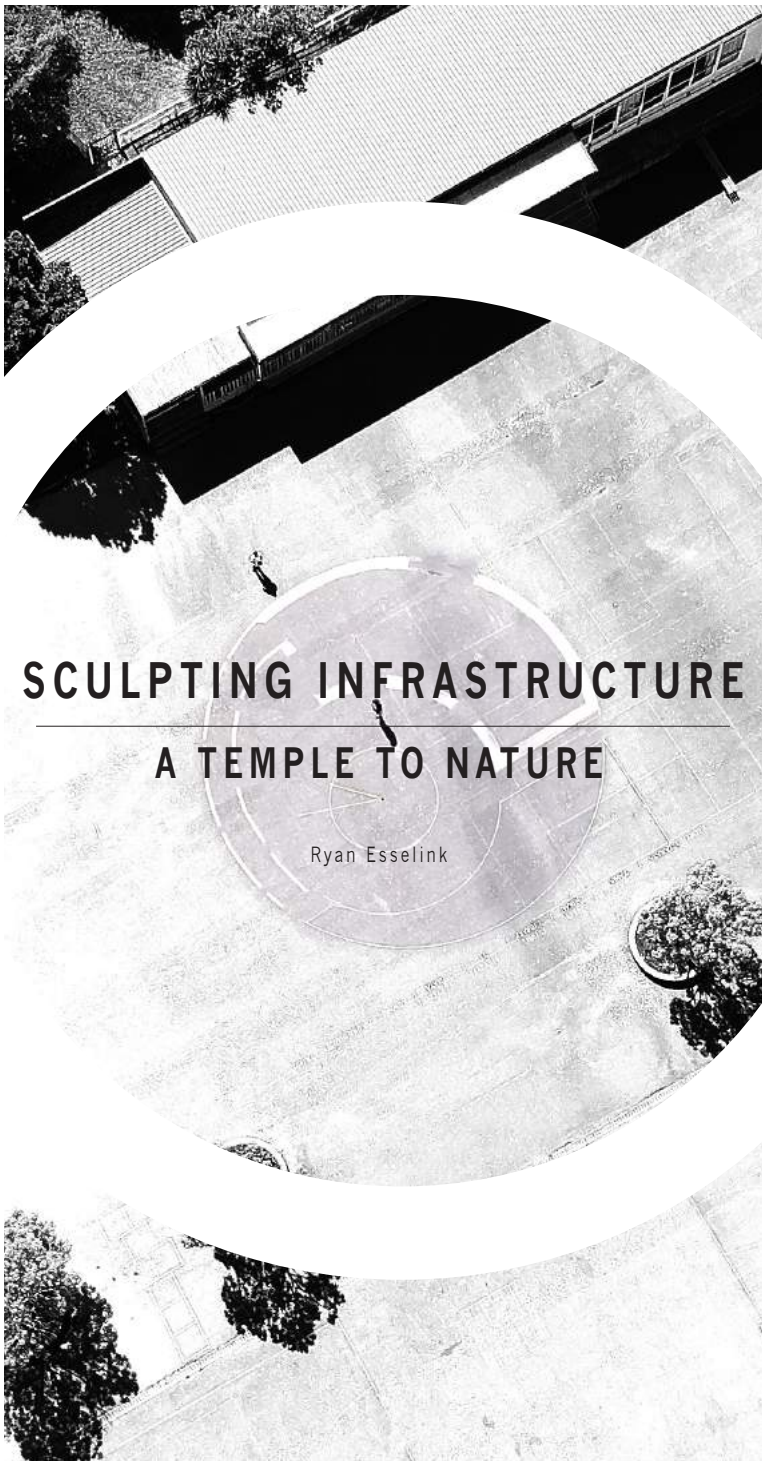


SCULPTING INFRASTRUCTURE

A TEMPLE TO NATURE

Ryan Esselink

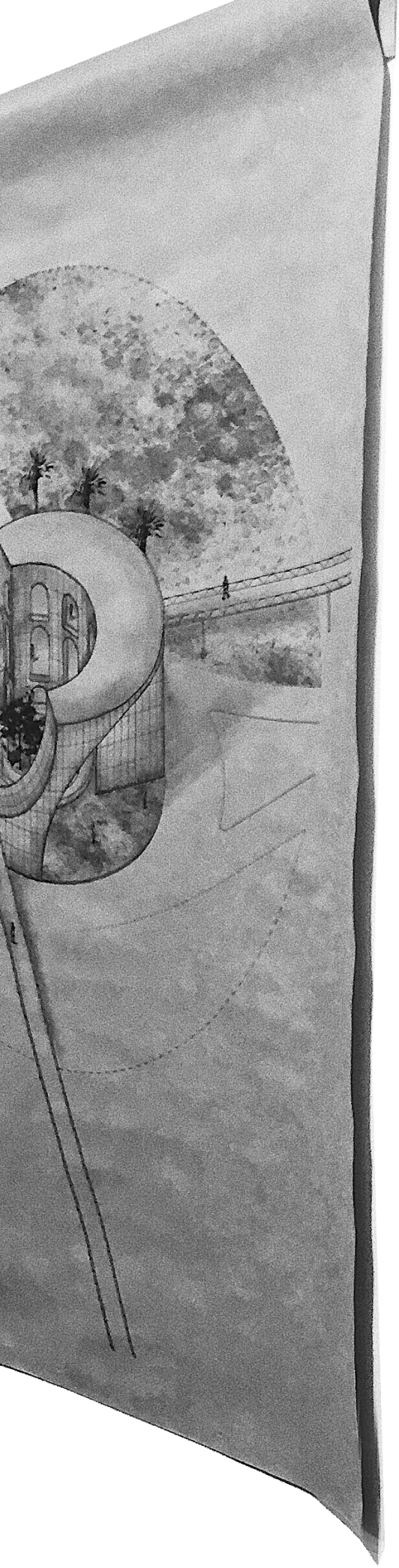
SCULPTING INFRASTRUCTURE

A TEMPLE TO NATURE

Ryan Cameron Esselink

A 120-point thesis
submitted to Victoria University of Wellington
in partial fulfilment of the requirements for the
degree of Master of Architecture (Professional)
Victoria University of Wellington
School of Architecture

2018



ACKNOWLEDGEMENTS.

I would like to thank:

My supervisor Sam Kebbell for your relentless support and guidence throughout the year. Your enthusiasm and knowledge has been invaluable.

To my cohort, your friendship and support throughout the year made the experience much more enjoyable.

To my family and friends for their constant encouragement and fresh perspective. The endless love and support will always be remembered.

<

Figure 1. *Perspective drawings*

RIMU
KORO MIKO
KOWHAI
RATA
LIBRARY

ABSTRACT.

Off the coast of Paraparaumu lies one of New Zealand's most iconic tourist attractions, the Kapiti Island nature reserve. Home to many native plant and wildlife species, this island sanctuary offers a unique nature experience that is under appreciated. The now flourishing nature deserves to be honoured a respected by locals and tourists of the Kapiti region. To date there is no designated building where ticket purchases and bio-security checks can be undertaken for island visitors. No obvious link exists from the local shops to the beach front where the visitors depart. This presents an opportunity for a gateway building to create a slice of the Island's nature on the mainland. In doing so this would honour and celebrate the sanctuaries nature, installing a level of reverence for the island as visitors pass through.

This thesis looks to explore the possible synergies between nature, highway infrastructure and religious architecture types. In order to develop a critical understanding of each architecture type and the possible synergies, explorations involving mass, volume and symmetry were conducted. These specific qualities put the project into a tradition of monumentality. As an understanding of this tradition developed Louis Kahn became an important precedent for me. Just as the late Louis Kahn achieved presence in his buildings, I argue that monumentality could be used in developing a successful synergy between infrastructure and religious architecture types. In the same way monuments and temples typically evoke respect I believe a monumental building on the Paraparaumu beach front will install a reverent homage towards nature as visitors to the island pass through.

Throughout this thesis the series of design experiments involving traditional monumental qualities explore the synergies between nature, highway infrastructure and religious architecture types. The exploration utilizes the gateway building as a project to test the possible synergies in context . Operating within a design-led research methodology, varied approaches using multiple mediums explored formal language, spatial experience, composition and proportion of monumentality.

The final design, situated on an existing roundabout, is a cylindrical concrete temple connecting the shop and beach front. The form is a subtracted mass obtained through an exploration of subtraction and composition. This temple evokes the desired homage towards nature as its visitors pass through to the island. Although grand in size, I argue, because the temple is situated on a traffic island, the over bearing power of monumentality is played down, respecting its surrounding context. As the design process unfolded a shift occurred in the preferred method for experiments. In the early stages a reliance on a digital experimentation method existed, however a shift towards an analogue experimentation method occurred as an understanding of monumentality and possible synergies between nature, highway infrastructure and religious architecture types were realised. This shift in methodolody, required more precision and rigour for each experiment, invoking a deeper understanding of each success and failure. Critically reflecting on this transition forms the discussion of my thesis, understanding the opportunities of Paraparaumu and how a modestly scaled building can be developed that still imposes its significance in the surrounding context.

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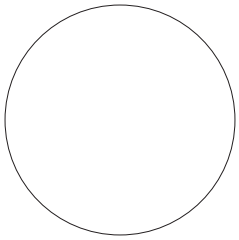
Figure 1. Drone Picture



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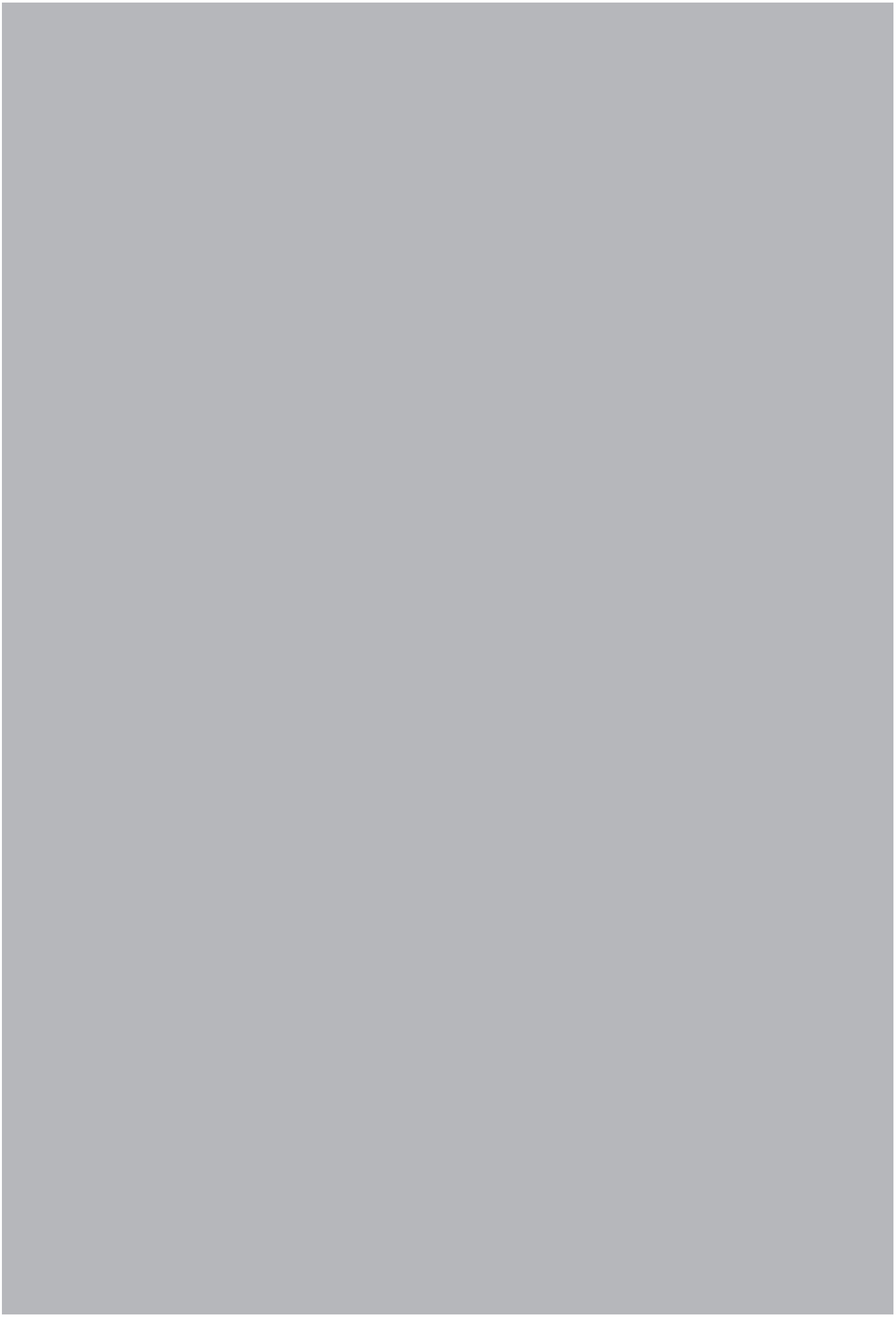
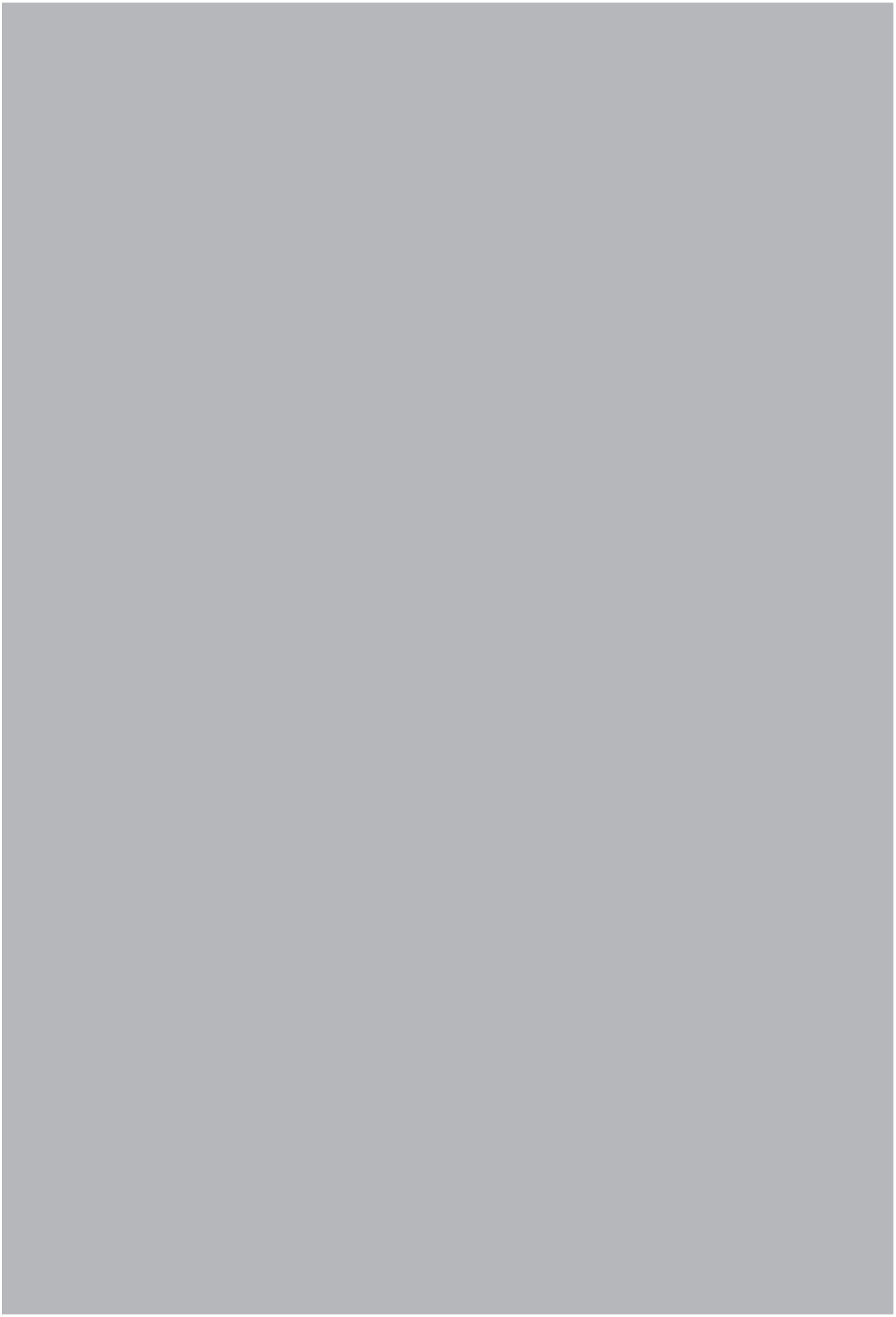


It is to be noted that all unsourced images were used in the final design review in November 2017. Sourced images will be depicted in the list of figures at the end of the document.



1.0

CONTEXT:

Setting the Scene.

New Zealand

< **Figure 2.** *New Zealand Map.*

Lower North Island

< **Figure 3.** *Lower North Island Map.*

SITE LOCATION.

The location chosen for the entirety of this thesis research is Paraparaumu. This tourist town is located in the south-western part of the North Island, New Zealand. It lies on the Kapiti Coast, 55 kilometres north of the capital city, Wellington. Being so close to the nation's capital, Paraparaumu enjoys a healthy influx of tourists throughout the year. The Kapiti region sits in an oceanic climate that experiences moderate temperature changes throughout the seasons. like other coastal settlements in New Zealand it faces increased risk due to climate change, eroding shorelines, liquefaction, flooding, tsunamis and earthquakes. The future of these coastal settlements is dependent on the mediation of these increased risks. Paraparaumu makes up the majority of the Kapiti Coast population 49,104 (NZ, 2017), an increase of 6.3% from the previous 2006 census. Along with a sustained growth in tourism the region boasts a vibrant, diverse and thriving local economy, thereby providing opportunities for future development.

THE PROBLEM.

In such an idyllic location, adjacent to 40 kilometres of unspoilt beaches and within touching distance of New Zealand native bush, Paraparaumu boasts an attractive option for locals and tourists of the region. The shore front is lined with cafes and stores that open onto the publicly accessible Maclean Park which is nestled into the start of the beach front dunes. Five kilometres off the beach front lies Kapiti Island. The island is an internationally-famed nature reserve protecting some of New Zealand's most endangered plant and bird species. Currently, none of these areas of interest in Paraparaumu are linked. As a visitor or local to the area travels down the main Kapiti Rd or Marine Parade no obvious point of arrival exists. There is currently no obvious connection between the shore front, beach front and Kapiti Island.

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Figure 4. *Paraparaumu Map showing the missing link between shop front, shore front and island.*

Figure 5. *Kapiti Boating Club site.*

THE EXISTING.

The only link that currently exists in Paraparaumu is that between the shore front and Kapiti Island. This link however also does not have an obvious departure point where visitors to the island are designated to meet. This connection to the island is operated out of the existing car park (fig.5) that surrounds the Kapiti Boating Club. Two companies currently run island tours out of this derelict car park. Both sell tickets and conduct bio-security checks all from the back of the boat trailer. This ugly departure process is in stark juxtaposition with the beautiful nature reserve that awaits. Not only does the departure experience contrast with destination experience, it also completely risks the livelihood of the islands nature. With no designated area for safe bio-security checks, it also endangers the livelihood of the island. Transporting either of these over to the island risks the destruction of the beloved nature reserve.

With this in mind, the opportunity for a building to be developed that satisfies the missing link from the shop front, beach front and Kapiti Island arises: A building that is both iconic to the area and acts as the town's entry point. The developed building's importance grows with the need for a designated departure space to the island, one which can be utilized effectively by both companies operating tours.

Figure 6. *Maclean Park.*

Figure 7. *Maclean Park.*

Figure 8. *Kapiti Boating Club site.*

EXISTING SITE LOCATIONS.

The Kapiti Coast District Council supports the development of an i-site that operates as a gateway building to the island. The council has previously conducted an independent feasibility study that produced three proposals, all involving schemes that completely renovated or added onto the existing Kapiti Boating Club (fig.9). There have also been proposals completed for the redevelopment of Maclean park (fig.7&8). Both of the site propositions however have been meet with staunch opposition politically. With four major parties involved i.e Boating Club members, Department of Conservation (DOC), local Iwi, and Kapiti Coast District Council, the process has been slow. With all parties having separate agendas the consensus has been hard to find.

Each site has its positives, The Boating Club offers an existing building that sits atop a hill seemingly ensuring protection from imminent climate change. The boating club members, however, have opposed the possibility of altering their club seeking to keep their original building. The Maclean Park proposal appears to be the more viable option however erecting a building that successfully navigates the climate change issues proves difficult, and also disrupts the park that so many locals and visitors utilize. This leads to the question of where to locate the proposed development?

THE CHOSEN SITE.

In response to the outlined contextual, environmental and political issues, I have selected an alternative site for the development of the gateway centre. Due to Maclean Park and the Kapiti Boating club sitting on a constantly shifting beach front landscape a decision to retreat further inland becomes the most appropriate option. Opposite the entry to the boating club car park is large , vacant roundabout, 30 metres in diameter (Fig.9). This roundabout is situated where Kapiti Rd and Marine Parade meet, acting as an effective arrival point. Sitting north of the shop front and Maclean Park the site proposed would act as an effect anchor point for the link to the beach front. Currently covered in vegetation this traffic island provides an opportunistic space devoid of previous regional political issues.

Visiting Paraparaumu and exhibiting to local's early design moves including the proposed roundabout site proved very favourable. The Kapiti locals responded positively to the alternative gateway centre site, enticed by the idea of circling their cars around an iconic building as they made their way through the town. Erecting a building on a site situated at each main entry point to the shore front appealed to local's desire for increased tourism.

>

Figure 9. *Site Map showing the proposed site for development.*

Kapiti Rd

Marine Parade

Paraparaumu

New Zealand

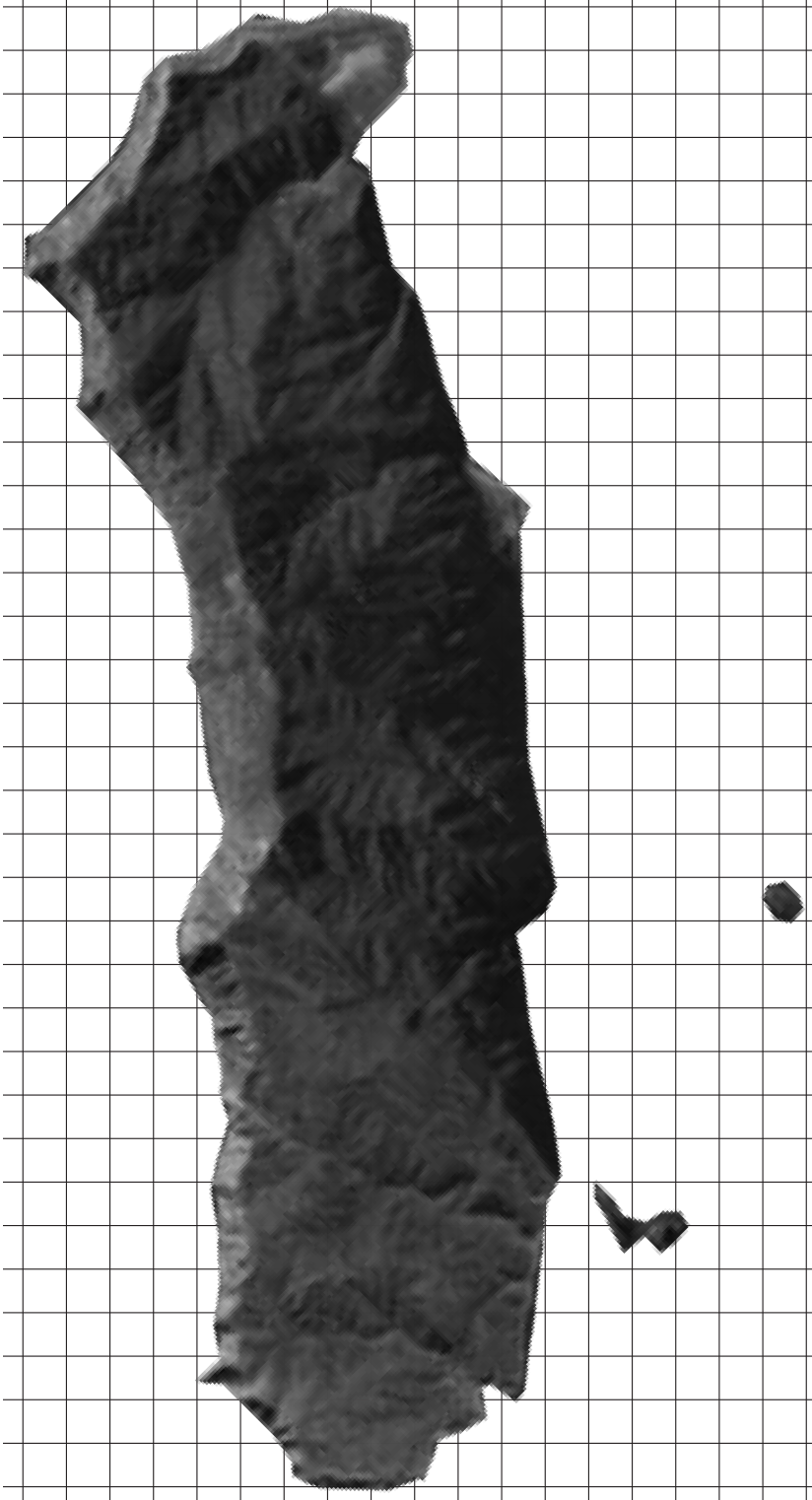
Location Map

Figure 10. *Graphic demonstrating the sanctity of Kapiti Island.*

HONOUR THE ISLAND.

Kapiti Island, the predator free, flourishing nature haven! I believe it is often unrealised how unique this detached island sanctuary truly is. Locals of the area value how significant Kapiti Island is but how are tourists expected to understand this? In an expanding industrialised world these untouched native reserves are fast dying out. This increases Kapiti's importance in the role of harbouring endangered plant and wildlife species.

The current set up, as mentioned, is a complete juxtaposition: the idyllic destination is contrasted with the grotesque departure. The sheer importance of the island isn't realised until arrival, which I believe is too late. The island deserves to be honoured and celebrated on the mainland. In doing so a sense of reverence for the island can be installed in visitors as they prepare for their journey across. This will aid in a sustained livelihood of the island, if visitors understand how important the destination is more care will be taken in the bio-security checks upon departure. This will insure the chances of threats being transported to the island are diminished.



KAPITI ISLAND

THE ISLAND.

The Kapiti Island Nature reserve lies five kilometres off the Kapiti coastline. A submerged mountain range created by an earthquake 200 million years ago, the island was first identified as a sanctuary as early as 1870. The reserve protects some of New Zealand's most endangered plant and wildlife species. It is one of the nation's preeminent sites for bird recovery. The 1,956 hectare island is internationally-famed with visitors coming far and wide to experience a slice of New Zealand's native flora and fauna. The island peaks at 521m high with vegetation dominated by scrub and forest of kohekohe, tawa and kanuka. Some of the most iconic birds the island harbours are the kaka, weka, spotted kiwi, and tieke (saddleback). It is currently run and maintained by the Department of Conservation (D.O.C).

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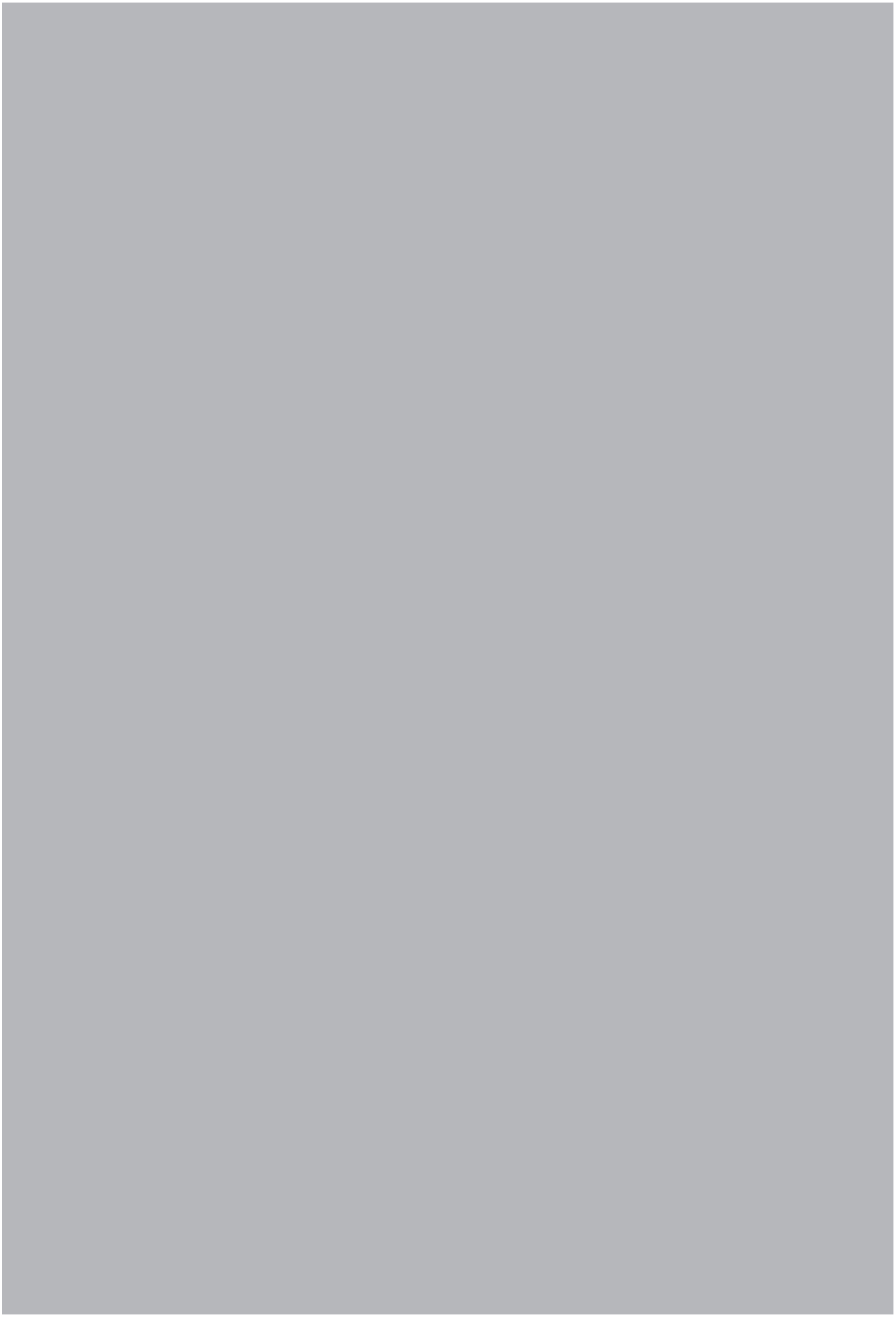
Figure 11. *Kapiti Island.*



TYPOLOGY STUDY.

Prior to the design of the Kapiti Visitor's centre an investigation into other relevant New Zealand visitors centres was conducted. This investigation looked into other visitor centre typologies and how the design of the architecture addressed the contextual issues. The Orokonui Visitors Centre located just outside of Dunedin and the Waitomo Caves visitors Centre in Otorohanga were chosen as relevant precedent. This was because of their prominent architectural design and relevance to the Kapiti Visitors Centre as both also operated as gateways to iconic tourist attractions.

OROKONUI VISITORS CEN· TRE.

Designed by the Dunedin based firm, Architectural Ecology the Orokonui Visitors centre (fig.12 & 13) services conservationists and tourists of the surrounding ecosanctuary. Just like the Kapiti Visitors centre, it is open for people to explore the area, learn about native species, and help preserve biodiversity. The design includes a conference room, atrium, landscaped gardens and cafe. The Dunedin firm designed and built the centre to respond to its local climate conditions but yet still exert minimal impact, hence the low profile of the form and use of surrounding materials which allow it to blend into the landscape. The building is designed to be the focal point for visitors of the ecosanctuary, like the Kapiti Visitors centre it acts as a gateway.

