

## ABSTRACT

Title of Document:

### **ARCHITECTURE WITHOUT VISION**

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What is architecture if you cannot see? How might we perceive if we ignore our dominant visual sense to focus on inputs from the senses that we rarely engage as we move through the built environment? How might architects design buildings to fully engage our senses? This thesis began to address that question through research including a literature search, analysis of examples of architecture for visually impaired users, and interviews with blind individuals and people who work with visually impaired people. This research informed the development of a set of principles for the design of built environments that enrich the ability to people along the spectrum from sighted to blind to navigate the spaces of their lives through multi-sensory perception. These principles are tested by application to the design of a building, a Creative Co-Lab, in which blind and sighted users come together on the Baltimore waterfront to learn collaboratively about the multi-sensory ways to perceive and create space, place, and objects without vision.

# **WHAT IS ARCHITECTURE WITHOUT VISION?**

By

Elizabeth Camilla Nolen

Thesis submitted to the Faculty of the Graduate School of the  
University of Maryland, College Park, in partial fulfillment  
of the requirements for the degree of  
Master of Architecture  
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Advisory Committee:  
Associate Professor Madlen Simon, Chair  
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## Introduction

Blind architecture. Architecture for the blind. Architecture without vision. What is architecture if you cannot see? How can we ignore our visual world to focus on perception through the other senses we so often forget?

I woke up one summer morning a few weeks after graduating high school and was struck with the reality that, overnight, I had lost part of the vision in my left eye. After the immediate shock and the mysterious sudden loss of part of my retina, I realized just how valuable vision was. If I lost my eyesight, how would I live? How is a blind person supposed to navigate daily life? The blind utilize their other senses – all of them – in an integrated manner. Those of us who are sighted largely ignore these other senses. How might the designed world better orient and guide the visually-impaired? Can the designed world heighten the utilization of the non-visual senses? How might the designed world provide similar experiences to the visually-adept and visually-impaired?

This thesis will begin with the process of researching through reading, precedent analysis, site visits, and interviews. Readings consist of varying topics – those relating to architecture, cognitive psychology, phenomenology, universal design, sensation, and perception. Precedent analysis not only takes place in the two-dimensional study of plans, sections, and perspectives, but will also look at the different ways specific scenarios are represented. These scenarios include space, path, transition, and threshold. Site visits will be conducted to experience certain precedents. Interviews with visually-adept

and visually-impaired will work to reinforce or challenge researched ideas. I will be conducting interviews with members of the blind community, members of the sighted community who interact daily with the blind, and members of the sighted community who currently have no interaction with the blind community.

Oliver Sacks in Pallasmaa's *The Embodied Image*<sup>1</sup> states, "The world of the blind, of the blinded, it seems, can be especially rich in...in-between states – the intersensory, the metamodal – states for which we have no common language. And all of these...blend into a single fundamental sense, a deep attentiveness, a slow, almost prehensible attention, a sensuous, intimate being at one with the world which sight, with its quick, flickering, facile quality, continually distracts us from" (p54). This quote opened me up to thinking about who actually has the handicap. Are the blind handicapped because they cannot see the world around them? Or are the sighted handicapped because their vision consumes and dulls all the other senses?

I intend that this project will result in a raised awareness of how all the senses may be used to experience a place and what the architect's role in engaging these senses can be. My hypothesis is that there need not be a major difference between architecture for the blind and architecture for the sighted. It is important to note that multi-sensory design is needed across the full spectrum of senses. My goal is to design a space or spaces that will bring the blind and sighted together to learn about perception without vision.

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<sup>1</sup> Pallasmaa, Juhani. *The Embodied Image: Imagination and Imagery in Architecture*. John Wiley & Sons LTD. West Sussex, United Kingdom. 2011. Print.

# Chapter 1 : Research

## What is Blindness?

Blindness has many definitions. Some define blindness as a complete inability to see, whereas some may state blindness still entails a differentiation between light and dark. The National Federation of the Blind encourages people “to consider themselves to be blind if their sight is bad enough – even with corrective lenses – that they must use alternative methods to engage in any activity that persons with normal vision would do using their eyes.<sup>2</sup>” That is, blindness in this case is a condition in which someone requires an alternative way of doing things.

The United States Bureau of the Census question about “significant vision loss” considers both total or near-total blindness, as well as “trouble seeing, even when wearing glasses or contact lenses” as vision loss.

Legal blindness requires that central visual acuity is 20/200 or less in the better eye with best possible correction, or a visual field of 20 degrees or less. There is no widespread definition for “visually impaired,” “low vision,” or “vision loss,” although there is a widely understood norm for these categories.

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<sup>2</sup> “Blindness Statistics.” *National Federation of the Blind*. NFB. 6 Aug. 2014. Web. 03 Sept. 2014. <https://nfb.org/blindness-statistics>

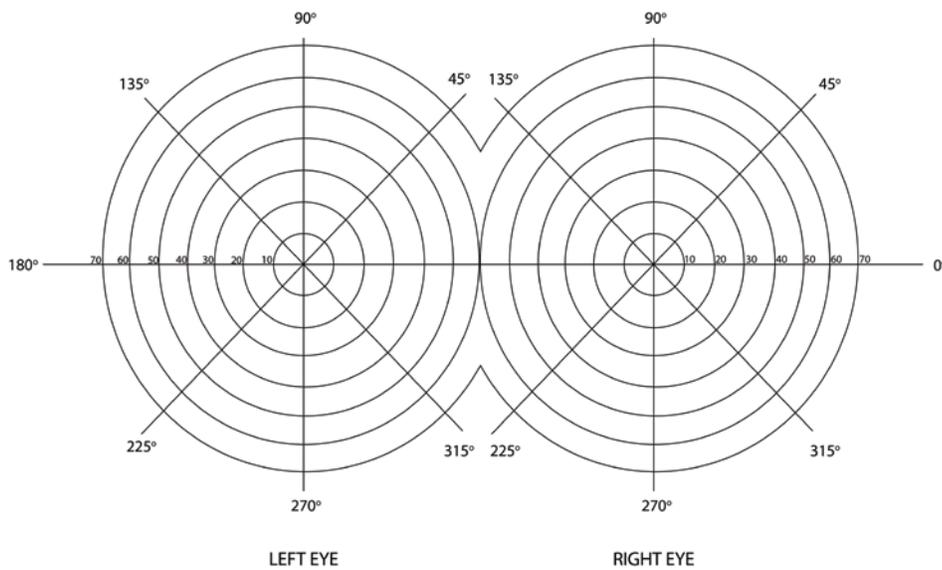
A common misconception is that a blind person cannot see anything, that someone who is blind sees nothing but empty black. The following series of images will portray different views a person with varying degrees of visual loss or impairment may experience.

The original scene is shown below in Figure 1.1. This is an image taken on the coast of Aperlae, Turkey. The object slightly to the right of center is an ancient tomb, which has been partially submerged with other portions of the ancient city.



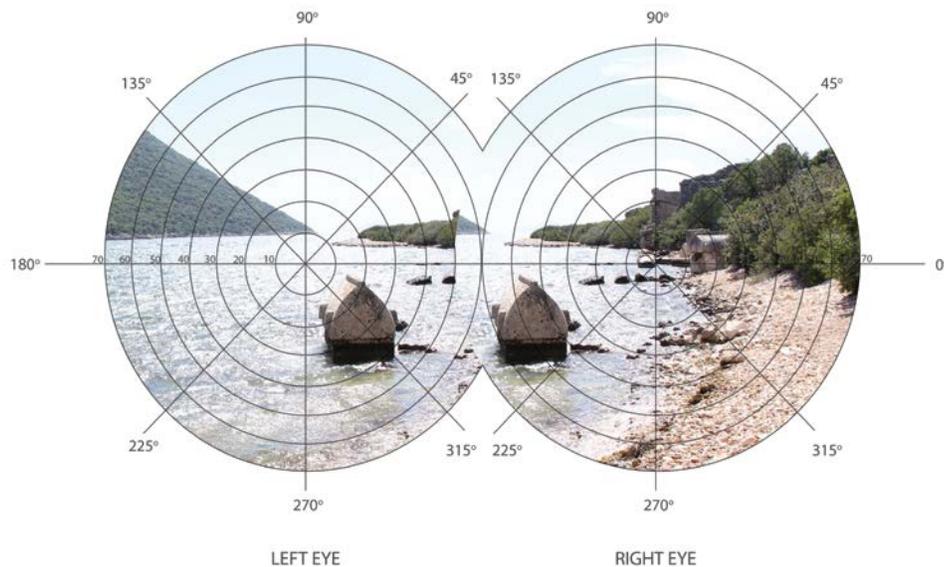
**Figure 1.1: Aperlae. Image by author.**

Pictures flatten the world around us, so the latter image is not what the eye sees originally. There are two eyes feeding information to the brain; therefore, we essentially have two images that feed into a stream of information and relay one image back to the brain. The visual field chart, portrayed in Figure 1.2, shows the degree or cone of vision that a normal sighted person can see using both eyes. The two circles are representative of the left and right eyes, portraying the center of vision with the smallest circles.



**Figure 1.2: Visual Field Chart. Image by author.**

The image of the coastline of Aperlae, Turkey (seen previously in Figure 1.1), actually appears differently as it first enters the eyes. Laying the image over a visual field chart, we can see how this information is first reflected back onto the retina. Figure 1.3 portrays the vision of a person with full visual field and 20/20 visual acuity.



**Figure 1.3: Full visual field and 20/20 acuity. Image by author.**

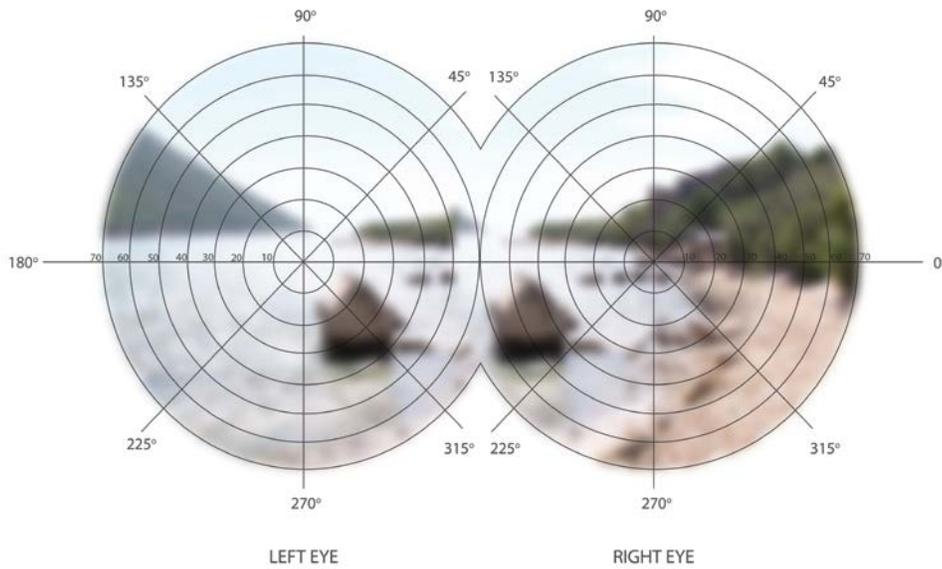
The next series of visual perception studies will look at a decrease in quality of visual acuity, as well as different cases of retinal vision impairment. These will be categorized into the following: vision loss, visual impairment, legal blindness, and total blindness. Definitions of each degree of blindness and more detail may be found on the National Federation of the Blind website.<sup>3</sup>

---

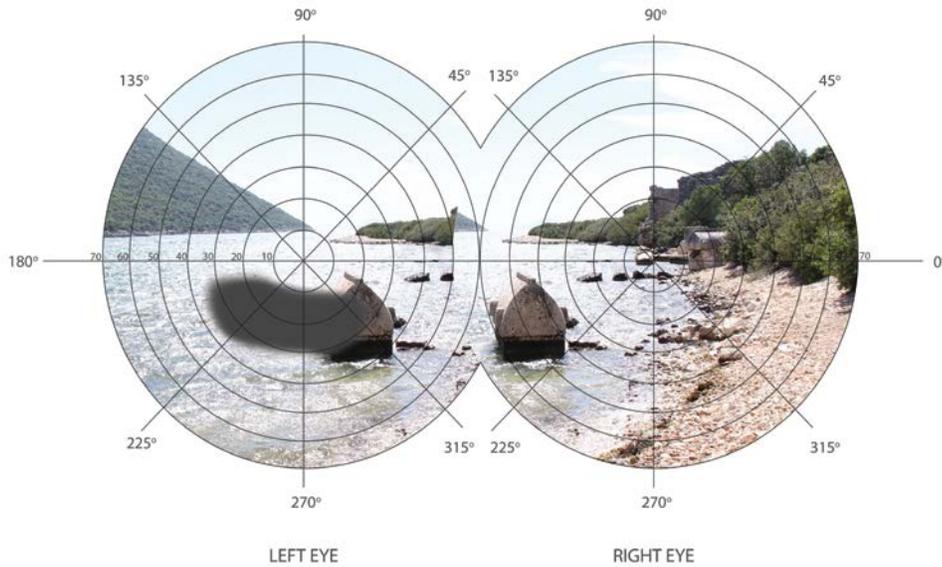
<sup>3</sup> "Blindness Statistics." *National Federation of the Blind*. NFB. 6 Aug. 2014. Web. 03 Sept. 2014. <https://nfb.org/blindness-statistics>

# VISION LOSS

While it has no official definition, vision loss is a slight inability to see. This degree of loss will have a small effect on the individual, but not affect daily life too drastically. Figure 1.4 portrays 20/40 visual acuity, while Figure 1.5 portrays a scotoma in the eye.



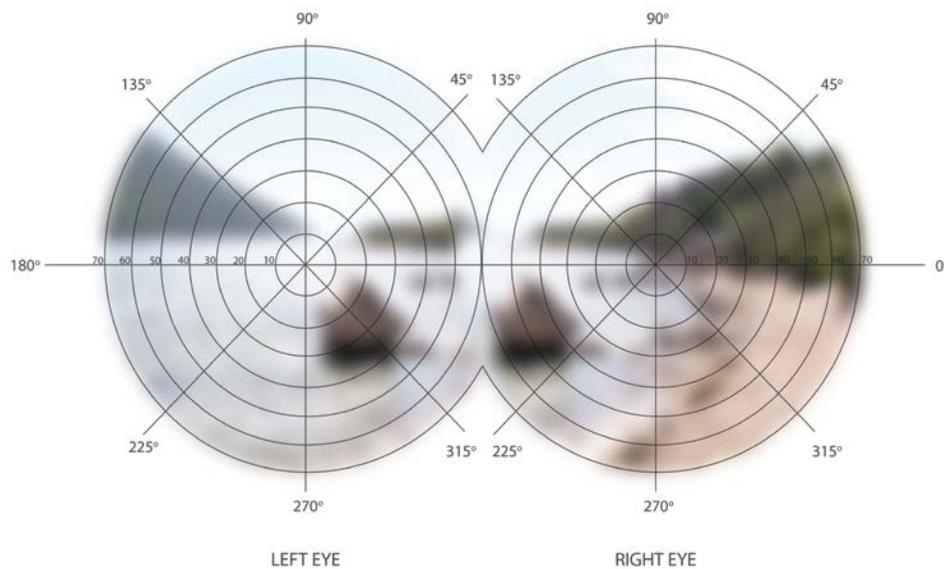
**Figure 1.4: 20/40 visual acuity. Image by author.**



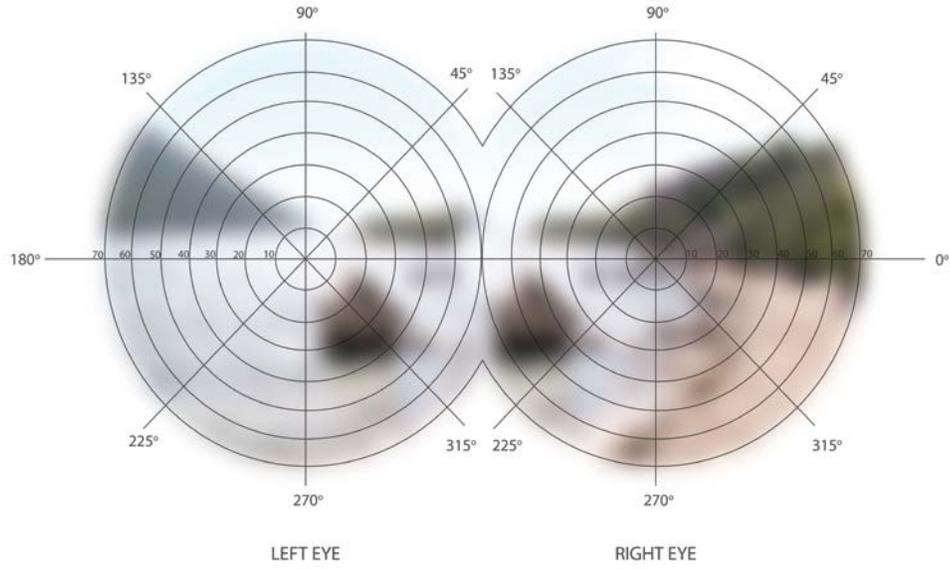
**Figure 1.5: Scotoma. Image by author**

## VISUAL IMPAIRMENT

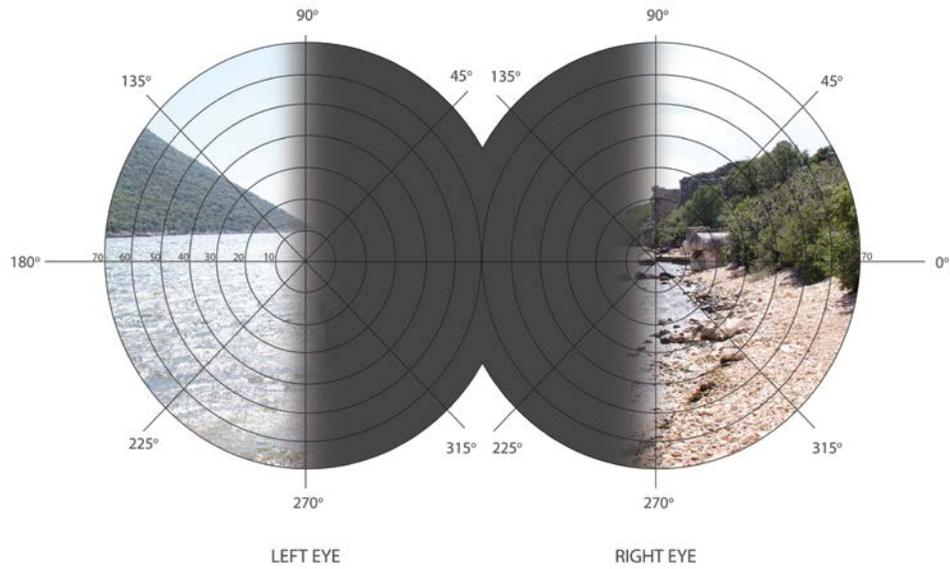
Visual impairment, like vision loss, has no official definition but will be examined as a significant loss in vision. This is still not considered as legal blindness. Portrayed in the next few images are 20/70 acuity (Figure 1.6), 20/100 acuity (Figure 1.7), bitemporal hemianopsia (Figure 1.8), inferior hemianopsia (Figure 1.9), and a 40 degree cone of vision (Figure 1.10).



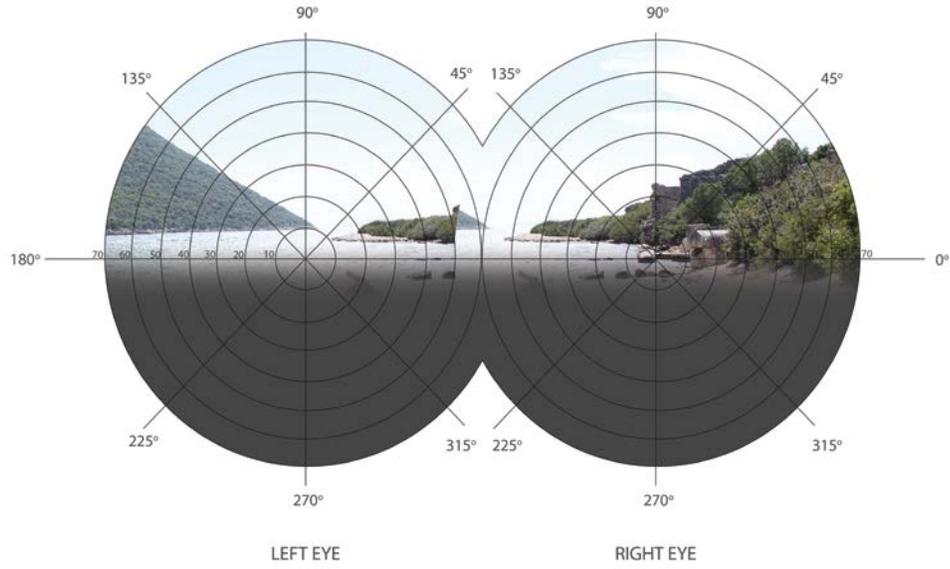
**Figure 1.6: 20/70 visual acuity. Image by author.**



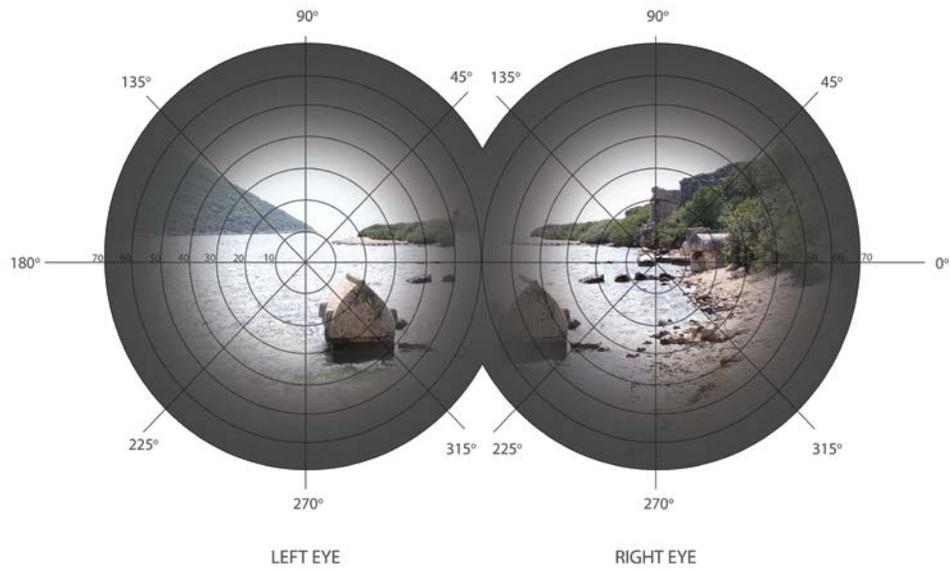
**Figure 1.7: 20/100 visual acuity. Image by author.**



**Figure 1.8: Bitemporal Hemianopsia. Image by author.**



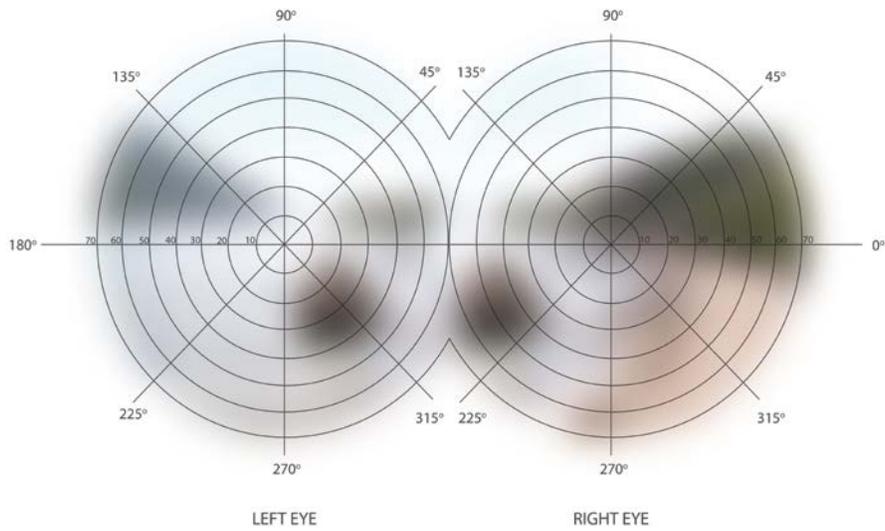
**Figure 1.9: Inferior Hemianopsia. Image by author.**



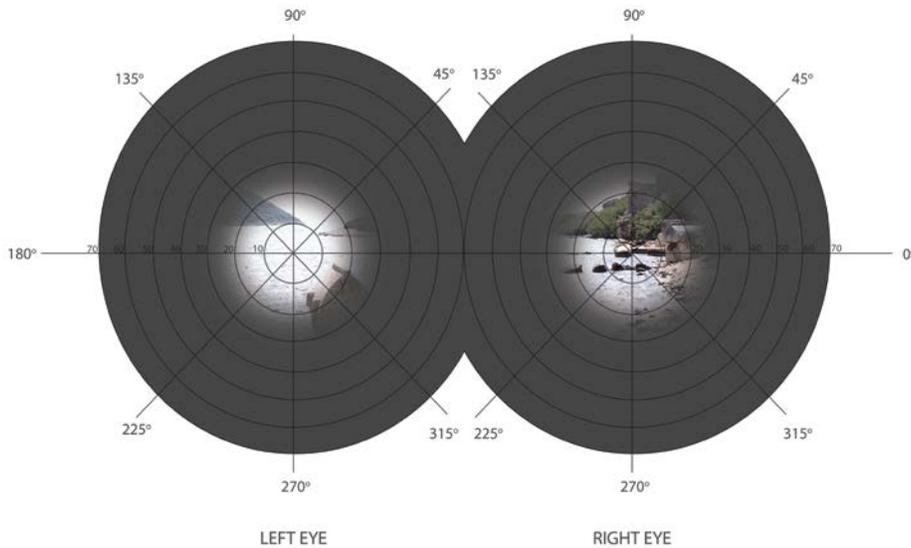
**Figure 1.10: 40 degree cone of vision. Image by author.**

# LEGAL BLINDNESS

A person is legally blind if central visual acuity is 20/200 or less in the better eye with best possible correction, or that the visual field is 20 degrees or less. The following figures portray 20/200 visual acuity (Figure 1.11) and a 20 degree cone of vision (Figure 1.12).



**Figure 1.11: 20/200 visual acuity. Image by author.**



**Figure 1.12: 20 degree cone of vision. Image by author.**

# TOTAL BLINDNESS

Total blindness, as the name implies, is when a person cannot neither see form nor make out lightness and darkness. This is portrayed in Figure 1.13.

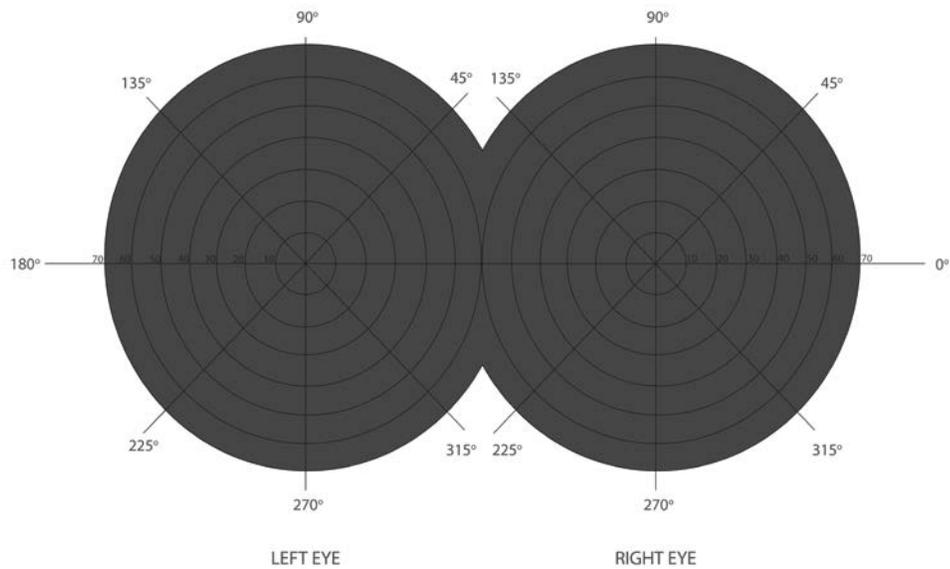


Figure 1.13: Total blindness. Image by author.

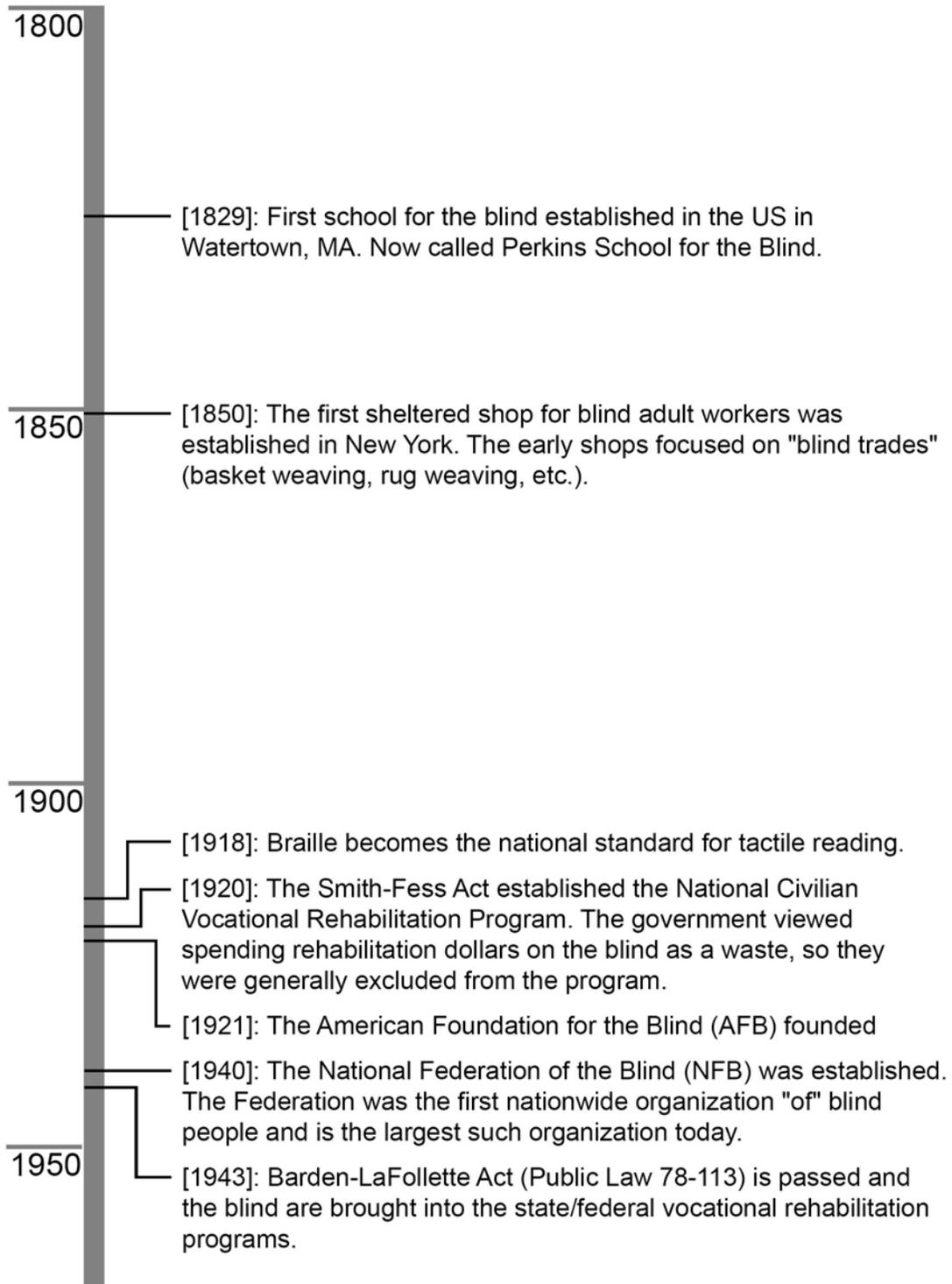
## Blind in US Society

In primitive times, the blind were not held in high regard. They were not included in hunts or battles, as they were not expected to be able to use weapons accurately in times of need. The natural “fear of the dark” held by most of society lends itself to the manifestation of these destructive and negative social attitudes about blindness. In early civilizations, blind babies were reported to have been abandoned and left to die. Blind adults were sold into slavery, used for amusement, or lived their lives as beggars. In some rare cases, the blind were cared for by families. Middle aged societies, specifically in Europe, began to care for the blind. They believed they had an obligation to care for the less fortunate, which included the blind and handicapped.<sup>4</sup>

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<sup>4</sup> Omgig, James. “History of Blindness: Summary of the History of the Education and Rehabilitation of the Blind.” *American Action Fund for Blind Children and Adults*. Web. 28 Oct. 2014. <https://www.actionfund.org/history-blindness>

The following timeline shows specific impacting events in the history of the blind. It was not until rather recently that the blind community became, by law, more integrated into the educational environment and public system, thus into society. Before then, the blind were treated as outsiders.



1970

[1973]: Congress enacted Title 5 of the Rehabilitation Act of 1973, allowing civil rights protection for people with disabilities.

Section 501 - "federal government" could not discriminate against "otherwise handicapped individuals" on the basis of disability and must provide "reasonable accommodations" for the physical or mental limitations

Section 502 - Architectural and Transportation Barriers Compliance Board, dealing with accessibility.

Section 503 - "federal contractors" can not discriminate on the basis of disability

Section 504 - "recipients of federal funds" not discriminate on the basis of physical or mental disability and that "reasonable accommodation" be provided to overcome the physical or mental limitations of a qualified handicapped individual.

[1975]: Congress passed the first law requiring that public schools accept handicapped students in "the least restrictive environment."

1990

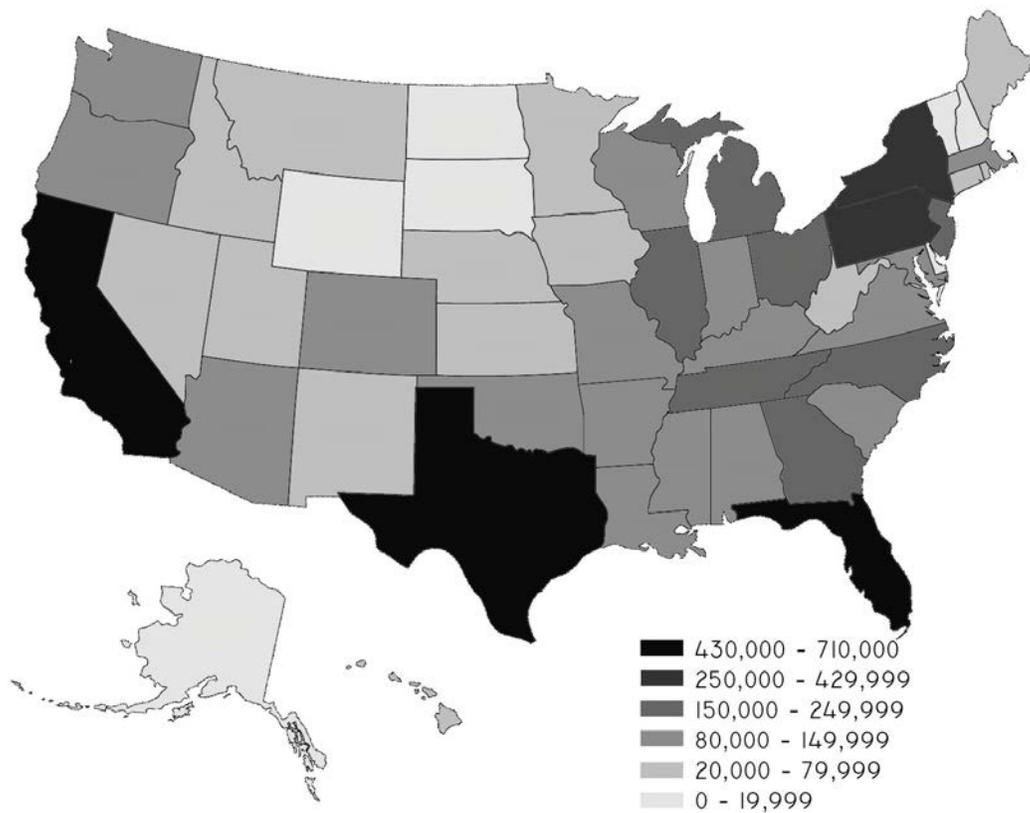
This law is now known as The Individuals with Disabilities Education Act (IDEA) and has led to the placement of countless blind children into public schools.

[1995]: The National Federation of the Blind established NEWSLINE FOR THE BLIND. This is a system whereby blind people can read newspapers and magazines using telephones.

2000

[2006]: Congress agreed, spurred by the National Federation of the Blind, to mint a commemorative Louis Braille coin to recognize Braille's 200th birthday in 2009.

