

AT WATER'S EDGE: IMAGINING FUTURES ON SHIFTING GROUND

Amilie Marie Napier

A THESIS

Presented to the Faculty of Miami University in partial
fulfillment of the requirements
for the degree of

Master of Architecture

Department of Architecture and Interior Design

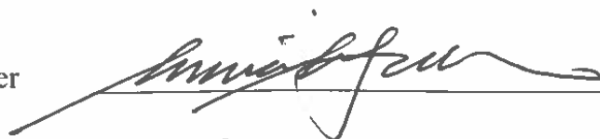
The Graduate School
Miami University
Oxford, Ohio

2026

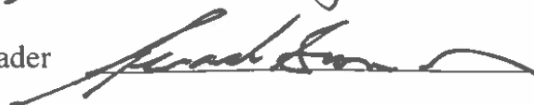
Labib Hossain, Advisor

A handwritten signature in black ink, appearing to read "Labib Hossain", written over a horizontal line.

Marcia Lopes de Mello, Reader

A handwritten signature in black ink, appearing to read "Marcia Lopes de Mello", written over a horizontal line.

Gerardo Brown-Manrique, Reader

A handwritten signature in black ink, appearing to read "Gerardo Brown-Manrique", written over a horizontal line.

©

Amilie Marie Napier

2026

ABSTRACT

This thesis investigates architectural strategies for engaging flood-prone landscapes through coexistence rather than control. As climate change disproportionately impacts vulnerable communities, the project emphasizes the need for culturally responsive and collaborative approaches to design. Combining international precedents with physical modeling experiments, it examines structural and spatial responses to unstable ground and fluctuating water levels. The design proposal develops a research and education campus in the wetlands of East New Orleans, using elevated structures and low-impact infrastructure to support environmental stewardship, observation, and learning. Together, these strategies form a flexible framework that encourages architects to ask better questions, work with affected communities, and design more responsibly for the shifting conditions at water's edge.

TABLE OF CONTENTS

Abstract	iii
Table of Contents	v
Dedication	vii
Acknowledgements.....	ix
Architectural Resilience in Coastal and Flood-Prone Regions	1
Addendum	11
Design Process	15
Architectural Building Design	34

DEDICATION

This thesis is dedicated to my partners, John Catron and Derek Baer, for their enduring support across shifting ground.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my thesis committee chair, Labib Hossain, for his guidance, insight, and support throughout the development of this thesis. His feedback and encouragement were instrumental in shaping both the direction and depth of this work.

I am also grateful to my committee readers, Marcia Lopes de Mello and Gerardo Brown-Manrique, for their thoughtful critiques and valuable perspectives, which strengthened this project at every stage.

I extend my thanks to Terry Welker, Mary Ben Bonham, and May Khalife for their guidance throughout my thesis journey, which began with a research paper that first sparked my interest in architectural resilience to flooding.

I also acknowledge the Northwest Ohio Scholarship Fund for supporting my travel to New Orleans, making it possible to visit my site and engage with it directly.

I am especially grateful to my friends, colleagues, and mentors, Caroline Galecki, Mark Bartlett, Chris Mayfield, and Nathaniel Stoltz, whose support during the graduate school application process helped make this journey possible.

Finally, I am deeply thankful to John Catron and Derek Baer, my parents, Phil and Lisan Napier, my brother, Alex Napier, and my extended family for their unwavering support, patience, and encouragement throughout this process and beyond.

Architectural Resilience in Coastal and Flood-Prone Regions

Thesis Statement

This thesis will evaluate existing architectural solutions to high waters, and it will ultimately propose an adaptable framework for coping with flooding wherever the issue may arise.

Key Words

Climate-responsive design, water-based architecture, community-driven design

Thesis Abstract

This thesis explores architectural strategies for living and thriving when faced with rising waters and frequent flooding. Climate change is driving up the frequency of water-based natural disasters, and more communities will need to face this issue as time progresses. This study searches for tactics that can play on the blurring of the line between nature and structures. Case studies from Brunei, Nigeria, China, and Bangladesh are analyzed to show several demonstrably effective architectural approaches that allow flood-prone communities to flourish when faced with environmental hardships. Thus far, this investigation has concluded that the best solution in any given environment is one that is tailored to the region and community in which it is built. Therefore, this thesis will involve not only designing a structure on a flood-prone site but also creating a framework for evaluating the suitability of different architectural methods for specific flood-prone sites. This framework will include elements of cultural sensitivity and heritage preservation, as it is crucial that the project be accepted by the residents where it is being built. Site research will be conducted through the examination of architectural histories, local news articles, historical photographs and diagrams, drawings, and materials.

Introduction

Flooding and rising waters are an increasingly pressing problem worldwide that affects people's livelihoods, security, and dignity. This is especially concerning because of the disparity in climate disaster experiences between wealthier and poorer regions. While wealthier areas have advanced flood mitigation infrastructure, marginalized communities generally rely on their own ingenuity to solve the problems caused by flooding. There is also an imbalance between the communities that have contributed the most to global warming and those that are affected by its consequences. This unfairness and a desire to mitigate it are large driving forces behind this project.

Throughout this study, a key point will be that structures should respond to their environment, support the people who live in them, and anticipate future challenges. Thus, the goals of this research are twofold: First, to explore innovative, culturally sensitive solutions that help communities thrive in the face of environmental uncertainty. And second, to create an extensible framework to guide architectural flood mitigation efforts worldwide.

Hypothesis and Speculation

The framework developed over the course of this thesis project will likely consist of some or all of the following components.

It may involve a hybrid strategy of using local materials when possible but balancing this with using materials that will most effectively perform the necessary job.

It will involve consulting with local residents to learn what their priorities are and ensure that

these are considered during the design and build process.

It will include research into historical and indigenous techniques as well as modern technologies and likely recommend a blend of strategies.

Modern guidelines such as ADA accessibility and universal design will also be considered, so as to include as many people as possible.

Ultimately, some paths will result in a recommendation to retreat rather than attempt to build, as it is not always advisable to resist nature.

Methodology

Several research methods will be used concurrently while completing this thesis project.

Architectural Histories and Politics of Space

Historical photos and transformations will be used to gather historical information about the case studies and possible sites and to elucidate the role that politics has played in those cities throughout history. Local news articles will also be used to provide local perspectives on the scenarios being studied.

For example, Makoko is an informal settlement that is not recognized or supported by the Nigerian government. While the Makoko Floating School had the backing of an architectural firm, it did not have any protection from looters and bad-faith actors, which played a role in its ultimate failure. On the other hand, Chinese sponge cities are being pushed by the Chinese government; in fact, they are requiring that at least 80% of urban land implement sponge city strategies by the year 2030. This means that sponge city projects are likely to be supported by the government, at least theoretically, even if they are funded locally.

Material Studies

Materials are highly relevant to this thesis, and the role of materials will be studied for its relation to the values of each culture, behaviors of the people, and the level of technological advancement.

An especially strong example of this is Kampong Ayer, which is grappling with conflicting priorities regarding housing materials. Traditionally, it has made the most sense to use local materials and to allow housing units to form organically in close-knit formations, and many of the residents value keeping a traditional aesthetic. Because of the recent demand for electricity and internet access, there is a need for fire safety strategies such as increased space between housing units, non-combustible roofing, and sprinkler systems. But as they integrate these safety strategies with the structures, fire-safe materials need to be imported from outside the community.

Drawings, Maps, and Diagrams

Drawings are a versatile medium that can expose strengths and weaknesses of structures and architectural techniques. Drawings and diagrams will likely be especially useful when analyzing the failure of the Makoko Floating School. The structure is relatively simple, and diagrams of it are readily available (Figure 1).

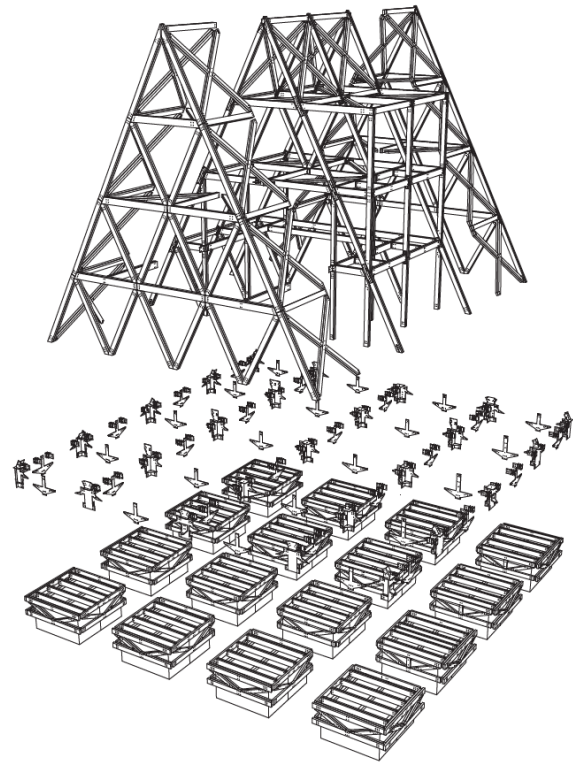


Figure 1. Exploded axon diagram of the Makoko Floating System.

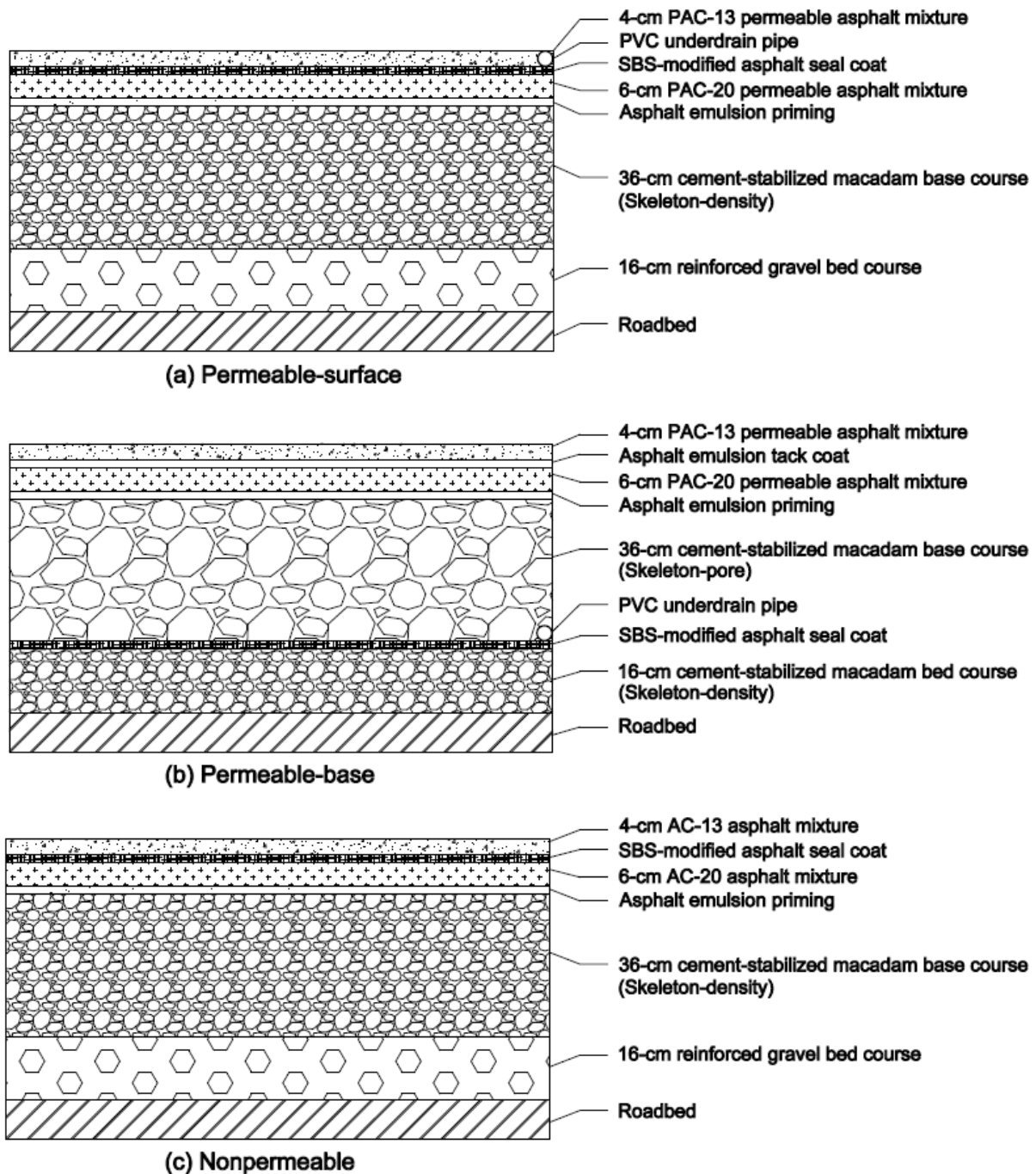


Figure 2. Structural systems for asphalt pavements in China.

Diagrams and maps are also likely to be useful when studying different sponge city techniques such as permeable pavements (Figure 2) and constructed wetlands, as they can illustrate these techniques more effectively than photos can.

Methodological Challenges

Only one methodological challenge has been identified so far, and that is finding broader sources about each site's history of water-related challenges and methods of coping with them. This challenge has been largely

overcome already, as discussed in the *Potential Site Options* section of this proposal.

Literature Review

Some of the literature that informs the theoretical side of this study is summarized here.

Amale Andraos' essay, *What Does Climate Change?* addresses the relationship between urban and natural environments. In it, Andraos emphasizes the need to design for uncertainty and changing conditions.

In Donna Haraway's *Staying with the Trouble: Anthropocene, Capitalocene, and Chthulucene*, she challenges anthropocentrism and explores the complexities of humanity's role in nature. It serves as a reminder that humans are one of many species that live on this earth, and it is important to consider this when developing architecture.

In *Pluriverse: Proposals for a World of Many Worlds*, Mario Blaser and Marisol de la Cadena discuss the harm caused by "extractivism," the antithesis to environmentalism. The concept of the pluriverse is proposed as an analytical tool for rethinking the ethnographic experiences that shape a diverse and interconnected set of worlds.

Amitav Ghosh's book, *The Great Derangement*, relates climate change to history and politics. In it, he analyzes the role that colonization has played in the development of coastal settlements, and he critiques the desire for short-term economic gain over the long-term sustainability that traditional knowledge had prioritized.

In *Opening Up the Canon of Knowledge and Recognition of Difference*, Boaventura de Sousa Santos et al advocate for the recognition of many systems of knowledge, each of which is incomplete on its own. They argue that the production of knowledge is a reflexive social practice that drives the epistemological diversity seen throughout human existence.

Theoretical Lenses

The following theoretical lenses will be used to guide the direction that this study takes.

Environmental Justice

Research efforts will examine how architecture can address disparities in who bears the burden of flooding and displacement. This will be considered as a central component to the extensible framework developed.

Resilient Systems

This study will explore complex, interconnected systems (e.g. urban, ecological, and social) and their capacity to adapt to change. These various perspectives will be analyzed and used to develop an ostensibly architectural structure that is resilient in many ways.

Critical Regionalism

Global innovation (e.g. sponge city technologies) will be balanced with regionally-sourced materials and community knowledge. This is likely to also be a critical part of the framework developed.

Ecological Urbanism

Structures will be designed to center ecological systems and foster environmental stewardship. They will be developed with not only humans in mind, but also the other living things with whom humans share the earth.

Case Study Analysis

Kampong Ayer, Brunei

This neighborhood was originally built in the ninth century CE in an area that frequently floods, and it is still standing. The settlement consists of houses on stilts and elevated walkways. It is modular and organically-formed, and it is largely built from local materials, though this has changed some in the last century. The combination of densely-packed, flammable houses and modern demands for utilities such as electricity and internet access has created a fire hazard, and there is a conflict between the desire to keep a historic aesthetic and the need for safety.

Makoko Floating School, Lagos, Nigeria

This floating structure was built in a region that experiences severe floods three to four times a year, as a proof of concept that innovation did

not require destroying any existing slums. It was a successful prototype, and it could support 100 adults even during extreme weather. However, it fell into disrepair quickly. Due to a lack of security, its anchor chains were stolen, so the structure drifted away and later collapsed completely during a bout of heavy rains. Makoko is an informal settlement that lacks government recognition, which contributed to the failure of this project. Furthermore, some argue that it reduced the residents' lives to an architectural experiment.

Sponge Cities, China

China has launched an initiative to create "sponge cities," which would absorb or reuse 70% of their stormwater through low-impact development infrastructure, to solve the problem of excessive flooding due to extreme rain events. A variety of sponge cities have been implemented, using several different techniques that could arguably be considered successful or not. Permeable pavements come in two main varieties that each come with their own tradeoffs, and each city should decide which one better suits its needs.

Khudi Bari Houses, Bangladesh

During the COVID-19 pandemic, "khudi bari" houses were developed in Bangladesh as a lightweight, vernacular solution to homelessness along the shores of a large river delta, where the ground is largely composed of accumulated silt. They were more affordable than the pre-existing housing options, fit in with the existing homes, and could be assembled without any electricity.

Potential Site Options

Two sites are being considered as site options for this thesis project: New Orleans, Louisiana and Miami, Florida. Both sites are well-known cities in the United States that have a long history of facing floods and will need to prepare for more rising waters in the decades and centuries to come. Each city presents some unique opportunities because of its culture and history.

New Orleans, Louisiana

New Orleans is located at the mouth of the Mississippi River (Figure 3) along the Gulf of

Mexico. Algiers Point is one of the city's oldest neighborhoods and is poised to be an example of adaptive reuse of historic structures. The Treme is one of the oldest Black neighborhoods in the United States, and it would be ideal for exploring the intersection of resilience and heritage preservation. The Lower Ninth Ward is a historically underserved neighborhood that suffered immensely during Hurricane Katrina and has great potential for community-based design.

