

Ecological Reclamation In The Lower Garden District

MARKET STREET POWER PLANT

New Orleans, Louisiana
University of Delaware
Senior Capstone



Acknowledgements

I would like to thank Anna Wik for helping me throughout this entire process and providing helpful critics and many words of encouragement.

I would also like to thank Danielle Duhe and Leila Hamroun for taking time out of their daily lives to be a part of my committee, attending critiques, and providing necessary feedback throughout this process.

Lastly, I would like to thank Zac Gunaratnam-Bailey for providing his expertise in Global Sustainable Development to help me calculate the benefits this project will have on the Lower Garden District of New Orleans.



Project Narrative

The Market Street Power Plant, located in the Lower Garden District of New Orleans, stands as a towering symbol of the city's industrial past despite its prolonged abandonment. Its 1920s-style architecture and riverfront location make it an ideal site for adaptive reuse and ecological reclamation. Adaptive reuse refers to repurposing existing structures (i.e. the post-industrial building) for new functions, while ecological reclamation is the process of assisting the recovery of severely degraded ecosystems to benefit native biota by establishing habitats, populations, and communities. Neglected sites pose both environmental risks and significant opportunities; ecological reclamation can transform them into sustainable developments that promote ecological health and cultural heritage (Milligan,2022).

By integrating biophilic design principles, this project will enhance the area's aesthetic appeal while promoting sustainable practices and ecological benefits (Xue,2019). Biophilic design is the incorporation of natural elements and patterns into the built environment to foster human-nature connections. The inclusion of vegetation and other natural elements can help mitigate negative environmental impacts, such as pollution and the urban heat island effect (Kennon,2015).

The Lower Garden District is an urban area lacking access to nature, and the introduction of green spaces through ecological reclamation can increase biodiversity, improve air and water quality, and support the well-being of local residents (Feng,2018). This is achieved by providing recreational opportunities, enhancing social connections, and reducing stress.

To achieve these ends, the project will focus on three main objectives:

Function Specific Successional Plantings:

will promote ecological reclamation perform specific functions, rather than choosing based on native/non-native distinctions, that improve the sustainability of urban living and contribute to biodiversity conservation and provide at least one of the nine key services: flood control, soil stabilization, fire control, climate control, water treatment, habitat for endangered flora and fauna, pest control, air purification, and modulation of human immune systems.

Green Corridor Installation:

will create a pedestrian connection to proposed extension of Convention Center Blvd to reduce vehicular use and integrate the Lower Garden District into the city.

Factory Integration:

will bring ecological implementations, such as water features and plantings, into the abandoned factory while keeping the building's history apparent to create an immersive experience for visitors to explore and enjoy the rejuvenated site.

The Market Street Power Plant offers a unique opportunity to boost the environmental health of New Orleans while addressing the need for natural elements in urban areas, but achieving this goal requires a transdisciplinary collaboration between landscape architects, architects, and ecologists. By embracing biophilic design principles and emphasizing ecological advantages, such projects can improve residents' quality of life and contribute to the region's overall ecological well-being.

Table of Contents

Introduction	1
Site Analysis	3
Initial Concept Designs	7
Masterplan	9
Inside Market Street Power Plant	13
Benefits	17
Research	19

Introduction



Site History

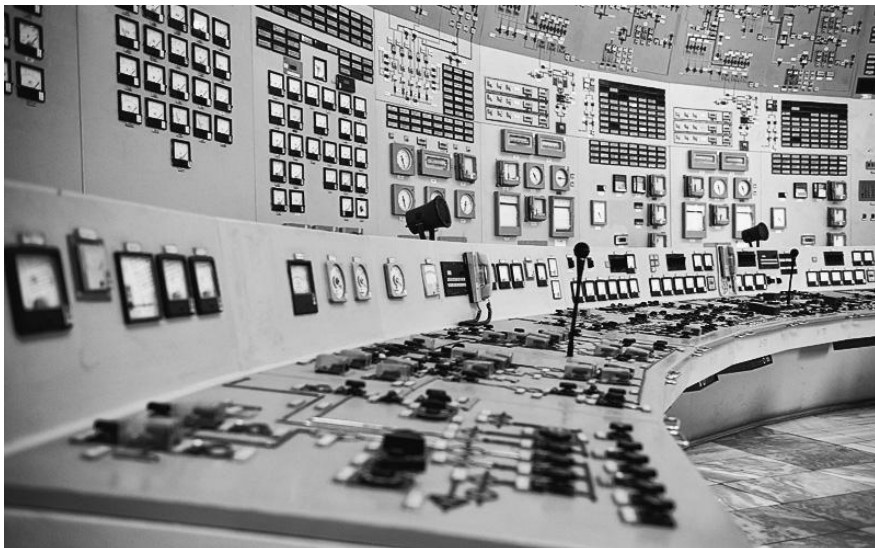
In 1905, the Market Street Power Plant in New Orleans, Louisiana, commenced operations as the largest electrical generating facility in the southern United States. For decades, it supplied the entire city with power, until its eventual closure in 1973. Since then, this historically significant site has remained vacant, with numerous proposed redevelopment plans failing to materialize over the years.

The plant has been the subject of various ambitious proposals, including its transformation into a Bass Pro Shop, a film production center, or a mixed-use development featuring condominiums and retail spaces. Despite these plans, the iconic stacks continue to stand, bearing witness to the passage of time and the plant's former glory.

While the site's redevelopment has faced ongoing delays, the plant's derelict state and graffiti-strewn walls have attracted filmmakers in search of unique and evocative settings. As a result, the Market Street Power Plant has been featured in several films, including "Dawn of the Planet of the Apes" and "Oblivion." This continued interest in the site underscores its enduring cultural and historical significance, even as its future remains uncertain.



(Crescent City Living , 2023)



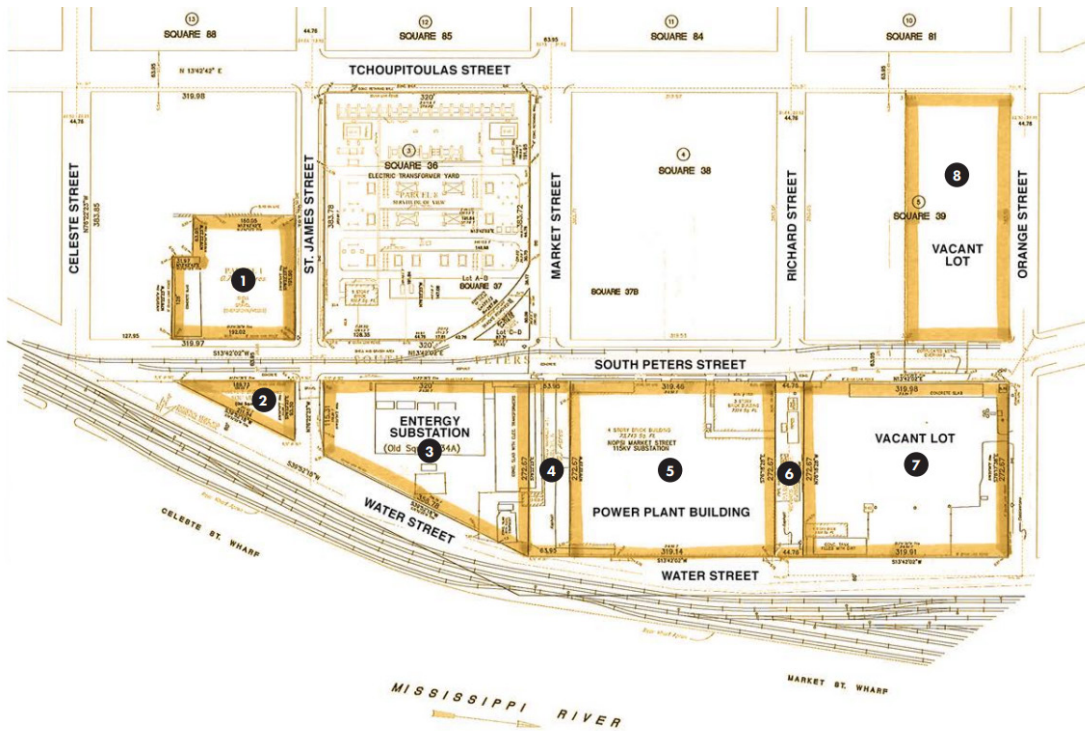
(photonshouse,2014)



(Franck. C, 1947)

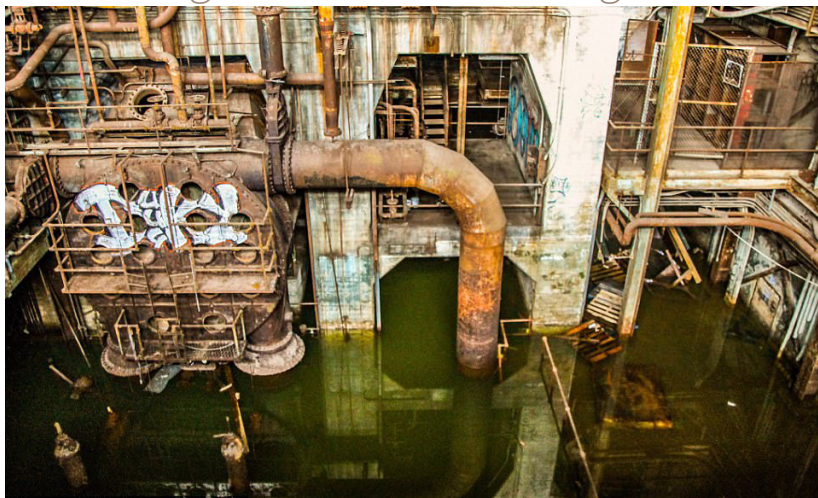
Existing Conditions

Site Plan and Lot Type:



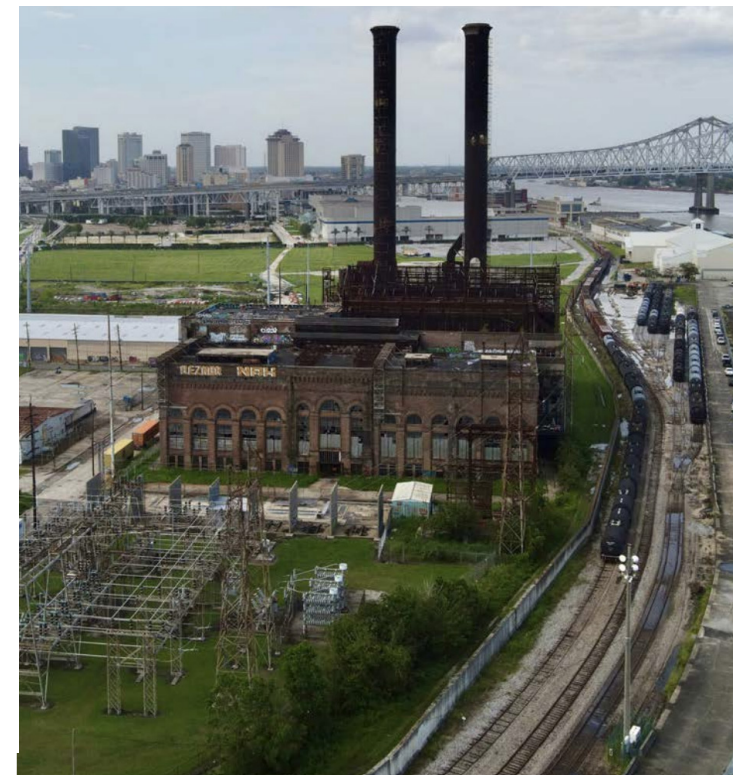
(CorporateRealty,2020)

Flooding Inside Building:



(Daily Mail,2017)

View of Electric Substation:



(CorporateRealty,2020)

The Market Street Power Plant is on a decommissioned 20-acre site facing several challenges, including 310,676 square feet of impervious surfaces, an operational electric substation, and flooding concerns. The site is located next to the levee system with no access to the Mississippi River. Predominant impervious surfaces exacerbate stormwater runoff and local flooding, while the nearby substation poses constraints on redevelopment plans. Although most lots on the site are vacant with minimal restrictions, the lot containing the electric substation cannot be built on directly. However, construction adjacent to or above the substation is feasible, provided that it remains accessible.

