



NATURE AS MATERIAL

TIME AS TOOL

Chuchu Chen
2023

NATURE AS MATERIAL TIME AS TOOL

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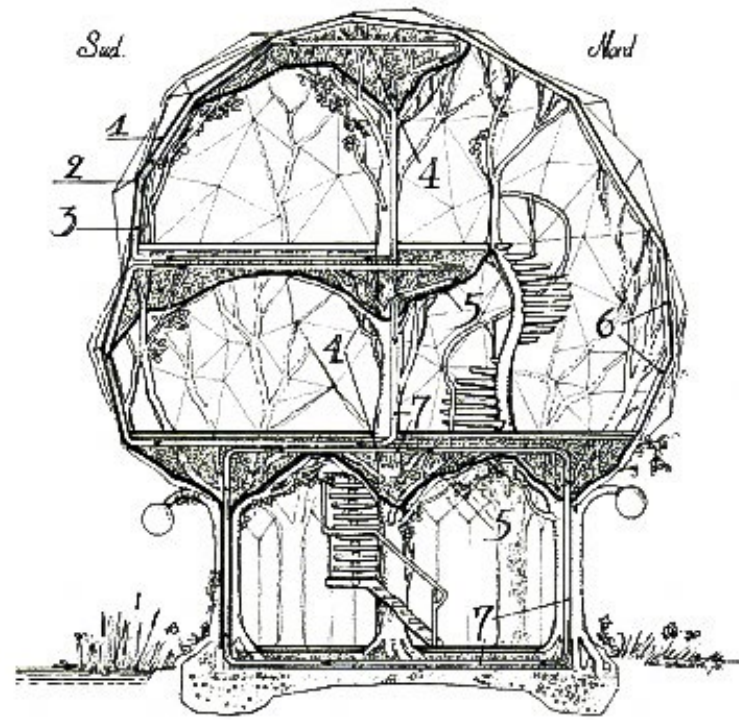
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Abstract

No building stands forever. Over time, the natural environment acts upon the outer surface of the building, leading to the failure of materials and the final dissolution of the structure itself, leading to ruin. In order to prevent this or retard its occurrence, we constantly maintain and renew the things we build. Nature seems to stand in opposition to architecture. The passage of time is constantly subtracting from the building.

However, what differentiates nature from architecture? This thesis questions whether these two are not opposed, but on a continuous spectrum. Approaching the building as part of the overall environment that "grew from" the site, rather than as an object that is placed alone on the site. It is time to accept that the power of nature and time give buildings a new skin, in the form of patina. This transformation can be treated as positive. We can accept architecture as ever-changing, as an expression of the passage of time.

How can a single place be building, ruin and nature? This thesis uses Pollepel Island as a test site, proposing various responses by designing multiple back-to-nature retreats. These retreats are partly man-made and partly rely on nature to become complete over time. They exist between architecture and nature, showcasing the merging of natural and built spaces and creating a symbiotic relationship between the two, ultimately revealing our connection with the natural world.



Foreward

We live in a time of destruction, where new buildings are constantly replacing old ones, and nature seen as a menace to the maintenance of buildings. With the passage of time, all buildings decay. In order to solve the problem of aging buildings, we fight against nature, spend money on maintenance, or entirely destroy and rebuild, which seems to be the general trend of this era, an inevitable "natural process". Some buildings are abandoned because their demolition and reconstruction value is lower than the land value. The corpses of these buildings lie quietly, the glory and memory of the past finally surrendered to nature in the form of ruins. These buildings, stripped from society, are gradually swallowed up by nature over time.

I have studied both landscape and interior architecture and have a deep fascination with the natural world, leading me to frequently reflect on the relationship between architecture and the environment. In typical interior design projects, we often search for the "most suitable" building materials from the library we have created to meet our diverse needs, which seems reasonable. However, I often wonder if we have strayed from the right path in our treatment of architecture. As we use our materials to try to block out wind, rain, and anything that may pose a danger to us, are we also rejecting the beauty of nature?

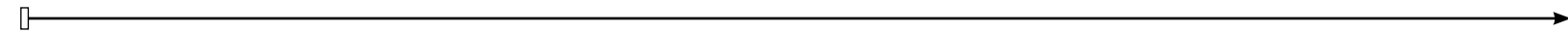
Nature once served as the paradigm for our creation. Our Neolithic ancestors relied on natural materials such as wood, stone, and earth to control the environment around us. But with the advancement of technology, artificial materials such as reinforced concrete and glass curtain walls have become the label of the new era of architecture, constantly pursuing timeless architecture. However, what does 'timeless architecture' mean? And where is nature now? What we mean when we say "nature" is often entirely man-made.

In my opinion, many designs claiming to "integrate nature with architecture" still treat natural elements as mere "decorations" for buildings. Through my research, I hope to make more people realize that architecture and nature can have a symbiotic relationship. This balance can only be achieved by treating nature and the built environment on an equal footing.

We enjoy the fruits of the plains and of the mountains, the rivers and the lakes are ours, we sow corn, we plant trees, we fertilize the soil by irrigation, we confine the rivers and straighten or divert their courses. In fine, by means of our hands we essay to create as it were a second world within the world of nature.¹

Cicero, De natura deorum
(1st century BC)

Research



First nature

Second nature

Nature Defined

The ancient Roman philosopher Cicero described the natural environment as "first nature" and the world crafted by human "discovered by the intelligence and observed by the senses"² from a first nature as "second nature", in order to reorient perceptions of human beings existing within nature. Second nature is like a circle within a larger circle of the first nature. We need to raise awareness of the fact that nature as a whole should not be confined to mere wilderness, distinct from human intervention. **Humans are the first species to consciously change our environments, to some extent guiding and altering the flow of nature itself. What we usually describe as "natural" is as much a result of human design, such as New York's Central Park.**

We constantly create places to reveal our presence in the world, directly or indirectly set into the world of nature, serve as a kind of "second nature"³. We see the natural world as something that we might exploit and control for our benefit, however, we gradually forget our origins and gradually move us farther from the natural, which was once served as the paradigm of our creation, even, it seems, to the detriment of the natural world. We unconsciously experience the world as outside ourselves, separate ourselves from nature, and even see it as an adversary to our targets. This turning

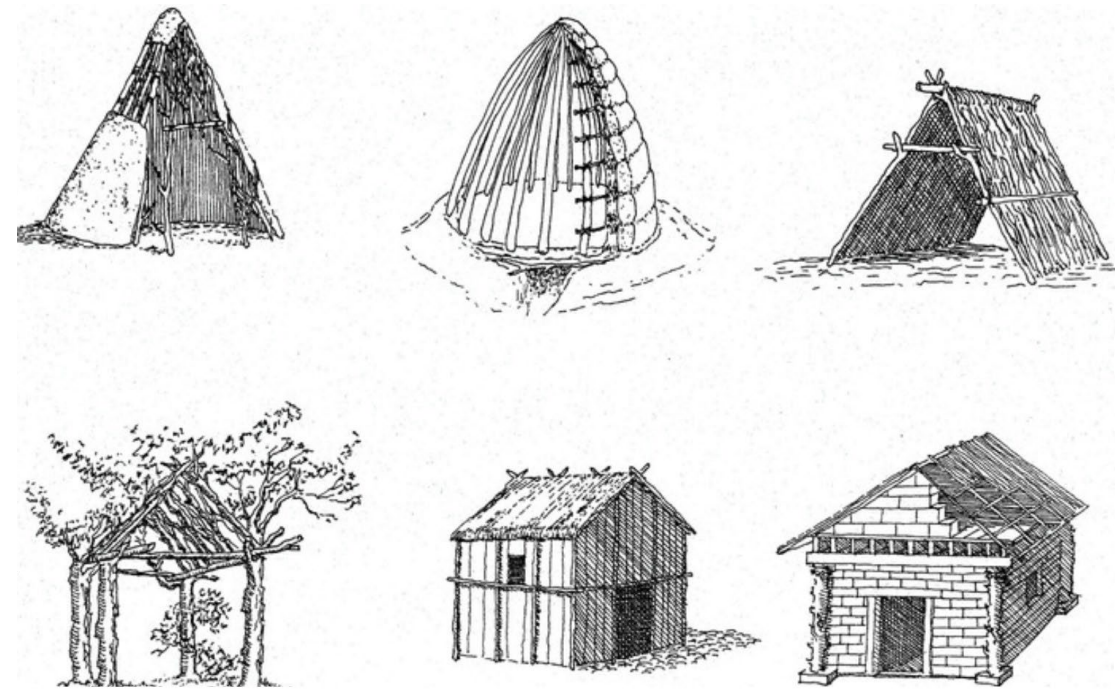
point should have begun when humans moved from wandering to living in permanent houses.

Having a fixed and permanent domiciles means not having to surrender to nature like other creatures. Humans began to purposefully rearrange natural materials. Nature can be interrupted and animals can be domesticated to meet human needs. The emergence of "architecture", as a man-made shelter, provided people with an alternative to the natural environment to resist the impermanence of nature and protect its inhabitants from cold winds and torrential rain. Architecture provides us with a new order.

Between the world and our idea of the world is a fascinating kink. How can we reconsider this artificial divide and balance the built world and nature? Everyone has an ideal concept in their minds, and that balance guides the way we shape our world. There is no specific value here, but a worldview that is not same for everyone everywhere. But what is certain is that the two are not opposed, but on a continuous spectrum. They are one and the same in different forms.



^{2,3} Crowe Norman. 1995. Nature and the Idea of a Man-Made World : An Investigation into the Evolutionary Roots of Form and Order in the Built Environment. Cambridge Mass: MIT Press



“Architecture is not unknown to animals: The worm’s hole the ant’s gallery, the bee’s hive...the gorilla’s hut., the house, the castle keep, the temple, and the palace all satisfy the same need, infinitely diversified. A common law may be induced from them, and that is the law of adaptation, Utility is the ground for architectural aesthetic”⁴

André Lefèvre

Primitive Huts

Humans must live in response to nature, in encounter with our natural environment. Because all that we have and are was grown in or gathered out of nature.⁵ What distinguishes humans from other creatures is that human intervention is self-conscious subjective initiative, while animals act instinctively. Similar to a ship’s voyage, we can use the wind to control that we want to go forward. The architectural world, as a kind of nature of our own that we consciously create, is the result of the interaction of multiple forces, including our quest for meaning in the things we create, the fundamental nature of the materials out of which the world we create for ourselves is built, and our idea of nature itself.⁶

"Primitive Huts" has connotations as the earliest form of architecture, the first experiments in creating habitable structures with what you can get your hands on. These huts were built using resources sourced from the land—stones, wood, mud... deeply connected to their environment and would eventually return to it in the future. They were not like the permanent buildings we define today, but rather resembled temporary shelters for wandering people. However, these return to the essence of architecture’s beginnings, perhaps serving as a reference point for us to be closer to nature and better understand its value. Viewing nature as an integral part of our existence, we construct and enhance our world by adapting to and working with the environment.

We need to timely return to contemplating the essence of architecture. Architecture can have complex forms and intricate components, but it can also be simple but pure. The value and significance of this simplicity have been somewhat overlooked by many.



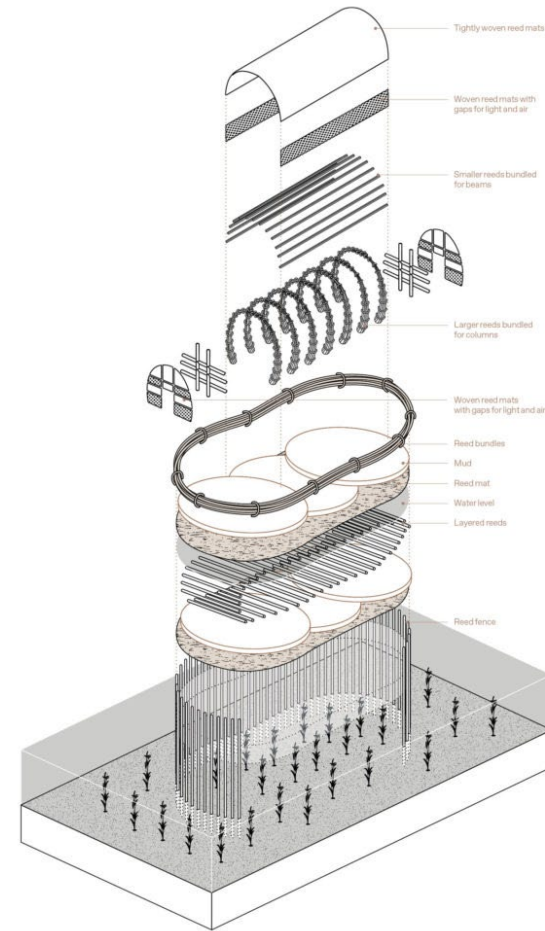
Frontispiece of Marc-Antoine Laugier: Essai sur l'architecture 2nd ed.

⁵ Rolston Holmes. 1988. Environmental Ethics : Duties to and Values in the Natural World. Philadelphia: Temple University Press.

⁶ Wynne J. P. F. 2019. Cicero on the Philosophy of Religion : On the Nature of the Gods and on Divination. Cambridge: Cambridge University Press.

Al-Tahla Floating Islands, Iraq

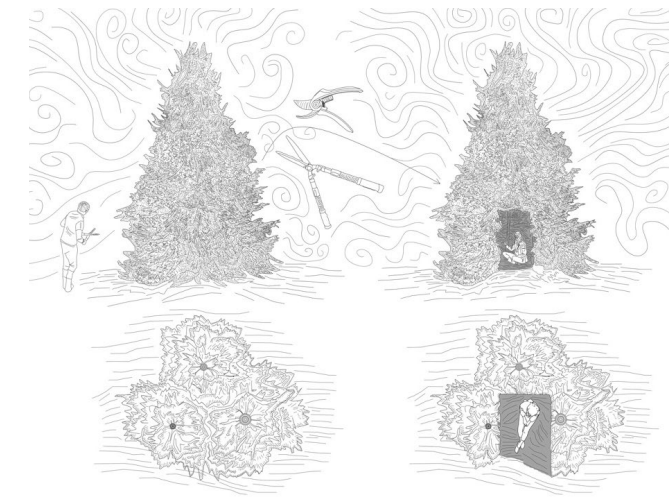
The Ma'dan, or Marsh Arabs, live in the marshy area where the Tigris and Euphrates rivers meet in Iraq. They are a semi-nomadic tribal community with a unique culture that has remained largely unchanged for thousands of years. Their entire existence revolves around the marshes, and one fascinating aspect of their lifestyle is the construction of floating houses using reeds and Qasab, a tall grass similar to bamboo that can grow up to 25 feet (7.6 meters) tall. These houses are built entirely without nails, wood, or glass, and even the islands on which they rest are made of compacted mud and rushes. The advantages of these floating houses include their adaptation to wetland environments, their environmental friendliness, and their flexibility and mobility. With a construction time as short as three days and a lifespan of over 25 years with proper care, these unique dwellings embody the harmony between humans and their natural surroundings.

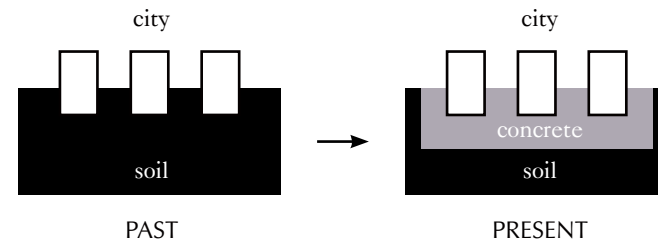


Spruce Hut, Sweden

The Swedish architect Ulf Mejergrén explores the relevance of "Primitive Huts" concept in contemporary architectural context. He has created a series of temporary pavilion-like structures using locally available materials and extremely simple construction techniques. With a simple approach, these structures achieve unparalleled beauty.

Spruce is the most common tree in Sweden, accounting for over 40% of the total tree population. This tree has adapted to the northern hemisphere climate and possesses various winter adaptations. The Primitive Hut in question is constructed from three spruce trees, with a room carved out at the intersection. This design choice provides a more spacious interior compared to using just one tree, as the stem would have obstructed the space.





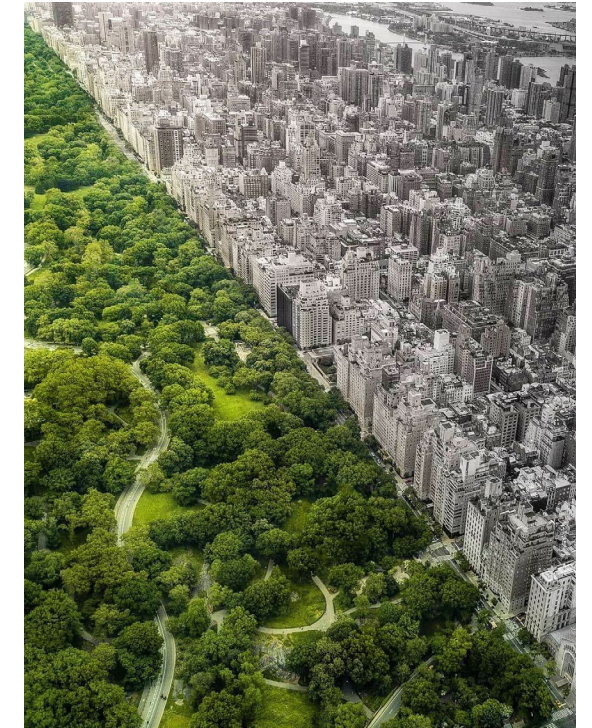
We modern humans, increasingly competent about making our way through the natural world, have been decreasingly confident about its value, its meanings. The correlation is not accidental. It is hard to discover meaning in a world where value appears only at the human touch, hard to locate meaning when we are engulfed in sheer instrumentality, whether of artifacts or natural resources. One needs a significant place to dwell.⁷

Holmes Rolston, *Environmental ethics : duties to and values in the natural world*
1988

A Man-made World

Human progress has been so rapid that we seem to get from nature and get rid of dependence on natural processes in these decades. Industrialization development let us master cultivating hybrid crops, change coal into electricity, make iron into automobiles... The natural world is seen by humans as something to exploit freely and allows us to structure our daily lives in ways that further distance us from nature. We live in a man-made world. The night sky of the city has lost the stars, food is served directly to the table, and the fast pace of life makes us in the scenery but can not feel their existence. Now the city is like a giant bonsai, and the concrete bases has freed the city almost completely separated from the soil that nurtures life, and nature is ruthlessly isolated from the outside. Humans at this time, forget that we are at best minor actors in the broad natural order.

We need to be clear that it is we receive nature with favor, not nature which shows us favor.⁸ We proudly think that human beings have created many new things, but in fact, they are all the evolution and transformation of nature. It's time to look back and think about the way we look at nature and our place in nature, because this once harmonious relationship has gone awry.

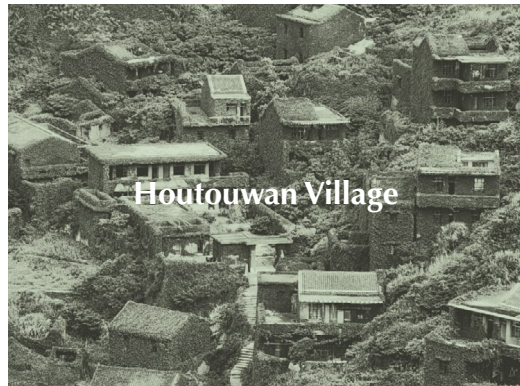


Central Park, New York

Precedents



Ta Prohm temple



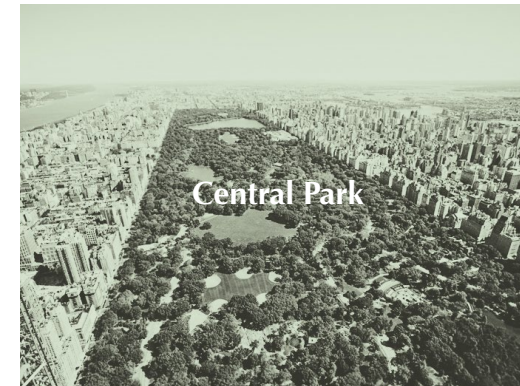
Houtouwan Village



Living Root Bridges



Forest Building for BEST



Central Park



Twin Mountains

Nature

(First Nature)

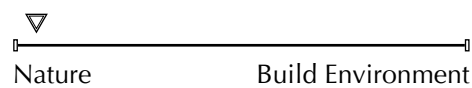
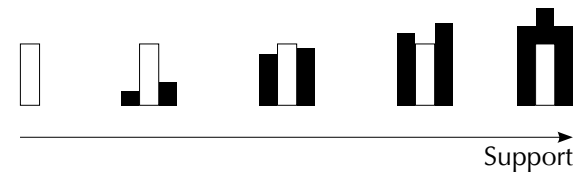
Build Environment

(Second Nature)

▮ Ta Prohm temple, Cambodia



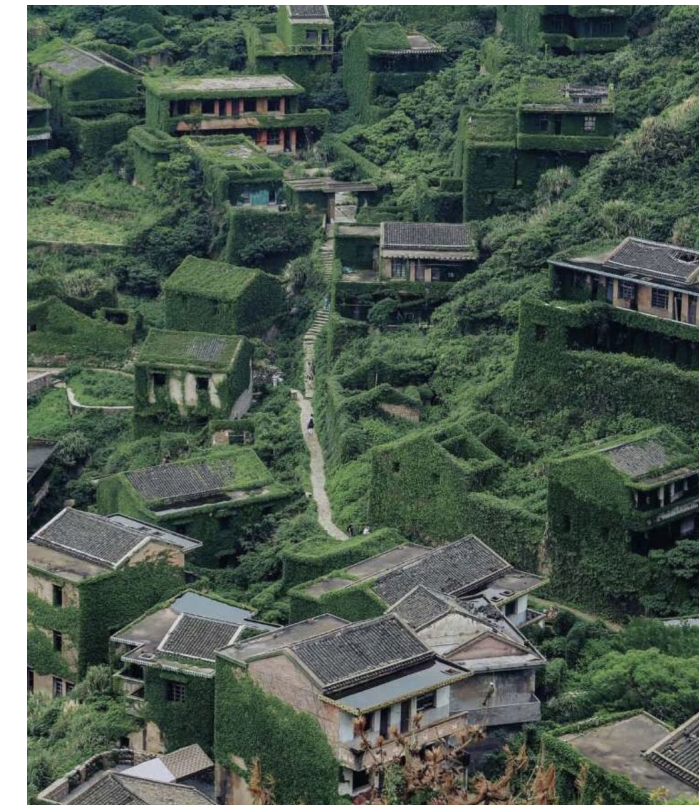
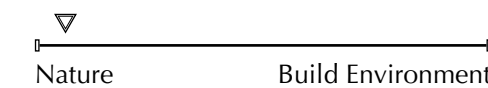
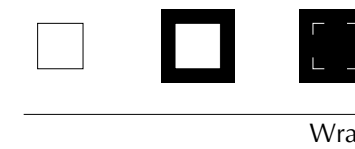
The temples of Ta Prohm in Cambodia date back to the 12th and 13th centuries. It now retains what it was like when it was discovered in the early 19th century. They are forgotten into the jungle and gradually reclaimed by nature over time. Huge creeper fig trees cover the temple, which began growing at the temple naturally setting its roots on both sides of the building. This formation amazingly makes both trees and temple's walls to support each other over time. While splitting the walls and crushing the carvings, the huge root system that clings to the walls also supports the building. This is not the result of human intervention, but the nature claiming back its land. We can see the struggle between the stately monuments and the hungry trees, which adds to the grandeur and enduring charm of the temple of Ta Prohm. Here, architecture and nature blend together. "If we cut the trees down now, the gate will surely fall," says Var Morin, a courtly Cambodian and a former student of John Sanday. *It is hard to say whether nature is part of the architecture or whether architecture is part of nature.*



□ Houtouwan Village, Zhoushan, China

The village of Houtouwan on Shengshan Island, located in Zhoushan, China, was once inhabited by more than 3,000 people who made a living from fishing. However, with the change of fishery resources and the advancement of urbanization, the highlight of Shengshan Fishery is stuck in the sixties and seventies of the last century. Since the 90s, the inhabitants of the village have moved to the city, and since then the village has been abandoned and has become an uninhabited village. Forgotten by time for more than 20 years, the houses in Houtouwan Village have gradually been "eaten" by green climbing tigers, and it has become L. Frank Baum's Wizard of Oz-like dreamland. It was discovered by a photographer in 2015 and then became an instant hit. Based on the fame of the photographer's images, it was later developed into a scenic area.

