

ABSTRACT

Title of Thesis:

THE VELVÆRE:
RE-IMAGINING HEALTH &
WELLNESS WITHIN POST-INDUSTRIAL
URBAN INFRASTRUCTURE

Collin Haslup, Mater of Architecture, 2020

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A health-conscious mindset is imperative to effectively promote a sustainable healthy living lifestyle. We must continuously engage and evolve our “velvære” to enhance our overall quality of life and emulate the true meaning of human prosperity. Velvære is a term of Danish origin that means “well-being”. Through an investigation and critique of current architectural practices, this thesis fosters an opportunity for individuals to achieve a healthier living lifestyle. By exploring the opportunity to expose outdated urban industrial infrastructure that has harmed the health of our environment and people could be reversed to promote a holistic balance of well-being for our everyday lives. Obtaining a holistic balance of physical activity, nutritional value, social interaction, education, and psychological growth, will directly impact and benefit our health, comfort, and happiness. Using innovative approaches of architectural planning and sustainable design, the Velvære will manifest a new form of post-industrial urbanism and redefine the essence of accomplishing pinnacle human well-being.

THE VELVÆRE: RE-IMAGINING HEALTH & WELLNESS WITHIN POST-
INDUSTRIAL URBAN INFRASTRUCTURE

by

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List of Abbreviations

ACSM: American College of Sports Medicine

AMSA: American Medical Student Association

BRFFSS: Behavioral Risk Factor Surveillance System

CDC: Center for Disease Control and Prevention

EIA: Energy Information Administration

FEMA: Federal Emergency Management Agency

GIS: Geographic Information System

GWI: Global Wellness Institute

GCSU: Georgia College and State University

GSF: Gross Square Feet

HWB: Human Well-Being

ILFI: International Living Future Institute

IWBI: International WELL Building Institute

LBC: Living Building Challenge

LEED: Leadership in Energy and Environmental Design

LEED GA: Green Associate

LEED AP: Accredited Professional

LEED AP BD+C: Building Design + Construction

LEED AP O+M: Operations + Maintenance

LEED AP ID+C: Interior Design + Construction

LEED AP ND: Neighborhood Development

NHANES: National Health and Nutrition Examination Survey

NOAA: National Oceanic and Atmospheric Administration

NPS: National Park Service

PRGS: Potomac River Generating Station

SF: Square Feet

USGBC: United States Green Building Council

UST: Underground Storage Tank

WHO: World Health Organization

Introduction

Overview

Our human well-being (HWB) is a fundamental concept of our everyday life. It encompasses a multitude of interpretations with numerous amounts of synonymous connotations to describe its meaning, yet there is no singular universal definition. For an individual to live a healthy lifestyle, one must grasp this understanding to successfully develop their best sense of well-being in a manner that is most beneficial to their own selves.

HWB is the essential focus of which this thesis addresses. Architecture that responds to both well-being and sustainability as of recent, has been analyzed and researched before, but has seen an unfavorable trend of designing to meet basic standards of occupant health for the collective, rather than the individual. Additionally, sustainability techniques which are implemented in the built environment are commonly disregarding human health and only accommodate the needs of our natural environment.

This thesis aims to challenge not only this current inclination of sustainable design, but to also critique the current healthy community living lifestyles we see today. By creating a new communal building typology in a heavily populated urban context, a populace at large can learn to engage in different aspects of healthier life decisions to ultimately promote and enhance the best possible individual satisfaction of human well-being

Chapter 1: Interpreting Our “Well-Being”

Defining Our Well-Being

Misinterpretations

It is not uncommon in today’s society to subconsciously misinterpret the true essence of our own definition of “well-being”. After all, how can one fully comprehend this subjective term and understand how it inherently exists within each and every individual yet in its own unique way, without knowing its historical significance? It is essential for us to understand how to not simply identify the meaning of well-being to merely define itself by the state of being healthy. Every individual characterizes health differently, therefore, our well-being should be too. Within this thesis, the interpretation of our well-being and overall quality of life will delve into a much deeper intuition beyond the surface of suitable conditions of human health. By exploring the evolutions of our societal perceptions and beliefs of health and well-being over time, it will assist to decipher categorizations and the multitude of existing interpretations of well-being.

The Center for Disease Control and Prevention (CDC) defines well-being as “the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), satisfaction with life, fulfillment and positive functioning.”¹ Focusing more so on the level of psychological

¹ “Well-Being Concepts | HRQOL | CDC.” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Accessed October 19, 2019.
<https://www.cdc.gov/hrqol/wellbeing.htm>.

awareness of well-being, this establishes a key way of thinking about this subject in one of many ways to be covered throughout this thesis. With that being said, the investigations that dissect the true meaning of our well-being and learning what it means to achieve the pinnacle condition of such, must first be discovered from our past exemplars.

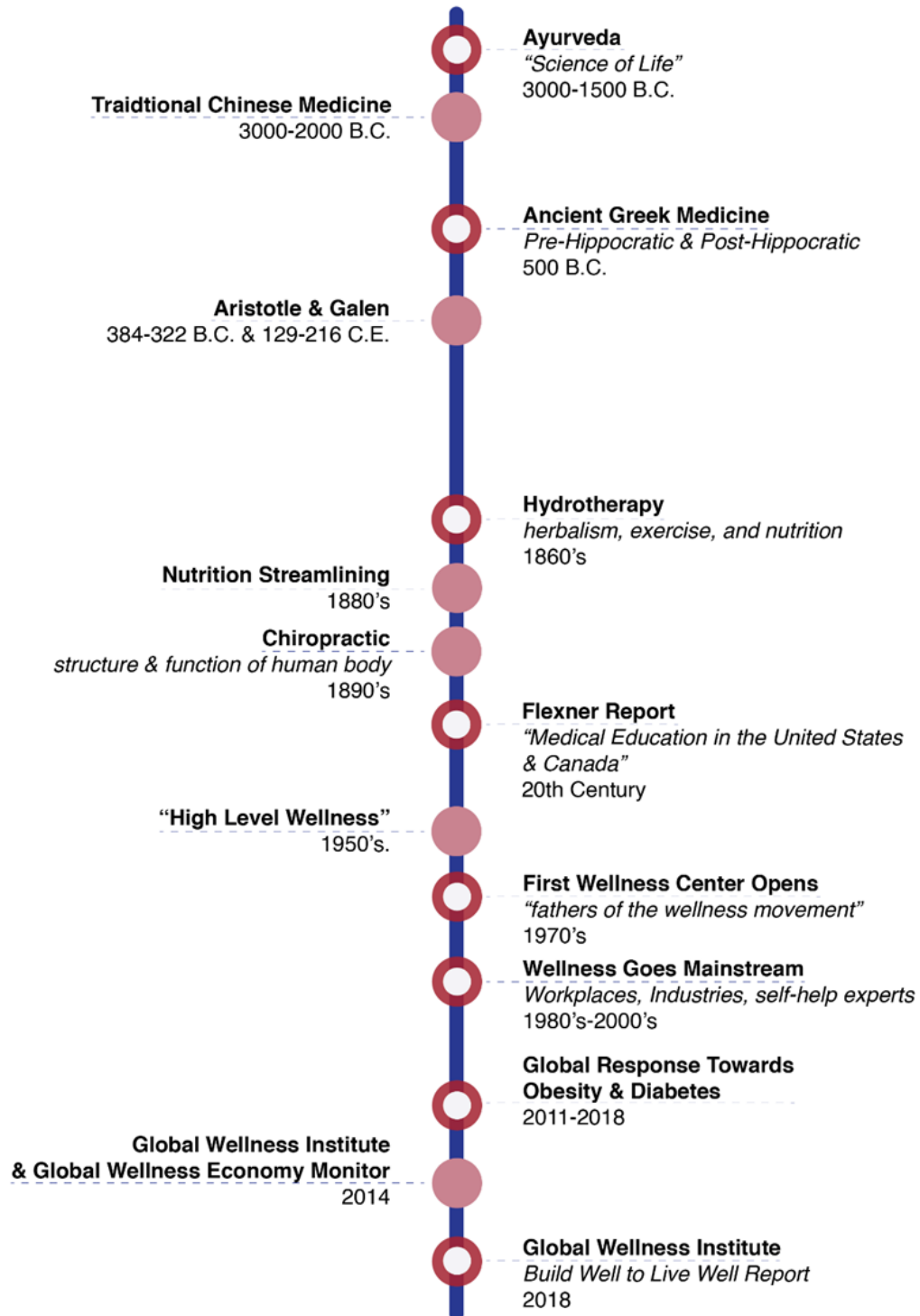
Historical Traditions & Beliefs

Throughout history we have seen countless cultural traditions and beliefs attempting to capture and convey what categorizes our well-being and quality of life. For those in the past who did seek well-being in the most innovative ways for the good of mankind, has proven to show a direct correlation that has guided our understanding and interpretations of the matter today. Some of the most prevalent civilizations to acknowledge begin with the Arya's of the ancient Bronze Age (c. 1000-500 BC), the Vedic of the Iron Age (c. 600 BC), and the Gupta Empire (C. 320 to 550 CE).² Later down this timeline, looking at the ancient Greek and Roman eras, we recognize a shift from large communal practices to smaller individual teachings from people such as Hippocrates (c. 460-370 BC), Aristotle (c. 384-322 BC), Galen (c. 129-216 CE) and more.

² "History of Ayurveda." National Ayurvedic Medical Association, <https://www.ayurvedanama.org/history-of-ayurveda/>.

Origins of Developing Well-Being

Evolution of Wellness Timeline



This timeline in Figure 1 provided depicts the evolution and various practices that encapsulate wellness from its earliest conception revolving around medicines, all the way to present day teachings and reports. This chapter will cover the major milestones along this timeline and set a chronological story of the development of human and societal consciousness towards well-being and overall quality of life.

Ayurveda

Examining well-being from some of the earliest influences, one the first developed practices to recognize dates back approximately 5,000 years ago circa 3,000-1500 BC, known as Ayurveda. Ayurveda is a holistic system of natural medicines originating from ancient India as an oral tradition that translates to “science of life”, and stems from the spiritual teachings known as the Vedas”.³ The Vedas is a collection of four original sacred Hindu Sanskrit texts that strives to harmonize the body, mind, and spirit, and celebrates elements of life such as earth, fire, wind, and water. The four texts are Rig Veda, Yajur Veda, Sama Veda, and Atharva Veda.⁴ Within the Vedas, you would learn about the three psychophysiological constitutions of the man, rituals and practices to improve health and longevity, and references to herbs and treatments of certain diseases.

The major focus of Ayurveda is discovering the wisdom that cannot make you immortal, but it can bring you closure to an excellent state of physical, mental, and

Figure 1: The Evolution of Wellness (source: Author)

³ “Ayurveda.” Global Wellness Institute,
<https://globalwellnessinstitute.org/wellnessevidence/ayurveda/>

⁴ “What Is Ayurveda? The History Of Ayurveda.” Ayurvedic India, 29 Sept. 2019,
<https://www.ayurvedicindia.info/history-of-ayurveda/>.

spiritual consciousness that leads to a happier and healthier life. Still notably present as a distinct entity around the world, primarily in both Southern Asian and European cultures, Ayurveda also includes other academic disciplines such as sociology, economics, ecology and so on.⁵

Ancient Greek Medicine

Continuing down the timeline, the next major chronological era of analysis is the age of ancient Greek medicine. Ancient Greek medicine can essentially be divided into two developmental periods; the first being pre-Hippocratic and the second being post-Hippocratic.⁶ These two periods refer to times before and during the life of the “Father of Western Medicine” or better known as, Hippocrates (c 460-370 BC) the Greek physician, born on the island of Cos, Greece.

⁵ Gupta, S.N. “Ayurveda - Brief History and Philosophy.” [http://iaf-ngo.org/pdf/Microsoft Word - Ayurveda-brief history and philosophy.pdf](http://iaf-ngo.org/pdf/Microsoft%20Word%20-%20Ayurveda-brief%20history%20and%20philosophy.pdf).

⁶ “Ancient Greek Medicine.” Health and Fitness History, <https://healthandfitnesshistory.com/ancient-medicine/ancient-greek-medicine/>.

During the pre-Hippocratic era of medicine, there was a strong focus on the spiritualistic side of healing with natural herbal and sterilizing remedies. In the post-Hippocratic era of medicine, a turn to empiricism and scientific experimentation was practiced. Hippocrates (Figure 2) led the way in diagnosing diseases and ailments to natural causes such as environmental factors, contractions

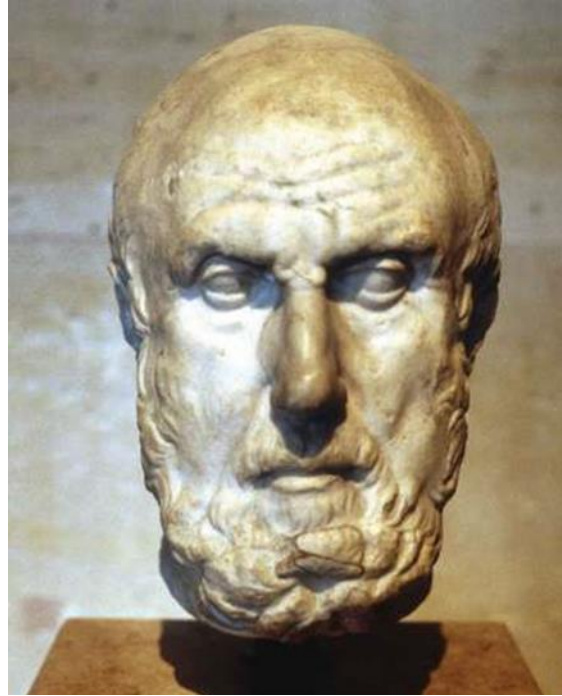


Figure 2: Hippocrates, undated bust (source: Photos.com/Thinkstock)

from animals, and accounting for our diets as well. Additionally, he came up with the concept that the human body is controlled by the four humours which are blood, phlegm, black bile, and yellow bile. He is largely known from the Hippocratic Oath, an ethical code of guidance for all physicians and teachers of the medical profession to follow and pledge to only beneficial treatments according to his/her judgement and refrain from any harm or hurt.⁷

In addition to Hippocrates, other great minds alike who followed in Hippocrates footsteps and rejected old ancient notions and teachings and rather looked towards biology were, Aristotle (c. 384-322 BC), and, Galen of Pergamum (c. 129-216 CE). Aristotle's work mainly revolves around the knowledge of the animal

⁷ The Editors of Encyclopædia Britannica. "Hippocratic Oath." Encyclopædia Britannica, Encyclopædia Britannica, Inc., 20 June 2019, <https://www.britannica.com/topic/Hippocratic-oath>.

kingdom and theories on human biology. Though false, he believed the body was controlled by the heart, rather than the brain. Observation and experimentation as such even with errors like these, allowed the medical profession to further develop and advance. Galen, another physician and philosopher of the Roman times, studied extensively on the anatomy of the body, specifically on the heart, brain and blood. His writings on anatomical, physiological, pharmaceutical, and therapeutic theories is where most of our knowledge of modern-day medicines up until the 17th century originate from.⁸

18th & 19th Centuries

Fast forward through the timeline of wellness to the 18th and 19th centuries, the rise of new intellectual movements, philosophies and medical practices rapidly began to accumulate, most notably in Europe and the United States. These new alternative methods of self-healing and holistic approaches included homeopathy, osteopathy, chiropractic, and naturopathy.⁹ For the first time, the ideas of incorporating exercise and nutritional choices as a measure of wellness are considered in these methods. For example, in the 1860's, Sebastian Kneipp, a German priest, promotes hydrotherapy with herbalism, exercise, and nutrition. In the 1880's, Swiss physician, Maximillian Bircher-Benner streamlines nutritional research for a balanced diet of fruits and vegetables. In the 1890's Daniel David Palmer develops Chiropractic, which focuses on the structure and function of the human body. John

⁸ "Ancient Greek Medicine." Health and Fitness History, <https://healthandfitnesshistory.com/ancient-medicine/ancient-greek-medicine/>.

⁹ "History of Wellness." Global Wellness Institute, <https://globalwellnessinstitute.org/industry-research/history-of-wellness/>.

Harvey Kellogg advocates healthy diet, exercise, fresh air, and hydrotherapy; the use of exercise in a pool for treatments of arthritis and paralysis. Naturopathy, the theory of treating and preventing diseases without the use of drugs also spreads throughout the U.S.

20th Century

At the turn of the 20th century, the wellness movement had experienced even more attention and recognition. Without the publication of “Medical Education in the United States and Canada”, by Abraham Flexner (Figure 3) otherwise known as the Flexner Report, our modern disease oriented and evidence-based medicine practices may have never seen



Figure 3: Abraham Flexner (source: Global Wellness Institute)

the changes in their standards and rigor of our medical schools and professions we see today.

A few decades later, in the 1950's, the “High Level Wellness” was written by physician Halbert L. Dunn, that was presented in 29 lectures and whose ideas were later embraced in the 1970's by the “fathers of the wellness movement” in the United States. These fathers were Dr. John Travis, Don Ardell, and Dr. Bill Hettler. What these men and their associates were responsible for were; developing the world's first wellness center in California and the first university campus wellness center at the University of Wisconsin-Stevens Point (UWSP). As well as establishing the National

Wellness Institute and National Wellness Conference in the U.S.¹⁰ From that point, concentrating on the decades of the 1980's to the 2000's, workplace programs, fitness and spa industries, self-help experts began to see an uproar across the country.

21st Century

Now in the 21st century, the numerous wellness movements have gone completely global. Nearly all industries sought to transform their marketing strategies to reflect this global wellness movement. The culmination of fitness, diet, healthy living, and wellbeing are finally coming into play in everyday lives of society. However, chronic diseases and obesity rates are seeing a crisis worldwide between the years of 2011-2018. A result of this was an influx of new laws and taxes on soda and sugary drinks in nations worldwide, such as Finland, Hungary, Norway, France, UK, Portugal, Mexico, and more. U.S. cities who did the same were Berkeley, CA; Oakland, CA; Boulder, CO; Philadelphia, PA; and Seattle, WA.¹¹

Now as recently as 2014, GWI released research data showing that the global wellness industry was a \$3.4 trillion market. Four years later in 2018, noted on the timeline, GWI released “Build Well to Live Well”, a report on the global wellness real estate and communities sector revealing that intentionally putting people’s health at the center of design, and creation and redevelopment are the next frontiers in real estate. With statistics like this, and seeing the markets value rise year after year, it is imperative to continue these trends and lifestyles, in order to reverse the US and

¹⁰ “History of Wellness.” Global Wellness Institute, <https://globalwellnessinstitute.org/industry-research/history-of-wellness/>.

¹¹ “History of Wellness.” Global Wellness Institute, <https://globalwellnessinstitute.org/industry-research/history-of-wellness/>.

worldwide crisis of chronic diseases, obesity, and other health related issues. This thesis aims to do exactly that, starting with one community at a time.

Chapter 2: Healthy Living & Quality of Life

Current Health Related Issues in the United States

Obesity

Our well-being and health are no longer solely dictated by the access of medical treatments and natural healing techniques. According to the World Health Organization (WHO), health is defined as “a state of complete physical, mental and social well-being”.¹² This goes without saying that an individual must care for their body, mind, and soul, both physically and mentality. In the United States alone, we are seeing a rise in health risks specifically related to obesity and chronic diseases. In surveys done by the National Health and Nutrition Examination Survey (NHANES) in 2015 – 2016, and 2016 – 2018, the prevalence of obesity in the US (Figures 4, 5, and 6) has reached an alarming 39.8% affecting over 93 million adults.¹³ Nationwide, there are now seven states statistically above 35% of the population battling obesity.¹⁴ They are Alabama, Arkansas, Iowa, Louisiana, Mississippi, Oklahoma, and West Virginia.

¹² WHO. (2001). Fifty-fourth World Health Assembly. Geneva: World Health Organization.

¹³ “Adult Obesity Facts.” Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 13 Aug. 2018, <https://www.cdc.gov/obesity/data/adult.html>.

¹⁴ IBID

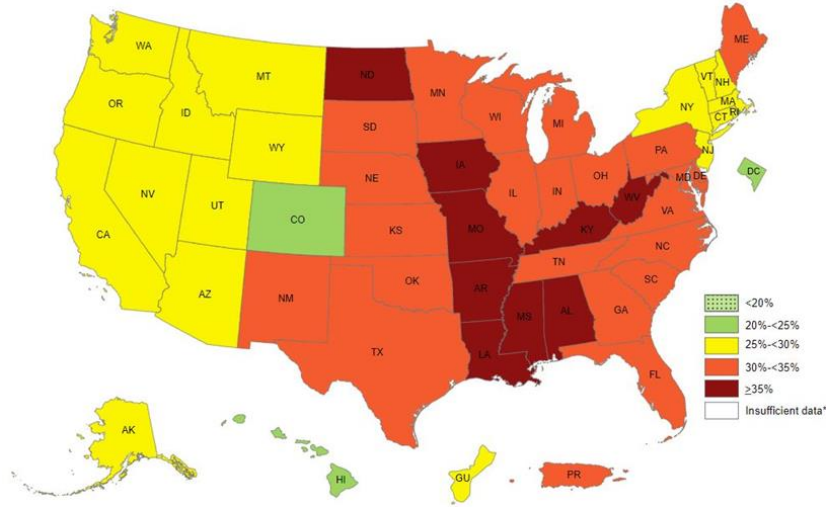


Figure 4: Overall Prevalence of Obesity 2015-2016 (source: BRFSS)

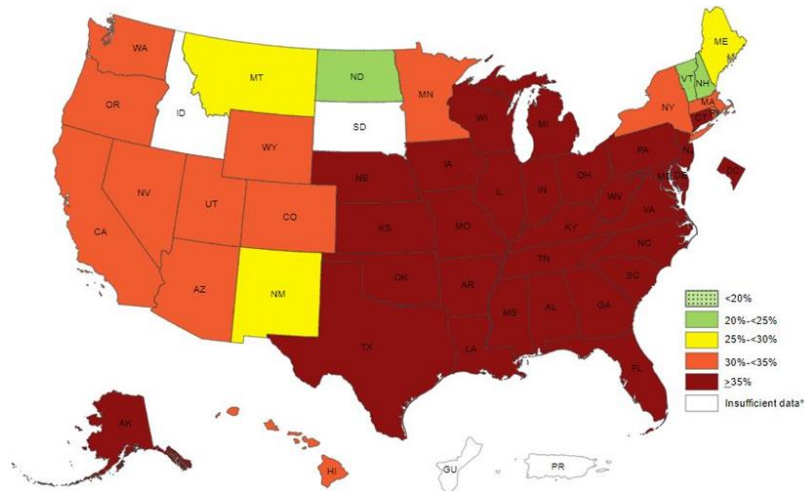


Figure 6: Overall Prevalence of Obesity in African Americans (source: BRFSS)

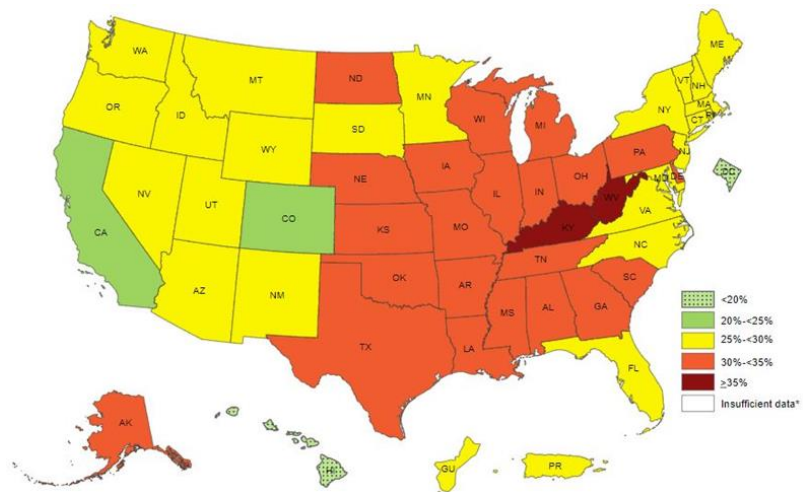


Figure 5: Overall Prevalence of Obesity in Hispanic Adults (source: BRFSS)

Obesity is not only becoming a serious problem for adults, but also in our younger generations as well. The prevalence of obesity in 2016 was 18.5% and affected about 13.7 million children and adolescents from the ages of 2 – 19 years old and these numbers are rising.¹⁵ These are the highest reports of obesity in both adults and children ever documented by NHANES. Obesity is quite a complex health issue though. It is not caused by one single factor, and it is not always avoidable for everyone due to certain behaviors and genetics in some cases. A few behaviors to mention are dietary patterns, physical activity and inactivity, medications, and other exposures. Obesity has become such a serious health risk in America because of the side effects it leads to such as poor mental health, bad quality of life, high blood pressure, sleep apnea, body pains, and even can result in some of the leading causes of death in the U.S. such as heart disease, stroke, type 2 diabetes, and certain types of cancer, most of which are avoidable.