Figure 12. *Orokonui Visitors Centre Perspective.*

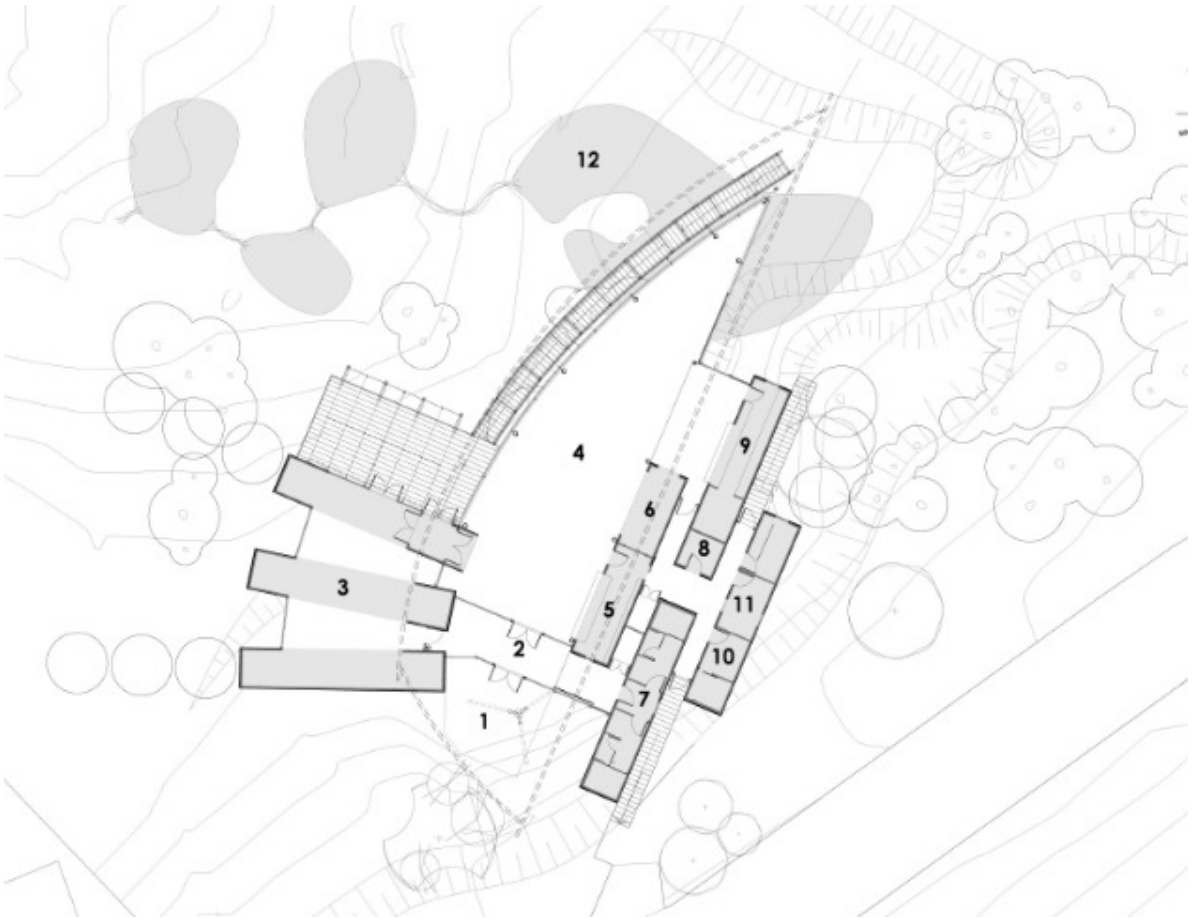


Figure 13. *Orokonui Visitors Centre Building Plan.*

WAITOMO VISITORS CENTRE.

Designed by the Wellington based firm, Architecture Workshop, the Waitomo Visitors Centre (Fig.14) has been erected to service visitors and workers to the glow worm caves in Otorohanga. Like the Kapiti Visitors centre, the Waitomo centre acts as a gateway to the glow worm caves. Situated at both the entrance and exit paths of the caves, like the Kapiti Centre the design of the building must capture the essence of the destination as visitors pass through. The Wellington firm designed the architecture to emphasise the connection with the Waitomo stream and the flows of water running through the caves. The curve of the canopy is aligned with the curve of the Waitomo stream in order to generate the idea that this project is a canopy in combination with the caves. Through the architecture the visitors centre creates a sense of place, foreshadowing the experience of the glow worm caves.

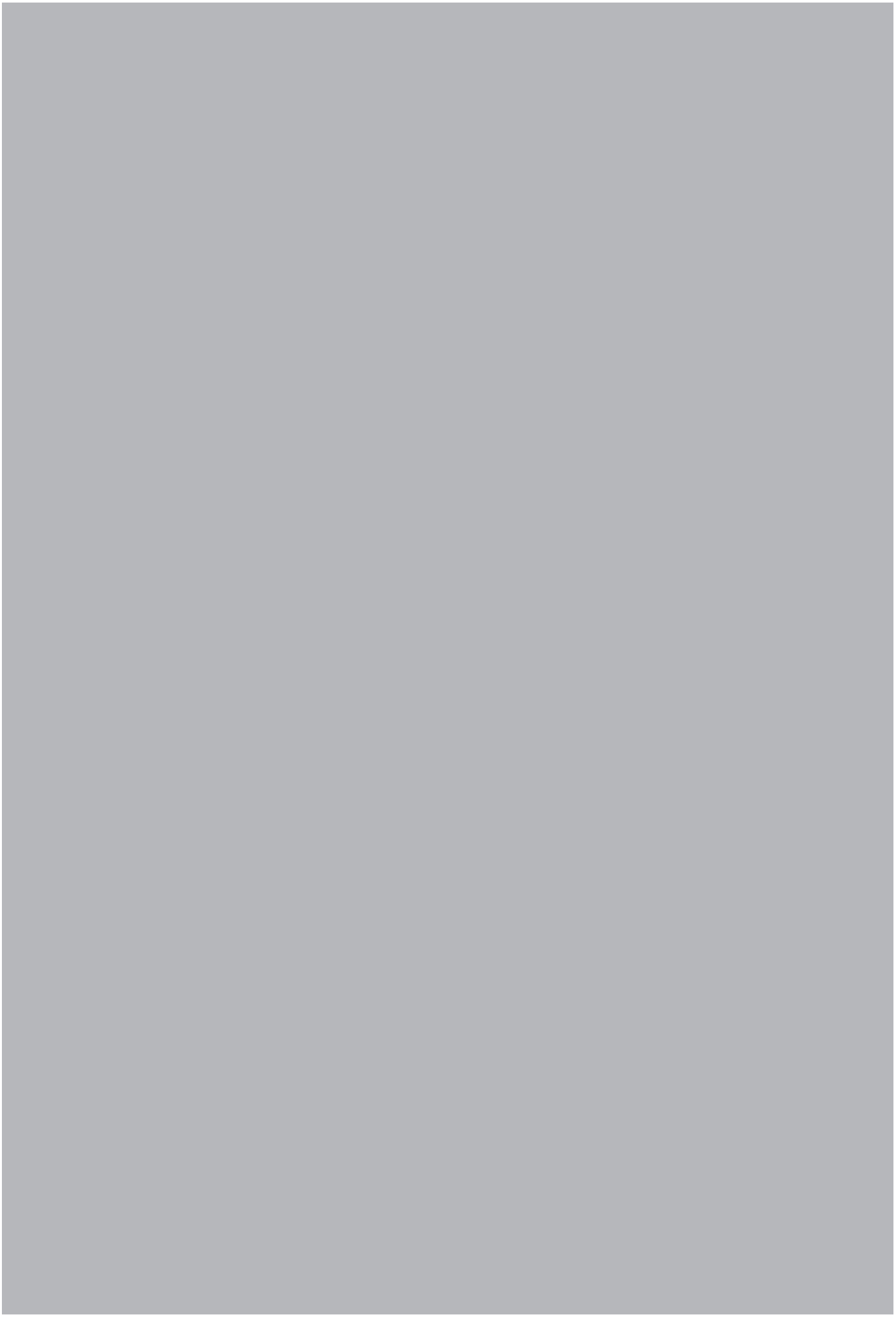
I believe using the surrounding context in the buildings formal language and material choice effectively creates the essence of the glow worm caves.

Figure 14. *Waitomo Visitors Centre Perspective.*

KAPITI VISITORS CENTRE.

The proposed development of the Kapiti Visitors Centre boasts a unique opportunity. The previous two iconic New Zealand visitor centres operate adjacent to the tourist attractions they represent. The main contrast between the Orokonui, Waitomo and Kapiti centres are location. Due to strong D.O.C regulations the Kapiti Visitors centre is situated 5km away from the attraction on the mainland.

This leads to the questions, how can a piece of Kapiti Island be recreated on the mainland as visitors pass through? How can this slice of the island create an accurate representation of the islands essence in order to evoke a sense of reverence in the visitor?



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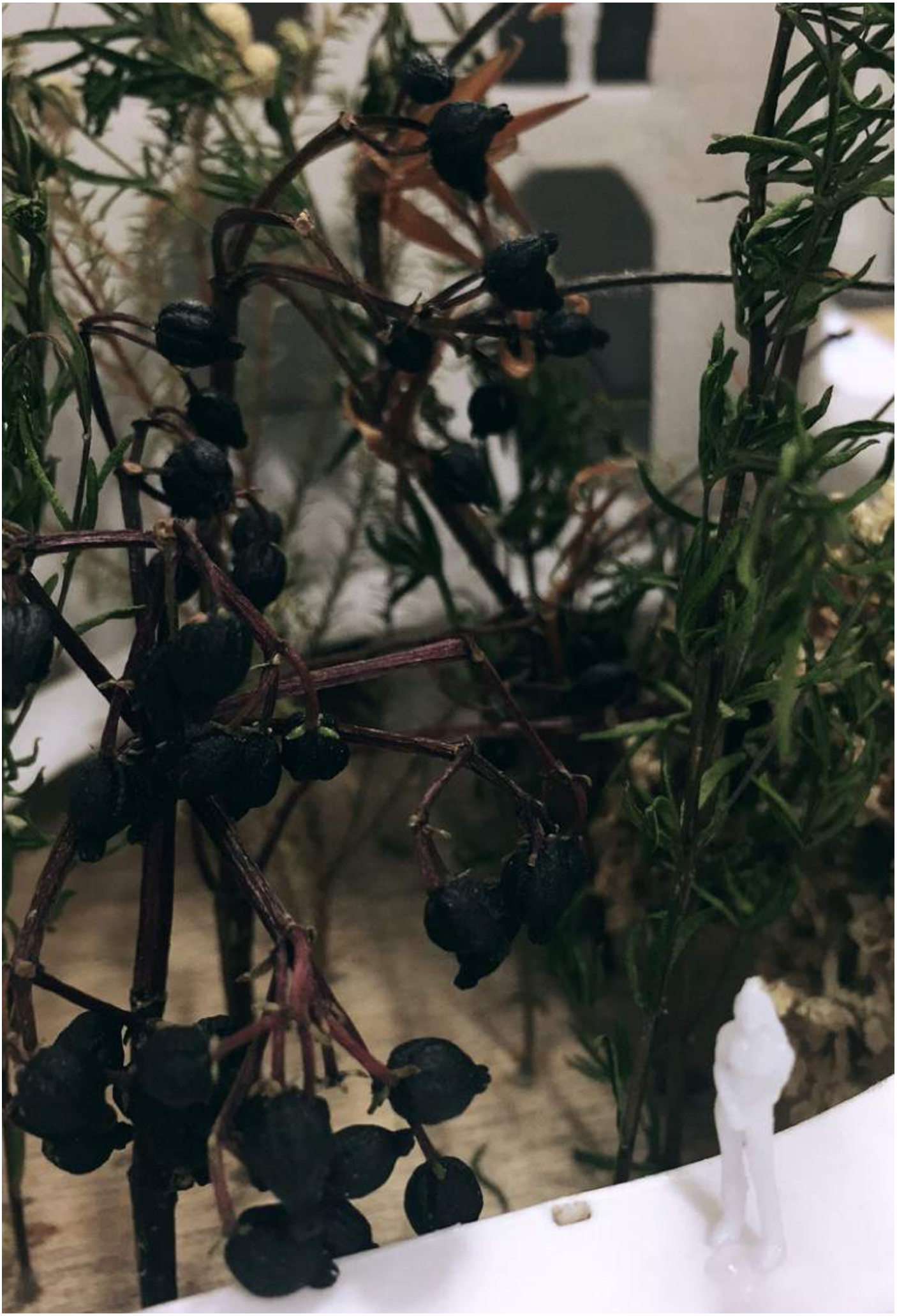
DESIGN:

A Temple To Nature.

^ **Figure 15.** *Final Proposal Model courtyard perspective.*

v **Figure 16.** *Final Proposal Model courtyard perspective.*

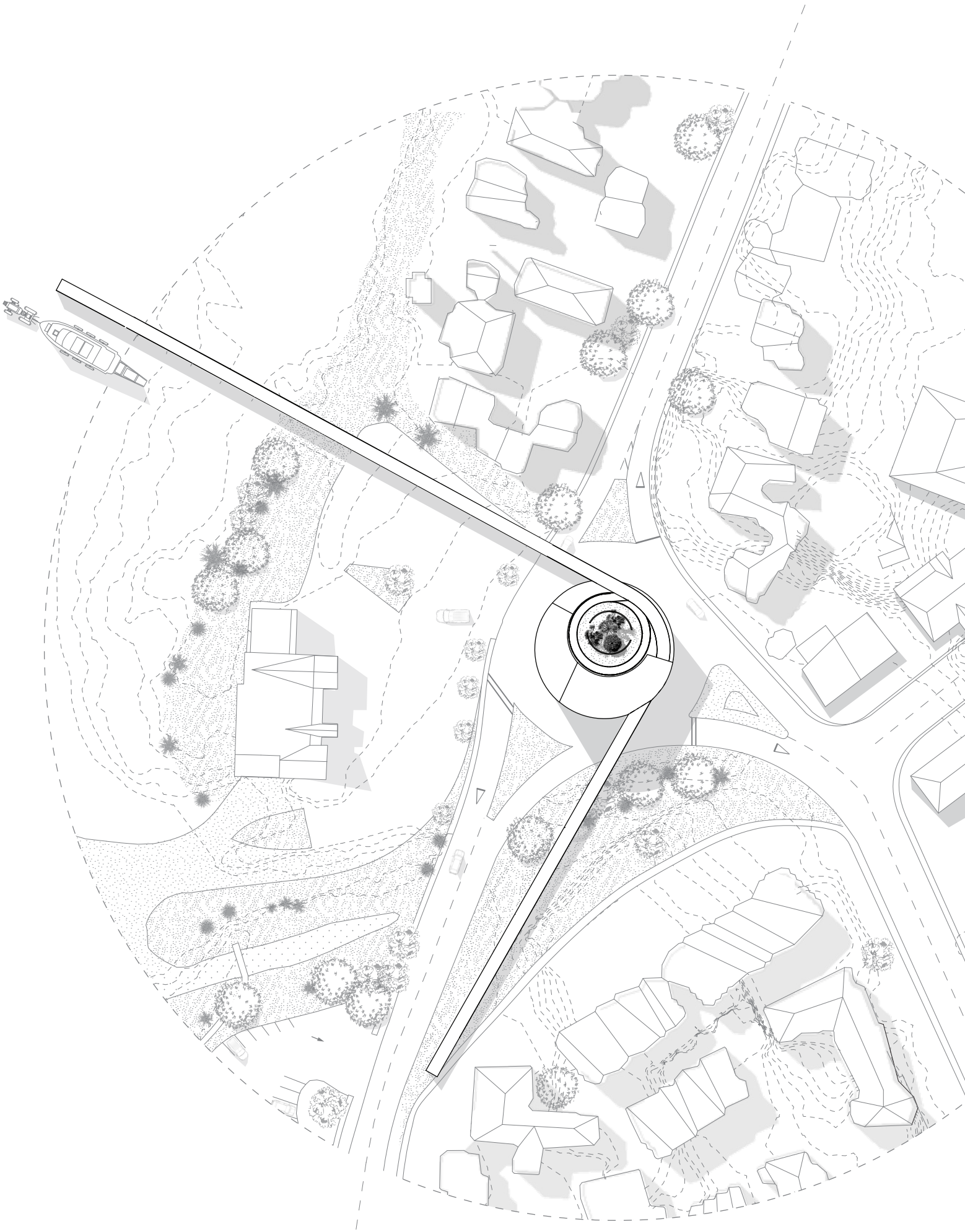


THE DESIGN.

The significance of Kapiti Island is truly understood through experience. The rarity of a predator free reserve speaks volumes on the importance the island has in New Zealand's nature preservation. I argue the island itself becomes a nature temple, symbolising the beauty and conservation of native plant and wildlife. The island is a nature temple for New Zealand but specifically for the Kapiti Coast. In response to this I have proposed on the designated roundabout an 18m tall, subtracted cylindrical concrete building labelled a temple to nature. This temple with its forested circular courtyard is designed to pay homage to the nature that exists on Kapiti Island. The architecture is designed to emphasise the importance of the Island and the nature it protects.

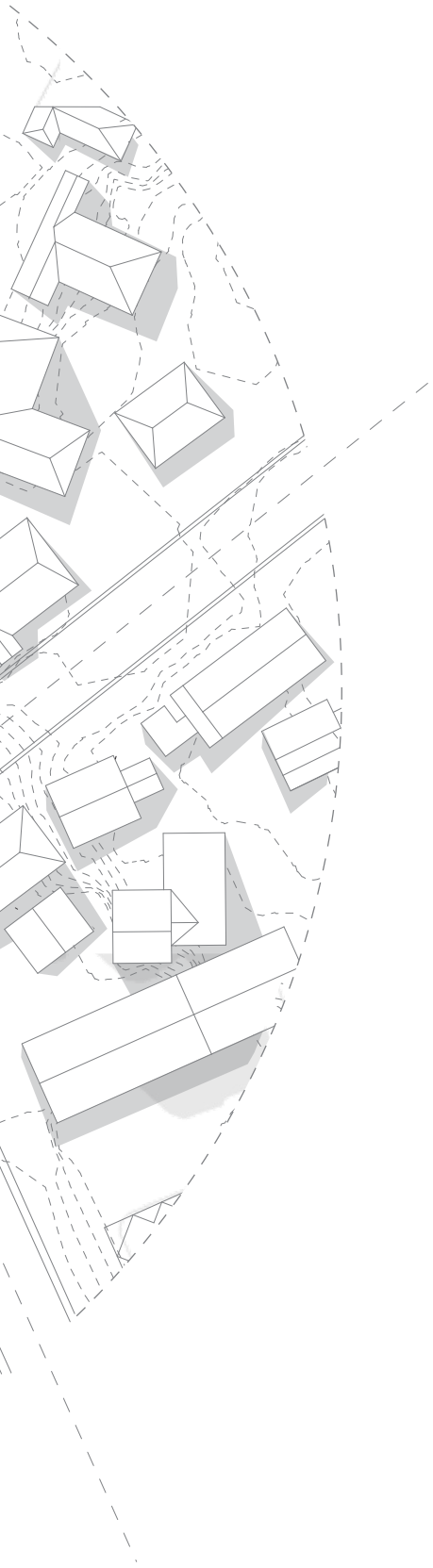
Typical of temple and religious architecture the design exerts the architectural language of monumentality, because of this the architect Louis Kahn has proven an integral precedent. The design wrestled with the idea of scale whilst exploring monumentality, how its modest size can still impose its significance in the surrounding context. A connection from the shop front to the beach front has been designed with the proposed temple acting as the anchor point. This represents the synergy between nature, highway infrastructure and religious architecture types.

< **Figure 17.** *Final Proposal Model courtyard perspective.*



SITE MAP

Scale 1:500



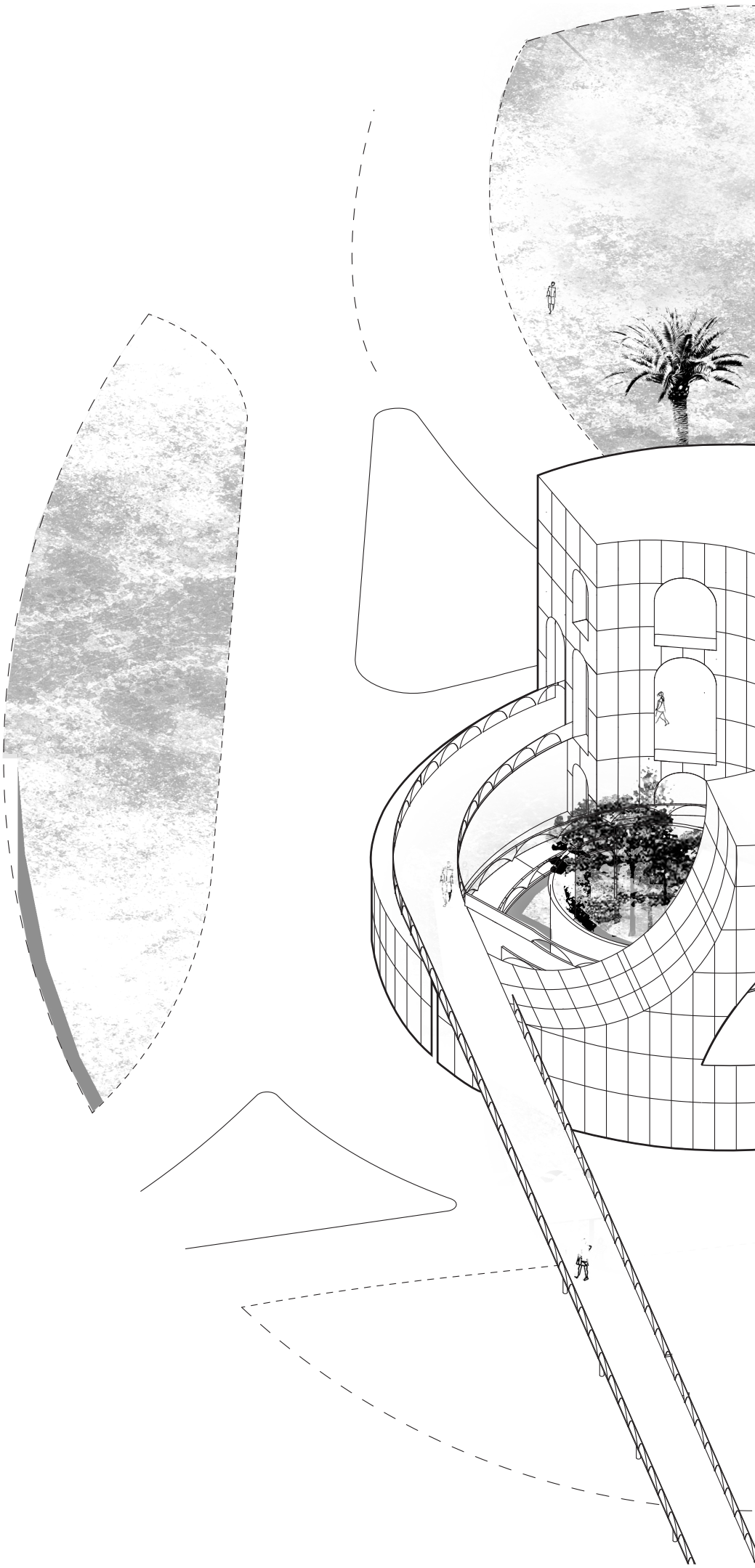
THE CONNECTION.

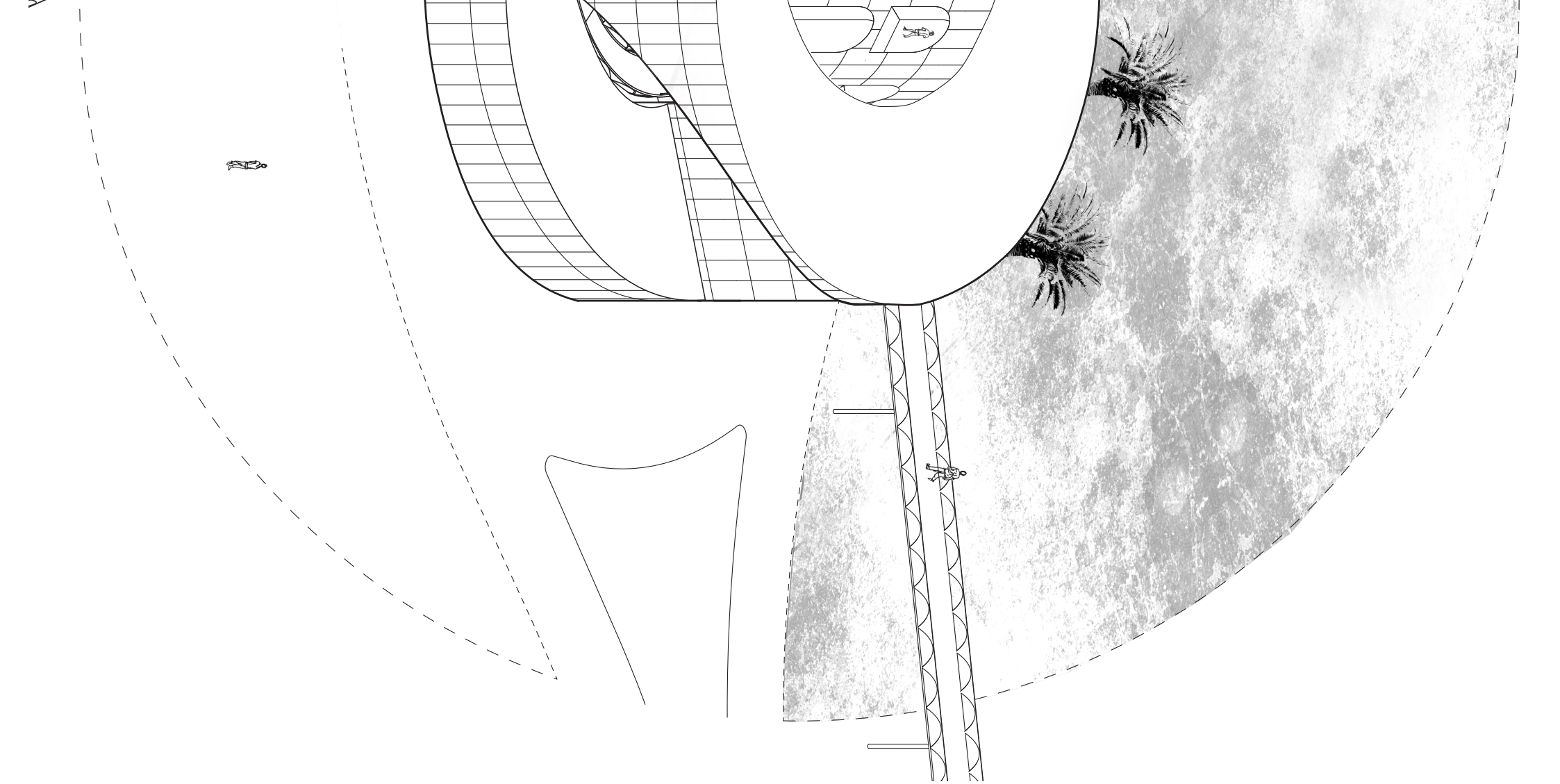
To enhance the tourist and local experience of Paraparaumu it was outlined prior the need for a connection from the shop to beach front and onto the island. To satisfy this a piece of infrastructure has been developed.

The proposed design includes a light steel 200 millimetre thick pedestrian over bridge that begins at the shop front, then anchoring around the building, and finally extending north-west onto the beach front where visitors to the island depart (Fig.18). It ascends to a total height of 4m in order to provide ample clearance for traffic passing under the roundabout. The over bridge also winds down into the courtyard space encouraging a continued circulation through the building and connection.

The design of the infrastructure is intended to read the same as the temples architecture, in order to achieve the amalgamation of both types. The 900 millimetre high, 50 millimetre thick balustrade is designed through the repetition of circular subtractions from a rectangular mass. The resulting arches in the balustrade created from the subtractions allow the infrastructures formal language to read the same as the temples. The architecture of both types is designed to read holistically.

∧ **Figure 18.** *Final Proposal Site Plan showing the envisioned infrastructure link.*



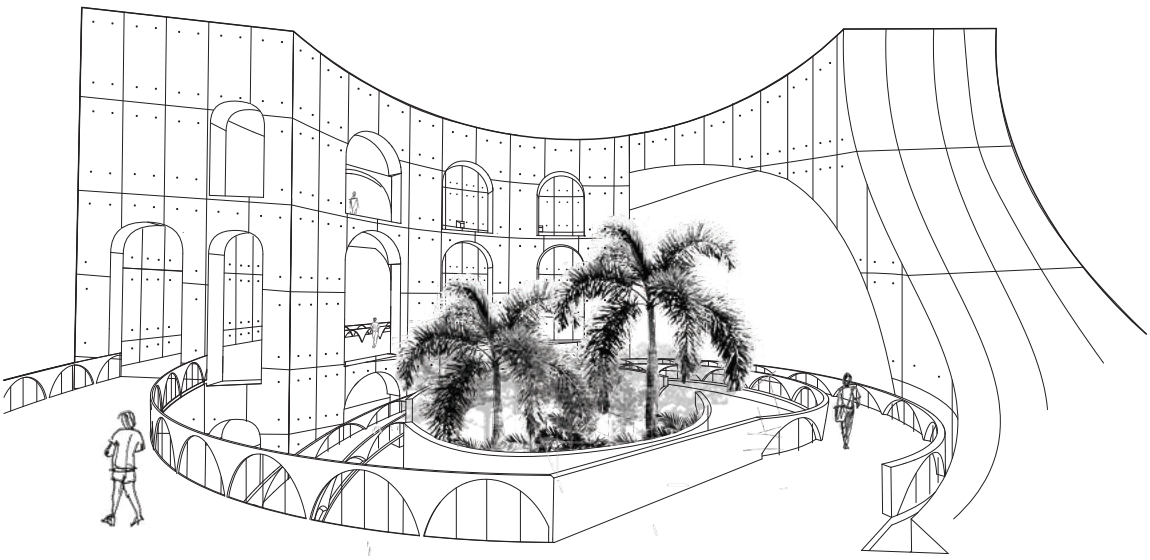


^ **Figure 19.** *Final Proposal Axonometric Drawing.*

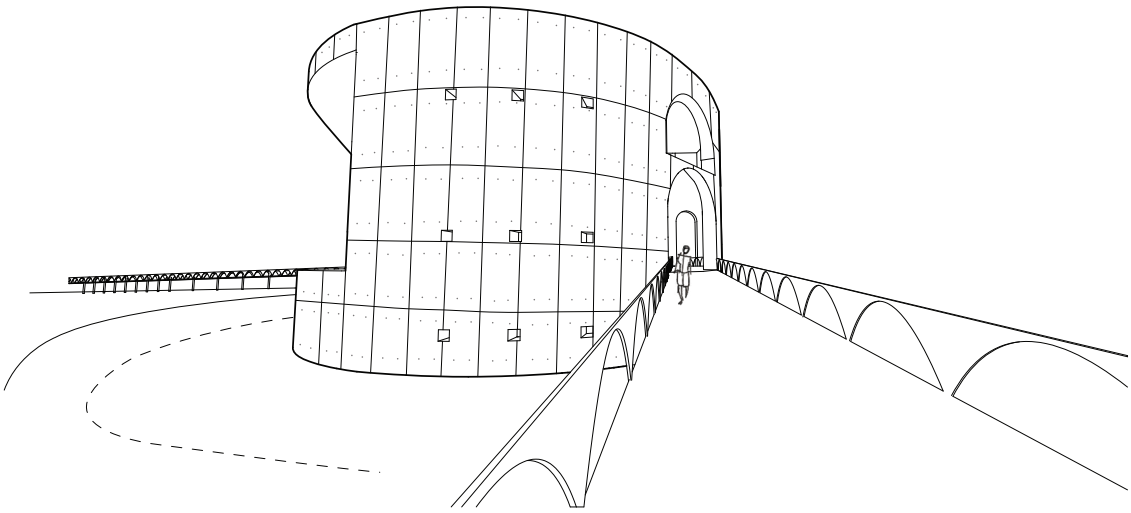
THE COURTYARD.

The architecture of the temple is designed to pay homage to the island and its nature. To achieve this a circular subtraction was made from the cylindrical mass for a protected courtyard space (Fig.20). Further calculated subtractions were also made based on view shafts, circulation and site conditions. All were rigorous and achieved through a series of formal experiments.

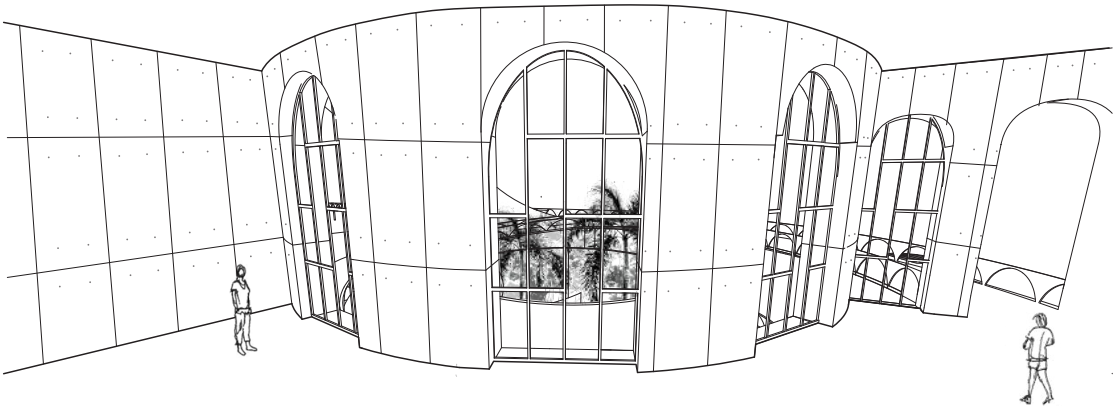
This courtyard is designed to be covered in local trees and vegetation. This forested space that recreates a piece of the island on the mainland captures the essence of the islands sanctuary experience. Winding down the spiralled over bridge through the trees and vegetation provides a glimpse of the sensual beauty that awaits on the island. In doing so the inhabitant notices the surrounding architecture, strong and robust in aesthetic, completely surrounds the courtyard symbolising its protection of the nature inside. This is to communicate how precious the nature is, alluding to the significance of the nature that exists on the island. As visitors to the island pass through this space a sense of reverence for the island is created.