Unlike the fig tree that grows in the Ta Prohm temple with a brutal posture, here, the structure of the building itself becomes the support of soft vines, guiding the growth of plants, becoming an indispensable link, and finally giving the wild nature a geometric shape. Such a collision is unintentional and coincidental. Architecture and nature have since acquired a new definition: *architecture is no longer solidified, it can grow, change, and have different coats in different seasons; and nature can be shaped, functional. They can become the skin of the building, or even the building itself.*

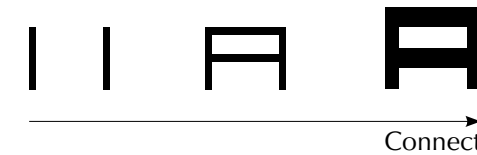
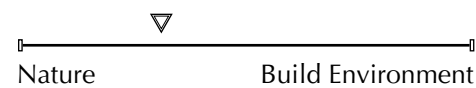


H Jingkieng Dieng Jri, Living Root Bridges, Meghalaya, India



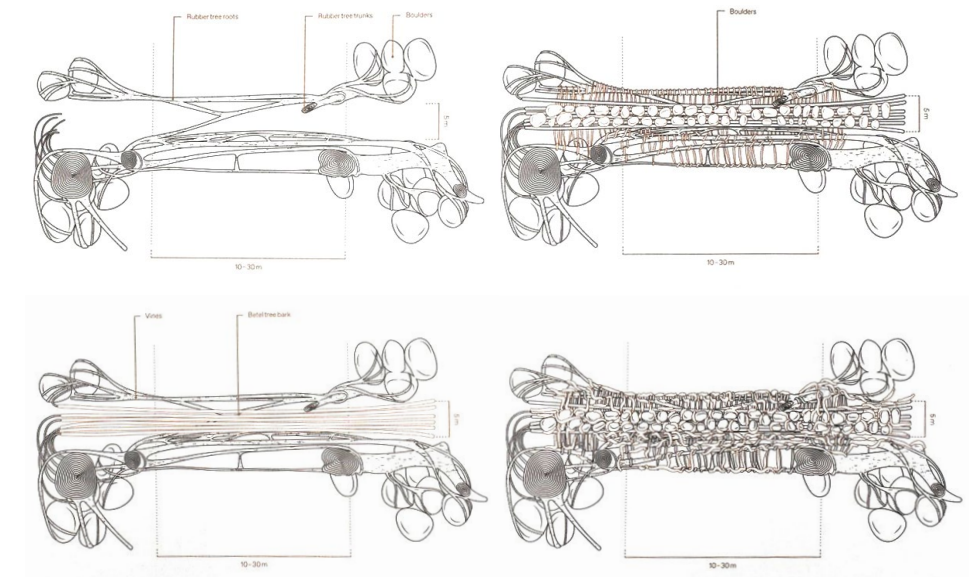
In the forested depths of northeast India's Meghalaya state, one of the wettest habitats on planet Earth, the ancestors of the Khasi tribe, survived the extreme conditions with their ingenuity, using their genius thinking to give birth to the living root bridges to cross flooded rivers to other villages during the monsoon. The root bridges and their organic looking composition appear to have grown themselves, reaching across the river, as if the forest canopy itself folds to form connections. In reality, it is a bridge created by human beings. The rubber tree trunks being elastic in nature are planted on either side of the river and the roots are put into hollow betel nut plant trunks to guide them to grow in the right direction. Over time the roots are pulled and woven to meet the tree on the other side. The roots are then tied with one another and by a process of fusion called anastomosis, they merge together. Once the trees reach a certain level of maturity, they add more roots to the network which are woven into the bridge by the localites. Although the Living Root Bridge takes around 10 to 15 years to take its shape, it can last up to 500 years and become strong enough to carry up to 50 people and span 15 to 250 feet.

Unlike modern building materials such as concrete and steel, which quickly rust and decay in humid climates, if the foundational tree remains healthy, the living root bridge will naturally self-repair and grow stronger as the structural roots grow thicker and can survive for centuries, up to 500 years. The living infrastructures are low in cost, maintenance, and embodied energy. ⁹ "It's an ongoing process of growth, decay and regrowth"(says Ferdinand Ludwig, CNN) At the same time,



unlike the previous precedents, here we can recognize that trees have the potential to be used as an internal part of the structure. There is no finished objects - it's an ongoing process and way of thinking.

The living root bridges also support several life forms. Coated in mosses and lichens and newly formed leaves, these bridges breathe life into other parts of the ecosystem. Therefore, the



architecture of these bridges is not only incredible but also designed with the lowest construction and maintenance costs. Technology can use nature and the systems that make it up to do something for us.



Forest Building for BEST, Richmond, Virginia, 1980

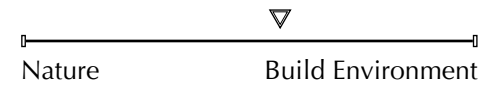
In the late 1970s, James Wines, founding principal of SITE, was commissioned to design retail stores for the catalog merchant company BEST. The new outlet in Richmond, Virginia, was to be located on a lot occupied by a beautiful forest. Whether the existing trees at the edge of the lot should be conserved has become a top priority. Eventually James Wine decided to slice the building and move the entire facade a distance as a freestanding ruin, while retaining the original trees as a vegetal buffer and situating the retail store's functional boxes behind them.

“Specialists spent months on the building site, re-training the roots of the trees to grow away from structural footings and foundations,” (David Douglass-Jaimes, 2015.12.7, post for ArchDaily) The attitude towards plants is cautious and treated with care. Architecture has always adapted to the presence of

plants, even up to the point of being destroyed, and not the other way around, as with the current fashion of plants perched over buildings. Without affecting the stability of the building, let nature do its thing.

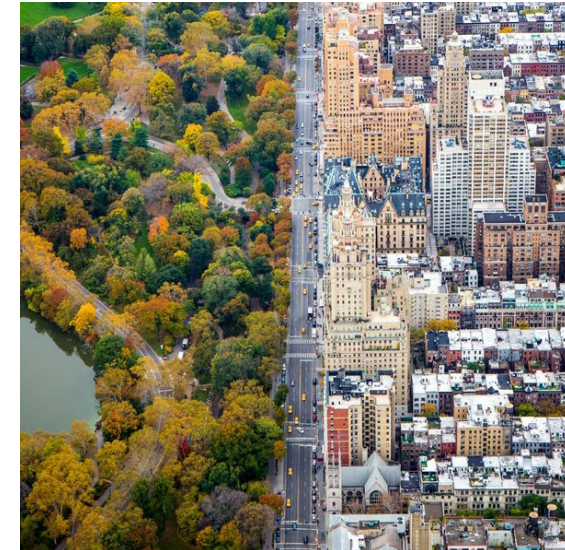


Adapt



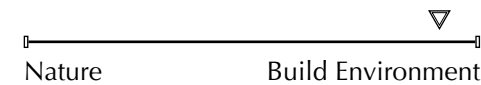


Central Park, New York, United States



One of New York's most identifying features, Central Park is set in the heart of bustling Manhattan and was designed by Frederick Law Olmsted and Calvert Vaux.

A popular misconception about Central Park is that its 843 acres are the last remaining natural land in Manhattan. It looks as if made by nature itself, it is almost fully landscaped. The flora, landforms, water, and other features of Central Park do not exist, but are human-made. In a sense, everything here is fake, the result of artificially planting, but it meets the needs of New Yorkers well, creating a green sanctuary inside the dense, hectic metropolis.

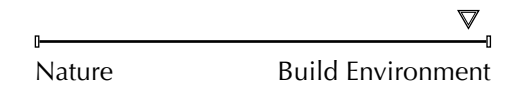
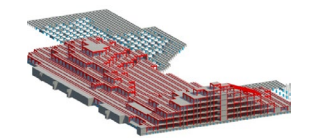


Twin Mountains, Shanghai, China



This is a project that is still under construction, located in the heart of Shanghai, China. The terrain of downtown Shanghai is very flat and with no mountains. Twin Mountains is in fact a pure man-made landscape architecture. The whole mountain is built by covering the steel-concrete combination structures, the interior of the mountain is designed to be a huge parking garage. According to the plan, the relative peak of the Twin Mountains will be 48 meters, and the residual vein height will be 8 to 37 meters, which looks like a natural mountain forest. In the center of Shanghai, which lacks urban green space, it provides citizens with a relaxing urban park.

The project is similar in a sense to the Central Park in New York. From the change of terrain to the selection of plants, all are the result of careful human arrangement, and people rely on advanced technology to achieve a certain degree of control over nature. The cost is staggering, but it really meets the needs of people who lack green space in high-density cities, and for them, there is no doubt that this is nature.





1956



1959



1961



1965

One thing hastens into being, another hastens out of it. Even while a thing is in the act of coming into existence, some part of it has already ceased to be. Flux and change are for ever renewing the fabric of the universe, just as the ceaseless sweep of time is for ever renewing the face of eternity. In such a running river, where there is no firm foothold, what is there for a man to value among all the many things that are racing past him?¹⁰

Marcus Aurelius, Meditations
(167 A.C.E.)

The Perceivable Time

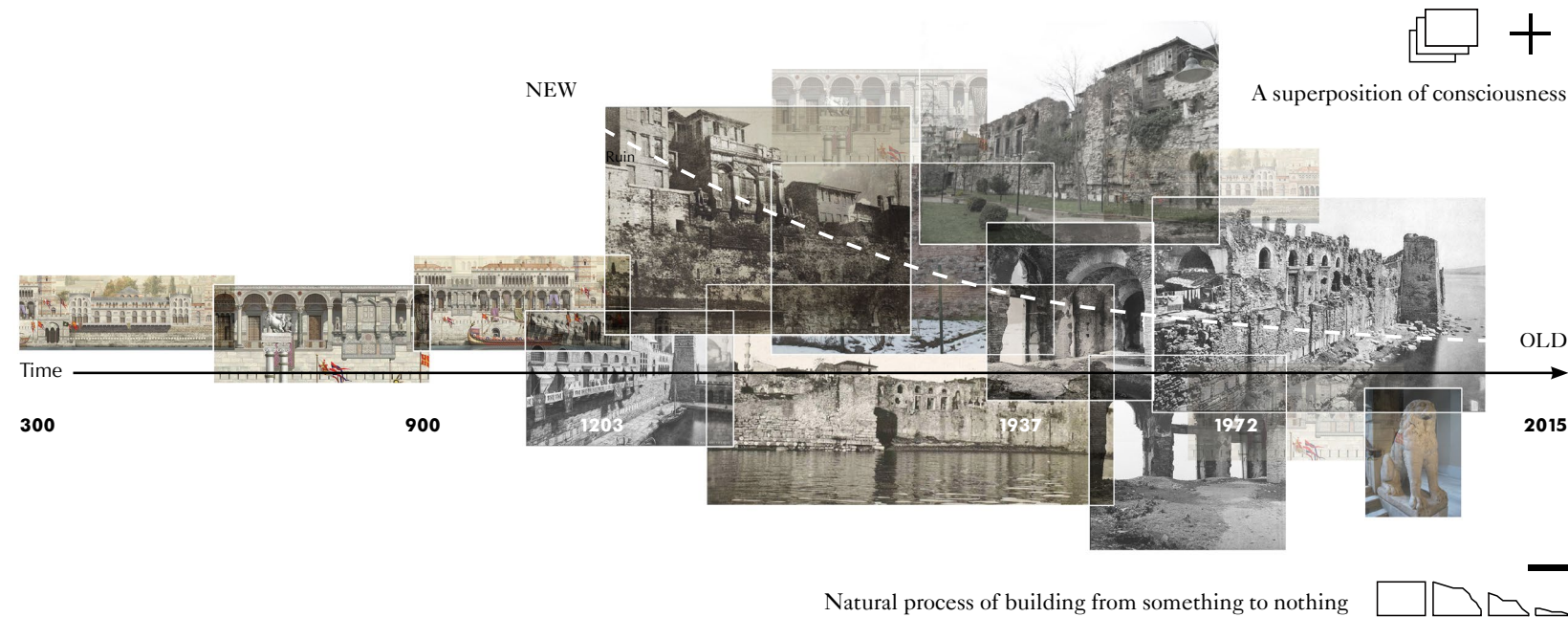
The traces of time left on buildings are often seen as "ugly". Buildings do not become stronger and more beautiful over time, on the contrary, what is left is all the broken bricks and peeling walls. Time is seen as a destructive threat to buildings. But is time just constantly subtracting buildings? Thinking back to my trip to Europe and seeing the ruins of Rome's thousand-year-old buildings still standing on the ground, I felt the traces of time, some shocks from the depths of my soul that I could not feel in front of any new building. It has lost its original function, but has become a model in people's hearts as a "monument". The sense of time, like the sense of place, arises in the strength of memory and the change in nature.

Therefore, the relationship between time and architecture has two meanings, one is subtraction and the other is addition. Subtraction is the natural process of building from something to nothing, constantly cutting back, and eventually disappearing. Addition is a superposition of consciousness, a changing "mottled" picture that exists in people's minds. As if the history itself is difficult to perceive, we can only judge time itself based on the current context. Just like Aristotle and Plato have the two opposing views of time, one moving and one fixed.

The changes of time is inevitable, but it can be seen as much positively as possible, not just pessimistic about the decay of the passage of time. Ruins, as relics of past stories, human time has ended, but the past is still partly being experienced now, and the reality is connected with people's imagination of the past. "This may be the meaning to give permanences: they are a past that we are still experiencing."¹¹ Therefore, it is necessary to properly preserve traces of the past, to stand at a certain point in its evolutionary process, and maintain the glory of the building past.



The history of Boukoleon Palace, Istanbul



From another perspective, buildings undergo constant renewal while the environment remains eternally unchanged. Trees grow and go through the seasons, seemingly in a state of constant transformation, yet always rooted in the same land, reaching upward and grounding downward. Rocks are continually sculpted by the tides, presenting a different face at every moment, yet standing steadfast in their ancient positions, bearing witness to the succession of one building after another. Every mark on the stones records a story of time, and they remain quietly present, enduring.

Time, for nature itself, operates both in addition and subtraction. Addition manifests as the continuous growth of life, while subtraction arises from external forces of destruction. However, the physical reduction caused by such destruction can also be perceived as an accumulation of the past. It carries a sense of weight and depth.

Time is perceptible. It can be sensed through architecture and also through nature. Time can become a tool.



1863 - The first Cliff House was built in 1863 to take commercial advantage of the site's spectacular view of Seal Rocks (which crawled with sea lions) and Pacific sunsets. The restaurant's commercial success was always tenuous, because its customers in San Francisco were seven sandy miles away to the east.



1878 - In 1868 the original owner tripled the Cliff House in size with two asymmetric wings and a long roofed balcony. It was by now a successful gambling casino. San Francisco silver-mining millionaire Adolph Sutro, having built a home and public garden on the heights overlooking the Cliff House, didn't like its rowdy reputation, so he bought the place and converted it to a family restaurant. On Christmas night in 1894 a kitchen fire burned the building down.



1895 - Adolph Sutro was an engineer accustomed to huge projects. He hired architects C. J. Collyer and Emile S. Lemme to design a chateau-style edifice to match the grandeur of the site.



ca. 1900 - Presidents McKinley and Roosevelt dined at Sutro's Cliff House. Eight stories high, it had art galleries and ballrooms as well as dining rooms and bars. Sutro began building a railroad to bring customers to his amusement palace. Slightly nailed to its cliff with iron rods, the building suffered no damage at all from the great earthquake and fire of 1906.

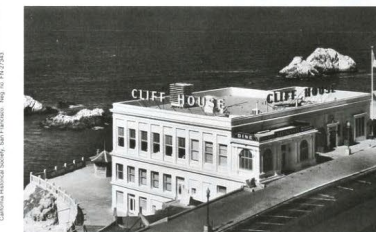


1907 - On September 7, 1907, the dream burned to rubble, with just a few chimneys left standing.

(NATURAL) SITE IS ETERNAL. At San Francisco's famous Cliff House, the house



ca. 1910 - Sutro's daughter, Dr. Emma Merritt, had the next Cliff House made of fireproof concrete and steel, designed by brothers named Reid. President Taft dined at this one.



ca. 1946 - After a series of owners and a number of years being closed, the Cliff House was bought and refurbished by George and Leo Whitney in 1937. It featured the largest curio shop in the world.



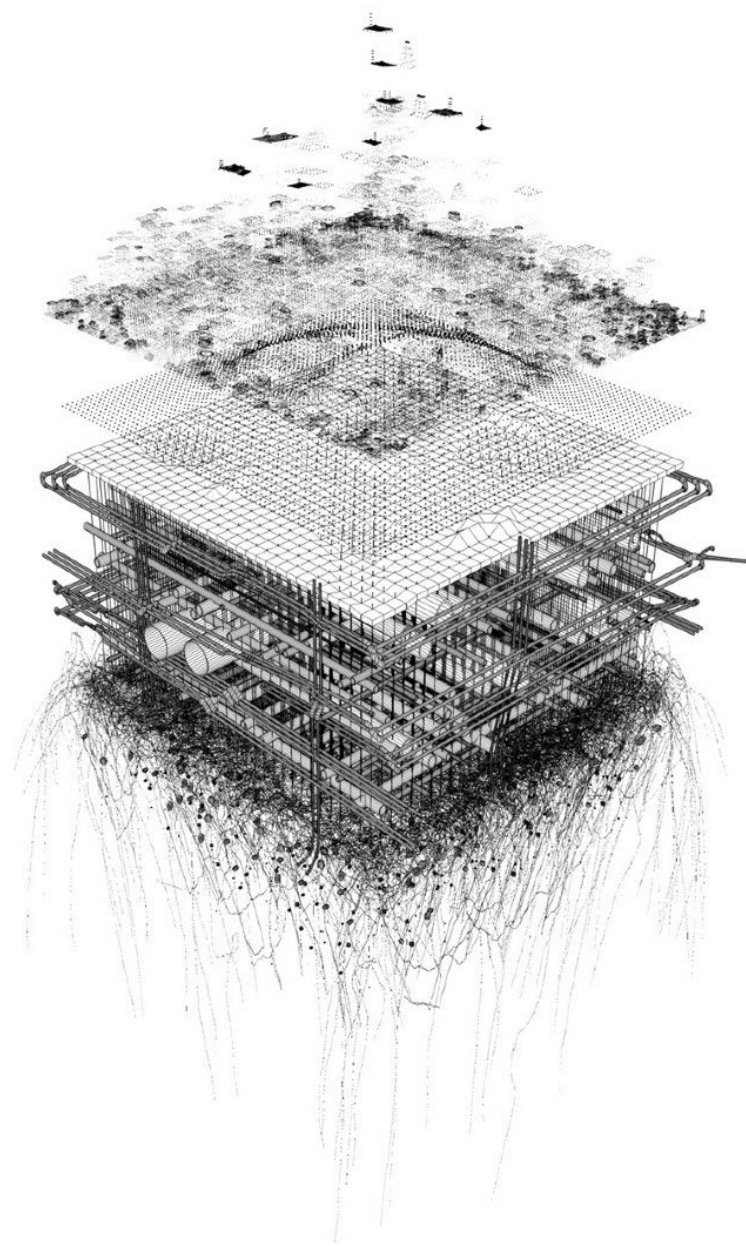
ca. 1954 - In 1950 the Whitney brothers drastically remodeled the building with redwood siding and extended it to the left. The building never did get its dignity back.



1973 - The Cliff House closed again in 1969, then reopened in 1973—during San Francisco's "psychedelic" heyday—with a heady mural of ocean waves and spray. Most of the photos and information on these two pages are from San Franciscana. Photographs of the Cliff House (San Francisco: Blaudel, 1985), by Marilyn Blaudel. See Recommended Bibliography.



1991 - In 1977 the National Park Service took over the Cliff House as part of the Golden Gate National Recreation Area. It is appropriately staid and public-spirited in demeanor. Every so often someone revives the fantasy of rebuilding Sutro's extravaganza. Stranger things have happened.



Mutualism

Mutualism is a type of symbiosis, a term borrowed from the life sciences. It is a process by which two seemingly opposite organisms interact in such a way as to benefit one another. Through this approach that architecture can aspire to be more than a building. Built form without natural form is building. Natural form without building is landscape. It is this in-between area where architecture lies. We need to think about the two-way relationship between nature and the built environment from the perspective of symbiosis, and let the two work together to support each other, which will bring both short-term and long-term benefits.

How to achieve a symbiotic relationship? We need an open structure that creates a dynamic relationship between building form and natural form while allowing them to survive. Buildings are destroyed over time, but as mentioned in the previous chapter, it records the traces of time, and we need to protect them as much as possible and refuse to restore. "...neither [to] have repairs nor things ruined...Let them take the greatest possible care of all they have got, and when care will preserve it no longer, let it perish inch by inch"¹². Nature as a material, is ephemeral and constantly changing, but at the same time eternal. Under the conscious guidance of the structure, nature can be shaped into architectural elements or even into the structure itself. Our goal is not to imitate nature, but to return to nature.

Mutualistic architecture is about change: how do built and natural form morph over time through this relationship? It's a long process, and time can be seen as a tool. Architecture is able to transform itself over time, i.e. integrating the architecture of the past and permitting it to be consistently transformed into the future. Essentially, it is a holistic system with the whole greater than the sum of its parts. Individual parts alone do not constitute architecture. Architecture emerges when the parts are assembled into a single organism. Through the use of mutualism, architecture no longer is an either/or proposal but rather a more inclusive both/and.¹³

¹² John Ruskin, "Letter to His Father 1845", in *The Works of John Ruskin*, (London: G. Allen, 1901)

¹³ Workman, Vivian Ann, "Mutualism in Architecture: An Architecture of the In-Between." Master's Thesis, University of Tennessee, 2004. https://trace.tennessee.edu/utk_gradthes/2253



Site Analysis

Pollepel Island



Pollepel Island

Hudson River, New York

Pollepel Island is a beautiful uninhabited island in the Hudson River in New York. The principal feature on the island is Bannerman's Castle, an abandoned military surplus warehouse. The island is about 50 miles (80 km) north of New York City and about 1,000 feet (300 m) from the Hudson River's eastern bank. It covers about 6.5 acres (26,000 m²), most of it rock.¹⁴

The island is easily visible from Route 9D and can be seen by rail passengers traveling on Amtrak and Metro-North's Hudson Line. It takes just 1.5 hours to travel from Grand Central. People can access the island by ferry or kayak.

In 1900, Frank Bannerman VI purchased the island and built a Scottish-style castle as a warehouse to store his military surplus goods. He also constructed a smaller family summer house at the top of the island. Over the years, the island fell into ruin due to the end of wars, a devastating explosion, and a destructive fire. It remained abandoned and gradually reclaimed by nature. However, in the 1990s, the Bannerman Castle Trust, a nonprofit organization, was established with the goal of preserving the island for the public to appreciate its cultural and historical value. Today, people can visit the island from May to October by ferry or kayak. (Tours are not wheelchair accessible, unfortunately.) Visitors can take a guided tour around the fortified castle (access inside is not permitted for safety reasons, only exterior viewing.), as well as explore the Bannerman residence, which has been transformed into a museum. Additionally, the trust regularly hosts movie nights, lectures, special dinners, and theatrical performances in the shadows of the castle.

