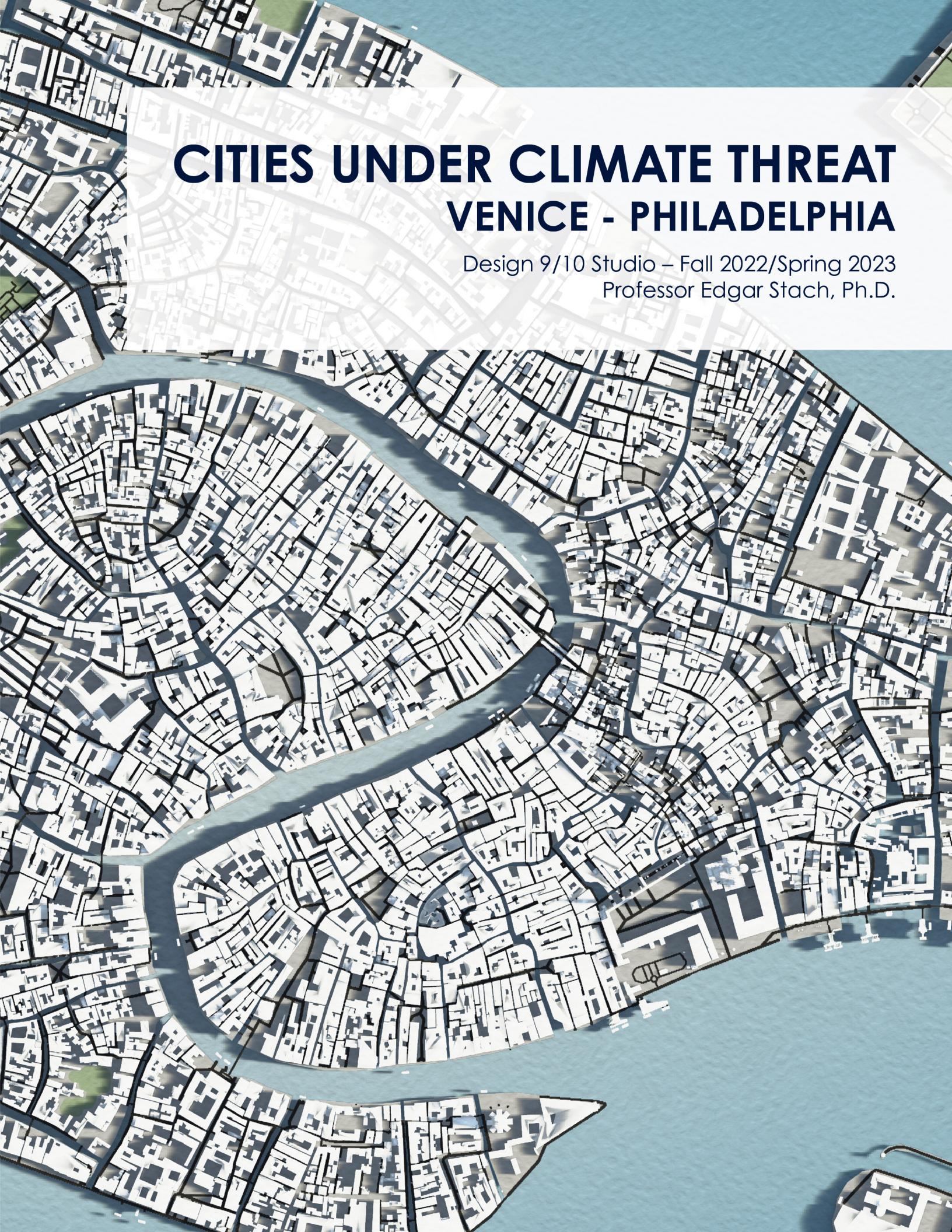
CITIES UNDER CLIMATE THREAT

VENICE - PHILADELPHIA

Design 9/10 Studio – Fall 2022/Spring 2023

Professor Edgar Stach, Ph.D.



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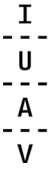
Jefferson
Philadelphia University +
Thomas Jefferson University
HOME OF SIDNEY KIMMEL MEDICAL COLLEGE



Università Iuav
di Venezia

Acknowledgment:

I am pleased to present this book, featuring the remarkable design proposals of students developed during the first collaborative studio between Thomas Jefferson University and Iuav University of Venice in Italy during the fall and spring semesters of 2022/23.

The publication, "Cities Under Climate Threat: Venice – Philadelphia," explores solutions for the pressing issues of urbanization, public health, environment, and climate change. This collaboration between the Institute for Smart and Healthy Cities at Thomas Jefferson University and the Università Iuav di Venezia represents an aggregator and facilitator of transdisciplinary research and education across multiple disciplines.

I would like to express my sincerest gratitude to all individuals who have contributed to this publication. I extend my thanks to Francesco Musco, Ph.D., Director of Research at Università Iuav di Venezia, for supporting this collaboration. Special thanks to Carlo Federico dall'Omo, Ph.D., and Vittore Negretto, Ph.D., from the Department of Architecture & Arts, for organizing the Exhibit at the Palazzo Badoer and providing valuable input during online reviews and planning sessions. I would also like to thank Peng Du, Ph.D., my colleague, for collaborating on the Exhibit.

I am grateful for the unparalleled support of Thomas Jefferson University, especially Barbara Klinkhammer, Dean at the College of Architecture and the Build Environment, and Dr. Ignazio Marino, Director of The Jefferson Italy Center, for their unwavering support of this university collaboration. The Venice Exhibit 2023 and publication would not have been possible without the generous support of our sponsors, Dr. Charles Pohl from Thomas Jefferson University's Foerderer Award, Ms. Franca Riccardi from the America-Italy Society of Philadelphia, and Ms. Yocasta Lora from AARP Pennsylvania.

The partnership and collaboration between Iuav University of Venice and Thomas Jefferson University were only possible with the vision and leadership of Mark Tykocinski, President of Thomas Jefferson University.

Finally, I would like to express my gratitude to my students for their dedication and enthusiastic interest in exploring solutions for tomorrow's most pressing problems, including urbanization, public health, the environment, and climate change.

Sincerely,
Professor Edgar Stach, Ph.D.
May 2023

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Editing and Layout
Gabriella Bellino, Joseph Falcone, Joseph Sauers

Research Contributors
Health and Quality of Life - Gabriella Bellino, Joseph Sauers
Environmental Hazards - Jacqueline Thornton, Giovanni Ruiz
Urban Planning - Ben Hoffman, Francesco Rizzi
Mobility - Joseph Falcone, Colin White
Technology and Innovation - Earl Heim, Michael Catalfano
Buildings and Technology - Onel Santiago-Medina, Daniel Paul

Research Editor
Gabriella Bellino

Research and Design Faculty
Professor Edgar Stach, Ph.D.
Thomas Jefferson University
Philadelphia, Pennsylvania

Printing
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INTRODUCTION

Introduction

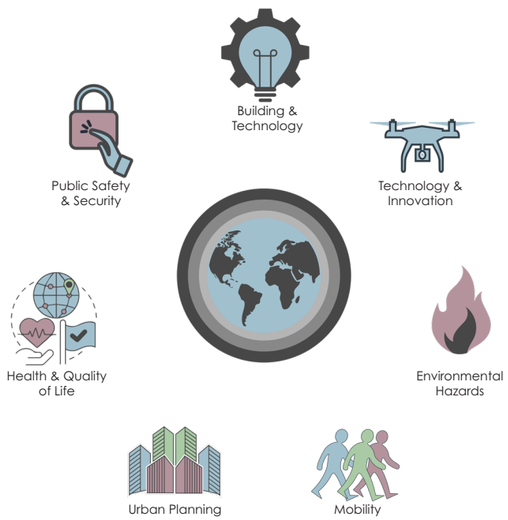
> Understanding the impact of Climate Change on Cities: Policies, Urban Design, Economics, Environment and Population Health

The effects of climate change, urban infrastructure, transportation, and energy on the health of populations can no longer be ignored. “Despite the adoption of the Paris Agreement on climate change and the establishment of the 2030 United Nations Sustainable Development Goals, significant gaps remain between the scientific and political communities when it comes to an understanding how climate change risks cascade through environmental, social, and economic systems.” [1]

The Smart and Healthy Cities Studio at Thomas Jefferson University developed seven climate indicators to unlock the relationship between climate change and the risks to the built environment, ecology, and population health. Aspects such as health & quality of life, environmental hazards, urban planning, mobility, public safety & security, technology & innovation, and building & technology play a crucial role in mediating the adverse effects of climate change. The seven indicators display the complex ways climate change threatens urban environments and shows the immediate necessity for more drastic and immediate climate action.

Science indicates that climate change cannot be reversed, and new holistic approaches are necessary to mediate and perhaps reverse the adverse effects of climate change. New planning tools, policies, regulations, changes in human behavior, and technological innovations are required to address climate change in every aspect.

The Smart and Healthy Cities Studio shows the complex interconnection between climate change and the macro, mezzo, and micro–contextual relationships between factors that have often not been considered. The studio offers solutions for how cities can be better prepared for future global crises and how to transform cities under climate threats into more resilient towns to support a fair city to live, work, and do business.



1. World Economic Forum –Strategic Intelligence, Climate Indicators.

Vision

The Smart and Healthy Cities Studio has the vision to show the solutions for tomorrow's most pressing problems; urbanization, public health, environment, and climate change. The studio is conceived as an aggregator and facilitator of trans-disciplinary research and education across multiple disciplines. The systems thinking approach will allow for a holistic method of analysis of the effects of climate change on urban environments and population health. The research will consider the UN's 17 Sustainable Development Goals (SDGs). The goal is to increase cities' resiliency to strengthen population health, mitigate climate change, and support a fair city to live, work, and do business in.

Mission

- To understand the entire city as a system and solve tomorrow’s most pressing problems: urbanization, public health, energy, and transportation.
- To make a direct impact at the community and city scale by researching the intersection of environmental conditions, housing, workplace, transit, public infrastructure, and health.
- To partner with other universities to provide students access and support through co-invention.
- To educate the public about the complex interrelationship of climate change.
- To provide solutions for climate resilient cities.
- To unlock the connection between climate change, urbanization, and health.

Network of Knowledge

University Collaboration

The collaboration between Università Iuav di Venezia and Thomas Jefferson University is developing a Centre of Excellence on Resilient Cities and Climate-proof Design and Planning. The combination of expertise and knowledge provides a cutting-edge approach to rethinking the concept of a resilient city.

The interdisciplinary portfolio will enhance the opportunity of managing highly complex urban criticalities from an innovative perspective while redefining priorities and altering design approaches. The cities of Philadelphia and Venice are increasingly impacted by negative consequences of climate change such as urban heat island effects, rising water levels, and more frequent flooding events. Each of these factors play an essential role in the citizens' socio-economic and population health well-being.

The Università Iuav di Venezia is located in Venice, Italy. The Department of Architecture and Arts, and the Planning and Climate Change LAB focus on spatial planning as part of the complex and dynamic relationship between man and nature. The Climate Change Lab concentrates on the effects of climate change on Cities. Especially coastal cities like Venice and Philadelphia which experience the dramatic impact of climate change, and the increase in extreme weather events. Iuav's Planning Climate Change Lab focuses on this new challenge for urban and regional planning processes by defining new adequate policies, planning tools, and technologies.

Jefferson's Institute for Smart and Healthy Cities supports trans-disciplinary research, education, and innovation to advance the development of the urban environment through collaboration across the architecture, design, engineering, health, and science disciplines. These institutes focus on transforming urban environments into smart and healthy cities in the face of climate change, social inequity, rapid urbanization, and health disparity.

RESEARCH

Research

What is the purpose?

Our research was conducted with an emphasis on the current climate issues in the cities of Philadelphia and Venice, and provided a baseline for future sustainable development within the urban context.

Research Scope

Our research investigated the key issues of the climate crisis at a Micro, Mezzo, and Macro scale to ensure an in-depth understand of each issue and the many ways they impacted the urban environment.

The Circular Map

The circular map combines the issues most relevant to the topic 'Cities under Climate Threat' and contextualizes them. The map highlights the seven key issues of the topic 'Cities under Climate Threat.' Each key issue has a specific focus and subcategories represented in the outer ring of the circular map. The map emphasizes the interconnections and overlap between key issues and subcategories linked to climate change and urbanization. The seven areas of focus are Health and Quality of Life, Environmental Hazards, Urban Planning, Mobility, Public Safety and Security, Technology and Innovation, and Buildings and Technology. The dynamic characteristics of the circular map show each category of climate change highlighted in a single image, and the many topical connections across a network of global issues.

Areas of Focus

Health & Quality of Life

Health & Quality of Life is a multi-dimensional concept influenced by factors of both the built and natural environment. Evolving technologies and design strategies are necessary to negate the effects of climate change, and improve the health and quality of life for all.

Environmental Hazards

Environmental Hazards arise as a direct result of climate change and create global imbalances, threatening ecosystems, resource supply, and overall health.

Urban Planning

Urban environments are a key contributor to climate change, and urban planning involving smart policies and design solutions will work to negate environmental impacts on a large scale, creating safe and healthy living spaces for all.

Mobility

Current methods of mobility are a major contributor to greenhouse gas emissions and climate change. In order to shift these contributions, walkability within cities and sustainable transit methods must be promoted.

Public Safety & Security

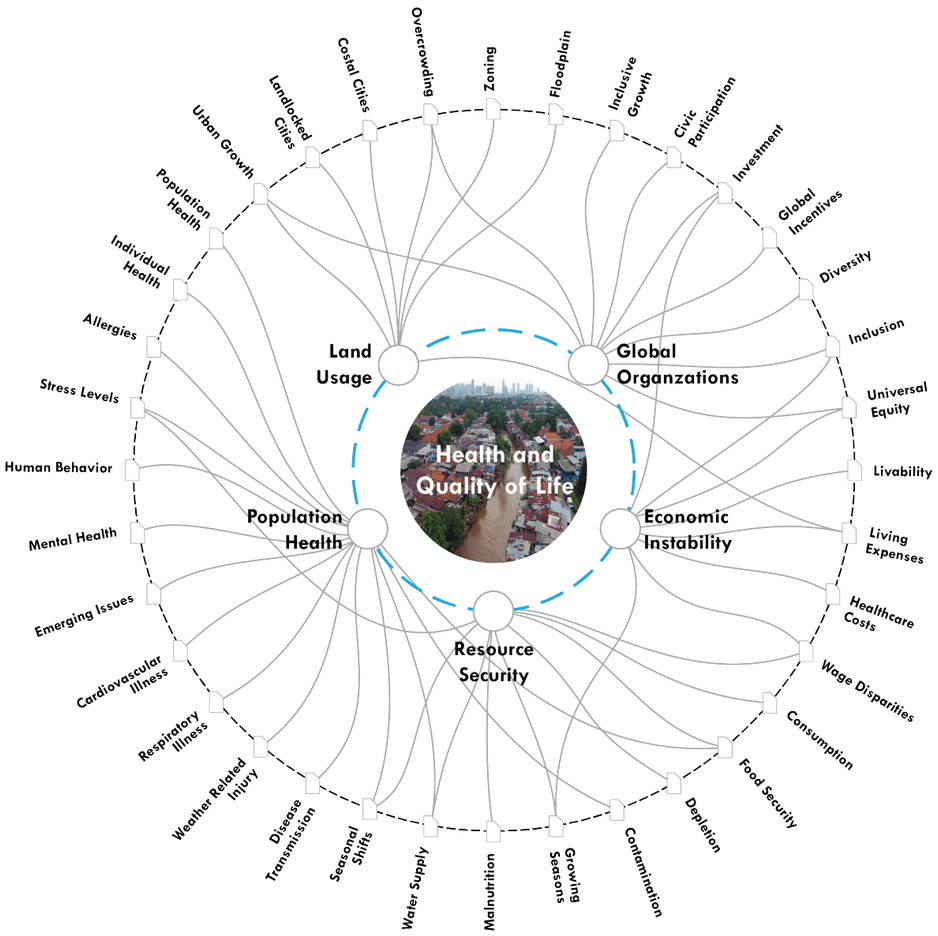
Frequent extreme weather events related to climate change jeopardize public safety. Implementing services and programs to promote the use of technology and inclusive design will create safer spaces for every community.

Technology & Innovation

Technology and Innovation allow for the exploration of man-made interventions against climate change, which are essential to ensuring the avoidance of catastrophic climate events.

Buildings & Technology

The rapidly evolving understanding of a building and its components allows for designers to recognize the environmental impacts of their choices, and make design decisions that actively combat the climate crisis.



Health and Quality of Life

Research by Gabriella Bellino and Joseph Sauers

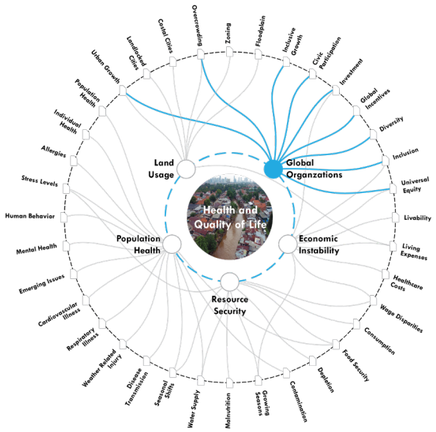
Health and quality of life are defined as a multidimensional concept, influenced by the areas of physical, mental, emotional, and social functioning related to one's life, and focuses on the direct impact that personal health status has on quality of life.[1] This definition is given at two levels: a larger scale community level, and a smaller scale individual level. The level of health in a community is constantly changing as a result of the various and evolving effects of climate change. On a global scale, the direct effects of climate change will vary based on geographic regions and varying populations, but population health will be widely impacted by issues of resource security, land usage, and economic instability.[2] The growing effects of climate change on health and quality of life threaten to undo the progress that has been made in these areas, and widen shrinking equity gaps.

1. "Related Quality of Life & Well-Being." Health. Healthy People 2020. https://www.healthypeople.gov/2020/topics-objectives/topic/health-related-quality-of-life-well-being.
2. "Climate Change and Public Health - Policy." Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, September 9, 2019. https://www.cdc.gov/climateandhealth/policy.htm.

Areas of Focus

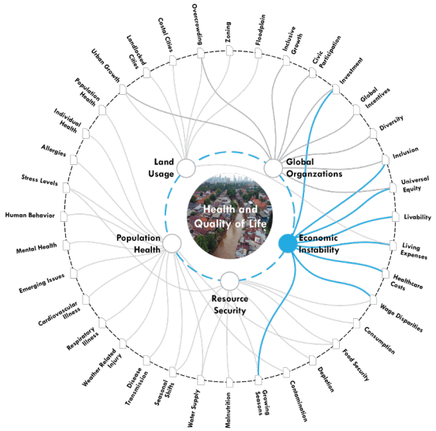
Global Organizations

Global organizations are necessary to provide consistent guidance on the rules and regulations related to action against climate change, as well as for working to ensure that no group is bearing a disproportionate load of the effects of climate change. Organizations must be created to regularly asses the impacts of climate change, and produce feasible solutions.[1]



Economic Instability

The desire to be comfortable comes with higher costs of living due to overpopulation of locations with more temperate climates.[2] Consequentially, this over population leads to various governmental, social, and logistical problems that influence the climate's contributions to Economic Instability.



Resource Security

Rising temperatures and seasonal shifts cause a decrease in the levels of readily available natural resources. [3]

1. "About the IPCC." IPCC. IPCC. https://www.ipcc.ch/about/.
2. "How Does Climate Change Affect Migration?" Stanford Earth. Accessed August 29, 2022. https://earth.stanford.edu/news/how-does-climate-change-affect-migration#gs.ab55pa.
3. "Seasonal Shifts." Seasonal Shifts | USDA Climate Hubs. https://www.climatehubs.usda.gov/climate-impacts/growing-season.

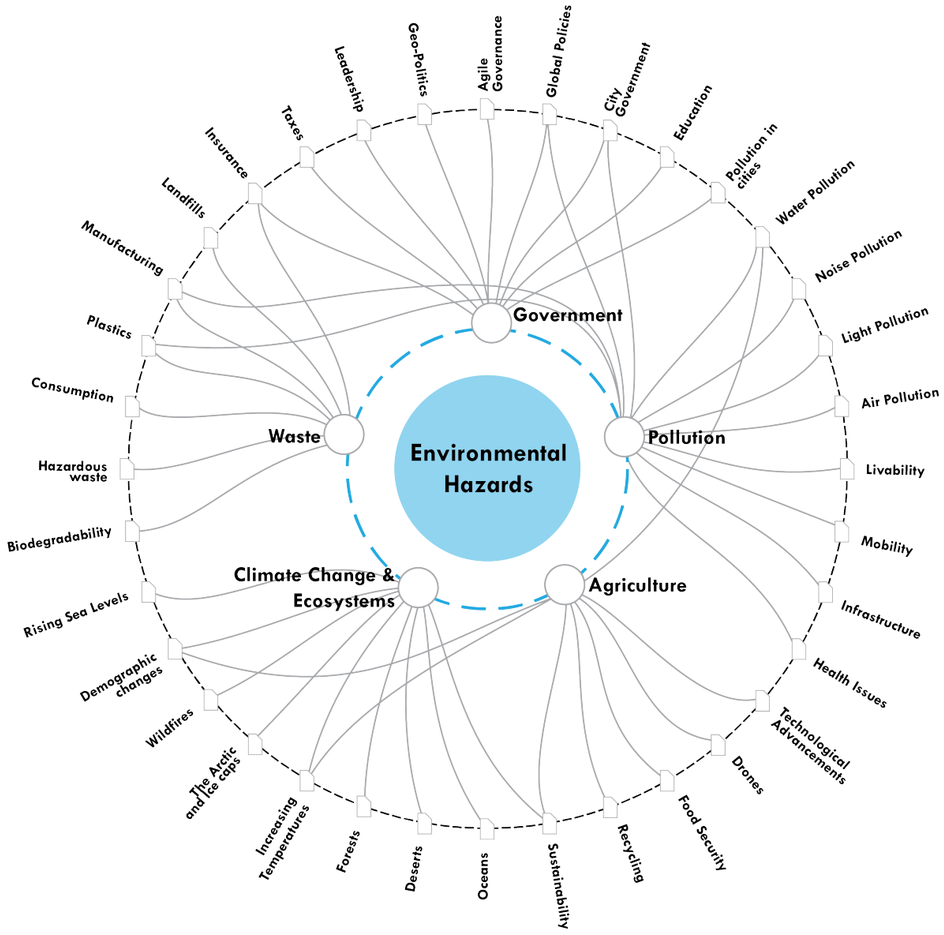
Population Health

Changes in climate create discomfort on an individual level impacting overall physical and mental health, while extreme weather patterns increase the risk of weather related injuries, and decrease the amount of time people are willing to spend outside. [4]

Land Usage

The land that we live on is experiencing rapid changes caused by the climate. In coastal areas sea levels are rising and hurting adjacent freshwater ecosystems and drinkable water sources. Inland, drought and prolonged dry seasons are affecting food and water supply and rapidly increasing the rate of forest fire natural disasters.[5]

1. Bell, J.E., S.C. Herring, L. Jantarasami, C. Adrianopoli, K. Benedict, K. Conlon, V. Escobar, et al. "Ch. 4: Impacts of Extreme Events on Human Health." The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment, April 4, 2016. https://health2016.globalchange.gov/extreme-events.
2. "Climate Impacts on Human Health." EPA. Environmental Protection Agency, January 13, 2017. https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-human-health_.html.



Environmental Hazards

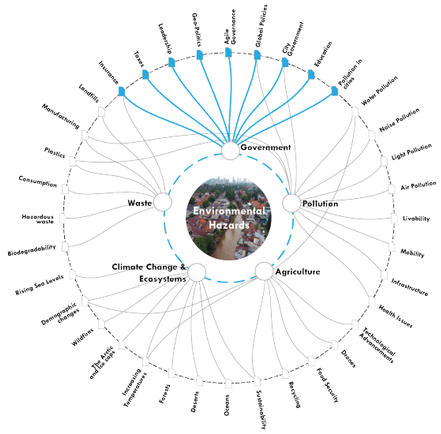
Research by Jacqueline Thornton and Giovanni Ruiz

Environmental hazards are any objects or events that are a direct threat to the natural environment or human population. These hazards create global imbalances which threaten ecosystems on micro, mezzo, and macro levels, causing large scale issues in local communities and around the world. The issues caused by environmental hazards create health issues, disrupt farming processes, and hurt the economy. Attention must be focused on government, pollution, agriculture, waste, and ecosystems to create regulations regarding environmental impact and allow society to transition towards sustainable practices and systems of operation.

Areas of Focus

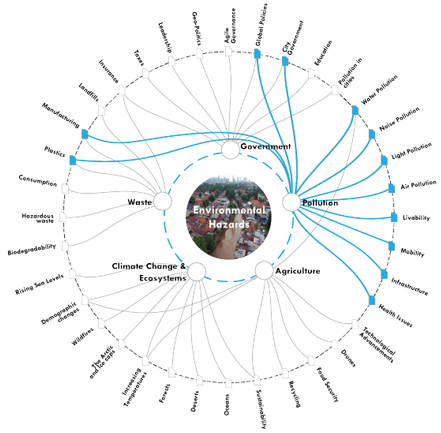
Government

Governments of all scales must take initiative to work with scientists to improve climate related issues withing their communities. The first step is to create laws and regulations regarding practices related to pollution, agriculture, waste, and the health of the worlds many ecosystems, ensuring environmental protection.[1]



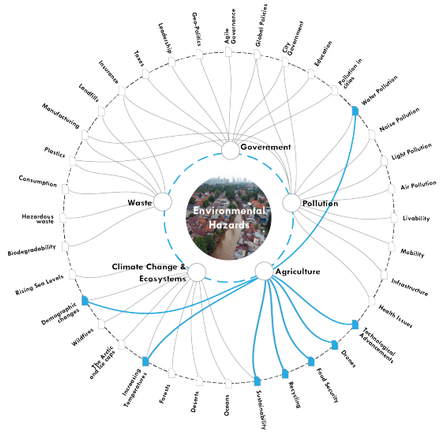
Pollution

Air, water, noise, and light pollution pose a direct threat to biodiversity and human health through the ecological disruptions associated with each form. In urban areas, the effects of each type of pollution are highlighted by the large populations, and it is essential for changes to be made to decrease the impact of pollution in all of its forms.[2]



Agriculture

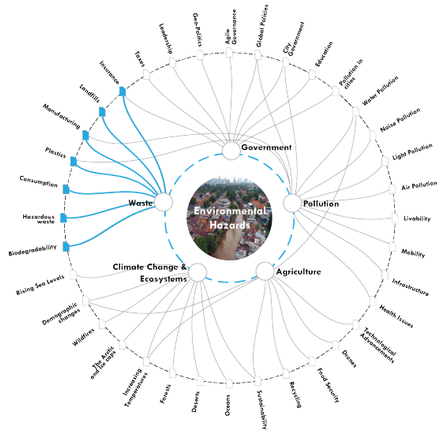
The agriculture industry is essential for sustaining life in both urban and rural settings, and understanding how farming practices are affected by and effect climate change will help solve issues related to the production and consumption of agricultural goods.[3]



1. Johnstone, "Global governance and the Global Green New Deal: the G7's role," 3
2. Gulia et al., "Urban air quality management-A review," 287.
3. Devkota et al., "Managing salinity for sustainable agricultural production in salt-affected soils of irrigated drylands,"

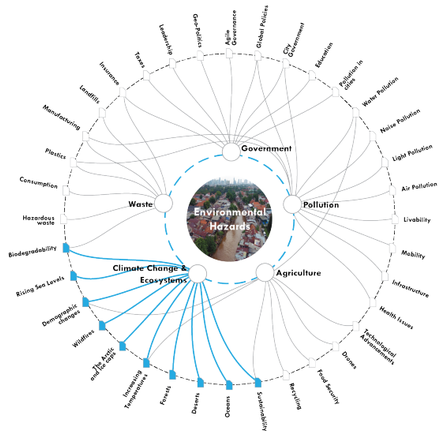
Waste

The current cycle of human use from production to disposal is unsustainable, and has a negative impact on the environment. Most products used in todays world have a short, single use, life cycle and use irresponsibly sourced materials, meaning the production of waste caused by humans only continues to increase.[1] Creating of a cycle of reuse, and using environmentally friendly materials will decrease the amount of unnecessary waste produced by humans.

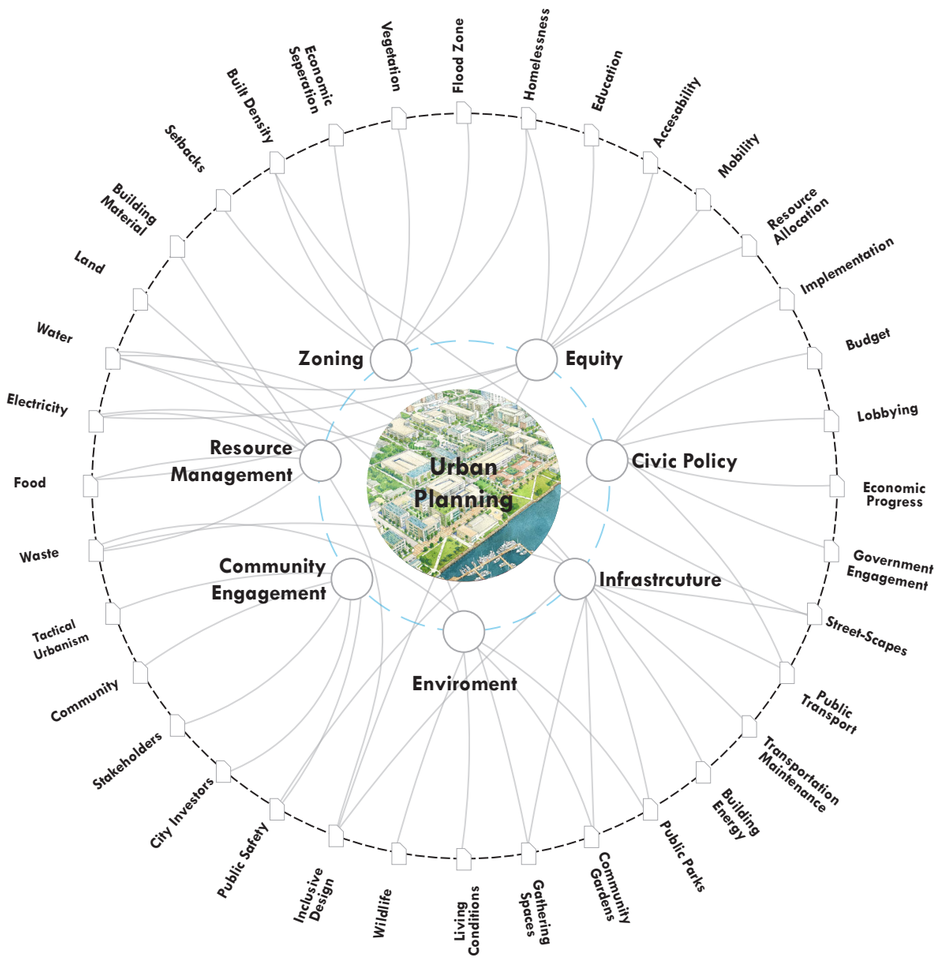


Ecosystems

Ecosystems around the world are suffering from the impact of humans endangering biodiversity and their natural habitats. Rapid changes caused by extreme climates makes it harder to sustain life in these areas, and as a result, ecological communities around the world are suffering.[2]



1. Moshood et al., "Biodegradable plastic applications towards sustainability: A recent innovations in the green product," 1-2.
2. Jentsch and Beierkuhnlein, "Research frontiers in climate change: Effects of extreme meteorological events on ecosystems," 622-623.



Urban Planning

Research by Ben Hoffman and Francesco Rizzi

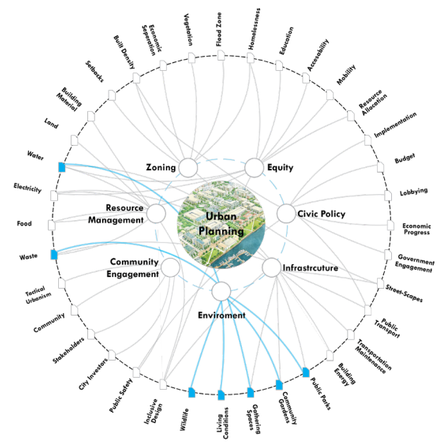
With the majority of the world's population living in urban areas, these spaces are a focal point for mitigating the harmful effects of climate change at a large scale. Concerned and innovative urban planners curate these environments with the main goal of improving these environments for people and the planet by changing the way humans interact with their environment on a daily basis.[1] Thoughtful urban planning proposes smart design strategies and solutions that work to increase the livability of these environments while combating the impacts of climate change.

1. C. E BEVERIDGE, "Cities as Environments," accessed August 29, 2022,

Areas of Focus

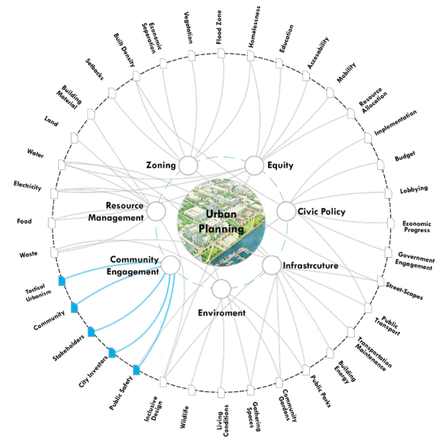
Environment

Our environment is defined as the conditions that surround us, and in the context of a city this environment is the urban fabric. Understanding this urban fabric as its own environment allows for a deeper understanding of how a city is negatively impacting the environment, and how it must adapt to counteract climate change.



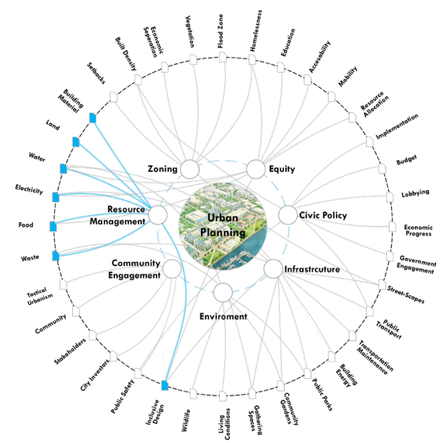
Community Engagement

Community engagement is an essential bridge between policy makers and the public. The discourse allows for education and advocacy for all groups in the community.



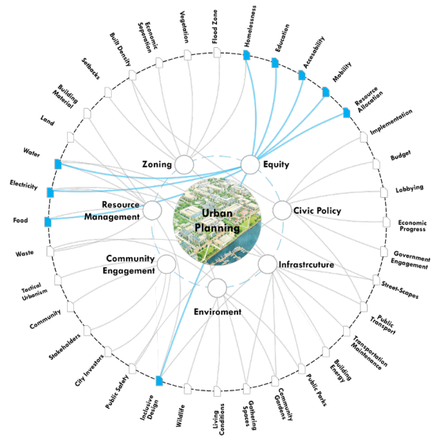
Resource Management

The responsible collection, use, and management of natural and man made resources is essential for reducing human impact on climate and creating more sustainable urban environments.



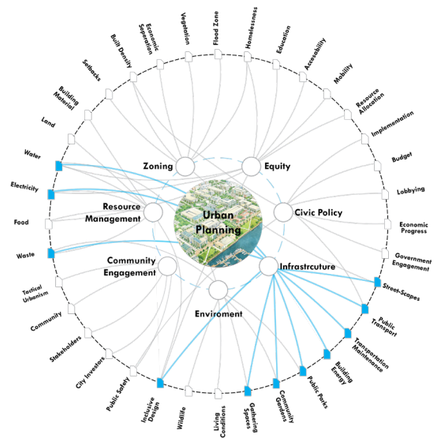
Equity

The effects of climate change affect different groups across a population more or less severely depending on social and economic standards and have a disproportionate effect on people of the lower classes. These effects have an impact on health, living conditions, housing displacement and a variety of other resources.



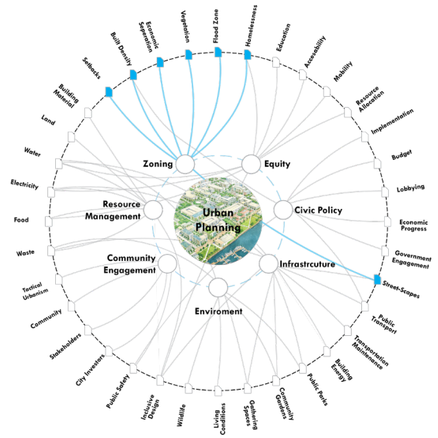
Infrastructure

The infrastructure of an contemporary urban environment can be strained due to the effects of climate change. These strains can cause failures within the systems affecting and effected by the environment of the cities such as transportation systems and waste collection systems, and place a large economic burden on the city.



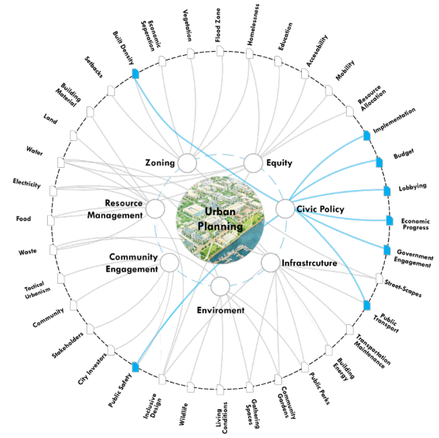
Zoning

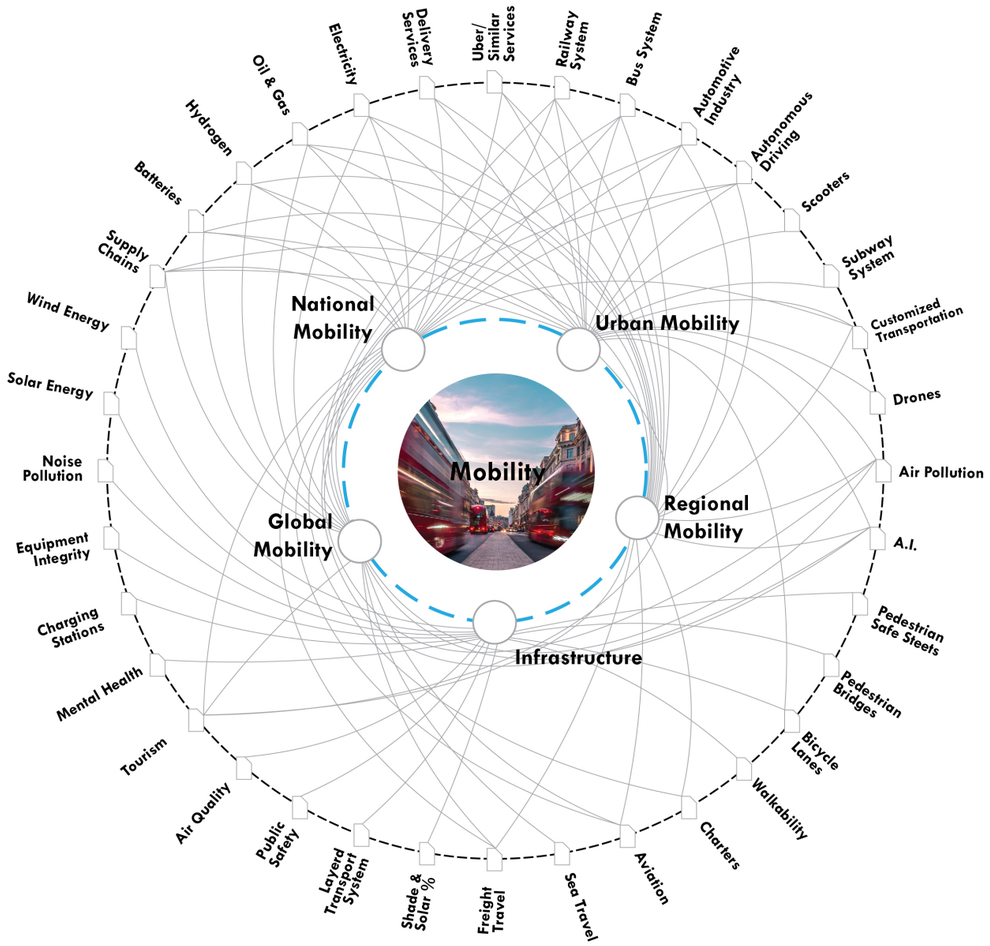
As cities continue to grow, the restructuring of vulnerable zones within the urban environment is necessary to help mitigate the disproportionate effects of climate change. Restructuring the zoning of urban areas will continue to improve the city's economic viability and continue to improve the city's physical infrastructure and the wellbeing of its residents.



Civic Policy

Community engagement on a large scale will guide local governments into implementing climate saving strategies influenced by local residents. This engagement is essential in building the resilience of the city so that each resident can help combat the effects of climate change.





Mobility

Research by Joseph Falcone and Colin White

Mobility is crucial for global existence, economic means, and human well being. On a macro scale transportation allows for the outsourcing of goods which supports the economy, and allows consumers to access worldwide goods. To contrast, the micro scale of mobility allows users to travel using a series of networks within their context, on a local, regional, national, and global scale. Throughout history, mobility has been a necessity for humans, starting with the most basic form of mobility, walking. Being able to move freely and get from one point to another is critical for humans,and allows for travel and the exchange of ideas, while also benefiting health. Transportation has allowed humans to create the culture and world we know today, but unfortunately current methods of mobility are not sustainable for the environment, as 16.2% of greenhouse gas emitted is from transportation. [1]

1. Hannah Ritche, "Sector by Sector: Where do Global Greenhouse Gas Emissions Come From?" , 1

Areas of Focus

Urban Mobility

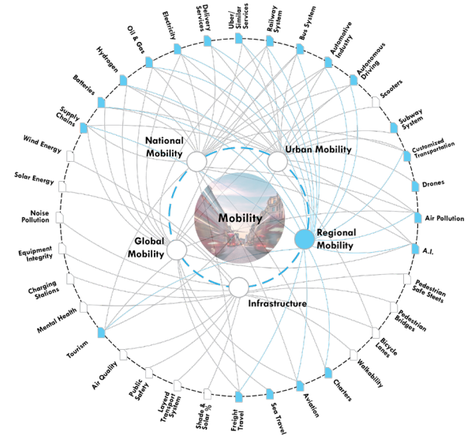
Urban Mobility refers to the ability of a person to navigate their local environment, most likely being a city or town. Common methods of urban mobility are walking, personal motorized and non motorized vehicles, public transportation, and customized public transportation, such as Uber.

Regional Mobility

Regional Mobility largely consists of the use of different classes of cars, trains, buses, and planes. Travel within a region can be extensive so within future travel methods, there is much room for improvement for both the time and efficiency of these trips.

Infrastructure

In order for mobility to be efficient within a city, the infrastructure needs to meet the needs of the people. Urban design strategies such as pedestrian only streets create safe spaces for people to navigate their environment. Pedestrian-only streets also promote exercise and increase air quality, while lowering the risk of vehicular accidents.

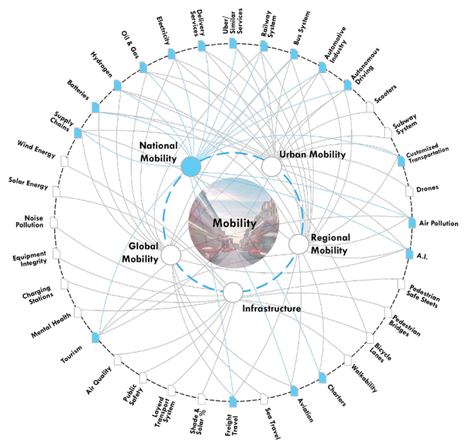


Global Mobility

Global Mobility refers to both outsourcing goods from different areas of the world, as well as extensive travel. Global mobility is typically carried out by the use of freight shipping overseas, freight by air, or pedestrian air travel.

National Mobility

National Mobility looks into large scale travel. Means of travel such as railways and planes have allowed for a shorter time frame to travel across countries. This national mobility allows for pedestrian travel, and also the exchange of goods.



Public Safety and Security

Research by Alvia Rios and James Sanchez

The Global Peace Index (GPI) is a ranking based on 23 factors related to the presence of factors related to fear and violence. For Philadelphia to climb the ranks of the GPI, it must first begin to address its current issues. The implementation of inclusive design will make the city safe for those with disabilities. The creation of services and programs will help keep the less fortunate financially afloat. Increasing education will keep city residents informed on current world topics such as climate, which will inform their future decision making. In turn, this will keep climate change in each resident's subconscious, allowing for them to make environmentally conscious decisions. [1]

1. Institute for Economics and Peace,"United States Peace Index Report 2012,," Sydney, 26."Climate Change and Public Health - Policy."

Areas of Focus

Inclusive Design

Inclusive design enables users of every background to benefit from public works and spaces within their environment.

Services and Programs

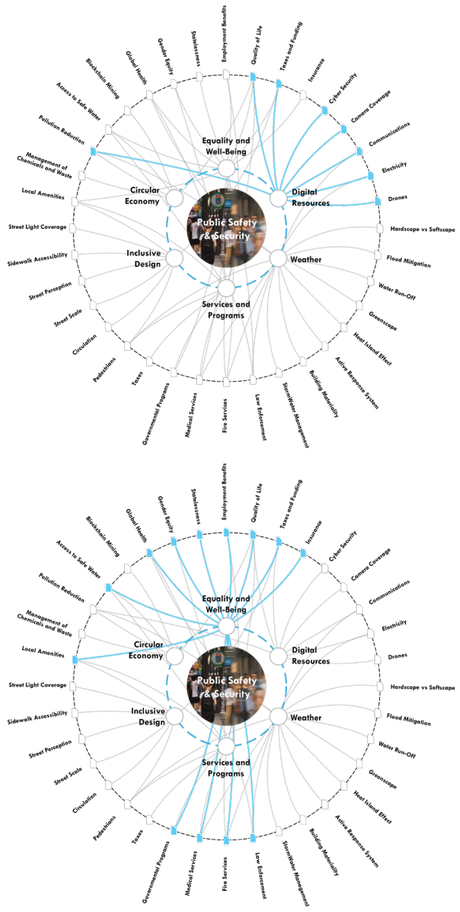
The implementation of public services and programs would allow for a worldwide reduction of hunger, increase in water supply and healthcare, as well as many other benefits for the population as a whole.

Weather

Climate change has altered weather patterns to become more sporadic and dangerous, calling for resilient and sustainable design. These unpredictable weather patterns lead to an increase in severe storms, intense flooding or droughts, fires, and strong wind which all put the health of the population at risk.

Digital Resources

Technology has become an essential part of our daily lives, and can become a helpful tool when combating climate change. Technology can be used to increase safety through surveillance, but it can also be used as an innovative method for educating the public on climate related safety, and potential climate related threats.

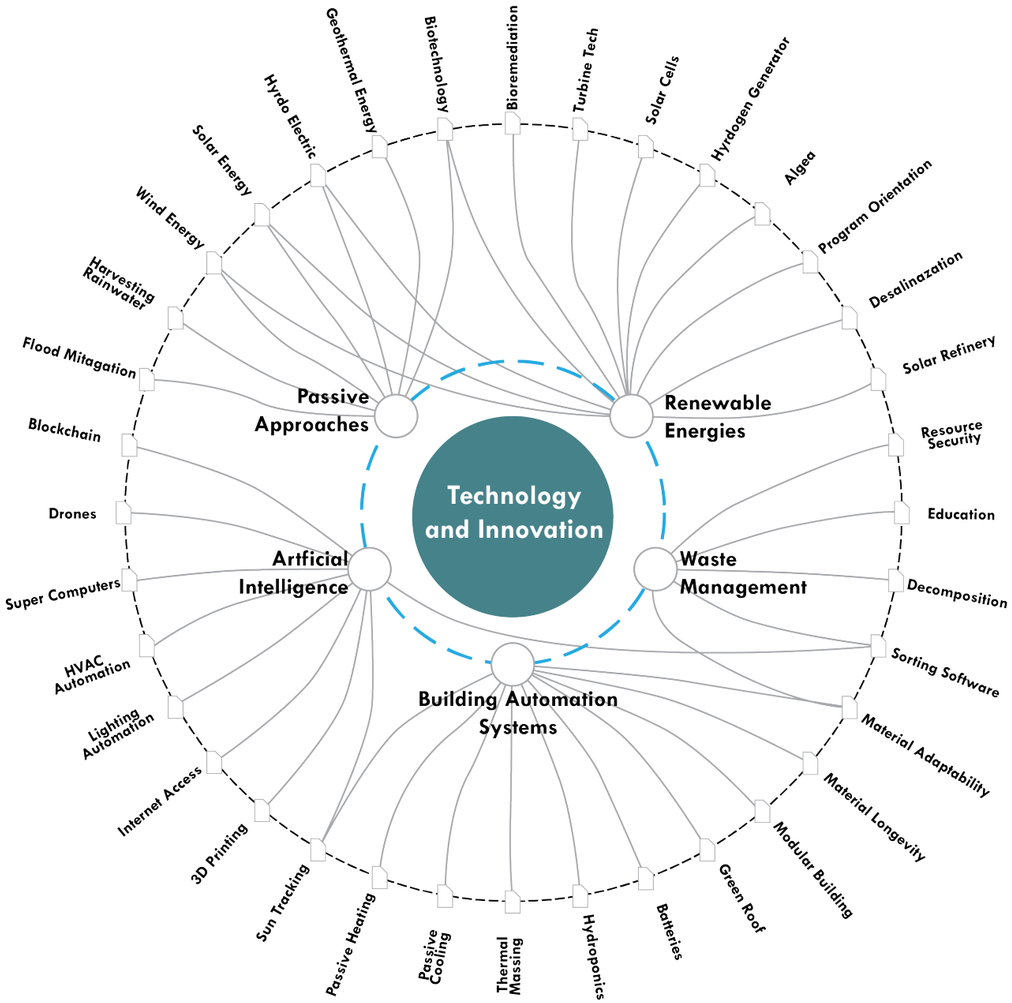


Equality and Well-Being

The consequences of climate change have a disproportionate affect on different groups within a population, with the majority of the impact landing on lower class groups. Climate factors will eventually limit the amount of resources available, and how often we can obtain them with the brunt of this impact falling on lower socio-economic groups.

Circular Economy

The thermal comfort of occupied spaces is the primary way people feel the effects of climate change, but there are other less noticeable impacts on agriculture and natural resources. By creating a new cycle of smart use and reuse, the amount of resources being consumed daily will be limited, ensuring their availability for future use.



Technology and Innovation

Research by Earl Heim and Mike Catalfano

By exploring new technology that helps us manage our impact on the earth, and taking advantage of the sustainable resources already provided, we can help reverse the effects of climate change. There are an abundance of new technologies being developed to make our daily lives more sustainable, passive approaches allow us to decrease our carbon footprint and save energy in a way that uses existing natural processes to achieve goals without added systems, particularly at the urban and residential scale. Achieving optimal comfort levels within the built environment can be achieved by taking advantage of geothermal properties of a site. As time has gone on, we have started to develop fuels that replace conventional energies and replace them with ones that are cleaner. Sun, wind, wave, and fusion energies have started to help us combat the damage that has been done to the climate, therefore, advancing these renewable energies is a crucial goal.

Areas of Focus

Passive Approaches

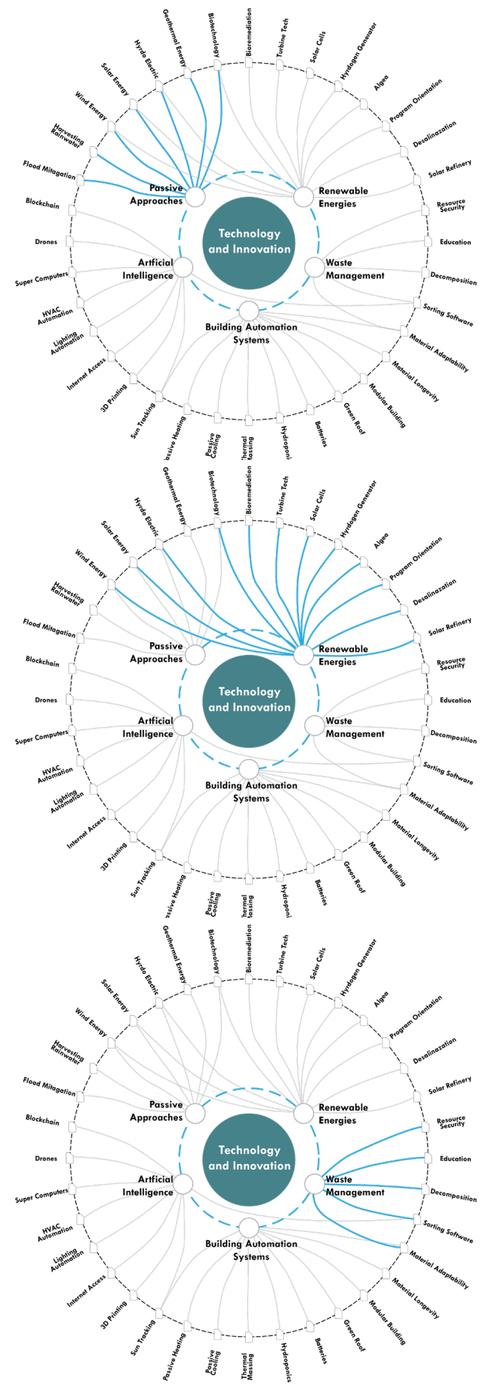
These solutions allow for the creation of a healthier environment with a lower carbon footprint, eliminating the need for external power sources. Passive approaches can be more cost effective, and can reduce the chances of climate related problems arising.

Renewable Energy

Current energy sources are constantly polluting our environment so it is necessary to find alternative ways to power devices and systems in ways that are more sustainable. By using prevalent and renewable energy sources like wind, water, and sun modern technology can be powered with a source that is undepletable, and produces no further environmental pollution.

Waste Management

Controlling the emission of different types of harmful pollutants and changing how they are stored andrepurposed can help to restore damaged areas of land as well as limit the potential for further damage in the future.