∧ **Figure 20.** *Final Proposal Courtyard Perspective Drawing.*



∧ **Figure 21.** *Final Proposal Entry Perspective Drawing.*



∧ **Figure 22.** *Final Proposal First Floor Perspective Drawing.*

∧ **Figure 23.** *Final Proposal Courtyard Perspective Drawing.*

THE JOURNEY.

The proposed combination of temple and infrastructure intends to significantly enhance the experience of locals and visitors passing through to Kapiti Island. The desired effect of such an iconic intervention is to increase the Paraparaumu national profile in order to attract more visitors to the Kapiti region as whole. The journey through the design is an integral part of this experience. The over bridge provides ease of access from the shopping and park, over the road into the temple and onto the beach. It is envisioned to be utilized by not only island visitors but also people enjoying the available recreation of the shore front. In between island departures the over bridge is intended to be used as a boardwalk or cycle way that people can enjoy. Due to the 4m height, people travelling over are subject to stunning views of the beach and island. With a public access at each end the design of the over bridge encourages continued circulation through and over the temple.

Figure 24. *Final Proposal 1:50 Scale Section Drawing.*
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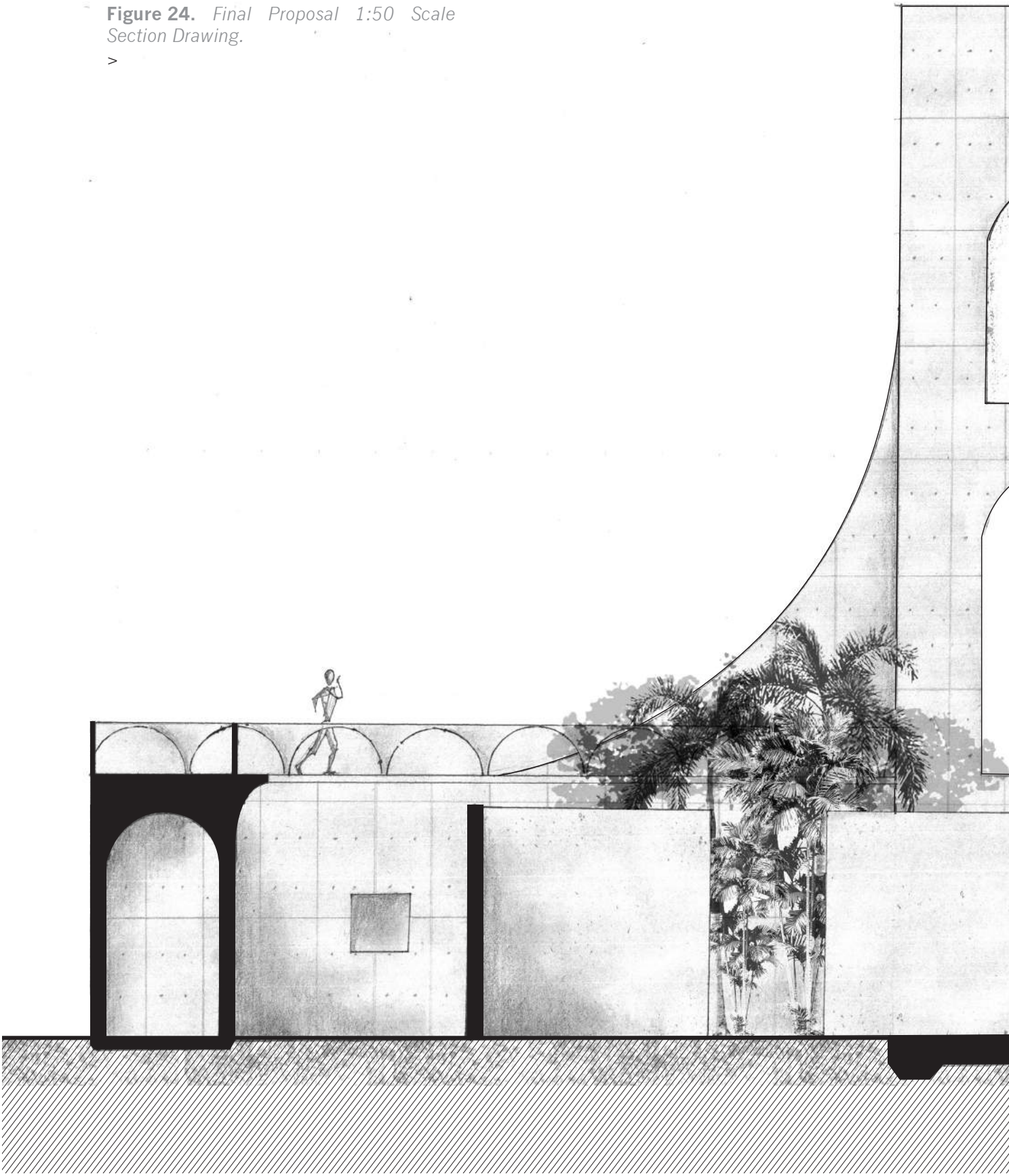
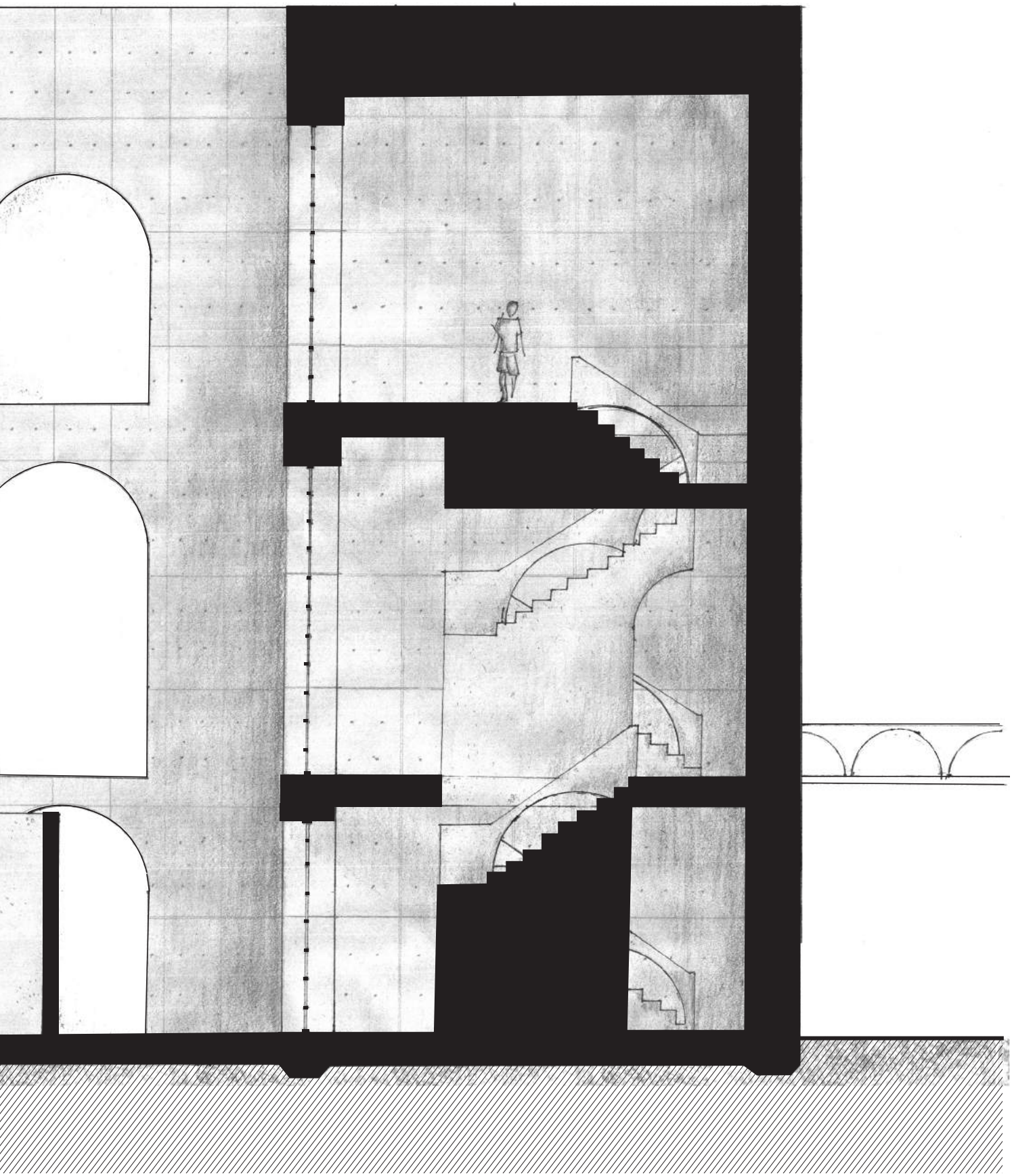
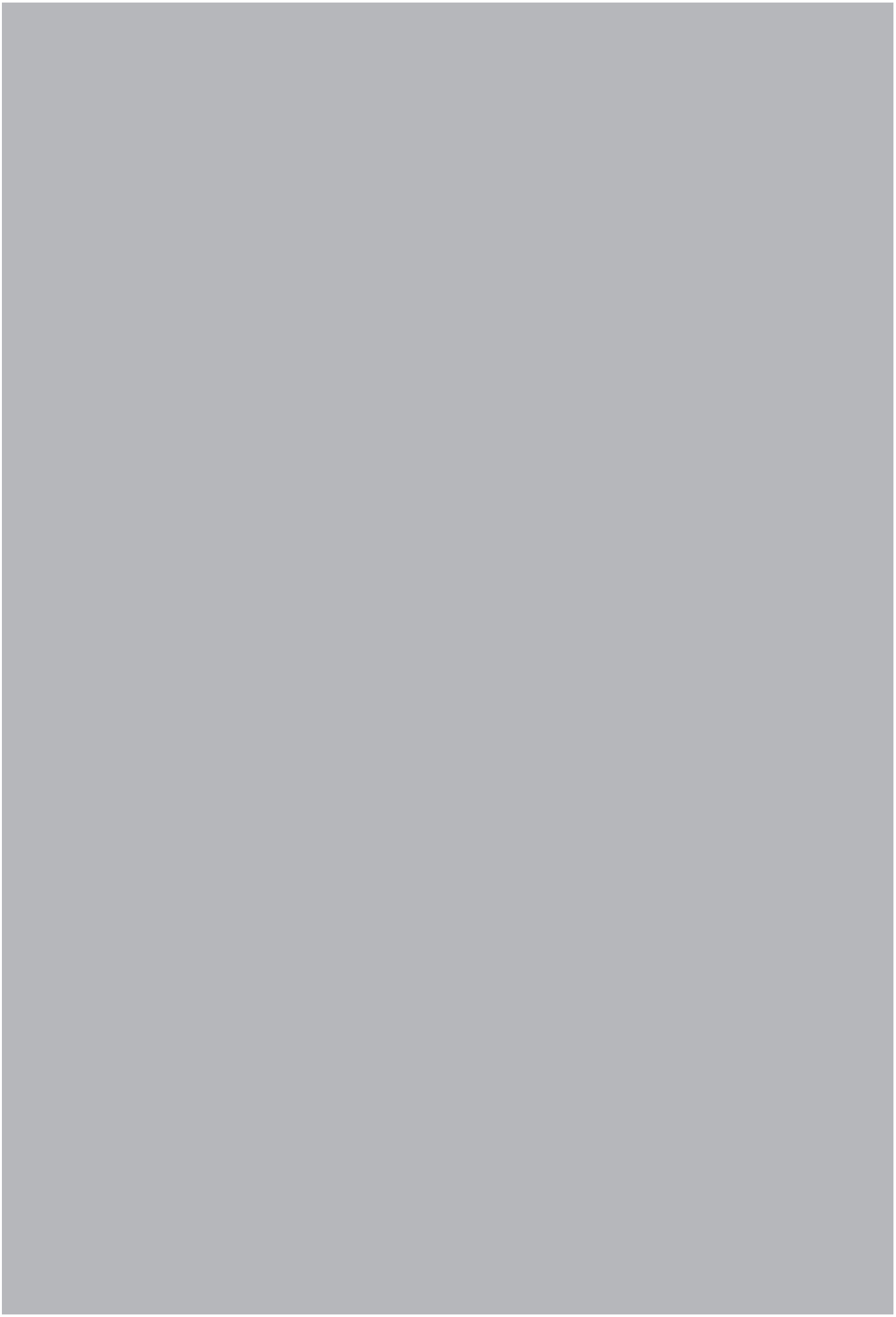
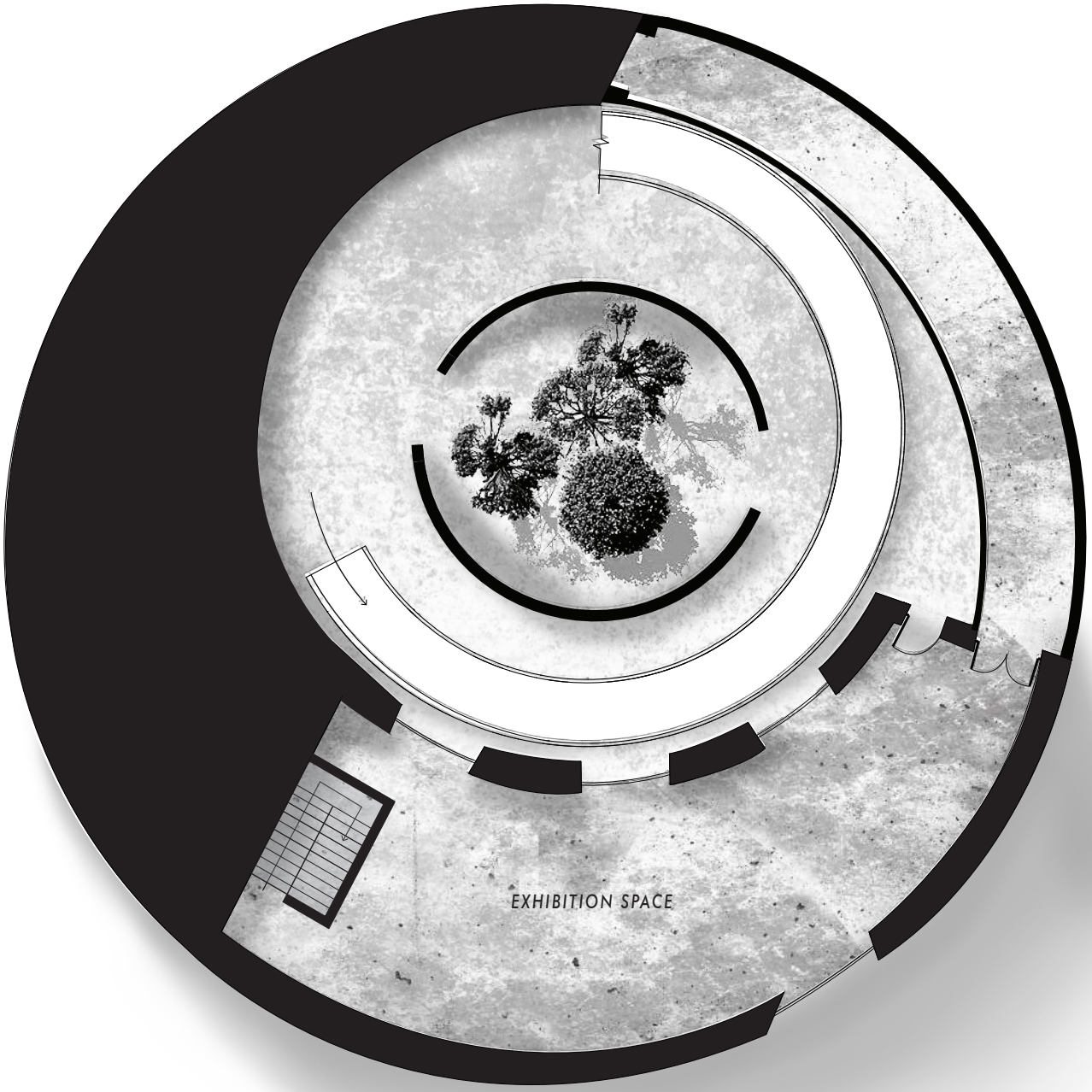






TEMPLE PROGRAMME.

The proposed temple to nature includes three floors with varying programme on each. Each floor is situated on the south-east of the temple, this insures view shafts towards the courtyard and island are established. The circulation between each floor is a u-shaped monolithic staircase that sits on the west wall. Asides from the entry and exit points of each floor the only other penetrations are the large chapel like glazed windows facing the courtyard and island. This is to ensure inhabitants views are directed to the most significant parts of the design, creating a space designed to pay homage to the nature on Kapiti. These windows are inserted into penetrations with 900 millimetre thick concrete. The visibility of this abnormally thick concrete emphasises the monumental quality of the building. All of the walls, floors and ceilings are constructed out of cast-insitu concrete, this is because of its material properties like weight and lifespan. This choice in material is typical of religious architecture types and monumental buildings.



GROUND FLOOR

Scale 1:100

Figure 25. *Final Proposal 1:100 Scale Ground Floor Plan.*

GROUND FLOOR.

The ground floor (fig.25) programme is predominantly exhibition space where local artists and designers can display their work in an effort to generate exposure to out of town tourists. This space is also intended for public hire such as functions, seminars and conferences. Inhabitants can enter either from crossing the road at ground level, descending down the staircase circulation or, the preferred circle down into the courtyard space

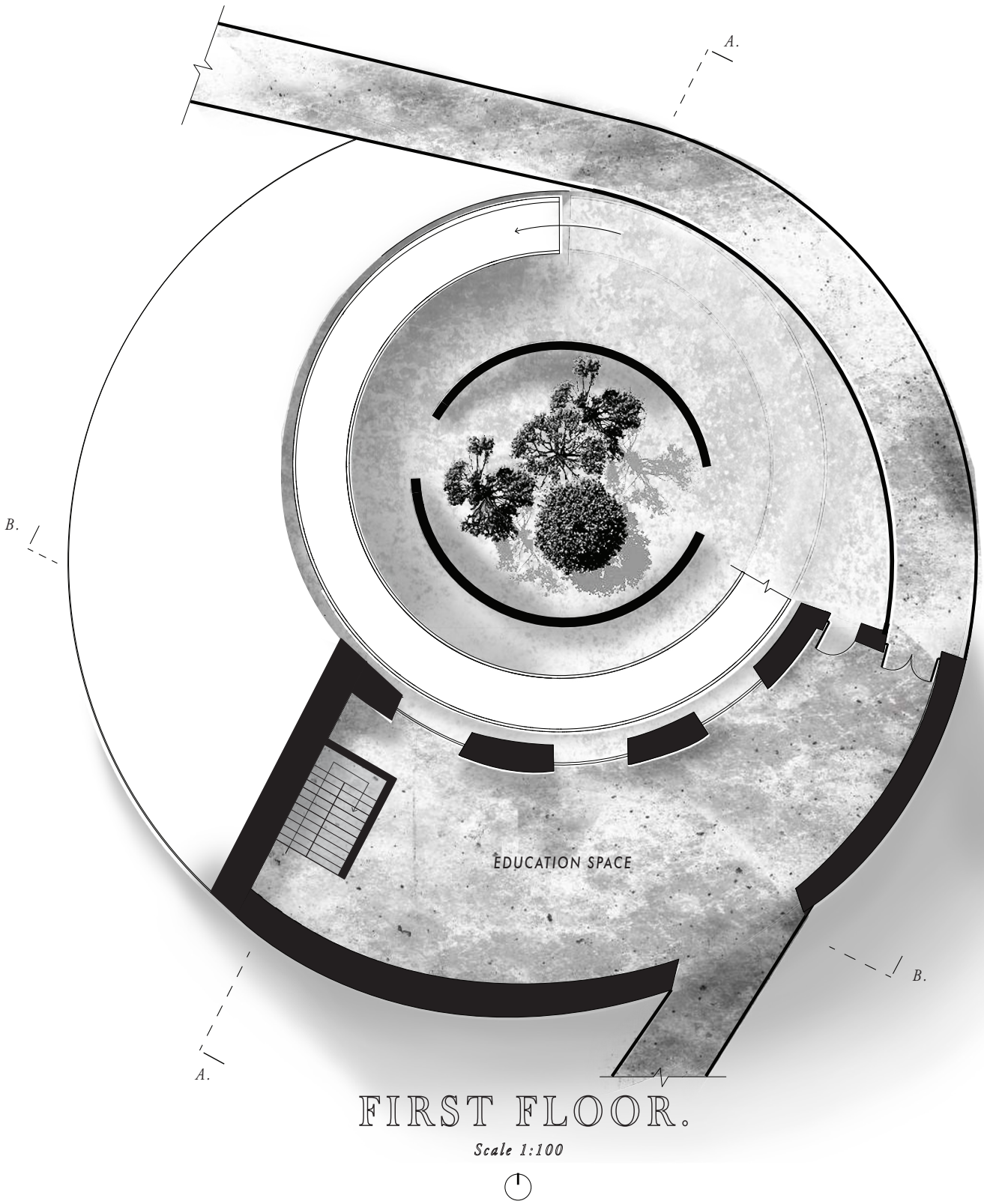


Figure 26. *Final Proposal 1:100 Scale First Floor Plan.*

FIRST FLOOR.

The first floor (fig.26) programme is intended to be the i-Site which will also operate as an education space. Visitors enter directly from the over bridge at either direction, or up from the staircase circulation on the west wall. Here people will be able to enquire about the regions attractions, activities, accommodation and travel. This will also be the designated space where island visitors purchase their tickets and learn about their impending trip to the nature reserve. Here visitors and non-visitors are educated on the significance of Kapiti Island and the importance of biosecurity. From this i-site space people are encouraged to circle down and enjoy the forested courtyard or venture down the over bridge onto the beach front.

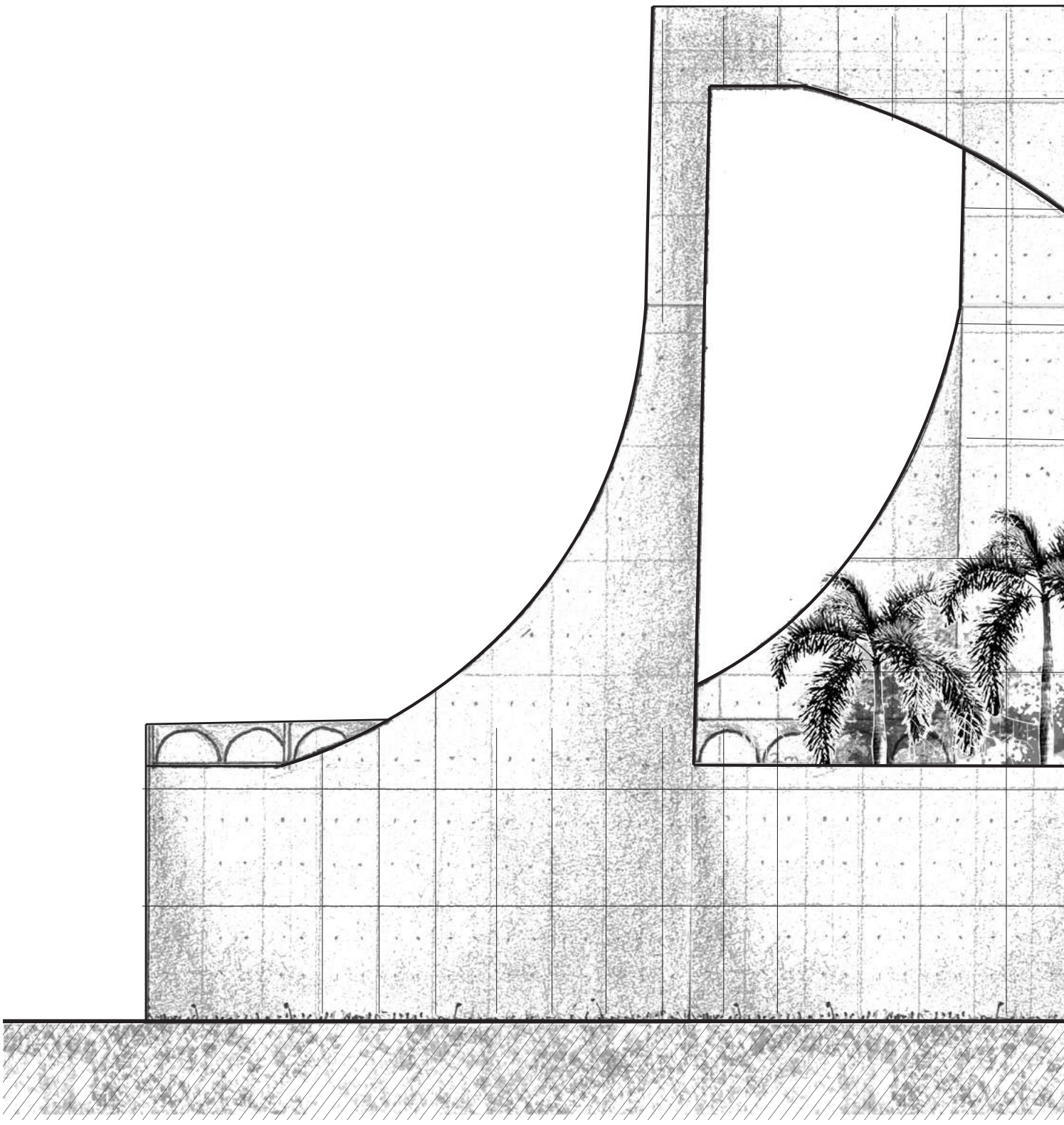
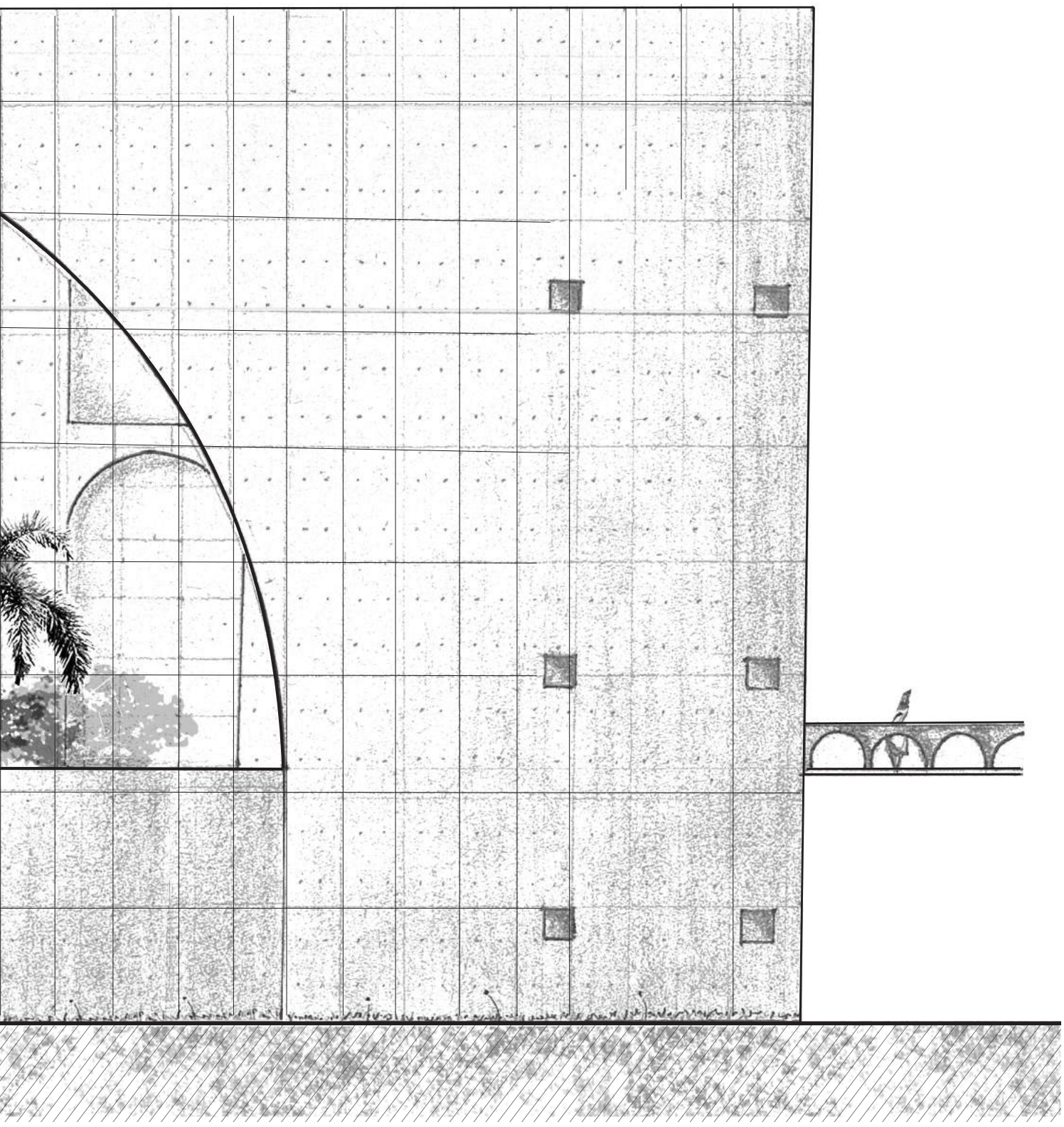


