

Lights, Camera, Innovation

Architecture Without Limitation

Through the tool of Cinematic Architecture





“Did you ever realize that everything going on in your mind -- every thought, feeling, sensation, everything you are aware of -- is in fact happening only in your private internal world? Your thoughts appear only to you and are not being heard by anyone else whatsoever. There is one physical world here on earth, but billions of different internal worlds. We are all in our own separate theaters, witnessing entirely different shows, and yet we behave as if we are in the same audience…….”



Lights, camera, Innovation

Architecture Without Limitation

Through the tool of Cinematic Architecture

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

By

Marie D Tucker

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

TABLE OF CONTENT

| | |
|--|---------|
| LIST OF TABLES AND FIGURES | |
| | 7 |
| ABSTRACT | |
| | 8 |
| NARRATIVE | |
| | 9 |
| TYOLOGY | |
| | 9 |
| CASE STUDIES | |
| | 10 - 22 |
| SITE | |
| | 23 - 25 |
| PROJECT GOALS | |
| | 26 - 27 |
| PLAN FOR PROCEEDING | |
| | 28 - 29 |
| THESIS RESEARCH | |
| | 30 - 32 |
| LITERATURE REVEIW | |
| | 33 - 39 |
| Performance Criteria | |
| | 40 - 42 |
| PROJECT JUSTIFICATION | |
| | 43 - 44 |
| HISTORICAL, SOCIAL, AND CULTURAL CONTEXT | |
| | 45 - 47 |
| SITE ANALYSIS | |
| | 43 - 42 |
| PROCESS SCHEDULE | |
| | 59 |
| FINAL DESIGN SOLUTION & PROCESS WORK | |
| | 65 |
| SENCE OF PLACE | |
| | 76 |
| APPENDIX | |
| | 83 |

TABLE OF FIGURES

LIST OF TABLES AND FIGURES

CASE STUDY {BLACK PANTHER)

Figure 1 -8

CASE STUDY {PARIS SMART CITY 2050)

Figure 9 -16

CASE STUDY {DEFYING GRAVITY)

Figure 17-19

CASE STUDY {TOMMOROWLAND)

Figure 20 - 24

KOBLENZE SITE LOCATION AND IMAGES

Figure 25 - 30

SUN SHADE AND SHADOW

Figure 32 - 47

SITE & RENDERING PERDPECTIVES

Figure 48 - 54

SECTION CUTS

Figure 55 - 56

UNDERGRONG SITE LAYOUT

Figure 57

SKYWALK DETAIL

Figure 58

PROCESS ORDER SKETCHES

Figure 58

PROCESS SKETCHES

Figure 59-97

PROFILE PICTURE

Figure 98

ABSTRACT

Creativity is characterized by the ability to perceive the world in new ways, to find hidden patterns, to make connections between seemingly unrelated phenomena, and to generate solutions. Architects are creative to the extent that gravity and codes (and Engineers) will allow them to be. But when it comes to cinematic Architecture the possibilities of design are endless. Rules are basically thrown out the window and we can allow our minds to soar and make the impossible, possible. My project will be a fictional Microcosm of a city in a conceptual alternate world.



NARRATIVE

Technology is quickly advancing, affecting the way we design today. What architects have accomplished through digital design is astonishing and in turn created new jobs we never knew architects would have. Architects are now called for in the gaming industry, computer software industry, and of course, the film industry. The digital world of cinematic design gives architects an important role to play when engaging the audience. Whether we create a city that already exists/existed or completely construct a new Fictional city; our audience becomes engaged in the world we engulf them in.

When Architects' change their design field to cinematic; several are slow at first to adopt the free form ideology around it. Bob fear explains that many designers making the switch find the rules very different between the clinical perfection of pristine architectural delineation and the gritty imperfection of rendering the real world (Architecture + film II, 2000). Don't get me wrong, innovation and creativity are a huge part of architecture, but we were trained to think a certain way; where structure and gravity rule our design decisions. Cinematic architecture encourages our minds to think far outside the box aside from just inching past it, by letting us create without restrictions.

This research strives to answer the question of what we can design if we have no real world architectural construction barriers in our way. The overall premise invites the idea that through this exploration of design we can give light to new innovative thoughts. So, I say let's use the tool of cinematic architecture to show our audience new ideas and lead the direction of design. How can innovation strike if we don't see something new, or different occasionally? Through cinematic architecture we can explore fresh architectural propositions and experiences; opening our minds eye to a more creative, less rigid and structural way of thinking. What can we create when we don't have to worry about height limits, water erosion, or material endurance? Does this hinder us, or does it aid us in ideas of what could be?

TYOLOGY

Conceptual Urban Design



CASE STUDIES

Production
Designer/
Cinematic
Architect:
Hannah Blecher



1

Introduction

Urbanists and city planners are amazed by the concept and design of Black Panther's Wakanda, A hidden fictional city that escaped colonization and developed an African Cultural aesthetic, powered by a made up high energy source called vibranium. The question is asked; can this city be a real probability? Experts agree that ““some” of the design and infrastructure of the fictional place have real-life possibilities.” Lets explore what is able to be built in this city and what can only be constructed in cinematic design.

Walkable streets and transportation

Aside from the occasional bus-like shuttles Wakanda's citizens walk the streets where they can trade and bargain for goods. A refreshing plan that many people are excited to pursue. Instead of paving all our streets to make room for the big metal traps that shoot pollution into our atmosphere. Car free cities promotes health “how you move around your city shapes your social interactions, your job, and even your family dynamics.



2



3

Inspired by
Zaha Hadid mixed with African cultural Architecture



+



+



+



4

5

6

7

A dystopian utopia some are saying, with a high essence in culture. with the organic shapes of zaha hadid's architecture and grounded beauty of African architecture Wakanda is formed. the plot of the movie and character culture inspires earth tones and intimate, giving a sense of connection. the heights of the city building were created in all urban scales, "Unlike most superhero movies, where cities are filled with futuristic glass-and-steel towers reaching into and above the clouds....." says Charisma Acey

Only in Cinema

Roof

Thatched roofs on top of the high-rise buildings in Wakanda were a very interesting touch that definitely spoke to some areas of African style architecture. they are used to shed water away from the inner roof, but these roofs are usually made with dry vegetation such as straw, water reed, sedge, rushes, heather, or palm branches; too light weight to go on top of a high rise where wind levels are at there highest. the material would get stripped

Day Lighting

Looking at the image below we see a lack of windows in the architectural structures. although this is something that is possible outside of the world of cinema it is impractical. sun and day lighting are very important to the human body. "Good daylighting has been shown to improve the overall attitude, satisfaction and well being of building occupants....Daylighting, with proper electric lighting controls, can result in significant energy savings by reducing electric lighting loads and associated cooling loads." not that the fictional city of wakanda has to worry about that.



8

Architectural Observation

Circled in figure 13 is a building with a very unrealistic overhang and seemingly steep ramp. I couldn't find what that building is used for in the movie but even with a good core it would be too tiny to hold up that spherical top. the ramp that curls around the core of that building would be a hazard for anyone in a wheel chair or otherwise. I don't believe that building would be up to

TAKE AWAY

.Inspired to think differently about what public spaces should look like.

.Cultural site, movie plot, and a character's personality play a huge role in cinematic architectural design.

.In Cinematic design you can be more innovative with the materials used, (whatever you need to do to sell the idea essence of the city)

.Cinematic design does not have to consider building loads or codes

.Lighting accuracy is still important in cinema such as sun and shadows to create a realistic view but since cinematic architecture is more focused on the digital portion of the overall city not having windows on exterior forms wont hurt anyone

CONCLUSION

During the exploration of this case study we set out to see what about the fictional city of wakanda designed for the movie Black Panther would be able to be built in the real world and what can only be constructed in cinematic design. I found that this city is sturdy and well constructed, with desirable ideas about walkable streets and human interaction. Although cinematic design has no rules I found that when you design a place to look realistic for your audience; that believability in itself is your rule and limitation. In this case study, it was not easy to find things that aren't plausible to be done in a real city and can only be a cinematic idea; I found three things that stood out to me in supporting my thesis; the roofs of some high-rises were made out of thatch material that would never stand up against all the wind loads on a high-rise building, lack of windows and day lighting issues , and a building that would not be safe if it were built in reality. This research encourages my thesis even further by challenging if i can create a city based not no rules or limits and still make the audience believe in its possibilities.

PARIS SMART CITY 2050

INTERNATIONAL DESIGN ARCHITECT: Vincent Callebaut Architectures, Paris

CLIENT: Mairie de Paris - Paris City Hall



INTRODUCTION

Function will never deteriorate; even in cinematic design we have to consider what and who we are designing for and how to convey that message to the audience, but when it comes to form we are able to be more flexible in our pursuit to fulfilling this function. This case study's focus is based on form and function. Architecturally it has been debated whether form decides function or function decides form. This digital conceptual urban city, designed for the year 2050 has several sections/ districts with towers meant to uphold a certain function; each tower presents a new creative form. For this study we will center on three towers.



Form And Function

FARMSCRAPERS TOWERS

Form:

References the shape and form of stacked rocks

Function:

Offer local food production

Analysis:

If you tie the link to food production grown in nature and rocks formed by nature then you could say function directly relates to form or vice versa in this scenario. rocks are commonly found in the dirt and soil used to grow food





12



13

Form And Function

HONEYCOMB TOWERS

Form:

References the shape and form of stacked Honeycomb

Function:

Interlocking homes, double the height of the city's existing residences.

Analysis:

The honeycomb shape compliments both function and form. this is a great approach. each cell stacks together perfectly leaving little room for error. its a strong form that serves its function well. I can see this pattern being a strong aspect for the future.



Form And Function

MANGROVE TOWERS

Form:

References the shape and form of the distinct mangrove trees

Function:

Mixed program of offices, hotels and housing dedicated to international and traveling customers.

Analysis:

Form not directly related to function of the buildings, instead the form capitalizes on the green portion of the cities design, punctured with tubular gratzel cells to store more energy





TAKE AWAY

.Function does not decide form and form does not decide function

.Form stemmed from unifying theme of nature

.Made for the year 2050 we see linear city overpowered by these towers each form different function.

CONCLUSION

Cinematic Architecture is basically just digital conceptual design made for viewing globally. So I chose to study this digital conceptual city and the forms of these high towers. The form of the buildings all stemmed from a unifying theme of nature. So maybe we should argue that theme and culture decides form. When it comes to digital conceptual design or cinematic design the function of the building can be somewhat hidden unless there are scenes directly done with that building or area. The function of these buildings had little to nothing to do with the forms created for them. The Farm Scaper towers were lucky in this because you can always relate farming to nature. On the other hand the interlocking housing that looked like honeycomb was an interesting concept and creative connection. Now you might be wondering what this case study has to do with my thesis idea; I felt it was important to study forms expressed through digital design to give me a better idea of the future forms I myself will be designing.

INTRODUCTION

Gravity is a force where all things with mass or energy pull towards each other. So when you can't catch your balance and you fall down, blame gravity because it's at fault. People aim to defy gravity all the time or at least give the illusion that gravity has been conquered. Architecturally speaking we could argue that gravity rules our design decisions at the end of the day. We have to consider and calculate the building loads that gravity will allow in terms of height, overhang, etc. Architects have tried to push the boundaries of gravity before but maybe we haven't tried everything yet. This case study focuses on three buildings that seem to defy gravity.

17



Museum of Tomorrow,
Brazil

Everything about this building screams that can't possibly be real, and yet it is. This protruding volume of a cantilever almost twice the size of its building

TAKE AWAY

.Can give the illusion that gravity has been overcome

.There are many different ways that we could present the defiance of gravity

18



Cube houses, Netherlands

These houses create an illusion that the bottom portion of the houses are holding up a much bigger area and weight. the top parts of the houses are tilted 45 degrees to you dizzy. the

.Balancing loads can be important when constructing risky architecture designing in the real world

19



Balancing Barn, England

The overhang of this building should not be possible the Architects found a way to balance the load so solidly that he was even able to add a swing at the end of it,

CONCLUSION

Architects have to design with the notion of gravity and loads on their minds there is no getting around that. These Architects creatively found a way to show people that if we try we might be able to beat gravity first hand. Gravity is still very much a factor in all of these structures we just can't see what's hidden behind the scenes



Introduction

Tomorrowland, which is the name of both the movie and the city the characters travel to; A fictional Utopian metropolis city existing somewhere between time and space. Tomorrowland presents a fascinating soaring urban landscape with elevated pathways and buildings that essentially look as tall and as thin as a blade of grass. This city is riddled with many voluptuous curves and creative architectural elements. This case study reaches past what we have developed in urban cities today and look to the future. Unlike some movies, where the possibility of the conceptual urban design looks within our reach somewhere within the immediate future, Tomorrowland's Architecture looks as though it would not be possible to be built until centuries later.

Inspired by

Santiago Calatrava's City of Arts and Sciences in Valencia



Elevated streets

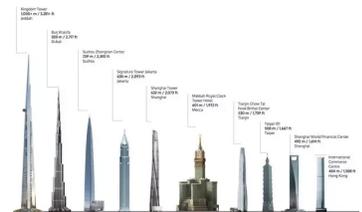
The elevated streets in tomorrow land is not supported like they should be to with stand traffic loads; the streets span above the water is too long to nit have in that area. Elevated paths for transportation purposes is not a new concept for a futuristic urban cities; this design have been portrayed in many other cinematic movies depicting future concepts. Elevated monorails and walking paths are being designed in places such as parks and arboretums that move through the city. Although Engineers assure the possibility of elevated highways we are not that confident about heavy metal contraptions racing above our heads.



Sky Scrapers

Tomorrowlands sky scrapers reach above and beyond the clouds. The tallest building outside of the digital world is the Burj Khalifa which reaches 2,717 ft above the ground.

These sky scrapers reach well past that. as of right now in architecture today this is not possible.



24

TAKE AWAY

.Although the city is fictional designed for a future we still take inspiration from current architects today the inspire our idea for the future

.Elevated highways and paths are a common futuristic concepts that is problematic if they aren't structurally sound.

.Height limits do not matter in architecture.

CONCLUSION

This study's focus was on a futuristic city called Tomorrowland. The architecture in this city had wild unrealistic curves and Skyscrapers that traveled past the clouds. yes, this city obviously was not concerned with height limits unless they are telling us that maybe in the future our height limits surpass the sky. In real life a lot of the concepts in this design would be hard, impossible, or some might even say "unnecessary" to build. structural reinforcement of the highways over the water would need to be added if this was indeed constructed in our world today. This movie's city pushes the limits through the tool of cinematic design giving a sneak peak into their envisioned future.

CASE STUDY SUMMARY

Each case study that was analyzed helped me acquire knowledge about my thesis question and overall premise. I aimed to find information that supported my thesis and surprisingly this was harder than I initially thought it was going to be. I set out to find out what we can design if we had no barriers in our way; and I wanted to explore this through cinematic design. There are two case studies that actually looked through the lens of Urban Architecture created in the cinematic movies Black Panther and Tomorrowland. You would think that because you can design a conceptual/made up city, in a digital space where the sky is the limit that the architecture created would be more daring or beyond the realm of this world's possibilities. Taking a look at Tomorrowland my expectations were met with the buildings that went past the clouds or the unnecessarily curvy elevated streets that could give a person whiplash. Other's weren't so obvious. Black Panther's city Wakanda had thatched roofs (lighter weight, dry vegetation roofs) which aren't feasible for a High-rise structure and there was one building that stood out where the overhang seemed as though if it were placed in our world today it would not hold up. I was relieved to find these things although I had to look hard for some of them; they support my thesis.

