2017

Nature Nurtures

Moriah Rhodes

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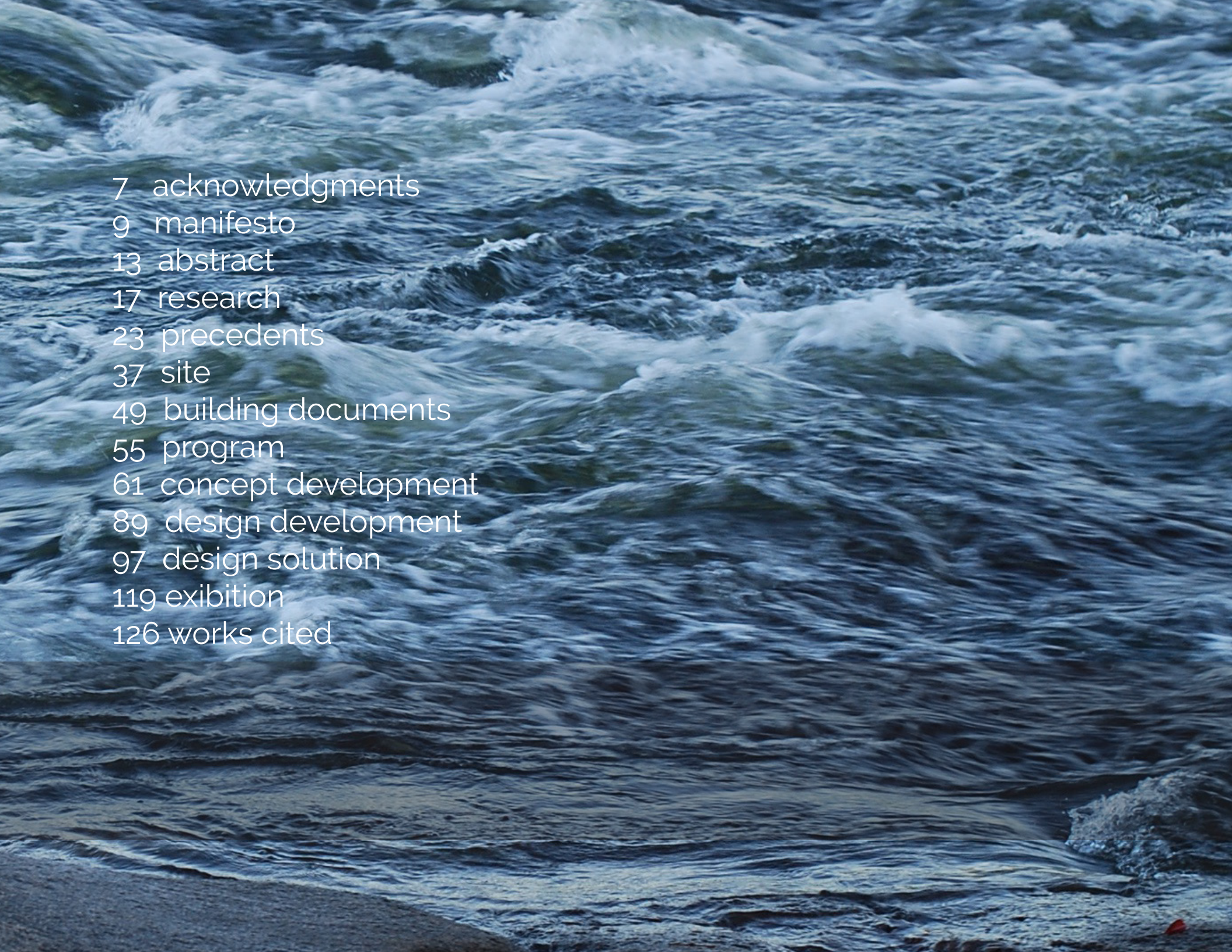
Moriah Rhodes
M.F.A- Thesis Project May 2017
VCUarts Interior Design

CONTENTS



A thesis submitted in partial fulfillment of the requirements for the
Degree of Master of Fine Arts at Virginia Commonwealth University.

Moriah Rhodes

A.F.A. - Art Education
St. Louis Community College, 2012

B.B.A. - Business Administration
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M.F.A. - Interior Environments
Virginia Commonwealth University, 2017

To my biggest cheerleader.. my mom. I love you so much.

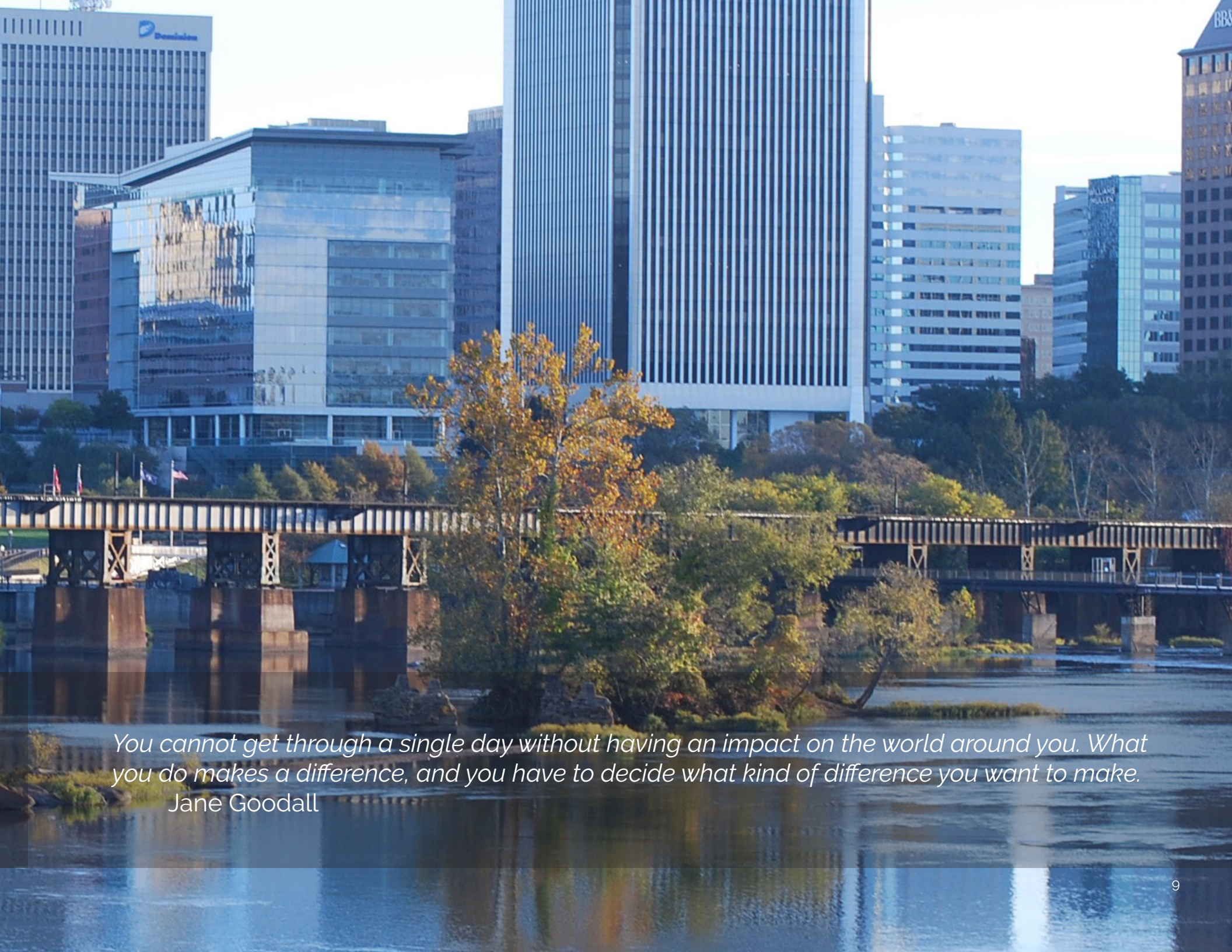
To my family, for always being there.
To my classmates, for always being so inspiring.
To my IDES faculty for being so strong, knowledgeable and encouraging.
To my friends, that never stop listening.
To the staff of VA Library, the Valentine, National Park System for being helpful, open and friendly.

You all have made me who I am today and have helped me get me where I am today.

Never forget how amazing you all are.

Thank you.

MANIFESTO



You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make.

Jane Goodall

design should...

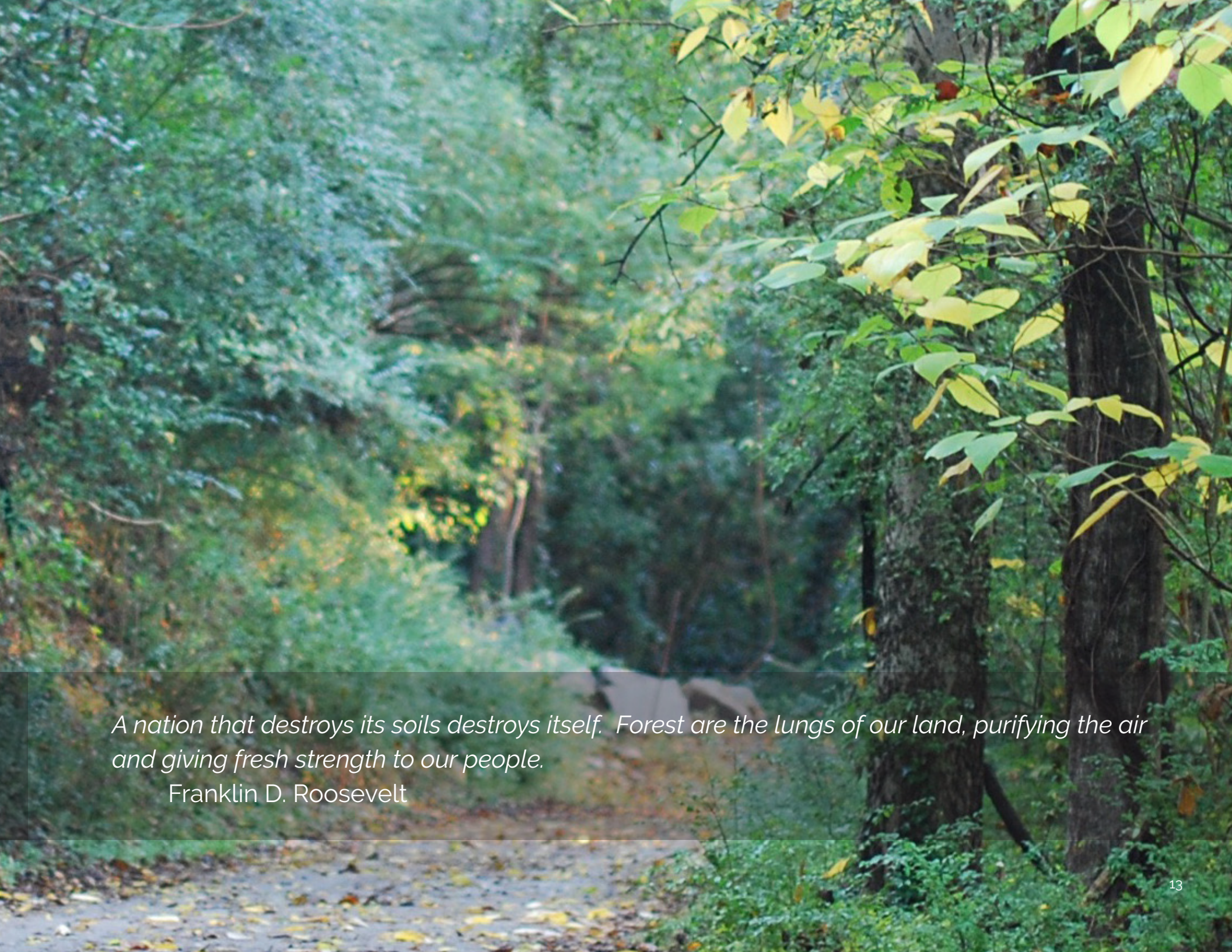
UNDERSTAND our connection to the earth because materials, water and energy sources do not last forever.
HELP reduce our carbon footprint to impact future climate change.
UTILIZE renewable resources and decrease need for new materials.
use "GREEN" water and energy practices and forward thinking, leaving a positive impact for future generations.
RECOGNIZE, RESPECT and VALUE the full spectrum of humanity, regardless of social or economic status.
EVOKE EMOTION despite race, culture, age, sex or religion.
RESPOND to our physical and emotional health and contribute to it.
STIMULATE growth in our local economy with the understanding that local growth enables local and global stability.

Foster a sense of pride and connectedness in your community.

ABSTRACT

... destroys itself ... fresh strength to our people.

—Franklin D. Roosevelt



A nation that destroys its soils destroys itself. Forest are the lungs of our land, purifying the air and giving fresh strength to our people.

Franklin D. Roosevelt

How can interior environments strengthen our connection to nature?

Richmond, Virginia is defined by our connection to the James River. The James River Park system stretches over 550 acres of natural beauty. The park is broken into 14 different sections from the Huguenot Bridge in the west to a half mile beyond the I-95 Bridge in the east. The James River includes water features that appeal to the young and curious to the most experienced river-adventurer. The James River Park System boasts idyllic shorelines, peaceful meadows, and miles of challenging hiking and biking trails that appeal to the community and guests alike. Every year thousands of people come to Richmond for activities and events like the XTerra Races, Dominion RiverRock, the Folk Festival and many more. Amazingly, at this time, there are no convenient downtown or riverfront facilities to allow locals and guests of Richmond to interact with the James River Park system.

With use of the Pattern Building at Tredegar Iron Works, this project will combine the ideas of *biophilia,* and *eco-tourism* to design a boutique hotel that will cater to outdoor enthusiasts. In addition to guest suites, this boutique hotel will offer an outdoor recreation rental, retail and repair facility that will offer bikes, kayaks, tubes, paddle-boards, climbing equipment and other essentials for outdoor exploration. A small cafe will offer healthy, locally sourced, farm to table snack and drink options. Both indoor and outdoor seating areas and/or lounges will be available for relaxation. The outdoor patio will feature an interactive garden and give guests a place to enjoy scenic views, practice yoga, meditate and relax. In addition this space could be rented to host special events.

The term *Biophilia* was first used by a German-born American psychoanalyst Erich Fromm in *The Anatomy of Human Destructiveness* (1973), which described the term as "the passionate love of life and of all that is alive". Later the term was used by American biologist Edward O. Wilson in his work *Biophilia* (1984), that proposed that humans

tendency to focus and affiliate with nature and other life-forms has a genetic basis. Humans biologically gravitate toward the rich and diverse shapes, colors and life that exists in the natural world. As we are drawn to the natural world, we also benefit from it. Nature nurtures us and has a positive effect on our health, well-being and happiness. Research led by Yoshifumi Miyazaki at Chiba University sent 84 subjects to stroll in seven different forests, while the same number of people walked city centers. Overall, those who spent time in the forest, showed a 16% decrease in the stress hormone cortisol, a 2% drop in blood pressure, and a 4% drop in heart rate. Although we spend nearly 90% of our lives indoors, those interior environments often do not reflect the characteristics of nature, trigger a positive emotional response, and are not often designed in a sustainable manner. Too often, our surroundings are designed in a way that deteriorate the environment and separate us from the natural world. The built environment of this project will emphasize the human need for contact with nature that is good for physical, emotional and physiological benefit and satisfaction.

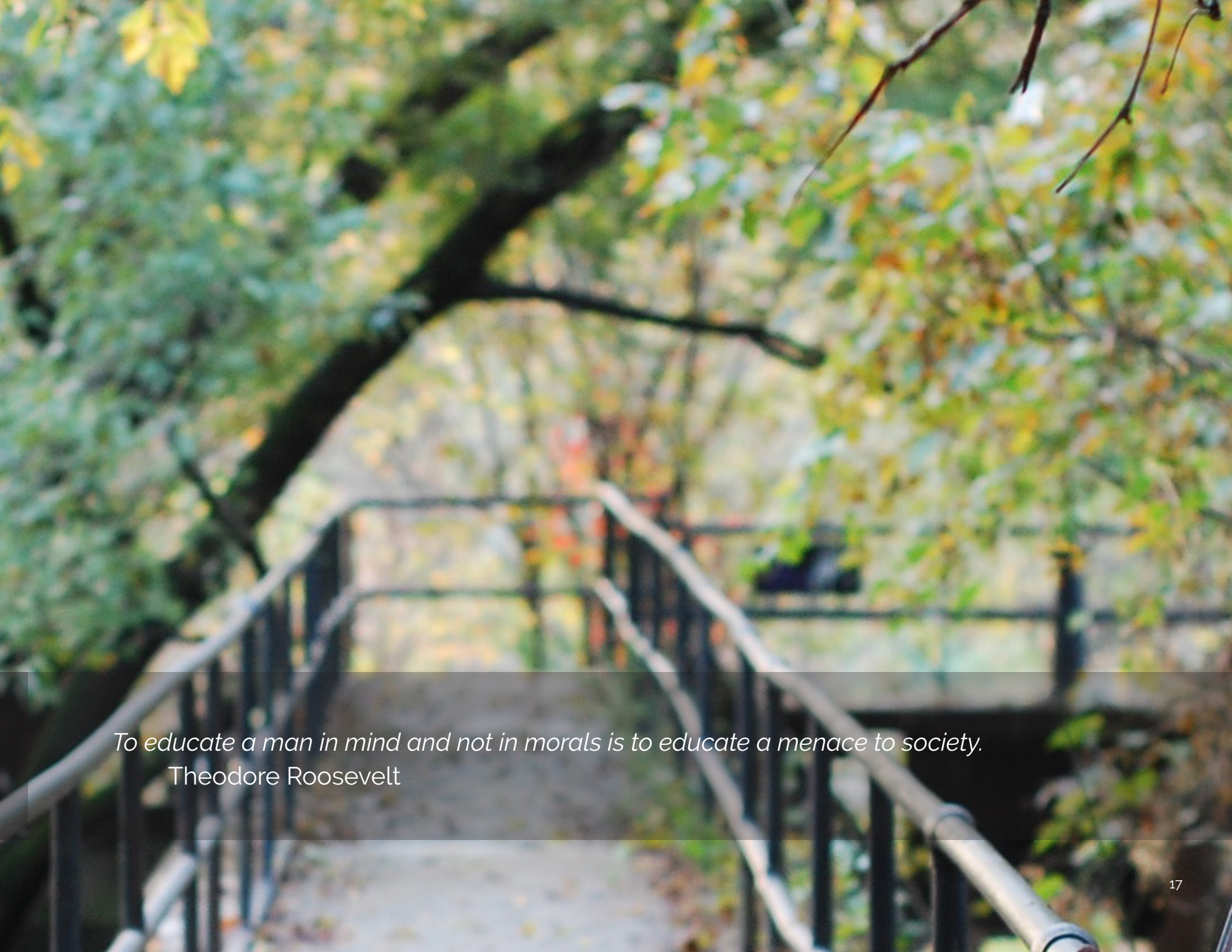
While *Eco-Tourism* is not a new concept the popularity of Eco-tourism increased in the 1980's when large scale educational efforts by the government touted the benefits of conserving and protecting the environment and planet. Eco-Tourism is a piece of the "Green Movement" (scientific, social and political movement addressing environmental issues) but since there has been an increase in information about how people are negatively impacting the planet. The travel industry has been considered a strong influence and a demand for green hotels, restaurants and transportation is on the rise. Eco-Tourism is defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education".

Tourism often comes with its footprint on the environment. Tourism and hospitality must be sustainable. How can we still enjoy the natural wonders of the world yet minimize our impact? By exploring the concepts of Eco-tourism this project will reflect a positive environment and educate visitors on how to make their own changes. Guests will be encouraged to interact with the natural wonders of Richmond in a low impact manner, so that it may remain for others to enjoy.

Research begins by understanding terms like sustainability, Eco-tourism and biophilic design and continues by researching and experiencing examples of them. By studying cases like Frank Lloyd Wrights project "Falling Water" and Mies van der Rohe's project "Farnworth House," understanding of a unique connection to the organic environment can occur. By studying Swedish architects Martin Videgard and Bolle Thams project "Tree Hotel" ways to incorporate travel with nature will be discovered. Finally by studying Agence Ter's project the "Pudong Left Bank" in Shanghai inspiration on how to encourage a city to interact with its natural environment will occur.

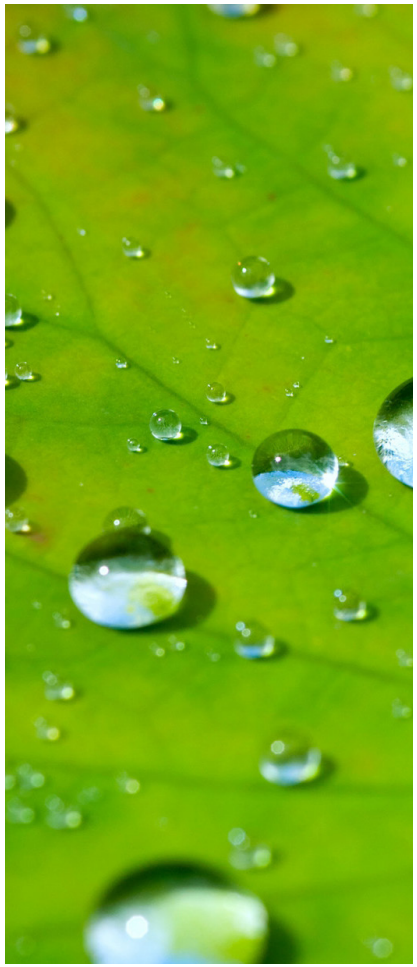
The goal of this project is to understand the relationship between human and nature and how it can be controlled and how we can benefit from an Interior Environment.

RESEARCH



To educate a man in mind and not in morals is to educate a menace to society.
Theodore Roosevelt

Biophilia & Design



Biophilic Design-

Deliberate attempt to translate an understanding of the inherent human affinity to affiliate with natural systems and processes.

Effects of Biophilic Design-

Contact with nature has been found to enhance healing and recovery. Those healing from surgeries or an illness, when in direct contact with nature or from representational ideas of nature, patients have a quicker recovery time. (Kellert, 2008)

Health issues and social problems are less likely reported from people living close to open outdoor spaces. Regardless of urban or rural residence, income or education. (Kellert, 2008)

Natural lighting and natural air flow contribute improve work performance, creates less stressful work environments and encourages motivation. (Kellert, 2008)

Why is it important?-

Contact with nature is critical to human function, health and well-being. Biophilic design intentionally tries to understand and respond to humans inherit attraction to the natural world and its systems- known as biophila. (Kellert, 2008) Understanding that we are not just attracted to the natural world but that we can benefit from it. There is value in incorporating aspects and features of nature into our built environment because these features benefit our physical and mental well-being. When a majority of the population spends 90% of their day indoors, that environment should add quality to performance. Exposing people to the nurturing aspects of nature creates an ideal environment that improves cognitive functioning. (Berman, 2008)

Dimensions of Biophilic Design-

1.) Organic or naturalistic dimension - the shapes and forms in our environment that reflect the connection humans have to nature. Elements such as daylight, plants, animals, natural habitats and ecosystems.

2.) Place based or vernacular dimension - the buildings and landscapes that connect to the culture and ecology of a locality or geographic area. The idea that the sounding environment helps humans create a sense of place and becomes part of a human identity.

Biophilic Design Elements & Attributes

environmental features

color
water
air
sunlight
plants
animals
natural materials
views and vistas
facade greening
geology and landscape
habitats and ecosystems
fire

evolved human-nature relationships

prospect and refuge
order and complexity
curiosity and enticement
change and metamorphosis
security and protection
mastery and control
affection and attachment
attraction and beauty
exploration and discovery
information and cognition
fear and awe
reverence and spirituality

natural shapes and forms

botanical motifs
tree and columnar supports
animal motifs
shells and spirals
egg, oval and tubular forms
arches, vaults, domes
shapes resisting straight lines and right angles
simulation of natural features
biomorphy
geomorphology
biomimicry

light and space

natural light
filtered and diffused light
light and shadow
reflected light
light pools
warm light
light as shape and form
spaciousness
spacial variability
space as shape and form
spacial harmony
inside-outside spaces

place-based relationships

geographic connection to place
historic connection to place
ecological connection to place
ecological connection to place
cultural connection to place
indigenous materials
landscape orientation
landscape features that define building form
landscape ecology
integration of culture and ecology
spirit of place
avoiding placelessness

natural patterns and processes

sensory variability
information richness
age, change, and the patina of time
growth and efflorescence
central focal point
patterned wholes
bounded spaces
transitional spaces
linked series and chains
integration of parts to wholes
complementary contrasts
dynamic balance and tension

Hospitality, Sustainability & Eco-Tourism

What is the hospitality industry?

A broad range of fields within the service industry that include accommodation, restaurants, bars, travel and tourism.

What is sustainable development?

Development that meets the needs of the present without compromising the ability o future generation to meet their own needs.
- International Institute for Sustainable Design

What is Eco-tourism?

Responsible travel to natural areas that converses the environment, sustains the well-being of the local people, and involves people, and involves interpretation and education.
- The International Eco-Tourism Society)

A number of environmental problems can be related with the Hospitality Industry. Problems relating to water consumption, energy consumption and waste management. The increase in environmental concern and issues, creates a push for the hospitality industry to respond and to start actively making more "green" choices. Because there is a demand from the tourist's themselves, the expectation is rising. The industry has responded over the past ten years and has started to switch to energy-efficient technologies such as LED lighting and low-flow water facilities. (Swami, 2011) The industry and the owners of these businesses have the ability to make a huge impact on social, economic and environmental conditions and the ability to positivity contribute to them in a sustainable way. (Fentaw, 2016)

Poor planning and lack of concern for the environment leads to the waste and increased money spent on electricity, gas and water. Pressure from the government, consumers, investors and professional organizations are all contributing factors for the change in attitude and policies toward the environment. (Swami, 2011) Regardless of outside pressure, social responsibility plays a big role. A concept that impacts business operations in areas like social and environmental concerns, and acts as a obligation for the business to make decisions that benefit the society at large. The success of these businesses will rely on them responding to the push for green efforts. (Fentaw, 2016)

Lighting attributes for 15-20% of the hotels electricity consumption. Add in heat generated from those light bulbs, then increased air conditioning for compensation and that percentage increases. By upgrading lighting to more modern, energy efficient options businesses can get four times the amount of energy and the bulbs will ten times longer. (Swami, 2011)

PRECEDENTS

We can learn whatever we need in nature because we are part of nature. Human begins are part of Creation. We live by the same laws as all of nature.

Anne Wilson Schaef

Fallingwater

ARCHITECT: Frank Lloyd Wright
LOCATION: Run Mill, PA
DATE: 1936-1938
SIZE: 5,330 sq ft.
HIGHLIGHTS:

Frank Lloyd Wrights Fallingwater House is a wonderful example of a strong connection between nature and architecture. The house itself is built into a stream and is part of a waterfall. When inside the house the sound of falls can be heard but not always seen. Giving guests a sense of the falls and allowing the house and stream to become one. With the placement of the house in the falls, the house itself becomes a participant of the falls vs. a spectator if it was placed back viewing the falls.

Although the house consumes more materials then you would want it reflects positive and affirmative shows a compelled relationship with people and nature. In one instance where Wright reflected this with incorporating a rock that projected above the living room floor into the design of the central hearth in the living room. Uniting the house with the earth. While uniting Wright also respected the existing nature by building features around existing trees.

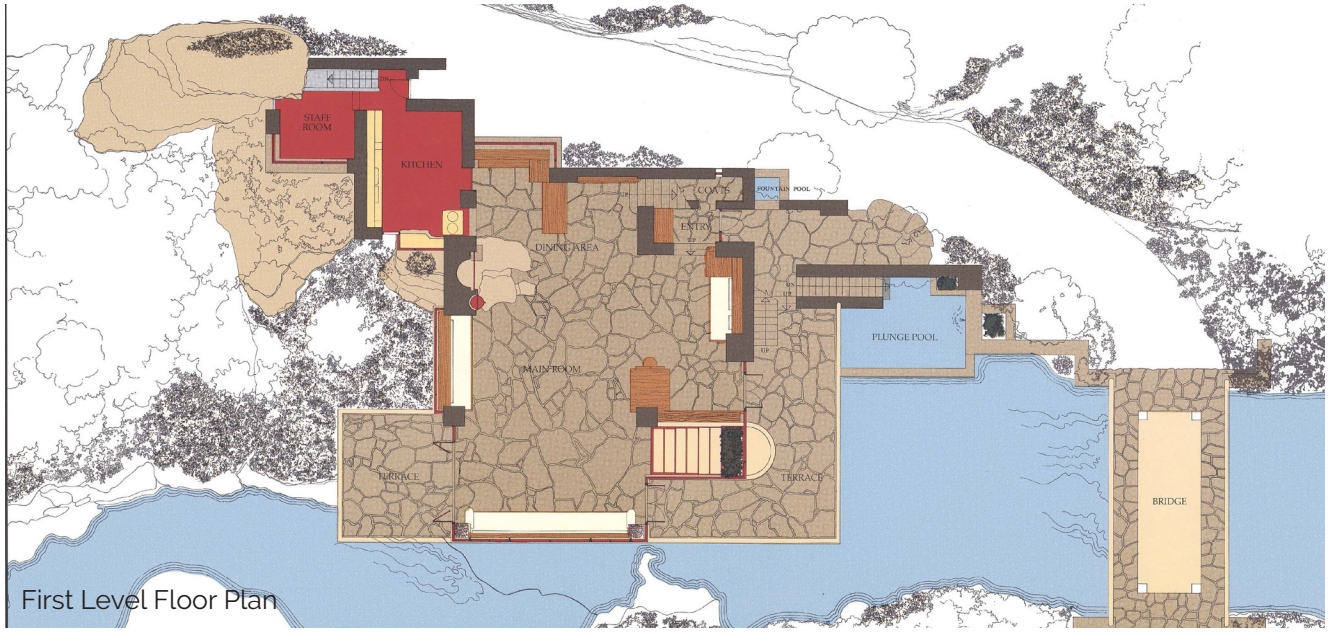
Wright continues to connect with nature with the extensive use of glass. The shortened ceiling height and lack of walls facing the falls provides and encourages guests eye to look out to the horizon and wooded surrounding. In some case the use of “corner turning windows”, allow the corners of rooms disappear.

