



[MUSO-ARCH]itectonics

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Abstract

Music and sound, from simple rhythms and pulses to the most intricate harmonies and scales, offers the complexity of experience inherent in things dependent on a medium of time; habitually, musical perception corresponds to auditory experience.

Architecture and space, from primitive huts to the most elaborate of forms and details, illustrates the complexity of experience inherent in things dependent on a medium void of time; habitually, architectural perception corresponds to visual experience.

This project proposes an investigation between two seemingly disconnected phenomena. The hypothesis claims that there is a kind of architecture that can disclose itself in both the domain of the spatial world and the aural world—when looked at from either angle, this architecture is transparent, layering the essential qualities of both. The result could be a richer architecture—one that is conscious of something not completely clear in the lived world. Perhaps to fully experience architecture, an individual needs to listen and see.

Personal Statement

Much of the work gathered through this investigation has been rendered by the presence of a relationship; and one that I had not even realized upon entering architecture school. I believe that architecture should be multivalent, touching upon ideas that augment the nature of the lived experience. But this notion is still new to me—I have only begun to understand its potential.

This thesis proposes an investigation--an inquiry about our aural world and our spatial world as it relates to building. It has been my intention throughout this project to allow these relationships to manifest themselves through experimentation so that the product is not prematurely identified, but is able to take the form of what the investigation discloses. That music and architecture exist in separate and contradictory media is not of concern--it is how they could work together, enhancing the experience of space.

Music floats about our lived world, marking time, remaining abstract and elusive because we can only hear it--but can we only hear it? Can we only see architecture? My thesis proposes a possible answer to these questions. Throughout the 5 years, I have become increasingly interested in the theoretical underlining's of architecture. Theory has become the vehicle to which I have been able to make the most fruitful discoveries about music and architecture. Without theory, the realization of this project would be limited, practical, and disappointing. It is phenomenology that has become the most important theory in my work thus far. Because it seeks pure experience as its thesis, it seems to bare a natural connection to the way in which we experience space and music. Edmond Husserl would ask how music and architecture come to work together, not why? It was this idea in mind that this project begins.

As I already have come to realize, assumptions disable and even paralyze the manifestation of a richer architecture. They force architecture to be univalent, stagnant and simply there. But this thesis, I suspect, will not end here—it is an initial gesture that I believe to be partly finished. Avoiding all clichés, this project is an attempt to uncover something to be ever present in our lived world—something we should be more aware

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of in our day-to-day interactions with the lived world. Heidegger would call this disclosure truth.

Lastly, I would like to state that this project is not about creating analogies where “architecture appears to be like music.” It is about making discoveries—it is about exploring the complexity of things within our lived world—it is this notion that sheds light on these hidden truths. This project is about illuminating truth through the lens of phenomenology.

This project is about illuminating truth through the lens of phenomenology.

Igor Stravinsky

All music has a spatial implication. Igor Stravinsky's music, however, is inherently more spatial; more experiential in that it defines a process and one that I find very applicable to design. So when given the opportunity to explore music and architecture, I needed to ground the word "music" into something more concrete.

Stravinsky has been one of the most influential composers of the 20th century. His music is atypical and complex. Much of his compositions embraced atonality and dissonance—all which were new to the realm of classical music. At times, his music sounds very unmusical, straddling the border between music and noise. There is also a sense that Stravinsky's music lacks a definitive beginning, middle and end. These quirks or peculiarities can easily define a way of thinking about design. So this thesis is defined in the spirit of Igor Stravinsky and serialist music.

He was undoubtedly a handsome man and characterized by a unique, eccentric personality. A bit of a musical diva as you can see in the photograph, his personality none the less can be heard or seen in his compositions. He has often been quoted as saying “My music is best understood by children and animals.” This attitude illustrates much of Stravinsky’s process in music. This same comment can also orient an architecture project. Perhaps Stravinsky alludes that only the untainted purified consciousness of a child or an animal could absorb the meaning behind this music. Children and animals are also free from assumptions as to what something is expected to be like.

“My music is best understood by children and animals.”

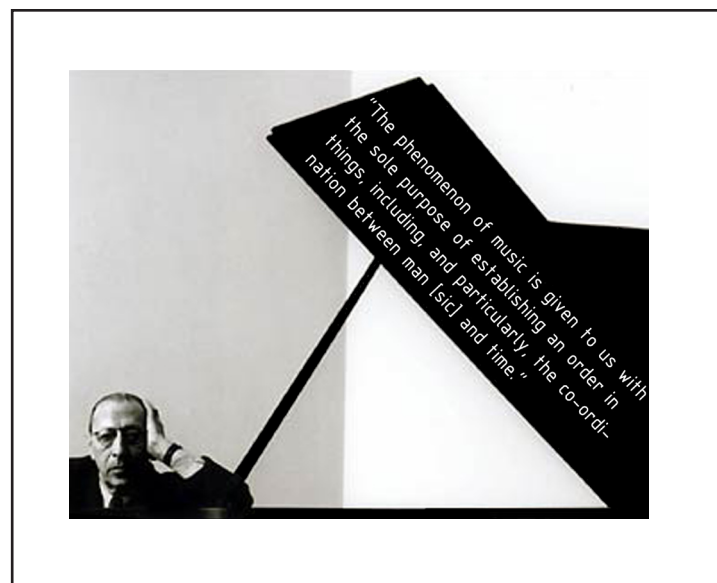
Stravinsky was born in St. Petersburg Russia in 1882 and died in the US in 1971. He was born to wealthy, upper class parents and so he was able to spend most of his summers in the Russian countryside. His first musical recollections took place there. As a child he had taken piano lessons and was urged by his father to continue an education in law. He never finished a semester and instead, began composition



lessons under the musical giant Nikolai Rimsky Korsakov. He never formally attended music school, and yet was still able to gain renowned recognition as one of the greatest composers of the 20th century. Much of his work kept the following underlying principle: “The phenomenon of music is given to us with the sole purpose of establishing an order in things, including, and particularly, the co-ordination between man [sic]

and time.” As architects, we are to provide an order in things as well. It is the creation of a relationship, the uncovering of a truth that is ubiquitous in our lived world. This is how Stravinsky felt about music, and this is what I feel to be true of architecture as well.

Unlike most composers, Stravinsky is defined by 3 significant musical movements—the Russian, Neoclassical, and Serialist movements. All 3 style completely different approaches to composition and yet Stravinsky was able to keep the Stravinsky like character in all of those styles. He was an avid user of dissonance, balancing the ambiguous line between noise and ordered noise, music. In the music world, it was heard to convince listeners of the complexity and musical qualities that can arise from this process of composing—he was widely criticized although the music was in fact extremely intelligent. He never cared what other people thought. He was comfortable with his music and so inevitably he was comfortable with himself.



Russian Music:

Russian music was inherently nationalistic in nature relying upon broad and eclectic resources yet was able to retain national idioms. It looked to Russian tradition, character, and folk song, but never took this inspiration literally. Folk songs were never taken out of context and then inserted into a larger work—instead, the structure of harmony, balance, and orchestration was understood by its nature and that was used to drive the design of the composition. The result was a musical style that was even given a title in music history. This nationalistic music was rich in style and melody, articulated with flashy rhythms and brilliant orchestration. It was often characterized by intense dynamics.

Some of the same kinds of things were happening in architecture and design with the Russian constructivists like Kadinski, Malevich, and Pevsner. Creative minds were plentiful in Russia at this time.

Neoclassical:

The term neoclassical is sort of a misnomer for this style of music—it was quite different than neoclassicism in architecture. The compositions from this did not sound like typical classic revival. In fact, these composers looked beyond what classical music sounded like and instead,

embodied its melodic shape, orientation, and transitional movements. These works were often humorous with no nostalgia. Many composers even wrote parodies or quoted specific works.

Serialist:

Serialism describes music that is characterized by a series of 12 tones rather than the conventional 7 tone scale. The 12 tones appear in a work in any order, as long as all 12 are played out in the series. They can be played in succession to form melody or simultaneously for harmony, giving Serialist music its edgy, dissonant sound. The order of the series can be manipulated via inversions, retrograding, turning upside down, or inverting the retrograde.

The idea of the series is not just limited to the actual notes—dynamic markings and patterns with in the music also carry this level of complexity. Serialist music is highly mathematical, highly formulaic, and wonderfully complex. The structure can appear as a whole and then carried down to smaller details within the larger work.

stylistic periods			
1 .	RUSSIAN	1908 - 1917	[<i>constructivism</i>]
2 .	NEOCLASSICAL	1918 - 1950	[<i>modernism</i>]
3 .	SERIALIST	1951 - 1971	[<i>post modernism</i>]



Muso-Architectonics

We often assume that the spatial realm of architecture adheres to the “time less” qualities associated with physical objects existing in space. But our bodies are more attentive—they can absorb more than what we simply see in our spatial world. Engaging with architecture involves all the senses, including hearing. And because we think we see our spatial environment more than hear it, there is a sense that we have never fully experienced the buildings in our lived world.

My claim is that our culture has privileged the eye over the ear in our experience of the lived world. The predominance of the eye has centered our attention to the more visual realm of experience, and as a result, emphasis is placed on what we see in architecture. Because of this, we do not “see” with our eyes and our ears together. By doing so, we are diluting and depriving ourselves of a more holistic architectural experience.

I intend to support this claim by looking to music and its elemental properties, describing how they are present as an experience of space in a Gothic Cathedral, Stravinsky’s Concertino for 12 Instruments, my thesis project for architecture school, and Bernhard Leitner’s Soundcube. These fundamental aspects of music could include sound, rhythm, pulse and movement. A phenomenological description of the essential qualities of these works will help concretize and focus the direction of this discussion. They can all begin to offer a more holistic spatial experience because of their connection to our aural world and our spatial world.

Examinations of the body and the senses will be critical aspects to supporting this architectural analysis. Drawing on the works of Bloomer and Moore and Juhani Pallasmaa will help elevate our understanding of the ways in which music and architecture work together. By exploring these concepts, we will see how architecture and music together can foster our ability to dwell. Dwelling, in the Heideggerian sense, will be more clearly understood in terms focused on music and architecture. I will not try to impose my ideas onto Heidegger, but to elaborate more on his ambiguous concept.

So why should anyone care? Architecture has largely been associated with the plastic arts while music has been associated with the arts of time. Although they exist in separate mediums, they each embody qual-

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ities that could provide us with a more holistic experience of our lived world. Both delve into the deepest of human emotions, and when understood together, they could enhance the nature of the lived experience. Although this discussion will help elucidate a deeper understanding of the world for all individuals, my goal is more specific—to target the architect and the ways in which architecture can collaborate more intimately with sound and music.

Sound vs. Music

Before I begin, I would like to explore the fundamental differences between music and sound in order to help clarify how architecture comfortably fits within this domain of time. Sound is an element of music. Both share a common feature. They exist through the medium of time—they are both temporal. Because of time, sound is fluid and dynamic. As time moves, sounds appear and dissipate—they fluctuate and change with constant motion.

Aural manifestations have a duration—a beginning and an end in time. To fully perceive sound with our ears, we must understand how time belongs to it. So long as time exists and our ears are capable of hearing, we can always perceive our world as an aural experience. So how does sound distinguish itself from music? The difference occurs in its organization. Music appears to our consciousness in exactly the same ways as sound. However, music exists as organized sound. These sounds are set within a fixed framework of duration. We can extract things like tempo, rhythm, pulse, dissonance, and consonance. These experiential elements of music can naturally begin to compliment the creation and experience of architecture. This notion will be investigated more rigorously in later discussions.

Anything detected by the ear can be described as sound. But sound is not limited to aural manifestations produced by sound waves. What about the absence of sound? Silence is also an important aspect of our aural world. Although silence does not physically produce sound waves, we still hear it—silence has a sound. We are always hearing because we have ears; because we have ears, we can hear silence. So sound, music, and silence, all move fluidly through time, changing our experience of space.

Because of time, sound is fluid and dynamic. As time moves, sounds appear and dissipate—they fluctuate and change with constant motion.

If music is organized sound including silence, then how do we know when something is organized sound? It seems to be a matter of our perception. If we are walking down a corridor with a regular rhythm and our shoes create sound upon impacting the flooring material, we can perceive that sound as being slightly more organized than the leaves blowing outside of the building. Music, just like sound, is ubiquitous—depending on how we perceive its organization. This is why some people can say that a Stravinsky Symphony is anything but music—its organization is atypical for a symphony. However, our rhythm down the corridor in the earlier example could be understood as more musical.

I am not arguing that all sound is music—but when we engage with architecture, the aural world can begin to document our movements through space similar to the inherent qualities in music. Trying to avoid all clichés, this aspect of the discussion will eventually dissolve a more forceful connection between architecture as a translation of music. This will help disprove simple analogies between architecture resembling music. Further analysis of this notion will be examined later in this discussion.

Sound can be perceived similar to music as long as we perceive it to be organized. If everyone hears, then how are we not hearing more fruitfully our spatial world? Even before the architect can design a work of architecture in the medium of space and time, he must be aware that there exists a difference between hearing and listening. As stated earlier, we are always hearing—but this way of perceiving the world is more passive than listening. Listening is a more involved way of hearing. We understand and extract more from experience when we listen. So to fully embrace the position of this discussion (and the possibilities it proposes to the architect), we must acknowledge that music conjures more experience and emotion when we listen to it. Stravinsky argues that “Music must be listened to; it is not enough to hear it. A duck hears also.”¹ Listening accumulates more meaning for sound and music. It carries us towards a more holistic experience of the spatial world. When we listen, our ears actively involve our bodies in the experience of music and space. This notion can directly influence the experience of our spatial world. When the architect consciously harmonizes the aural world and the spatial world, architecture is more revealing. It is less passive and more integrated into our experience of the lived world. We can then be more attuned to absorbing (or understanding) what architecture is capable of disclosing. The experience of architecture is more complex than

Listening is a more involved way of hearing. We understand and extract more from experience when we listen.

¹ Igor Stravinsky, *An Autobiography: Igor Stravinsky* (New York: Norton 1936). Stravinsky gives a candid and Witty account of his life. This quotation describes a personal philosophy about how an individual should experience music. The same can be said for architecture.

what we simply see. Habit has compromised our ability to understand the complex connections between music and architecture

But what about the active compliments that allow us to engage with architecture? If listening and hearing belong to music, then seeing and looking belong to architecture. There is a sense that we are always looking at our world when we have our eyes open—but this experience lacks involvement and intimacy. This changes when we see something. It affirms that we are consciously reflecting upon it. Our experience of something is more sophisticated and complex when we see it. We are able to delve deeper into something's meaning. Seeing affirms our ability to understand.

Description of a Gothic Cathedral

I will now present a series of descriptions. The first will look at architecture and how it converges with music; the second will look at music converging with architecture. This will help to enhance the notion that both worlds can overlap.

So how can the architect bring space into the domain of music? I am arguing it to be a conscious act. However, the Gothic Cathedral and its relationship to Gregorian chant is a perfect example illustrating this complexity without any form of planning—this kind of relationship is coincidental (and worth describing). I will talk about an experience of a Gothic Cathedral when it is filled with Gregorian chant. This description will illuminate one kind of relationship between space and music:

Upon entering the building, the eye is met with an incredible volume of space. The immensity conveyed at this scale evokes emotion—I can begin to hear the building calling my attention upward. The size of such a building is meant to dwarf the individual, forcing them to face towards the power of the heavens.

The volume of this space is created by a series of vaults in a regularly spaced rhythm—if our eye was to follow these elements, we could hear that they document time like a bass line in music. They are the underlying pulse of the composition (not the melody). If we move our eye down the space, we can see them more in time and like a rhythm. But the phenomenon of perspective does something curious to these structural members—it accelerates their appearance in space. The farther we see down the cathedral, the closer the members are spaced; there is less time for our eye to find the next. And so the rhythm is faster, acceler-

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ating towards the alter.

Although the underlying rhythm of the space is prominent, the melody or harmony of the space is slightly muted. This visual muteness results from the materiality of the space. The drab stone and the lack of light have a kind of tranquil quietness. They hush the space by veiling it with shade and in the same monotone color. We hear the space as one voluminous bellow with the underlying beat of the structural elements—the harmonization of architectural ideas are more reserved and require more attention by the individual. So we are hearing only a fraction of the space when we see it.

Muting implies a kind of temporality—things must be heard before they are muted. So when does a Gothic cathedral become audible? Something has to activate the space. This occurs when Gregorian chant diffuses through the cathedral's immense volume.

When the music first appears, it is clear and directional—but after about 10 seconds, the walls of the space act as a barrier, unable to absorb and transmit the sound out of the space. This single layer of sound is then multiplied by itself because of the architecture—after several multiplications Gregorian chant is fully experiential. The long reverberation time allows the first single layer of music to create more depth, filling the container.

We hear the music approach our bodies—although we can not directly see it, we know the music approaches us. It is set into motion, coloring the space and illuminating everything it comes into contact. We find our bodies being cast in sound with the shape of a Gothic cathedral.

This music does not stop at touching our skin at the surface—it penetrates into our bodies as well. Juhani Pallasmaa describes this experience well: "Sight isolates, whereas sound incorporates; vision is directional, whereas sound is omnidirectional. The sense of sight implies exteriority, but sound creates an experience of interiority. I regard an object, but sound approaches me; the eye reaches, but the ear receives."² This tension that Pallasmaa describes is exactly what the body feels in space. We are projecting outward with our eyes and taking in with our ears. The process is simultaneous. This is how Gregorian chant in a Gothic cathedral is so deeply emotional. The power of this experience lies with architecture and music overlapping.

This visual muteness results from the materiality of the space.

This music does not stop at touching our skin at the surface—it penetrates into our bodies as well.

² Juhani Pallasmaa, *Architecture and the Senses* (London: Wiley, 2005), 49. Pallasmaa essentially describes the eye and the ear in terms of their essential qualities in architecture. This tension is explored during schematic design.

But this “muso-architectonic” experience affects other aspects of our perception as well. Time seems to change. When the chanting first enters the space, it begins to document an experience of time. We perceive that time based on the feel of the music. If the music occurs in a space like a Cathedral, that same line of music is augmented. The music has no orientation—it is messy and less distinguishable as a single layer of music. Its documentation of time is directly connected to this phenomenon. Time seems just as messy. It moves slower because we are unable to understand the clarity of time passing—the beginning is clear but the end is not. It would be quite some time before our we realize the music had stopped.

When Gregorian chant moves through a Gothic Cathedral, it also brings a kind of aural energy to the architecture. As stated previously, it brings a kind of color to an otherwise dark space. The music impacts these walls, and they are aurally manifested. They are no longer mute, but activated from the appearance of the music; the music is then activated by the architecture. Both are codependent.

Concluding thoughts about the cathedral

I would like to conclude this first description by shedding light on a question that emerged from this discussion. Earlier, I concluded that sound is received as music when we perceive an organization of that sound in time. Do we perceive Gregorian chant as being organized sound when it is multiplied within the confines of the space? Is it then music or sound? Because of the acoustical properties of such a space, my inclination is to say that Gregorian chant is less organized in a cathedral; but this is the beauty behind Gregorian chants. When we hear it as disorganized in the cathedral, this is when its most musical. If we were to listen to it in any other space, the experience would be fractional. In this example, our aural field of perception and our spatial field of perception are truly blurred, resulting in a wonderfully complex “muso-architectonic” experience.

It is doubtful the medieval architects were consciously fusing the aural world with the spatial world. However, this example illustrates the complexity that can be achieved when architecture and music converge. The result is a simultaneous layering of the inherent qualities of both, where the eye is not privileged over the ear. The result is an experience that begins to harmonize our perception of architecture. We become conscious that we are seeing something aural and hearing something visual.

The music impacts these walls, and they are aurally manifested.

Description of the Concertino for 12 Instruments

Now that I have described an architectural work in terms of its aural qualities, I will now attempt to describe a work of music by its spatial qualities: Igor Stravinsky was a leading composer for Serialist music. The structure for this music is atypical for traditional composition—the composer passes a series of 12 tones through an equation. This re-orders the tones in different series—hence Serialist music. Stravinsky's convention is inherently dissonant and extremely spatial. As a musician, I will attempt to briefly describe a spatial experience of the Concertino for 12 instruments. For a more interesting examination, I listened to the piece in a den space with the door shut and the lights completely turned off. The room was almost entirely void of light and lacked any kind of depth or spatial perception. A direct visual connection between the music and the architecture was eliminated. This is what I remember from the experience:

Even though I have heard this concertino many times before—and I could anticipate the beginning—I feel like I have never really heard the piece before. And it is because every time a piece of music sounds, it alters time. It alters time differently based on the experience of time before it. So this new situation sets up time differently for me. And this is how we perceive time—as a fluid sweep of constant changes.

The same dramatic entrance takes me by surprise even though I know exactly what is about to happen. The first note appears, and I take my first step in a new world—I take my first step in a new space. This is in the aural space of the Concertino for 12 instruments.

I am walking in a corridor sloping downward. My footsteps are accelerating down the ramp enclosed by this corridor. Intense sun light permeates the space in specific locations—I am not completely submerged. I move downward, towards the earth; yet I am lifted by the appearance of the light. My body is compressed and inflated. Am inside or outside?

The color of this corridor is a dark grey—the music has a grey feel. I feel weighted down—the grey slows my footsteps even though I am accelerating downward. The rhythm of my footsteps is synced to the corridor. Every fourth step is accented—every fourth beat the material changes—alternating patterns of aggregate and slate change the texture beneath my feet. I am more aware of time passing because I hear my footsteps—I hear the alternating sounds. This beat is kept constant for quite some

time; my mind wanders here—I remember my place before entering the corridor.

The key changes and I am abruptly thrown into a new space—a large volume that is formed by walls of stone. Aurally, I am reminded of a space similar to a cathedral. The same monotone color drapes this space; the silence is in the materials. But new tones appear in this space from different kinds of instruments. The reverberating music colors these walls as well. I feel slightly disoriented, encased in sounds from every color range.

This stone is in its natural form down here. It occurs on all six planes within this volume; and so I must be beneath the surface of the earth. The space feels like a cave—like the basement of my childhood house. And the reverberating music reflects this experience. My memory is flooded with images that describe my experience of dark and dimly lit spaces.

A new voice appears. A piercing sound that signals me to move up, to look beyond what is in front of me. But this directional sound is pulled apart by intrusions. The direction is still upward, but not linear. I have reached the lowest point of this space. The new voices affirm my ascent.

I am then confronted with a set of white stairs. They radiate a kind of upward energy—the pitch is high as if signaling me to move quickly. I leap up the stairs—the white seems to help power my body. The end of this stairwell projects me towards the sky. A kind of crescendo back into the lived world—the sun envelops my body and I am encased in a new kind of energy. I feel revitalized having left the depths of the previous space.

Analysis of the Concertino

The spatial implications in Stravinsky's work are anything short of overwhelming. Especially in the concertino, I feel the music begins to describe how my body might feel in different spatial situations. "All architecture functions as a potential stimulus for movement, real or imagined."³ Even though this space was imagined, it was a direct result of music.

There were specific musical cues that had exceptionally strong spatial implications. For example, a key change drastically alters the feel of the music. This occurred when I entered the space terminating the first corridor. Once in that volume, the musical voices interacted similarly to

³ Bloomer and Moore, *Body, Memory, & Architecture* (London: Yale, 1977) 59. Bloomer and Moore provide a subjective account on how the body moves through space. Because of the reference to time, their analysis works with this discussion.

that of the space in a cathedral. The image evoked by that passage provided me with a memory of such a space. Different musical voices start to introduce different tones or colors. Musical phrases that move up the scale tend to point the body in the same direction.

Music does not just describe the form of the space, but also the movements that the body can employ. The rhythm I experienced moving down the corridor was accentuated because I could feel my body choreographed to it. Bloomer and Moore would say that "Given this rhythmic richness which we all possess, and the fact that patterns as mundane as pavement cracks and picket fences can elicit complex haptic responses, we might well wonder why any building can not be as good as the next in generating a body response."⁴ Choreography is a key component in understanding architecture's place to music. Body movements take place in time similar to this notion. A rhythm, whether it is by our body movement or in our architecture, can begin to synthesize an experience that fuses the aural world more closely with the spatial. If we perceive this rhythm as being organized, then we have musically choreographed our body to the architecture: "The architecture takes on more life and gives more as it becomes a stage for movement."⁵

Music does not just describe the form of the space, but also the movements that the body can employ.

As a musician and an architect, I feel that I have a kind of advantage in understanding the possibilities that can emerge between the layering of both music and architecture. As much as I feel familiar with these subjects, it was very challenging to write about a space that I experienced when I listened to music. The ideas are very personal; it requires the individual to put all presuppositions about music and architecture aside.

This is the first time that I had ever written about a space I experienced through music. Listening to the performance in the dark was particularly enhancing. Imagining a space with just my ears vividly created a complex space. All my attention was focused on it because I had nothing else to look at. I was able to imagine the architecture in concert with my body movements. The space was a fragment of an entire building.

The music gave scale to my environment. The descending corridor I imagined was at the scale of the den. If I were in a larger room, the music would appear differently to my consciousness. It would even be interesting to experiment with the lights on. The situations are infinite. These emergent possibilities became the design concept for much of my

⁴ Bloomer and Moore, *Body, Memory, & Architecture* (London: Yale, 1977) 61.

⁵ Bloomer and Moore, *Body, Memory, & Architecture* (London: Yale, 1977) 68.

thesis work thus far. I will now describe briefly what my thesis is about and how I intend on addressing the possibilities that arise from music and architecture.

Thesis project application

This is where my approach to designing architecture begins: Sound is present in our world as much as space is; so we experience sound equally as much as we experience space without our realization. I intend on examining the complex relationships that exist between music and architecture. One such connection has been described by Juhani Pallasmaa when he says "...architecture is the art of petrified silence."⁶ Perhaps Pallasmaa understands that a truly emotional architectural experience is "silencing." There is a sense of awe when we are faced with something that evokes our inner world. Or perhaps he places the importance upon memory. The images that our memory contains are a vast archive of past experiences. When we remember these images in silence, their energy is rekindled. The power of those images is petrified in the same sense that architecture is petrified. Silence can be a catalyst for architecture just as much a sound and music can.

The images that our memory contains are a vast archive of past experiences

This studio project began by examining the seemingly disconnected or fragmented relationships between music and architecture in order to disclose a more conscious layering between our aural field of perception and our visual field of perception. If sound and music are proposed to be apart of the same experience of the lived world, then how does music more holistically impact architecture? As a classical musician, this question pointed towards the design of some kind of container exclusively for music—a performance facility became a natural programmatic element in the design. So how do we learn from the experience of a Gothic cathedral and Stravinsky's *Concertino* without literally implementing their qualities into a design project? I will describe some of the spatial situations I have designed that begin to articulate this question. This includes the body and how it receives a more holistic musical performance.

The stage is the source of music—it leaves this place, fluidly moving through space. This movement can be controlled by the architecture. This manipulation becomes the concept for designing the form of the building.

⁶ Juhani Pallasmaa, *Architecture and the Senses* (London: Wiley, 2005), 51. Superficial analogies between music and architecture have no use for the work in this thesis. Pallasmaa's description is particularly illuminating.

Part of the seating in this performance hall rises upward from the stage in traditional concert hall form. The issue with this kind of seating, aside from offering more perfect acoustics and the ability to see the musical performance occurring, is that it limits the experience that can occur between music and architecture simultaneously. We can derive more from the architecture in terms of a musical experience. Watching an orchestra and receiving the performance near perfectly deprives us from really experiencing the music. I do not wish to eliminate traditional seating in this performance hall, but to identify other ways of experiencing music because of space.

Watching an orchestra and receiving the performance near perfectly deprives us from really experiencing the music.

As stated previously, the seating in this concert hall is raked upward in traditional concert hall form; but this is only the first section. The second section of seats begins to rotate—first slightly skewed and eventually turned completely 180 degrees in the opposite direction. The pattern of the seats is mirrored in the opposite direction. This allows the receiver to hear the performance without the visual cues from the orchestra. The music reaches the body from behind. The motion of the music is outward as well as the receiver's position. My eyes are looking in the direction of the projected music, signaling me to something beyond the wall.

My eyes are looking in the direction of the projected music, signaling me to something beyond the wall.

The next increment of seating continues downward. Here, the receiver will find the seating in complete darkness and in the earth. This next space alludes to the experience of the concertino. There are no man made walls in this space; only the exposed rock that form this volume or chamber. In the darkness, the receiver is able to experience the music as a diminished voice. There is no depth perception without the music; and because the musical source is not directly within the space, the spatial experience is not overwhelming. The music skips within the confines of this space, rather than bouncing off at full force. Listening to a performance at this intensity of sound would render the music more like one sound. The Listener might not be able to distinguish each individual voice in the performance. This whispering effect makes us more attentive. When somebody whispers to us, we always find ourselves more alert, trying to understand what is being communicated. In a sense, we are listening to the music as if the musicians were whispering to us. The end of this chamber is closed—it can be opened to allow for sunlight to illuminate the space. The rolling hills beyond this lake bleed off and into the horizon. The end seems imperceptible. If this door remained open during a performance, there would be a natural connection to the faint outline of whatever is beyond and the whispering effect of the music.

Our experience of the performance, in this situation, is completely enhanced by the space created by the building.

This kind of seating is one variation out of many that I intend to further explore in my examination. Other forms might include seating where the distinction between inside and outside is blurred. Perhaps another section of the seating is completely outside. What if the individual could stand during a performance? These questions really begin to question the typical aspects of concert hall design.

I am proposing a concert hall that has a network of spaces, corridors, and chambers that penetrate into the performance space. These manipulate music to various degrees. Architecture's ability to influence the way we receive music can begin to offer us more in terms of experience. What if a chamber was able to totally filter the sound of music and keep only the vibrations of the sound waves? What if a corridor absorbed the bass tones of the performance? Music can impact us differently depending on the environment—this project allows us to receive the same performance in different degrees of aural manifestation.

One such manifestation could include the Echo. Essentially, once the source of the music stops, the architecture keeps the music alive—when we hear echoes, we are essentially hearing a memory of the music while it still exists in time. The memory of the music is not within our imagination; but still in our lived world. All of these possible experiences are ways that we can experience music holistically because of architecture.

Essentially, once the source of the music stops, the architecture keeps the music alive—when we hear echoes, we are essentially hearing a memory of the music while it still exists in time.

There also exists a more subjective component to this project. This notion deals more intimately with the materiality of architecture and its physical form. I think that there is something very loud and high pitched about a solid white wall; or something rhythmic about repetitive columns or structural members. The same can be said for light. The sun, especially when it penetrates into a dismal space, has a very even tone quality. Shadows, quite the opposite, have a low intensity rumble. Objects of the same material or cast in the same quality of light have kind of muted energy. This kind of response to architectural objects is slightly more difficult to listen for. However, thinking about architecture in terms of this kind of experience can add another layer of complexity into a space. The richness in this kind of experience would be unlike any other. It would truly blur the distinction between the eye and the ear. Neither one is privileged over the other.

The Soundcube

As a precedent study for the thesis project, I looked at Bernhard Leitner's Soundcube. The cube form is a visually neutral space. One material covers all 6 planes in the cube. Leitner then places an orthogonal grid of speakers spaced evenly on all of the planes. His hypothesis was based on the idea that sound, because it fills a volume, can create space. In executing this notion, he analyzed the properties of certain sounds, pitches, intervals, and in some of his later work, actual music. The carefully chosen sound types were played across the speakers in a pattern one at a time. The individual listening in the sound cube, even with their eyes closed, would experience the illusion of space from the movement of the sound. His investigation centered on the audio-physical properties of the space.