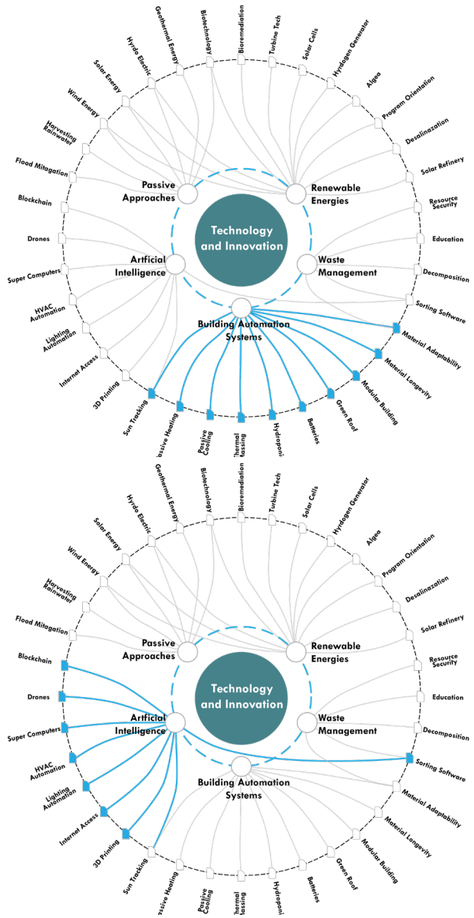


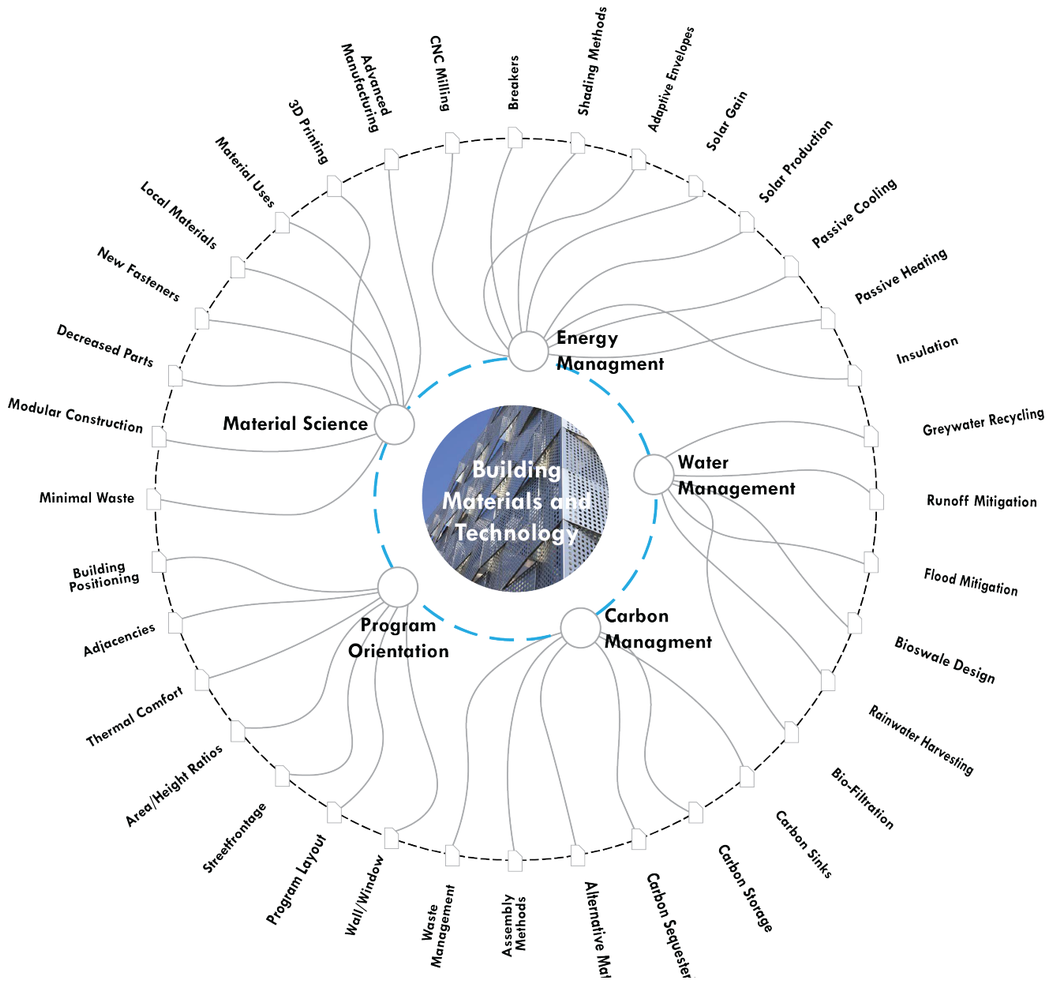
Building Automation Systems

Developing different ways to streamline building construction and maintenance processes for optimal efficiency allows the operational costs to be reduced drastically, while also decreasing the negative impact of the building on its surrounding environment.

Artificial Intelligence

Training machines to make informed decisions that increase the efficiency of program procedures and analysis at a building level, decreasing the environmental impact. AI based systems can rapidly identify issues and provide humans with the data necessary to create a solution.





Buildings and Technology

Research by Daniel Paul and Onel Santiago-Medina

Personal Technologies is a field that has been rapidly expanding and evolving over the last few decades, in large part due to abundant competition. Given the volatility of this market, it stands to reason that some of these advancements have shifted into building technologies as well. Our modern understanding of building materials, how to create and source those materials, and how we assemble them into a final program can help designers reduce the architect's footprint in the global crisis of climate change. When applied to larger scales, such as city ordinances, this potential becomes exponential.

Areas of Focus

Material Science

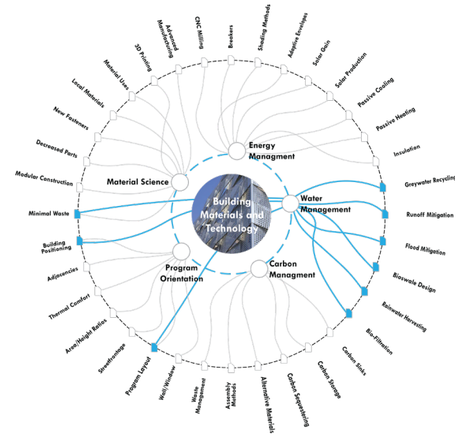
Unsustainable material sourcing, use, and production cause irreparable damage to our surroundings and produce a built environment that does not work to combat the effects of climate change. Finding ways to reuse carbon heavy materials or sourcing new sustainable materials will reduce the carbon footprint of new construction.

Energy Management and Preservation

A large portion of energy infrastructure is dependent on the burning of fossil fuels, and with a growing population energy consumption is one of the largest parts of climate change. Using modern technologies, buildings that consume less energy or even produce their own energy can have a positive impact on the urban fabric they exist in.

Water Management

Water scarcity and rising flood planes are a direct result of climate change and now threaten many communities across the world.[1] By implementing systems to manage the water cycle, buildings can consume water sustainably and limit the amount of harmful runoff and water pollution they produce.



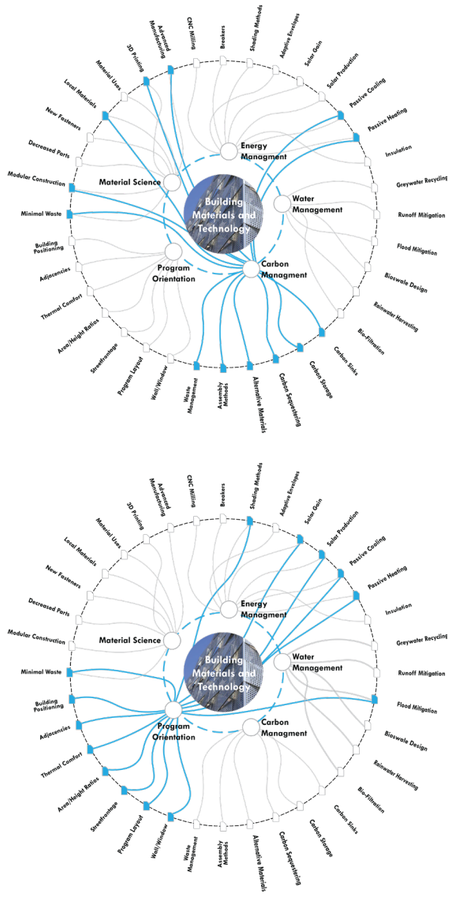
1. Elizabeth English, Natasha Klink, and Scott Turner, "Thriving with Water: Developments in Amphibious Architecture in North America," E3S Web of Conferences (EDP Sciences, October 20, 2016)

Carbon Emissions

The building industry continues to be responsible for the majority of greenhouse gas emissions, and many cities refuse to implement large scale solutions to this problem. These emissions continue to impact and compromise the quality of air and water, decreasing overall population health.

Program Orientation

Positioning and organization of the urban fabric can help produce a healthy and adaptive city that creates a higher quality of life on a global and local scale. By using smart design strategies, less mechanical systems will be required in a building, decreasing the overall negative impact on the environment.



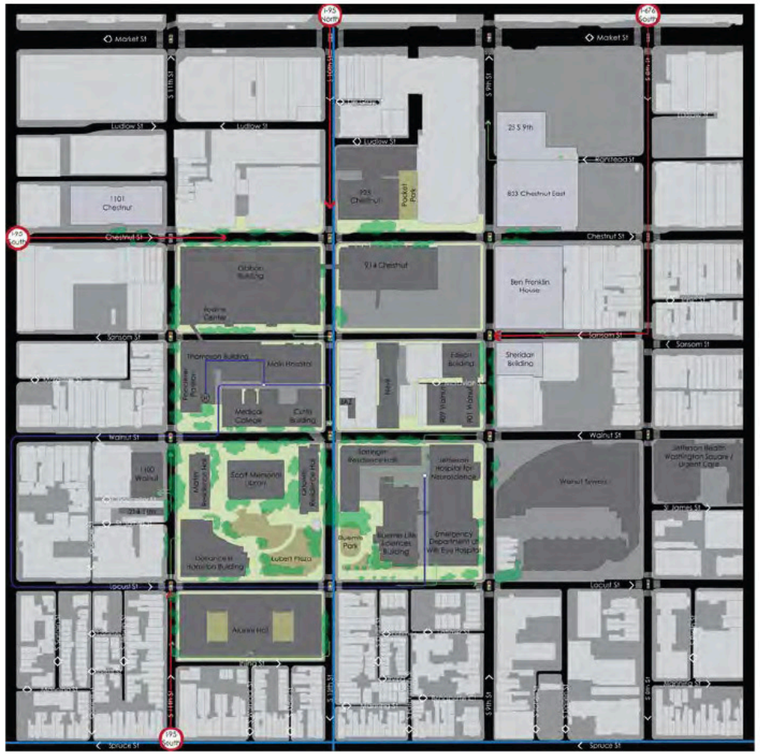
PHILADELPHIA
SUPERBLOCK

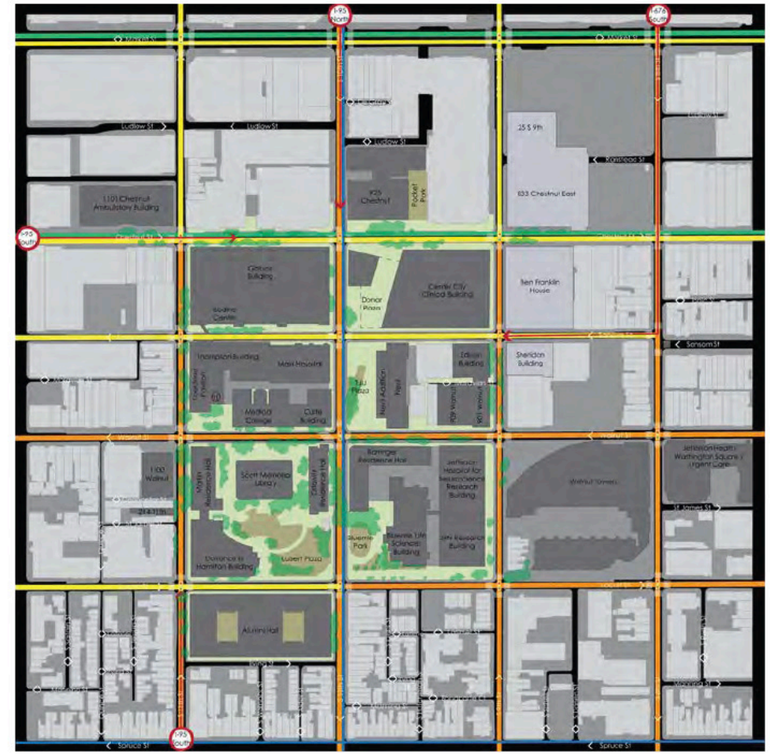
Legend

- Public Roads
- Paved Surfaces
- Realm of Public Activity
- Green Space

- Context Buildings
- University Buildings
- Leased Buildings

- Site Access
- Delivery Service Route
- Trauma Route
- Bicycle Network Paths





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Congestion Delays
- 13.01-20%
- 20.01-30%
- 30.01-40%

Jefferson University Campus Superblock

On weekday afternoons throughout Center City, many commuters have become accostumed to traveling through a city snarled with barely-moving traffic. While all successful major cities experience some form of congestion, Philadelphia's challenges are compounded by the inherited narrow streets from William Penn's 1682 plan.[1] While the existance of a pre-auto urban planning structure lends itself to the creation of an intimate urban fabric and a sense of socialibility in residential neighborhoods, the revival experienced in Center City over the last 30 years has contributed significantly to congetsion bringing a greater density of development resulting in increased density and diversity of land-use.[2] How does increased density contribute to traffic congestion? As the density of people within Center City has increased, so has public demand for street space exceeding the available supply.[3]

Congestion can be expressed as a function of:
1. Amount of users attempting to access the same space at the same time
2. Selected mode of transit
3. Presence or absence of thoughfully calibrated regulations governing use of limited space[61]
4. Observation of posted regulations by users
5. Severity of consequences for non-observance of posted regulations.

These causes of congestion place a burden on the Philadelphia Parking Authority to maintain systematic enforcement throughout the city. Yet the analysis of transit lanes and commuter behaviors within these lanes are only one vital aspect to determine how a street functions; the allocation and management of the curb lane has an enormous impact[5] to street functionality and congestion.

While it may be easy to argue for the removal of street side parking to increase maximum transit efficiency, urban streets also exist to serve adjacent building functions requiring them to accomodate multiple functions. Therefore, it is imperative for policy makers to constantly reexamine "is this the optimal distribution of curb space"[6] as determined by the priorities stated by City Council.

An effective means to structure the conversation regarding optimal use and designation of curba space requires Philadelphia City Counsel to establish a classification system with a Philadelphia specific context[7]. Six general functions for consideration include:

1. Mobility: for the purpose of moving people and goods
    - Bus lanes, bike lanes, vehicle lanes
2. Access for People: arrival, transfer and departure points for people
    - Bus stops, bike parking, passenger loading, short-term parking
3. Access for Commerce: arrival and departure points for goods/services
    - Truck deliveries and loading
4. Activation: creating moments of social engagement
    - Food trucks, parklets, art, street festivals
5. Greening: providing areas of nature within the urban fabric
    - Plantings, planter boxes
6. Storage: permanent and semi-permanent obstacles restricting access for other functions
    - Bus layover, long-term parking, reserved spaces, construction staging

1. Philadelphia Development Corporation. "Keep Philadelphia Moving." Center City Reports. May 2018. 1.
2. Center City District & Central Philadelphia Development Corporation. "Keep Philadelphia Moving." Center City Reports. Mar 2018. 2.
3. Center City District & Central Philadelphia Development Corporation. "Keep Philadelphia Moving." Center City Reports. Mar 2018. 3-5.
4. Ibid.
5. 62 Center City District & Central Philadelphia Development Corporation. "Rethinking the Curb Lane in Center City." Center City Reports. Sep 2019. 1.
6. Center City District & Central Philadelphia Development Corporation. "Rethinking the Curb Lane in Center City." Center City Reports. Sep 2019. 6.
7. Ibid.

Legend

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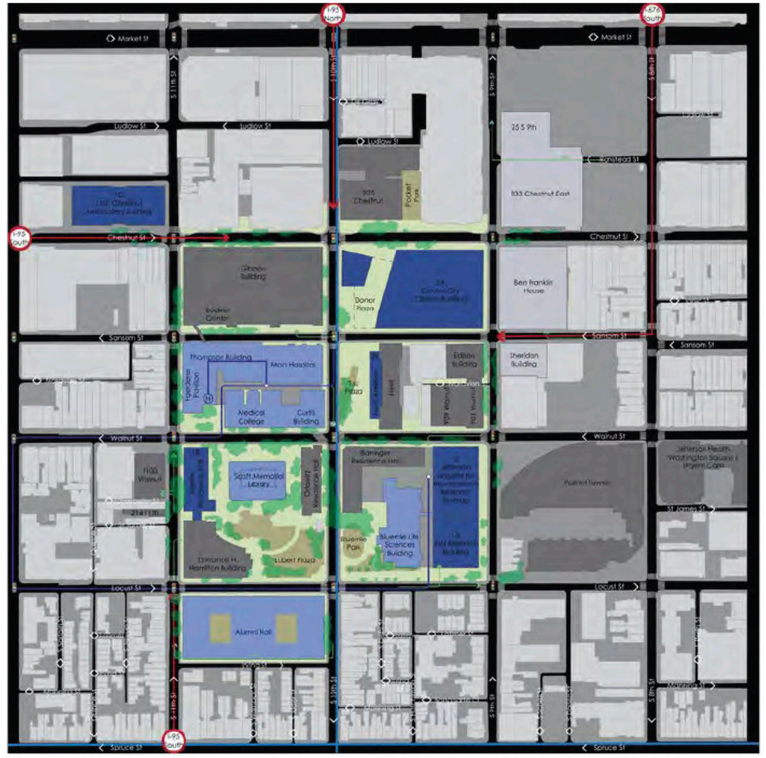
- New Construction
- Renovation Projects



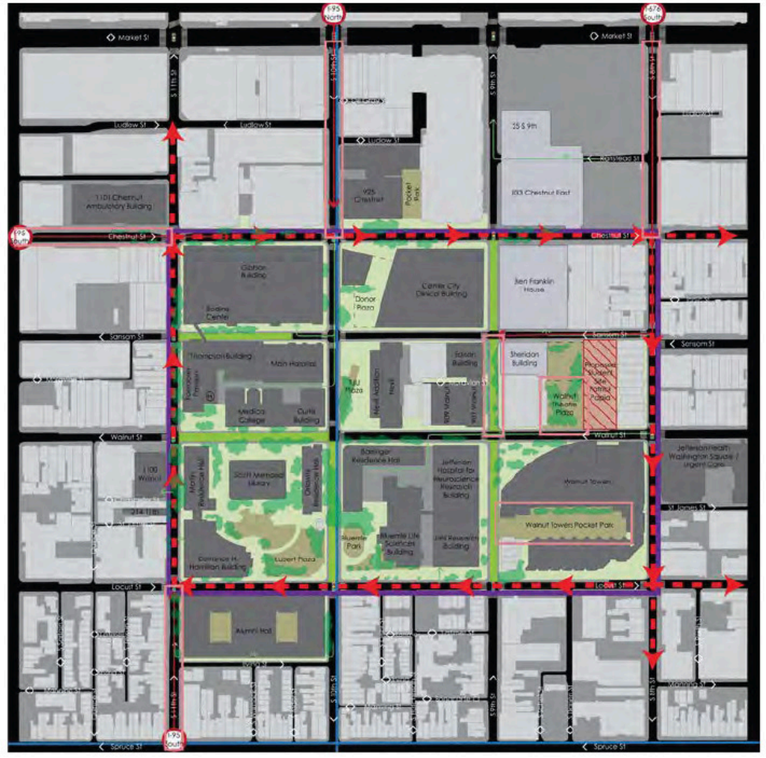
2030 Institutional Vision

Through strategic expansion and mergers, Jefferson University has grown into a dynamic organization poised to become a regional and national leader in healthcare, research, and education; this heritage with deep roots in healthcare delivery, research, and education since the founding of Jefferson Medical College, combined with the imperative "to drive strategic integration to transform health,"[8] became the foundation for this master facility plan.

With an overall Jefferson Health goal to become a world-class healthcare organization by 2024, the Campus Vision for Center City is to serve as a bestin-class Academic Medical Center for the University.[9] The plan featured above denotes the phased implementation strategy for the buildings marked for construction and renovation as a result of the 2030 Institutional Vision.

Goals for the Center City campus within the 2030 Institutional Vision include:[10]
- Create an identifiable campus within the center city urban context
- Operate the existing campus facilities at their highest and best use
- Improve the pedestrian, vehicular and public transit for all
- Leverage Jefferson as a system
- Provide exceptional care to the highest acuity patients at Center City
- Focus on patient experience and commit to all single beds
- Provide patient, family, and staff amenities across campus
- Focus on the patient experience and commit to all single beds
- Create ambulatory centers of excellence
- Create state of the art research facilities
- Expand simulation capacity
- Expand instructional spaces and create more flexibility

8. NBBJ. "Jefferson University and Jefferson Health Multi-Campus Master Plan - Final Report." 31 May 2018. 3.
9. NBBJ. " Jefferson University and Jefferson Health Multi-Campus Master Plan - Final Report." 31 May 2018. 9.
10. NBBJ. " Jefferson University and Jefferson Health Multi-Campus Master Plan - Final Report." 31 May 2018. 69.



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- Proposed Bicycle Path
- Traffic Routing
- Street Parks
- Vignette Callouts

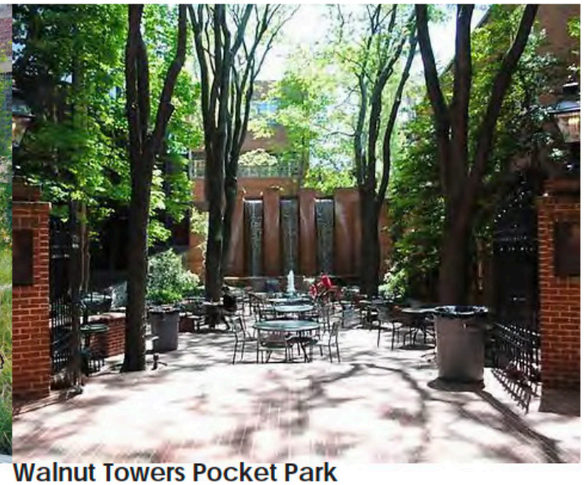
PROJECTED BENEFITS	POTENTIAL CONFLICTS
Pedestrians can easily access all major campus buildings easily	Motor transit cannot drive straight through the campus
Trauma services not impeded by transit congestion within Superblock campus zone	Walnut St commonly used as motor transit route; blocking the road would force that traffic congestion onto traffic routing path
Encourage positive behavioral health	Existing traffic congestion added to motor transit routing streets
Reduction of heat islands within Superblock	Community resistance
Increase green space within Center City	Negotiations with City Council, local PD and Transportation Authority
Promote social engagement of residents within Superblock campus zone	Handicap visitors cannot directly access campus buildings
Reduction of psychosocial disorders within campus Superblock for students and patients	Inequitable community engagement and outreach before implementation
Loss of weight from community residents	Increase air pollution for surrounding streets
Increase of life satisfaction/happiness reported among community	Potential trigger for gentrification and resident displacement
Enhance "sense of place" and community identity	
Reduction of crime rates and KIS accidents	
Increase land and real estate property values	
Improve urban microclimates	

SOCIAL HEALTH INDICATORS	QUANTITATIVE MEASURES	IMPLEMENTATION STRATEGIES
Traffic congestion	- Congestion delays - Commute time - Urban gridlock	- Remove traffic from selected streets - Route thoroughfare around campus core - Change direction of 1-way vehicular transit between 8th and 11th St
Behavioral Health	- Reduction of sick days - Increase life expectancy - Increase cycling or walking as main transit method - Reduction of air pollution due to motor transit - Increase recovery speed of Jefferson patients	- Block transit from roads to promote community engagement with streetscape - Promote pedestrian transit by limiting vehicular access
Recreational Use of Road/Paved Surfaces	- Level of social engagement with affected streets - Removal of transit provides opportunity for street to become an extension of the sidewalk	- Block transit from roads to promote community engagement with streetscape
Separation of Pedestrians and Vehicular Transit	- Physical or visual barriers between pedestrian and vehicular transit	- Permanent barriers blocking vehicular traffic access to affected roads - Temporary barriers blocking vehicular access to affected roads during specified times
Pedestrian Access	- Pedestrian-friendly infrastructure connecting major zones within Philadelphia	- Ground floor for commercial and mixed-use buildings restricted for community resources and retail
Places to Stop/Rest	- Increase availability of places to stop/rest	- Allow local businesses to buy the curb space in front of their building for use as outdoor seating
Accidents between Vehicles and Pedestrians	- Elimination of KIS accidents	- Remove traffic from selected streets
Road Trauma	- Elimination of accidents between pedestrians and vehicles	- Remove traffic from selected streets
Trauma Transit Routes	- Streamline trauma transit routes - Cost to buy/lease curb space for designated ambulatory routes - Amount of time taken to travel the road in an ambulance with vs without designated lane	- Designated ambulance lane - Fines for vehicles blocking the lane - Connect hospitals to major transit routes via designated ambulance lanes
Psychosocial Disorders	- Reduction of psychosocial disorders within community	- Provide spaces for social engagement
Air and Noise Pollution	- Motor-related noise pollution - Air pollution as a result of GHG emissions	- Provide pedestrian-focused environments removing motor-related pollutions
Crime Rates	- Reduction of crime within Superblock	- Reduce "getaway" speed for potential crimes - Increase social engagement with streetscape discouraging crime
Urban Microclimates	- Temperature and humidity within Superblock microclimate	- Incorporate greenery within urban fabric
Social Engagement	- Level of social engagement with affected streets - Removal of transit provides opportunity for street to become an extension of the sidewalk	- Block transit from roads to promote community engagement with streetscape

Superblock Proposal Vignettes

Ambulance Lanes: Connecting hospitals to major transit routes through designated ambulance lanes

Walnut Theatre Plaza



Walnut Towers Pocket Park

Street Parks: Pedestrian engaged streetscape

Like many major cities, Philadelphia is already experiencing the effects of climate change. Some of the impacts that the city is experiencing include:

- Rising temperatures: Philadelphia is experiencing hotter summers, which can lead to heat-related illnesses and deaths, as well as increased demand for energy to power air conditioning systems.
- Increased rainfall: Philadelphia is also experiencing more frequent and intense rainfall events, which can cause flooding and damage to infrastructure and homes.
- Sea level rise: As a coastal city, Philadelphia is at risk from sea level rise, which can cause flooding and erosion along the Delaware River and its tributaries.
- Air quality: Climate change can worsen air quality by increasing the concentration of pollutants in the air. This can lead to respiratory problems and other health issues for the residents of Philadelphia.

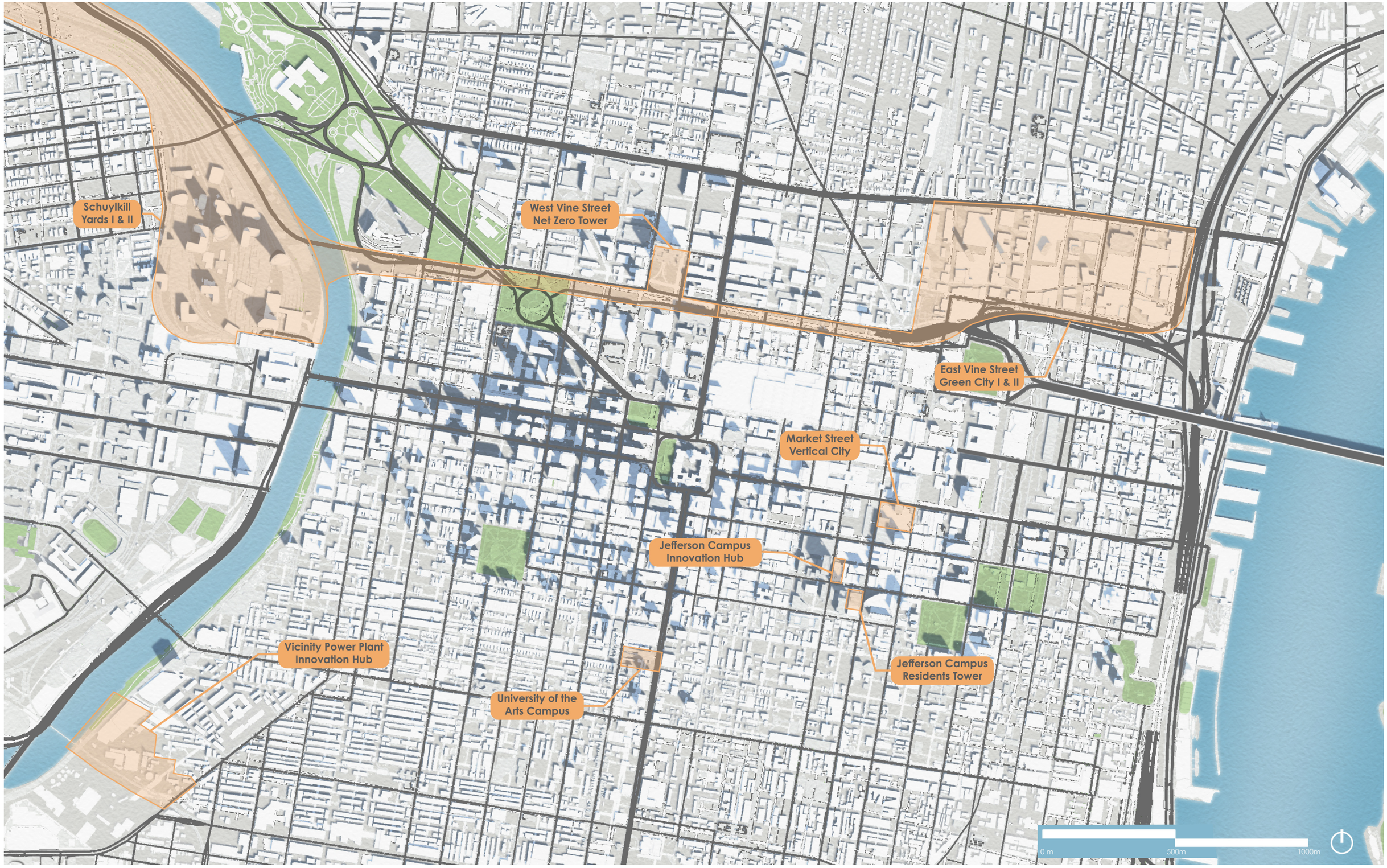
To address these impacts, the city has developed a Climate Action Plan, which includes strategies to reduce greenhouse gas emissions, increase energy efficiency, and promote sustainable transportation options. Additionally, Philadelphia is investing in green infrastructure projects, such as rain gardens and green roofs, to help manage stormwater and reduce the risk of flooding..

The negative effects of climate change are not limited to any specific part of Philadelphia but are felt citywide. However, some neighborhoods and communities may be more vulnerable to the impacts of climate change due to factors such as their location, infrastructure, and socioeconomic status.

For example, low-lying areas and areas near waterways may be more vulnerable to flooding and erosion caused by sea level rise and intense rainfall events. Additionally, neighborhoods with older housing stock and inadequate infrastructure may be more vulnerable to the impacts of extreme heat and poor air quality.

To address these disparities and ensure that all residents are protected from the impacts of climate change, the City of Philadelphia's Climate Action Plan includes a focus on equity and resilience planning. The plan includes strategies to prioritize investment in vulnerable communities, increase access to green space and shade, and improve emergency preparedness and response.

PHILADELPHIA
2050

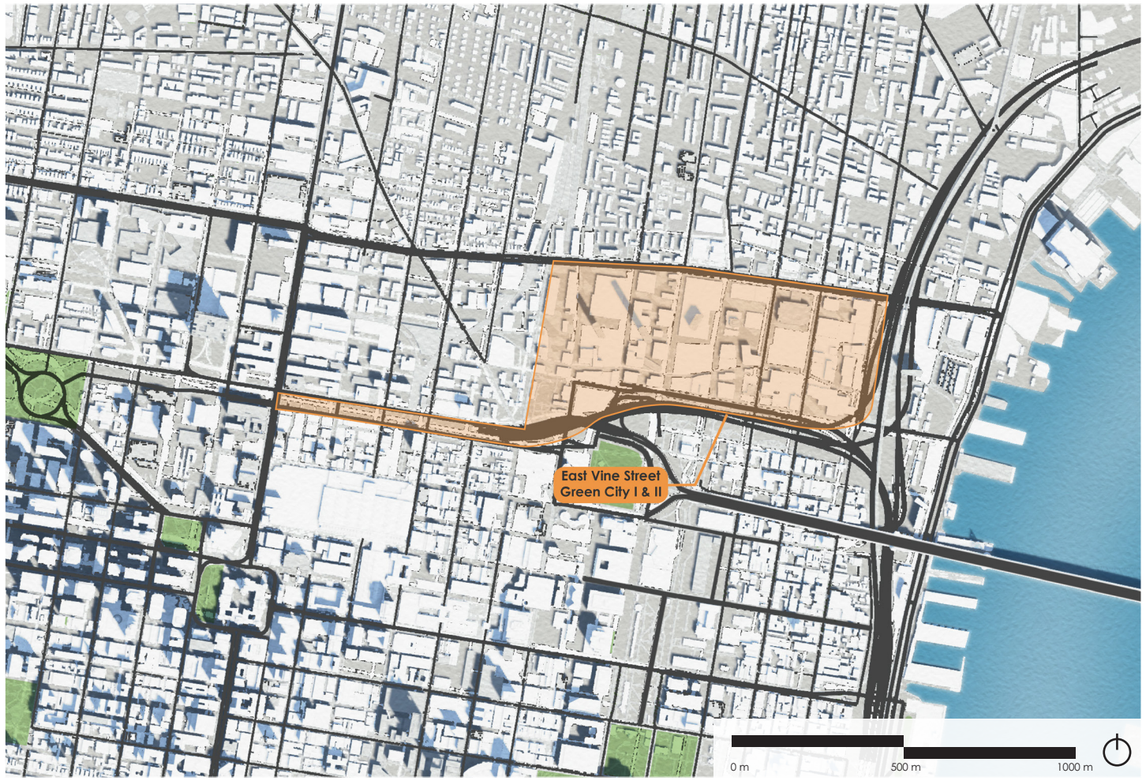

Schuylkill Yards I & II
West Vine Street Net Zero Tower
East Vine Street Green City I & II
Market Street Vertical City
Jefferson Campus Innovation Hub
Jefferson Campus Residents Tower
Vicinity Power Plant Innovation Hub
University of the Arts Campus
0 m
500m
1000m

East Vine Development
Vine Street - East

Francesco Rizzi, Ben Hoffman

This project involves the arrangement and design of buildings, public spaces, transport systems, services, and amenities. Our process gave form, shape, and character to groups of buildings in the new East Vine Street neighborhood, an area marred by parking lots and industrial sites. As designers it is our responsibility to create smart and healthy cities that combat issues that are present across this site, such as heat island effect and storm-water management.

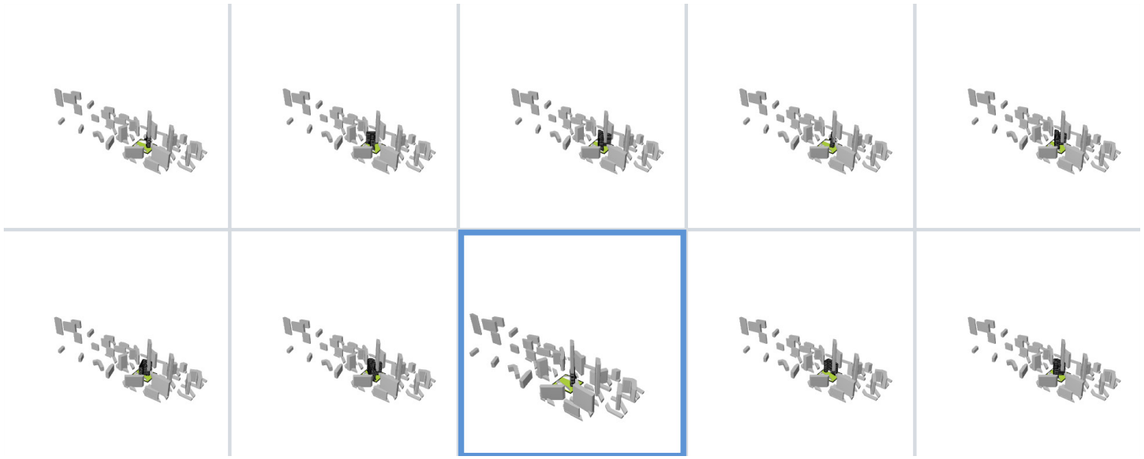
In a development of this scale it is impossible to control the design of every building. By using generative software and the implementation of strict parameters we can create a "menu" that designers can follow so each building has a hint of the same characteristics allowing for a more cohesive development.



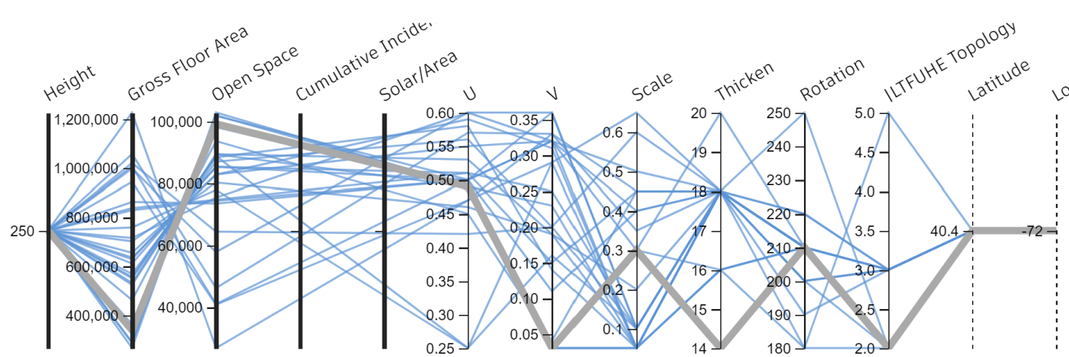
Urban development plan

The street grid is continued across the site and establishes hierarchy. Vertical streets are for primary vehicular traffic, horizontal streets are for pedestrians but can also handle vehicle traffic, and diagonal streets are pedestrian only. The street grid also frames three super blocks, with the two end blocks being higher density areas.

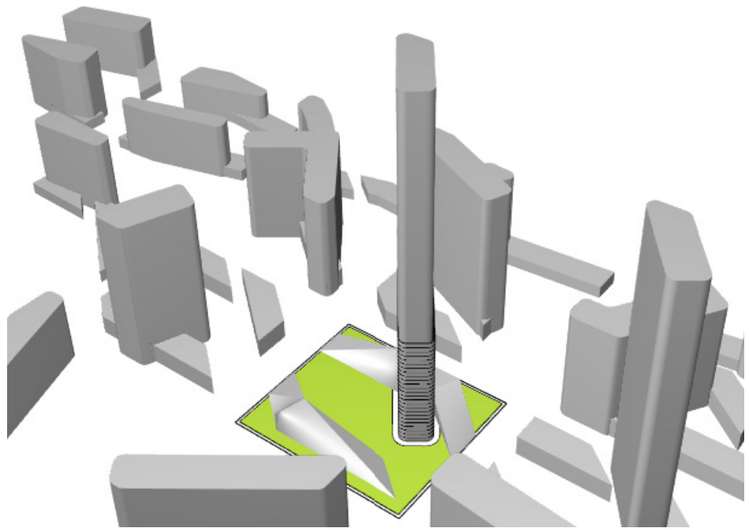
The capped expressway provides an extension for adjacent Franklin Square, and improves connection to the Delaware River Waterfront. The green spaces are designed to flood to alleviate the strain on the city's storm water infrastructure.



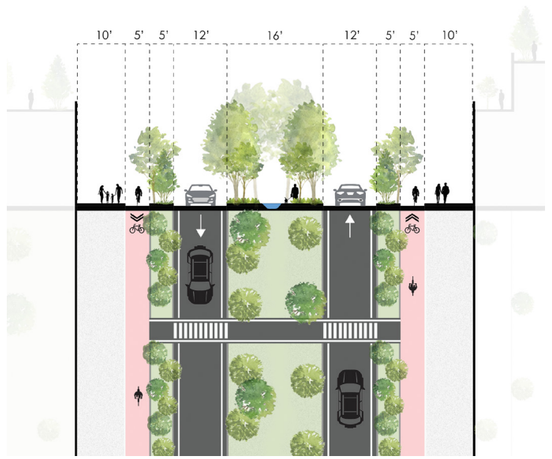
Generate Outcomes
Specify parameters and number of iterations to generate outcomes for random or optimized massing.



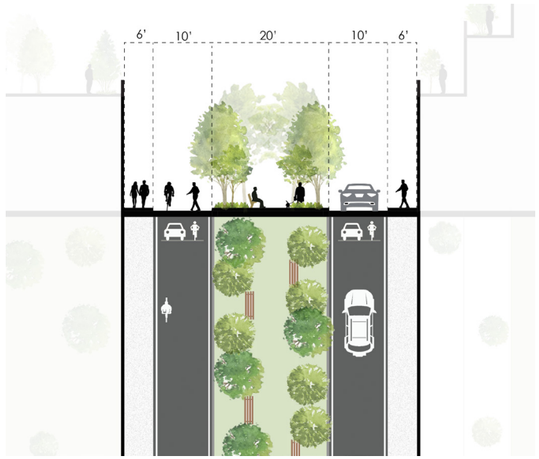
Evaluate
Choose massing that fits desired criteria - Maximum Open Space, Cumulative Incident Solar and Solar/ Area.



Populate Massing
Massing that maximizes open space and solar gain are generated across the site.

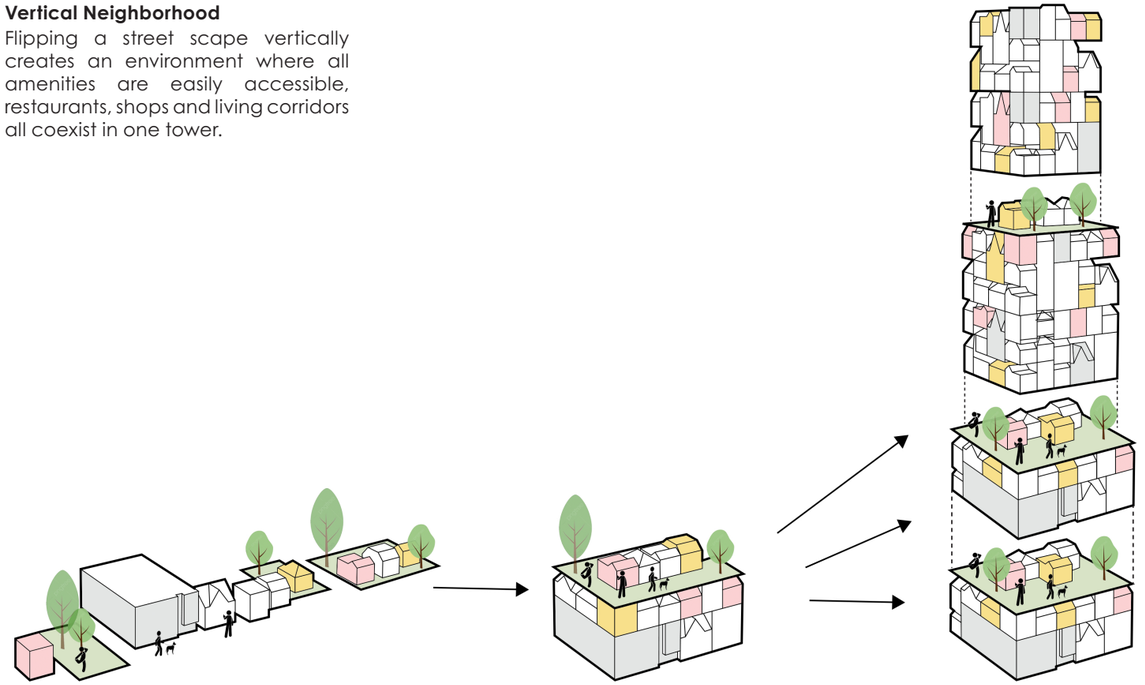


Proposed Street Section- Main Circulation
(Vertical Streets)

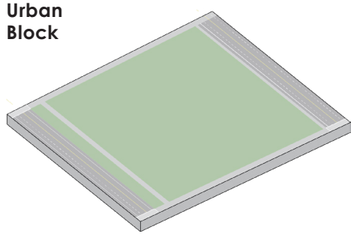


Proposed Street Section- Secondary Circulation
(Horizontal Streets)

Vertical Neighborhood
Flipping a street scape vertically creates an environment where all amenities are easily accessible, restaurants, shops and living corridors all coexist in one tower.

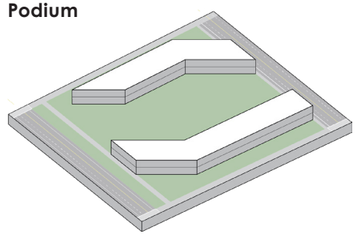


Urban Block



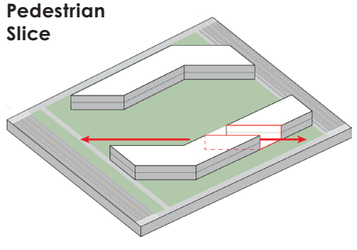
A typical layout/boundaries of a proposed block.

Podium



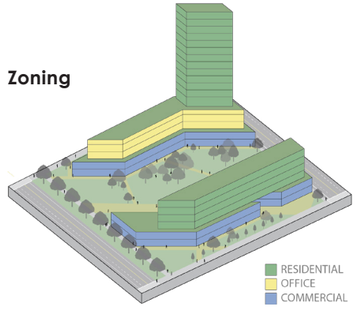
Shaped podiums provide a base for additional structure.

Pedestrian Slice



Voids slice through podiums to allow for pedestrian travel.

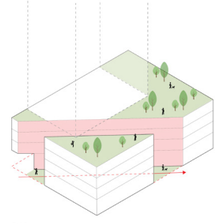
Zoning



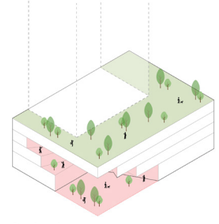
Uses are stacked to provide equitable access to housing and amenities.

Podium

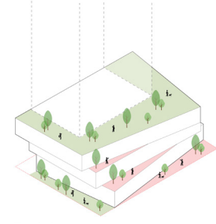
The podium of the large towers that will dominate this urban plan are important. They are the spaces that will provide access to the tower, will determine how pedestrians feel on the site, and how they will interact with the site.



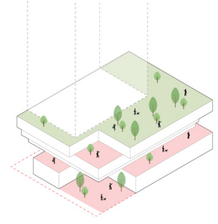
Slice



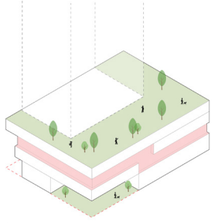
Spiral



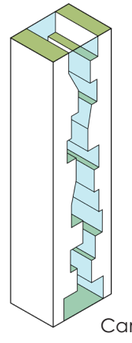
Twist



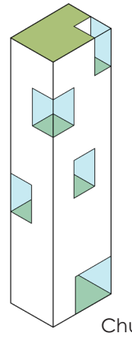
Shift



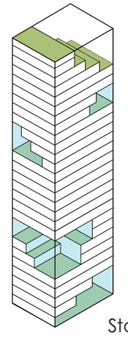
Layers



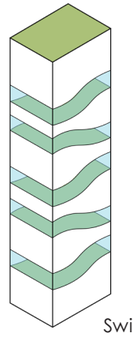
Carved



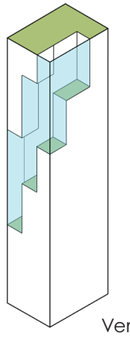
Chunk



Stack

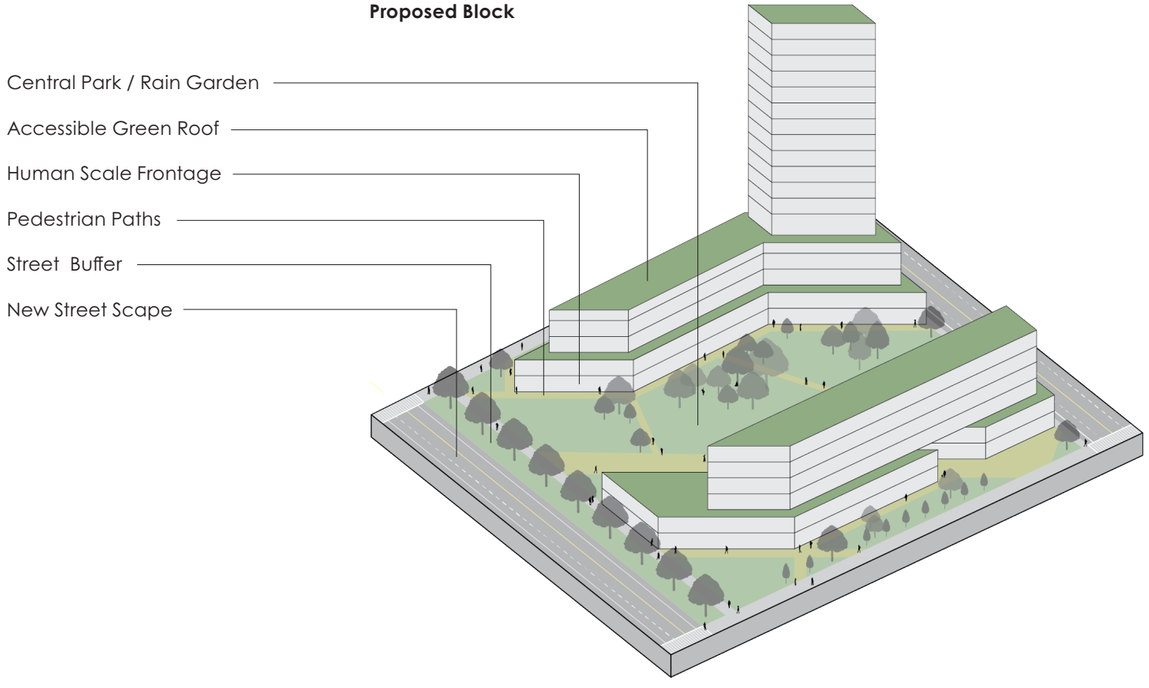


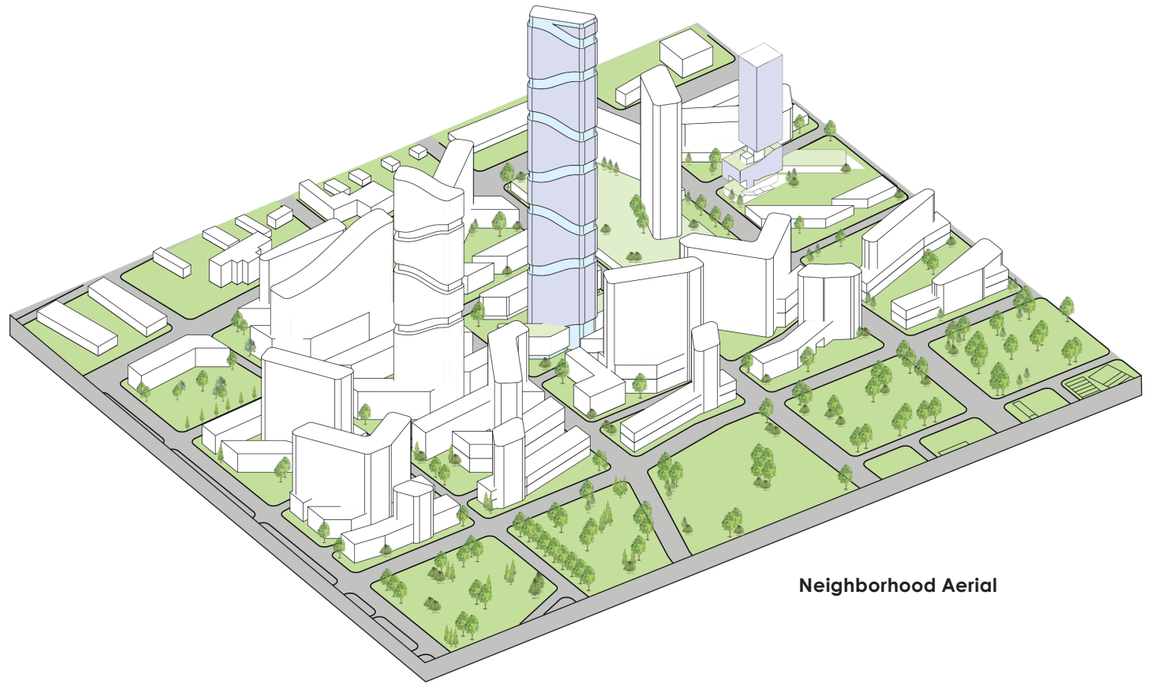
Switchback



Vertical

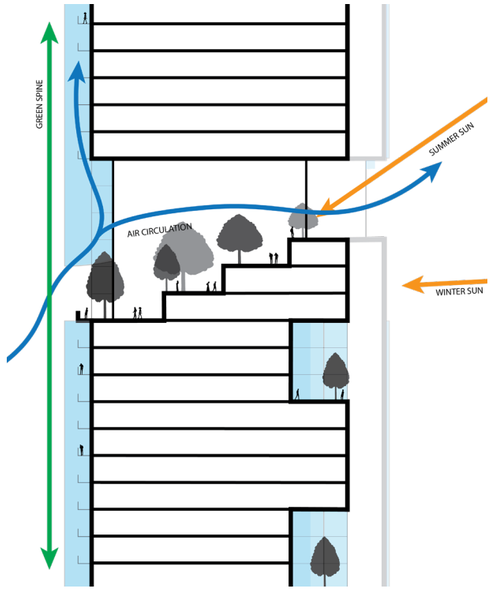
Proposed Block



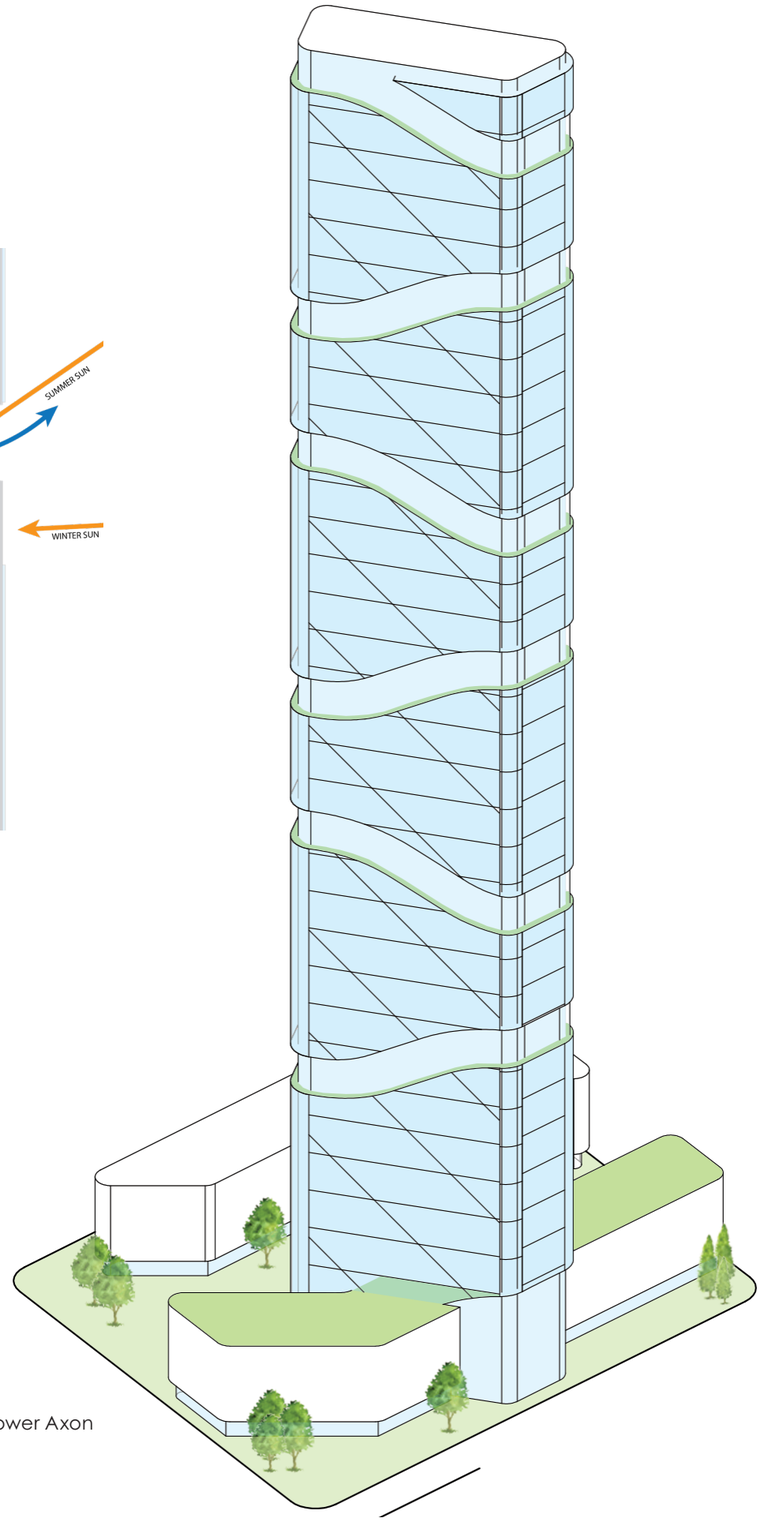


Neighborhood Aerial

High-Rise Tower



Tower Section



Tower Axon

Upper Floor Plan

Entry Floor Plan

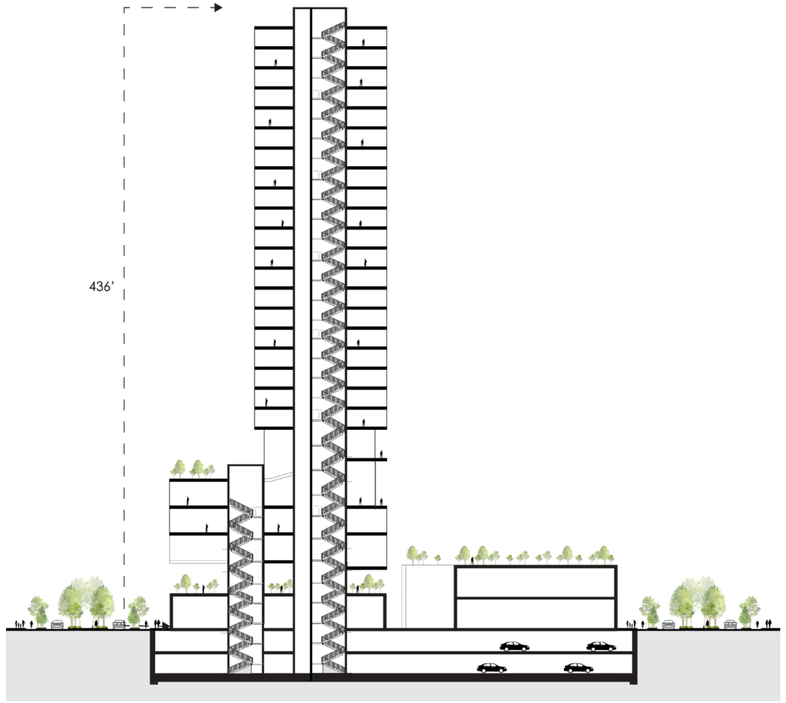
Circulation
Showing the circulation in and around this individual block shows that pedestrian modes of transportation such as biking walking etc. dominate over vehicular transportation.