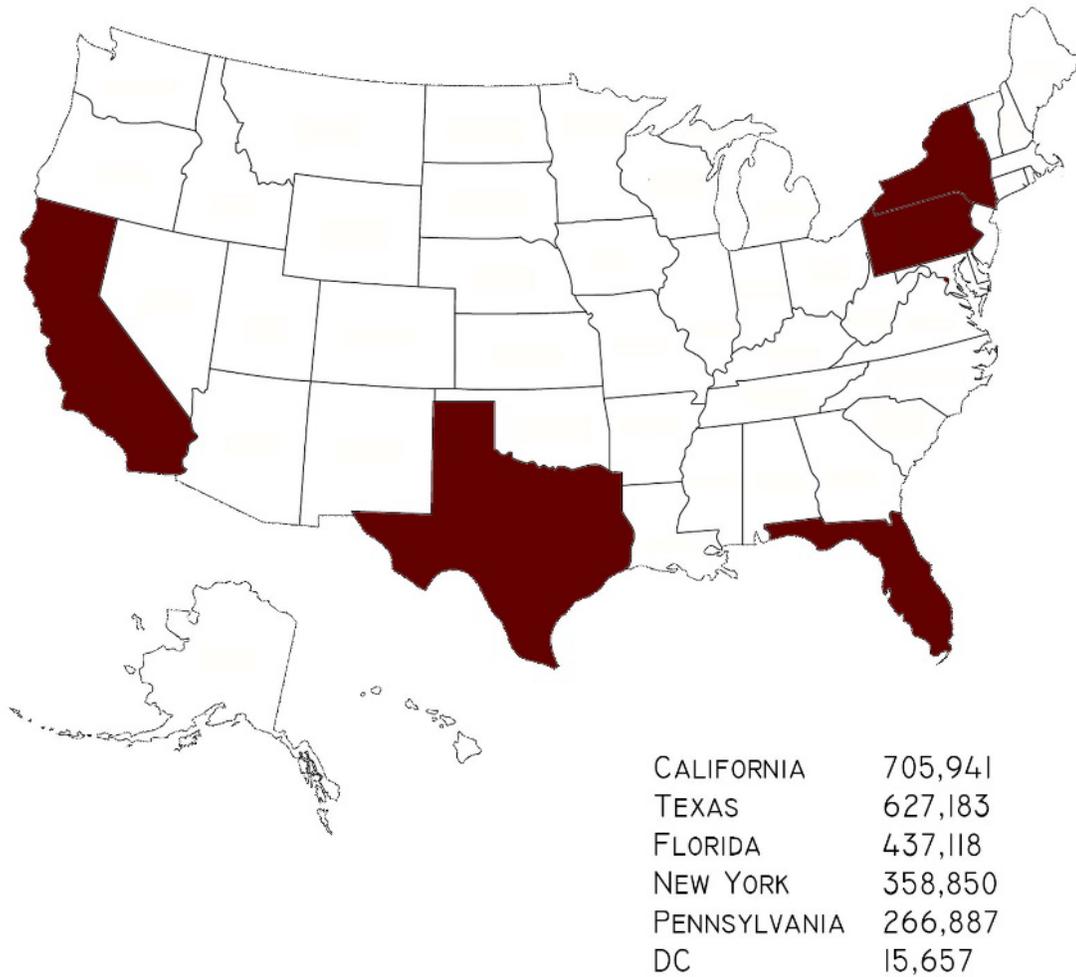
Definitions of blindness, vision loss, and vision impairment vary throughout census data and polling, so the following numbers and calculations are not guaranteed to be perfectly accurate representations of the blind population. The following data is meant to give an idea of the overall impact blindness has on our society. Full data and state-specific statistical information may be found on the American Foundation for the Blind website,<sup>5</sup> as well as in Appendix A. The map of the United States in Figure 1.14 shows blind population per state.



**Figure 1.14: Blindness population per state. Image by author.**

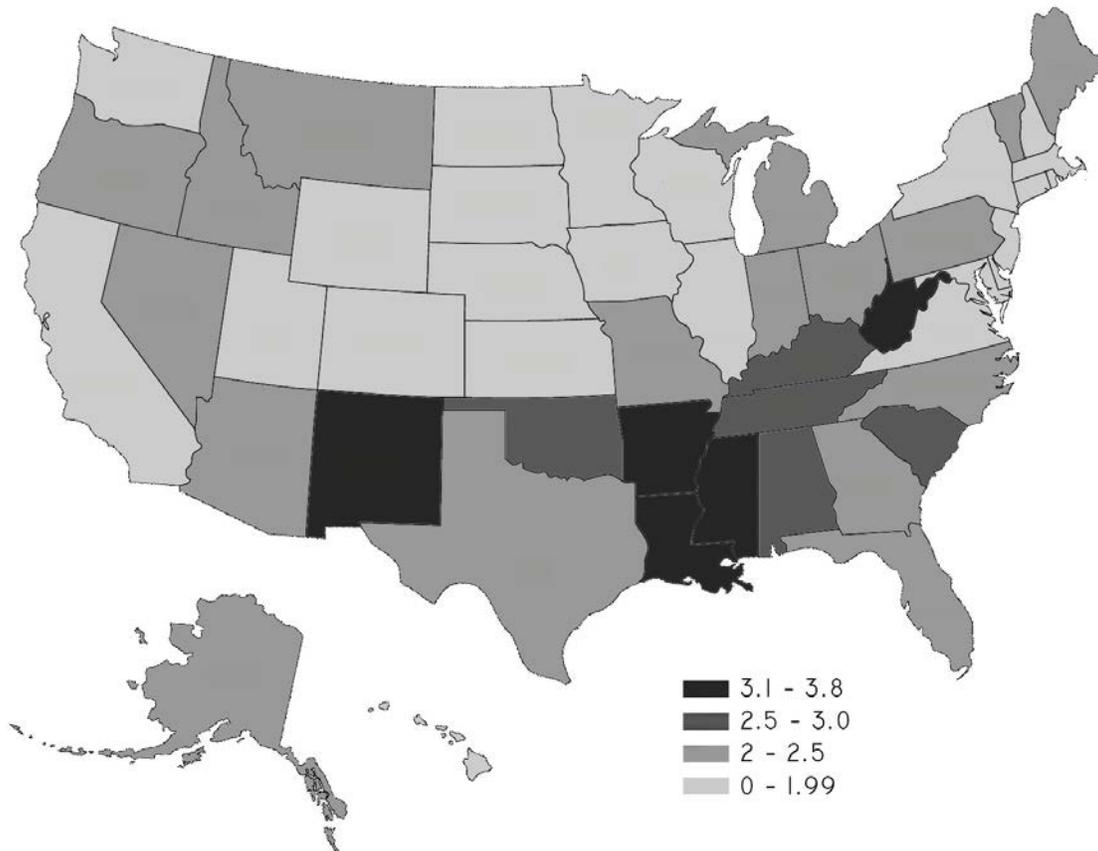
<sup>5</sup> “State-Specific Statistical Information.” *American Foundation for the Blind*. American Foundation for the Blind, 2014. Web. 24 Aug. 2014.

The states with the highest population of visually impaired or blind people are California (705,941), Texas (627,183), Florida (437,118), New York (358,850), and Pennsylvania (266,887). This is shown in Figure 1.15.



**Figure 1.15: Highest population of visually-impaired. Image by author.**

Figure 1.16 shows that West Virginia (3.8%), Mississippi (3.4%), and Louisiana (3.13%) have the highest percentage of the blind.



**Figure 1.16: State percentage of blind individuals. Image by author.**

While these maps showing blind population and blind percentage show numbers and population statistics, we must think in the broader picture. Where is a program like this needed? It is not just needed by the blind community; rather, it is something from which everyone can benefit. This program should not just look at where there is a large community of the blind, but also where it is important to educate the community about perception.

## Preliminary Survey

I found, through personal experience, that vision was held in high regard in our society, but wanted to complete a survey at the local scale to reinforce my hypothesis. My results, from polling one hundred participants, gave the same results as the research I had found. Oftentimes, after completion of the survey, participants would start conversations with each other to compare results and responses. The first question asked the participant which sense they believed was the most important. Sixty-four percent responded with sight. The second question asked which sense they used the most to perceive their surroundings. Undoubtedly, vision again took the lead with eighty-two percent. The third and final question asked participants to choose one sense they would live without. For this question, gustatory (taste) and olfactory (smell) senses were listed jointly (as you cannot lose one while keeping the other). This category received sixty-two percent of responses, while sight was the lowest ranking at ten percent. This means that ninety percent of people would rather not lose their eyesight. Complete survey results may be found in Appendix B.

## Literature Survey

This section summarizes information taken from readings and offers insight as to how these readings can relate to the issue at hand. Readings are listed alphabetically by the author's last name. A full list of these readings, as well as other works engaged in the research process, may be seen in the References section at the end of this document.

## *Universal Design: Solutions for a Barrier-Free Living*<sup>6</sup>

Universal design is not aimed toward a target group of people, but for the betterment of design for all. “What at first seems like purely special solutions end up being universal. One example here is the low-floor technology used in public transportation that has become common in buses and trams. What was once developed as a standard only for people with limited mobility is now a popular convenience for everyone.” (p39). This book raises awareness of design simplicity and its effects on daily lives of all. Manfred Tsheligi, professor of applied science at the Vienna University, states, “We are often oblivious to the number of ineffectual objects we are confronted with on a day-to-day basis. We have just gotten used to getting annoyed” (p28).

Pictograms (i.e. exit signs, bathroom logos, phone symbols) are often used as an orientation system or way-finding devices in buildings. Designer Ursula Wangler comments on Orientation Systems in the Age of Universal Use: “An orientation system or any interactive system always has to be anchored in the architecture. It is best if we can plan together with the architects” (p80). The same way we use pictograms to portray orientation system messages in a clean and simple way, we can use tactile feelings and materials. What if tactile “pictograms” were spread as a part of universal design and the world became much more of a tactile environment?

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<sup>6</sup> Herwig, Oliver. *Universal Design: Solutions for a Barrier-Free Living*. Basel: Birkhauser, 2008. Print.

## *Thermal Delight in Architecture*<sup>7</sup>

We have the ability to tell what temperature something is. We know warm from cool. The ability to sense temperature usually falls categorically under the sense of touch. “They are taken as one, probably because the thermal sense is located in our skin where our senses of touch and pressure also lie, or perhaps because we notice the temperature of something most acutely when we touch it directly, that is, when we conduct heat to or from it. But the thermal sense is definitely a separate sense, for we have specialized nerve endings whose only function is to tell us if some part of our body is getting cooler or warmer” (p18).

Our senses do not function separately from each other. “Each sense contributes to the fuller comprehension of other sensory information. Indeed, one may not even be able to understand the information from one sense properly, until it can be related to information from other senses” (p24). The senses trade information about objects and scenarios. We can learn to use all these senses in conjunction. A person born blind because of a congenital cataract who has sight restored must learn to see. They first see light patterns, flat and meaningless. They then learn to use those light patterns for a better understanding of the world that was previously understood through the other senses. “By associating sight with bodily movement and touch, the brain begins to perceive form and depth and perspective” (p24). Human fascination with fire may be rooted in that it stimulates all of our senses. “The

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<sup>7</sup> Heschong, Lisa. *Thermal Delight in Architecture*. Cambridge, MA: MIT, 1979. Print.

fire gives a flickering and glowing light, ever moving, ever changing. It crackles and hisses and fills the room with the smell of smoke and wood and perhaps even food. It penetrates us with warmth” (p29).

Thermal function of a building can be used as an effective element of design. Thermal qualities of a space are an important part of our experience of that space; they influence what we do in the space as well as how we feel about it. Studies have shown that people can sense slight variation in the temperature of a single room. “In one experiment subjects were put in the center of a room with constant air temperature, but where the surface temperatures of the end walls could be regulated. A majority of the subjects could notice a 5°C elevation in the temperature of one of the walls, a miniscule change in the average radiant temperature” (p16). Islamic gardens were designed with high walls, not only for privacy, but to keep the cool of the garden separate from the heat of the desert right outside of the garden walls. This strategy of playing with temperature is used effectively to denote the garden as a place to rest and feel comfortable versus the heat of the desert, which one may choose to avoid at all costs. Islamic gardens also offer a multi-sensory experience, encouraged to do so by the following Turkish garden motto:

*Roses for perfume,*

*Nightingales for song,*

*And the sight and sound*

*of running water.*

## *Questions of Perception: Phenomenology of Architecture*<sup>8</sup>

This book is split into several chapters, consisting of essays written by three different authors. In the first essay, “The Space of Architecture: Meaning as Presence and Representation” by Alberto Perez-Gomez, I discovered meaning in a word I had never heard before – “chora.” Plato came up with the word “chora.” The nature of chora is a paradigmatic architectural work. It is both the “work” and the “space.” It’s a space for recognition. A space to recognize the association between space, contemplation, and action. Chora is a take on the invisible significance of architecture. In one way, you could say that chora is the experiential side of architecture - that we experience architecture in a way that words cannot describe. Good architecture has a strong sense of chora and calls for action.

Perez-Gomez calls architects to design passionately. Architecture is not static – it calls for us to be involved in one way or another. “Some [architects]...simply built within this prosaic world and embraced the technological values of efficiency and economy, asserting that ‘meaning’ was not the concern of the architect, that it would simply follow” (p21). I challenge this believe and tendency we have. We must design intentionally. In 1898, architecture was officially declared the *art of space*. According to Schmarzow, it was the artistic manipulation of space. A synthesis between these manipulations of space, spatial imaginations, and materiality is demanded by

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<sup>8</sup> Holl, Steven, Juhani Pallasmaa, and Alberto Perez-Gomez. *Questions of Perception: Phenomenology of Architecture*. San Fransisco, CA: William Stout. 2006. Print.

architecture. We direct people through space, as if space is a theatrical stage. “The architect, in a sense, now must write the ‘script’ for his dramas, regardless of whether this becomes an explicit or implicit transformation of the ‘official’ building program.” (p23). The spectator in a building must remain both distant and involved. He must be distant so that the work represents mystery and memory. He must also be involved intimately with the architecture. He is participating in the space. I need to imagine myself as engaging the role of both creator and spectator.

In the essay “An Architecture of the Seven Senses,” Juhani Pallasmaa discusses issues in perception and ways to use all the senses in perception of architecture. “Architecture at large has become an art of the printed image fixed by the hurried eye of the camera. The gaze itself tends to flatten into a picture and lose its plasticity; instead of experiencing our being in the world, we behold it from outside as spectators of images projected on the surface of the retina” (p29). The world is at our fingertips, yet sometimes we refuse to engage with it in a multi-sensory way. We do not embrace the world. We merely look at it. How can architecture reinforce this inherent connection we have to the world and cause us to have an experience not dominated by a visual image projected onto the surface of the retina? As discussed in Pallasmaa’s essay, the senses were understood during the Renaissance as a system relating back to the image of the cosmic body: vision correlated to fire and light, hearing to air, smell to vapor, taste to water, and touch to earth. They were also seen hierarchically, with touch being the least important

sense. Perhaps it is during the Renaissance that we lost our ability to focus on all the senses in perception. We pushed touch to the bottom rung of the ladder, treating it almost as a symbolic cosmic evil.

Emphasis on senses have changed drastically throughout time. The world used to have more emphasis on the world of hearing. We depended upon hearing to relay information, through conversation and language. As language moved from spoken to written, “print replaced the lingering hearing-dominance in the world of thought and expression with the sight-dominance which had its beginning in writing” (p30). We should not only depend upon sight, but also use the other senses to rationalize our experience and give a stronger perception of space. “Sight makes us solitary, whereas hearing creates a sense of connection and solidarity; the gaze wanders lonesomely in the dark depths of a cathedral, but the sound of the organ makes us realize our affinity with the space” (p31). We reconcile our placement in space through sound. Pallasmaa says that the most essential of the auditory experiences is tranquility, stating that “architecture is the art of petrified silence” (p31). Architects have the ability to create sound and to take it away. The sound can be made as a result of human interaction with built form (i.e.- echoing of voice, sound of footsteps) or it could be built form or an object itself creating sound itself (i.e.- the swinging of a pendulum through space and the noise which follows).

Smell, often overlooked, also has a strong presence in creating memory of space and place. “A particular smell may make us secretly re-

enter a space that has been completely erased from the retinal memory; the nostrils project a forgotten image and we are enticed to enter a vivid daydream” (p32). Imagine all the smells you experienced this morning, from the time you woke up to the smell of coffee until now as you may be sitting in a café filled with the smell of pastries, listening to the low murmur of your fellow customers. All your senses constantly perceive and relay information about your surroundings back to you.

The penultimate chapter “Questions of Perception: Phenomenology of Architecture” is an essay written in collaboration between Steven Holl, Juhani Pallasmaa, and Alberto Perez-Gomez. This essay discusses our relationship to space and how we can start to rationalize our understanding of it. You must realize where you are and how you relate to a space before you can start to perceive it. “An awareness of one’s unique existence in space is essential in developing a consciousness of perception” (p40). This does not imply a dependency upon vision. You are able to realize and perceive your place in a space without seeing it. We merely need to train our other senses to be more aware of our surroundings. “The everyday act of pressing a door handle and opening into a light-washed room can become profound when experienced through sensitized consciousness” (p40). Now, as vision takes hold of us, we lose track of the multi-sensory world. “We could redefine space by shifting our attention from the visual to how it is shaped by resonant sounds, vibrations of materials and textures” (p87). Tactile and acoustics have a strong presence in our experience of space, but we often sublimate these responses and

reactions to that information. "Sound is absorbed and perceived by the entire body. A parade drumroll vibrates the stomach. An explosion can shake one's bones and make the head ache. A sequence of sounds can have a mesmerizing effect on the psyche" (p87).

The final essay, "Archetypal Experiences of Architecture" by Steven Holl, left me with questions about experiencing a series of spaces. How do I experience a space and why is my perception of space different each time I engage in said space? "A city is never seen as a totality, but as an aggregate of experiences, animated by use, by overlapping perspectives, changing, light, sounds and smells. Similarly, a single work of architecture is rarely experienced in its totality (except in graphic or model form) but as a series of partial views and synthesized experiences. Questions of meaning and understanding lie between the generating ideas, forms and the nature and quality of perception" (p130). We get a different view of a space each time, even if we walk through the doors of our homes multiple times per day. Never the same. Our place in relationship to space changes. Our relationship to that space and response to it changes each time we pass through. Architecture cannot create a specific experience, but provides the opportunity to have a memorable experience of space.

## *Essentials of Sensation and Perception*<sup>9</sup>

This book gives an introduction to the basics of sensation and perception. The human sensory system has four kinds of receptors: mechanoreceptors, chemoreceptors, photoreceptors, and nociceptors. Mechanoreceptors respond to sound, body position, body movement, and touch and are found all over the body. Chemoreceptors respond to gases, liquids, and solids. These receptors are primarily olfactory and gustatory (smell and taste). Photoreceptors respond to light. Rods and cones in the eye respond to dim and bright lights respectively. Cones also are sensitive and receptive to color. There are more rods than cones in the eye. Eyes are weakest at dusk – neither rods nor cones are in charge of light perception and it becomes a balance of the two. Nociceptors sense dangerous stimulation likely to cause tissue damage and are found all over the body (p18). Brain stimulation and neuroimaging data both reveal that the cortical destination of incoming fibers determines the character of sensations; when you see a light, hear a sound, or feel a touch the appropriate area of cortical tissue is active. These cortical cells are highly specialized and only respond to specific stimuli (p52).

Multi-sensory processing can take advantage of the correlation between signals in different modalities to improve processing efficiency and reliability. Many phenomenological and psychophysical experiments find evidence for multi-sensory effects in perception, but it is often difficult to

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<sup>9</sup> Mather, George. *Essentials of Sensation and Perception*. London: Routledge, 2011. Print.

distinguish between decisional integration and truly perceptual integration (p143). This issue presents itself to those who research the brain, as we are still trying to comprehend fully how the brain operates.

Modern theories of perception are theories about how the brain constructs internal representations of the world (p168). Major scientific issues remain to be resolved concerning the interplay between different processing routes (bottom-up/top-down, ventral/dorsal), the use of more natural stimuli, and the origin of conscious perceptual experience (p168)

## *The Eyes of the Skin*<sup>10</sup>

Juhani Pallasmaa, in his book *Eyes of the Skin* approaches experiences of the world in a multi-sensory way, focusing especially on the built environment. Architecture must strive to provide an experience to engage all the senses. Pallasmaa states, “It is evident that ‘life-enhancing’ architecture has to address all the senses simultaneously, and help to fuse our image of self with the experience of the world” (12).

How have we perceived the world of vision in the past and why is this important for us to know? The invention of drawing in perspective view focused our attention on “the eye [as] the center point of the perceptual world as well as the concept of the self” (18). People began to consider eyesight as the center of the world. Descartes regarded vision as “the most universal and noble of the senses” (22), yet he also considered touch equal to vision. Touch, according to Descartes, was “more certain and less vulnerable to error than vision” (22). Through personal experience, I have discovered that vision does not answer all questions of perception. There are things that you must touch in order to understand completely. We not only perceive with eyesight, but with all the senses. Pallasmaa quotes Maurice Merleau-Ponty, saying “My perception is [therefore] not a sum of visual, tactile and audible givens; I perceive in a total way with my whole being: I grasp a unique structure of the thing, a unique way of being, which speaks to all my senses at once” (23).

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<sup>10</sup> Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. Chichester: Wiley-Academy, 2005. Print.

How do we experience the world? Pallasmaa states, “An architectural work is not experienced as a collection of isolated visual pictures, but in its fully embodied material and spiritual presence” (48). Specific snapshots and images from our sequential experiences are remembered specifically. As we walk through a space, we notice movement and how our body relates to that space. We confront architecture and it affects our memory. “A meaningful architectural experience is not simply a series of retinal images. The ‘elements’ of architecture are not visual units or Gestalt; they are encounters, confrontations that interact with memory” (67). Design must interact with emotions, senses, and memory to provide a meaningful experience.

Our views of perception are constantly changing. We have begun to notice our other senses. Ashley Montagu, an anthropologist, is quoted by Pallasmaa saying, “We in the Western world are beginning to discover our neglected senses. This growing awareness represents something of an overdue insurgency against the painful deprivation of sensory experience we have suffered in our technological world” (41). Pallasmaa refers to this new awareness of the senses as a projection from numerous architects around the world who are attempting to “re-sensualize” architecture. This re-sensualization occurs through the increased use and sense of materiality, hapticity, texture, weight, density, space, and light. Through experience and interaction with this architecture in a personal way, experience becomes more personal and less distant. This thesis aims to describe principles which encourage this “re-sensualization” of architecture.

## *The Embodied Image*<sup>11</sup>

We tend to focus on vision as the primary sense, leaving our other senses under-utilized. We subconsciously use these other senses more than we realize. “Regardless of the immediate character of visual perception, paradoxically we have already unconsciously touched a surface before we become aware of its visual characteristics; we understand its texture, hardness, temperature, moisture instantaneously.” (p52) Architecture is not just about visual image; rather, it is about embodied image. “The embodied image is a spatialized, materialized, and multi-sensory lived experience” (p11). Architectural design should take into account the role of the body and our personal relationship to it. If we detach ourselves, architecture becomes merely an image and we deny any sort of interaction with it. “The image is usually thought of in terms of the purely visual and fixed picture, but a characteristic quality of the senses is their tendency to mingle and integrate; a visual image is always accompanied with repercussions connotating experiences in other sense modalities” (p51). Architecture is able to emphasize these interactions our senses have with our environment and give us a heightened realization of our perception.

“Thus, the impact of architecture on the human experience is too deeply existentially rooted to be approached solely as an element of visual design.” (p124)

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<sup>11</sup> Pallasmaa, Juhani. *The Embodied Image: Imagination and Imagery in Architecture*. John Wiley & Sons LTD. West Sussex, United Kingdom. 2011. Print.

## *The Thinking Hand*<sup>12</sup>

“We are not usually aware that an unconscious experience of touch is unavoidably concealed in vision. As we look, the eye touches, and before we see an object, we have already touched it and judged its weight, temperature, and surface texture” (p101). This book examines the relationship between the brain and hand as it pertains to perception of our environment. It analyzes the “essence of the hand and its semiole role in the evolution of human skills, intelligence, and conceptual capacities” (p21). The hand is an integral part of our society. Without it, we would not be able to function – even more so than if we did not have vision. How does our hand relate back to our brain and what is the relationship between the brain and the hand? Pallasmaa quotes Wilson in *The Hand* as he says, “The brain does not live inside the head, even though it is its formal habitat. It reaches out to the body, and with the body it reaches out to the world. We can say that the brain ‘ends’ at the spinal cord, and that the spinal cord ‘ends’ at the peripheral nerve, and the peripheral nerve ‘ends’ at the neuromuscular junction, and on and on down to the quarks, but brain is hand and hand is brain, and their interdependence includes everything else right down to the quarks” (p33).

A professor at the University of Virginia named Sanda Iliescu teaches drawings to students through the sense of touch. The students are not able to see the objects they are assigned to draw; rather, they must read into a cubic

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<sup>12</sup> Pallasmaa, Juhani. *The Thinking Hand: Existential and Embodied Wisdom in Architecture*. John Wiley & Sons LTD. West Sussex, United Kingdom. 2011. Print.

volume made of black cloth and figure out the object through the sense of touch. "It is remarkable that students pay attention to entirely different characteristics and qualities of objects in their drawings when observing them through their hands instead of the eyes." (p95). The drawings made from visual observance are drastically different in ambience compared to those made by tactile observance. This conversation ties in to talk about computer-generated designs. This is a highly debated topic in the context of architectural design. Pallasmaa takes the stance that "Fully computer-generated designs may well project a seductive surface appeal, but in fact they take place in a world in which the observer has no skin, hands or body. The designer himself remains an outsider in relation to his/her own design and body. Computer drawings are devices for a bodiless observer" (p99). I believe this is a valid argument and definitely something to consider through the design process. I aim to design using both hand and computer, as any designer should.

Ashley Montagu is an anthropologist who comments on the role of skin as one of our organs. "[The skin] is the oldest and the most sensitive of our organs, our first medium of communication, and our most efficient protector [...] Even the transparent cornea of the eye is overlain by a layer of modified skin [...] Touch is the parent of our eyes, ears, nose, and mouth. It is the sense which became differentiated into the others, a fact that seems to be recognized in the age-old evaluation of touch as 'the mother of the senses'" (p100).

## Chapter 2 : People

To raise personal awareness of the issues at hand within the blind community as well as further refine the direction of thesis efforts and research, I conducted interviews. These interviews targeted three different groups of people: members of the blind community (“Blind”), members of the sighted community who are in constant collaboration with the blind (“Sighted Collaborators”), and members of the sighted community who are isolated from the blind community (“Sighted General Public”).

### Blind

This process started with a focused intention of solely interviewing people who are blind. This section documents conversations with members of the blind community, all of whom have integrated themselves into our visually dominant society. At the beginning of the interviews, I had intended to design for the blind community, but throughout each conversation I realized I wanted to proceed forward in a slightly different direction.

**Debbie Brown: “Everyone needs multisensory design, not just the blind.”**



**Figure 2.1: Debbie Brown. Image by author**

Debbie Brown (**Error! Reference source not found.**) is the Vice President of the Maryland National Federation of the Blind. She was born blind in Pottstown, PA and attended Overbrook School for the Blind in Philadelphia. Her perception of buildings is derived from the details. She is most comfortable in buildings she knows, as there is a sense of familiarity and memory. The biggest challenge of blindness, she says, is that “you could walk by something and not know what it is.” There is often an inability for spontaneity because of the need for a guide. She advised that I design in a way so as to not handicap the blind further with tactile warnings/automatic doors, but to give them confidence and independence in movement. After meeting with Debbie, my view of thesis topic and design process changed drastically. I would like to design a space that would make Debbie feel comfortable and at home – to enjoy being in a space not only for its activities, but also for its design and experience of architecture. One of the most inspirational bits from the discussion with Debbie was this: “Everyone needs multisensory design, not just the blind.” Moving forward from this point, I decided that I should not only design for the blind, but design with everyone in mind. How can I design in a way that makes the blind feel at ease and gives the sighted a strong multi-sensory environment?

## **Scott White:**

**“If you can’t touch it, you can’t see it. It doesn’t exist.”**

Scott White is the Director of Sponsored Technology at the National Federation of the Blind in Baltimore, MD. He was born in Richmond, VA and went to a public school in the Richmond area. Scott was born with sight and at the age of ten started a gradual loss of vision due to a condition called Retinitis Pigmentosa. He is completely blind now and does not remember too much from before that time. People have no idea that he is blind when they talk on the phone at work. Before working at the National Federation of the Blind, Scott worked tech support at Circuit City. A typical day is waking up, going to work, heading back home for dinner, filling the night with activities, and then going to bed. His wife, Jen, helps out when needed. She sat with us throughout the conversation and offered helpful comments and input. The biggest challenge of being blind for Scott is transportation, as well as access to print materials. Jen drives him wherever he needs to go, so he does not see this as too much of an issue. A solution for the lack of print materials is “Newslines,” a news source run by National Federation of the Blind that can be accessed by telephone. Another solution is the “KNFB Reader” app for the iPhone, which you can use to take a picture of text and then hear it read the text back out to you. Jen’s answer to the biggest challenge of blindness was the misconceptions of sighted people. People overlook the blind and are rude. In restaurants, the waiter or waitress tends to ignore Scott and speak to Jen as if Scott is not able to. In the grocery store, Scott will hold his hand out for

the change and the cashier will hand the money to Jen instead. The sighted treat blind people as if they are not capable of everyday activities, when in fact they are. They aren't any different from those who have sight.

When asked about positives to being blind, Scott said, "Your choices and life events dictate who you become. It's the same with blindness. You become what you make of it." Blindness has made him more aware of others in their disabilities, as well as more patience when interacting with people. Jen stated that Scott's true advantage was that he takes people for who they are and not what they look like. Scott responded to this by saying he hoped he would act that way even if he did have vision.

Without vision, Scott says there isn't too much of a difference in how he sees the world. He uses reference points to tell where he is and where he is going. This is especially helpful when it comes to the perception of buildings. It is easy for him to tell an atrium versus hall versus closed room. They all sound different as people talk and you hear the sound of the cane taps. While talking about experience in buildings, Scott said, "If you can't touch it, you can't see it – it doesn't exist." In a new building, you can hear the size of the area to try to figure out where you are or just simply ask. Some blind people use the cardinal directions (front, left, back, right) to navigate – they will avoid walking diagonally – as well as picking up on different textures. In experience of a familiar building, Scott made the example of driving the same street over and over again. You forget the journey and sometimes do not pay attention to where you are going, but you have memorized the path it takes to get there.

If given the opportunity with minimal risk of repercussions, Scott would jump at the chance to get his vision back. He says it would take care of a lot of things and would make life easier, especially when it comes to other people's expectations. Some people just sit around and do nothing when they go blind, but the trick is to get up and do things. To be active and get involved. Scott said, "I feel perfectly complete as I am." He doesn't need sight. One of Scott's biggest aspirations is as follows: "I want to leave this world and feel that I have done something to help people."

I left this conversation really questioning my perception of the world and dependency upon vision. I may think that I understand something as I look at it, but in reality I need to touch it to understand. If I am not able to touch it, do I really know anything about it? I was able to present my ideas of thesis concept to Scott through a series of tactile models that I had constructed. Through this tactile discussion, he was able to better understand my intentions. I remember visiting the Chiesa dell'Autostrada del Sole outside of Florence, Italy. The church is made from board-formed concrete that I honestly thought was wood until I had the chance to touch it. I didn't believe it was concrete until I felt it. Experience should be embraced as multi-sensory, as that is the way we subconsciously remember places and buildings.

## Sighted Collaborators

As I interviewed and the direction of my thesis changed, I found that my clientele was no longer just the blind community; rather, this sort of multi-sensory design was for all. This section includes interviews of sighted people who have daily interaction with members of the blind community. Through their near-constant communication with the blind, they become aware of adjustments that need to be made in answer to the needs of the blind. These conversations with the “Sighted Collaborators” provided different perspectives on how to design an experience where the blind would feel at home. This group of people became more aware of their multi-sensory surroundings by being in close proximity to the blind community.

## **Russell Tutt:**

### **“Where are you and how do you get there safely?”**

Russell works at the Maryland School for the Blind in Baltimore, MD. He grew up on the campus of MSB and has been involved in some form since a young age. Currently, he is completing his Masters in Orientation Mobility. Russell gave me a tour of the Maryland School for the Blind campus and offered further insight to working with blind students. He encouraged me to design so that navigation is intuitive for both the blind and sighted cultures. During my tour, we had the chance to enter the new buildings, designed by Ayers Saint Gross, which had not been open to the campus community yet. The new buildings provided much excitement for the staff and students at Maryland School for the Blind, as much of the architectural design was more helpful to engage a teaching and learning community. Sufficient storage and circulation space was provided in each of the classrooms, as well as a contrast in floor color to denote center versus edge of room. In the hallways of the old buildings, metal ADA railings were attached to the walls. The teachers had taped different textured materials (sandpaper, felt, bubble wrap) at certain points along the rail. Russell showed and explained that a student knows where the entry to a specific classroom is based on the texture that is felt while walking along the railing. What if these elements of tactile orientation mobility were included in the design of a building? As well as giving me a tour of the building, Russell provided me with the opportunity to speak with a few of the teachers.

## **Meredith McArdle:**

**“They can do anything a sighted person can do.”**

Meredith is an elementary school teacher at the Maryland School for the Blind. I entered her class as she was about to take her four students to their lunch break, all four that had some level of visual impairment. The students were full of energy and excited to tell me how their Friday morning was going and what their favorite subjects in school were (math and gym were the top players). Meredith said that the blind use landmarks to know where they are, just as we may use visual landmarks. “Landmarks are the cues we need,” she said as the students walked down the hallway to the cafeteria, tapping their canes along the tiled floor. They hear cane taps and count doors to know where they are. There is also attention paid to auditory and tactile landmarks, as well as a contrast in color for those with low vision.

**Bev Schmitz:**

**“It’s a fun challenge... My students teach me how to teach.”**



**Figure 2.2: Bev Schmitz.**  
Image by author.

Bev Schmitz (pictured in Figure 2.2) is a physical education and health teacher at the Maryland School for the Blind. She has a minor in Adaptive Physical Education, but received no formal education or training when it came to teaching curriculum to the blind. She says that learning to teach has been fun, and that each child has his or her own story. Each student learns

differently, so there is a learning curve to the teaching process. Bev’s strategy is to start with less instruction (specifically tactile, or using hand-on-hand to direct) and add more when needed. She’s found that her blind students are willing to try anything, stating, “How do you know you can’t do something unless you try?” If a student is tentative to do an activity in gym class, there are ways to change instruction so they are willing to try. Bev suggested focusing attention on lighting and acoustics. Their gym has a high ceiling and unreliable or spotty lighting. The gym is not evenly lit and, for students with low vision or some ability to see, this is a hindrance. Acoustics may be more important than lighting. A high ceiling, such as in the gym, gives an echo that makes it hard for students to concentrate.

**Chris Wellmann: “Simple adjustments for the blind make a huge difference.”**



**Figure 2.3: Chris Wellman. Image by author.**

Chris Wellmann (pictured in Figure 2.3) is a physical education and health teacher at the Maryland School for the Blind, who also has a visual and hearing impaired daughter. His daughter attended Maryland School for the Blind. Chris and his wife have set up the house so that his daughter

knows where things are. “When she comes down the stairs, she knows exactly where her chair is going to be.” While his daughter can navigate the house gracefully and without much assistance, she uses a wheelchair for longer distances (she becomes very tired for longer trips, so the wheelchair gives her ease of travel). Chris believes that society as a whole is getting better as it relates to the blind community, but he still sees areas that could be improved.

**Matthew Mescall:** “We live in a society built on borders and boundaries. That’s not how they see things.”



**Figure 2.4: Matthew Mescall. Image by author.**

Another physical education and health teacher at Maryland School for the Blind, Matthew Mescall (Figure 2.4), has a wealth of knowledge in how the blind navigate sports and motion. Goal Ball is a tactile and acoustic sport that is Matthew says is “beautifully laid out” and engaging for all who play. It was a sport invented by members of the blind community. There are Goal Ball tournaments held on the Maryland School for the Blind campus. Matthew noted that even objects and tools for the blind can still be designed to be better. As he said this, he picked up a red ball lying on the gym floor that made a two-tone beeping noise. He pointed out the two pitches of the tones could signify a difference in distance, and that this may be confusing for someone who is visually impaired. “Our visual world we take for granted,” he said. We agreed that this society focuses so much on vision that we forget that other senses exist. In his four years of teaching at Maryland School for the Blind, Matthew has noticed many things about the blind community that those who interact with the blind would be slow in noticing. The blind students he works with have such a willingness to absorb information and learn how to do things.