The individual listening in the sound cube, even with their eyes closed, would experience the illusion of space from the movement of the sound.

Leitner's investigation is more scientific than my approach. He is looking to the more objective qualities of music and architecture. I have dealt more with the subjective qualities. Both, however, converge and compliment each other naturally. The experience of space is enhanced because of the presence of sound.

Heideggerian Dwelling

Now that we have affirmed that listening and seeing together can more holistically influence the way we experience space, can it elevate the degree to which we dwell? When the architect is more conscious of the co-existence between the aural world and the spatial, the possibility exists.

Dwelling in the lived world is inevitable; we dwell at different degrees. When we dwell less authentically, we hear and we look at our lived world separately. When we dwell authentically, we are actively engaged in seeing and listening. This allows the experience of the lived world to disclose relationships that would otherwise be veiled. Elaborating on Heidegger, we could possibly dwell most authentically when we experience architecture and music together.

When we dwell less authentically, we hear and we look at our lived world separately.

Heidegger describes dwelling as cultivating, presencing, preserving, disclosing, protecting, and safe guarding. These terms are ambiguous and fail to identify whatever is to be "cultivated." In *Origin of the Work of Art*, Heidegger speaks about truth, or *alethia*. It seems that much of Heidegger's vocabulary is about truth and its appearance within the lived world. Truths exist infinitely—but it remains hidden when we engage with the world less experientially—when we look instead of see.

If we were to really see the experiences that present themselves to our consciousness, there is an elevated level of understanding. We are not passive beings, but are engaged with the world more consciously; these truths are more likely to emerge.

When the architect is more conscious of the ability to “presence” or “safeguard” truth, the ability to dwell in architecture is possible. If the architect imagines that the overlapping of music and architecture can “cultivate” and experience beyond what is typical or already known, then the truth of their connection is more likely to be made manifest. The architect can bring us closer to authentic dwelling by “presencing” two seemingly disconnected worlds. In the case of music and architecture, the architect can “nurture” or “care for”⁷ their fragmented relationship. In a sense, the architect is augmenting the possibility of truth and experience in the lived world—there is a sense that dwelling would be more likely to occur. But as stated previously, the individual must actively participate by seeing and listening to the experiences of the lived world in order for dwelling to occur most authentically.

Conclusion

I feel that there is a truth that has emerged from this discussion—that architecture and music can be apart of the same experience. My hope is that the architect can become more aware that the aural world and the spatial world compliment one another, enhancing the nature of the live experience. Architecture should not be reduced to purely visual experiences. Although I have focused exclusively with music and architecture, I am sure that the connections to other experiences could yield similar truths. Architecture, in a sense, is versatile and can naturally compliment aspects of our lived world that could often be overlooked or ignored especially because of habit.

So why should anyone care about this discussion? We are depriving ourselves of holistically experiencing the phenomena of our lived world when we chose to see with our eyes and hear with our ears. The aural world and the spatial world exist in different mediums, but can offer the same experience in concert. Seeing and Listening are active compliments. Illuminating possibilities that are often neglected, architecture can bring us closer to dwelling in the lived world.

I feel that there is a truth that has emerged from this discussion—that architecture and music can be apart of the same experience.

⁷ Martin Heidegger, *Poetry, Language, Thought* (New York: HarperCollins, 1971). The presence of truth, which is most often hidden, is essential to Heidegger. This thesis is concerned with hidden truths.

Precedent Analysis

Gothic Cathedrals
[Europe]

Various Architects

Soundcube
[Berlin, Germany]

Bernhard Leitner

Stretto House
[Dallas, Texas]

Steven Holl

Vernacular
[Kareliya, Russia]

Various Craftsmen

[This analysis looked at both precedent and anti-precedent buildings and ideas. Steven Holl, for example, is an anti-precedent for this thesis.]

GOthic CATHEDRALS + Gregorian Chant

[Europe] --- Various Architects

Ant.
1.



S Al-ve, * Re-gí- na, máter mi-se-ricórdi- ae :



Ví- ta, dulcé- do, et spes nóstra, sál-ve. Ad te



clamá-mus, éxsu-les, fí-li- i Hévae. Ad te suspi-rá-



mus, geméntes et flén-tes in hac lacrimá-rum válle.



E- ia ergo, Advocá- ta nóstra, illos tú- os mi-se-ri-



córdes ócu-los ad nos convér-te. Et Jésum, benedí-



ctum frúctum véntris tú- i, nó-bis post hoc exsíl-í- um



os-ténde. O clé-mens : O pí- a : O dúlcis

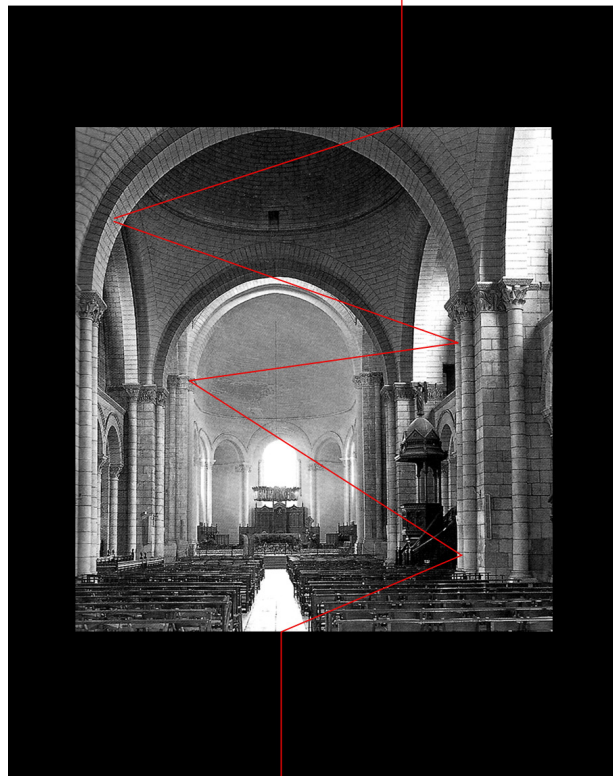


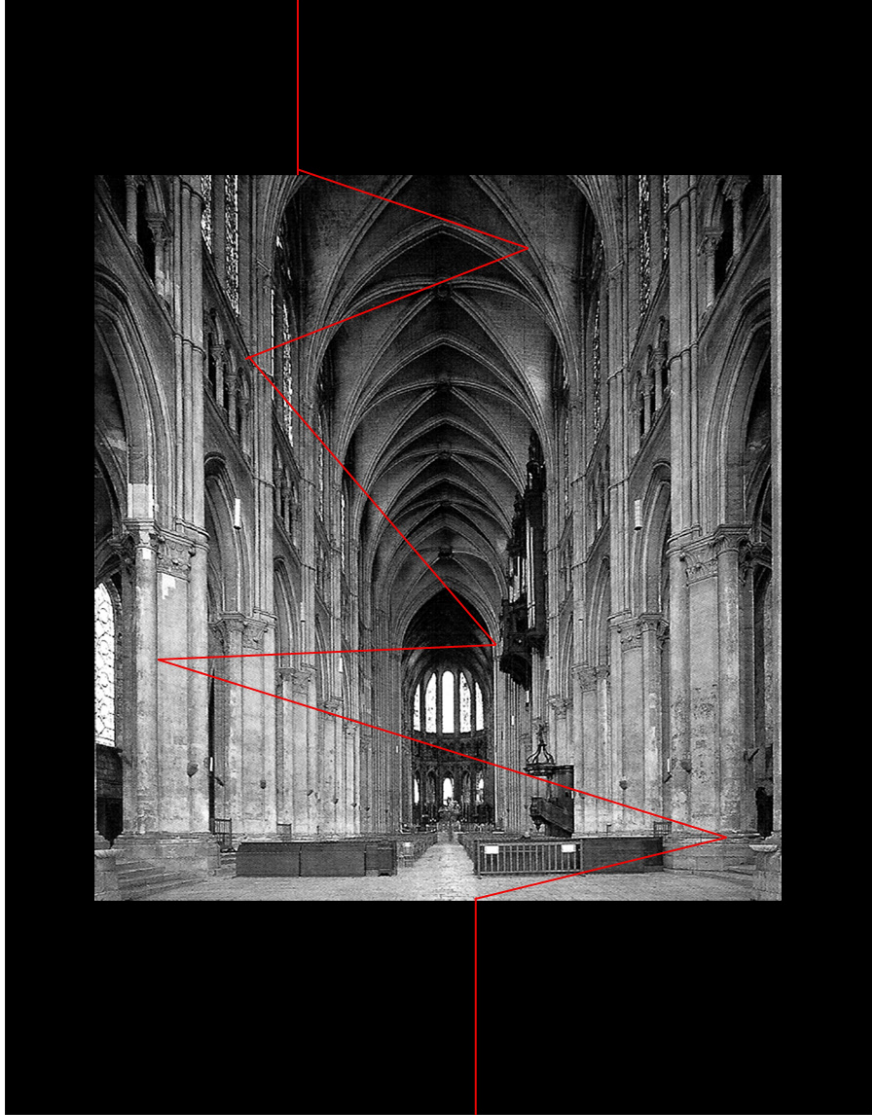
* Vírgo Ma-rí- a.



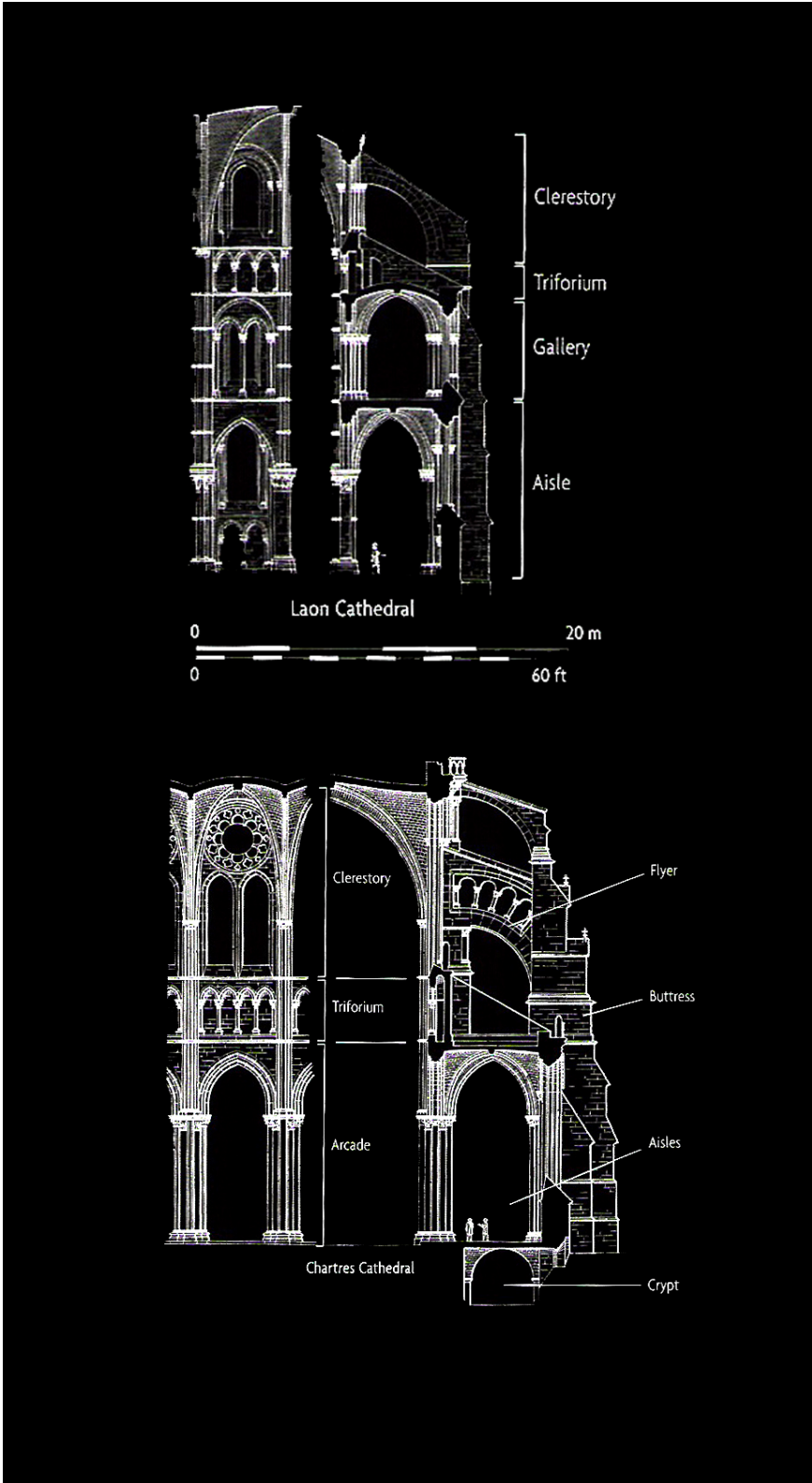
The Gothic, Medieval, and Romanesque churches can be described as kind of container for Gregorian Chants. The relationship between music and the way in which it is actually heard is of interest to the project. Without the extremely high reverberation time, the Gregorian chants would not be successful in conveying the kind of spiritual power that they embody.

Gregorian chanting requires a high reverberation time to build upon the notes that have already passed to create a deeply complex and richly layered music. If Gregorian chants were performed in an acoustically perfect concert hall, we would perceive each individual note, not the overlap of the sounds. Once a note sounds, in the cathedral, its volume still exists and is contained by that space for up to 15 seconds after it begins its manifestation in time. The architecture influences the music because of its materiality and interior form, affecting the way in which the music is rightly heard. Architecture can distort sound in an infinite amount of ways, allowing an individual to hear the aural world differently depending on their environment.





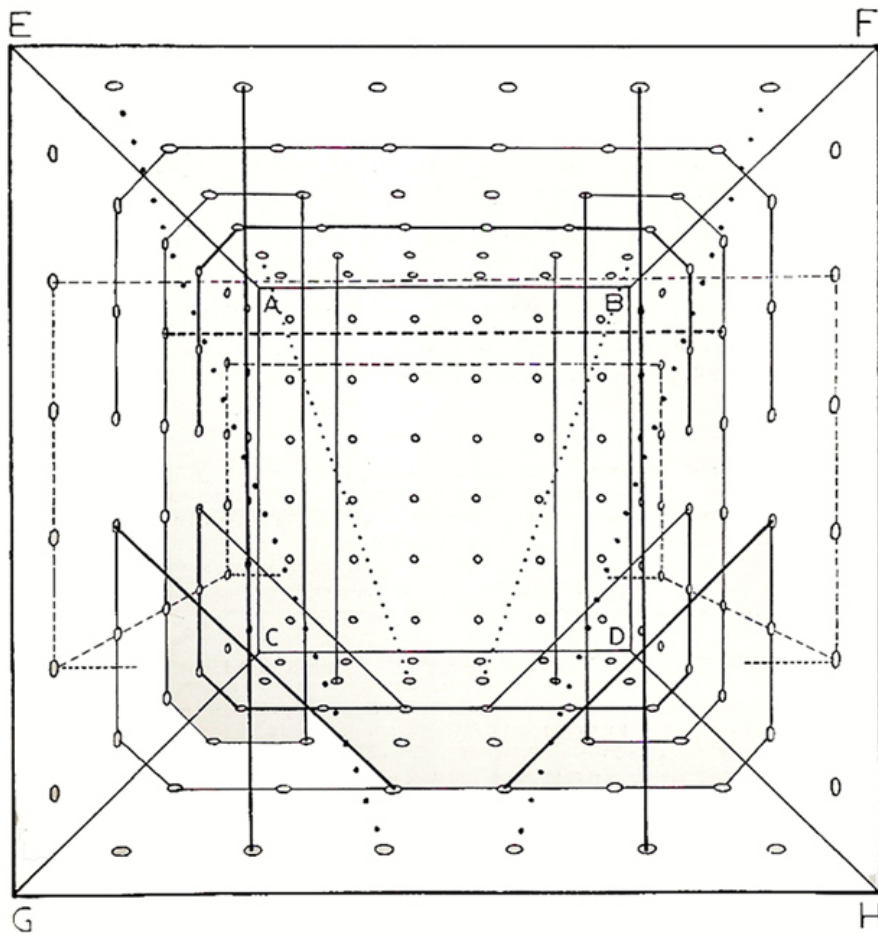
There exists three major layers in a section of a cathedral. The same structure has been said to exist within Gregorian chant.

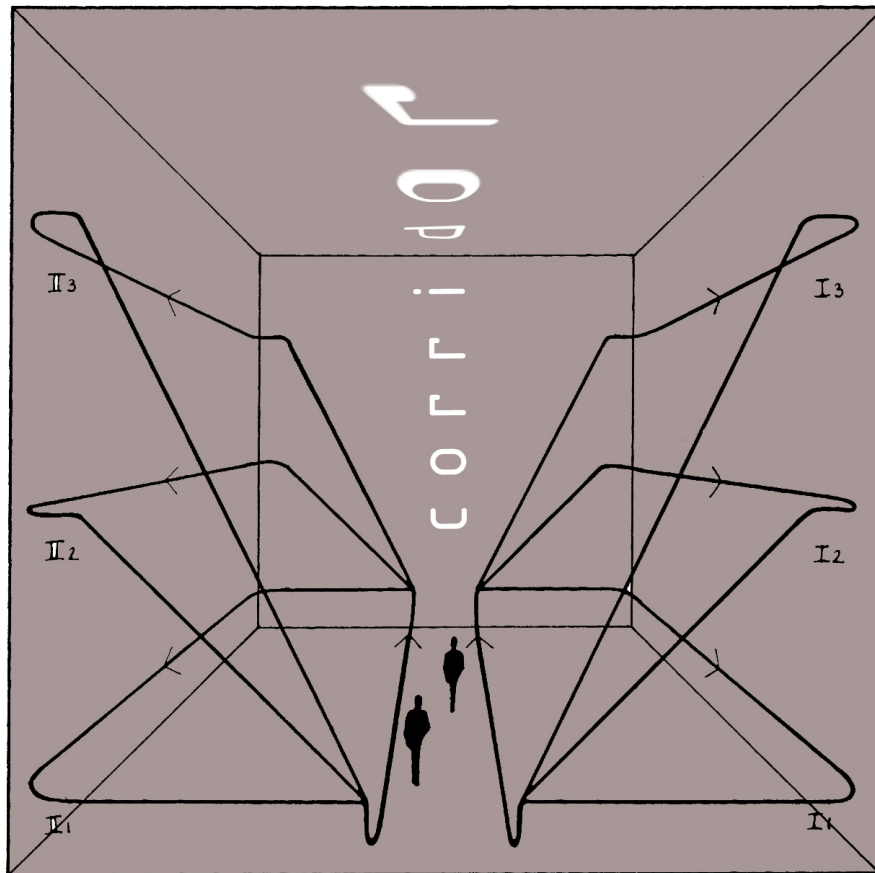


SOUNDCUBE

[Berlin, Germany] --- Bernhard Leitner

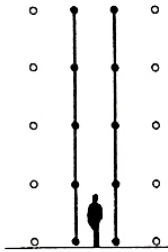
The sound cube is a visually neutral space. One material covers all 6 planes in the cube. Leitner then places an orthogonal grid of speakers at the same spacing on all of the planes. His hypothesis was based on the idea that sound, because it fills a volume, can create space the illusion of space. In executing this notion, he analyzed the properties of certain sounds, pitches, intervals, and in some of his later work, actual music. The carefully chosen sound types were played across the speakers in a pattern.



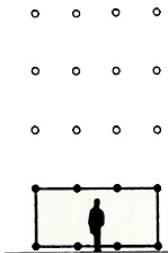


The speakers were not playing at once—the sound would have a starting point and then progress to the subsequent speakers. The individual listening to the soundcube, even with their eyes closed, would experience space. The fluctuation and movement of the sound creates a kind of spatial pattern. Our ears are perceptible to the movement of the sound and its general placement, thus denoting the boundaries of the space within the soundcube. So within this visually neutral space there exists a very rich spatial experience derived from sound. This notion extends beyond the assumption that we customarily interpret space based only on the visual.

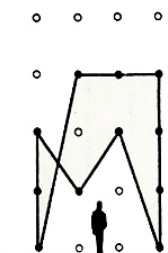
Other examples can be seen--Leitner creates a kind of corridor, forcing the individual on a certain path. Something that can not be seen is controlling movement in the same way that a wall would. Music is orienting the observer.



B5C5	B4C4	B3C3	B2C2	B1C1	B1C1	B2C2	B3C3	B4C4	B5C5
CELLO <i>sfz</i> <i>sfz</i>									
0,5	1,0 SEC	0,5	0,5	1,0 SEC	0,5				



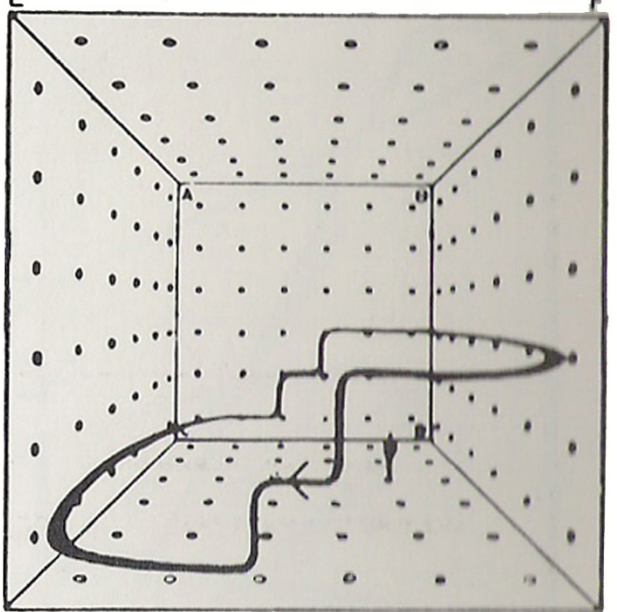
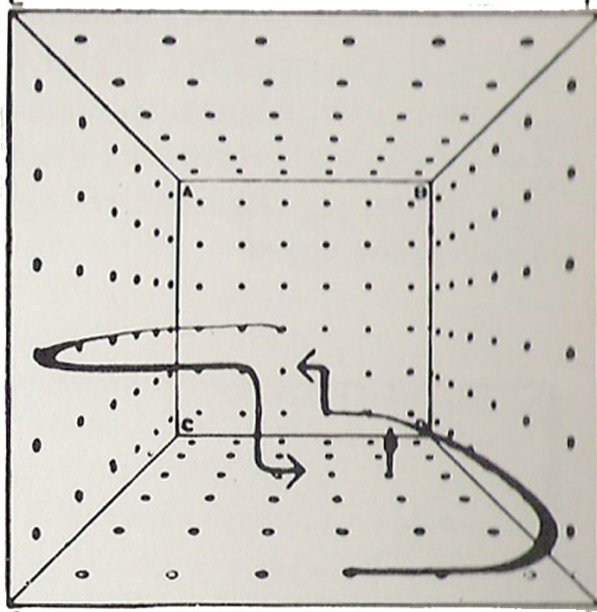
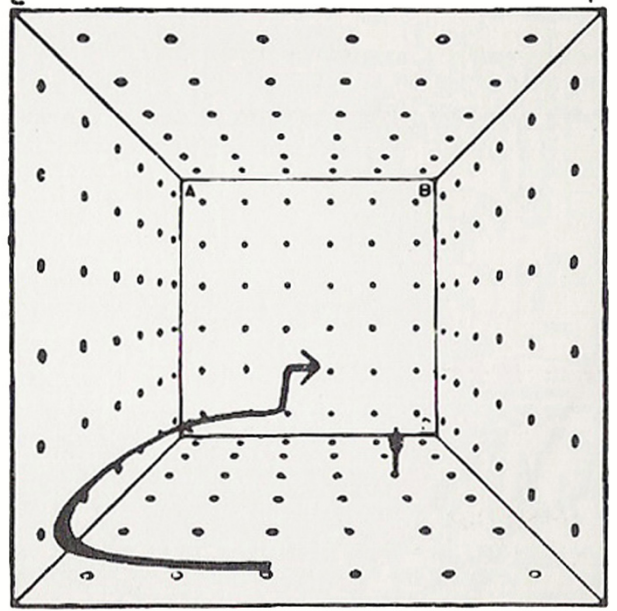
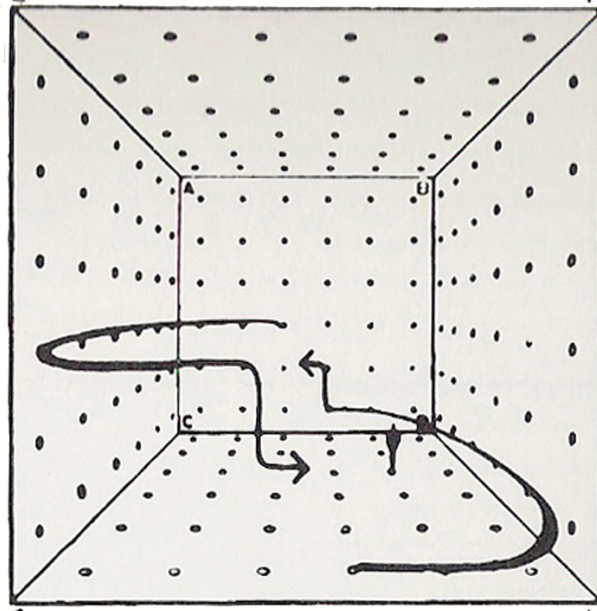
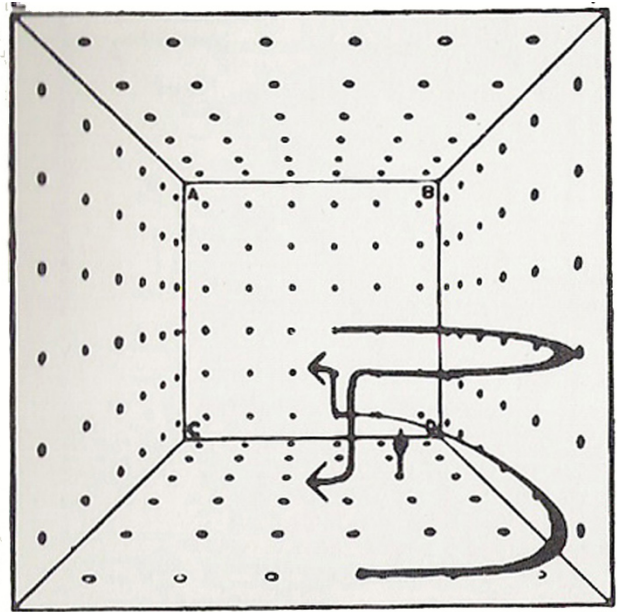
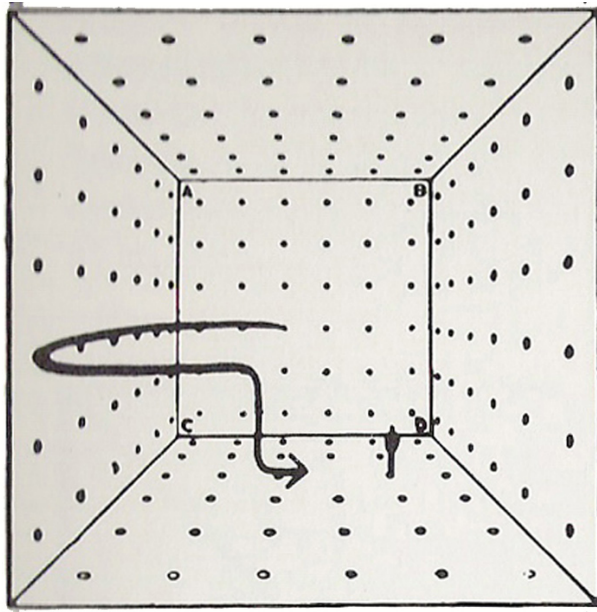
C2	B2	A2	A1	B1	C1	D1	D2
TIMPANO G <i>mf</i> <i>f</i>							
1,5	3,0 SEC						



- 5
- 4
- 3
- 2
- 1

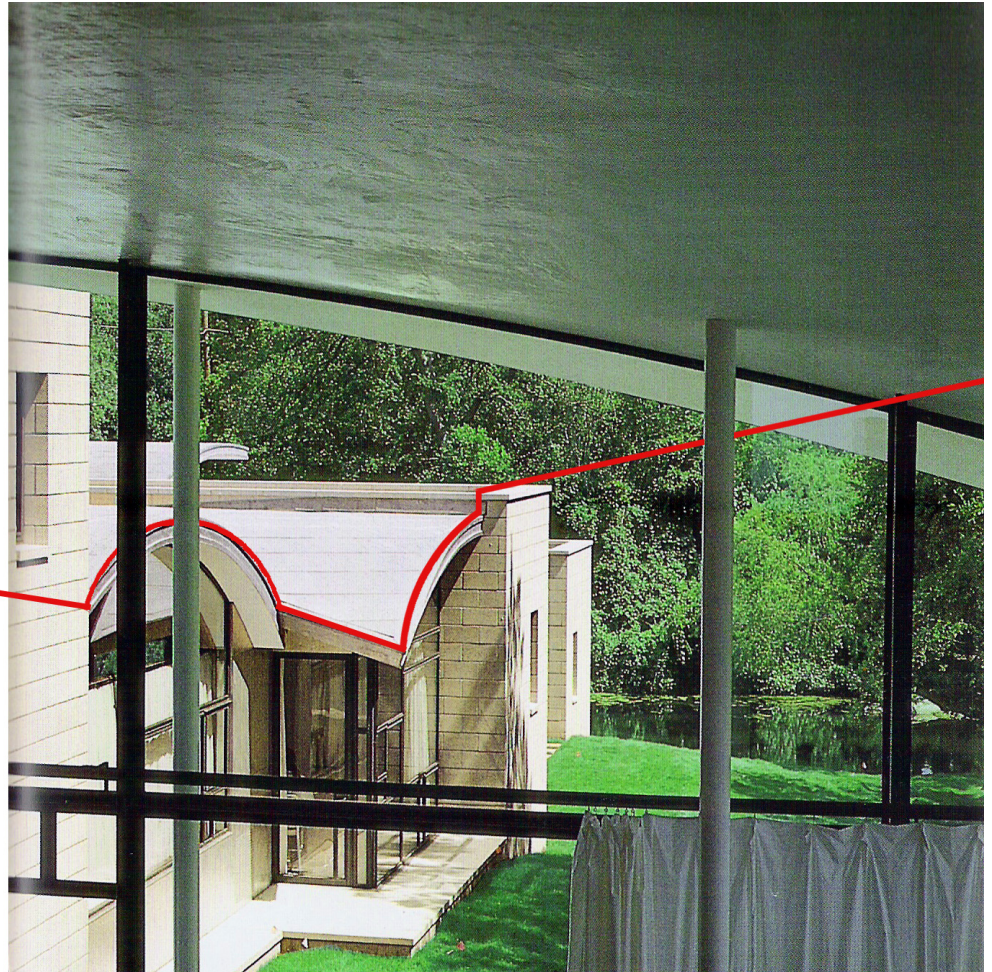
B4	A1	A2	A3	B2	C3	D1	D2	D3	D4	C4	B4
TIMPANO <i>mf</i> CELLO TIMPANO <i>mf</i>											
1,5	1,5	0,5	2	2	2	0,7	0,5	0,5	0,5	0,5	0,5

A B C D

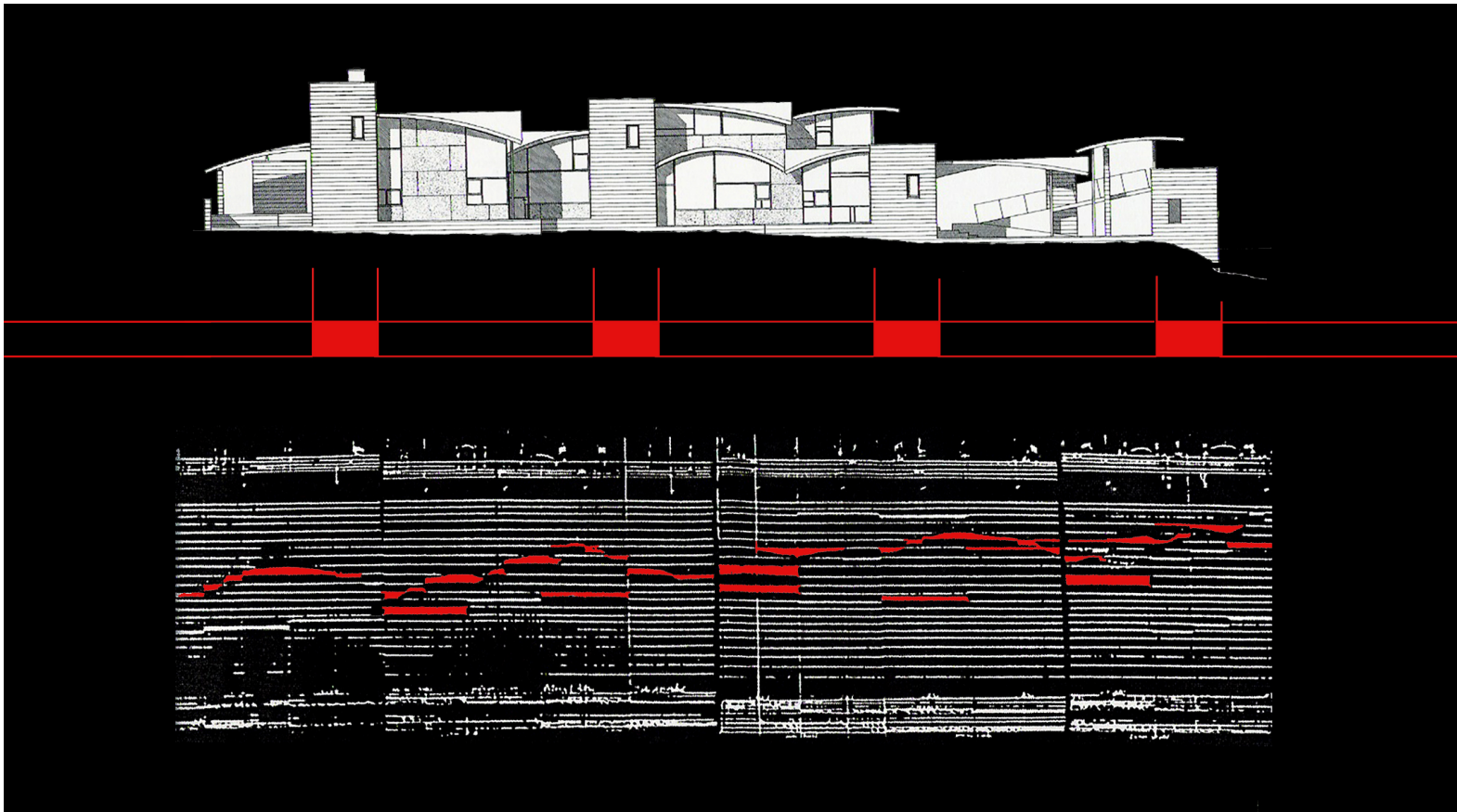


STRETTO HOUSE

[Dallas, Texas] --- Steven Holl



The Stretto House is an anti-precedent. It represents precisely what I would not like to do in this thesis investigation. Although the Stretto House was designed using Bela Bartok's *Music for Strings, Percussion, and Celeste*, it fails to accomplish a rigor in understanding the inherent properties of the music. Holl studies the intervals in the work and creates a roof line based on the shape of the developing curve. The building is divided up into sections that mimic the structure of the 4 movements in Bartok's work. There is a prominent and strong percussion line layered upon a lighter melody which is also present in the architecture—this is manifested in four parts similar to the layout of the music. In a sense, the house is like a visual snapshot of that music.



