A Framework for Site Informed Light Art Installations

By

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A Report

submitted in partial fulfillment of the requirements for the degree

Master of Landscape Architecture

Department of Landscape Architecture, Regional and Community Planning
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Approved by:

Major Professor:
Mary Catherine (Katie) Kingery-Page

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Abstract

The purpose of this study is to investigate and design public light art installations. The investigation consisted of evaluating select examples of public light installations in order to develop a typology, and designing two site-specific light art installations: one in Wichita, Kansas, and the other, in Midtown Denver, Colorado. Though public light art is found in most cities, its potential is often lost or unrecognized. In certain cases, public light art can be 'plop art,' which is plopped senselessly without much regard to context or experiential qualities. This project seeks to explore the different types of public light art and to find what approach or qualities should be considered when designing public light art.

My approach can be described as artistic research. The methods include an apprenticeship to an artist, a precedent study, development of a light typology, an analysis of site and context, establishing a design matrix for two design projects, and an iterative process of making. Each of these methods were undertaken in order to effectively address my research question: What type of public light art is most appropriate for a specific site and how does it relate to creative placemaking?

This project overlaps with a collective project group entitled Creative Place-Making, which is made up of other fifth-year master of landscape architecture students with an underlying interest in art and design as place-making tools. Each student in the group addressed the site in Wichita, Kansas in a unique way. I addressed this site as a temporary landscape, creating an interactive light installation intended to be in place up to five years. In contrast, I addressed the Denver, Colorado site as a long term landscape, and designed a sculptural illuminating gateway. Each of these light art installations were informed by a particular set of characteristics that make each design site-specific.

Keywords:

Site-Specific; Site-Informed; Public Art; Public Light Art; Creative Placemaking; Informing Typology; Design Matrix

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Acknowledgements

Thank you to Katie Kingery-Page, my major professor, for being so supportive of my project. Without your constant feedback and direction from early visualizations to final production, this project would not have been possible. This project would also not have been possible without Professor Anne Beamish, who supported my research from the very beginning. Thank you to Dustin Headley, for opening up a new world of digital fabrication tools to me. Your knowledge of cutting edge technology and tools is an inspiration. I look forward to expanding my modeling and fabrication techniques in the near future.

Digital fabrication of each moiré prototype could not have been accomplished without Professors Dustin Headley and Richard Thompson. Their knowledge and expertise of fabrication methods allowed my moiré designs to be executed properly.

Thank you to Alan Armour and Brandon Lambrecht for making my final design a reality. Without your knowledge and skillset, this project would not have become a built work.

And thank you to all of my family: your love and support system has been a blessing. I cannot imagine being where I am today without all of you. I am so grateful.

Figure 1.1: Light Leak: Early Visualizations
(Author, 2015)

Introduction

Introduction

Public art adds significant value to cities as a contributor of social, economic, and especially cultural dimensions. Though public art is sometimes dismissed, its value is important (Knight 2008). The complex interactions and opportunities surrounding public art not only improve our built environment, but also lend meaning to our public lives. Public art can add unique meaning to public space and provide a sense of identity.

The field of landscape architecture is continually trying to activate public space creatively, while engaging cultural, social, and economic issues. These goals are synonymous with the role of public art. Both landscape architecture and public art remain interrelated in that each seeks to influence space in a positive way. Moreover, landscape architecture has the ability to showcase public art and frame its experiences. With the help of landscape architects, public art can be integrated into the design process and act as a significant player in creating identity, enriching culture, and activating place.

This project investigates public art and in particular 'public light art.' The approach is rooted in three categories: 1) artistic research, 2) apprenticeship, and 3) and precedent study and light typology. These categories will help inform the design of light art that will be created and installed in the WDDC Pop-Up Park and Midtown Denver, Colorado. The aim of the light typology and design project is to reveal an understanding of the 'types' and characteristics of light art installations. This project's purpose is to highlight the importance of public art, the role it plays, and develop site-informed public light art.

The role of light in the landscape plays a valuable role in creating identity, stimulating economic growth, and accentuating or activating space. Without the presence of light, particularly in regard to the landscape, nighttime environments would be less useful. Additionally, without the presence of public art, the built environment would become dull, monotonous, and certainly less memorable. Public art humanizes space, encourages communication, and facilitates relationships (Knight 2008).

After setting the project goals to organize a typology of public light art, and install site informed public light art. A number of questions arise: Who is the project stakeholder? Will the project need funding? Where will the public art be installed on site? What type of public light art is most appropriate? What materials should be used? What is the relationship between art and audience?

Eventually, my specific research question became: what 'type' of public light art is most appropriate for a specific site, and how does it relate to creative placemaking? In order to answer this question, I reviewed selective light installation precedents and developed a typology of public light art installations. This typology informed the design and fabrication process, and provided a framework of site variables to respond to.

In the end, I designed public light art that responded to two sites: Midtown Denver, Colorado, and a pop-up park in Wichita, Kansas.

Stakeholders for the Midtown, Denver Colorado project included Norris Design as the landscape architecture firm, and Brookfield Residential as the developer. This site was suburban in character and a permanent landscape. My focus resulted in the design of a gateway for the Midtown site. Due to design development and implementation costs, the final design was not installed.

Stakeholders for the pop-up park in Wichita, Kansas included Bokeh development and the Wichita Downtown Development Corporation (WDDC) as the third party. This site was urban in character, but a temporary landscape. My focus resulted in the design of an overhead lighting program. Subsequently, the final design moved into prototyping and final design implementation.

Ideally, the public light art will engage cultural, social, and economic issues as well. "Places with strong public art expressions break the trend of blandness and sameness, and give communities a stronger sense of place and identity (Val 2014)." In terms of social engagement, the public light art's goal is to trigger thoughts and conversation of admiration and or production methods. Likewise, the public light art has the potential to act as a meeting place or landmark for social interaction. In terms of economic engagement, the public light art aims to attract people into the site, which can potentially support local businesses located nearby.

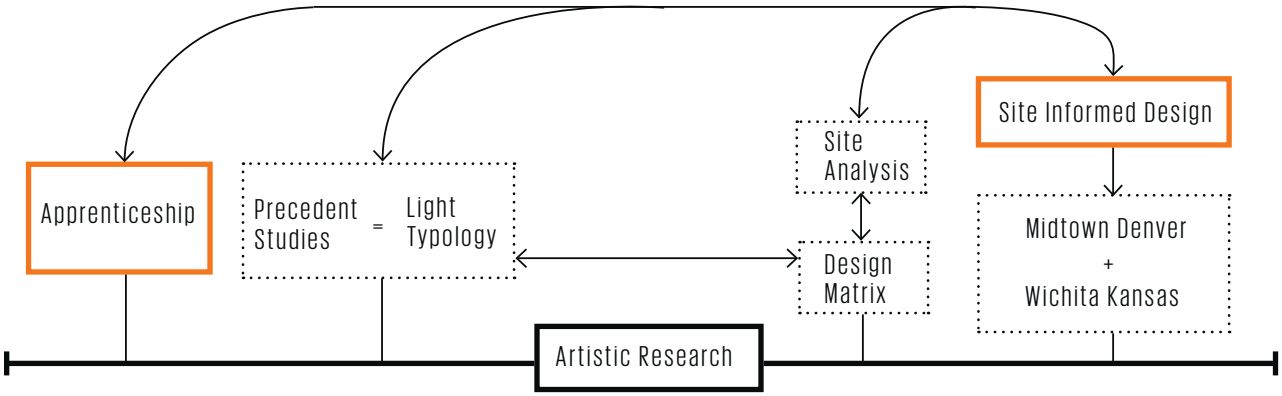


Figure 1.2: Artistic Research as Approach:
Connection of Methods for Site-Informed Design
(Author, 2015)

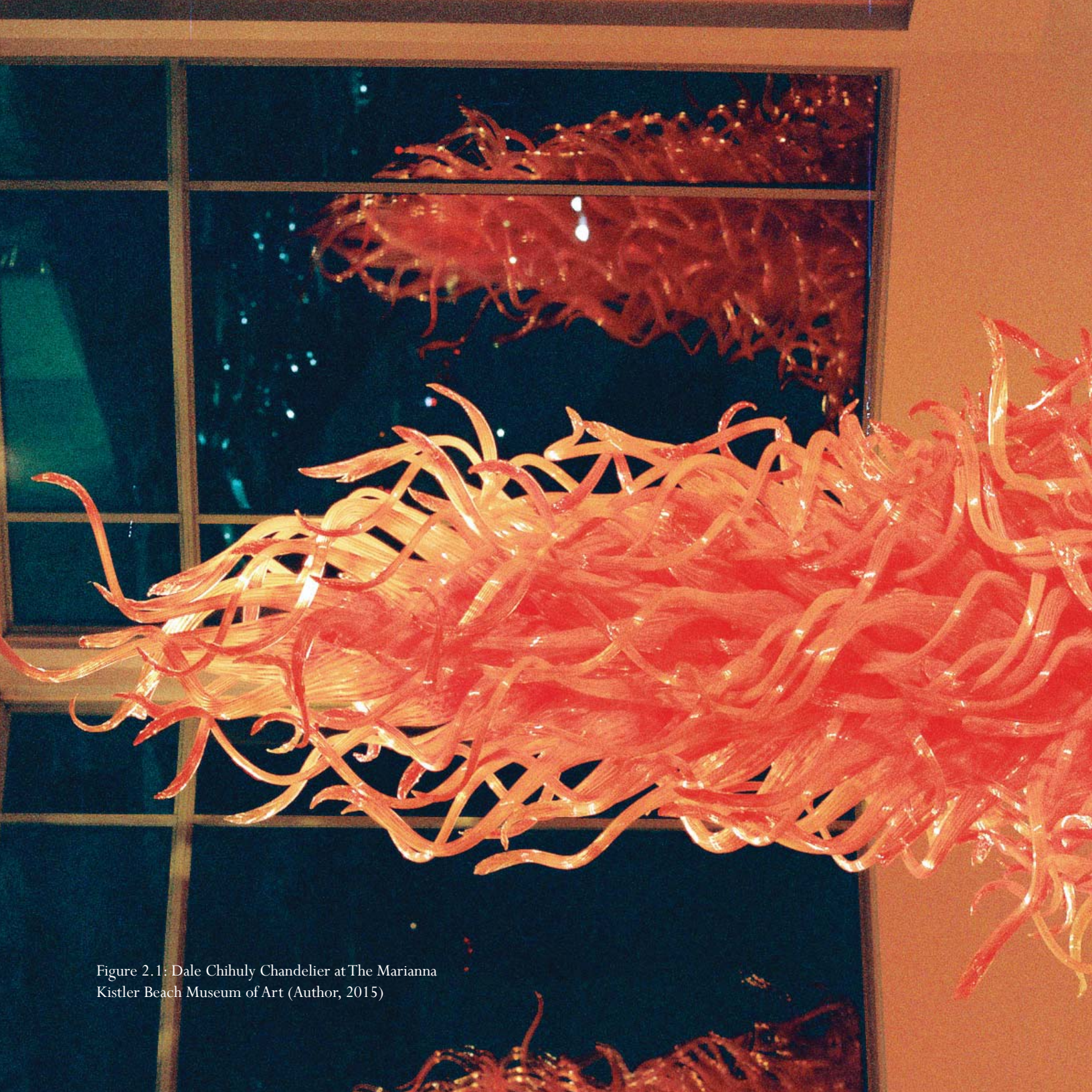
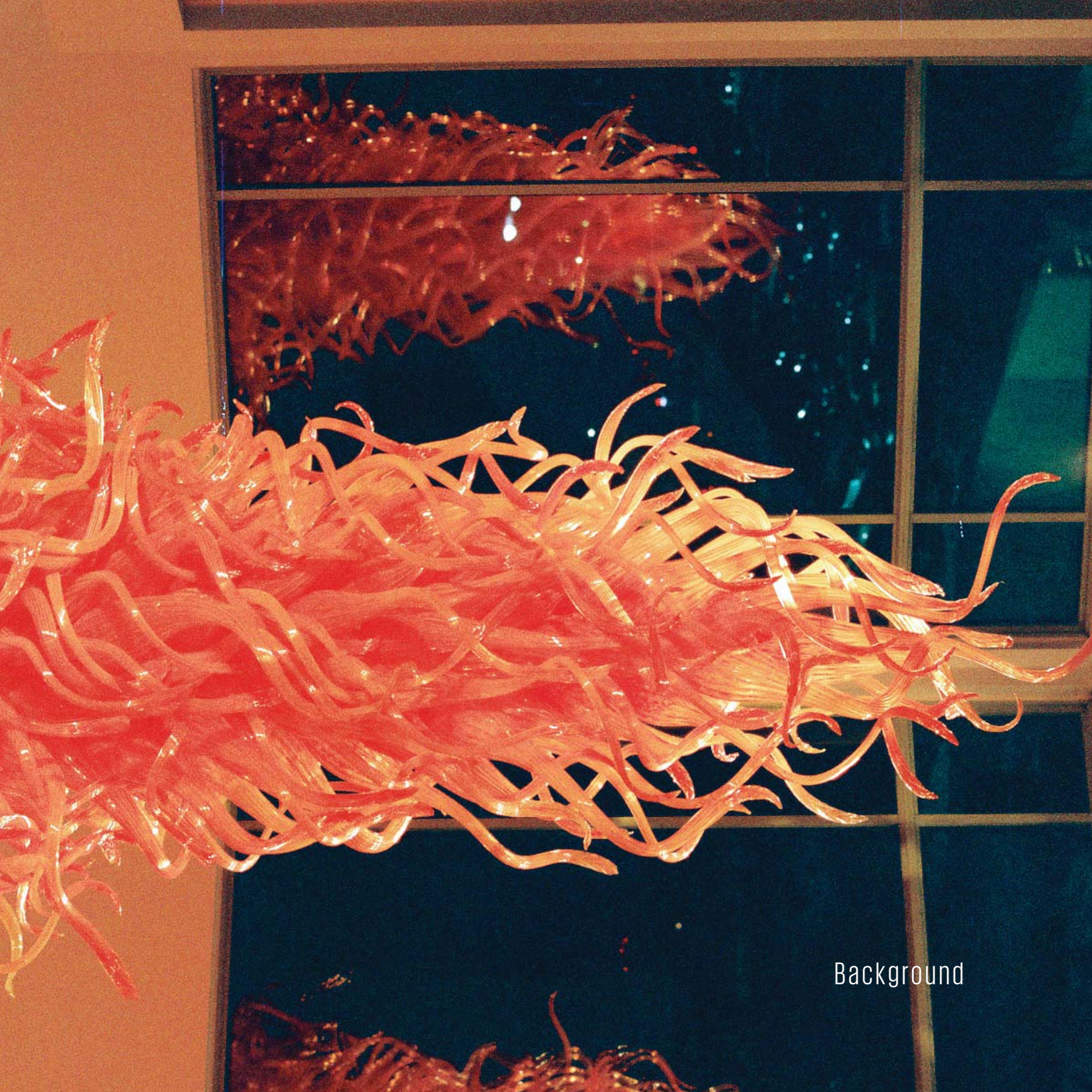


Figure 2.1: Dale Chihuly Chandelier at The Marianna Kistler Beach Museum of Art (Author, 2015)



Background

Background

"What is art? Should the usage of the word "art" be considered ethnocentric or not, and should it be applied to activities of peoples who do not have such a word, as well as how should it be defined? Confusion here lies in the fact that art is not a phenomenon but a concept. Being a concept it has no objective referent, and so one cannot say what it is or is not, but only what the user means by the term" (Hatcher 1999).

Art is broad in definition and can extend out to just about anything depending on one's perspective and attitude. In general, perspective remains an important role in art because it dictates whether something, is, or should be considered, 'art.' Widely considered a scandalous and extreme conceptual challenge, Marcel Duchamp's "Fountain," created in 1917, illustrates how art can be misconstrued (Knight 2008). In Duchamp's eyes, "the spectator affirms the power" because he or she interprets art with his or her meaning. (Duchamp 1957).

Figure 2.2: Marcel Duchamp's 'Fountain' (Logue *2011)*

Creative Placemaking: WDDC Pop-Up Park

This project overlaps with a collective group entitled Creative Placemaking. Creative Placemaking is a group of landscape architecture students under the guidance of major professor Katie Kingery-Page. Each student project identifies with the term creative place-making in a distinct way. Project titles of interest include: *Temporary Landscapes*, *Placemaking in Socially Resilient Site Design*, *Using Urban Triage to Plan for Walkability,* and *The Happy City.* Figure 2.3 illustrates the participation of each individual in regard to the Wichita Downtown Development Center (WDDC) Pop-Up Park.

In terms of the group Creative Placemaking, the group's primary focus is art and design as placemaking. In terms of defintion, Creative Placemaking is a term with a number of definitions and implications. I define Creative Placemaking as introducing creative energy into a space to stimulate positivity and growth.

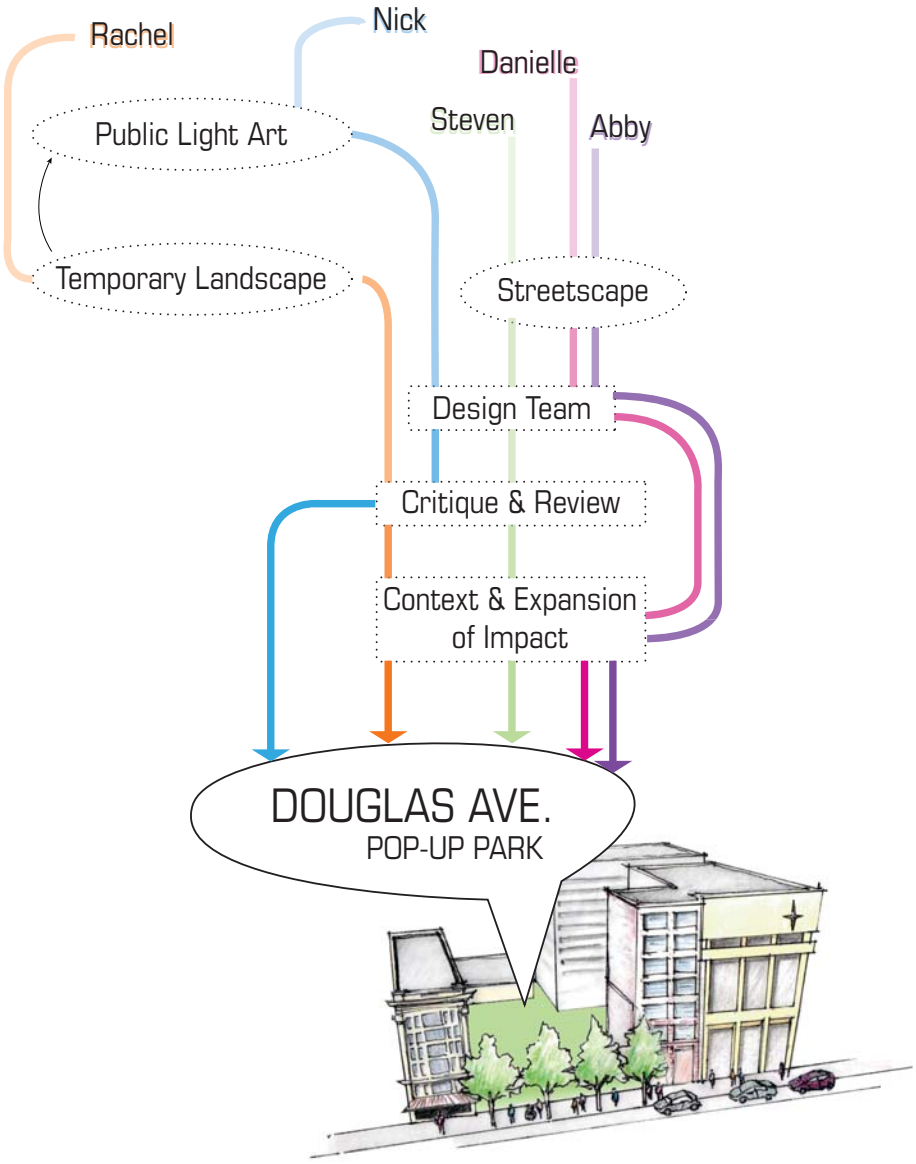


Figure 2.3: Creative Placemaking: Douglas Ave. Pop-Up Park (Author *2014)*

An Apprenticeship with an Artist: Stan Herd

Stan Herd, a pioneer in his own form of 'crop art,' is a Kansas native and considered a world-renowned crop artist. Herd's work ranges across a multitude of subjects, but his canvas choice remains for the most part the same: a field of earth. Unlike most artists, Herd's methods include digging, plowing, burning, and in some cases planting. Together these methods form a composition that can only be fully seen from an aerial perspective. The scale of Herd's work is what sets him a part from the rest. Instead of painting with acrylics or oils, Herd is painting with landscape. As a child, Herd grew up on a farm and naturally became familiar with tools associated with the terrain. After studying at Wichita State University, he returned to the tools and techniques he learned while growing up in a rural context.

During the fall of 2014, Herd worked with students from the Kansas State University (KSU) departments of Art and Landscape Architecture to design a temporary art installation in the Stolzer gallery. The Stolzer gallery is located in the Marianna Kistler Beach Museum at KSU. Herd's encounter with cairns introduced the program for the installation. Cairns are defined as a pile of stones that mark a place, such as the place where someone is buried or a battle took place, or that shows the direction of a trail.

Figure 2.4: Stan Herd inside the Stolzer Gallery (Sprague 2014)

Figure 2.5: Stolzer Gallery & Designation of Cairn Location (Sprague 2014)

Six Kansas State students were chosen to help Stan Herd design and install "Cairns at the Beach." I was selected to help participate in the project. Our aim was to expose the mysterious quality of cairns and develop an interesting interplay between art and audience. The exhibit will be open for two years.

This project acted as an apprenticeship. Working with Herd allowed me to observe his creative process as an artist and see how an artist approaches the design of an installation. Furthermore, this project acted as a test pilot for my own creative process.

The images to the left depict Herd within the Stolzer gallery of the Marianna Kistler Beach Museum. The Marianna Kistler Beach Museum is a campus museum located on the southeast side of Kansas State University. Unlike many of Herd's projects, this project involved a much different scale, materiality, and context. Nevertheless, the landscape remained at the heart of this project. The choice of medium: stone.

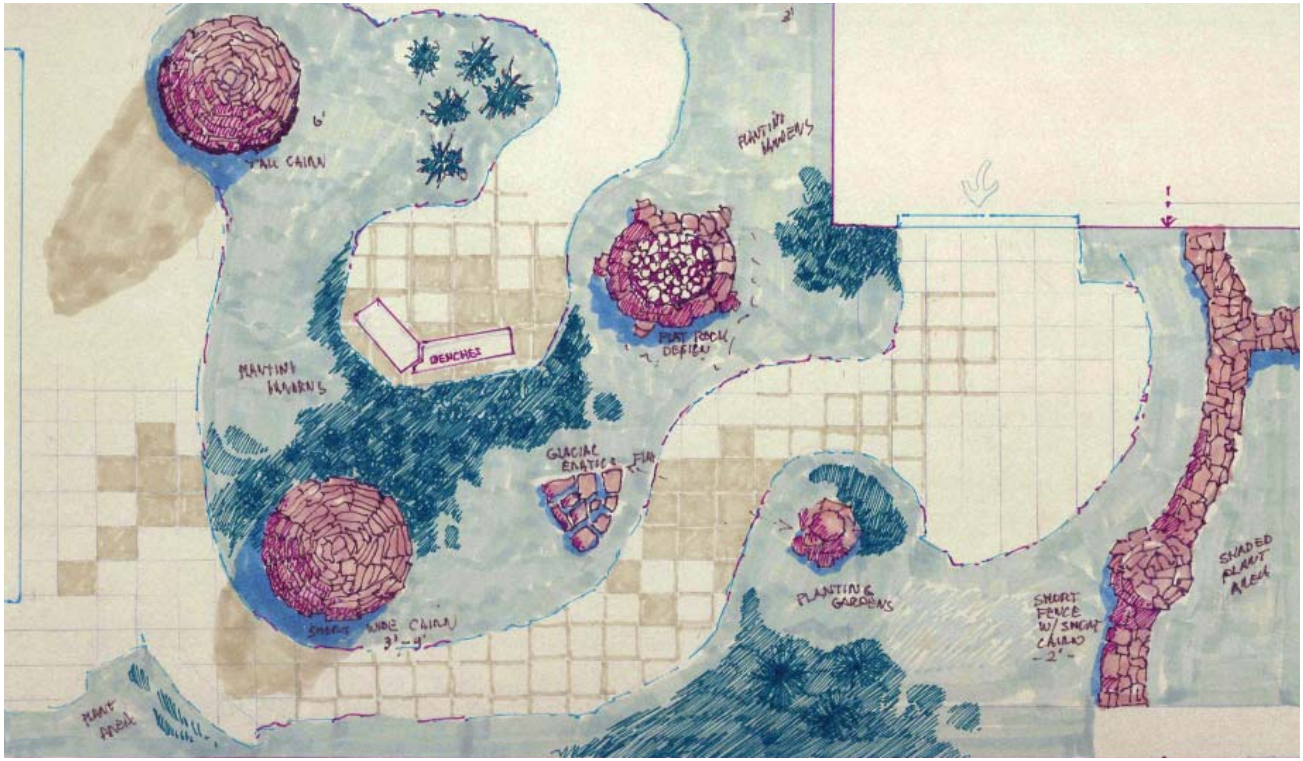


Figure 2.6: Stan Herd Plan Rendering (Herd, 2014)

Where would one normally experience cairns? This question fueled the approach of this design. The aim was to transport the audience into a naturalized cairn context. Taking on an organic, meandering, natural landscape, this design placed the audience in a space where cairns would normally reside.

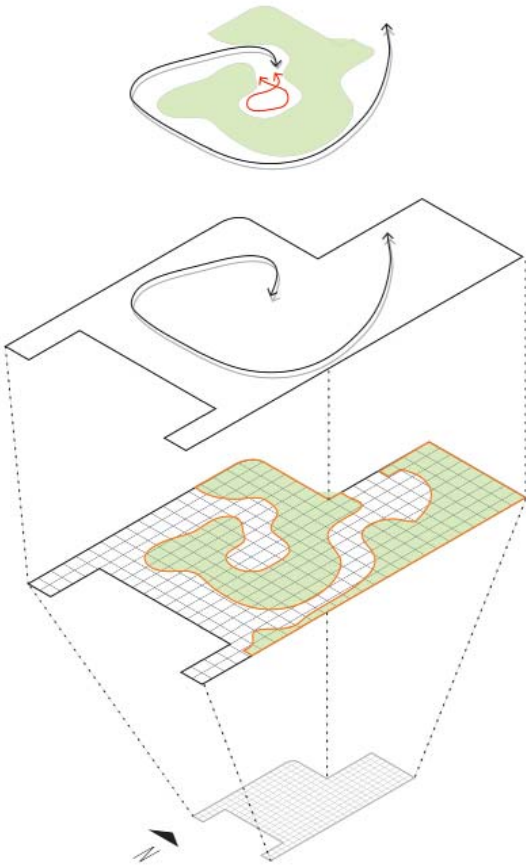


Figure 2.7: Grid & Circulation Diagram (Author, 2015)

The adjacent diagram illustrates the existing 2' x 2' granite tiled grid of the Stolzer Gallery. The initial proposal is simplified and overlaid on the existing grid. Carving out the space of circulation, the naturalized green space and cairns ultimately determine the user experience. Users experience the site within the boundary of the cairns, looping in and out of the site. The red loop in Figure 2.6, depicts users confronted with having to retrace his or her steps in order to exit the exhibition.

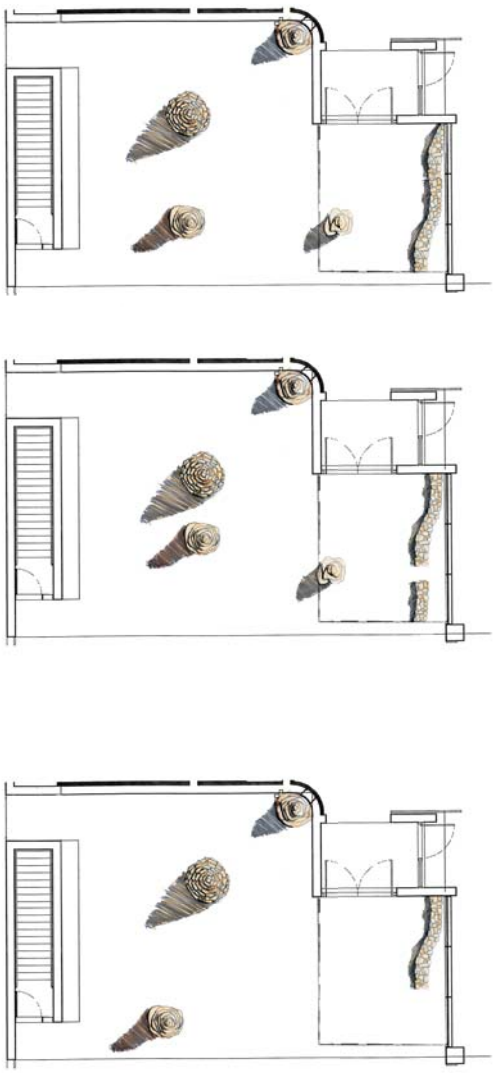


Figure 2.8: Cairn Location Diagram (Author, 2015)

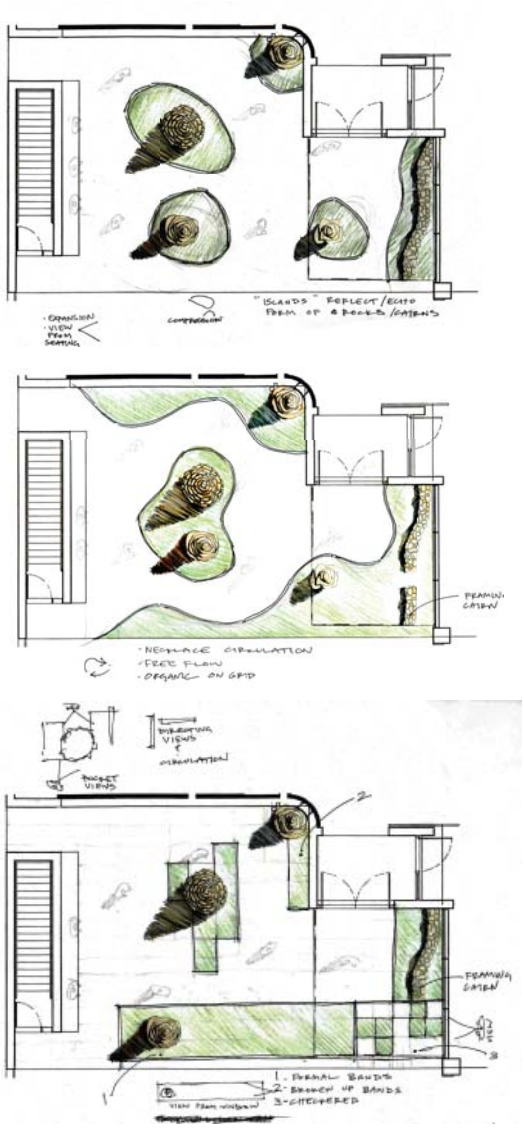


Figure 2.9: Design Concepts (Author, 2015)

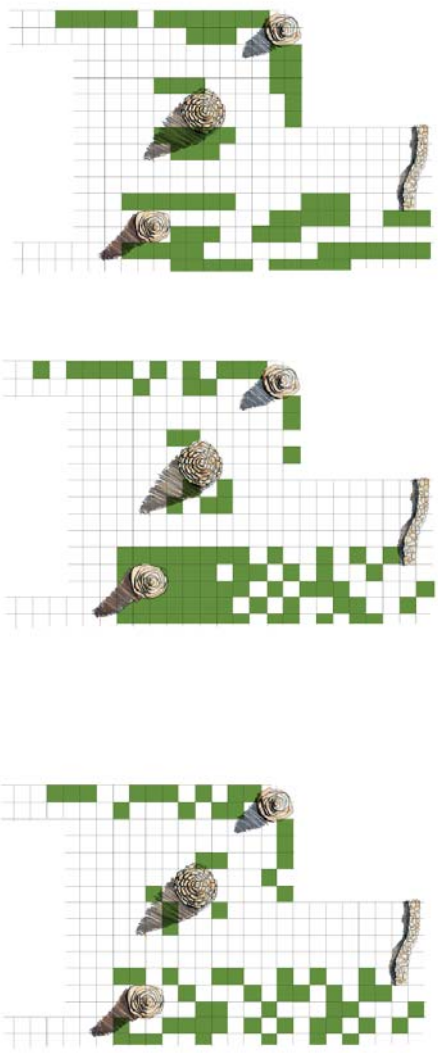


Figure 2.10: Grid Designs (Author, 2015)

After reviewing design concepts, a consensus was made. A more linear approach to the design allows for a more powerful experience. An organic meandering design would neglect the existing two by two foot granite tiled grid and ultimately appear disconnected. Making use of the existing grid reinforces the geometry of the ground plane and creates a more contemplative space by calling attention to the contrast between naturalistic stones and human made architectural geometry.