Green Roofs & Plaza
It is beneficial to urban revitalization to replace the area the buildings footprint takes up somewhere on the form of the building. Giving added square footage to the and green space to the site. Adding other types of recreation allows the site to be active other than just allowing circulation.

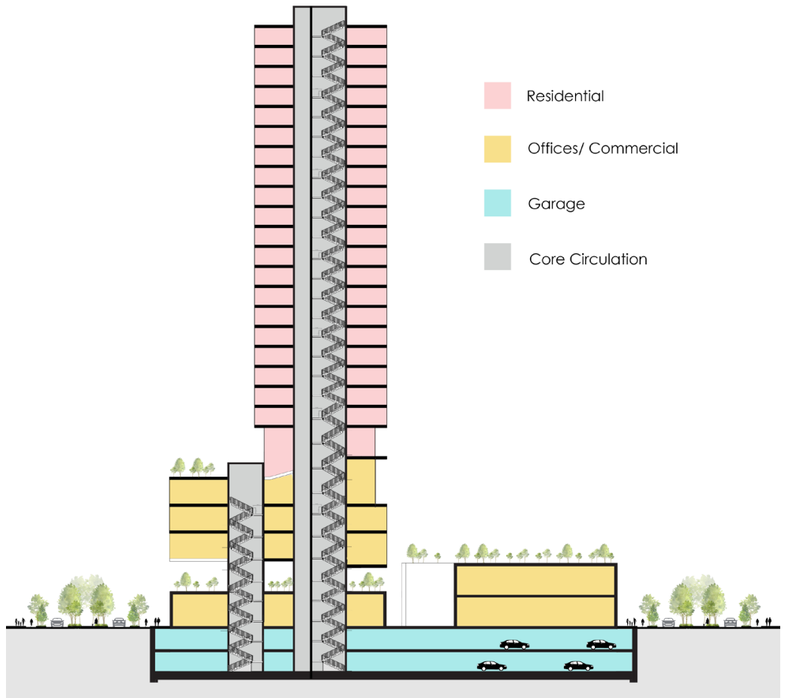
Vegetation
Vegetation on the sight allows for a more comfortable space. Today there are a lot of urban areas that are void of life other than humans. Adding vegetation and green spaces also cools the area preventing heat island affects.

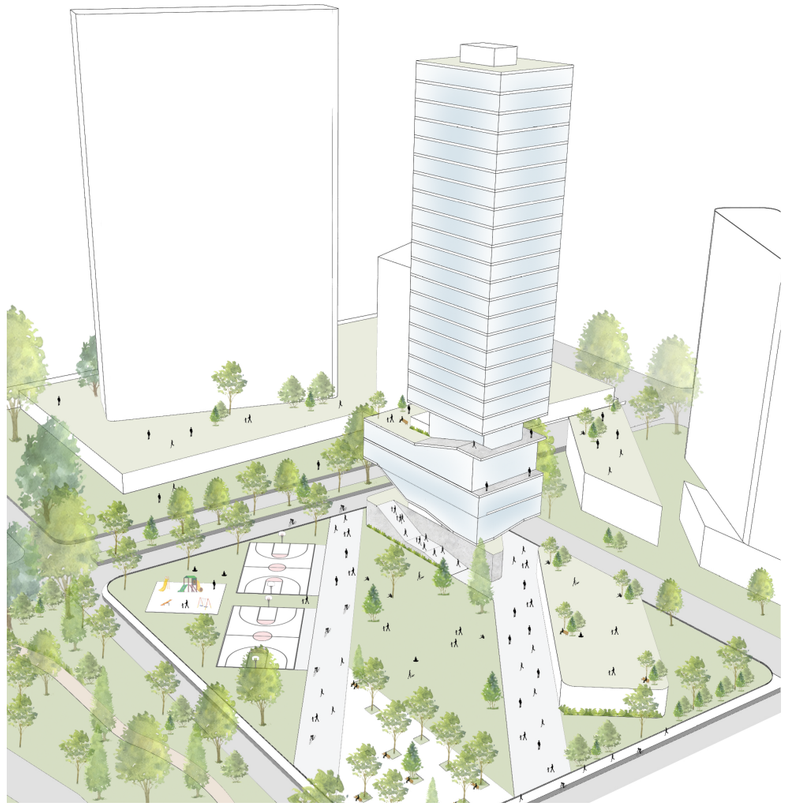
Active Sites
With the combination of everything these blocks can become very active and comfortable spaces even within an urban environment. It can bring a sense of comfortability back to the cities and allow for an escape from the fast paced environment that cities have.

Low-Rise Section

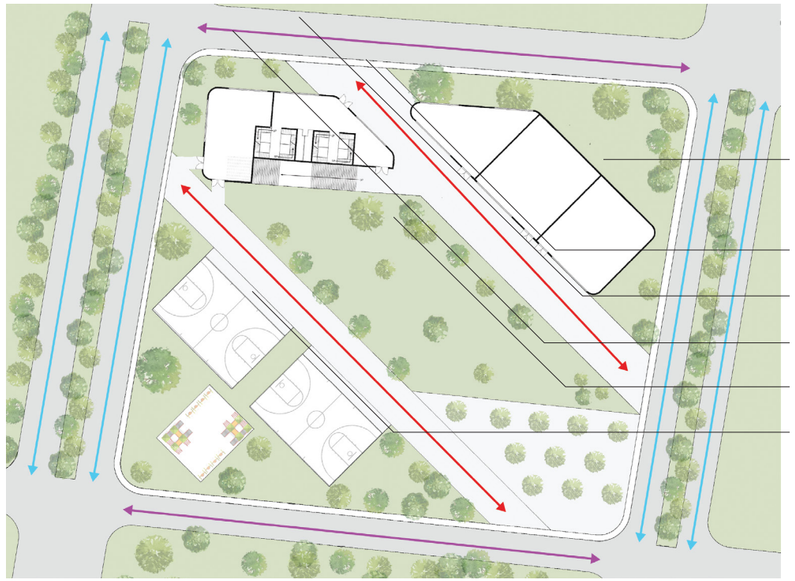


Program Breakdown





Active Site Render



Pedestrian Dominated

Car Dominated

Car/ Pedestrian Mix

Low-Rise Building
This conceptual building is apart of the Low- Rise area our site. This has a focus on the podium level and an emphasis on how to open the block to the public allowed as much green-space as possible.

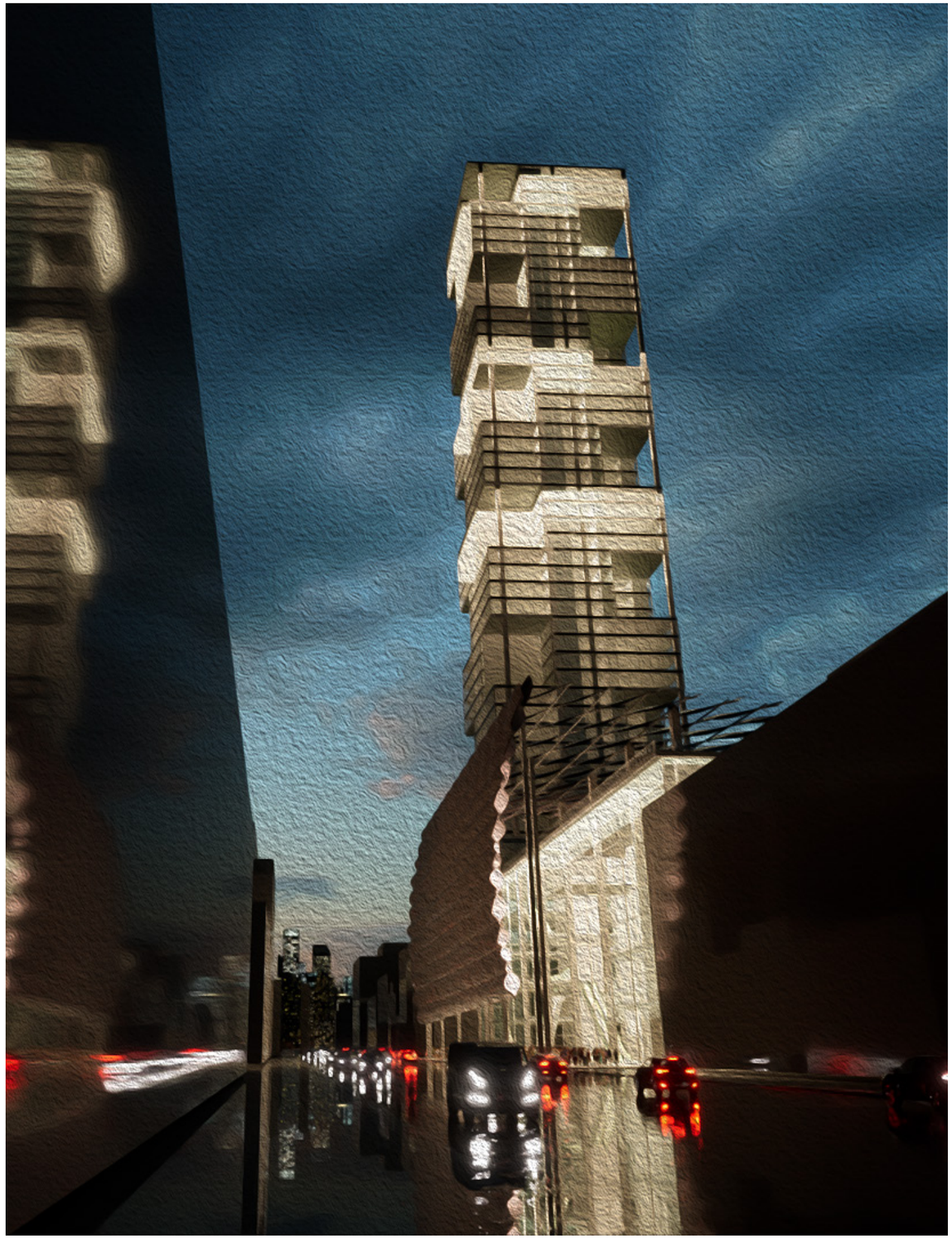
Active Sites
Our main focus with each block was to allow diagonal circulation for pedestrians to allow for more public access. This also allowed a unique building podium form.

Market Street Vertical Village
East Philadelphia

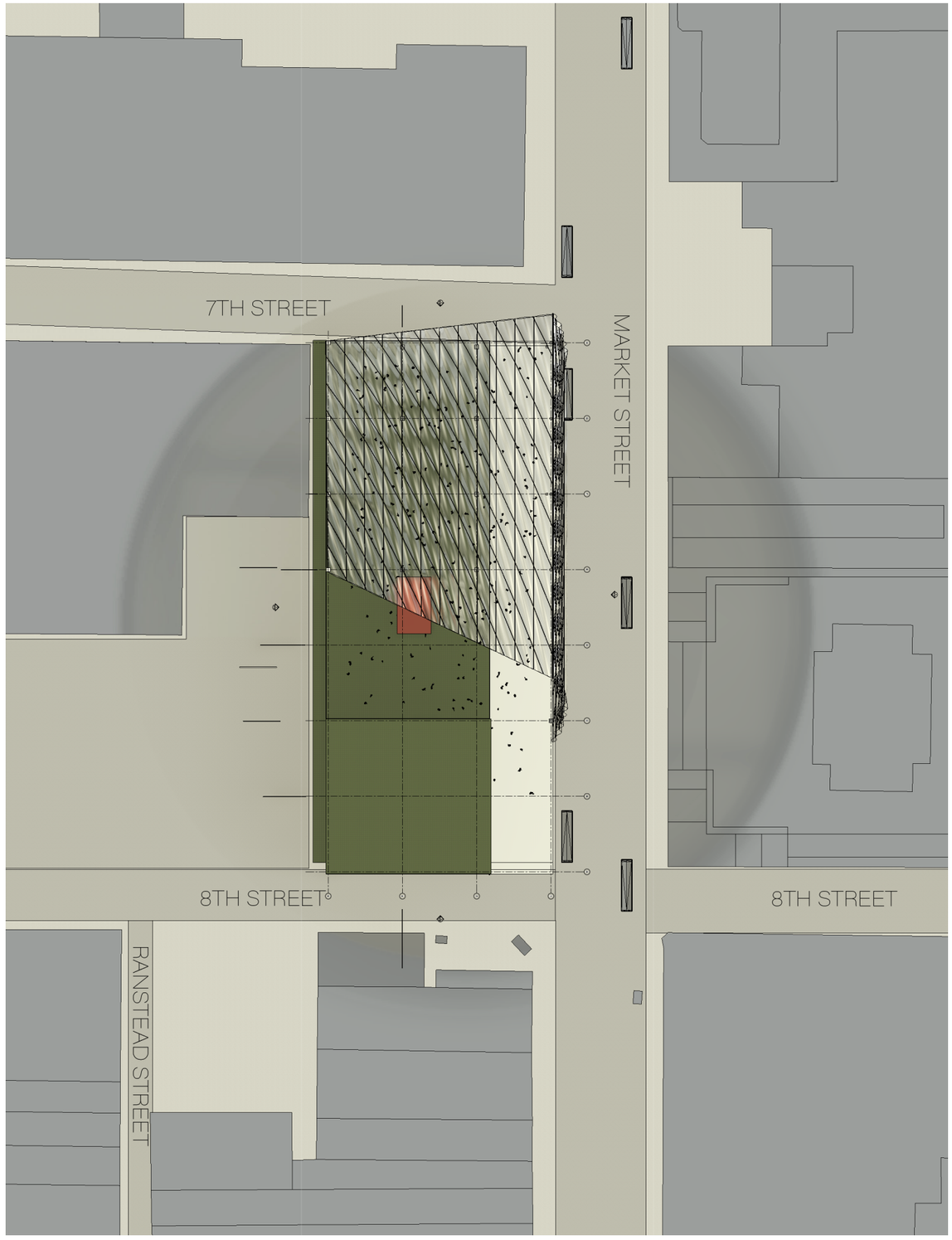
Mike Catalfano

Taking an existing parking lot that is not contributing to the fight against climate change and turning it into a Vertical Village with plenty of green space that can help reduce the Heat Island Effect on Market Street.

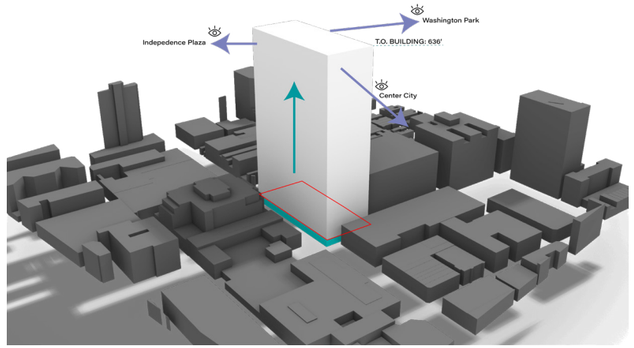
Reinvigorate the city by taking influence from the surrounding green spaces and bringing them through the city. Implementation of passive technologies and active technologies to help mitigate the heat island effect and come to a net zero carbon emission.



Night Render

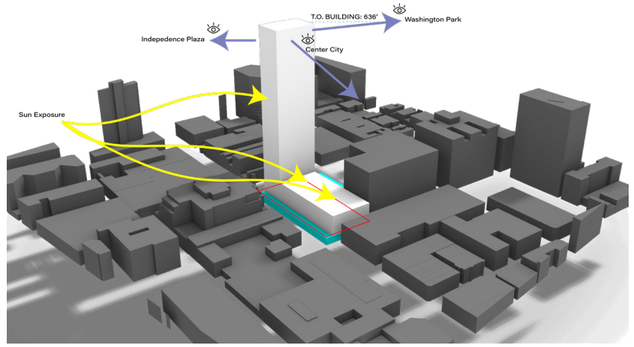


Site plan showing surrounding streets



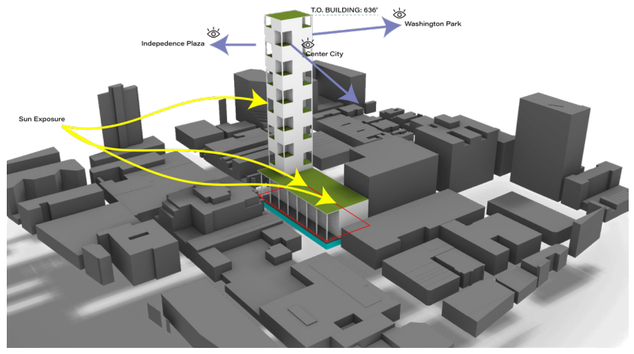
Building Volume

Extruded total area of site up to 636' to stay relative to surrounding context.



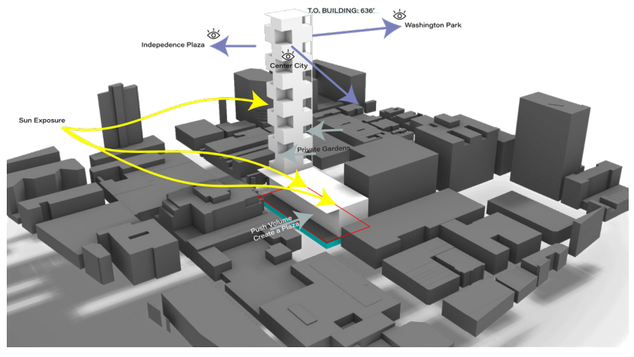
Cutting Volumes

Splitting based on sun exposure and giving the residential tower views.



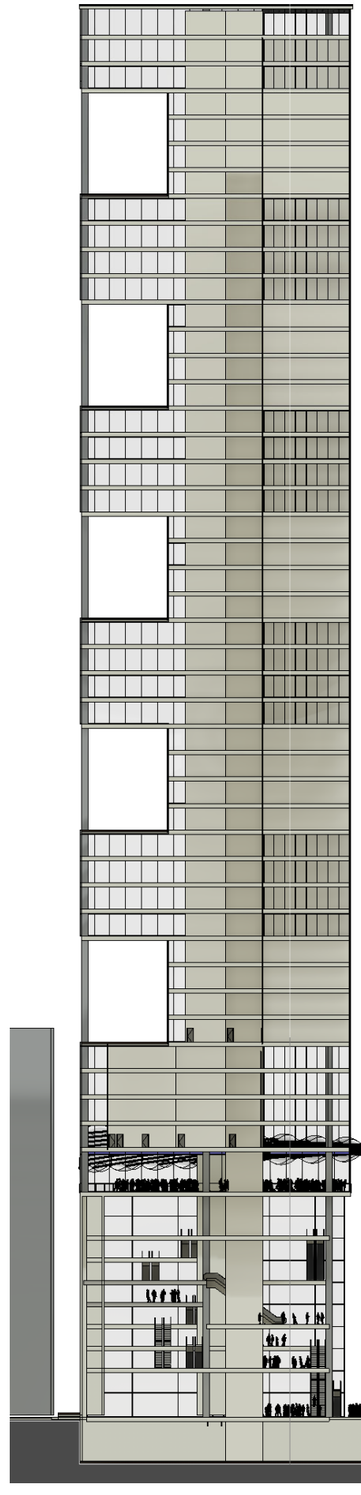
Final Form

Showing the green spaces how they are linked to the views i want to capture.



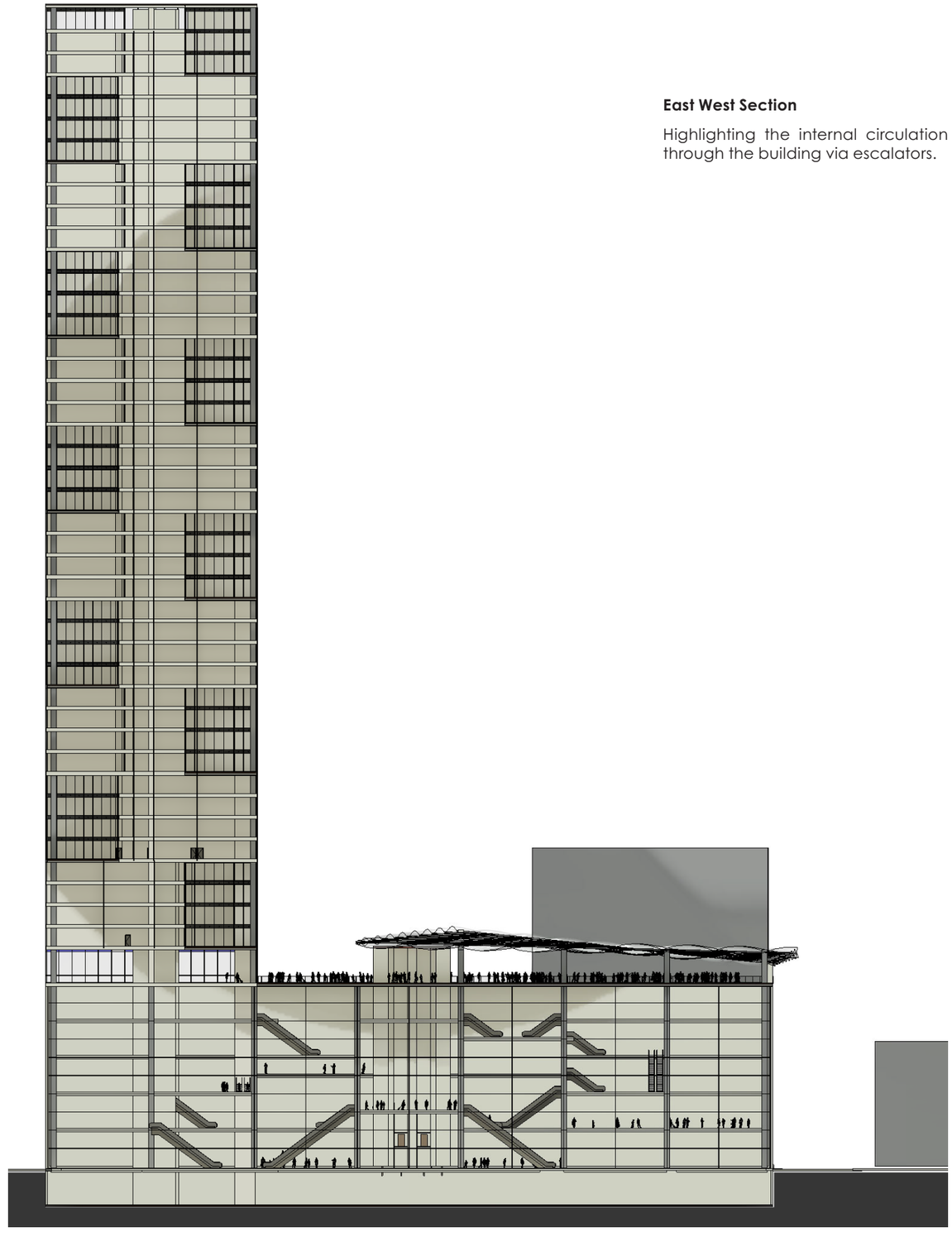
Subtracting Volumes

Subtracting gardens in residential tower. Subtract from the podium to create a plaza from market street.



North South Section

Main cut through the residential tower and showing the separation between that and the podium along with highlighting the plaza on market.

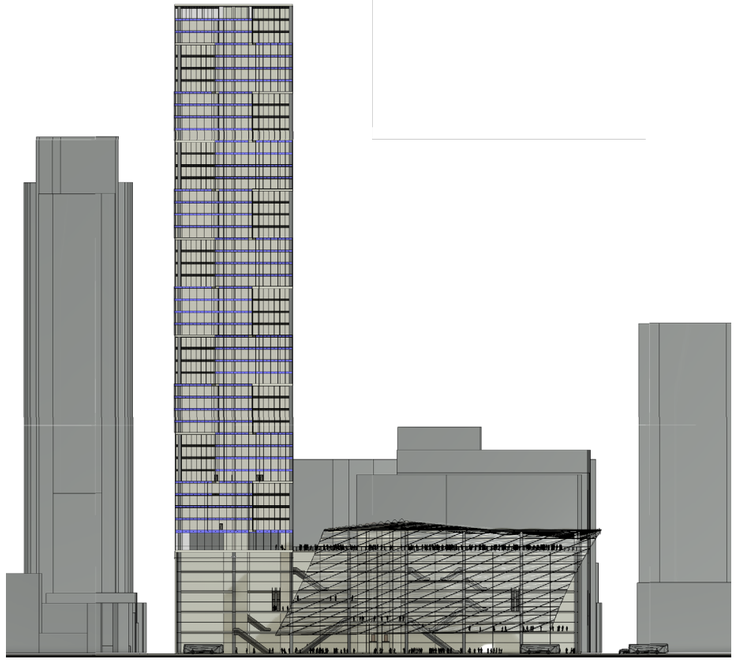


East West Section

Highlighting the internal circulation through the building via escalators.

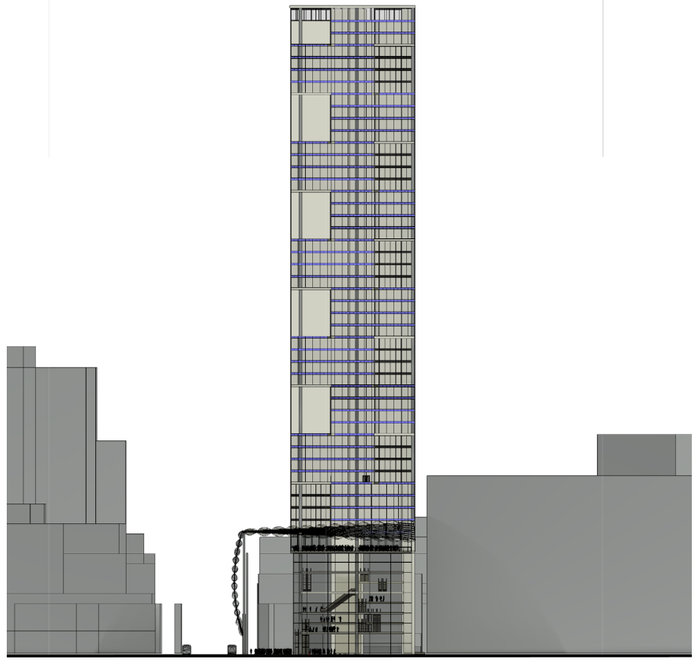
North Elevation

Showing surrounding context and surrounding heights.



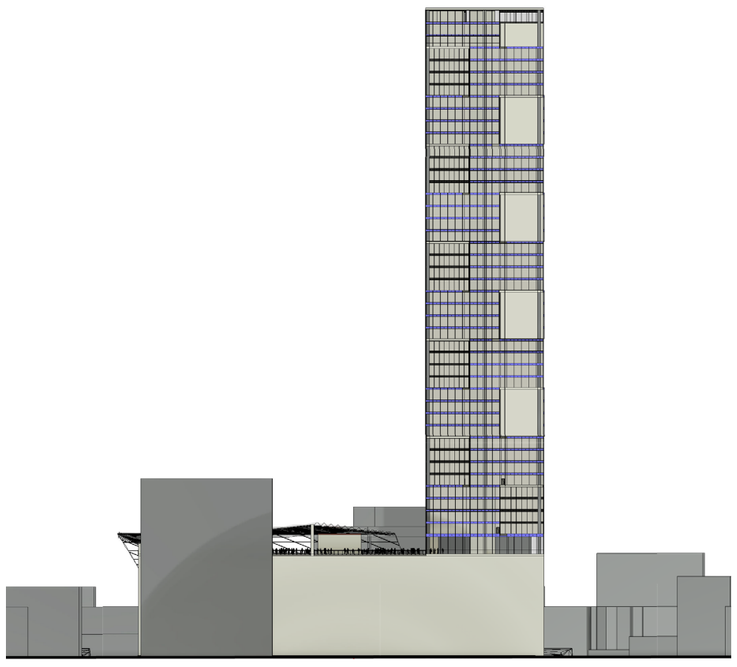
West Elevation

Showing etfe shroud and surrounding context.



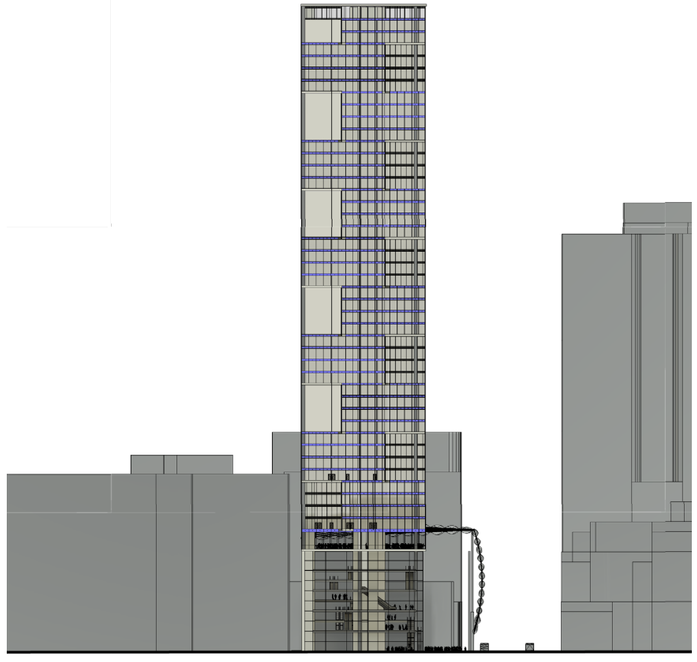
South Elevation

Showing surrounding context looking up 7th and 8th street.



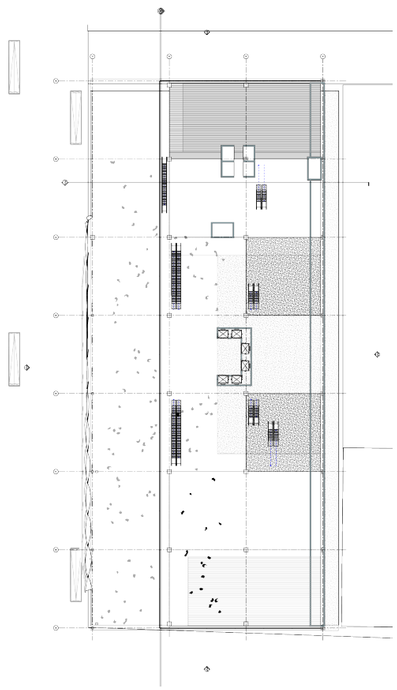
East Elevation

Showing residential facade and interaction between podium and residential tower facade.



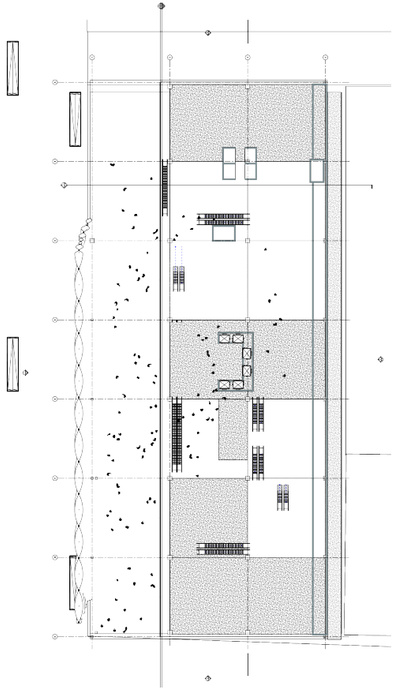
Level 1 Multi use podium space

Level 2 Multi use podium space

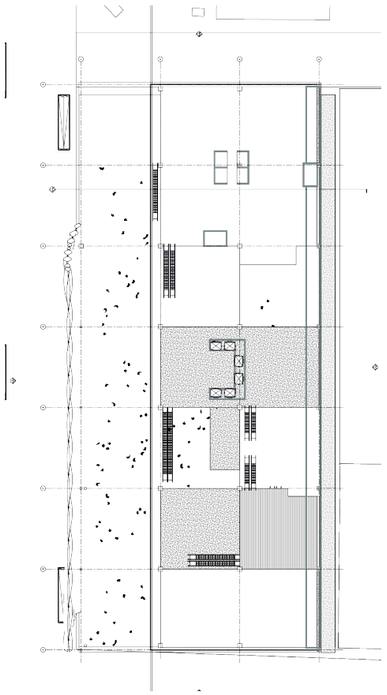


Level 3 Multi use podium space

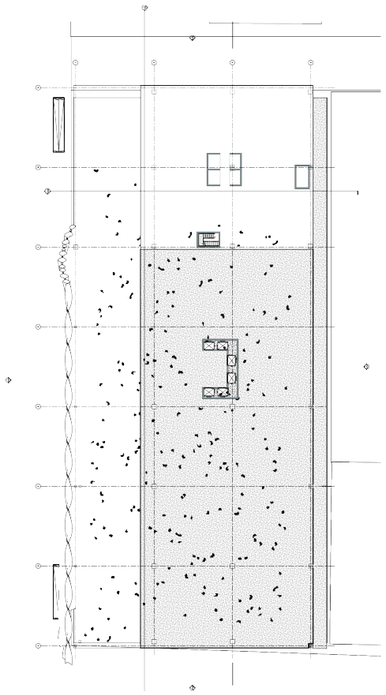
Level 4 Multi use podium space



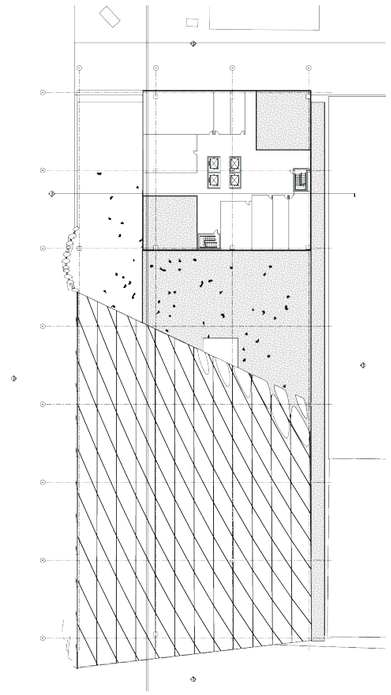
Level 5 Multi use podium space



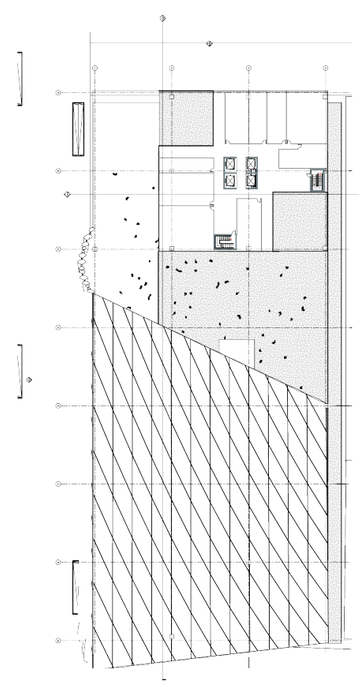
Level 6 Flex space to roof garden



Level 7 NW & SE garden layout



Level 11 NE & SW garden layout



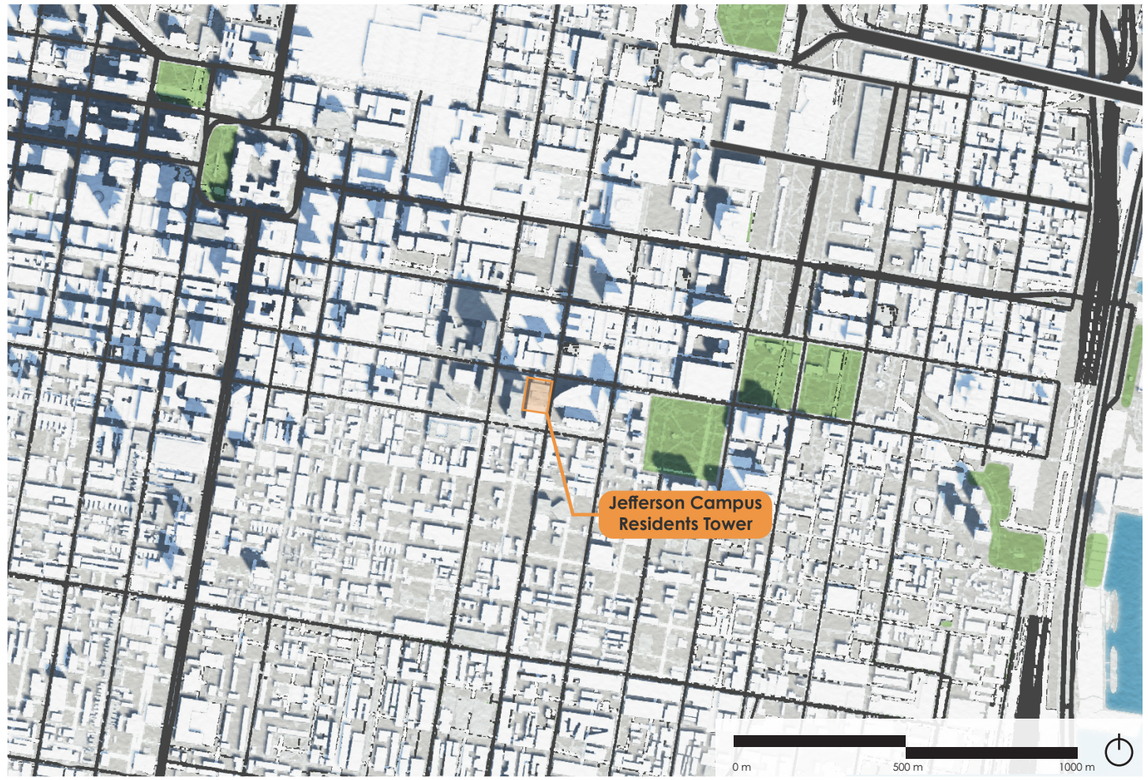
Day Render

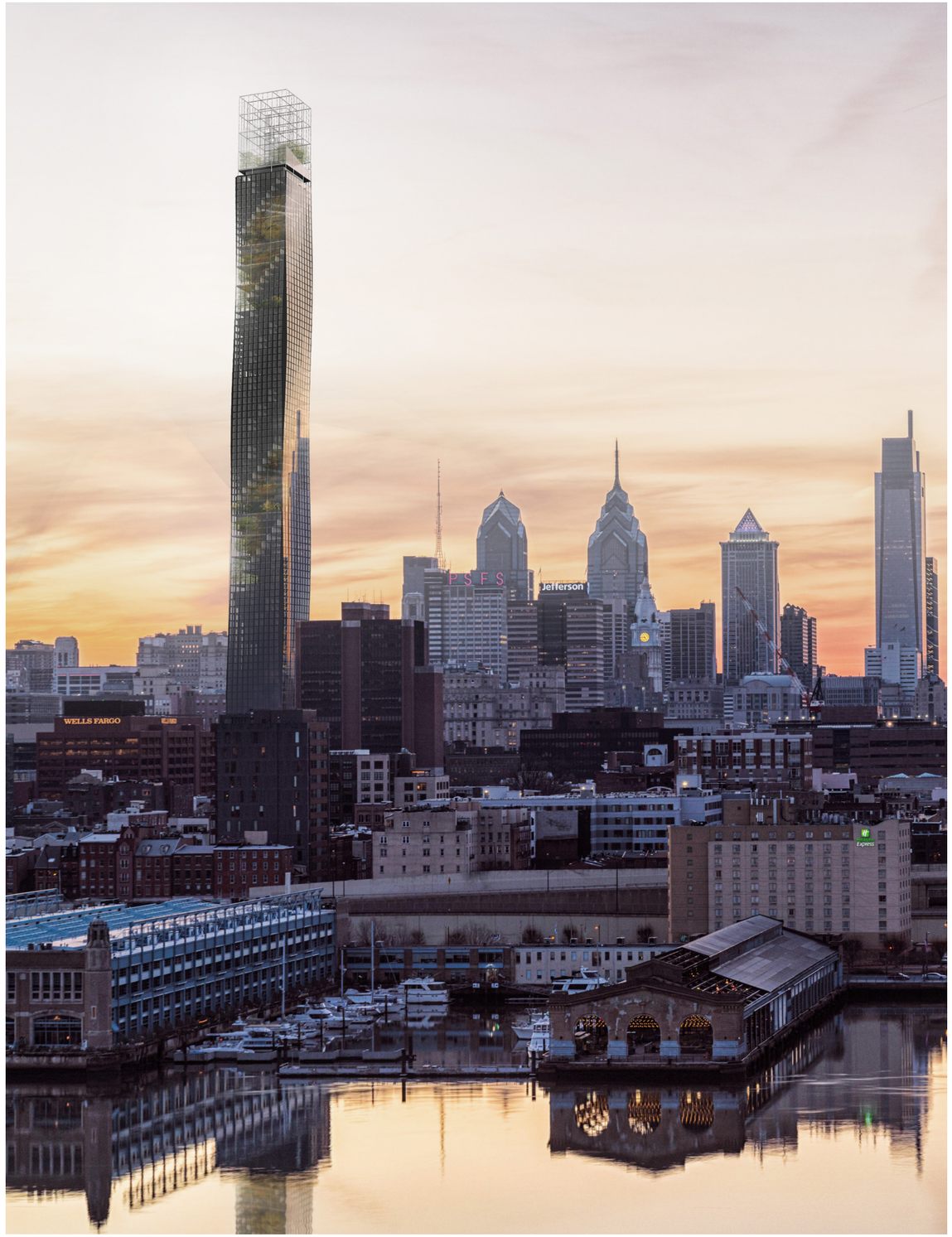
Campus Residents Tower
Thomas Jefferson University - Center City

Joseph Sauers

The vision for the Campus Residents Tower is to connect the Jefferson community and subtract from the cities pollution totals. The project will house essential workers, students, and the elderly in it's goal to become a beacon for the future of Philadelphia living and movement. Neighborhood 8 will stand as the cornerstone of the new Green Spine urban concept. The Green Spine will be a the series of corridors amongst the urban grid to promote pedestrian movement and a green footprint.

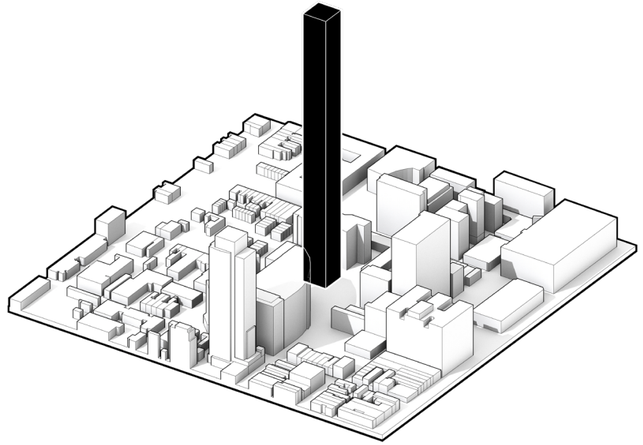
The mission is to get funding and support from Thomas Jefferson University to begin construction of the tower and the redesign of the urban grid. The purpose of the project is to generate revenue for the University whilst also providing needed housing for the expansion of the Universities campus and hospital.



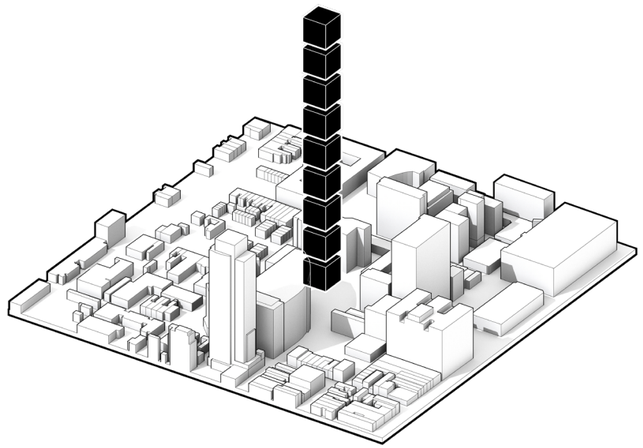


Evening rendering from the Ben Franklin Bridge looking towards Center City Philadelphia

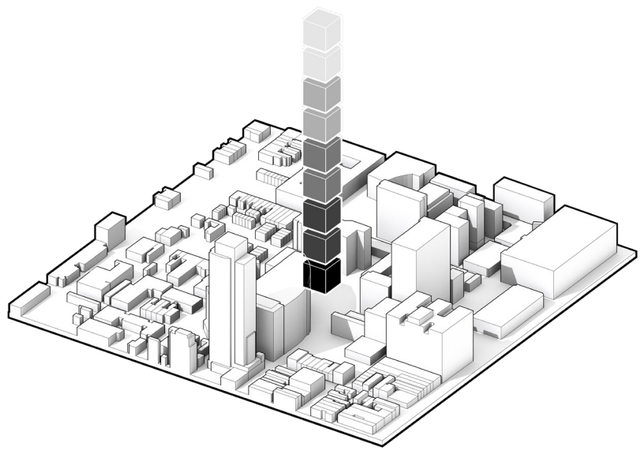
Extrusion
Vertical extrusion of the site's small footprint.



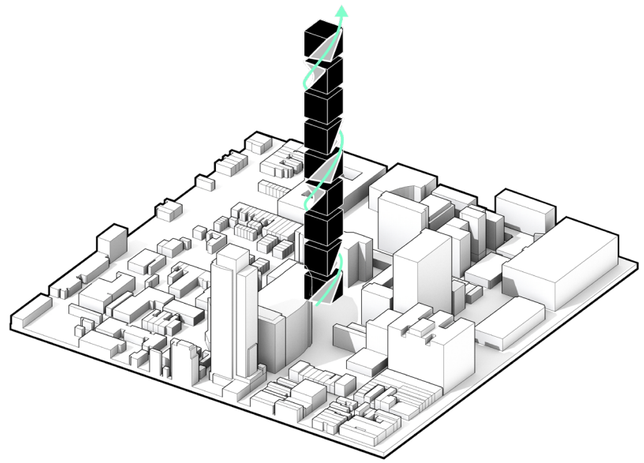
Divide
Dividing the extrusion into modular sections.



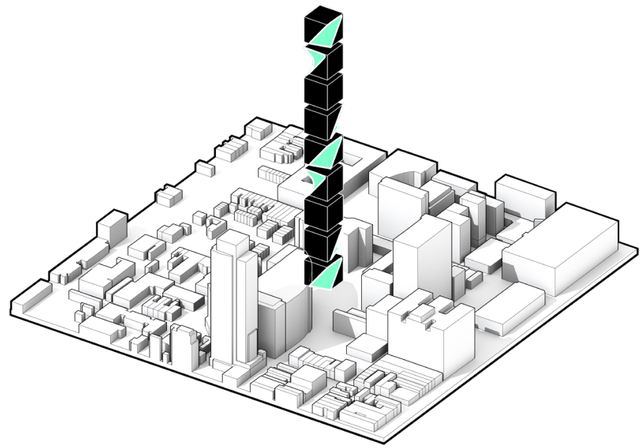
Program
Designating specific residential programs to the modular sections.



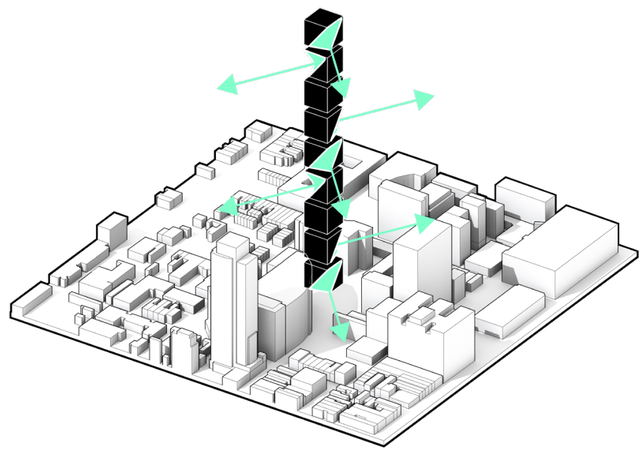
Twist
Subtracting a vertical twist around the building.



Foliate
Creating community winter gardens into the negative space of the twist connecting the Jefferson's green spine at street level.

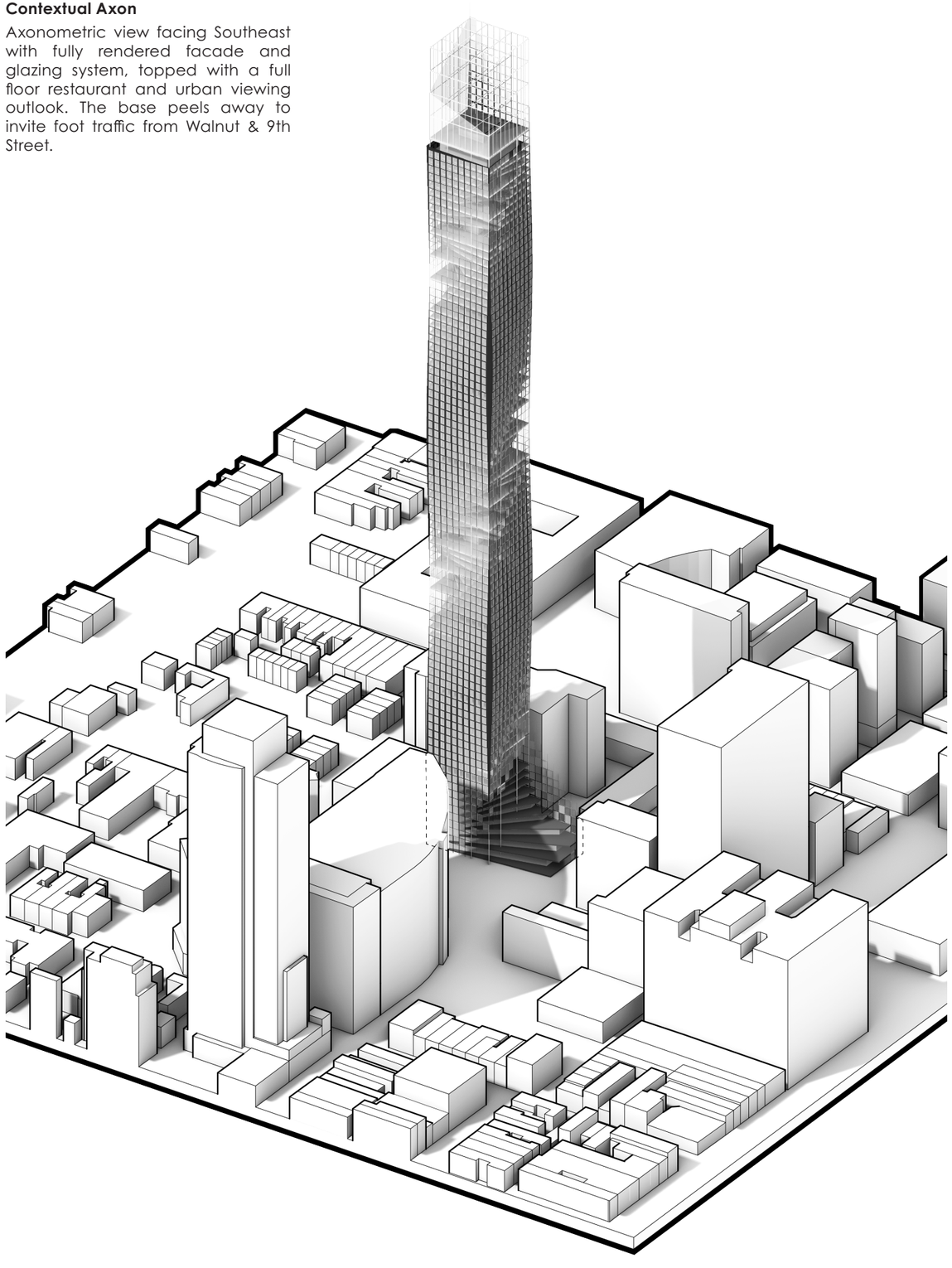


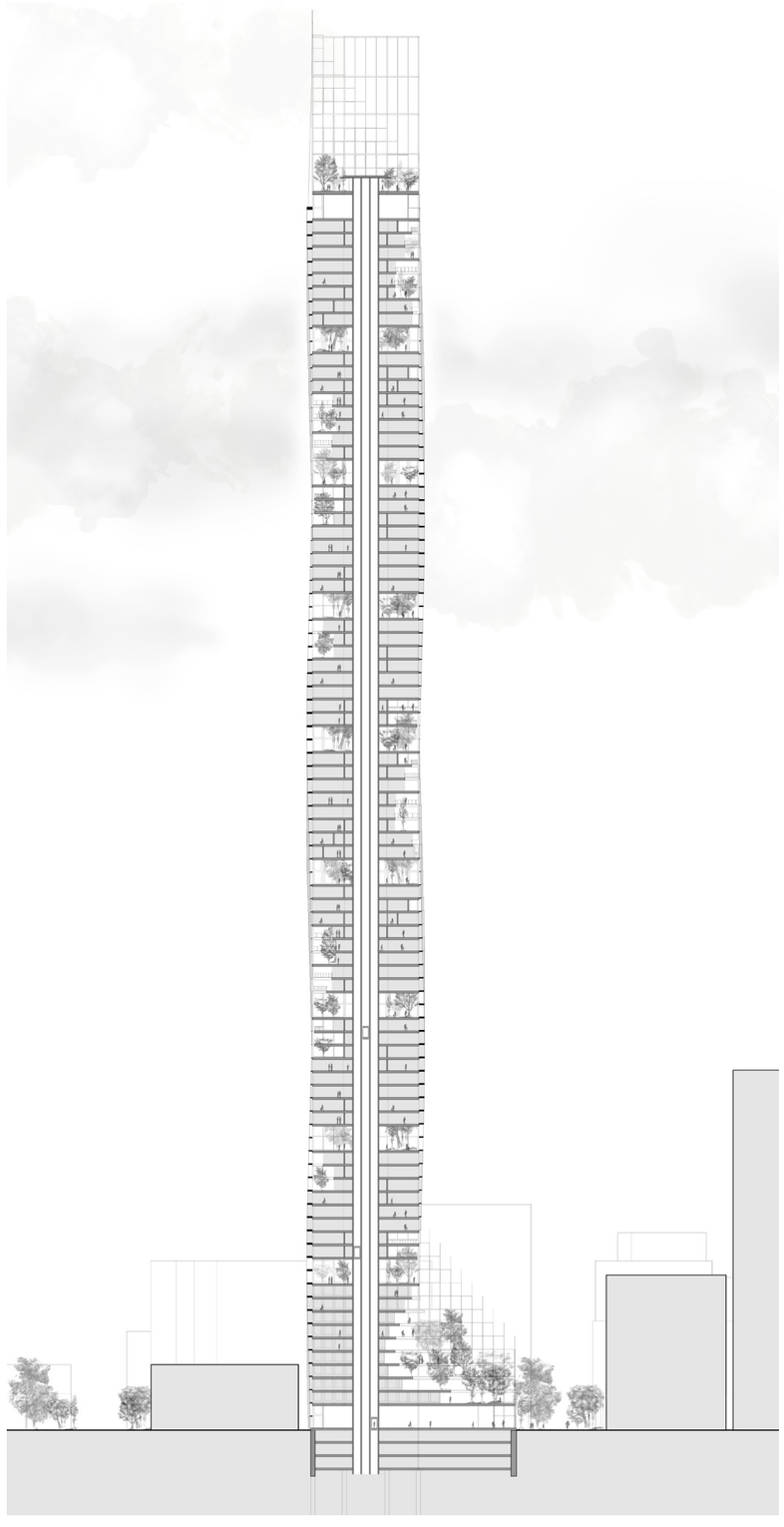
Views
Locating views of Philadelphia created by the community winter gardens.