Physical Inactivity

Poor health behaviors, particularly bad diet and physical inactivity are also showing a detrimental increase in the U.S. It is reported by the Behavioral Risk Factor Surveillance System (BRFSS) that just over half of adults nationally, 51.7%, meet the national Physical Activity Guidelines for aerobic activity.¹⁶ The highest reported percentage of inactivity by a state is Kentucky, at 32.3% and the lowest amount of physical inactivity being Washington at 19.2%. In Figure 7, a visual data

¹⁵ “Childhood Obesity Facts.” Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 24 June 2019, <https://www.cdc.gov/obesity/data/childhood.html>.

¹⁶ “Physical Inactivity in the United States.” The State of Childhood Obesity, <https://stateofchildhoodobesity.org/physical-inactivity/>

map shows the percentage of adults who achieve at least 150 minutes a week of moderate-intensity aerobics, or at least 75 minutes of high-intensity aerobics per week.

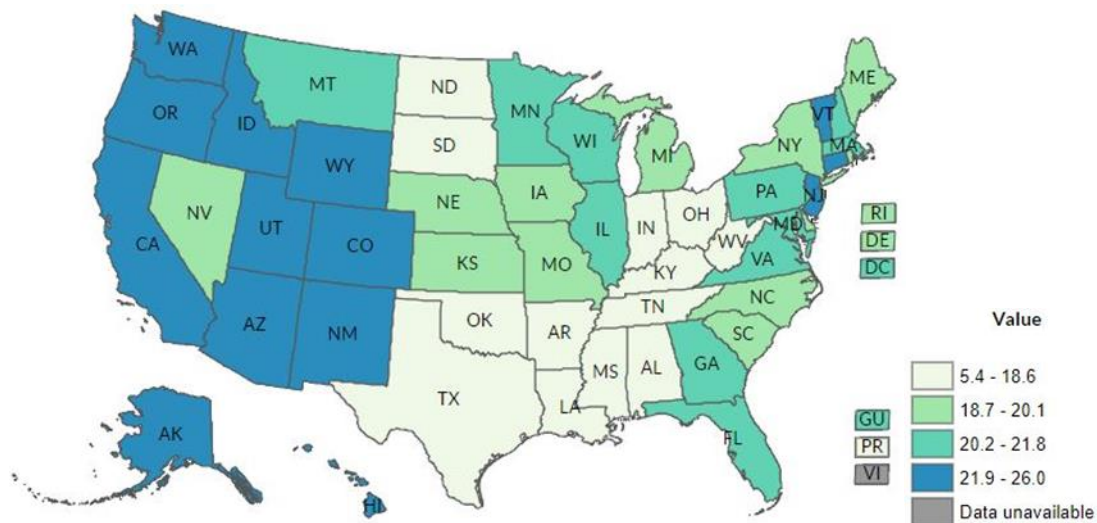


Figure 7: Percentage of Adults Who Engage In 75 – 150 Minutes of Physical Aerobics Per Week

(source: BRFSS)

With an alarming 25.6% of U.S. citizens currently physically inactive, these states percentages are far too low for a country so heavily invested in such a large market of a global wellness industry. The serious consequences and results directly related to physical inactivity have made a huge impact on the country not only physically, but towards our economy as well. There is a clear connection between physical inactivity, obesity rates and medical spending in the United States.

According to Project HOPE, medical costs of obesity were estimated to be as high as \$78.5 billion in 1998, and as of 2008 that value has reached \$147 billion per year.¹⁷

¹⁷ Finkelstein, Eric A., Justin G. Trogdon, Joel W. Cohen, and William Dietz. “Annual Medical Spending Attributable To Obesity: Payer-And Service-Specific Estimates.” Health Affairs 28, no. Supplement 1 (2009).

Chronic Diseases

Put simply, the spending towards obesity is nearly entirely a result of spending generated from treating diseases that obesity causes. According to Charles Roehrig and colleagues, the annual medical costs for people with diabetes totaled at \$190.5 billion in 2004.¹⁸ Being said, even though not all of the costs are directly related to obesity, excess weight is the number one factor in predicting the development of diabetes.

Understanding Importance of Wellness

Benefits

We as humans define our own well-being. Knowing there is no one single answer or definition to the term “well-being” gives it its uniqueness for everyone. We often seek

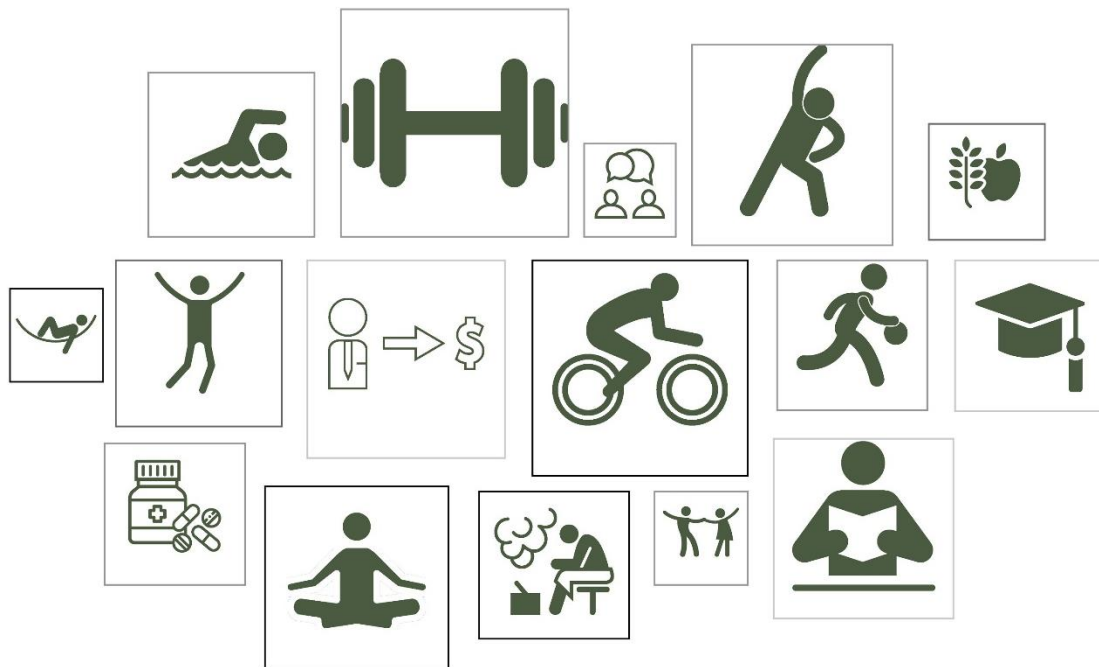


Figure 8: Wellness Attribute (source: Author)

¹⁸ Roehrig C, Miller G, Lake C, Bryant J. National health spending by medical condition, 1996–2005. Health Aff (Millwood). 2009;28(2):w358–67.

to find health & wellness that works for others in ourselves, but it does not always work like that. Each and everyone of us must continue to find what works for us and stick to it in order to achieve happiness, comfort, and satisfaction.

Physical Activity

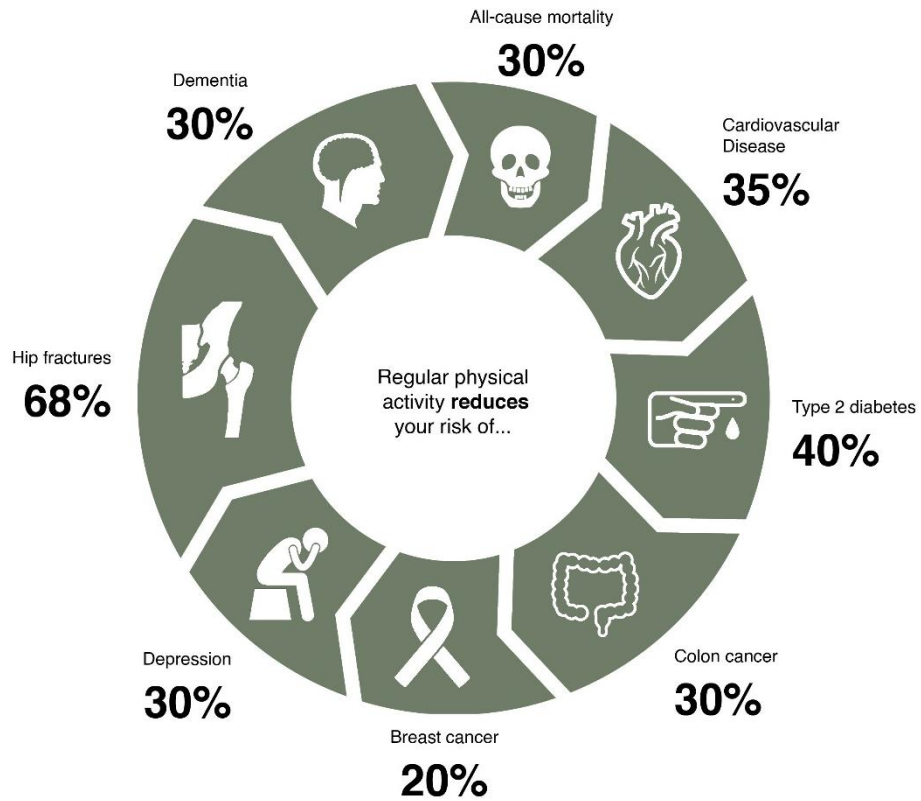


Figure 9: Benefits of Physical Activity (source: Author)

Chapter 3: Speculating Upon Sustainability

Typical Sustainable Building Performance Standards

It may seem unclear at this point understanding how the research thus far has landed itself in an architectural thesis. Speculating upon the topic of sustainability, this chapter will begin to shed light on the topic between our well-being and the built environment, specifically relating to the use of sustainable strategies for the health of a building's occupants.

As designers have come to learn, it is crucial to always think about and consider certain measures of sustainability for any project they are contributing towards. It is not a new concept which has been recently discovered, in fact, quite the opposite. That being said, for what reasons should a good designer constantly utilize sustainability when the opportunity presents itself? That answer is simple. Without sustainable design, we as a race would no longer be able to maintain the overall quality of life we are accustomed to today, and above all else, we would eventually collapse as a society and cease to exist. Earth's ecosystem relies on a healthy balance of resources and diversity in order to remain stable and continue to thrive. In order to do so, we must live harmoniously with nature and the environment to protect and reverse the harmful damages our planet has endured for centuries.

As the integration of sustainability has evolved in our modern-day resource depleting society, many notable practices and standards have accumulated over the past few decades. In particular, they have been organized to address the needs of our technological and economic advancements. The intriguing part about sustainable development is that not only is it heavily relied upon to ensure humanity continues to

prosper, but at a finer detail also has a key role on the effects of our built environment which directly correlates to human health and behavior.

LEED



Figure 10: LEED Logo (source: USGBC)

The most widely used and arguably most known sustainable building performance rating system around the world today is LEED (Figure 8), short for Leadership in Energy and Environmental Design. LEED was established in 1999 and unveiled in 2000 as a green building rating system created by the USGBC, or U.S. Green Building Council, which was established seven years prior by Rick Fedrizzi, David Gottfried, and Mike Italiano.¹⁹ With over 12,800 organizations, 30,000 members, 76 state chapters, and over 200,000 projects to date, it is no question they are at the forefront of the industry as leaders of sustainable design. The USBGC advocates to provide a framework through LEED which will create healthy, highly

¹⁹ "About USGBC." USGBC. Accessed December 12, 2019. <https://new.usgbc.org/about>.

efficient and cost-saving green buildings. Strategies to improve energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LEED sets incredible standards for how to successfully design a building to minimize environmental impacts and perform with top energy quality goals in mind. Periodically, LEED has come out with newly updated versions of itself that goes beyond the standards of its predecessor in order to stay up to date with best practices. However, the major takeaway from a performance standard like LEED is to recognize how it becomes very focused on the building itself, and begins to deviate away from the occupants,

Living Building Challenge

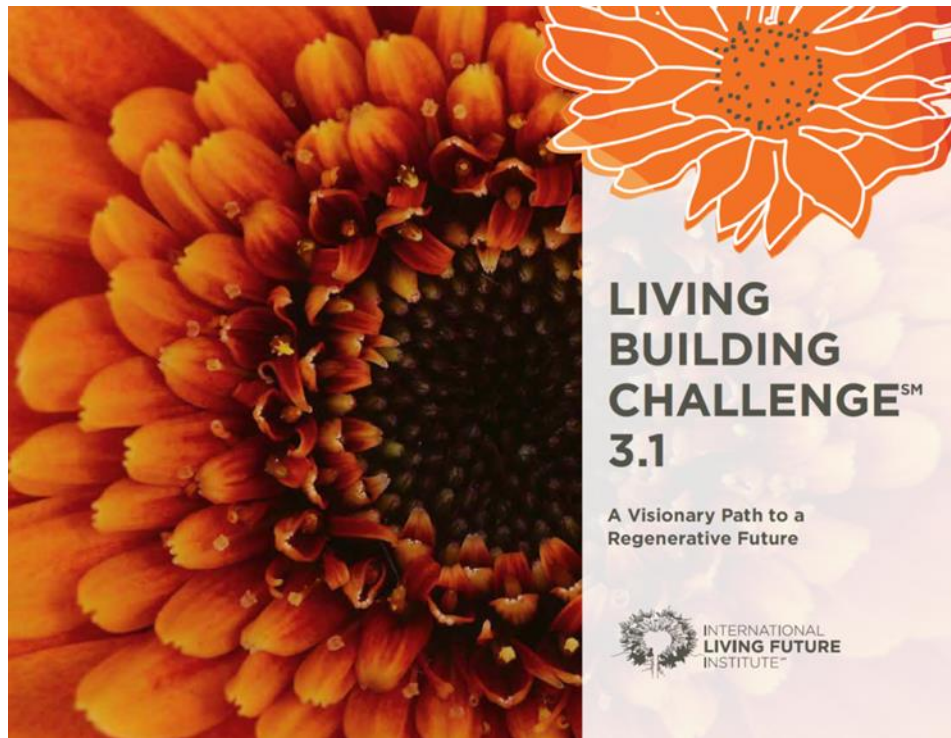


Figure 11: Living Building Challenge (source: ILFI)

With LEED setting the bar as a catalyst for building performance standards, a new generation of programs have begun to develop. The Living Building Challenge (Figure 9), or LBC, has seen a dramatic increase of popularity and use within the United States. Similar to LEED, LBC is a framework under the International Living Future Institute, or ILFI, for sustainable design within the built environment but strives to take that goal a step further. The Challenge claims to define the most advanced measures of sustainability in the built environment and act rapidly to diminish the gap between current limits and the positive solutions of an ultimate goal.²⁰ What makes The ILFI stand out from LEED is their seven performance areas or “petals” that replicate a flower. These seven petals are place, water, energy, health

The 20 Imperatives of the Living Building Challenge: Follow down the column associated with each Typology to see which Imperatives apply.

Imperative omitted from Typology Solutions beyond project footprint are permissible

	LIVING BUILDING CHALLENGE 3.1			
	BUILDINGS	RENOVATIONS	LANDSCAPE + INFRASTRUCTURE	
PLACE				01. LIMITS TO GROWTH
	SCALE JUMPING		SCALE JUMPING	02. URBAN AGRICULTURE
			SCALE JUMPING	03. HABITAT EXCHANGE
				04. HUMAN-POWERED LIVING
WATER			SCALE JUMPING	05. NET POSITIVE WATER
ENERGY			SCALE JUMPING	06. NET POSITIVE ENERGY
HEALTH + HAPPINESS				07. CIVILIZED ENVIRONMENT
				08. HEALTHY INTERIOR ENVIRONMENT
				09. BIOPHILIC ENVIRONMENT
MATERIALS				10. RED LIST
			SCALE JUMPING	11. EMBODIED CARBON FOOTPRINT
				12. RESPONSIBLE INDUSTRY
				13. LIVING ECONOMY SOURCING
EQUITY				14. NET POSITIVE WASTE
				15. HUMAN SCALE + HUMANE PLACES
				16. UNIVERSAL ACCESS TO NATURE + PLACE
			SCALE JUMPING	17. EQUITABLE INVESTMENT
BEAUTY				18. JUST ORGANIZATIONS
				19. BEAUTY + SPIRIT
				20. INSPIRATION + EDUCATION

Figure 12: 20 Imperatives of the LBC (source: ILFI)

²⁰ “Living Building Challenge 3.0: A Visionary Path to a Regenerative Future.” International Living Future Institute. Last modified 2014, accessed December 11, 2019

& happiness, materials, equity, and beauty which are then broken down into 20 imperatives (Figure 10) which are mandatory per building typology category.

The Living Future Institute promotes ‘living buildings’, which they define as “regenerative buildings that connect occupants to light, air, food, nature, and community... that create a positive impact on the human and natural systems that interact with them.”²¹ Again, we see here how another reputable building performance program is deeply invested in the generic terminology of connecting humans, as a collective, to light, air, nature, etc. Not focused on the singular individual.

²¹ “Living Building Challenge 3.0: A Visionary Path to a Regenerative Future.” International Living Future Institute. Last modified 2014, accessed December 11, 2019

WELL Building Standard



Figure 13: WELL Building Standard (source: IWBI)

The final building standard to discuss is the WELL Building Standard (Figure 11). The International WELL Building Institute (IWBI) is the leading global movement first to be focused exclusively on the ways that buildings, and everything in them, can improve our comfort, drive better choices, and generally enhance, not compromise, our health and wellness.²² The WELL standard takes a similar approach as LBC by using seven categories to distinguish their standards of wellness. They are: Air, Water, Nourishment, Light, Fitness, Comfort, and Mind. These seven categories are then further divided into Features which are then divided in Parts and Requirements. Features deal with specific health aspects, while the Parts deal with specific building typologies.

²² "International WELL Building Institute." About | International WELL Building Institute. Accessed December 11, 2019. <https://www.wellcertified.com/about-iwbi/>.

Identifying Conjectural Practices

This thesis aims to address a misconception between designing architecture for our health and well-being in ways by exposing the conjectural practices that take places today. To begin, we design for the collective, but not the individual in most cases. What this means, is that whether it's a masterplan or even a single building, we lose sight of how to design a well-rounded project that supports the needs to stimulate individualized health and wellness. We must always keep in mind that we all don't think the same or interact with others the same. We certainly don't live the same, breathe the same, or develop the same in life.

Standardized practices of sustainability are a good measure and direction to design for up until a certain point. Architectural design in regard to sustainability only merely scratches the surface for human wellness and health when analyzing the micro scale of individual personalized human needs. We know how to promote better indoor air quality for occupants as a whole, as well as utilize plentiful amounts of natural ventilation and daylighting. But where can we seek to improve? Other than avoiding Sick Building Syndrome, SBS, and a less productive workday in an office, these methods are falsely leading the design world to incorrectly enhance humans' well-beings. These strategies are not guaranteed to promote the same amount of health benefits for one individual as it does for another. Yet, we continue to design in this way due to the fact we have seen what works, and we want to emulate the success that has been done before, resulting in a blindness from the true underlying factor to design sustainably. However, it must be stated that there can be no doubt that

negative physical health-related considerations associated with, for example, poor indoor environmental quality should be avoided in sustainable design.

All of the green rating systems mentioned previously are hovering around the importance of human well-being but take a far more focused approach towards the impacts on our environment, rather than the users. Bridging the gap between humans and the built environment in terms of sustainable design needs to begin assessing its approaches and standard practices and begin to focus not on the collective, but the individual. In other words, modest improvements for large populations are now the outdated way of designing.

Designing with Wellness in Mind

Valuing the occupant as an individual with different needs and health issues no matter the setting or building program is undoubtedly on the rise as new best practice. We have nearly perfected sustainable design for a building's entire occupancy at a basic fundamental level of generic human necessity. Granted, this concept being introduced is one that may not be feasible nor practical in all cases when you take account for clients, marketing, budgeting, and so on. However, it has still yet to be created, and the Valvaere will prove to be the first of its kind. To value every occupant, we must take drastic measures in designing to accommodate all the different aspects of human nature.

Five Ways of Well-Being

Building design needs to move beyond optimizing single parameters such as temperature and humidity, to more holistic approaches that take their cues in health-

supporting human behaviors. Key physical design characteristics can be summarized in five ways of well-being. They are Connect, Keep Active, Take Notice, Keep Learning, and Give.²³ These five ways of well-being are the key behaviors that support human well-being. Social connections correlate with reported wellbeing as well as physical health. Keeping active through physical activity has shown countless counts of evidence to reduce symptoms of mental and physical health. By taking notice, one must pay attention to the present and be aware of their thoughts and feelings to reduce stress, anxiety, and depression. Continuously learning and having higher aspirations results in attaining a higher well-being. Lastly, by “giving” or emerging yourself in pro-social behavior has a direct impact on happiness.²⁴

Implementing Appropriate Sustainable Techniques

Salutogenic Design

The way in which designers intentionally configure elements within space has a much greater effect on occupants than the choices of certain colors and textures of materiality. Salutogenic design and biophilic design are two key approaches for designing with wellness in mind. Salutogenesis is a term coined by medical sociologist Aron Antonovsky, as a theory of how and why certain people stay healthy, and the factors that support human health and well-being, being the opposite of pathogenesis. According to The Salutogenic Life, 80% of diseases are caused by

²³ Steemers, Koen. “ARCHITECTURE FOR WELL-BEING AND HEALTH - The Daylight Site: Daylighting Research, Architecture, Practice and Education.” The Daylight Site | Daylighting research, architecture, practice and education, July 23, 2015. <http://thedaylightsite.com/architecture-for-well-being-and-health/>.

²⁴ IBID

lifestyle choices.²⁵ The essence of salutogenic design is to aid the occupants in a building to operate at peak conditions and maintain a physical and mental well-being.

Biophilic Design

Biophilic design is an innovative way of designing the places where we live, work, and learn.²⁶ Connecting ourselves closer to nature in a fundamental fashion, it is the connection between architecture and humans that completes the circle for green sustainable design of the built environment. With green infrastructure on the rise, tending to improve the built environment, including ideologies of biophilic design will improve health upon individuals both mentally and physically. Impacts on physical and mental fatigue, awareness, memory cognition, depression, cardiovascular and musculoskeletal health have a direct relation to the way we design.

One of the most essential concepts for good design that humans will positively react to is a well laid and easily maneuverable circulation pattern within a building. When someone knows how to get from one space to another with ease, they produce a feeling of comfort and safety. When done oppositely, humans tend to see tension rise and stress development. Giving users optimal opportunity to engage with a building is a simple yet critical design decision that will carry out very meaningful results. Design should be more adaptable and responsive to user needs, behaviors and requirements, offering users a freedom of choice and control over their environment.

²⁵ “The Salutogenic Life.” Salutogenic Life. Accessed December 14, 2019. <https://salutogeniclife.com/pages/about>.

²⁶ “Biophilic Design: The Architecture of Life.” Biophilic Design: The Architecture of Life. Accessed December 14, 2019. <http://www.biophilicdesign.net/>.

We as designers must be cautious not to attempt to design the perfect space or environment, otherwise we risk reducing the stimuli that encourages occupants to be engaged with the built environment around them.

Chapter 4: Site Selection & Research

Articulating the Motive

This thesis engages with a conceptual idea that has not yet been heavily prioritized nor steadily developed anywhere around the United States. The conceptual design which will later be explained in greater detail in Chapter 8, primarily attempts to combine many different individual programmatic aspects of wellness into a singular social hub of public communal shared spaces to promote a community's holistic sense of a healthy interactive lifestyle. Therefore, how does one begin to find a site that is fitting for this type of unprecedented hybrid model? Motives for the site began by discovering where certain communities may have needed this kind of help the most. As mentioned previously in Chapter 3, the CDC identified cities and states across the entire country of the United States in multiple categories related to health issues such as obesity rates and physical inactivity percentages. We see that majority of the Southern Mideast region of the United States is at the top of all these categories. Seeking communities within this region of the country was the original goal toward finding a site.

This is where the emergence of a pivotal moment of critical thinking about the success of a new living wellness center originated from. It is also where this thesis began to shift into a critique of healthy community living lifestyles. In order for this new building typology to break ground and succeed, it cannot be built in an area where the lifestyle doesn't support the function. Otherwise it would become a meaningless facility in its region and never be utilized to its fullest potential. The Valvaere must find a site where the lifestyle it reinforces already exists with potential

to exceed their current well-being. Additionally, if there were ever a chance for this new building typology to grow, multiply, and set itself as the new standard in which sustainability and human health are coexisting with one another, it must find a community that will celebrate its presence and take advantage of the opportunity at hand.

