

FALLING INTO MEMORIES:  
THE EVOCATION OF EMOTIONS AND RECOLLECTION OF MEMORIES  
THROUGH ARCHITECTURAL DESIGN

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## Dedication

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To my father, brother, grandmother, and grandfather, thank you for your unconditional love and care. Thank you for your patience, support, and guidance throughout my life. My deepest memories of you were the inspiration to this project.

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## ABSTRACT

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A forest floor is illuminated by streams of light passing through the intricate lattice of leaves and branches of its inhabitants. This space between the canopy and the brush is one of the first forms of shelter utilized by man. Nature is able to maintain its well-being by visually communicating emotions in order to foster an unspoken, compassionate relationship with man. However, our own architecture rarely seems to pay attention to the mental well-being of its inhabitants like the natural world is apt to. Driven by aesthetics, flexibility, and financial return, it often lacks the necessary characteristics and qualities for humans to develop this intimate relationship. The purpose of this project is to use human psychological sciences to develop an architectural design with the aim of eliciting memories by means of visual psychological triggers and emotionally driven dialogue between visitors and their built environment. This involves the investigation of memory formation, memory recognition, and an in-depth look at human emotions and their relationship to human perception. Research reveals that memory is strongly correlated to the way one perceives, senses, interacts and emotionally feels within their environment. Nevertheless, memory recollection only occurs with an individual's perception of their current setting in comparison to a threshold of characteristics of past events.<sup>1</sup> This project will also examine the six universally evident emotions and their incorporation in built and natural settings in order for them to be applicable to all users. With the implementation of these concepts to architecture, the Memory Recollection Center will exhibit architecture's ability to have a profound effect on human perception.

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<sup>1</sup> Bartsch, Renate. 2005. *Memory and Understanding: Concept Formation in Proust's*. Amsterdam: John Benjamins Publishing Co.



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## INTRODUCTION

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How does one go about describing their experiences in life? Everything significantly positive and negative that an individual has ever been through is like a collection of stories embedded within their minds. These memories have played a significant role in shaping us to be the people we are today. Unfortunately it is not often that we can fully reflect on the most significant and impactful parts of our lives.

Falling into Memories discusses architecture that is cultivated towards the remembrance of life's events as well as supports the need for humans to have a deeper relationship with their built environment. This project intends to broaden the existing knowledge of psychology and its relationship to architecture so that our built environment can emotionally connect with us. Architecture has been following a narrow path paved solely for economic feasibility, financial return, and insignificant aesthetical pleasures. Designs are meant to make use of every single square foot on a site, placing the highest priority on economic return rather than on the psychological benefit of its users.

In an effort to target a solution to this problem, this project takes an interpretive look at the psychological sciences behind memory construction and memory recognition, as well as universal human emotions. The creation and recollection of memory is strongly connected to human perception as well as emotions, so there is a section dedicated to explaining the psychological effects of color and lighting, and also the elements of lines, space, shapes, and forms. It continues with an analysis of three case studies that each has the intent to evoke emotions and trigger memories.

The creation of the proposed Memory Recollection will establish a destination that is made for the purpose of triggering and bringing back memories based on a framework intended to evoke positive emotions. The final chapters of this project will explain the process of applying human psychological sciences to architectural design in the actualization of this Memory Recollection Center.

## CHAPTER 1. UNDERSTANDING MEMORY

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The goal of this dissertation is to determine a way for architectural design to be able to trigger the recollection of memories. To aid in the completion of the targeted research, this chapter defines and explores the creation and recollection of memory.

### 1.1 LONG-TERM MEMORY

When we think of memory, it is commonly understood as remembering something that has happened in the past. Long-term memory can be broken down into two types: declarative and non-declarative.<sup>2</sup>

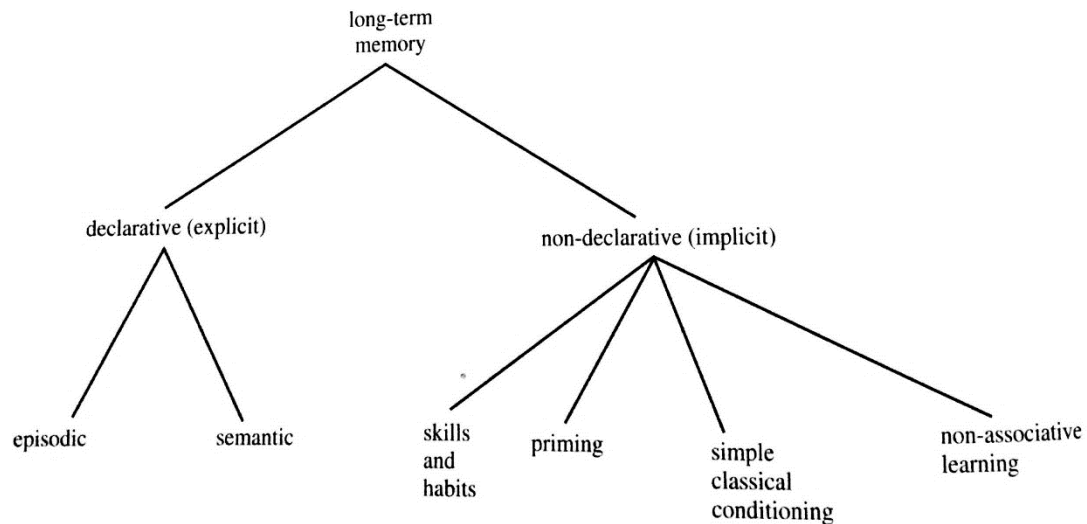


Figure 1. Long-term memory diagram. Source: Baddeley, Alan, John P Aggleton, and Martin A Conway, 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 4.

“Declarative memory refers to the conscious recollection of events (episodic) and facts (semantic).”<sup>3</sup> Whereas non-declarative memory refers to the unconscious types of memory such as motor skills. This project’s main focus is on remembering past events in our lives, which uses our declarative memory.

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<sup>2</sup> Baddeley, Alan, John P Aggleton, and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 4.

<sup>3</sup> Baddeley, Alan, John P Aggleton, and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 4.

## 1.2 EPISODIC MEMORY

Episodic memory, a type of declarative memory, is capable of doing what other forms of memory cannot: it allows an individual to mentally travel into their past.<sup>4</sup> During this process, the individual recalling these episodes always experiences them as an observer and as an actor. Events in these cases are made up of interactions with animate and inanimate objects in a particular setting. When the memory is later recalled, the individual usually visualizes the event as a series of scenes. Sometimes, certain experiences become strongly associated with emotional responses such as fear or joy; when a person recalls this memory, it is possible that they may experience that emotion again. Episodic memories are usually remembered in a logical way due to semantics, which enables our minds to store the information as long-term memory. Generally put, events that are remembered later are initially, experienced consciously as a series of perceptual and semantic representations of objects, which includes the experiencer, interacting with space and time.<sup>5</sup>

Episodic memory recollection is usually intentional and requires effort, but sometimes it can happen unintentionally. The recollection of a similar experience can be triggered automatically with a particular thought or perception of something. This is commonly known as *déjà vu*.<sup>6</sup> Using architecture, it is possible to influence the way a person perceives and what they perceive in order to achieve this sort of involuntary episodic recollection.

## 1.3 MEMORY RECOLLECTION

One way to look at the elicitation of memory is by looking at it as the past and embracing each other. "In the experience of recognition, perception and remembrance merge into each other. In recognizing a place or an object, the recollection of an image is connected with courses of actions or movements."<sup>7</sup> To

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<sup>4</sup> Baddeley, Alan, John P Aggleton, and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 5.

<sup>5</sup> Ibid, 86-87.

<sup>6</sup> Ibid, 101.

<sup>7</sup> Bartsch, Renate. 2005. *Memory and Understanding: Concept Formation in Proust's*. Amsterdam: John Benjamins Publishing Co, 70.

better understand this concept, there are two separate processes regarding episodic memory recollection: recollection and familiarity. "Recollection is assumed to reflect a threshold process whereby qualitative information about the study event is retrieved, whereas familiarity response criterion are accepted as having been studied."<sup>8</sup> The following table is a short example of the differences between the processes of familiarity and recollection.

FAMILIARITY	RECOLLECTION
GREEN	<del>GREEN</del>
COLD	<del>COLD</del>
BRIGHT	<del>BRIGHT</del>
JOHN DOE	?JOHN DOE?
CARROT	<del>CARROT</del>
VACUUM INSULATOR	?VACUUM INSULATOR?
LOUD	<del>LOUD</del>

Table 1. Memory Recognition Process. Made by author

In this example, a person walks into a space that has elements that are green, cold, bright, and loud, and has objects such as a John Doe, a carrot, and a vacuum insulator. The familiarity process is when their mind automatically starts to analyze if they know what these things are. It is then followed by a recollection process, during which the mind then runs through a checklist of everything they have ever experienced. In the case above, the individual recognizes the green, cold, bright, carrot, and loud things, but does not recognize John Doe or the vacuum insulator. Since this process works according to a threshold, if enough familiar points of the environment or situation is met, this further leads to a recollection of when the person saw/experienced these things before.

Looking at the field that contains indicators relative to episodic memory, we can see that it is closely connected with emotional, proprioceptual, sensorial, routine,

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<sup>8</sup> Baddeley, Alan, John P Aggleton , and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 31.

and motor fields. These are the fields from which memories of events can be induced,<sup>9</sup> and can also be manipulated by natural and built environments. By utilizing the fields of episodic memory towards architectural design, a control point can be established to effectively influence a person's recollection of memories in a particular space. In this way, the built environment can be programmed to control the way a person moves through a space, and, if choreographed correctly, can greatly influence the emotions of the person experiencing it.

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<sup>9</sup> Bartsch, Renate. 2005. *Memory and Understanding: Concept Formation in Proust's*. Amsterdam: John Benjamins Publishing Co, 21.

## CHAPTER 2. SIX UNIVERSAL EMOTIONS

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Emotions are strongly tied to memory, as well as the way we perceive and react in response to stimuli in our environment.

"An emotion-producing event, such as a failure, occurs and produces both an affective state and a set of relevant cognitions (e.g., self-devaluation). The cognitions produced by the event the directly prime, or semantically cue, other items in long-term memory (e.g., life experience) that are associated with them, thus increasing their recall accessibility."<sup>10</sup>

Because of the nature of emotions, they can influence and determine the type of memories we recall. An online article out of Cornell University, *Six Universal Emotions*, states that all humans have six universally evident emotions: happiness, sadness, anger, fear, disgust, and surprise.<sup>11</sup> This means is that these emotions have always affected people, transcending culture and time. People displaying each emotion share similarities in specific facial expressions, or physiological expressive patterns, and a distinct subjective or phenomenological quality. None of these three characteristics can function as an emotion on its own: each of them are a component of an emotion.<sup>12</sup>

This chapter explores and describes the six universal emotions. Using these emotions, a conclusive base can be developed for emotion-evoking architectural design. Having these universal emotions as a basis will allow this design to influence a greater part of society.

### 2.1 HAPPINESS

Happiness is understood to be one of the greatest experiences. It has very significant purposes in our lives, because it plays a role in many aspects of our

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<sup>10</sup> Rholes, William S., John H. Riskind, and James W. Lane. 1987. "Emotional states and memory biases: Effects of cognitive priming and mood." *Journal of Personality and Social Psychology*, 92.

<sup>11</sup> Hung, Daniel D, and Heji Kim. 1996. *Six Universal Emotions*. April 20. Accessed April 1, 2014. <http://www.nbb.cornell.edu/neurobio/land/oldstudentprojects/cs490-95to96/hjkim/emotions.html>.

<sup>12</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 83.

thoughts and actions.<sup>13</sup> Although happiness is indeed a much-coveted emotion, it is not something that is desired continuously. This emotion is more so a by-product of events and conditions rather than the result of direct efforts to obtain it. It gives you the feeling that you are capable of coping with the problems and pleasures of life. This emotion is also accompanied by some form of momentary self-contentment, as well as contentment with others and with the world.<sup>14</sup> An active state of happiness is characterized by a sense of confidence, meaningfulness, and a feeling of being loved. Another state of happiness is receptive joy, which is a feeling of trust and acceptance of the surrounding world.<sup>15</sup>

### **Neural Activation of Happiness**

In the brain, happiness is activated by a sharp reduction in the gradient of neural stimulation.<sup>16</sup> Happiness is an emotion that is activated by a sharp reduction in the gradient of neural stimulation. According to this principle, whatever emotion that can describe a person's current or ongoing experience has to have a decrease in the density of neural firing in order to experience joy. For example, if a father tosses his baby up in the air, the baby will feel excitement on the way up and it will feel joy when it comes back down to rest in his/her father's hands. This is a simple example of how joy is activated through increasing and then decreasing stimulation.<sup>17</sup> With that in mind, one must also understand that the feeling of happiness will only occur if the individual knows they are in a safe and secure environment. In the case of the baby and the father, if the father tosses his child in the air and does not catch him/her, the fall will then become associated with negative emotions.

### **Biological Significance of Happiness**

Happiness serves our species in a number of biological ways. First, happiness regulates social responsiveness; the reason for this is because there is an evolutionary and biological value for humans to exist in social groups. Secondly, this emotion offers relief from negative emotions. For this same reason, it can also cause

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<sup>13</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 240.

<sup>14</sup> Ibid, 244.

<sup>15</sup> Ibid, 86.

<sup>16</sup> Ibid, 86.

<sup>17</sup> Ibid, 242.

attachment, commitment, or addiction to objects that have helped reduce or eliminate negative emotions. By promoting attachment and social responsiveness, happiness creates the social framework from which people can learn to become fully functional human beings in a society.<sup>18</sup>

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<sup>18</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 244.



<b>Antecedents of Joy</b> <b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
1. Enjoyment	31.5
2. Relieved, Problems, Relaxed, Comfortable	26.9
3. Self-Confident, Successful	25.4
4. Accepted and needed, have something to offer	11.5
5. Other	4.6
<b>Thoughts</b>	
1. Of pleasant, happy times	26.9
2. Of a particular person, or activity	23.8
3. Of people, special activities	21.5
4. About own capability, success	12.3
5. About goodness of life and future	6.2
6. Of being accepted and needed, having something to offer	3.8
7. Other	5.4
<b>Actions</b>	
1. Doing one's favorite thing	32.3
2. Doing well, one's best	28.5
3. Helping others	14.6
4. Doing something with a particular person	11.5
5. One's duty	6.9
6. Being involved in something stimulating	4.6
7. Other	1.5

Table 2. Antecedents of Joy. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 261.

## Phenomenological Experience of Happiness

The phenomenon of happiness and the different ways it can be experienced can be described through the parallels of activeness-passiveness, individuation-affiliation, and excitement-serenity. Activeness is seen as a characteristic that is felt when one plays an active role in events that bring about joy during the experience. Passiveness is what one feels when they feel comfortable in their surrounding environment. Individuation is a feeling that the self is distinct and separate from the surrounding world. Affiliation is described as the aspect of happiness that is caused by from communal participation, where there is a sense of oneness with the persons, objects, or events in the surrounding world. The excitement aspect is characterized as a feeling of vigor related to being alert. Serenity is defined as a relaxed peacefulness, an absence of muscular tension, and a tendency to experience the world with a sense of harmony.<sup>19</sup>

Happiness increases a one's ability to appreciate the world; the person is more likely to see beauty and goodness in nature and in others than negativity and ugliness. When a person is joyful, they are more likely to appreciate an object for what is it than be critical or analytical of it. They may even see that object as an enhancer to their personal well-being.<sup>20</sup>

Happiness can make you feel that you have a distinctive bond between yourself and the world. This is an extraordinary bond because it goes way beyond just seeing the world and one's self with a positive attitude; it can be described as a keen sense of affinity or oneness with the object affiliated to the emotion and also with the world. This emotion is often accompanied by feelings of strength and vigor. It has been proven many times through research as well as personal experience that the combination of happiness and this drive are further associated with the feelings of confidence and competence.

This emotion is likely to be complemented by a feeling that you are more than or distinctly different from your usual self. In moments of ecstasy, people usually feel light and bouncy, or almost like they can fly. Everything takes on a different

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<sup>19</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 264.

<sup>20</sup> Ibid.

perspective because of your slightly altered state of mind. Some people have stated that in extreme levels of happiness, they tend to lose their individual identity, resulting in mystical experiences associated with meditation.<sup>21</sup>

## **2.2 SADNESS**

Sadness and distress are generally considered one and the same. Distress is a very important fundamental emotion that serves key biological and psychological functions. It is also the most common negative emotion. Sadness is caused by a change in density level of stimuli. It happens when there is a continual level of excessive stimulation. There are numerous stimuli that can cause of sadness, such as changes in temperature, pain, loud noises, or bright lights. It can also be triggered by feeling disappointed in one's self, disappointed in another person, failure, loss, and death.

Sadness/distress is also the key component of grief and depression. Grief is typically a reaction one feels when they lose something. This can mean a temporary separation from a person, object, or situation, or a more permanent separation, such as the death of a loved one.<sup>22</sup> Other feelings associated with this emotion include downheartedness, feeling discouraged, lonely, out of touch with people, or general misery.<sup>23</sup>

One of the most common causes of sadness is physical or psychological separation. A human typically experiences their first moments of distress as an infant when he/she is physically separated from their mother. As the child goes through life, separation becomes innately associated with this emotion. For example, whenever people have to physically leave their family, friends, or loved ones, they might experience feelings of distress. Even psychological separation, such as language barriers between people or even a person just feeling left out of a conversation, can cause these feelings.

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<sup>21</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 270-271.

<sup>22</sup> Ibid, 288.

<sup>23</sup> Ibid, 286-287.

Another common cause of sadness is failure. This can mean the inability to live up to one's own standards or the standards set by others, whether it be physical or psychological. People can have different perceptions of what is deemed a "failure". For example, one person could view a "B-" grade as gravely unsatisfactory, while someone else might find it a moderate success.<sup>24</sup>

### **Psychological Functions of Sadness**

There are four psychological functions of sadness. The first function communicates to one's self that they are not alright. The person will draw the attention of others in order to let them know their unhappiness with audio and visual cues. To do this, the person exhibits a sad face or even starts to cry until they are offered assistance. The second function of this sadness will prompt a person to take him or herself away from or adjust their relationship with the problem. The third function directs people toward negative motivations. This function causes us to be responsive to our own problems as well as the problems we see in our environment. For example, if a person has a problem with public speaking, he or she will have this problem until the problem is solved. Instead of sparking a desire to improve on his or her public speaking ability, the person will instead avoid it and the fear will never get overcome. Without the last function of sadness, people would not be able to believe that the existence of happiness would be possible. This function causes us to have the desire to be close to our friends, family and loved ones. To explain: when we lose someone close to us, the force that binds us to others we feel close with are also associated with that person we've lost. Without this bond, it is plausible to say that the world would be absent of joy and love.<sup>25</sup>

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<sup>24</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, Ibid, 286-287.

<sup>25</sup> Ibid, 288.

<b>Antecedents of Sadness</b> <b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
1. Distress, Sadness, Discouragement	33.9
2. Feeling lonely, isolated, rejected	30.9
3. Physically, mentally upset	14.0
4. Feelings of failure, disappointment in self, incompetence, inadequacy	13.2
5. Other	9.5
<b>Thoughts</b>	
1. About a specific personal problem	42.0
2. About failure, incompetence, etc.	19.8
3. Of sadness, death	16.7
4. About loneliness, rejection	8.7
5. Other	13.2
<b>Actions</b>	
1. Something stupid, a mistake	36.1
2. Something to hurt others	15.9
3. Others impose their will on subject	11.9
4. Something morally, legally wrong	7.1
5. Passive, does nothing	7.1
6. Retreat, withdraw	5.5
7. Other	16.7

Table 3. Antecedents of Sadness. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 302-303.

## 2.3 ANGER

Anger is often a result of physical or psychological restraint, which may be in terms of physical barriers, rules, regulations, or one's own inabilities. However, if the restraints are indirect or disguised, the initial response may not always be anger. Anger may also result from interference with a goal-oriented activity. A barrier that prevents the achievement of a highly desirable goal will almost certainly result in anger. While low levels of anger may be possible to suppress, doing so for a long period of time will be at a cost to the person's health and runs a risk of a future explosion of rage.<sup>26</sup>

Other causes for anger include personal insults, everyday frustrations, interrupting of personal interests, being taken advantage of, and being forced to do something undesirable. While these things may elicit anger in many people, individual and cultural differences need to be considered. Some of these situations may evoke other emotions, or even additional emotions on top of anger. Most causes of anger are a function of personal experiences, cultural conditioning, and learning; there are not many situations that cause anger. Sadness/distress that has not been addressed is also an activator of anger.<sup>27</sup>

### Neural Activation of Anger

Anger is a density-level emotion. Its neural activation happens as a result of a moderately high and constant level of neural activation. A steady level of neural stimulation similarly activates sadness and distress, which is why extended periods of distress can increase the chances of becoming angered. An actively angry person's face becomes hot, their muscles tense, and this energy induces a feeling of power, an increase in confidence, and an impulse to attack. Anger has played a huge role in the evolution of human beings, but its positive functions have become less noticeable. Nowadays, anger can be justified when it supplies an added source of strength and courage necessary for a person to respond to oppression or a life-threat.<sup>28</sup>

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<sup>26</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 329-330.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid, 330.

<b>Antecedents of Anger</b> <b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
1. Of being misled, betrayed, used, disappointed, hurt by others	40.8
2. Anger-rage synonyms	17.6
3. Hatred, dislike, disapproval of others, detrimental thoughts	12.0
4. Aggressive, revengeful, like attacking others	8.0
5. Of failure, disappointed in self, self-blame, inadequacy	5.6
6. Sense of injustice in world	3.2
7. Distress-anguish synonyms	.8
8. Other	12.0
<b>Thoughts</b>	
1. Of hatred, dislike, disapproval of others; detrimental thoughts	31.2
2. Of being misled, betrayed, used, disapproved, hurt by others	19.2
3. Of having failed, disappointing self, blaming self, inadequacy	10.4
4. Injustice, world problems	10.4
5. Of destruction, revenge	14.4
6. Irritating, things go wrong	8.0
7. Other	6.4
<b>Actions</b>	
1. Something wrong, stupid	34.4
2. Something violent, rash, let off steam	16.8
3. Something unappreciated by others	12.0
4. Something that you don't want to do, others impose their will	8.8
5. Aggression, revenge	8.0
6. Something legally or morally wrong or harmful	7.2
7. Other	12.8

Table 4. Antecedents of Anger. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 334-335.

## 2.4 DISGUST

Disgust often occurs together with anger, but it has some distinct motivational-experiential features of its own. Physical or psychological deterioration, such as something rotting, tends to cause disgust. When feeling disgusted, one may feel like there is a bad taste in your mouth, and in intense disgust, it might feel as though you are sick to your stomach. Disgust combined with anger may motivate destructive behavior; anger can motivate ideas of attacking and disgust suggests the idea of getting rid of the particular object. However, disgust can also prove to be beneficial in some cases. Disgust with pollution, destruction of nature, and malicious wasting of natural resources may help motivate people to actively work towards creating a healthier atmosphere and ecology.<sup>29</sup>

Typically, when something disgusts us we usually want to either get rid of it or change it in such a way that it is no longer so abhorrent. In evolution, disgust probably helped motivate organisms to keep their environment sufficiently sanitary enough for their health and also prevented them from consuming contaminated food and water. In the same way, disgust probably motivates us to keep our own bodies healthy. Social standards may lead to rejection and isolation of individuals that give the impression of being disgusting, such as having a dirty, unkempt appearance or giving off body odor.<sup>30</sup>

A person can direct feelings of disgust towards things, ideas, other people, or even themselves, however, self-disgust can lower self-esteem and cause self-rejection.<sup>31</sup> For example human body odors or the appearance of bad hygiene tends to be disgusting to the others as well. In other cases disgust becomes combined with anger which will motivate destructive behavior. The reason for this is anger can motivate ideas of attacking and disgust suggests for the idea of getting rid of the particular object.

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<sup>29</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 86.

<sup>30</sup> Ibid, 336-337.

<sup>31</sup> Ibid, 337.



<b>Antecedents of Disgust</b> <b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
1. "Sick of something," repelled, tired	27.7
2. Of failure, disappointment in self, anger toward self, incompetency	26.8
3. Of dislike, disapproval of actions of others	17.7
4. Disgust synonyms	6.9
5. Distress synonyms	6.9
6. Anger synonyms	3.8
7. Contempt synonyms	3.1
8. Other	4.6
<b>Thoughts</b>	
1. Of hatred, dislike, disapproval of actions of others	24.6
2. Of failure, disappointment in self, anger toward self, incompetency	22.3
3. War, politics, racism	20.8
4. Smelly, unpleasant things	14.6
5. Unclear thoughts	4.6
6. Lonely, isolated, rejected	3.8
7. Other	5.4
<b>Actions</b>	
1. Blames self	30.8
2. Something wrong, stupid, a mistake	25.4
3. Has to do something unpleasant, others impose their will	15.4
4. Does something unappreciated by others	12.3
5. Does something legally or morally wrong or harmful	10.8
6. Other	5.4

Table 5. Antecedent of Disgust. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 334-335.

## **2.5 FEAR**

Fear is a powerful emotion that affects every human being. It can burn into our minds certain experiences where fear was a huge factor, and for that reason fear is the most toxic of all the emotions.<sup>32</sup> This emotion commonly exists in memories or experiences that are not often forgotten. It can be re-experienced through dreams and the recollection of memories. Fear is a very negative and powerful emotion, and at its most intense form is even capable of killing a person.

Fear is initiated by a rapid rise in the density of neural stimulation, stemming from real or imagined danger. A strong form of fear accompanies anxiety, uncertainty, a reduced sense of safety, and imminent disaster. This energy can enable an individual to respond by instinct in order to escape from danger. A rare version of this emotion is extreme fear, which is capable of paralysis.<sup>33</sup>

### **Neural Activation of Fear**

At the neurophysiological level, fear is a density-increase emotion; it is activated by a very rapid rise in the concentration of neural firing. Fear-terror is one of three density-increasing emotions, the other two being surprise-startle and interest-excitement. The natural and learned behaviors of these three emotions has prepared the human being for every major incident of stimulation increase. The quickest and severest increases in density of neural firing activates a feeling of being startled. The next sharpest increase of stimuli triggers fear.<sup>34</sup>

### **The Causes of Fear**

Fear can be triggered internally (psychologically) or externally (physically). "The cause of fear may be either the presence of something threatening or the absence of something that provides safety and security."<sup>35</sup> There are conditions outlining this emotion that result in various ways in which it can be set into motion. Four categories that can stimulate fear are "environmental events or

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<sup>32</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 355.

<sup>33</sup> Ibid, 90.

<sup>34</sup> Ibid, 356.

<sup>35</sup> Ibid, 357.

processes, drives, other emotions, and cognitive processes, such as thinking, remembering, and imagining.” The causes of these are either innate or learned.<sup>36</sup>

Environmental events can result in either an innate or cultural fear. Instinctive fear can be categorized into four groups: “intensity, novelty, special evolutionary dangers, and issues coming from social interaction.”<sup>37</sup> An example of an intense stimulus would be the sound of thunder striking in the middle of the night. Novelty would be something unfamiliar, such as a stranger, or the absence of something which is expected, for example, a child who waits after school for their mother to pick them up and the mother fails to arrive. The fear of heights and darkness are examples of evolutionary dangers, of which humans have created many technological advances to protect themselves against death. Forms of fear related to social interaction are commonly observed in populated areas, where fear can be caused by a verbal or physical threat.

Fear that is learned culturally can sometimes be the result of an innate response. “For example being frightened of imaginary monsters, thieves, and ghosts is an example of fear being afraid of the dark. Another example could be a person rationalizing the fear of guns on the basis that they could be shot by one.”<sup>38</sup>

Drives and homeostatic processes are the least significant in relation to the cause of fear. A drive becomes psychologically essential when it rises to a point where it indicates a life-threatening deficit and activates emotion. In some of these cases the emotion activated is fear. For example, when a person desperately needs air enough to require a drive activation, it also activates an immense fear reaction, which quickly reaches a sense of panic if the obstacle causing the drive activation is not removed.<sup>39</sup>

Other emotions can be a cause of fear as well. At a neurophysiological level, excitement and the feeling of being startled has the possibility of activating a sense of fear. A basic interest-surprise-fear relationship derives from similarities in the neurophysiological mechanisms underlying these emotions. Specific excitement- or

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<sup>36</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 357.

<sup>37</sup> Ibid, 358.

<sup>38</sup> Ibid, 359.

<sup>39</sup> Ibid, 362.

surprise-fear connections may be learned. Any of the other emotions may also become learned activators of fear. Of course, fear itself is an innate activator or amplifier of fear. Thus, the experience of fear is frightening.<sup>40</sup>

Cognitive processes make up the most basic universal causes of fear. For example, the fear of a certain object can be related to the mental reconstruction of that object in a person's memory. However, sometimes the mental reconstructions can be inaccurate, so it is possible that a person might be afraid of the wrong situation or multiple situations, and possibly even life. The anticipation or memory of fear is enough to activate it. If a child mistakenly identifies a person and associates them to a source of fear, the child will anticipate the meeting of this person, object, or situation. In this case, the person, object, or situation may become a source of fear through the child's own hypothetical theory. A person's own mind has a really powerful ability to evoke fear, enough that they are literally capable of scaring themselves.<sup>41</sup>

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<sup>40</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 363.

<sup>41</sup> Ibid.

<b>Antecedents of Fear</b>	
<b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
6. Threatened, in danger, in trouble, overpowered	31.2
7. Fear Synonyms	26.4
8. Alone, lost, isolated, rejected	16.0
9. Threat to self-esteem, impending, failure, feels inadequate	15.2
10. Other	11.2
<b>Thoughts</b>	
6. Of threatening, danger, or trouble	36.8
7. Of death, loneliness, sadness	28.0
8. Of loss of self-esteem, failure, of being inadequate	19.2
9. Of things not understood (supernatural, etc.)	4.0
10. Other	12.0
<b>Actions</b>	
8. Something legally or morally wrong, harmful	32.0
9. Something dangerous	22.4
10. Something that threatens self-esteem	20.0
11. Panicky, irrational things	8.0
12. Trying to escape, run away, withdraw, protect self	7.2
13. External force (caught using drugs, drafter, etc.)	5.6
14. Other	4.8

Table 6. Antecedents of Fear. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 372-373.