Materials in the house begin to reflect the voices prominent in the music. Holl analogizes the house as embodying the music--this kind of description is meaningless. There is no rigor in delving into the meaning and structure of the music in order to disclose overlaps that can inform a truly musical experience of the architecture. Music is portrayed literally and Holl has missed many opportunities to discover worlds within the realm of music which can challenge the usual design process in architecture. An analysis similar to Holl's would fail to bring about the experimentation involved in thinking about architecture and music—everything in the house is reduced to appearance and analogy.



VERNACULAR

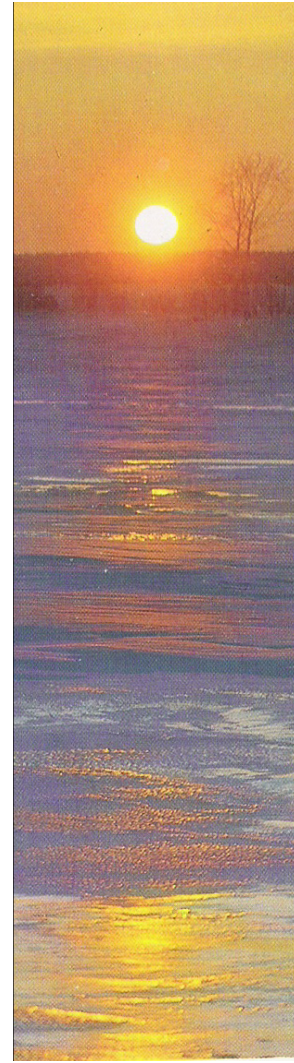
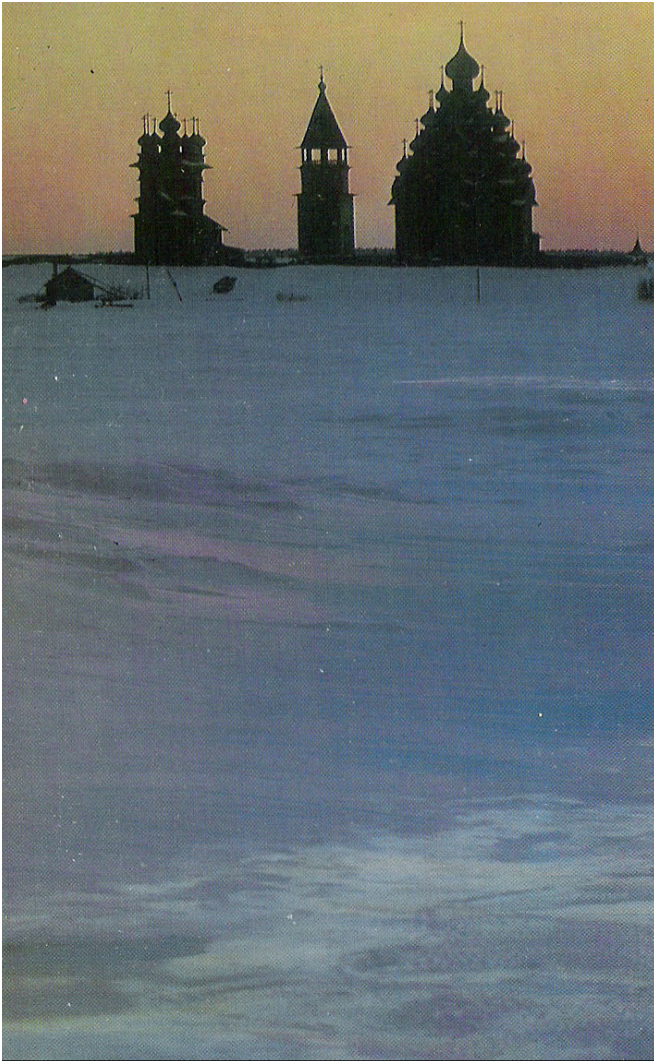
[Kareliya, Russia] --- Various Craftsmen

Kareliya, Russia is known for its wooden churches. The Holy Transfiguration Church is the most famous of these churches. The vernacular in the area is of particular importance to this project. Much of the architecture in this area is designed by craftsmen, carrying with them a specific method of timber construction.

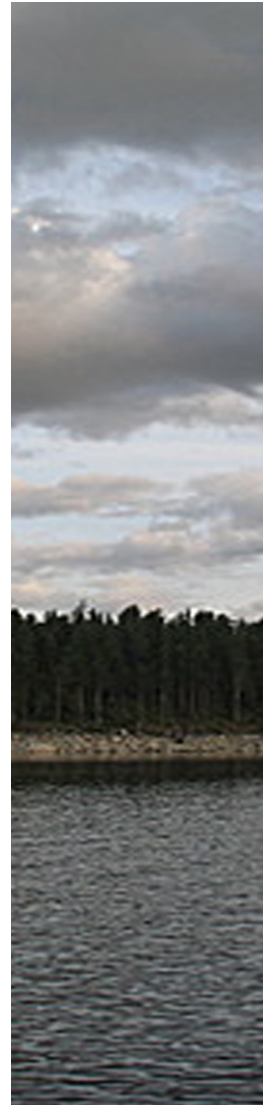
The most abundant material in the area is wood--it is best suited for protecting and insulating the interior of the buildings from the relatively harsh northern winters. The basic unit for constructing this kind of architecture is the *srub*--it is nothing more than rectangular interlocking logs.

What is most significant is the craftsmen's ability to create elaborate structures out of timber construction. The buildings are not simple, but begin to push timber to the limits of its structural capability. These buildings illustrate the precision in craft, attention to materiality, and sophisticated in design that are all in concert with the site and the context.

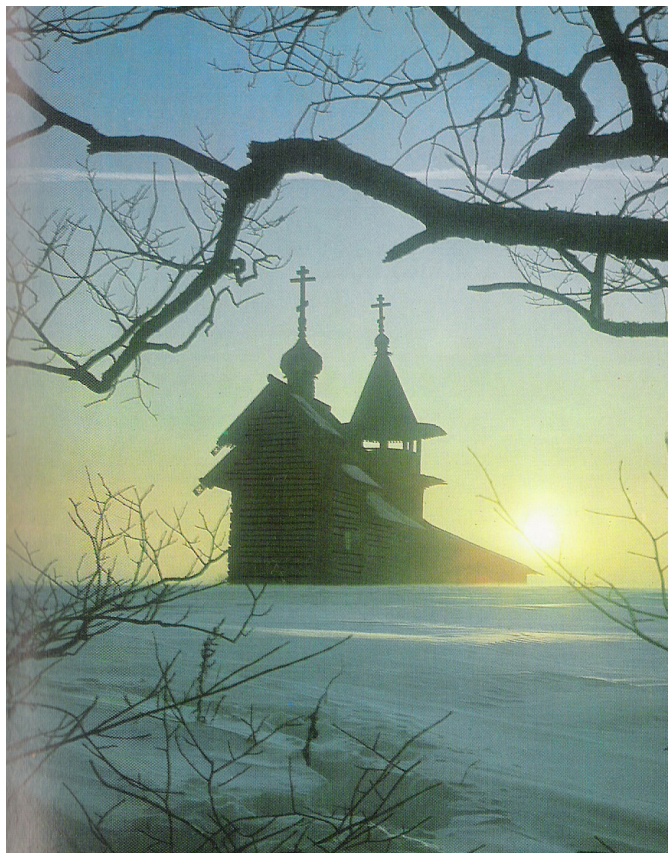




The site is also of particular importance to this project. In music, notes are harmonized with other notes--it allows for music to have depth. It begins to layer and create relationships between notes--simply stated, it makes music sound good. These buildings also begin to harmonize materiality, design, and context. These buildings, all though it may appear so, are not just placed upon the earth. There is a an intimate connection resulting from a harmonious layering of water, earth, trees, building, and sky. Christina Norberg-Schulz would call this Genius Loci--the architecture has captured the spirit of the place. These buildings epitomize Genius Loci--their power as an architectural object in the lived world lies in their relationship to the site.

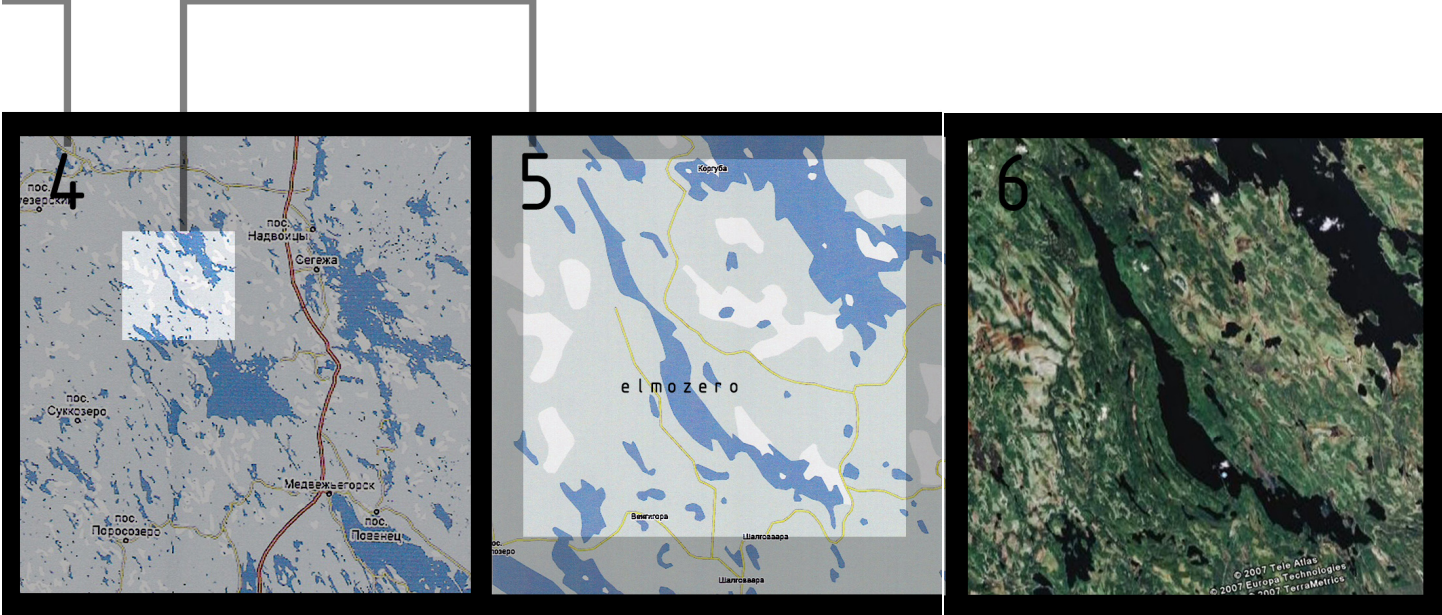


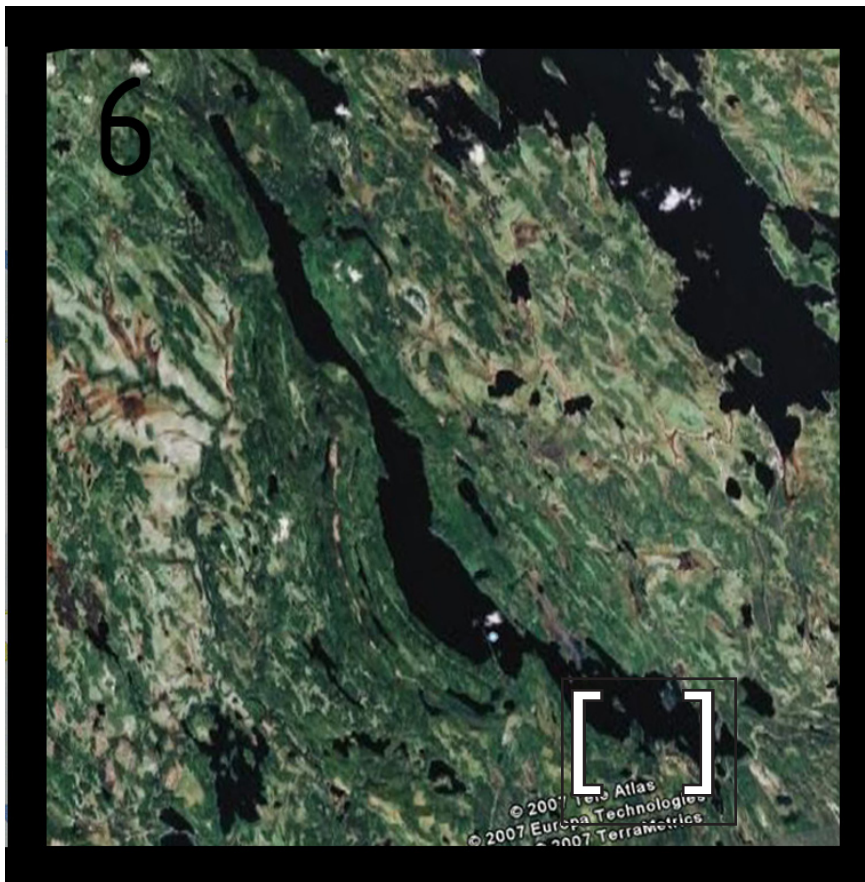
Again, the building is tucked in between the layers of water, earth, trees, and sky. The resulting images resonate a kind of quietness--quietness in the sense that there is a certain amount of awe that overcomes the individual when experiencing such a building.



The Site

Kareliya Lakes region of Russia



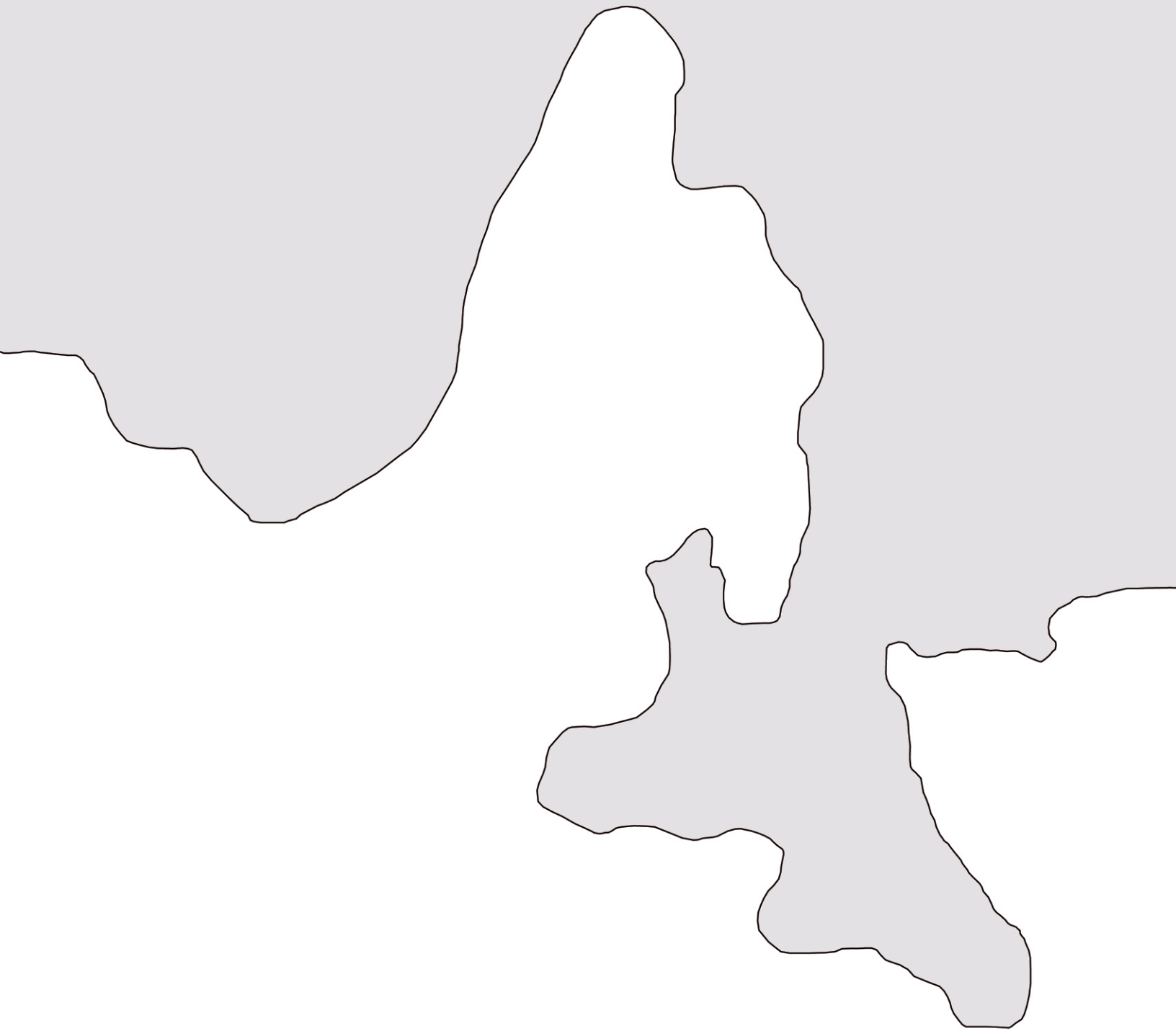


The Site

Designing a project with the spirit of Igor Stravinsky naturally needs a specific site. This area of Russia holds significant emotional ties for Stravinsky—it is here that he says to have had his first musical recollections. Many Russians from St. Petersburg have summer homes in the lake region.

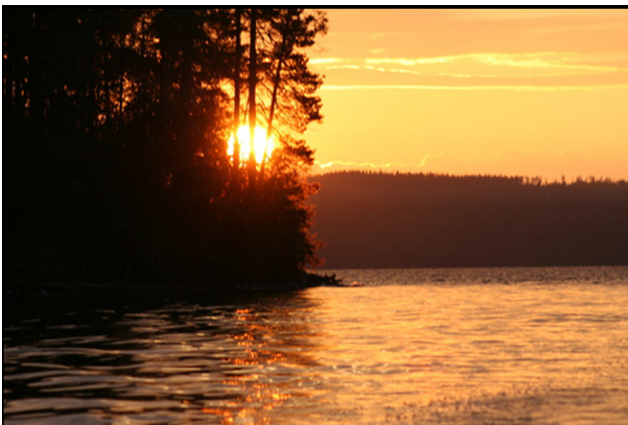
The Kareliya region of Russia is located North of St. Petersburg and east of Finland and 3 degrees below the Arctic Circle. There are 60,000 lakes in Kareliya. I have chosen Lake Elmozero, which is 5 hours from St. Petersburg and just off the major highway that runs North into Finland and across to Norway.

Many of the residence of St. Petersburg have second homes which are sprinkled across the lake region in the area. Although the site seems desolate, tourism and vacationers populate the region more frequently in summer months.





Much of the geography was caused by glacial scraping evidenced by the general shape of the lakes. The terrain is very hilly and carpeted with dense conifer trees—the land fluctuates between 500 and 200 feet above sea level. The soil appears to be very rocky—there is exposed rock in many of the images of the site. Although Kareliya is located around the Arctic Circle, its temperatures are regulated by the amount of water and the proximity to the ocean. The temperatures do not plunge as would be assumed. As with Northern locations, Kareliya sees a drastic decrease in light in the winter months and a dramatic increase in the summer months. Because of its northern location, the summer months have a drastic increase in the hours of daylight while in the winter months, the opposite occurs. The Aurora Borealis would be another phenomenon occurring in the area.



There is something ideal about a performance facility in the wilderness of Russia. It seems to fit naturally, harmonizing the architecture with the site.

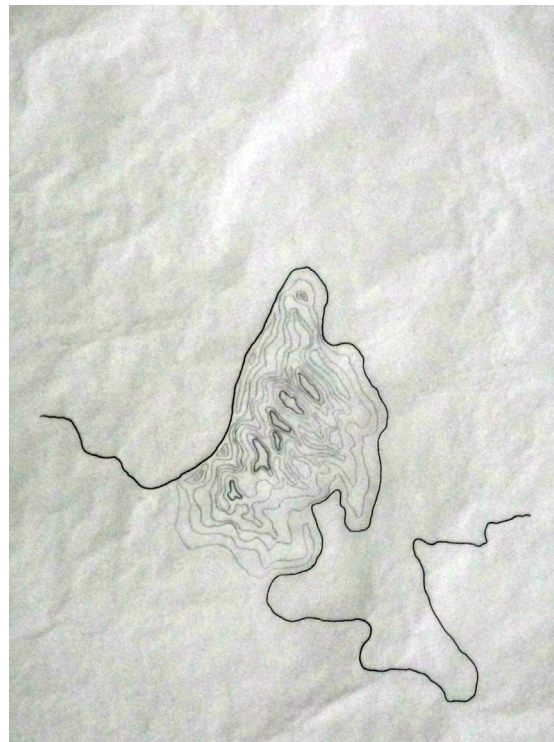
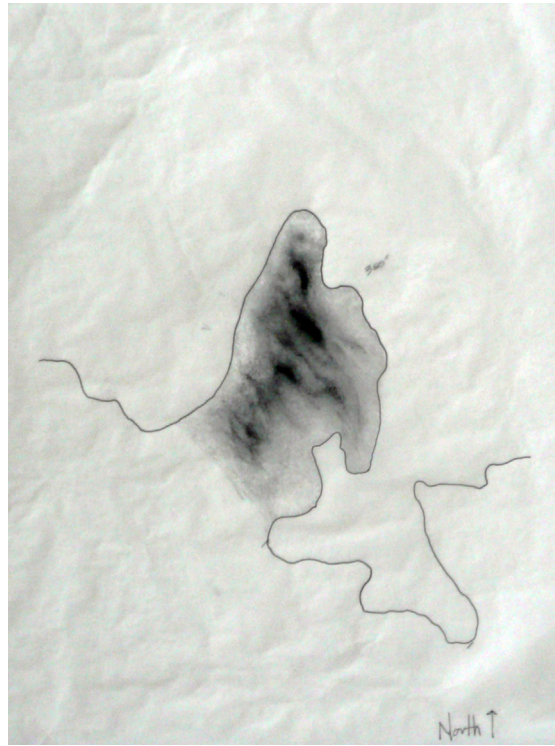
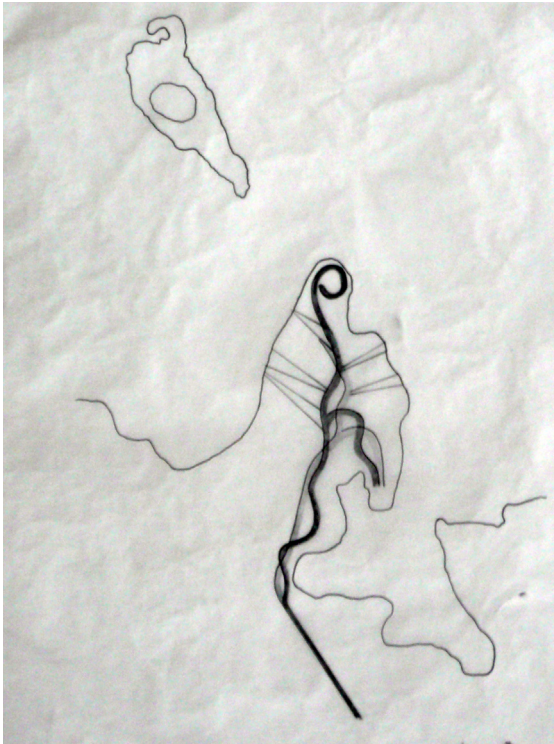
In all of the images, there exists a kind of quietness about the place. The drama lies in the layering of water, earth, trees, and sky, which all come together so powerfully, that there is a sense that things are hushed--muted to the point where all we hear is our inner thoughts because of what we see.

