ABSTRACT

Title of Thesis:	ROOTED IN SENSES: MULTISENSORY DESIGN FOR MENTAL WELLBEING
	Olivia Ryan, Master of Architecture, 2026
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Modern society's increasing disconnection from nature has produced measurable consequences for mental, emotional, and physiological well-being. Technology dependence and indoor-centric lifestyles have severed the harmonious human-nature relationship that historically supported cognitive development. This condition is intensified in urban conditions where efficiency is often prioritized over human perception.

This thesis investigates how biophilic and multisensory design strategies can restore this essential link by embedding nature within the urban fabric through architectural experience. Blurring the line between interior and exterior spaces positions nature not only as a backdrop but also as an active participant in design, reconnecting people to the natural world. Research demonstrates that exposure to nature produces immediate and long-term psychological benefits, such as reduced stress, improved mood, and enhanced cognitive performance. Ultimately, this thesis argues that in a time where fast-paced lifestyles are idealized, architecture becomes an

essential intervention for creating spaces where mindfulness can be cultivated and sustained through embodied, sensory experience.

ROOTED IN SENSES: MULTISENSORY DESIGN FOR MENTAL WELLBEING

by

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Chapter 1: Introduction

Introduction

As a society, we are more connected to our devices than to the natural world, and our mental health is paying the price. It was not always this way; in fact, humans have lived amongst nature throughout their entire existence. The human species has adapted to live in harmony with nature, deriving psychological, physiological, and emotional benefits from direct interactions with natural environments. Unfortunately, the advancement of technology has altered our lives to become more technologically dependent and indoor-centered. Ultimately, this lifestyle has led to a surge in mental health problems, particularly in younger generations. While multiple factors contribute to this mental health crisis, an often-overlooked dimension is humanity's increasing disconnection from the natural world. The environment has also been significantly altered due to the impact of climate change, adding to the increased stress and anxiety in communities, especially in coastal areas where extreme weather events and sea-level rise are inevitable. Habitats are being disrupted, shoreline patterns are shifting, and natural buffers such as wetlands and dunes are diminishing. These changes threaten the ecology of the very environment that is necessary to reconnect humans with nature.

Given the more recent mental health decline resulting from nature deprivation and climate stress, this thesis investigates: How can coastal architecture foster mental

well-being and restore the human connection to nature through immersive sensory experiences?

Built Environment Response

Climate change is inevitable; therefore, this thesis expects and embraces the disturbance it has on the environment. The built environment can respond to climate change by allowing sea level rise to seep into the building footprint, allowing it to become an interactive element. The project can consist of multiple buildings to encourage an experiential promenade throughout the site. A modular compilation of buildings can initiate long-term goals for the project. As sea levels rise, it may eventually take over the entire site, but a modular design can be relocated to other areas along the bay. Long-term goals set visions for the building's longevity without limitations enforced by climate change.

Rather than thinking of nature as a separate element from the built environment, this project intentionally blurs the lines between the two, creating an immersive experience. The benefits nature has on mental well-being are significant and extend beyond sight. The more senses that are activated, through sounds, textures, and scents, the more impactful the results. Aromatic plants and natural ventilation systems can engage olfactory senses, triggering memory and emotional responses. Strategic use of natural lighting, including dynamic shadows and seasonal light patterns, connects users to natural cycles. Ultimately, the built environment response recognizes that restoring the human-nature connection is essential for the well-being of society. By thoughtfully integrating biophilic principles with

multisensory design, architecture can create spaces that nurture the fundamental relationship between humans and the natural world.

Chapter 2: Literature Review

Human Connection to Nature

Humans have lived amongst nature for our entire existence, yet modern society has increasingly severed this connection. Technological advancements have led to increased urbanization and indoor lifestyles, limiting exposure to natural environments. The psychological, physiological, and emotional benefits that have historically been derived from direct interactions with nature are being diminished. This thesis investigates the role of biophilic and multisensory design strategies in order to restore the human link to nature. Thoughtfully designed spaces can foster mental well-being, resilience, and inclusivity for everyone to experience.

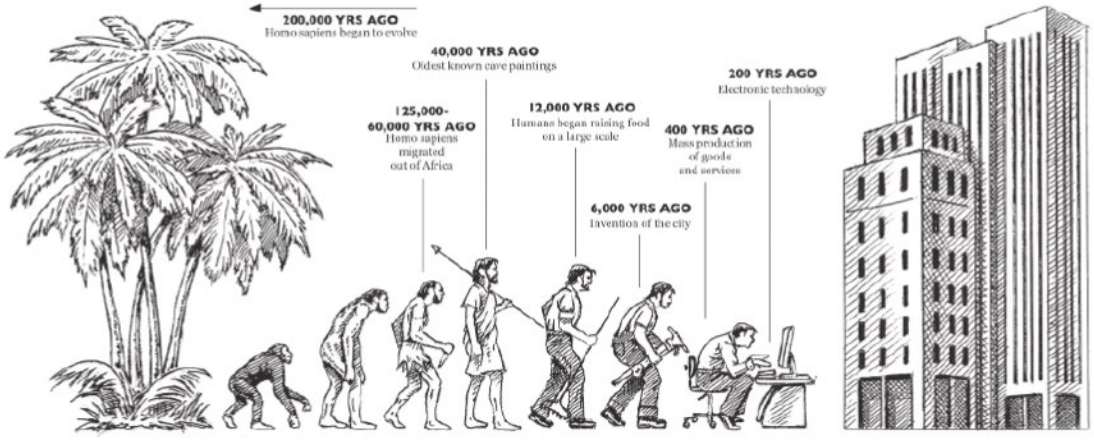

Figure 1: Human adaptation to the modern world. Kellert, *Nature by Design*, fig. 1.1, 3.

The Psychological Impact of Nature Deprivation

Humans have an innate need to connect with nature, a concept that is central to understanding the importance of designing environments that foster mental well-being. In early human societies, survival and cognitive development were closely shaped by exposure to the natural world. This link lasted throughout the evolution of people and enhanced adaptation. People are disconnected from the natural world as society tends to spend more time indoors, become less active, and more reliant on technology.[1] The lost attachment to the natural world negatively impacts humans, as they have evolved to live in harmony with nature. The disconnect has shown measurable effects both psychologically and physically, highlighting the need to intentionally restore contact with natural elements.

Research demonstrates that exposure to nature produces almost an immediate response, as well as long-term psychological benefits. Exposure to natural environments has been directly linked to reduced stress, improved mood, and enhanced cognitive performance. For instance, participants who walked in a natural setting experienced a rapid decline in blood pressure and reported lower levels of anger compared to those in urban settings.[2] Similarly, walking in nature reduces self-focused rumination and decreases neural activity in the subgenual prefrontal cortex, a brain region associated with stress and emotional regulation.[3] These findings suggest that natural settings can serve as a non-clinical intervention to support mental health,

[1] Stephen R. Kellert, *Nature by Design: The Practice of Biophilic Design* (New Haven, CT: Yale University Press, 2018).
[2] Terry Hartig et al., "Tracking Restoration in Natural and Urban Field Settings," *Journal of Environmental Psychology* 23, no. 2 (2003): 109–23, https://doi.org/10.1016/S0272-4944(02)00109-3.
[3] Gregory N. Bratman et al., "Nature Experience Reduces Rumination and Subgenual Prefrontal Cortex Activation," *Proceedings of the National Academy of Sciences* 112, no. 28 (2015): 8567–8572.

particularly for individuals who experience high levels of stress or are at risk for depression.

The importance of nature for mental well-being is not limited to adults. Children, in particular, are highly vulnerable to the effects of nature deprivation. Richard Louv's concept of Nature-Deficit Disorder explains the consequences of spending less time in nature. This term acts as a diagnosis, although not medically accurate, and can come with symptoms such as attention difficulties, higher stress levels, mood imbalances, and reduced creativity and empathy. Louv's research illustrates how modern lifestyles have weakened the essential and fundamental relationship between children and nature; however, he states that it can be applied to society as a whole. He acknowledges that nature is a fundamental component of life and human health, rather than a luxury. This relationship between human well-being and environmental engagement forms the foundation for biophilic design as a restorative strategy.[4] Louv's concepts of nature being a necessity for human health set the foundation for programs, such as Nature Rx, that prescribe time in nature as a solution. The symptoms that Louv lists as an effect of deficient time in nature are supported by research that shows that children who engage with green spaces exhibit lower levels of attention deficit hyperactivity disorder (ADHD), reduced anxiety, and improved emotional regulation. Urban planning and environmental design can foster cognitive and emotional development in children by providing accessible green spaces.[5] Design interventions can provide early exposure to natural environments,

[4] Richard Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, Updated and Expanded (Chapel Hill, NC: Algonquin Books of Chapel Hill, 2008).
[5] Victoria Derr and Krista Lance, "Biophilic Boulder: Children's Environments That Foster Connections to Nature," *Children, Youth and Environments* 22, no. 2 (2012): 112–43, https://doi.org/10.7721/chilyoutenvi.22.2.0112.

establishing the foundation for lifelong well-being and encouraging a sustained connection to the environment.

Nature Deprivation and Contemporary Challenges

The COVID-19 pandemic dramatically changed the way people engage with the world and resulted in a decline in overall well-being. Daily lives consisting of being confined indoors and deprived of access to natural and social environments negatively impacted society. COVID-19 impacted the frequency, duration, and quality of nature interactions people experienced. Even though people interacted with nature less, it was found that there was still an affinity towards nature, and people's attitudes about the environment did not change. Additionally, there was a decline in mental well-being, particularly in individuals who live in more urban spaces.[6] A study on adolescents during the pandemic found a 52% decline in mental well-being, and 64% of children reported less outdoor activity time.[7] After experiencing deprivation, the need for humans to connect with nature became much stronger. The pandemic serves as a worldwide case study of the direct effects of nature deprivation for long periods of time, resulting in negative consequences for humans. Environmental deprivation illustrates how the restorative benefits of nature are more important now than ever.

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[6] Agathe Colléony, Susan Clayton, and Assaf Shwartz, "Impacts of Nature Deprivations during the COVID-19 Pandemic: A Pre-Post Comparison," *Biological Conservation* 268 (2022), https://doi.org/10.1016/j.biocon.2022.109520.

[7] S. B. Jackson et al., "Connection to Nature Boosts Adolescents' Mental Well-Being during the COVID-19 Pandemic," *Sustainability* 13, no. 21 (2021): 12297, https://www.proquest.com/scholarly-journals/connection-nature-boosts-adolescents-mental-well/docview/2596061290.

Figure 2: Indoor-centric lifestyle by the author.

The Restorative Power of Water and Sensory Connection

Water is one of the more powerful elements of nature, with its natural calming and restorative presence in human experience. Multiple studies show a correlation between proximity to water, blue spaces, and improved mental health outcomes. Participants described the light on the water as magical, therapeutic, and calming, which is linked to reducing depression.[8] Another study was conducted for residents along the coast to examine how the ocean has therapeutic value and effects on emotions. The results found that the two main emotions experienced at the coast are awe and nostalgia, which create a safe haven, also described as emotional vulnerability away from daily stressors.[9] These emotional responses reveal the unique psychological resonance of water, which can ground individuals and provide relief from the pressures of modern life. Ultimately, these findings demonstrate that

[8] Jing Guan et al., "The Role of Blue Space in Enhancing Mental Health and Well-Being Among Older Adults: A Systematic Review," *Sustainability* 17, no. 8 (2025), https://www.proquest.com/docview/3194646343.