View from downstream of Falling Water

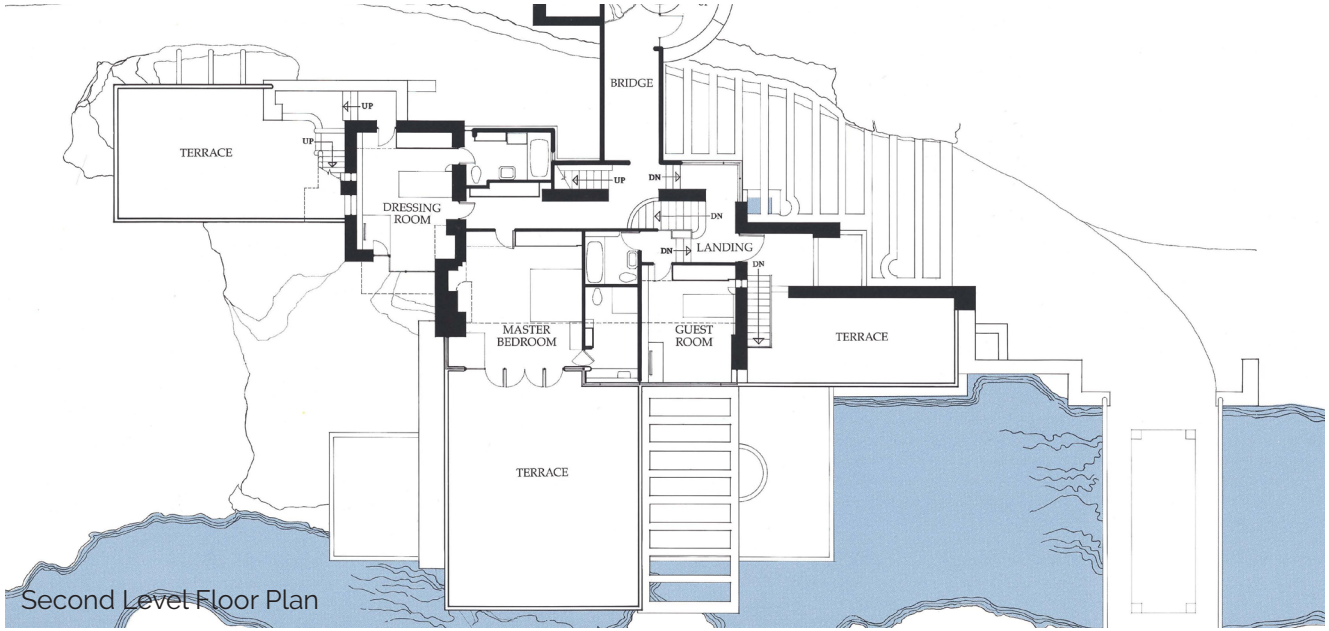
River, right before the waterfall. Located under living room

living room in Fallingwater house

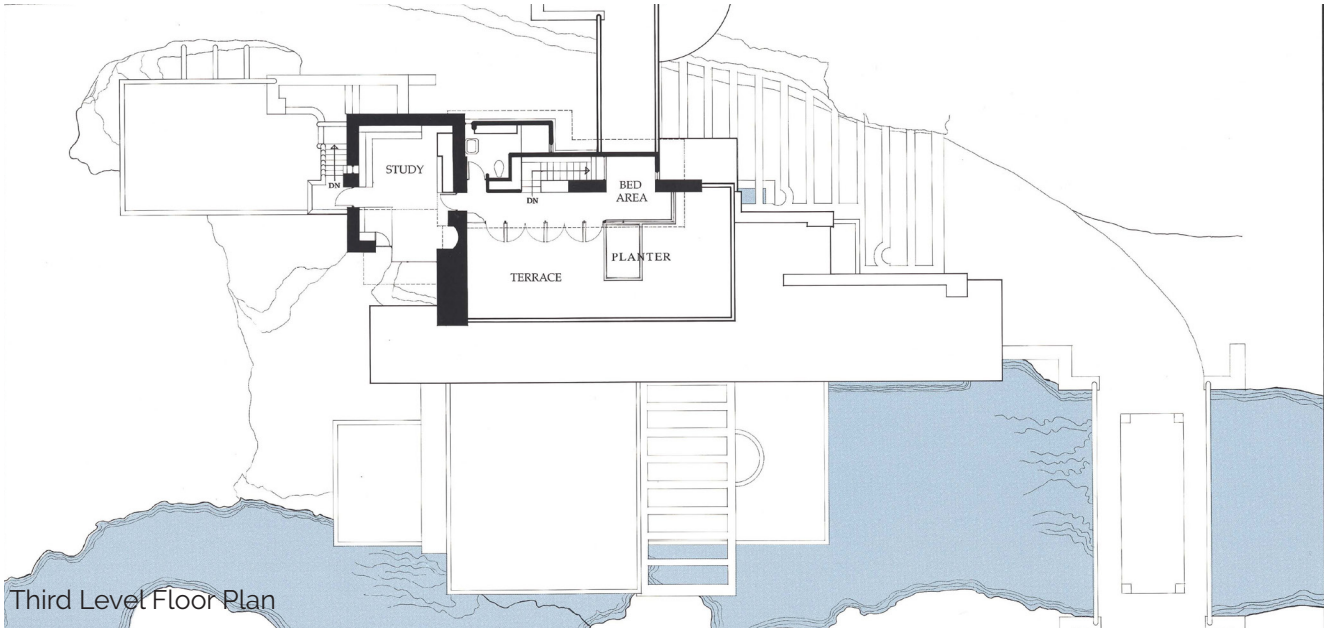
fLiving room stairs let out into a pool of river, right before the waterfall



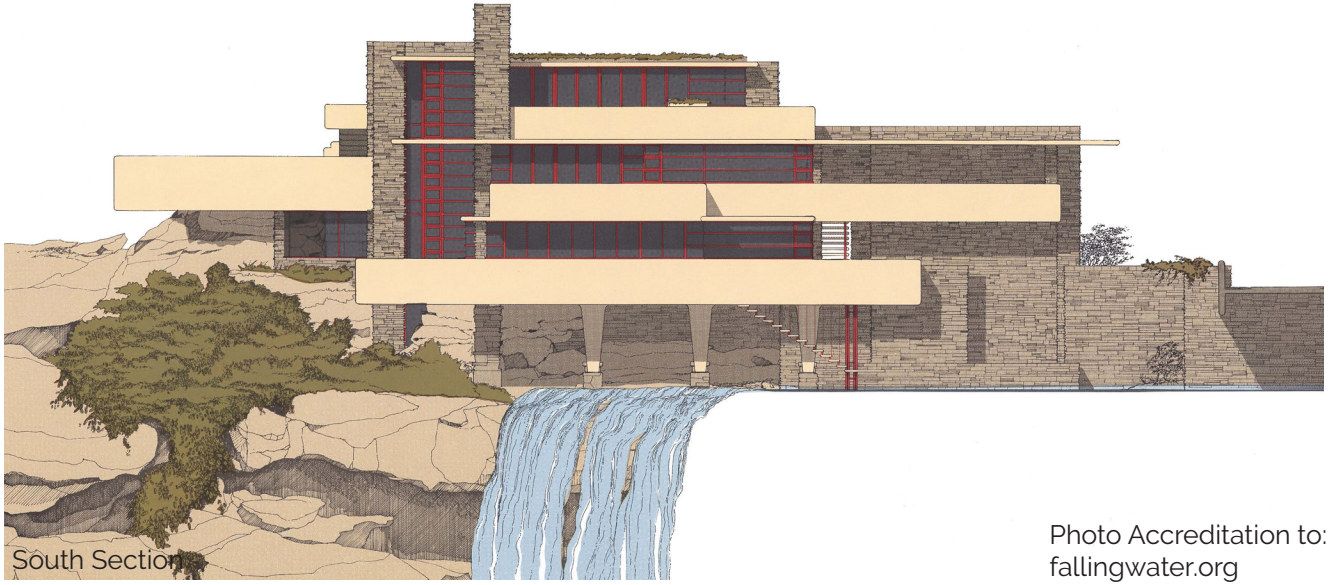
First Level Floor Plan



Second Level Floor Plan



Third Level Floor Plan



South Section

Photo Accreditation to:
fallingwater.org

Oberlin College- Adam Joseph Lewis Center

ARCHITECT: William McDonough + Partners
LOCATION: Oberlin, OH
DATE: Complete January 2011
SIZE: 13,600 sq. ft.
HIGHLIGHTS: This building is a prime example of how architecture and design can be sustainable. The Lewis center incorporates many energy efficient features including passive solar design, natural lighting and high-efficiency electrical lighting, natural ventilation, an enhances thermal envelope, integrated thermal mass, and a ground source heat pump.

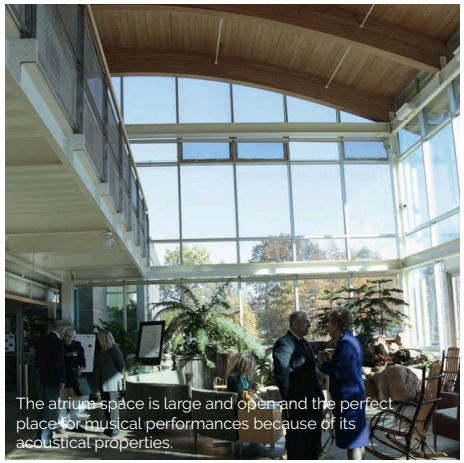
Each room has the ability to heat and cool the room, they are well ventilated, and the lighting works on motion sensors. Every room is also equip with windows.

The building features low windows on the north side of the building a high windows on the south side to help offset the overuse of air conditioning. The roof features solar panels.

The building has high water conservation efforts. The Living Machine on site helps treat and recycle about 90% of the water used on side. Low flow toilets are used in this building.

A variety of recycled materials are used throughout the building.

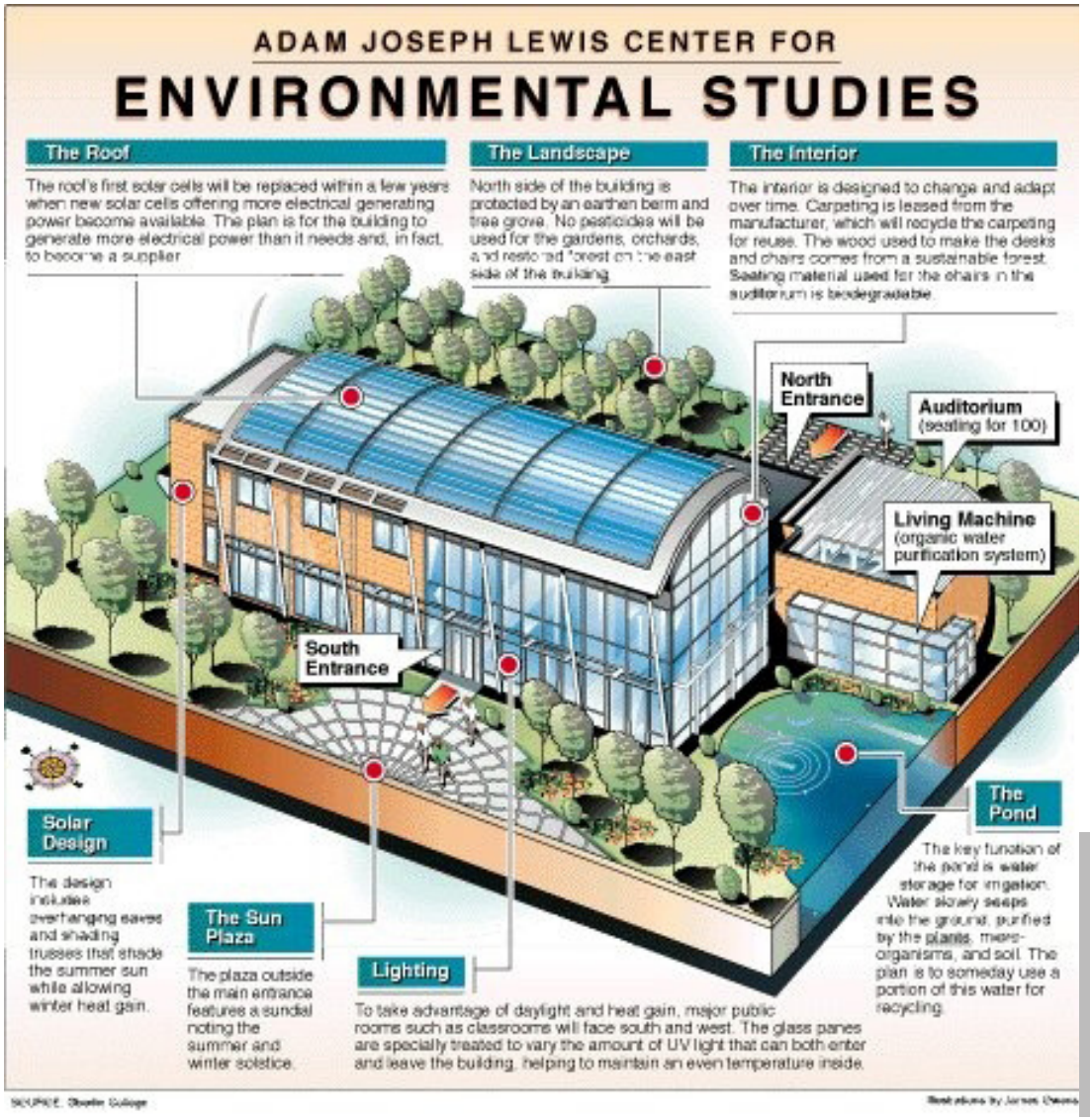
The Lewis Center features 100% daylight during work hours, with the exception being the auditorium. (Peterson, 2011)



The atrium space is large and open and the perfect place for musical performances because of its acoustical properties.

The living machine naturally treats wastewater with microbes, plants, snails and insects and is designed to treat 2,000 gallons of waste water daily.

Students help maintain and operate the ecological performance.



Farnsworth House

ARCHITECT: Mies van der Rohe
LOCATION: Plano, Illinios
DATE: 1945-1951
SIZE: House- 676 sq. ft.
Land- 59+ acres
HIGHLIGHTS:
Strong relationship between house and nature.

Single-Story house made with eight I-shaped steel columns that support the roof and floor frameworks. These beams are structural and expressive.

Floor to ceiling windows around the entire house, opening rooms to the woods around it

Ground floor is elevated and wide steps slowly bring bring guests up as if they are floating to the entrance.

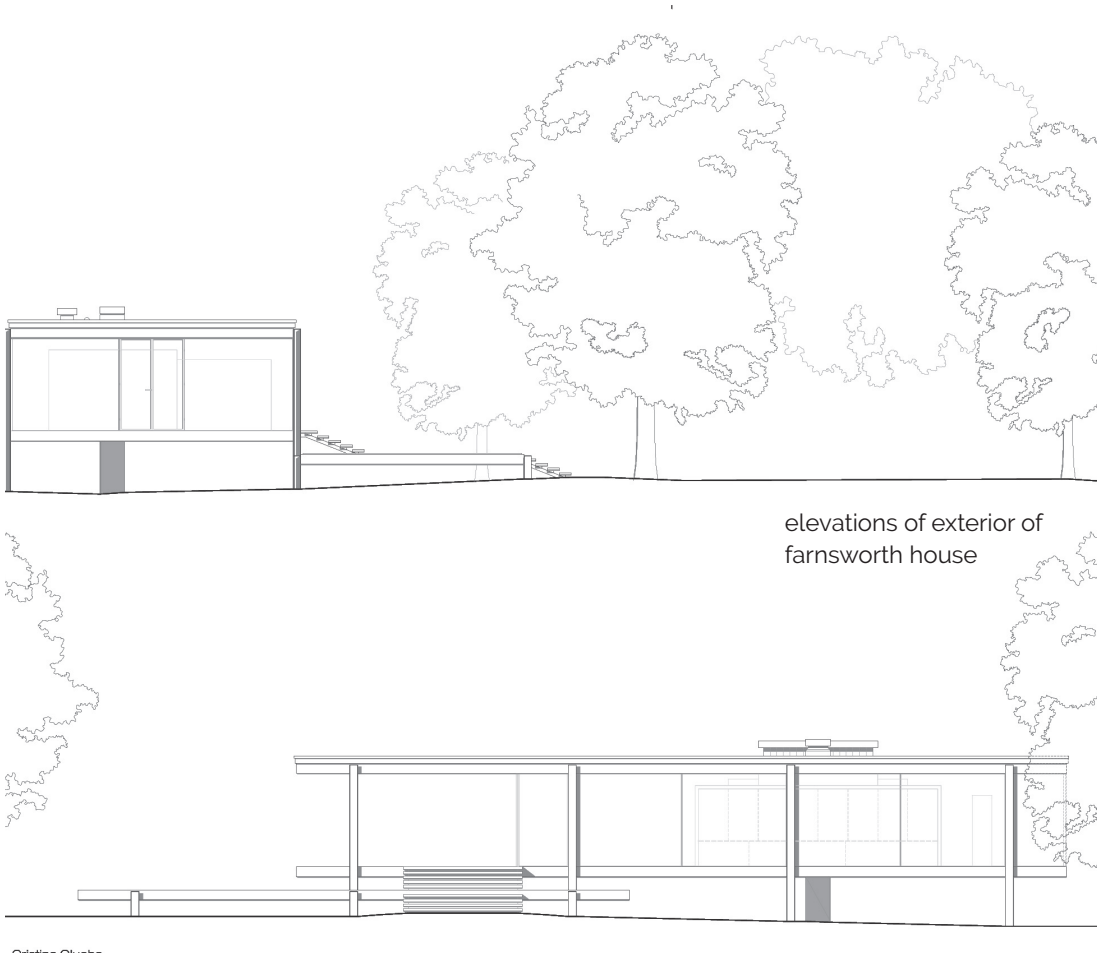
RELATIONSHIP:
Construction was minimal and affordable.

Interior or space is part of the natural environment in all spaces.

Materials and colors reflect the surrounding the environment, making them cohesive.


exterior of farnsworth house


interior of farnsworth house



elevations of exterior of farnsworth house

erior of farnsworth house

Pudong Left Bank

ARCHITECT: Agence Ter
LOCATION: Shangai, China
DATE: 2016- 2019
SIZE: 13+ sq. miles
HIGHLIGHTS:
Revisioned riverfront along the Huangpu River

The idea was to create a "living interface" between the neighborhoods and the river by inserting an array of activities into a underutilized place.

Everyday activities and large events take place here.

Three main paths-discovery, main, and sports- help organize the space.
- Main Path (Pedestrian Promenade)- Food stalls, playgrounds, and activity lawns.
- Sports Path- For active guests who was to bike or run. The path also includes fitness training support.
- Discovery Path- For guests who want to interact with the waterfront. It included great views of the city and highlights biodiversity and the protection of plant life.

RELATIONSHIP:
This project is a representation of a similar system happening here in Richmond with the James River. This project could help inspire ways to make the Pattern Building a gateway to the James River Park system and help reshape our riverfront. This project allows for an Urban connection with nature and inspires downtown residents to be active outside and to explore the natural environment close to home.

Tree Hotel

ARCHITECT: Tham & Videgard Arkitekter
LOCATION: Harads, Sweden
DATE: 2008-2010
SIZE: Mirror Box Room - 4 x 4 x 4 meters
HIGHLIGHTS:
The exterior reflects the surroundings and the sky, creating a camouflaged refuge.

Interior is made of plywood.

Large windows allow a 350 degree view.

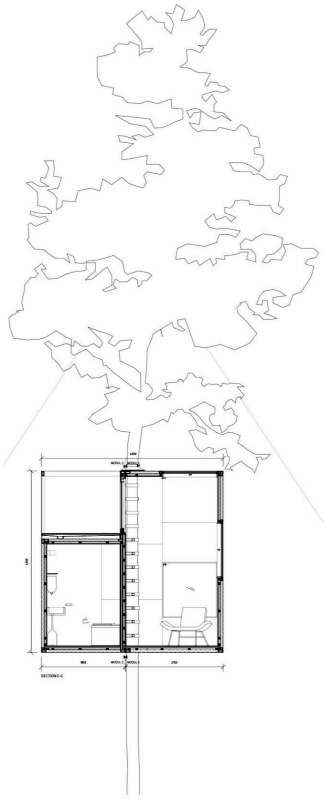
The construction alludes to how man relates to nature.

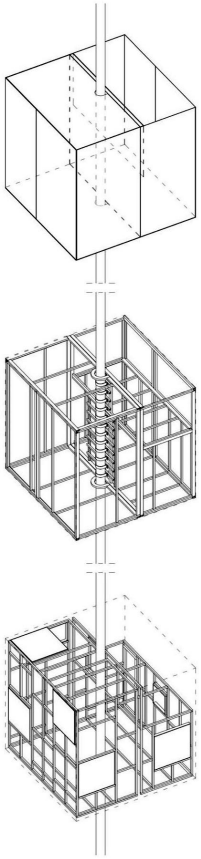
Cabin provides living for two people- a double bed, a bathroom, living room and roof terrace.

Access to cabin is by a rope bridge

RELATIONSHIP:

Literal example of people interacting with nature.
Guests are placed in nature.
The exterior of some cabins coincide with the idea of blending in with the surrounding environment.
Being part of it not bring it in to our world.





SITE

It is not the beauty of a building you should look at; its the construction of the foundation that will stand the test of time.

David Allan Coe

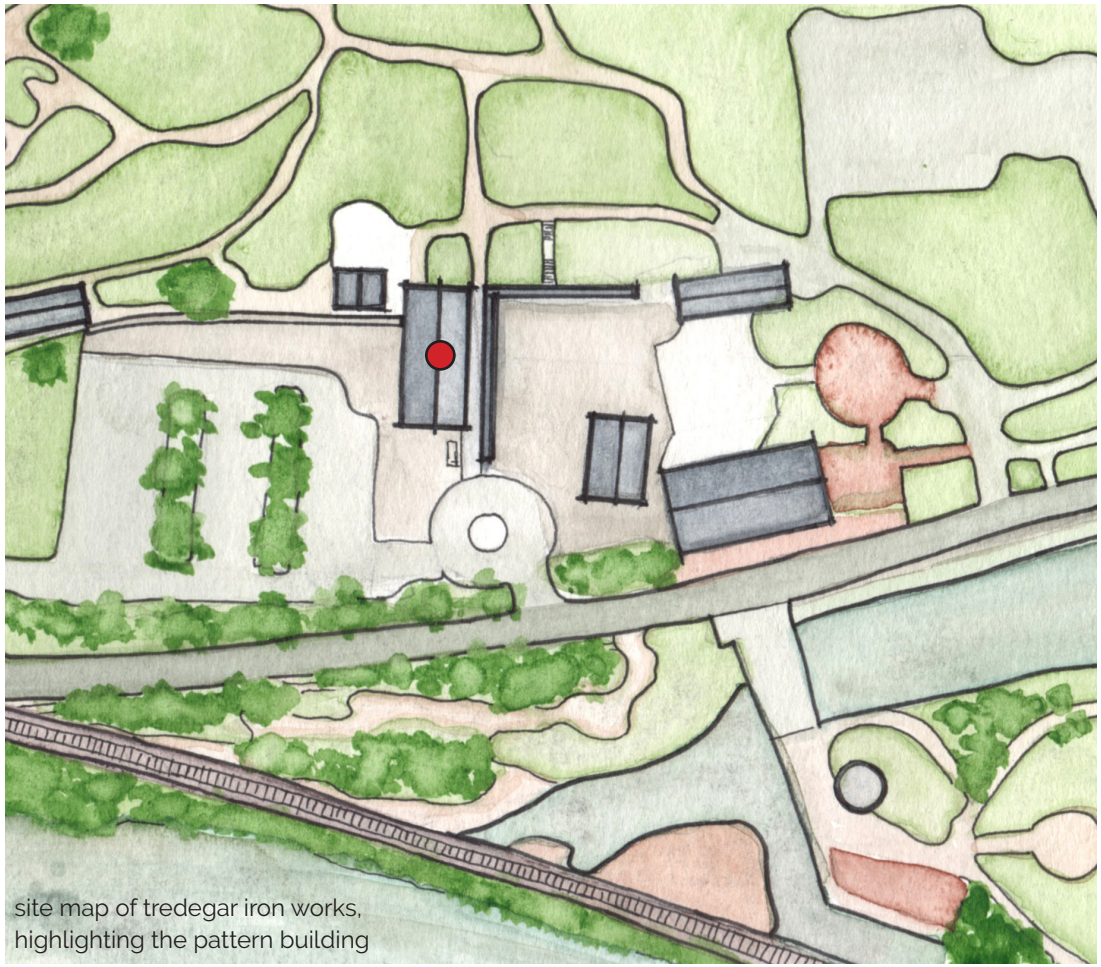
Tredegar Iron Works

map of richmond, va
highlighting tredegar iron works

Located in downtown Richmond along the James River the Tredegar Iron Works consists of many buildings, all part of the Historic Iron Foundry.

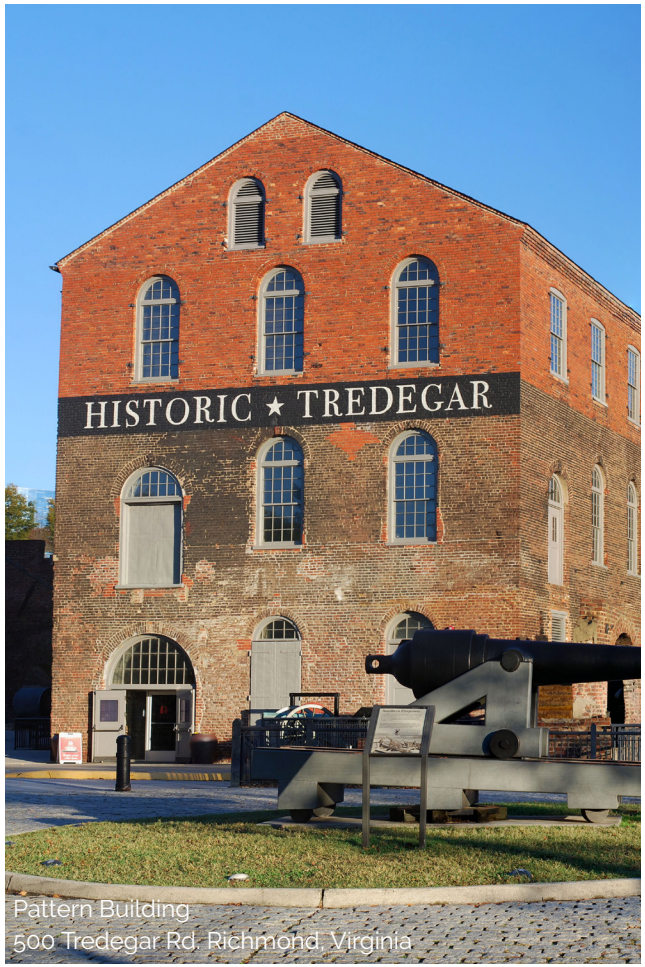
The Tredegar Iron Works site operated from 1836 until 1952. During the civil war, Tredegar was the largest iron supplier for the war.

The Iron Works site harnessed energy for power from the James River. With the use of overshot water-wheels and water turbines allowed the foundry ran stickily on hydro power.



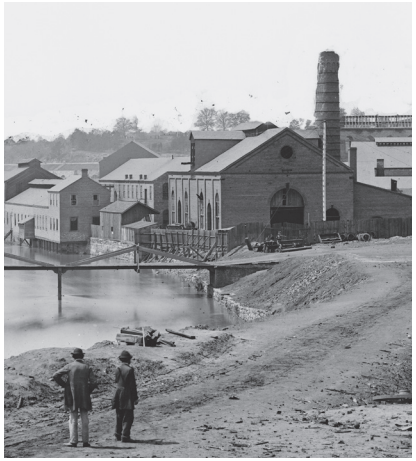
site map of tredegar iron works,
highlighting the pattern building

Pattern Building History



Pattern Building
500 Tredegar Rd. Richmond, Virginia

What today is known as the "Tredegar Pattern Building" was built in 1854 and operated as a Flour Mill until 1860. In 1861, the building was re-purposed by the Crenshaw brothers, and it became the Crenshaw Woolen Mill. Situated in the five story building on the grounds of Tredegar Iron Works, the Crenshaw Woolen Mill was one of the chief producers of Confederate uniform cloth and blankets for the civil war. The mill worked almost exclusively for the military. On May 14, 1863, one of the pickers ignited in flames causing a mechanical fire. The building was left in ruins until 1867, when Tredegar rebuilt a three story pattern shop over the foundations of the Crenshaw mill.



This building held patterns for casting guns, railroad wheels, and machinery. In 1890, the building suffered another fire. The third floor was destroyed but subsequently rebuilt. The red brick of the upper floor and the change in the window form is an indicator of the 1890 rebuild. The building continued to be used to store patterns from the 1890s to 1952, when Tredegar was forced to close because of yet another fire. In 1970 the Ethyl Corporation purchased the property and restored the surviving buildings. Today the site is home The American Civil War Center and the Richmond National Battlefield Park Visitors Center.