After the initial proposal, students were assigned to plan additional designs of the cairns. My approach heavily considered cairn location and user circulation. The three plans illustrated on the far left depict an array of cairn location options. This first phase of design focused closely on which cairns would be positioned where. This phase allowed for easy location positioning, because the main focus was on the cairns themselves. The designed landscape was not considered until three plans of cairn location were determined. Once the locations of the cairns were determined, the design proceeded to forming the vegetated landscape.

The design of the vegetated landscape, to be created by extensive green roof trays, took on three separate concepts: echo, necklace, and banding. Echo reflects the form of the cairns on the ground plane. Here the landscape is designed in a way that echoes the overall form of a cairn on the base

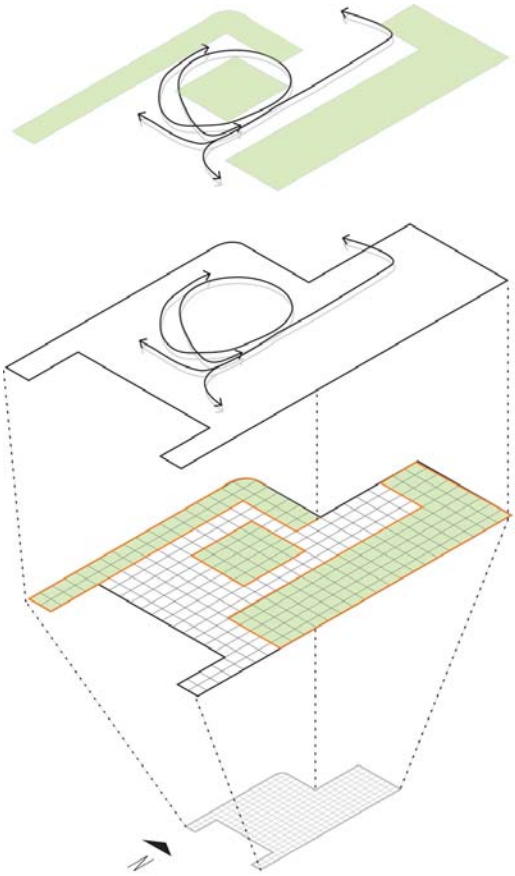


Figure 2.11: Grid & Circulation Diagram II
(Author, 2015)

plane. Each cairn is encircled by green space, almost providing a stage for viewing. Necklace resembles the initial concept, but with adjusted circulation. This allows users to loop around the site instead of having to retrace their steps. Lastly, the banding concept takes on a more formal approach. Linear bands of green space occupy the space around the cairns, while also reinforcing the existing 2' x 2' granite tiled grid.

The three linear designs shown on Figure 2.9 illustrate the number of possibilities the grid offers. For instance, the design can take on a more formal banding of several green tiles in sequence. Additionally, the design has the opportunity to gradate in sequences and appear checker-like.

The diagram on the left illustrates the linear approach overlaid on the grid. The design of the landscape is reinforcing the grid while also carving out a logical user circulation. Users are able to walk around the site comfortably without having to retrace their steps.

Figure 2.12: Final installation of Carins
(Author, 2015)

The southern view of the first phase of the final installation, shows each cairn assembled and positioned on site inside the Stolzer gallery.

Figure 2.13: Phase II: Vegetative Landscape Installation in Progress (Dempsey, 2015)

Diane Cocchiara and Beth Krehbiel focused their efforts on research and implementation of the vegetative landscape. Both Cocciara and Krehbiel are Landscape Architecture students at Kansas State University.

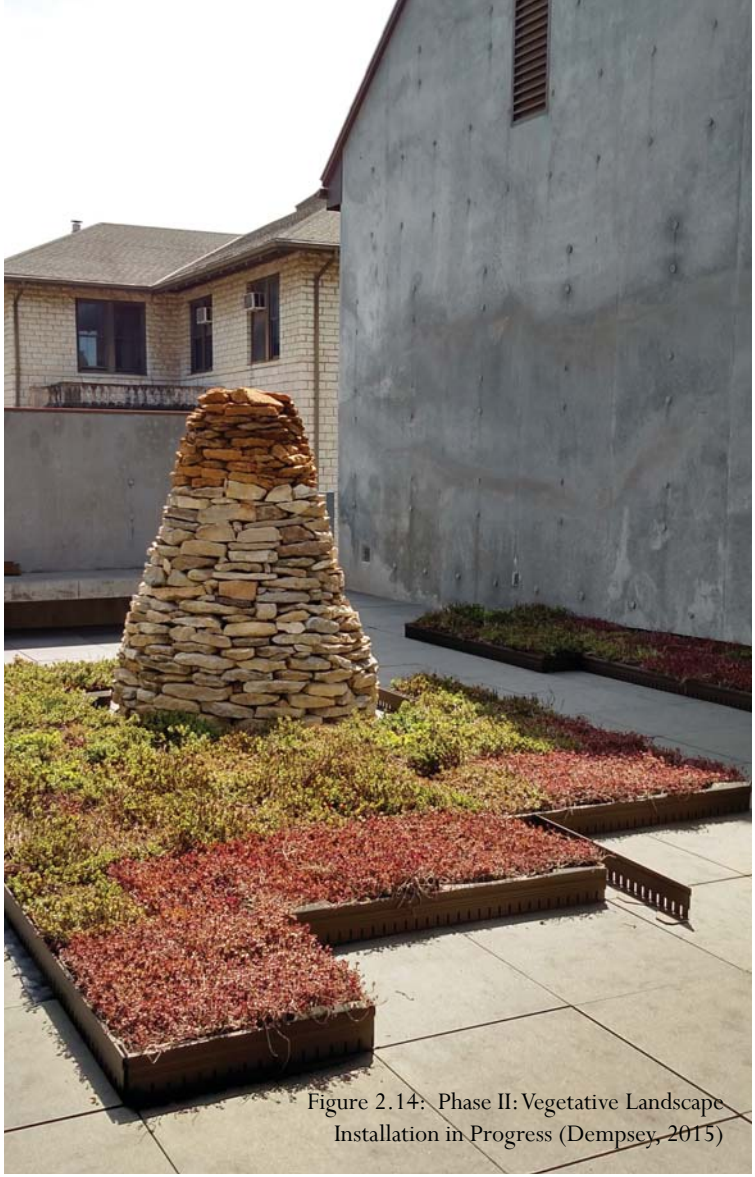


Figure 2.14: Phase II: Vegetative Landscape Installation in Progress (Dempsey, 2015)

The northern view of the second phase of the design proposal shows almost complete installation of green rooftrays with a variety of sedums.

Figure 2.15: Stan Herd Left and Author (Sprague, 2014)

Summary

Lessons Learned from an Artist Apprenticeship

Working with Herd was an exciting privilege and honor. Herd is friendly, ambitious, easily approachable, and modest. These qualities are what shaped the project into what it is today. Herd's charisma and ambitious attitude rubbed off on everyone involved in the project, making the design process exciting and very enjoyable. As the project progressed, there was an understanding that the project belonged to everyone involved. Herd also made sure that if someone wanted to be a part of something, he or she would be included. Herd's character and demeanor as an artist is an inspiration.

I have learned that the creative process as an artist revolves around trial and error, patience, and an inquisitive attitude. These elements of the creative process are intertwined with each other and always subject to change. Furthermore, the creative process is about change, knowing change, and knowing when to stop. One stopping point took place after establishing the importance of the existing tiled grid. Responding to the site grid improved the project by allowing implementation of an organized, yet powerful vegetated landscape, comprised of extensive green rooftrays.

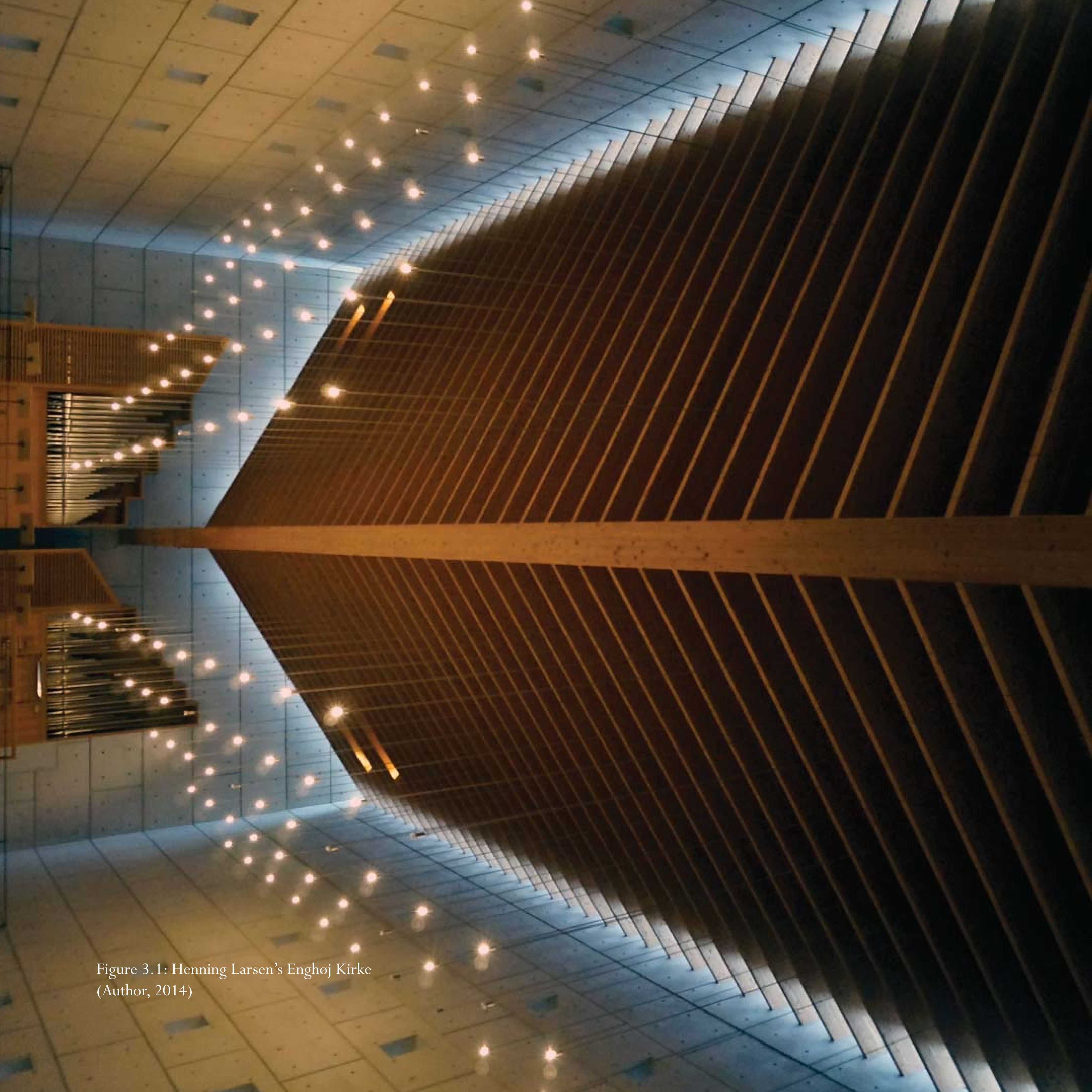
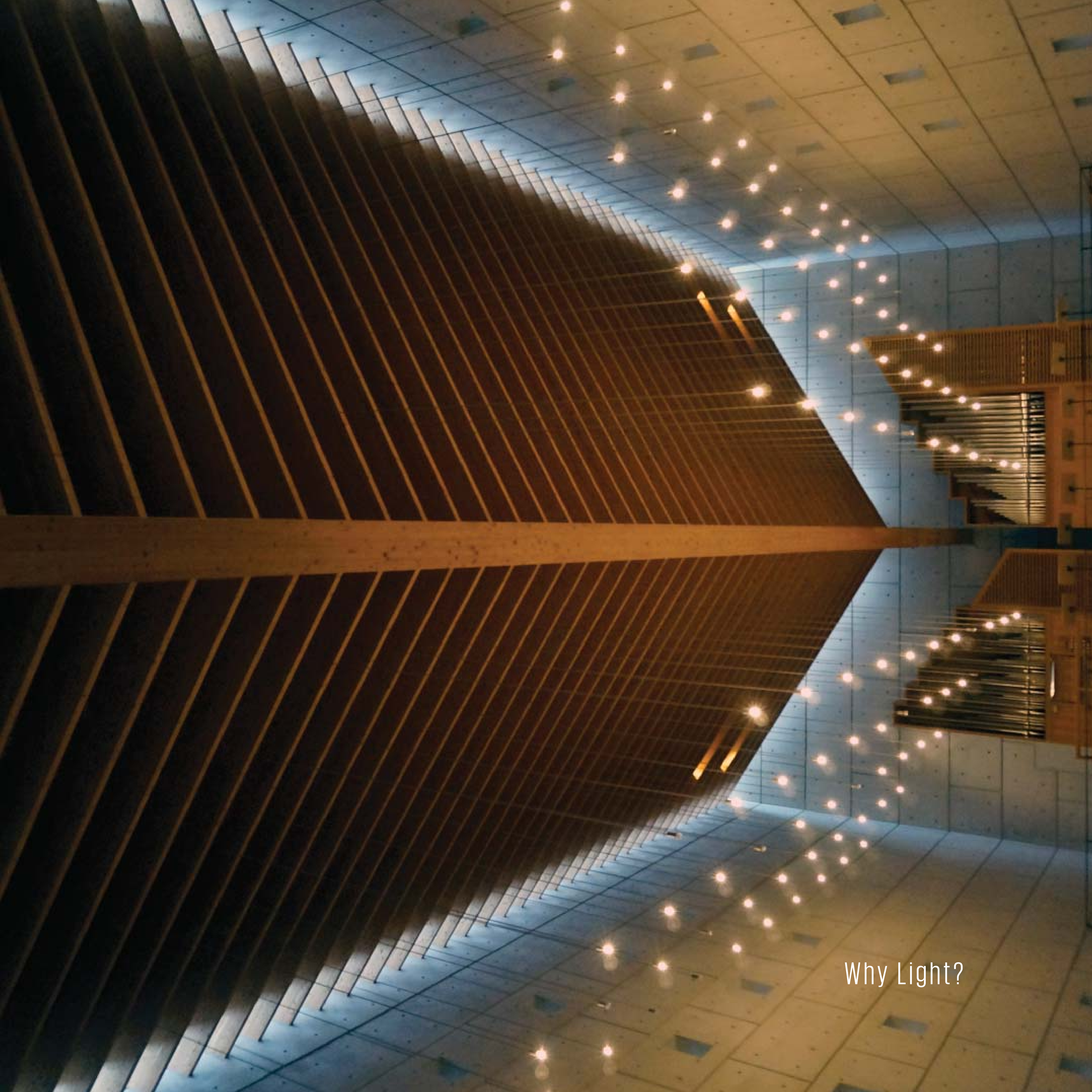


Figure 3.1: Henning Larsen's Enghøj Kirke
(Author, 2014)



Why Light?

Why Light?

My interest in working with light can be divided into 3 parts: the qualities of light, the importance of light in the built environment, and the value of light in a community.

Light is a beautiful and compelling thing. Without light we lose virtually everything in the built environment. Light is responsible for rendering the world and all the forms and beauty that exist within it. The compelling part lies within how we perceive light, and specifically, color. Paul Gregory, a lighting designer of Focus Lighting in New York, states "if you stand in an area that's filled with red light for ten minutes, it starts to look pink and then looks whiter. Your eye tries to acclimatize, to make an area white. But then the blue at the other end of the hall looks incredibly strong, rich, beautiful and intense. And if you walk down there, once you're bathed in the blue light it starts to become lighter and lighter, and the red that you were in before appears rich and strong…and yet nothing has changed except for the way your eye perceives things" (Laganeir & van der Pol 2011). The quality of light is what initially sparked my curiosity as a designer.

Whether triggering a physical or emotional response, light intrigues viewers through its elusive quality. For instance, a difference in perception may exist between a group of people. Someone might perceive light as a certain color or intensity, while someone else might perceive that same color differently. The elusive quality of light offers an interesting point of conversation within an audience.

Light is a very unique material for designers. As James Turrell describes, light is "a medium that you can't get your hands on – it's not like clay. It's very difficult to form. You end up forming everything but it" (Adcock 1990). This quality also increased my curiosity. As a designer, it's easy to get carried away or caught up with form, but in the case of light, there's not much opportunity for it. Light has an atmospheric quality that almost prevents designers from shaping it. However, form can be applied to other materials, which can be overlaid with light. This opens up opportunity for forming the filtering of light.

Figure 3.2: Philadelphia Oval Garden (Fischetti 2014)

Another major reason for pursuing light goes back to its importance in the built environment. Oftentimes, lighting is left out of the discussion or receives little attention. Leni Schwendinger, a lighting artist and designer, explains "when people think about cities and large developments, streetscapes, transit-oriented development (TOD), they're generally thinking about the daytime. When you see a rendering, it's generally a daytime view. My job is to remind people of the nighttime and say look at this as a canvas of darkness" (ASLA, Grajales). The importance of lighting is essential in the built environment. Lighting not only accentuates architecture, but it also provides a means of navigating architecture. Lighting can define space and direction, evoke interest or anticipation, and evoke a sense of place or mood. "Lighting influences people in a subconscious way. It influences how users feel in a place. This also determines how people perceive, behave and use the place. It strongly determines the appreciation, and thus their behavior: if people like a place, find it attractive, striking, relaxing, intriguing, inviting, they tend to stay longer" (Laganeir & van der Pol 2011).

Light adds immense value in a community beyond just lighting for safety and security. Light can help create identity, stimulate economic growth, and activate space. In terms of identity, lighting can strengthen existing design and create a unique visit experience. Even if the space is used regularly during the daytime, lighting can enhance the site and reinforce its perception as a destination. Additionally, lighting can provide marketing-related value and stimulate economic growth. For instance, at the project site in Wichita, Kansas there will be a place for food trucks to sell food. With the introduction of overhead lighting, the food trucks will become more visible from a distance. In turn, this has the potential to attract more people to the food trucks and stimulate economic growth. Lastly, lighting can activate space through its ability to encourage visiting, initiate conversation, and induce interaction on site. Roos Molendijk states that "light partly determines the atmosphere of a place, and through this, also the mood and emotions of the people in it. It is not so much about lighting buildings or spaces alone, but rather evoking reactions in people through the lighting" (Laganeir & van der Pol 2011). Whether it is evoking an emotional reaction or stimulating conversation, light plays a significant role in activating space.

In summary, the quality of light, importance of light in the built environment, and value of light in a community contribute to my interest in working with light. These aspects not only prompted my initial investigation, but also reinforced the pertinence of light art installations in regard to landscape architecture.

Figure 4.1: Captured Light
(Author, 2015)

Methods

Methods

An artistic research approach was undertaken in order to effectively address my research question: What type of public light art is most appropriate for a specific site and how does it relate to creative placemaking? Methods within this approach tied together to address the research question. These methods include: artistic research and making, an apprenticeship to an artist, precedent studies, development of a light typology, an analysis of site and context, and establishing a design matrix.

Artistic Research & Making

Elliot Eisner, formerly a professor of Art and Education at the Stanford Graduate School of Education, describes "what art seeks is not the discovery of the laws of nature about which statements or explanations can be given, but rather the creation of images that people will find meaningful" (Eisner 1981). In regard to this report, the creation of appropriate light art and its specificity to place brings meaning. Two separate sites are being addressed which inform two site specific design outcomes. The specificity of each design lends meaning to each space. Herbert Read describes, "art is a mode of expression, a language which may make use of such utilitarian things much as language itself makes use of ink and paper and printing machines: to convey a meaning – by which I do not mean a message" (Read 1966).

Art making followed a non-linear iterative process that involved constant back and forth reflection. In general, separate art-making processes occurred for each site: Wichita, Kansas and in Denver, Colorado. However, there were instances where each site, and its correlating art making, coincided with each other.

As Herbert Read describes, art making involves "the unifying of all feelings and desires, and as the crystallization of the instincts in a process that can only take place through the senses" (Read 1974). Moreover, this process was fluid and fused personal and aesthetic expressions onto paper, or as Read aptly describes: "comprising subjective and sensuous activity" (Read 1974). The art making process began with loose ideas sketched quickly on paper.

This allowed for a number of ideas to be represented without fixating on any one idea. Afterward an evaluation period took place to determine which ideas were most meaningful and site-specific. However, the process of sketching ideas and evaluating ideas continued intermittently for weeks at a time. This process continued until reaching a level of contentment, where select ideas were chosen for further design development.

Apprenticeship

The apprenticeship with Stan Herd provided a new lens of understanding site through the eyes of an artist. Initially, Herd's approach focused less on the physical site conditions and more on the role of art in the landscape. An emphasis was put on metaphor and the immersive quality of the site. Herd's approach aimed to transport the audience into a natural place of contemplation where one might view Cairns in their likely state. This new perspective allowed for a new understanding of my site in Denver, Colorado, and Wichita, Kansas.

In addition, this apprenticeship involved working with others, which introduced a new method of approach and fabrication. When a group of nine people are working on the same project, decisions have to be made unanimously or motivation and interest diminishes. As a result, a number of considerations arise and a consensus must be reached. This collaboration provided a new understanding of working with others, and understanding what the group can accomplish.

Precedent Study

The compilation, organization, and study of light installation precedents informed the different types of light found in light installation projects. In the beginning, it became necessary to approach my precedent study with a broad stroke. This involved the discursive review of many light installations, and compiling images of these installations into a document. After making a broad collection of light installations, a reduction in scope was needed to further my investigation. In order to do so, a criterion was established to find which projects most useful. The criteria included: recentness of the work, acknowledgement, feasibility, and appeal.

Recentness of the Work: Light installation cannot be older than 10 years

Acknowledgement: Light installation must have received considerable attention based on prestigious awards & honors, and or showcasing from a widely known design publication such as *Archdaily*, *Designboom*, and *Dezeen*.

Feasibility: Light installation must be applicable to the scale and scope of the study sites in Denver and Wichita. In other words, the installation could be reproduced locally or on campus by tools available to me.

Appeal: Light installation is visually enticing, engaging an audience, and thought provoking.

After filtering light installations through the list of criteria, nine projects were chosen. These carefully selected light installations set the stage for a range of diverse work that could be referenced at any time during the design process. This also allowed for an understanding of the distinct types of light found within these projects, which then could be collected and applied to the development of the light typology. In the end, the precedent studies revealed which combinations of light types existed and how certain types responded to site conditions.

Development of Light Typology

Creating the light typology involved careful analysis of each selected precedent. The analysis focused on: the installation as a whole, and how light itself was being addressed. These two areas of focus became primary categories of light types, which are referred to as Installation-Based and Light-Based. Within these two categories, a number of types were derived through analysis of site conditions, user experience, materiality, and concept.

The Light-Based category draws its primary effect from the light itself rather than depending upon a relation to context. Types within this category include: contained, uncontained, or projected

The Installation-Based category is more concerned with the installation as a whole. Its effect is dependent upon activating space of context or setting. Types within this category include: stationary, mobile, suspended, transformative, interactive, functional, multi-sensory, and multi-dimensional

Analysis of Site and Context

An analysis of site and context is critical to any landscape arhiceture project. Two sites were addressed: Midtown Denver, Colorado, and Wichita Downtown Development Corporation (WDDC) Pop-Up Park.

Both sites began with a background presentation by the client, followed by a design charrette. The Midtown charrette took place at Kansas State University in the School of Architecture Planning and Design. I led a team of four lowerclassmen, whom were also students of architecture. The WDDC Pop-Up Park charrette took place at the Wichita Downtown Development Corporation and was comprised of professional landscape architects, architects, developers, local residents, and colleagues.

I used a distinct approach for analysis of each site and context. In the case of Midtown, all of the analysis was based on digital drawings provided to us and discussions with John Norris of Norris Design and Marc Savela of Brookfield Residential. The analysis of digital drawings helped develop basic spatial relationships and circulation considerations. To further design development, discussions with Norris and Savela helped address considerations such as scale, materiality, and color. In contrast, my analysis of the WDDC Pop-Up Park was informed by visits with a group of developers, local residents, designers, and colleagues. This allowed for on-site documentation, photography, and discussion. Visiting the Pop-Up Park site in person made analysis of site and context more accessible and ultimately more successful than the analysis of Midtown.

Establishing a Design Matrix

In order to establish a design matrix of site and light parameters, a collection of design considerations was needed. These design considerations, or parameters, address site program, site conditions, light types, levels of light, levels of transparency, and orientation. Development of these considerations was made possible through reflection of precedent studies, analysis of site and context, and client requirements.

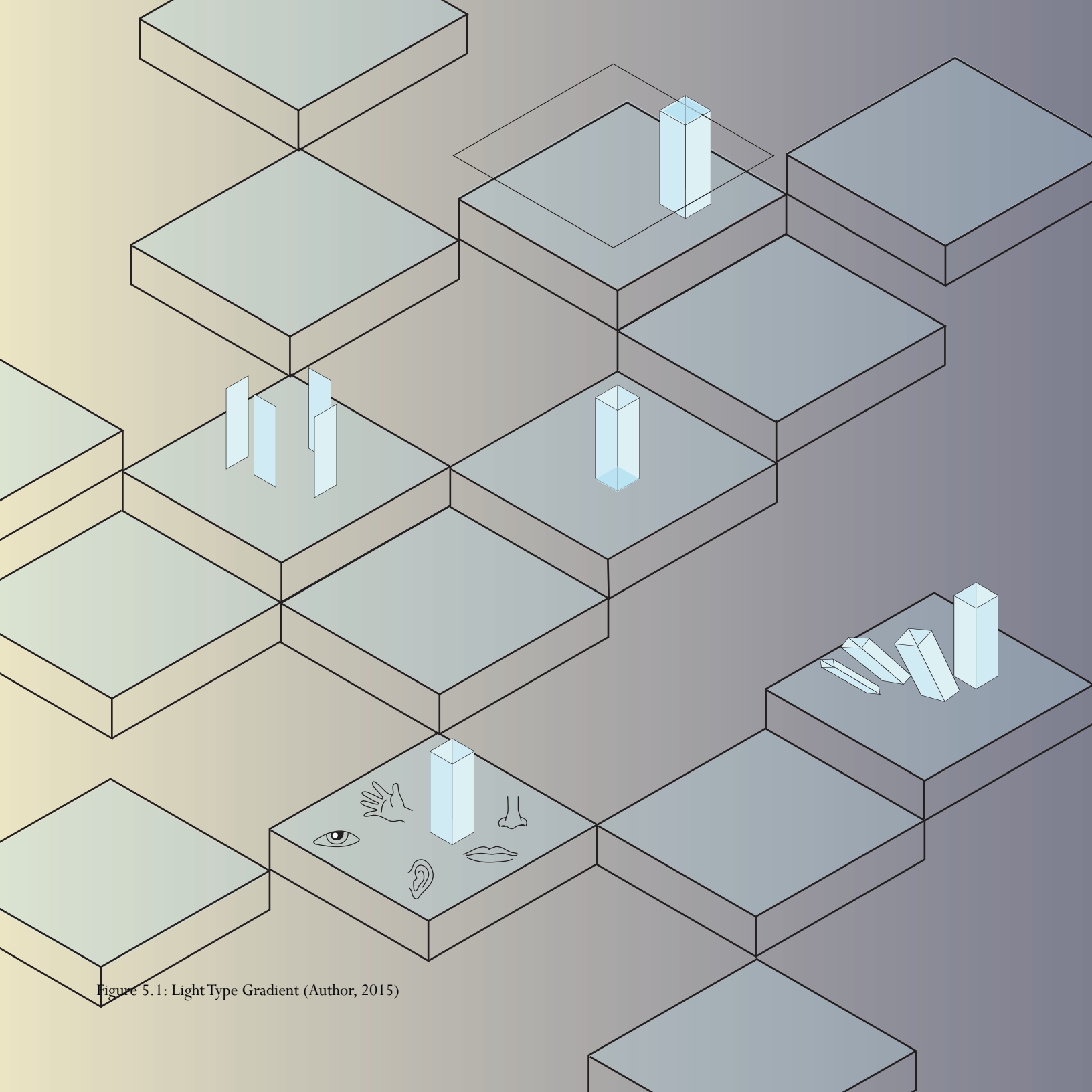
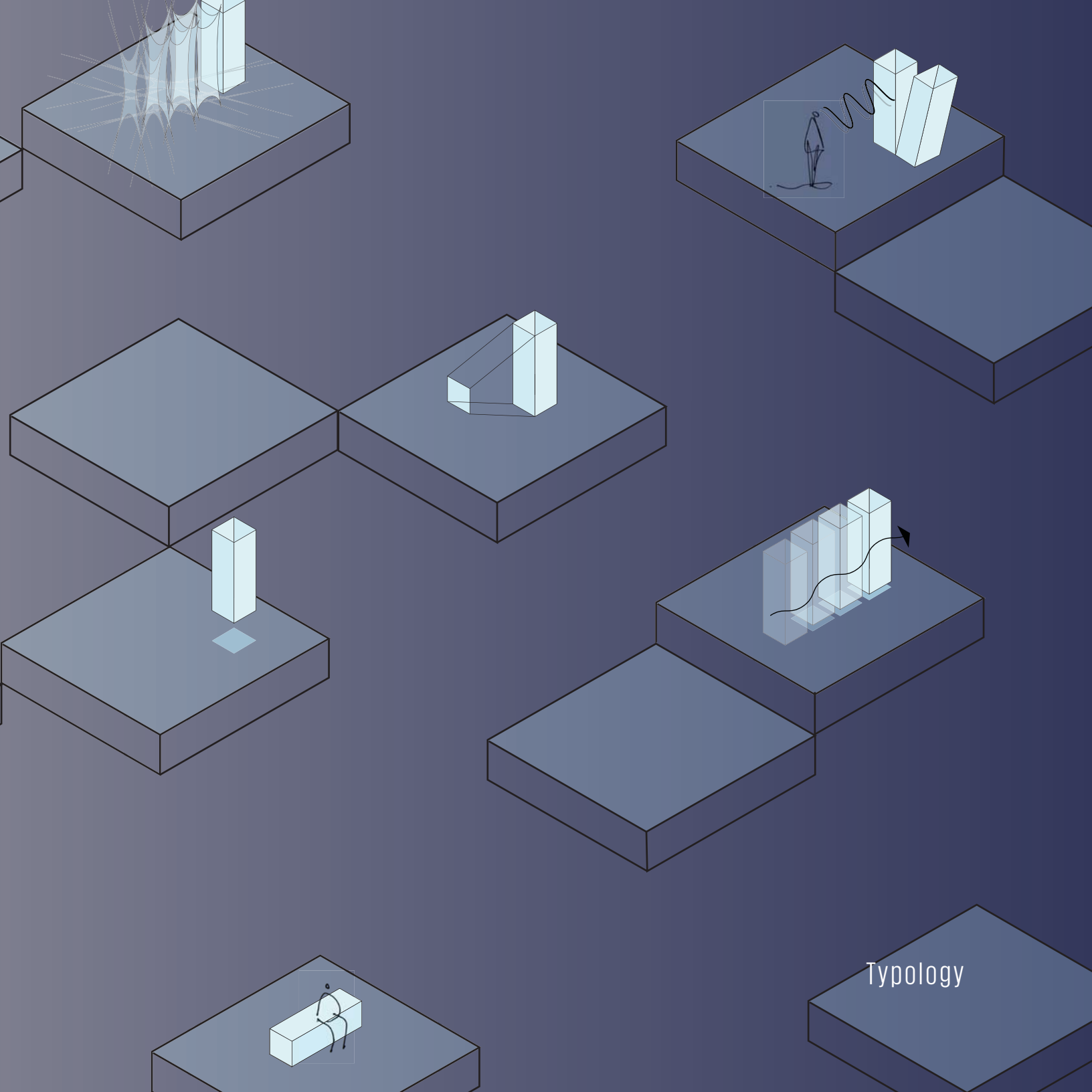


Figure 5.1: Light Type Gradient (Author, 2015)


Typology

Typology

The distinct types that comprise the light typology were derived from precedent studies. These eleven types address distinct characteristics of light installations such as: site conditions, user experience, materiality, and concept. Two primary categories of light types exist within the typology:

1) Light-Based Types
2) Installation- Based Types

The Light-Based category draws its primary effect from the light itself. Types within this category include: contained, uncontained, or projected within the installation.