## **2.5 SURPRISE**

Every self-aware living organism is familiar with the feeling of surprise, but it is quite difficult to define. One particular reason that this emotion is hard to describe is due to it being a very short-lived feeling. The main reason for its inexplicability is because the mind appears to be blank in the moment of surprise. Normal thought processes seem to be put on pause. In the moment of surprise, you do not know exactly how to react. There is a feeling of uncertainty created by the sudden unexpected event.<sup>42</sup>

### **Neural Activation of Surprise**

Surprise is activated by a sharp increase in neural stimulation. The external condition for surprise is any sudden and unexpected event, such as a clap of thunder, the boom of fireworks, or the unexpected appearance of a friend.<sup>43</sup> Surprise is an emotion that is always in a short-lived state. This emotion has a very useful purpose in the nervous system: it frees the mind of its current intrinsic and cognitive state so that the individual can respond properly to the present situation and the unforeseen change he or she has just gone through.<sup>44</sup>

### **Significance of Surprise**

Surprise is a very momentary feeling: it comes and goes away quickly. Unlike other emotions, surprise does not motivate behavior for long periods of time. Its primary function is to help prepare the individual to effectively deal with the new or sudden event as well as the consequences of it. It clears the neural pathways for new and different activity.<sup>45</sup> From an instinctual standpoint, it is important for a person to be able to deal with sudden changes; failure to do so with the sudden appearance of, for example, a predatory animal, could end up fatally.<sup>46</sup>

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<sup>42</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 277-278.

<sup>43</sup> Ibid 277.

<sup>44</sup> Ibid, 280-281.

<sup>45</sup> Ibid, 86.

<sup>46</sup> Ibid, 280-281.

<b>Antecedents of Surprise</b> <b>Approximately 130 College Students Analyzed</b>	
<b>Responses</b>	<b>% of Subjects Giving Response</b>
<b>Feelings</b>	
1. Surprise synonyms: startled, shocked	31.4
2. Unexpectedly aware of something	22.3
3. Lost, Bewildered, Confused	12.4
4. Physically/ mentally stimulated	8.3
5. Misled, hurt, used by others	7.4
6. Distress synonyms: depressed, sad	4.6
7. Shame synonyms: embarrassed, shy	.7
8. Other	12.4
<b>Thoughts</b>	
1. Something wrong, stupid	27.3
2. Of some specific person, activity	23.9
3. Unexpected awareness	19.8
4. Something original, creative	16.5
5. Other	12.4
<b>Actions</b>	
1. Something original, creative	33.9
2. Unexpected success or failure	33.1
3. Something stupid, makes mistake	15.7
4. React to stimulus	7.4
5. Other	9.9

Table 7. Antecedents of Surprise. Source: Izard, Carroll E. 1977. Human Emotions. New York: Plenum Press, 281-282.

### CHAPTER 3. THE EFFECTS OF COLOR ON EMOTIONS

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"Color is stimulating, calming, expressive, disturbing, impressional, cultural, exuberant, symbolic. It pervades every aspect of our lives, embellishes the ordinary and gives beauty and drama to everyday objects. If black-and-white images bring us the news of the day, color writes the poetry."<sup>47</sup>

Understanding the perception of color on the conscious and subconscious levels is beneficial as a design tool because it will allow for its applicability to architecture. The combination of color psychology and architecture can provide for a very pliable environment.

#### 3.1 THE EXPERIENCE OF COLOR

Color is experienced through a visual sensory process. Colors are seen due to a physiological response to a light stimulus. People today experience color in two different ways. Color can be perceived as direct light and reflected light. An example of direct light is the colors from a monitor screen. Reflected light can be thought of as the colors from the physical world such as printed pages, objects, and the environment.

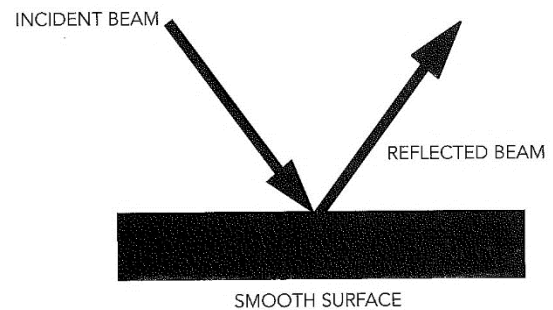


Figure 2. Diagram of Reflected Light. Source: Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers Third Edition*. Hoboken: John Wiley & Sons, Inc., 20.

Seeing direct light is a very simple and straightforward process: light touches the eyes directly from a light source. With reflected light, the visual process is more intricate. As illustrated in the figure here, the colors of the physical world are seen indirectly; light is reflected from a surface, which causes us to see specific colors. As opposed to direct light, reflected light is a cause and effect process where the light is the cause of the color,

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<sup>47</sup> Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers Third Edition*. Hoboken: John Wiley & Sons, Inc, 2.



the colorants, such as paints or dyes, are the resources used to produce color, and the colors are seen as the effect.<sup>48</sup>

"Only light generates color. Without light, no color exists. Light is visible energy that is emitted by a light source. A light source can be any one of a number of things: the sun, a luminous panel, a neon sign, a light bulb, or a monitor screen. The eye is a sense organ that is adapted to receive light. The retina of the eye receives the energy signal and transmits it to the brain, where it is identified as color."<sup>49</sup>

The visible energy emitted from light sources come in pulses or waves. Light energy is emitted at different frequencies or in simpler terms different distances apart. The distance from one peak to the next peak of a wave is called wavelengths which are measured in nanometers (nm).

Our human eye is able to detect light energy wavelengths that range between 380nm to 720nm. On a graph red is the longest visible wavelength (720nm), following by orange, then yellow, green, blue, indigo and violet, ending with the shortest visible wavelength being at 380nm. The acronym for the wavelengths of the visible spectrum is ROYGBIV. Beyond this range are colors that are not within the visible spectrum for humans. Some common colors that we are only capable of seeing with technical devices are infrared and ultraviolet.

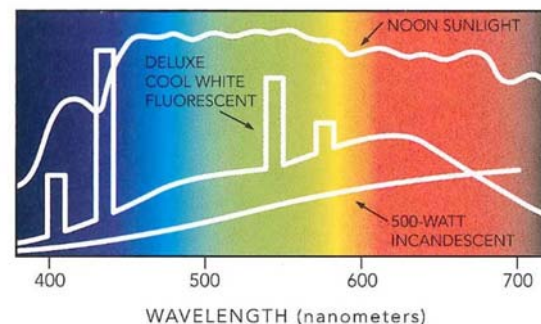


Figure 3. Visible Light Spectrum Wavelengths. Source: Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers Third Edition*. Hoboken: John Wiley & Sons, Inc, 13.

The experience of color is best visualized as a pyramid with six levels, as seen below:

"personal relationship,

<sup>48</sup> Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers Third Edition*. Hoboken: John Wiley & Sons, Inc, 2-3.

<sup>49</sup> Ibid, 13.

influence of fashion, styles and trends,  
cultural influences and mannerisms  
conscious symbolism-association  
collective unconscious  
biological reactions to a color stimulus"<sup>50</sup>

The bottom and largest part of the pyramid houses the innate, physiological, and unlearned responses to color. The next tier up is the collective unconscious, which refers to universal and cross-cultural responses. This, for example, can refer to the color yellow being associated with the sun.

The next two levels are responses to color that are learned. Colors can have a particular meaning and are able to symbolize and be associated with non-color ideas. For example, the United States Congress Occupational Safety and Health Act of 1971 uses colors to communicate safety information. It uses colors such as red for fire-fighting equipment, violet for radiation hazards, and yellow for school buses.<sup>51</sup>

Different cultures might associate different meanings to different colors. In many Western cultures the color white is a symbol of purity, whereas in India the color white is associated with mourning. Cultural color associations have the potential to be ingrained into the subconscious memory of individuals.

Colors can also be associated with other ideas unrelated to symbolism or cultural influences. For example, the color green can be associated with the environment while blue can be associated with the sky and water. Red can be associated with all kinds of ideas relating to fire and passion.<sup>52</sup>

At the top of the pyramid is "personal relationships." This is where the experience of color can enter into the unconscious memory, and later the deeply embedded association can create an emotional, subconscious response to certain

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<sup>50</sup> Mahnke, Frank H, and Rudolf H Mahnke. 1987. *Color and Light in Man-made Environments*. New York: VNR, 11.

<sup>51</sup> Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers Third Edition*. Hoboken: John Wiley & Sons, Inc, 40.

<sup>52</sup> Ibid, 41.

colors. Here is an example: John hates celery but his aunt makes him eat it anyway in her orange-colored kitchen. John now may hate celery as well as the color orange because of how they've become associated.

Personal experience can also determine each individual's thought of colors, such as different versions of the same color, as explained below:

"If one says "Red" (the name of a color)

And there are 50 people listening,

It can be expected that there will be 50 reds in their minds.

And one can be sure that all these reds will be very different.

Even when a certain color is specified which all listeners have seen innumerable times – such as the red of the Coca-Cola signs which is the same red all over the country – they will still think of many different reds."<sup>53</sup>

### **3.2 PSYCHOLOGICAL EFFECTS OF COLORS**

We all have an innate and psychological response to color. This following section analyzes the typical human responses to the colors in our visible light spectrum: red, orange, yellow, green, blue, indigo, and violet, as well as white, black and gray. Included in analysis of each color is a brief psychological description, positive and negative feelings associated, as well as its variations. The feelings associated with variations of certain colors have a higher chance of being felt or understood differently depending on culture.

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<sup>53</sup> Albers, Josef. 1975. *Interaction of Color*. New Haven and London: Yale University Press, 3.

### 3.2.1 Red



Figure 4. Image for the color red.

Source:

<http://www.colour-affects.co.uk/psychological-properties-of-colours>

Red is a warm and positive color associated with our most physical needs and our determination to survive. It energizes, excites, and motivates one to take action, which signifies leadership qualities such as ambition and determination. This color can also improve confidence in those that who shy or feel as though they lack power. It can also boost our physical energy levels, increase our heart rate and blood pressure, and prompt the release of adrenaline. Red can stimulate the physical senses and stimulate the deeper passions within us such as sex, love, and courage. Conversely, it can also promote hatred, revenge and anger, which can lead to destruction. Different shades of red are able to evoke different feelings, for example, the color pink is better used to express love.<sup>54</sup>

Surrounding ourselves with an exaggerated amount of the color red has been known to cause individuals to become annoyed, tense, aggravated and eventually angry. With low amounts of red, it is can cause one to become cautious and fearful.<sup>55</sup>

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<sup>54</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-red.html>.

<sup>55</sup> Ibid.

### Positive and Negative Feelings Exhibited from the Color Red

Positive	Negative
energized	aggressive
assertive	dominating
confident	over-bearing
stimulated	straining
excited	anger
powerful	ruthless
passionate	fearful
driven	intolerant
courageous	rebellious
strong	quick-tempered
spontaneous	violent
determined	brutal

Table 8. Positive and Negative Feelings Exhibited from the Color Red. Source: Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-red.html>.

### Variations of the Color Red<sup>56</sup>

**Maroon:** A dark bluish red, it represents more controlled and thoughtful action. It is slightly softer than burgundy and not as dramatic as true red.

**Burgundy:** A dark purplish red, it is more sophisticated, serious, and less energetic than true red. It indicates controlled power, determined ambition, dignified action and is often preferred by wealthy individuals.

**Crimson:** This variation of red has a little blue in it. It directs a determination to succeed without upsetting anyone else. It radiates sensuality rather than sexuality.

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<sup>56</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-red.html>.

**Scarlet:** This red has a little orange in it, making it rich and bright. It shows enthusiasm and a passion for life. It is less intense and more playful than true red, and is relative to a small amount of disobedience.

### 3.2.2 Orange



Figure 5. Image for the color orange. Source: <http://www.colour-affects.co.uk/psychological-properties-of-colours>

The color psychology of orange is optimistic, uplifting, and rejuvenating to the spirit. Orange offers emotional strength and a positive outlook on life during difficult emotional times. It is very effective in keeping us motivated so that we may bounce back from disappointment and despair. With its enthusiasm for life, this color relates to adventure and risk-taking, inspiring physical confidence, competition, and independence. Orange is encouraging and stimulating for social communication. It be used to aid in the creation of new ideas by freeing the mind of limitations.<sup>57</sup>

Taking a negative stance, if you take warmer tones of orange mixed with black, this color can indicate deprivation, superficiality, and the lack of intellectual value.<sup>58</sup>

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<sup>57</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-orange.html>.

<sup>58</sup> Ibid.

### Positive and Negative Feelings Exhibited from the Color Orange

Positive	Negative
sociable	superficial
optimistic	insincere
enthusiastic	over-bearing
cheerful	dependent
self-confident	self-indulgent
independent	pessimistic
flamboyant	inexpensive
adventurous	unsociable
extroverted	overly proud

Table 9. Positive and Negative Feelings Exhibited from the Color Orange. Source: Scott-Kemmis, Judy. n.d. Empower Yourself With Color Psychology . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-orange.html>.

### Variations of the Color Orange<sup>59</sup>

**Peach:** Peach encourages great communication and conversation. It inspires good manners and puts people at ease. It has all the attributes of orange but in a much softer, gentler, and more cautious form.

**Golden Orange:** This version of orange encourages vitality and self-control.

**Amber:** Amber helps to inspire greater confidence and better self-esteem.

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<sup>59</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

### 3.2.3 Yellow



Figure 6. Image for the color yellow. Source: <http://www.colour-affects.co.uk/psychological-properties-of-colours>

In the visible color spectrum, yellow has a relatively long wavelength which causes it to be quite stimulating. In color psychology, yellow is uplifting and illuminating, offering hope, happiness, cheerfulness, and fun. It relates to acquired knowledge and inspires original thoughts and curiosity. This color resonates with the left side of the brain, which stimulates our mental abilities; it increases mental agility and perception. Yellow helps us with the clarity of thoughts and ideas as well as our ability recall information, which is useful during exams. This is color works well to create enthusiasm for life and can improve confidence and optimism.<sup>60</sup>

Certain shades of the color yellow can cause us to feel aggravated or anxious. They also have a tendency to make you more critical and analytical, leading to an individual to be more critical of themselves and others. Older people or people experiencing many changes in their lives are least likely to be found using these colors because large amounts are too emotionally intense for them.<sup>61</sup>

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<sup>60</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-yellow.html>.

<sup>61</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.



### Positive and Negative Feelings Exhibited from the Color Yellow

Positive	Negative
optimistic	critical
cheerful	judgmental
enthusiastic	analytical
fun	impatient
confident	fearful
creative	impulsive
logical	egotistical

Table 10. Positive and Negative Feelings Exhibited from the Color Yellow. Source: Scott-Kemmis, Judy. n.d. Empower Yourself With Color Psychology . Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-yellow.html>.

### Variations of the Color Yellow<sup>62</sup>

**Light Clear Yellow:** This color helps to clear the mind, making it open and alert.

**Lemon Yellow:** It promotes self-reliance and a need for an orderly life. It also increases our sensitivity to criticism.

**Cream:** Cream, tinted with a hint of yellow, encourages new ideas. However, this very pale color can also indicate a lack of confidence and a need for reassurance.

**Dark Yellow:** The darker shades of yellow indicate an inclination toward depression and melancholy, lack of love and low self-worth.

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<sup>62</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

### 3.2.4 Green



Figure 7. Image for the color green. Source: <http://www.colour-affects.co.uk/psychological-properties-of-colours>

Green is an emotionally positive color. It is one that impacts the feelings of balance and harmony. As a peacemaker it helps create an equilibrium between the head and the heart. Green is also associated with nature, growth, the spring season, renewal, and restoration. Away from the stresses of modern living, it renews and restores us back to a sense of well-being. This color relates positively to our thoughts of stability, endurance, and persistence.<sup>63</sup>

The negative side of green is that it can indicate stagnation, and if incorrectly used, can give off the impression of blandness.<sup>64</sup>

#### Positive and Negative Feelings Exhibited from the Color Green

Positive	Negative
growth	possessive
vitality	materialistic
renewal	indifferent
restoration	overcautious
self-reliance	envious
logical	selfish
emotionally balanced	greedy
compassionate	inconsiderate
nurturing	hypochondriac

Table 11. Positive and Negative Feelings Exhibited from the Color Green. Source: Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-green.html>.

<sup>63</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-green.html>.

<sup>64</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

### Variations of the Color Green<sup>65</sup>

**Pale green:** It allows us to see things from a new perspective, to make a fresh start.

**Emerald green:** This is an inspiring and uplifting color that is beneficial to a person's emotional well-being and helps promote creative ideas.

**Lime green:** Lime green inspires youthfulness, naivety and playfulness; it is liked the most by younger people. It creates a feeling of anticipation, and helps to clear the mind of negativity.

**Dark green:** There is a degree of resentment in dark green. Often used by wealthy businessmen, ambitious and always striving for more wealth, dark green signifies greed and selfish desire.

**Aqua:** Aqua calms the spirit, offering protection and healing for the emotions.

### 3.2.5 Blue



Figure 8. Image for the Color Blue.  
Source:  
<http://www.colour-affects.co.uk/psychological-properties-of-colours>

The psychology of the color blue is that it has a sense of peace and tranquility, which encourages physical and mental relaxation. It reduces stress and creates a sense of calmness and relaxation. For example, we feel a sense of calmness when we lie on our backs and look into a blue, cloudless sky. Blue is also a non-threatening color and the most universally liked. It can enhance our feelings of freedom (paler shades) and ability to communicate our needs and wants. Blue can also influence our sense of nostalgia when we relate the present and the future to our experiences in the past. This color is able to physically slow the metabolism and is known to be able to lower blood pressure.<sup>66</sup>

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<sup>65</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

<sup>66</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-blue.html>.

The negative aspect of blue is that certain shades can be perceived as frigid, unemotional, untrustworthy, and unfriendly.<sup>67</sup>

### Positive and Negative Feelings Exhibited from the Color Blue

Positive	Negative
honesty	depression
thoughtfulness	sadness
reliability	predictable
responsibility	weak
conservatism	unforgiving
perseverance	aloof
caring	coldness
idealistic	unfaithfulness
peacefulness	untrustworthiness
tranquility	

Table 12. Positive and Negative Feelings Exhibited from the Color Blue. Source: Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-blue.html>.

### Variations of the Color Blue<sup>68</sup>

**Pale Blue:** Pale blue inspires creativity and the feeling of being free.

**Sky Blue:** Sky blue is one of the calmest colors, it inspires selflessness and loyalty. This shade is non-threatening and influences healing.

**Azure Blue:** This color indicates contentment, inspires determination and ambition to achieve goals.

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<sup>67</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

<sup>68</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-blue.html>.

**Dark Blue:** Dark blue is the color of conservatism and responsibility. Although it appears to be cool, calm and collected, it is the color of the non-emotional worrier with repressed feelings, the pessimist and the hypocrite. Dark blue can be compassionate but has trouble showing it as its emotions run deep. Dark blue is a serious masculine color representing knowledge, power, and integrity, and is used quite often in the corporate world.

### 3.2.6 Violet



Figure 9. Image for the color violet.

Source:

<http://www.colour-affects.co.uk/psychological-properties-of-colours>

Violet and purple are often used in the same context, however, violet is the hue that appears in the visible light spectrum, while purple is just a mix of red and blue. Violet has the highest frequency wavelength in the visible spectrum. The color purple is associated with imagination and spirituality. It is an introspective color that calms our emotions and allows us to get in touch with our deeper thoughts. In color psychology, purple and violet encourage harmony of the mind and emotions, which ends up benefiting mental stability between thought and activity. This color also encourages sensitivity and compassion.<sup>69</sup>

Excessive amounts of the color purple can promote or aggravate depression in some people. It is a color that should be used very carefully and in small amounts by individuals who are easily depressed.<sup>70</sup> Another negative aspect of violet is that, if the wrong tone is used, it can make something appear to be cheap and disgusting quicker than any other color.<sup>71</sup>

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<sup>69</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-purple.html>.

<sup>70</sup> Ibid.

<sup>71</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

### Positive and Negative Feelings Exhibited from the Color Violet

Positive	Negative
individuality	inferiority
creativeness	impracticality
intuitive	cynic
humanitarian	arrogance
selflessness	suppression
mysterious	corruption
spiritual	

Table 13. Positive and Negative Feelings Exhibited from the Color Violet. Source: Scott-Kemmis, Judy. n.d. Empower Yourself With Color Psychology . Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-violet.html>.

### Variations of the Color Purple/Violet<sup>72</sup>

**Lavender:** This light purple color has a bluish hue, and a light violet color. It is a color that is attracted to beautiful things. It has a sense of fragility, sensitivity and vulnerability to it.

**Lilac:** This shade is a pale muted violet color with a slightly pinkish hue. It implies immaturity, enthusiasm, superficiality and youthfulness.

**Mauve:** This shade of purple sits somewhere between lavender and lilac. It can help influence our decisions, so that we do the right thing and make good choices.

**Amethyst:** A mystical color, amethyst opens intuitive channels. It protects the vulnerable and assists the humanitarian. It is the color of the evolved soul.

**Deep Purple:** Dark purple is related to higher spiritual attainment. A powerful color, it can also indicate arrogance and ruthlessness.

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<sup>72</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

### 3.2.7 Brown



Figure 10. Image for the color brown. Source: <http://www.colour-affects.co.uk/psychological-properties-of-colours>

Brown is one of the major colors on the planet, since it is associated with the outdoors, health, wellness, nutrition, agriculture, and farming. This “earthy” color is comforting and stabilizing. It provides a sense of structure and support, which one could relate to their own home. In color psychology, brown gives the impression of honesty, dependability, and sincerity. Various shades of brown can also give one a sense of warmth and calmness. It is sensual, sensitive, and warm, engulfing one in a feeling of safety and comfort. The use of brown colors can suppress emotions and create a safe haven from the stresses of the world. Brown can also vary slightly depending on the colors mixed to make it. It can be a combination of black, yellow, orange, red, gray, green, blue, pink and purple, and each of the colors in it will add a variation to its effect.<sup>73</sup>

#### Positive and Negative Feelings Exhibited from the Color Brown

Positive	Negative
wholesome	dull
practical	lack of sophistication
approachable	predictable
friendly	cheap
stable	
structured	
safe	
warm	

Table 14. Positive and Negative Feelings Exhibited from the Color Brown. Source: Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-brown.html>.

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<sup>73</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-brown.html>.

### Variations of Brown<sup>74</sup>

**Light Brown:** This color gives off a sense of approachability, sincerity, and honesty.

**Dark brown:** This color gives off a sense of strength and to a degree, sadness and depression.

**Tan:** This color is ageless and timeless, uncomplicated and natural.

**Ivory:** This very light variation of brown is calming, encouraging, and a slightly sophisticated.

**Beige:** This color gives off a sense of practicality and reliability, conservation, and loyalty.

### 3.2.8 Gray



Figure 11. Image for the color gray.  
Source:  
<http://www.colour-affects.co.uk/psychological-properties-of-colours>

In color psychology, gray is an unemotional color: detached, neutral, impartial, and indecisive. Gray does not stimulate, energize, rejuvenate, or excite. Being neither black nor white, it is the transition between two non-colors. The closer gray gets to black, the more dramatic and mysterious it becomes. The closer it gets to silver or white, the more illuminating and lively it becomes. Since it is motionless and emotionless, gray is solid and stable, which can create a sense of calm and composure.<sup>75</sup>

Excessive amounts of the color gray can trigger sadness and depression as well as a tendency towards loneliness or isolation. It can also cause a lack of confidence and a fear of exposure.<sup>76</sup> To alter this stifling and depressing energy, the color gray can be mixed with other colors to

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<sup>74</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-gray.html>.

<sup>75</sup> Ibid.

<sup>76</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.



create a steadying effect, toning down the stronger and brighter colors and illuminating the softer ones.<sup>77</sup>

### Positive and Negative Feelings Exhibited from the Color Gray

Positive	Negative
formal	indecisive
conservative	non-emotional
elegant	boring
mature	sad
intelligent	depressed
classic	lifeless
stable	lonely
calming	isolated

Table 15. Positive and Negative Feelings Exhibited from the Color Gray. Source: Scott-Kemmis, Judy. n.d. Empower Yourself With Color Psychology . Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-gray.html>.

### Variations of the Color Gray<sup>78</sup>

**Light gray:** This color can be enlightening, soothing and calming. It can improve the way one feels in difficult situations.

**Dark gray:** This color is conventional and constrained. It provides for feelings of seriousness and solemn, inflexibility and strictness. It relates to self-discipline and control.

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<sup>77</sup> n.d. *Psychological Properties Of Colours*. Accessed February 7, 2014. <http://www.colour-affects.co.uk/psychological-properties-of-colours>.

<sup>78</sup> Ibid.

### 3.2.9 White

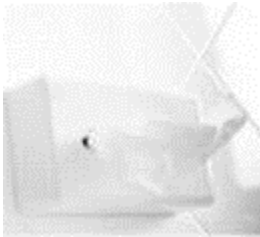


Figure 12. Image for the color white.

Source:

<http://www.colour-affects.co.uk/psychological-properties-of-colours>

White is the color of purity, innocence, wholeness, completion and perfection. White signifies new beginnings. The color itself is not very stimulating to the senses, it instead gives the mind a clean slate, preparing it for what it may conceive in the future. It helps to create a sense of efficiency and order. White is also a color of protection and encouragement; it provides a refreshing sense of peace, calm, comfort, and hope, promoting renewal of energy and the alleviation of emotional upsets. White can indicate the completion of a cycle in one's life. For example, people tend to wear white when going on an overseas trip for the first time, or if they are moving houses after being in one place for a long time.<sup>79</sup>

Some negativity associated with this color is that too much white can be cold, isolating, and empty. It can suggest a feeling of sterility, detachment, and disinterest, providing little stimulation for the senses. Because of this, in many cultures white is traditionally related to death and mourning, where death is an end and as well as the beginning of something new. An excessive amount of white can cause feelings of isolation and emptiness because of its pristine nature. It can make one feel anxious, as if they should "tread softly" to avoid upsetting someone or creating a mess.<sup>80</sup>

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<sup>79</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-white.html>.

<sup>80</sup> Ibid.

### Positive and Negative Feelings Exhibited from the Color White

Positive	Negative
innocence	sterile
purity	stark
cleanliness	particular
equality	empty
complete	isolated
simplicity	cautious
immaculate	plain
pristine	distant
open	unimaginative
self-sufficient	critical
organized	boring

Table 16. Positive and Negative Feelings Exhibited from the Color White. Source: Scott-Kemmis, Judy. n.d. Empower Yourself With Color Psychology . Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-white.html>.

### 3.2.10 Black



Figure 13. Image for the color black. Source: <http://www.colour-affects.co.uk/psychological-properties-of-colours>

The color black is associated to the hidden, the mysterious, and the unknown. Black can be viewed as a shelter from external emotional stress, according to color psychology. Black creates a barrier between an individual and the outside world, providing comfort and protection of emotions and feelings, and hiding insecurities and deficiencies. This idea of a barrier made from the color black can also be applied to power and control. For example, an individual with power might want to keep important information to themselves rather than trusting anyone else with it. This color can be intimidating, unfriendly, and unapproachable because of the sense of power it conveys. Because of this, it can inhibit two-way conversations. This color radiates authority, creating fear in the process. Black indicates a sense of discipline, sophistication, independence, and a strong will, thus giving an impression of

authority and power. This may be why many architects prefer to dress in the color black.<sup>81</sup>

An excessive amount of black can cause depression and mood swings, creating a decidedly negative environment. When combined with just the color white, the contrast can create an argumentative environment. Black is best used with other colors so that its dominating effect can be lightened and brightened.<sup>82</sup>

#### **Positive and Negative Feelings Exhibited from the Color Black**

<b>Positive</b>	<b>Negative</b>
protected	unfriendly
comforted	depressing
strong	pessimistic
powerful	secretive
in control	withholding
contained	conservative
sophisticated	serious
seductive	sadness
mysterious	negativity
endings & beginnings	

Table 17. Positive and Negative Feelings Exhibited from the Color Black. Source: Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-black.html>.

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<sup>81</sup> Scott-Kemmis, Judy. n.d. *Empower Yourself With Color Psychology* . Accessed February 20 , 2014. <http://www.empower-yourself-with-color-psychology.com/color-black.html>.

<sup>82</sup> Ibid.

## CHAPTER 4. THE EFFECTS OF LIGHTING ON EMOTIONS

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Light is a necessity as well as a medium that allows us to perceive the world around us. Its different properties and intensities are able to create specific conditions that significantly impact our perception.

Lighting design, whether it is done through natural or artificial lighting, is the creation of how we see our environment. Effective lighting designs are able to create perceptual environments that enable us to work efficiently and orient ourselves safely while stimulating a sense of happiness, comfort, and security in a particular environment.<sup>83</sup> Light influences architecture in many different ways, such as with objects, zones, boundaries, the spatiality of rooms, and how it can separate or link one space to another.

The three elements of lighting that we see are general or ambient lighting, task lighting, and highlighting. Ambient lighting will illuminate the majority of a specific area. It provides a comfortable level of brightness, allowing people to see and move around safely. Task lighting helps people perform specific tasks such as drawing, typing, arts and crafts, homework, or playing games. Highlighting can add character and drama to a room. It helps emphasize particular objects and creates visual interest. It is often used for decorating to point out art, plants, trophies, awards, and pictures. It can also be used to point out textures on a wall or outdoor landscaping.<sup>84</sup>

The brightness contrast of a space can determine its emotional impact. The individual impressions of a space, the relationship of lit surfaces in contrast to dark ones, and the contrast between foreground and background are different forms of brightness contrast. The degree of brightness contrast can establish the emotional setting in a room. It can ultimately affect the performance of a task, influence behavior in a space, and impact the amount of pleasure we feel.<sup>85</sup>

The next series of images visually describes how lighting can control the

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<sup>83</sup> n.d. "Designing With Light." *RS Lighting Design*. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_Light_in_Architecture_and_Psychology_of_Light.pdf), 2.

<sup>84</sup> Ibid, 77.

<sup>85</sup> Ibid, 54.



Figure 14. Monotone Space. Source: n.d. "Designing With Light." RS Lighting Design. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_-\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_-_Light_in_Architecture_and_Psychology_of_Light.pdf), 15.

evocation of emotions in spaces.

In figure 14, the space is entirely lit up. The lights are too bright and it gives the space a monotone effect. The space becomes boring and unlively.

In figure 15, the space is unlit causing it to be quite dark. With the lack of light one becomes unaware of their surroundings. One might feel unsafe because there is a sense of not knowing what will happen next. These sensations could result in fear.



Figure 15. Dark Unlit Space. Source: n.d. "Designing With Light." RS Lighting Design. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_-\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_-_Light_in_Architecture_and_Psychology_of_Light.pdf), 15.

In figure 16, the back of the room is lit. Through brightness and contrast we can see that there is a hallway in the back. The light draws our eyes towards the back because we can visualize what is there, making us feel that the space is comfortable and more secure.



Figure 16. Back Lit Space. Source: n.d. "Designing With Light." RS Lighting Design. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_-\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_-_Light_in_Architecture_and_Psychology_of_Light.pdf), 15.

In figure 17, there are two objects that are lit in the dark room. The light not only draws us to these objects but also gives them a mysterious aura. These objects are given a sense of importance and power.