Existing Site Conditions

historic overshot waterwheel located out front of main entrance

raceway carrying water toward overshot waterwheel on east side of pattern building

historic water turbines located on the west side of the pattern building

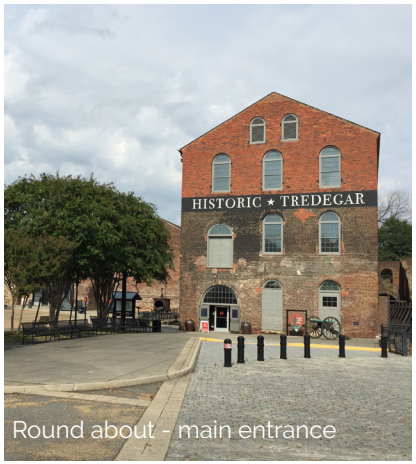
Exterior Conditions

South Side of Pattern Building - Main Entrance

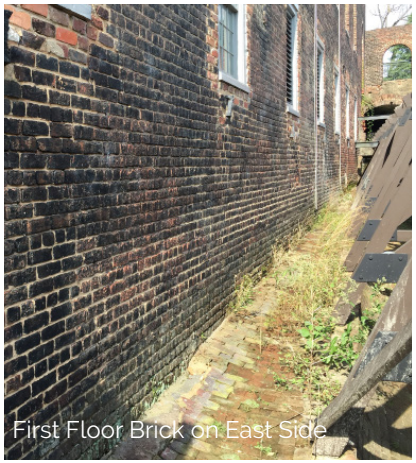

East Side of Pattern Building

North Side of Pattern Building

West side of pattern building



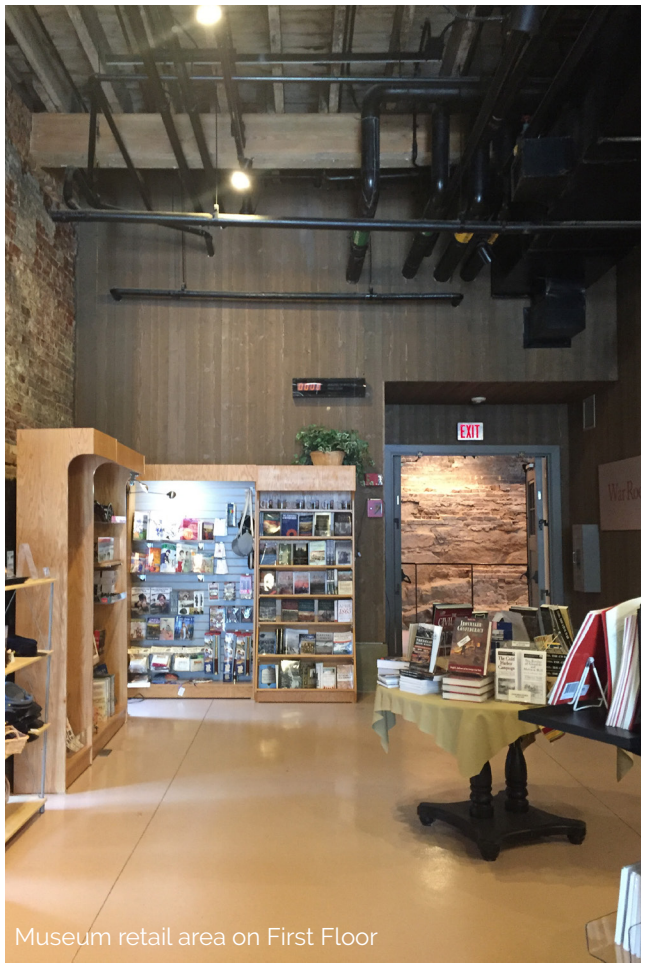
Round about - main entrance



First Floor Brick on East Side

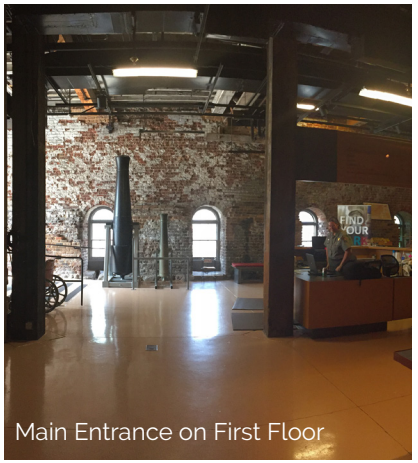
Historic water turbines on west side of building

Interior Conditions



Museum retail area on First Floor


Open museum space on 2nd Floor

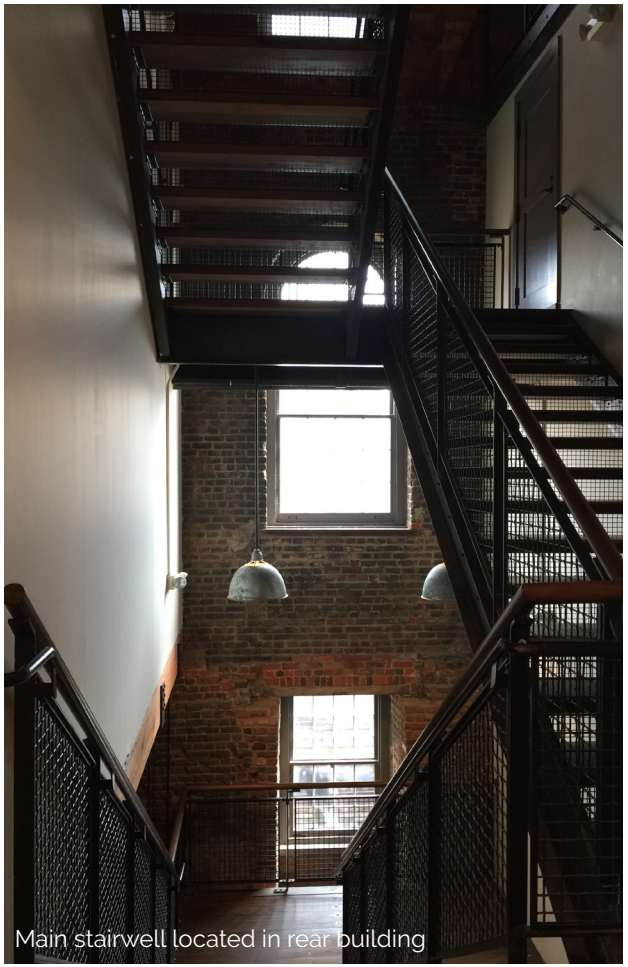

Main Entrance on First Floor


Structural Wall on North Side of Building

Large 5' W x 10' H Windows on 3rd Floor

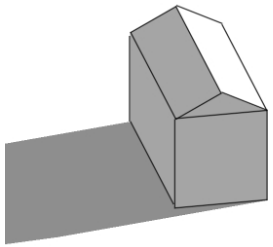
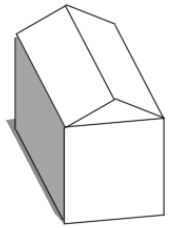
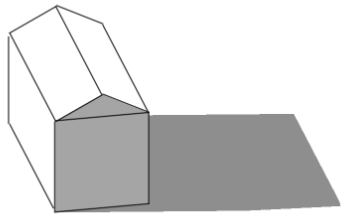
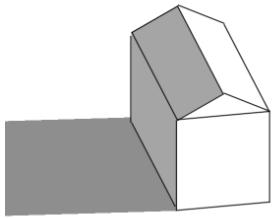
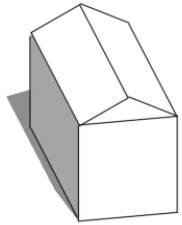
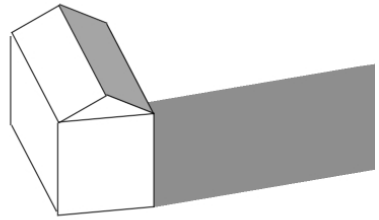
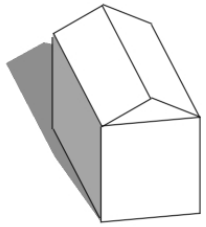
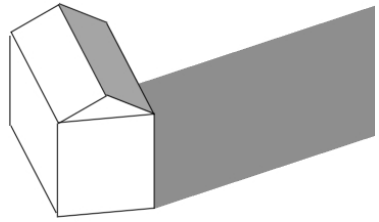
Wall thickness variation

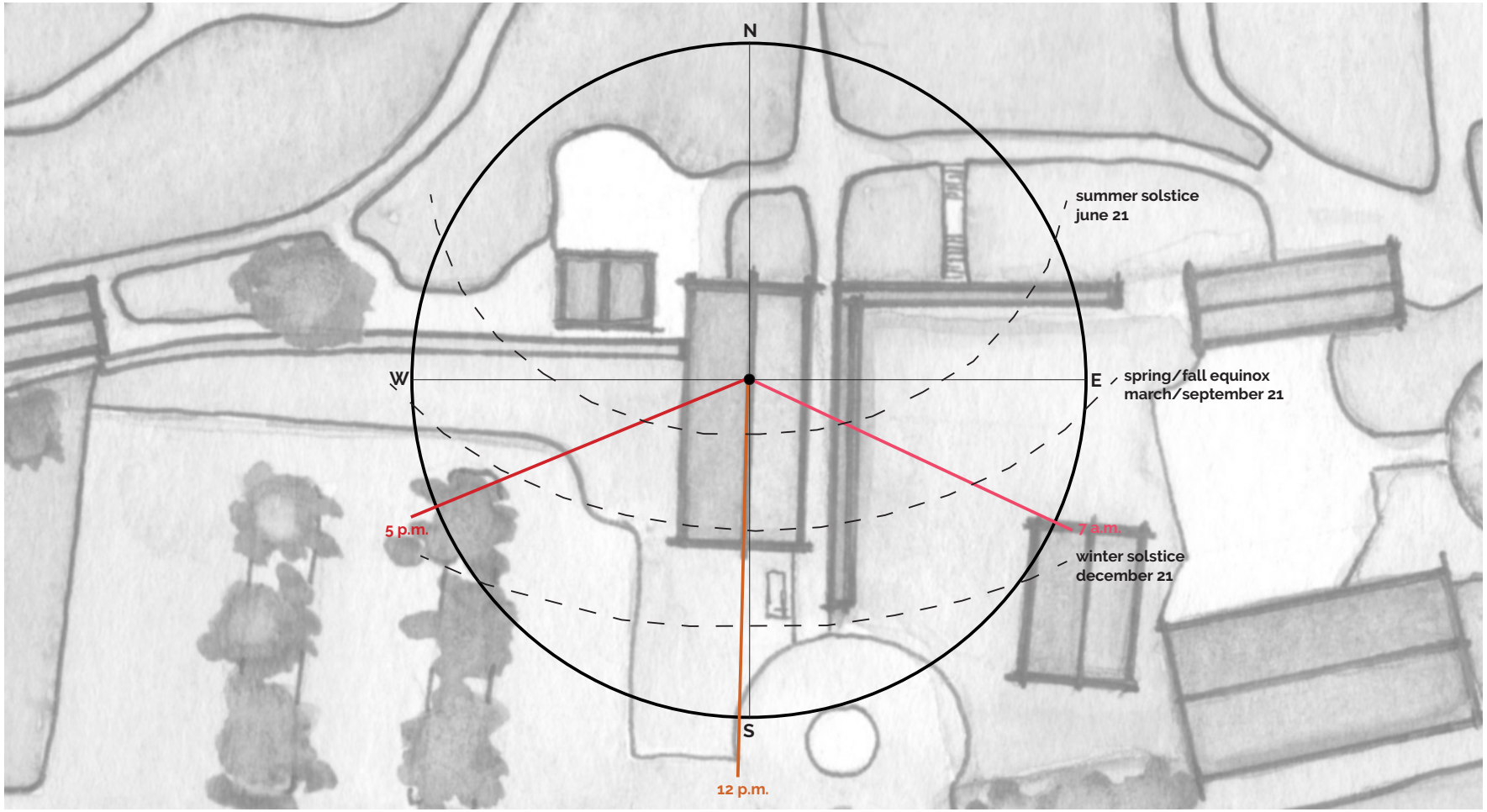
Museum space on 3rd Floor



Main stairwell located in rear building

Site Study- Sun Paths

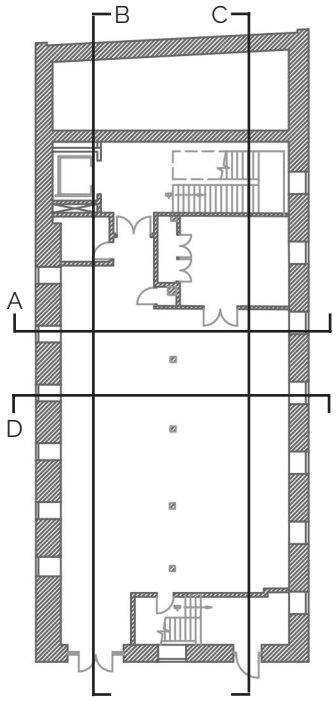
	7 a.m.	12 p.m.	5 p.m.
summer solstice june 21			
spring/fall equinox march/september 21			
winter solstice december 21			


N
W
E
S
summer solstice
june 21
spring/fall equinox
march/september 21
winter solstice
december 21
5 p.m.
7 a.m.
12 p.m.

BUILDING DOCUMENTS

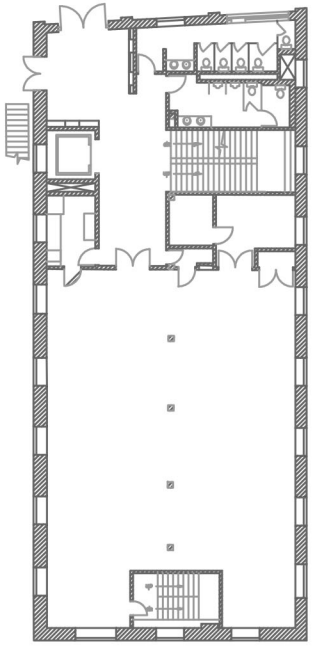
"WTell me, I'll forget. Show me, I may remember. But involve me and I'll understand."
Chinese Proverb

Existing Building Plans

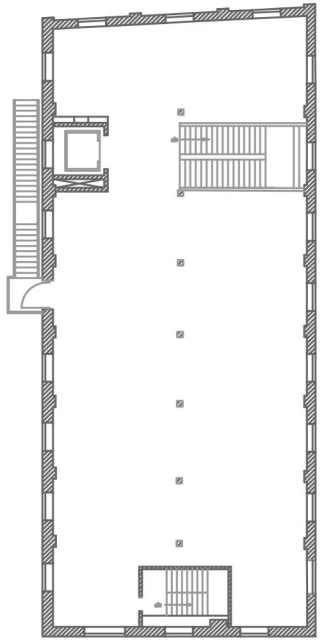


Level 1 Floor Plan

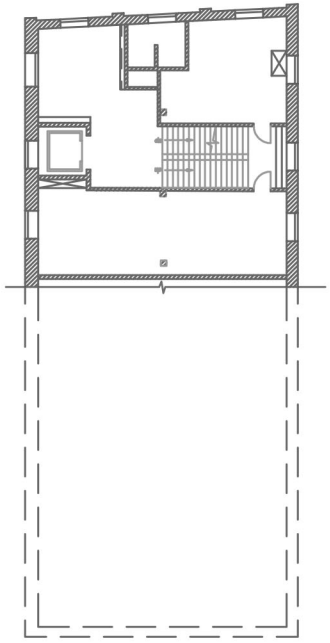
Scale: 1/32" = 1'-0"



Level 2 Floor Plan

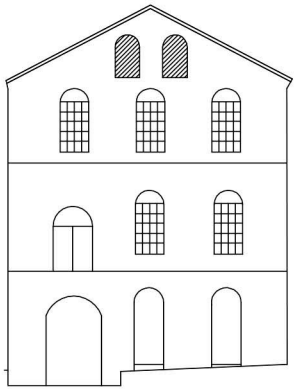


Level 3 Floor Plan

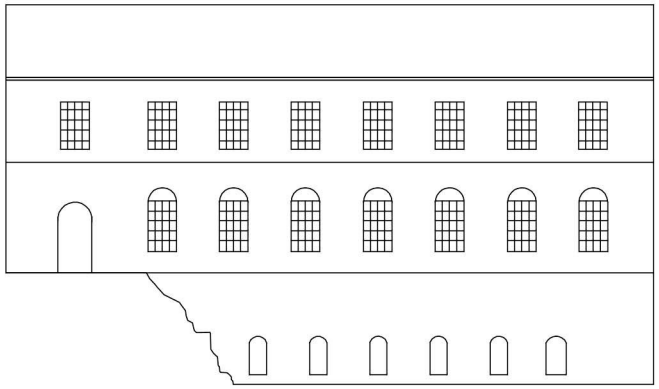


Mezzanine

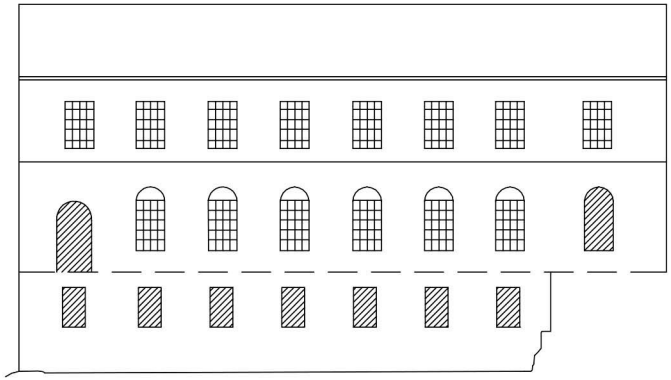
Existing Building Elevations



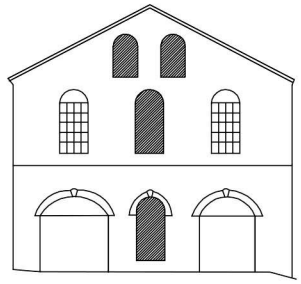
South Elevation



West Elevation

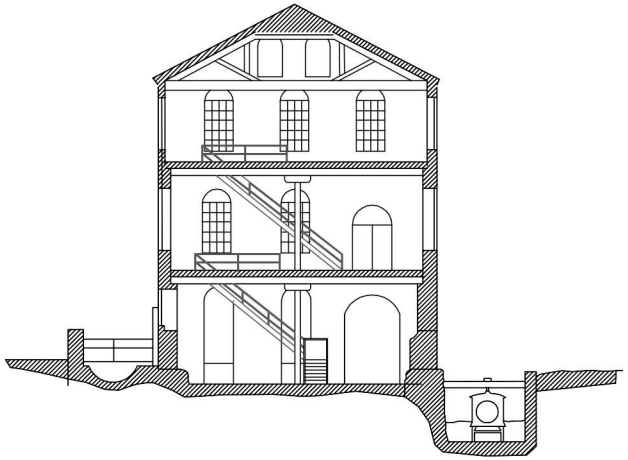


East Elevation
Scale: 1/32" = 1'-0"

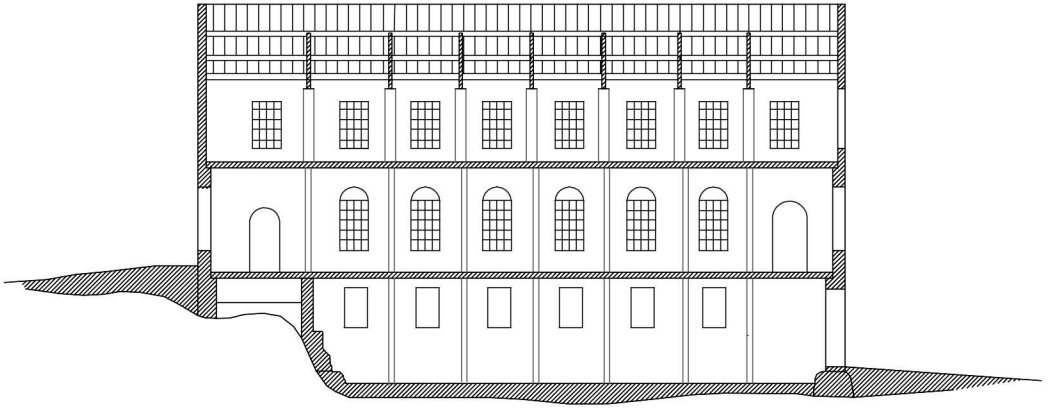


North Elevation

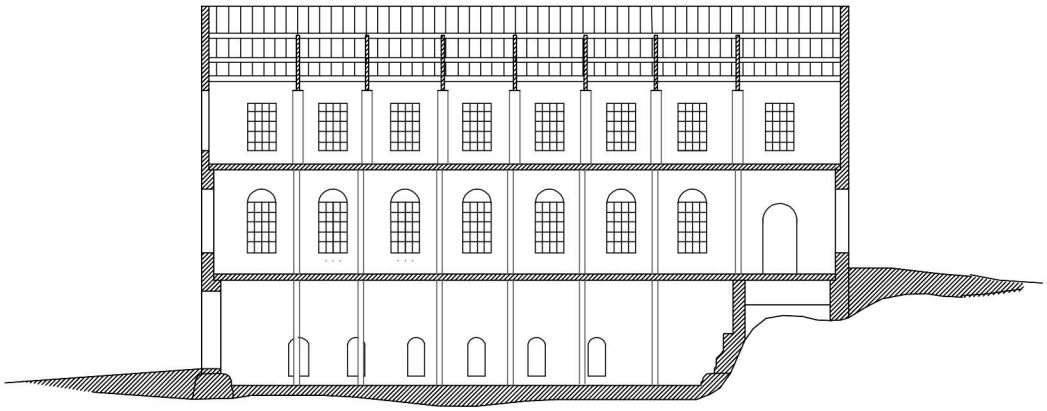
Existing Building Sections



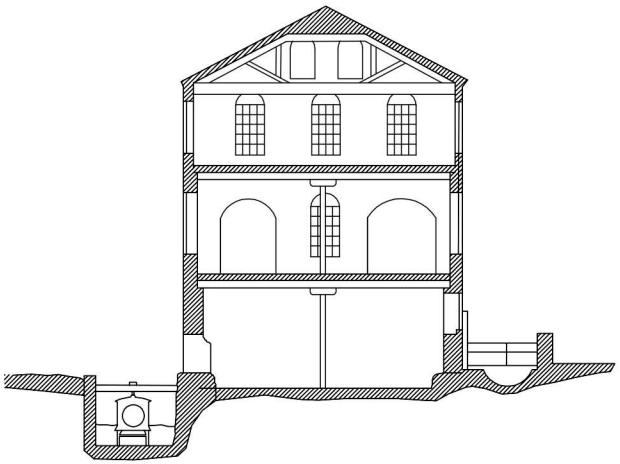
A. Section facing South
Scale: 1/32" = 1'-0"



B. Section facing East

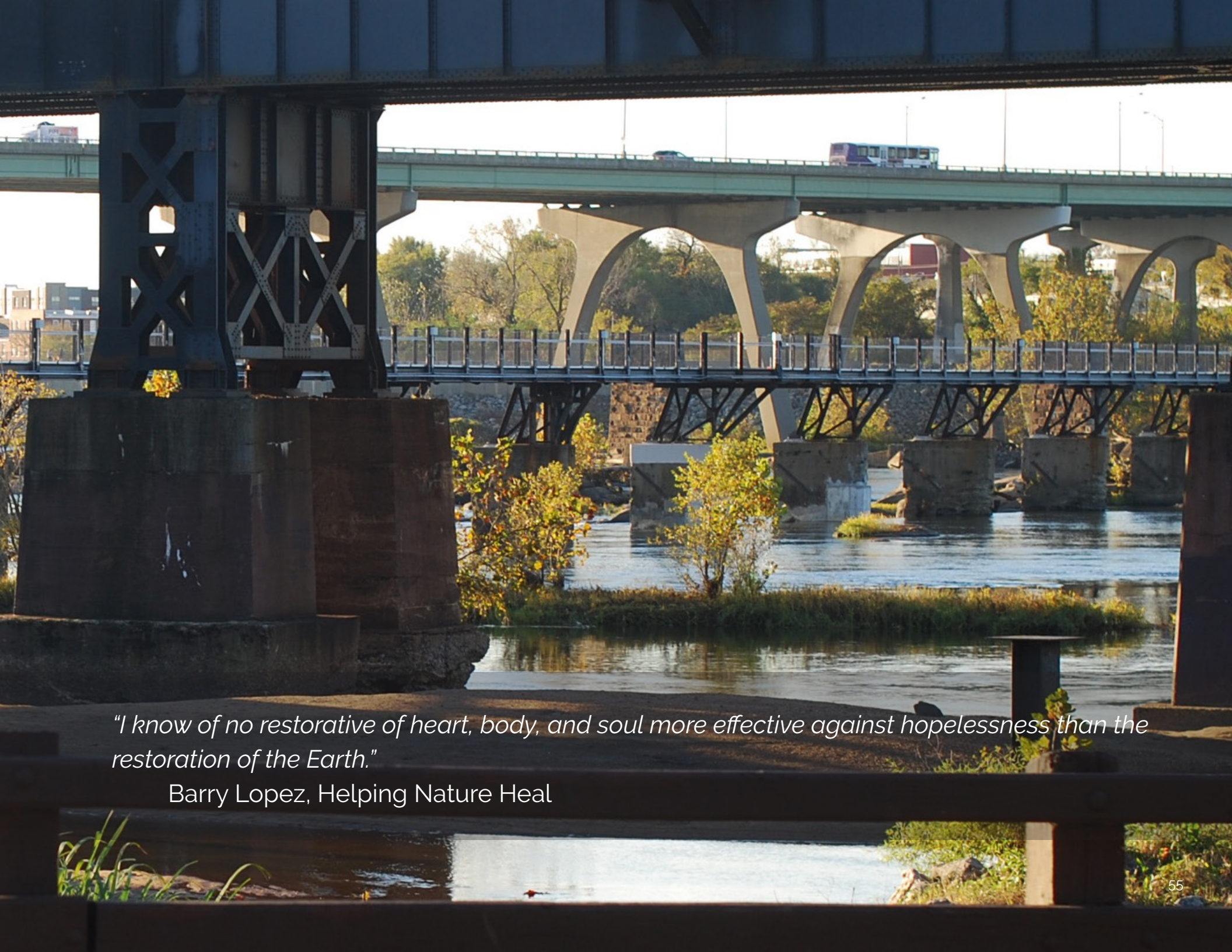


C. Section facing West
Scale: 1/32" = 1'-0"



D. Section facing North

PROGRAM



"I know of no restorative of heart, body, and soul more effective against hopelessness than the restoration of the Earth."

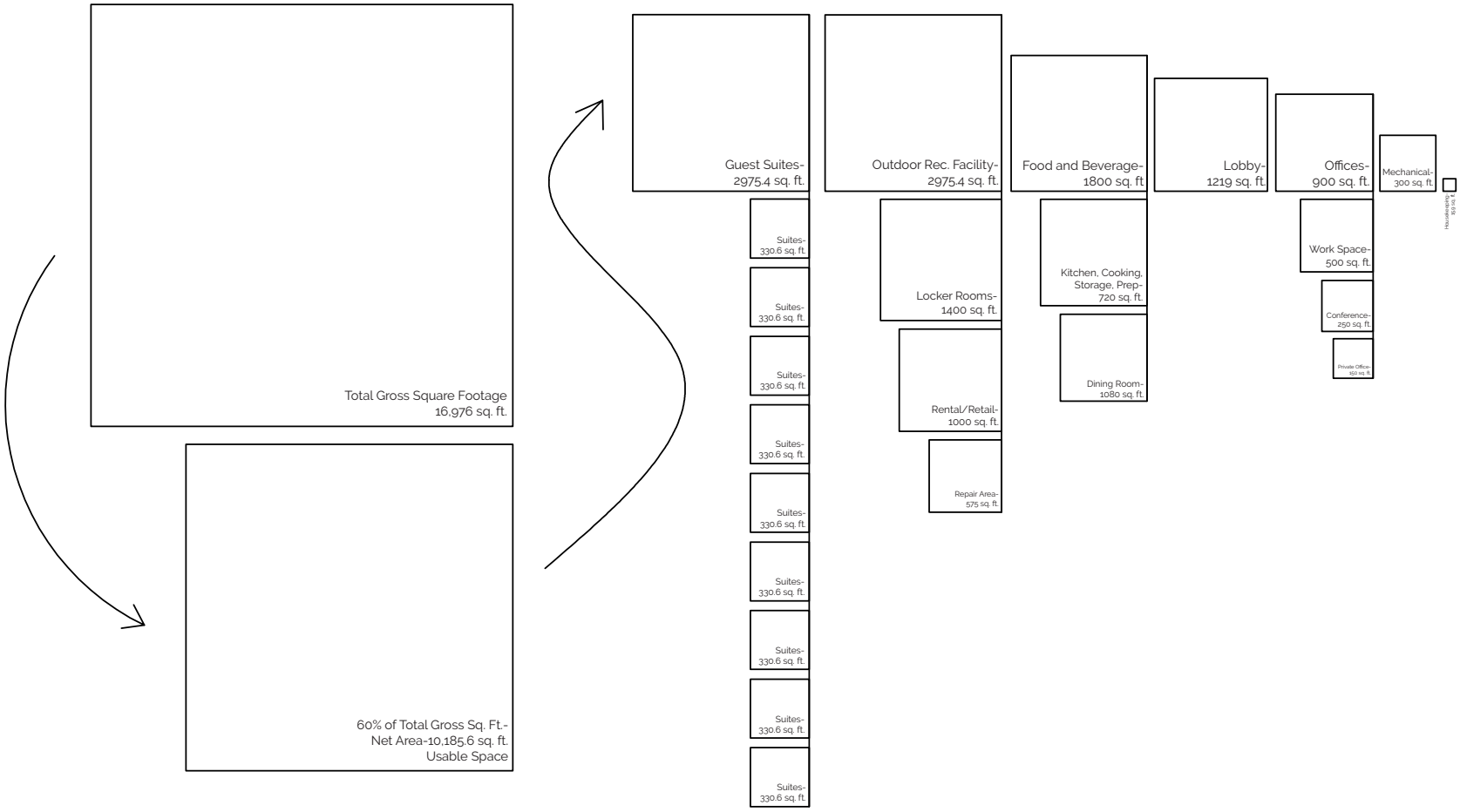
Barry Lopez, Helping Nature Heal

Initial Program

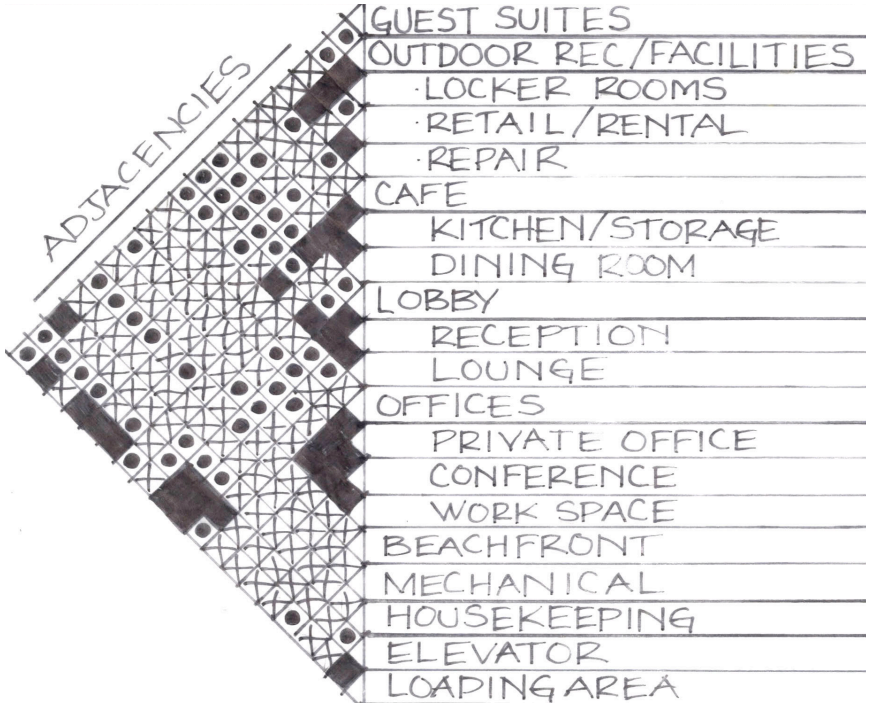
Tredegar Iron Works - Pattern Building Boutique Hotel and Outdoor Recreation Equipment Center Type of Construction: Type III Total Gross Square Footage- 16,976	How Many?	Area	Occupant Load	Brief Description
Guest Suites	9	330.6 sq. ft. (per room)	36	1 & 2 Bed - Hotel Guest Suite
Outdoor Rec/Facilities		2975.4 sq. ft.		
- Lockers Rooms	2	1400 sq. ft. (700 per gender)	28 (14 per gender)	Public Family Changing Room w/ Bathrooms and Showers
- Retail / Rental	1	1000 sq. ft.	9	Public Rental and Storage of Outdoor Recreation Equipment: Kayaks, Canoes, Paddle boards, Bikes, Tubes and Climbing Equipment
- Repair	1	575 sq. ft.	2	Public Repair for Outdoor Equipment or Damaged Rental Equipment
Cafe		1800 sq. ft.		
- Kitchen/Storage	1	720 sq. ft.	8	Cooking, Prepping and Storage of healthy locally sourced, farm to table food
- Dining Room	1	1080 sq. ft.	72	Selling and Consumption of healthy locally sourced, farm to table food
Lobby		1219 sq. ft.		
- Reception	1	219 sq. ft.	4	Check-In and Check Out for Hotel Guests and Reception for Public Facilities on Site
- Lounge	1	1000 sq. ft.	50	Indoor and Outdoor Lounge for guests to enjoy scenic views, practice yoga, meditate and relax. Special Occasion Events
Offices		900 sq. ft.		
- Private Office	1	150 sq. ft.	2	Private Office for Hotel Manger
- Conference	1	250 sq. ft.	15	Meeting Space for 15 people
- Open Work Space	1	500 sq. ft.	5	Open Concept Work Space for Hotel Employees
Beachfront	1	TBD		Public Space for Relaxation and Support of Outdoor Activities
Mechanical	1	300 sq. ft.	1	Mechanical Equipment
Housekeeping	3	15 sq. ft. (per room)	1	Housekeeping one for each floor
Loading Area	2	TBD	1	Loading and Unloading of Guests Belongings of Outdoor Equipment