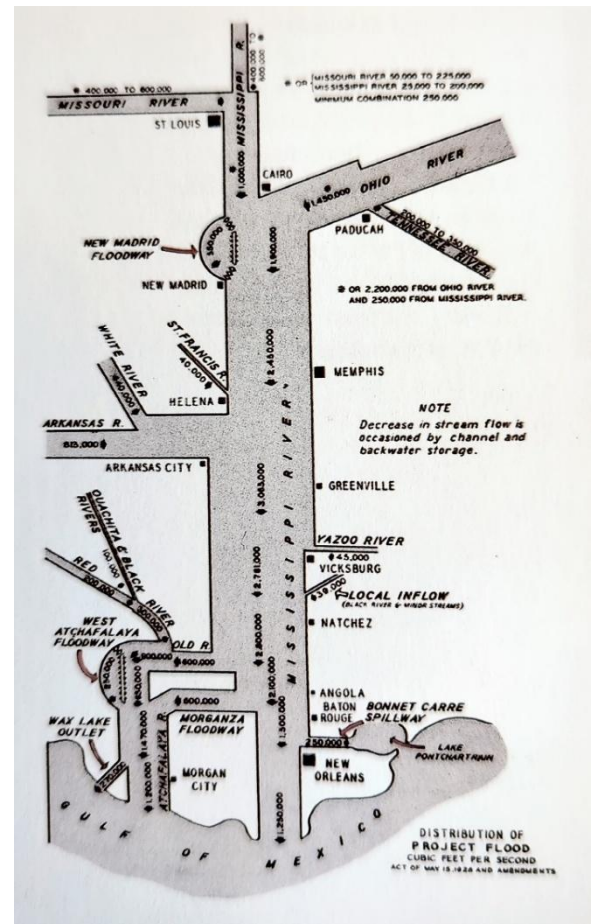


Figure 3. A graphical representation of the Mississippi River's tributaries and delta. New Orleans can be seen toward the east side of the delta.

Miami, Florida

Miami is located on the southeastern coast of Florida, facing the Atlantic Ocean. Little Haiti is exceptionally rich in immigrant identity, though it is vulnerable to gentrification due to being on higher ground. It would offer a chance to explore anti-displacement design, community

land trusts, and affordable housing. Overtown was formerly a thriving Black cultural hub, that was fragmented by highway construction. It has some potential for transit-adjacent development and reparative design. South Beach suffers from chronic flooding and king tides, and developing there would be an opportunity to consider flooding resilience in tourism infrastructure and luxury housing. Also, Sealey et al posit in *Will Miami Survive?* that “[f]ew places better demonstrate the complex interactions between the natural environment and the system of finance, insurance, and real estate than [Miami-Dade County]” (2018).

Research and Analysis

According to Stefan Al, there are four main types of floodproofing: wet floodproofing, dry floodproofing, elevating the structure, and amphibious or floating structures. Wet floodproofing designates spaces where water can enter and leave as needed. Dry floodproofing uses a watertight design to prevent water from infiltrating the structure at all. Elevated and amphibious structures are more expensive but can be more effective in many situations. The relative cost of these strategies is illustrated in Figure 4.

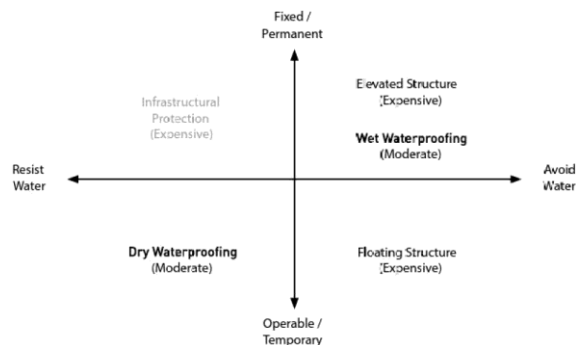


Figure 4. Relative cost of waterproofing strategies.

Al goes on to show examples of elevated and amphibious structures, and it just so happens that these examples are located in Miami and New Orleans. The Float House in New Orleans sits atop a buoyant base, and the Pérez Art Museum in Miami is raised by a platform that keeps the critical parts of the structure 18 feet above the ground (2018).

An important factor in building resilient communities is the financial element. Flood

insurance is typically much cheaper than it should be, due to a variety of factors. Miami real estate agent Alex Larmier explains to his clients that flood insurance premiums could shoot up at any time, since they don't currently reflect the risk to the property, but most people are unconcerned and don't think very far ahead. "This is all theory for a lot of people," Larmier says (Ariza, 2020). According to Sealey et al, the key to resilience in coastal communities is "the integration of ecological services with instruments used in financing home construction" (2018).

A counterpoint to this thesis is the argument that people should stop building on sinking lands and move inland instead. This perspective will be taken into account, as there must be a balance between persevering and picking one's battles when faced with the unstoppable forces of nature. In fact, this point sometimes aligns with indigenous knowledge. Some colonized cities such as Bombay and Hong Kong "now appear as acts of utter recklessness. [...] Why would anyone want to create a settlement in a place that was so exposed to the vagaries of the earth?" (Ghosh, 2017). But over time, people have largely chosen to move closer to the water, setting aside the old wisdom of dwelling on safer grounds (Ghosh, 2017).

As stated by Mathur and Da Cunha in *Design in the Terrain of Water*, it's vital to empower the local residents to shape the discussions around these issues. Furthermore, since the government cannot be relied upon to always act in the citizens' best interest, there is a need for "primarily incremental solutions that can be flexible at the scale of individual properties" (2014).

Design Process Tactics

The design process for the thesis studio project will apply several qualitative and quantitative strategies, rooted in community engagement, iterative design, and climate-responsive architecture. Once a site is selected, information will be gathered from residents through a combination of surveys and interviews, to identify lived experiences, traditional knowledge, and priorities for the future. The site will be analyzed by layering maps and data on climate, floodplains, hydrological modeling, socioeconomic

information, and infrastructure to identify zones where the most impact could be made.

Two potential material palettes will be analyzed: one based on locally available and culturally accepted materials, and another based on high-performance systems for safety and durability. These materials will be evaluated for their carbon footprint, cultural appropriateness, flood resistance, safety in a modern context, and their potential for reuse in the future.

Design will be done starting with hand sketches and Rhino, eventually evolving into a detailed Revit model. Research will be done on how to perform simulations that test the design's response to flooding and other natural stressors. The results of these simulations will inform the direction of the project at various stages.

In terms of developing the framework, this will grow out of the case study analyses and integrate information gained during community engagement and site research. Modularity and scalability will be explored in order to provide the most potential benefit to flood-prone communities.

Conclusions

As climate change reshapes coastlines and floodplains around the world, architects must rise to meet the intertwined challenges of environmental resilience, cultural sensitivity, and community empowerment. This thesis recognizes that no universal solution exists for flood-prone regions, and it proposes an adaptable, community-driven framework for designing responsive architecture in the face of rising waters.

By analyzing international precedents and deeply engaging with local contexts, this project aims to produce not only a resilient structure but also a replicable methodology. It embraces architecture as a tool of justice and imagination, and it positions architects as facilitators of community endurance.

Ultimately, the success of this work will not be measured solely by the form of the final structure, but by the framework's capacity to help future architects ask better questions, listen more closely, and design both for and

with those living on the shifting edges of land and water.

Sources

1. Adeyemi, Kunlé. "Circling Research With Design: NLÉ's African Water Cities Project and Prototype Floating School for Makoko." *AD Reader Ground Rules for Humanitarian Design*, April 24, 2015, 142–47.
<https://doi.org/10.1002/9781119148784.ch10>.

This article is written by Kunlé Adeyemi of NLÉ Architects, the Netherlands, the firm responsible for building the Makoko Floating School. Adeyemi explores the construction of this school and how it responds to the effects of climate change in Africa. This source contains several photographs that show how the school is used, and it also contains some specifications of the building's structure. I will use this article to describe the school's structure and its significance in the context of global warming.

2. Ahmad, Azman. "The Constraints of Tourism Development for a Cultural Heritage Destination: The Case of Kampong Ayer (Water Village) in Brunei Darussalam." *Tourism Management Perspectives* 8 (October 1, 2013): 106–13.
<https://doi.org/10.1016/j.tmp.2013.09.002>.

Azman Ahmad is Vice President and Associate Professor for Islamic Studies at Universiti Brunei Darussalam (UBD). Ahmad's perspective as a scholar of Islamic Studies lends credibility to this piece of writing, which discusses the challenges to the tourism industry at Kampong Ayer and prospects for the future. I will reference this article when discussing the modern state of Kampong Ayer, how its historic nature draws tourists, and what some of the constraints are on tourism development.

3. Al, Stefan. *Adapting Cities to Sea Level Rise: Green and Gray Strategies*, 2018.

Stefan Al is an architect and urban designer who is experienced with integrating architecture, urban design, and sustainability in his work. He has worked in Amsterdam and therefore knows about architectural strategies that work in flood plains. This book outlines strategies that cities can use to protect themselves, gracefully handle flooding, and when necessary, retreat from the coastline. I will use this book as a starting point for developing my adaptable framework for responding to rising waters architecturally.

4. Andraos, Amale. "What Does Climate Change? (For Architecture)." In *Climates: Architecture and the Planetary Imaginary*, ed. James Graham.

New York: The Avery Review, 2016. [pp.297-301]

Amale Andraos is Dean Emeritus and Professor at Columbia Graduate School of Architecture, Planning and Preservation. Andraos holds a valuable perspective on the relationship between urban and natural environments, as she co-founded WORKac, a firm in New York that addresses that relationship. This article discusses the ways in which climate change is affecting architecture, and the blurring of the line between architecture and nature. I will use this article to provide background information about climate change and its relationship to architecture.

5. Ariza, Mario Alejandro. *Disposable City: Miami's Future on the Shores of Climate Catastrophe*. Hachette UK, 2020.

Mario Alejandro Ariza is an investigative reporter in South Florida, who immigrated to the United States from the Dominican Republic. In this book, he touches upon several facets of living in Miami, interviews Miami residents, and explores the precarity of the city's situation due to climate change and rising waters. I will use this book to explore the economics that surround people's decisions to stay in or leave Miami.

6. Campanella, Richard. *Delta Urbanism: New Orleans*. Routledge, 2017.

Richard Campanella is a geographer and associate dean for research with the Tulane School of Architecture, and he has written many books and articles about New Orleans and Louisiana. In this book, he analyzes New Orleans as a case study for urban planning, because he believes it to hold a prophetic role among world cities. The diagrams in this book will be useful for exploring New Orleans' population demographics over time and changes in population distribution after Hurricane Katrina.

7. Crook, Lizzie. "Marina Tabassum Installs Bamboo Khudi Bari House at Vitra Campus." *Dezeen*, June 27, 2024. <https://www.dezeen.com/2024/06/26/marina-tabassum-khudi-bari-vitra-campus>.

Lizzie Crook, Architecture Editor at Dezeen, explores the idea of the *khudi bari* as one is installed at the Vitra Campus in Germany. Crook describes the structure of the house and how it was designed to fit in with the communities of Dhaka, Bangladesh. This source is useful as a reflection on the original *khudi bari*, its role of creating housing during the lockdowns of the COVID-19 pandemic, and later "as a reminder of the precariousness of our existence" on the Vitra Campus. I will reference this article when

describing the history and context of the *khudi bari* and to elaborate on the way these houses are viewed from a German perspective.

8. Gaestel, Allyn. "Things Fall Apart." *The Atavist Magazine*, April 22, 2021. <https://magazine.atavist.com/things-fall-apart-makoko-floating-school/>.

Allyn Gaestel is an award-winning journalist based in Lagos, Nigeria, who covers topics including inequality, politics, global health, women, and human rights. Her perspective on the Makoko Floating School is useful, as she was in Lagos when the school collapsed. In this piece, Gaestel analyzes the school's construction and demise. I will reference this article when explaining how the school's existence came to a premature end.

9. Ghosh, Amitav. *The Great Derangement: Climate Change and the Unthinkable*. University of Chicago Press, 2017.

Ghosh is an author whose works address colonialism and environmental change. In this book, he critiques the relative dearth of modern literature about climate change, and he explains why the "deranged" ways in which we have responded to climate change thus far have been inadequate. He describes the pros and cons of using history to predict the future when it comes to climate. I will reference this book when discussing the human response to climate change and evaluate the sociopolitical landscape surrounding it.

10. Hamdi, Muhammad Faiz Zul, Norhidayah Abdullah, Hazimatul Diyana Binti Narudin, and Paul J. Carnegie. "Belonging and Unbelonging in Kampong Ayer, Brunei Darussalam." In *Asia in Transition*, 171-84, 2023. https://doi.org/10.1007/978-981-19-6059-8_10.

Muhammad Hamdi et al delve into the human geography of Kampong Ayer and the ways that migration has shaped the community in recent history. Carnegie works at the Institute of Asian Studies at Universiti Brunei Darussalam, and Hamdi, Abdullah, and Narudin are independent scholars at Bandar Seri Begawan. Together, they create a rich picture of Kampong Ayer and the complexities of what it means to live there. I will use this article when discussing the role of resettlement programs, fire destruction, and migration into and out of Kampong Ayer on the everyday sense of belonging felt by its residents.

11. Haraway, Donna. "Staying with the Trouble: Anthropocene, Capitalocene and Chthulucene." In *Anthropocene or Capitalocene? Nature*,

History, and the Crisis of Capitalism, ed. Jason W. Moore. Chicago: PM Press, 2016. [pp.34–77]

Donna Haraway is a scholar of science and technology studies and Professor Emerita in the History of Consciousness and Feminist Studies departments at The University of California, Santa Cruz. She often critiques anthropocentrism and explores the importance of nonhuman processes. In this text, she explores the complexities of humanity's role in nature and the need to recognize the interconnectedness of all life forms. I will reference this text when providing background information on the relationship between humans and nature.

12. Hutton, Jane Elizabeth. *Reciprocal Landscapes: Stories of Material Movements*. Routledge, 2020.

Jane Hutton is an Assistant Professor at Harvard Graduate School of Design, and she has degrees in Landscape Architecture and Biology and Environmental Science. In *Reciprocal Landscapes*, she discusses the lifecycle cost of materials and methods of improving sustainability in construction, and she points out that tracing materials and commodities inevitably leads to land. This book will be useful as a theoretical lens that I can use to relate landscapes to materials and architecture.

13. Jones, Andrew. "Urban Conservation Issues in Brunei Darussalam: The Case of Brunei's Water Villages." *Planning Perspectives* 12, no. 4 (January 1, 1997): 457–75. <https://doi.org/10.1080/026654397364627>.

Andrew Jones was a research fellow at the University of Brunei from 1994 to 1995 and later became a senior lecturer in heritage tourism at Swansea Institute South Wales. In this article, he discusses the challenges of balancing modern development with the preservation of cultural heritage in the water villages of Kampong Ayer. Jones' perspective as heritage tourism expert allows him to expound upon the realities of life for the residents and the reasons that they stay or leave. I will use this article to discuss these reasons along with conservation initiatives and economic diversification in the area.

14. Mathur, Anuradha, and Dilip Da Cunha. "Mississippi Delta Project." In *Design in the Terrain of Water*, 104–11. ORO Applied Research + Design, 2014.

In this book chapter, Elizabeth Mossop explains the history of the Mississippi River Delta and how flooding has impacted different facets of the community over time. She includes photos and diagrams of the region that elucidate the relationship between sediment movement,

forestation, urban recreation, and more. I will use this chapter to provide background information on significance of the Mississippi River to New Orleans.

15. Mathur, Anuradha, and Dilip Da Cunha. *Mississippi Floods: Designing a Shifting Landscape*. Yale University Press, 2001.

Mathur was a practicing architect and Professor of Landscape Architecture at the University of Pennsylvania, who focused on water and the opportunities it creates for resilient design. In this book, she and Da Cunha call attention to the role of visual and artistic representation of the Mississippi River in our ongoing attempts to control its course and prevent it from damaging communities. I will use this book to explore architectural strategies that have been used along the banks of the Mississippi River and evaluate their strengths and weaknesses.

16. Pope, Albert, Brittany Utting, and Marina Tabassum. "Architecture for a Shifting Landscape." *Log* 15474690, no. 60 (2024): 104–8.

Albert Pope and Brittany Utting interview Marina Tabassum, a Bangladeshi architect who developed the *khudi bari* project to address displacement caused by rising sea levels and erosion. They discuss the design and build process and how it was influenced by the politics and economics of the time and place. Tabassum's perspective is a valuable one, as she oversaw the project. I will use this article to provide background information on the design and construction of the *khudi bari* houses.

17. Riise, Jan, and Kunlé Adeyemi. "Case Study: Makoko Floating School." *Current Opinion in Environmental Sustainability* 13 (February 23, 2015): 58–60. <https://doi.org/10.1016/j.cosust.2015.02.002>.

The case of the Makoko Floating School is analyzed by Jan Riise of Mistra Urban Futures, Chalmers University of Technology, Sweden and Kunlé Adeyemi of NLÉ Architects, the Netherlands, the firm responsible for building the Makoko Floating School itself. They also discuss the geographical, political, and economic context of Makoko in 2011–2015. This source is useful because one of the authors was involved directly with the project and can speak knowledgeably about the design process. I will use this article as a starting point for describing the context and details of the Makoko Floating School.

18. Santos, Boaventura De Sousa. "Beyond Abyssal Thinking: From Global Lines to Ecologies of Knowledges." In *Epistemologies of the South*:

Justice Against Epistemicide, 130–47, 2015.
<https://doi.org/10.4324/9781315634876-14>.

Santos is Emeritus Professor of Sociology, University of Coimbra in Portugal, and Distinguished Legal Scholar at the University of Wisconsin-Madison. He has written about globalization, epistemology, decolonization, and cognitive justice. In this chapter, he discusses the concept of “abyssal thinking,” where invisible distinctions create tangible divides and “us vs them” mentalities. He suggests that we recognize the epistemological diversity in the world and recognize that every system of knowledge is incomplete. I will use this chapter to address the complexity of the “ecology of knowledges” surrounding climate change and the need to incorporate diverse perspectives into our understanding of rising waters and flooding.

19. Sealey, Kathleen Sullivan, Ray King Burch, and P.-m. Binder. *Will Miami Survive?: The Dynamic Interplay between Floods and Finance*. Springer, 2018.

