

"The point of cities is multiplicity of choice."
-Jane Jacobs, The Death and Life of Great
American cities

ARTHUR SQUARE

A Mixed Use Building Space in Norfolk

Final study project by Tarun Potluri

This book is dedicated to my family, I am greatful to my parents for supporting me all these years. I am incredibly grateful to my committee chair professor Michael Obrien for his advices and constant motivation. I would also like to express my profound gratitude to my studio Professor Dr.James Haliburton & my committee members Dr.Kochiro Aitani, & Dr. Dawn Jourdan for their useful suggestions and valuable guidance

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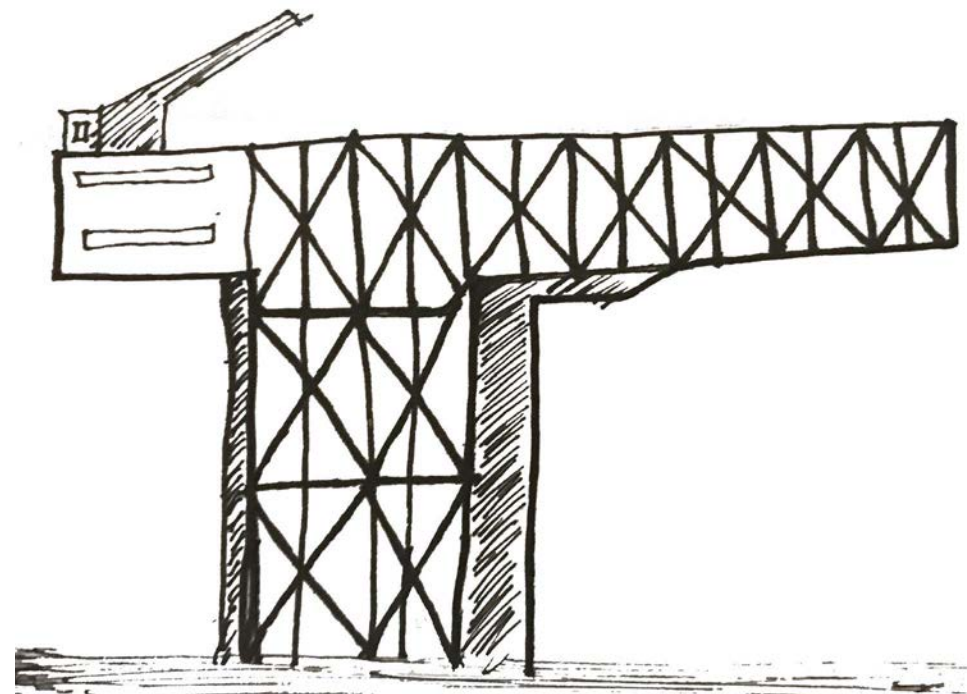
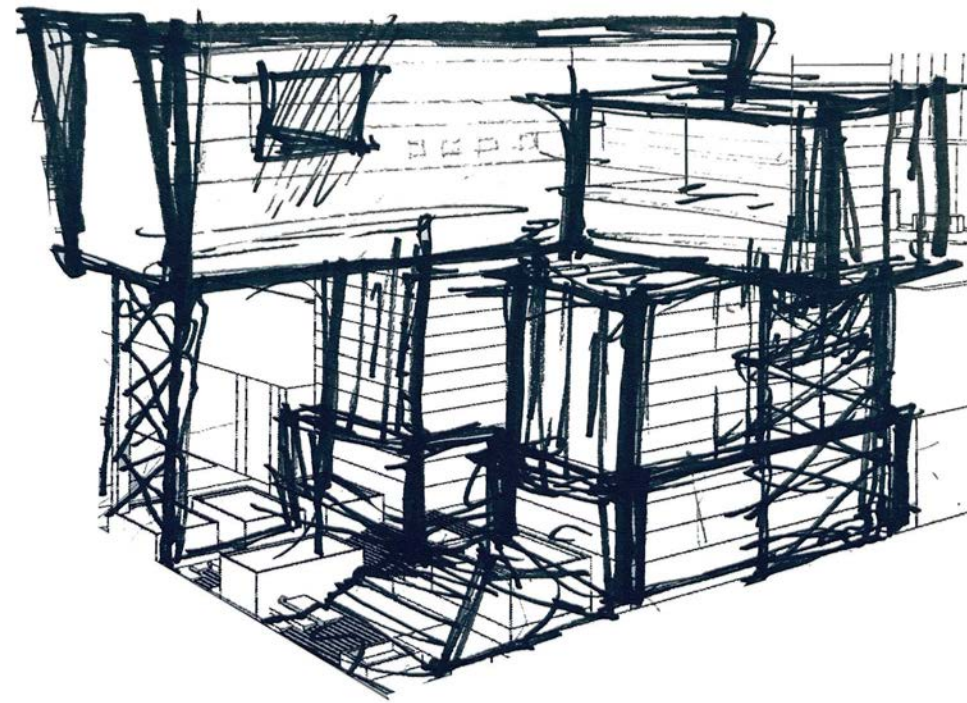
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01 | Introduction



Arthur Square

Looking at cities gives me pleasure. Every person living in the city develops a long association with some part or often with multiple parts, and this image is soaked in memories and meanings. Identity, structure, and meaning are three critical components that help in creating a strong memory. To develop an image, the object's identity is the most significant thing. This implies it is distinct from other things; it can be recognized as a separate entity. Along with its identity, it must generate a solid or emotional connection to the observer.

As a kid, since the start of my middle school, my family and I, lived in a residential neighborhood, away from downtown. This time has been the most memorable part of my childhood. I had many friends in that community, and we had many open places to play football and cricket. Due to my father's business, my family and I moved to an Apartment in the downtown of the city. The downtown is densely populated with many buildings. I ended up having neither friends nor the open places to play. I felt very lonely and stayed at home the entire time.

I feel this is the current condition of many kids and people living in busy downtowns of modern cities. Due to the massive density, we cannot find any open park or public place for recreation. Currently, the cities are becoming concrete jungles without adequate green spaces. I want to design an iconic building as an identity to downtown Norfolk with public green spaces that attract and engage people in the community.

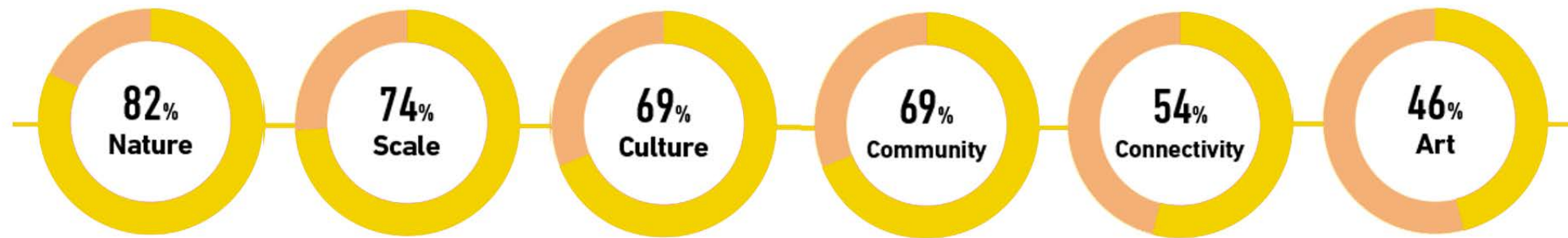
02 | Theory

*"I don't think that architecture is only about shelter.
It should be able to excite you, to calm you, to make
you think."*
- **Zaha Hadid**



What is Mixed Use?

Mixed use development provides a variety of benefits including the creation of a vibrant sense of place and community, with areas that are active throughout the day. Mixed use development can provide housing options for a diversity of household types, often including higher density housing, such as apartments and townhouses. Mixed use developments provide a variety of services and activities within a walkable distance of housing, allowing residents to conduct more of their daily activities without depending on automobiles, and in many instances can provide increased travel options.



In the gensler survey people were given a questionnaire to rate importance of above elements in the mixed use design. The people should rate each element for 100 percent. The above elements were arranged based on rating given by people

Mixed-use environments unlock the possibilities of a diverse, urban lifestyle and breathe new life into cities. The key lies in activating the voids between buildings where social interactions reside, and integrating these intangibles to create developments that elevate the human experience. Mixed land use reduces the probability of using a car for commuting, shopping, and leisure trips, since jobs, shops, and leisure facilities are located nearby (Alberti 2000). Mixed use of space can renew life in many parts of the city and in turn enhance security in public spaces for disadvantaged groups (Elkin, 1991)

The suburban shift: Less auto - dependent, More Convenient

Suburban shifts toward city centers are producing a less auto-dependent culture while creating mixed-use opportunities with greater density. These residential shifts drive mixed-use developments toward districts in cities that have been largely forgotten or ignored. Millennials and baby boomers are relocating to urban cores, seeking more compact, walkable, and less auto-dependent lifestyles. Even in the suburbs, people are looking for an urban experience. Successful developments will include human-scale, mixed-use, transit-oriented places that foster a meaningful sense of community.

Public Space is key

As neighborhoods densify, users demand better and more engaging public spaces. Great placemaking commands a premium and enhances property values. According to the Gensler Experience, public spaces support the widest range of activities, with more unstructured time than anywhere else. They're reported as ideal places for reflection, inspiration, and unplugging all better experience.

1.5x

People who visited public spaces designed for inspiration rated the spaces 1.5 times higher on exceeding expectations



Oxic, China

Architect - EID Architecture

Location - Xi'an, Shaanxi, China

Developers - Canadian Government.

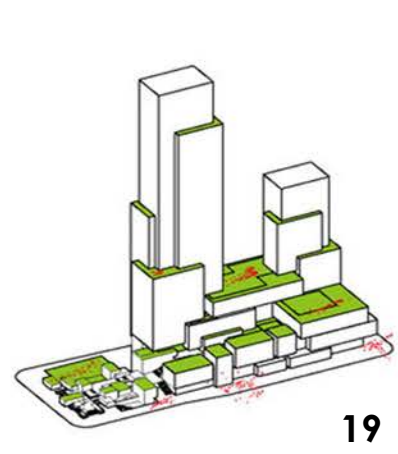
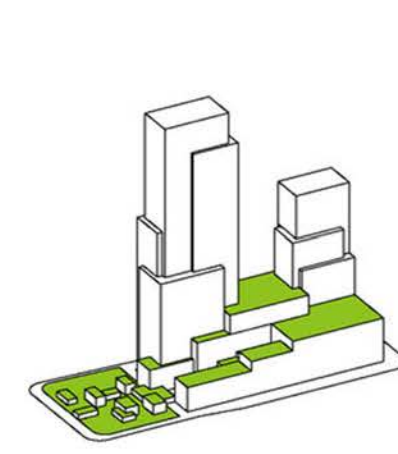
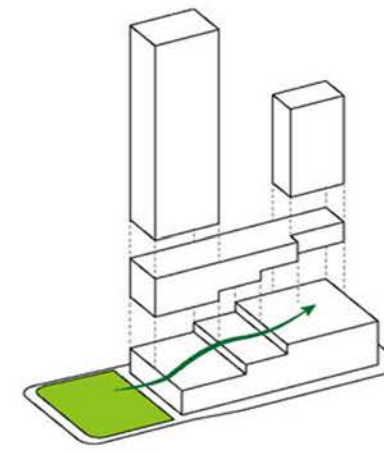
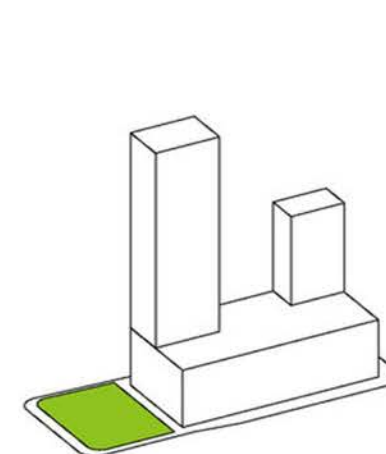
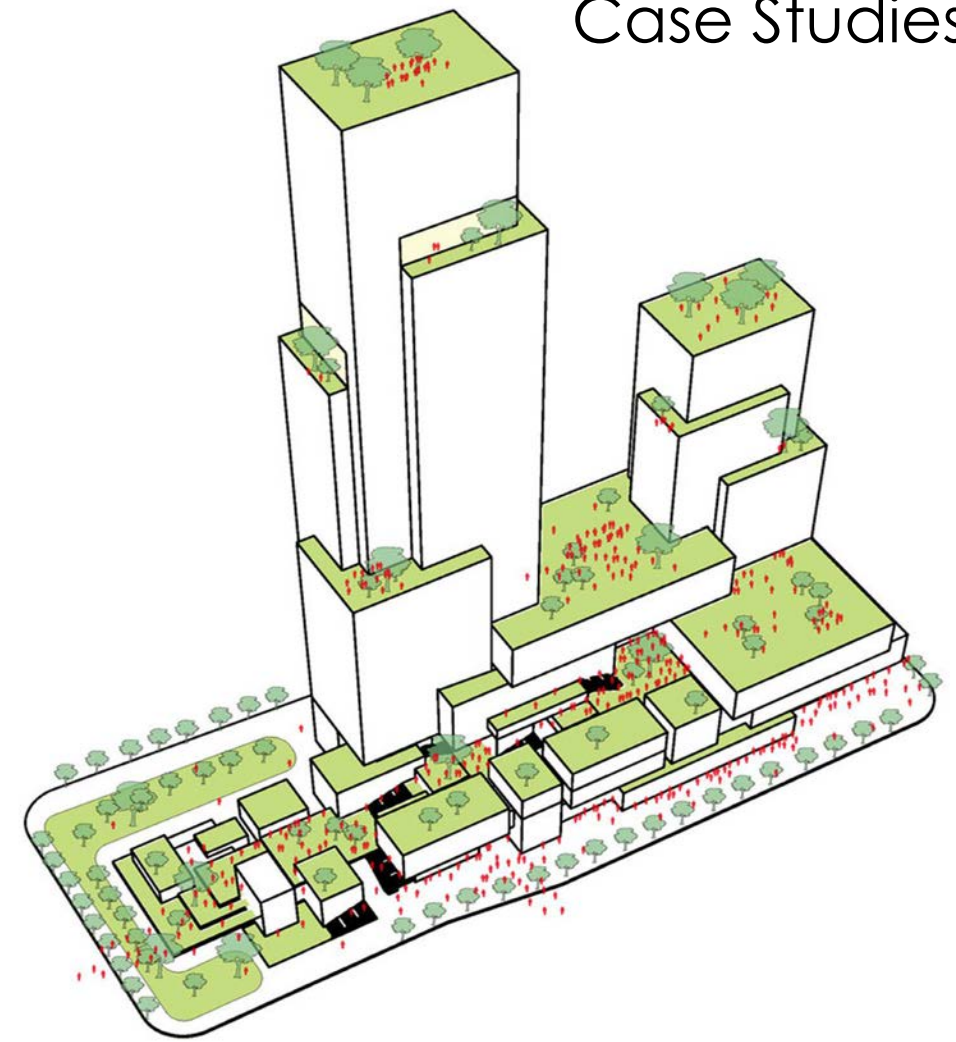
Concept - Exploration of vertical urbanism, the design is strategically organized horizontally and vertically to create a vibrant, permeable urban center.