Contextual Axon

Axonometric view facing Southeast with fully rendered facade and glazing system, topped with a full floor restaurant and urban viewing outlook. The base peels away to invite foot traffic from Walnut & 9th Street.

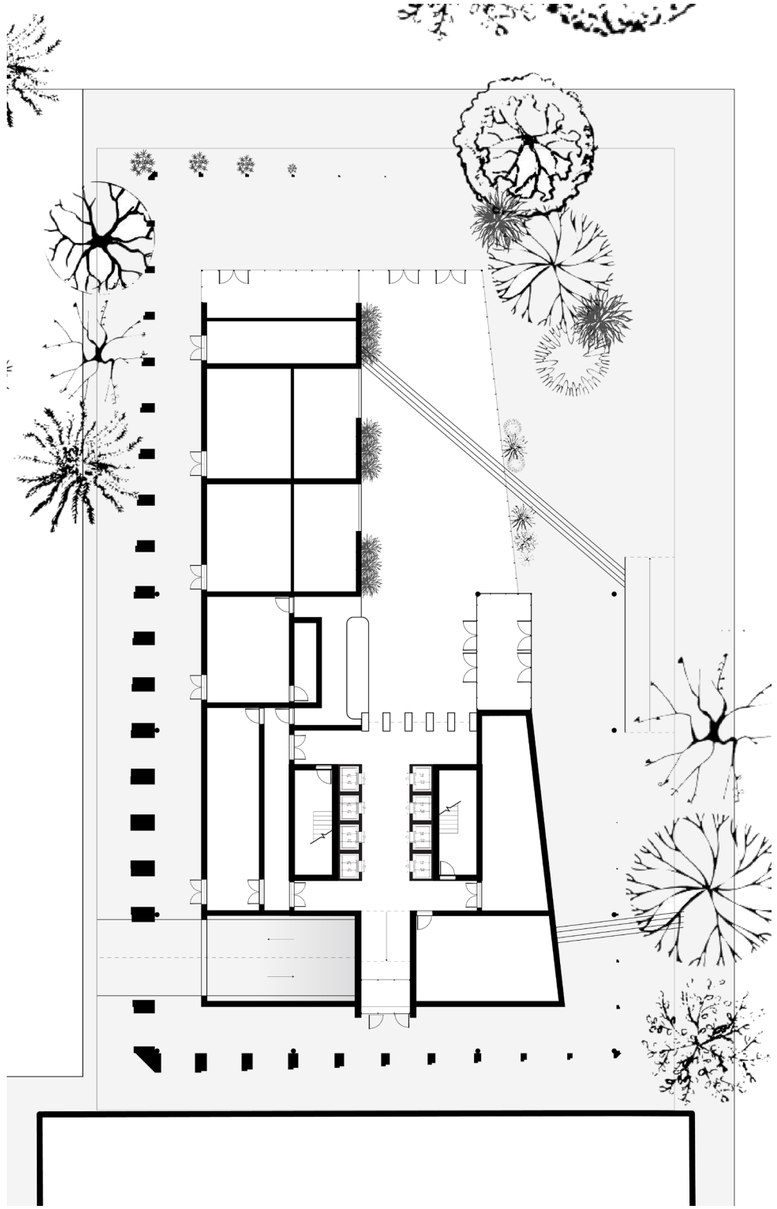




Longitudinal Section

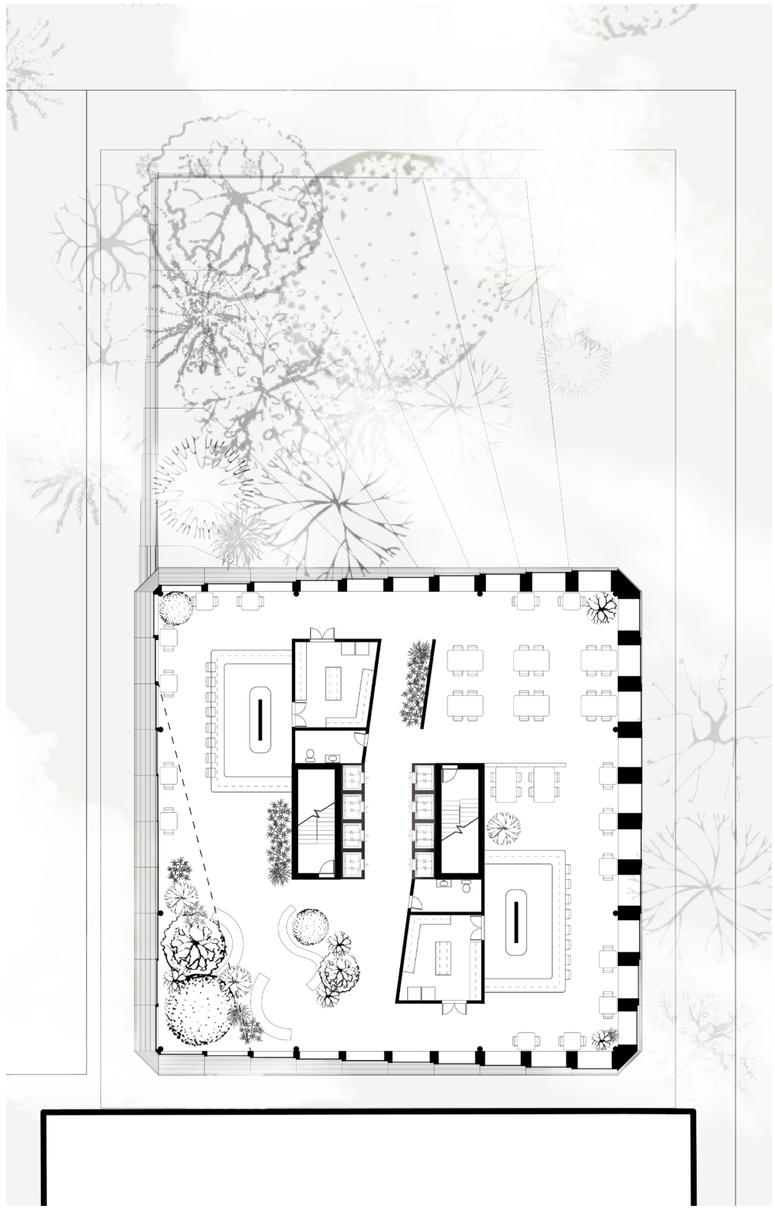
Full building section cutting from North to South through The Thomas Jefferson University Green Spine on Walnut Street. The eight neighborhoods are connected by the core and the two-story sky lobbies.

Evening rendering of the parametric facade and winter gardens



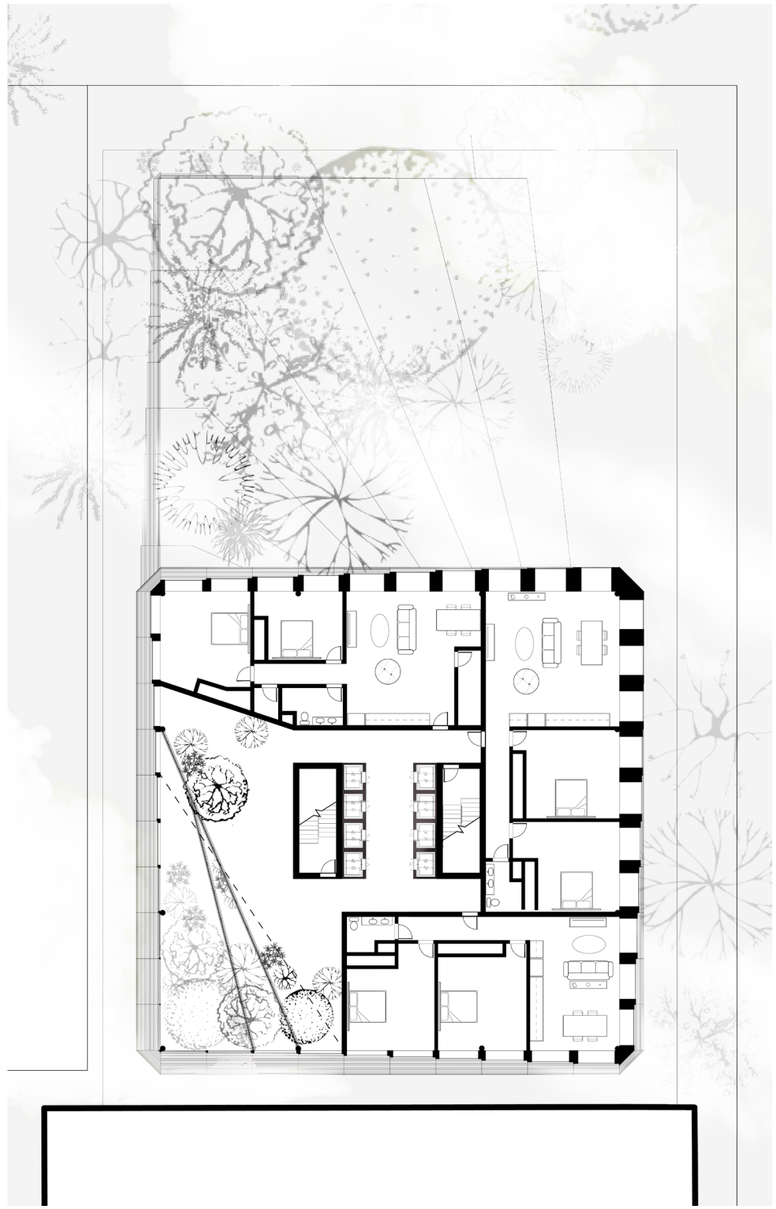
Lobby Level

The base of the structure has an open lobby floor plan connected to commercial store fronts that activate the North and East sides of the building. The form steps back from 9th Street to create an exterior community space.



Sky-Lobby

Periodically throughout the vertical neighborhoods are two-story sky-lobbies that feature large winter garden and restaurant spaces.



Apartment Level

Each apartment level in the neighborhoods have three units per floor. The interior twist creates a balcony and personal garden for residents of each floors.

Evening rendering from the Ben Franklin Bridge looking towards Center City Philadelphia

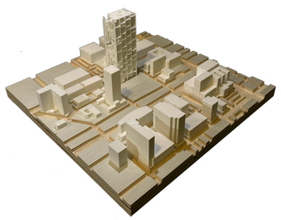
Net-Zero Vine Street Tower

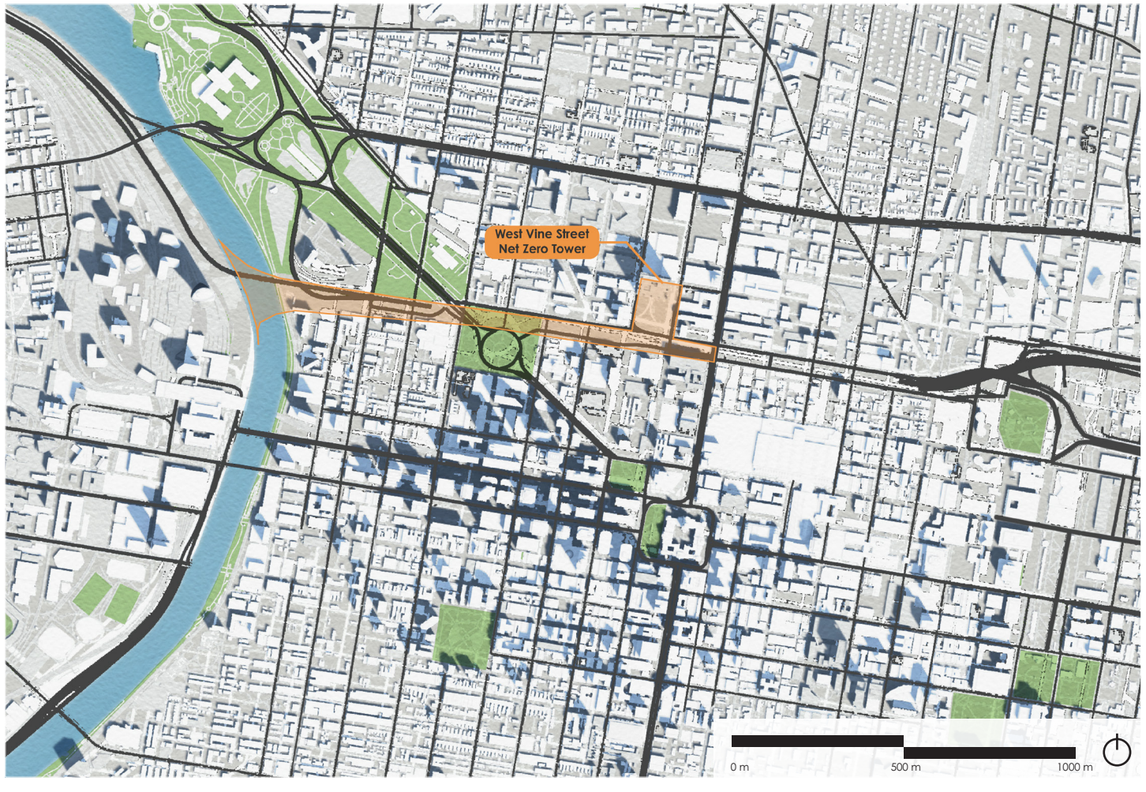
Vine Street Express Way - West

James Sanchez, Alvia Rios

Our vision is to develop the city of Philadelphia into a safer and more sustainable city.

Our mission is to implement an urban plan that includes four major aspects. The first is to develop an urban park that will keep residents safe and healthy, as studies have linked green space to lower rates of crime. Our second method involves the implementation of rain gardens and bioswales in our green spaces. This will reduce storm water runoff and increase the amount of permeable surfaces in the city of Philadelphia. In addition, developing safer bike routes for cyclists will become a priority. This will reduce the number of pedestrian accidents, and keep residents safe. Our final method involves the implementation of sustainable materials. The use of sustainable materials, such as wood, will reduce our overall carbon footprint and allow for responsible wood harvesting.





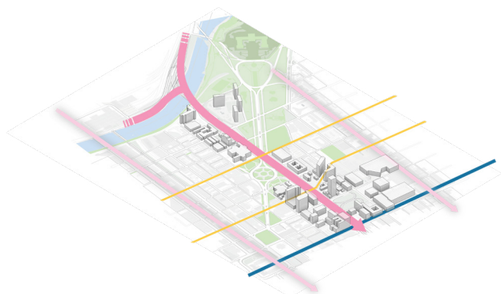
Aerial daytime render showing urban context and the proposed urban park to cap the Vine Street Expressway

Urban Site

Site

Additional Site context, showcasing surrounding buildings

Zoning of the surrounding Site



2050 Super-block Concept

Green space Proposal along Vine Street Expressway

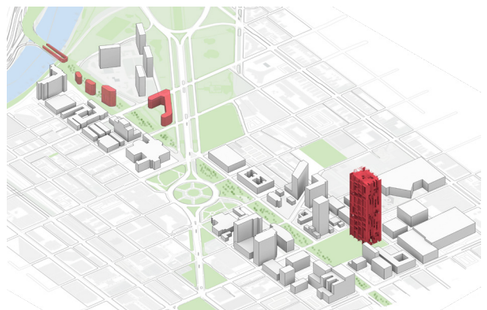
Site Proposal For 2050

Site Context

Commercial Proposal along I-676 Bridge

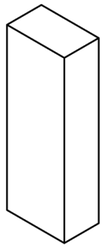
Residential Proposal

Institution Proposal

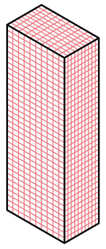


Mixed-Use Proposal

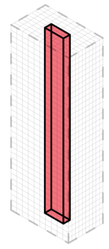
Final Site Proposal, including hyperloop along Vine Street Expressway



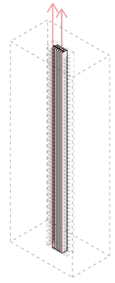
Rectangular Box Extruded



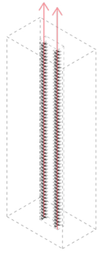
Grid system developed to organize programmatic elements



Grid system developed to organize programmatic elements

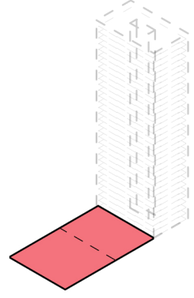


Vertical Circulation from Elevators

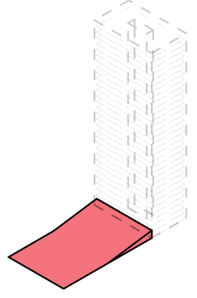


Vertical Circulation from stairs

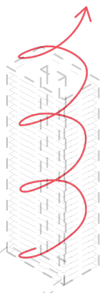
Floor Plates



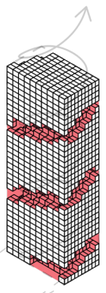
Site of the building



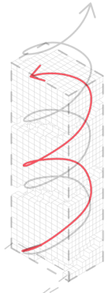
Site of the building raised, as to not disturb car circulation underneath



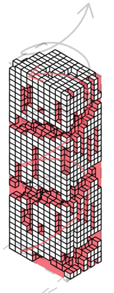
Public Circulation runs vertically towards the exterior of the building, linking the site to the building.



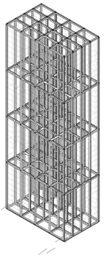
Public Circulation creates a void space



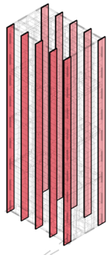
Private Circulation runs the opposite direction as public circulation



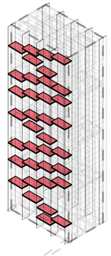
Private Circulation creates a void space



Secondary structural members

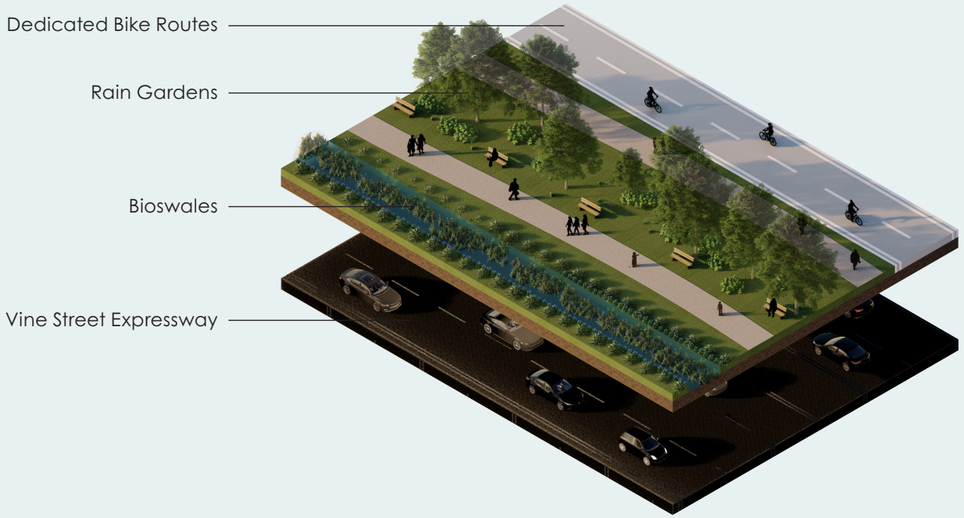


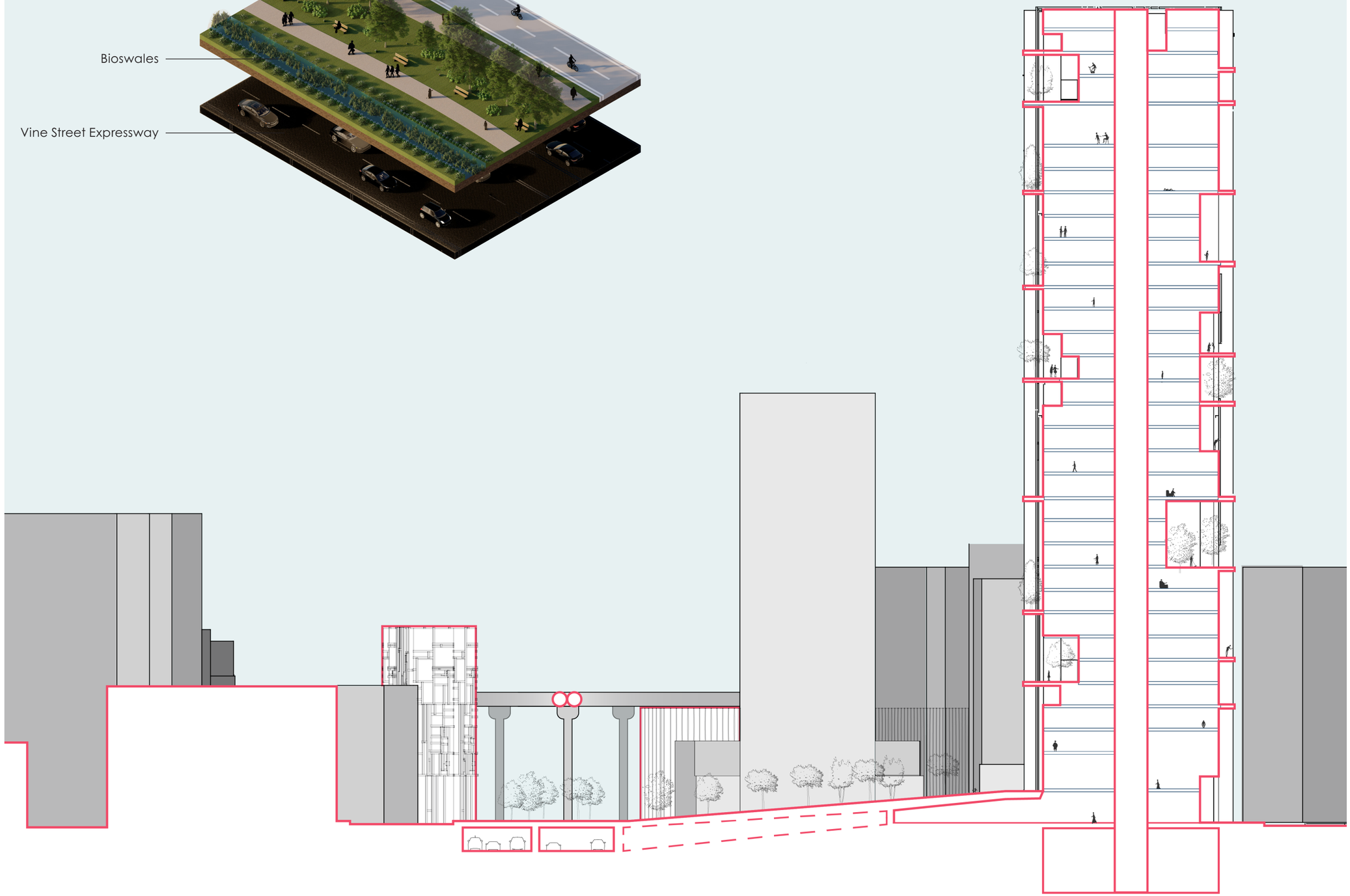
Primary vertical structural members on the north and south side of the building



Horizontal balconies that frame views on the north and south side

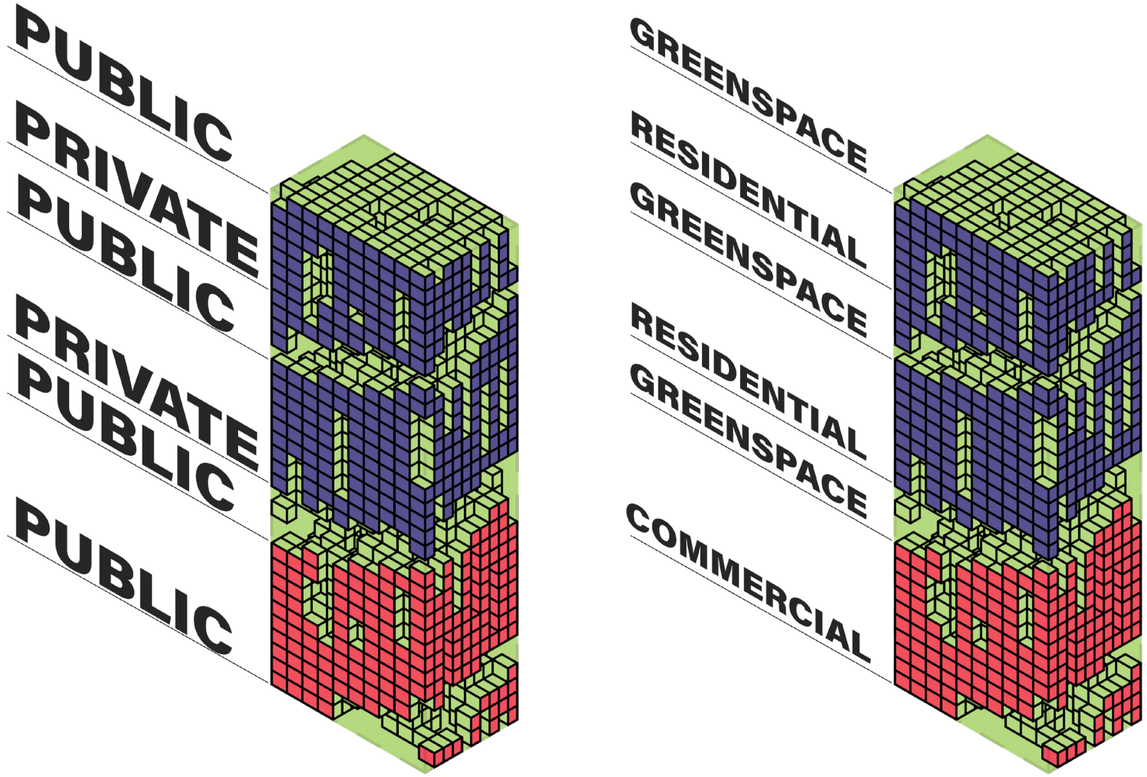
All elements finalized and combined, including a secondary facade.





North-South ection showing the relationship between the high rise and Vine Street Expressway

Night render showing the Net-Zero tower as a part of the Philadelphia skyline



Steel

One Square meter of floor space supported by a steel beam emits 40kg of CO_2 and 516 megajoules of energy.

Concrete

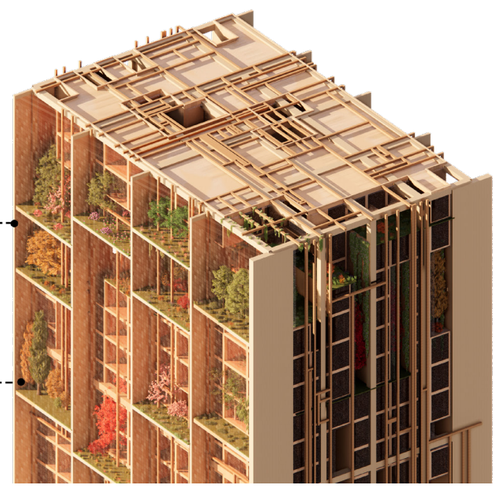
One Square meter of floor space supported by a concrete beam emits 27kg of CO_2 and 290 megajoules of energy.

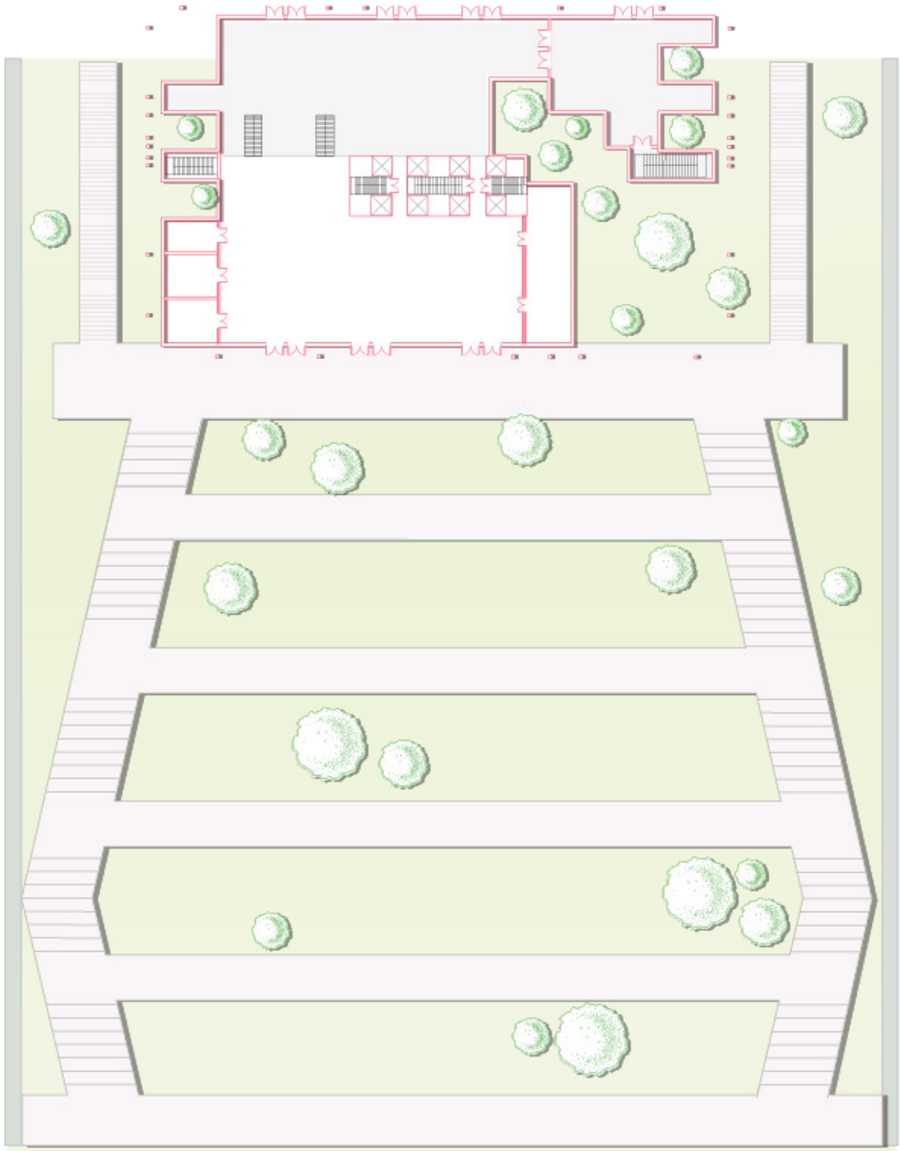
Cross Laminated Timber

One Square meter of floor space supported by a wood beam emits 4kg of CO_2 and 80 megajoules of energy.

Frosted Glass

The double skin facade allows for the building to be cooled during the hot summer months, and warmed up during the cold winter months.





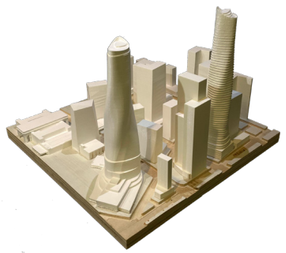
Ground Floor Plan showing the entrance level and first floor

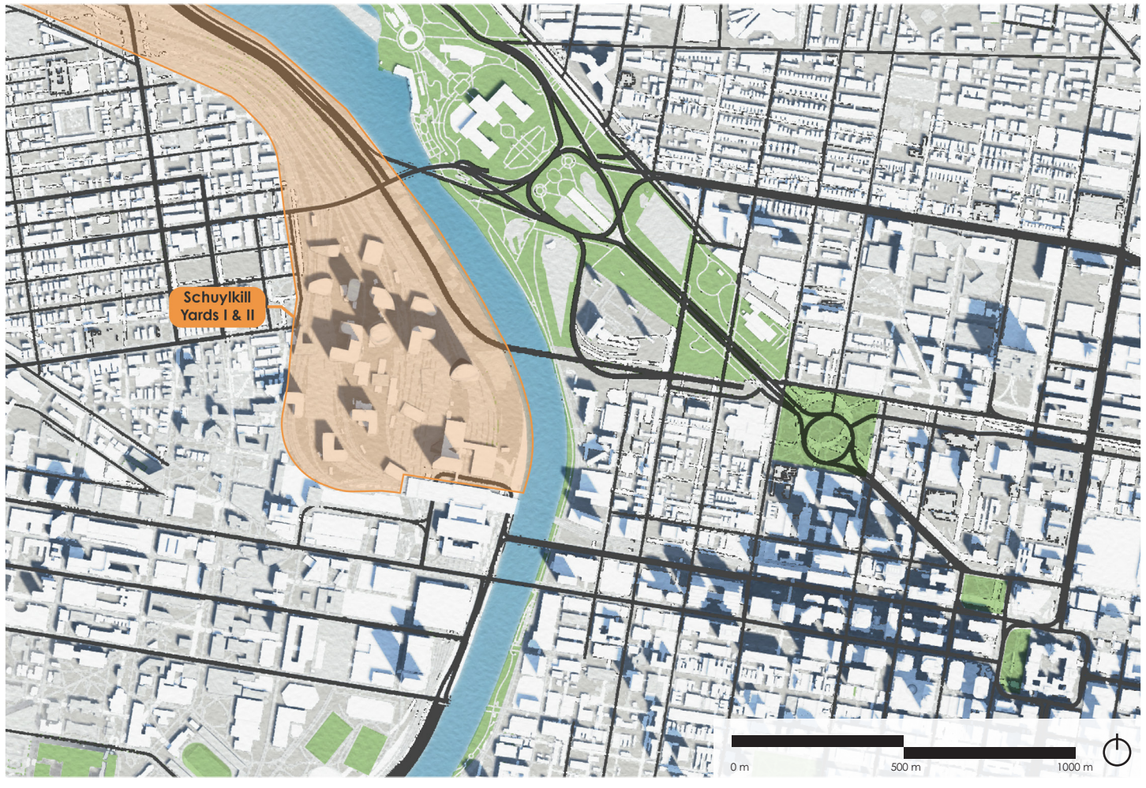
Render from Benjamin Franklin Parkway

Schuylkill Yards 2
Schuylkill Yards
Onel Santiago

The goal of Schuylkill Yards Two is to develop an all encompassing superstructure in the new Schuylkill Yards Development to address overpopulation.

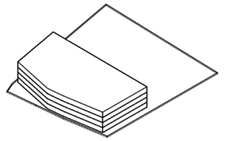
Schuylkill Yards Two provides high density housing with a wide range of programmatic elements. The tower integrates a new commercial district to serve the surrounding communities throughout Philadelphia. The site is highly connected to the adjacent pedestrian corridors, and incorporates pocket green spaces throughout the structure to add biophilic elements and cultivate a sense community. The tower employs passive design principles and high performance facade systems.

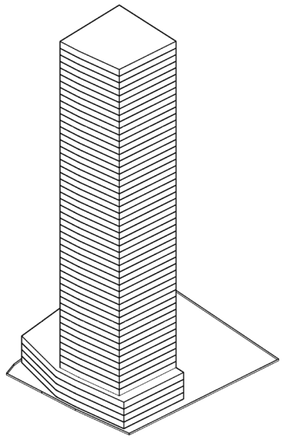




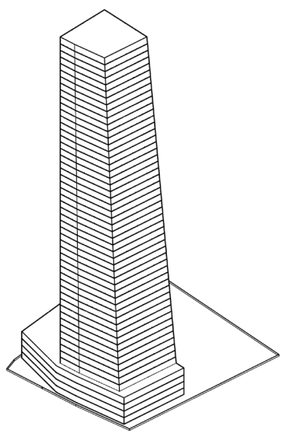
Street level exterior render

Base Volume
15' minimum offset along property lines to outline the podium



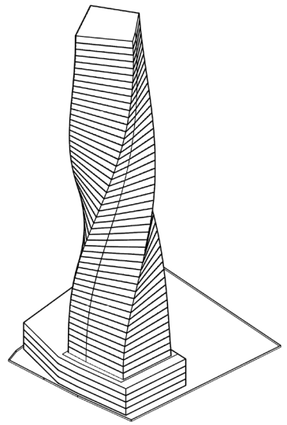


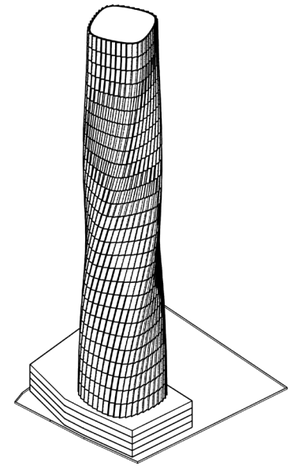
Extrude
Extrude narrow massing for the vertical city concept



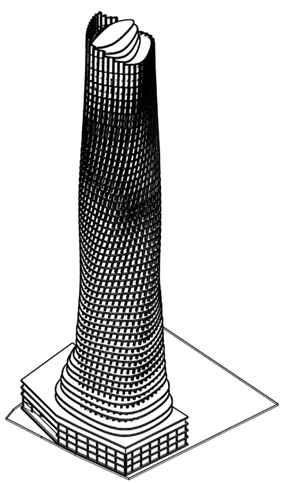
Taper
Taper massing in order to allow sunlight to reach the streetscape

Twist
Gradual 120-degree twist of massing in order to deflect wind, maximize solar gain, and frame views of the city of Philadelphia.



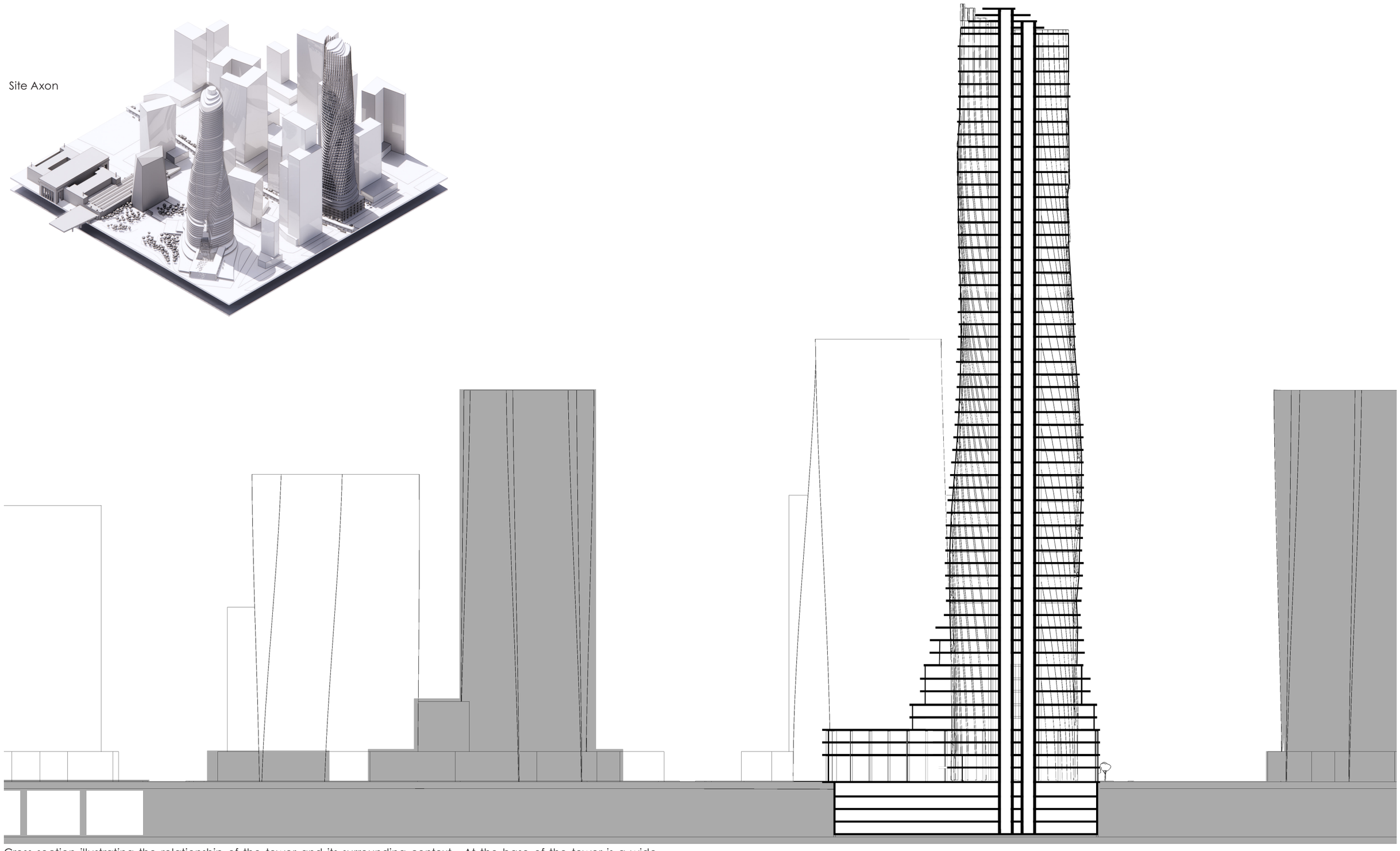


Round Geometry
Fillet harsh edges and provide undulating facade for shade

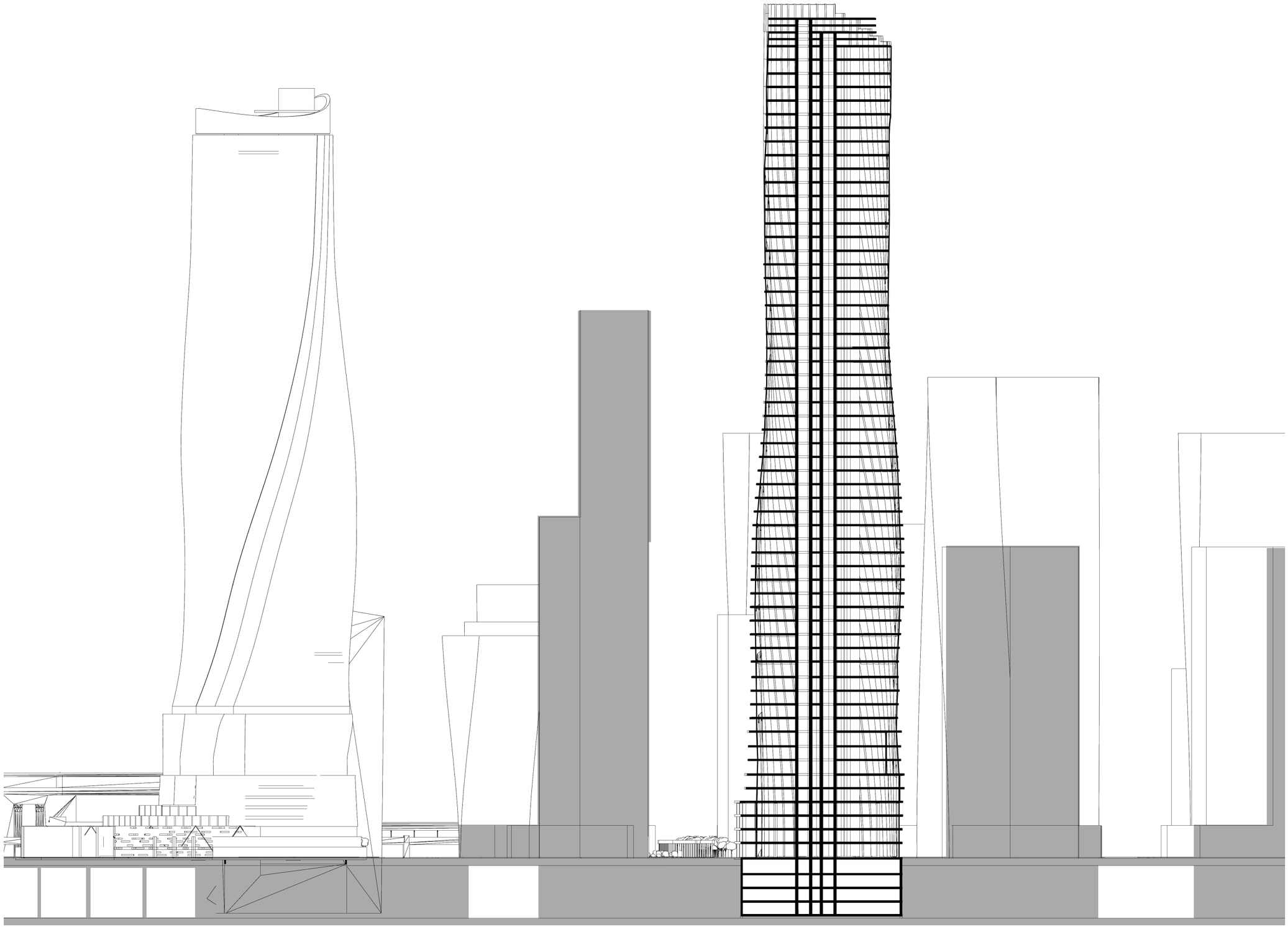


Final
End result

Site Axon



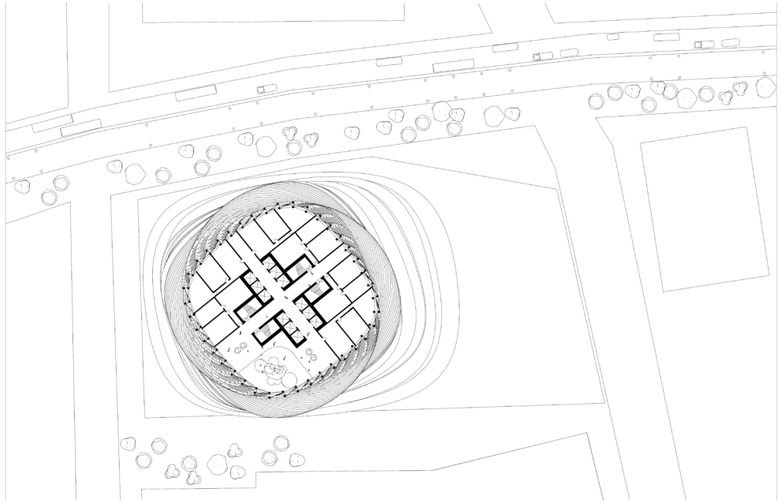
Cross section illustrating the relationship of the tower and its surrounding context. At the base of the tower is a wide boulevard which houses the existing elevated freight line, a new pedestrian corridor, and a new expressway.



Longitudinal Section illustrating the relationship the tower has with its surrounding context. This view showcases the podium as well as the wide pedestrian corridors that run along either side of the tower.

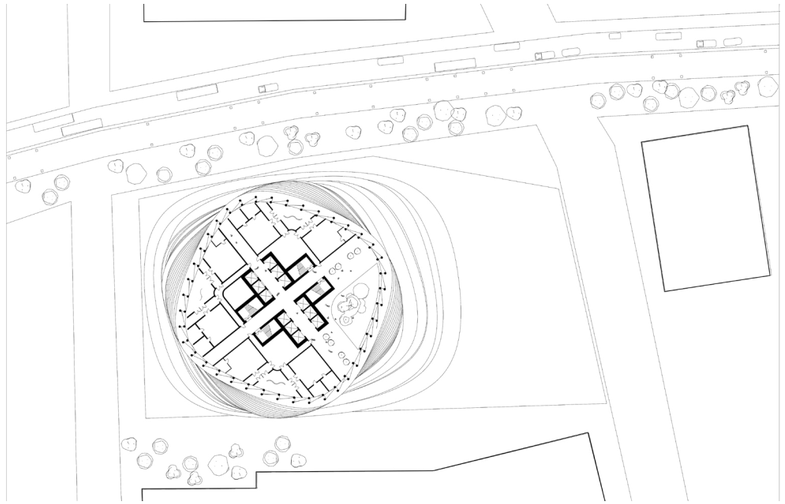
Apartment Floors

A large percentage of the tower is reserved for housing, each floor offering 8 apartments with access to large communal winter-gardens which connect floors with one another.



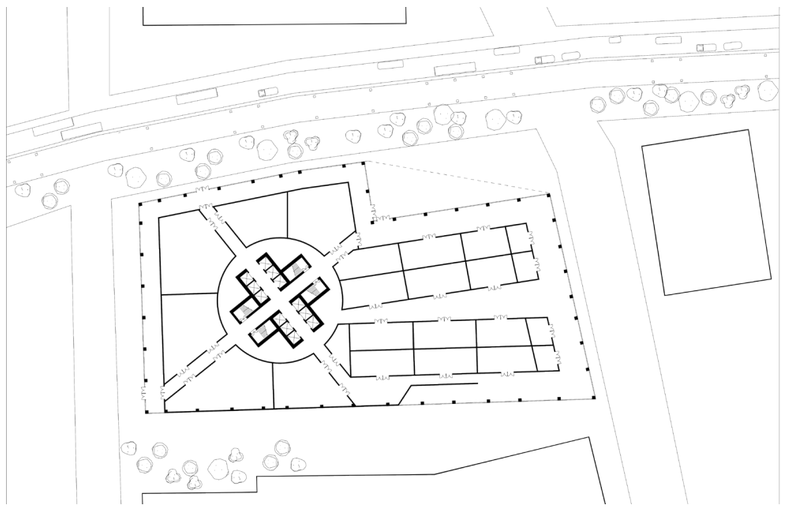
Office Floors

Towards the middle of the tower resides the floors designated for highly flexible office spaces.



Podium Floor Plan

The first few floors within the podium are designed to house a large commercial district which also provides business opportunity and engages the general public. The top of the podium provides a large open recreational space.



View of the Schuylkill Yards Skyline from Comcast Center

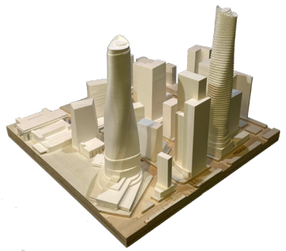
Interior render of winter garden space

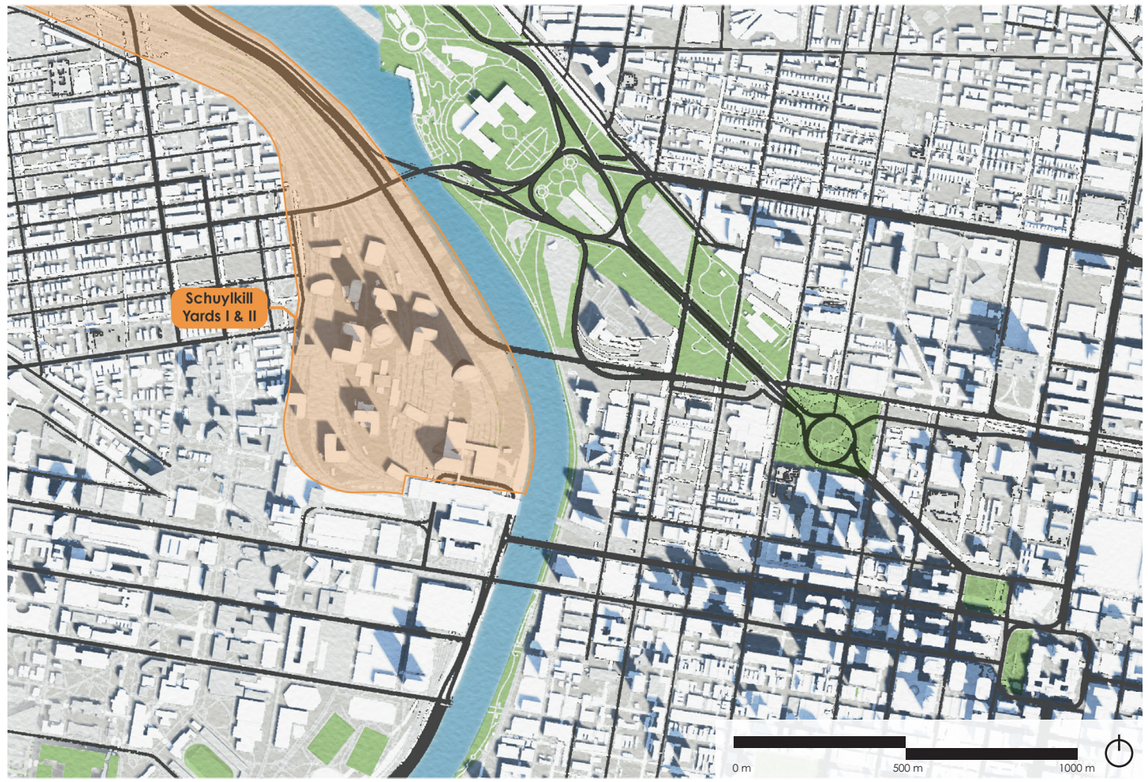
Aerial view of Schuylkill Yards Development

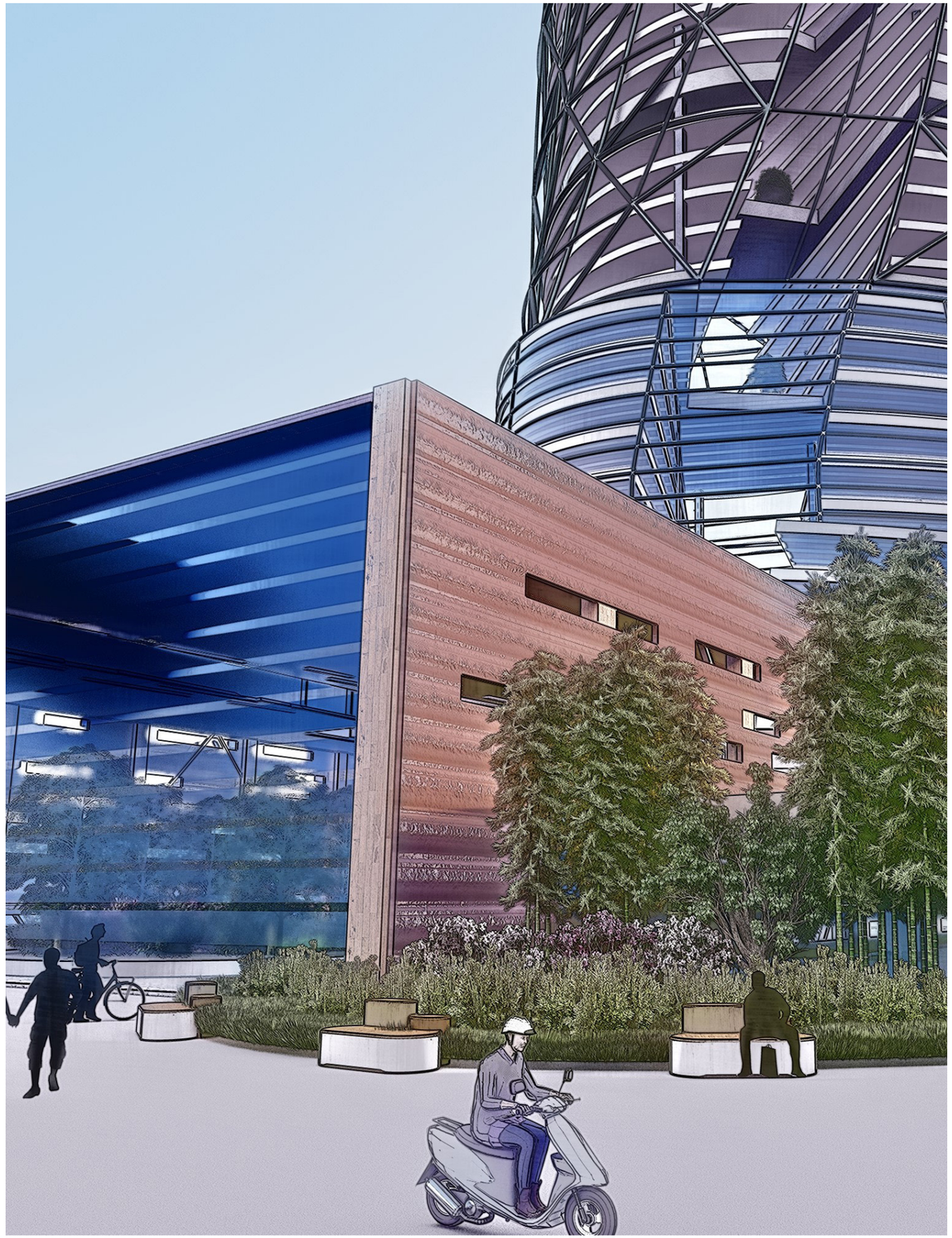
Schuylkill Yards 1
Schuylkill Yards
Daniel Paul

The goal of Schuylkill Yards 1 is to develop a centralized transportation hub around 30th Street Station and the new hyperloop system. The development also includes and an all encompassing vertical city in the tower above the transit hub which features centralized, mixed use neighborhoods.