Summary of Action in space	Plumbing Requirements	Specialized ff•e	Accessibility	Acoustic Privacy	Visual Privacy	Sunlight	Security Needs
- Sleeping - Bathing/Bathroom - Eating - Relaxing	1 Water closet 1 Lavatory per room	bedding bathroom storage	Y	Y	Y	Y	Y- Doors should lock
- Changing - Showering - Bathroom - Storing personal items	8 Water closets (3 Male/5 Female) Lavatories (1 Male/2 Female)	lockers showers bathrooms sinks janitorial	Y	Y	Y	Y	Y- Lockers should lock
- Retail Transaction - Storage/exchange of outdoor equipment (variety of sizes)	n/a	equipment storage retail desk retail display	Y	N	N	Y	Y- Register/ equipment
- Repair of outdoor equipment	n/a	storage work bench	N	N	N	Y	N-
- Prepping/Cooking Food	n/a	stove/hood oven prep counters cooler/freezer	N	Y	Y	Y	N-
- Serving of food		tables chairs	Y	Y	N	Y	N-
- Retail and Business Transactions - Way finding		reception desk seating transaction counter	Y	Y	Y	Y	Y- Register/ Computer
- Sitting - Standing - Gatherings		lounge seating special event tables/chairs versatile furniture	Y	N	N	Y	N-
- Office Duties - Small Meetings		desk chairs storage	Y	Y	Y	Y	Y- Door should lock
- Meetings		large table projection	Y	Y	Y	Y	N-
- Office Duties		open concept desks chairs	Y	Y	N	Y	N-
- Outdoor Activites - Relaxation		lounge seating dock	Y	N	N	Y	N-
- Storage			N	Y	Y	N	Y- Door should lock
- Storage		storage	N	N	Y	N	Y- Door should lock
- Loading/Unloading		ramp	Y	N	N	Y	N-

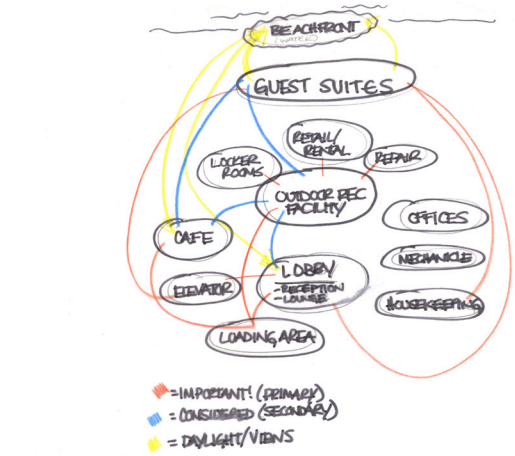
Pre-Design Graphic Studies

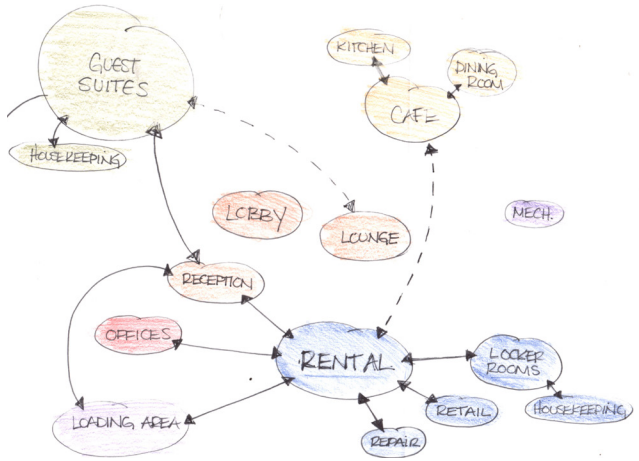


Graphic Program



Adjacency Matrix





Proximity Bubble Diagrams

CONCEPT DEVELOPMENT

"This world is but a canvas to our imagination."
Henry David ThoreanW

Concept development began the summer of 2016, before thesis even began. I traveled overseas to study abroad and live in Florence, Italy for a month. While there I traveled around Italy and Switzerland. Most days were spent outside, walking the cities and discovering new places. Every day my grandmother would message me and remind me that I was walking in the same steps as masters like Michelangelo, Leonardo Da Vinci and Raphael. So I would reflect on these steps, the same steps taken by thousands and wonder how long these streets had been there. And yet they were man constructed, often the material was natural. So strong, supportive, everlasting and beautiful, just like mans relationship with nature.

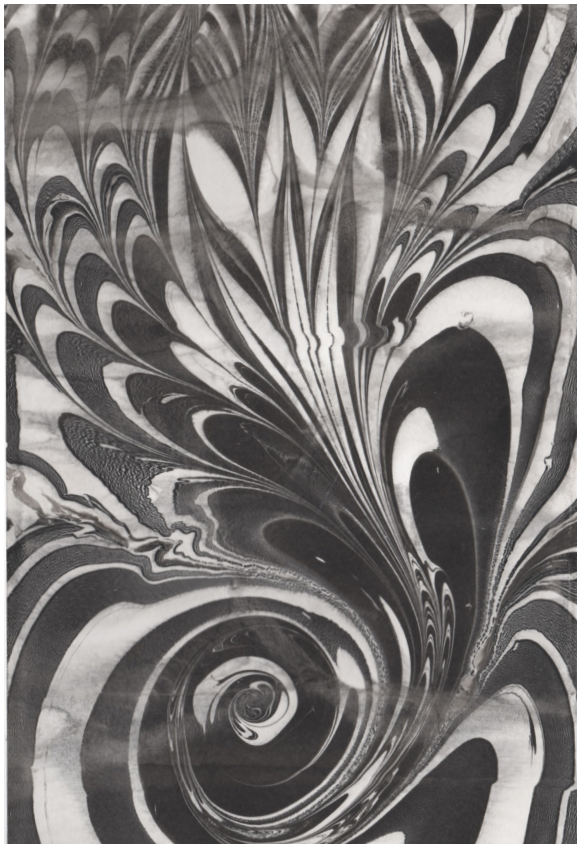


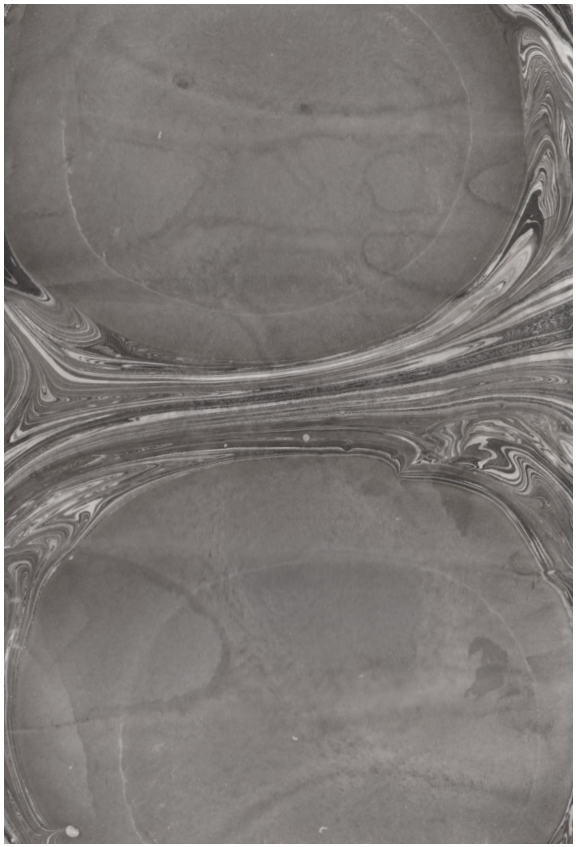
Since living in Richmond, Virginia the James River has become one of my best friends. The adventures that takes place in and around the James, balance out hectic school and work schedules.

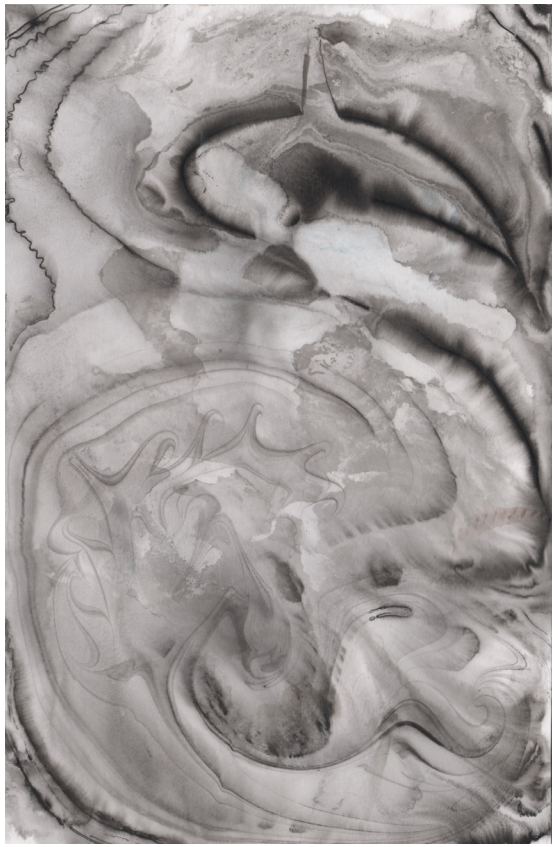
Linking my own personal connection and affiliation with the natural world, the concept of biophilia, and the program of this space I was instantly drawn to the James as inspiration for this project.

These paper marbling concept pieces illustrate and explore the connection and organic shapes created by running water.

Understanding how the river rocks divert direction and flow and can create a catch and release of movement.







CONCEPT:

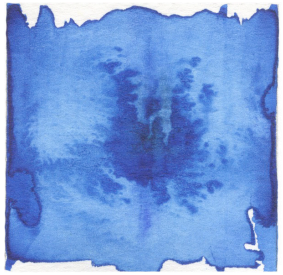
+ INTERCONNECTION
+ NATURE W INTERIOR
+ PEOPLE W RIVER → SOUND
• EXPERIENCE
• FEELING (MATERIAL

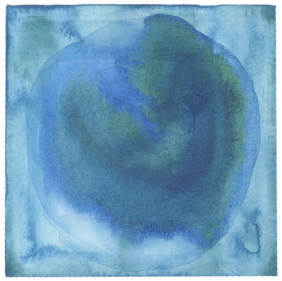
+ INSIDE OUTSIDE
+ ABSENCE OF INTERIOR

WHY?

- FULL CIRCLE OF RELIANCE.
- DEPENDANCY ON EACHOTHER'S SYSTEMS.
- HEALTH-WELLBEING ASPECT.
- WHY NATURE IS GOOD?
- WHY BLUR THE LINE.
- WHY SEPARATION.
- NATURE SUSTAINABILITY
WHY SUSTAINABLE
ECOTOURISM! ENCOURAGE GUEST
BUT HOW DOES HOTEL ENCOURAGE.

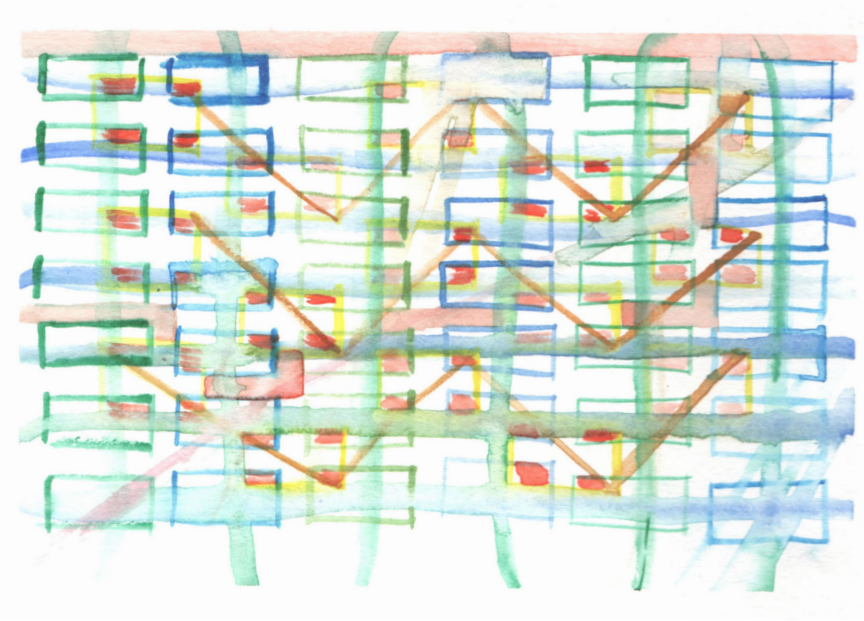
HOSPITALITY INDUSTY.
WHAT MAKES IT NOT SUSTAINABLE?



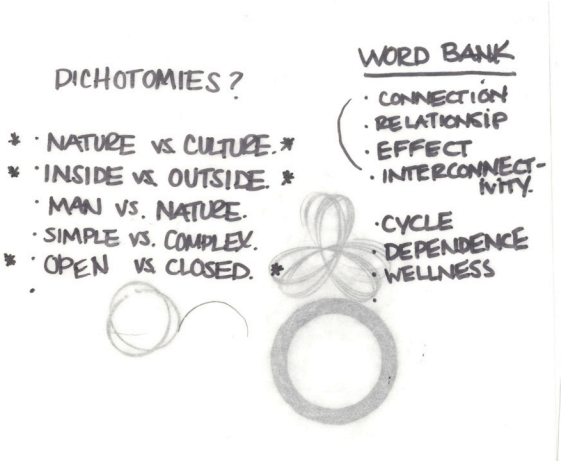



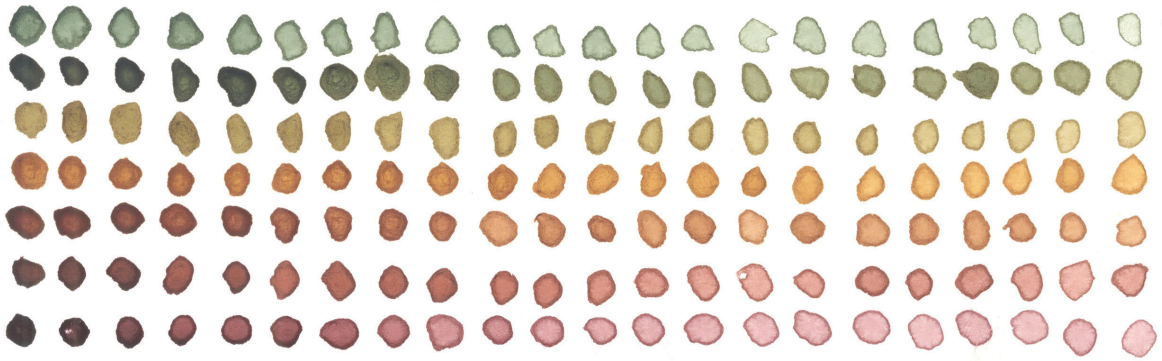
Watercolors exploring the relationship to inside to outside. Hard barrier vs. blurred.

The connection between human and nature, and humans affiliation toward nature began to shape my concept. Understanding the interconnection of these different aspects and how they influenced each other became important. Asking questions and creating word banks help me develop concept work like watercolors, diagrams and models.



Watercolor exploring the interconnection to inside and outside

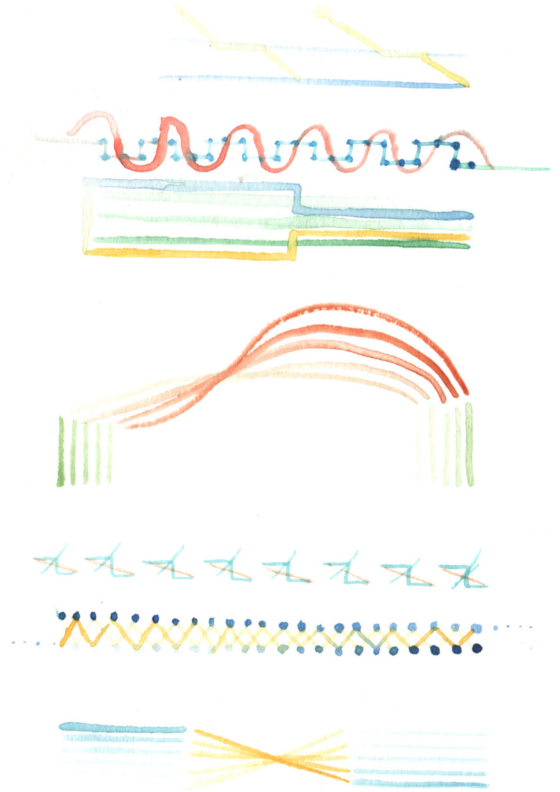


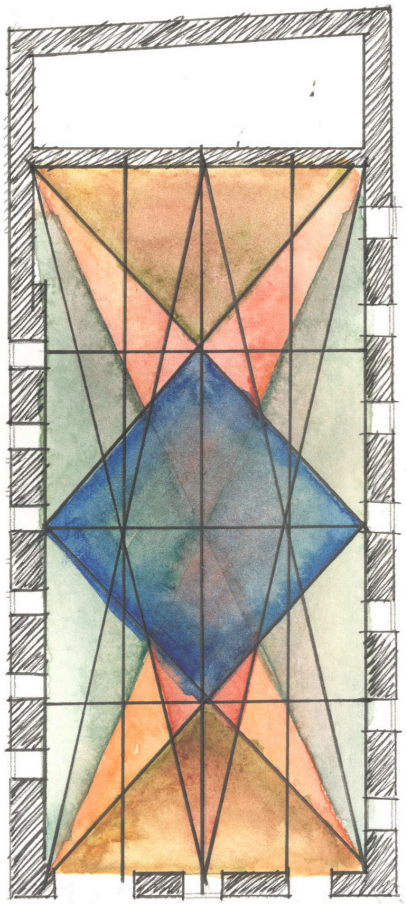


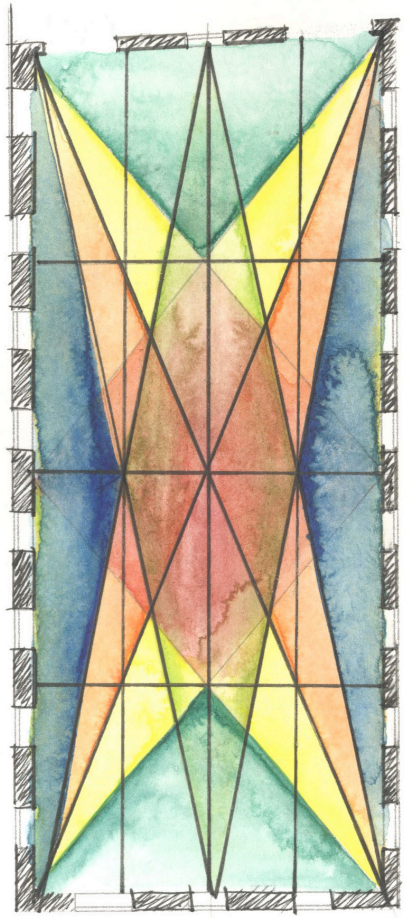
Watercolor exploration of the concept of hard and soft barriers. Connecting two things, in this case watercolor paint and paper, how can one connection differ from another? Distinct barriers are created by the paint itself, similar to the structure of the pattern building, although the relationship to the inside of each shape to the outside strengthens and weakens with different tones. How could this translate into design derisions.

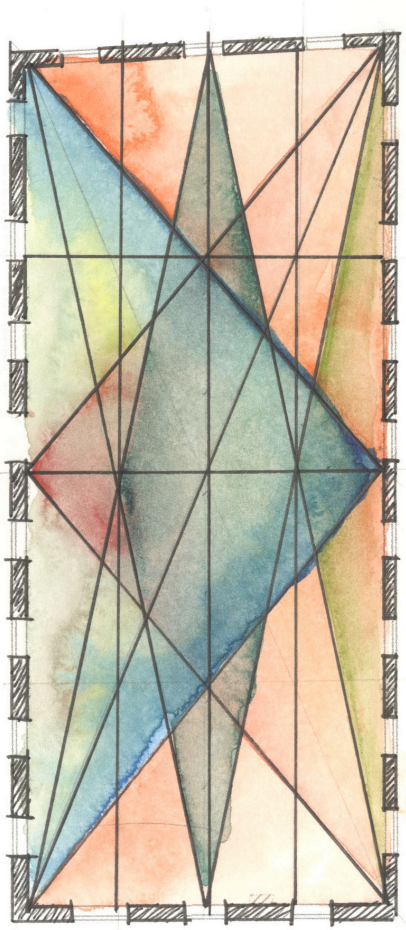
INTERCONNECTION

- PEOPLE W/ RIVER
  RIVER W/ CITY
- RIVER:
  - SMOOTH FLOW
  - RIPPLES
  - OVERLAPS
  - BLURRED LINES
  - CONVERGING ORGANIC LINES
- ROCK: DIVERSION IN DIRECTION
- CATCH & RELEASE
  - PATHS CROSSING
  - DIVERS
- IRREGULAR
- FLUID

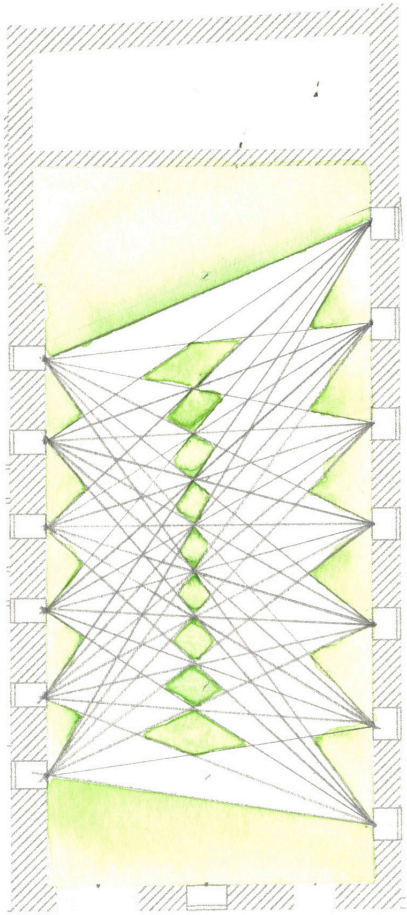


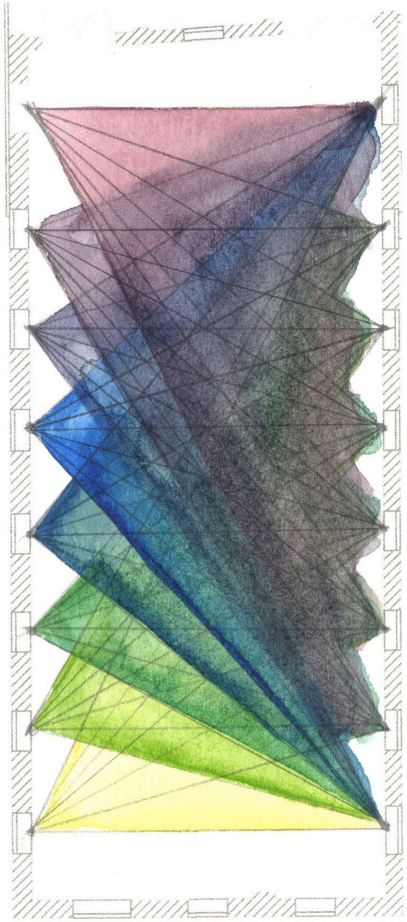


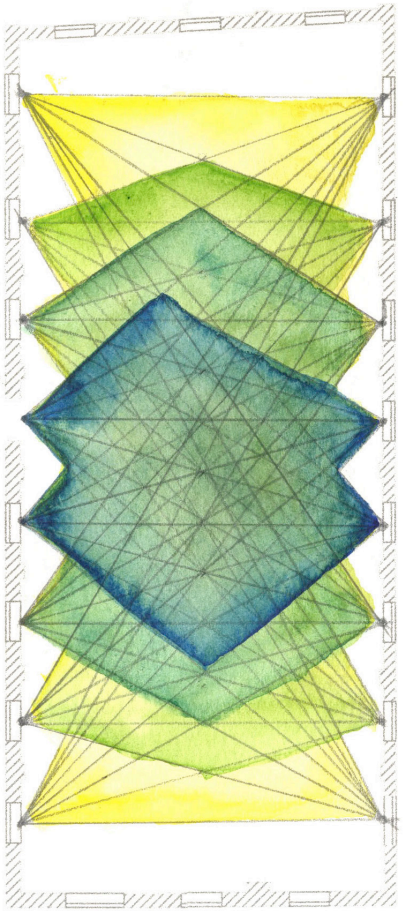




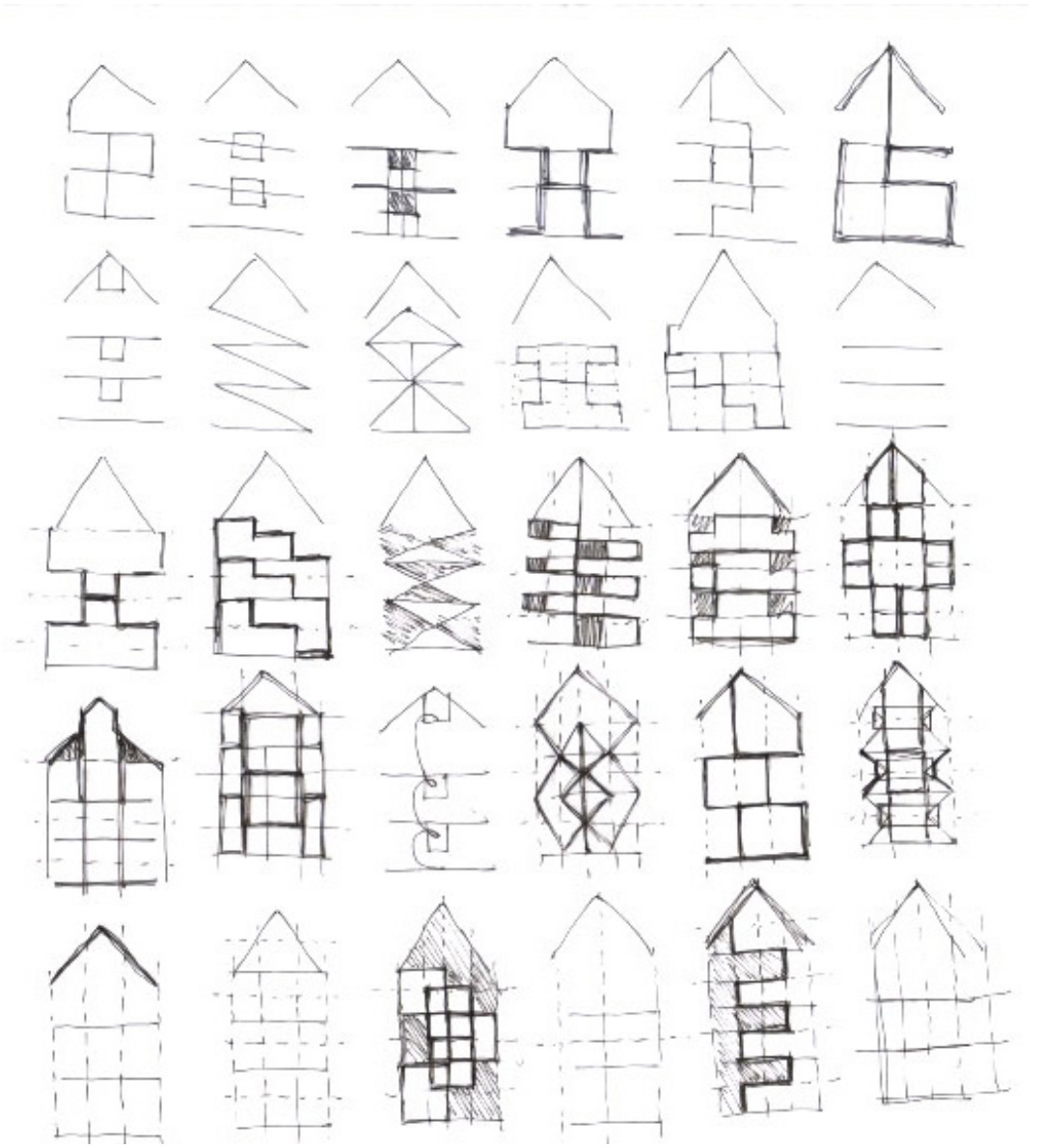
With traditional masonry construction, the base of a brick building is traditionally thicker at the base and thinner toward the top. What makes this building so unique is that it used to stand many stories taller, thus the thickness of the base of the current structure is three feet thick, two feet on the level two and one foot thick on the third level. In addition to wall thickness variation, this building also features a irregular spaced column grid, and windows that vary in size and alignment with others.