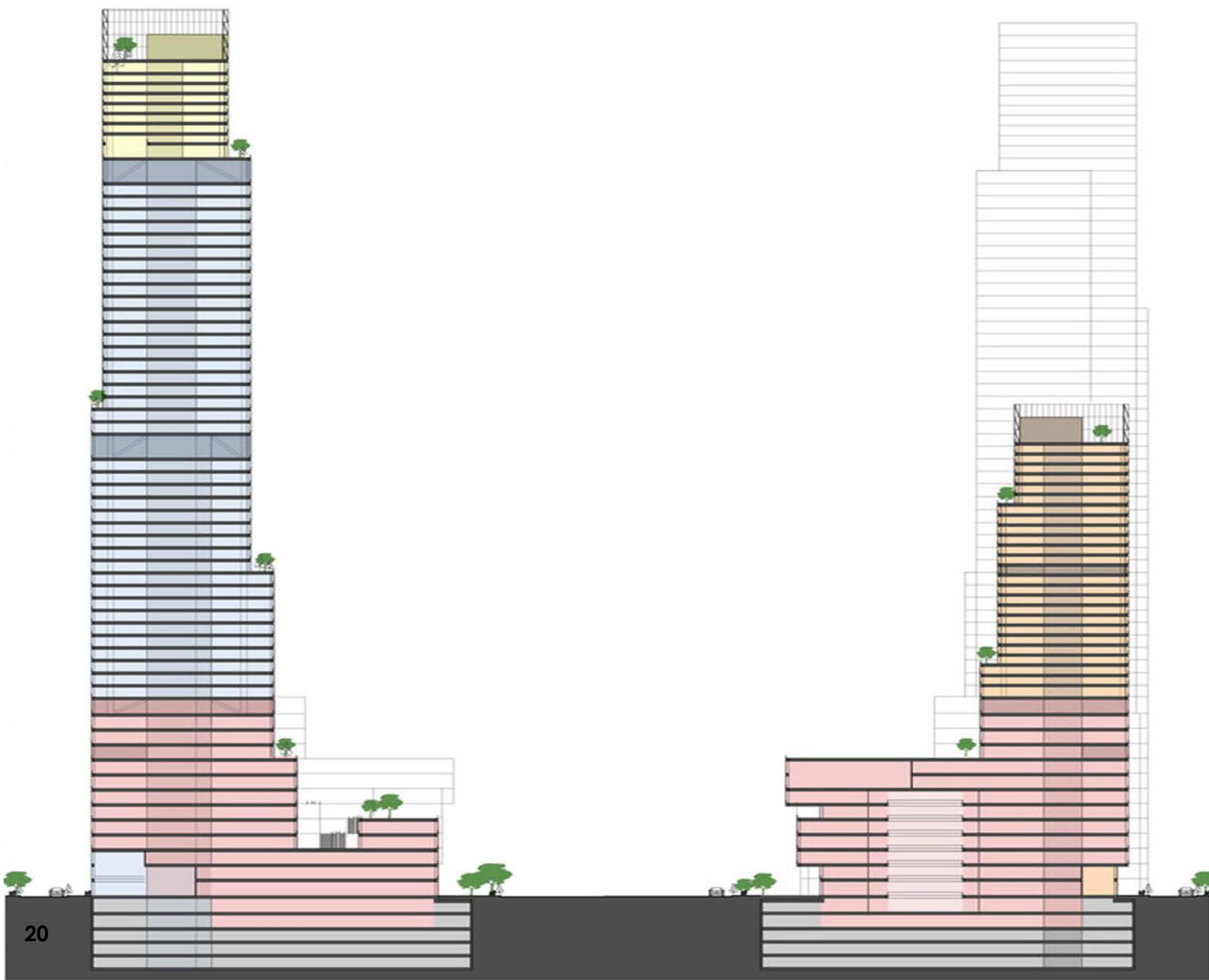
Total no of Towers - 3 (320 meter tower for offices and boutique hotel, 220 meter apartment tower, and 12-floor retail and entertainment spaces)

The design of the OXIC is inspired by the rectangular grids of the historical city of Xi'an. Occupying high vantage points as public space also relates to the ancient city walls, which are currently a public space important to Xi'an's character and lifestyle.

Integration with an adjacent park is achieved via the ascending terraces of outdoor retail space, ensuring pedestrians are engaged with the building and that the building relates to the surrounding streetscape. The landscape is integrated as a part of the vertical community via green terraces and roof gardens.

Case Studies







Valley, Amsterdam

Architect - MVRDV

Location - Zuidas, Amsterdam

Developers - OVG real estate

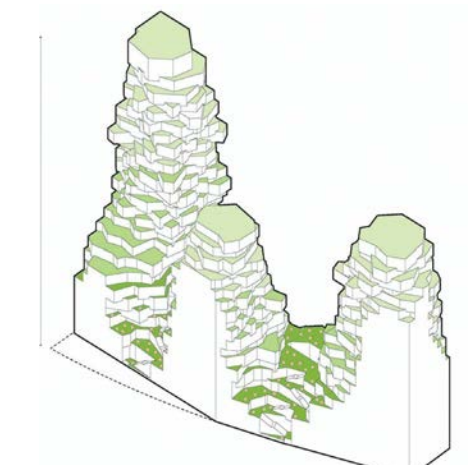
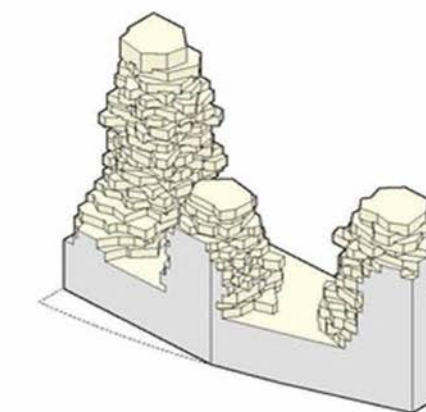
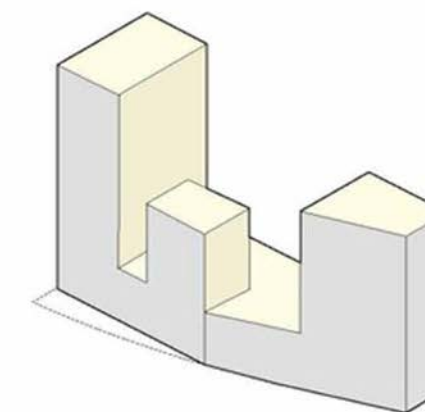
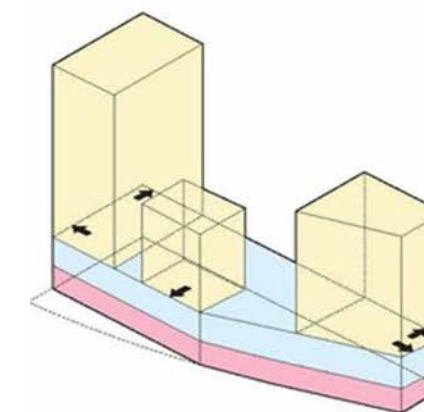
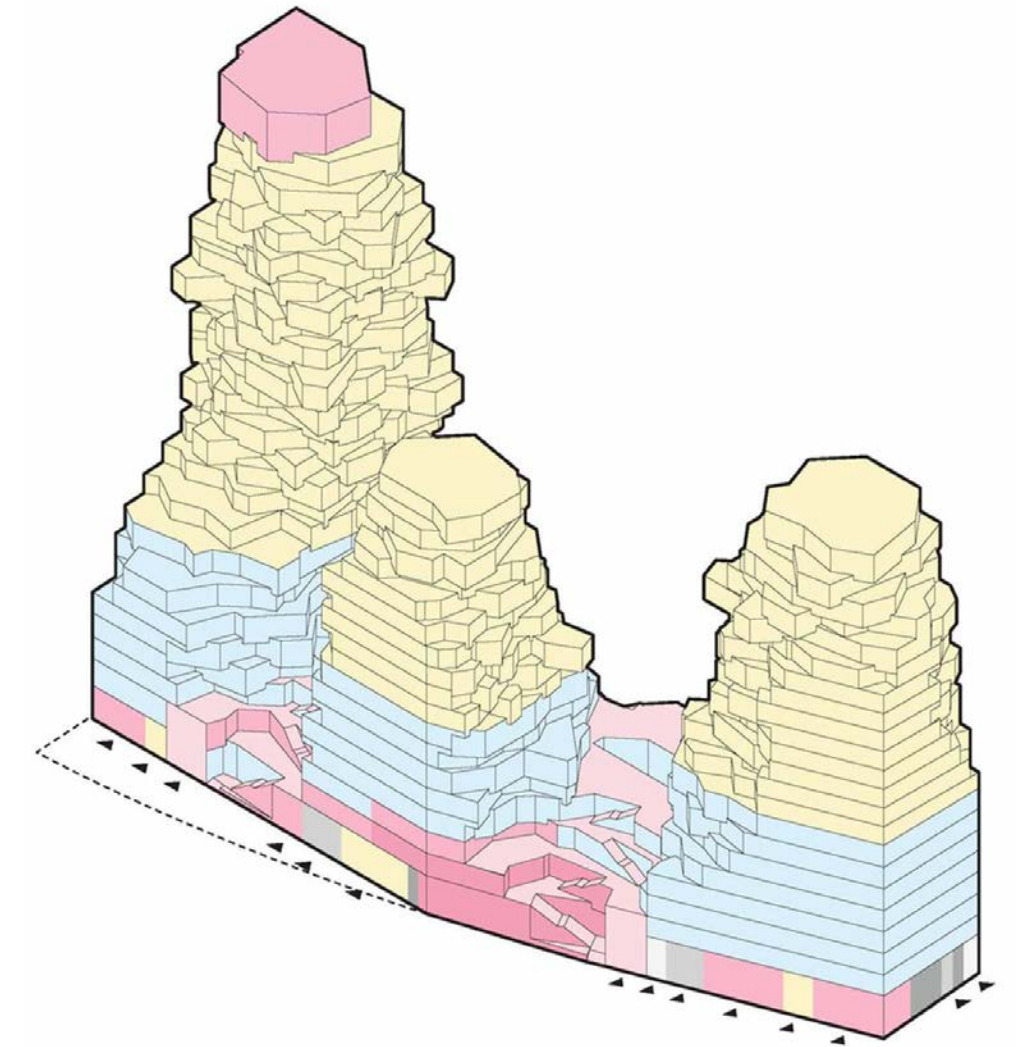
Total Area - 75000 sqm

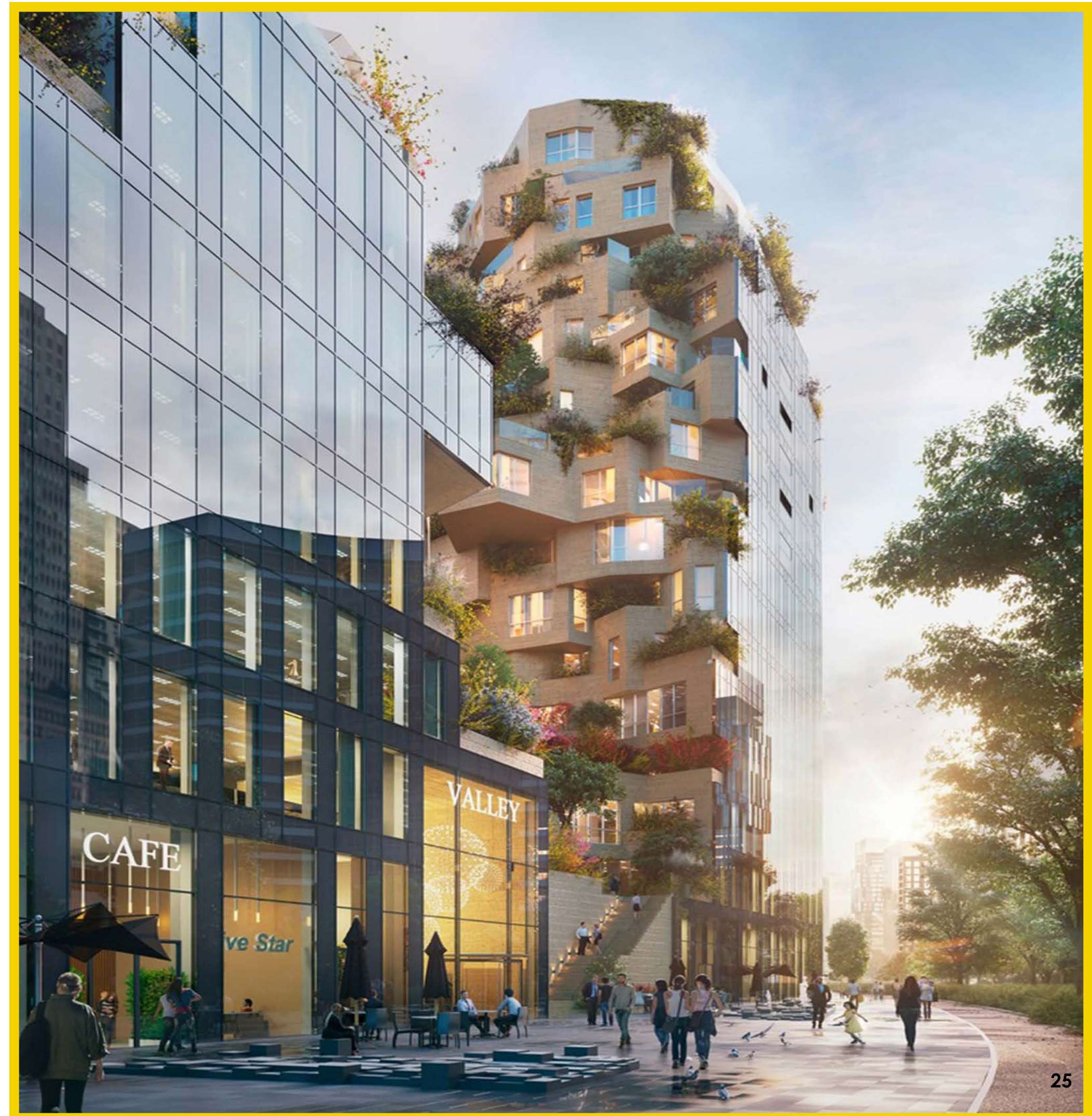
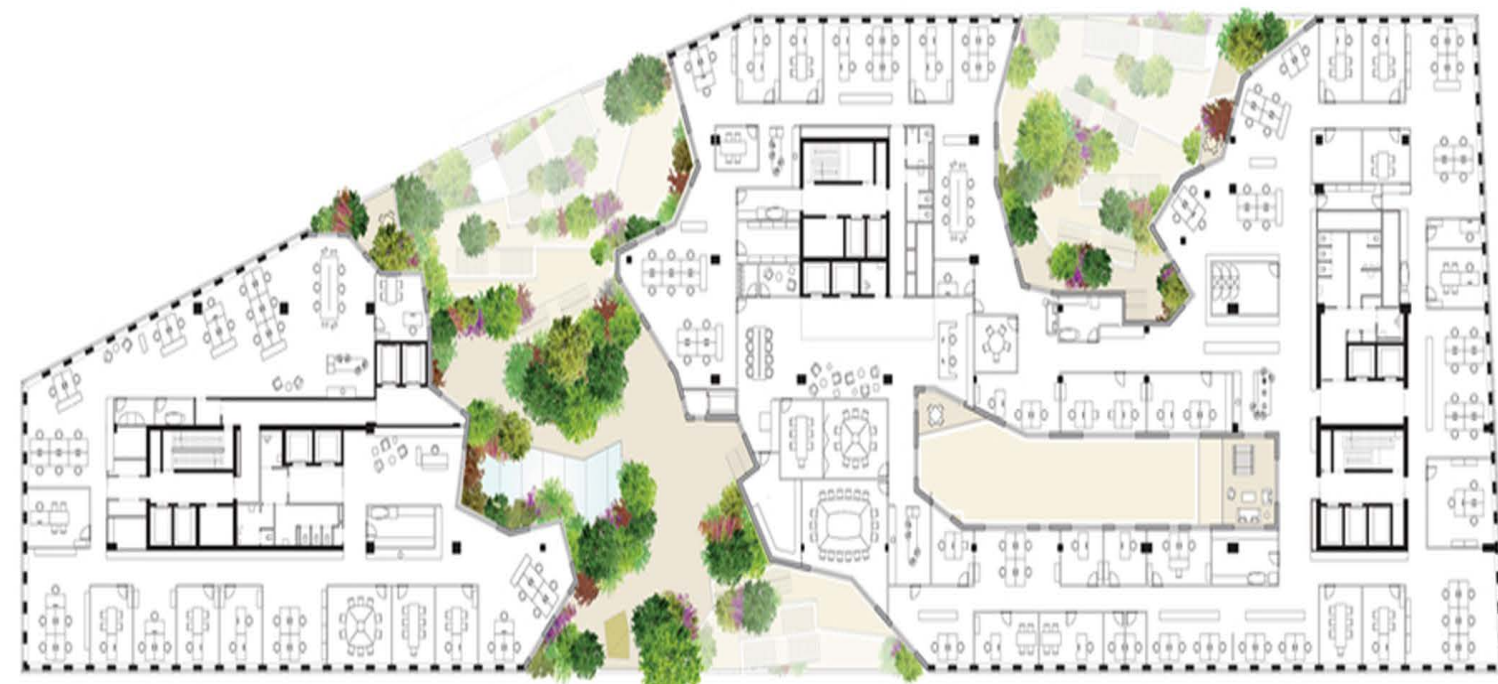
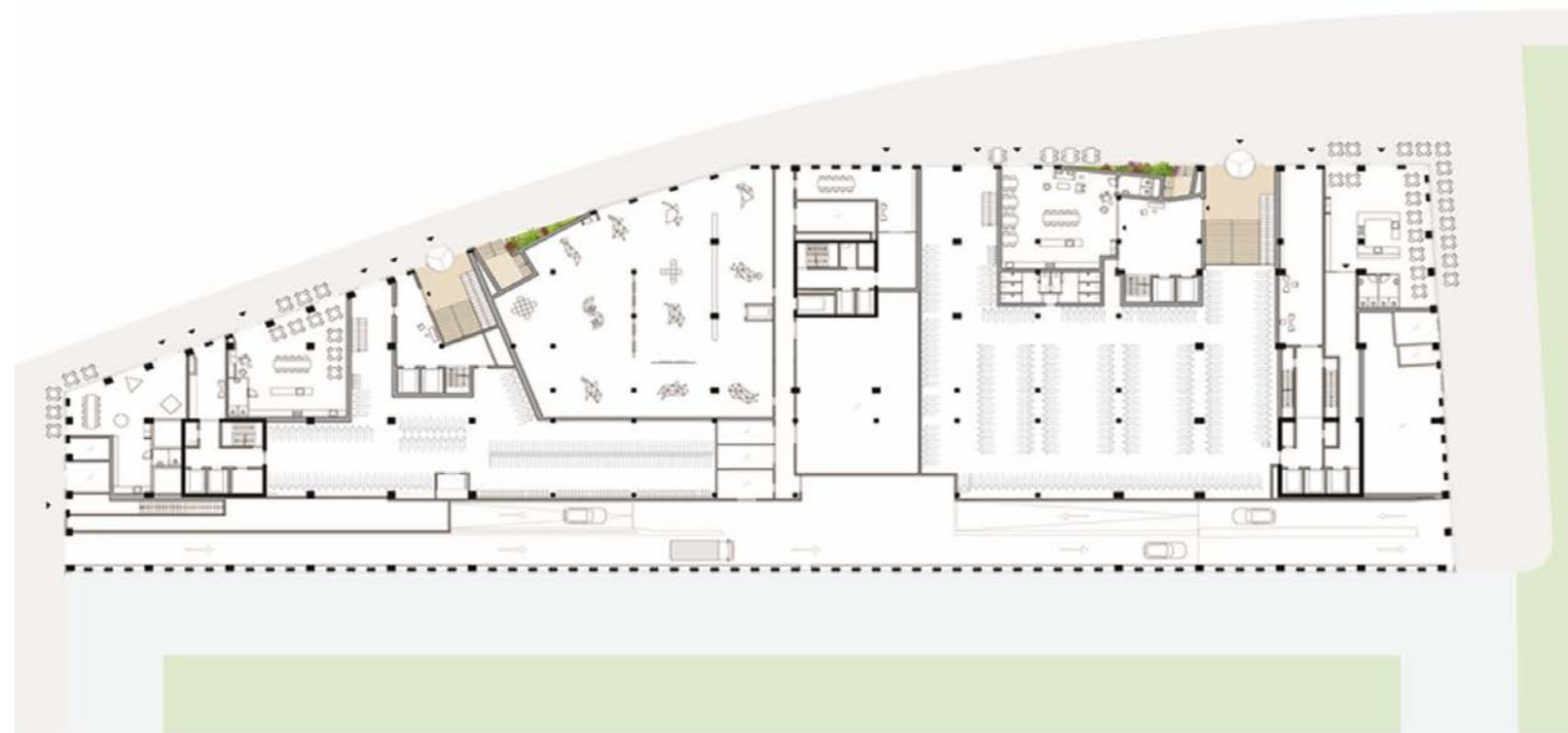
Concept - Transforming the district into a more varied and livable urban space and creating a sense of life.