## Jeannette Hobbs: “What would it look like for someone who doesn’t have vision?”



**Figure 2.5: Jeannette Hobbs. Image by author.**

Jeannette (Figure 2.5) is undergoing her first year teaching at the Maryland School for the Blind. She received a Bachelor’s degree in Elementary Education and a Master’s of Special Education. Previously, she taught at a public school in Baltimore, but found herself searching for a job in which she could teach the disabled. She does not have a lot of experience working with the visually impaired, but says it has been a good learning opportunity, as she has been immersed in the blind culture for the past two months. Jeannette says, “It was a big learning process learning how to approach students.” She currently teaches a small group of students a curriculum in functional and career-based work, as well as covering the normal subjects (math, science, and reading). When it came to planning her classroom layout and decoration, she found it was drastically different than the visual environment she created in her previous teaching job. She had to take a step back and think about it, inspiring me with the quote, “What would it look like for someone who doesn’t have vision?”

## Sighted General Public

This section includes conversations with people who do not currently have an ongoing collaboration with those who are members of the blind community. These individuals have limited knowledge of the blind and how they function as a culture. In order to get a large amount of responses to the questions, these conversations took the format of an online survey, hosted by the website SurveyMonkey<sup>13</sup>. Respondents to the survey were given the option to remain anonymous if they wished. A list of questions asked in the survey can be found in Appendix C.

I found that most of the respondents, guided by the series of questions in the survey, tried to put themselves into the shoes of the blind. The questions began by asking which sense would be lost, if they had to choose one. Each respondent was then asked to describe what their life would be like if they became completely blind. Through this process, they realized that blindness is not something that sets our two worlds apart completely. Many of the respondents admitted they would simply require some additional support to get where they needed to go. They all hoped that life would not change drastically if they became blind and some of them even challenged the idea that blindness should be considered a handicap. Responses to five of the survey respondents will be included in this section. The remaining responses will be recorded in Appendix D.

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<sup>13</sup> <https://www.surveymonkey.com>

## **Respondent #1: Anonymous**

**“Not being able to see is a pretty big deal, but blind people are able to live completely normal lives, and that's pretty amazing.”**

Respondent #1 is a female student between the age of 18-24, going to school for Piano and Voice Performance. If she lost her vision, she says, “I would probably do the exact same things as I would be doing now. I would still go to school, learn the same things, interact with the same people, etc.” She mentioned that she would probably make use of a service animal to help her “see” where to go. As she mentioned what she is studying (piano and voice), she said both of these were “doable even if you’re blind.” Many activities, such as playing piano, are able to be done without vision – these things we often overlook.

She has never interacted with a blind person, but believes it would be a rather normal interaction. “I would interact with them exactly as I would with a person that wasn’t blind,” she states. Respondent #1 would be there to offer support maneuvering around obstacles after politely asking to assist them. She reinforced that the blind are just like us, stating that one of the biggest misconceptions is “That they’re oblivious as to what's going on around them or that they can't live a normal life.” If she were to organize an activity, she would think of “hiking, shopping, going to a restaurant. Anything.” She once again reinforces that the blind are capable of “anything.” Respondent #1 learned from the blind that, “You can overcome any obstacle with a little faith and hard work.”

## **Anina Nolen**

**“We treat [the blind] as if all their senses are decreased as well. We may talk slower to a blind person, even though they can hear and understand just fine.”**

Anina is a Registered Nurse in her mid-20s. If she suddenly became blind, she worries that she would not be able to complete tasks in her current job. Most of the paperwork and medical documents are completed on an electronic database. “I guess I could do patient teaching and work at community centers organizing health fairs and outpatient programs,” she says with a positive outlook. She sees blindness as a completely life-changing event, but definitely one that you can adjust to. Where Anina lives, there is no public transportation. Her solution would be to get a seeing-eye dog.

She has only had brief interactions with completely blind people, but her grandmother is completely blind in one eye and has decreased vision in the other. Anina notes that interaction with her grandmother was never difficult, although she would occasionally forget that her grandmother couldn't see on one side or notice suddenly-appearing things. “I would feel bad. She never made a big deal about it, but would sort of play along and act like she saw the sudden far away things we would point out even when we knew she probably hadn't.” Anina says that knitting or listening to music would be a good activity to do with someone who is blind. These are tasks that can be completed through tactile senses and awareness. Going to the park and smelling flowers would also be things to include. The most important thing to learn from the blind, according to Anina, is patience.

## **Erin Glinowiecki**

**“[Sighted] people depend so much on our eyesight in everyday life. It’d be interesting to learn how to tap into my other senses more often.”**

Erin is a young professional currently living in the Baltimore area.

When asked how she would live if blind, she said, “Well, it would definitely be a completely different lifestyle.” Her life would change from the current habit of driving long distances every day to either having to depend upon someone to drive her or using public transportation. She says that it would be much more difficult to get where she needed to go. Erin couldn’t think of what type of job she would do if blind.

“I know that with braille and with technology today, that makes it possible for blind people to do many of the normal things that seeing people can do, but I also know there are lots of challenges.” Being blind would be life changing. She has aspirations of being able to act independently if that were to happen, as she has noticed most people who are blind are able to do daily activities without help. “Most blind people I have met are very independent and don't want to be treated differently just because of their handicap,” she states. The next question asked about common misconceptions of the blind, which Erin completed by saying, “I think the biggest misconception is the idea that blind people can't do a lot of the same things as seeing people can. There's a huge lack of communication between the blind and seeing community, and that breeds a lot of misunderstanding about how being blind affects a person's life and ability to work.” She brings up a good point that

miscommunication is one of the biggest sources of misconceptions about the blind. If the sighted and blind communities can learn to communicate effectively, we can learn more from and about each other.

Erin suggested a day where she could learn about the life and routine of a blind person. She strives to learn more about the blind community, but is also intimidated to put herself in an uncomfortable situation. She says, “I think it'd be interesting if I could be blindfolded for a day while I shadow a blind person as they guide me through their day. That also sounds a little terrifying and I imagine I would not finish that day without a few bumps and bruises.” What if I could design a place that could foster relationships and give Erin the possibility to interact with a blind person with ease? She would not need to feel uncomfortable or terrified about the learning experience. There is much knowledge that can be exchanged between the blind and sighted community that we are missing out on.

## Heather Wheat

**“[The biggest misconception about the blind is] that they are ‘handicapped.’”**

Heather is an English teacher in her mid-30s currently working in the Denver area. Blindness would come as a complete shock and life changing event for her. She says, “I would have to rely on other people for basic needs, and it would drive me absolutely nuts. I’m not even sure what job I would have, because I don’t know what jobs are available to the sightless.” Heather notes that a lot of her independence would be lost initially, as she would have to depend on others to help her learn how to navigate a new lifestyle. Eventually, this dependency on other people would fade, which is something many people may overlook at first.

In the public school setting, Heather once had a blind student who used a touch-type translator for work that had to be turned in. The blind student would depend heavily on other students to help her navigate through the crowded and chaotic hallways of a public high school. Heather says, “She was totally reliant on others for help, including teachers, who would have to read tests to her in order for them to respond to them.” Testing in the school setting was different for her blind student. Heather would go through the process of submitting the test to a braille translator so that her blind student could take the tests. From her experience with the blind student, Heather has started to realize how valuable vision is. She hopes, if she were to work more with the blind, she would learn “How to appreciate my vision, and hone my other senses.”

## Allison Lynn

**“I'm sure this seems cliché, but I could surely learn not to rely on a single sense too much (in my daily life, in coming to conclusions about things, in evaluating situations).”**

Allison is a writer/editor/professor who has faith that she could still be a writer if she were to become blind. She says, “Assuming that I'd once had sight and lost it, my work (which uses words but feels very visual to me) would probably rely intensely on the past, on images I'd saved from when I had sight.” Memory would have a strong play in Allison's life, as most of her work would depend upon experiences she had stored from the past. Imagine experiencing a world with only a few sighted memories – how would you know how to visualize something you had never seen before?

A recent move from New York City to Indianapolis, where there is less public transportation, would not bode well if Allison were to become blind. She had, in NYC, frequently seen blind people navigate the streets with ease. NYC, Allison states, is “particularly well equipped for the blind.” She notes that she would attempt to take a bus that stops near her home, but “curse [herself] for having left NYC.” At first, she says, adjusting to a new lifestyle would be very difficult. With the encouragement and aid of her husband and friends, she would learn how to do daily activities – “cooking, crossing our local streets where the drivers are crazy, for getting our child taken care of, using technology, and reading signs. Though with time I'd hope to master most of this.” Her positive outlook shows that she does not see blindness as a complete end to normal life, as some believe.

One of the biggest misconceptions about the blind according to Allison is that cities are hard places for them to live. She noticed a stark difference in the ability of the blind to navigate an urban scenario such as NYC versus a less urban city Indianapolis, to which she recently relocated. She also notes that many people misconceive the internal processes of the blind, “that [the blind] don’t have internal visual lives, very different from the rest of ours,” but the general public almost refuse to believe their experiences are “rich nonetheless.”

If she were to plan an activity to complete with someone who is blind, Allison says, “Anything goes, it seems.” There are almost no limits when it comes to doing something with a blind person. This is a great attitude to have, as she is able to see past the blindness and simply desire to do activities such as planning a party or having an intellectual debate. She also states, “Building something tactile might be interesting.” Allison has a positive attitude about the blind culture and seems as though she could learn a lot from engaging and collaborating with someone who is blind.

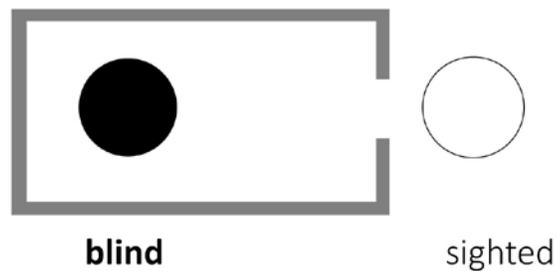
## Chapter 3 : Concept

I explored different program types to determine what sort of program would help me meet my goals in design. Different program types that engage both the blind and the sighted were studied as a way to understand how relationships currently operate. A school for the blind is where children come to learn a normal school curriculum, as well as oftentimes learning how to use a sight cane and other orientation mobility strategies. This is typically a K-12 school, yet of a different nature because all of the students are visually impaired or blind. It entails a different type of teaching and learning style and, oftentimes, the general public is not well-informed of what happens behind the school doors. Students may stay overnight at a boarding school, or leave daily to go home, yet they only interact with the outside world upon exiting the building. The relationship of blind to the sighted general public in the setting of a school for the blind is very distant – almost non-existent (Figure 3.1). The general public sighted population is distant from schools for the blind and intimidated to approach.



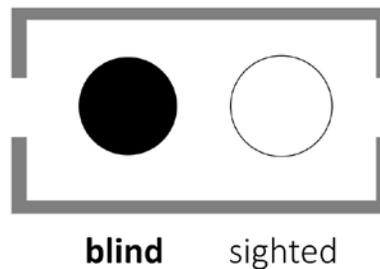
**Figure 3.1: Conceptual diagram [school for the blind]. Image by author.**

A center for the blind is typically where adults come for training and education about the blind culture and community. In this scenario, the sighted are less intimidated to approach and the blind are encouraged to test their training (i.e. blind cane use, navigational skills, etc) in the real world. There is a hint at more porosity to the exterior in this scenario as well as a closer relationship to the sighted community (Figure 3.2). In some cases, centers are more integrated into the community and the sighted do have a stronger relationship with the blind. More often, the general public is hesitant to approach, as they are not well-informed of what happens in these centers. A lack of education and overall misconception is the largest preventer of entry into these centers.



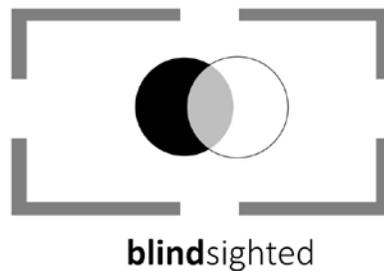
**Figure 3.2: Conceptual diagram [center for the blind]. Image by author.**

In the setting of a museum, people come to learn about a specific topic. This topic could be focused on the world of blindness. If this focus were the case, the scenario welcomes both the blind and the sighted and is more porous to the exterior environment. Open to the general public, this is a place where the blind and sighted come to learn about issues relating to blindness. We finally inhabit the same space, yet there is still a lacking interaction and collaboration between the blind and sighted communities (Figure 3.3). Most museums consist of exhibits or exhibitions that forbid a tactile response, whereas a museum of blindness could start to incorporate this tactile world.



**Figure 3.3: conceptual diagram [museum]. Image by author.**

All of the previously stated concepts involve both the blind and sighted in some capacity, yet we miss the opportunity to collaborate. There is still a gap between the blind and sighted. I strive to close the gap and create a place where both communities come together to collaborate in a porous and open learning environment (Figure 3.4).



**Figure 3.4: Concept for thesis design project. Image by author.**

My concept aims to unite the blind and sighted in a place where vision is not dominant. This is a place to experience architecture through all the senses. The blind and sighted meet in a site and program where they both feel at ease. What does this program look like? The blind teach the blind how to see without vision. The sighted could gain a stronger awareness of the senses and how to perceive our world without vision. There is a collaboration between both the blind and sighted.

## Chapter 4 : Precedent Analysis

It is important to look at existing structures that were designed for the blind or designed to be multi-sensory experiences so that the design process may be more informed. How have structures for the blind been designed to adapt to the blind community's needs? My hypothesis is that there need not be a major difference between architecture for the blind and architecture for the sighted. It is important to note that multi-sensory design is needed across the board. How do multi-sensory buildings address experience through all the senses and which strategies can I use in design?

I am not designing specifically for the blind; rather, I embrace a process in design aimed to create a multi-sensory experience. As I examine each precedent, I will focus on space, edge, path, transition, threshold, and landmark. These are architecture elements used to guide people in and throughout space. Within those individual categories, I will critically analyze how each one of those acts in the visual, tactile, and acoustic realms.

## Center for the Blind and Visually Impaired

Architect: Taller de Arquitectura – Mauricio Rocha  
Location: Mexico City, Mexico  
Year: 2001

The Center for the Blind and Visually Impaired (CBVI) is located in Mexico City, Mexico in one of the most disadvantaged and highly-populated parts of the city. Iztapalapa is the district with the largest population of visually impaired individuals in Mexico City. The whole center, approximately 91,000 sqft, was designed to enhance spatial perception and use the five senses to supply a strengthened experience. “A water channel runs through the center of the plaza, so that the sound of the water guides users along their way.”<sup>14</sup> Plants are also used in outlying gardens to orient users to different areas or zones of the complex.

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<sup>14</sup> "Center for the Blind and Visually Impaired / Taller de Arquitectura-Mauricio Rocha" 11 Aug 2011. ArchDaily. Accessed 24 Oct 2014. <<http://www.archdaily.com/?p=158301>>

## SPACE\_[main outdoor corridor]

The following diagrams focus on the feeling of space in two areas within the Center for the Blind and Visually Impaired. Figure 4.1 shows the main outdoor corridor in plan as well as an arrow to denote where the view in perspective is. You can see that the outdoor space in general goes from wall to wall face and breeches across a channel of water running from left to right in the diagram. There are no overhangs into the main space, so it has a very open feel. Abstract representation of space appears in Figure 4.1. Since it is a very open space, there is no upward boundary to the acoustics; therefore, the space sounds very open, vast, and unenclosed.

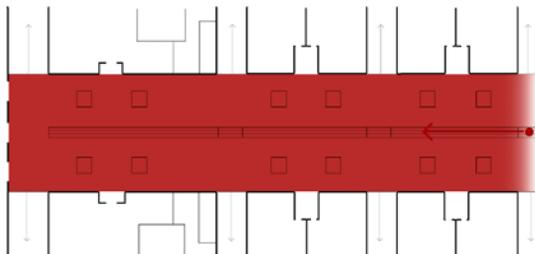


Figure 4.1: Space. By author



Figure 4.2: Visual. By author

## EDGE\_[main outdoor corridor]

Edge is highlighted in the plan and perspectives below (Figure 4.3 and Figure 4.4). While the sighted can see the large hard blocks as an edge-definer, someone who is blind finds the edge with the touch of their cane. Walls have grooves in them, marking a specific type of room by the style of the pattern on the walls (Figure 4.6). This technic could be useful for the design process. The edge is not defined by a distinct change in texture or material; rather, the visitor may hear the sound echoing off the walls (Figure 4.5) as a way to orient themselves in space.

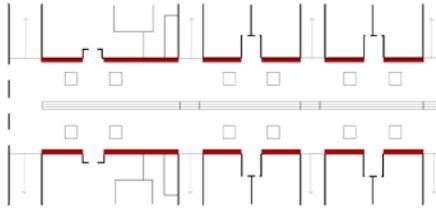


Figure 4.3: Edge. By author



Figure 4.4: Visual. By author



Figure 4.5: Acoustic. By author.



Figure 4.6: Tactile. By author.

## PATH\_[main outdoor corridor]

We once again take a look at the main outdoor corridor, this time focusing more on path. The main path through the space runs along a channel of water, as seen in Figure 4.7 and Figure 4.8. The channel of water orients visitors in the direction of the main gathering space. This channel is highlighted in Figure 4.9. Supporting gathering spaces within buildings lie parallel to the channel and path. Sound of the water directs and orients the visitor, while the path is far enough away from the wall faces to denote a separate space and acoustic quality. A strip of pebbles next to the water (Figure 4.10) acts as a tactile warning so that the blind feel it with their sight cane and do not fall into the channel.

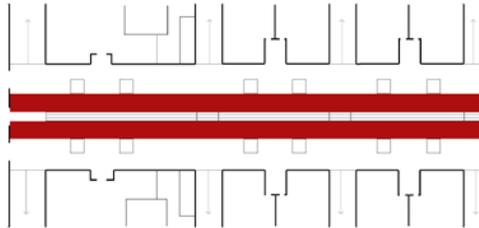


Figure 4.7: Path. By author.



Figure 4.8: Visual. By author.



Figure 4.9: Acoustic. By author.



Figure 4.10: Tactile. By author.

## TRANSITION\_[main outdoor corridor]

Transition in the main outdoor space occurs as you cross the water channel to enter another portion of the complex (Figure 4.11). This transition happens perpendicular to the path shown in the previous section (refer back to Figure 4.8 if needed). These transition zones are represented in the perspectival view in Figure 4.12. As users cross the water, there is a change in material (Figure 4.14). This change in tactility acts to warn the user that the water channel is being crossed and he or she is transitioning from one space to another. The water channel also acts as an acoustic warning (Figure 4.13).

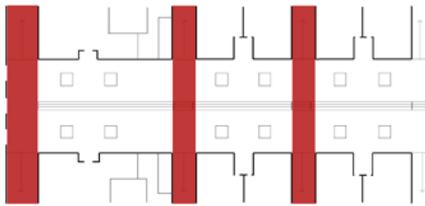


Figure 4.11: Transition. By author.



Figure 4.12: Visual. By author.



Figure 4.13: Acoustic. By author.



Figure 4.14: Tactile. By author.

## THRESHOLD\_[main outdoor corridor]

In the main outdoor space, threshold to enter another space occurs on the cross-axes that run perpendicular to the channel of water seen previously (Figure 4.15). Thresholds highlighted in Figure 4.16 act as a movement from one space to another, as they ramp down to the small outdoor corridors. They create moments of compression before moving into the next space, although there is no vertical compression (Figure 4.16). Openness of the threshold makes them easy to find and easy to have multiple users at the same time.

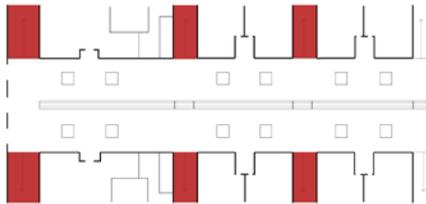


Figure 4.15: Threshold. By author.



Figure 4.16: Visual. By author.

## LANDMARK\_[main outdoor corridor]

Landmark as an architectural element is an important piece in this main outdoor corridor, as it seeks to orient the user (both blind and sighted). Landmark is typically a result of the other elements, and becomes that element which users seek to orient themselves in a space. The acoustic landmark is the sound of the water channel (Figure 4.19), which runs throughout the entire outdoor space. There is a strip of pebbles along the water's edge (Figure 4.20) to warn someone that a drop is coming. Another landmark primarily for the sighted is the large building in the distance. It is different from the rest and therefore a hierarchical landmark (Figure 4.17).

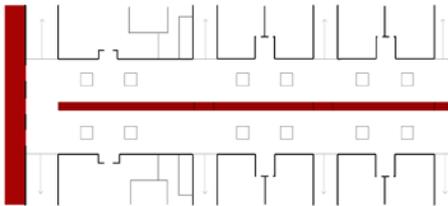


Figure 4.2: Landmark. By author.



Figure 4.1: Visual. By author.



Figure 4.3: Acoustic. By author.



Figure 4.20: Tactile. By author.

## SPACE\_<sub>[small outdoor corridor]</sub>

A small outdoor corridor runs parallel to the main outdoor corridor. The arrow in Figure 4.21 plan shows where the perspective views begin. In Figure 4.22, you see the buildings to the left and right frame the space as well as the floor and floating planes which create an interesting variation and denote different areas within the space. These floating planes frame the space from above and create an interesting acoustic scenario, as seen in Figure 4.23. The sound on the left is open in relation to the large volumes whereas the planes to the right are placed closer to each other and create echo to denote a smaller space. The “large” sound to the left and “small” sound to the right denote the large and small volumes of spaces: large gathering spaces versus smaller classrooms.

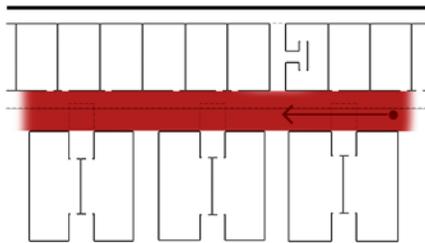


Figure 4.4: Space. By author.



Figure 4.225: Visual. By author.



Figure 4.6: Acoustic. By author.

## EDGE\_[small outdoor corridor]

Edge of the small outdoor corridor is denoted most specifically in the tactile nature of the wall (Figure 4.27). One may walk along the corridor while feeling the wall to get a good sense of the rhythm of the space. Since it is a relatively smaller space compared to the main outdoor corridor, the reflection of sound off the walls will not be as loud, therefore marking edge of space with the rhythm of loud and soft noises (this strategy of rhythm is used similarly in transition).

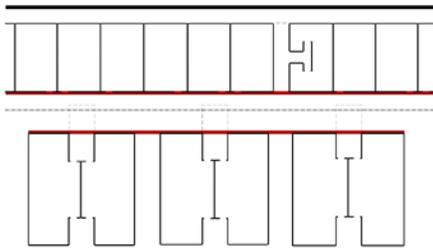


Figure 4.24: Edge. By author.



Figure 4.7: Visual. By author.



Figure 4.8: Acoustic. By author.



Figure 4.27: Tactile. By author.

## PATH\_[small outdoor corridor]

The path of the small outdoor corridor runs along the opening to the smaller rooms, as shown in Figure 4.30. This is not the widest part of the path, but it maintains a relationship with those small rooms and allows access to those spaces. Figure 4.28 highlights the spaces of the small corridor path on the right. The horizontal plane sitting above the path (Figure 4.29) gives the space a smaller feel, allowing an acoustic quality to reinforce the idea that the spaces in direct relation to this path are small classrooms. A change in tactile quality differentiates the path from the rest of the space. The path on the right is raised one step above the remaining portion of the space, supplying a tactile warning that one is moving on or off the path (shown in Figure 4.31).

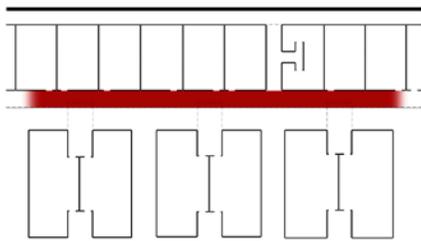


Figure 4.9: Path. By author.



Figure 4.10: Visual. By author.



Figure 4.11: Acoustic. By author.



Figure 4.12: Tactile. By author.

## TRANSITION\_[small outdoor corridor]

The small outdoor corridor transition occurs between the path and the three opposing square rooms below the transition zone shown in Figure 4.32 and Figure 4.33. In this series, we will look at the transition from path to rooms. The alternation of horizontal planes versus empty space above causes dramatic shadows as well as a play with acoustics, seen in Figure 4.34. Tactile transition is evident and obvious for those with a sight cane, as it is a change in the size of the tiles (Figure 4.35). A sight cane user would feel the tile change and note that there is something of importance in line with the materiality change. The change is not as obvious for those who observe the space visually. Multi-sensory experience could be enhanced by changing the color as well as texture, not only the size of the tiles.

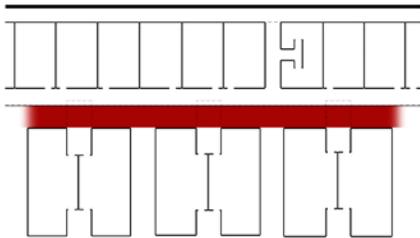


Figure 4.32: Transition. By author.



Figure 4.13: Visual. By author.



Figure 4.34: Acoustic. By author.



Figure 4.35: Tactile. By author.

## THRESHOLD\_[small outdoor corridor]

Thresholds from the main outdoor space lead to the small outdoor corridor. The latter transition zone (Figure 4.33) moves us from the path into the threshold. This threshold is the space between the outdoor zone and the indoor gathering rooms (Figure 4.36). A perspective view of the visual threshold zone is shown in Figure 4.37. A horizontal plane above each threshold stands as an acoustic marker for users who enter the rooms (Figure 4.39). The subtle change in tile size as one approaches the threshold to enter the gathering space could be emphasized more strongly (Figure 4.38).

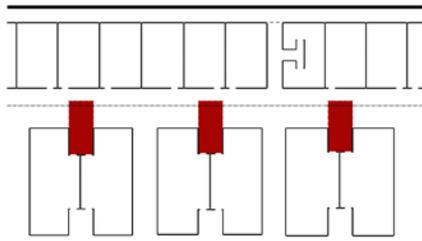


Figure 4.36: Threshold. By author.



Figure 4.37: Visual. By author.



Figure 4.38: Acoustic. By author.



Figure 4.39: Tactile. By author.

## LANDMARK\_[small outdoor corridor]

When walking through the small outdoor corridor, the strongest orienting landmark is the rhythm of noises coming from each of the openings highlighted in Figure 4.40. The rhythm not only comes across visually (Figure 4.41), but also shown acoustically in Figure 4.42.

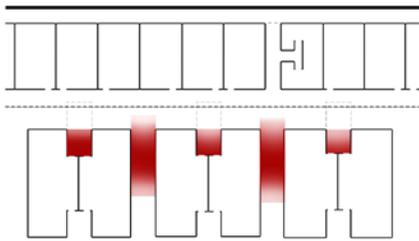


Figure 4.40: Landmark. By author.



Figure 4.41: Visual. By author.



Figure 4.42: Acoustic. By author.

## Hazelwood School

Architect: Alan Dunlop Architect Limited  
Location: Glasgow, Scotland  
Year: 2007

Hazelwood School, situated in the suburbs to the south of Glasgow, was designed through an architectural competition as an educational facility for young people, ages 2-18, who are blind and deaf. These dual sensory-impaired children experience their education in a rather new type of project – one specifically designed to enhance the experience of those who experience physical handicap and some form of cognitive impairment. The architect Alan Dunlop says, “I was determined to create a school which would support the needs of the children and the aspirations of their parents, a place of safety and ambition that would free the teacher and inspire the child.<sup>15</sup>” The building has received multiple national and international awards. Hazelwood’s educational staff aims to create and foster independence, aided by the architectural elements found in the building. The school’s head teacher says, “Adults who are blind and have learning difficulties can lead passive lives. But the more independence they have, the more choices they will be able to make and the more stimulating their lives will be.<sup>16</sup>” Orientation within the building supports this independence. A sensory wall was developed in the circulation core as a navigational tool to allow the children to move around the

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<sup>15</sup> “Hazelwood School.” *Architizer*. Web. 03 Sept 2014.

<http://architizer.com/projects/hazelwood-school/>

<sup>16</sup> “Hazelwood School for the Multiple Sensory Impaired: DesignShare Projects.” *Hazelwood School for the Multiple Sensory Impaired*. Web. 03 Sept. 2014.

<http://www.designshare.com/index.php/projects/hazelwood-school-for-the-multiple-sensory-impaired/>

school safely. Students follow this “folded cork plane” that lines one side of the internal street to guide themselves independently between rooms. Within the wall of this “internal street” lie storage units, making use of poche that otherwise would have been left untouched. In early schemes, “classrooms, music rooms, and clinician rooms were like stepping-stones along a linear route,” Dunlop says of the internal street. “Now there is still a clear route with well-defined elements along it, but it’s much more sensual.<sup>17</sup>” Glazing along this internal street consists of louvre-protected windows and clerestory windows. Classrooms primarily contain clerestory windows, as expansive full-height windows may distract students who have partial sight or low vision. The architect was asked to not make everything too safe. Head teacher Monica McGeever says, “There are corners in this building, there are challenges. The world is not built like a school environment.<sup>17</sup>” The following analysis looks at this “internal street” of circulation as well as a point of entry through which students access the internal street. The internal circulation seemed to foster independent movement, but how did students approach the building from the exterior? There must be a point at which the building became less of a crutch and more of a learning opportunity to take into the outside world. My discovery was that this point of entry was the hinge point between the unpredictable outside world and the controlled environment inside the walls of the school.

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<sup>17</sup> Sokol, David. “Hazelwood School.” *Architectural Record*. Web. 03 Sept. 2014.  
[http://archrecord.construction.com/schools/08\\_hazelwood.asp](http://archrecord.construction.com/schools/08_hazelwood.asp)

## SPACE\_[internal street]

The “internal street” acts as a spine to unite the classrooms and exterior spaces. From this space, students may access classrooms in one direction and outdoor spaces in the other. In the plan of Figure 4.43, you may notice a hint at the curvilinear features of this internal street. The space is visualized in Figure 4.44, where one may note the glazing acts to highlight the cork wall on the opposite side. The amount of light is evenly spread and not overwhelming to those with low vision. Figure 4.45 shows how acoustics may act in this space – an echo off the hard floor material dissipates up into the high ceiling. Some sound is also absorbed into the cork wall. This space will be louder than the classroom spaces to denote it is more heavily-occupied.



Figure 4.43: Space. By author.



Figure 4.44: Visual. By author.



Figure 4.45: Acoustic. By author.

## EDGE\_[internal street]

Edge of the internal street is marked strongly by the cork wall (highlighted in Figure 4.46) and reinforced by a strip along the floor shown in Figure 4.49.

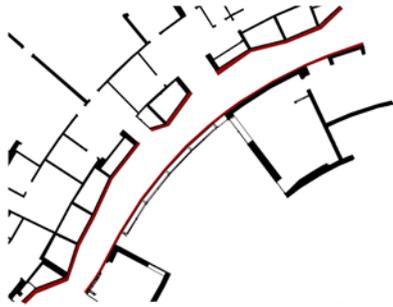


Figure 4.46: Edge. By author.



Figure 4.47: Visual. By author.



Figure 4.48: Acoustic. By author.



Figure 4.49: Tactile. By author.

## PATH\_[internal street]

Looking once again at the internal street, we note that the space itself is the path (as seen in Figure 4.50). There is no specific path within the space, although students may naturally drift more towards the sensory wall to guide them through the space. Silhouettes portrayed in Figure 4.51 allude to the movement of students on the path. Figure 4.52 highlights the cork portion of the sensory wall – a material that absorbs sound. This helps to dull sound on one side of the path, making an acoustic pull towards the more quiet area. The tactile hand rail, as well as a vent along the opposite side of the path, are highlighted in Figure 4.53. These tactile features denote the edge of path.



Figure 4.50: Path. By author.



Figure 4.51: Visual. By author.



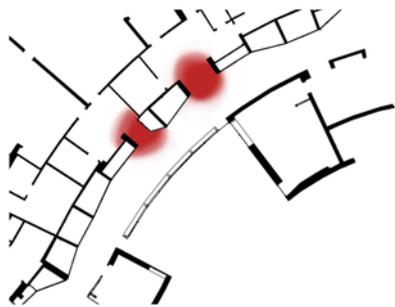
Figure 4.52: Acoustic. By author.



Figure 4.53: Tactile. By author.

## TRANSITION\_[internal street]

Transition from the internal street to classrooms is highlighted in the plan of Figure 4.54 and shown in visual perspective in Figure 4.55. These transition spots happen at varying intervals throughout the internal street. The curvilinear nature of the internal street is truly reflected in the pure curve along the glazed wall. On the opposite wall which contains the sensory cork wall, the students do not move in a completely curvilinear path; rather, they feel the sudden change when there is an approaching transition between the internal street and another space. Students are able to move gracefully along the sensory wall and feel openings along the tactile hand rail, as shown in red in Figure 4.56.



**Figure 4.54: Transition. By author.**



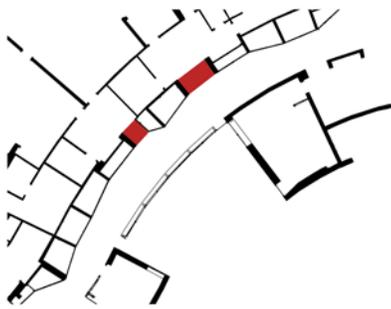
**Figure 4.55: Visual. By author.**



**Figure 4.56: Tactile. By author.**

**THRESHOLD\_[internal street]**

Students experience a threshold as they transition from space and path of the internal street into the vestibules of the classrooms (shown in plan in Figure 4.57). This is primarily experienced as a visual emphasis, as portrayed visually in Figure 4.58. How does one know when they leave one space and enter the next if they are not able to see? There is not a marker of acoustic or tactile change, besides that the hand rail disappears upon entering the classrooms. Threshold in this case was found to be solely emphasizing visual experience.



**Figure 4.57: Threshold. By author.**



**Figure 4.58: Visual. By author.**

**LANDMARK\_[internal street]**

The cork wall running along one side of the internal street (Figure 4.59 and Figure 4.60) acts as the landmark and orienting device for all the senses. This is one of the more successful ways at orienting people within a path. The grooves on the cork wall let the user know (if they are running their hand along the wall) that they are approaching a specific room based on the amount of grooves. The wall also absorbs the sound of children moving in the hallway between classes.

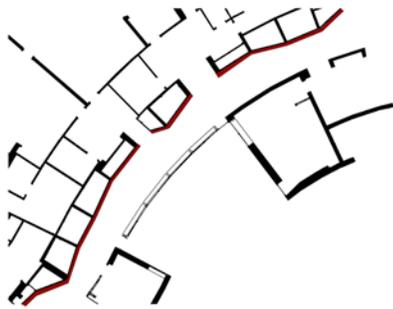


Figure 4.59: Visual. By author.



Figure 4.60: By author.

SPACE\_[point of entry]

As you approach one of the entrances of Hazelwood School, you note that the space is mostly defined by the ground surface highlighted in Figure 4.61. Walls to the left and right of this view, shown as an arrow in the plan of Figure 4.61, imply an enclosed nature of the space although it does not have an upper bound. This lack of boundary and enclosing feature on the top of the space makes the acoustics dissipate into the air above and around, as shown in Figure 4.63. Acoustics have no container. Acoustic change happens upon transition into the interior space, as we will discuss shortly. The space is defined by a tactile ground surface – wood covered in a metal mesh. The directionality of this material is noted in Figure 4.64. This changes upon entry into the school itself.

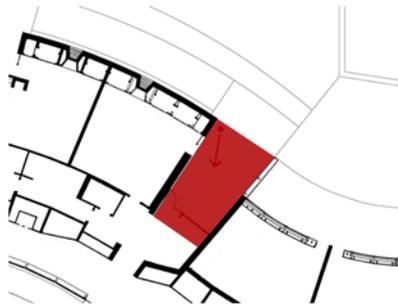


Figure 4.61: Space. By author.



Figure 4.62: Visual. By author.



Figure 4.63: Acoustic. By author.



Figure 4.64: Tactile. By author.

EDGE\_[point of entry]

Edge of the point of entry is defined well in the visual and acoustic sense, but not specifically in the tactile sense. There is no change in material, besides the user bumping into the wall to know the edge is there (Figure 4.68). Acoustically, the edge as you get closer to the point of entry is more defined and a smaller area (Figure 4.67). Out in the open space, the sound dissipates.



Figure 4.65: Edge. By author.



Figure 4.66: Visual. By author.



Figure 4.67: Acoustic. By author.

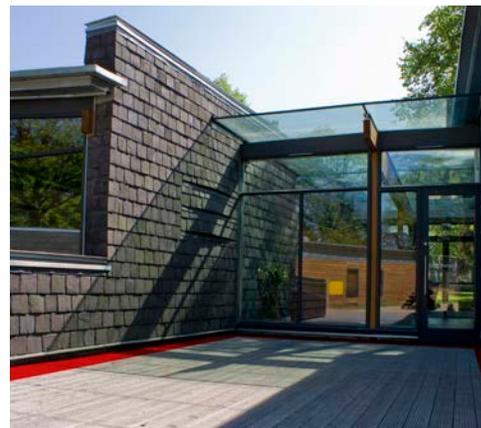
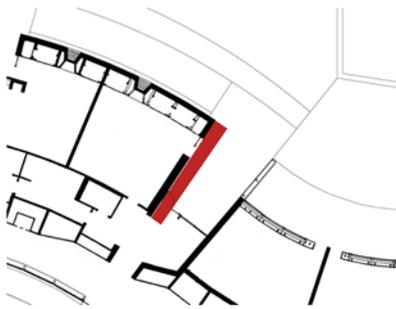


Figure 4.68: Tactile. By author.