The Installation-Based category is more concerned with the installation as a whole. Its effect is dependent upon activating space of context or setting. Types within this category include: stationary, mobile, suspended, transformative, interactive, functional, multi-sensory, and multi-dimensional

Following the description of light types are nine precedent studies. These types are overlaid with each precedent study and reveal the distinct types associated with each light installation.

Types

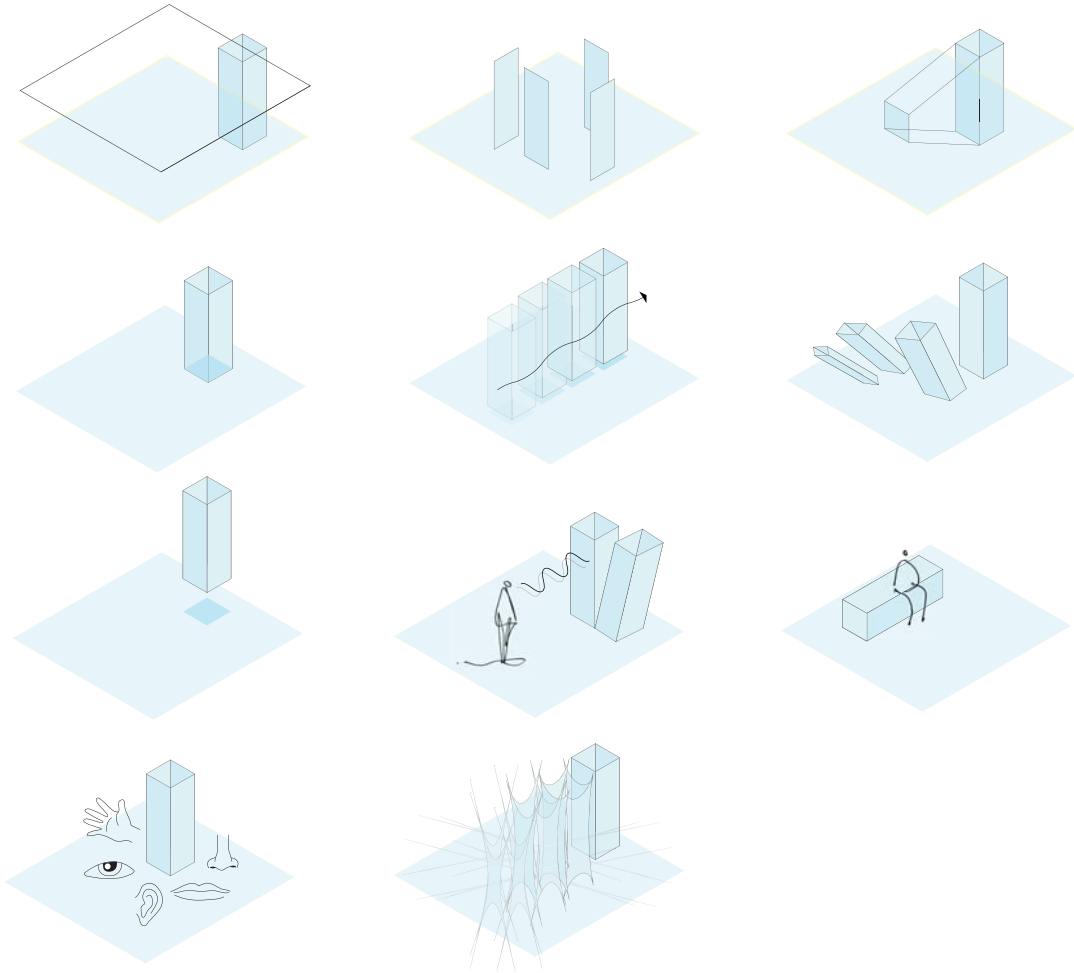


Figure 5.2: Unlabeled Light Typology
(Author, 2015)

Light-Based Types

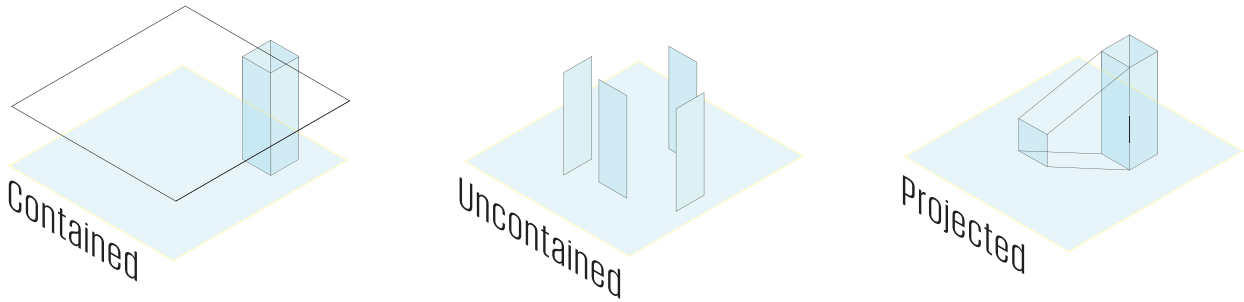


Figure 5.3: Light-Based Types
(Author, 2015)

The Light-Based category draws its primary effect from the light itself rather than depending upon relation to the setting. Types within this category include: contained, uncontained, or projected within the installation.

Light-Based Types Defined

Contained - Light is physically confined or harnessed by material (usually artificial light). Figure 5.4 illustrates *Gleaming Lights of the Souls*, in which suspended orbs contain and harness light.

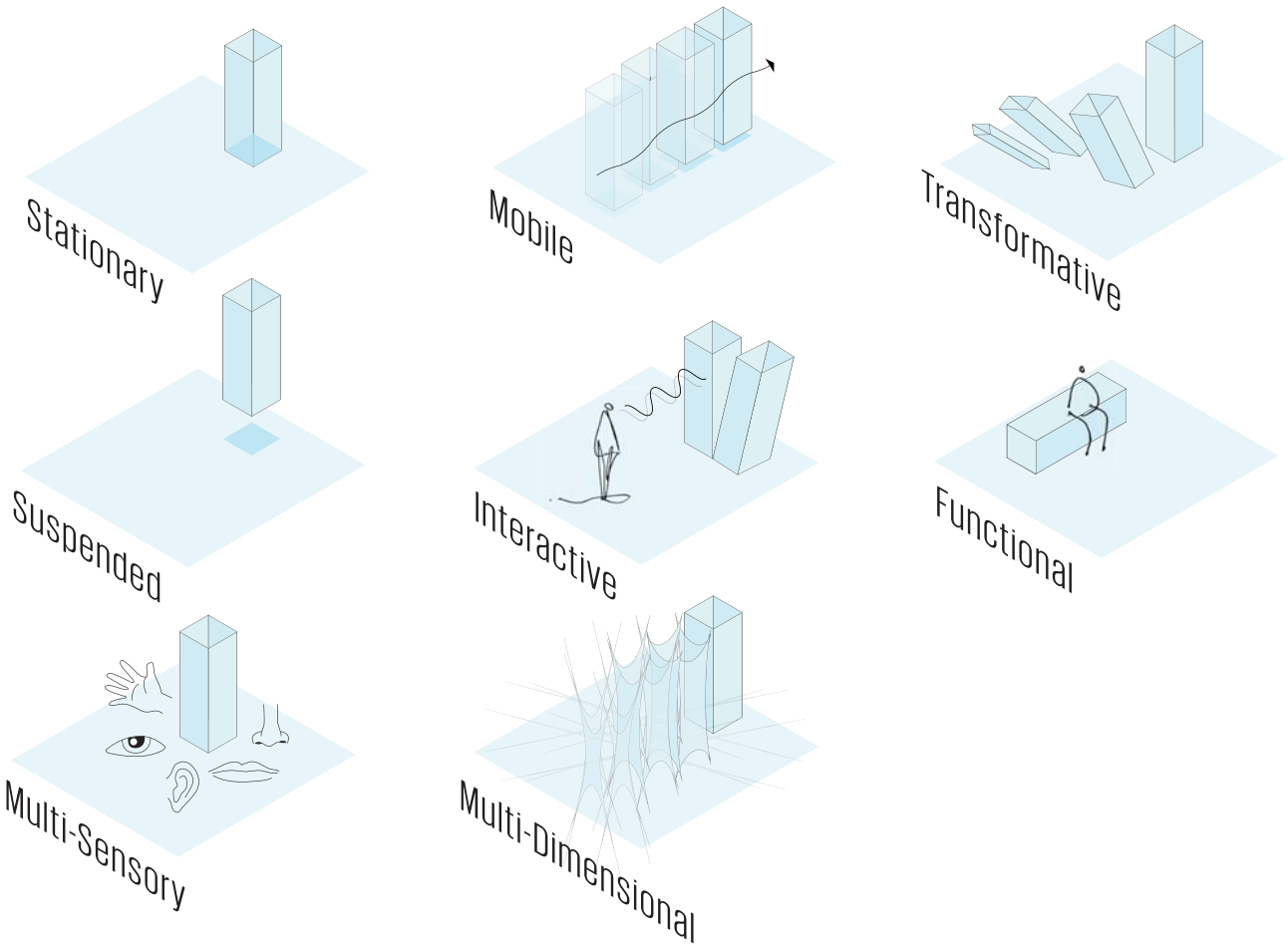
Uncontained - Light is unconfined and exists naturally in space (usually natural light). Figure 5.5 illustrates uncontained light. Turrell frames light instead of containing it.

Projected - Light is cast and extended out onto a surface. Figure 5.6 illustrates light being projected onto Echelman's *Amsterdam* installation.

Figure 5.4: Yayoi Kusama's Gleaming Lights of the Souls (Author, 2014)

Figure 5.5: James Turrell's Blue Planet Sky (Hashimoto, 2010)

Figure 5.6: Janet Echelman's Amsterdam Installation: (Eijnden, 2012)



The Installation-Based category is more concerned with the installation as a whole. Its effect is dependent upon activating space of context or setting.

Figure 5.7: Installation-Based Types
(Author, 2015)

Stationary – The light installation is non-moving and remains still within space. However, the light itself may be changing and moving. Figure 5.8 illustrates *Bourrasque's* electroluminescent sheets suspended and fixed in space. These sheets do not move and are stationary.

Mobile – The light installation is physically moving in space. Figure 5.9 illustrates the 3-D printed shell of *Air Turbine Rotor LED*. The shell traps wind which rotates the axis, in turn generating and transforming energy into light. This installation becomes mobile once wind triggers rotation of the shell.

Suspended – The light installation is suspended in space (almost always stationary). Figure 5.8 illustrates *Bourrasque's* electroluminescent sheets that appear to be floating. However, these sheets are being suspended by cables that span the length of a courtyard.

Figure 5.8:
Paul Cocksedge's Bourrasque Installation
(Cocksedge, 2015)

Figure 5.9: Margot Krasojevic's Air Turbine Rotor LED
(Krasojevic Ph.D, 2015)

Interactive – The audience or viewer is physically engaged with the light installation. In some cases, the light installation may change or evolve in the presence of the audience or viewer. Figure 5.10 illustrates the interactive quality of Brown's *Cloud* which encourages the audience to turn light bulbs on and off.

Functional – The light installation provides purpose and is usually designed to have some sort of practical use. Functional also refers to dual purpose as security, task, and way-finding lighting. Figure 5.11 illustrates the functional aspect of *Your Rainbow Panorama*. The colored panels function as the only load-bearing structures that support the roof.

Transformative – The light installation changes or evolves in some significant way outside its original composition. Figure 5.12 illustrates Webster's *Enigmatica*, which transforms into a number of colorful patterns.

Figure 5.10: Caitlind Brown's Cloud (Brown, 2012)

Figure 5.11: Olafur Eliasson's Your Rainbow Panorama (Author, 2014)

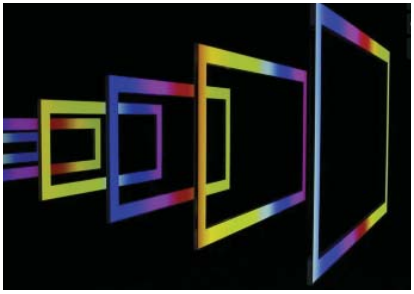


Figure 5.12: Kit Webster's Engimatica (Webster, 2015)

Multi-Sensory – The light installation affects multiple physiological senses of the audience or viewer. Figure 5.13 illustrates Lovegrove's *Future Primitivism*. Audio sounds of a car can be heard simultaneously as colorful patterns transform, which makes this installation multi-sensory.

Multi-Dimensional – The light installation involves or relates to multiple dimensions. Oftentimes, this type is illusory or immerses the audience or viewer within a space that appears to have no boundaries. Figure 5.14 illustrates Kusama's *Gleaming Lights of the Souls*. This installation introduces a room full of mirrors which creates an illusion of infinite color changing orbs and multiple projections of the viewer. Immersing the audience into an infinite atmosphere, this installation is multi-dimensional.

After studying each precedent carefully, a light typology took form. The precedent studies allowed for an understanding of the distinct types associated with each project. I learned that each precedent combines a number of different types, not just a single type. Moreover, each project had a unique combination of types. The following spreads showcase each precedent study overlaid with their associated types.

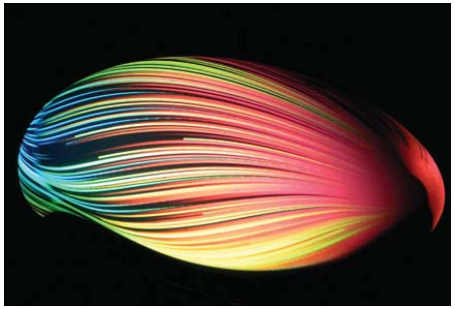


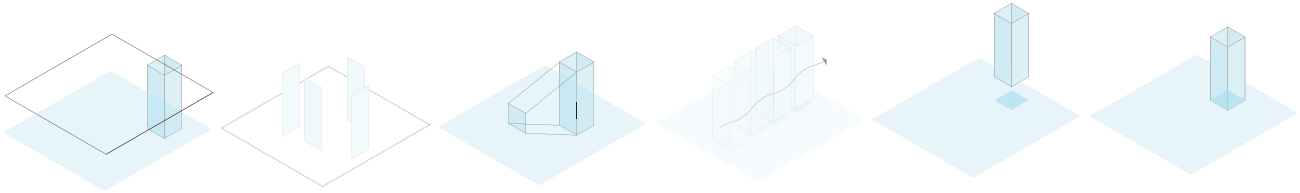
Figure 5.13:
Ross Lovegrove's Future Primitivism
(Cupoli, 2015)

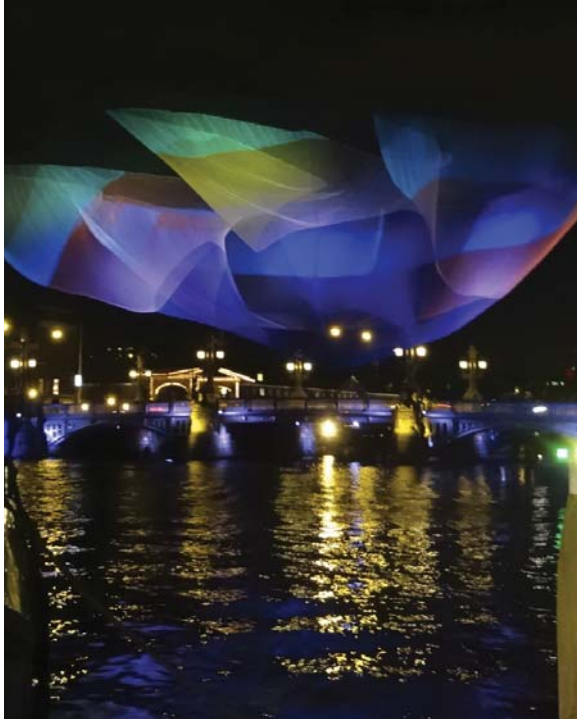
Figure 5.14: Yayoi Kusama's Gleaming Lights of the Souls (Author, 2014)

Figure 5.15: (Lijnden, 2012)

Janet Echelman (Amsterdam)

Designer: Janet Echelman
Location: Amsterdam
Completion Date: December 2012
Size: 230’ (Length) x 140’ (Width) x 30’ (Height)
Material: Spectra Fiber, High-Tenacity Polyester Fiber, Colored Lighting





Description

Just one of several Echelman projects, this aerial sculpture is suspended over the Amstel River in front of Amsterdam's city hall. Most notable is the transforming color reflecting on the water below. A metaphor that Echelman states, "invites the viewer to pause and consider how we're knitted into a larger fabric" (Echelman 2012).

Figures 5.16 & 5.17: (Taylor, 2012), (Eijnden, 2012)

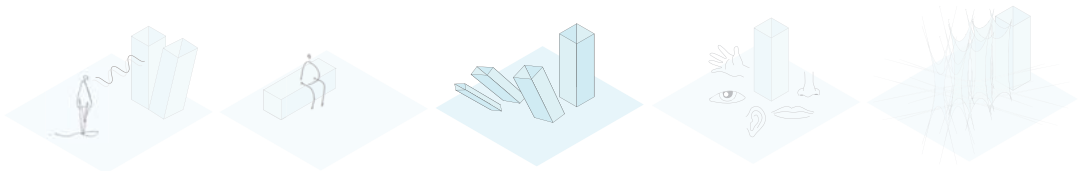
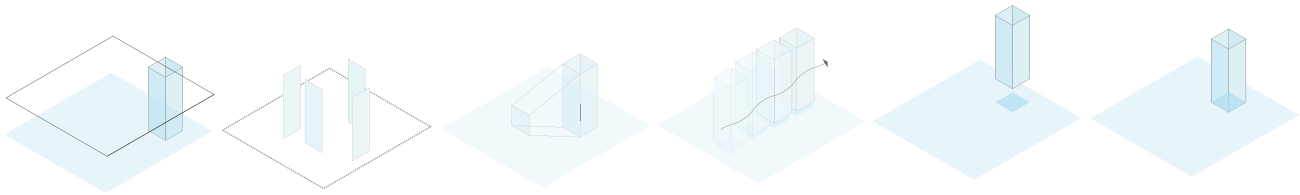


Figure 5.18: (Cocksedge, 2012)

Bourrasque Light Installation

Designer: Paul Cocksedge
Location: London, England
Completion Date: 2012
Size: Individual A3's spanning the length of courtyard
Material: Electroluminescent sheets



Description

Suspended outside in a courtyard, *Bourrasque* introduces a playful light design that mimics sheets of paper being caught by the wind. Most noteworthy is how each of these double-sided illuminated sheets have been meticulously assembled. This results in an assembly that appears to be floating in space without any means of suspension.

Figures 5.19 & 5.20: (Cocksedge, 2012)

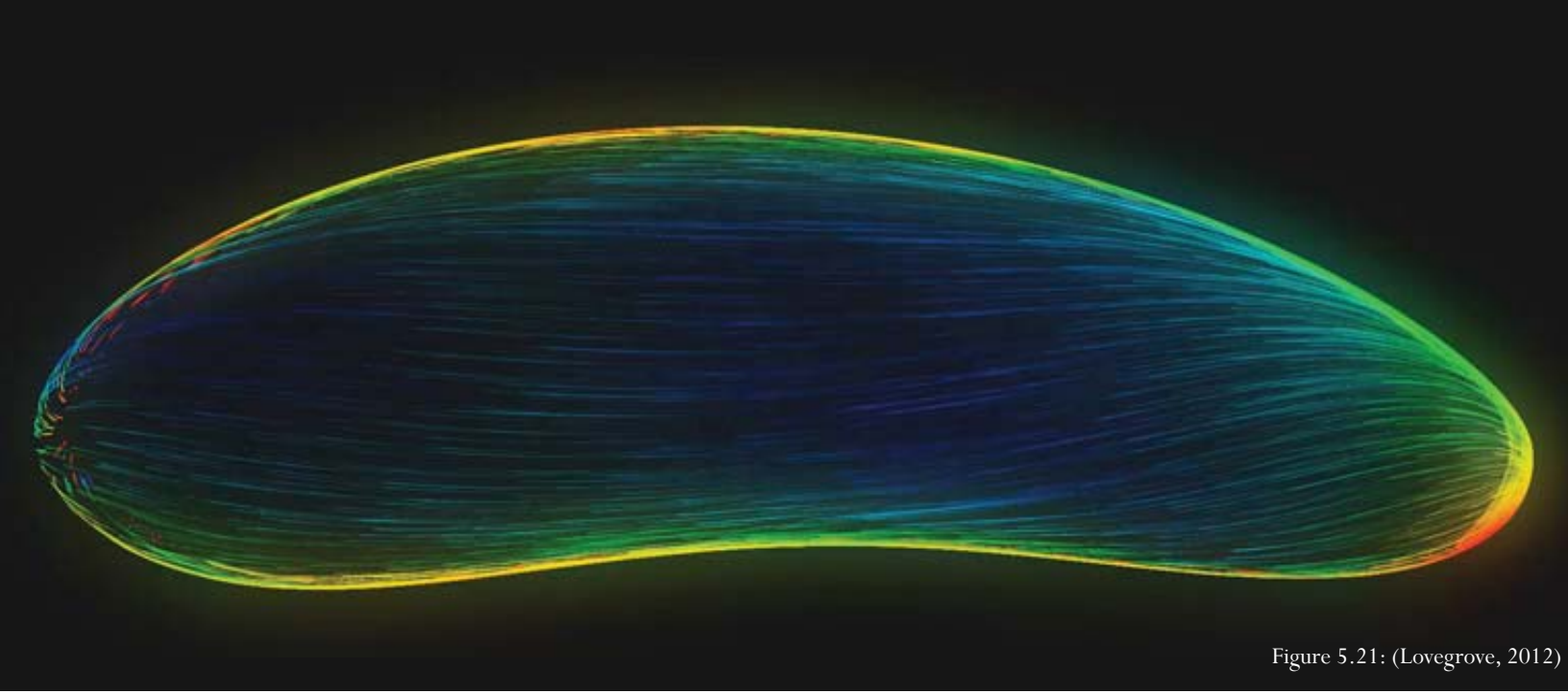
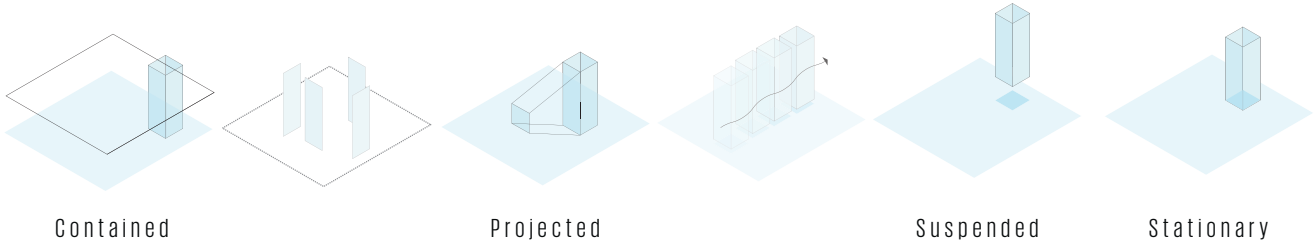
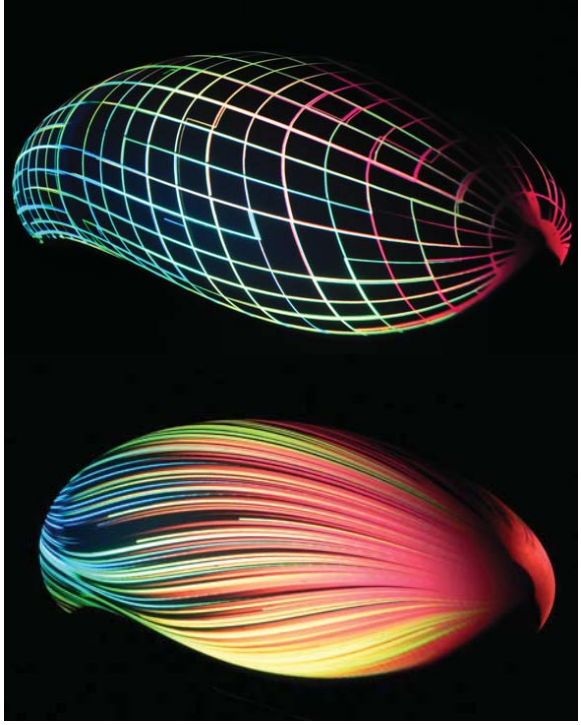


Figure 5.21: (Lovegrove, 2012)

Futuristic Primitivism

Designer: Ross Lovegrove
Location: Kortrijk, Belgium
Completion Date: 2012
Size Estimate: 2-4’ x 7’
Material: Fibre Glass Model

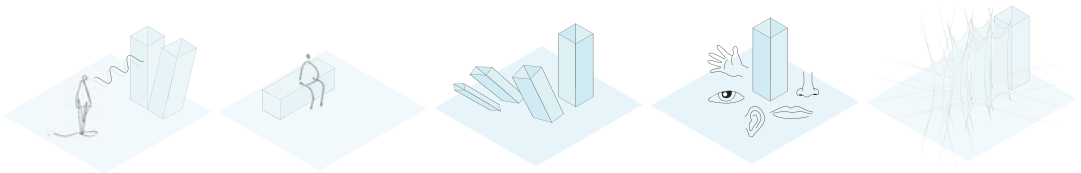




Description

Developed with an influence of fluid dynamics, aerodynamics, and the human form, *Future Primitivism* suspends from a ceiling to act as a screen for colorful light-audio visualizations. Audio sounds of a car give the sensation that the installation is in motion.

Figures 5.22 & 5.23: (Cupoli, 2015)

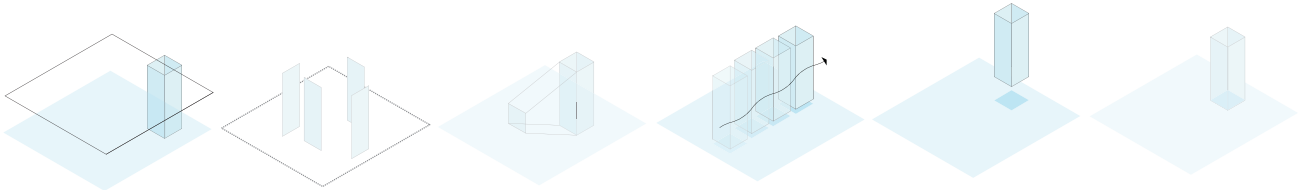


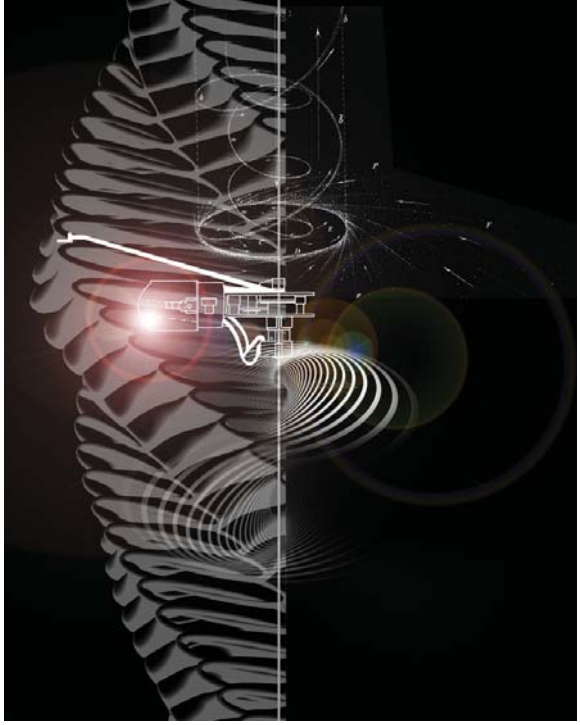
Transformative Multi-Sensory

Figures 5.24 & 5.25: (Krasojevic, 2013)

Air Turbine Rotor LED

Designer: Margot Krasojevic
Location: Unknown
Completion Date: 2013
Size Estimate: 4" x 12"
Material: 3D Printed Thermoplastic, Dynamo Generator, & Capacitor





Description

Inspired by the Ropatec wind rotor, this 3-D printed light is both functional and sculptural. "The ceramic body of the light is attached to a vertical axis which turns a diode rotor that transforms the movement into light. This 3D-printed shell traps wind which rotates the axis in turn generating and transforming energy into light" (Krasojevic 2013).