Therefore, by learning the values and interests' communities have on healthy living, the shift in the investigation of site analysis found a new focus towards the ideal urban setting that showcases the highest standards of a health-conscious living community within the United States. In doing so, the Valvaere can be integrated into the community so as to enhance their lifestyles even further beyond what was thought to be possible. Furthermore, by following this method of decisive site selection, it will engender the probability of successful occupancy and promote a new era of human prosperity across the country.

Site Exploration

Delving into the specifics of essential site criteria, the considerations can be broken down into a diverse group of elements. Some of the most important site factors to incorporate are; choosing a populated urban area, urban agricultural opportunity, accessibility via walking, biking, public transportation and car. Additionally, the site should be located on an outdated industrial brownfield in which it can demolish or reuse the existing structure and excavate the contaminated soil to avoid any greenfield disturbance on new developable land. A few other factors to examine for site criteria are topography and hydrology. Being located near a body of

water creates opportunities for sustainable water systems and connections to existing trails and esplanades. A final key element in regard to site criteria is the history, culture, and society in which the Valvaere will inhabit.

Taking all the essential site criteria into consideration, as well as knowing where thriving communities are located, three conceivable sites to be investigated for consideration are, the Mirant Potomac River Generating Station (MPRGS) in northern Alexandria, VA. Gas Works Park, in northern Seattle, WA, and the Xcel Energy plant in the Sun Valley District of Denver, CO. These three sites, all in vastly different locations across the United States, show promising futures for the addition of the Valvaere. Each site follows all the critical elements of site criteria from being an industrial brownfield, to having waterfront access, which provides connections to existing trails and esplanades running along the site.

Gas Works Park – Seattle, WA



Figure 14: Gas Works Park. (source: Google Earth & author)

Looking at the first of three potential sites, lies Gas Works Park – Seattle, WA. Initial exploration of this site lead to the realization that Seattle contends as one of the fittest cities in America, ranking at #2 just behind Arlington. Furthermore, the city of Seattle ranks 7th in bicycle usage, one higher than Arlington, 3rd in personal health, 9th in community/environment, and 5th in overall exercise according to ACSM.²⁷ Seattle is a city surrounded by bodies of water with numerous state parks, trails, infrastructure, and heavily populated urban areas. Gas Works Park (Figure 16),

²⁷ Patch, Gretchen S., et al. "ACSM American Fitness Index." American Fitness Index, Anthem Foundation, 2019, americanfitnessindex.org/.

located on the southern point of the Wallingford neighborhood looking out onto Lake Union, has a lot of historical significance on site.



Figure 15: "Seattle Gas Company plant on Lake Union, ca, 1951 (source: Puget Sound Maritime Historical Society)"

A controversial decision to use such a site, nonetheless. Currently existing as a park with plenty of green space for activities such as picnics, walking, bicycling, and a few events year-round, the most iconic aspect of the park, is the old structure of the former Gas Light Company plant (Figure 17). This structure which still stands today, dates back to the early 1900's as one of the first major synthetic gas manufacturing plants in the country.²⁸ The landscape architect, Richard Haag, was commissioned to design the park and insisted on keeping the industrial structure on site so as to honor

²⁸ Golden, Hallie. "Gas Works Park Is a Beautiful Way to Remember a Toxic Past." Curbed Seattle. Curbed Seattle, April 12, 2019. <https://seattle.curbed.com/2019/4/12/18306264/gas-works-park-environmental-history>.

and maintain the culture and historical importance that remains today.

Without disturbing the old structure, using Gas Works Park as the site for this thesis will enhance the health-conscious lifestyle for individuals in Seattle and continue to contribute to the success they have already established. Once again, this site's current green space would allow excellent utilization for outdoor physical activity and engender urban agriculture along the Lake Union waterfront.

Xcel Energy Plant – Denver, Co

Shifting the focus towards the second site of conceivable interest in beautiful downtown Denver, CO. In what is considered to be the poorest district of Denver, the Sun Valley neighborhood, located just south of Empire Field at Mile High Stadium, along the Platte River, resides the Xcel Energy Plant (Figure 18).



Figure 16: Xcel Energy Plant (source: Google Earth & author)

Sun Valley has a median annual income of just \$9,874.83 with a 70% unemployment rate.²⁹ As a coal powered energy plant, it is one of the most-unhealthy types of energy producing plants in use today that cause many detrimental impacts on the environment. Coal fired power plants release many toxins and pollutants such as nitrogen, sulfur, and greenhouse gases including carbon dioxide and methane which have a direct relationship to the contribution of global warming and climate change.³⁰ To say this isn't bad enough, these types of energy plants also require an immense amount of water consumption in order to remove impurities from the coal. This results in effects on aquatic life in close proximity as well as other animals that rely on the available water sources. The state of Colorado generates over half of their electricity from coal-fired plants, with and have seen an increase in production for the first time since 2017.³¹ Figure 19 & 20 below show in detail the net electricity generation, and energy consumption estimates of Colorado in 2019.

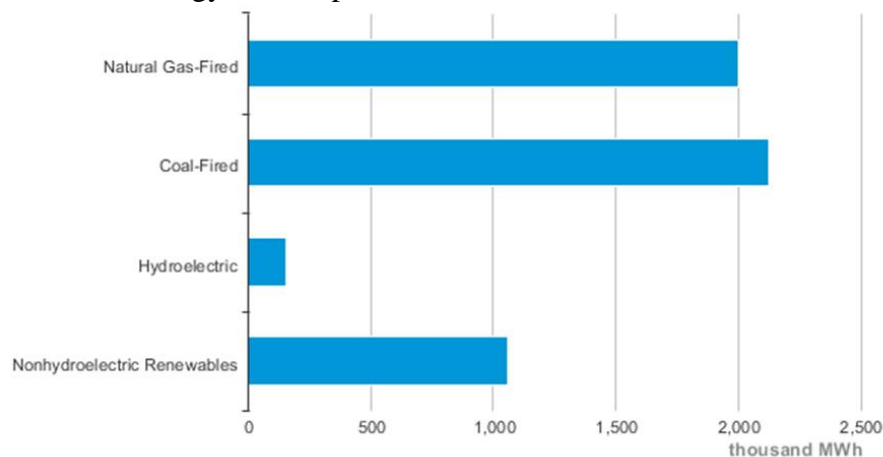


Figure 17: Colorado Net Electricity Generation, 2019 (source: EIA)

²⁹ Jackson, Margaret. "Sun Valley Could Be Denver's Next Big Thing." Westword. 4, December 18, 2018. <https://www.westword.com/news/sun-valley-one-of-denvers-oldest-and-poorest-areas-could-be-the-next-big-thing-9981911>.

³⁰ J.M.K.C. Donev et al. (2019). Energy Education - Coal fired power plant [Online]. Available: https://energyeducation.ca/encyclopedia/Coal_fired_power_plant. [Accessed: October 18, 2019].

³¹ J.M.K.C. Donev et al. (2019). Energy Education - Coal fired power plant [Online]. Available: https://energyeducation.ca/encyclopedia/Coal_fired_power_plant. [Accessed: October 18, 2019].

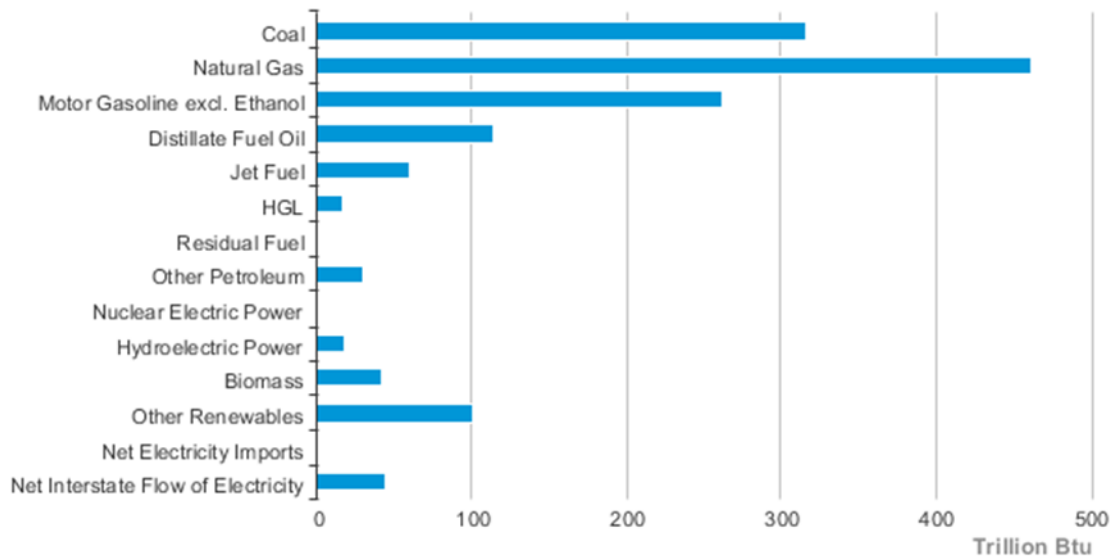


Figure 18: Colorado Energy Consumption (source: EIA)

The justification behind considering this site not only stems from being one of the most geographically central neighborhoods in Denver, but also due to the potential of eliminating a harmful power plant to better protect the ecosystem and developing this new typology in a community that has been left behind in a city that is vastly growing and attracting more people year by year. It's location along the Platte River, adjacencies to Dry Gulch Park and professional sports stadiums, as well as its immediate proximity to Decatur Federal Station finds itself at a perfect intersection of accessibility and plentiful amenities within in a thriving city.

Potomac River Generating Station – Alexandria, VA

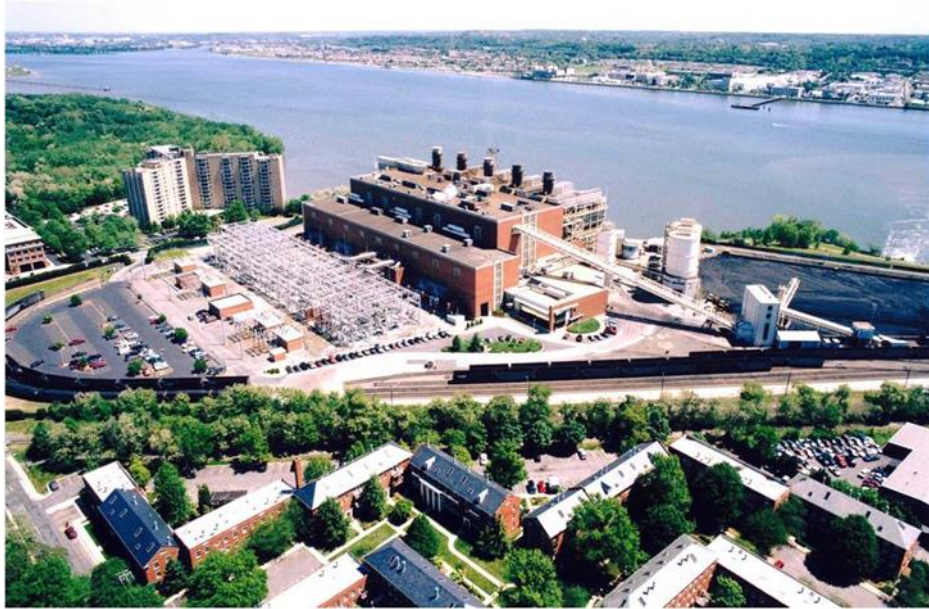


Figure 19: Former Mirant Potomac River Generating Station (source: CPP)

The third and final site of consideration for this thesis, lies the former Potomac River Generating Station (Figure 18), located in Alexandria, VA. The former PRGS, operated from 1949 to 2012. Located along the Potomac River and just north of the Old Town North neighborhood of Alexandria, its long-term vacancy creates a unique opportunity and project site. The reasoning behind selecting this location as a potential site for this thesis is due to its proximity to Arlington, VA. According to the 2019 ACSM American Fitness Index Summary Report, Arlington was ranked the #1 fittest city in the country.³² Arlington's waterfront is heavily

³² Patch, Gretchen S., et al. "ACSM American Fitness Index." American Fitness Index, Anthem Foundation, 2019, americanfitnessindex.org/.

occupied by major roadways and governmental property. This led me to continue looking south down the Potomac River where I landed at the MPRGS.

The city of Alexandria is only 8.4 miles away and acts as a perfect neighboring city which can emulate and soon surpass Arlington as one of the top health-conscious and fittest cities in America. Alexandria has plans for future development in the adjacent neighborhoods of Northeast Alexandria Old Town North. Another attribute about the site that is so intriguing is its immediacy to the 17-mile-long Mount Vernon Trail (Figure 14) that runs north-south along the Potomac River. With spectacular views looking across the river towards the Washington D.C. skyline, all pedestrians and bicyclists can enjoy the trail from sunrise till sunset, having the Valvaere as the central mediator of the trail.

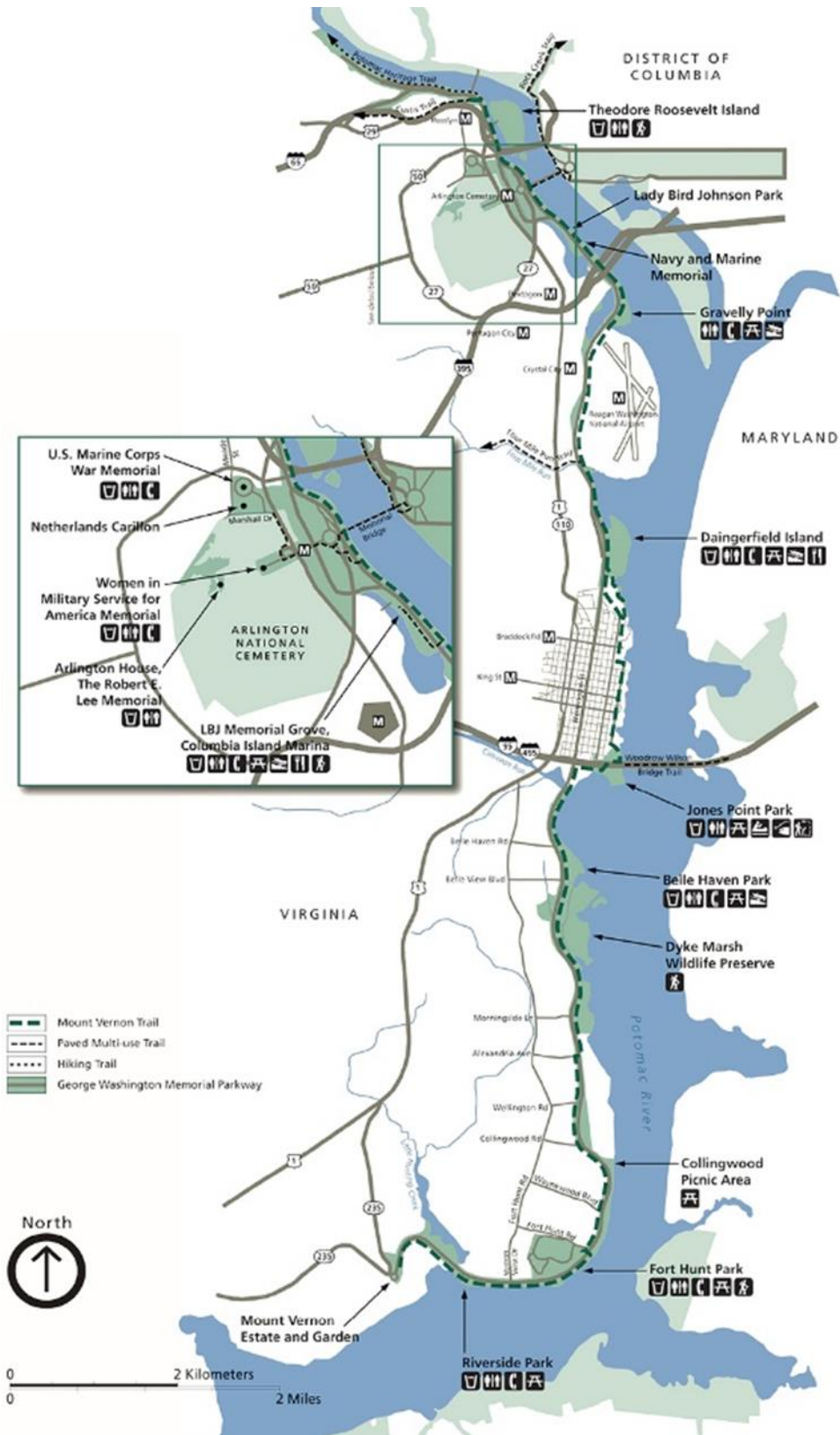


Figure 20: Mt. Vernon Trail (source: NPS, U.S. Dept. of the Interior)

Analyzing the site from a bird's eye view (Figure 20), there is an exceptional amount of land and majority of the topography being relatively flat, giving excellent opportunity for urban agricultural utilization.



Figure 21: MPRGS (source: Google Earth & author)

Site Criteria & Matrix

These three sites summarized together show remarkably similar characteristics that will engender the prosperous result in which the Valvaere pursues. Using this set of detailed site criteria and creating a site matrix (Figure 21) that ranks each category, has resonated a conclusion for the process of site analysis to which preferred direction this thesis shall undergo. In the site matrix shown above, the findings from the ranking system that uses a scale of 1 – 4 with 1 being the lowest and 4 being the highest, the clear favored site is the Potomac River Generating Station located in Alexandria, VA.





SITE MATRIX	Potomac Rl. Generating Station: Alexandria, VA			Gas Works Park: Seattle, WA			Genessee Park & Playfield: Seattle, WA			Industrial Zone Riverfront: Denver, CO		
												
Populated Urban Area	The city of Alexandria has a population of 144,301	1	The city of Seattle has a population of 755,745	3	The city of Seattle has a population of 755,745	3	The city of Denver has a population of 619,968	2				
Urban Argicultural Opportunity	Large site with flat land	4	Large site but majority of it has hills and changing topography	1	Large site with flat land	3	Medium site with flat land	2				
Connection to trails, parks, waterways	Site sits between the Mt. Vernon Trail	3	Site sits between the Burke-Gilman Trail	2	Site sits between the Colmon Park & Seward Park Trail	2	The city of Denver has a population of 619,968	3				
Accessibility	Multiple bus routes and pedestrian sidewalks surrounding site, including trail	2	Bus routs .16 miles away, vehicle and pedestrain friendly	1	Bus routes cuts through site, sitting within neighborhood for easy pedestri-an aceces	4	Site rest along the South Platte River Trail, Lakewood Trail, and Weir Gultch	3				
Brownfield/ Undeveloped Land	Site is located on the old Potomac River Generating Station	4	Currently a park, no longer a brown-field	2	Currently a park, not industrial, but very undeveloped	1	Lot is old factory site on river	4				
Industrial/ Commer-cial Reuse	Site is located on the old Potomac River Generating Station	4	Site is located on the old Seattle Gas Lihgt Company gasification plant	2	Not an industrial/commercial reuse site	1	Lot is old factory site on river	4				
Proximity to Future Development	Plans for more neighborhood devel-opment in Old Town North are being proposed	3	Currently located adjacent to shipyards and ports	1	No future development plans in area	2	Plans for the River Mile and Staidum lots being developed	4				
Waterfront Land	Site sits on the Potomac River	3	Site sits on Lake Union with no south-ern obstruction	4	Not directly located on water, setback within neighborhood	1	Site sits on the Platte River	2				
Sea Level Rise	Direct site not in danger, Park ot the North is in dangerous zone	3	Low Lying Area	1	Low Lying area	2	Not in any direct threat	4				
Light + Air	Adjacent to river with no obstruction	4	Sitting on the North shore of Lake Union at the south end of Wallingford	4	Surrounded by neighborhood housing	4	In a low density area adjacent to river and park	4				
TOTAL		31		21		23		34				

Figure 22: Site Selection Matrix (source: Author)

Chapter 5: Site Analysis

Alexandria, VA

This chapter deals with site analysis of the PRGS in Alexandria, VA, as well as the surrounding context. Gaining a better understanding of the surrounding context and delving into both land and water, as well as transit and land use will further help in the decisive design decisions that will mark the Valvaere as a gateway for the city of Alexandria. Looking at an overall zoning map of Alexandria helps show the existing building typologies in the immediate area, and what lacks thereof. In Figure 22, we see the current conditions of the site are categorized as UT, meaning Utilities and Transportation.

Land Use

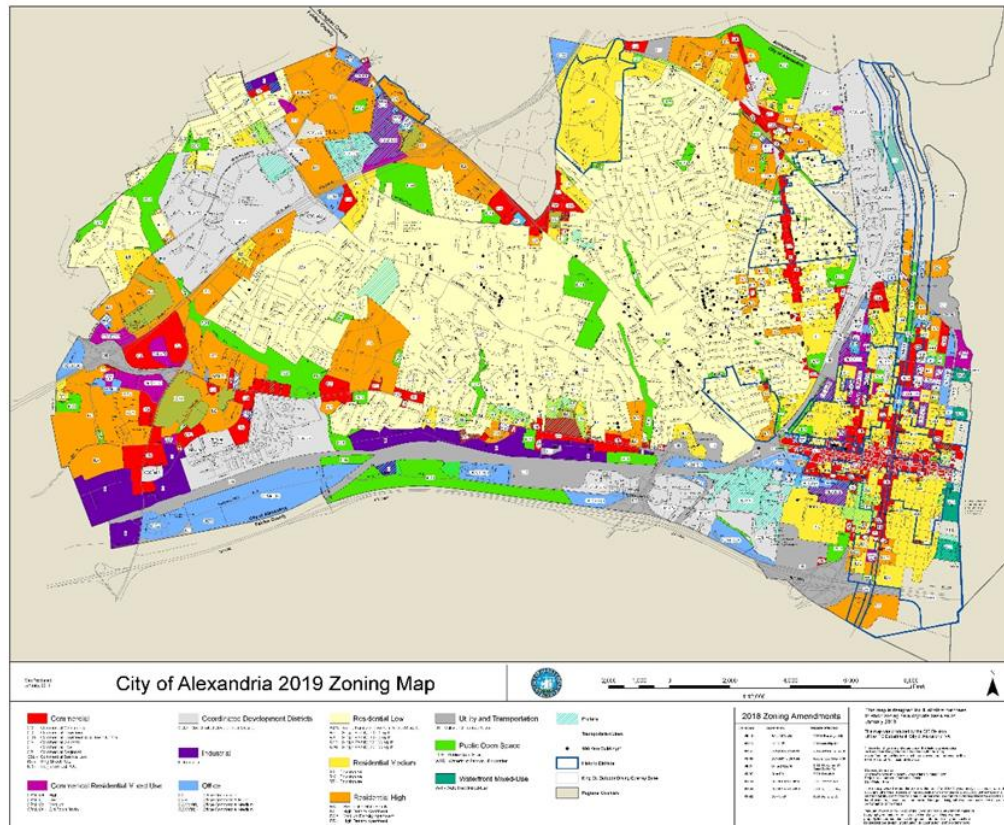


Figure 23: : Zoning Map 2019 (source: GIS Div. of ITS Dept., Alexandria, VA)

Recreation

With learning the overall zoning designations of Alexandria, we begin to particularly focus on the open green spaces and the locations of existing parks and recreation facilities (Figure 23).



Figure 24: Recreational Facilities and Parks (source: GIS Div. of ITS Dept., Alexandria, VA)

Resource Protection

There is a clear hierarchy on the importance of dedicating the waterfront edge along the Potomac River for parks and green buffers. As for recreational facilities, we see the opposite. All scattered across the city yet none with waterfront access along the Potomac. That is not necessarily a coincidence, however. Alexandria's City Council has been involved in a resource protection act since 2004 that preserves a 100' perennial stream buffer and a 50' intermittent stream buffer along the Potomac River. Shown in Figure 24 below, we can compare the two maps and begin to make

sense as to why there is very little to no development on the river edge.



Figure 25: Resource Protection Areas of Alexandria, VA (source: GIS Div. of ITS Dept., Alexandria, VA)

Topography

Responding to this data of resource protection, the next phase of site analysis to analyze is the topography of Alexandria (Figure 25).