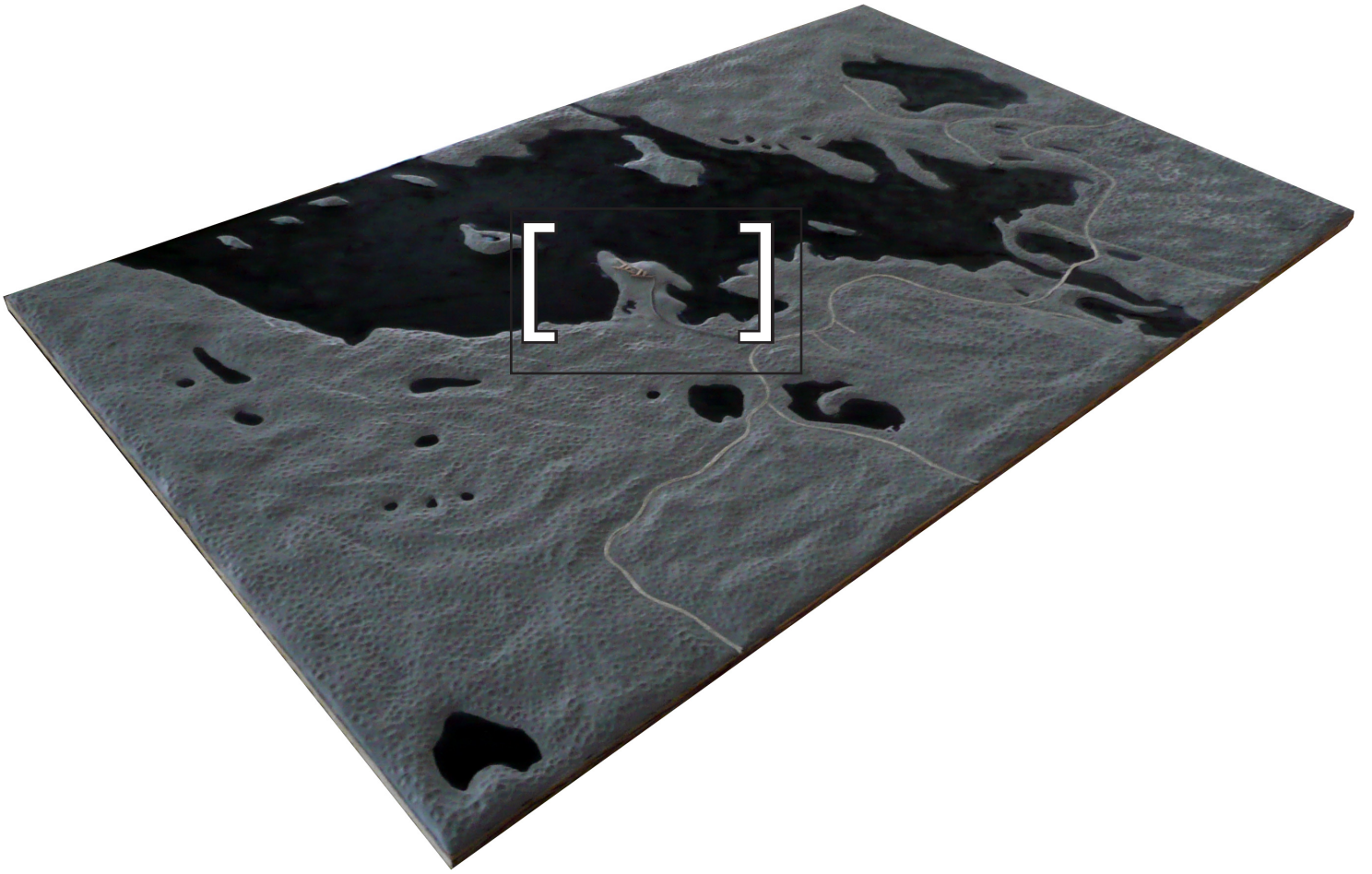


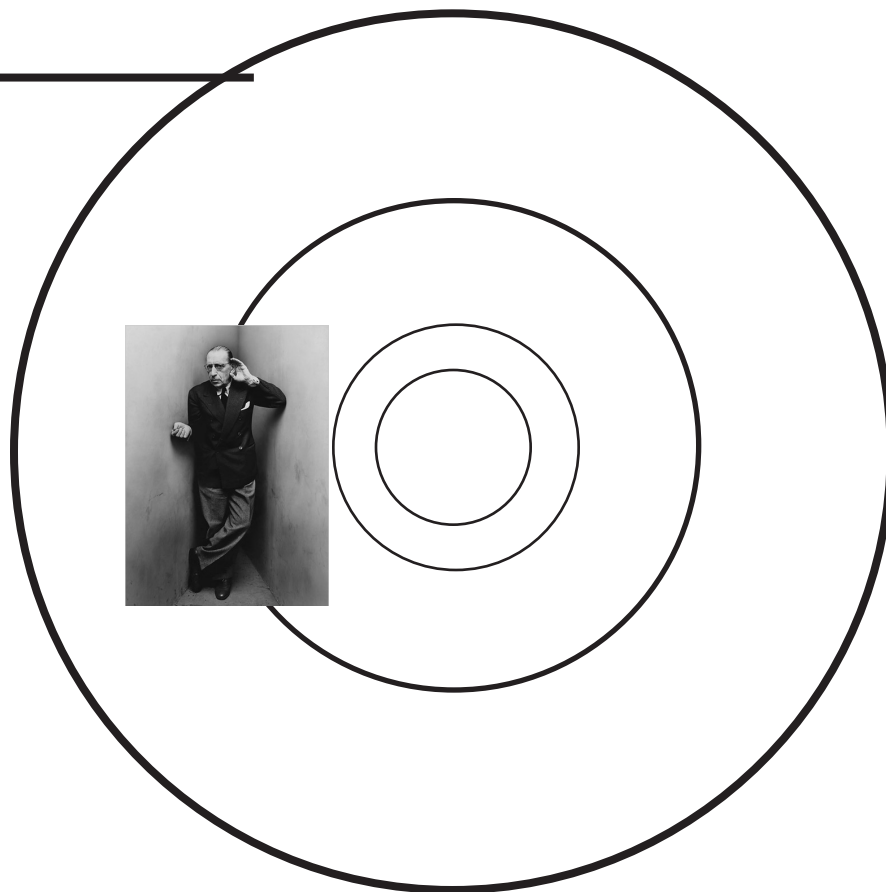
There also exists some interesting topographical features as well. The lagoon across from the peninsula where the building is proposed to be located is a very unusual and rare feature. It is an island with a lagoon directly in the center. Although the island will not be used in the project, it makes for an interesting feature.



Locating specific site information about the Kareliya Lakes region was a challenge. These drawings studied the topography in the area based on Google Earth images. These lakes were formed by receding glaciers. The topography would reflect the movement of such a condition.







The schematic design of this thesis begins by listening; by creating complex objects that begin to manifest architectonic relationships to music. These studies will heavily influence the design of the building because the final product was not identified prior to their creation. Different techniques will be employed in a variety of singular and multi-media forms, rigorously looking to Stravinsky as their beginning or concept; but with other objects, it was intuition that fueled their discovery. Not only do these ideas suggest architectural forms, but occurrences that might not be seen in building form. For this reason, the observer must listen; must be aware of what could happen to their bodies in concert with such objects.

It has always been my desire to create complexity within architecture--complexity, however, is not complication. The objects in schematic design will help create a multi-faceted architecture even if the concept appears simple. Complexity implies a kind of multiplication of both experience and spatial configuration.

Conceptual Sketch 1

Conceptual sketch 1 was an exploration in watercolor and ink. The deepest color represents a musical source and how it might begin to move through and take the shape of the building to which it is contained. The ink begins to suggest the ability for architecture to contain the aural world to various degrees. The drawing captures the energy emitted from a musical source and how architecture begins to mold the volume of music into a form. The volume becomes less dense as the music naturally moves through time--it is affected by duration. In a sense, the music begins to paint the architecture--it can begin to give it life, bringing an aural quality to a physical object.

How does this occur in our everyday lived world?

Sound, manifested in our physical world, exists within the physical realm or architecture--are we conscious of this phenomenon?

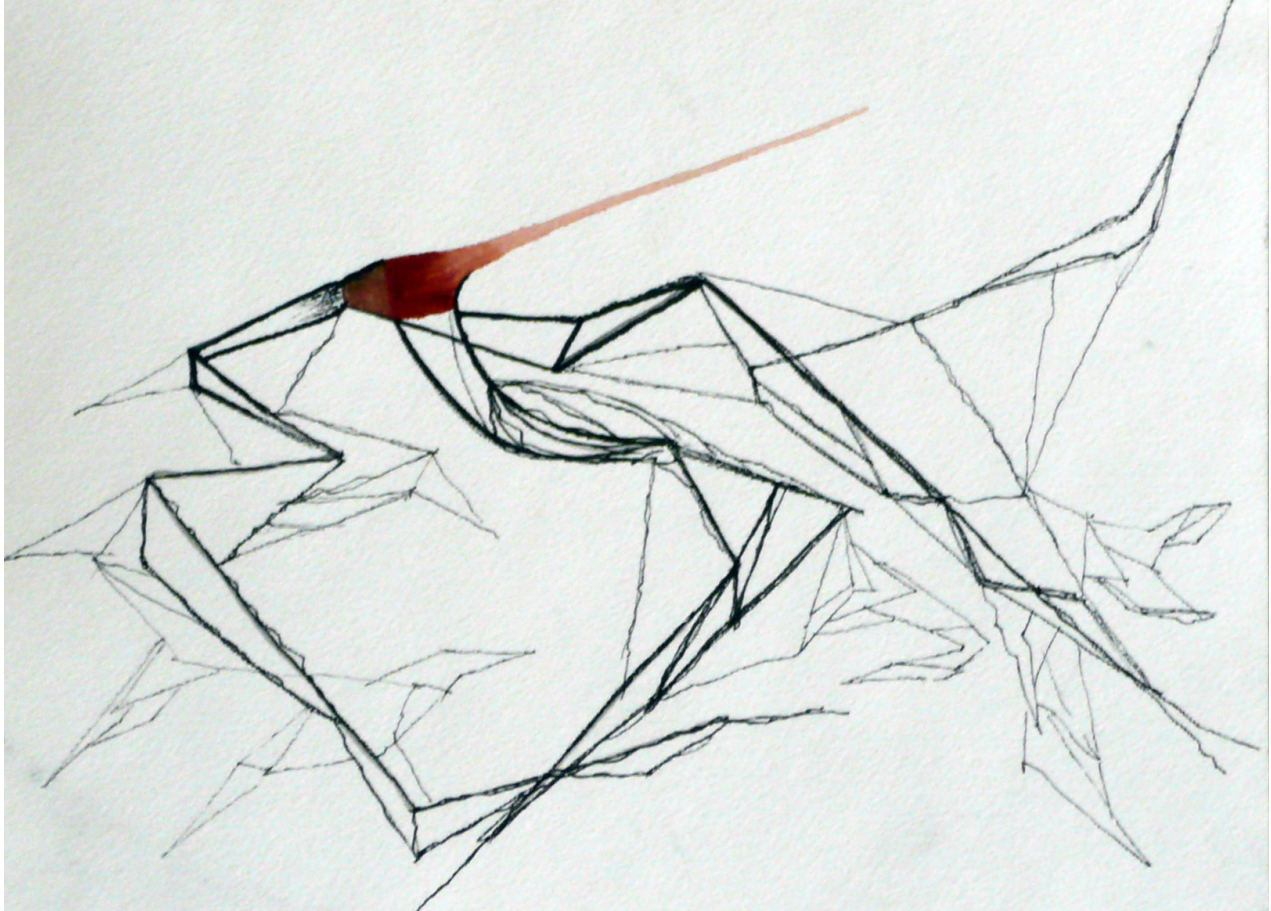
What happens when the residues of a sound source overlap?

How can architecture create a physical form expressed by the ink that allows for the music to form in the ways represented by gradients?



Conceptual Sketch 2

Conceptual sketch 2 begins to examine the same qualities as conceptual sketch 1. The ink begins to express the possibility of architectural form more clearly. The watercolor is less organic and more geometric--this quality suggests that the music is contained completely by a more geometric container.



Is it possible for music to be completely contained by a physical form?

How can sense deprivation work with this idea?

With if the sound is completely contained by the form but the vibrations are allowed to pass.

Can we experience the emotion inherent in music through its vibrations?

Did Beethoven do it this way?



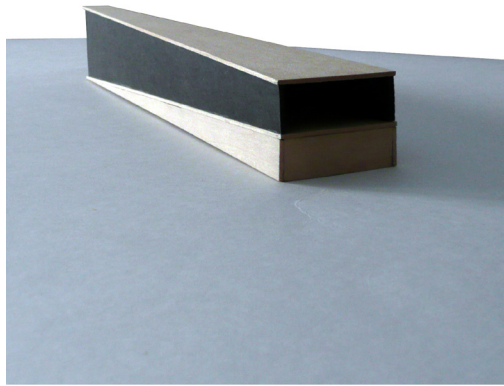
How can the individual more holistically experience and absorb a musical performance projected onto the body through the physical properties of architecture?

Conceptual Model 1

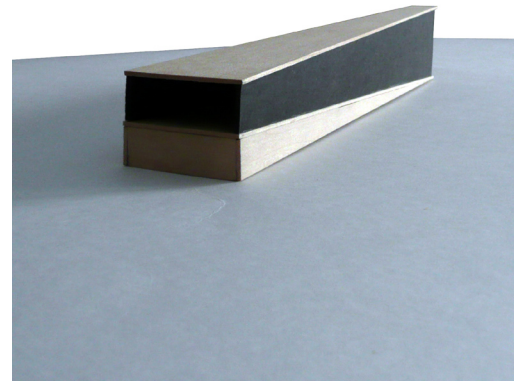
The inversion

This model was the beginning of the examination testing how physical form can be derived from the structure inherent in Stravinsky's serialist music. Inverting a line of music is typical in a serialist composition.

A plane angled upward from zero is inverted or mirrored to form a top. When the sides are closed, this also is an inversion. The complexity in the derivation of form exists in all directions. So the inverted form can be oriented in any direction.



The opening of One end is oriented longitudinally while the other opening latitudinally. Inverting forms result in symmetry along one axis. This process implies a kind of multiplication,

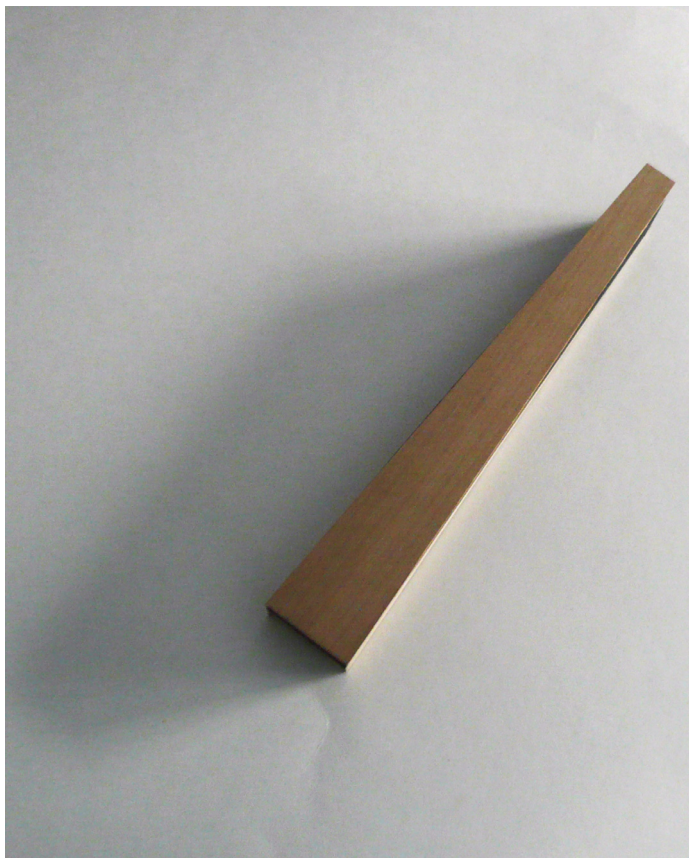
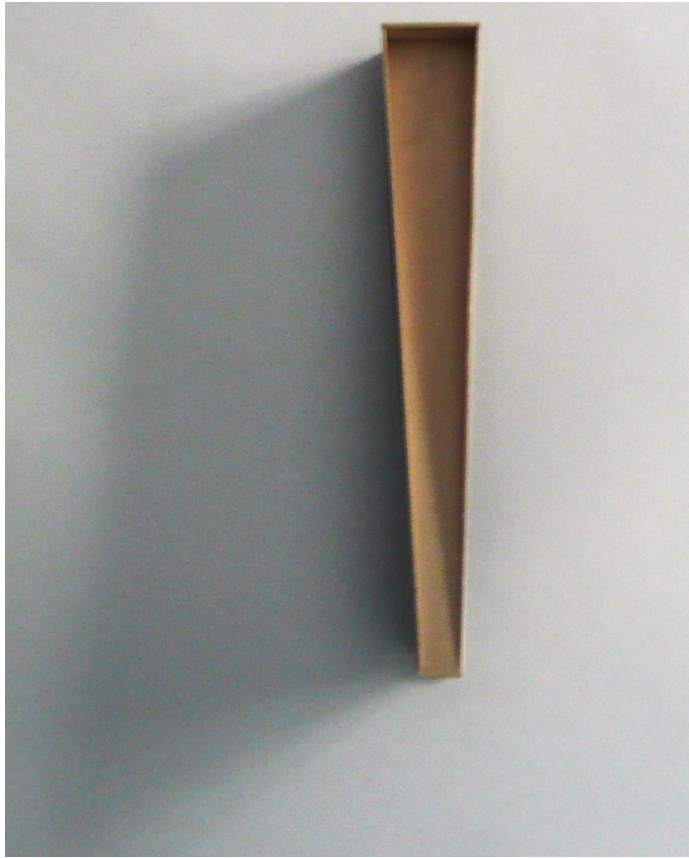


moving the form to more complex configurations.

What would happen if this form were to be inverted?

How would sound move through this space?

Would there exist a venturi affect similar to the properties of a fluid?



Conceptual Model 2

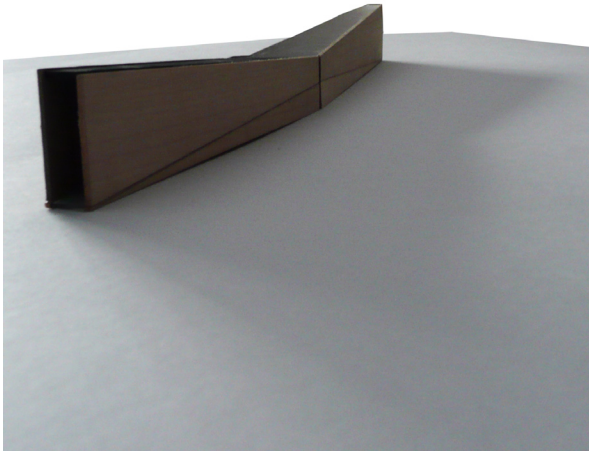
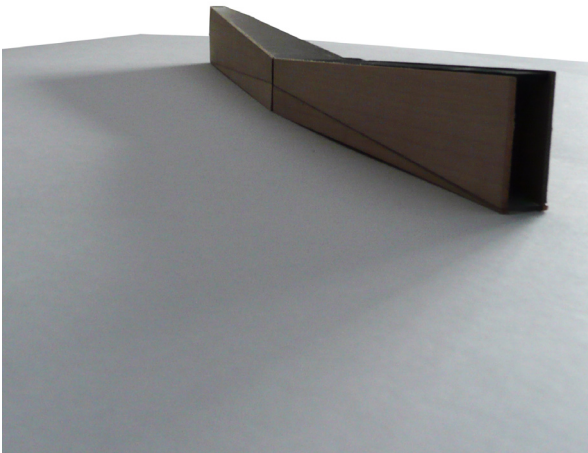
Inversion in 2 directions

Even simple forms and ideas can have an inherent complexity. All the forms in these models are simple; the complexity that they can begin to create is what continues to drive this thesis investigation. Inverting is a

simple process that augments the complexity

in form. These next sketch models are based off of sketch model 1--the difference is that the inversion occurs in two directions. In Sketch model 2, a set of inverted forms are merged together. Symmetry now runs in both

directions. When compression occurs at one end, tension occurs at the other.



What is most interesting in this model is the tension implied by longitudinal end and the latitudinal. If an individual were to walk through this space like a corridor, the body would feel long, short, and long again. This stretching and compressing

can be absorbed by the body only in time. As stated earlier, music exists in time--it has a duration. So the tension resulting from the form, the individual needs to be moving through time--there is a beginning and an end.



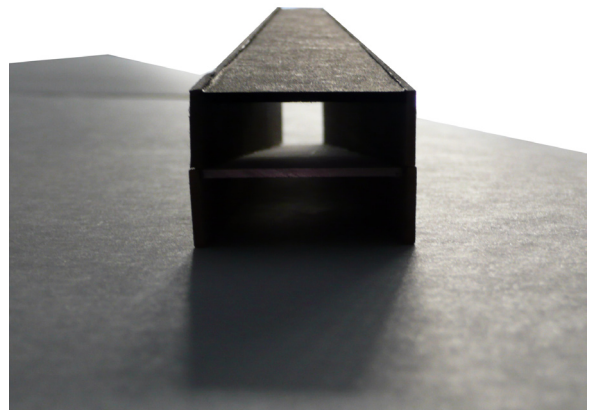
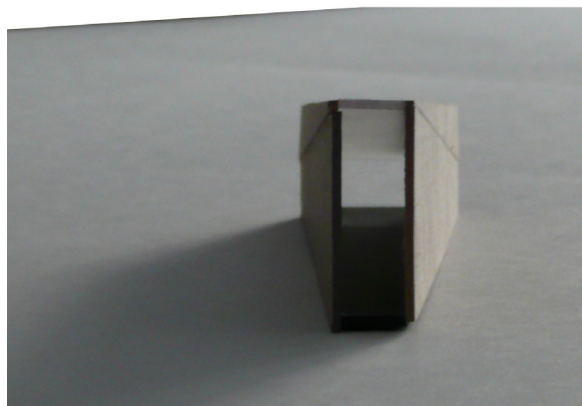
This notion also begins to reference Bloomer and Moore's Body Image Theory--the architecture, in this case, promotes a kind of choreography based on its inherent properties. The body responds accordingly.

Stravinsky's music often has an ambiguous beginning and end--this model does not--how could the beginning and end of this model become more like Stravinsky's music?

How does the degree of compression affect the movements employed by the body? Pace? Rhythm?

Does the body behave like a liquid in the same way that sound could in such a space?

Sketch Model 2 also examines materiality and how it can begin to visually express the structure and complexity of the form.





Conceptual Sketch 3

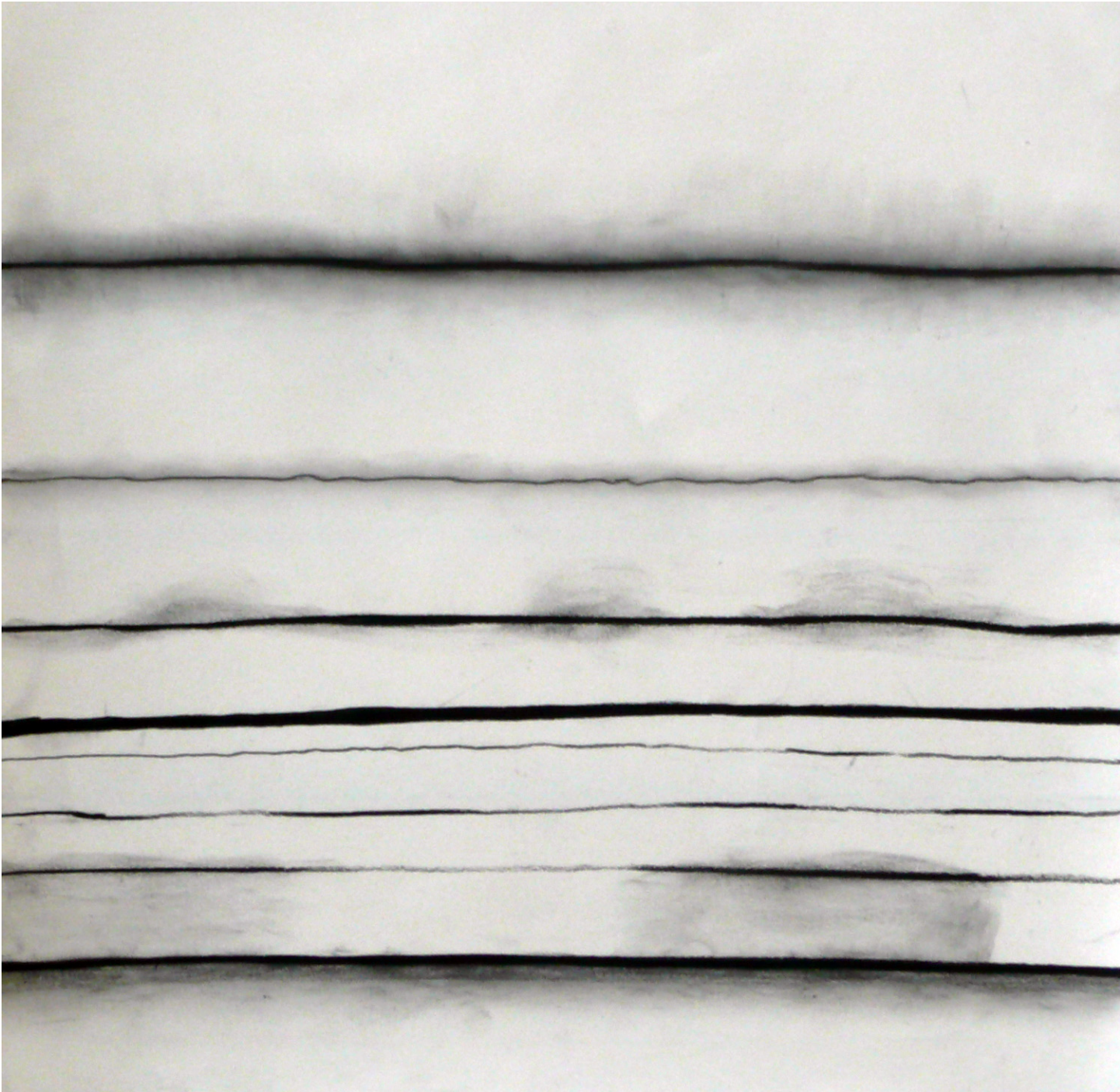
This sketch begins to describe the degrees to which music exists within its container. Sound waves move around objects but can penetrate them as well. The darkest part of each line represent a kind of sound source--the gradient resulting is how music is filtered or absorbed by the material properties of a form. For example, the fourth line from the top could be a form that completely contains the music within it--the shape of the music is molded to the architecture. In other examples, the music might begin to bleed. In the first line, the music penetrates through the building and the individual outside of that form would hear the resulting distortion--the music would be muffled. In the last line, there could be two materials--one that allows the penetration of music on one side and the other which totally contains it.

What happens when sound source are mixed? Do we perceive the music as music since its organization is less structures as described earlier in the book?

Because of filtration, augmentation, containment, or penetrability, can we more holistically experience music?

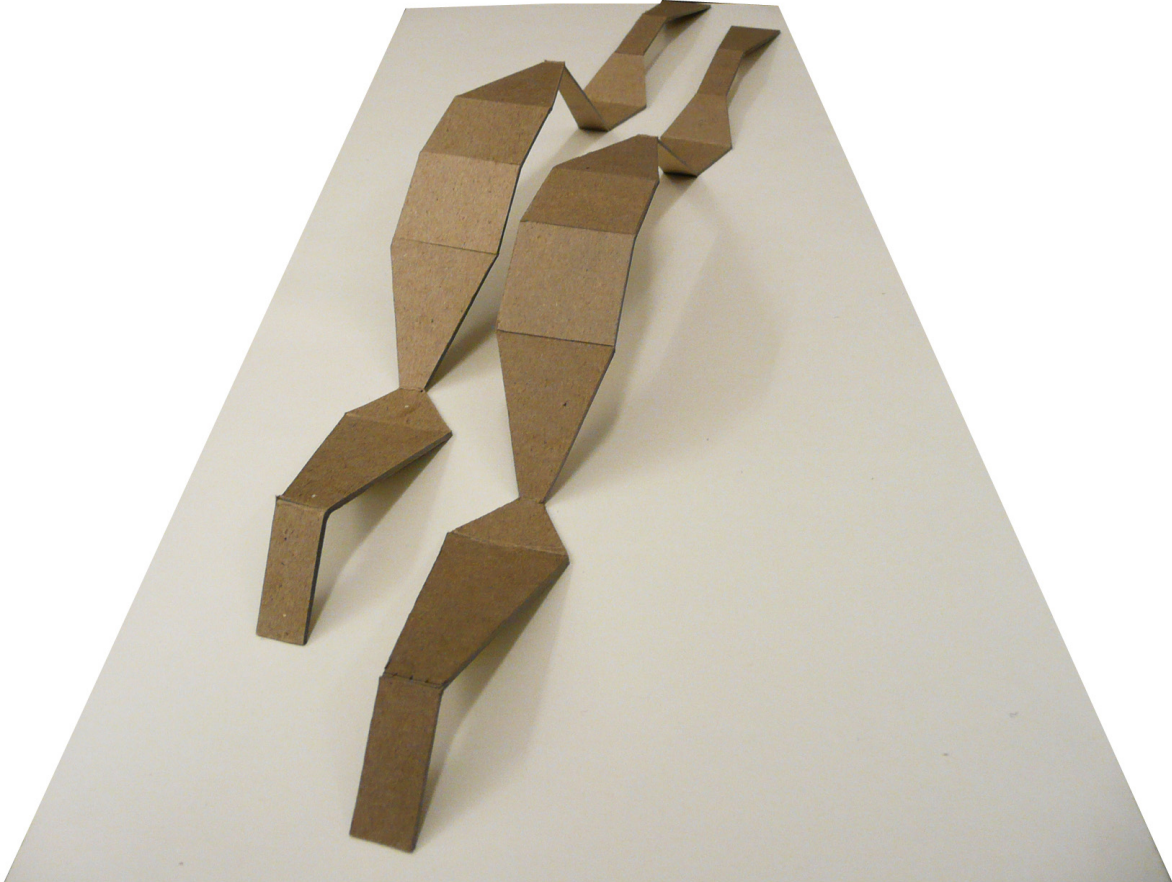
If Music passes through A filter that diminishes its volume, but keeps its intensity, how does that affect the way we hear a piece of music? Is it the same piece of music? Would one feel differently? There is a sense that less volume requires the individual to be more attentive--or is it the opposite--does it make us less attentive because it is harder to hear/listen?

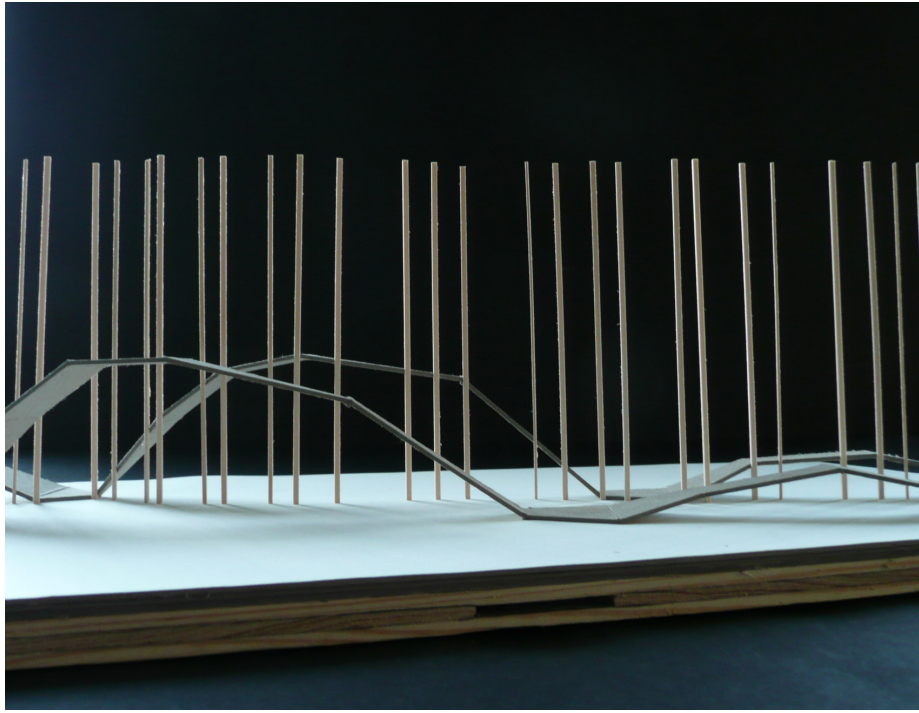
If and individual is moving through architecture filled with music at a higher intensity and volume, we can not really hear ourselves--there is a sense that the music is carrying us or floating. We can not hear our footsteps because there is no audible reaction. Perhaps the ground feels soft?