Total no of units - 196

Height of building - 100 meters

The project takes the form of green-terraced stacked boxes that rise to three peaks of different heights. By placing the residential volumes on top of the multi-functional plinth and pushing them to the very edge of the envelope, the resulting volume reads as one single entity. In mirroring the corporate surroundings through its reflective exterior facade, the design acknowledges its corporate heritage and visually connects to its immediate neighbours.





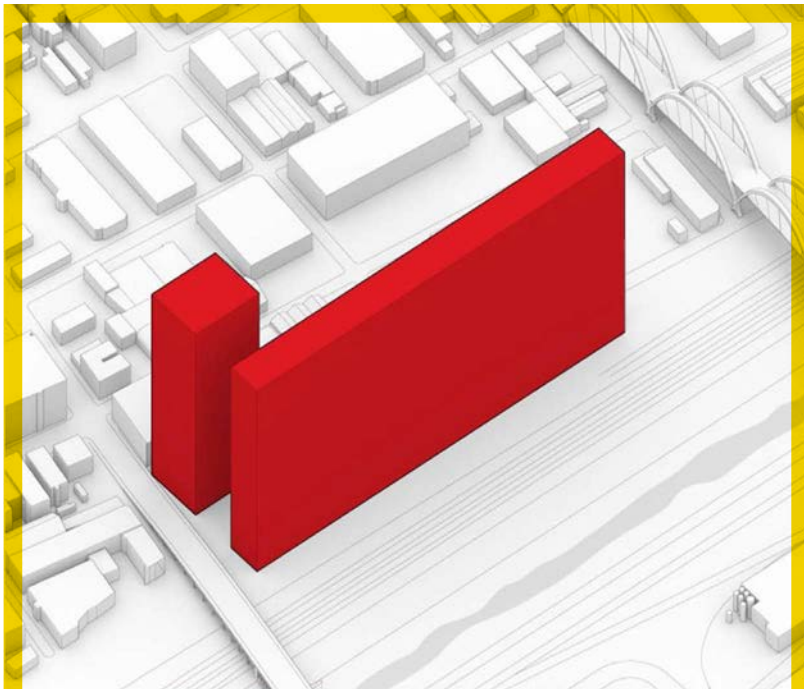


670 Mesquit, LA

Total Area - 2.6 million square foot (242,000 square meter)
 Location - Los Angeles
 Developers - Big retail developers

Mixed -Use complex in LA's burgeoning arts district. The project designed in the form of a series of stepped boxes containing 800000 square foot of office space, 250 residential units and two hotels. The development will mark as interesting project in Los Angeles. Located along the Los Angeles river, the proposed complex consists of two connected 30-story buildings inside of an L-shaped building, organized around a grid of concrete cubes measuring 45 feet on each side. The large size of these modules will allow interiors to be subdivided based on program types and the needs of the incoming tenants with varying ceiling heights and mezzanine levels.

Like a flexible framework the project operates on two scales:the big bare bones of the buildings and the human-scale completion for its individual inhabitants.As a gateway to the arts district and the LA river,it will constitute a major step toward reclaiming and transforming the river bank into a vital new urban lanscape that can be enjoyed and appreciated by residents and visitors to this vibrant part of Los Angeles.



03 | Iconic Building

“Architecture is a visual art and the buildings speak for themselves.”
-Julia Morgan



Empire State Building



Gherkin Building



Piazza San Marco

Iconic Building: Iconic buildings act as a symbol of the city. They create unique and memorable identities in the city's context. Iconic buildings are easily identifiable and attract people's attention. The Iconic buildings are the points of reference considered to be external to the observer are simple physical elements which may vary widely in scale. The Iconic buildings act as a landmark and enjoy uniqueness and specialization. Iconic buildings are more easily identifiable and significant. These buildings stand as unique silhouettes against the background of the city. The Empire State building in Newyork, Gherkin building in London, Pi-azza San Marco in Italy are Iconic buildings that stand out against the background of the entire city.

Everyone needs an identity. It defines our existence. When someone hear about Norfolk the first thing they remember is Norfolk naval port due to its prominence as a strategic military base of United States. The naval port is the identity of Norfolk city. To enhance the economy of Norfolk's downtown, it requires an identity. The proposed mixed-use building "**Arthur Square**" will be the identity of downtown due to its proposed Iconic structure. The building's archi-tecture takes inspiration from the historical hammerhead crane that stood in the Norfolk seaport and contextualizes the surroundings by creating an illusion of shipping containers.



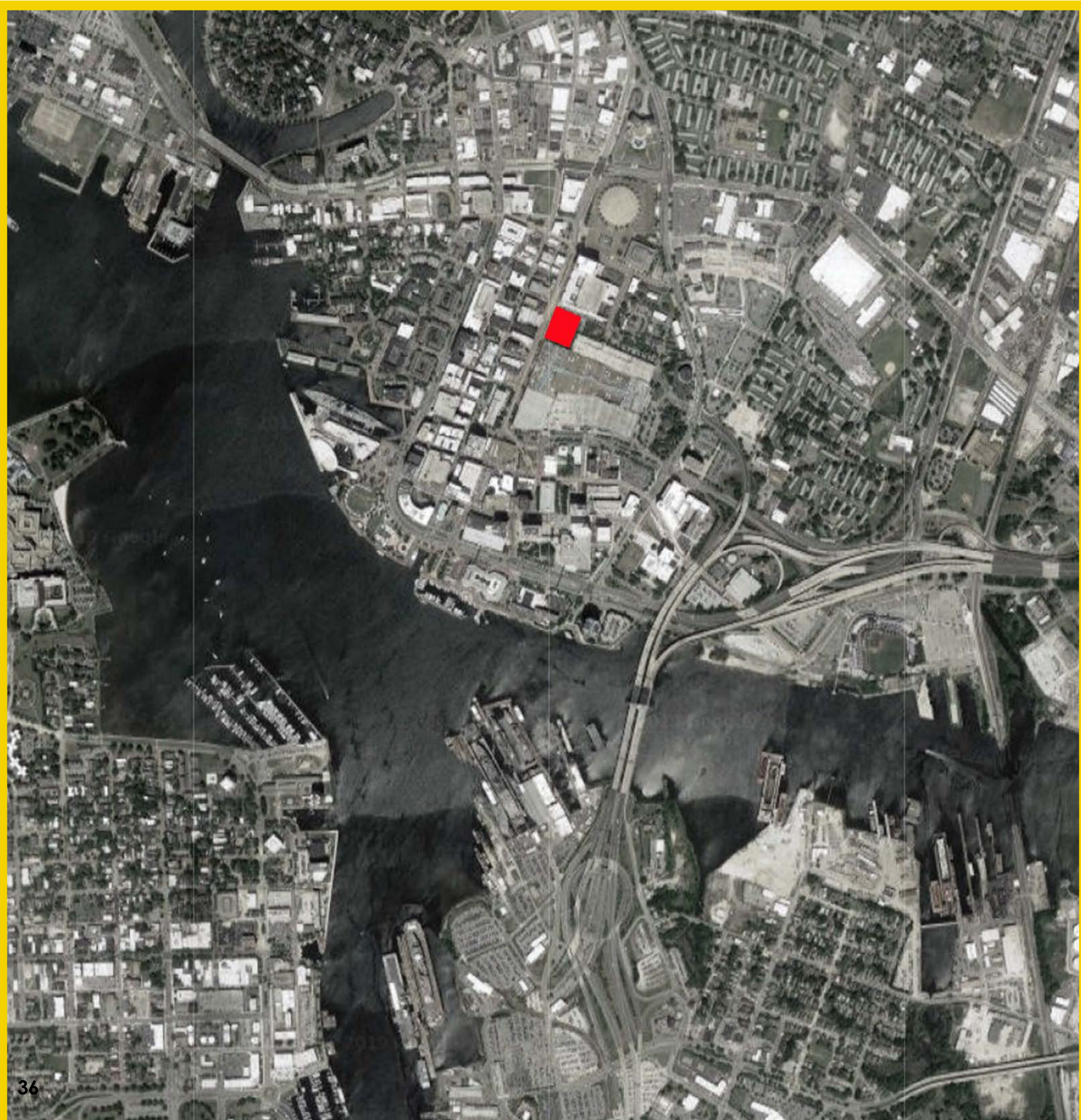
04 | The proposal

“Recognizing the need is the primary condition of design.”
- Charles Eames

Journey to Norfolk

My journey with Norfolk started with studying its comprehensive plan 2030 to analyze planning policies related to flooding issues and housing problems. Norfolk is a city with 1.7 million people and It is influential city in the Chesapeake Bay with one of the world's largest naval stations. The major economy of the city comes from the naval seaport and container shipping. During my research, I observed the problems of housing and flooding. Norfolk is affected by floods at least 3 to 4 times per annum. The size of the Norfolk is around 28,000 acres, but the availability of vacant land for new development is only 3.1%. So there is a necessity of mixed-use development to reach the infrastructure requirements of Norfolk.

The proposed site for the mixed-use building is on Monticello Avenue in downtown of Norfolk. The site is half a mile away from the coast line. Every year the downtown is affected by flooding at least two to three times a year, and the water level usually reaches one foot deep in the downtown where the site is located. Most of the residential buildings in downtown are individual homes, and only a few infill plots were available for the new development. So slowly the city is moving to mixed-use development to support downtown's residential and commercial needs. Downtown Norfolk is one of the crucial economic generators of Norfolk. Based on Norfolk's vision document the downtown is considered as an key economic zone for developing new urban infrastructure.



Existing Site conditions

Selection of site in Downtown: There are many infill plots in the downtown, but one infill site attached my attention for its unique features. I found a site which is 285 feet by 269 feet on Monticello avenue beside the McArthur shopping mall. The open plot is owned by starwood developers, who also own the McArthur shopping mall. I found there is a clear workability of the project due to its physical due to its physical and economic characteristics. There are two parking garages associated with the shopping mall with excess parking for 2800 cars, which can be used for the new proposed mixed-use building.

Surrounding site transportaion: The site is connected with public transportation. There is a light rail lane passing beside the site on Monticello avenue with a station in front of the site. There are bike lanes in the area that encourage usage of bikes.