[9] Marine I. Severin et al., "A Qualitative Study on Emotions Experienced at the Coast and Their Influence on Well-Being," *Frontiers in Psychology* 13 (2022), https://doi.org/10.3389/fpsyg.2022.9021.

the human tie to nature is not merely aesthetic but an essential component of mental and emotional well-being.

The human need to connect with nature is not limited to physical interaction, but imagined or symbolic associations can also have therapeutic implications. An article discusses how healthcare professionals guide clients through mental imagery of a place to promote relaxation, emotional healing, and self-awareness. These imagined landscapes are grounding techniques to evoke sensations of warmth and safety, or conversely, confront distressing emotions in order to reframe feelings of fear, trauma, or anxiety.[10] Architecturally, there are opportunities to reinterpret nature through design strategies that evoke sensory and emotional qualities, rather than through the literal inclusion of green or blue spaces. This reinforces the broader thesis argument that human well-being is intrinsically tied to the environment, and thoughtfully designed spaces can restore lost connections to nature while supporting diverse user needs.

Overall, the evidence compiled from these studies demonstrates the inherent need for humans to engage with the natural world. The link is deeply embedded in human evolution and provides health and mental benefits. Disruptions from modern lifestyles, urbanization, and climate change have heightened the importance of restoring the relationship. By recognizing and prioritizing this innate need, architecture can integrate biophilic design strategies into the built environment to create therapeutic, serene spaces that actively restore the human connection to nature.

[10] Gavin J. Andrews, "(Re)Thinking the Dynamics between Healthcare and Place: Therapeutic Geographies in Treatment and Care Practices," *Area* 36, no. 3 (2004): 307–18, http://www.jstor.org/stable/20004396.

Biophilic Design

Biophilic design is a strategy that thoughtfully and intentionally incorporates elements of nature in the built environment to improve the overall well-being of humans. The concept of biophilia proposes that humans have an inherent connection to the natural world, and engagement is essential for maintaining mental, emotional, and physical health.[11] Biophilic design prioritizes meaningful interactions between humans and natural elements or forms that create spaces that are psychologically restorative and physiologically supportive.[12] Biophilic design can be utilized as a framework for enhancing the human experience within the built environment, which bridges the gap between modern urban life and the relationship between humans and nature.

Biophilic Patterns and Therapeutic Applications

Mental well-being can be supported through interaction with natural elements, whether that is visually or experientially, within biophilic design. Through the measurement of blood pressure, emotion, and attention, a study proves the direct link between exposure to nature and the reduction of stress levels. One group of participants walked in nature, while the other group was in an urban environment. It was discovered that the urban walk increased feelings of anger and aggression in the participants, while the opposite was found in the natural environment.[13] Even small interventions, such as plants, exposed natural materials, or views of water, can

[11] Kellert, *Nature by Design*.
[12] William Browning, Catherine Ryan, and Joseph Clancy, *14 Patterns of Biophilic Design* (Terrapin Bright Green, 2014), https://www.terrapinbrightgreen.com/reports/14-patterns/.
[13] Terry Hartig et al., "Tracking Restoration in Natural and Urban Field Settings," *Journal of Environmental Psychology* 23, no. 2 (2003): 109–23, https://doi.org/10.1016/S0272-4944(02)00109-3.

generate significant improvements in mental health, reinforcing the notion that biophilic design is not simply a decorative choice but is intentionally for therapeutic purposes.

Strategies for biophilic design can be categorized into several patterns that influence human perception and behavior. The 14 patterns of biophilic design were created by Terrapin Bright Green, ranging from direct experiences of nature, such as daylight and vegetation, to indirect connections, like natural materials, forms, and imagery. Each pattern either reduces stress, improves cognitive performance, enhances mood, or falls under multiple categories of well-being.[14] These patterns were created to guide designers when translating the human-nature connection into the built environment, encouraging the creation of spaces that are restorative, engaging, and responsive to basic human needs. By thoughtfully considering the 14 patterns, biophilic design moves beyond aesthetics to create environments that actively support human well-being.

[14] Browning, Ryan, and Clancy, *14 Patterns of Biophilic Design*.

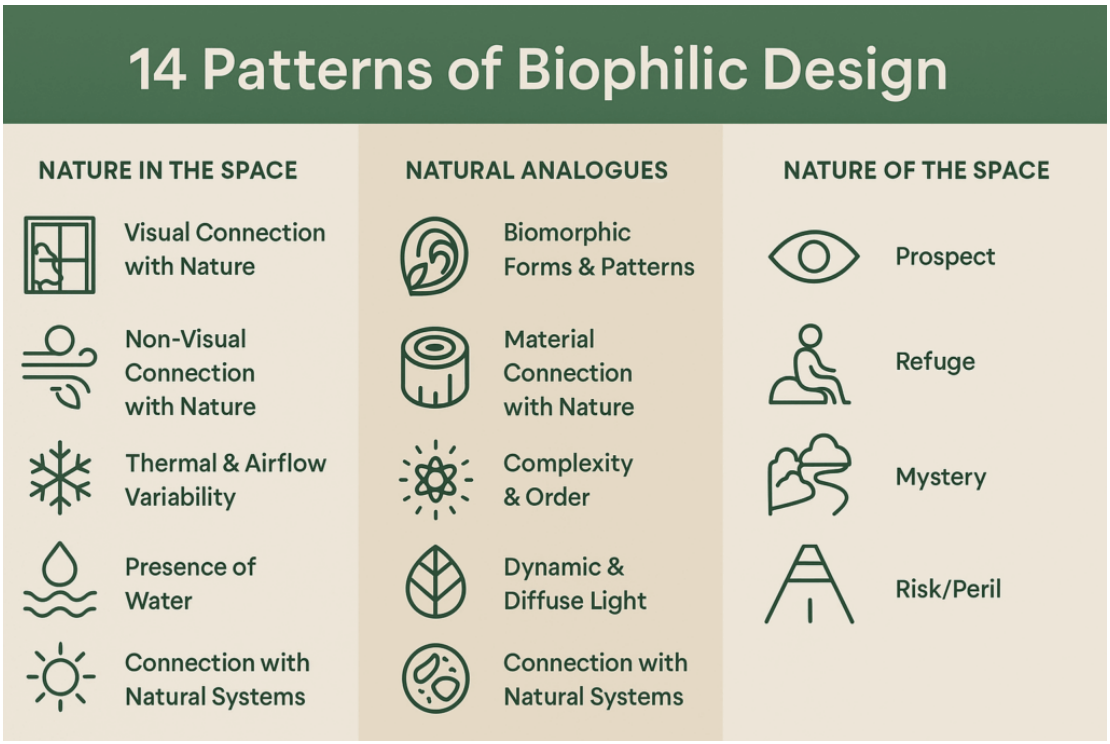

Figure 3: *14 Patterns of Biophilic Design.* Biophilic Design Blog (2025).

The concept of Nature Rx programs further illustrates the potential of biophilic interventions in improving mental health. Programs such as Nature Rx prescribe time outdoors as a wellness intervention. They show measurable health improvements, including increased concentration and reduced stress, particularly in young adults. In these programs, students engage in activities within natural environments, ranging from walking in green spaces to hands-on gardening, which has been shown to reduce stress, improve focus, and enhance mood.[15] Quantitative studies show the same results using salivary cortisol levels, a hormone found in saliva that measures stress, along with additional self-reported surveys. The results indicate that as little as 10 minutes in nature can produce noticeable improvements,

[15] Donald A. Rakow and Gregory T. Eells, *Nature Rx: Improving College-Student Mental Health* (Ithaca, NY: Cornell University Press, 2019), http://www.jstor.org/stable/10.7591/j.ctvfc544p.

while longer exposure accumulates greater benefits.[16] Nature Rx highlights how intentional engagement with nature, whether through architectural design or organized programming, can provide equitable access to therapeutic experiences.

Accessibility and Contemporary Relevance

Access and inclusivity are equally important when it comes to biophilic design in the built environment. Research shows that disparities in accessibility to green or blue spaces can intensify inequities in mental health outcomes, particularly in urban areas where low-income communities often lack nearby natural environments.[17] Designing inclusive biophilic spaces ensures that the therapeutic benefits of nature are available to all users. Accessibility can be achieved through physical design, as well as sensory design that engages users who may have visual impairments or other disabilities.[18] The integration of both sensory and spatial strategies transforms biophilic design from a privilege to an accessible resource that is designed to support diverse communities.

The pandemic has shaped lifestyles and habits that rely heavily on technology and involve significantly more time spent indoors. Studies indicate that after the pandemic, people are seven times more likely to prefer biophilic design due to the decreased amount of time spent outdoors during the pandemic. However, people now tend to prefer telework options, which often confines them indoors and

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[16] Genevive R. Meredith et al., "Minimum Time Dose in Nature to Positively Impact the Mental Health of College-Aged Students, and How to Measure It: A Scoping Review," *Frontiers in Psychology* 10 (2020), https://doi.org/10.3389/fpsyg.2019.02942.

[17] Colléony, Clayton, and Shwartz, "Impacts of Nature Deprivations during the COVID-19 Pandemic: A Pre-Post Comparison,."

[18] Nina Sobol Levent and Alvaro Pascual-Leone, eds., *The Multisensory Museum: Cross-Disciplinary Perspectives on Touch, Sound, Smell, Memory, and Space* (Lanham, MD: Rowman & Littlefield, 2014).

emphasizes the need for a restorative nature within residential and workplace environments.[19] Architecture can incorporate biophilic principles into the built environment to encourage the association with nature, mitigate the stress of indoor confinement, and promote long-term mental health. Human-environment relationships are adapting to contemporary lifestyles, just as they did in natural settings during early evolution.[20] These lifestyles of increased technology and more time spent indoors negatively affect the mental health of society. Screen time in the bedroom can interfere with melatonin production and physiological rhythms due to the electromagnetic radiation and light of the screen, resulting in individuals not getting the appropriate amount of sleep. Bad sleeping habits can lead to mental health concerns, such as anxiety, depression, and low self-esteem, which are more prominent in younger generations due to the more frequent use of social media.[21] The habits of a contemporary lifestyle often contribute to mental health challenges, which can be improved through biophilic design. Incorporating natural elements into everyday environments is a way that architecture can utilize the inherent restorative characteristics of nature to enhance individual well-being and promote a healthier society as a whole.

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[19] Kalterina Shulla et al., "People-Environment Relations Following COVID-19 Pandemic Lifestyle Restrictions: A Multinational, Explorative Analysis of Intended Biophilic Design Changes," *Discover Sustainability* 5, no. 1 (2024), https://doi.org/10.1007/s43621-024-00423-y.

[20] Kellert, *Nature by Design*.

[21] Yang Chen et al., "Problematic Social Media Use May Be Ruining Our Sleep: A Meta-Analysis on the Relationship Between Problematic Social Media Use and Sleep Quality," *International Journal of Mental Health and Addiction* (2024), https://link-springer-com.proxy-um.researchport.umd.edu/article/10.1007/s11469-024-01407-9.