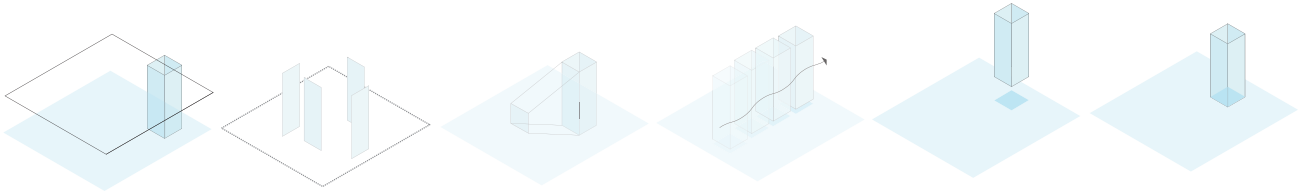
Figures 5.26 & 5.27: (Krasojevic, 2015)

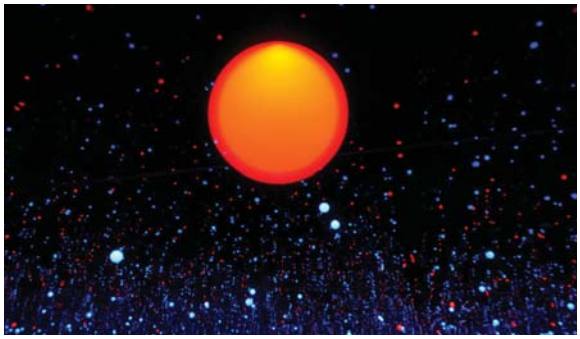
Functional

Figure 5.28: (Author, 2014)

Gleaming Lights of the Souls

Designer: Yayoi Kusama
Location: Louisiana Museum of Modern Art (Denmark)
Completion Date: 2008
Size Estimate: 4 x 4 meters
Material: Mirrors, Reflecting Pool, Hundreds of illuminated orbs

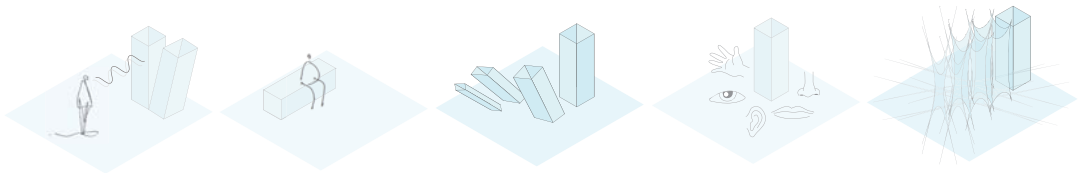




Description

Kusama has created an immersive experience where viewers step into a room full of mirrors and suspended color-changing orbs. A small platform is situated above a reflection pool which adds to the infinite atmosphere Kusama creates.

Figures 5.29 & 5.30: (Author, 2014)



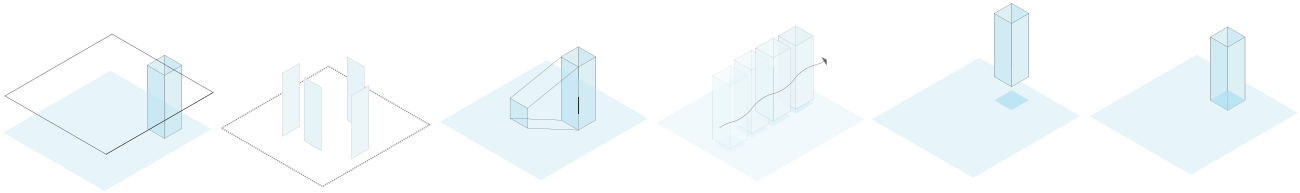
Transformative

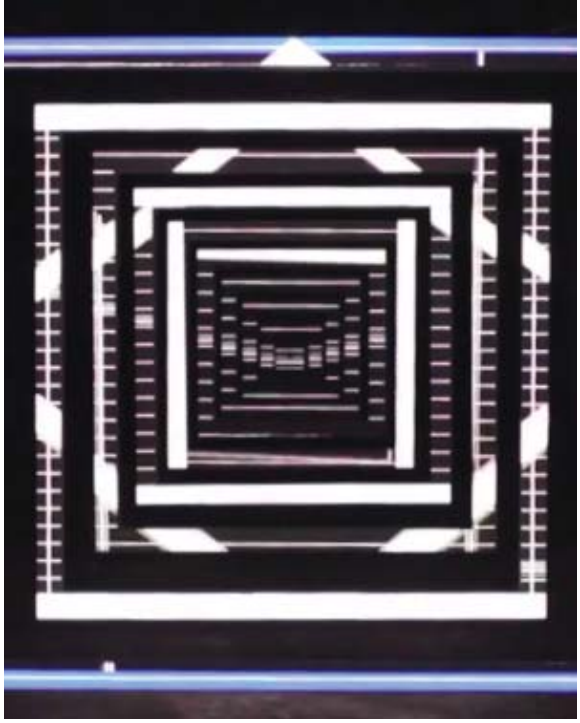
Multi-Dimensional

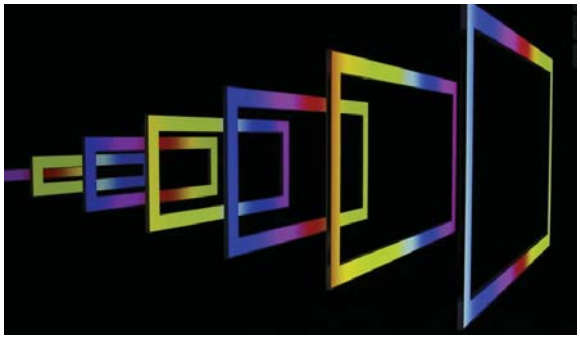
Figure 5.31: (Webster, 2014)

Enigmatica

Designer: Kit Webster
Location: Melbourne, San Paulo, Geneva, Saint Brieuc, Nantes, Auckland
Completion Date: 2012
Size Estimate: Unknown
Material: Unknown



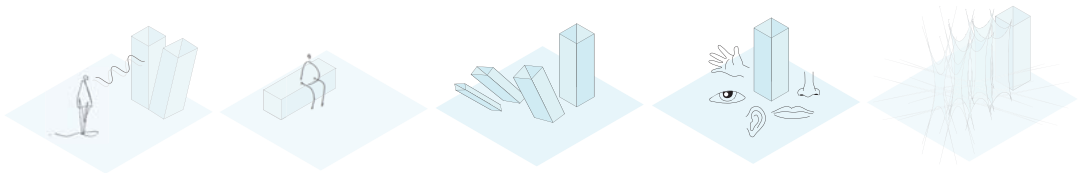




Description

Enigmatica is a suspended video sculpture which consists of ten concentric frames. Animated geometry is projected onto the frames in cohesion with complementary sound compositions.

Figures 5.32 & 5.33: (Webster, 2015)

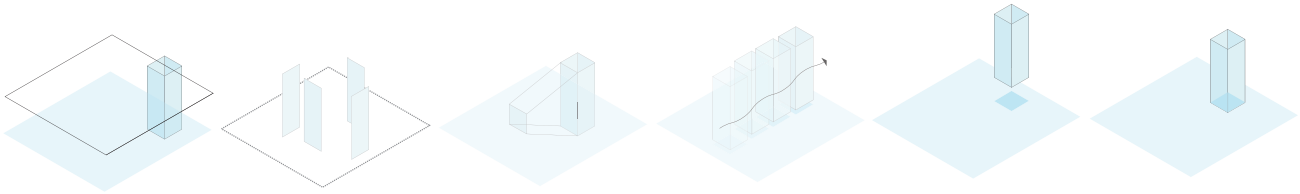


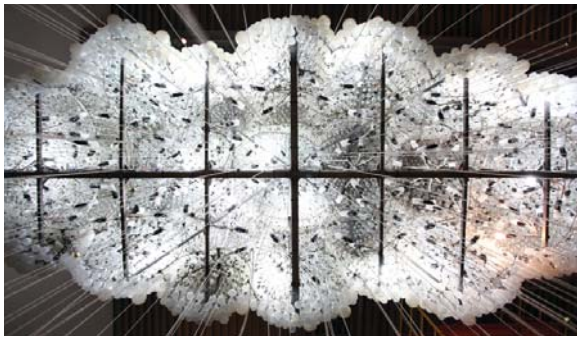
Transformative Multi-Sensory

Figure 5.34: (Brown, 2012)

Cloud

Designer: Caitlind Brown & Wayne Garrett
Location: Calgary, Canada (Nuit Blanche Art Exhibition)
Completion Date: 2012
Size Estimate: 7' x 12'
Material: Steel, Metal Pull-Strings, 6,000 Light Bulbs

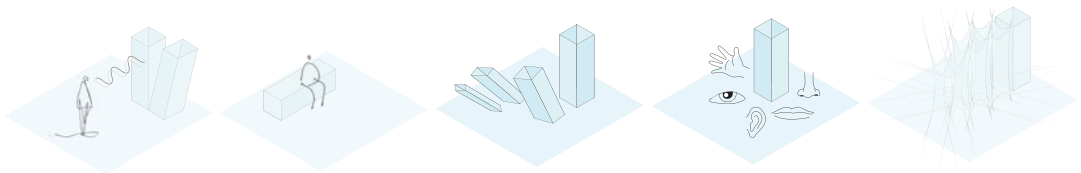




Description

Cloud is an interactive light installation that invites audience participation. The end effect mimics the aesthetics of an actual electrical cloud.

Figure 5.35 & 5.36: (Brown, 2012)



Interactive

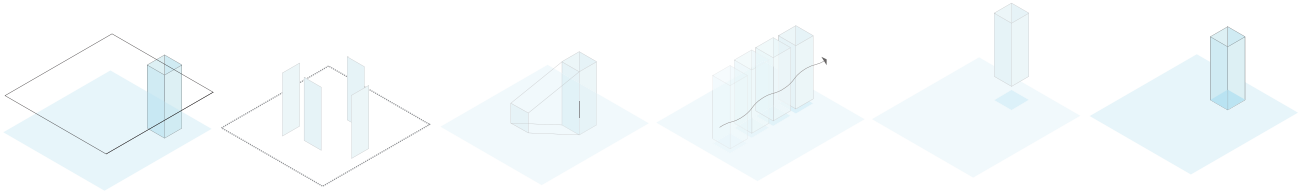
Transformative

Multi-Sensory

Figure 5.37: (Ewing, 2008)

Multiverse

Designer: Leo Villareal
Location: Washington, DC. (National Gallery of Art)
Completion Date: 2008
Size: 200' Long
Material: 41,000 computer-programmed LED nodes



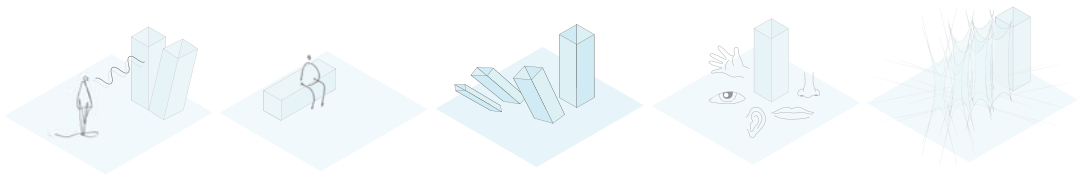
Contained

Stationary

Description

Multiverse, one of Villareals most acclaimed and ambitious works to date, spans from the East and West Buildings of the National Gallery of Art. Approximately 41,000 computer programmed LED nodes transform along a moving walkway.

Figure 5.38: (Ewing, 2008)

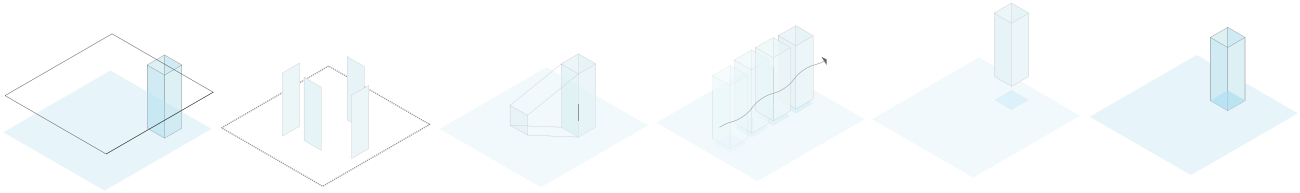


Transformative

Figure 5.39: (Author, 2014)

Your Rainbow Panorama

Designer: Olafur Eliasson
Location: ARoS Aarhus Kunstmuseum. Aarhus, Denmark
Completion Date: 2011
Size: 150 meters long, 3.5 meters wide
Material: Colored glass



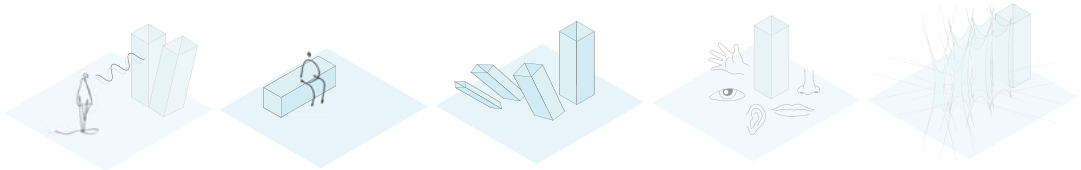
Contained

Stationary

Description

Your Rainbow Panorma, a circular walkway above the roof of ARoS, offers a ccolorful perspective onto the city of Aarhus. Eliasson notes “I have created a space that can almost be said to erase the boundary between inside and outside - a place where you become a little uncertain as to whether you have stepped into a work of art or into part of the musuem” (Eliasson 2013).

Figure 5.40: (Author, 2014)



Functional Transformative

Figure 6.1: Midtown Collage by Author
(Adapted from images by: Headley 2014)

Midtown Denver, Colorado

Located on a former brownfield site, Midtown is an urban infill community five miles north of downtown Denver, Colorado. Brookfield Residential, a North American land developer, and Norris Design, a planning and landscape architecture firm, are working together to restore the land and create a new urban neighborhood.

Midtown aims to create a green friendly environment by proposing a number of green spaces, a network of bike lanes, and pedestrian paths that encourage walking. Nearly forty-five percent of Midtown is dedicated to parks and open space. A forty-three acre regional park is found at the terminating west axis, while an urban farm and community garden is adjacent to the main access point off Pecos Street. Additionally, Midtown supports biking and walking by proposing a number of connections to existing trails. Its location also lends itself to walking to commuter rail stations. Three commuter rail stations are located within a one mile radius of Midtown.

Midtown is conveniently located by providing easy access to major highways such as Boulder I-36, the mountains on I-70, and a number of other locations in Denver on I-25. Additionally, Midtown is a short fifteen minute drive from LoDo (Lower Denver).

Considered the heart of Midtown, the Community Center promotes interaction among the neighborhood to create a sense of community. Acting as a primary space, the center is equipped with community gardens, on-site urban farms, adult and kid play areas, green roof canopies, and creative gathering spaces.

My involvement with Midtown Denver results from enrolling in Dustin Headley's digital fabrication class, a design build course sponsored by Brookfield Residential and Norris Design of Denver Colorado. My task involved designing a 'gateway' outside a community gathering space. In addition, there was an emphasis on integrating site specificity and lighting into the gateway design.

Location

Figure 6.2: Midtown Context Map (Bing Maps 2015)

Midtown - Residential Development

I-25

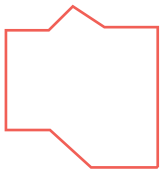
I-70

Lower Denver

N (Not to Scale)

Figure 6.3: Midtown Promenade Plan (Norris, 2015)

Midtown is centered around a community gathering park which funnels into a centralized green corridor. This green corridor is designed to connect parks and encourage interaction among neighbors. Bike trails are located at the southern edge of Midtown, providing access to the forty-three acre regional park.



Larger Focus Area

Figure 6.4: Focus Area: Location of Gateway (Norris, 2015)

Acting as a gateway into Midtown, this space is located near an open lawn, water park, and playground. A number of pedestrian circulation paths intersect at this space. The primary function of the gateway is to act as a point of entry and visual landmark. A sculptural approach was encouraged by John Norris, the founding principal of Norris Design.

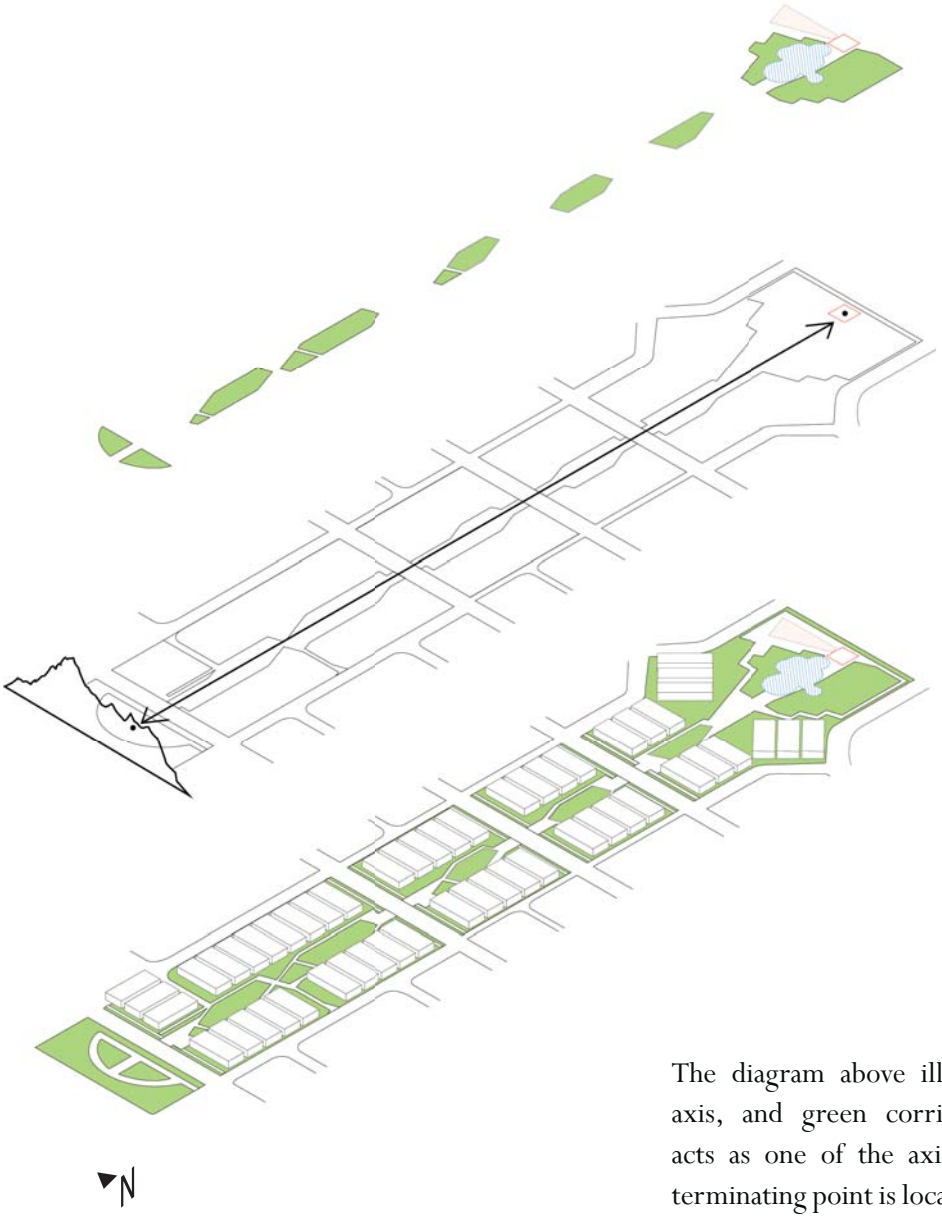
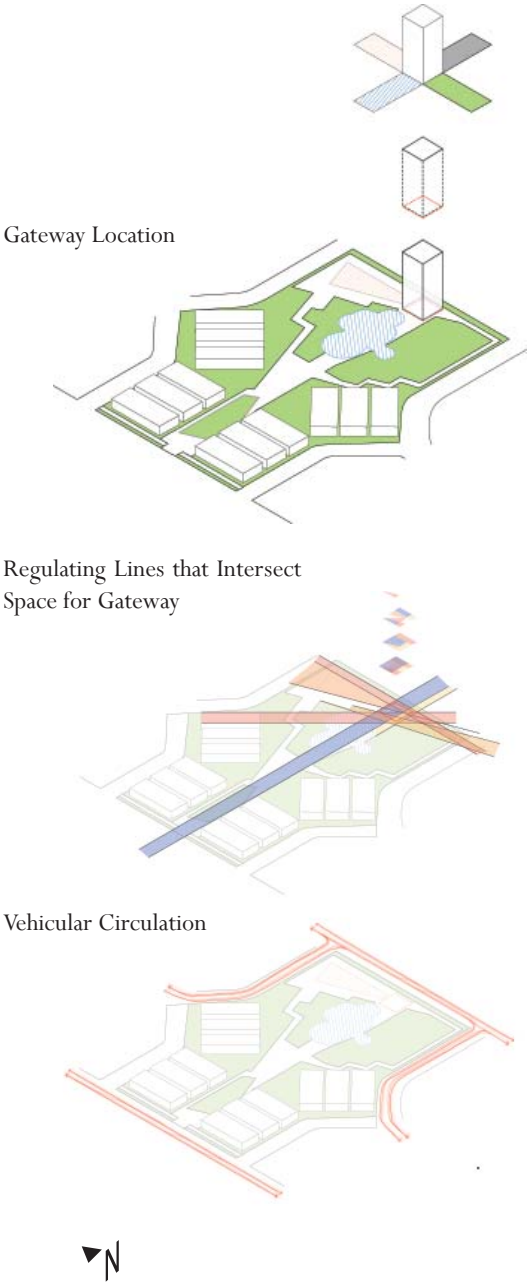
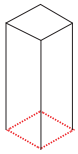


Figure 6.5: Midtown Axon Corridor Diagram (Author, 2015)

The diagram above illustrates the existing site, axis, and green corridor. The gateway design acts as one of the axis terminations. The other terminating point is located west of the site looking at the mountains. Additionally, the green corridor illustrates three distinct spaces: the water park, playground, and designated gateway space.





Space for Gateway

Street
Open Lawn
Playground
Water Park
Vehicular Circulation

The location of the gateway is surrounded by various spaces: Street, Open Lawn, Playground, and Water Park.

Multiple contextual factors overlap within the location of the gateway: regulating lines, pedestrian circulation, and views. These factors are superimposed on one another to further understand existing site conditions in relation to the location of the gateway (Figure 6.6).

Figure 6.6: Midtown Stack Diagram (Author, 2015)

Design Matrix: Midtown Denver, Colorado

Establishing a design matrix for Midtown Denver, Colorado became an essential method for designing site informed light art. Each parameter of the design matrix responds to a primary 'heading' or element of organization. These six primary headings or elements of organization include: Program, Site Conditions, Light Types, Levels of Light, Levels of Transparency, and Orientation. Within these six primary headings or elements exist additional sub-parameters (Refer to Figure 6.7).

This allows for a site informed process of decision-making. Moreover, the design matrix illustrates which elements need to be addressed and provide different options and opportunities for design development.

In particular, the program for Midtown Denver, Colorado involved the design of a gateway which could take on three different forms: Traditional, Abstracted, and Suggested.

Design Matrix: Midtown Denver, Colorado

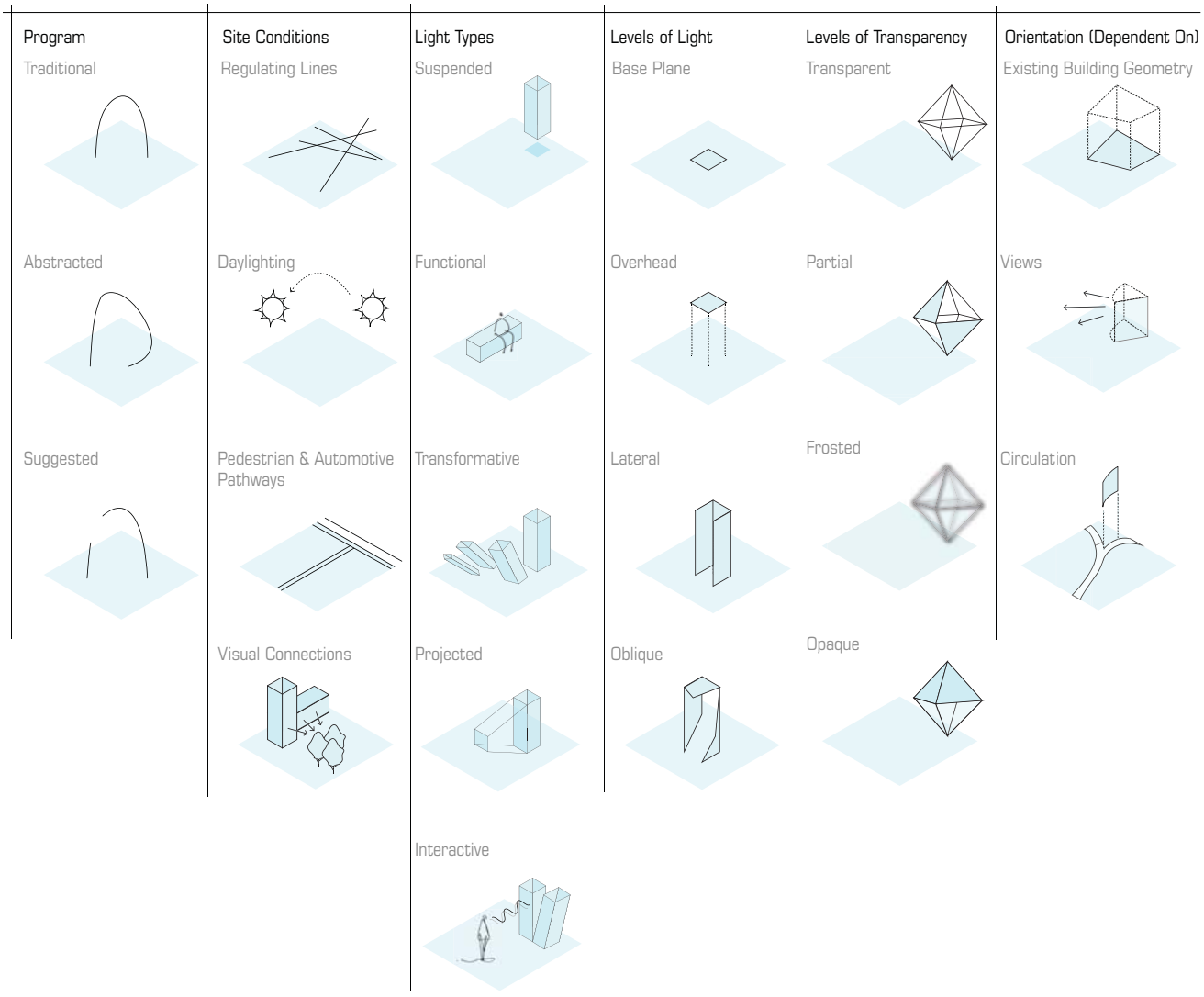
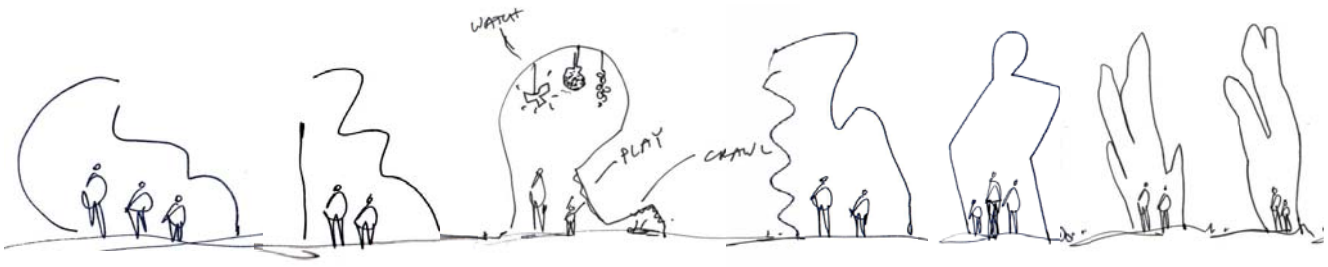
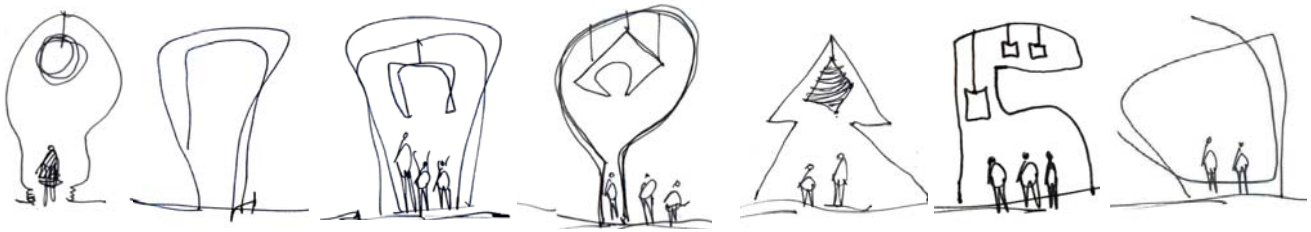
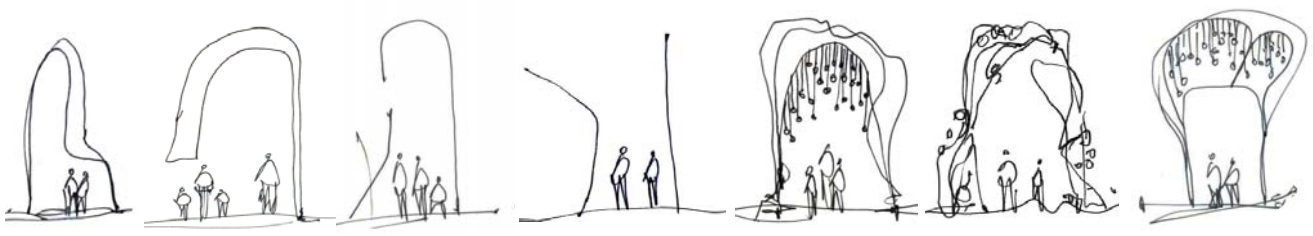


Figure 6.7: Design Matrix
(Author, 2015)


WATCH
PLAY
CRAWL

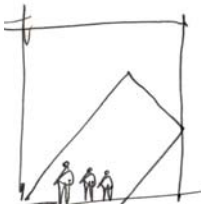




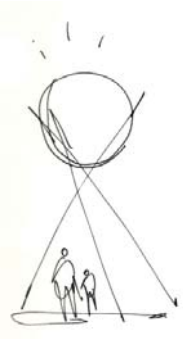
The Gateway: Exploratory Sketch

Figure 6.8: Exploratory Sketches of Gateway (Author, 2015)

Slant



Splinter



Stilt

The sketches above depict three gateway concepts. These three designs were developed further and will be showcased in the following spreads.

Slant

Slant acts as an abstracted gateway into Midtown. Its orientation is dependent on circulation and views. Oriented along the primary axis, Slant's volume and orientation frames the water park and Rocky Mountains. Additionally, Slant's materiality is comprised of exterior steel and interior wood which encourages exploration and tactility. Though a number of lighting possibilities could be integrated into Slant, lighting took on secondary importance. The primary importance of Slant was to create an enticing gateway for users to explore and circulate through.

After presenting Slant to John Norris, he suggested pursuing another design proposal. Due to considerations such as fabrication, size, and cost, Slant did not move to design implementation.

