIENT DESCRIPTION

The progression of spaces is proposed to be an interactive learning tool integrated with experiential spaces that allow for visitors to fully understand the concepts introduced. The site is located just south of Slide Rock National Park. Situated in a prime vacation spot for people not only from North America, but from all over the world, this site offers the perfect opportunity to create an experience that will become a destination spot for travelers of all ages.

Children and adults alike will find the empirical learning unlike anything they have experienced before. By integrating the experiential with the informational, learning will become subconscious as you are drawn through the spaces.

Parking on the site will be shared by the adjacent Slide Rock National Park, as well as shuttle buses for off-site parking.

MAJOR PROJECT ELEMENTS



The main spaces of the facility will be made up of water. Through the variation of depths and temperatures between the baths visitors will be able to experience the water in as many ways as possible.

BATHS

Upon entrance visitors will have the choice to explore freely throughout the baths, letting the water guide their way.

Throughout their visit guests will have the opportunity to explore the site around the facility as well. There are many hiking trails leading down to the creek bed, as well as longer trails through the canyon.

TRAILS

Along the entrance trail there will be man made pools of water for visitors to explore upon entering the facility. This trail will also reveal the site of the creek to visitors before entering.



BIKE STORAGE

RESTROOMS

MECHANICAL

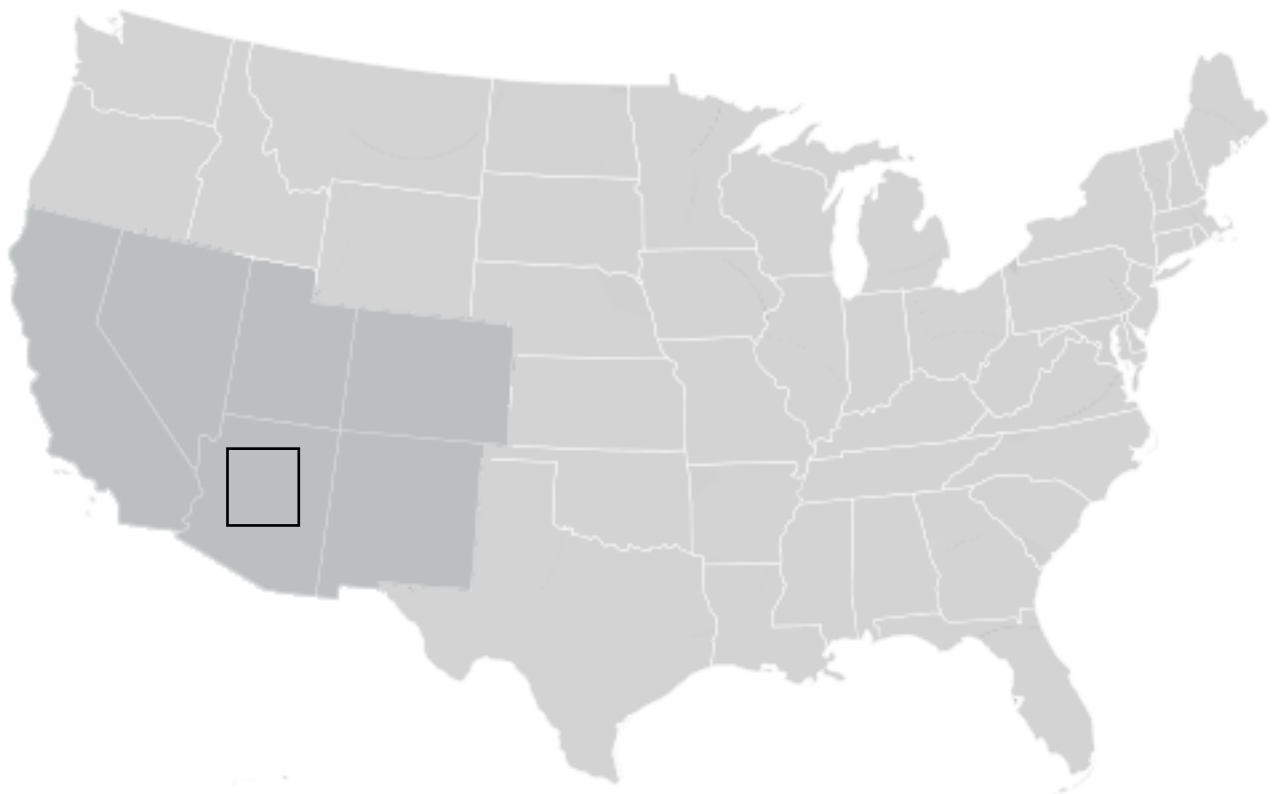
SITE INFORMATION

The site rests in the center of the southwestern United States, which typically includes New Mexico, Arizona, Colorado, Utah, Nevada, California, and occasionally Texas and Oklahoma. Specifically, the site rests in the north central region of Arizona.

The southwest is home to many subregions, all vastly different from the dramatic mesas, buttes, and deserts of Arizona; and the Sangre de Cristo Mountains of New Mexico, to the broad flatlands of the lower Rio Grande Valley.



MACRO: SOUTHWEST UNITED STATES



MACRO: SEDONA, AZ



The site will lie in the region of Sedona, Arizona, just around 110 miles north of the Phoenix metropolitan area. The region is known for its vibrant red sandstone formations, the Red Rocks of Sedona. When illuminated by the rising or setting sun, these formations put off a brilliant glow of orange and red.

Sedona has a temperate high desert climate of mild winters and summers, with the average temperatures ranging from 75 degrees F for a high, with 45 as a low.



MICRO: OAK CREEK CANYON



The area that will be specifically looked at is in the valleys of Oak Creek, where the contrast of the lush vegetation surrounding the creek meets the vibrant colors of the red sandstone of the area. The surrounding site will play a large part in the design development.

OAK CREEK



MAPS COURTESY OF GOOGLE EARTH







The focus of this project lies in the use of our natural resources on site, in perfect cohesiveness with the structure to enhance our overall well-being as inhabitants of the space. The natural environment has provided so much for this area in the past, there is much to be learned from by looking to civilizations in the area such as the Hopi and Navajo nations. Their use of the land as shelter, nourishment, and recreation can be vital information to how we develop in the future.

PROJECT EMPHASIS

THE PLAN

RESEARCH DIRECTION

Research throughout this project will be conducted in many different areas. There are many questions to be raised. What is water? What does water mean to us in our daily lives? How are we responsible for controlling the use of this resource sensibly?

There's much to be learned from the Natives of the Southwest and their use of the land, as well as the geological history of the area.

DESIGN METHODOLOGY

The method I will be using throughout the research and design of this project will be a mixed method of qualitative, quantitative approaches. By constantly revisiting my theoretical premise/unifying idea, I will be able to incorporate my data in a cohesive manner specific to this project.



DOCUMENTATION OF DESIGN

Documentation throughout the project will be conducted every few days. As it is one of the most important parts of the design process, documentation will occur through sketches, writing, process models, and photography. This documentation will be neatly composed for the viewer to review at the completion of the project.

SECOND YEAR

FALL

Darryl Booker

Tea House, Fargo, ND

Rowing Club, Minneapolis, MN

Mountain Dwelling, Colorado

SPRING

Steven Wischer

Entry Project, Fargo, ND

Music House, Fargo, ND

THIRD YEAR

FALL

Cindy Urness

Center for Excellence, Fargo, ND

Public Library, Moorhead, MN

Urban Renewal, Moorhead, MN

SPRING

David Crutchfield

Performance Art Center, Austin, TX

Hotel Galactica, New Mexico



PREVIOUS STUDIO EXPERIENCE

FOURTH YEAR

FALL

Bakr Aly Ahmed

Vertical Community, San Francisco, CA

KKE Musical Instrument Design Competition

SPRING

Darryl Booker, Frank Kratky, Paul Gleye

Santo Domingo Urban Design, Dominican Republic

Santo Domingo Housing Design, Dominican Republic

Marvin Windows Competition, Tanzania, Africa

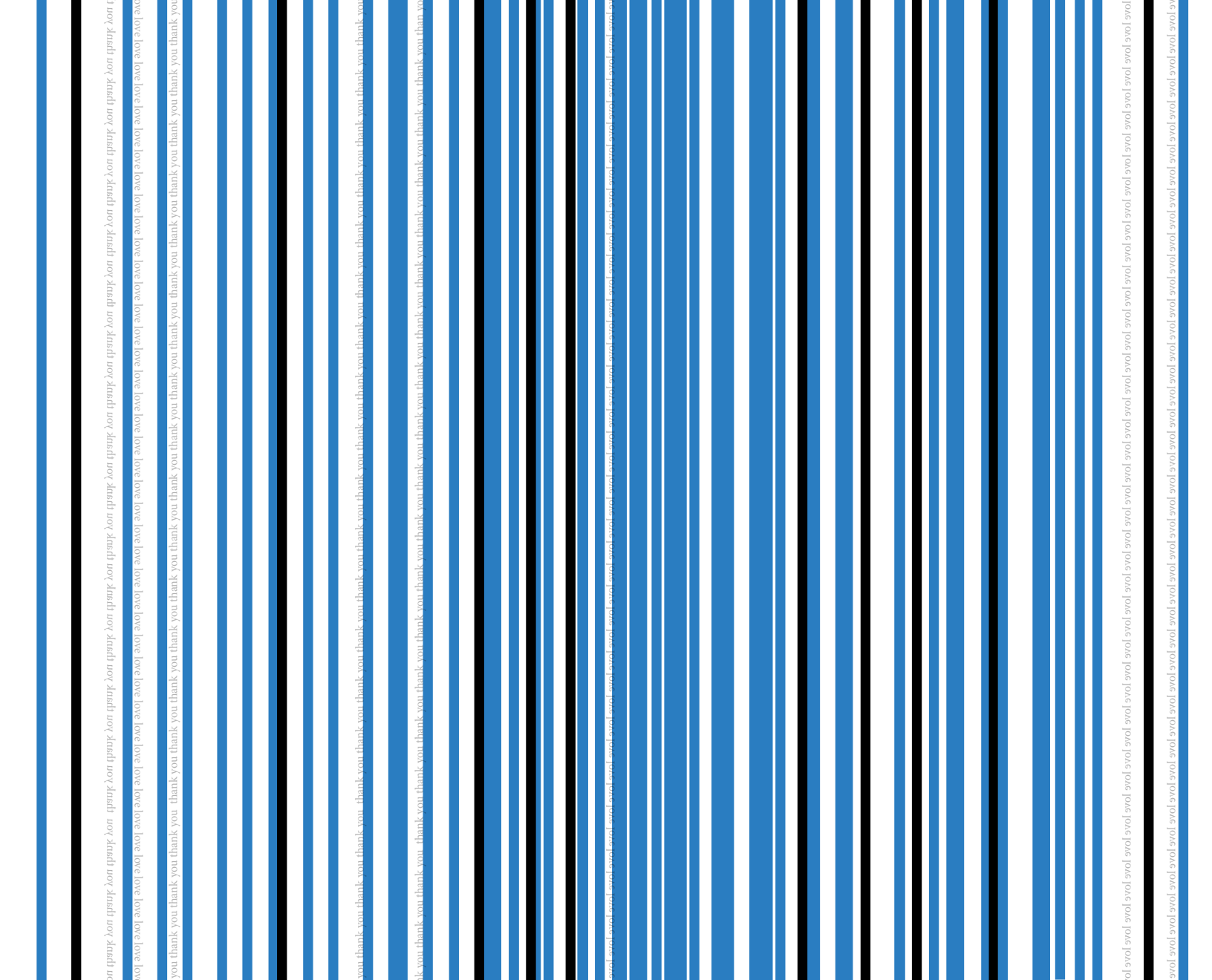
FIFTH YEAR

FALL

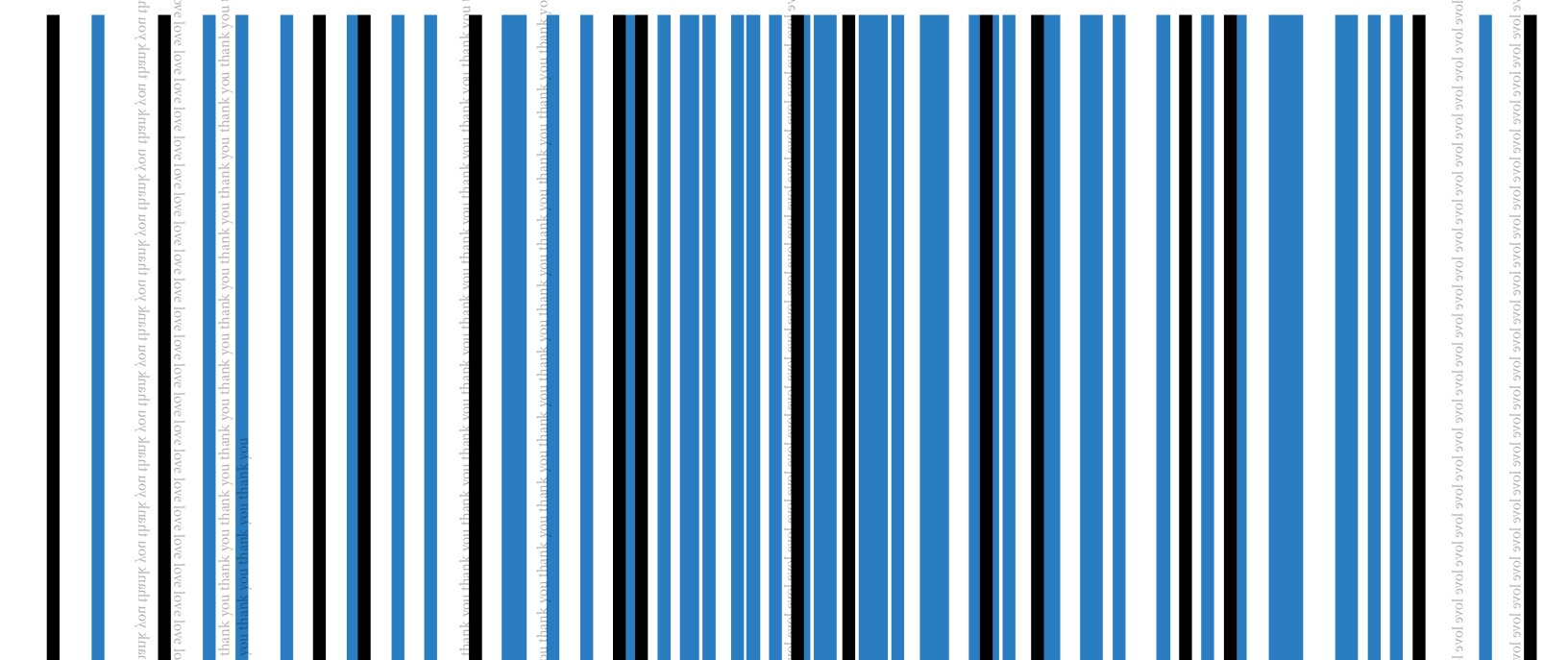
Cindy Urness

Utopian Community, Minnesota





PROGRAM DOCUMENT





THEORETICAL EXPLORATION



There is much to be explored in not only the spiritual realm of this premise, but in the scientific facts as well. The first idea to be explored is the notion that as humans, we are greatly affected by the emotions of those around us. There are many different theories on what causes our emotions and why.

The James-Lange theory suggests that our emotions are a response to experiences in the world. He states that emotions are feelings that come about as a result of physiological changes such as muscular tension, perspiration, dryness of the mouth and a rise in heart rate. For example, a person would realize that he or she is crying, therefore he or she must be sad.

My theory ... is that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion. Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect ... and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble ... Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually feel afraid or angry (Ellsworth, 2002).

This theory can be supported in situations where people are suffering from various psychological challenges, such as panic disorders. They often experience trauma only after physiological responses arise in their body. These responses, which were conditioned to be associated with a particular emotional state, have been known to become disassociated through therapy.



The theory is proved correct by stating that our emotions are a response to an experience.

There are other theories, however, that challenge the validity of these statements. One such theory, known as the Cannon-Bard Theory, suggests that individuals experience emotions and physiologically react simultaneously. For example: “I see a bear outside my car. I am afraid. I begin to perspire.”

The Cannon-Bard Theory found controversy in that it is suggesting that emotion lacks a mechanism. Many theorists then went on to provide a further explanation. One such theory seems to remain the best formulation of emotion thus far: Schachter & Singer’s two factor theory of emotion. In this theory they explain that emotion is the cognitive interpretation of a physiological response, meaning the subject needs to be fully aware of their physiological state to react with such an emotion.

Our understanding of our emotions can then be branched off into the mystery of perception. Special progression has a different meaning to everyone, depending on their former experiences in their life. Even someone who has experienced a space earlier in their lifetime can return to that same space twenty years later and have a complete opposite reaction to the space visited twenty years prior. This phenomenon can only be explained through the emotions and perceptions that we felt during the initial visit to the space.



“Architecture is understood as a kind of object to be looked at, inhabited by the viewer who is detached from it, inhabited precisely by being looked at, whether it is by the user, visitor...it is not simply a platform that accommodates the viewing subject. It is a viewing mechanism that produces the subject, it precedes and frames its occupants. Thus showing that the perception of space is not what space is but one of its representations, in this sense built space has no more authority than drawings, photographs, or descriptions.” (Object of Desire, Jayesh Sidpara, 1996)

It’s an interesting thought, that through such things as drawings, photographs and descriptions our mind can imagine such a vivid picture, that it seems almost better than if the real thing were to materialize right in front of us. Our perceptions of what we are seeing can be a very powerful tool in the hands of an architect.

Is it actually what we are seeing that forms our perceptions of the space around us, or might it be what we are feeling? Our thoughts and emotions are very powerful tools. This brings us back to the unifying idea of this research and how our built environment is shaped:

“Our built environment is created within our own perceptions, through our thoughts and experiences. By creating a healthy environment within ourselves we are able to affect the feelings of everyone around us. There are similarities throughout the human race, water being one of the most mysterious. “



A look into the research of Japanese scientist, Masaru Emoto (2005), will shed a new and intriguing light on the power of our own thoughts and emotions and their ability to affect the physical environment around us.

How happy are you? Do you have a sense of peace in your heart, a sense of security about your future, and when you wake up do you find yourself anticipating the day ahead? I think I can safely say that not many people are truly happy. What is it then, that causes us to be so unhappy with our lives. According to Japanese scientist Masaru Emoto, we are living in an age of chaos.

We find ourselves living lives filled with confusion, unorganized matter and fatigue. Our world is plagued with economic distress, ethnic prejudice and religious wars. The world is continually becoming ever more estranged and divided. So what, we asks, can be the solution to all of this distress and unhappiness? Could there possibly be one simple solution that brings us back into harmony with ourselves?

Here lies the heart of my research. Water. The average human body is 70 percent water (Emoto 2005). We start out our lives as fetuses as 99 percent water. Then as newborns we are 90 percent water, and by the time we are full grown adults our bodies are composed of mostly water.

“In other words, throughout our lives we exist mostly as water.”

When thought of in a physical perspective, humans are water. When looked at in this way, a whole new realm of possibilities begins to show through. The fact that we have discovered a physical connection between all persons of the world is intriguing.



From here a connection can be made by the physical characteristics of the water. Our bodies contain water, mostly in our blood streams. A healthy person has good blood flow throughout their body and into their brain. Good circulation is a measure of good health. When blood stops flowing, especially to the brain, it can be life threatening.

Modern researchers have shown that the condition of the mind has a direct impact on the condition of the body (Emoto). Your body knows when you are living a joyous life, full of energy and happiness, likewise, we feel physically weighed down when we are under a lot of emotional stress. Our emotions flowing through our body, moving and ever-changing, this is what life is all about.

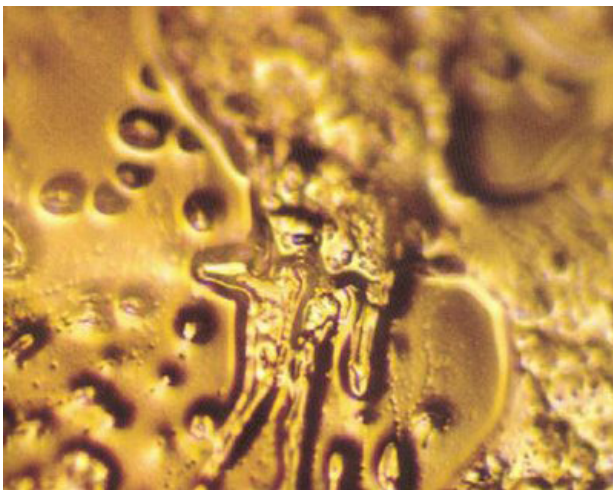
There is more to our relationship with water than that contained inside our bodies. Water remains one of the most central and mysterious components of nearly all of the world's religions. Dating back to the time of Christ, many miracles were performed utilizing the healing strength of water. These spots around the world are still, to this day, gathering places for believers and non-believers alike.

So the question remains, we have found a connection between human life, that has the ability to affect our physical being, but can it be proven through scientific research?

Through the work of Dr. Emoto, we are able to clearly see the results that positive thoughts can have on water. His experiments through photographing water crystals with high powered microscopes show some of the most amazingly beautiful transformations.

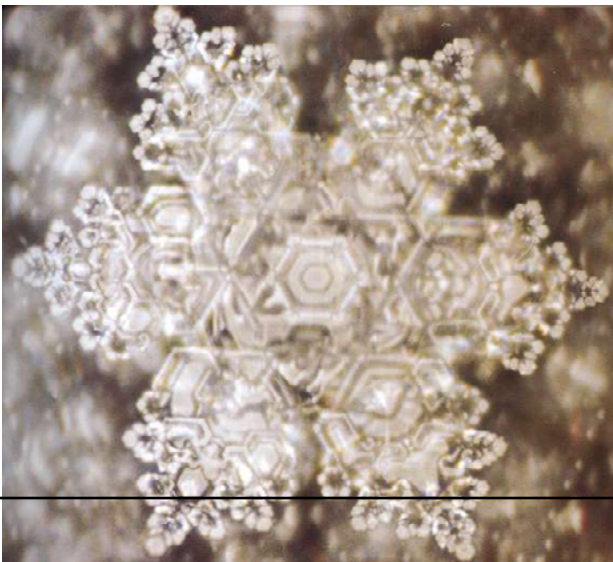


"YOU MAKE ME SICK. I WILL KILL YOU" (JAPANESE)



Emoto's research began with the realization that no two snowflakes are alike. Finally, an answer that contains physical proof that can be seen through illustrations. So there began his quest to prove that water has the ability to copy information from thoughts and emotions.

The experiments were done in a lab with petri dishes frozen at -20 degrees C for three hours in a freezer. The surface tension forms drops of ice in the dishes about one millimeter across. The crystal appears when you shine a light on the crown of the drop of ice.



Some of the crystallizations were similar, but it was soon conceived that different water formed different patterns in the crystals, if patterns were formed at all. Emoto first took water from different locations. Water taken from Tokyo was a complete mess, not a single crystal was formed. Tap water varies from natural water, in that chlorine is used to sanitize it, destroying most of the natural formations of the crystals.

Further experiments showed, however, that natural water, wherever it was from (lakes, streams, glaciers, rivers, etc), formed complete crystals when frozen.

Once the theory was formed, that water can form an identity, Emoto took his research to the next level. He exposed the water to music. One would imagine that the vibrations of music would have some sort of effect on the water. So there it began; Emoto designed studies to test different types of music and what their effects were on the crystalline structures of the water. Once again, the results were astounding. “Beethoven’s Pastoral Symphony”, with its bright and clear tones resulted in beautiful and well-formed crystals. “Mozart’s 40th Symphony”, a graceful prayer to beauty, created crystals that were delicate and elegant.



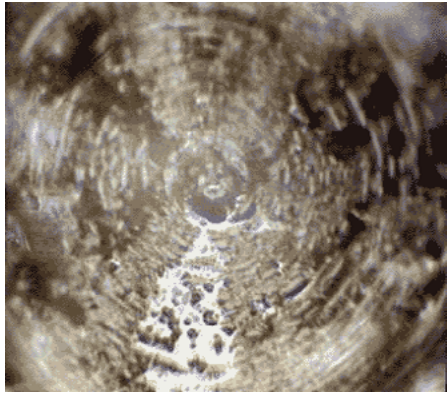
In contrast, water exposed to violent heavy metal music resulted in fragmented and malformed crystals at best.

The experiments that I found particularly intriguing, however, were the studies done when words were typed and spoken to the water on a daily basis before the water was crystallized and photographed. Phrases such as “thank you” and “you’re beautiful” were taped to the water bottles, as well as negative phrases such as “you fool” and “you make me sick”. The crystals formed by the water with the positive words were beautiful hexagonal crystals, whereas the water exposed to the negative connotations failed to produce any sort of organized crystalline structure.

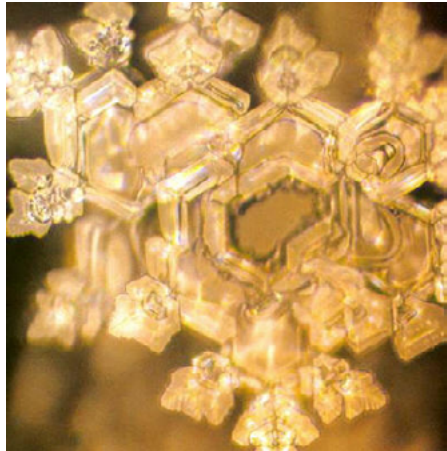


LAKE WATER AFTER A BUDDHIST HEALING PRAYER

If our bodies consist of 70 percent water, just imagine what those negative words can do to us.