The investigated thesis question that you see in my narrative at the Beginning of my project was changed slightly due these cases. My thesis question now is "what we can design if we have no real-world architectural construction barriers in our way" but it used to just say "what can we design without barriers in our way. Barriers, meaning limitations. I had to change this because these case studies taught me that there are actually barriers in cinematic design and the main barrier turned out to be believability. In cinema they want their audience be able to envision themselves in that space but that becomes harder when what you're seeing looks unrealistic. So they were mentally constrained in a way. There were no rules set in place and yet there secretly was one. So instead of say no barriers or limitations at all I change it to no real world architectural barriers. These barriers include but are not limited to:

Building Code, safety Issues, Height limit, Building failures, Gravity, Egress, Water erosion, Environmental forces, Construction Budget, Management of material, etc

USER/ CLIENT or AUDIENCE

Anyone who watched movies or television



SITE

SITE LOCATION

Koblenz, Germany

In Cinematic design culture and theme help drive the design and innovative ideas, since I will be in charge of creating my own plot I felt Kloblenz, Germany and their architectural style stood out to me. I want this to be the base culture of my design as Africa and south Africa did for the movie Black Panther's Wakanda.



25

History

It lies at the junction of the Rhine and Moselle (Mosel) rivers (hence its Roman name, Confluentes) and is surrounded by spurs from the Eifel, Hunsrück, Westerwald, and Taunus mountains. A Roman town founded in 9 BC, it was a Frankish royal seat in the 6th century and was given to the archbishops of Trier in 1018 by the Holy Roman emperor Henry II. It was chartered in 1214. After passing to Prussia in 1815, it was the capital (1824–1945) of the Prussian Rhine Province. After World War I it was the seat of the Inter-Allied Control Commission for the Rhineland (1919–29). Although most of Koblenz was destroyed in World War II, many of its historic buildings have been restored, the reconstruction giving the city a spacious, modern appearance.



26



27

Site

Although I will be creating a fictional microcosm of a city meant to be viewed in motion picture; set to be created in the spring semester for the design portion of our thesis. I decided to begin my process by choosing an actual plot of land. Choosing a real world site will be beneficial to my future research needed to determine things such as the Idea topography or what the shadows should look like at the time and year of the movie setting.

The site chosen is along the Rhine river, I chose this site because when creating my fictional site I envision it being near a body of water. The size of my micro urban city was chosen to be 3 million Sq Ft. This may sound big but trust me it's not. The size a small city that houses a population of 4,000 people is roughly around 100 million Sq Ft. So as you can see my site is truly a microcosm.



28



29



30



PROJECT GOALS

Thesis

- explore what forms are possible to design when real world construction rules and limitations don't exist, explain why these forms would not work if the rules were set in place.
- Describe how, by observing these more architecturally abstract ideas through Cinematic architecture
Innovation and creativity can be pushed and expanded, impacting physical Architecture in the future.
- Find Accredited sources for my project research
- Gain knowledge of new site and culture located outside of the united states
- Integrate my ideas and thoughts into other people's minds as well

Personal

- Present a project that I am proud of that reflects my interests
- Inform the reader thoroughly about this project that I am very passionate about and explain my concepts clearly to be understood by readers in and outside the architectural profession
- Gain knowledge into the world of cinematic architecture
- Acquire new or improve on skills such as process, modeling, rendering, writing, etc.
- Stay focused and driven throughout the Entire design Process.
- Improve my presentation abilities
- Update portfolio to reflect my thesis for future Prospects



PLAN FOR PROCEEDING

The Thesis Question and Unifying Idea

The research into my Thesis question and unifying idea (what we can design if we have no real world construction barriers in our way. The overall premise invites the idea that through this exploration of design we can give light to new innovative thoughts.)

1. We will first dive into why cinematic architecture was chosen as the decided tool of choice for this project design.
2. We must look what insights innovation to help explore the overall premise.

Case Studies

Case studies were done to show cinematic and digital conceptual urban cities to reflect the design typology (urban design) through a cinematic screen. Each case study presented a new urban city design idea submitted to be either a utopian or dystopian conceptual city plan or concept. All case studies planned for the future by proving aspects of green design. Likewise, an example was giving for each case study of how real world construction limits could be stretched or ignored in cinematic architectural design.

Context

The Historical context of cinematic architecture will be researched through multiple validated recorded websites. This research will consist of:

1. History of cinematic Architecture and it's effects on real world architecture
2. Interactions between Cinematic architecture and citizens of the world
3. Cinematic architecture and it's relationship to cultural concerns

Site Analysis

Researching my site analysis where the site is located in Germany which consists of an entirely different UTC then here in the US. Examined will be:

1. The shadows and sun patterns of the site, this will mainly focus on or around the winter and summer solstice
2. Around site attractions, finding out are unique or commonly visited areas around the site
3. Construction style and textures, this is very important to my research as my design aesthetic will weigh heavily on this aspect.
4. Wind analysis
5. Circulation



THESIS RESEARCH

Why use the tool of Cinema instead of virtual reality or Augmented Reality?

The question of why I would choose cinematic design as my tool of choice instead of virtual or augmented reality (VR/AR) is a very valid question. Virtual reality and Augmented reality are fairly new in the design world. I was surprised to find out that outside of the design world augmented reality has actually been a thing for over 30 years. Virtual and Augmented reality are up and coming technology tools, used to help us experience simulated situations and real or conceptual spaces from anywhere in the world. Augmented reality and virtual reality are confused a lot of the time. Having a little knowledge using each one I found that both are hands on tools, but virtual reality allows more freedom. Virtual reality permits you to move and look in all different directions giving a sense that you are actually there in real life. Augmented reality allows you to look around in a 360 view from one specific area as if your feet were planted, it can also be placed a top of an existing reality.

Some companies are shy about investing in AR and VR technology as of yet, although many believe this technology has a very bright future in aiding us in many aspects of design. Some time in the near future both AR and VR will be more widely used but I don't believe it will surpass cinematic viewing . Film has been around since 1888 and is not going anywhere any time soon. People from all over the world love being entertained, which means that movies with funny/dramatic actors or action-packed films, etc. will never go out of style and will keep being watched throughout time by a wide range of audience. Cinematic design also presents widespread access to our intended viewers; there are so many devices now days that you can stream and watch movies on these days. Some examples of streaming devices are phones, video game systems, dvd players (although we're not sure how long these will still be used for), smart TV's, Computers, etc.

Cinematic architecture is watched through a screen, you're expected to sit back and enjoy the show. You see only what the director wants you to see. What augmented and virtual reality have that architecture through cinema may not have is the freedom to choose where and what you look at. Although this is nice being able to have free will in all, my goal for this project is not to simply have an audience look at the different architectural concepts. I want them to see how it's used as well, and take in the concept of "what if" something was designed this new way instead. The way these actors move through and interact about the architectural design ideas will help in accomplishing this goal, showing how the city flows with the people. Having a directed point of view may be beneficial in getting the design aspects across to the viewers

“To endow with a poetic value that which does not yet possess it, to willfully restrict the field of vision so as to intensify expression: these are the two properties that help make cinematic decor the ideal setting for modern beauty.” - Aragon



LITERATURE REVIEW

Literature Review

The literature reviews taking place in this research study will assist me in the scope of my research. After reading through some Articles and Skimming through books I have found that many others have investigated the cross section of cinema, architecture, and the limitations associated with both. The question investigated is “how does real world Architectural construction limitations inhibit our design creativity?” This literature review will focus on three articles that were analyzed to give insight into the investigated question.

Focusing on constraints inhibits design excellence by Paul Finch (2017)

This first article Focusing on constraints inhibits design excellence by Paul Finch was written in 2017 and posted to the Architects Journal website. Paul has many opinions on what he feels defines good design and how to approach design to provide the utmost creativity. Paul has been all over, watching lectures, reading design reviews, and traveling to architecture festivals. He has seen how architects present their work and found that more and more are starting the design process by analyzing what they can't design on the site first; because of this, architects are essentially proposing that because they couldn't do “that”(“that” being the restraints) they were forced to design “this”(“this” being the final product/solution). To me The word “forced” has a very strong connotation to it. We don't want to hear excuses from our designers to why they couldn't design what they wanted to design instead we want to hear how they overcame it.

Reading this Article, I found that I agreed with a lot of what Paul was saying. Like him, I believe that it doesn't make sense to start off with looking at your constraints in the beginning of the design process. Why not, you ask? That's a good question, what stood out to me most when reading this article is the uncomplicated answer to that question or at least what I took away to be the answer; simply, constraints are constantly depressing things. How do you expect to have a good outcome if you're focused on the bad? The good and the bad are contrasting concepts that do not work well together.

This article was very informative and intuitive but there were some points I just didn't agree with. In Paul's travels he believes that the best presentations that he has witnessed and most creative involved site analysis and the context of the history of the site. Not the ones that focus on the limitations but the ones that center on the relationship of one to another. He also mentioned that projects that propose form and massing are impactful in their creativity. I agree, in the sense that one process is capable of presenting a more creative result over the other but I also would disagree by pointing out that both processes are widely used, and I can't help but think that we need a change.

I found it odd that in this article Paul addresses one constraint specifically when there are many to consider. He talks about not letting the budget of the project impede on your innovative course. Now, I'm not sure if Paul believed that budget was the most crippling restriction or not, but if he revealed this constraint then he should have expanded on all the rest as well or at least a brief few. By inserting that section into the article, it sort of threw it all out of whack. It was no longer about the focus of all the constraints inhibiting design excellence but lingered on a single one. This part of the article was a bit unnecessary if you ask me and if it was left out of the article completely his point would still have gotten across clear as day.

Paul ends his article by speaking of other approaches taken to achieve excellence. There is an approach he gave that can solve some of your restrictive elements of your project before you even are aware of them. By merely looking at your site and studying its surroundings you can already get a sense of height and other issues. This way, when your design gets to the stage where it's absolutely necessary for you to look at your constraints you won't have much to change anyways and your design is not forced or compromised.

This Article Focusing on constraints inhibits design excellence had its strengths and flaws. There were countless points that I agreed with and others I was not so keen on. In the end it was clear why focusing first on the constraints would be like having as Paul declares "metaphorical hands tied behind our backs." Paul was brave enough to give an opinion that went against the grain some teaching techniques and I applaud him for that.

The Psychology of Limitations: How and Why Constraints Can Make You More Creative by Belle Beth Cooper (2014)

You may be able to tell from the title of this article The Psychology of Limitations: How and Why Constraints Can Make You More Creative by Belle Beth Cooper that this article aim is to contradict my investigated question. Written in 2014 this piece claims that limitations don't inhibit our creativity but in fact does the opposite. Although belle provides an amazing argument her point is soon contradicted first by a mere comment attached to her article and again when (spoiler alert) my next article shows that "constraints are beneficial up until a certain point and then eventually become too restrictive thus reducing creativity" (joyce,2010).

Belle believes that having too many choices can actually cripple us; I've read many articles and found out that they call this the blank canvas effect. She believes that constraints that limit our options help us make faster and more specific creative decisions. This article provides multiple works of people who were able to accomplish great things despite their restrictions or the odds against them. Some works she offered were about entire stories that had to be told with the restriction of only six words. Another work spoke of an artist that acquired a disability that made his hand shake, and he learned that his shortcoming founded a new type art, since then, this artist decided to embrace limitations by adding more, taking the challenges as a creative strength. She gives many more examples in this fashion of artists being creative with the restrictions presented in front of them and explains of their triumphs, but a lot of the restrictions spoken of in the article thus far seemed self-inflicted aside from the onset disability acquired by the one artist. One artist wrote poems by blacking out words in a newspaper and his restriction was that it had to go in consecutive order. Although impressive, this restriction was one he made for himself unlike real world architecture where there is a book of code and the restrictions are set for us involuntarily.

These examples were all well and good, but I was glad to find that Bella had an extra card up her sleeve. Restrictions in the workplace. Dealing with company size specifically the small upcoming companies such as 37signals; that started off small with little to no budget and crazy work accommodations such as time difference from having employees work in separate locations and focusing on existing clientele as well. Now they're big and successful Belle points out.

I was reading the comment section way at the end of the article where people were able to give their thoughts on the article and it was very well received by some but there were still other arguing points. One person names comments regarding the section of the article that talks about 37signals and their restrictions. He writes "I'm confused about your 37signals example. All the things you listed as constraints were things they had when they were a smaller, not-well-known company. As they got more successful, they seem to have gotten rid of all of them. DHH is in the US, they don't have design clients, they have a larger team and they have outside investment. This seems to suggest that *reducing* constraints is correlated with being successful."

From this mere comment, Belle's article unravels. I was Surprised, to be honest it was hard for me to find a dispute in the article report until the comment section presented itself. This comment brought my investigated question back up to the surface. Where belle felt as though she was proving her point, she in turn proved mine (limitations inhibit our design creativity) without even knowing it.

I was incredibly amazed to learn how one little comment could produce so much damage to a well thought out and graphically pleasing article such as this. Bella presented visuals and told her stories well. I consider this a great article worthy of being my adversary.

The Blank Page: Effects of Constraint on Creativity by Caneel K. Joyce (2010)

This will be the last article Presented in this literature review. Caneel is an accredited Doctor of Philosophy in business administration. She wrote a dissertation titled The Blank Page: Effects of Constraint on Creativity regarding the effects of constraints and restrictions in the design process. This essay was created at the university of California Berkley, in the year 2010. In this study Caneel set out to see if whether the amount of constraints given limited or influenced creativity. This was a controlled study concentrated around a product design task.

To conduce this dissertation Caneel did more than just rely on research alone, instead she conducted her own study consisting of 246 undergraduate participants. I was always taught in my Biology classes that the larger the control group the more accurate your results, so as far as I'm concerned Caneels results are pretty accurate In terms of her sample size. The main flaw that I can tell with this control group is that the age range was too focused. Undergraduates range from many ages, but we can assume that most are around the age of 18 to 24 as this is the average undergraduate age range. Directing more studies with a greater age variety would make the results of this dissertation undeniable.

Performed in a laboratory, these participants were encouraged to creatively come up with a new product design through research and by delivering a written proposal. These proposals were each judged by five separate judges and were later used to test Caneel's initial hypothesis. Turns out as she expected the results proved to be curvilinear, which she explained to mean that in some cases constraints weren't all that bad. A moderate amount or restrictions proved to generate higher ratings then the variables that had either a too high or too low amount of restrictions.

There are many articles and books on this topic, Caneel saw that there was a controversy on this subject of restraints and its direct correlation to design creativity; rather than choosing a side on whether it will enhance or inhibit design creativity , she decided to stay neutral and say that in a since, both are true. Although some might read this paper and feel as though Caneel discredited both point of views, I argue that she made the point of view where constraints hinder design creativity even stronger.