Figure 27. *Final Proposal 1:100 Scale West Elevation.*



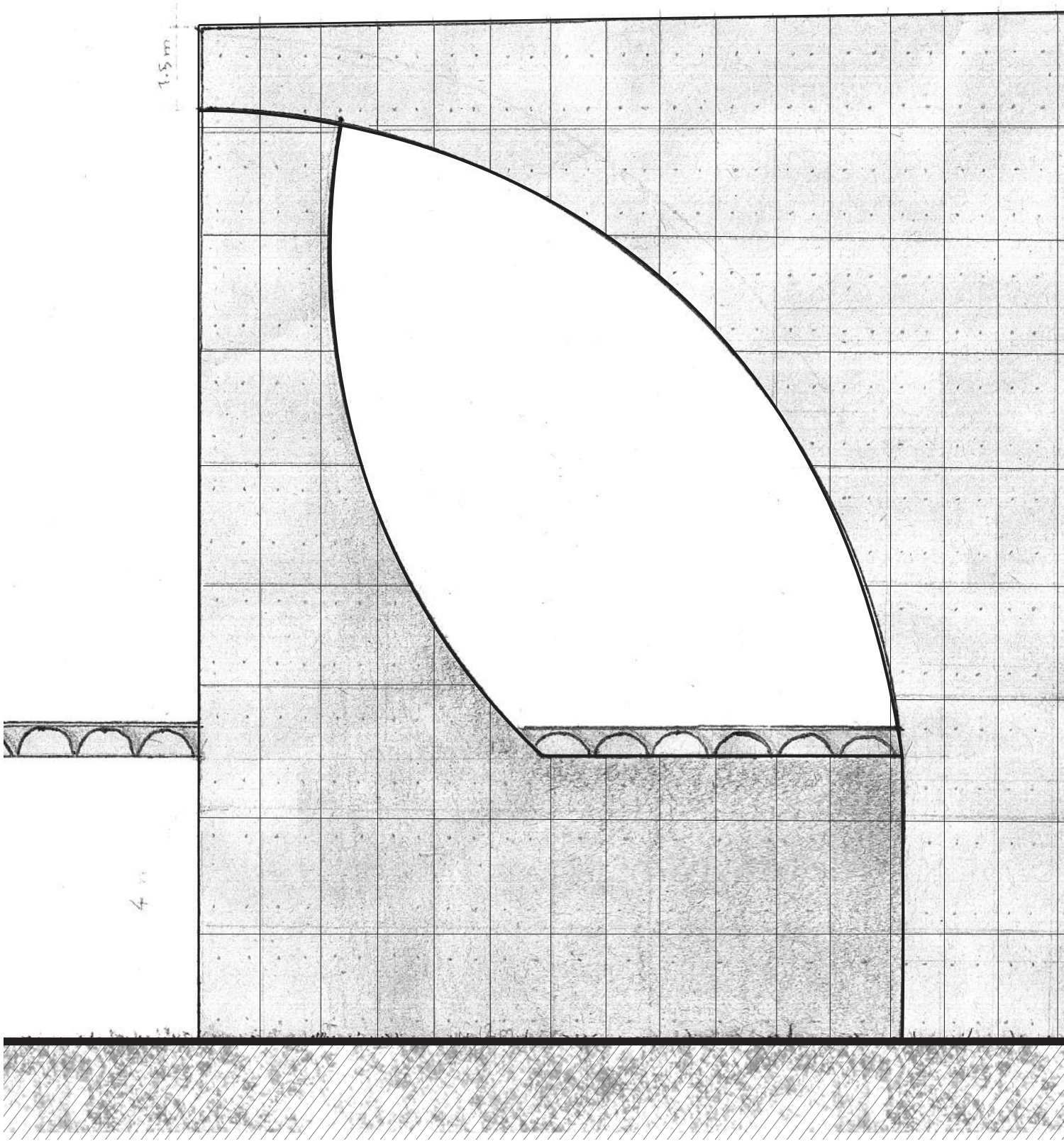
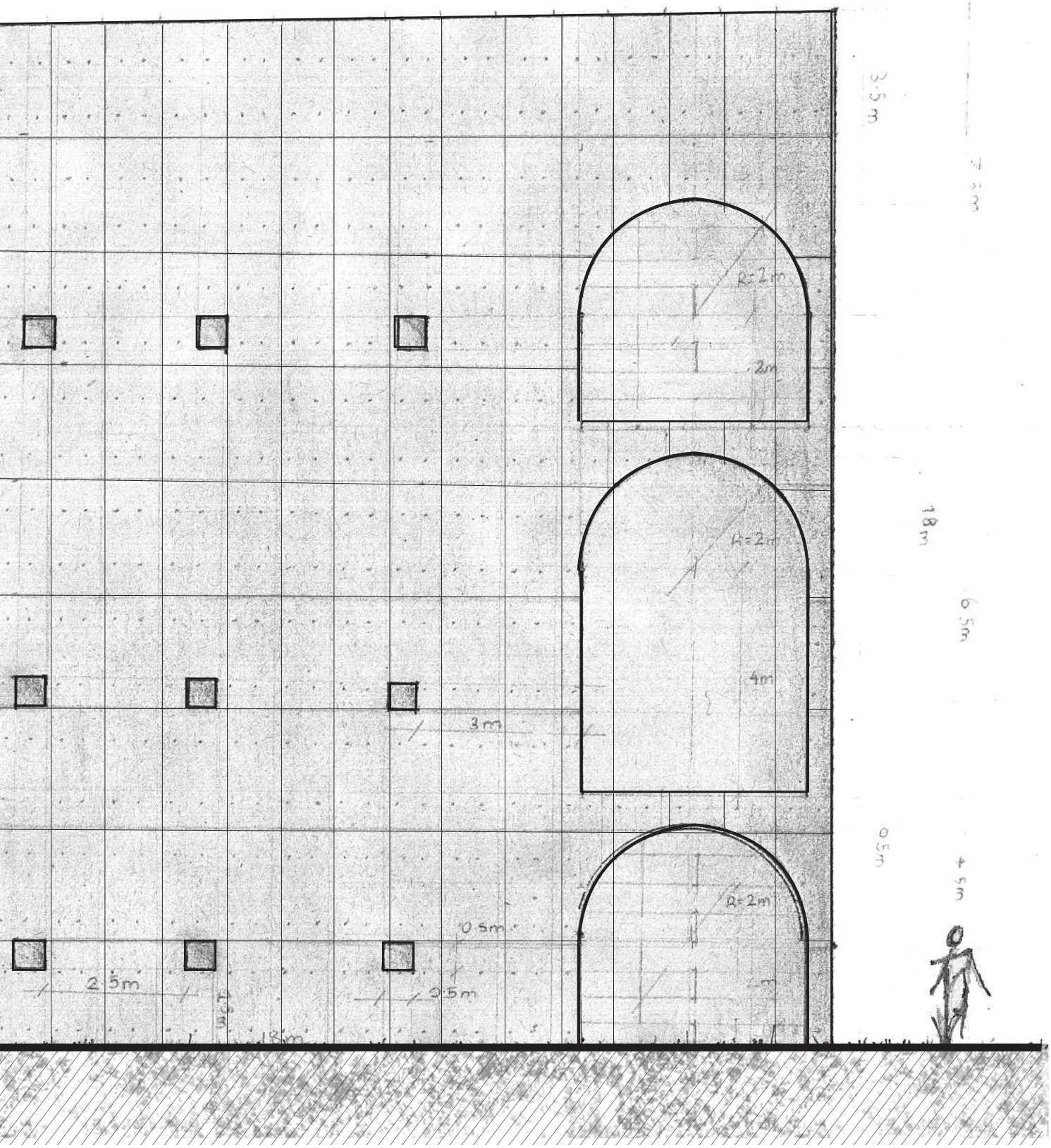
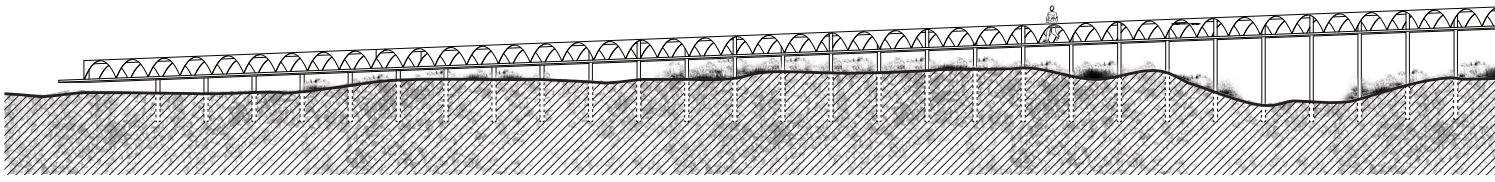


Figure 28. *Final Proposal 1:100 Scale West Elevation.*





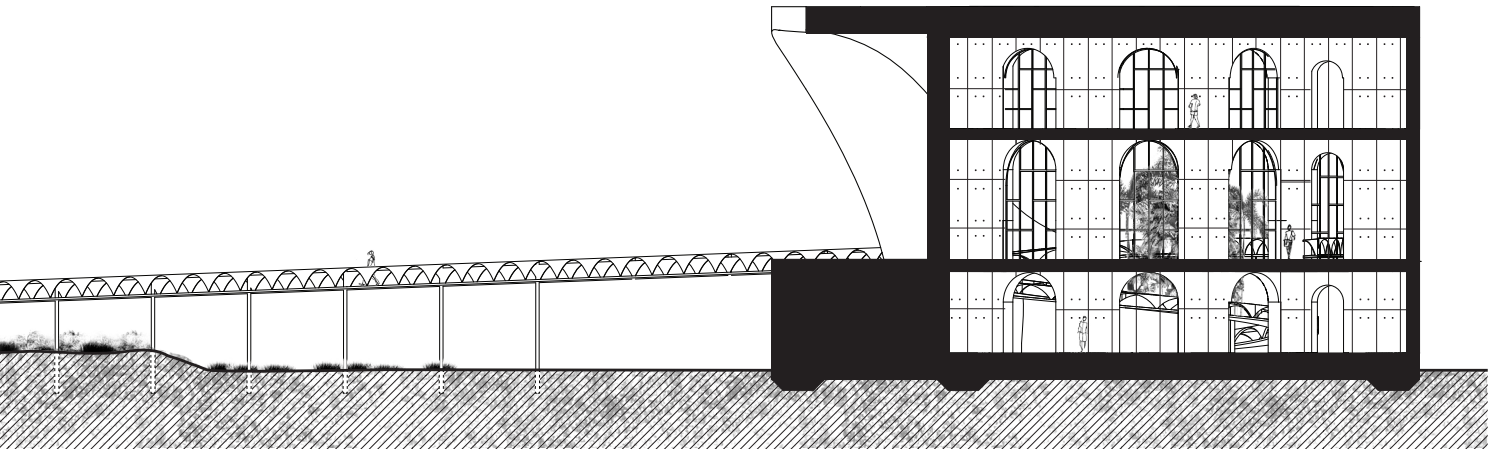


Figure 29. *Final Proposal 1:200 Section.*

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Figure 30. *Synergy Diagram.*

THE SYNERGY.

The proposed Temple to Nature operates as a gateway centre and link to Kapiti Island. The proposal however is a manifestation of design experiments exploring nature, highway infrastructure and religious architecture types, and the possible synergy between them. The exploration involved experiments with mass, volume and symmetry, typical of the architectural language of monumentality. Louis Kahn left the idea in relation to monumentality and its role as a language that architecture must be a proactive force, both at the scale of the environment and the scale of the human interaction (Merrill, 2010), I believe through my proposal the amalgamation of infrastructure, religious architecture and nature develops upon this idea. The temples architecture is designed to pay homage to its surrounding environment, and the journey through intends to be proactive in educating visitors on the importance of Kapiti Island biosecurity. Exploring the possible synergy between nature, infrastructure and religious space, typically opposites, I believe produces an interesting provocation, arguing for a new public architecture type.

Highway infrastructure is typically defined as an intervention designed to connect two points, cities or roads, offering a direct path or course for any form of transport. The envisioned over bridge addresses the need for a new piece of public infrastructure in Paraparaumu, linking the shop and beach front with the island. Infrastructure is designed with the sole purpose to service people, often this means the functional design neglects the aesthetic. Unlike the design of religious architecture or description of nature, the terms beautiful or elegant are not typically associated with infrastructure design, I believe combining infrastructure design with the latter proposes the idea for a new public infrastructure.

Religious or 'sacred' architecture types as they are commonly referred to in the modern world, have as Vincent Scully suggests in his essay "The Earth, The Temple, and Today" experienced a resurgence in the built environment. Towards the end of the 20th century "specifically religious structures as embodiments of the sacred were dwindling" (Britton, 2010) although protagonists argue modern architecture retained this sacredness. Vincent explores through precedent in the past and present what religious and sacred space is and how it is embodied in architectural form. To my understanding sacred space is embodied in the architectural form through its occupation and experience to the individual. How the architecture of the religious space is designed for its surrounding community and public interaction, I feel symbolizes its purpose. Religious space is designed for the people who inhabit it. With this in mind I feel a link is established between infrastructure and religious architecture types, both existing for the communities they are designed for, representing a possible synergy.

Nature, specifically the nature that exists on Kapiti Island becomes the sacred element the temple is paying homage to. A relationship between nature and our built environment has always existed whether it has been positive or negative. Many religious buildings have been designed with nature, however highway infrastructure typically is not. I believe Nature possess similar physical qualities to that of monumentality, Nature itself is monumental, a forever lasting material, powerful in experience, and sacred in its existence. I argue it is these similar qualities that allow the architectural language of monumentality to produce a successful synergy of religious and highway infrastructure types with nature. Designing with the language of monumentality creates a formal amalgamation of religious architecture and highway infrastructure, producing a temple and over bridge that read as one.

Through my design research a clear correlation between nature, highway infrastructure and religious architecture types arises. To my understanding the binary relationship between nature and religious architecture is defined through the sensory experience of the space. The way in which one moves through and experiences space, I believe becomes the fundamental element of the synergy I explore in my temple to nature's design.

> < **Figure 31.** *Final Proposal Model Photos.*

v ^ **Figure 32.** *Final Proposal Model Photos.*

> < **Figure 33.** *Final Review photos.*

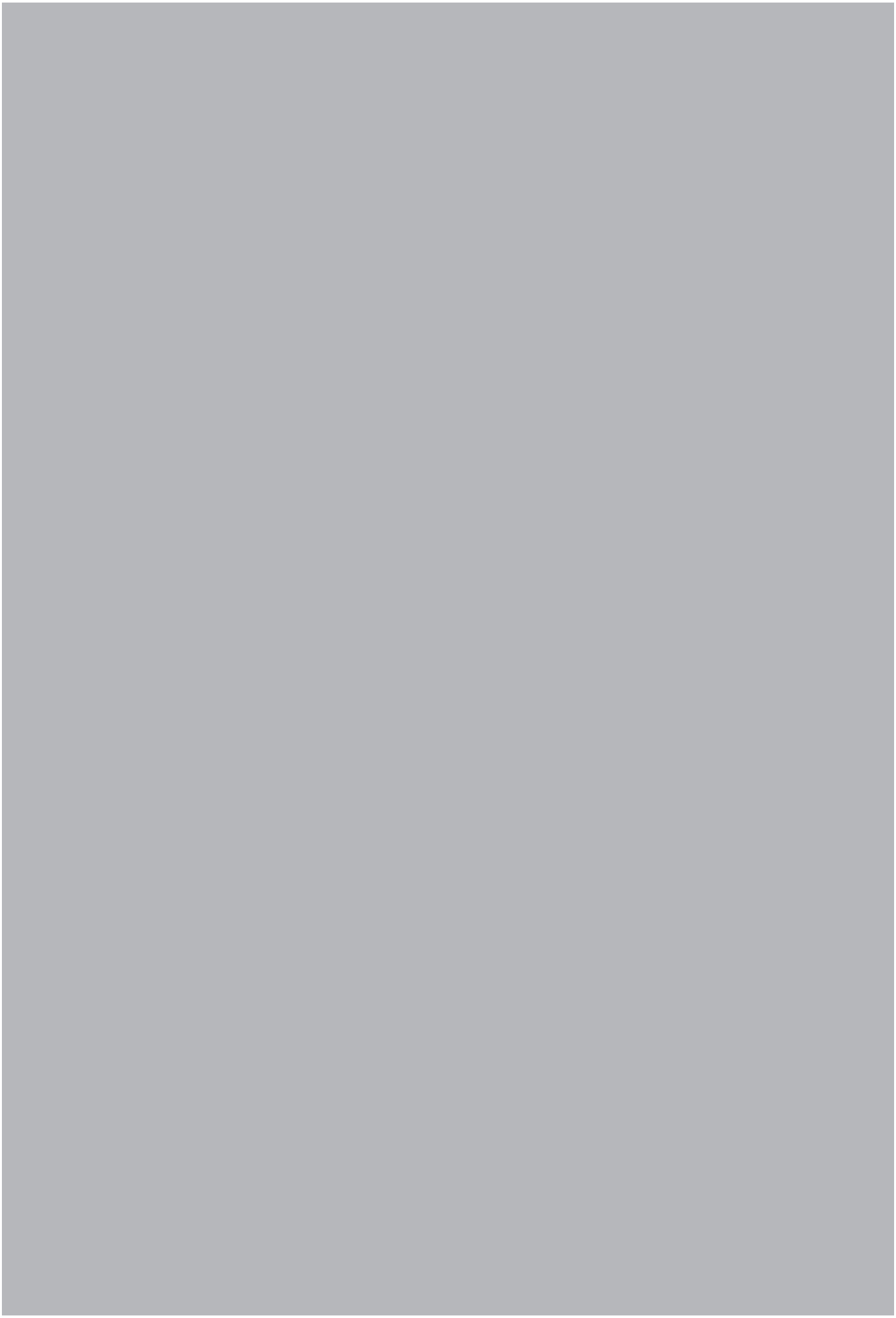

NATURE

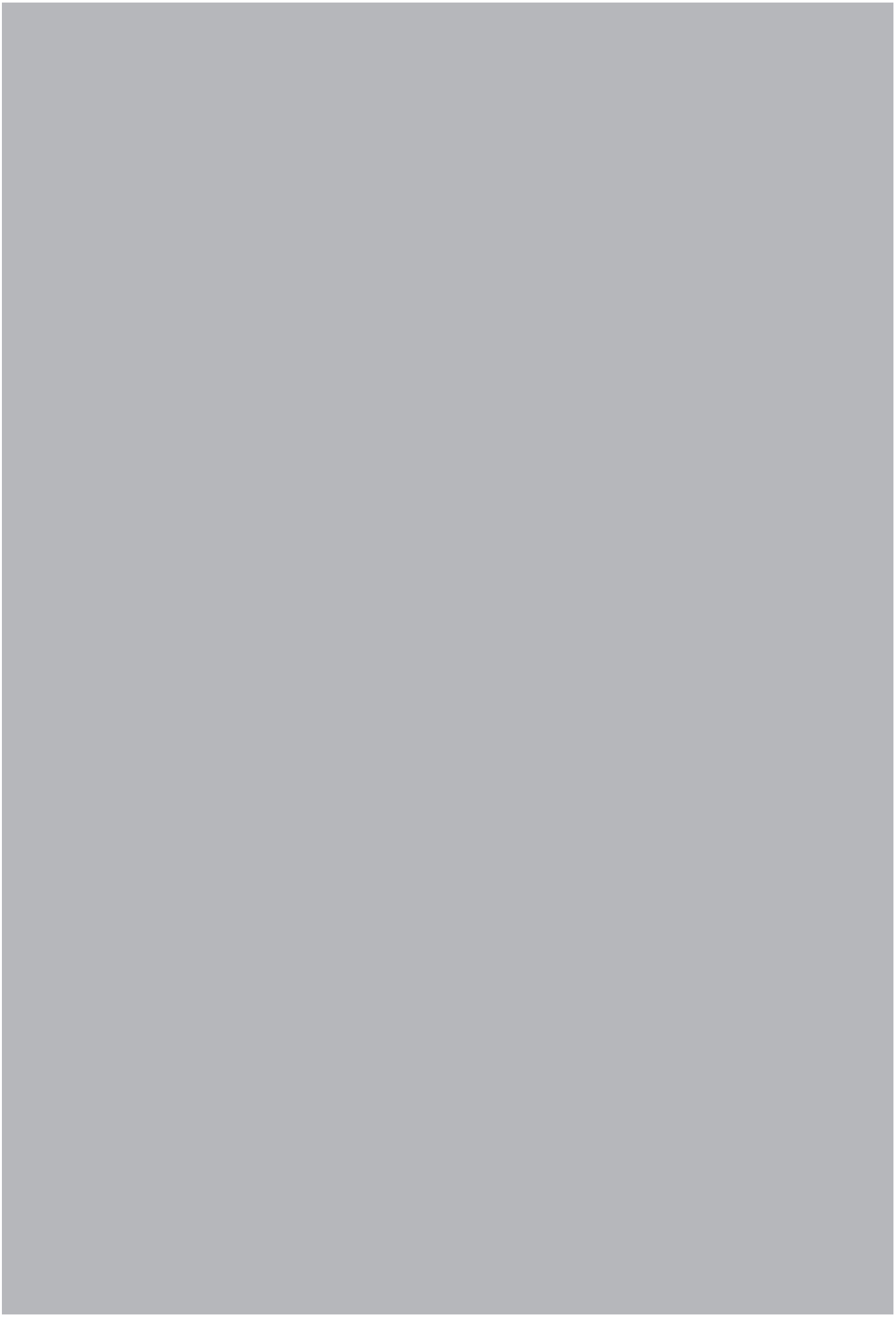
REFLECTION.

The new, speculative design for the Kapiti Visitors Centre explores the possible synergy of the typically opposite nature, highway infrastructure and religious architecture types. The envisioned temple to nature addresses the towns need for a gateway centre that establishes a link from the shop to beach front and Kapiti Island. It attempts to celebrate and protect the beautiful nature that exists on the island in order to evoke a sense of reverence towards the island as visitors make their way over. The design aimed to explore the architectural language of monumentality in order to succeed in developing a modestly scaled building that still imposed significance in the surrounding context. It was also used as way to investigate the possible synergy of architectural types. In doing so the design creates an interesting provocation, arguing for a possible new type of public architecture, one that incorporates religious space and infrastructure with nature.

The design process of the Temple to Nature became as insightful as the final product. Through the design, I gained an understanding into how a design led enquiry may lead to unexpected outcomes. . I explored numerous ways to understand form, composition and symmetry, all influenced by relevant precedent also addressing similar design issues.

The design process of the Temple to Nature became as insightful as the final product. Through the design, I gained an understanding into how a design led enquiry may lead to unexpected outcomes. I explored numerous ways to understand form, composition and symmetry, all influenced by relevant precedent also addressing similar design issues. The resulting form was rigorously attained through calculated subtractions, each subtraction was explored through a series of design iterations. The forms began chaotic and disjointed in composition, I continued to wrestle with the idea of elegance in form and scale. The idea of elegance began to be realised when the form started responding to things other than the aesthetic, like circulation, environmental conditions, and programme. This also became clear through the chosen method of exploration, beginning with a digital process but finishing with an analogue process. This shift in method became crucial in my understanding of monumentality, the analogue required more precision and rigour for each experiment, and this slowed down the process of each design experiment invoking a deeper understanding of each success and failure. I became stuck in the “Semi automatic result of interplay in arbitrary selection of (not always appropriate) parameters” (Berkel, 2006) within the free form digital world. I could rapidly produce forms through a digital test but results were to amorphous, they didn’t translate into feasible constructions. This reflection on the design methods has helped me understand their value in the design process, an understanding I feel will be applied in future design lead projects.

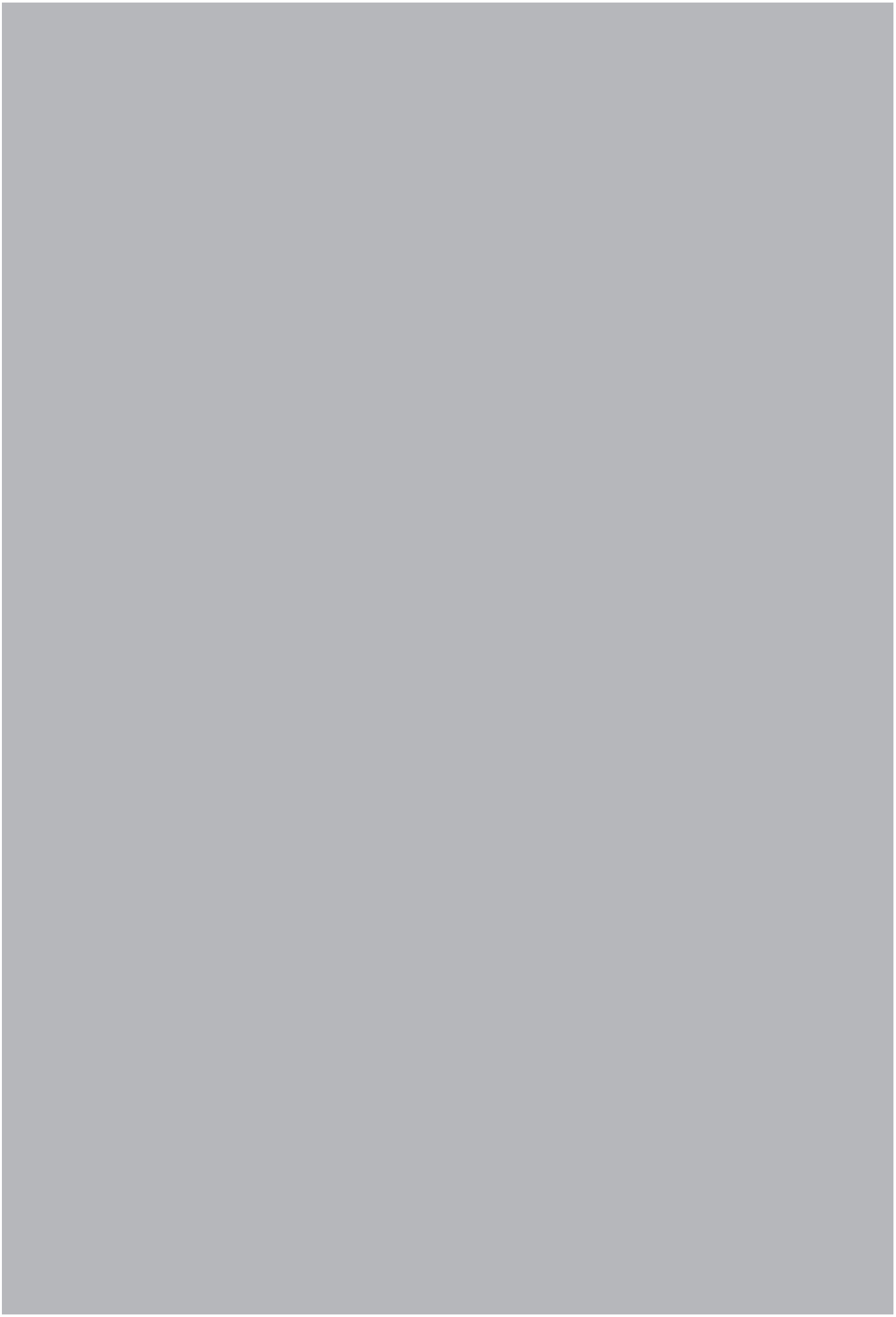




3.0

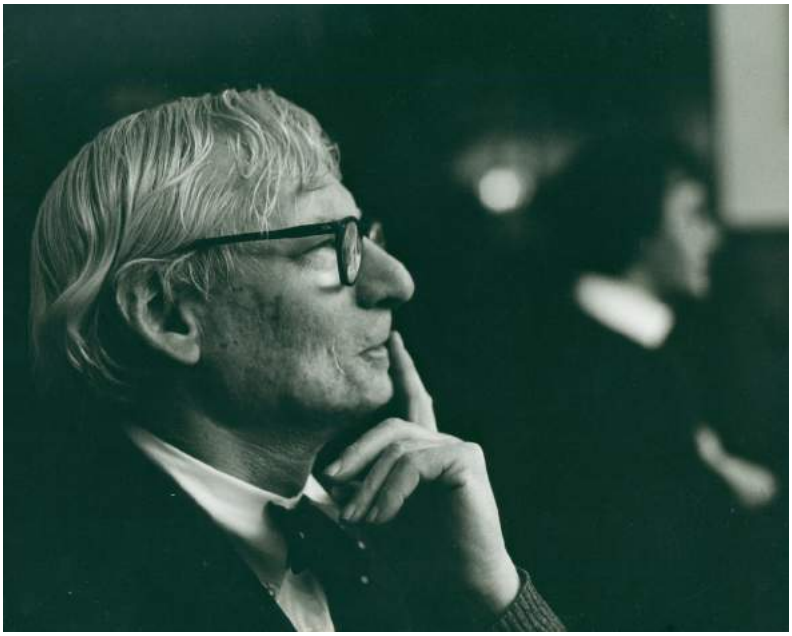
DISCUSSION:

MONUMENTALITY.
Concrete, Circles & Arches.



THE DISCUSSION.

The Temple to Nature has been presented as a provocation for a new type of public architecture, one that involves the synergy between highway infrastructure, religious space and nature. It responded to the problems of the area, the missing link from shop to beach front and island, and need for a gateway building that operated as a biosecurity checkpoint and departure space to the island. The imposing form of the design is attributed to an exploration and understanding of the architectural language of monumentality, and the influences of Louis I. Kahn a pioneer in monumental architecture. The following section unpacks the influence Louis Kahn had on the design, and more broadly discipline specific design processes and tendencies. Design experiments, successes and failures, are analysed and reflected, along with relevant literature and precedent studies that fed into the design lead research. This section is broke into three key parts, 3.1 Form, 3.2 Plan, and 3.3 methodology. Within these the traditional monumental qualities I was exploring, mass, volume and symmetry are divulged.



“A lot has happened in architecture since Kahns death, some of it good, some of it appalling - and each of us has a different idea about which is which. But all of it makes Kahn’s work look better than ever on its own terms, better in its solidity, its gravity”

- **Vincent Scully**

^

Figure 34. *Louis I. Kahn profile photo.*

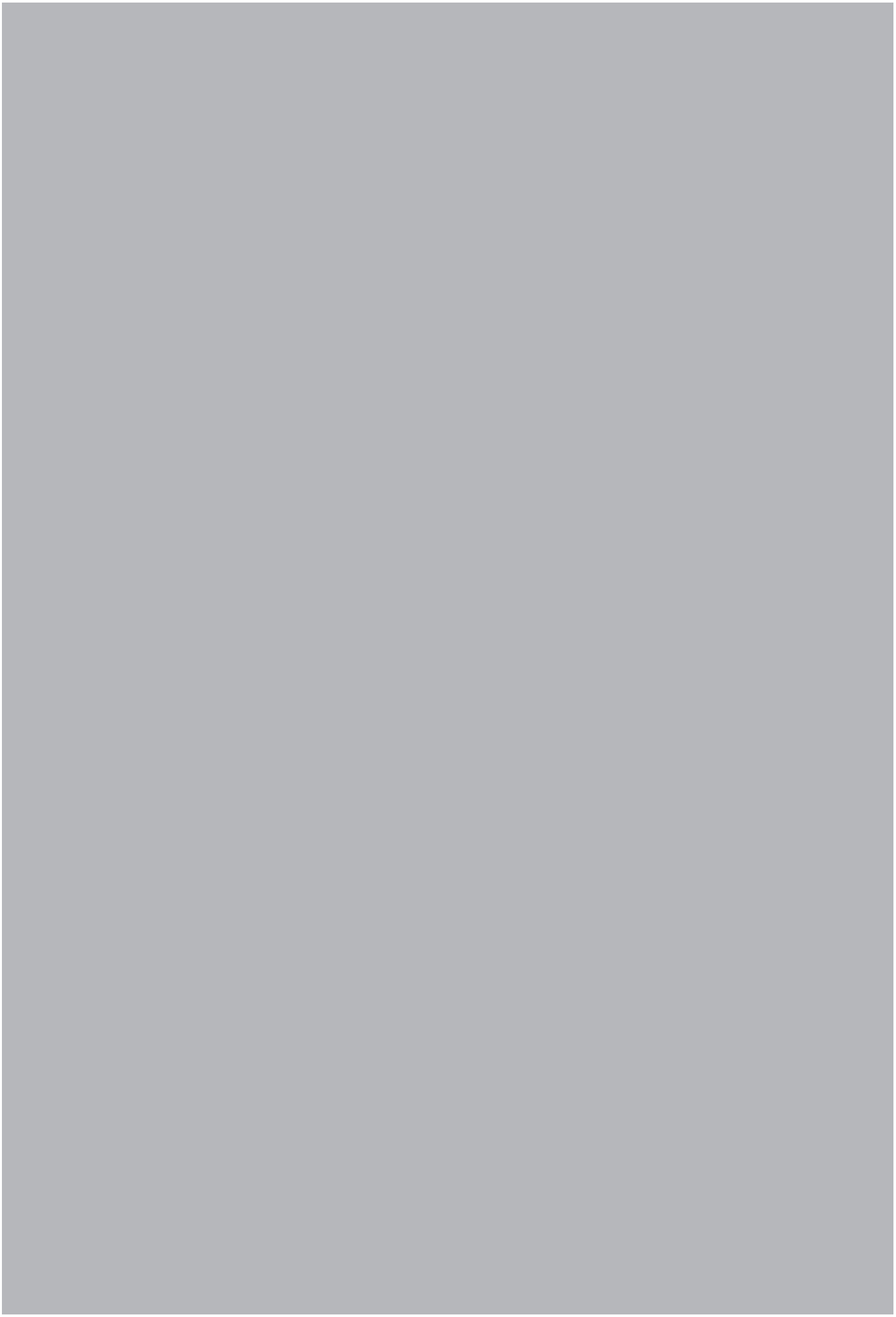
LOUIS KAHN.

The key protagonist for this thesis research was louis I. Kahn. He is regarded as one of the great 20th century architects, known for combining modernism with the weight and dignity of ancient monuments, because of this he is one of the pioneers for contemporary monumentality in architecture. This thesis investigated his buildings, built and unbuilt, his insights, and his design processes, methods, and tendencies.

Firstly his buildings the Trenton Bath House and National Assembly Building of Bangladesh were used as case studies to understand form and its role in the architectural language of monumentality. Kahn states “Form is what. Design is how. Form is impersonal, but design belongs to the designer.” (Merrill, 2010) Vincent Scully explains this as form characterizing a harmony of spaces good for a certain activity of man, and design being a circumstantial act, how much money is available, the site, the client, and the existing knowledge. This resonates with the Temple to Nature as its form is dependent on man’s occupation and experience of the space and the design is a response to the site and client.

Secondly his buildings are used as case studies to understand the composition and symmetry of a monumental buildings plan and section. Scully argues “A well-drawn floor/site plan will tend to unfold in the architects mind more fully, into more dimensions, than a stationary perspective or a sequential 3D model” (Britton, 2010) which is evident in all of Kahn’s design processes and final design drawings.

This then leads into analysis of Kahn’s design processes, methods and tendencies, all of which influenced the temples design and my understanding of monumentality. This forms my understanding of personal design methods and their application in the design process. It adds to the discipline specific discussion, how traditional design methods in architecture are responding to the rapid influx of the digital, “to what degree has our ability to reflect and conceptualize kept pace with the speed of our tools?” (Merrill, 2010).



3.1

FORM:

Case Studies + Design Evidence

THE TRENTON BATH HOUSE.

The Trenton Bath House (fig.36) “marks the crystallization of architectural concepts and images that Kahn was to develop later in larger, grander buildings” (Solomon, 1984). It is a modest structure, yet still exerts the same sense of monumentality as other buildings of Kahn’s, like the National Assembly building of Bangladesh. The bath house became the most important of case studies for the development of the Temple to Nature, developing an understanding of its formal qualities and the design process that preceded were crucial. Exploring the qualities of monumentality in the design, that like the Kapiti Visitors centre wrestled with size and scale, became influential.

The Bath House designed for the Jewish Community Centre, includes changing and bath rooms, checking facilities, pool director’s office, and chlorination plant. The careful articulation of these programs help develop the “aggressively simple” (Bierig, 2010) form. The way in which Kahn infuses historical forms like the pyramids with the modernist cubiform volumes produces a truly elegant result. The use of the historical form of the pyramid evokes a sense of power and dominance that is associated with the pyramids in Egypt. As like other projects Kahn seeks inspiration and influence from classical architecture in order to develop his language of monumentality.

The symmetrical arrangement of these bold geometric pyramids create a cruciform plan (fig35) that centralizes the main atrium space. The classical symmetry of the cruciform plan I believe creates a religious or sacred essence in the experience of the form and perception of it. The proportion of the strong geometric forms are elegantly simple, structurally resting atop of columns at each corner Kahn carefully demonstrates the “transference weight to the ground” (Richards, 1994).