HEAVY METAL MUSIC



BACH "AIR ON THE G STRING"

The world we live in is comprised of our built and natural environments. Architectural design offers the opportunity to either enhance the experience of our built environment, or destroy it.

“Water’s reflective properties, along with the audiovisual effects of moving water, offers architects a tool for creating energy and space. Most people can be seduced by the burbling brook phenomenon, that beguiling quality created by water. The popularity of fountains all over the world clearly demonstrates its mass appeal; an appeal which is frequently harnessed by architects.”
(Toy 1997)

Looking back at the insight and theories of Dr. Emoto, maybe there is more to the use of water in architecture than what meets the eye. Perhaps the water is a mechanism in which emotions are transmitted. The use of water within architecture is often used to illicit a peaceful response... (Moore 1994).

Is the peacefulness felt because of our reaction to the calmness of the water, or vice versa?

The use of water through architecture, however, must be very precise and meaningful, otherwise it loses its significance. “Emotional contact with water occurs when people are allowed to get as close as possible without actually touching it, resulting in our famous ‘mental leaning out over.’ The most important thing to consider when creating designs involving emotional contact with water is the edge” (Moore 1994).

“To invite contact, water must seem fresh, clear, sparkling and clean, full of messages of beauty and health”
(Moore 1994).

There are many directions one can take when attempting to understand the human psyche. As my research continues, I will always explore new and interesting ways to explain the driving factors of human experience. Because architecture is based upon the experience one gets progressing through the space, to be able to fully understand what forms one's experience will ultimately lead to cleaner and more dynamic designs.

The scope of research that I compiled was mainly based upon attempting to not only understand what affects our experience through a space, but the ability to explain it through scientific theories and exploration. As we could see through Dr. Emoto's extensive research, it is possible to analyze the effects our mood can have on our physical environment, and ultimately how it affects everyone around us.



RESEARCH SUMMARY

There are many different definitions of a ‘healthy’ environment. Achieving a healthy environment within our own selves seems to be the first step in changing the environment around us. Through this project, I will attempt to put forth a design that opens our minds to the possibility that our own thoughts and actions affect others through our built environment, and how, in turn, that created environment will affect the next visitor: A ripple effect through architectural design.



1

PROJECT

Thermal Baths

SITE

Vals, Switzerland

ARCHITECT

Peter Zumthor 1996

Following the bankruptcy of a hotel in the remote village of Vals, Peter Zumthor was commissioned to design and build a new thermal bath.

Built over the only thermal spring in Switzerland, it took a short two years after opening to become a protected building. People travel from all over the world to experience this architectural masterpiece.

Zumthor portrayed the concept of the building by using images of water flowing from the ground. The building is composed of local Valser quartzite as well as concrete, and is composed in a way to reflect a huge rock embedded in the hillside. The areas on the interior of the bath are further defined by uniquely using light, water, and to some extent, heat and steam.

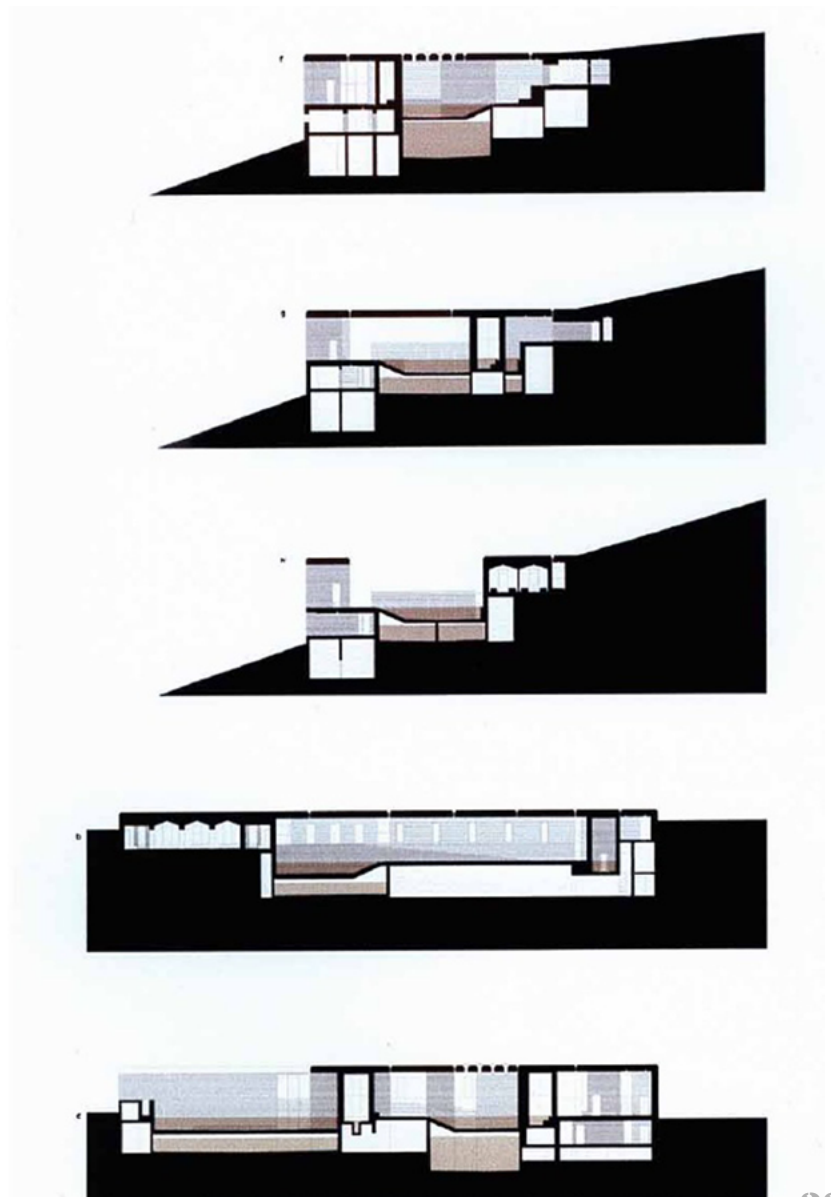
The organization of the building is primarily based on the primal act of bathing. You enter through a tunnel followed by a filtering volume where you enter from one side, undress, and reveal yourself on the other side into the bath.



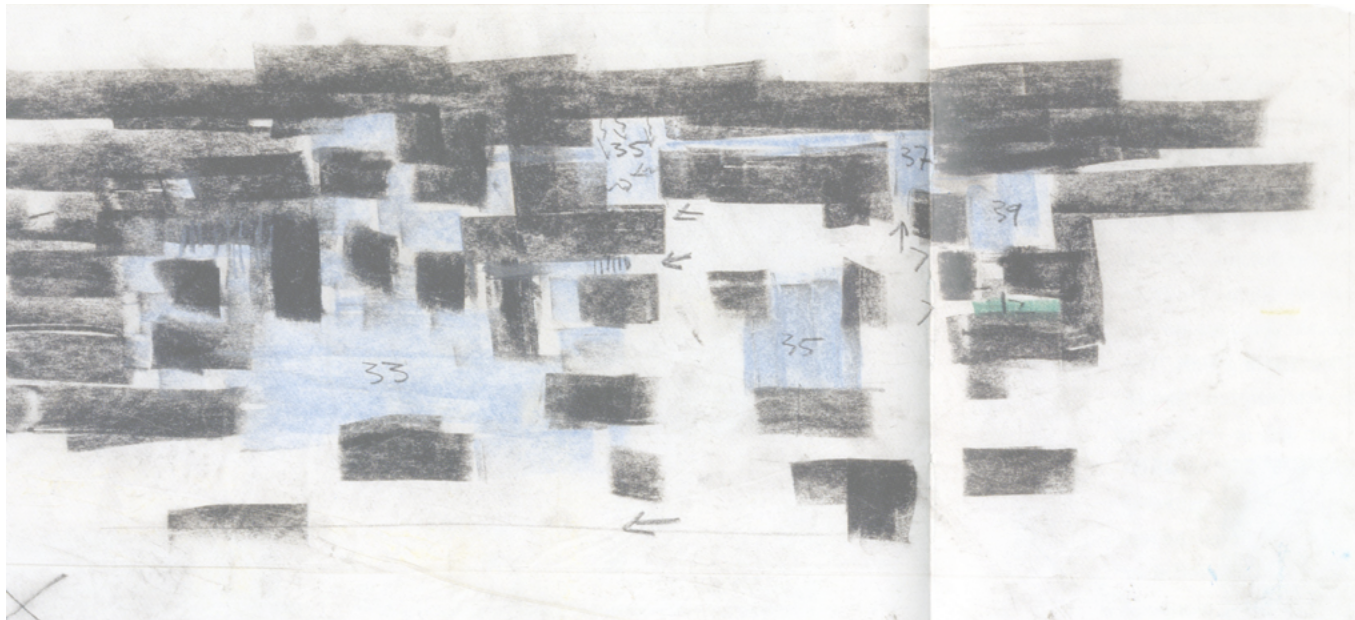
A series of stones define the main floor. These cubic volumes house baths at different temperatures, along with drinking spaces, showers and resting spaces. There are spaces within the baths that frame the surrounding mountains, connecting the baths even further to their existing site.

Following the main central bath, swimmers can move out onto the terrace outdoors. There are also smaller spaces below the main bath where therapy, such as massage and physiotherapy, is offered (Hauser 2008).

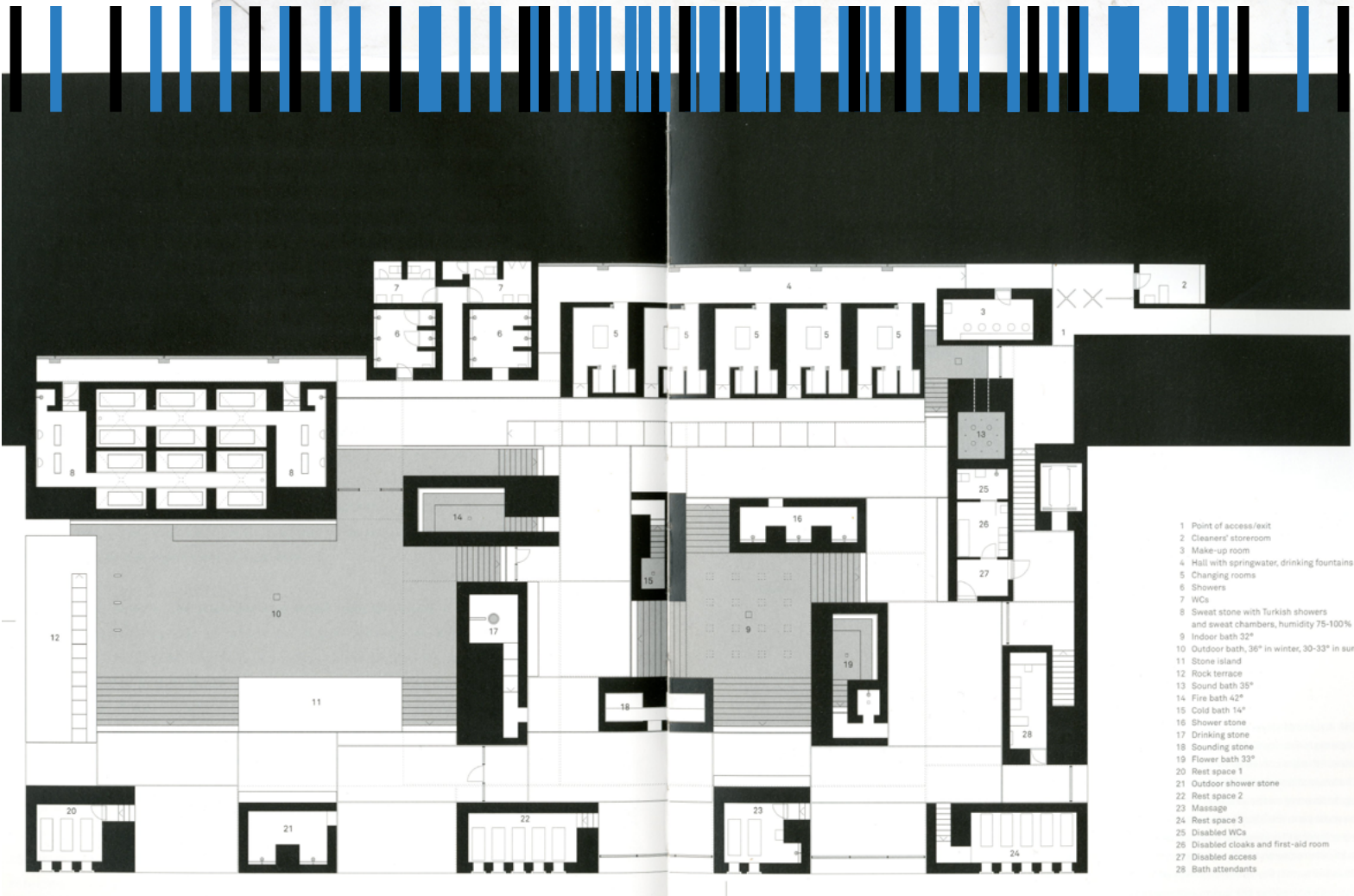
Roof planes are cantilevered concrete slabs that give a sense of floating above the water. Small fissures between the wall and the ceiling planes accentuates this affect of floating throughout the building.



1



CONCEPT SKETCH



- 1 Point of access/exit
- 2 Cleaners' storeroom
- 3 Make-up room
- 4 Hall with springwater, drinking fountains
- 5 Changing rooms
- 6 Showers
- 7 WCs
- 8 Sweat stone with Turkish showers and sweat chambers, humidity 75-100%
- 9 Indoor bath 32°
- 10 Outdoor bath, 36° in winter, 30-33° in summer
- 11 Stone island
- 12 Rock terrace
- 13 Sound bath 35°
- 14 Fire bath 42°
- 15 Cold bath 14°
- 16 Shower stone
- 17 Drinking stone
- 18 Sounding stone
- 19 Flower bath 33°
- 20 Rest space 1
- 21 Outdoor shower stone
- 22 Rest space 2
- 23 Massage
- 24 Rest space 3
- 25 Disabled WCs
- 26 Disabled cloaks and first-aid room
- 27 Disabled access
- 28 Bath attendants

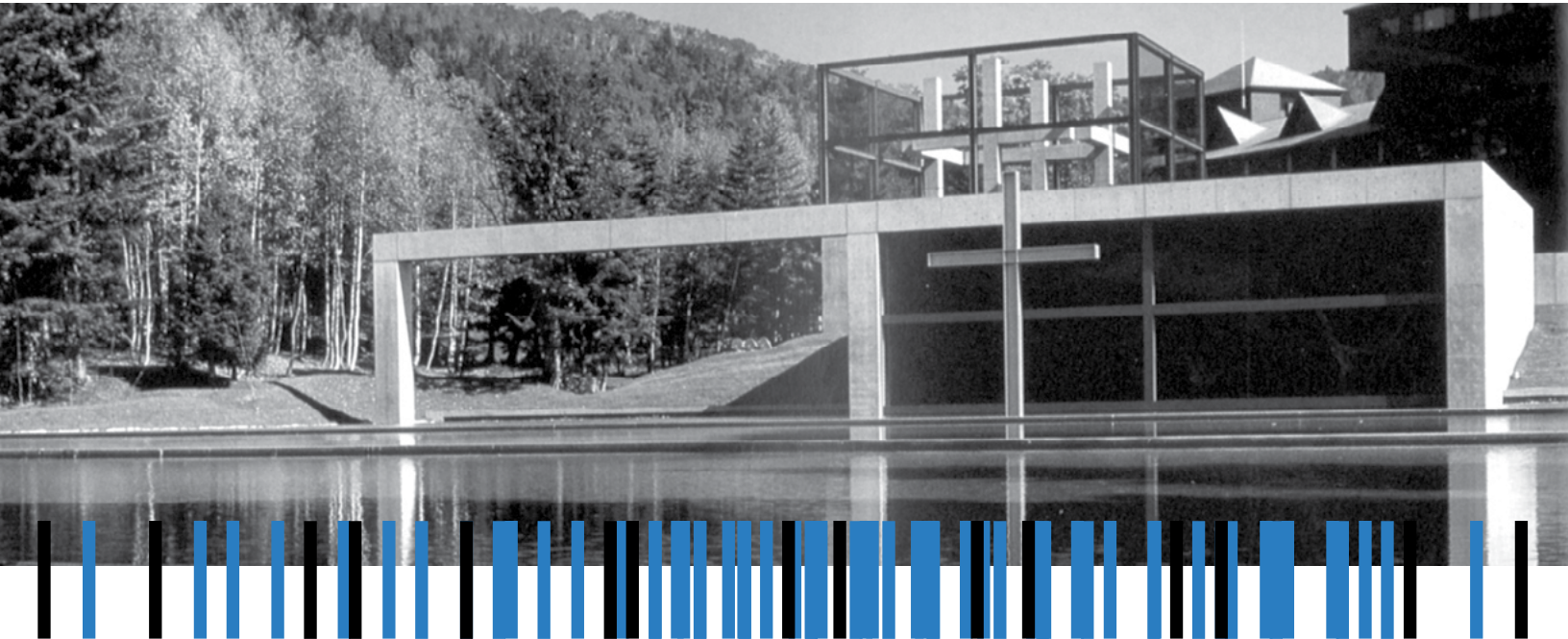
FLOOR PLAN



Zumthor's design opens up the eyes of the users to not only a higher understanding of the ritual of bathing, but he also brings them together in an environment where the soul can be cleansed from the stresses of day to day life. Guests of the thermal baths experience new and interesting revelations through the subtle changes in materials, lighting, and placement of massing throughout the spaces.

Another aspect of Zumthor's design that is interesting is his placement of the thermal baths into the landscape. Inspiration drawn from "a solitary building or large, grass-covered stone object set deep into the mountain and dovetailed into its flank" (Hauser 2008).

My proposed design will draw inspiration from Zumthor's use of mass and void, with the in-fill of water as transitional spaces.



Church on the Water

Hokkaido, Japan

Area: 520 sq. m

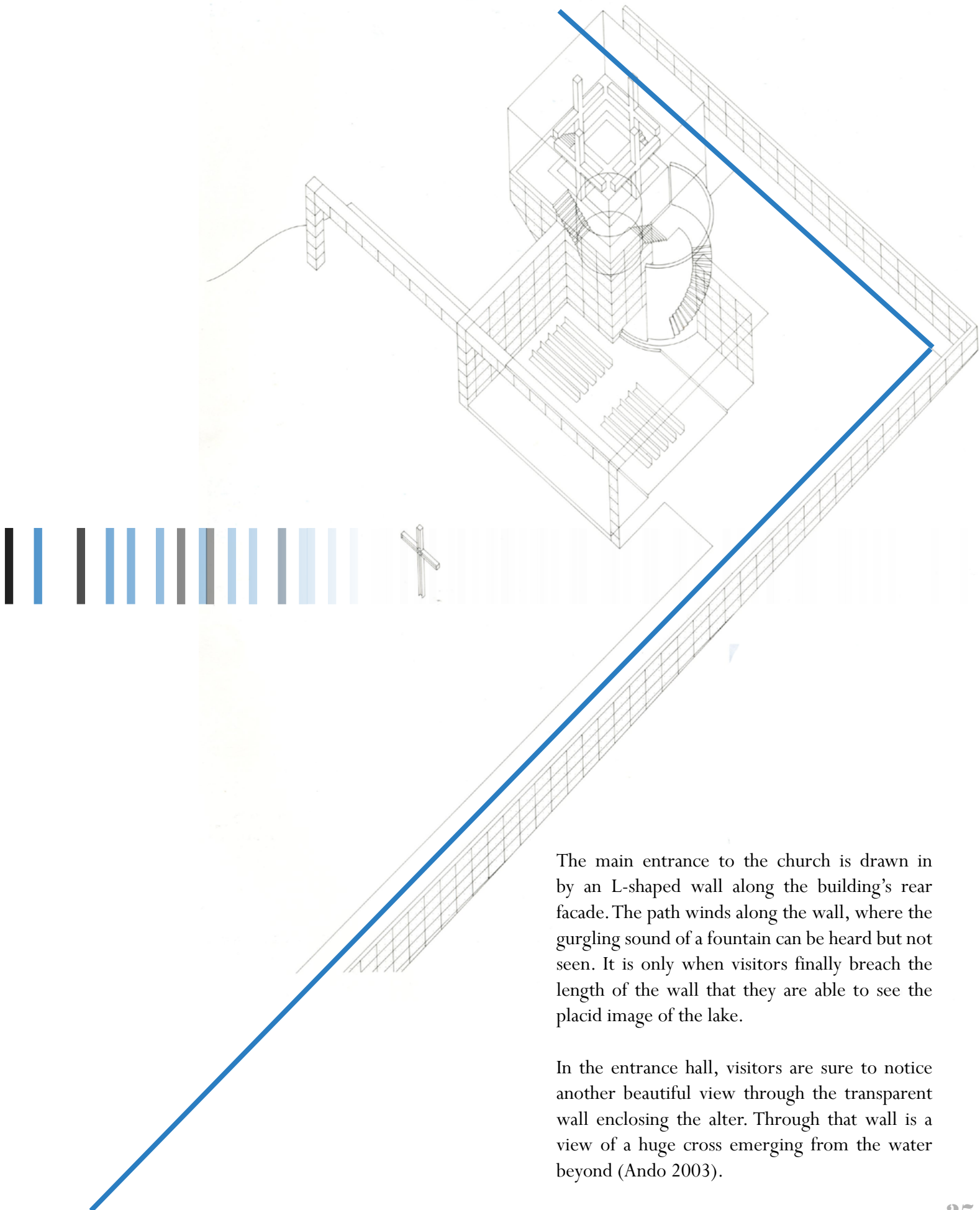
Tadao Ando 1988

Erected on a plateau in the Hokkaido mountains, one of the northernmost and coldest areas of Japan, lies a chapel. Encircled by an horizon of dense woodland, the church has the ability to take on the changing colors with the passing of the seasons.

The chapel was built on an artificial lake, created by the diversion of a stream close by. As in many of Ando's architectural masterpieces, he is able to create a relationship to nature, the union of the sea, sky and air, water and animals. This type of architecture is believed to be synonymous with the building as a haven for the human spirit (Ando 2003).

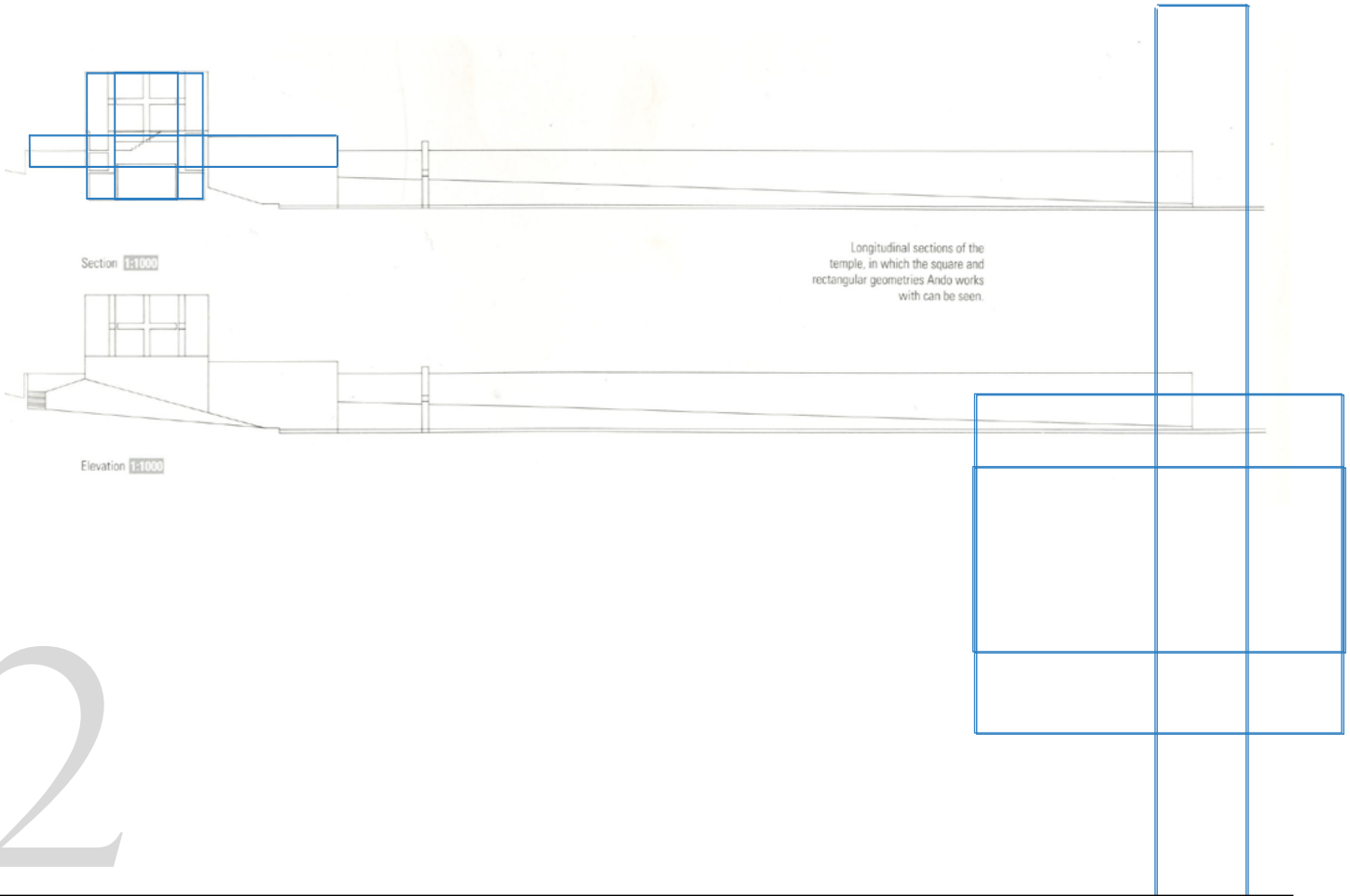
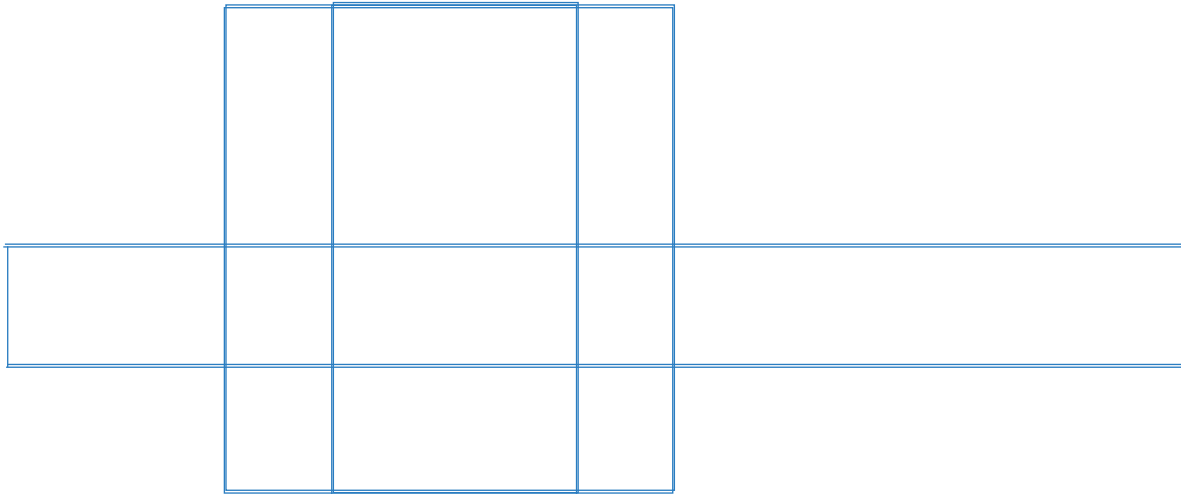
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“ARCHITECTURE AS THE CREATOR OF NEW LANDSCAPES; BUILDINGS AS A SETTING FOR THE TRANSIENCE OF NATURE: THE LIGHT OF DAY AND OF THE SEASONS, WIND AND WATER, AND SPACE ITSELF AS AN ENTITY WHICH SEPARATES MAN FROM, AND CONNECTS HIM TO, NATURE AND TO HIMSELF ARE THREE OF THE IDEAS THE WORK OF THE JAPANESE ARCHITECT EXPLORES” (ANDO 2003).