PATH\_[point of entry]

There is no prescribed path to meander through the space of this point of entry, but there is a direct path to the door into Hazelwood School from the point at which this perspective is taken in Figure 4.69. One rounds the corner, and typically follows along the wall to the right to approach the entry. There is no material or acoustic change along this path, so it is primarily visual as seen in Figure 4.70.



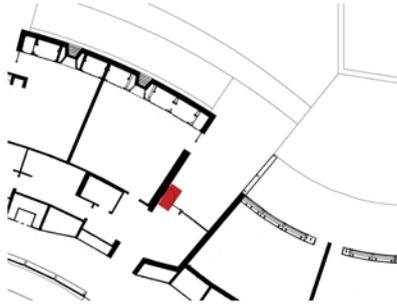
**Figure 4.69: Path. By author.**



**Figure 4.70: Visual. By author.**

TRANSITION\_[point of entry]

The transition between the exterior and interior is marked in the plan shown in Figure 4.71. As one approaches the transition between indoor and outdoor, there is a glass overhang above the door as seen in Figure 4.72. This overhang is a visual marker of change as well as an acoustic barrier. When one stands under the glass overhang, the sound is captured by the highlighted overhang in Figure 4.73. The sound quality is different and more enclosed than if that person were to stand out in the open space.



**Figure 4.71: Transition. By author.**



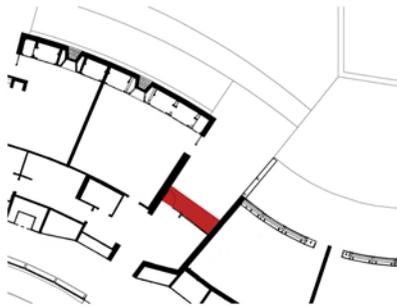
**Figure 4.72: Visual. By author.**



**Figure 4.73: Acoustic. By author.**

**THRESHOLD\_[point of entry]**

At the point of entry, there is a threshold to mark that the visitor is making the change from exterior to interior space. This threshold is shown in a plan view in Figure 4.75 as well as in perspective in Figure 4.74. There is an acoustic change in the space before the threshold, as one enters below the horizontal glass which hangs over the threshold. The sound is more concentrated. This glass element that makes the acoustic scenario change is highlighted in Figure 4.76.



**Figure 4.74: Threshold. By author.**



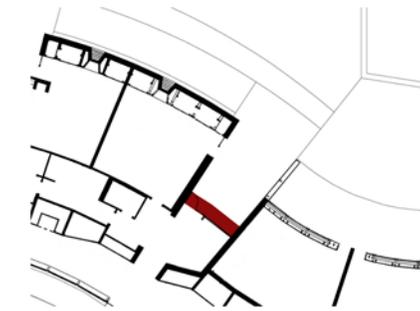
**Figure 4.75: Visual. By author.**



**Figure 4.76: Acoustic. By author.**

LANDMARK\_[point of entry]

At the point of entry, visually one may see the door as a landmark (Figure 4.77). The most significant landmark that the user may remember is the texture of the floor material. It is directional (leading the user in the direction of the entry point), but also is a metal mesh placed over wooden planks (Figure 4.80). It is very unique and the user may use this difference in material as a way to remember which space this is.



**Figure 4.76: Landmark. By author.**



**Figure 4.77: Visual. By author.**



**Figure 4.78: Acoustic. By author.**



**Figure 4.79: Tactile. By author.**

## Maryland School for the Blind

Architect: Ayers Saint Gross  
Location: Baltimore, MD  
Year: 2014

Maryland School for the Blind is a 96-acre educational campus for blind students located in the suburbs of Baltimore, MD. Educational programs for children ages 5 to 21 are provided in a growing and thriving campus, consisting of approximately 200 students and 400 staff members. Staff are available to aid students 24/7 in dormitory-style living quarters. Students who choose to stay on campus reside in the dorms from Sunday to Friday. This information was gathered from a site visit to Maryland School for the Blind. Russell Tutt (included in the Sighted Collaborators section of Chapter 2) was the tour guide and provided this information.

There are two new buildings being constructed on the Maryland School for the Blind campus, both of which I had the opportunity of entering amidst the near-completed construction. These two new buildings were designed by the Baltimore-based architecture firm Ayers Saint Gross, whereas the old buildings were designed in the 1970s. One of the oldest buildings, Newcomer Hall, was built in 1910. This precedent study will focus on a hallway within the academic building designed by Ayers Saint Gross.

## SPACE\_[hallway]

The hallway in the newly-constructed academic building on the campus of Maryland School for the Blind is color coded to allow students with low vision to associate place with color. The perspective shown in the images below is from the view denoted with an arrow in the plan of Figure 4.82. Also in that figure, the space is highlighted in red. The space is easily visualized in Figure 4.81, as a long straight space with alcoves where the classroom doors lie. Within the hallway, acoustics are controlled and contained by the size of the space as shown in Figure 4.83. In the next section, we will look more specifically at acoustics along the path within the space.

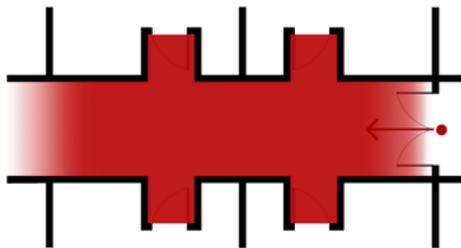


Figure 4.80: Space. By author.



Figure 4.81: Visual. By author.



Figure 4.82: Acoustic. By author.

## EDGE\_[hallway]

Within the hallway, edge is well-defined visually using a strong contrast tile in comparison to that of the path itself (Figure 4.84). Acoustically, there are bulletin boards along the sides of the hall that work to absorb the chatter of students during class change. Visually, I believe the contrast works but there should be breaks where entrances to classrooms lie. Otherwise, someone with low vision may feel as though there is one continuous hallway with no break.

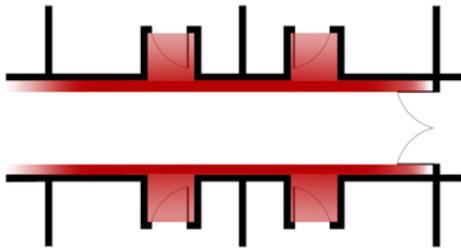


Figure 4.83: Edge. By author.



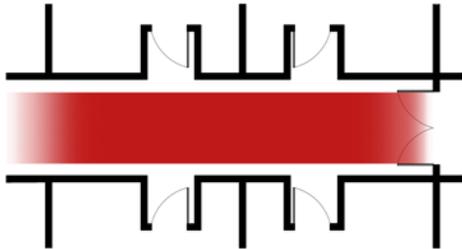
Figure 4.84: Visual. By author.



Figure 4.85: Acoustic. By author.

## PATH\_[hallway]

The path within the hallway lies about a foot away from the wall, as portrayed in Figure 4.87. The design intent was to call out the edge of a space with a stark contrast and color change. You can see the darker tiles lining the edge of the hallway in Figure 4.88. They put emphasis on the path running down the middle of the hallway. Acoustic ceiling tiles line the ceiling above the path, as shown in Figure 4.89. Also portrayed in Figure 4.89 are sound-absorbing bulletin boards outside the classrooms. These can be used to pin up announcements as well as to help absorb the loud shuffle during classroom changes.



**Figure 4.86: Path.** By author.



**Figure 4.87: Visual.** By author.



**Figure 4.88: Acoustic.** By author.

## TRANSITION\_[hallway]

Transition from the path of the hallway into classroom occurs at the portions highlighted red in both Figure 4.91 and Figure 4.90. Once again, we note the contrast in color of tile for those that line the path and those that sit at the edge of the space. A critique of this system is that the dark tiles marking the edge of space do not break where there is a transition into a classroom. The transition into a classroom, for those with low vision, may be a slight optical illusion since they may assume the transition occurs at a break in the darker tile. There is a lack of acoustic and tactile definition at these specific points solely due to the architectural elements. A hand rail was added to the hallway that assists as a tactile warning, as shown in Figure 4.92.

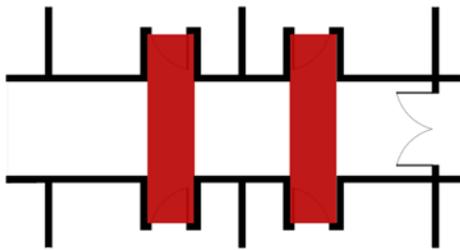


Figure 4.89: Transition. By author.



Figure 4.90: Visual. By author.



Figure 4.91: Tactile. By author.

## THRESHOLD\_[hallway]

The transition space shown in the last set of diagrams lead the students and visitors in the entry vestibules of the classrooms. Each of these throughout the building is color coded and easy to spot for those who have vision. The thresholds are highlighted in red in the plan in Figure 4.93 and perspective of Figure 4.94. There is no tactile marker for the threshold specifically. There is no change in material besides that the floor tiles become the color of the classroom. There is a slight change in acoustics, as one steps into the vestibule. The ceiling above is lower, as shown in Figure 4.94, and the walls are closer together. This relationship of architectural elements creates a confined space in which sound is also more confined. It is a step away from the bustle and noise of the hallway.

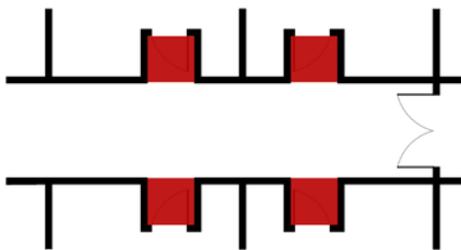


Figure 4.92: Threshold. By author.



Figure 4.93: Visual. By author.



Figure 4.94: Acoustic. By author.

## LANDMARK\_[hallway]

The strongest landmark in the Maryland School for the Blind hallway is the color of the walls sitting outside of each classroom (highlighted in both Figure 4.96 and Figure 4.97). Each color marks a different type of classroom. This method of visual landmark is successful for those who are sighted or with low vision, but of no use to those who are totally blind.

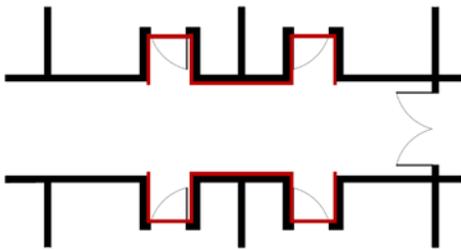


Figure 4.95: Landmark. By author.



Figure 4.96: Visual. By author.

## Chapter 5 : Program

In order to establish a method for determining program, a scorecard was made to grade each idea under specific categories. Main categories that will help establish a strong connection between the blind and sighted are as follows: collaboration, porosity, and social awareness. Collaboration refers to the blind and sighted working together in the same environment. The program must help foster this collaboration and provide a place to do so. Porosity opens the program to the exterior world (both blind and sighted) and allows that it be easily entered and welcoming. Porosity is not only shown in design of building itself, but should be reinforced by the program occurring within the building. Social awareness is a consideration how the internal program will challenge views of the blind community held by the general public. This program should aim to change common views held by the general public about the blind community, and to establish a new view charged with empathy. Besides the latter three categories, I considered the places that each program would need in generalities. These places are as follows: a place for learning, a place for teaching, a place for action, and a place for repose. Does the program have a space to learn? To teach? To take action and be active? To rest and provide repose? All of these places in the building program fall in succession under the three main categories, yet should be considered more specifically as a way to integrate people within the program.

Ideas were first listed and described, waiting until the end for scoring. The purpose of waiting to score each programmatic idea was so that multiple

ideas could be generated without being over encumbered with the labor of scorecard thought process. After listing ideas, scores were assigned under each specific category. Each category had a high, middle, and low score, as seen in Table 5.1. The ideal program, with all high scoring categories, would have a total score of 80 points.

	<b>High</b>	<b>Middle</b>	<b>Low</b>
Collaboration [blind + sighted]	10	6	2
- Youth	5	3	1
- Adults	5	3	1
Porosity [blind + sighted]	10	6	2
- Youth	5	3	1
- Adults	5	3	1
Social Awareness [blind + sighted]	10	6	2
- Youth	5	3	1
- Adults	5	3	1
Place for Learning	5	3	1
Place for Teaching	5	3	1
Place for Action	5	3	1
Place for Repose	5	3	1
<b>Total</b>	<b>80</b>	<b>48</b>	<b>16</b>

**Table 5.1: Program scorecard. By author.**

The following pages document a series of scorecards, leading from lowest-scoring to highest-scoring. Although there is variation among views of certain programs, each program was envisioned and described as a specific instance of stated program. Abstract spatial diagrams are shown for each program to help visualize relationships shown in the scorecard. The highest scoring programs are listed here, while the lower-scoring may be found in Appendix E.

Porosity and social awareness of a “Center of Perception” are strong, as it is a place both the blind and sighted come to learn about perception in an active and engaging environment. Individuals participate in various activities to learn about perception, leaving collaboration with a lower score in Table 5.2 because there is no purposeful integration of blind and sighted. Both blind and sighted occupy the building to have an active learning experience of perception, although the program is more focused on providing a learning experience for the sighted.

<b>CENTER OF PERCEPTION</b>	
Collaboration [blind + sighted]	2
- Youth	1
- Adults	1
Porosity [blind + sighted]	6
- Youth	3
- Adults	3
Social Awareness [blind + sighted]	6
- Youth	3
- Adults	3
Place for Learning	5
Place for Teaching	3
Place for Action	5
Place for Repose	5
<b>Total Score</b>	<b>46</b>

Table 5.2: Center of Perception scorecard. By author.

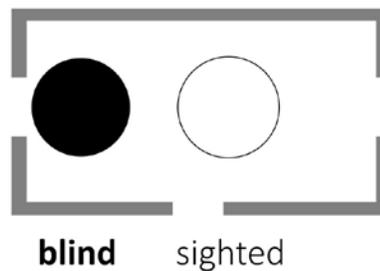
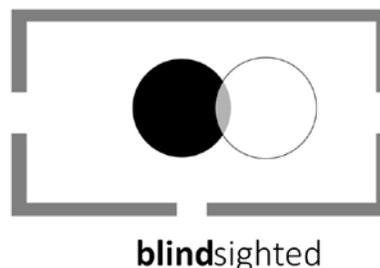


Figure 5.1: Center of Perception diagram. Image by author.

The “Museum of Darkness” is completely dark. The blind community, with a high advantage in the dark, lead the sighted through exhibits in the “touch and feel” style. Exhibits do not necessarily pertain to blindness, as their main emphasis is to begin dialogue between the blind and sighted about how to engage in exhibits without vision. There is a strong effect on social awareness as the sighted are put directly into the shoes of those who are blind. Porosity and collaboration are both moderately high (portrayed in Figure 5.2), although there may be hesitancy for those who are sighted to put themselves in such a vulnerable state.

<b>MUSEUM OF DARKNESS</b>	
Collaboration [blind + sighted]	6
- Youth	3
- Adults	3
Porosity [blind + sighted]	6
- Youth	3
- Adults	3
Social Awareness [blind + sighted]	10
- Youth	5
- Adults	5
Place for Learning	5
Place for Teaching	3
Place for Action	3
Place for Repose	3
<b>Total Score</b>	<b>60</b>

**Table 5.3: Museum of Darkness scorecard. Table by author.**



**Figure 5.2: Museum of Darkness diagram. Image by author.**

Exhibits in the “Museum of Blindness” contain information about perceiving the world without vision. Parts of the museum are dark to allow those who are sighted to have a more acoustic and tactile-focused experience. Table 5.4 shows that the museum is porous and allows for all to enter, although it is rather inwardly focused and does not have any emphasis on collaboration between the blind and sighted. The porosity and closeness of blind and sighted is shown in Figure 5.3, where it can also be noted that collaboration is lacking.

<b>MUSEUM OF BLINDNESS</b>	
Collaboration [blind + sighted]	6
- Youth	3
- Adults	3
Porosity [blind + sighted]	10
- Youth	5
- Adults	5
Social Awareness [blind + sighted]	10
- Youth	5
- Adults	5
Place for Learning	5
Place for Teaching	1
Place for Action	3
Place for Repose	3
<b>Total Score</b>	<b>64</b>

Table 5.4: Museum of Blindness scorecard. Table by author.

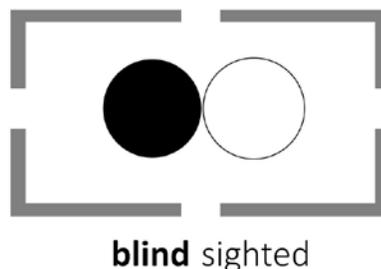
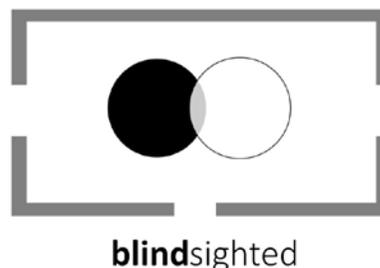


Figure 5.3: Museum of Blindness diagram. Image by author.

A “Center of Collaborative Perception” is a highly porous and collaborative learning environment (portrayed in Figure 5.4). The name does not necessarily describe what happens in the building, but this is a place where the sighted learn how to "see" things differently from the blind through various activities. It engages all who enter in a social collaborative process and provides opportunity to learn, teach, act, and rest (Table 5.5). The activities both blind and sighted participate in work to educate both in opposite views of perception. Educational perception is not an explicit focus, although it is implicitly intertwined in the activity.

<b>CENTER OF COLLABORATIVE PERCEPTION</b>	
Collaboration [blind + sighted]	10
- Youth	5
- Adults	5
Porosity [blind + sighted]	6
- Youth	3
- Adults	3
Social Awareness [blind + sighted]	10
- Youth	5
- Adults	5
Place for Learning	5
Place for Teaching	5
Place for Action	5
Place for Repose	5
<b>Total Score</b>	<b>72</b>

**Table 5.5: Center of Collaborative Perception scorecard. By author.**



**Figure 5.4: Center of Collaborative Perception diagram. Image by author.**

After going through the scoring process, I discovered that the highest-scoring program entitled “Center of Collaborative Perception” was still lacking in the category of porosity. This center lacked a sense of porosity because there was a need for activity or specific program occurring within the building walls. A pull or draw was needed so that the program environment would be more open and porous to the general public. This necessary draw manifested itself in a combination of defined activity within the building as well as location. What would happen within the walls of the building and where would it be located? Location, especially if it were in a very public and walkable area, would allow publicity to influence porosity. It would be approachable because of where it was situated. The discussion of location and site continues in Chapter 6: Site.

The activity occurring within the walls of the building must foster collaboration. If the blind and sighted were to complete activities together and work towards a common goal, they would be learning, teaching, and collaborating. All of the categories of the scorecard would be fulfilled by an activated program. The program becomes a “Creative Co-Lab,” shown in the scorecard in Table 5.6. This is a place where the blind and sighted come together to create collaborative art – various forms of art, including jewelry, pottery, painting, etc.

<b>CREATIVE CO-LAB</b>	
Collaboration [blind + sighted]	10
- Youth	5
- Adults	5
Porosity [blind + sighted]	10
- Youth	5
- Adults	5
Social Awareness [blind + sighted]	10
- Youth	5
- Adults	5
Place for Learning	5
Place for Teaching	5
Place for Action	5
Place for Repose	5
<b>Total Score</b>	<b>80</b>

Table 5.6: Creative Co-Lab scorecard. Table by author.

Spaces in the Creative Co-lab are the following:

- **Studio/Maker Space (4,200 SF):** Consists of a flexible area that can be used for numerous types of artwork. Includes storage for supplies and artwork, as well as individual classrooms for a more quiet work setting.
- **Gallery (5,200 SF):** Flexible gallery space with moveable walls and smooth flooring. Could be used as reception/lobby area. Bathrooms in close proximity (could be shared with studio bathrooms). The gallery must have a curator whose office will be located in the building as well. Sales of artwork could happen in the gallery itself.
- **Venue Space (6,400 SF):** Hosts 350 people for lectures, conferences, receptions, etc. Office for rental must be located within building, as well as close proximity to bathrooms.

- **Library (7,000 SF):** Stacks provide storage for the expansion of the library located in nearby National Federation of the Blind Jernigan Institute. Potential for the sale of objects for the blind (as the library in Jernigan Institute has). Provide conference room and office/reception area for the librarian.
- **Sensory Perception Exhibit (500+ SF):** Flexible square footage allotment for the exhibit. Could be an educational signage or an experience walking through space. The experience would happen in the dark with a blind tour guide. Users learn how to navigate space without the use of vision. Educational journey in discovering more about perception.
- **Restaurant (7,500 SF):** Typical restaurant with access to loading dock and bathrooms. Special experience inside a portion of the restaurant for those who want to eat in a completely dark room.
- Supporting Spaces:
  - Bathrooms
  - Storage
  - Circulation
  - Mechanical

Roughly, the Creative Co-Lab building will be 40,000 square feet including all supporting spaces. The Co-Lab provides places for teaching, learning, collaboration, recreation, action, and repose.

## Chapter 6 : Site

A program that enforces collaboration between the blind and sighted as well as offering a multi-sensory experience of architecture is needed all over the world. The national center of the National Federation of the Blind (NFB) Jernigan Institute is located in Baltimore, MD. This is a place where the blind and sighted work together towards a more integrated society. “The National Federation of the Blind knows that blindness is not the characteristic that defines you or your future. Every day we raise the expectations of blind people, because low expectations create obstacles between blind people and our dreams. You can live the life you want; blindness is not what holds you back.<sup>18</sup>” Founded in 1940, the NFB has grown to over fifty thousand members, making itself the largest organization of blind and low vision people in the United States. Blindness is not seen as a hindrance. People who are blind are encourage to involve themselves in normal activities, often collaborating with the sighted at work in their national center.

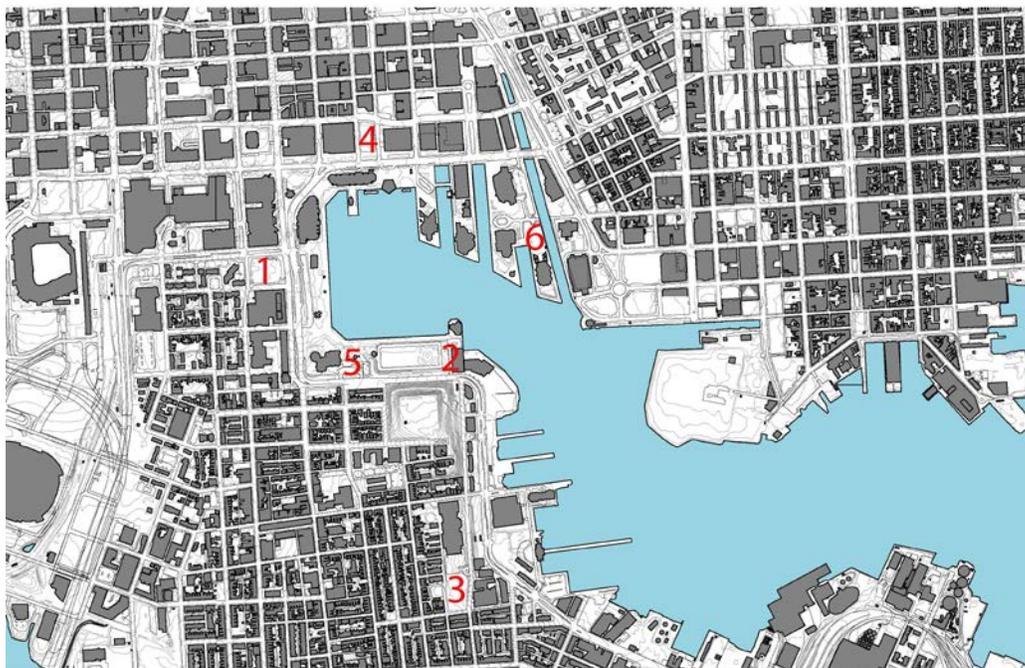
During a site visit to the Jernigan Institute, I was able to see this collaboration first-hand, as young blind elementary students participated in programs aided by both blind and sighted individuals. The NFB in this national location aims to be involved and has started reaching out to the local community. What if Baltimore were to have another center in the downtown area that served as a collaboration space between the blind and sighted? Baltimore’s Inner Harbor is currently thriving, and has potential for the

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<sup>18</sup> “About the National Federation of the Blind.” *National Federation of the Blind*. NFB. <https://nfb.org/about-the-nfb>

addition of more activated buildings to complete urban infill. There is a museum concentration around the Inner Harbor and filling the downtown area. It is well-populated with people and very active. By focusing my attention on the heart of the downtown area, this program has the potential of reaching an optimum number of people. Collaboration, porosity, and social awareness within the program would be easier to obtain with a location that also enforced those three principles. The story could be that someone within the National Federation of the Blind sponsors a building that fosters collaboration between the blind and sighted.

Sites for opportunity within Baltimore, specifically sites near the Inner Harbor were chosen. Sites, six in total, are labeled with a large red number denoting the number of the site in Figure 6.1.



**Figure 6.1: Site Key [Baltimore, MD]. Image by author.**

Each of the sites was examined with an analytical eye – which site was going to provide the best location to establish this program? There were interior influences to the grading of a site as well as exterior. Interior influences were categorized into three main categories: porosity, collaboration, and social awareness. Which sites reinforced the strong and compelling ideas that were established in the conceptual ideas of the program? Subcategories were established to analyze each site with a more careful eye. Within “Porosity” lie 24/7 activation and street wall + edge. Was the site going to be populated with people and was it easily accessed from the street? Did it have a street presence or was it removed from the porous environment of the downtown area? Within the category of “Collaboration” I considered safety, noise levels, and sustainability. These qualifications of the site would work towards having a collaborative environment, both socially and physically. The site needs to collaborate effectively with its neighbors as well as providing a situation in which to place such a collaborative program. Sustainability efforts work to maintain a collaboration, so to speak, with the environment. Lastly, within the category of “Social Awareness” was a take on urban impact. How would the community be effected by the addition of a program within this site? Exterior influences include outside factors that have a strong influence on the addition of a building within the site: tourism, accessibility/transportation, approximate uses, controversy/community response, and urban fill of a void. Would the addition of a built form on this site be well-accepted? What are the neighboring uses and are those an asset

to the program? Table 6.1 shows the scorecard established for the grading of each of the six sites. While the highest score is desired, I found that the program may work to fill some of the requirements of the site. This program should ideally be able to be placed anywhere and allow for a strong collaboration with the blind and sighted. The scoring of the site is to allow the urban infrastructure to inform where the program is needed within the city.

	High	Middle	Low	N/A
<b>INTERIOR INFLUENCES</b>				
<b>Porosity</b>	10	6	3	0
24/7 Activation	5	3	1	0
Street Wall + Edge	5	3	1	0
<b>Collaboration</b>	10	6	3	0
Safety	5	3	1	0
Noise levels	5	3	1	0
Sustainability	5	3	1	0
<b>Social Awareness</b>	10	6	3	0
Urban Impact	5	3	1	0
<b>EXTERIOR INFLUENCES</b>				
Tourism	10	6	3	0
Accessibility/Transportation	10	6	3	0
Approximate Uses	10	6	3	0
Controversy/Community Response	10	6	3	0
Urban Fill of Void	10	6	3	0
<b>TOTAL</b>	110	66	30	0

Table 6.1: Site scorecard. By author.

The three highest scoring sites will be included in the main body of the document. Detailed scorecards for the remaining three sites may be found in Appendix F.

Site 4 is a surface-level parking lot that sits on the north side of the Inner Harbor, highlighted in Figure 6.2. Across the street lie Harborplace and the Gallery as well as the World Trade Center. This site has a score of 100, as seen in Table 6.2.

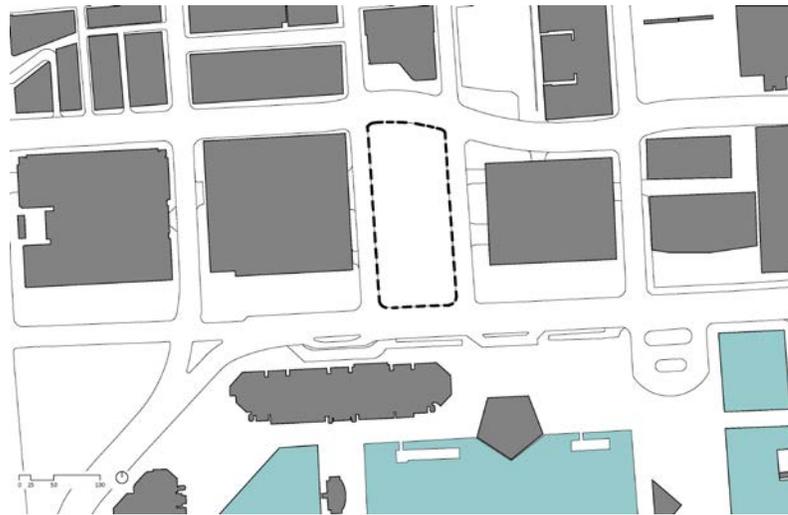


Figure 6.2: Site 4 Extents. Image by author.

	<b>SITE 4</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	10
24/7 Activation	5
Street Wall + Edge	5
<b>Collaboration</b>	3
Safety	5
Noise levels	3
Sustainability	5
<b>Social Awareness</b>	10
Urban Impact	5
<b>EXTERIOR INFLUENCES</b>	
Tourism	6
Accessibility/Transportation	10
Approximate Uses	6
Controversy/Community Response	10
Urban Fill of Void	10
<b>TOTAL</b>	<b>97</b>

Table 6.2: Site 4 scorecard. Image by author.

Its neighboring functions to the east and west are commercial offices and some food and clothing retail, as shown in the land use diagram (Figure 6.3). This site is dominated primarily by commercial buildings and retail. There is a strong food presence and culture, as well as a few institutional buildings. The US Customs Services building lies to the northeast, as well as the World Trade Center to the southeast. The aquarium is also a short walk southeast. The site is close to the active area of downtown and able to be accessed from the Inner Harbor area.

A concern for this location would be noise levels, being so close to food production and the bustle of downtown. There are ways to mitigate sound in design, or to capture it for use. Another thing to consider is how collaboration would be fostered by the site. With who would the collaboration occur and how would the location foster this relationship?



Figure 6.3: Land Use [site 4]. Image by author.

Site 5 consists of a few rear parking lots supporting the Maryland Science Center (Figure 6.4). Rash Field lays to the east and the site has a direct proximate relationship to the Inner Harbor. The site received a score of 102, shown in Table 6.3.



Figure 6.4: Site 5 Extents. Image by author.

	<b>SITE 5</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	6
24/7 Activation	3
Street Wall + Edge	5
<b>Collaboration</b>	10
Safety	5
Noise levels	3
Sustainability	5
<b>Social Awareness</b>	10
Urban Impact	5
<b>EXTERIOR INFLUENCES</b>	
Tourism	10
Accessibility/Transportation	10
Approximate Uses	10
Controversy/Community Response	10
Urban Fill of Void	10
<b>TOTAL</b>	<b>102</b>

Table 6.3: Site 5 Scorecard. By author.

Perhaps collaboration in this location could occur with the Science Museum, directly to the west. For that reason, the site received a high collaboration score. As seen in Table 6.3, the site did not receive full marks in the porosity category. It is rather removed from the center of activity in the downtown area as well as being pushed back from the edge of the Inner Harbor. Figure 6.5 shows the approximate uses surrounding the site, providing a mix of commercial, institutional (or civic), and residential. The site would not be overly noisy, but because of that lack of noise would not have as many passerby as the following two sites.



**Figure 6.5: Land Use [site 5]. Image by author.**

Site 1 is located across the street from the Visitor Center, highlighted by a dashed line in Figure 6.6. Proximity to the Visitor Center would allow for much porosity and activation, as well as being so close to the Inner Harbor. This is one of the higher scoring sites with a score of 104 (Table 6.4)



Figure 6.6: Site 1 extents. Image by author.

	<b>SITE 1</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	10
24/7 Activation	5
Street Wall + Edge	5
<b>Collaboration</b>	6
Safety	5
Noise levels	3
Sustainability	5
<b>Social Awareness</b>	10
Urban Impact	5
<b>EXTERIOR INFLUENCES</b>	
Tourism	10
Accessibility/Transportation	10
Approximate Uses	10
Controversy/Community Response	10
Urban Fill of Void	10
<b>TOTAL</b>	<b>104</b>

Table 6.4: Site 1 scorecard. By author.

As seen in Table 6.4, the exterior influences on this site are very strong. It sits in a prominent location in the downtown Baltimore area. Because of this location, it is a very porous site – people are able to easily walk across the site to get to other places. There are two bus stops on the block which allow for easy access to and from the site. Because of its prominent location, the noise levels may be higher. There are ways to mitigate noise levels, but this is something to consider. There could be a collaboration with neighboring buildings, yet the specificity of that relationship is currently unclear.

It is close to a mix of commercial, residential, and institutional buildings (Figure 6.7). There is a hotel to the immediate south, while more food-related commercial sits to the north of the site. The Baltimore Convention Center is on the block to the northwest.



Figure 6.7: Land Use [site 1]. Image by author.

Site 1 was chosen as the principle site, as it had the highest score amongst the scorecards. Yet, this site was difficult to get to (a busy street as barrier) and was not the most ideal location for collaboration amongst different users. A decision was made to move the site across the street, as shown in Figure 6.8.



**Figure 6.8: Final site selection. Image by author.**

To give a better idea of the site, an illustrative plan of the current condition is shown in Figure 6.9.



**Figure 6.9: Illustrative plan of site. Image by author.**

The site has a direct relationship to the water (Figure 6.13) and is within a quarter-mile radius (5 minute walk) of many popular areas on Baltimore's inner harbor (Figure 6.12). This allows that the site be easily accessed (more so than the previously chosen site across the street). Now that there is no longer a major road to pass, the site will be truly activated! There is also the presence of a few neighboring city parks (Figure 6.10), so part of the site could be used to extend and connect this string of parks along the harbor.



**Figure 6.13: Water.** By author.



**Figure 6.12: Radius.** By author.



**Figure 6.10: Parks.** By author.



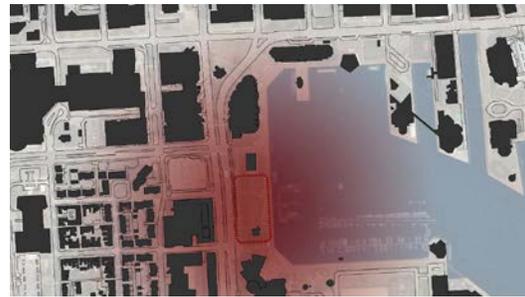
**Figure 6.11: Collaboration.** By author.

There is a potential for some form of collaborative program between neighboring buildings, including the Visitor Center, Science Center, and Harborplace/Gallery (Figure 6.11). This diagram does not include the National Federation of the Blind (NFB), which is a mile to the south. The NFB could be a potential client for a program like this, that seeks to unite the blind and sighted in a very collaborative and active environment.

As a currently very popular location for passersby, this site presents itself as immediately porous (Figure 6.15) and has great potential for the spreading of social awareness (Figure 6.14) of a new collaborative space involving the blind and sighted communities.



**Figure 6.15: Porosity. By author.**



**Figure 6.14: Social. By author.**

Currently, the Spirit Cruises ticketing building sits on the southern portion of the site, hidden by trees. This brick building is approximately 3,000 square feet and the ticketing functions in the future plan to be moved to the finger pier on the harbor, as referenced in “Inner Harbor Plan 2.0<sup>19</sup>,” a document about the master plan for Baltimore’s harbor. As shown in Figure 6.16, the Spirit Cruises building currently lacks monumentality in section and does not address the city nor harbor in its architectural character. We can assume this building’s functionality will be re-apportioned to other places around the harbor and that the site is thus free for use.



**Figure 6.16: Site section through city and harbor. By author.**

<sup>19</sup> <http://waterfrontpartnership.org/inner-harbor-2.0>

## Chapter 7 : Design Principles

After much research into example buildings, discussion with different types of people, and discovery of different sites and programs, design principles were established to help regulate and give reason to each move made in design. Following the elements researched in example projects, the design principles became space, edge, path, transition, and threshold. Landmark is also an important feature in buildings, but oftentimes is linked with feeling and memory so it is much harder to prescribe. One of the more successful landmarks used within buildings is water, described by Pallasmaa as one of the strongest provokers of the senses. "Water is the most potent image of the imagination...water is a complete poetic reality<sup>20</sup>." Water will be shown as a design element in the design process.

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<sup>20</sup> Pallasmaa, Juhani. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons, 2011. Print.