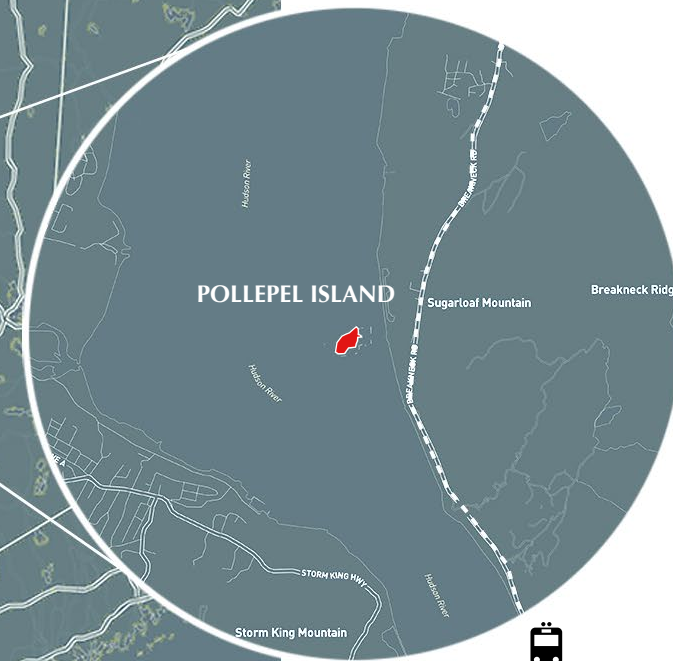
¹⁴ Beattie, Rich. "Kayaking to Pollepel Island." *The New York Times*, July 28, 2006. Accessed November 17, 2006.

Location

Beacon, New York



● DIA BEACON



Dia:Beacon is the museum for Dia Art Foundation's renowned collection of art from the 1960s to the present. The museum, which opened in 2003, is situated on thirty-one acres on the banks of the Hudson River in Beacon, New York.



Metro-North Train - Hudson Line train
Grand Central → Beacon
1.5h

User group

It is estimated that an average of 68,420 visitors visit Dia Beacon each year, approximately 95% of museum attendees came from outside Dutchess County. These "nonlocal" visitors (an estimated 65,000 per year) bring money, through their local expenditures, into the Dutchess County economy that most likely would otherwise have been spent in their own county.¹⁵

It's a perfect escape from New York City. An hour and a half from NYC and just a quick train ride on Metro-North, Dia:Beacon makes a great day trip from NYC.

Existing Buildings

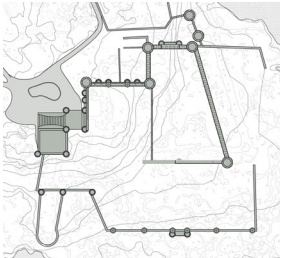
Bannerman Castle

Current situation: Ruin

In 1900, in the center of New York City millionaire, businessman Francis Bannerman VI runs a successful military surplus empire.

Construction ceased at Bannerman's death in 1918. In August 1920, 200 pounds of shells and powder exploded in an ancillary structure, destroying a portion of the complex. After the sinking of the ferryboat Pollepel, which had served the island, in a storm in 1950, the Arsenal and island were essentially left vacant. The island and buildings were bought by New York State in 1967, after the old military merchandise had been removed, and tours of the island were given in 1968. However, on August 8, 1969, fire devastated the Arsenal, and the roofs and floors were destroyed. After that, the island was deemed unsafe and placed off-limits to the public. Until 1992, Neil Caplan, a resident of nearby Beacon, New York, formed the Bannerman Castle Trust. The group raised money to preserve the architectural gem, tours are once again given on the island, in addition to other special events hosted there. *But for security reasons, the main castle is not accessible to tourists anymore and people can only see it from a distance.*

Although the trust has restored parts of the castle since the '90s, weather has still taken a toll on the structure in recent decades. Much of the castle's shell collapsed one night in December 2009. Then more walls fell just a month later, during a January storm in 2010. The future of this castle is a concern. What can we do without sufficient funds for maintenance?



Floor Plan

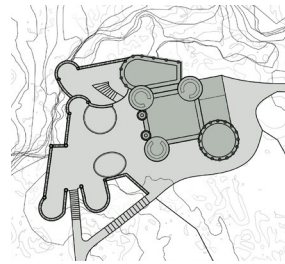


Bannerman Residence

Current situation: Adapted for museum uses

The former Bannerman Residence is the smaller of the two castle-like structures on the island and was used as a summer home by the Bannerman family during operation of their business on Pollepel Island. It was called "The Big House" by the workers who lived on the island. Construction started in 1908 and would continue until 1918 when Frank Bannerman VI passed away. The home began life as a one story residence and would later be expanded to a two story three bedroom house. The West Wing Sun Room and Sleeping Porch were the last structures built on Bannerman Island.

The residence has been transformed into a visitors' center now, providing ample information and exhibits showcasing the island's history. Surrounding the area are beautifully manicured gardens. Additionally, the open space at the entrance serves as a versatile event venue. Regularly scheduled activities, including movie nights, live music concerts or performances, stage readings, dinner menus, and more, take place here. It's important to note that the capacity is limited to approximately 30 people, and overnight accommodations are not provided.



Floor Plan

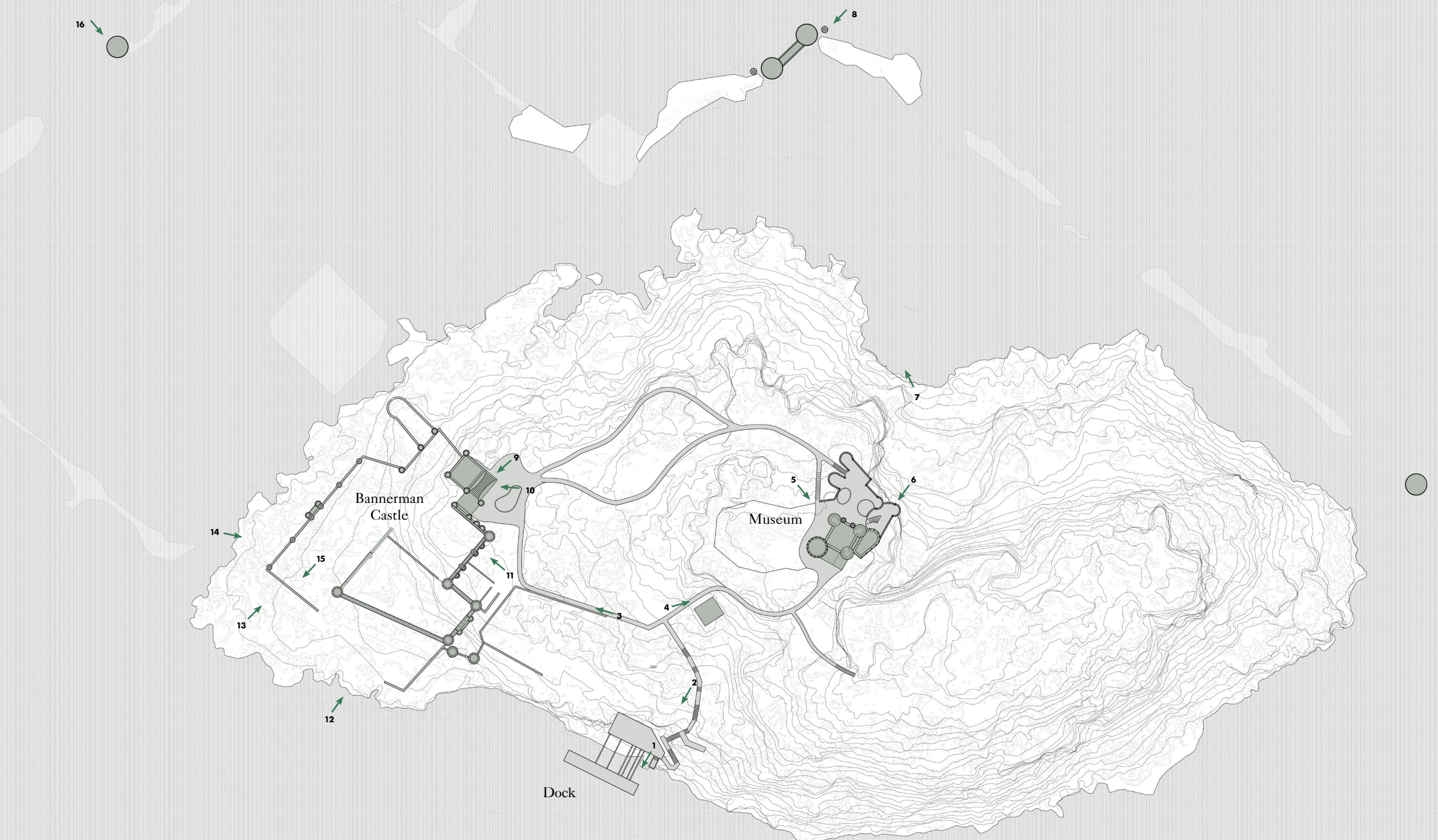


Interior Museum

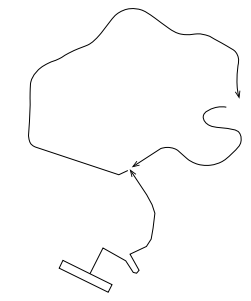


Exterior Venue





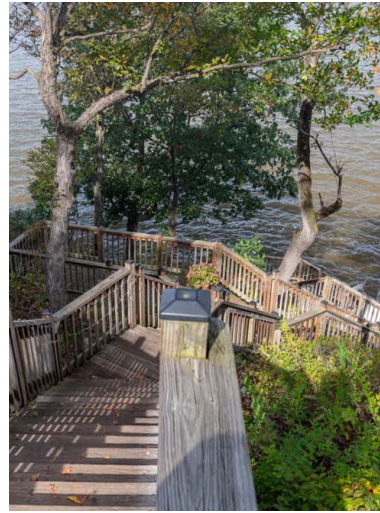
Flow Analysis



The flow pattern of the site is very straightforward. Upon arrival at the ferry dock, visitors need to climb a total of 72 steps to reach the starting point of the tour (with rest platforms along the way). The entire tour follows a circular path, connecting Bannerman Castle and the Museum on either side. Since entry into Bannerman Castle's interior is not allowed, visitors can only see limited angles of the castle from the outer pathway. It is common for people to take photos and capture memories at the spacious platform near the entrance. The island is abundant in plant resources, with tall trees and meticulously maintained gardens lining the pathways. Continuing along the path, visitors will soon arrive at the museum, where they can learn about the island's history and artifacts. The outdoor platform provides seating for visitors to rest. If there are no events on the day and visitors are only participating in a walking tour, approximately 2.5 hours is sufficient for the entire island visit. (30-minute boat ride over to Bannerman Island aboard the Estuary Steward. Guided 45-minute walking tour of the island.) The island itself is not large, and most areas are left in a purely natural state, with visitors not allowed to enter unauthorized areas.



1 The dock



2 Stairs leading to the starting point



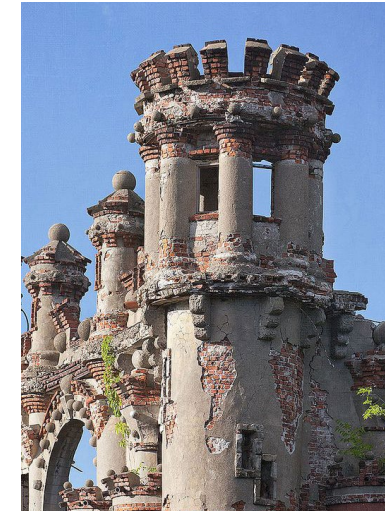
3 Pathway leading to the castle



4 Public restroom



9 The bridge leading to the tower



10 A close-up of a turret



11 The warehouse wall



12 The north gate of Bannerman Castle



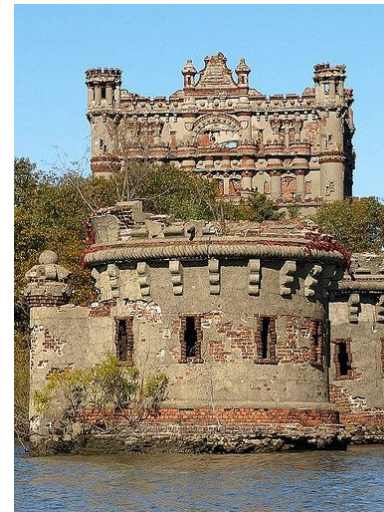
5 Bannerman Residence from the west



6 Bannerman Residence from the north



7 Twin Towers from the island



8 The twin towers



13 The northeast corner of castle



14 The front of the No.2 Arsenal



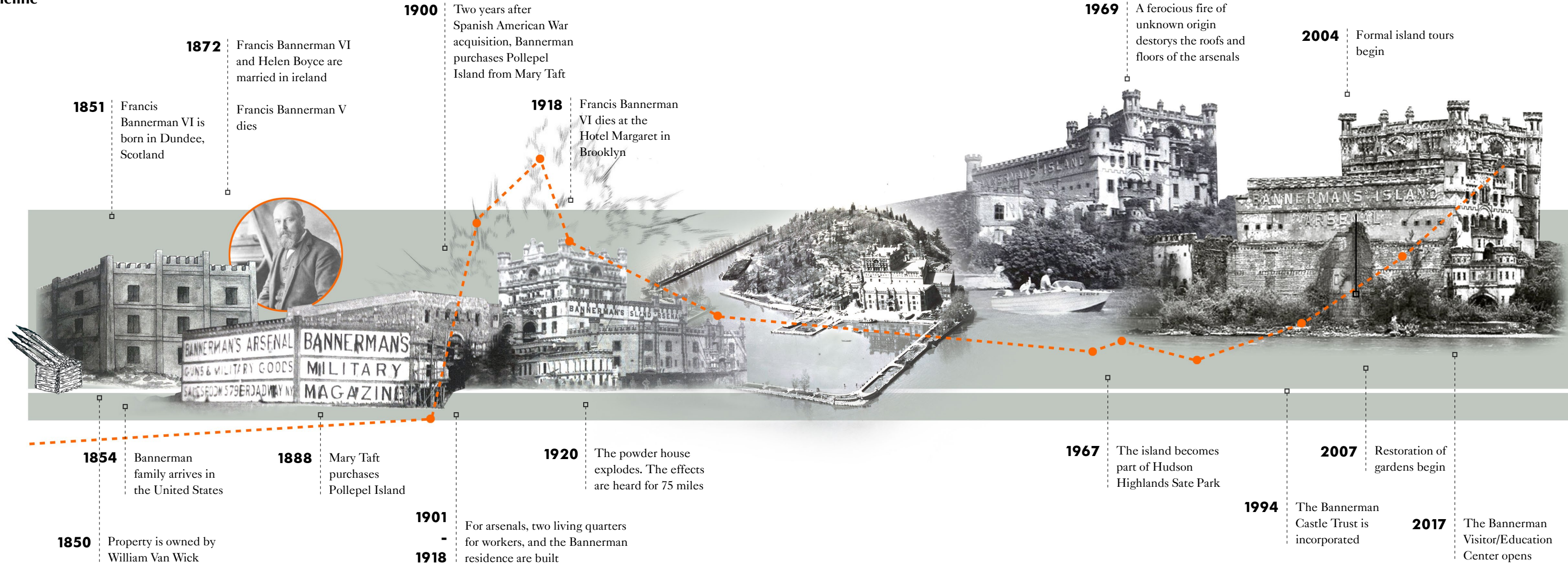
15 Interior view of No.3 Arsenal



16 The gap tower

Century's Transformation

Timeline



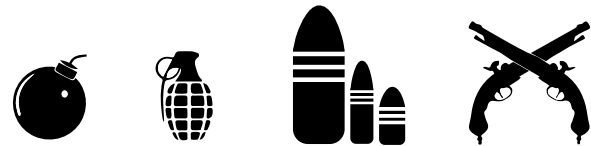
Original Function

1901-1918

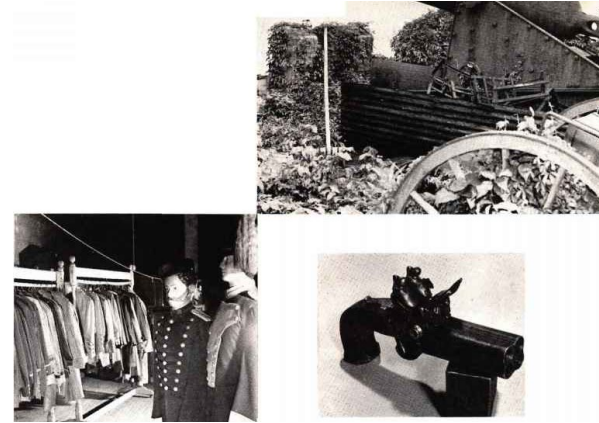
Francis Bannerman VI bought the island primarily to solve the storage problem. Because he had a large stock of black powder that he couldn't safely store in his Brooklyn storeroom. He had not built a castle, just a arsenal.

Meanwhile, Bannerman used the arsenal as an advertise-ment. He put the name of his business with the address of his store on the walls of the arsenal. Passengers on the passing cars, boats and trains now saw his billboard.

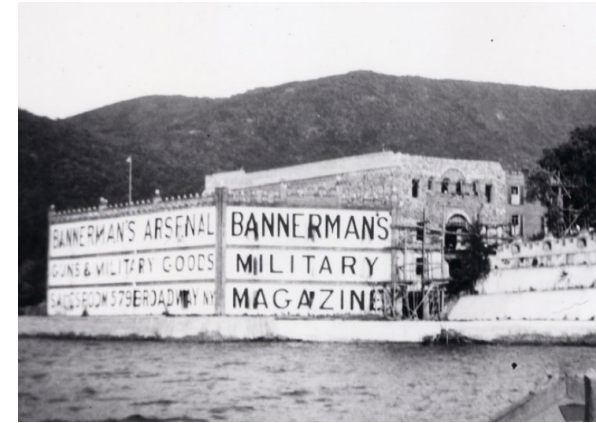
The smaller family residence, located at the center of the island looking down river towards West Point. It used as a summer home for themselves and special guests. He and his wife Helen, planted several gardens along the trail leading to the residence. To this day, the The Bannerman Castle Trust still takes care of these gardens.



1. Storage



2. Advertising



Painted walls advertise Bannerman's whilst under construction, 1905



3. Family Residence



From Building to Ruin

Francis Bannerman VI was interested in architecture, heavily influenced by castles from his Scottish background. He did not have formal training in design or engineering, but he considered himself to be an amateur architect.

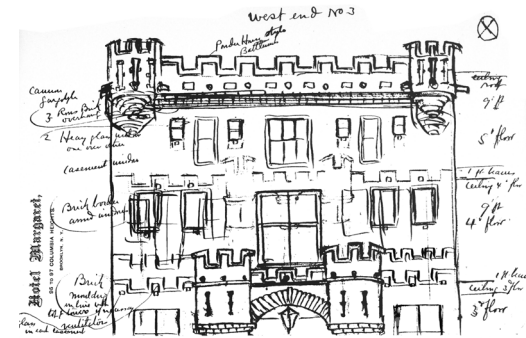
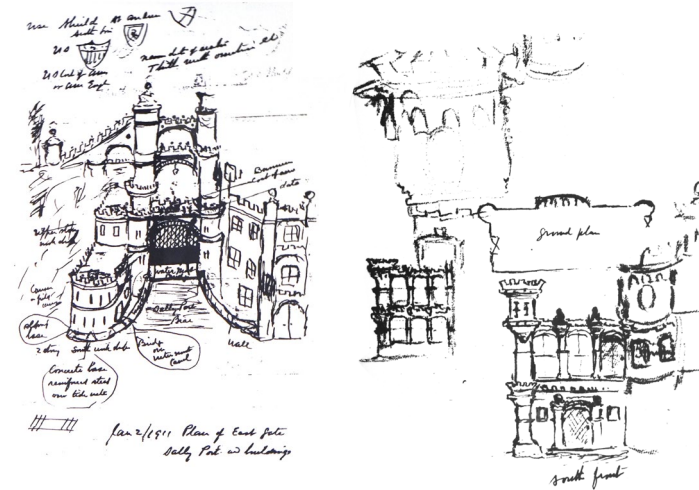
Bannerman had an eye for style, but like many good designers he also had an ego. He largely refused to lean on professionally-trained architects, engineers, and contractors. Instead, Frank preferred to hire general builders and oversee the operation himself. Acting as conductor allowed him to express design philosophy without intervention... for better or worse.

It's not surprising that several of Frank's castle walls were not even in length. Acute and obtuse angles seemed to outnumber the 90s. This quirk gave a casual observer of the building a false sense of it being larger in size than reality.

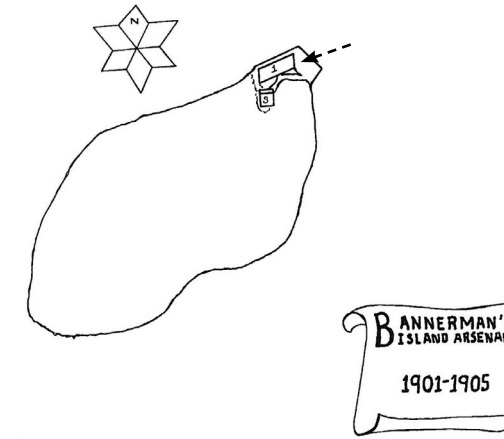
He was a visionary, but not necessarily a problem-solver. Bannerman would scribble design ideas on cocktail napkins and hand the napkins to the builders, leaving them to their own devices to "make it work."

The process was enormously frustrating for the builders, but it made for an impressively ornate structure, built free of some typical engineering constraints.

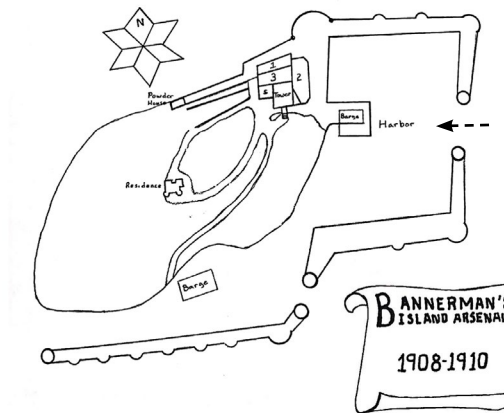
The island would eventually have seven buildings, and reportedly due to Frank's alterations, none had complete blueprints.



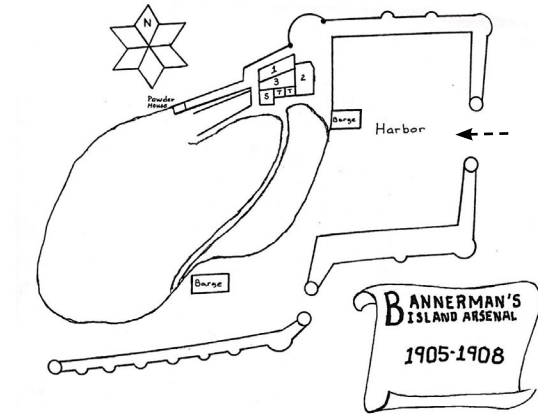
1, 2, 3 - No.1, No.2, No.3 Arsenal
S - Superintendent's house
T - Towers



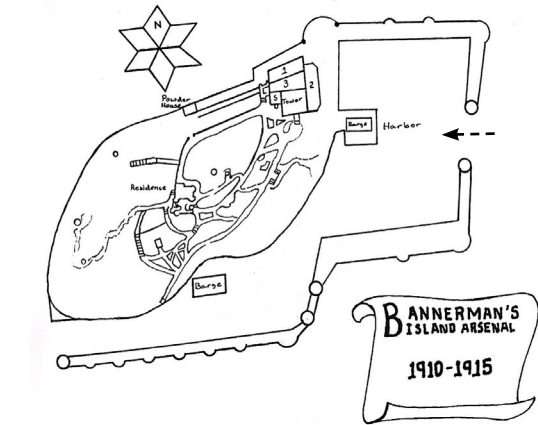
Francis Bannerman VI built the No.1 Arsenal for storage. It is unknown why he designed the building without right angles at the corners. Maybe he believed the building appeared larger that way.



He designed and built the most distinctive part of the complex, the tower. He also started the family residence, located at the center of the island.



His business had grown dramatically and he needed to expand the arsenal. He also improve his dock and built a harbor. The arsenal started to look like a castle.



Bannerman had built all of the storage space he needed. The arsenal was done. He and his wife Helen then planted the gardens along the trail leading to the residence.