The main entrance to the church is drawn in by an L-shaped wall along the building's rear facade. The path winds along the wall, where the gurgling sound of a fountain can be heard but not seen. It is only when visitors finally breach the length of the wall that they are able to see the placid image of the lake.

In the entrance hall, visitors are sure to notice another beautiful view through the transparent wall enclosing the altar. Through that wall is a view of a huge cross emerging from the water beyond (Ando 2003).



Longitudinal sections of the temple, in which the square and rectangular geometries Ando works with can be seen.

2



PHOTO COURTESY OF SKJSTUDIO.COM

Tadao Ando has such a unique ability to control our every step through his design, all the while making us believe that we are in control. The way that he integrates the church into the landscape, along with his central use of the artificial lake, are very inspirational aspects of this design. The proportions and geometries of the building need also be taken into account, especially when working with a place of worship such as this.

Much like the other cases that I have looked at, Ando responds to the site in a way that not only harmoniously embeds the design, but ultimately enhances the site because of it. Through his use of geometries and massing, he is able to control our views out onto the landscape to create some truly breathtaking moments throughout the experience of this chapel.

3

PROJECT

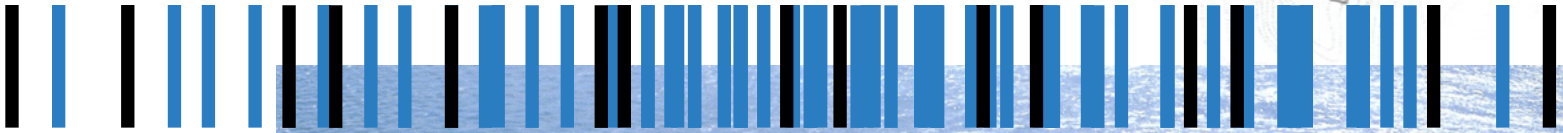
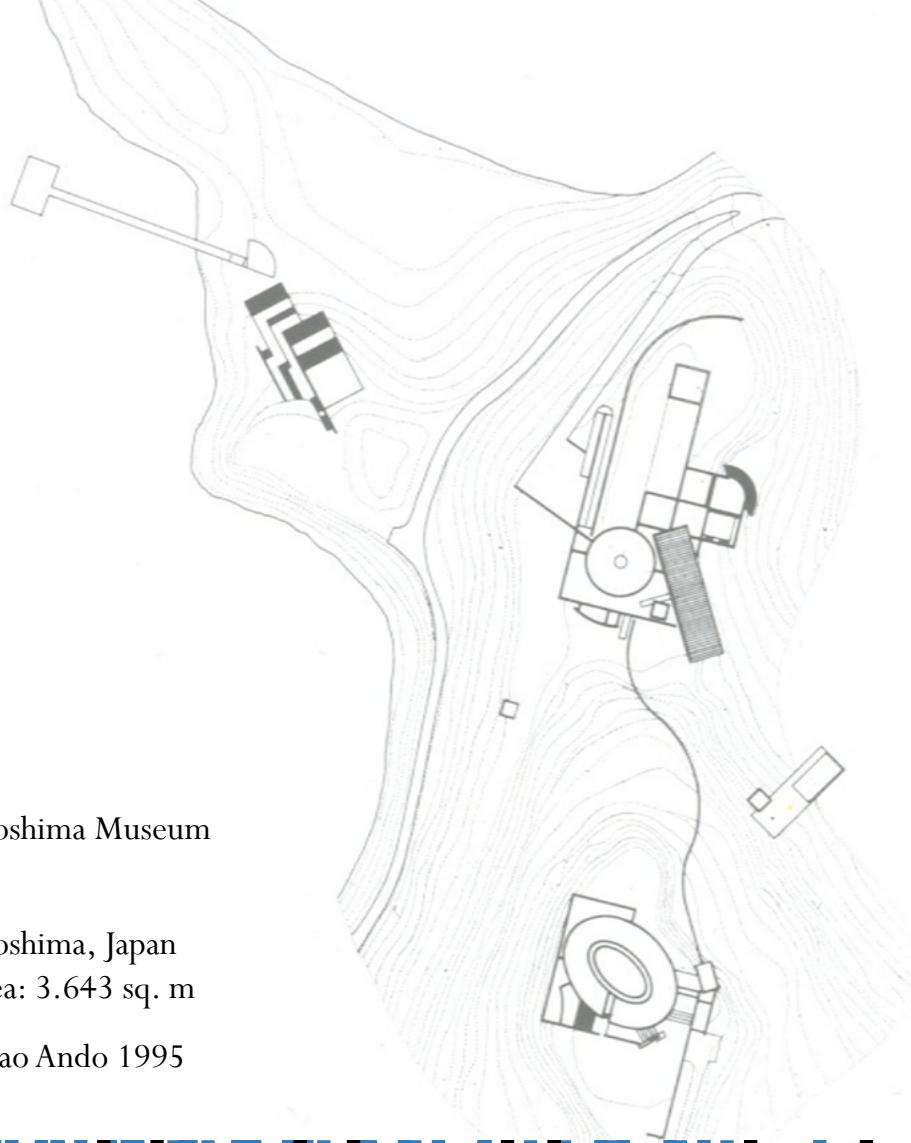
Naoshima Museum

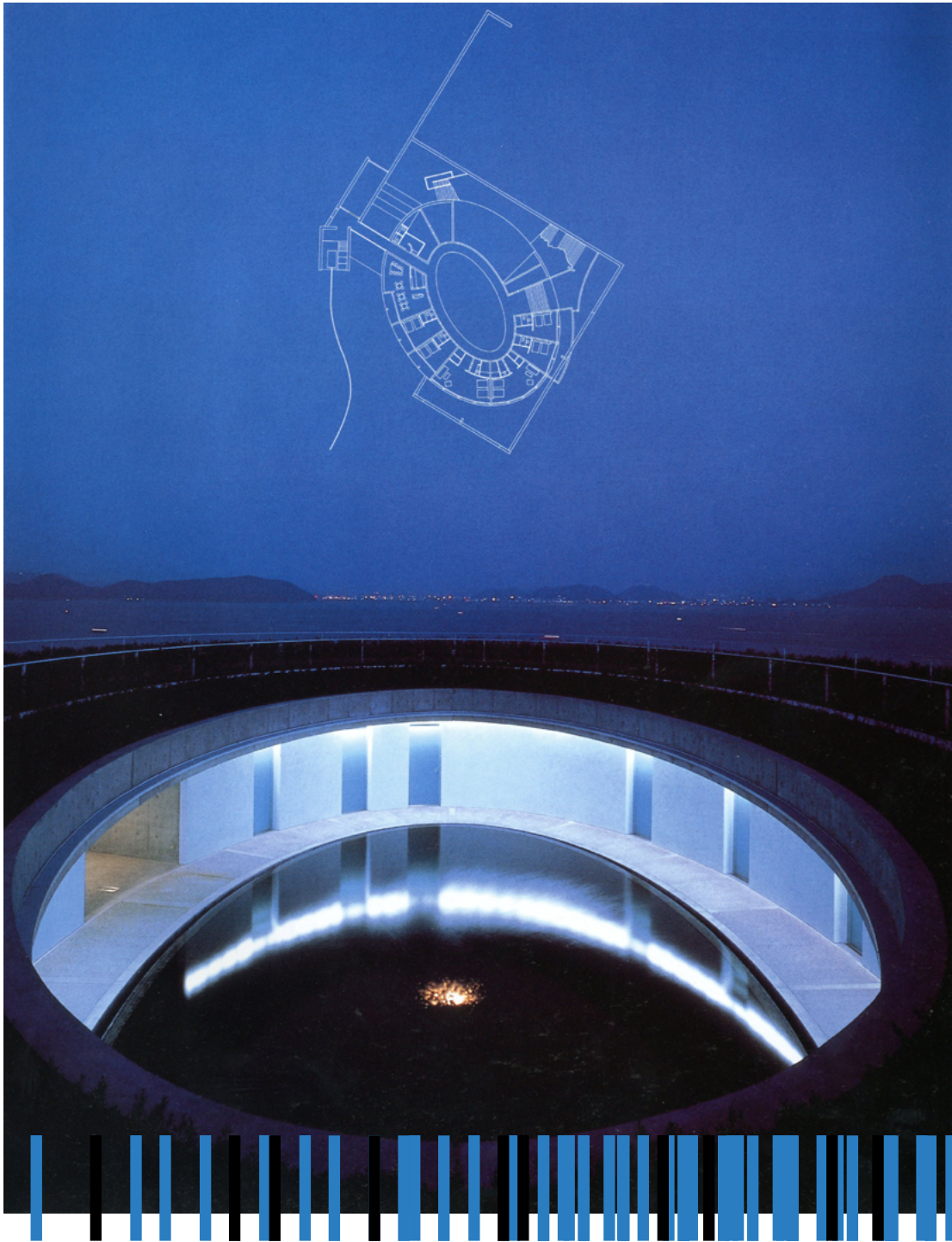
SITE

Naoshima, Japan
Area: 3.643 sq. m

ARCHITECT

Tadao Ando 1995





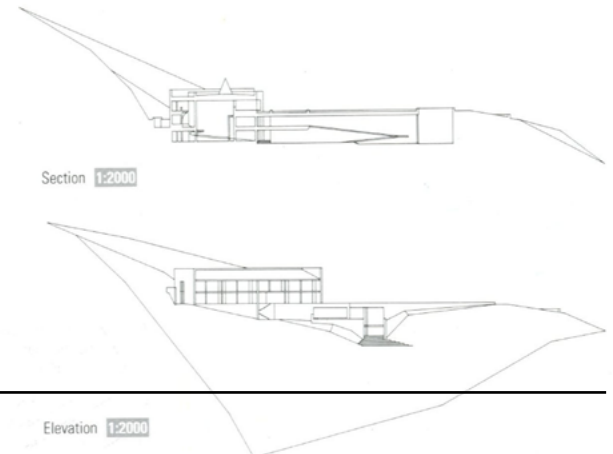
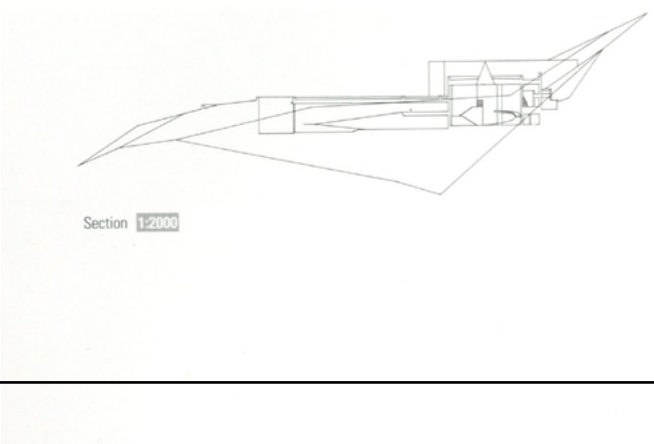
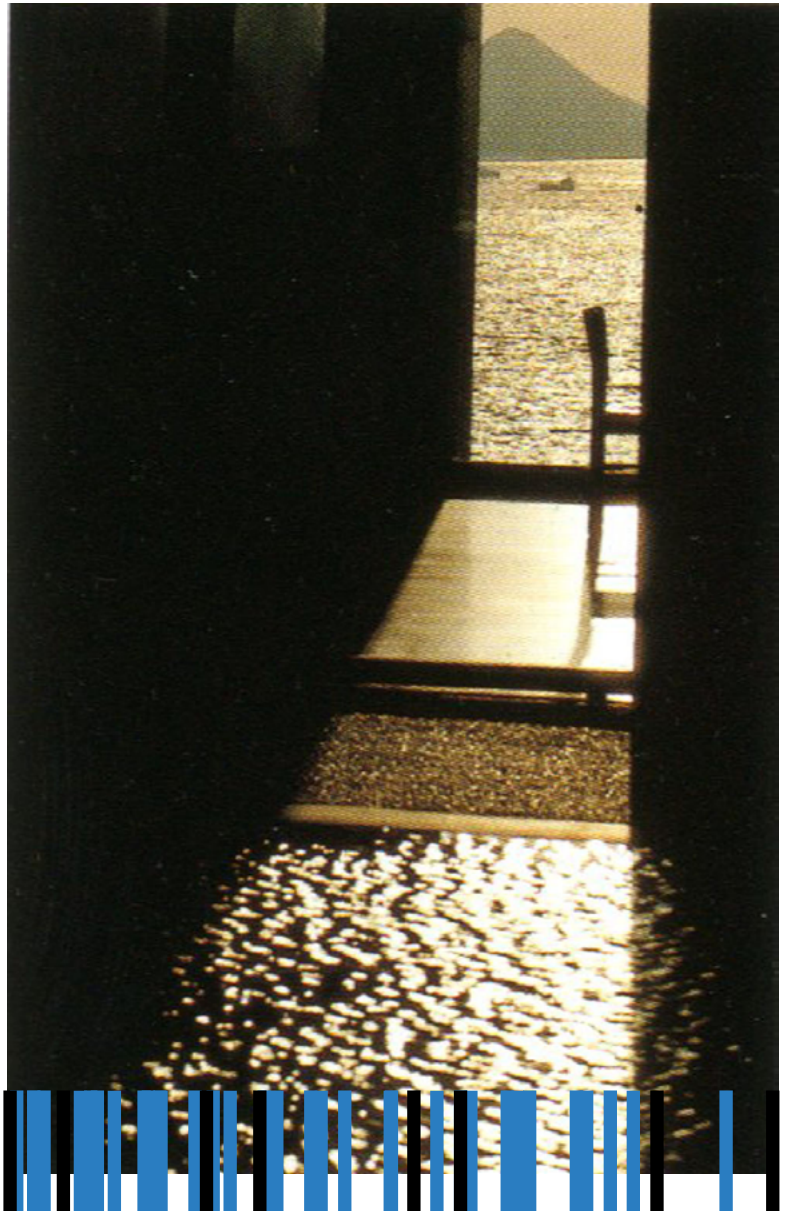
The Naoshima Museum, sitting on a small island in the Sea of Japan, appears to contemplate the tranquil beach extending at its feet. Much like other Ando projects, the museum intends to affirm the natural presence of the surrounding landscape. The building is orientated towards receiving visitors from the sea and is reached by climbing a stepped plaza that ultimately shelters the museum's outer buildings and acts as an open air amphitheater.

As to not disturb the visual relationship between the land and the sea, the top of the plaza is surrounded by the lush greenery of the National Park.

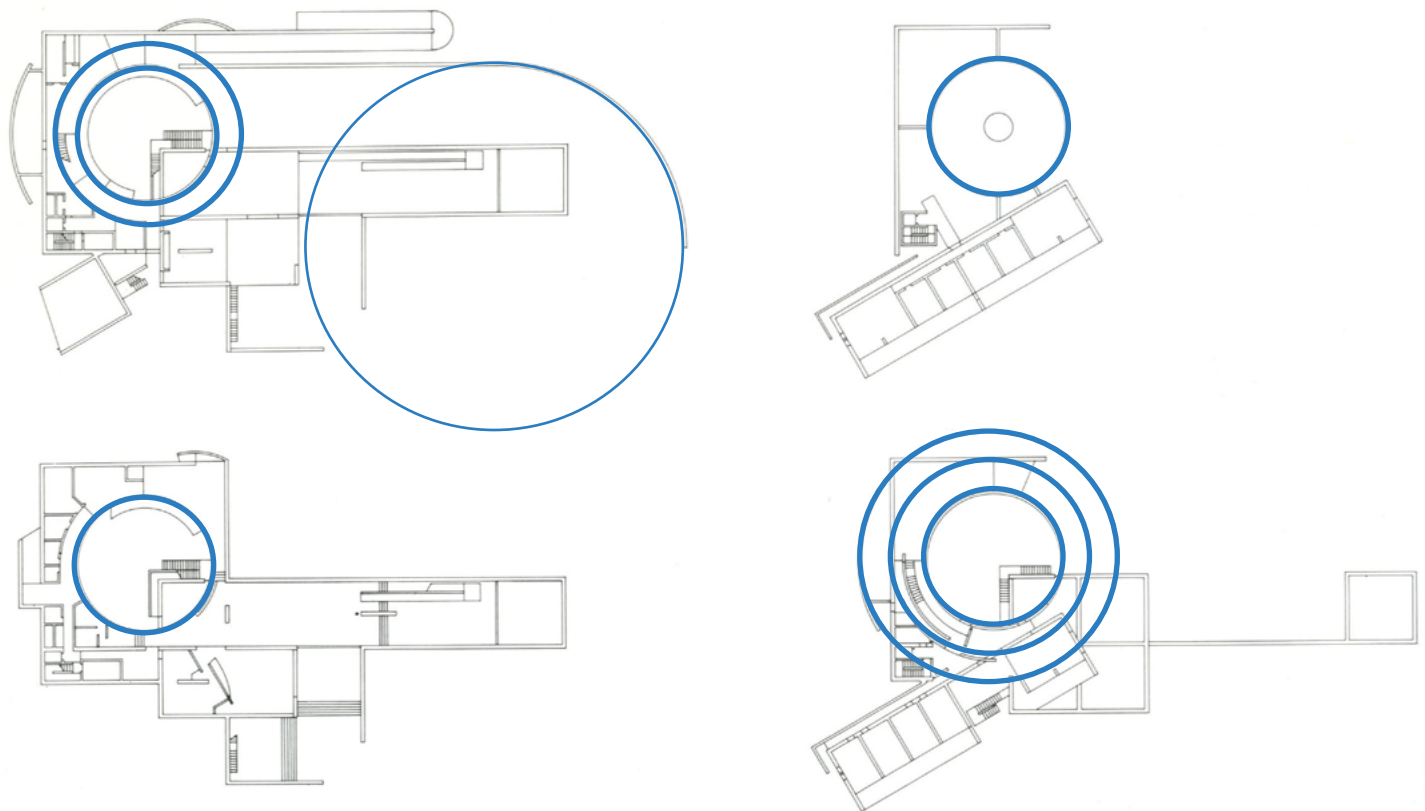
“...BUILDINGS THAT ADDRESS THE SPIRIT, BUT THROUGH THE SENSES...”
(Ando, 1998)

Once again, Ando's response to the land in such a unique and sympathetic manner is proof that by integrating a structure into the landscape, the experience of the space will have a much more dramatic and cohesive feel. Through the progression of spaces in the museum, Ando is able to express a sense of mystery and hierarchy. By setting the building so low into the ground that only the stone walls are able to be seen from the landscape above, it intrigues visitors to learn more. Also, by utilizing the circular patterns throughout his plans, he is able to form a break in the design and create a sense of importance to that one space. The art then becomes the main focus of what the building encompasses.

By keeping in touch with the natural environment, as well as the progression of space, there is much to be learned from this museum's design.



The central use of the geometric patterns in Ando's design creates a continuing sense of importance for this main space. By relapsing back to that circular unit, a sense of hierarchy is created around that space, giving it much greater meaning throughout the program of the building.



The light-wells around some of the facades and the double space of different outbuildings lend drama to the interior illumination of the museum.



There is much to be said about learning from those that have gone before us. Studying other's failures and accomplishments allows us to take our levels of design to a new stage of development. Not only are we more aware of what has worked or failed, but by utilizing these past projects, we are also able to sometimes experience them firsthand. One of the most exhilarating things for a designer is to be truly inspired by the work of a fellow artist.

These studies truly tested the theoretical premise that I have been examining, as stated earlier:

“Our built environment is created within our own perceptions, through our thoughts and experiences. By creating a healthy environment within ourselves we are able to affect the feelings of everyone around us. There are similarities throughout the human race, water being one of the most mysterious”.

It's through these case studies that we are able to understand just how effective our perception of space is and how that perception affects our emotions and so forth. Just like water cycling through the environment, our emotions are cycled through our immediate environment as well.

It was interesting to see how water was used in different, yet very similar ways in all of these studies. The odd way in which the water in a pool being still, could still direct a pathway throughout space. Interestingly enough the property of 'fluidity' was still able to be felt throughout the space even when the water was completely tranquil.



CASE STUDIES SUMMARY

There have been a few times throughout my research and studies of past projects that I have felt this way. I admire the way Tadao Ando is able to express his love for the natural and spiritual world through his progression of spaces. Or how Zumthor is able to break down the methodical ritual of bathing in such a way that it brings a whole new appreciation to an everyday activity. That is what I find truly astounding about my research of these projects: how all of them were able to put on a type of 'performance' for the visitor through the architecture. It wasn't just about going to church and continuing home, or taking a dip in the local swimming pool. They were able to create experiences by connecting with your senses in ways that touched the subconscious.

There are many other architectural masterpieces in the world that achieve exactly what I mentioned; these projects relate, however, on so many different levels. Their integration into their landscape, for one, was a strong driving factor while choosing these projects. The site that I have chosen is in such a delicate, yet naturally beautiful environment, that it will be of the utmost importance to integrate them respectfully throughout my design.



HISTORICAL CONTEXT


SEDONA

Sedona: the name of a woman, one of the first to carve out a life in an isolated, rough land where life was balanced by breathtaking beauty and hard work. The very name itself sounds sibilant, inviting, even a bit mysterious. Some point out that it's an anagram for "anodes" and an indication that powerful earth energies emanate from red rock canyons and spires (Bryant 2).

One might claim that Sedona began 350 million years ago. That's how long it has taken to Nature to form the red rocks by earth thrusts, sea changes and erosion forces. Or maybe 1000 years ago, when primitive hunter-gatherers evolved into the Native Americans we know as Sinagua, who farmed and traded with faraway tribes (Sedona Historical Society). However long it took for the landscape to form, there is more to the area than breathtaking views and tourist attractions. The area of Sedona holds paranormal energies that attract people from all walks of life looking to unveil some of Sedona's most elusive mysteries.

Red Rock Country is a place of intensely blue skies, greens of every hue, and reds and golds from the palest peach to the deepest vermilion. It's also an in-between place, not as vast as the Grand Canyon, three hours to the north, nor as extreme as the Sonoran Desert, little more than an hour to the south.





Here, the scenic vistas are closer, friendlier, inviting exploration. The water of sparkling Oak Creek continually draws wildlife and humans alike to its lush banks. With each passing season there is much variety to experience. Springtime brings wildflowers, summer thunderstorms, during the fall oak creek comes alive with vibrant colors, and winter covers the land with a cool blanket of snow and fog. All year long the mild climate of Sedona makes it possible to enjoy this beautiful and natural setting (Bryant 2).