The vertical city provides varied housing options and elevated commercial spaces that are designed for residents and visitors. The towers connections with SEPTA and Amtrak that allow for the creation a new transportation hub in Philadelphia. Gardens spread through the tower bring Philadelphia's signature biophilia and parks indoors and showcase how we can develop green cities both horizontally and vertically.





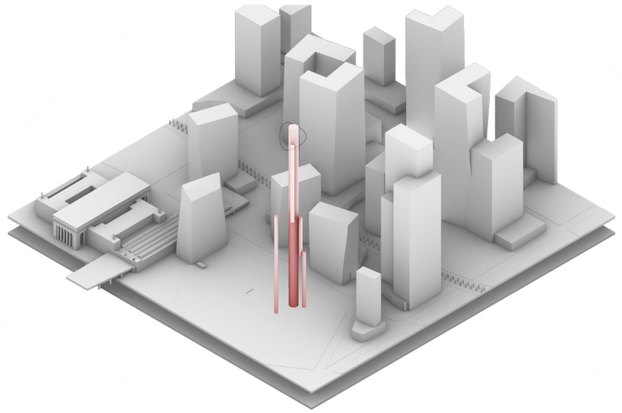


Main entry from plaza

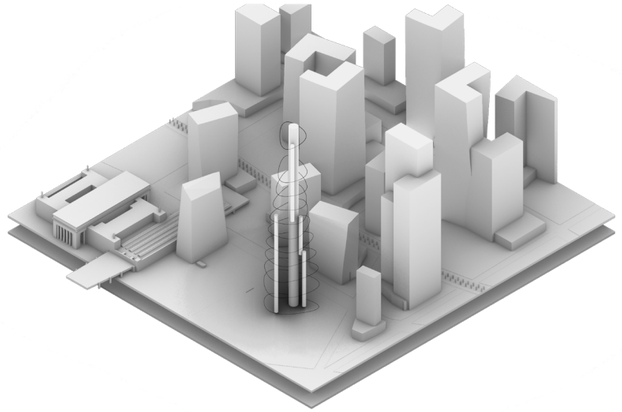
Entry Hall and Main Atrium

Upon entering on the ground floor, guests have a series of gardens that lead to the hyperloop atrium. A group of escalators (or elevators) take commuters up 6 floors to the main platform where they can access the hyperloop that connects with cities from Boston to Florida.

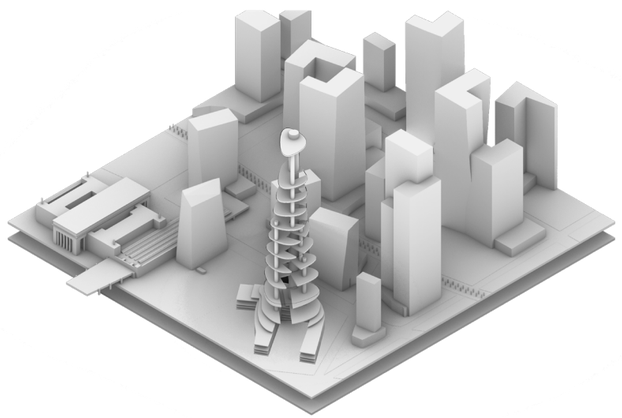
The Cores
Main central cores that contain main rigid structure as well as the elevators and stairwells.



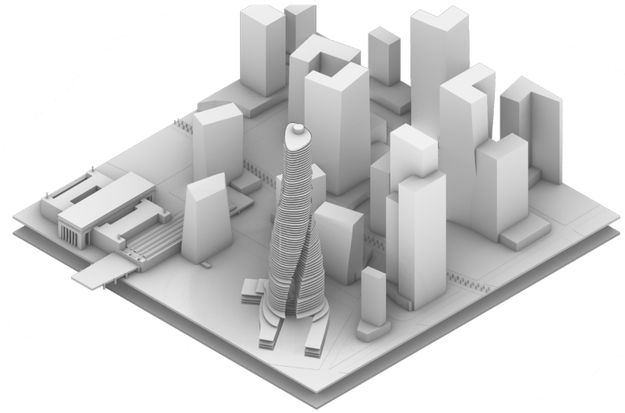
Defining Angles from Views
Around the cores a series of lines were drawn and using Grasshopper analytics these were shaped to face optimal views and channel wind around the tower.



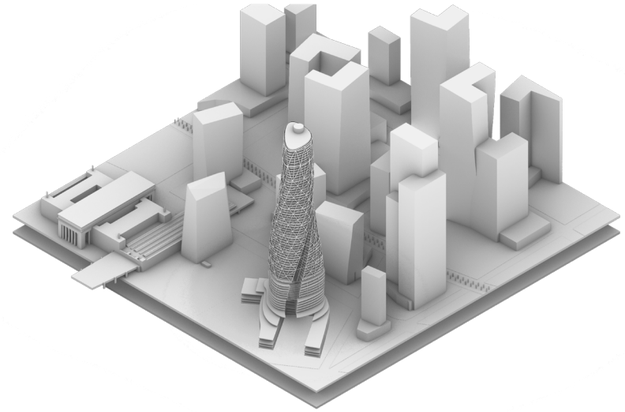
Neighborhood Core Floors
These floors contain public gathering spaces and other "public" areas, such as educational space, winter gardens, and administrative spaces.



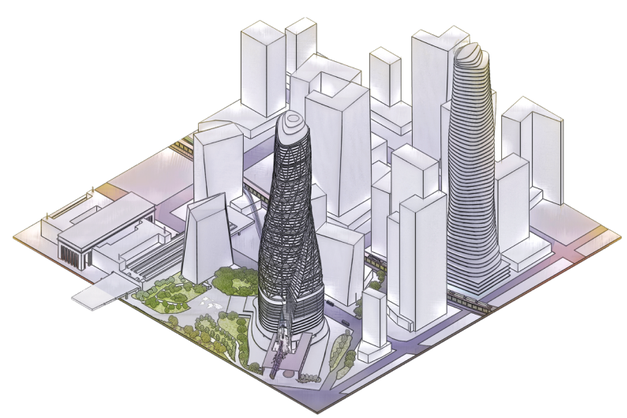
Intermittent Floors
These are the floors that contain most of the commercial and residential spaces.

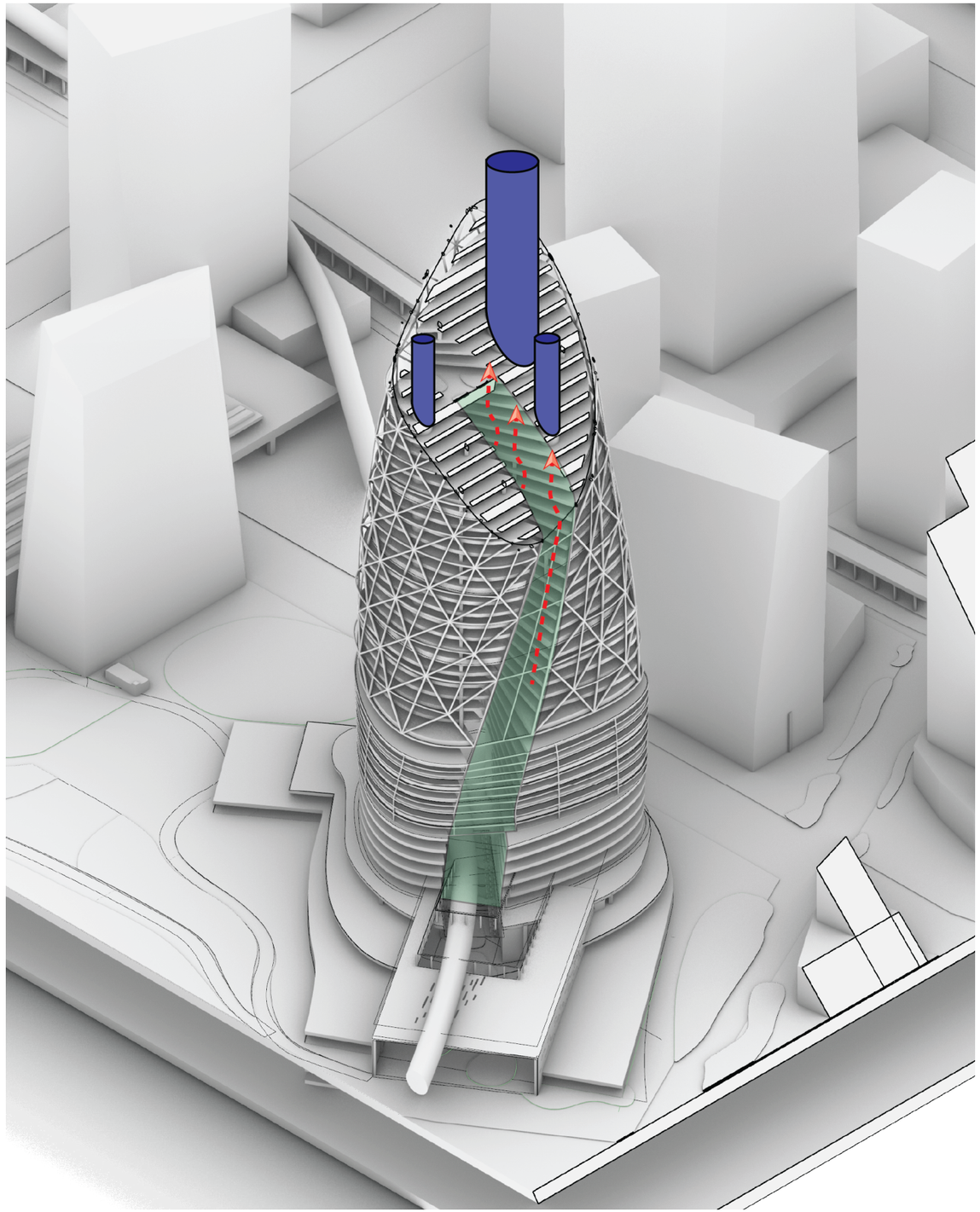


External Structure
A series of main supports for the tower that appear to twist around the structure.



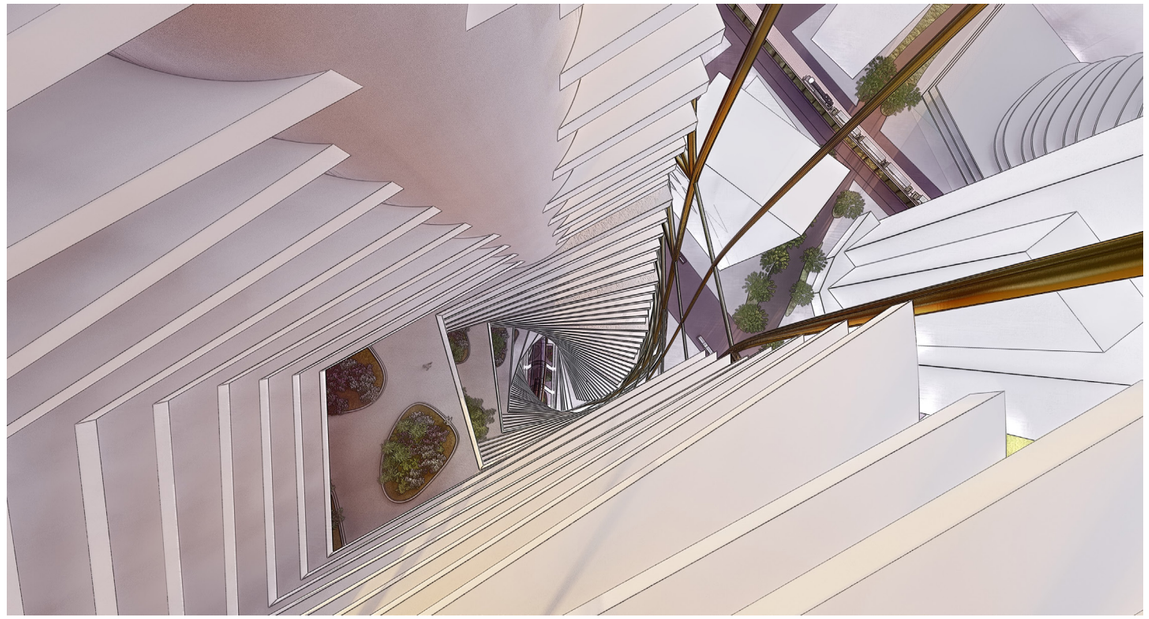
Site Axonometric highlighting Schuylkill Yards One and Two.





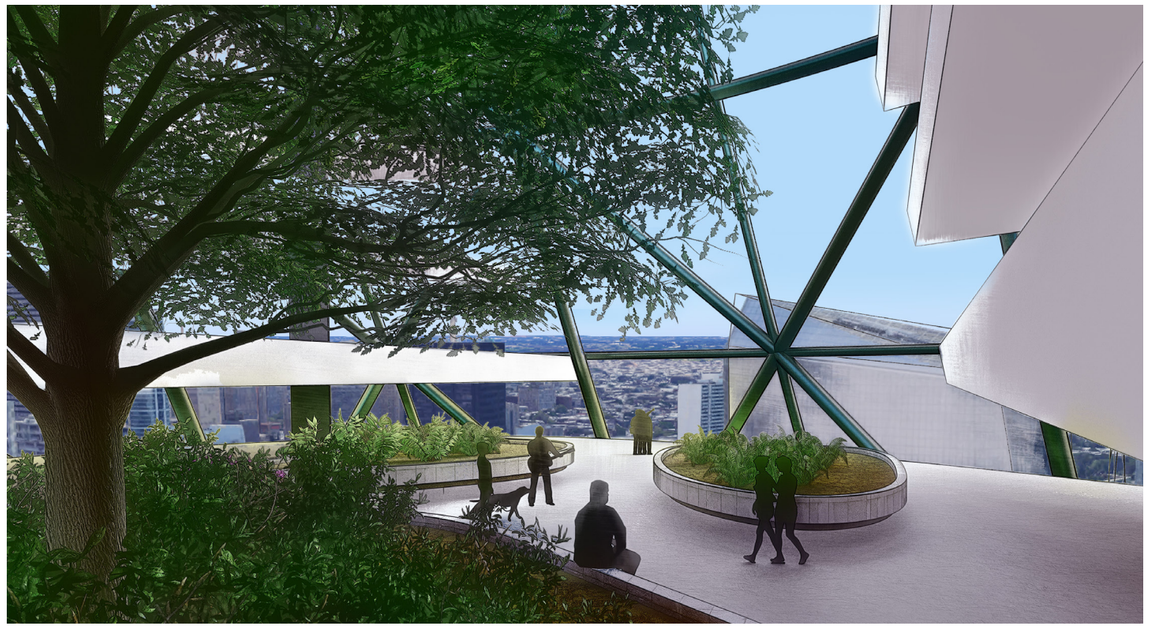
Circulation & Ventilation

The tower features three main circulatory and structural cores, each of which contains stairs and elevators. These cores allow easy circulation throughout the building under normal and emergency circumstances. In between these cores is the main atrium, which operates as a passive system to both cool and heat the building.



Split Tower Atrium

One Schuylkill yards main tower is actually two, separated by a 60 floor atrium that twists to provide lighting and more to every floor and even the heart of these floors of a deep tower. This vertical space also allows for a passive heating and cooling system, with the facade on either side having the capability to open small vents and allow airflow directly across the space or close these vents and allow for a thermal chimney to form. The two towers are bridged across this atrium with a series of winter gardens every few floors, dividing the tower into smaller neighborhoods. See other figure.

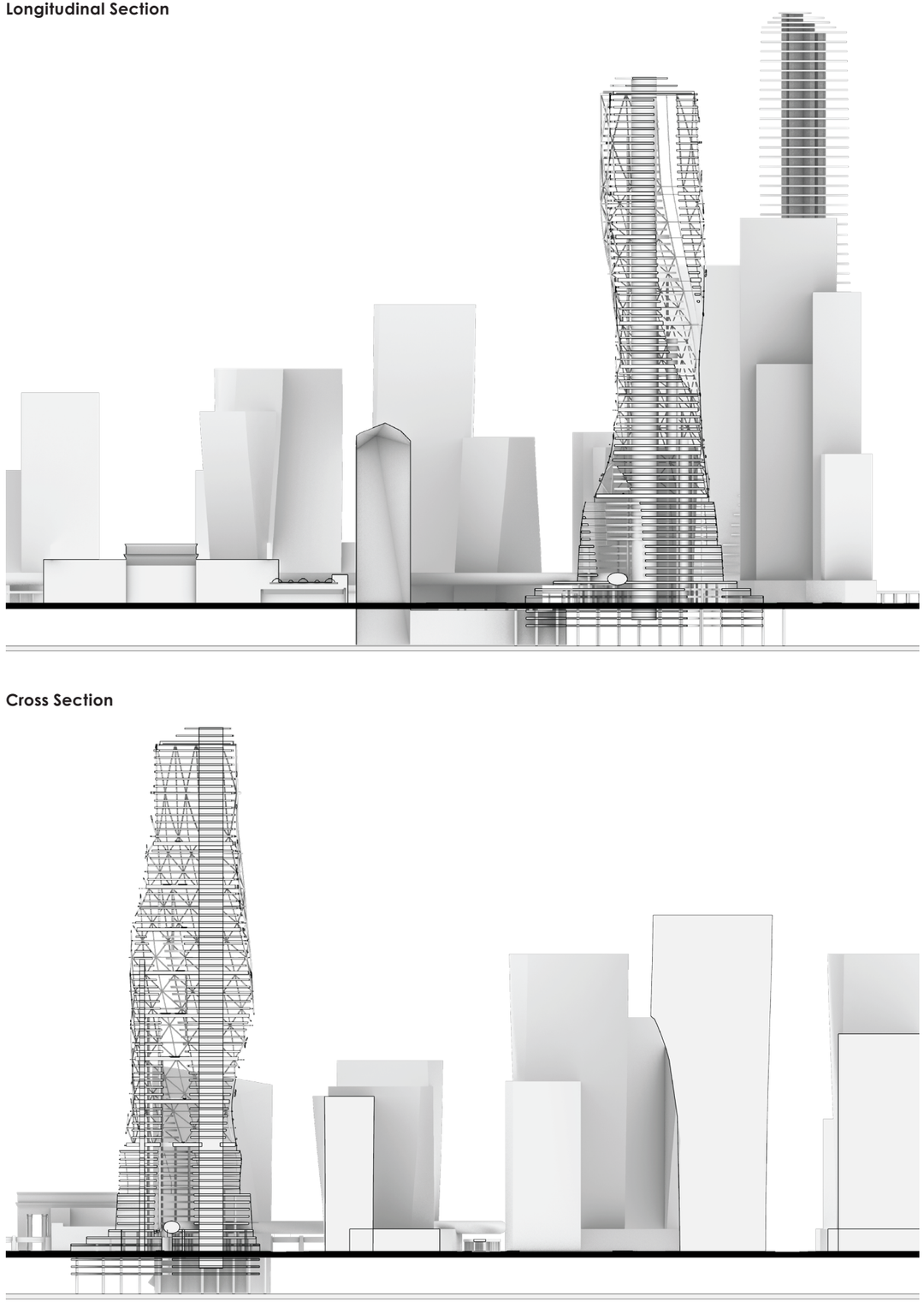


Floor 36 Winter Garden and Lounge

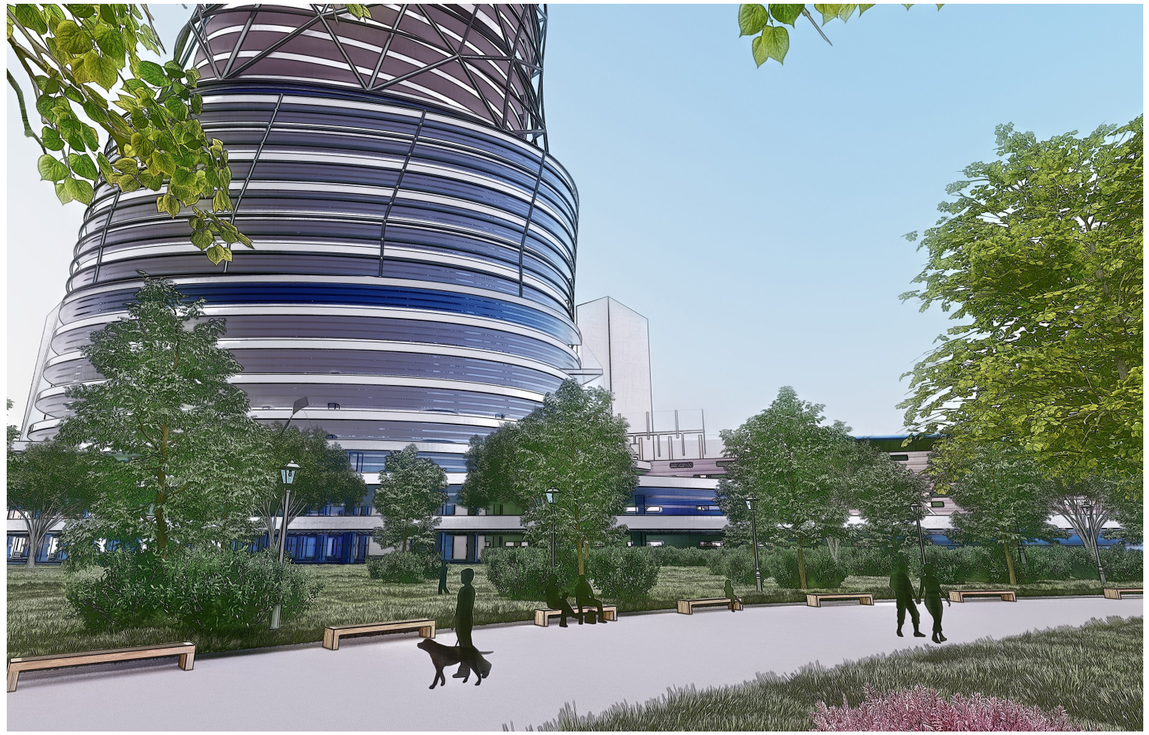
Every six floors above the base contains a 45' tall common space where the floors above can look down on foliage and occupants. In this space are chairs, benches, and interactive elements to encourage a sense of community. Some of these spaces will also have community gardens for growing local food nearly 1000 feet in the sky.

Main Entry From Plaza

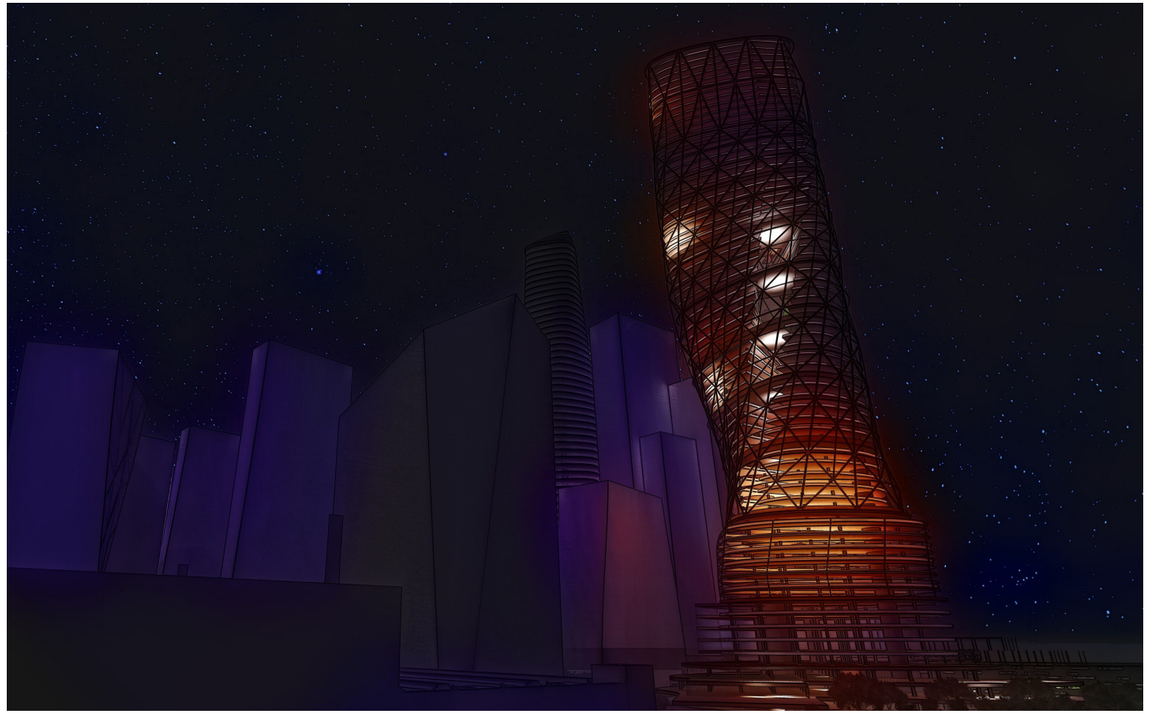
Longitudinal Section



Cross Section



One Schuylkill Plaza Park



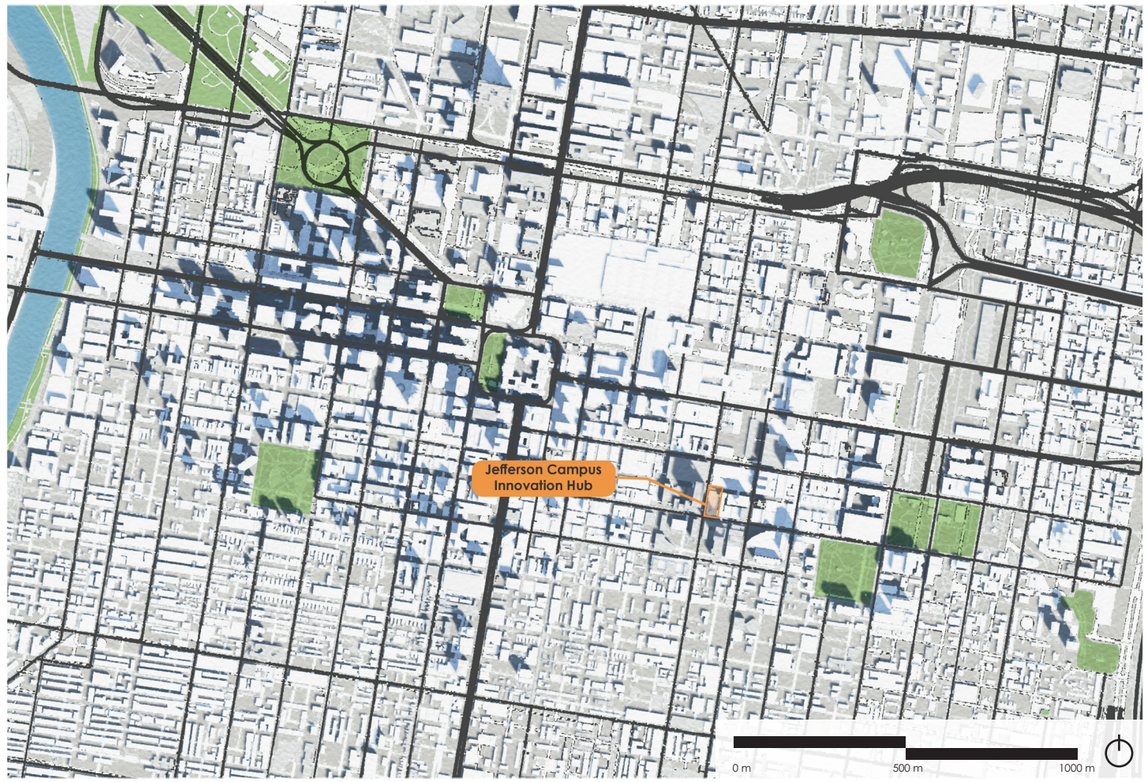
One Schuylkill Yards illuminated

Center City Technology & Innovation Hub
Thomas Jefferson University Campus

Gabriella Bellino

The centralized location of this site proved to be the ideal location for the Center City Technology & Innovation Hub. Located on the corner of 10th and Walnut Streets, the hub is a space dedicated to scientific innovation and research and promotes the spread of information between doctors, researchers, and students on the Jefferson Campus. Located in an area of the city with few pedestrian friendly streets and little green space, the hub and its surrounding space incorporate sustainable elements that contribute to the urban fabric in a positive way.

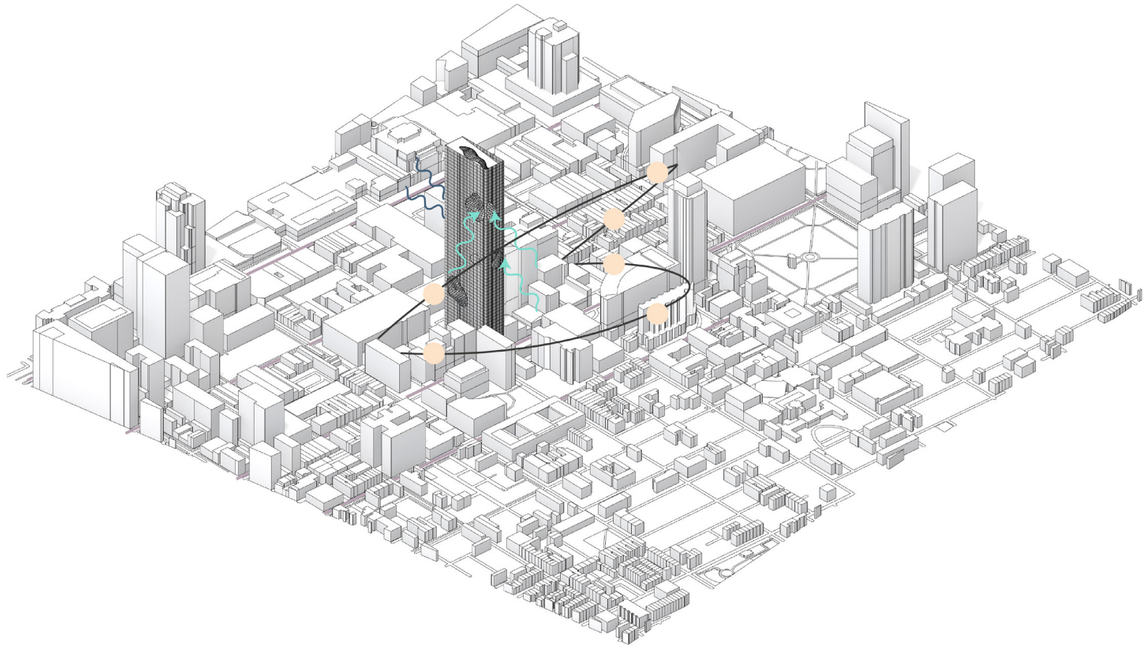
The hub contains lecture halls and exhibition spaces, open to the public to display cutting edge research and innovation. It is split into four program groups, each dedicated to a specific research field. These spaces are linked by a central green spine which connects the research spaces, promoting the spread of information.



Evening rendering from the Ben Franklin Bridge looking towards Center City Philadelphia

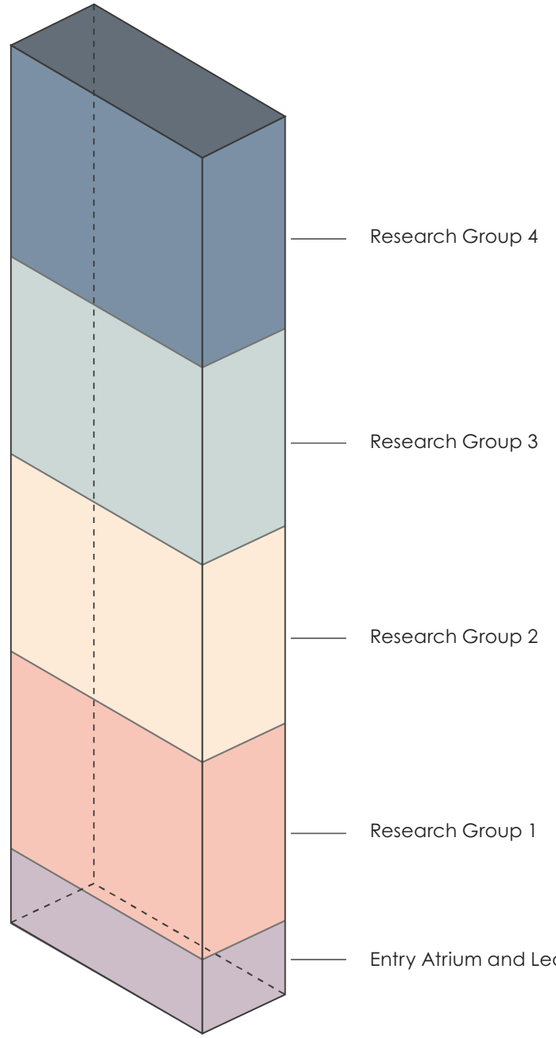
Site Analysis

Site analysis showing sun angles and prevalent winds



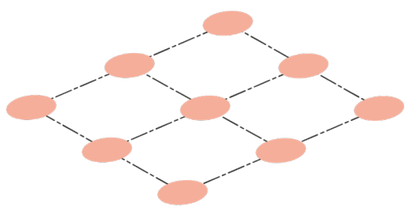
Program Analysis

The close proximity of the site to Jefferson University hospitals was the ideal location for a hub focused on scientific research and innovation and allows for information to easily be shared with employees and students in the surrounding buildings. The program contains lecture halls and exhibit spaces, as well as four blocks dedicated to different areas of research.

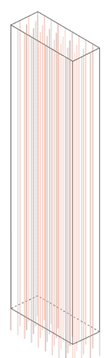


Form

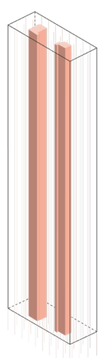
The circulation cores are aligned to the 30'x25' structural grid. The central spine acts as an atrium, creating connections across all levels. Light and sound travel through the atrium, and transfer between spaces similar to how the spine transmits information through the body. The facade interruptions in the form of a cell. Behind these facade interruptions are large gathering spaces, with connections to the central atrium. Designed as collaboration areas they facilitate the spread of information among the research groups.



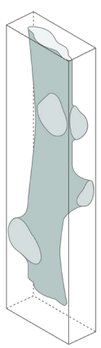
32 x 25 Structural Bay Layout



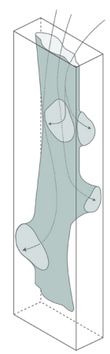
Structure



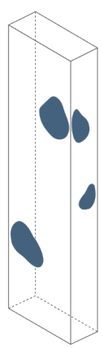
Cores



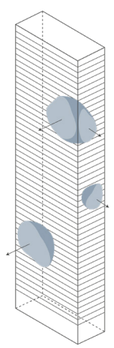
Spine



Natural Lighting

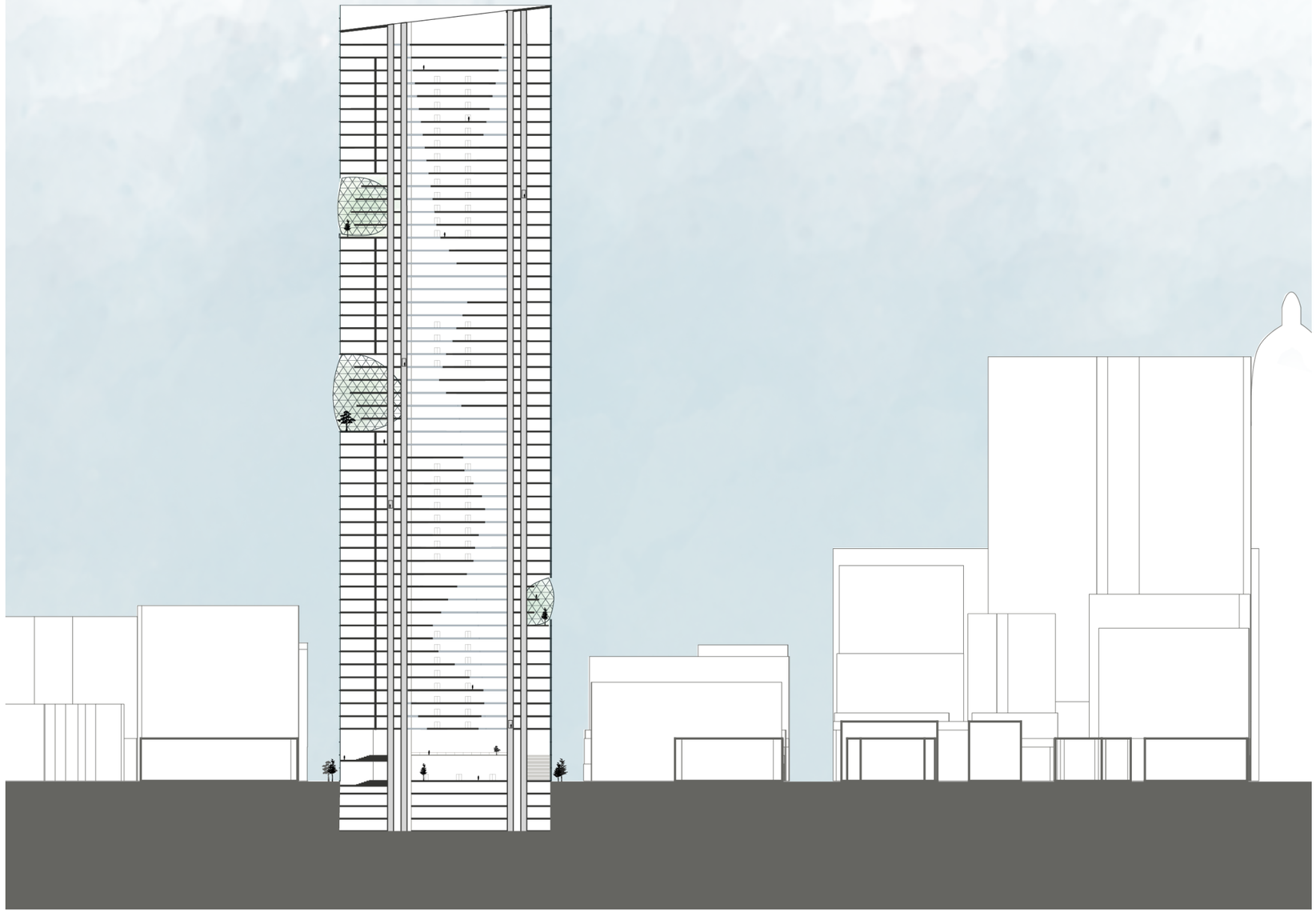


Facade Cells



Gathering Spaces

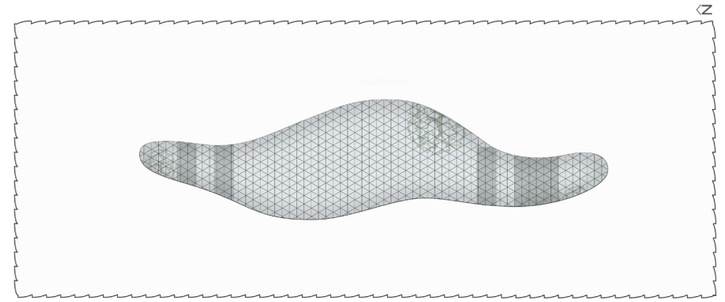
Sunrise rendering looking Southeast from the Comcast Tower



Section facing West, cutting through central spine and collaboration spaces

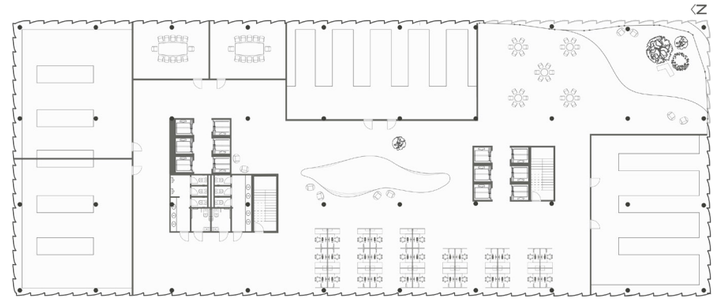
Roof Plan

Roof plan showing glass dome that caps the central spine.



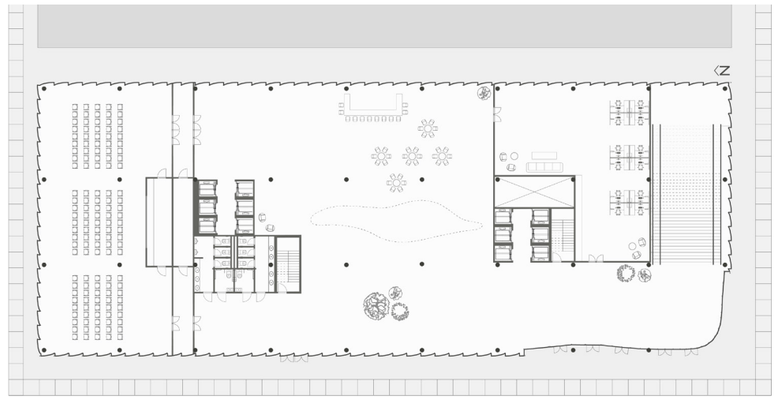
Typical Plan

Typical upper level plan showing relationships between lab space, conventional office spaces, and collaboration spaces

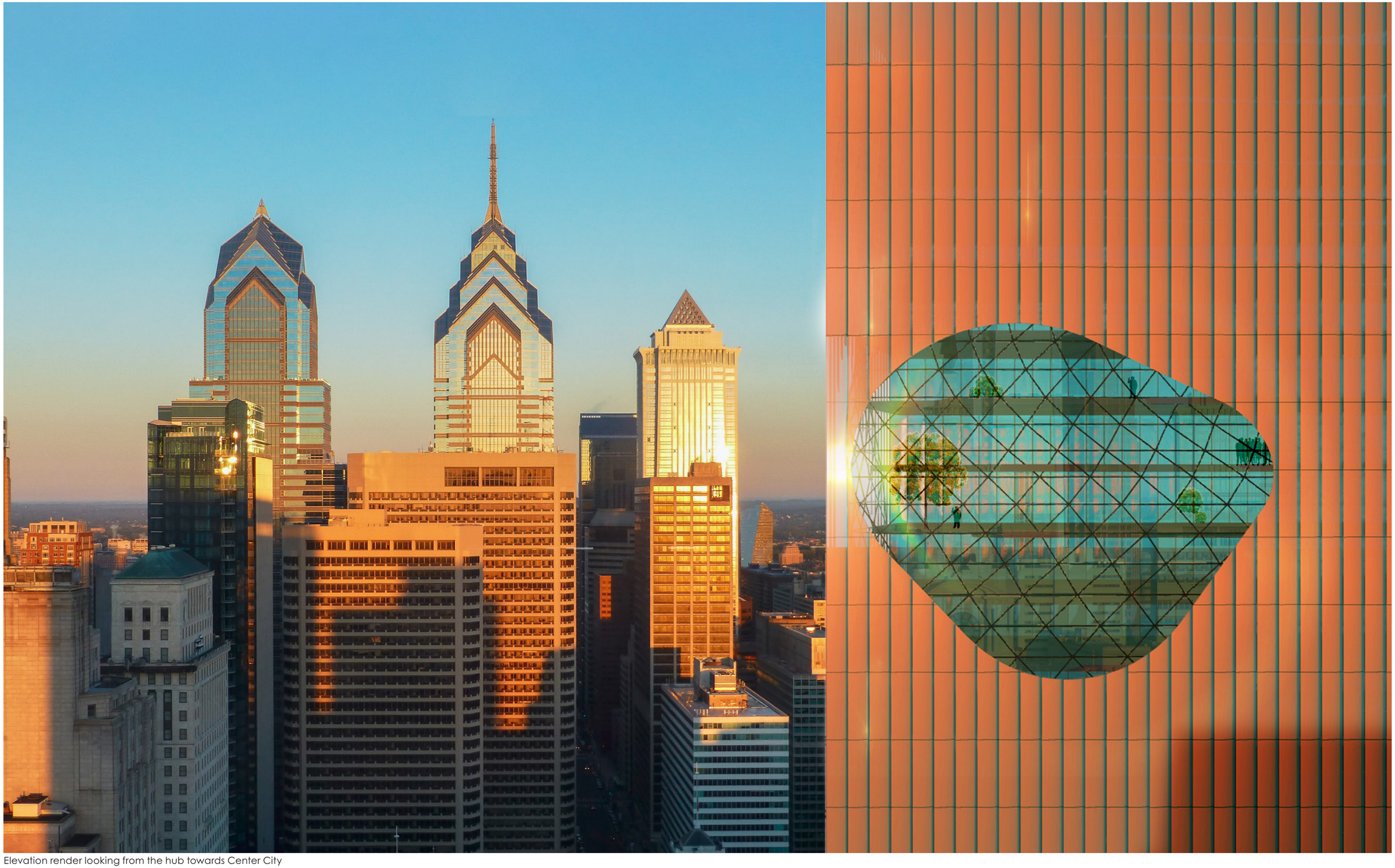


Atrium Level Plan

Atrium level plan showing lecture halls, entry lobby, and faculty spaces.



Night render looking Southeast showing the relationship with the Philadelphia Skyline



Elevation render looking from the hub towards Center City

University of the Arts
South Broad Street

Jacqueline Thornton, Giovanni Ruiz

Our goal is to combine all the buildings of the University of the Arts campus and turn them into two new sustainable structures. These two new buildings will be adjacent to each other on the same site, opening up five lots on South Broad Street creating future opportunities for new eco-friendly projects.

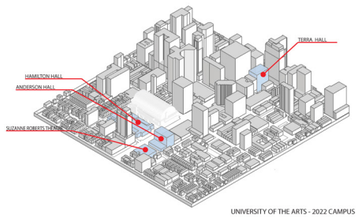
The proposal will promote a new environment for Philadelphia, where programs can be integrated into larger buildings and become more multi-functional. This multi-functionality allows for a new perspective on how city living looks, and how it can change for the better. As the built environment becomes more technologically advanced, it can be beneficial to apply new energy saving methods into these buildings.

The buildings create interesting views of the city while providing greenery to help dissipate noise and cleanse the air for the Students.

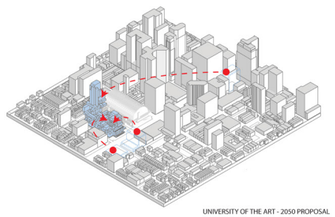
Urban Plan

Our proposed plan consists of integrating greenery throughout the surrounding area. The greenery helps reduce sound, absorb water, combat heat islands, purify the air, and reduce stress levels. The plan implements foliage lanes on the surrounding streets of the site. On South Broad Street a central green lane will separate the two-way lanes. On its opposing street side, the street is a one-way traffic lane with a green lane. The two streets in between are solely green lanes with no through traffic to help maximize the safety for students and create a more peaceful environment.

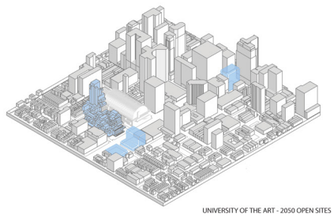
Aerial view of the urban context surrounding the University of the Arts on S. Broad Street



UNIVERSITY OF THE ARTS - 2022 CAMPUS



UNIVERSITY OF THE ART - 2050 PROPOSAL



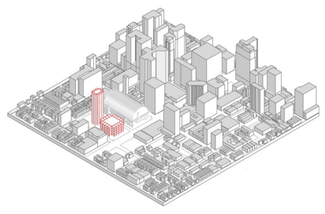
UNIVERSITY OF THE ART - 2050 OPEN SITES

Proposal Diagrams

The University of the Arts sits along South Broad Street and the neighboring streets. Its campus consists of multiple housing buildings, recreational buildings, and program spaces. It also has the privilege of being near multiple theaters and galleries. Our vision is to rethink what a city campus can look like while ensuring the project is performing sustainable efforts. The proposal for the University Arts consists of taking the spread-out campus and placing them onto one site where housing, education, and recreation can occur. In doing so, it opens up lots to reused and allows the university to become vertically dominant.

Form

Our form is derived from our instinct to place all the programs together. An interlocking concept represents our idea to combine all the buildings onto one space and having to be woven into each other. Upon doing so, it open up opportunity for the modular blocks to be oriented in certain directions allowing for great views of the city and for opportunity to have occupiable green roofs. As part of our mission to integrate greenery into the city, we propose to have greenery on multiple roofs and the interior.



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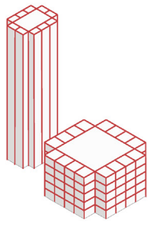

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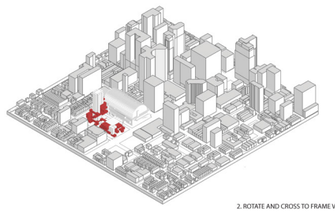
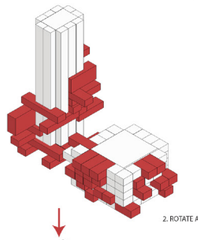


2. ROTATE AND CROSS TO FRAME VIEW



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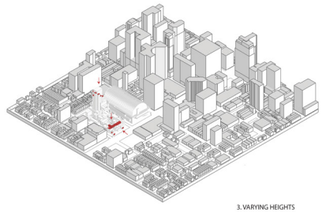
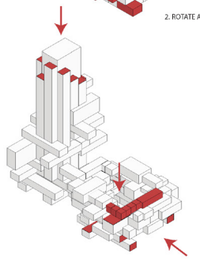


3. VARYING HEIGHTS



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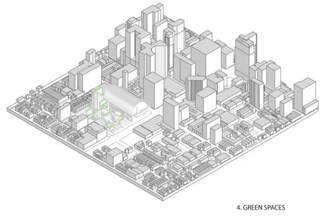
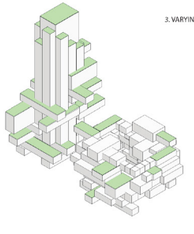


4. GREEN SPACES



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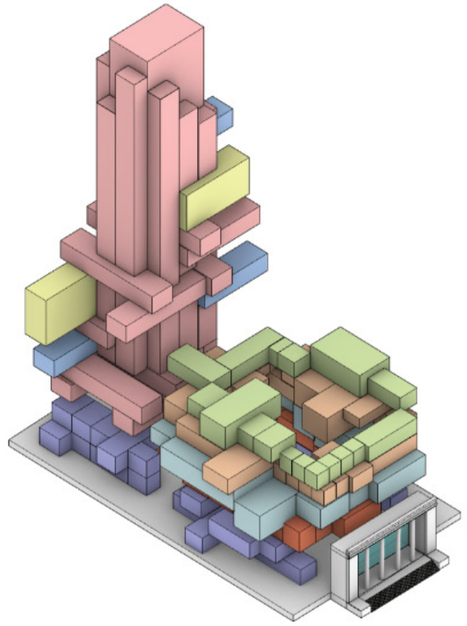
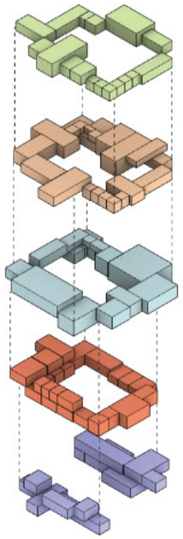
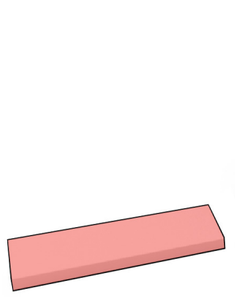




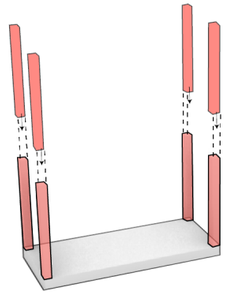
CAFE
RECREATIONAL SPCAE
DORMS
LOBBY
MUSIC
DANCE
ART
FILM

Program

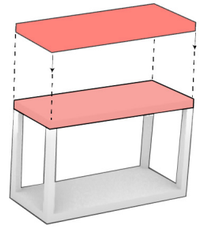
The programs are layered to accommodate for views, privacy and functionality. The taller building is the housing tower and the right building is the education building.



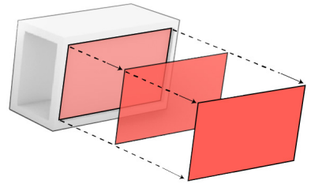
Base



Columns



Roof

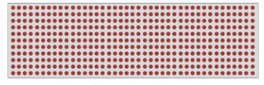


Walls & Exterior Finishes

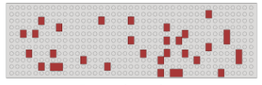
Structure

Utilizing a prefabricated approach the modules will save on energy consumption and costs. Dorce Prefabricated Buildings and Construction Inc. offer low-carbon solutions with volumetric steel structures and have heavy experience with sustainable building.