Pollepel Island (1940)



Bannerman Island Aerial

1. The Tower
2. Number 1 Warehouse
3. Number 2 Warehouse
4. Number 3 Warehouse
5. Superintendent's House
6. Portal Lodge
7. Portcullis / Drawbridge
8. Breakwater, North Arm
9. Breakwater, South East Arm
10. Breakwater, West Arm
11. Twin Tower Bridge
12. South Gap Tower
13. North Gap Tower
14. Margaret's Tower
15. Bannerman Family Residence
16. Barge in Wee Bay

Bannerman Castle



1920



1930



2020

Bannerman Residence



Materiality

Architecture Materials

Since August 8, 1969, fire devastated the Arsenal. The firemen helpless to fight the enormous blaze. Due to the intense heat, no efforts were made to fight the fire. All that remained after the fire were stone, cement, and brick walls of the building. The interior floors made from ships' planks, coated with creosote, were totally destroyed as were much of the wooden beams.¹⁶

Suffering from explosions, fires, and without the support of reinforced concrete, the building has crumbled.



Stone



Brick



Cement



The towers of the castle require external beams for support. The braces are made of steel. Each individual section weighs 250 pounds. But even with this support, there's still a risk that the walls could fall. So the castle is not accessible to tourists and people can only see it from a distance.

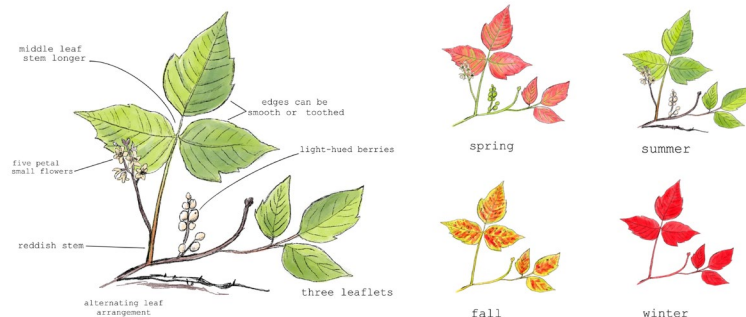
The building needs a support structure, but only in the form of steel beams?

Nature Elements

Climbing Plants

Poison ivy *Toxicodendron radicans*

Poison ivies can grow as small plants, shrubs, or climbing vines, most often thought of as an unwelcome weed. They are commonly characterized by clusters of leaves, each containing three leaflets.¹⁷ They grow in wooded or marshy areas throughout North America, attaching itself via hairy roots directly from the main vine that fill nook and crannies of bark, masonry, and brick mortar. The plants aren't really poisonous. They have a sticky, long-lasting oil called urushiol that causes an itchy, blistering rash after it touches your skin.



Identify

Seasonal Changes

Virginia Creeper *Parthenocissus quinquefolia*

A woody, deciduous vine, Virginia Creeper can be high-climbing or trailing, 3-40 ft. It can be used as a climbing vine or ground cover, its leaves carpeting any surface in luxuriant green before turning brilliant colors in the fall. Its tendrils end in adhesive-like tips, giving this vine the ability to cement itself to walls and therefore need no support. The presence of adhesive tips instead of penetrating rootlets also means it doesn't damage buildings the way some vines do.



Identify

Seasonal Changes



The interior of the empty shell of the building is full of climbing plants, which are fully nourished by the sun and rain, grow at an amazing rate and can climb to the top of the building. The materials of the building stones allow them to hold on better and more steadily. These are the "first nature" of pure natural growth. There is no doubt that by creating a structure in the building, these vines will spontaneously grow and climb on it. These greenery may do more than just decorate the building as it does now.

Woody Trees

Black Cherry *Prunus serotina*

Prunus serotina is a medium-sized, fast-growing forest tree growing to a height of 15–24 metres (49–79 feet). The leaves are 5–13 centimetres (2–5 inches) long, ovate-lanceolate in shape. Fall leaf color is yellow to red. Flowers are small, white and 5-petaled. Aromatic tree; crushed foliage and bark have distinctive cherry-like odor and bitter taste.



Black Oak *Quercus velutina*

Black oak is a deciduous, medium-to-large oak tree. Black oak generally grows to about 80 feet tall, some can grow to be 100 feet tall. The crown of the tree is spreading, which makes this a good shade tree. Fall color is yellow to yellow-brown. The wood of black oak hard, heavy and strong.



Populus Tremuloides Quaking aspen

Quaking aspen is a tall, fast-growing tree, usually 15–18 meters (50–60 ft) at maturity, with a trunk 25 centimeters (10 in) in diameter¹⁸; The trees have smooth pale bark, scarred with black. The glossy green leaves, dull beneath, become golden to yellow, rarely red, in autumn. Very light, porous and flexible wood.



Black Gum *Nyssa sylvatica*

The black gum tree is a tall tree with horizontal branches and a flat-topped crown. It generally grows in a rounded shape with a straight trunk. One of the most attractive features of the tree is its fall color. The leaves change from a dark glossy green to brilliant shades of red, orange, yellow, and purple in the fall.



Garden Flowers



Lobularias



Impatiens



Dianthus



Zinnia



Rose



Bleeding Heart



Stargazer Lily



Black-eyed Susan



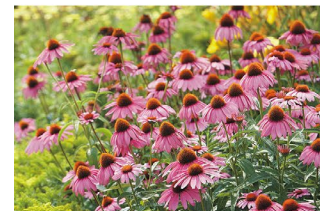
Nasturtium



Pricky Pear Cactus



Day Lily



Coneflower



Foxglove



Iris



Chrysanthemum



Cypress Spurge



Francis Bannerman VI and his wife Helen, introduced plants from different regions and planned gardens. Although it has been abandoned for a while, it is now well maintained by Bannerman Castle Trust. This is an important part of the island, attracting both humans and insects alike. "The gardens on Bannerman Island are a butterfly sanctuary, home to hundreds of Monarch Butterflies who make their long journey south every year!" (Bannerman Castle Trust)



Stone

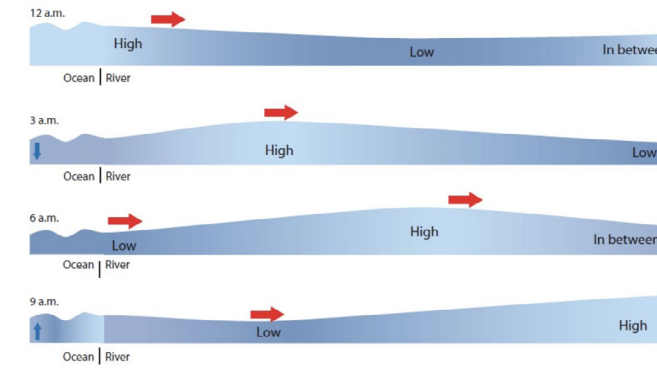


The island is predominantly rocky, but over time and the forces of nature, certain areas have accumulated soil and become lush with vegetation. However, in other areas, the rocks remain exposed. Due to the island's distance from the mainland, construction materials had to be transported by boat, requiring significant human and logistical effort. Therefore, the readily available stones on the island serve as a valuable resource. Both Bannerman Castle and Bannerman Residence have utilized the island's stones directly in their construction, showcasing an energy-efficient and sustainable approach.



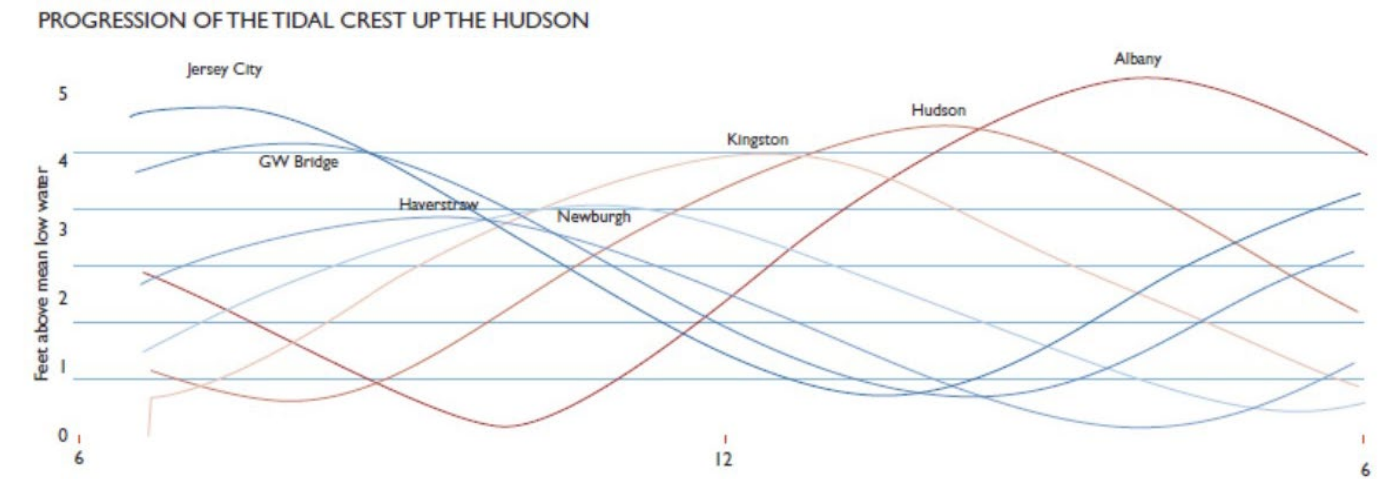
These stones have undergone a journey, being excavated from the island, transformed into construction materials, and bearing witness to the rise and fall of the Bannerman family. They have been stained by the smoke of warfare, destroyed by explosions, and consumed by raging fires. Every mark is etched onto each stone, telling a story of its own, and their very existence speaks volumes about history.

Tide



The Hudson River experiences daily fluctuations in water level due to the tides. Unlike the direct influence of the moon, the tides in the Hudson are caused by the rising and falling of water at the river's mouth. The estuarine section of the Hudson River stretches from New York City to Troy. The tidal effect travels upstream, reaching the Troy dam and causing the water in the river to slosh back and forth, similar to the movement in a bathtub. If the dam did not block the water's flow in Troy, the tide would extend even further. The oscillation in the ocean generates a wave that travels up the river, indicated by the red arrow in the diagram. The smaller blue arrow illustrates the movement of water at the river's mouth.¹⁹

The graph below shows the range of tide heights in the estuary.



Events

The castle is not accessible, and most events use it as a beautiful backdrop



Bannerman Island
Cruise & Walking Tour



Kayak or Canoe Tour



Musical or Performance



Bannerman Castle
Farm to Table Dinner



Movie Night at
Bannerman Castle



Stage Reading



Self Guided Tour with
Live Music Beacon



Weddings on
Bannerman Island



Event photos

Bannerman Castle Trust

Years ago my good friend, Dr. Sheila MacManus, gave me a book called Day Hops to the Hudson Valley. I have a background in theater and my wife Darlene and I were taking trips to the Hudson valley to find a theater space. In the book was a small drawing of Bannerman Island, by Hudson Valley artist John Guild. Darlene and I both looked the picture and the small description about the island's history, and thought it would be a great place to do theater. There was one big problem. The castle and the grounds needed to be stabilized before anything could be done.

The island seemed to be claimed by surrounding towns of Cold spring and Cornwall on Hudson. After some research, we found that the island was in the Town of Fishkill, NY and was owned by New York State Parks. I immediately contacted the Parks Department and they told me to write them a letter. I sent a letter to NYS Parks and wrote about all the wonderful possibilities for Bannerman Island. I shortly received a letter back from the Parks, who told me that the Island was "off limits" and it was "forever wild." I really do not like to take no for an answer, so I started a campaign to "Save Bannerman Castle" and to charge the status of the island from a "scenic ruin," so it could be opened as an historical, educational and cultural facility. People told me I was nuts and the castle could not be saved.

By chance, I would meet Thom Johnson, who has been a Bannerman Island enthusiast since the 1970's, along with Mrs. Charles S. Bannerman (Jane Campbell Bannerman), the wife of the builder's grandson. She loved the idea to use the island

for theater and art. With the help of Susan Andersen, Dr. Sheila MacManus, Dutchess County Assemblyman John Ballo, Alison MacAvery, Dorie Papas, Robert McKenna, the Director of Housing and Community renewal in Newburgh, and my wife Darlene, in 1993, we formed the Bannerman Castle Trust, Inc. to save Bannerman Island, and open it to the public.

- Neil Caplan, Executive Director and Founder, The Bannerman Castle Trust, Inc.

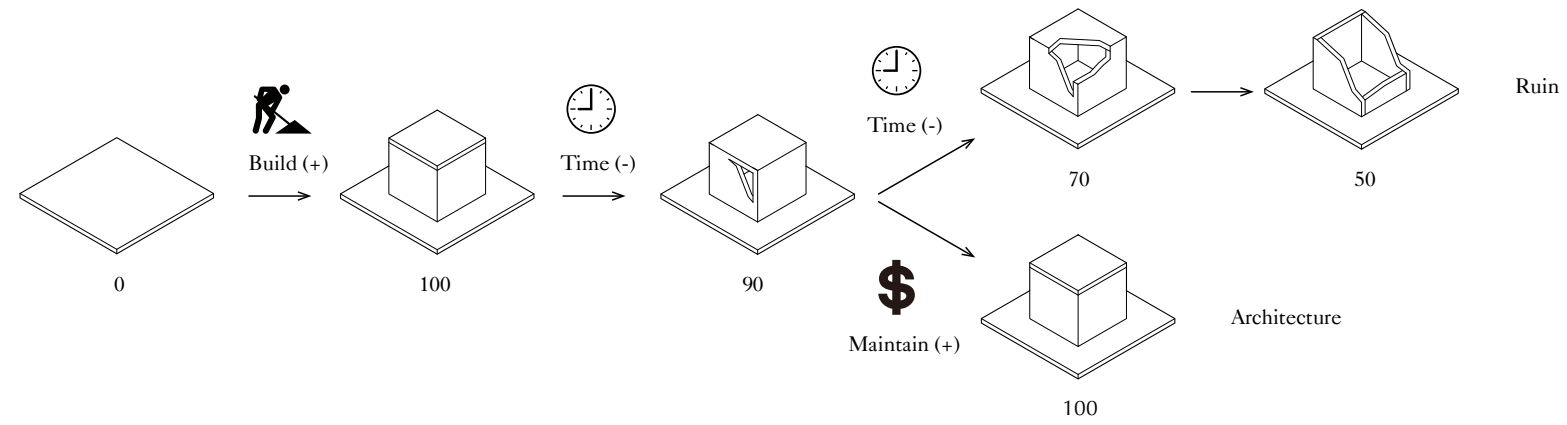


What will be the future of the castle ?

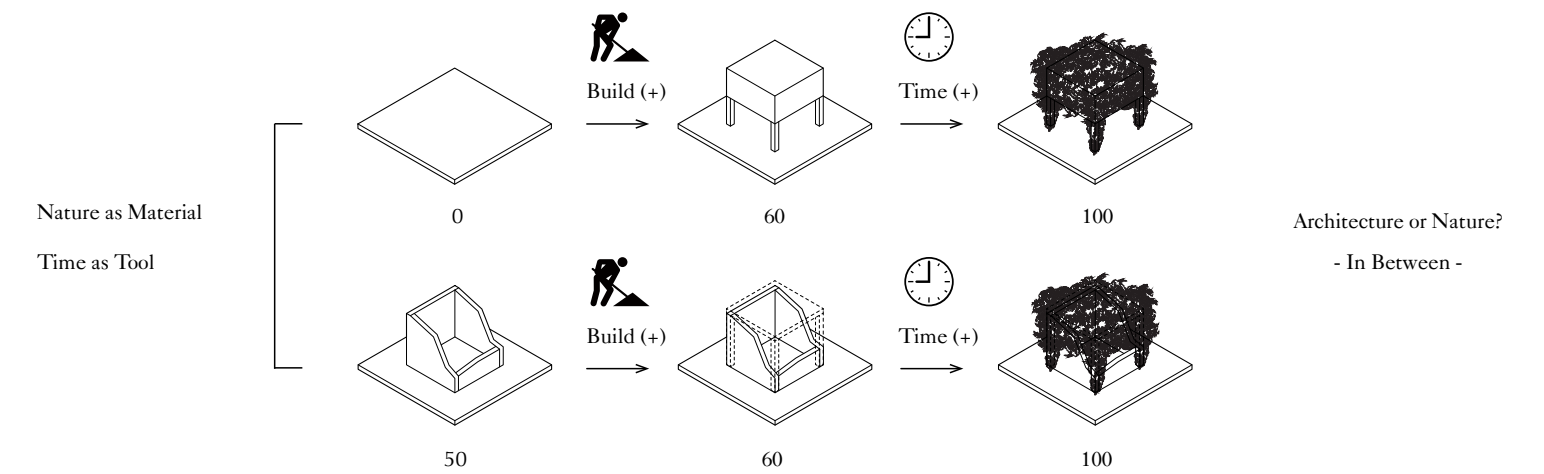
In 1962, Bannerman's grandson, Charles, wrote, "No one can tell what associations and incidents will involve the island in the future. Time, the elements, and maybe even the goblins of the island will take their toll of some of the turrets and towers, and perhaps eventually the castle itself, but the little island will always have its place in history and in legend and will be forever a jewel in its Hudson Highland setting."

Design Proposal

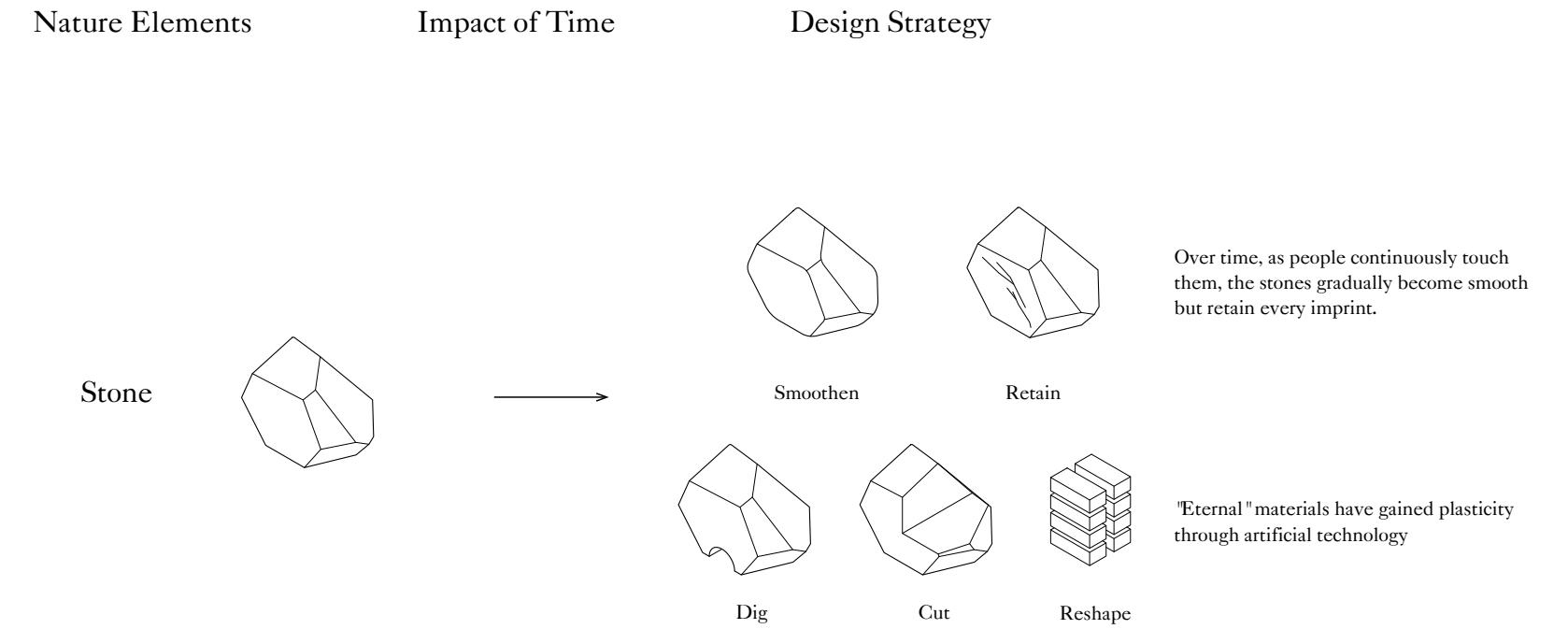
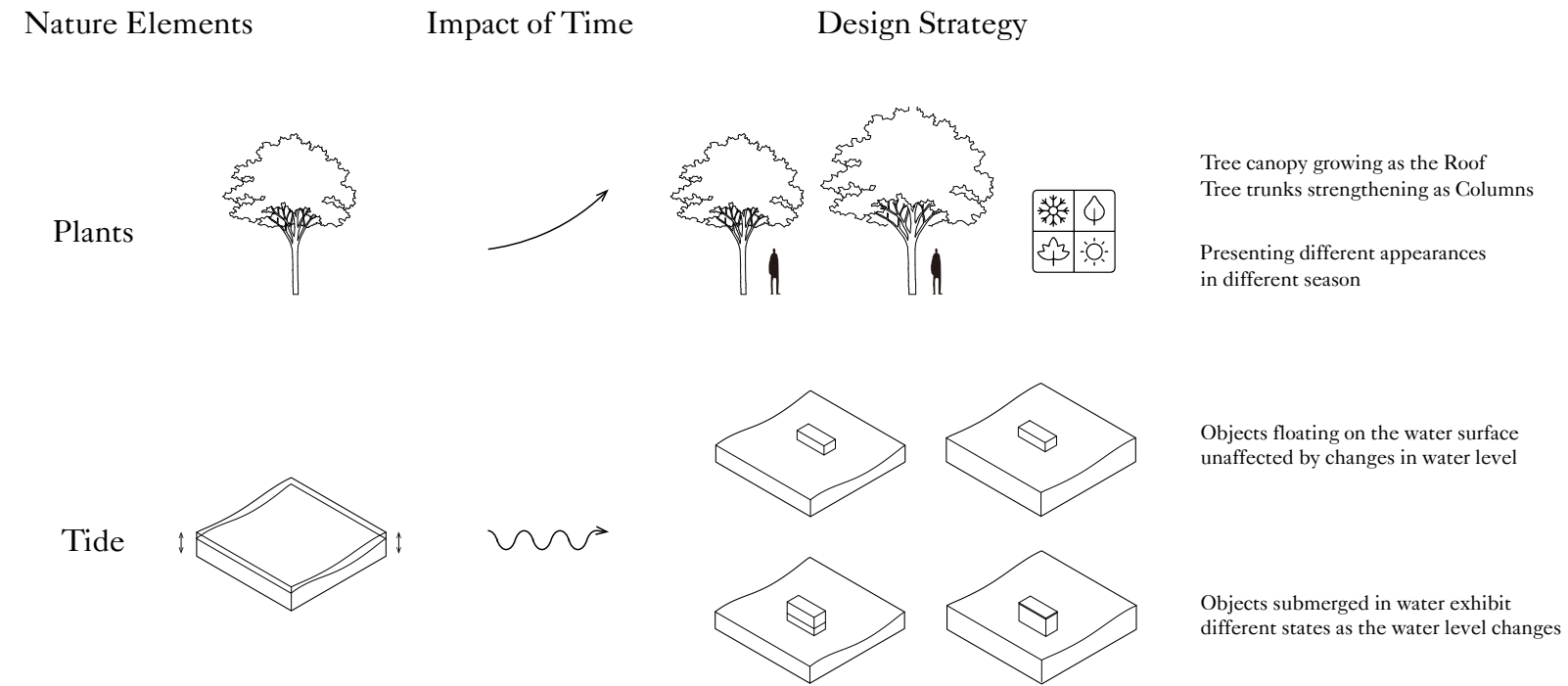
The Life of Architecture



