

A RIVERFRONT REVIVAL

TRANSFORMING ST. PAUL'S DOWNTOWN IN SYNERGY WITH THE MISSISSIPPI
RIVER

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John Roman Meyer

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ABSTRACT

St. Paul is the capital city of Minnesota and a very historical area. It is one of the biggest cities in the state and has started the birth of other cities in the metropolitan area. It has been a leader to other cities and is a very important location, but St. Paul still has many issues. The downtown area of the city is located next to the Mississippi River, but the connection is not as strong as it should be. With this, the skyline of the city is not very impressive and could do with some upgrades. While working with the aesthetic of the city, safety should also be increased as St. Paul is currently dealing with a fair amount of crime.

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DEDICATION

This section dedicates the disquisition to my father, Tim Meyer. He has taught me everything I know about construction and laid my foundation to help me grow as I work to become an architect. His hard work is exceptional, and I hope to show the same amount of value and purpose in my work as he expresses in his. If it were not for him, his drive to be an honest and great carpenter, and his teachings for me in the field, I would never have worked to become an architect.

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LIST OF ABBREVIATIONS

MSP.....	Minneapolis / St. Paul
Metro.....	Metropolitan Area
One WTC.....	The One World Trade Center
NYC.....	New York City
CPTED.....	Crime Prevention through Environmental Design
RTCs.....	Rehabilitation Tax Credits
PHAs.....	Public Housing Agencies

LIST OF SYMBOLS

- SymbolExplanation of Symbol. If the symbol text runs longer than one line, the subsequent lines are aligned with the first word in the entry.
- DirectionsAfter entering a Symbol, press Tab to get an automatic dot leader to the definition column. After typing the definition, press Enter to start a new line for a new symbol.

1. Introduction

The site was picked for this thesis due to its location right beside the Mississippi River, and it has the potential to create a grand view. A new river connection and improved skyline will bring people back into downtown St. Paul. This will help the city grow in success and, in turn, will improve the safety of the city. St. Paul's riverfront and skyline have never been a great aspect of the city, and roads and railroad tracks get in the way of have a connection with the river. St. Paul is also not a very safe city, so its improvement in aesthetics and purpose is important to help the city grow and allow its people a safe living environment.

This site has the opportunity to connect the downtown area with the Mississippi River. This is because the site sits on a large elevation change between the downtown area and the riverfront. Because of this, it is important to design a stronger connection with the downtown area and the river while working with this drastic change in levels.

Rivers have always been very important when it comes to the life and birth of a city. St. Paul is no different, so a solution must be found to help the city thrive. The Mississippi River is also a main key for increasing the livelihood of St. Paul. It can create a public area and give people more of a reason to be there. St. Paul is sadly not a very safe place, and the downtown area is a large part of this problem. Bringing people in can help create a safer area which also makes people want to be there. A connection to the Mississippi River is critical for this, and it will revitalize the entire city, and more importantly the downtown area. The connection to the river will be an important reason why people will choose to come back to downtown St. Paul, and the city will thrive because of it.

1.1. Research Objective

Throughout the work of this thesis, research of many sites will be conducted regarding the well-being of cities and many other problems which come with them. Because of this, the city plans for the Twin Cities is a great resource to figure out what the council and population of Minneapolis and St. Paul believe is needed. Attention then turns to scholarly works which express what is needed in cities and how high-rises may affect them. After this, case studies will be found to figure how towers have improved urban areas. Along with this step, there will be investigations of towers found intriguing and believed to help with the design for these new high-rises. This will also help create a better understanding of how these towers use their site locations to improve their cities.

1.2. Problem Statement

The biggest problem meant to be solved for this thesis is the crime of St. Paul and the poor connection of the city to the Mississippi River. The Metro Area of the Twin Cities has been known for not being as safe as it used to be, and the downtown locations are typically the most dangerous areas. Safety is a concern which needs to be taken seriously in St. Paul to allow the city and its people to grow and prosper. Along with this, downtown St. Paul is situated next to the Mississippi River, but the riverfront is underutilized and disappointing. Being the twin to Minneapolis, St. Paul seems to pale in comparison to its larger and grander brother, and a lot of improvement is needed to make them equal.

1.3. Research Question and Proposed Outcome

With many people moving out of downtown areas to relocate in the suburbs, cities have been negatively impacted. The urban locations have become less funded, and in turn, less safe. When people with higher incomes leave, cities will not prosper as they once had, and this can

lead to a loss of safety. It is the role of this thesis to ask if the construction of residential towers and a small park can bring people back into the city, and to find if they can liven up the area by connecting the downtown area with the Mississippi River. The answer will express a way to make St. Paul safer, and it will make improvements for the city as it continues to become more impressive. Through this, people will come to live downtown and move throughout a new scenic area, and it will be tougher for crime to exist as this location will be well populated and watched over.

2. Background / Research

This site is set at a steep elevation change from the rest of the downtown area. It is a goal of this thesis to use this 90-degree wall in the design and create a means of access and travel between the downtown area and the river. This will be done through terraces and paths which slowly decline to the lower elevation. There is to be a creation of two towers which will be built into these new terraces to connect these two areas. The towers being built into these new hills will also use the site and its oddities rather than completely changing it. Inspiration has been taken from towers around the world, including the One World Trade Center, the Bank of America Tower, and 30 Hudson Yards in New York City. Other skyscrapers are also intriguing to this thesis, such as the Shanghai World Financial Center and the Vista Tower.

2.1. Site / Location

This site is rather skinny and long, and it runs alongside the Mississippi River. It is not particularly centralized and may seem awkward to work with, but there is a lot of potential which can be brought to life. The location itself is perfect for high rises as it has a good depth, and it is in a great area downtown and on the river. This will create great views and make people prouder to live in St. Paul.

The site's shape and topography may hold many problems, but the location is perfect for new high-rise towers and community engagement. At the heart of downtown St. Paul, this thesis will connect the city with the Mississippi River through the creation of a congregational area. However, there is still the issue of Shepard Road and a railroad track in between the site and the river, but with this issue comes more opportunities and solutions for the city. This site is not normal by any means, but it allows for creative ideas and an inspirational outcome for St. Paul and other cities.



Figure 1 / Downtown St. Paul
<https://www.google.com/maps/@44.9429796,-93.0927898,1311m/data=!3m1!1e3?authuser=0&entry=ttu> (Google Maps, n.d.)

2.2. Riverfront and Downtown Relations

This site is set in a very busy part of St. Paul, and Wabasha Street Bridge is on its northeastern side. This can bring a new dimension to the site as people will be walking along this bridge. It also makes the creation of a tunnel over the railroad and Shepard Road more possible. This is the more ambitious part of the project, but it may be crucial to make a more connected and lively downtown area. This will bring people to the river and allow them to enjoy the area more than they do now. Most importantly, people will be able to get here right from downtown, and they will not need to go out of their way to get to the riverfront.

This site's strengths and oddities will be used to create a stronger and different design most people have never seen. A Riverfront Revival is meant to transform St. Paul to help the community and the city grow. It is a project meant to protect the people of St. Paul and ensure their security throughout time.



Figure 2 / Site Photo from the East
Picture by Author



Figure 3 / Site Photo from the Bridge looking North to Downtown St. Paul
Picture by Author



Figure 4 / Site Photo from Bridge looking Southwest to the Mississippi River
Picture by Author

2.3. St. Paul

At the start of research, the first step is to investigate St. Paul as a city and figure what is needed for its people through the *Thrive MSP 2040 Plan*. These sets of plans have included many ideas and goals for Minneapolis and St. Paul. The *Thrive MSP 2040 Plan* states on page 139 how the councils of the cities need to focus on the infrastructure of the cities for a future which supports growth and renewal. They also speak of working strongly for areas with high instances of low income and race issues. This is meant to “better connect the residents of these areas with opportunity.” The council also wants to work with the residents to promote

sustainability and to focus on the 2040 Transportation Policy Plan (MSP 2040 Plan Council, p. 139).

In an effort to help with Housing Affordability, the MSP Council states on page 140 of the 2040 Plan how they want to “Invest in and expand regional systems to support redevelopment in communities that partner in the preservation and expansion of housing choices.”

When it comes to Economic Competitiveness, the MSP Council acknowledges on page 142 of the 2040 Plan how they mean to “Invest in regional amenities and services including transit, regional parks and trails, and bikeways to reinforce the Urban Center as an attractive place to locate and do business.” They also speak on this same page about how they wish to improve troubled areas and how they should “Invest council resources to clean up contaminated properties and facilitate reinvestment, including infill, adaptive reuse, and redevelopment.”

The Council then states in the *Thrive MSP 2040 Plan* on page 144 to work with and improve on what the city already has and must build for a strong future. Along with this, the Council also speaks of Natural Resources Protection on page 145 of the 2040 Plan, saying they will “Integrate natural resource conservation and restoration strategies into regional system plans and capital projects.”

2.4. Crime in St. Paul

Over the past several years St. Paul has not been the model of a safe city. Many problems have troubled the area including racial discrimination and many other issues. It is very important for these problems to be solved in an effort to enhance the safety of the Twin Cities. Zeigler explains in his article, *American Cities, Urban Planning, and Place-Based Crime Prevention*,

how surveys have indicated how “multi-unit residential developments,... entertainment centers,... and plazas” are all locations where crime tends to take place. With this thesis focusing on large residential structures and community spaces, it is crucial to find how to work through this situation.

2.5. Safe Cities

A safe city can be described as an urban area with reduced crime and a healthy environment. Everybody wants to live in a city with less danger, and every parent wants a safe place for their children to grow up in. These cities are greener and include more pedestrian elements with less vehicular danger. If people are able to walk outside with little to no fear of what their surroundings may do to them, the cities they live in are very safe.

At this point, it is time to look into other cities around the country to see how they have worked to make their cities safer. This is the key to finding how this thesis’s towers and park can help St. Paul grow and become a safer area as more people move in. Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. explain in their journal, *Examining the Role of Renovation in Reducing Crime and Increasing the Safety of Urban Decline Areas, Case Study: Tehran’s 5th District. Armanshahr Architecture & Urban Development*, 9 many ways to help cities grow and return to being safe locations for their residents. They explain on page 182 of their paper how “Public opinion often imagines urban crimes as a threat to “social order” and “public safety” in its clearest sense” (2016). Because of this, it is obvious most people are worried about crimes in urban areas and how they can be detrimental to the overall health and wellbeing of society. This is why finding solutions to this problem is very important to all cities and countries around the world.

There are many different methods Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. bring to light in their journal, and one of them is the Theory of Defensible Space given on page 184: Changing “the physical conditions of the neighborhoods so that residents are able to control their home surroundings” (2016). This thesis means to create two towers for housing and a park right next to them. According to this theory, looking into residents’ needs and designing the park to accommodate for them will make the area safer by increasing community involvement and lively energy.

Another method given on page 184 by Zalnezhad, K., Esteghamati, M., & Hoseini, S. F is the Theory of Crime Prevention through Environmental Design: “crimes committed in the built environment can be prevented with proper designing of residence, work and life of people” (2016). This explains how proper designing of the residential towers and an environmental park may help reduce the crime of downtown St. Paul. The creation of a newly built environment in the city can bring people out to the area and increase the beauty of the city while also bringing the chance of crime down due to the higher frequency of traffic. Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. then claim on p. 184 in 2016 how Crime Prevention through Environmental Design, or CPTED, is the “Proper design and effective use of the environment and building which will reduce crime and the fear of crime. In other words, ... can improve quality of life in addition to crime prevention and also reduce the fear of crime.” (Crowe, 2000, p. 46). On page 185 they also quote Rahmat, 2009, p. 105 by saying ‘Environmental clutter of urban areas increases the rate of crimes and creates an environment full of stress and anxiety.’ Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. on p. 185 also quote Hinkle, 2009, p. 10 by saying “The concept behind this theory (Broken Window Theory) is that as much as existence of small signs about lack of care can cause devastating social problems, fighting against less serious crimes,

will reduce delinquency and crime rate and ensure social security” (2016). This theory was proposed by Wilson and Kelly.

Space Syntax Theory by Hillier and Hanson in 1980 explains “that an urban spatial space determines the relations through flow motions (especially walking) and affects the pattern of land use and urban density” (Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. 2016, p. 185). Zalnezhad, K., Esteghamati, M., & Hoseini, S. F. then state on p 185 in 2016 how New Urbanism Theory works with “focusing on the permeability of layers in community in each other... and the second thing is focusing on complex applications” (Schneider, 2008, p. 22).



Figure 5 / Downtown St. Paul
Picture by Author

2.6. Towers



Figure 6 / Vista Tower

<https://www.skyscrapercenter.com/building/the-st-regis-chicago/17137> (*The St. Regis Chicago - The Skyscraper Center*, n.d.)