Conceptual Model 3

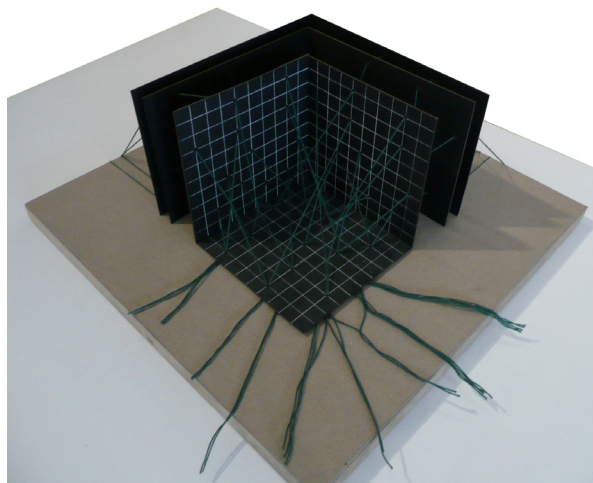
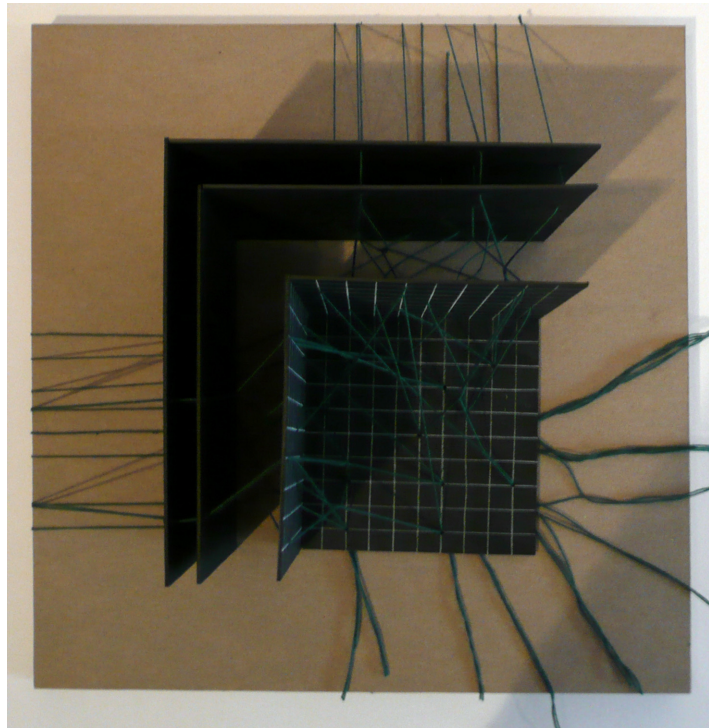
12 segments compose each piece of this model. They become a sequence such as one used in serialist music techniques. They are slightly offset from one another, creating the tension inherent in chords or rhythm that are offset. The space formed by their offset parallelism are of significance hear.

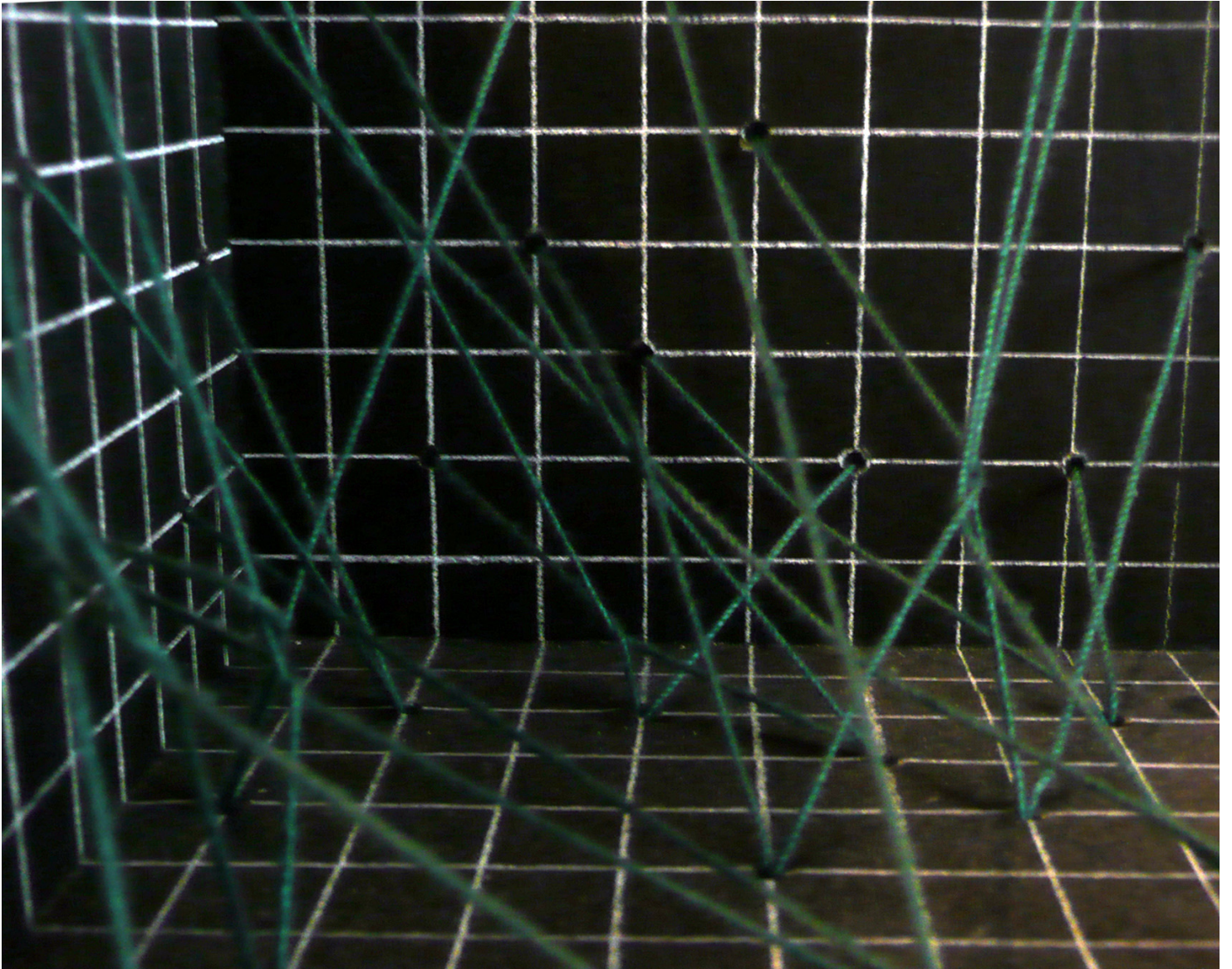




Conceptual Model 4

In this model, I took the role of Stravinsky in design. This study illustrates the composition process of a serialist piece of music. Serialist music identifies 12 tones and places them in a series. The series appears to different degrees within the work and is manipulated by inversions, retrograding, etc. Here, 12 tones or intervals were pierced on the grid of the first plane. Here is the first manifestation of the series. When the string passes through the second plane, the intervals appear in a new series. This complexity continued onto the third plane, where the series from both directions are added together to push the complexity further. This technique is how serialism becomes so structured and mathematical. The result for architecture is an image that could begin to describe a multitude of ideas. Perhaps the forms could begin to describe how the body might move through space--first ordered and then more chaotic. Issues of scale are also a possibility--this could begin to describe the approach to the building starting with the car ride to the actual site. It could even suggest forms that could appear in the final building.

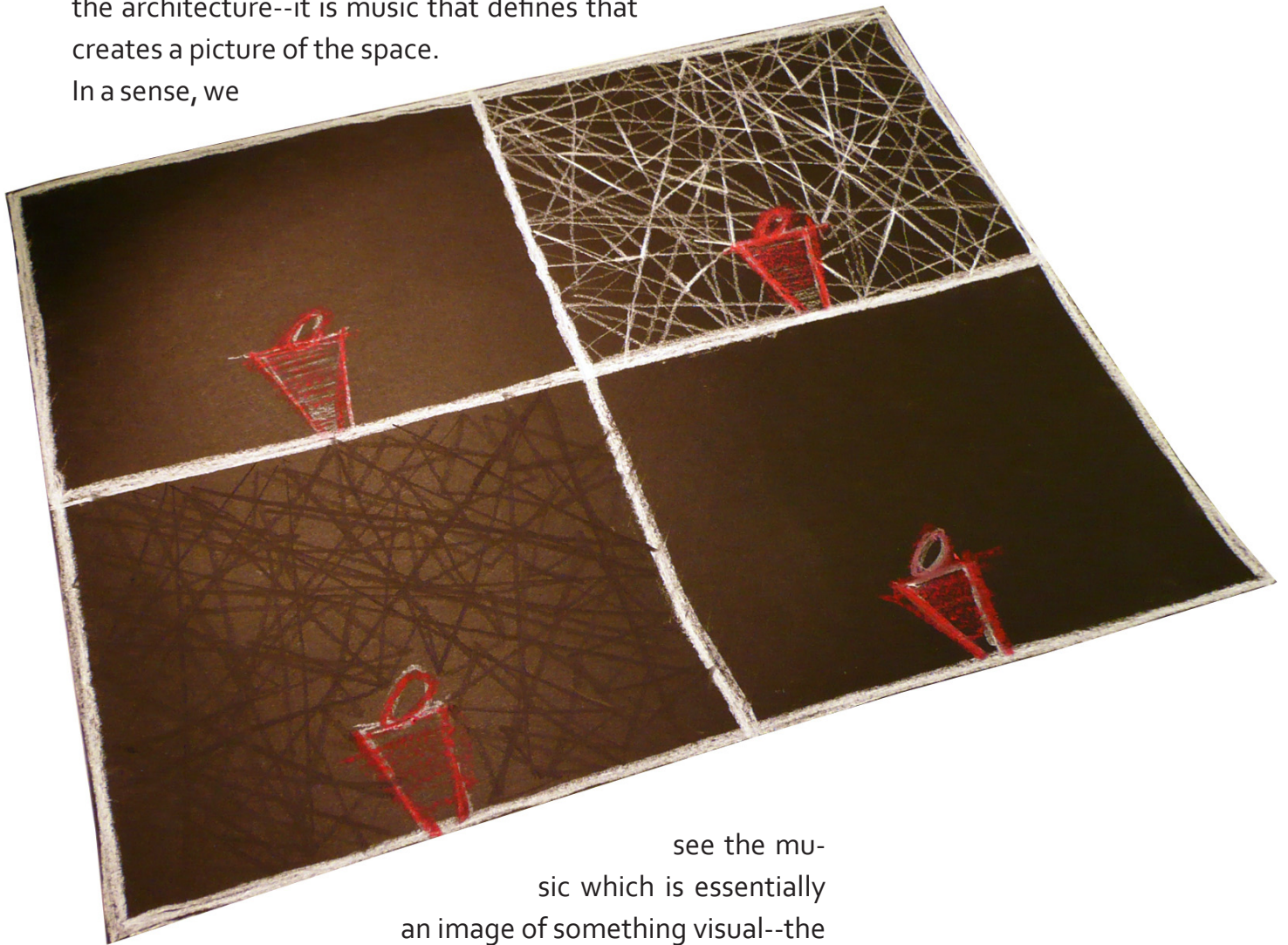




Conceptual Sketch 4

In revisiting the question of holistic musical experiences, this sketch illuminates another possibility. When we listen to music in space, the music reflects the properties of that architecture and affects the way the music is projected on to and absorbed by our bodies. The music gives depth perception to a space in the same way that we perceive depth perception with our eyes. If an individual is in a space and completely deprived of sight (the lights are turned off), it is the music that colors the architecture--it is music that defines that creates a picture of the space.

In a sense, we



see the music which is essentially an image of something visual--the architecture. When an individual listens to music in the dark, there is a sense that they can see more. Seeing does not simply mean what we see with our eyes.

Can we listen to a musical performance in the dark?

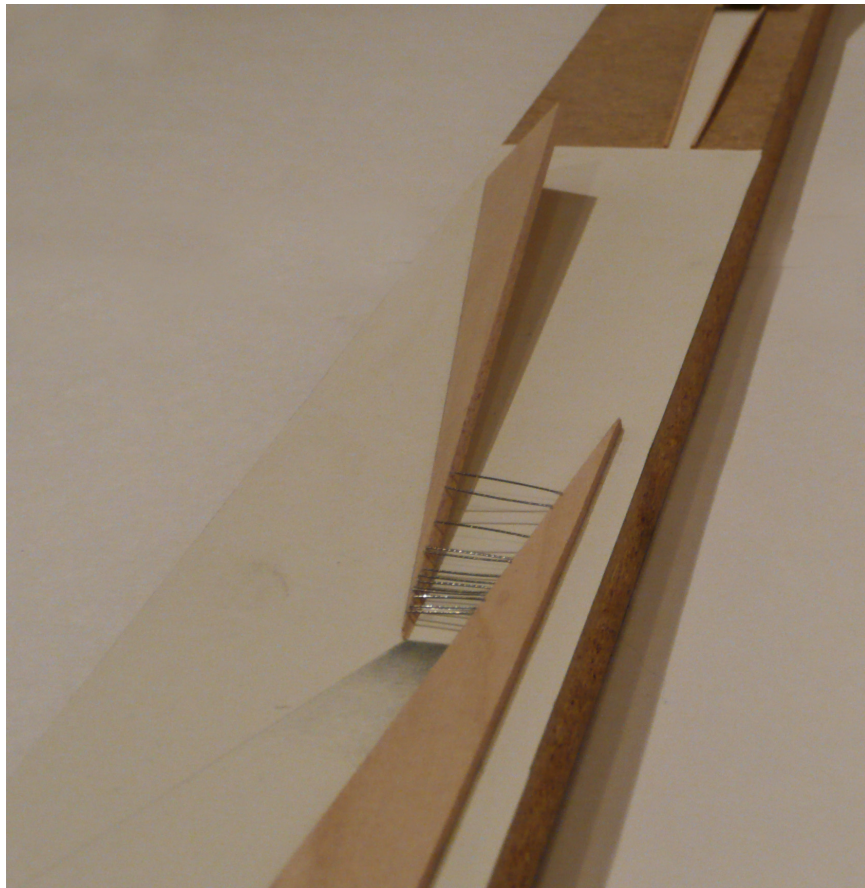
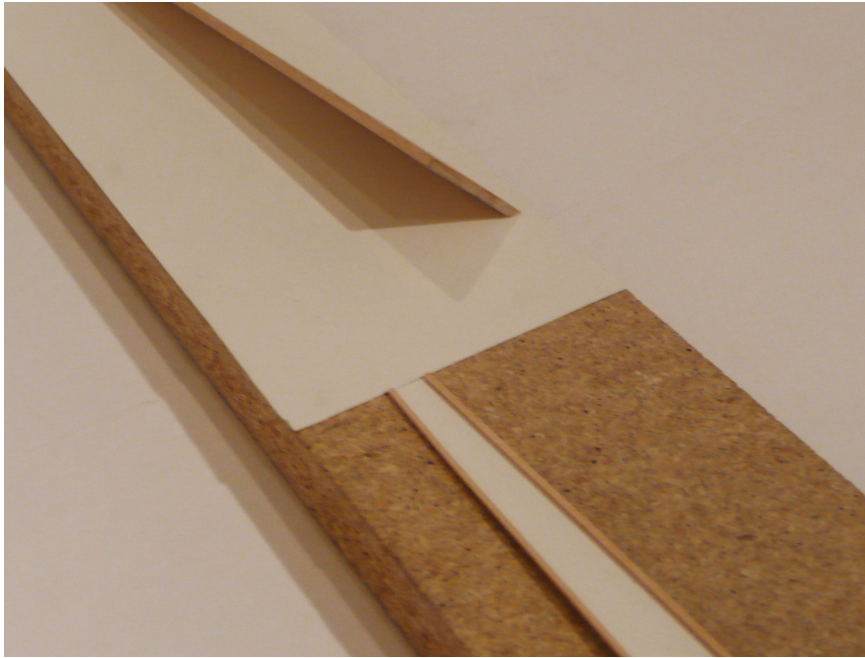
Can music guide us through a space because it has direction and time?

Conceptual Model 5

This multi media model also examines the relationship between planes and how they can begin to articulate architectural form. The planes could be a musical pitch or sound. One has been manipulated, suggesting the 3D world and space. Both planes are fixed together with the bridging element. The planes become more ordered.

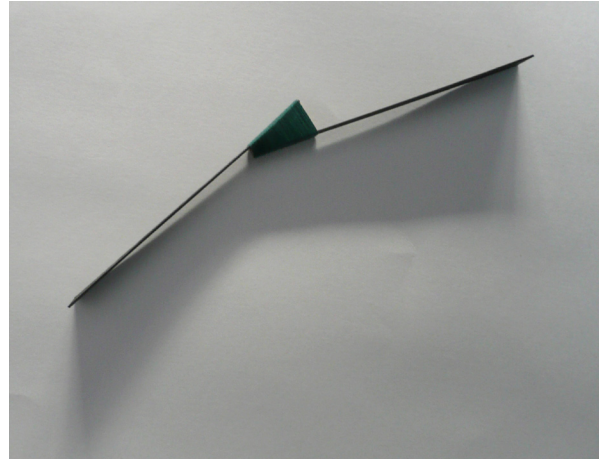
An axis was maintained in the model. If there were music or sound projected in the direction of this axis, how would the music appear to different points along the model?





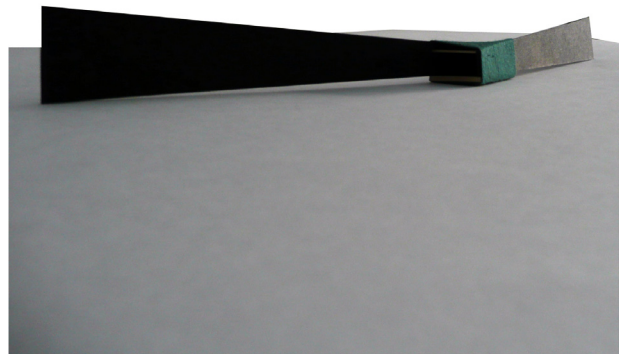
Conceptual Model 6

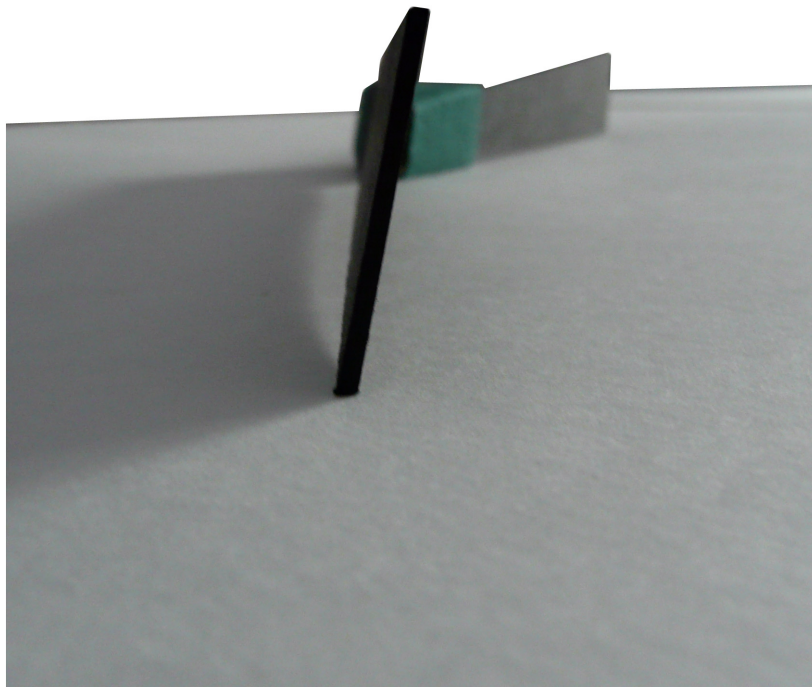
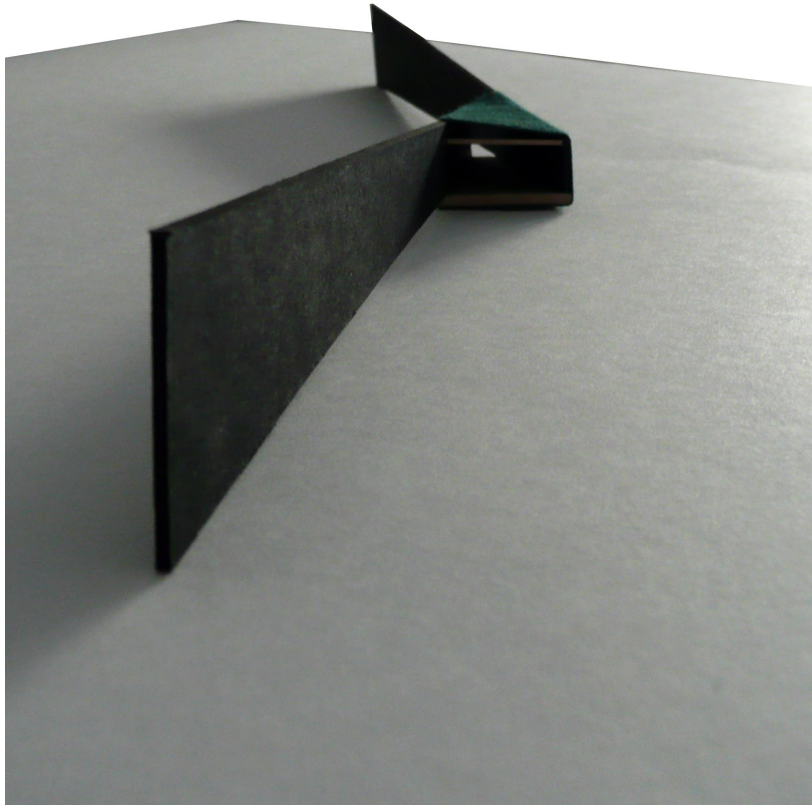
This model has been extension of many of the other models seen previously. The two planes can each begin to describe an element of music--but these elements are only related by their form and material. The wrapping affect of the green string unites these two forms--their addition creates a new form and one that can begin to suggest more of an architectural form. Earlier in this thesis investigation, the differences between music and sound had been introduced. In summary, sound is music so long as we perceive it to be organized. Although this was not the intention when the model was constructed, the wrapping element in this model becomes the gesture that brings the two forms into an more organized relationship. In a sense, the two forms become architecture in the same way that two sounds might become music.



The form of this model naturally occurs in most traditional concert hall construction. The narrower end would house the orchestra and the seating would continue outward.

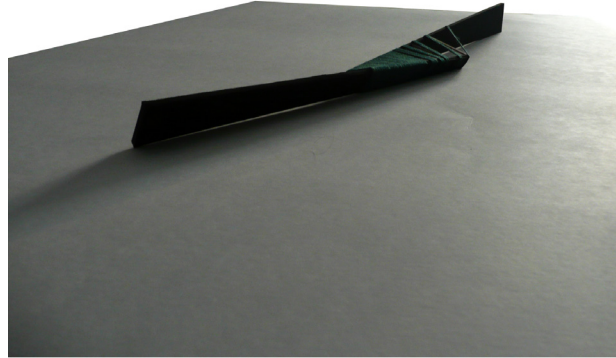
There is a kind of energy in this model--a motion that signals the possibility of a building folding into the landscape. This is a crucial aspect in making a building harmonious with its surroundings. The movement of the building seems to fold within its surroundings.



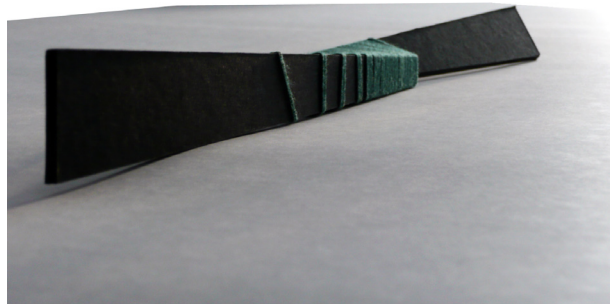


Conceptual Model 7

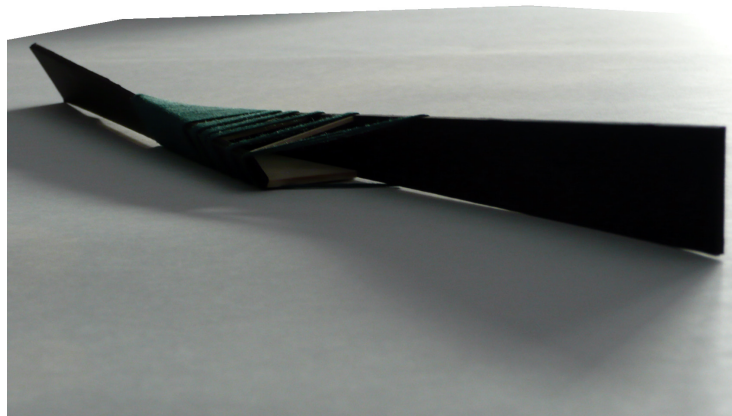
This model is a more complex extension of model 6. One plane is slightly skewed and the wrapping affect begins to break from the general form. This begins to describe the building as if it were assembling itself. The rhythm of strings increase in density until they create a substantial space for dwelling. There exists an interesting tension and compression in this model similar to models 1 and 2. The planes are compressed together while the wrapping element is kept in tension. In this case, it is the wrapping element that creates the tension in the same way that a musical composition creates tension.

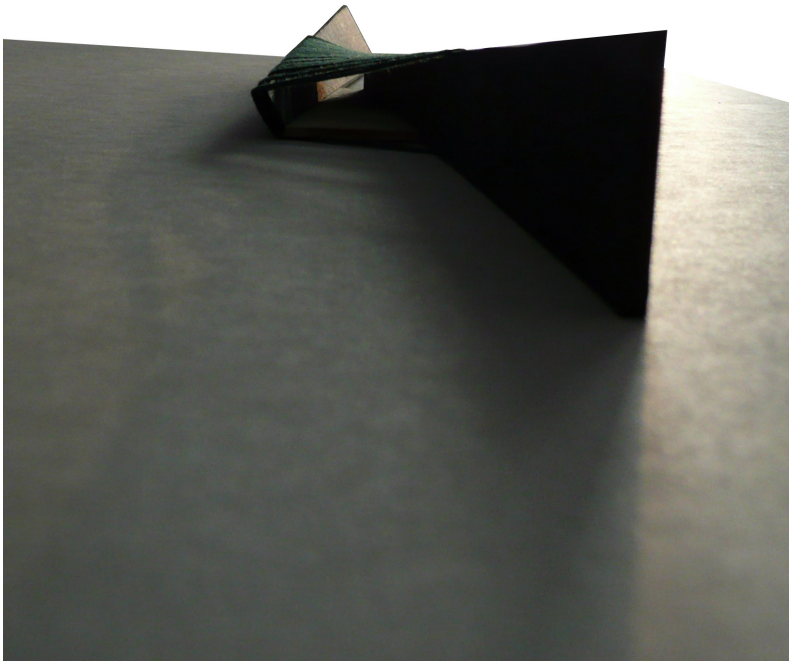


As with many of the previous conceptual models, there is an inherent architectonic in each. All have the potential to suggest powerful architectural gestures within the scope of a building.



How can the idea of creating architecture and music based on an element that brings out organization be implemented in other architectural situations? Can a stair and a wall be organized in the same way? What would this element look like?





Conceptual Model 8

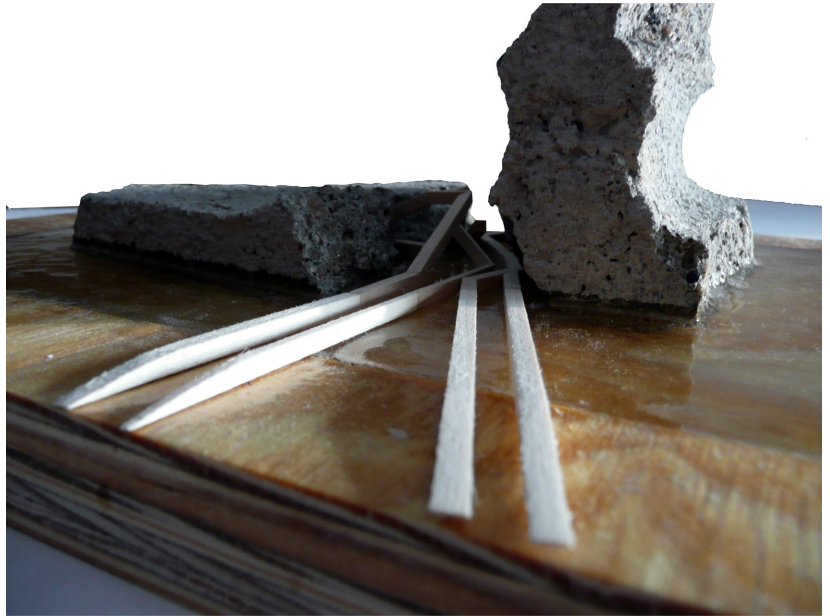
Model 8 took its cue from sketch 3 using concrete, wood, and resin. The concrete begins to describe architectural form. The wooden piece in the center can begin to describe the ways in which music might move through a space, the movements of the human body, and architectural form.

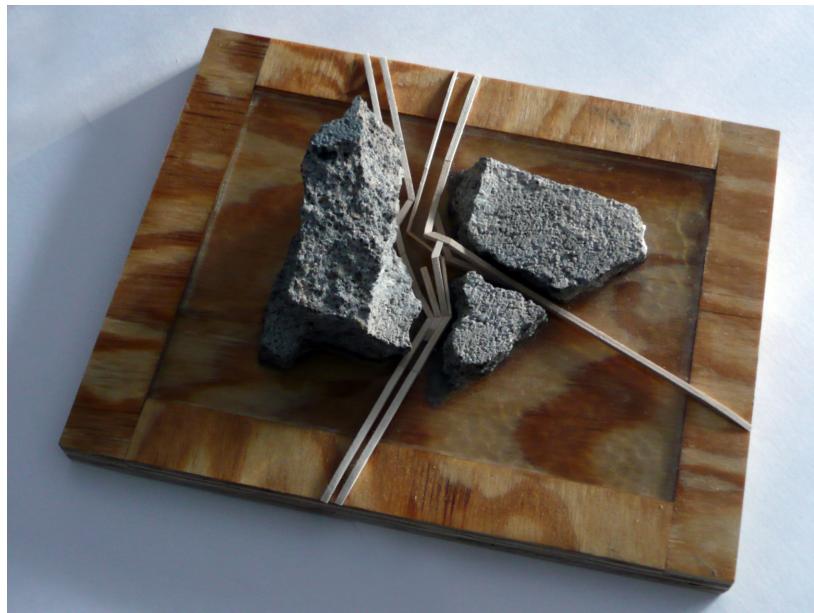
The wooden members also begin to introduce the idea of interval. The wood could be a line of music that could describe an individual's path or circulation in a building.

How is the body affected by interval?

How does interval affect the way in which we engage with space? How does interval affect the way we receive a musical performance?

What happens when we listen to music in an organic, natural, or open environment like the one suggested in the space formed by the concrete?





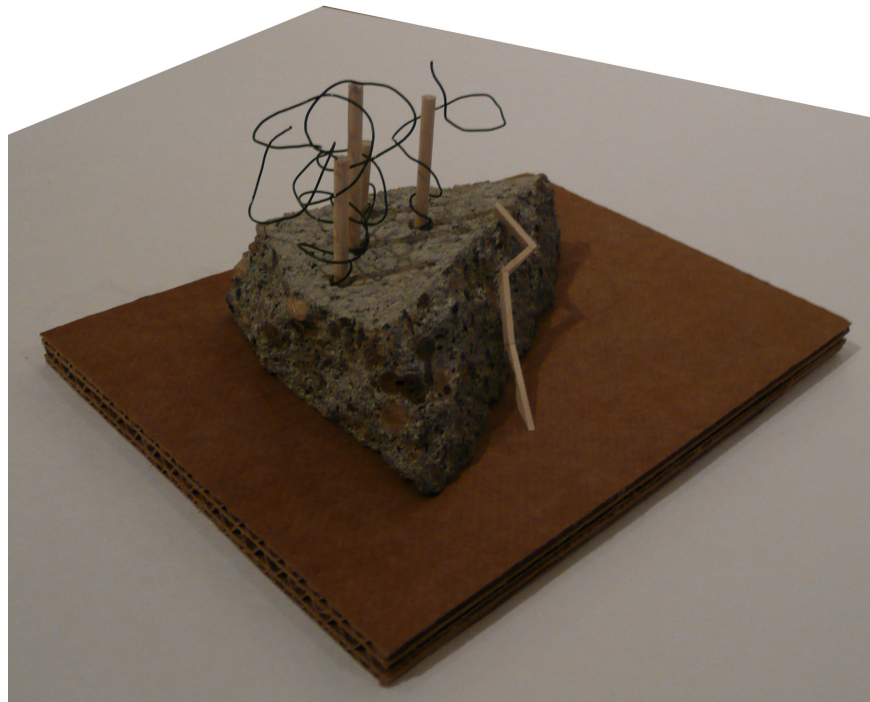


Conceptual Model 9

As a musician, I have found it particularly gratifying to be able to play music outside. A pristine environment such as Kareliya could be the epitome of such a musical experience. The soil conditions in this area, as described earlier, consist of exposed rock from glacial scraping. This model illustrates the possibility of imploding or chiseling spaces out of the rock where



individuals can climb onto a platform or “rock island” to practice their instruments. These spaces are exposed to various degrees with trees.