Deisgn Concept



Design Strategy





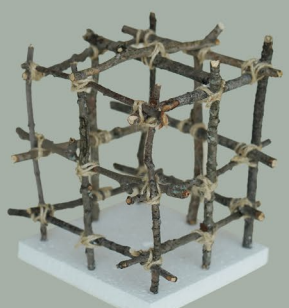
Cave



Tree Wall



Stack



String Off



Turning



Wood Board



Rack



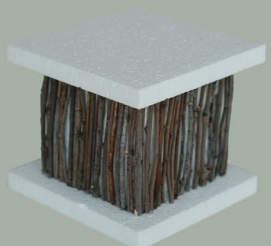
Put on



Birds' Nest



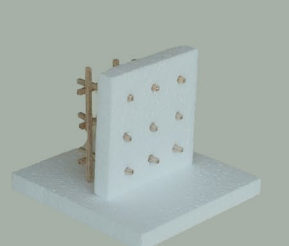
Stone Wall



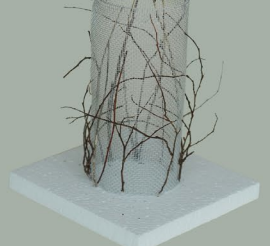
Enclose



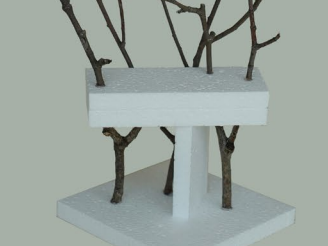
Adjustable



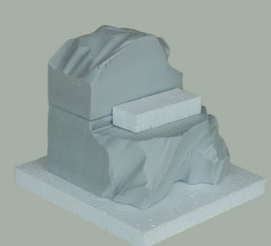
Support



Wire Mesh



Intersect



Cut



Tree Shade



Stone Bridge



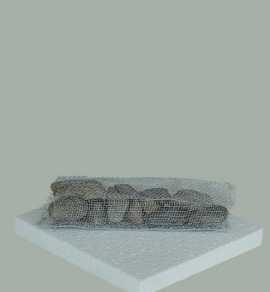
Overlap Joint



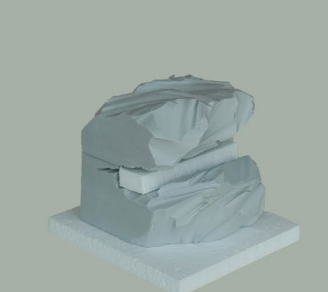
Connect



Wood Structure



Wrap



Throughout

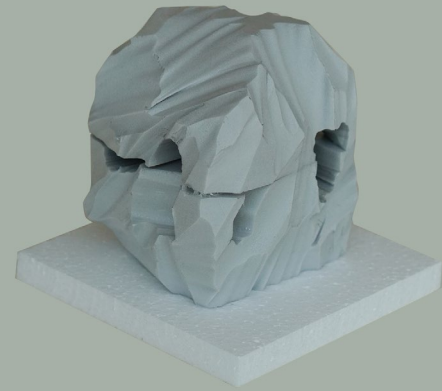


Tree Houses

Concept Models

Phase 1

Natural existing shelters



Cave



Birds' Nest



Tree Shade

Phase 2

Collecting materials from nature



Tree Wall



StoneWall



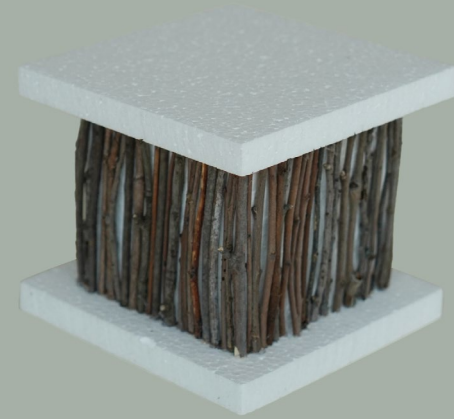
Stone Bridge

Phase 3

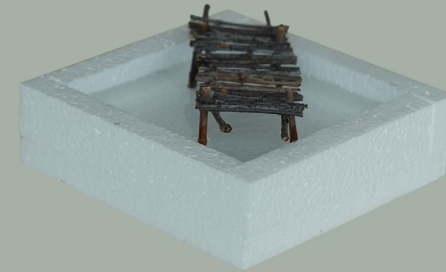
Creating primitive architectural structures with slightly more intricate assemblage techniques



Stack



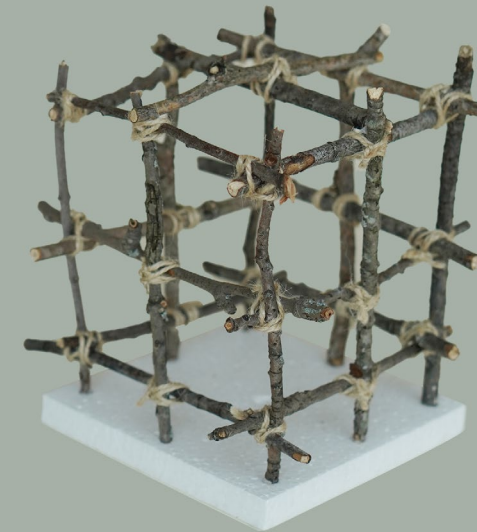
Enclose



Overlap Joint

Phase 4

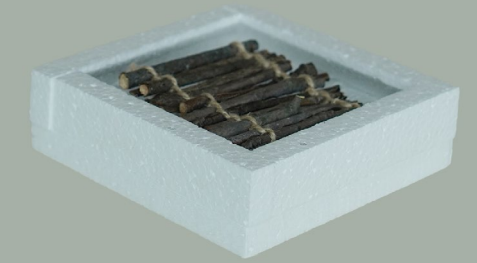
Achieving complex architectural structures through the use of lashing



String Off



Adjustable



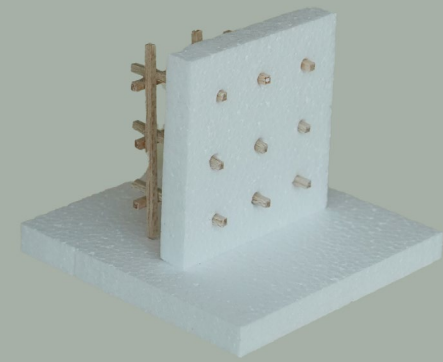
Connect

Phase 5

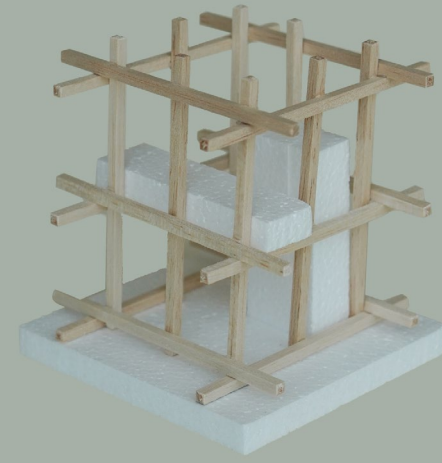
The machine processing of wood results in smoother and more uniform timber



Turning



Support



Wood Structure

Phase 6

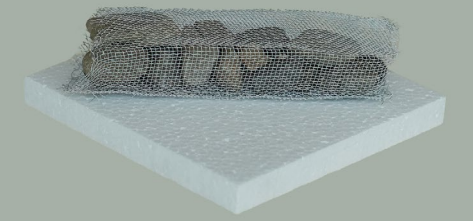
The incorporation of artificial composite materials provides greater possibilities



Wood Board



Wire Mesh



Wrap

Phase 7

Various ways in which architecture attempts to integrate with nature.



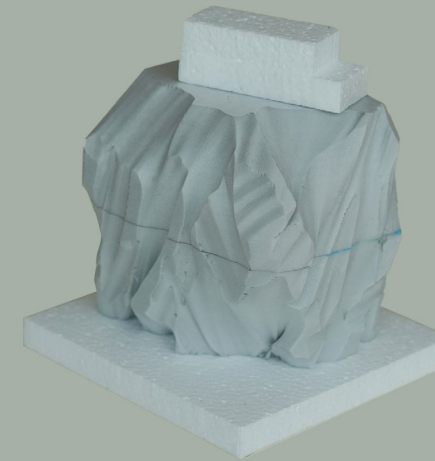
Rack



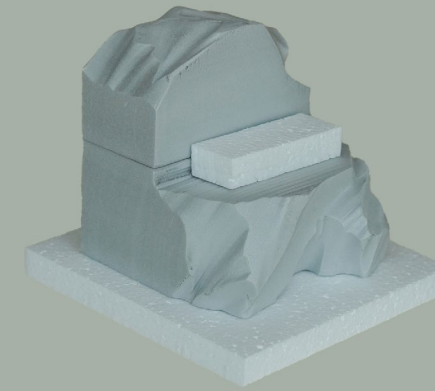
Intersect



Throughout



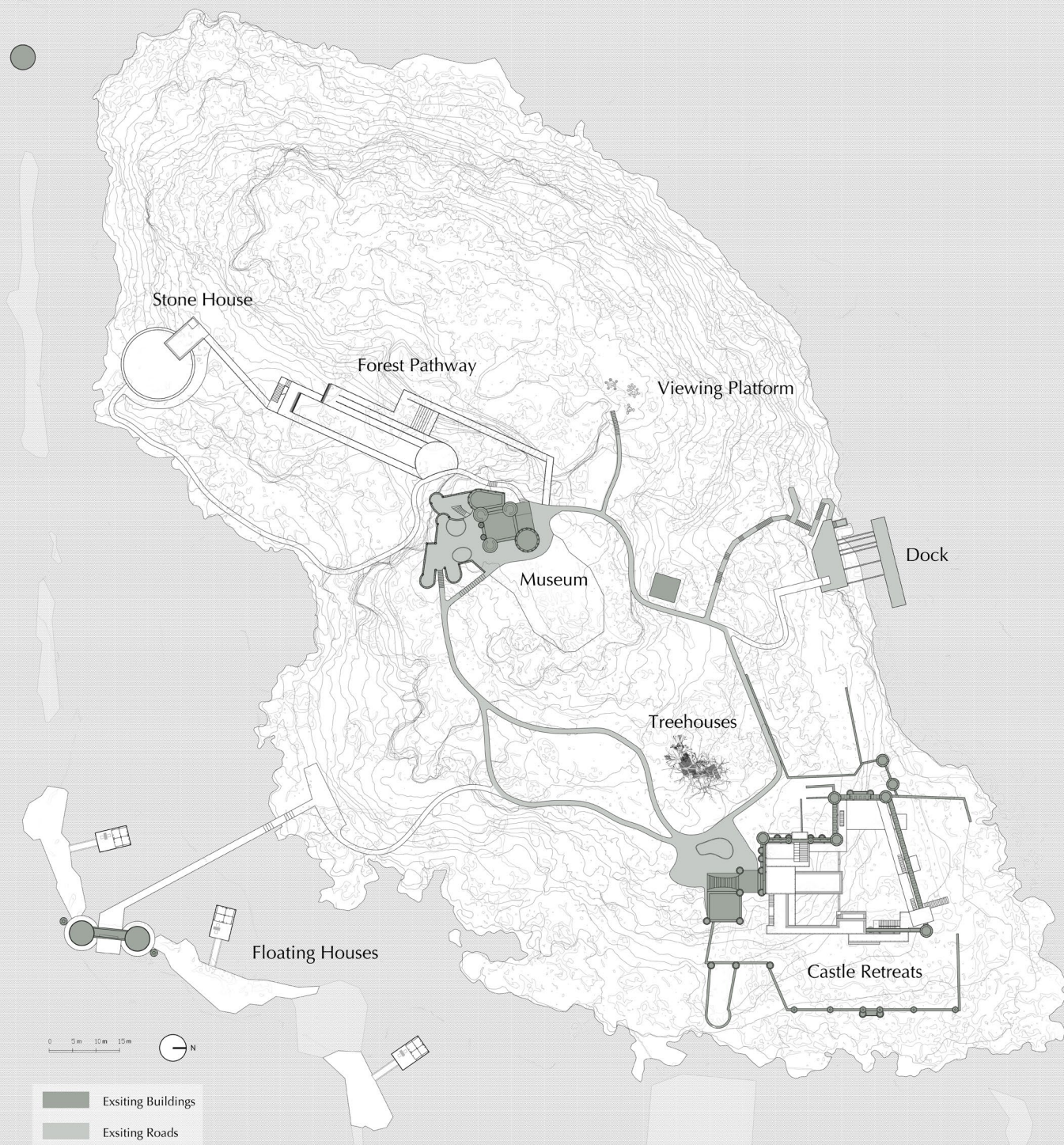
Put on



Cut

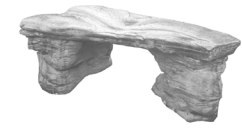


Tree Houses



Site Plan

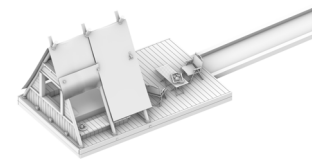
Pollepel Island



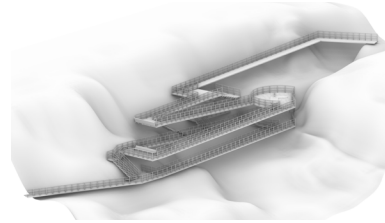
1. Stone Furniture



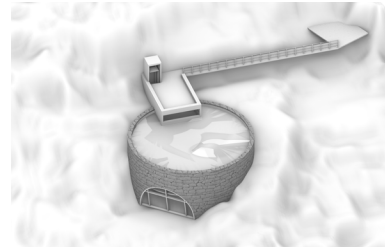
2. Treehouses



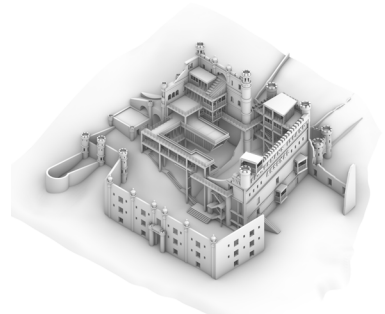
3. Floating Houses



4. Forest Pathway



5. Stone House

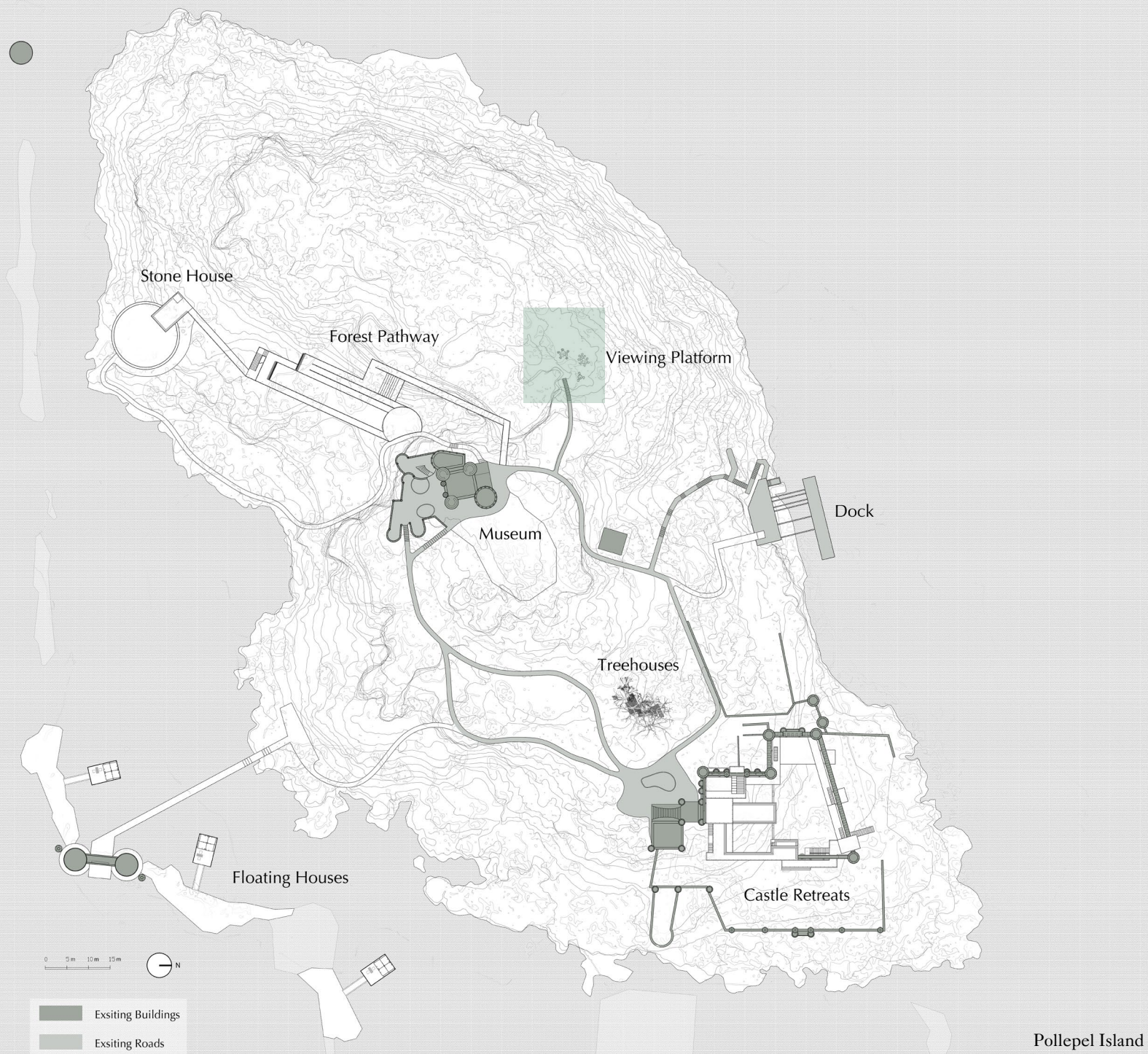


6. Castle Retreats

Retreats to Nature

This design incorporates various retreats at different scales on Pollepel Island. These retreats are partly man-made and partly rely on nature to become complete over time. They exist between architecture and nature, showcasing the merging of natural and built spaces and creating a symbiotic relation between the two.

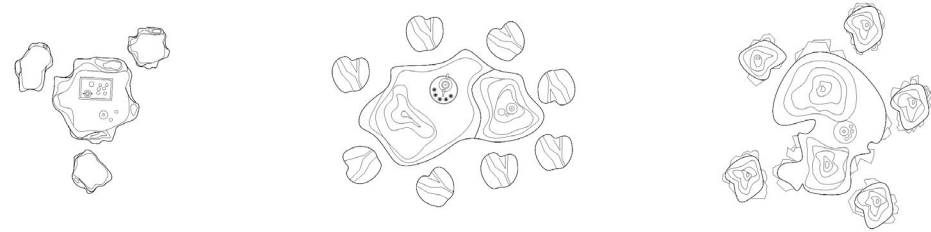
The designs are organized in ascending order, with lower numbers indicating a closer proximity to nature, while higher numbers indicate a closer proximity to architecture.



1

Stone Furniture

Scenic viewing and relaxation



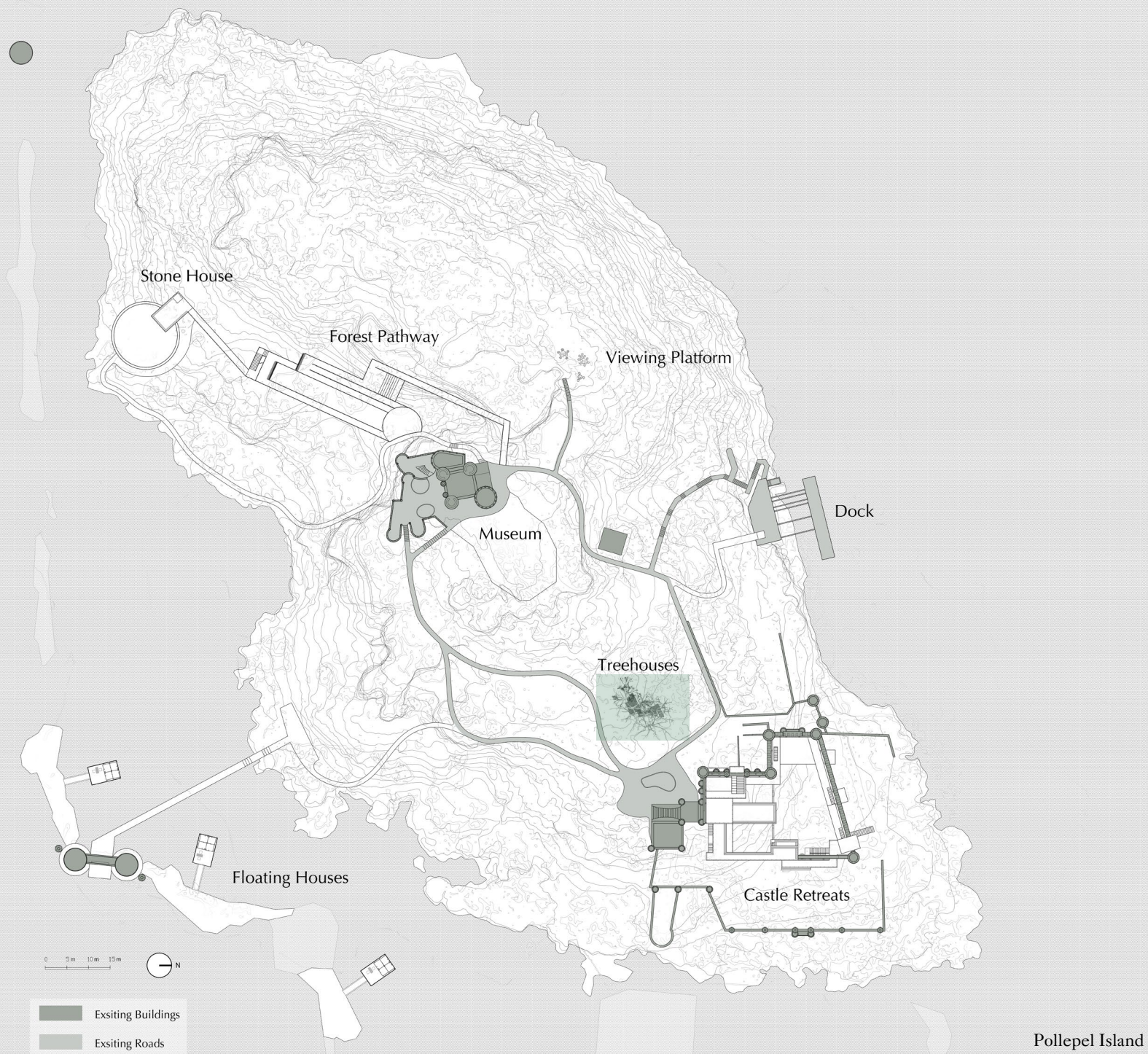
Plan



Elevation



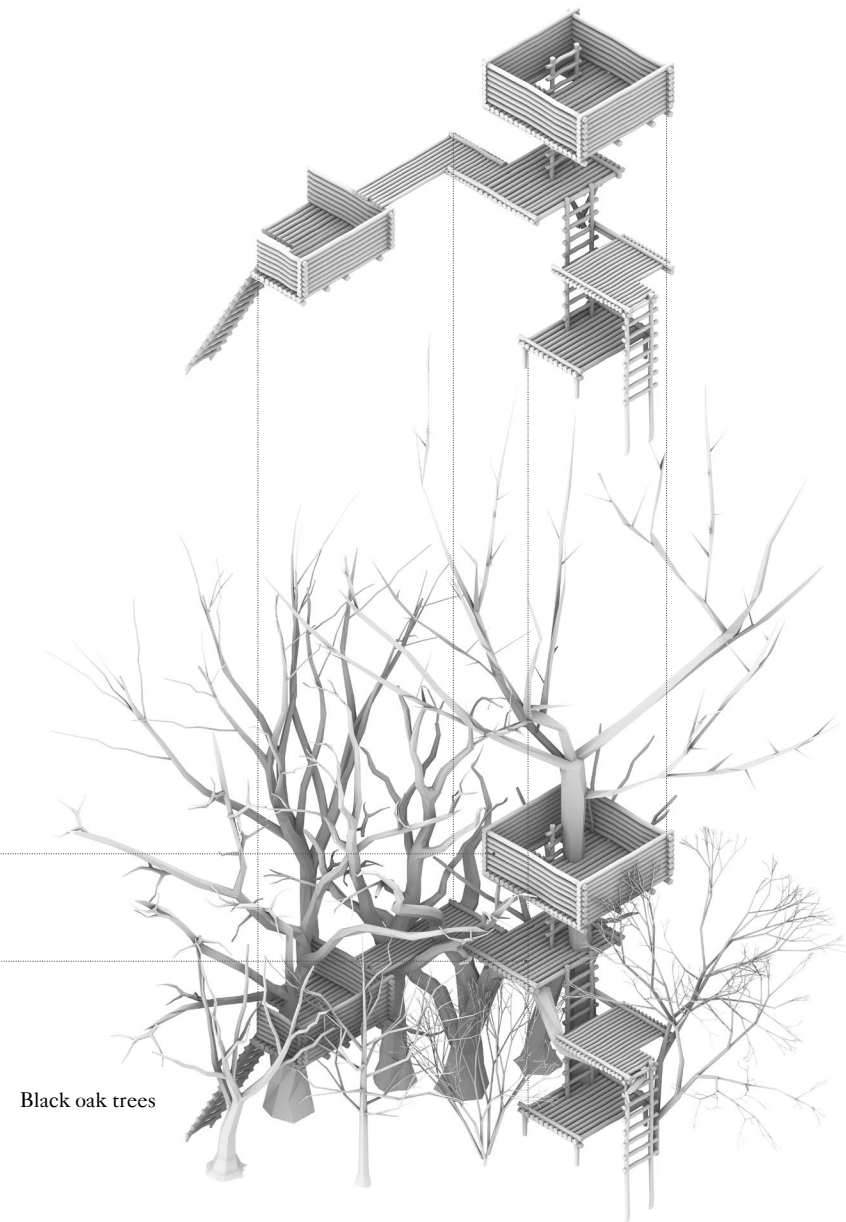
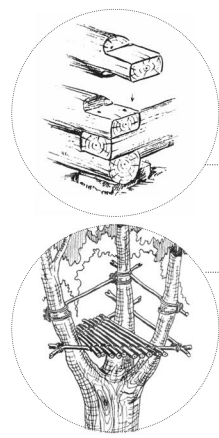
Using the island itself as a material, the rocks are shaped into tables and chairs. Over time, the rough stones become smooth and polished through the touch of people.