In order to design high-rises for a city, the study of other towers is necessary to figure out how to create tall structures meant for urban areas. Charney states on page 249 of his work, *Transforming a tower: How did the One World Trade Center eclipse the Freedom Tower?*, how

skyscrapers are “one of the most visible and spectacular features in the urban landscape” and how they “represent multiple development motivations and socio-political meanings” (2014). Works including the Vista Tower and the One World Trade Center are instrumental to the designs showcased in this thesis. Specifically, Jeanne Gang and Juliane Wolf express in their work, *A New View, and a New Gateway, for Chicago*, how important the Vista Tower has been to the city of Chicago in the last several years. The Vista Tower was designed by this paper’s coauthors and their firm, Studio Gang Architects. Jeanne Gang and Juliane Wolf proclaim how the “Vista Tower tightly knits the downtown Lakeshore East community to its surroundings with unprecedented urban connections and enhanced public access to the Chicago River” on page 12 of their journal in 2019. They also ask on the same page “What if skyscrapers can be porous connectors, rather than barriers, for the public realm?” This is a question meant to be answered in this thesis for St. Paul, and this study includes incredible insight into this view of towers.

Jeanne Gang and Juliane Wolf state on page 13 how “Designing Chicago’s third tallest building presented a great opportunity to create a tower that would function as a distinctive anchor at the scale of the city while also making fine-grained connections for people on the ground. Achieving this goal proved particularly challenging because Vista Tower’s “ground” plane is in fact a three-level roadway (Upper Wacker Drive, Lower Wacker Drive, and Lower Lower Wacker Drive) that has limited access to Chicago’s riverfront for decades” (2019). The same problem occurs between downtown St. Paul and the Mississippi River at the exact location of this thesis’s site. Shepard Road and a railroad track separate the city from the river, and the inclusion of a ground level park stretching over the roads to the river may solve this problem. Jeanne Gang and Juliane Wolf state on page 14 how “Every iteration of the design always included a public ground-level gateway at its center, so that people could connect between park

and riverfront” and how “The building’s overall profile is the result of prioritizing this urban connection and carefully studying the interior experience to increase daylight for its inhabitants” (2019). The Vista Tower has proven it can connect two separate parts of a city, and this same option has already been an idea for this thesis.

2.7. Options for Occupancy

One important aspect about designing towers is to figure out who is going to be the residents and how the towers occupancy will work. This can range from apartments to condominiums and many other options. Different occupancy styles can determine who lives in the towers we design and how the structures will be run. Apartments allow companies to come in and rent out units to a variety of people depending on the size or quality of the apartment. Another option would be condominiums, which allow people to own the units they live in. This is an aspect many residents would enjoy.

Mathew Novak describes on page 280 of his paper, *The view beyond Downtown Luxury Towers: Diversity of condominium developments in a contemporary mid-Sized City. Canadian Geographies / Géographies Canadiennes*, how “Rather than the typical association with downtown luxury towers, condominiums are found across a range of housing styles, locations, and price points” (2019). This thesis will find a good mix between a luxury tower and a lower income tower on its site to allow for the living of people with varying incomes. Mathew Novak also describes in his paper on page 280 how “Local conditions and consumer demand among other factors are essential for understanding the complex role of condominiums within housing markets and urban development processes” (2019). Mathew Novak then expresses on page 280 how “Recent developments can be found in gentrifying neighborhoods; however, they remain a minority as many more units are found in middle-class suburbs and wealthy inner-city

neighborhoods. Owing to their varied manifestations, the predominant associations of condominiums with a downtown, luxury housing format needs expanding to include locations throughout the metropolitan area, distinct building types, and wide range of prices” (2019).

Mathew Novak states on page 281 how “Condominium research is relatively sparse with much of the work focusing on contemporary downtown high-rises, neglecting their other spatial and physical manifestations along with their development history” (2019). Mathew Novak then states on page 281 in 2019 how CMHC expressed in 2018 how “Developments entail privately owned units arranged with commonly owned spaces; condominiums are an ownership structure rather than building style” (CMHC 2018). Mathew Novak continues on page 282 in 2019 about how “Condominiums are often linked with inner-city revitalization, including longstanding examples in Vancouver” (Ley 1981).

Mathew Novak explains on page 286 how “Condominium styles range from detached family homes, through townhouses, to mid- and high-rise buildings. Low-rise apartments of two to five stories are the most common” (2019). Mathew Novak continues on pages 289 and 290 in 2019 about how “Governments look favorably to condominium developments in promoting re-urbanization as a strategy to counter sprawl, achieve environmental targets, and grow their tax base” (Lehrer and Wieditz 2009; Lehrer et al. 2010). However, the study of this paper is from the city of Halifax in Canada, not a city in the USA. Mathew Novak also describes on page 286 how condominiums have made for about half of the new housing construction from the past several years in different cities in Canada; indicating the increase of their importance and value in today’s world (2019).

2.8. Holding On to the City's History

St. Paul may not currently have a spectacular skyline or monumental structures, but the history of the city still exists, and the buildings have a lot to do with that. As people try to help St. Paul grow and change, they must remember where the city came from and the importance of holding on to that. One way to work with this is through the use of historic rehabilitation tax credits, or RTCs. Even though the rehabilitation of current structures is not the goal of this thesis, it is still important to investigate this issue.

Ryberg-Webster speaks about historic rehabilitation tax credits, or RTCs, and asks if they are a key component to the recovery of cities' downtown areas. She expresses how important RTCs are for saving dying cities. Ryberg-Webster also makes the claim in her article how RTCs "cannot be used for owner-occupied units, public schools, or government buildings" (2013).

The plan of this thesis is to design new structures to put into the heart of downtown St. Paul, but it is still crucial to know how important historic preservation is for cities. Keeping the theme and original life of a city intact is a main key to help it grow, so Ryberg-Webster's article is still very important for this thesis and the city of St. Paul.

2.9. Previous Ideas and Plans

In order to dive into the growth and additions to a city, one has to look into the previous ideas which have been proposed in the past. It is important to realize what was done right and what needs work in these projects in order to come up with a better idea and solution to the city's problems. There have been several proposals for this thesis' site in the past, but they have seemed to fall short and have never been constructed. For this thesis, one must investigate their issues so they are not replicated here. This is a must for the success of this project.

2.9.1. RiversEdge Redevelopment Project



Figure 7 / RiversEdge Redevelopment Project

<https://www.startribune.com/riversedge-redevelopment-project-moves-forward-in-downtown-st-paul-despite-covid/572010242/>

Jim Buchta from the Star Tribune explains in his article, *RiversEdge redevelopment project moves forward in downtown St. Paul, despite COVID*, how Commissioner Rafael Ortega was “still committed 100 percent” to this project, but it has still fell short and was never built. This project was supposed to be a “\$788 million riverfront redevelopment” while “seeking \$40 million in state funding” according to Jim Buchta.

2.9.2. Great River Passage Conservancy / River Balcony

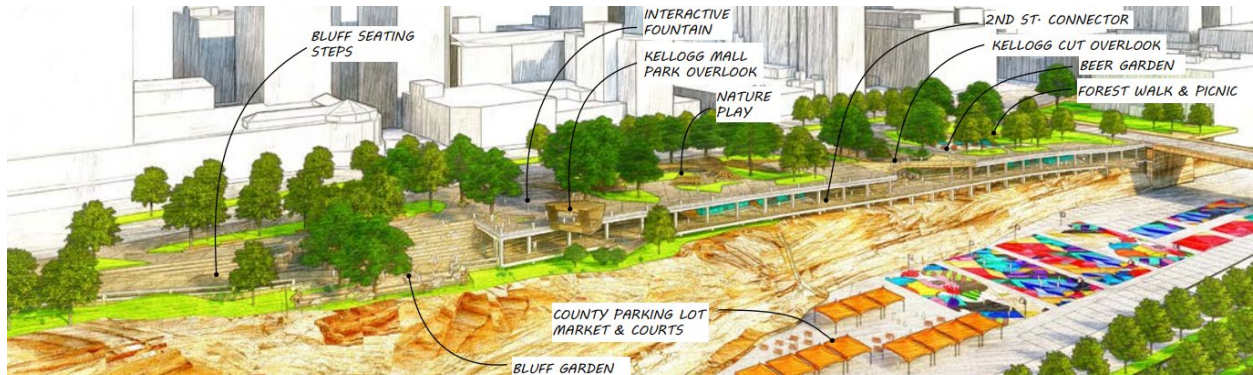


Figure 8 / Bird's-Eye View of the Great River Passage Conservancy / River Balcony
(*River-Balcony-Final-Report.Pdf*, n.d.)



Figure 9 / Park Rendering of Great River Passage Conservancy / River Balcony
(*River-Balcony-Final-Report.Pdf*, n.d.)

The authors of the *River Balcony Basis of Design Report* describe how “The design approach” of this project “builds on what is already here, establishes critical connections and

creates a series of distinctive elements that help to activate the bluff and riverfront and cultivate connections to this special place” (*River-Balcony-Final-Report.Pdf*, n.d. p. 5).

This project team includes James Conner Field Operations, 106 Group, Claim Our Space, Forecast Public Art, HR&A, Dharam Consulting, SEH, Full Circle Indigenous Planning and Design (*River-Balcony-Final-Report.Pdf*, n.d. p. 2).

On page 5 of the presentation, the authors describe how “The River Balcony is a proposed 1.5 mile promenade along downtown Saint Paul’s river bluff, connecting public spaces, civic landmarks, and development sites, providing new connections to the river and sparking economic development and activation along the riverfront” (*River-Balcony-Final-Report.Pdf*, n.d.). Much of what is included are several overlooks which grant views to the Mississippi River and other locations of the city’s downtown (*River-Balcony-Final-Report.Pdf*, n.d.). This project has expressed how important it is to connect downtown St. Paul with the Mississippi River, proving it is an issue worth solving.

As of now, the designers wish to construct their River Balcony, but they have not started or broken any ground. It has an estimated budget of around \$114.3 million (*River-Balcony-Final-Report.Pdf*, n.d. p. 159) and has no rough idea of when constructed could start. A lot is proposed for this project to create a lively location for St. Paul’s residents, including walking paths, beer gardens, seating areas, and play features (*River-Balcony-Final-Report.Pdf*, n.d. p. 99). It is unclear if this project will be brought to fruition, so it is the goal of this thesis to find what can be brought in for the betterment of the city and its people.

2.10. The Role of Housing in Public Safety

In order to have a safe city, there must be adequate living accommodations for its residents. Goetz describes on page 270 of his paper, *Where Have All the Towers Gone? The Dismantling of Public Housing in U.s. Cities*, how “Since the 1980s the stock of public housing has been regularly depleted through the demolition and sale of public housing” (2011). This explains how there is not enough housing in urban regions for residents to live in. Goetz also explains on page 271 how “The sale of public housing to residents has been a minor part of local housing authority programs for decades. For the most part, PHAs have been anxious to participate in such programs because the units typically chosen for purchase and the families wishing to participate in the program are both the cream of the crop for local authorities” (2011). Because of this, PHAs, or public housing agencies, have been unable to purchase units for low-income families. Goetz then states on page 280 how “Gentrification of inner city neighborhoods led to conditions in which public housing projects were islands of poverty and distress in the midst of areas of wealth and renewal” (2011). This makes it very clear cities much invest more money into the well-being of low-income families when trying to redevelop more poverty ridden areas. Instead of tearing down public housing for new luxury homes, city developers must spend their money on low-income housing and other facilities which will help this section of cities’ populations.

Goetz makes it clear on page 267 of his paper how “*public housing removal is most prevalent in cities facing gentrification pressures, and the cities in which the management of public housing by the local housing authorities was subpar. Public housing removals are also associated with higher levels of racial segregation and violent crime*” (2011). Goetz has found how many struggling and crime ridden cities are the ones which are seeing the demolition of

public housing. This reinforces how important it is to revitalize these areas and give their residents better housing and a stronger environment. Goetz also states on page 267 how “the dismantling of public housing is not limited to the removal of high-rise towers, but affects mid-rise, row-house, and even single-family, scattered units as well” (2011). It is great to hear of the deconstruction of inefficient buildings which do not help the livelihood or safety of city residents, but new buildings need to be constructed for the needy if this strategy is going to work.

3. Methodology

3.1. Riverfront Connections

In order to make this project work, it is crucial to find ways to connect the site and St. Paul’s downtown with the Mississippi River. For many years the city has struggled to combine the strength of its downtown area with the beauty of the river while it creates one of the natural borders of the downtown area. Strong points of connection with the Mississippi River will strengthen the beauty of the city and bring people together to enjoy scenic views of the river.

Pathways and observation platforms are some of the most common ways to bring people to grand visuals of nature, but parks will keep people there to enjoy time for a while. Especially in the fast-paced society this county has, it is important to bring people in urban areas to natural settings with life and scenery.

3.2. Tunnels and Coverings of Roads and Railroads

One of the biggest issues with this thesis is the railroad and Shepard Road which separates its site from the Mississippi River. One way to solve this is through the construction of tunnels for the roads. This will allow people to walk to the riverfront without the danger of crossing roads. Instead, people will be able to walk over the danger and enjoy a park above cars and trains.