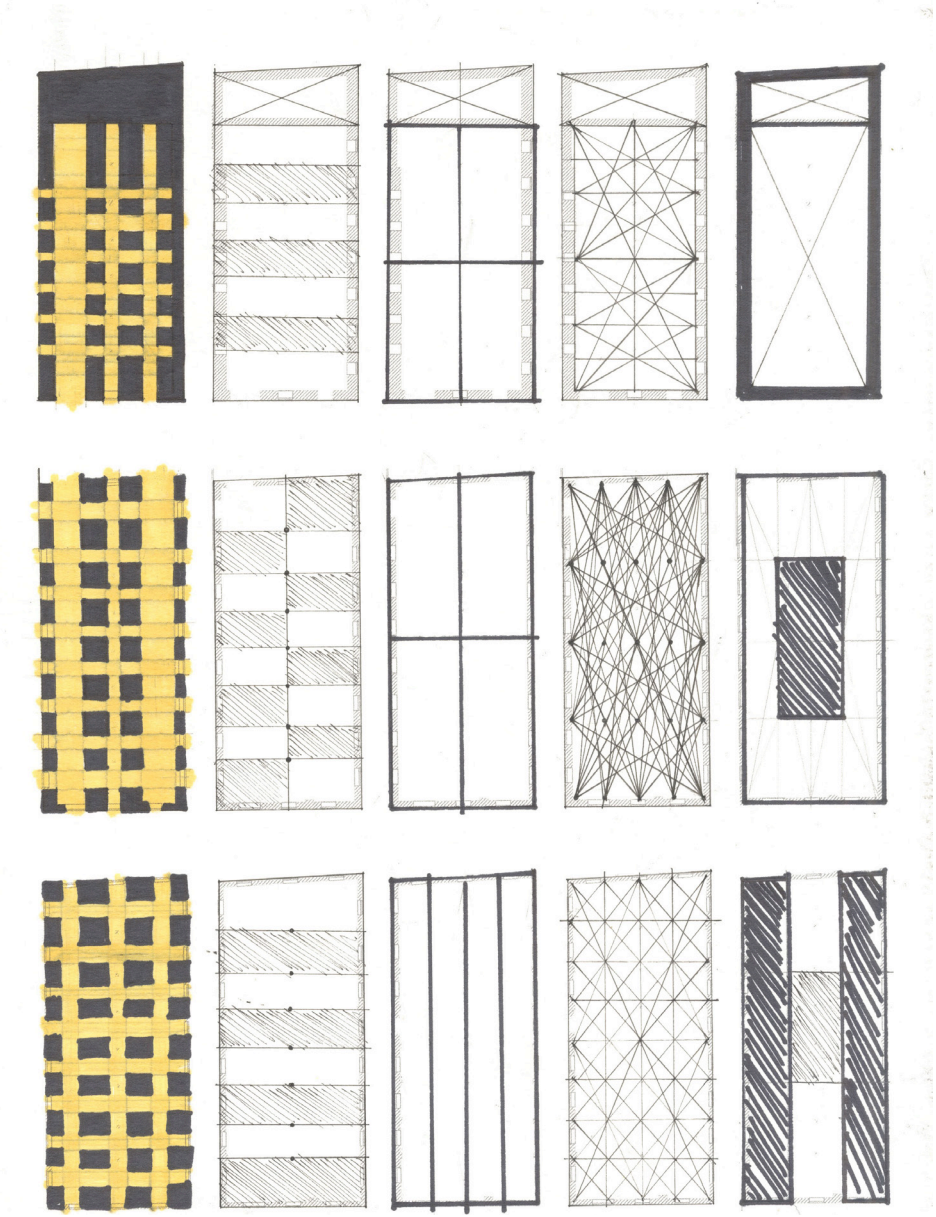




Considering these different aspects, helps to understand that the geometry of each level changes as the wall thickness changes. Relationships between windows and openings do the same. These watercolor diagrams explore this inconsistent relationship to further understand the space and to discover natural divisions of the space.

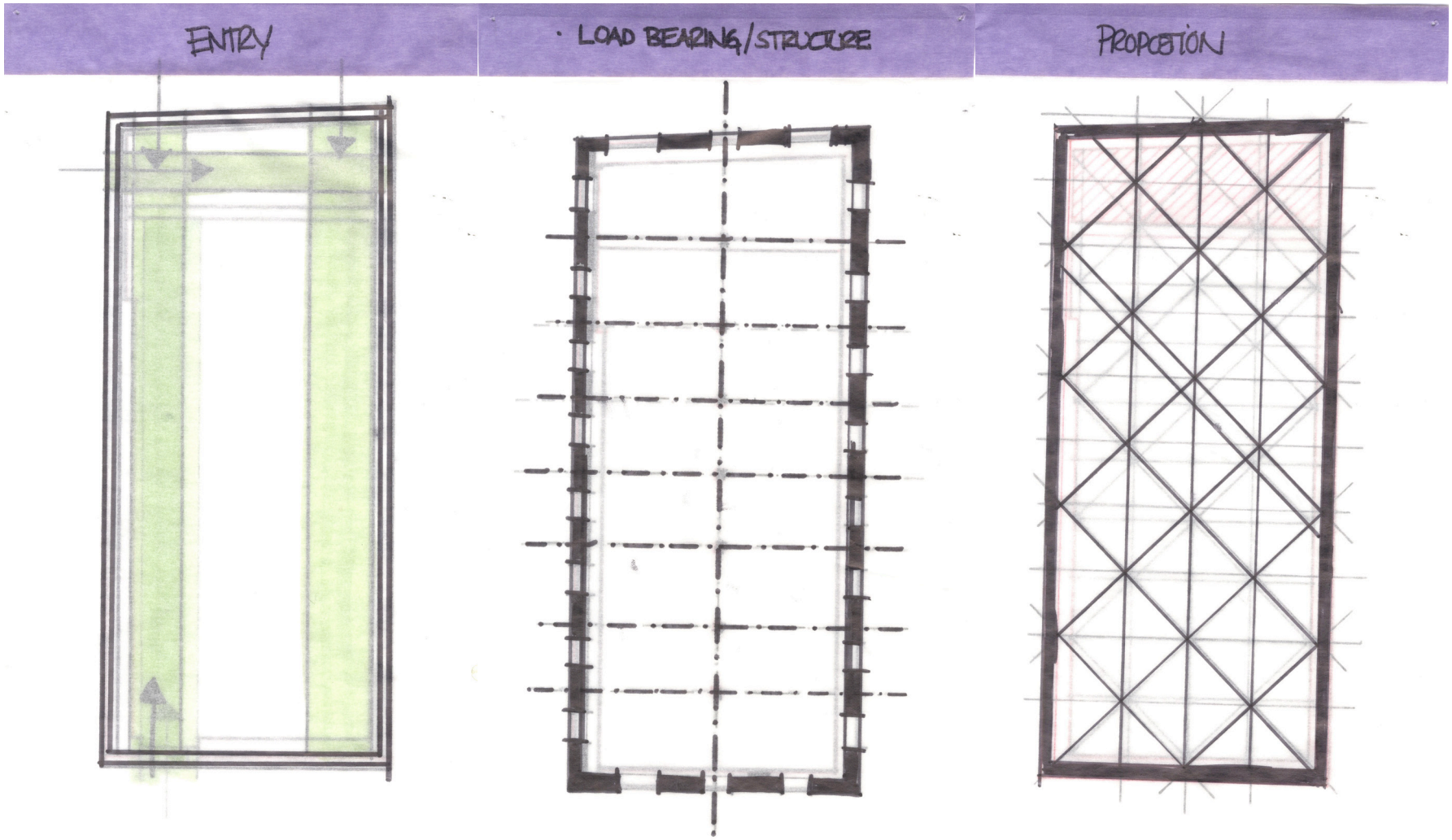


The concept of interconnection goes beyond inside and outside. The interconnection of activities, spaces and levels helped push this concept further. These diagrams consider how these activities, spaces and levels could interconnect vertically.



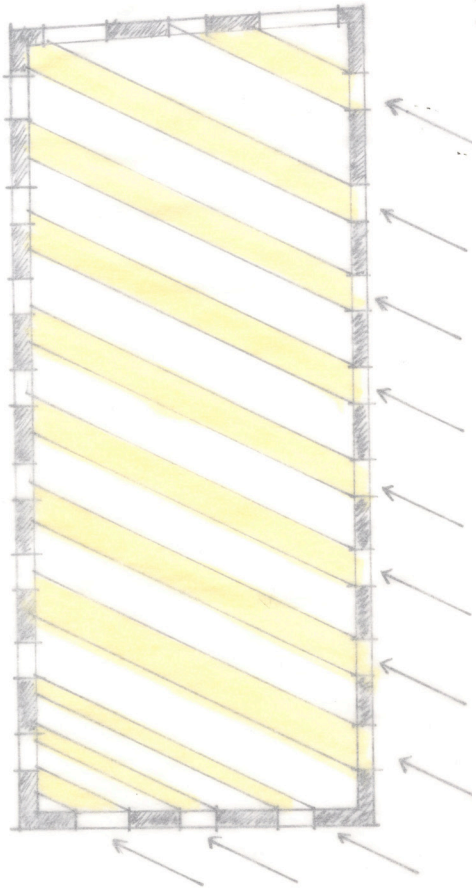
The relationship between openings in the pattern building are inconstant on the first level, although become more constant as a user moves through the space vertically.

Division of space, that responds to the structure and its natural geometry help create more of a connection between the spaces and its structure.

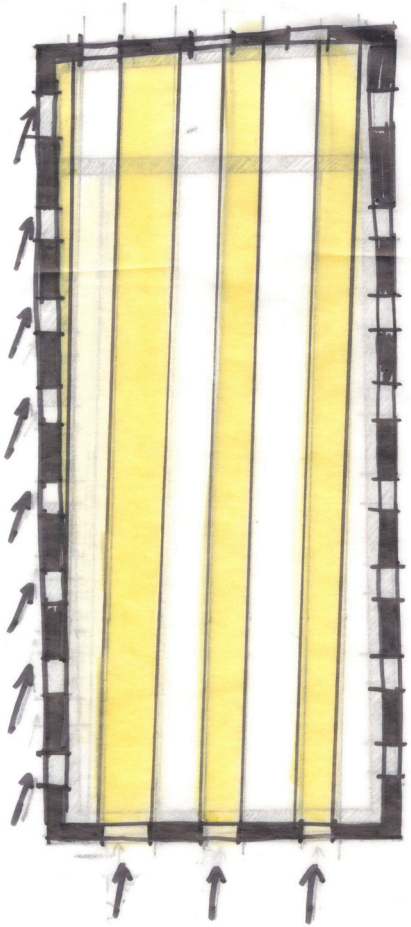


Parti Diagrams explore points of entry, the relationship of load bearing structural elements, the proportion of levels and effects of lighting during different times of day and year.

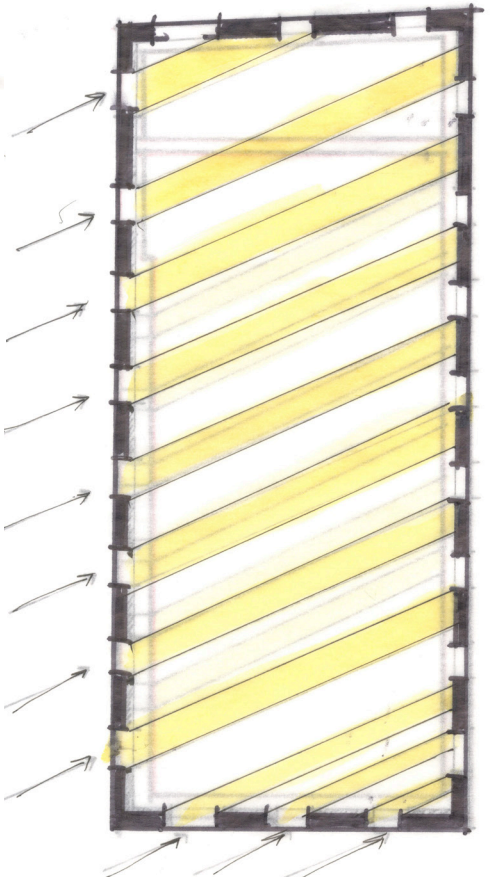
DAYLIGHT. SPRING/FALL EQUINOX. 9AM

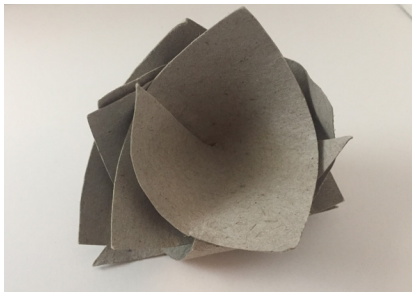
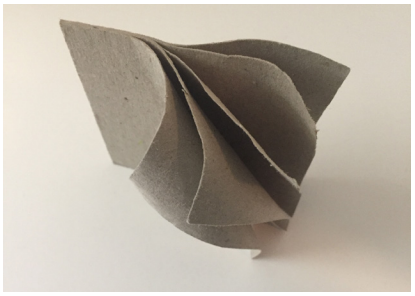
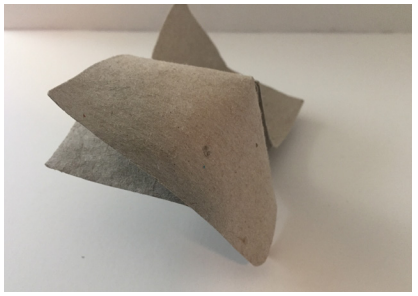
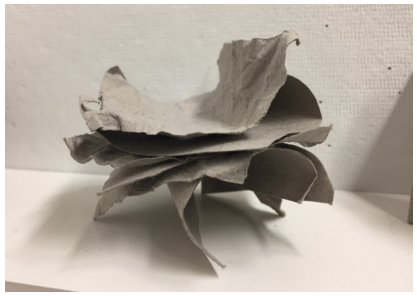


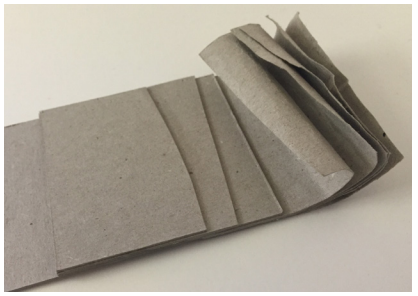
DAYLIGHT. SPRING/FALL EQUINOX. 12. PM.



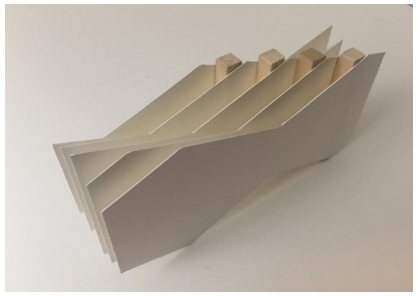
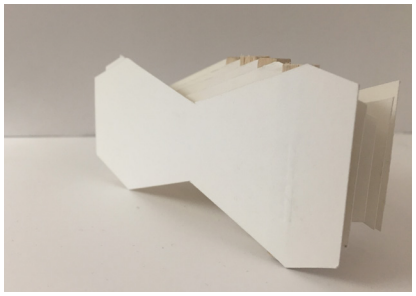
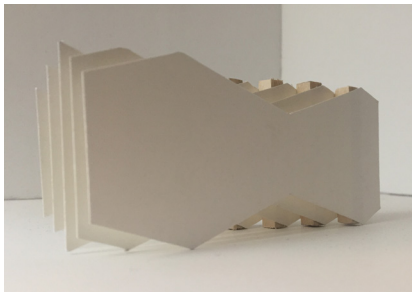
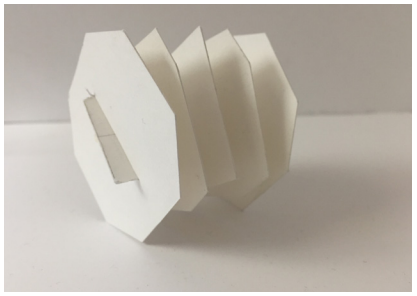
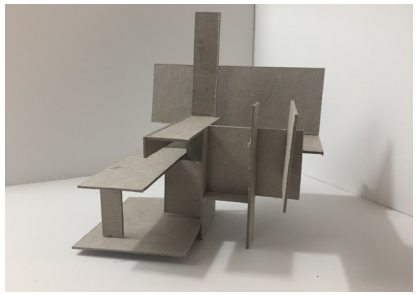
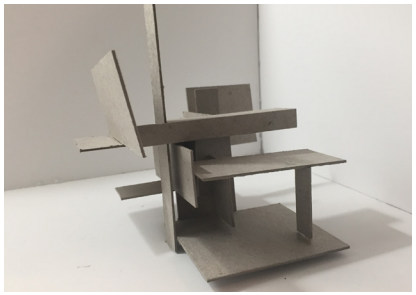
DAYLIGHT: SPRING/FALL EQUINOX : 5PM

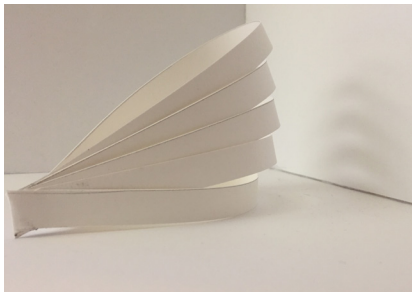


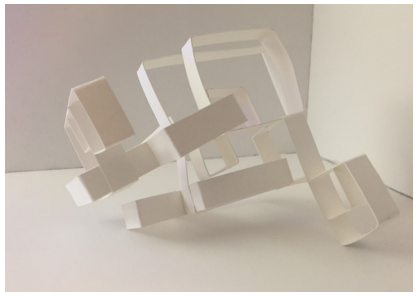
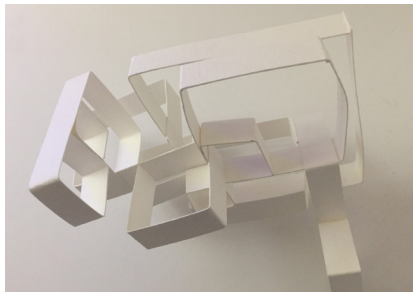
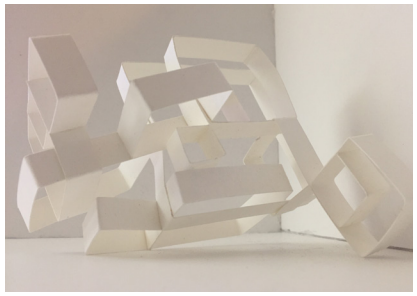
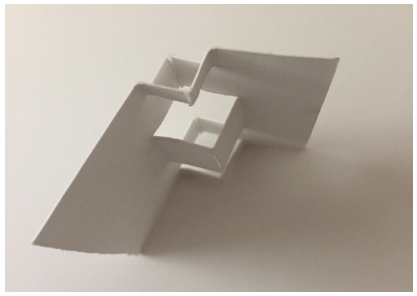
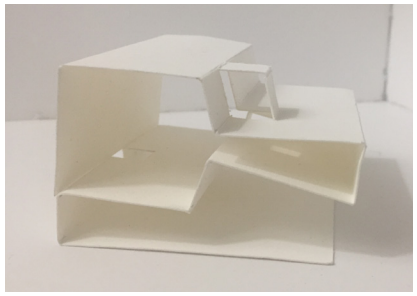
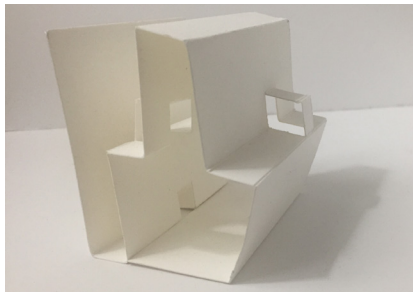
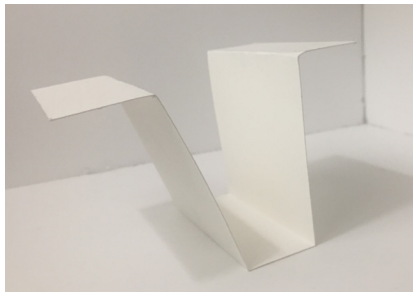
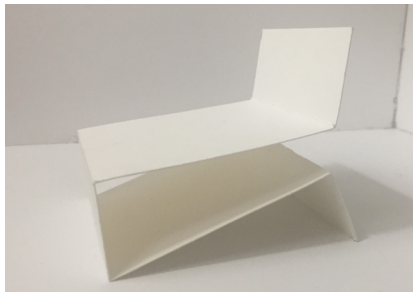



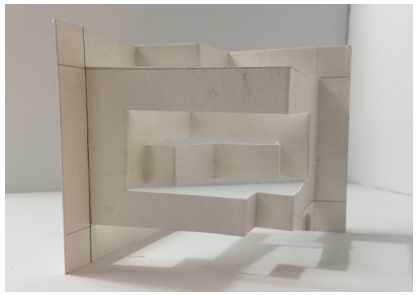
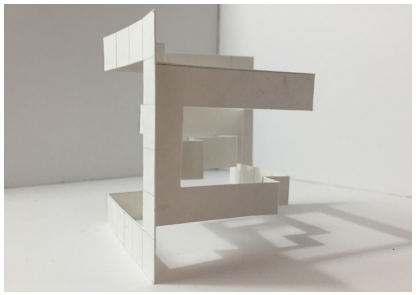
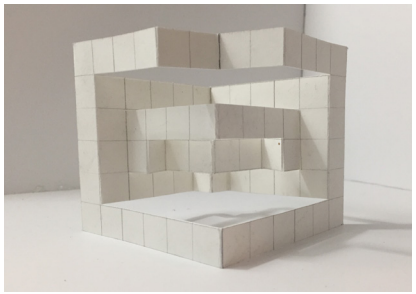
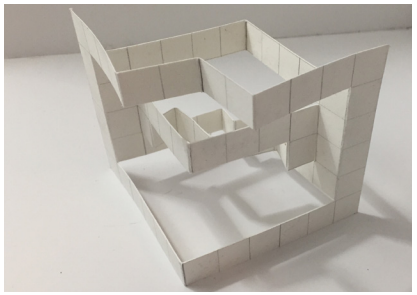
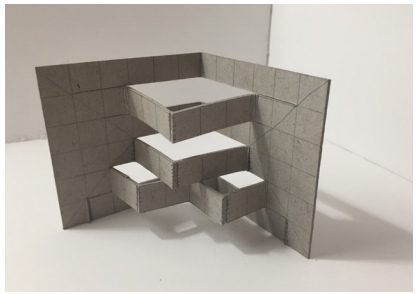
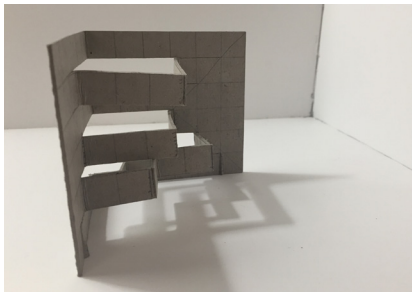
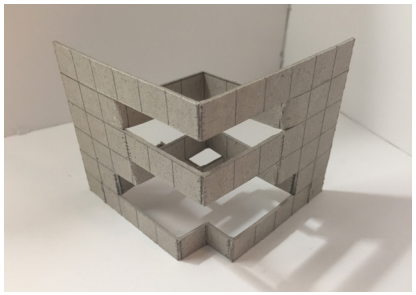
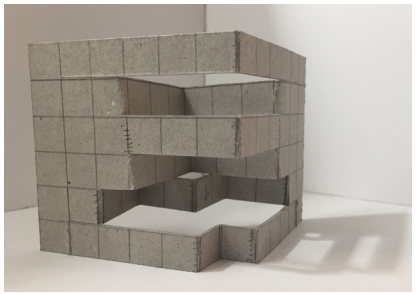
Too understand a relationship between a straight semi hard material, and the concept of the James River the material was sprayed or soaked in water, peeled apart and then manipulated.

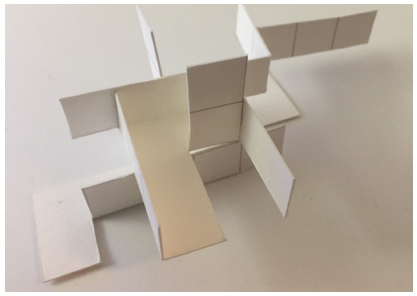
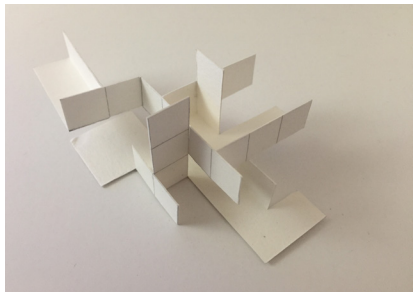
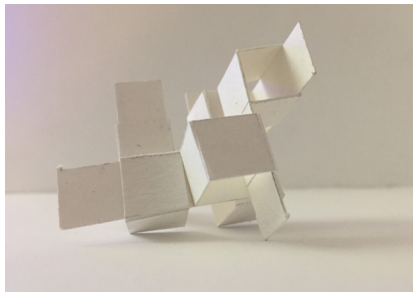
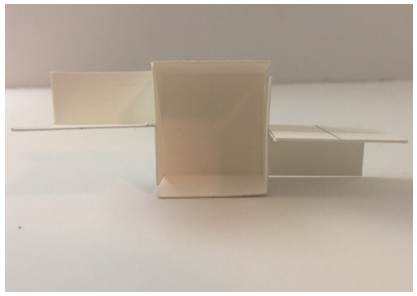
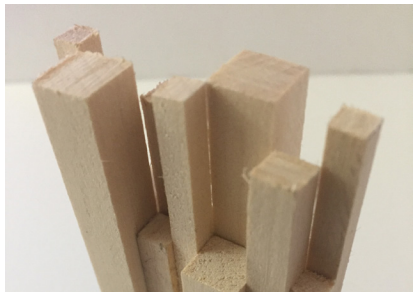
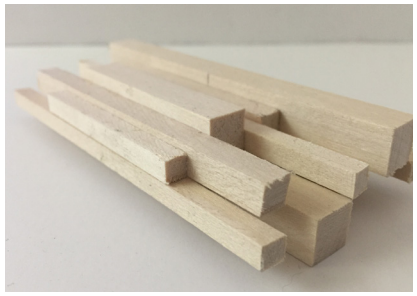
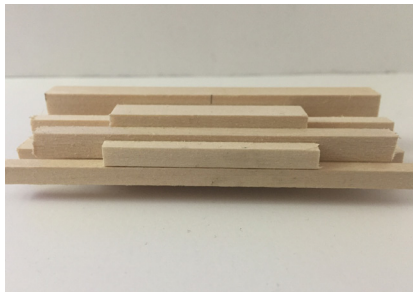
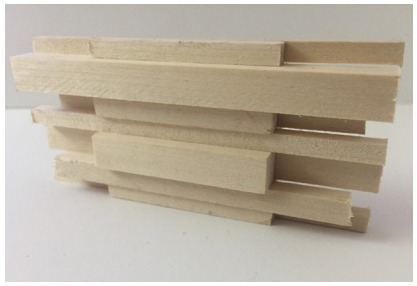







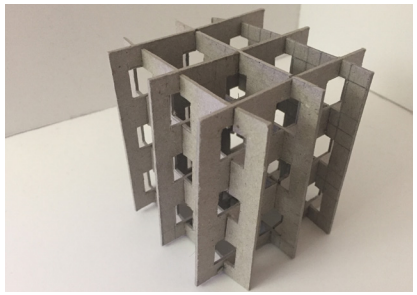
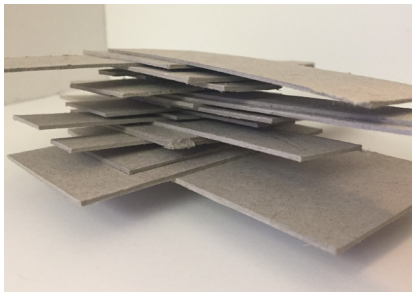


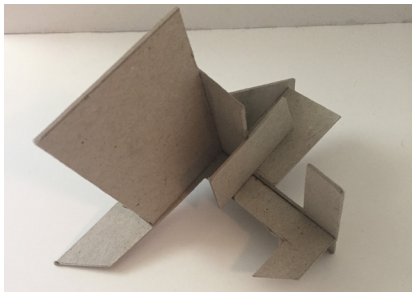
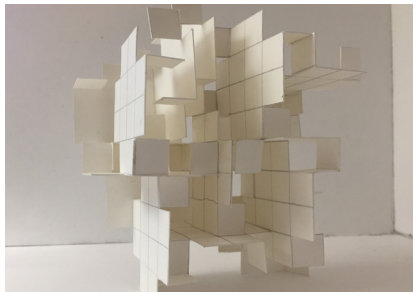
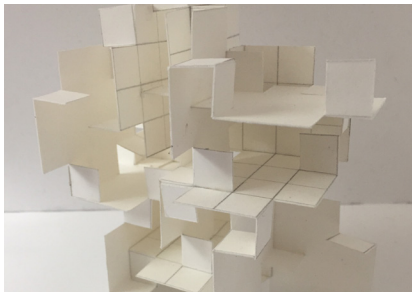
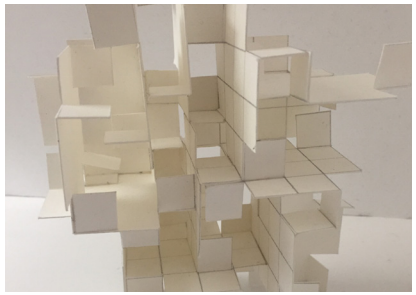
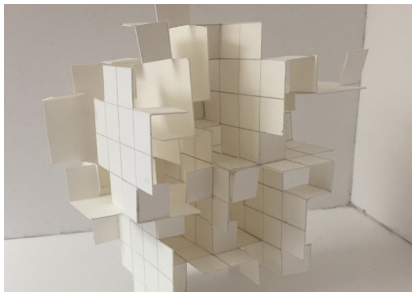
Continuing the exploration of inside and outside and interconnection in 3D. Blurring and celebrating the barrier.