Site Analysis



Surrounding Landmarks

Legend:

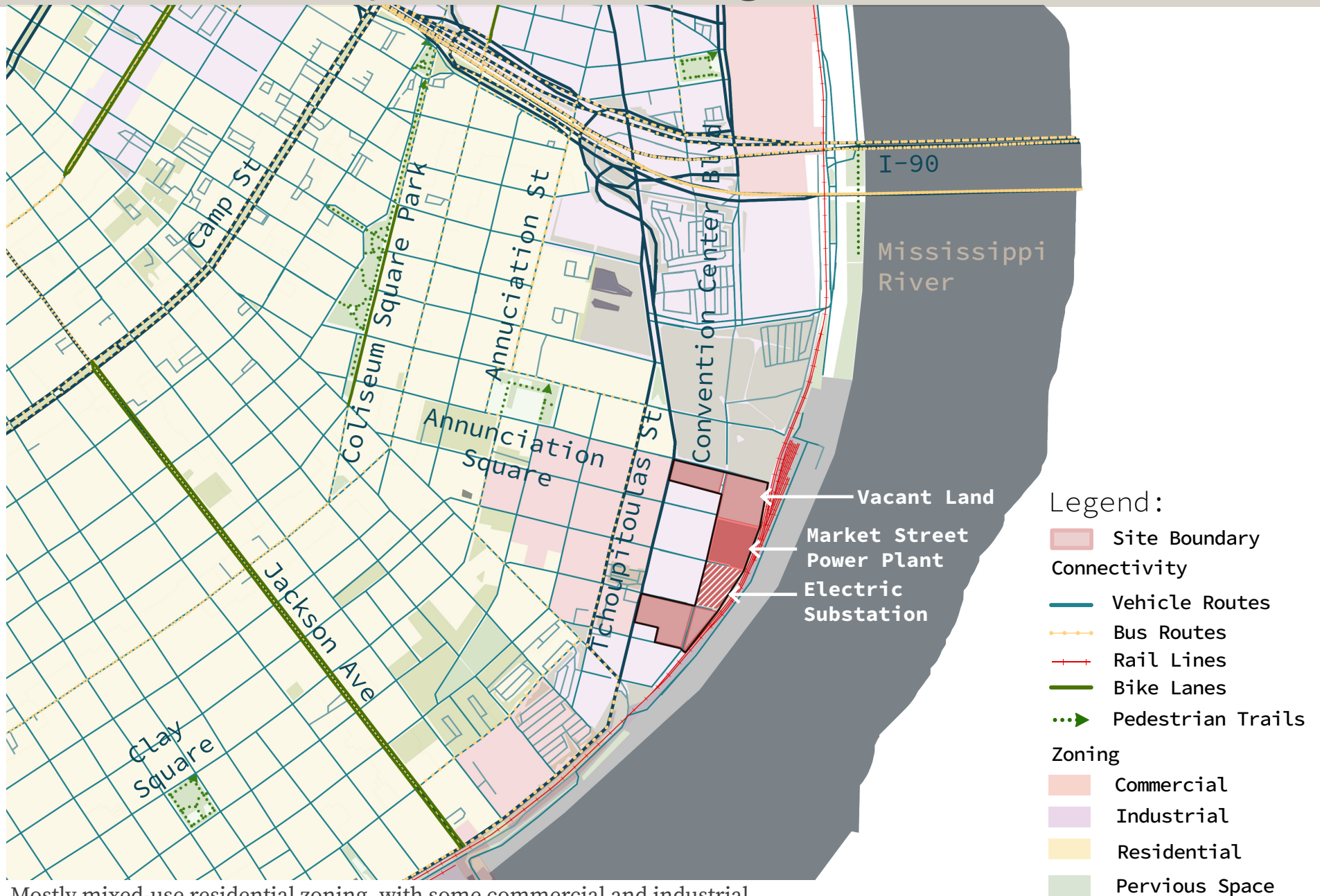
- Site Boundary
- NOLA Landmarks
- Existing Green Spaces
- Population Density
Low
High



New Orleans is a popular tourist destination with many landmarks, and the Market Street Power Plant Site is in close proximity to many of these landmarks.

1. Audubon Park 2. City Park 3. French Quarter 4. Riverwalk 5. NOLA Port

Connectivity And Zoning



Mostly mixed-use residential zoning, with some commercial and industrial areas. Limited safe trails and bike lanes, resulting in heavy vehicular traffic.



Future Development



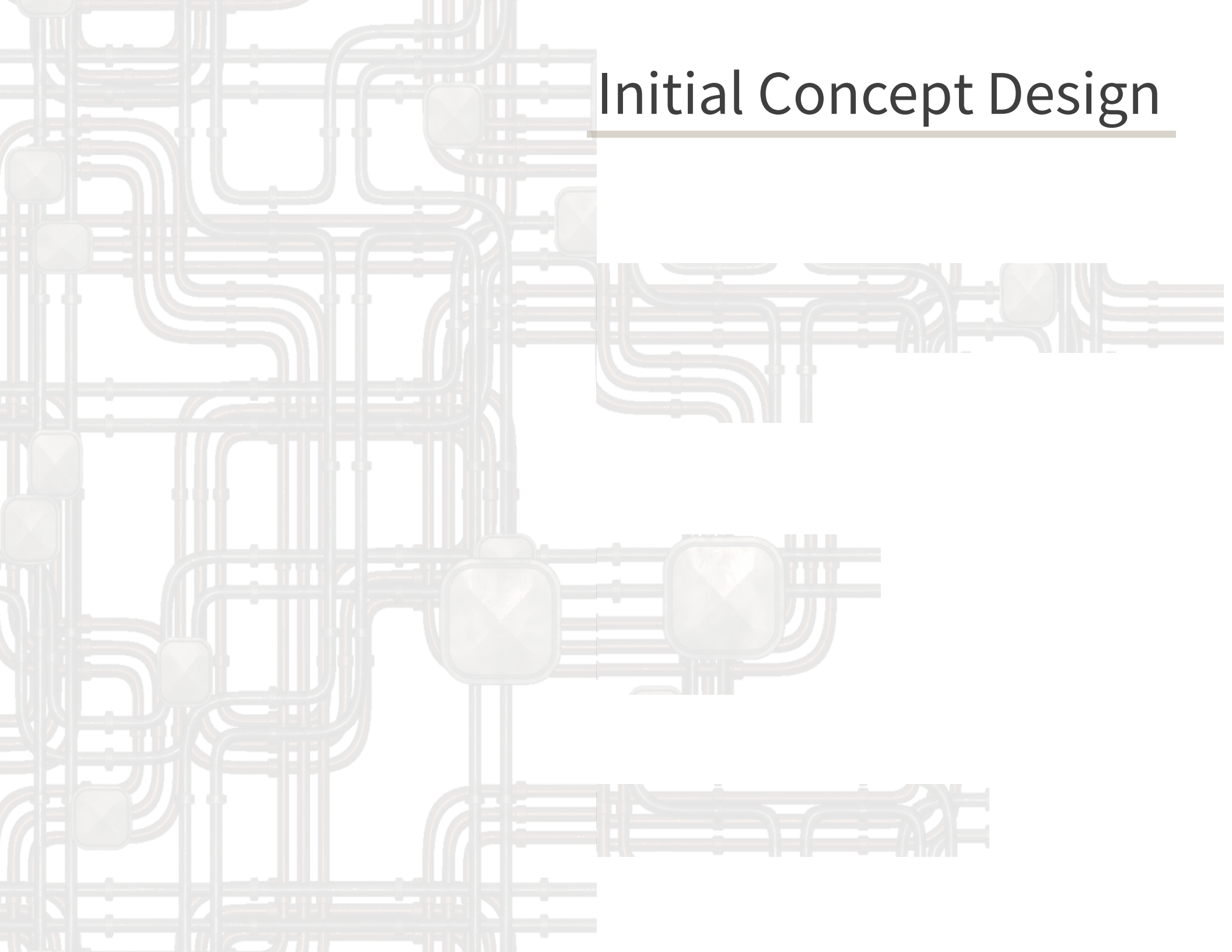
Legend:

-  Site Boundary
-  Existing Development
-  Future Commercial
-  Future Residential
-  Future Green Space



There are development proposals from Convention Center Blvd to the riverfront around the power plant. There are no current plans for the power plant site but there are plans for a mixed-use development in the areas surrounding the site.