## Space

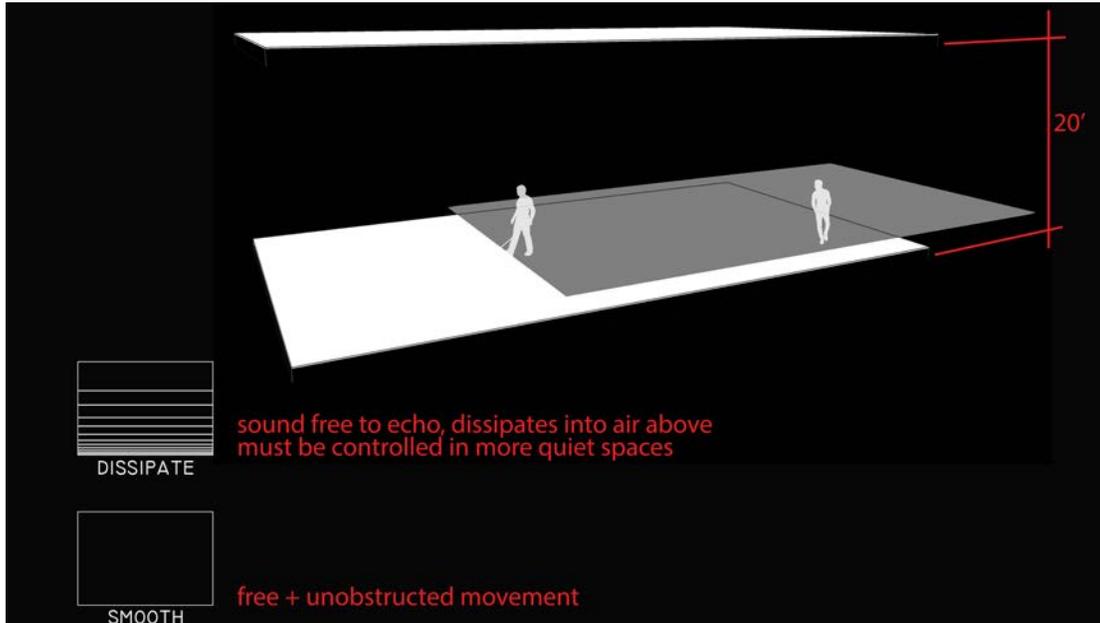


Figure 7.1: Space. Image by author.

## Edge

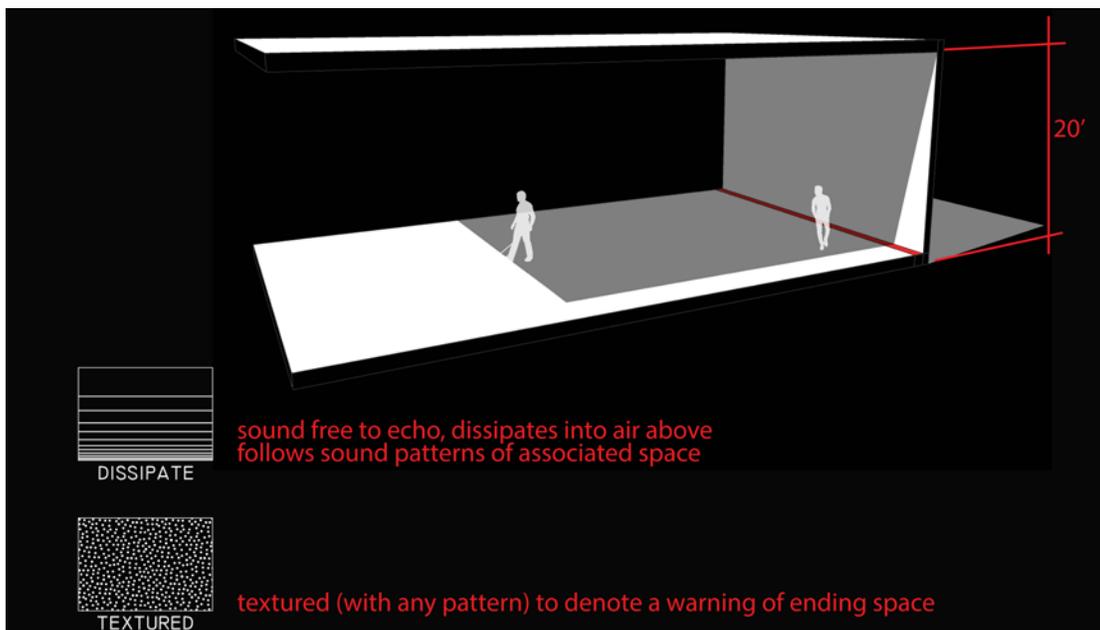


Figure 7.2: Edge. Image by author.

## Path

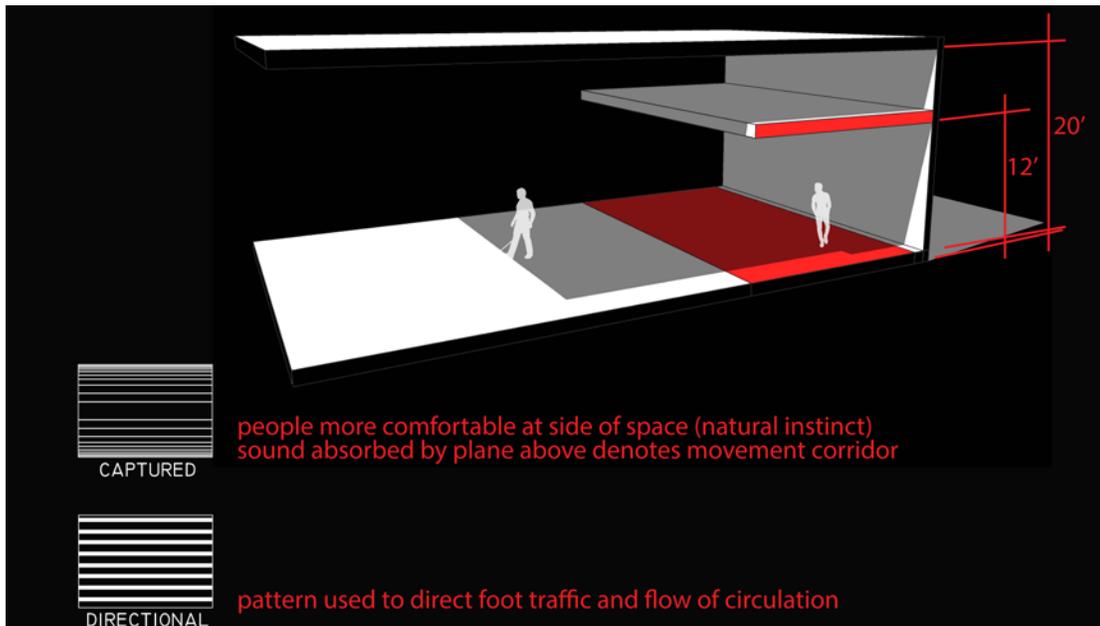


Figure 7.3: Path. Image by author.

## Transition

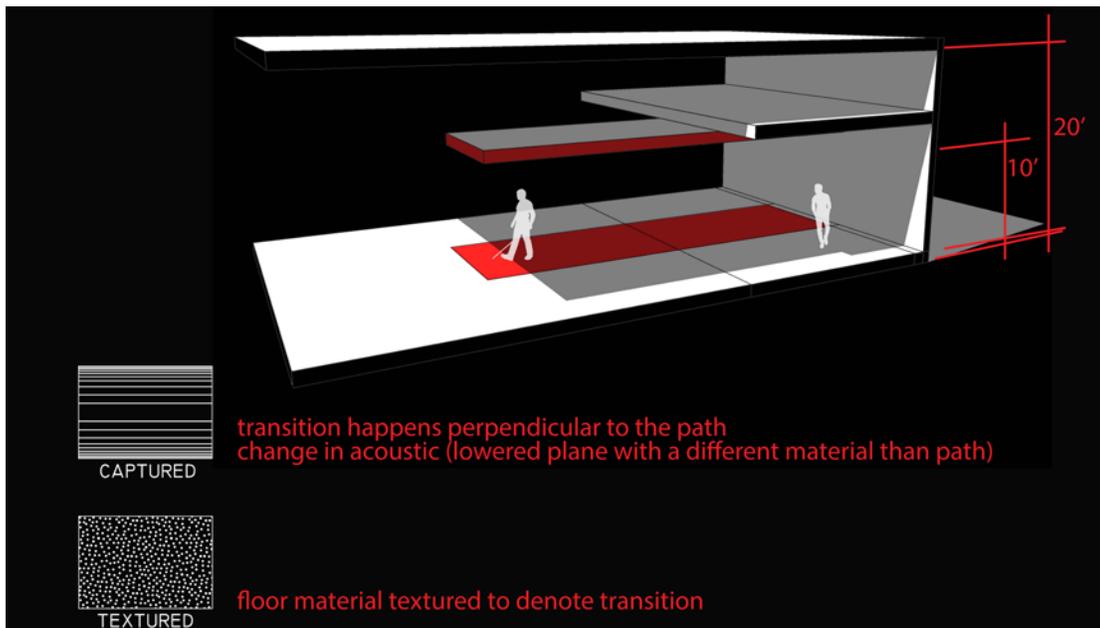


Figure 7.4: Transition. Image by author.

# Threshold

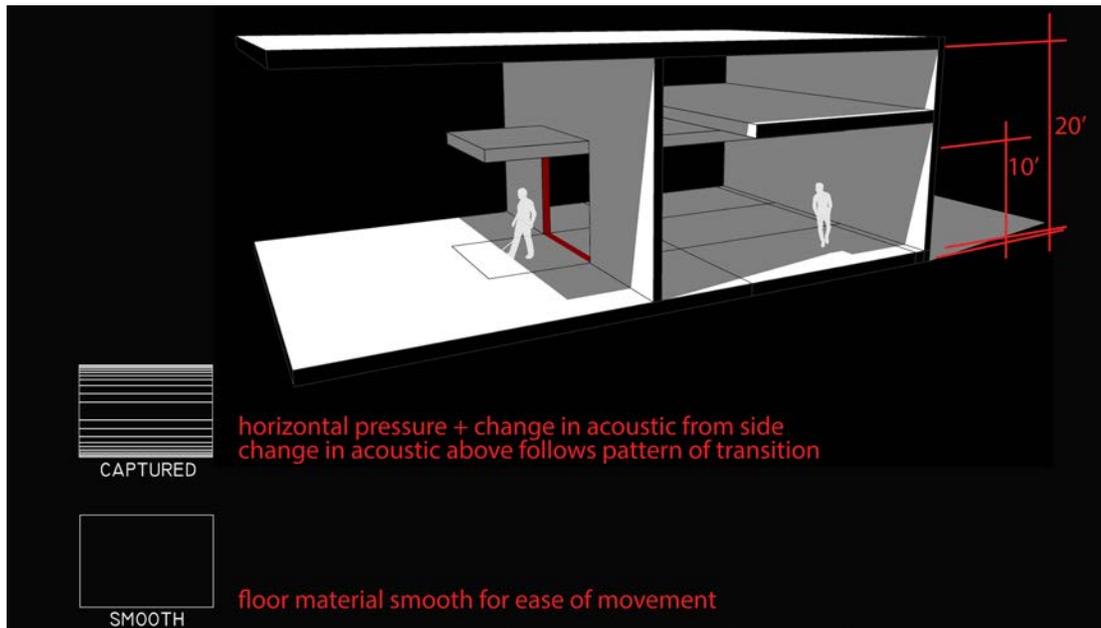


Figure 7.5: Threshold. Image by author.

## Chapter 8 : Design Process

### Initial Massing on Multiple sites [January 2015]

One of the first steps was to test how the building footprint could be placed on the site. Before choosing a site, the design process began with sculpting a potential building massing upon each of the top three sites (described in Chapter 6: Site). This was a quick study to see the impact of development and how it would make a difference in the surrounding building landscape.

Note: This was done before deciding to move the site across the street.

## SITE 1



Figure 8.1: Site 1. By author



Figure 8.2: Site 1 massing. By author.

## SITE 4

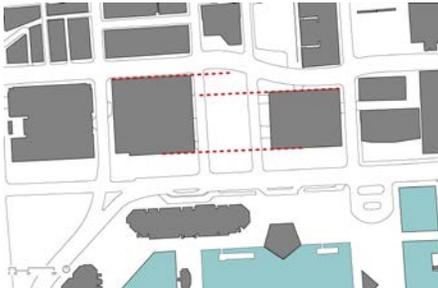


Figure 8.3: Site 4. By author.

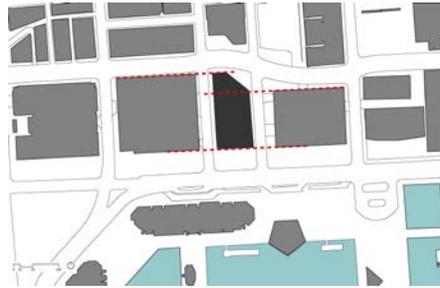


Figure 8.4: Site 4 massing. By author.

## SITE 5

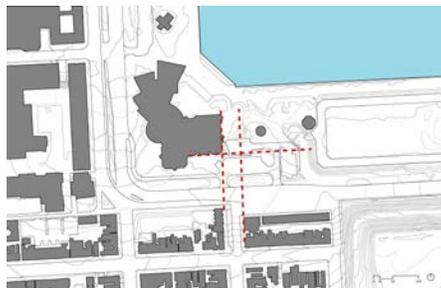


Figure 8.5: Site 5. By author.

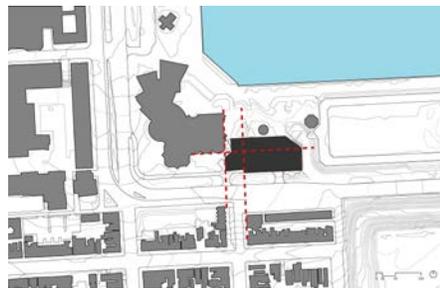
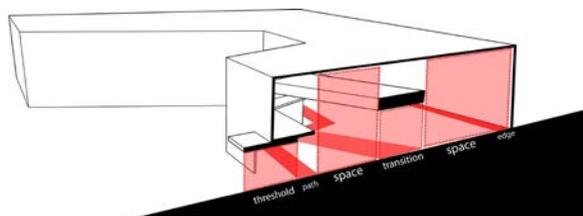
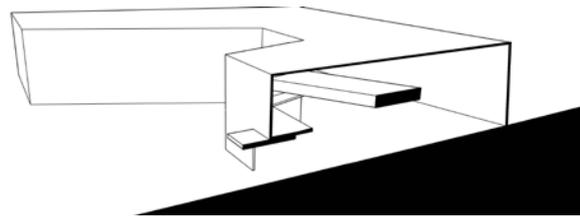
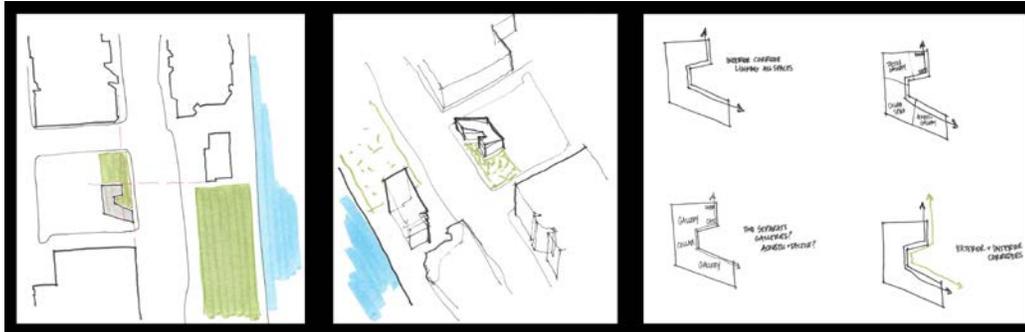


Figure 8.6: Site 5 massing. By author.

## Scheme One [February 2015]:

A decision was made to move forward with Site 1. Two more schemes were proposed for the site (once again, note that this occurred before deciding to move the site across the street).



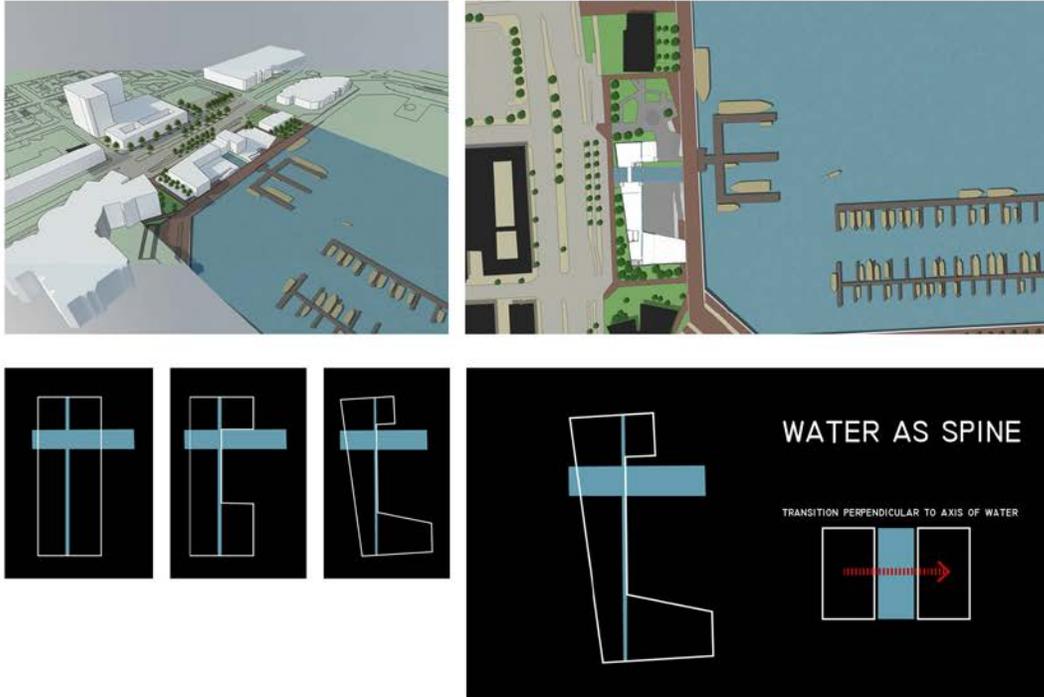
**Figure 8.7: Scheme One [02/2015] drawings. By author.**

This scheme responded to the harbor by opening up its gaze toward the water. It attempted to pick up passersby into the U-shaped element and pull them through the main path within the building. A connection was sought between those circulating within the building and those walking by outside.



At this point, a decision was made to pick a different location for the final site. After playing a video during one of the meetings with my committee, it came to my attention that a much better site location was just across the street (between the Visitor's Center and Science Center). The video was of a sound clip on the original Site 1. The traffic sounds as well as the street acting as an obstacle for porosity made moving the site across the street a much better option.

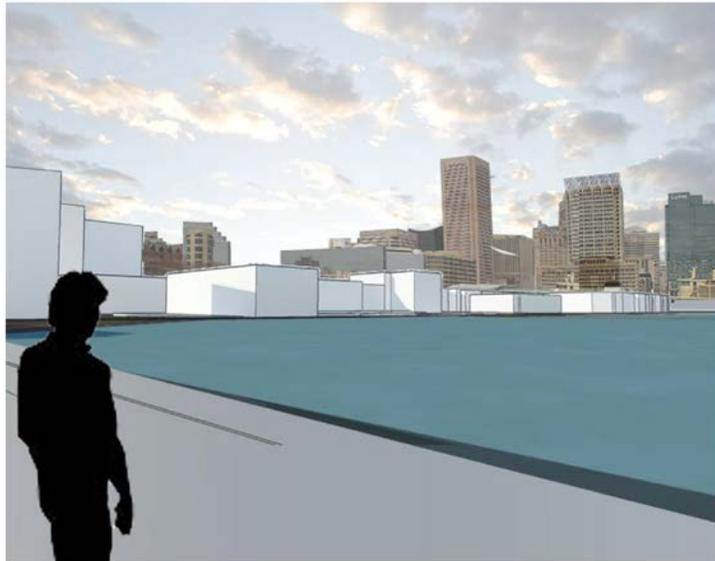
## Scheme One [March 2015]:



**Figure 8.9: Scheme One [03/2015] images. By author.**

Scheme is entitled “Water as Spine.” Water is used as an orienting device for circulation, as transition into different spaces happens across the axis of water. Scheme one was successful in its response to the city and harbor sides of the building. It allowed for ease of access from both the city and harbor. One of the details in moving forward would be to figure out exactly how transition along and across water would occur.

The following perspectives highlight approach from the south and show how the building appears against the backdrop of high-rise Baltimore.



**Figure 8.10: Scheme 1. Perspectives. By author.**

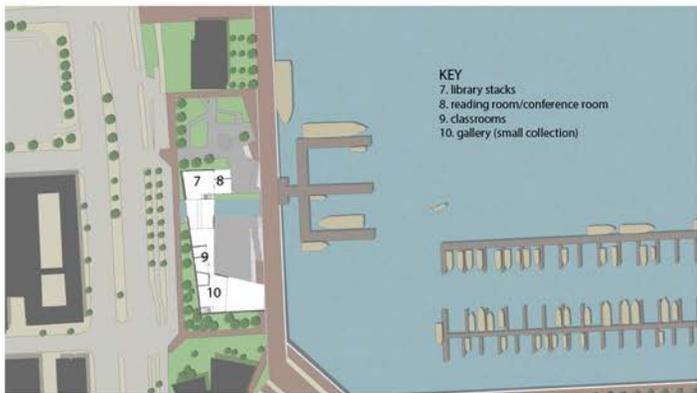
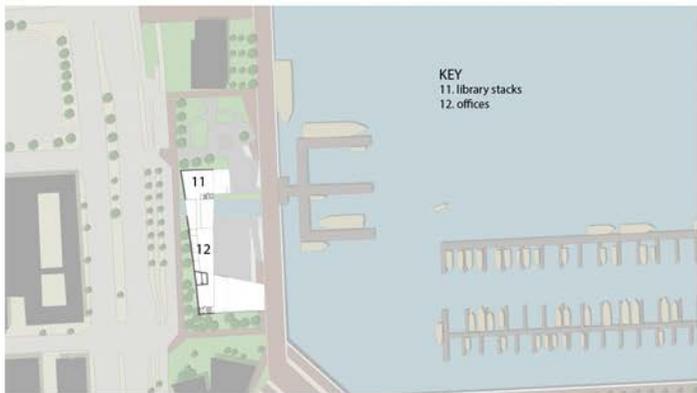
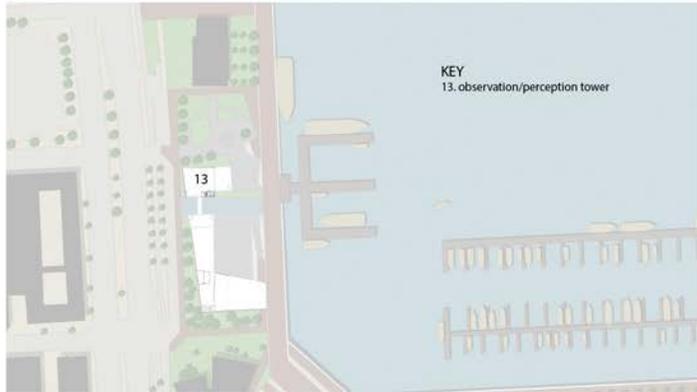
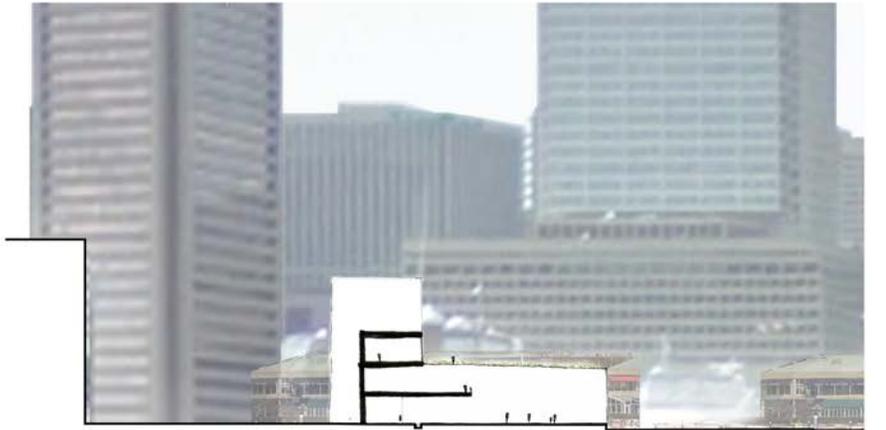


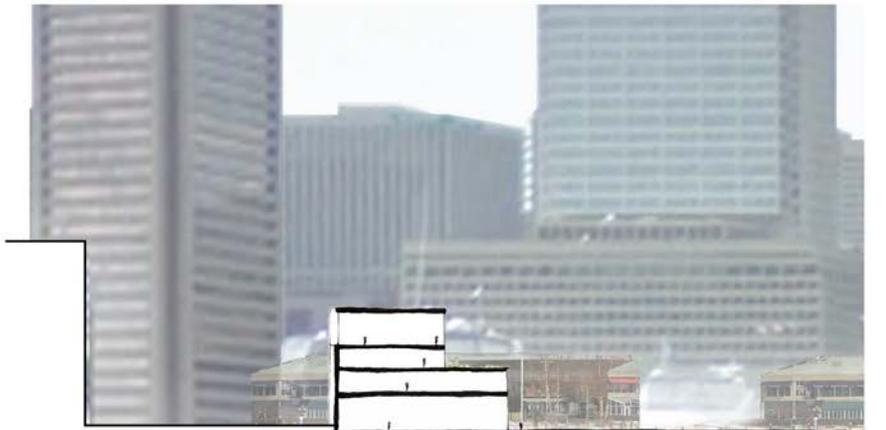
Figure 8.11: Scheme 1. Floor Plans. By author.



SCHEME ONE  
SECTION A-A  
1/32" = 10'



SCHEME ONE  
SECTION B-B  
1/32" = 10'



SCHEME ONE  
SECTION C-C  
1/32" = 10'

Figure 8.12: Scheme 1. Sections. By author

The following diagrams attempted to make connections between the original evaluation of design principles and application in design itself.



Figure 8.13: Scheme 1. Principles. By author.

## Scheme Two [March 2015]:

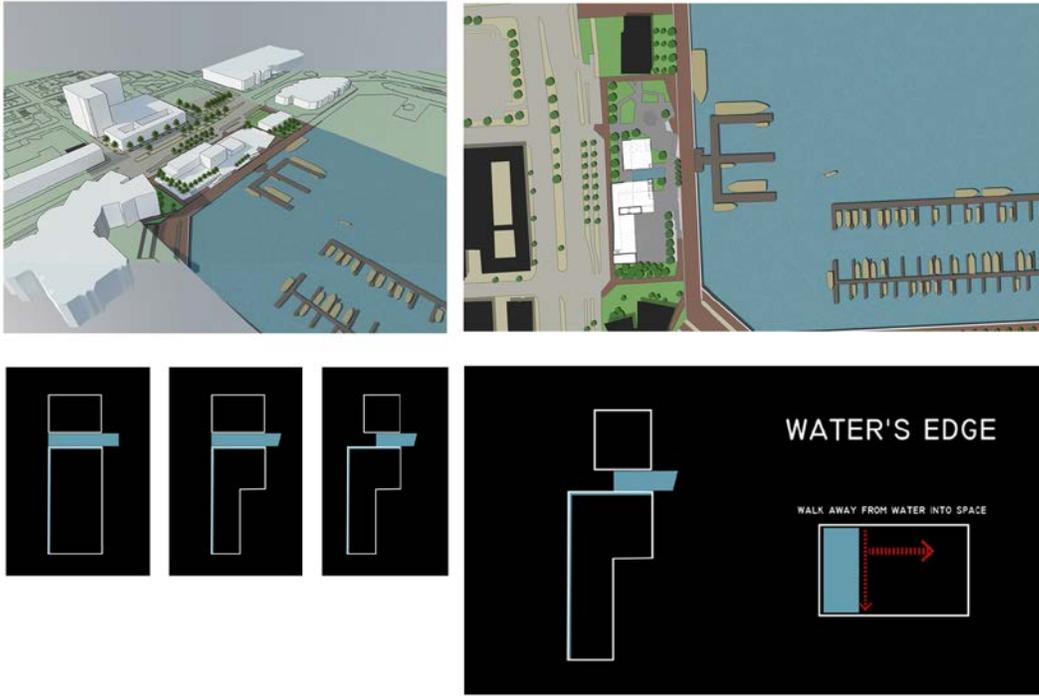


Figure 8.14: Scheme Two [03/2015] images. By author.

Scheme two uses water as an orienting device for edge. Throughout the building circulation, users would walk along water to circulate and then transition perpendicularly in the opposite direction in order to go into opposing spaces.

The following two images are perspectives of the southern approach to “Scheme Two.” All images are by author.



**Figure 8.15: Scheme Two perspectives. By author.**

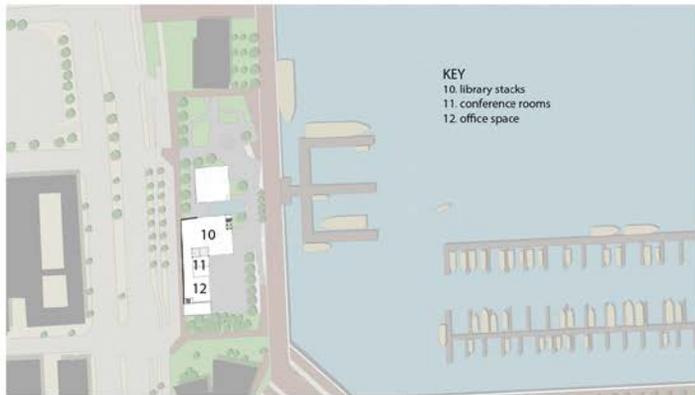
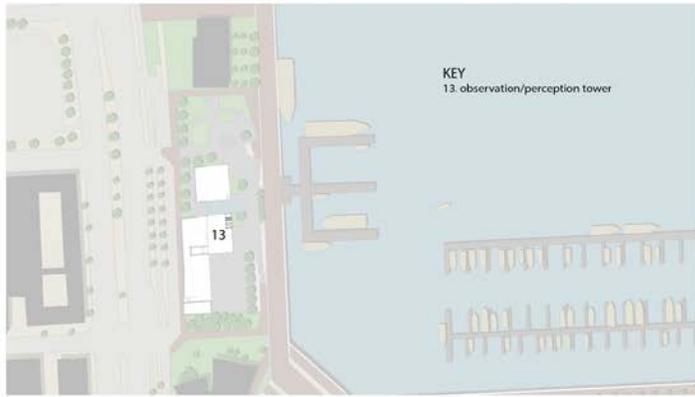


Figure 8.16: Scheme Two plans. By author.



SCHEME TWO  
SECTION 01  
132' x 70'



SCHEME TWO  
SECTION 01  
132' x 70'



SCHEME TWO  
SECTION 01  
132' x 70'

Figure 8.17: Scheme Two sections. By author.

These drawings highlight the transition from one building to the other, trying to make a connection with the design principles. The section callouts focus on the height differences (implication of acoustic changes), but a next step would be to apply materials.

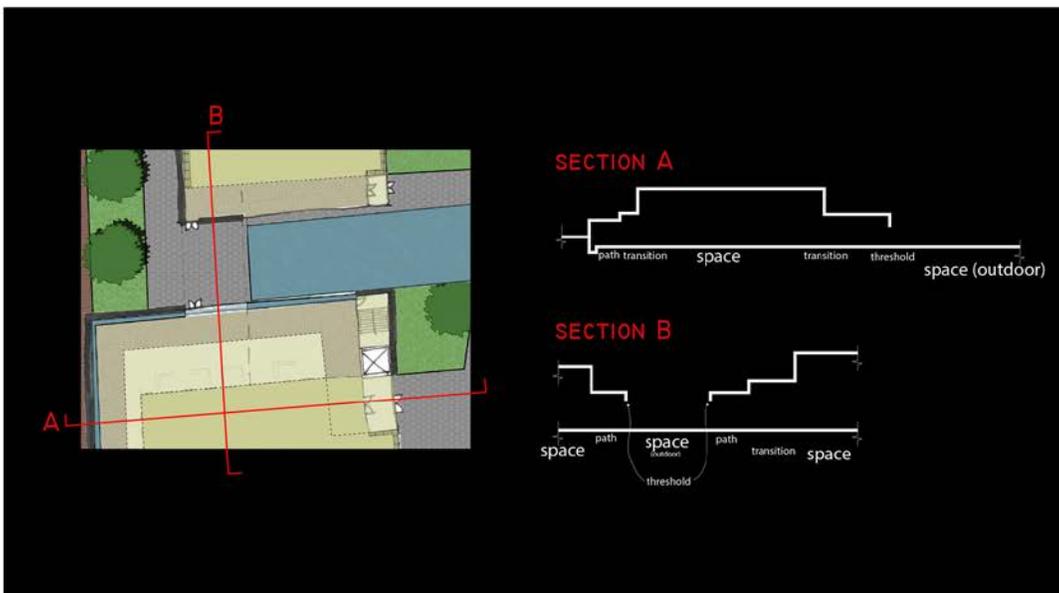


Figure 8.18: Scheme Two applied principles. By author.

## Scheme Three [March 2015]:

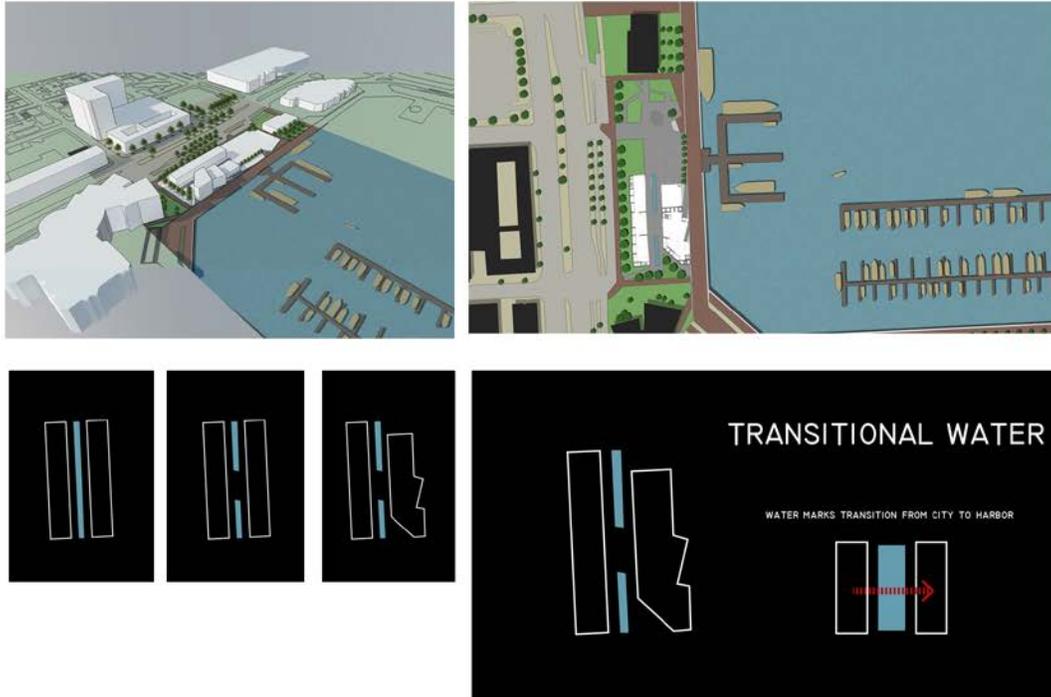


Figure 8.19: Scheme Three [03/2015] Images. By author.

Scheme Three treated water as a transitional strip. There were two buildings (one that represented the city and one that represented the water). To pass from one building to the other, a water feature had to be crossed. The sound of the water acted as a landmark and orienting device – when the user heard the sound of the water, he or she would know where they were in relation.

As you can see in the perspectives, this scheme brought the building face right up to the edge of the harbor path.



Figure 8.20: Scheme Three perspectives. By author.