At this point I'm sure I confused some people. You might be wondering how I could say that instead of disproving my investigated question, Which I will reiterate to be how restrictions inhibit design creativity, Caneel presented to us exactly how it can inhibit us. The presence of a high amount of limitations to a design project proved to restrict our design creativity. By finding that a moderate amount of restrictions gave higher creative design ratings proved little because you could make the point that all design projects start with a moderate amount of restrictions and set of rules that you just can't get past. Take my project for example; An urban design project that is based on having no real-world construction limitations which should leave me with a pretty open field range to almost do as I please. Instead by specifying that I'm working on an "Urban design" project, that alone, although not much, creates a set of constraints/rules that need to be adhered to, to make it in fact able to be labeled Urban. In a separate article called How to Define Constraints in Project Management that we will not be analyzing in this literature review; the author, Jordan James, agrees by saying that.....

“ Constraints are an inevitable part of any project.”

As Caneel proved, the higher the constraints are, the design creativity is negatively effected.

Caneel, an accredited Doctor of Philosophy shed light on the effects of constraints and restrictions on our design creativity. This review was based on study one of her dissertation mainly because it was the one that related most to my project and gave insight into the investigated question. Although her study consisted of a large sample size, Caneel could have went farther, testing other age groups as well. caneel's results of her study didn't favor the idea of constraints on a design project nor did it favor the idea of no constraints at all; instead it showed that a modest amount of constraints proved to give the highest creative design performance. Caneel didn't consider the fact that all projects come with an inevitable moderate amount of constraints. Knowing this, means that constraints that surpass the initial moderate amount can and will inhibit our design creativity according to caneel's findings.

Literature Summary

The three articles analyzed for this literature review were very well written and thought out. All articles presented, gave knowledge on the topic of constraints and its effects on design creativity. Each article contradicts the other but in the end (without being aware) they all agreed on the same issue; that constraints have an adverse effect on our design creativity. The first article felt strongly that constraints and restrictions limited our design creativity, the second article chose the opposing side, arguing that limitations actually enhance our creativity and the third article decided not to choose one over the other, they argued that neither was right and instead a perfect balance between the two is what enhances our design creativity. With that being said, the second article was compromised by a comment made on its very own site unraveling their entire article. The third article didn't crash and burn like the second one, but in its quest to get their point across they answered the investigated question by proving that restrictions can eventually deter your design creativity. The third article also proved that a slight amount of restrictions enriches design innovation and since all projects inevitably have slight restraints to even begin the project it just proves that moderate restrictions are basically ground zero for a project, so loading that Beginning project up with an abundance of extra restrictions will limit the design creativity.

When reading this literature review you might notice that the three articles spoke about all design project limitations. None of them focus on architectural construction limitations specifically, which is specified in my investigated question that this literature review is based on. This is because when talking about construction limitations such as Building Code, safety Issues, Height limit, Gravity, Egress, Water erosion, Environmental forces, Construction Budget, Management of material and the list goes on and on; the constraints are profound. Knowing this, I decided that looking into restrictions on design creativity alone would be enough to give an answer to my investigated question. With the many limitations given in a real-world architectural construction setting, each article presented insightfully share one thing, giving a total of three, that can be applied to the explanation of why all these restrictions will hinder us.

- 1, Simply, limitations are bad for your design creativity because you are focused on the negative part of your design when you should be focused on the positive (what you can do, instead of what you can't).
- 2, When you remove your limitations and obstacles in your way you will thrive, and your design creativity will thrive with you.
- 3, A high amount of restrictions is proven to limit our design creativity.



Performance Criteria

The criteria for this project are meant to be mentalistic to help keep the mind open. In order to design an urban city without real world rules or limitations and use this design through cinema to spark future ideas there are certain things I need to include in this project. I have studied what makes an urban city well, urban. The criteria for this project will include the most basic needs of a city to define it as urban rather than rural or sub-urban. The criteria of this project also incorporate what's needed to inspire innovative thoughts in others.

Criteria

What does an urban city need to have?



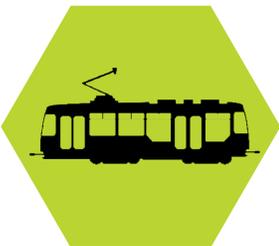
Buildings

- School
- Police Station
- Hospital
- Post Office
- Bank
- Restaurant
- Fire Station
- Club
- Court
- City Council
- Living (apartments and houses)



Public Spaces

- Plaza
- Parks
- Outdoor Spaces



Transportation

- Trains
- Shuttles/Buses
- Air Travel
- Etc.



Streets/ Pathways



Landscape

- Topography
- Vegetation

Important for form and spatial definition

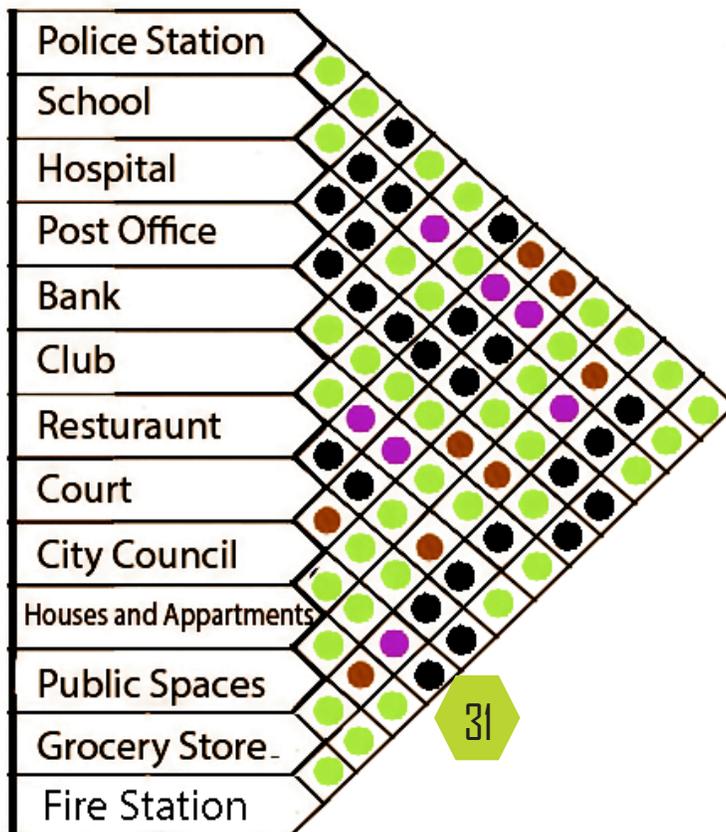
- ◆ Order ◆ Unity ◆ Balance ◆ Proportion ◆ Scale
- ◆ Hierarchy ◆ Symmetry ◆ Rhythm ◆ Contrast ◆ Context
- ◆ Harmony ◆ Beauty ◆ Texture ◆ Detail ◆ Hierarchy

- What does the audience need to see to help spark future innovation?
 - ◆ New Ideas (something that hasn't been done or used before in this context)
 - ◆ Green Design (the future is headed their so incorporation is key)
 - ◆ Function (does everything work together smoothly)

Adjacency Table

ADJACENCY

- ADJACENT
- NEARBY
- NOT RELATED
- NO





PROJECT JUSTIFICATION

Projects Justification

This project is important to me because architecturally we are not pushing our boundaries in innovation far enough and I don't like the idea of a world where innovation stands still. As architects we are stuck in a way of thinking; we need to push through and see past the veil over our eyes that's obstructing our view and the creative things that can still be thought of and constructed. I'm not proposing that we do this on our own. we can't see a new way of designing if we keep looking at the same old stuff. Einstein Agrees when he points out that "Doing the same things but expecting different results is what they call madness'." So, let's give them something new to look at, whether it's a new way to design or layout an urban city or a different way to design our everyday living quarters, etc. We have an opportunity to show new types of designs, creations that aren't obstructed by real world construction limitations. Enlisting the help of cinematic design will give us new ways to inspire innovation by proposing new ideas on a global scale; helping to open our minds and get those creative juices flowing.

This project will help me understand how cinematic Architecture works giving me insight into a different form of architecture that we are not taught in our five-year architecture program here at North Dakota State University. In the future I will have more of an advantage for this reason and could possibly choose the route of cinematic architecture instead of the other conventional architecture jobs out their; going in with a bit more knowledge than my peers.

Its important that is project is done now and some might argue that in some ways it is being done currently. You might be surprised to find out that I am one of those "some". Architecture take from cinematic ideas all the time and vice versa but in too small of increments. Consumption is key; unfortunately, no one is taking this seriously enough. My goal is not to have them copy exactly what they might see on the screen but to inspire. So we need to do this now and stop thinking as architecture in cinema as just the background behind the actors but as an important tool that can invite new ideas into our future real world construction.



HISTORICAL, SOCIAL, AND CULTURAL CONTEXT

History

It wasn't until the mid to late 90's that people realized how architects could make an important impact in film design. Before architects had a role in film, the architecture was handled by the production designer or art director. This is still the case sometimes depending on the film's budget. Bob Fear explains how

“Their primary role was to create visual form and emotional tone in the backdrop of a film.”

Production designers and art directors did just that, and little more. They searched and studied the right aesthetic and mood they wanted their movies to portray; scoping out materials such as steel that eludes a more cold and distant feeling or designing their buildings to reflect the time and or culture the movie was set for. Although these methods are all important, they focused more on the visual aspects “preferring reference and assembled imagery over a methodical, iterative design process. As a result, we are left with often banal representations of the city, with skylines almost comical in their naivete and awkward in their massing.” Expecting a production designer or art director to do the work of an architect is like asking an architect to direct the cast and dialogue of a movie, it just doesn't make much since in terms in what they were trained and are experienced in. Architects are now very active in the film industry.

Social

Unless you're kept in a box or a society that doesn't use electricity then you've seen a motion picture and witnessed the architecture through it whether you decided to focus on that aspect of it or not. Over 19 percent of Americans go to the movie theater frequently (as in one or more times a month). Over 54 percent go within the year. If you're like me these numbers still sound pretty small but don't worry; more people are watching these movies through streaming apps such as Netflix or showtime. Dare I say it, there are even people streaming illegally (hush) through pirated sites and other forms of media. Now, I couldn't find the statistics but if I were a betting woman, I'd say that more than 90 percent of people watch motion pictures. and through these films people of all ages are brought into the scenes through the architecture created around them.

Cultural

“cinema is a visual language that tells stories in moving images.”

The stories we tell through the architecture in cinema brings light to cultural concerns, cultural fixes, and lets not forget just culture in general. A lot of movies gave insight architecturally to predictions of what our future would look and be like and how that could affect our culture and way of life.

Cultural concerns

Take the movie High-rise for example; with the wealthier people living towards the top and the not so wealthy towards the bottom. or the movie metropolis with its” subterranean level homes to an enslaved underclass existing only to keep the city running for the elite class living above.” the architecture in these movies are made to reflect cultural concerns in a future city design such as this one proposes.

Cultural Fixes

Cinematic architecture also deals with cultural fixes. This doesn't mean that they fix or change one culture, but cinema has been used to address cultural integration issues and injustices. An example of a movie that does this is a movie called Ruby. Ruby was a movie created in 1998 about an African American girl attending a white school back in the day. You can imagine some people in this movie were not happy about that, but the few people of the opposite culture that went out of the way to include this little girl and her family is what brought both cultures together. Movies like this that show two or more cultures and their past or present conflicts and how they can resolve and integrate with one another is how cinema helps fix cultural conflicts and much more.

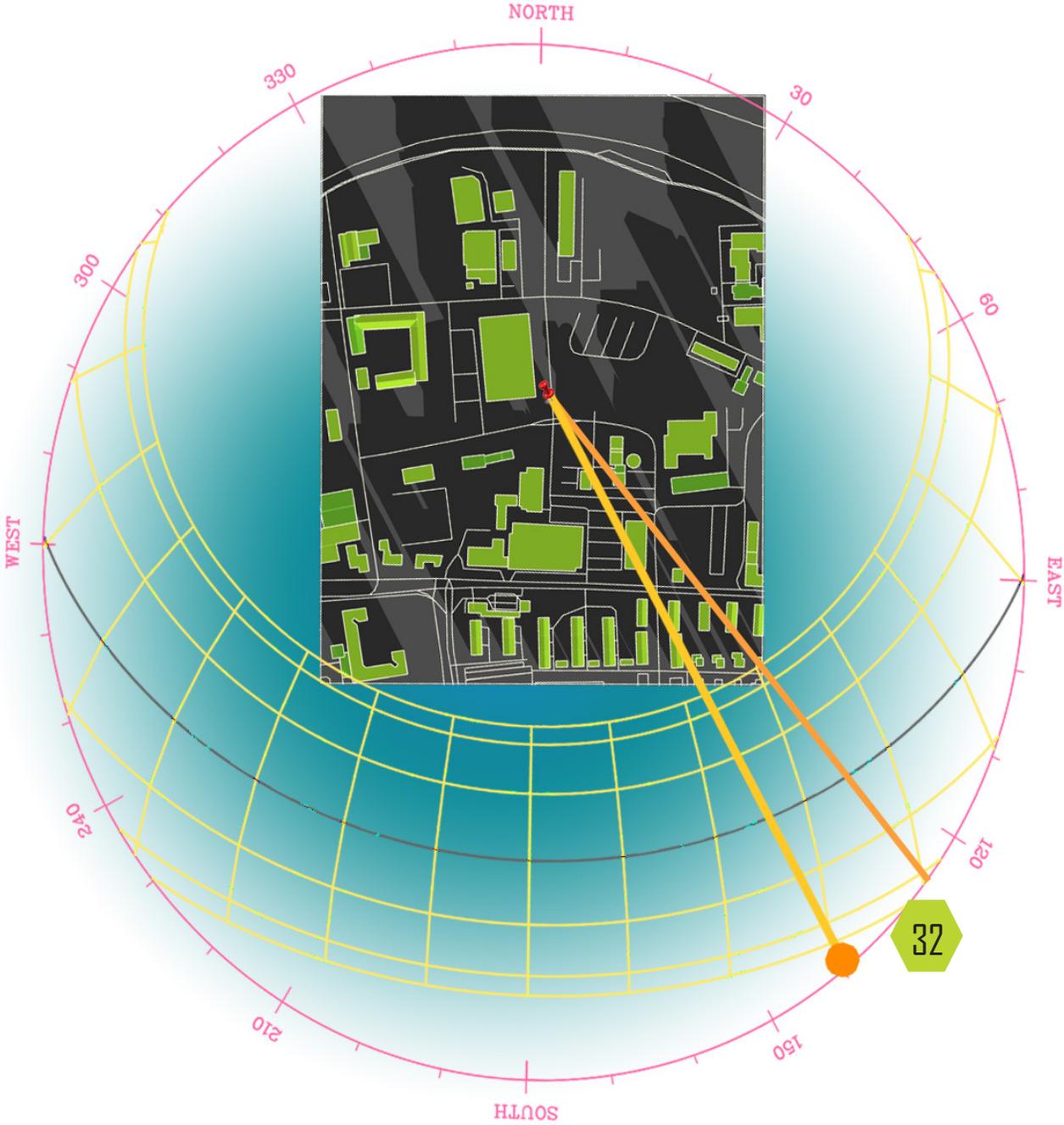
Culture

Culture plays the biggest role in cinematic design. I would argue that culture is what we strive to reflect in our architecture either digitally or in the real world. Without the knowledge of the culture and way of life how would we know how to design our digital city? The simple answer is that we wouldn't; everything would be generic blank white rectangles if you ask me (if that).