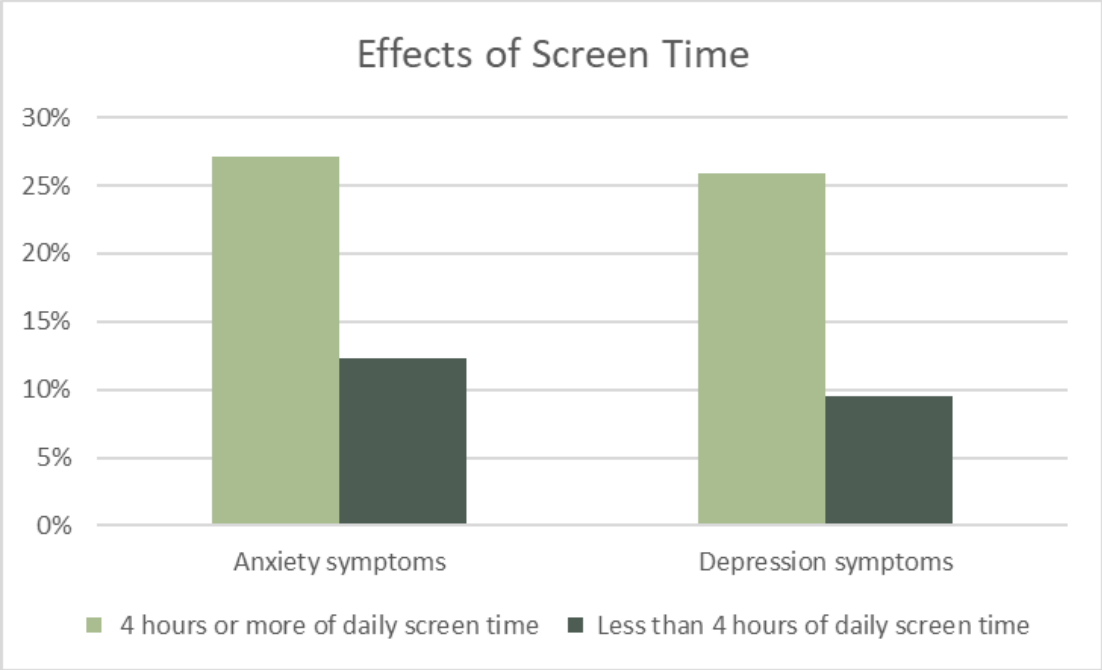

Table 1: U.S. adolescent screen time and mental health symptoms. Based on NCHS Data Brief no. 513 (CDC, 2024).

Biophilic Design and Environmental Stewardship

Biophilic design not only promotes human health, but it also addresses a broader environmental concern for climate change. Unfortunately, when there is no direct relation to humans, there tends to be a lack of knowledge or care for ecological health. Restoring the relationship between humans and nature through biophilic design can encourage pro-environmental behaviors. Natural interventions not only enhance mental health but also promote involvement with sustainability efforts, fostering feelings of connectedness in users.[22] Supporting environmental improvement efforts is shown to improve psychological outcomes in the context of

[22] Jonathon P. Schuldt, Katherine A. McComas, and Sahara E. Byrne, "Communicating about Ocean Health: Theoretical and Practical Considerations," *Philosophical Transactions: Biological Sciences* 371, no. 1689 (2016): 1–9, http://www.jstor.org/stable/24768638.

climate anxiety.[23] Biophilic design serves as both a personal and societal intervention, supporting individual health while protecting the ecological systems that humans depend on.

The bond between humans and the natural world can be restored through biophilic design efforts that create restorative, adaptive, and inclusive spaces. Programs such as Nature Rx prove that the integration of these principles results in physiological, psychological, and social benefits. Although contemporary lifestyles have increasingly distanced people from nature, biophilic design serves as an essential intervention to rebuild that bond. By ensuring equitable access to the healing effects of natural environments, architecture can foster resilience, sustainability, and community well-being. The built environment can then be redefined as a therapeutic and nurturing space that supports people and the planet in harmony.

Sensory Engagement

Sensory engagement deepens the relationship between people and their surroundings, transforming ordinary spaces into restorative environments that nurture emotional balance and mindfulness. Research demonstrates that multisensory interactions with nature, such as listening to water or birdsong, support the restoration of wellbeing and enhance the overall effect of nature.[24] The inherent multisensory qualities of nature, from sound and texture to movement and scent, offer a model for

[23] Ogunbode et al., "Climate Anxiety, Wellbeing and Pro-Environmental Action: Correlates of Negative Emotional Responses to Climate Change in 32 Countries."
[24] Lara S. Franco, Danielle F. Shanahan, and Richard A. Fuller, "A Review of the Benefits of Nature Experiences: More Than Meets the Eye," *International Journal of Environmental Research and Public Health* 14, no. 8 (2017), https://doi.org/10.3390/ijerph14080864.

how design can foster similar feelings of immersion and serenity. Water can be utilized as a sound buffer, especially in urban settings, because it reduces noise and enhances soundscapes. It has been found that lower decibels of water noise level are more desired; however, the sound of water itself improves psychological health regardless of the decibel level.[25] Overall, the evidence highlights that multisensory experiences with nature support mental restoration and can inspire the design of spaces that foster calm, focus, and emotional balance.

Inclusivity Through Multisensory Design

Multisensory design also plays a crucial role in making biophilic spaces inclusive and equitable. Sensory strategies not only improve mental well-being but also create more inclusive environments by compensating for limitations in access to direct nature exposure. A multisensory design ensures that users of all abilities and ages can engage meaningfully with their environment. For instance, tactile elements such as exposed textured materials allow visually impaired users to experience the qualities of the environment through touch. Other opportunities allow for beyond-site immersive experiences through auditory cues like running water or rustling leaves.[26] Similarly, scent can be incorporated through aromatic plants or natural ventilation, engaging users who may have mobility restrictions or are hearing impaired. These approaches highlight the ability of sensory design to expand access to the therapeutic

[25] Xindi Zhang et al., "Waterscapes for Promoting Mental Health in the General Population," *International Journal of Environmental Research and Public Health* 18, no. 22 (2021), https://www.proquest.com/scholarly-journals/waterscapes-promoting-mental-health-general/docview/2602077001.

[26] Levent and Pascual-Leone, *The Multisensory Museum: Cross-Disciplinary Perspectives on Touch, Sound, Smell, Memory, and Space.*

benefits of nature and create spaces that are emotionally and mentally restorative for diverse populations.

Embodied Perception and Architectural Theory

Architectural theorists have long emphasized the importance of embodied perception in shaping human-environment interactions. Pallasmaa argues that bodily participation and sensory experience are essential for memory, creativity, and the creation of meaningful spaces.[27] This highlights the interconnectedness of the hand, eye, and mind in both architectural and artistic processes. Pallasmaa's arguments encourage mindfulness within a space, fostering awareness of the senses. This allows users to experience restorative effects while forming memories that reconnect them with the natural world. Building on this, Pallasmaa explains that an overemphasis on vision can isolate users from fully experiencing a space, emphasizing that architecture should be perceived through the entire body.[28] This perspective suggests that spaces designed to stimulate multiple senses can cultivate deeper psychological benefits and mindfulness than environments that rely solely on visual cues.

Similarly, Papineau highlights that spatial perception is shaped not just by what is seen or heard.[29] The environment itself, influenced by our actions and surroundings, changes the way we experience the world. This implies that the body's active participation within a space enhances the holistic experience of the built environment. Architects can translate these ideas into design through layered sensory stimuli, such as textured pathways, flowing water, or various natural lighting, to

[27] Juhani Pallasmaa, *The Thinking Hand: Existential and Embodied Wisdom in Architecture* (Chichester, UK: Wiley, 2010).
[28] Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses*, 3rd ed. (Chichester: Wiley, 2012).
[29] David Papineau, *The Metaphysics of Sensory Experience* (Oxford: Oxford University Press, 2021).

create environments that engage users on multiple levels. This creates spaces that extend beyond visually compelling aspects into environments that create a deeper, more meaningful attachment to nature.

Interaction with the natural world stimulates creativity and curiosity, promoting exploration and a richer sensory experience. Intentionally constructing multisensory experiences that engage both the body and mind is essential to encourage active participation and creativity.[30] Hahn writes "recipes" for sensory activities that demonstrate unique narratives for each participant. The recipes are designed to produce individual emotional and cognitive responses, demonstrating that structured engagement with the senses can deepen the individual relationship that each person has with the natural world. Architecture can layer visual, auditory, and tactile stimuli, such as textured surfaces, moving water, or shifting light patterns, to produce environments that support mindfulness, relaxation, and emotional restoration. Hahn's work reinforces the concept that multisensory design is not merely decorative but a deliberate strategy to enhance well-being, encouraging users to interact fully with their surroundings and be creative within a space. Creative interaction helps users internalize experiences, forming meaningful memories connected to the space, and encouraging a sense of belonging.

Integrating Biophilic and Multisensory Design

The health benefits and healing impact of biophilic design and Nature Rx principles are amplified when applying multisensory aspects. Biophilic design begins to create meaningful interactions with nature; however, sensory engagement executes the immersive experience. The combination of biophilic and multisensory design

[30] Tomie Hahn, *Arousing Sense: Recipes for Workshopping Sensory Experience* (Urbana: University of Illinois Press, 2021).

transforms space into aesthetically pleasing, serene conditions that support mental health and social interaction.[31] The integration of visual, tactile, and fragrant elements produces an immersive experience where users can be conscious of all surroundings. Being present in the moment nurtures a shared sense of belonging, inviting natural opportunities for social interaction.

In conclusion, sensory engagement in architectural design is essential for creating therapeutic, inclusive, and restorative environments. Through the incorporation of sight, sound, touch, and smell, designers can produce spaces that go beyond aesthetic appeal to improve overall well-being. Multisensory experiences implement biophilic principles, enhance the effect of Nature Rx interventions, and provide equitable access to the benefits of nature. In a contemporary society with rapid urbanization and increased use of technology, incorporating sensory engagement into design strategies is critical for addressing mental health, fostering resilience, and cultivating deeper bonds between humans and the natural world.

Human disconnection from nature poses serious challenges to psychological, emotional, and physiological health in modern-day society. Biophilic design, reinforced by multisensory engagement, provides a strong foundation for restoring this connection. Built environments can serve as healing, inclusive, and adaptive spaces through immersive, multisensory design. By utilizing the inherent healing qualities of nature, this thesis demonstrates that reconnecting humans with nature is an essential strategy for fostering well-being.

[31] Claire Latané, "Healing with Nature," *Landscape Architecture* 99, no. 11 (2009): 28–35, http://www.jstor.org/stable/44791937.

Chapter 3: Methodologies

Research methodology serves as the foundation for translating theoretical concepts into design practice. In order to bridge the gap between research evidence and architectural application, a wide variety of methods are necessary. A subjective thesis requires multiple lenses to be investigated to provide an informed, evidence-based design. The approach to research throughout this thesis moves beyond subjective assumptions to create interventions that support psychological restoration and human-nature reconnection. Lucas mentions that qualitative research is subjective; however, it can be beneficial in humanities-based architecture. I view this challenge as an opportunity to embrace subjectivity in my design process, while using the research as a way to improve human experience through provoking emotional responses.

The research methodology sits on a spectrum from qualitative to quantitative data. It is essential to frequently switch between the two in order to determine if the quality of the space is solving the problems deriving from the quantitative data. Qualitative research helps us understand how people feel, while quantitative research explains why. The methodology also operates on a scale from analysis to application. Literature review and precedent analysis inform conceptual understanding, while site studies and the program translate these concepts into spatial strategies. This progression ensures that design proposals are grounded in established research while being responsive to specific contextual conditions and user needs.

Literature Review and Professional Consultation

Research began through the compilation of sources from peer-reviewed articles online to books found on the library shelves. As these sources were compiled, they were accompanied by a short explanation of the application to the thesis topic, as well as keywords to spark memory when reading through them. Sources were selected based on their direct relevance to three core themes: human connection to nature, biophilic design principles, and sensory engagement. A variety of disciplines were used throughout the research, including public health, psychology, science, and landscape architecture. Together, these materials establish a theoretical foundation that justifies design decisions.