3.3. Method / Sketches

Sketches are the first step to finding the design of structures and will be crucial to give an idea of what should be designed. This project is more conceptual and will mainly feature the exterior of the towers and their relations with the rest of the city. The entire context of the project is far more important than the small details, and sketching will bring these ideas to life. To design what St. Paul does not currently have, one must open their mind to creative thoughts and ideas. Designers also must never hold themselves down to one proposition. This is something people cannot do straight away on computers; instead, sketching will open minds to ideas previously thought to be incomprehensible.

3.4. Method / Concept Models

Concept models are a fun exercise to get minds moving, and they allow for the design of creative objects which may not be tangible but will give inspiration to the final outcome. This is another way to open oneself to new ideas and to see a three-dimensional rendition of something people may have already drawn. It is great to actually see what one imagines as an object so they can look into how it may work as a structure or how people could react to it. This step can help people find new designs or grow the ones they already have, and it is very freeform. Concept models are great because they allow designers to have fun and create new ideas they otherwise would never have thought of.

3.5. Method / Rhino Model

One way to get quick designs figured out in the landscape of the site is to use the program, Rhino. Rhino is great for freeform design and 3D modeling of structures and landscapes. This is phenomenal for brainstorming and finding new ideas for a project's design.

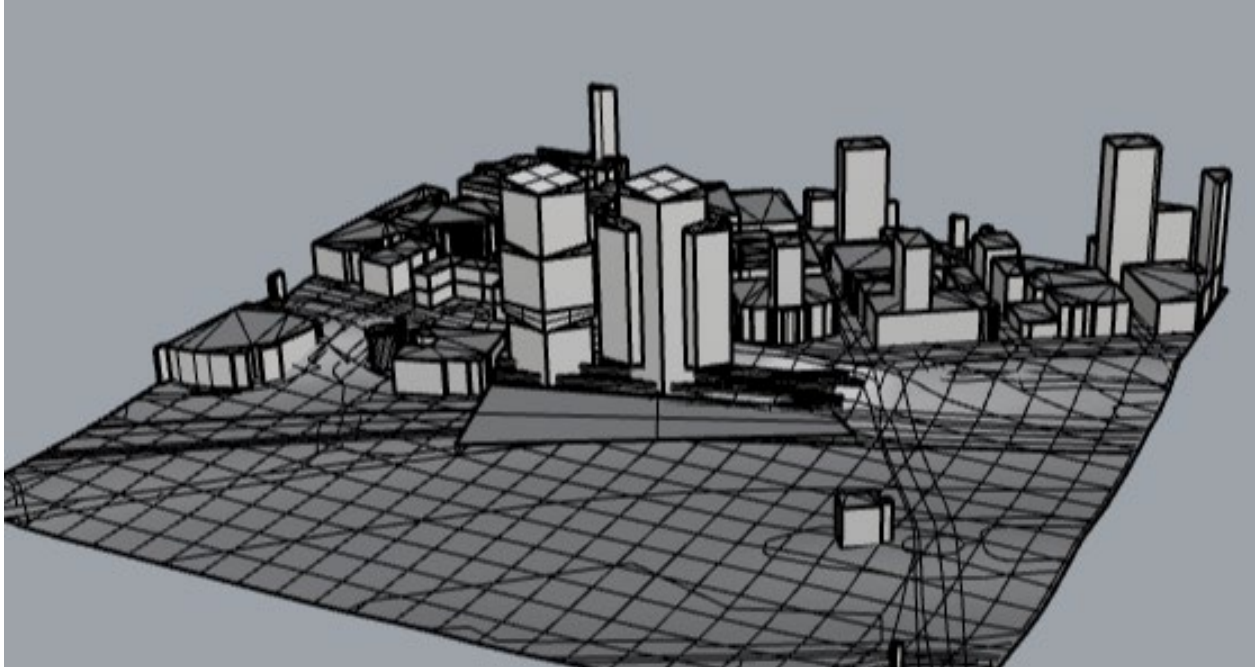


Figure 10 / Early Rendition
Picture by Author from Rhino

3.6. Structure

With taller structures comes a large amount of weight which needs to be transferred to the ground. Because of this, studies of other towers with similar configurations and shapes will greatly help with finding ways to construct this thesis' high-rises. Two towers come to mind when looking at the designs for this thesis and trying to find similar structures. These include the MetLife Building in New York City designed by Pietro Belluschi, Walter Gropius, and Emery Roth, and the IDS Center in Minneapolis designed by John Burgee and Philip Johnson. Both structures show off the use of steel columns around the outside of the buildings and a central concrete tower with staircases and elevators. These two features will become very important for the final structure of this thesis' towers.

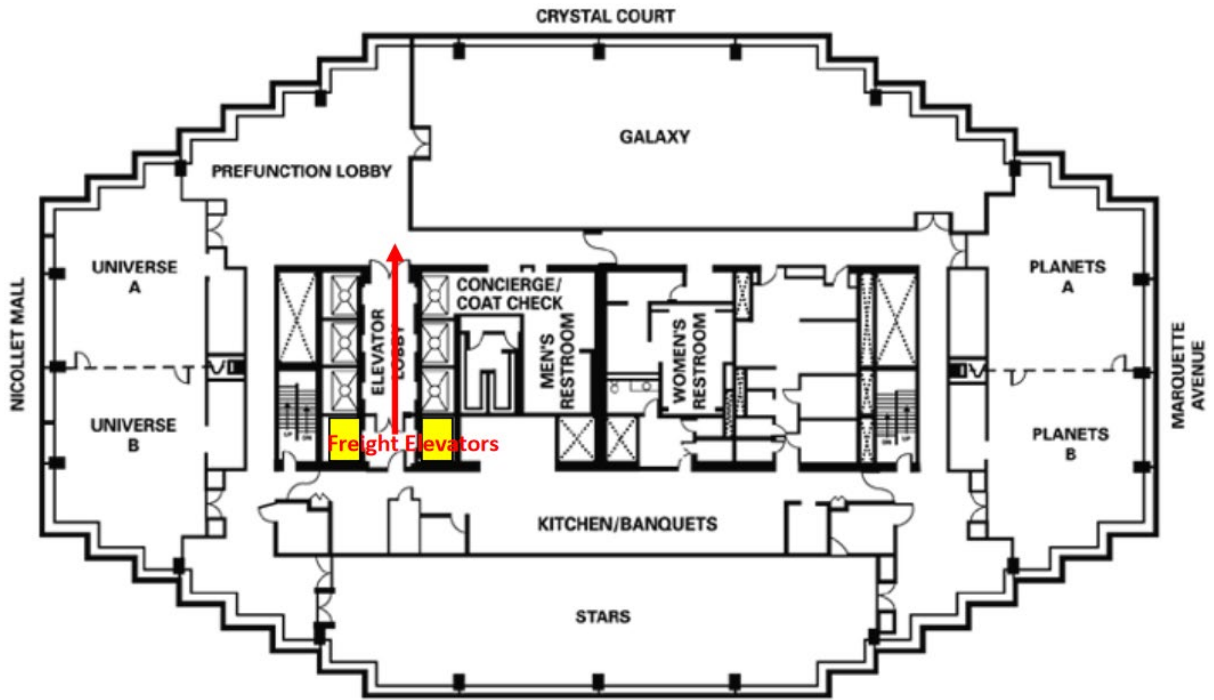
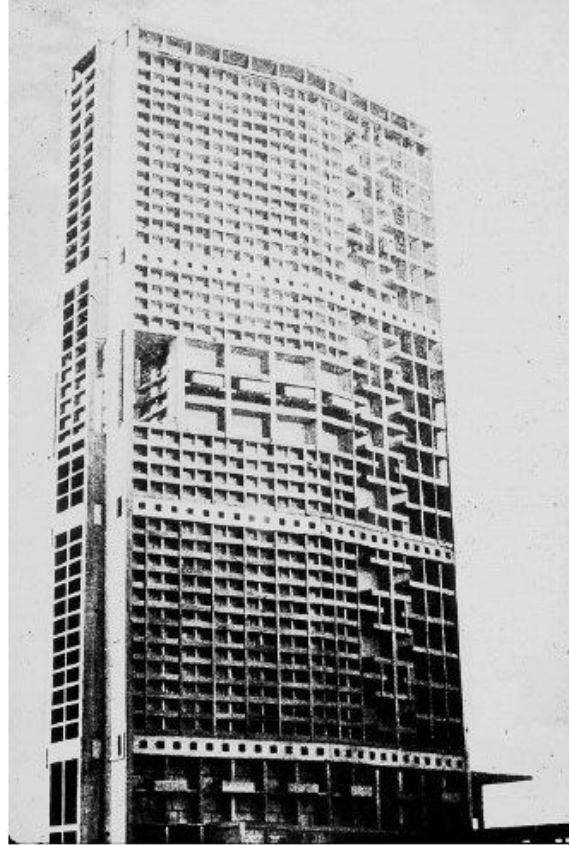
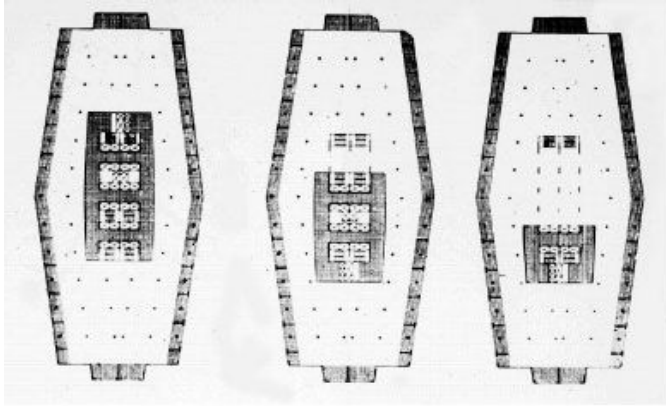


Figure 11 / IDS Center Structure
 (Vendor_Cheatsheet_WOM.Pdf, n.d.)



Obus E Project for Algiers Le Corbusier Cap de la Marine 1938

Figure 12 / MetLife Building Structure
 (Great Game Changers: How the MetLife Building Redefined Midtown Architecture 6sqft
 Metlife Building, Building, Architecture - Online Store, n.d.)

Through the use of studying these towers and their structures, different configurations have been designed to figure out what the final structural support of the new towers should look like in order to create successful and safe buildings.

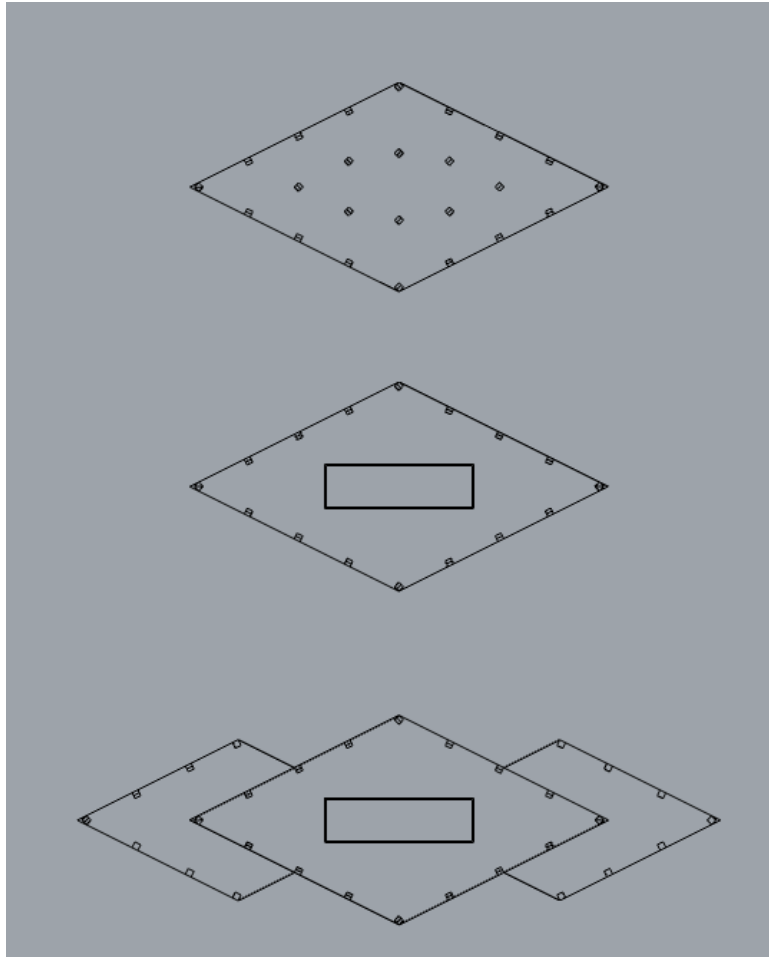


Figure 13 / Thesis Structure Concepts
Photo by Author from Rhino

All of the above design options express the use of big steel columns 3' x 3' large, however, the first design only uses these columns and no central concrete structure. The second design includes the central concrete structure instead of the interior columns. This is very similar to the IDS Center's structure. The third design is then meant for the second tower and includes large extensions on its sides with steel columns going along the outer walls as well. All these columns are around 20 to 30 feet apart.

In order to create more symmetry with the exterior structure and the interior shell, research was done on I.M. Pei and his design for the East Building of the National Gallery of Art in Washington D.C.