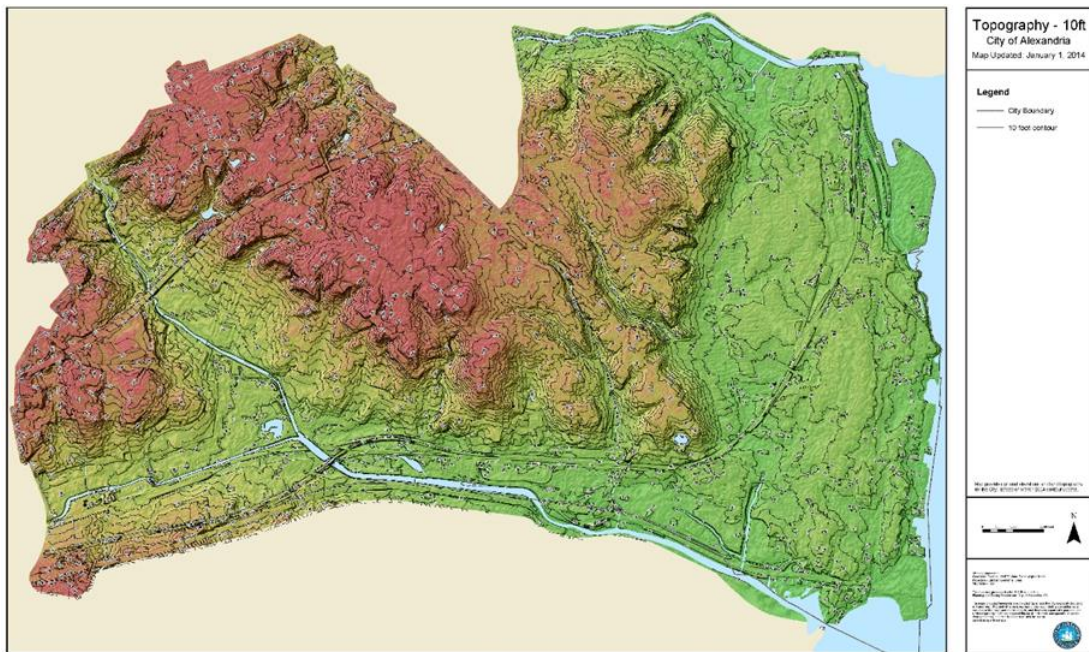


Figure 26: Resource Protection Areas of Alexandria, VA (source: GIS Div. of ITS Dept., Alexandria, VA)

From this data collected in 2014, there is a gradual change in slope through the topography from West to East. As one can imagine, the land succumbs to the level of the Potomac River. The current PRGS is elevated thirty-four feet above sea level shown in the section drawing below (Figure 26). This section of the current structure also reveals the existing Potomac River trail that passes by the site along the water's edge, illustrating the height elevation from ground to sea level.

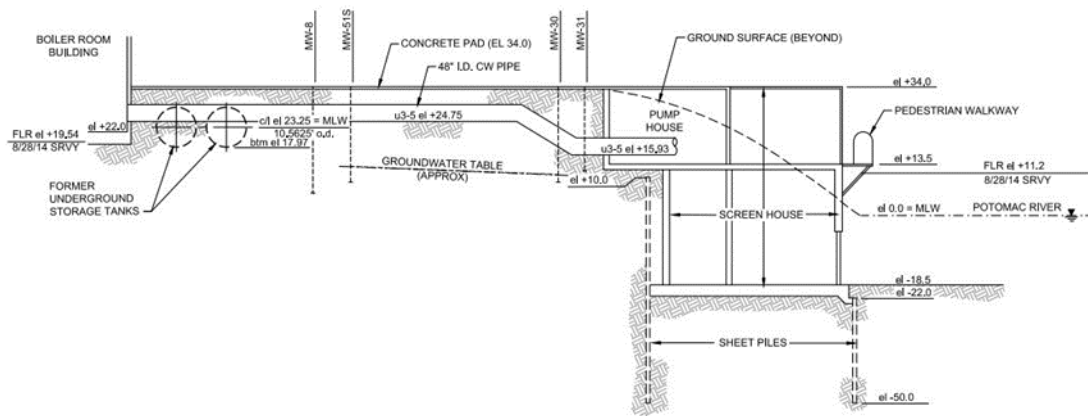


Figure 27: Section Through the Concrete Pad of PRGS (source: Geosyntec Consultants)

Sea Level Rise

Continuing on the topic of sea levels, the critical element to be aware of for a project like this lying on the edge of such a large body of water, is the threat to sea level rise. According to both the Federal Emergency Management Agency (FEMA) and the National Oceanic and Atmospheric Administration (NOAA), this site is fortunately just out of reach of any potential hazards to future sea level rise. In the images below (Figures 27 & 28), we can see just how the site sits on the border of sea level rise line.

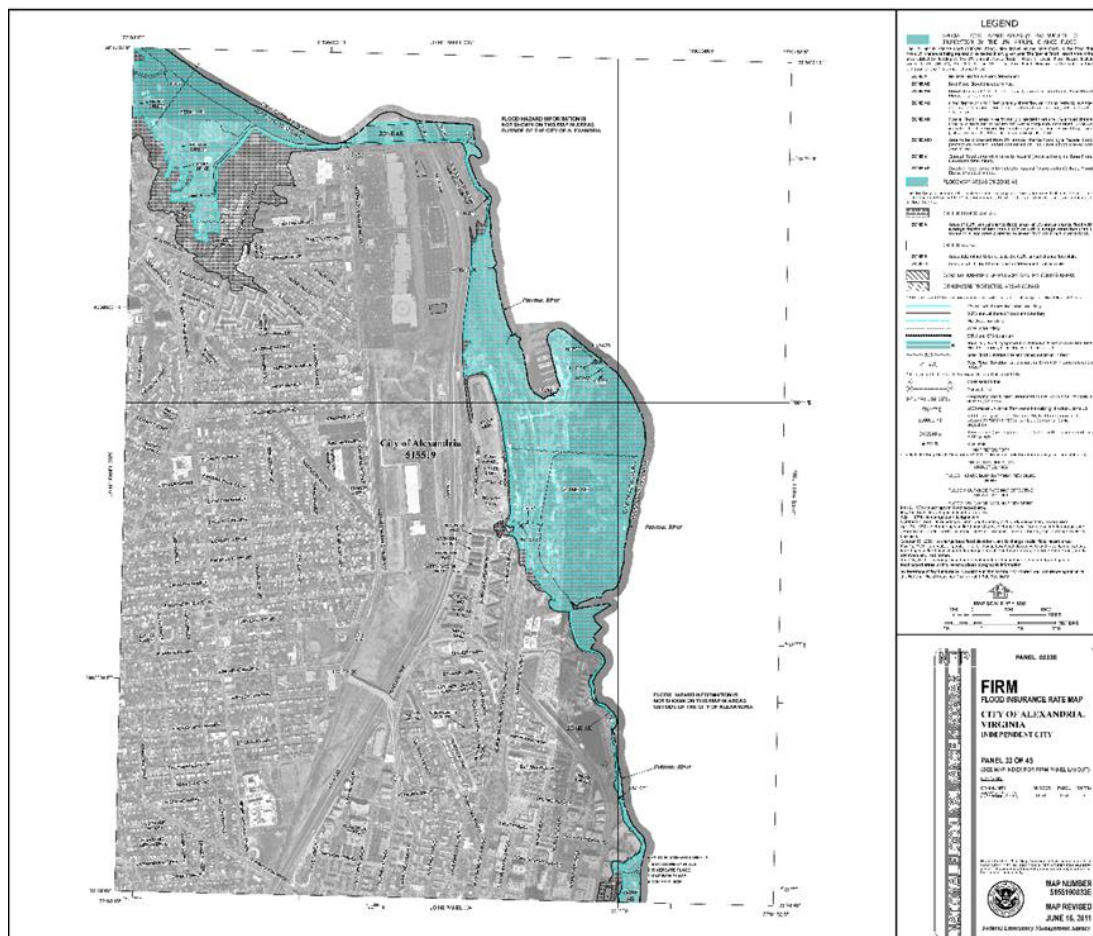


Figure 29: Flood Rate Insurance Map (source: FEMA)



Figure 28: 10 ft. Sea Level Rise (source: NOAA)

Localized Scale

Narrowing down the scope of the site analysis, the focus shifts to a regional perspective around the site. Included in the following illustrations are previously mentioned; recreation protection buffers, bicycle pathways, and bus routes & stops near the site. At an even closer scale of the site, existing conditions such as building height restrictions, zoning, and residential blocks of Old Town North are depicted as a means of creating a starting point for design guidelines.

From this collection of research, continuing to explore iterations of site analysis through diagramming will set the stage for future design development. In the diagrams provided, the approach acknowledges the current existing urban grid just south of the site. A potential site design strategy will be to break down the overall PRGS' massive 20-acre property by extending this existing grid through the site to begin organizing the site into more workable spaces. From here, A second approach is to understand the relationship the site has with the adjacent neighborhoods, and then identify optimal site entrances. Aiming to become a new gateway and head of the city of Alexandria, it is imperative to create multiple access points to the site, both from the south and north locations.

Currently surrounding the site is an outdated and unused railroad and switchyard that stands as a major divide between the site and the rest of the city. Eradicating this factor will open up the entire front face of the site to the rest of the community and ensure a new sense of welcoming to the Valvaere.

With such a large presence and long-lasting generating plant in the middle of the site, careful consideration about its preservation and post-industrial use will be the

next phase. If the building shall remain as a monumental historic structure, one design decision would be to split the site into three parcels, utilizing the northern and southern parcels for new construction.



Figure 30: Localized Topography of Potomac River Generating Station (source: Author)

Resource Protection

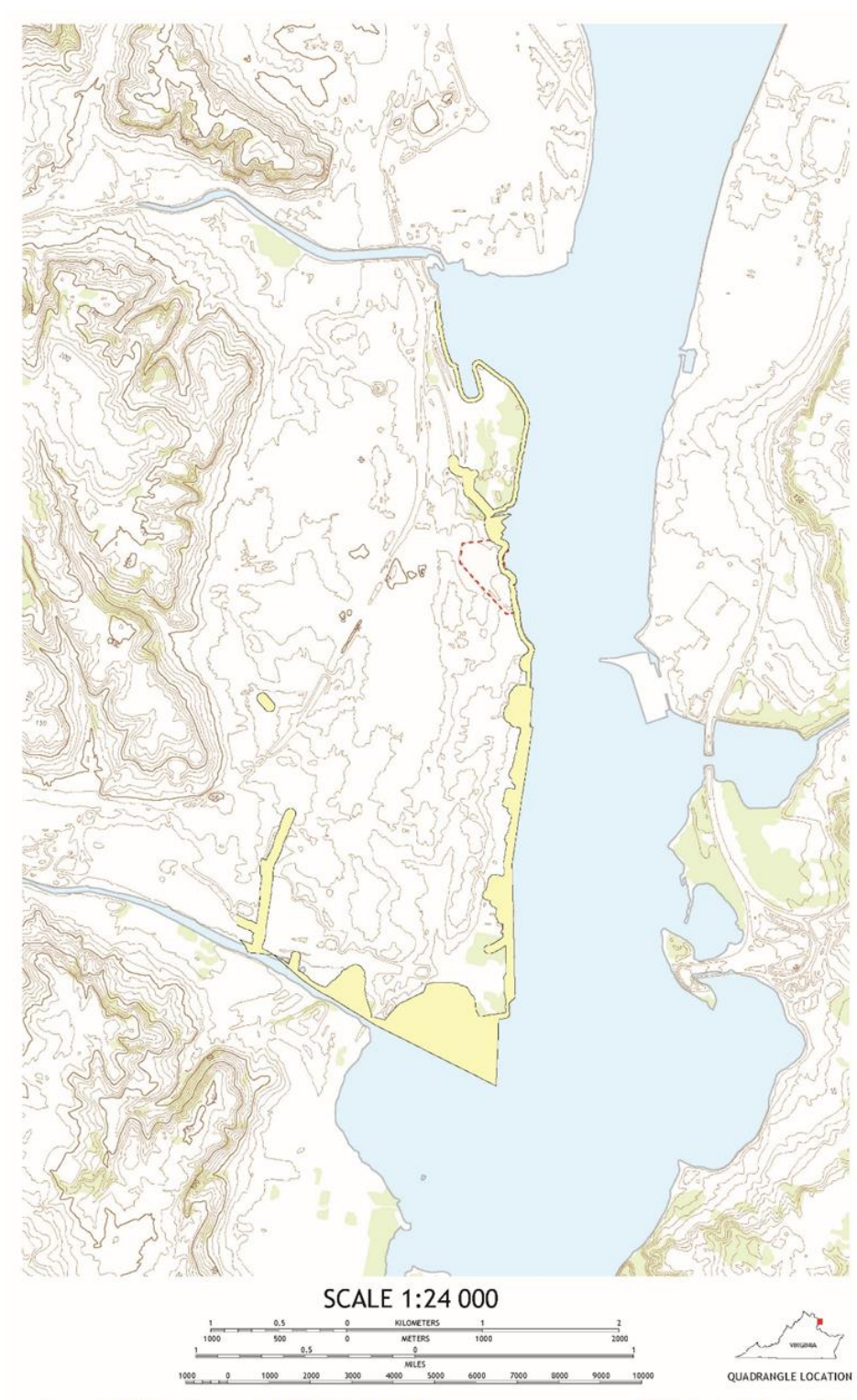


Figure 31: Recreation Protection (source: Author)

Bicycle Pathways

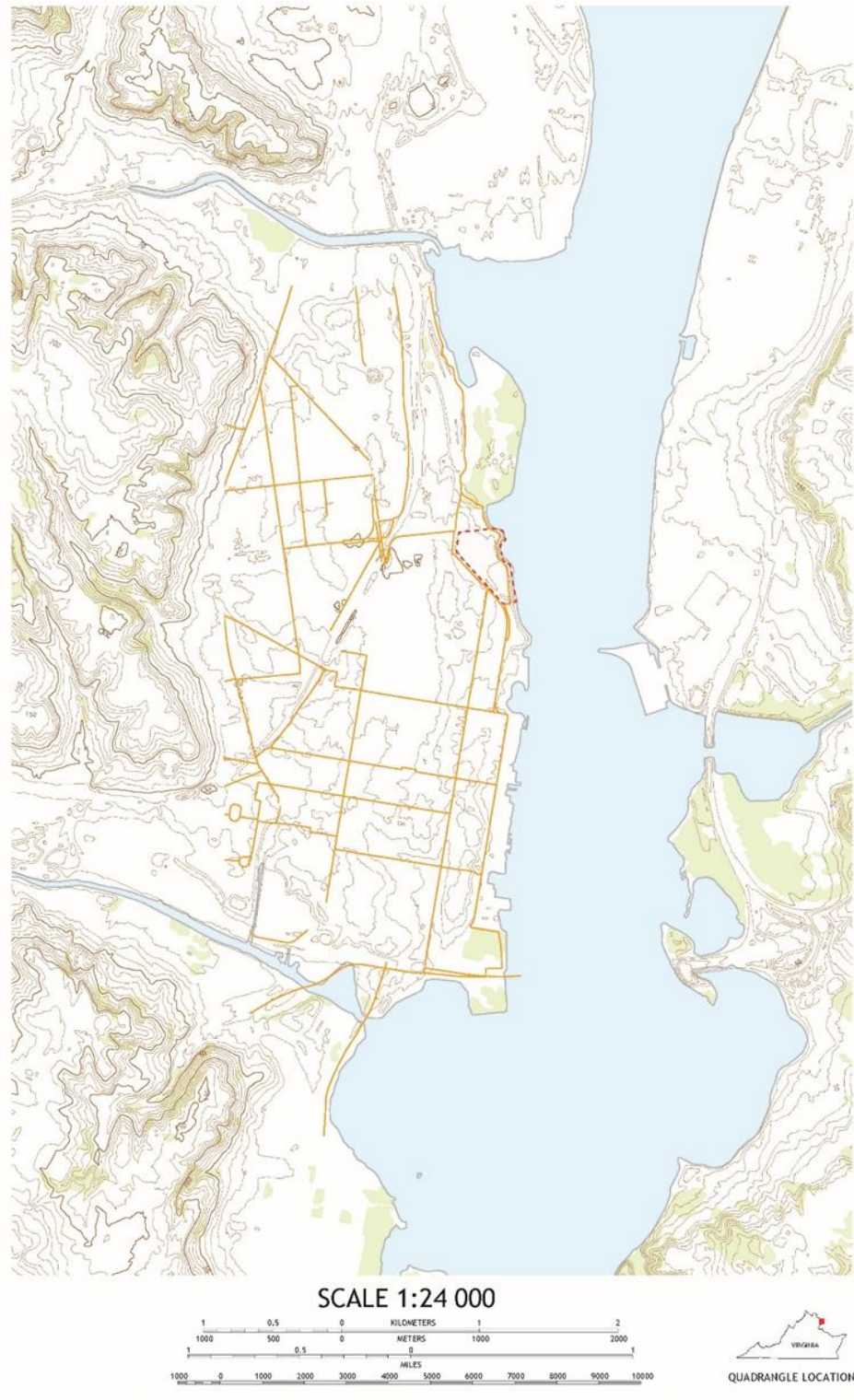


Figure 32: Bicycle Pathways (source: Author)

Bus Transit

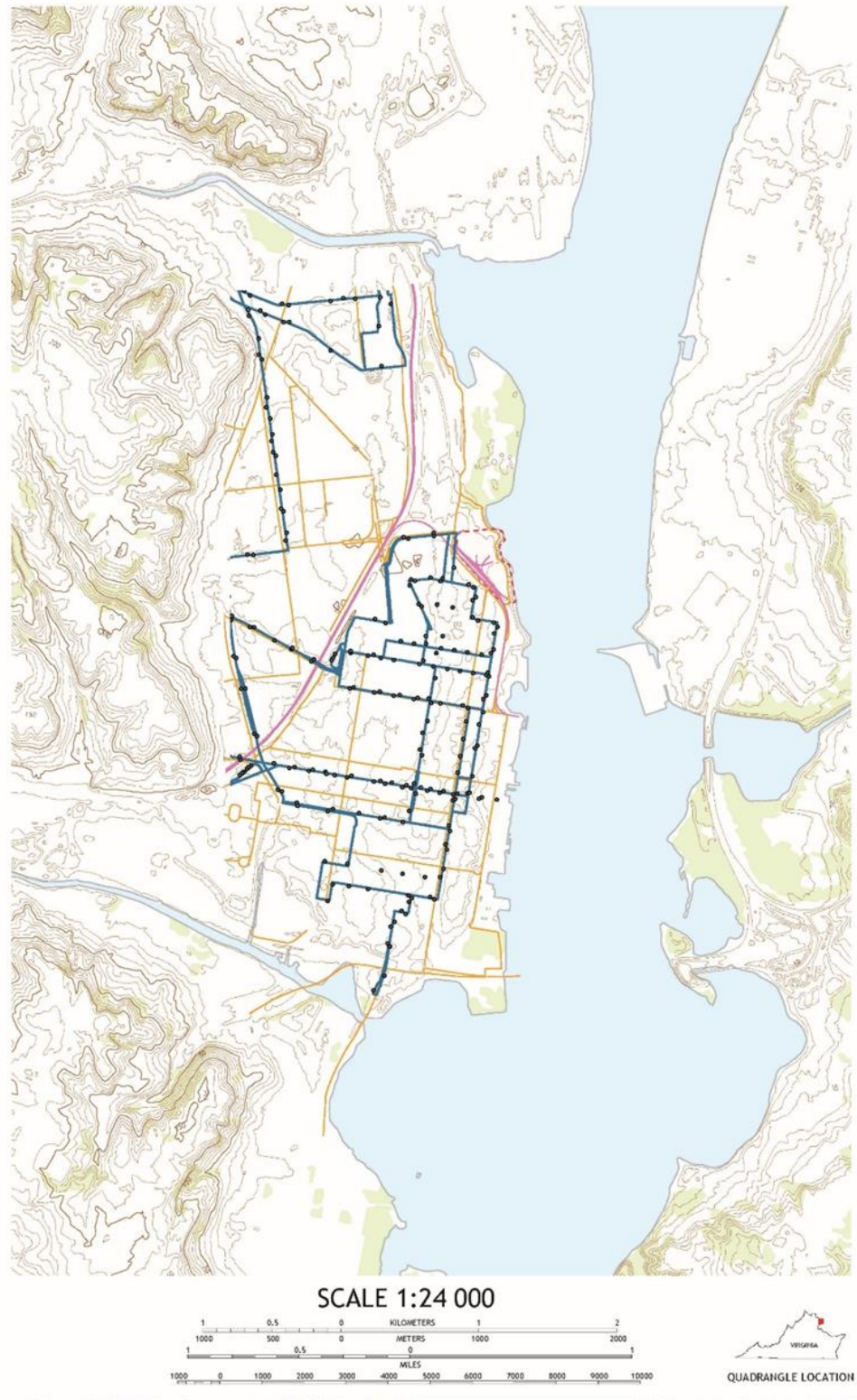


Figure 33: Bus Routes & Stops (source: Author)

Height Limitations & Zoning

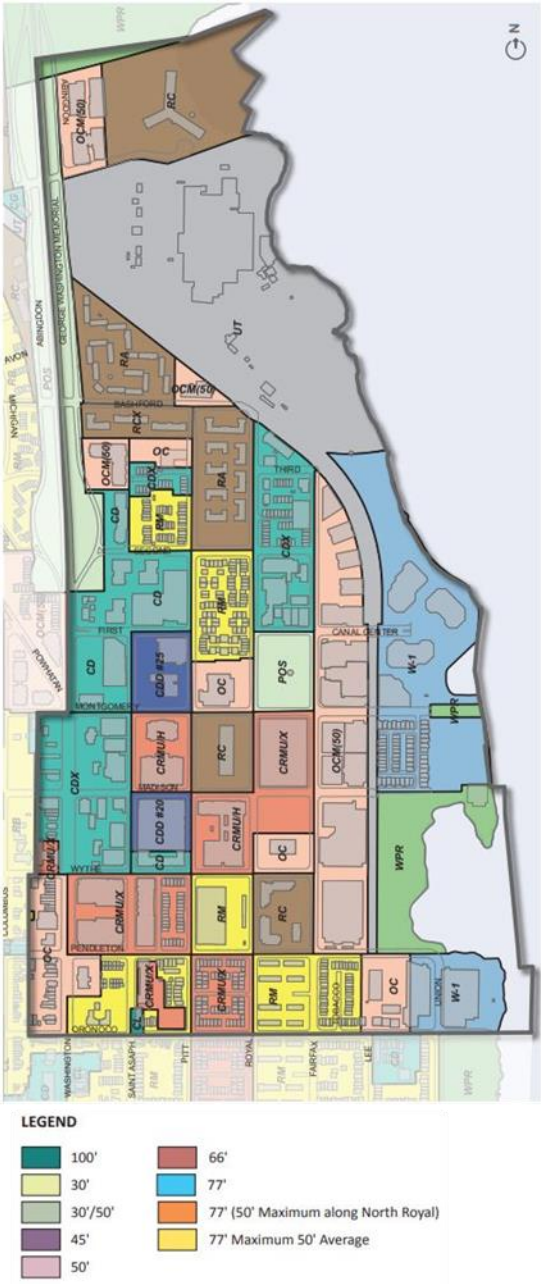


Figure 35: Existing Zoning (source: Old Town North SAP Advisory Group)

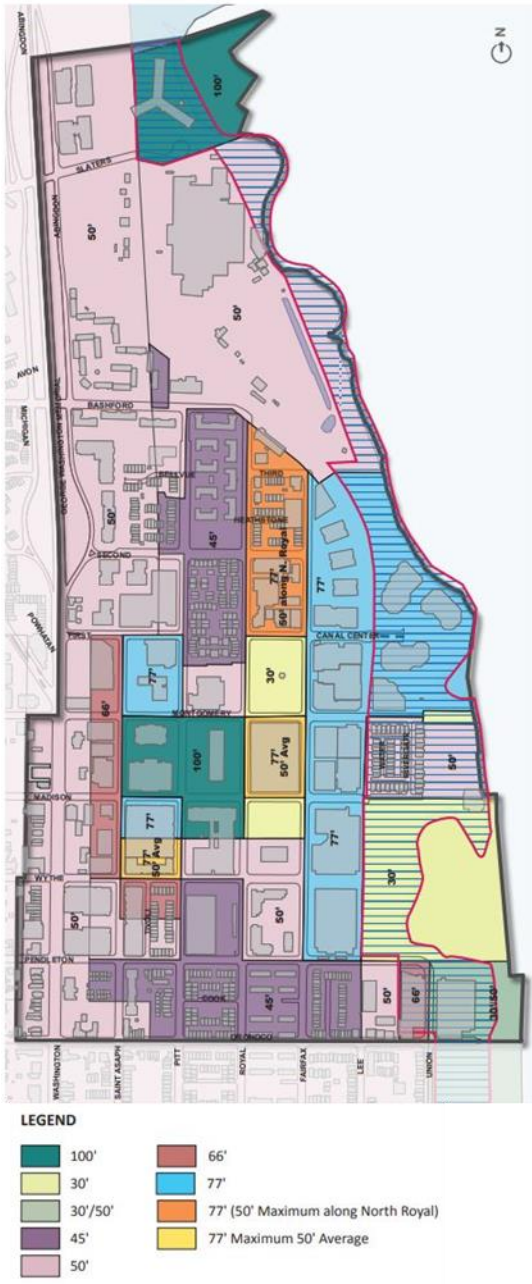


Figure 34: Existing Zoning (source: Old Town North SAP Advisory Group)