Figure 17. Object Focused lighting. Source: n.d. "Designing With Light." RS Lighting Design. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_-\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_-_Light_in_Architecture_and_Psychology_of_Light.pdf), 15.

In figure 18, the room is lit with high and low contrasting elements, which stimulate the human mind. The overall amount of light is not overwhelming; it is enough for us to identify the objects and spaces in the room. We trust and are comforted by the surrounding environment, and the addition of stimulation from lighting, directs our mind towards positive emotions.



Figure 18. Comfortably lit space. Source: n.d. "Designing With Light." RS Lighting Design. Accessed April 15, 2014. [http://www.rsltg.com/images/Design\\_-\\_Light\\_in\\_Architecture\\_and\\_Psychology\\_of\\_Light.pdf](http://www.rsltg.com/images/Design_-_Light_in_Architecture_and_Psychology_of_Light.pdf), 15.



## 4.1 NATURAL LIGHTING

Natural lighting has been linked to an improved mood, increase in self-esteem, lower fatigue, and reduced eyestrain. One of the most important psychological aspects provided by natural lighting is the need for contact with our natural, living environment.<sup>86</sup>

Our bodies use daylighting as a nutrient, just like water, for metabolic processes. Natural light is made up of a combination of various colors of light energy which stimulate key biological functions in our brains and our bodies. Our mood and energy levels can be greatly affected in environments lacking natural light.<sup>87</sup>

"When we speak about health, balance, and physiological regulation, we are referring to the function of the body's major health keepers; the nervous system and the endocrine system. These major control centers of the body are directly stimulated and regulated by light, to an extent far beyond what modern science...has been willing to accept."<sup>88</sup>

The use of natural light also tends to result in positive responses and is effective in reducing stress and anxiety as well as improving attention span and

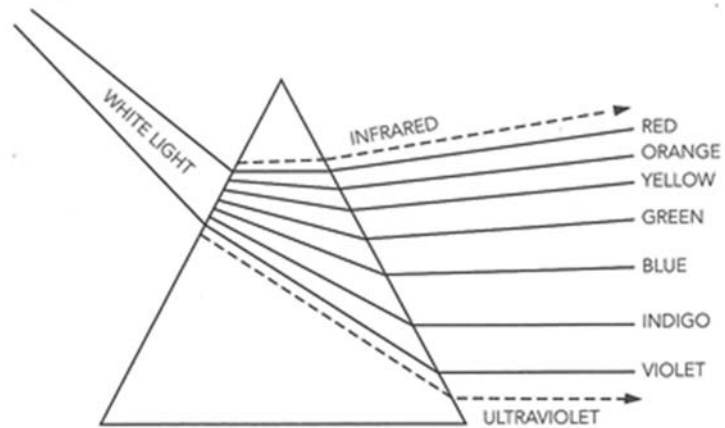


Figure 19. Breakdown of natural light through a spectrum. Source: Holtzschue, Linda. 2006. *Understanding Color: An introduction for Designers* Third Edition. Hoboken: John Wiley & Sons, Inc, 14.

<sup>86</sup> Edwards, L, and P Torcellini. 2002. *A Literature Review of the Effects of Natural Light on Building Occupants*. Technical Report, Golden: National Renewable Energy Laboratory, 4.

<sup>87</sup> Ott Biolight Systems, Inc. 1997. *See Better, Feel Better, Look Better*. California: Ott Biolight Systems, Inc.

<sup>88</sup> Edwards, L, and P Torcellini. 2002. *A Literature Review of the Effects of Natural Light on Building Occupants*. Technical Report, Golden: National Renewable Energy Laboratory, 4.

mood. It has been found that test subjects in nature have lower muscle tension, skin conductance, higher pulse rates, and lower blood pressure. People exposed to natural light tend to have more positive emotional states, and wakeful relaxation states.<sup>89</sup>

## **4.2 ARTIFICIAL LIGHTING**

Artificial light is not as beneficial to our health as natural daylighting. It serves a purpose to light our environments but the light that is produced is quite different from natural lighting because it uses imbalances in color reproduction. For example, fluorescent bulbs create a blend of yellow and green light. With high amounts of exposure to artificial lighting from fluorescent lights, there have been reports of a decrease in certain brain hormones such as norepinephrine, serotonin, and dopamine, which have led to depression and anxiety.<sup>90</sup>

There are artificial lights that use the entire visible spectrum to make light, these are incandescent lamps. Their light is a by-product of heat produced through a burning process. Other forms of light that emit similar white light like the sun are candles, and firelight.

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<sup>89</sup> Heerwagen, J.H. 2000. "Green buildings, organizational success and occupant productivity." *Building Research & Information* 28 (5-6): 353-367.

<sup>90</sup> Mahrke, Frank H, and Rudolf H Mahrke. 1987. *Color and Light in Man-made Environments*. New York: VNR.

## CHAPTER 5. THE EFFECTS OF LINE, SPACE, SHAPE, AND FORM ON EMOTIONS

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Lines, spaces, shapes and forms can be used to describe any of our built environments or natural environments. Therefore the manipulation of any of these subjects can have adverse effects on the way our environment conveys a mood and evokes emotions. The following portion of this chapter defines and exemplifies each description.

### Line

A line's existence can be described in several ways. It can be the extension of a point, an elongated mark, a connection between two points, and even the effect that the edge of an object gives off.<sup>91</sup>

#### 9 Aspects to Analyze Line:<sup>92</sup>

1. Path
2. Thickness
3. Evenness
4. Continuity
5. Sharpness of the edge
6. Contour of the edge
7. Consistency
8. Length
9. Direction

### Physical and Psychological Effects of Lines

The strongest aspect of a line is its direction because it draws the attention of one's eyes creating an area of focus. Vertical lines give an effect of being awake, alert, rigid, firm, stable, strong, and defiant of gravity. Horizontal lines give an effect of restfulness, gravity, quietness, repose, passivity, calmness, and serenity.

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<sup>91</sup> Rigdone, Kevin. n.d. "Line, Space, Shape, and Form." *Elements and Principles of Design*. Accessed April 15, 2014. [https://secure.class.uh.edu/theatre\\_facapp1/Data/Docs/KEVINRIGDONEElementsandPrincipalsofDesign.pdf](https://secure.class.uh.edu/theatre_facapp1/Data/Docs/KEVINRIGDONEElementsandPrincipalsofDesign.pdf), 1.

<sup>92</sup> Ibid

Diagonal lines can appear to be undecided, unstable, busy, active, dynamic, restless, dramatic, sporty, lengthening, and they can reduce the effect of horizontal and vertical shapes.<sup>93</sup>

## **Space**

A space is a two or three dimensional area in which all other elements can be placed, meaning lines, shapes and forms are the components for creating a space. Spaces are organized by using lines that subdivide, rearrange, push, pull, and manipulate. They can become shapes and forms, and when multiplied they can create patterns. "Drawing a line around a space will create a shape, this shape then becomes enclosed space, which means that line, space, and shape are inseparable."<sup>94</sup>

### **6 Characteristics of Spaces that Control Visual Perception<sup>95</sup>**

1. Size of spatial divisions
2. Overlapping
3. Closeness of Shapes
4. Density of spatial divisions
5. Convex and concave
6. Character of enclosing lines

### **Physical and Psychological Effects of Space**

Physiologically space can cause illusions in size.<sup>96</sup> A space divided into long and narrow vertical spaces will give off the impression that it is heightened, longer, and slim. A space divided into horizontal sections will give off the impression that it has been shortened or widened.<sup>97</sup>

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<sup>93</sup> Rigdone, Kevin. n.d. "Line, Space, Shape, and Form." *Elements and Principles of Design*. Accessed April 15, 2014.  
[https://secure.class.uh.edu/theatre\\_facapp1/Data/Docs/KEVINRIGDONElementsandPrincipalsofDesign.pdf](https://secure.class.uh.edu/theatre_facapp1/Data/Docs/KEVINRIGDONElementsandPrincipalsofDesign.pdf), 2.

<sup>94</sup> Ibid, 4.

<sup>95</sup> Ibid, 5

<sup>96</sup> Ibid, 6.

<sup>97</sup> Ibid, 7.

Psychologically normal undivided space will feel dramatic, sophisticated, bold, serene, calm, confident, certain, open, simple, and straightforward. A space divided unequally can create slight intrigue. A large broken space will feel closed-in, tight, busy, and complex. A small space broken up will feel dainty, delicate, feminine, and intriguing.<sup>98</sup>

## **Shapes and Forms**

A shape is a flat, two dimensional area enclosed by lines. A form is a three dimensional area enclosed by a surface.<sup>99</sup>

### **Types of Shapes and Forms**

Various shapes and forms make up the world around us. Equal sided and unequal sided are terms we can generally describe shapes with. Forms can be broken down into two general types regarding mass, volumes and solids. Volumes are hollow forms, and solids are solid forms.

With equal sided shapes we find, squares, circles, equilateral triangles, pentagons, hexagons, octagons, diamonds, marquis, ogive, and stars. With equal sided forms we find spheres, and cubes.

In unequal sided shapes we can see ovals, scalene and isosceles triangles, rectangles, parallelograms, trapezoids, hearts, teardrops, paisleys, clubs, spades, pears, and kidneys. With unequal sided forms we find, tubes, cylinders, cones, pyramids, rectangular boxes, bells, domes, ovoids, egg shaped, hourglass figured, trumpets, and barrels.<sup>100</sup>

### **Psychological Effects of Shapes and Forms**

Shapes and forms tend to convey the moods of the type of lines and their direction that enclose them as well as the spaces within them.<sup>101</sup>

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<sup>98</sup> Rigdone, Kevin. n.d. "Line, Space, Shape, and Form." *Elements and Principles of Design*. Accessed April 15, 2014. [https://secure.class.uh.edu/theatre\\_facapp1/Data/Docs/KEVINRIGDONEElementsandPrincipalsofDesign.pdf](https://secure.class.uh.edu/theatre_facapp1/Data/Docs/KEVINRIGDONEElementsandPrincipalsofDesign.pdf), 7.

<sup>99</sup> Ibid, 8.

<sup>100</sup> Ibid, 8.

<sup>101</sup> Ibid, 8.

Circular shapes give an impression of connection, community, wholeness, endurance, movement, safety, and perfection. These shapes relate more to ideas of femininity such as warmth, comfort, sensuality and love.<sup>102</sup>

Vertical shapes such as cubes and rectilinear boxes give an impression of order, logic, containment, and security.<sup>103</sup>

Triangular shapes give an impression of energy, power and balance. These shapes relate more to the ideas of masculinity such as strength, aggression, and dynamic movement.<sup>104</sup>

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<sup>102</sup> 2010. *Psychological Effects of Shapes*. April 18. Accessed March 7, 2014.  
<http://archive.csustan.edu/oit/WebServices/SupportResources/PsychOfShapes.html>.

<sup>103</sup> Ibid.

<sup>104</sup> Ibid.

Our built environment has various types of architecture serving different purposes. Some of these spaces are designed to generate an emotional response, but rarely do they affect everyone who experiences it.<sup>105</sup> This chapter will provide an analysis on two architectural spaces that strongly evoke positive emotions and one that strongly evokes negative emotions.

### Villa Mairea by Alvar Aalto



Figure 20. Alvar Aalto's Villa Mairea. Source: [http://upload.wikimedia.org/wikipedia/commons/e/e7/Villa\\_Mairea.jpg](http://upload.wikimedia.org/wikipedia/commons/e/e7/Villa_Mairea.jpg)

"Alvar Aalto's Villa Mairea, turns into an epic narrative of cultural history and life, nature and artifice, utility and beauty, and it offers an empowering promise of a more humane feature. This house is not an ordinary tectonic Modernist structure; it fuses irreconcilable imageries into a symphonic whole.....Already, upon arrival, the

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<sup>105</sup> Eberhard, John Paul. 2009. *Brain Landscape: The Coexistence of Neuroscience and Architecture*. New York: Oxford University Press.

house presents an extraordinary cordial welcome and gives a silent promise to take good care of the visitor.”<sup>106</sup>

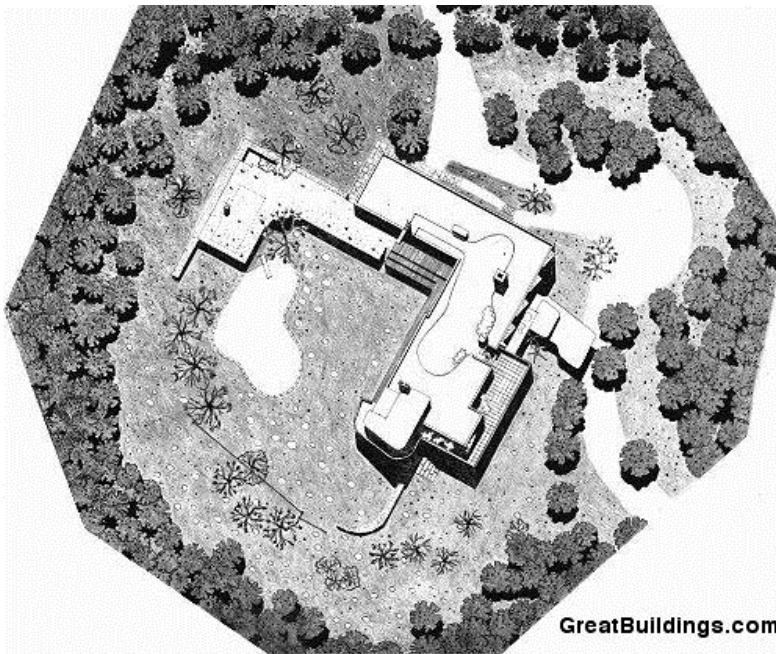


Figure 21. Villa Mairea Site Plan. Source: [http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Villa\\_Mairea.html/Villa\\_Mairea\\_Site\\_Plan.jpg](http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Villa_Mairea.html/Villa_Mairea_Site_Plan.jpg)

Villa Mairea sits surrounded by a pine forest where the spatial characteristics of this house interacts with a sense of infinite space in nature. Aalto tied the building to aspects of nature on many levels: the use of natural materials, textures, forms indicative of natural processes and rhythms.<sup>107</sup> Studies have shown that instinctually humans

prefer spatial situations that combine an area of where one can seek refuge or feel protected with an open view of the environment which results in a sense of security and control.<sup>108</sup> From the placement of this house on its site and the views of the surroundings, it is able to connect deeply with us through our species biological history. Aalto created an artificial sense of rhythm throughout the home. He intended for the rhythm of the building to match the irregular patterns of nature. From the main area of the house, and throughout its secondary spaces the use of vertical wooden poles are placed in an irregular rhythm which creates a sense of continuation and harmony unifying the interior with exterior. In the psychological effects of rhythm, the longer the development is to a climax, provides for a greater

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<sup>106</sup> Pallasmaa, Juhani. 2011. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons, 84.

<sup>107</sup> Pallasmaa, Juhani. n.d. *Villa Mairea*. Accessed May 2, 2014. <http://www.villamairea.fi/en/villa-mairea/architecture>.

<sup>108</sup> Pallasmaa, Juhani. 2011. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons, 44.



amount of excitement. With Aalto's design, while one walks through the home and experiences the irregular rhythm of the wooden poles, they reach a brief moment of



Figure 22. Irregular Rhythm in Villa Mairea. Source: <http://static.panoramio.com/photos/large/52975147.jpg>

excitement when realizing the artificial is interacting with the natural.

Villa Mairea creates an extraordinary connection with nature as a building and for its users. The homes purposeful irregularities create numerous surprise elements making it a very stimulating space.

## Jewish Museum in Berlin, Germany by Daniel Libeskind

“The Holocaust” is recognized historically as the genocide or mass murder of approximately six million Jews brought about by Adolf Hitler during World War II. An event as such is filled with emotions and memories so strong that words and images are unable to describe them. The Jewish Museum in Berlin by architect, Daniel Libeskind effectively uses architecture to translate the life and struggles of a Jew during that sorrowful time period.



Figure 23. The Jewish Museum in Berlin, Germany by Architect Daniel Libeskind. Source: <http://daniel-libeskind.com/projects/jewish-museum-berlin/images>

In the figure 24 an aerial photograph shows the locations of the original and more recent building of the Jewish Museum. The building to the right is the Baroque Kollegienhaus Museum (Original Jewish Museum in Berlin). The dynamically shaped building with a silver zinc façade on the left side is the extension designed by Libeskind. The architect's concept intended to express the emotional state of a

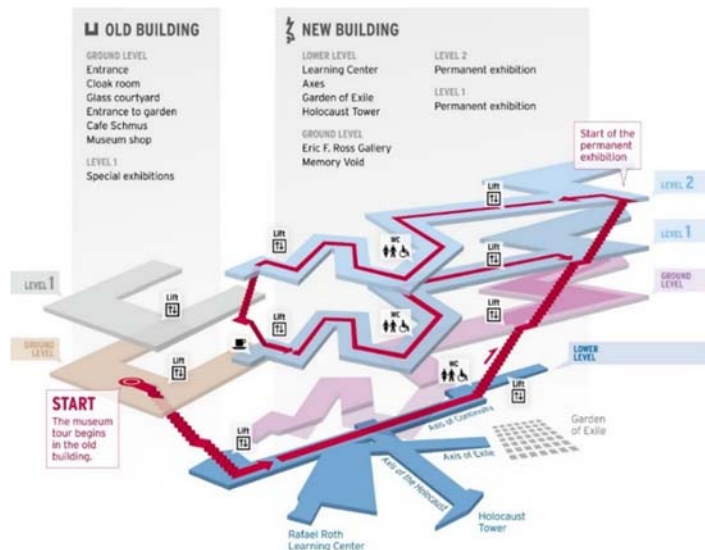


Figure 24. Circulation through Jewish Museum Extension. Diagrammatic Source: [http://www.jmberlin.de/main/EN/Pdfs-en/Visitor-Information/Museumsplan\\_EN\\_2013.pdf](http://www.jmberlin.de/main/EN/Pdfs-en/Visitor-Information/Museumsplan_EN_2013.pdf)

disappearing Jew culture. The Jewish people went through extreme feelings of absence, emptiness, and invisibility. The design narrates and evokes visitors with

an experience of the effects of the Holocaust on both the Jewish culture and the city of Berlin.<sup>109</sup>

The entrance to Libeskind's extension is not a typical "enter through the front" type of entrance, instead, one must enter the new extension through an underground corridor starting from the lower level of the original museum. The experience for the visitors is designed so that he or she must suffer and feel the anxiety of hiding and losing their sense of direction before coming to an intersection of three different pathways.

These three routes provide visitors with an opportunity to see the Jewish experience of emigration from Germany during the Holocaust. The buildings acute angles form a circulation path that causes visitors to move in a rigid and indirect progression. This design slows the walk of visitors allowing them to experience the spaces within forcing them to mentally and physically understand the hardships during this time.



Figure 25. Dead End Space, Jewish Museum, Berlin. Source: <http://daniel-libeskind.com/projects/jewish-museum-berlin/images>

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<sup>109</sup> Kroll, Andrew. 2010. "AD Classics: Jewish Museum, Berlin / Daniel Libeskind." *ArchDaily*. November 25. Accessed April 20, 2014. <http://www.archdaily.com/91273/ad-classics-jewish-museum-berlin-daniel-libeskind/>

Even more complex than the exterior is the building's interior spaces. The architect's creation directs people through galleries, empty spaces, and dead ends. A good amount of the extension is void of windows and monotonous in materiality. The interior is mainly concrete which adds drama to the empty spaces especially the dead ends where only a sliver of light enters. Libeskind wanted people to feel the darkest moments. To do so some of the spaces make you feel like you will never escape, and when you see a small trace of light, your hope is restored. One of the most impactful spaces in the building is a 66' vertical

space that runs unobstructed from floor to ceiling. The large vertical concrete walls adds a very dominant and cold sensation to the space which is lit by small slits of skylights in the ceiling. The floor of this space is overwhelmed by an exhibit of 10,000 coarse iron faces which symbolizes those lost during the Holocaust. The expression on the faces relate to the emotions of sadness.



Figure 26. Permanent Exhibit, Jewish Museum, Berlin. Source: <http://daniel-libeskind.com/projects/jewish-museum-berlin/images>

Libeskind's extension continues outside in the Garden of Exile. Visitors are once again directed into a space where they will feel lost among 49 tall concrete pillars that are covered with plants. The large pillars creates a sense of misdirection and confusion, but when looking upwards there is dappled lighting which comes through the plants, which gives a glimpse of hope again. "This museum is an emotional journey through history and it exhibits a powerful translation of the human experience into a physical place."<sup>110</sup>



Figure 27. Garden of Exile, Jewish Museum Berlin. Source: <http://mythologicalquarter.net/2012/04/02/garden-of-exile/>

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<sup>110</sup> Kroll, Andrew. 2010. "AD Classics: Jewish Museum, Berlin / Daniel Libeskind." *ArchDaily*. November 25. Accessed April 20, 2014. <http://www.archdaily.com/91273/ad-classics-jewish-museum-berlin-daniel-libeskind/>



## Google

Google, a tech company started in 1998, has been built up from its internet search engine. Google services millions of people, and in order to do so continually in such a positive way, they've laid out how the company is run. Google states about their culture and workplace,

"Our offices and cafes are designed to encourage interactions between Googlers within and across teams, and to spark conversation about work as well as play."

Today, it is commonly said, "a happy employee is more productive," and Google is one of the best examples of a company that is able to keep their employees happy. As you can see in the figure below, their work environment utilizes stimulating colors.

They also seldom use typical office furniture, a possible reason being that they do not want their workers to feel like it is an "office" working environment. They seem to make every possible effort to convince their employees that they are going to have fun rather than work. When we look at a typical office, it is



Figure 28. Google work environment. Source: <http://www.cogniview.com/blog/ten-tips-to-create-a-collaborative-culture-at-work/>

comprised of cubicles, which makes it difficult to socialize. Meetings are held in a different conference room. People are always intentionally separated, senses of or actual hierarchy develops, and any unorganized competition is bad for the workplace.

Looking at Google, employees don't have set boundaries, they seem to be allowed to roam free through the workplace. They also don't call their place an "office" or "firm," but the "Google Campus." The furniture is abstract and

comfortable, the lighting design creates stimulating and contrasting environments resulting in positive emotions. As humans we require social interaction, this can be related to the happiness emotion. Having social interaction helps us feel they we are needed, giving us a sense of self satisfaction. The Google workplace also tries to bring the outdoors, indoors. This is beneficial to human beings because our bodies have been found to function improperly without views onature or natural lighting.<sup>111</sup>

Google has also incorporated stimulating activities into their workplace. There are slides that accompany stairs, making it fun to go

down a floor rather than using effort it takes to walk down a flight. Bowling alleys, pool rooms allow worker to play while they are at work. Studies have shown that neurological functions work better when the brain is stimulated in positive way.



Figure 29 . Google bringing the outside in. Source: <http://blog.eoffice.net/wp-content/uploads/2013/02/1.jpg>



Figure 30. Google work place slide. Source: <http://www.scglondon.com/wp-content/uploads/2012/10/google-slide.jpg>

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<sup>111</sup> Pallasmaa, Juhani. 2011. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons, 44.

Google's work environment is a desirable place to be whether one is working or not. They have created a space using color psychology, lighting and spatial techniques that is able to consistently evoke happiness, interest and surprise all of which are beneficial towards the productivity of their work.



### 7.1 SITE SELECTION CRITERIA

The site for the Memory Recollection Center needed to have provision for a “clean slate” opportunity for ideal cognitive functionality. It must also meet criteria based on polarization of the six universal human emotions.<sup>112</sup> Polarizing the emotions will place two main categories on the site criteria, one being the ability to elicit positive emotions, and the other to elicit negative emotions. The two have a potentially significant impact on the recollection of memory. An analysis of the opposites is essential towards determining how their possible interferences could affect the design of the space. The division of the emotions places, happiness and surprise in the positive category. The negative encompasses sadness, fear, disgust, anger, and surprise. As previously written, surprise can be seen in various emotional contexts.<sup>113</sup>

#### Criteria

- Sense of isolation – Being isolated or distanced from places that have excessive amounts of neural stimulation will be beneficial towards a “clean slate” for the reflection of one’s personal thoughts. Isolation will also have an impact on the number of visitors, which will likely keep the center from overcrowding. Visitors can reflect about their own thoughts without the interference of what is going on in the rest of the world.

#### Characteristics Eliciting Positive Emotions

- Safety and security
- Open spaces
- Elevated vantage points
- Healthy and lively
- Receives ample amounts of sun light

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<sup>112</sup> Hung, Daniel D, and Heji Kim. 1996. *Six Universal Emotions*. April 20. Accessed April 1, 2014. <http://www.nbb.cornell.edu/neurobio/land/oldstudentprojects/cs490-95to96/hjkim/emotions.html>.

<sup>113</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press. p 277.

- Receives a comfortable amount of air flow
- Good view corridors

### **Characteristics Eliciting Negative Emotions**

- Dark Spaces, insecure sense of not knowing what's coming
- Sense of loss or separation, which one has no control over
- Idea of death, the lack of health or life
- Dense uncontrolled foliage, feelings of entrapment
- Elevated areas with no sense of safety
- Feelings of impending disaster

## **7.2 SITE ANALYSIS**

### **Site Location**

Located on the southern portion of the island of Oahu in the State of Hawaii, is Pu'uohi'a more commonly known to local residents as Mount Tantalus. This mountain is the western wall of Manoā Valley. It is fully surrounded by breath taking views. From the best vantage points on Tantalus,



Figure 31. View of Mt. Tantalus from the south. Source: <http://www.cameronbrooksphotography.com/Landscapes/Best-Prints/i-sjZbgjz/2/S/TantalusRainbows2x3-S.jpg>

panoramic views start from the south eastern shore and reach the south western edge of the island. The real estate in this area is low in density and considered to be in the higher price range when compared to the rest of the state. Plot sizes are relatively larger in size thus even more distance from the already distant neighbors.

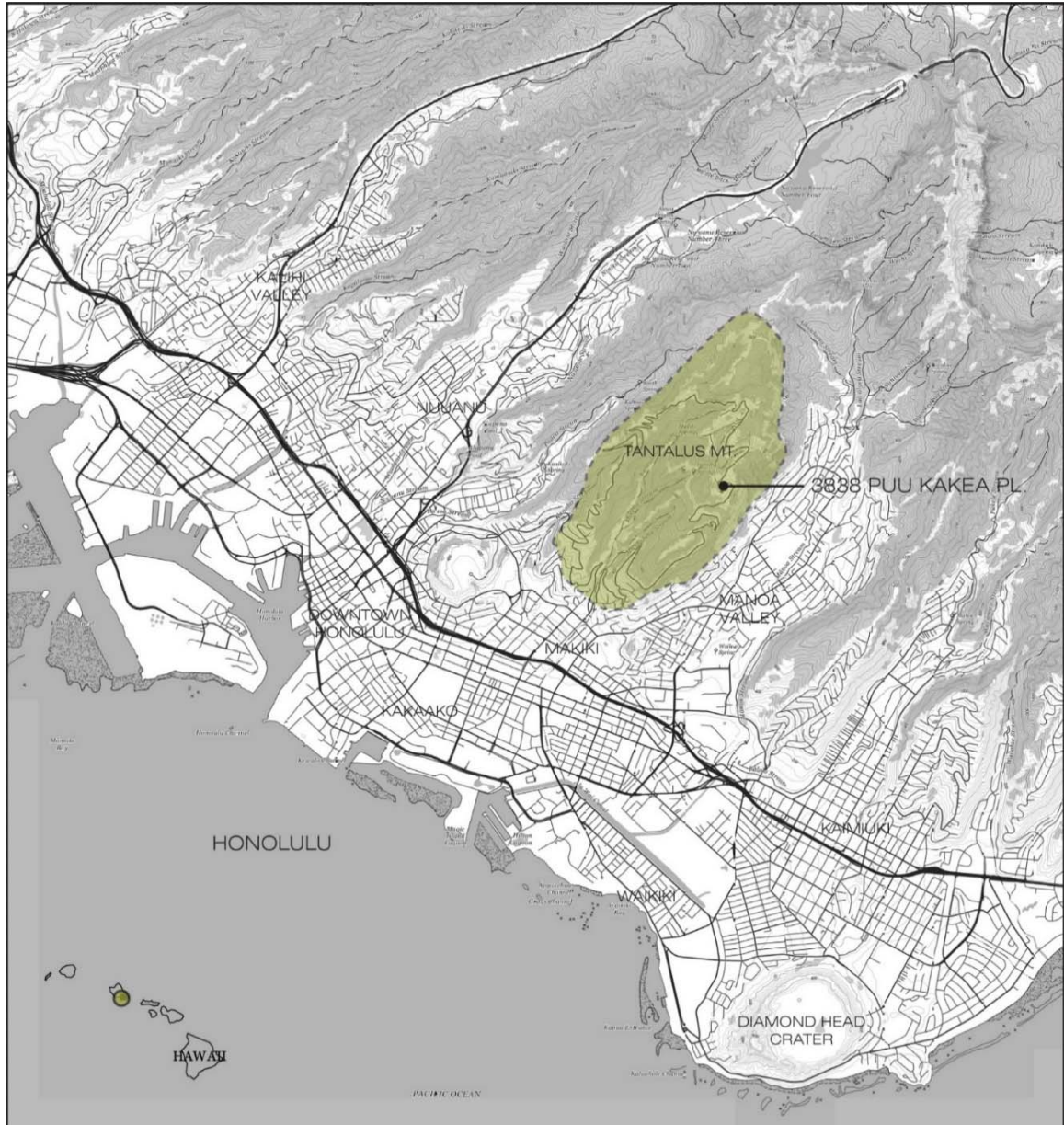


Figure 32. Area location diagram. Made by author.

Mount Tantalus is a very nice, quiet, and beautiful place to live. It can also be a very dark and lonely place to live as well.