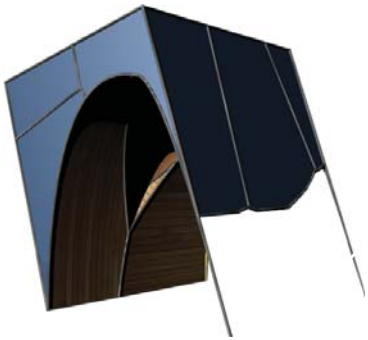


Figure 6.9: Perspective
(Author, 2015)

Figure 6.10: Worm Perspective
(Author, 2015)

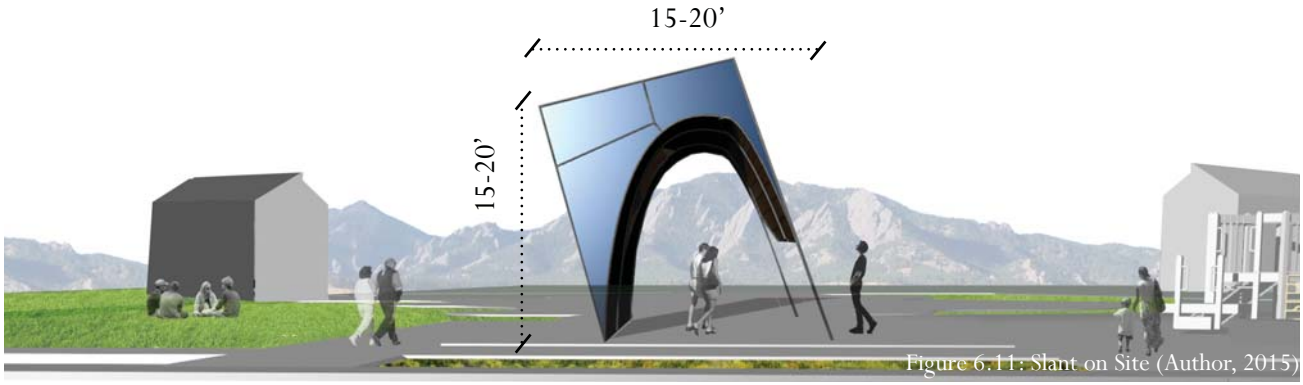
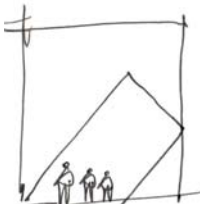


Figure 6.11: Slant on Site (Author, 2015)



Splinter

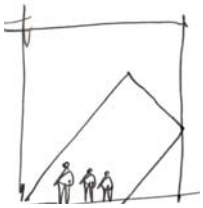
Splinter acts as an abstracted gateway into Midtown. Its orientation is dependent on circulation and views. Framing the Rocky Mountains in a unique way, Splinter mimics the form of mountains with its negative space. Additionally, Splinter's materiality is comprised of exterior steel and interior wood which encourages exploration and tactility. Splinter offers a number of lighting possibilities through its oblique planes, though the rendering displays up lighting as an option. The primary importance of Splinter was to create an enticing gateway for users to explore and circulate through.

John Norris enjoyed Splinter as a concept, but suggested pursuing another design proposal. Due to considerations such as fabrication, size, and cost, Splinter did not move to design implementation.

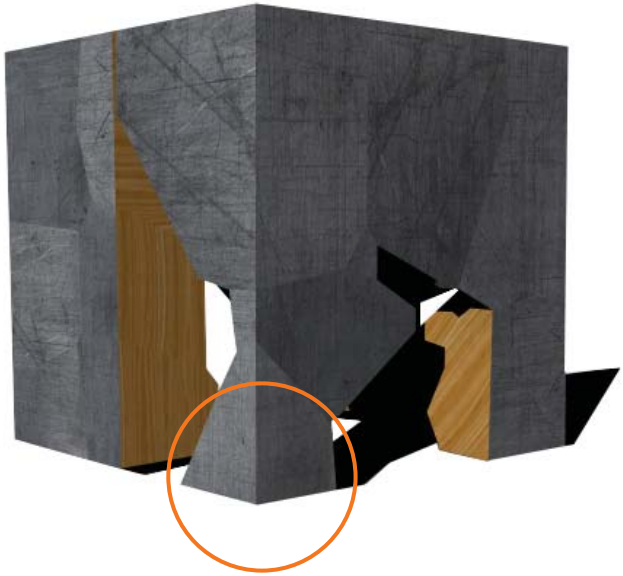
Figure 6.12: Worm Perspective of Splinter (Author, 2015)

Worm Perspective: Looking up and underneath Splinter. Note: These oblique planes offer a number of lighting and material possibilities.

Figure 6.13: Splinter on Site (Author, 2015)



Splinter Continued



Note: Weathered Steel texture not representative of proposal, see adjacent powder coated colors.

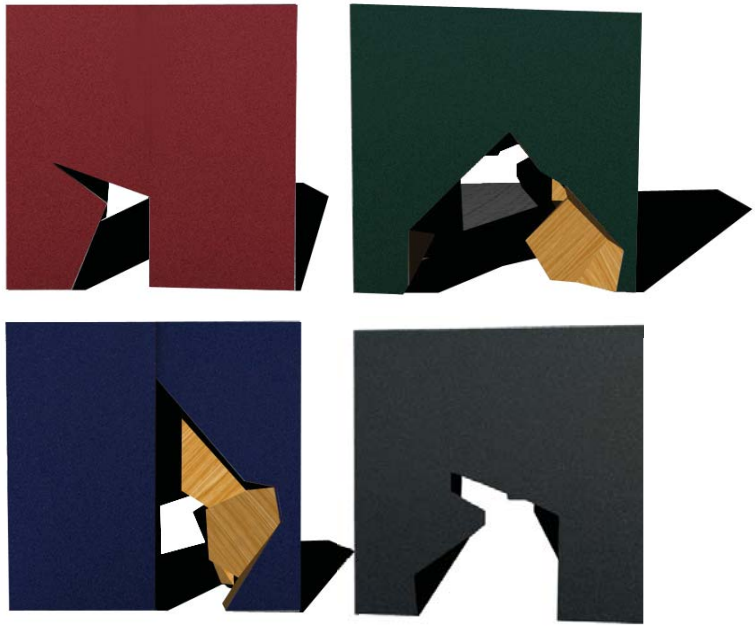


Figure 6.14: Splinter Elevations (Author, 2015)

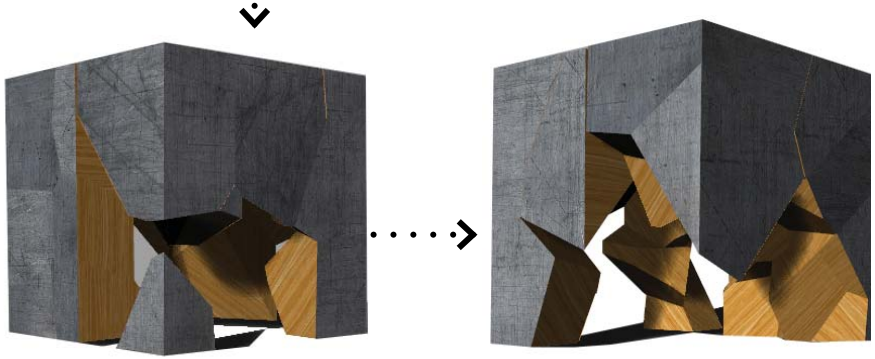


Figure 6.15: Steel Splinter (Author, 2015)

The three adjacent perspectives illustrate the opportunity for fragmentation and the possibility of removing a "leg" of Splinter. Though this element would call for a larger structure in order to support itself.

Stilt

Stilt acts as an abstracted gateway into Midtown. Its orientation is dependent on circulation and views. Stilt addresses intersecting circulation through three vertical columns which allow access from the playground, lawn, and water park. Unlike Slant and Splinter, Stilt has less volume which minimizes the opportunity to frame space. However, the primary focus of Stilt is to create a sculptural gateway with enticing lighting. During the night, the sphere of Stilt would illuminate and give the illusion that the sphere is floating.

John Norris enjoyed Stilt the most out of all of the design proposals due to its sculptural approach and feasibility. As a result, Stilt continued into design development.

Figure 6.17 illustrates a number of sphere variations that were modeled in Rhino. However, most of these sphere were too intricate to assemble. Additionally, the weight of the sphere in Figure 6.16 became an issue and prompted further investigation into an alternative sphere.

Figure 6.16: Daytime Perspective of Stilt (Author, 2015)

Tectonic Variations of Sphere

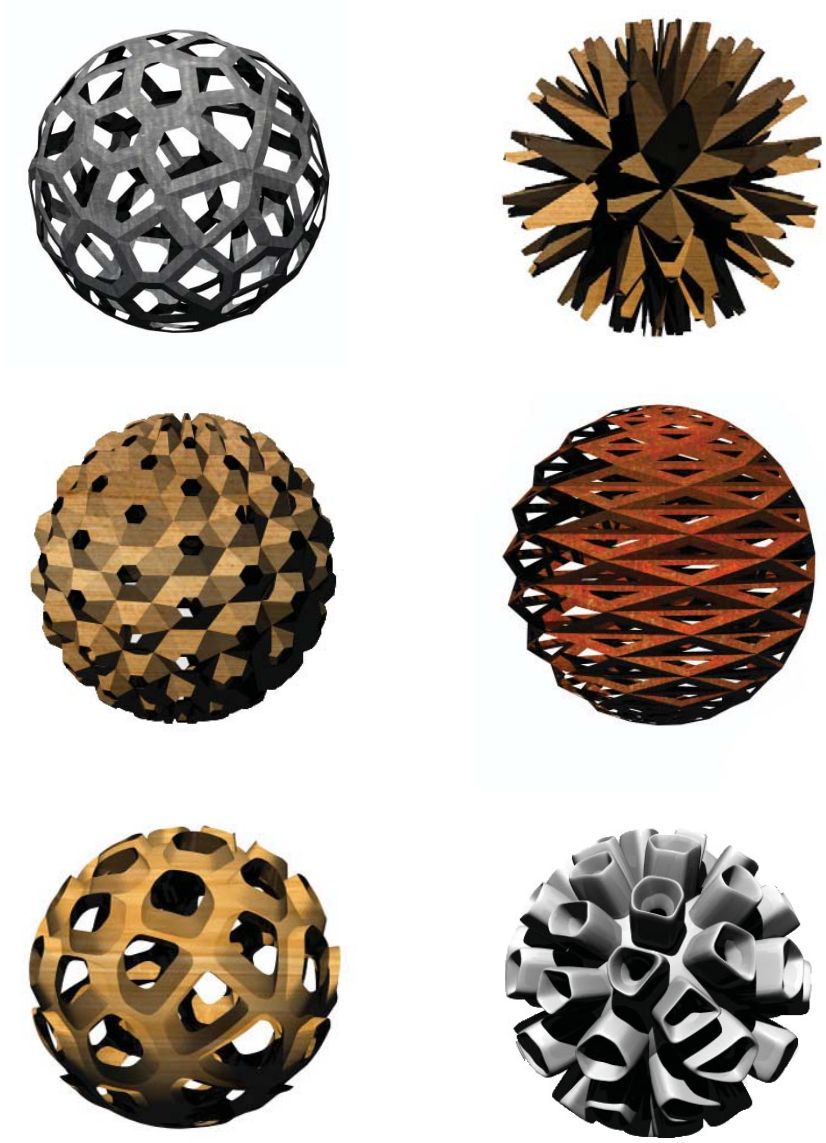


Figure 6.17:
Sphere Variations
(Author, 2015)

Stilt

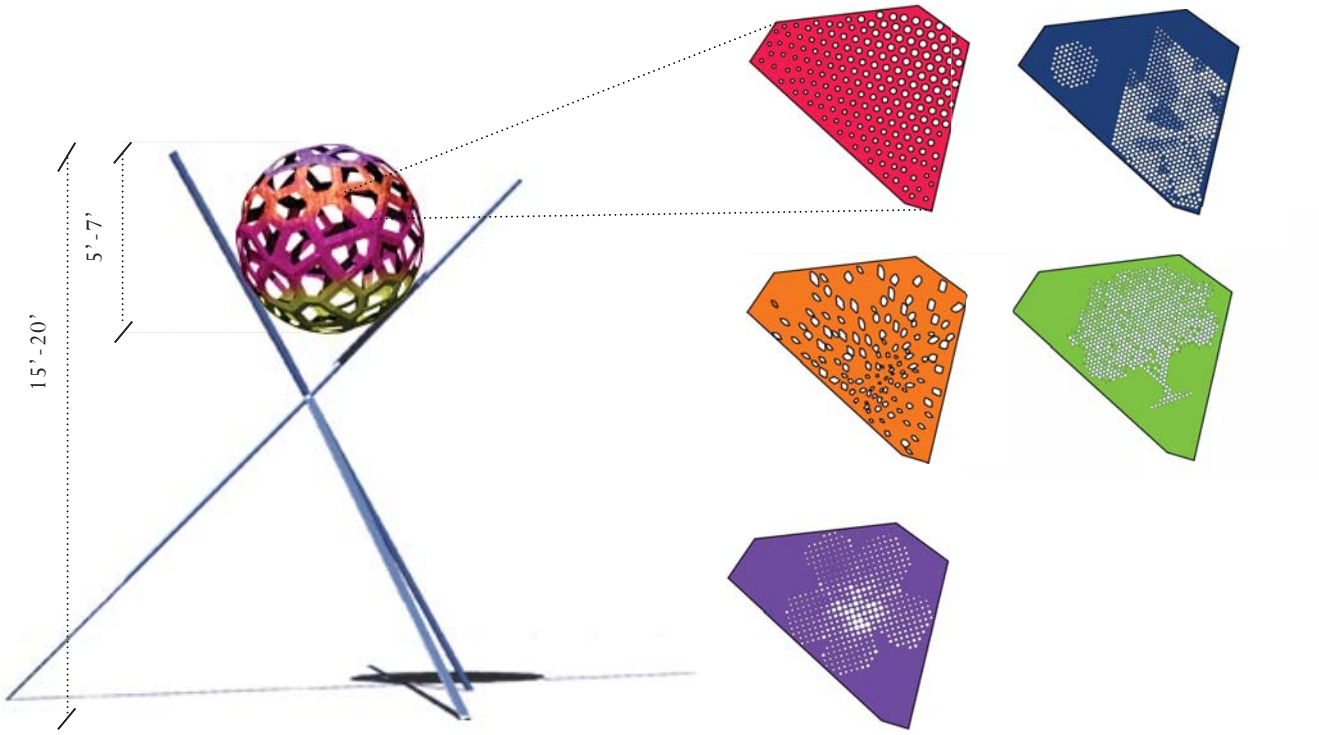


Figure 6.20:Perforation Diagram (Author, 2015)

Figure 6.20 illustrates the initial concept for the sphere of Stilt with accompanied dimensions. The sphere would be plasma cut steel and welded together. However, after presenting Stilt, John Norris suggested simplifying the sphere in order to reduce weight.

Simplifying & Abstracting the Sphere

Figure 6.18: Interlocking Sphere Models
(Author, 2015)

Figure 6.18 illustrates the simplification of the sphere for Stilt. The models illustrate an interlocking system of planes, beginning with a simple sphere that gradually becomes abstracted. Integrating the use of acrylic in this system would significantly reduce weight as well. Despite this weight reduction, the implementation of Stilt would call for a structural engineer, which ended further design development and implementation.

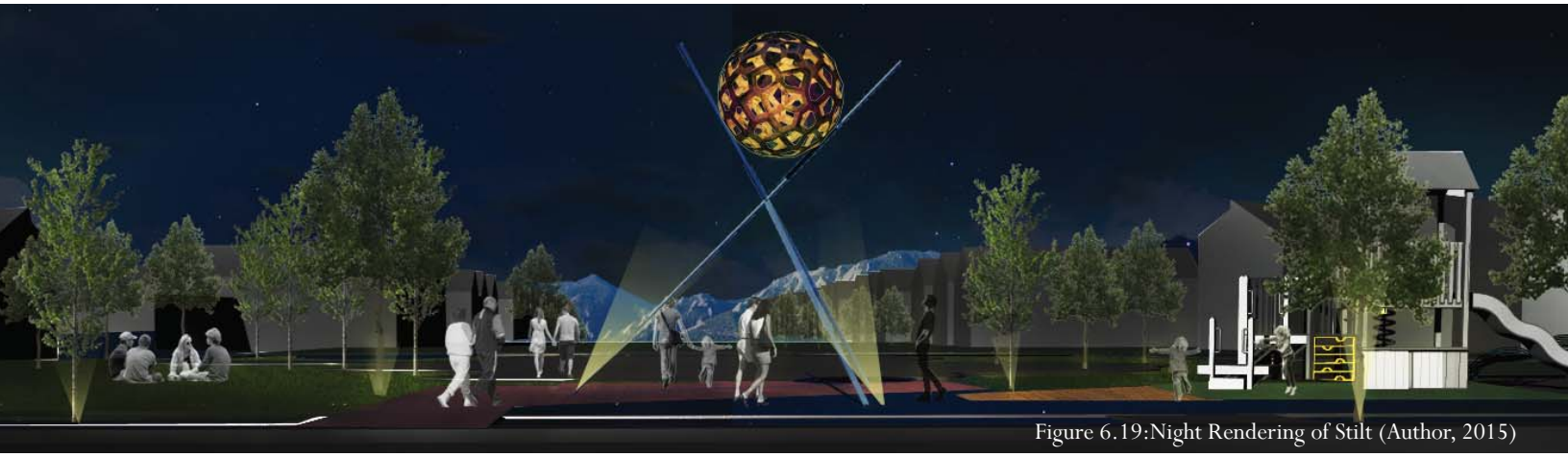


Figure 6.19:Night Rendering of Stilt (Author, 2015)

Stilt Navigating the Design Matrix

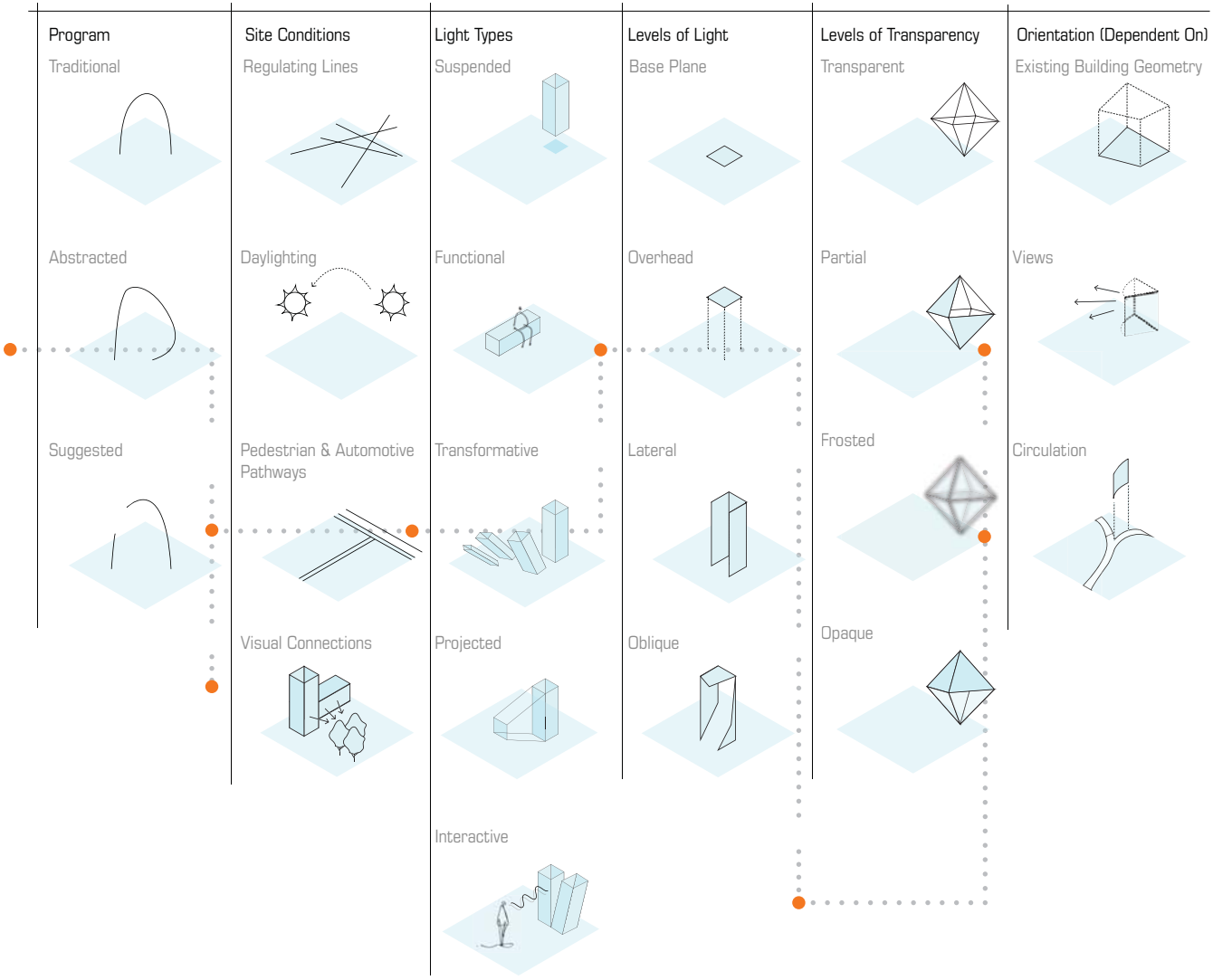


Figure 6.21: Stilt Navigating the Design Matrix
(Author, 2015)

Stilt Navigating the Fabrication Matrix

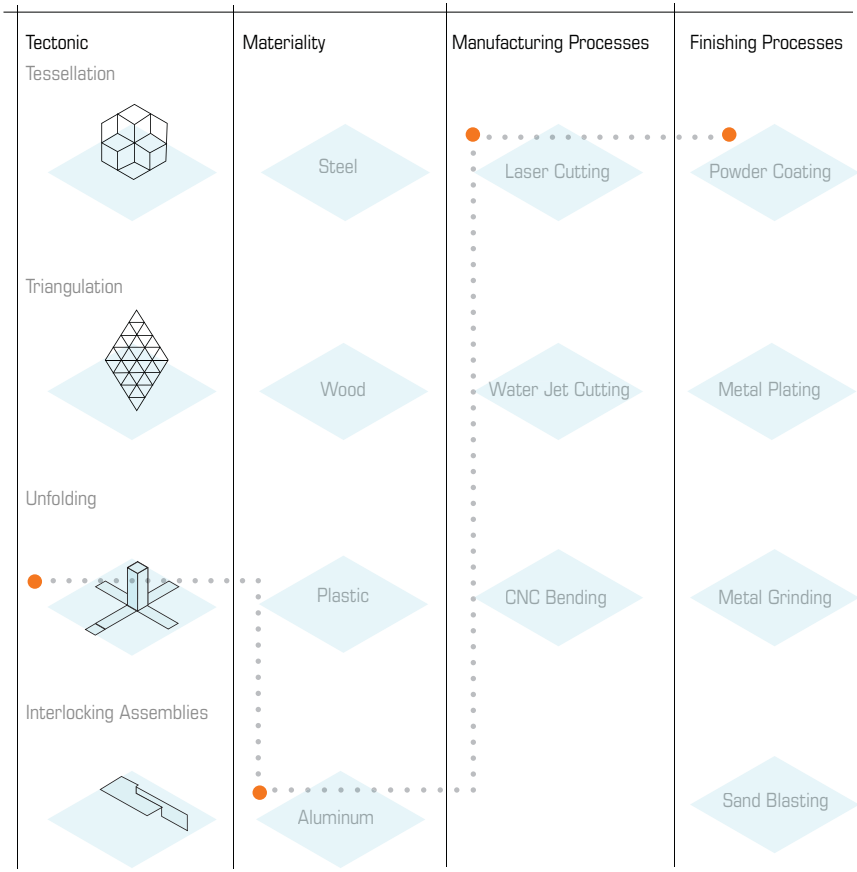


Figure 6.22:Stilt Navigating the Fabrication Matrix
(Author, 2015)

Figure 7.1: Pop-Up Park Night Rendering Developed from WDDC's Most Current Site Plan Proposal by Terri Farha RLA. (Author, 2015)

WDDC Pop-Up Park

WDDC Pop-Up Park

WDDC Pop-Up Park is located on the south side of Douglas Avenue between Main and Market Street in Wichita, Kansas. Commonly referred to as the "Hole" or "Pit," the empty lot came into existence in 2007 when redevelopment plans by a previous owner fell through. This site was once an urban street wall edge, but now is an eyesore on one of Wichita's most popular streets. However, the Wichita Downtown Development Corporation (WDDC), plans to transform this space into an urban Pop-Up Park.

Wichita Pop-Up Park is a component of Project Downtown: The Master Plan for Wichita. The WDDC has determined key areas of downtown Wichita that have significant potential to grow as a community. The plan aims to create a more strategic revitalization for downtown. In order to do so, Good Clancy and a team of planners have derived five principles to initiate the downtown vision: 1. Offer something for everyone. 2. Leverage Downtown's inherent strengths to generate economic value. 3. Expand choices for people – and the region. 4. Support Development that fosters walkable connections. 5. Promote Downtown's role in advancing regional sustainability. (Clancy 4.1) Goody Clancy is an architecture, planning, and preservation firm serving educational, governmental, and private sector clients nationwide.

Recently the WDDC received a grant from the Knight Foundation that would allow for the cost of constructing an urban pop-up park in "Hole" on Douglas Avenue. Currently, the empty lot is owned by a local development team: Bokeh Development. Bokeh Development owns both buildings adjacent to the site: the Caldwell Murdock Building to the west and the Woolf Brothers Building to the east.

Our creative placemaking team attended a charrette with local design professionals, developers, business owners, and residents in order to help develop a proposal for the pop-up park. After working on plans for the pop-up park, my focus shifted into designing overhead lighting for the site.

Figure 7.2: Pop-Up Park Location (Google Earth, 2015)

As mentioned earlier, the Pop-Up Park is located along a major street in downtown Wichita. Unlike Midtown Denver, this site is located in a dense urban environment with plans of temporary intervention. A 3-5 year plan has been envisioned by the WDDC.

Figure 7.3: Pop-Up Park Concept I (WDDC, 2014)

The initial concept for the WDDC Pop-Up Park includes tables with shade, food truck vendors, raised planters, moveable tables and chairs, an outdoor activities area, and overhead string lights.

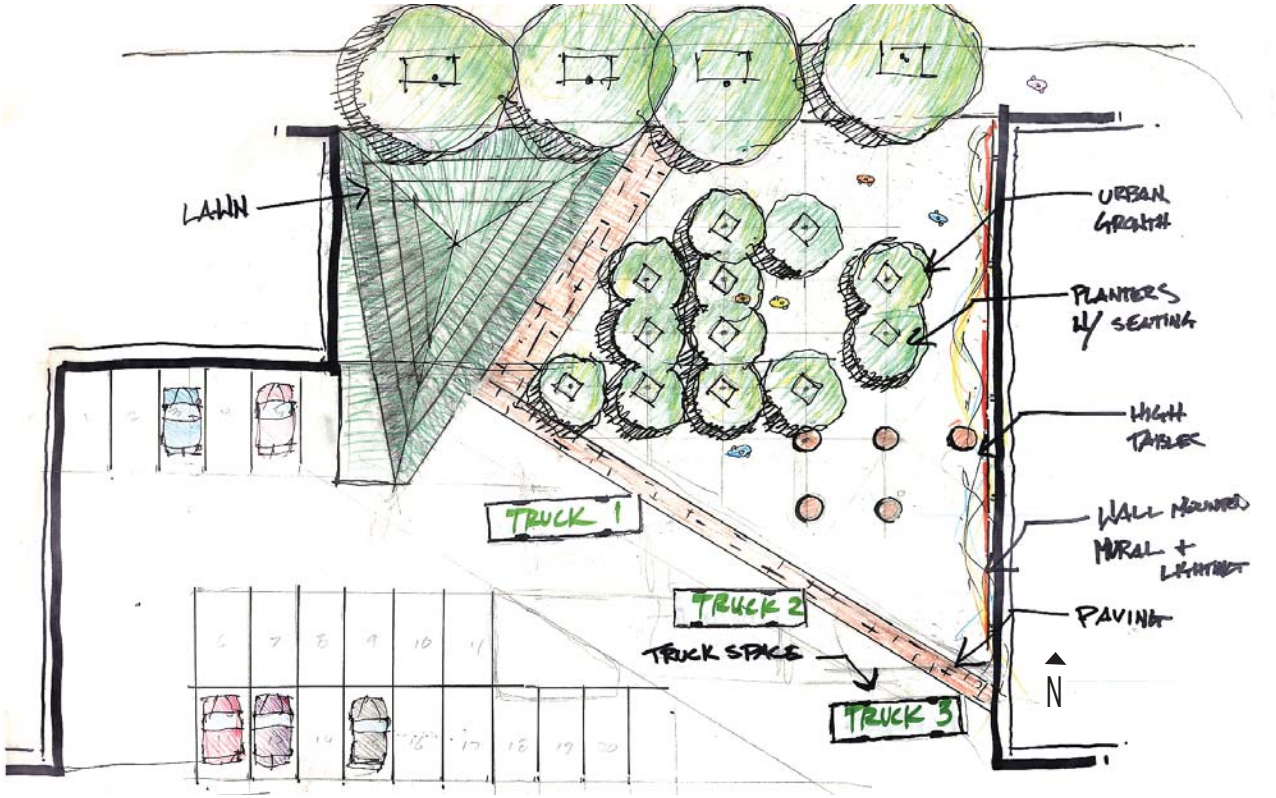


Figure 7.4: Charrette Concept (Author, 2015)

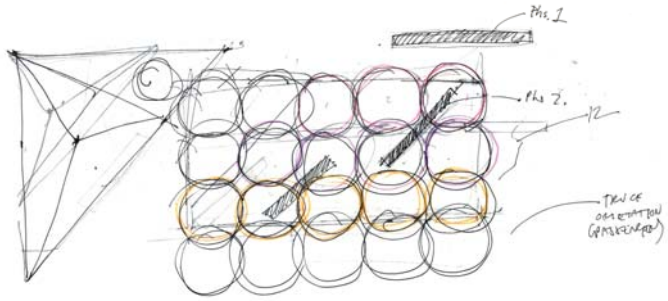


Figure 7.5: Urban Grove Sketch (Author, 2015)

Figure 7.4 illustrates the Pop-Up Park concept drawn during the WDDC charrette. The existing lines of street trees and organization of food trucks established the overall geometry, while a formal grid of raised planters maintained views into the site. Figure 7.5 depicts a dense grove of trees without the 'pockets' of open space seen in Figure 7.4.

After the charrette concluded, Abby Glastetter and I were tasked with continuing the Pop-Up Park plans. Abby Glasstetter is also part of the Creative Placemaking group with a focus on placemaking for socially resilient site design. Our strategy involved planning the Pop-Up park in phases.

As illustrated in Figure 7.6, the first phase includes a triangulated berm accompanied by a few raised planters. Most noteworthy are the bands of gray pavers. These bands were extensions from existing columns found on the Woolf Bros. building to the East. Moreover, each band acts as a marker for locating food trucks.

The second and third phases gradually engage more of the site by populating additional space with raised planters, seating, and programming activities such as ping pong and washers. Food trucks also gradually move south toward the parking lot.