SITE ANALYSIS

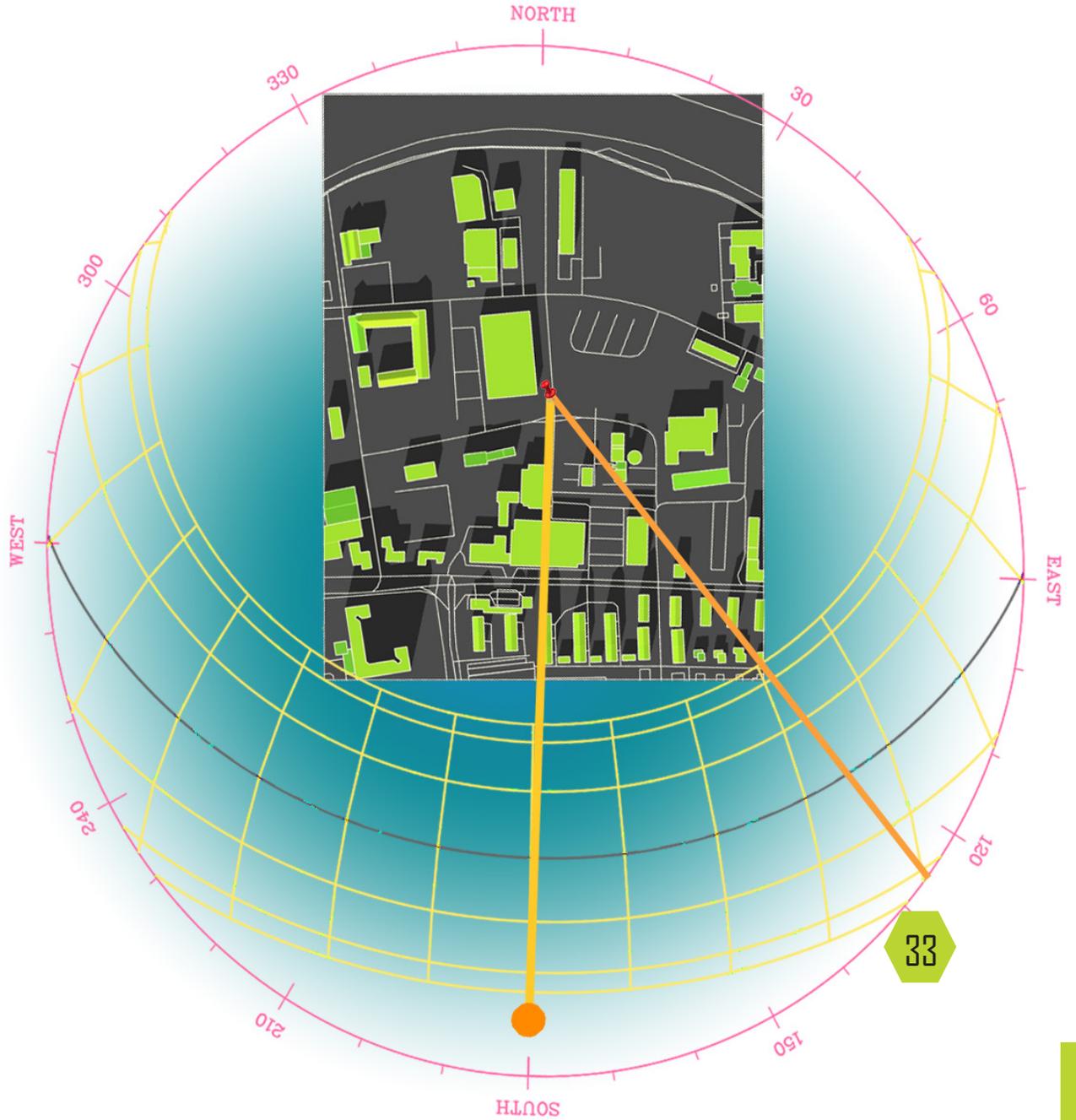
Winter Solstice: Sun, Shade, and Shadow



December 21st

9:00AM

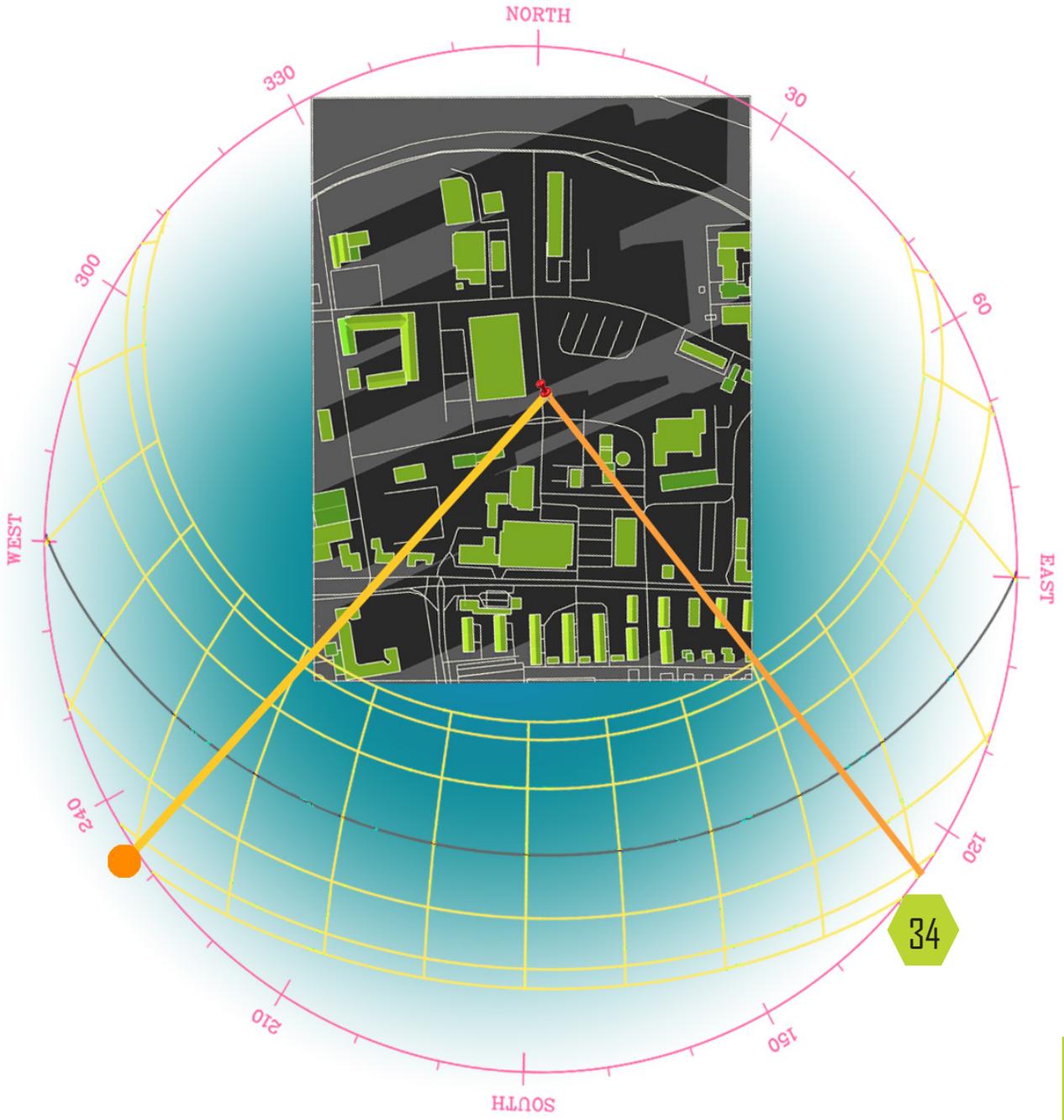
Winter Solstice: Sun, Shade, and Shadow



December 21st

12:00PM

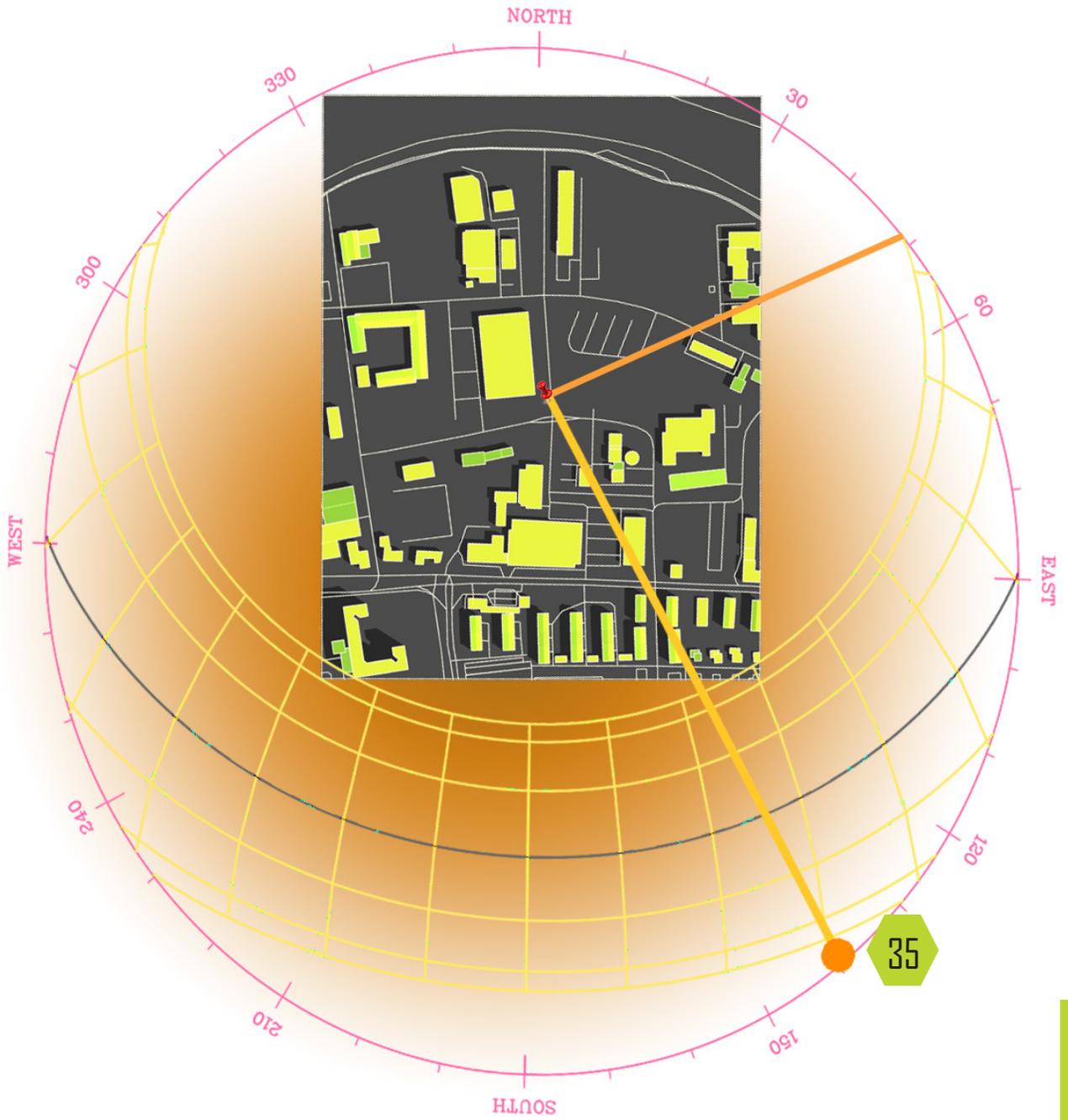
Winter Solstice: Sun, Shade, and Shadow



December 21st

4:00PM

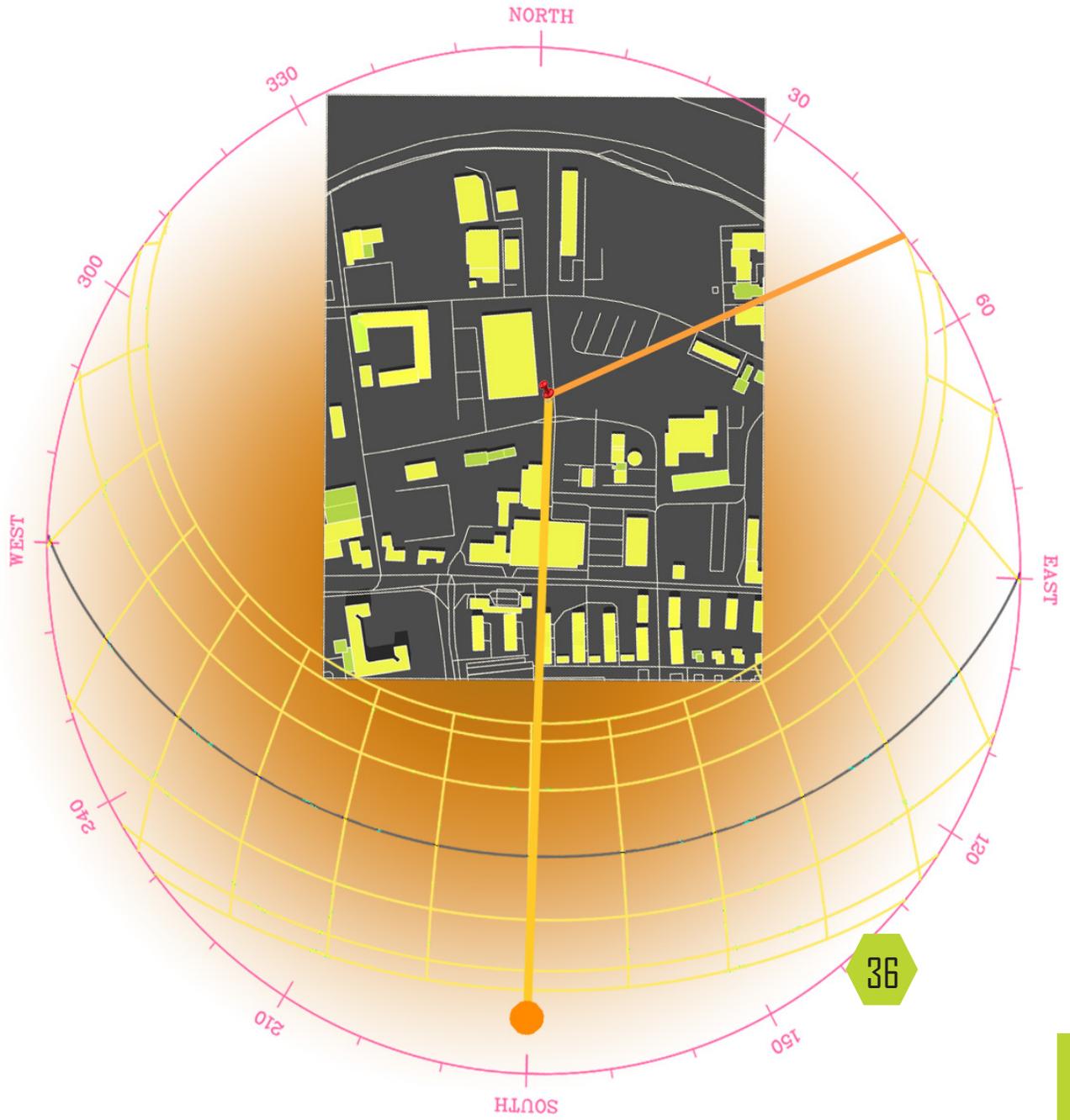
Summer Solstice: Sun, Shade, and Shadow



June 20th

9:00AM

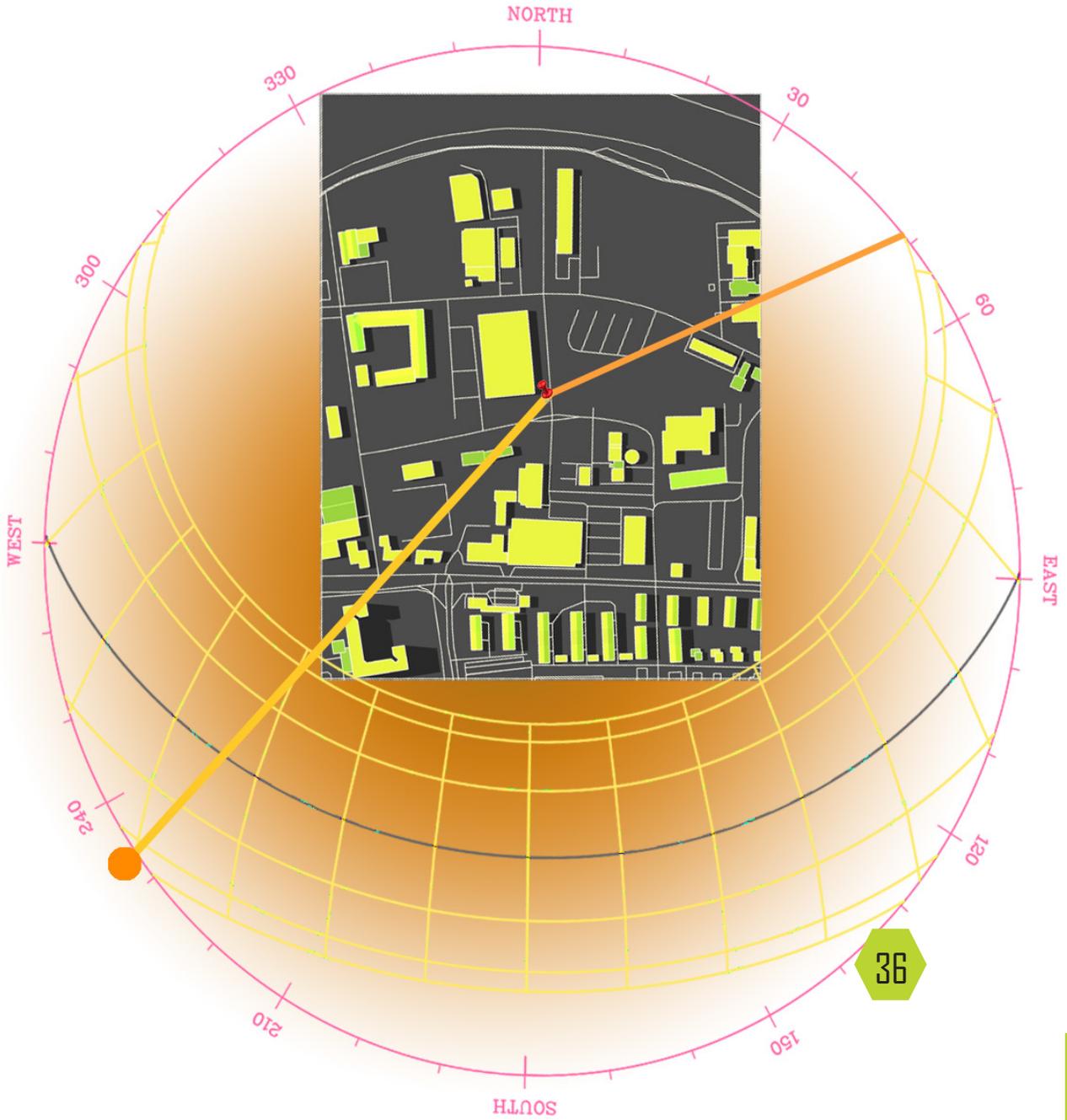
Summer Solstice: Sun, Shade, and Shadow



June 20th

12:00PM

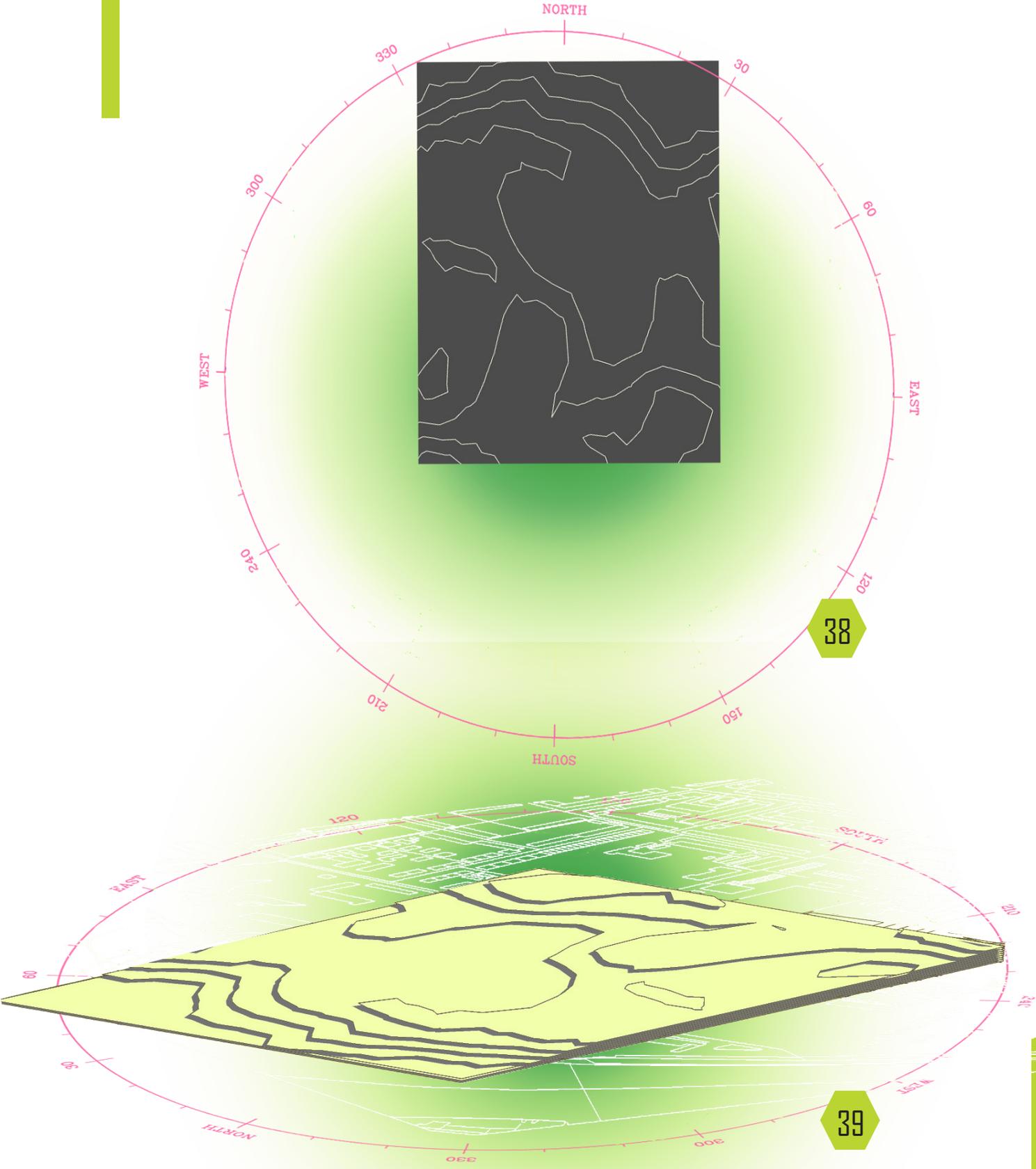
Summer Solstice: Sun, Shade, and Shadow



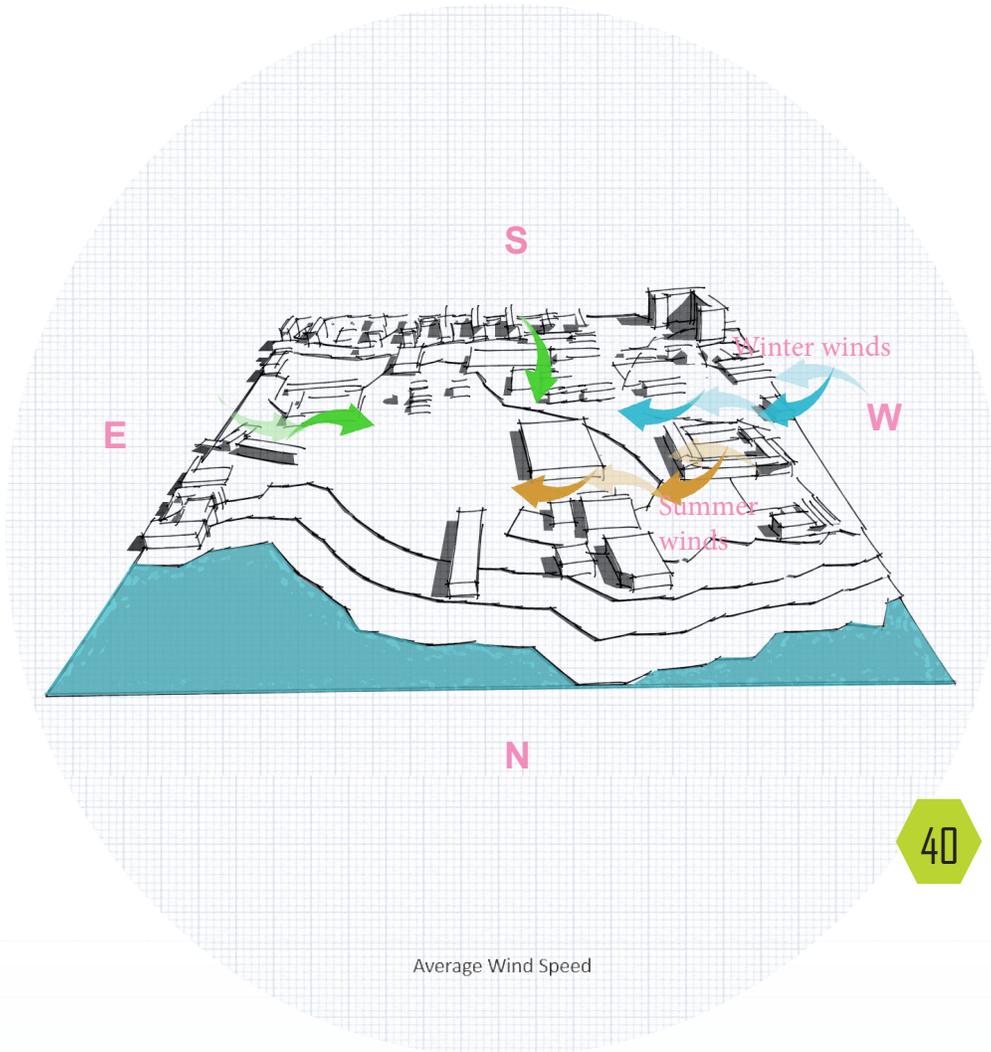
June 20th

4:00PM

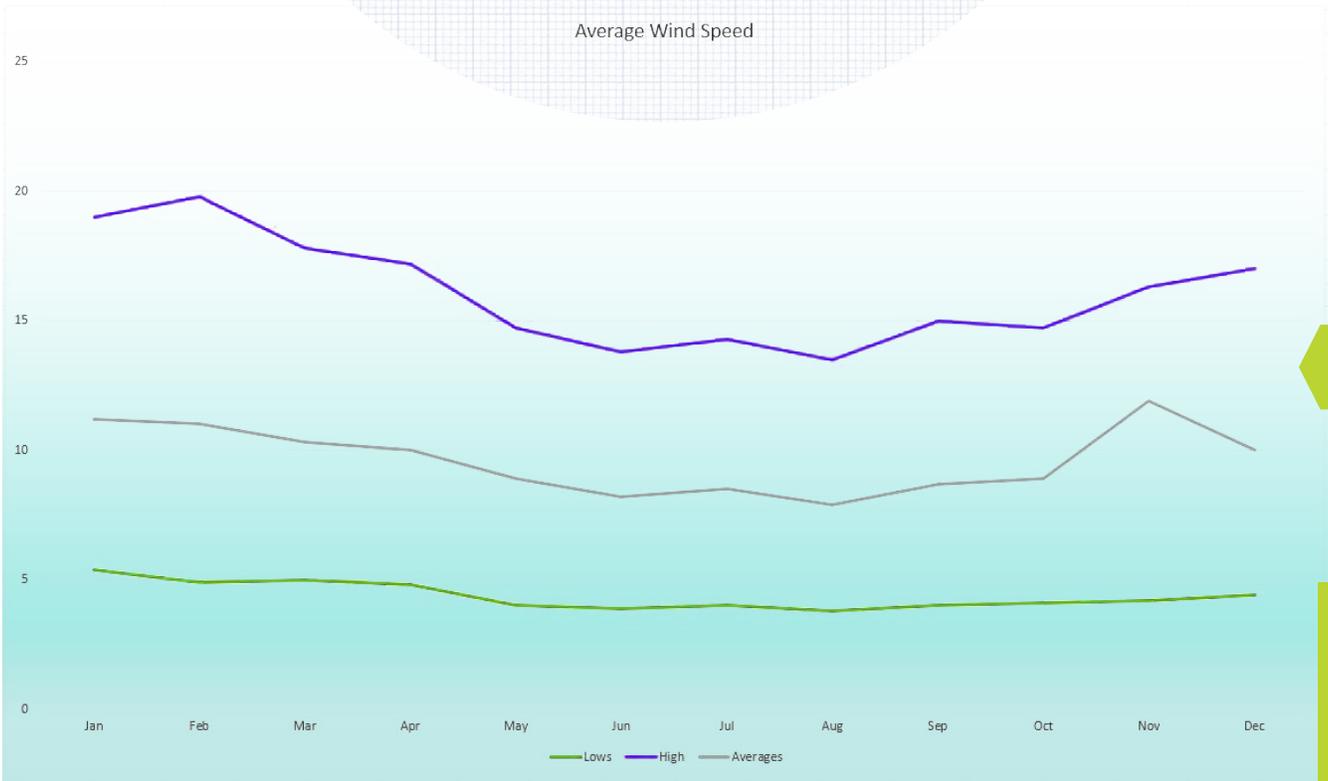
Existing Site Topography



2D & 3D Image



40



41

Direction and Speed

City Attractions and Activities



42

Castles

- ◆ Stolzenfels Castle
- ◆ Ehrenbreitstein Fortress
- ◆ Burg Laheneck
- ◆ Marksburg



43

Town square: Shopping

- ◆ Florins market



44

Dance Clubs

- ◆ Druckluftkammer
- ◆ Circus Maximus
- ◆ S 38

City Attractions and Activities

Cable Cars

- ◆ Gondola lift station



Gardens

- ◆ Konrad-Adenauer-Ufer
- ◆ Rhine
- ◆ Blumenhof
- ◆ Schlossgarten



Museums

- ◆ DB Museum
- ◆ Wehrtechnische Studiensammlung
- ◆ Ludwig Museum





PROCESS SCHEDULE

January

| S | M | T | W | T | F | S |
|----|----|----|----|----|----|----|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | |



Week 1

Spatial diagram (drawings and sketches)
and zoning mass models



Week 2

Martin Luther King Jr. day 
Continue with spatial diagram (drawings)



Week 3

design (organic) above
paths and underground Streets

February

| S | M | T | W | T | F | S |
|----|---------------|----|----|----|----|----|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |



Week 4

Finish path and street layout, Research Koblenze architectural design style and techniques



Week 5

Digital model 1st iteration of urban city design related to site



Week 6

Presidents' Day 

Revise Ideas based on group discussions and start on



Week 7

city design development

March

| S | M | T | W | T | F | S |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |



Week 8
Continue on city development. Render digital model and construct board layout design idea for midterm review.