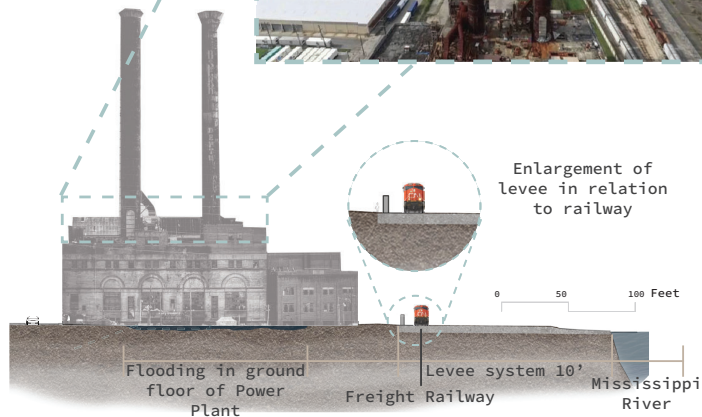
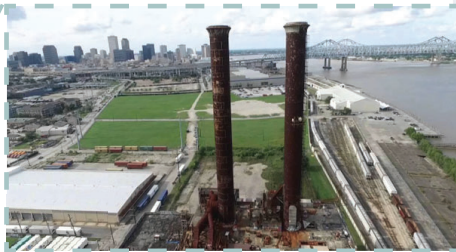
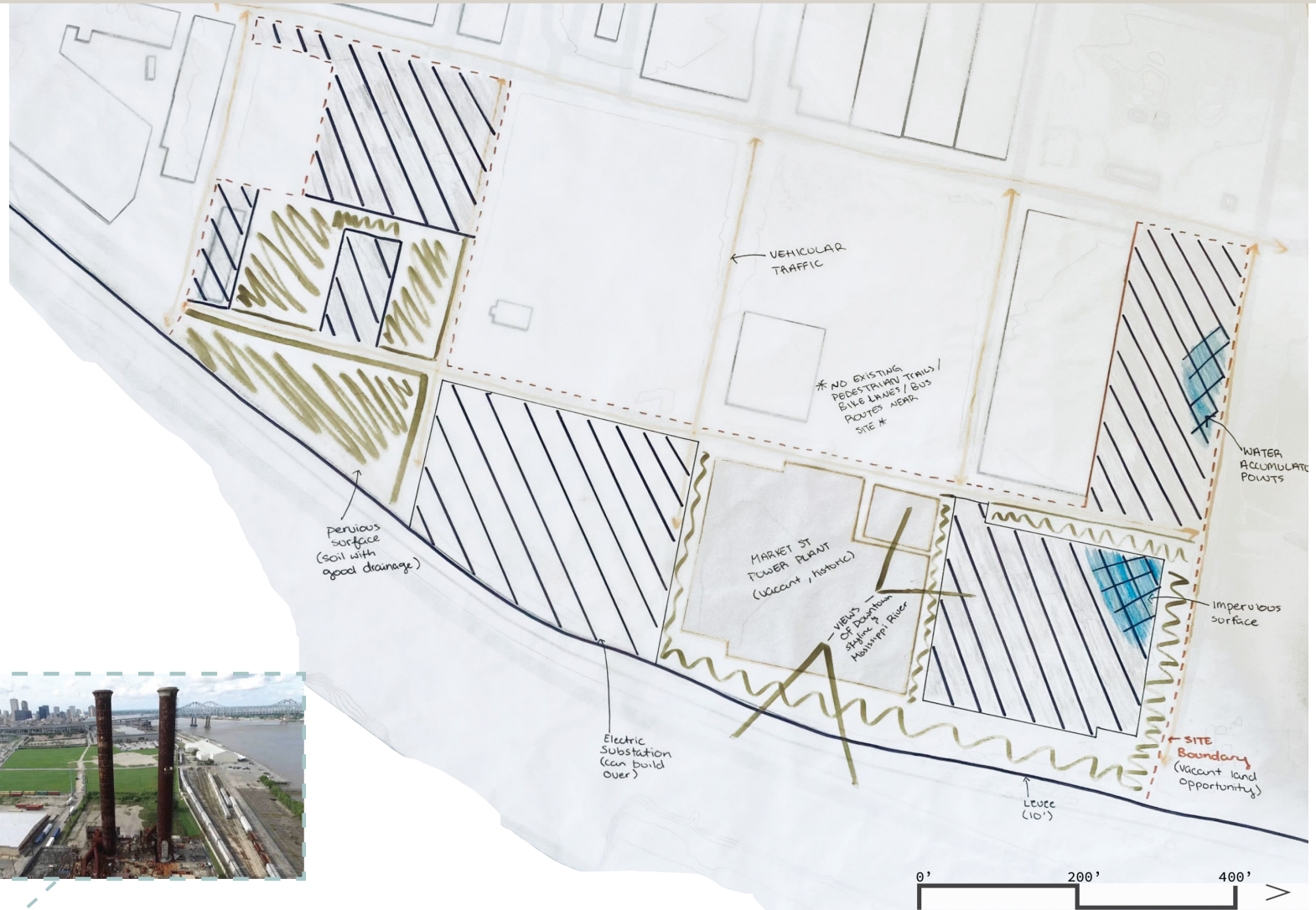




Initial Concept Design

Opportunities And Constraints

- Opportunities
- Constraints
- Water Accumulation
- Site Boundary
- Traffic Flow



There are many opportunities with working on this site. It is one of the only locations in New Orleans without a high flood hazard and it is in close proximity to new development with easy access to. The constraints of working with this site consists of large impervious surfaces, flat existing topography, and the 10' levee floodwall .

Initial Design Concepts



Concept One: Raised Greenery

This initial concept focused on changing the existing topography on the site to allow more vegetation and urban forestry while provide views of the river with an elevated boardwalk.



Concept Two: Permeable Hardscapes

This initial concept implemented more formal structures that would mimic the structure around and throughout the Market Street Power Plant.

Masterplan



Masterplan

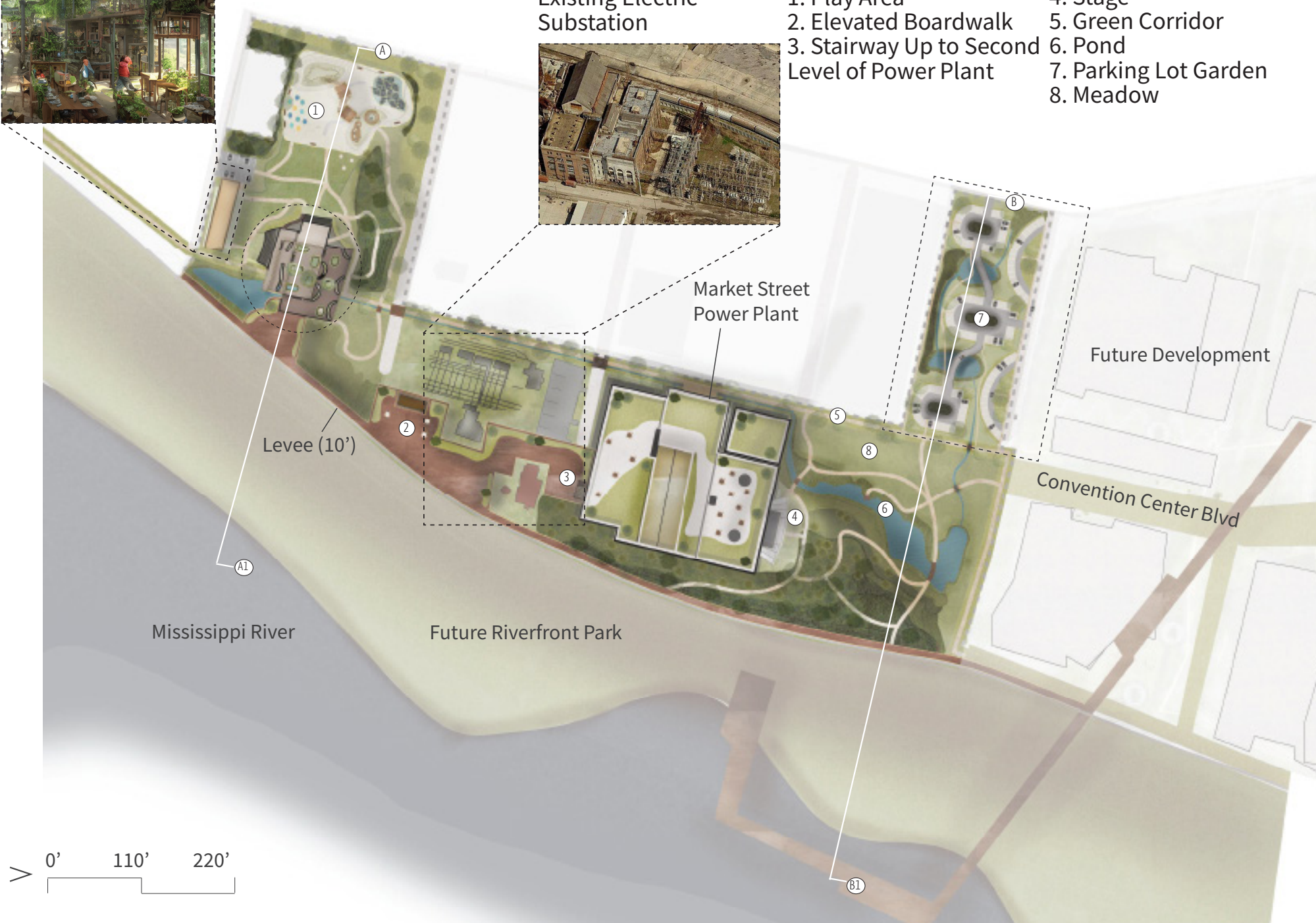
Indoor/Outdoor Cafe



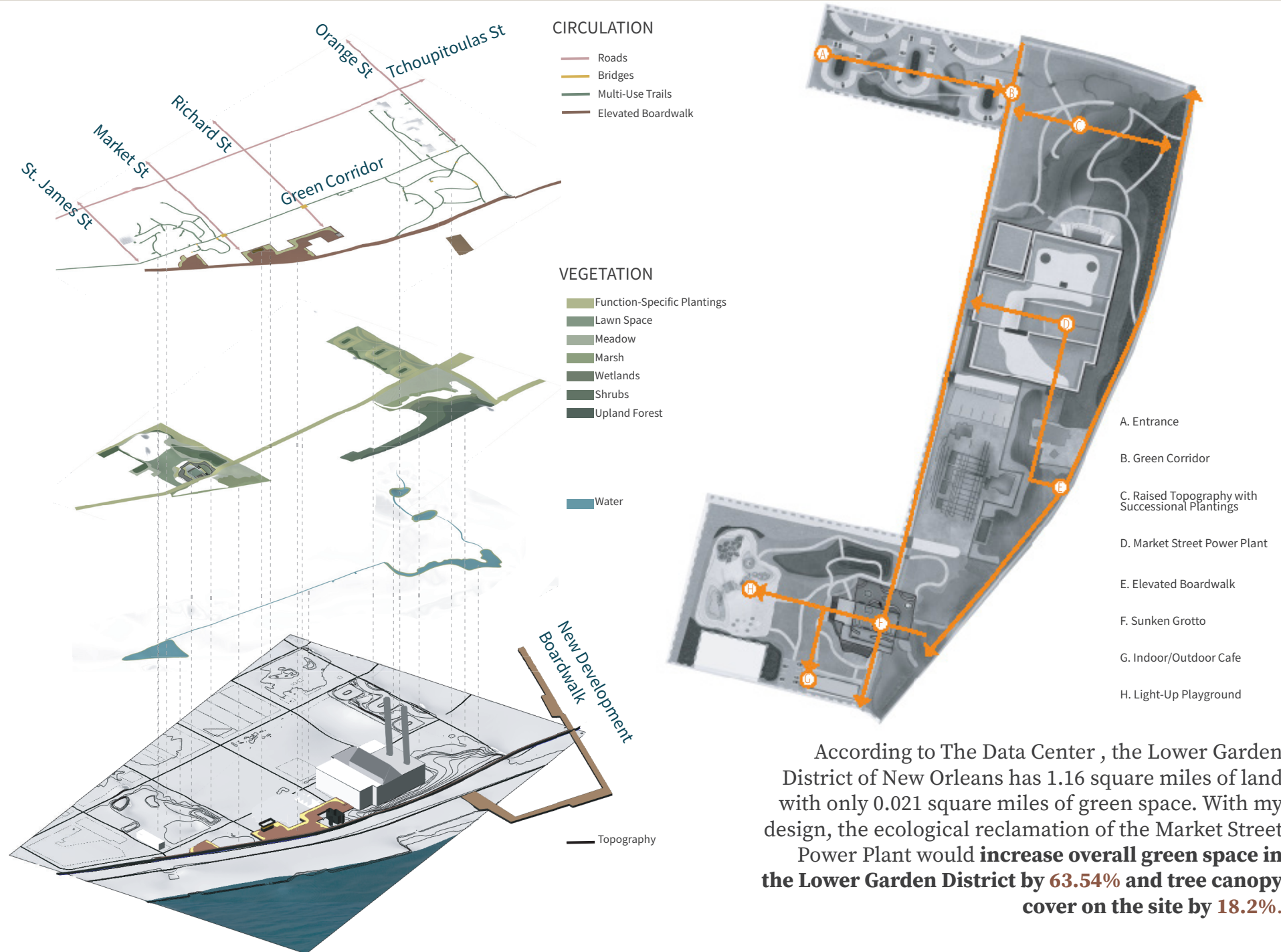
Existing Electric Substation



1. Play Area
2. Elevated Boardwalk
3. Stairway Up to Second Level of Power Plant
4. Stage
5. Green Corridor
6. Pond
7. Parking Lot Garden
8. Meadow