WATER

Oak Creek Canyon is often described as “God’s Country.” Adjectives seem inadequate when trying to explain the liquid brilliant blue of the sky and the warm shades of red rock, riveted with rusty stains where water has flowed for millennia. In fact, being one of the few year-round sources of water in Arizona has played a role in virtually all of Sedona’s development. Early residents relied on Oak Creek and some built irrigation systems not only to provide for their families and livestock, but also to grow crops that became important in the area’s commerce. The creek also helped Sedona become a mecca for tourists from the earliest days. And even the layout of the roads depended on what routes carved out by early residents could be best navigated during high water (Heidinger and Trevillyan 7).



These roads that wind through the town of Sedona and Oak Creek and eventually lead south to the metropolitan Phoenix area are not only dictated by the path of Oak Creek Canyon, but beautifully enhanced by the scenic variety the creek gives to the area.

Arizona, as in all arid regions, water means life. Arizona faces constraints on its water supply more severely than almost any other state in the nation. The eternal problem of scarcity is obvious when we consider the etymology of the state's name. "Arizona" is believed to have been derived from the Native American word "arizonac," which means "the place of the small spring." Arizona's major water problems are the stress consumption places on supply, and an imbalance between the places people live and where water is most abundant. Averaging less than 10 inches of rainfall per year, Arizona relies on groundwater for more than 40 percent of its water supply. Agriculture has historically pumped vast quantities of groundwater, and the state's rapid population growth in recent years has amplified the use of groundwater for municipal and industrial purposes (Arizona Department of Water Resources, 2010).



In Arizona, most of the water that seeps into aquifers (recharge) comes from streams fed by mountain runoff. Additional recharge occurs when crops and turf are irrigated and comes from storm water and municipal discharge of treated sewage. Northern Arizona aquifers are characterized by fractured rock; in many places, wells must be drilled to great depths, and may yield little or no water. In parts of Arizona, overdraft is a serious problem that has led to land settling and cracking (subsidence), lower well yields, quality degradation and the drying up of streams and rivers. In 1980 the Arizona legislature passed the Groundwater Management Act to regulate pumping in areas with substantial overdraft and to bring pumping and recharge into balance (University of AZ, 2010).

The fragile state of the groundwater in Arizona is an issue that needs to be handled with the utmost care. Water conservation is at the base of all development and is especially important in the southwest. By understanding new methods and technologies, as well as learning from the mistakes of the past, we can hope to not only survive on the water of the land, but thrive on it as well.

ENERGY

Many people believe Sedona is not only blessed with the physical beauty of the vibrant red rocks and Oak Creek Canyon, but is also home to some of the earth's most active energies. It is often a destination for those who seek out spiritual locations where the energy is right to facilitate prayer, meditation and healing. These locations are referred to as vortexes, much the same as a whirlpool in a river, or the swirling wind of a tornado. Vortexes, however, are not created by wind or water, but from spiraling spiritual energy.



“A VORTEX IS A PLACE IN NATURE WHERE THE EARTH IS EXCEPTIONALLY ALIVE AND HEALTHY (ANDRES 12).”

The scale by which we measure the aliveness of something or someone is called health. That's what we call people when they are full of life: healthy. The most obvious way we recognize health is through physical indicators. When we see a healthy person, we may notice the tone of the skin, the brightness of the hair or the sparkle in the eyes. A second sign of good health is that a person has what all healthy beings have: more energy. We can't necessarily point to a body part that contains the energy, but we know it is there. This sounds fine, but what does it have to do with a vortex? Consider one of the most significant advances in scientific thought of recent time. Having reviewed the cycles and changes in geological, atmospheric and climactic aspects of our planet, scientists have begun to consider that the Earth itself is a living organism. Ironically, this is exactly what ancient peoples who have lived close to the land have said for centuries and what environmentalists have been suggesting for decades. The Earth is alive. This raises a couple of interesting questions. If the Earth is alive like other living beings, is it possible that there are places where it is healthier? If so, what would such places look like, and what would they be called?

Such a place would be called a vortex, and Sedona is one such place.

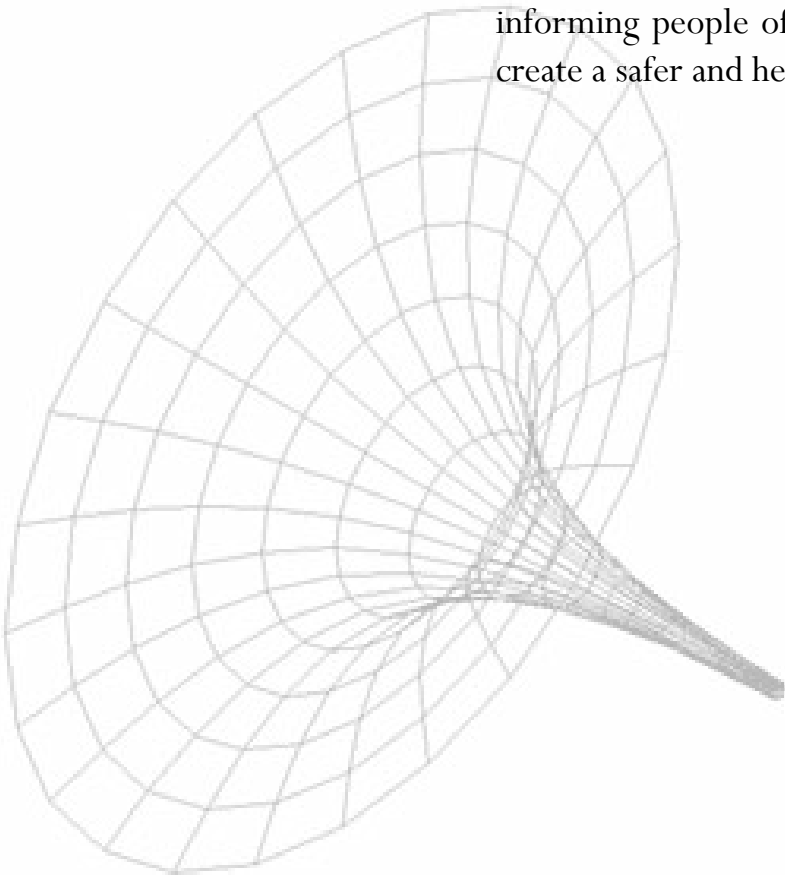
SUMMARY

There are many projects in history that attempt to explore the unknown. Some of the most interesting and architecturally meaningful are often churches and places of worship. They are often places of true belief, where healthy energy is directly focused. The experiences had in these environments is much like the experience I will help the visitors of my site experience. By mixed methods of teaching and experiencing, I intend to leave guests with a feeling of fulfillment, happiness and health.

Our day to day experiences are filled with unhealthy thoughts and messages. From the commercials on television, to the conversations



overheard walking down the street, there is an escalating amount of negative energy circulating in our society. By creating an environment free of those thoughts and emotions, along with informing people of their affect on others, it may be possible to create a safer and healthier society.



GOALS

ACADEMIC

During my thesis research I intend to not only explore the thoughts and ideas of well-known artists, scientists and philosophers of the past, but combine those theories in new and interesting ways. Through my studies I propose to combine these theories through the language of architecture. My main goal is to transfer the act of learning into an empirical spacial progression, where learning is done on a subconscious level and the experience is of the conscious.

PROFESSIONAL

My goal throughout this thesis project is to create and develop a program that is of a professional level. Not only will I strive to create a project visually and graphically pleasing, but one that shows the fullest understanding of design documentation. Structural innovation will also be a strong driving factor in my project. I believe that one of the biggest gaps between academia and the work force lies in the fundamentals of building construction. Throughout this design I will attempt to develop a structural system that is not only cohesive with my design, but takes into consideration the complex and intricate formations of the chosen site.

PERSONAL


Through design development and research, my intentions are to not only explore a new building typology, but to expand my knowledge of the theoretical base behind my studies. Through documenting case studies, scientific theories, site analysis and statistics, I hope to expand my knowledge on not only this topic, but many others. The overall goal of my project is to complete a comprehensive study through the architectural design of a new and interesting building typology to further enhance the health and wellness of our society.



SITE ANALYSIS

Selecting a site was one of the most important choices from the start of my project. The relationship between the natural and built environment is one of the most important factors of study.

I first stumbled upon this area of the country while living in Phoenix for the summer. Passing through Sedona many times, eventually I was drawn into spending more time there, camping, hiking, biking, and enjoying the beauty of the landscape.



There was one specific time that I can recall, while hiking a trail along Oak Creek that connected me to the true beauty of the area. The remoteness of the area is something to be cherished. There are fewer and fewer places that have yet to be tarnished by economic growth and development, and I can say that Sedona and the Oak Creek Canyon remain one of them.

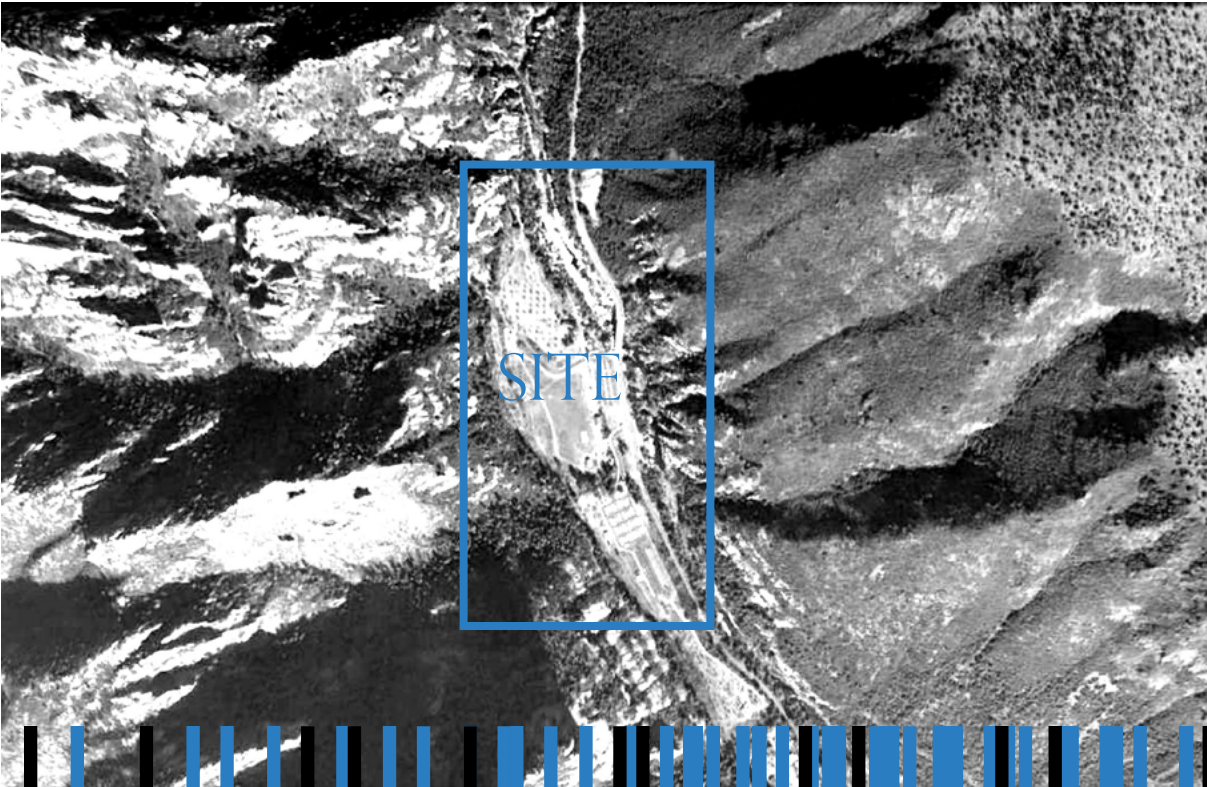
While hiking along a well beaten path, most likely travelled by thousands of enthusiasts alike, I couldn't help but wonder what brought us all to this same exact spot. The views are breathtaking, the terrain feasible, but what intrigued me more was the mystery of how that tiny creek could carve such an amazing path through the solid walls of rock that climbed hundreds of feet above us. I started to think about the mystery of the creek in not only earth-shaping ways, but about what draws us to water. The trickle of the creek drew us along this path for a good two miles or so, then disappeared. We had the choice to turn around and hike back the way we came, or to proceed and find out where this tiny creek was headed. We continued on.



As the lush vegetation closed around us, making the path hardly a figment of our imagination, the sound of the creek was always there in the background, drawing us closer. After another few miles of hiking, we rounded a sharp corner and there, a fair twenty feet below us, was a calm pool of deep blue water. The faint echo of soft rapids could be heard in the distance. As we climbed down to the pool it was near impossible to ignore the complete tranquility of the scene. We took off our shoes and slipped our bare feet into the water. As the cool water soothed my aching feet, I couldn't help but wonder: what is it about water that dictates not only our actions, but our emotions?

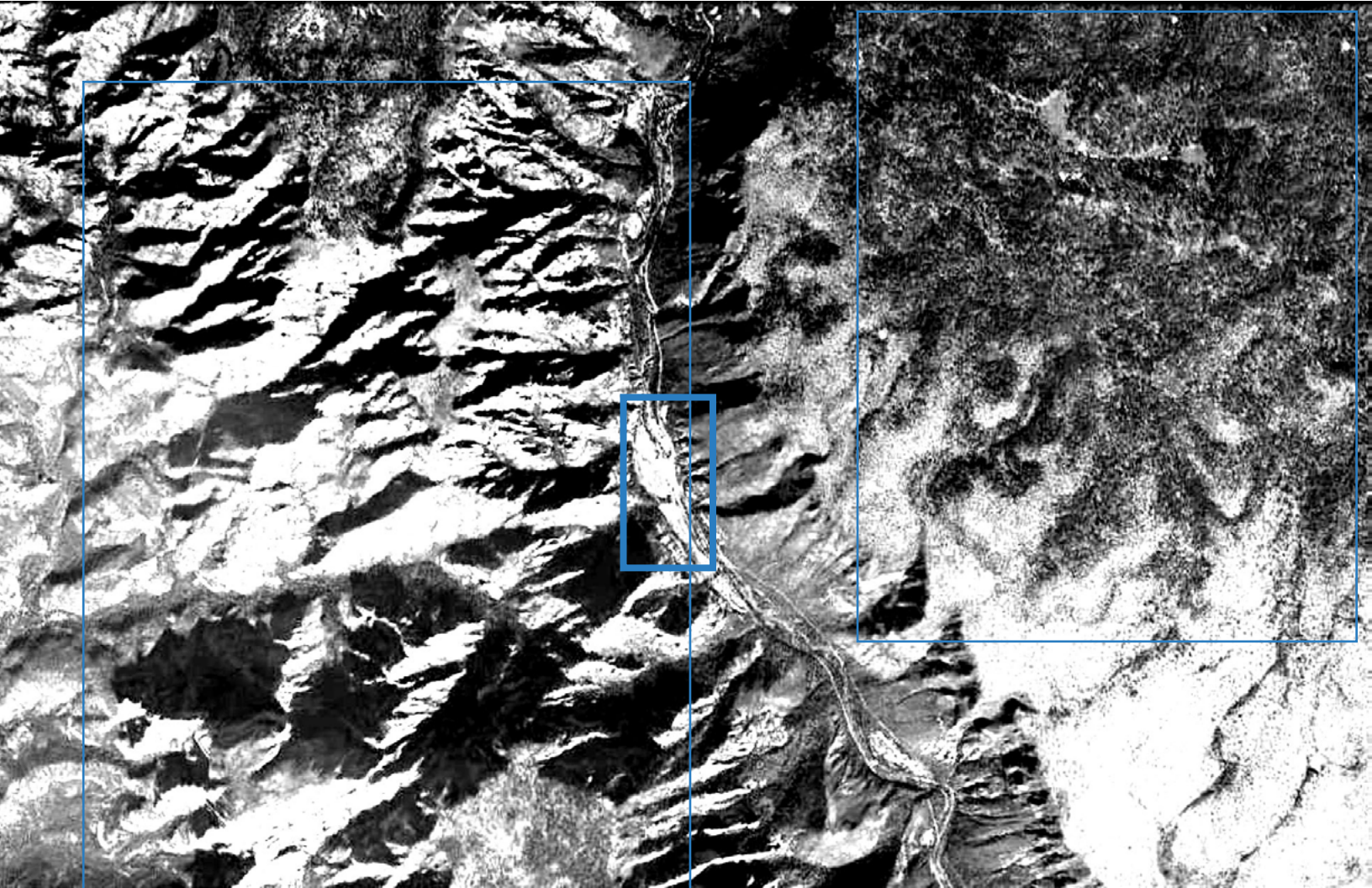
The site of my proposed project is in a remote area where any sort of grid system is irrelevant. The contour lines of the area form their own type of a natural grid system, but as far as development goes, highway 89A is the only sort of path along which to develop.

GRID SYSTEM



Oak Creek Canyon is composed of many different textures. The natural juxtaposition of the jagged rocks against the lush vegetation along the creek is what gives the area such intrigue. Looking out across the landscape, one is able to see such a vast expanse that the spotting texture of brush from a distance may appear to be shrubs, but in actuality is a forest of trees. Perception plays a large role when analyzing this landscape. A peak that looks a mere ten minutes away can easily turn out to be a four hour hike.

TEXTURES



PHOTOS COURTESY OF GOOGLE EARTH

The texture of the mountains to the west forms a striking contrast to the lush sloping brush to the east.







GEOMETRIES

There are many types of geometric shapes in nature, so it was not uncommon to notice geometry all around me. A few of the examples I chose, however, struck me as slightly more powerful. The contrast of the steel bridge stretching across the river valley is one example of a man-made geometry that fits nicely in with the landscape.

The mirror-like reflection of the rock into the calm pool of water from Oak Creek is another example of geometry at work in the natural environment.





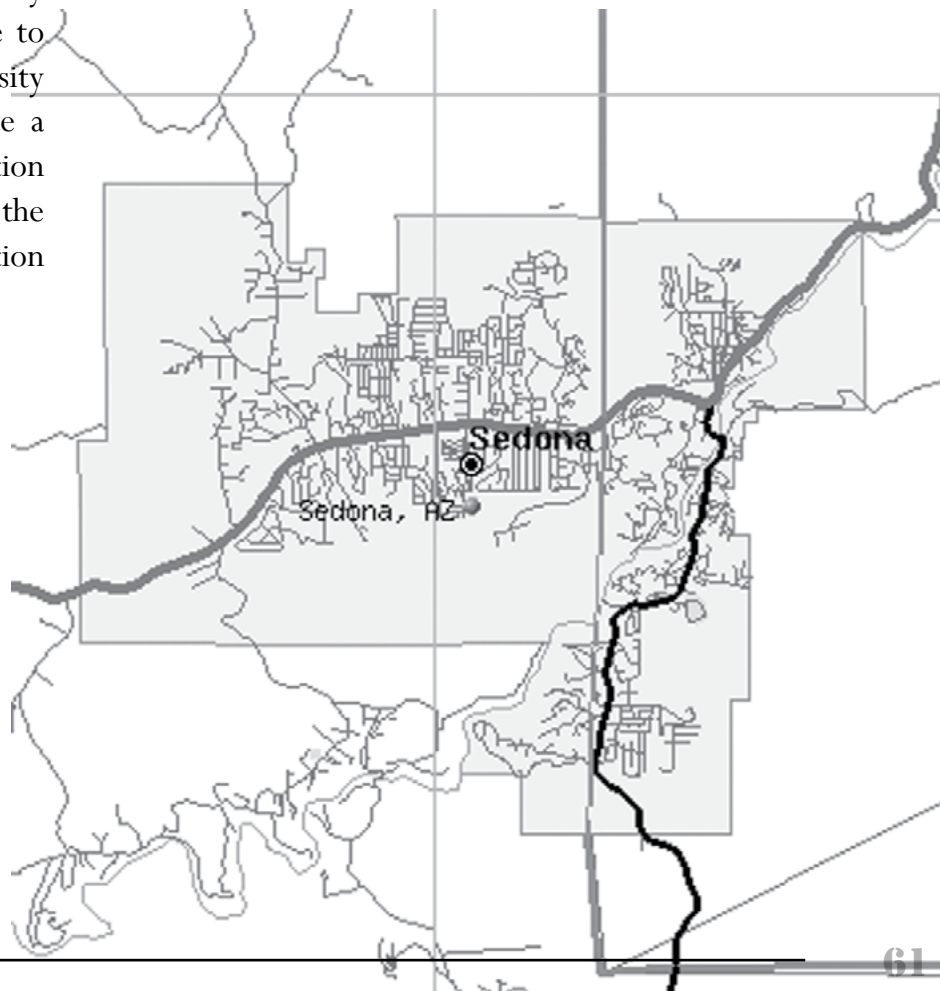
SHADE AND SHADOW



In such an extreme terrain, the shade and shadow patterns of the sun have a large impact on design solutions. Awareness of these patterns is especially important while working in such close proximity to extreme elevation changes.

The population density of the city of Sedona is 624 people per square mile (Courtesy of City-Data.com). This is a relatively low density rate for Arizona, however, the site home to my proposed project is undeveloped. Density in the area increases and decreases quite a bit because Sedona is such a 'hot' vacation destination. Many city-dwellers living in the Phoenix metropolitan area have vacation homes in the hills of Oak Creek Canyon.

DENSITY



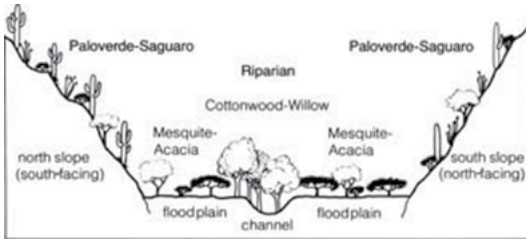


Along with the drastic changes in the shade and shadows of the Oak Creek Canyon, light plays a large role in my site analysis through its reflection on the creek. The reflection of the light off of the creek enhances the experience of the pooling water in the canyon. During the winter months, Sedona will often get a fair amount of snow, light will then be a factor, once again bringing out the crisp and clean lines of the rocks and vegetation against the ravines of the canyon.

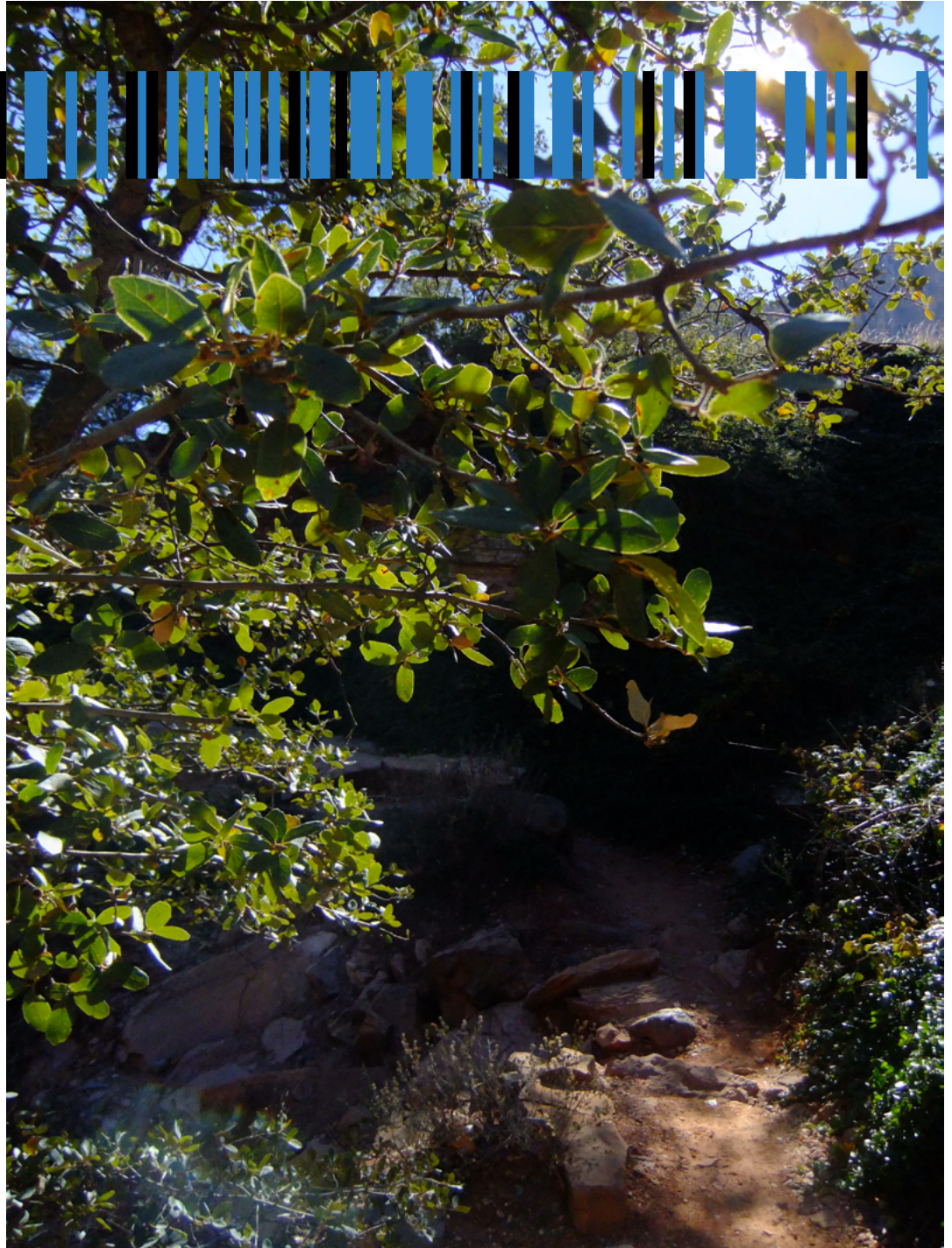
LIGHT

VEGETATION

There is a wide variety of growth in the Oak Creek Canyon area. Specifically around my chosen site, you will be able to find Cottonwood, Willow, Acacia and other small brush much like that of creeks in other parts of the country.