Existing Residential

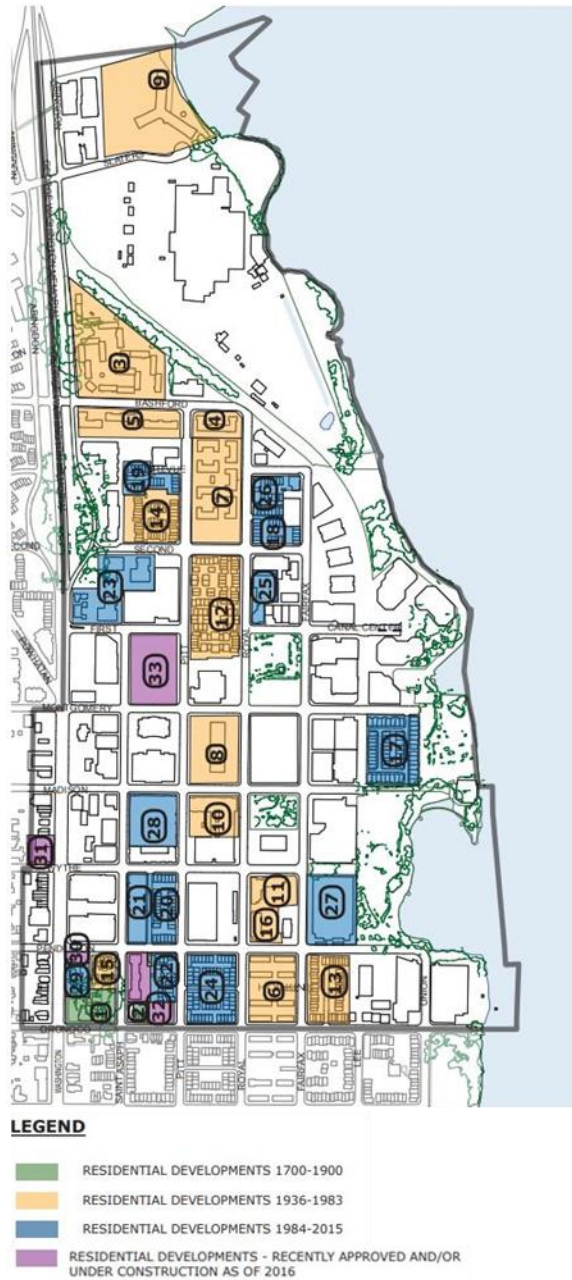


Figure 36: Existing Residential (source: Old Town North SAP Advisory Group)

Site Diagramming

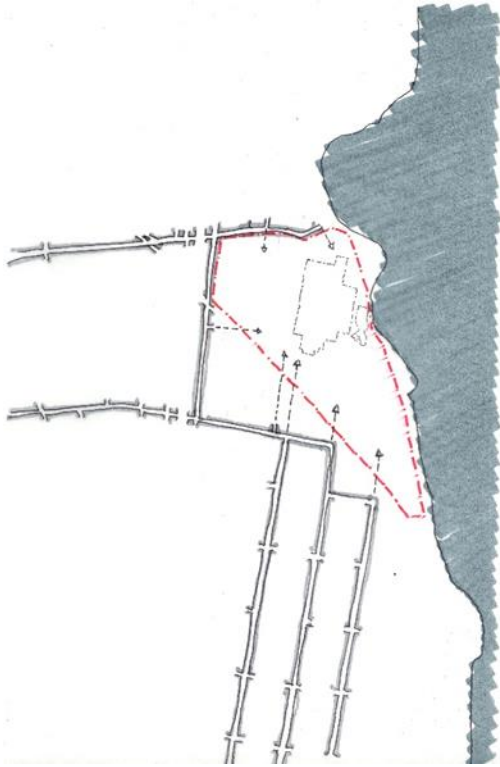


Figure 37: Extending Existing Fabric of Grid (source: Author)

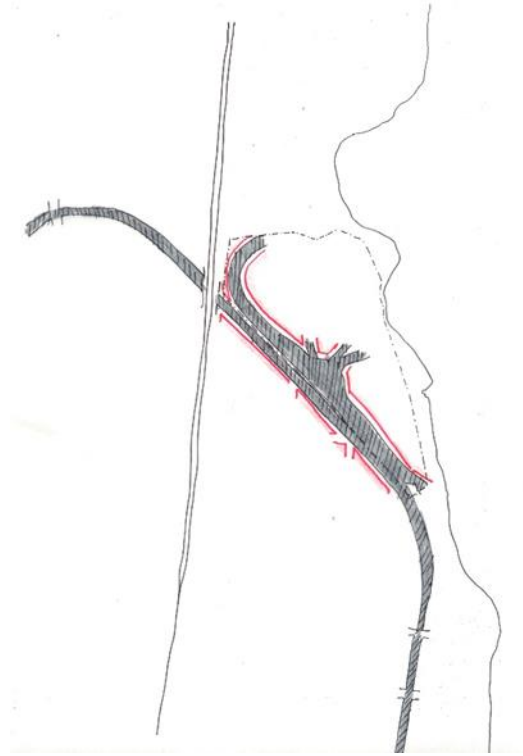


Figure 38: Railroad as A Divider (source: Author)



Figure 39: Existing Street Corridors for Site Entry (source: Author)



Figure 40: Dividing Site into Parcels (source: Author)

Chapter 6: Programmatic Elements & Precedent Studies

Establishing the Focus

Now with a site decided upon, the next phase of this thesis is to grasp a better understanding of just exactly what programmatic elements can and should be implemented into the design. Establishing a site allows for a clearer direction in terms of being able to begin calculating overall program sizing and organization on site. Acknowledging that the Valvaere is arguably the first building typology of its kind, the task of researching and analyzing precedents will prove that one must examine the largely diverse and individualistic wellness typologies that exist in the United States today.

As this industry continues to grow and new standards evolve, so too must the architectural practice and the buildings designed to respond to its needs. Key wellness program to consider for this thesis could have an extensively long list. However, to ensure all major objectives for this thesis are satisfied, major program criteria to review are; physical fitness, educational/academic, work, food/nutrition, health and hospitality, spiritual and place of worship, outdoor & indoor physical activity, private and communal space, and more.

Precedents

Health & Wellness Center – Western Oregon University, OR



Figure 42: Health & Wellness Center Exterior (source: Opsis Architects)



Figure 41: Health & Wellness Center Gymnasium (source: Opsis Architects)

Opsis Architects
Sports and Wellness Facility
3 Stories
Completed: 2011
Gross Square Footage: 113,000 sq. ft.
LEED Gold Certified

This precedent is a university sports and wellness facility for all students and faculty of the university. A state-of-the-art facility includes a mixed-use combination of student recreation, athletics, and over 20,000 sq. ft. of classrooms, labs, and facilities. Spaces are dedicated to but limited to cardio and weight areas, multipurpose courts, multipurpose studio rooms for dance, yoga, martial arts, aerobics, and spinning, a climbing wall, and a cantilevered running track. Its LEED Gold certification implements natural ventilation and daylighting strategies including sunshades, operable windows, and skylights.

Willowbrook MLK Wellness Community – Southern Los Angeles, CA



Figure 43: Willowbrook MLK Masterplan & Concept (source: Gensler)

Gensler
Wellness Community Masterplan
Status: In Progress
Total Acreage: 42

The Willowbrook MLK Wellness community is a precedent that quite literally translates this thesis into a much larger scale of urban master planning. This project utilizes the new existing infrastructure of medical facilities on campus as the first initiative to re-establish the context of health and wellness, while also promoting social, economic, and environmental quality for South Los Angeles. The major design intent of this master plan is shown on the bottom right image above. A “wellness spine” open spaces that increases connectivity across the campus and promotes physical activity and a sustainable environment.

The Mirai (The Future) – Oberhausen, Germany



Figure 44: The Mirai (source: RSG Group)

RSG Group

Physical Fitness

3 Stories

Status: In Progress

Total Gross Square Footage: 592015 sq. ft.

This precedent is no ordinary gym or fitness center. The Mirai, which will be built and located in Oberhausen, Germany aims to reach out to people who have previously had little or no direct contact with fitness. With interactive events and experience zones, fitness studios and training methods, an aqua fitness center, and sky run that traces the entire building will become a mecca for inspiring those who want to be motivated to become more physically active in their day to day lives and seek a new healthy lifestyle. The most intriguing aspect of this new concept is that all memberships are free. The Mirai seeks to accommodate people of all ages and social classes.

INSCAPE – Manhattan, New York, NY



Figure 45: INSCAPE Meditation Space (source: Frederick Charles)

Archi -Tectonics
Hospitality + Sport + Wellness/Spa
3 Stories
Completed: 2016
Total Gross Square Footage: 5,000 – 10,000
sq. ft.

This precedent looks towards a different meaning for the term wellness. INSCAPE, a meditative concept located in Manhattan, NY, of

a singular room that is formed like a rounded tent. With natural materials that absorb humidity and special aroma therapy filtration systems, one begins to feel a sense of comfort within this space. As Archi-tectonics states, “meditation requires a different state of mind – A transition into a completely ‘other’ space with an immersive light and sound environment can completely transform one’s mood and state of mind...”³³ The significance of this precedent analyzes an individual’s well-being through a cognitive sense rather than physical.

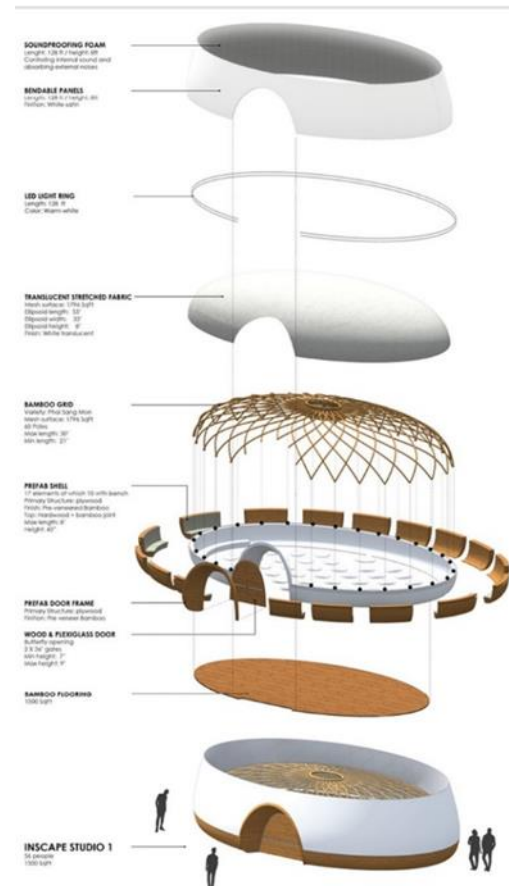


Figure 46: Exploded Axonometric (source: Archi - Tectonics)

³³ “INSCAPE.” Architizer, <https://architizer.com/projects/inscape/>.

Value Farm - Shenzhen, China



Figure 47: Value Farm Crop Grounds (source: Value Farm)



Figure 48: Aerial View (source: Value Farm)

Thomas Chung
Landscape Architecture + Urban Farming
Former Guangdong Float Glass Factory
Completed: 2013
Total Gross Square Footage: 87402 sq. ft.

Value Farm is an initiative to break away from the densely urban populated city of Hong Kong and re-envision a responsible eco-revitalization. This precedent explores how urban farming in the city can mesh with community-building and post-industrial regeneration. Value Farm is located on the former 87,402 sf. Guangdong Glass Factory site in Shekou. Using the old structures such as staircase cores, old walls and other brick platforms, Value Farm finds an innovative strategy to reuse the old factory that once stood there. By revealing existing site qualities, the new site invokes a sense of enclosed gardens configured for farming and physical cultivation.³⁴

³⁴ “Thomas Chung: Value Farm.” arthitecturalcom Thomas Chung Value Farm Comments. Accessed December 14, 2019. <https://www.arthitectural.com/thomas-chung-value-farm/>.

Program Tabulations

GCSU Wellness & Recreation Center – Milledgeville, GA



Figure 49: GCSU Wellness & Recreation Center (source: CannonDesign)



Figure 50: GCSU Wellness & Recreation Center Site Plan (source: CannonDesign)

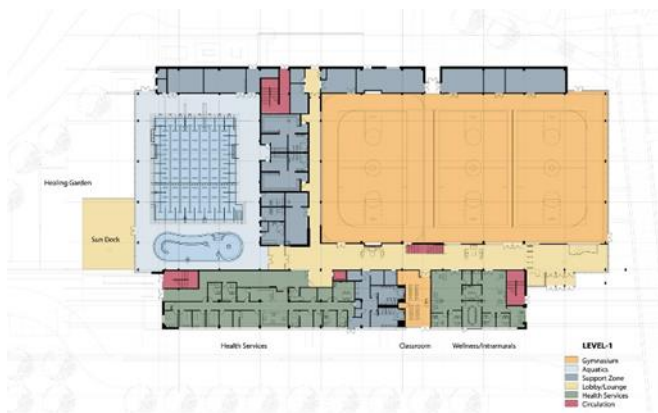


Figure 54: Ground Floor Plan (source: CannonDesign)

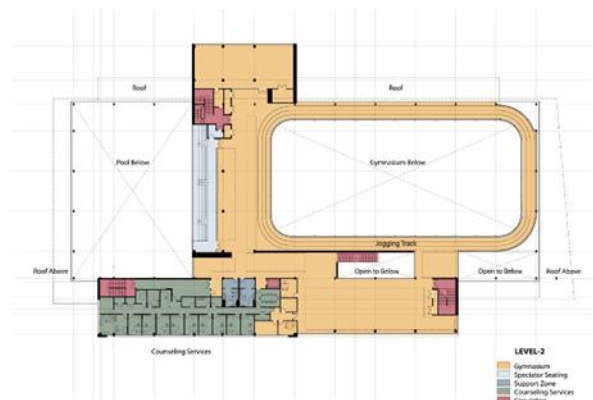


Figure 53: 2nd Floor Plan (source: CannonDesign)

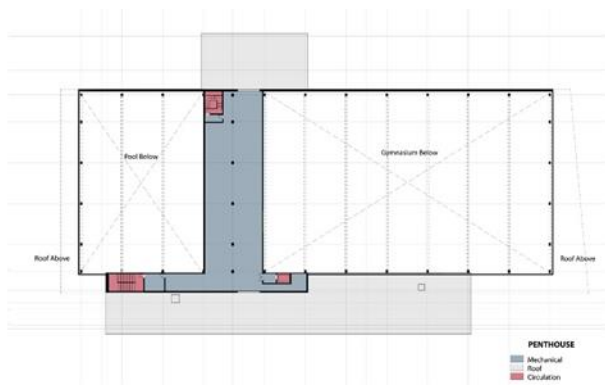


Figure 52: Penthouse Floor Plan (source: CannonDesign)

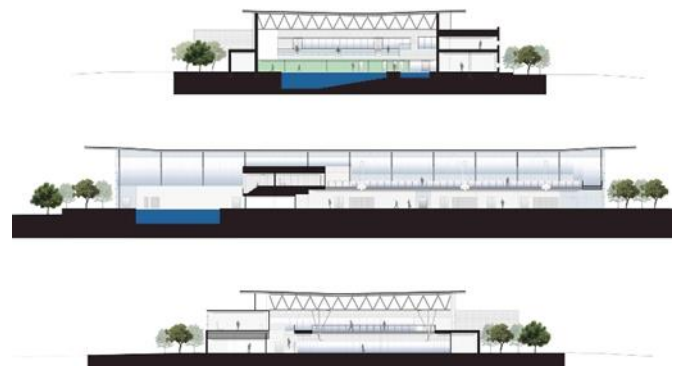


Figure 51: Building Sections (source: CannonDesign)

This final precedent, the Georgia College and State University Wellness and Recreation Center (Figure 48), designed by CannonDesign and Winer + Menefee Architects, shows a break down through graphic analysis of program tabulations. In these tabulations are all the essential descriptions as to what each project consists of in terms of rooms and designated spaces.

The first tabulation (Figure 54) is representative of GCSU and the second (Figure 55) represents a theoretical trajectory of the Valvaere moving forward in the design process. This useful exercise assists in helping one to grasp and understand programmatic sizing and total square footage use. The GCSU Wellness & Rec Center has a similar correlation to both size and programmatic use in which the Valvaere will consist of. At total Gross Square Footage (GSF) of 120,000, GCSU provides majority of programmatic elements one would recognize in the Valvaere. However, the

Valvaere is more than just a fitness center, more than just a place for deep meditation, more than just an environment to learn and work. The Valvaere aims to concentrate on all of these elements and more. Becoming the first place of its kind to embody all conditions of human well-being.

Room/Space Description	Quantity	Size
FITNESS		
Centennial Outdoor Pool	1	75' x 45', 6 lane outdoor pool
Classrooms	28	100 - 225 Sq Ft
Climbing Wall	1	
Court	1	4,200 Sq Ft
Fitness Floor	1	6,600 Sq Ft
Group Fitness Studio	1	1,500 Sq Ft
Indoor Track	1	3 lanes
Lobby	1	1,300 Sq Ft
Multipurpose Court	3	21,500 Sq Ft
Multipurpose Field	4	
Outdoor Basketball Court	1	
Pool I Leisure/Therapy	1	1,000 sq ft
Pool I Recreation/Lap	1	25 Yard, 8- Lane Recreation Pool
Pool I Patio	2	11,400 Sq Ft
Softball Fields	1	1,900 Sq Ft
Stadium Pool Seating	1	
Tennis Court	1	
Village Field	1	
Volleyball Beach Court	1	
ADMINISTRATION		
Offices	9	2,300 Sq Ft
EGRESS		
Stairs	5	1,355 Sq Ft
SUPPORT		
Locker Rooms	6	5,800 Sq Ft
Total		
Project Cost		\$28.2 million
Total Net Sq. Ft.		105,000 Sq. Ft.
Total Gross Sq Ft.		120,000 Sq. Ft.

Figure 55: GCSU Wellness & Recreation Center Program Tabulation (source: Author)

Room/Area Description	Quantity	Size
FITNESS		
Recreation Pool	1	85' x 45', 8 lane
Lesiure Pool	1	1,000 Sq Ft
Fitness Floor	1	8,000 Sq Ft
Group Fitness Studio	5	3,000 - 3,500 Sq Ft
Indoor Track	1	3 - 4 lanes
Climbing Wall	1	
Multipurpose Court	3	22,000 Sq Ft
Outdoor Running Trail	1	1 mile
Pool Patio	1	2,000 Sq Ft
Multi Purpose Field(s)	3	150' x 300'
Outdoor Basketball Court(s)	3	50' x 94"
Tennis Court(s)	3	60' x 120'
EDUCATION		
Classroom/Conference	15	100 - 225 Sq Ft
Library	1	3,000 Sq Ft
Break Out Room(s)	10	70 - 90 Sq Ft
Lobby	1	1,300 Sq Ft
Large Lecture (seating 120)	1	1,200 Sq Ft
Large Multi Purpose Meeting	2	750 Sq Ft
Computer Lab	1	675 Sq Ft
ADMINISTRATION		
Reception	1	150 Sq Ft
Large Offices	4	140 Sq Ft
Small Offices	6	100 Sq Ft
Lobby	1	1,300 Sq Ft
Supply Room	3	40 Sq Ft
EGRESS		
Stairs	4	500 - 750 Sq Ft
Elevators	6	
SUPPORT		
Locker Rooms (Male)	2	500 Sq Ft
Locker Rooms (Female)	2	350 Sq Ft
Sauna(s)	4	4' x 8'
Mechanical/Electrical	2	2,300 Sq Ft
Attendee Toilets (Male)	8	180 Sq Ft
Attendee Toilets (Female)	8	180 Sq Ft
Meeting Room Storage	1	60 Sq Ft
Equipment Repair Storage	1	200 Sq Ft
TOTAL		
Project Cost		\$\$\$\$\$\$\$
Total Net Sq. Ft.		180,000 Sq. Ft.
Total Gross Sq Ft.		200,000 Sq. Ft.

Figure 56: The Valvaere Program Tabulation (source: Author)

Chapter 7: Design Proposal

Parti

The main idea of this thesis is incorporating and showcasing the multitude of ways an individual can define their own well-being. The final vision of the former Potomac River Generating Station intends to enrich and re-envision the post-industrial urban infrastructure that remains rather than demolishing it all and starting new. (Figure 57) This proposal tackles issues of environmental health and human health through architecture, adaptive re-use, landscape and urban design strategies that activate a connection to nature, brings oneself closer to a better state of mental and physical well-being, and opens more sustainable opportunities for further future development in similar site locations across the United States.



Figure 57: The Velveare - Aerial (source: Author)

Urban Scale

Looking at the city of Alexandria as a whole, the urban strategy of this design proposal aims to connect people to multiple points around the city that could further promote physical activity and connectivity to nearby regions. In figure 58 below, we see how by using the existing the train tracks on site that were once used to bring coal shipments in from the regional rail can now be converted into a small northern district line going from the Braddock Metro Station, around the northern part of Alexandria to two new stations along the Potomac.