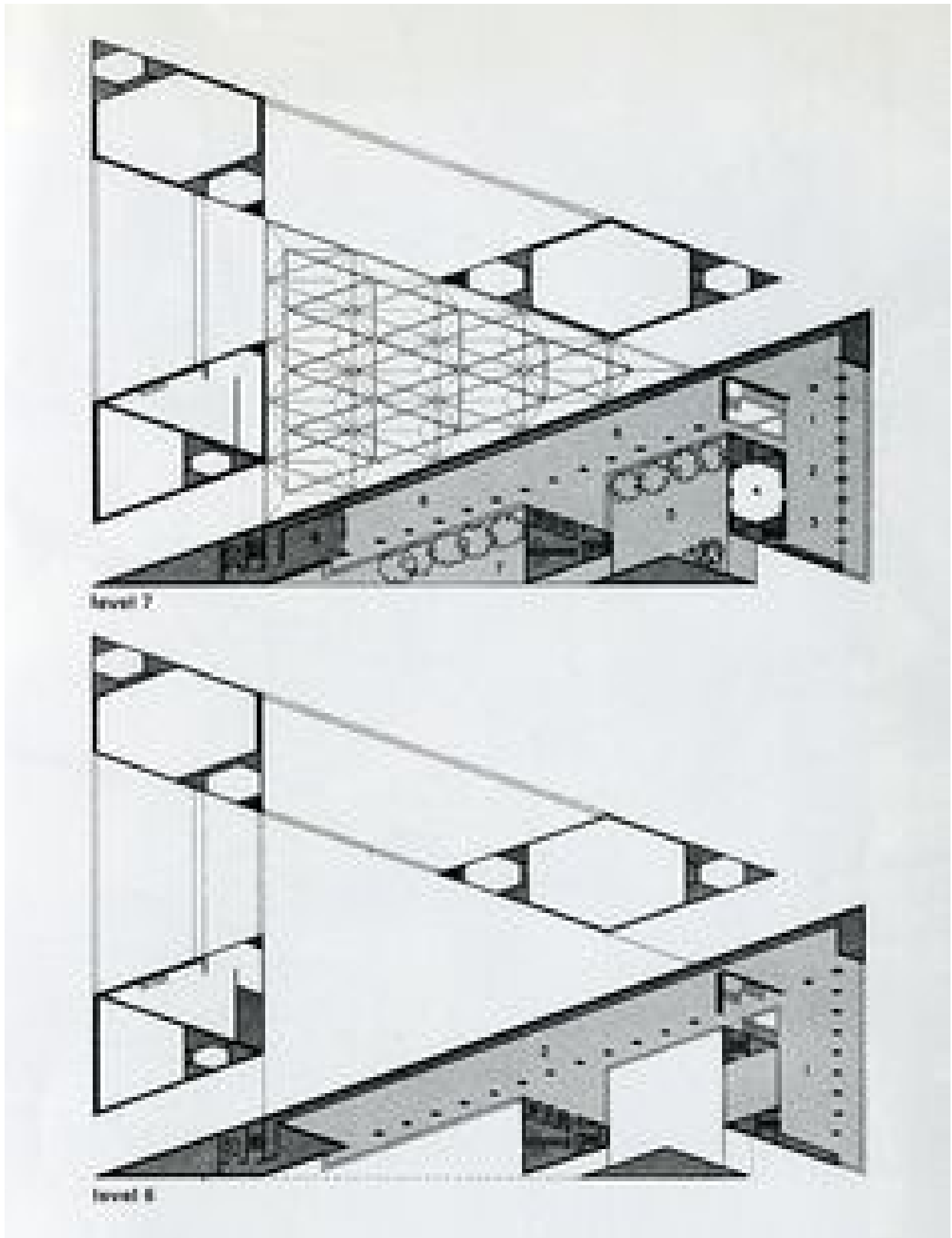


Figure 14 / National Gallery of Art East Building Structure
(*East Wing Washington Dc i m Pei - Google Search, n.d.*)

Through this research new designs came into fruition with diagonal shear walls. This was done to create more space within the buildings and allow for a larger quantity of rooms and a more efficient flow of foot traffic throughout the towers.

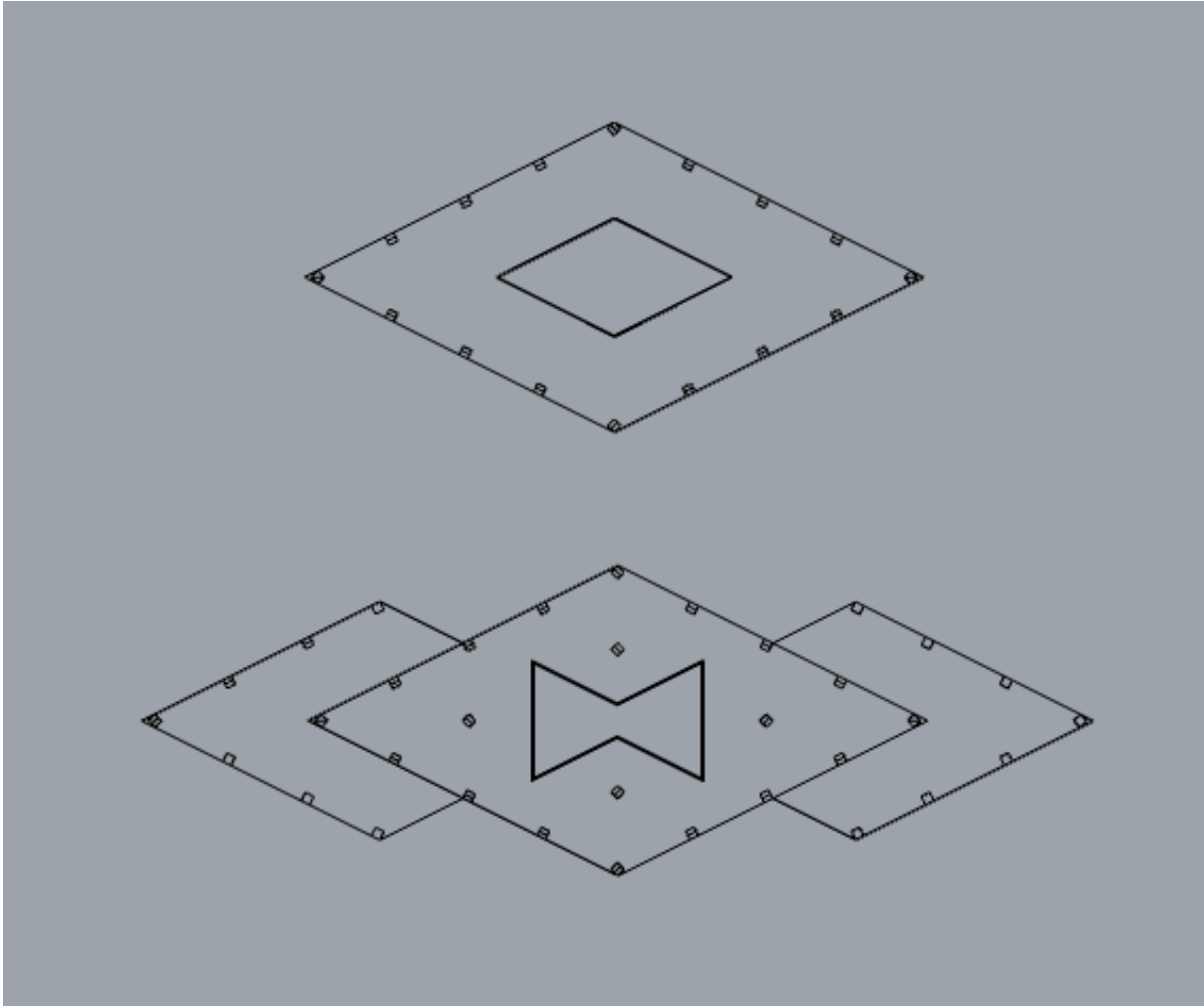


Figure 15 / Thesis Concept Structures 2
Photo by Author from Rhino

3.7. Inspiration

Many different structures can provide inspiration for the design of other structures, and it is very important to look into buildings with a similar context. Because of this, several buildings from different locations and with different designs have been investigated to provide help for this thesis. Some of these buildings have interesting connections with hills and varying elevations

while others are towers which define city skylines. It is particularly special to find a connection between these two characteristics which will make A Riverfront Revival a more meaningful project.

3.8. Inspiring Architects, Designs, and Actions

Several different architects have inspired the designs in this thesis. These include Tado Ando, Kohn Pederson Architects, David Childs, and several others. Their strengths and structures have greatly helped with the results of A Riverfront Revival.

3.9. Rokko Housing



Figure 16 / Corner Perspective of Rokko Housing
<https://arquitecturaviva.com/works/edificios-rokko-i-ii-iii-kobe>



Figure 17 / Front View of Rokko Housing

https://www.multifamilyexecutive.com/design-development/design/landmarks-rokko-housing-one-tokyo_o

Several inspiring structures have been found which can help throughout this thesis' design. One of these is Rokko Housing 1 designed by Tado Ando. These housing units are built into a hill and are stacked on top of each other until they reach the top of it. The structure also shows off a terraced design which will help with the final product as well. This structure is in Kobe, Japan, and it is believed in this thesis it can give St. Paul a new kind of flair from the other side of the world.

The most interesting aspect of Rokko Housing 1 is how the building is constructed into the hill. This connects the top of the hill with the ground level below. This structure is different than many others with its ability to work with several planes of the Earth. Residents of Rokko Housing 1 are able to climb to a height which gives them a great view, but also settles them at the top of the hill. A Riverfront Revival has a site which deals with two elevations and needs to find a way to connect them. The use of terraces is a great way to bring people down from one height to the next and compels them to keep exploring.

3.10. The Bianchi House



Figure 18 / Rear View of The Bianchi House

<https://archeyes.com/bianchi-house-at-riva-san-vitale-mario-botta/>



Figure 19 / Front View of the Bianchi House
<https://www.pinterest.com/ardiellondon/bianchi-house-mario-botta/>

The Bianchi House designed by Mario Botta is a structure which can help this thesis considerably with the connection of the two elevations and the towers in between. The towers being designed for this thesis will have a lower entrance closer to the river, while there will also be a higher entrance connecting to the downtown area. The Bianchi House has a bridge which leads to an elevator and brings its passengers down to the house. Much can be learned from this house about how to make a lobby work while there is housing still below it. This building in Riva San Vitale, Switzerland is perfect for teaching how to connect two areas at different elevations.

The largest takeaway from the Bianchi House for this project is how to connect two varying elevations. With one side of the structures being at the same level as downtown St. Paul, and the other being many feet below, it is important to find how these towers will work with both heights and human traffic from both sides.

3.11. Cook's Camden



Figure 20 / View of Cook's Camden from the Central Walkway
<https://placesjournal.org/article/the-modern-urbanism-of-cooks-camden/>



Figure 21 / View of Cook's Camden from the Road
<https://architecturetoday.co.uk/cooks-camden-2/>

Cook's Camden in the United Kingdom is also a structure meant to be studied for inspiration. This case study will help more than the others as this is a larger building complex meant for the use of many families rather than just one. This apartment complex is essentially two structures which were built on the opposite sides of a courtyard. They both have terraces and create a valley at the center. This thesis will use the site's cliffside as a way to connect the river and the downtown. This project also includes an apartment complex, and this is the most important part as it brings people to live downtown.

One of the best aspects to take away from Cook's Camden for this thesis is how it allows people to live in a hill-shaped building. Even though these proposed towers are not going to be shaped in this way, Cook's Camden still expresses the importance of an experience on the lower

side of a hill and how people approach and exit a hillside structure. With a riverside park being right next to these residential towers, it is important to figure how residents can approach their homes while still having privacy from other people enjoying the park. This structure shows the importance of an enclosure and how it creates its own environment.

3.12. 30 Hudson Yards



Figure 22 / 30 Hudson Yards
<https://www.skyscrapercenter.com/building/30-hudson-yards/13325>

30 Hudson Yards designed by Kohn Pedersen Fox Architects has a rigid form and stands beside a park for people to enjoy as they stand on the Hudson Riverfront. What 30 Hudson Yards has to offer for St. Paul is an idea of a non-uniform structure and a new feel. St. Paul's current skyline does not have many modern structures, and these new ideas will help St. Paul propel toward the future and will give its residents a sense of importance and value for their city.

The biggest lesson taken from 30 Hudson Yards is how the structure still works and gives a great look to New York City while also not keeping a consistent and uniform shape. It is very original and expresses how important it is for designers to not always follow the beaten path and create what others would never have imagined.

Standing beside the Hudson River, 30 Hudson Yards has “a flat elevation to the river and a slanted façade toward the east, with a cantilevered Skydeck offering dramatic city views” (“River Dance,” 2017). This tower also has a strong connection with another which shares its site. 30 Hudson Yards and 10 Hudson Yards are connected by “A large, eight-story retail podium” on an “ambitious new 28-acre mixed-use district... over an active rail yard” (“River Dance,” 2017). 30 Hudson Yards is a piece to a larger puzzle which is meant to propel the city of NYC and its people into the future with a strong economy.