Interviews with professionals were conducted to establish a real-world understanding of aspects that apply to the natural world and psychological impact. Olivia Mays, the Mental Health and Stress Management Coordinator at the University of Maryland, conducts a Mindful Moments Walking Tour and provides insight on user experience and patterns she notices from these tours. Meeting with professionals throughout the research process can help apply the thesis to real-world situations.

Precedent Analysis

Precedent Analysis was utilized to determine how projects accomplished the goals of the thesis in different ways. A variety of precedents were chosen with guidelines regarding time period and location to ensure a wide range of examples. The comparison of precedents as a part of the design process opens opportunities for design and inspiration. For instance, the Fondazione Querini Stampalia by Carlo Scarpa inspired design possibilities to incorporate water that may enter the building

and adapt to tides. The visual methodology of diagramming allows for pattern recognition across projects and facilitates the selection of specific design principles applicable to this thesis. Principles were examined, such as biophilic design, materiality, passive design, spatial orientation, sensory engagement, and user experience. Precedent analysis translates theoretical concepts into tangible spatial strategies. By examining how other designers have addressed similar challenges, this method compiles tested approaches while identifying opportunities for innovation.

Site Selection and Analysis

Site selection and analysis were conducted by comparing various sites and determining the benefits and challenges each presents. The site must support the thesis objectives while presenting opportunities for meaningful integration of biophilic and multisensory strategies. Potential sites were evaluated based on the need for intervention and connectivity for access to all users. The field study consists of a sensory map to record the existing soundscape, scents, textures, and visual qualities. Videos and photos of the sounds and visuals will allow for later reference. Behaviors of people who visit the site and interviews on why they come to the site can provide community insight. Sketches of the existing site as well as surrounding vernacular architecture can be used to inform design and massing. Synthesizing these into a document, along with wider-scale diagrams, can show a holistic view of the existing conditions and areas of opportunity. Site analysis transforms abstract design principles into context-specific strategies.

The methodological rigor outlined ensures that design proposals are not speculative but grounded in evidence about the factors that support human well-

being. This approach transforms architecture into a tool for public health, demonstrating that thoughtfully designed spaces can serve as non-clinical interventions for mental health challenges that society faces. Together, these methods create a framework that ensures the final design is both research-driven and responsive to human needs.

Chapter 4: Precedent Studies

The examination of architectural precedents is essential to this thesis because it bridges theoretical research with practical application. This demonstrates how biophilic and multisensory design principles can be successfully applied to various contexts. Chapter 2 established the scientific foundation for why humans need a connection to nature, while precedent studies reveal how architects have translated these principles into built form.

The precedents range from the year built to different countries, which represent a diverse range of approaches. They all integrate nature into the built environment, but highlight various aspects of the thesis. The Alhambra and Generalife demonstrate how symbolic and geometric interpretations of nature can create spatial sequencing to foster contemplation. Fallingwater represents architecture embedded within nature, showing how multisensory engagement can create immersive experiences that dissolve the boundaries between interior and exterior. The Mill Owners Association Building challenges typical biophilic design by demonstrating how modern materials like concrete can still foster a connection. Instead, it relies on passive environmental strategies instead of solely relying on materiality for biophilic effects. Glenstone Museum creates a therapeutic environment through water features and an architectural promenade. Lastly, the Vibes Office creates an oasis away from a dense urban environment, yet located in one, through the integration of nature, central courtyards, and dynamic facade materials. Through the

analysis of these precedents, I intend to extract design principles to build a foundation for creating a therapeutic multisensory environment.

Generalife Garden

The Generalife Garden within the Alhambra, located in Granada, Spain, demonstrates how cultural and spiritual values can be embedded into spatial design to foster contemplation. I selected this precedent for its approach to abstracted natural elements, particularly multisensory engagement beyond literal greenery. Its courtyards, gardens, fountains, and flowing water create direct experiences of nature, while elements like geometric ornamentation and materiality represent a symbolic connection.

Figure 4: *Alhambra Gardens and Courtyards.* Lions in the Piazza, updated July 27, 2025.

The garden itself is symmetrical, which creates harmony in the courtyard. The courtyard is an oasis that creates space for meditative contemplation. The geometry of the walkways and vegetation creates clarity and order. The surrounding building is asymmetrical, one side consisting of a colonnade that intentionally frames views of the lower-lying city. The enclosure provides a sense of protection and safety for reflection, while the framed views create a visual connection to the landscape. Water features function as the primary sensory element through ponds and fountains. The pond reflects the surrounding architecture, while the gentle sound of flowing water enhances the calming effect of the reflective space. The constant flowing masks any outside noise and provides meditative focus. The Generalife Gardens show that the therapeutic nature connection does not have to rely exclusively on plants. The abstraction and symbolism of natural patterns can produce positive psychological effects. Water emerges as the most versatile biophilic element because of its geometric shape, acoustics, and visual impact.

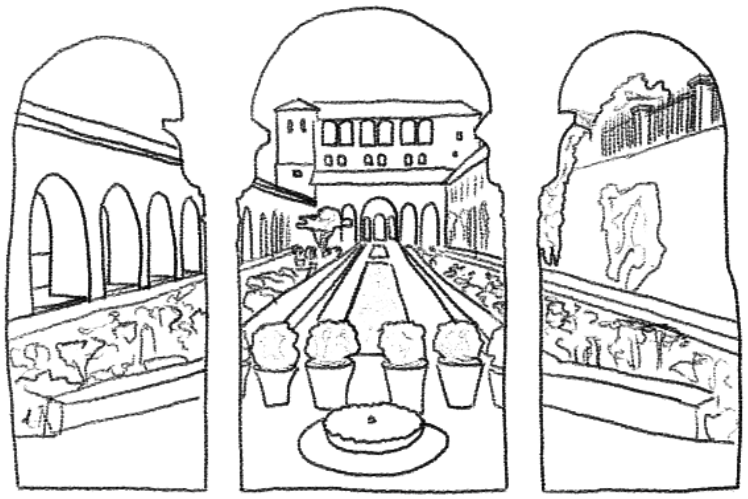

Figure 5: Framed Views by the author.

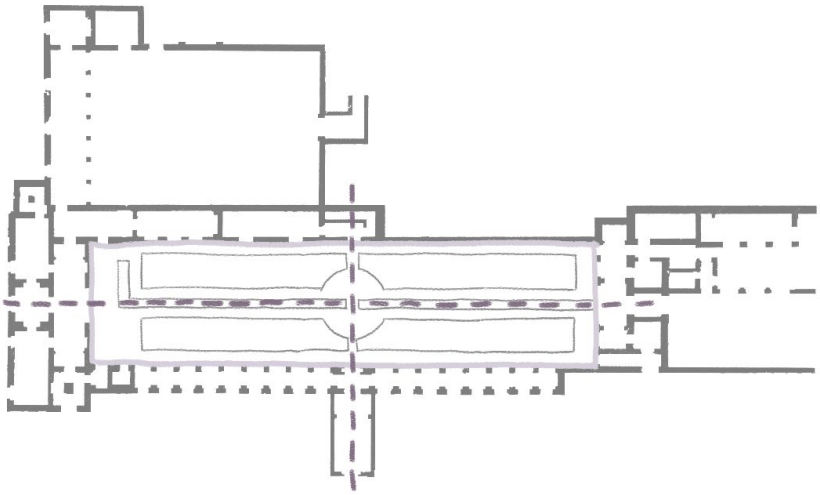

Figure 6: Symmetry by the author.

Fallingwater

Fallingwater represents architecture embedded within nature, where the building and landscape achieve integration and harmony. Positioned directly above Bear Run waterfall, the house is immersed in the continuous movement and sound of the rushing water. The building itself is embedded into a rocky hillside, and then the floor plates extrude outward, extending over the water. The plan revolves around a central fireplace where an original stone is incorporated into the building, blurring where nature ends and architecture begins.

Figure 7: *Fallingwater House.* ArchDaily (2010).

Materiality is rich throughout the house, but is deeply rooted in the native stone that creates a tactile experience. The hearth of the building is the fireplace that anchors the horizontal floor plates and is made from local stone. The horizontal windows that eliminate traditional corners also blur the lines between interior and exterior, as they provide panoramic views of the surrounding forest. These windows allow for dynamic lighting as the sun moves through the canopy of trees.

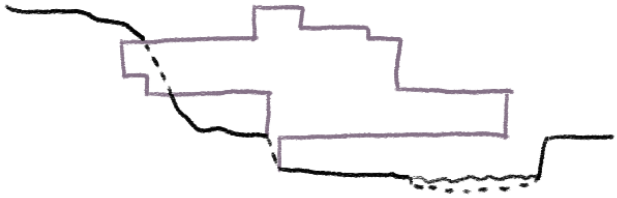

Figure 8: Embedded Form by the author.

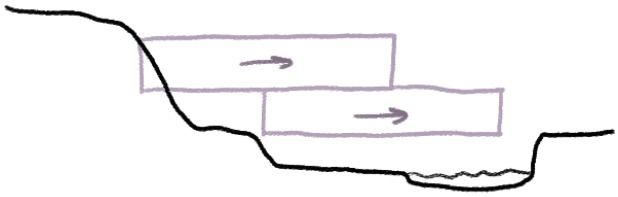

Figure 9: Extruded Form by the author.

The house sits on Bear Run, which radiates a dynamic sound through the building, creating an immersive atmosphere and provoking calming reflection. Stairs descend from the living room down to the water, which intensifies the auditory

experience and transforms the sound from background noise to a stronger encounter with nature. This proves that auditory experiences can be just as powerful as a visual connection to nature when creating therapeutic environments. Finally, the low, compressed interior ceilings paired with the long, horizontal floor plates create a gentle pressure that directs movement outward. This makes stepping into the surrounding landscape feel even more expansive and liberating by contrast.

Figure 10: Materiality of Fireplace by the author.

Fondazione Querini Stampalia

Fondazione Querini Stampalia reveals how architecture can transform water from a destructive force into a place that incorporates it in the design. It offers an essential lesson in designing for adaptive, resilient environments while maintaining the healing qualities of nature. Carlo Scarpa greets the Rio Querini, a small canal, on the ground floor of the building during higher tides through a porous facade. He incorporates water into the building because he was commissioned to renovate it after a series of floods and to anticipate more flooding.

Figure 11: *Palazzo Querini Stampalia details. Metalocus* (2016).

Scarpa creates a small footbridge to enter the ground floor of the building, which is slightly lower than the platform people enter from. He challenges the very notion of ground solidity, suggesting that Venice is either anchored in the mud below or seemingly suspended above it. Rather than fighting against water, it is embraced through water channels that allow intake of the tides. When the water recedes, the lack of water leaves a presence because there is no defined boundary for the water levels, leaving visitors with no assurance of where the water will rise.

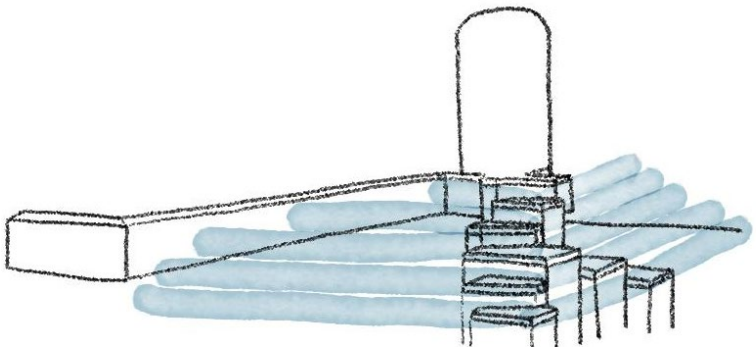

Figure 12: Water Levels by the author.