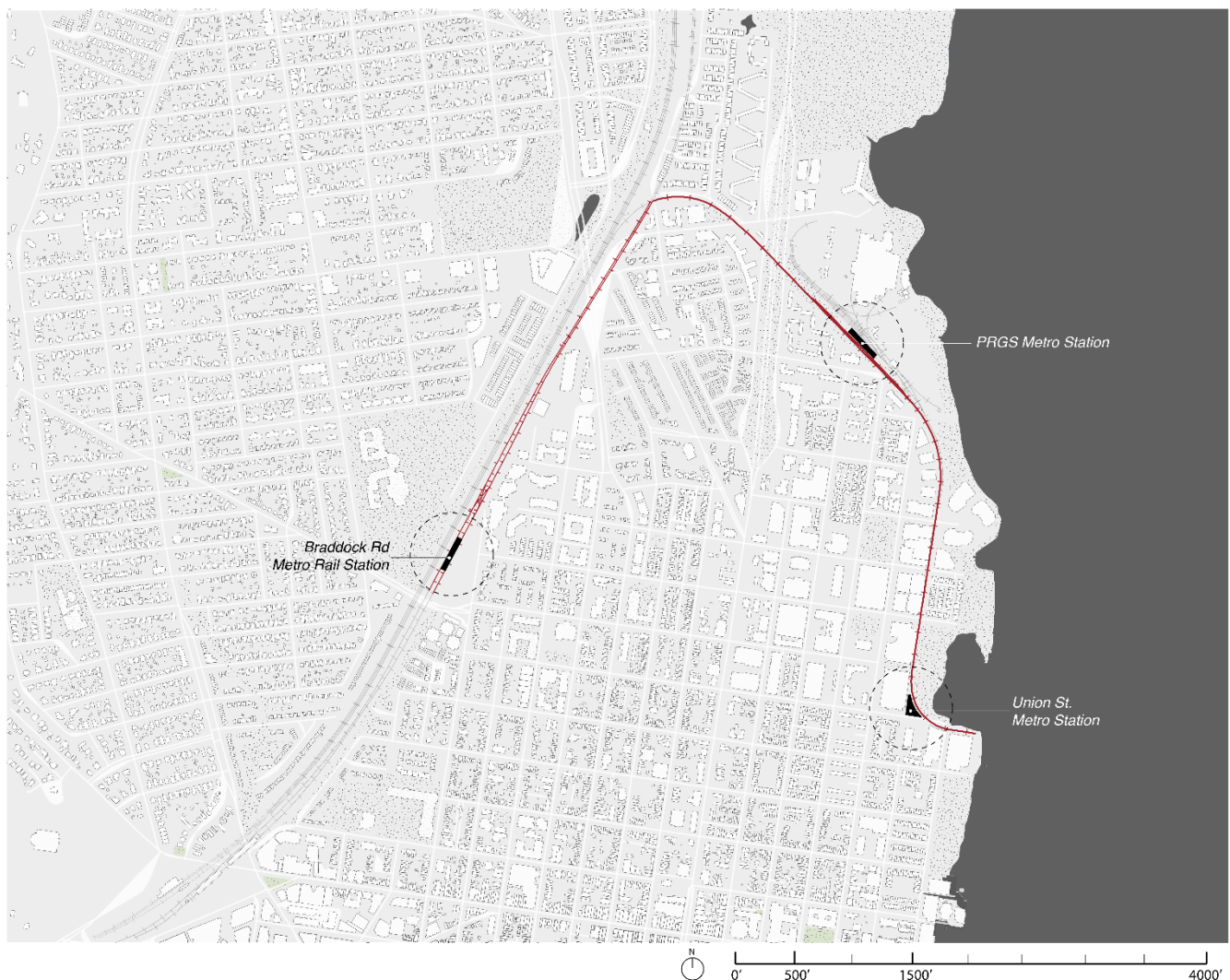


Figure 58: Integrating A New Metro Line (source: Author)

From there, utilizing the existing streetscape of Alexandria's neighborhoods, a new “wellness loop” is mapped out to promote physical activity once again among Alexandria residents. (figure 59)

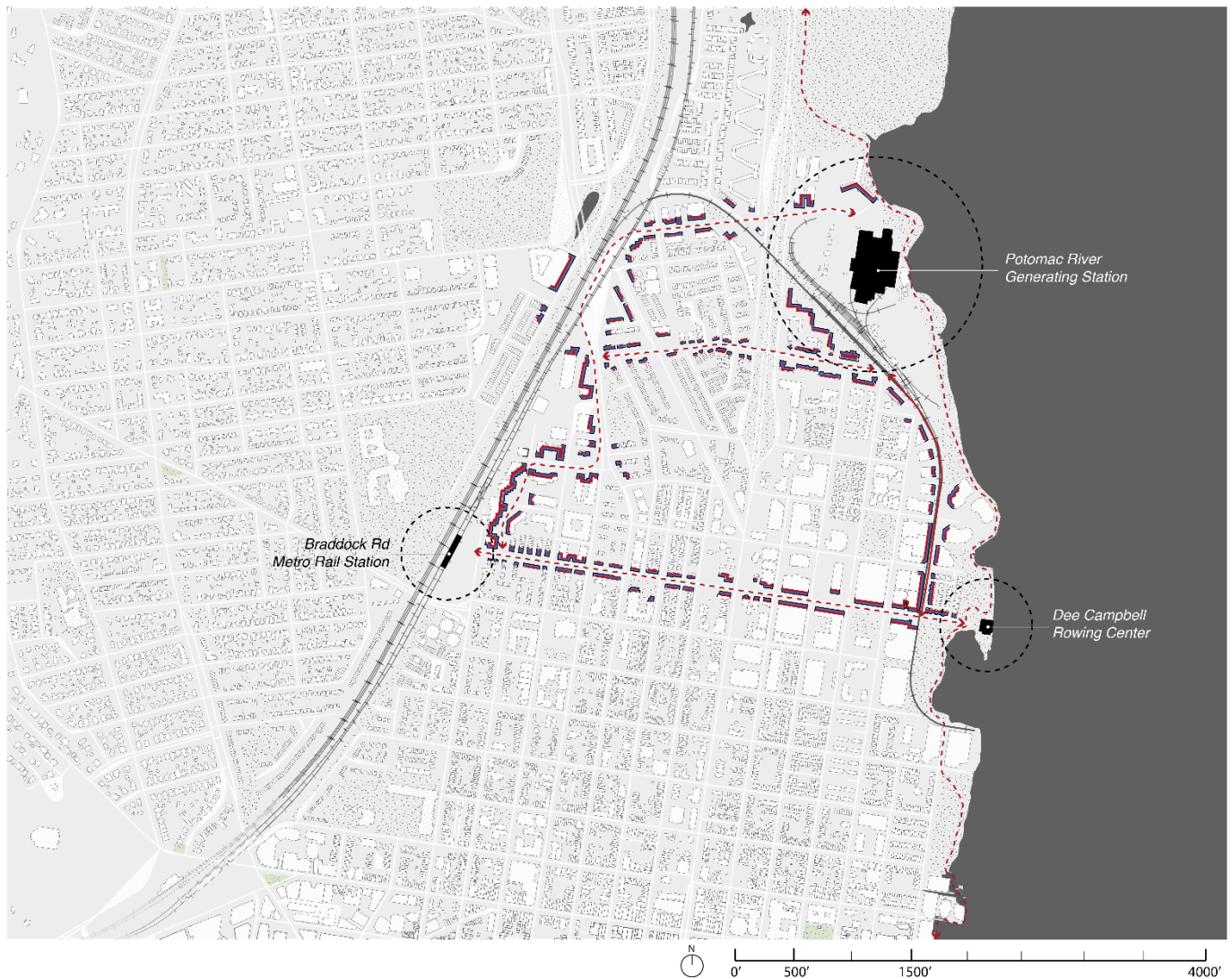


Figure 59: Urban Wellness Loop (source: Author)

3 Phase Proposal

With all that needs to be done to this site to successfully carry out the vision intended; it must be broken up into a phased project (Figure 60).



Figure 60: Phase 1 (source: Author)

Here in phase 1, we have one of the most critical steps of the entire project. To phytoremediate and decontaminate the entire site's soil and ground water from the coal mound and hazardous pollutants that have leaked from two 25,000-gal underground storage tanks (UST's) before decommissioning (Figure 61). Specific

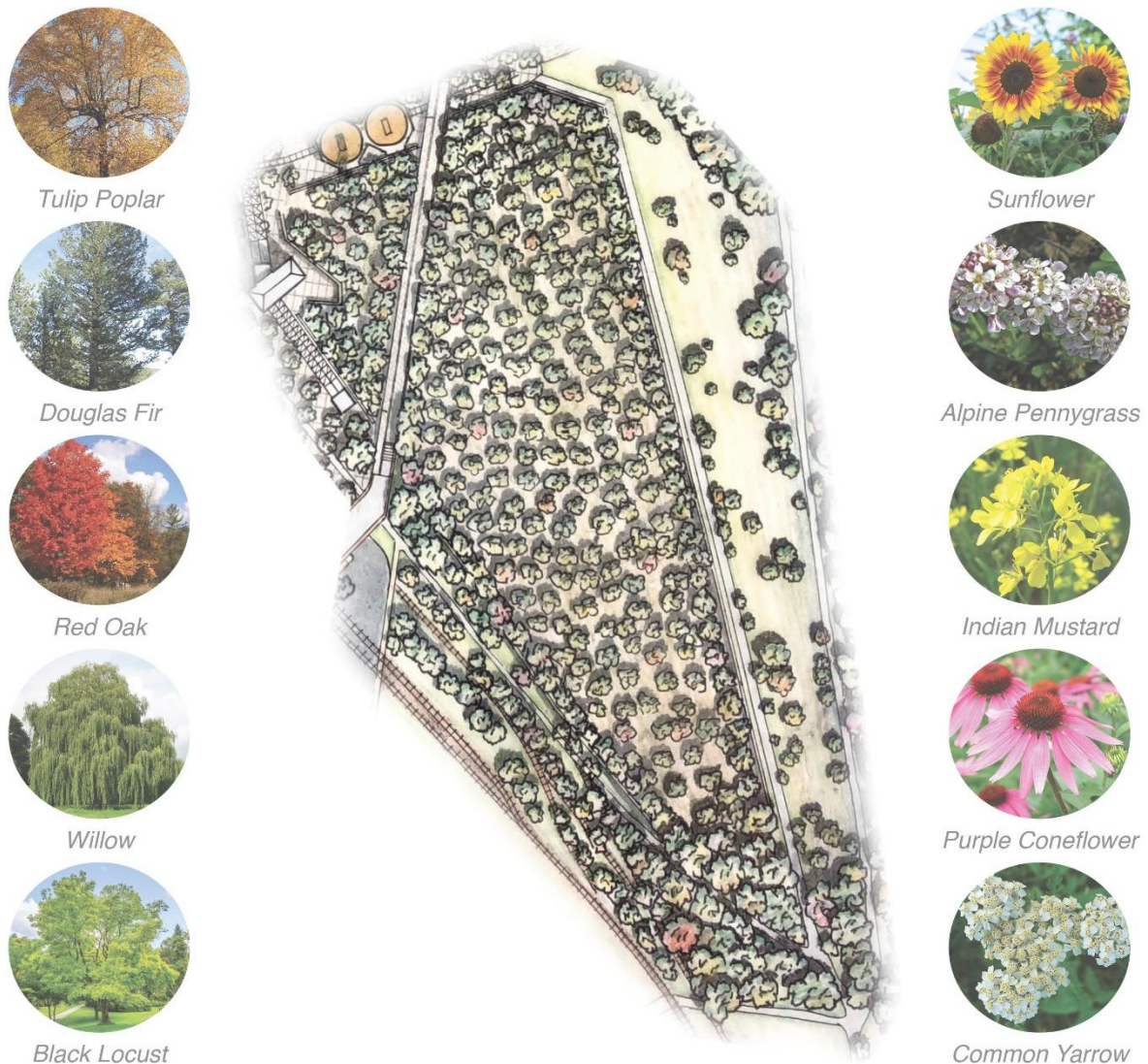


Figure 61: Phase 1 Coal Mound Phytoremediation (source: Author)

herbaceous vegetation and tree species were planted amongst the site that have favorable qualities of phytoremediation while also sequestering carbon and having a shorter growth timeline such Willows, Tulip Poplars, Black Locusts, Red Oaks and more.

Phase 1 also consists of the new metro line and a new parking lot (Figure 62) made entirely out pervious pavers for rainwater filtration and better tree planting growth to connect to Alexandria/s multi-modal public transit.

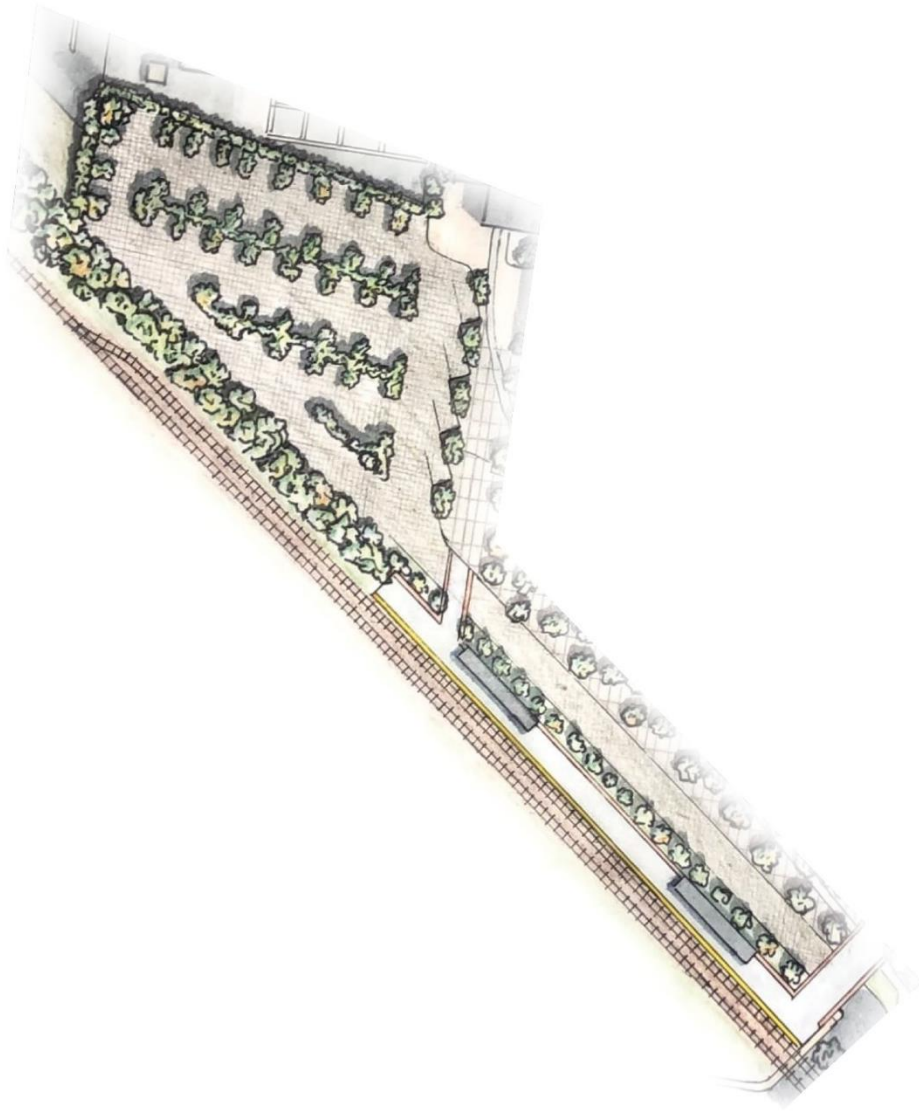


Figure 62: New Metro Stop and Parking Lot (source: Author)

In part 3 of phase 1 (Figure 63), there is a major focus on connecting to the outdoors of the existing infrastructure of the plant. Additionally, more public outdoor program is introduced to create incentive and recreational purpose to the site.



Figure 63: *The Bosque & Pier* (source: Author)

As you enter the bosque you walk through the threshold made up of the former ash conveyor belts. As you enter the site and walk along the main promenade, you see all the new forestry and vegetation healing the site. At the end of both of these paths, you find yourself approaching the new public pier with a floating pool and kayak launch

to the East. While to the West, you find the staircases that lead you to existing catwalks amongst the scaffolding and ductwork of the power plant.

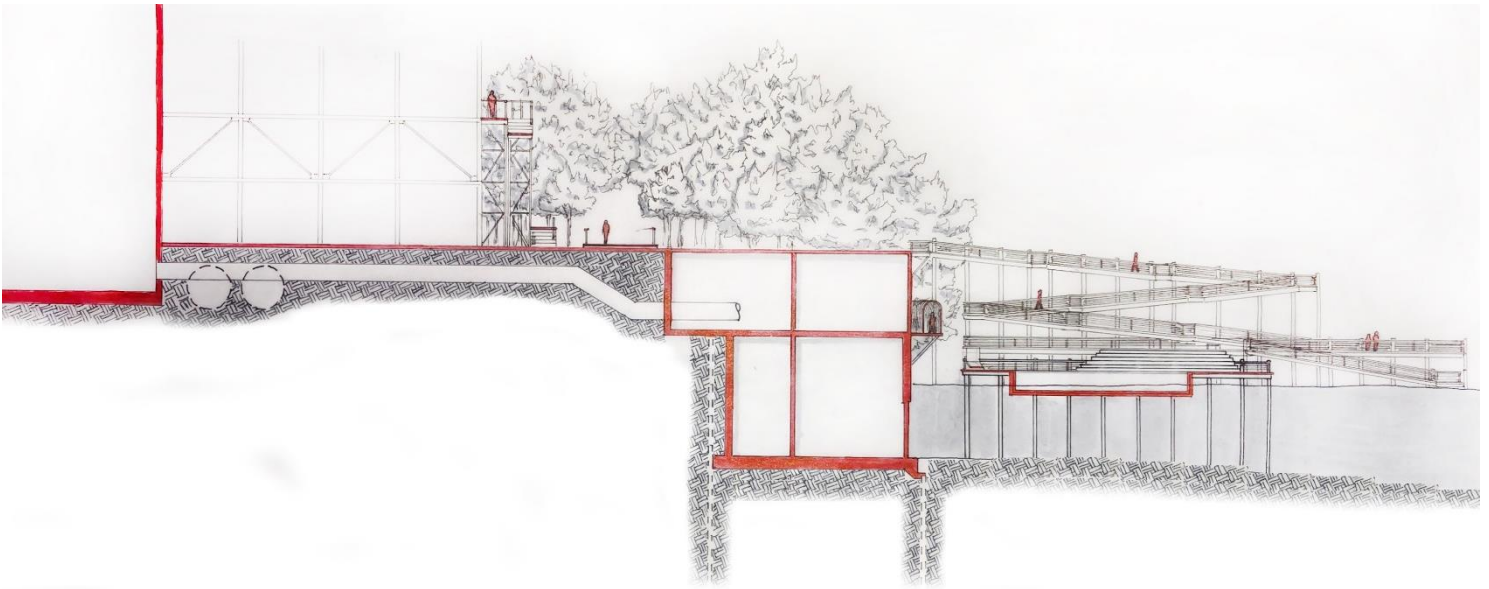


Figure 64: South Section through Catwalks, Plaza, and Pier (source: Author)

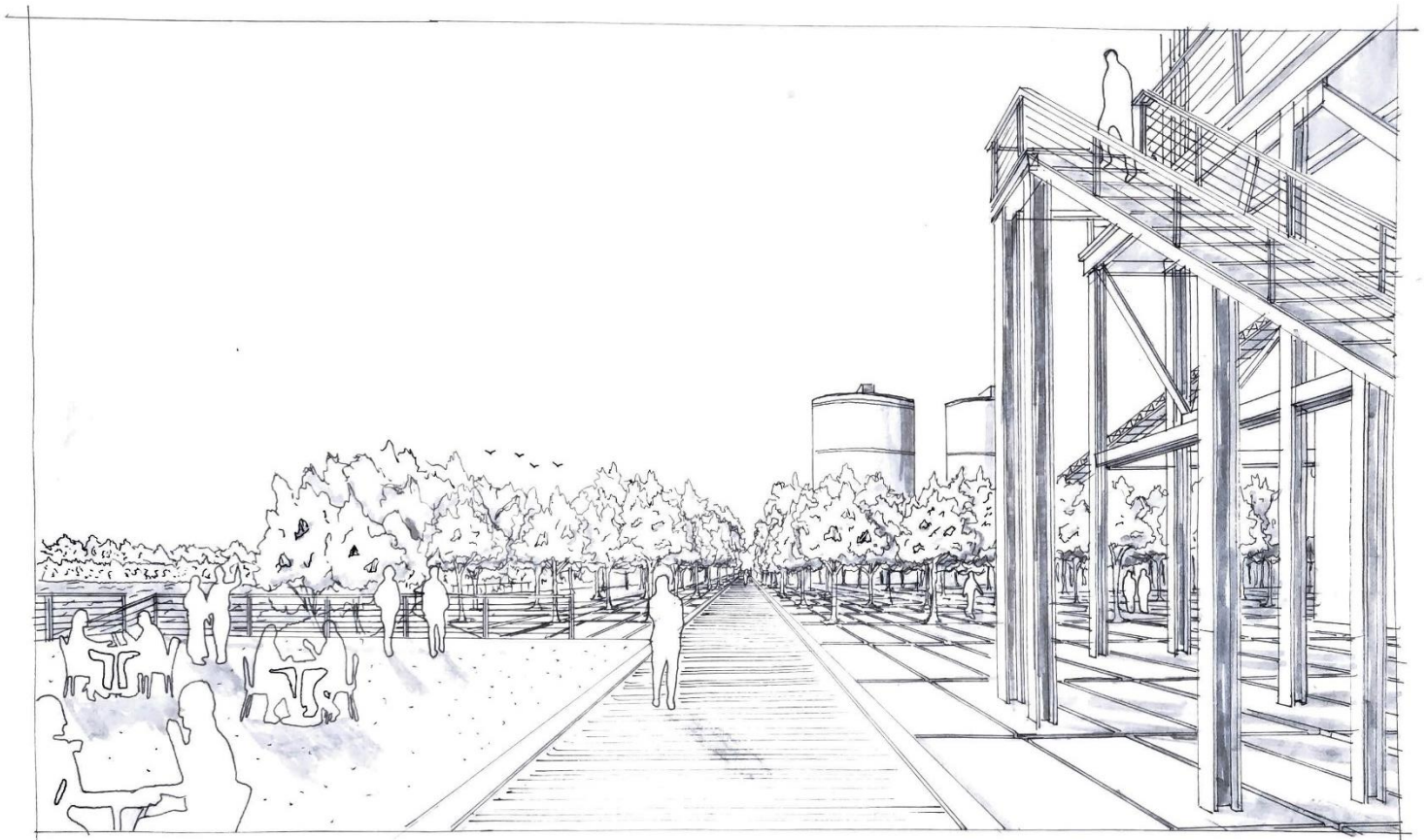


Figure 65: The Bosque & Plaza (source: Author)

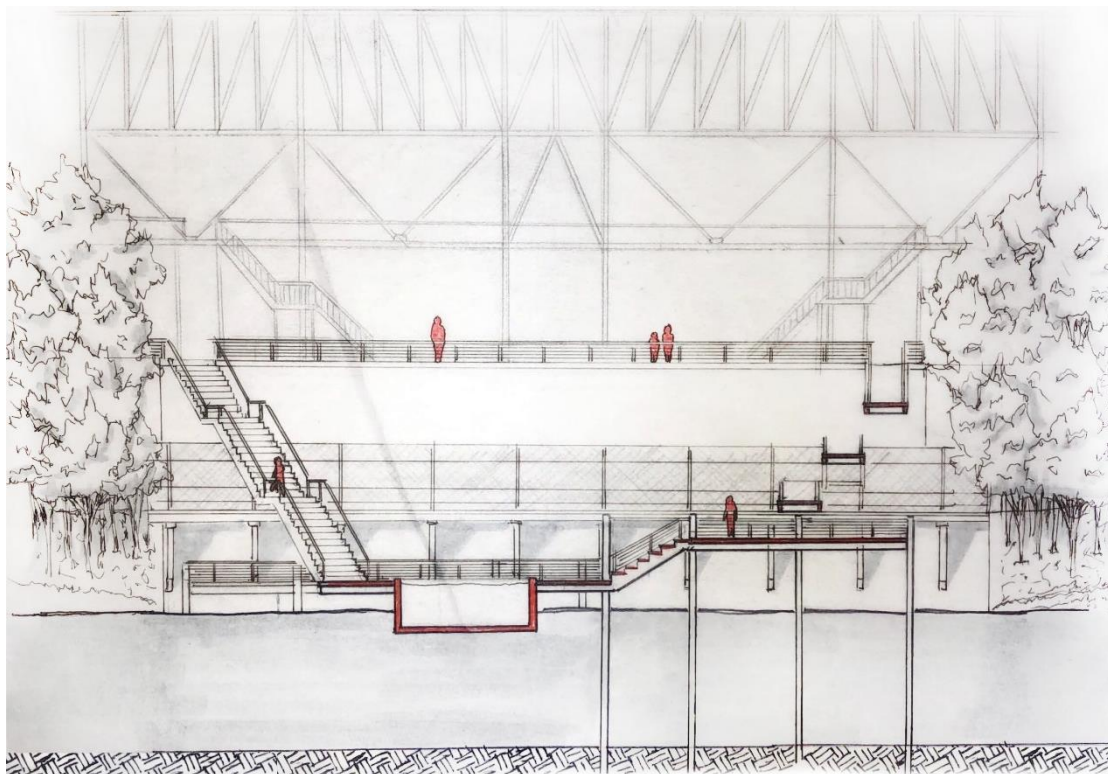


Figure 66: East Section through Public Pier and Floating Pool (source: Author)