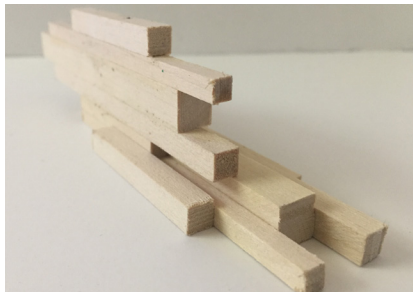
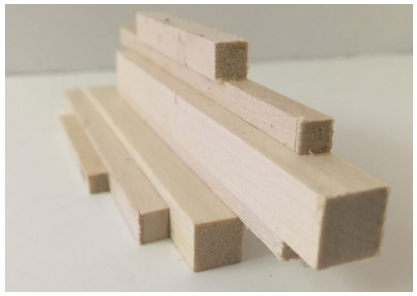
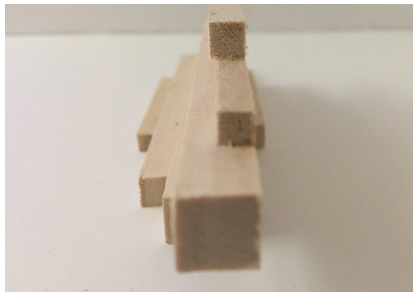
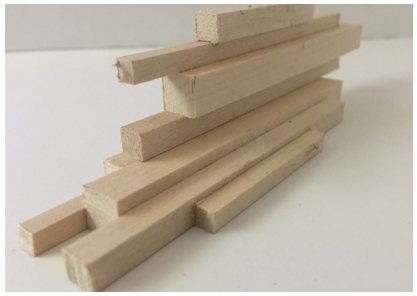
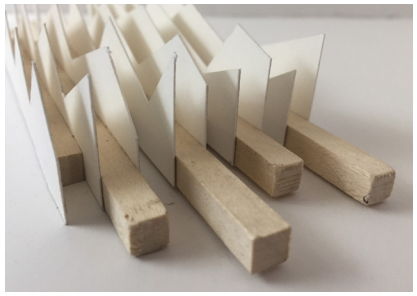
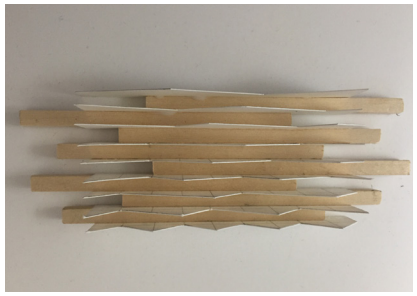
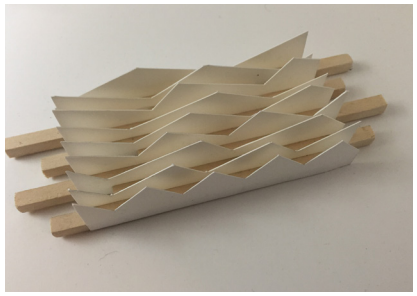
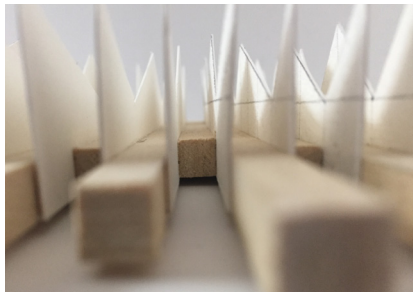









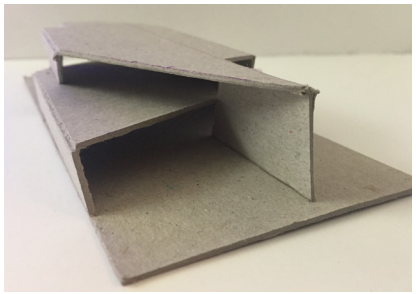
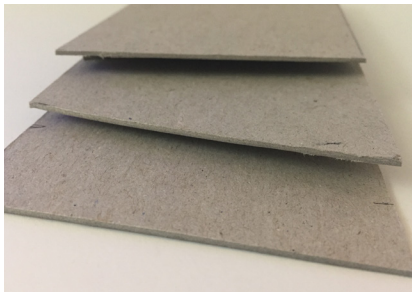
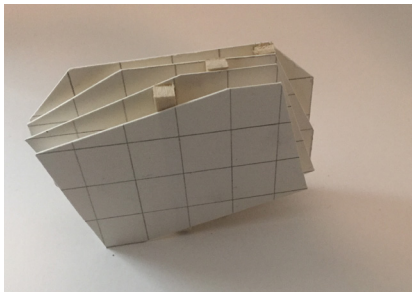
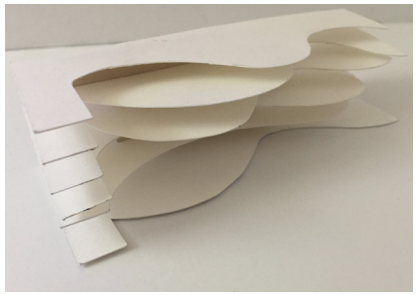
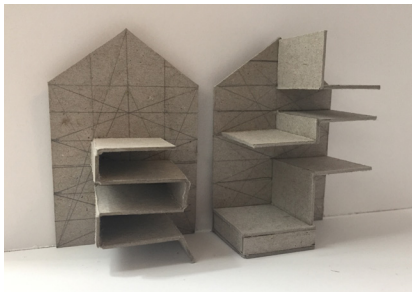
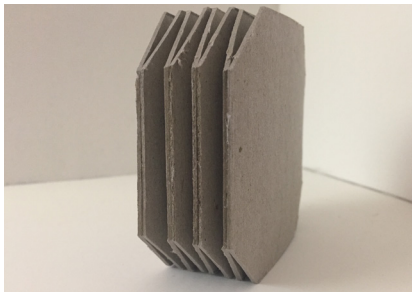
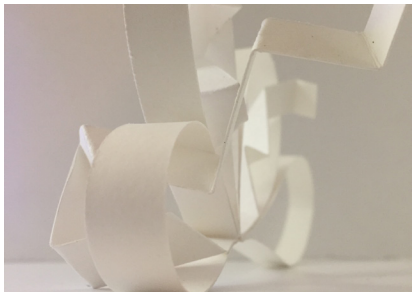









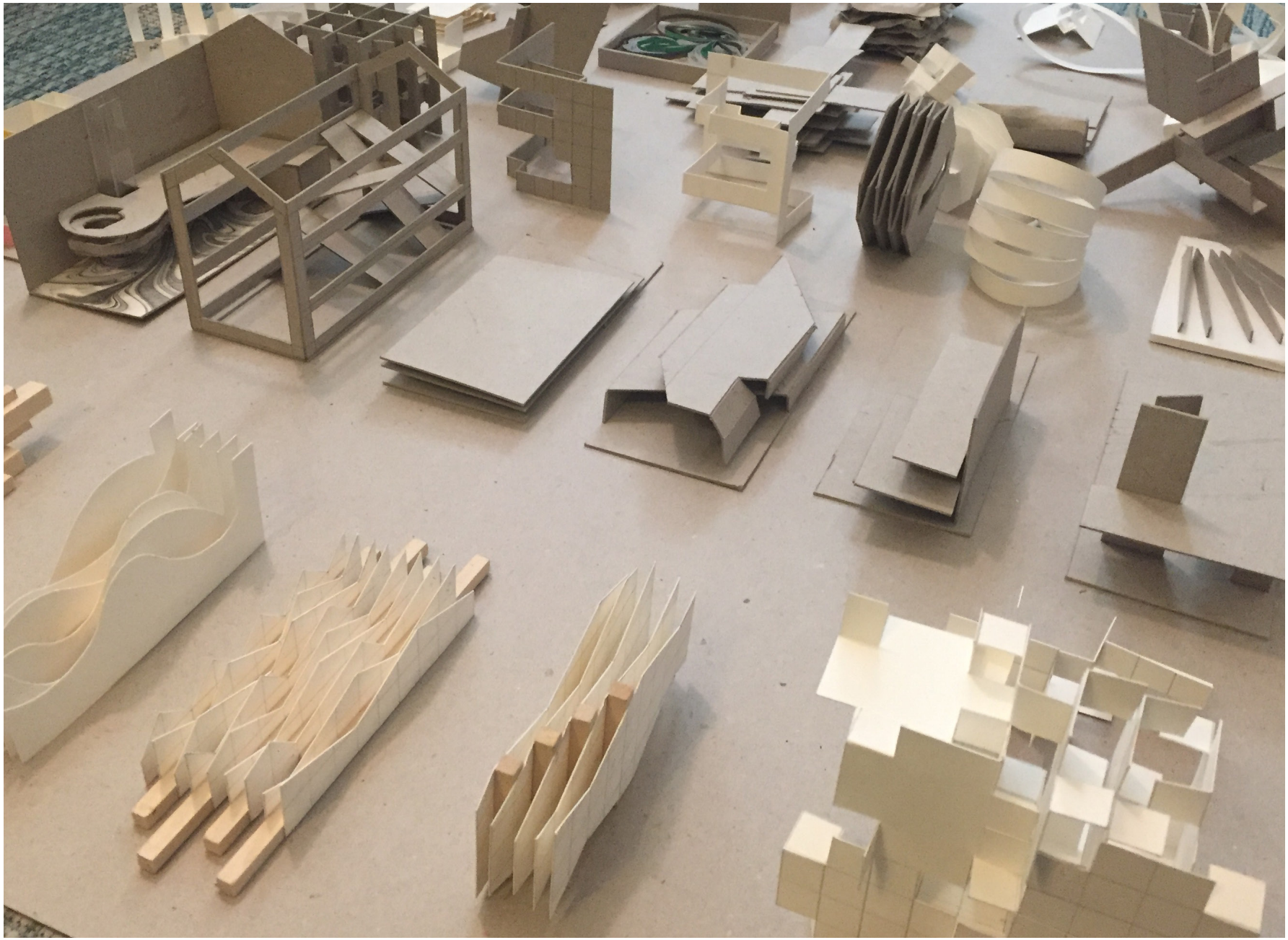









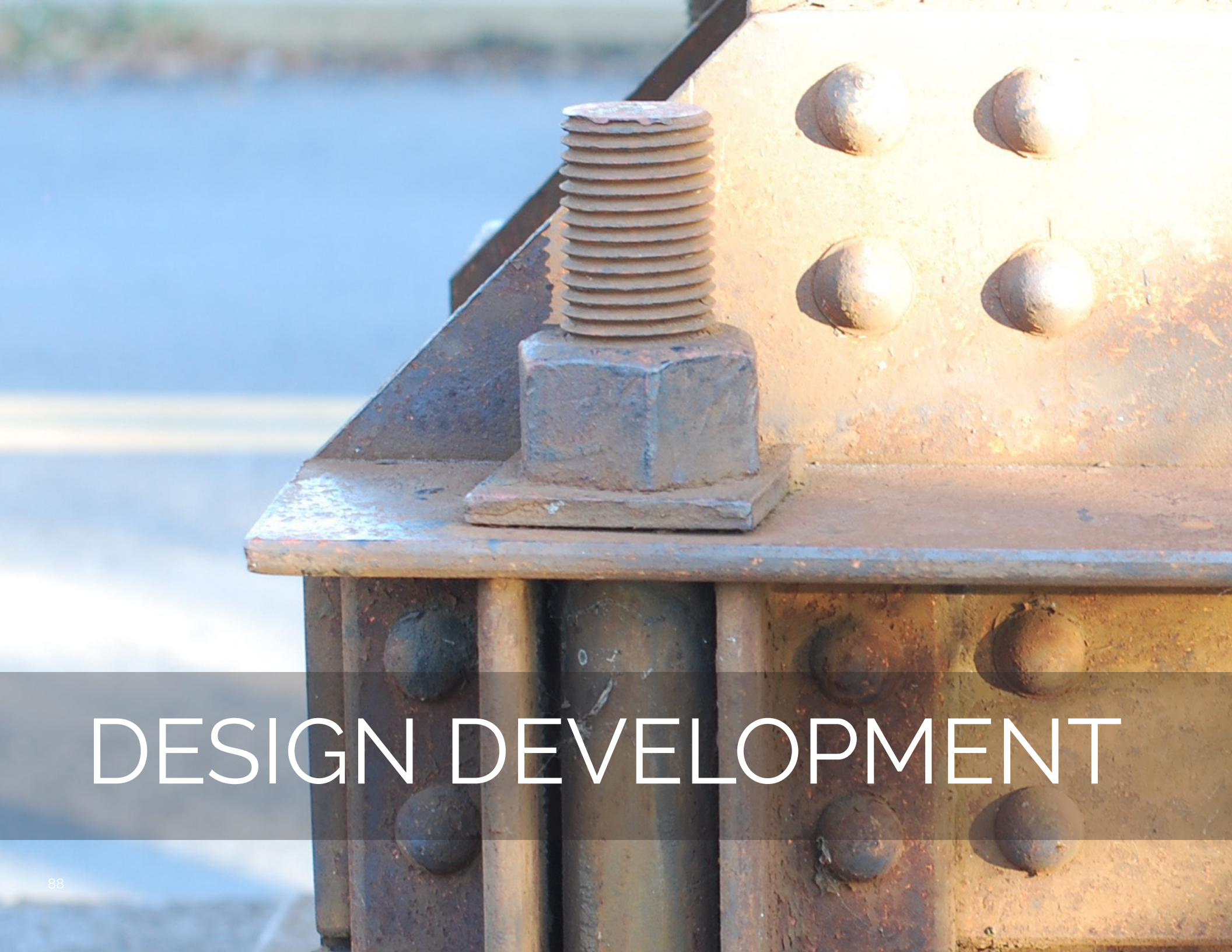











Final Concept

The concept is the interconnection of inside & outside and human & nature with the use of natural elements and materials.

The concept is the James River.
The flowing water creates organic forms and curvy lines, influencing the shape of the curvy overlapping levels.
Large smooth river rocks divert direction of water and create a catch and release in movement. This influences the placement of furniture throughout the space, creating a catch and release of traffic flow.

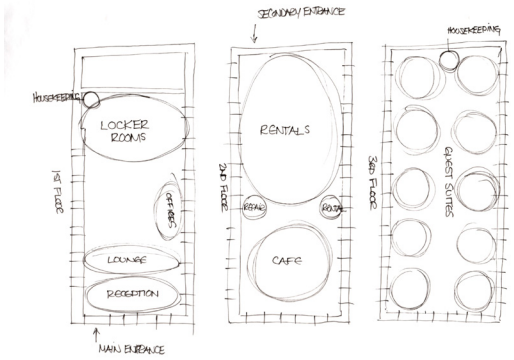


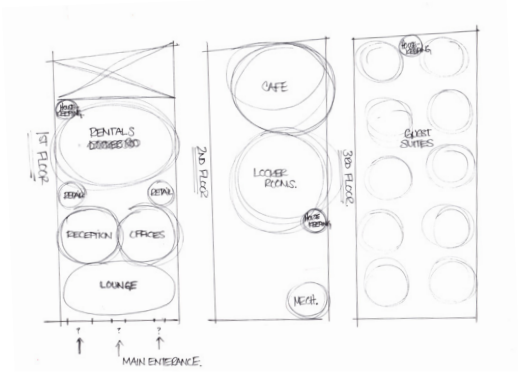
DESIGN DEVELOPMENT

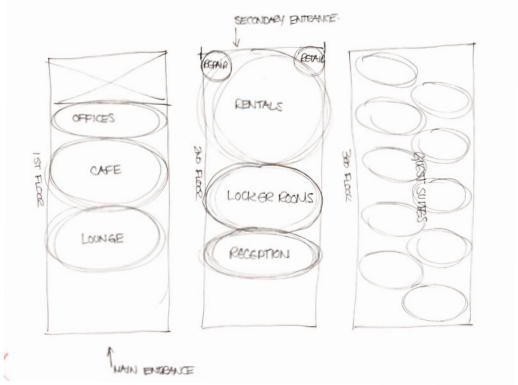
Design is a funny word. Some people think design means how it looks. But of course, if you dig deeper, it is really how it works.

Steve Jobs

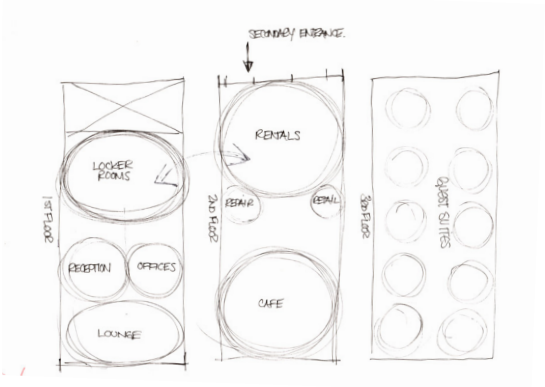
Space Planning

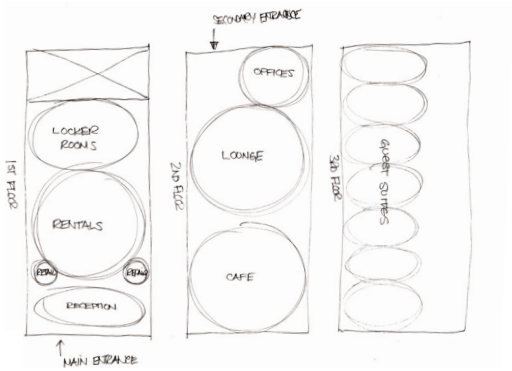


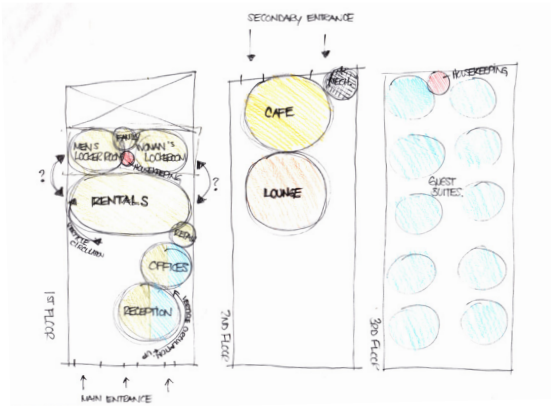


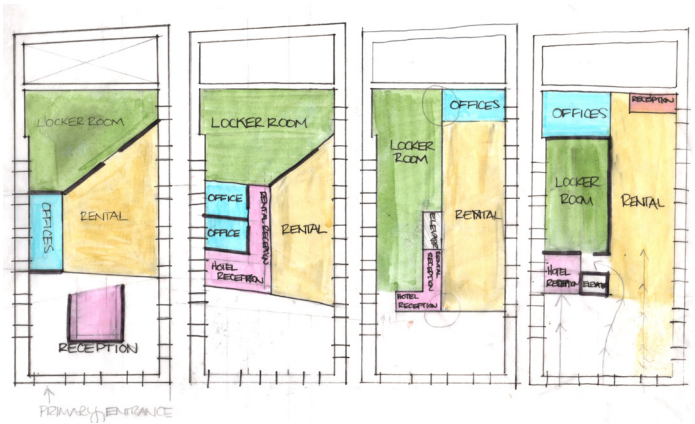


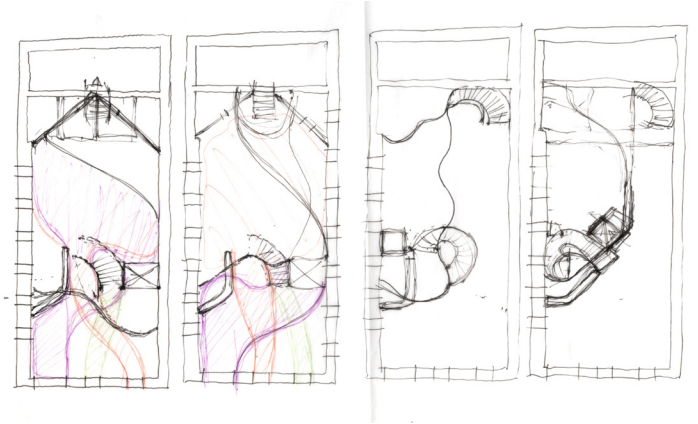
Working with various space planning options for activity and space placement. Originally, only the existing three levels were considered for programming. Attempting to flesh out the best relationship between each space.

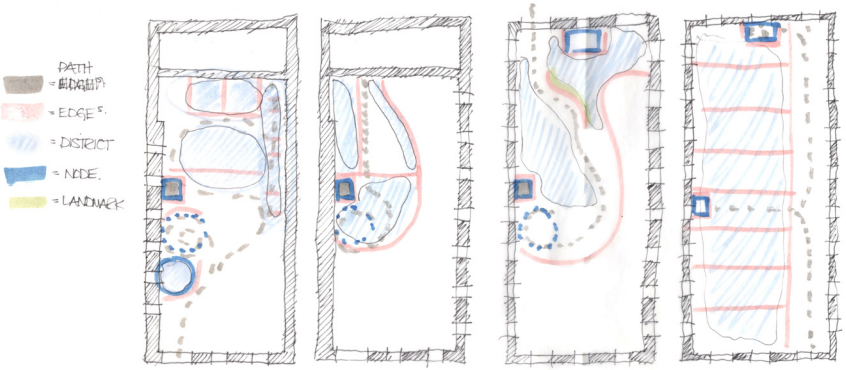

SECONDARY ENTRANCE
LOCKER ROOMS
RENTALS
REPAIR
RENTAL
CAFE
RECEPTION
OFFICES
LOUNGE
GUEST SUITES
1st FLOOR
2nd FLOOR
3rd FLOOR

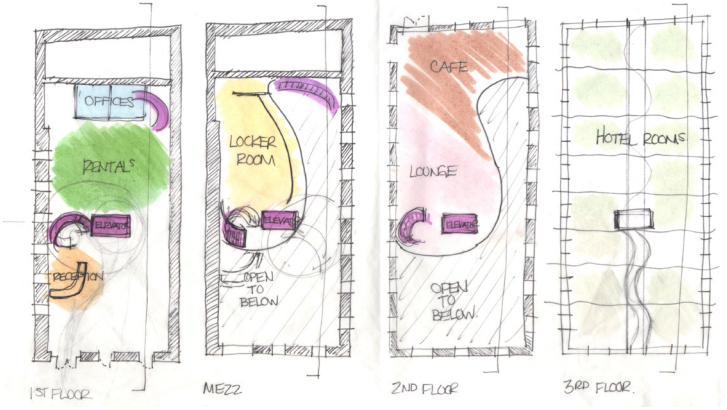

SECONDARY ENTRANCE
LOCKER ROOMS
RENTALS
REPAIR
REPAIR
RECEPTION
OFFICES
LOUNGE
CAFE
GUEST SUITES
MAIN ENTRANCE
1st FLOOR
2nd FLOOR
3rd FLOOR


SECONDARY ENTRANCE
CAFE
LOUNGE
RENTALS
OFFICES
RECEPTION
GUEST SUITES
HOUSEKEEPING
MAIN ENTRANCE
1st FLOOR
2nd FLOOR
3rd FLOOR

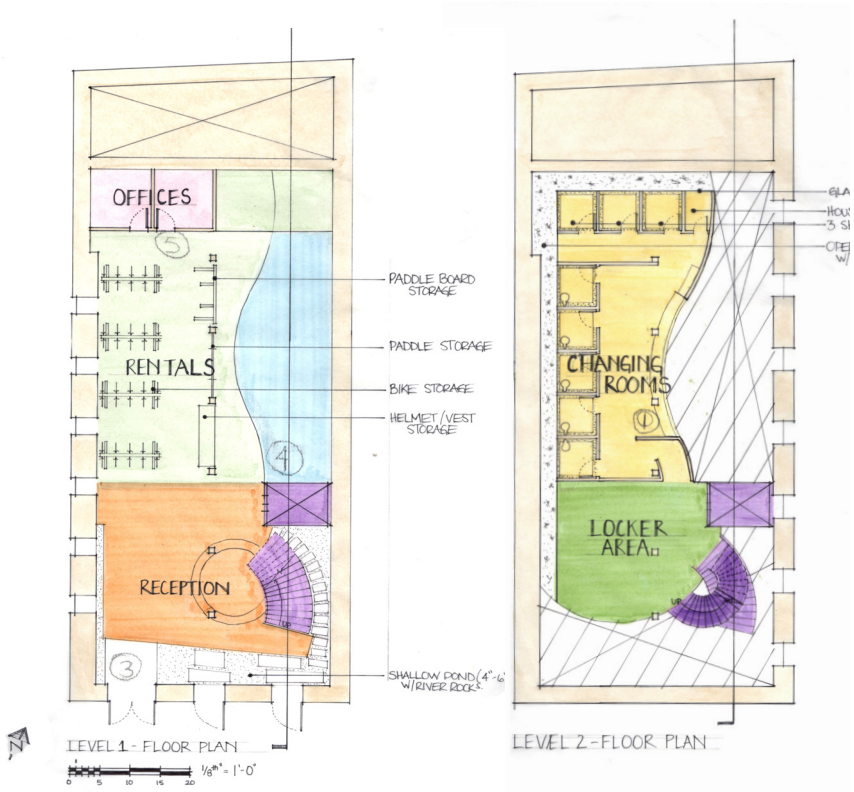




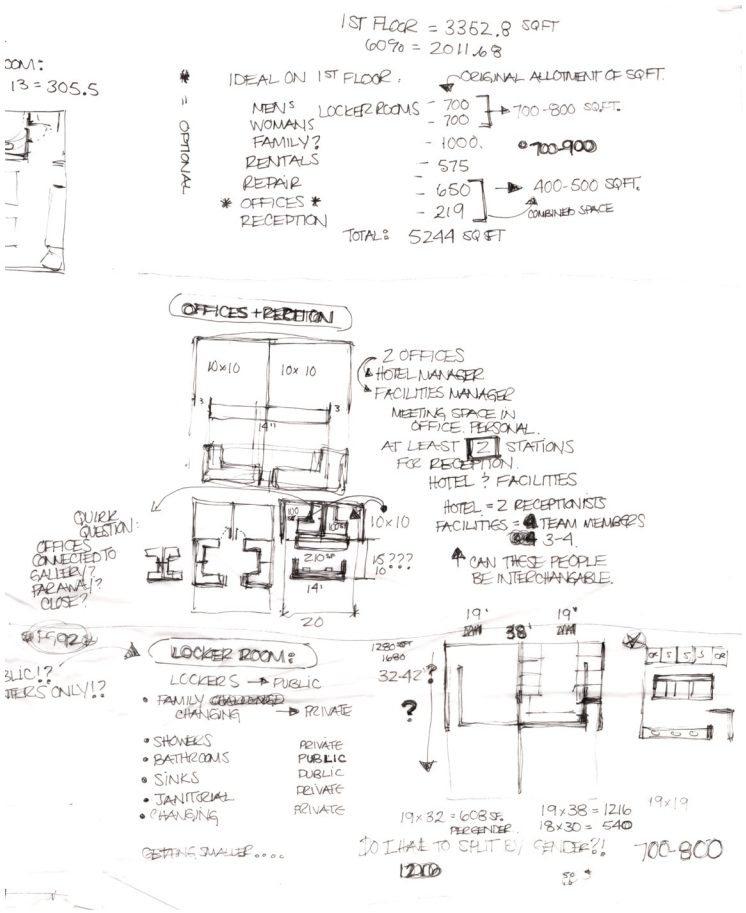




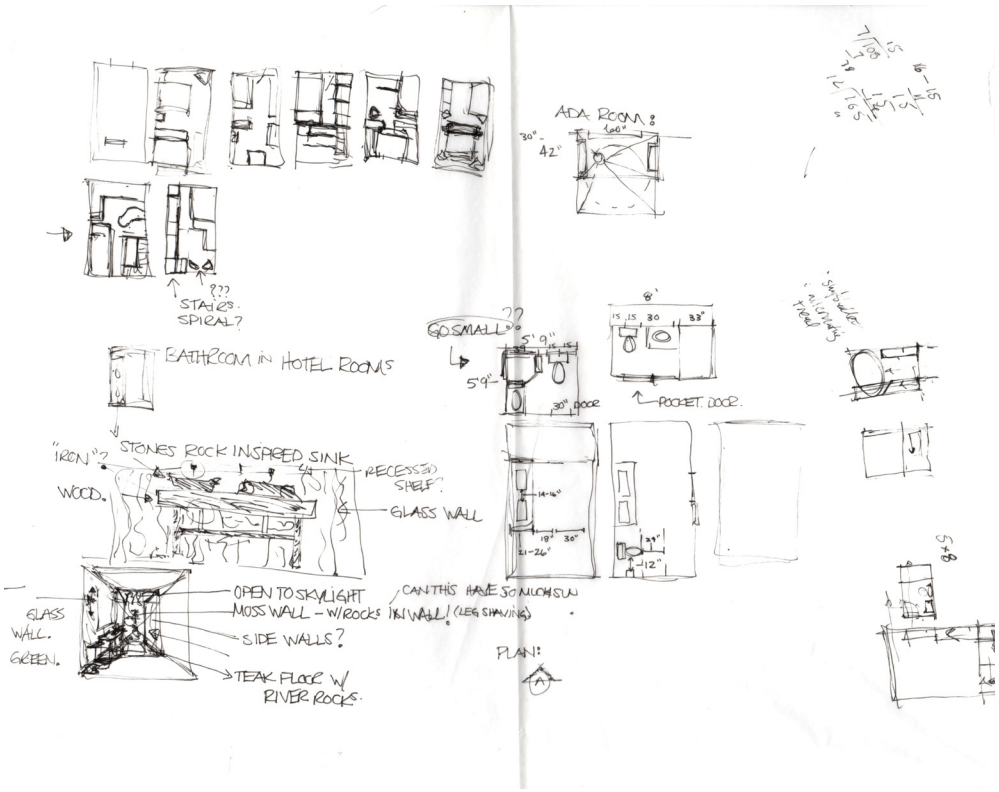
The height of the first and second levels are 18' and the third floor to the pitch of the roof is 26'. The existing building had a mezzanine between levels two and three, primary dedicated to mechanical and storage. For this project, the tall ceilings were utilized and a mezzanine between the first and second level became part of the design development. These blocking exercises continue to flesh out placement of different spaces and activities.



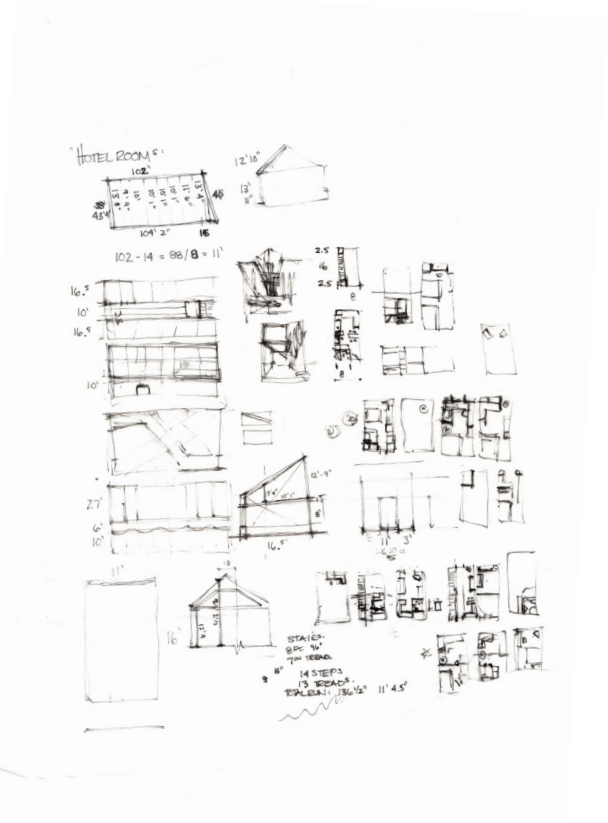
Vertical circulation became a big part of space planning. This building is narrow, long and very tall. Celebrating the manner in which users would connect with different spaces became a focus. Peeling back and exposing different levels spoke to the overlapping and translucent qualities of the James River and helped create an open atrium that connects users the moment they walk through the main entrance with multiple activities and spaces.