3.13. The One World Trade Center



Figure 23 / The One World Trade Center

<https://www.loopnet.com/Listing/One-World-Trade-Center-New-York-NY/4043898/>

Since the One World Trade Center's completion, it has stood as the tallest tower in New York City with its simple but elegant and rigid shape. The One World Trade Center was designed by Daniel Libeskind and David Childs. The form of this tower may be simplistic, but the subtle ridgelines and turns allow this structure to stand apart from the crowd. The tower's sharp turns are what make it one of the most famous towers in the world. Along with it being one of the tallest towers on Earth, it can give inspiration to St. Paul which currently does not have very tall high-rises. This does not mean a tower in the top ten highest in the world is what St. Paul needs, but two towers which rise above what the city already has while bolster it in a competitive nature.

At the time of its completion, “the Freedom Tower/One WTC is the most expensive skyscraper ever built in the United States” (Charney, 2014, p. 252). Charney then expresses on p. 253 of his paper, *Transforming a tower: How did the One World Trade Center eclipse the Freedom Tower?* how “the Bottom line of every structure is neither directly or exclusively linked to technological feasibility but to the intricate combination of public and private interests” (2014). This proves the importance of every building being made for the people it serves, just like the One WTC, because of how its ”combination of fading symbolic nuances, exacerbated economic difficulties and enduring state intervention makes it a unique supertall and, at the same time, the emblematic supertall of the early 21st century” (Charney, 2014, p. 253). The One WTC was made after the terrorist attacks of 9/11, and it was very important to create a monumental structure where the Twin Towers once stood. This is meant for people to remember who and what we lost, but how we can still move forward with respect.

3.14. Shanghai World Financial Center



Figure 24 / Shanghai World Financial Center
<https://www.skyscrapercenter.com/building/shanghai-world-financial-center/131>

Much like the One World Trade Center, the Shanghai World Financial Center designed by Kohn Pedersen Fox Architects has a simple and rigid shape while also being amongst the tallest skyscrapers in the world. This structure is halfway across the planet from St. Paul, but its shape is one which can transform any city. This tower brings a sense of modernity and success to Shanghai, and it is a great representation of what a tower should be.

3.15. The Bank of America Tower



Figure 25 / The Bank of America Tower
<https://www.homedit.com/tallest-buildings/us/nyc/bank-of-america-tower/>

The Bank of America Tower designed by Rick Cook may not be as tall as the other buildings previously listed, but the sheer rigidity of the tower is a marvel in itself. This tower stands beside Times Square and has helped keep this area lively and impressive. Inspiration from this tower comes from its irregular shape and its ability to form one cohesive building while also not being a uniform tower. The strange cuts, edges, and turns on its façade are what gives the Bank of America Tower an important and creative structure in New York City.

The Bank of America Tower can also greatly influence the design of towers in St. Paul, Minnesota, because of its height. The fact this tower is not as tall as many other buildings in New York City brings a relation to the smaller city of St. Paul. It appears more realistic for this tower to be in St. Paul than the others listed and expresses what can be done in Minnesota.

The Bank of America Tower also has several different features which make it environmentally friendly. One of these aspects is its concrete components. “Mixing slag with concrete saves energy and makes the concrete stronger” (Lemonick, 2007). The tower is also meant to “save so-called gray water from washrooms” and creates “much of its own electricity from natural gas, a less potent carbon emitter than coal” (Lemonick, 2007). Because of these reasons, the Bank of America Tower is a very strong and sustainable structure to take inspiration from.

3.16. Olympic Sculpture Park



Figure 26 / Olympic Sculpture Park

<https://www.floornature.com/weiss-manfredi-olympic-sculpture-park-seattle-14549/>

Olympic Sculpture Park designed by Weiss/Manfredi has found creative ways to connect downtown Seattle with a large waterfront. The sharp edges of this park cover roads and railroad tracks in order to bring people to the water. The towers meant for this thesis will have rigid and sharp edges, and their connections to the site and park are important for this project to work. As a connection to a waterfront is an important part of this thesis, one could learn a lot from the Olympic Sculpture Park to help St. Paul. This case study can teach how to overcome roads as obstacles and how to make a waterfront a part of a city. The green space of the Olympic Sculpture Park is also a very important characteristic as it is situated in a highly urbanized location with greenery far away. This is a problem many cities must overcome, and it is one which is meant to be fixed in St. Paul. This park expresses the grandness of art, form, and nature, and it is one which overcomes different challenges to positively impact its community.

4. Final

This thesis is meant to help St. Paul with bringing people in from the suburbs and other surrounding cities. These people are going to be from different demographics and have varying wages, which will pull people together and add life to the heart of the city. Housing will be made for many different citizens, and an increased amount of foot traffic will bring people to a natural setting of trees and grass by the Mississippi River. This will connect St. Paul with the river and help the city grow while creating a sharper riverfront and skyline.

4.1. 3D Printed Mass Models

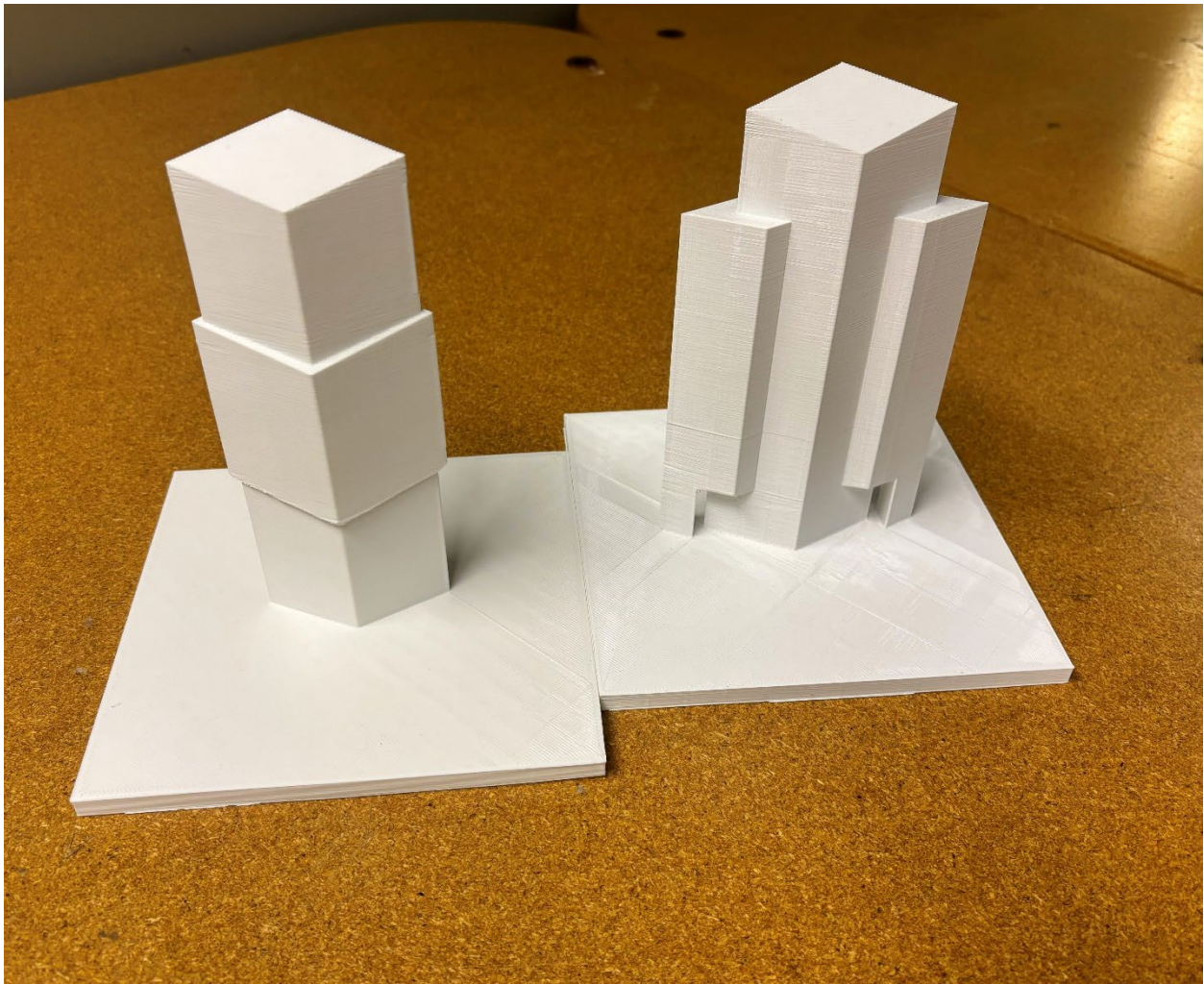


Figure 27 / 3D Printed Mass Models
Picture by Author

These two models were 3D printed with the intent of finding what the structures could like in their full forms. They were constructed early in the Spring Semester to assist in the designing of these towers. Although the overall design did not change much from these models to the final results, much was found from their existence which has helped find many solutions.

One of the solutions found from these models was figuring out just how large these towers need to be. At first, the intent was to have them skinny, and that is how these models were designed. However, in order to create a proper and functional building, there must be adequate floor plans. The intent of this thesis is making homes for people on the Mississippi River, and the floor plans would not function very well if they ended up being this skinny. Because of this, the overall depth of the towers was increased to accommodate more apartments.

The other issues solved by these models are the supports for the juttied-out areas of the East Tower. At first, they were never supposed to exist, instead those areas were just meant to create large overhangs. These supports were put in place to make sure the model would not fail as it was printing, but then it was found just how important they actually are. The construction of large overhangs as big as these is very improbable and accomplished only through very specific and expensive ways. Because of this, and the need for fire exits on the larger and higher up floors, the supports were added to the final design.

4.2. Final Exterior Renders



Figure 28 / Final Skyline Render
Render by Author from Lumion

Background Photo by <https://www.youtube.com/watch?v=Tn09ovlDzCE>



Figure 29 / West Exterior Render
Render by Author from Lumion

Background Photo by <https://fmr.org/updates/land-use-planning/st-paul-riverfront-roundup-five-projects-watch>

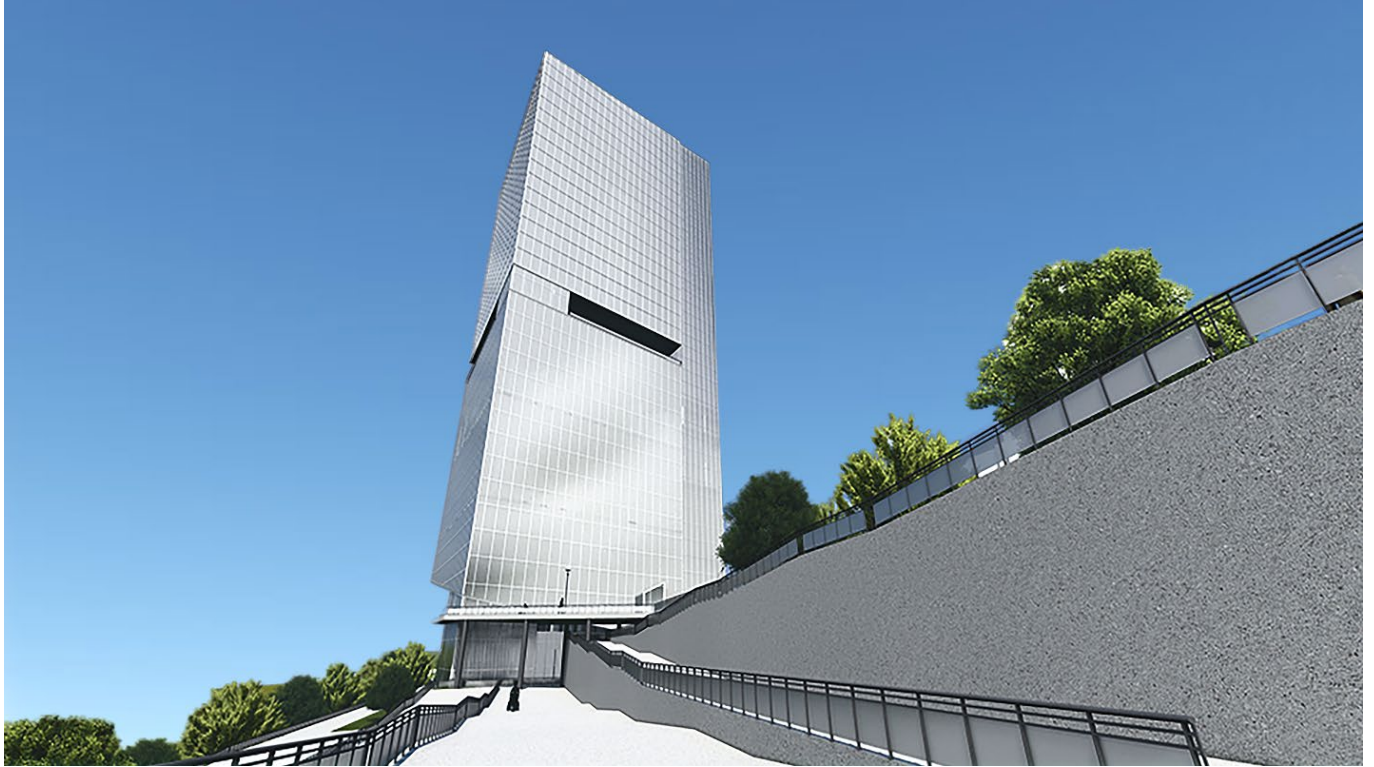


Figure 30 / Exterior Render from ADA Ramp
Render by Author from Lumion

Background Photo by <https://stock.adobe.com/search?k=cloudless+sky>

4.3. Program

The new development designed for downtown St. Paul includes two towers with a total of 56 floors in each structure. Included in the West Tower is a total of 490 apartments. 128 of these apartments are one-bedroom units, while 166 are two-bedroom units and 196 are three-bedroom units. Also included are four offices spaces on each lobby level with a total of eight offices spaces and two lobby levels. One lobby opens to the lower riverside elevation, while a lobby on a higher floor opens to the downtown area.