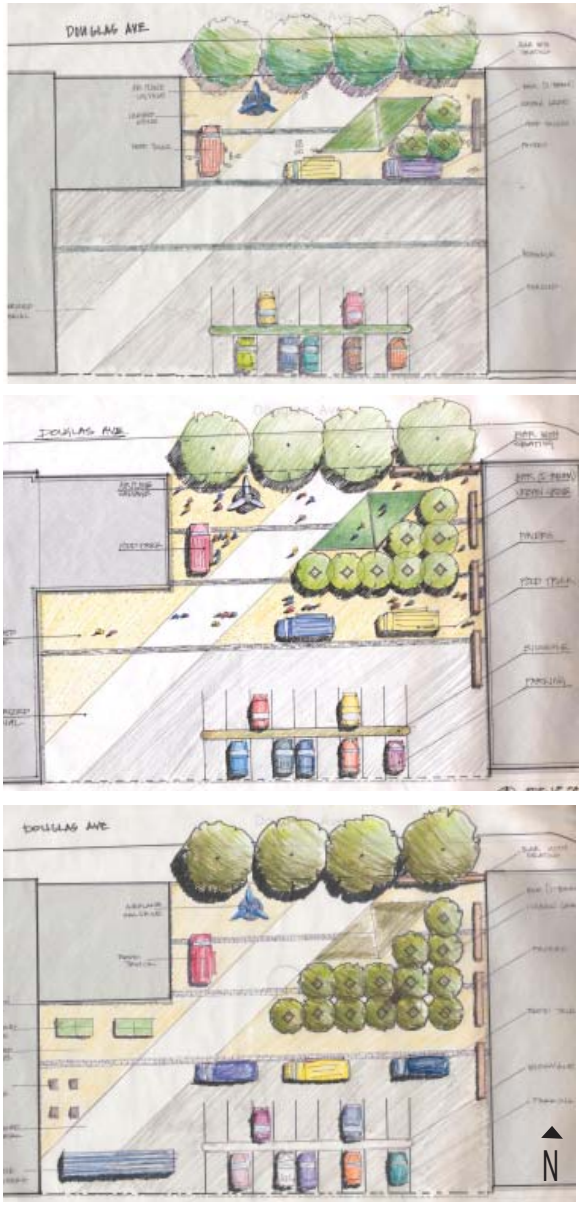


Figure 7.6: Phasing Plan Drawings
(Author; Abby Glasstetter, 2015)

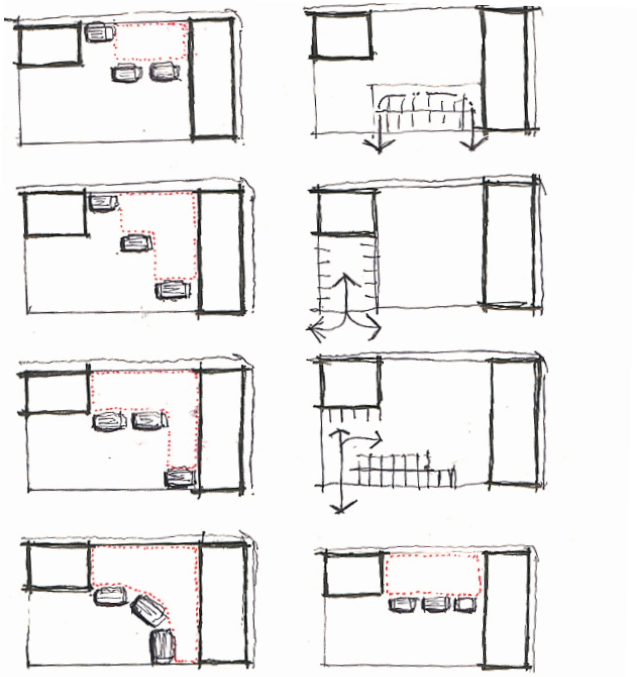


Figure 7.7: Phasing Diagram Sketch
(Author, 2015)

The placement and organization of food trucks led the space making and phasing strategy. Figure 7.7 illustrates a number of food truck orientations and parking lot configurations. The location of the parking lot determined major spatial relationships. For instance, the vertical parking lot orientation creates an evenly dispersed primary space. However, this option also limits opportunity for activating the west side of the site.

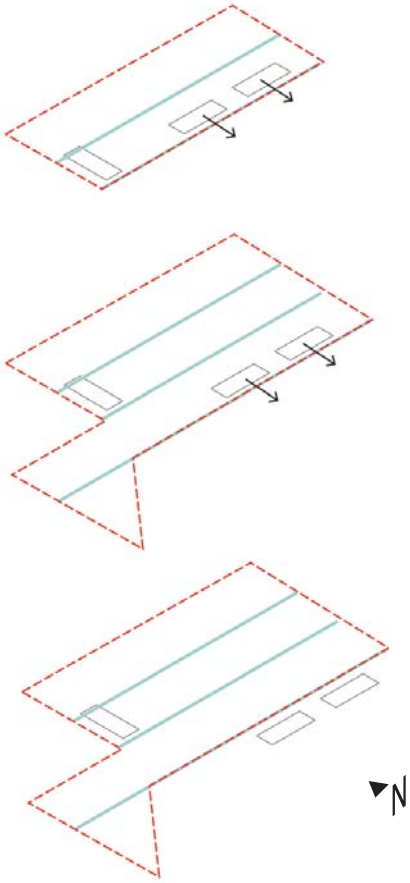
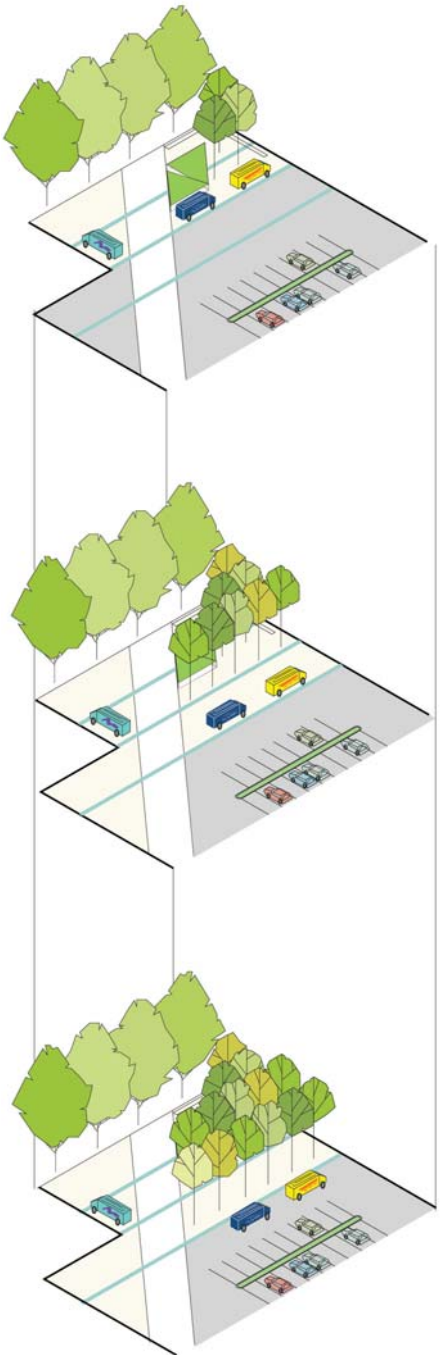


Figure 7.8: Food Truck Phasing Diagram
(Author, 2015)



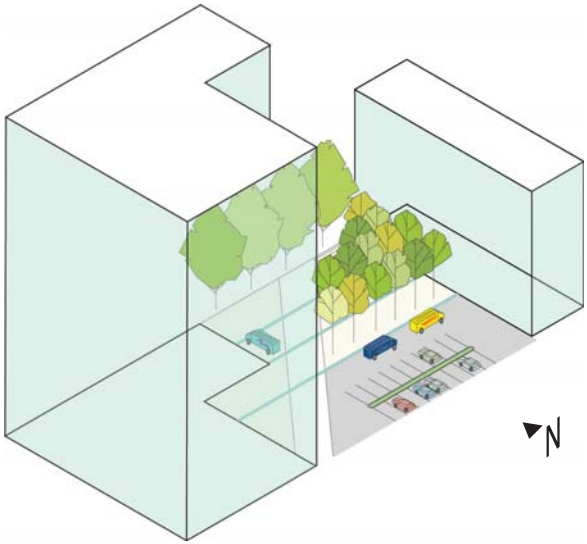


Figure 7.9: Site Phasing Diagram
(Author, 2015)

Figure 7.9 illustrates the final phasing plan that Abby Glastetter and I produced for the WDDC Pop-Up Park. However, to reduce installation cost and allow more of a project budget to be set aside for even programming, registered landscape architect, Teri Farha, simplified the site plan. (Figure 7.11)

Design Matrix: WDDC Pop-Up Park

Establishing a design matrix for WDDC Pop-Up Park became an essential method for designing site informed light art. Each parameter of the design matrix responds to a primary 'heading' or element of organization. These six primary headings or elements of organization include: Program, Site Conditions, Light Types, Levels of Light, Levels of Transparency, and Orientation. Within these six primary headings or elements exist additional sub-parameters. (Refer to Figure)

This allows for a site informed process of decision-making. Moreover, the design matrix illustrates which elements need to be addressed and provide different options and opportunities for design development.

In particular, the program for WDDC Pop-Up Park involved the design of overhead lighting.

Design Matrix: WDDC Pop-Up Park

Program	Site Conditions	Light Types	Levels of Light	Levels of Transparency	Orientation (Dependent On)
Overhead Lighting	Regulating Lines	Suspended	Base Plane	Transparent	Existing Building Geometry
	Daylighting	Functional	Overhead	Partial	Views
	Pedestrian & Automotive Pathways	Transformative	Lateral	Frosted	Circulation
	Visual Connections	Projected	Oblique	Opaque	
		Interactive			

Figure 7.10:Design Matrix: WDDC Pop-Up Park
(Author, 2015)

Overhead Lighting

Figure 7.11: Rendering of Site with String Lighting Developed from WDDC's Most Current Site Plan Proposal by Terri Farha RLA. (Author, 2015)

Jason Gregory, the executive vice president of the WDDC, expressed an interest in string lighting as well as a suspended lighting installation. Figure 7.10 showcases the first phase of the WDDC Pop-Up Park during the evening. After phasing of the Pop-Up Park, my focus shifted into the design of an overhead lighting installation.

Topo

Topo acts as overhead lighting suspended across the WDDC Pop-Up Park. Referencing the existing topography of the Arkansas River, Topo is comprised of 8 concentric frames which are evenly spaced. Each of these frames would be laser cut acrylic and illuminate in the evening. The scale of Topo was a primary consideration for the site. In order to balance the site scale, Topo would have to be 10-15 feet in length. As a result, Topo moved into design development, but due to problematic connection details and weathering considerations, this design idea was abandoned.

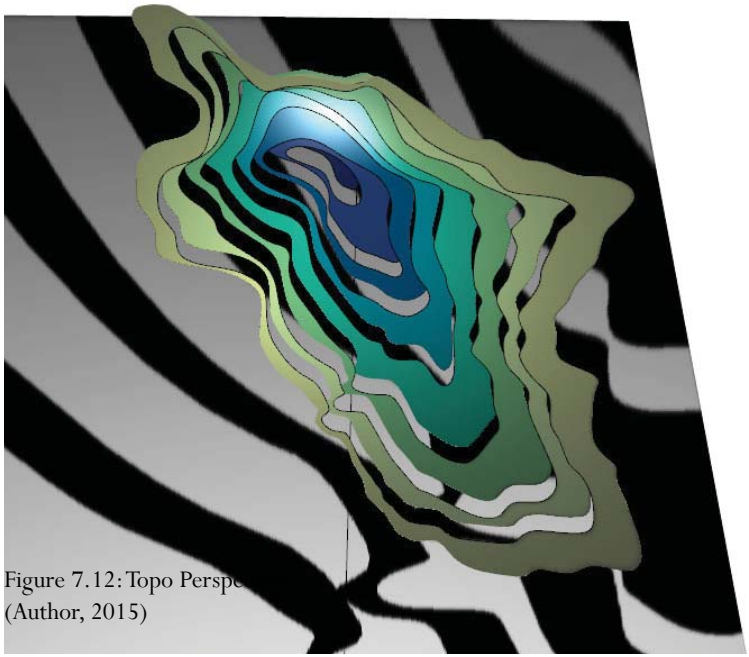


Figure 7.12: Topo Perspe
(Author, 2015)

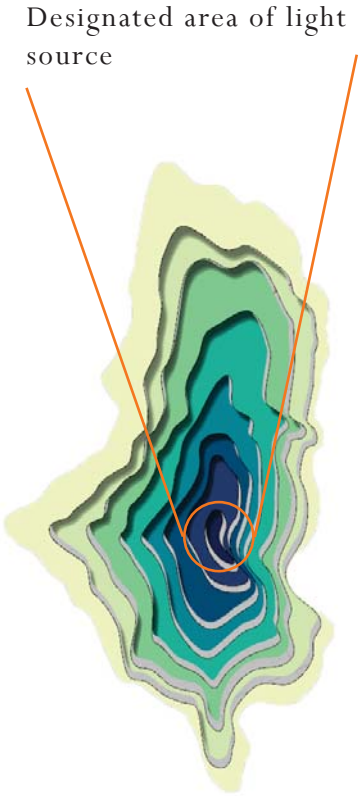


Figure 7.13: Area of Light
(Author, 2015)

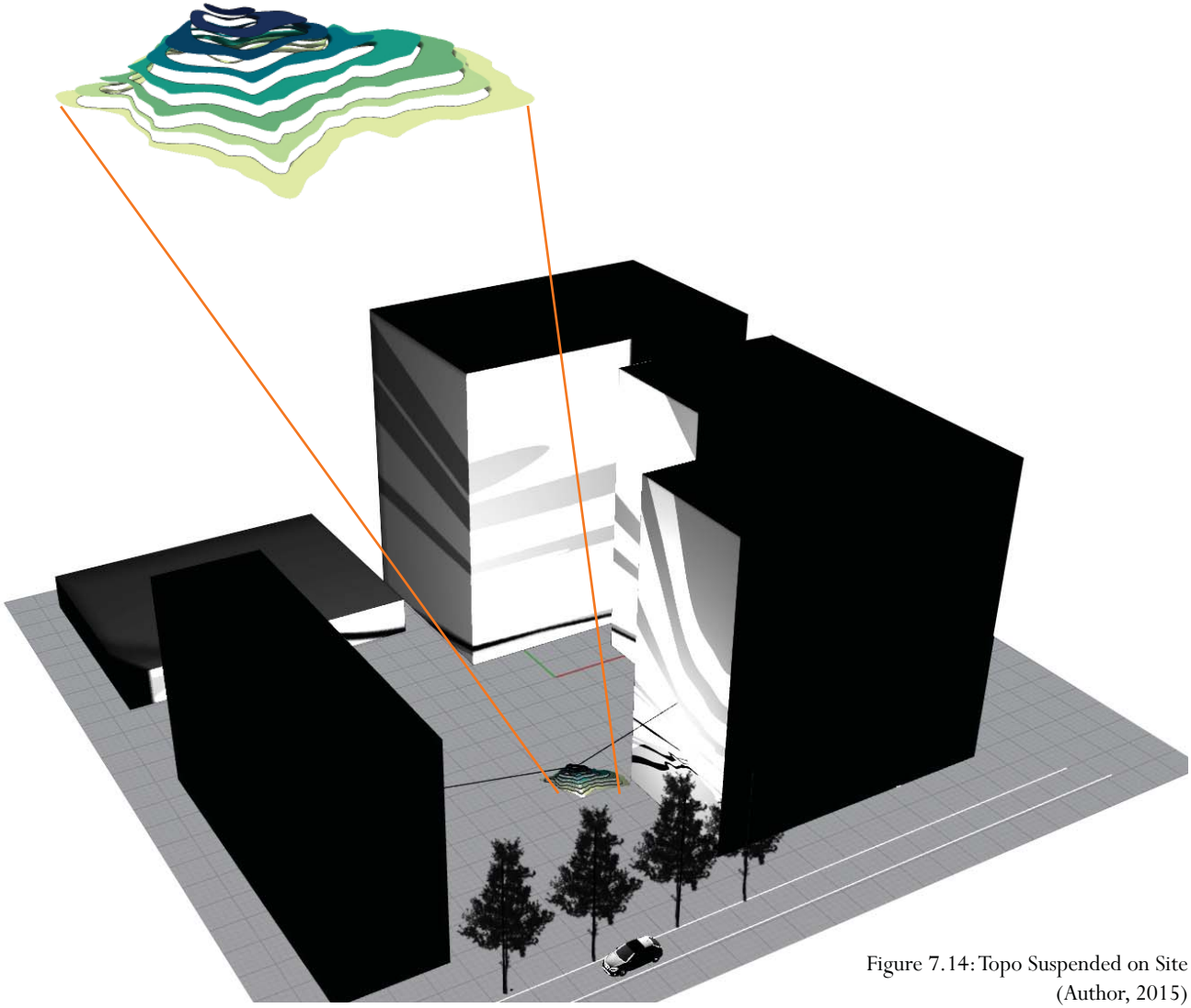


Figure 7.14: Topo Suspended on Site
(Author, 2015)

Gem

Gem acts as a series of suspended overhead lighting across the WDDC Pop-Up Park. Similar to Topo, Gem is comprised of concentric frames that mimic the form of gems. These series of sculptures would be laser cut acrylic and balance the scale of the site through its numbers. As a result, Gem had a similar construction method to Topo and presented problematic connection details. This design was also abandoned.

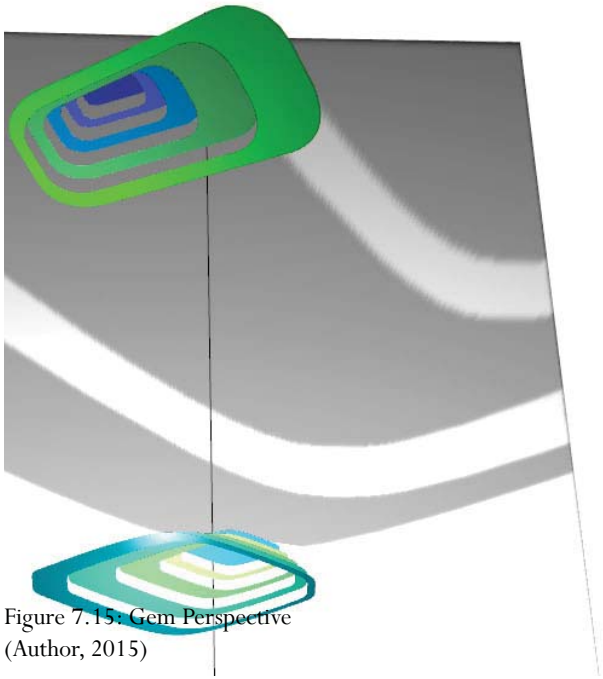


Figure 7.15: Gem Perspective
(Author, 2015)

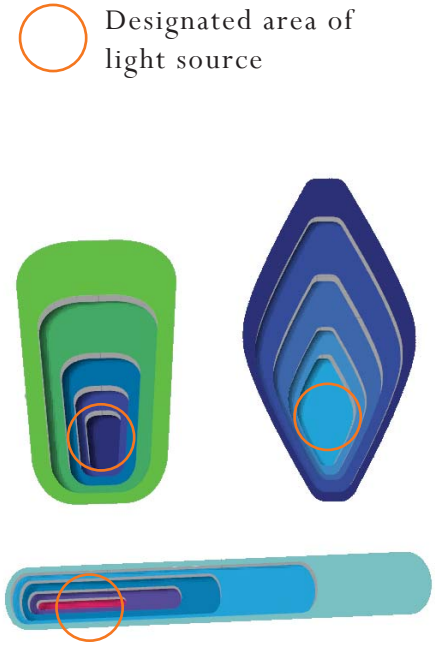


Figure 7.16: Gem Elevations
(Author, 2015)

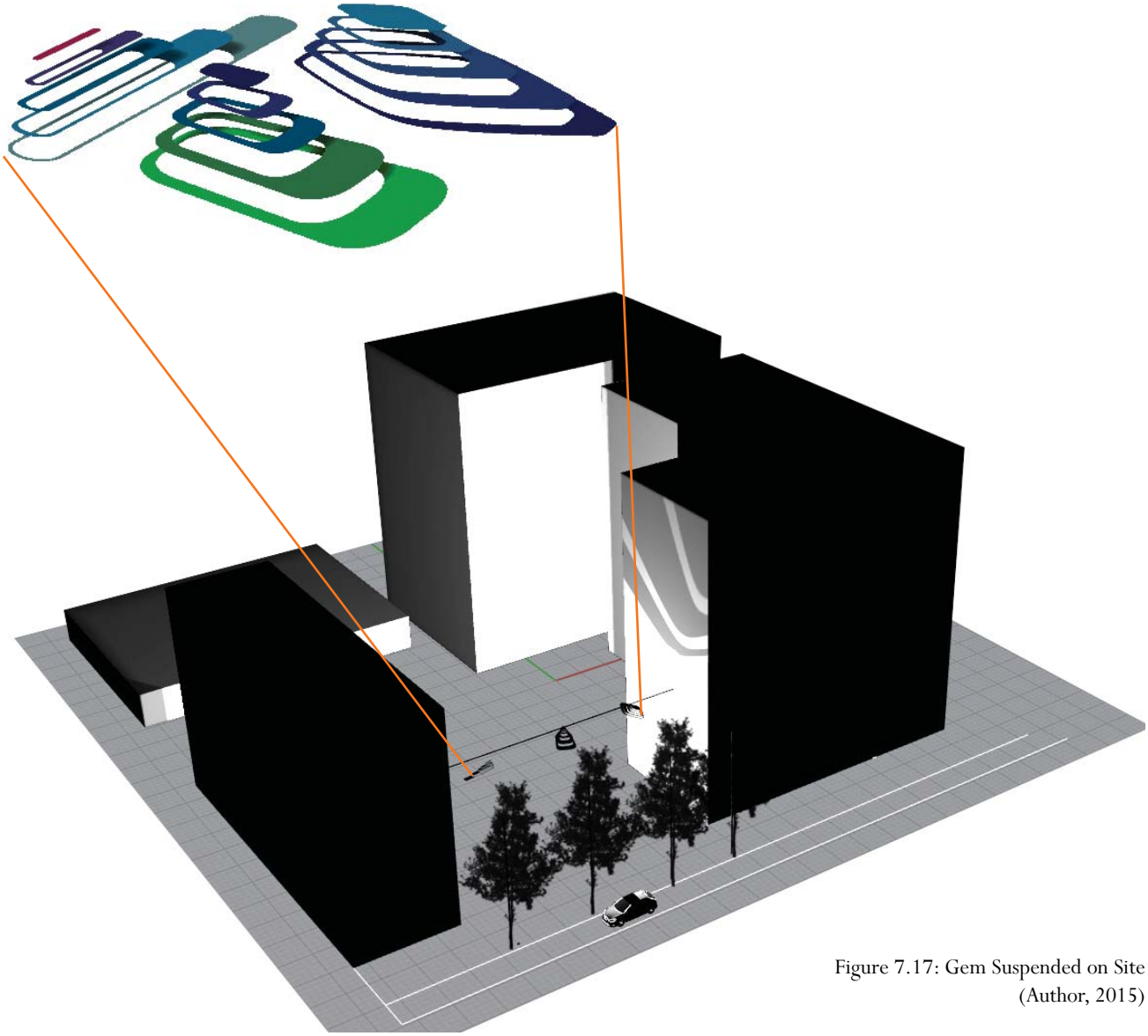


Figure 7.17: Gem Suspended on Site
(Author, 2015)

Spheres

Spheres acts as a series of suspended overhead lighting across the WDDC Pop-Up Park. Each sphere would be made of steel, but take on a number of different scales. In addition, each sphere would be comprised of different facets to introduce a variety of lighting and shadow options. Similar to Gem, these series of spheres would balance the scale of the site through its repetition. However, in order to fabricate each sphere, an intensive amount of welding would have to occur. As a result, this design was cost prohibitive and was abandoned.

Figure 7.18: Zoomed Perspective: Spheres
(Author, 2015)

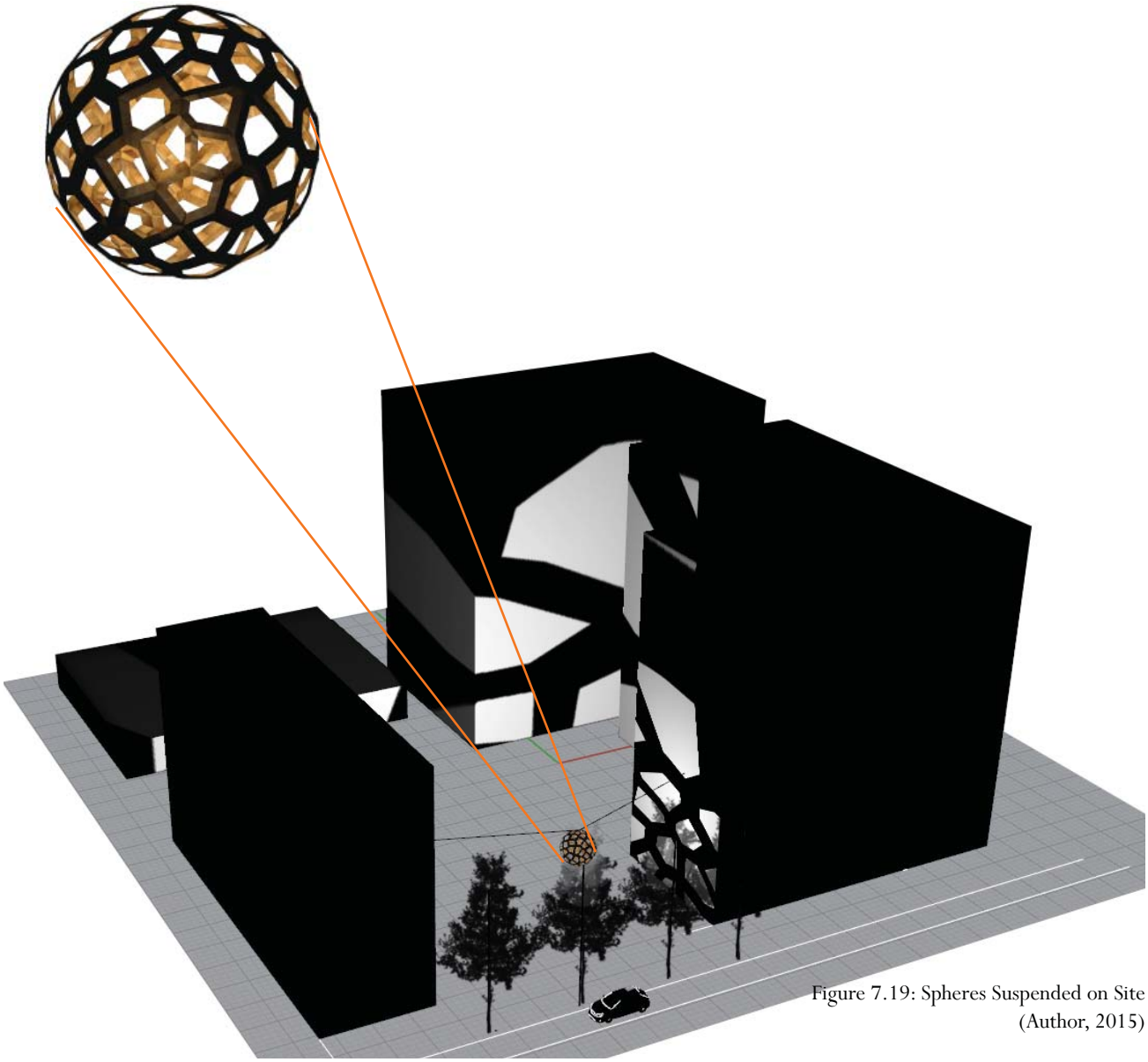


Figure 7.19: Spheres Suspended on Site
(Author, 2015)

‘Sunflower Spheres’

Figure 7.20: Sunflower Stringlight
(Author, 2015)

The sunflower concept was a continuation of the Spheres proposal, but aimed to become a highlight and focal point of string lighting spanning across the site. In addition, the state flower of Kansas is the sunflower, which lends meaning and specificity to the site. The 3D printed sunflower would act as a shell or lampshade within select areas of string lighting.

The multi-faceted extrusions allow for an attractive framing of light. The design contains 96 total extruded facets. However, due to the cost of 3D printing and available sizing options of each sphere, this design proposal was abandoned as well.

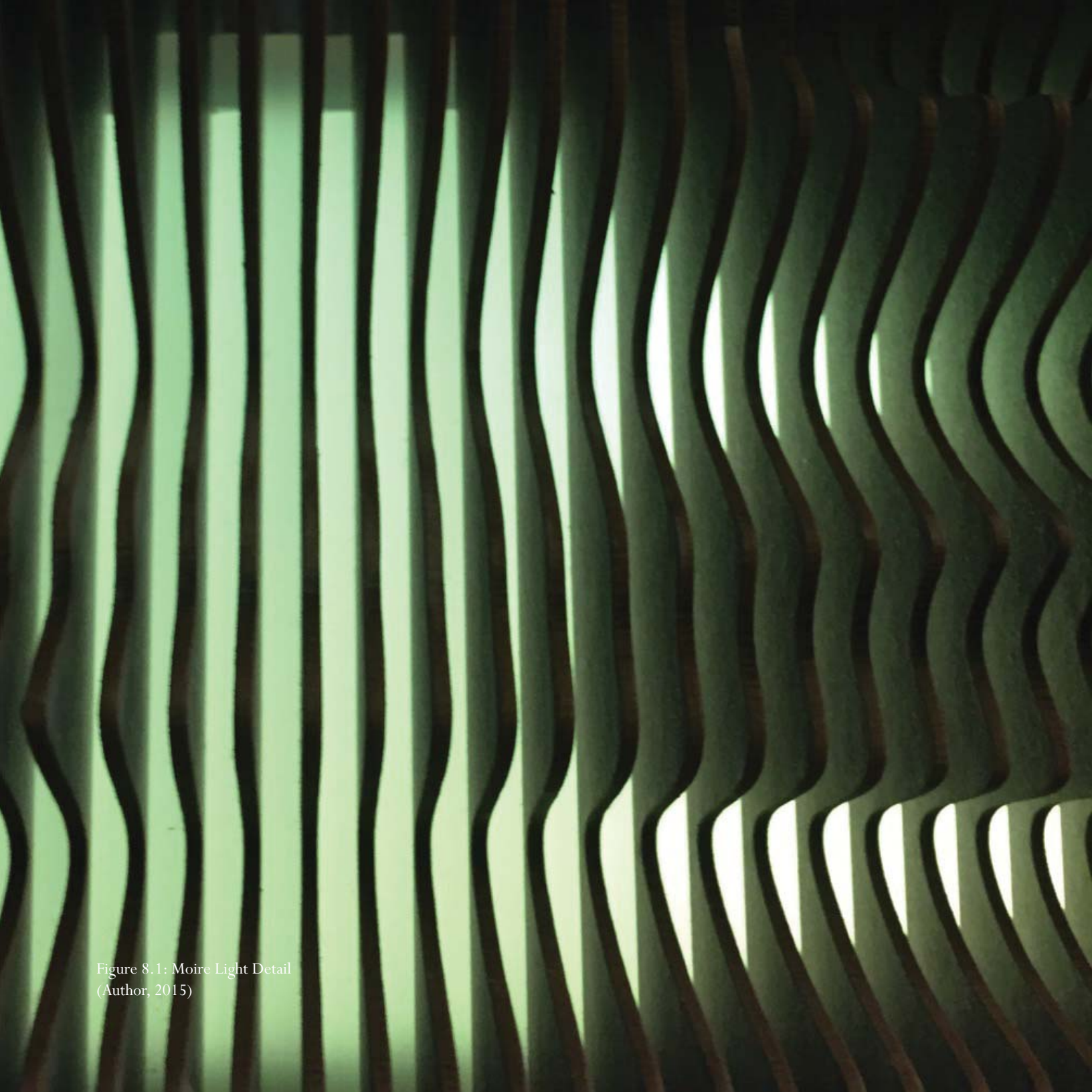
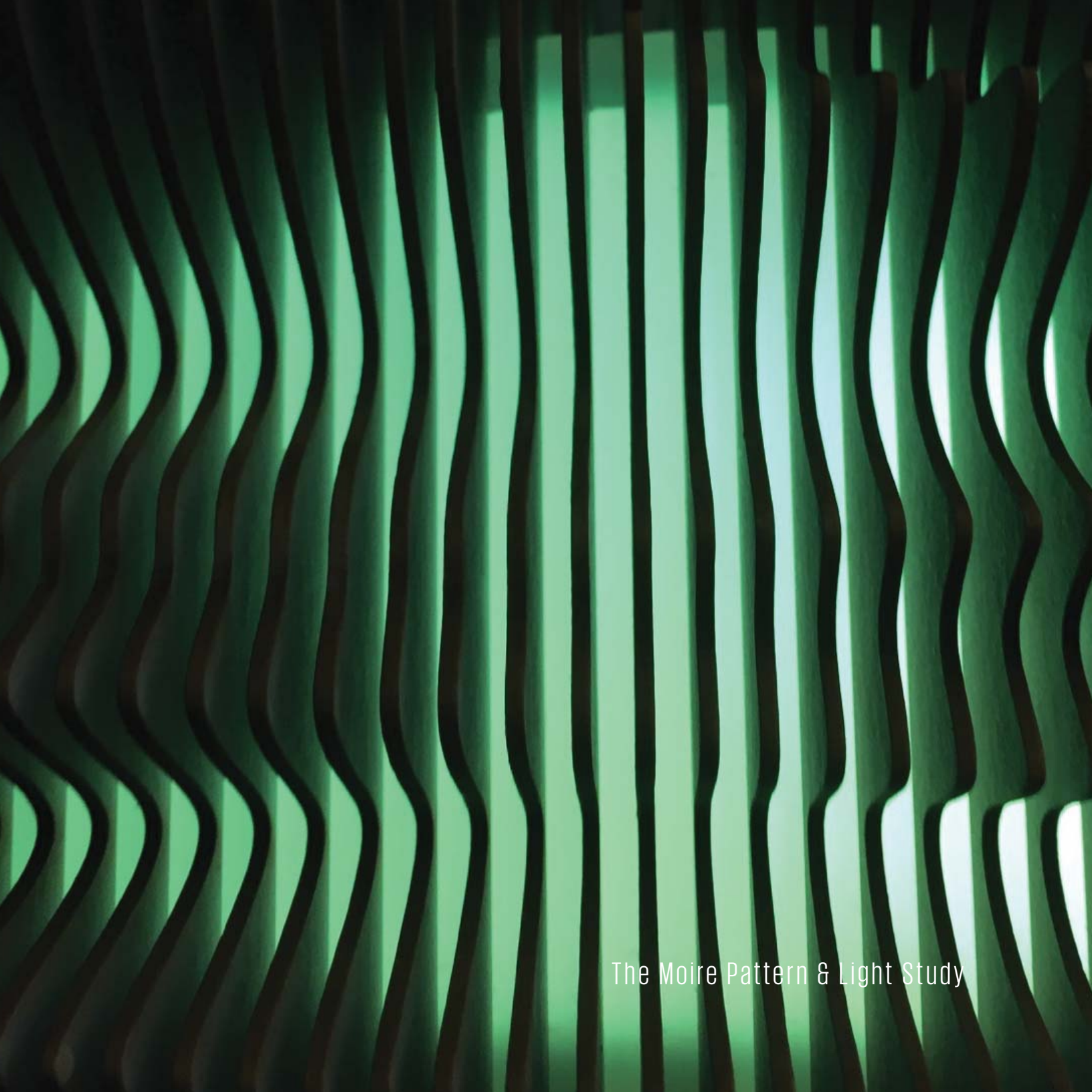


Figure 8.1: Moire Light Detail
(Author, 2015)


The Moire Pattern & Light Study

The Moiré Pattern

After multiple design ideas were abandoned, a new path of investigation emerged. Dustin Headley, an Interior Architecture Product and Design (IAPD) professor at Kansas State University, suggested experimenting with the moiré pattern.