zoning map



Transportation map



Storm surge map

Project site

McArthur Shopping Mall

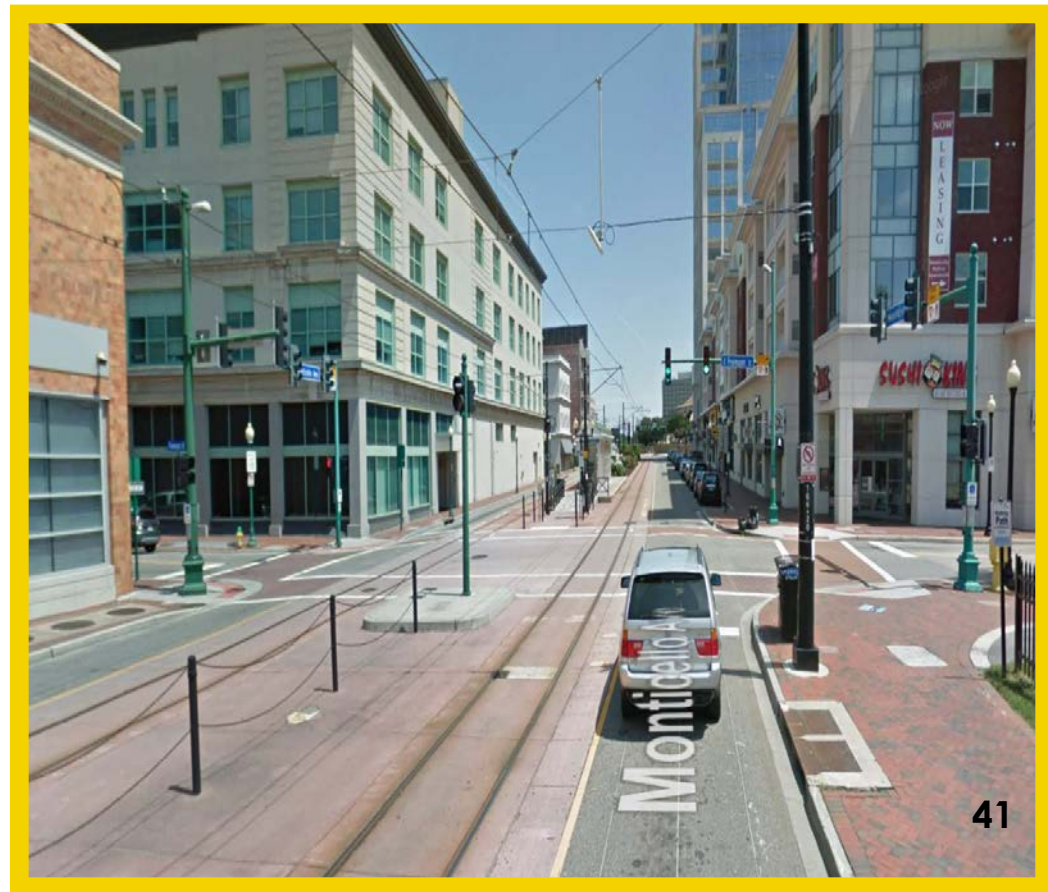
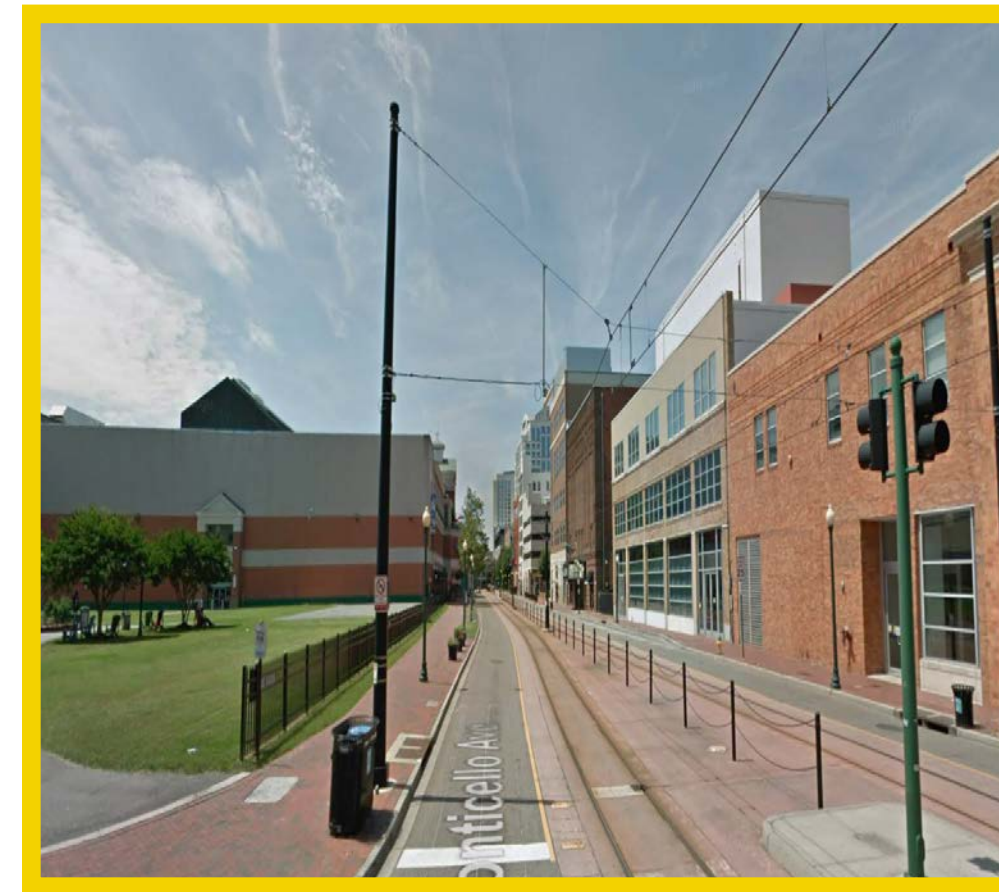
Parking Garage

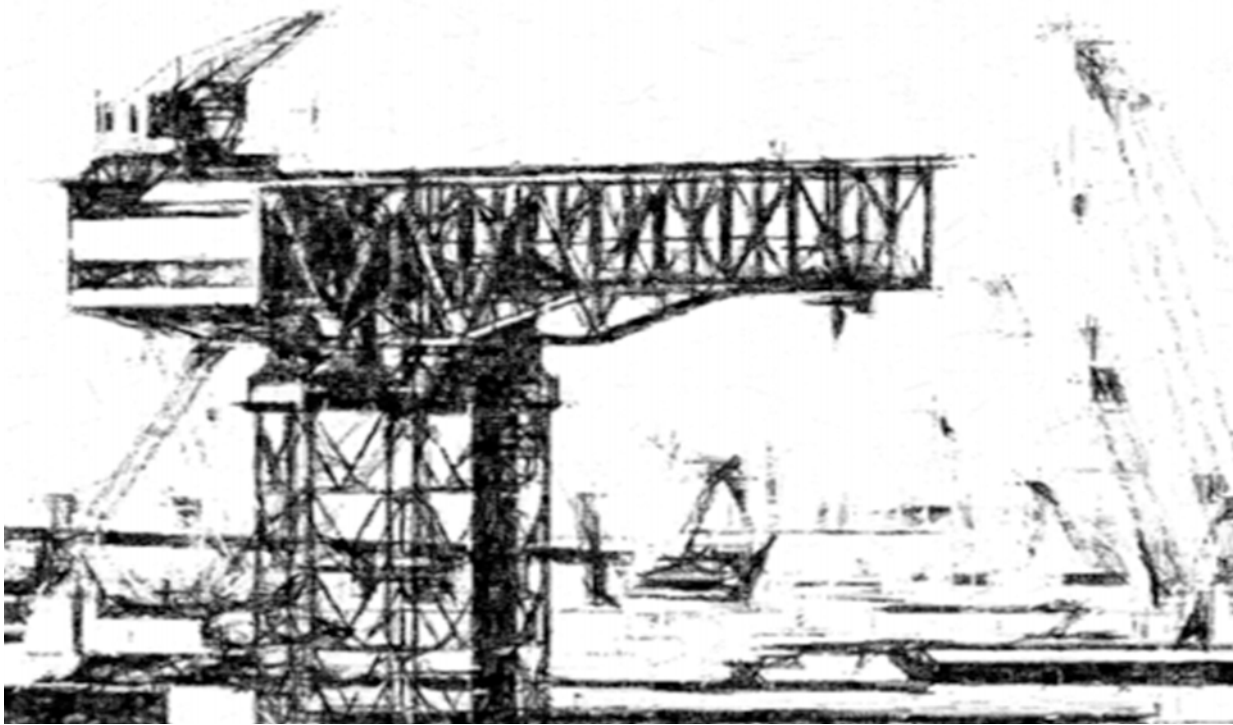
Site

Rail
Lane

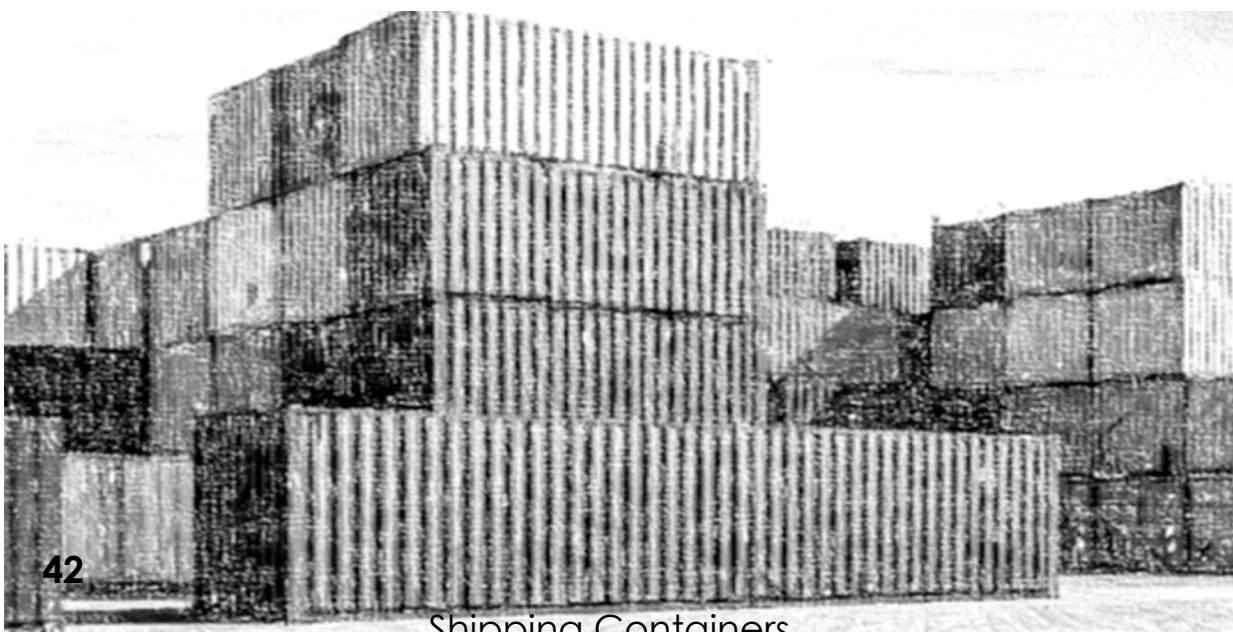


Existing Site





Historic Hammer head Crane



Shipping Containers

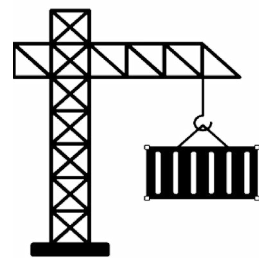
Historic Hammer head Crane

The Historical Hammer head crane of Norfolk is built between 1939 and June 1940. For 77 years, it has towered over Norfolk naval shipyard in Portsmouth, as an icon of the region's waterfront. It is a key player during the yard's world war II effort in building war ships. Due to the huge cost for restoration, the hammer-head crane got dismantled in 2016.

The **History** of Norfolk naval shipyard is **incomplete** without **remembering** Historical iconic **hammerhead crane**.

Connection

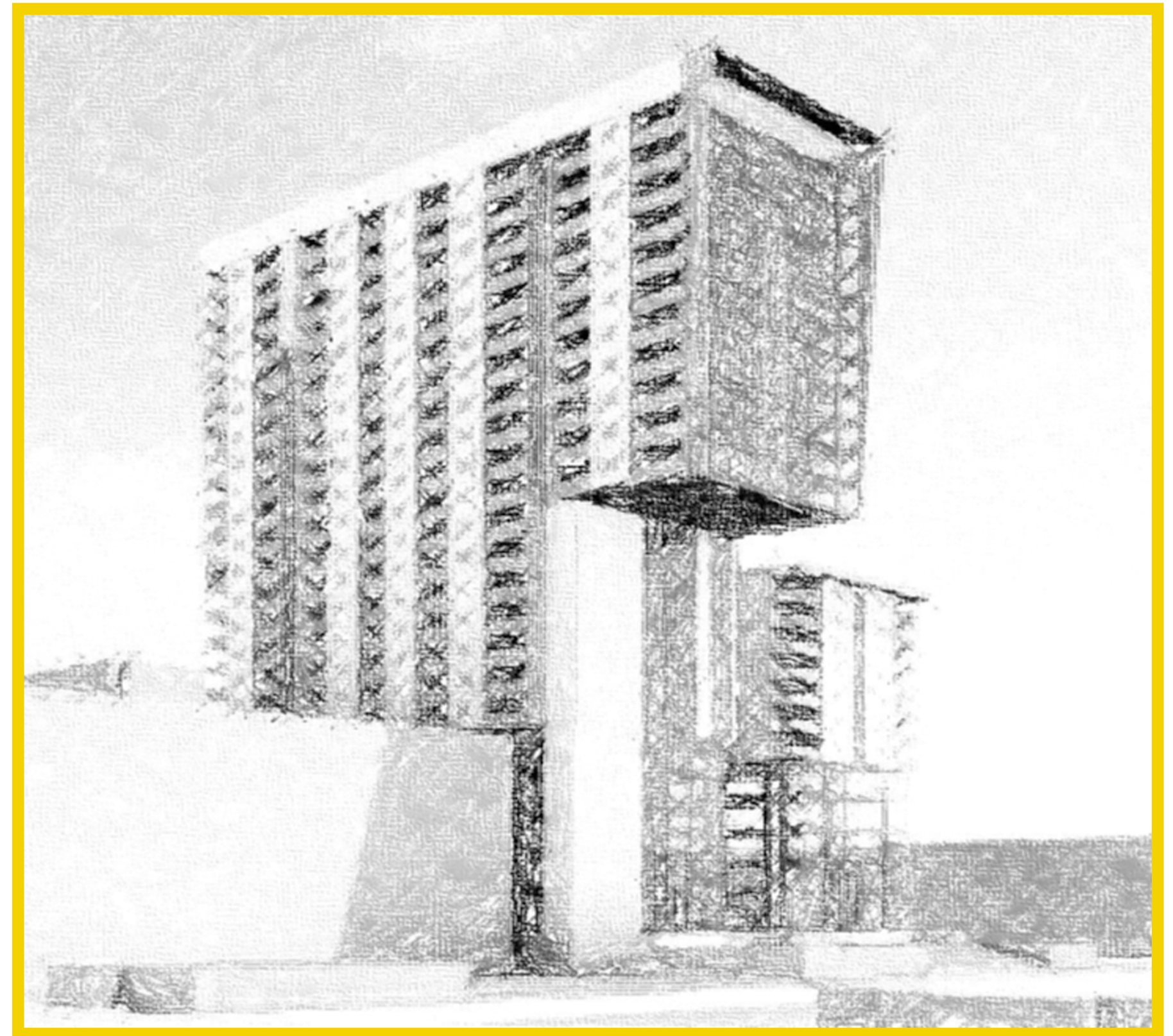
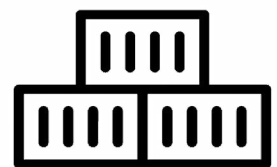
Historic hammer head crane
iconic element of naval sea
port of Norfolk.



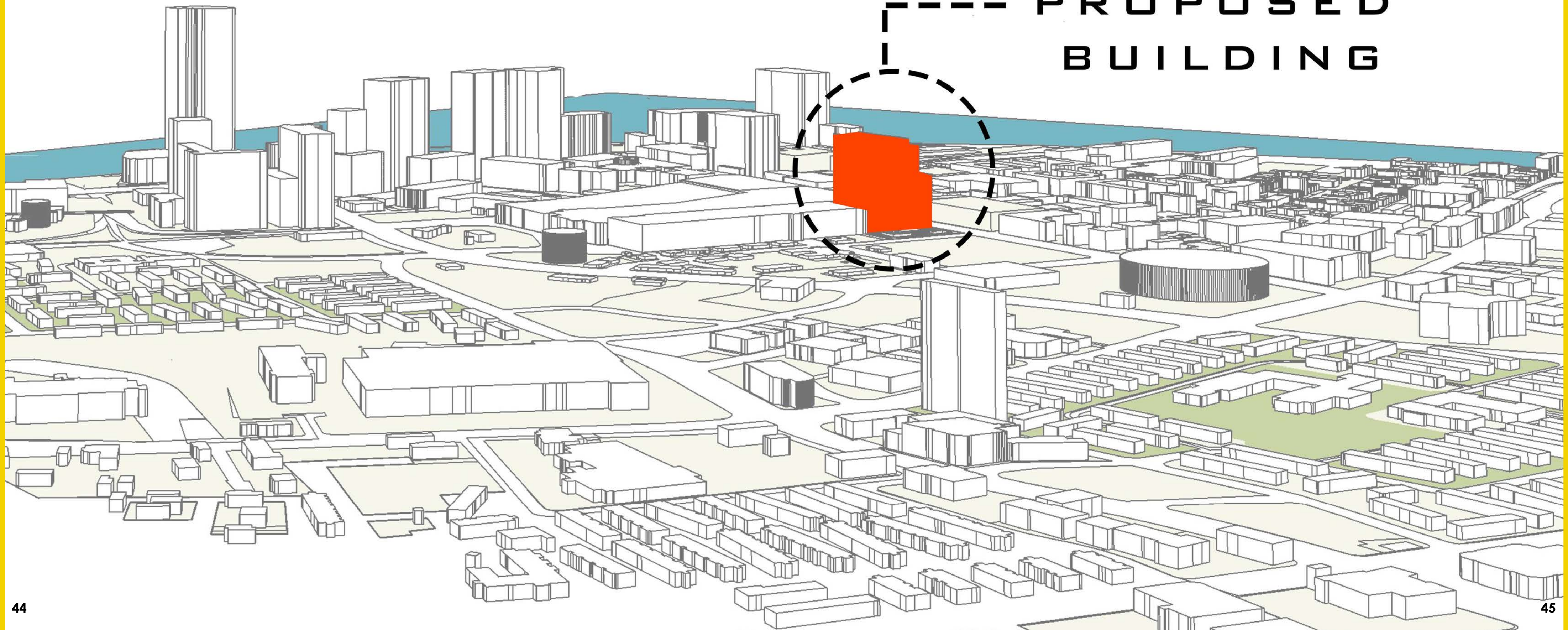
Naval sea port is the first thing
people remember when
they hear Norfolk