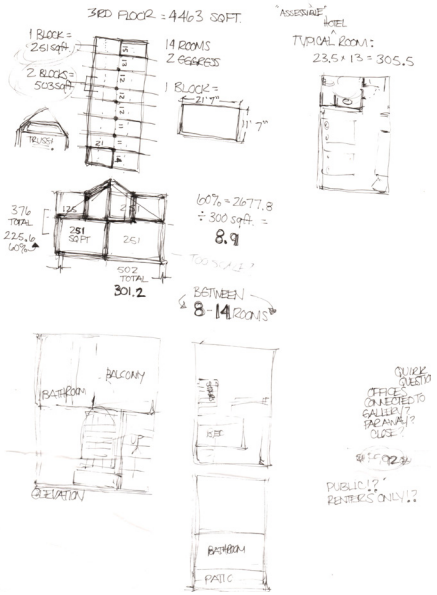


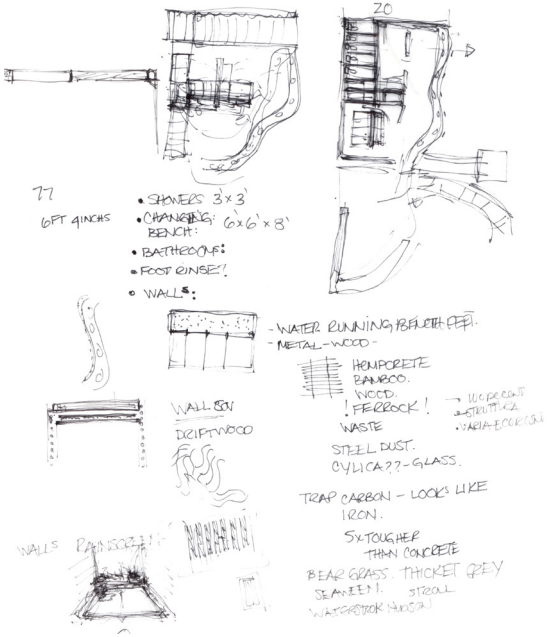
Office Development



Hotel Room Development







Changing Room Development

DESIGN SOLUTION

The best way to change the future, is to design it.
M. Cobanli

NATURE NURTURES

Strengthening our interiors relationship with the natural environment.

PROJECT

Boutique Eco-Hotel & Outdoor River Equipment Rental Facility

Set on the banks of the James River, this hotel combines the concepts of **biophilia**, **eco-tourism** and **sustainability** to cater to the outdoor enthusiast. In addition to guest suites, this hotel will offer bikes, kayaks, tubes, paddle-boards and other essentials for outdoor exploration.

Why Biophilia?
People spend 90% of our time indoors. Our interiors should benefit our well-being and facilitate a healthy environment.

Biophilia is the hypothesis that humans have an innate tendency to seek connections with nature and its systems and processes. Environmental features like light, sound, scents, wind, weather, water, vegetation, animals and landscapes have a positive impact on the development and health of the humans mind and body. Introducing aspects of natural world into our interior spaces can have a large impact on our well-being.

Hospitality and Sustainability

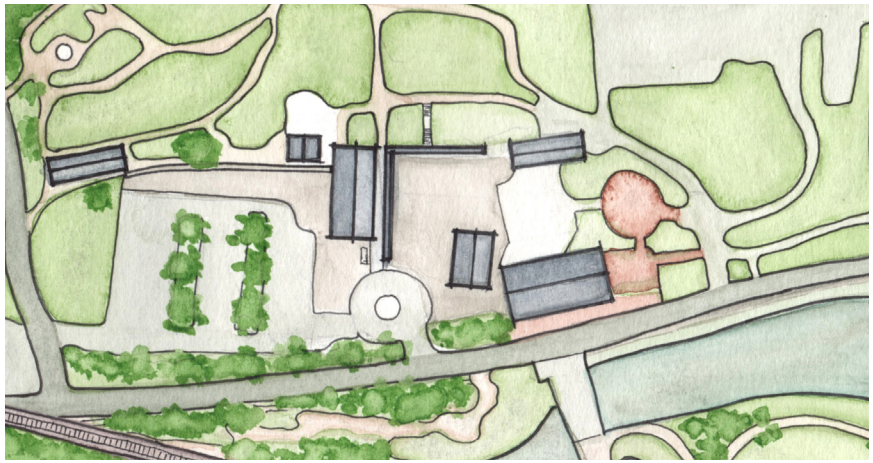
The hospitality industry has a considerable impact on the environment through excessive energy and water consumption and waste of consumable and durable goods, along with the creation of solid and hazardous waste. Despite requests for "greener" behavior, like the reuse of towels and the denial of fresh sheets daily, **American hotel guests still consume 25 gallons of water per day during their stay.**

Sustainability revolves around the ideas of energy conservation, natural resource preservation and waste reduction,

Is there a way to see the wonders of the world in a way that has less of a negative effect on our environment?

Eco-tourism is distinguished by its emphasis on conservation, education, traveler responsibility and active community participation. Eco-Tourist adopt these principles and incorporate them into their travels plans.

SITE



Richmond and its River

The city is defined by its connection to the James River. The James River Park system stretches over 550 acres and is broken into 14 different sections from the Huguenot Bridge in the west to a half mile beyond the I-95 Bridge in the east.

The James River includes water features that appeal to the young and curious to the most experienced river-adventurer. The James River Park system boasts idyllic shorelines, peaceful meadows, and miles of challenging hiking and biking trails.

Every year thousands of people come to Richmond for activities and events like Bike Races, Dominion River Rock, The Folk Festival and many more. Currently there are no convenient downtown or riverfront facilities to allow locals and guests of Richmond to interact with the James River.

Tredegar Iron Works

Located in downtown Richmond along the James River the Tredegar Iron Works consists of many buildings, all part of the Historic Iron Foundry.

The Tredegar Iron Works site operated from 1836 until 1952. During the civil war, Tredegar was the largest iron supplier for the war.

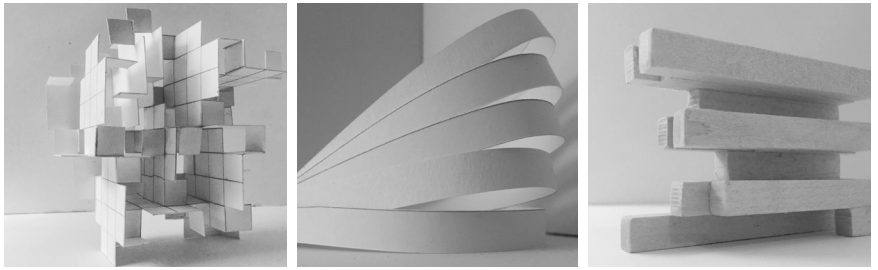
The Iron Works site harnessed energy for power from the James River. With the use of overshot water-wheels and water turbines allowed the Foundry ran stickily on hydro power.

Pattern Building

What is known today as the "Tredegar Iron Works Pattern Building" was built in 1854. This masonry building once stood six stories high and was the home to manufacturing a variety of goods including flour and wool.

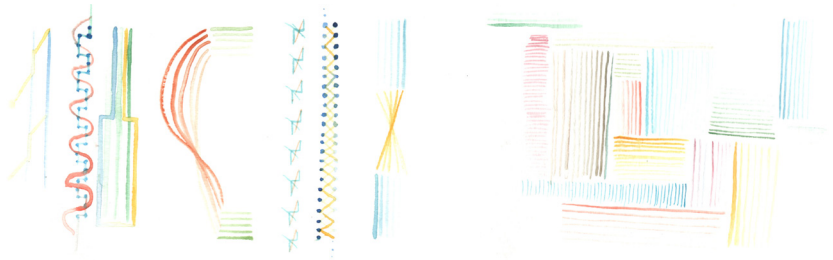
Eventually the "Pattern Building" housed the patterns for casting guns, railroad wheels, and machinery. Throughout the years the building suffered a variety of fires which are reflected in change in bridge color between levels. Today the building stands three stories high and is home to the National Park Services- Richmond National Battlefield Park Visitors Center.

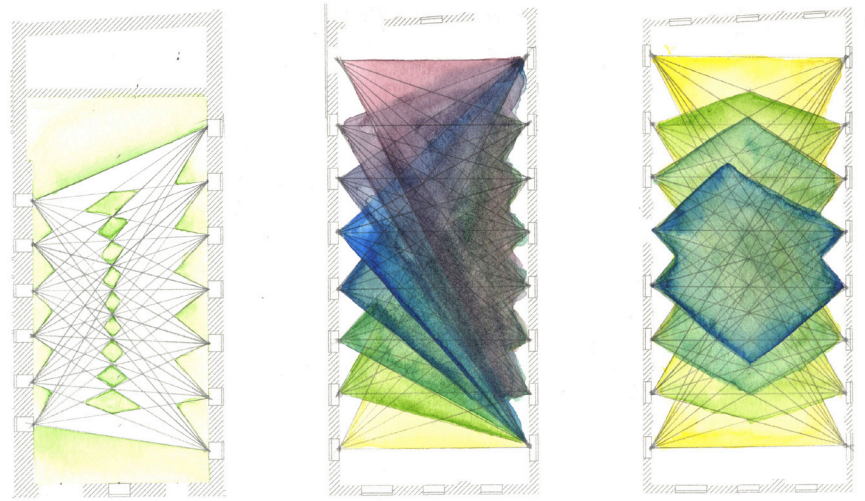
CONCEPT



A study of the **interconnection of inside and outside & human and nature** with the use of natural elements and materials.

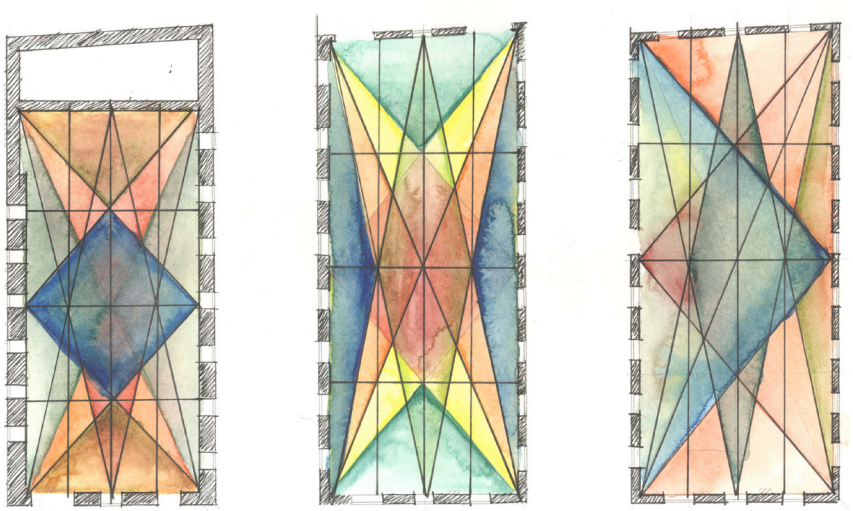
Running WATER flows and creates **organic lines and shapes**.
The EARTH'S strong smooth river rocks **divert direction** and **create a catch and release of water**.
Fresh AIR creates a sense of **openness and energy**.



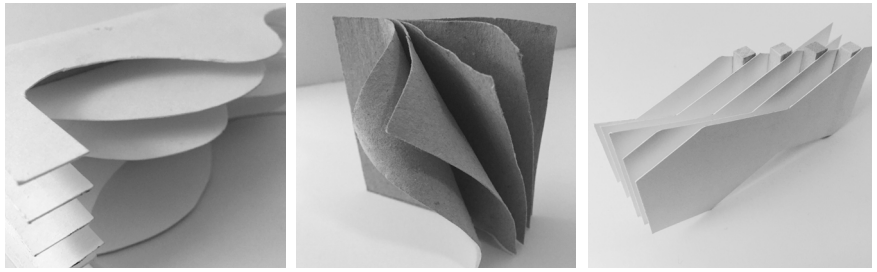


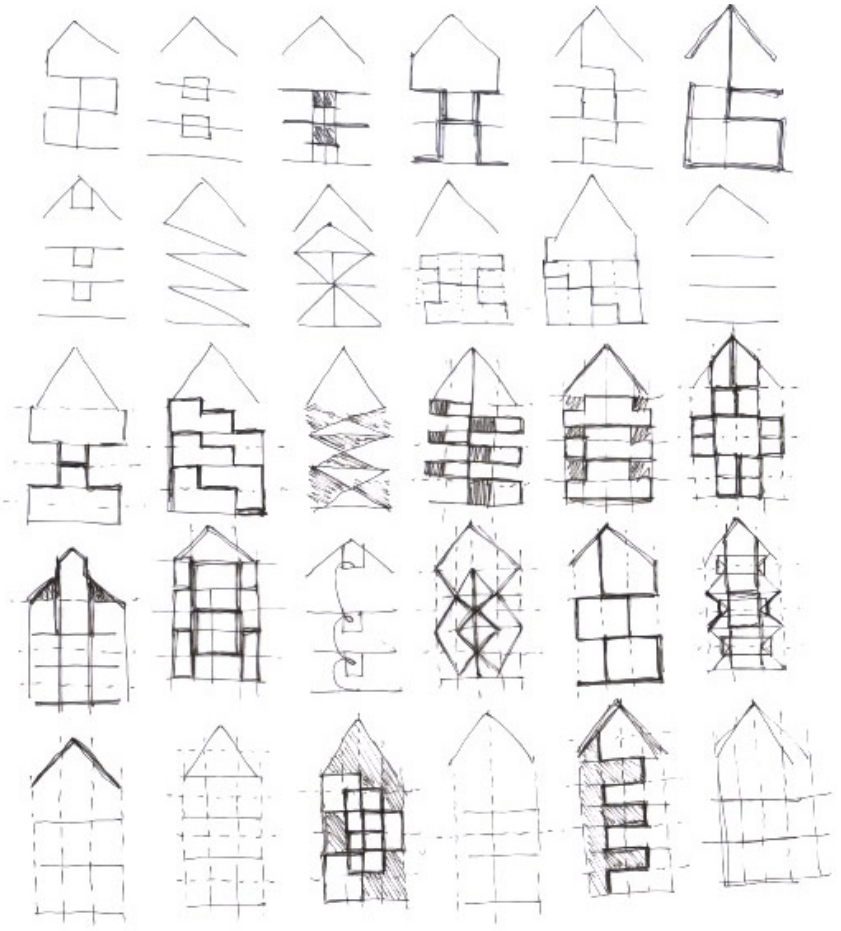
The interconnection of the inside and outside can happen by blurring the barrier between the two. The connection between the inside and outside creates a connection between humans and nature. This connection can be celebrated, accentuated and treated as two or simplified, blended and treated as a whole.

Discovering the relationship between windows and doors of the Pattern Building was important. Identifying their location helped understand where fresh air and natural light would enter the building, which openings cross paths and what natural geometry happens with their relationship.



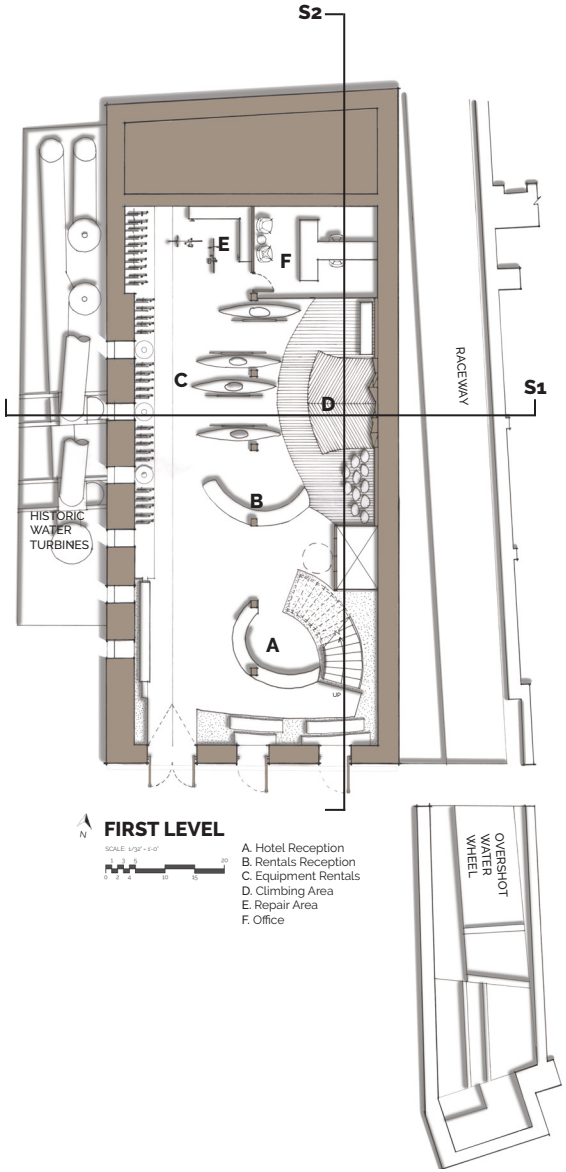
The area of each level differs, and thus the geometry and proportions of each level changes. This watercolor examines the proportions of the interior space and the relationships they have to different levels.





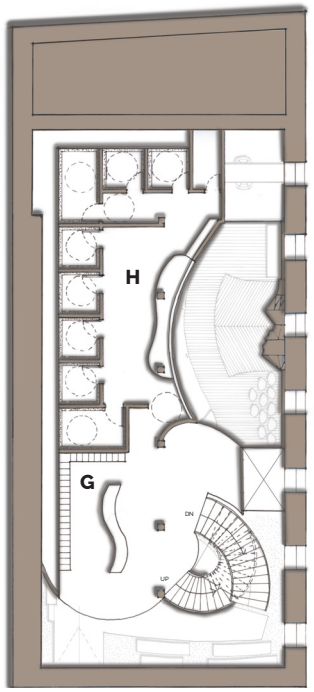
Diagrams of the vertical relationship between levels. The shapes created by the division of the space accentuate the concept of inside and outside.

FLOOR PLANS



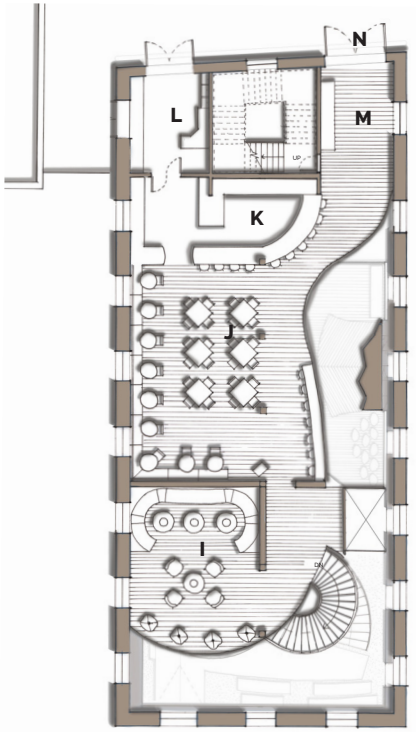
FIRST LEVEL

A. Hotel Reception
B. Rentals Reception
C. Equipment Rentals
D. Climbing Area
E. Repair Area
F. Office



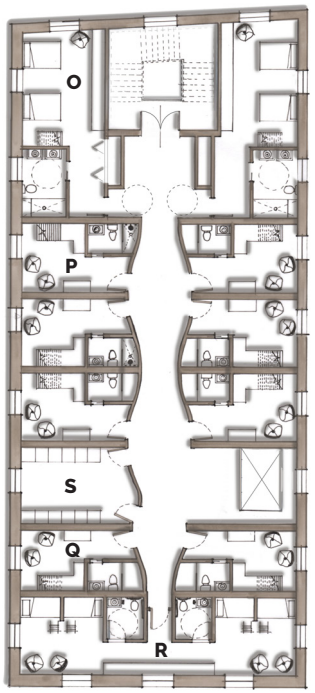
MEZZANINE

G. Locker Area
H. Changing Room



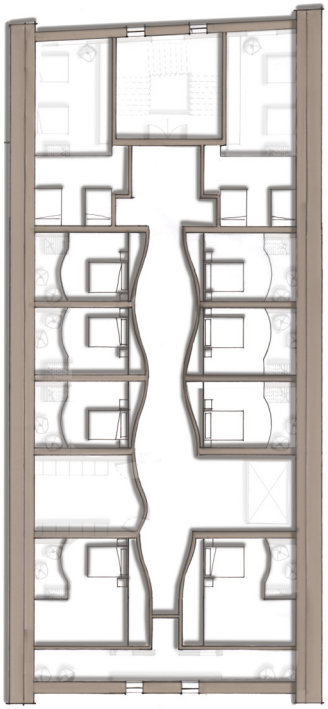
SECOND LEVEL

I. Lounge
J. Cafe Dining Room
K. Bar/Open Kitchen
L. Storage/Dish
M. Breakfast/Coffee Bar
N. Outdoor Lounge



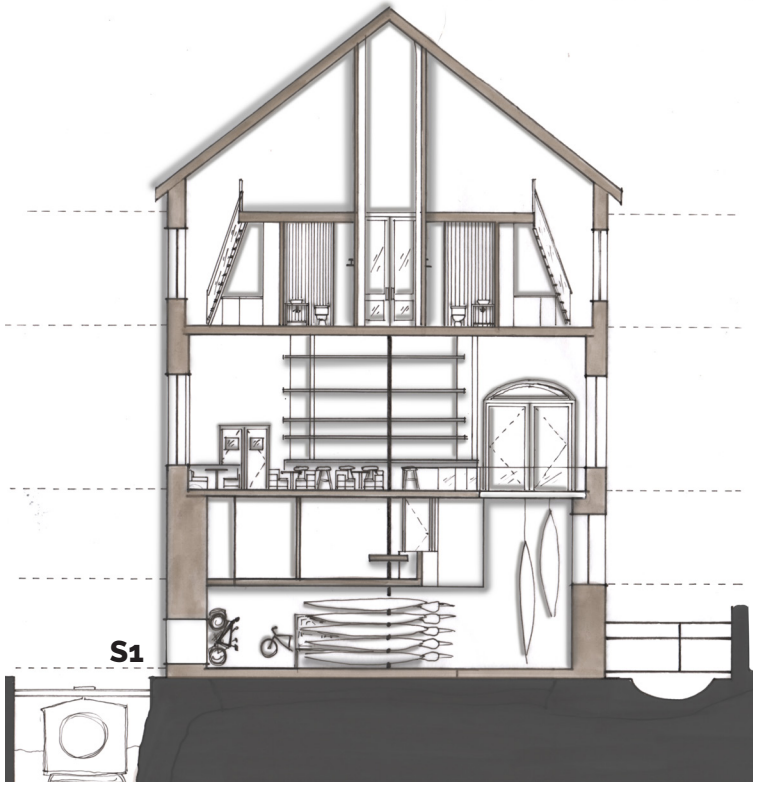
THIRD LEVEL

O. ADA Accessible/Family Room
P. Traditional Suite w/loft
Q. Traditional Suite w. large loft
R. Hostel Room
S. Laundry/Vending



LOFTS

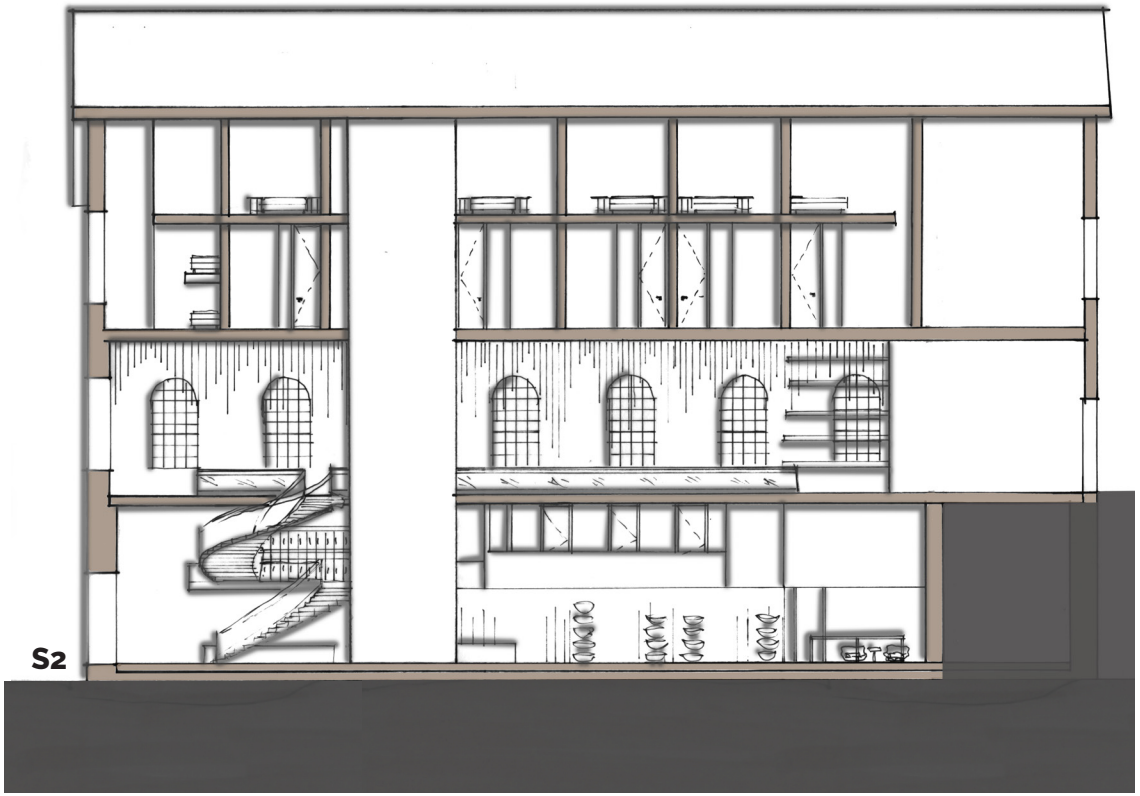
SECTIONS



SCALE: 1/16" = 1'-0"

1 3 5 20

0 2 4 10 15



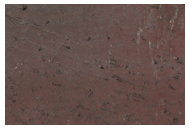
SCALE: 1/16" = 1'-0"

1 3 5 20
0 2 4 10 15

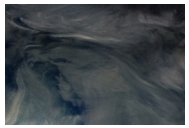
RECEPTION

When first entering the building the levels are peeled back and exposed making the space feel open and airy. The main entrance is ADA accessible and has a ramp that crosses over a shallow pond filled with river rocks. The two secondary entrances feature stepping stones that lead guests across. The winding staircases and directional material draw you into the space. 26' ceilings are lined with LED pin lights, resembling the sun sparkling on top of water.

The first space you enter is the reception area. This is where hotel guests check in. The floor is original concrete with a blue/grey watercolor like stain. The desk is constructed of a light colored bamboo, chosen for sustainability and rapidly renewable qualities. The counter-tops are a recycled glass and marble material with a color pallet influenced by the coast and includes oyster shells, attributing to Virginia's link with oysters.