To my understanding, Kahn’s masterful curation of bold geometric forms are the key aspects to the sense of monumentality generated in his Trenton Bath House. The elegance achieved in the mass and composition of the forms is what I strove to achieve in design lead experiments for the Temple to Nature. Facing a restriction on scale “embracing the initial assignments limited program and scarce means” (Bierig, 2010) the Trenton Bath House formal aesthetic and spatial experience emphatically generates a sense of monumentality, one that aims to be replicated in the Kapiti Visitors centre facing similar issues.

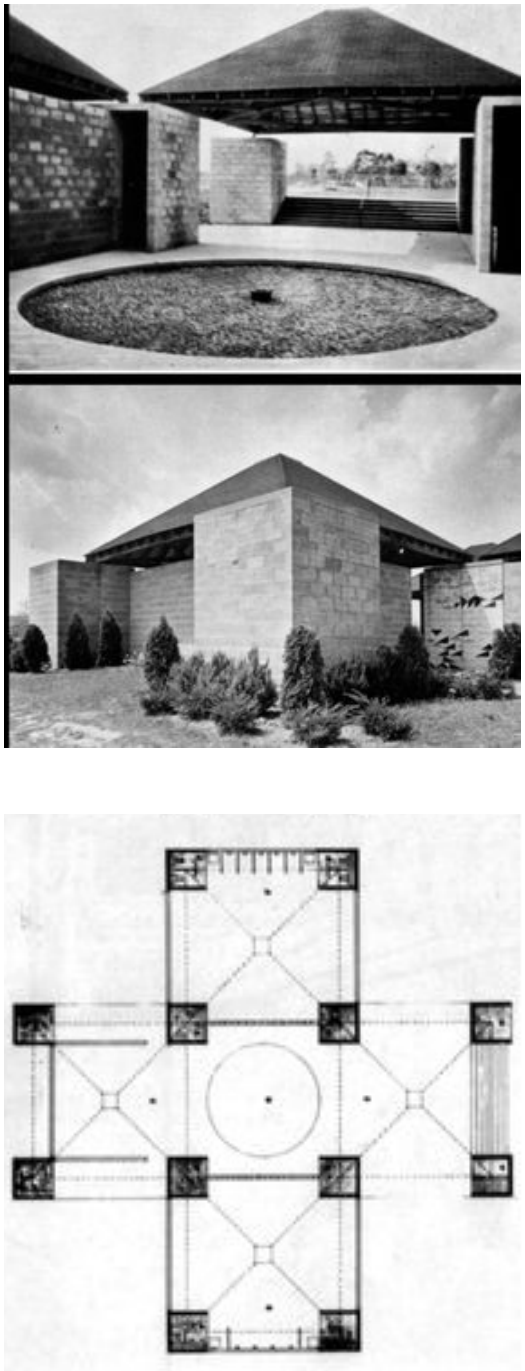


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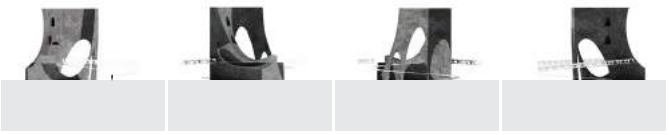
Figure 35. *Louis I. Kahn Trenton Bath House Building perspective & Plan.*

FORM.

Form experiments investigating scale, composition, and proportion became the crux of the design lead research. The design series in (fig.37) was inspired by the analysis of Kahn's Trenton Bath House, exploring the typical monumental qualities mass, volume and symmetry. Completed using a 3D modelling program the bold geometry of a circle and cylinder were manipulated in freefrom in order to understand the formal possibilities in relation to site and context. The resulting forms, although exhibiting some traits of elegance in the arches created were judged to be to chaotic, lacking the "structural clarity and pure classical symmetry" (reference) found in the Trenton Bath House. The parameters of scale and volume of the site were quickly realised however.

>
Figure 36. *Digital Form Design Series.*



FORM.

This series of form experiments (fig.38) explored different compositions of masses and volumes of varying geometry. The experience of each form created was evaluated through section or interior perspective. Here like Kahn's design of the Bath House the masses were generated in relation to their designated programme, pushed and pulled achieving the desired volumes. The results were judged to be formally uncontrolled and not an elegant composition of geometry.

>
Figure 37. *Digital Form Design Series.*

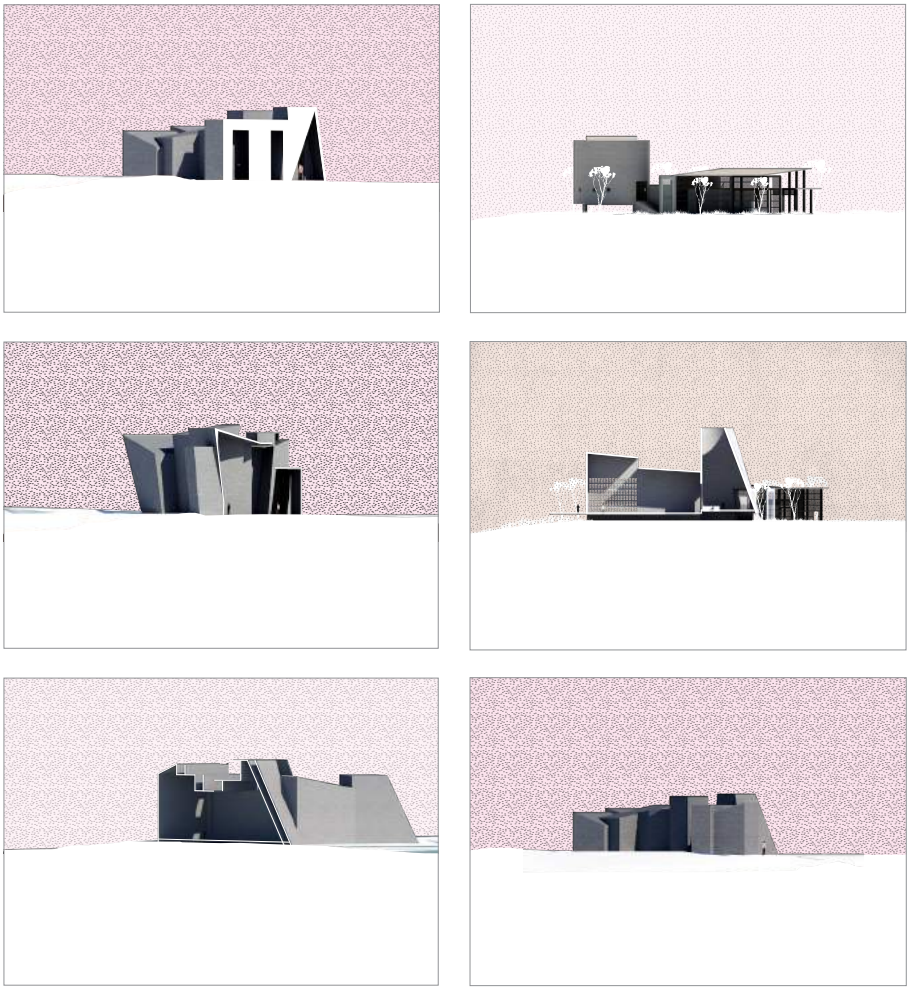


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Figure 38. *Digital Form Design Series.*

FORM.

The experiments exploring compositions of masses and volumes of geometry continued through the use of 3D modelling software (fig.39). Compositions could be rapidly tested and evaluated but the results continued to produce inelegant forms, this is when a tension between digital and analogue design methods began to arise.

NATIONAL ASSEMBLY BUILDING.

The National Assembly Building of Bangladesh (fig.40) "represents the culmination of the development of a design ideology" (Ksiazek, 1993) with which Kahn had been struggling with since his earlier works like the Trenton Bath House. Specifically an ideology of monumentality and how it can be used to "express the aspirations of civic living" (Ksiazek, 1993). The formal qualities of the National Assembly Building represent the continued struggle with monumentality and similar motifs that are derived from the design of the Trenton Bath House. Analysing the form of the Assembly building allowed me to understand how Kahn masterfully created a monumental building, typically modernist in nature. Modernist architecture was often described as utilitarian and void of context, Kahn however contradicted this and expressed the Bangali people and region through formal language. Kahn successfully designed through formal ques a building that was a monument to the people of Bangladesh and their Democracy, symbolizing a new hope after independence from Pakistan in 1971. The sheer size and mass of the building evokes the sense power and solidity of the now democratic government, "he conceived the National Assembly building as a monument to the democratic ideals" (Ksiazek, 1993).

The design of the Assembly Building's form like the Trenton Bath House, is an elegant composition of bold geometric volumes. Kahn again draws inspiration from classical architecture seeking to use "the great monumental techniques of the past: two grand axes sweep toward the climatic capitol, which is separated from the city and reflected in water surrounding it"(Ksiazek, 1993). His strong geometric penetrations in the buildings facades are abstracted forms inspired by traditional Bangali culture, intended to symbolize His strong geometric penetrations in the buildings facades are abstracted forms inspired by traditional Bangali culture, intended to symbolize "a marriage of old and new cultural identities" (Ksiazek, 1993). This contradiction to typical modernist architecture allows the people of Bangladesh to form a connection with the architecture, grounding it within its context.

Kahn expertly composes the scale of the National Assembly, softening the massiveness of the overall monumentality, something I wrestled with the design of the Kapiti Visitors Centre. He does this through the management of scale on the elevation "which pulls the viewer into a bodily relationship with the building" (Larson, 2000). Architectural elements are purposefully arranged according to the experience at the human scale in order to develop this relationship, like the marble bands on varying facades which appear every 5 feet creating a comfortable reference to the human body.

The geometric volumes achieve their monumental presence through verticality, the share height from afar and up close emphasises the weight of the structure. I feel the proportion of these volumes becomes crucial, if they become disjointed in size the forms composition detracts from the overall sense of monumentality it is trying to achieve. The way these bold geometries, like the cylinder and cuboid, intertwine becomes iconic in the Kahn vernacular. This mediation of geometries is something I explored through design lead experiments for the Kapiti Visitors centre. To my understanding it is the masterful composition, scale and proportion of these volumes which represent Kahn's developed monumentality. The careful articulation of pure geometries like the cylinder in relation to architectural elements at the human scale is what helped me develop the Temple to Natures form. to architectural elements at the human scale is what helped me develop the Temple to Natures form.

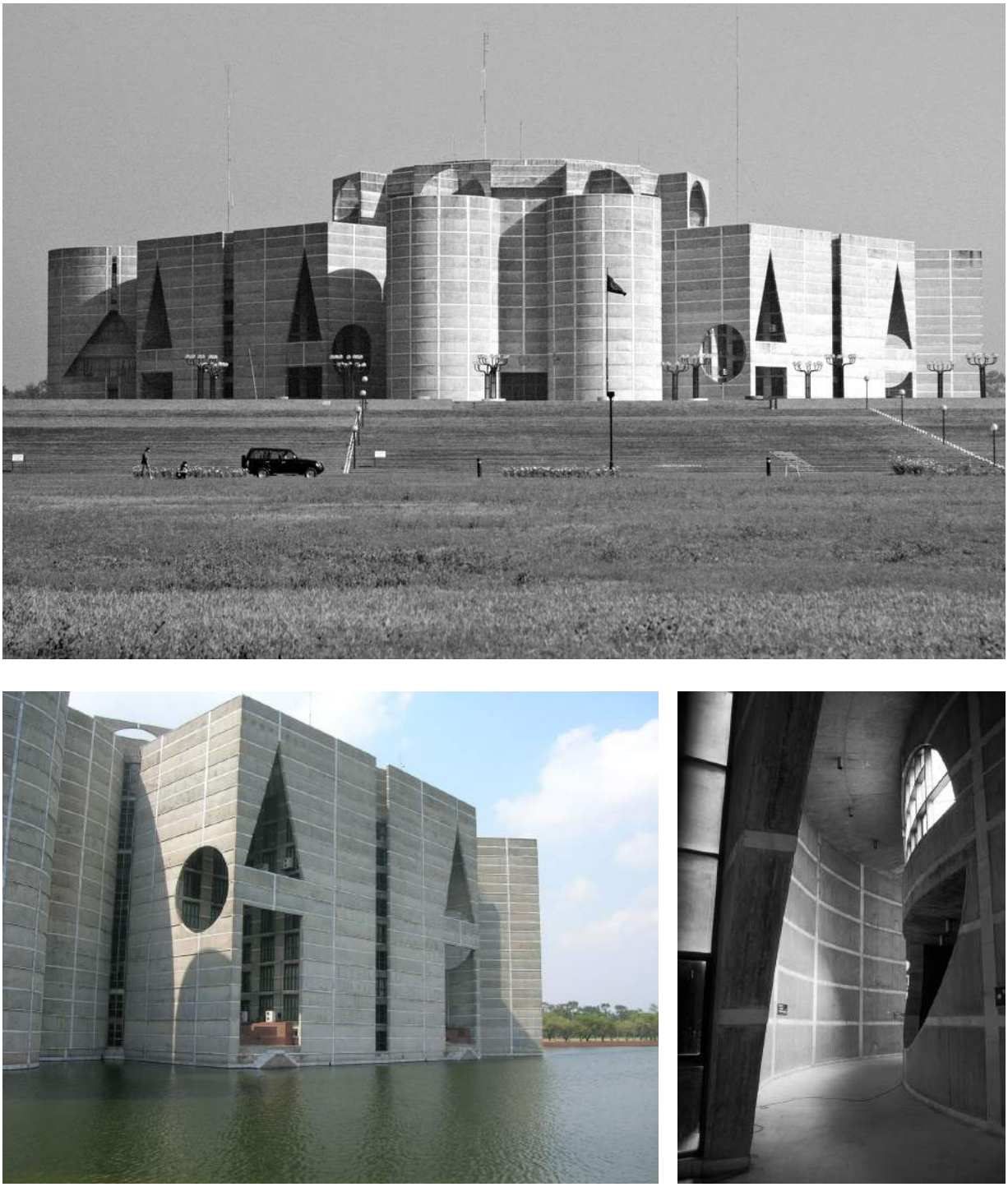

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Figure 39. *Louis Kahn National Assembly Building of Bangladesh photographs.*

FORM.

The following collage of images (fig.41) is evidence of my design experiments. Using Kahn's National Assembly building and the analysis of its formal language I explored using a 3D modelling program varying compositions and scales of geometries. I had a fascination with the circle and cylinder derived from the form of the chosen roundabout site. Whilst exploring these geometries I constantly evaluated the spaces they created and the relationship this had at the human scale. Like the Trenton Bath House to my understanding the sense of monumentality is generated through the perception and spatial experience of the National Assembly building "Imposing as the building is, it shows an attention to the human scale and path which inspires the user to feel not only awed by the grandeur of the place, but also empowered" (Ksiazek, 1993). The resulting forms however lacked clarity in the structural design, continued experiments in the digital realm produced unbuildable designs.

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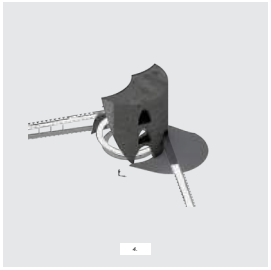
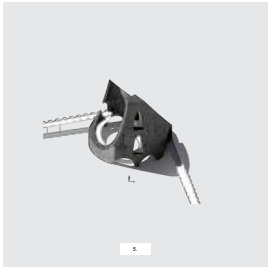
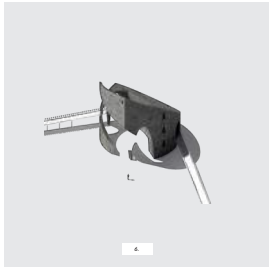
Figure 40. *Digital Form Design series exploring scale and composition.*

Circle

Oval



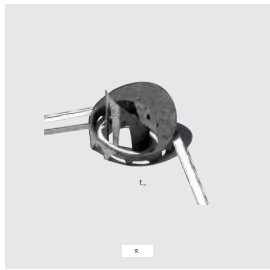




Circle

+

Oval



Circle

+

Oval

+

↑

Verticality

FORM.

As my fascination with the pure geometry of a circle and massing of a cylinder developed, I proceeded to undertake more rigorous form experiments. I explored subtraction as a method to obtain the elegance in composition, scale and proportion I strived for (Fig.41). Each subtraction was dependent on either circulation, view shafts, programme, or environmental and site conditions. This began to produce forms that were less chaotic as the previous, an elegance in the curvature of the form began to arise. Materiality began to be explored with concrete, typical of monumental buildings being chosen. Like Kahn's Assembly building each design explored verticality in form in order to convey the sense of monumentality at the human scale.

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Figure 41. *Digital Form Design series exploring subtraction.*

Figure 42. *Concept Proposal Exterior Perspective.*

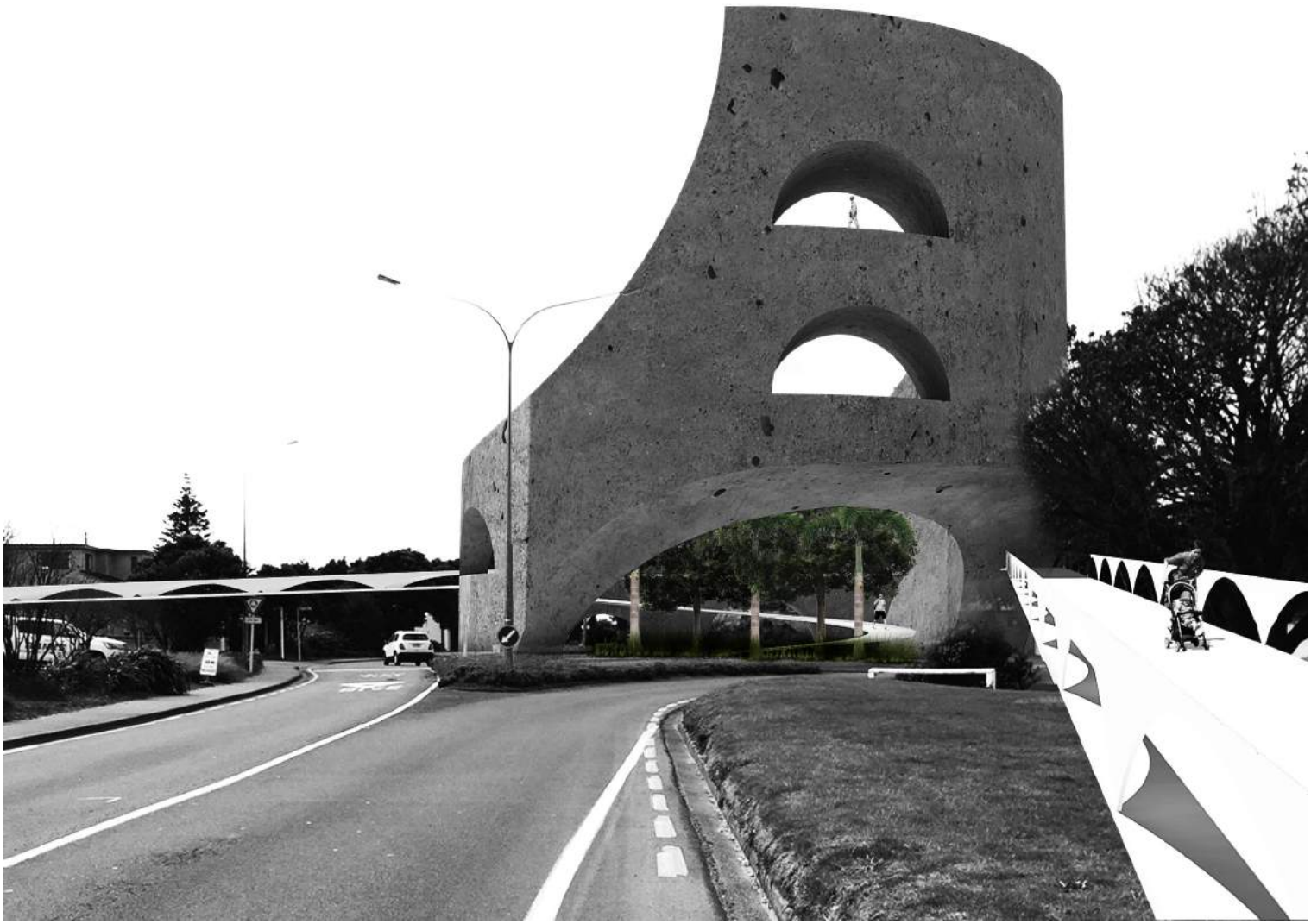
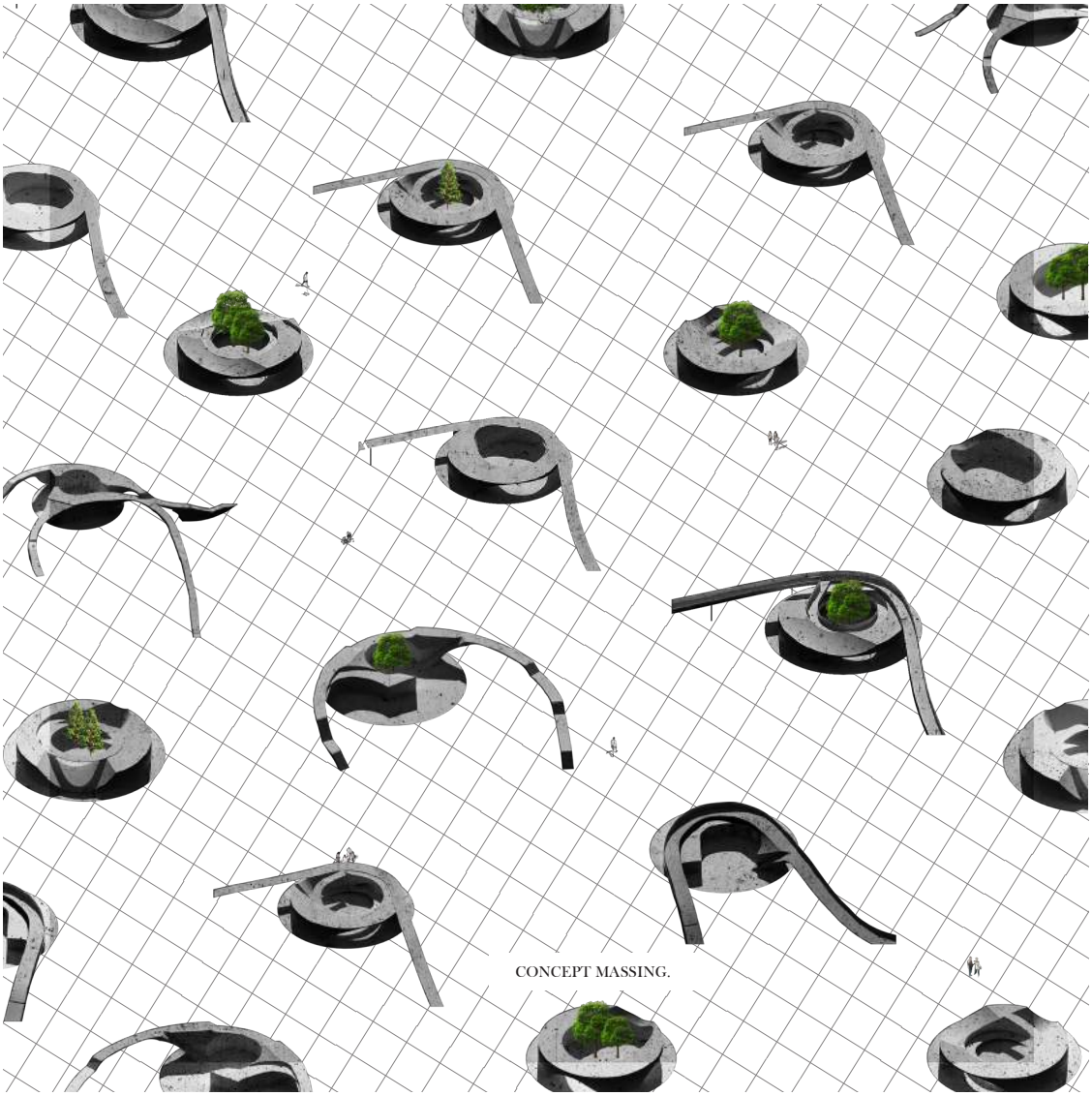


Figure 43. *Concept Proposal Exterior Perspective.*

V

Figure 44. *Concept Proposal Exterior Perspective.*

Figure 45. *Concept Proposal Exterior Perspective.*



CONCEPT MASSING.

FORM.

Design experiments involving the subtraction of circle and cylindrical masses continued to be explored (fig.47). The curvature of the forms produced for the building were also translated into the form of the infrastructure. The entire design process thus far exploring form had all been completed in the digital realm, upon reflection an interest arose in changing the current method to analogue.

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Figure 46. *Digital Design Series exploring infrastructure form.*

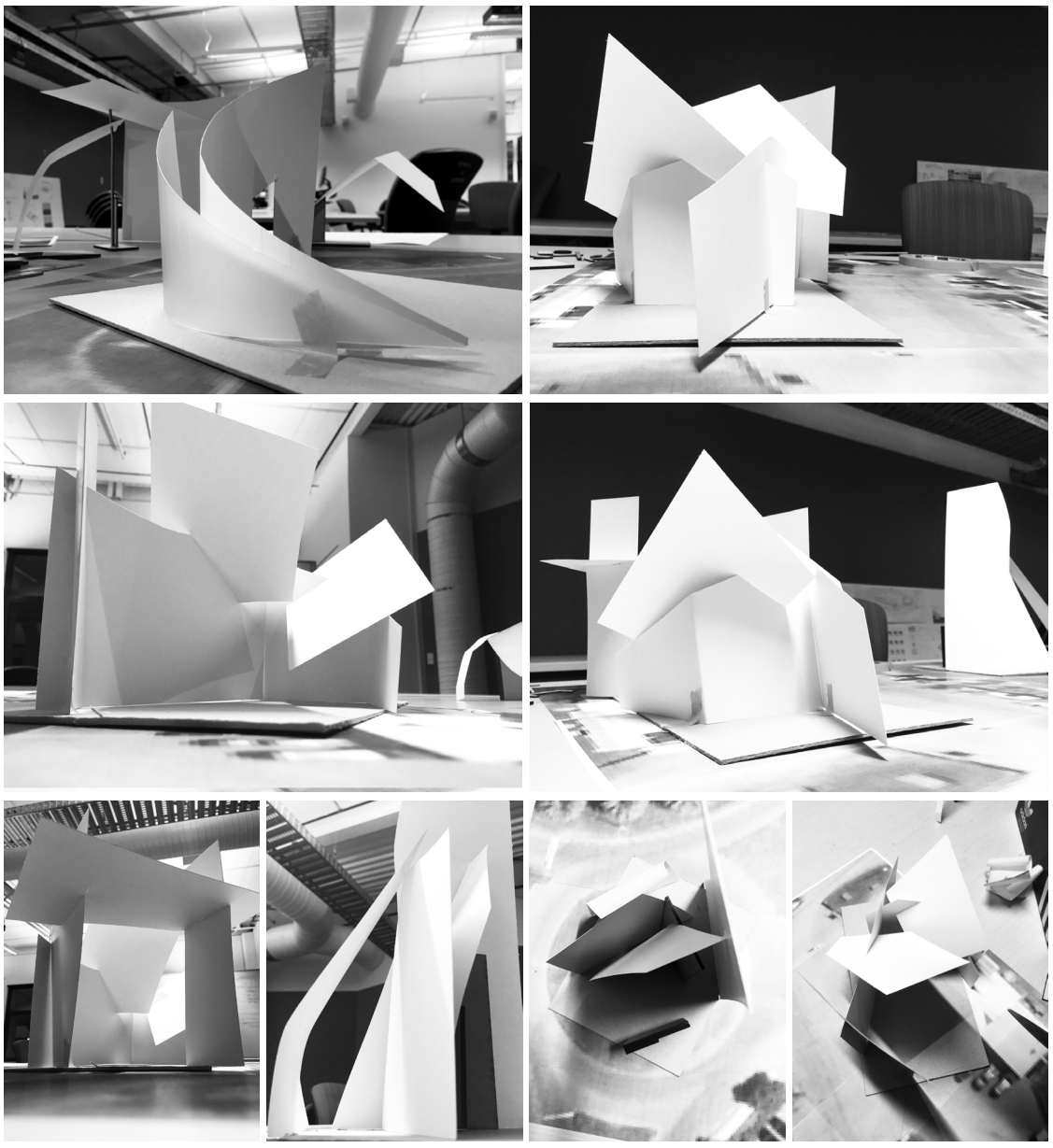

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Figure 47. *Physical Model Series exploring form.*

THE ANALOGUE FORM.

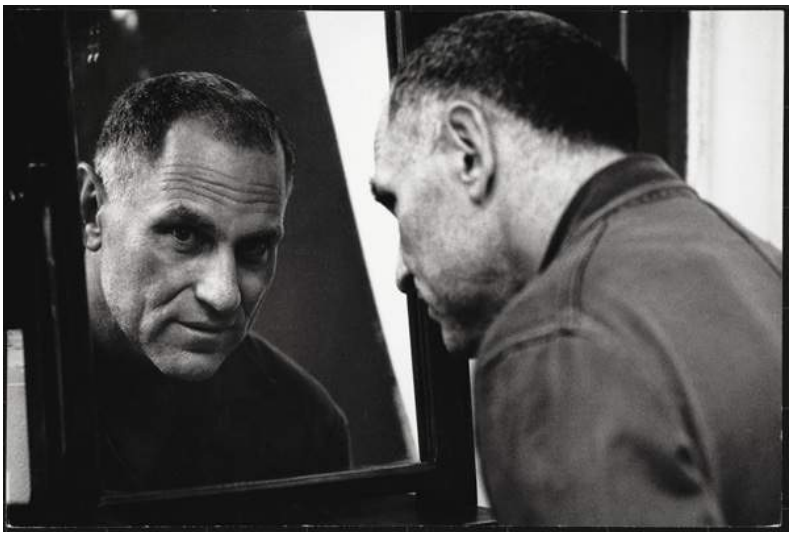
The continued experiments in the digital realm began to find clarity in form, however the decision to explore the analogue method, specifically physical modelling was made. I began with simple experiments involving the manipulation and fold of paper (fig.48), further exploring the spatial qualities of curved forms previously created in the digital realm. I quickly learnt the sculptural properties of the curved profile and this intrigued me. Through photographing each composition of curves certain spatial qualities were realised, how the light enters and refracts within the space, how the body of movement would be affected, and how perception could be altered through angle and proportion. I took inspiration from Kahn's use of bold geometries to build aggressively simple yet elegant designs.

RICHARD SERRA.

The transition of method from digital to analogue proved crucial in developing an understanding of monumentality and its formal language. The early experiments with the paper modelling allowed me to view the overall form design from a different perspective. In previous projects digital modelling existed as my preferred method, a reliance on it was evident, exploring physical modelling further became intriguing. I began an investigation into sculpture and architecture and how, even if, there was an existing relationship with monumentality. This led me to the preeminent figure in the international art scene, Richard Serra.

Famous for his work in museums and public and private outdoor installations, Serra explored the very nature of sculpture with his monumental designs that challenged the way we see and experience space.

Some argued his art even entered the realm of architecture, however Serra always opposed this by stating his work other than aesthetic and experience was functionless “art is purposefully useless and that’s what makes it more free than buildings” (McShine, Cooke, & Museum of Modern, 2007). Through my design research I believe an interesting link arises between Serra and Kahn and the way they achieve monumental designs. Serra always “deals with single units because it’s purer” (McShine et al., 2007) much like Kahn uses bold geometric forms in his designs. To develop a better understanding of Serra’s perception of monument design I analysed two of his most famous installations: the Torqued Torus inversion and sequence at MOMA. I sought to feed my understanding of Serra’s case study back into the design of the Kapiti Visitors centre.



“There is to many constraints in architecture, architects have to deal with a whole host of functions that are not an aesthetic”

- **Richard Serra**

^
Figure 48. *Richard Serra Profile Photograph.*

TORQUED TORUS INVERSION & SEQUENCE.

The Torqued Torus Inversion (fig.50) and Sequence pieces (fig.51) at the MoMA are some of Serra's most popular works. Free standing and specific to no one site, the torqued series of his work have often been labelled his most "affective sculptures"(Serra, 1994). "Rough simplicity is its genius" (Serra, 1994) the forms that Serra achieves in his sculpture through the careful manipulation of singular steel pieces are elegant and pure, like Kahn's aggressively simple formal design.

The Torqued Torus Inversion design consists of two steel enclosures, these are described by Serra as "imagining two bicycle rims on the ground almost 13 feet high, pulled into ovals then twisted like bottle caps so that their tops and bottoms end up at right angles to each other" (Serra, 1994). With one enclosure leaning inward and the other outward, the sheer elegance and experience of the space generated by the forms cannot be fully appreciated except firsthand.

The Sequence design is described as "two different spirals connected, both ends you have the choice of entering through one or two openings. One will lead you to the containment of an interior space; the other will direct you into a seemingly endless path between two leaning walls" (McShine et al., 2007). I believe the journey through the 'inside' and 'outside' of these pieces is where Serra exposes the user to kind of experience normally unavailable, evoking a sense of awe and empowerment. The sheer size of these sculptures laments the argument for their inclusion in the discussion of architecture, however I believe because of Serra's aesthetic driven intentions the purity of the functionless forms excludes themselves. The art does however originate from similar design principles as my architecture, being the subject matter of the person and how they walk through and experience space.