The address of the selected site is 3838 Puu Kakea Place. This privately owned parcel of land has an area of 90,008 square feet, which is slightly larger than 2 acres. For the purpose of this study the owner has given his consent for its use. 3838 Puu Kakea Place is at the pinnacle of a dead end street. The entry sits at the



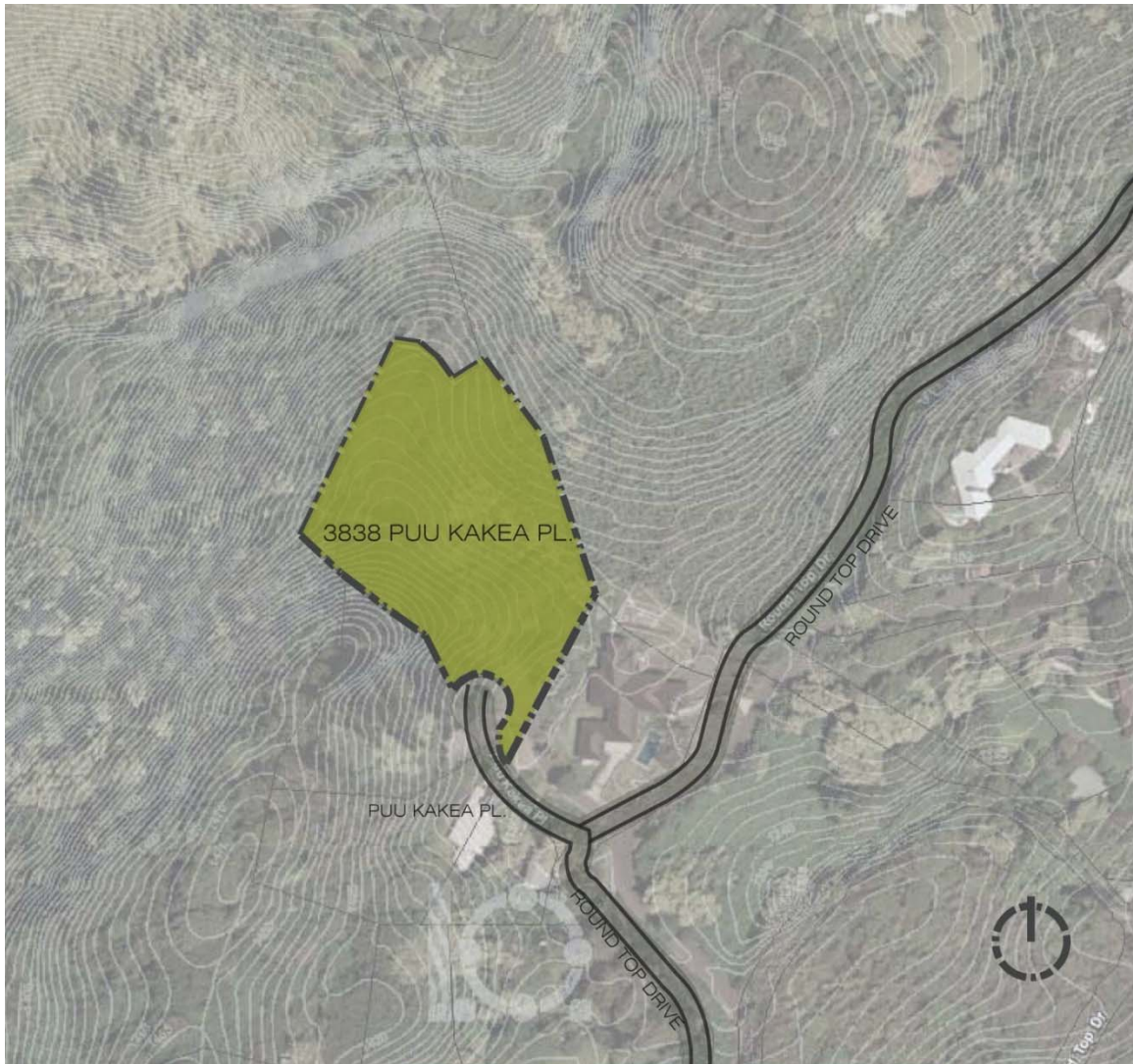


Figure 33. 3838 Puu Kakea Pl. Site Map. Diagram made by author

southern end of the site at an elevation of 1,365 ft. The lowest elevation on the site is 1,305 ft. which is located on the eastern side. The southwest side is the highest area at 1,385 ft. Between the highest and lowest portions is an 80 ft. change in elevation. The majority of the site slopes downwards to the east northeast direction into a deep ravine. Thick foliage covers most of the site and thickens towards the ravine. Past the property line the ravine rises up creating walls of a valley that open

towards the southwestern shore of the island. The geological formations of the site in relations to the valley creates an immense bowl like area.

3838 Puu Kakea Place can increase one's confidence, because of its visual vantage points from the higher portions of the site. Its lowest portion of the site towards the ravine surrounded by valley walls could potentially belittle as well.

### **Site Access**

The only road with access to the site is Round Top Drive. This road is a loop and will bring you to 3838 Puu Kakea Place whether approaching from the western or eastern route. Bringing you from the bottom of Tantalus to the site quickest is the eastern route taking about 10-12 minutes in an automobile. Access to the site is available through the use of an automobile, public transportation, a bicycle, or walking. Frequently there are cycling enthusiast who bike up for the workout and great views. Pedestrian traffic is the least heavy due to the continuous uphill trek.

In part of meeting the criteria for site, the journey up this long winding can prime an individual with positive and negative emotions varying with the time of day. On a well-lit day the drive up this mountain is very scenic, there is tall green grass, bushes and trees at various heights, the mountain is full of life. There are brief moments where there are stunning views of the entire City of Honolulu. In these views, the Pacific Ocean sits in the background its colors of dark to light blue contrast with the greenery and city scape making one really appreciate the magnificence of the place they are in.

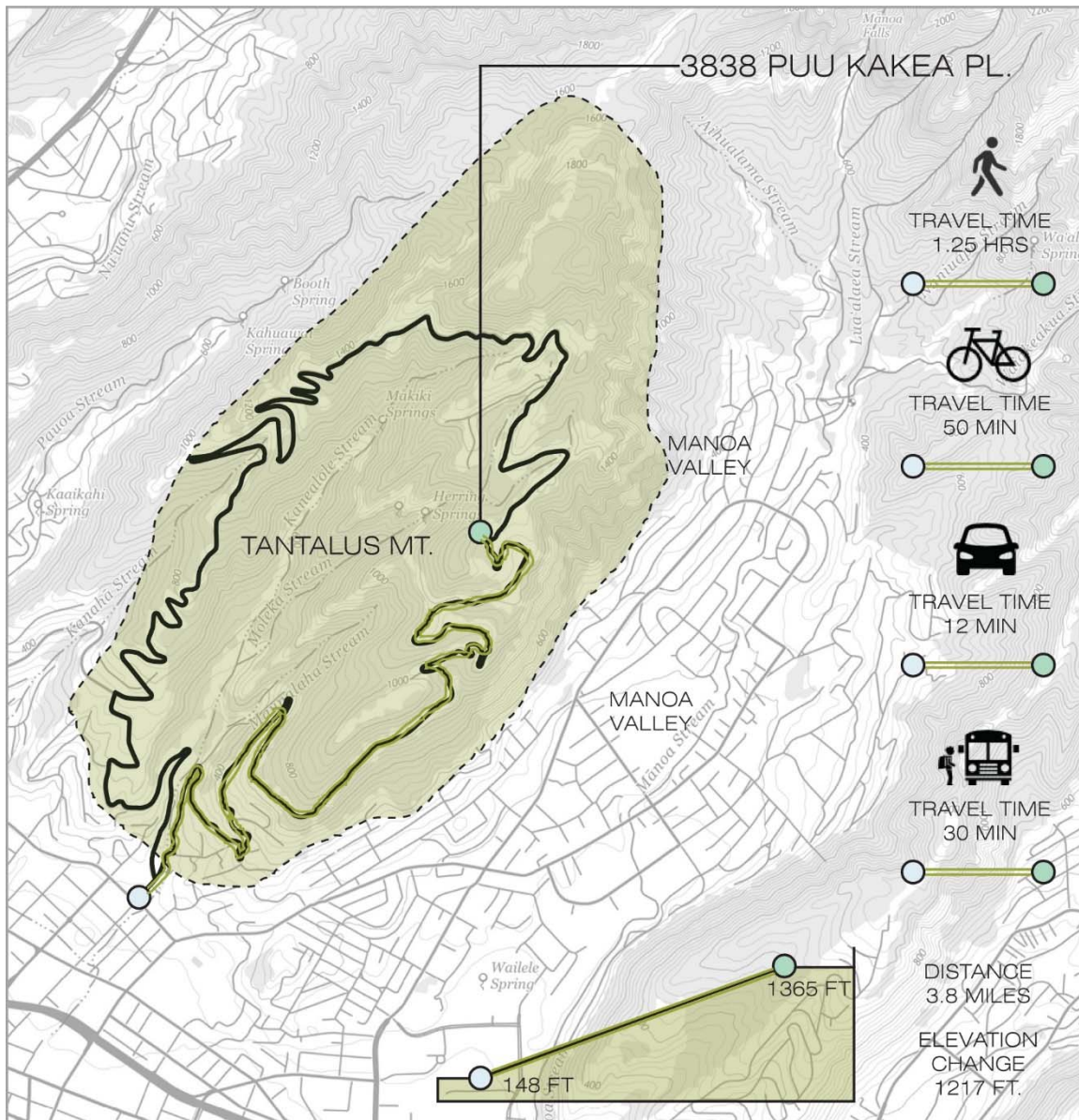


Figure 34. 3838 Puu Kakea Pl. Site Access Diagram made by author.

When the time of day changes to night, the road, the mountain, and scenery becomes dark, secluded, and quiet. A drive during these times will prime you for negative emotions. Barely lit, the blue of the ocean is no longer visible, and the idea of the city and people being awake is absent. The winding road provides for a more difficult time with navigation because one will have difficulty predicting what's coming around the turn. The foliage along the drive becomes foreign compared to the daylight hours when one could see through the foliage. The darkness during the night can cause one to get lost in their thoughts of what may lie beyond their visible



spectrum.<sup>114</sup> The sense of safety begins to retract at night. There have been occasions in the past where bodies or bones have been discovered in the dense undergrowth. There are fewer than 200 homes on this mountain, making it a likely place for crimes.

### Annual Sun Path Analysis

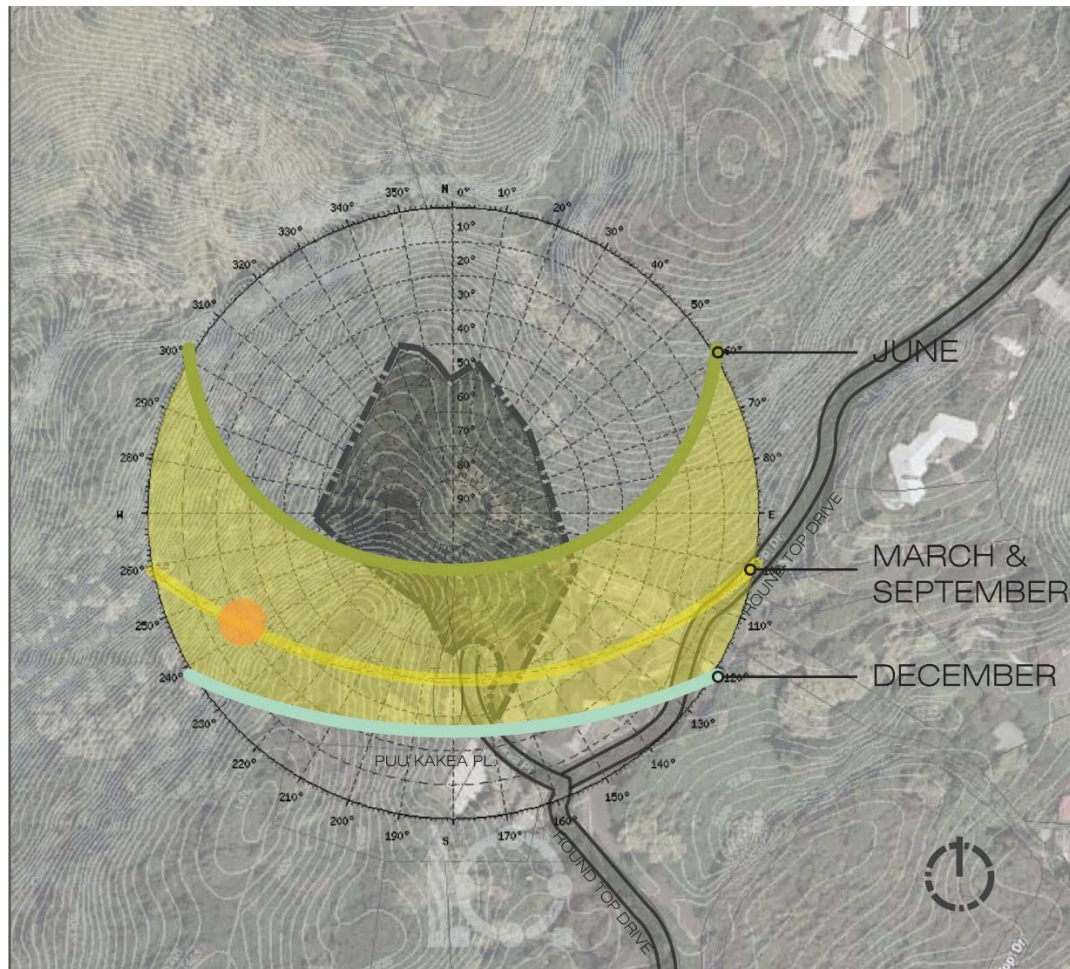


Figure 35. 3838 Puu Kakea Annual Sun Path Diagram. Made by author.

The diagram illustrates the direction of the sun's path throughout the year as well as the sun angles throughout the days. The north and northeast facing areas of the site receive the least amount of sun throughout the entire year. Whereas the

<sup>114</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 363.

south, east, and west receive the most. The longest days occur in the summer and the shortest are in the winter.

### Annual Air Flow Analysis

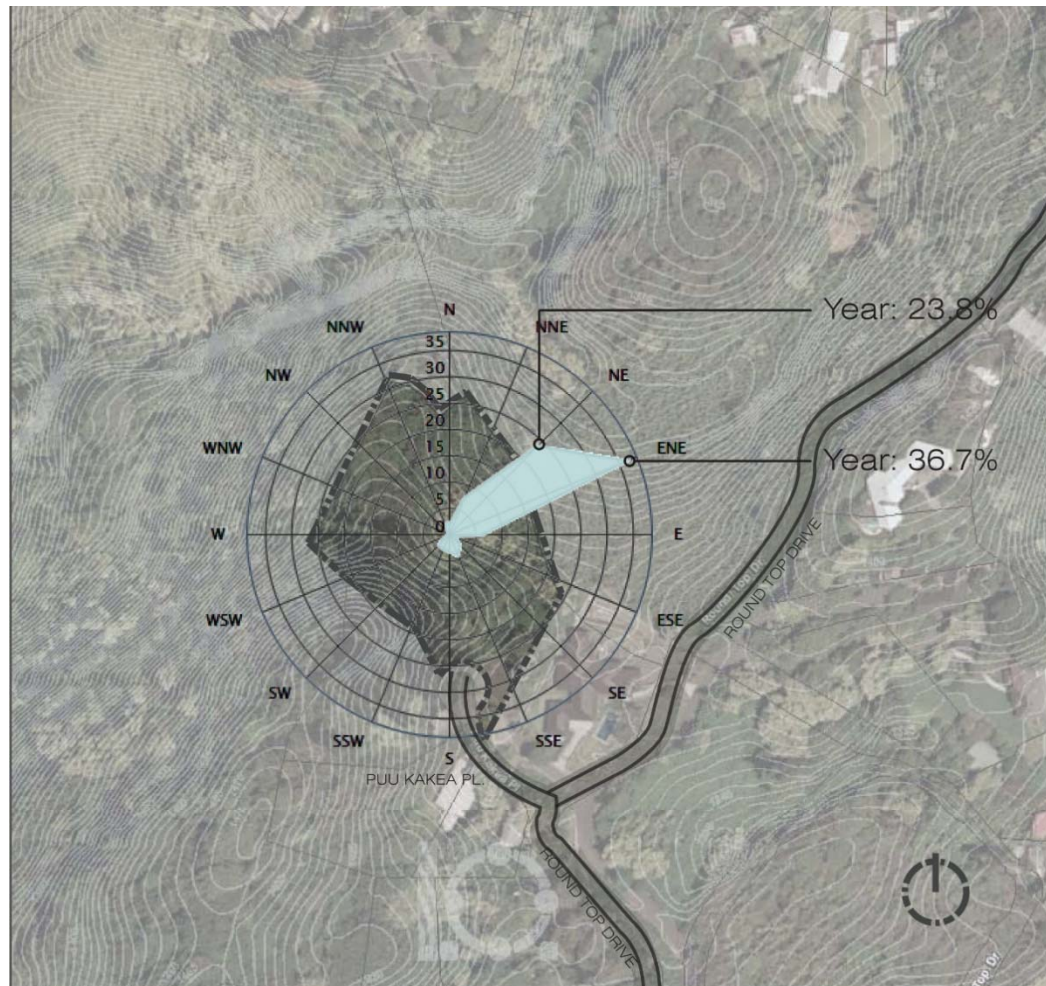


Figure 36. 3838 Puu Kakea Annual Air Flow Diagram. Made by Author.

The majority of air flow in the Hawaiian Islands come from trade winds blowing from the Northeast and East Northeast directions. Hawaii's location being in the northern hemisphere around 20 degrees north of the equator, it receives winds that blow from northeast to southwest coming from North and South America. These winds eventually reach Asia. The geography at 3838 Puu Kakea provides for a consistently cool environment.



## Site Views

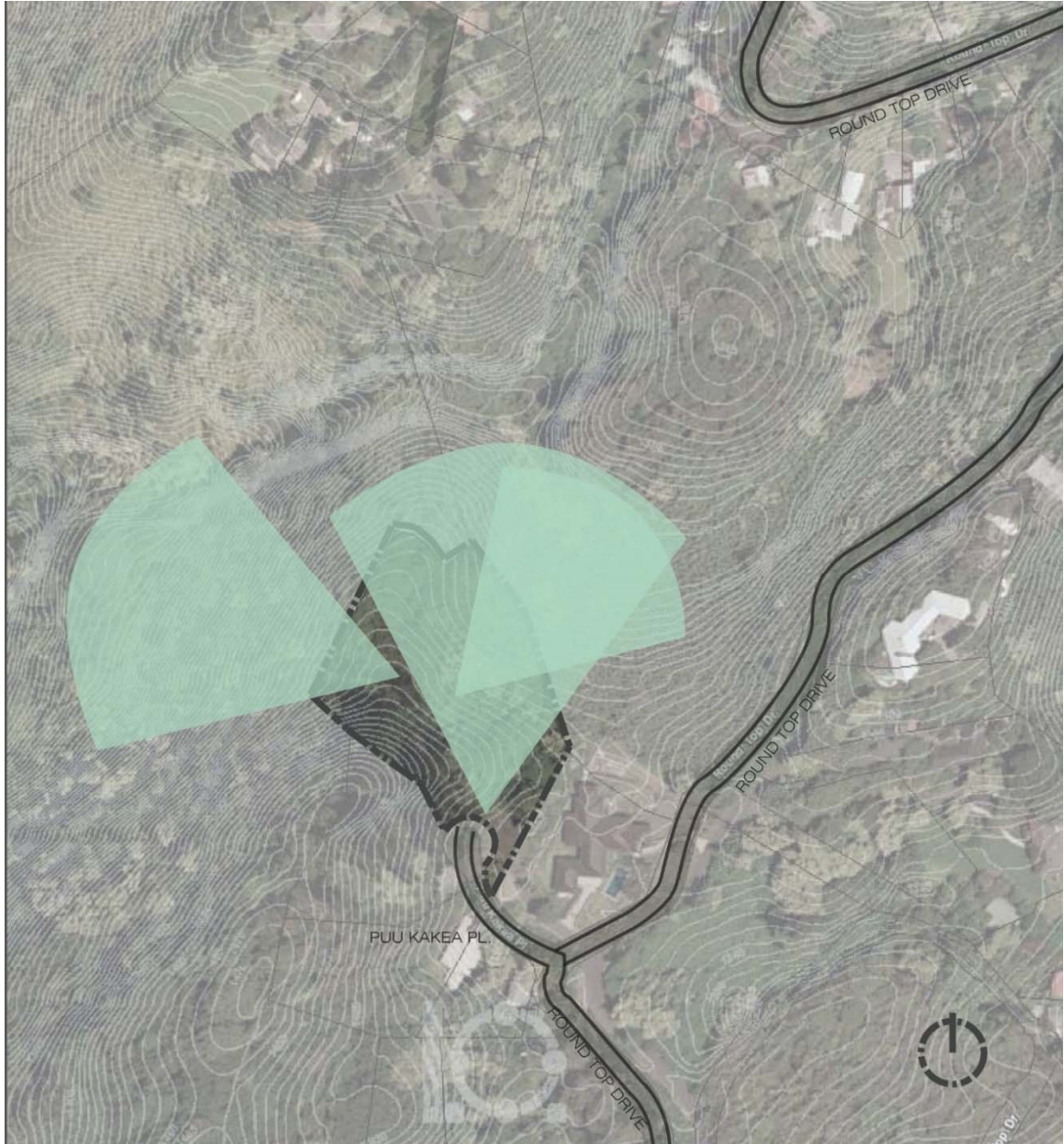


Figure 37. 3838 Puu Kakea Site Views Diagram. Made by Author.

Views from the site vary according elevations. The lowest point of the site doesn't have much to offer besides dense foliage. Moving higher towards the elevation which the entry is located, there is a very pleasant panorama of the northern valley wall. The highest portion of the site has an even broader view which shows the northern valley wall and the deeper parts of the valley.



Figure 38. Image of view towards northern valley wall and southwestern portion of Oahu. Image taken by author.

The area of the site with the most spectacular view is the most northern part. From here there is almost a 360 degree view showing the higher portions of the site to the deeper parts of the valley, the northern valley wall, and reaching all the way to the south western shore of the island.

Architecture whether man made or formed through nature is an entity that subconsciously influences the actions and behaviors of living organisms within its context. In some cases its influence goes beyond the walls that define it. This ability of leaving a permanent mark within an individual is remarkable. Although today in many cases the built environment falls short of this potential and fails to emotionally connect with its inhabitants. The purpose of this project is to design a place which sole purpose is to connect with it users and enable the users to connect with their own memories.

### **Process of Program Development**

An elementary school services teachers, faculty and students. The typical spaces required for an elementary school would be, classrooms, restrooms, administration, library, cafeteria and playground. How these spaces are determined is by its users and their relationship to the activities they will be performing. Understanding the necessary spaces for a school is quite straight forward because it's a typology that has been around for hundreds of years.

The initial development of a program for A Memory Recollection, as with all new typologies, required an in depth and innovative approach to determine its architectural necessities. In this process, a series of questions was asked. Some questions arose from answers which were responses to the previous questions. The dialogue went about as such:

Q: What will people be doing at the memory recollection center?

A: Users will visit this place where their experience through it will result in the evocation of positive emotions thus creating a cultivating environment for the recollection of memories.

Q: How do you architecturally make an experience which evokes positive emotions?

A: In design the use of colors, geometry, spatial proximities, circulation, and relationship to environment, such as weather, lighting, and views can influence positive emotions.

This answer was a sensible but simple, it didn't seem to have the strength necessary to connect with its users on a deeper level.

Which then lead to breaking down the concept of experience. Between architecture and its users there is a level of non-verbal, physical communication. Users perceive their environment in a certain way causing them to respond in a certain way.

Naturally, if a person is afraid of heights they will tend stay away from areas where it seems like they may fall a great length. Our perception influences our emotions.

Emotions is what causes people to have various responses depending on the state of the environment.<sup>115</sup> This perception and emotion intertwinement was followed by:

Q: Of the six universal emotions<sup>116</sup>, two fall into the positive category, which are happiness and surprise. How does a person experience happiness?

A: As previously written, happiness is an emotion that requires some state of surprise in order to be experienced. In the case of happiness there is a sharp decrease in the amount of neural stimulus. Surprise plays a role in this experience because it creates the sharp increase of neural stimulus required in order to have a sharp decrease. During the sharp decrease an individual will feel happy, only during this rapid drop of neural stimulus will a person experience happiness. It is followed by sense of content. This state of content only exists if the individual knows that they are safe or secure.<sup>117</sup> This neural activation of happiness, can be applied to architectural design.

Q: How can we apply the activation of happiness to architectural design?

A: Architecture doesn't move but it is able to cause the people within it to move a certain way, see certain things. Scale, materials and colors all have the ability to trigger innate responses. The regulation of temperature is beneficial to comfort within a space. The amount of natural lighting is relative to our internal bodily functions. Lighting is crucial to our understanding of safety and security. In Japan

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<sup>115</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 291-293

<sup>116</sup> Hung, Daniel D, and Heji Kim. 1996. *Six Universal Emotions*. April 20. Accessed April 1, 2014. <http://www.nbb.cornell.edu/neurobio/land/oldstudentprojects/cs490-95to96/hjkim/emotions.html>.

<sup>117</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 242

some tea houses are designed with a circulation that uses the landscape to hide and reveal pleasant views as one goes about. It is the circulation throughout a space that people experience architecture. The design is what influences the experience. Therefore the design for a memory recollection center must be developed with the understanding that the circulation and spaces require aspects which can cause a sharp increase in neural stimulus, then a sharp decrease, followed by form of content. The circulation has the ability to choreograph a person's movements and initial views of spaces. This means circulation has the potential to activate happiness. Still needed is the spaces which provides the form of content after the rapid decrease.

Q: What type of spaces would be most applicable to memory recollection and positive memories?

A: Episodic memories are triggered through a form of similarity and association. A person's current environment has features which perceptually have been experienced before. These features are then cognitively analyzed. Typically episodic memories happen through self-recall. One has to purposely think of a past event. The past event they are likely to recall is one that has a similar emotion to the one they are experiencing in their current environment. Depending on the amount of similarities associated to previous events, a user will be able to recall different episodes. With high levels of similarities relative to associations, déjà vu or feelings or nostalgia are possible.<sup>118</sup>

The amount of similarities that can be associated with one's past determines the memory recollected, and for that reason if we look more carefully at the emotion of happiness. The emotion can be broken down to its phenomenology or experiences. Three experiences that can be tied to architecture are serenity, association, and individualization. Serenity is defined as a sense of relaxation, and a tendency to experience the world with a sense of harmony. Association is defined as a sense of happiness felt through communal acceptance, and social participation.

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<sup>118</sup> Baddeley, Alan, John P Aggleton , and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press, 101.

Individualization is the feeling of being a unique person that is separate from the typical surrounding world.<sup>119</sup>

These phenomenological types of happiness can be used as targeted design experiences for the nodal points of the memory recollection center. Three types of happiness will provide for a greater degree of recollected memories associated with positive emotions.

The question and answer dialogue in this section developed the initial programmatic aspects for the Memory Recollection Center. Two approaches were taken towards designing the center. The first approach was logical, having a circulation that brought visitors through spaces using strategies that would activate happiness. It had the right phenomenological spaces. This original design was too logical though, it followed all the typical rules of designing a building according to specific criteria. This first memory recollection center wasn't designed in an innovative way, it failed to fully capture the essence of the site and its surroundings. The next section diagrammatically illustrates the circulation, spaces, and building form of the initial design approach. Included are descriptions as to why the first design attempt was not a success and why a second approach had to be taken.

### **8.1 A MEMORY RECOLLECTION CENTER DESIGN APPROACH 1.0**

The structure of the design process was direct. It went through the needs of the project like a checklist. A goal was set followed by a concise list of objectives which stated how this goal was going to be met.

#### **Goal**

Create an experiential architectural design that enables its users to emotionally connect the present with their past.

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<sup>119</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press, 264.

## **Objectives**

With the understanding that episodic memories are strongly tied to our perception and experience in our environment, this project aims to:

- Strategically use the environment, architectural design, materials, colors, and lighting to provide users with a spatial experience that evokes positive emotions resulting in the recollection of positive memories
- Provide spaces capable of exhibiting serenity, association, and individualization
- Create a circulatory path which connects and heightens the effect of each spatial experience

## **Program for a Memory Recollection Center 1.0**

Aside from the research proven, necessary spaces, the center in a basic sense is a place that people will be visiting. Meaning typical spaces which accommodate visitors needed to be included in the program.

### **Visitors Center**

- Parking for approximately 8 vehicles (limiting the amount of vehicles allowed on site, controls the amount of visitors, also reduces the amount of open unused space when vehicles are not present)
- Bicycle Parking
- Reception Area
- Restrooms

### **Memory Recollection Center**

- Approximately 15,000 ft<sup>2</sup> (A footprint of this size would take up 16% of the site which would leave much of the sites natural landscaping for views)

## Space Types

The type of space for each phenomenological experience of happiness was determined by combining the results from an analysis regarding how and what type of spaces could elicit serenity, association, and individualization.

Serene spaces are quite, relaxing, and tranquil. In spaces like these it is easier to hear and reflect on one's own thoughts. Therefore individual reflection rooms would be suitable to elicit serenity.

Association or affiliation is a trait of happiness achieved through the acceptance of others in the surrounding world.<sup>120</sup> Biologically happiness is the emotion that regulates our social responsiveness.<sup>121</sup> A space conducive to social interaction would elicit a feeling of social acceptance. A carefully designed outdoor garden would be able to elicit association.

In individualization a person feels that they are a distinct and significant individual.<sup>122</sup> An elevated space, being able to highlight and separate an individual would be capable of individualization.

- Individual Reflection Rooms (Serenity)
- Outdoor Garden (Association)
- Elevated Highlighting Space (Individualization)

## Key Program Elements for Evoking Positive Emotions

- Operates during daylight hours
- Location of structure should be placed at a higher elevation to create sense of security as well as confidence
- Scale, proportions and form should be relative to strength, security and comfort.
- Circulation choreographed to neutrally activate happiness.
- Building should allow natural lighting and air flow

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<sup>120</sup> Izard, Carroll E. 1977. *Human Emotions*. New York: Plenum Press. p.264.

<sup>121</sup> Ibid, 244.

<sup>122</sup> Ibid, 244.



- Colors and Materials relative to positive emotions

### Initial Schematic Design

The schematic design phase started with a compilation of the data from the site analysis. A site opportunities diagram was created, highlighting areas and conditions that were ideal for the pieces of the memory recollection center. Then strategically a circulation was designed to connect these spaces together.

### Site Opportunities

Site opportunities on the site come from 3 points. The entry has an area of large flat space. The western portion of the site provides an elevated vantage point with clear views of the surrounding landscape. The northern portion of the site has the most impressive view. A consistent amount of wind flows to the site from the northeast.