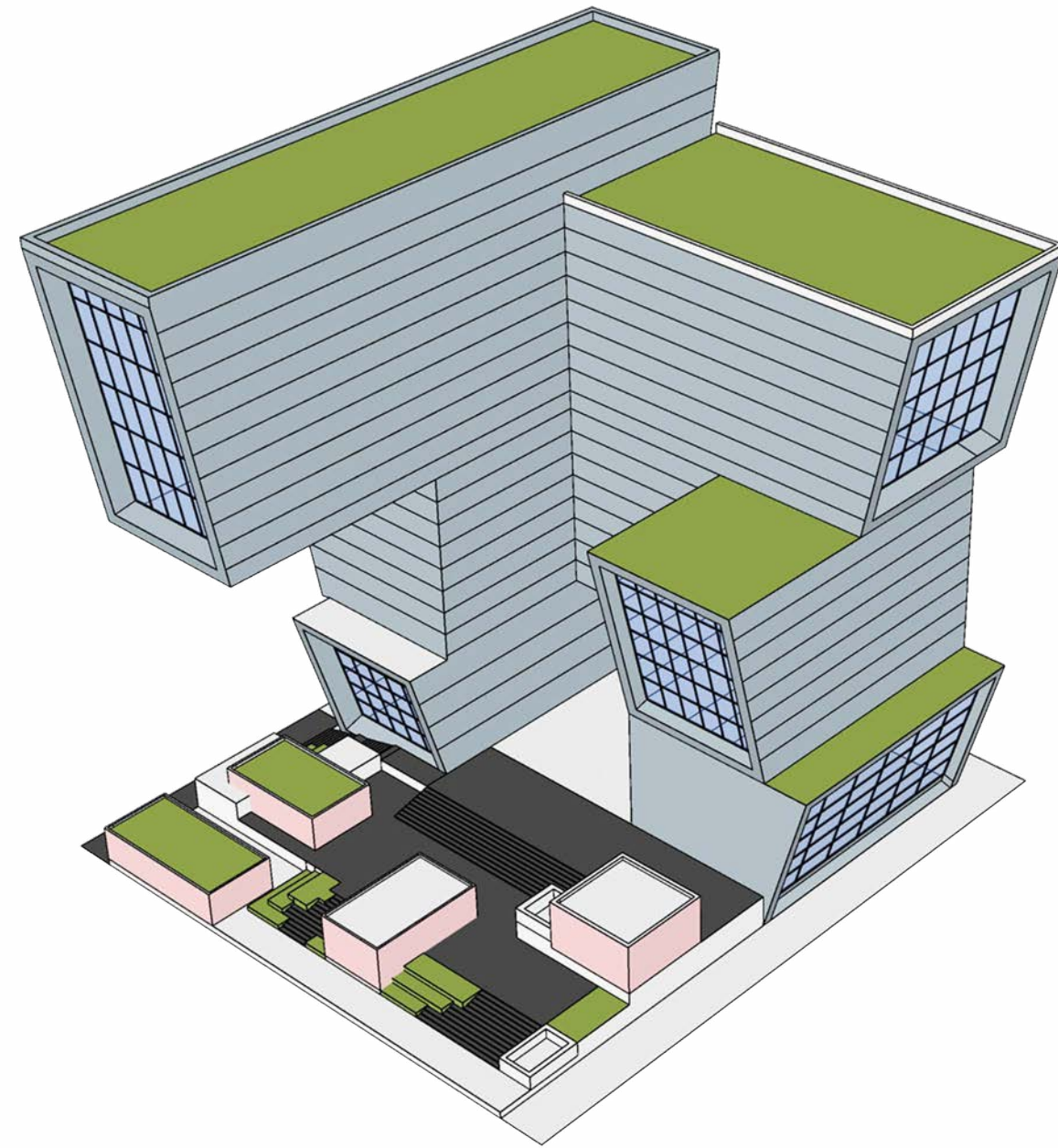
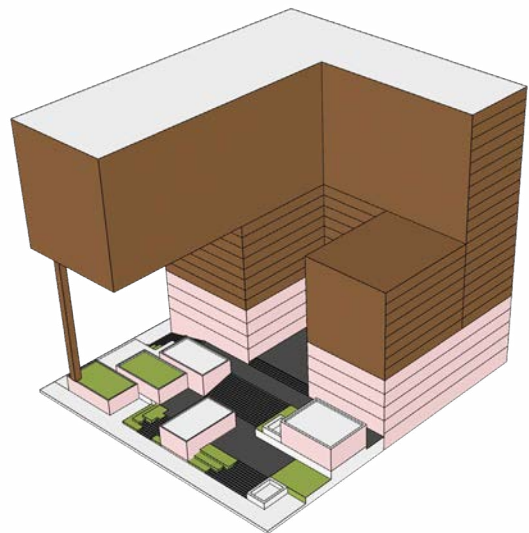
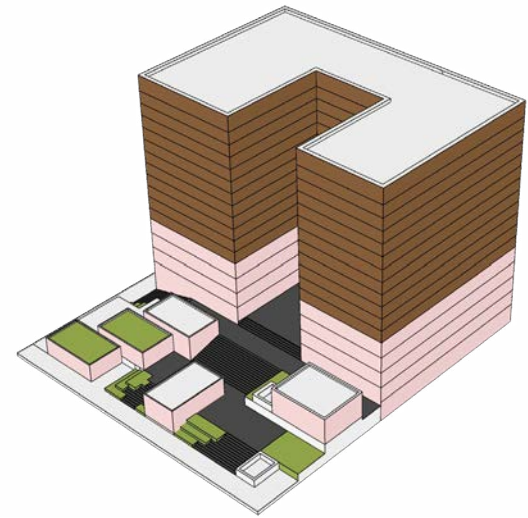
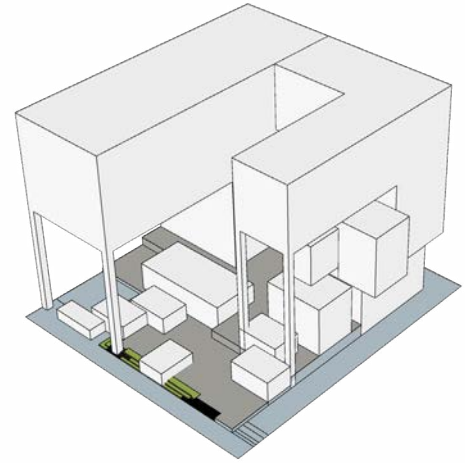
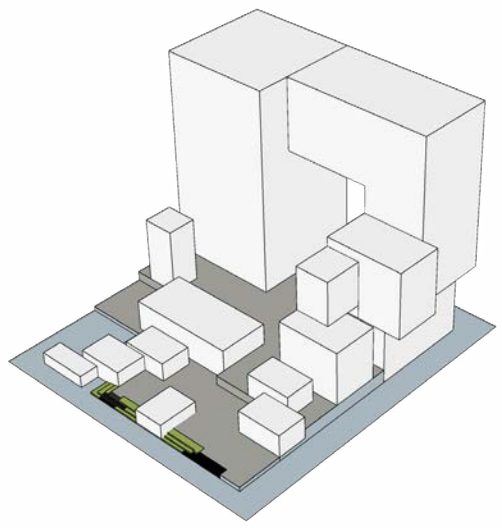
Container export is the
economic driven factor of
Norfolk and naval sea port



**PROPOSED
BUILDING**

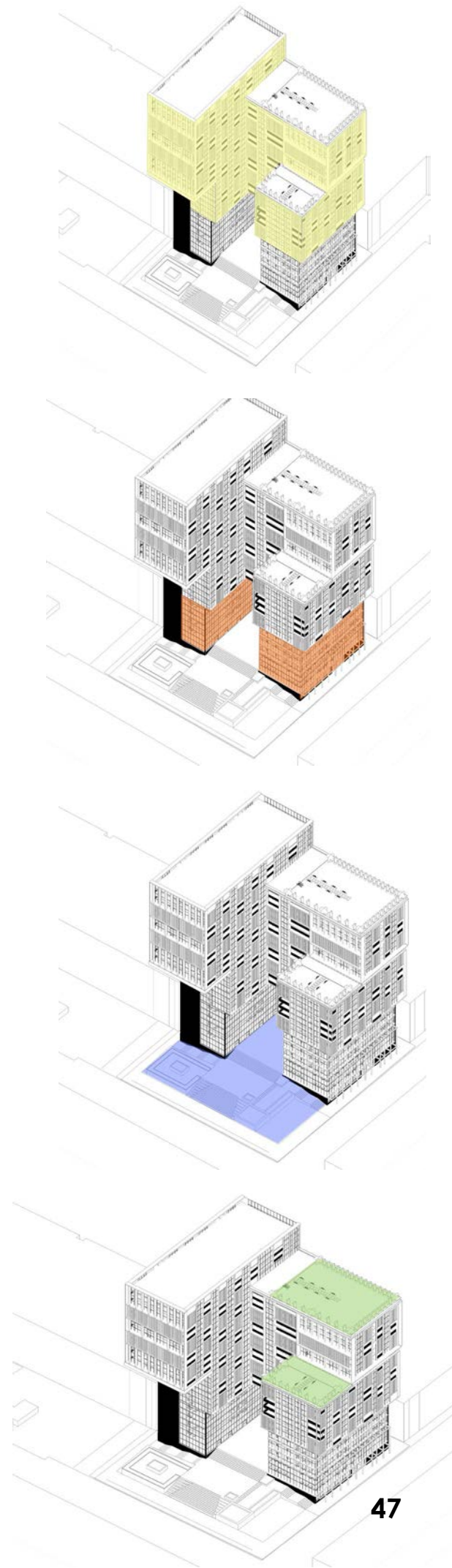
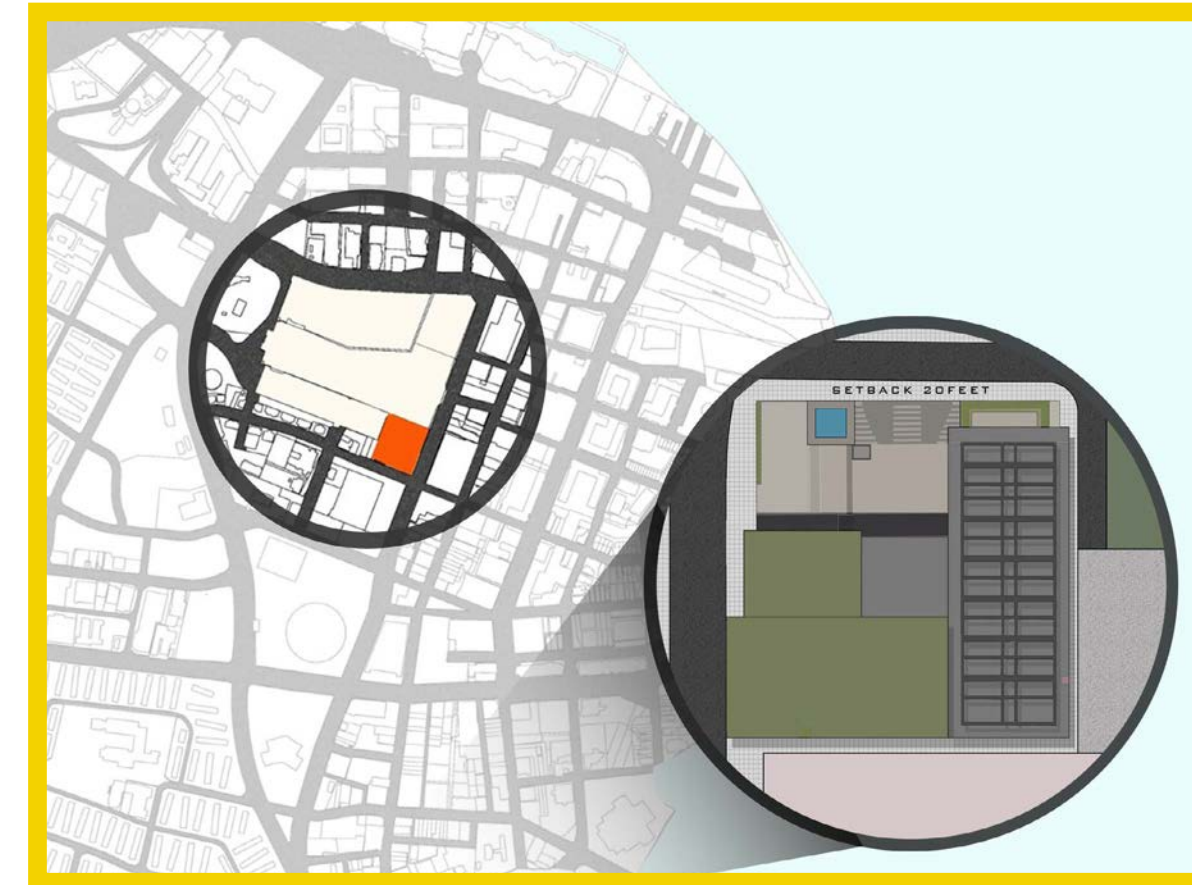