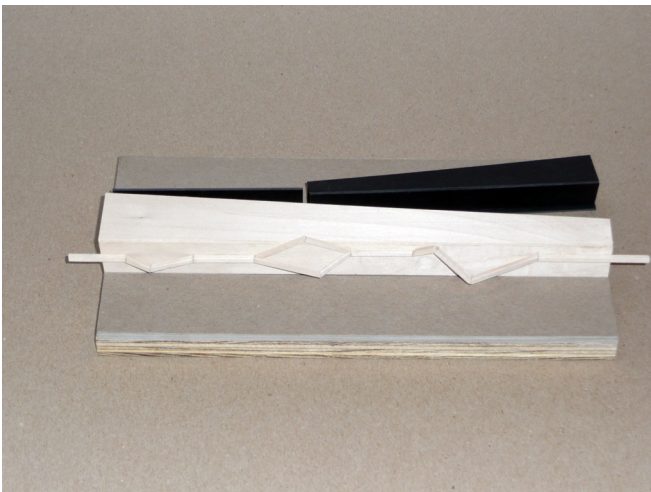
Conceptual Model 10

Conceptual model 10 is a culmination of many of the elements from previous models. The corridors are meant to manipulate music for a more holistic experience of it. One of the tubes breaks open and creates a space suggesting an exterior space. This can begin to suggest outdoor seating. Experiencing a performance outdoors could be just as gratifying for the individual as practicing outdoors for the musician.

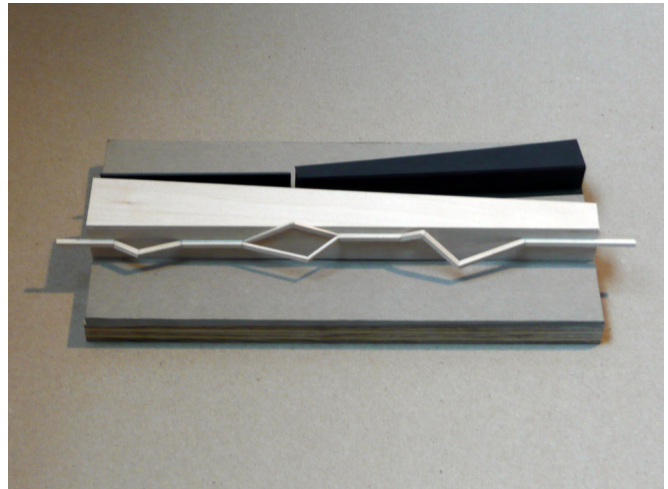
The wood element on the side of the model is a ramp system--it looks at interval and the way in which we might hear music based on movement. As the individual moves up, the sound may become louder and as the individual moves down, the opposite may occur.

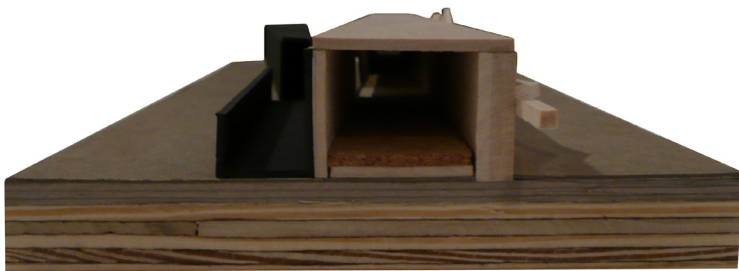
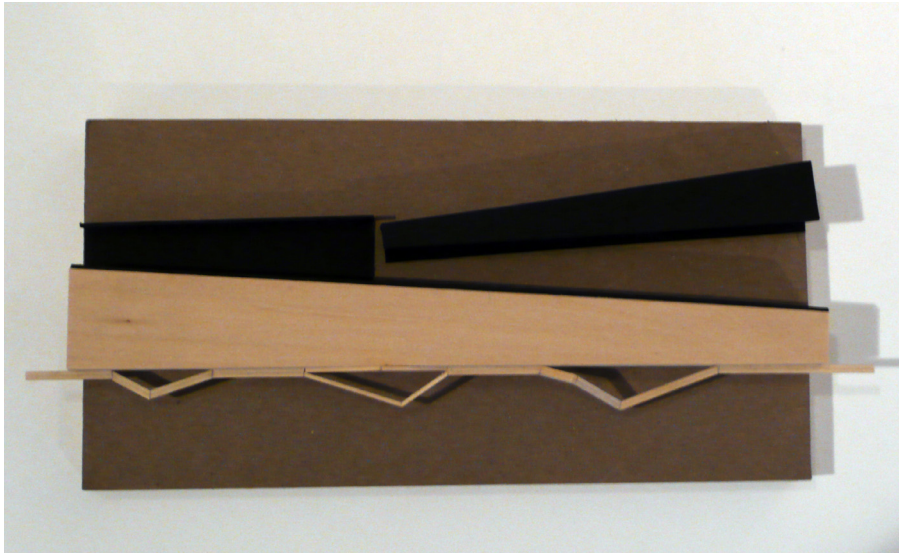
Materiality was also examined in this model. A dark material conveys a bellowing low volume sound while a lighter material conveys a high pitch tone. Materials have a thermal quality and a visual quality, they can also have an aural quality.

Objects of the same material layered upon each other sound muted. The ramp system against the corresponding corridor is visually and aurally mute. A kind of quietness is present because each one conveys the same sound--they are camouflaged. There exists nothing to make one louder



than the other. When the object is exposed, this phenomenon is most apparent. When the shadows are present, each individual piece becomes separately manifest.

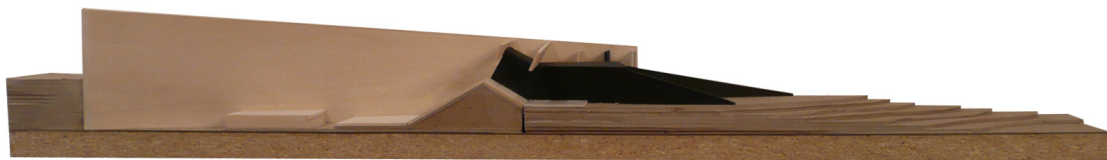
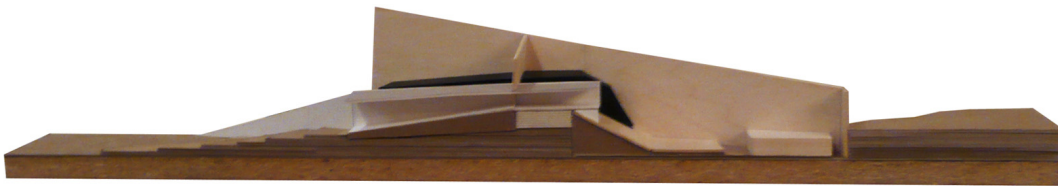






Design Development Models 1

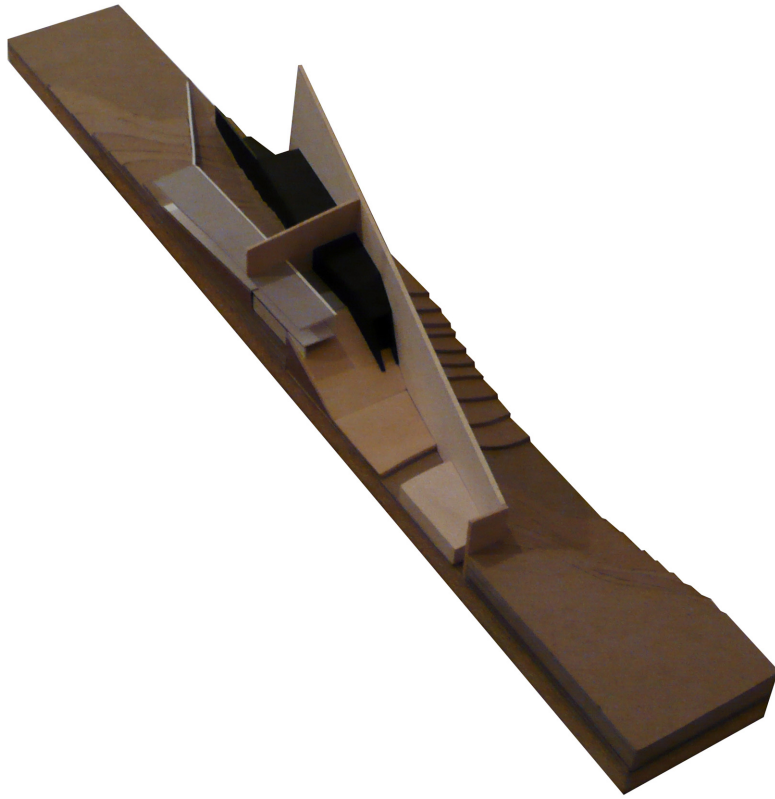
Conceptual models 11 are sections that look at how the chambers and corridors that manipulate music interact with the interior of a concert hall. The idea is that they may form a network of spaces that allow the individual to be mobile throughout the performance if they choose. It also allows the individual to experience the music in concert with the natural landscape.



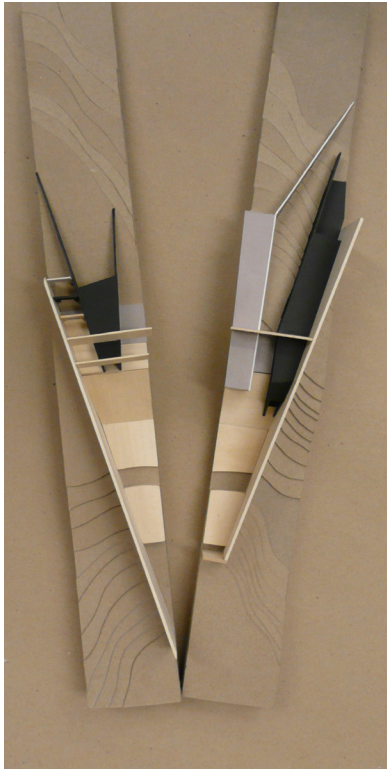
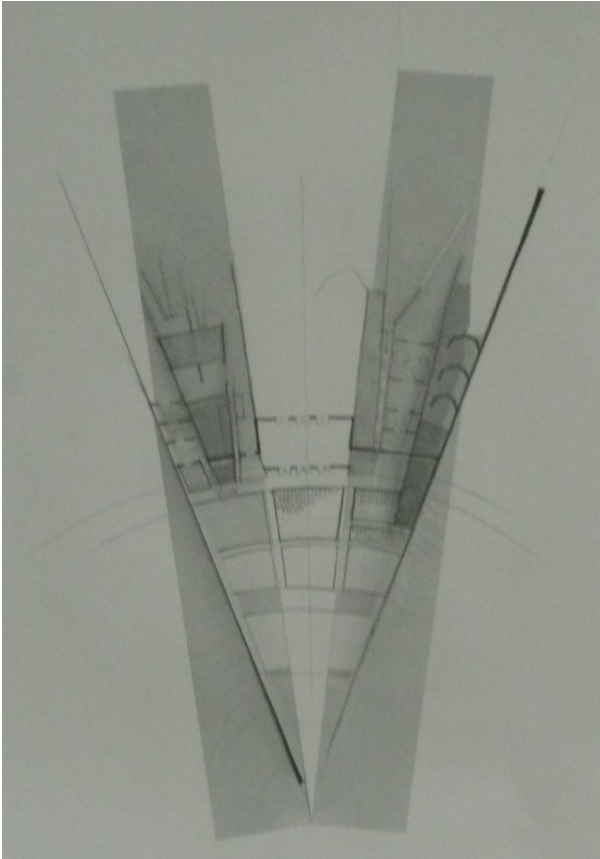
How can these chambers and corridors question traditional concert hall formats?

How can they interact with the topography and the natural occurring elements of the site?

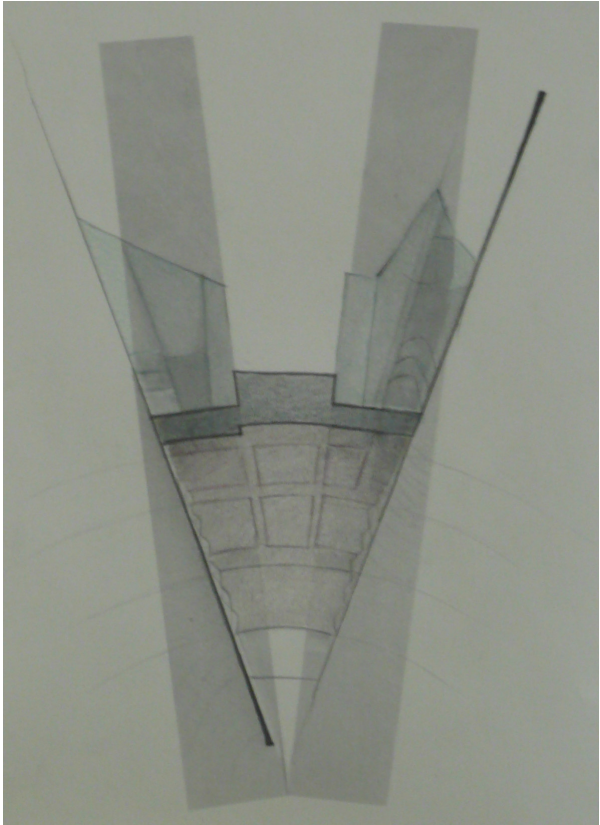
Do these chambers have seating in them as well?



Design Development Sketches 1

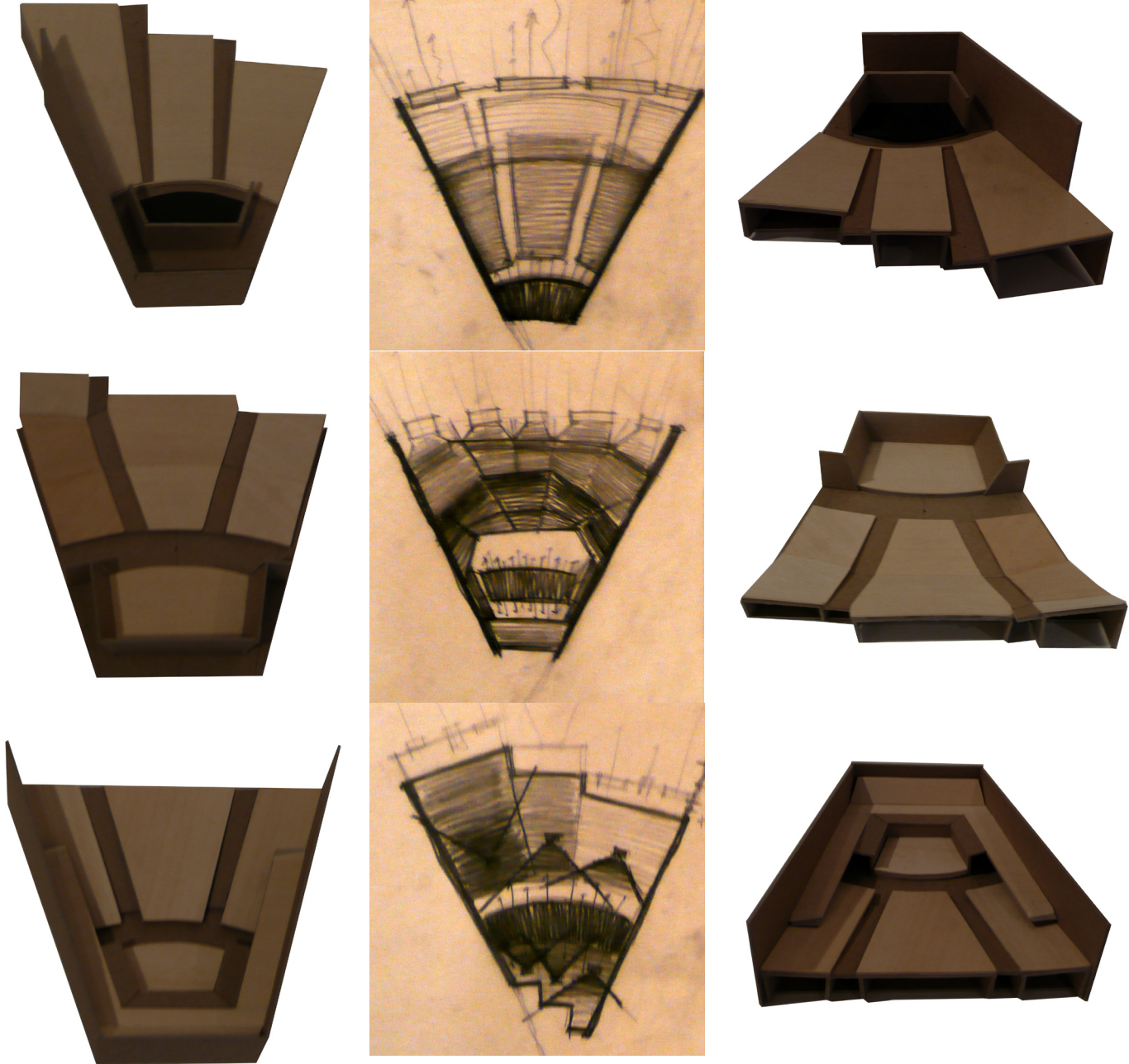


These multi-media sketches are an attempt to look at the spatial conditions within the section model more detailed.

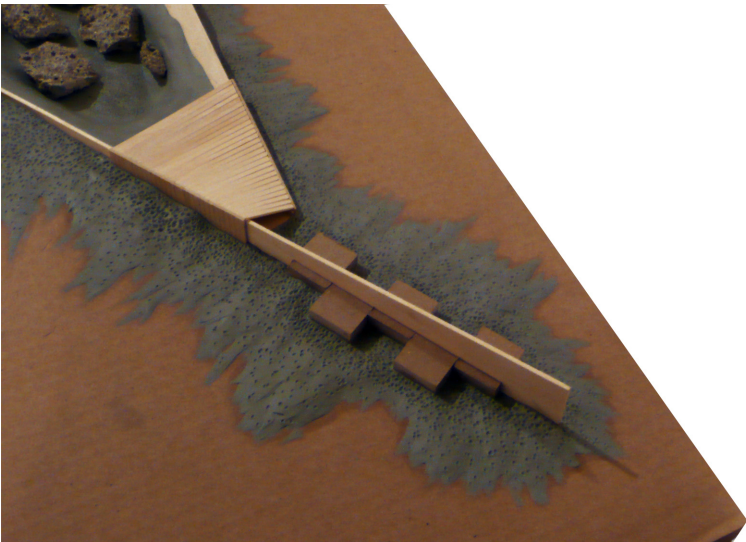
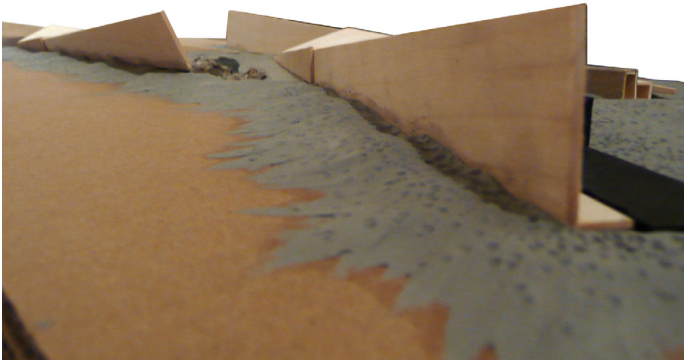


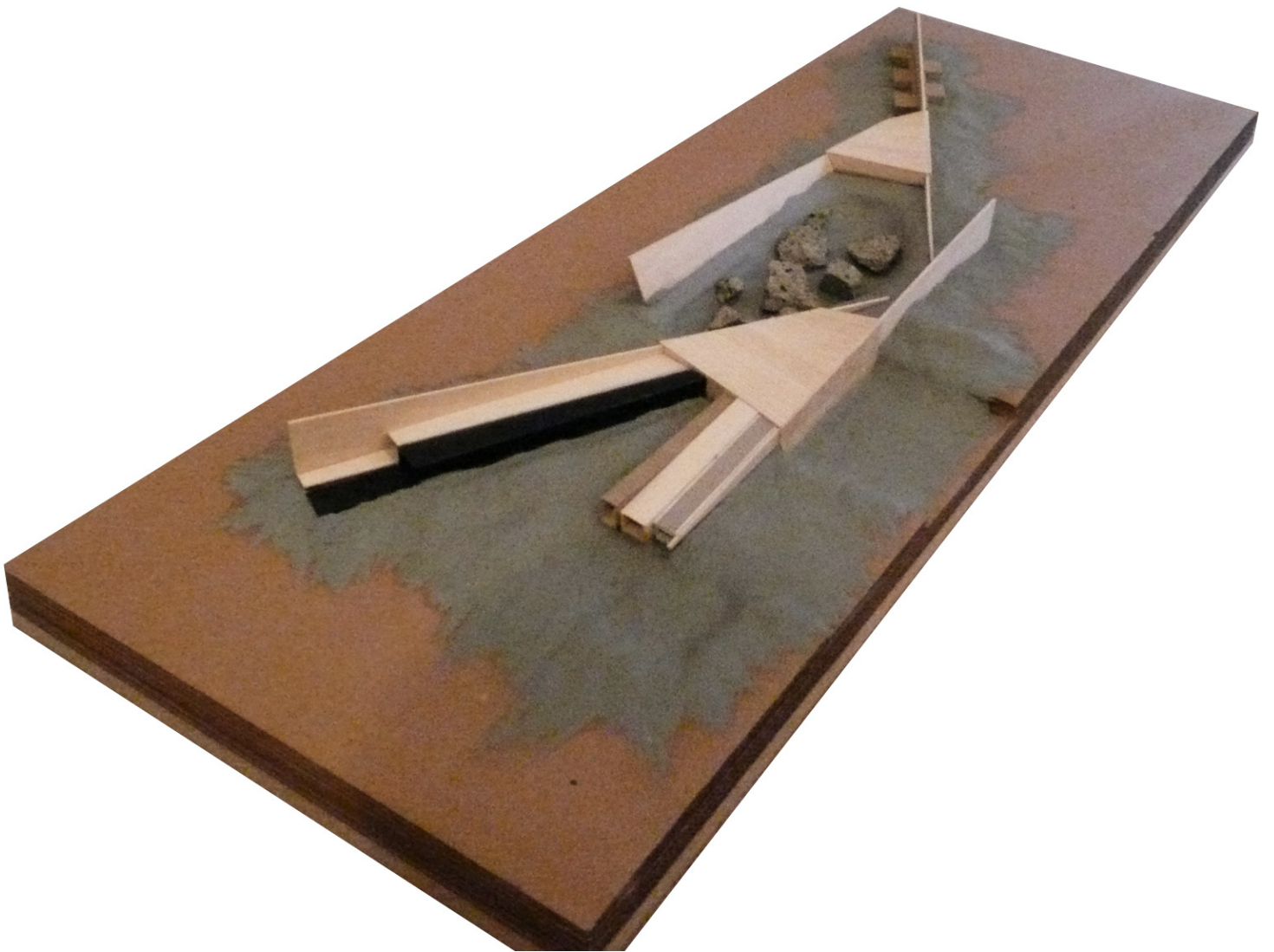
Design Development Models 2

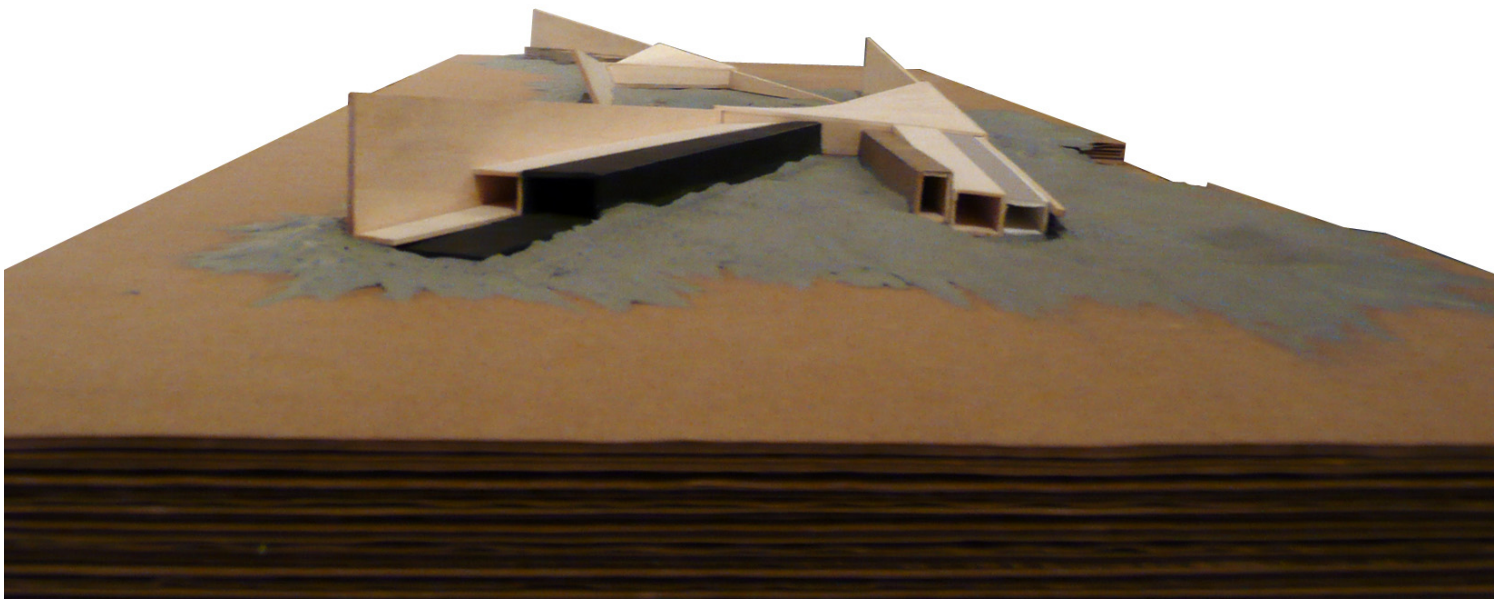
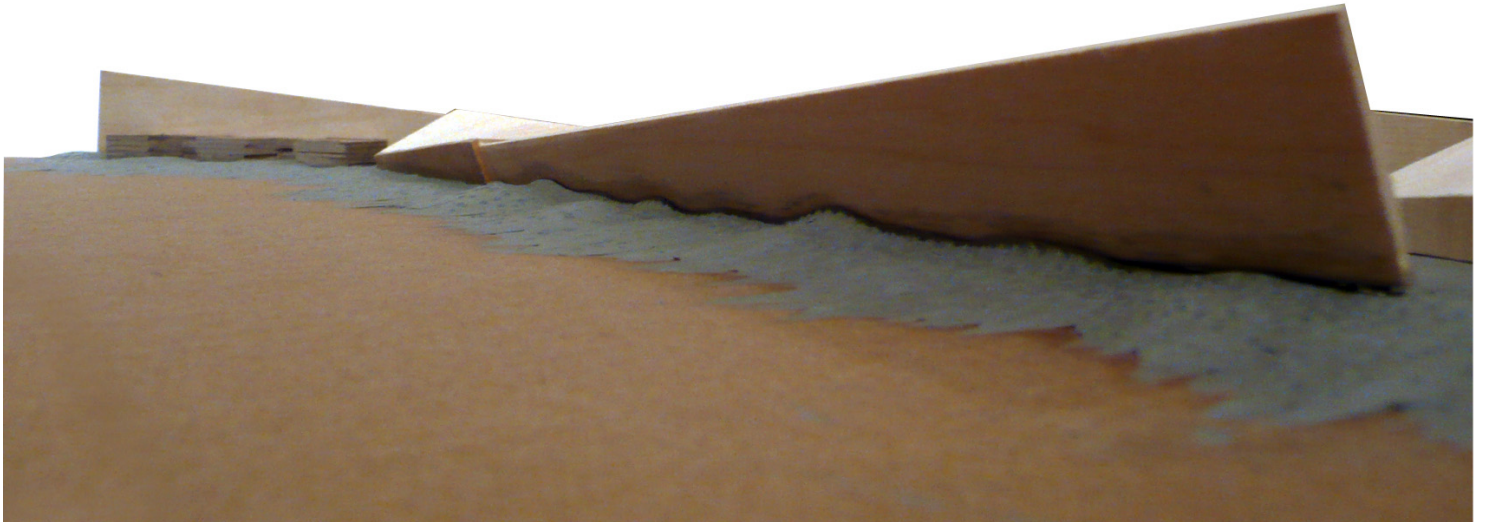
These models and sketches look at the form of traditional concert halls. In order to challenge the form, it is important to understand how it first works.