Kathleen Sealey is a Professor Emeritus of Biology at the University of Miami. In this book, she explores the financial aspects that govern the housing and location choices made by residents of Miami, in relation to the looming threat of floods. I will use this book to explore the economic side of life in Miami and learn more about what makes people stay in or leave the city.

20. Wei, Ying, Xinyu Cao, Jianing Li, and Yuan Chang. “Greenhouse Gas, Water, and Economic Implications of Permeable Pavements: Quantification for Pilot Sponge Cities in China.” *Journal of Cleaner Production* 471 (August 22, 2024): 143424.
<https://doi.org/10.1016/j.jclepro.2024.143424>.

Wei, Cao, Li, and Chang are Chinese scholars in finance, economics, and civil engineering. In this article, they discuss the role of life-cycle greenhouse gas (GHG) and rainwater in various “sponge cities” in China, according to the types of surface pavement used in these cities. They provide a cost-benefit analysis of replacing nonpermeable surfaces with permeable ones in urban road construction. I will use this article to showcase facts and figures relating to rainwater management in these cities.

21. Xu, Changqing, Wei Lin, Yifei Zhu, Bin Zhang, Zhaohua Wang, and Haifeng Jia. “A Macro-level Life Cycle Environmental-economic Impact and Benefit Assessment of Sponge Cities in China.” *Resources Conservation and Recycling* 211 (August 9, 2024): 107859.
<https://doi.org/10.1016/j.resconrec.2024.107859>.

Xu, Lin, Zhu, Zhang, Wang, and Jia are Chinese scholars in the fields of environment, ecology, economics, and management. They assess the environmental and economic impact of “sponge cities” and provide a cost-benefit analysis of urban runoff source control facilities (URSCFs). I will use this article to discuss the environmental-economic impact of “sponge cities” and how these insights could be used to drive green policies in China.

22. Yuan, Yuan, Yan Zheng, Xiankai Huang, and Jianqing Zhai. “Climate Resilience of Urban Water Systems: A Case Study of Sponge Cities in China.” *Journal of Cleaner Production* 451 (March 13, 2024): 141781.
<https://doi.org/10.1016/j.jclepro.2024.141781>.

Yuan, Zheng, Huang, and Zhai are Chinese scholars in economics, tourism, eco-civilization, mathematics, statistics, and climate studies. In this article, they discuss the importance of urban water systems and evaluate the resilience of cities in the Sponge City pilot program. I will reference this information to provide quantifiable metrics on the resilience of these “sponge cities” compared to non-pilot cities.

Addendum

Introduction/Background

This thesis investigates how architecture might respond to conditions of flooding and environmental instability without relying on strategies of exclusion, containment, or permanent control. Rather than treating water as an external threat to be resisted, the work approaches wetness as an active and dynamic condition that shapes land, infrastructure, and human settlement over time. This perspective emerged from research into flood-prone and coastal environments where conventional architectural and infrastructural responses have often intensified vulnerability, particularly in socially and ecologically marginalized landscapes.

My earlier research examined how modern systems of flood control and land management rely on abstracted understandings of water as bounded, measurable, and controllable. These frameworks have produced rigid physical and political boundaries, such as levees, property lines, and zoning districts, that conflict with the fluid and indeterminate nature of water itself. Through precedent analysis and critical mapping, I argued that such approaches obscure ecological processes and reinforce inequitable patterns of risk and displacement. That work raised a central question that continues to guide this thesis: what would it mean for architecture to operate in coexistence with water, rather than in opposition to it?

Since completing that research, the thesis has shifted from a primarily theoretical and analytical project toward a site-specific architectural investigation. The challenge is no longer only to critique dominant paradigms of flood control, but to translate those critiques into spatial strategies that can be experienced, tested, and evaluated. This addendum documents that transition, tracing how discourse, mapping, and precedent research informed the selection of a wetland site in East

New Orleans and shaped the development of an architectural proposal that prioritizes access, stewardship, and adaptability over permanence or occupation. In doing so, the thesis seeks to position architecture as a mediator between human presence and ecological systems, capable of engaging uncertainty as a design condition rather than a problem to be solved.

Discourse Development

The development of this thesis has been shaped by interdisciplinary discourses that question dominant assumptions about water, land, and architectural responsibility. My research engaged scholars who critique the treatment of water as a bounded and controllable entity. Jamie Linton's concept of "modern water" was particularly influential in framing water as a historical and political construction, produced through scientific abstraction and infrastructural management rather than experienced as an ecological and social reality. This critique provided a foundation for understanding flooding not as a failure of control, but as a consequence of systems that attempt to impose fixed order on inherently dynamic conditions.

This perspective was reinforced by theoretical work that challenges human-centered and technocratic approaches to environmental design. Donna Haraway's writing on situated knowledge and multispecies entanglements encouraged me to consider architecture as one actor within a broader ecological network, rather than as an instrument of dominance over nature. Similarly, Amitav Ghosh's critique of climate narratives and their limits within modern modes of representation underscored the difficulty of addressing environmental instability through conventional disciplinary frameworks. These ideas supported a shift away from singular architectural solutions and toward forms of engagement that acknowledge uncertainty, interdependence, and change.

Landscape-based theories further shaped my thesis approach. Mathur and da Cunha's concept of rain terrain reframed landscapes as continuously shaped by non-linear hydrological processes rather than fixed topographic boundaries. This challenged architectural assumptions about stable ground and encouraged design strategies that operate in relation to fluctuation and saturation. In

parallel, Boaventura de Sousa Santos's work on epistemologies of the South informed a critical awareness of whose knowledge systems are privileged in environmental decision-making, particularly in regions shaped by colonial histories and infrastructural violence.

Mapping and historical analysis functioned as supporting tools in this process. Drawing in part on Denis Cosgrove's understanding of mapping as a cultural and political practice, I used layered representations of wetlands, infrastructure, and flood risk to situate the site within longer histories of environmental transformation. These exercises helped contextualize the project, but the thesis ultimately moved beyond representation toward architectural testing and spatial proposition.

Together, these discourses reframed architecture not as a means of resolving flooding, but as a way of engaging wet conditions responsibly and legibly. This theoretical groundwork shaped a design approach that privileges systems over objects, access over occupation, and adaptability over permanence, and it set the foundation for a site-specific investigation grounded in ecological stewardship.

Site and Program Selection

The selection of a site in East New Orleans emerged directly from the theoretical concerns established in the earlier phases of this thesis. Early in the project, I considered sites closer to the city center, including several urban neighborhoods in New Orleans that have historically been associated with flooding and environmental risk. However, further research revealed that many of these areas are now protected by extensive levee systems, which significantly reduce their exposure to frequent flooding. While these neighborhoods remain socially and politically shaped by histories of water management, their current conditions limited the extent to which water operates as an active and visible presence in daily life.

As a result, I shifted my focus to sites outside the primary levee protection system, where flooding, saturation, and ecological processes remain ongoing conditions rather than exceptional events. I was drawn to East New Orleans because of its long history of wetland alteration, flood control, and environmental

vulnerability, which makes it an especially charged landscape in which to test architectural responses to water. Rather than situating the project on land shaped to accommodate standard architectural practices, I intentionally selected a site that remains predominantly wetland, where environmental instability is not mitigated through large-scale protective infrastructure.

The site encompasses approximately one hundred acres of wetland bounded by Chef Menteur Highway, Victory in Japan Road, and Old Chef Menteur Road, directly west of the Venetian Isles development and adjacent to the Bayou Sauvage area. This location occupies a threshold between protected ecological systems and suburban expansion, making visible the tensions between development pressure and environmental restraint. Its proximity to major infrastructure provides access and visibility, while its ecological sensitivity resists conventional forms of occupation. These conditions made the site well suited for an architectural intervention focused on coexistence rather than control.

Program development underwent a significant refinement during this phase of the thesis. In early iterations, I explored residential or community-focused programs intended to address the needs of East New Orleans residents. While this work helped clarify the social stakes of flood-prone environments, it also revealed the limitations of attempting neighborhood-scale intervention within a wetland context. As I developed these schemes, the project began to expand beyond the scope of a single architectural intervention and toward speculative master planning, which conflicted with my thesis goals.

In response, I narrowed the program to prioritize research, education, and environmental stewardship. This shift aligned more closely with the ecological character of the site and with the values of conservation-oriented stakeholders, including the United States Fish and Wildlife Service. I developed a program for a small campus of research and educational facilities that support wetland observation, study, and public engagement without promoting permanent settlement. Limited housing for visiting researchers is included as a supporting function rather than a primary use, reinforcing my intention to enable presence without occupation.

By pairing a focused program with a highly vulnerable site beyond the primary levee system, I established a framework in which architecture operates as a mediator between human access and ecological protection. Together, the site and program create conditions for testing how built form can facilitate learning, stewardship, and adaptation while acknowledging the limits of architectural intervention in dynamic wetland environments.

Concept Development

The conceptual framework for this project emerged from recognizing that architectural strategies are always conditioned by their sites. While many architectural approaches rely on assumptions of stable ground and predictable environmental behavior, I chose not to apply those assumptions to this wetland context. Instead, I treated fluctuation, saturation, and ecological interdependence as defining site conditions that should actively inform architectural decision-making.

I use elevation as a primary spatial strategy to allow water to move freely beneath the project while maintaining human access to the site. By lifting occupied spaces above the wetland ground plane, the architecture remains in close proximity to ecological processes without interrupting them. In this framework, the ground is not treated as a surface to be occupied, but as ecological territory whose continuity shapes where and how building mass can occur.

I prioritized access over footprint by organizing the project around a network of raised walkways. These walkways connect buildings, extend into the wetland, and structure how the site is experienced. Rather than concentrating activity in a single object, I distributed movement across the landscape, allowing architecture to guide circulation, frame views, and create moments of observation. Movement becomes an architectural device through which wetland systems are encountered over time.

Throughout the design process, I made deliberate choices to limit the scale and intensity of intervention. I reduced the number and size of buildings, concentrated programmatic uses, and avoided treating the site as an area to be fully activated. These decisions reflect a focus on clarity and purpose rather than maximization. By emphasizing

frameworks over complete occupation, I sought to create an architectural proposal that supports stewardship and learning while remaining responsive to a dynamic environment.

Through these conceptual decisions, I position architecture as a mediator between human presence and ecological processes. The project does not attempt to stabilize the wetland or resolve its variability. Instead, it establishes spatial conditions that allow people to engage wetness directly, thoughtfully, and over time.

Schematic Development

The schematic design translates the project's conceptual framework into a spatial proposal that organizes access, program, and ecological engagement across the wetland site. Rather than consolidating activity into a single structure, I developed a distributed campus composed of five elevated buildings connected by a continuous network of raised walkways. This arrangement allows the architecture to remain largely suspended above the landscape, maintaining physical separation from the wetland ground plane while still enabling close visual and experiential engagement with it.

Each of the five buildings measures approximately forty feet by one hundred twenty feet and is lifted above the wetland surface. These dimensions were informed in part by passive design considerations. The relatively narrow forty foot width allows natural daylight to penetrate deep into interior spaces, reducing reliance on artificial lighting and supporting flexible program layouts. Program is distributed across the buildings to support research, education, and stewardship, including a nature center with interpretive exhibits, classrooms and meeting spaces, offices, and a wet research laboratory. Housing for visiting researchers is concentrated in one building and consists of four total units, reinforcing the project's emphasis on limited and temporary occupation.

Access to the site is organized through a primary vehicular loop branching from Chef Menteur Highway near the southeast corner of the parcel. This loop serves the clustered buildings while minimizing disturbance to the surrounding wetland. Parking is located beneath the buildings, reducing the overall impervious footprint and preserving the

wetland surface as continuous ecological territory. From this central campus, raised walkways extend outward to structure movement through the site.

The elevated walkway network functions as both circulation and experience. In addition to connecting the five buildings, the walkways extend to three access points, including the primary campus entry, a secondary entry along Chef Menteur Highway near the center of the southern edge of the site, and a northeastern entry near the end of Old Chef Menteur Road. These access points allow visitors to engage the wetland at multiple scales, from brief encounters to extended exploration, while maintaining separation from sensitive ground conditions.

At the schematic level, the project is not intended as a finalized architectural solution, but as a spatial proposition. The arrangement of elevated buildings and walkways tests how architecture can facilitate observation, learning, and research within a dynamic wetland environment while minimizing physical impact. By prioritizing elevation, distributed program, and controlled access, the schematic design articulates one possible framework for inhabiting the edge of water in a manner that supports ecological stewardship and long-term coexistence in flood-prone landscapes.

Design Process

Context

Discourse Development

The early stages of my design process were shaped by engaging with environmental, infrastructural, and territorial discourses that frame New Orleans as a constructed and continuously managed landscape. I began by examining the systems that regulate water, stabilize land, and determine which areas are protected or exposed. Through diagrams, sections, and mapping drawn from primary and secondary sources, I investigated how levees, pumps, subsurface conditions, and ecological boundaries structure architectural possibility. This informed my understanding of flooding as a political and infrastructural condition rather than a purely natural one, and it established the conceptual foundation for selecting a site beyond the primary levee system and developing an architectural intervention that mediates between human access and ecological processes.

EMPTYING THE BOWL

New Orleans sits below sea level and is shaped like a bowl. Rainwater can not drain out of the city because it can not defy gravity, so it must be pumped out. The system in New Orleans can only handle 1 inch of rain for the first hour and only 0.5 inches every hour after that. One location in New Orleans was inundated with 9.6 inches in 4 hours on Saturday, far more than the system can handle.

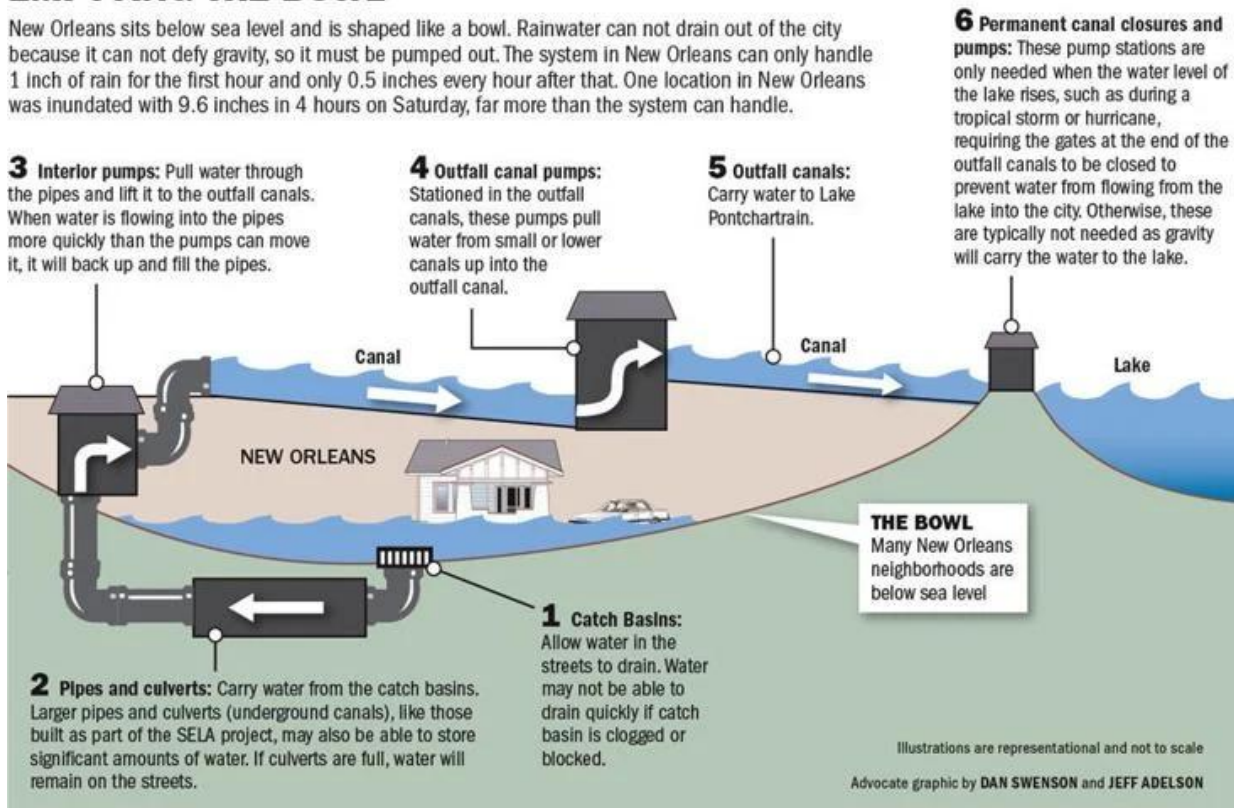
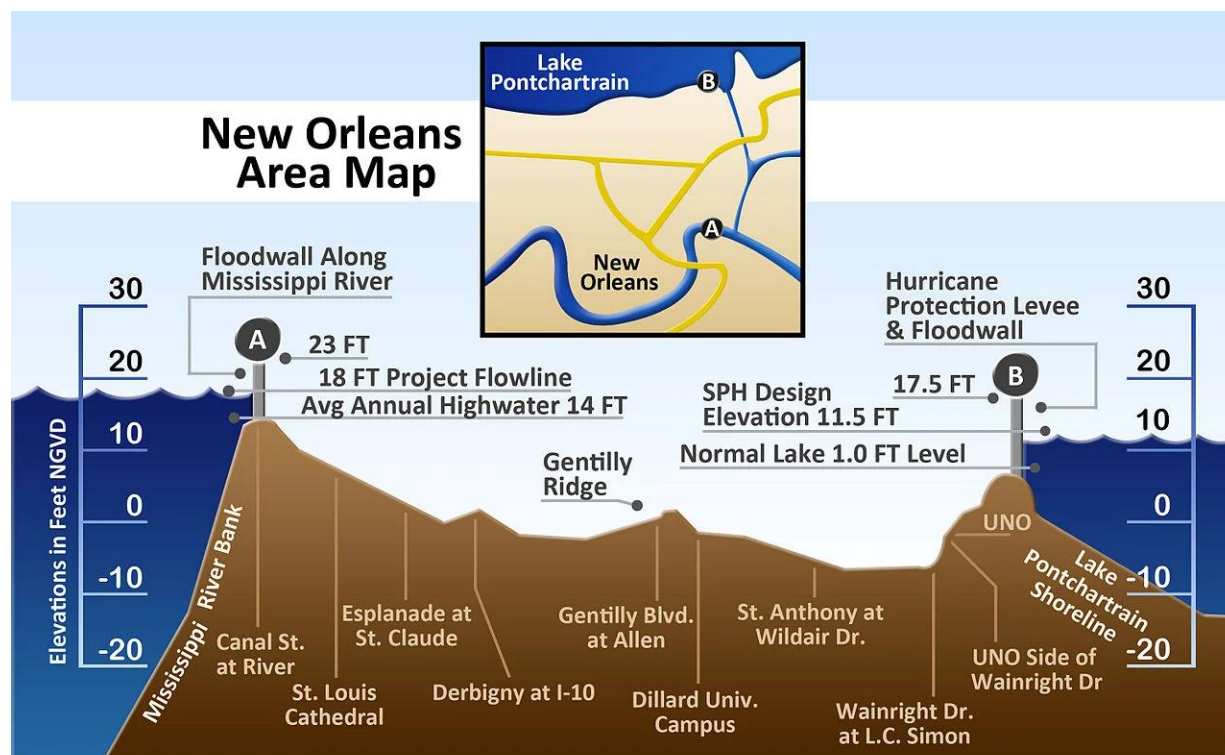


Figure 1: This diagram illustrates New Orleans as an actively managed hydraulic system, dependent on continuous pumping and drainage to remain habitable.