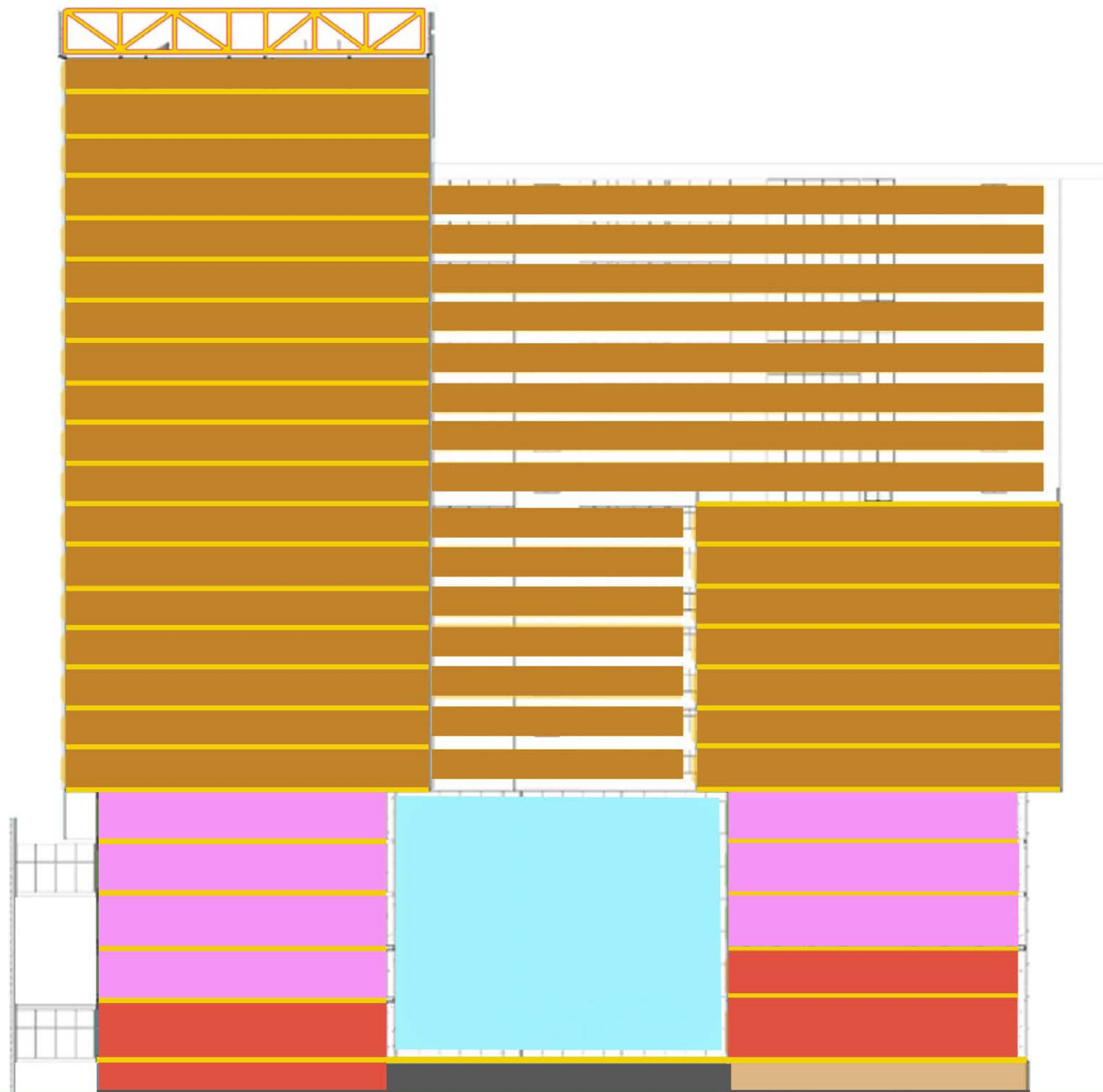
Parti Diagram



Site Development

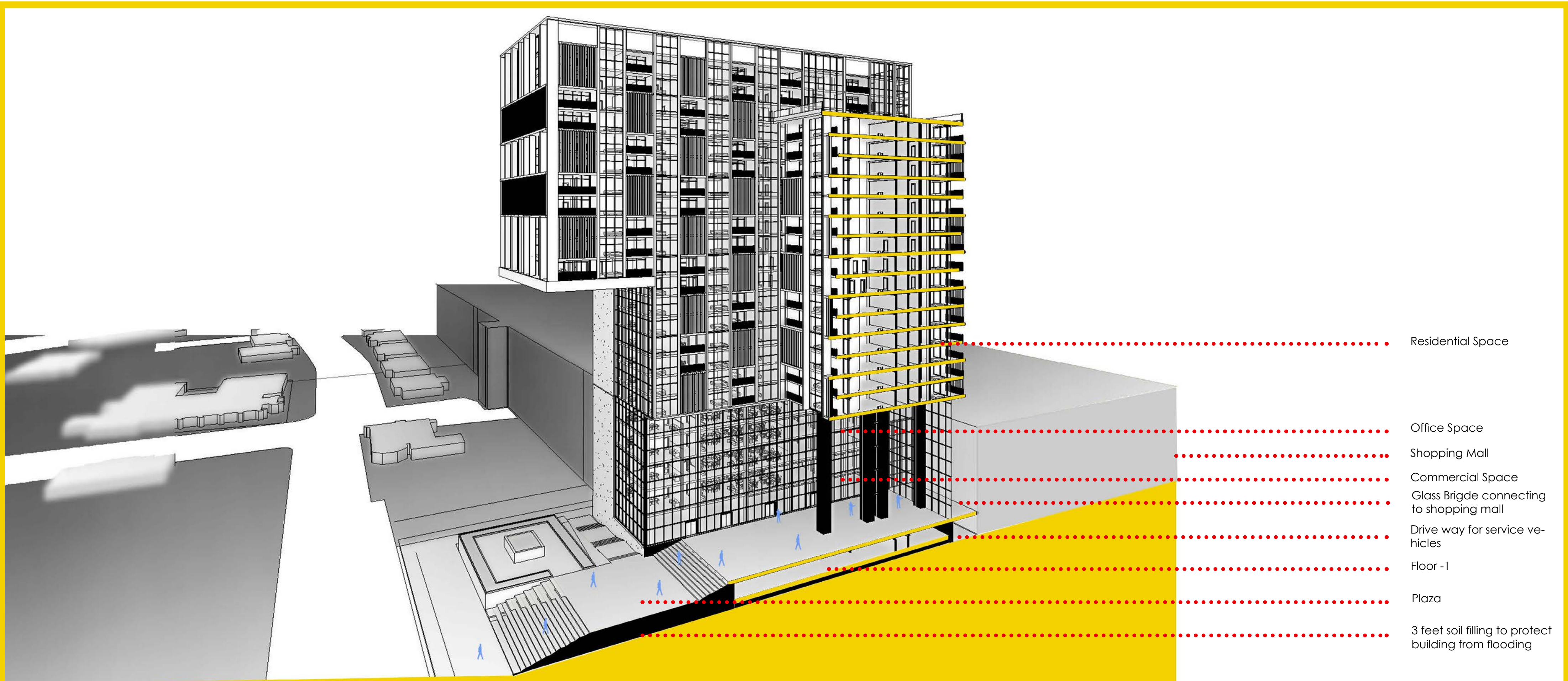
The project site is located on Monticello Avenue in the downtown, Norfolk city. As mentioned before, the project site is 284 feet by 269 feet. This proposed project is a mixed-use highrise building with residential aptmnts, restaurants, office spaces, shopping spaces, and a public plaza. One of the problems that came up through the beginning stages of this project was the separation of commercial and office areas from the residential areas. As a solution to this problem, the site is divided into three different sections private, semi-public and public. To keep the residential areas private, a semipublic transition space is added. The residents will enter from the east side and west side into a private lobby which cannot be accessed by the visitors. The public entrance to the building is on the north side through the public plaza.





- Residential
- Office Space
- Commercial Space
- Residential Lobby
- Soil fill to increase building height
- Open space connecting to shopping mall





Residential Space

Office Space

Shopping Mall

Commercial Space

Glass Bridge connecting
to shopping mall

Drive way for service ve-
hicles

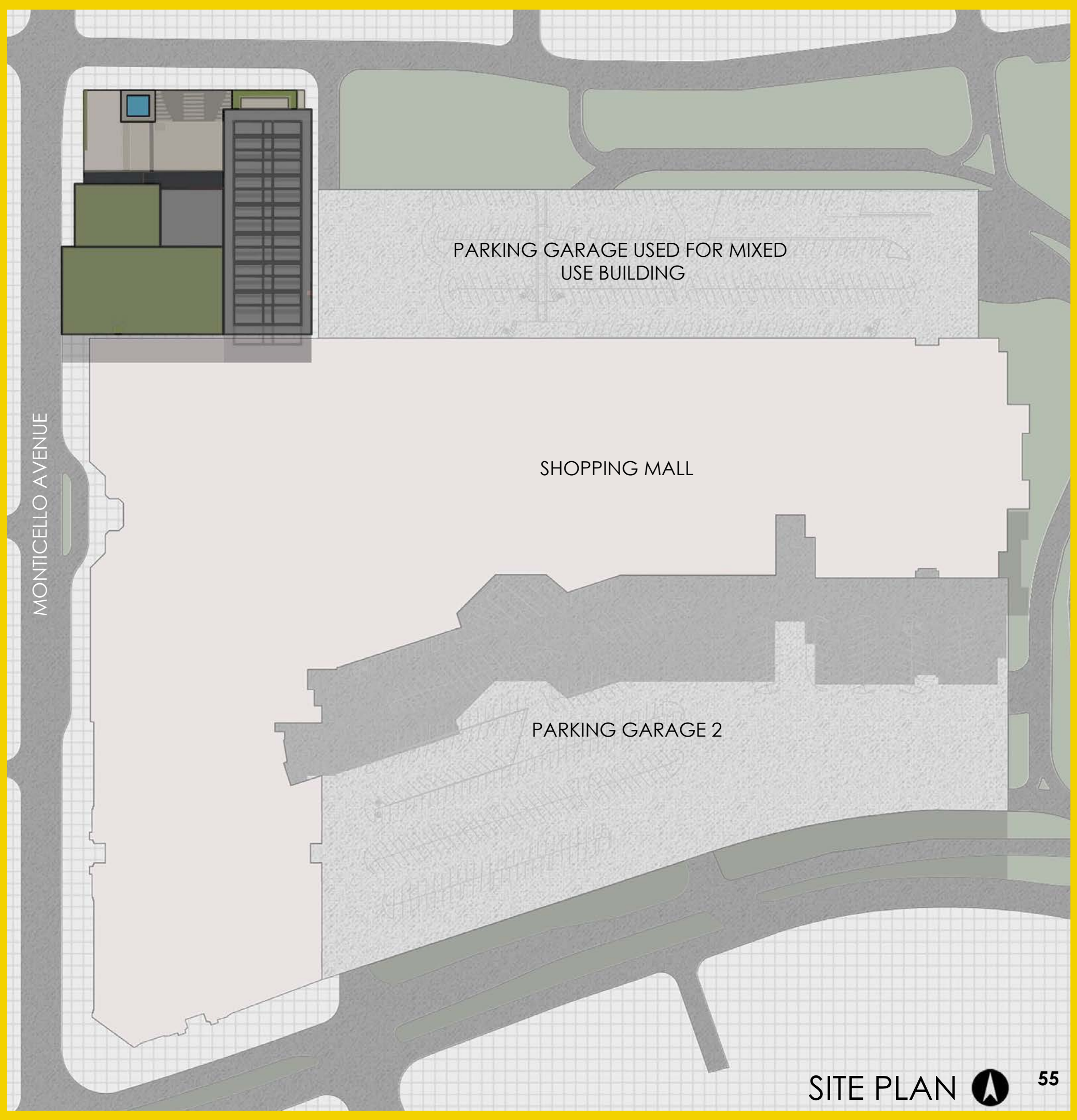
Floor -1

Plaza

3 feet soil filling to protect
building from flooding

Program Development: The building program includes vertical circulation from the ground level. The bottom two floors consist of lobby spaces, commercial areas with retail, a restaurant, and a public plaza. Level 3 and 4 contain the office spaces. The upper levels include residential units, a roof garden, and a public gym.

In the project, the central public plaza provides grandeur to the building. The plaza also acts as a grand entrance to the building and the shopping mall. The public plaza starts at the ground floor level and gradually increases its height and connected to the first floor at 15 feet height. The people enter into the public plaza walk through the green spaces of plaza and reach the courtyard space with commercial spaces on either side. From the courtyard space people can walk directly into the shopping mall through glass bridge which is designed as a connection between Arthur Sqaure and McArthur shopping mall The total no of apartment units were 275 and total square footage of the building is 368000 sft