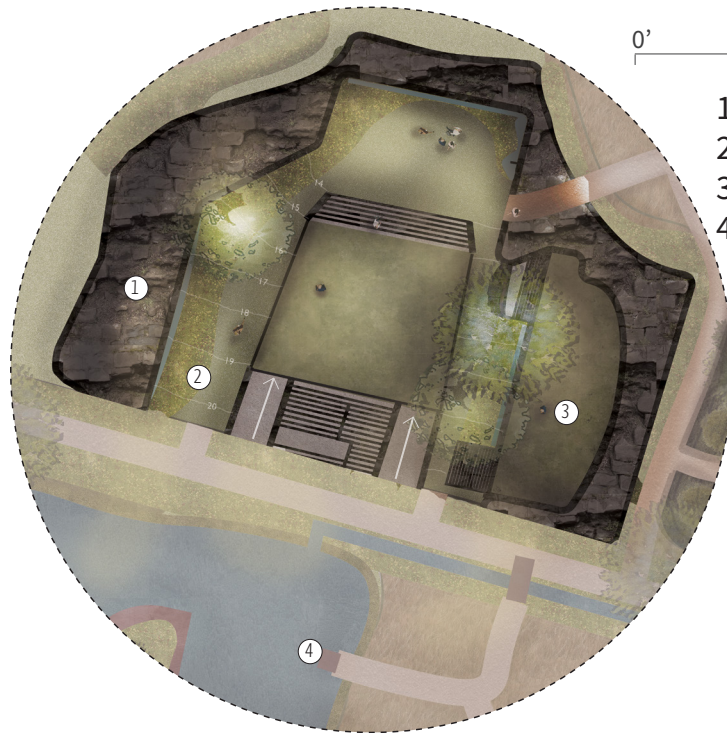


Site Layers And Movement



According to The Data Center , the Lower Garden District of New Orleans has 1.16 square miles of land with only 0.021 square miles of green space. With my design, the ecological reclamation of the Market Street Power Plant would **increase overall green space in the Lower Garden District by 63.54%** and **tree canopy cover on the site by 18.2%.**

Sunken Grotto



1. Stone Wall Enclosure
2. Gradual Slope Down
3. Raised Seating Area
4. Pier Over Pond

Urbanite:

Current site with 310,676 sqft impervious surface



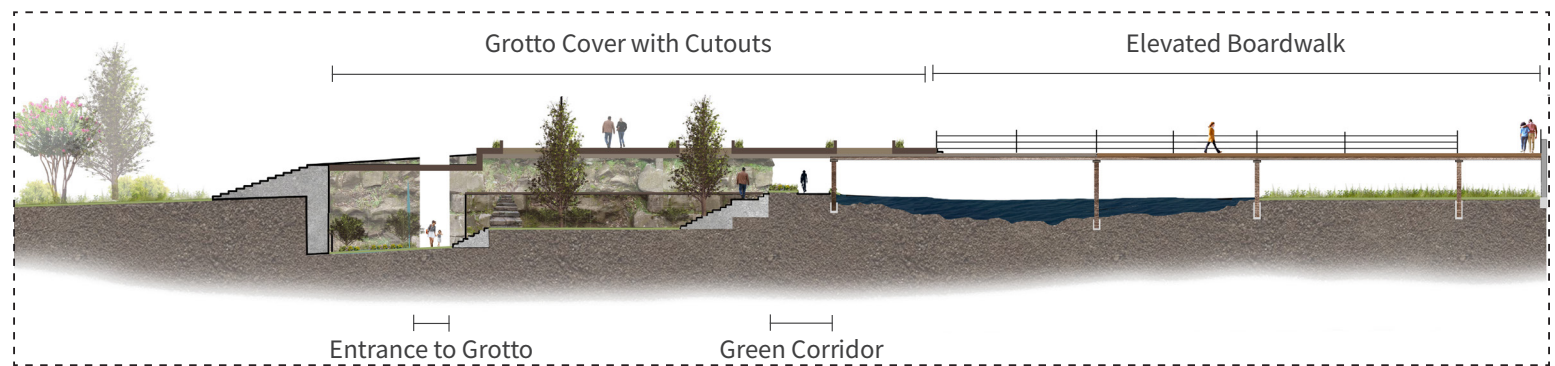
Demolition of concrete on site used for grotto wall enclosure



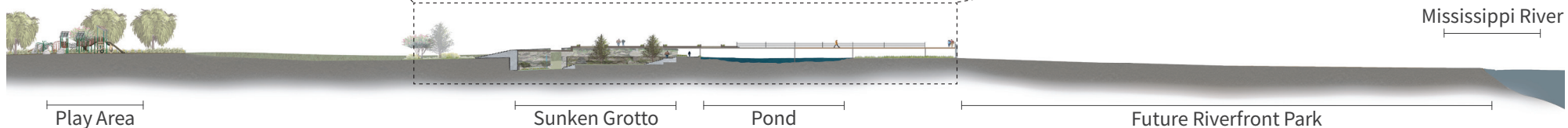
The process of urbanite, recycling of demolished concrete, can reduce CO2 Emissions SIGNIFICANTLY. This can lead to a better quality of life and healthier environment for the Lower Garden District.



Volume of reclaimed concrete needed for grotto: 777.78 cubic yards = 1575 tons of concrete. Producing one ton of new concrete generates 0.9 tons of CO2 Emissions. CO2 emissions saved = 1,575 tons × 0.9 tons CO2/ton concrete = **1,417.5 tons of CO2**



A-A1 0' 50' 100'

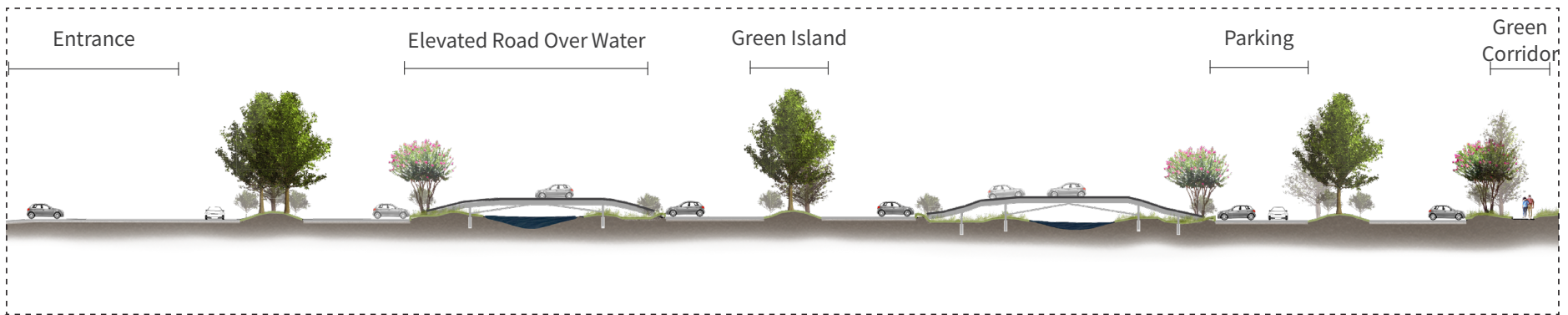
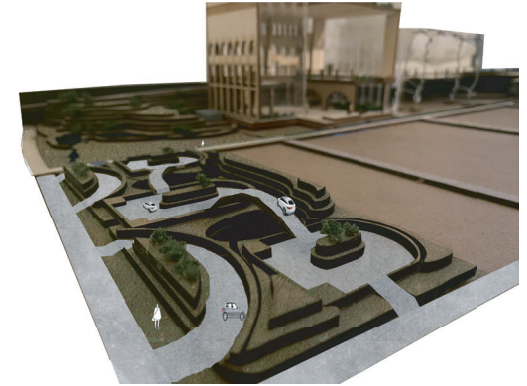


Parking Garden

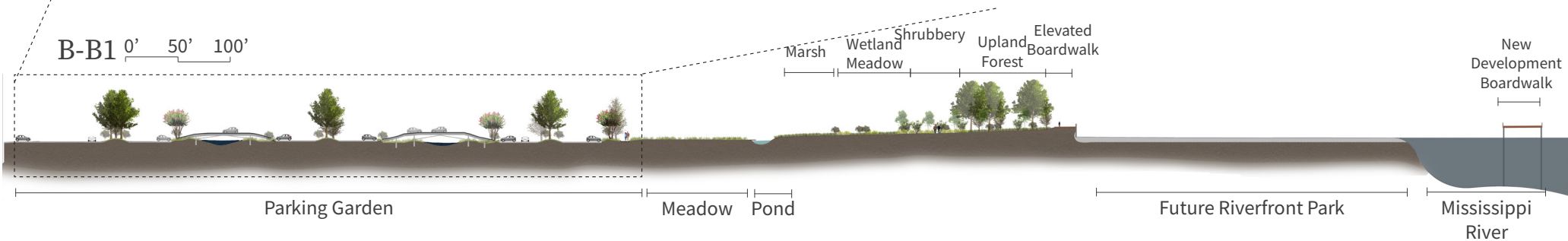


0' 50' 100'

1. Entrance
2. Raised Roadway
3. Shrubby
4. Green Island
5. Meadow
6. Pond
7. Pedestrian Trails



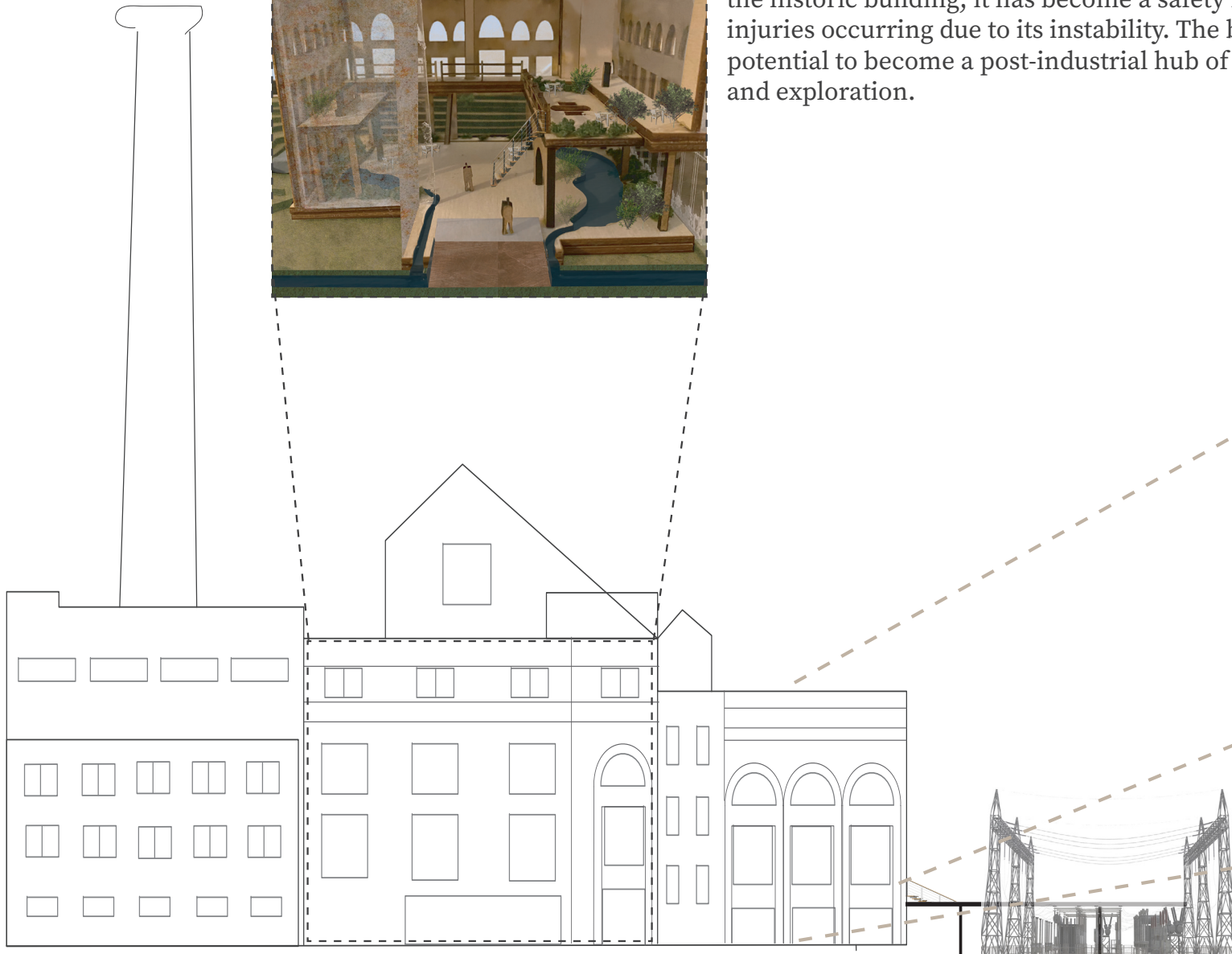
B-B1 0' 50' 100'