City of New Orleans Ground Elevations

From Canal St. at the Mississippi River to the Lakefront at U.N.O.

Figure 2: This section diagram cuts through New Orleans between the Mississippi River and Lake Pontchartrain, showing how the levees protect the land from projected flood levels.

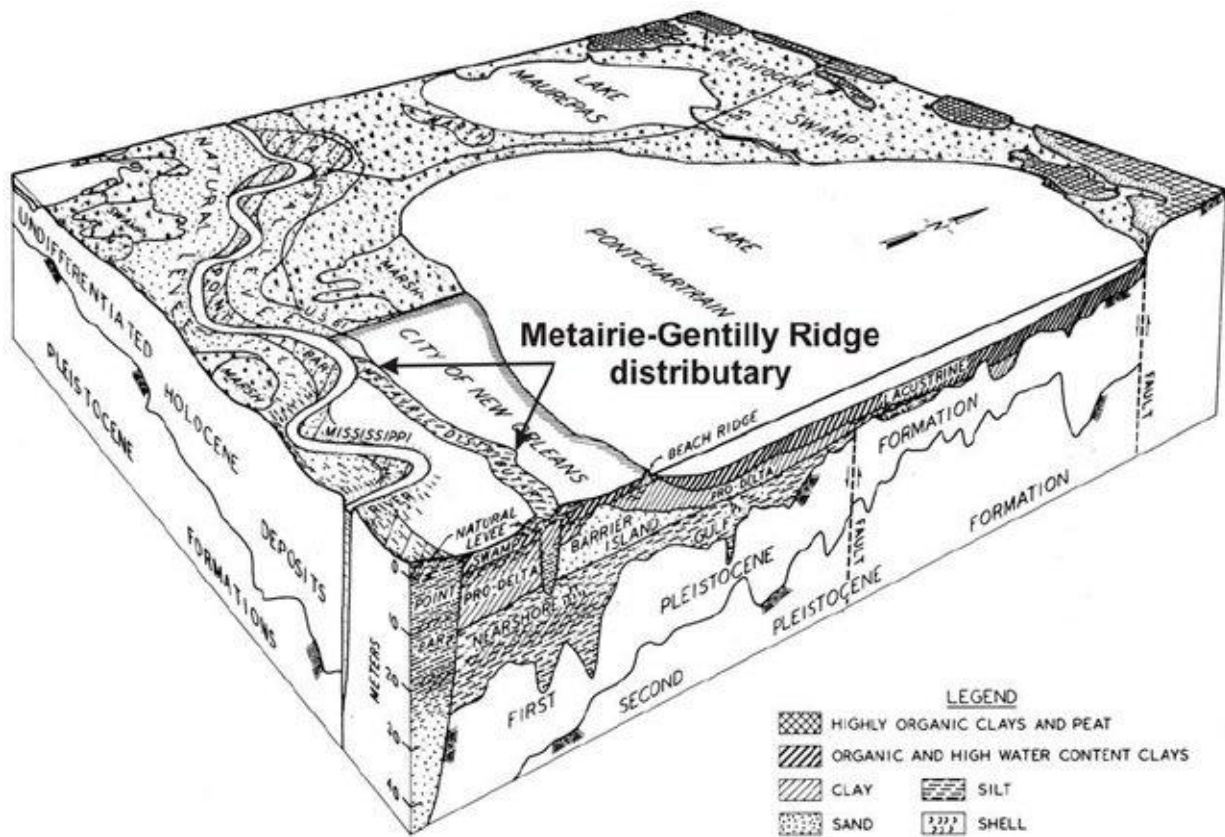


Figure 3: Section diagram showing the layers of Pleistocene sands beneath New Orleans and the dynamic, wavy nature of the ground that the city is built on.

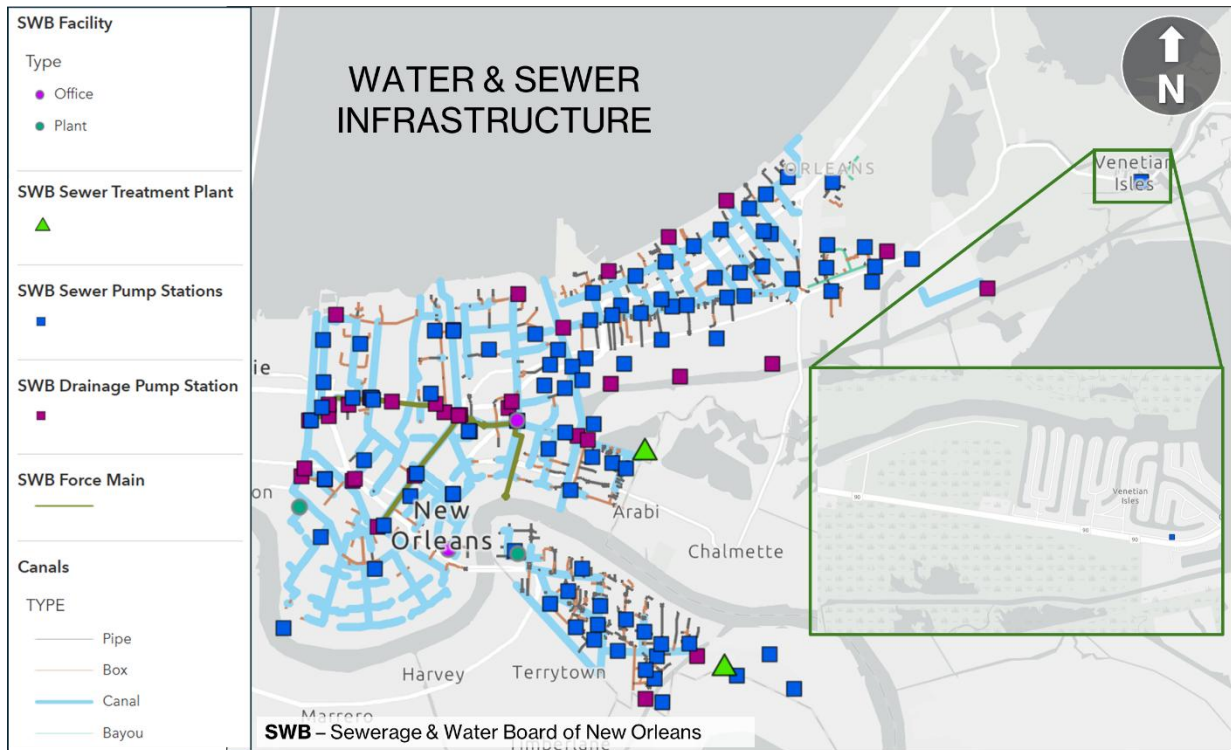


Figure 4: Water and sewer infrastructure in New Orleans. There is a single sewer pump station in the Venetian Isles, and everything else is within the levee system.

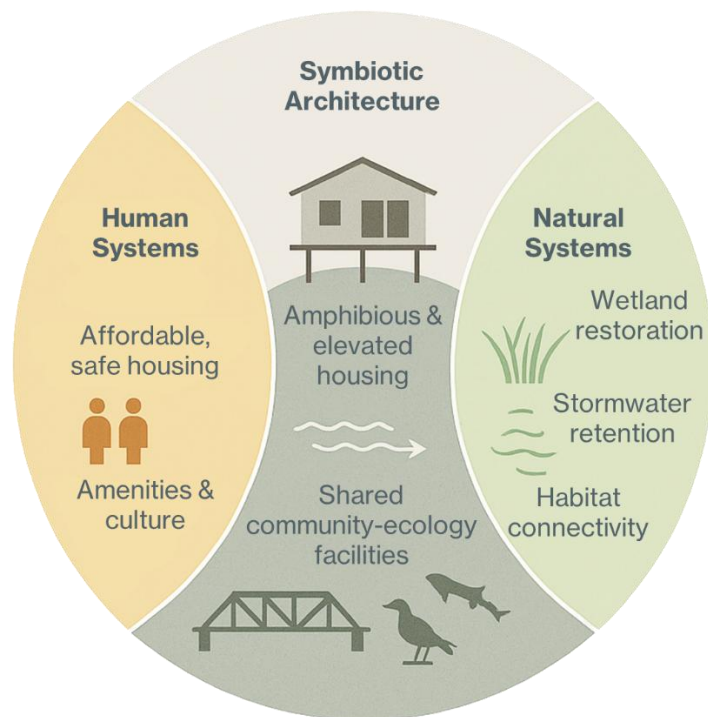


Figure 5: Infographic showing how my architectural intervention will bridge the gap between human and natural systems.

Methods Experimentation

I designed a model riverbank with sand, water, and an aquarium pump to test how different architectural strategies respond to erosion, undercutting, and fluctuating water levels. The model abstracted complex hydrological processes and was not intended as a predictive simulation, but as a comparative tool for understanding relative performance under unstable conditions. This enabled me to observe failure, instability, and adaptation over time through repeated physical manipulation.



Figure 6: Section view of the riverbank model.



Figure 7: Types of model houses that were tested in this experiment. From left to right: amphibious bases, trusses, arches, short piles, medium piles, and deep piles.



Figure 8: Elevation view of the riverbank model.



Figure 9: Plan view of the riverbank model.



Figure 10: The first building to fail was a control house that had no foundation at all.



Figure 11: The second building to fail was a house on short foundation piles.



Figure 12: All houses on medium and deep piles remained standing, even after a substantial amount of sand had washed away from underneath them. This indicated that excessively deep piles would not provide proportional performance benefits within this context, reinforcing the value of moderate elevation strategies.



Figure 13: The amphibious houses rose with the water as expected, but they also introduced an unexpected mode of failure, in which a house flipped upside down after rising above its guideposts.

These experiments informed my decision to elevate buildings above the wetland ground plane and to avoid architectural strategies that rely on stable soil conditions. Observing how pile-supported structures remained intact under significant erosion reinforced the importance of minimizing contact with the ground and allowing environmental processes to occur beneath the architecture.

Context and History

This section situates the project within broader environmental, infrastructural, and architectural contexts that inform both its necessity and its programmatic direction. It traces flooding and wetland loss as ongoing conditions shaped by systems of land management and flood control, while also examining emerging architectural responses that seek to work with ecological processes rather than against them. In parallel, this section reviews precedents and programmatic models that frame research, education, and stewardship as appropriate forms of intervention in vulnerable landscapes. Together, these contexts establish the foundation for understanding why a research- and education-focused architectural proposal is both relevant and necessary within flood-prone wetland environments.



Figure 14: A bioswale - a common example of green-blue infrastructure in urban environments.



Figure 15: A retention pond - a common example of green-blue infrastructure in lower-density regions.



Figure 16: Example of a levee in New Orleans.

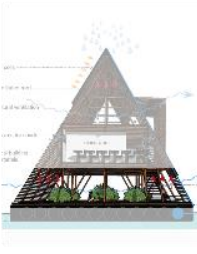
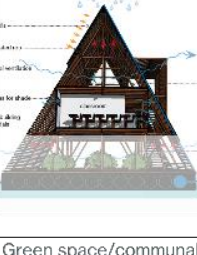
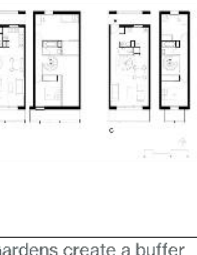
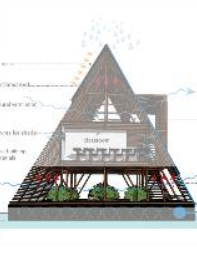
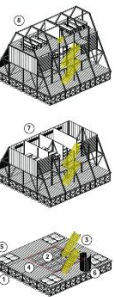
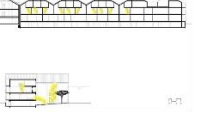
Typology	Makoko Floating School Lagos, Nigeria	The Docks Dombasles Le Havre, France	Vancouver Convention Centre Vancouver, BC, Canada
Ground floor community/public space	Green space/communal area/playground on first floor 	Offices on first floor, accessible to the public 	Exhibition halls take up most space on the first floors 
Private upper floor(s)	Upper floors are classrooms and research areas 	Residential units on second and third floors 	Ballrooms and breakout rooms are on the upper floors 
Green/outdoor space	Green space/communal area/playground on first floor 	Gardens create a buffer between the river and buildings where people can relax 	Living roof areas and beehives on upper floors 
Vertical circulation	Central stairs going from first to third floors 	Private spiral stairs going up through each unit 	Grand stairs, escalators, and elevators located along exterior walls 

Figure 17: Typology studies for the Makoko Floating School, The Docks Dombasles, and the Vancouver Convention Centre, examples of mixed-use waterfront (or on-water) buildings. These precedents were selected for their ability to accommodate public access, research, and ecological engagement within wet or waterfront conditions.

Floating Office Rotterdam

THE NETHERLANDS

Public/Community spaces



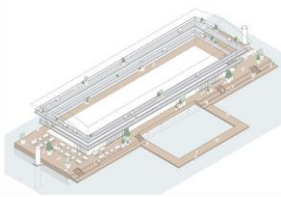
First floor offices, outdoor public lounge area

Private spaces



Quieter office spaces on upper floors

Green Spaces



Green spaces including trees and beehives dispersed throughout

Vertical Circulation



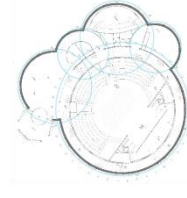
Large spiral staircase in the center of the southeast wall

Figure 18: Typology study for Floating Office Rotterdam, an example of a floating mixed-use building.

Rotterdam Floating Pavilion (Drijvend Paviljoen)

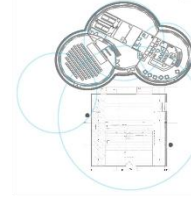
THE NETHERLANDS

Public/community spaces

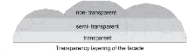


Exposition/convention center on first floor

Private spaces



Smaller breakout rooms on second floor

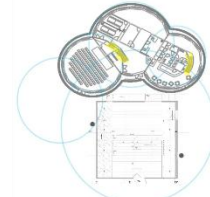


Green Spaces



Floating trees surround the structure

Vertical Circulation



Two staircases in hallway spaces

Figure 19: Typology study for Rotterdam Floating Pavilion, an example of a floating mixed-use building.

Context and History of Site and Stakeholders

This section focuses on the primary stakeholder groups whose values and priorities shape how the project site can be engaged. While the site is largely unoccupied and ecologically sensitive, it exists in relation to adjacent communities and conservation-oriented agencies whose interests influence appropriate forms of access and intervention. Rather than attempting to represent individual users or speculative futures, this analysis identifies shared and divergent stakeholder values in order to frame the architectural role of the project. The diagram that follows synthesizes these relationships and establishes the basis for a program that prioritizes stewardship, education, and limited human presence.

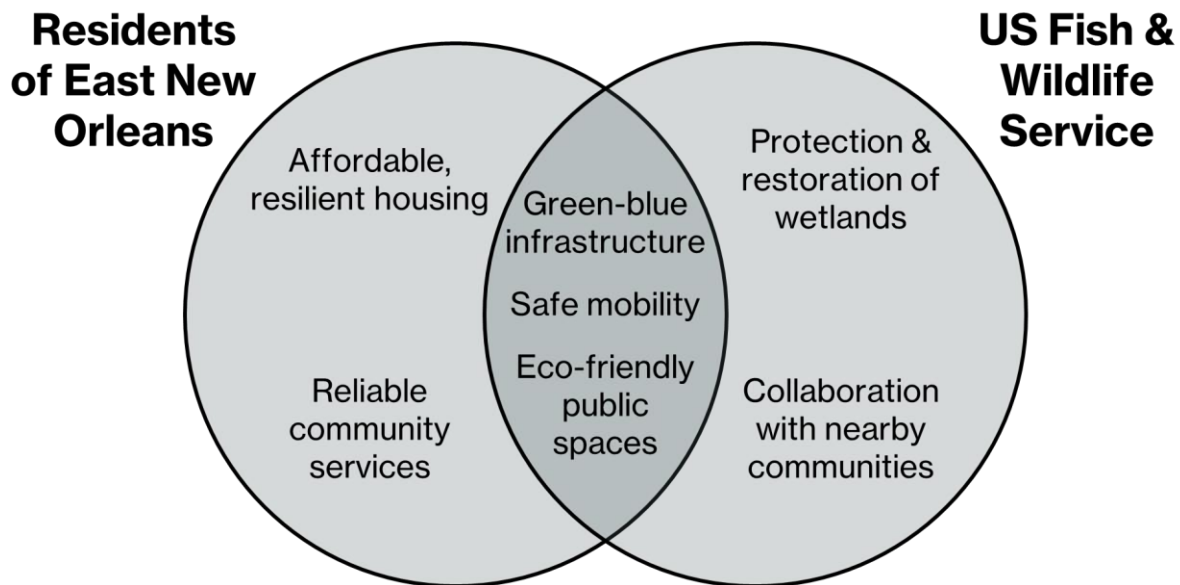


Figure 20: This diagram illustrates the overlapping values of East New Orleans residents and the United States Fish and Wildlife Service in relation to the project site, highlighting shared interests in environmental protection, access, and long-term ecological health.