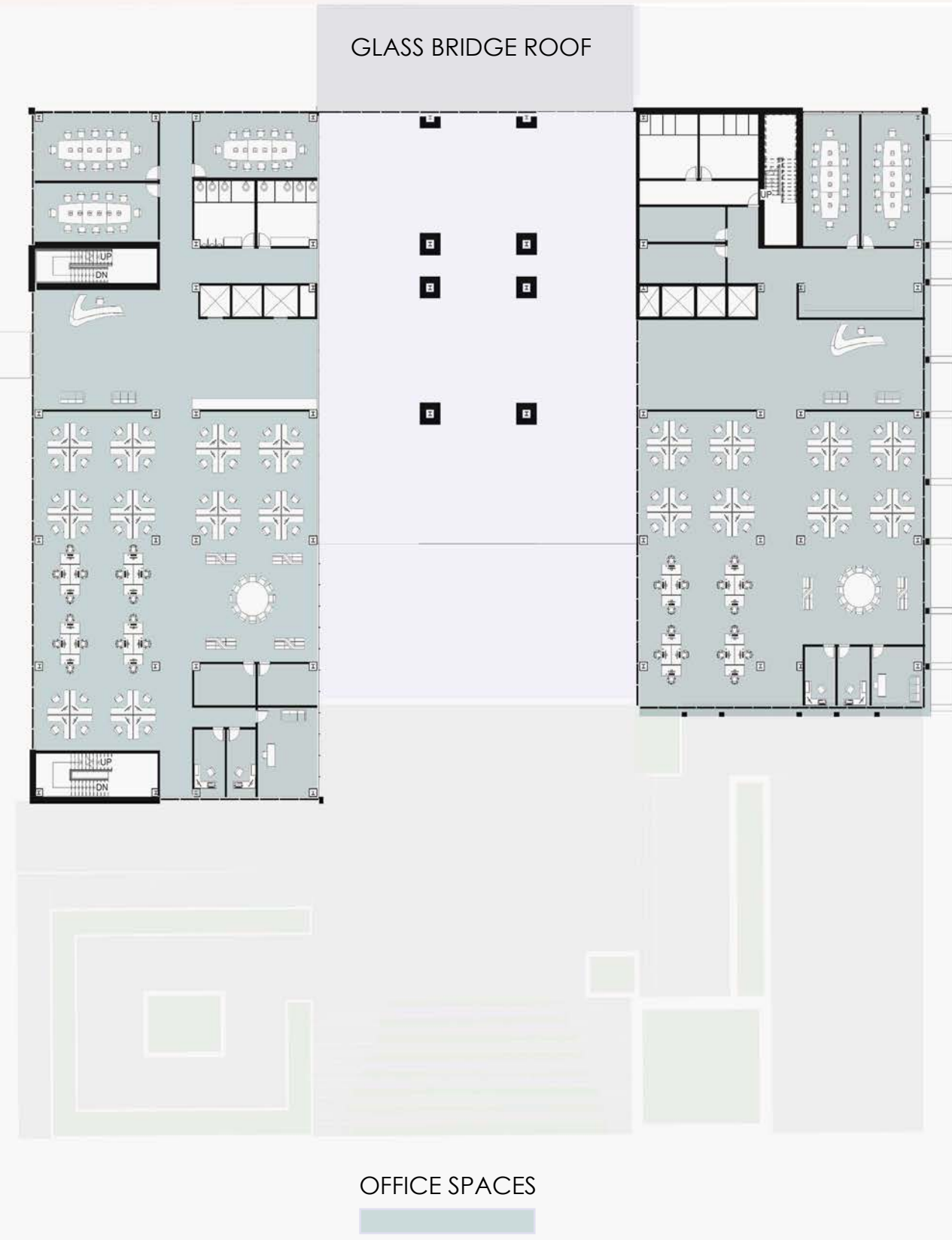




Restaurant View -1



Restaurant View -2



LEVEL 3-5 TYPICAL FLOOR PLAN

SCALE 1=1/16





CIRCULATION

1 BED

2 BED

3 BED

LEVEL 6-12 TYPICAL FLOOR PLAN



SCALE 1=1/16





CIRCULATION

1 BED

2 BED

3 BED

LEVEL 13-21 TYPICAL FLOOR PLAN



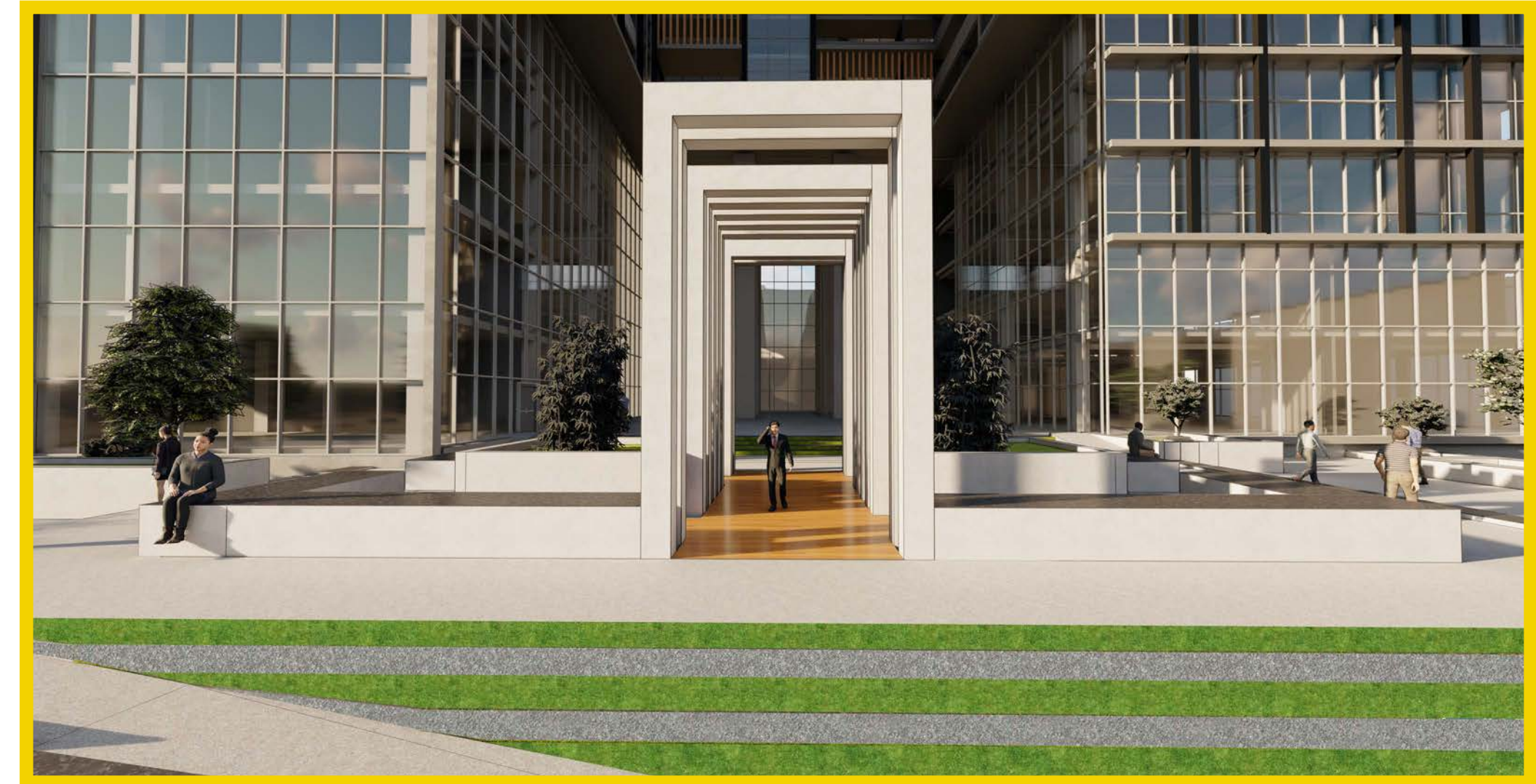
SCALE 1=1/16





LEVEL 22-24 TYPICAL FLOOR PLAN

SCALE 1=1/16



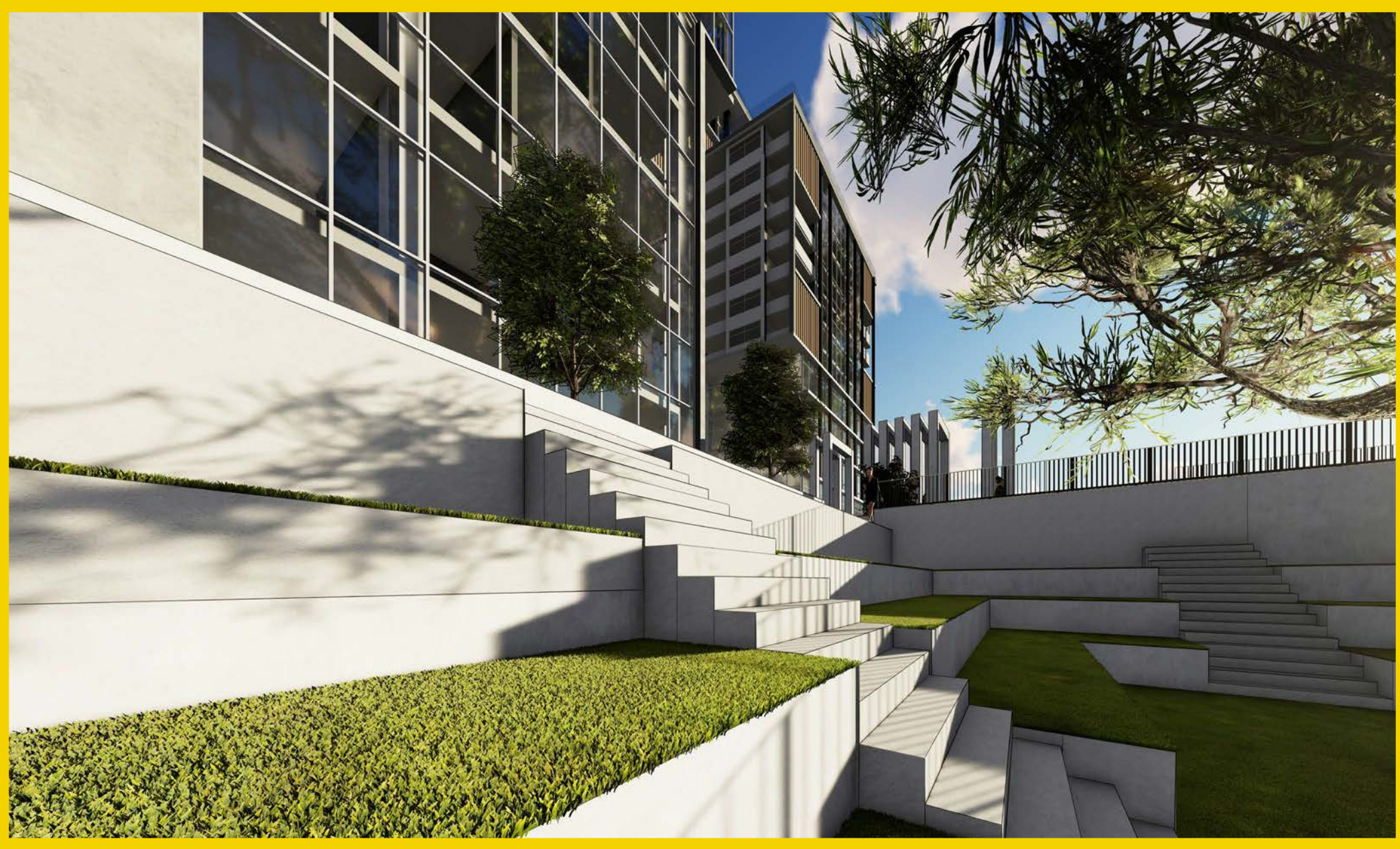
Plaza View -1



Plaza View -2



Plaza View -3



Plaza View -4

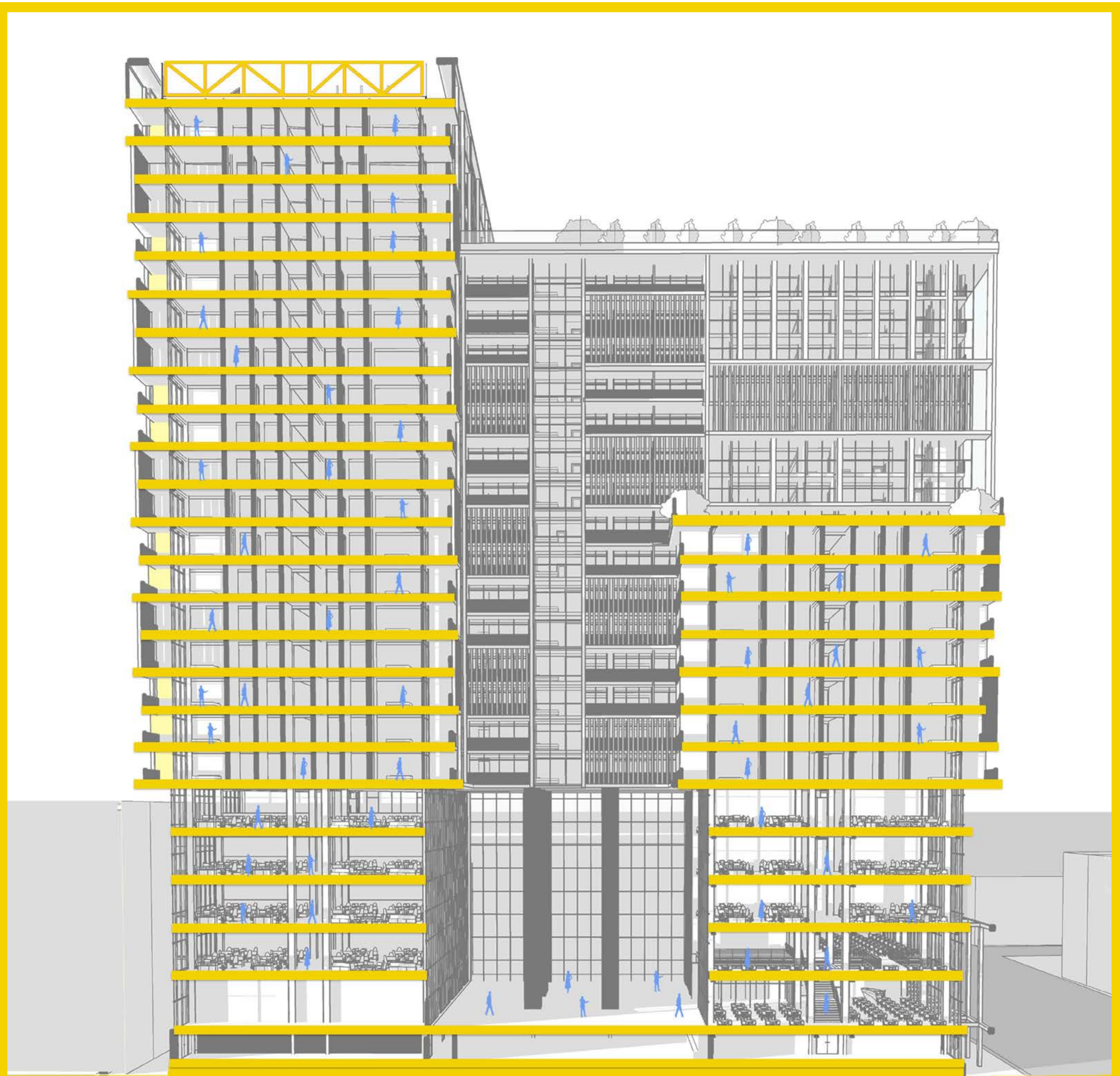


Plaza View -5

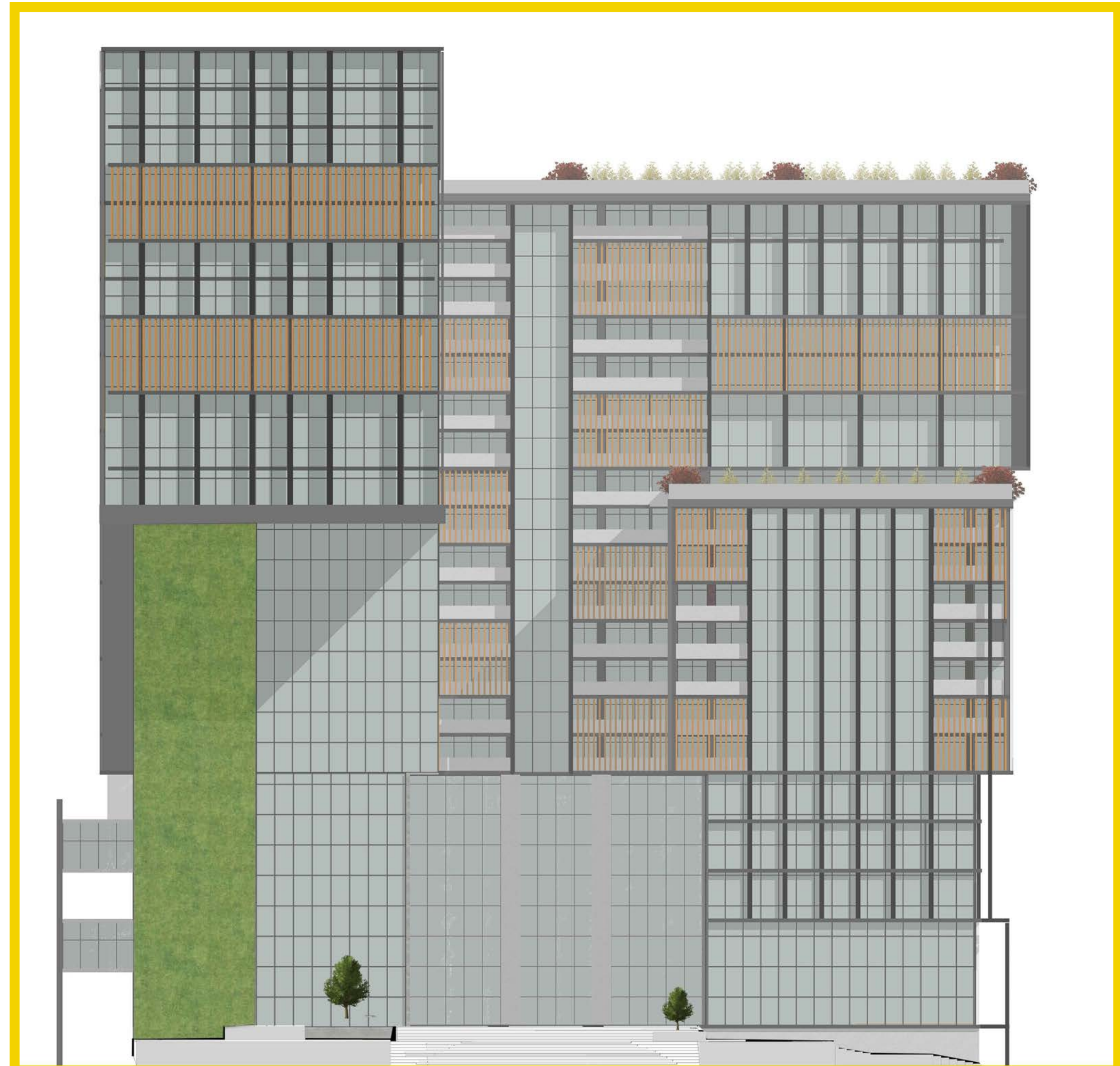
Vertical louvers were used in entire facade at regular intervals for ventilation, lighting and aesthetic purpose. The wooden facade louvers are made of durable thermally modified wood.