The water garden creates a sensory experience through reflecting pools that allow water to fill them up and flow through the channels. The garden embraces rainfall as the source of water, which still does not define the limit of the reflective pools. As the water fills the empty spaces, it moves through them, creating a dynamic experience that can be both a visual and an auditory experience. Furthermore, the garden creates a reflection space away from the typical streets of Venice, which acts as an oasis. Scarpa redefines how water will affect the architecture by embracing it rather than fighting it.

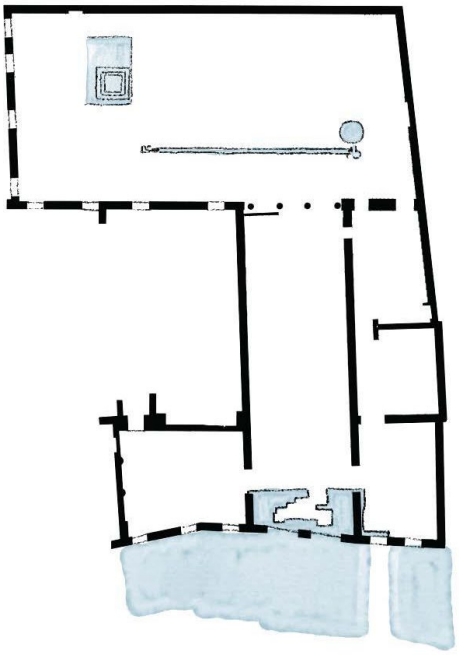

Figure 13: Water in Plan by the author.

The Glenstone Museum

The Glenstone Museum represents a contemporary approach to embedding architecture within a natural landscape while creating specifically designed spaces of contemplation. Located in suburban Maryland, Glenstone demonstrates how therapeutic environments can be created outside traditional urban or wilderness contexts through journey, water, and threshold dissolution. The site includes a winding promenade through various art exhibits, including outdoor statues and a main gallery building where the galleries are scattered as rooms connected by a central water court. The galleries act as pavilions and are embedded into the topography, appearing to emerge from the hillside. Each pavilion feels like a discovery along a path rather than an object imposed on nature.

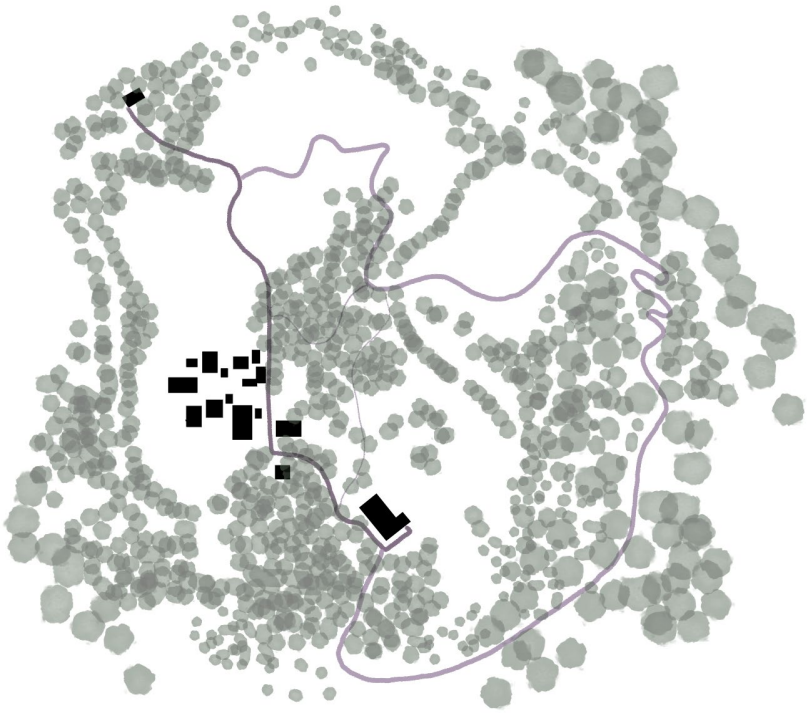

Figure 14: Site Plan by the author.

The water court consists of a central reflecting pool with native plants and functions as the heart of the building. The court is enclosed by glass panels, which blend the experiences of indoors and outdoors. This courtyard creates a shell and core, where the exterior walls are stereotomic and made of stone, and the interior walls are transparent and made of glass. The glass panels create the illusion that there is no boundary between the main corridor and the water court. The illusion is created down to the detail, allowing the glass to be pulled away from the floor, as if the ground continues into the exterior space.

Figure 15: *The New Glenstone.* ArchDaily (2018).

The shell is broken in selective spaces, creating a viewing point out to the landscape. One of which is a reflective space where viewers are encouraged to sit and observe. Galleries must use specific lighting fixtures; therefore, there are fewer windows and more diffused lighting from the ceiling. Glenstone blends the boundary between the natural landscape and the built environment, creating a visually stimulating environment. The atmosphere creates a calm space for contemplation and immersion into nature.

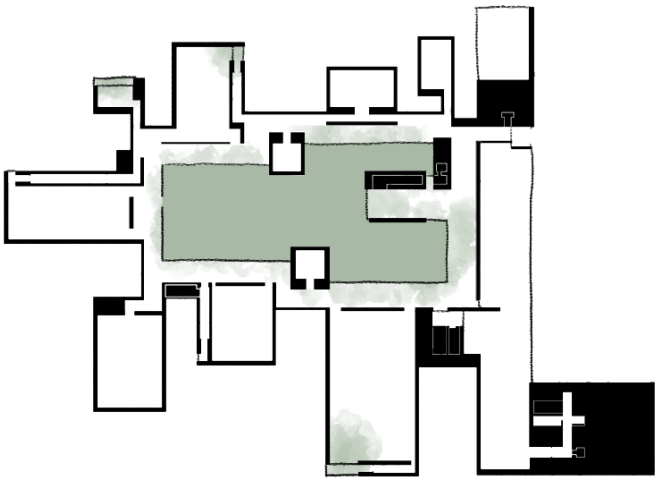

Figure 16: Dissolving Boundaries by the author.

The Vibes Office

The Vibes Office addresses creating restorative environments within dense, polluted urban contexts where access to nature is limited. Located in An Phu, Vietnam, this project demonstrates how biophilic interventions can serve as therapeutic counterpoints to environmental degradation through central courtyards, promenade, and dynamic facade materiality.

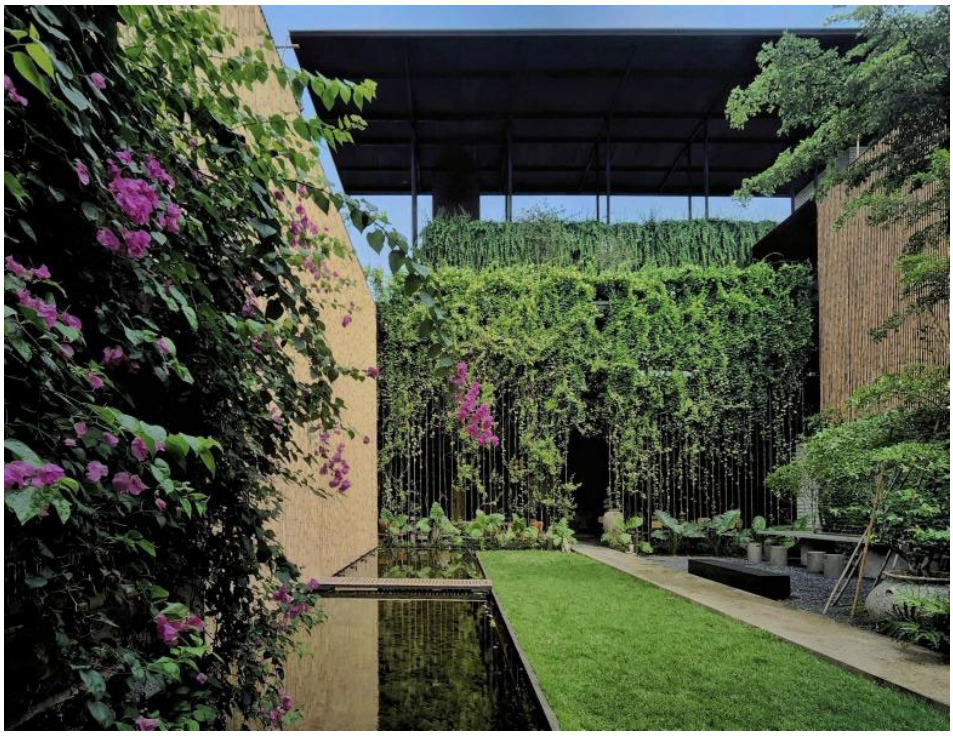

Figure 17: *The Vibes Co-Space.* World-Architects (2024).

The plan organizes around a central courtyard that guides people away from the urban context along a long promenade and into the serene environment. The promenade is intentionally made to be longer, which allows users to decompress from the busy city and allows time for stress levels to decrease before entering the building. This central courtyard creates views for every workspace to have a direct connection to nature, which ensures mental health benefits for the employees. The courtyard features a continuous vertical greenery extending from ground to roof, maximizing vegetation within a limited site area.

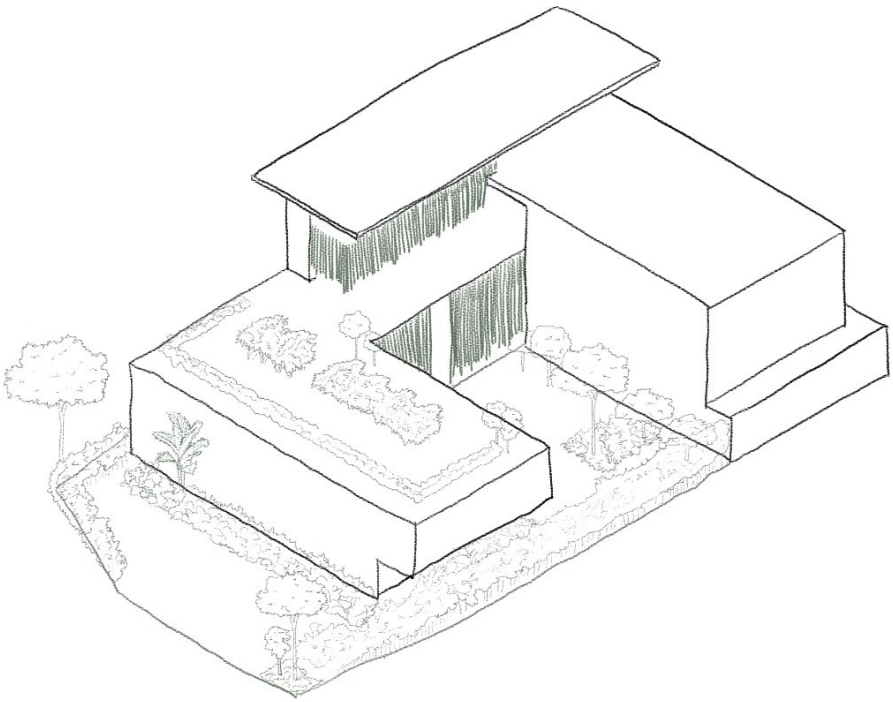

Figure 18: Vegetation by the author.