Analysis

Site and Program Analysis

This section analyzes the project site and programmatic constraints across multiple scales in order to identify the conditions that shape architectural intervention. Using regional and city-scale mapping, site imagery, and infrastructure data, I examined how flooding, wetland continuity, access, and adjacency inform where and how architecture can operate. Rather than identifying optimal building locations or fixed program zones, this analysis focuses on understanding limits, thresholds, and relationships between land, water, and human use. These findings establish the constraints to which the subsequent architectural proposal responds.

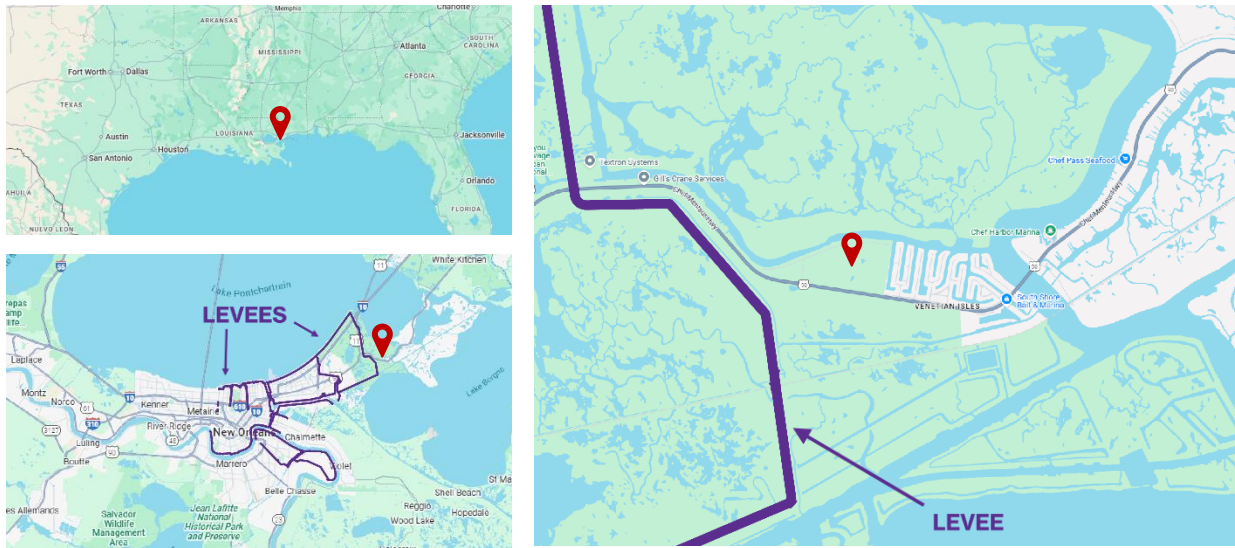


Figure 21: Location of my site on a map of the Gulf Coast of the United States, a map of New Orleans, and a zoomed-in map of the region directly surrounding the site.



Figure 22: Satellite imagery of my site (highlighted in red). The green barrier to the west of my site is a levee.

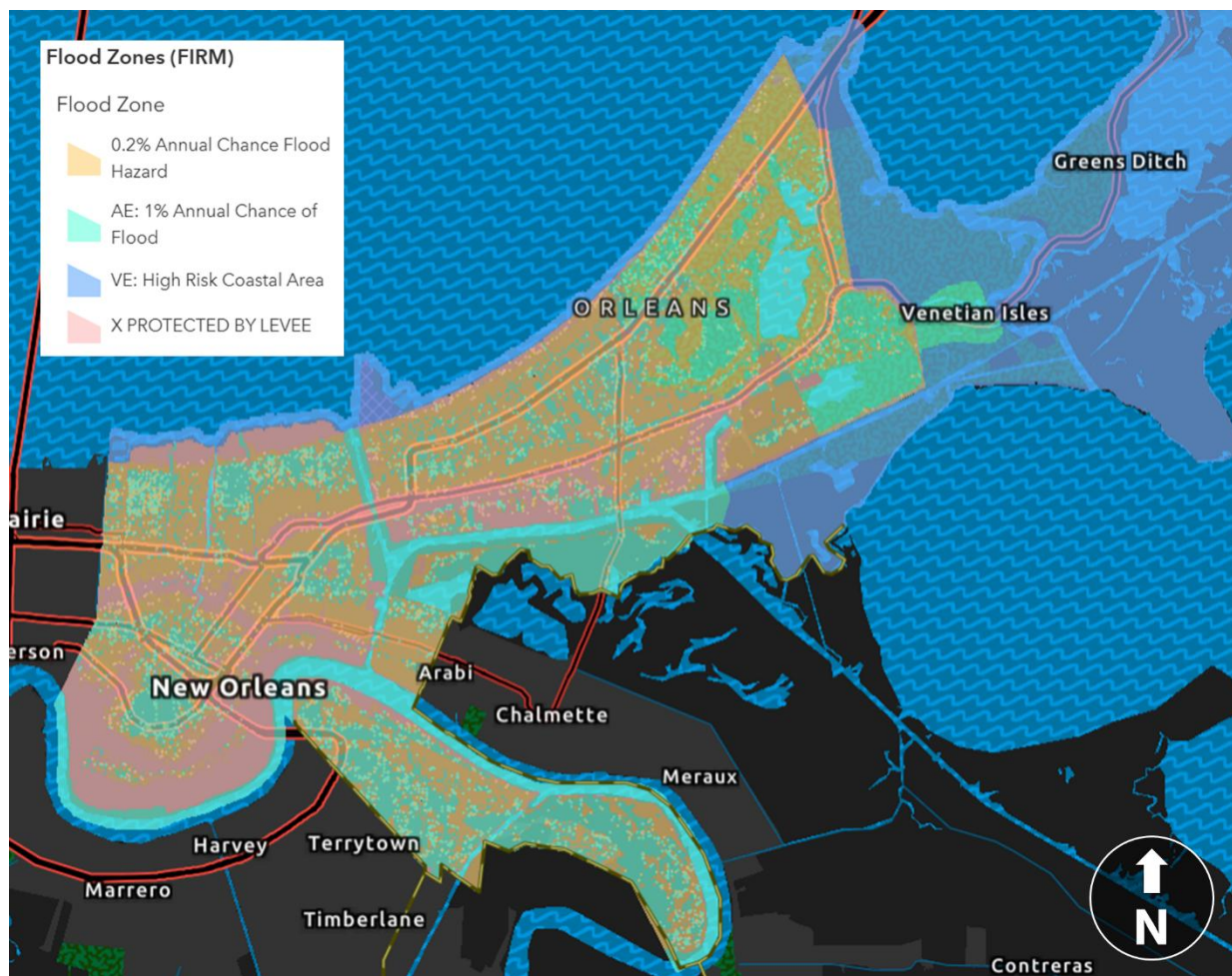


Figure 23: Map showing protected areas and flood zones in New Orleans.



Figure 24: The extents of Bayou Sauvage, with some labels like boat ramps and parking areas.

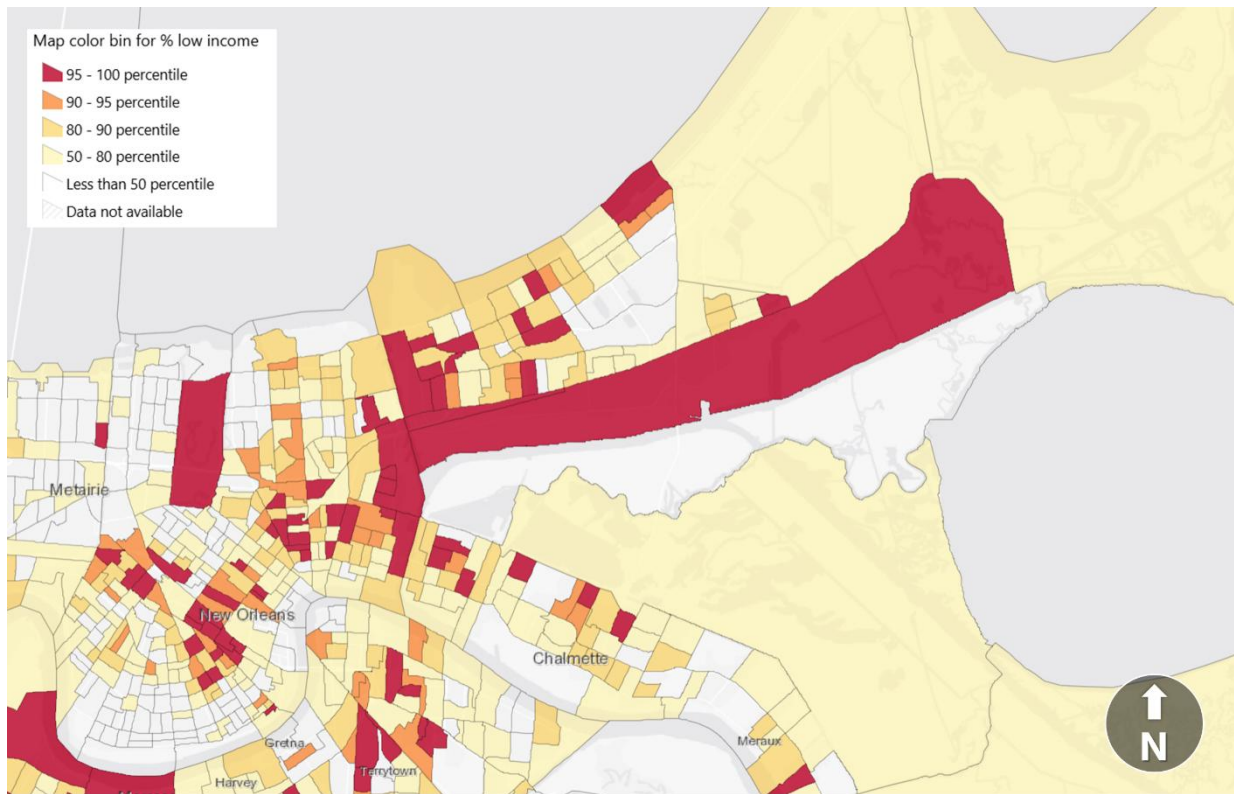


Figure 25: Map showing neighborhoods in New Orleans, shaded by percentage of residents that are low-income.

Conceptual Analysis

This section documents the early stages of formal development that informed the schematic proposal. Rather than progressing through an extensive series of formal iterations, this phase of the project focused on establishing clear conceptual priorities and testing initial spatial relationships. The studies presented here reflect a compressed but intentional process in which goals related to ecological stewardship, access, and adaptability guided early decisions about building distribution and circulation. Formal exploration continued into the schematic design phase, where these concepts were further refined.



Figure 26: Goals I identified that would align with stakeholder values. These core project goals reflect early priorities and, guided initial design decisions, and established constraints for formal development. Some of these priorities changed later, as the project scope narrowed.

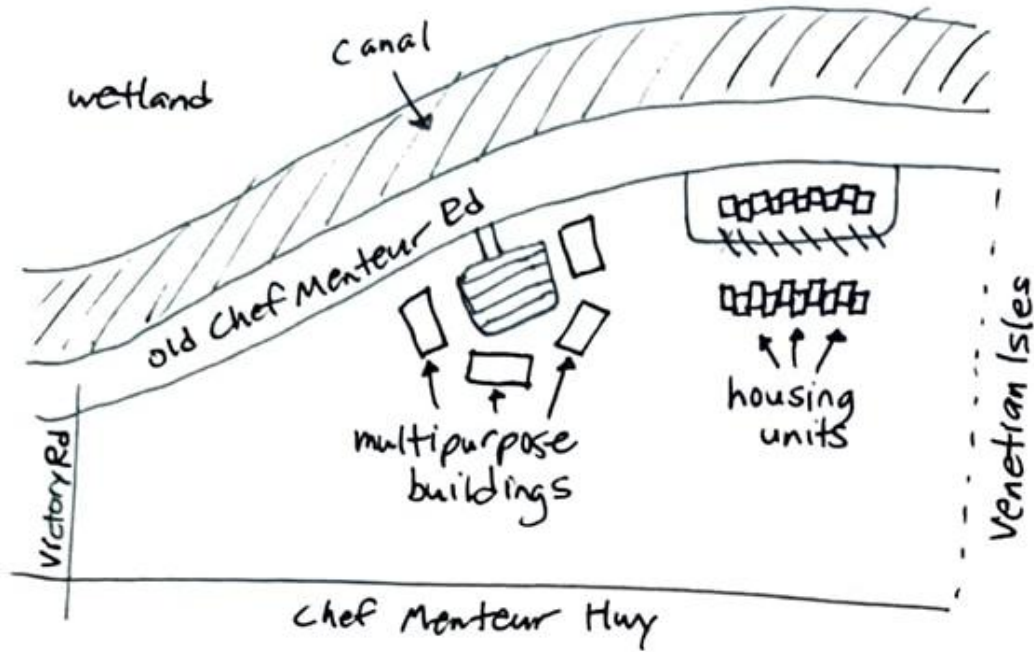


Figure 27: An initial sketch where I considered including a mixture of multipurpose buildings for ecological stewardship and modular community needs, plus a collection of housing units for low-to-moderate income residents.

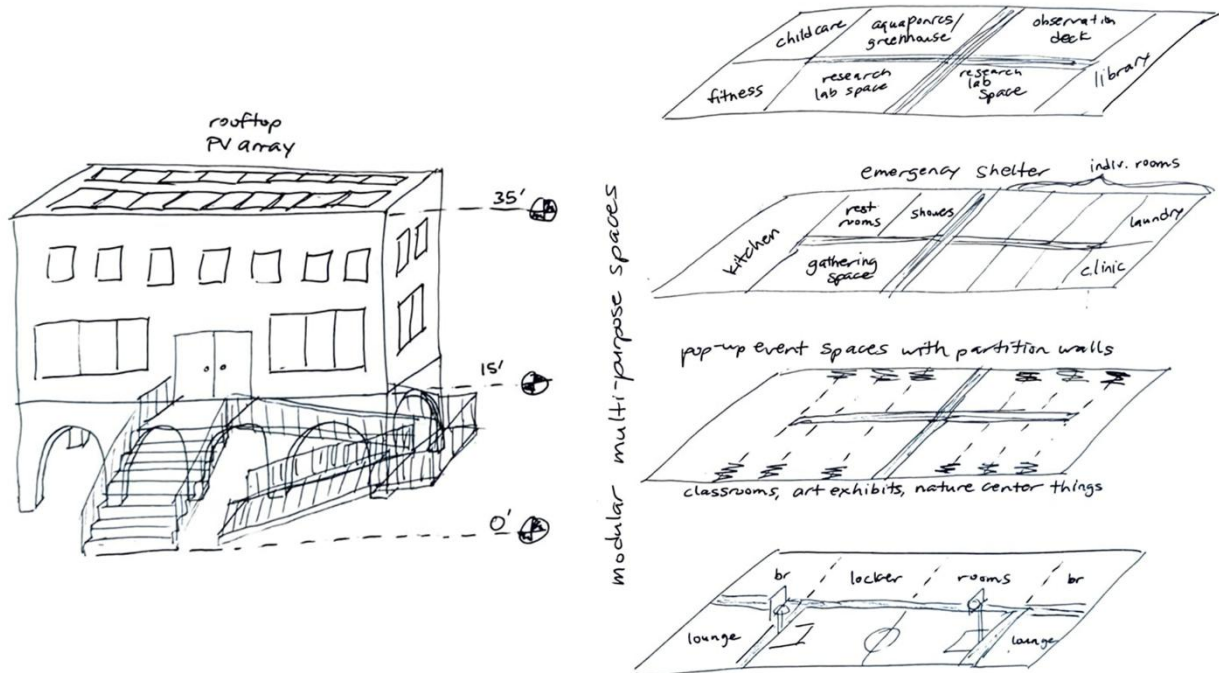


Figure 28: Early sketches showing possible programming for the multipurpose buildings. This study investigates alternative arrangements of rooms and facilities, testing how they might be grouped and organized logically.

Schematic Design Proposal

This section presents the current schematic design proposal, which synthesizes the analytical and conceptual work developed throughout the thesis. The proposal takes the form of a small research and education campus composed of elevated buildings connected by a network of raised walkways. Rather than functioning as a finalized architectural solution, the scheme represents a working framework that prioritizes access, ecological stewardship, and adaptability in a wetland context. The drawings that follow illustrate how site conditions, programmatic limits, and conceptual priorities are translated into spatial organization and form.