Inside Market Street Power Plant



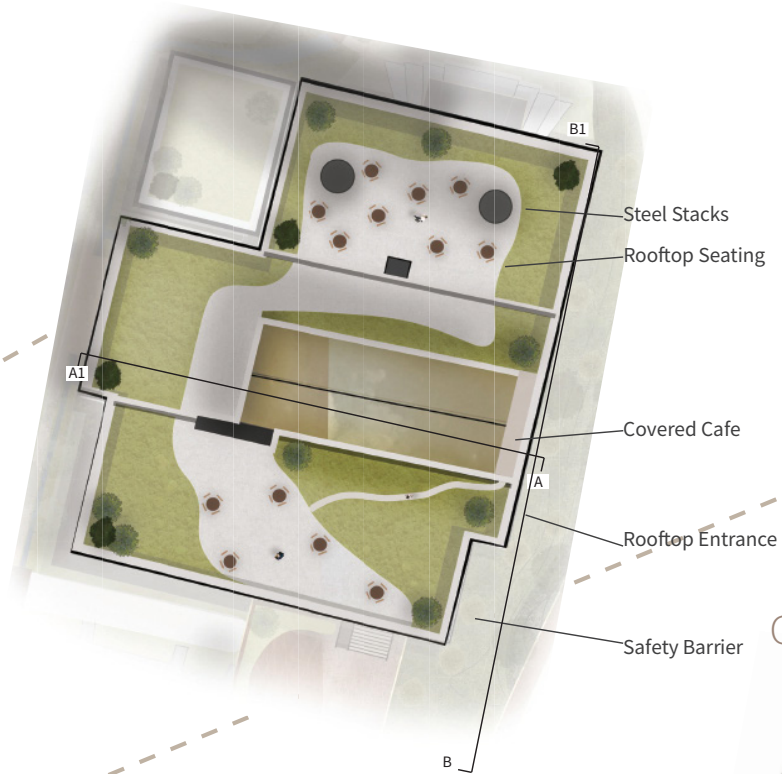
The Market Street Power Plant once provided electricity to the entire city of New Orleans, but since the power plant shut its doors in 1973, it has remained abandoned. With many wanting to explore the historic building, it has become a safety hazard, with numerous injuries occurring due to its instability. The building has the potential to become a post-industrial hub of ecological reclamation and exploration.



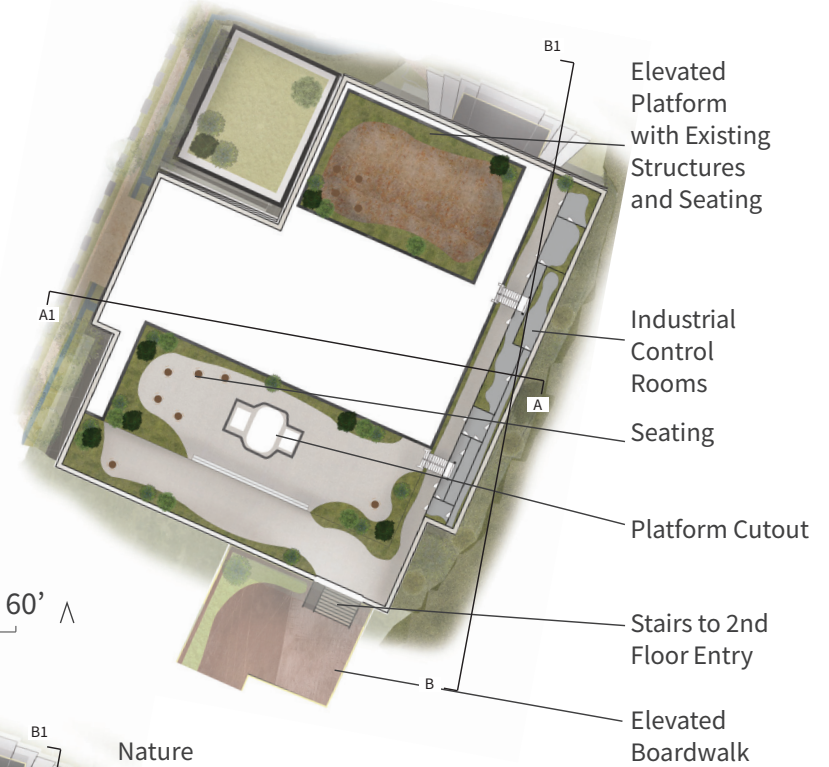
Front of Power Plant

Floor Plans

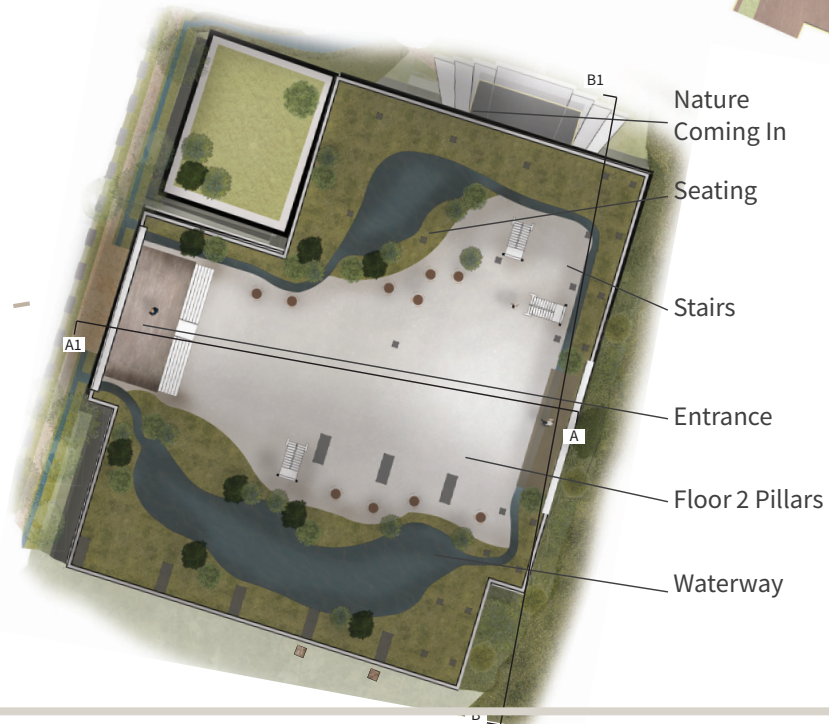
Green Roof 0' 30' 60' ^



Floor 2 0' 30' 60' ^



Ground Floor 0' 30' 60' ^



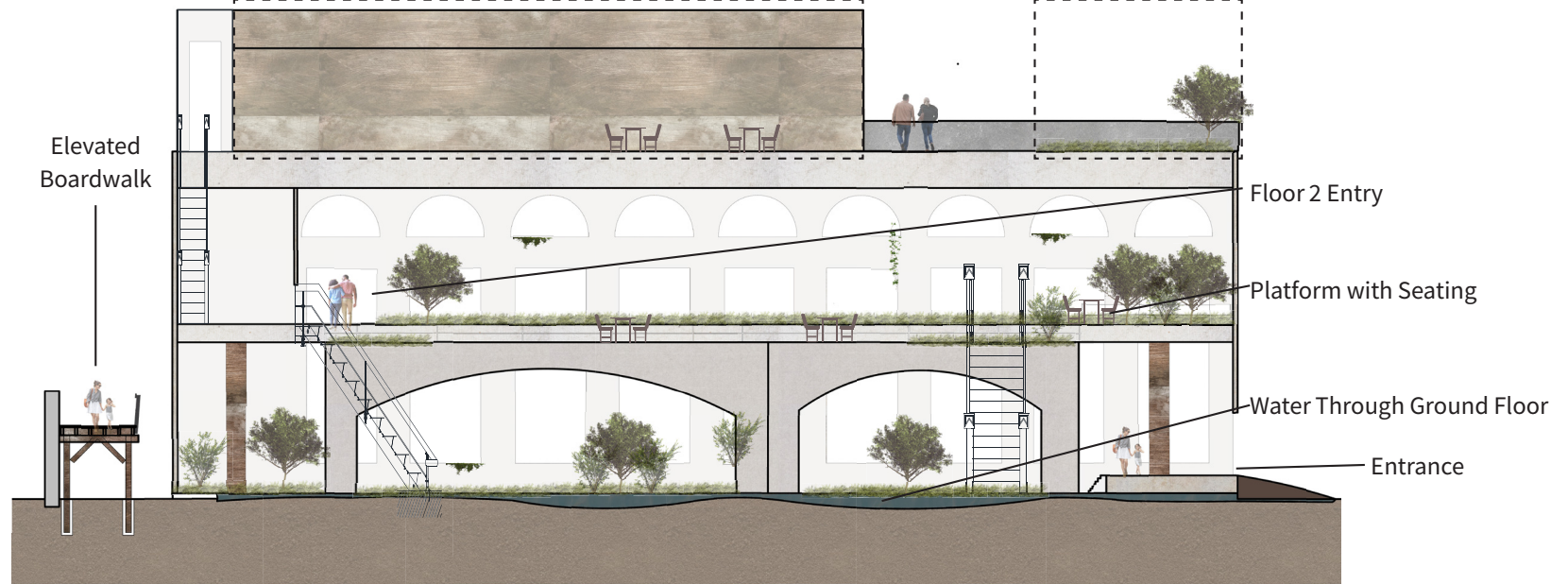
Architectural Sections

A-A1 0' 30' 60'

Rooftop Cafe



Rooftop Views



B-B1 0' 30' 60'