2

Treehouses

Children's activity platform



Black oak trees



Spring



Summer

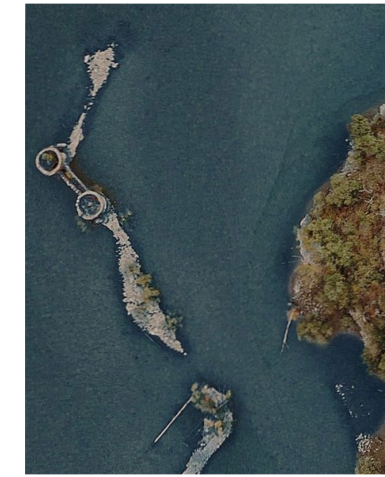
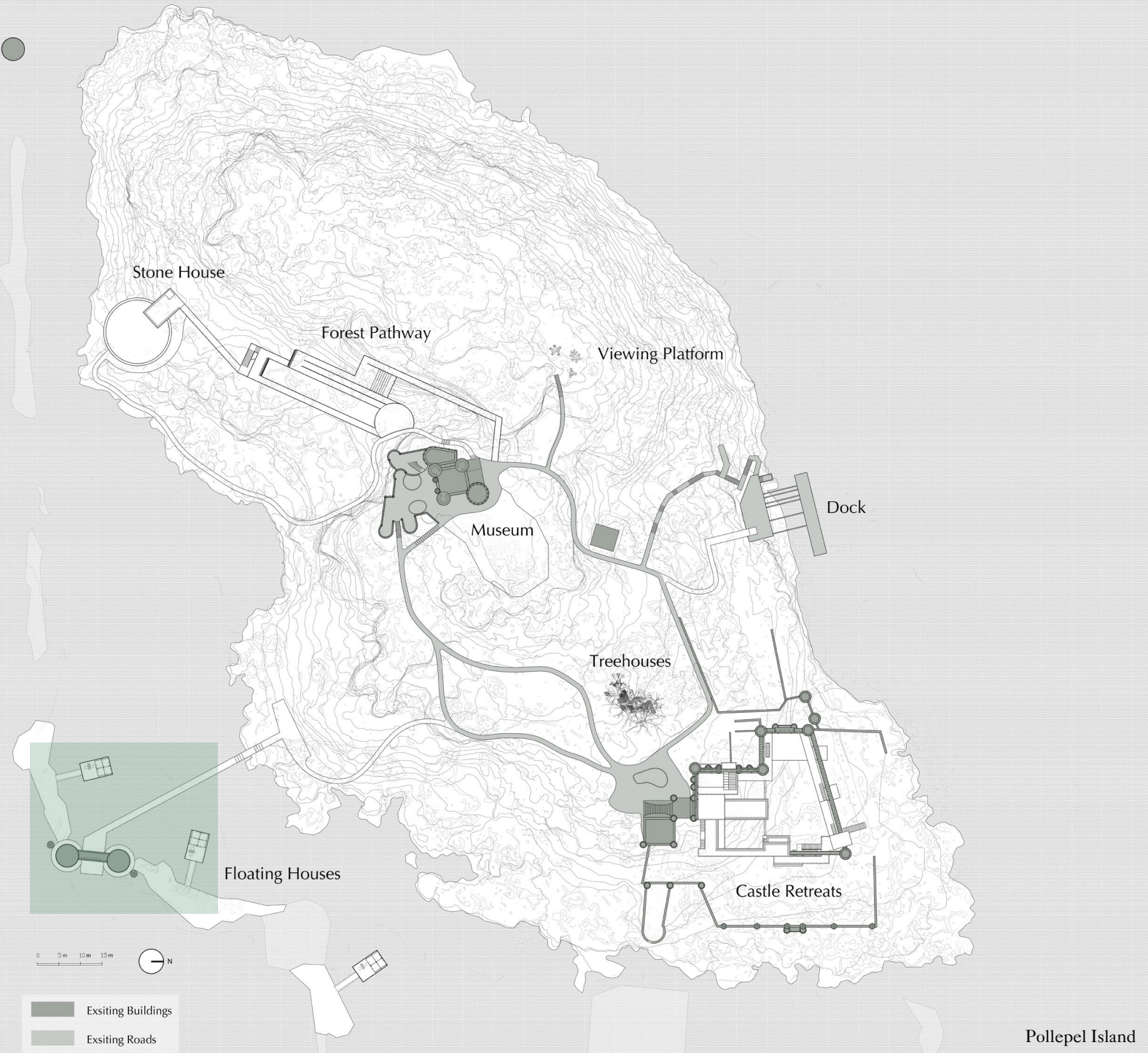


Autumn



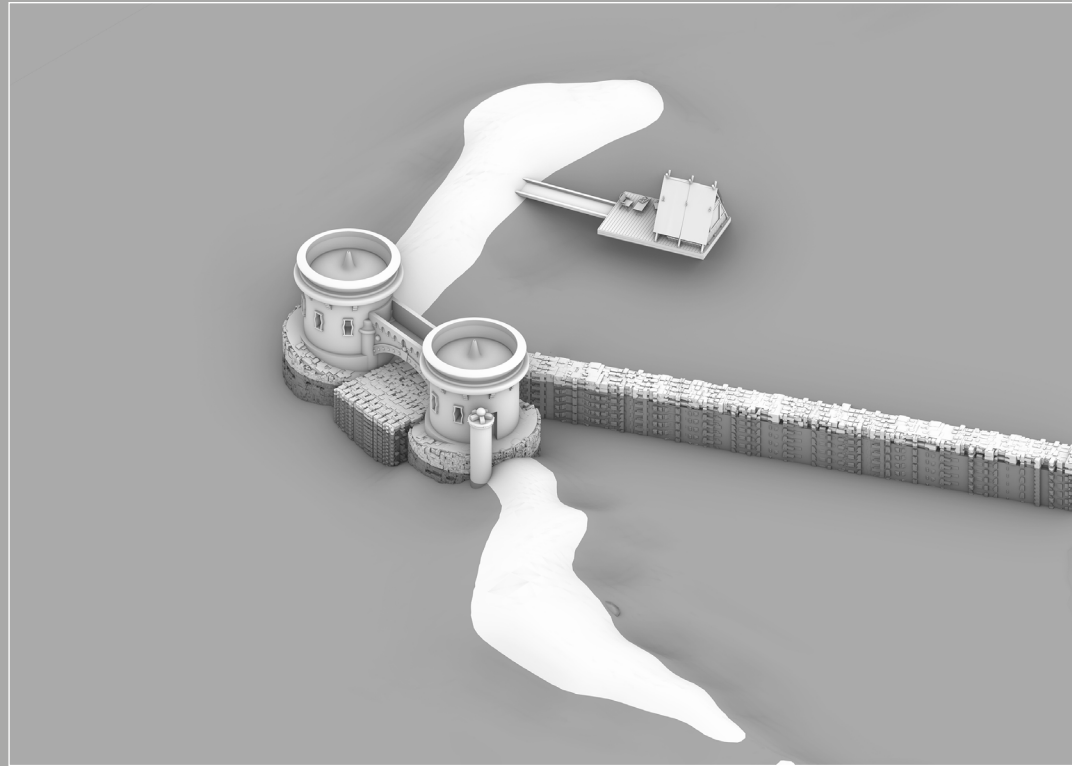
Winter



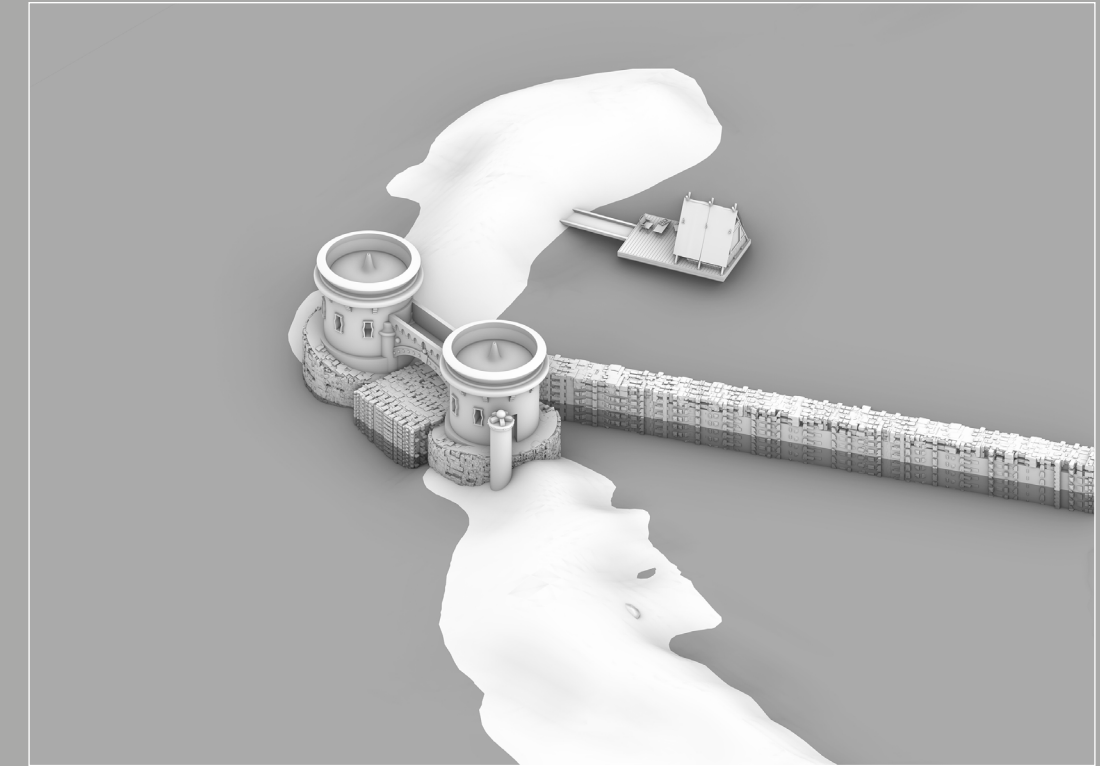


3 Floating Houses

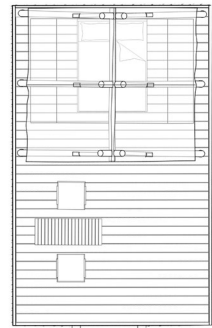
Camping experience



Higher Tide



Lower Tide



Plan

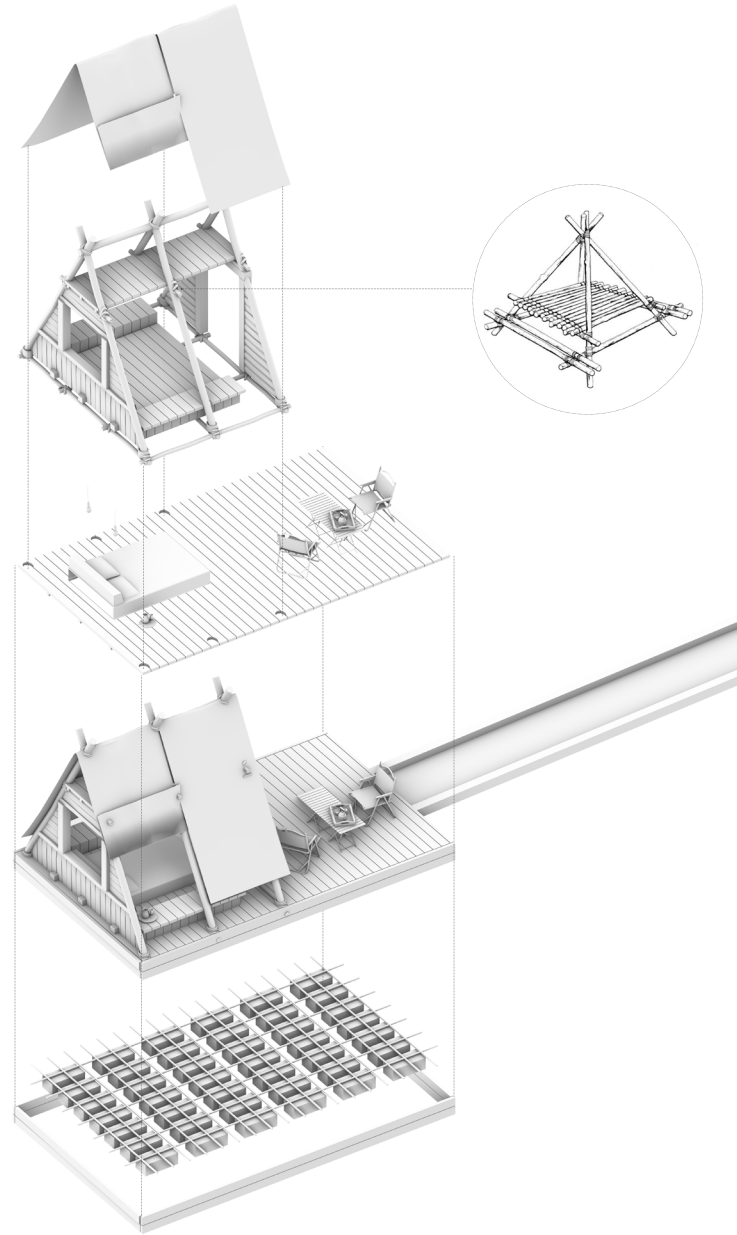
This design consists of two parts: the stone bridge and the floating houses. The distinction lies in their interaction with the changing tide. While the floating houses remain on the water's surface and are unaffected by the tide, the exposed section of the stone bridge fluctuates with the water level, offering various areas to explore depending on the time of day.

Canvas

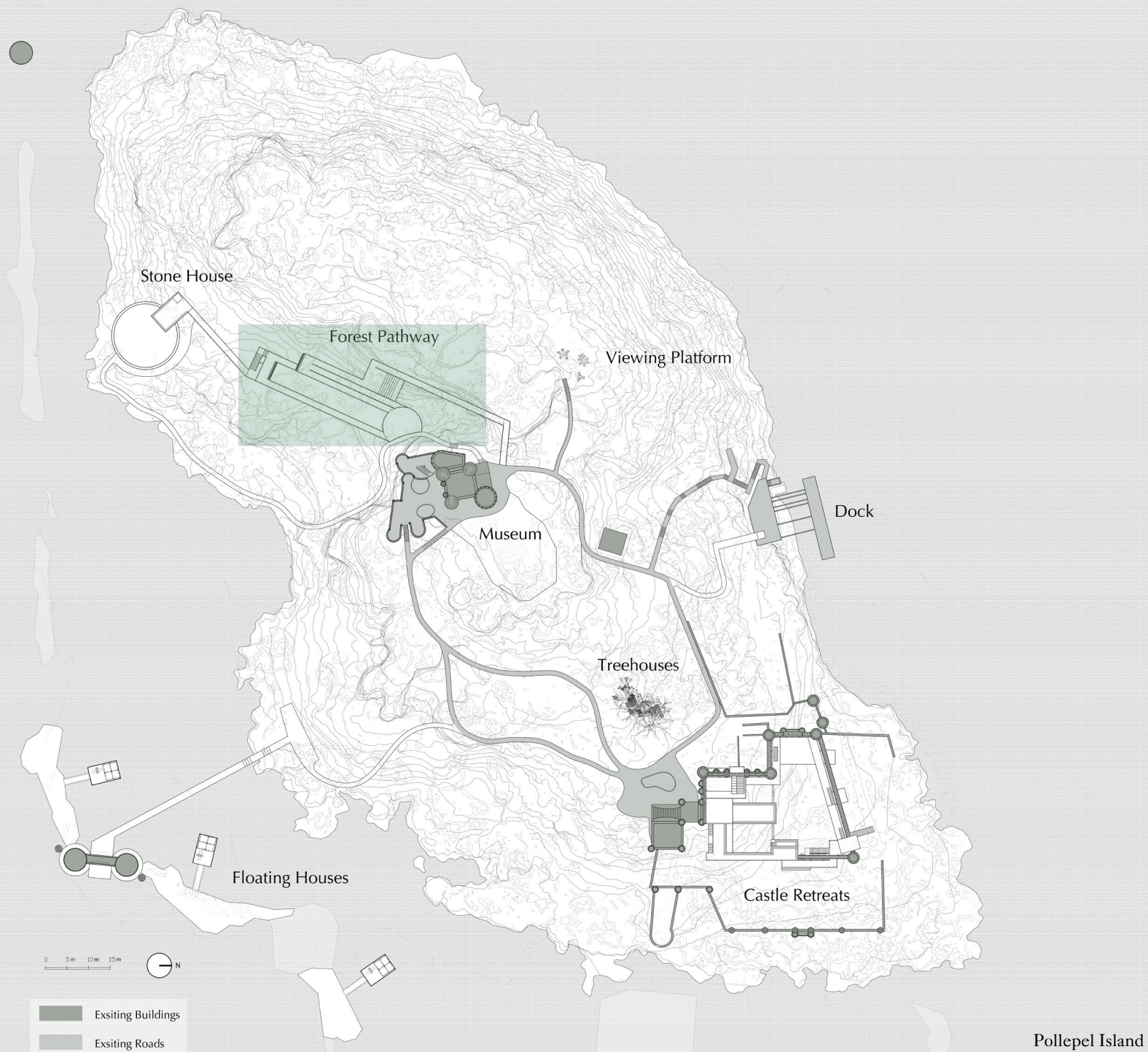
Primitive wooden supports

Wood boards & Furniture

Floating system



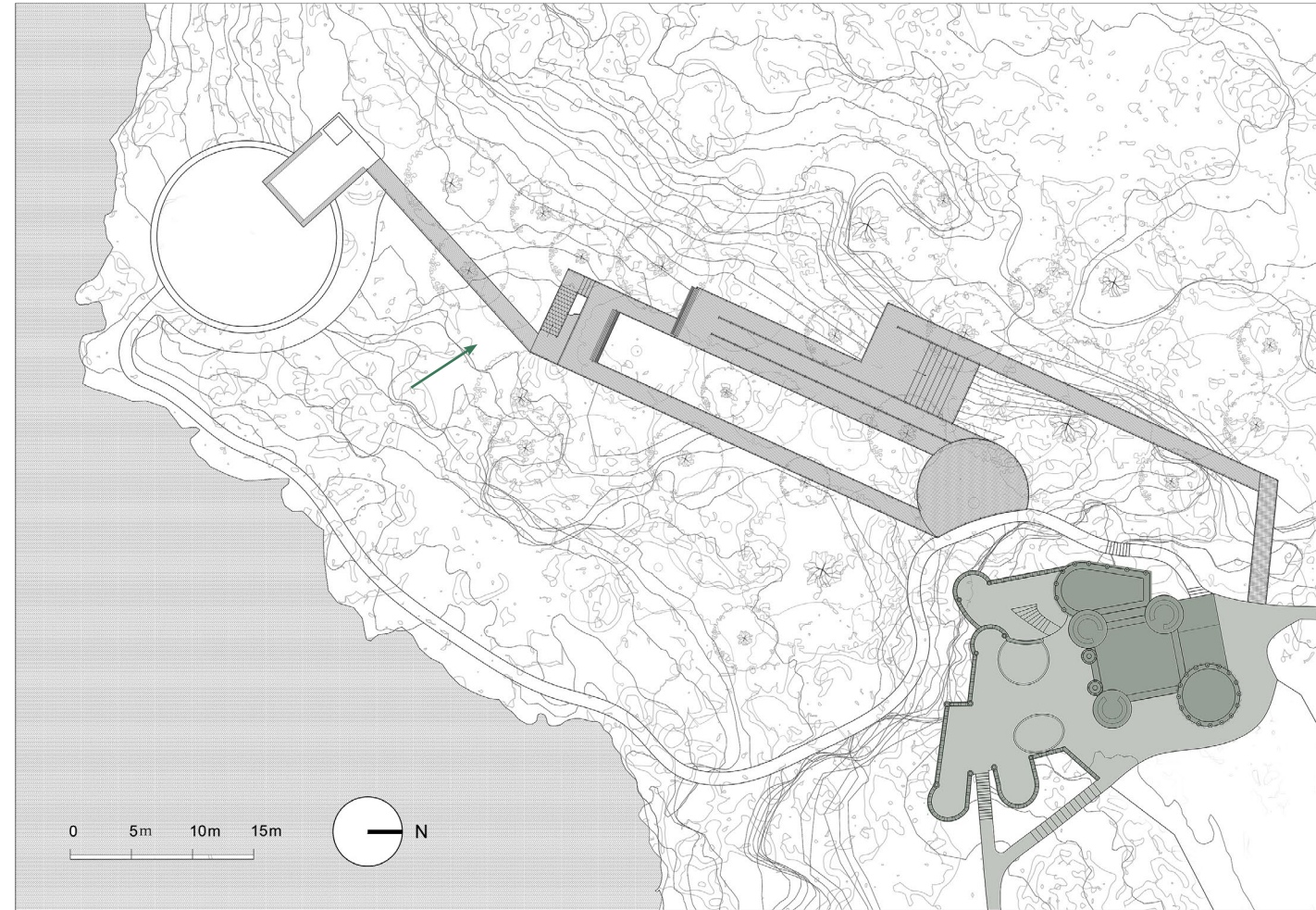




4

Forest Pathway

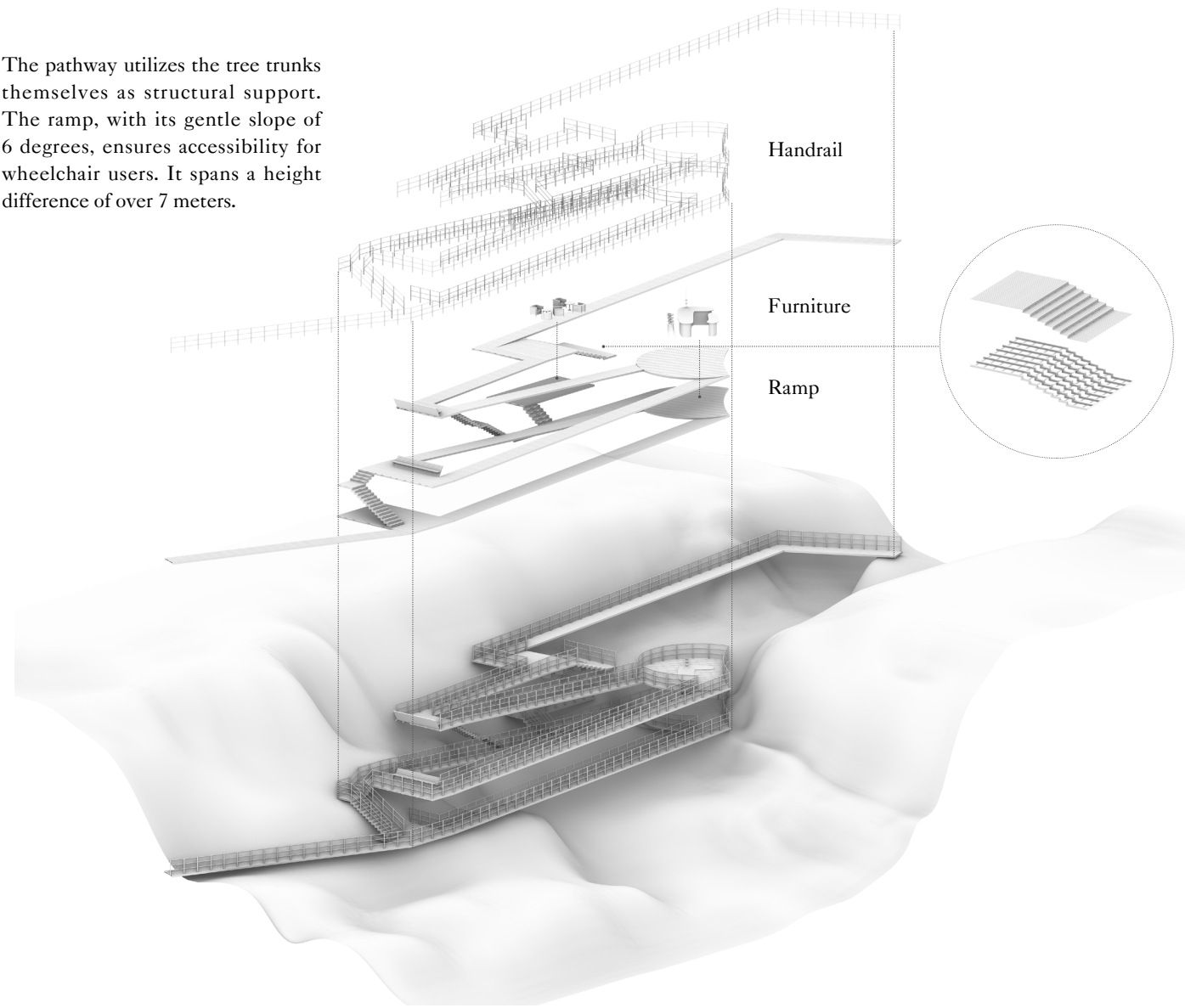
Accessible recreational trail for people with disabilities, featuring resting platforms for scenic views, as well as a temporary café / gift shop.