LOW ELEVATION RIPARIAN WOODLAND (AFTER C.H. LOWE, 1972)



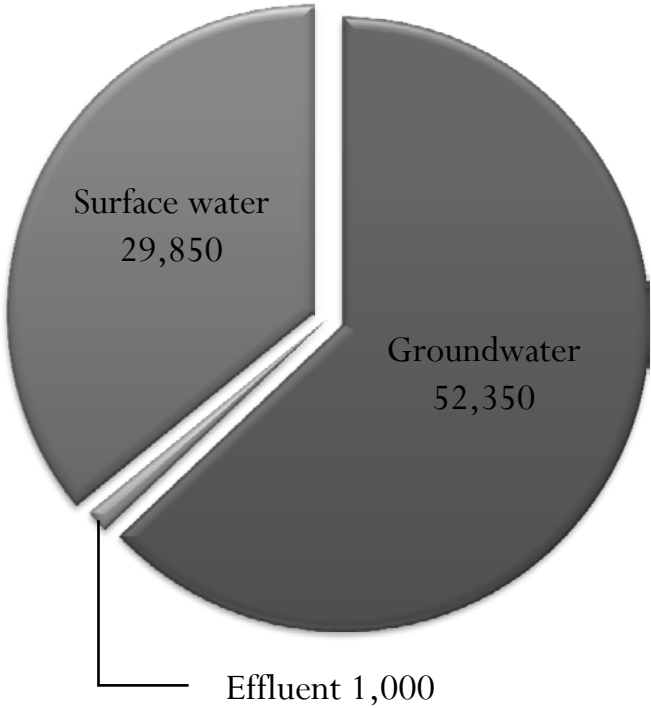
WATER

Water of course plays a main role in the developments of my project. In an area where water is a scarcity in the summer months, the stark contrast of a building designed fully around water will be ever more enticing to visitors.

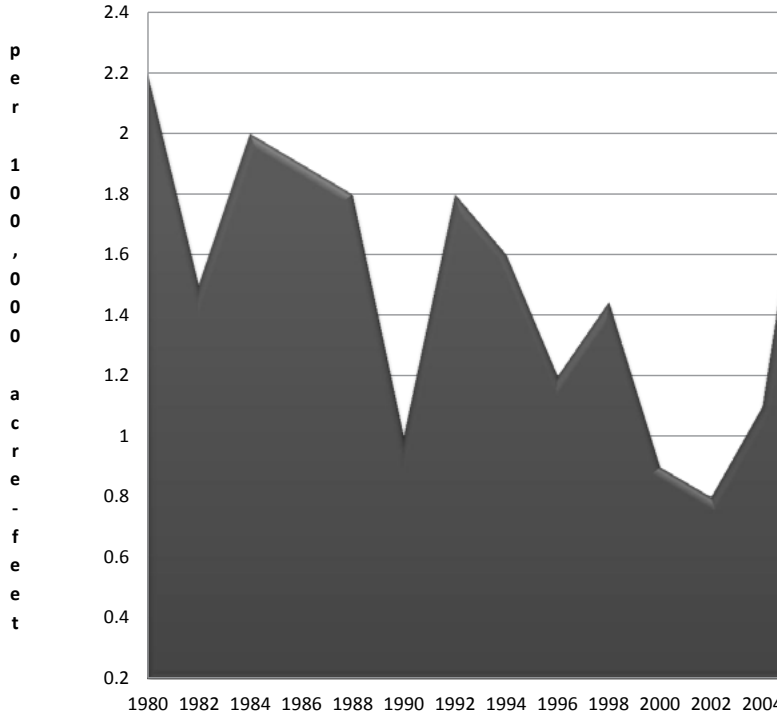
Oak Creek is a tributary of the Verde river, the median flow at the Oak Creek Gage near Cornville is about 531,000 acre-feet. The lowest flow reported at the Oak Creed Gage was about 214,500 acre-feet in 1956 (Arizona Department of Water Resources, 2009).



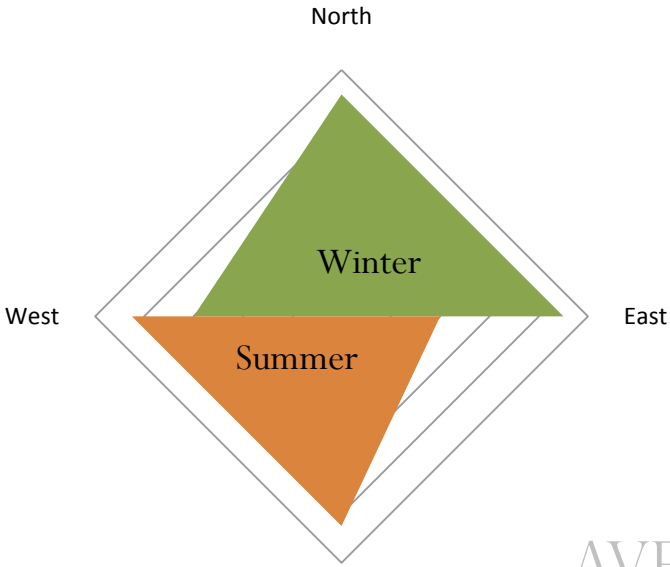
AVERAGE ANNUAL WATER SUPPLY UTILIZED IN THE CENTRAL HIGHLANDS PLANNING AREA (IN ACRE-FEET)



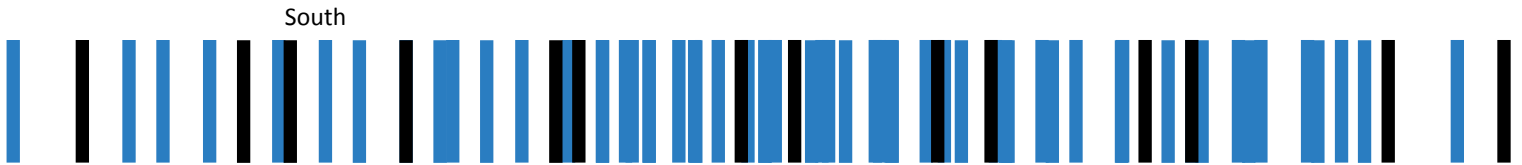
WATER STORED ON MAY 1ST IN SRV RESERVOIR ON THE VERDE AND SALT RIVERS, 1980-2006



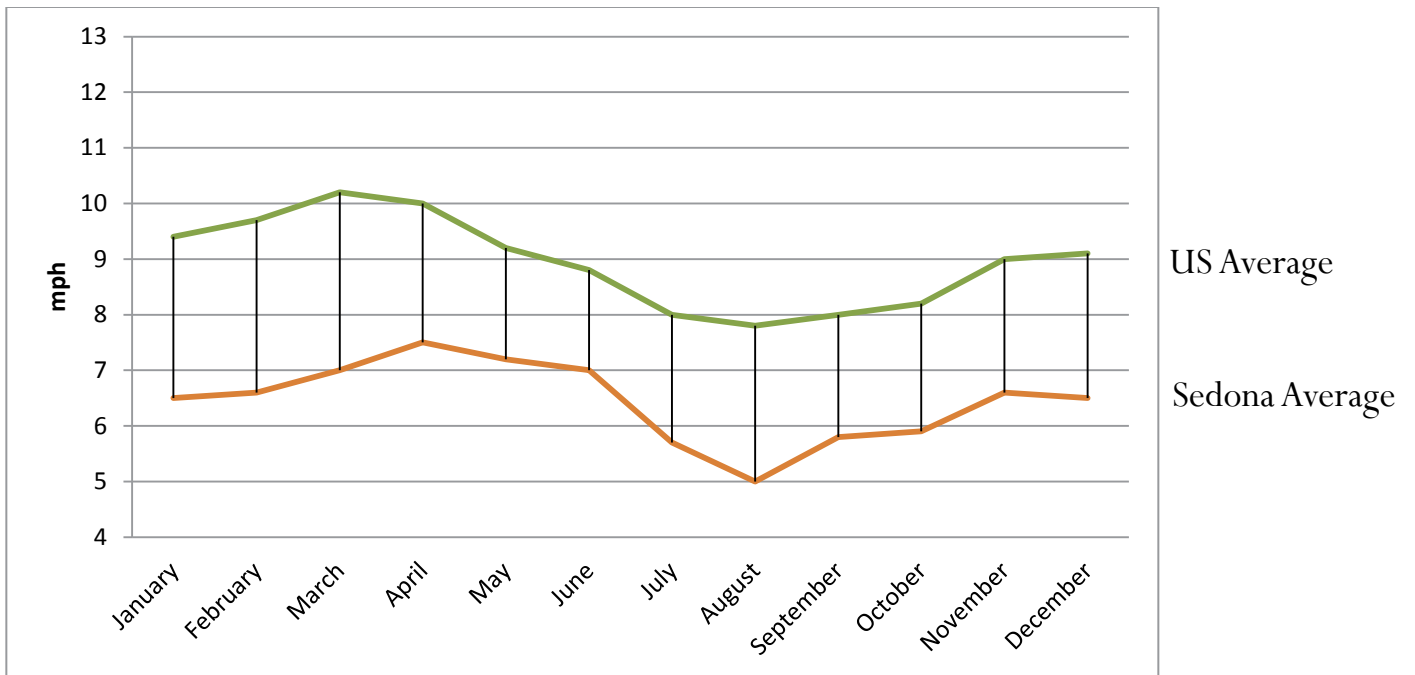
WIND



AVERAGE WIND DIRECTION



AVERAGE WIND SPEED



HUMAN CHARACTERISTICS

The human characteristics of the site are very minimal. With Slide Rock State Park just to the north, human interaction is directly focused already. The area still remains intensely remote if travelling off the beaten path. Just as far as 50 yards or so down the creek from the state park, on one of its busiest summer days, it is almost impossible to hear another human voice.

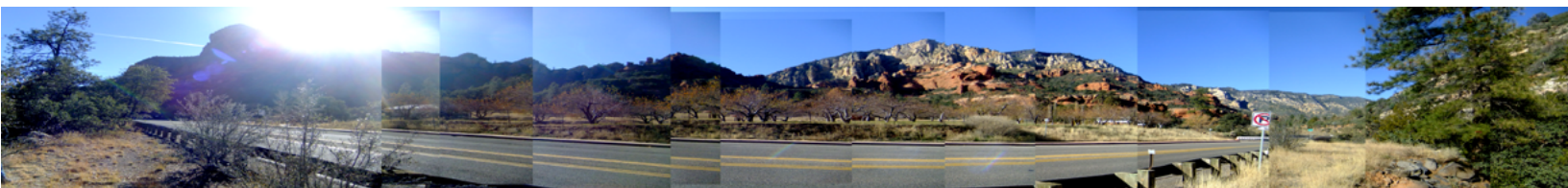
DISTRESS

The distress on the site becomes more evident at a macro level of analysis. The distress on the land is mostly caused by the erosion of the canyon through years and years. As Oak Creek continues to carve a path through the canyon, more and more mysteries will likely be revealed.



SOILS

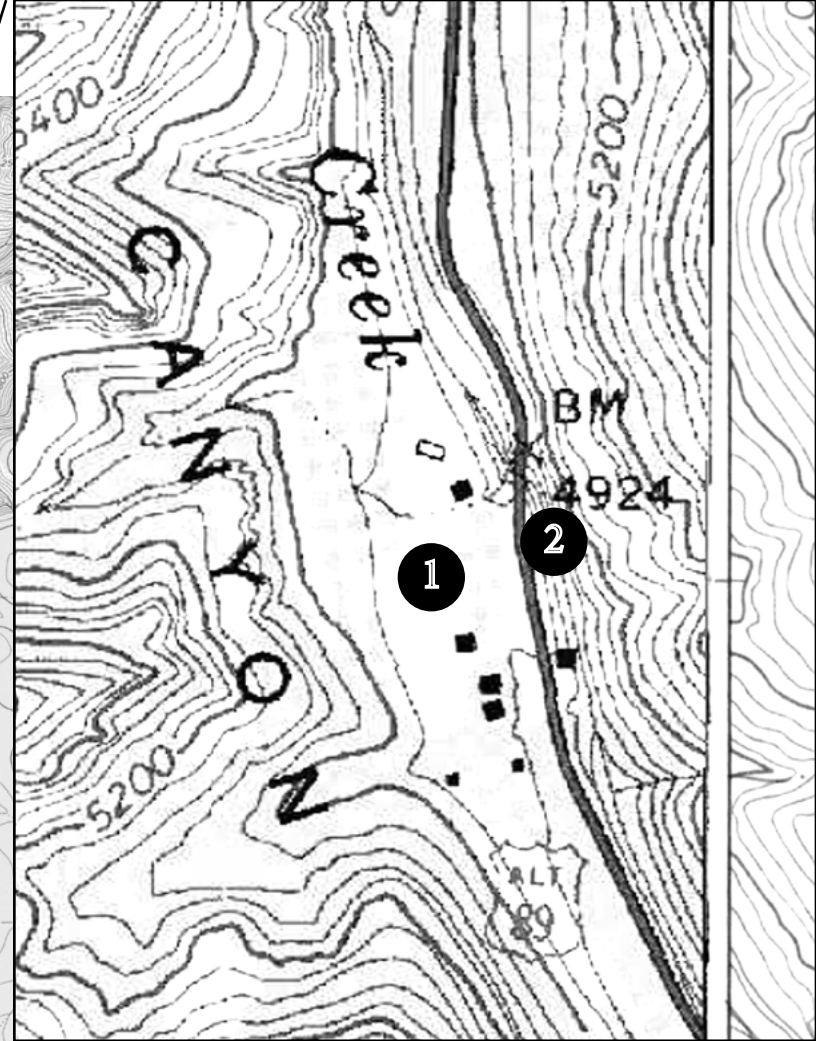
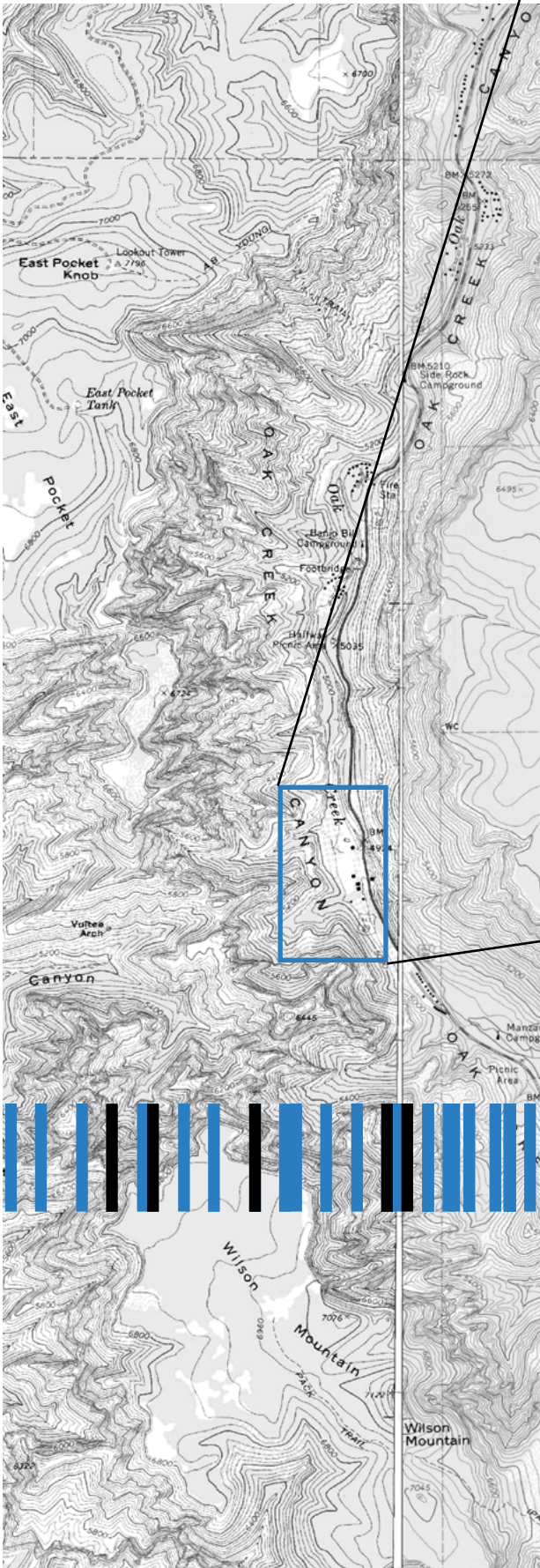
The monumental formations of Sedona are caused by the vibrant red sandstone and much erosion throughout the decades. This sandstone, a member of the Supai Group, was deposited during the Permian Period.



TRAFFIC

Vehicular Traffic to and from the site is restricted to highway 89A. The only highway connecting Sedona to her northern neighbor, Flagstaff. Pedestrian traffic on the site is controlled by wide paved walkways throughout the State Park. There is one main access point down to the creek from the plateau for parking. This creates a stream of traffic that is highly concentrated in one area of the site, leaving the rest of the site still very







1 view looking south



1 view looking west

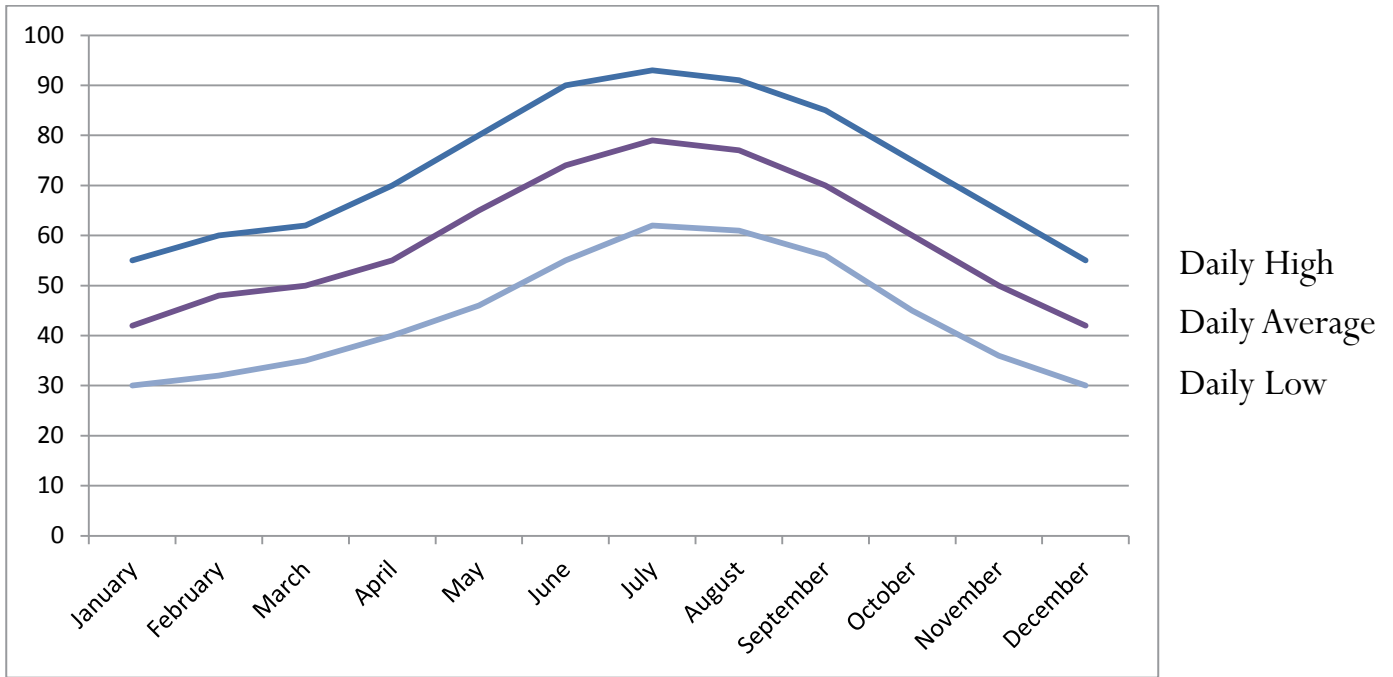


1 view looking north

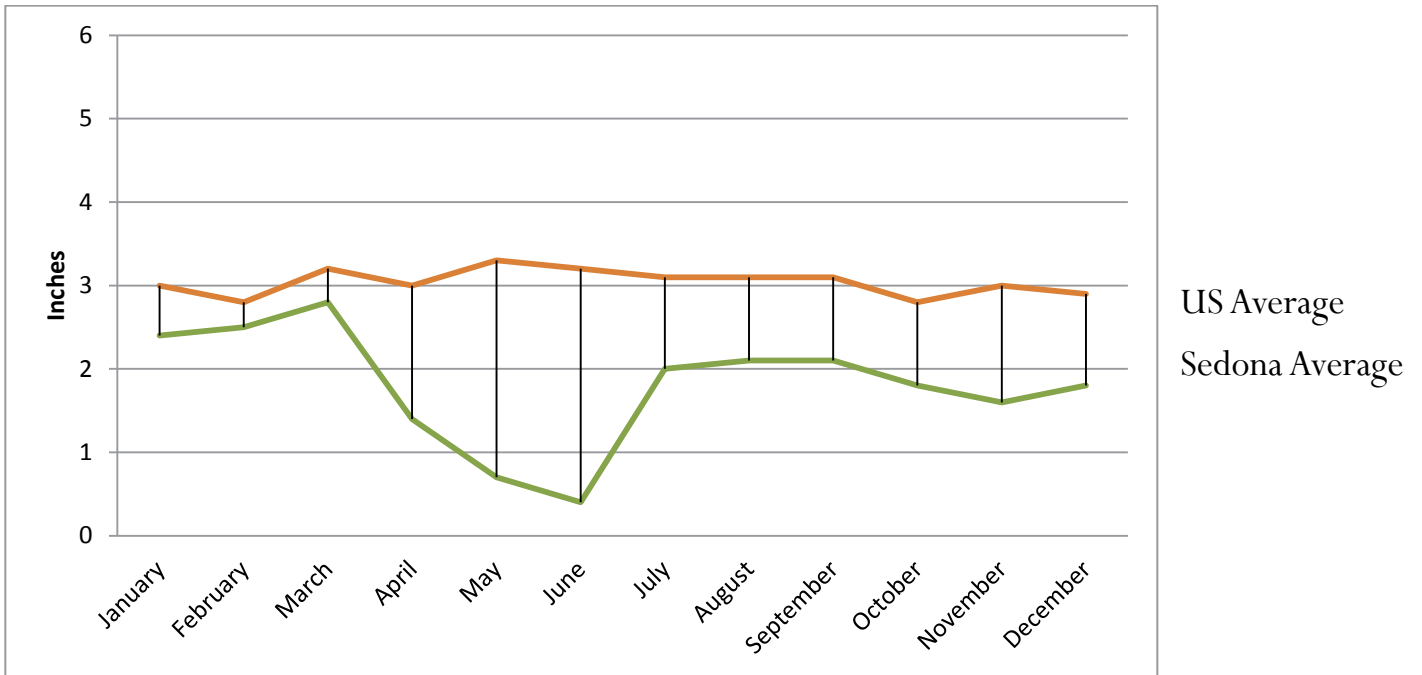
2 panoramic of creek looking south



AVERAGE TEMPERATURES



PRECIPITATION



CLIMATE DATA

EMOTO RICE EXPERIMENT

This experiment was conducted over a ten week period





Two containers were filled with cooked rice. On one container was written “Thank You”, on the other, “You Fool”. Both containers had those words repeated to them on a daily basis. The photos shown are the results of the contents changing every two weeks.



EMOTO RICE EXPERIMENT



DAY ONE

This experiment was conducted over a ten week period



EMOTO RICE EXPERIMENT



WEEK TWO

This experiment was conducted over a ten week period



EMOTO RICE EXPERIMENT



WEEK FOUR

This experiment was conducted over a ten week period



EMOTO RICE EXPERIMENT



WEEK SIX

This experiment was conducted over a ten week period



EMOTO RICE EXPERIMENT



WEEK EIGHT

This experiment was conducted over a ten week period



EMOTO RICE EXPERIMENT

THANK YOU



YOU FOOL



WEEK TEN

As seen throughout the photos, the rice had a strong reaction to the negative connotations written and spoken to it. With the rice being up to 75 percent water, makes you really think about how our negative words can affect others. Up to 70 percent of the human body is made up of water.