Metal Sheet



Perforate Sheet

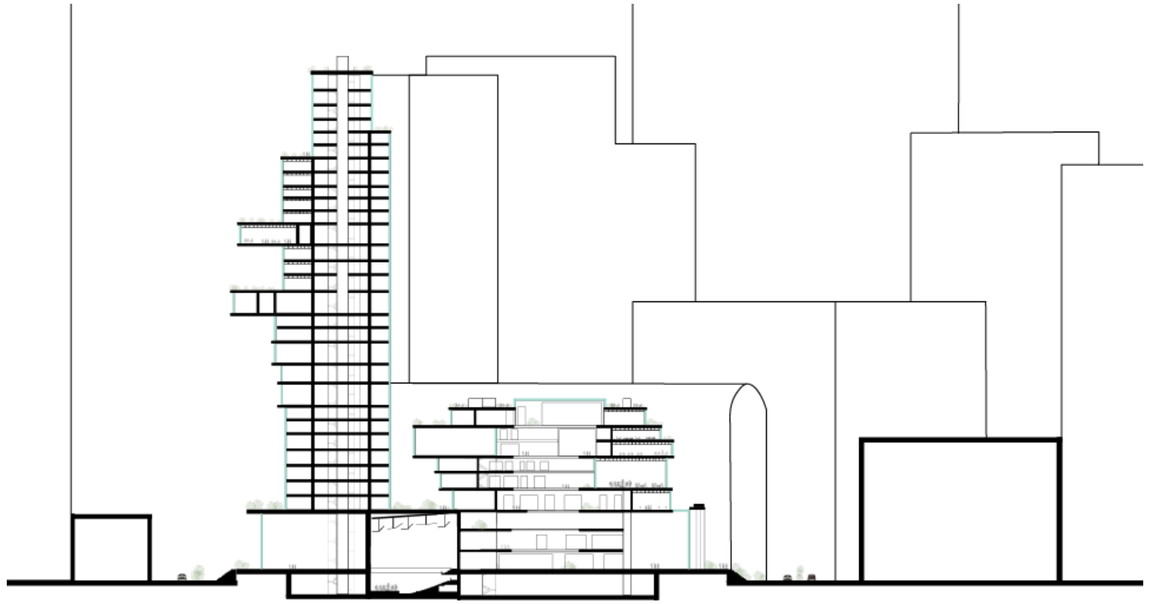


Randomize

Final Iteration

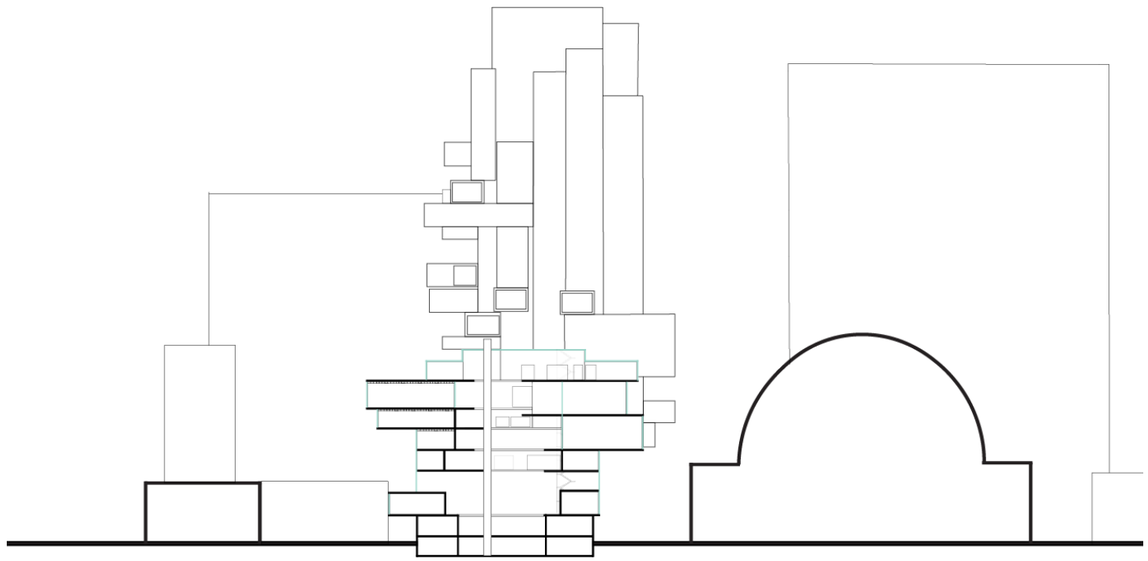
Facade Development

The perforated metal facade is primarily a shading device to keep the rooms cooler and overall reduce the amount of direct light into the rooms.



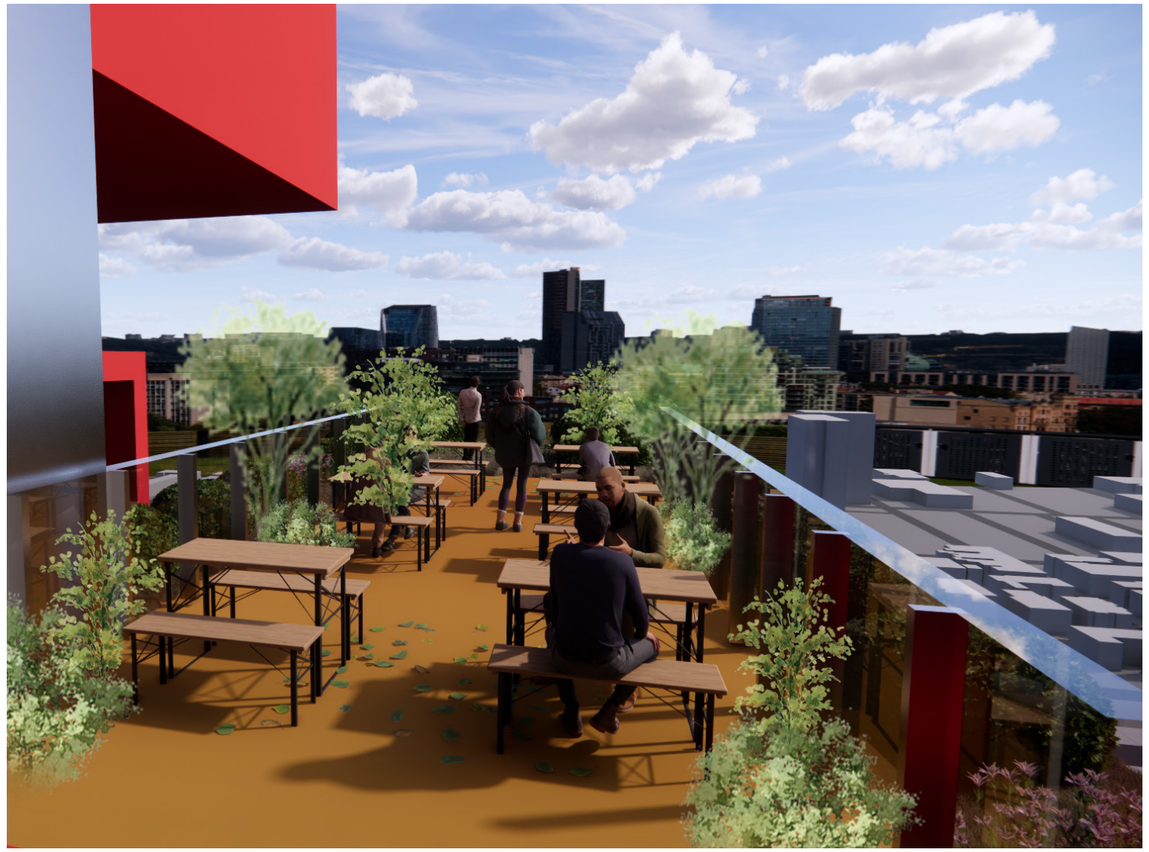
Latitudinal Section

Cutting through the center of each building, the relationship between the two buildings is best understood. The two buildings share an outdoor green roof space that connect one another besides the first floor. The housing tower has a central circulation spine while the education building disperses their circulation to keep a cleaner central atrium space.
The housing building has a thicker base and becomes slimmer as it rises. The modular spaces continue to interlock with another and become less as it rises.



Latitudinal Section

A simple cut through the education building to show how the modular spaces create an atrium space that has an alternating pattern.

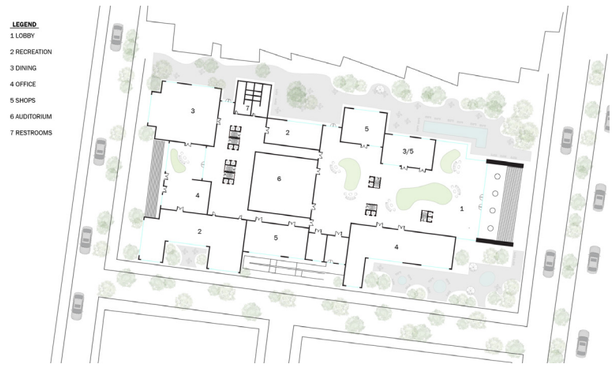


A typical occupiable roof space with integrated greenery.

Inside the housing tower, on each dormitory floor there is a shared kitchenette space.

A practice dance room where students can gather and use together while enjoying views of the city.

A dormitory room showcasing the use of the facade to shade and add an interesting affect to the space.



Roof Plan

Part of our mission is to implement as much greenery as possible into our buildings, in doing so, placing a mixture of occupiable and non-occupiable green roofs throughout our two buildings will help create a healthier environment for the city and students.

Dorm & Education Plan 2

The dorm floors repeat themselves compared to the educational building where each floor is completely different. On this floor of the educational building, theater and film programs are held here along with a few classrooms and library spaces.

Dorm & Education Plan 1

The housing floors consist of 15 dorm rooms, 4 group lounge spaces and a shared kitchenette. The spaces alternate their views to maximize energy consumption, sun exposure and overall beauty. This floor of the education building hosts the dance program. There is a variation in room sizes to accommodate the different practice sizes of individual, group, and rehearsal.

Ground Plan

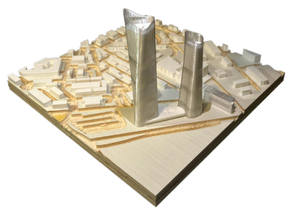
Each building has a main entrance from the respected street along with a few side exits to reach the outdoor plaza spaces.

Vicinity Campus
Schuylkill River Walk

Joseph Falcone, Colin White

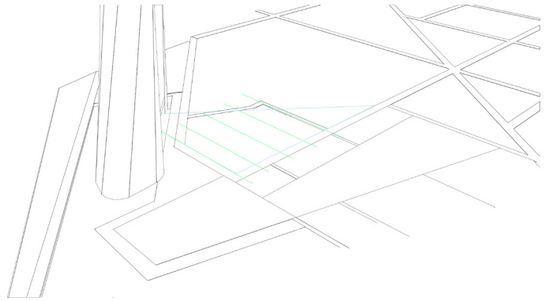
Taking influence from the nearby context, the climate-resilient building forms of the Vicinity Complex were designed to accentuate the rigidity of the gridded city in contrast to the fluidity of the River Walk. Creating these forms to function as flex spaces while still maintaining residential and mixed-use areas was essential in the design process. In a conclusive manner, Vicinity Campus was assembled to extend the cities' environments while keeping impending climate threats in mind.

Elevating specific programmatic and circulatory spaces as well as placing each building in a spatially aware plan allows for the campus to become a staple for the city, and an accommodative hub for the nearby neighborhoods. The health science buildings in the Vicinity Campus function to aid further research. The once underutilized Vicinity Power Plant and brownfield site can be used to its full potential.

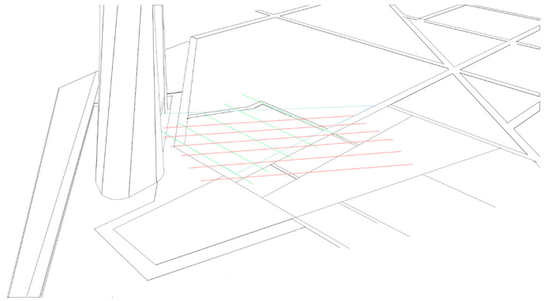


View of Vicinity Tower from the Schuylkill River

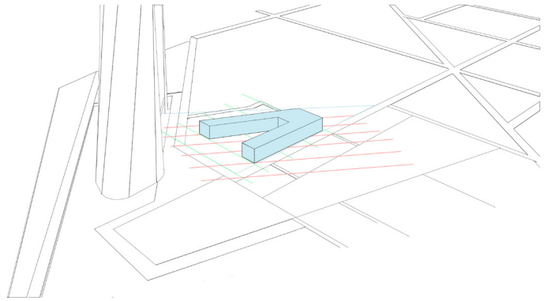
Health Science Building A: Site Derived Form Sequence



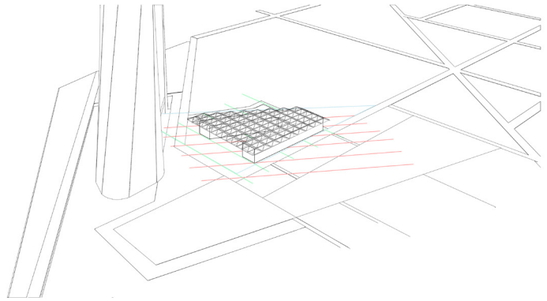
Vertical Grid



Diagonal Grid

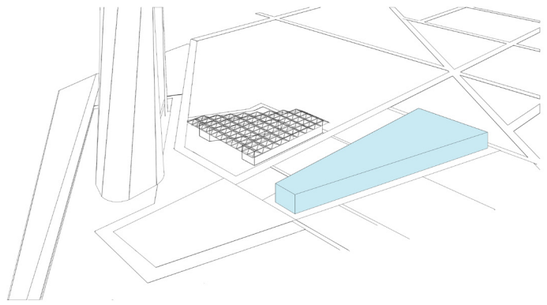


Extrusion



Roof Application

Health Science Building A: Form Sequence



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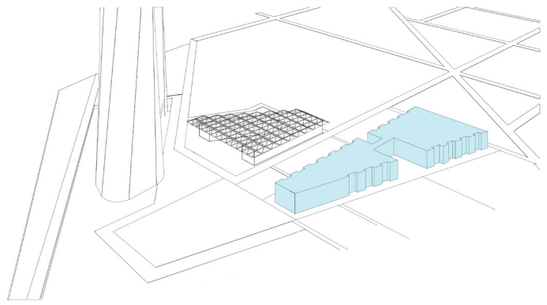
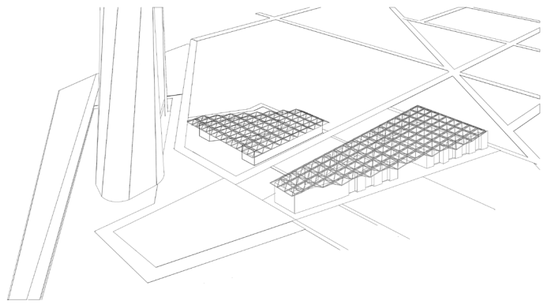
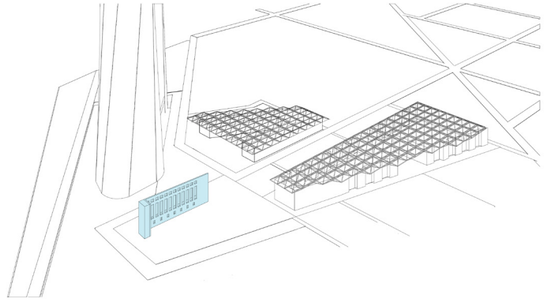


Split

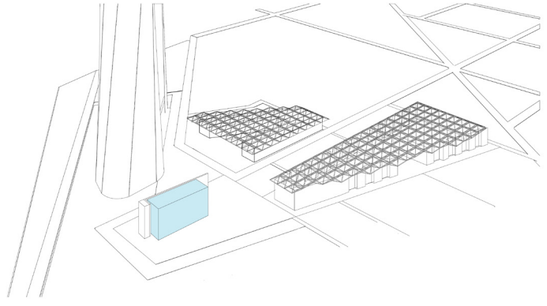


Roof Implementation

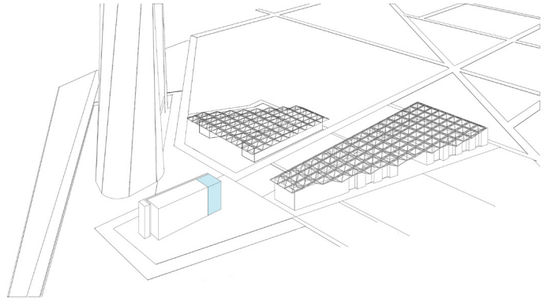
Gallery: Form Sequence



Preservation of Original
Power Plant Facade

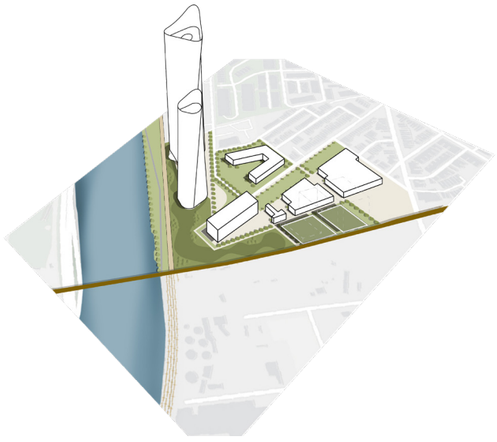


Gallery Massing

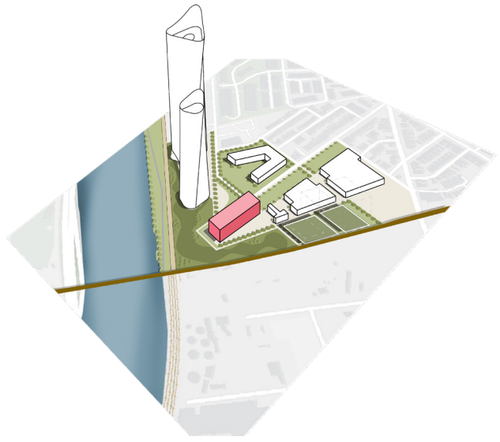


Roof Extension

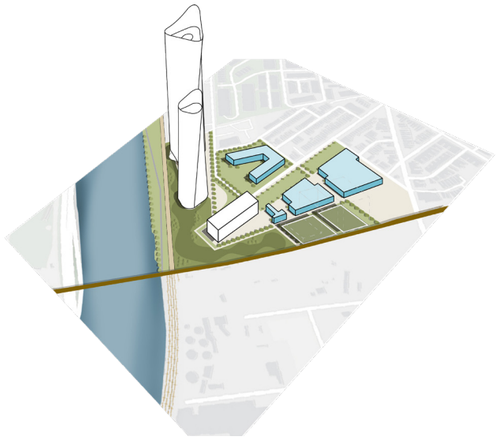
Site Analysis



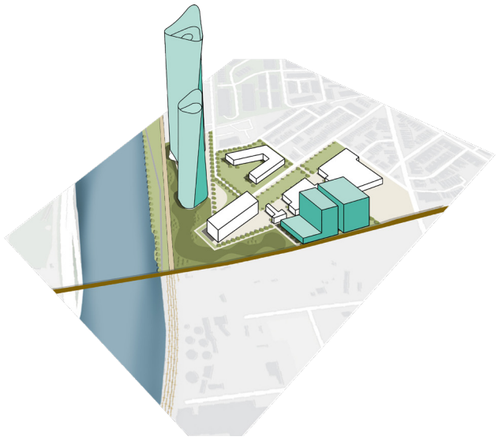
Site Axon



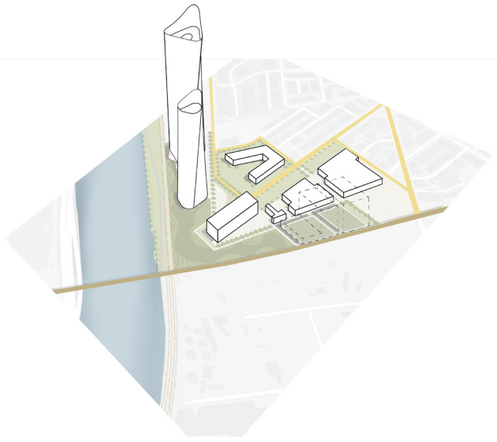
Preserved Existing Building



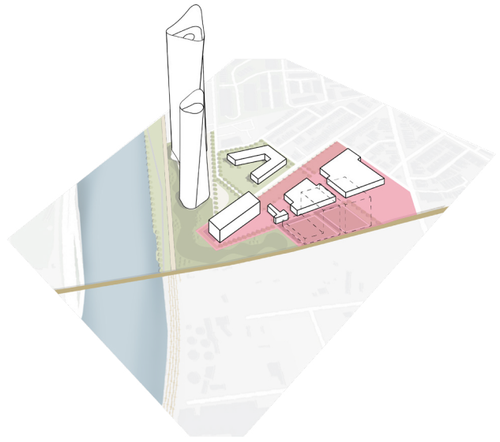
Health Science



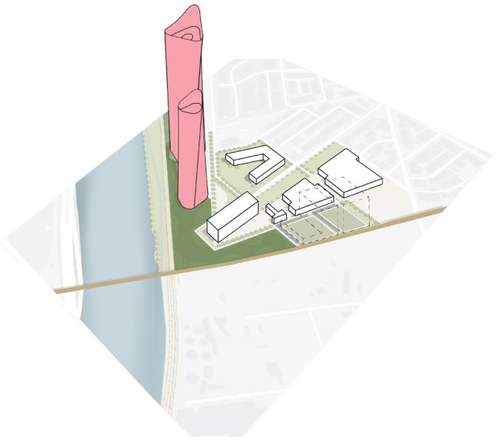
Mixed Use



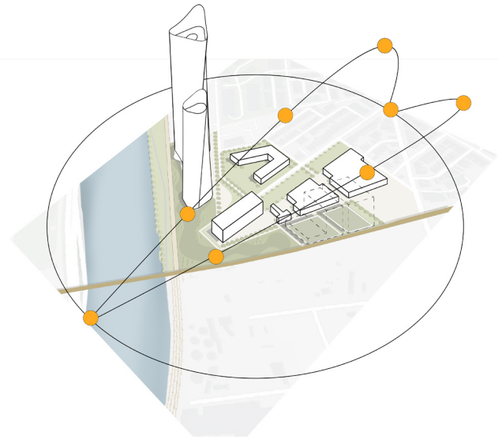
Vehicular Roads



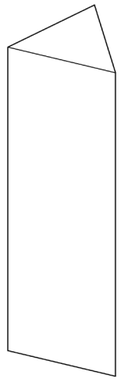
Pedestrian Zones



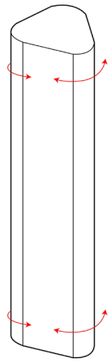
Green Space



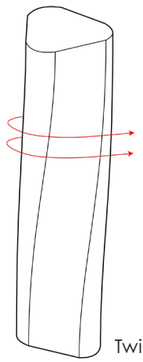
Sun Analysis



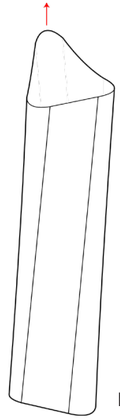
Triangle



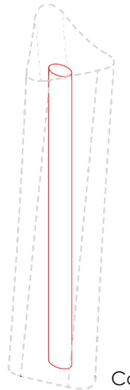
Rounded Edges



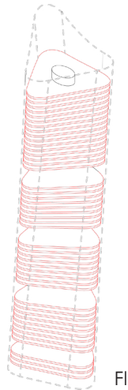
Twist



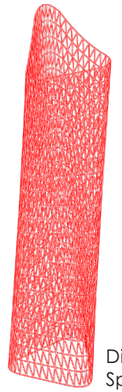
Raise



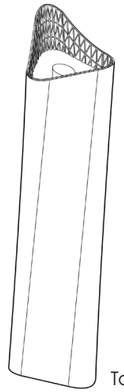
Core



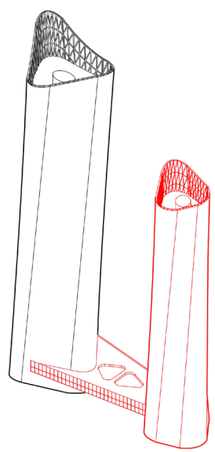
Floors



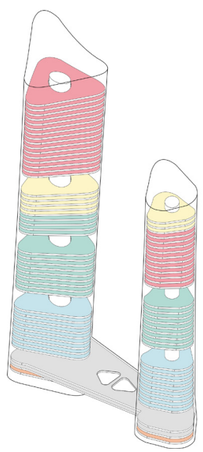
Diagonal Grid
Space Frame



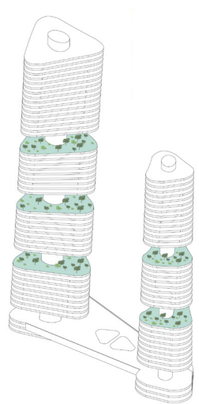
Tower 1



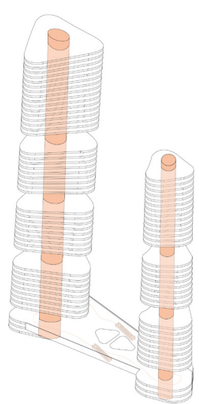
Tower 2 & Deck



Program



Winter Garden

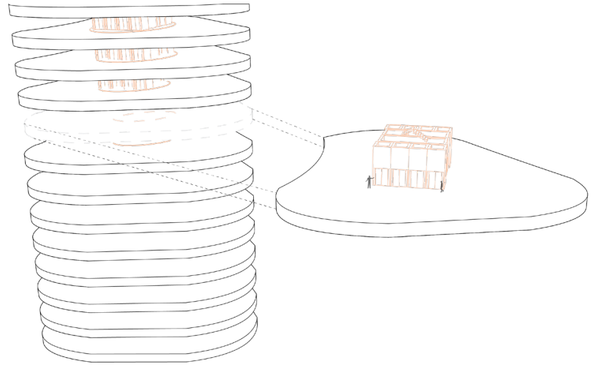


Ciruclation

Courtyard Perspective: Displays Health Science Building B, the Gallery, and Vicinity Tower

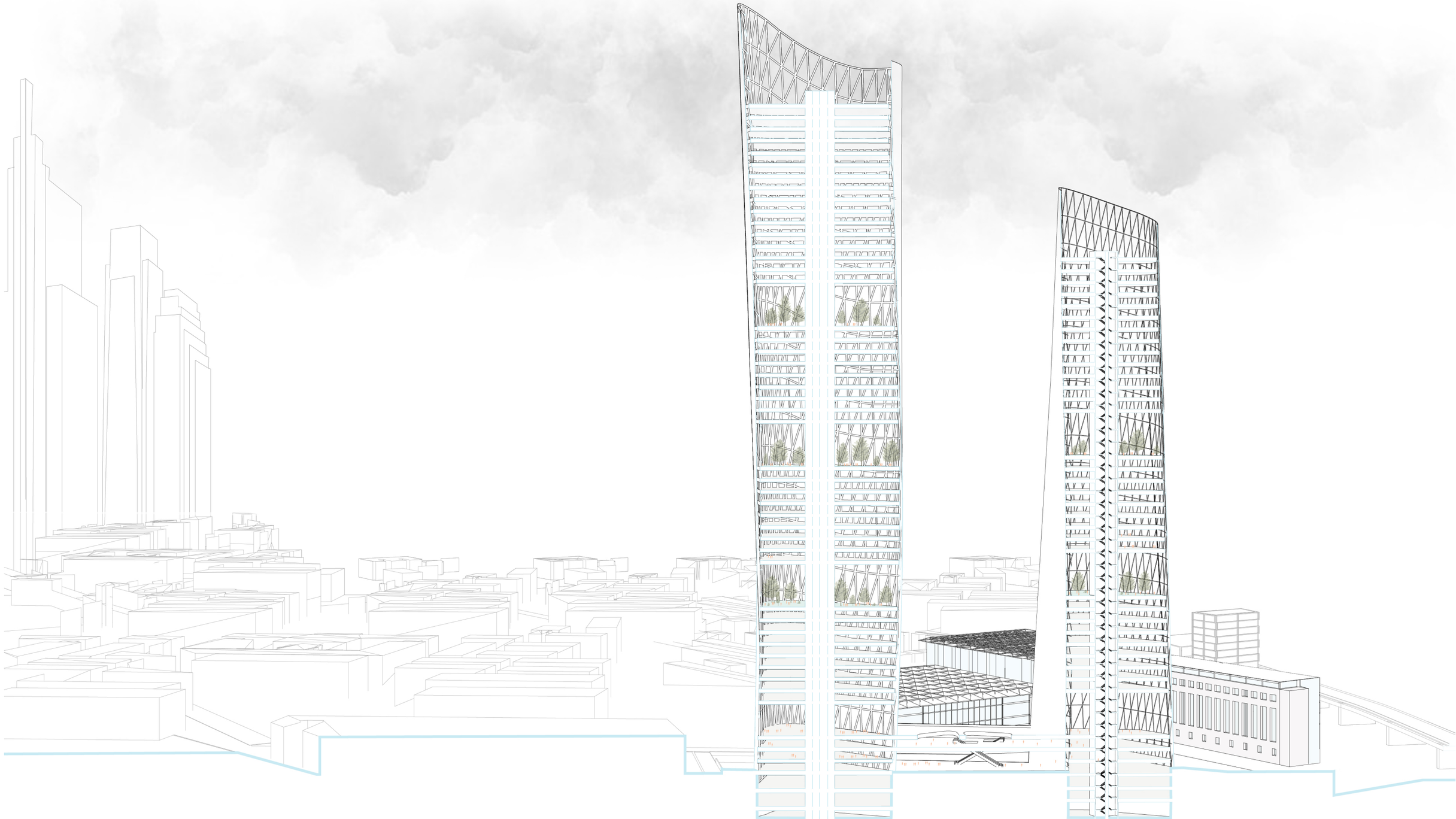
Vicinity Tower : Oblique Approach

Section A of Vicinity Tower: Displays the 2 Story Occupiable Deck, Ground Floor Plaza, and Marsh / Wetlands Implementation

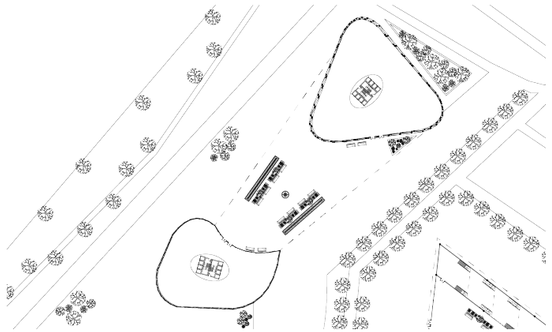


Core Diagram: Displaying the centered internal circulation that is made up of 8 elevators and 2 stairs.

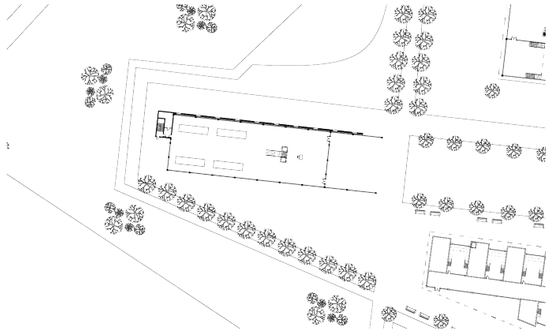
Vicinity Tower : Winter Garden



Section B of Vicinity Tower: Displays the Core, Winter Gardens, and Deck Circulation

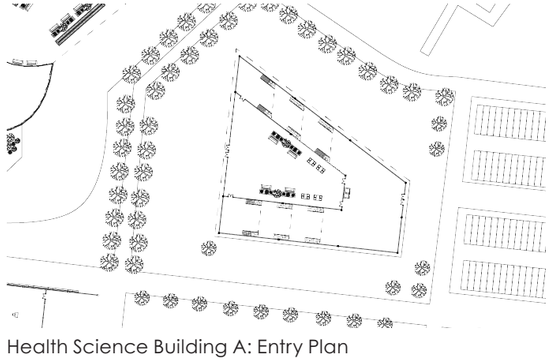


Vicinity Tower: Entry Plan

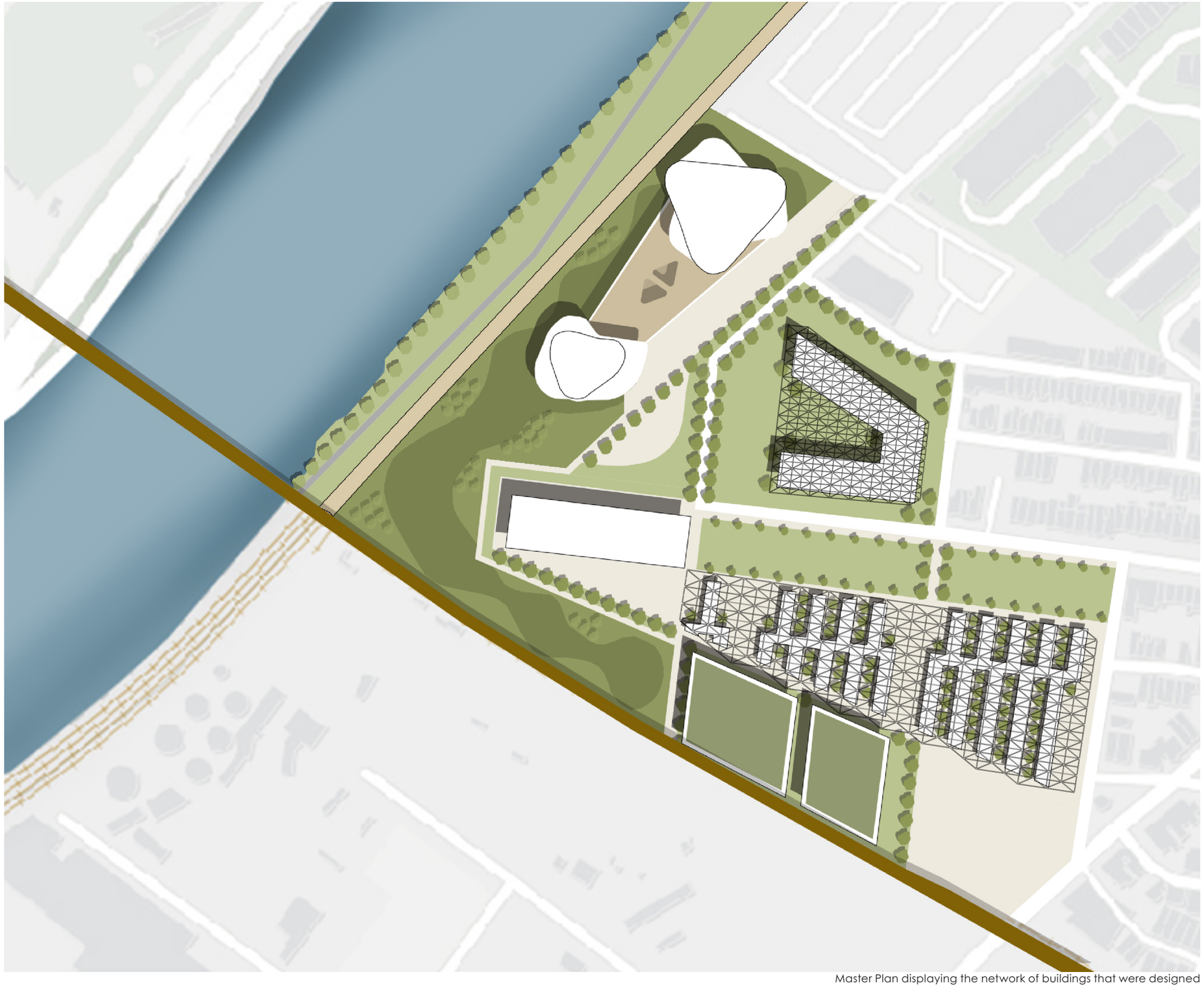


Gallery Space: Entry Plan

Health Science Building B: Entry Plan



Health Science Building A: Entry Plan



Master Plan displaying the network of buildings that were designed

Health Science Building A: Interior Perspective

The city of Venice is highly vulnerable to the impacts of climate change, particularly in relation to sea-level rise and flooding. As the sea levels continue to rise due to melting glaciers and thermal expansion, the city is becoming more prone to flooding and experiencing high tides.

Venice is built on a series of islands that are separated by canals and linked by bridges. The city's historic buildings, infrastructure, and cultural heritage are all at risk due to climate change impacts. The city is already experiencing more frequent and severe flooding events, with the most recent major flood occurring in November 2019, which resulted in significant damage to the city.

To address this issue, Venice has implemented a range of measures to protect the city, including building a series of mobile barriers called MOSE, which can be raised to protect the city during high tide events. Additionally, the city is also investing in sustainable urban development and adaptation strategies, such as the promotion of green infrastructure, and the restoration and preservation of historic buildings.

However, despite these efforts, the long-term viability of Venice as a city remains uncertain due to the ongoing impacts of climate change

VENICE
2050

Tronchetto Site
A Development
Tronchetto Site
B Development
Tronchetto Site
C Development
Iuav Campus
Expansion
Sacca San Biagio
Development
Arsenale
Development
Isola Sant'Elena
Development
0 m
500m
1000m
2000m

Tronchetto Site A Development
Santa Chiara, Venice

Daniel Paul, Onel Santiago-Medina

As the first thing visitors and residents on their approach to Venice, the Tronchetto A development should be a beacon of what the city represents and can be when reaching its full potential. Instead, visitors are currently greeted by two large warehouses and a concrete parking garage situated on underdeveloped and vacant land. In order to reinvigorate the local economy while improving the face of Venice, our development, Resurfacing Venice, begins by adding a new neighborhood in the city dedicated to the Venetians that keep the city alive.

The proposed development features a band of green residential infrastructure with modern villas, surrounded by community-building piazzas and streetscapes. As a barrier to the changing climate, the island will be surrounded with a new park system that rises above restored wetlands, helping to mitigate flooding to the rest of the lagoon. A central park and infrastructure hub at the top corner of the island will become a new spot for the community members to gather and enjoy their deep-seeded connection to the lagoon, as well as providing unobstructed views towards the Dolomites. This same park will also become the anchor that replaces the current parking garage as the first thing visitors see when arriving, imprinting them with the idyllic and romantic emotions that a city like Venice should evoke.

Aerial view of the stadium and surrounding green spaces.

View of the field within Stadio Pier Luigi Penzo.

Axon view of the green network added ot the site.

Axon view of the programmatic divisions on the site.

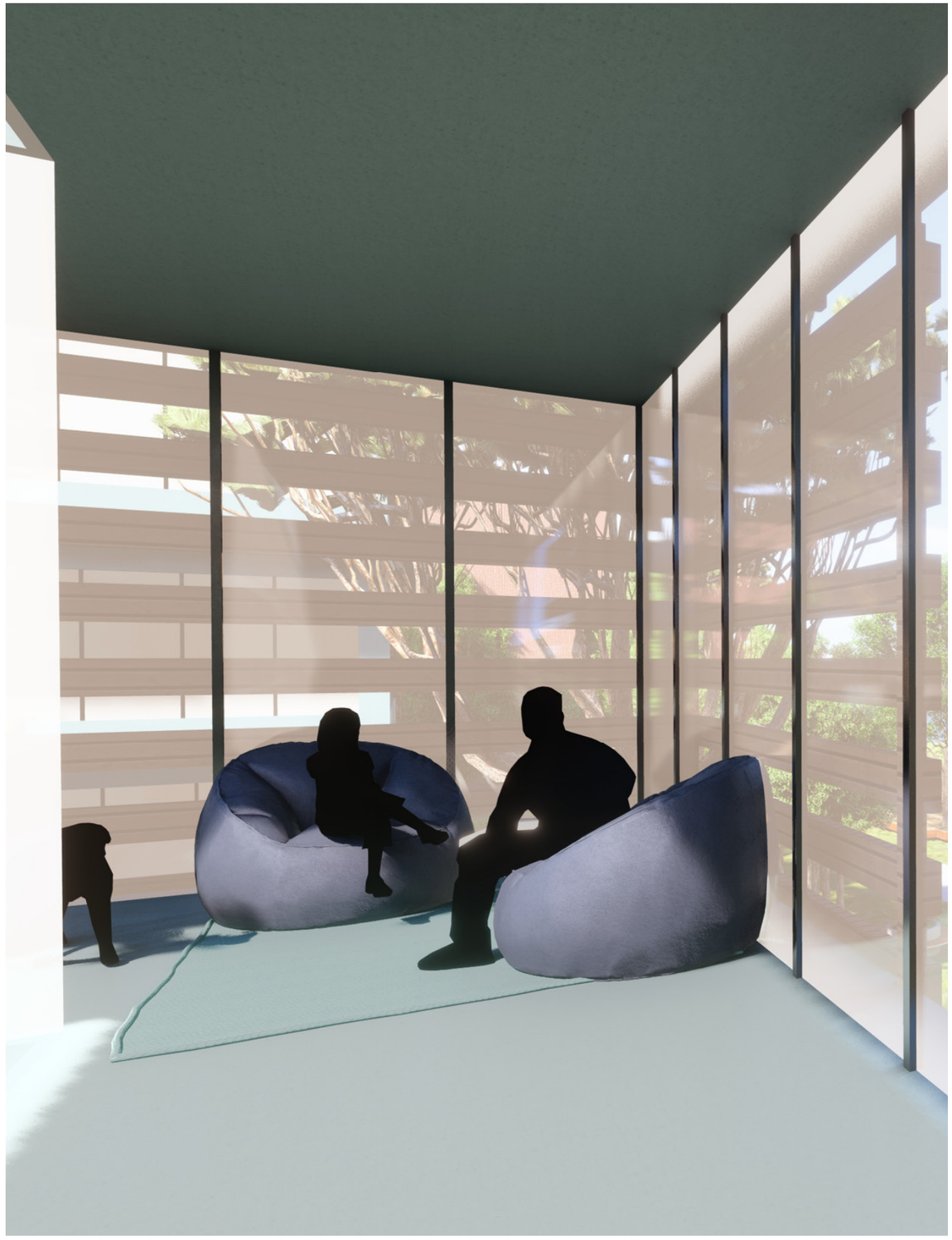
Axon view of the modified transportation network on the site.

Axon view of the projected population growth due to redevelopment.

Interior perspection of the Stadio Pier Luigi Penzo concourse.

Aerial view of the housing blocks in the first residential neighborhood.

Exterior perspective from a piazza space in the first residential neighborhood.



Interior perspective of a lounge space within one of the residential buildings.

Exterior perspective of the pedestrian pathways and piazzas within the residential zones.

Aerial view of the housing blocks in the second residential neighborhood.

Aerial view of the housing blocks in the second residential neighborhood.

Exterior perspective from a third floor balcony in the second housing block.

Tronchetto Site B Development
Santa Chiara, Venice

Joseph Falcone, Colin White

Taking into consideration impending climate threats, the Tronchetto Site B Development creates a resilient built environment that will thrive for years to come. The programmatic elements were carefully selected to best fit the needs of Venice, specifically its population and economic needs. Sitting at the south end of the site is a concert hall with connections that flow into the residential areas lining the entire west side of Tronchetto B. The right side of the site is occupied by commercial spaces and offices, which are then met by a series of closed, semi-open, and open air markets.

The roof systems of the concert hall and market spaces are layered with solar panels to promote the use of green energy along the island, while being surrounded by public green spaces. The green energy works cohesively with the autonomous bus line that functions as smart means of transportation from each end of the island. The open air market spaces are angled to promote proper air ventilation and other passive heating and cooling strategies. Between each island the implantation of green canals are used for dual purposes. One of these purposes being to divide the districts within Site B, as well as acting as retention ponds when necessary in the case of heavy rain or flooding.

Tronchetto B master plan showing the series of buildings proposed to revitalize the site.

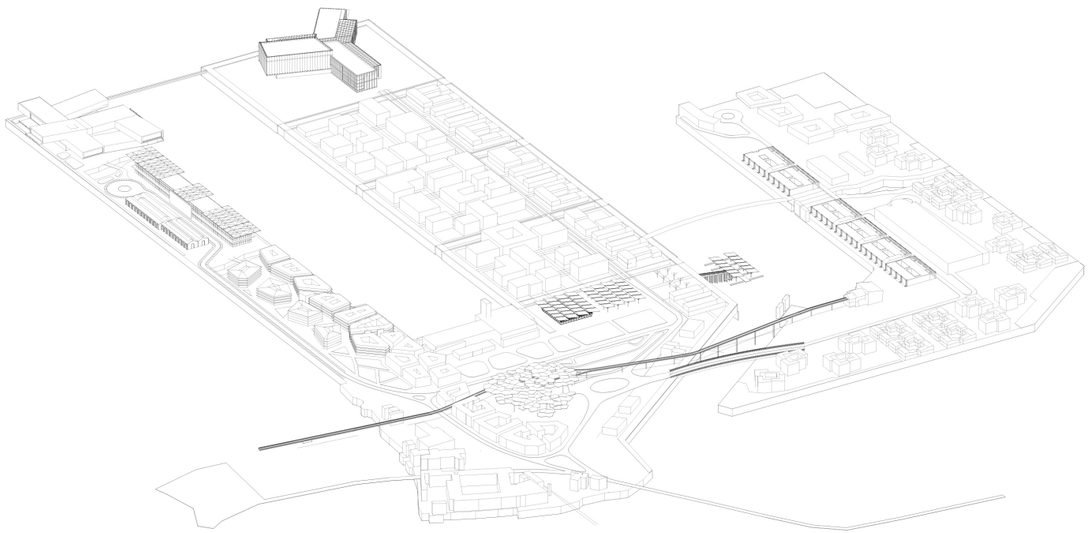
Programmatic Divisions

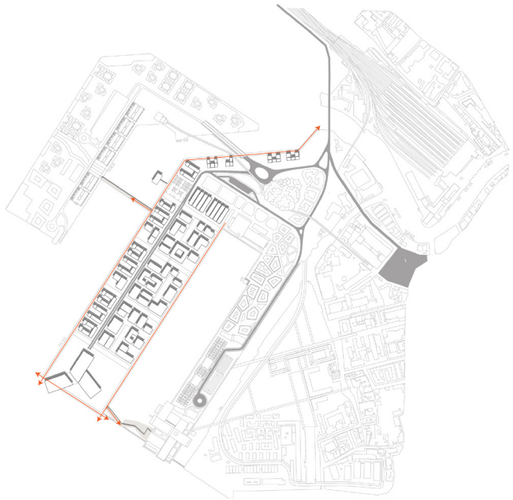
Master plan highlighting the 5 major programmatic divisions existing on Tronchetto B.

- Market
- Mixed Use
- Residential
- Office
- Concert Hall

Site Context

Tronchetto B site axon showing context of the fully designed Tronchetto.





Green Belt

Tronchetto B site plan showing the extensive green belt which wraps around site.

Pedestrian Corridors

Tronchetto B site plan showing the pedestrain oriented roads which intersect the site.

Autonomous Shuttle

Tronchetto B site plan showing the autonomous shuttle used to transport visitors up and down the site.

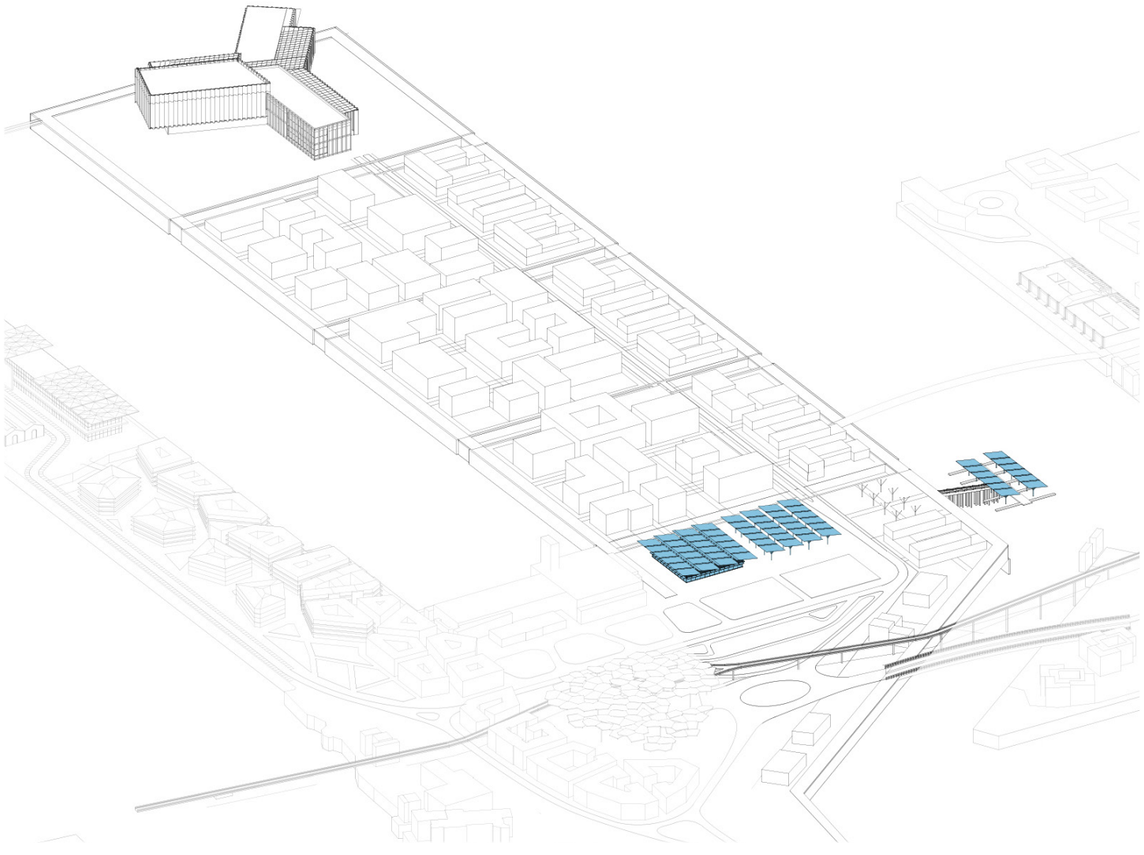
View of the intersecting pedestrain and vehicle roads with office and residential buildings displayed in the background.

View of the perimeter green belt, showing the pedestrain circulation network and extensive green spaces.

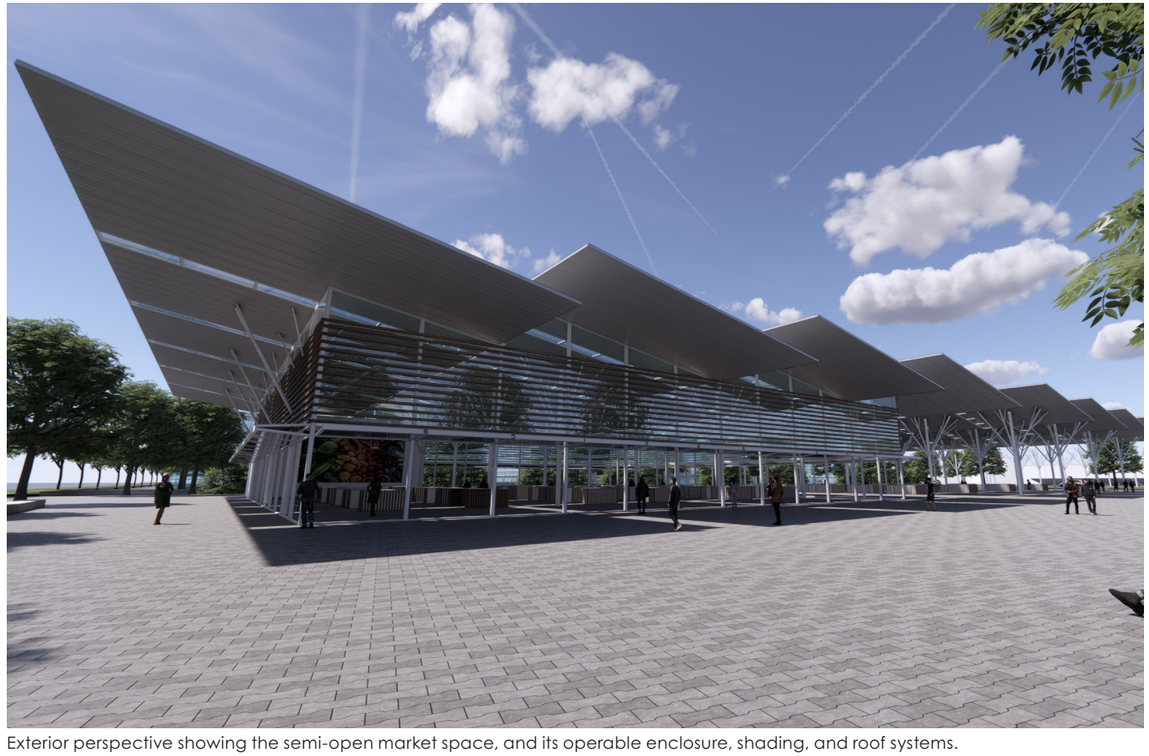
Venetian Market
Tronchetto B

Joseph Falcone

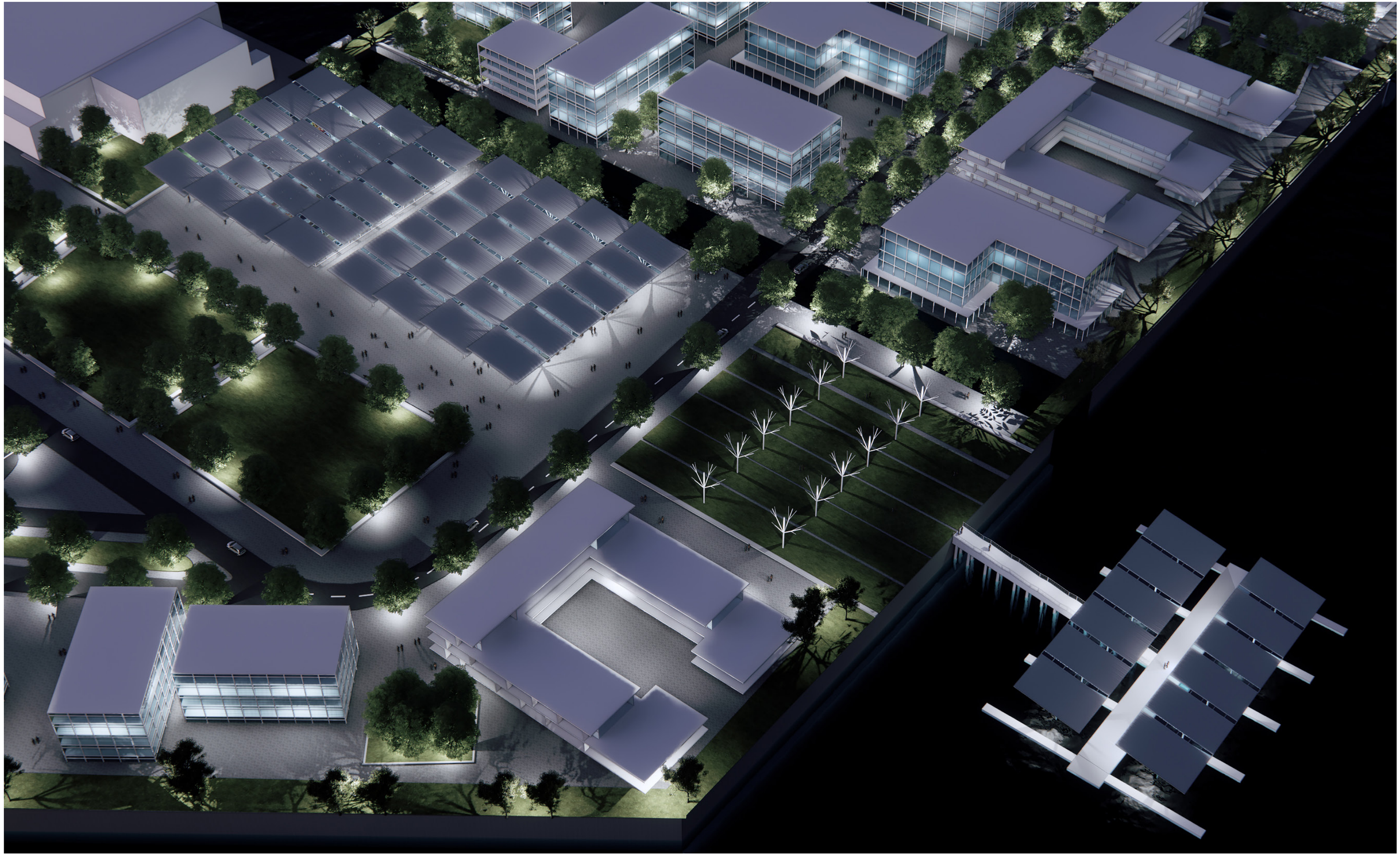
At the entrance of Tronchetto B stands a series of market spaces. A closed, semi-open, open and covered boat dock are linearly arranged to promote continuity throughout the site. These resiliently designed forms use the environment to their advantage. Understanding the sun exposure, and prevailing winds, the roofs were angled to embrace those conditions with angled roofs that promote passive cooling and absorb green energy with the solar panel layered roofs. The market spaces also stand versatile in circumstances of flooding especially the closed market space due to the ability to remain completely closed and even open if needed to combat storm surges or flooding



Interior market perspective showing the structural and roof components, as well as moving vendor carts.