The East Tower is a little different when it comes to the number of apartments and configurations. This tower includes a total of 616 apartments with only 56 of those being one-bedroom units. There are also 300 two-bedroom units and 266 three-bedroom units. Along with

this, the East Tower also includes the same amount of offices spaces and lobbies as the West Tower, but it includes features the other does not have. This tower has two restaurant spaces opening out to balconies and a bar halfway up the structure for the community to enjoy.

One problem found with this design is the fact there are so many apartments and not many community spaces. Along with this, there are very few office spaces as well. Because of this, it can be understood that many apartments can be removed from the plans to accommodate far more offices spaces. However, more time should have been spent on including other spaces for the community or the residents as well, including work out spaces. The issue about this is how much of the time spent on designing the towers was meant for finding the best configurations for different apartments and the number of units on each floor. The goal of this project was to create living accommodations for people in downtown St. Paul while connecting the community to the riverfront. Because of this, it was important to spend a lot of time working to create rooms for community members to live in.

When it comes to the exterior areas of this project, a park was designed to bring people from the downtown area to the river. This includes green spaces by the higher downtown location, and even more natural areas further down by the river. Connecting these two areas is an ADA ramp with many cutbacks to reach the much lower river. This ramp also includes a landing every 30 feet for the safety of its users. However, this may be a lot of moving for some people, so an elevated walkway to the East Tower was designed to allow for people to access its elevators and staircases for easier access to this park's amenities.

4.4. Sustainability Factors

In a way to work through the large scale of this project and the impact it would have on the environment, sustainability factors have been included to keep our planet healthy. Starting

this off is the recycled steel for the structural columns, beams, and decking. Urban green spaces have also been implemented in the park and balconies to introduce more nature into the city. Also added were photovoltaic glass panels which will help with the generation of energy for these two towers (*Curtain Wall with Photovoltaic Glass - Onyx Solar Solutions for Buildings*, n.d.). Along with this, ORNILUX Bird Protection Glass was also implemented in the curtain walls to decrease the number of bird casualties from these structures (*ISOLAR® Products*, n.d.).

4.5. Interior Renders



Figure 31 / Lobby Render
Render by Author from Lumion

This interior rendering shows off the lobby space on the West Tower, but this lobby is the exact same as the one in the East Tower. The main point to get out of this picture is the open space for many residents to enjoy. Another of its important features is the glass façade present around the entire structure of both towers. This allows for more natural light to enter the structures which raises people's morale and helps them feel more at ease. The curtain walls also

allow for a view of the Mississippi River from inside the towers, and this helps the inhabitants feel more connected to nature.



Figure 32 / Apartment Render
Render by Author from Lumion

The curtain wall façade allows for every apartment in each structure to have adequate daylighting throughout the rooms. Another important aspect of these apartments is the open concept of them. The living room and the kitchen are connected while all getting lit up from natural light. Living rooms and kitchens are the main gathering spaces of every home, so these areas were meant to be open to all its inhabitants.

4.6. Site Plan

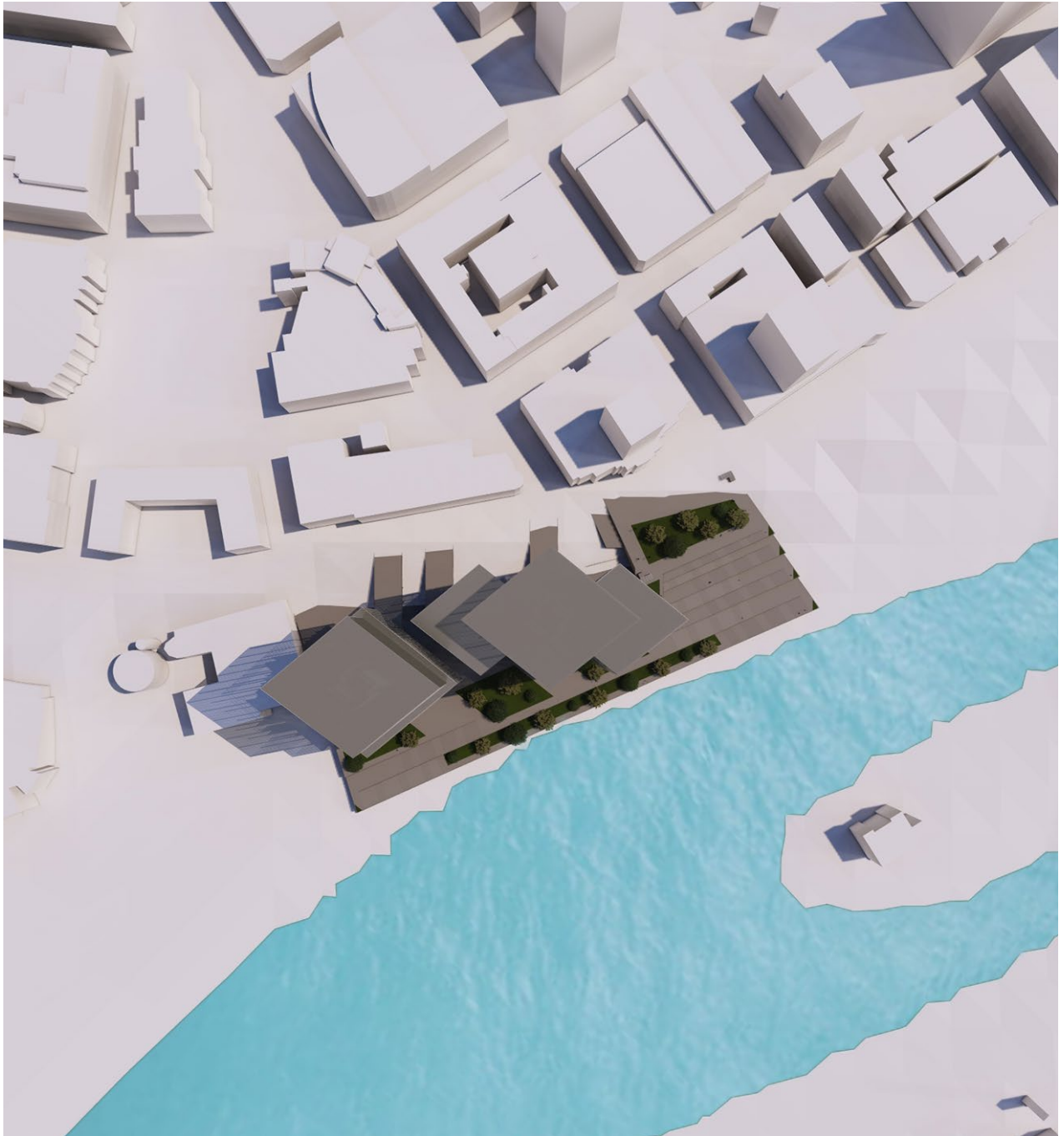


Figure 33 / Site Plan
Render by Author from Lumion

River Photo by <https://www.istockphoto.com/photos/water-top-view>

4.7. Floor Plans

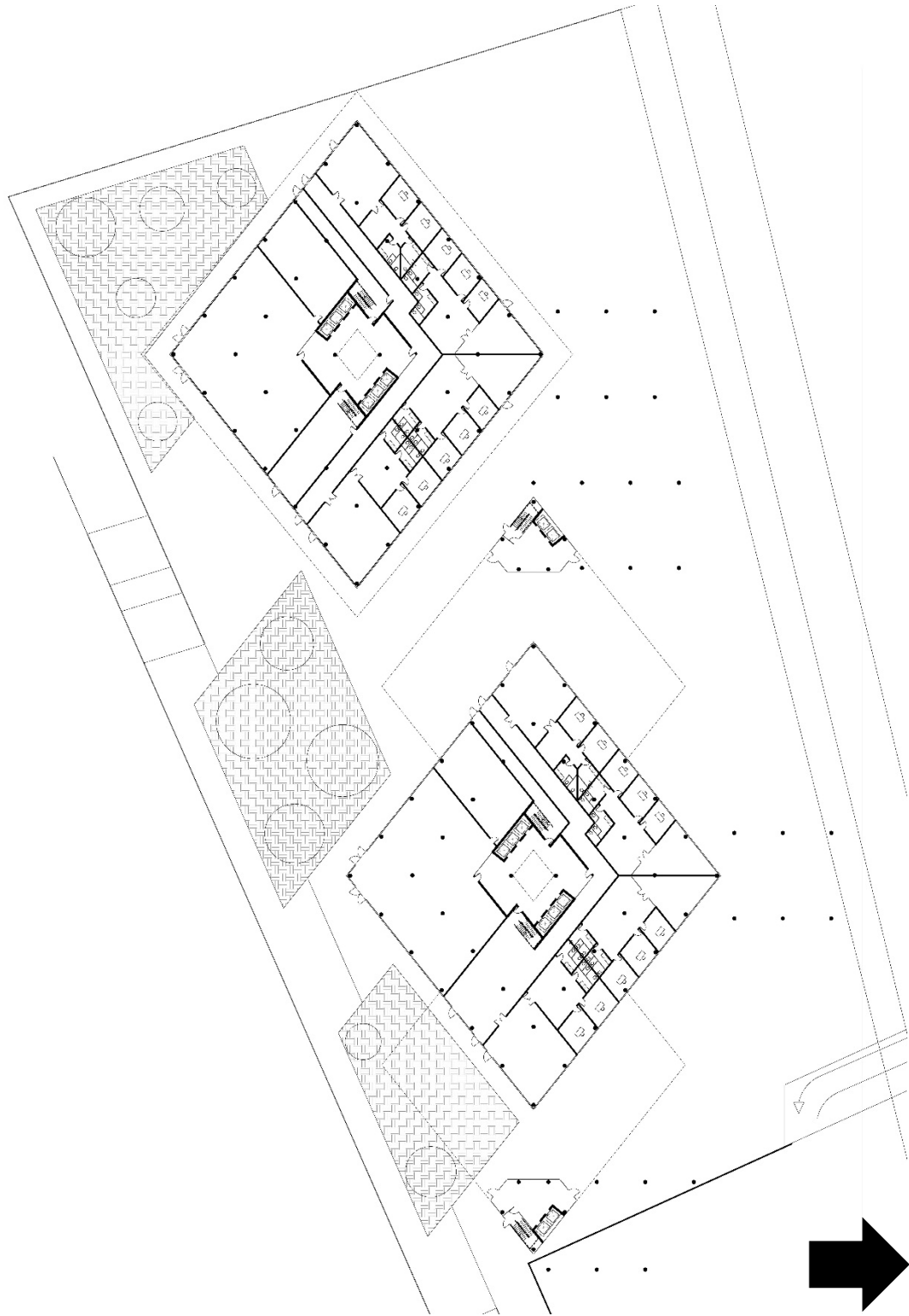


Figure 34 / First Level Floor Plans
Drawings by Author from Revit

The first floor of the two towers is the same as each other with one difference. The East Tower has two staircases and several elevators farther out from its East and West corners. This allows for the safe exit of residents from floors above in case of a fire. These floors include a large, wide open lobby space for their residents to enjoy together. The main entrance is in the South corner of each tower, but there are also entrances farther to the East and West for the staircase fire exits. Also included are two more entrances farther East and West meant for the hallways connecting to the four office spaces in each tower on the Northeast and Northwest sides.