Figure 19: Courtyard in Plan by the author.

The facade strategy also employs bamboo screening, serving multiple functions. The office includes sustainable strategies by using bamboo because it is a regional material that is an invasive species. The bamboo filters the sunlight into

diffused lighting, as well as a passive strategy for cooling in warmer seasons. The bamboo can be activated by the wind, initiating a dynamic, swaying facade.

Figure 20: Facade Detail by the author.

The Vibes Office proves dense urban sites can achieve a biophilic experience through vertical organization and central courtyards. The project demonstrates the therapeutic value of thresholds; an extended entry sequence creates psychological separation even when physical distance is minimal. The utilization of an invasive, regional plant reveals that biophilic design can address multiple needs simultaneously through a single material choice. Overall, the office addresses the mental health needs of the occupants of the building and successfully creates a healing space.

These precedents reveal principles that are both universal principles and context-specific strategies for creating therapeutic environments through biophilic and multisensory design. Water appears as one of the most versatile biophilic elements across all precedents, providing visual, acoustic, and calming benefits. My

thesis site prioritizes water and intends to incorporate it as a design element, rather than restricting it. Thresholds and transitions prove to be just as important as the built environment, carefully considering the approach to the site. One of the benefits of my chosen site is the long promenade that leads to the destination, where the threshold of vegetation then opens up to panoramic views of the bay. The precedents emphasize context-specific strategies that consider density, climate, and cultural context. My thesis can incorporate passive strategies that respond to the winds, solar path, and overall climate of the site. Furthermore, I can include invasive plants that surround my site, such as Phragmites australis, as a building material for sustainable practices, similar to the bamboo facade of the Vibes Office. These precedents demonstrate that biophilic design is not a single approach but a framework adaptable to diverse contexts, programs, and user needs. My thesis will be informed by the contribution of new strategies for creating therapeutic environments that restore human connection to nature while supporting mental well-being, resilience, and community.

Chapter 5: Zones and the Program

Overview

This thesis proposes a museum and creative hub that reconnects people with nature through biophilic and multisensory design strategies. The facility serves as a therapeutic destination where visitors can engage with the central park vegetation and the vibrant murals of NoMa. This space intends to support mental well-being as an amenity for the nearby community. Research demonstrates how human interaction with natural environments positively impacts mental health. The combination of a natural space in a dense urban setting with NoMa's public works gives the city an anchor that strengthens the community connection and identity.

The Museum

Two buildings make up the site: The Museum and The Creative Hub. The museum is a place that creates an anchor for the city of NoMa by showcasing art that represents the identity of the community. The building consists of a ground-floor cafe and bookstore. The retail ground floor allows the building to blend in with the surrounding building uses, as the majority of them are mixed-use with retail ground floor elements, as well. The upper floors of the museum are gallery spaces that host the archived murals of NoMa. Murals are an essential part of NoMa, and having a showcase to allow for the murals to live on will enrich the community and enhance the feeling of belonging. According to Pallasmaa, an excessive focus on sight can

detach users from a space's full experiential depth, making multisensory engagement essential.[32] The isolation of vision within a gallery space will allow users to fully experience the rest of the site.

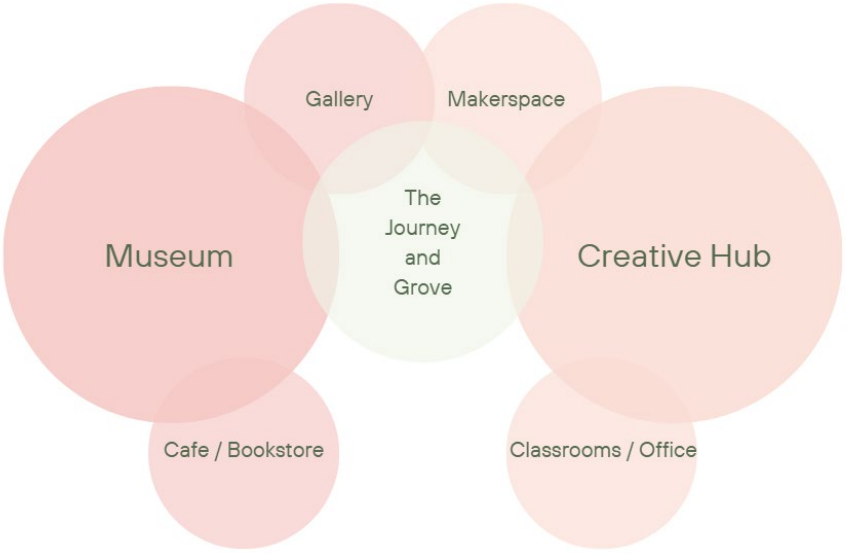

Figure 21: Program Diagram by the author.

The Journey and Grove

The central green space between the two buildings serves as the Journey that leads to the Grove and eventually back out to the urban environment. This program is meant to engage users with their senses and direct contact with nature. Various areas are zones, which are represented through vegetation height and materiality of the path. Straying from the linear path are organic pathways that bring users through the Journey, starting with the reflective pool. The next zone is the auditory garden with

[32] Pallasmaa, *The Eyes of the Skin: Architecture and the Senses.*

plants at waist height. Finally, the conifer grove was created as an enclosed outdoor room through the canopy of the trees. Together, these zones demonstrate that thoughtfully designed spaces incorporating biophilic and multisensory strategies can restore the essential human connection to nature, fostering mental well-being, resilience, and inclusivity. Pallasmaa argues that embodied engagement and multisensory experience are fundamental to memory, creativity, and the formation of meaningful spaces.[33] Although these areas will inherently provide visual framing elements, they invite visitors to slow down, listen, and feel the environment. The Journey fosters stronger place attachment and lasting sensory memories that cannot be achieved through visual framing alone.

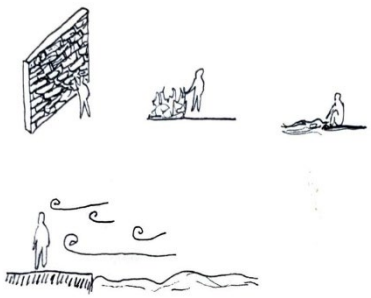

Figure 22: Tactile experiences by the author.

The Creative Hub

The Creative Hub supports the Museum by offering a learning space for the community. The building consists of a makerspace for local artists of all kinds. This keeps the process local and accessible for people who struggle to find space for their

[33] Pallasmaa, *The Thinking Hand: Existential and Embodied Wisdom in Architecture.*

unique art types. Classrooms are located on the second floor so that the community can have hands-on experiences led by local artists and teachers. Although it is important for all age groups to gain knowledge, Louv's Nature-Deficit Disorder encourages exposure to nature at a young age to avoid nature deprivation.[34] Engagement through senses can facilitate more intimate learning experiences, allowing classrooms to be more dynamic than an exhibition. Finally, the NoMA Business Improvement District (BID), a non-profit organization in charge of the public art and murals, will be hosted on the upper two floors of offices. This building is intended to draw the community in to participate. It serves as an intervention to prescribe the community with programs like NatureRx. The program helps society learn and engage with nature to receive the natural benefits, like reducing stress, improving focus, and enhancing mood.[35]

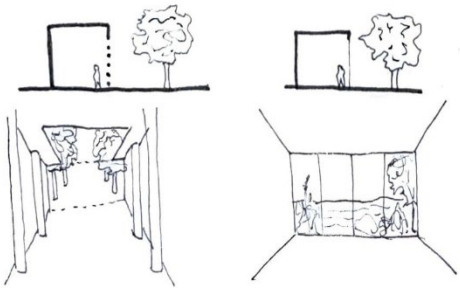

Figure 23: Blur interior to exterior by the author.

The precedents chosen for this thesis informed the program and successfully integrated biophilic and multisensory design principles. Glenstone Museum heavily influenced the gallery and central green space. The Vibes Office intentionally makes the entrance to the building long to decompress visitors before entering. As little as

[34] Louv, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder.*
[35] Rakow and Eells, *Nature Rx: Improving College-Student Mental Health*.

10 minutes in nature can produce noticeable improvements, while longer exposure accumulates greater benefits. Immersive reflection spaces, like the sounds and tactile gardens, create sensory-focused environments integrating water, light, and vegetation specifically for contemplation. These are inspired by Fallingwater's multisensory approach, specifically the intent of gathering around the fireplace and the stairs that lead down to the water. The Fondazione Querini Stampalia's reflective water garden contributed to the creation of the reflective pool, which leads to the stepping water aspect that is more urban-facing. Finally, each of these precedents included various biophilic elements, all blurring the boundary between interior and exterior spaces.

Chapter 6: Site Selection and Analysis

North of Massachusetts Avenue (NoMa) in Washington, D.C. is an up-and-coming city that has been rapidly developed in the past few years. Characterized by its high-rise buildings, it presents a dense, urban site that isolates people from nature. The thesis site, an existing public parking lot made of asphalt paving and enclosed by a gate, sits along a highly utilized corridor on the corner of First and L Street.

Site Investigation

My site investigation included walking the site, the surrounding areas, and observing how people interacted with the area. Users came to the site with the intention of utilizing it for its existing purpose of a public parking lot. Due to the existing gates, there is a lack of variety of uses within the site. I met with the non-profit organization, NoMa BID, which organizes all events held in the city. They believed the site selection was beneficial due to its connectivity and central location. After presenting my initial idea of a museum for the program, the employees provided me with ideas regarding space for local artists due to the current lack of space for various kinds of art. I was then inspired to include office space for the NoMa BID employees, since they are in charge of many events, so the building would represent them being at the heart of the city.

Site Analysis

The site is connected with the rest of Washington, D.C. through various modes of transportation. Major streets create large nodes within the area. The NoMa metro stop is located only one block away from the thesis site. NoMa lacks green space in the city, including only one major park, the Alethia Tanner Park, located North of the site. Surrounding buildings are a majority of mixed-use buildings with retail ground floors and a few government buildings.

Figure 24: Site analysis diagrams by the author.

The existing parking lot at the intersection of 1st and L Street was selected for its location within a dense high-rise district where access to nature is limited and often fragmented. Surrounded by hard urban edges and isolated green gestures, the site presents an opportunity to reintroduce meaningful connections to nature within the everyday city experience.

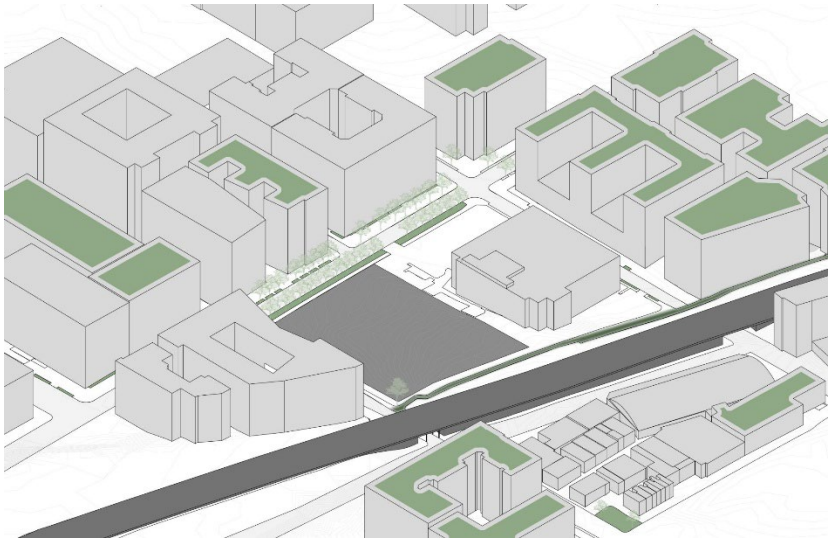

Figure 25: Urban vs. Nature by the author.