It became fascinating to me the way Serra conducted his design process, the steel torus series is a culmination of years of exploring sculpture through different scales and material like rubber (fig.52). The larger forms were preconceived at much smaller scale using the hand, which Serra states "is the fundamental process of the sculptor" (McShine et al., 2007). His perception of art and architecture caused me to reflect on my own perception of form and how sculptural principals may feed into my design process. I began to think about the positive and negative space that is created from the curvature produced through my subtracted forms and how this could influence the monumental experience.

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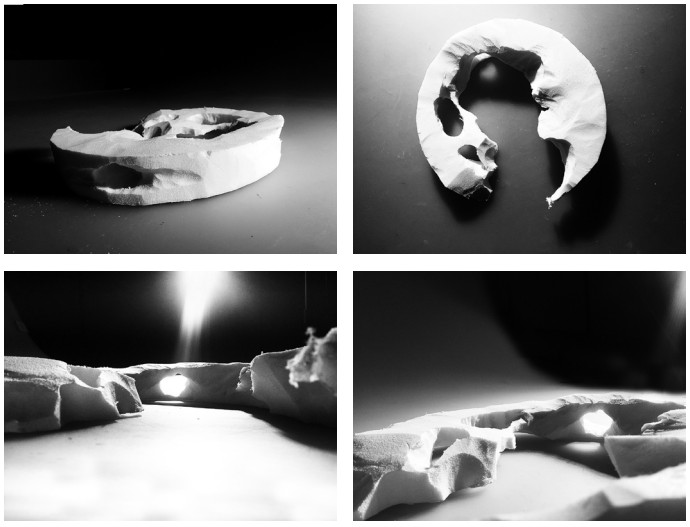
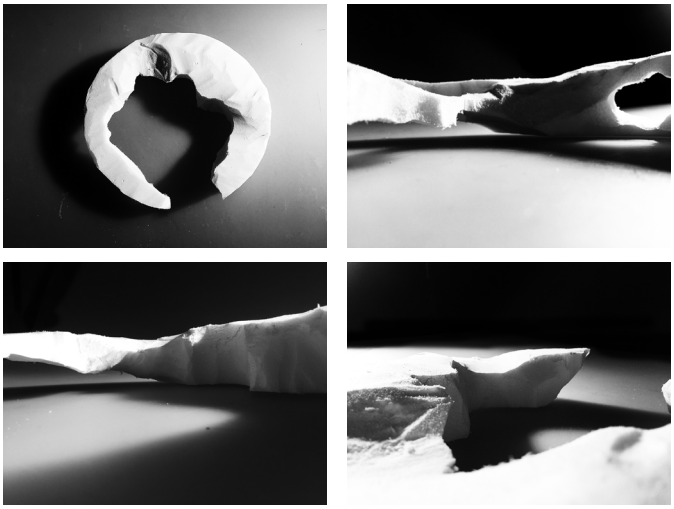
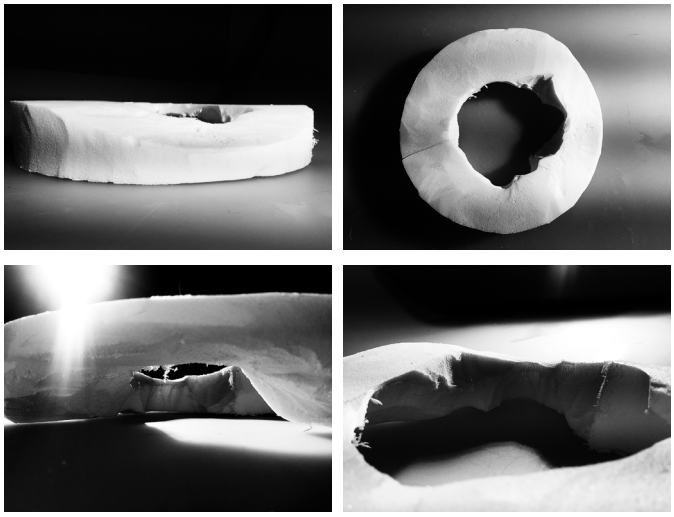
Figure 49. *Richard Serra Torqued Torrus Inversion.*

Figure 50. *Richard Serra Sequence.*

Figure 51. *Richard Serra Process Models.*







Understanding Sculpture.

Influenced by Richard Serra and the analysis of his sculpture I decided to further my understanding through continued design experiments involving physical modelling. I sought inspiration from Serra's early hand developed forms (fig.52) and decided to continue my previous method of subtraction from cylindrical and circular masses. This time however I was more rigorous with my experiments, each model was to a 1:100 scale and the chosen material was gold foam because of its physical properties that were similar to that of concrete. The gold foam allowed me to, through the use of specific tools carve out each subtraction by hand. This method created an element of unknown, I let the tools dictate the outcome of the form which I believed felt more organic. As my ability to use the tools increased more controlled subtractions were executed, producing to my understanding more elegant forms. Through photographing each series of models (fig.53) to scale I could understand how light influenced the experience of the space as it cast over the form work. With these photographs I began to superimpose varying models onto site images in order to test different spatial experiences. I began to feel more confident with my formal moves, the organics of designing with the hand felt more fluid than designing in the computer.

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Figure 52. *Physical Models exploring sculpture.*

Figure 53. *Physical Models exploring sculpture in context.*

v

Figure 54. *Physical Models exploring sculpture in context.*

V

Figure 55. *Physical Models exploring sculpture in context.*

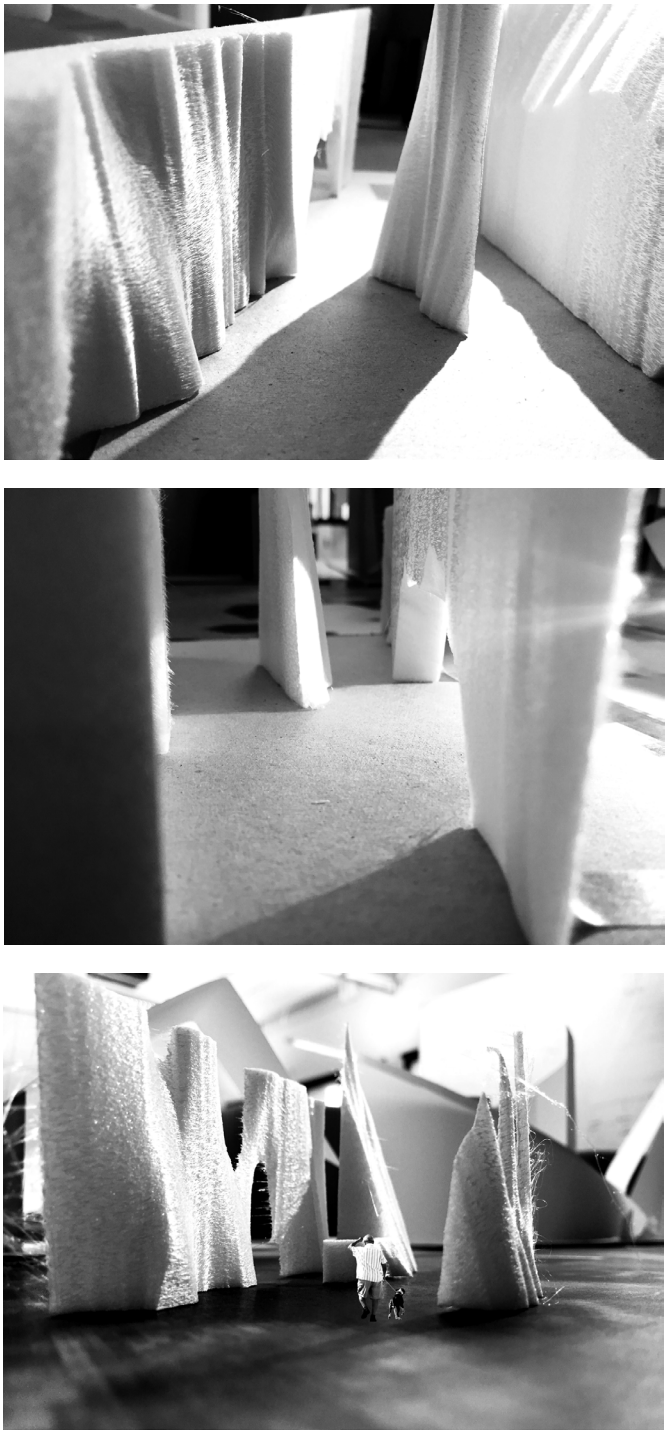

Figure 56. *Physical Models exploring sculpture in context.*

v

Figure 57. *Physical Models exploring sculpture in context.*

v

MONUMENT VS MONUMENTALITY.

To my understanding it is typical when imagining monumentality to envision enormous uninhabitable monuments like synagogues or holy relics. Whilst exploring sculpture through physical modelling I began to find it hard to develop forms which were more architectural than sculptural. The forms created were judged to be more like the typical monument rather than a building exerting monumentality. I was sculpting masses that became more elegant and monumental in form, however they lacked function which is what Serra stated was the way to differentiate sculpture from architecture.

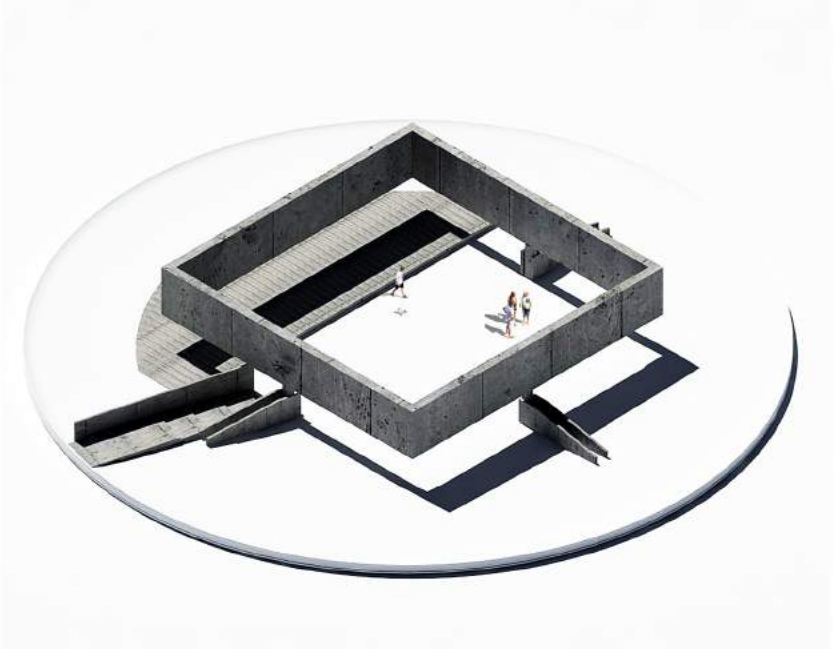

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Figure 58. *Gino Valles Monument to The Resistance.*

Figure 59. *Replicated digital model.*

MONUMENT TO THE RESISTANCE.

To understand the differences between monuments and monumental architecture I explored relevant case studies which satisfied both. This led me to Gino Valle's Monument to the Resistance in Udine, Italy (fig.59). Gino Valle was an Italian architect who specialised in city and regional planning. His Monument to the Resistance was erected on a roundabout in the centre of Udine, it acts as a reminder of the horrors experienced during Nazi invasion in World War Two. Monumental in size, the form is strong geometrically with Valle contrasting the circular roundabout with a pure square.

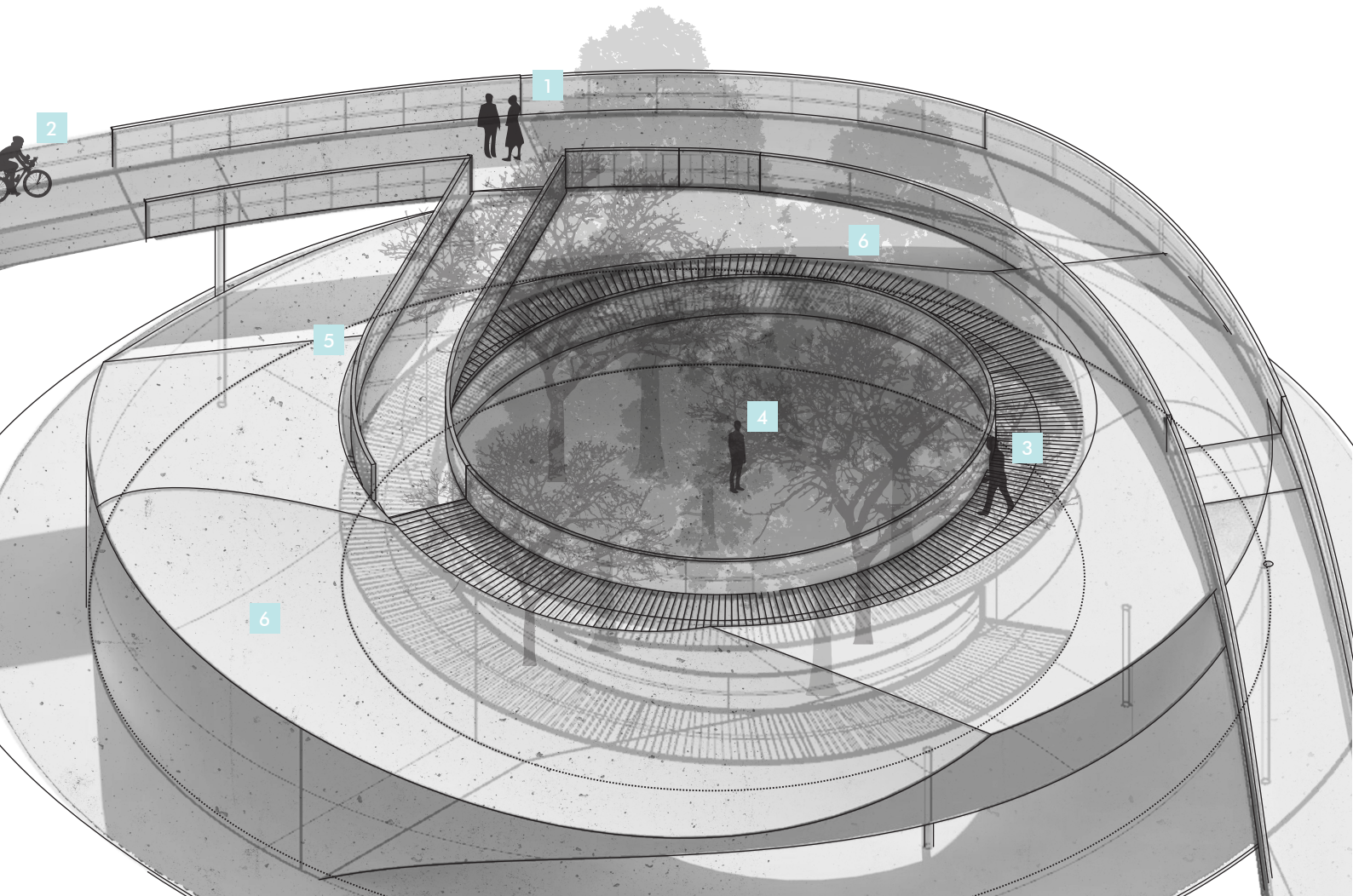
Just like my proposal for the Kapiti Visitors centre the Monument to Resistance is experienced as visitors to the town circle the roundabout. As visitors circle the monument they witness how grand the structure truly is, the monumental form is merely supported by three pillars at the centre of three faces. I believe this conveys Valles emphasis on precision and craft when it comes to the design of his form work.

The square form contrasts the elegant urban planning that surrounds it, reminding Udine residents of the sacrifices of war and the liberation and values of freedom and democracy that Valle supported (Irace, 1989). The weight of the structure I believe symbolizes the monumental struggles of the past and how close Udinese liberation came to be lost forever.

I chose to replicate Valles monument using a 3D modelling program in order to understand its design properties like scale and proportion (fig.60). The form delicately sits atop of the pillars allowing view shafts from the centre out and from the outside into the centre. A calming sense is created with the sound of running water from the fountain, encouraging reflection as one passes under. Other than its symbolic quality and spatial experience the monument is functionless, this is again what I understand differentiates monuments and monumental architecture. Without added function like program I believe the monument exists in the realm of art rather than architecture, it is monumental but does not communicate the architectural language of monumentality found in Kahn's buildings.

CONCEPT PROGRAM

1. *Pedestrian Overbridge*
2. *Cyclist Overbridge*
3. *Shared Spiral Ramp*
4. *Forrested Courtyard*
5. *I-site*
6. *Gallery Space*
7. *Bio-security Space*



PROPOSAL ONE.

At the 6 month mark the culmination of my design lead research produced my first proposal for the Kapiti Visitors Centre (fig.61). This was the first chance to obtain design feedback on my proposal which had been heavily influenced by form experiments. Experimenting with different methods lead to a sculptural form designed through physically subtracting from a mass using various tools. This subtracted mass was and then translated into the digital realm using the computer modelling program Rhinoceros 3D. Constructed entirely from concrete the design included a thin steel over bridge that wound down into the circular courtyard space. The proposal received positive feedback at the review in terms of form development, however it lacked programme and the relationship between the envisioned religious architecture and infrastructure didn't cohesively read as one language. Upon reflection I decided to push the design further through exploring spatial planning, using the plan to influence the form development.

Figure 60. *Proposal One Exterior perspective.*

Concept Mo

Courtyar

Figure 61. *Proposal One Exterior perspective.*

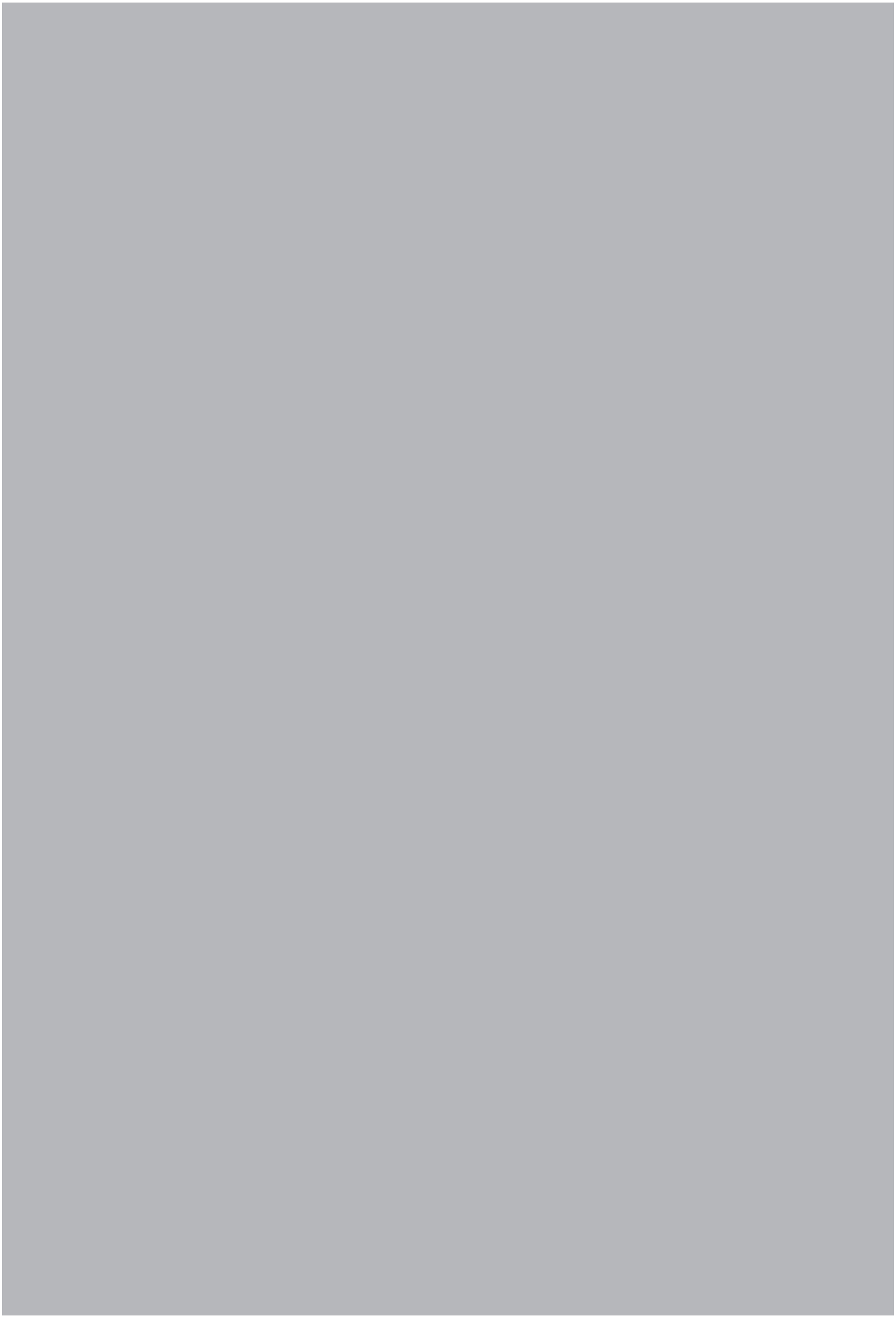
ODEL VISUAL.

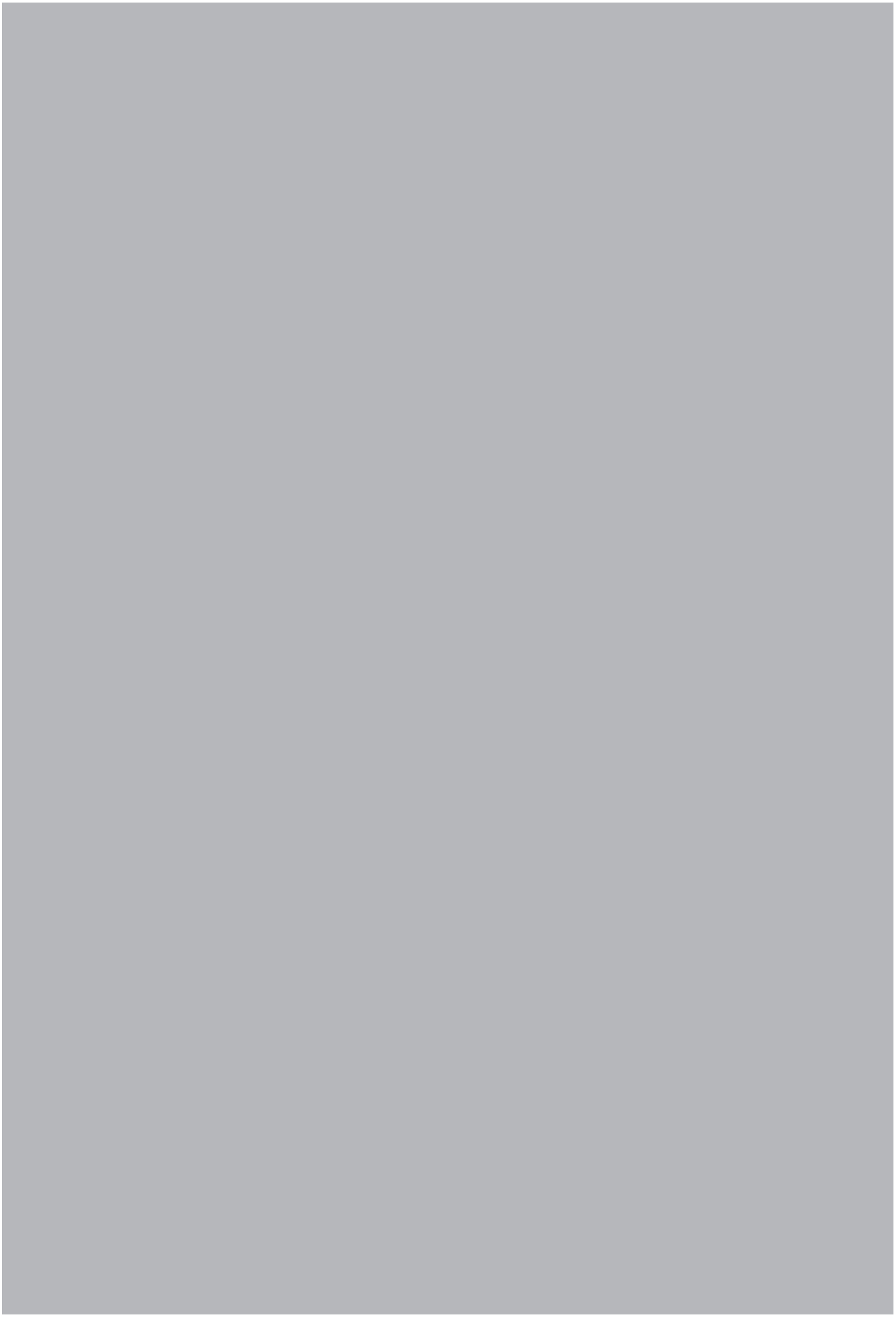
RD SPACE.

Figure 62. *Proposal One Physical Model photographs.*

Reflection.

This section demonstrated my design exploration of form and how form develops the architectural language of monumentality. Through analysing the form design of two of Louis Kahn's most iconic buildings, the Trenton Bath House and National Assembly Building of Bangladesh, I developed an understanding of Kahn's monumentality and used this to influence my own design of the Kapiti Visitors Centre. During this form study I also explored Richard Serra and his form ideals in sculpture and monumentality. Analysing two of his iconic pieces the Torqued Torus Inversion and Sequence changed my perception of design methodology and spatial experience. This change caused me to shift methodology from a digital exploration to an analogue exploration. This proved to be very useful in understanding formal geometries and the possible scale and proportion of the cylindrical massing I was experimenting with in context. This development in formal language is what drove further my understanding of monumentality and its role in the design of the visitors centre.





3.2

PLAN:

Case Studies + Design Evidence

THE TRENTON BATH HOUSE.

Upon further investigation into Louis Kahn's Trenton Bath House it became apparent the effect the buildings plan (fig.64) and the design of its plan had on the development of its monumentality and form. As mentioned prior the incorporation of a cruciform plan I believe creates a religious or sacred essence in the experience and perception of the building's form. The buildings plan may read simple with its symmetrical clarity but the design process of the plan is far from simple.

Kahn used "a plan as a generator" (Merrill, 2010) whether it was an abstraction of programme or representative of the overall building design. As I've understood it is the experience of the space generated by the building that evokes the sense of awe and empowerment which is the essence of monumentality. I believe the design of the buildings plan is key to creating this monumental experience of space. Kahn's careful placement of programme in the shape of the cruciform plan creates an open atrium space of pure design elegance, this simple design move became instrumental in creating a monumental design of modest scale like the proposed Kapiti Visitors centre.

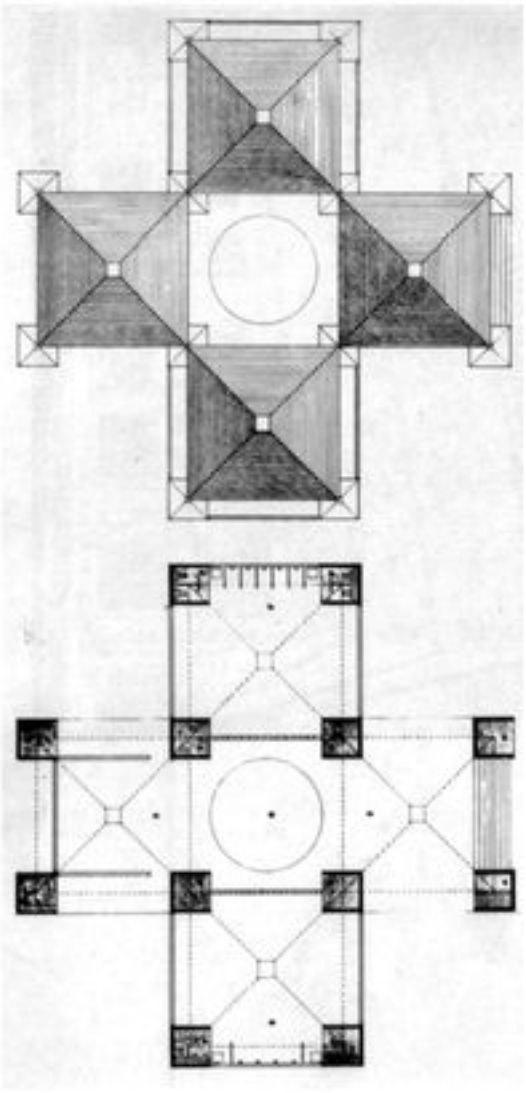


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Figure 63. *Louis Kahn Trenton Bath House building Plan.*

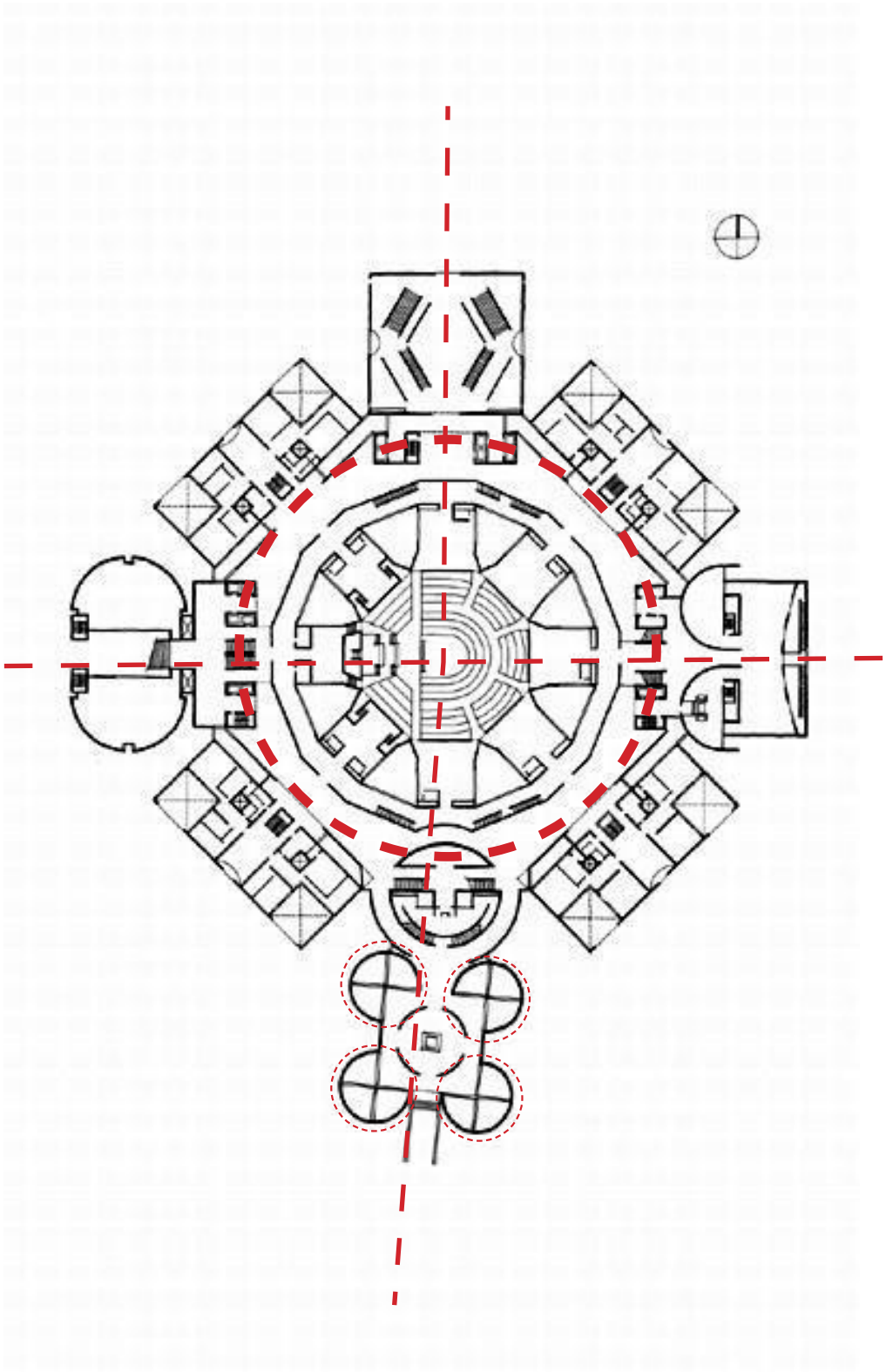

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Figure 64. *Louis Kahn National Assembly Building of Bangladesh building Plan.*

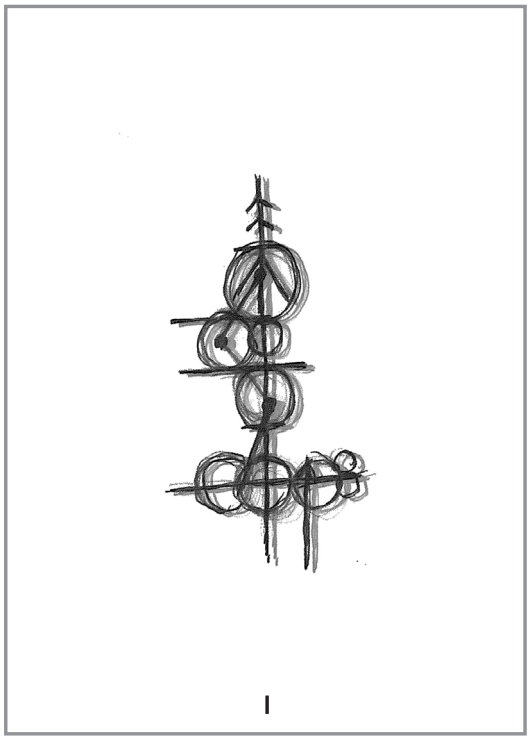
NATIONAL ASSEMBLY BUILDING.