Entrance From Boardwalk



Control Rooms



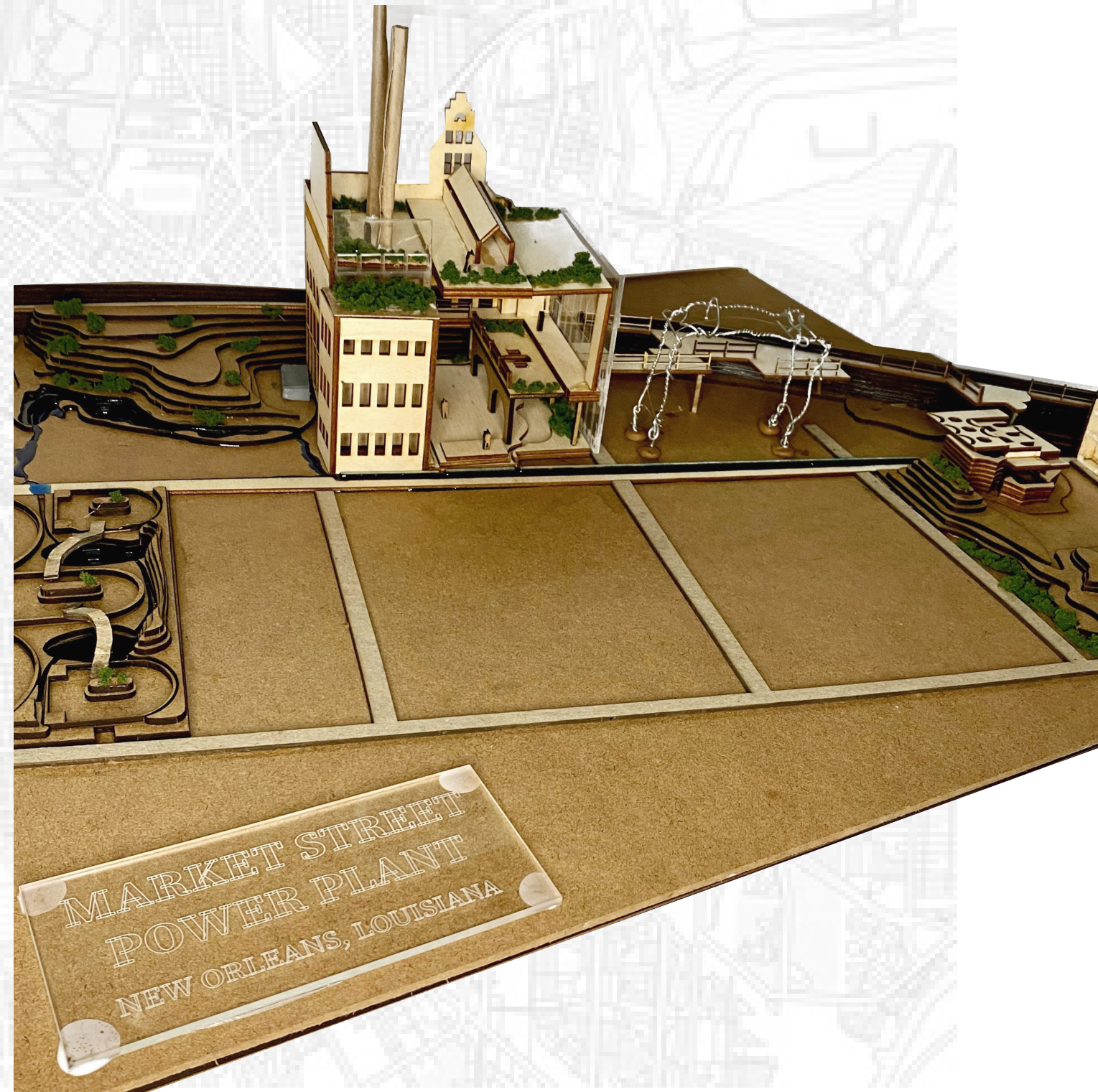
Elevated Platform with Existing Structures and Seating

Platform with Seating

Entrance

Water Through Ground Floor

Benefits



Green Space and Tree Cover

Lower Garden District Total Land: **1.16 sqmi**

Lower Garden District Existing Green Space: **1.18%**

Market Street Power Plant Land: **372,753 sqft**

Market Street Power Plant Impervious Surface: **310,676 sqft**

Market Street Power Plant Tree Cover: **0%**

% Green Space After Implementation:

2.96%

% Tree Cover After Implementation:

18.2% Increase

63.54% Increase

CO2 Emissions Through Urbanite: **1,417.5 tons**

= around 1417 round trip flights NYC to LA

Effects

LGD Green Space

Before 1.18%
After 2.96%

Urban Heat Index Reduction

New Trees 39.2°F
Mature Trees 59°F

Pollution Reduction

PM2.5 15.25%

Poor Health and Mortality Reduction

Depression 17.16%
Anxiety 9.53%
Cardio Metabolic
Mortality Rate 21%



Research



Ecological Reclamation

Key Findings:

Ecological reclamation requires an approach that takes into account the complex interactions between *design, ecology, and social factors*. Designers can play a key role in shaping the future of landscapes by intervening in their evolution through the use of “*temporal infrastructures*” which refer to techniques and relational assemblies that affect how time happens in the landscape.¹ Furthermore, *nature-based design* has the potential to create sustainable and resilient cities that prioritize the natural environment, but achieving this goal requires *transdisciplinary collaboration* between architects, engineers, biologists, ecologists, social scientists, and local communities.² One approach that can be used is the use of plants and *plant-based technologies* for the remediation of contaminated sites and their integration into landscape design.³ Ecological reclamations represent an opportunity to address the challenges of the past and present, and to create a more *sustainable future*.¹ Through a collaborative and interdisciplinary approach, ecological reclamations can help to foster a more inclusive and democratic society by engaging diverse stakeholders in the design and management of urban spaces.



(Interbreeding Field, 2010)

“Intentionally speeding or slowing down a landscape involves designing temporal pathways for its evolution and dwelling in their effects.”



(Sooprayen. V, 2017)

Sources:

1. Milligan, B. (2022). Accelerated and Decelerated Landscapes. *Places Journal*. <https://doi.org/10.22269/220208>
2. Butt, A. N., & Dimitrijević, B. (2022). Multidisciplinary and Transdisciplinary Collaboration in Nature-Based Design of Sustainable Architecture and Urbanism. *Sustainability*, 14(16). <https://doi.org/10.3390/su141610339>
3. Kennen, K., & Kirkwood, N., (2015). *PHYTO: Principles and Resources for Site Remediation and Landscape Design*. Routledge.

Design Implications for Market Street Power Plant:

Incorporate a transdisciplinary approach between historic preservation of the building's architecture and plant installation to create a safe environment throughout the entire site.

Repurposing existing infrastructure, such as the plant's turbines, cooling towers, or chimneys.

Use of functional plants throughout the site to remove contaminants from the water and surrounding air.

Incorporate green walls and roofs in the power plant to help reduce the urban heat island effect, improve air quality, and provide space for biodiversity.

Integrating public art and cultural elements into the landscape architecture design can create a sense of place and meaning for the community.

Biophilic Urbanism

Key Findings:

Research suggests the potential of biophilic design to promote *sustainable urbanism* by integrating nature into the built environment. Biomorphic urbanism, which incorporates biophilic design principles into urban planning and development, has the potential to address challenges facing cities such as *climate change, biodiversity loss, and declining livability*. However, effective implementation of biophilic design principles requires collaboration between *multiple stakeholders*, including developers, architects, planners, and policymakers, to ensure sustainability and enhance the quality of life for urban residents.¹ Incorporating *function-specific plant systems* into urban planning and design can have significant positive impacts on sustainable urban development.² Specifically, this approach can lead to improved air and water quality, reduced urban heat islands, and increased biodiversity. Moreover, for implementation in New Orleans, the design should take into account both *aesthetic and functional considerations at various scales*, from individual properties to the broader urban landscape.³ Overall, the research emphasizes the need for a collaborative and context-specific approach to urban planning and design that prioritizes sustainability and enhances the well-being of urban residents.

Sources:

1. Xue, F., Zhonghua, G., Lau, S., Chung, K., & Zhang, J. (2019). From Biophilic Design to Biophilic Urbanism: Stakeholders' Perspectives. *Journal of Cleaner Production*, 211, 1444-1452. <https://doi.org/10.1016/j.jclepro.2018.11.277> Sustainability, 14(16). <https://doi.org/10.3390/su141610339>

2. French, K. E. (2021). Designing Function-Specific Plant Systems for Sustainable Urban Development. *Frontiers in Sustainable Cities*, 3. <https://doi.org/10.3389/frsc.2021.581764>

3. Shelley, E. (2014). Landscape and Longevity: Pursuing Integrated Aesthetics and Function at Multiple Scales in New Orleans. *Landscape Research Record*, (2), 19-29. https://www.academia.edu/download/47036693/lrr_no_2.pdf#page=26



(SOM,2014)

Design Implications for Market Street Power Plant:

Incorporate biophilic design principles, such as green roofs, living walls, and vertical gardens, to improve the quality of urban spaces and promote human wellbeing. These principles can be applied to the site to create an attractive and sustainable landscape.

The use of natural materials, such as wood, stone, and water, to create a sense of connection to nature and promote biophilic responses.

Function Specific Plant Species could be used to develop “buffer zones” that surround certain features of the site.

Ensure that their design for the abandoned industrial site incorporates sustainable and resilient features, such as green infrastructure and community spaces that can be used during and after flooding events.

Adaptive Urban Waterfronts

Key Findings:

The issue of storm surge disasters in New Orleans is becoming more serious due to global climate change and rising sea levels. The traditional method of storm surge defense, involving **grey infrastructure** such as seawalls, breakwaters, dikes, and floodgates, has drawbacks including impact on the ecosystem, high costs of construction and maintenance, single function defense mode, and splitting of the urban texture. A new and more sustainable approach to storm surge adaptation is the concept of **landscape infrastructure**, which carries resources and energy flows and supports urban development. However, many of these solutions, such as constructed wetlands, floating islands, and riprap, are not as effective as grey infrastructure against strong waves. An **organic integration** of both grey and landscape infrastructure is the ideal solution, considering the combination and collaboration of the two during the design and planning phase.¹ Furthermore, **riparian buffers**, which are strips of vegetation along the banks of rivers and streams, can enhance water quality, biodiversity, and ecosystem resilience, making them a critical landscape feature for managing freshwater ecosystems.² New Orleans is a **sinking city** due to groundwater extraction, sediment compaction, and natural processes such as sea-level rise and tectonic activity.³ This sinking also exacerbates other environmental problems, such as coastal erosion, saltwater intrusion, and land subsidence, which have implications for public health, infrastructure, and the economy.



(Lloyd/SWA,2018)

Sources:

1. Feng, L. (2018). Research on Storm Surge Adaptive Landscape Infrastructure. International Conference on Architectural Engineering and New Materials, 3. 29055-46209-1-SM.pdf
2. Graziano, M. P., Deguire, A. K., & Surasinghe, T. D. (2022). Riparian Buffers as a Critical Landscape Feature: Insights for Riverscape Conservation and Policy Renovations. Diversity, 14(3), 172. <https://doi.org/10.3390/d14030172>Sustainability, 14(16). <https://doi.org/10.3390/su141610339>
3. Goh, K. (2019). Urban Waterscapes: The Hydro-Politics of Flooding in a Sinking City. International Journal of Urban and Regional Research, 43(2). 250-272. <https://doi.org/10.1111/1468-2427.12756>

Design Implications for Market Street Power Plant:

Add landscape infrastructure, such as wetlands and successional plantings, to existing grey infrastructure, such as the levee systems, for added protection from flooding to the site.

Have retention ponds put in place in areas of high flood risk to protect the rest of the site and can be used as a habitat for greater biodiversity and visual appeal for visitors.