The high-rise buildings present a street facade that is then broken at the thesis site. The building heights step down from recent developments to long-term rowhomes. The metro line creates a boundary on the edge of the site.

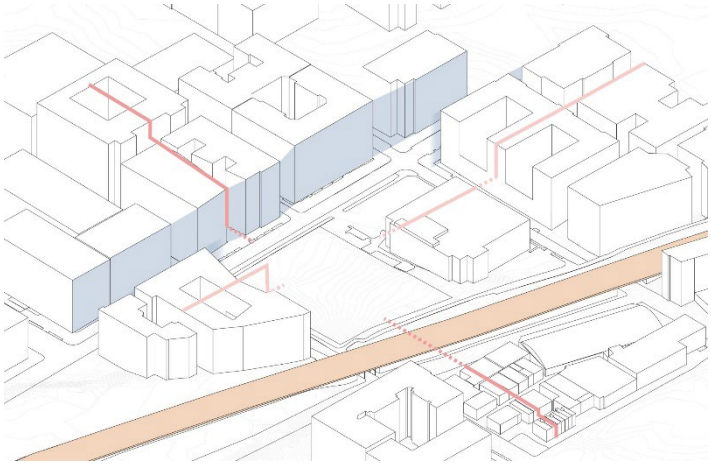

Figure 26: Physical Connection by the author.

A void is created along the street facade, which then breaks the typical grid of the urban fabric to create a small plaza across from the site. Users are visually connected to the metropolitan branch trail, which acts as an axis to the park. The site itself sits on the corner, creating unobstructed views from several points.

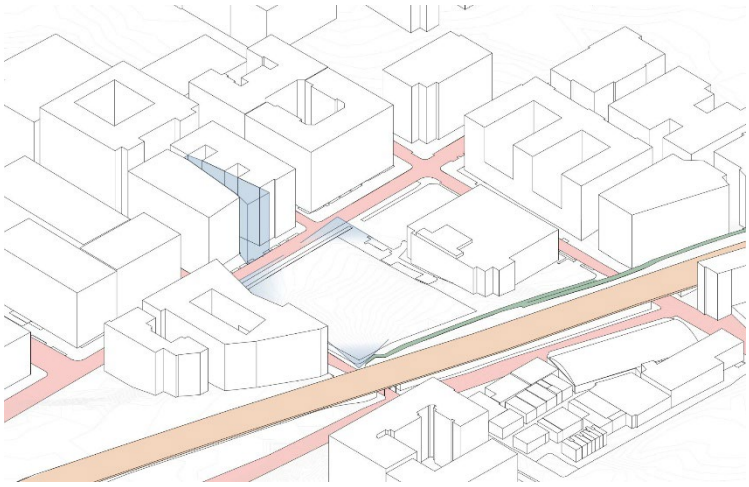

Figure 27: Visual Connection by the author.

First Street is a more prominent road in NoMa, allowing for vehicles, bikes, and pedestrians along the axis. A primary node sits along 1st Street, where most people gather nearby. Additionally, the metro radiates sounds when it passes by, all creating intense energy bordering the site.

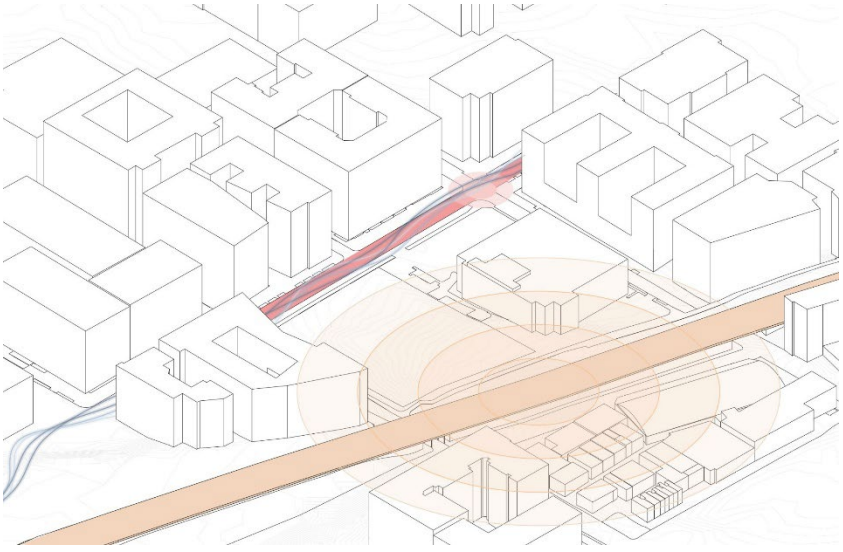

Figure 28: Energy by the author.

NoMa lacks a true civic anchor within the city; however, it has developed a strong cultural identity through public art and murals. The NoMa Business Improvement District hosts the NoMa in Color Festival, where artists from across the

DMV create murals along the walls adjacent to Alethia Tanner Park. Unfortunately, the city lacks walls for these murals to be painted on, so they must be painted over every two years. Hence, the need to revitalize the artistic identity and provide the museum to host the lost murals of NoMa. The murals at Alethia Tanner Park are positioned along the Metropolitan Branch Trail, which terminates at a staircase directly connected to the thesis site. This relationship establishes both a visual and symbolic connection between the site and the newest murals on display, allowing the project to extend the experience of the trail into the architecture itself. The murals at Alethia Tanner Park are positioned along the Metropolitan Branch Trail, which terminates at a staircase directly connected to the thesis site. This relationship establishes both a visual and symbolic connection between the site and the newest murals on display, allowing the project to extend the experience of the trail into the architecture itself.

Figure 29: Mural Analysis by the author.

Chapter 7: Conceptual Testing of the Thesis

To fully immerse people in nature, there are two opposites that balance each other: the urban fabric and the organic landscape that begins to influence design within the buildings. The design intention for this building is to provide a space where people can reconnect with nature and escape the fast-paced city lifestyle, establishing a balance between the two.

Precedent Influence

The precedent studies directly inform the project's spatial organization, massing, and integration of landscape. Research into museums, therapeutic landscapes, and biophilic architecture demonstrates the importance of experiential sequencing, sensory engagement, and building relationships to nature. The precedent analysis contributed to a library of biophilic design strategies that successfully integrate natural analogues and spatial qualities into the building form. Lessons from these precedents contribute to the development of gallery spaces that encourage reflection and moments of pause while maintaining strong visual connections to the surrounding landscape.

Specific elements from the precedents include framed views, which are portrayed through windows, and the inclusion of balconies. The central water element and journey through nature were inspired by the water court of Glenstone. The office

building in Vietnam provided vegetative screens for passive design, which were included in shading devices for the South side of the Museum. Finally, Carlo Scarpa strategically integrates water throughout the building, which led to the inclusion of a waterfall in the center of the Museum building. These precedents reinforce the thesis objective of creating an architecture that not only preserves art but also actively supports artistic production and community engagement in a way that still connects people back to nature.

Site Response

It is essential to weave design into the existing urban fabric; however, NoMa has a stark difference between large, high-rise, new development and the existing row homes that border the city. To bridge the gap between new and old buildings, the height of the buildings on the site steps down, with the largest height completing the street facade along First Street. An infill building was placed along the street, intended to be a mixed-use residential building with a retail ground floor. The museum building, located on the northern part of the site, breaks from the existing urban grid and is rotated to align parallel to the axis of the Metro line. This shift in orientation establishes a sense of hierarchy within the site while creating oblique views upon entry, guiding visitors visually and spatially toward the museum. The Creative Hub fits back into the urban fabric and aligns with both the infill building and L Street.

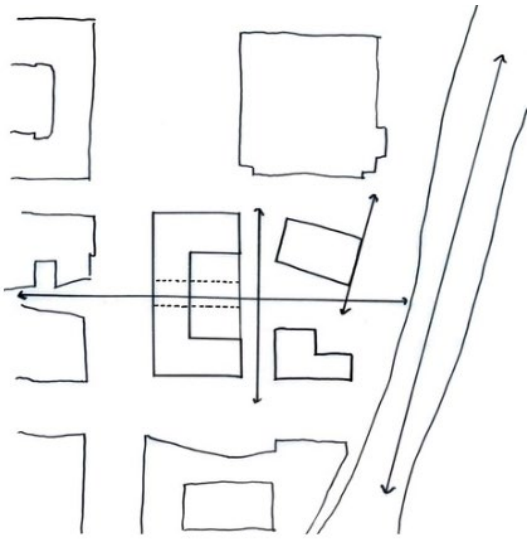

Figure 30: Site Response by the author.

Design Iterations

After various massing studies, it became evident that organizing the program into two buildings separated by a central green space responded most effectively to the thesis goals and site conditions. The open space between the buildings creates a shared public landscape that strengthens the human connection to nature while establishing a transitional gathering space within the dense urban context.

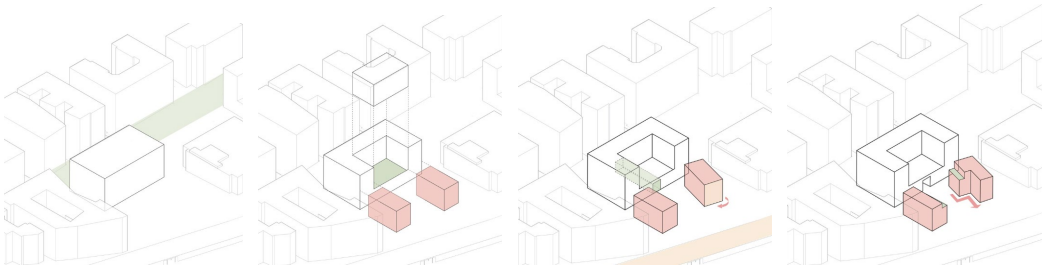

Figure 31: Evolution of massing by the author.

Tectonic vs. Stereotomic

The buildings each display stereotomic forms framing the urban edges. In contrast, the site facing inward displays tectonic elements through a change of materiality on the pergolas and open facades. The stereotomic elements create a grounding experience and sense of enclosure from the surrounding urban fabric. The materiality of the rough limestone cladding complements the surrounding concrete through an elevated and refined representation, while providing tactile engagement.

Within the interior and balcony spaces, tectonic elements create a lighter and more permeable atmosphere. The wooden pergolas reinterpret the vertical rhythm of tree trunks, filtering light and framing views toward the landscape while maintaining visual connections back to the city. This contrast between heavy and light, enclosed and open, reinforces the thesis goal of blending the built environment with nature.

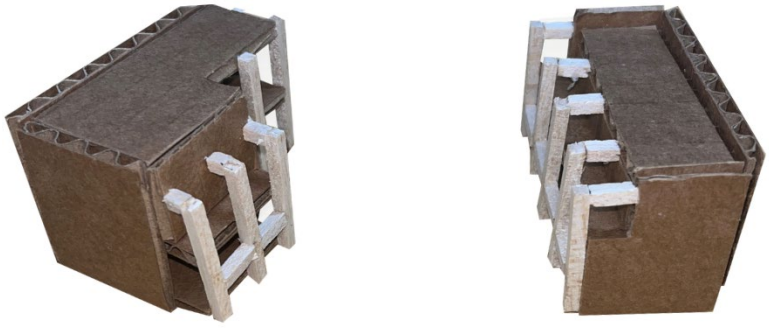

Figure 32: Study Model by the author.