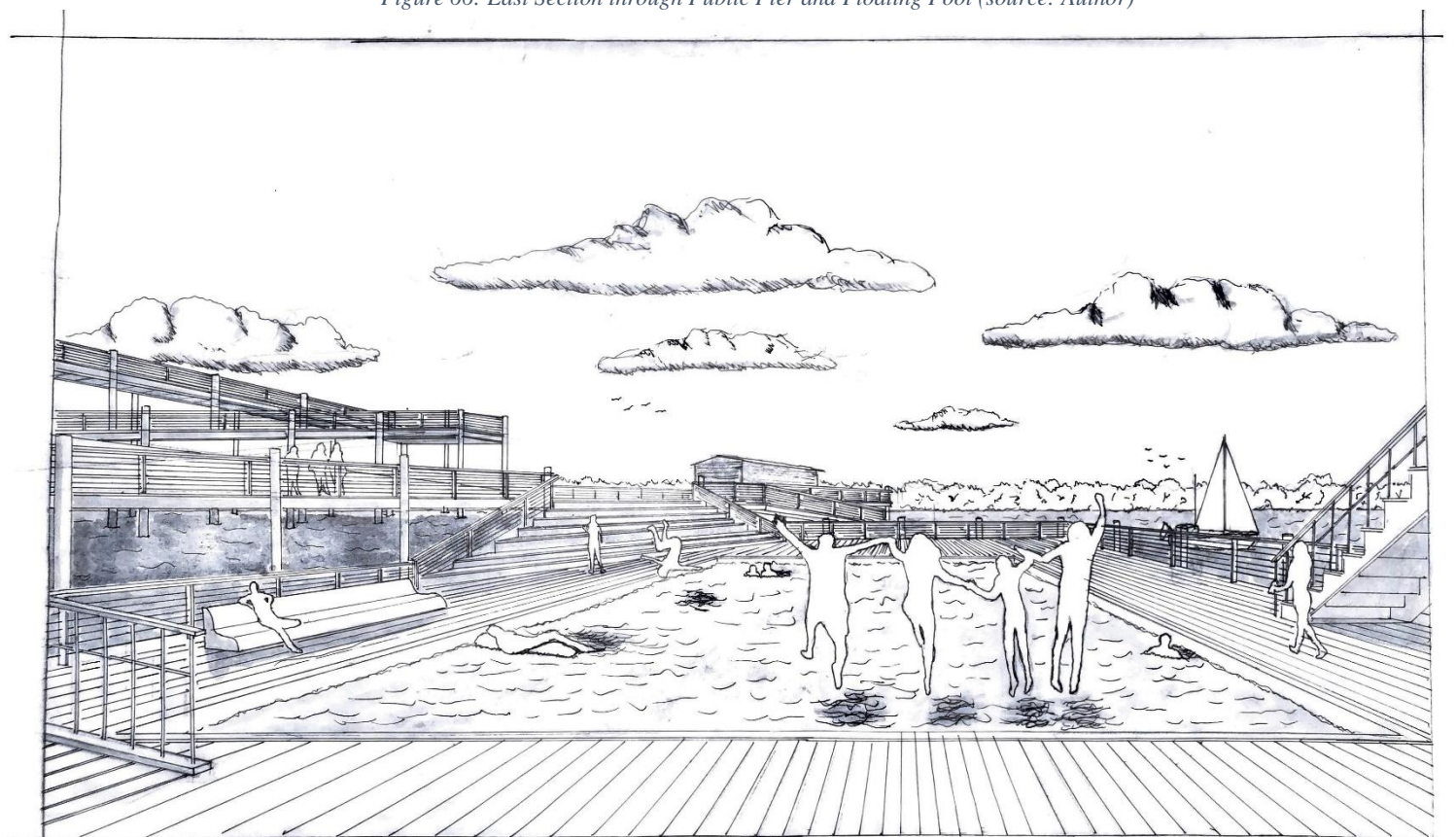


Figure 67: Pier Floating Pool (source: Author)

Phase



Figure 68: Phase 2 (source: Author)

Now in Phase 2 (Figure 68), we transition from outdoor to indoor, and through this transition, the growth and development of the forest and tree canopies

continue to phytoremediate and grow. Part 3 of phase 2 (Figure 69) also centers its attention around recreation and the physical fitness aspects of our well-being. By adaptively re-using a portion of the power plant, specifically the Turbine Room, we

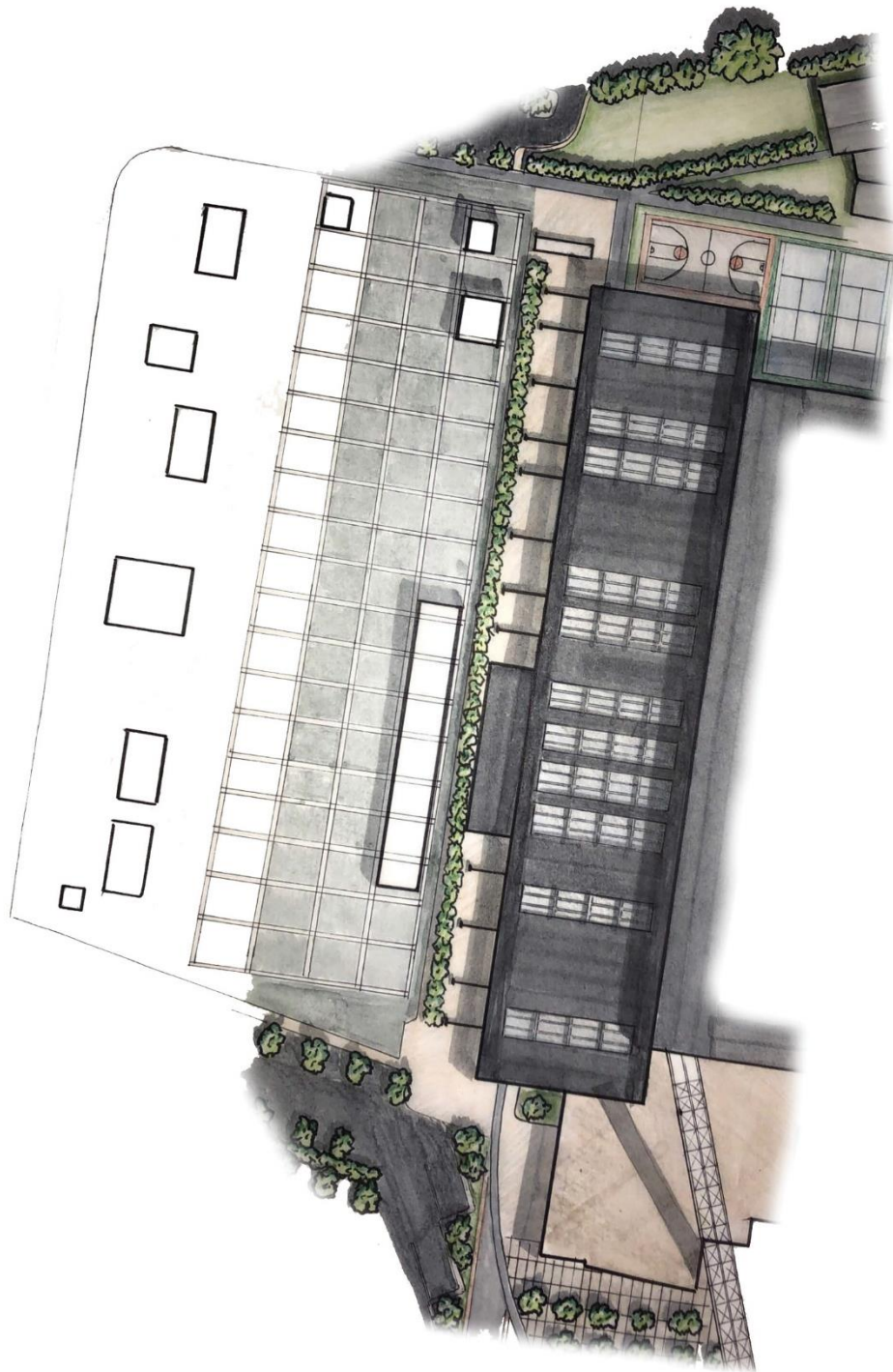


Figure 69: Phase 2 Turbine Room Re-Use (source: Author)

can manage to sustainably preserve and re-envision the existing industrial structure.

With a 500' x 85' open space with a metal truss system, we can utilize the space for larger public gathering spaces of recreation and socializing such as gallery spaces,

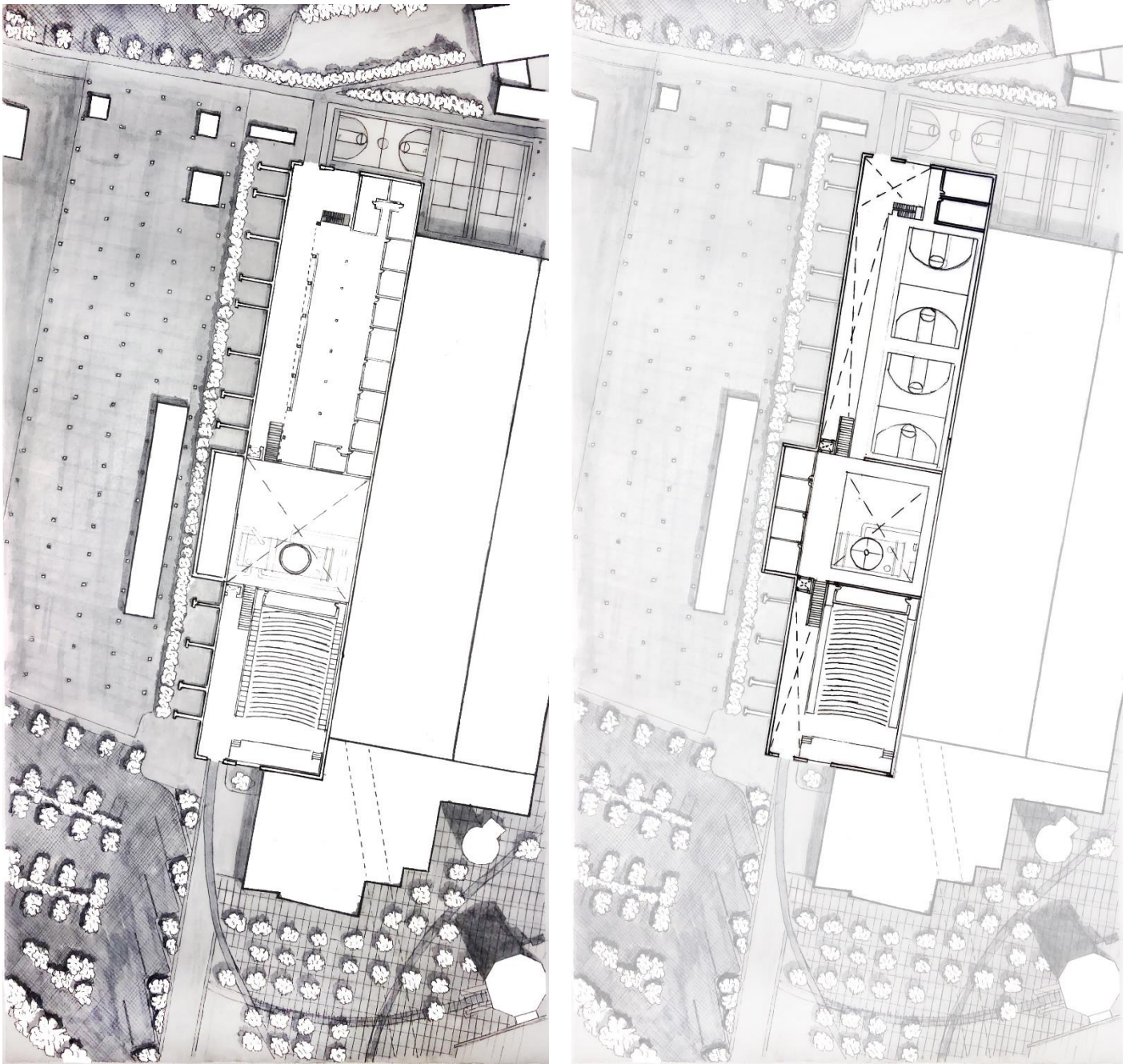


Figure 70: Turbine Room 1st & 2nd Floor Plans (source: Author)

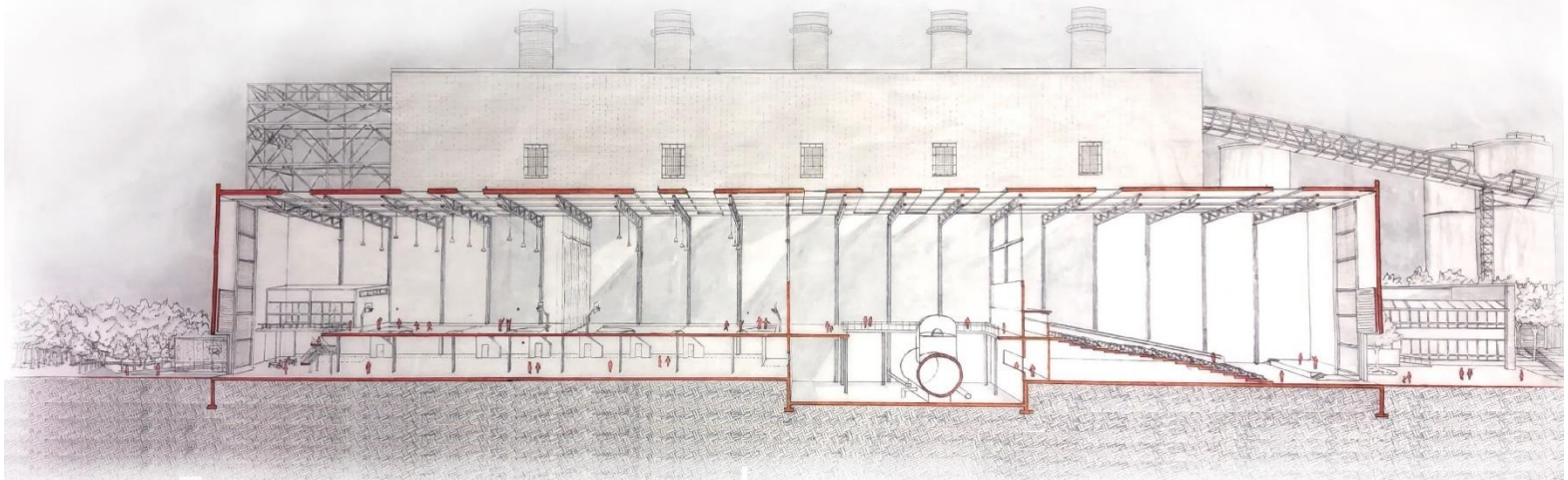


Figure 72: Section Perspective - Transformed Turbine Room (source: Author)

1. Control Board - Elec. Control Room
2. Electrical Equipment
3. Instrument & Service Air Receivers
4. Air Compressor
5. Air Comp. Gauge Board
6. Condensor Tube Withdrawal Space
7. Primary Condenser Pumps
8. Main Condensor
9. 80,000 kw Turbine Generator
10. Boiler Feed Pump
11. Pipe Gallery
12. Evaporator
13. Evaporator Condenser
14. Electrical Equipment
15. Hot Storage Tank
16. 150 ton Crane
17. Crane Rail
18. Steel Howe Truss
19. Elevator
20. Public Viewing Deck

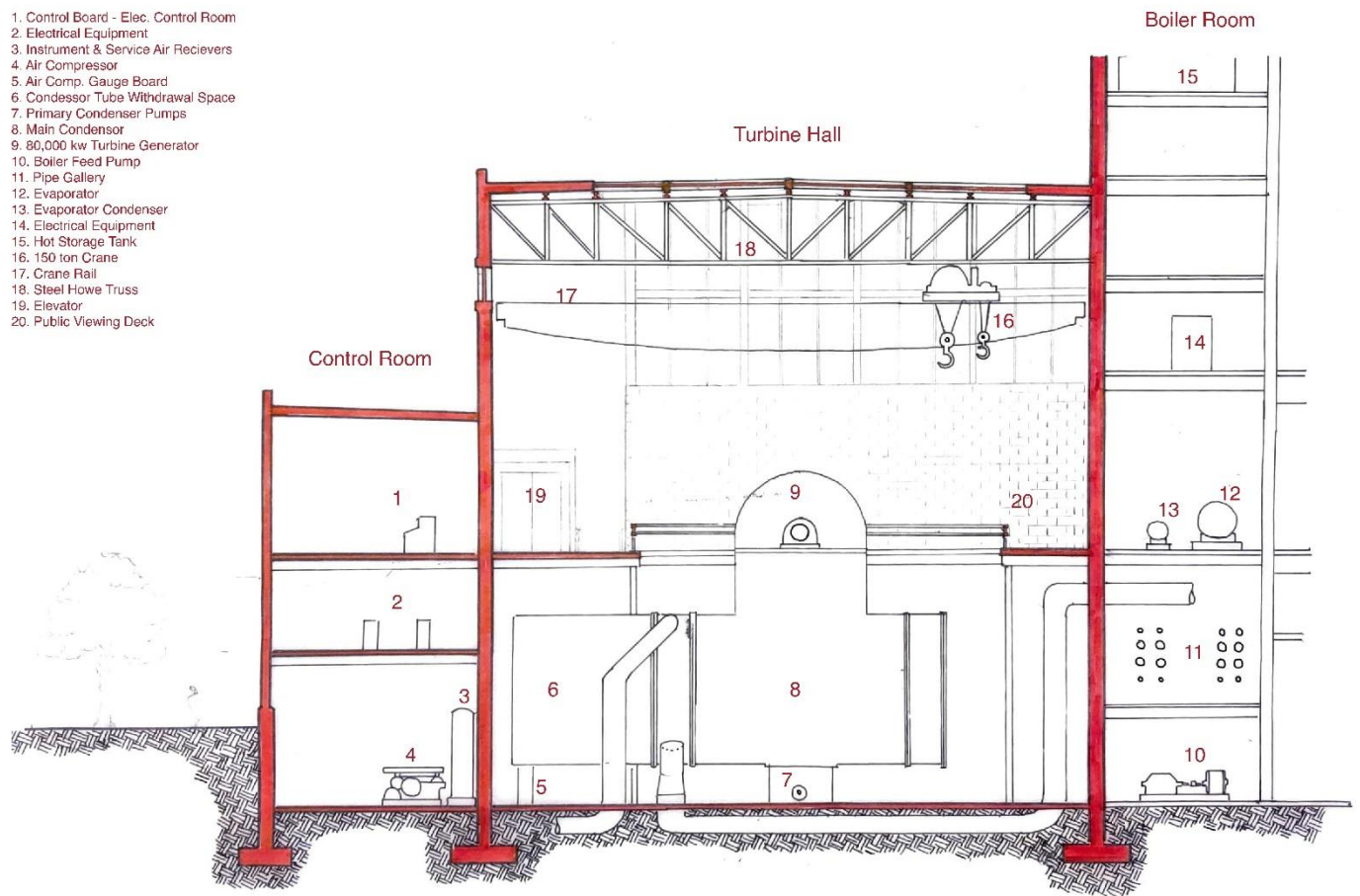


Figure 71: Turbine Room Section (source: Author)

athletic courts, fitness studios, and even a gym. The central zone acts as a preserved gallery space containing the former 80,000 kw turbine generator and a 1-ton crane suspended from the steel trusses above. The northern volume is reserved for physical fitness and recreation spaces. The first floor contains a large central flexible gym space while locker rooms and fitness classrooms surround the perimeter. The second floor holds two full size basketball courts and racquetball court spaces. Outside there is an additional hardscaped basketball and tennis court area made out of a recycled material called Mondo turf which is free of heavy metals, water resistant, and lasts up to 15 years.

Phase 3

In the final phase of the design (Figure 73), newly built architecture and landscape design predominantly occupy the site. A plethora of new health & wellness focused



Figure 73: Phase 3 (source: Author)

program are implemented, but this time, not for the physical, but the mental. In order to obtain a complete holistic balance of health and wellness, we must address our mental well-being just as much as the physical.



Figure 74: Phase 3 Landscape Design (source: Author)

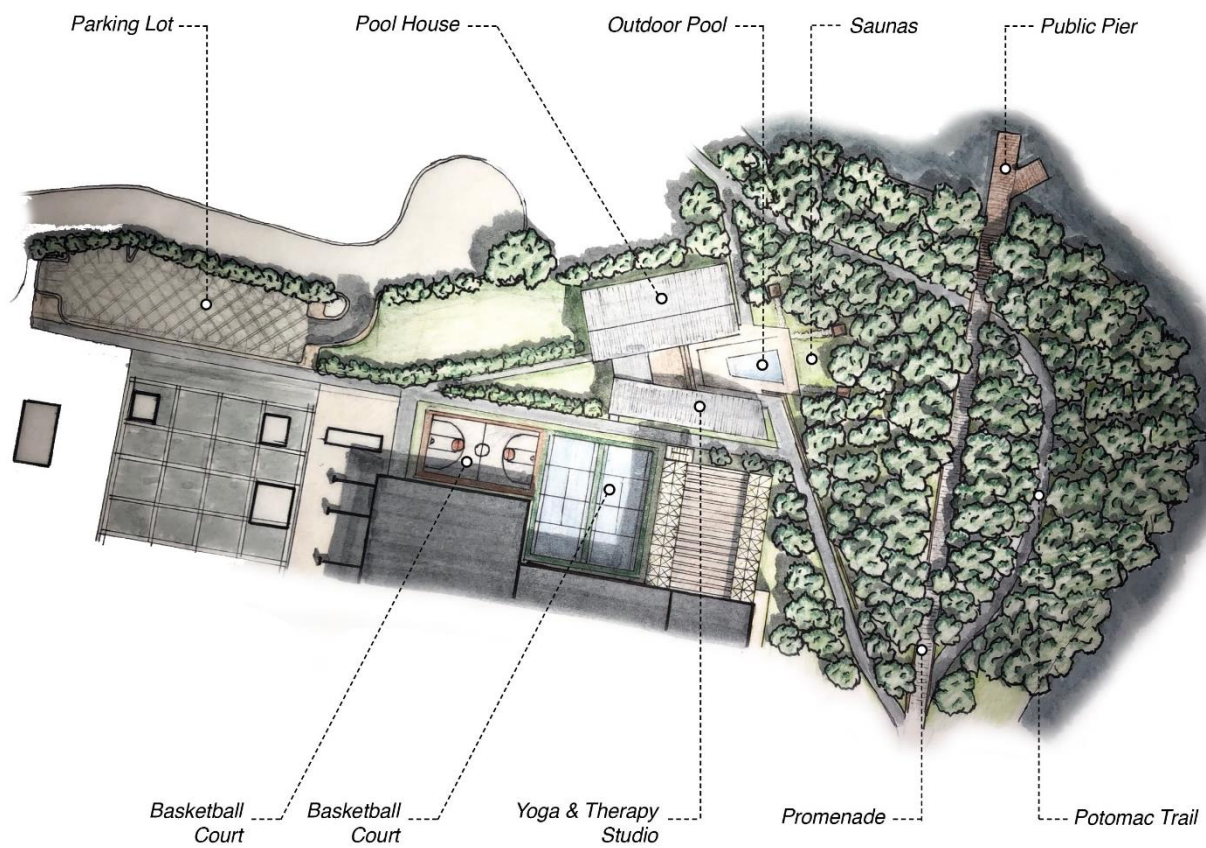


Figure 76: Phase 3 Pool House & Sauna Village (source: Author)

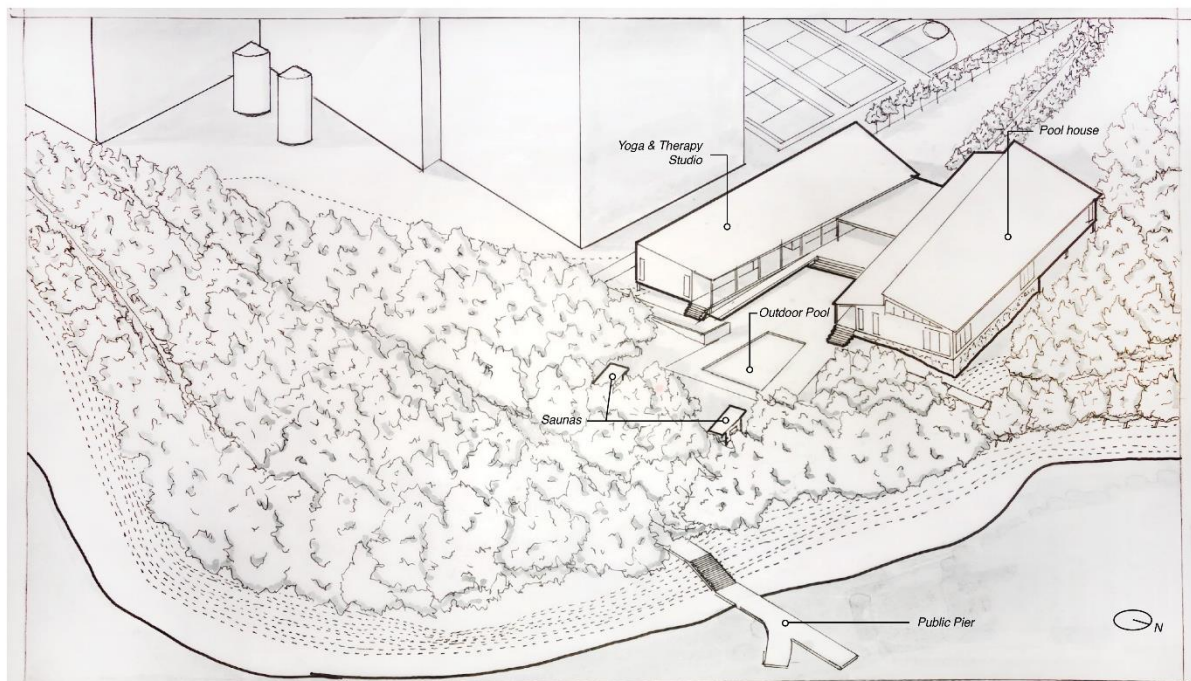


Figure 75: Village Axon (source: Author)