facade





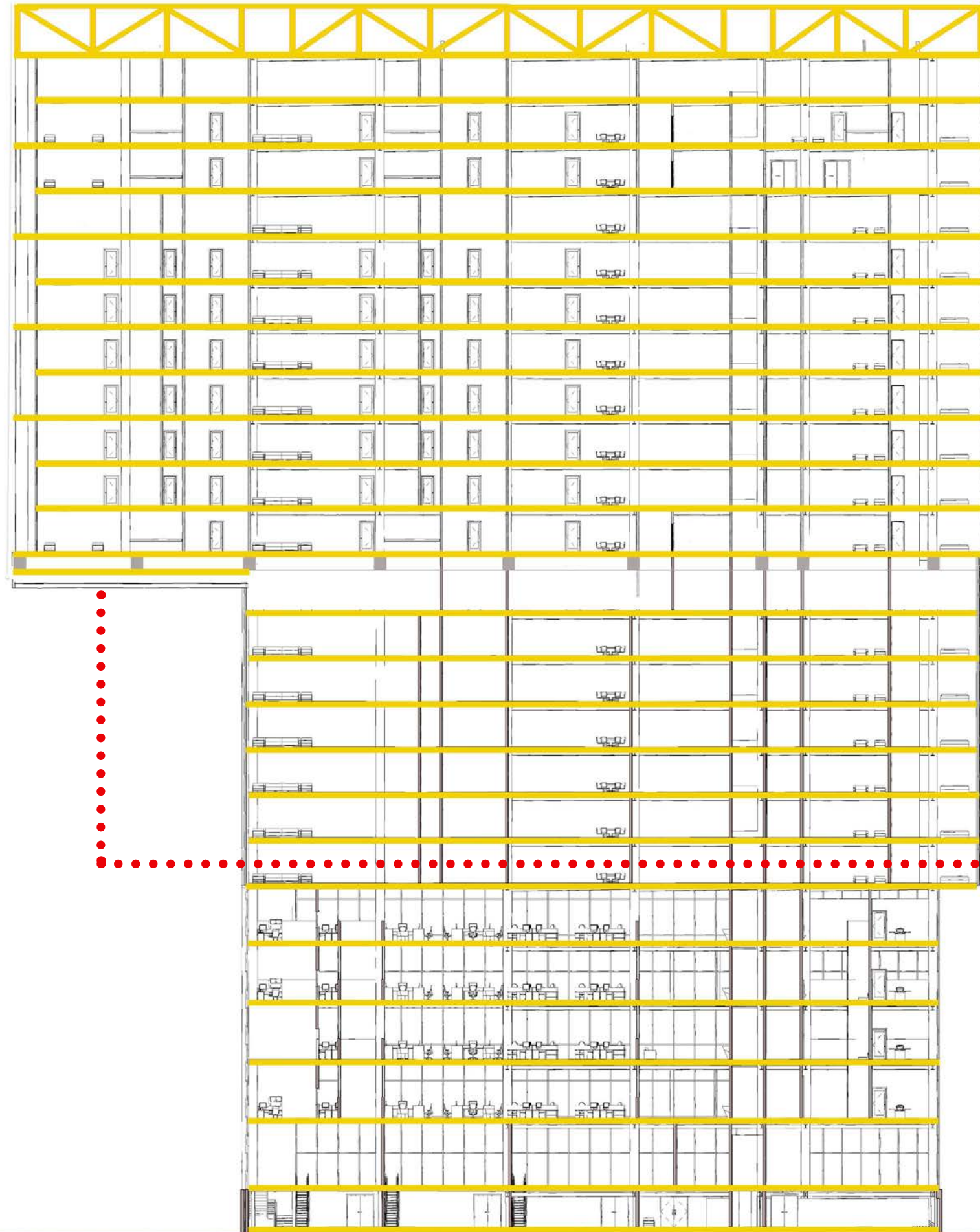
Sectional Perspective



South Elevation



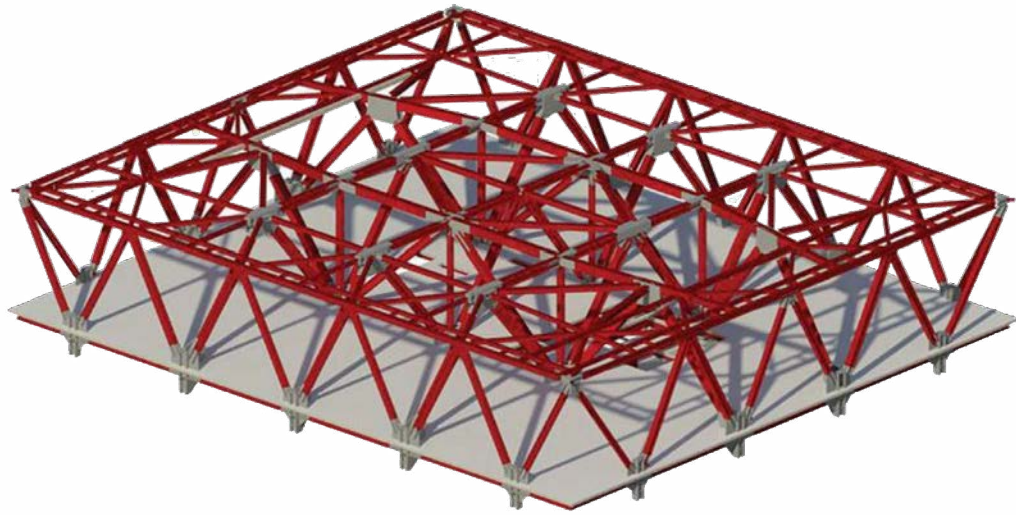
05 | Structural



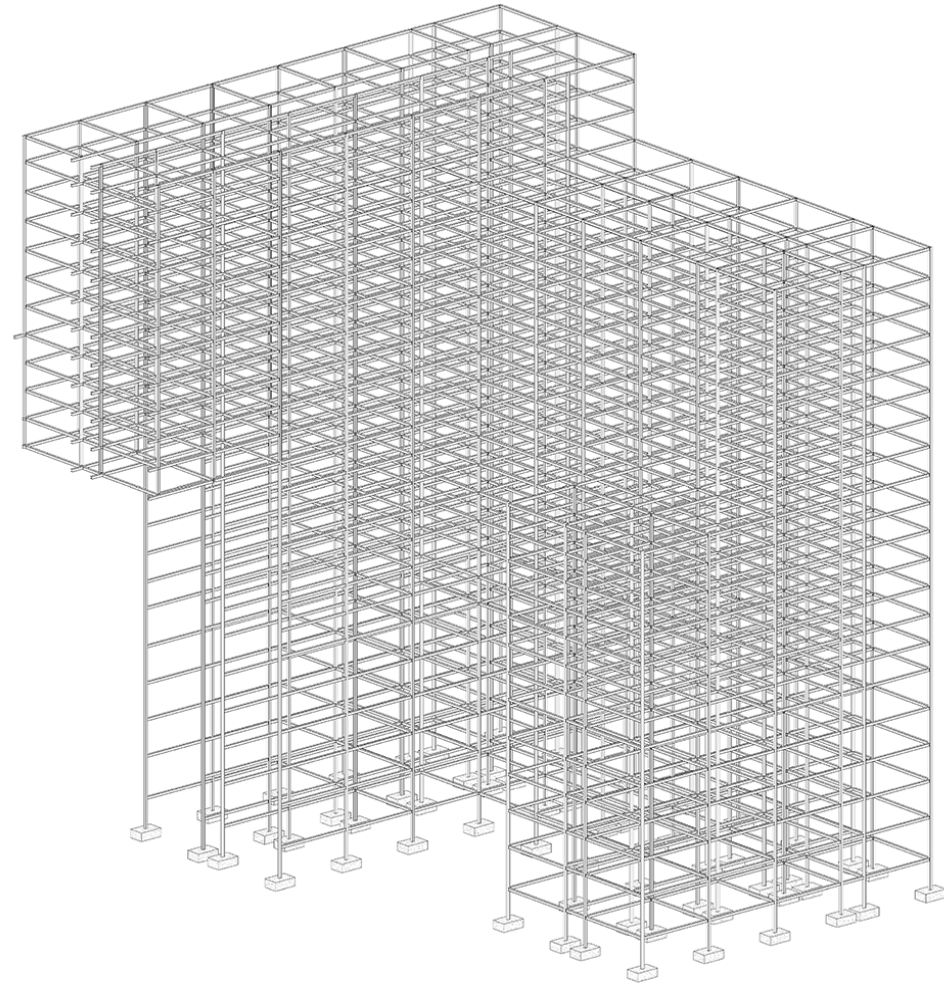
Hat truss is used in structural system to carry overhanged piece of the building

Overhanged piece of the building 50 feet

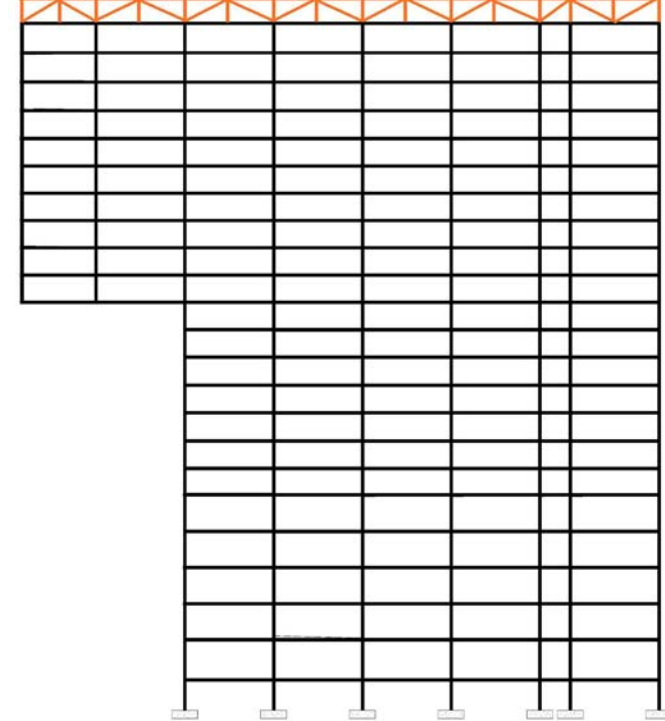
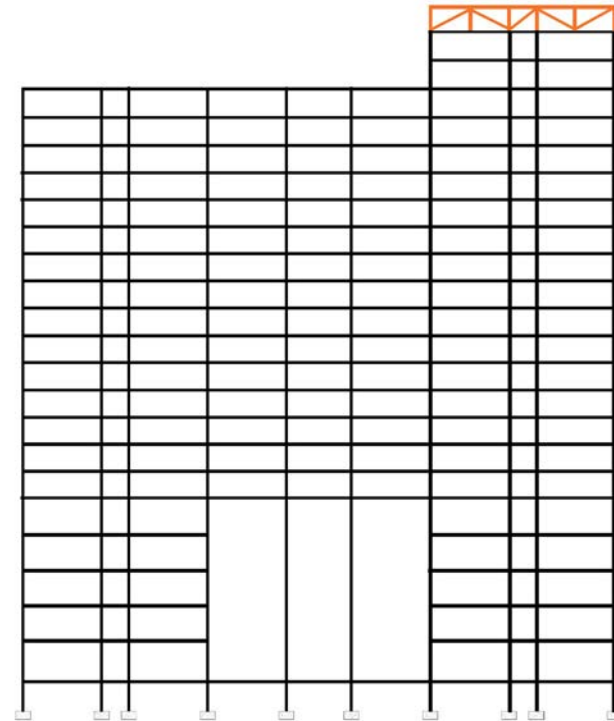
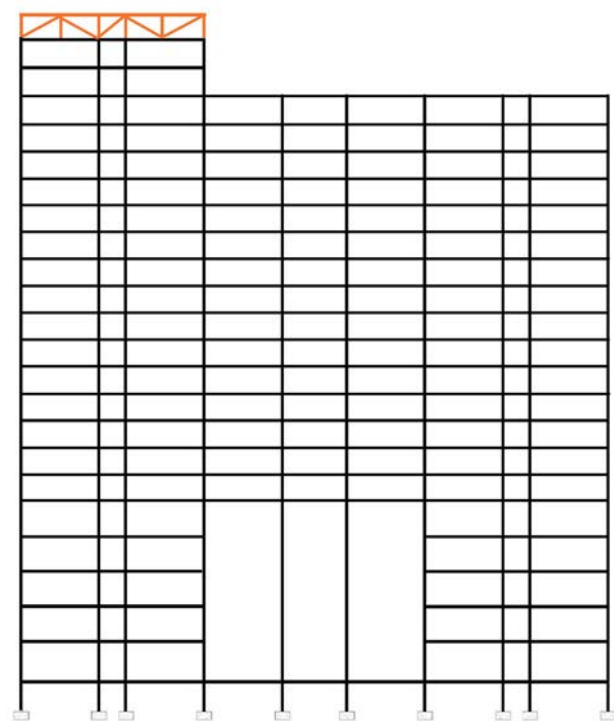
Section



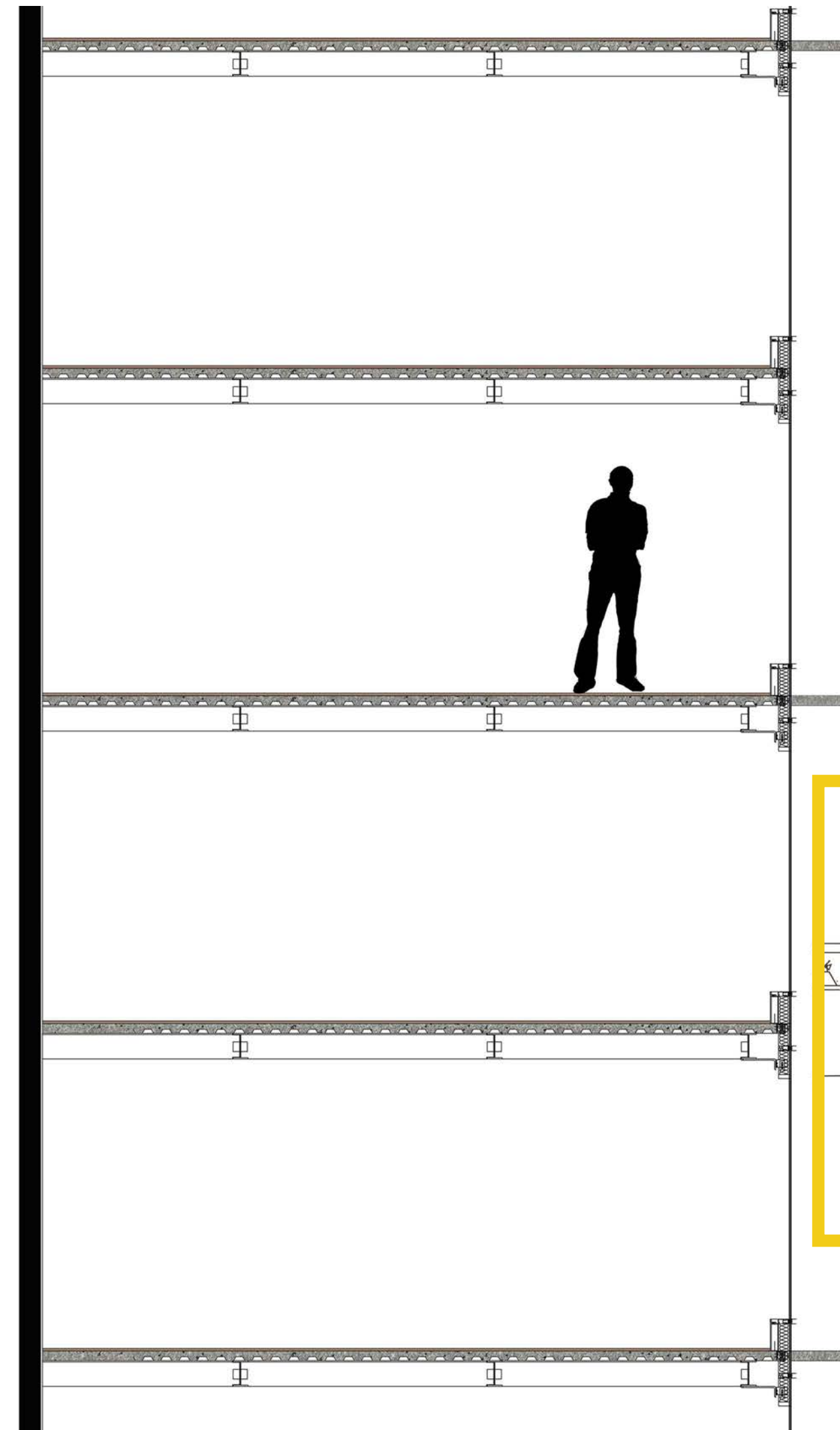
Hat truss system



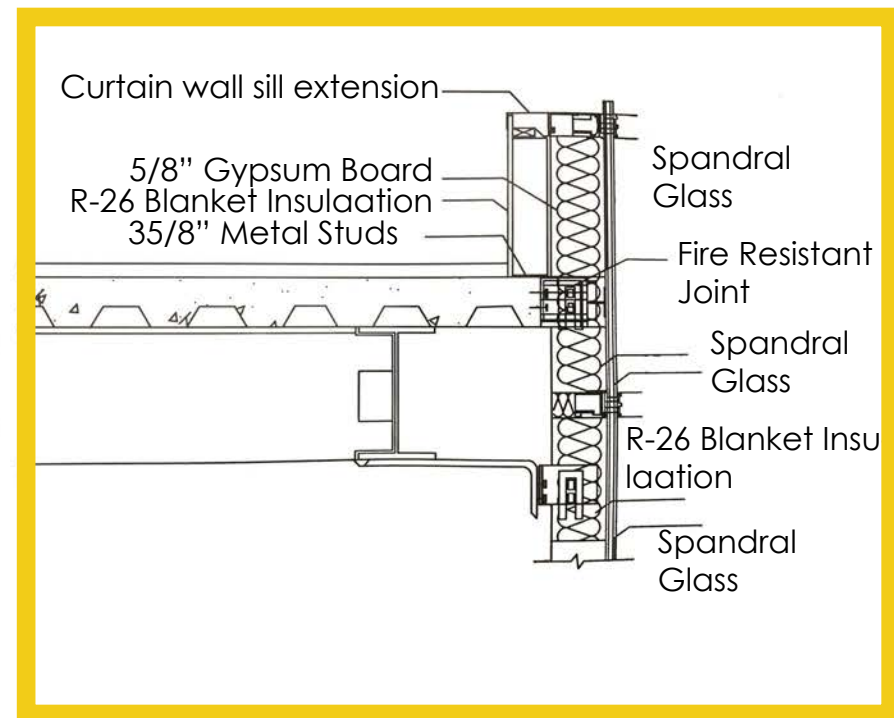
Structural Framing



Rigid Frame



Wall Section



06 | Conclusion

Conclusion

Mixed use building is a challenging buliding design which integrate different uses such as commercial and residential into one building. Providing separate circulation to residents living in apartment units and normal public, play an important role in the design process. The Arthur square's Iconic projection represents the historic hammerhead crane of Norfolk and act as a symbol of Norfolk and attract people attention. The public plaza acts a amusement place that attract and engage people in Downtown. The need of mixed use buildings in Downtown and history of Norfolk naval port are the binding agents used to craft Iconic Arthur sqaure by using commercial, residential, office and green spaces as a building blocks.

Bibliography

1. Lynch, K. (1960). The image of the city (Vol. 11). MIT press.
2. Rossi, A., & Eisenman, P. (1982). The architecture of the city (p.111). Cambridge, MA: MIT press.
3. www.norfolk.gov/DocumentCenter/View/2483
4. www.norfolk.gov/documentcenter/view/27768
5. pilotonline.com/business/defense-shipyards/article_0b064e9e-fe6d-53c6-bd02-d834293b334a.html
6. cranenetworknews.com/historic-hammerhead-crane-is-an-iconic-regional-landmark/
7. www.structuremag.org/?p=10022
8. www.archdaily.com/878864/eid-architecture-redefines-high-density-mixed-use-development-in-xian?ad_medium=gallery.
9. www.archdaily.com/879113/mvrdv-breaks-ground-on-mixed-use-valley-to-inject-life-into-amsterdams-business-district.
10. www.archdaily.com/801339/big-unveils-mixed-use-concrete-super-structure-for-los-angeles-arts-district.
11. www.gensler.com/uploads/document/593/file/Gensler_Design_Forecast_Shaping_the_Future_of_Cities.pdf.
12. www.Googleimages.com