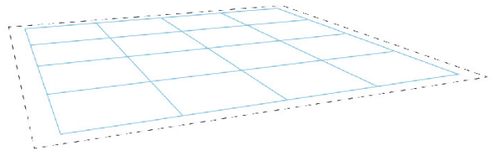
Exterior perspective showing the semi-open market space, and its operable enclosure, shading, and roof systems.



Aerial view showing the main series of market spaces and the surrounding context.

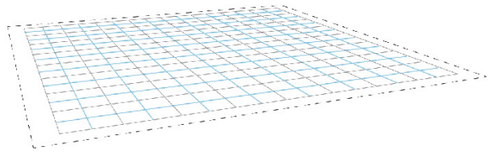
Base Grid

Site divisions to dictate structure, rooflines, and facade divisions.



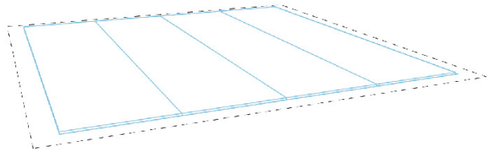
Subdivision

Further division of site grid to define interior and spatial use.



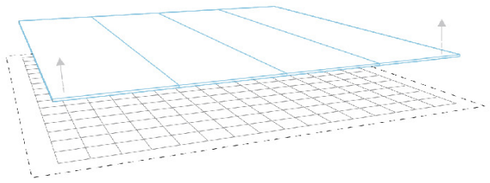
Roof Divisions

Horizontal divisions along base grid dictate rooflines.



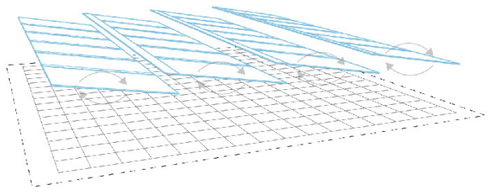
Elevate

Divided roofs are raised to create occupyable spaces below.



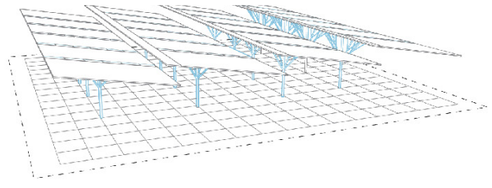
Angle

Roof planes are precisely angled to prevalent winds and sun to passive heating and cooling.



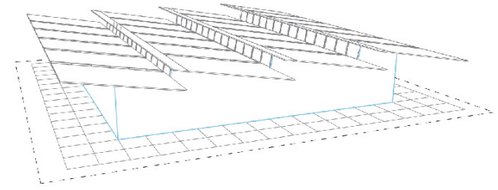
Structure

Structural trees provide support for the market roofs and emulate the trees in the green belt on the site.



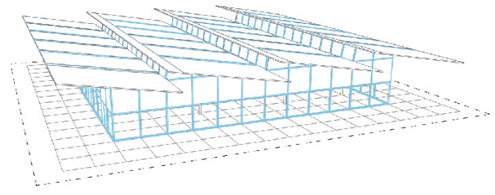
Volume

The occupyable space of the market is defined.



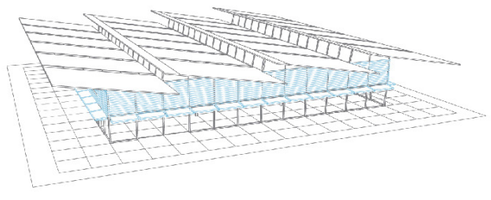
Enclosure

Occupyable volume is enclosed by glass facades sized to align with the subdivided grid.

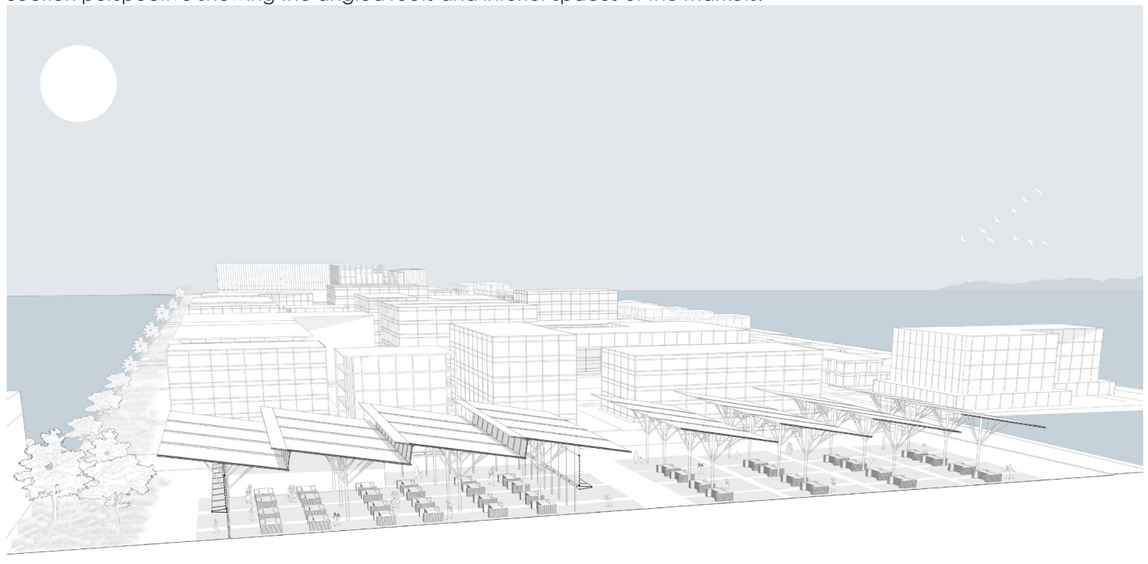


Operability

The divided facade operates to allow for passive heating and cooling, and provides connections to the outdoors.



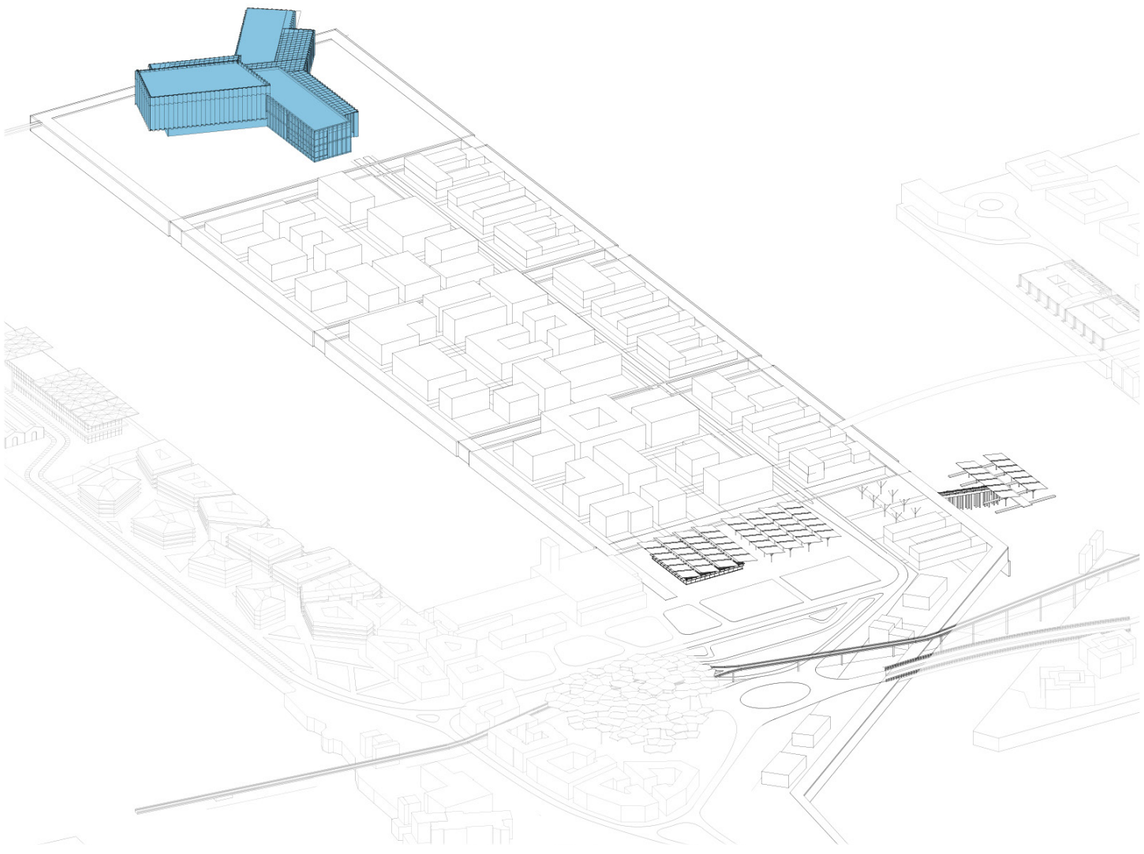
Section perspective showing the angled roofs and interior spaces of the markets.



Concert Hall
Tronchetto B

Colin White

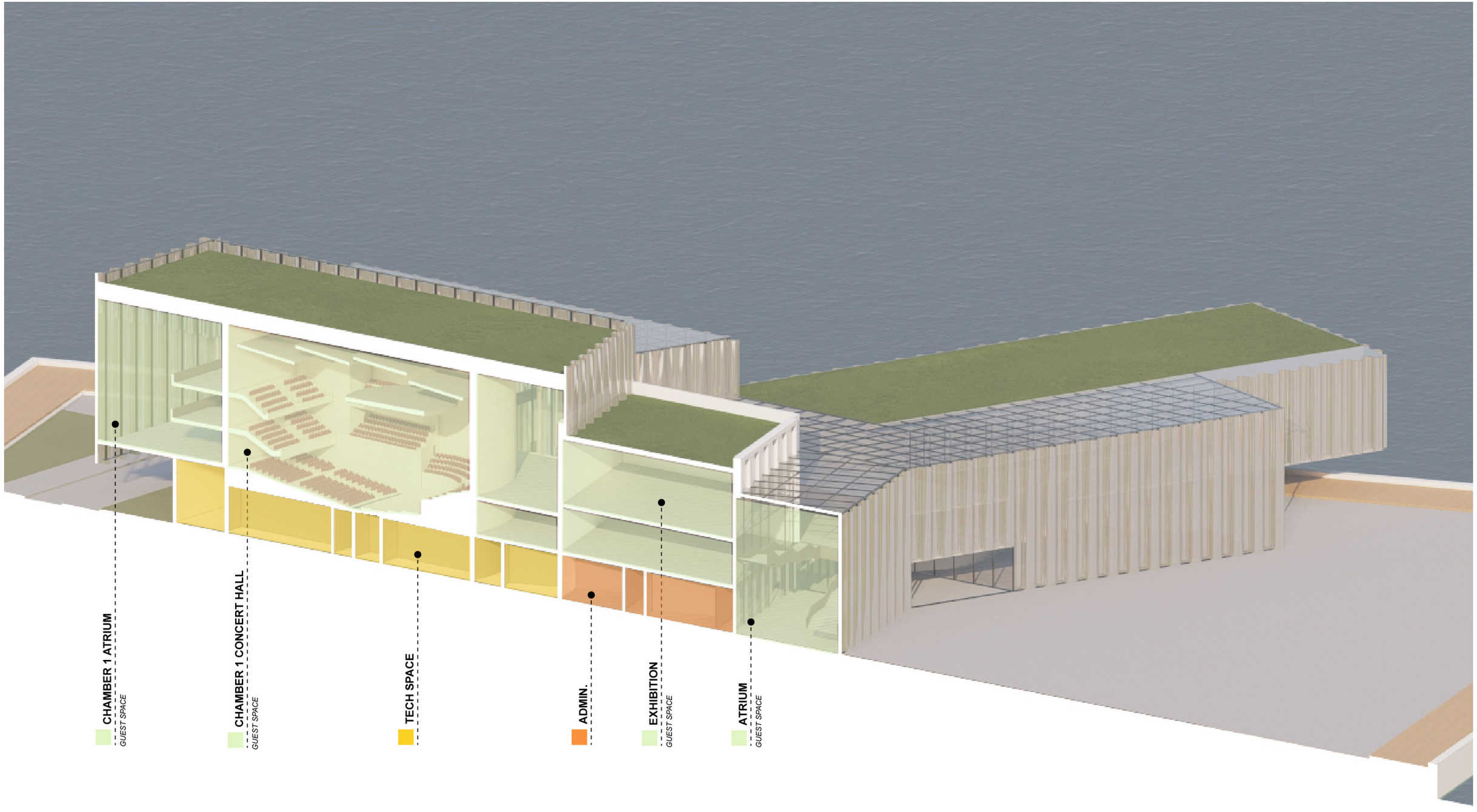
As a key focal point of Tronchetto B, the concert hall was designed with a strong focus on views if the surrounding city and lagoon. The concert hall sits at the end of the redeveloped Tronchetto B, and overlooks the Venetian lagoon. The project consists of two chambers, one angled toward the historical center of Venice, and the second chamber angled towards the Dolomites in the distance. The wavy glass facade is inspired by the Venetian water, while also connecting to simple musical theory rules such as repetition and melody.



Interior perspective of main lobby showing the glass facades which provide natural lighting and an airy feeling in the space.

Interior perspective of main lobby showing the glass facades which provide natural lighting and an airy feeling in the space.

Interior view of the main concert hall showing the wavy facade and performance space.



Perspective section cut through the main chamber of the concert hall, showing adjacent program and scale.

Exterior view of the concert hall from the water, looking north.

Tronchetto Site C Development
Santa Chiara, Venice

Gabriella Bellino, Jacqueline Thornton

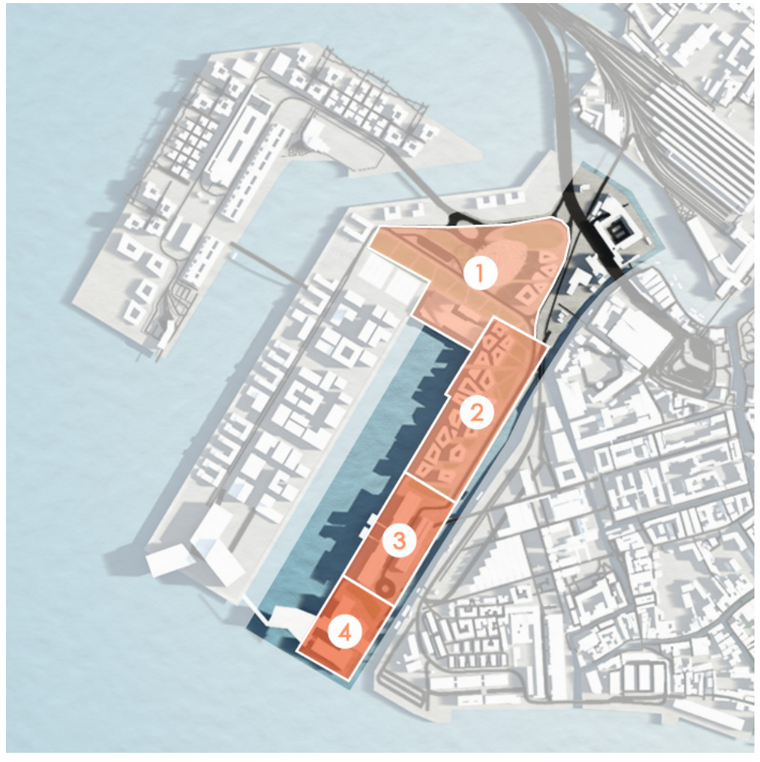
Today, the needs of the Tronchetto are exceedingly different from the time of their original design and as a result, the site today is highly underutilized. Originally designated as a parking lot for the adjacent cruise terminal, the parking spots now are vacant and negatively impact the environment through hardscape runoff, increased heat island effect, and inefficient land use. The site's lack of a significant purpose in a post pandemic world has no draw for visitors to Venice, and has poor connections to the city center.

Re-purposing this site by implementing modern sustainable technology and efficient programming will negate environmental impacts due to its current condition. Implementing these meaningful programmatic elements will add appeal to the site, making the area a point of interest for visitors and residents of the city.

The master plan divides the site into four zones, each with elements that increase transport efficiency, provide connections to the rest of the city, and create spaces that attract visitors and residents to educate and immerse them in Venetian culture. A green network weaves through all zones of the site providing access to public parks and green piazzas, decreasing the runoff caused by the existing hardscape in the area.

Our master plan will relieve Venice from its oppressive density and make room for another iconic location in the city. Sustainable technologies like photo-voltaic panels and retention ponds will be implemented to generate clean renewable energy, and work to decrease negative environmental impacts.

Tronchetto C master plan showing the proposed and existing buildings on the site.



Programmatic Divisions

Tronchetto C is divided into four zones, each with a distinct programmatic use.

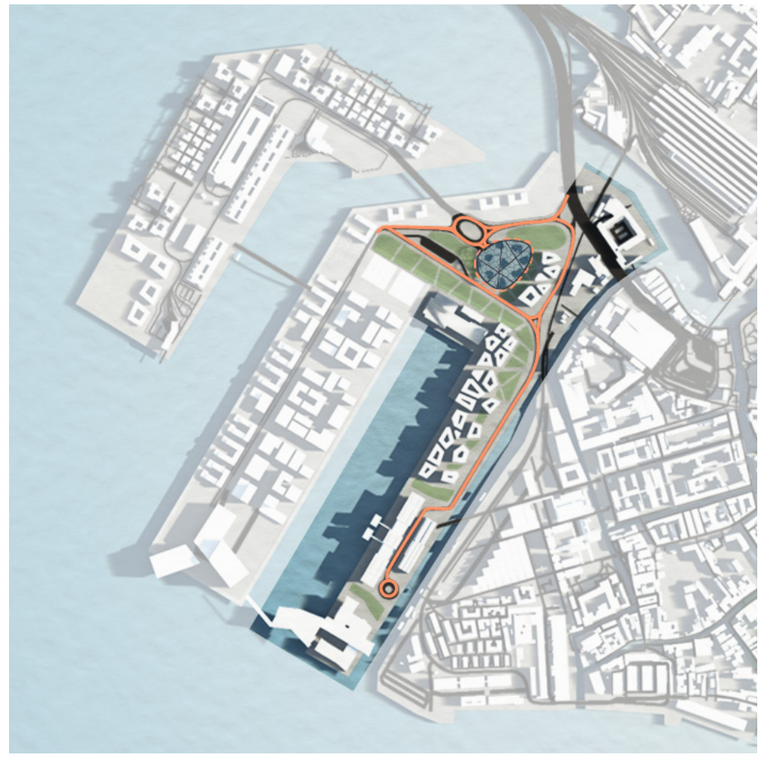
1. Transportation
2. Housing
3. Cultural Experiences
4. Exhibit/Gallery Space

Green Network

The extensive green network on the tronchetto site provides green spaces adjacent to all buildings on site, reduces runoff and heat island effect, and promotes biodiversity.

Vehicular Circulation

The new vehicular circulation network exists in addition to the existing road network, and interacts with the transportation hub at the entrance to the site. This hub works to decrease reliance on personal transport methods and allows access to all areas of the tronchetto when needed.



Pedestrian Circulation

The main corridor of the pedestrian circulation network intersects each zone of the tronchetto providing access for all visitors. Smaller branches stem from the main corridor and provide direct routes for residents of the area.

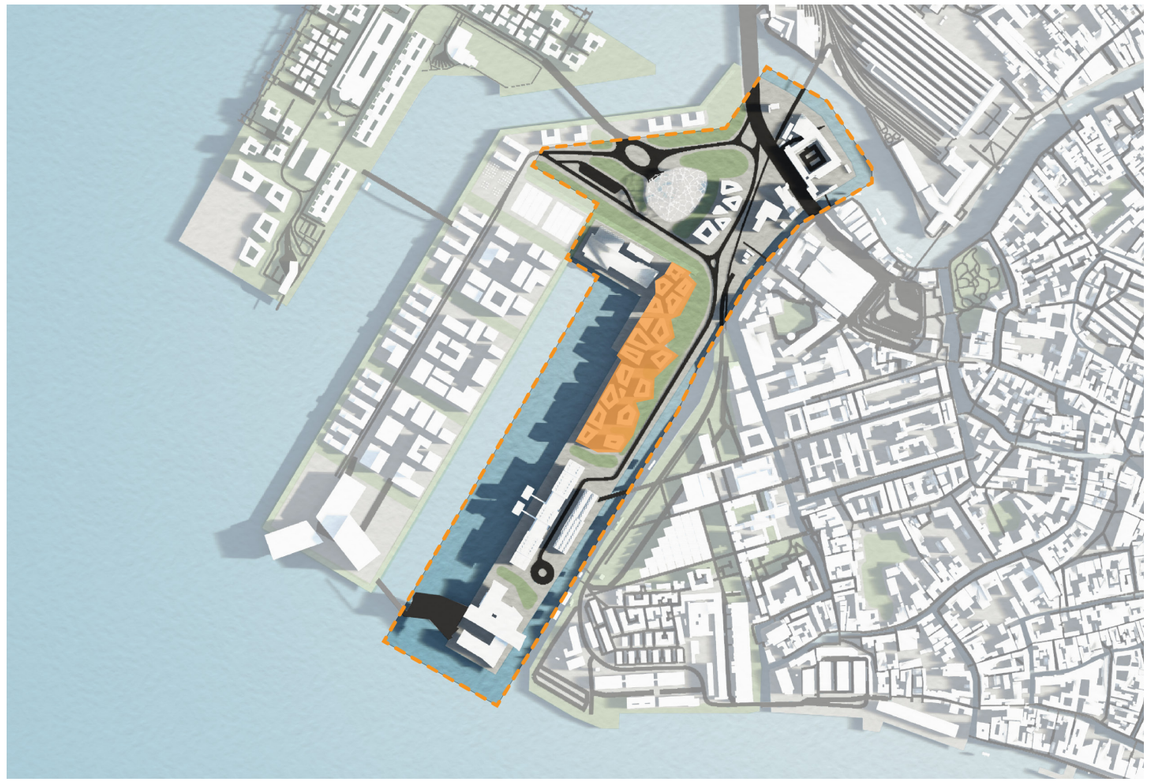
Aerial of the Tronchetto C site

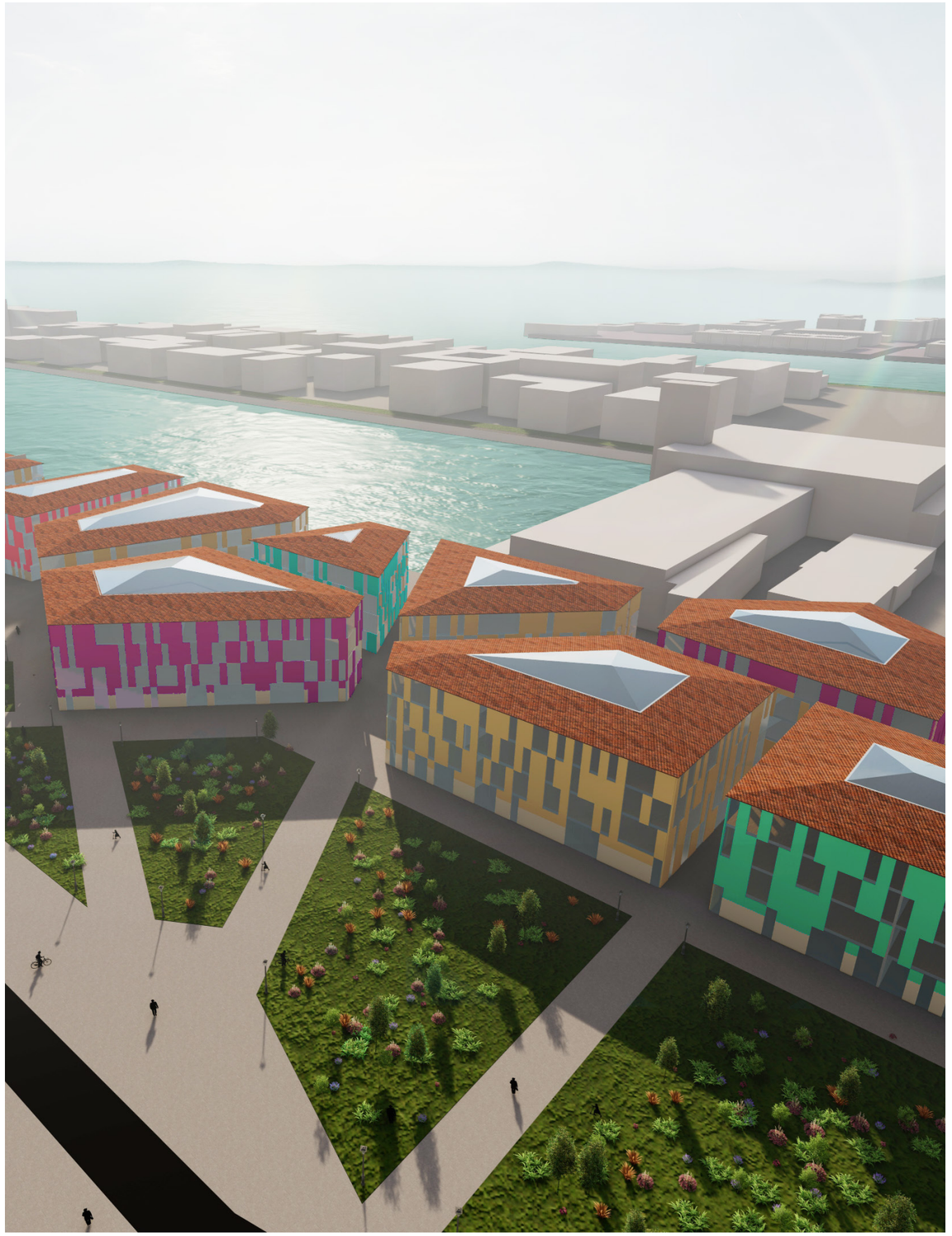
Transportation Hub and Housing
Tronchetto Site B, Venice

Gabriella Bellino

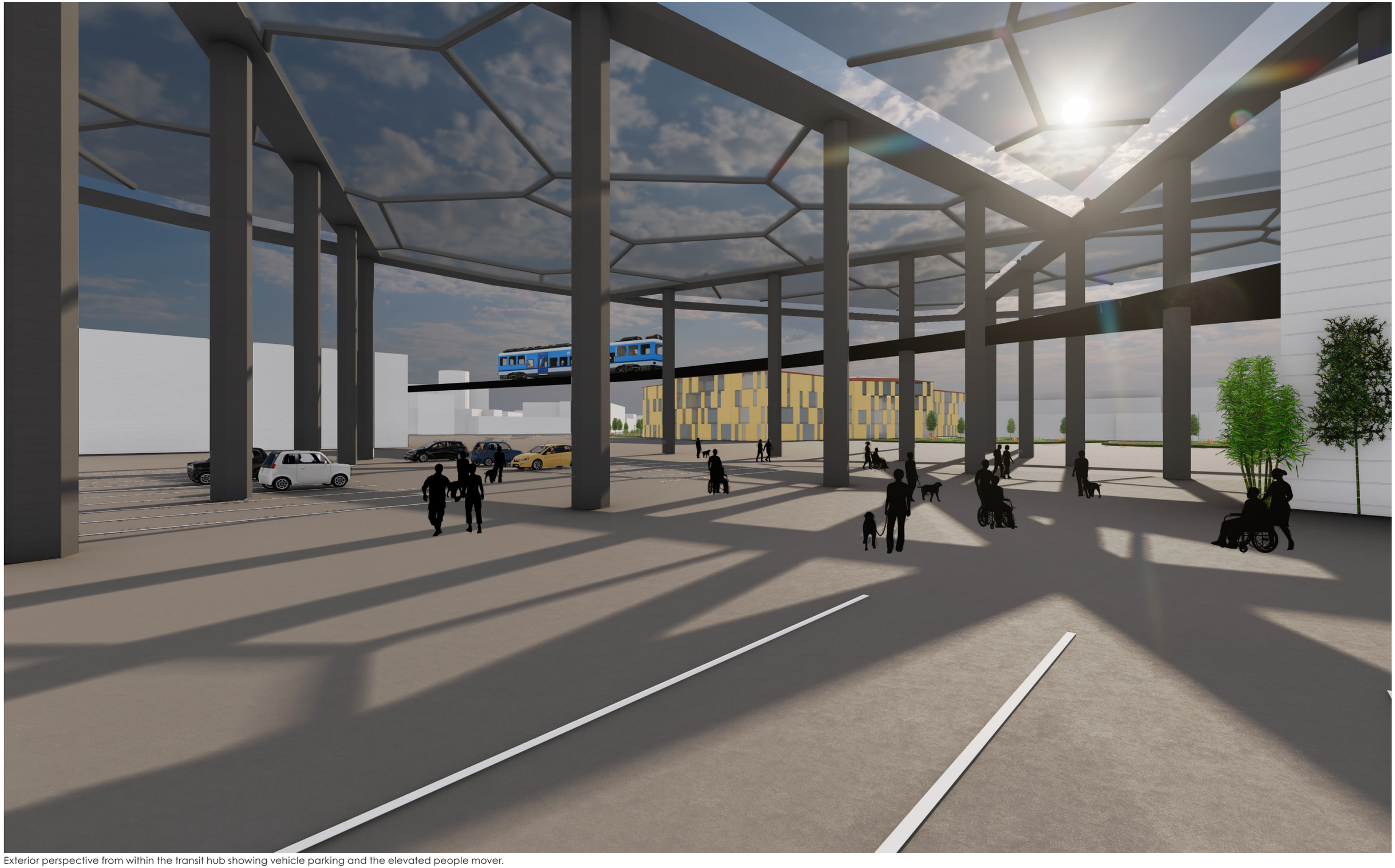
At the entrance of the Tronchetto sits the newly designed transport hub, with connections to Mestre on the mainland and the historical center of the city. The transport hub brings all methods of transportation under one roof, and houses short term parking, a drop off zone for visitors arriving via bus, and the people mover which provides a connection between the tronchetto and the historical areas of Venice. The roof pattern of the hub draws inspiration from the islands of Venice, and hosts an array of photo-voltaic panels for energy collection.

Just beyond the transportation hub is the housing development. This development consists of 17 unique buildings designed to provide housing geared towards university students and local artisans. On the lower levels, there are shops and studio spaces designed for resident use, and the upper levels host one and two bedroom apartments. Each building is adjacent to a park or piazza space, and each apartment has a balcony overlooking one of these exterior green spaces. The central atriums of each building are home to gardens allowing access to green space in every season. Each building has solar panels on its roof to collect energy, and the facades use thermal massing and high efficiency glazing to minimize the amount of heating and cooling needed.



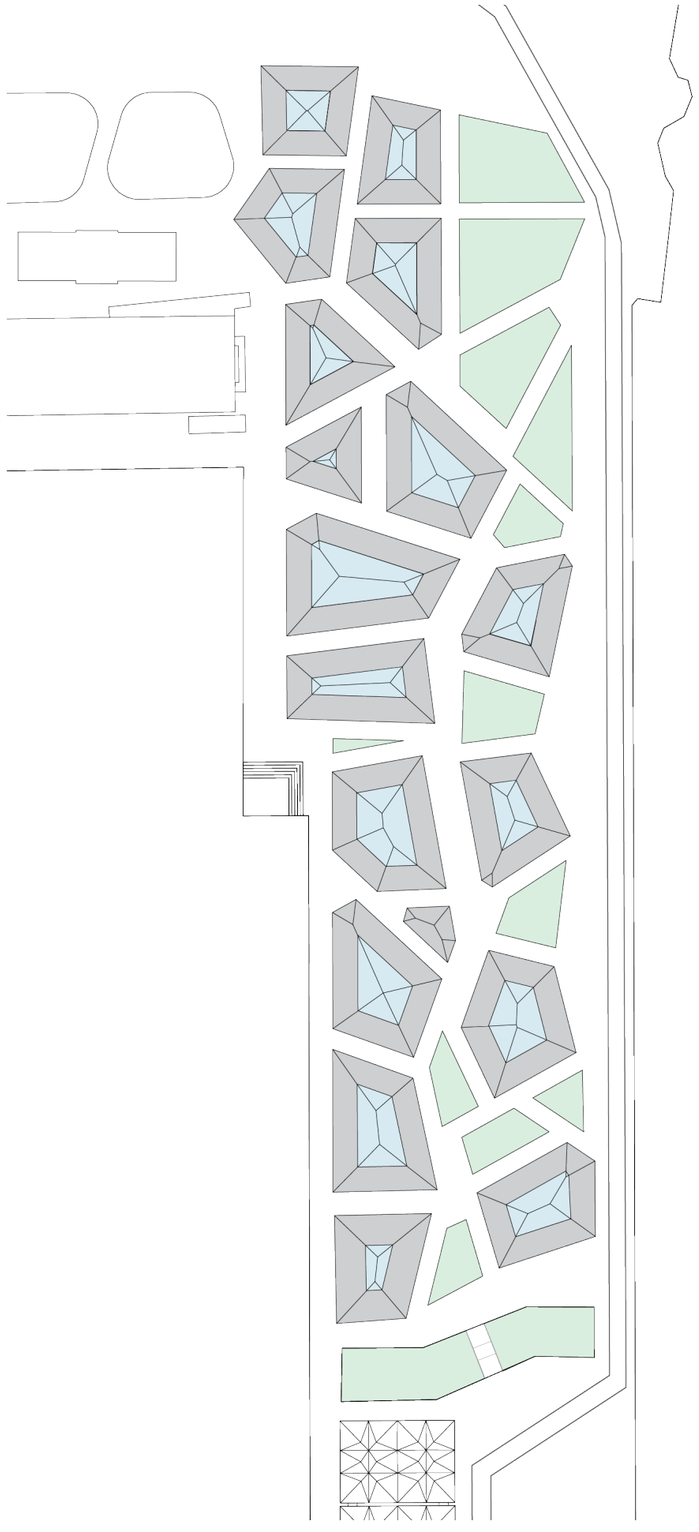


Aerial view of housing buildings and green spaces.



Exterior perspective from within the transit hub showing vehicle parking and the elevated people mover.

Exterior perspective looking into public green spaces with housing buildings in the background.

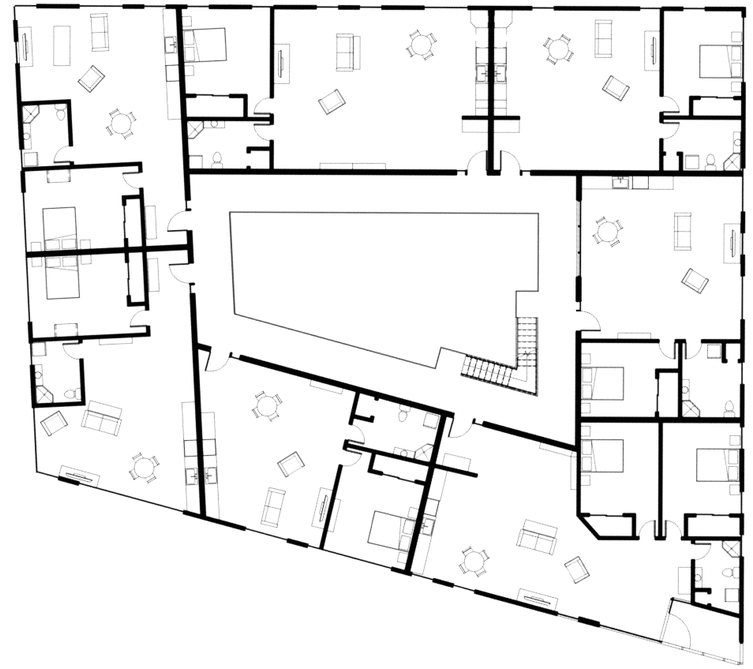


Housing Zone

The housing zone is divided following major lines around the site to keep physical and visual connections with the rest of the city. The individual buildings are all located in close proximity to either a green space or a centralized piazza.

Typical Floor Plan

A typical floor plan of one of the housing buildings. Each building has a variety of one and two bedroom units, and each unit has a balcony space with operable enclosure making them usable in all seasons. The central atriums of each building contain garden spaces providing residents with access to green spaces in all seasons and providing passive cooling.



Building Facade

The materiality on the housing buildings are indicative of the spatial usage on the inside and provide an additional aspect of sustainability. On the ground level, the Istrian stone marks commercial spaces and the upper residential levels, have a typical stucco finish. Typical wall construction provides thermal massing, and high efficiency glazing reduces energy loss, while solar roof tiles provide clean energy collection.

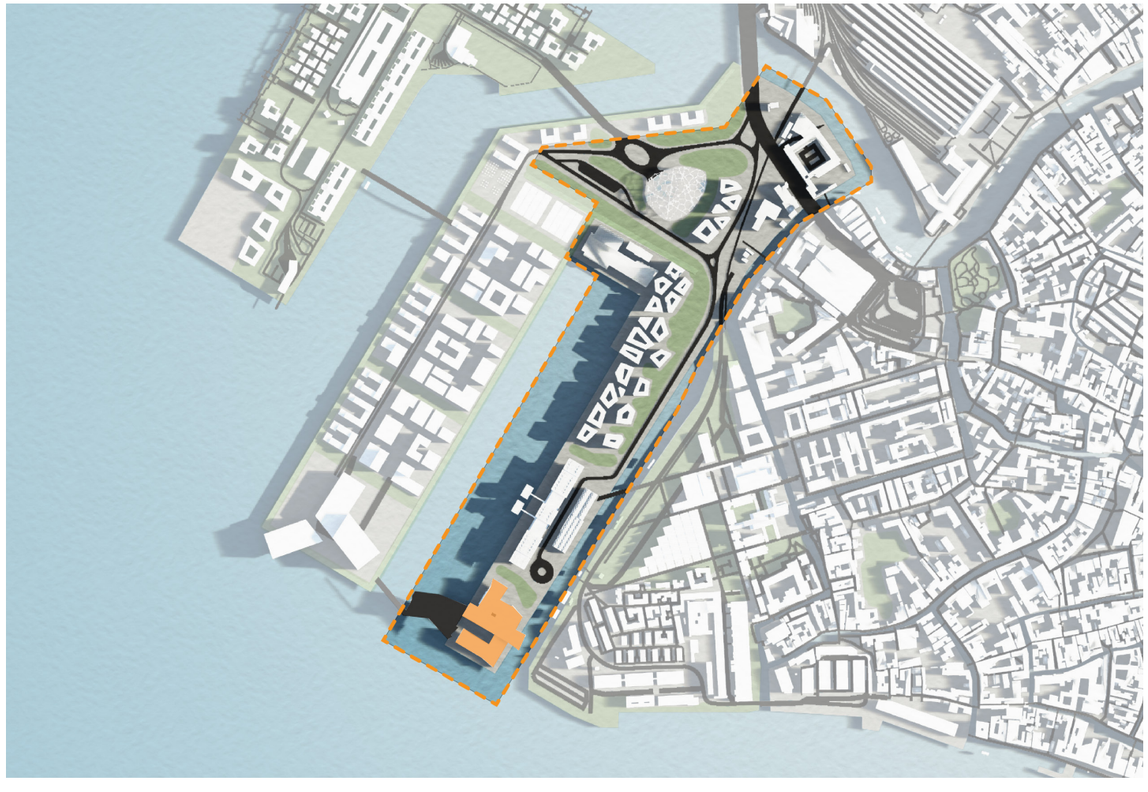
Interior perspective of atrium green space.

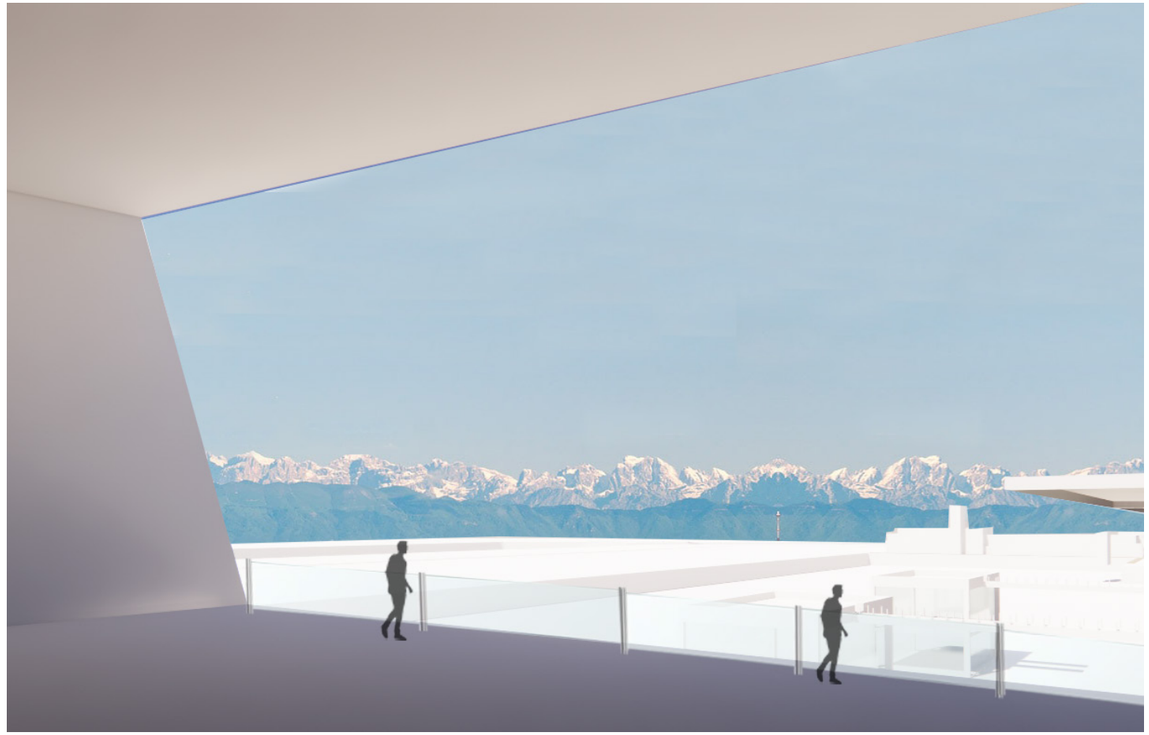
Venice Culture & History Museum
Tronchetto C

Jacqueline Thornton

Situated at the very end of Tronchetto C, is a museum exhibit that teaches about Venice's cultural history and surroundings. The museum hosts multiple gallery spaces, a library, a restaurant, balcony space, and a shop. Visitors can comfortably navigate the museum and its surrounding site as the building utilizes cantilevering forms to create occupiable interior and exterior spaces, and to ensure that water can move and drain easily.

The museums form juxtaposes typical Venetian buildings while creating a home for itself within the culture of the city and region. Its clean and sleek aesthetic contrasts the intricate ornamentation of the Venetian Gothic style, but takes advantage of the vast volumes and spatial awareness of the churches and renovated structures in the city. The large protruding volumes direct the visitors eyesight to a specific view that has been deemed important to the culture and history of the city and region. On the lower level, the museum includes a piazza space that has connections to Tronchetto B via pedestrian bridge. The piazza space provides another gathering area close to the water, and also serves as a vaporetto stop.

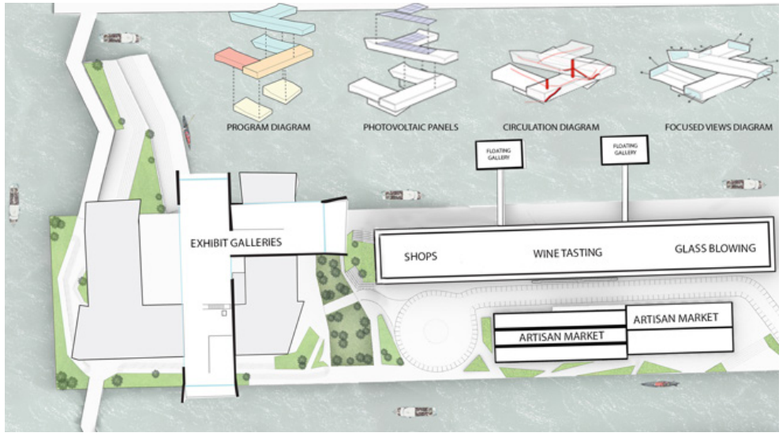




Interior perspective from gallery space with views directed towards the Dolomites

Interior perspective of the illuminated, spacious library offering information on a range of topics.

Aerial view showing the connections to the surrounding site via pedestrian walkways and vaporetto lines.

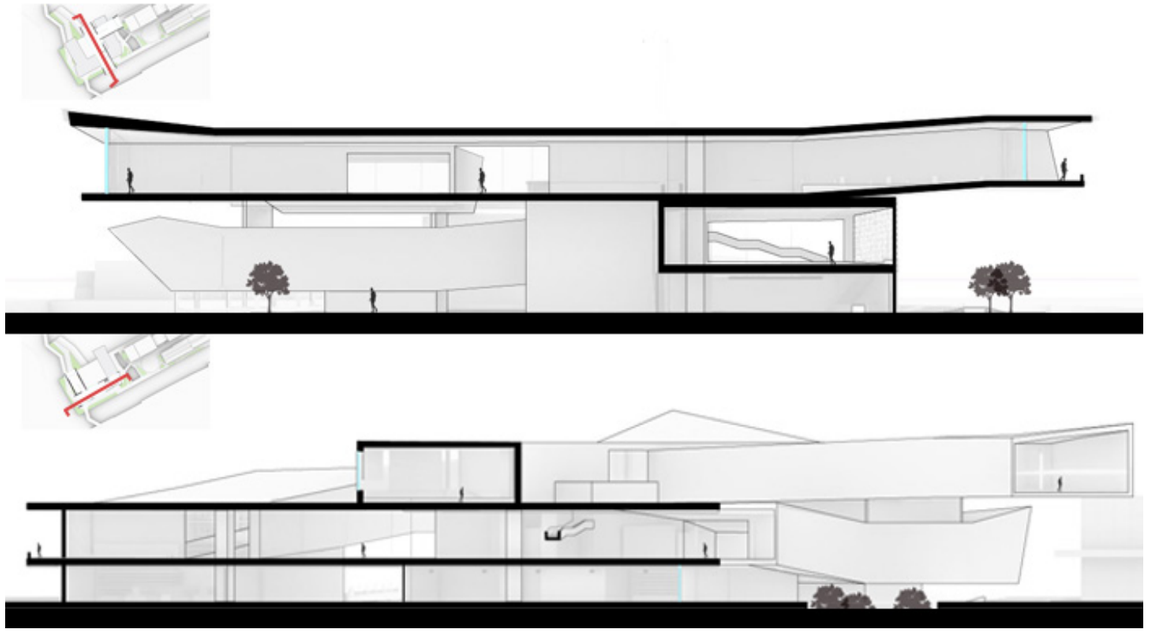


Site Plan

To access the museum, visitors pass between the Artisan Market in a renovated industrial building, and a multipurpose experience space existing in the renovated cruise terminal. Visitors can participate in wine tastings, glass blowing, and other shopping. Additional museum spaces exist in glass boxes attached to the terminal that sit in the water and display historical boats of Venice.

Sections

These sections cut through the second floor space and third floor gallery (top) and the second floor restaurant and ground level piazza and exterior circulation spaces (bottom).



Exterior perspective from the pedestrian bridge connecting to Tronchetto B with a view of the floating exhibit boxes visible in the water.

Aerial view of the pedestrian bridge which links the tronchetto sites together.

Interior perspective of the gallery wing which views the city center and displays historic and cultural Venetian pieces.

View from exterior plaza space showcasing the ornamental facade which draws inspiration from the Venetian Gothic style.

Iuav Campus Expansion
Dorsodouro, Venice

Joseph Sauers, Giovanni Ruiz

The Universita Iuav di Venezia is the premier location in Venice, and the North-East region of Italy, for higher education in the arts. Currently, the Campus is tucked in the Southwest corner of the Venetian Historical Center. The IUAV expansion project extends the university's programmed spaces, provides additional on-campus housing for a growing student population, and continues connections between the tronchetto sites and the historical center of Venice. The urban gesture fills in previously vacant land to the North of the existing campus.

New buildings will include state-of-the-art design facilities, a sporting complex, much needed on-campus student housing, and a commercial district connected to Rio Tera dei Pensieri. The new construction will be self-sufficient through sustainable strategies like solar collection, rain collection, and thermal heating and cooling. A new urban grid establishes simpler transportation by increasing access to the site and nearby neighborhoods. Connecting the new and existing campus is a linear park that borders the waterfront of the lagoon. The park acts as a buffer to protect the campus while giving the communities around the school green space for recreation.

Master plan of the Iuav Campus

Campus Expansion

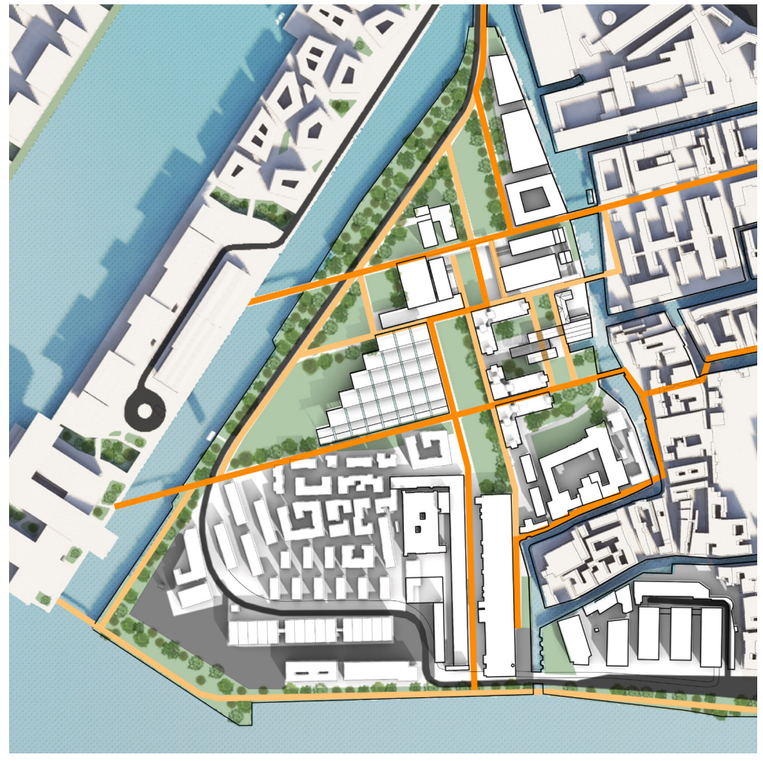
New building proposals for the Iuav Campus.

Program Groups

- Commercial Area
- Academic Facilities
- Student Housing
- Sports Complex

Circulation

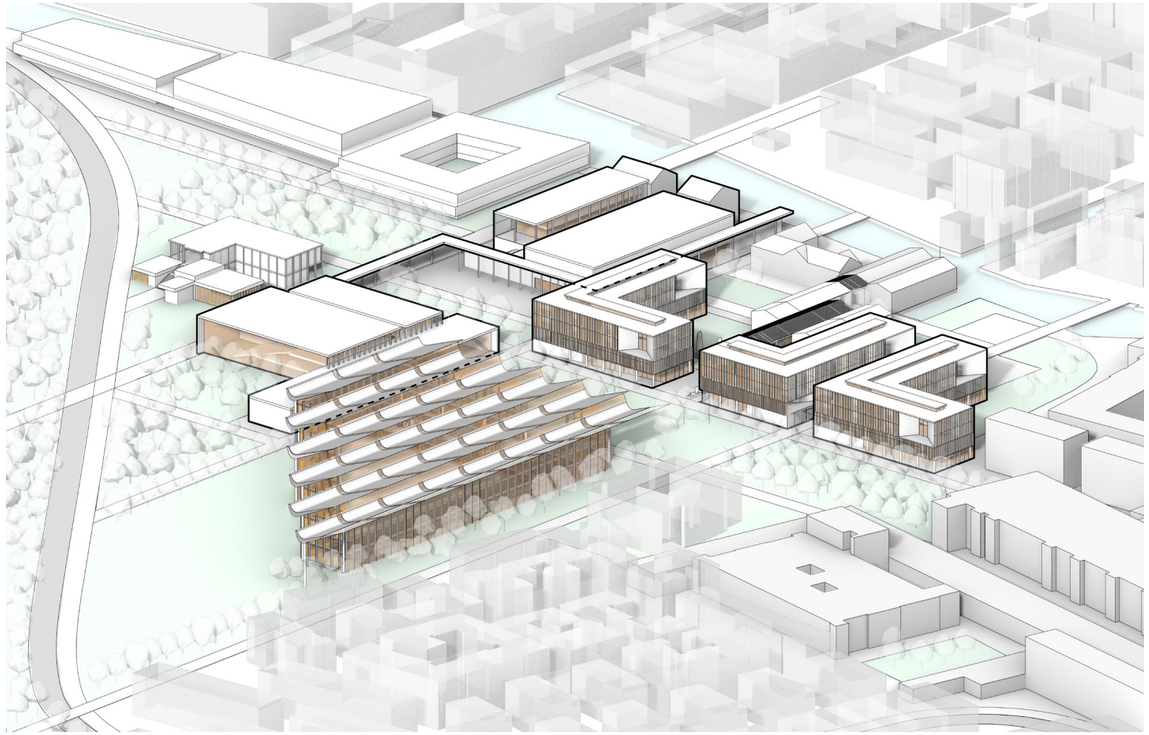
Additions to the existing pederstrian circulation network follow prominent site lines and create connections between the Iuav Campus and the Tronchetto Sites.



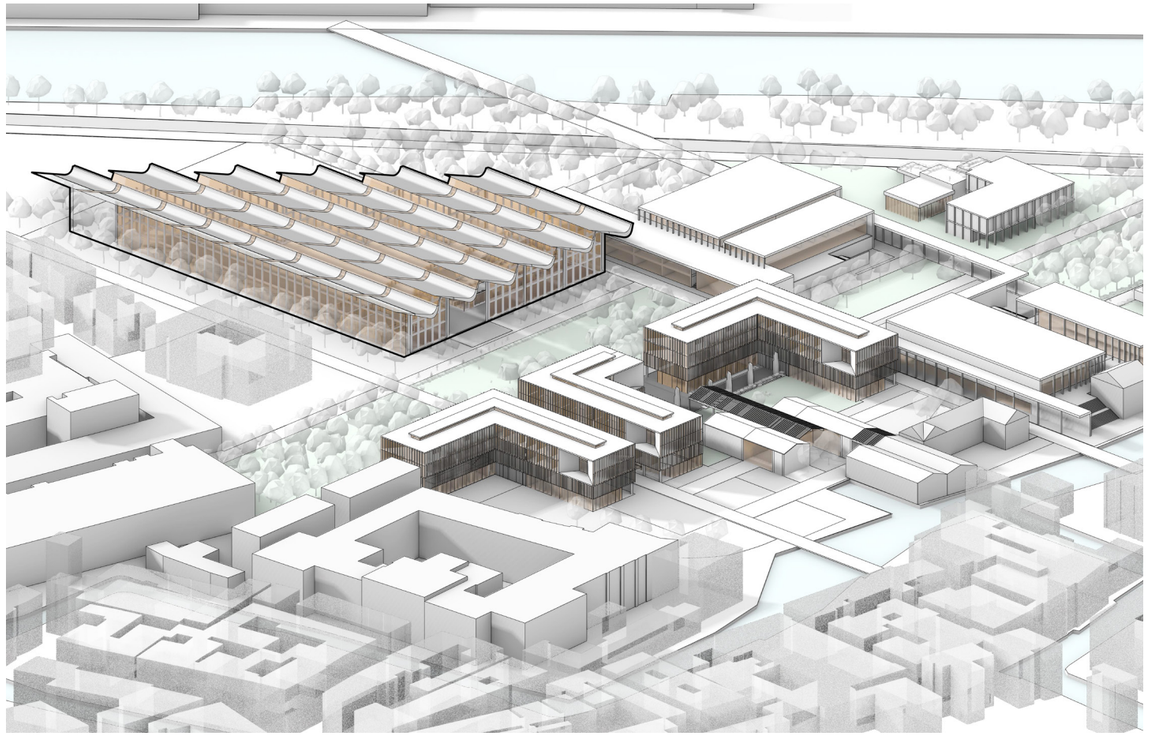
Linear Park

The linear park wraps around the campus expansion adjacent to the water on the South and West sides. The linear park connects to the green spaces spread throughout the campus.