Original Red Brick



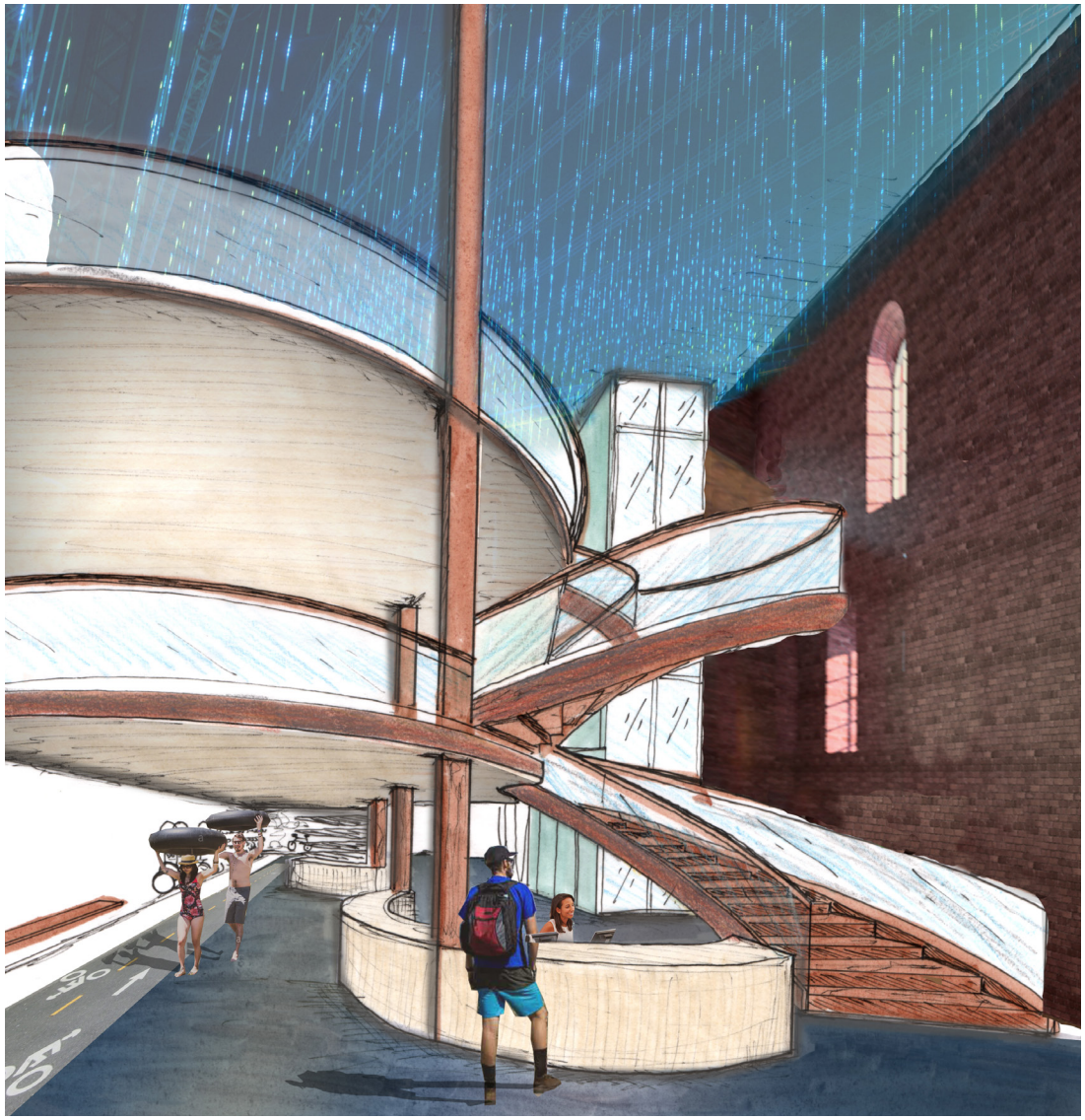
Original Concrete w/ Ecoprocote- Submarine & Charcoal Grey

Recycled Iron

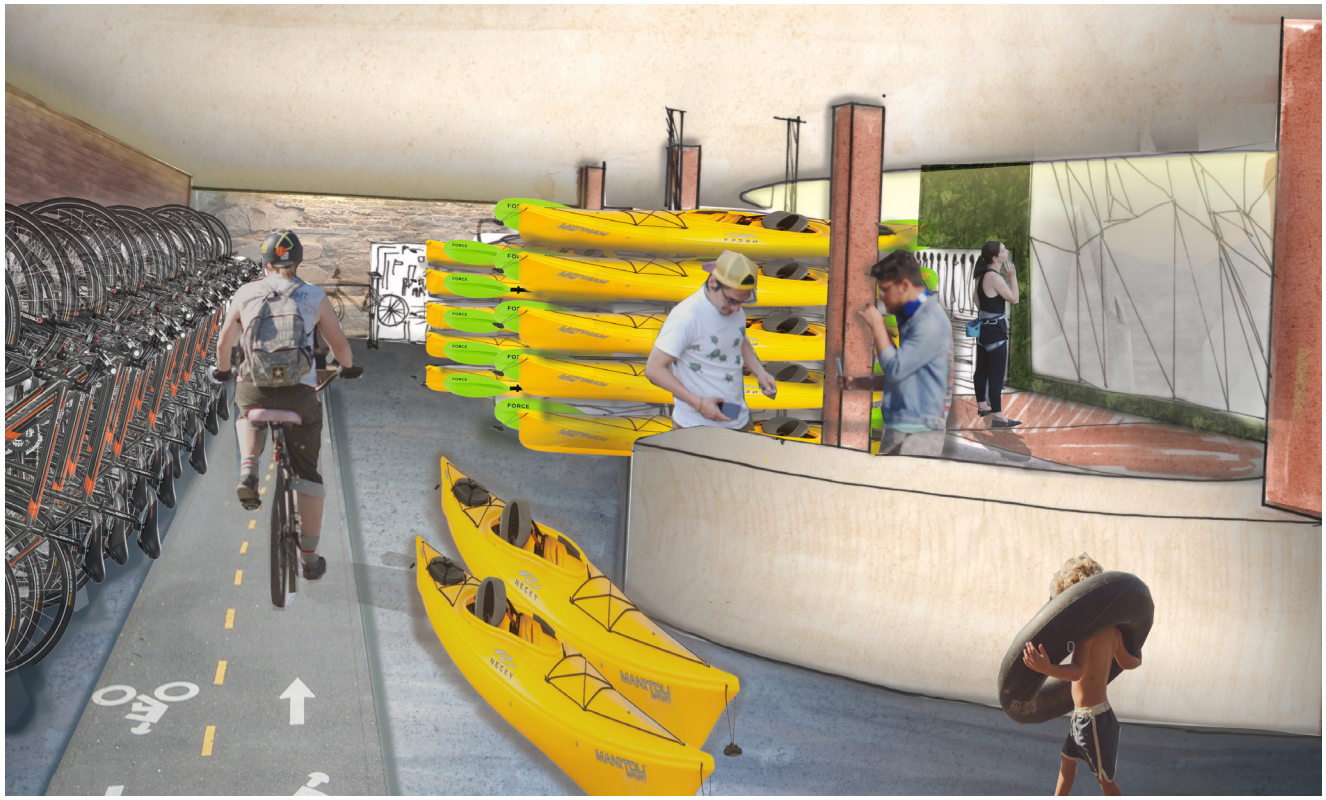
Plyboo
Natural Flat/Edge Grain

Vetrazzo
Emerald Coast - Slab

ADJ
LED Pixel Tube 360



RENTALS



Moving past the hotel reception, the next space is the rental reception area. This is where guests of the hotel and the public check in and out outdoor equipment. the desk has the same material qualities as the first. A bike lane connects the front door to this space. Bike storage is along the west side of the room. Kayak and paddle boards are stored in the center. Toward the back of the room is the bike repair center open to the public and for staff. The back east corner of the room features a office for the hotel and facilities manager.

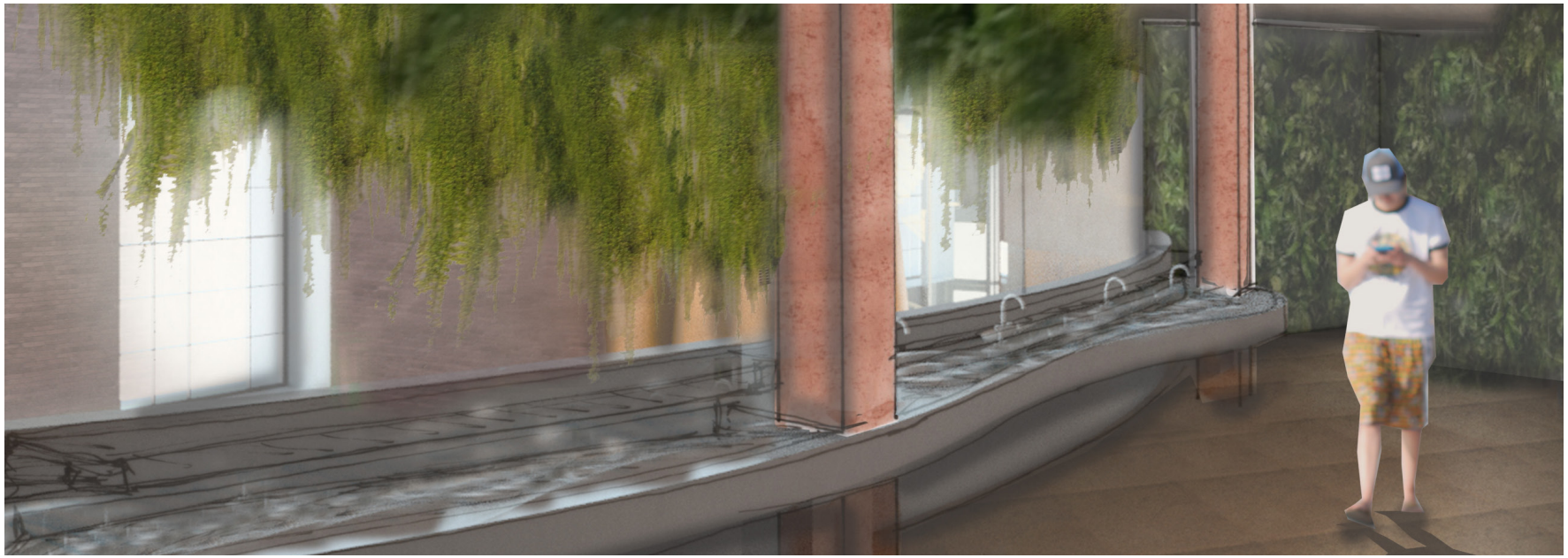
CLIMBING WALL

Off to the east side of the room is the climbing area. The floors in this area are constructed by the reclaimed plank wood floors, from the part of the second level that is now exposed. Next to the water like cement floors, this is an ode to how wood floats on water. Two green walls run along either side of the climbing wall. The 26' climbing wall and green walls connect all the spaces exposed to this open atrium. As the activity is viewable from multiple areas of the hotel. The material of the climbing wall is Richlite. A recycled paper product that is very strong and has been used in applications such as skateboard ramp applications.

Original Historic Wood Flooring

Richlite
Casecade- Adams 1"

CHANGING ROOMS



Utilizing the winding, curving staircase or glass elevator, guests can make their way to the mezzanine level. This level is perfectly in line with the windows on the east side of the building. These windows do not begin until 9' high on the first level and stand 8' tall. The first space one enters on the mezzanine is an open locker area. Moving past a large curved green wall one makes their way into a unisex, public changing room. There are five bathrooms, and three showers. Most stalls are 6' x 6'. All are ADA accessible and some feature a larger space, ideal for families. The floors are cork, chosen for both sustainability reasons and antimicrobial qualities. The room is open to the atrium allowing natural light and fresh air to flood the space. Moss walls separate each stall and trailing plants are used to add a little privacy between the atrium and changing room. The counter-top is a recycled glass and marble material, same as used in the reception area.

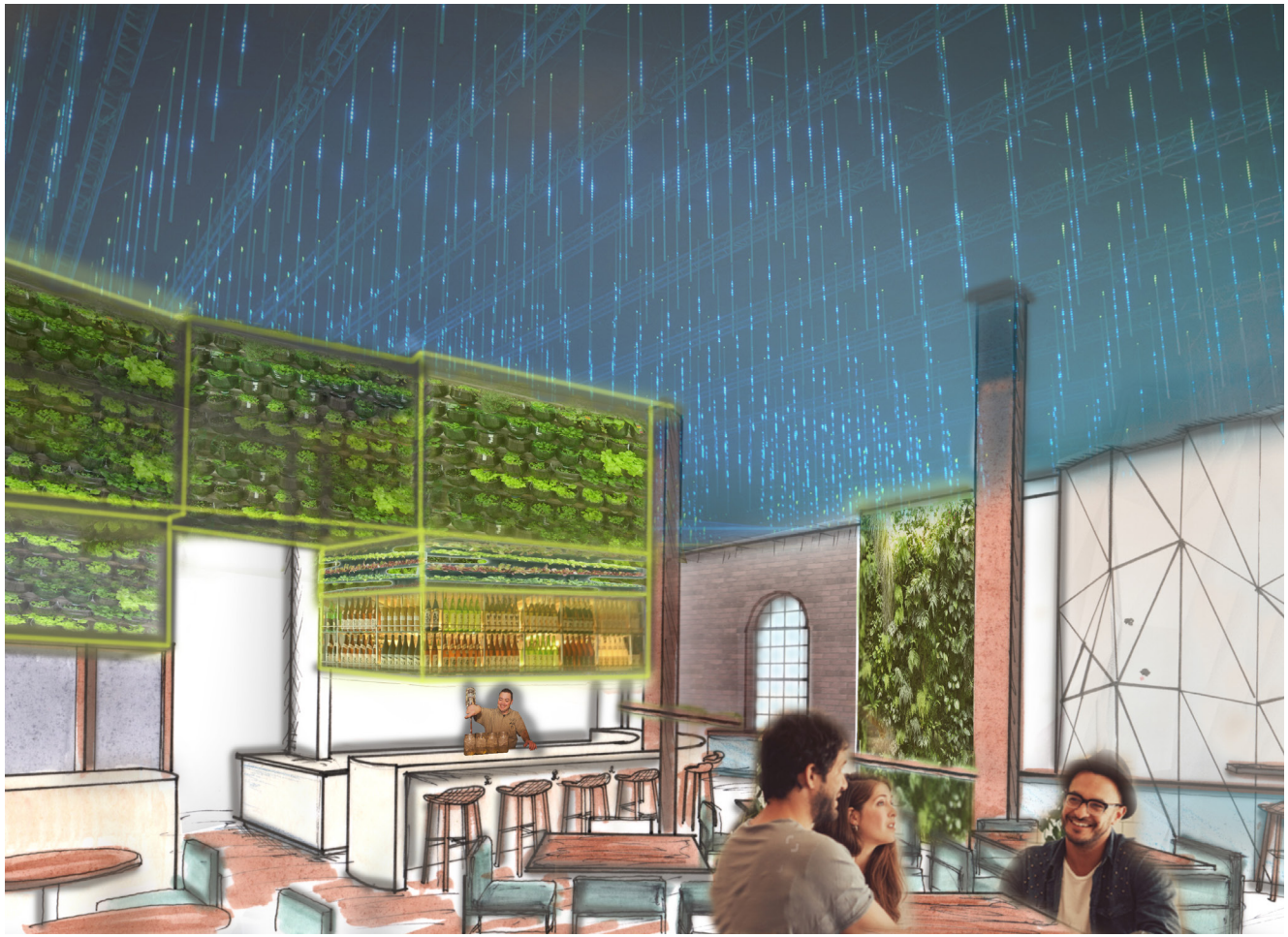
SuBERRA Cork Flooring
Libboa

Vetrazzo
Emerald Coast- Slab

CAFE

The second level features a lobby with many seating options, featuring natural fiber hammock chairs that are suspended from the 18' ceiling.

Past the lobby and an 18' green wall is a farm to table open kitchen concept cafe. Banquets, a bar and tables for four offer a variety of seating. Here the kitchen and its process of preparing food is open and exposed to the guests. Vertical gardens grow above. The open kitchen and food growing on site furthers the concept of interconnection by connecting guests with the with where their food comes from and how their food is prepared. The floors are the original hardwood plank floors, the bar has the same materials as the reception desks, made of bamboo and counter-tops made of recycled glass and marble. The second level exit in the rear of the building is also ground level. Creating a perfect outdoor lounge and eating area.



HOTEL ROOM

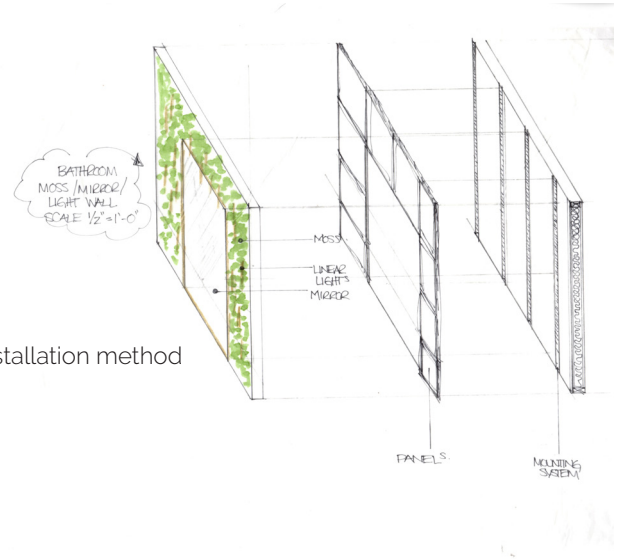
These boutique rooms offer a loft style setting with alternatives for singles, families and those with accessible needs. The shower features a two-story moss wall which continues through to the bedroom level. Kitchenette and enough storage is available for your personal bike, kayak or paddle board.

GREEN WALL LOCATIONS

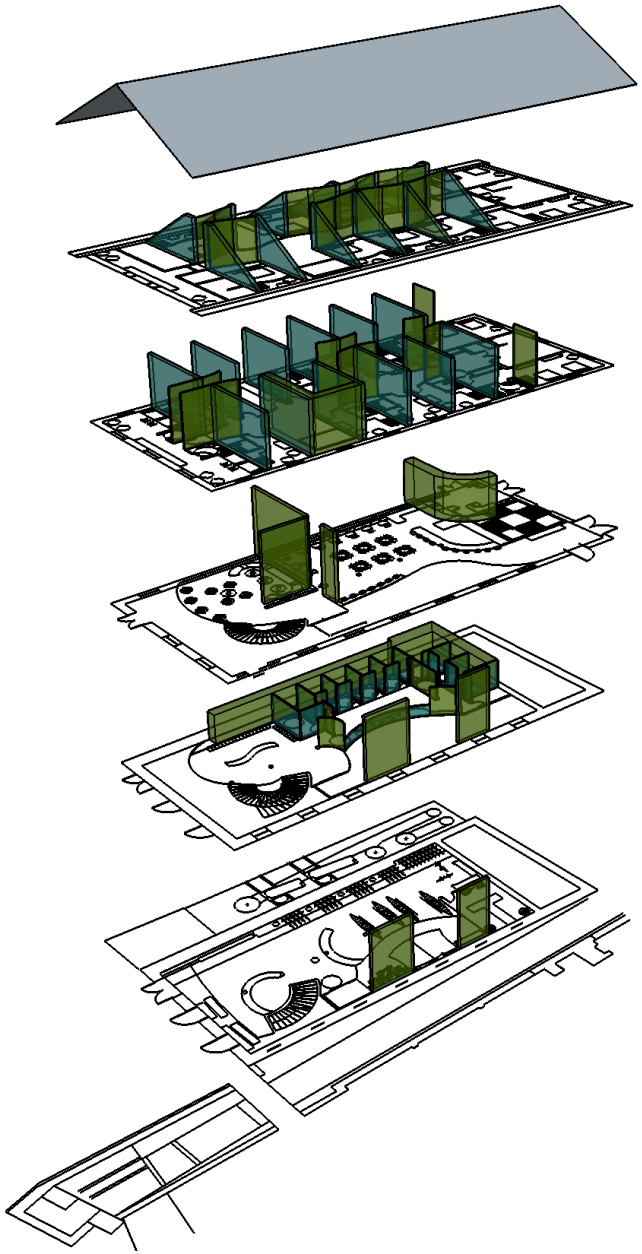
Grey water is recycled from the hotel and funneled outside into the raceways. There it is naturally treated, used in combination with the overshot water wheel to create energy and then cycled back into the building for use of watering the “green walls”.

The green walls in the diagram represent any wall that has an aspect of life. Some green walls may not necessarily need irrigation. The blue walls represent plumbing walls, in which where the grey water that is being recycled is coming from.

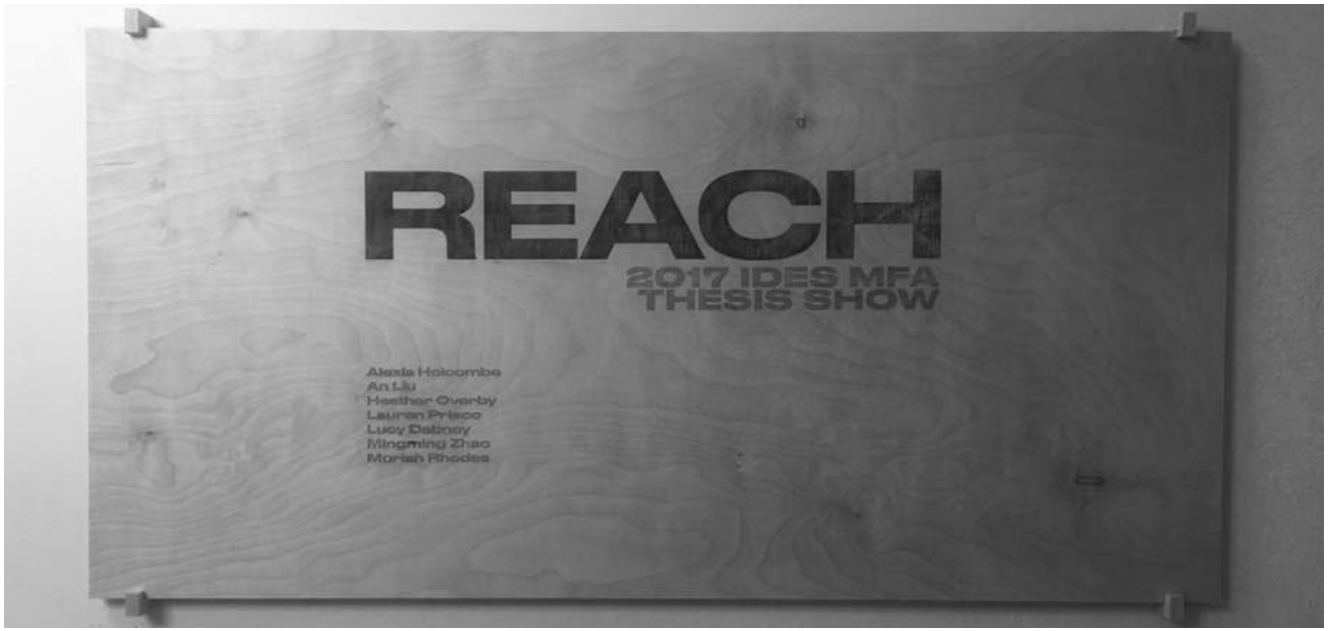
Exposed plumbing educates guests about the water recycling program at the hotel. By peeling back the layers and exposing guest to what is beneath, evokes curiosity. That curiosity will lead to more knowledge about the buildings sustainable measures.



Moss wall installation method



A small group of determined and like-minded people can change the course of history.
Mahatma Gandhi


REACH
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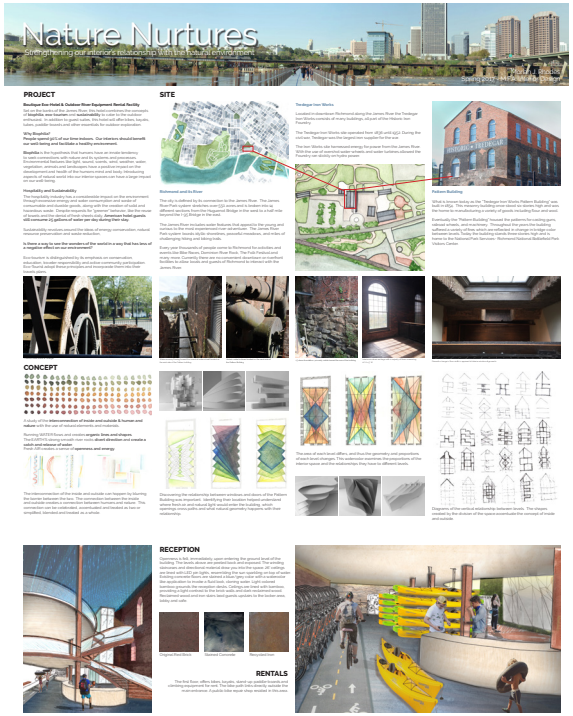

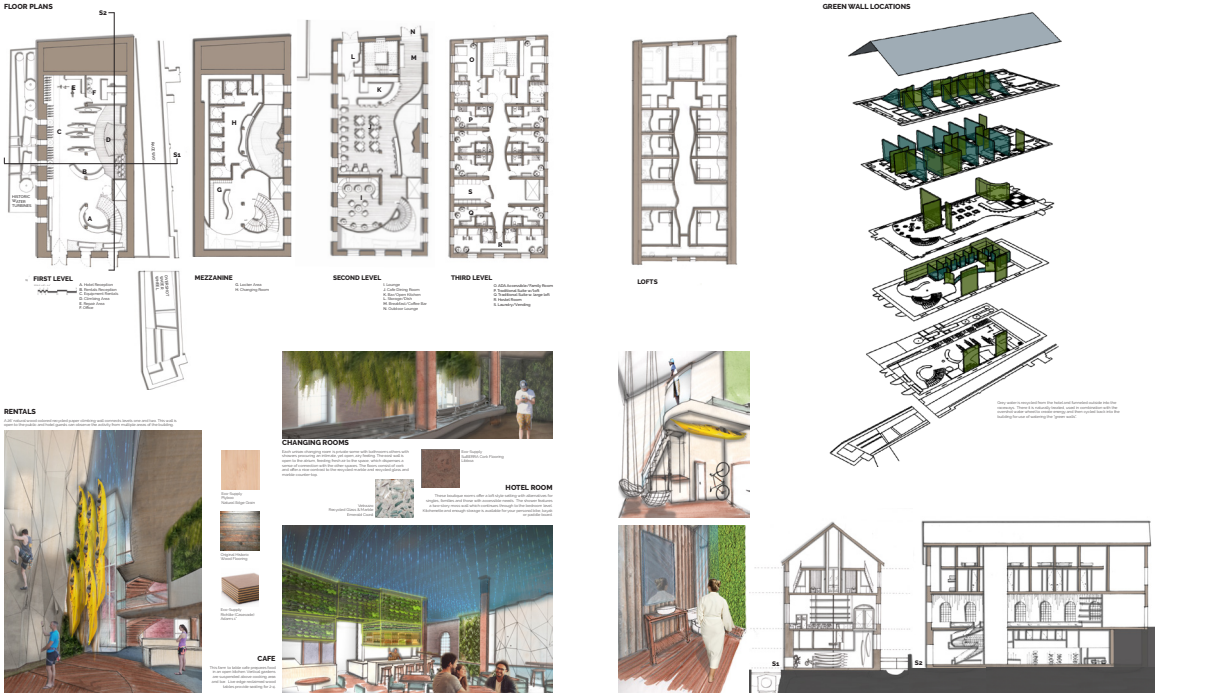

Final Poster Boards

Final Models

Works Cited

2013-01-22FinalRichmondRiverfrontPlan_R2.pdf. (n.d.). Retrieved from http://www.richmondgov.com/planninganddevelopmentreview/documents/2013-01-22FinalRichmondRiverfrontPlan_R2.pdf

A Guide to the Tredegar Iron Works Records, 1801-1957 Tredegar Iron Works Records, 1801-1957 23881, 24808. (n.d.). Retrieved October 11, 2016, from http://ead.lib.virginia.edu/vivax-tf/view?docId=lva/vi00494.xml;query=;

Agence Ter Proposes 350 Hectares of Parkland Along the East Bund in Shanghai. (2016, June 23). Retrieved November 1, 2016, from http://www.archdaily.com/790123/agence-ter-proposes-350-hectares-of-parkland-along-the-east-bund-in-shanghai

Barbosa, J. A., Araújo, C., Mateus, R., & Bragança, L. (2016). Smart interior design of buildings and its relationship to land use. Architectural Engineering & Design Management, 12(2), 97–106. https://doi.org/10.1080/17452007.2015.1120187

Berman, M. G., Jonides, J., Kaplan, S., 2008, The cognitive benefits of interacting with nature, Psychological Science, 19, 1207-1212.

Clemons, S., asid@asid.or. (2015). The Yin+yang of Culture+design. Interiors & Sources, 31(6), 98–101.

Connecting the Rhythms of Nature. (2014). Architecture plus Design, 31(12), 84–90.

Energy, Daylighting, and a Role for Interiors. (n.d.).

FENTAW, T. (2016). ENVIRONMENTAL SOCIAL RESPONSIBLE PRACTICES OF HOSPITALITY INDUSTRY: THE CASE OF FIRST LEVEL HOTELS AND LODGES IN GONDAR CITY, ETHIOPIA. Ethiopian Journal Of Environmental Studies & Management, 9(2), 235-244. doi:10.4314/ejesm.v9i2.11

Flegg, E. (2004). Evolutionary Design Principles. Irish Arts Review, 21(2), 116–122.

Gale, A. J. ., Martin, D., Martin, K., & Duffey, M. A. . (2014). The Burnout Phenomenon: A Comparative Study of Student Attitudes Toward Collaborative Learning and Sustainability. Journal of Interior Design, 39(1), 17–31. https://doi.org/10.1111/joid.12022

Gokarakonda, S., & Kumar, A. (2016). Passive Architectural Design Index applied to vernacular and passive buildings. International Journal of Environmental Studies, 73(4), 563–572.

Hall, S. (2014). Development and initial trial of a tool to enable improved energy & human performance in existing commercial buildings. Renewable Energy: An International Journal, 67, 109–118. https://doi.org/10.1016/j.renene.2013.11.022

History of Richmond, Virginia. (n.d.). Retrieved October 11, 2016, from http://www.u-s-history.com/pages/h3916.html

How Do You Make A Person Feel Connected to Nature? (2014, August 19). Retrieved September 30, 2016, from https://www.thesca.org/connect/blog/how-do-you-make-person-feel-connected-nature

Huppatz, D. J. . (2012). Creative Living, Ecological Design and Russel Wright's Manitoga. Journal of Design History, 25(4), 363–378.
Ioannou, K., & Meletiou, M. (2011). Sustainable Friendly Design: Process and Artifact. Design Principles & Practice: An International Journal, 5(3), 355–365.

Manso, M., & Castro-Gomes, J. (2015). Green wall systems: A review of their characteristics. Renewable & Sustainable Energy Reviews, 41, 863–871. https://doi.org/10.1016/j.rser.2014.07.203

McCoy, J. (2012). Sustainability: Environmentally Responsible Interior Design. Journal of Interior Design, 37(1), 5–6. https://doi.org/10.1111/j.1939-1668.2011.01070.x

Mehmetoglu, M., & Normann, Ø. (2013). The link between travel motives and activities in nature-based tourism. Tourism Review, 68(2), 3–13. https://doi.org/10.1108/TR-02-2013-0004

Petersen, John E. Oberlin College's Adam Joseph Lewis Center: Oberlin, OH (n.d.): n. pag. Web.

Qin, J., Sun, C., Zhou, X., Leng, H., & Lian, Z. (2014). The effect of indoor plants on human comfort. Indoor & Built Environment, 23(5), 709–723. https://doi.org/10.1177/1420326X13481372

Record, H. A. E. (n.d.). Tredegar Iron Works, U.S. Route 1, along James River, Richmond, Independent City, VA [still image]. Retrieved September 21, 2016, from http://loc.gov/pictures/item/va1268/

Richmond: A Discover Our Shared Heritage Travel Itinerary. (n.d.). Retrieved September 21, 2016, from https://www.nps.gov/nr/travel/richmond/Tredegar.html
Riverfront Canal Walk. (n.d.). Retrieved October 11, 2016, from http://www.rvariverfront.com/index.html

Siikamäki, P., Kangas, K., Paasivaara, A., & Schroderus, S. (2015). Biodiversity attracts visitors to national parks. Biodiversity & Conservation, 24(10), 2521–2534. https://doi.org/10.1007/s10531-015-0941-5

Söderlund, J., & Newman, P. (2015). Biophilic architecture: a review of the rationale and outcomes. AIMS Environmental Science, 2(4), 950–969. https://doi.org/10.3934/environsci.2015.4.950

Szenasy, S. S. . (2012). Reflections on Sustainable Design. Journal of Interior Design, 37(1), 7–10. https://doi.org/10.1111/j.1939-1668.2011.01071.x

The Crenshaw Woolen Mills | "Plowshares & Bayonets." (n.d.). Retrieved October 18, 2016, from http://26nc.org/blog/?p=746

Tredegar Iron Works: Richmond's Foundry on the James by Nathan Vernon Madison | The History Press Books. (n.d.). Retrieved September 26, 2016, from https://www.arcadiapublishing.com/Products/9781467118941

Zelenski, J. M., & Nisbet, E. K. (2014). Happiness and Feeling Connected: The Distinct Role of Nature Relatedness. Environment & Behavior, 46(1), 3–23. https://doi.org/10.1177/0013916512451901