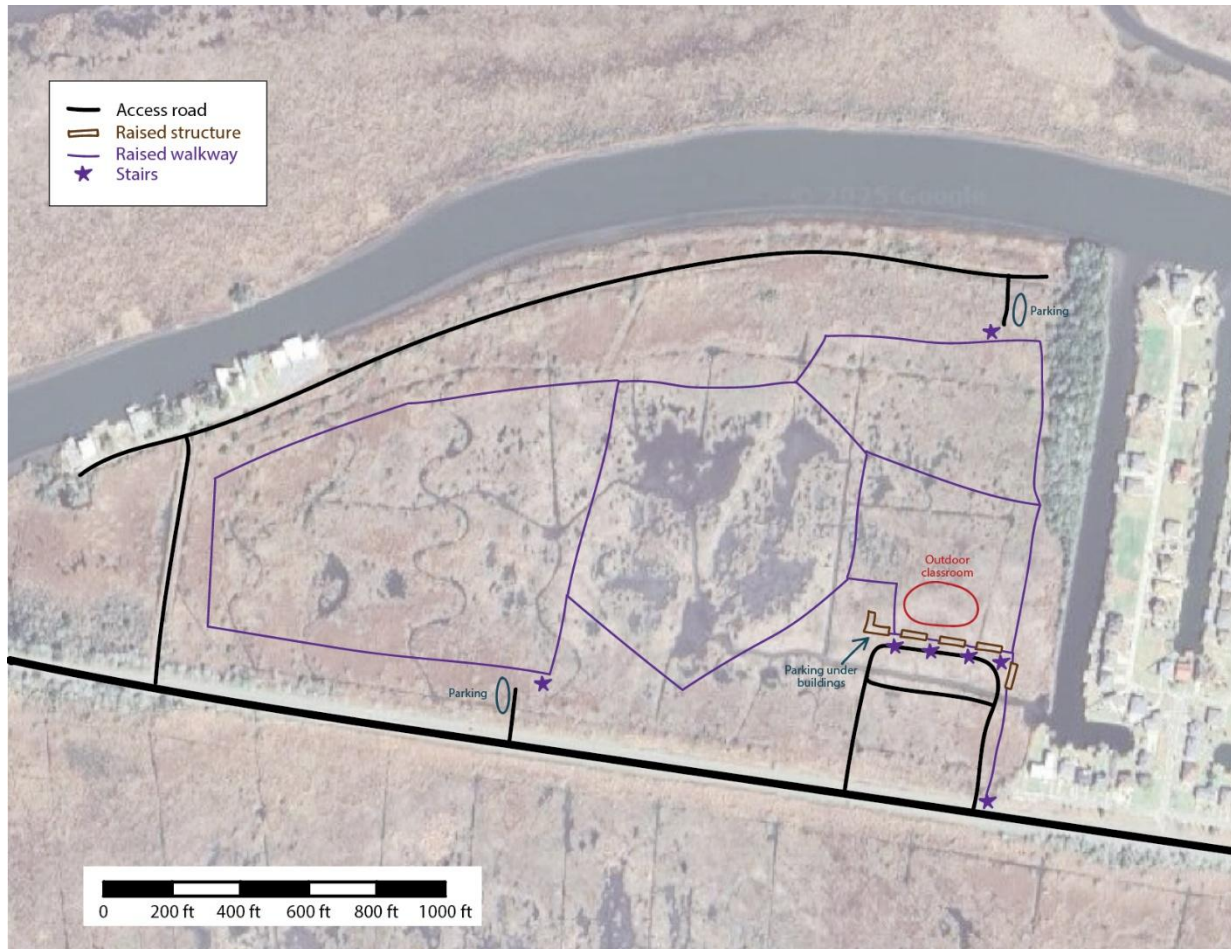


Figure 29: Proposed schematic including buildings, walkways, and vehicular access, overlaid on satellite imagery to show the details of the wetland.

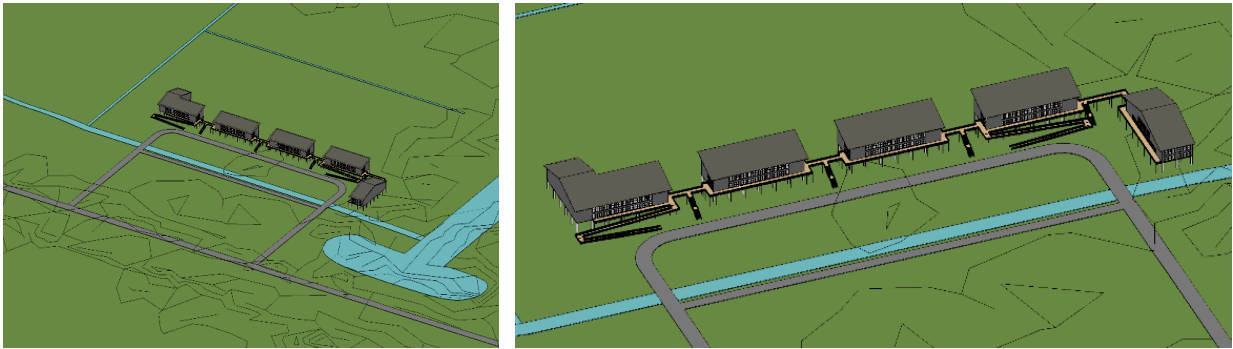


Figure 30: Preliminary renderings of the “Eco Complex,” a placeholder name for the collection of five buildings.

At the schematic stage, the proposal remains intentionally open and subject to refinement. Its value lies in establishing a clear architectural framework that can continue to evolve in response to environmental conditions, stakeholder needs, and further design development during the thesis phase.

Architectural Building Design

Site Plan

The final site plan consists of three main buildings, one of which is split into three pavilions, for a total of five distinct structures.

Starting at the west side of campus is the Educational Building, which consists of the Entry Pavilion, Classroom Pavilion, and Field Pavilion. This is the building that resembles a nature center, and it is where the most public activities take place.

The Entry Pavilion, closest to the road and boardwalk, is typically the first building that visitors enter, and it is meant to be the most engaging. It has an orientation hall, where they can get information about the facility and current events, before moving on to the immersive exhibits and multimedia theater.

The Classroom Pavilion contains more focused learning environments such as a library and commons zone, focused learning rooms that are like the immersive exhibits but smaller and more intimate, classrooms, and a reading nook that overlooks the wetlands.

The Field Pavilion is where hands-on children's activities happen and soil and water experiments are done on the open field work platform.

Next is the Lab Building, which is more private and filled with researchers. There is a wet lab and a research studio as well as offices and conference space.

Finally, the Residential Building sits on the east edge of campus and contains four apartments for visiting researchers, who typically stay for several months at a time.

The outdoor learning complex consists of an amphitheater, a wetlands-themed playground, and a children's garden. The amphitheater hosts educational and community events to connect with the locals and share knowledge about wetland stewardship.

The boardwalk system is comprised of 1.7 miles of trails, with three major scenic overlooks and ten other spots where visitors can stop to sit on benches and learn about wetland preservation through informational placards, as well as the main information kiosk at the parking lot.



Figure 31: Site plan and circulation diagram. All pedestrian traffic moves along the eastern boardwalk spine. Public pedestrian traffic moves through the three western pavilions and the boardwalks. Private pedestrian traffic moves through the two eastern buildings. Primary parking is located near the highway, to provide an immersive, pedestrian-centric experience on campus. Service and ADA vehicles are able to access the buildings more directly via the raised vehicular access road and parking spaces near the buildings.

Program

Facility	Net SF	Gross SF
Entry Pavilion	1086	4894
Classroom Pavilion	2809	6107
Field Pavilion	640	764
Educational Building TOTAL	4473	11765
Lab Building TOTAL	3973	5287
Residential Building TOTAL	2802	4878
GRAND TOTAL	11248	21930

Table 1: Program breakdown. The net square footage is significantly lower than gross square footage due to the large amount of spaces that are common areas not designated as rooms, or covered outdoor spaces that feel sheltered but are not technically indoors.

Material Palette

Organized in a gradient: durable, flood-resistant materials like concrete at the ground interface, transitioning to lighter timber structures above, and permeable surfaces where the project meets the landscape. This approach draws from both vernacular stilt construction and contemporary nature center precedents to balance resilience, environmental sensitivity, and human experience.

Concrete Piles

- Durable substructure
- Minimizes ground disturbance
- Common in Louisiana

Precedent: Gulf Coast houses



Figure 32: Examples of concrete piles in Gulf Coast houses. Image source: Topsider Homes.

Glulam Timber Structure

- Renewable material
- Warm and tactile
- Connects architecture to landscape

Precedent: Grand Teton Craig Thomas Discovery and Visitor Center



Figure 33: Examples of glulam timber at the Grand Teton Craig Thomas Discovery and Visitor Center. Image source: Nic Lehoux.

Composite + Timber Boardwalk System

- Doesn't rot like natural wood
- Lower maintenance in wet environments
- Still reads visually as "wood"

Precedent: Everglades National Park



Figure 34: Examples of composite + timber boardwalks in Everglades National Park. Image sources: Florida Rambler and National Park Service.

Wood Rainscreen Cladding

- Handles moisture well
- Allows drying and ventilation
- Extends lifespan of facade

Precedent: Mass Audubon Pleasant Valley Visitor Center



Figure 35: Examples of wood rainscreen cladding at Mass Audubon Pleasant Valley Visitor Center. Image source: Mass Audubon Pleasant Valley.

Standing Seam Metal Roof

- Sheds water quickly
- Reflects heat
- Durable and low maintenance

Precedent: Many nature centers and park buildings



Figure 36: Examples of nature centers with standing seam metal roofs. Image sources: Eaton Hill Nature Center and Hauser Nature Center.

Permeable Pavers

- Reduces runoff and allows infiltration
- Reinforces “light touch on the land” concept

Precedent: Lady Bird Johnson Wildflower Center



Figure 37: Examples of permeable pavers at Lady Bird Johnson Wildflower Center. Image sources: Overland Partners and Guide to Austin Architecture.

Site Model Photos

The site model was created using CNC foam, acrylic paint, epoxy resin, and laser cut basswood

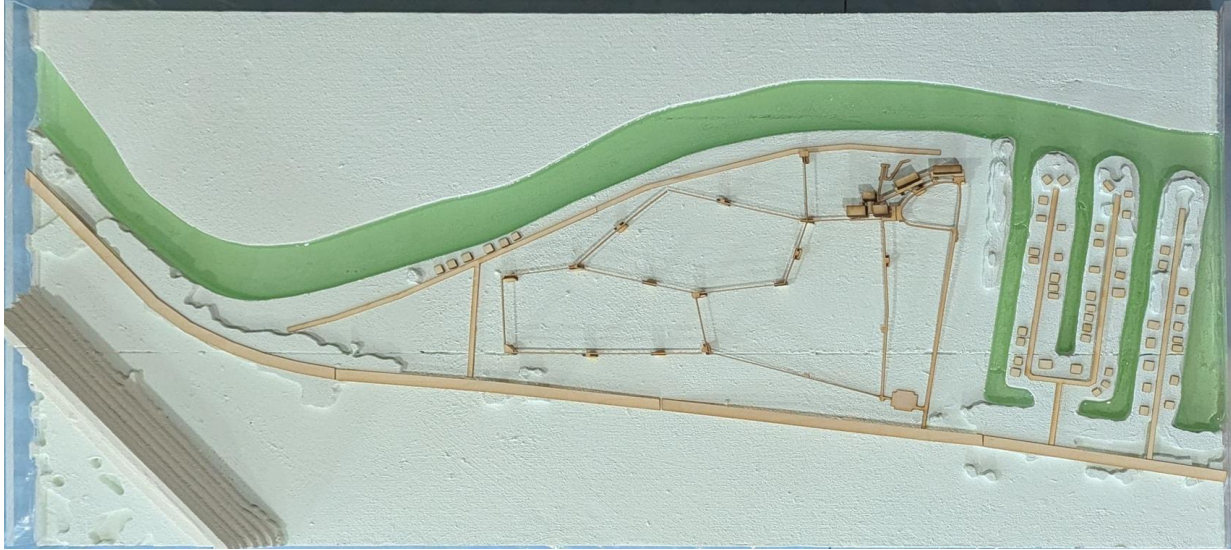


Figure 38: Overhead view of the site model, showing the surrounding area and this project. North is up. Part of a levee wall can be seen in the southwest corner. The Venetian Isles neighborhood can be seen to the east of the project site. A canal flows across the north side of the site.

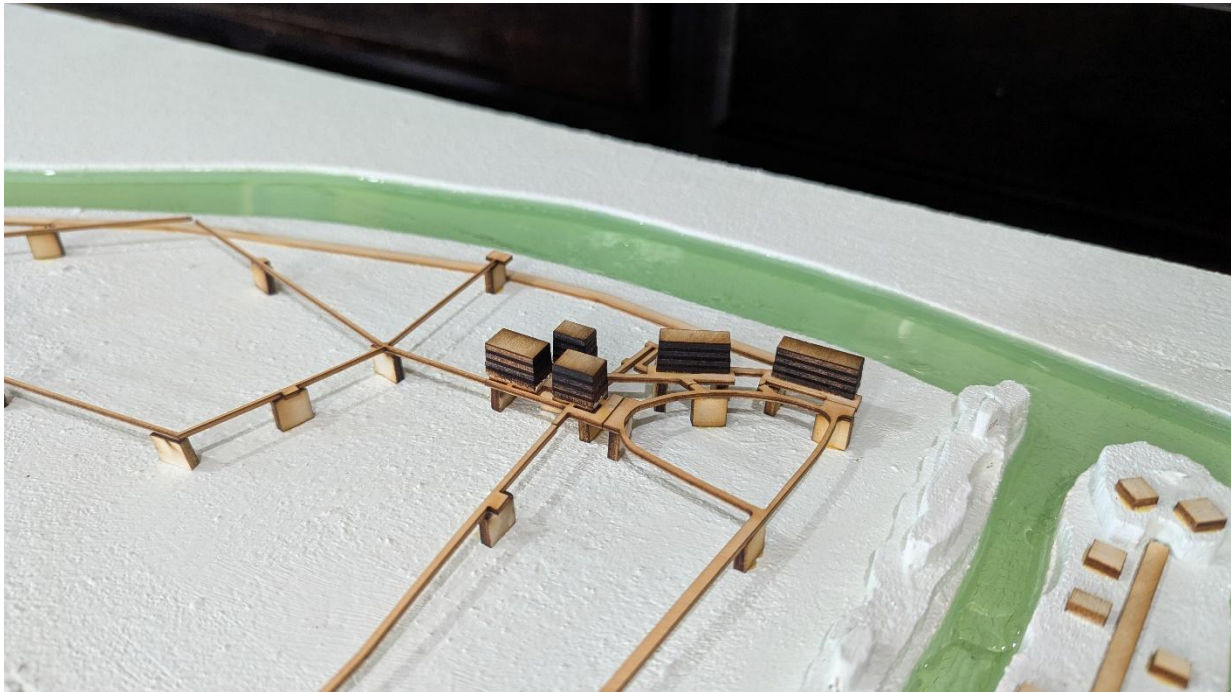


Figure 39: The five buildings making up this project. From left to right: Classroom Pavilion, Field Pavilion, Entry Pavilion, Lab Building, and Residential Building. Notice that the boardwalk and vehicular access road rise to meet the buildings at 15' above the ground, so no elevators are needed.

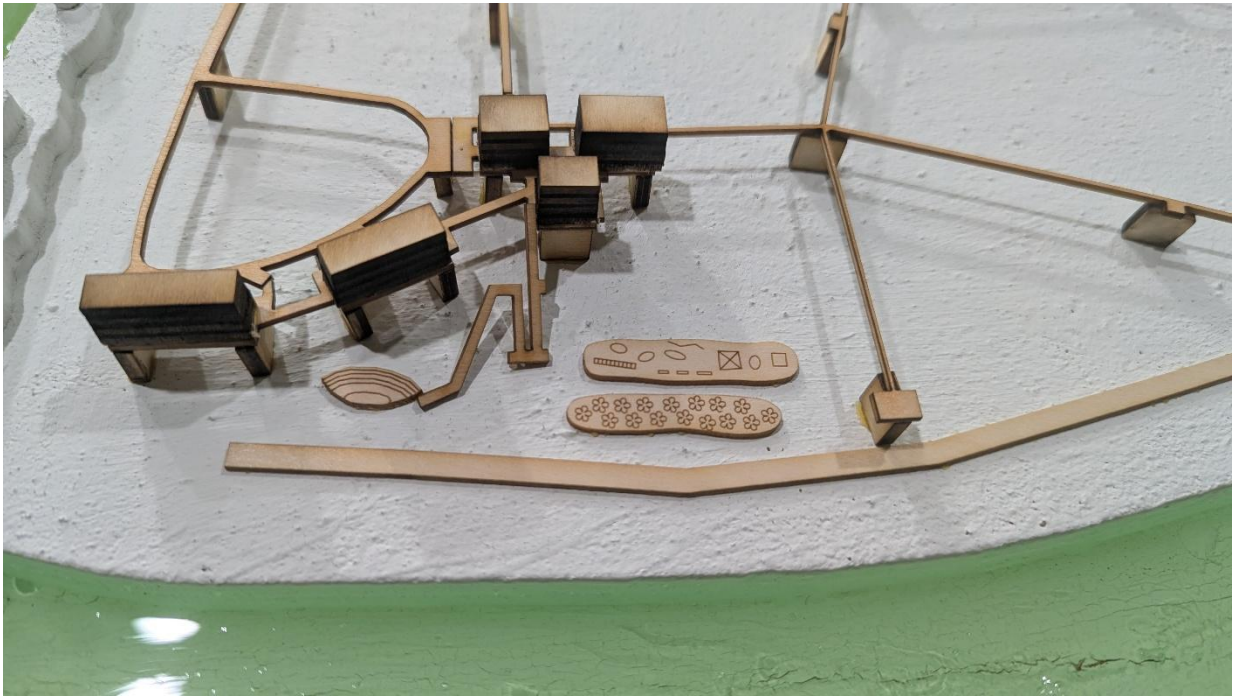


Figure 40: The outdoor learning facilities as seen in the site model. From left to right: The amphitheater, children's garden, and playground. There is a ramp from the Field Pavilion down to the amphitheater for easy access.