Week 9
Midterm presentations



Week 10
Spring Break



Week 11
Midterm Recap (continue with design development)



Week 12
Revision of buildings, paths, etc. based on midterm critiques and produce an official site plan

April

| S | M | T | W | T | F | S |
|---------------|---------------|----|----|----|---------------|---------------|
| | | | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | | |



Week 13

begin details, Section, and elevation drawings and plans



Week 14

Produce official final board layout idea
Start renderings, Finish details

~~Easter Break~~



Week 15

~~Easter Break~~
Final Production (design development)



Week 16

Final Production (design development)

May

| S | M | T | W | T | F | S |
|----|----|----|----|----|----|----|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |



Week 17

Final Presentations



Week 18

Final book modifications and uploads



FINAL DESIGN SOLUTION & PROCESS WORK



Cinematic Conceptual Urban city Backdrop

48

Plot

After the third war there was no more hope in preserving the world they once knew, every inch of it was littered, filled with sickness and violence. Ada longed for the city her grandmother always talked about in the fairytale she read to her before bed. A city devoid of violence, centered around clean air, and positive human interaction. A city where everyone could co exist no mater their status. Now, on her 16th birthday, Ada's Grandmother gifts her a snow globe with a map leading to a peculiar city inside. Ada sets out on a dangerous quest to uncover its destination, is it the city she always dreamed, or is it too good to be true?



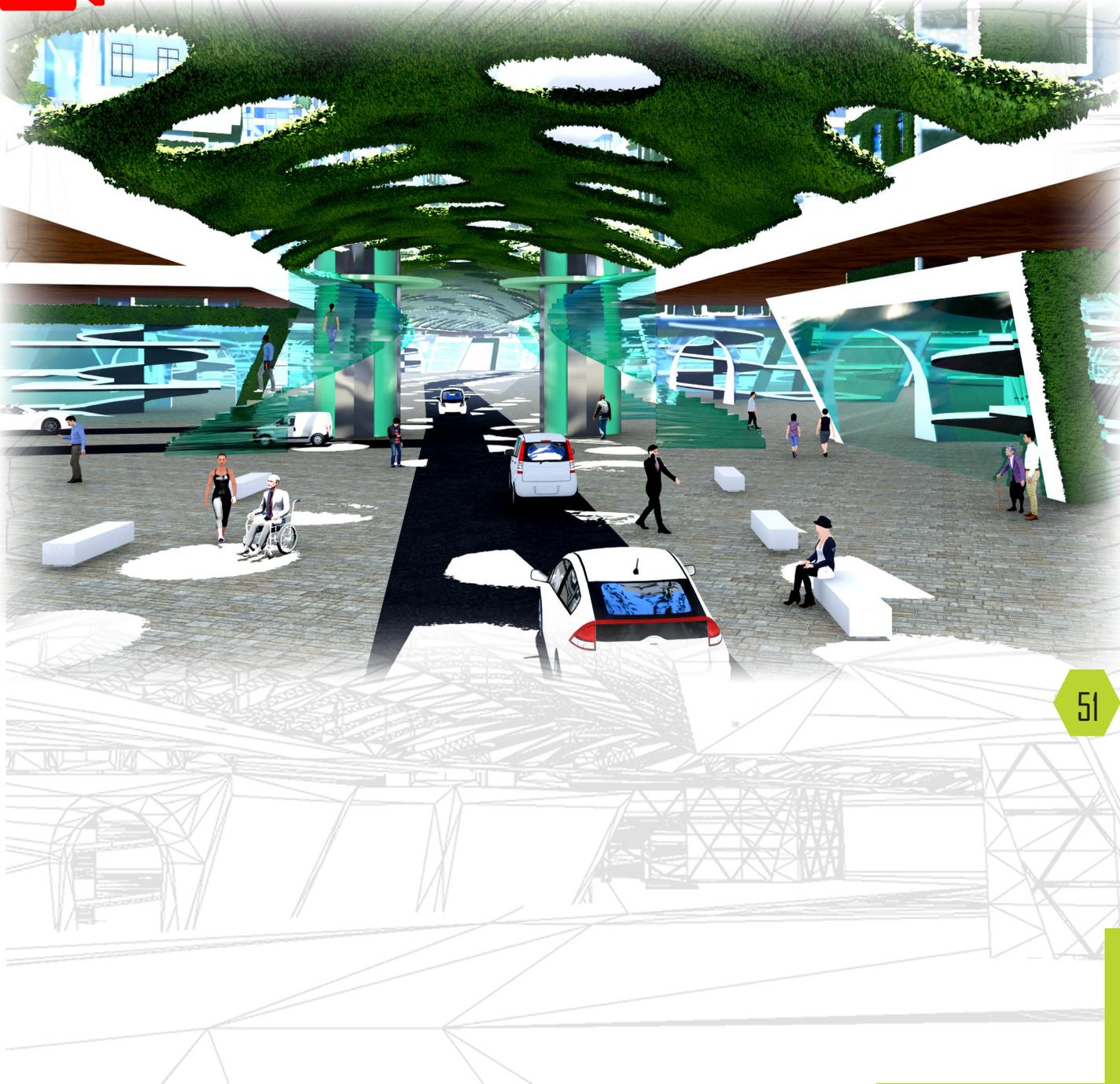
49

1



50

2



51



3



52



4

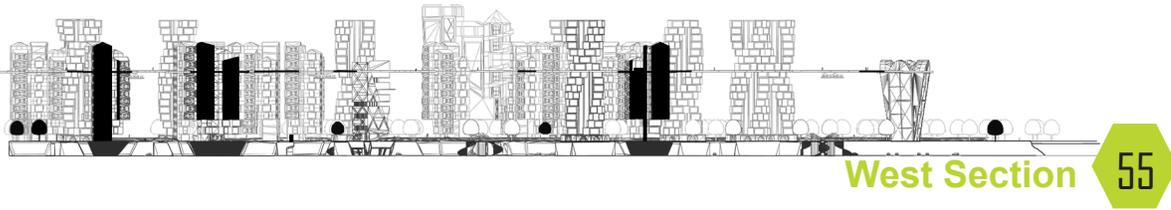


53

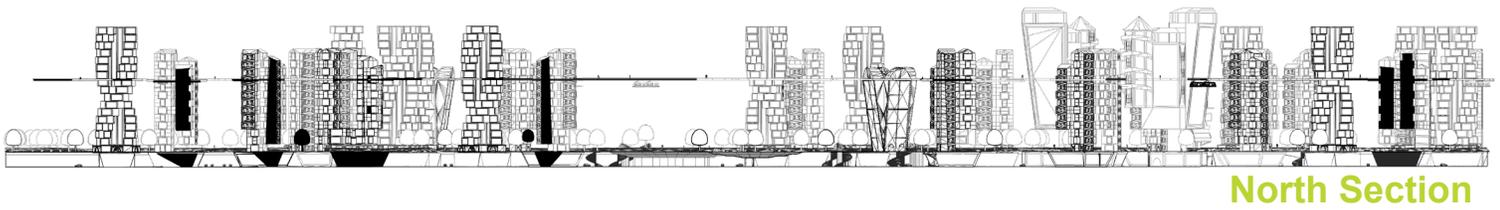
5



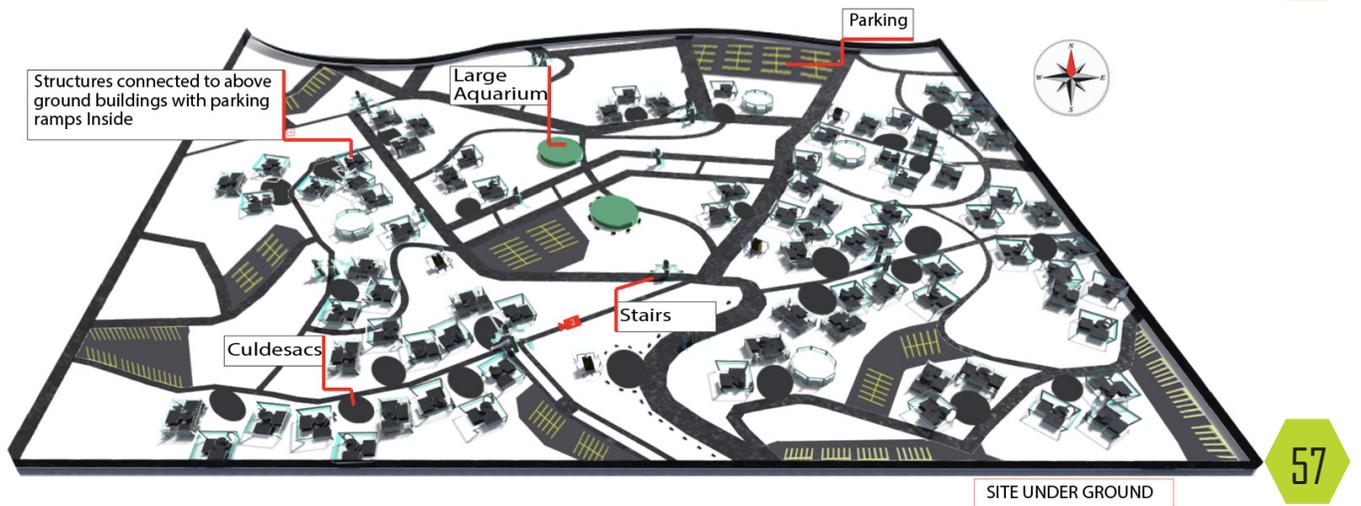
54



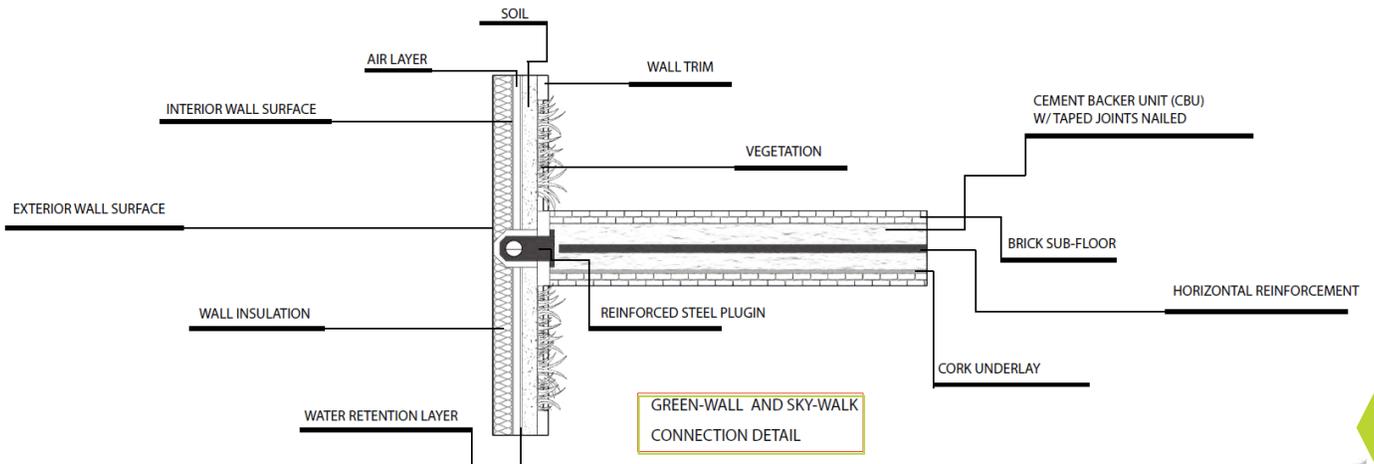
West Section 55



North Section 56

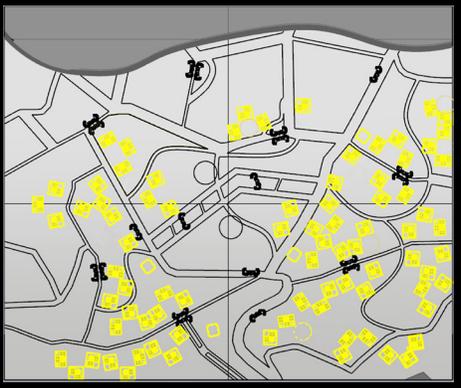
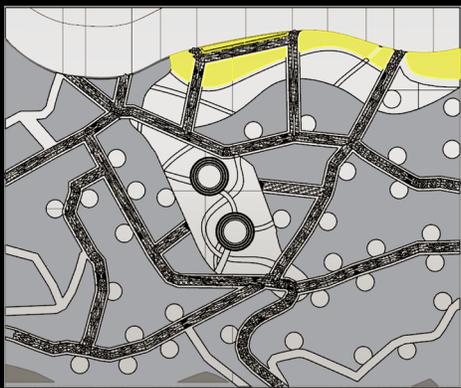
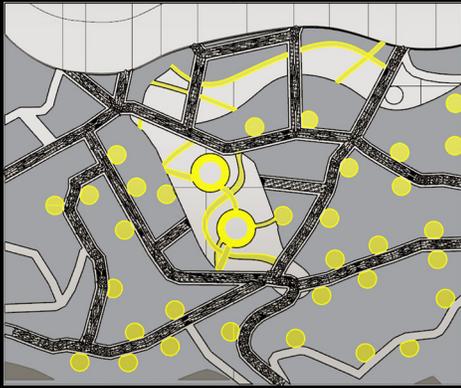
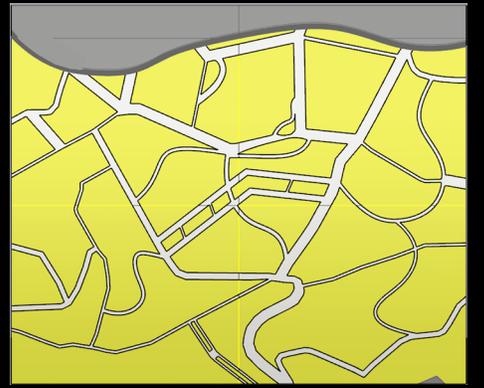
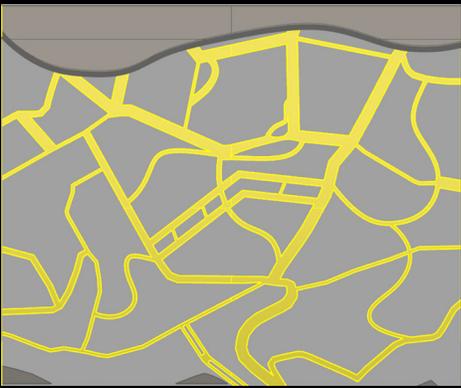
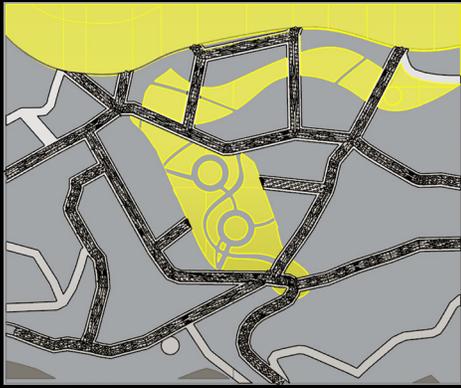
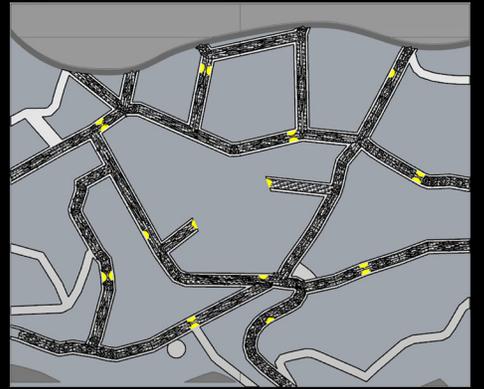
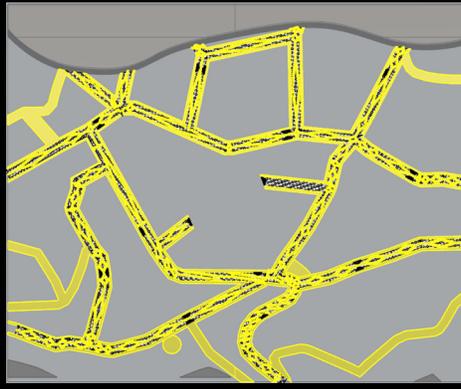