Moving on to analyse the plan of Kahn's National Assembly building (Fig.64) it is evident his ideas and motifs have developed since the Trenton Bath House. "In plan, elevation, scale, detailing, and sequence, Kahn drew from the ideologies of both the new humanism and regionalism to make the National Assembly a monument to the values of American democratic idealism in the fifties: the force of the individual voice, the gravity of civic responsibility, the separation of church and state, the defence against homogenizing mass culture"(Ksiazek, 1993). The building began to embody Kahn's civic ideals, enhancing its symbolism in Bangladesh's democratic revolution.

Like the Trenton Bath House the National Assembly is designed with a cruciform plan, using the religious symbol as a way to generate sacred space. Strong geometries are used again like the circle which sits at the heart of the plan, this is where the parliamentary grand chamber exists symbolizing the new heart of the nation. Smaller cubic geometries surround this central chamber "generating forms in plan and elevation with multiple symmetries" (Ksiazek, 1993). This arrangement of programme using the cruciform plan creates a building that exhibits fortress like forms, this further emphasises the power of the building and strength of its new democratic government.

I find it infinitely beautiful the way Kahn uses such bold yet simple geometries, I feel the proportion of the centre circle is critical in relation to its surrounding geometries. As one enters the building you are greeted with this monumental curving central space, I believe this encourages movement around the building. The elegant proportion of each room is not realised until seen in plan, the symmetrical arrangement allows hierarchy of space to be at the central chamber which is the most important.

Kahn achieves this elegant arrangement of geometries in plan through meticulous refinement, constantly redrawing "A plan in the hands of an architect are is not qualitatively different from wood in the hands of a sculptor or an instrument in the hands of a musician: to repeatedly 'grasp' something is to slowly understand its nature" (Merrill, 2010). With this in mind I decided to develop the spatial planning of my design through design experiments focused on the plan, beginning as abstract compositions that through refinement become elegant like Kahn's.



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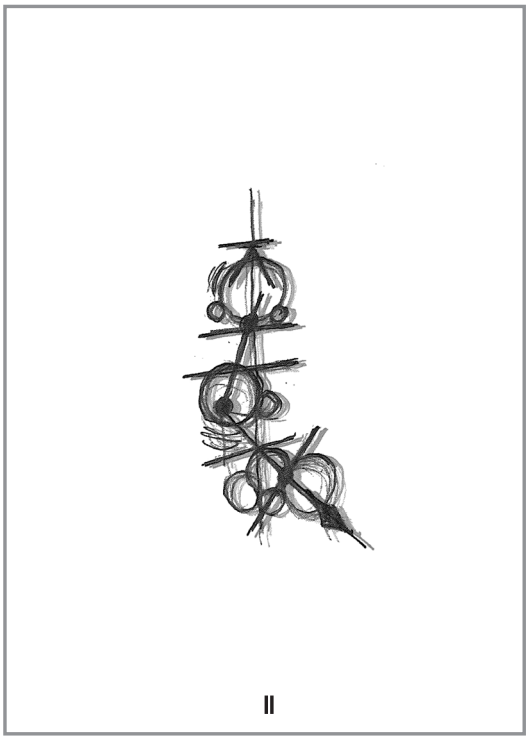

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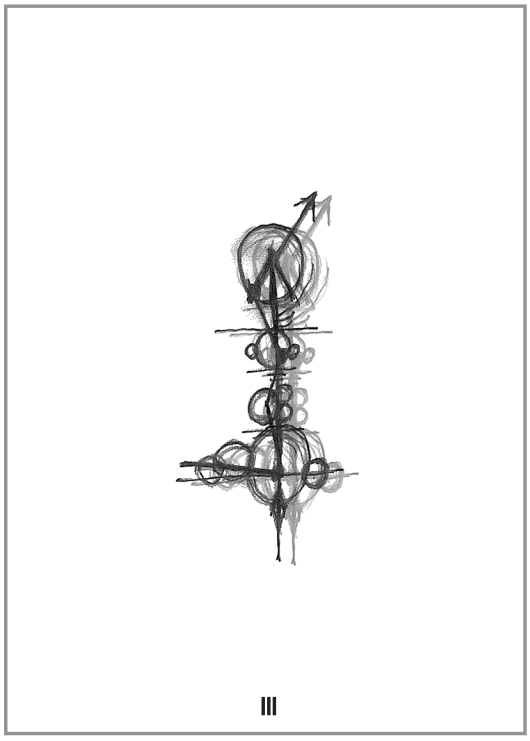

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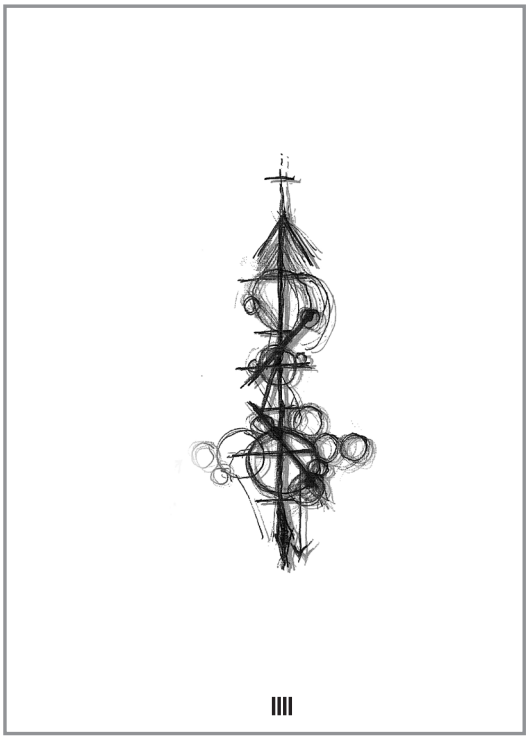

IIII

Initial Planning.

To begin exploring the design through plan, I started with abstract programme planning (fig.66) using the pure geometry of the circle. Here I focused on the journey through the building and the kind of spatial experience I was trying to create. I divided the journey into three key programmes,exhibition, biosecurity, and I-site/education. I then arranged associated programme around these hierarchical points exploring the composition of circular spaces. This allowed me to extract visually how I intended to design the journey through the Temple to Nature.

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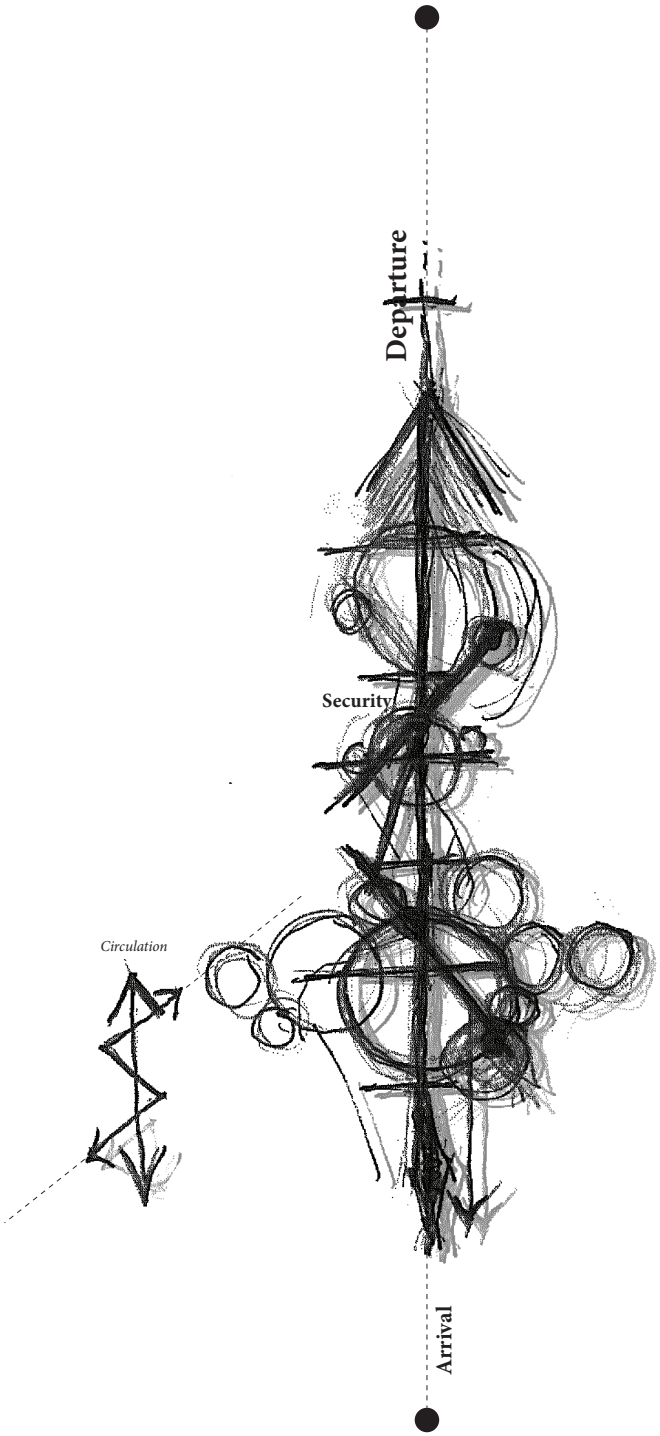
Figure 65. *Abstract Programme Plan Series.*


Departure
Security
Circulation
Arrival

Planning Diagram.

The abstract planning series continued to refine exploring varying arrangements of programme composition. Circulation between specific programmes began to be experimented with highlighting my envisioned journey through the building. This resulted in the final abstract of the series (fig.67) which depicted the final linear journey through the exhibition, biosecurity, and I-site/education spaces.

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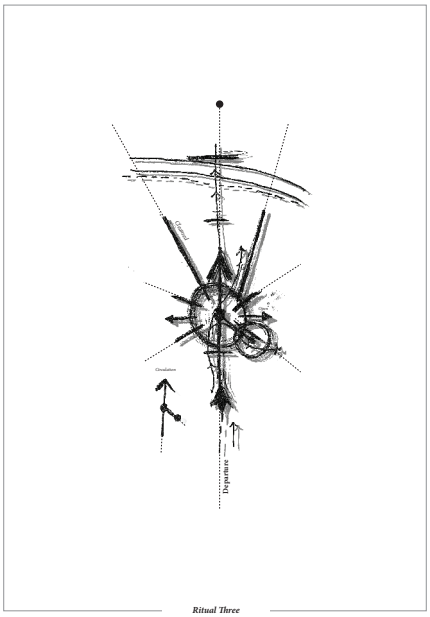
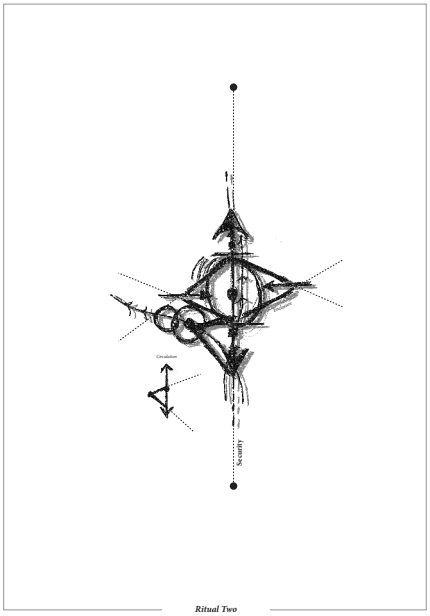
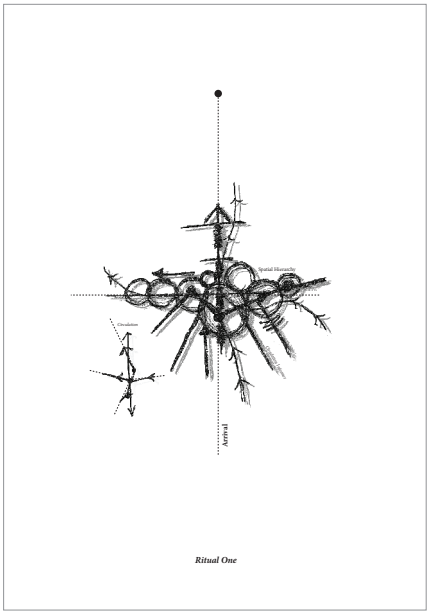
Figure 66. *Abstract Programme Plan.*



Ritual Three



Ritual Two



Ritual One

PROGRAMME ABSTRACTS.

This method of abstract planning for the entire building journey was then replicated in the design of each major programme space, exhibition, biosecurity, and i-site/education (fig.68). Public vs private space began to be explored, as well as view shafts to specific site context like the island. Each diagram became more refined as the requirements of each programme became evident.

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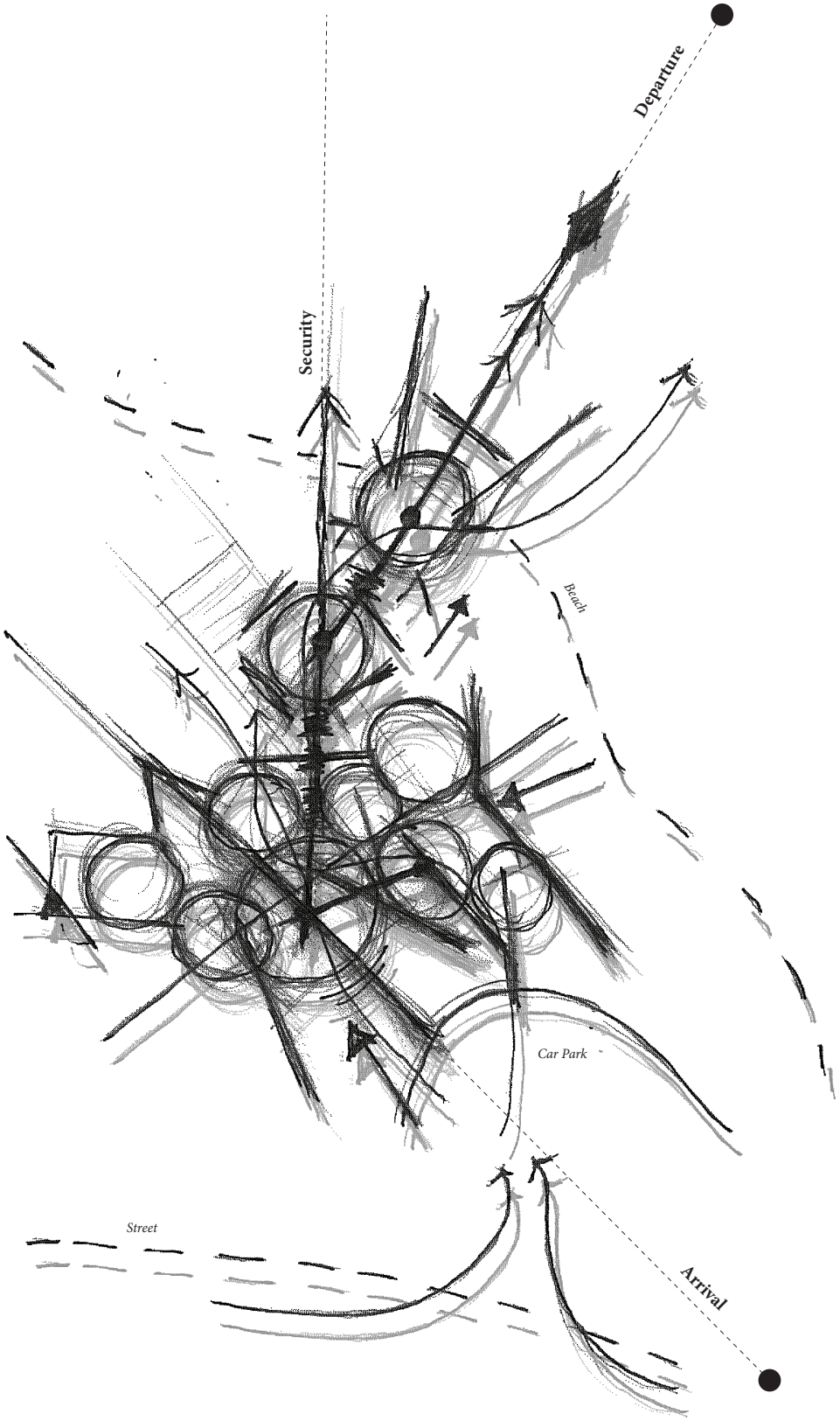
Figure 67. *Programme Abstract Plans.*


Departure
Security
Beach
Car Park
Street
Arrival

Final Diagram.

To conclude the diagram series one final abstract was made that was a collage of each abstract plan (fig.69). This final composition was created in response to site conditions and circulation. This entire design series helped to develop the journey through the Temple to Nature but lacked a sense of realism and rigour due its freehand unscaled method.

<

Figure 68. *Programme Abstract Collage.*

Precision Plan Design.

To achieve a sense of elegance and rigour in the form and plan design I moved on from the abstract diagram and began instrument controlled experiments. Here In plan I could use instruments, like the compass to continually redraw the curves of the building form until I achieved the desired level of compositional elegance. At a scale of 1:100 this produced a plan of the building and over bridge (fig.70) that curved around the roundabout site connecting the shop front and the beach front departure point. This refinement of drawing like Kahn produced a result that depicted in the same image, the final darkened drawing and associated process of the experiment. This analogue method of drawing was then developed further, like the previous experiments with form, through precision physical modelling (fig.71&72). This transition from 2D drawing to 3D physical modelling produced to my understanding a more controlled organic building form.

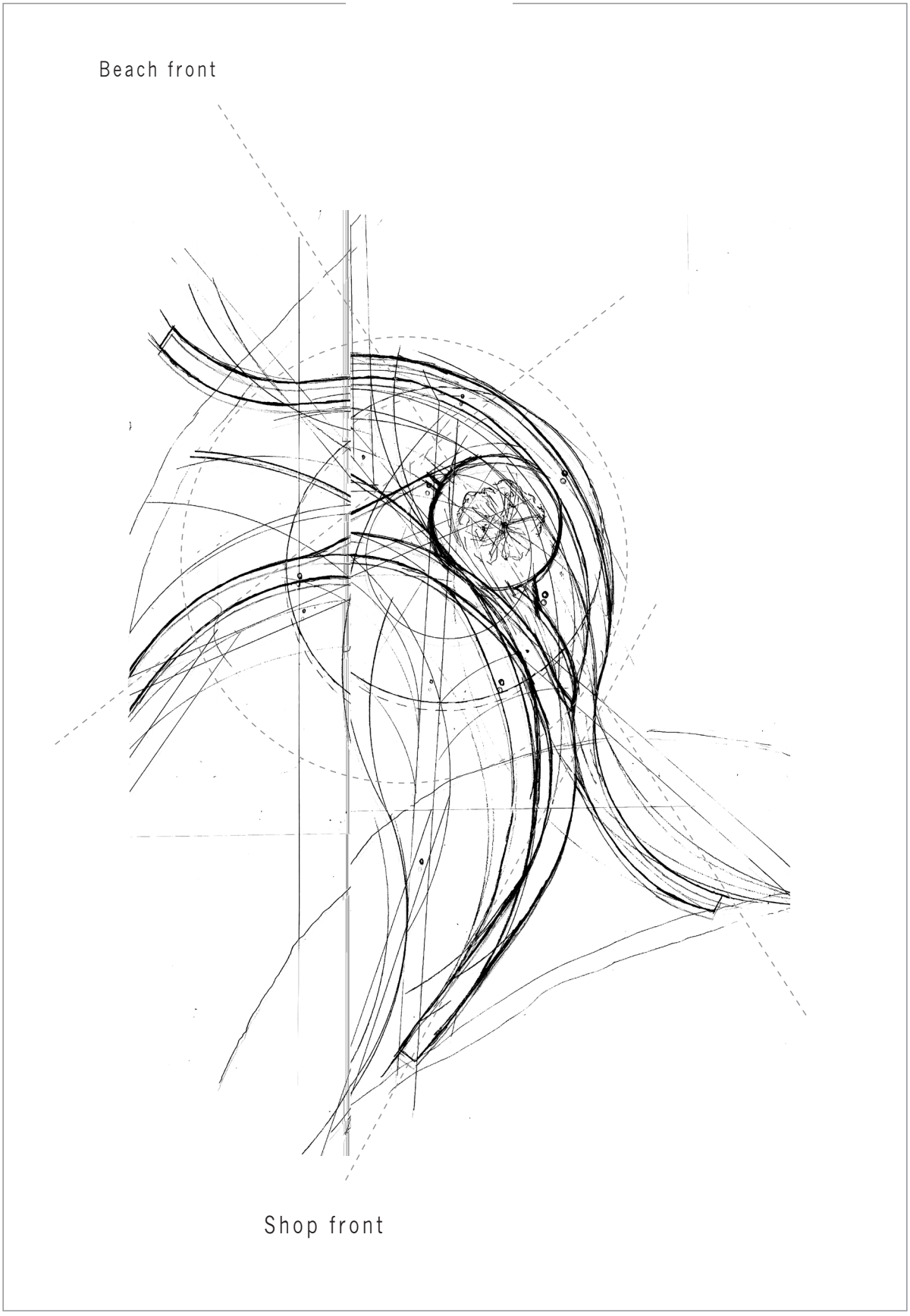


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Figure 69. *Precision Building Plan Drawing.*

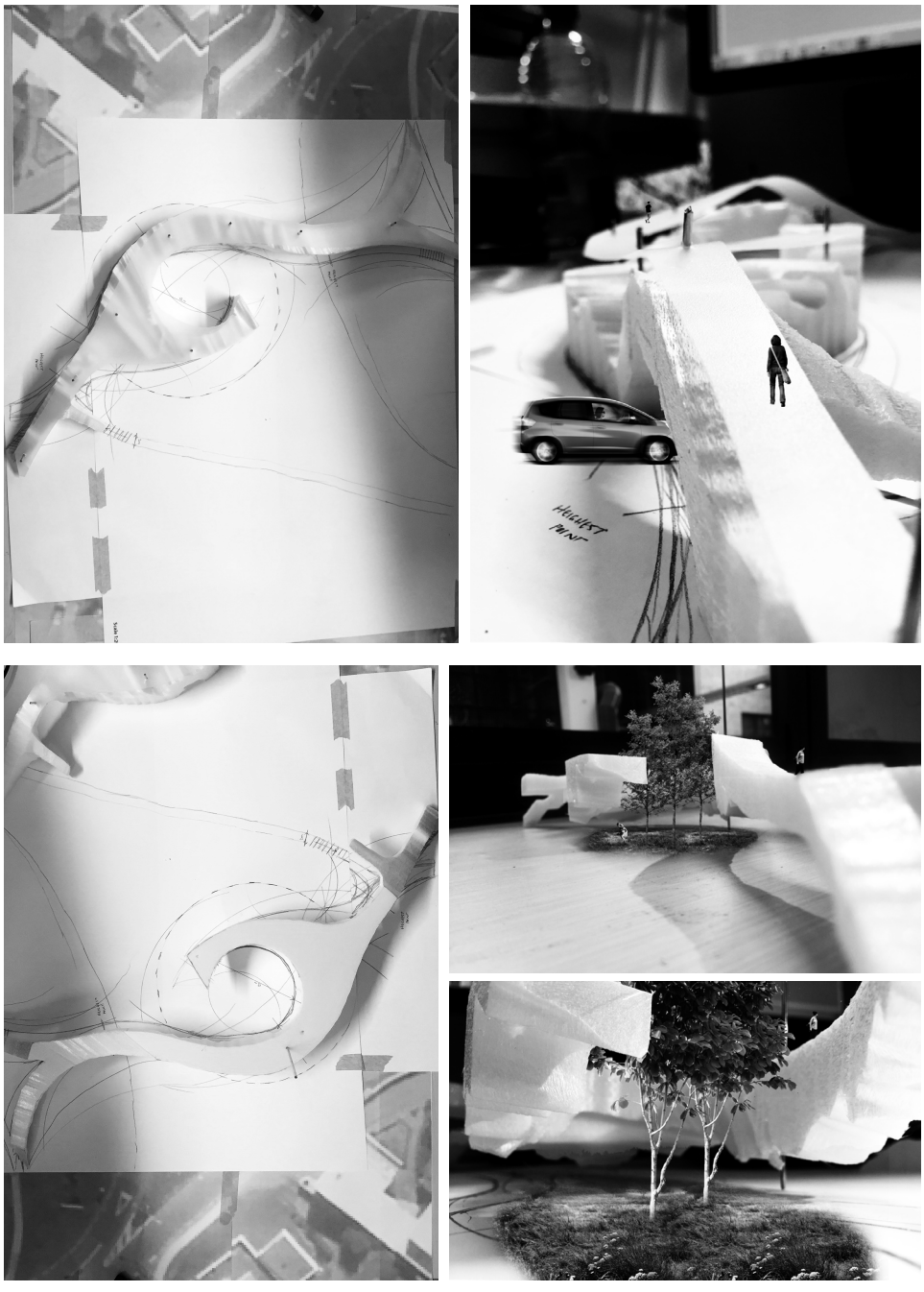

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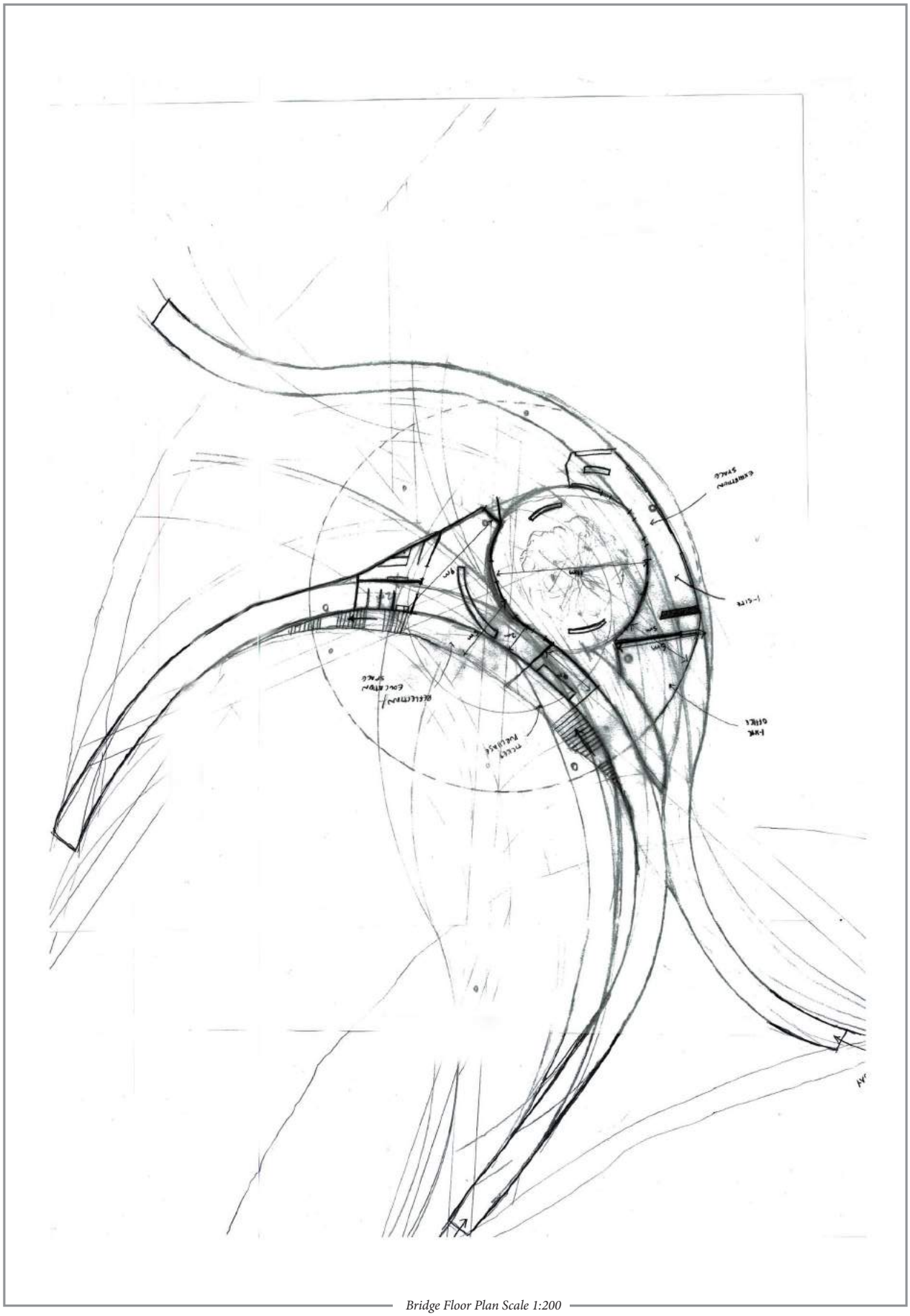
Figure 70. *Physical Models Derived from the precision building plan.*

Figure 71. *Physical Models.*



Bridge Floor Plan Scale 1:200

Precision Plan Design.

As the buildings form began to take shape physically, the planning of the desired programme was also developed (fig.73). Derived from the previous abstract diagrams, the exhibition, education, biosecurity and i-site spaces were implemented. This is when the proportions of each space were calculated to scale bringing a sense of buildability to the design.

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Figure 72. *Precision Ground Floor Plan Drawing.*

Over bridge refinement.

The precision drawing in plan produced a design of the building that felt more resolved in terms of its mass and volume, the form was judged to be nearing the elegance of monumentality. In order to simplify the design and create a purer geometry, an experiment involving the refinement of the over bridge was undertaken (fig.74). Here a piece of string was used on a 1:100 scale site plan, this mimicked the over bridge connecting the shop front to the roundabout and then onto the beach front. Varying configurations of the over bridge curve could be quickly tested and recorded. Upon evaluation experiment 5 was deemed to be the most elegant, this was because I felt the single arch that circled the north side of the roundabout and out onto the beach was purer in plan.

>
Figure 73. *Over bridge Form & Plan Development.*


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5
6

Figure 74. *Drone Photos of the drawn building Plan.*

Scale Plan.

The final development of the Temple to Nature's plan included an experiment involving scale. As previously stated, to my understanding it is the experience of the space generated by the plan that created the sense of monumentality in Kahn's buildings. I decided to redraw the refined floor plan of the Temple at a much larger scale (fig.75) in order to physically journey through the spaces I had created from the series of form and plan experiments. Using a drone I could photograph my journey through the building and evaluate the form proportion in relation to the human scale. This was the most effective way to also evaluate the tectonics of the design, the wall thicknesses, window sizes and view shafts created. I experienced first-hand the culmination of all my design experiments across the previous 9 months wrestling with an understanding of monumentality.

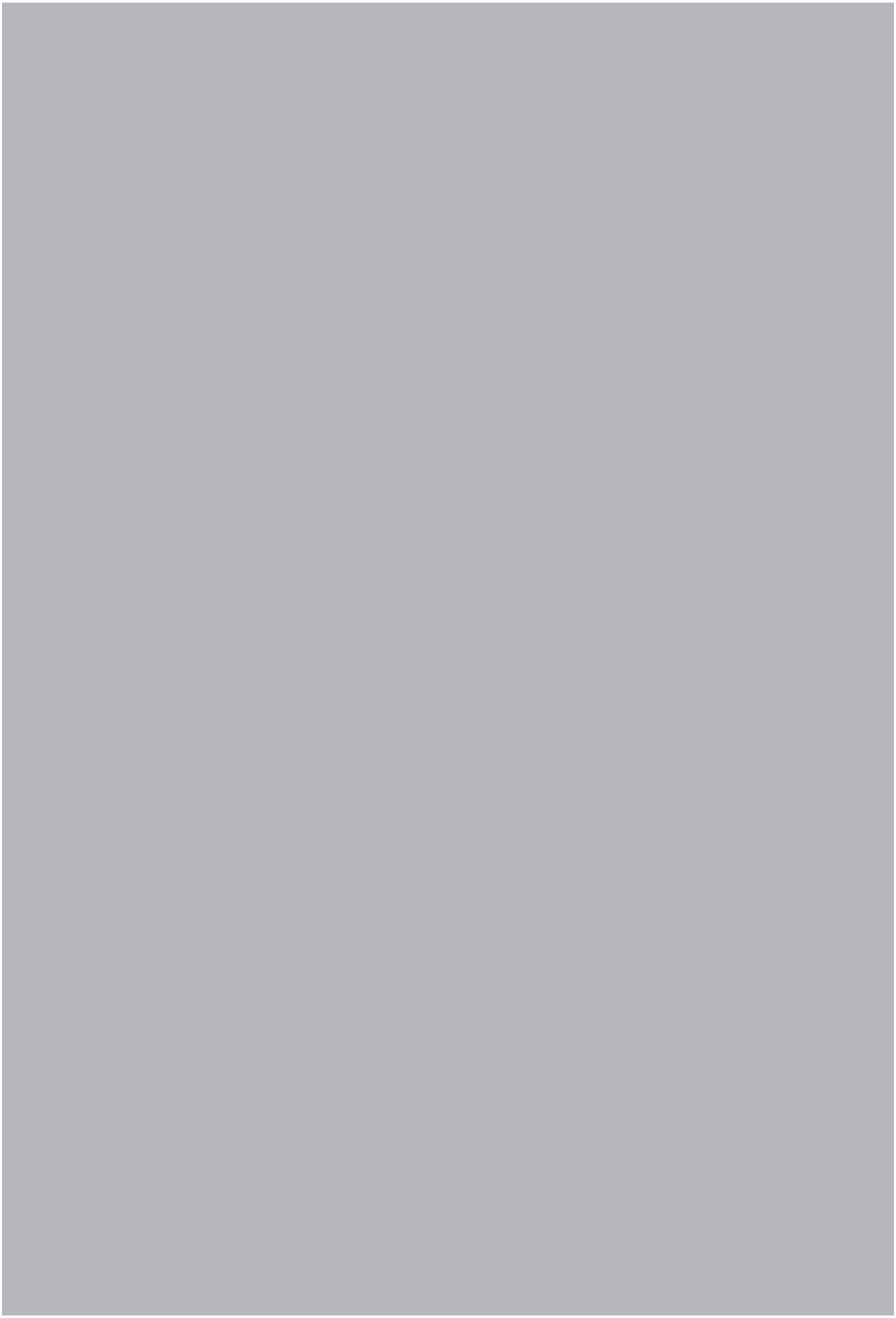
Although a luxury in terms of modern design practice, this large scale drawing developed my personal understanding of scale, proportion and mass that I believe will be valuable for future projects. After this experiment I felt the buildings plan had achieved the desired elegance and monumental experience, leading to the final design proposal for the Temple to Nature.