The moiré pattern is a pattern obtained when two sets of patterns are overlaid and rotated a small amount from one another. Usually these patterns are closely spaced and take the form of a grid. When these patterns are superimposed, the interference creates a moiré pattern. Additionally, the two patterns overlaid can be different or identical designs. Nonetheless, these two patterns must be overlaid at different angles in order to create a moiré pattern.

Figure 8.2 illustrates an example of the moiré pattern that was designed in the beginning of my experimentation. This design involved drafting two separate patterns slightly different in form. Once these patterns were overlaid or spaced closely together, the interference created a moiré pattern.

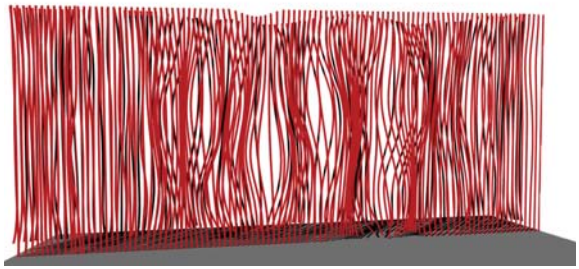


Figure 8.2: Moiré Pattern Rendered (Author, 2015)

Light Study

Figure 8.3: Dustin Headley's Moiré Model with LED
(Light Experimentation by Author, 2015)

Figure 8.4: Dustin Headley's Moiré Model
(Light Experimentation by Author, 2015)

The purpose of this study was to observe the relationship between light and the moiré pattern. Dustin Headley, an IAPD professor at Kansas State University, provided a moiré study model as a tool for my own research and design. In order to gain a better understanding of the relationship between light and the moiré pattern, I installed an LED into Headley's moiré model. This LED was integrated in a way to ensure the safety and original state of Headley's model.

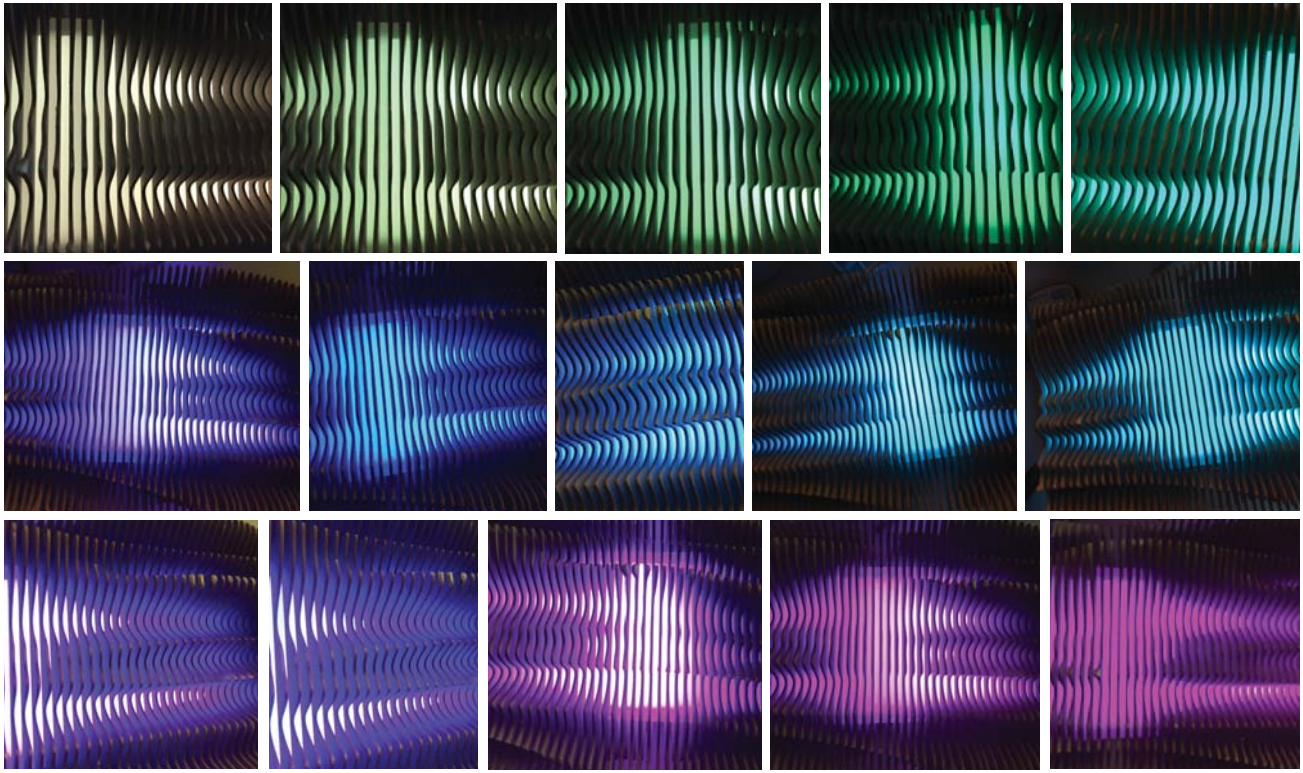


Figure 8.5: Dustin Headley's Moiré Model: Light Configurations
(Light Experimentation by Author, 2015)

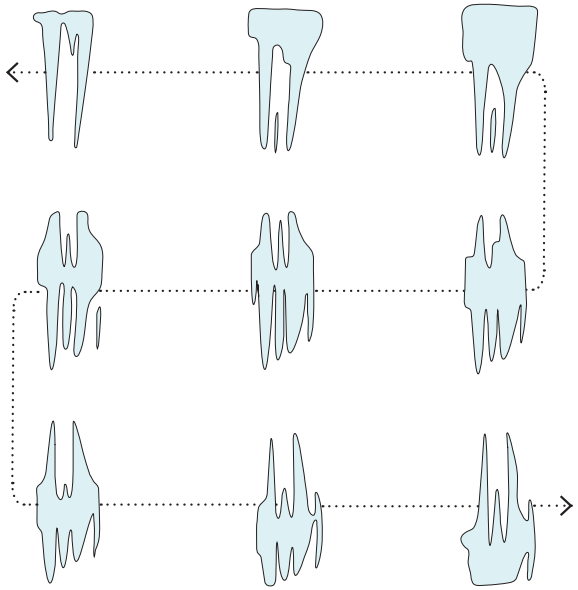


Figure 8.6: Light Study Diagram
(Author, 2015)

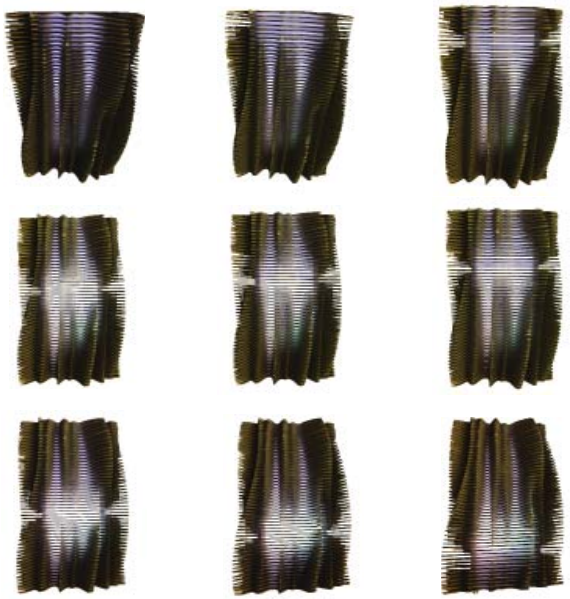


Figure 8.7: Dustin Headley's Moiré Model: Light Study
(Light Experimentation by Author, 2015)

The relationship between light and the moiré pattern is consistent. As the following diagram illustrates, as more space between surfaces is being viewed, more light permeates outward. Depending on the viewer's angle or perspective of the moiré pattern, a certain amount of light is visible. As the viewer moves across the moiré pattern, the amount of light displayed is consistent with the viewing angle. This also creates an illusion of motion. However, the only motion that occurs is within the viewer's cone of vision.

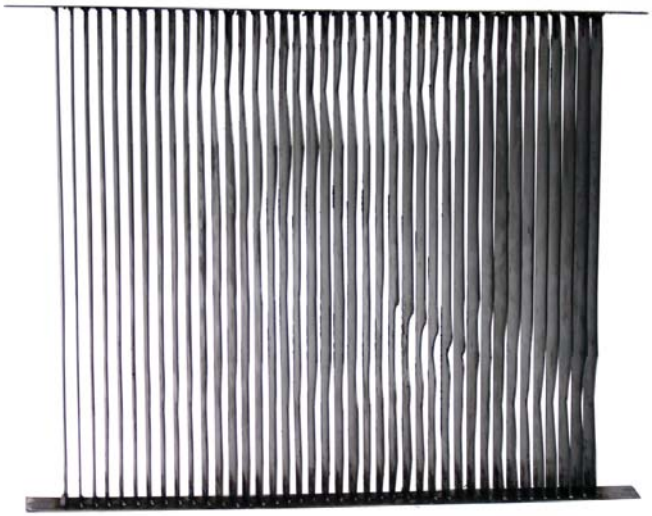


Figure 8.8: First Moiré Prototype
(Author, 2015)

The two moiré patterns designed for this project are formed by 40-50 steel slats inclined at a 90 degree angle spaced evenly. However, instead of two separate patterns overlaid, one three dimensional pattern creates the moiré pattern. This is made possible because two separate curves make up the surface of each slat.

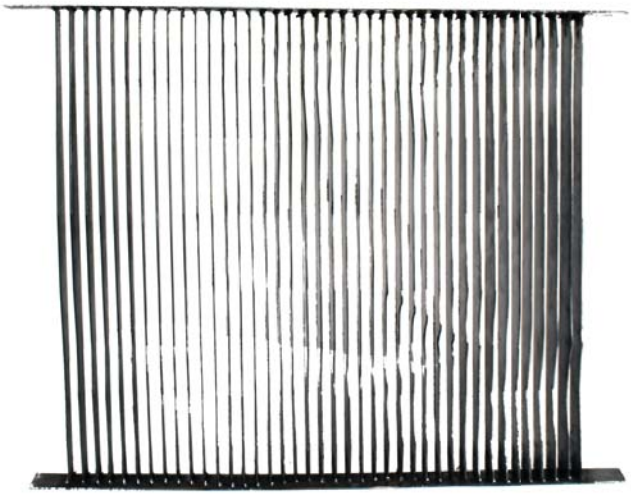


Figure 8.9: First Moiré Prototype: Activation Stills
(Author, 2015)

Also worth noting is the activation of the moiré pattern. Because the moiré pattern is created three dimensionally, the viewer activates the moiré pattern by changing his or her angle while circulating around the installation. The change in viewing angle creates the illusion that the installation is in motion, though the only movement occurring is by the viewer.

Figure 9.1: First Moiré Prototype Close Up
(Design by Author, image by Headley, 2015)

Prototyping

Prototyping

The fabrication process of each prototype included the following steps: preparation of digital drawings, plasma cutting, and assembly.

The preparation of digital drawings involved organizing pieces of each design onto four by eight foot steel sheets. After all pieces were organized in AutoCad, a DXF could be exported and read by the Plasma Cutter. Once all pieces were cut, assembly of the pieces began.

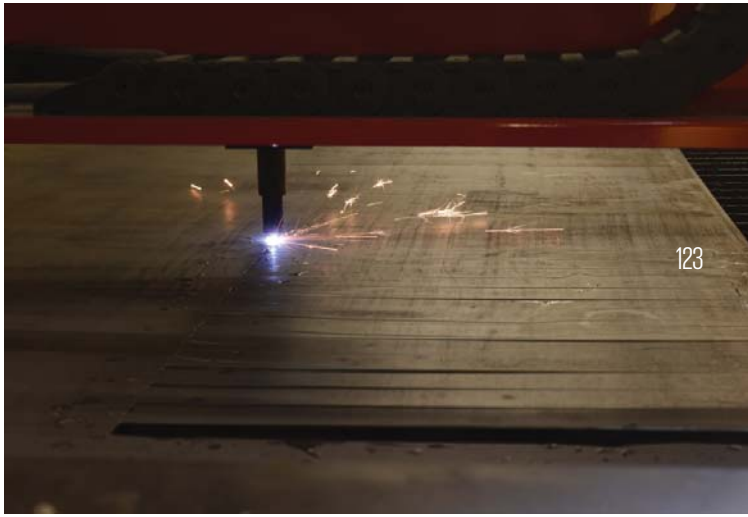


Figure 9.2: Plasma Cutting
(Author, 2015)

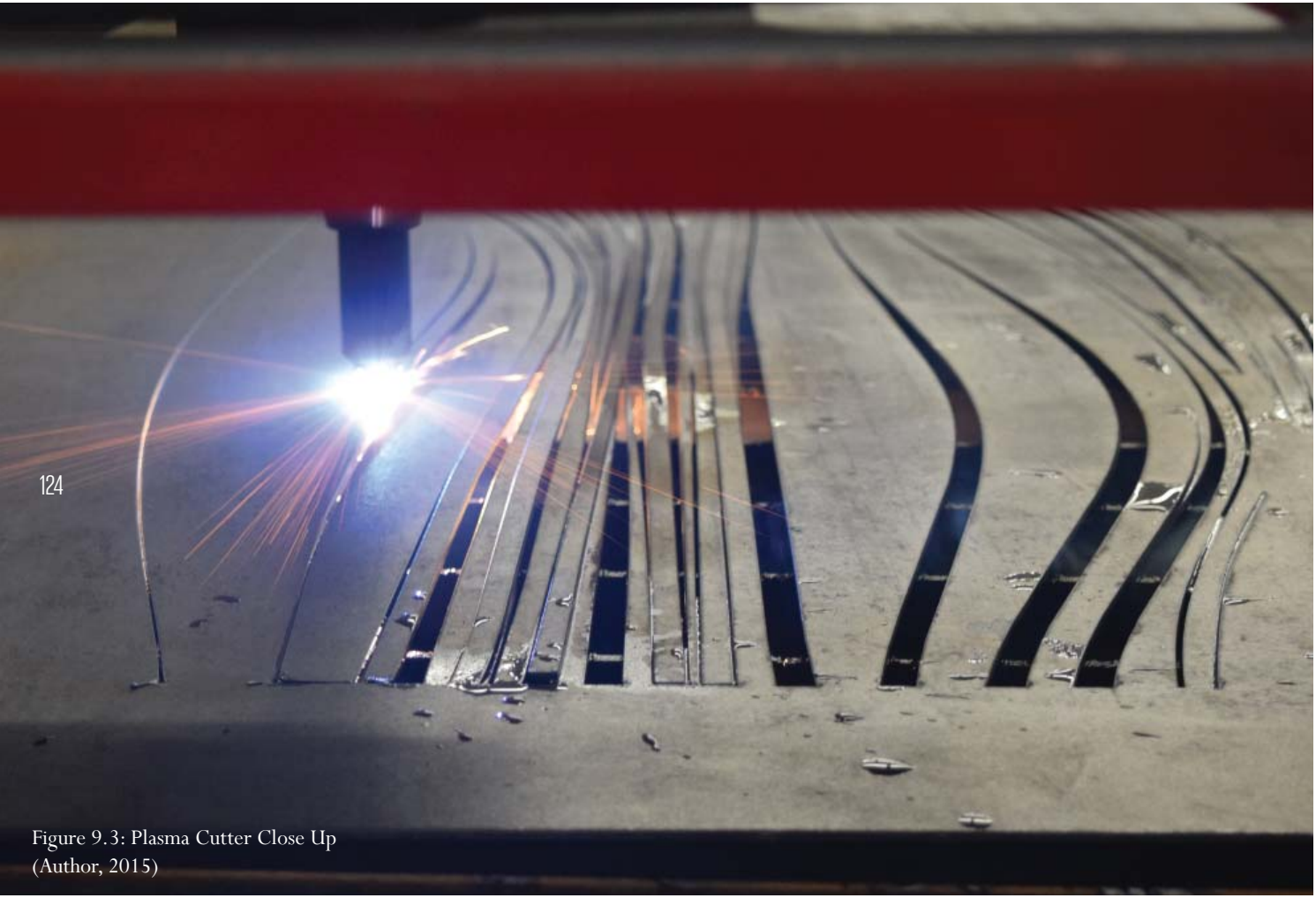


Figure 9.3: Plasma Cutter Close Up
(Author, 2015)

Figure 9.4: Plasma Cutter Close Up II
(Author, 2015)

Figure 9.5: Plasma Cutter Close Up III
(Author, 2015)

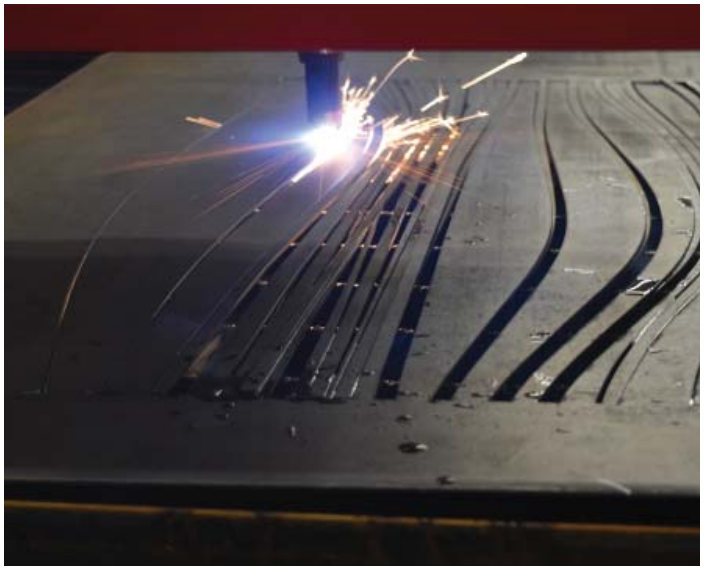


Figure 9.6: Plasma Cutter Close Up IV
(Author, 2015)

Figure 9.7: Plasma Cutter Close Up V
(Author, 2015)

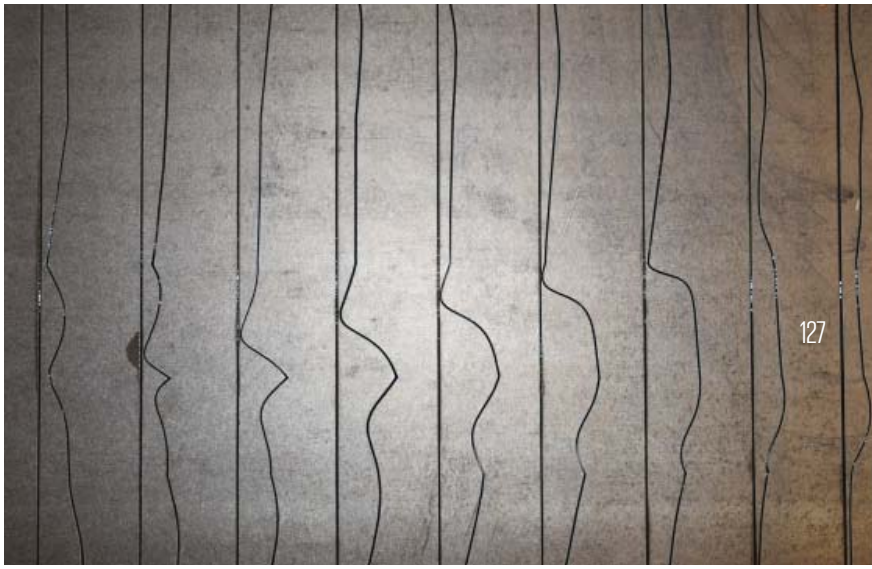


Figure 9.8: Plasma Cutter Close Up VI
(Author, 2015)

Figure 9.9: Moiré Prototype Assembled
(Design by Author, image by Headley 2015)


FROST
Nashua
PRODUCTS

Figure 9.10: Alan Armour Spot Welding I
(Design by Author, image by Headley, 2015)

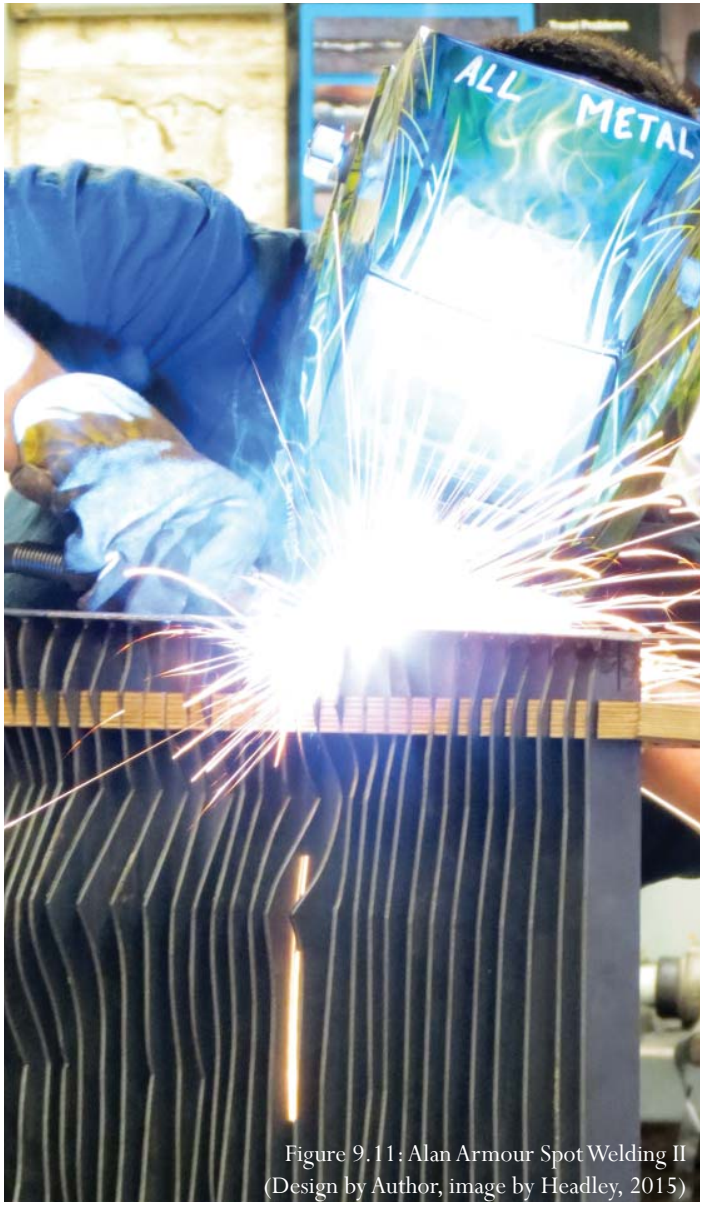


Figure 9.11: Alan Armour Spot Welding II
(Design by Author, image by Headley, 2015)

Figure 9.12: Alan Armour Spot Welding III
(Design by Author, image by Headley, 2015)

Figure 10.1: Sunflower Shadow
(Author, 2015)


Sunflower

Sunflower

After prototyping the initial moiré design, it became clear the moiré pattern could be applied to the WDDC Pop-Up Park. The moiré pattern could act as an engaging installation during the daytime and nighttime. Unlike the previous proposal, the moiré pattern functions as a kinetic installation that depends on movement for its effect. This aspect creates an interactive element between the installation and viewer. Additionally, the fabrication methods for the moiré pattern would be cost effective and offer a number of opportunities for site placement.

As far as site specificity is concerned, the moiré pattern offered room for exploratory forms that could reference site context. As a result, a topographic reference seemed ideal. The slats that comprise the moiré installation could create a visually enticing topographic relief. However, as investigation furthered, an interest in revealing an image from the moiré pattern took precedence.

The state flower of Kansas is the sunflower and is a recognizable motif to most Kansans. Figure 7.20 of the WDDC Pop-Up Park chapter illustrates the initial integration of the sunflower into string lighting. This naturally prompted my interest in applying the image of a sunflower to the moiré pattern.