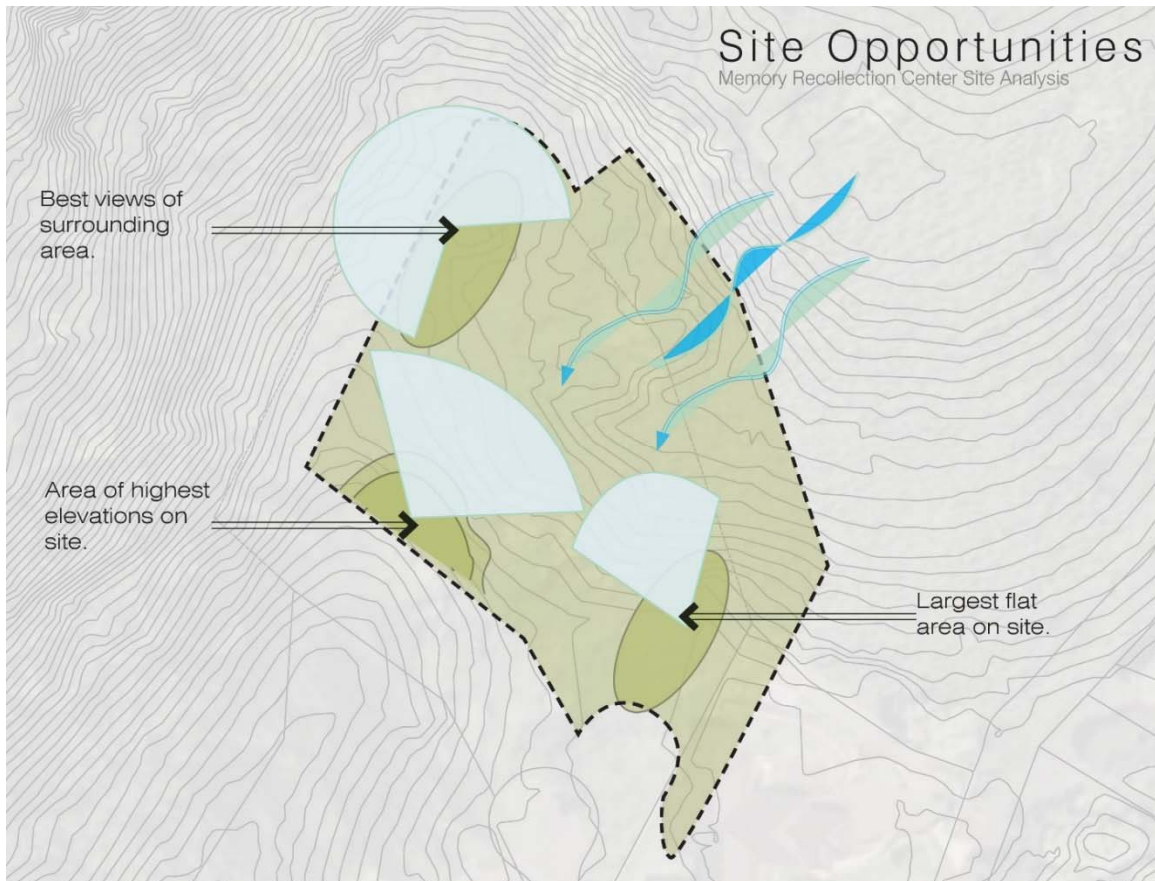


Figure 39. Design Approach 1 Site Opportunities Diagram. Made by Author.

Pieces of the program can be placed on these 3 points of opportunity. The flat area of the site is by the entry which would serve well as a parking and driveway to a visitor's center. Having the parking at the beginning of the site would prevent an eyesore of a large parking space in the middle of the site.

The western and highest area of the site would work well for the overall placement of the Memory Recollection Center. One side of the building would have the protection of the hill on the western side which elevates another 30 feet beyond the property line. To the east of the building, the topography slopes downwards which would allow for elevated views of the surroundings. If placed here the building would really create a sense of safety for its users.

At the 3rd and northern region is the unparalleled view of the surrounding valley and the southwestern coast of the island. This location would be ideal to accommodate the design for the individualization space. If the visitor's center was placed on the flat point it would have to be placed further towards the east to allow for traffic to come in. This meant that visitors would have to walk back in the direction of the driveway to avoid using the ravine as a transitional space to get the ideal space for the Memory Recollection Center.

Diagrammatically this created a linear path from the ideal entry of the building towards the individualization space. Placing the

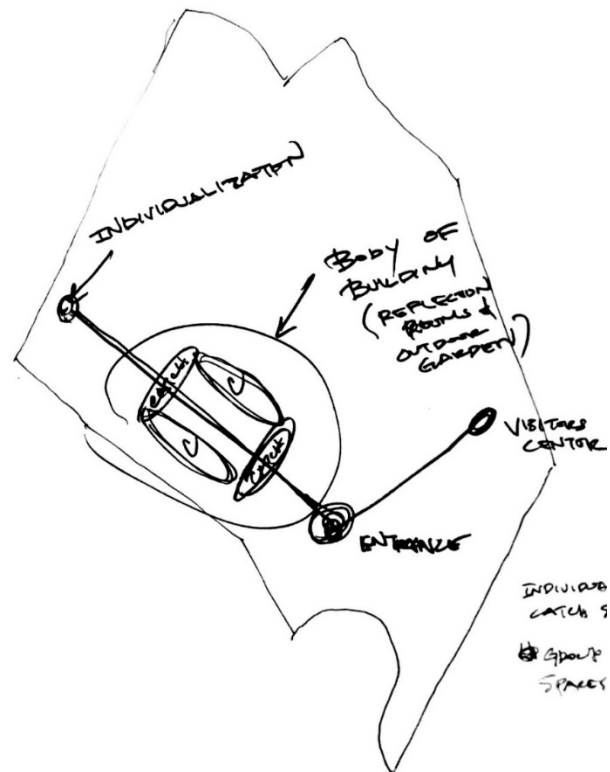


Figure 40. Design Approach 1 Space Planning Diagram Sketch. Made by Author

main body of the building on the western portion meant it would sit right over this linear path. The next task was to decide on the locations within this body would best suit the reflection rooms and outdoor garden.

Placing the reflection rooms in the east would give great views of the natural landscape. Having the outdoor garden on the western side of the path would mean the garden could use the building as a buffer from wind coming from the northeast. The buffer would reduce the amount of noise making socialization easier.

With the spatial planning set, the next step was to connect them. What path would generate the best experience? Reanalyzing the feelings intended for each space followed by the order in which they could be experienced would produce a strong effect. When a person experiences the individualization space they feel really great about themselves. In a reflection room, they feel content within. Association spaces would gratify one in the sense of being accepted and needed by others. A journey causing a user to feel comfortable, content, and understand themselves would start to build upon the positive emotions felt by a person. This growth of positivity would stimulate one for social interaction, therefore the outdoor garden would serve purposeful for the next point. At the outdoor garden, the socialization would further add to the positive emotions being felt. Ending the journey with individualization would create an even larger increase of positive emotions. Using this order to guide users would form a very thought provoking experience.

The planning process could now shift to design. The following diagrams show a site plan, spatial organization and layout with images depicting the design intended atmosphere of those spaces. Also included is a circulation diagram, and renderings of the building form.

## Site Plan

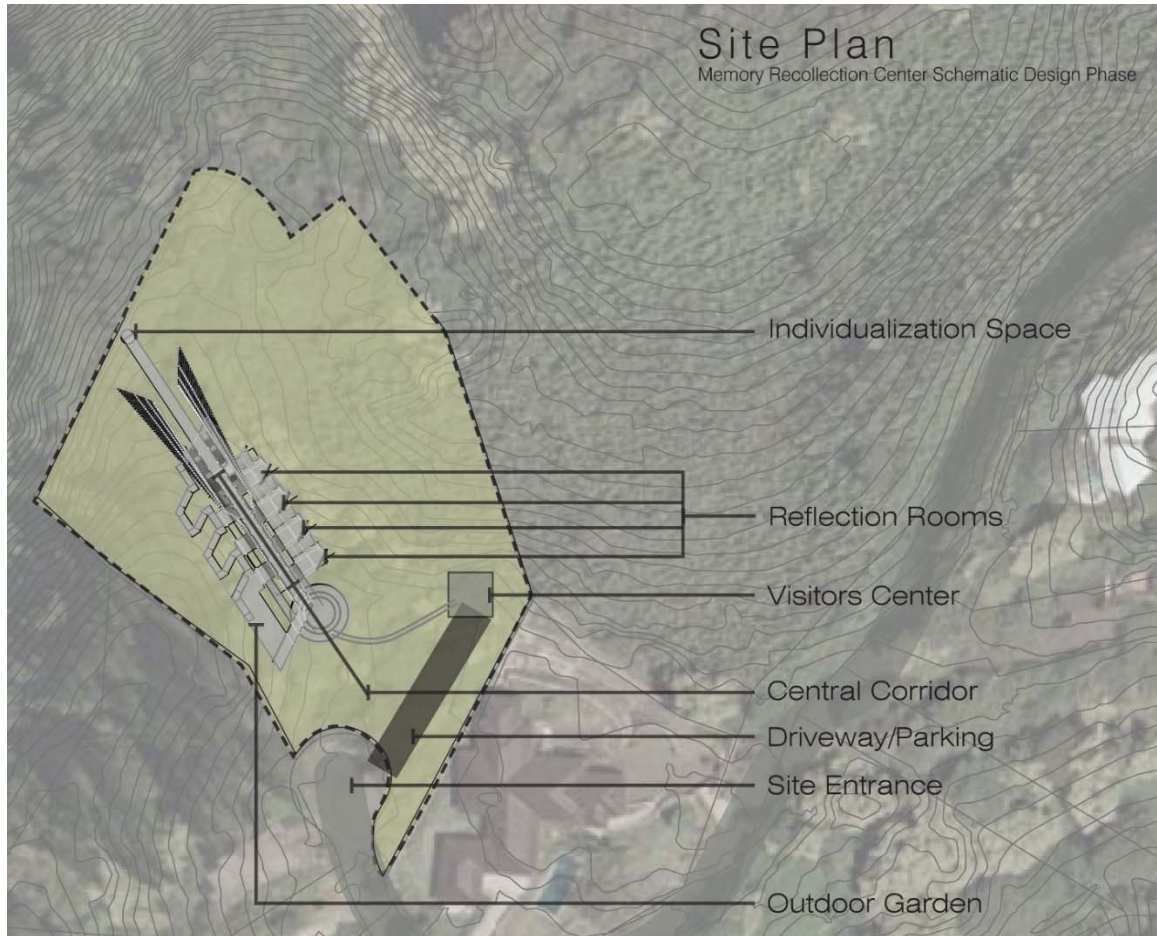


Figure 41. Design Approach 1 Site Plan. Made by Author.

## Central Corridor

## Central Corridor

Memory Recollection Center Schematic Design Phase

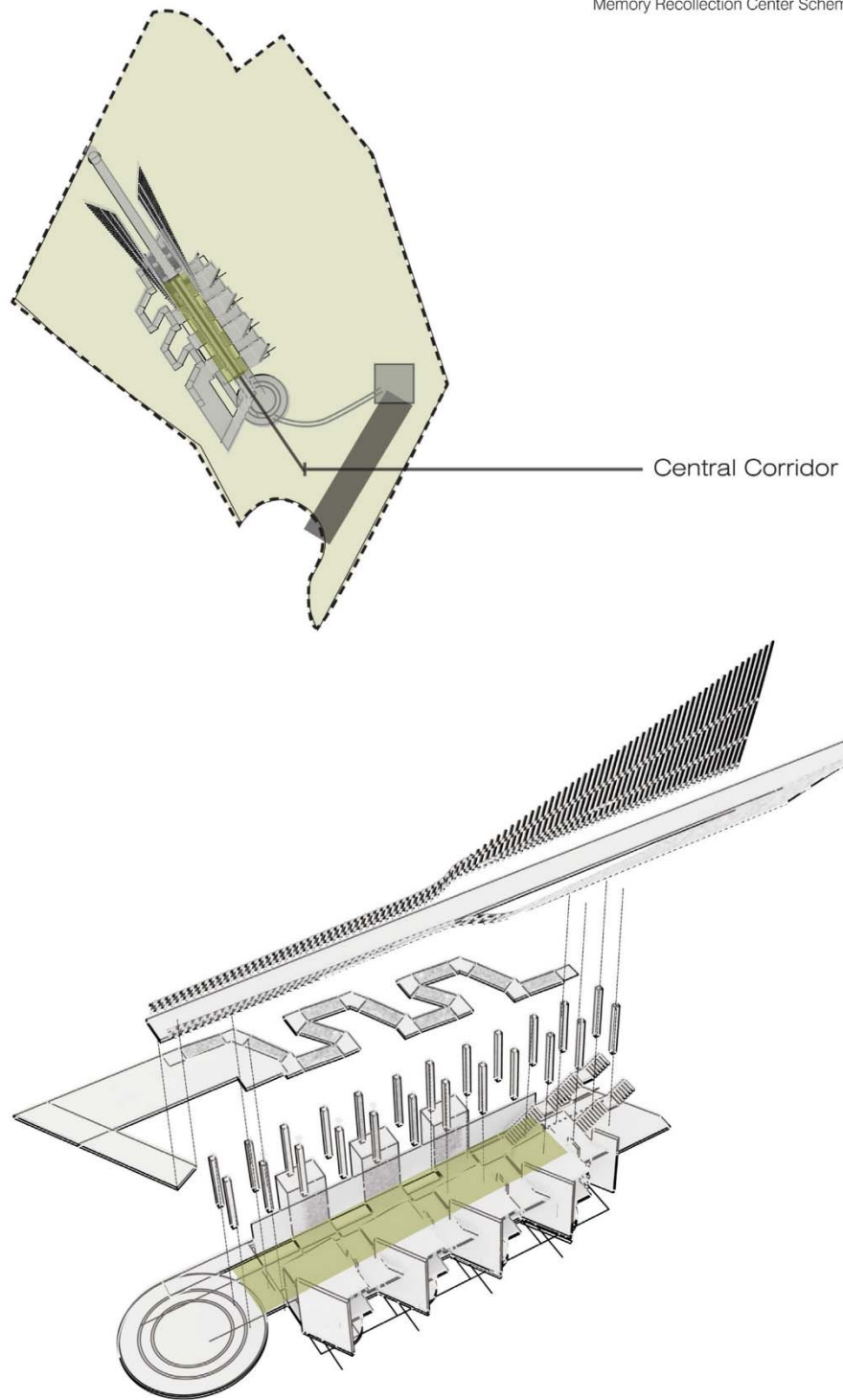


Figure 42. Design Approach 1 Central Corridor Diagram. Made by Author.



The central corridor is an extension of the entry way acting as a spine to the Memory Recollection Center. It was designed as a walkway using of flat planes over a water feature. The next space to follow is the reflection rooms.

### **Reflection Rooms**

The location and design of the reflection rooms allows for natural ventilation from the northeast and shading from the low sun angle in the mornings. These private rooms offers a comfortable and serene environment.

Large glass windows would give visitors a view of the surrounding landscape.



Figure 43. Image Depicting Atmosphere in Central Corridor of Design Approach 1. Source: <http://www.artdecorationsdesign.com/wp-content/uploads/2014/10/exquisite-reflecting-pools-for-a-fluid-and-tranquil-home-29.jpg>



Figure 44. Image Depicting Atmosphere of Reflection Rooms. Source: <http://blurblawg.typepad.com/.a/6a00e54f871a9c8833014e8b1bef4c970d-500wi>

## Outdoor Garden

## Outdoor Garden

Memory Recollection Center Schematic Design Phase

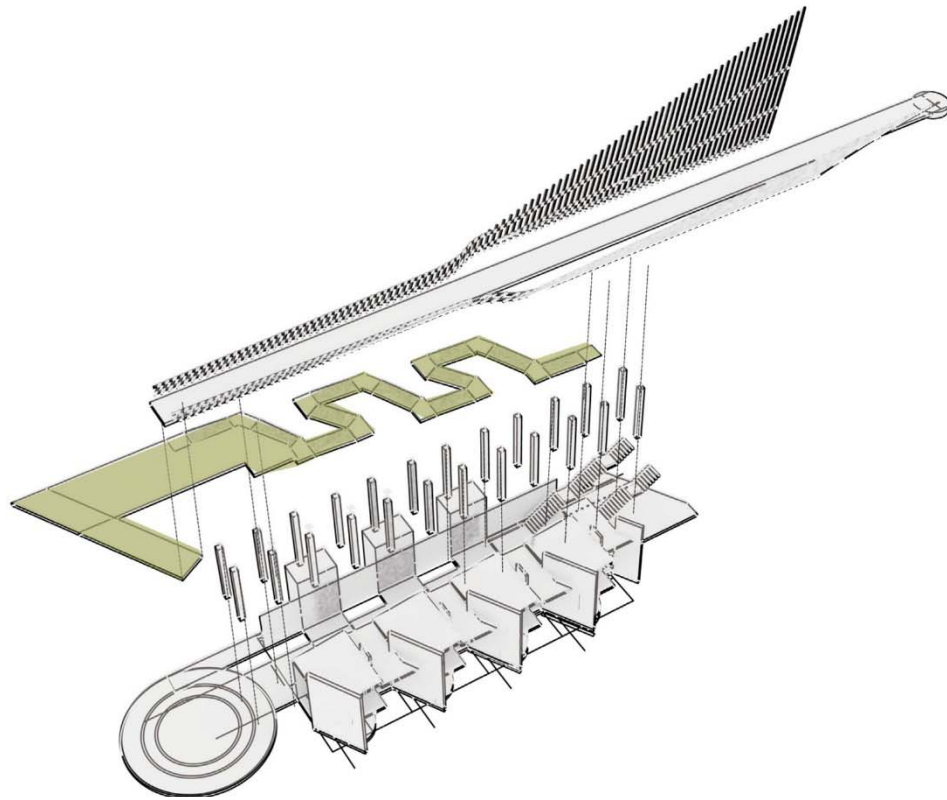
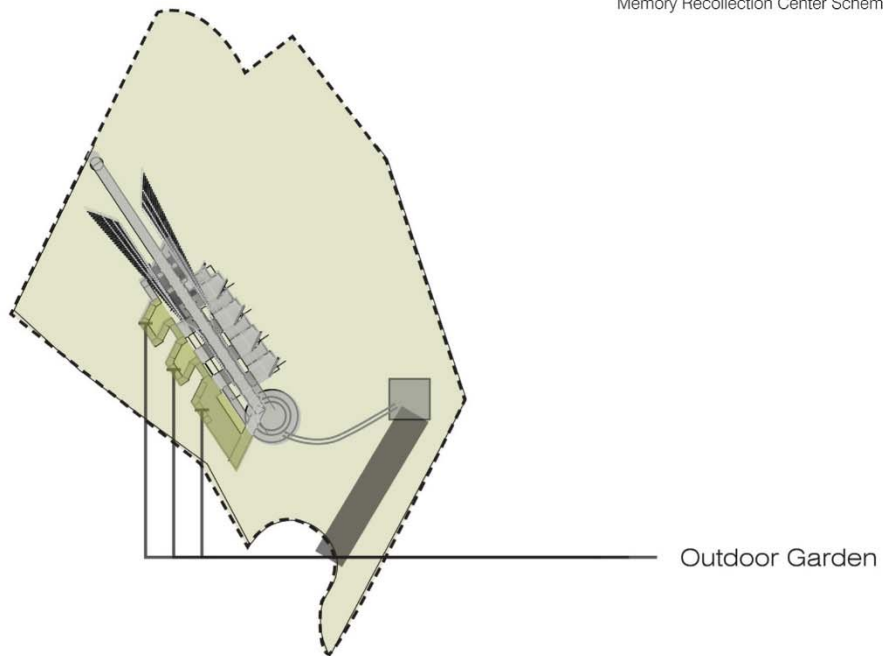


Figure 45. Design Approach 1 Outdoor Garden Diagram. Made by Author.



Figure 46. Image Depicting Atmosphere of Social Garden.  
Source:  
<http://www.theswellelife.com/.a/6a00e54ef168098833017ee817f17b970d-700wi>

The outdoor garden would provide a stimulating space for visitors to socialize. The design would be landscaped to include forms and colors that encourage activity and interaction. Seating would be made available and arranged to offer places for open or intimate conversations.

### Individualization Space



Figure 47. Image Depicting Atmosphere of Individualization Space. Source:  
<http://archinect.com/news/gallery/73222258/0/the-architecture-work-of-tatiana-bilbao#>

The location of the individualization space reaches out towards the northern edge of the site. The architectural forms rise and open directing users towards a small circular platform elevated and suspended at the edge of the site. From this point users are floating above the landscape and able to experience the best views available.



# Individualization

Memory Recollection Center Schematic Design Phase

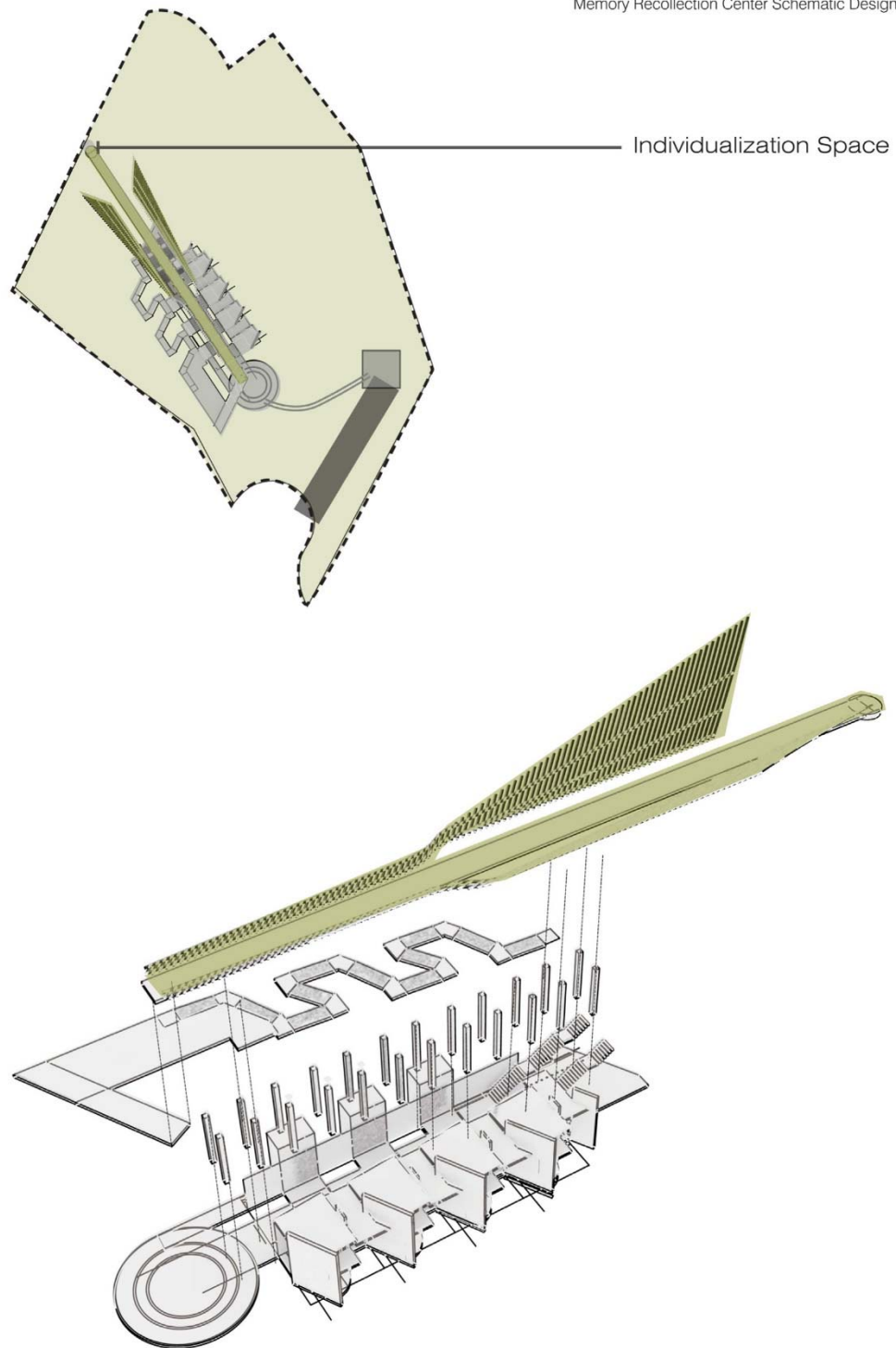


Figure 48. Design Approach 1 Individualization Space Diagram. Made by Author.

## Circulation

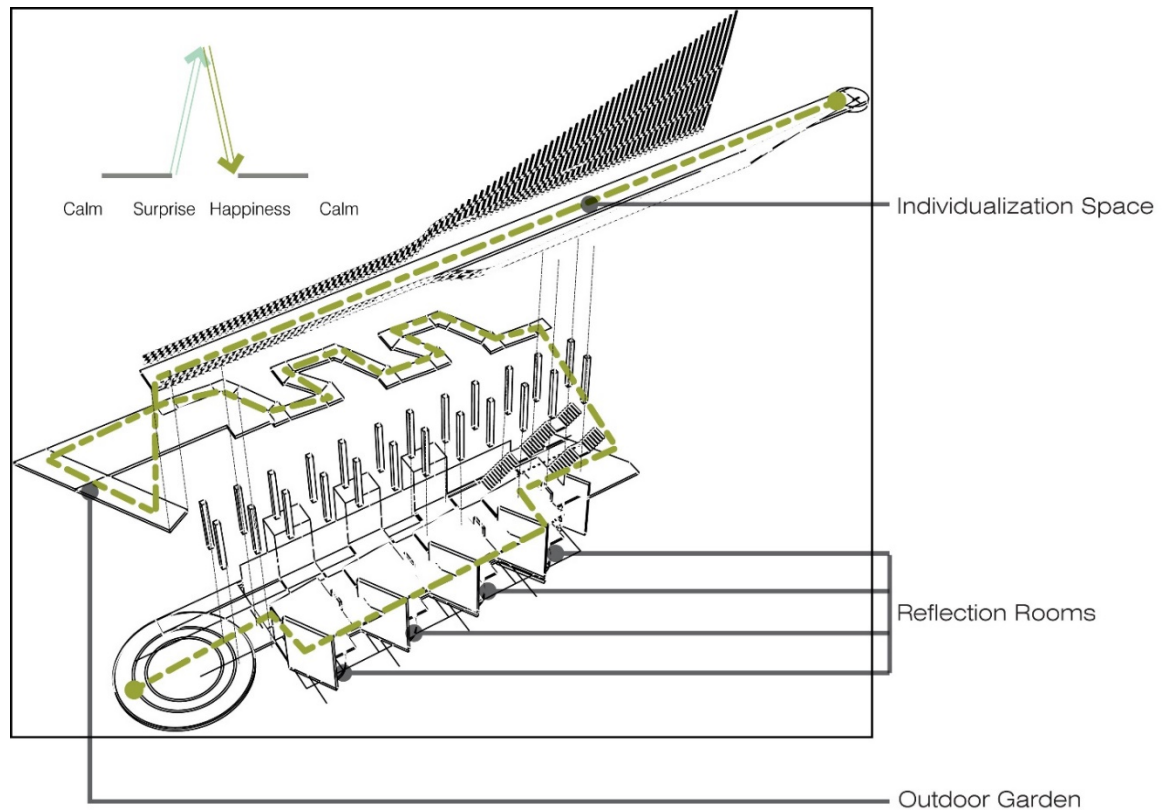


Figure 49. Design Approach 1. Circulation Diagram. Made by Author.

The path from the visitor's center to the Memory Recollection Center uses the dense foliage of the site to obstruct a direct view between the two. The purpose of this was to create a sense of awe using the building's scale and design when it is revealed to users reaching an opening from the trees. At this point a large circular plane forms the entry into the building. In shape psychology circles give the impression of connection, wholeness, comfort and safety.<sup>123</sup> These aspects gave reason to the design of the entry.

The central corridor follows, designed as a transitional space and extension of the entry way it forms spine through the Memory Recollection Center. Surrounded by a shallow water feature, flat planes formed a walkway raised slightly above the water line. The horizontal lines of the planes, joined with the character of the water

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<sup>123</sup>2010. *Psychological Effects of Shapes*. April 18. Accessed March 7, 2014. <http://archive.csustan.edu/oit/WebServices/SupportResources/PsychOfShapes.html>.

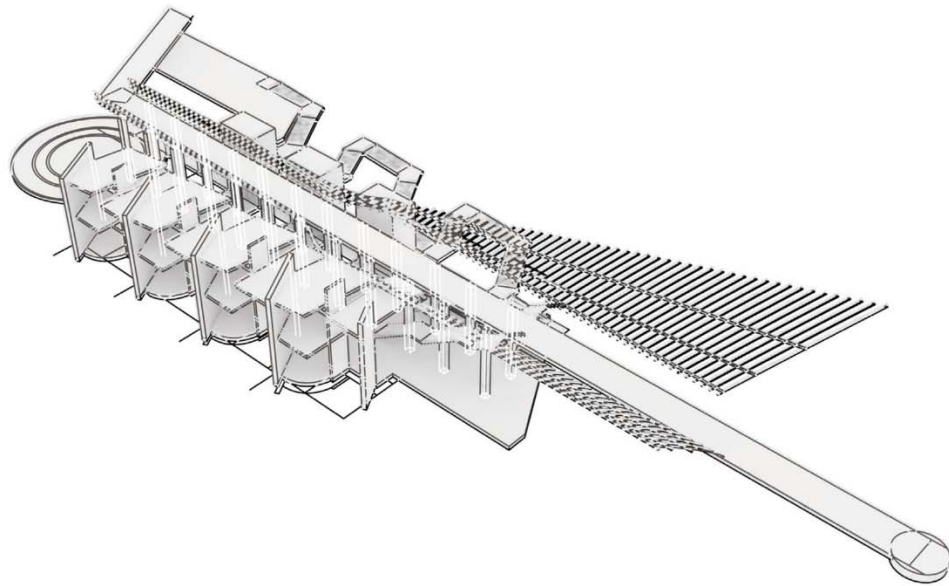
creates a tranquil and passive setting. This background primes and provides a smooth transition for their next experiential space.

Located on the eastern side of the building, the reflection rooms are angled towards the northeast using large walls which block the sun from the east during the morning hours. Facing the northeast allows for passive ventilation, keeping the space cool. Each room is meant for a single person. As one sits here, they can enjoy an unobstructed view towards the ravine below and the valley beyond. These rooms provide a very private area for reflection.

Afterward users circulate to the outdoor garden. This pathway switches back and forth to address the topography of the site. Influenced by the pathway, diagonal forms merged with stimulating colors in the vegetation start to stimulate the mind. Designed to include open space and secluded space, visitors will have a place for open or intimate conversations.

The individualization space is accessed by a ramp at the end of the garden. From the entrance of the Memory Recollection Center till the beginning of the individualization space, users have been on a journey that has been steadily rising. The feelings of confidence are often associated with being in higher places. The users may not constantly be thinking that they have been rising through the building, but consciously they would understand that they have reached a higher elevation. This individualization space has views along the entire path. The architecture directs one's attention towards the end of the path, its forms are suggestive of opening and uplifting. The end is a circular plane cantilevered above the landscape and sized comfortable for one person. In this space, individualization should be elicited.