Incorporate features such as vegetated swales, infiltration trenches, and rain gardens to help address these contaminants and mimic the functions of natural riparian buffers.

Implement mixed-aged riparian vegetation, vertical stratification, and variable successional stages, thus providing habitats for both seral and climax communities.

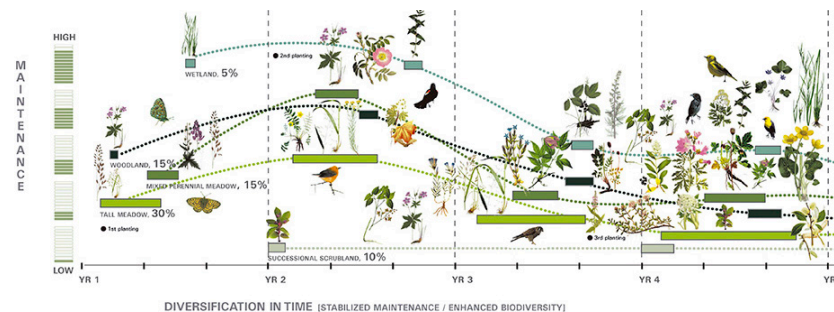
The High Line

Site History:

The High Line was originally built as an elevated freight rail line in the 1930s. The last train ran on the line in 1980, and the structure sat unused for many years. In the early 2000s, community activists formed the Friends of the High Line to advocate for the preservation and transformation of the elevated rail line into a public park. The first section of the High Line opened to the public in 2009. Today, the High Line incorporates biophilic design to create a peaceful and restorative oasis in the midst of the bustling city, providing a unique and valuable experience for visitors.

Goals:

- Create a unique and creative way to recycle the old railroad tracks.
- The High Line incorporates biophilic design elements into its park design, which aims to create a connection between people and nature
- The park features a variety of plants, trees, and flowers, carefully selected to create a diverse habitat for birds, insects, and other wildlife.
- Offers a new perspective on the city, the park promotes health and well-being by providing access to sunlight and natural environments.



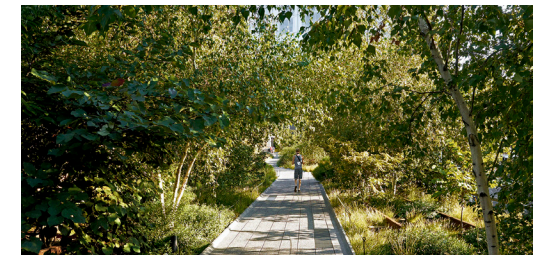
Inspiration for Market Street Power Plant

The High Line uses biophilic design to integrate nature into a busy city. This integration allows visitors to explore and learn about nature while allowing biodiversity to thrive.

For the Market Street Power Plant, biomorphic design can be used to restore nature and biodiversity in a post-industrial site.

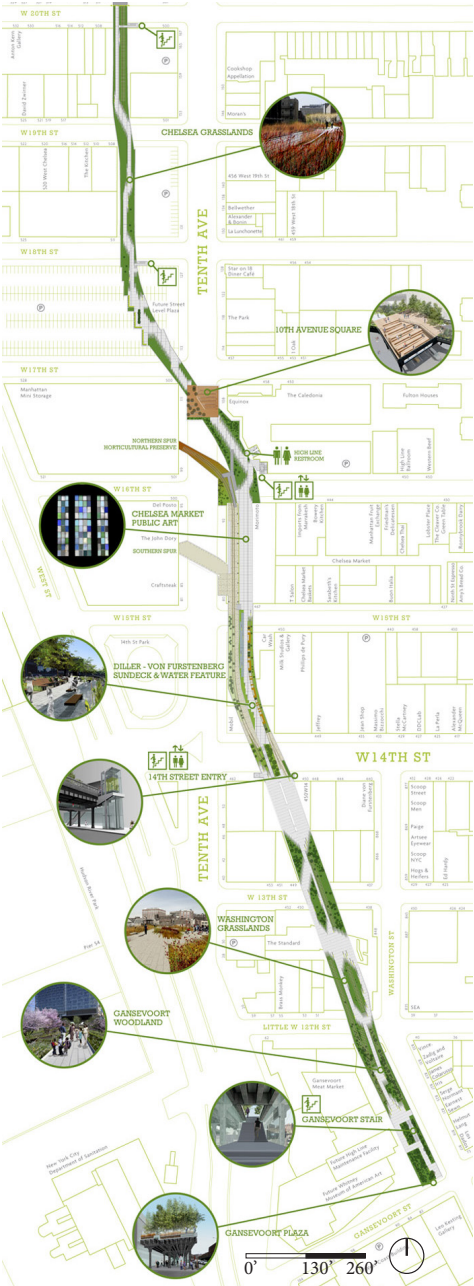
The use of a variety of plants, trees, and flowers will create a diverse habitat for birds, insects, and other wildlife.

Water features, natural materials, and views of the surrounding cityscape and Mississippi River will also contribute to the biophilic design approach.



Case Study: New York City

Site Plan



Users



The High Line is a popular destination that attracts a diverse group of visitors. Typical users include tourists, locals, families, fitness enthusiasts, and art lovers. Overall, the High Line's appeal and versatility as a public space attract a wide range of users, reflecting the diversity and vibrancy of New York City.

3D Model



The park stretches for 1.45 miles from Gansevoort Street in the Meatpacking District to 34th Street, between 10th and 12th Avenues.



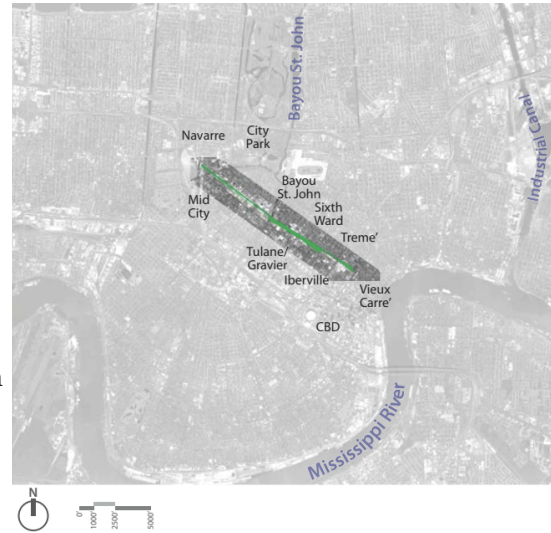
Site Section



Lafitte Greenway

Site History:

The Lafitte Greenway dates back to the early 20th century when the corridor was used as a railway line to transport goods and people across the city. In the mid-20th century, the railway declined in use and was eventually abandoned, leaving the corridor neglected and overgrown. After Hurricane Katrina, the city recognized the need for more green space and transportation options. Construction began in 2013, and the trail officially opened in 2015, providing a much-needed amenity to the surrounding neighborhoods. Today, the Lafitte Greenway is a thriving public space that connects people and communities across the city.



Goals:

- Create a green space and public amenity that enhances the quality of life for residents and visitors.
- Preserve and celebrate the history and cultural significance of the corridor, which was once a vital transportation route in New Orleans.
- Lessen the effects of urban heat island and increase stormwater management capacity. Specifically, the restoration of the natural edge conditions of Bayou St. John will encourage fish and wildlife habitat, support biodiversity and increase water quality.
- Provide a safe and accessible transportation option for pedestrians and cyclists, connecting various neighborhoods and destinations throughout the city.



Inspiration for Market Street Power Plant

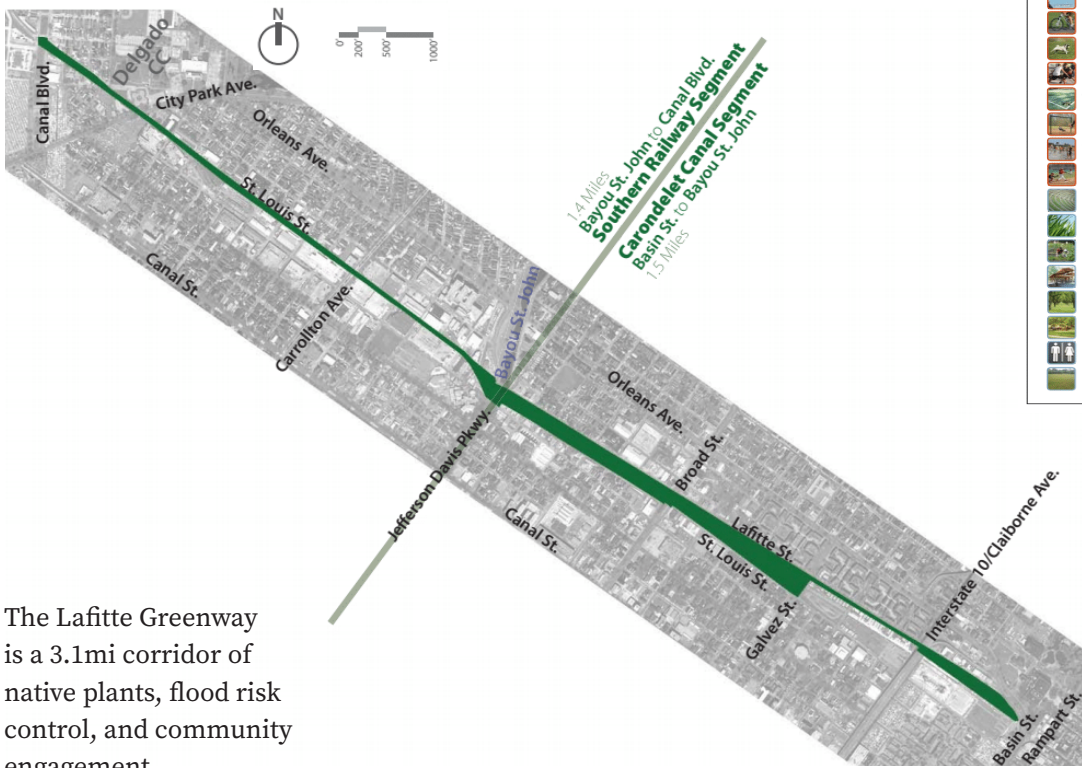
The Lafitte Greenway provides solutions for flood risks and biodiversity loss in the city while preserving the community and culture within the city.

My design for the Market Street Power Plant can draw inspiration from this project and how the landscape architects revitalized an abandoned industrial corridor with native tree species and stormwater management, while also implementing safe pedestrian transportation options for surrounding neighborhoods.

The abandoned power plant can draw from the plant species and flood control systems used to ensure ecological restoration of the site.