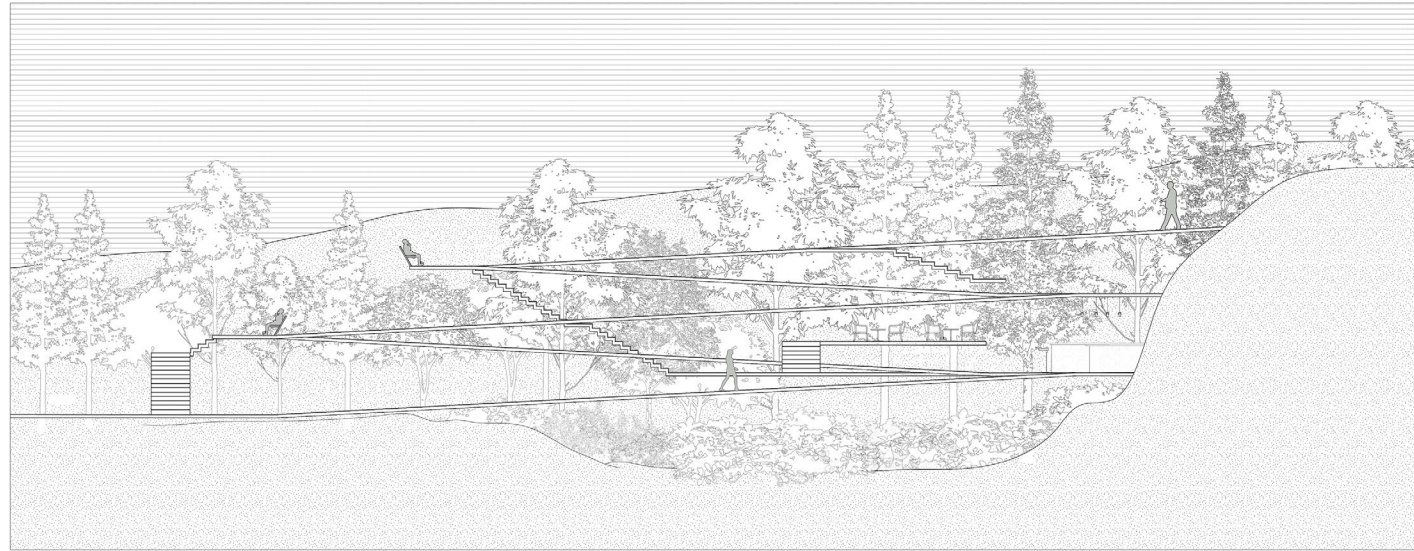


Plan



The pathway utilizes the tree trunks themselves as structural support. The ramp, with its gentle slope of 6 degrees, ensures accessibility for wheelchair users. It spans a height difference of over 7 meters.

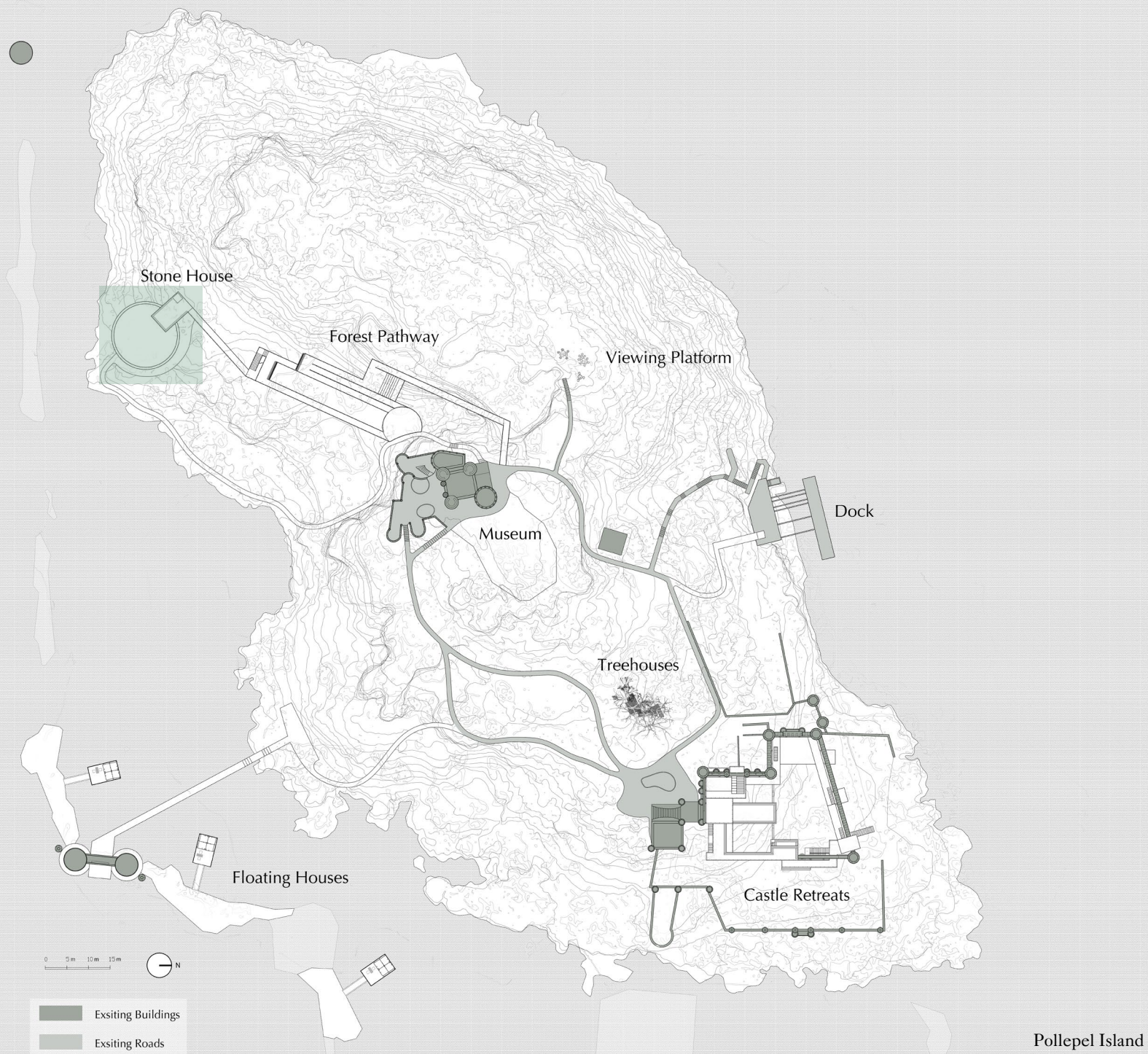




Ramp



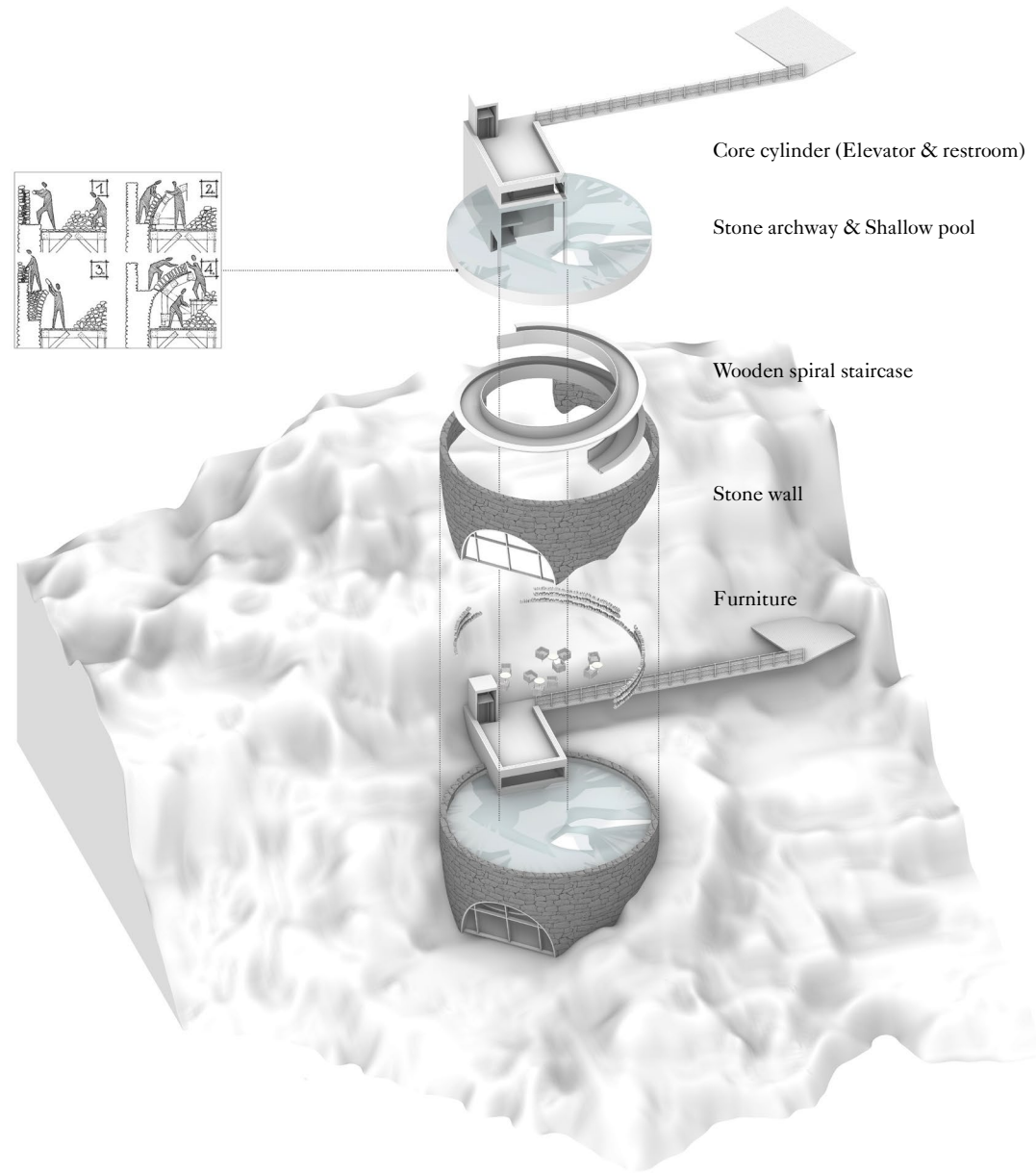
Hidden in the forest



5

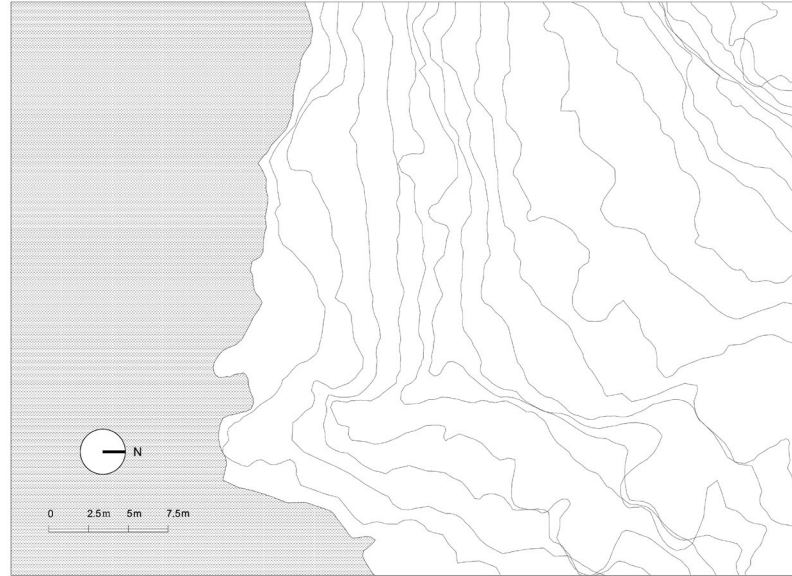
Stone House

Riverfront Library

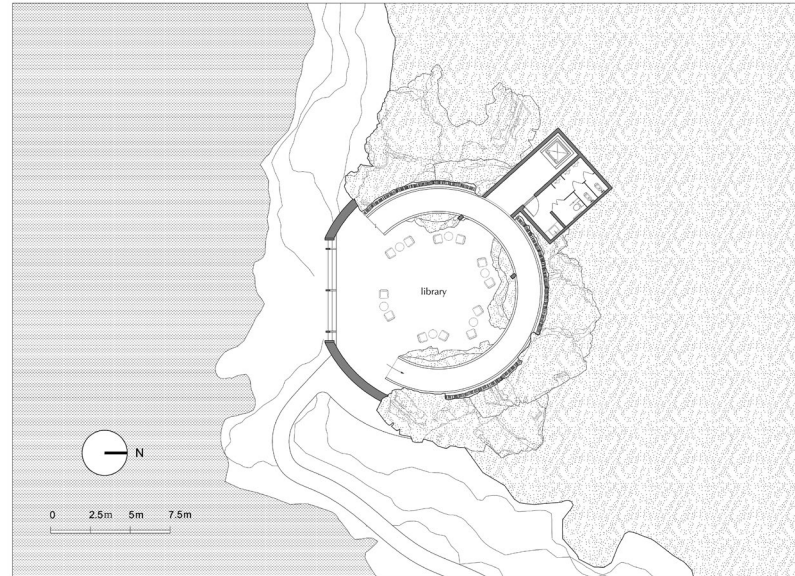


Crafted using artificial cutting techniques, the stones are intricately carved and incorporated into a library structure. The site's own stones are repurposed as construction materials.

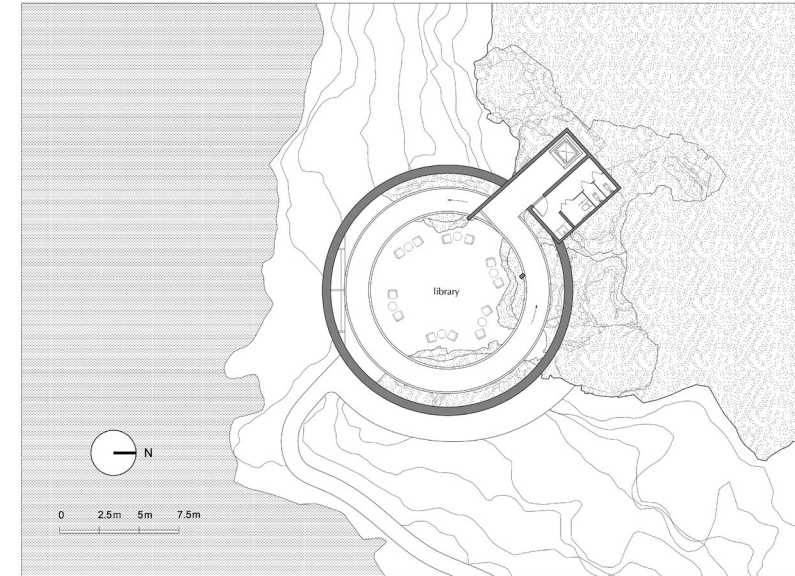




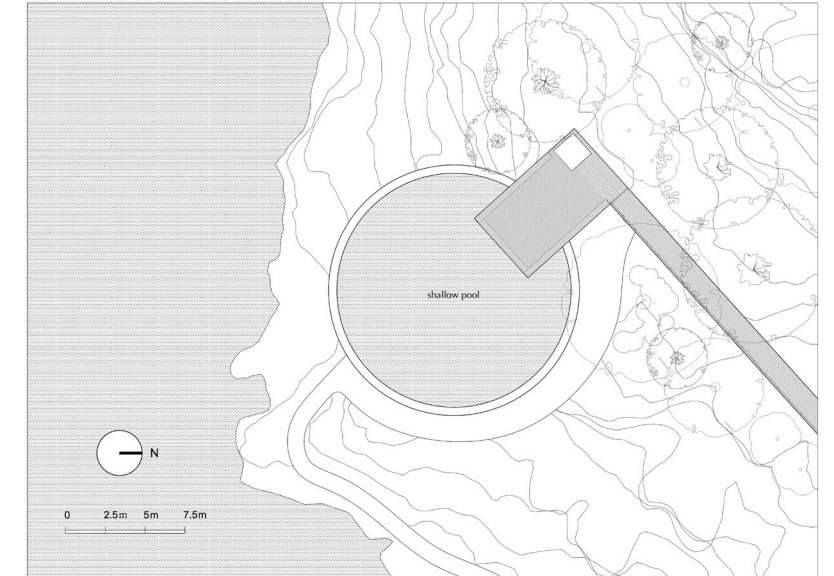
Existing Site



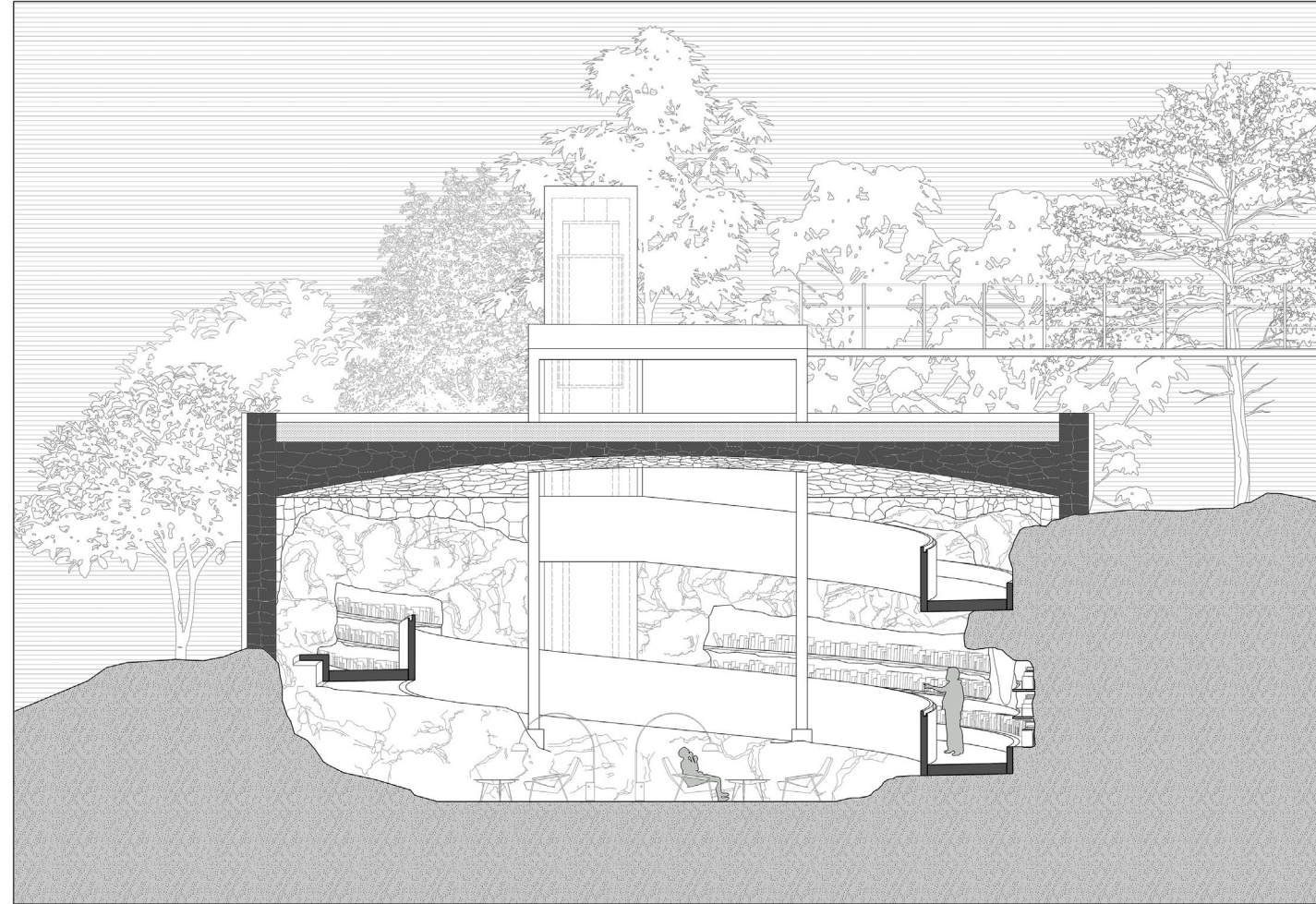
First Floor



Second Floor

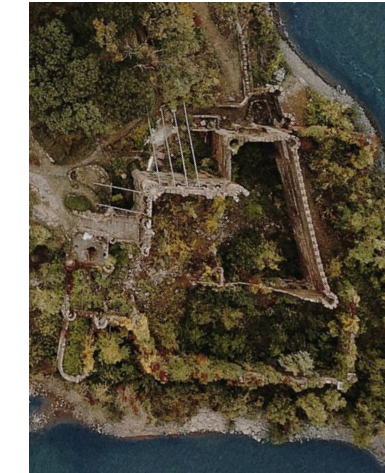
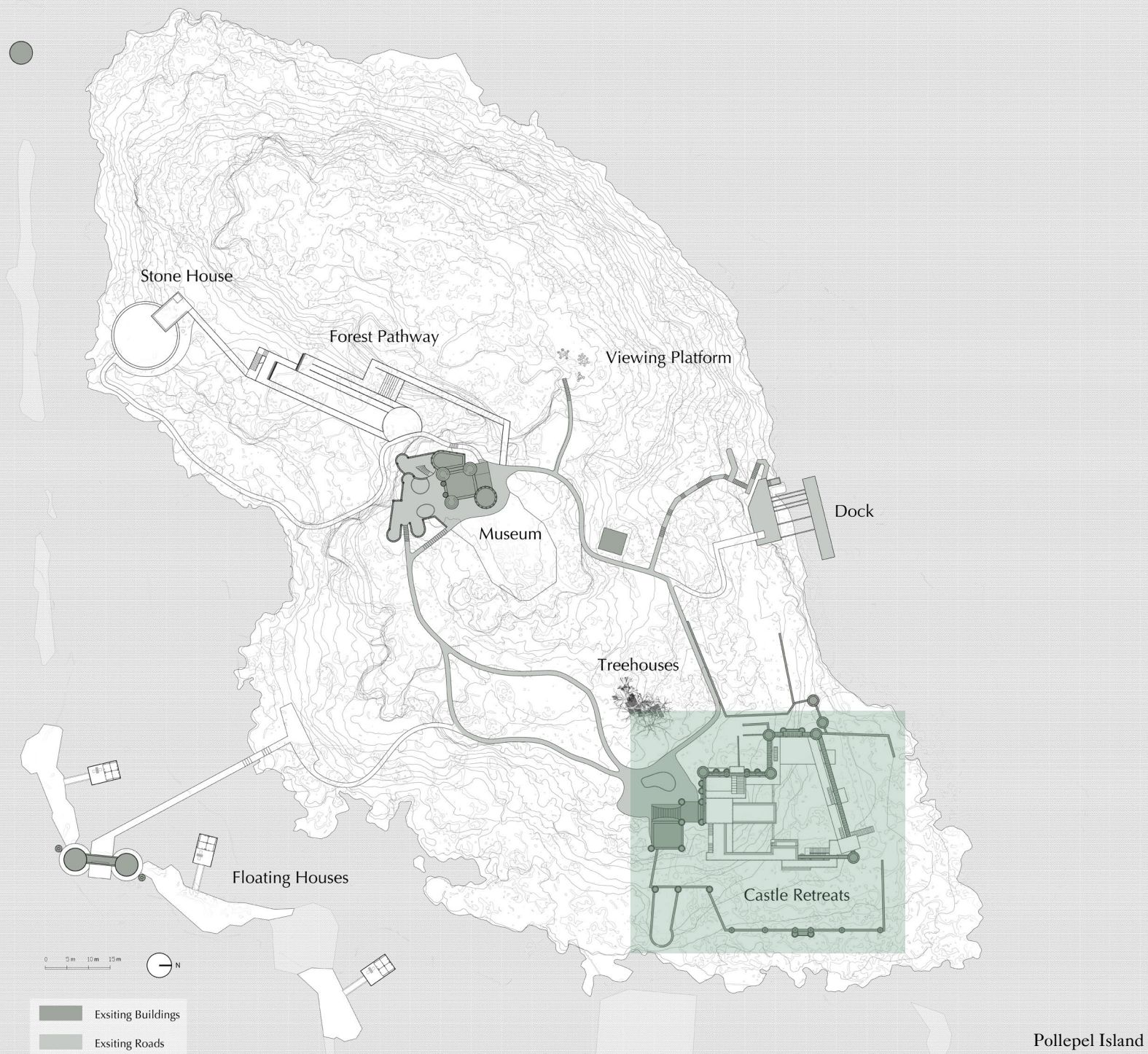