## Building Form Renderings



Building Form  
Memory Recollection Center Schematic Design Phase

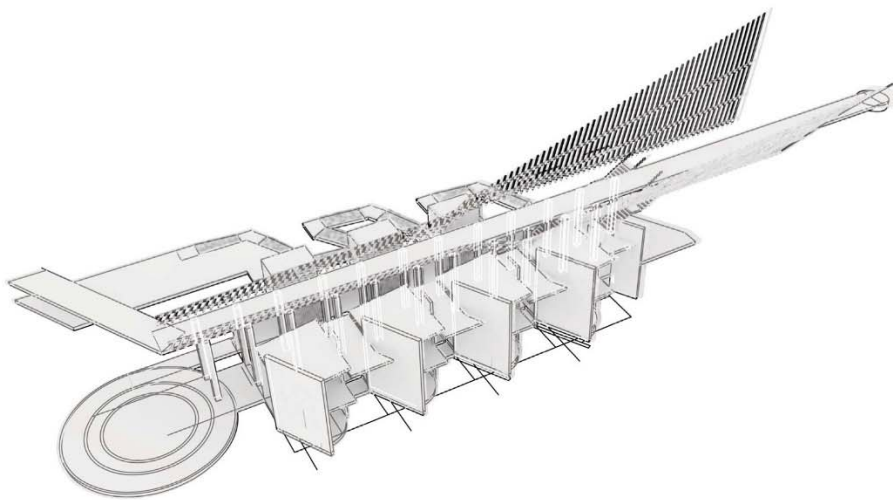


Figure 50. Design Approach 1 Computer Generated Renderings of Building Form.  
Made my Author

## **Review of Design Approach 1.0**

Design Approach 1.0 attempted to implement the research on human psychology into a built form in the schematic design phase. In some instances, the design was logical and relevant to the research. When thoroughly reviewing the proposed Memory Recollection Center, it became evident that more could be done to improve the experience

The first approach only skimmed the surface in terms of analyzing the conditions and potential areas on the site for building the memory recollection center. At first glance, if a certain part of the site appeared in anyway unbeneficial to the evocation of positive emotions it was completely disregarded. The eastern portion of the site was disregarded just because of the fact it was at a lower elevation. No thought was put further into evaluating this area for other potentials.

The design route taken was standard and typical of architectural design, it lacked the innovation necessary for the development of a new typology. It took three distinct site opportunities and placed pieces of the program in the most logical places. It utilized a majority of the western portion and it was monolithic. As a place for calming it was excessively dynamic making it appear aggressive. The visitor's center and parking was placed in the flat entry area because it was a commonsensically convenient location. This initial approach identified that the site was crucial to the experience and that it would ultimately dictate the type of space designed.

A review of the circulation path pointed out experiential issues. As a place that intends to have returning visitors, it needed elements that would draw people back. The initial design addressed mainly the visual aspects of first time visitors, not much thought was placed on the experience of return trips. The proposed circulation functions as one permanent path. Every visit may produce a slightly different feeling but ultimately, one's progression through the structure remains unchanged. Consistent visits would slowly leave users unaffected.

To function as the Memory Recollection Center as hoped for, an innovative approach to design was necessary. The new route has to address the visitors, the architecture, and site on multiple levels.

## **8.2 A MEMORY RECOLLECTION CENTER DESIGN APPROACH 2.0**

The second design approach reverts back to and restarts from the original concept of utilizing the neural activation of happiness as well as the different aspects of its experiences. This new method is innovatively built upon a structure designed to address key issues found from Design Approach 1.0.

Design Approach 2.0 acknowledges the fact that the site is crucial to the experience and that it would ultimately dictate the type of space designed. Therefore this became the point of launch for the new schematic design phase.

Starting clean, 3838 Puu Kakea Place was reanalyzed for site opportunities that had been previously overlooked or disregarded. The reanalysis was performed open-mindedly, if an area didn't initially look promising then architectural design has the possibility of changing its outlook. Architecture is a tool for problem solving, if something cannot be built on top of the site, it may be possible completely below, partially below, and even above. Therefore when evaluating a specific area, questions asked were; "how will architecture be able to emphasize the potential of the space? How will this space tie in with the evocation of positive emotions and memories? If architecture is designed for this space how will users react? Is this proposed idea innovative? Does this idea have multiple levels of meaning or reason?"

As this site analysis progressed, areas of potential began to appear, but analyzing them to the general descriptions of serenity, association, and individualization proved to be insufficient. These site areas had potential in regards to the combinations of architecture and phenomenological experience that could be applied. Some of these areas had possibilities for either a serene space or individualization space. Another arguably could house serenity or association. Additional explanations were needed to reach a conclusion. Each of these areas had to be unique to have the most significant impact. This led to the decision of further breaking down the phenomenological experiences of each one.

In what ways can serenity be experienced? What can people do to experience these forms of it? Where can they experience it? How can it be experienced? The same questions were asked of association and individualization. The answers for each experiences provided a more definitive and harmonic relationship with the site

and architectural possibilities. Now the chosen areas for interventions became unique.

With each location identified the subsequent task was to breed a circulation path between them creating a cohesive experience. This affinity would make the place recognizable as a Memory Recollection Center. Referring back to the circulation of Design Approach 1.0, visitors followed a planned experiential path in the order of serenity, association, then ending with individualization. Logically this attempt planned to have a strong emotional impact upon its users. The problem was, it was planned, and it had an obvious end. Eventually returning visits would end in poor results because each experience would basically be repeating the one prior. During our lives emotions do not stop nor do they end, therefore the circulation should do as such.

When a person is on a planned route, they know what to expect, the idea of something unexpected completely disappears from the picture. When the route is unplanned, the unexpected comes into play. This absence of expectation is relative to states of surprise. Relating back to emotions, happiness is an outcome of surprise. Forming a route that lacks expectation would mean that it would have to be unplanned. Users would be free to explore. This brought up the question, "Would an unplanned route still be capable of having a significant impact?" Each location chosen on the site serves a unique experiential purpose, an unplanned route would let users stumble upon the places dependent on their own preference and state of mind. The Memory Recollection Center addresses three general phenomenological experiences of happiness. Every individual lives a different life and experiences these phenomenologies, though the order or fashion in which it happens is typically not the same. Evoking feelings of serenity, association, and individualization in a nonspecific order would produce various states of positivity. A built environment designed to function in a way that yields emotional similarities to the lives we live is extremely conducive to memory recollection. Therefore the forming a circulation path connecting all the areas, and allowing for them to be visited in any order would return the most interesting and optimal results.

Design Approach 2.0 did not begin with a set program listing the spaces required. Instead it pinpointed key elements that needed to be addressed. A



combination of site conditions, architectural design possibilities, and emotional experience created a unique program.



Figure 51. Design Approach 2.0 Site Specific Selection Diagram. Made by Author.

The highlighted areas labeled 1-7 in figure 52 presented conditions most favorable to a combinational design method.



Area 1, is a level space encountered immediately after entering off the dead end road, the terrain on the left and right wings slope upwards forming a natural entrance way. The elevation of the entrance also has a scenic view of the valley to the north.

Area 2, to the right of Area 1 is situated where the terrain directed towards the north has a fairly steep slope. This slope is also dense with and abundance of large vegetation. The slope in relation to these trees presented an experiential opportunity.

Area 3, is located at the heart of the site. Its elevation is also relative to the midpoint between the lowest and highest points. The optimal view corridor is towards the east. Right below this view range is flows dense forest of bamboo towards the valley beyond. Fairly steep contours along the site separated by a ridge also proved to have potential.

Area 4, exhibited a mound that differed from the direction the overall terrain was headed. This mound elevated while the landscape was dropping. Existing adjacent to the mound was a flat plane. Area 4 displayed the best view of the site, a panorama ranged from the back of the valley in the east, traced the entire valley wall to the north to the urban western plain and down to the ocean.

Areas 5 and 6, had two large level planes nestled into the lower northeastern region of the site. A thick forest of bamboo grows wild here sheltering the ravine. The space felt lively and safe because of these features.

Area 7, is the highest portion of the site. Accessibility is only possible by trekking upwards. The view isn't as promising as Area 4, but it does provide the best vantage point of the entire property as well as the lush valley beyond towards the east.

The performance abilities of each area was weighed to draw a conclusion on whether eliciting serenity, association, or individualization was best. Areas 1 thru 4 presented the finest experience for serenity when unified with architectural design. Figure 53 color codes the spaces and categorizes them according to experience.

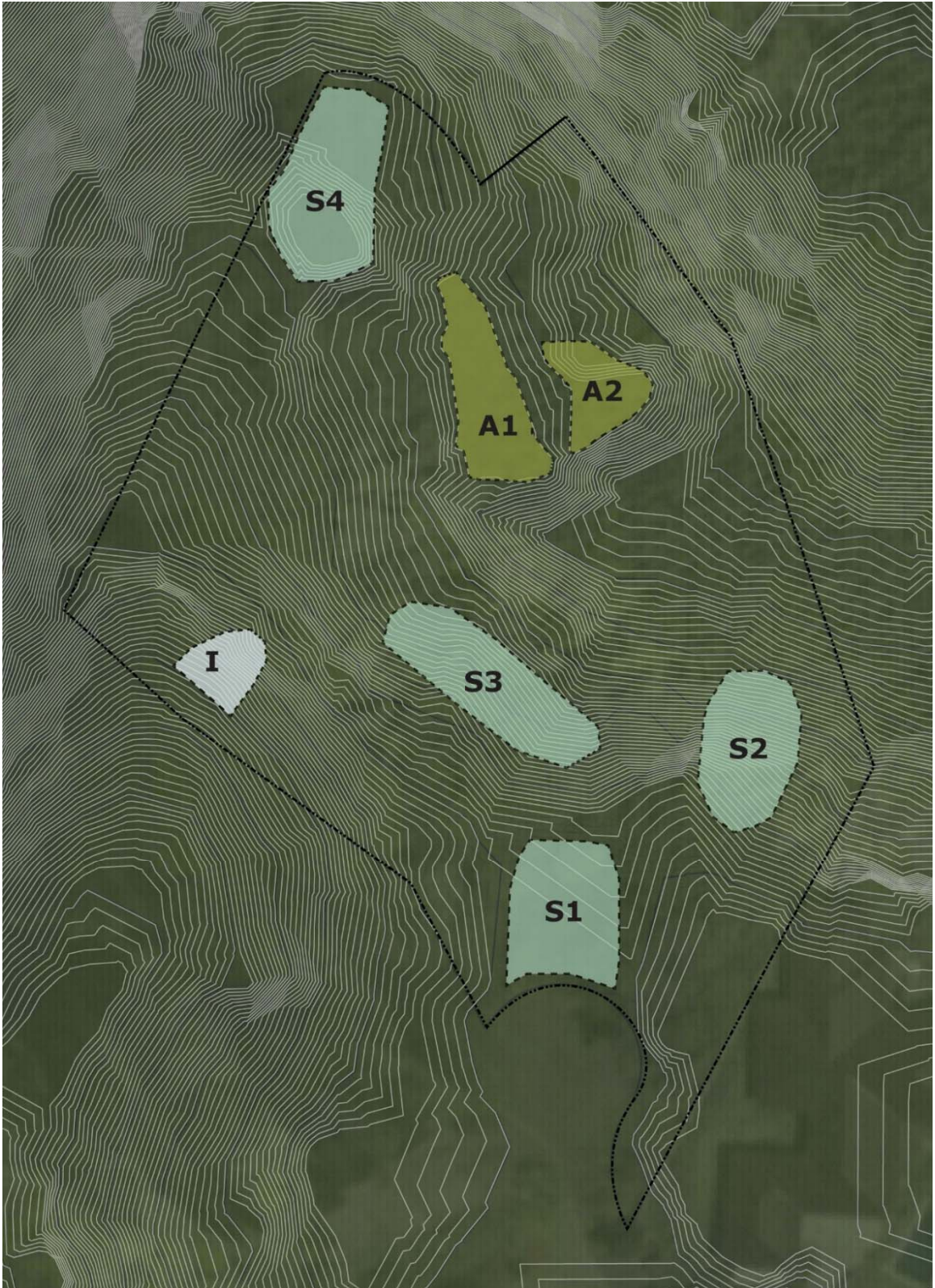


Figure 52. Experiential Differentiation Diagram. Made by Author



## Views

This very brief section illustrates the existing site conditions from each chosen area of the site. The images are labeled based on where the view was attained from. Some of the pictures taken don't provide much scenic details due to the dense vegetation in the area, but there are glimpses of great potential.

### Area S1



Figure 53. Image of Site View from Area S1. Image taken by Author.

## Area S2



Figure 54. Image of Site View from Area S2. Image taken by Author.



**Area S3**



Figure 55. Image of Site View from Area S3. Image taken by Author.

**Area S4**



Figure 56. Image of Site View from Area S4. Image taken by Author.

**Area A1 & A2**



Figure 57. Image of Site View from Areas A1 & A2. Image taken by Author.



## Area I 1



Figure 58. Image of Site View from Area I1. Image taken by Author.



Ultimately each designed space needed to be perceptually unique. Therefore through an exploration of to distinguish serene environments, the most appropriate description fitting each potential space was devised. The four descriptions that proved most encompassing for each location are transcendent, tranquil, placid, and balanced.

Placidity embodied the Area S1. Transcendent ensphered S2. Tranquility embraces S3, and balance

embraced S4. Areas A1 and A2 accommodated association perfectly. Area I, voiced individualization. Having the spatial plan set the circulation concept of self-guided exploration was implemented. With each spatial location and circulation path established, the design of built forms could initiate.

Design Approach 2.0 led to the final design of the Memory Recollection Center. The novel combination of these experiences with architectural design and site selection are illustrated in the following segment.

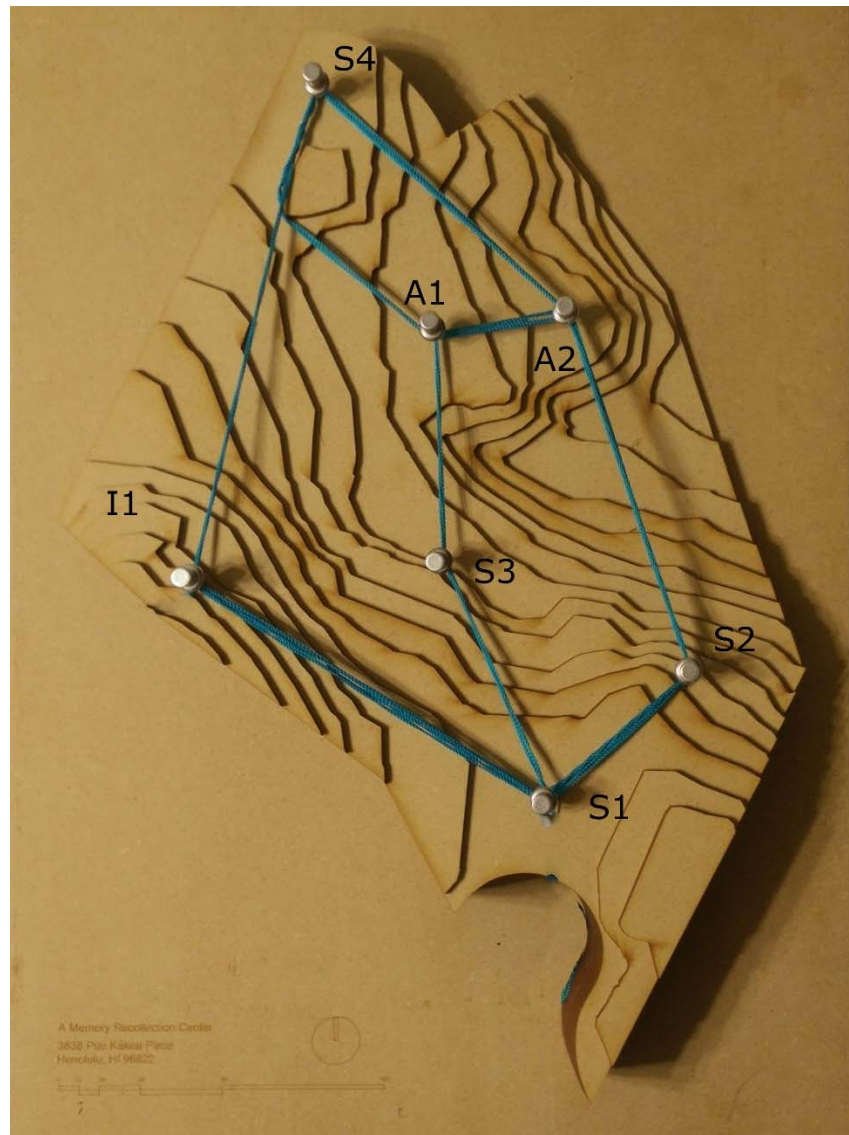


Figure 59. Initial Circulation Concept Diagram. Made by Author.



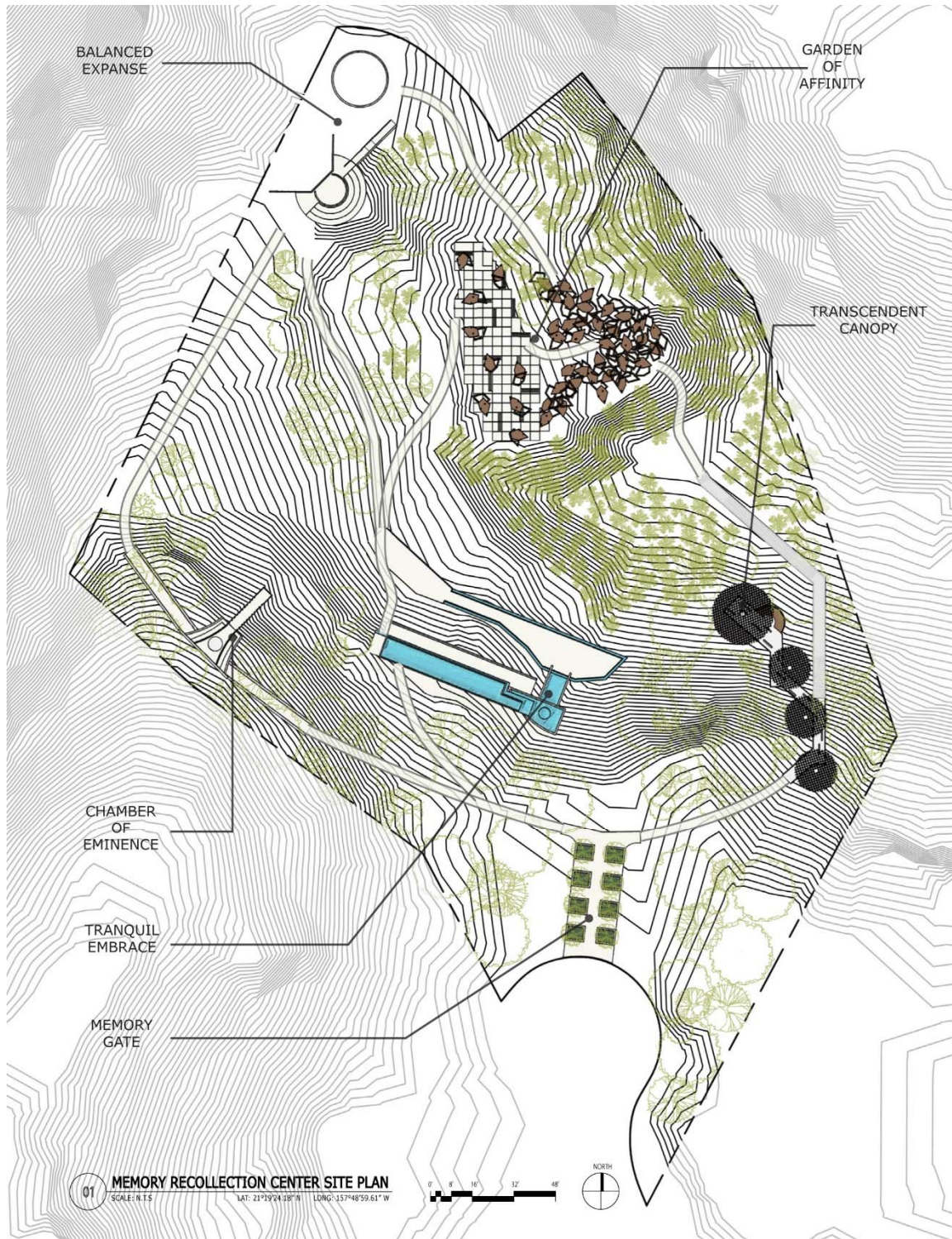


Figure 60. A Memory Recollection Center Final Design Site Plan. Made by Author.

## **Falling into Memories**

The recollection of episodic memories are often visualized from a third person's perspective. In this process it is as if a person is watching themselves in a previous time in space.<sup>124</sup> The specific events that occurred in the memory exists only in the mind of the individual. These memories create a unique non-physical realm that is overlain onto the world that we live in. In its depths this vast surreal world holds the events that have shaped and brought us to the current point in our lives. As we explore this world we simultaneously fall deeper into our memories. The Memory Recollection Center aspires to function as a medium from which this journey can begin.

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<sup>124</sup> Baddeley, Alan, John P Aggleton , and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press.



## The Memory Gate



Figure 61. Rendering of Memory Gate. Made by Author.

Edges formed by the naturally sloped landscape express an open path into the site. Placid refers to the form of serenity embodying the entrance to the Memory Recollection Center. The organized and simplistic layout, directing a view towards valley beyond is framed by architecture and existing vegetation. The design places a calm and composed like atmosphere upon visitors. The intentions of this design is to provide the minds of visitors a clean slate as they enter through the Memory Gate. This central path splits into two partially hidden paths at its end, thus creating a curiosity of what lies within. One of the key elements of the program brought forth from Design Approach 1.0 is the operation of this facility during daylight hours. With the environment well lit, users will feel safe and secure exploring because visually they are able to grasp what lies ahead.



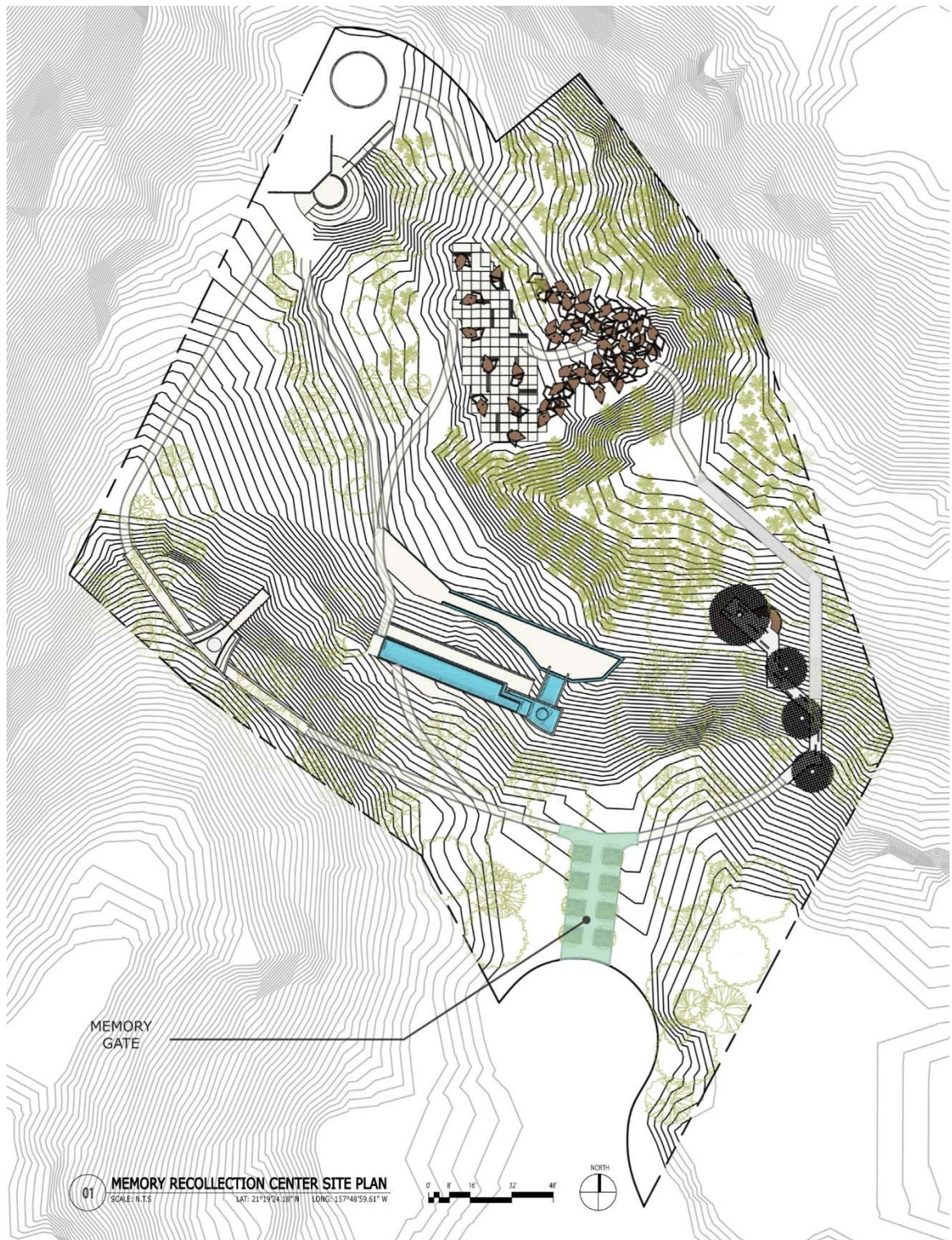


Figure 62. Memory Recollection Center Site Plan Indicating Location of Memory Gate. Made by Author.

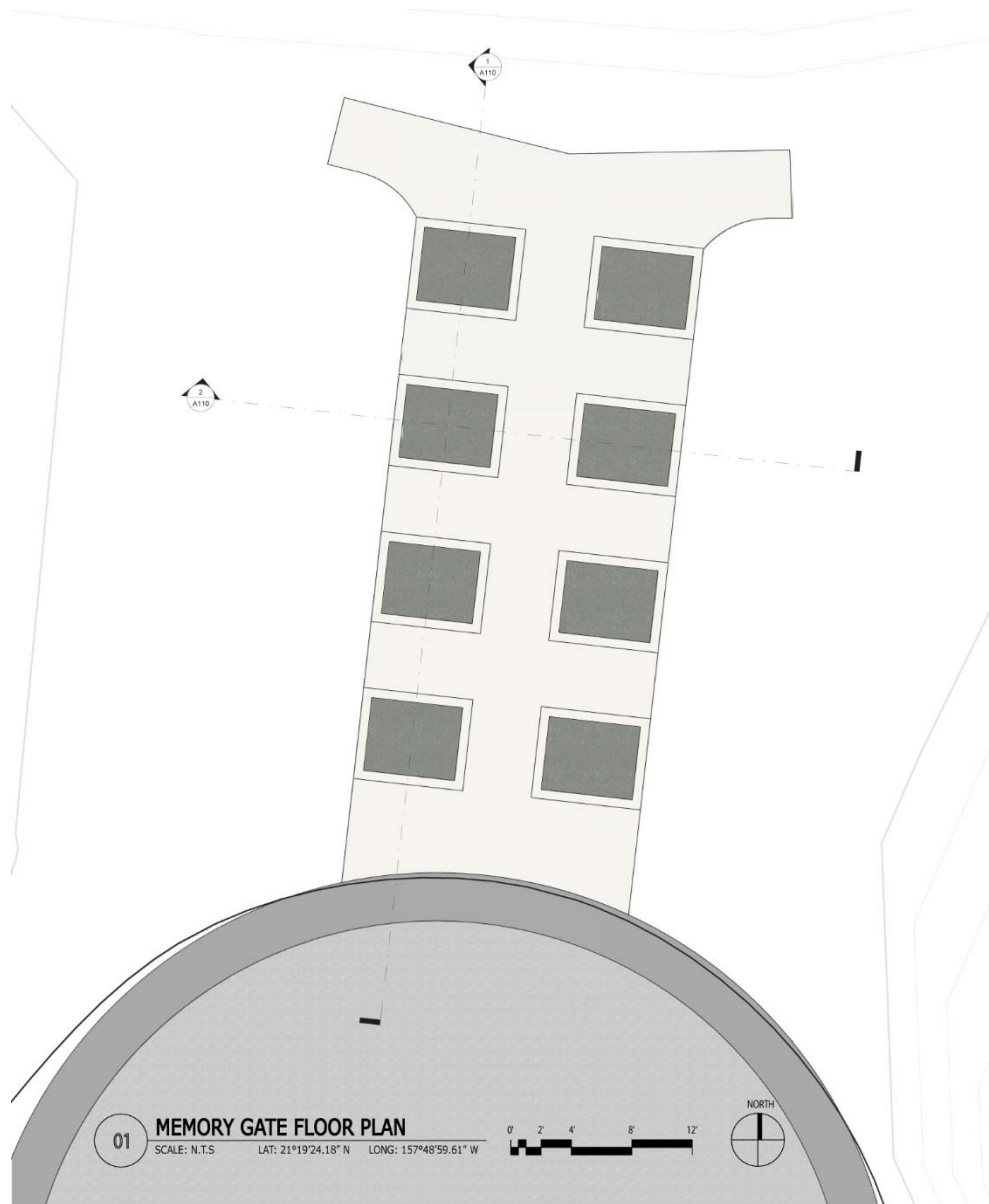


Figure 63. Memory Gate Floor Plan. Made by Author.





Figure 65. Memory Gate Cross Section. Made by Author.

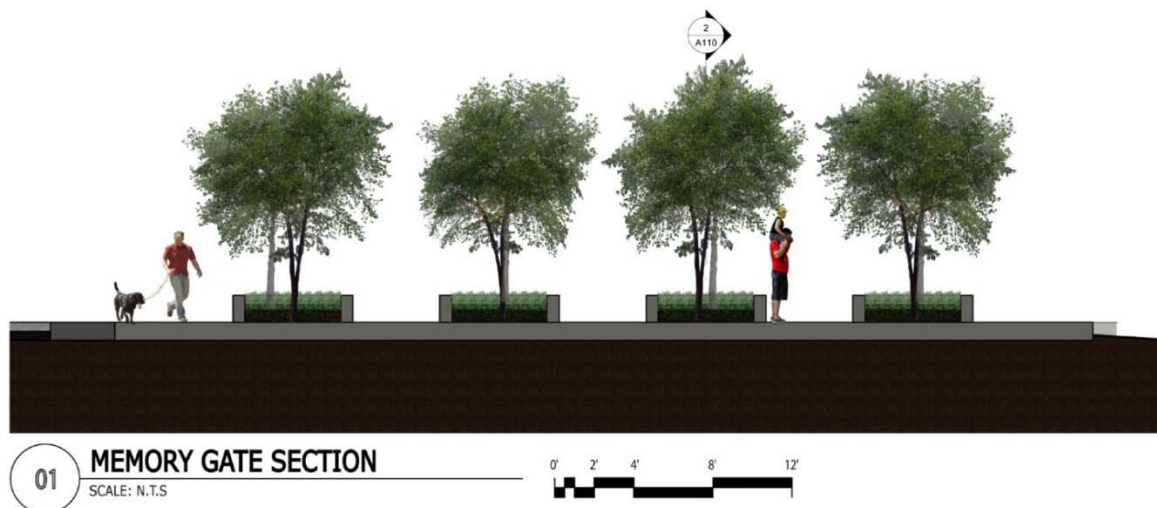


Figure 64. Memory Gate Longitudinal Section. Made by Author.