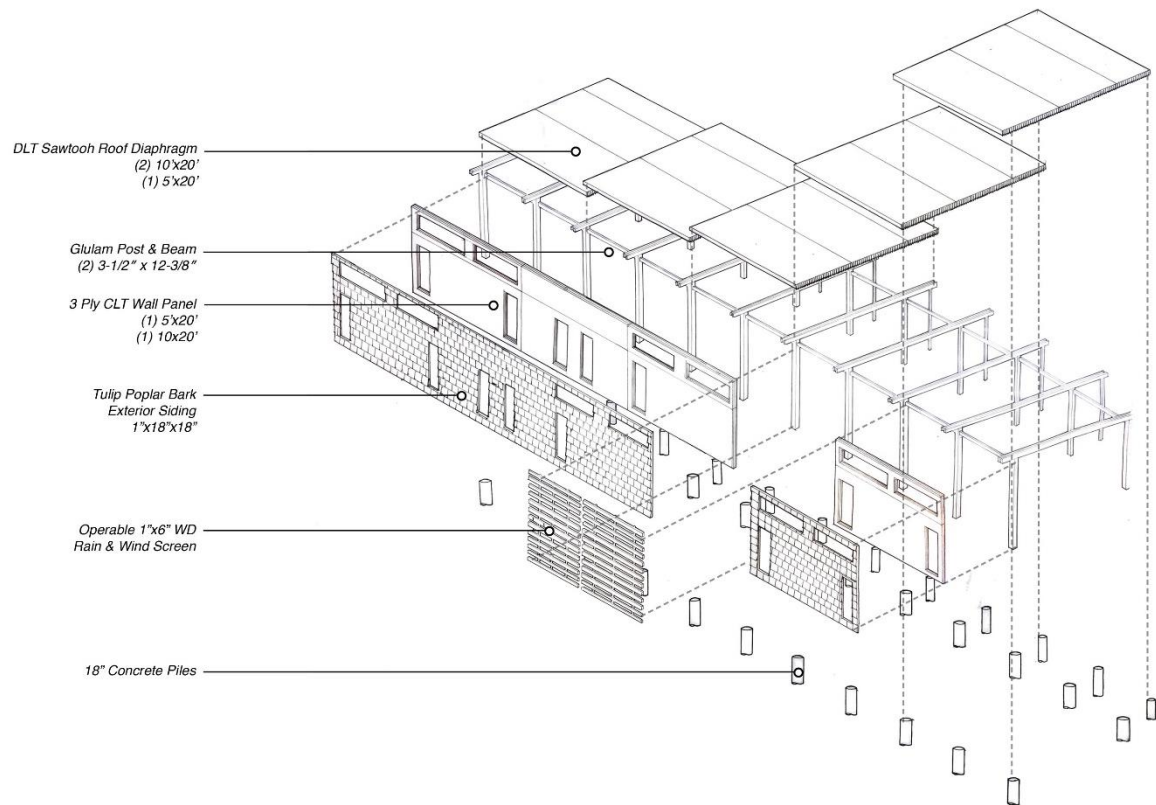


Figure 78: Therap & Yoga Studio Stuctural Axon (source: Author)

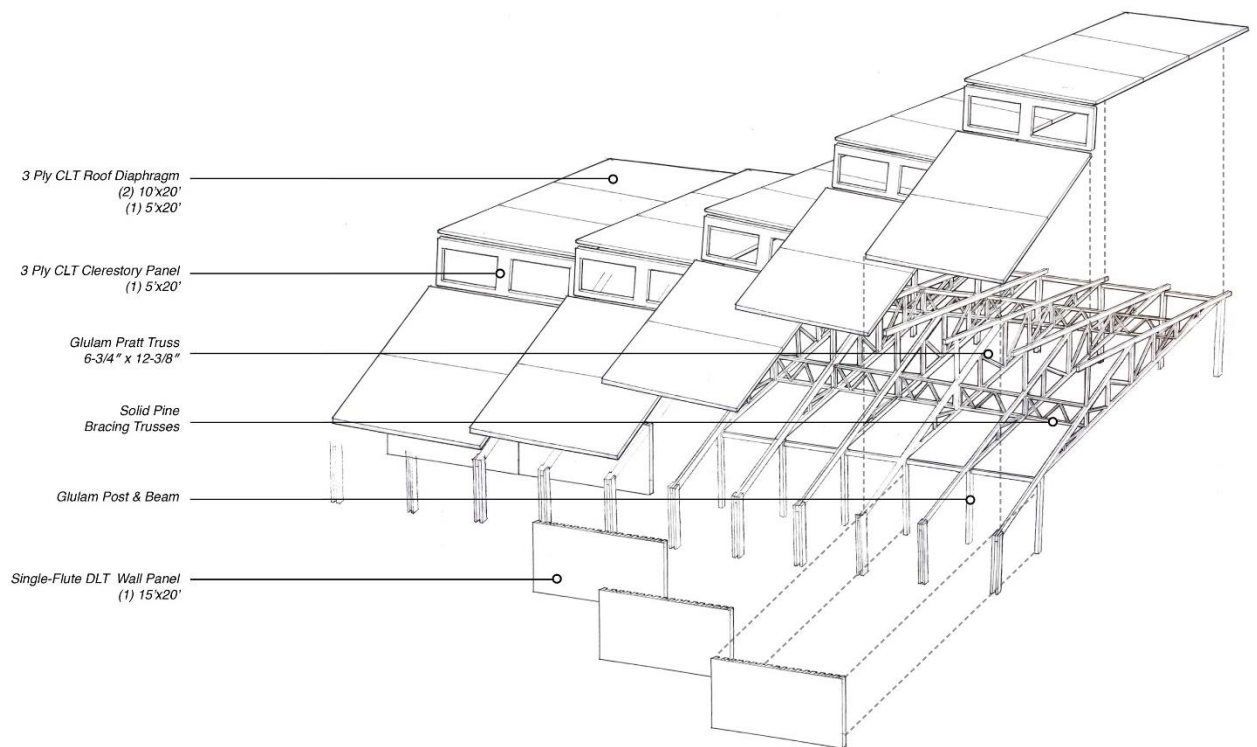
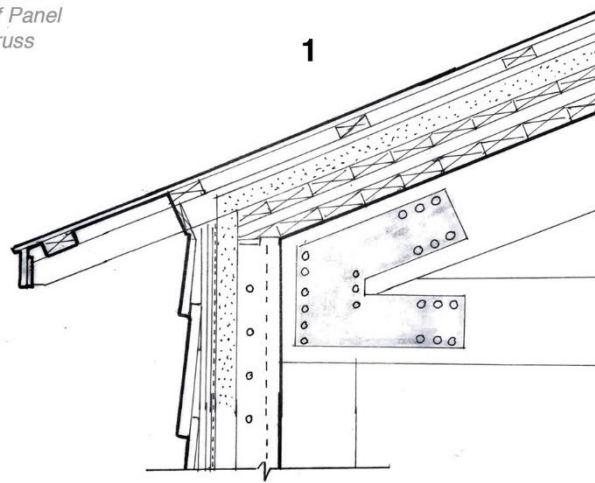


Figure 77: Pool House Structural Axon (source: Author)

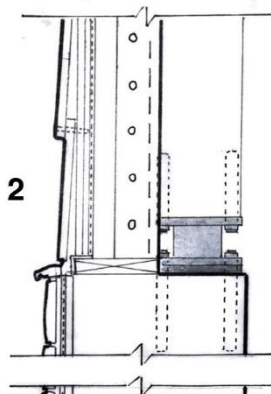
The key materiality choices of these buildings to note are heavy timber, and metal.

The timber is locally harvested on site from trees planted in phase 1 while the metal is recycled and reused from the ductwork and scaffolding armature of the power plant's smokestacks. The yoga and therapy studio utilize CLT & DLT paneling wrapped around a post and beam structural system with exterior tulip poplar bark siding.

- 1**
 Recycled Corrugated Metal Roof
 2" x 4" Purlins 24" O.C.
 2" x 6" Counter Purlins filled
 w/ XPS Rigid Foam
 3-Ply CLT Roof Panel
 Glulam Pratt Truss



- 2**
 Tulip Poplar Bark Siding
 Furring Strips
 5/8" Sheathing
 Waterproofing Membrane
 3" XPS Rigid Insulation
 Glulam Column set within
 Single Fluted DLT Wall



- 3**
 Stone Veneer
 Mortar Setting Bed
 Mortar Scratch Coat
 Metal Lath
 Cast in Place Concrete
 Foundation Weep



Figure 79: Wall Section Detail (source: Author)



Figure 81: Pool House (source: Author)

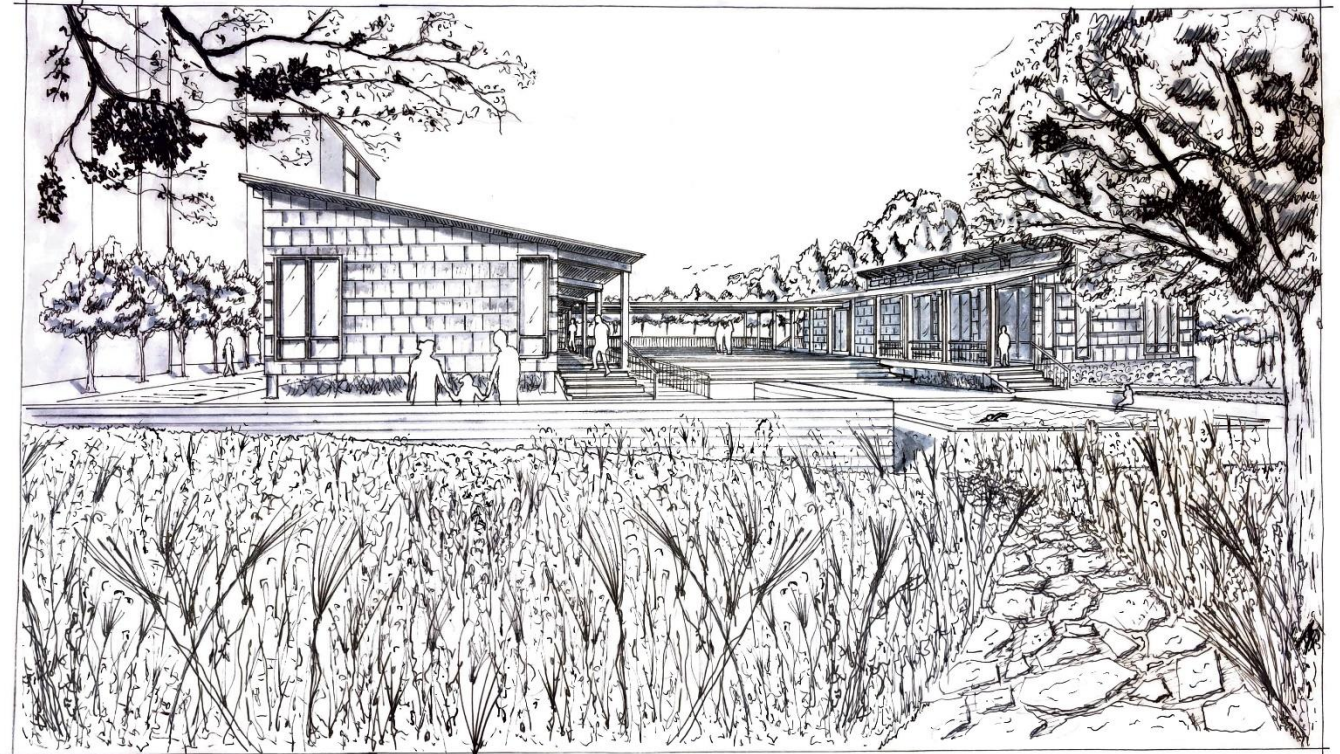


Figure 80: Sauna View of Village (source: Author)

1. Lobby/Reception
2. Main Pool Room
3. Hot Tub
4. Women's Locker Room
5. Men's Locker Room
6. Service/ Mechanical
7. Office
8. Outdoor Deck
9. Outdoor Pool
10. Saunas
11. Yoga Studio
12. Outdoor Yoga Studio
13. PT Rooms
14. Unisex WC
15. Break Room
16. Rehab Exercise Room
17. Catwalk North Stair
18. Basketball & Tennis Courts

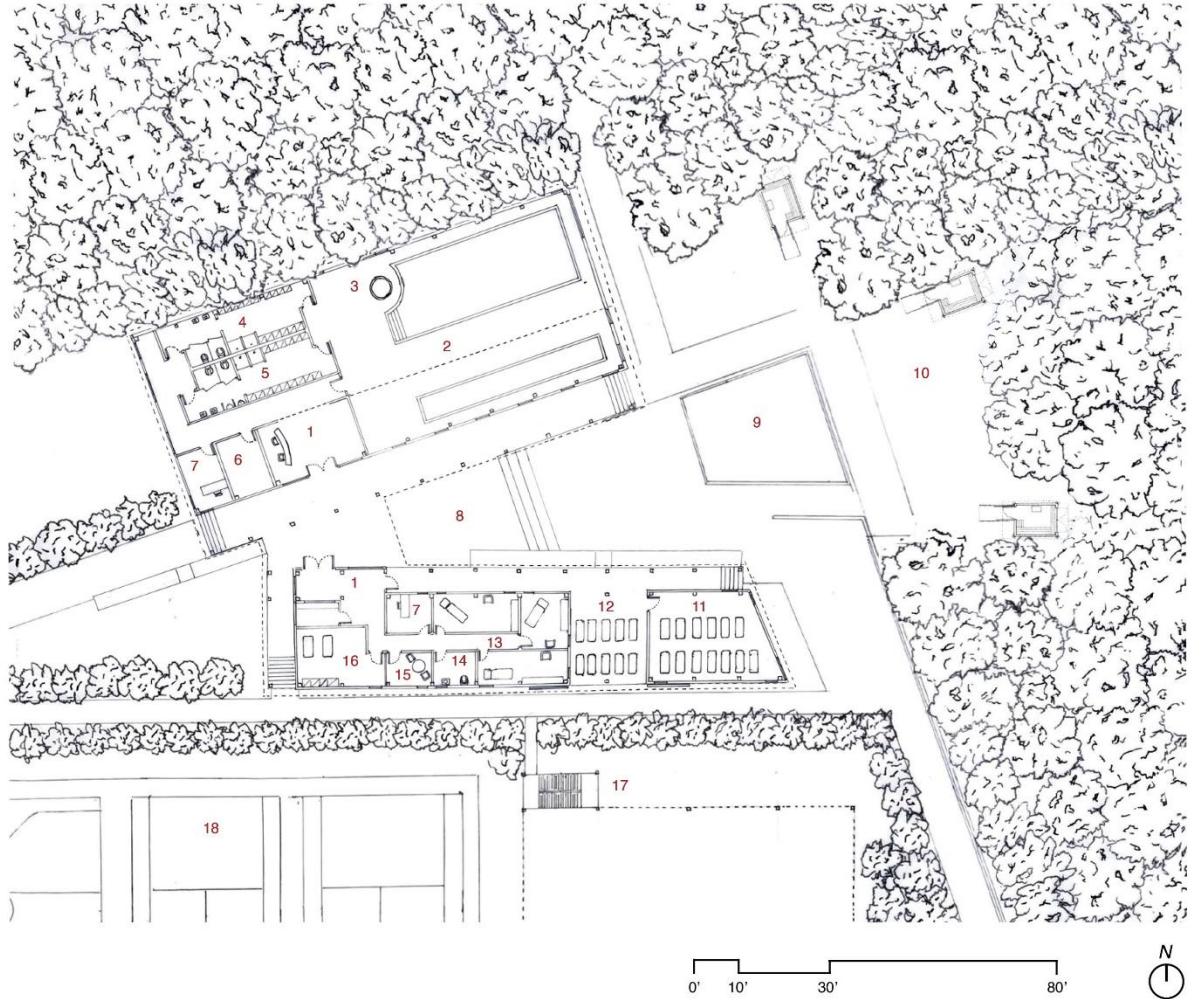


Figure 83: Village Site Plan

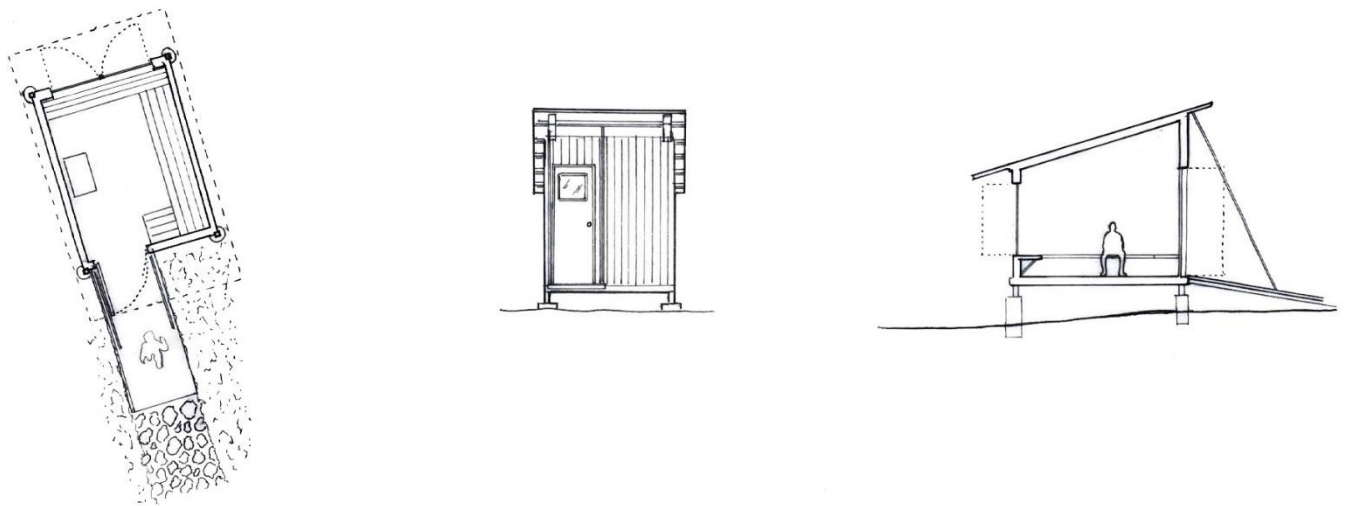


Figure 82: Sauna Plan, Elevation, Section (source: Author)

Chapter 8: Conclusion

This thesis explored the concepts of health & wellness, inspired by Scandinavian cultures and practices within a post-industrial coal-fired power plant in the urban river-front setting of Alexandria, VA. In doing so, the promotion and enhancement of a holistic balance of individual well-being is now available to the people of Alexandria, where they can utilize this new catalyst of a site. With all the research and time spent, this thesis led to the creation of a site that captures sustainable and health practices that range from various types of scales including regional, site, building, and tectonic.

This site of the Potomac River Generating Station became a perfect location for this thesis. It lies in a wonderful position along the Potomac River in an urban setting that has many post-industrial redevelopment plans already in the making. Being a phased proposal, it offers opportunity for even more additional future phasing that can blend and integrate into the existing fabric of the city while still maintaining its purpose and identity to become the new waterfront hub.

If the country is ever to reverse the crisis in rise of health risks and diseases, it will ultimately be up to the individual who makes that choice for themselves. The Velvaere is the resource serving that purpose to every individual for an entire community at large. The Velvaere is the vision in which it seeks a healthier environment and promote healthier lifestyles for those that inhabit the earth. We cannot solely focus on one of these ideas and let the other slip away. If we protect and heal our environment around us, it will naturally begin to give back and do the same for us.

Presentation Thoughts

This thesis defense was presented on May 14th, 2020 in a virtual setting due to the COVID-19 outbreak. It consisted of a 50-minute long time window where the first 20 minutes was a prerecorded video of myself presenting the thesis. Then 30 minutes of critique, questions, and feedback by panel of reviewers followed. The discussion consisted of University of Maryland School of Architecture, Planning, and Preservation faculty, as well as outside guest reviewers made up of architects and former alumni from the Maryland, Washington D.C., and other regions across the U.S. Within the 20-minute presentation there was a slide show to explain and illustrate this thesis' research and design intent, and a final 48" x 27" virtual wall seen on the next page (Figure 84).

After reflecting on the presentation, it was considered to be a very successful thesis topic with great feedback and analysis for further investigations in the design process. Some key points that highlighted the discussion were the re-use of the entire power plant, the placement of the pool house and sauna village, and how people get to and from the site. With the limited documentation of construction drawings available, there was not enough to do an entire adaptive re-use project effectively and accurately. Which leads to another point, that scale of programming and planning would have been entire thesis in itself. The scope of such a project is entirely too large to complete with the rest of this thesis' components. Although, bringing up this point could lead to a 4th phase of this proposal.

Overall, the reviewers of the jury seemed very pleased with the thesis, especially the free-hand drawing of each image, applauding a successful design

approach to an urban scale issue through the lens of a post-industrial site. It was said by the thesis chair, Jana VanderGoot, that the level of talent and clarity in the drawings really helped tell the story and create a sense of atmosphere and narrative for the site.

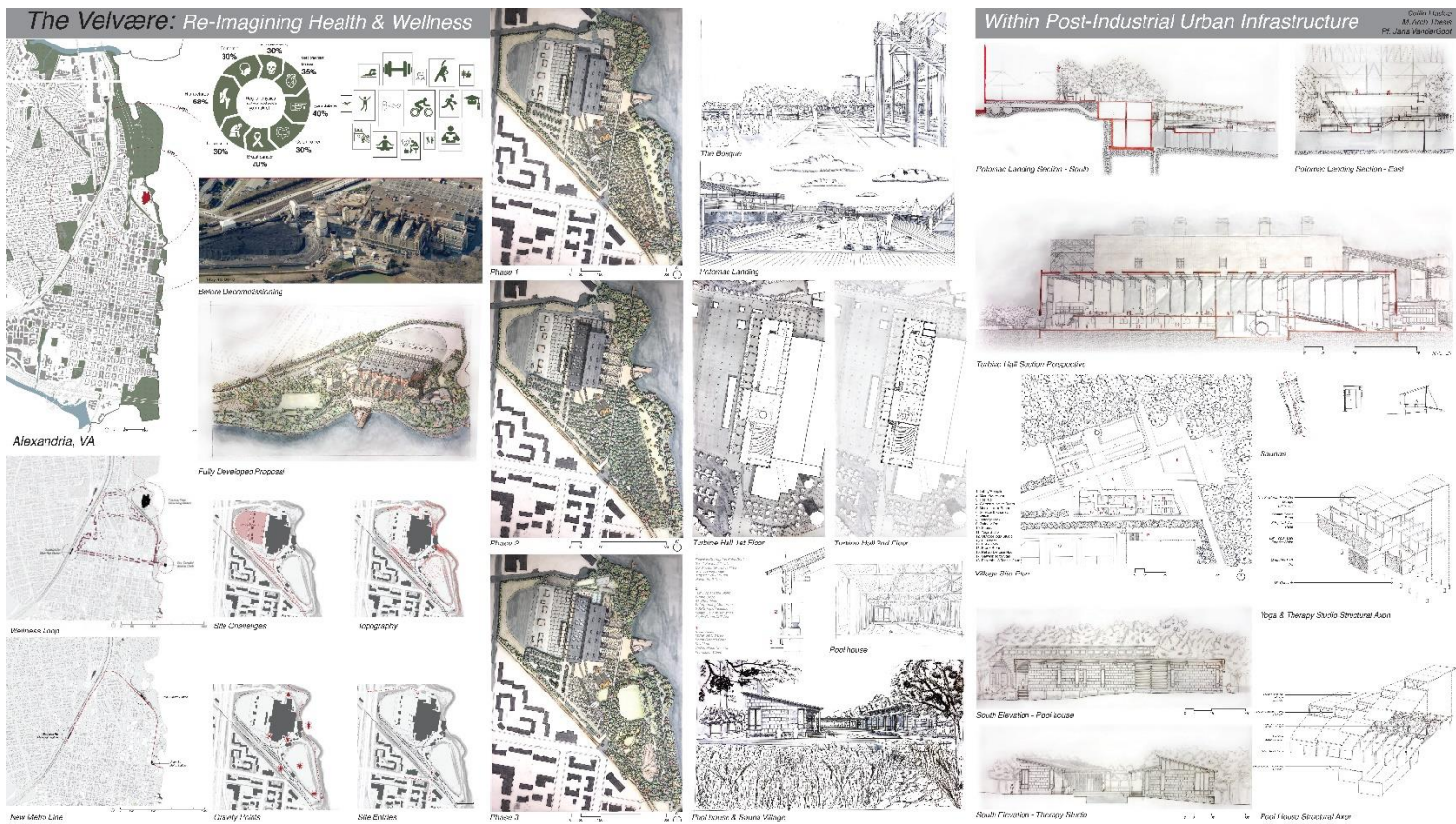


Figure 84: Final Presentation Board (source: Author)

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