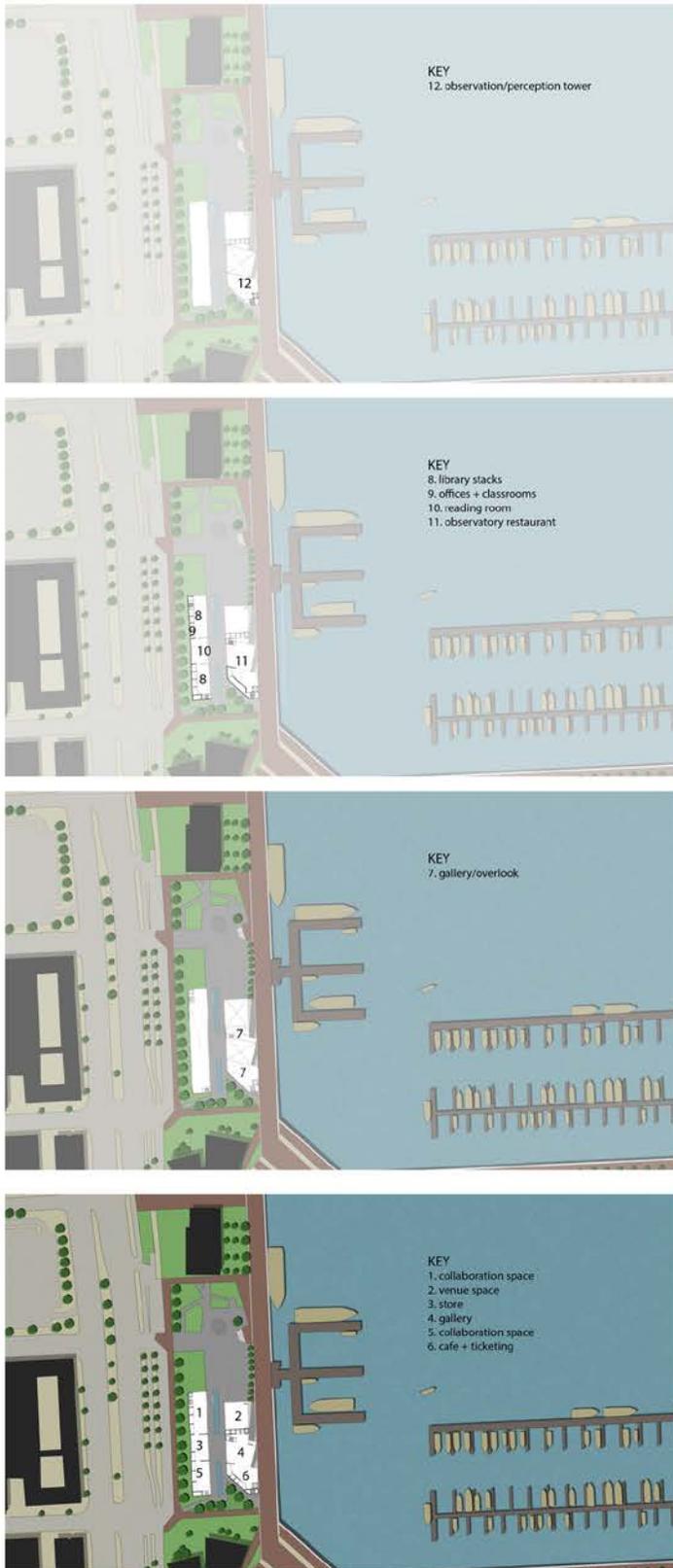
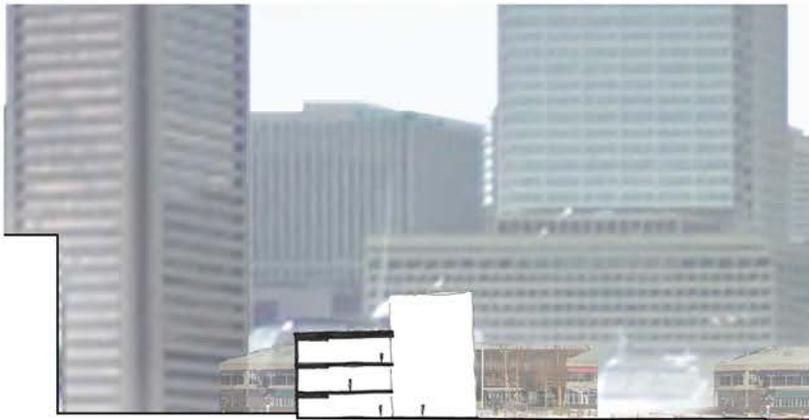


Figure 8.21: Scheme Three plans. By author.



SCHEME TWO  
SECTION A-A  
1/32" = 1'-0"



SCHEME TWO  
SECTION B-B  
1/32" = 1'-0"



SCHEME TWO  
SECTION C-C  
1/32" = 1'-0"

Figure 8.22: Scheme Three sections. By author.

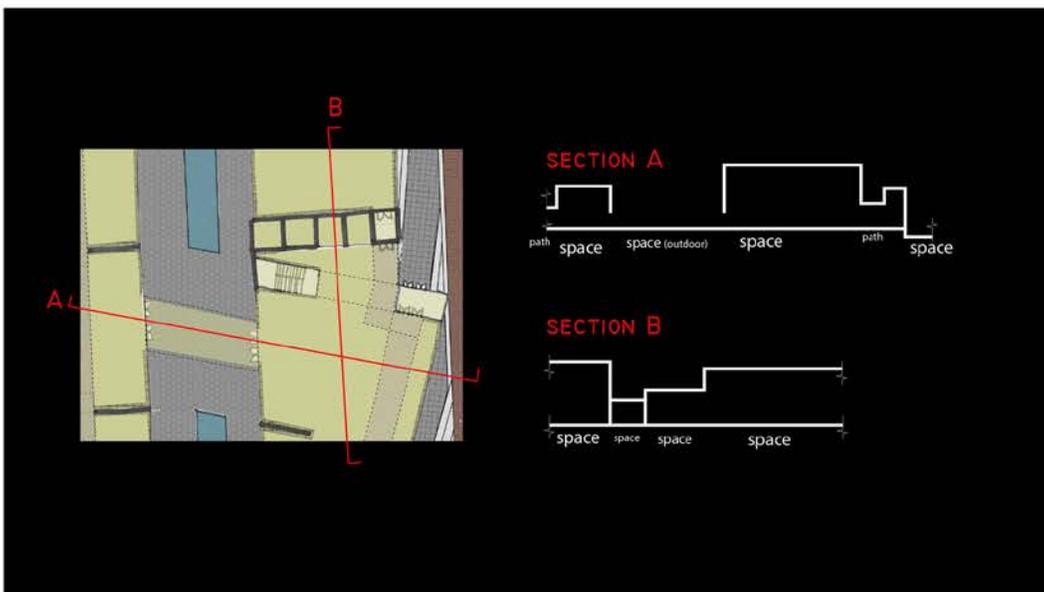
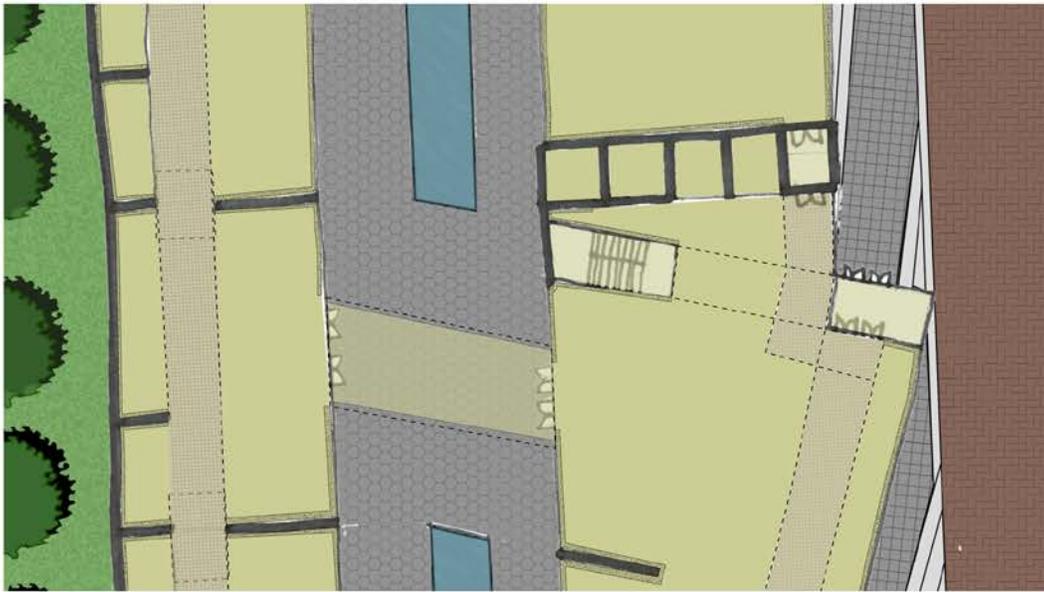


Figure 8.23: Scheme Three. Design Principles. By author.

## Process

Scheme one was chosen as the parti. Process after this point shows the push toward the final product, shown in Chapter 9 : Final Design. The following images are sketches done on trace paper, scanned to be included in the document. All images and sketches are by author.

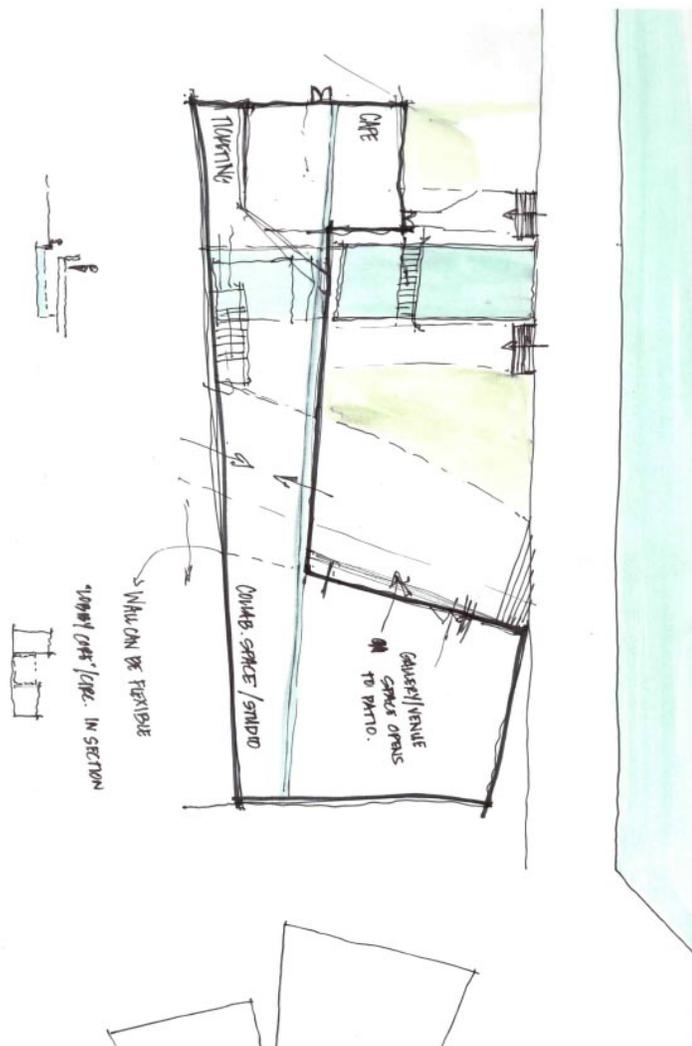


Figure 8.24: Process sketch, plan. By author.

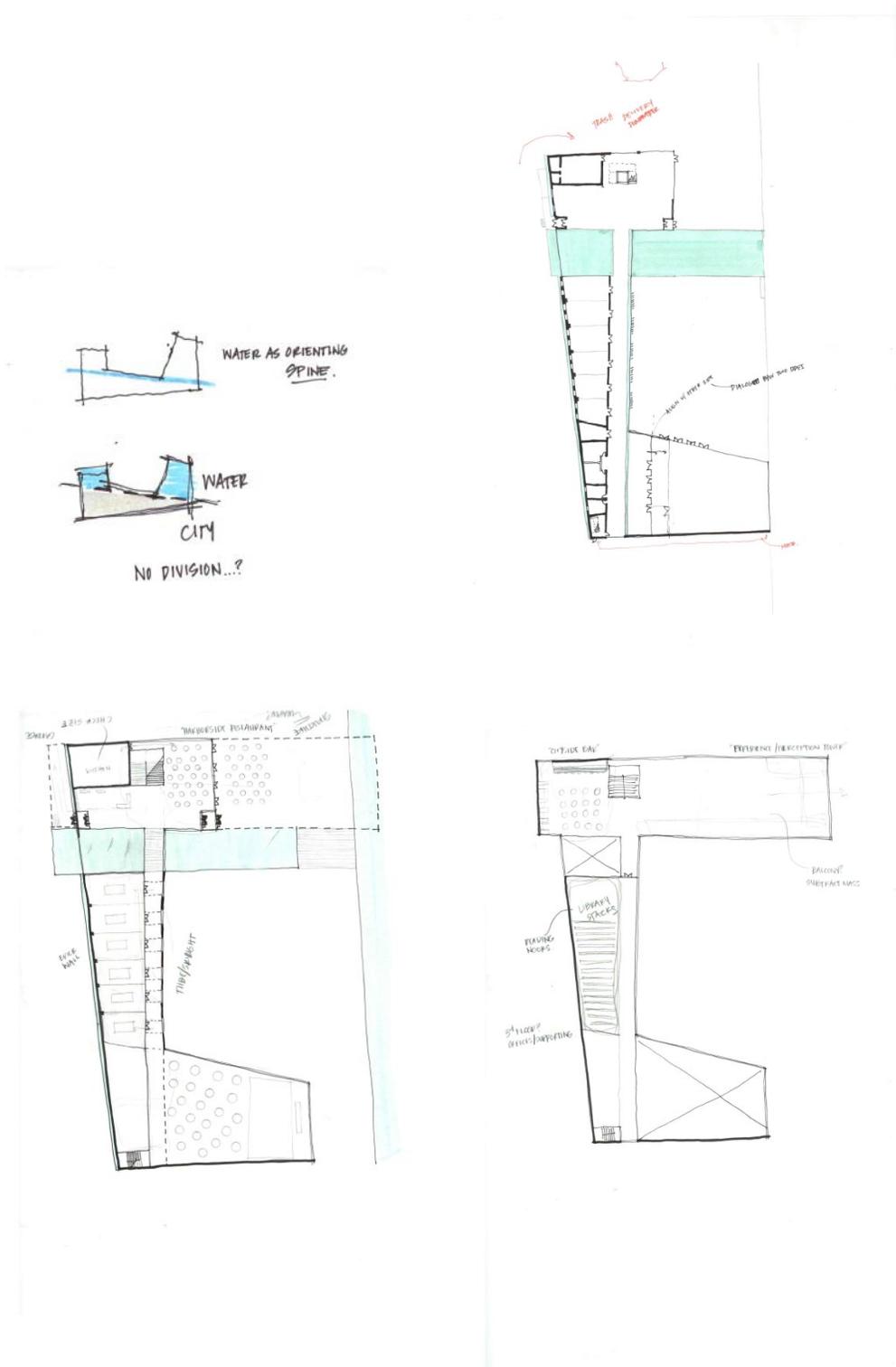


Figure 8.25: Process sketches. By author.



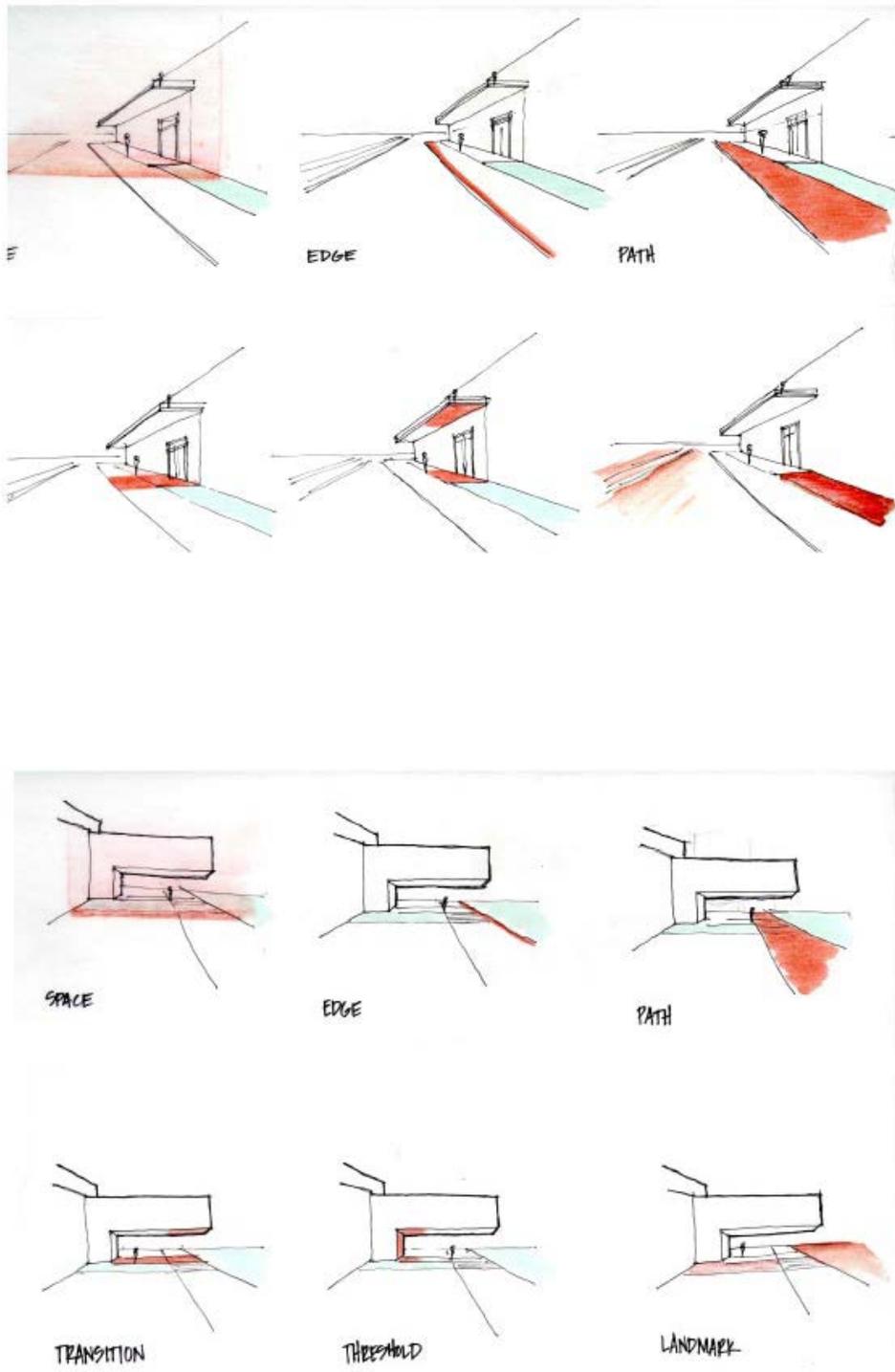


Figure 8.27: Process sketches. By author.

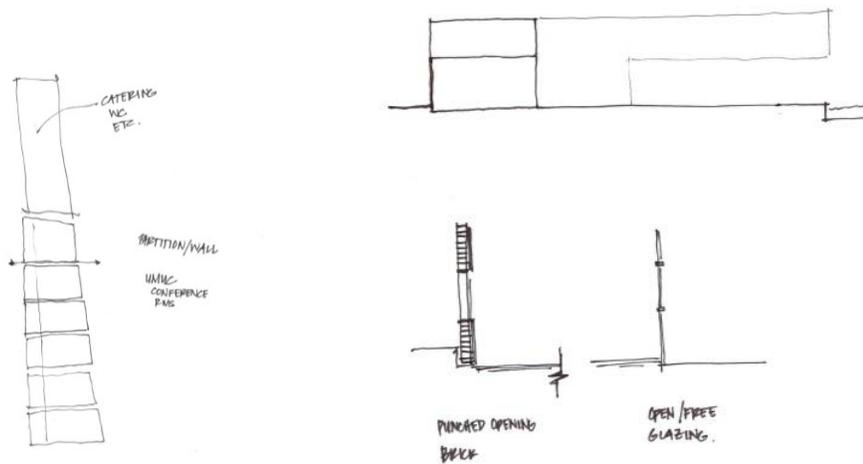
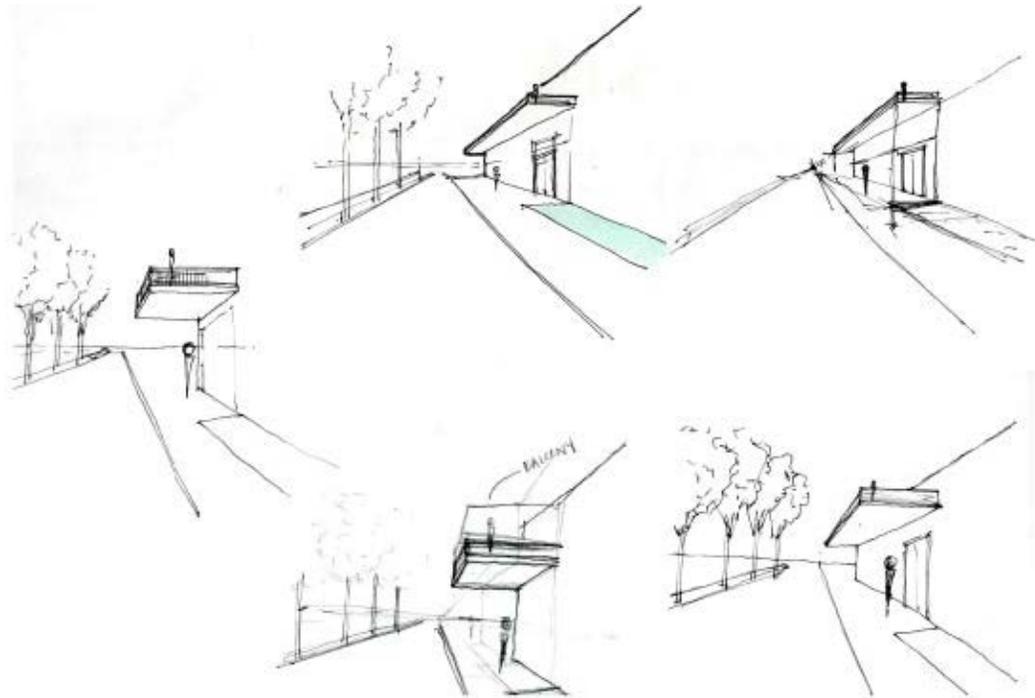


Figure 8.28: Process sketches. By author.

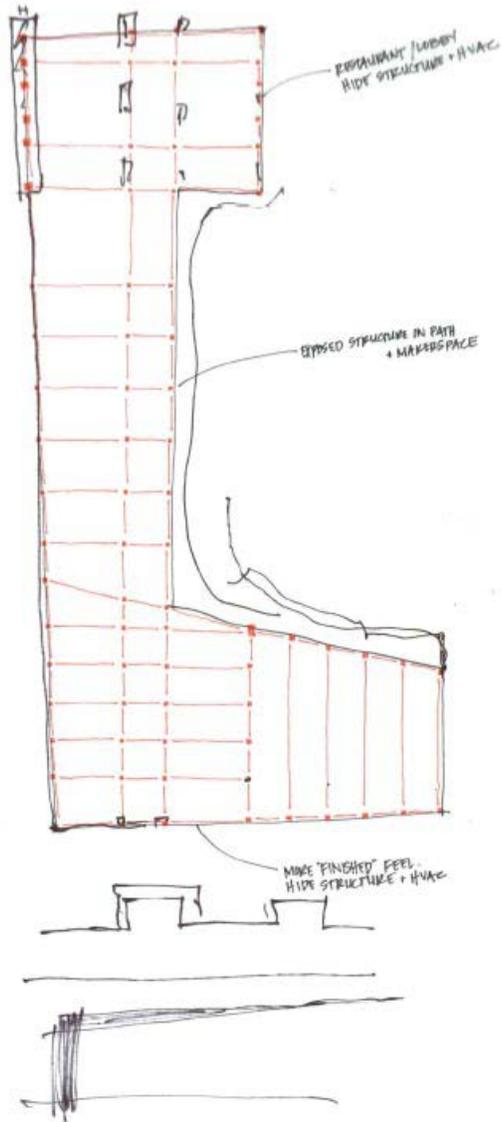


Figure 8.29: Process Sketches. By author.

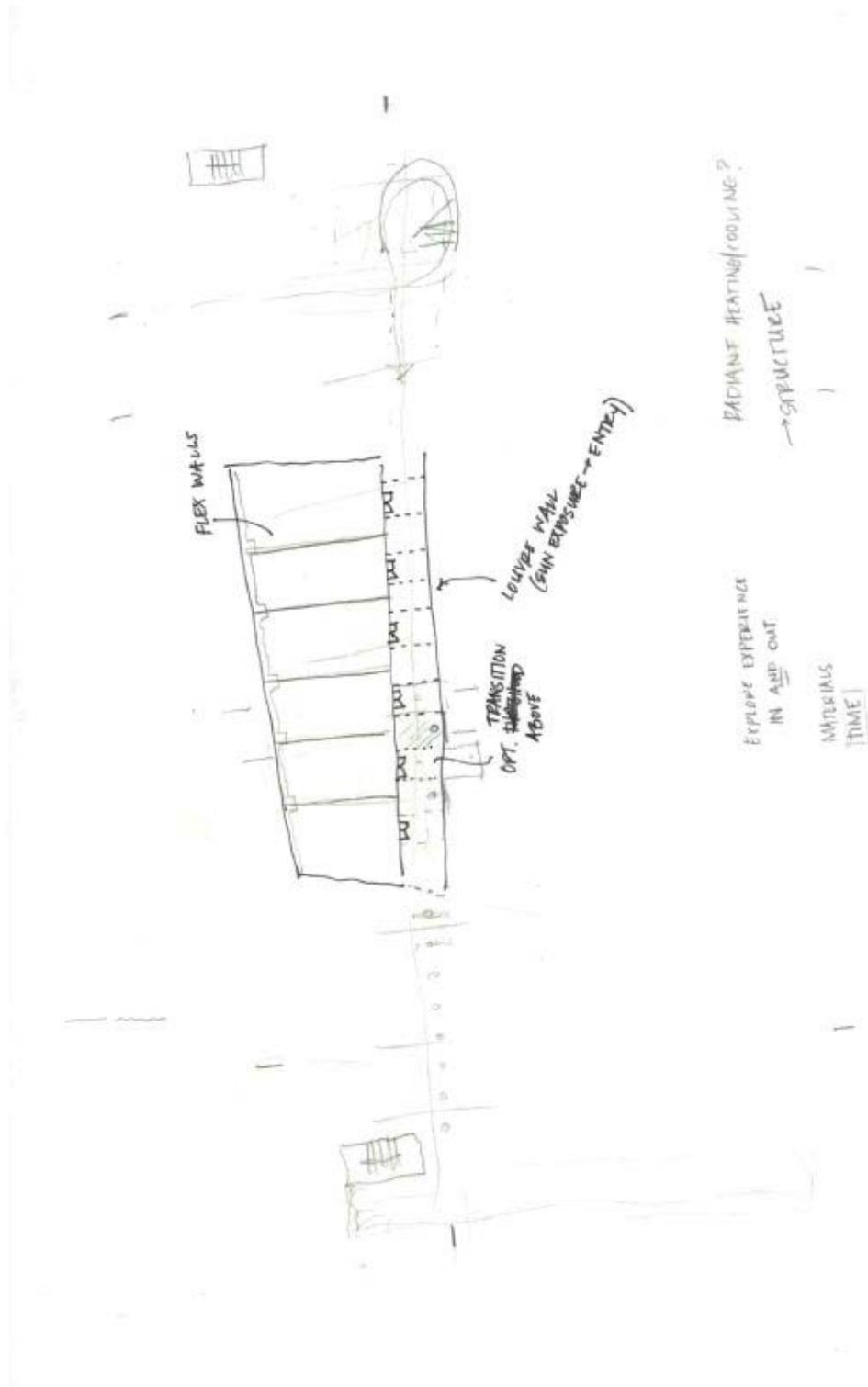


Figure 8.30: Process Sketches. By author.

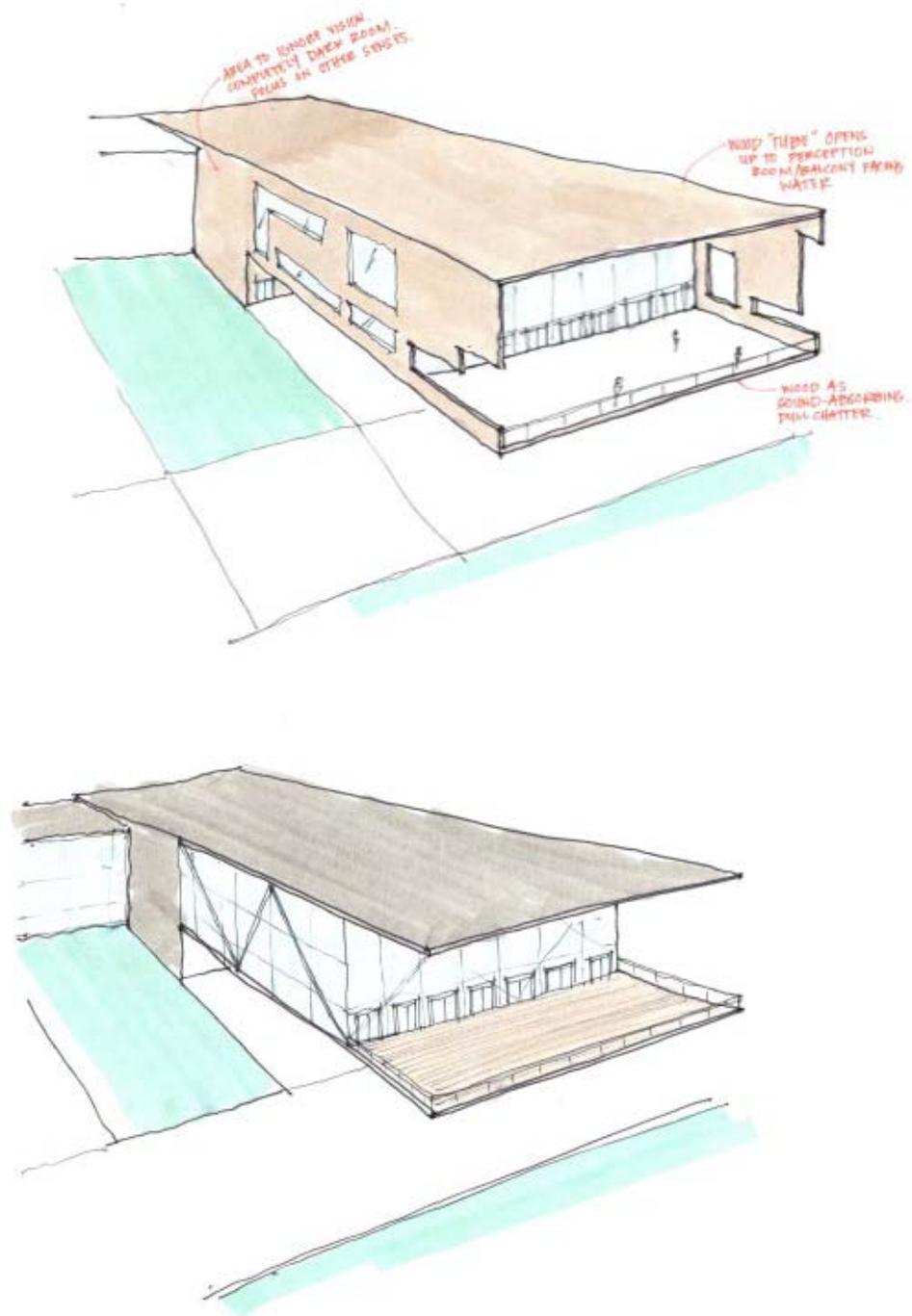


Figure 8.31: Process Sketches. By author

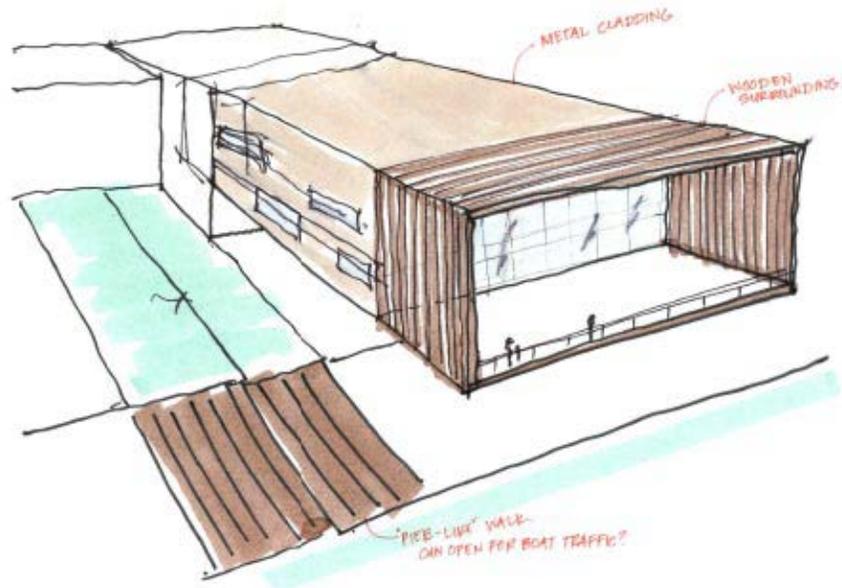
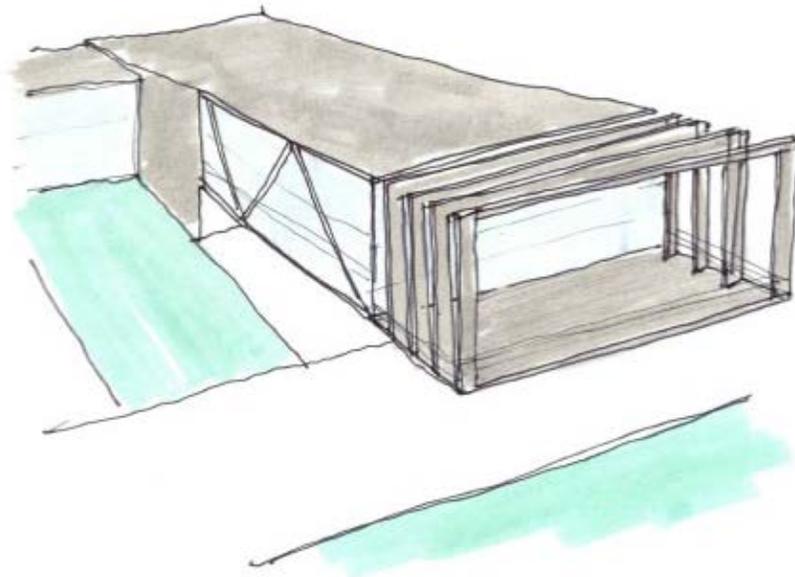


Figure 8.32: Process Sketches. By author.

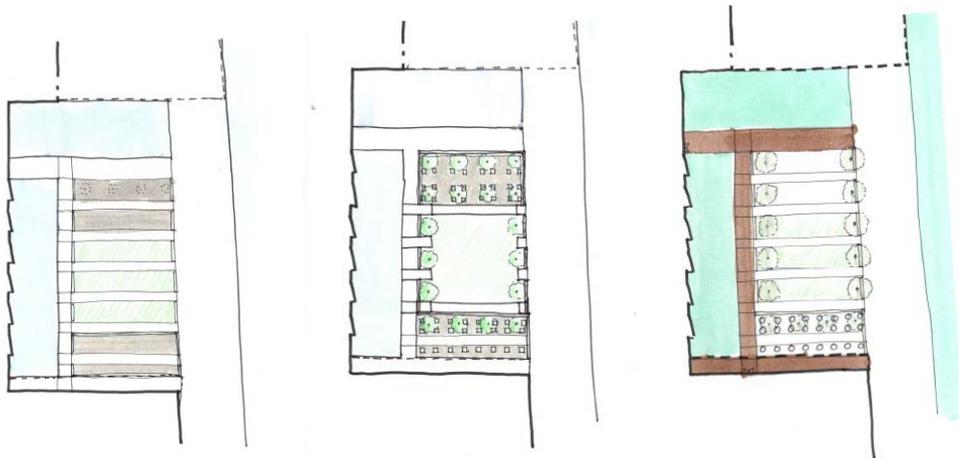
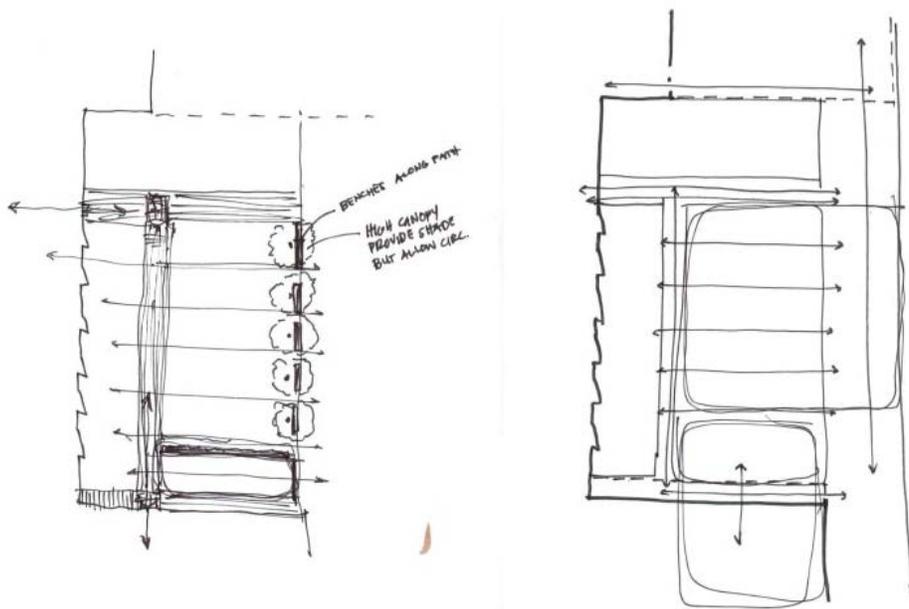


Figure 8.33: Process Sketches. By author.

## Chapter 9 : Final Design

### Narrative + Images

This “Creative Co-Lab” offers the opportunity for the blind and sighted to interact in a freeing and collaborative environment. An overall aerial of the building is shown in Figure 9.1, as well as supporting diagrams on the following page.