## The Transcendent Canopy



Figure 66. Rendering of Transcendent Canopy. Made by Author.

Located a short distance to the east from the Memory Gate is an area where the terrain drops with a substantially steep slope. Contrasting from the slope are large trees growing vertically with no regards to the steepness.

As our species walks in a forest we look up in awe to the majestic size of trees. We are only able to visually grasp the space that this form of nature occupies above us. We as a species are limited to the spaces we can physically and comfortably occupy. The spaces directly above are heads reaching to point above the canopies of trees is a realm existent and graspable in our imaginations.

The architectural intent of the Transcendent Canopy is to deliver its users to a surreal place. Extending horizontally from the high point of the sloping terrain, a platform with light wells in its floor weaves through the trees on the slope. As the slope declines, so does the distance between the canopies and the platform. At its extent, the platform reaches a space above the tree canopies.



Circulating through this space, users begin at our natural point of being at the base of trees, allowing them to go through a conscious understanding of scale and proportions. As they walk through this platform, light wells reveal the growing distance from the ground below while the height of the trees begin to decrease. Dappled lighting from the leaves above stimulate the floor space. At the end of the Transcendent Canopy visitors will end with the illusion or effect that they have floated above the trees. Seating along the platform will allow users to sit or lay down and reflect.

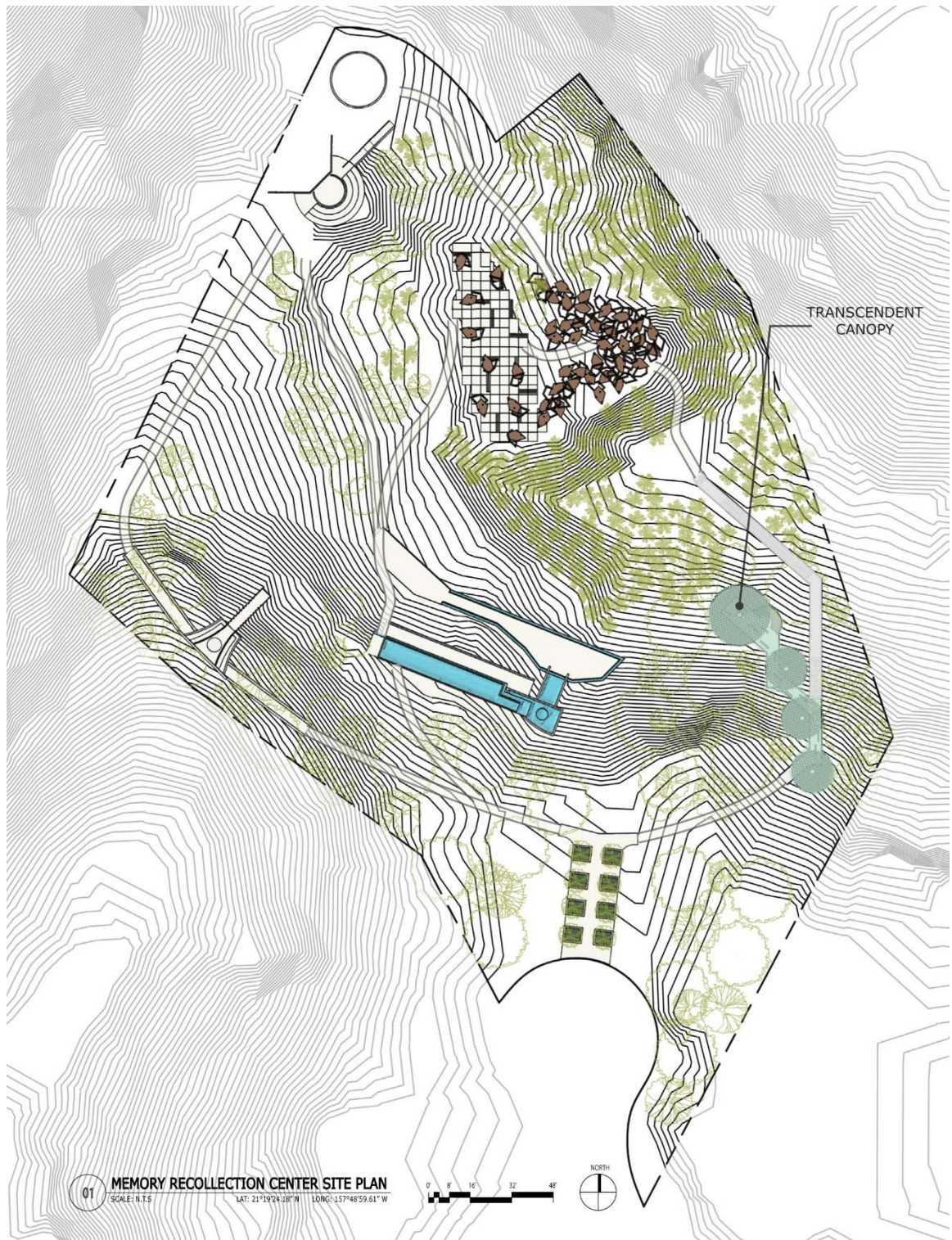


Figure 67. Memory Recollection Center Site Plan Indicating Location of Transcendent Canopy. Made by Author



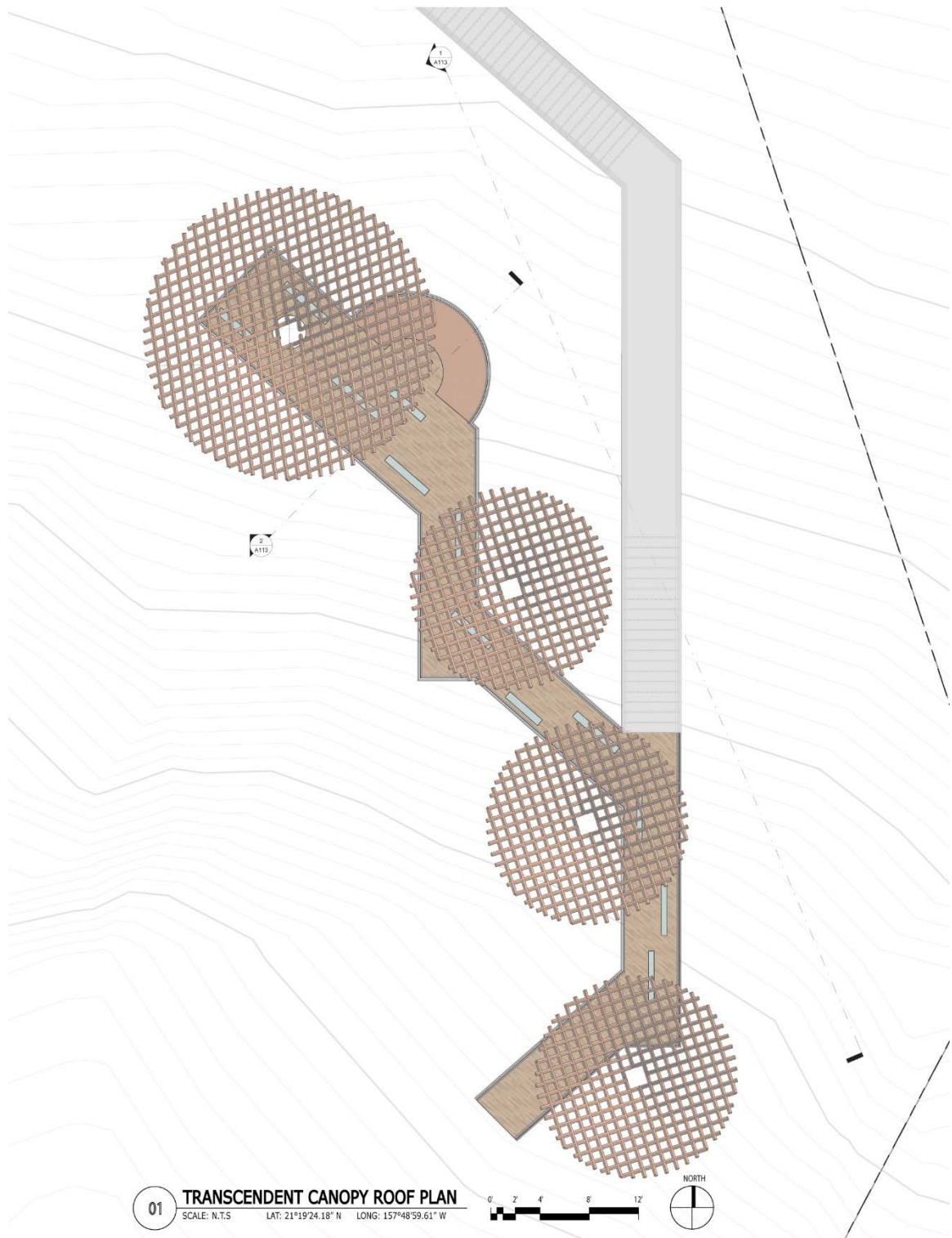


Figure 68. Transcendent Canopy Roof Plan. Made by Author.

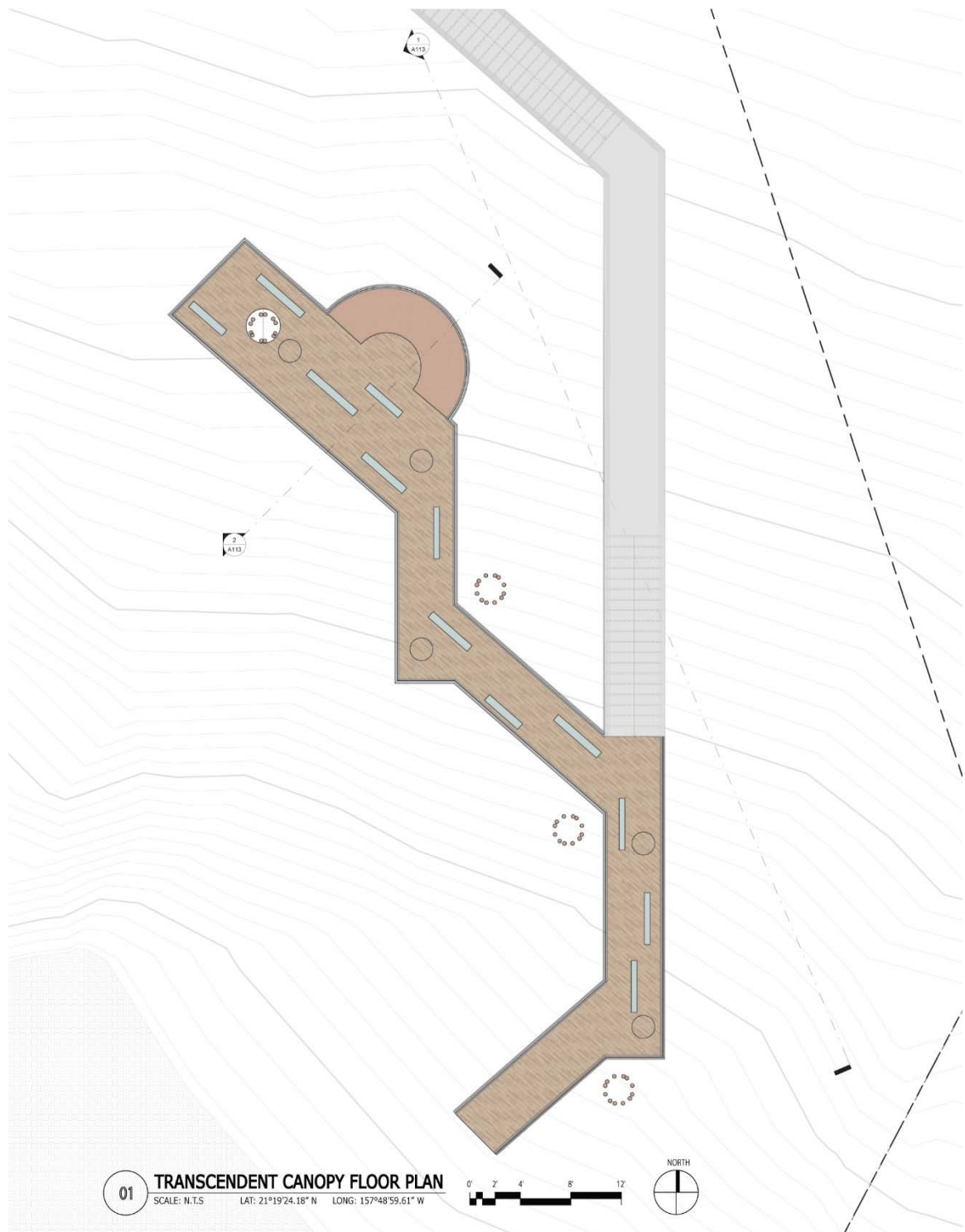


Figure 69. Transcendent Canopy Floor Plan. Made by Author.



01 **TRANSCENDENT CANOPY SECTION**  
 SCALE: N.T.S. 0' 2' 4' 8' 12'

Figure 70. Transcendent Canopy Longitudinal Section. Made by Author.



01 **TRANSCENDENT CANOPY SECTION**  
SCALE: N.T.S. 0' 2' 4' 8' 12'

Figure 71. Transcendent Canopy Cross Section. Made by Author.



## The Tranquil Embrace



Figure 72. Rendering of Tranquil Embrace. Made by Author.

The third of the serene spatial experience is the Tranquil Embrace. Located at the heart of the site it is neither high nor low. There is a steady decline of its curving contours which create inlets which are divided by a slight ridge. Its steady slope connects gradually towards a dense bamboo forest towards the east then to vastness of the valley.

The gentle decline of the terrain provides an opportunity to use water to unify its two inlets and connect with landscape below. Properties of water allow it to conform to any shape it comes in contact with therefore it appears tranquil but it functions physically in that sense as well.

The entrance to this reflection begins from a distance. From this point a shallow pool of water sits on a roof above the first of three terraced levels. Entering, one is now below the water, lips created at certain edges of the roof allow water to flow steadily in front of openings of walls, and at the outer edges of the walls. A

slight protrusion of the floor collects the water directing it slowly to a low waterfall to the terraced landing below. Circulating down to the next terrace visitors walk down a short flight of stairs where they can see the water flowing from the roof to the floor edge followed by the waterfall into the catchment space. This catchment area has a circular void designed to let the water flow smoothly to the next space below. Users will walk through this landing where one edge is the graded side of the hill and the other side, a view that expands towards the landscape. Reaching the last level of the terraces, visitors enter the first inlet. A four foot high wall borders the unprotected side of this inlet and the next. The wall in arrangement with the inlet creates space that seems naturally protected by the hill. Heading towards the next inlet, the distance between the ridge and wall begin to compress the space, at the same time there is a point where a wall appears and edges the side of the hill. Light amount of water begins to flow over both walls. Reaching the next inlet, the path becomes decompressed and one can see that the walls join together following the curvature of the inlet. The water flowing over the walls received its life a catchment area below the circular void at the second terrace. In this inlet one is able to see and feel the connection of the heart to the site. The water flowing over the walls at the outer edge gently connects the space with the surrounding landscape. While all this is existing visually they are tranquilly embraced by water and the land.





Figure 73. A Memory Recollection Site Plan Identifying Location of the Tranquil Embrace. Made by Author.

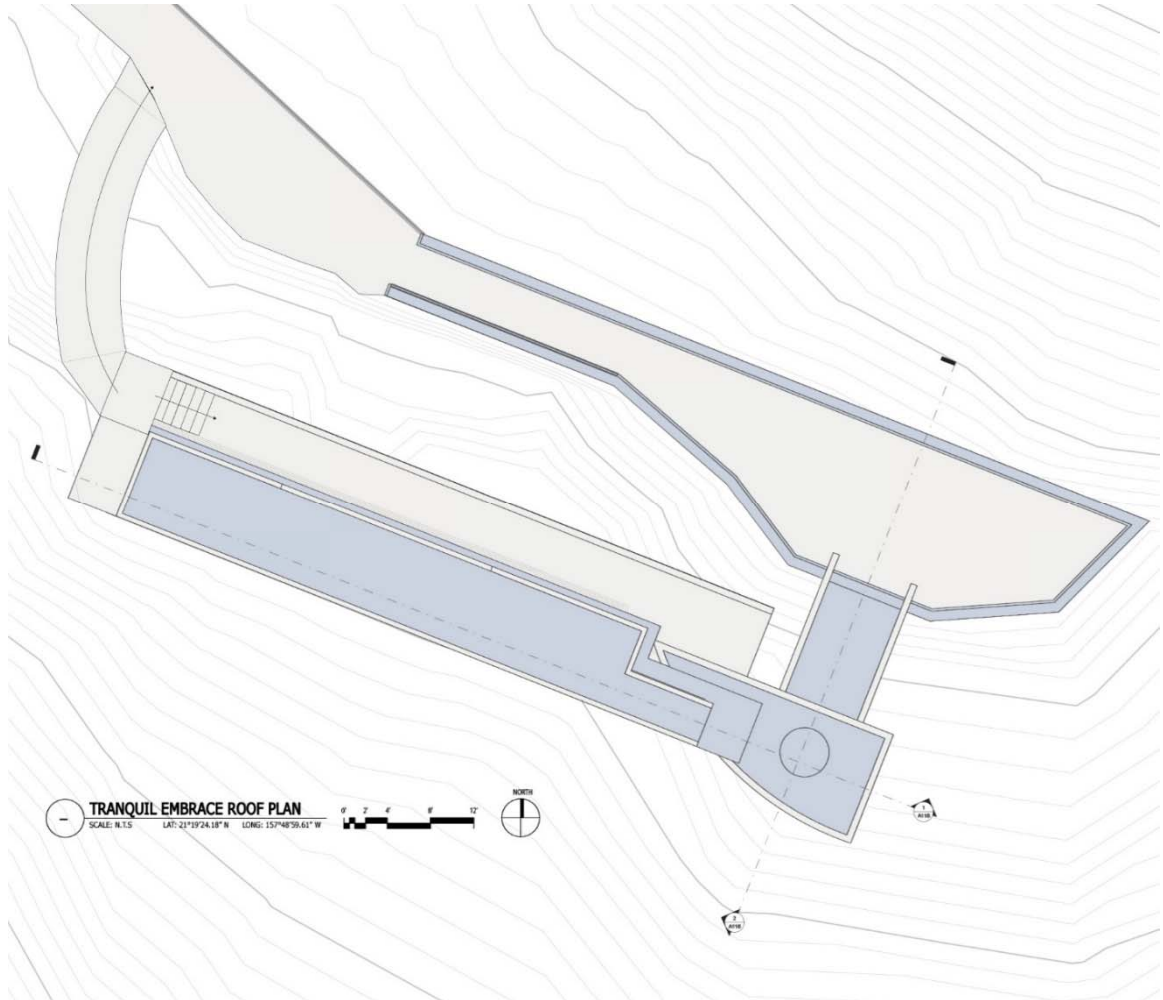


Figure 74. Tranquil Embrace Roof Plan. Made by Author.



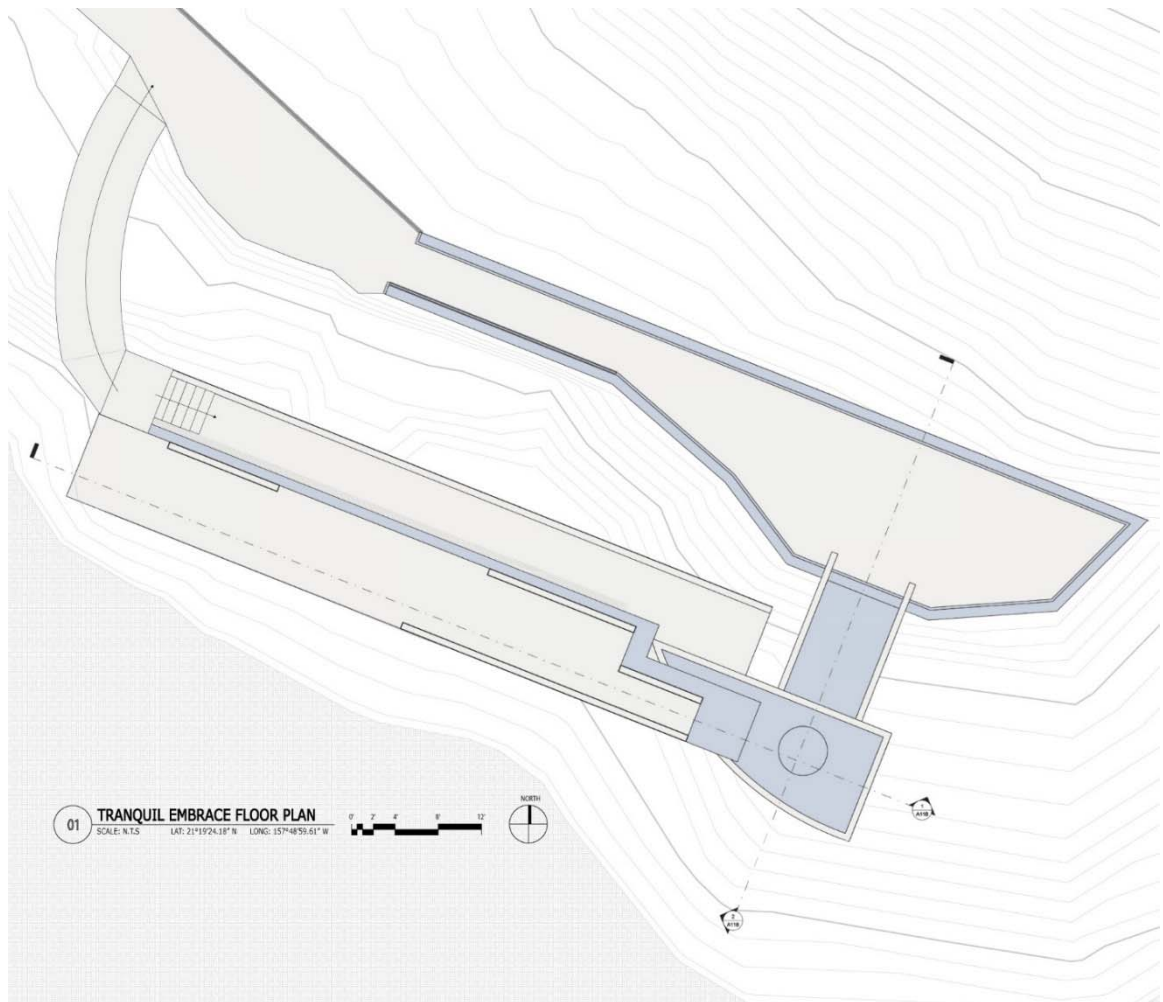
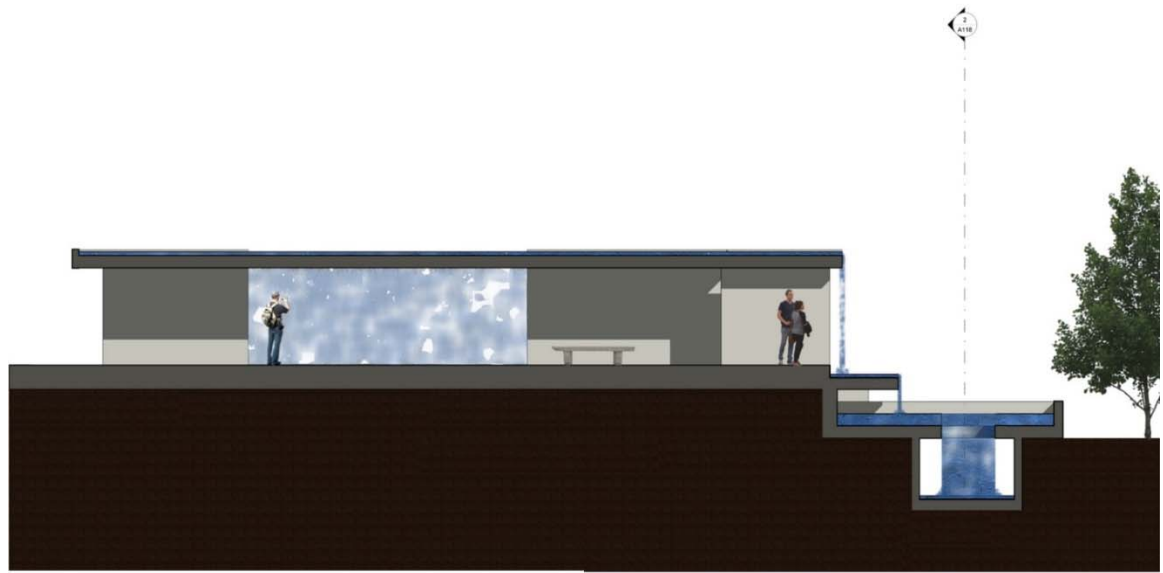


Figure 75. Tranquil Embrace Floor Plan. Made by Author.



01 TRANQUIL EMBRACE SECTION  
SCALE: N.T.S.

Figure 76. Tranquil Embrace Longitudinal Section. Made by Author.

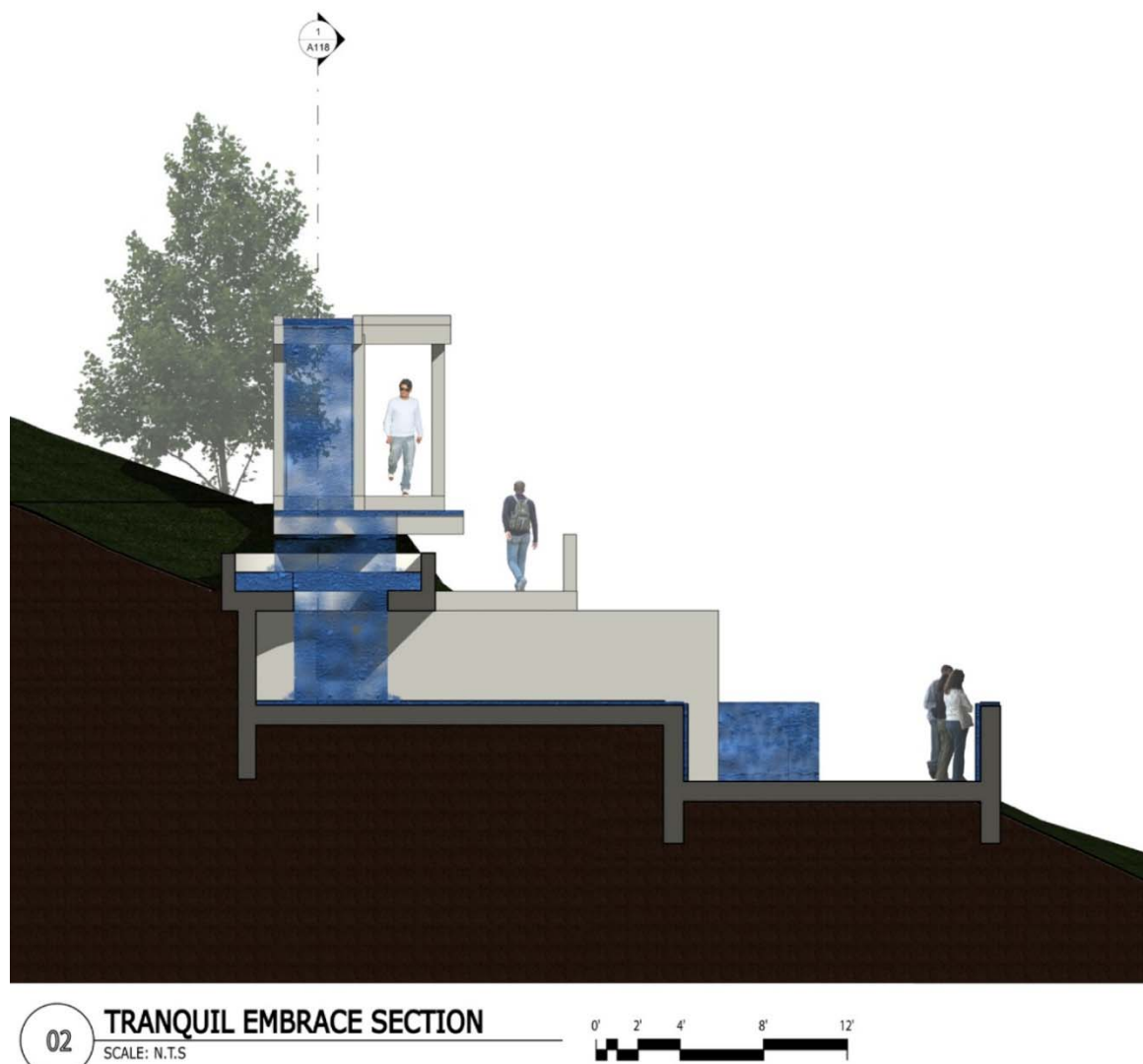


Figure 77. Tranquil Embrace Cross Section. Made by Author.

## Garden of Affinity



Figure 78. Rendering of Garden of Affinity. Made by Author.

Two large horizontal planes are nestled here in the lower northeastern region of the site. One sits approximately at a level five feet lower than the other. A lavish forest of bamboo grows wild here, there are contrasting yellows and green of the old and young bamboo. These features make the area feel lively and safe.

Psychologically yellow is an uplifting color, it aids in the clarity of our ability to recall information.<sup>125</sup> Psychologically green helps to balance emotions.<sup>126</sup>

Due to the size and emotions the site is able to evoke, the most suitable experience to create here is association. The flat planes provide the open space needed for conversation. The lower plane offers a more private area. The colors influence the positive emotions to stimulate conversation.

The architectural design uses the change in levels to as a means to distinguish between open and intimate conversations. For the larger plane a stimulating garden uses planes with heights ranging between 12 and 30 inches to

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<sup>125</sup> —. n.d. *The Color Yellow*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-yellow.html>.

<sup>126</sup> —. n.d. *The Color Green*. Accessed February 20, 2014. <http://www.empower-yourself-with-color-psychology.com/color-green.html>.

create play, provide seating, and light spatial divides. The planes and landscaping would use paints and vegetation for further stimulation.

The level below is addressed with a design beneficial to more private and intimate conversations. Leaf like forms, varying from open to solid, overlap creating a sun shade. The overlaps and voids filter streams of light into the space below. Columns support the leaf forms at overlapping points. This system of support results in various areas with dense or scattered columns. The range of densities then creates the private spaces for association.



Figure 79. Garden of Affinity, Private Conversational Space Study Model. Made by Author.



Figure 80. Garden of Affinity, Private Conversational Space Study Model. Made by Author.





Figure 81. Memory Recollection Center Site Plan Indicating Location of Garden of Affinity. Made by Author.