Roof



Section

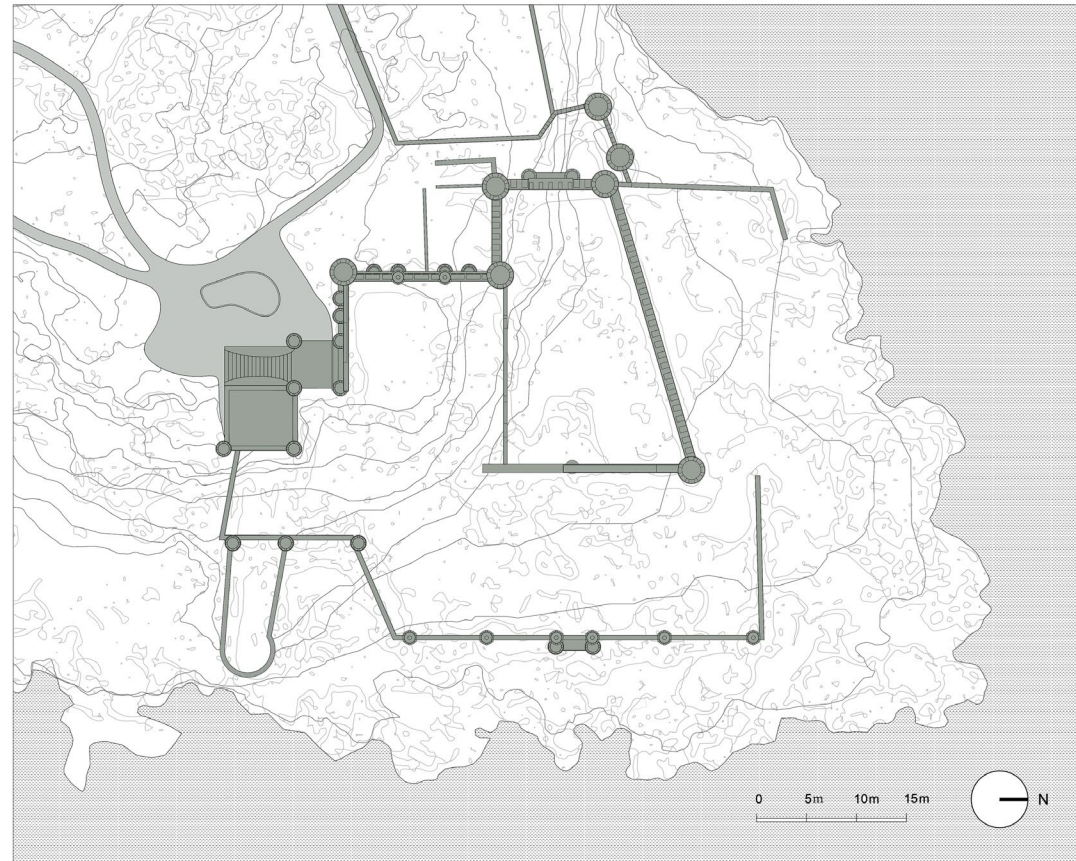




6

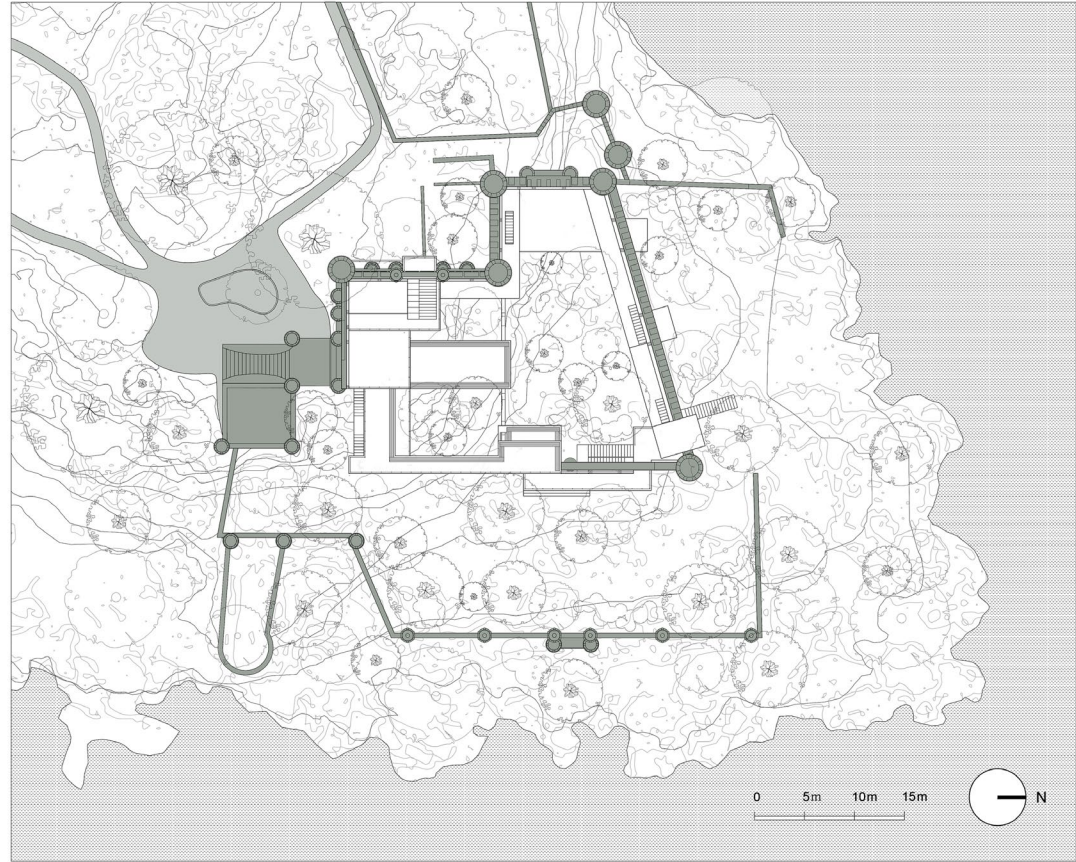
Castle Retreats

Multiple retreat spaces and event venues



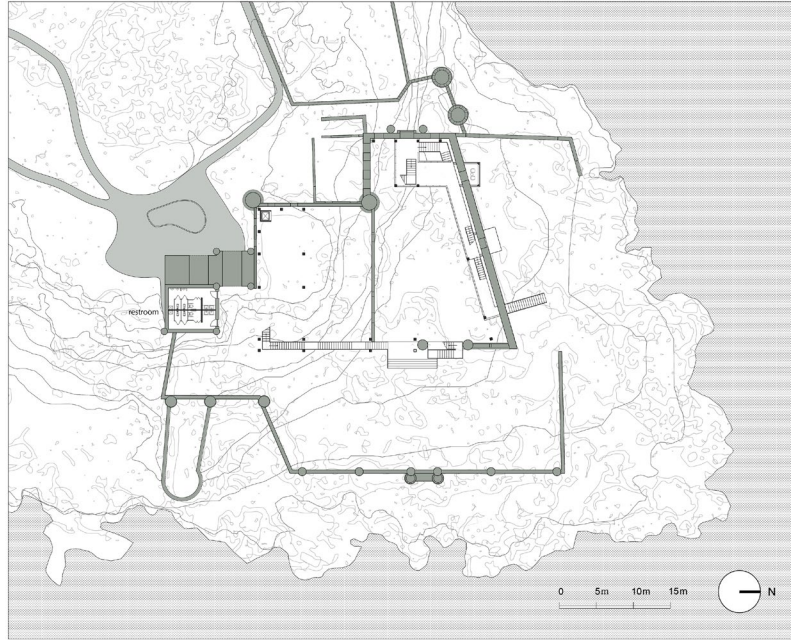
Existing Building



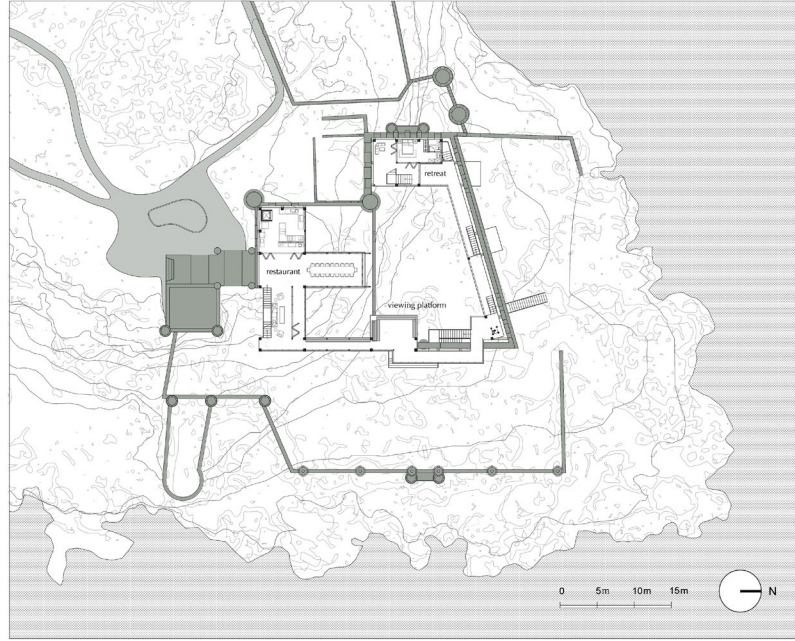


Designed Roof Plan

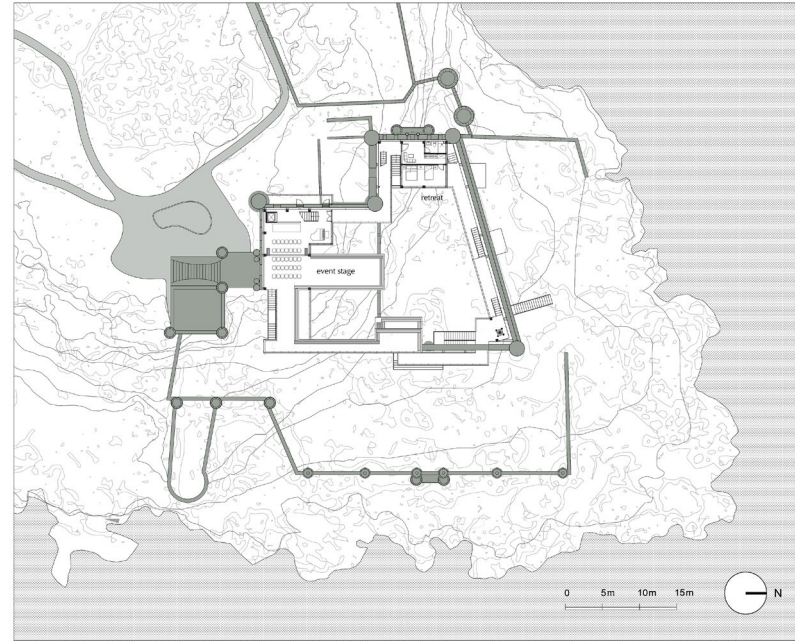




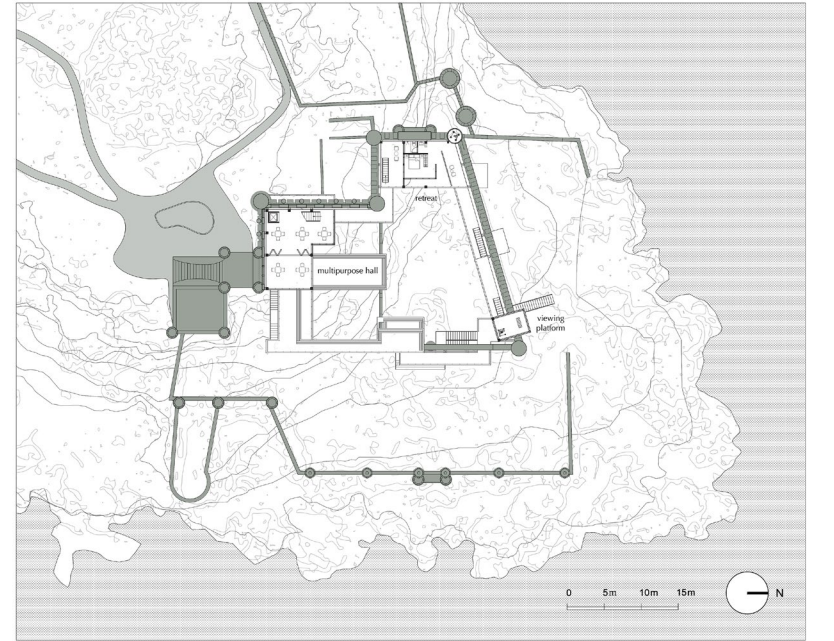
Ground Floor (left) & Second Floor (right)



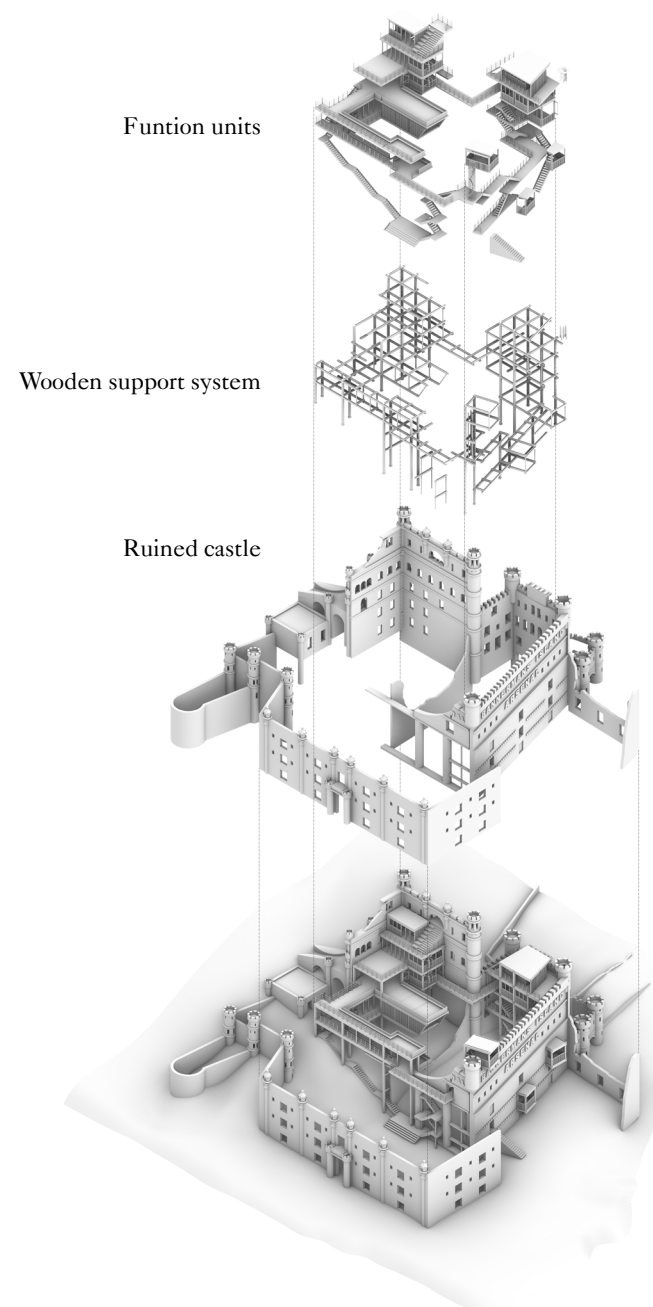
First Floor (left) & Third Floor (right)

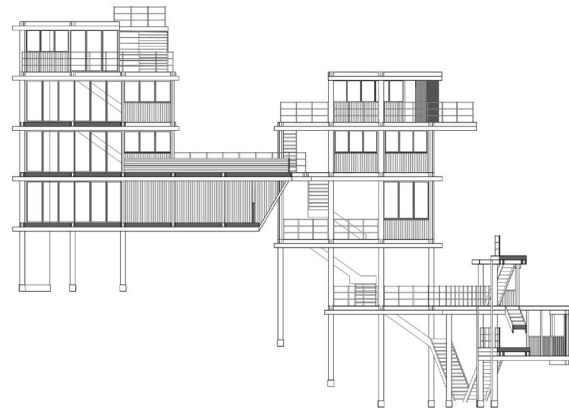


Second Floor (left) & Fourth Floor (right)



Third Floor (left) & Fifth Floor (right)





Embedded Structure



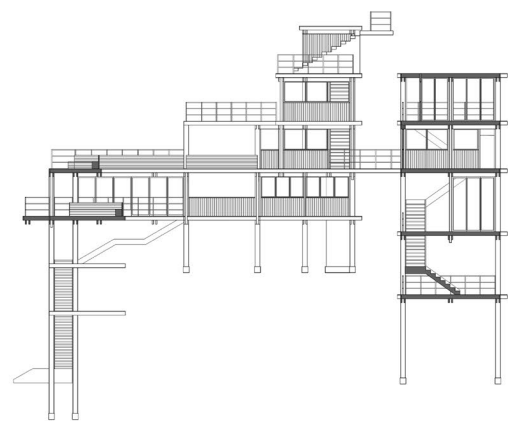
Existing Building



Design Proposal



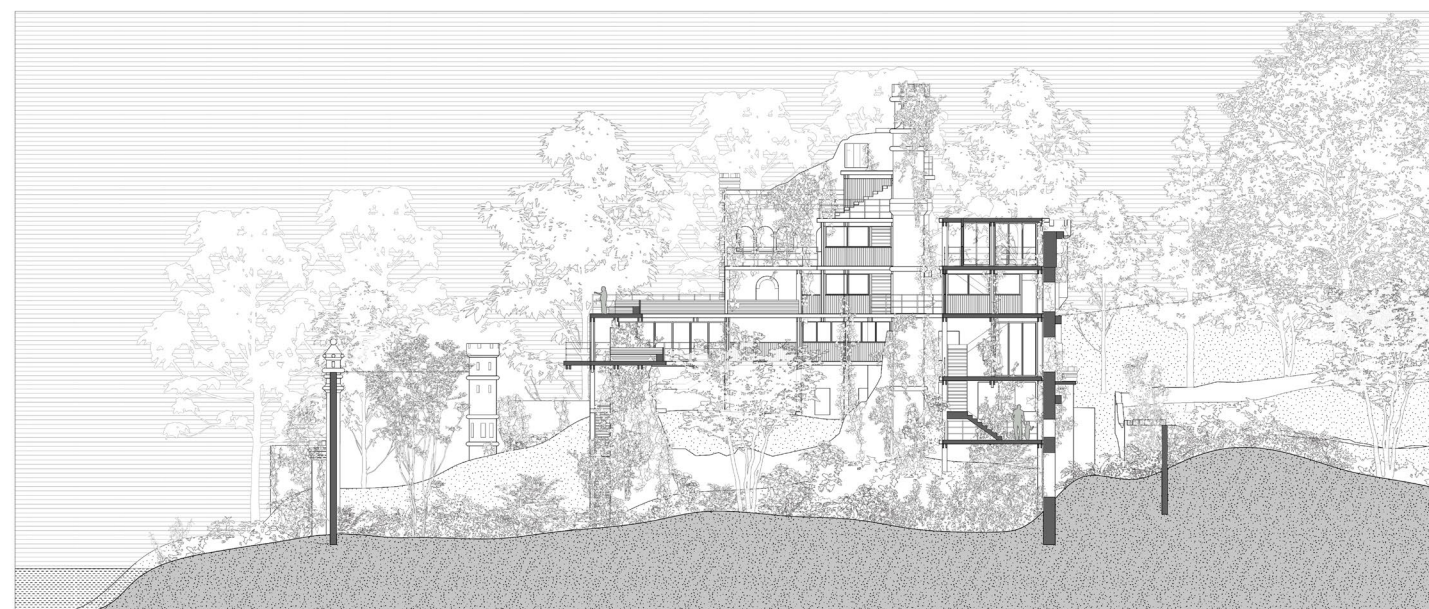
Years Later



Embedded Structure



Existing Building



Design Proposal



Years Later

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16 Thom Johnson and Barbara H. Gottlock. 2006. Bannerman Castle. Image of America Press.

17 Innes, Robin J. (2012). "Toxicodendron radicans, T. rydbergii". Fire Effects Information System (FEIS). US Department of Agriculture (USDA), Forest Service (USFS), Rocky Mountain Research Station, Fire Sciences Laboratory.

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19 Cary Insitute of Ecosystem Studies. "Tides in the Hudson River." Changing Hudson Project.

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Old Piano Tree, California. <https://zhuanlan.zhihu.com/p/345274576>

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"Primitive huts." Notre Dame OpenCourseWare. N.p., n.d. Web. 8 Dec. 2012.

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Frontispiece of Marc-Antoine Laugier: Essai sur l'architecture 2nd ed. 1755 by Charles Eisen (1720–1778). Allegorical engraving of the Vitruvian primitive hut.

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Entertainment in the Roman Forum and the current state of the area. <http://urban-networks.blogspot.com/2015/01/el-agera-de-atenas-y-los-foros-de-roma.html>

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Bannerman Castle. <https://hudsonvalleycountry.com/volunteers-needed-at-bannerman-island-for-2021-season/>

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Dia:Beacon, Beacon, New York. Photo by Michael Govan.

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One Tree Foue Seasons project. Photo by Ulf Mejergren Architects.