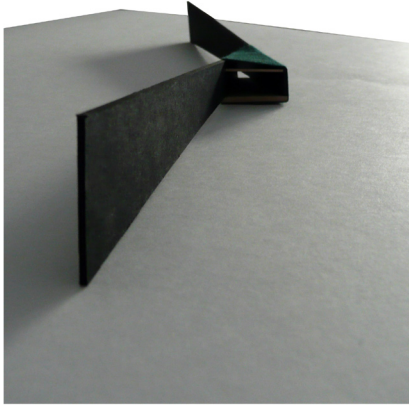
Design Development Model 3







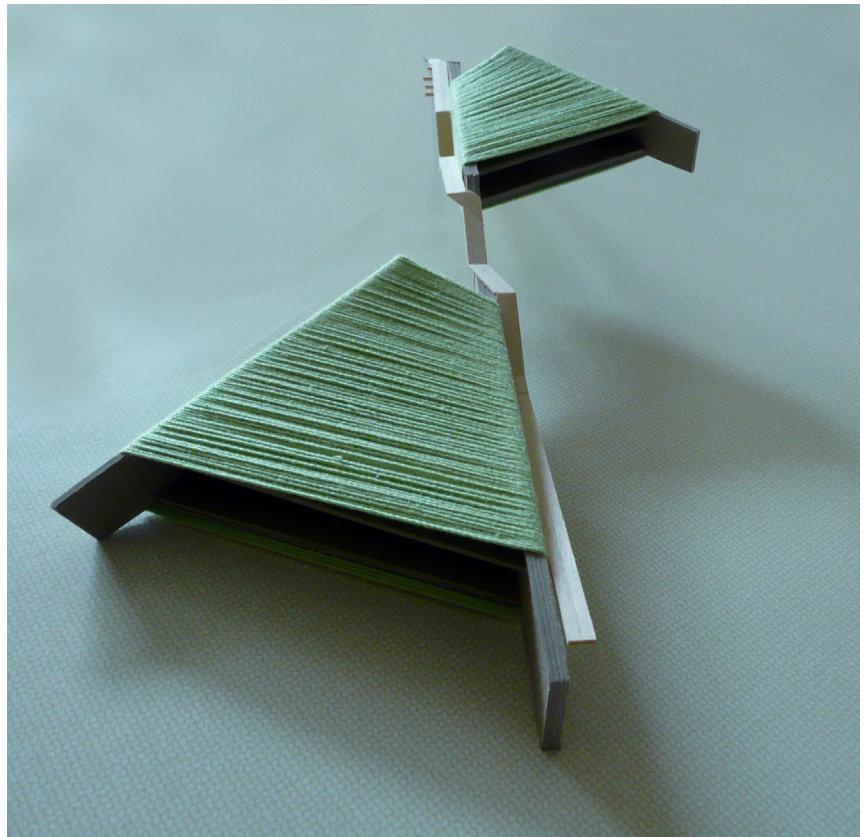
Design Development Model 4

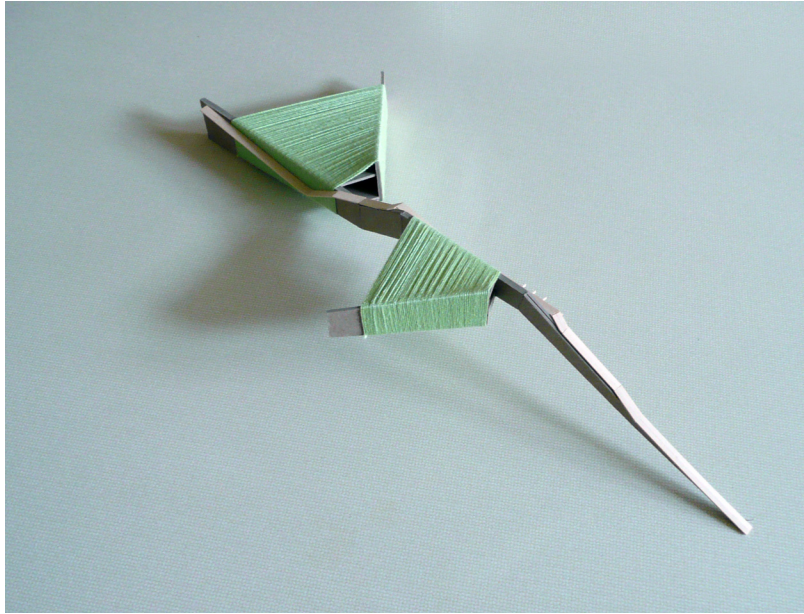


Design Development model 4, stemming from conceptual model 6, begins to adapt more accurately to site conditions; because the site has a substantial amount of topography, the form of this model begins to contour to the site. The main wall that is shared by both of the main forms begins at zero and terminates at zero. The effect of

the strings allows for the architecture to be wrapped onto these walls. In structural model 16, it will be seen how the tension implied by the rope is balanced by the compression of the interior structure. A ramping system ascends and descends the face of the wall until the entrance into the building occurs.

There is a kind of dynamic with this model--the architecture is implying an action--it begins to express how itself is made. When architecture begins to express how it is made, it allows for yet another layer of complexity to be manifest in the project. The overall form begins to take on a zoomorphic quality which will become evident in the final models. This is a result of the appendages of the model receding or tapering down to zero.





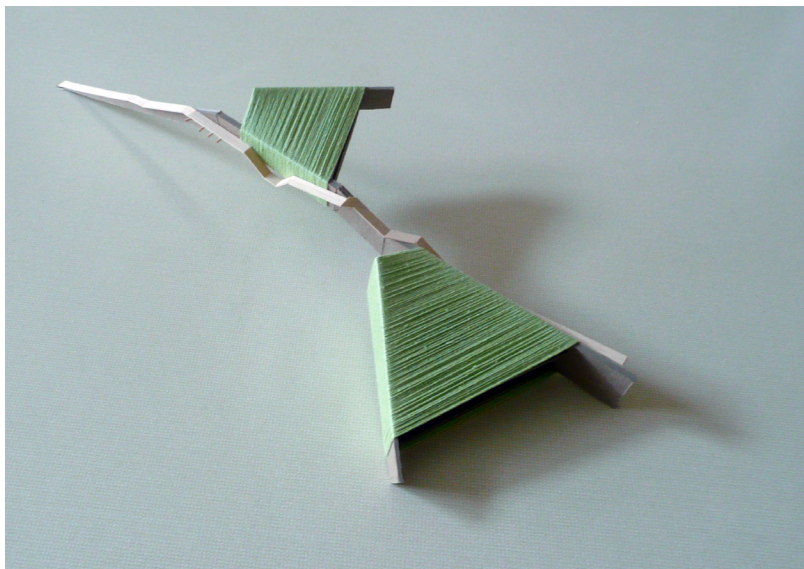
Because this thesis is challenging traditional concert hall forms, how does the overall form of the building work within this notion?

How can a material create a wrapping or tension effect such as the one in the model? Could it literally be rope?

Is the wrapping effect achieved by splining wood in a more traditional Russian manor?

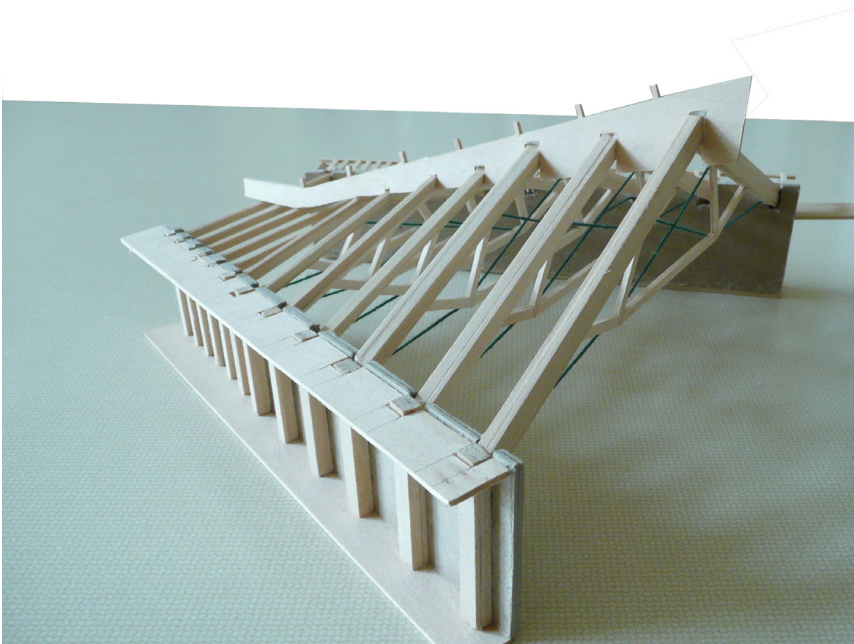
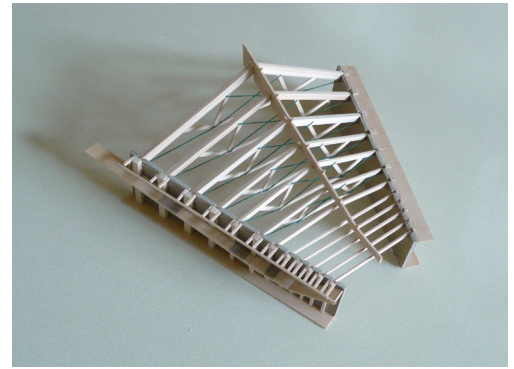
How do the ends terminate?

To what degree does the building adapt to the topography?



Design Development Model 5

Design Development model 5 reflects the interior structure of the building. A series of beams begin the building and gradually begin to form a pitch. When the pitch is steep enough, the member begins to form into a hybrid truss system of heavy timber and steel. A ridge beam connects all of these trusses and beams, which recedes in size as it needs less material at the beginning of the building. The trusses and columns also begin to reflect this idea. They increase in scale in both the size of the members and the spacing. The columns also extend beyond the wall, allowing the ramping system to attach. A pulley system hinges onto the columns, ramp, and ridge beam which allows the skinning material to be rope as alluded to in model 15. The individual moves through the building wall and skinning material before entering the building.



Circumstance

Music is received by the ear in a way that is an environmental reflection--a kind of map of the surrounding spatial conditions. Architecture has the ability to influence music; to make the listener hear things that might not have been audible in any other kind of space.

Naturally, the program of the building pointed towards a kind of architecture that would hold music and musical performances; but because this investigation has taken Stravinsky as its inspiration; it would be natural to question the role of how a musical performance is received. In traditional concert halls, the audience is placed in front of an orchestra, facing the music as it is received by the ears in the most balanced and acoustically proper manner--but music can deliver more experientially when it is affected by architecture; when the walls receive and aural manifestation; when music is forced to respect its container; when music adapts to what the architecture dictates. Music, then, would never be ancillary to architecture--their balance would reveal much about how we experience space. This notion would be carried into all facets of musical performances, from seating to circulation. The issues at hand, no doubt, can reveal a more holistic way of experiencing architecture and music, culminating into perceptual peculiarities of both space and time.

I am proposing a program that is skeptical about traditional music facilities, questioning its formal qualities and the roles of music and architecture. The program includes a main concert hall, a chamber music hall, and practice rooms all which attempt to reinterpret how music is performed, experienced, and received, considering the performers and the listeners appropriately.

The facilities in the program are to be used by any orchestra, individual, musician, author, passer-by, etc. that would find the refuge of this place desirable. The campus, because of its proximity and relationship to the natural phenomenon on the site, can also be a place to wander and contemplate. A sense of exploration enhances the architecture's ability to be in balance with its site. In architecture, the relationship between these two are almost never developed in concert--it has been my desire to consider the affects of the landscape and topography on the building--to really challenge how the building relates to its context. The resulting image of the building is a kind of natural retreat, where music, architecture, and the landscape harmonize.

The notion of arrival to the site is also of importance to this project. The drive and approach to the site, the parking layout, the journey into the programmatic elements of the site, and the return have all been orchestrated for the most holistic experience of architecture.

Programmatic Elements

The program of the project developed out of schematic design. The music facilities that create the program are experimental in nature:

- I. Performance Hall for Orchestra
- II. Chamber Music and Soloist Recital Hall
- III. Practice Rooms
- IV. Ticket Booths
- V. Bathroom Facilities
- VI. Mechanical and Maintenance Facility
- VII. Offices and Administrative Spaces

I. Performance Hall for Orchestra

a. Size and Scale

-Seating and parking for approximately 300 people

-An orchestra: 42 musicians

12 violins

5 violas

5 cellos

2 basses

2 flutes

2 oboes

2 bassoons

3 horns

2 trumpets

2 trombones

3 percussions

1 harp

1 piano

-20,500 sq/ft including the corridor and chambers that are extensions off of the main concert hall form, library, changing rooms, storage, mechanical, warm-up rooms, and rest rooms.

b. Purpose

-To provide a more holistic experience of music as a reflection of the architectonic elements of the space. This space allows the individual to be in motion or seated. Opportunities to enter corridors and chambers that change the manifestation of the music also allow for the experience of exterior and more natural spaces.

c. Materials and Construction

-Concrete load bearing walls

-Heavy timber truss system with steel tension members (model #)

-Pitched roof: height of ceiling begins at 28 feet and ends at 42 feet

-Various acoustical materials for corridors and chambers

-Slate: for echoes and different qualities of light

-Stone: for echoes in combination with dim light or no light

-Sound dampening: for muted sound

-Sound augmenting: for intense sound and light

-Screen materials for interior spaces

-Sound dampening

-Sound augmenting

-Rope for exterior skin

-Pulley system to keep rope taut

-Clouds for even sound distribution

-Canted walls for proper sound distribution

II. Chamber Music and Soloist Recital Hall

a. Size and Scale

- Seating for 150 people
- 5 stages for solo performers and small ensembles (chamber music, quartets, trios, etc.)
- 10,300 sq/ft including the corridor and chambers that are extensions off of the hall form, changing rooms, storage, mechanical, warm-up rooms, and rest rooms.

b. Purpose

-To provide a more holistic experience of music as a reflection of the architectonic elements of the space for the audience and the performers. The varying heights of the multiple stages allow for the performer to experience their performance more experientially also.

c. Materials and Construction

- Concrete load bearing walls
- Heavy timber truss system with steel tension members (model #)
- Pitched roof: height of ceiling begins at 22 feet and ends at 34 feet
- Various acoustical materials for corridors and chambers
 - Slate: for echoes and different qualities of light
 - Stone: for echoes in combination with dim light or no light
 - Sound dampening: for muted sound
 - Sound augmenting: for intense sound and light
 - Screen materials for interior spaces
 - Sound dampening
 - Sound augmenting
- Rope for exterior skin
- Pulley system to keep rope taut
- Clouds for even sound distribution
- Canted walls for proper sound distribution

III. Practice Rooms

a. Size and Scale

- 11 practice rooms in pod configurations
- 700 sq/ft each
- 10 foot ceilings
- 1 shared bathroom between each pod

b. Purpose

- These spaces allow for the practice of music and any other private activities such as composing, reading, writing, etc.
- Each room has the following equipment:
 - desk unit
 - piano
 - recording equipment
 - tuners

c. Materials and Construction

- The practice rooms are concrete extensions of the main walls that create the main concert hall and chamber hall.
- Similarly skinned with rope.
- Glass facade allows for views out to the surrounding landscape.
- Glass facade is operable, allowing it to open and close completely.
- A concrete stair allows the individual to descend down into the practice rooms from the main wall.

d. Special considerations

- Some practice are situated on top of the water.
- Concrete columns support these practice rooms.
- Elevated 5 feet above the water level.

IV. Ticket Booths

a. Size and Scale

- 3 ticket booths paired with one of the three parking sections
- 55 sq/ft each
- 8 foot ceilings

b. Purpose

- Provides ticket sales for certain performances so as not disrupt what occurs within the concert halls.

c. Materials and Construction

- Concrete roof, walls, and floor
- Skinned in rope
- Natural ventilation

V. Bathroom Facility

a. Size and Scale

- 2 detached bathrooms for the main concert hall and chamber music hall
- 500 sq/ft each

b. Purpose

c. Materials and Construction

- Concrete construction with rope skin

VI. Mechanical and Maintenance Facility

a. Size and Scale

- 700 sq/ft
- The rocky soil conditions allow for the campus to have a separate building for the mechanical space.
- The energy is delivered to each of the buildings through a tunneling system.
- All of the buildings are connected through this underground tunnel.

b. Purpose

To provide energy to all the programmatic spaces of the campus.
To house equipment needed to maintain the landscape and natural surroundings.

c. Materials and Construction

- Concrete roof, walls, and floor
- Skinned in rope

VII. Offices and Administrative Spaces

a. Size and Scale

- 775 sq/ft
- 4 offices
- 1 meeting room

b. Purpose

To provide basic facilities planning and operations.
Scheduling and performance planning.

c. Materials and Construction

- Concrete roof, walls, and floor
- Skinned in rope
- Glass front facade is operable for ventilation.
- Each room has its own window.

Final Model + Drawings

- I. **Final Model** $1/32"=1'-0"$
quantity--1
- II. **Site Plan** $1/32"=1'-0"$
quantity--1
- III. **Site Sections** $1/32"=1'-0"$
quantity--8
- IV. **Enlarged Site Section** $3/32"=1'-0"$
quantity--3
- V. **Floor plans** $1/16"=1'-0"$
quantity--3
- VI. **Building Sections** $1/16"=1'-0"$
quantity--5

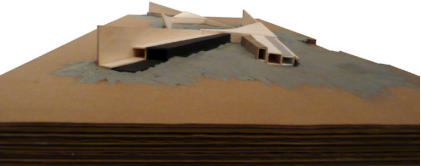
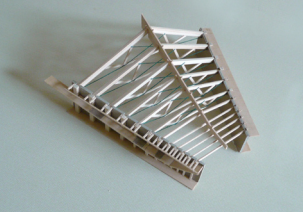
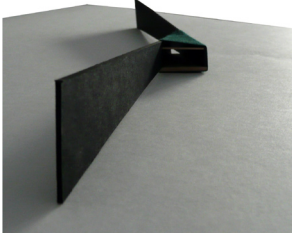
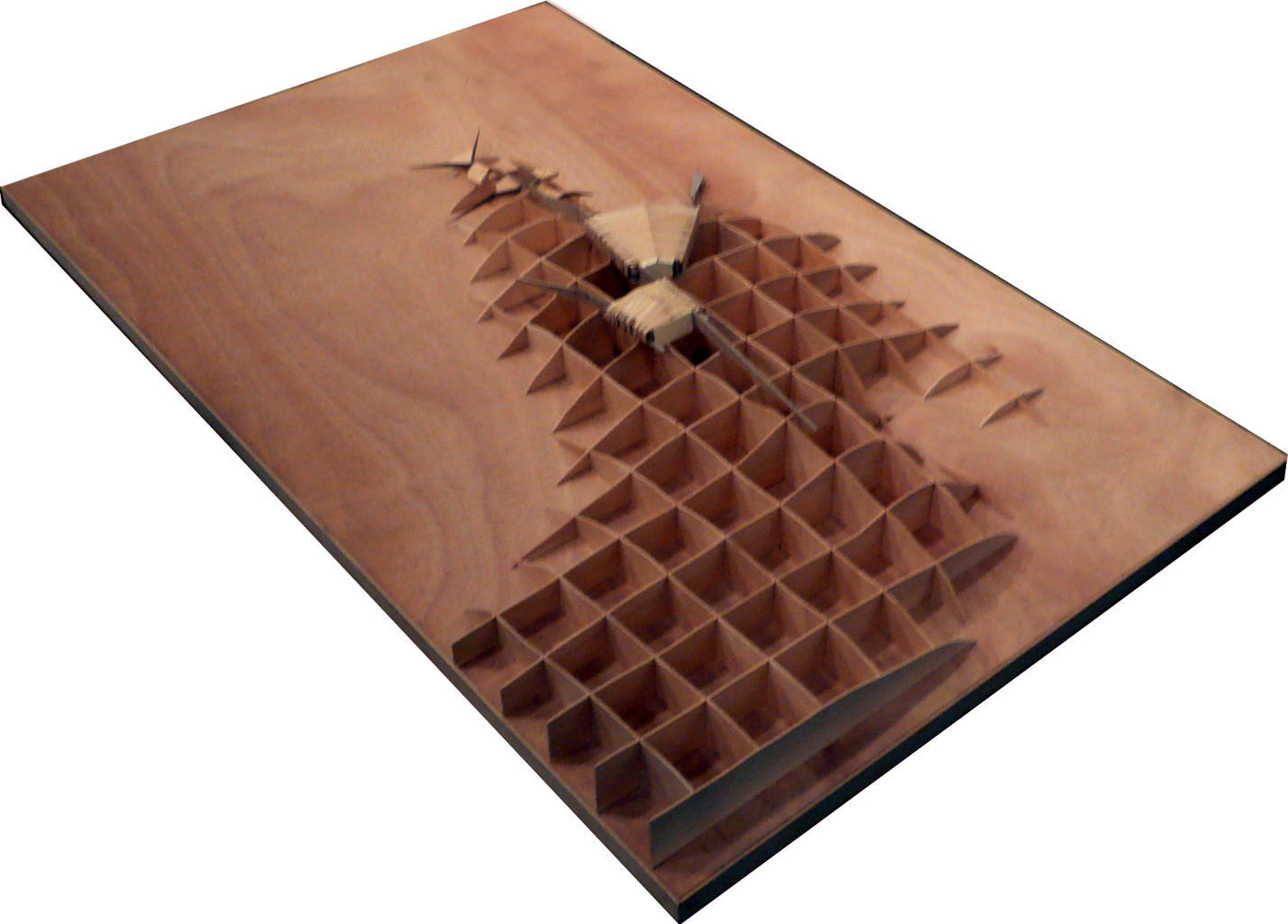
Methods of Construction

The final model was constructed out of basswood, museum board, and string. The topography was made using an egg crate technique, illustrating the topographic qualities of the site more dramatically.

The drawings are pictorial in nature. This allows for them to more accurately represent the spatial sequences in relationship to the topography and the natural features of the site. They are drawn on Strathmore paper using combinations of graphite, colored pencil, and pastels. The site sections, functioning like dissections through the site, illustrate the drama involved with such a landscape.



I. Final Model

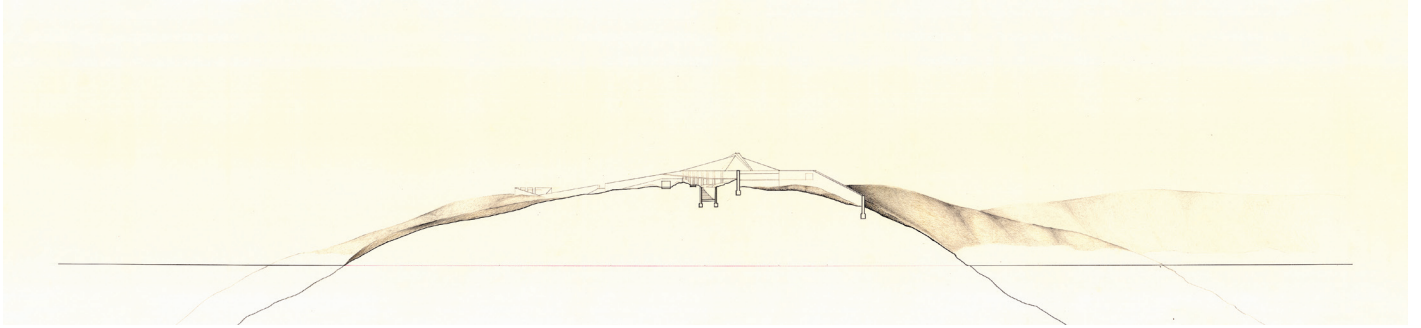


II. Site Plan

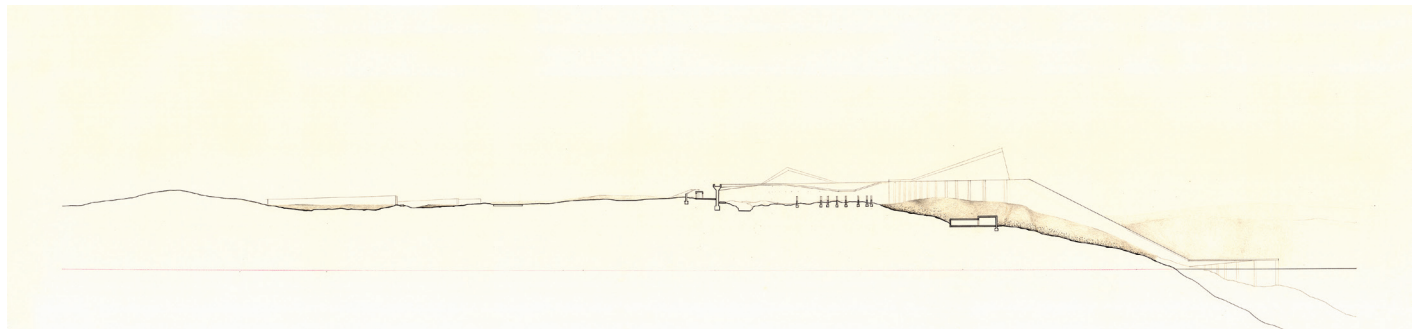


III. Site Sections

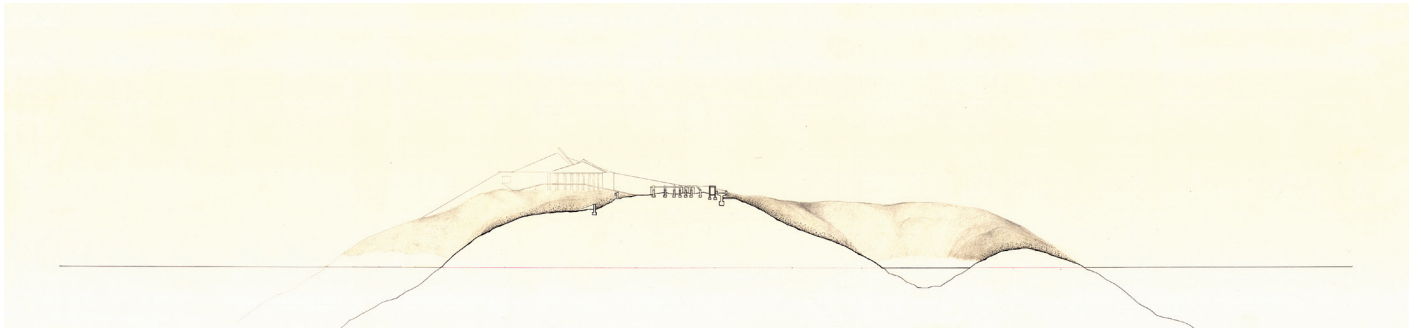
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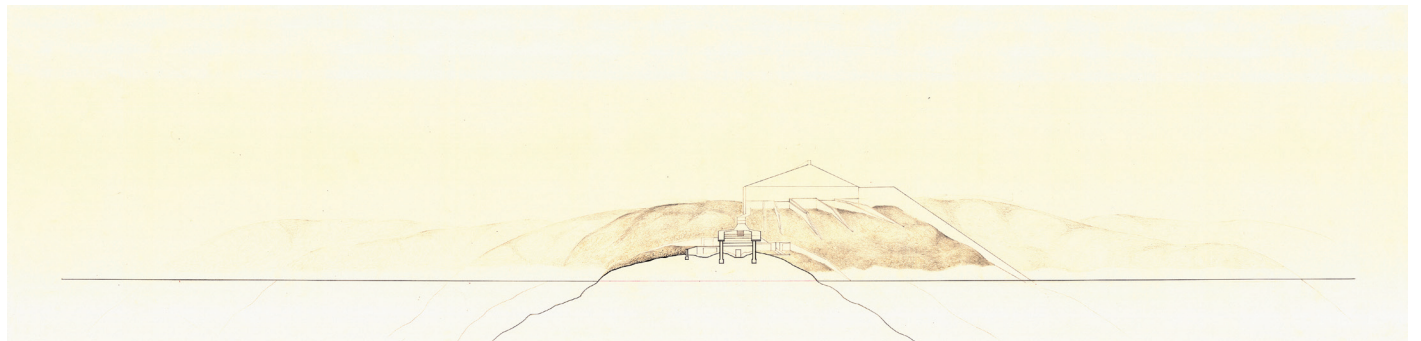
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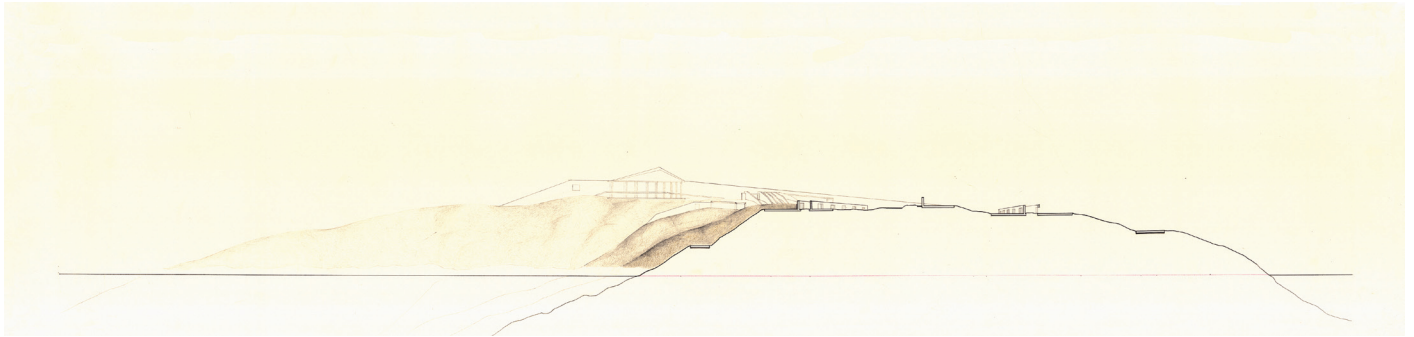
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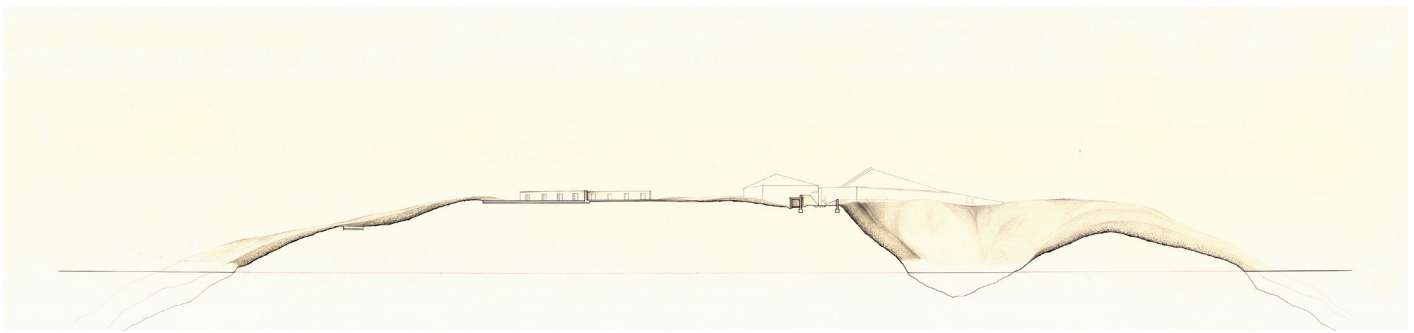
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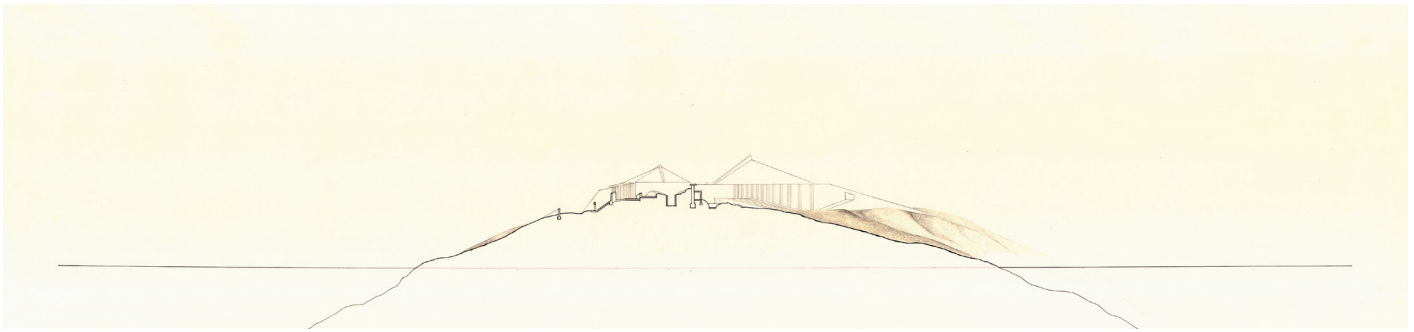
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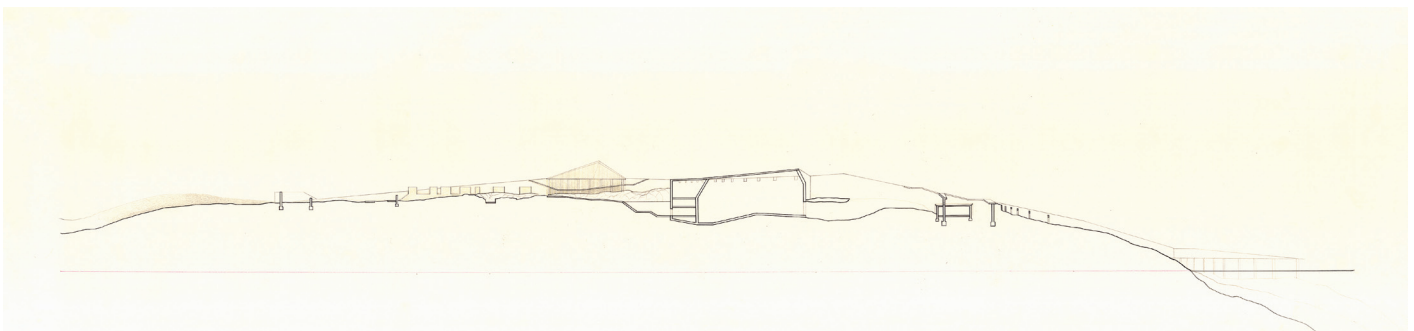
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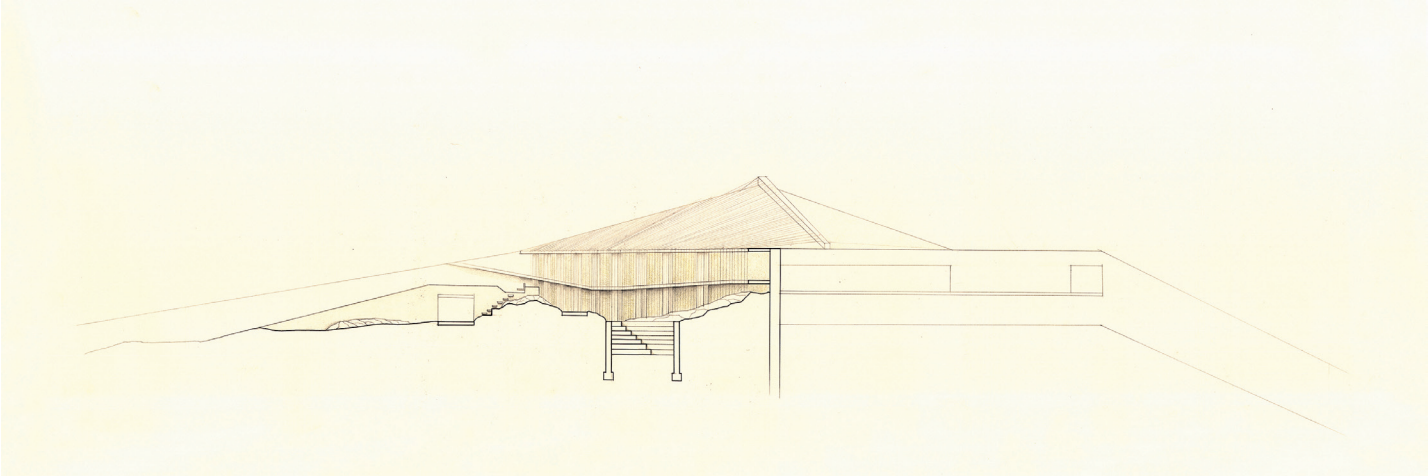