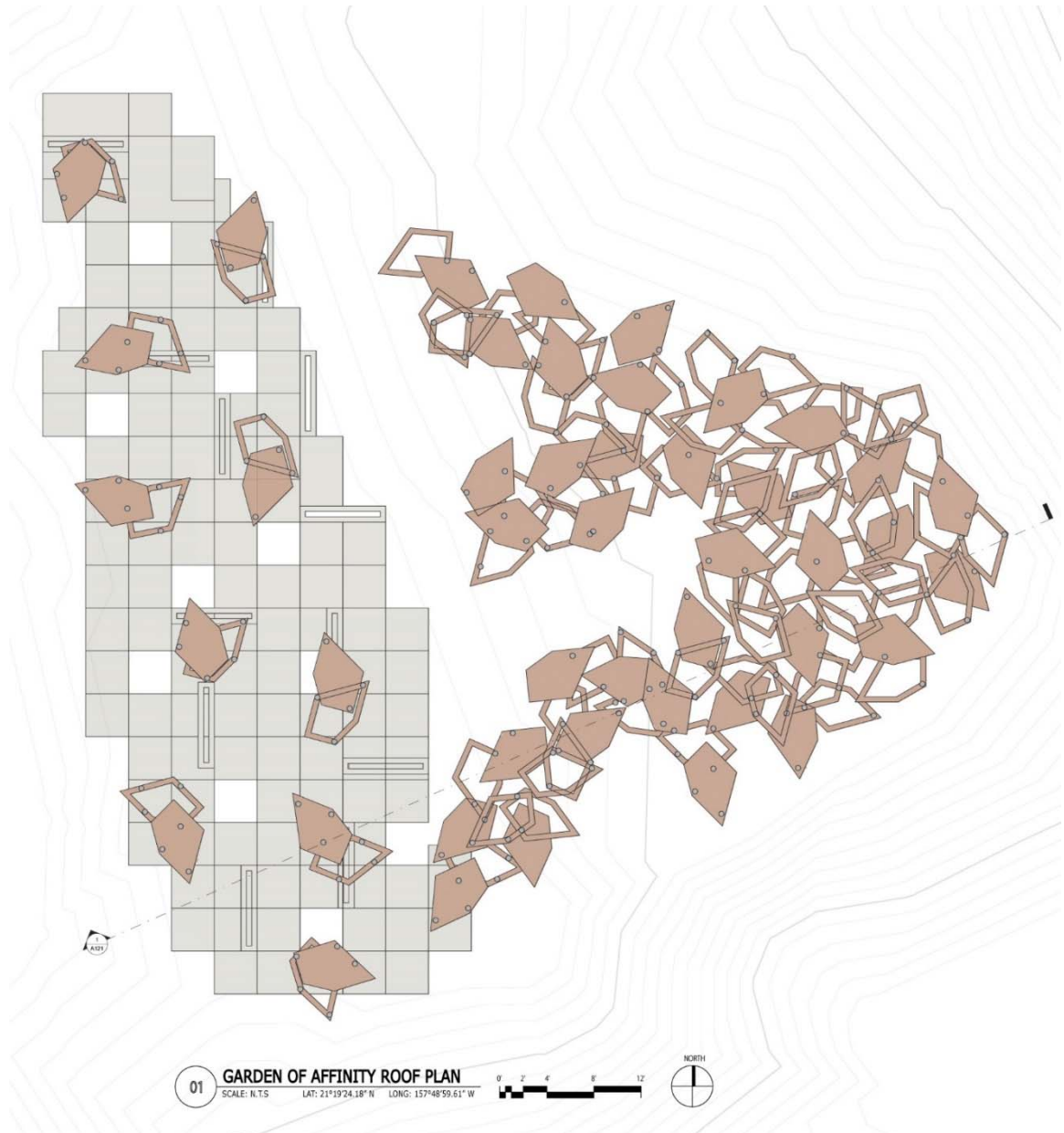


Figure 82. Garden of Affinity Roof Plan. Made by Author.



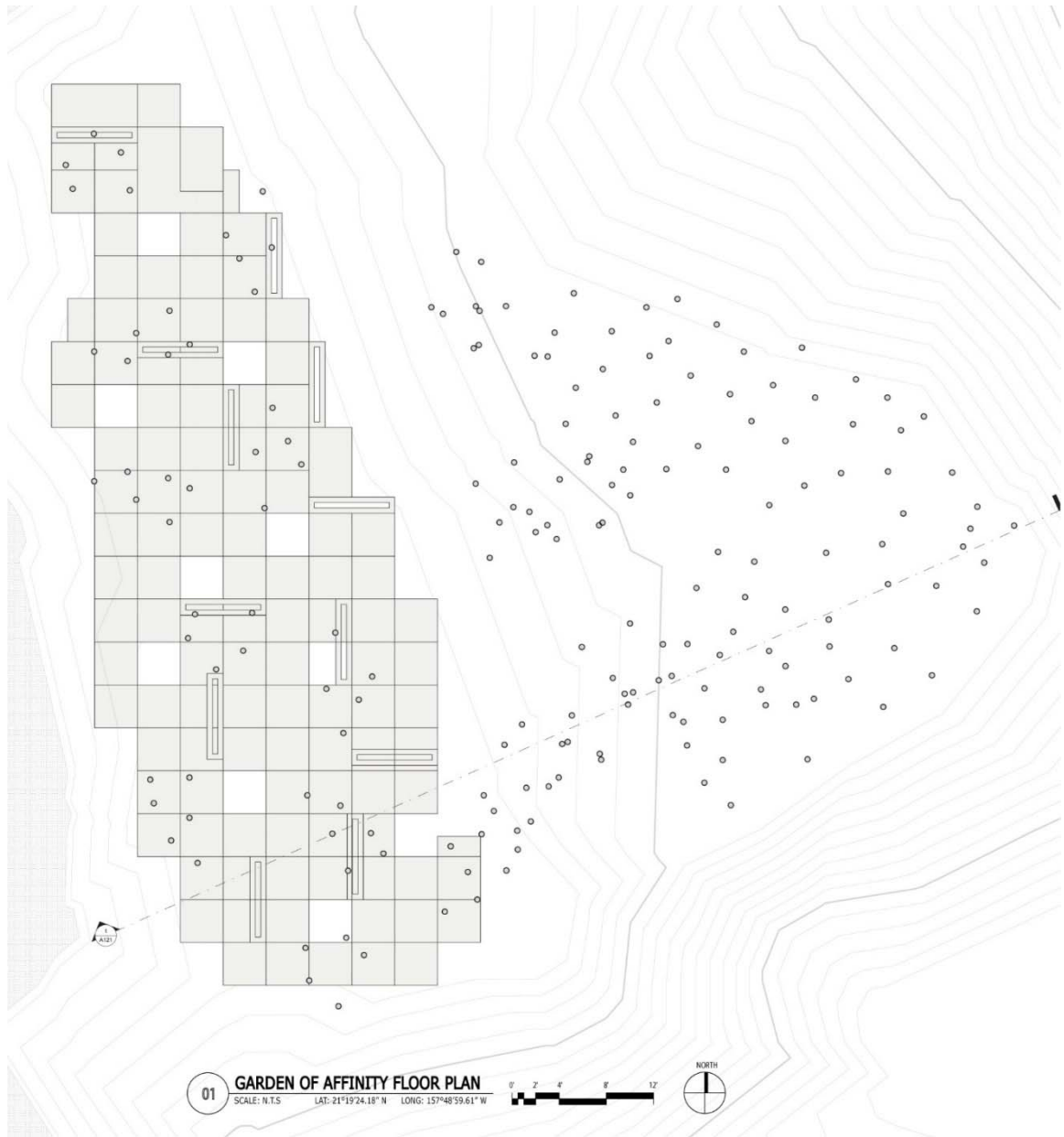


Figure 83. Garden of Affinity Floor Plan. Made by Author.



Figure 84. Garden of Affinity Longitudinal Section. Made by Author.

## The Balanced Expanse



Figure 85. Rendering of Balanced Expanse. Made by Author.

The northern point of the site exhibited a mound whose direction of slope differed from the overall terrain. This mound grew where the landscape dropped. Existing adjacent to the mound was a flat plane. This area of the site has an unparalleled panorama ranging from the back of the valley at the east, then traces the entire valley wall on the north to the urban western plain and ending at the ocean.

In the creation and recollection of memories, one perceives and interacts with space and time. The actions that one goes through in these events are stored. The repetition of these actions are relative to the triggering of these events.<sup>127</sup> Therefore if architectural design causes people to perform certain actions it can triggered stored memories.

The architectural design of this space respects the openness of the landscape. It provides a space balanced by the background of the built and natural environment, for people to engage in activities relative to the calm and expansive atmosphere. Examples of these activities would be Tai Chi, drawing, or playing the flute. A small seating area is set into the northern half of the mound, using the mound to hide the unnatural form. To the front of the side is a performance space, level with the ground and highlighted by narrow angular concrete forms. The open space uses a narrowly cast concrete circle also level to the ground to create a visual

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<sup>127</sup> Baddeley, Alan, John P Aggleton , and Martin A Conway, . 2002. *Episodic Memory: New Directions in Research*. Oxford: Oxford University Press.

divide. Placing one's self in this circle would evoke feels of connection and wholeness, emphasizing the balance felt within this space.<sup>128</sup>

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<sup>128</sup> 2010. *Psychological Effects of Shapes*. April 18. Accessed March 7, 2014.  
<http://archive.csustan.edu/oit/WebServices/SupportResources/PsychOfShapes.html>.





Figure 86. Memory Recollection Center Site Plan Indicating Location of Balanced Expanse. Made by Author.

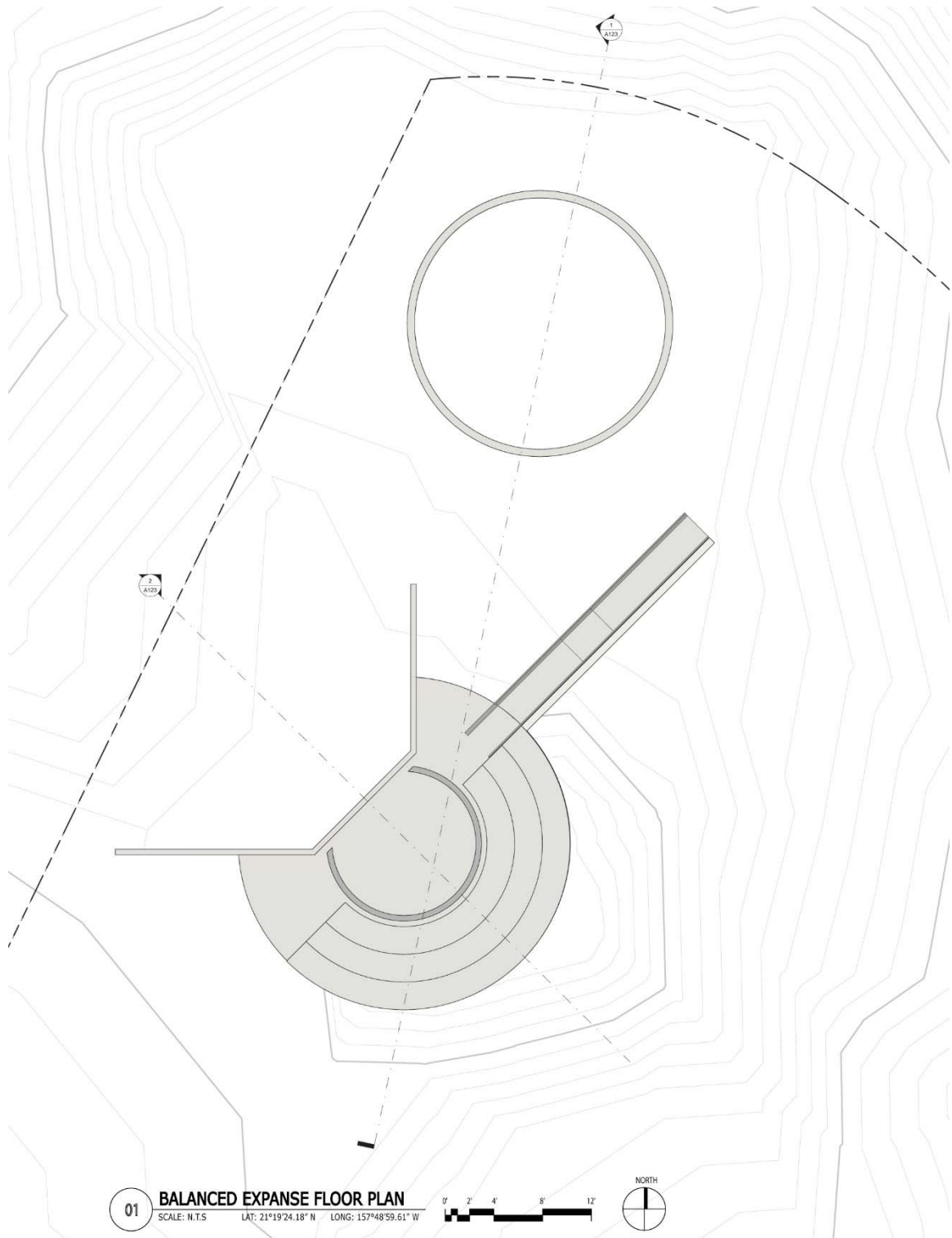


Figure 87. Balanced Expanse Floor Plan. Made by Author.

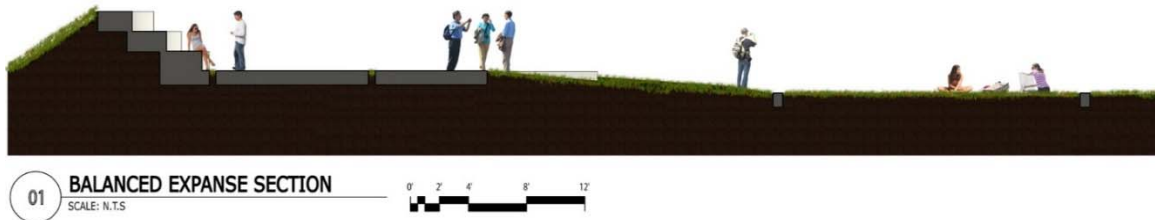


Figure 89. Balanced Expanse Longitudinal Section. Made by Author.

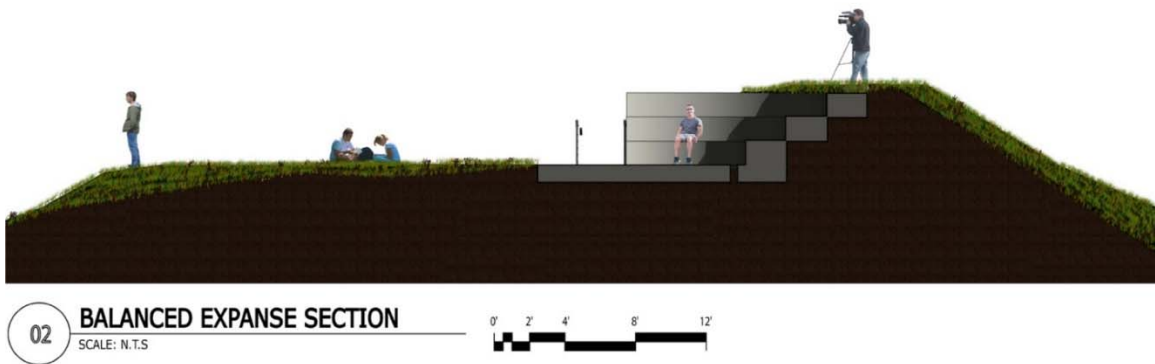


Figure 88. Balanced Expanse Cross Section. Made by Author.



## The Chamber of Eminence



Figure 90. Rendering of the Chamber of Eminence. Made by Author.

At the highest portion of the site is the location for the evocation of individualization. From both points of accessibility one must go on an upwards stroll. The view at the top provides the best vantage point of the entire property as well as the lush valley beyond towards the east.

The trek upwards will consciously make a person feel that they are rising and psychologically the elevation change in relation to the site will increase that persons feelings of confidence and significance.

The architectural design of this space utilizes the elevation change and vantage points of the site. The narrow pathways to the entrance are cut by retaining walls. This feeling of compression releases once a visitor reaches the chamber. Here a circular void, neighbored by curved openings in the ceiling direct natural light towards the center of the space. The walls supporting the structure curve towards the east directing ones attention towards the east, where the view is best. At the central opening between the curved walls, two large arrays of wooden elements line a path to a small platform at the end of its halls. These arrays are not roofed they help direct light in to the space encouraging an individual to walk down its hall. Reaching the end of the platform visitors reach a point of eminence overlooking everything below and beyond.

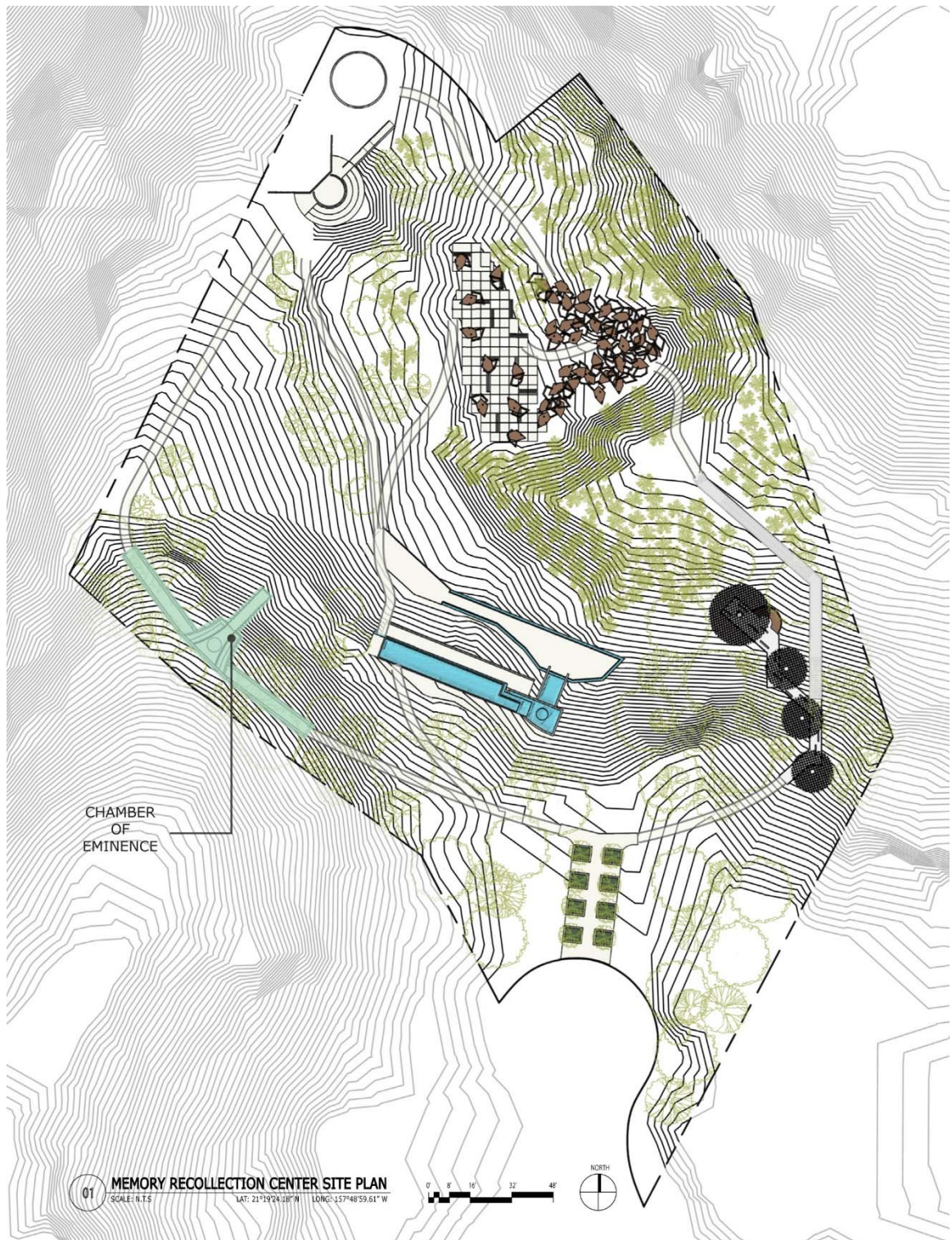


Figure 91. Memory Recollection Center Site Plan Indicating Location of Chamber of Eminence. Made by Author.



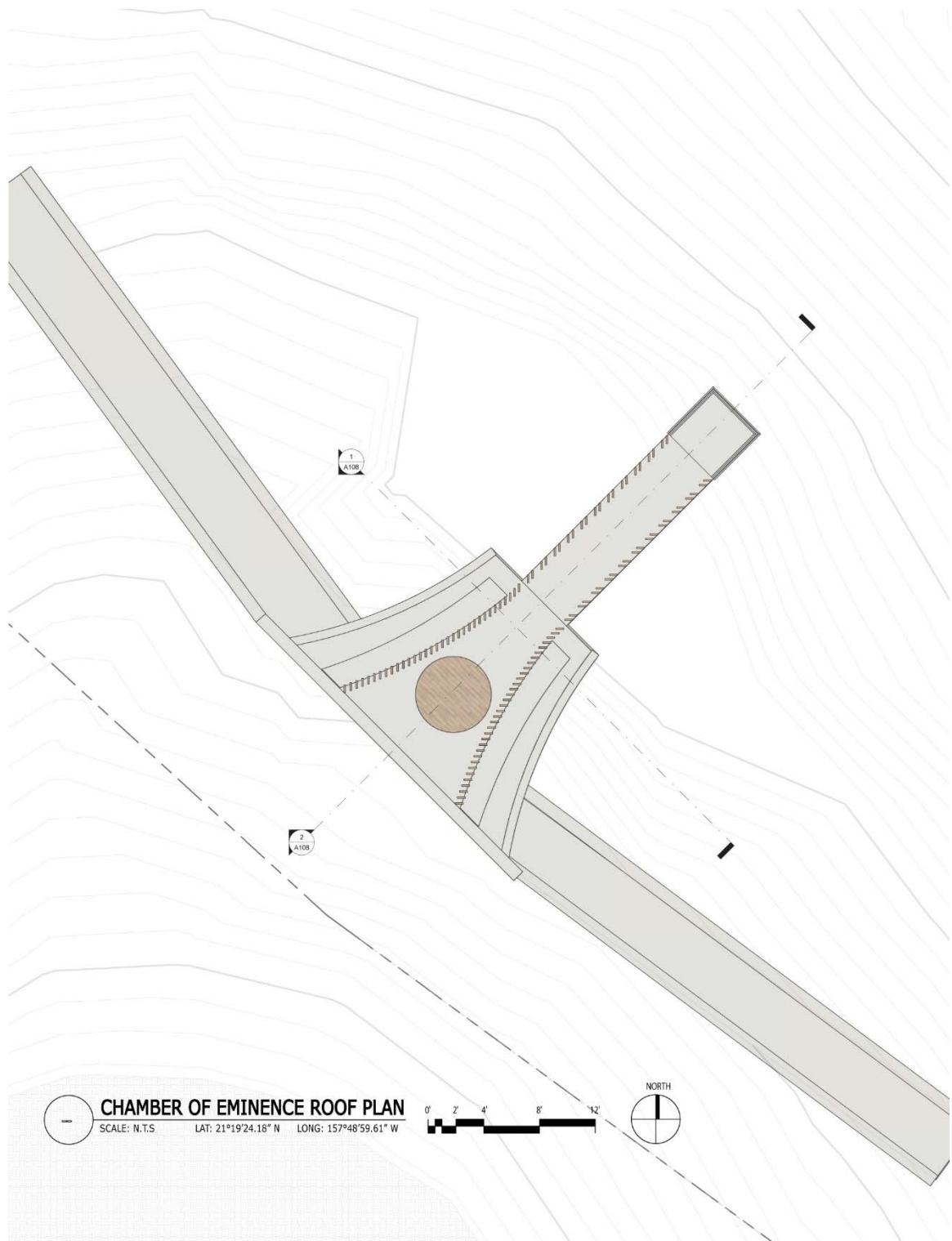


Figure 92. Chamber of Eminence Roof Plan. Made by Author.

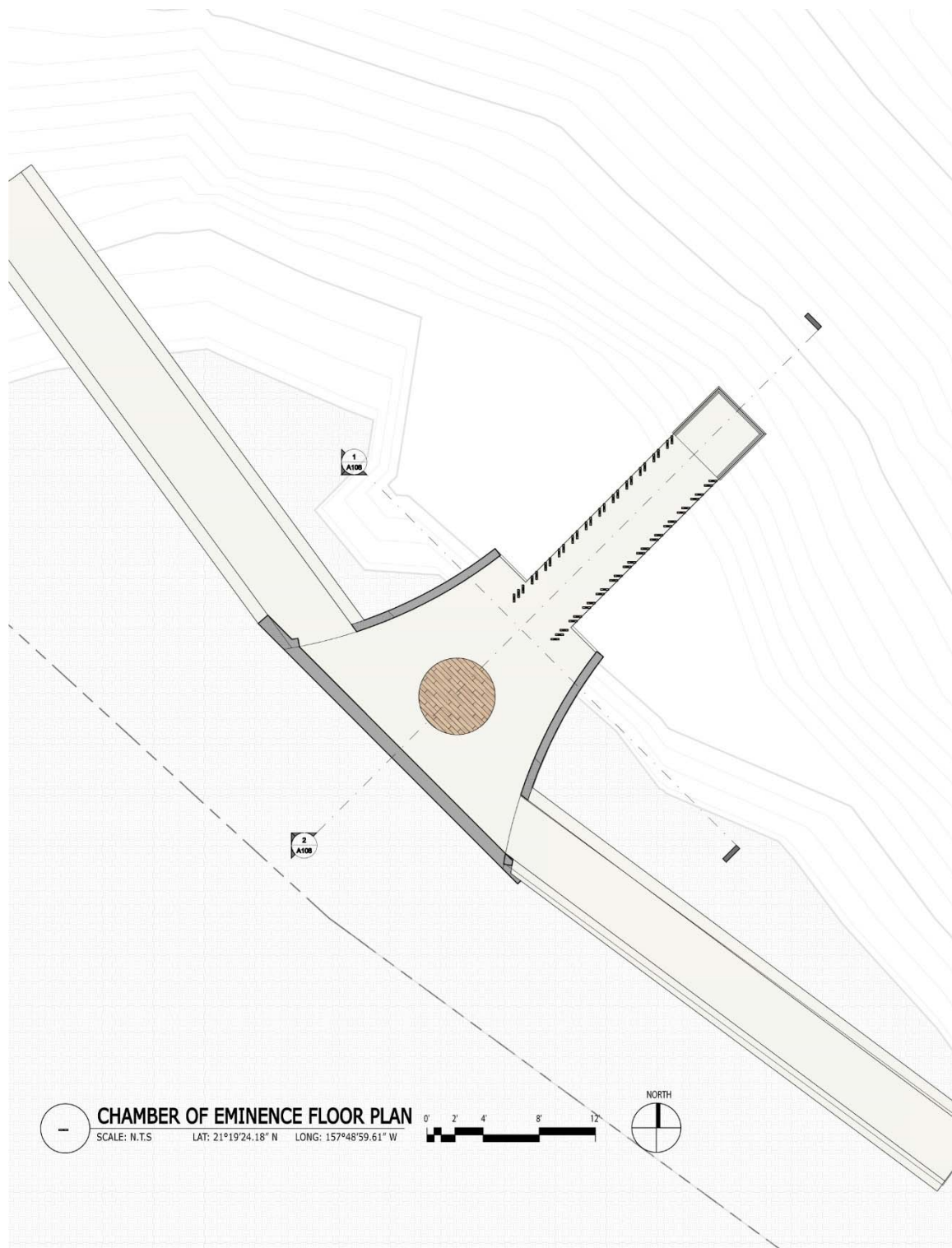


Figure 93. Chamber of Eminence Floor Plan. Made by Author.



01

## CHAMBER OF EMINENCE SECTION

SCALE: N.T.S



Figure 94. Chamber of Eminence Cross Section. Made by Author.



02

## CHAMBER OF EMINENCE SECTION

SCALE: N.T.S



Figure 95. Chamber of Eminence Longitudinal Section. Made by Author.

## CHAPTER 10. CONCLUSION

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Memories are intangible and have countless aspects that surround their creation, one of them being the emotional response of a person from their perception of an environment. This response is critical in creating memories that slowly mold a person into who they are. On the other end of the spectrum is the recollection of that memory. Retrieval of episodic memories is based on a process of perceiving similarity and creating association. What does the person see? How does it make them feel? A greater amount of similarities in an environment that a person can associate with something else will directly affect the memory they are able to recollect. It is clear that details are crucial in achieving memory recollection: therein lies the problem. Designing a place where each visitor can expect the recollection of specific memories is next to impossible. Such a place would require an extremely critical investigation of an individual's life, their moments of happiness, sadness, etc. This project would have to be translated into buildable and natural elements solely designed for one individual and their specific memories.

Falling into Memories conducts research to create a basis of design for a Memory Recollection Center, a place where multiple visitors can connect mentally and emotionally with their past with the main focus being the recollection of positive memories in general. Experiencing the six universal emotions (surprise, happiness, sadness, fear, anger, and disgust) is already influenced by and psychologically intertwined with visually perceived elements, and this project involves the examination of these emotions in order to create an architectural design that is conducive to the recollection of positive memories for a larger population. The built and natural world is made up of different lines, shapes, forms, spaces, colors, and lighting, so determining how combinations of these elements affects our emotions and its applicability to architectural design was of fundamental importance to the development of the Memory Recollection Center.

The initial design attempt failed to produce exemplary architecture beneficial to the triggering and recollecting of memories, so a second and more innovative approach was necessary. Schematic design commenced with the purposeful absence of a program, which was a significant contrast to typical architectural design approaches. The lack of a program indicated an uncertainty in the amount of necessary space and spatial types. Thus, a program grew simultaneously with the

factoring-in of three key aspects: unique site features, architectural design, and positive emotion evocation potential. Features unique to the site were combined and emphasized with architectural design in order to evoke specific experiences of happiness, which would inevitably lead to the triggering and recollection of positive memories. The site offered seven areas with the greatest potential: four serene locations offering tranquility and balance, two locations relative to the phenomenological experience of association, and one location beneficial to a person's realization of individuality. These seven pavilions were spread across the site, each accessible in any order according to personal preference. Similarly, happiness is evident in the memories of everyone's life, but the experiences of happiness have no fixed order. At the Memory Recollection Center, free exploration of these spaces is also intended to increase the odds of similarities in the order of which these emotions are felt in comparison to actual memories.

The interaction between visitors and the Memory Recollection Center establishes an intimate psychological and emotional bond between an environment and the recollection of memories. The center provides a medium where visitors can be transported from their current state of mind to a realm manifested by the most sentimental and meaningful events of their lives. As they seek the remembrance of these events, experiencing the Memory Recollection Center may allow them to fall deeper into their memories.



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