Sunflower Navigating the Design Matrix

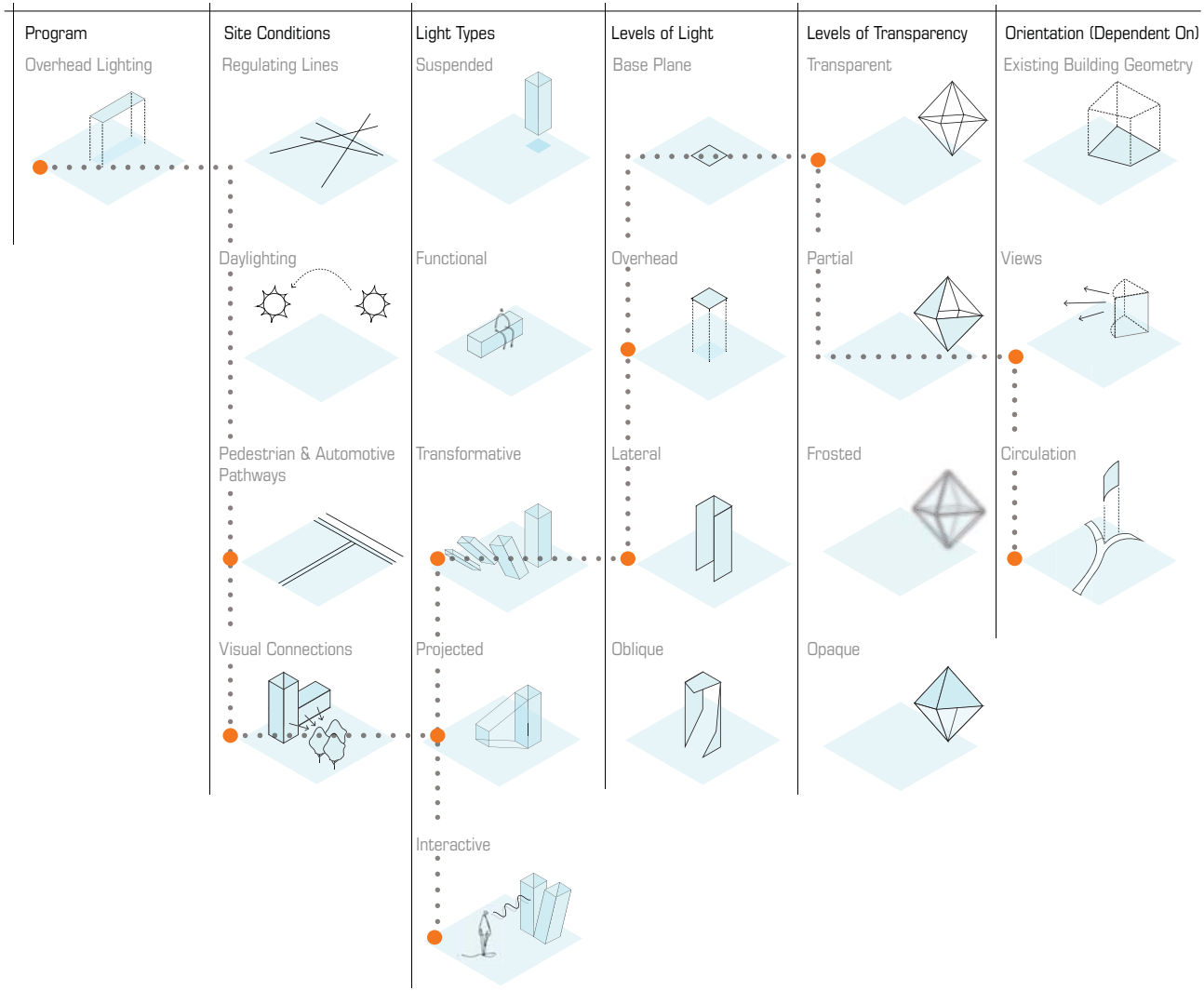


Figure 10.2: Sunflower Design Matrix
(Author, 2015)

Sunflower Navigating the Fabrication Matrix

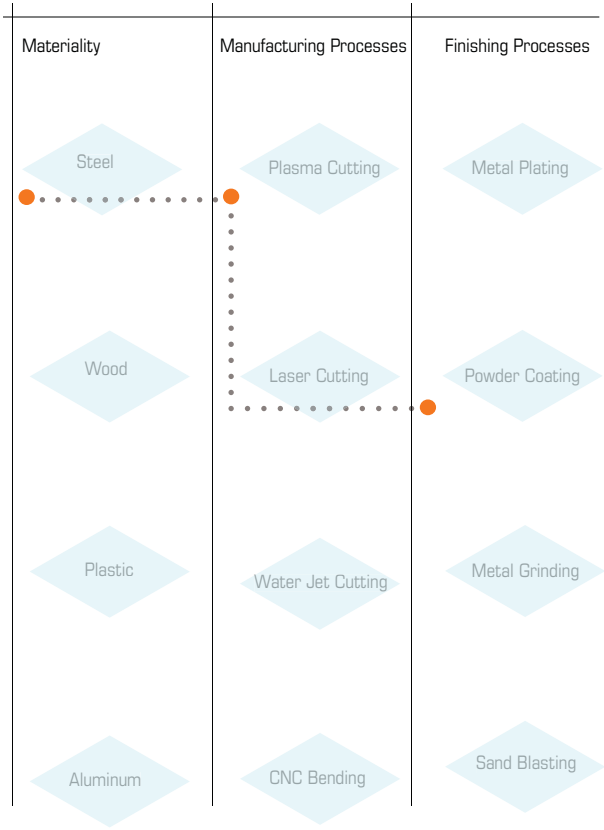


Figure 10.3: Sunflower Fabrication Matrix
(Author, 2015)

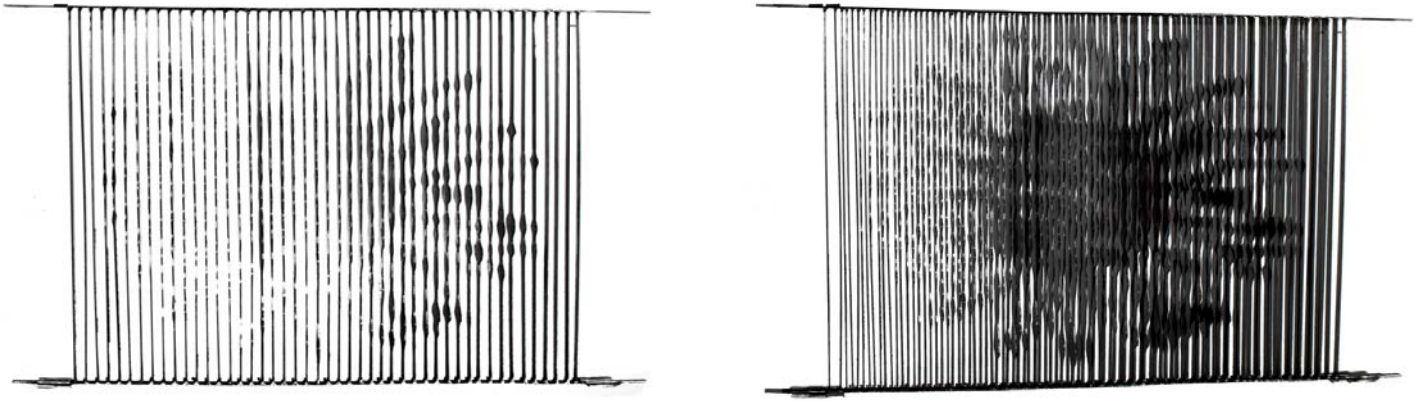
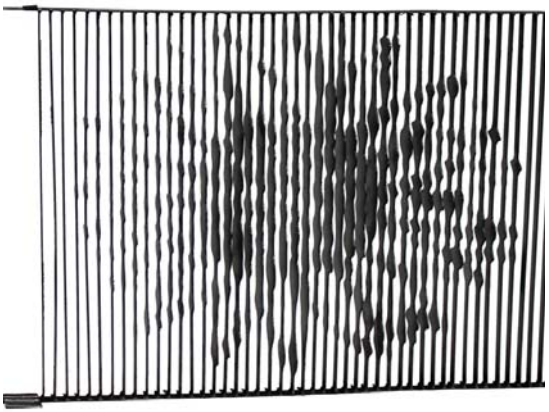


Figure 10.4: Sunflower Views & Reveal
(Author, 2015)



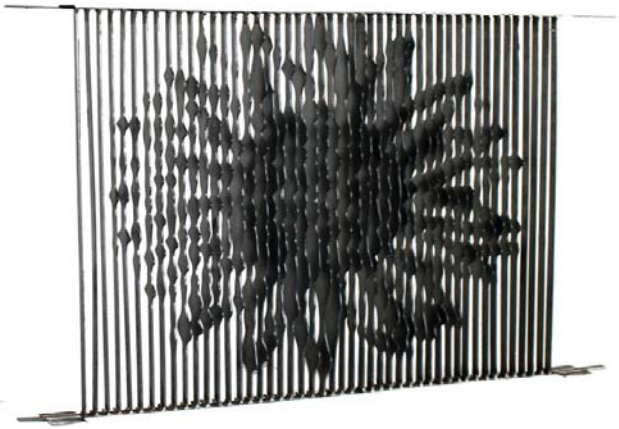


Figure 10.4 Illustrates the sunflower prototype photographed at different angles. This series of images displays the transformative visual effect of the moiré pattern. To reiterate, the moiré effect depends on movement for its effect. This aspect creates an interactive element between the installation and viewer.

Figure 10.5: Sunflower Illuminated
(Author, 2015)

Figure 10.6: Sunflower Illuminated II
(Author, 2015)

Figure 10.7: Sunflower Illuminated III
(Author, 2015)

After the assembly of sunflower, a number of light studies took place. Figures 10.5-10.7 depict the most successful approach to lighting sunflower, which involved down lighting of LED's with a radiant film diffuser. This approach is most successful because it allows viewers to experience the moiré effect during the nighttime. The second lighting option involved cast lighting as seen in Figures 10.8 & 10.9. Instead of illuminating the slats of the installation, directional spot lights showcase the shadow of sunflower. This approach focused on projection, instead of the illumination of the moiré effect.

Sunflower Shadows

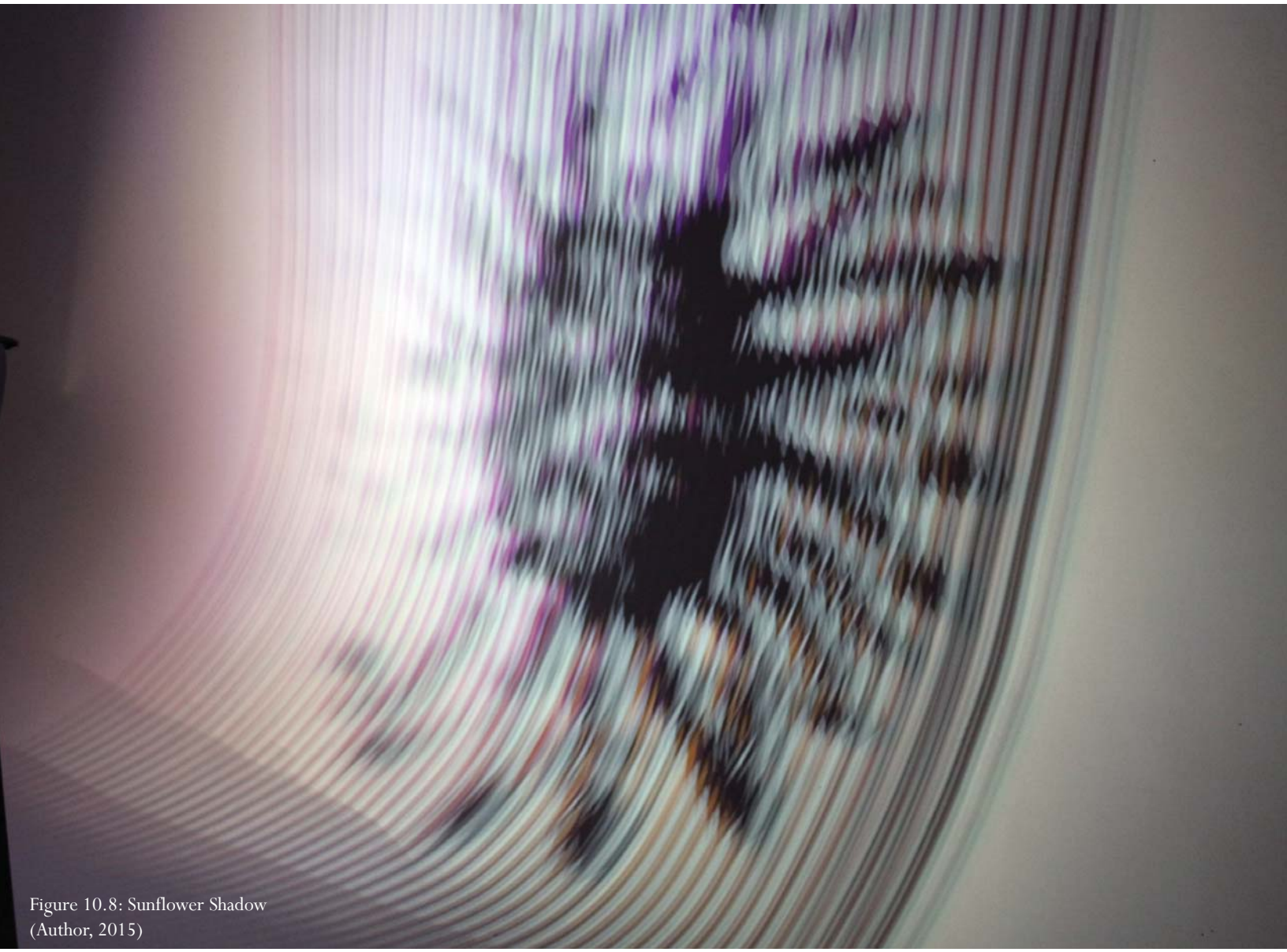


Figure 10.8: Sunflower Shadow
(Author, 2015)

Figure 10.9: Sunflower Colored Shad
(Author, 20

Sunflower: Wall Mounted Proposal

Figure 10.10: Sunflower Wall Mount Proposal
(Author, 2015)

The location and scale of sunflower also contributed to site specificity. Two location proposals were considered: Wall Mounted and Overhead.

Figure 10.10 illustrates the wall mounted proposal. The sunflower is rendered yellow and mounted on the Woolf Brothers. building to the East. Mounting Sunflower on the east facade would allow more viewing opportunities from passing cyclists and vehicles. Additionally, this option lends itself to an evenly textured backdrop which would benefit viewing of the installation.

Sunflower: Overhead Proposal

Figure 10.11: Sunflower Overhead Proposal
(Author, 2015)

Figure 10:11 illustrates the overhead proposal. The sunflower is rendered yellow and suspended in the middle of the site. Viewers must look up at different angles to activate sunflower. Additionally, the sky provides an ever-changing backdrop for the installation. However, Sunflower would be nearly invisible from the street.

Sunflower: Final Site Proposal

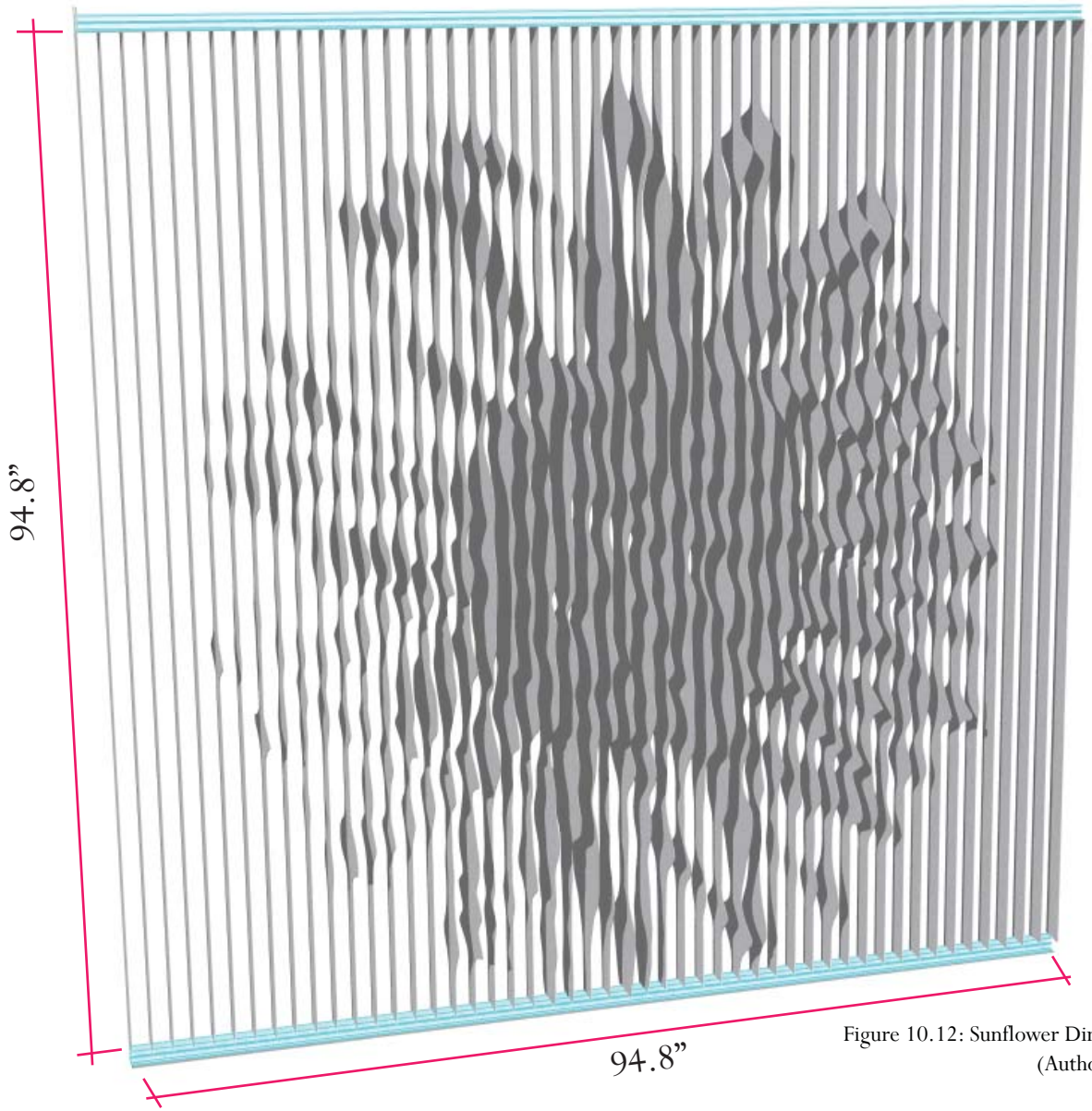


Figure 10.12: Sunflower Dimensions
(Author, 2015)

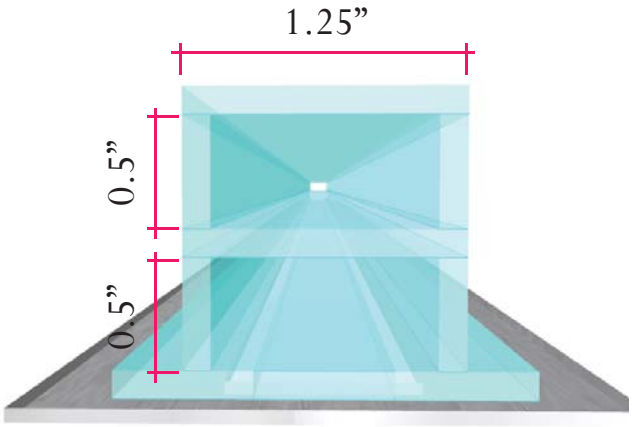


Figure 10.13: Acrylic Dimensions (Author, 2015)

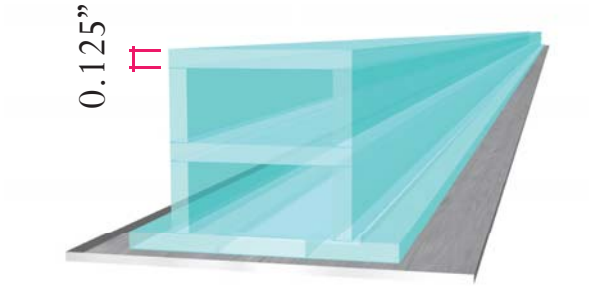


Figure 10.14:Acrylic Dimensions II (Author, 2015)

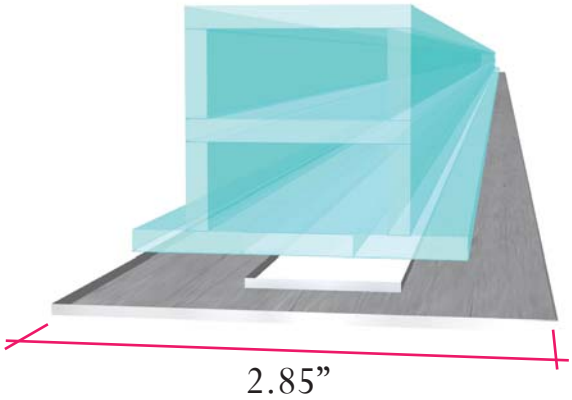
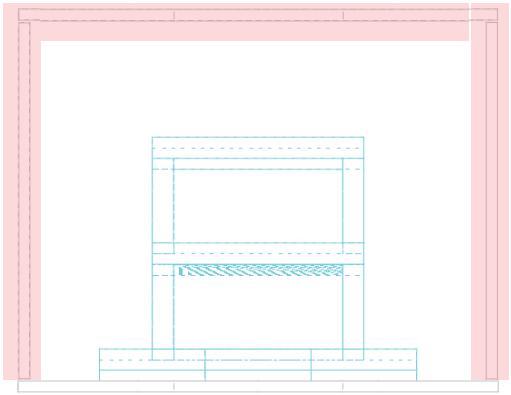


Figure 10.15: Steel Frame Dimensions (Author, 2015)



Steel Casing

Figure 10.16: Steel Casing (Author, 2015)

The final sunflower proposal will be 94.8” x 94.8” (7.9’ x 7.9’) 16 gauge steel. In order to illuminate the installation, a custom made frame will account for LED strip lighting and radiant film diffuser. Figures 10.13-10.15 illustrate the acrylic and steel frame dimensions.

In addition, the steel frame will be hollowed out to allow lighting to disperse through the installation (refer to Figure 10.15). The acrylic will be bonded by a solvent-based adhesive and bolted to the steel frame.

After the acrlyic frame is bolted, a steel casing will be welded around the entire frame (Figure 10.16).

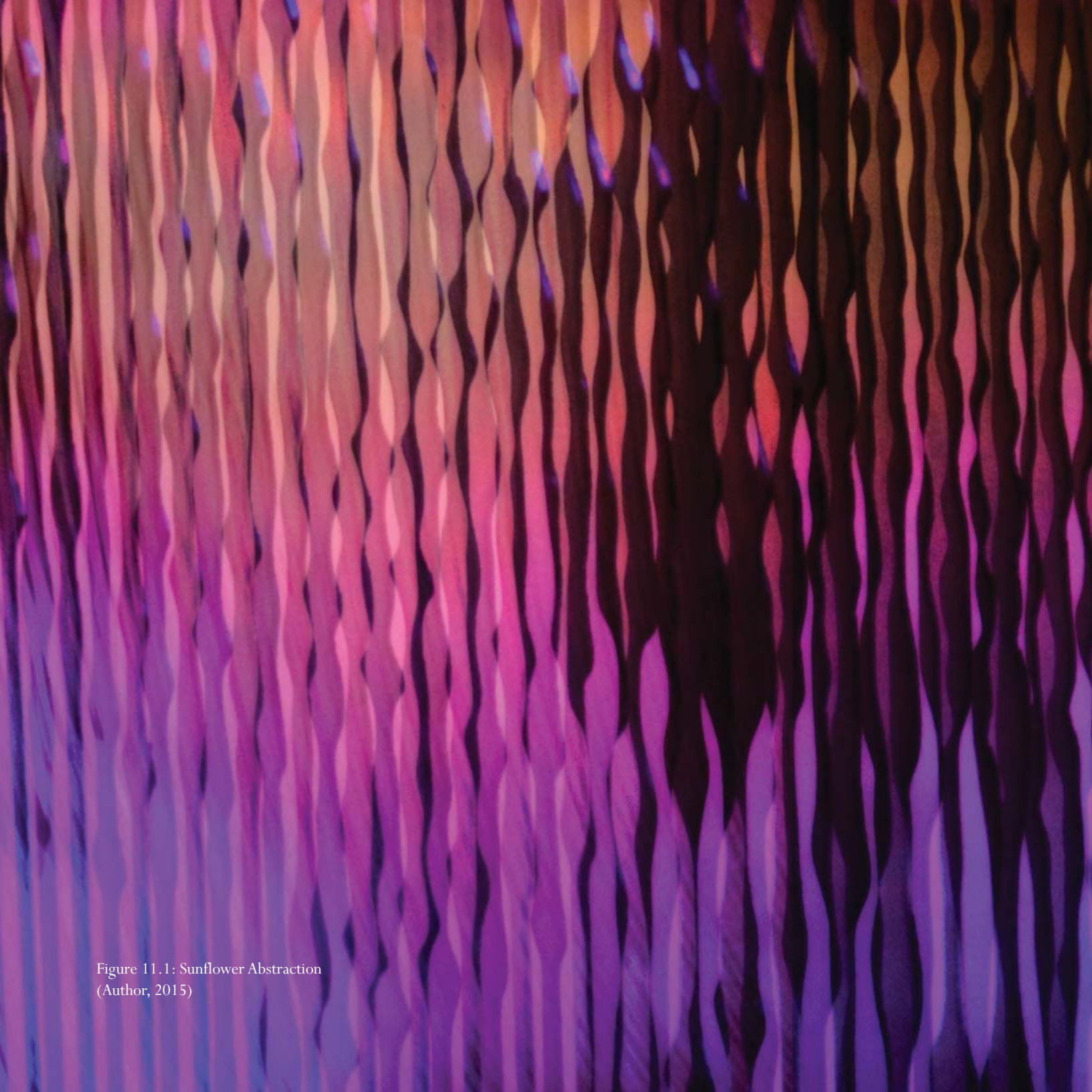


Figure 11.1: Sunflower Abstraction
(Author, 2015)

Conclusions

Conclusions

Through the synthesis of an array of methods, this report creates a framework for site-informed public light art installation. These methods include: artistic research and making, an apprenticeship with an artist, a precedent study, development of a light typology, analysis of site and context, and establishing a design matrix. This unique set of methods was undertaken in order to effectively address my research question: What 'type' of public light art is most appropriate for a specific site and how does it relate to creative placemaking?

A number of light art types can be appropriate for a specific site. The point of these types is not to dictate success rate, but rather to understand the different types that can exist and provide a mode of thinking about types within a light art installation.

The apprenticeship with Stan Herd introduced a new approach to site analysis and a new lens of understanding an artistic creative process. Herd's artistic approach to site and context revealed new paths to consider when designing space. In particular, Herd demonstrated the power of meaning and immersing an audience without focused attention to physical site conditions. Additionally, Herd's creative process revolved around trial and error, patience, and an inquisitive attitude.

My apprenticeship with Herd allowed me to integrate lesssons learned within my own project. For example, when designing Stilt for the Midtown project, I was focused less on physical site conditions and framing space, and more concerned with the lighting and its immersive quality. Similarly, the design of Topo and Gem concentrated on immersing the audience through concentric frames of lighting. Trial and error became a prominent element of my design process. Numerous designs were developed and presented, however only the Sunflower resulted in final fabrication. Patience and inquisitive attitude led to the investigation of the moiré pattern and ultimately the design of the Sunflower. My collaboration with Herd prompted new intersections of perspective, which allowed me to integrate a new way of approaching site analysis and the creative process.

A number of differences exist between an artist and designer. As far as the creative process is concerned, I found that fabrication is a primary difference between artist and designer. During my apprenticeship, Herd and our group worked with our hands in order to fabricate cairns and the vegetated landscape. In contrast, my project relied on digital fabrication. Although sketching remained essential during my design process, Rhino became integral when modelling ideas and eventually fabricating them. Rhino allowed for digital drawings to be exported in over 40 different file formats. The following file formats were used for this project: .obj, .stl, .dxf, .dwg, and .3dm. In order to use the plasma cutter a .dxf or .3dm was needed. Furthermore, Rhino allowed for my designs to be digitally fabricated in a relatively short period of time. The prototyping process of the moiré patterns involved cutting, organization, and assembly. This entire process could be completed within a days time.

The precedent study allowed my design project to operate within a field of understanding. After studying numerous light installation projects and selecting the projects most pertinent, an understanding of distinct types became apparent. Organizing the light typology led to the overlay of light types. This resulted in an illustrated understanding of what types exist and what combinations of light types comprise each light installation.

Establishing a design matrix for each site became an essential method for designing site informed light art. Each parameter of the design matrix responds to a primary heading or element of organization. These six primary headings or elements of organization include: Program, Site Conditions, Light Types, Levels of Light, Levels of Transparency, and Orientation. Within these six primary headings or elements exist additional sub-parameters. This allows for a site informed process of decision-making. Moreover, the design matrix illustrates which elements need to be addressed and provide different options and opportunities for design development.

In summary, the Sunflower design represents the culmination of the project. Site analysis and context informed the final design and proposal. As a result, a number of light types were combined in the WDDC Pop-Up Park light art installation.

Limitations

A number of limitations existed throughout the extent of the project. To begin, my lack of digital modeling knowledge contributed to a slow development of design ideas. However, I was able to pick up modeling designs in Rhino fairly quickly. As a result, it became a significant element in the design process because it allowed for visualization of the design as well as a opportunity for a range of fabrication methods.

Rhino is a very intuitive modeling software that has significant potential in the field of landscape architecture. Rhino offers a number of rendering plug-ins that allows for quick and clean renders, which can be integrated into an Adobe software workflow. This element, along with attachments like Grasshopper, make Rhino a very powerful software for digital visualization and fabrication.

Working on two design projects simultaneously became limiting as well. A balance of work needed to be made between each project to ensure even progress. However, there were times where a certain project would receive more attention than the other. Though in the end, a balance of work and production took form.

The most limiting factor was time. The amount of time allocated for the project limited the amount of work that could be carried out. Instead of two built light art installations for different sites, only one installation could be implemented. Additionally, the organization and thorough documentation of the project had to be accounted for. A framework for site informed light installations proved fairly large in scope. Not only did this report address a framework for site-informed light installations, but also addressed two sites with multiple site specific

Future Applications & Research

A Framework for Site-Informed Light Art Installation provides an organization of methods to design site specific light art installation. Documentation of each method highlights necessary relationships in order to achieve site informed design. In addition, this report provides an overview of the design process from schematic design to prototyping, which allows for an understanding of tools and considerations in an artitistic research process.

This framework may be used as a point of departure for future investigations in site specific light art installations. It is intended to provide direction and a number of considerations including: artistic approach and creative process, site analysis and context, light types and associated categories, modeling software, and fabrication tools and methods. These considerations have the potential to fill in missing gaps within future investigations. For instance, someone unable to experience an apprenticeship with an artist will have an idea of its importance and relevance to this field of design work. In regard to my own endeavors, this framework provides a means of pursing additional light art installations. I intend to seek out future projects in order to develop my framework further.

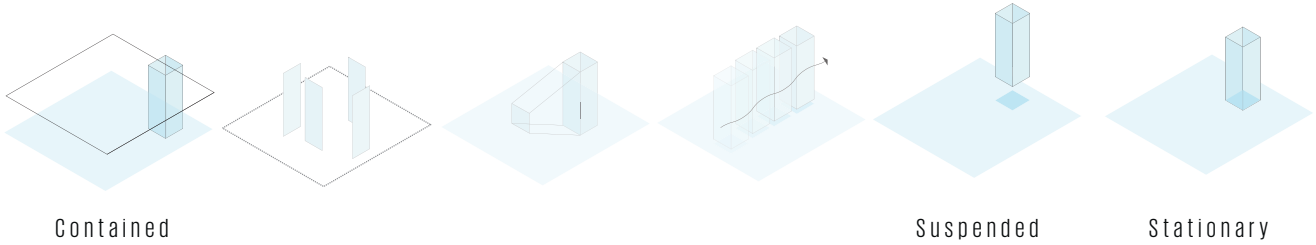
Sunflower

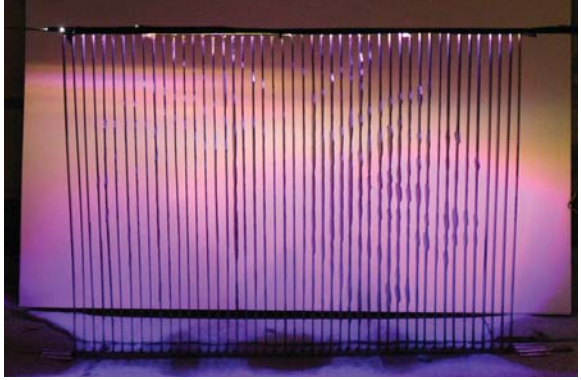
The final fabrication of the full scale Sunflower will take place the end of April 2015. After fabrication and assembly is complete, Sunflower will be installed in the WDDC Pop-Up Park in Wichita, Kansas (Figures 11.2-11.4).

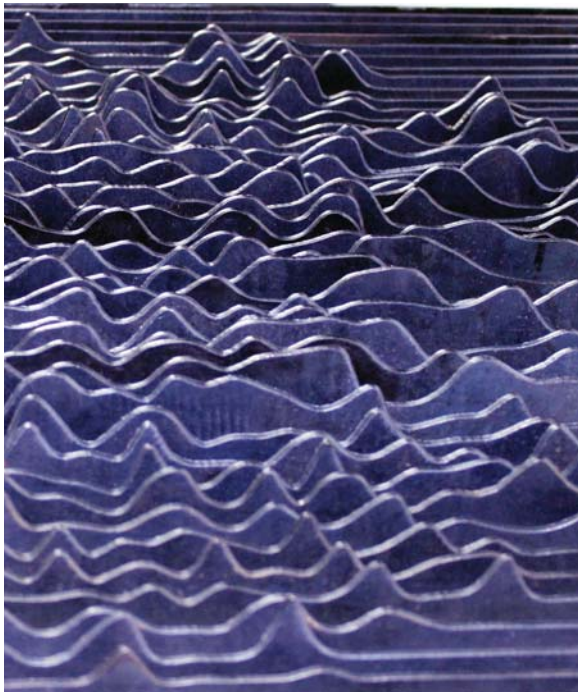
Figure 11.2: Sunflower Illuminated IV (Author, 2015)

Sunflower

Designer: Nicholas Mercado
Location: Manhattan, Kansas
Completion Date: 2015
Size Estimate: 7.9' x 7.9'
Material: Plasma Cut Steel, Acrlyic, LED's, and Radiant Film



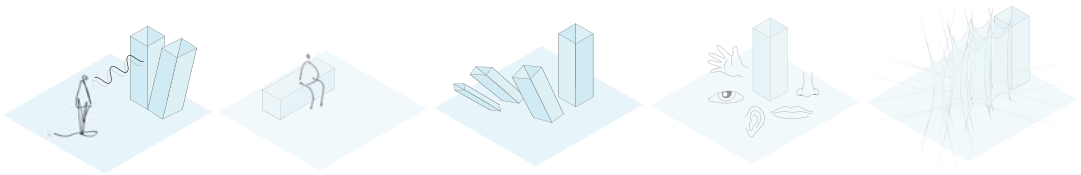




Description

Developed with the integration of the moire pattern, Sunflower is an interactive kinetic installation that can only be activated by viewer's movement. Specific to the WDDC Pop-Up Park in Wichita, Kansas, the Sunflower can be viewed during the day and night.

Figure 11.3: Sunflower Illuminated II (Author, 2015)
Figure 11.4: Sunflower Detail (Author, 2015)



Interactive

Transformative

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