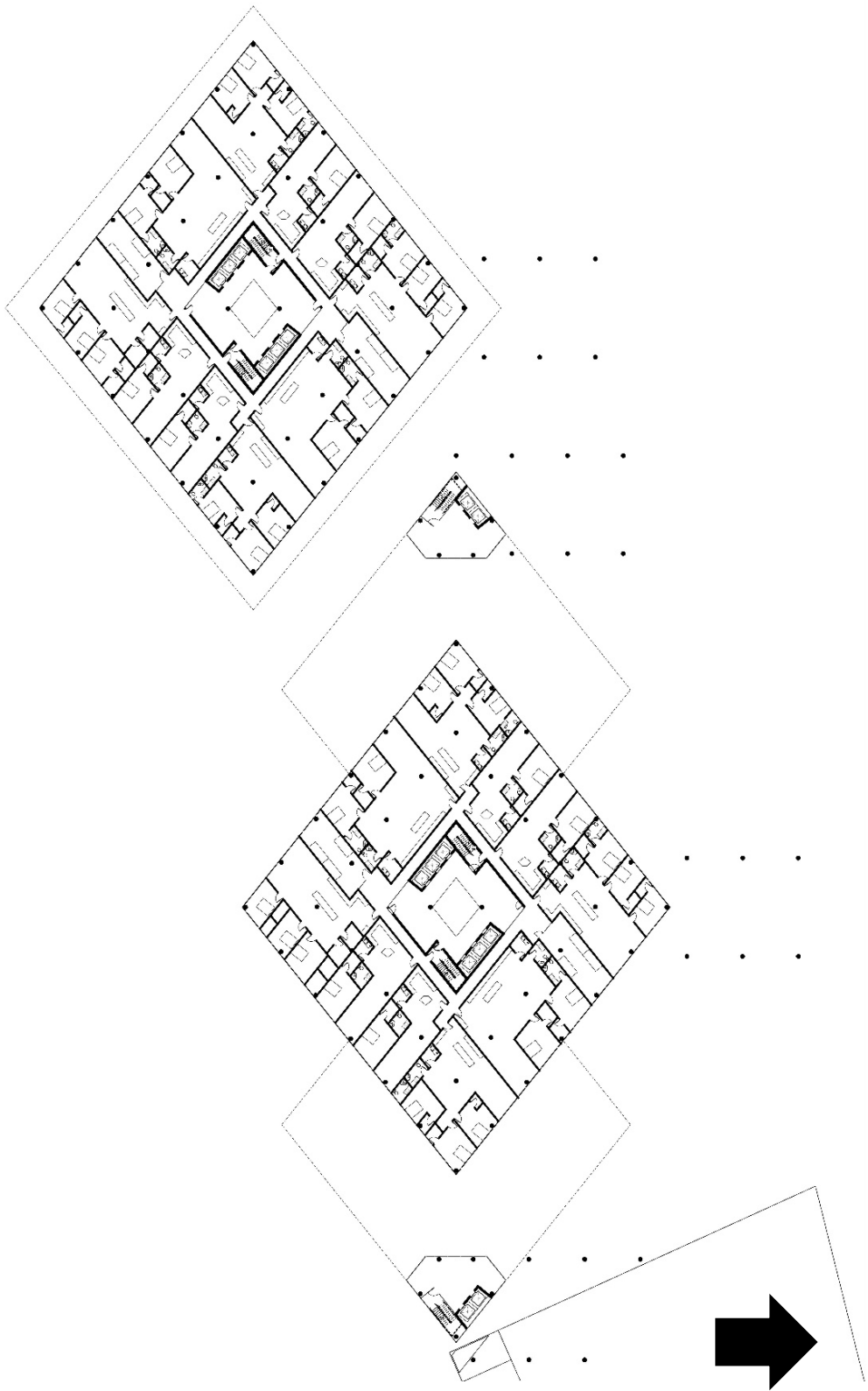


Figure 35 / Lower-Level Floor Plans
Drawings by Author from Revit

Near the first level of the towers is what is called the Lower-Level Floors. These floors are much smaller than those farther up, but they still include many apartment spaces. There are two lounges on the Southwest and Northeast side of each tower which bring light through their curtain walls all the way into the inner concrete shell through a curtain wall of its own. The interior shell where the staircases and elevators are also includes an open diamond shaped hole on each floor to allow for an open atrium feel and more natural light to enter the room. This may be a fire hazard in the future, so it is also proposed for the towers to include dropdown fire curtains which activate when fire alarms go off. These would be set around each floor opening on every level of the towers. When it comes to the number of apartments on these floors, there are four three-bedroom units, two two-bedroom units, and four one-bedroom units in each structure.

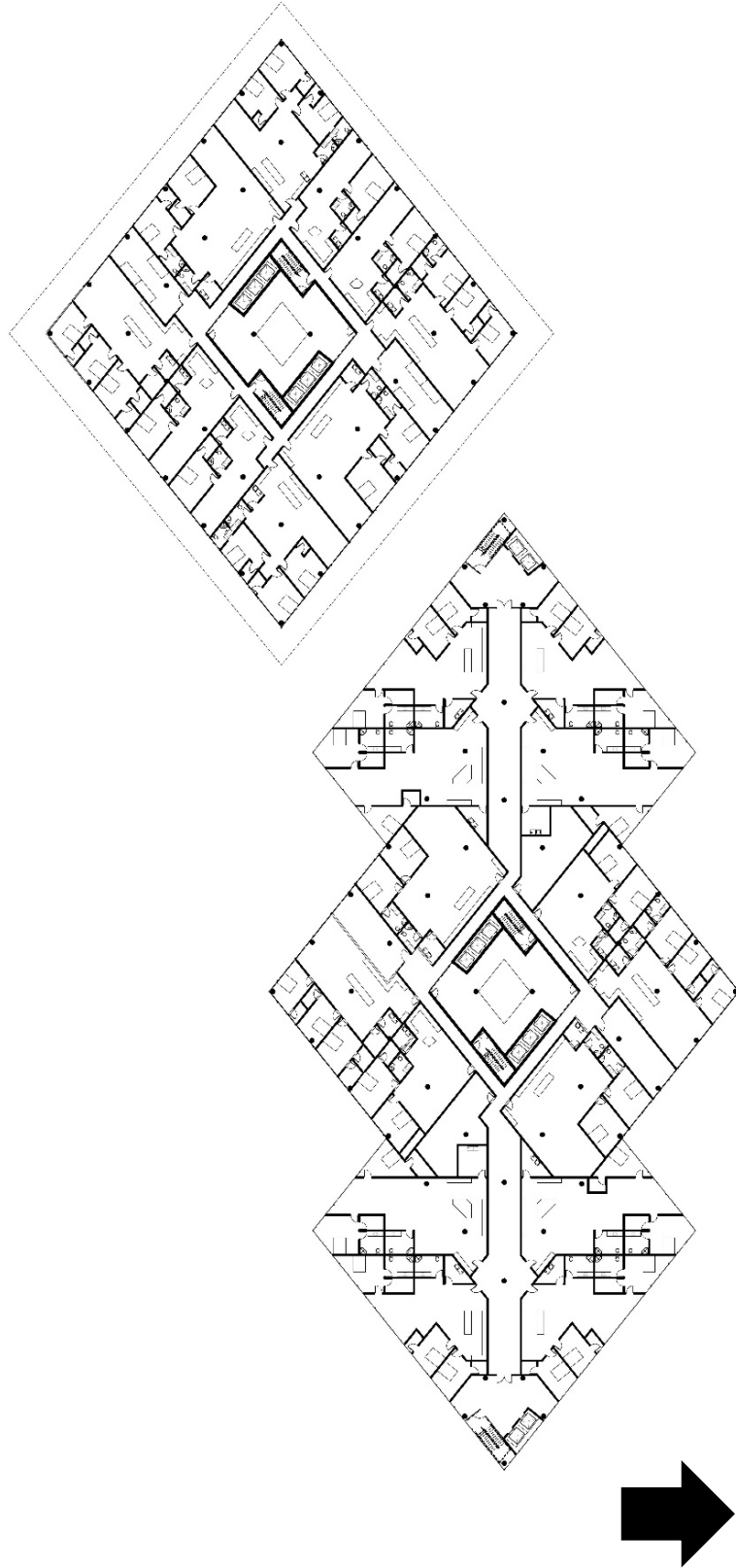


Figure 36 / Upper-Level Floor Plans
Drawings by Author from Revit

These levels start to express how the configurations of floors and apartments change as they rise throughout the towers. They also show how the two buildings can have very different layouts as well. The West Tower has the same layout as the previous floor plan below it, but the East Tower is much larger. The East Tower has juttred out sections to the East and the West, and this allows for far more apartments. There are six three-bedroom units, eight two-bedroom units, and no one-bedroom units on this floor. However, the lounges on the Northeast and Southwest sides are still there to let sunlight into the center of the tower. There is also more natural light coming in from the East and the West through the staircases and curtain walls in each corner. There are also larger hallways on these parts of the floors which help light the area.

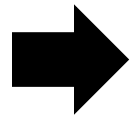
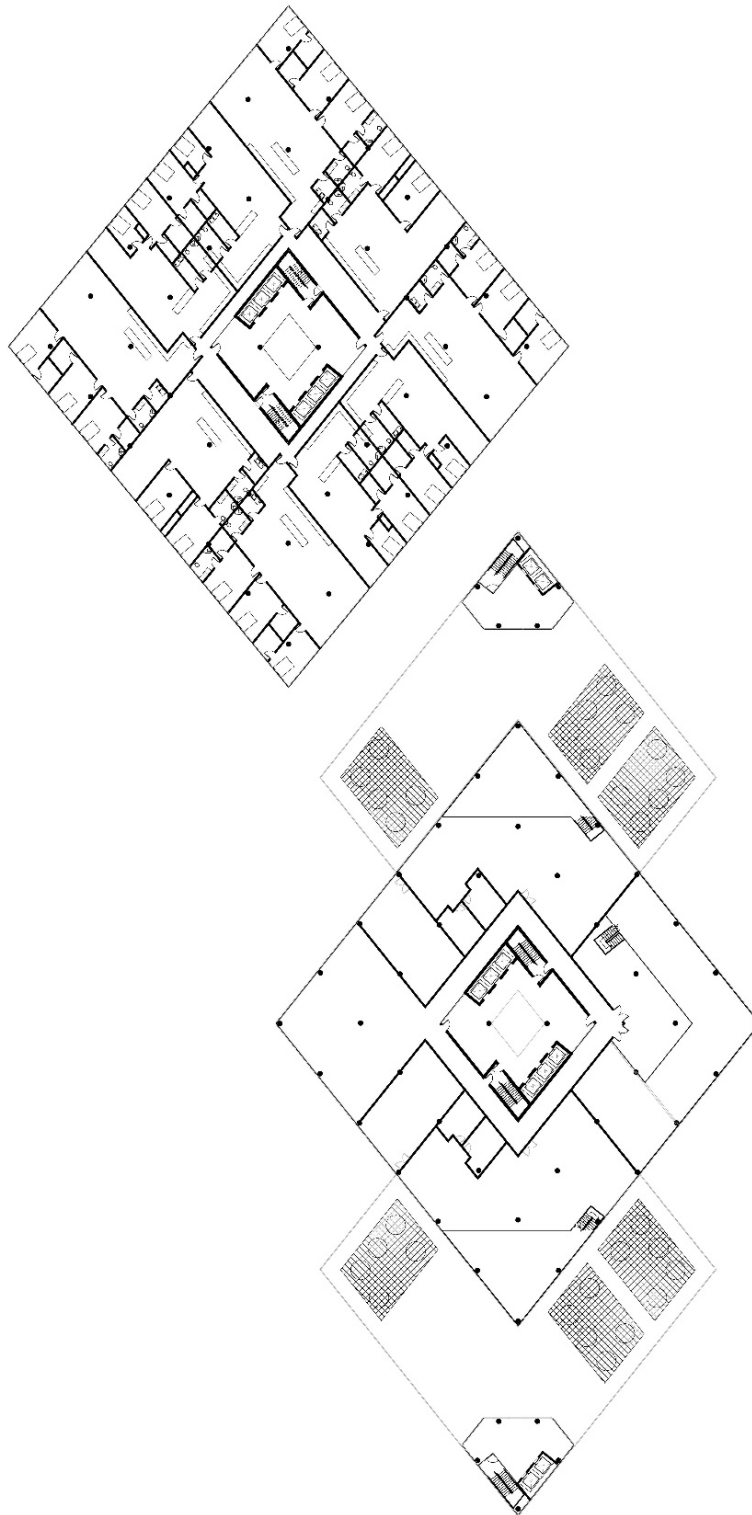


Figure 37 / Luxury and Restaurant Level Floor Plans
Drawings by Author from Revit

At the middle of the towers is where the floor plans start to change quite dramatically. In the West Tower there are luxury apartments which go for higher prices than the ones on the floors below and even higher up. There are a total of eight two-bedroom units and four three-bedroom units on these floors. In the East Tower there are now two restaurants in the East and West corners which open to the balconies outside. These balconies include several green spaces for the public to enjoy. These balconies also lead out to the staircases further to the East and West for convenience and safety. On the Northern side of this tower there is a bar space also open to the public. These restaurants and the bar all have open lofts on the floor above for extra seating and a more open two-story feel. Also located on this level is an open lounge on the South side of the East Tower for those who wish to relax in an open space with others.