Nothern campus entrance looking towards academic design facilities.



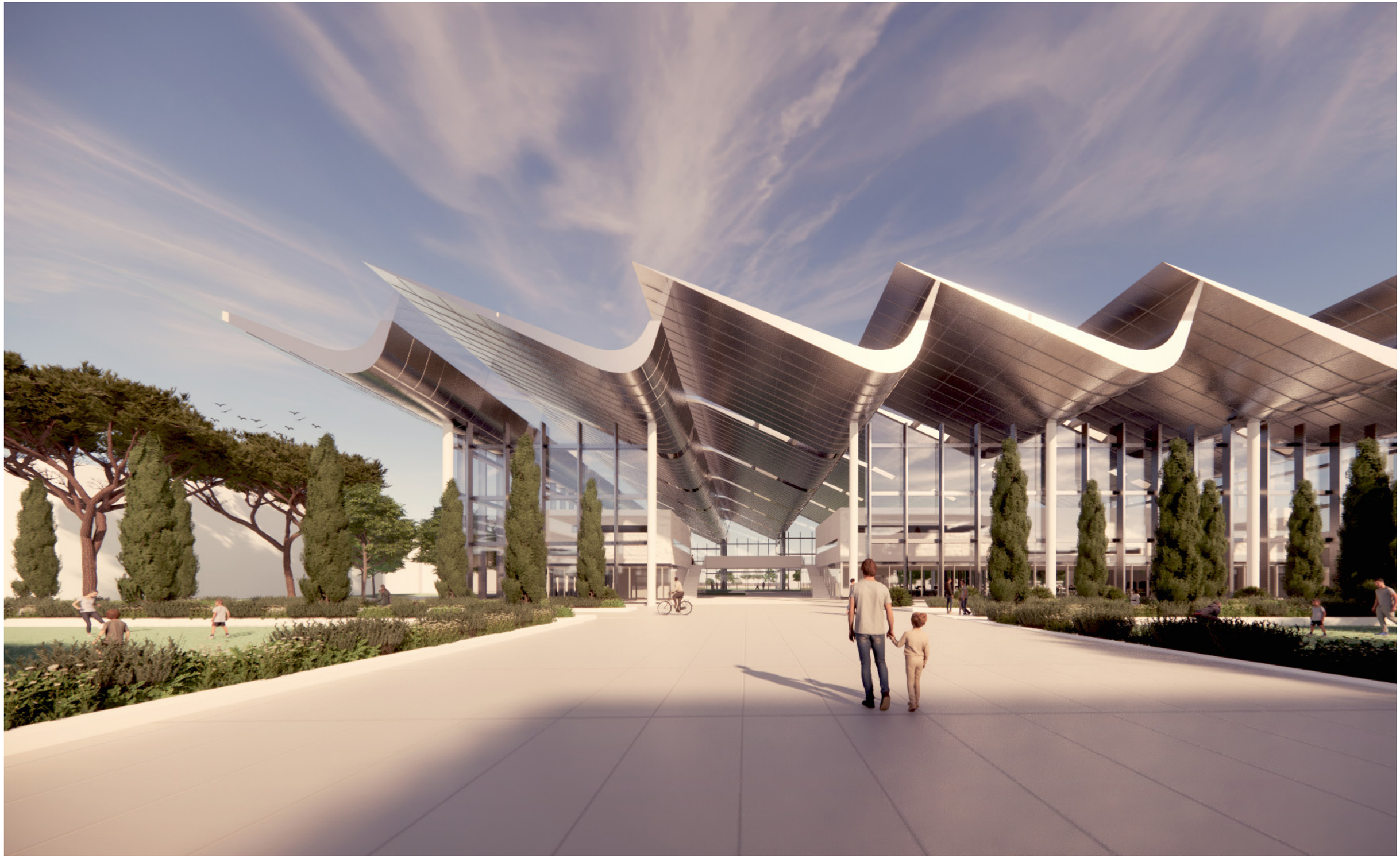
Axon from Southwest showing academic and housing buildings.



Axon from Southeast showing the sports complex.

Exterior perspective of courtyard space in the student housing neighborhood.

View from student housing looking towards the sports complex.



Entry sequence to the Iuav Sports Complex.

Adapting to the Tides
Sacca San Biagio, Venice

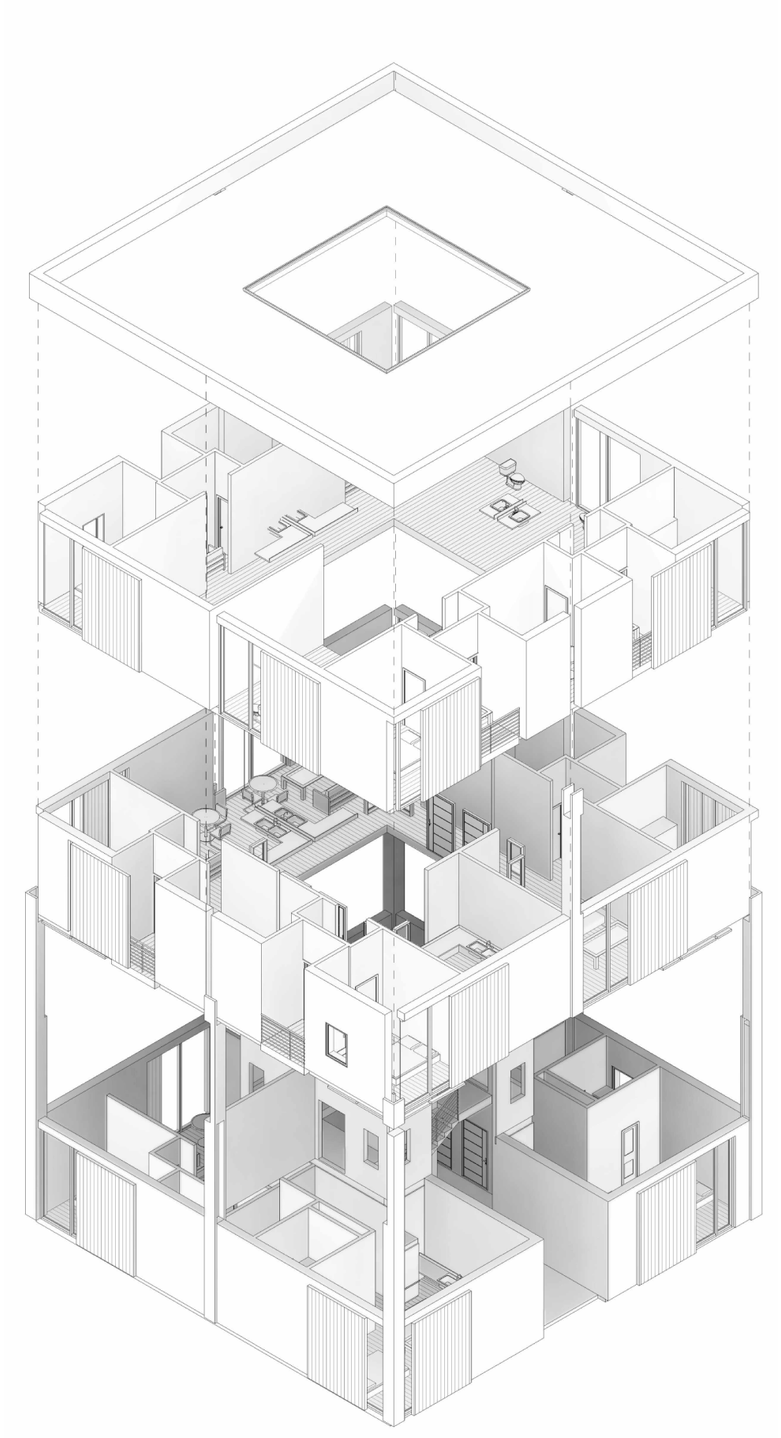
Alvia Rios, James Sanchez

Adapting to the Tides is a comprehensive and innovative design proposal for Sacca San Biagio that takes a community-based approach to increase the resilience and sustainability of the Venetian community. By addressing rising sea levels and other environmental challenges, the proposal will revitalize an underutilized island that serves as a landfill and currently has no direct access to any vaporettos.

The proposal reconnects the island with the rest of Venice by making it a vibrant and thriving part of the city. The project incorporates elevated residential blocks to combat flooding, a primary school focused on educating the younger generation, and a community center to enhance the community's resilience and promote inclusivity. In addition, green spaces and softscapes are integrated into the design to mitigate the effects of climate change and provide the community with additional space for recreation and relaxation.

Aerial view of the Sacca San Biagio Development.

Aerial view of the island showing the extensive greenery and public spaces.

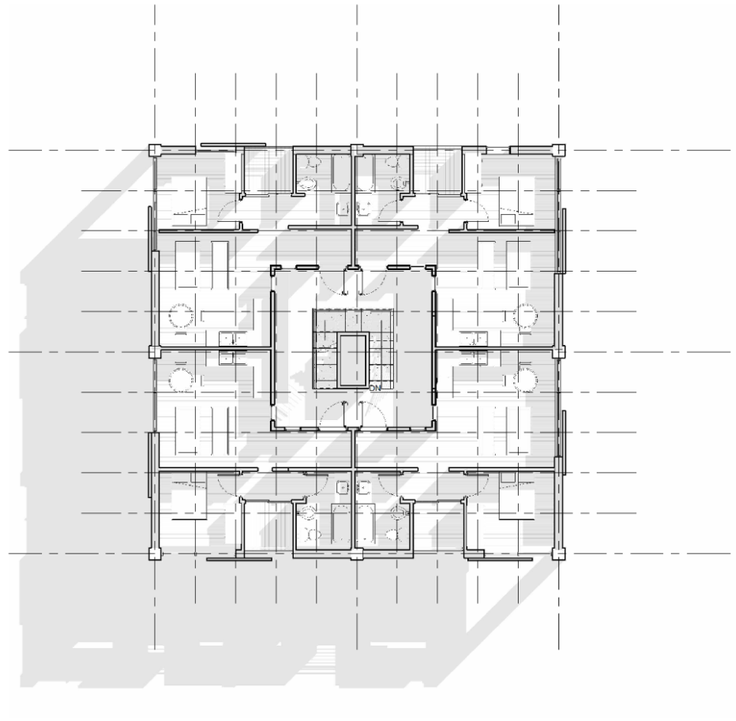


Housing Module

Exploded axon of a typical housing module. Each module varies based on its openings and windows.

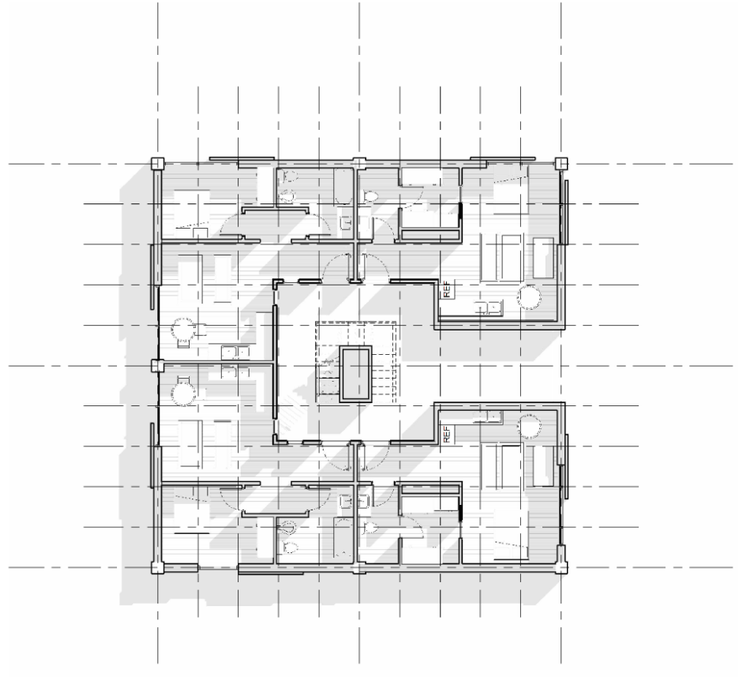
Upper Level Plan

Typical floor plan for housing module showing the arrangement of the individual units inside.



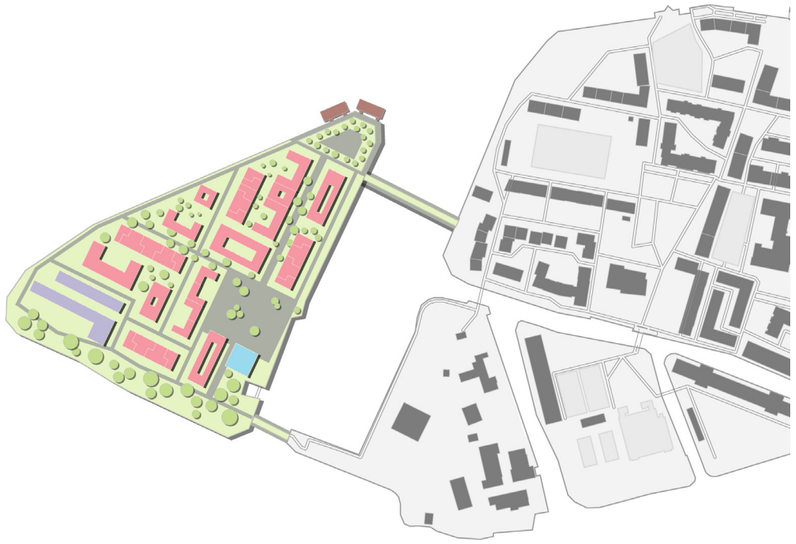
Ground Floor Plan

Typical ground level plan showing individual units and entry sequence.



Exterior perspective from the communal backyard of a set of housing modules, used for recreational activities.

Plan showing island in relation to the rest of the city and its existing transportation network.



Key

- Primary School
- Community Center
- Residential Buildings
- Vaporetto Stops

Plan of Sacca San Biagio development.

Night time aerial view of the island.

Day time aerial view.

Piazza render showcasing a new center for the community to gather and relax.

View from the sunken walking path designed to give the residential homes more front privacy.

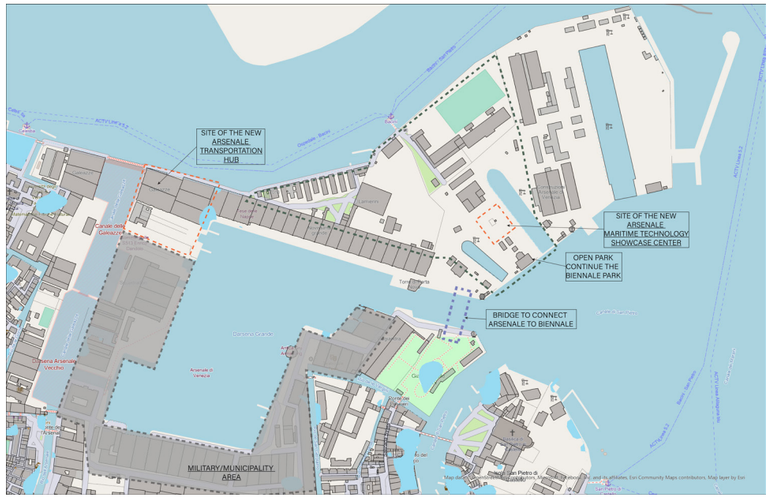
Arsenale Redevelopment
Castello, Venice

Michael Catalfano

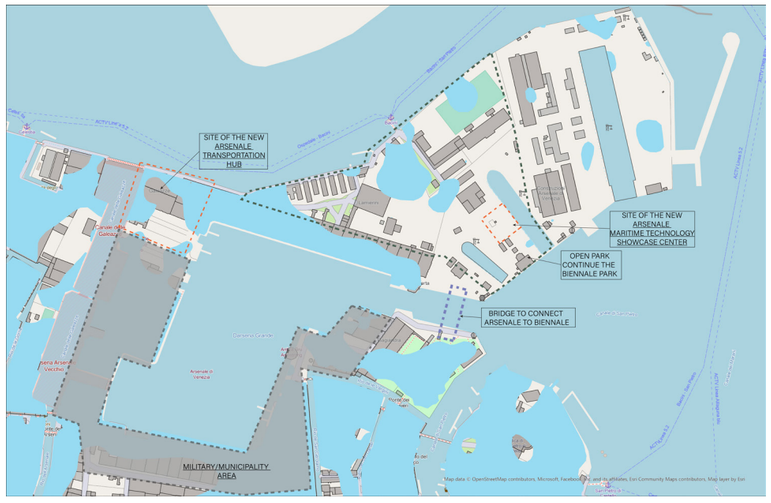
The Venice Arsenale is no stranger to change, constantly adapting to meet the needs of modern times and maintain its symbol as a nautical powerhouse on the Adriatic Sea. Today, the Arsenale needs to adapt for the present and the future as Venice faces growing climate issues and reclaim its position as a leader in nautical technology.

For the Arsenale to become a leader again, there are three main improvments to be made. The first step is to repair and add to the existing pedestrian oriented infrastructure along the northern tip of the Arsenale. The improved network creates small islands of green space which help with emission regulation, and provide a new park space adjacent to the existing Biennale space. The second area of focus addresses the abandoned dry dock. The redevelopment will see the abandoned dock reimagined through the Venice Maritime Technology Showcase Center, situated between the MOSE and an art exhibition space. The third area of focus is the reuse of an abandoned building on the Northeast corner of the site and the creation of a new entrance for the Arsenale. Currently, the Arsenale is only accessible from one vaporetto stop located near the site of the new Showcase Center. The new Transportation Hub will provide easier access into the Arsenale from the rest of the city.

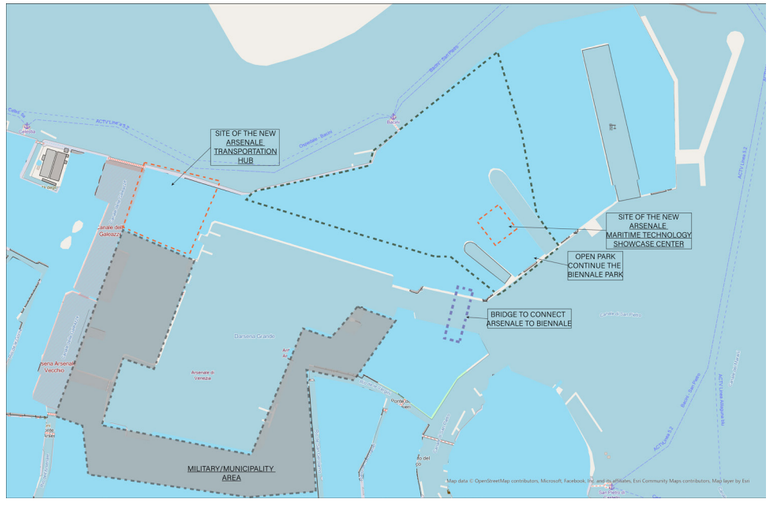
View of the Maritime Technology Showcase Center.



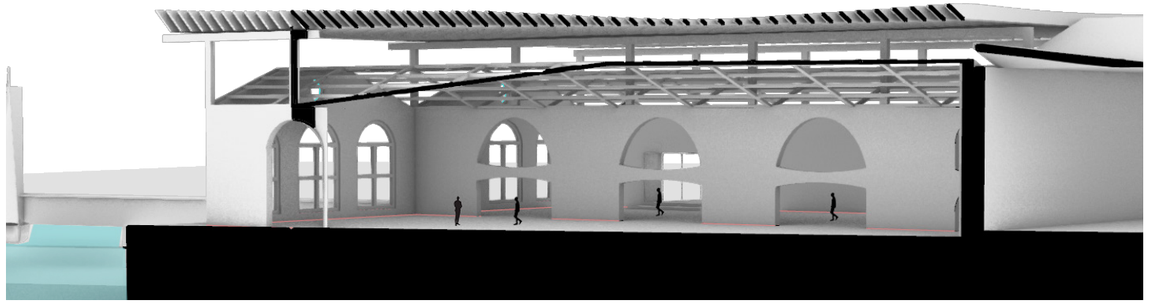
1 meter of sea level rise



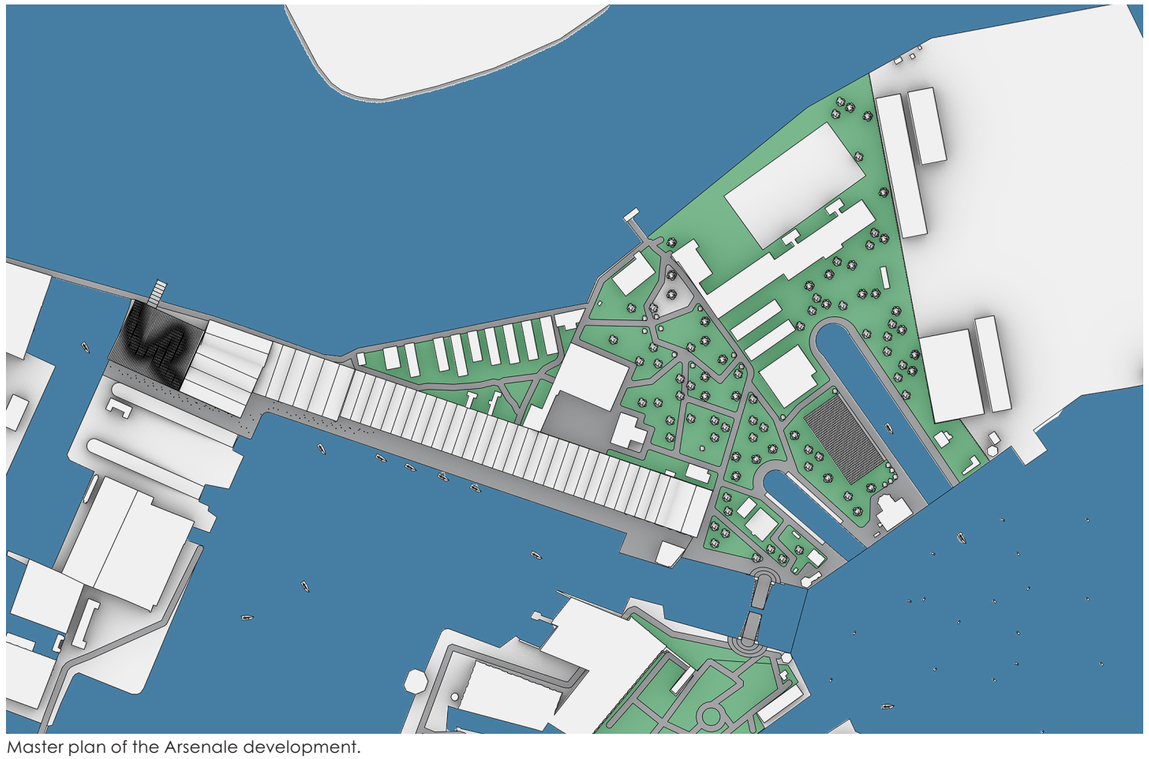
1.5 meters of sea level rise



2 meters of sea level rise

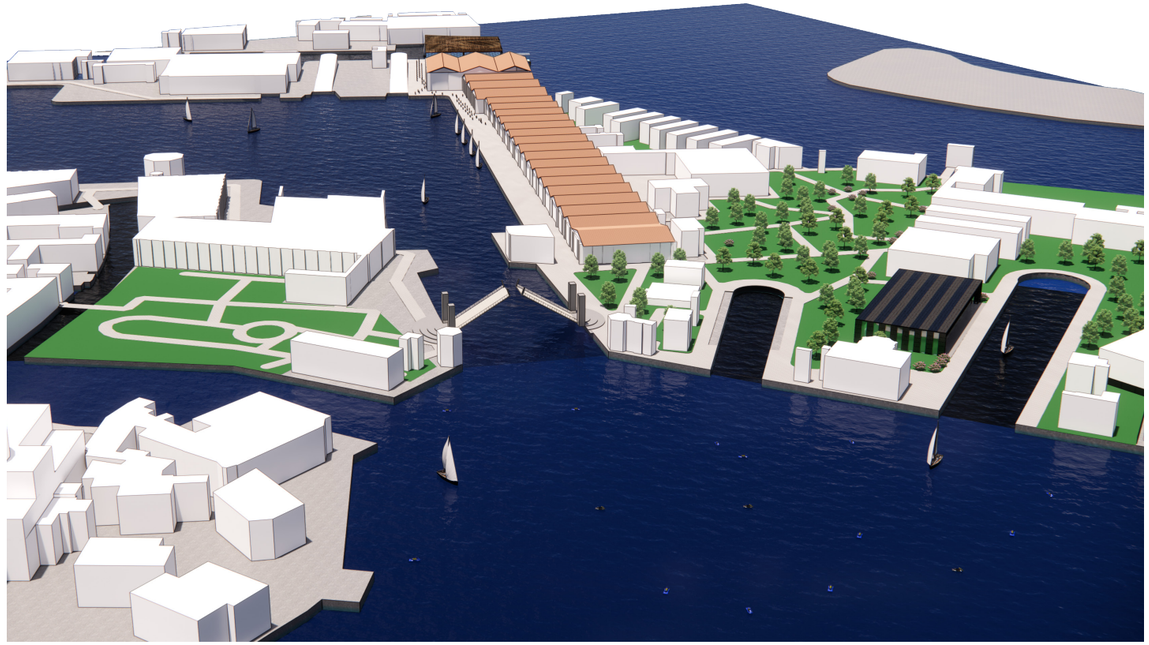


Section perspective showing the renovated transport hub and new roof.

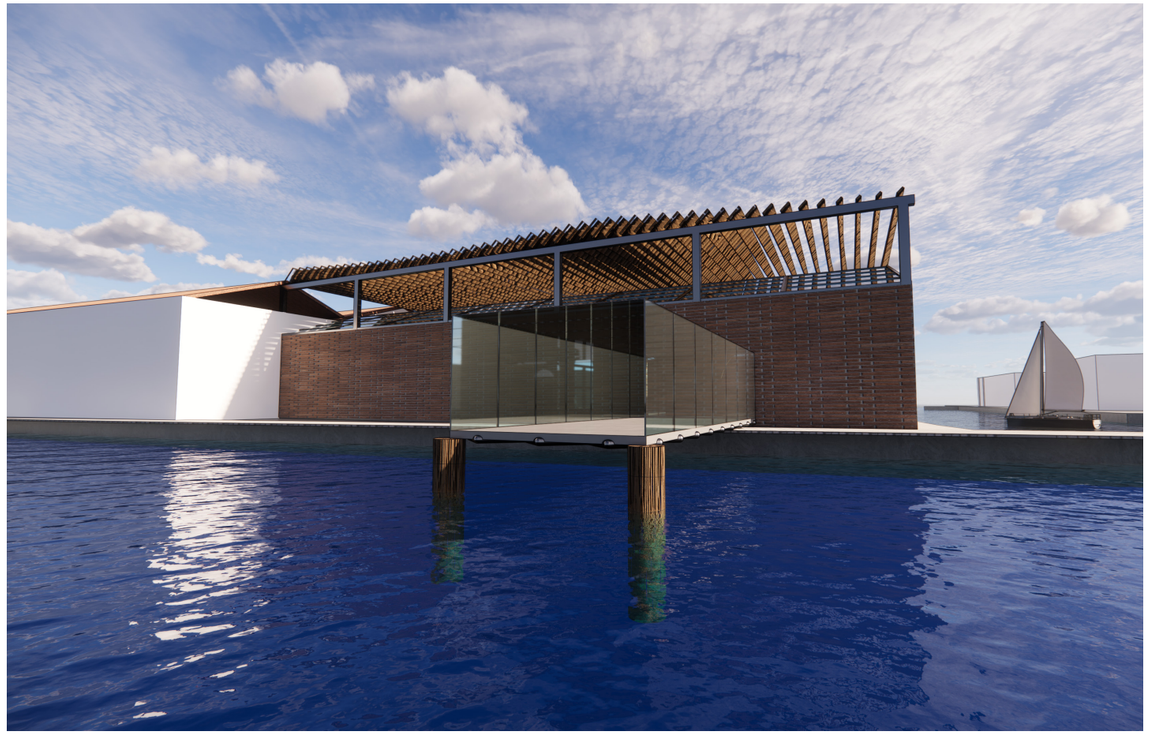


Master plan of the Arsenale development.

Axon view showing the new development projects adjacent to the existing structure.



Axon view showing the extensive development of green spaces.



Exterior perspective of the new dock and vaporetto stop.

Exterior view of the showcase center at dusk.

Isola Sant'Elena Development
Castello, Venice

Ben Hoffman, Francesco Rizzi

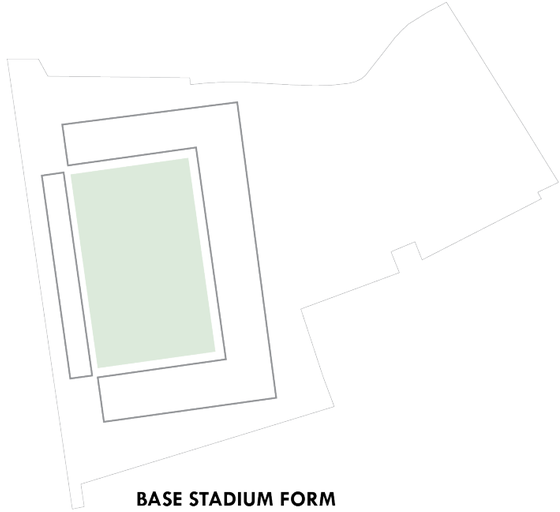
The northern portion of the Island of Sant'Elena is the location of the historic Stadio Pier Luigi Penzo, home of Venezia FC, and an adjacent large brownfield site. Situated at the end of the Biennale gardens and in close proximity to a residential neighborhood, the site is in a prime location to capitalize on its location and bring new life to the area.

The stadium sits at the heart of the site, and should have the permanent infrastructure the make the area more active beyond just game day hours. By including restaurants, bars, and other amenities in the stadium, the site can become an everyday destination for residents and fans alike. A field house will also be constructed to provide a space for locals to participate in sports year-round as well as creating a fitness center and multi-use spaces for classes. The existing yacht club will be improved by creating a new facility with increased amenities for members and non-members, and will provide a space for boat repair and storage. Each of these new structures will be woven together with a series of parks and plazas that will have the flexibility to hold thousands of soccer fans while still providing areas of intimate relaxation. The goal is to provide residents with the permanent infrastructure needed to allow them to stay, and further prevent the tourism industry from destroying the city.

Aerial view of the stadium and surrounding green spaces.

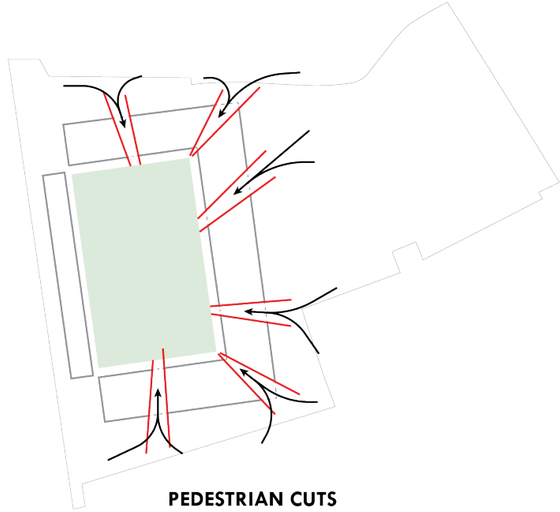
View of the field within Stadio Pier Luigi Penzo.

Analysis of the existing site and its circulation networks and adjacencies.



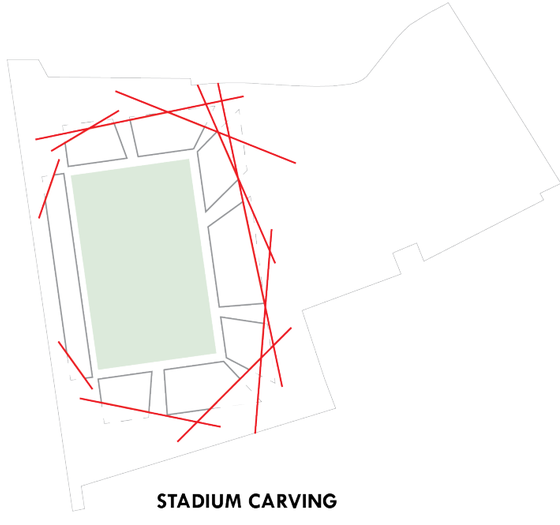
BASE STADIUM FORM

Existing form of Stadio Pier Luigio Penzo.



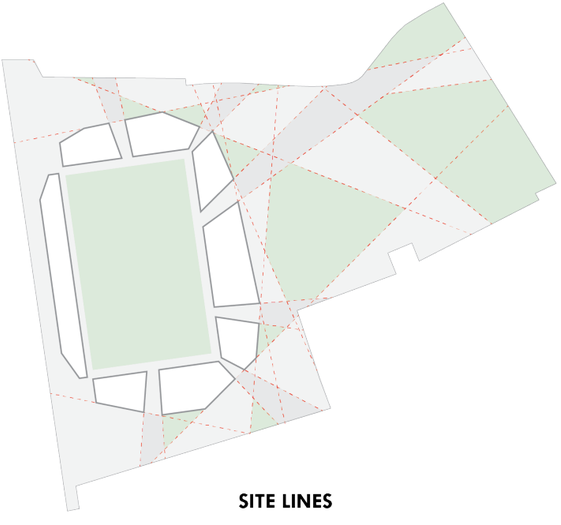
PEDESTRIAN CUTS

New divisions added to create a multitude of pedestrian access points from all areas of the site.



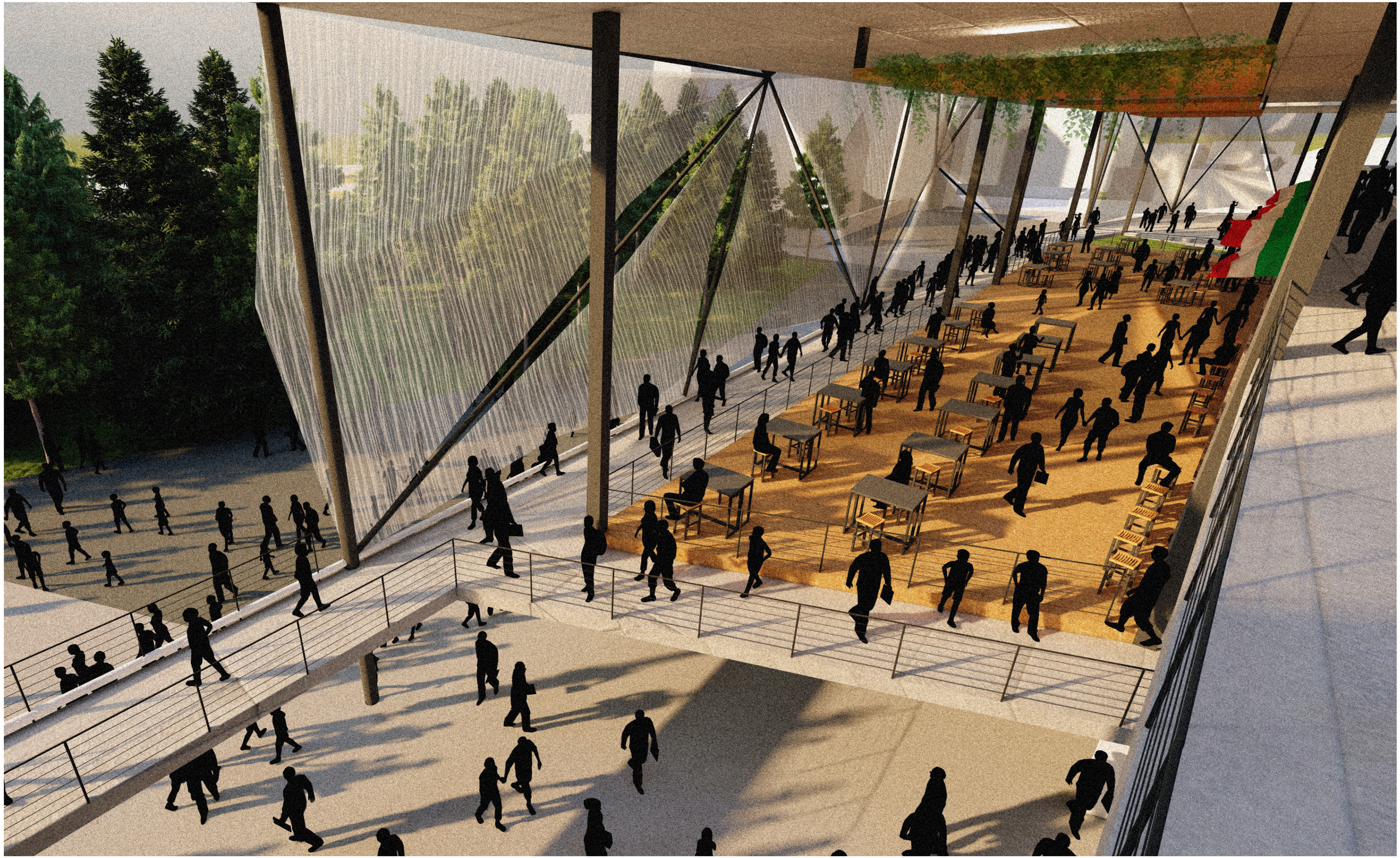
STADIUM CARVING

Carving the exterior edges of the stadium mass to provide expanded sightlines and create a more interesting form.



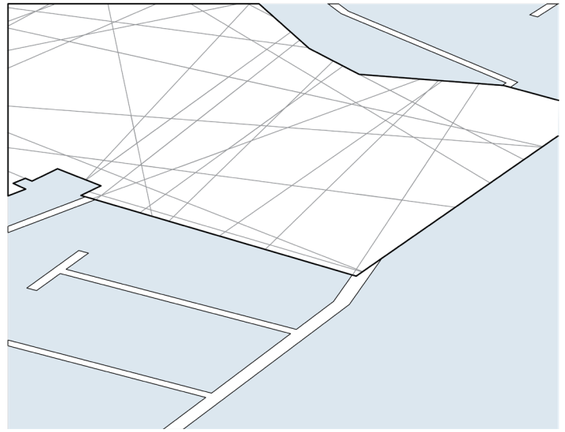
SITE LINES

Using the lines created by the stadium geometry to define green spaces, pedestrian pathways, and public plazas.

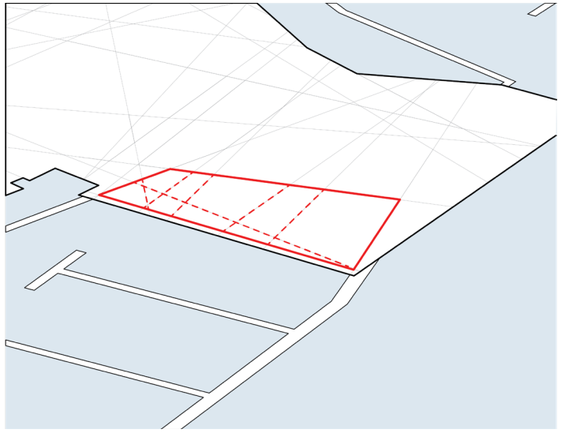


Interior perspective of the Stadio Pier Luigi Penzo concourse.

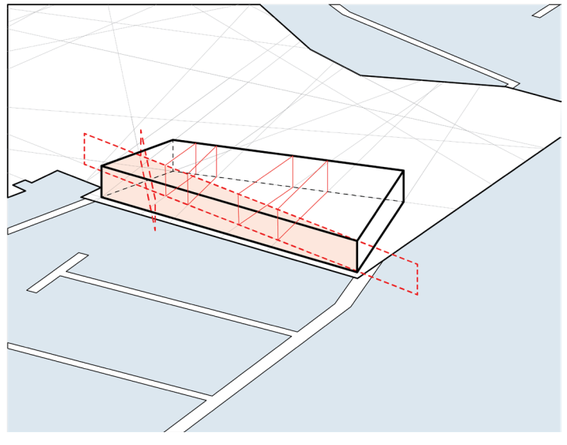
Analysis of the existing site and its circulation networks and adjacencies.



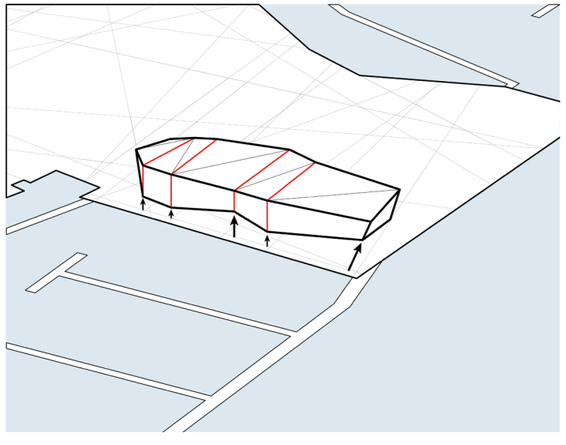
Site lines defined by the geometry created by Stadio Pier Luigi Penzo.



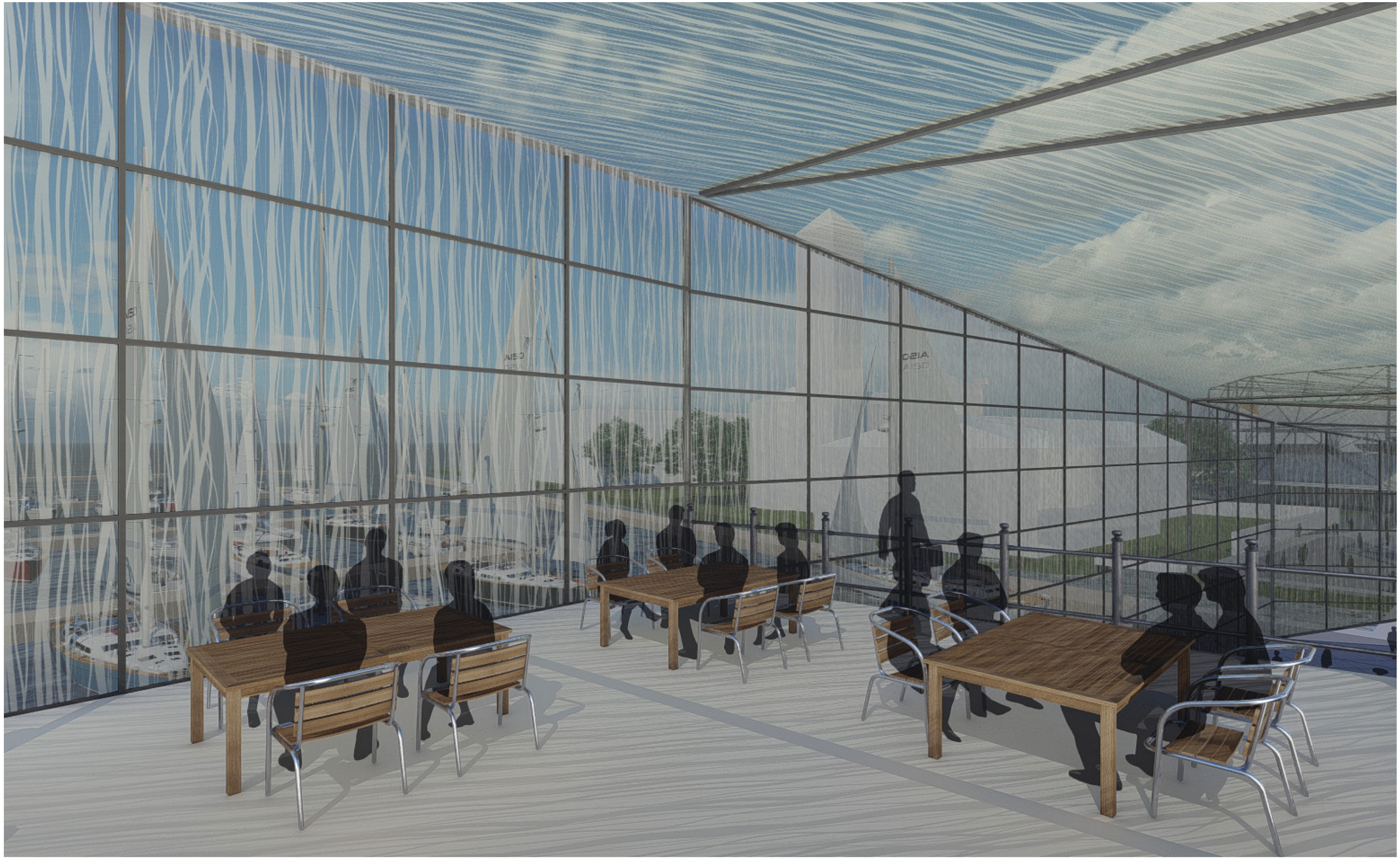
Intersections from the existing site lines are used to define the footprint of the new yacht club.



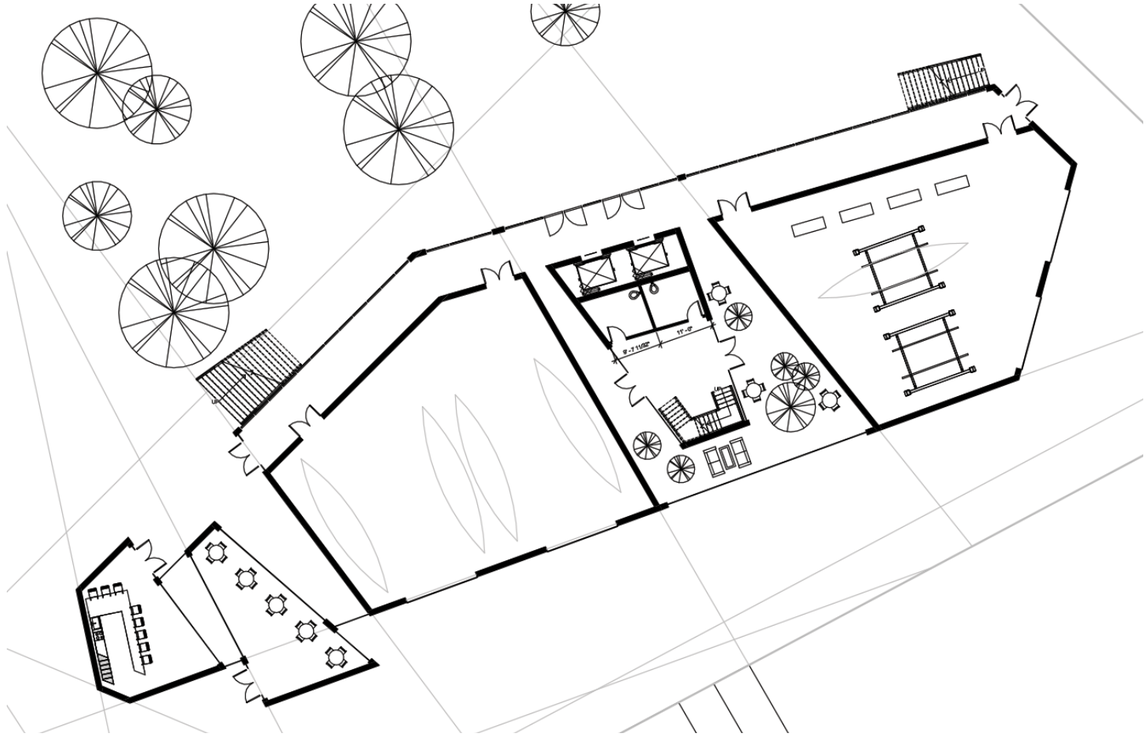
Prominent site lines are followed to carve the building form.



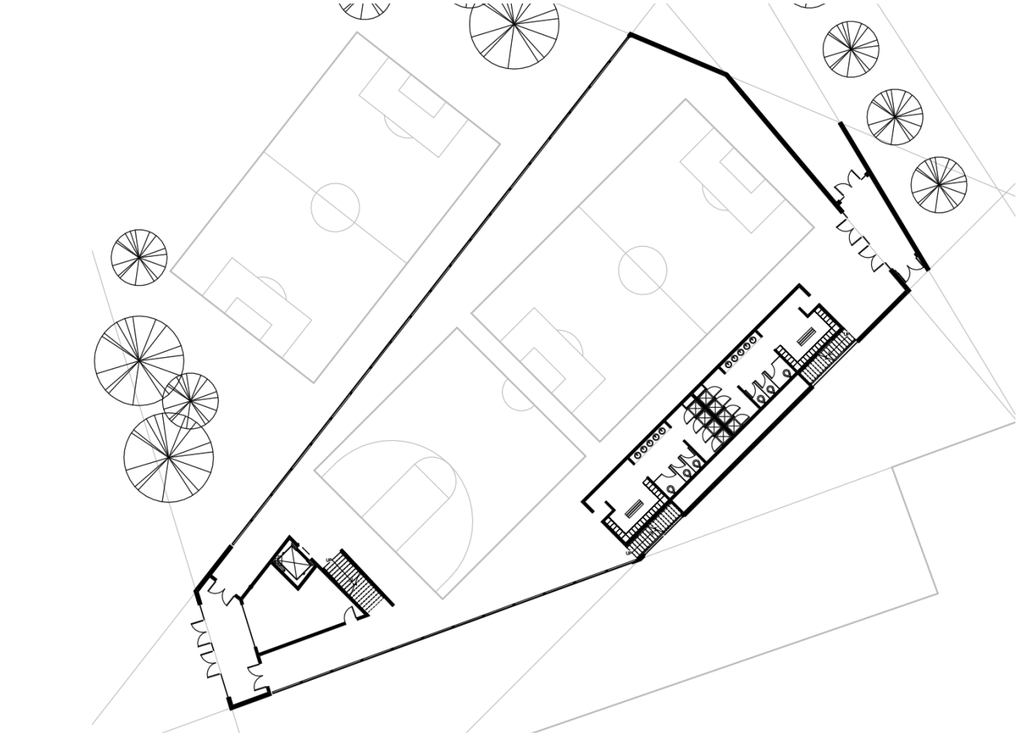
Other, closer spaced site lines are used to define changes in form such as elevated or angled roof lines.



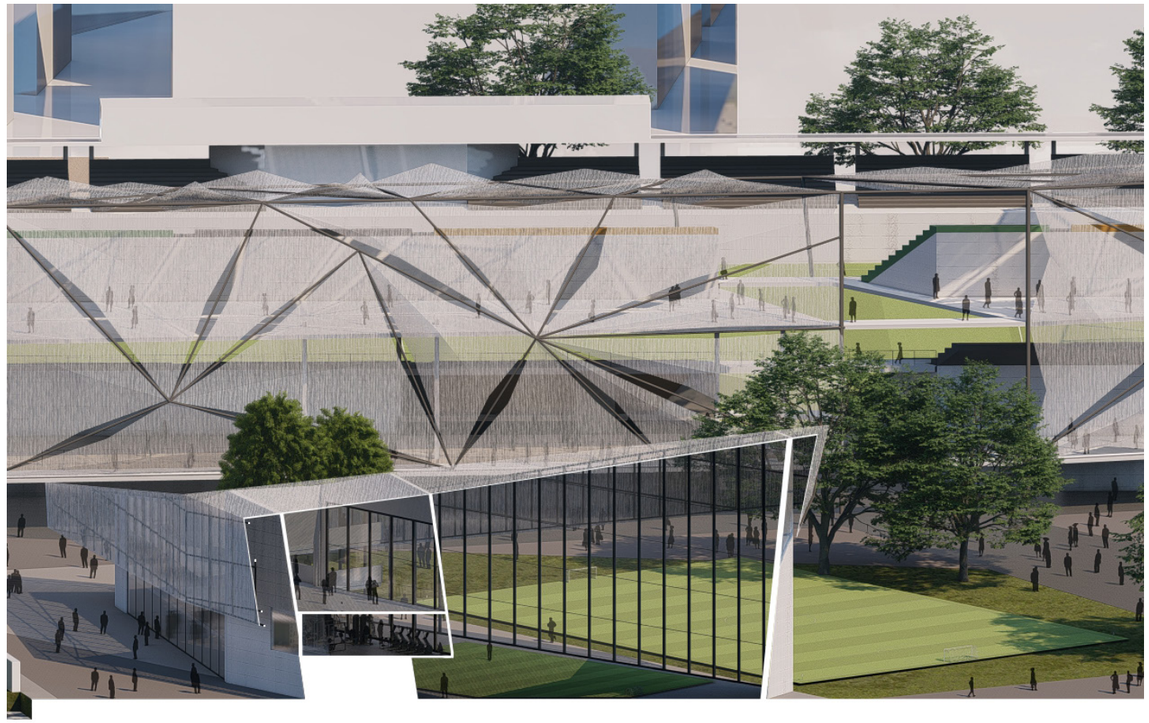
Perspective from the Yacht Club roof deck looking out onto the marina.



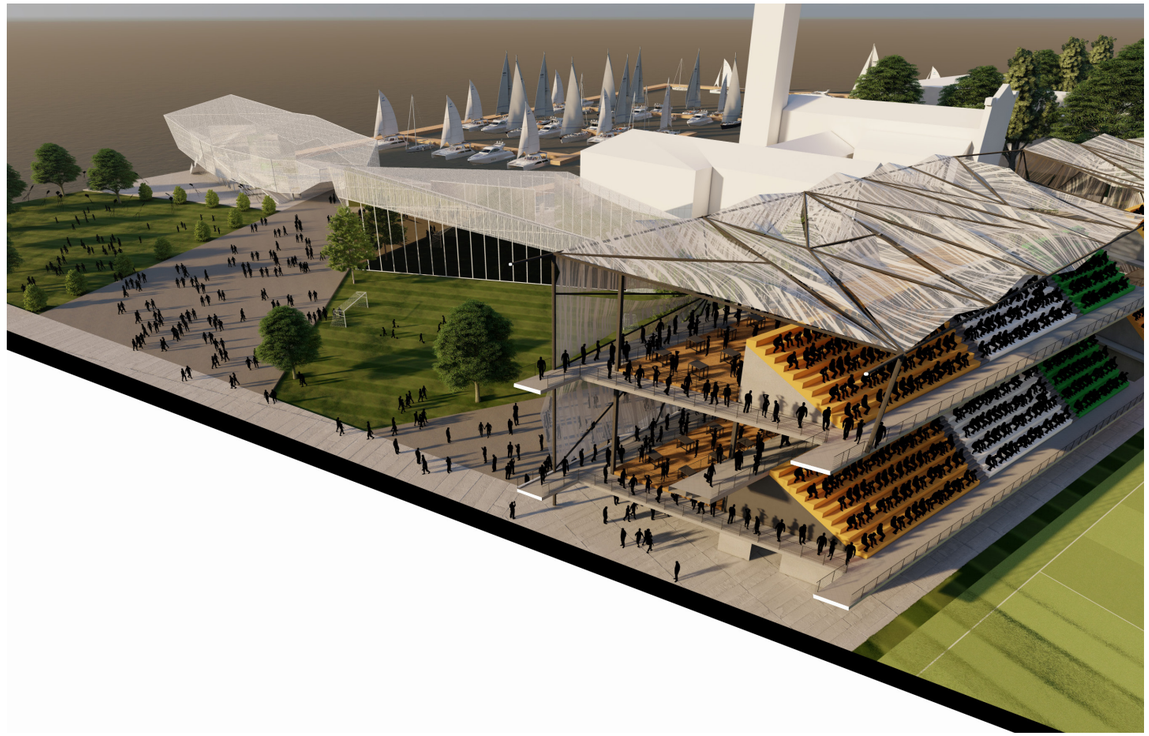
Ground level plan of Yacht Club showing boat repair and storage facilities as well as numerous atriums.



Ground level plan of Field House showing interior and exterior sports fields, and locker room facilities.



Section perspective cut through Field House with stadium in the background.



Section perspective cut through the stadium showing the rest of the buildings in the background.

Night time view of the development of Isola Sant'Elena