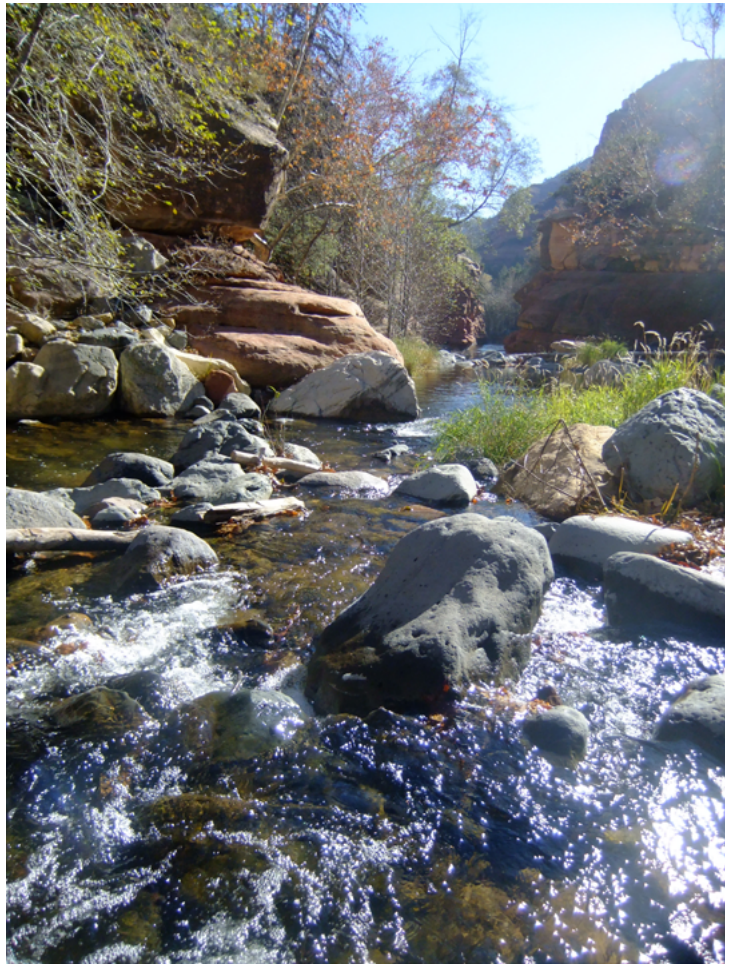


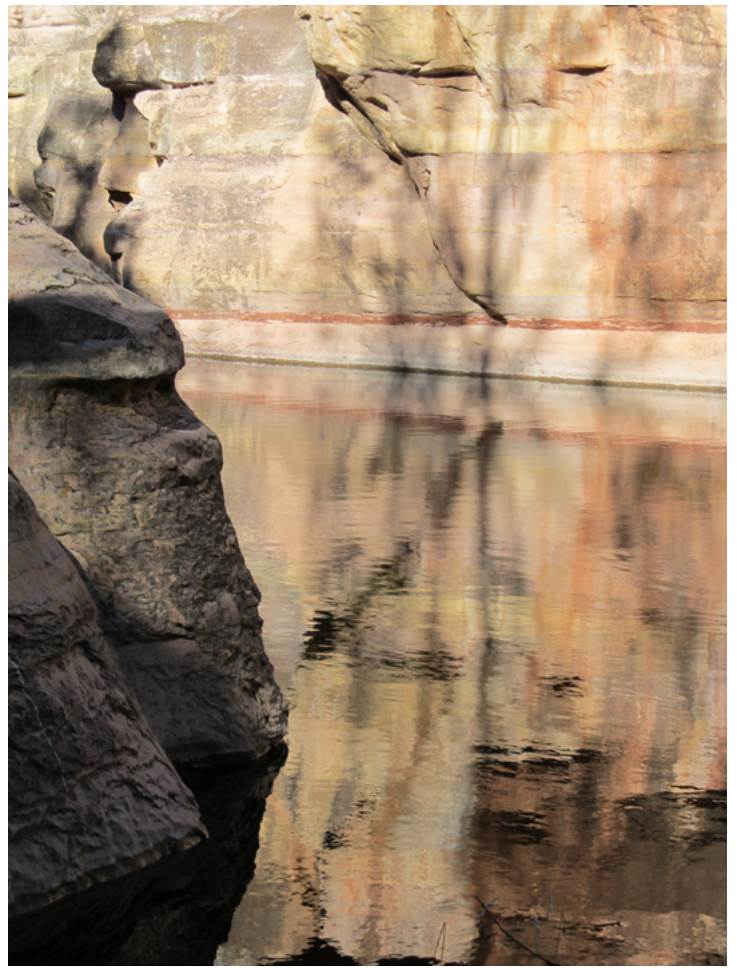
PHOTOS



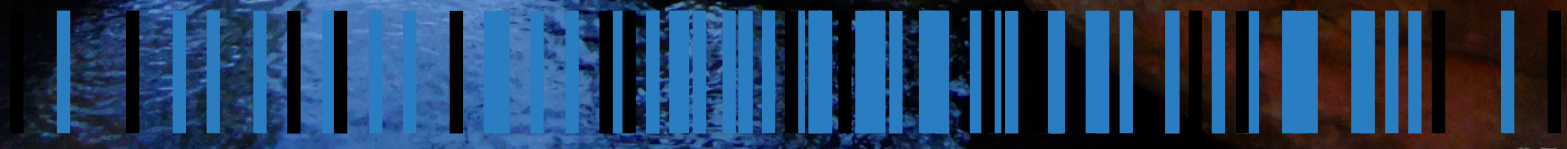












SPACES

1,000 s.f.

ENTRY

1,500 s.f.

CHANGING ROOMS/
REST ROOMS

Baths will transition throughout the other spaces, total square footage of the pools will be approximately 3,000 s.f.

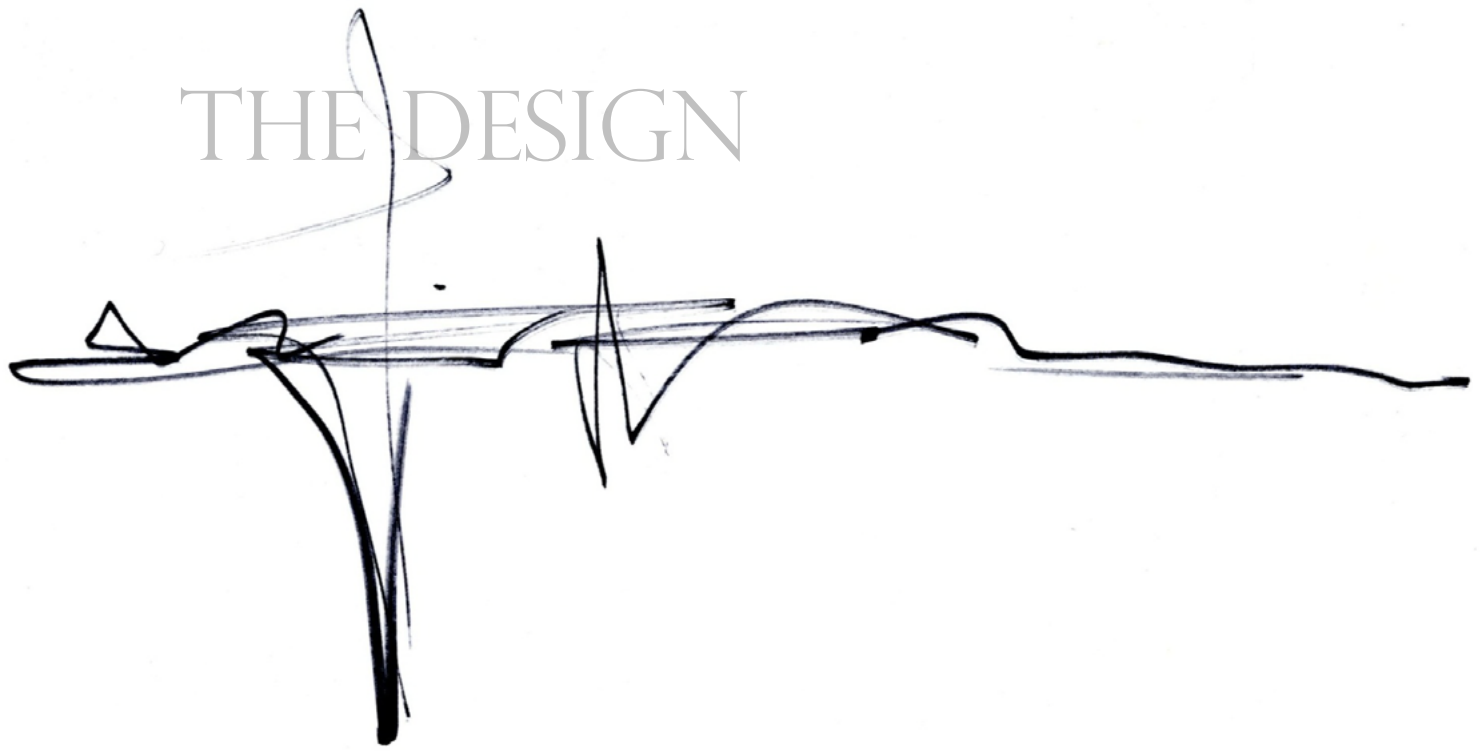
BATHS

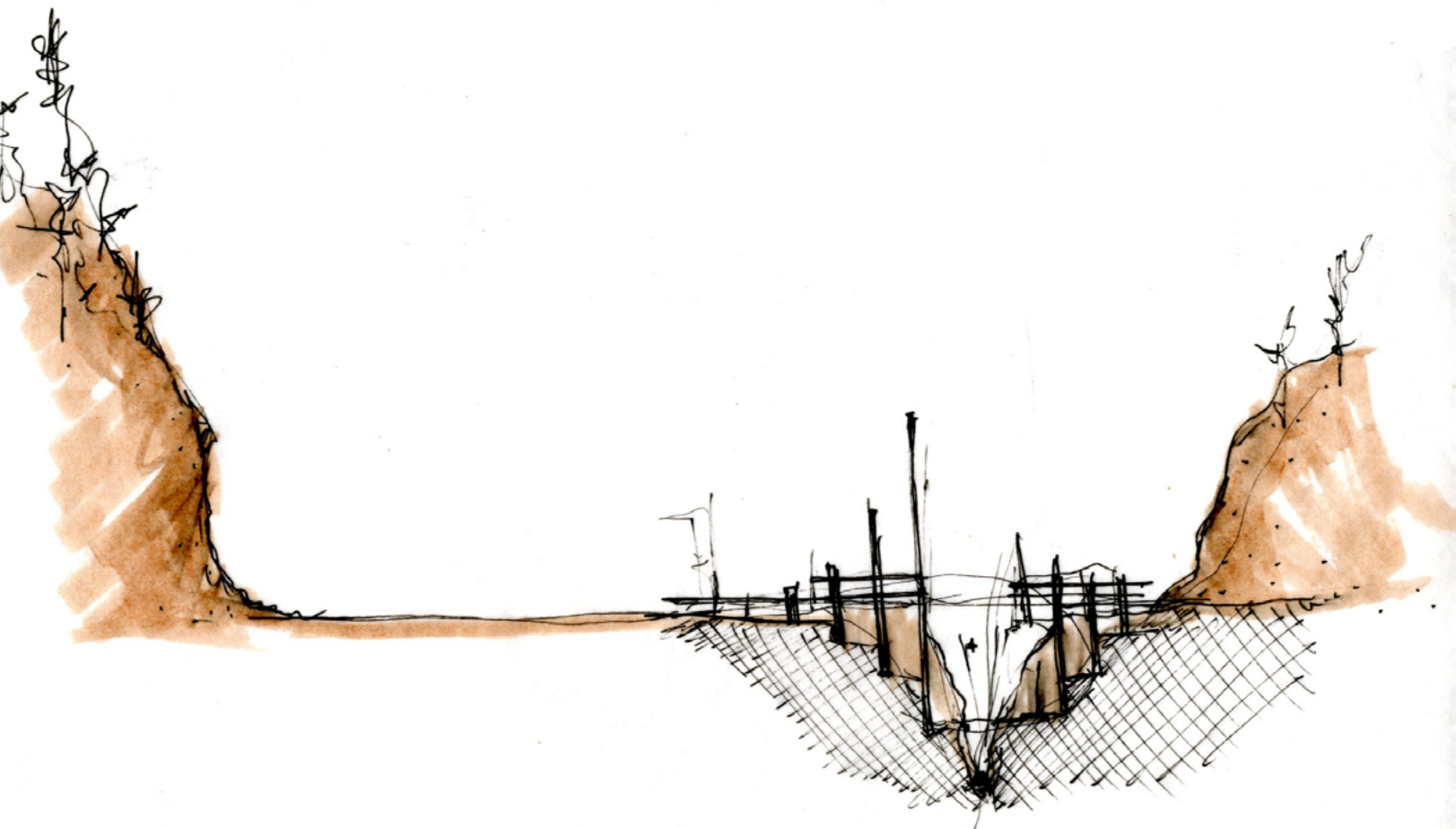
Addition space to house mechanical, equipment storage, and bike storage will be approximately 1,500 s.f.

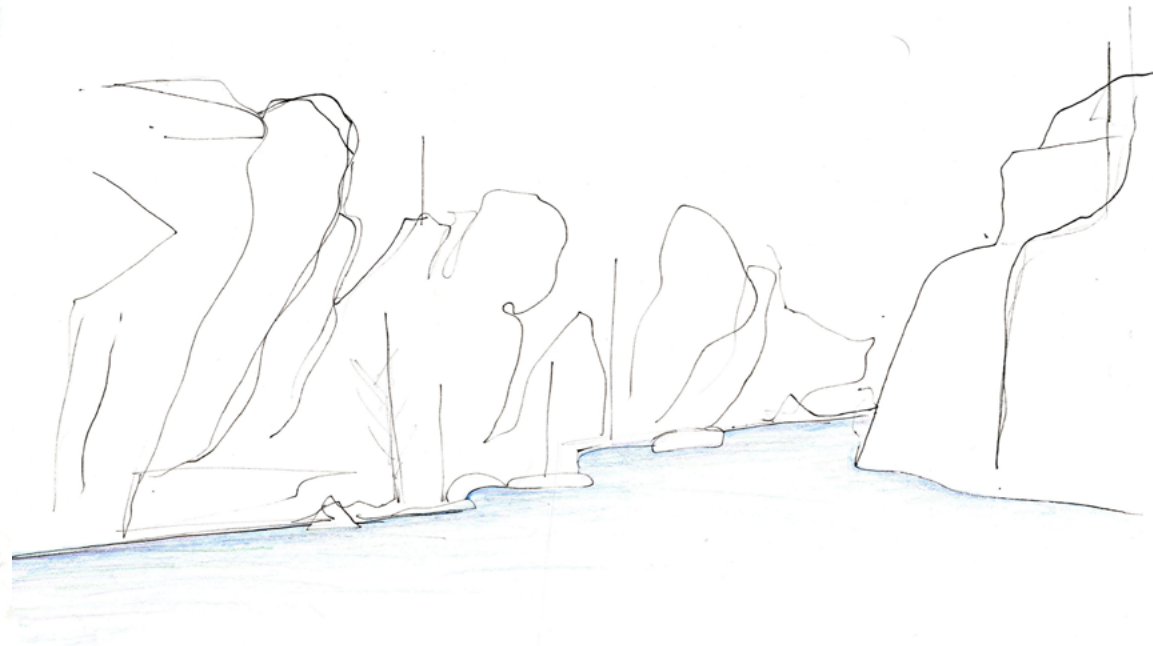
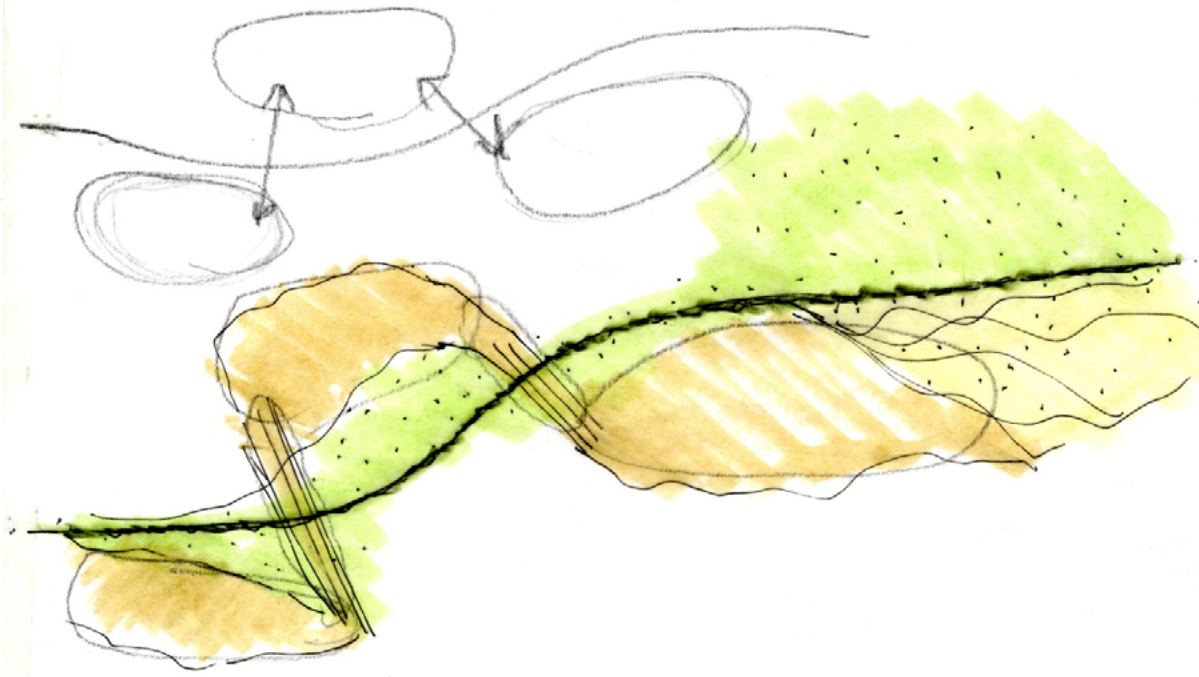
MECHANICAL
STORAGE