The Senses

Moving across the water along the boardwalk, visitors encounter two fountains designed to isolate sound for users crossing the bridge. The gentle trickling

of water creates a calming auditory experience that helps reduce stress and anxiety as users continue along the journey.

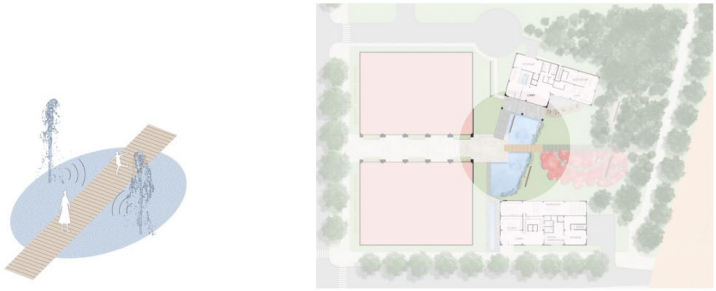

Figure 33: Auditory by the author.

Within the tactile garden, plant selections encourage visitors to engage physically with the landscape from soft grasses to velvety foliage. Secondary sensory experiences emerge through the crunching of gravel beneath one's feet, reinforcing awareness of movement through the space.

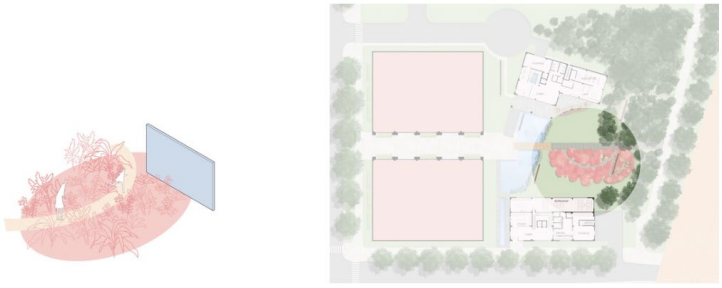

Figure 34: Tactile Garden by the author.

In the Conifer Grove, the fragrance of pine surrounds users, creating an immersive sensory room defined by a variety of evergreen species to explore. Differences in height, form, texture, and color provide additional layers of visual and tactile engagement, enriching the overall experience.

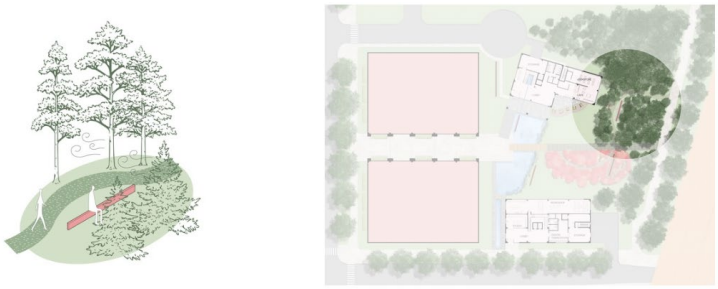

Figure 35: Conifer Grove by the author.

The herb garden is strategically placed along the edge of the outdoor seating area that supports the first floor cafe. This relationship allows the cafe to incorporate fresh ingredients grown directly outside the building, strengthening the connection between architecture, landscape, and sensory experience.

Figure 36: Taste by the author.

Plant Selection

Vegetation functions as a natural boundary throughout the site, creating outdoor rooms that define distinct spatial experiences within the landscape. This thesis explored a variety of plant species in order to establish zones, as well as support sensory conditions that strengthen the first-hand connection to nature.

Figure 37: Heights of vegetation by the author.

Ground cover plants are used to reinforce circulation throughout the site, guiding visitors along the primary pathway toward the museum building. The planting strategy strengthens wayfinding, then begins to transition into organic paths that stem from the primary axis of circulation through the site.

As visitors move away from the central axis, the vegetation begins to sprawl outward, encouraging movement through the various textured pathways. These less rigid circulation patterns invite users to slow down and engage more deeply with the surrounding sensory experiences.

Dense trees planted along the metro line create a natural sound buffer that helps reduce noise radiating from the Metro. This vegetated edge improves the

comfort of the site while reinforcing the sense of retreat from the intensity of the city.

Figure 38: Types of vegetation by the author.

Design

The form of the building responds to the needs of the urban fabric in order to strategically provide an intervention without disrupting the city's identity.

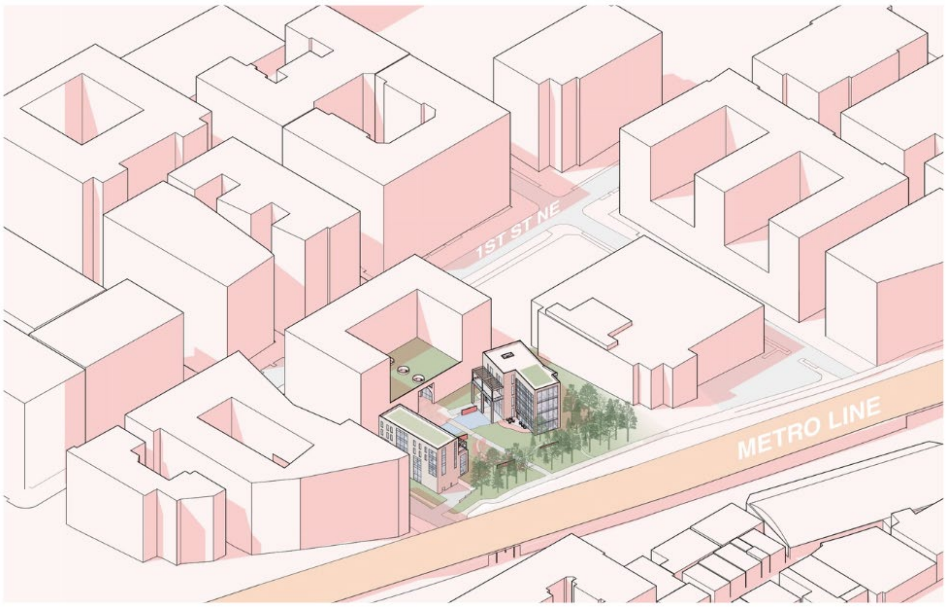

Figure 39: Axon by the author.

This thesis creates a sequence of spaces along a journey throughout the site and buildings. The landscape zones lead visitors through a variety of sensory

experiences that continue within the architecture, reinforcing the thesis through a continuous relationship between nature, movement, and the built environment.

Figure 40: Ground floor plan by the author.

The sequence begins with a transition from the urban streetscape through a portal into a vegetated oasis. Upon entry, visitors are immediately met with glimpses of dense vegetation and surrounding murals.

Figure 41: Arrival path by the author.

The museum building becomes the dominant visual element within the site through the display of murals, which are intentionally concentrated in the building with only selective instances extending into the landscape.

Within the building, the vertical circulation core creates a multisensory zone centered around a waterfall feature. The movement of water introduces the sound of trickling water within the building. Dynamic shadows are created when the skylight allows the sun to shine through the water. As users ascend through the space, they feel a cooling effect that the water has on the surrounding areas. The waterfall initiates a sensory sequence that continues throughout the remainder of the site and architectural experience.

Figure 42: Section perspective by the author.

The water moves through the site, providing a reflective space closest to the building, the auditory experience along the bridge, and then it flows away from the building, trickling down the topography. The water begins to pick up a slight speed, which symbolically represents the increased pace of the urban lifestyle.

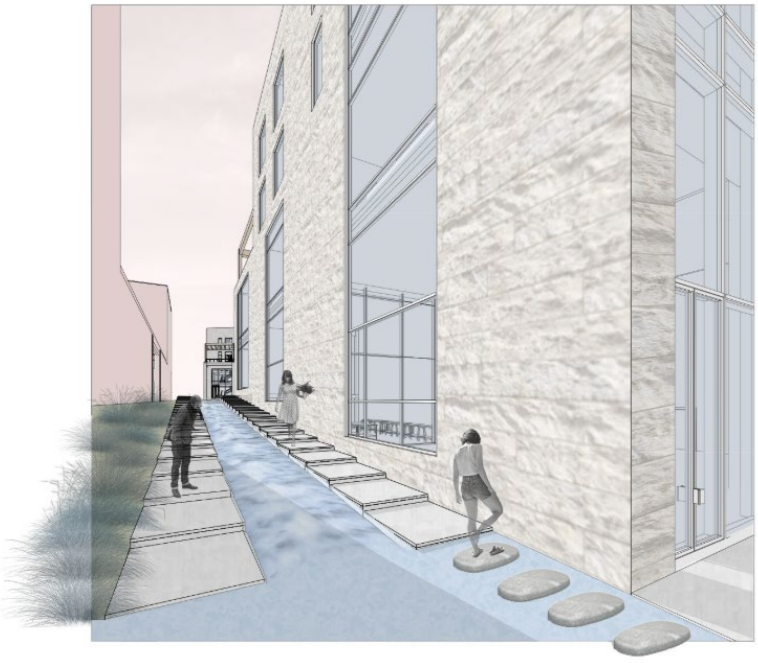

Figure 43: Water traverse by the author.

The gallery space occupies the upper floors of the museum, creating opportunities for reflection and more contemplative movement through the building. An extended architectural point follows the rhythm of the surrounding urban grid, while framing views back toward nature, reminding users of the site's broader ecological context as they move through the museum experience.

The Creative Hub building hosts maker space rooms to support the local artists. The creative space has large amounts of glazing to showcase their hands-on work to the visitors of the site. Furthermore, they are provided with direct views of nature in the central space. Classroom spaces allow for opportunities to engage the public in learning, while the office areas house the nonprofit organization responsible for the site's programming. This organization can then activate the site through events, workshops, and community initiatives.

Figure 44: Floor plans by the author.

From the office balcony, views extend across the site, visually linking the creative hub, the museum, and the surrounding landscape. The cityscape sits in the background, linking users to the sense of place within NoMa.

Figure 45: Terrace overlook by the author.

Figure 46: View from trail by the author.

Chapter 8: Conclusion

Conclusion

This thesis demonstrates that architecture can operate as a mediator between dynamic urbanization and the human need for connection to nature. The project responds to the conditions of the surrounding buildings, as well as the topography within the site. The thesis aims to create a seamless transition from the dense city, to a vegetated oasis, back to the Metropolitan Branch Trail alongside the Metro. The project responds directly to the challenges of contemporary urban life by reintroducing nature as an immersive and experiential system rather than isolated or distant gestures.

Through the integration of biophilic principles and multisensory design strategies, the project establishes a continuous sequence of spaces that begins at the urban edge and unfolds into layered ecological and architectural experiences. The journey through the site holds rich experiences that guide users through shifting conditions of sound, texture, light, thresholds, smell, and taste. Together these experiences are a part of a larger narrative that reimagines the built and natural environments as a unified system.

Various design approaches were discussed during the critique of the final defense. Suggestions of more plant interventions, as well as the repositioning of the buildings were proposed to block the view of the metro completely. The change in

orientation of the buildings would diffuse the connection between First Street and the Metropolitan Branch Trail, which leads back to the murals on display. Multiple iterations would have to be further explored in order to address these new proposals to the design.

Rather than separating the built and natural environments, this thesis proposes an urban condition where the two exist in continuity, allowing architecture to become a bridge that reconnects humans with nature.

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