SITE UNDER GROUND 57



GREEN-WALL AND SKY-WALK CONNECTION DETAIL 58

Process Order Sketches



Real World Street Layout



San Francisco (rigid = rules)

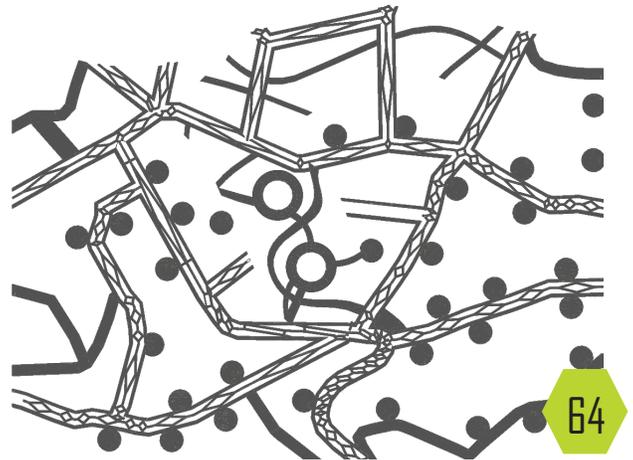
Thesis Design (organic)



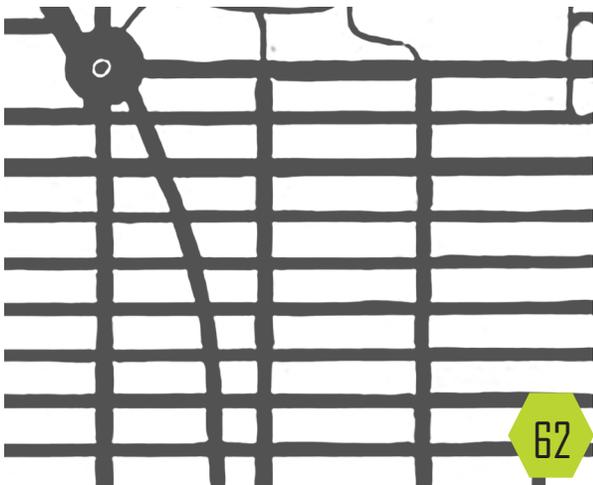
Underground Streets



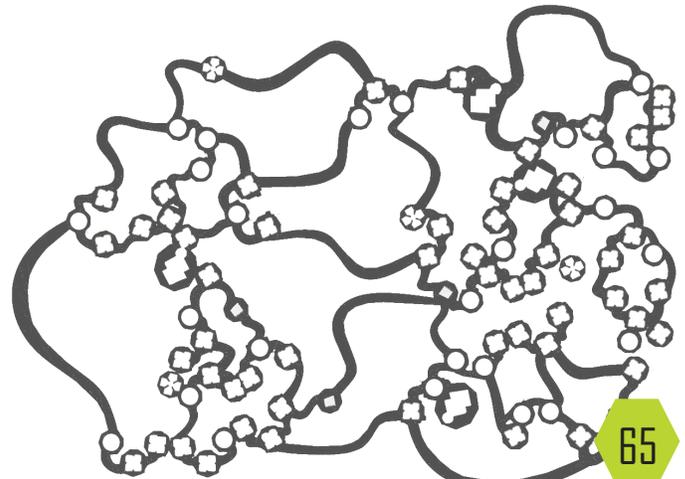
London (organic = no rules)



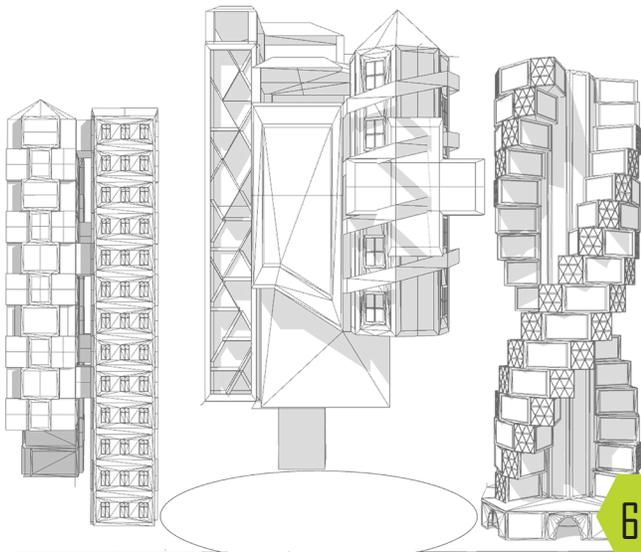
Main Ground Paths



New York (rigid = rules)

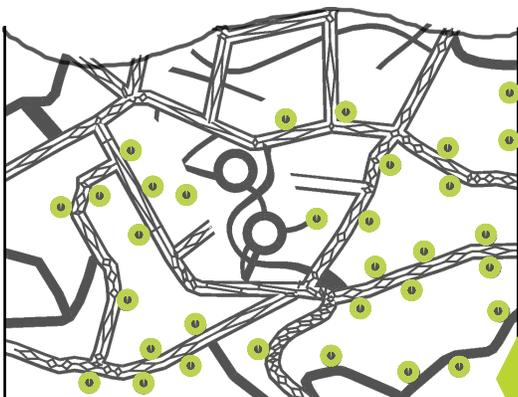


Skywalk Paths



Helps Promote Walkability and people interactions

To help promote human interaction and increase walk-ability in my urban city design I integrated cu-de-sacs all throughout my city. These cul-de-sacs generate a union where residential, office, commercial, emergency, religion, and mixed use zones all can exist within the same cul-de-sac to generate a more walkable city. Cul-de-sacs also Create a closer sense of community. People tend to get to know one another better in their close, seemingly secluded space. They often form tightly knit bonds and promote social cohesion simply because of logistics. The design of the cul-de-sac itself seemed to facilitate neighborliness. Cul-de-sacs usually embrace the phenomena of “see something say something”. Neighbors look out for one another, and will often report suspicious activity.





Sence of Place

Definition :

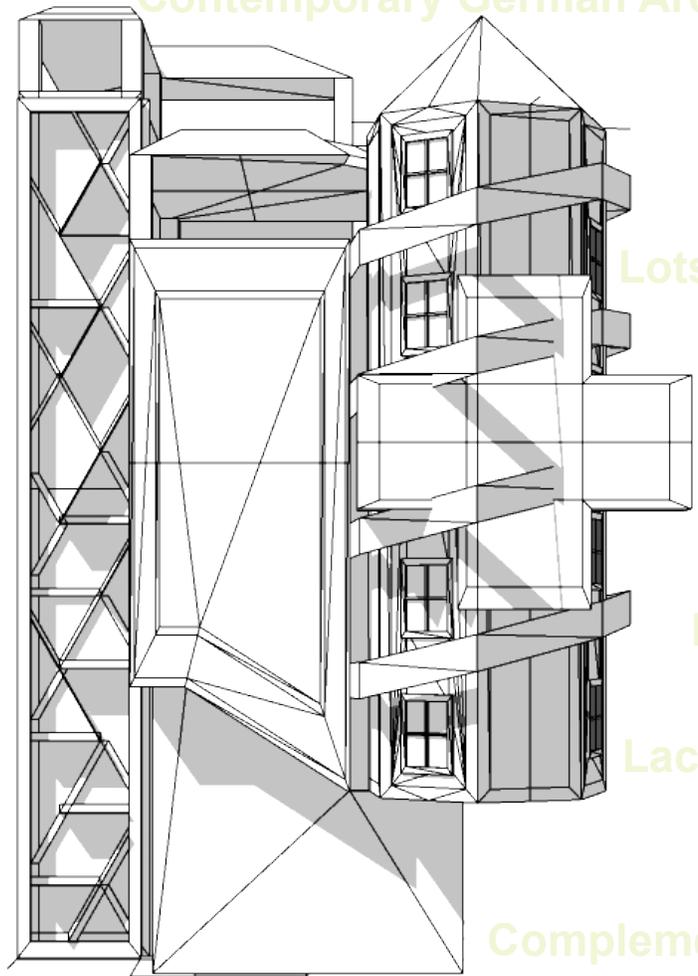
The particular characteristic of a place that makes it what it is. For example, though few people have visited Antarctica , most have some sense, an image in their mind's eye, of what that continent is like. That image may be realistic, or unrealistic, or may be dramatically simplified, but it will usually be based on physical characteristics that the place actually do have. .The buildings designed for my city derived from Koblenz germany architectural style and physical traits





Hospital

Contemporary German Architecture



Minimalism

Tapered Rooves

Lots of windows

Heavily Trimmed

Cross Trim

Clean Lines

Rectangular Style

Lots of windows

Haevy Trim

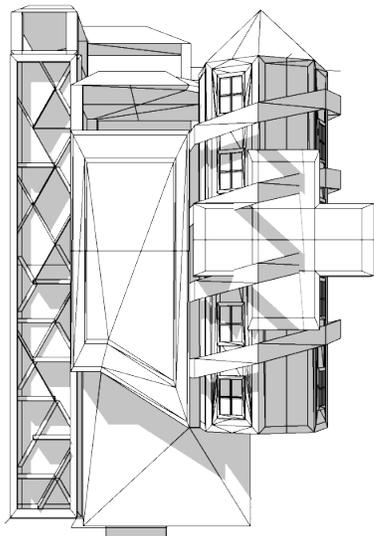
Large Windows

Lack of ornament

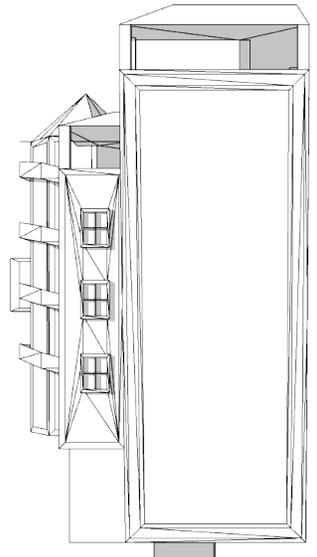
Complements Environment

73

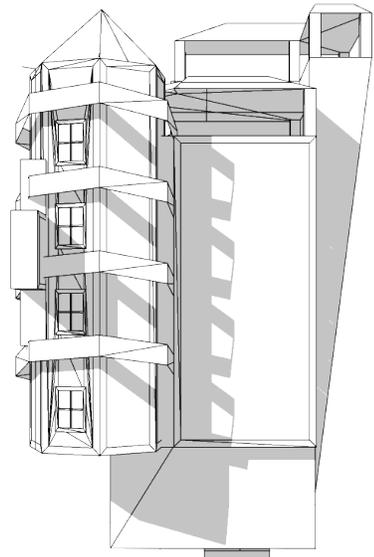
Curved top openings and windows



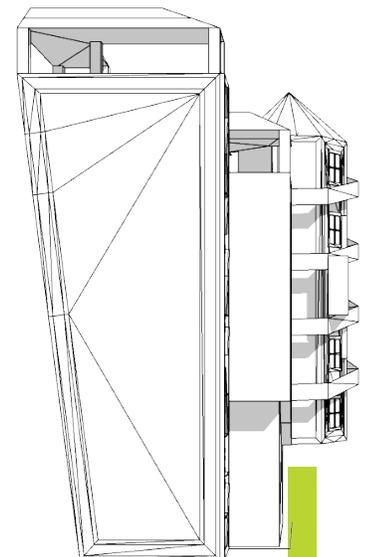
74



75



76



77

Contemporary German Architecture

Minimalism

Tapered Rooves

Lots of windows

Complements Environment

Cross Trim

Clean Lines

Rectangular Style

Lots of windows

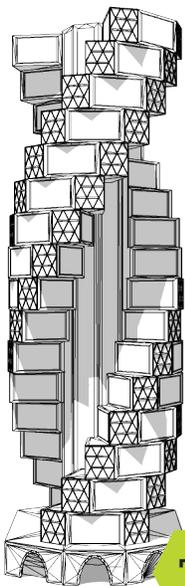
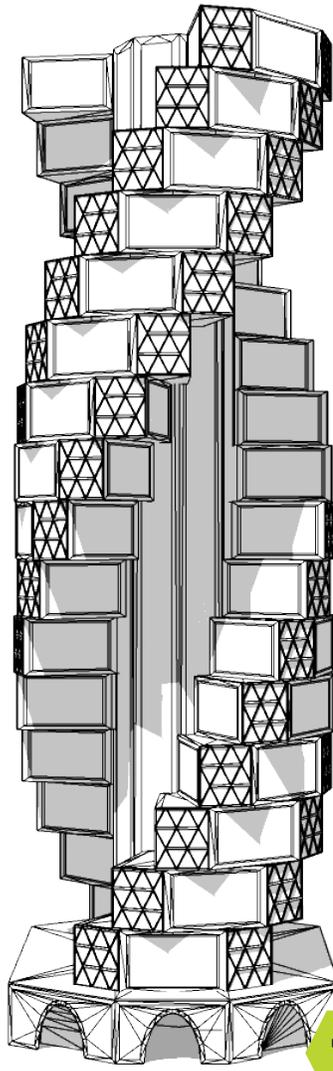
Haevy Trim