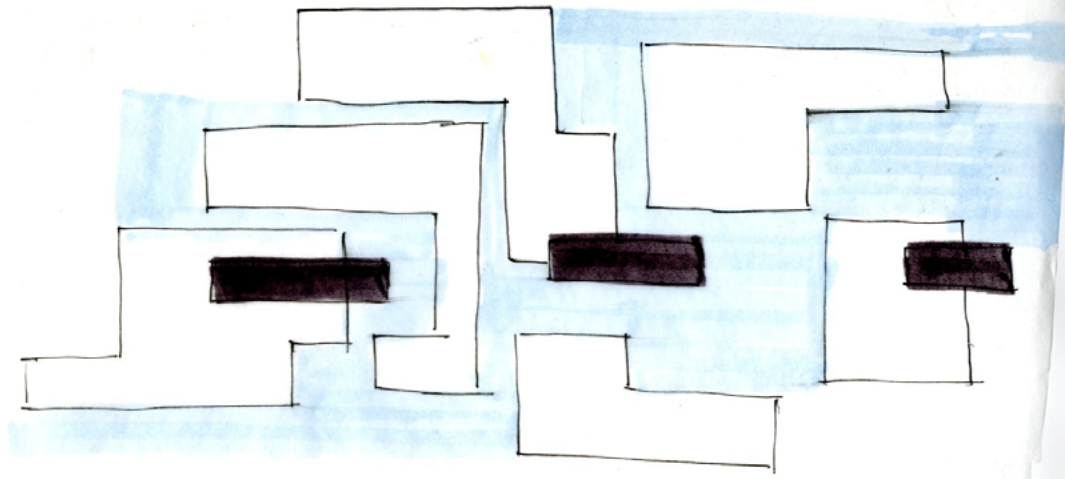


THE DESIGN



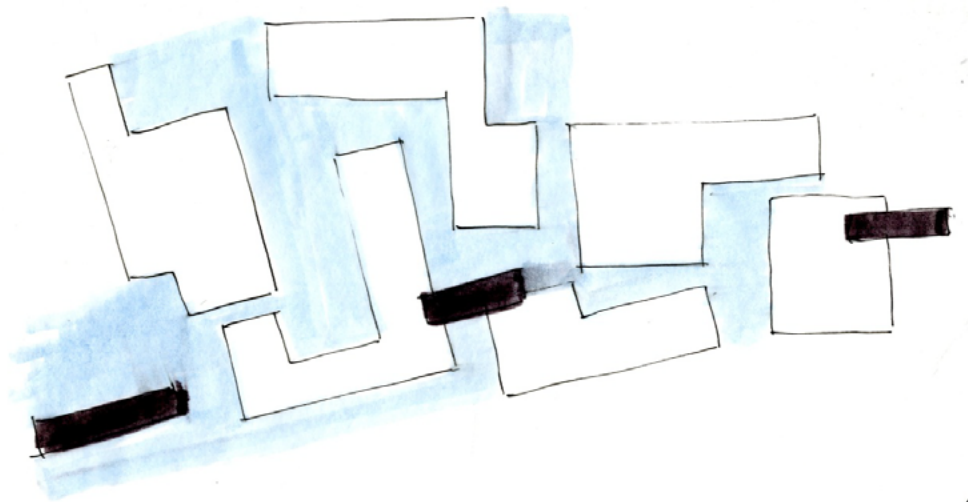




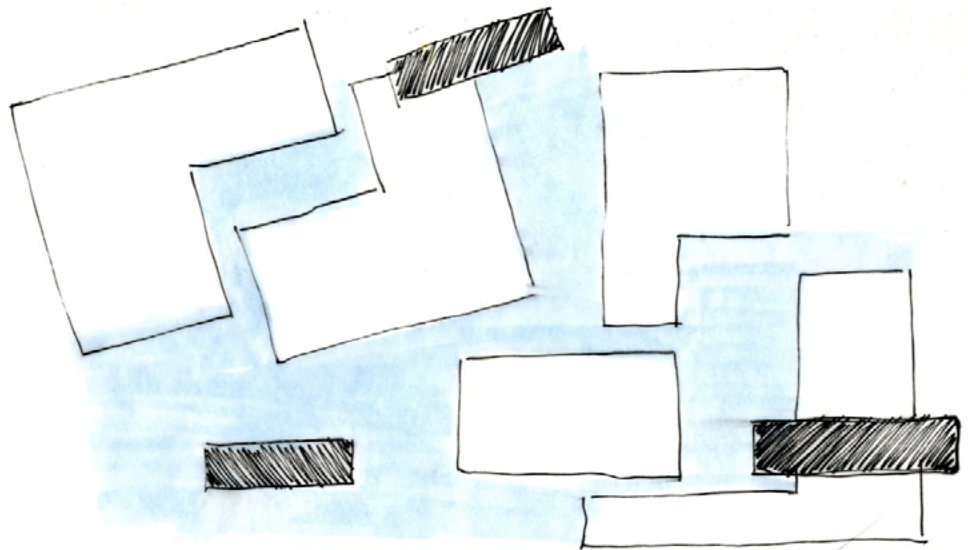


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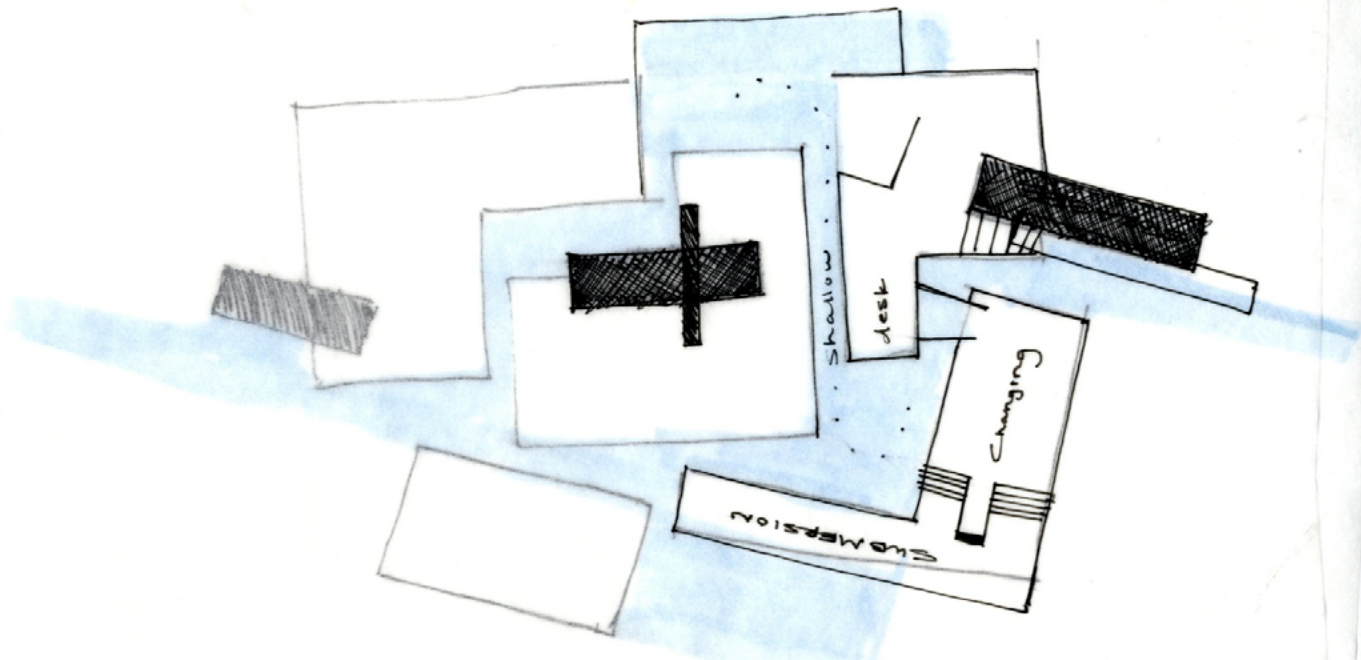
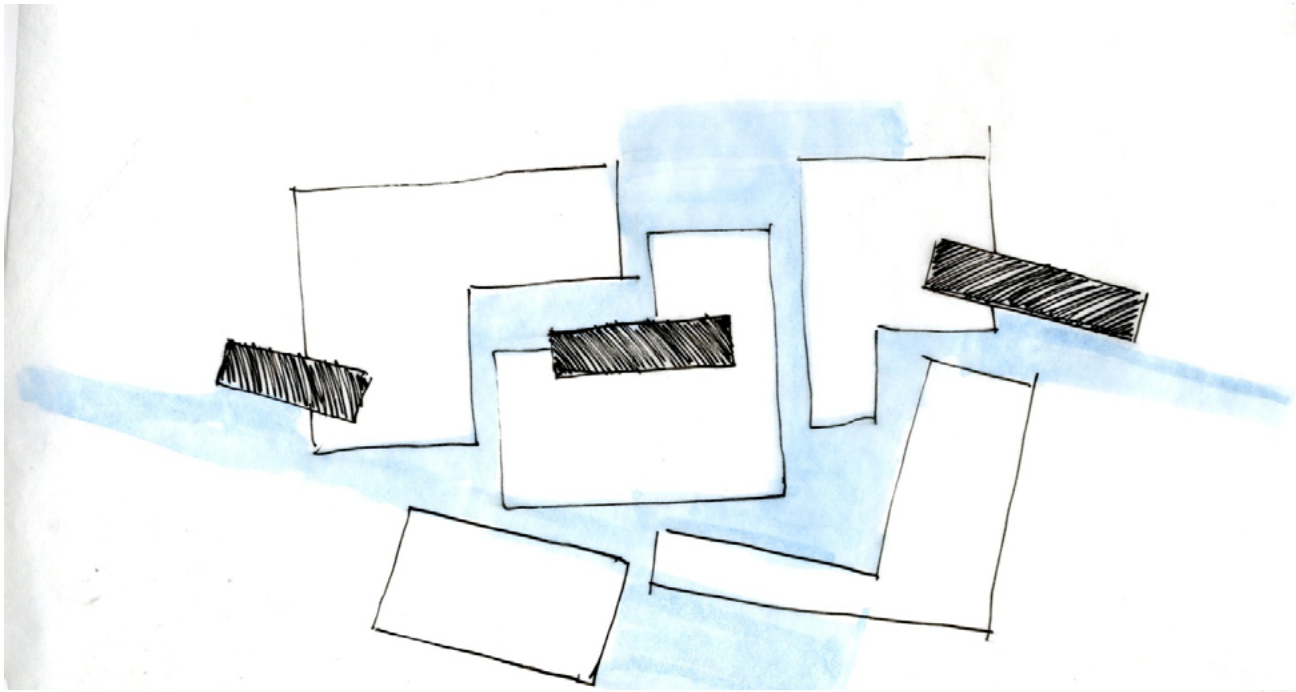
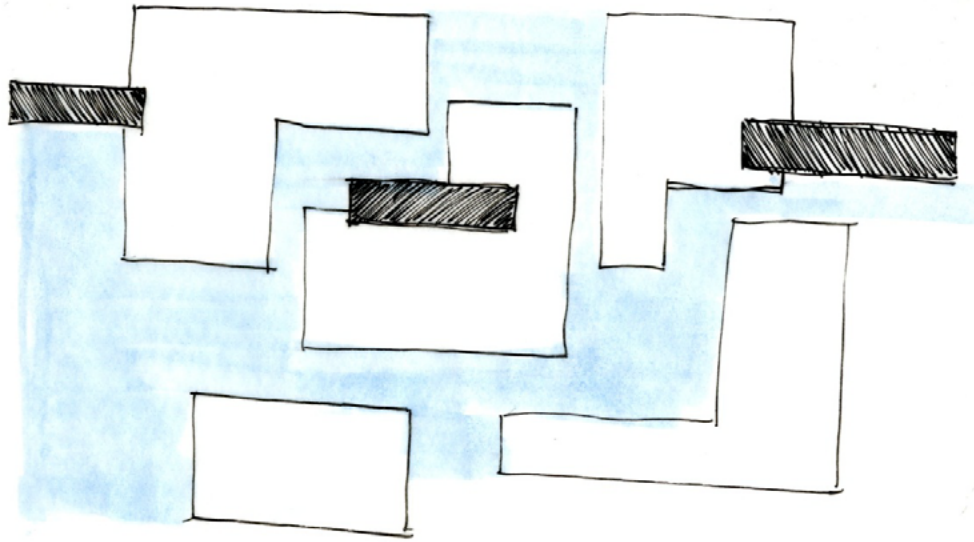
massing studies



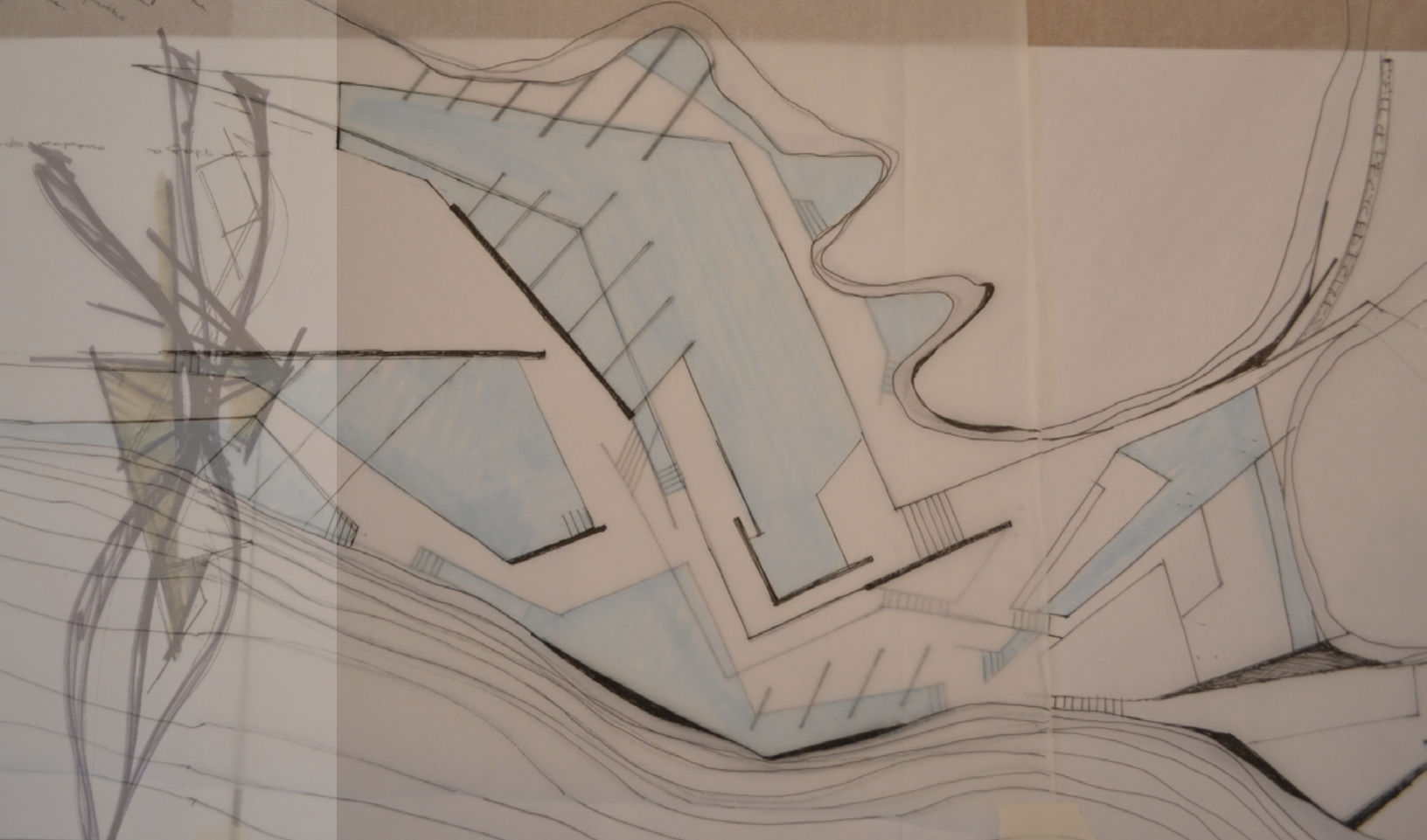
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5