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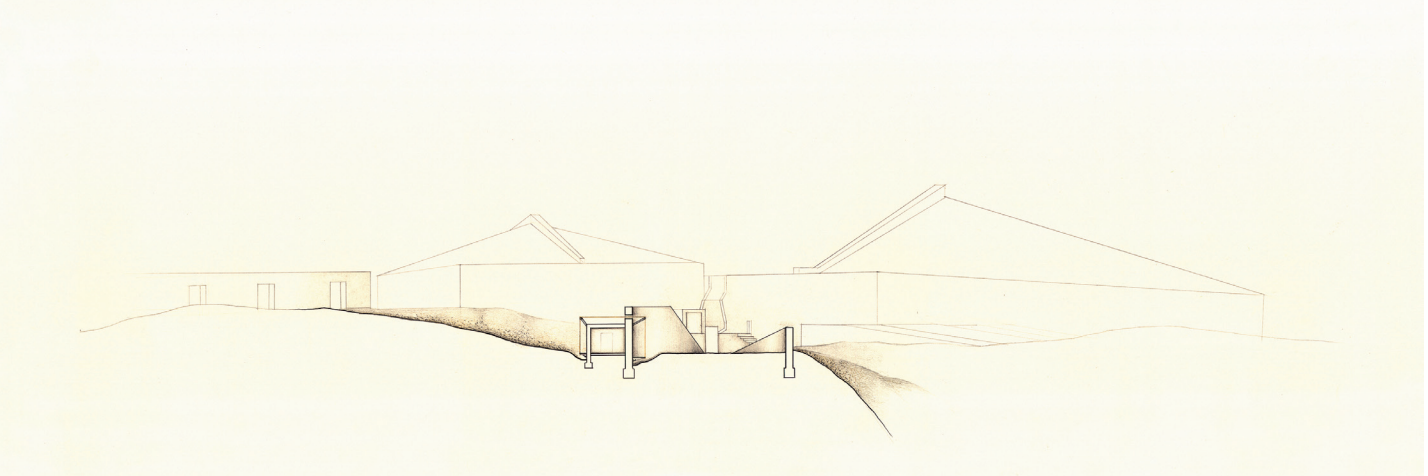


IV. Enlarged Site Sections

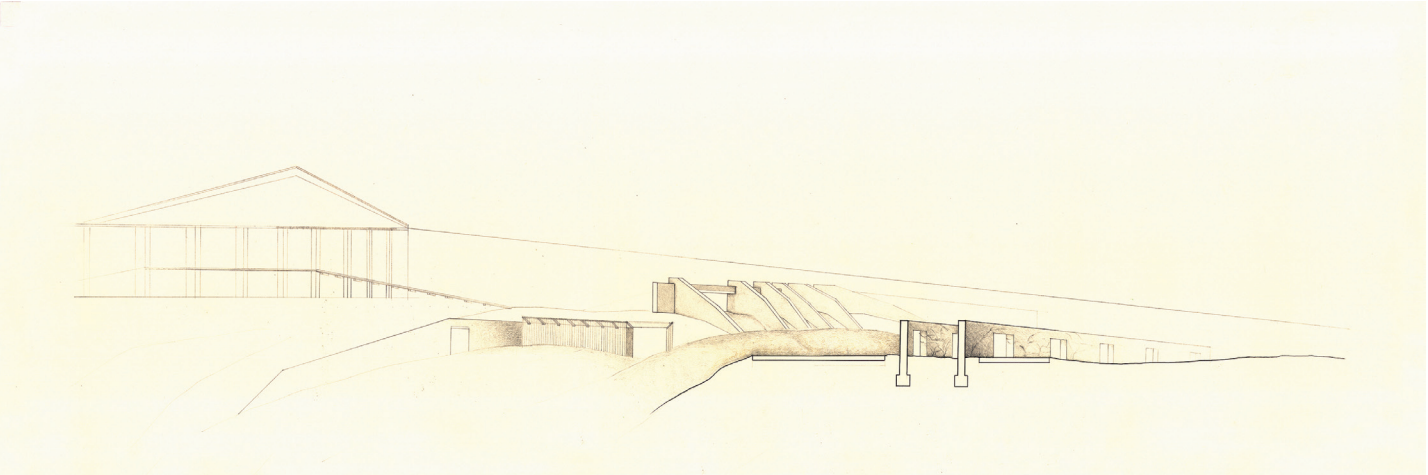
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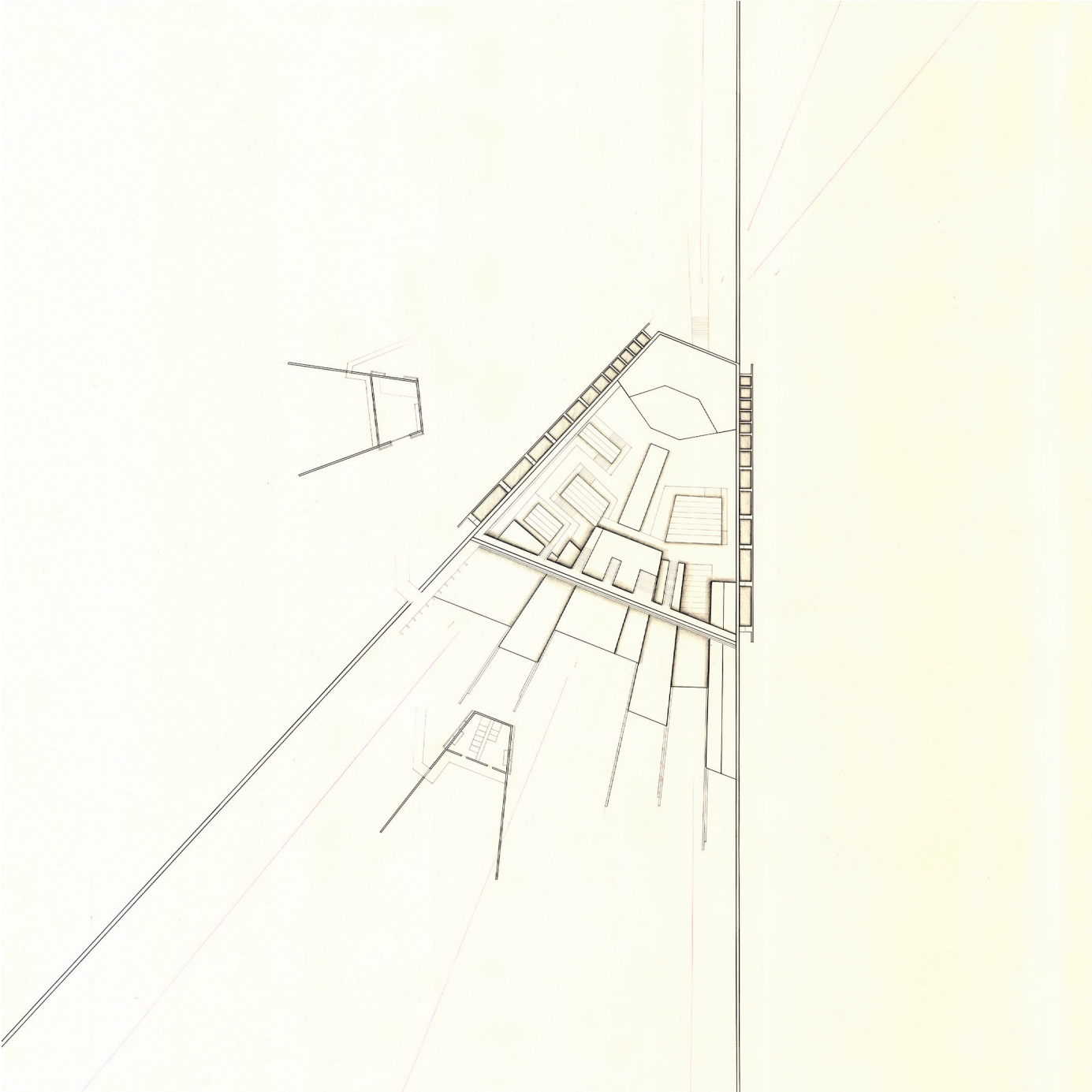


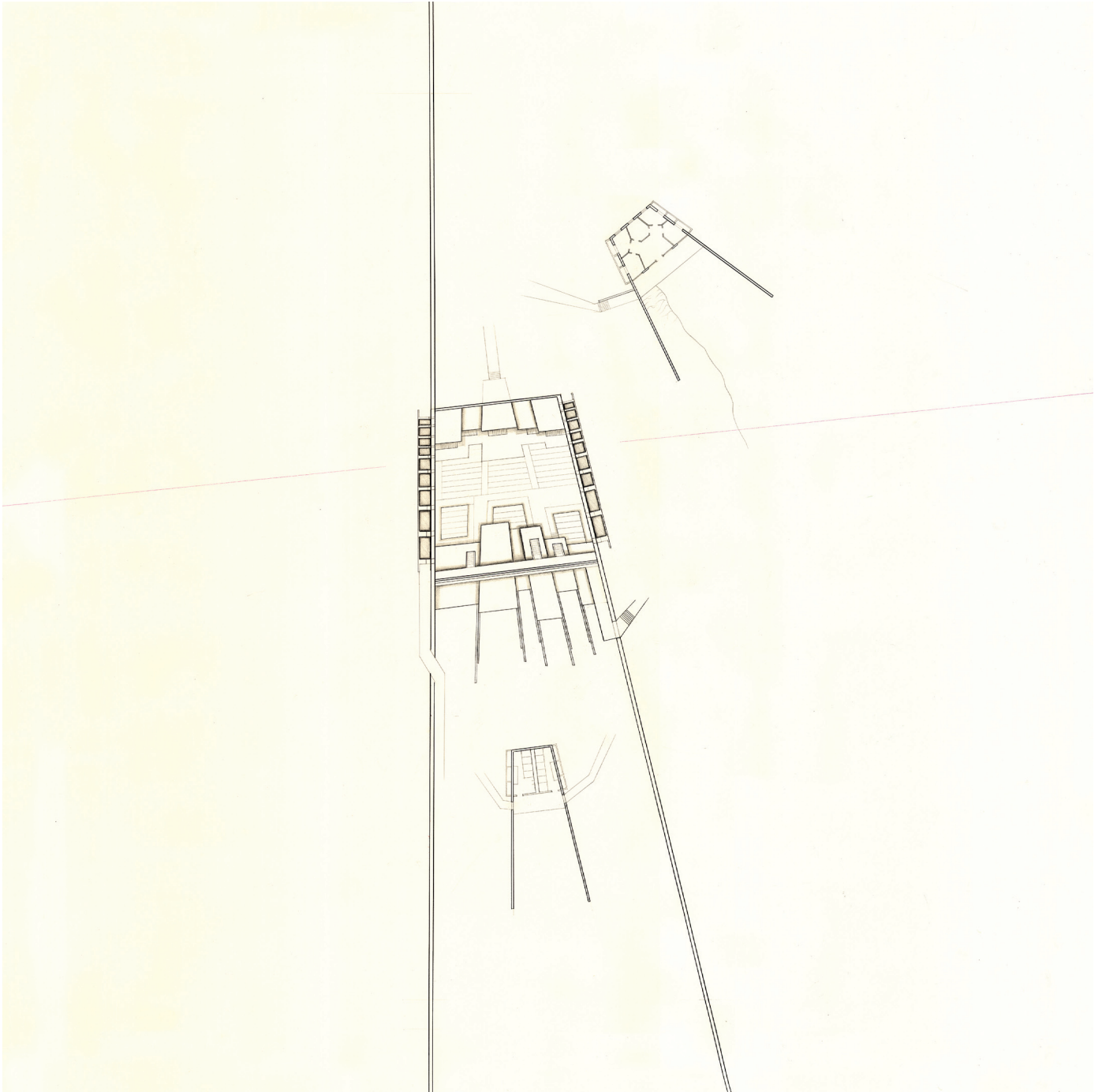
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IV. Floor Plans

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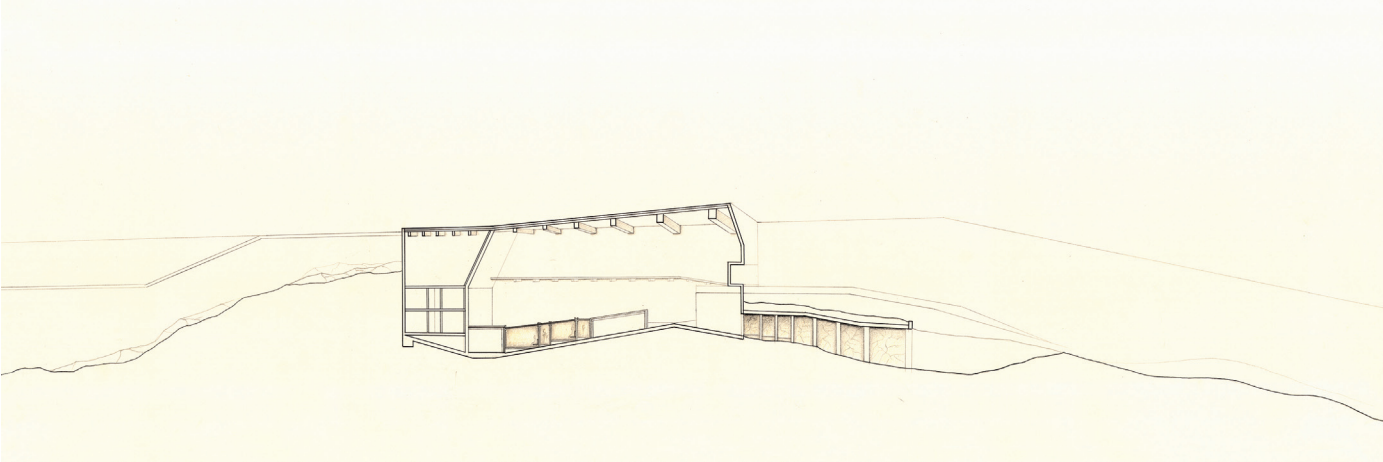




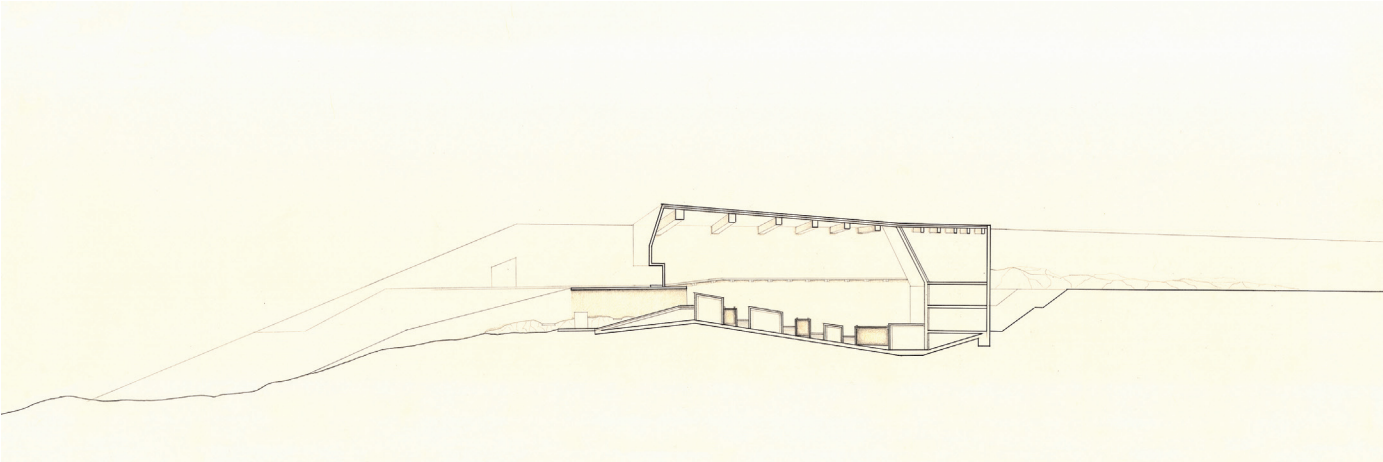


IV. Building Sections

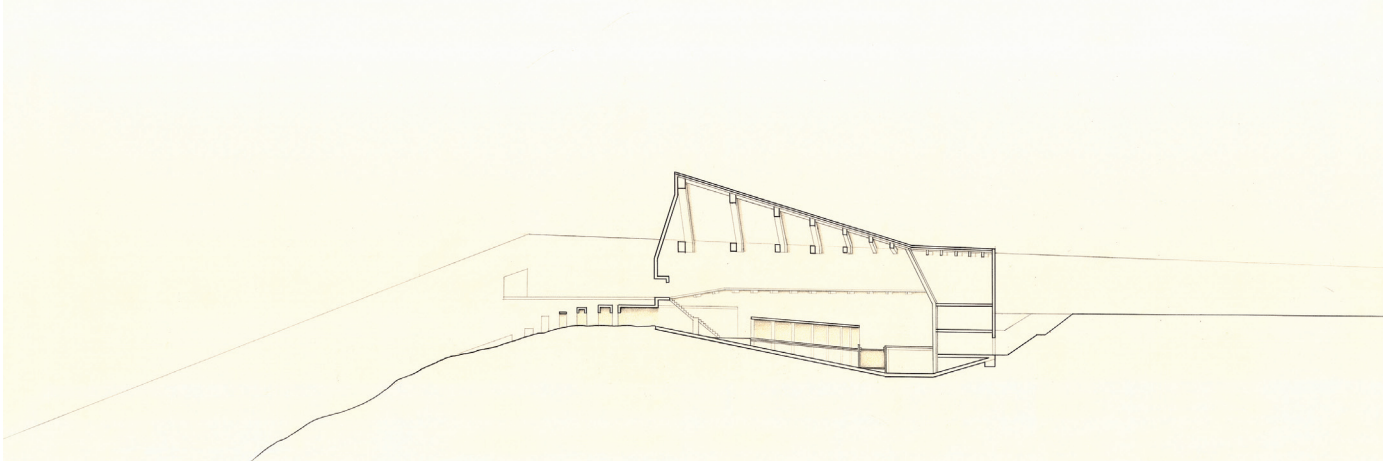
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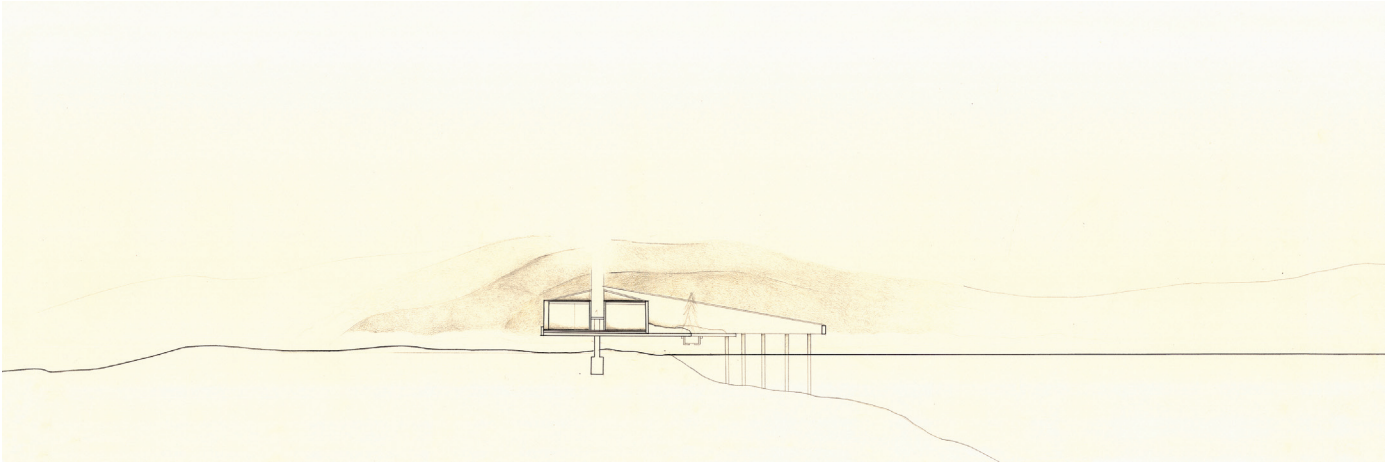
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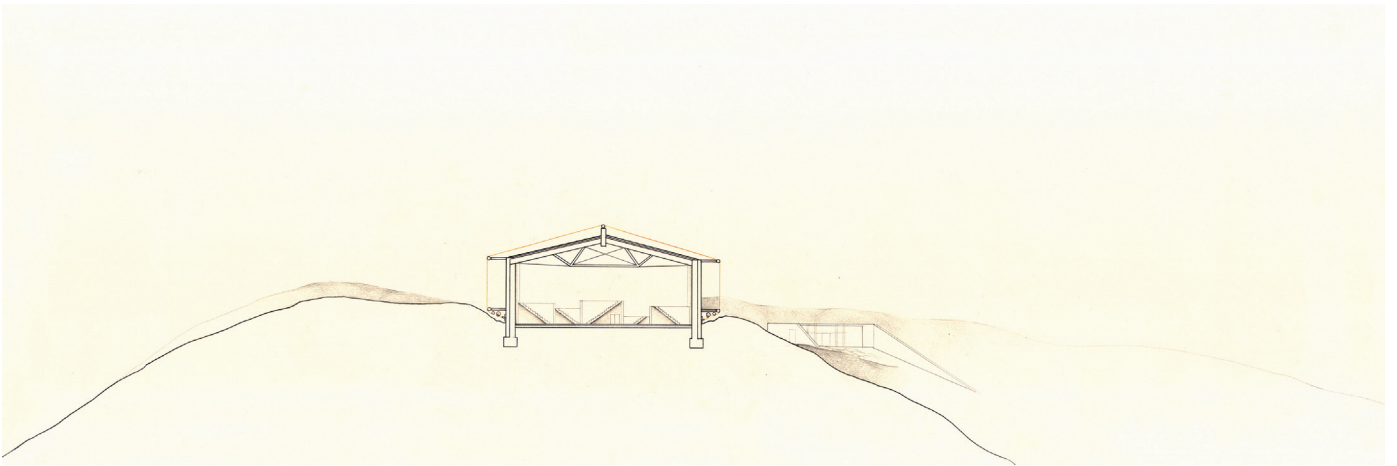
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Concluding Thoughts

To understand the complexity and subtle peculiarities in the project, I will describe a brief experience of the place as if we were experiencing the project:

Weaving through dense pine forests, the building begins to announce our arrival--vistas are cut through the trees, terminating at the waters edge. We enter the parking, the first of three configurations. In front of each row of parking exists a masonry wall, slightly weathered with vines stretching across--a kind of barrier, these walls hide whatever is beyond them. Every two parking spaces share an opening for which we are to enter this space, officially marking the entrance into the campus. We are contained by the wall separating the other parking rows from ours. In this space there exists small groupings of trees that create intense shadows upon the ground plane. These walls end with parking plane, but the walkway continues on--it narrows gradually as we reach our destination.

A slight slope takes us up through the forest--the pathway here is formed to the topography--small vistas are cut here as well, allowing short glimpses at the other paths that lead from the other two parking configurations. The walkway on this path way is made of alternating materials; the rhythm of his pattern becomes more dense as the approach to the building is realized.

Each path is then faced with a small kiosk, attached to a circular wall--each kiosk has its own opening, which is an entrance into another open space. Tickets or information are acquired at these kiosks. We then enter into this circular space. A two foot thick wall grows out from the ground plane--the idea that the building grows from this point helps enhance the notion that this building is a growth from its site.

A path then leads us on a journey with the wall. Again, the ground plane here consists of alternating materials, gravel and slate, that document our footsteps in time differently. The path way then begins to break away from the wall, circling around the trees--the steepest slope on the site exists here, and the path way is situated precisely at its edge. We then are confronted with a wall that separates us from the views to the

east. We ascend the stair, which is documented by the wall with an opening. The stair is necessary in order to compensate for the change in topography height between the two concert halls. At the top of this walk way, we are faced with three choices. We will go left first:

In turning left, we move through an opening in the main wall. A space that moves through the wall will be described as the second experience later. We are then confronted with topography at our grade--the height of topography is different by five feet on either side of the wall. We then move through a corridor with square openings for views. In this corridor, a series of walls that taper to zero begin to document our movements through this space. If we are musicians, we continue right and descend down into the chamber music hall. If we are administrative staff, we continue left, descending down a stair and through a wall that takes us into the entrance of the administrative building. The pathway here is cut into exposed rock stretching from a point further north and adjacent to the chamber music hall. If we are visitors to the chamber music hall, we continue on the middle path, moving through exposed rock and trees. The path then becomes ramp, ascending the wall of the facility--we are in a space that has an interval, moving between concrete wall, columns, alternating ground material, and rope. The rope is stretched across all of the building on the campus, creating dramatic spaces and shadows. The tension of moving through such of visually "noisy" space is of interest here. The ramp then slopes down and is met by a stair which ascends the wall, leading to an opening. Up until this point, the trees offered a considerable amount of shade. Once moving onto the other side of the wall, the trees are absent, and we are bathed in intense sunlight. A ramp, 15 feet above the ground, scales the front facade where we enter the facility from this height. We then descend down a series of stairs and ramps of our choosing into pods of seating. There are five stages in this space, all slightly offset in height, with a stair for each. Corridors and chambers penetrate this space and allow for circulation or mobility during a performance--they have the ability to takes us outside during a performance. To leave, this concert hall, we continue back the way we entered.

If we were to continue on the second direction, we would find ourselves moving through the wall at this point. It is much thicker here, allowing for this to occur. The thickness then tapers, forming a ramp that sits atop of the wall. We then move through the space formed by the rope,

walls, columns, and ramp. The ramp then continues on, descending down the hill to the practice rooms. Because of the steep slope here, the wall angles down towards the water. The ramp does not follow the top of the wall, but continues straight. There exists an opening in the wall. Here, the wall becomes thicker, allowing us to move through it as well. We then descend down stairs until we have reached the top of the wall. We then continue down a ramp which begins to take on a platform like quality, allowing the space to be slightly more spatial. We are then allowed to descend down stairs to the practice rooms at varying heights. The practice rooms bleed onto the water--the building is not bound by solid ground. The practice rooms do a curious things--some are completely exposed to the outside--they are created by the rock on the site. Flat surfaces are cut upon them for practice. The rock also begins to enter into the enclosed practice rooms as well.. The last pods of practice rooms terminate upon the water--here, they become like nests, cupped by a structure beneath, giving the illusion that they are floating upon the water--one of the practice rooms is exposed on the water as well--there are holes in this rock with planters that allow trees to be planted. The experience is that we are practicing on top of the rock, on the water, with trees. There are also larger sections of exposed rock at the edge of the site. These are connected by small bridges which allow us to practice or read. In going back, we retrace our footsteps.

If we take the path that bears right, then we continue on a pathway that moves forward with the wall. The pathway does not reflect the topography at this point. Freestanding walls exist to our right--they are contrasted in rhythm by the alternating ground plane--there are benches cut into the exposed rock if someone chooses to stop. These freestanding walls begin to form enclosures--and we continue through them. At this point, if we are musicians we bear left and descend down into the main concert hall. If we are visitors, then we continue straight and into the space created by the rope, walls, columns, and pathway. If we bear right, then we descend down slightly through exposed rock. We then move through a series of freestanding walls. The last few walls have cantilevered stairs that begin to climb them--there is a groove cut into the top of these walls where seating is--this is another kind of space for the individual to stop. Then the individual moves through more rock with seating. Then we meet the previous path the moved through the rope and wall--we are on the other side of this rope. Both

paths converge completely, terminating at a stair. The stair ascends into an opening where we enter into the space creating the front of the building. We can continue left into the main concert hall, or descend the appendage to the left. This takes us down the wall and onto a space that terminates on top of the water--again, these appendages are not bound by the earth.

If we continue into the main concert hall, we are faced with 5 entrances. Each entrance descends down into a network of spaces formed by the space between the 5 seating sections. Each section faces a specific group of instruments. We can thus remain immobile during the performance or mobile. The network of spaces, corridors, and chambers filters music to various degrees and sound qualities. All of these corridors lead to the exterior of the facility, where they begin to engage with the landscape. One corridor descends into the earth and becomes a subterranean listening chamber. Then we descend back up towards the entrance and through the wall, retracing our footsteps--revisiting our memories from past experiences.