Case Study: New Orleans, Louisiana Greenway Context Map



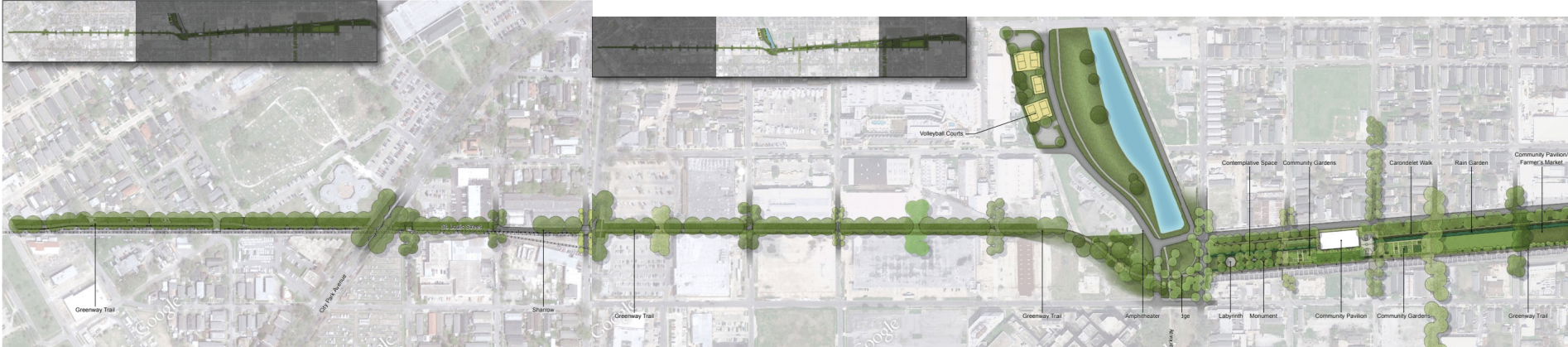
The Lafitte Greenway is a 3.1mi corridor of native plants, flood risk control, and community engagement.

Programmatic Elements

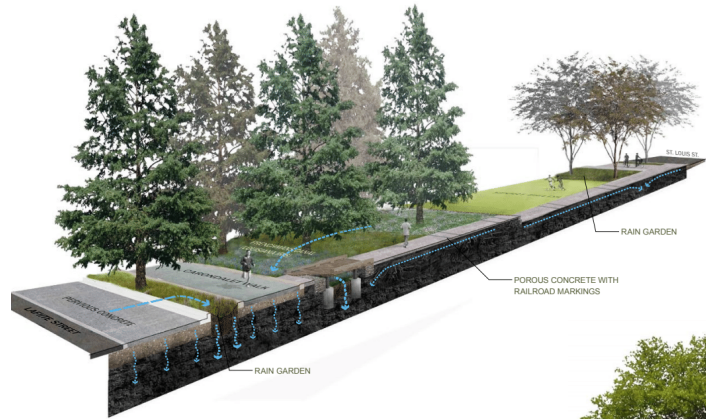
- Football
- Volleyball
- Running/Jogging
- Skate Park
- Biking
- Dog Park
- Basketball
- Tennis
- Playground
- Water Feature
- Baseball
- Amphitheater
- Contemplative Space
- Community Garden
- Pavilion
- Orchard
- Community Gathering
- Restrooms
- Open lawn



Greenway Plan

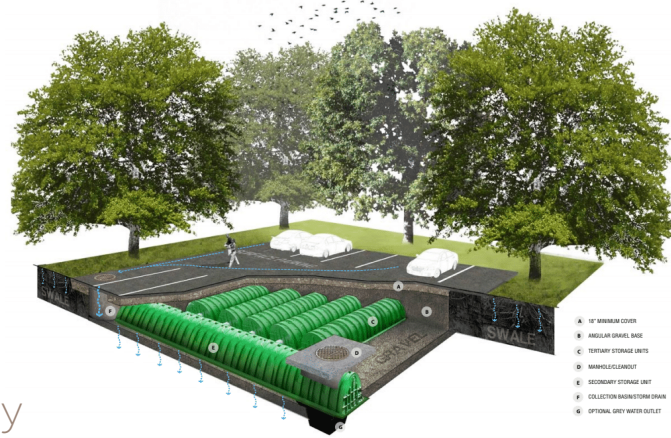


Case Study: New Orleans, Louisiana

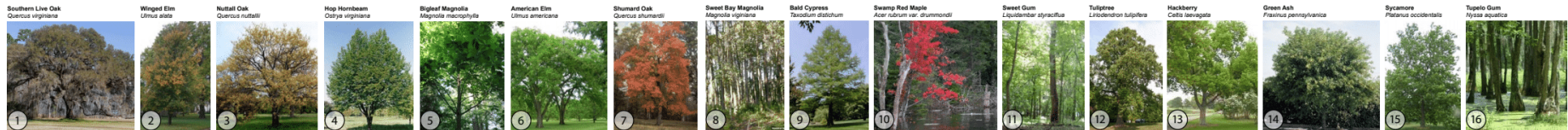


Green Stormwater Infrastructure 3D Models

There are several forms of stormwater management along the corridor including rain gardens, permeable pavement, and underground stormwater storage and outlets.



Trees Used On Greenway



Community Engagement



The planning for the project was driven by community engagement. The Greenway's community took part in meetings, surveys, and charrettes to ensure the project was community-driven. The Lafitte Greenway attracts a diverse range of users, including locals and tourists, who use the trail for various activities. The project was designed to be accessible to all.



SteelStacks Arts and Cultural Campus

Site History:

The site where SteelStacks now stands was once one of the largest steel mills in the world. The plant struggled in the face of increasing global competition, and it eventually closed in 1995. The site was left abandoned for several years until ArtsQuest began working on plans to transform it into a cultural and entertainment destination in the early 2000s. Today, SteelStacks is a vibrant campus that celebrates the history and culture of the region, while also providing a wide range of entertainment, educational, and cultural opportunities for visitors.



Goals:

- Re-forge a cultural link between historic downtown Bethlehem, the Lehigh River, Lehigh University, and the manufacturing heritage of the Lehigh Valley.
- Exchanging impervious cover for pervious, and minimizing the generation of stormwater runoff.
- Increasing the site's biomass, and a low level of illumination was accepted as a way to minimize energy consumption.
- Year-round art education and performances to expand their public programs.
- Represents a new landscape typology for small, post-industrial cities, and will continue to contribute to the extensive economic resurgence of this former factory town.

Inspiration for Market Street Power Plant

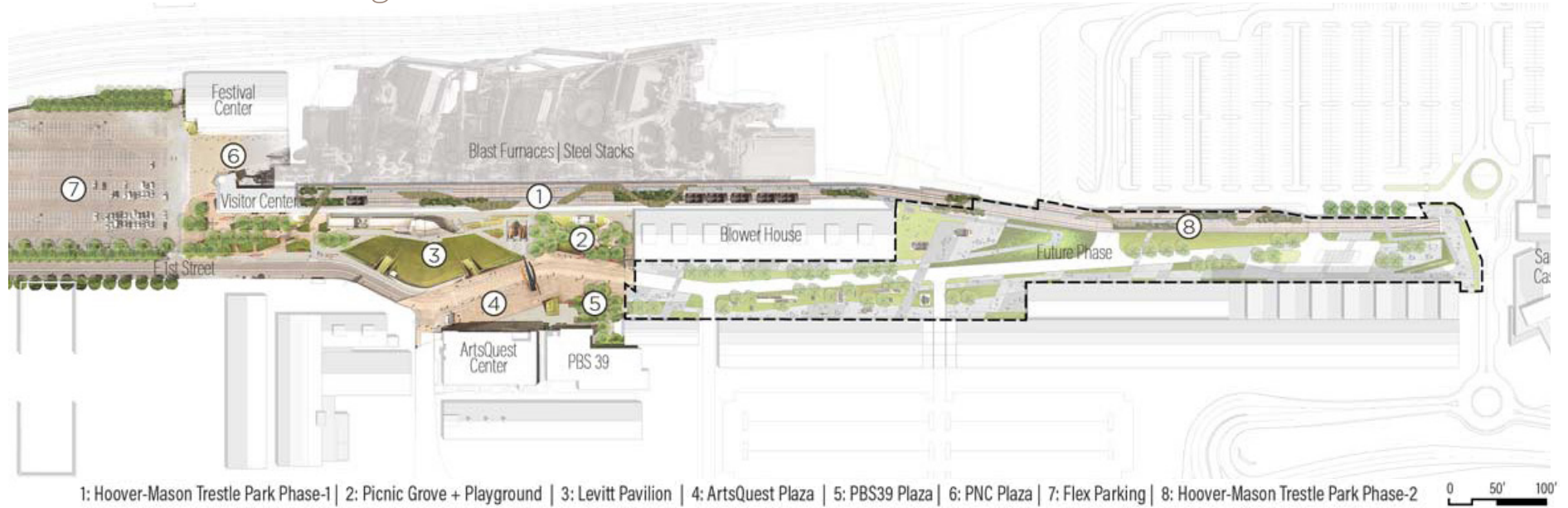
The SteelStacks site used adaptive reuse to show changes in landscape typologies post-industrialization. With removal of existing building foundations, the site was able to bring in native plant species for more pervious cover, biodiversity, and stormwater management.

The Market Street Power Plant can take inspiration for this restoration of a post-industrialized site while keeping the site's history intact. The focus of the site's landscape is sustainability and stormwater runoff mitigation while allowing space for economic resurgence through art, education, and culture.



Case Study: Bethlehem, Pennsylvania

Site Plan and Programmatic Elements



The 9.5-acre site is a hub for music, art, and culture, with spaces for concerts, exploration trails, art and history education and immersions, cinemas, and areas for food and picnics.

Users:



The community felt a lot of anger toward the abandoned steel facilities, and some residents wanted to tear down the steel stacks, but as the planning process proceeded, new ideas emerged. Currently the site brings in about 1.5 mil visitors annually. Community leadership was essential to make this project what it is today. It is a popular destination for a diverse range of users, including locals and tourists of all ages. The site attracts music lovers, art enthusiasts, history buffs, families with children, outdoor enthusiasts who enjoy hiking, biking, and other recreational activities, and foodies.



Sources



1. Butt, A. N., & Dimitrijević, B. (2022). Multidisciplinary and Transdisciplinary Collaboration in Nature-Based Design of Sustainable Architecture and Urbanism. *Sustainability*, 14(16). <https://doi.org/10.3390/su141610339>
2. Feng, L. (2018). Research on Storm Surge Adaptive Landscape Infrastructure. *International Conference on Architectural Engineering and New Materials*, 3. 29055-46209-1-SM.pdf
3. French, K. E. (2021). Designing Function-Specific Plant Systems for Sustainable Urban Development. *Frontiers in Sustainable Cities*, 3. <https://doi.org/10.3389/frsc.2021.581764>
4. Graziano, M. P., Deguire, A. K., & Surasinghe, T. D. (2022). Riparian Buffers as a Critical Landscape Feature: Insights for Riverscape Conservation and Policy Renovations. *Diversity*, 14(3), 172. <https://doi.org/10.3390/d14030172>*Sustainability*, 14(16). <https://doi.org/10.3390/su141610339>
5. Goh, K. (2019). Urban Waterscapes: The Hydro-Politics of Flooding in a Sinking City. *International Journal of Urban and Regional Research*, 43(2). 250-272. <https://doi.org/10.1111/1468-2427.12756>
6. Kennen, K., & Kirkwood, N., (2015). *PHYTO: Principles and Resources for Site Remediation and Landscape Design*. Routledge.
7. Milligan, B. (2022). Accelerated and Decelerated Landscapes. *Places Journal*. <https://doi.org/10.22269/220208>
8. Shelley, E. (2014). Landscape and Longevity: Pursuing Integrated Aesthetics and Function at Multiple Scales in New Orleans. *Landscape Research Record*, (2), 19-29. https://www.academia.edu/download/47036693/lrr_no_2.pdf#page=26
9. Xue, F., Zhonghua, G., Lau, S., Chung, K., & Zhang, J. (2019). From Biophilic Design to Biophilic Urbanism: Stakeholders' Perspectives. *Journal of Cleaner Production*, 211, 1444-1452. <https://doi.org/10.1016/j.jclepro.2018.11.277> *Sustainability*, 14(16). <https://doi.org/10.3390/su141610339>