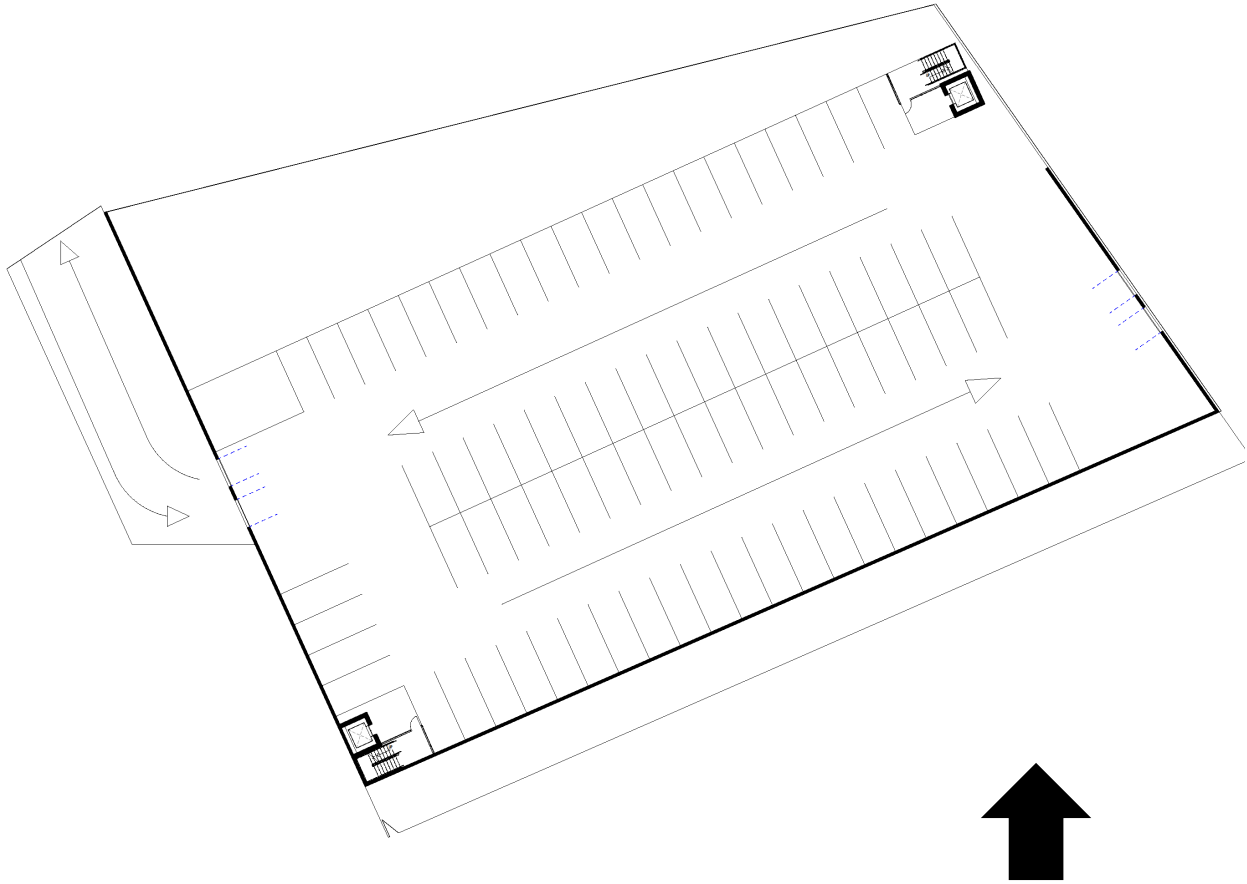


Figure 38 / Garage Floor Plan
Drawing by Author from Revit

Set underneath the main park on the East side of the site is where the garage is located. There are two walking entrances from staircases and elevators on the Northeast and Southwest sides of the park. There are 81 parking spaces on each floor, and they are meant only for the tenants of the towers. This garage has access to the higher downtown location through the entrance in the Northwest corner on the garage's highest level. Also included is an entrance from the much lower Shepard Road beside the Mississippi River in the Southeast corner on the lowest level of the garage.

4.8. South Elevation

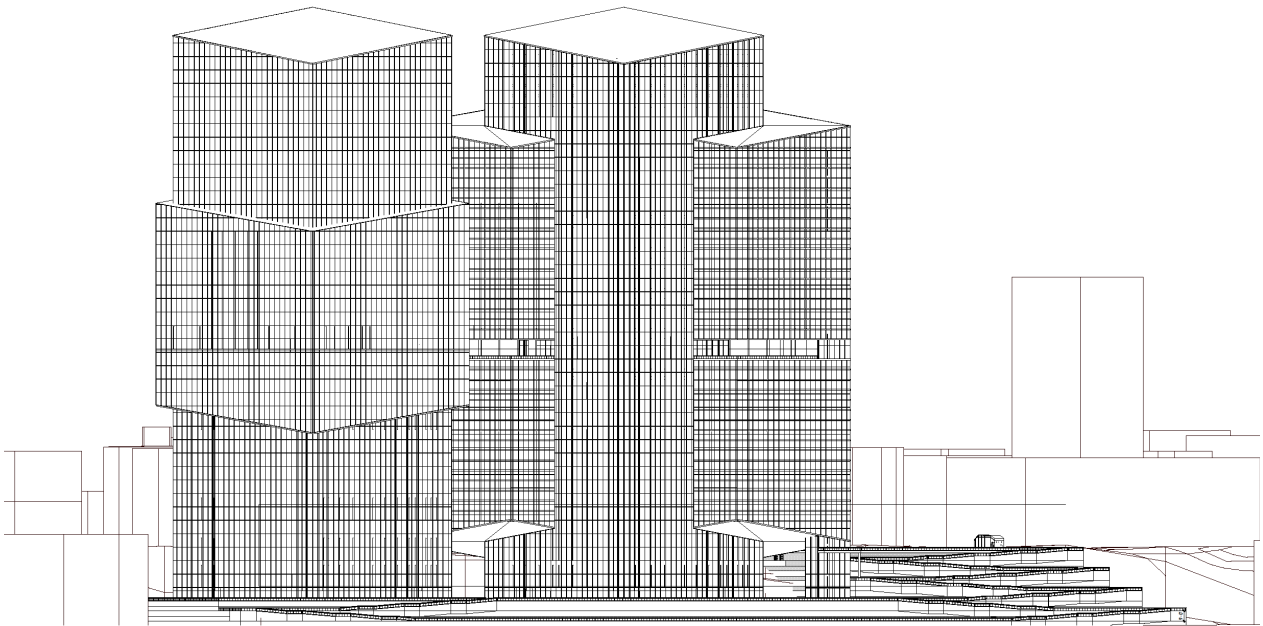


Figure 39 / South (Riverside) Elevation
Drawing by Author from Revit

From the Southern Elevation one can see how the towers look from the other side of the Mississippi River. What can be pointed out from this view is the curtain wall facades of the towers and the diamond shapes of each building. One can then see how the two towers interact with each other and sit on the site. Also noticed from this elevation are the open balconies halfway up the East Tower and the long ramp with many cutbacks that leads people from the downtown area to the river in front of the high-rises.

4.9. Section Cut

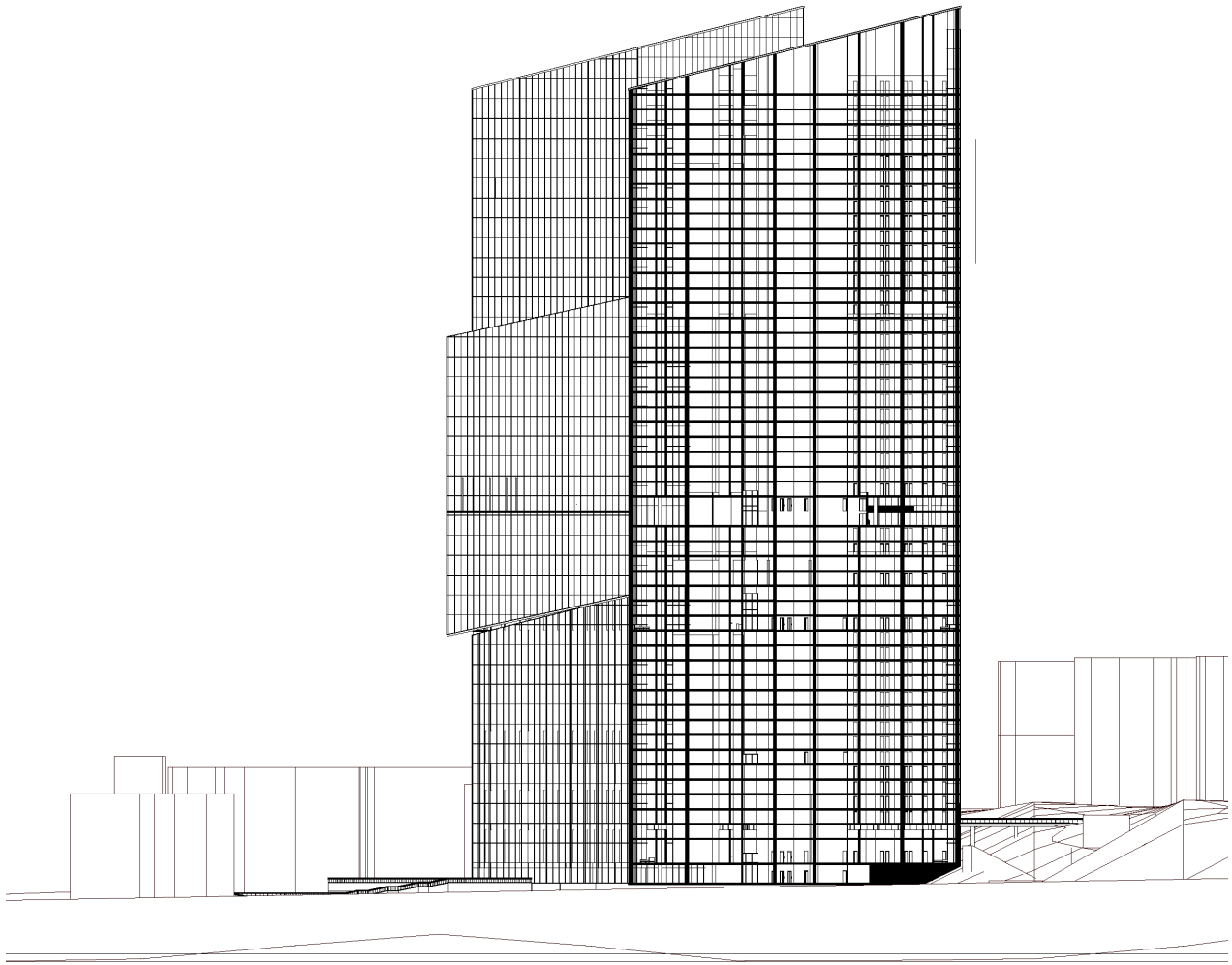


Figure 40 / East Section Cut
Drawing by Author from Revit

From this section cut people can witness how the structure of these towers work. Here one can see the steel columns going all the way to the top of the towers and the steel beams and decking running along the floors. Also noticed here is one of the elevated walkways from the towers which lead to the downtown area. This allows people to enter the tower at a lobby higher up in the tower than the first floor. However, the most important part of this section cut is how it expresses from the East side of the site how there is a large elevation change between the

downtown area and the Mississippi River. This important visualization then shows how the towers work in this space.

4.10. Conclusion

What can be learned from this thesis is what can bring people back into the downtowns of a city while revitalizing a riverfront. This final product consists of two 56 story towers and a park with a long ramp leading to the Mississippi River. Taking modern designs from several curtain wall façade towers around the world have led to the final design of the structures. Along with this, studies of much smaller residential buildings and green areas have also led to these results. It can be concluded from this thesis that the addition of a tower and park beside the Mississippi River in downtown St. Paul can indeed revitalize a riverfront and bring people back into the downtown area.

On the contrary to the above statement, it must be explained how what is included in an urban revitalization can better impact the community around it. The large number of apartments in this project may only allow for empty spaces along with other vacant residencies around the city, so a better range of different amenities in a tower would better suit the area than just apartments. It was explained in this thesis how a high priority was set to find different configurations of apartment spaces and their sizes to accommodate more people moving in. This has explained why there are not many office spaces in these plans, but it was also expressed how they can be added later. Other important pieces which could be added to a tower downtown would be workout facilities and even more areas for community and tenant use.

Along with this, the construction of one tower would better suit this city than two. This creates a smaller cost for the entire project, and it leads to a greener environment. This also gives more space for a larger park with a more spread-out ramp and walking path. More green space

would be added to this area and community foot traffic would increase. This all leads to a safer city and an even stronger connection between the downtown area and the Mississippi River.

It has been found from this thesis how a city and its riverfront can be revitalized. The strengths and weaknesses of this project explain what a city needs more than mere wants. It is concluded that only one tower should be designed and constructed for this area to minimize costs and to be a more environmentally friendly project. This also leads to more room for a park with green spaces and a stronger connection to the river. This, in turn, increases foot traffic and reduces crime. It has also been found that a larger range of spaces would be needed in the tower to bring more people downtown to live and work. This thesis expresses the possibility of a strong skyline and riverfront while creating a safer city, but it has also found how sometimes architects should not add too much to an area when other important needs still exist.

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