Floor Plans

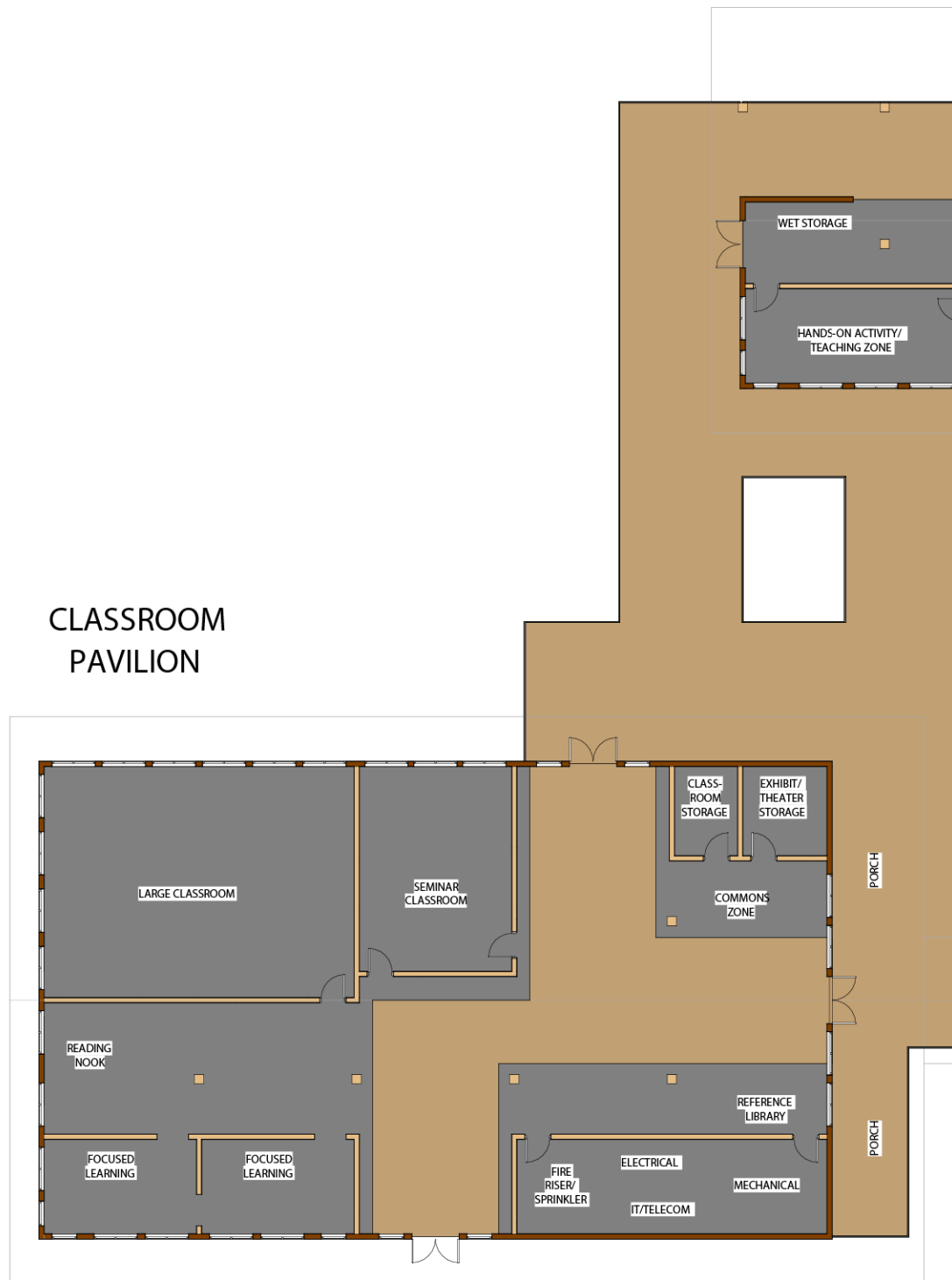
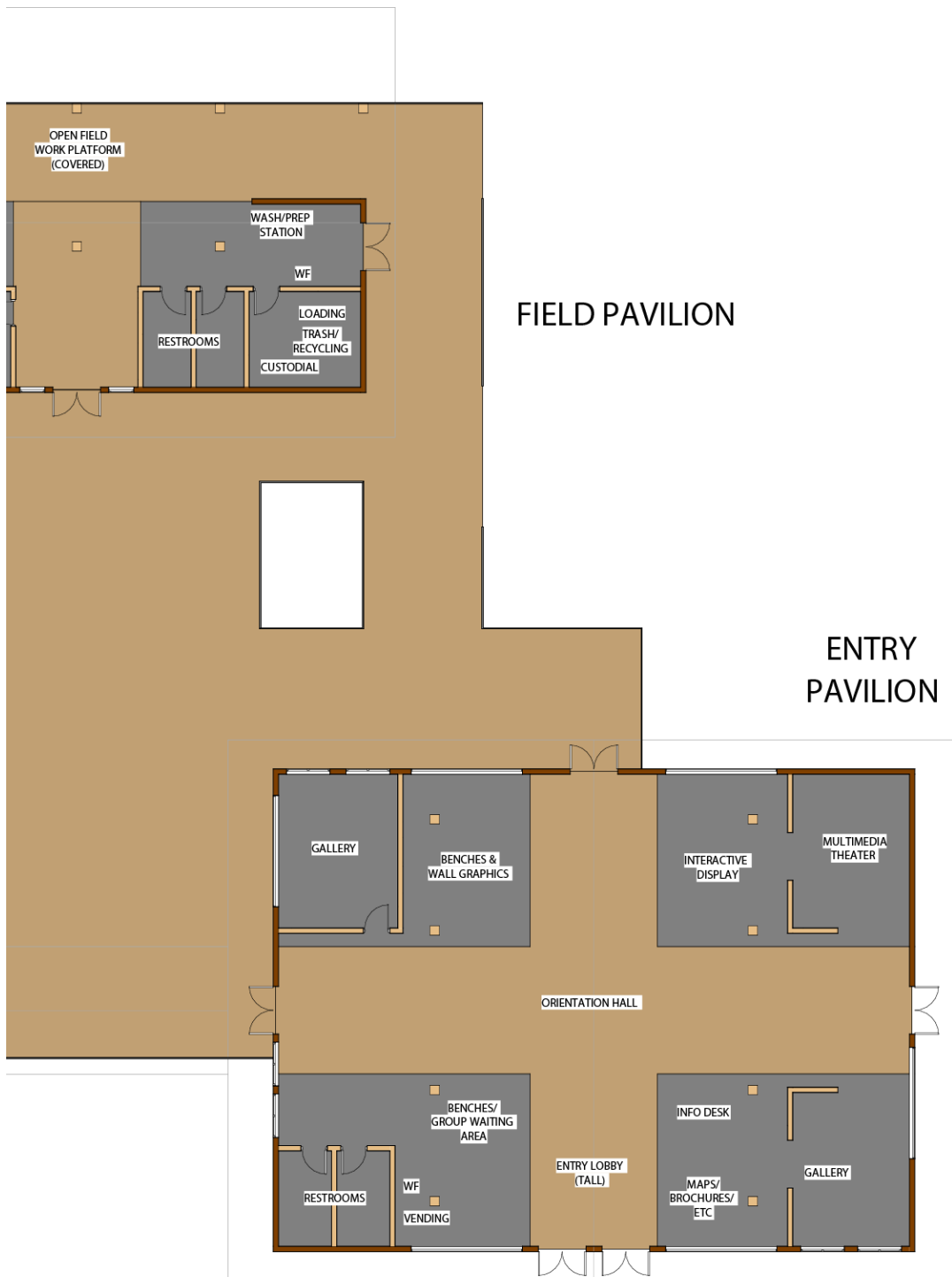


Figure 41: Floor plan for the Educational Building (this page and the next). Notice that the floor color matches the boardwalk for part of the indoor circulation, to create a continuous experience throughout the three pavilions.



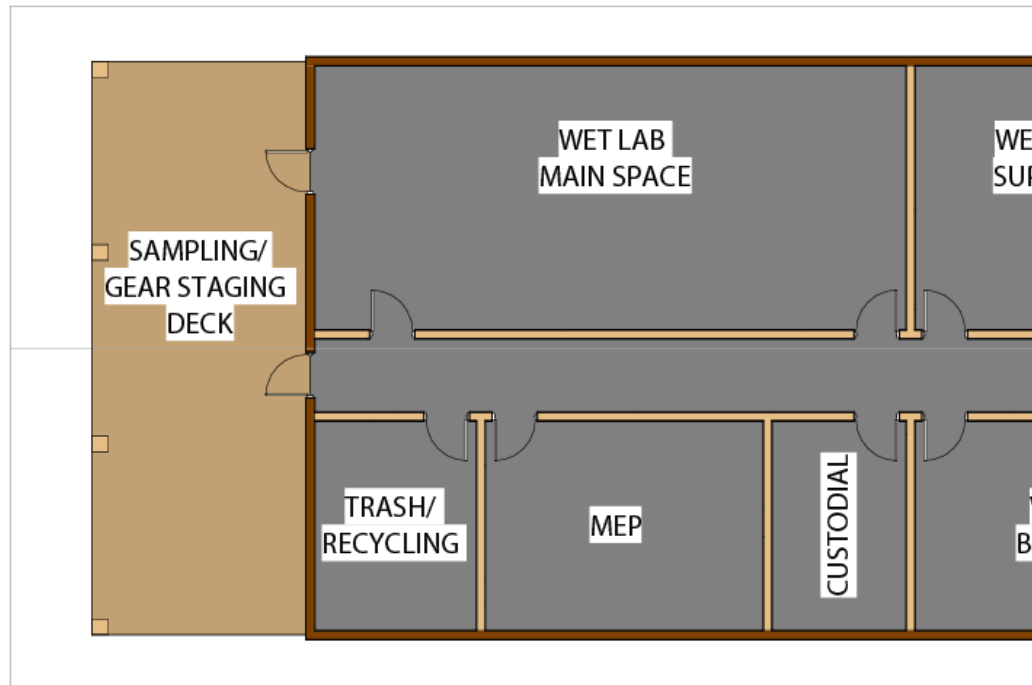


Figure 42: Floor plan for the Lab Building (this page and the next).

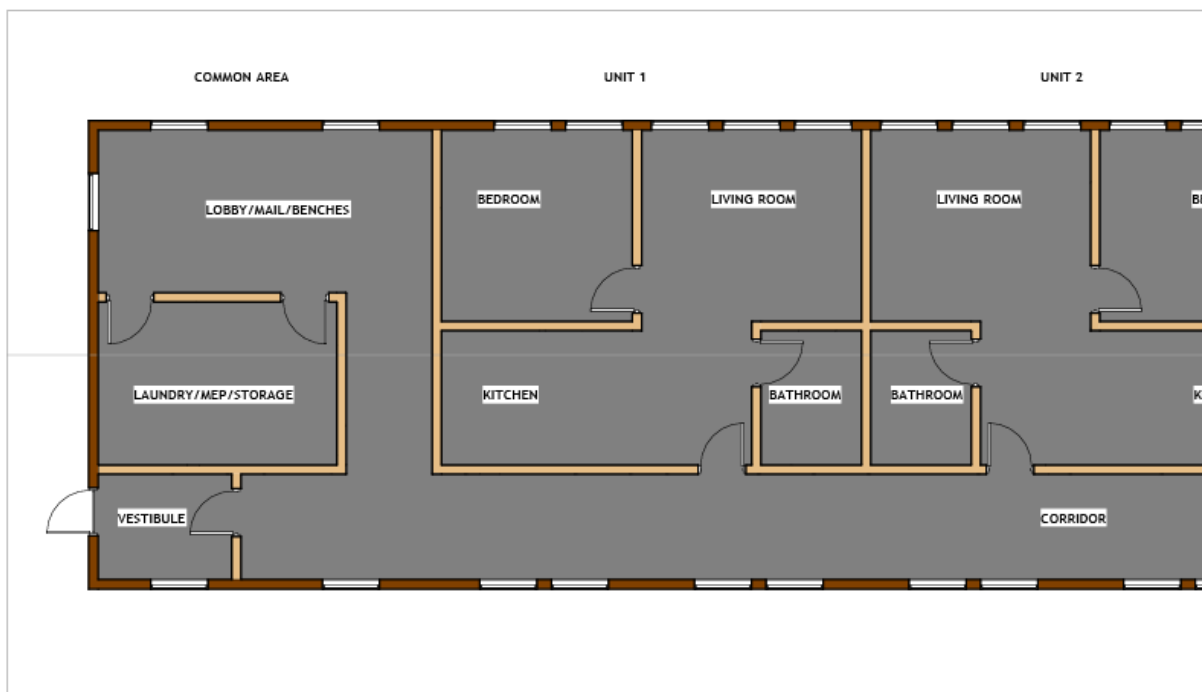
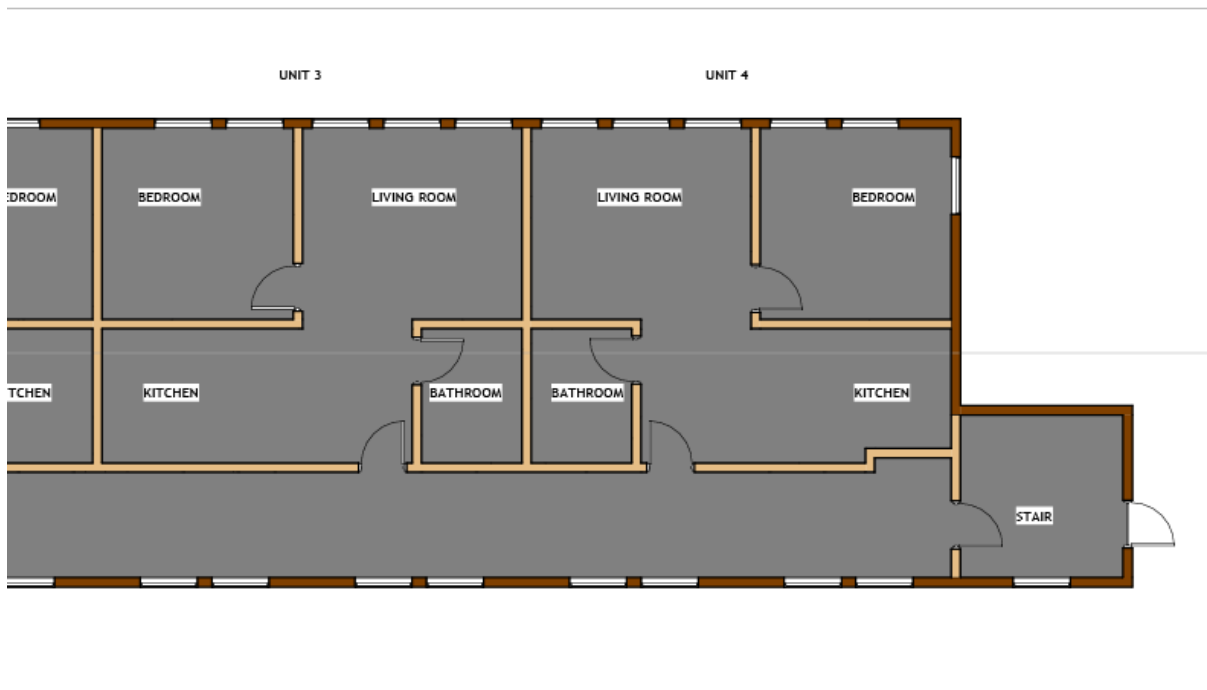
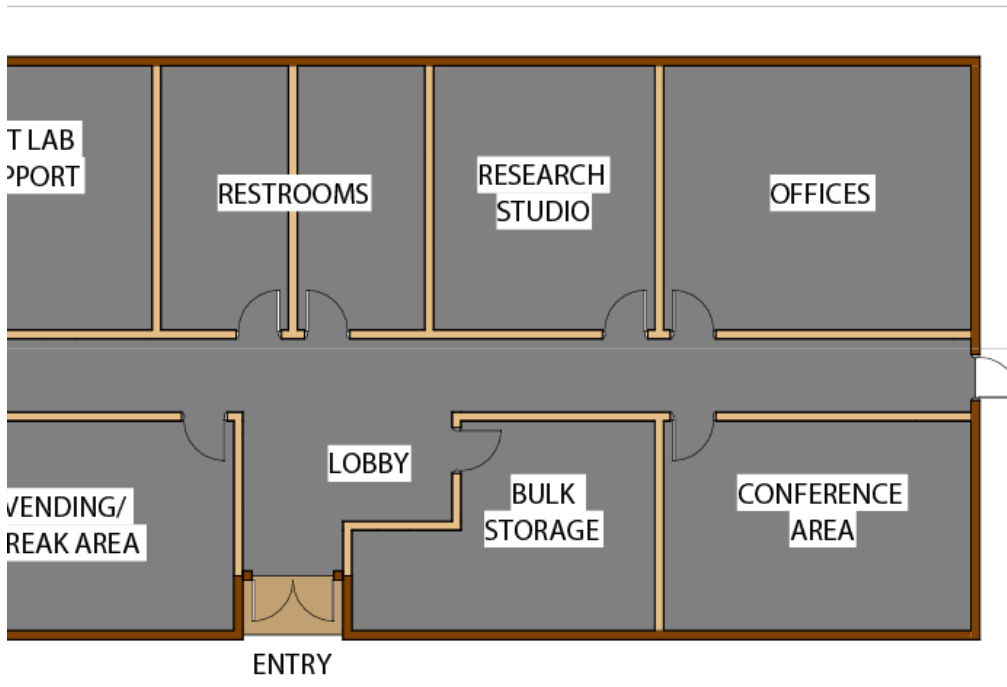


Figure 43: Floor plan for the Residential Building (this page and the next).