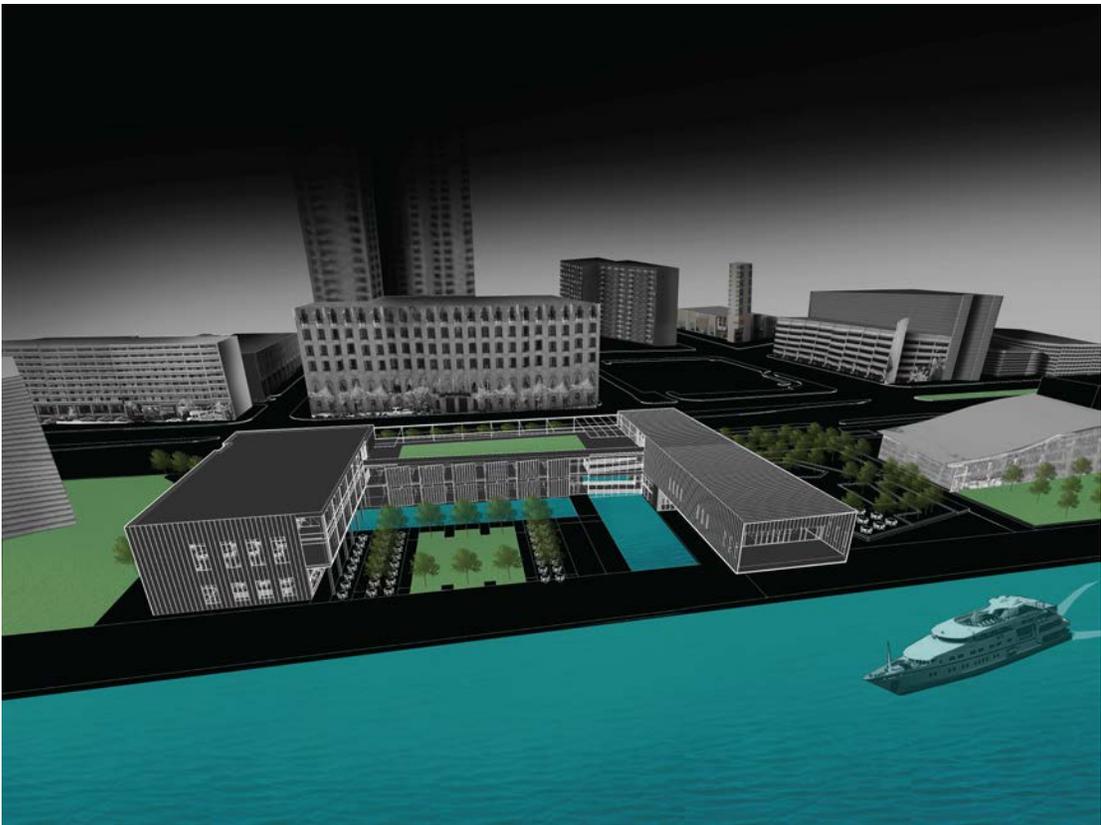


Figure 9.1: Aerial. Image by author.

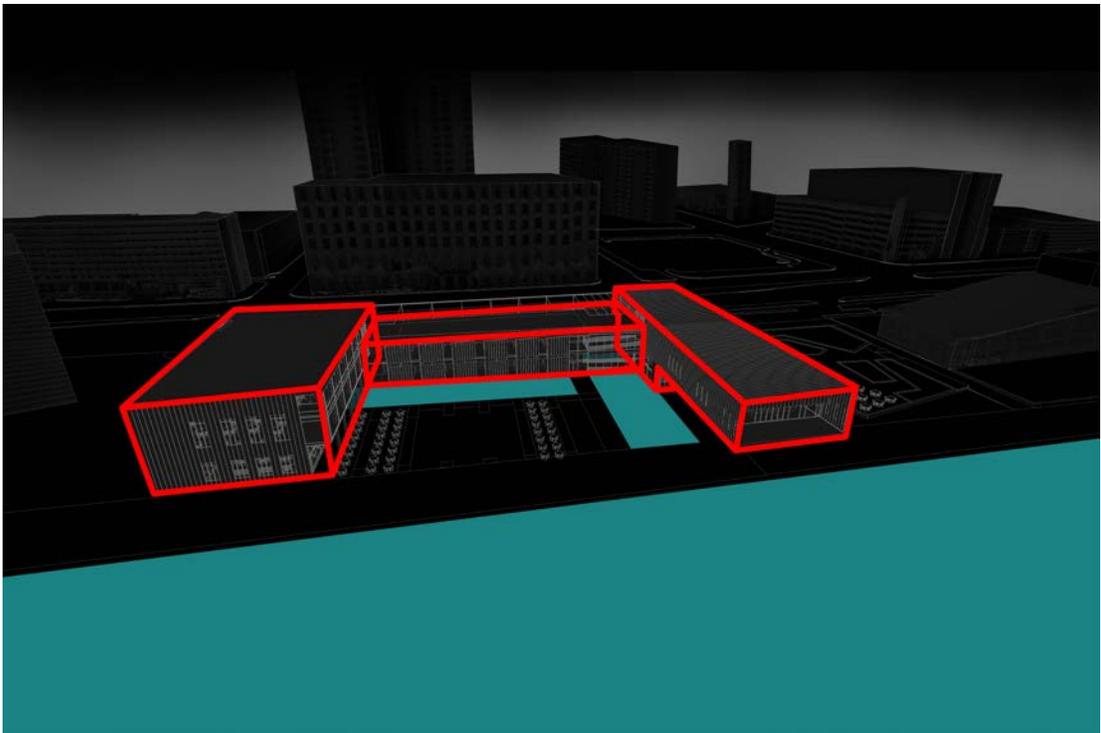
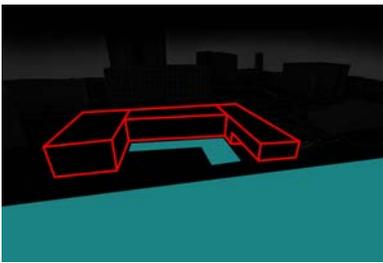
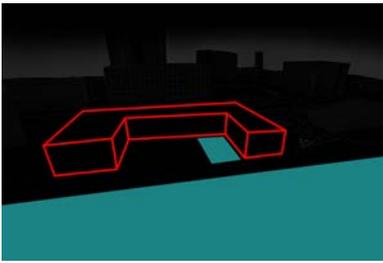
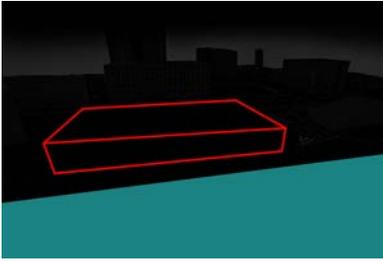
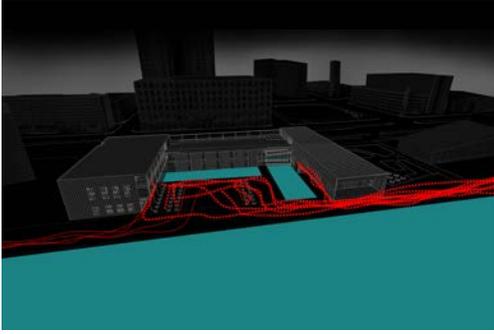
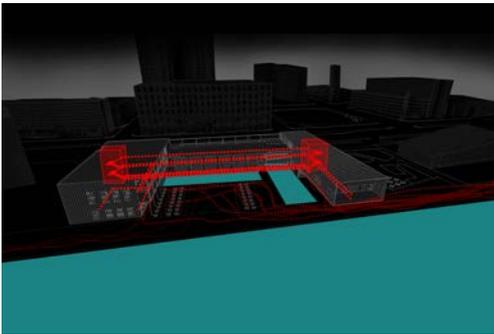


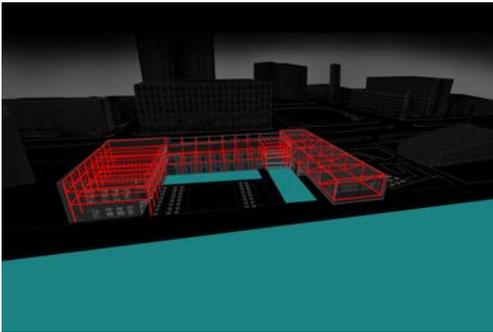
Figure 9.2: Parti evolution series. By author



**Figure 9.3: Exterior circulation. By author.**



**Figure 9.4: Interior circulation. By author.**



**Figure 9.5: Structure. By author.**

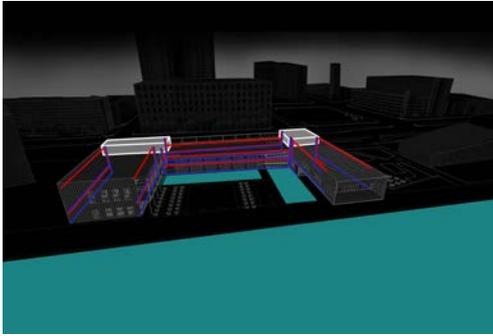


Figure 9.6: HVAC. By author.

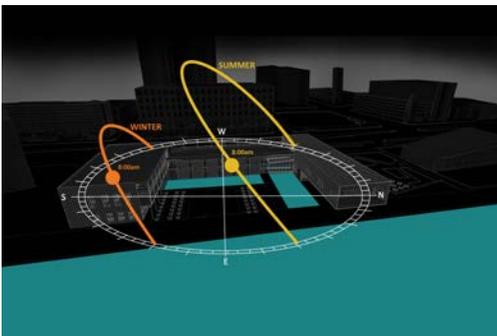


Figure 9.7: Sun diagram. By author.



Figure 9.8: View from harbor. Looking west. By author.

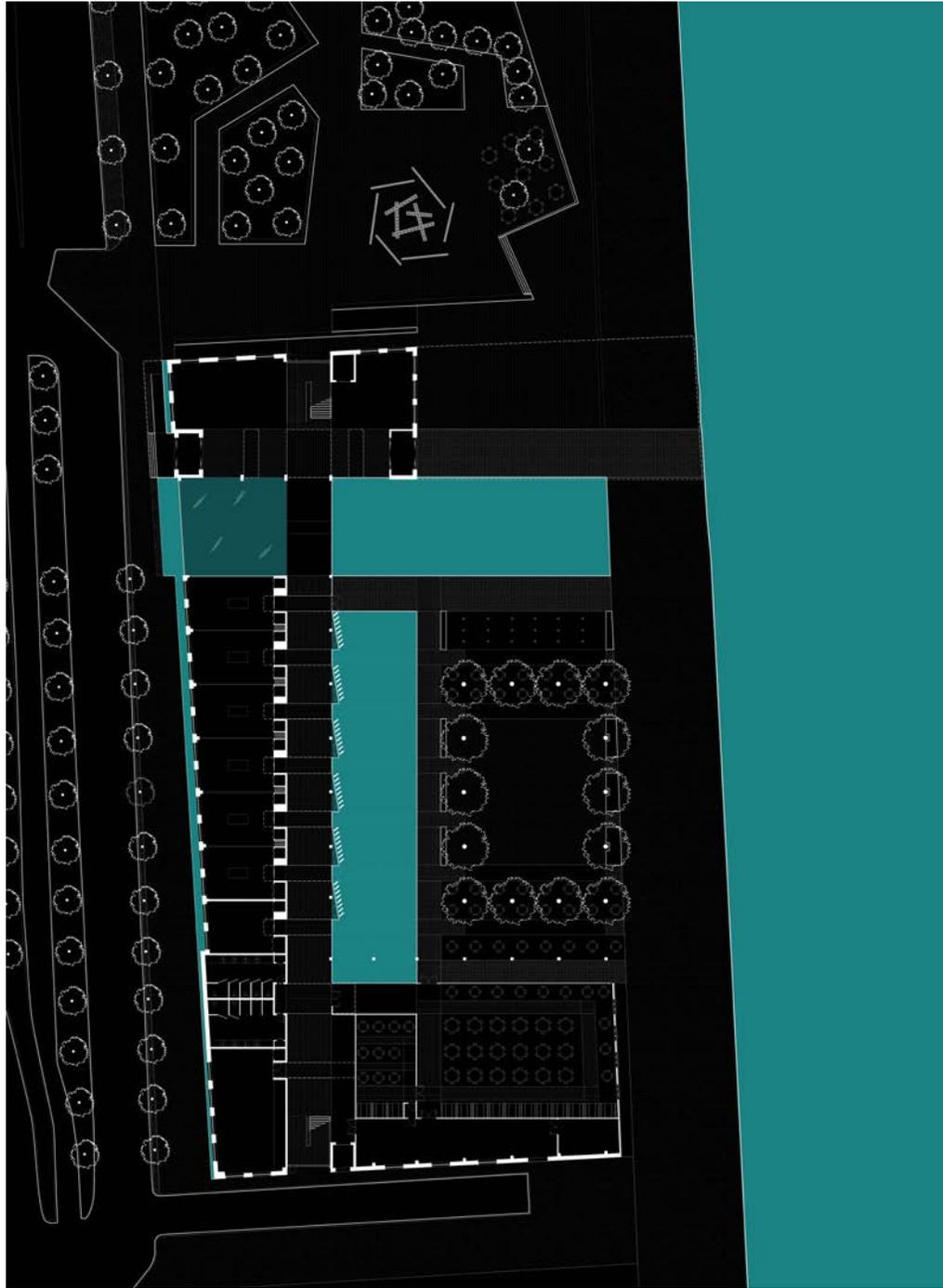


Figure 9.9: Ground floor plan. Image by author.

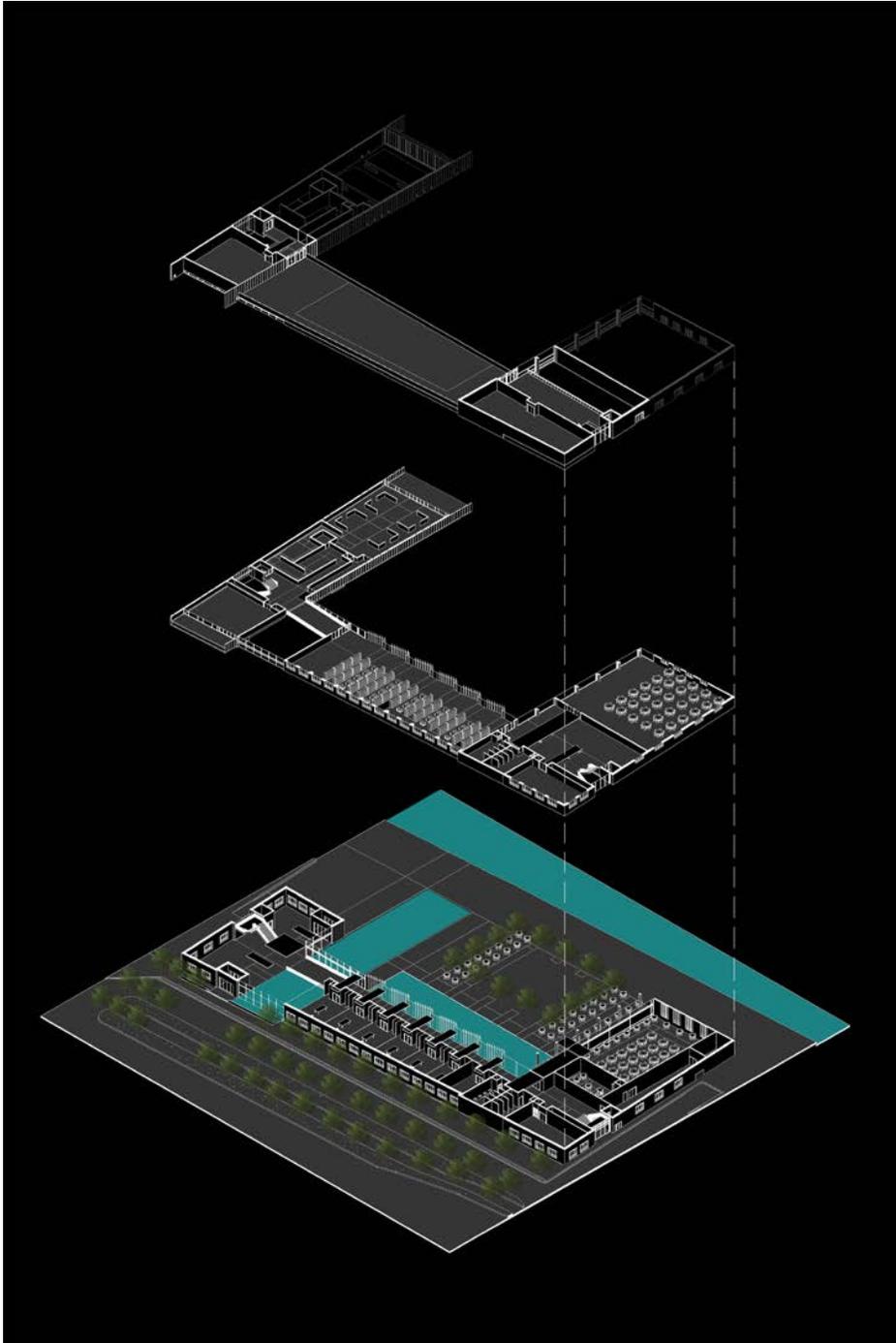


Figure 9.10: Exploded axon. Image by author.

Program includes various elements to reinforce collaboration between the blind and sighted. A makerspace, shown in Figure 9.3, is where the blind and sighted can create art of any kind together. It's a very flexible space.

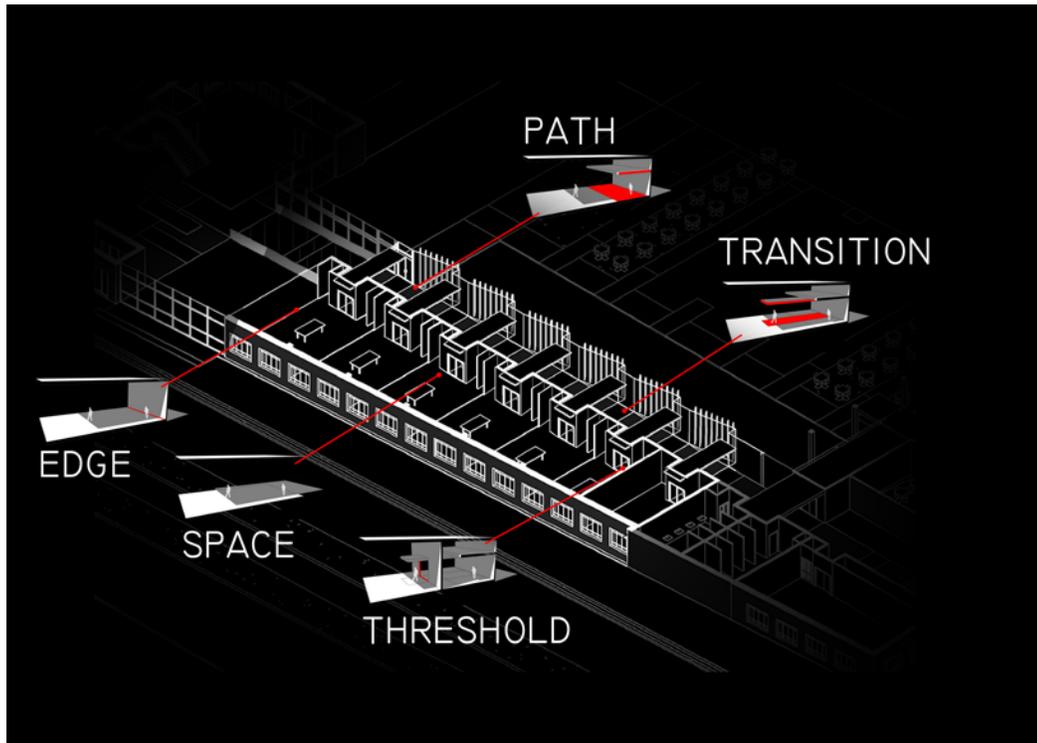
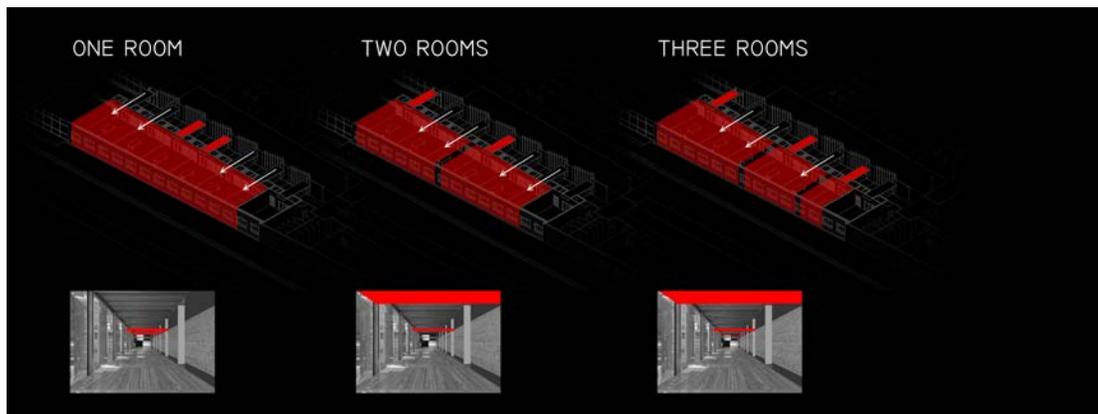


Figure 9.11: Makerspace. Image by author

Movable walls allow for flexibility in room quantity and size (shown in Figure 9.4). When a room is in use and that door is open, the panel overhead slides out into the path to mark the door as an entry. If the panel slides back into the room, the door closes.



**Figure 9.12: Makerspace flexibility. Image by author.**

There is also a gallery to display that art (with a potential to sell it). A restaurant that sits on the harbor (with a room patrons can choose to eat in that is completely dark. This style of restaurant is popping up in a few locations around the world). A venue space (that could partner with the local National Federation for the Blind to host activities close to the harbor). A library (also with a potential partnership with NFB. The typical library for the blind needs 3x as much stack space, so this helps to alleviate growing pressures in NFB's current library to the south). Office space and breakout rooms/conference areas support the library and venue space.

And lastly, the sensory perception exhibit (Figure 9.5 and Figure 9.6).

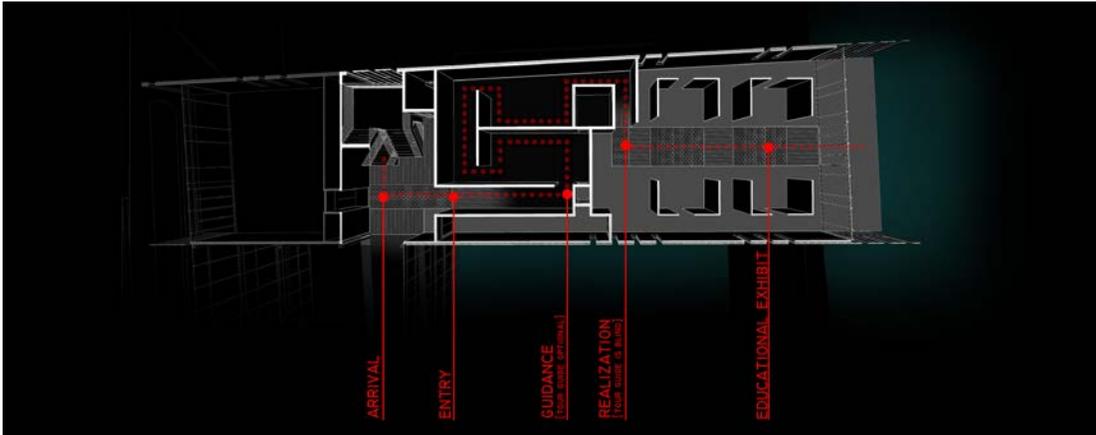


Figure 9.13: Sensory Perception Exhibit. Image by author.

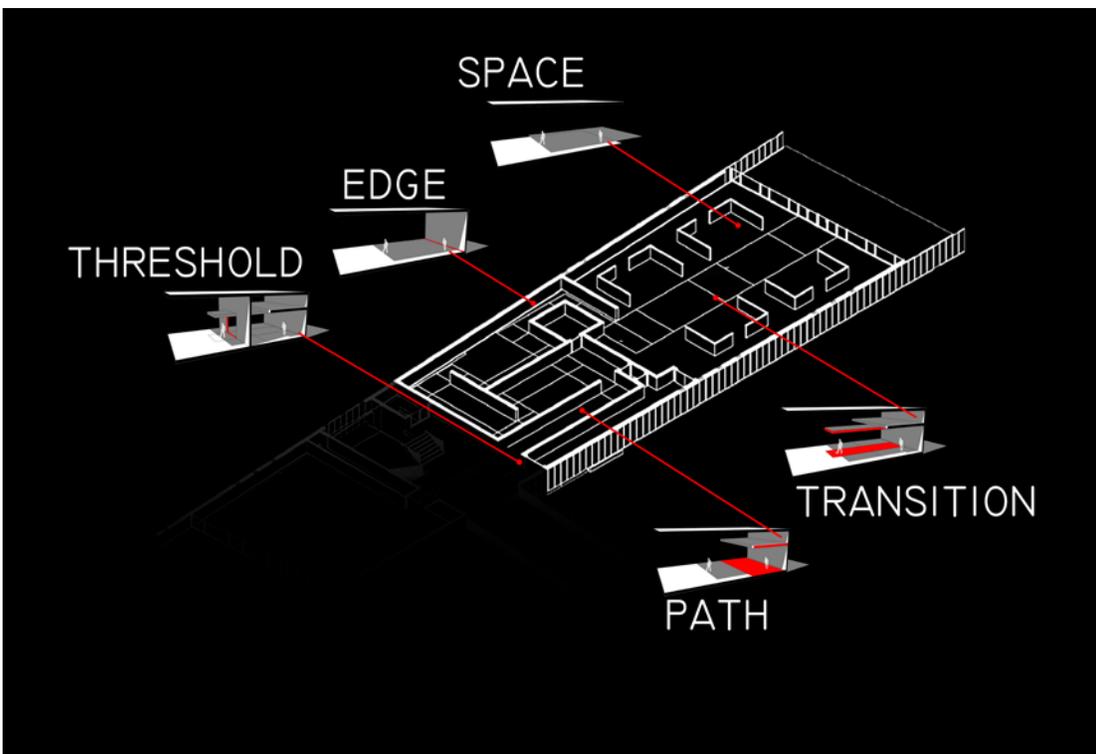


Figure 9.14: Sensory Perception Exhibit. Image by author.

Imagine you start walking down a corridor. The light fades behind you and you walk about 30' feet in darkness. You start to feel a little uncomfortable, but just as you are about to turn around a voice says, "Would you like the guided tour or self-guided?" You choose the guided tour, because there's no way at this point you'd feel comfortable walking around in the dark without knowing how to. A kind man leads you along the path, teaching you about directional textures in the floor and how to listen to tell if you're in a large or small space. You listen to echoes, and learn that every transition along the path is perpendicular. When you feel a different texture beneath your feet, you know it's time to turn. You follow the wall along the exhibit, sometimes feeling brave enough so that your tour guide can lead you to exhibits off the path. And eventually you come to the end of the dark space and realize that this whole time your tour was being given by a blind man. With a newly refreshed mindset about perceiving with your other senses, you enter the educational exhibit and learn a little bit more. Once you've passed through to the balcony, your vision doesn't need to dominate. You can feel the breeze. Listen to chatter below. Hear the seagulls. Smell the harbor (if you really want to). Smell food from places close by. Hear the music being played by the Science Center next door.

Most of the foot traffic will be approaching from the north, either city-side or harbor-side. If you approach from the harbor side, you'll get the cantilever experience (Figure 9.15) and feel the difference in acoustic and

temperature as you pass under the cantilever as an acoustic mark for transition (Figure 9.16).



**Figure 9.15: Harbor Approach. Image by author.**



**Figure 9.16: Harbor Arrival. Image by author.**

Then entering into the lobby (Figure 9.17) you feel the rhythm of the alternating materials and acoustics. When you hit the tiled paving pattern, you know to make a transition (Figure 9.18) across the water feature towards the maker space corridor, or spine..



**Figure 9.17: Harbor Lobby. By author.**



**Figure 9.18: Harbor Transition. By author.**

A strong rhythm there as well as the cork wall act as landmarks so you can orient yourself in space. Corridor is shown in Figure 9.19.



**Figure 9.19: Interior Corridor or "Spine." By author.**

If you approach from the city side, to your right will be the busy street and to the left will be the visitor center (FIGURE).



**Figure 9.20: City approach. By author.**

Children on school field trips may be dropped off at the bus slip on the city side, as shown in Figure 9.21.



**Figure 9.21: City arrival. By author.**

Users from the city side will enter into the lobby (FIGURE) and make a right turn (FIGURE) across the water feature into the spine of the building.



**Figure 9.22: City Lobby. By author.**



**Figure 9.23: City Transition. By author.**

## Application + Analysis of Design Principles

In order to test how well the building delved into the multisensory realm, I took an analytical stance for my own project. The following matrices of diagrams reflect how space, edge, path, transition, threshold, and landmark are reflected in each one of the perspectives in a visual, acoustic, and tactile manner.

The following grid, Figure 9.24, shows the arrival to the harbor as the user stands under the cantilever. This is a strong transitioning moment, as the difference in sound marks an acoustic transition into the building itself. The landmark I see as one of the more important features of the promenade, and in this case it is all-inclusive of the water feature next to the path. It acts as a visual, acoustic, and tactile landmark. As a person gets closer to the entrance, the increasing volume of a running water feature will mark arrival to the threshold.

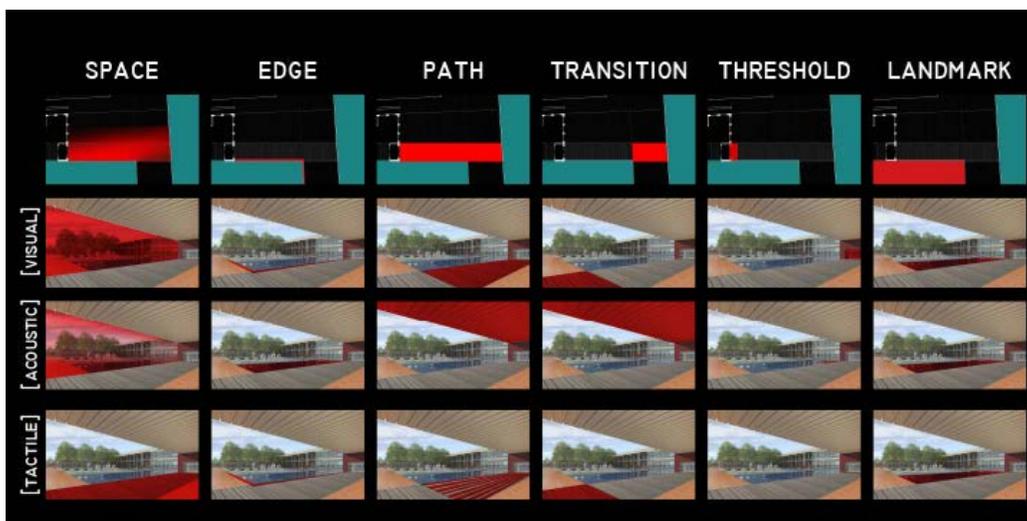


Figure 9.24: Harbor Arrival, Principles. By author.

Upon entrance into the lobby (Figure 9.25), a strong landmark to help you situate yourself in space is the rhythm of the materials and acoustic planes above. The space itself here acts more as a path, while space off the path hosts the reception desk and gallery exhibits.

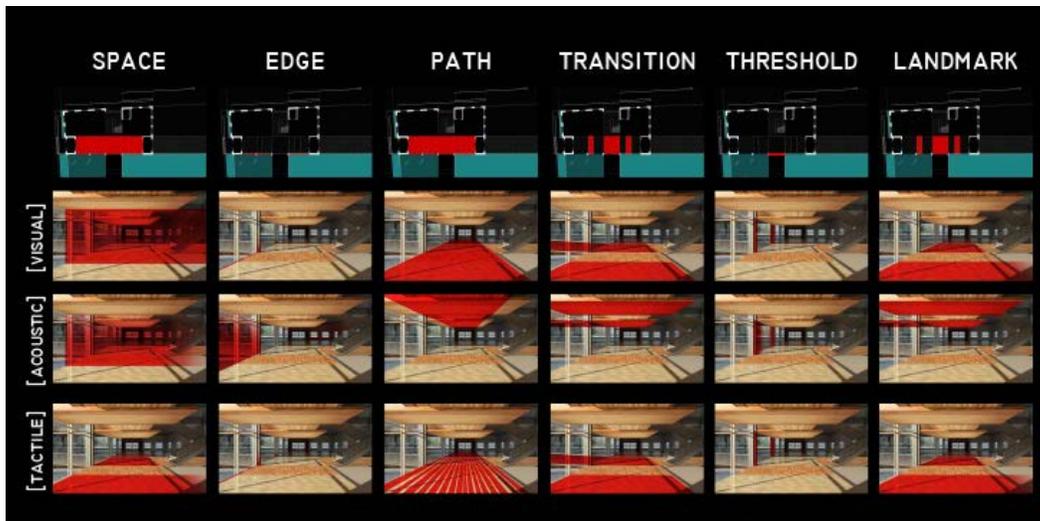


Figure 9.25: Harbor Lobby, principles. By author.

After taking a few strides into the lobby, you will feel the changing materials under your feet and transition across the water feature (Figure 9.26).

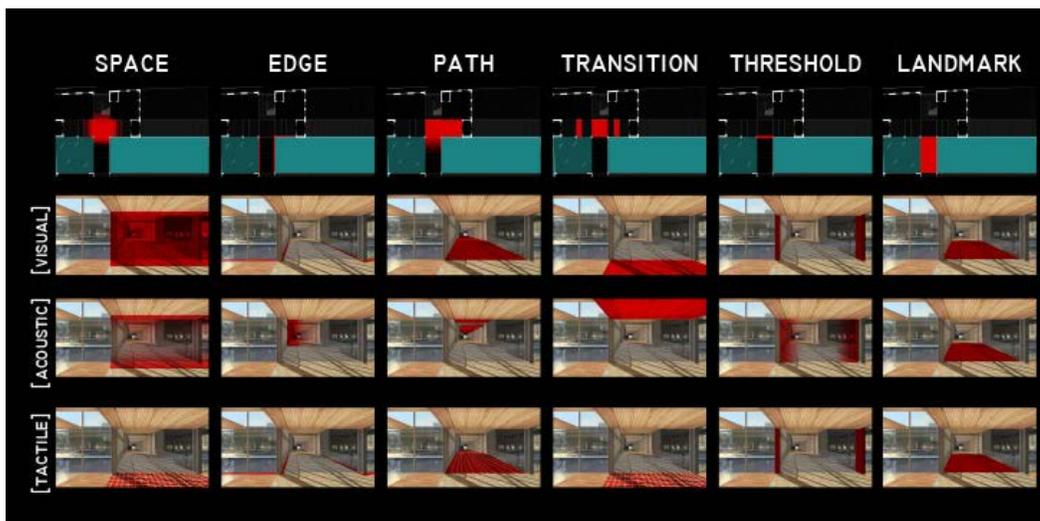


Figure 9.26: Harbor Transition across water feature, principles. By author.

One of the destinations in the program is the maker space, hosted off the corridor or “spine” pictured in the following diagrams. A strong landmark in this space is a cork wall which is highlighted on the right. It acts as a visual, acoustic, and tactile landmark, hosting varying grooves within the surface to warn the user that a specific door to the makerspace is coming next. This helps to specialize material per the use of the building.

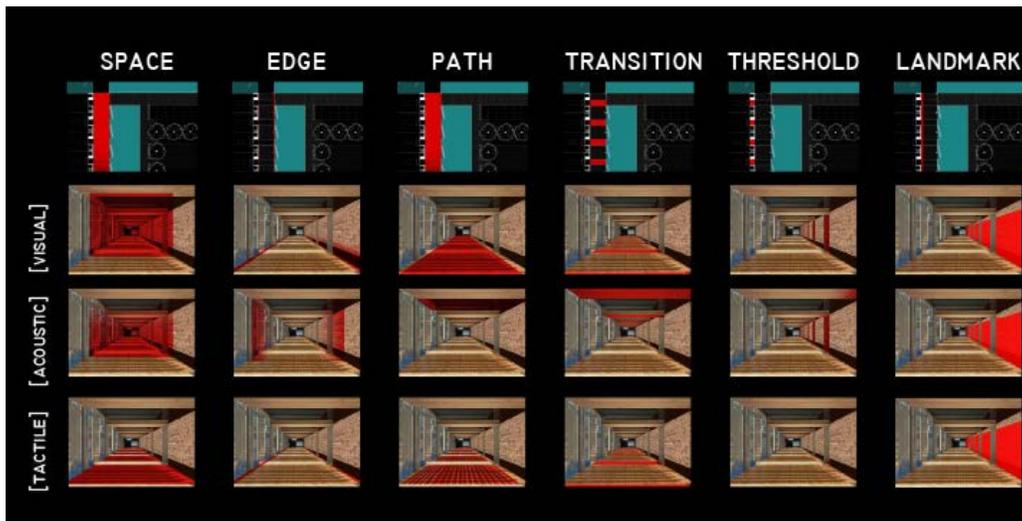


Figure 9.27: Corridor or "Spine," principles. By author.