Large Windows

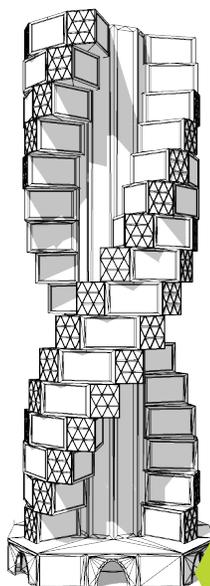
Lack of ornament

Heavily Trimmed

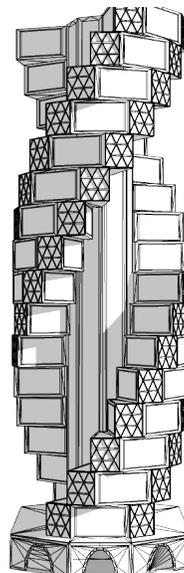
78 Curved top openings and windows



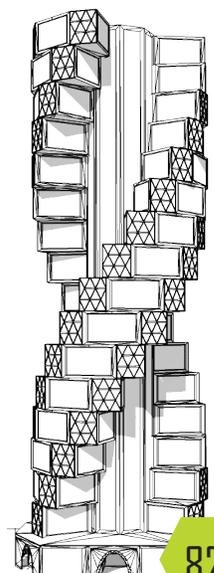
79



80



81



82

Minimalism

Complements Environment

Tapered Rooves

Cross Trim

Heavily Trimmed

Rectangular Style

Haevy Trim

Lots of windows

Large Windows

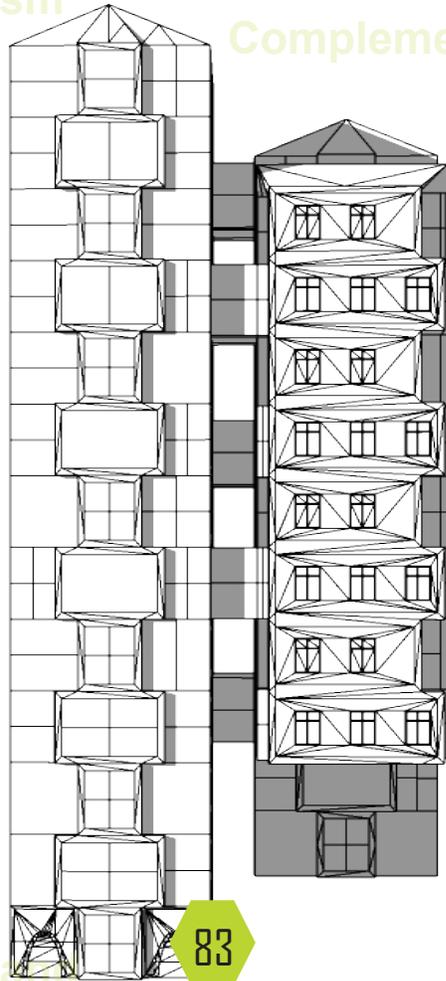
Lack of ornament

Clean Lines

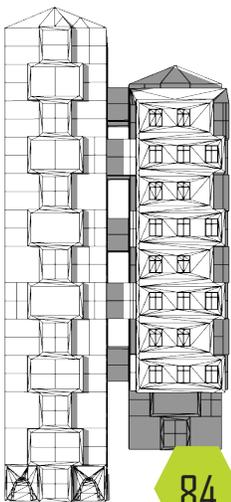
Lots of windows

Curved top openings
windows

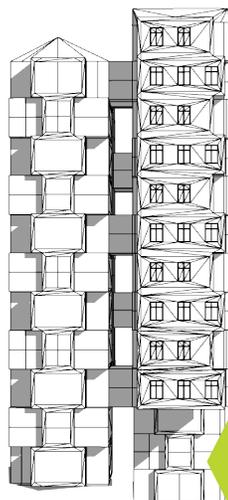
Contemporary German Architecture



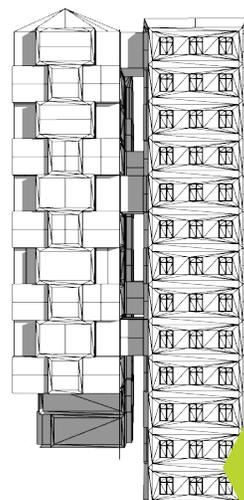
83



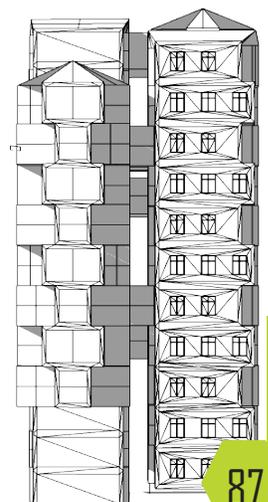
84



85



86



87

Contemporary German Architecture

Curved top openings and windows

Tapered Rooves

Lots of windows

Haevy Trim

Rectangular Style

Large Windows

Cross Trim

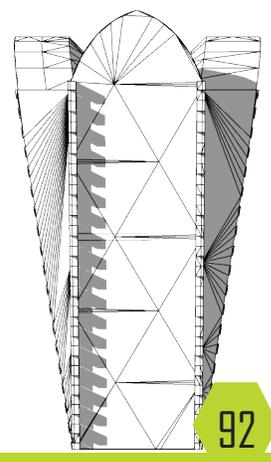
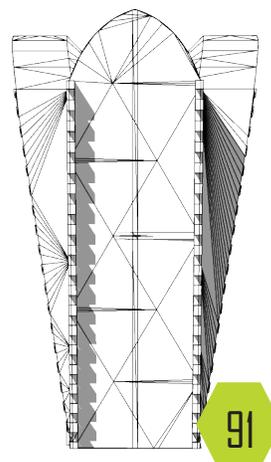
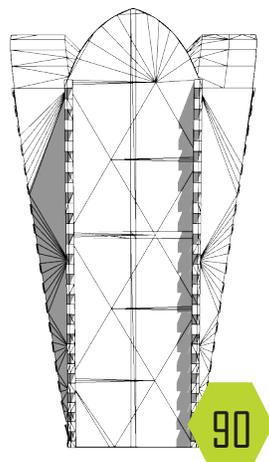
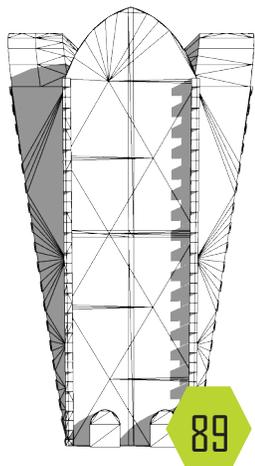
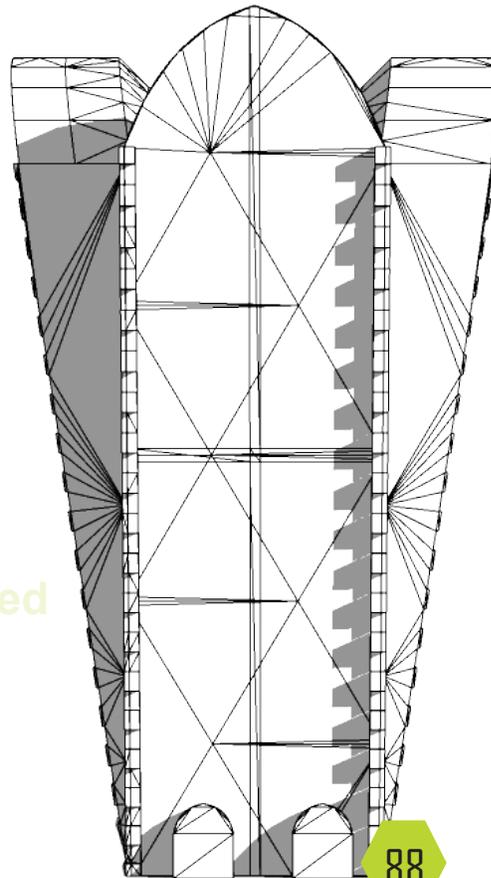
Heavily Trimmed

Lack of ornament

Clean Lines

Minimalism

Complements Environment



Complements Environment

Minimalism

Cross Trim

Tapered Rooves

Rectangular Style

Heavily Trimmed

Curved top openings and windows

Haevy Trim

Lack of ornament

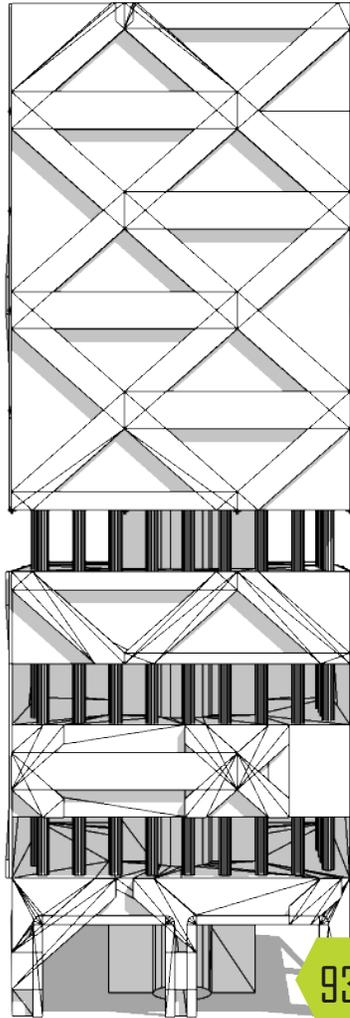
Clean Lines

Lots of windows

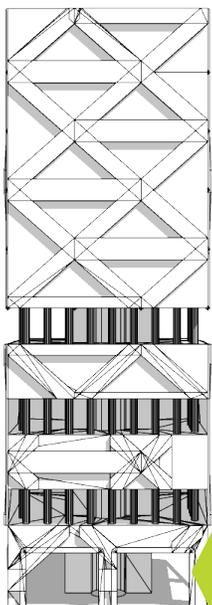
Large Windows

Lots of windows

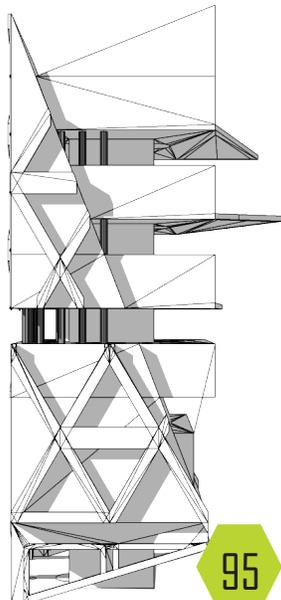
Contemporary German Architecture



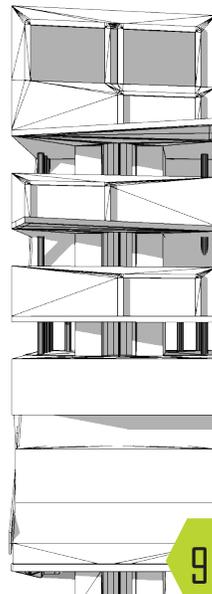
93



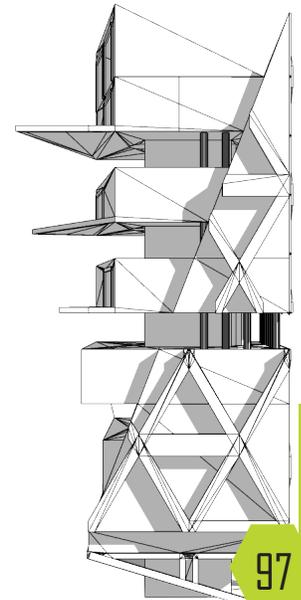
94



95



96



97



APPENDIX

Appendix

Pembrey, D. (2017, August 11). You Won't Believe How Hollywood Films Are Reshaping L.A.'s Skyline. Retrieved from <https://www.architecturaldigest.com/story/hollywood-films-los-angeles-architecture>.

Haridy, R. (2018, July 30). Science Fiction Cities: How our future visions influence the cities we build. Retrieved from <https://newatlas.com/science-fiction-cities-future-urban-visions-architecture/55569/>.

Sudjic, D. (2011, January 20). Building an audience for architecture. Retrieved from <https://www.theguardian.com/film/2011/jan/20/architecture-cinema-hitchcock-frank-gehry>.

Baratto, R. (2017, June 15). How Architecture Speaks Through Cinema. Retrieved from <https://www.archdaily.com/872754/how-architecture-speaks-through-cinema>.

Disegno Film Nights: Pascal Schöning on cinematic architecture. (n.d.). Retrieved from <https://www.disegnodaily.com/article/disegno-film-nights-pascal-schoning-on-cinematic-architecture>.

Watson, A. (2019, August 27). Frequency of going to the movies in the U.S. 2019. Retrieved from <https://www.statista.com/statistics/264396/frequency-of-going-to-the-movies-in-the-us/>.

Smyth, M., Helgason, I., Mitrovic, I., & Zaffiro, G. (2011, December 22). The City in Cinema: How Popular Culture can Influence Research Agendas. Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877050911006983>.

Cooper, B. B. (2014, February 28). The Psychology of Limitation: How Constraints Make Us More Creative. Retrieved from <https://buffer.com/resources/7-examples-of-how-creative-constraints-can-lead-to-amazing-work>.

Finch, 2017P. (n.d.). Focusing on constraints inhibits design excellence. Retrieved from <https://www.architectsjournal.co.uk/opinion/focusing-on-constraints-inhibits-design-excellence/10021932.article>.

Working out of the Box: Production Designer and Art Director, Colin Sieburgh. (n.d.). Retrieved from <https://archinect.com/features/article/116360307/working-out-of-the-box-production-designer-and-art-director-colin-sieburgh>.

Breznican, A., & Breznican, A. (n.d.). 'Tomorrowland': How to build a futuristic city from yesterday's dreams. Retrieved from <https://ew.com/article/2015/05/22/tomorrowland-futuristic-city/>.

The Editors of Encyclopaedia Britannica. (2013, September 12). Koblenz. Retrieved from <https://www.britannica.com/place/Koblenz-Germany>.

Walker, A. (2018, February 19). Wakanda is where every urbanist wants to live. Retrieved from <https://www.curbed.com/2018/2/19/17028794/black-panther-wakanda-urban-design-architecture-birnin-zana>.

James, J. (2015, October 6). How to Define Constraints in Project Management. Retrieved from <https://www.activia.co.uk/blog/how-to-define-constraints-in-project-management>.

Geary, P. J., & Hamerow, T. S. (2020, May 13). Architecture. Retrieved February 27, 2020, from <https://www.britannica.com/place/Germany/Architecture>

Sense of Place. (2020, May 13). Retrieved March 2, 2020, from <https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/sense-place>

Nicol, S., Nicolhttp, S., Segundo, E., Nicol, S., Segundo, E., El Segundo High School, ... Ucla. (2019, March 1). 7 Ways Cul-de-sacs Make the Best Streets - Local Expert Advice. Retrieved March 26, 2020, from <https://egundo.com/7-ways-cul-de-sacs-make-the-best-streets/>



Marie D Tucker