Environmental Section: Elevated Assembly

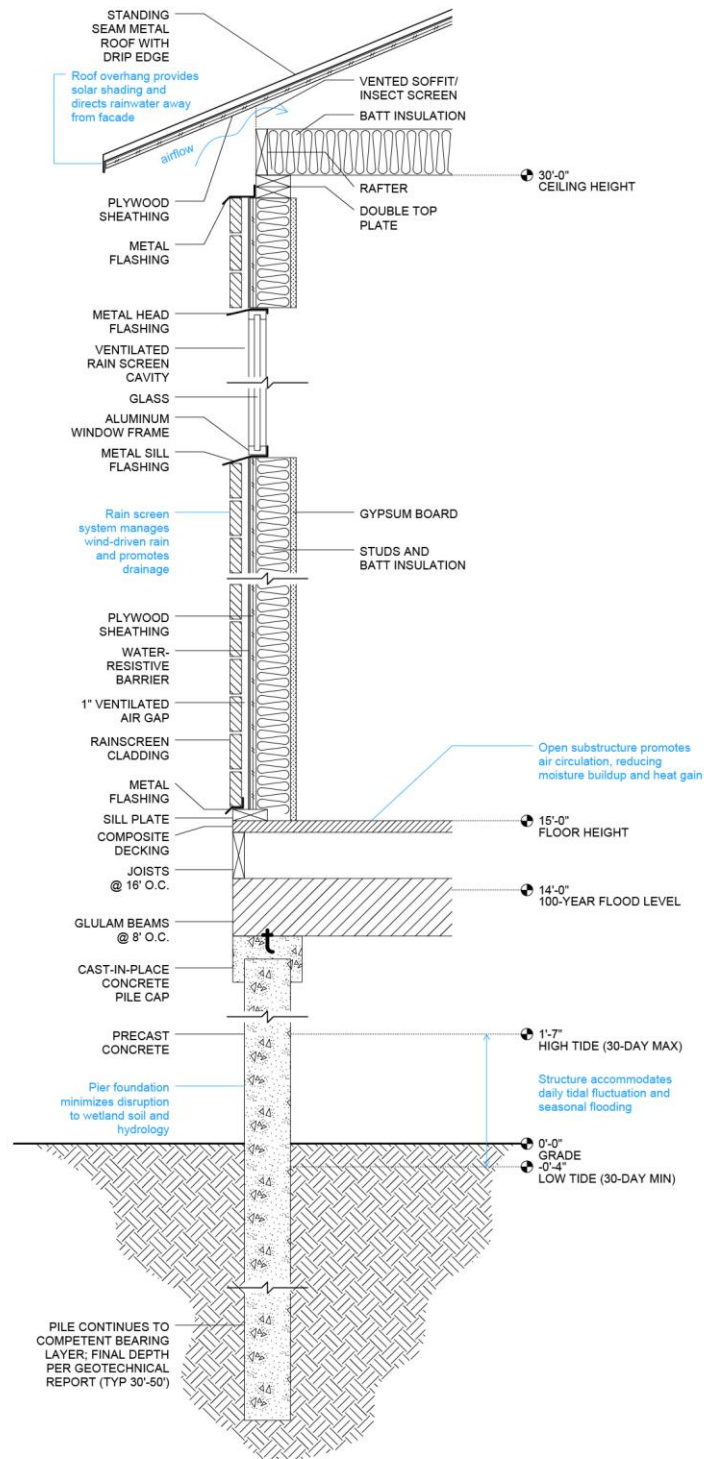


Figure 44: Typical wall section of a building in this project.

Vignettes

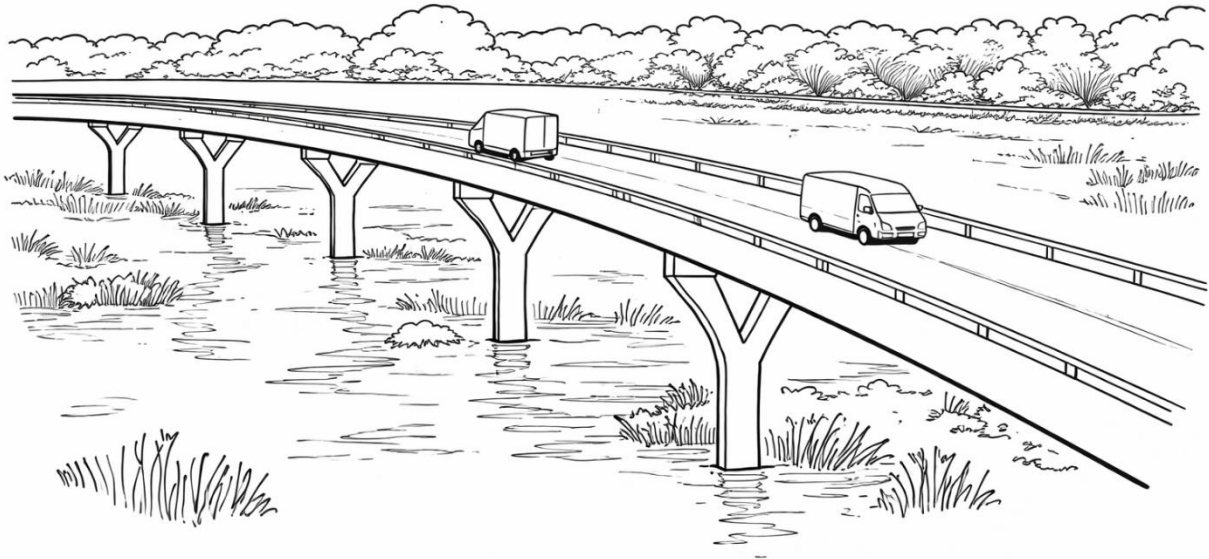


Figure 45: Vignette of the raised vehicular access road. Y-shaped supports reinforce the “light touch on the land” theme that ties this thesis together.

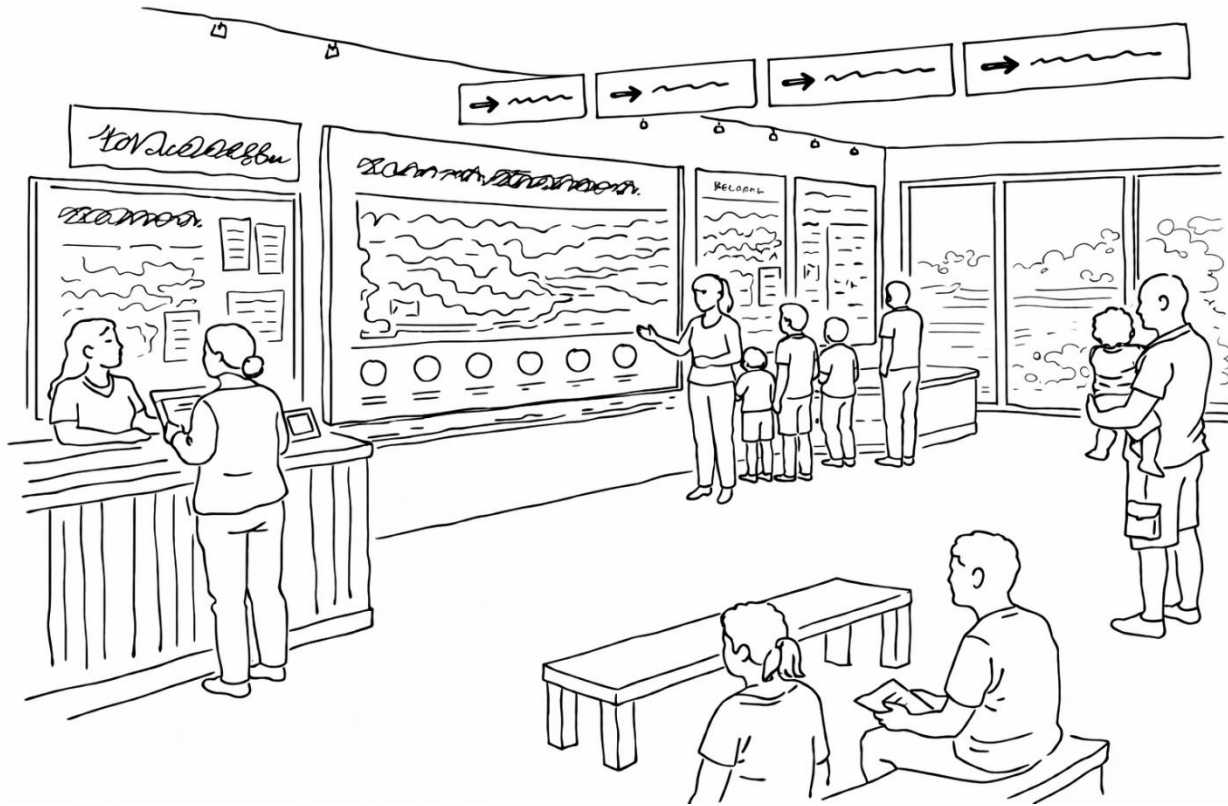


Figure 46: Vignette of the orientation hall in the Entry Pavilion.

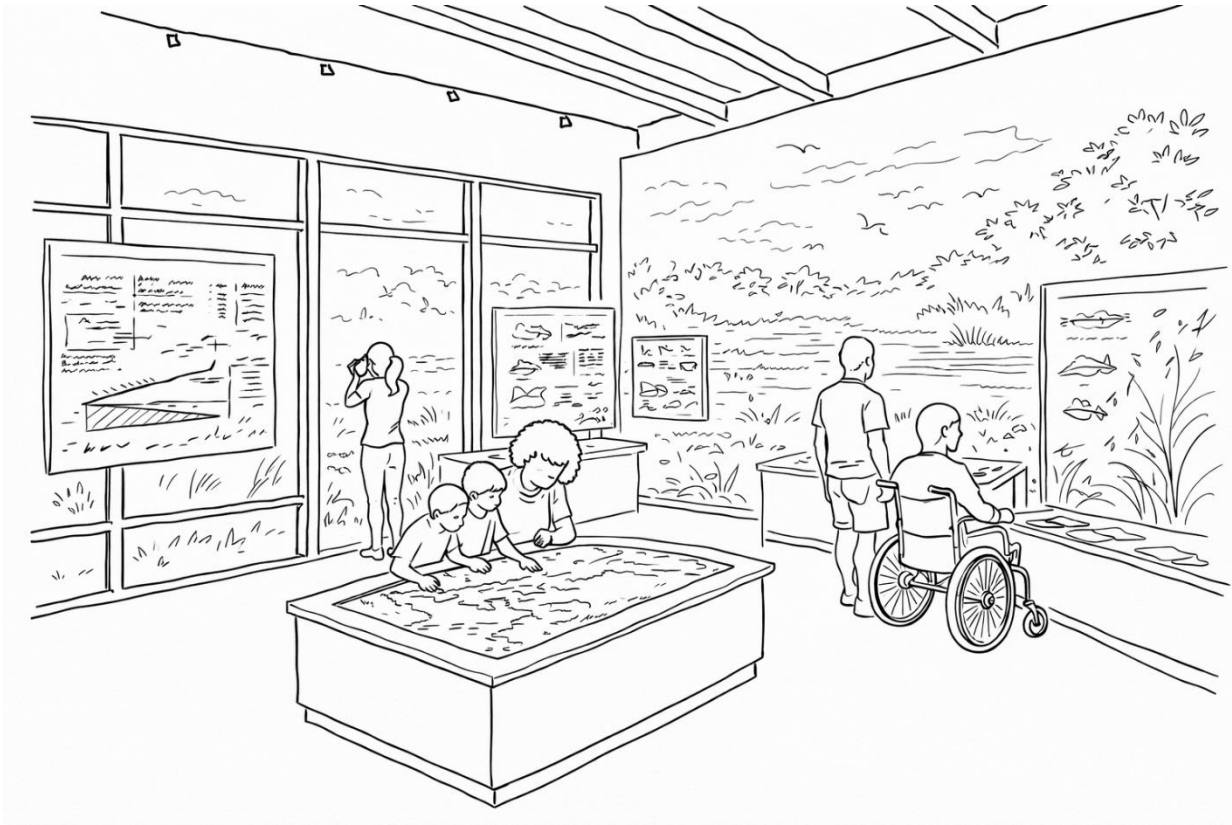


Figure 47: Vignette of an immersive gallery in the Entry Pavilion.

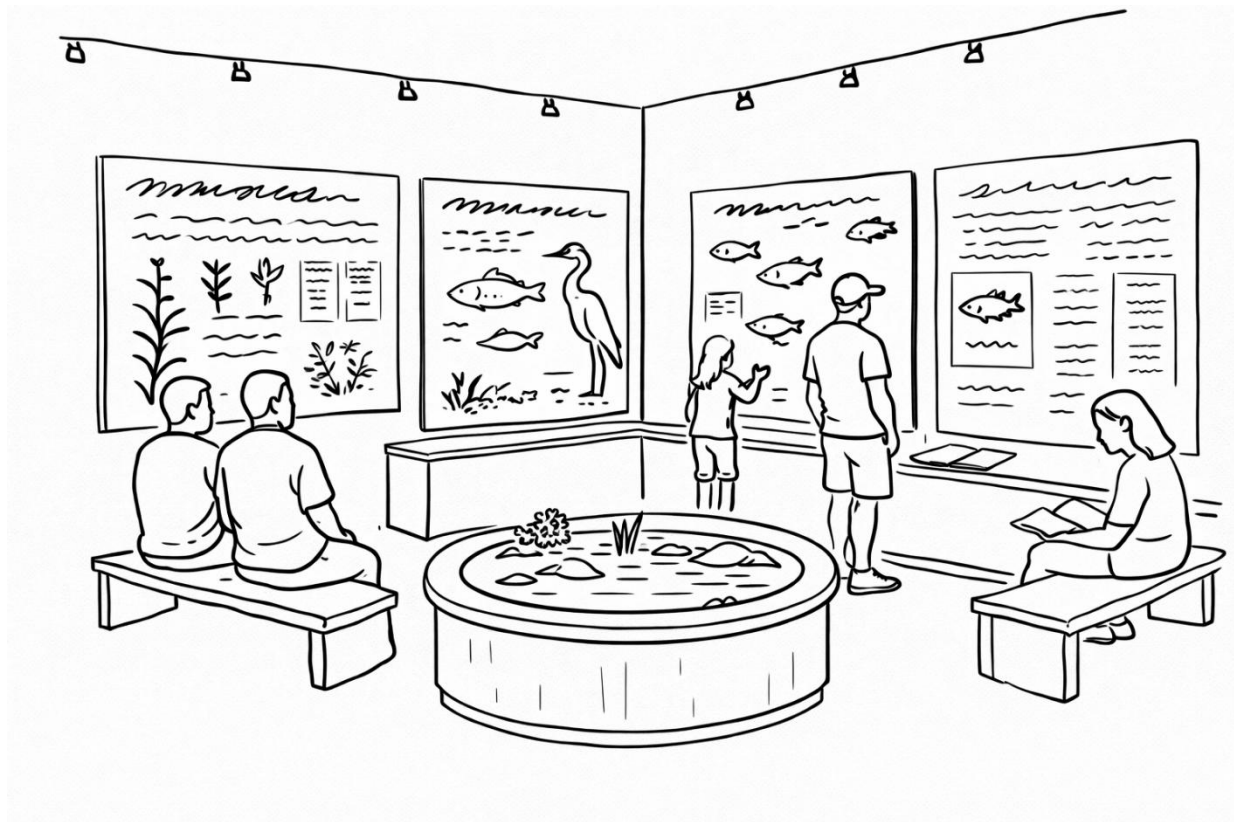


Figure 48: Vignette of a focused learning room in the Classroom Pavilion.



Figure 49: Vignette of the reading nook in the Classroom Pavilion.

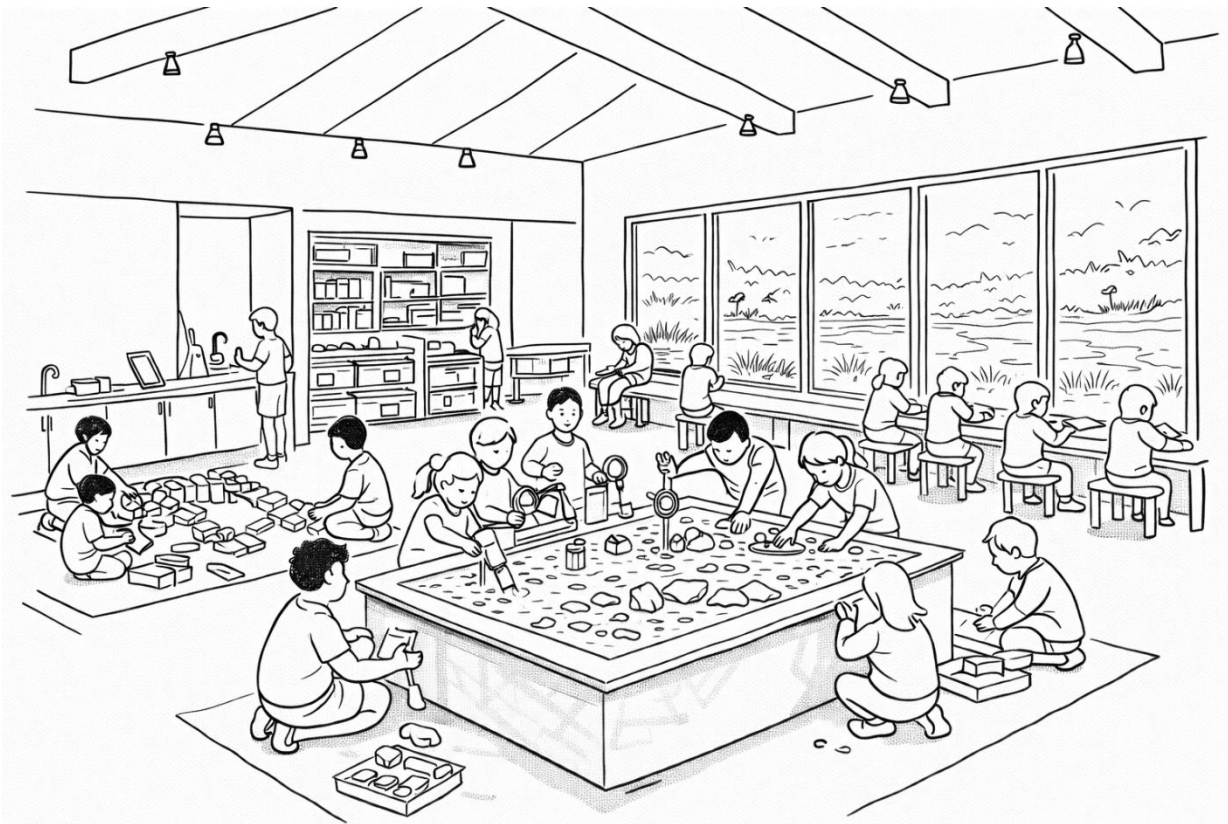


Figure 50: Vignette of the hands-on activity room in the Field Pavilion.

Renderings



Figure 51: Aerial view of the main campus, including the five buildings, outdoor learning facilities, vehicular access loop, and one of the major scenic overlooks on the boardwalk system.



Figure 52: Section view (this page and the next) cutting through the Entry Pavilion, showing the Field Pavilion in the background, then the ramp and amphitheater, and the relationship to the water.





Figure 53: Aerial view (this page and the next) of the main campus, including the five buildings and amphitheater. Buildings from left to right: Residential Building, Lab Building, Entry Pavilion, Field Pavilion, Classroom Pavilion. Especially noticeable at this angle is the deck of the Field Pavilion, where people are currently sitting and watching the water.





Figure 54: Eye-level view of people approaching the Entry Pavilion from the main parking lot along the boardwalk spine.