Those who approach from the city side will arrive to find a hint of the cantilever experience, shown in Figure 9.28.

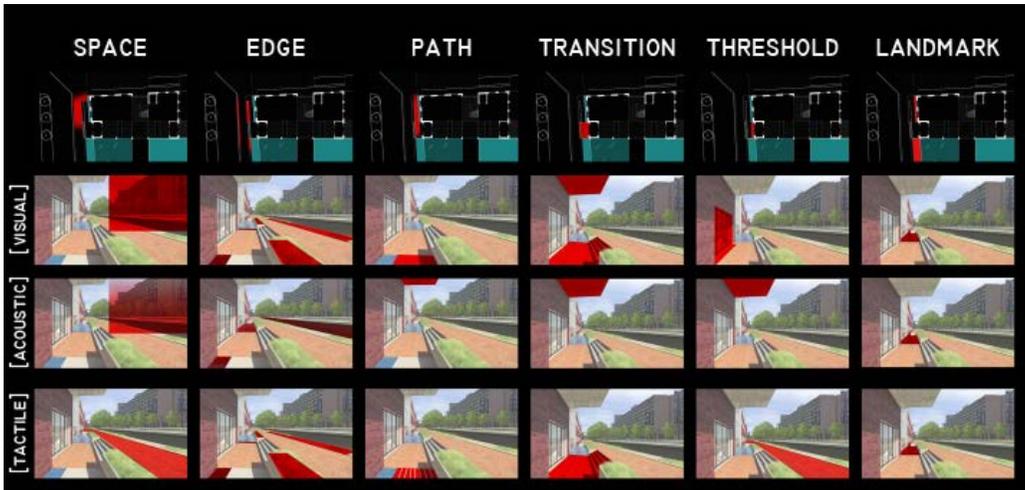


Figure 9.28: City side arrival. Principles. By author.

Upon entry, the experience is similar to the entry from the harbor side, but this time the water feature will be to the right (Figure 9.29). The rhythm once again is used as a landmark, taking note of the alternation of materials and sound patterns.

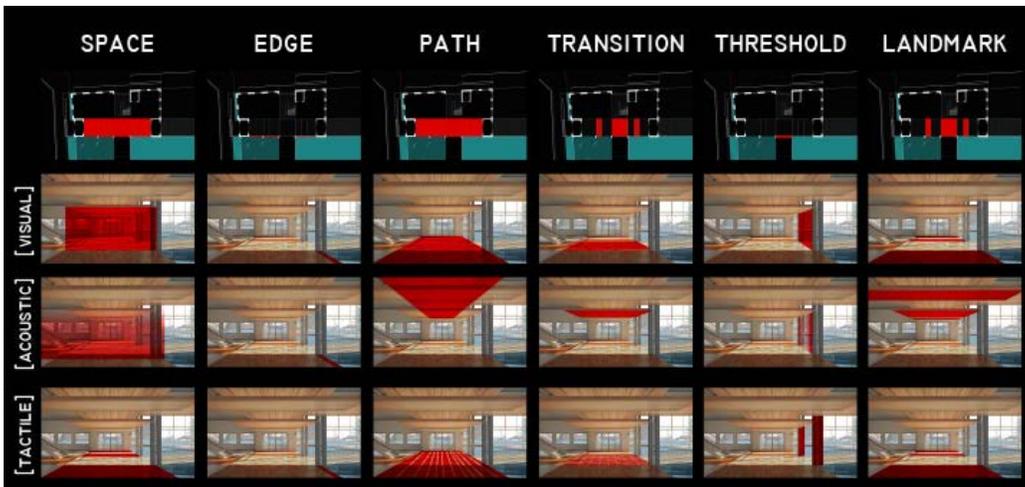


Figure 9.29: City side entry and lobby, principles. By author.

Before ultimately finding themselves in the spine of the building, the user who enters from the city side will turn to the right to transition across the water feature (Figure 9.30).

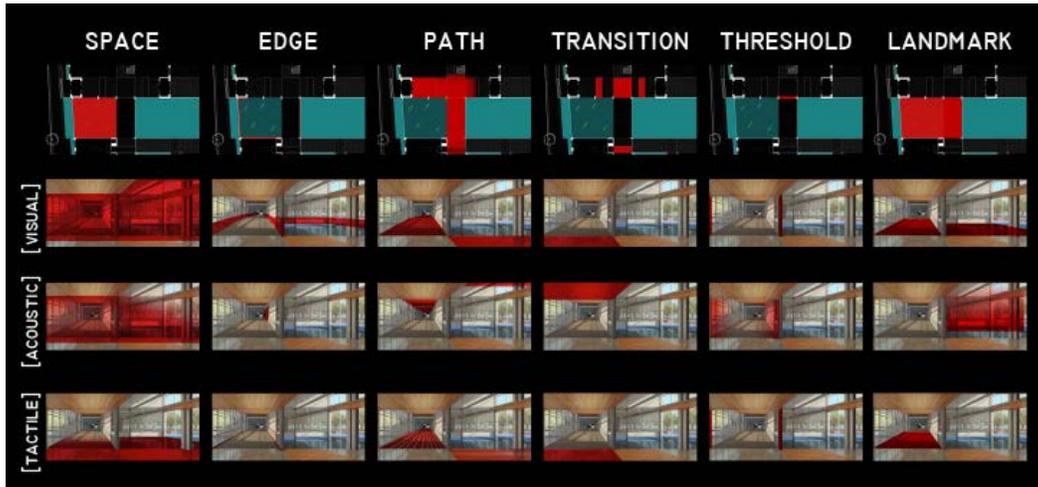
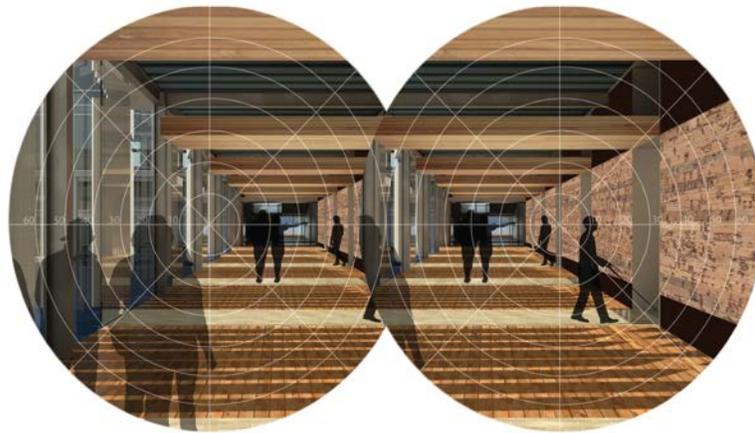


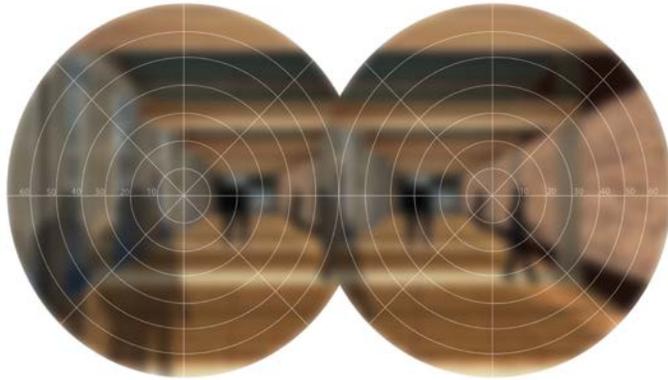
Figure 9.30: City side transition across water feature, principle. By author.

## People + Experience

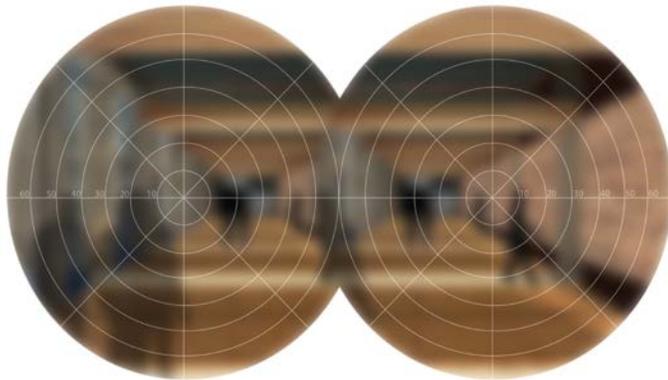
Just as the process begins with people, it also ends with people. Experience is not exclusive to design elements, material, etc; rather, it is highly dependent and necessitated by the inclusion of personal experience. People who use this building will be both blind and sighted. The following images are a series of perspectives seen through the diagram of the visual field (as was discussed in “Chapter 1: Research, What is Blindness?”) These images show the varying degrees of blindness when looking at interior corridor, or spine of the building.



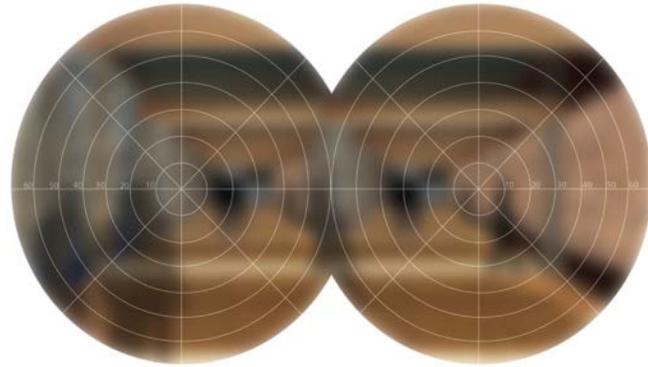
**Figure 9.31: Full Visual Field. Corridor. By author.**



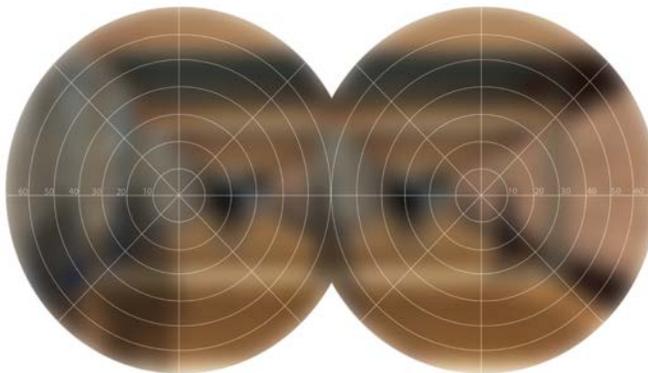
**Figure 9.32: 20/25 Visual Acuity. Corridor. By author.**



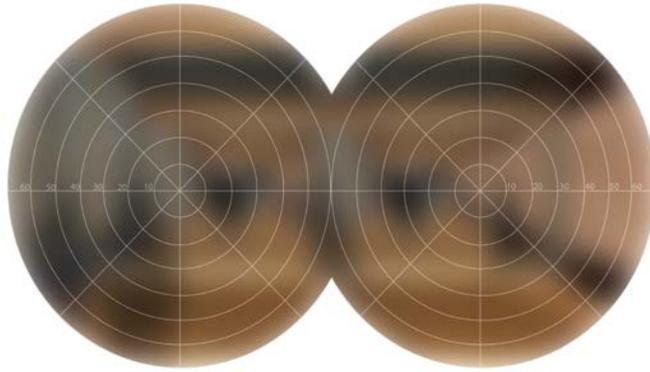
**Figure 9.33: 20/30 Visual Acuity. Corridor. By author.**



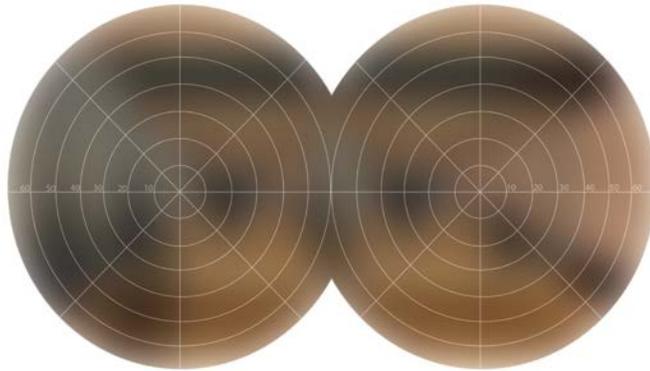
**Figure 9.34: 20/40 Visual Acuity. Corridor. By author.**



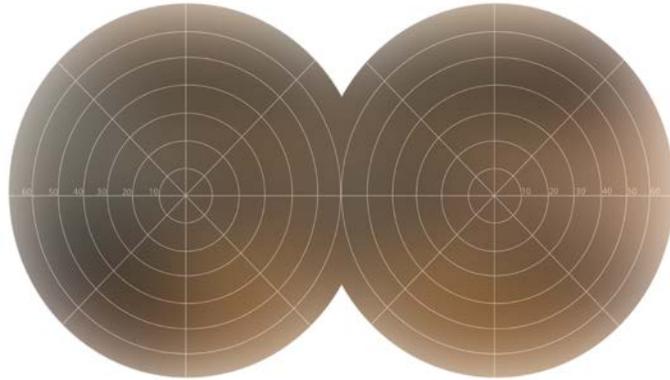
**Figure 9.35: 20/50 Visual Acuity. Corridor. By author.**



**Figure 9.36: 20/70 Visual Acuity. Corridor. By author.**



**Figure 9.37: 20/100 Visual Acuity. Corridor. By author.**

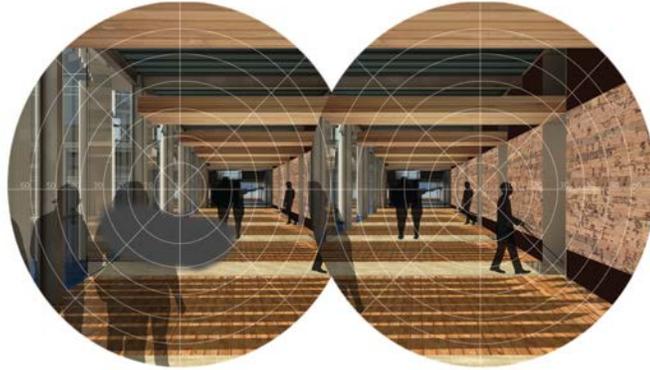


**Figure 9.38: 20/200 Visual Acuity. Corridor. By author.**

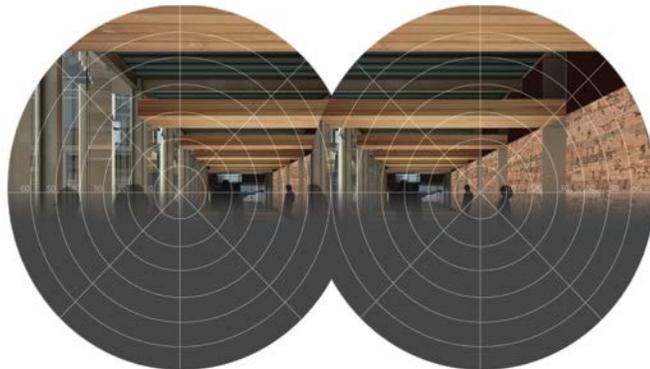
Andrew Potok is an artist who was diagnosed with Retinitis Pigmentosa. RP is a gradual loss of vision that can leave the patient with any sort of blindness. It usually hits around age 10-11. He would perceive the building very differently, portrayed in Figure 9.31. This perspective of the Corridor or “spine” has very vague hints at the edge of space. The color contrast helps to mark edge of space, but his experience will be mainly acoustic. Andrew said, “Disability – blindness – is not the only characteristic that defines me, but my recognition, at last, that it is a central part of me enables me to know better who I really am<sup>21</sup>.”

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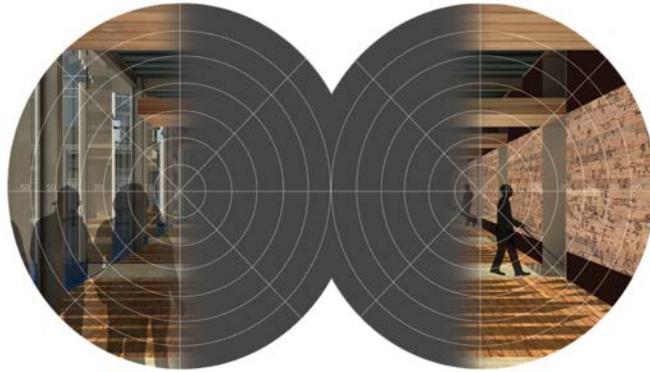
<sup>21</sup> Potok, Andrew. *Ordinary Daylight: Portrait of an Artist Going Blind*. New York: Holt, Rinehart, and Winston, 1980. Print.



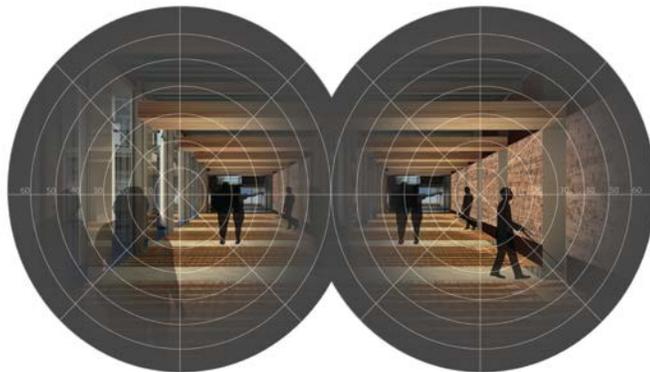
**Figure 9.39: Scotoma. Corridor. By author.**



**Figure 9.40: Inferior Hemianopsia. Corridor. By author.**



**Figure 9.41: Bitemporal Hemianopsia. Corridor. By author.**



**Figure 9.42: 40 Degree Cone of Vision. Corridor. By author.**

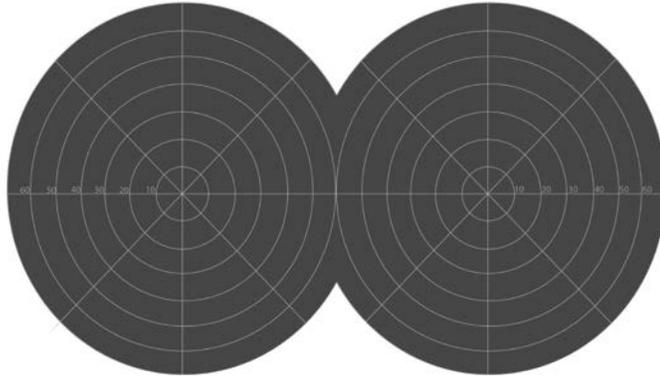


**Figure 9.43: 20 Degree Cone of Vision. Corridor. By author.**

Ingrid Ricks is an author who was diagnosed with RP in her early 30s. She still has a small cone of vision and would see the spine as shown in FIGURE. She notes these stereotypes that we have to break through. People feel more comfortable with blindness when they have healthy discussion about it. She says, “But I suddenly understood that maybe the only way to break through the stereotypes and uneasiness people had about blindness was to start talking about it and let the world know that behind the devastation of vision loss, there were normal people with the same hopes, dreams, and aspirations as everyone else<sup>22</sup>.”

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<sup>22</sup> Ricks, Ingrid. *Focus: A Memoir*. N.P.: Ingrid Ricks, 2012. Print.



**Figure 9.44: Total Blindness. Corridor. By author.**

Hugues de Montalembert is a French artist/photographer who moved to NYC. He was attacked in his apartment and paint thinner was thrown at his eyes, which rendered him completely blind (shown in FIGURE). His experience of vision is that it's a creation. Blind people process information differently than those with sight. He says, "Vision is a creation. It's not just perception... That's why some people see and some people don't see. Much the way they hear music or they hear noise" and also, "Vision is more than just eye function. A camera perceives, it doesn't see. Blindness has long-term effects on how the brain processes information and constructs one's view of the world<sup>23</sup>."

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<sup>23</sup> Montalembert, Hugues De. *Invisible: A Memoir*. New York: Atria, 2010. Print.

The last person we will discuss is Chris Downey, a blind architect. He was rendered completely blind in 2008 and continues to face life with a very optimistic attitude. He is a very influential person. His experience of architecture is acoustic. Testing materials and textures with his cane. Listening and feeling. He says, "Blind people rely on acoustics to get around. I test materials with my cane to see how they feel. Instead of doing a 'walk-through,' we create a 'tap-through,' so you hear what it's like when you tap your cane throughout the building<sup>24</sup>."

As part of the process, I created a sound rendering of my building. The sound rendering is a clip of my footsteps walking on the different paving patterns/materials as they would occur walking from the north harbor-side all the way to the interior corridor or spine of the building. The clip is currently on YouTube (<https://www.youtube.com/watch?v=qN8MDPQcSII>), but will also be submitted as a supplemental material with this thesis document on ETD/ProQuest. When you listen to the video, try it once with your eyes open and once with your eyes closed. You'll notice that your focus changes each time you watch it. The video has a key plan with a moving red dot to show where the footsteps are taking you.

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<sup>24</sup> "Chris Downey: My Life as a Blind Architect in San Francisco." Ideastedcom. TED Talks. 30 Sept 2013. Web.

## Presentation + Critic Response

Overall, the presentation was well-received. It seemed the crowd had much enthusiasm speaking about the topic, and gave me encouragement to continue forward in this research process throughout my career as an architect. One bit of advice was to include a principle about glazing and more specifically temperature. How can I move forward using temperature to guide people throughout space? Another critic suggested using modern technology (like 3D printing) to create specialized materials as a way to support the design principles I've created. The jury seemed to agree that this was a good set of principles that could be applied to other buildings. Also, that modern society is moving into a more experiential-based museum experience – which means the individual likes to experience settings that temporarily put them in psychological discomfort (example: skydiving, going to a pitch-black restaurant, etc.). So a situation like the “Sensory Perception Exhibit” seems like something that the current and future population would enjoy.

## Conclusion

Our dependency on vision is crippling our other senses. Let me ask this. Are the blind handicapped because they cannot see? Or are we (the sighted) handicapped because our dependency on vision inhibits us from using our other senses? Experiencing architecture is not merely a sighted activity. We inhabit a space with our whole being. “Thus, the impact of architecture on the human experience is too deeply existentially rooted to be approached solely as an element of visual design<sup>25</sup>.”

Thank you.

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<sup>25</sup> Pallasmaa, Juhani. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons, 2011. Print.

# Appendices

## Appendix A

### United States Blindness Statistics

#### Total Blind Population:

California	705,941
Texas	627,183
Florida	437,118
New York	358,850
Pennsylvania	266,887

#### Total Blind Population [percentage]:

West Virginia	3.80%
Mississippi	3.40%
Louisiana	3.13%
New Mexico	3.13%
Arkansas	3.11%

#### Total Blind Population [age 5-17]:

Texas	56,883
California	49,466
Florida	21,015
New York	18,673
Illinois	18,349

#### Total Blind Population [age 35-64]:

California	267,465
Texas	262,762
Florida	166,285
New York	137,874
Georgia	109,032

#### Total Blind Population [age 18-34]:

California	76,463
Texas	75,297
Florida	34,770
New York	34,418
Illinois	27,477

#### Total Blind Population [age 65+]:

California	300,771
Texas	219,082
Florida	210,102
New York	161,706
Pennsylvania	116,264

## Appendix B

Results of a personally-conducted survey of 100 participants through SurveyMonkey<sup>26</sup>. This survey sought to raise awareness of the senses in a concentrated group. I noticed that participants often engaged in discussion of results with each other immediately following the completion of the survey. The following three questions were included in the survey.

- I. For you personally, which is the most important sense?
  - A. Sight – 64%
  - B. Touch – 15%
  - C. Smell – 3%
  - D. Taste – 0%
  - E. Hearing – 17%
- II. Through which sense do you perceive your surroundings the most?
  - A. Sight – 82%
  - B. Touch – 4%
  - C. Smell – 2%
  - D. Taste – 0%
  - E. Hearing – 11%
- III. If you had to lose one sense, which one would it be? (we will consider smell/taste as linked senses – you cannot lose one and keep the other)
  - A. Sight – 10%
  - B. Touch – 10%
  - C. Smell/Taste – 64%
  - D. Hearing – 16%

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<sup>26</sup> [www.surveymonkey.com](http://www.surveymonkey.com)

## Appendix C

### **Interview Questions: Sighted General Public** (survey hosted by SurveyMonkey<sup>27</sup>)

Name (first and last):

Male/Female

Age:

Occupation:

If you had to lose one sense, what would it be?

Describe what it would be like if you were completely blind (typical day, what job you would have, how you would get around, etc).

Have you ever interacted with a blind person? If so, describe that time. If you have not, describe how you would interact with a blind person.

What do you think is the biggest misconception sighted people have about the blind?

If you were tasked with planning an activity to complete with a blind person, what activity would you come up with?

What could you learn from a blind person?

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<sup>27</sup> [www.surveymonkey.com](http://www.surveymonkey.com)

## Appendix D

This appendix includes raw answers from the interview questions for the remaining eleven “Sighted General Public” respondents that were not included within the text of the document. The questionnaire is shortened to be made as brief and easy to read as possible.

### **Respondent #2: Anonymous**

Female, 18-24

Nanny

LOSE SENSE: Taste

IF BLIND: “I would have to make sure I kept everything in the same place, and I would need someone to drive me to work, where I'd probably be an editor or linguist (in Braille, of course).”

INTERACTION: “I have had many interactions with blind people, including once I went to a movie with a blind person and described the scenes as best I could to him.”

MISCONCEPTION: n/a

ACTIVITY: n/a

TO LEARN: n/a

### **Respondent #3: Mark Sweet**

Male, 25-34

Teacher

LOSE SENSE: Taste

IF BLIND: “I could still teach but I would need someone to get to and from work or anywhere else.”

INTERACTION: “I have. I introduce myself when I speak to them. Let them know of obstacles if we are walking around. But treat them pretty normally unless they need to read something like a restaurant menu.”

MISCONCEPTION: n/a

ACTIVITY: n/a

TO LEARN: n/a

**Respondent #4: Lawrence Pascual**

Male, 18-24

Student

LOSE SENSE: Smell

IF BLIND: "If I was completely blind I would want a seeing eye dog. I would probably want to work as a historical tour guide."

INTERACTION: "This one time I saw a dog inside a store and i wanted to play with it but then I realize it was a seeing eye dog... Awkward."

MISCONCEPTION: "Whether or not that person is actually blind or just wearing sunglasses."

ACTIVITY: "Go to an amusement park for a day."

TO LEARN: "How to deal with things you can't control, like being blind."

**Respondent #5: Anonymous**

Female, 55-64

Administrator

LOSE SENSE: Taste

IF BLIND: "I struggle imagining this. I imagine I would rely on others to help me with pretty much everything. My life would be nothing like it is now."

INTERACTION: "Yes, three blind women. One as a teenager and one as a middle aged woman and the other slightly younger. I always spoke greetings first so they each recognized my voice. I am always amazed that they get around so well walking, and need relatively little help with what they are doing. Each was/is a friend."

MISCONCEPTION: "That they are completely helpless."

ACTIVITY: "Telling stories or jokes."

TO LEARN: "to give up my pity party."

**Respondent #6: Anonymous**

Male, 18-24

Architect Intern

LOSE SENSE: Taste

IF BLIND: "I could not imagine being blind. I honestly don't know what I would do to get around, or carry out daily tasks."

INTERACTION: "Yes, my lab partner in high school was blind. He wanted to be treated equally by doing half the experiment but he would often knock the experiment over and force us to start over. It was very frustrating to have to stay after school multiple times a week to do and redo work."

MISCONCEPTION: n/a

ACTIVITY: n/a

TO LEARN: n/a

**Respondent #7: Athena Nobles**

Female, 18-24

Optical

LOSE SENSE: Taste

IF BLIND: "I couldn't do my job properly, I wouldn't be able to pretest the patients, take measurements for their glasses, work on the computer well. I would rely solely on touch and sound and would probably quit my job."

INTERACTION: "My friend has blind parents, (yes, both parents are blind). They are great people, you interact normally. The only difference is eye contact, they are blind, so they obviously can't do that."

MISCONCEPTION: "That being blind heightens other senses. That's not true, I've asked them before and they say it's not true."

ACTIVITY: "I'm not sure"

TO LEARN: "You can learn the value of having sight, other than that you can learn the same from them as anyone else"

**Respondent #8: Jamie Steward**

Female, 25-34

Auto Broker

LOSE SENSE: Taste

IF BLIND: "Wake up from the alarm, go to the rest room, shower, get dressed, have transportation arranged to get to work and an aide to assist with errands. maybe work in a call center/phone work, that i could use special computer software and keyboard to do my job, have transportation arranged to get home."

INTERACTION: "Yes. As a customer service provider. Assisting with guiding them to where we were going. Being descriptive with details on certain products and doing research for them when needed."

MISCONCEPTION: "That they need you to do everything for them and they are helpless."

ACTIVITY: "Wine tasting or food tasting, Pottery making class, concert"

TO LEARN: "Learning how to rely on your other senses"

**Respondent #9: Kim Fisher**

Female, 45-54

Teacher

LOSE SENSE: Smell

IF BLIND: "Cannot even imagine how to answer this question!"

INTERACTION: "Yes, just talked to him like usual. Felt kind of awkward, though, knowing her couldn't see me."

MISCONCEPTION: "Probably that blind people cannot do things others can do."

ACTIVITY: "Listening to music while visiting."

TO LEARN: "How to overcome obstacles and lead a full life."

**Respondent #11: Anonymous**

Male, 35-44

Bank Manager

LOSE SENSE: Smell

IF BLIND: "With the help of others."

INTERACTION: "Yes, I used to work with a person that was legally blind. Despite this, he was able to get to work on his own."

MISCONCEPTION: "That they are not capable of completing normal, everyday tasks."

ACTIVITY: "I would plan an excursion to the movies, then a meal with music of their choice."

TO LEARN: "Empathy, compassion, courage and perseverance."

**Respondent #12: Heidi Bargman**

Female, 35-44

Administrator

LOSE SENSE: Touch

IF BLIND: "Extremely difficult since I'm on a computer 99%of the day. I could get a talking computer but that would be the last sense I would want to lose."

INTERACTION: "Yes. At my 1st Home Depot store our phone center associate was blind. I often times had to walk him to the back of the store for breaks."

MISCONCEPTION: "They are incapacitated from doing anything."

ACTIVITY: "Maybe we could read together or learn braile together. That is what I did with the phone center associate."

TO LEARN: "The power of adversity."

**Respondent #16: Anonymous**

Male, 65-74

Retired

LOSE SENSE: Hearing

IF BLIND: "I would be in a constant panic mode as I have difficulty dealing with darkness and close spaces"

INTERACTION: "Yes. The experience was completely normal. We had pleasant conversations about music which we both enjoy."

MISCONCEPTION: "They are handicapped."

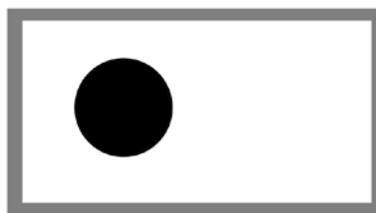
ACTIVITY: "A musical event."

TO LEARN: "Their heightened awareness of their surroundings based on their other senses."

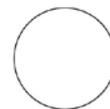
## Appendix E

A “School for the Blind,” discussed earlier in this document, hosts educational programs for blind children between the ages of 5-21. The scorecard shown in the table below gives evidence that this program is strong as a “Place for Learning” and “Place for Teaching,” but does not succeed in the integration, porosity, collaboration of the blind and sighted communities. Because of its inward focus, there is also a lack of social awareness in the surrounding community, shown in the figure below.

<b>SCHOOL FOR THE BLIND</b>	
Collaboration [blind + sighted]	2
- Youth	3
- Adults	2
Porosity [blind + sighted]	2
- Youth	1
- Adults	1
Social Awareness [blind + sighted]	2
- Youth	1
- Adults	1
Place for Learning	5
Place for Teaching	5
Place for Action	3
Place for Repose	3
<b>Total Score</b>	<b>30</b>



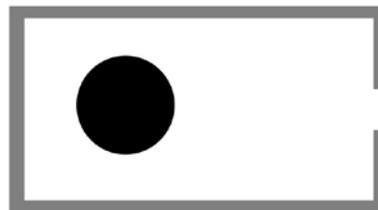
**blind**



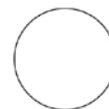
sighted

A “Center for the Blind” also discussed previously in this document, is a place where blind adults come to receive training and support from the blind community. There is a stronger sense of porosity and social awareness than in a school, since this program has more of an open-door policy; yet, there seems to be a potential for collaboration that is not yet fulfilled. Usually, the sighted general public do not enter these centers and the collaboration is left between the blind and the sighted who work in the building.

<b>CENTER FOR THE BLIND</b>	
Collaboration [blind + sighted]	2
- Youth	1
- Adults	3
Porosity [blind + sighted]	6
- Youth	1
- Adults	3
Social Awareness [blind + sighted]	6
- Youth	1
- Adults	3
Place for Learning	5
Place for Teaching	3
Place for Action	1
Place for Repose	5
<b>Total Score</b>	<b>40</b>



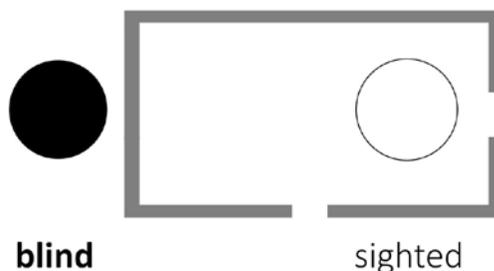
**blind**



sighted

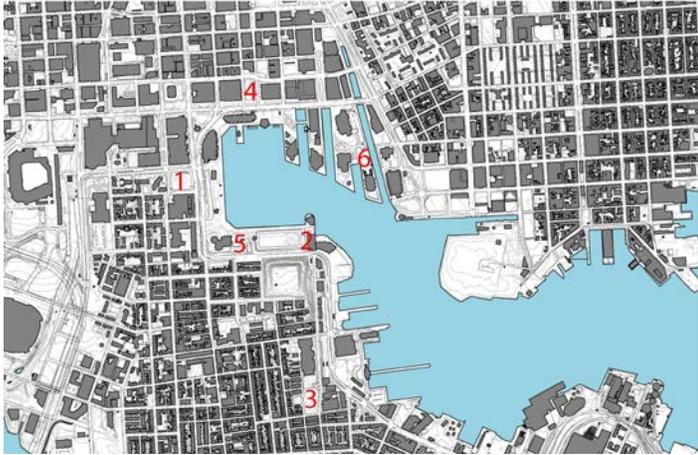
Research about the topic of perception happens in a “Perception Research Center,” although levels of collaboration between the blind and sighted general public are rather low. Research and teaching about visual perception occurs here to further studies of how people perceive the world. The doors are open to whoever wishes to enter, creating a decent amount of social awareness, but collaboration between those who work in the center and those who visit is rather weak. The blind general public may often feel as though they are outsiders unless heavily involved in the research in some form.

<b>PERCEPTION RESEARCH CENTER</b>	
Collaboration [blind + sighted]	2
- Youth	1
- Adults	3
Porosity [blind + sighted]	6
- Youth	1
- Adults	3
Social Awareness [blind + sighted]	6
- Youth	1
- Adults	3
Place for Learning	5
Place for Teaching	3
Place for Action	1
Place for Repose	5
<b>Total Score</b>	<b>40</b>



## Appendix F

This appendix includes detailed scorecards for the three lowest-scoring sites from Chapter 6: Site. Scorecards are in order from high to low scores. The key map of the whole Inner Harbor is included to find site locations quickly.



	<b>SITE 2</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	3
24/7 Activation	3
Street Wall + Edge	3
<b>Collaboration</b>	6
Safety	5
Noise levels	5
Sustainability	5
<b>Social Awareness</b>	6
Urban Impact	3
<b>EXTERIOR INFLUENCES</b>	
Tourism	6
Accessibility/Transportation	3
Approximate Uses	10
Controversy/Community Response	6
Urban Fill of Void	3
<b>TOTAL</b>	<b>67</b>

	<b>SITE 6</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	3
24/7 Activation	3
Street Wall + Edge	3
<b>Collaboration</b>	3
Safety	5
Noise levels	1
Sustainability	5
<b>Social Awareness</b>	6
Urban Impact	6
<b>EXTERIOR INFLUENCES</b>	
Tourism	6
Accessibility/Transportation	6
Approximate Uses	6
Controversy/Community Response	3
Urban Fill of Void	3
<b>TOTAL</b>	59

	<b>SITE 3</b>
<b>INTERIOR INFLUENCES</b>	
<b>Porosity</b>	3
24/7 Activation	1
Street Wall + Edge	3
<b>Collaboration</b>	6
Safety	5
Noise levels	5
Sustainability	3
<b>Social Awareness</b>	3
Urban Impact	1
<b>EXTERIOR INFLUENCES</b>	
Tourism	0
Accessibility/Transportation	3
Approximate Uses	0
Controversy/Community Response	0
Urban Fill of Void	3
<b>TOTAL</b>	36

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