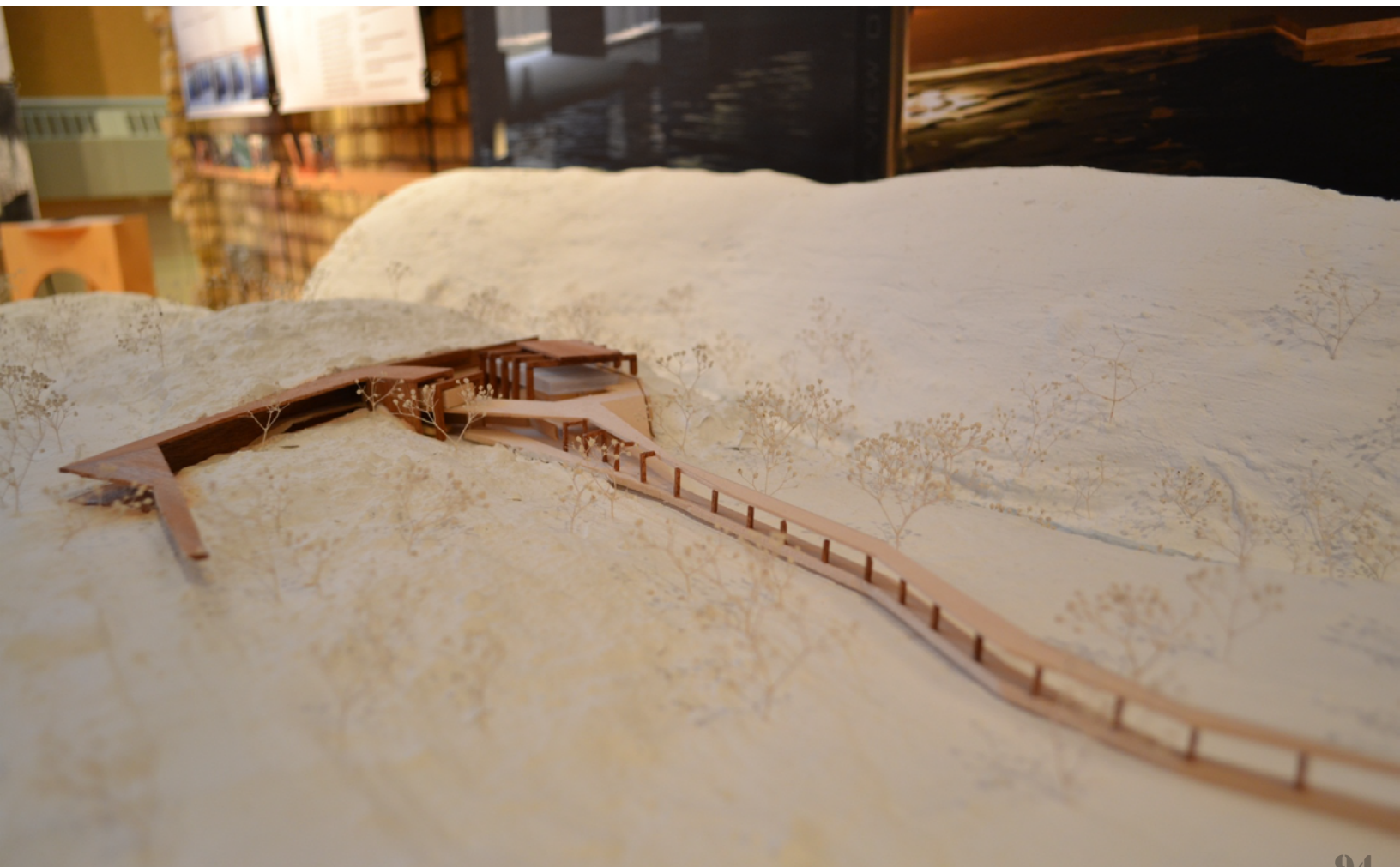


MIDTERM

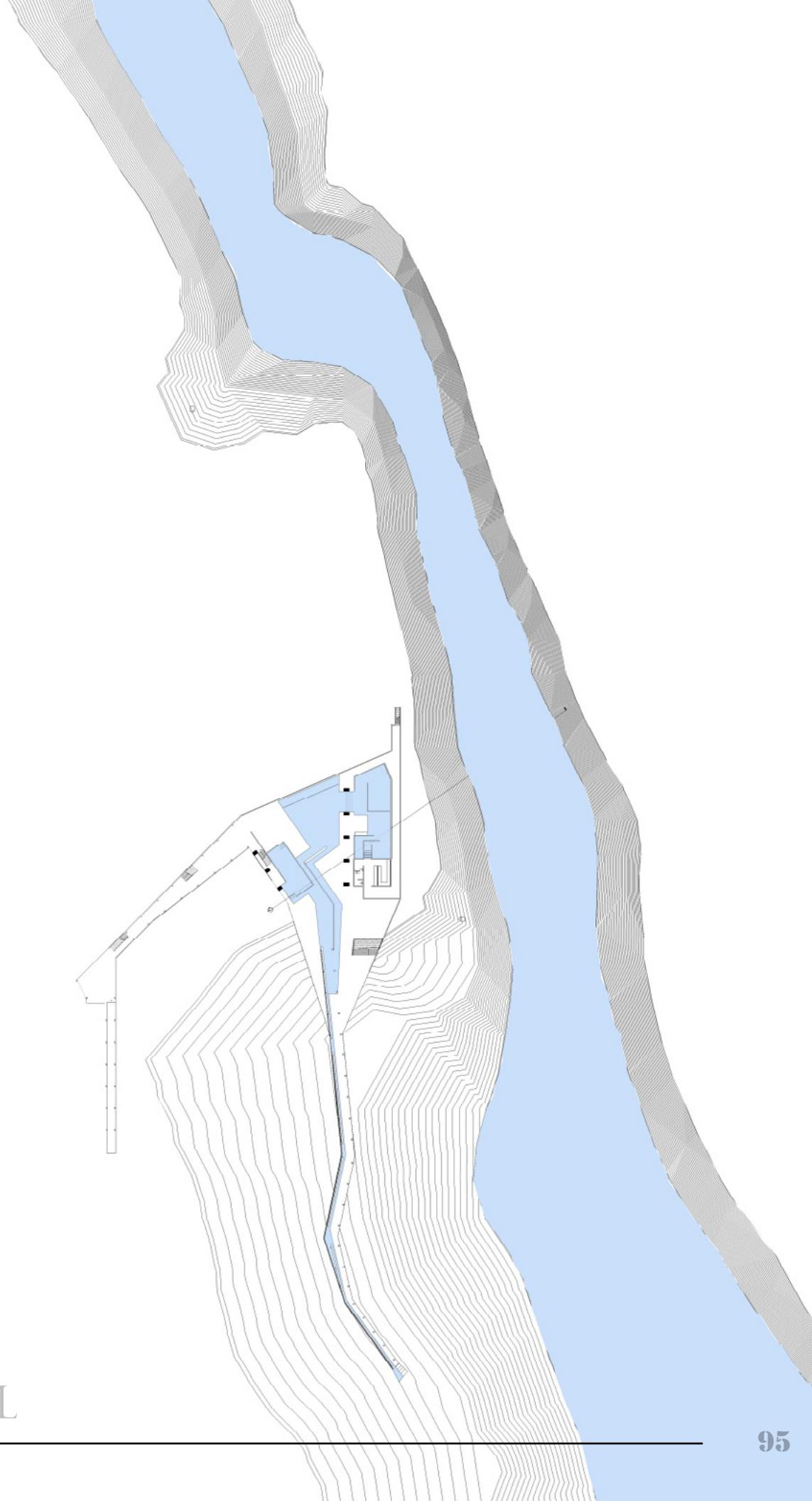


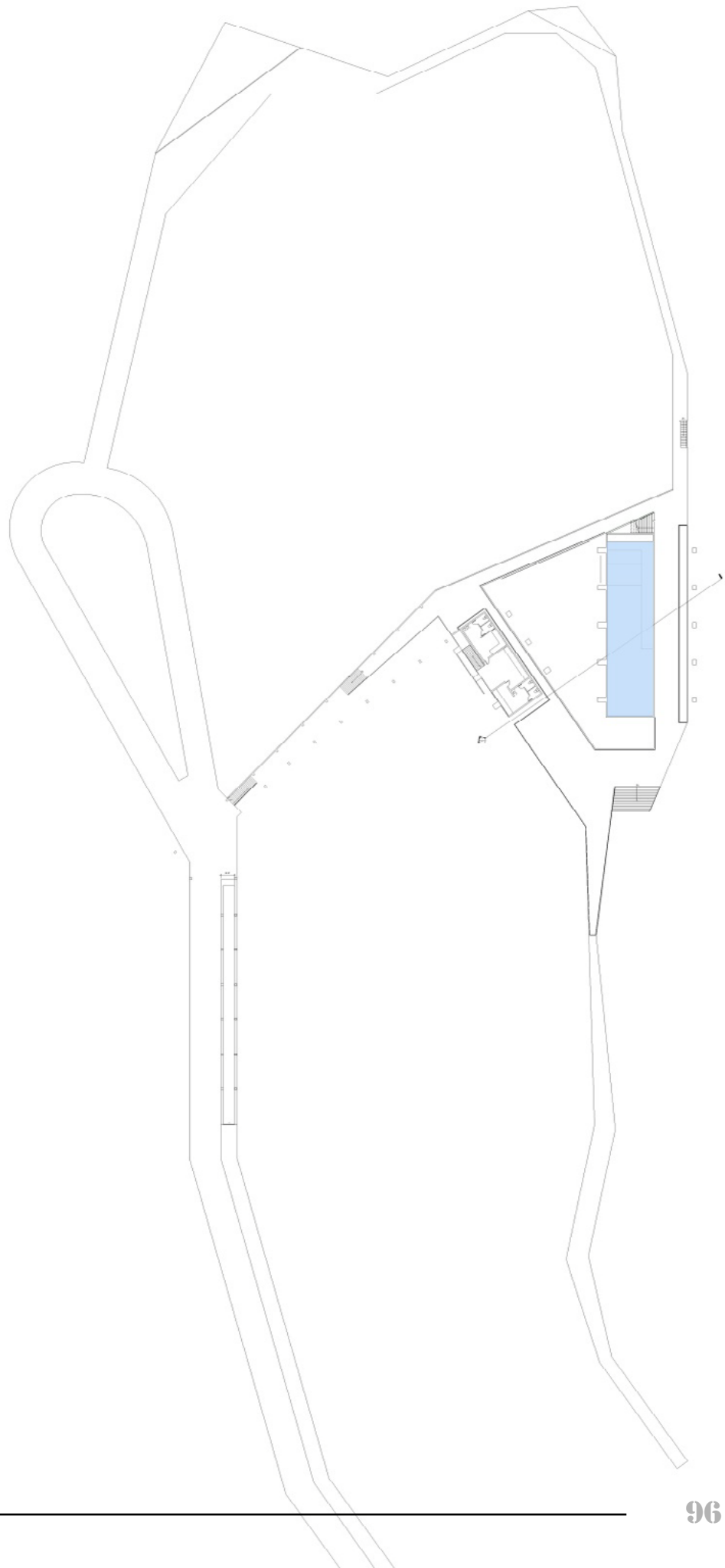


FINAL DESIGN



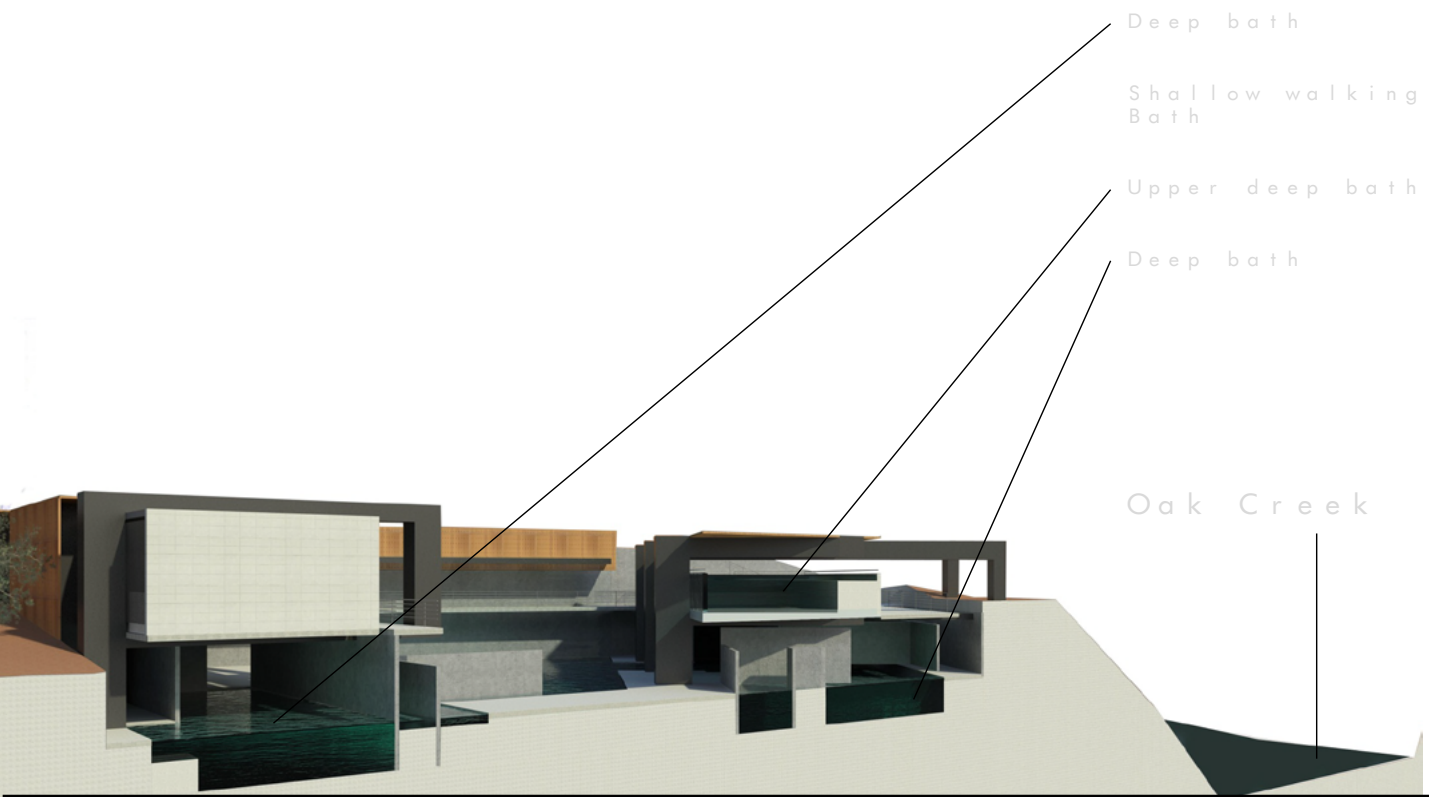
GROUND LEVEL

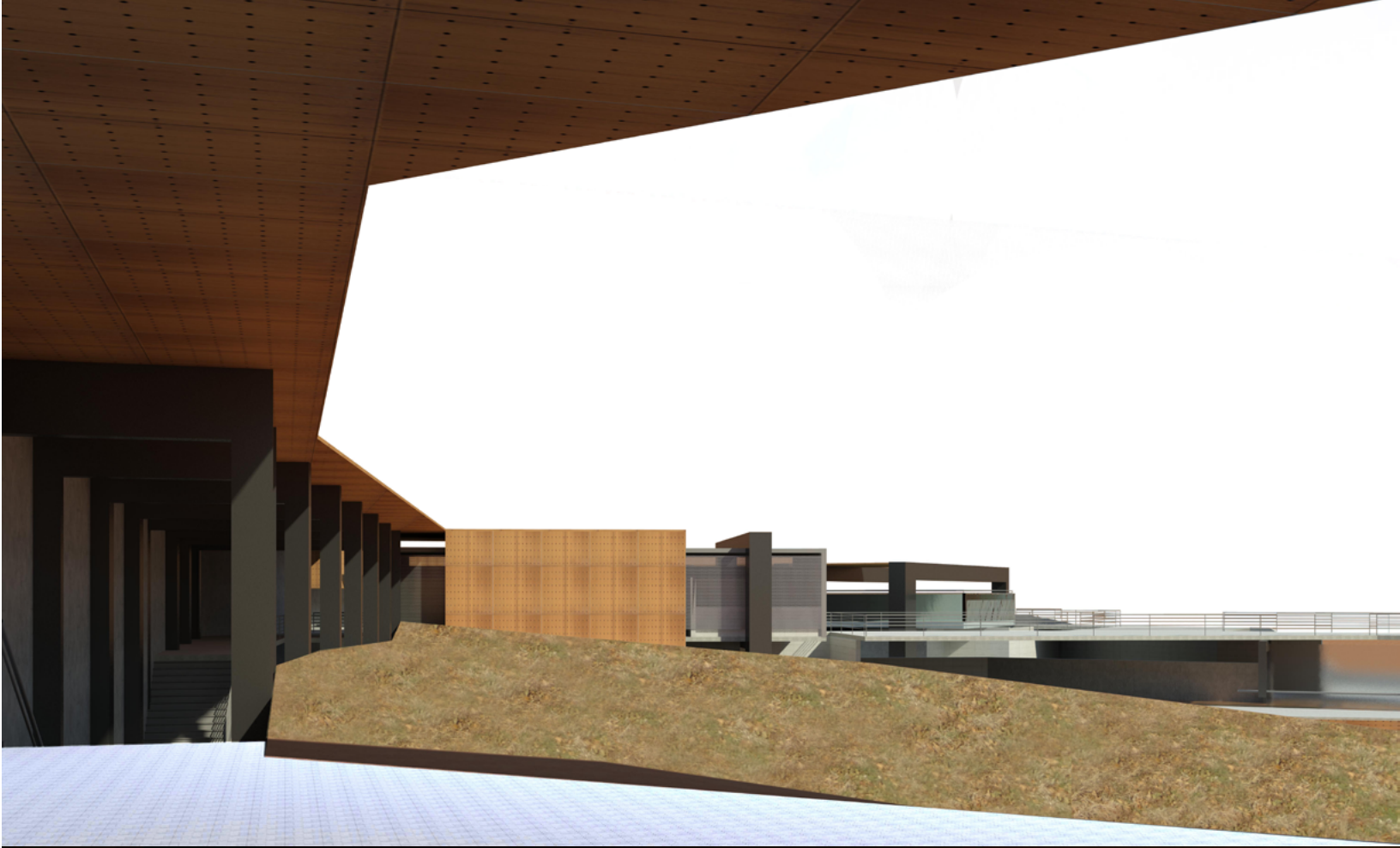


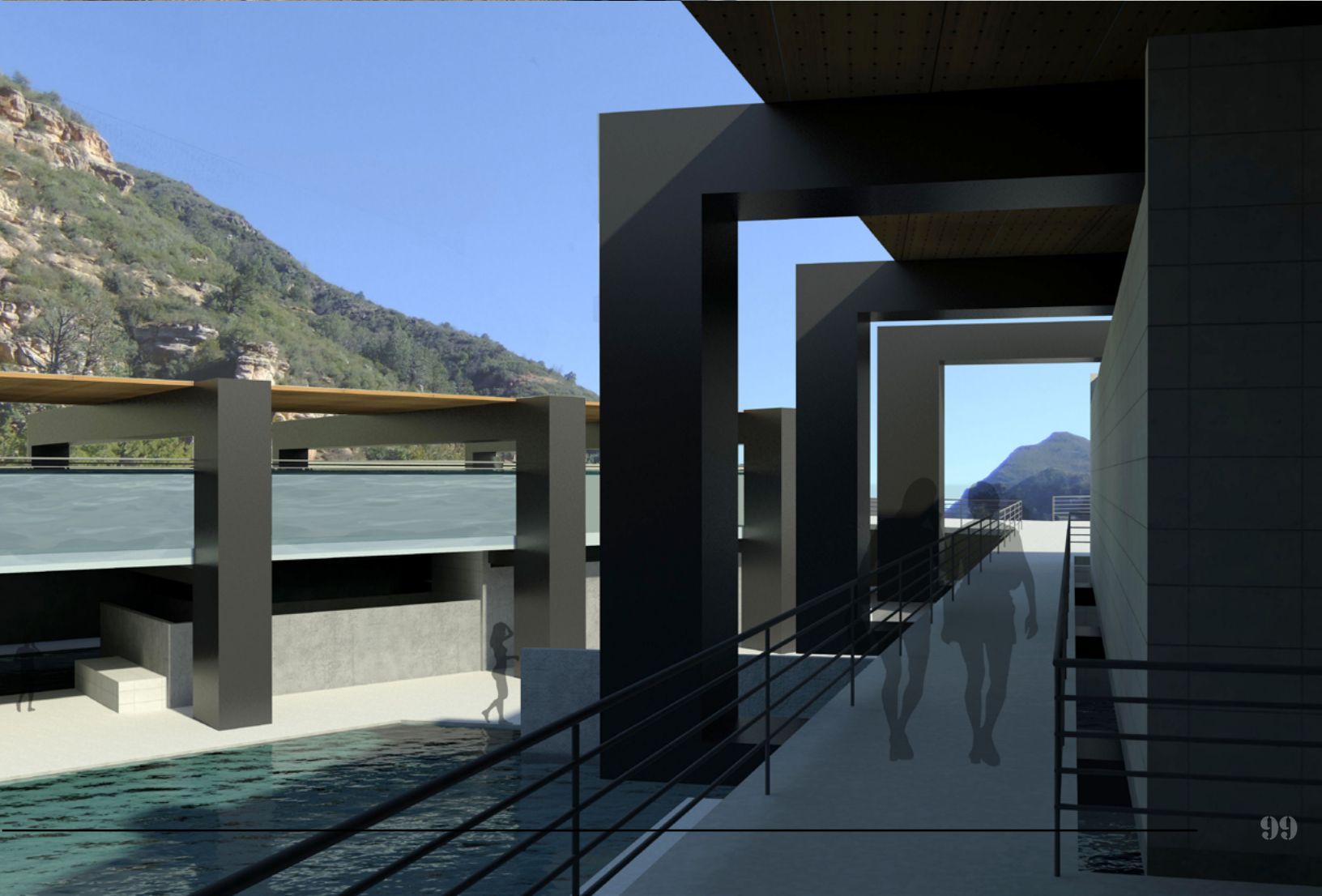
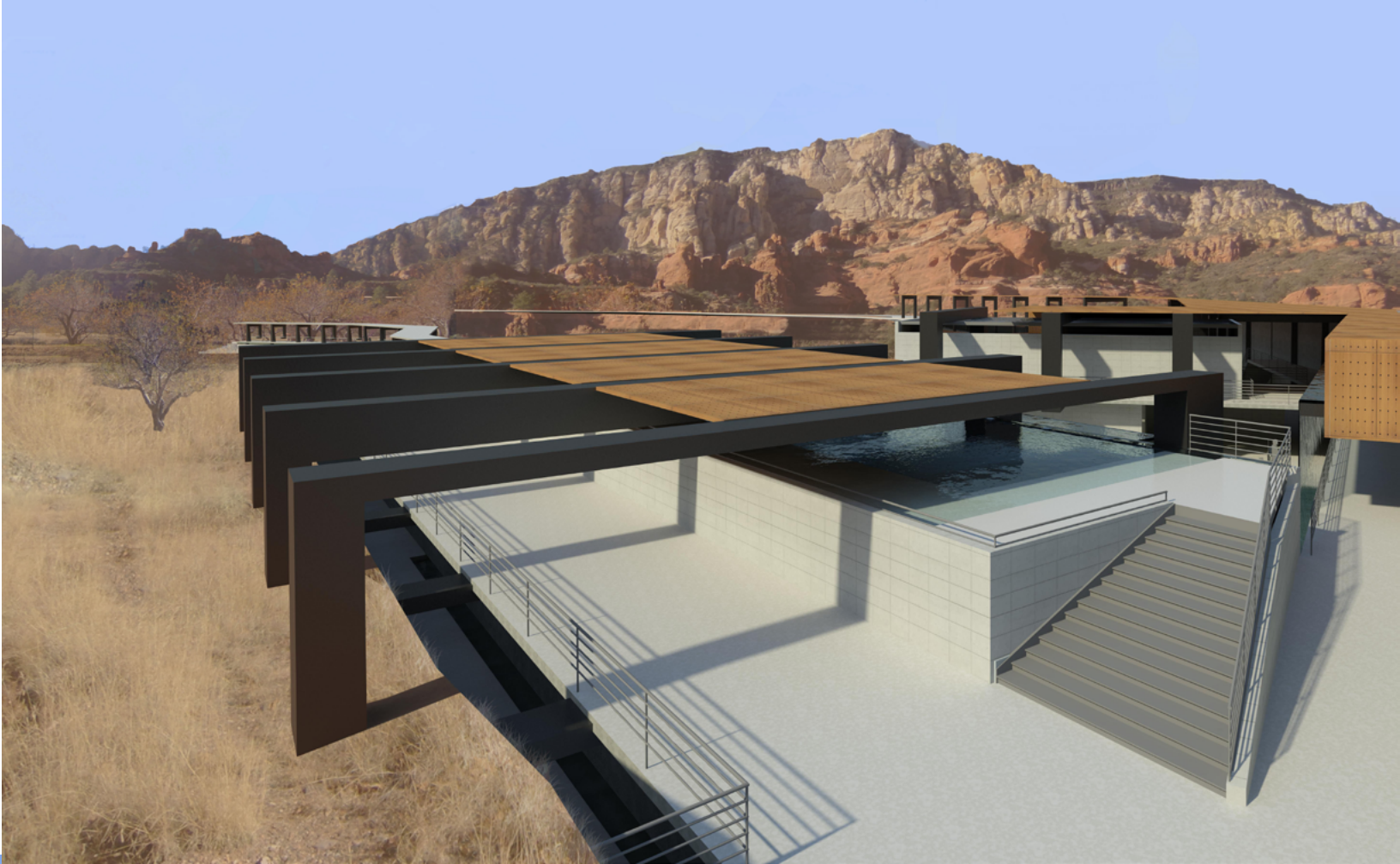


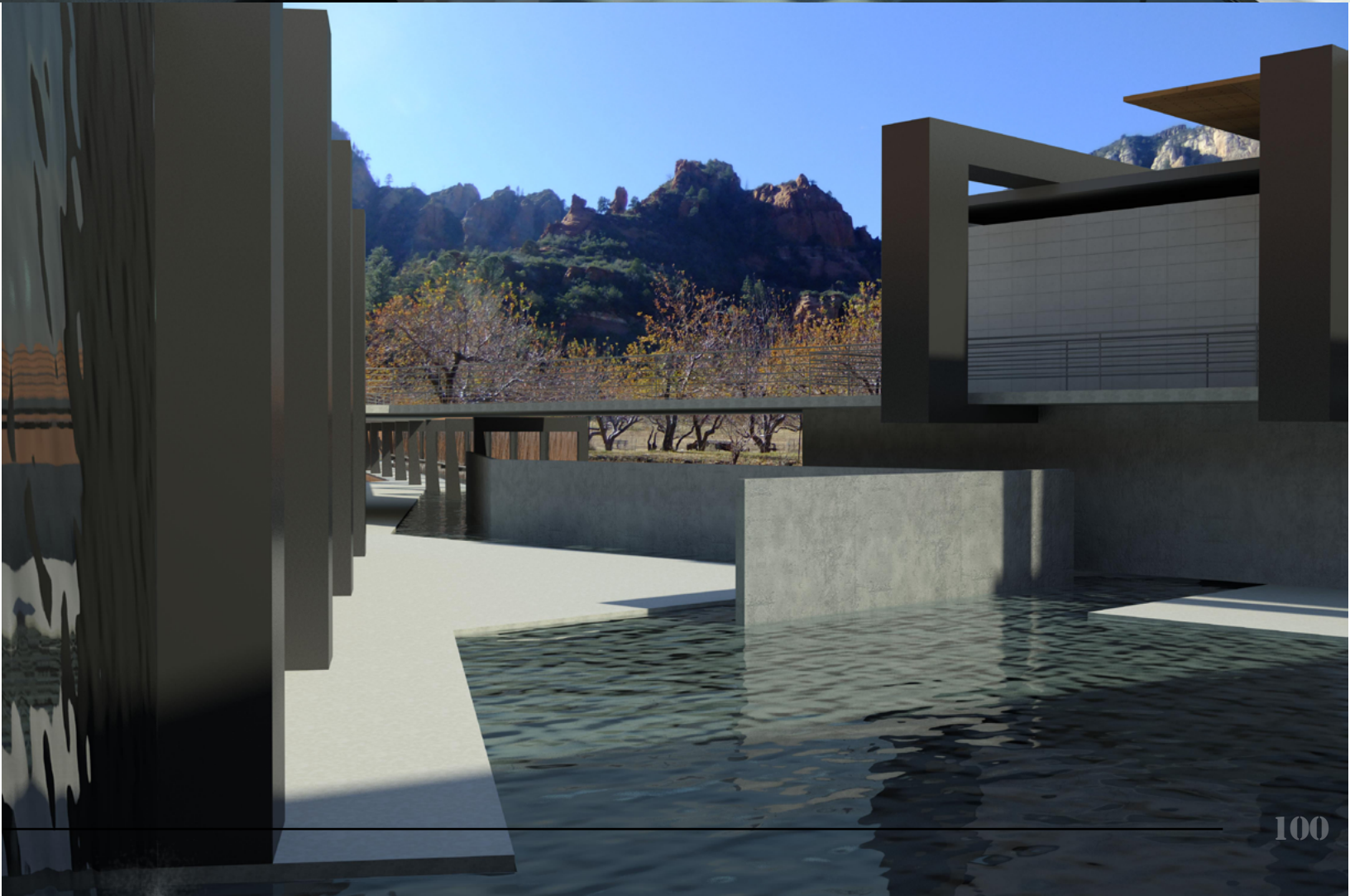
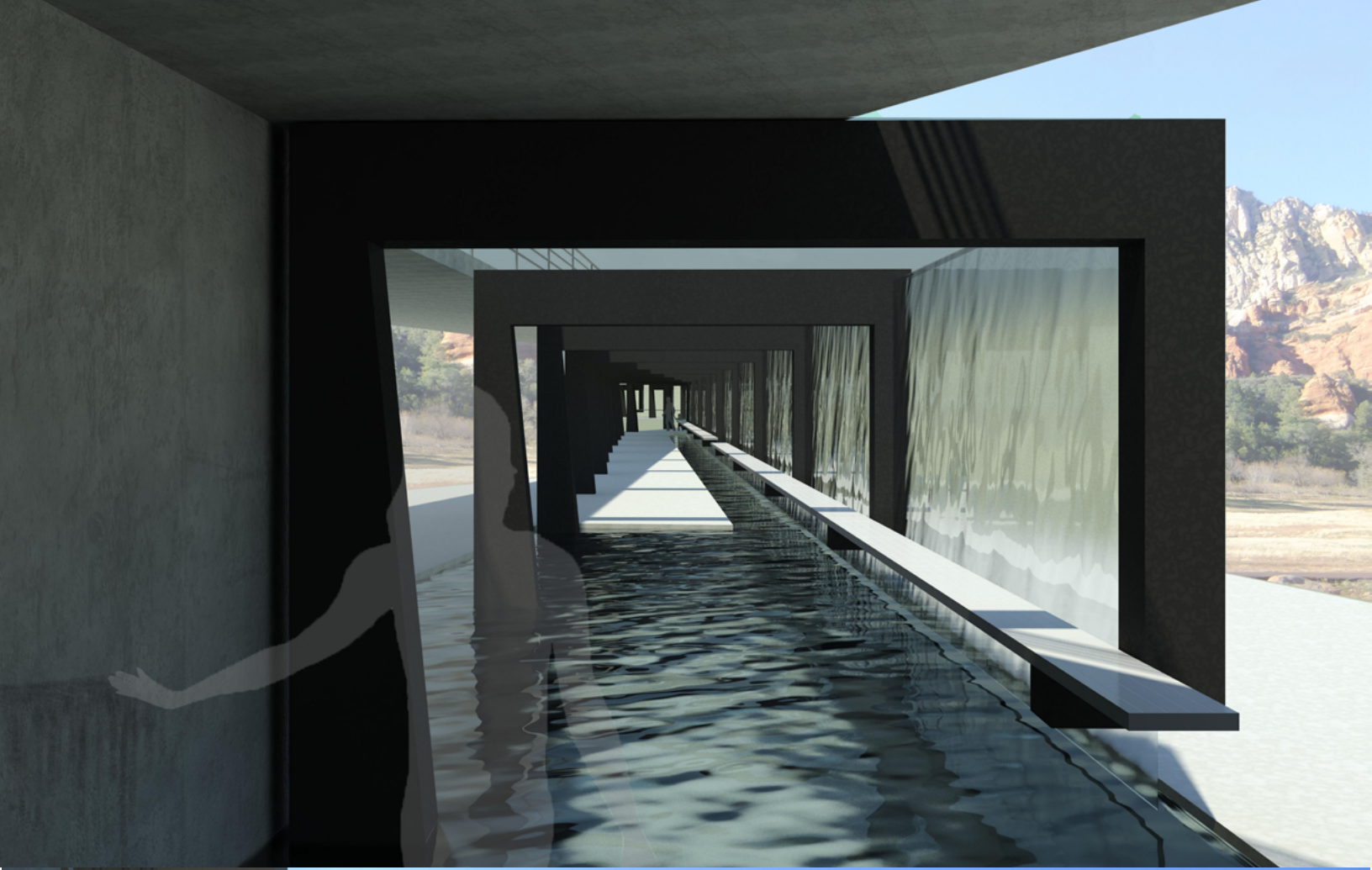
FIRST LEVEL

BATH DEPTHS

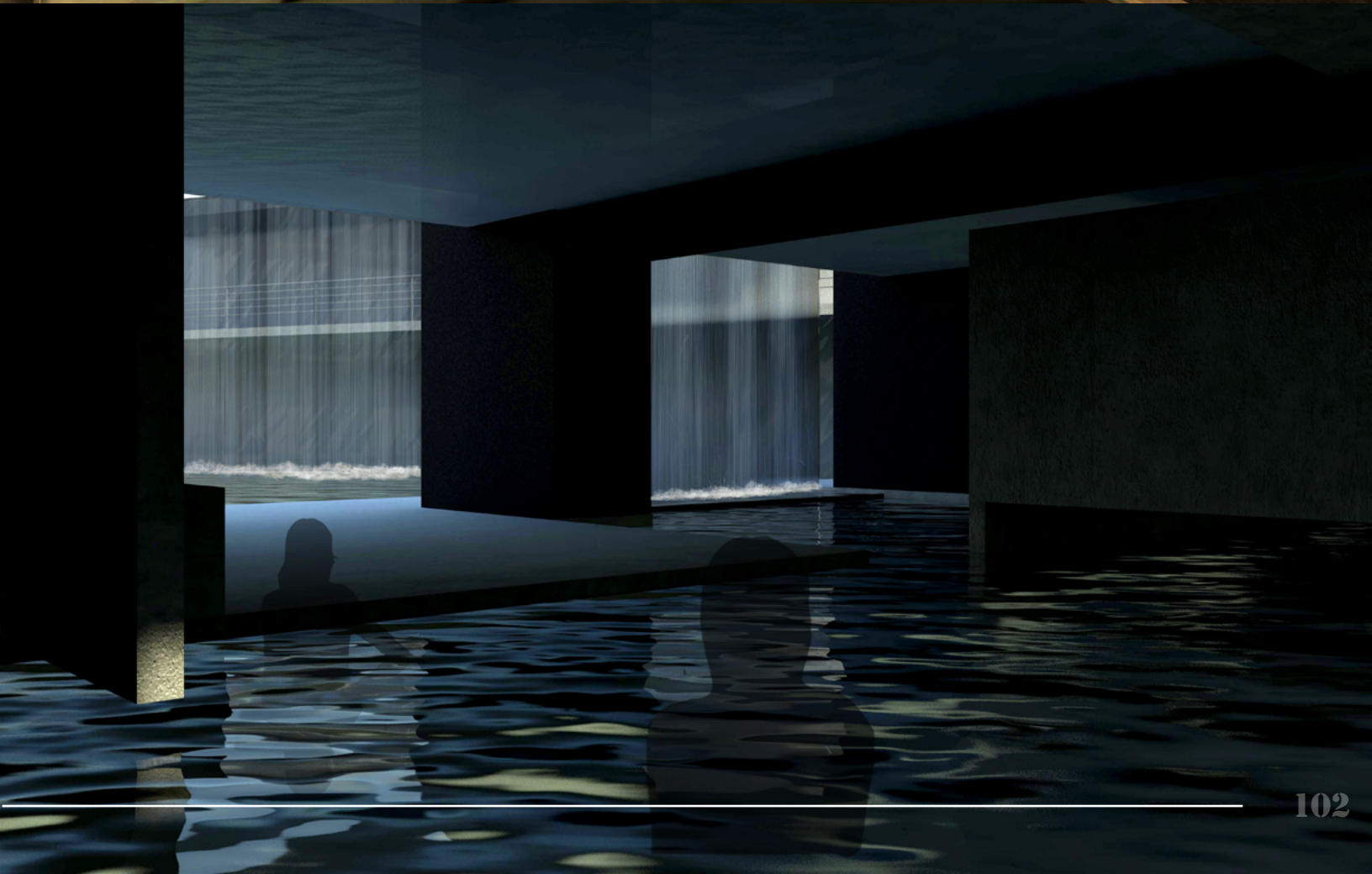


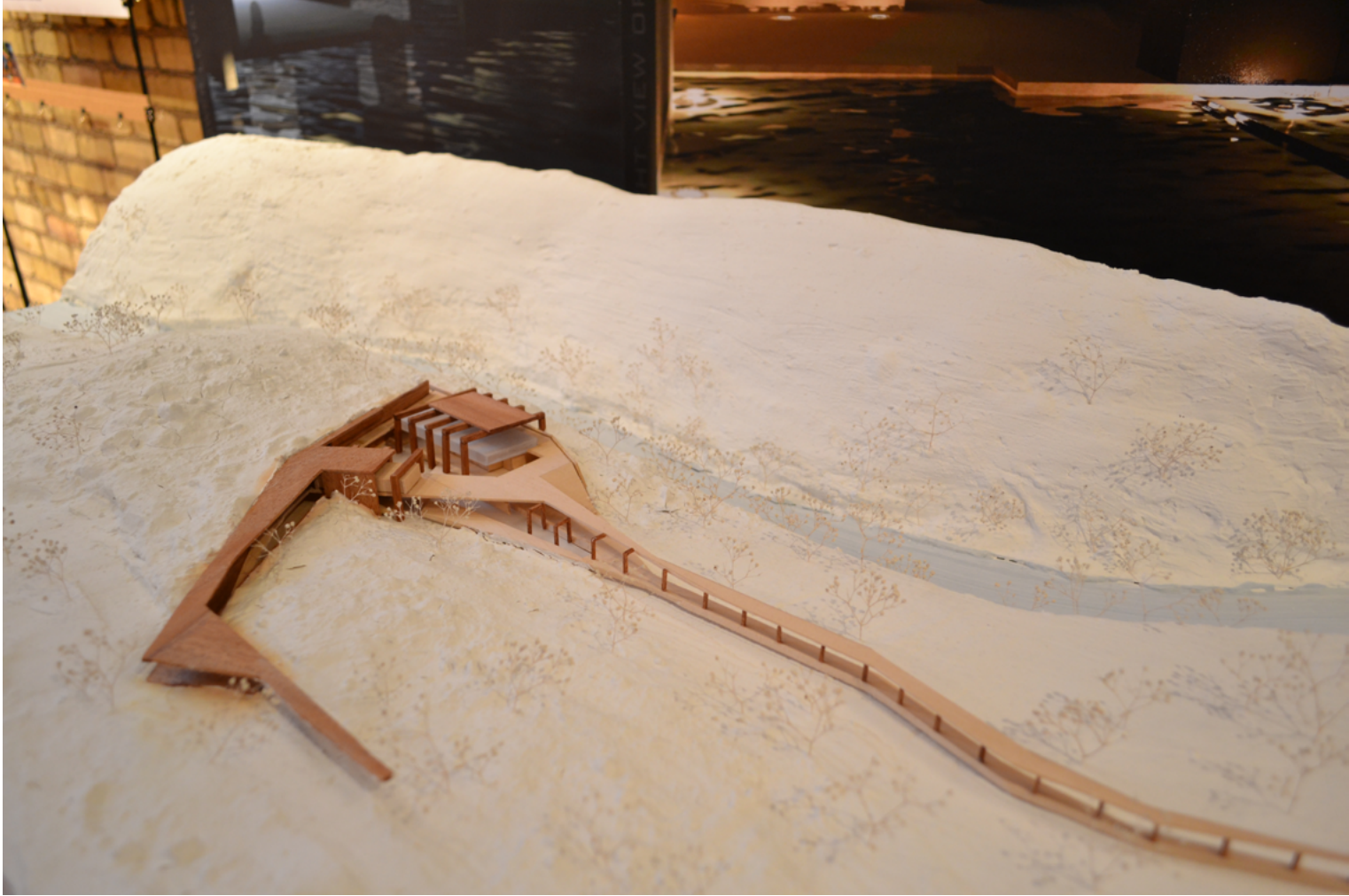












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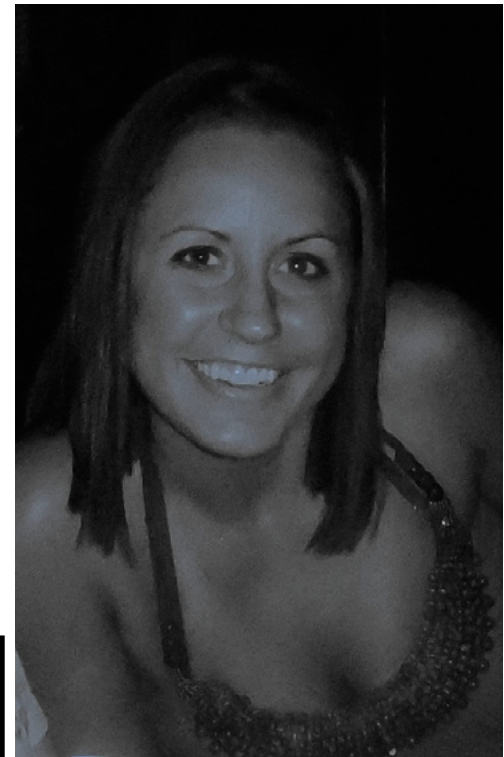
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