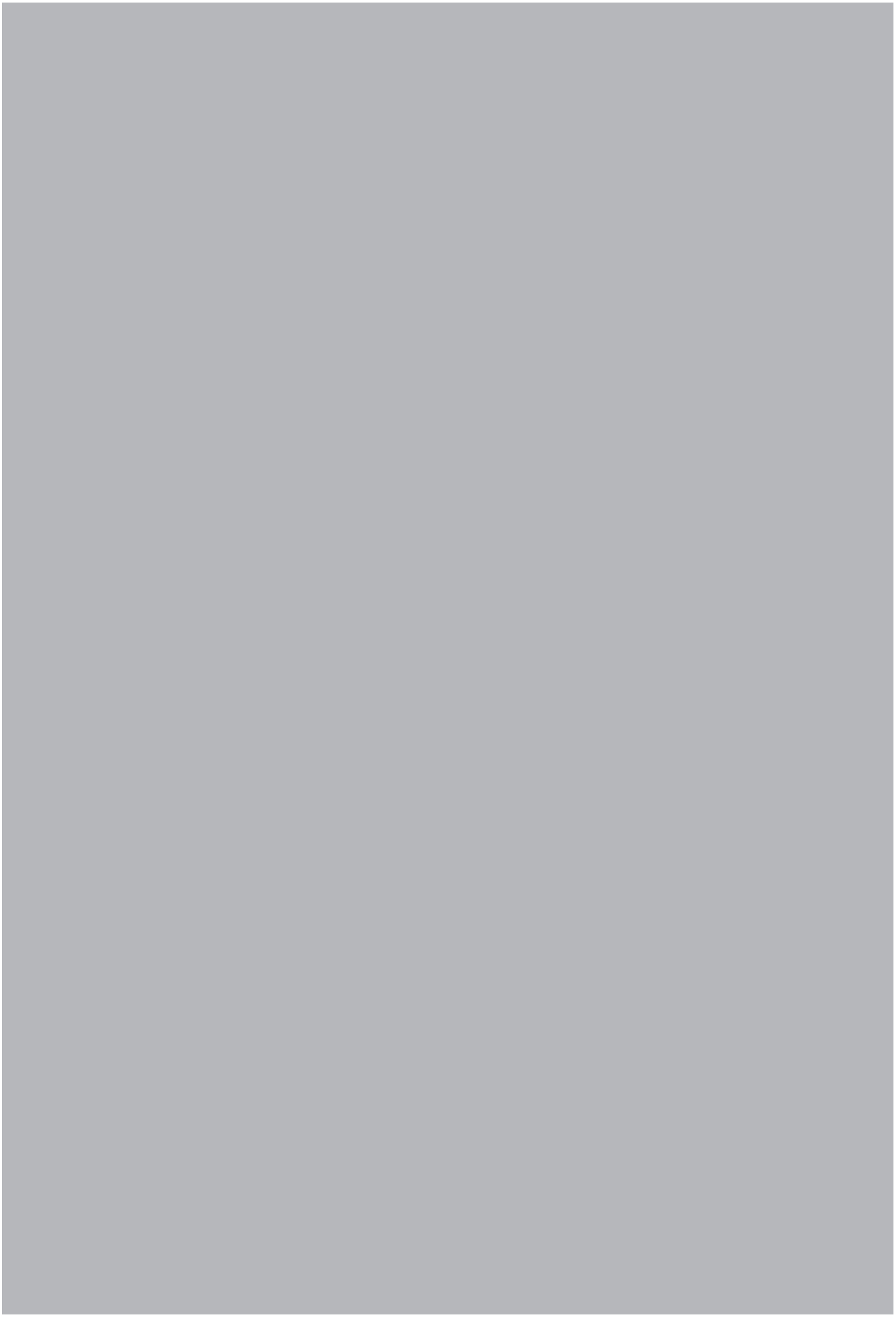
Reflection.

This section demonstrated my design exploration of plan and how it is used by Louis Kahn to develop the architectural language of monumentality. Through analysing the building plans and design processes involved in Kahn's Trenton Bath House and National Assembly Building of Bangladesh, I developed an understanding of how the plan influences a buildings sense of monumentality.

Like the form I believe the design of the plan is crucial in developing a journey through the building that evokes the sense of awe and empowerment, critical to the essence of monumental structures. I used the elegant simplicity of Kahn's geometries in plan to influence the design of my own for the Kapiti Visitors Centre. Upon reflection it is the design process of the plan which I believe to be the most influential in Kahn's development of monumentality. The constant refinement involved in the process is where the design really takes shape. Drawing using controlled instruments and model making brought a sense of precision and rigour, developing the final Temple to Nature design.

The continued design experiments using analogue as the preferred method is what leads into the final section of my discussion, further unpacking my understanding of monumentality as an architectural language.





3.3

METHODOLOGY:

DESIGN PROCESS + LITERATURE

“DRAWING TO FIND OUT”.

Throughout the discussion section of my thesis I have analysed key precedent and literature that fed into my design lead exploration of monumentality. With Louis Kahn being the key protagonist, it his work and understanding of monumental design that has had the largest influence on my proposal for the Temple to Nature. Upon reflection, although analysing Kahn’s buildings became instrumental in my design and understanding of monumentality, I believe it is actually the analysis of his design processes, methods and tendencies that were the most influential. In this section I will analyse Kahn’s methodology and reflect on how this influenced my design and understanding. This then forms the last part of my thesis discussion, evaluating more broadly the disciplinary tensions that arise for traditional design processes and methods in a rapidly evolving digital age.

Louis Kahn’s meticulous design process is analysed by Michael Merrill in his book “Drawing to Find out”. In this book Kahn’s unbuilt design for the Dominican Mother house in his native Philadelphia is presented through a collection of all his process drawings. Although unbuilt his design completed between 1965-1969 for the Mother house is an iconic example of Kahn’s relentless use of plan in the design of his monumental architecture. He is a strong advocate for the traditional method of hand drawing, the design for the Mother house includes hundreds of redrawn designs that slowly revealed the buildings form “drawings has something to do with tenacity, something to do with seeing design as a form of patient research”(Merrill, 2010). All of these hand drawn designs were completed on yellow sketching paper (fig.76) “a sign-like a painters flag- for work in-progress; that however detailed and elaborate that which is drawn upon it may be, it is in fact still “wet, “ in flux, subject to change, criticism, rejection.”(Merrill, 2010). This simple change in paper I believe lessened the formalities of every drawing allowing Kahn to mix process and final drawings freely, creating a more fluid and organic process.

This method really inspired me and I began the final design explorations for my proposed temple to nature on a 5m roll of brown paper (fig.77). Here I combined rapid process sketches with refined instrument controlled drawings. Like Kahn the brown paper felt less restricted and the final design proposal took shape.

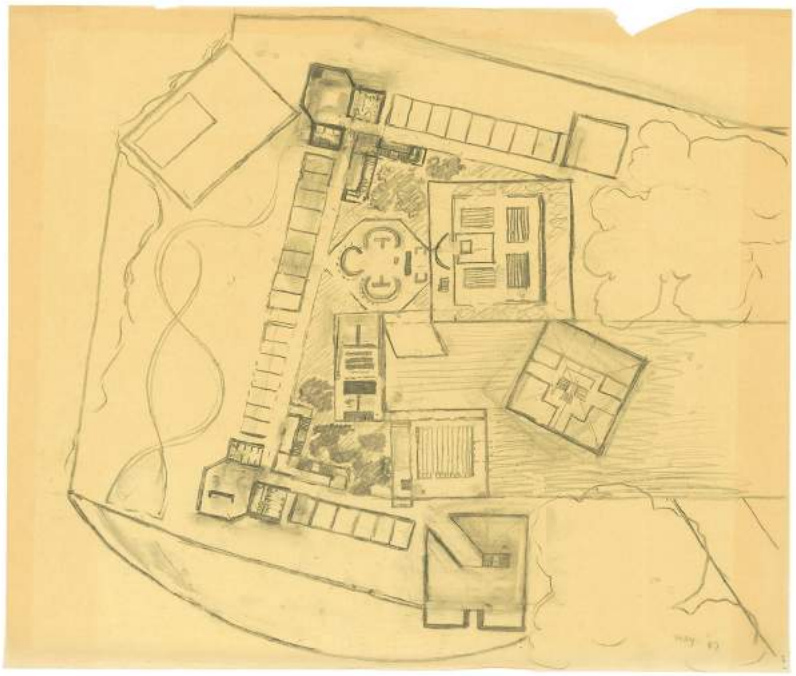


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Figure 75. *Louis Kahn Dominican Mother House Concept Plan.*

Figure 76. *Scan of the 5m Process Drawing Roll.*

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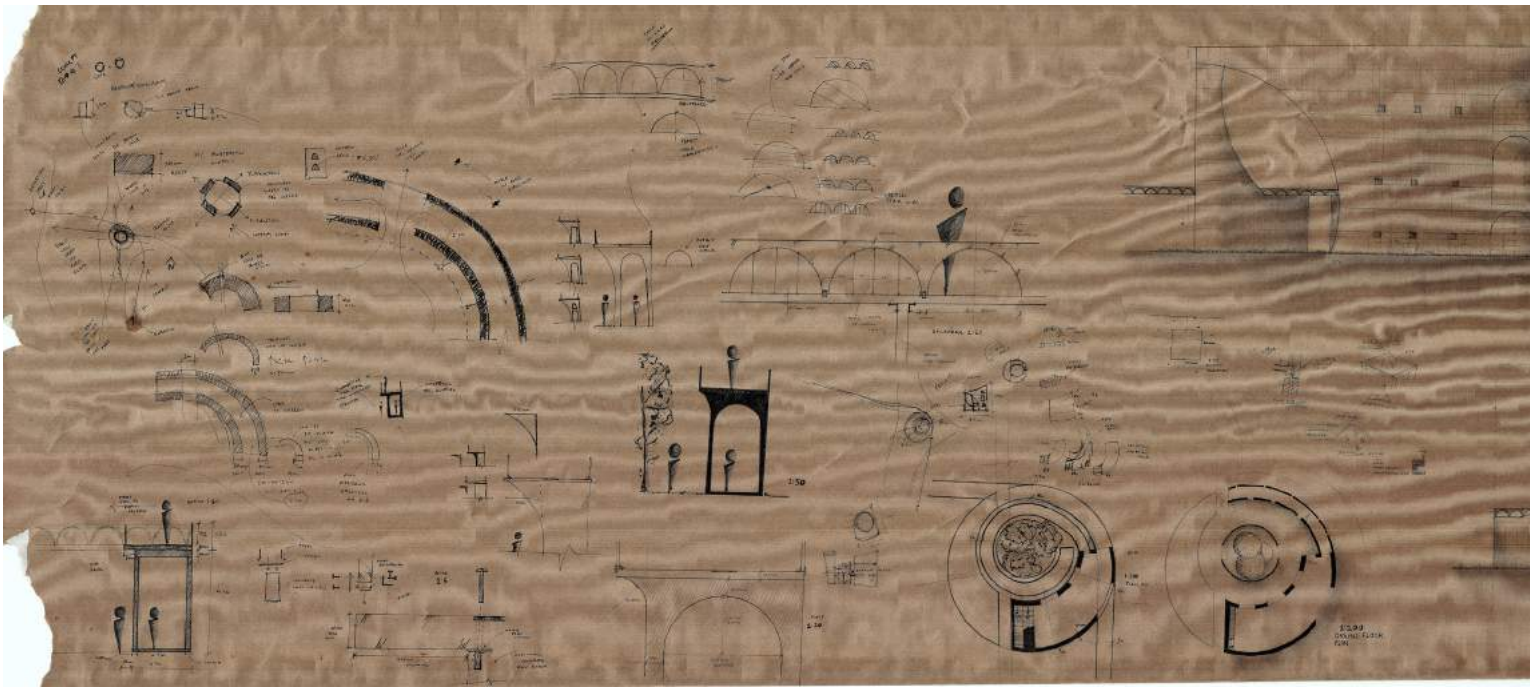
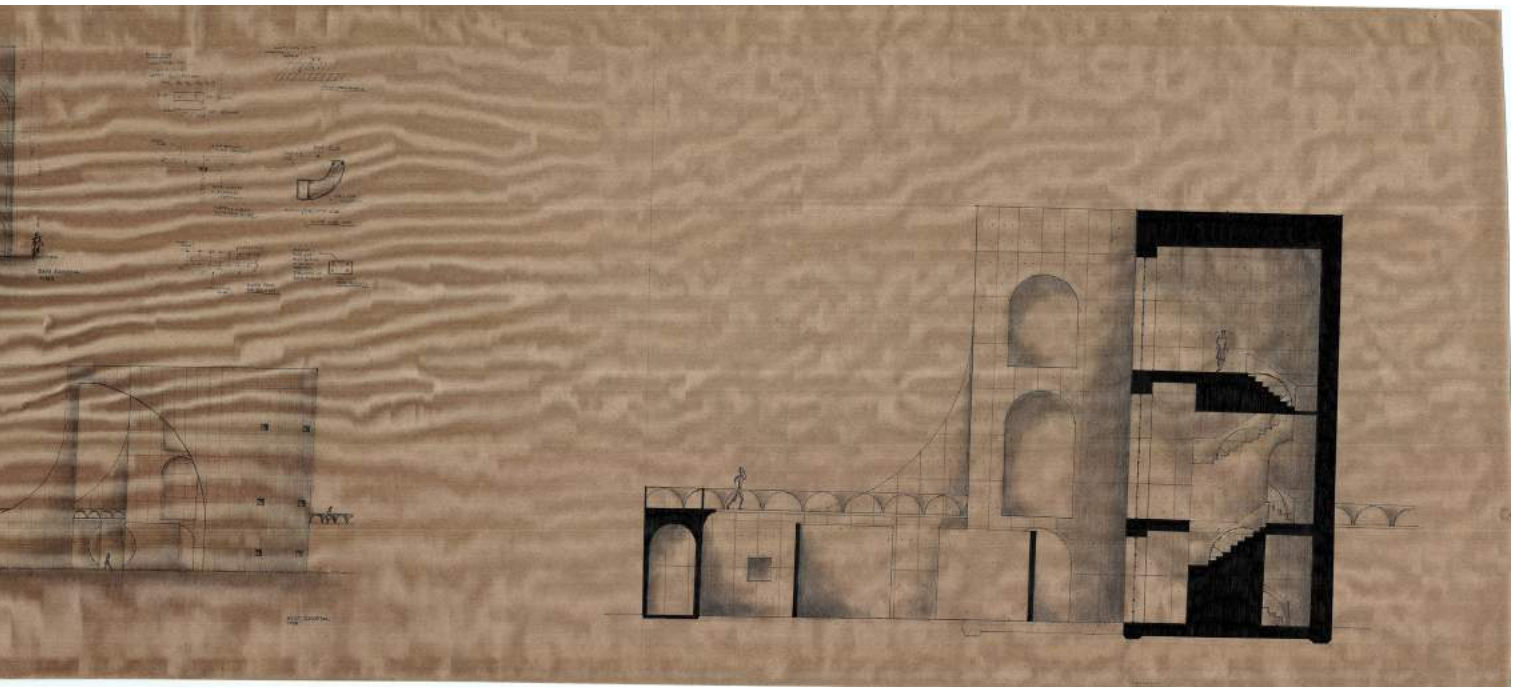
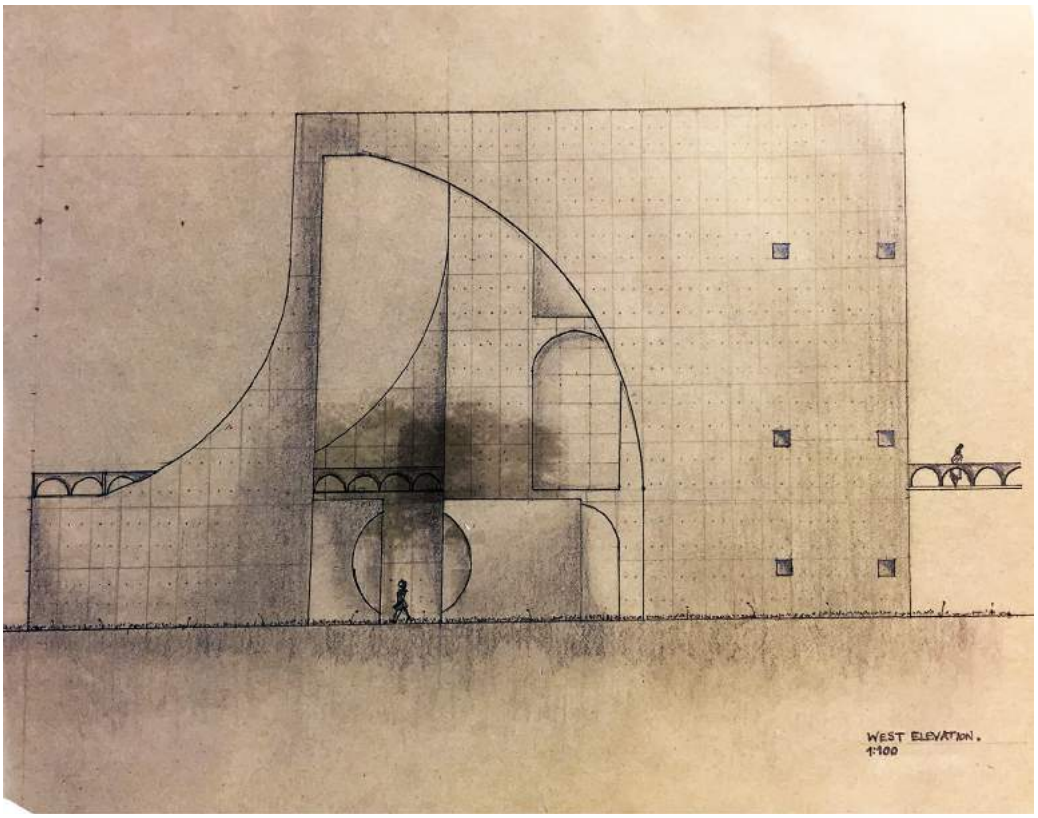


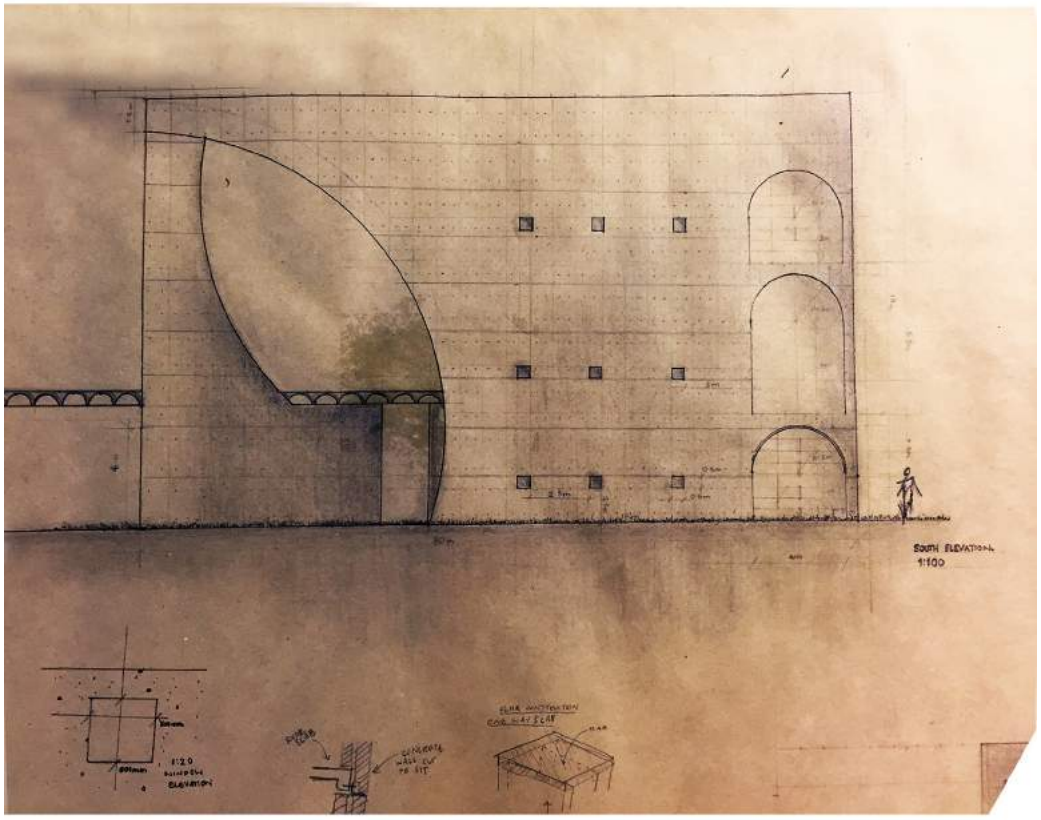


Analogue Process.

Closer scans of the instrument controlled drawings are depicted in figures 78 & 79 showing a series of elevations. Relevant ideas are explored through drawings around these more refined images feeding into the overall building design. Each drawing began with light free hand sketching, this was then darkened and refined through instrument precision and scale to produce final design images. In reflection this method was deemed the most successful In achieving the elegant monumental structure I had wrestled with for months.



∧ **Figure 77.** *Final Proposal West Elevation Drawings Scale 1:100.*



∧ **Figure 78.** *Final Proposal South Elevation Drawings Scale 1:100.*

Analogue Process.

The matrix to the right (fig.80) demonstrates the tectonics of the final design being explored. This involved detailed research into the concrete construction, wall and floor slab design, over bridge balustrade design, and window design. With each refinement specific measurements were established on the buildings final design creating a sense of buildability in the proposal.

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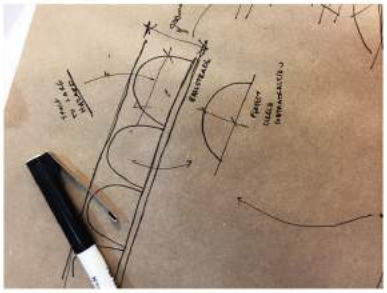
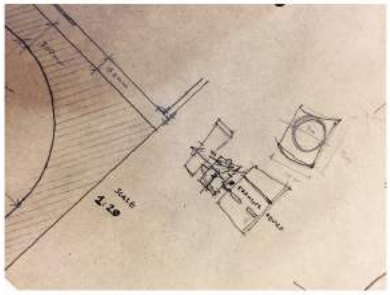
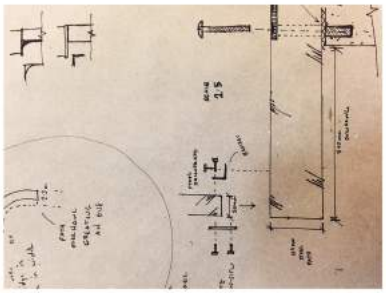
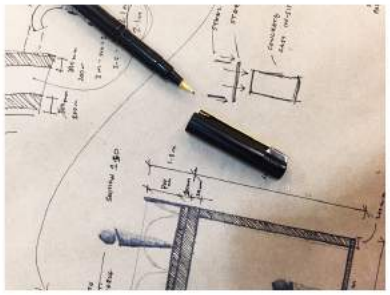
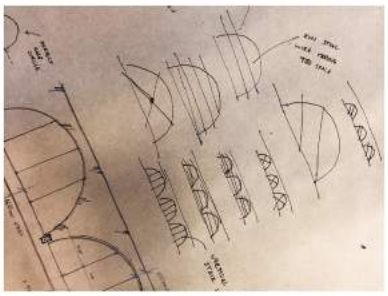
Figure 79. *Final Proposal Process Images.*

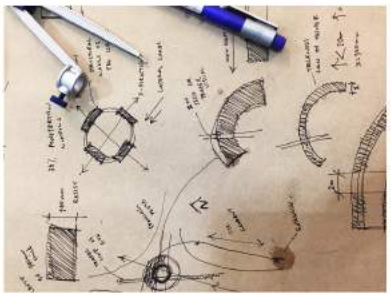


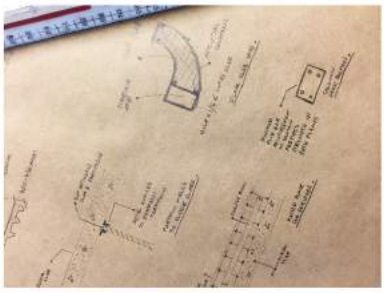


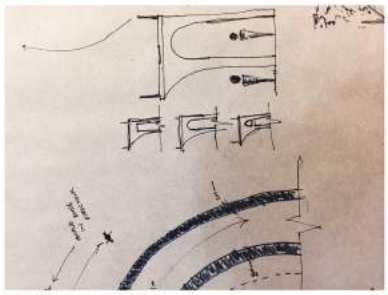


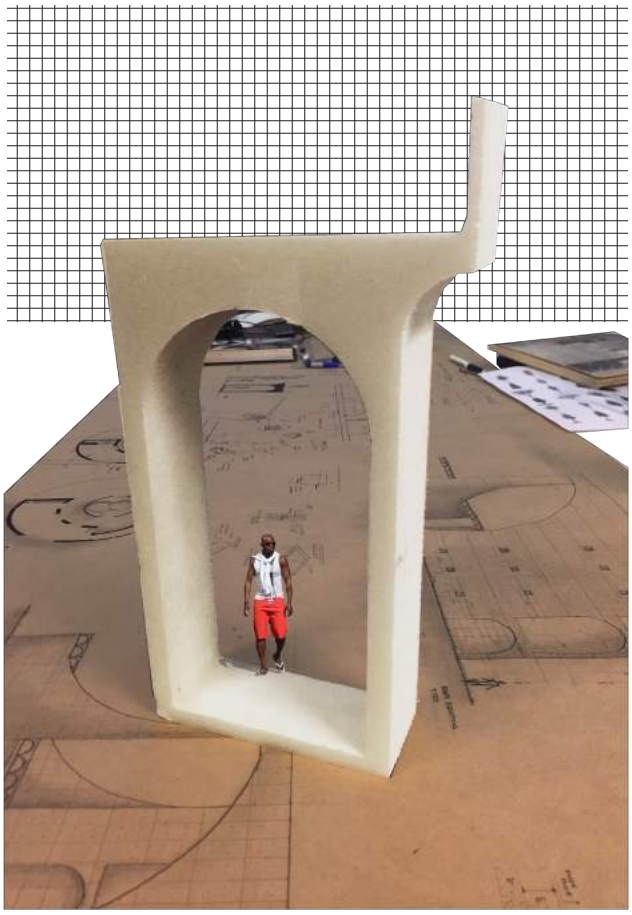


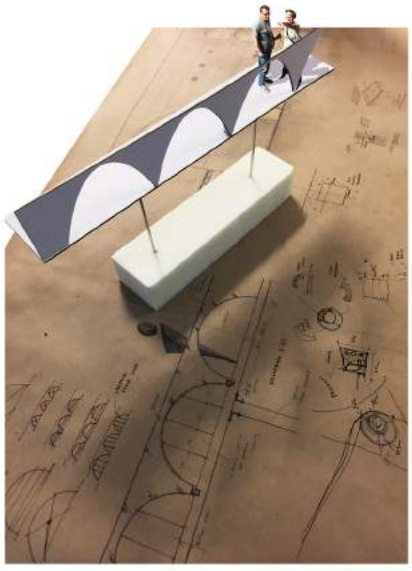












Precision Modelling.

The refined drawings of the final proposal were then used to produce physical models of the design. The precision achieved in the drawings were then translated into the models (fig.81 & 82) by using digital fabrication machines like the CNC router and laser cutter. This was completed in order to test the final form work and tectonics of the design, like the large scale drawing of the floor plan the monumental experience could be fully realised.

Reflecting on this experiment I began to see a positive link between the traditional analogue method of hand drawing and the rapidly evolving digital design and fabrication. This reflection forms my final thesis conclusion and insights.

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Figure 80. *Digitally Fabricated Door way & Over bridge section.*

Figure 81. *Digitally Fabricated Over bridge and balustrade.*

Figure 82. *Exhibtion process drawings & Display.*

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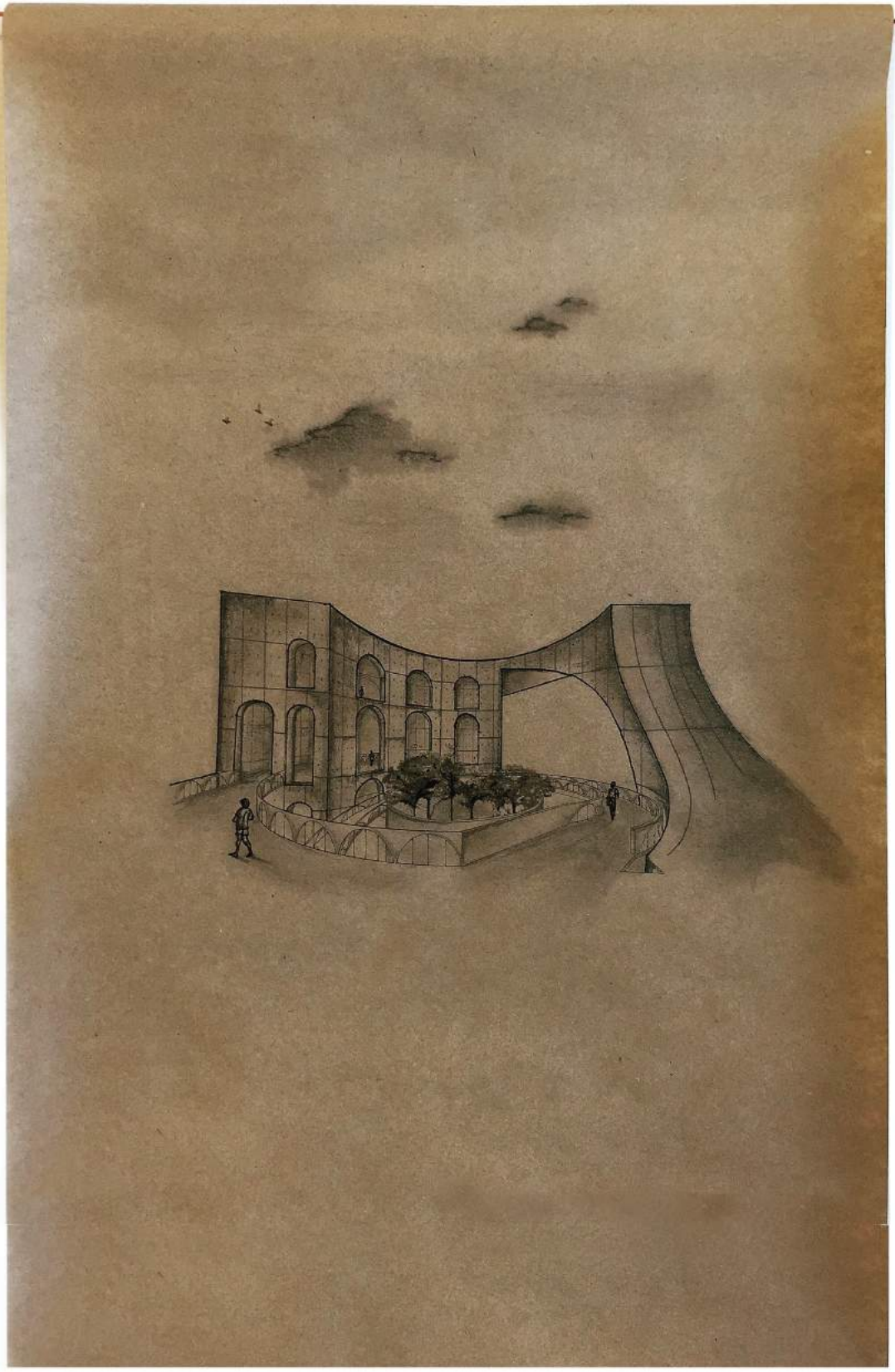
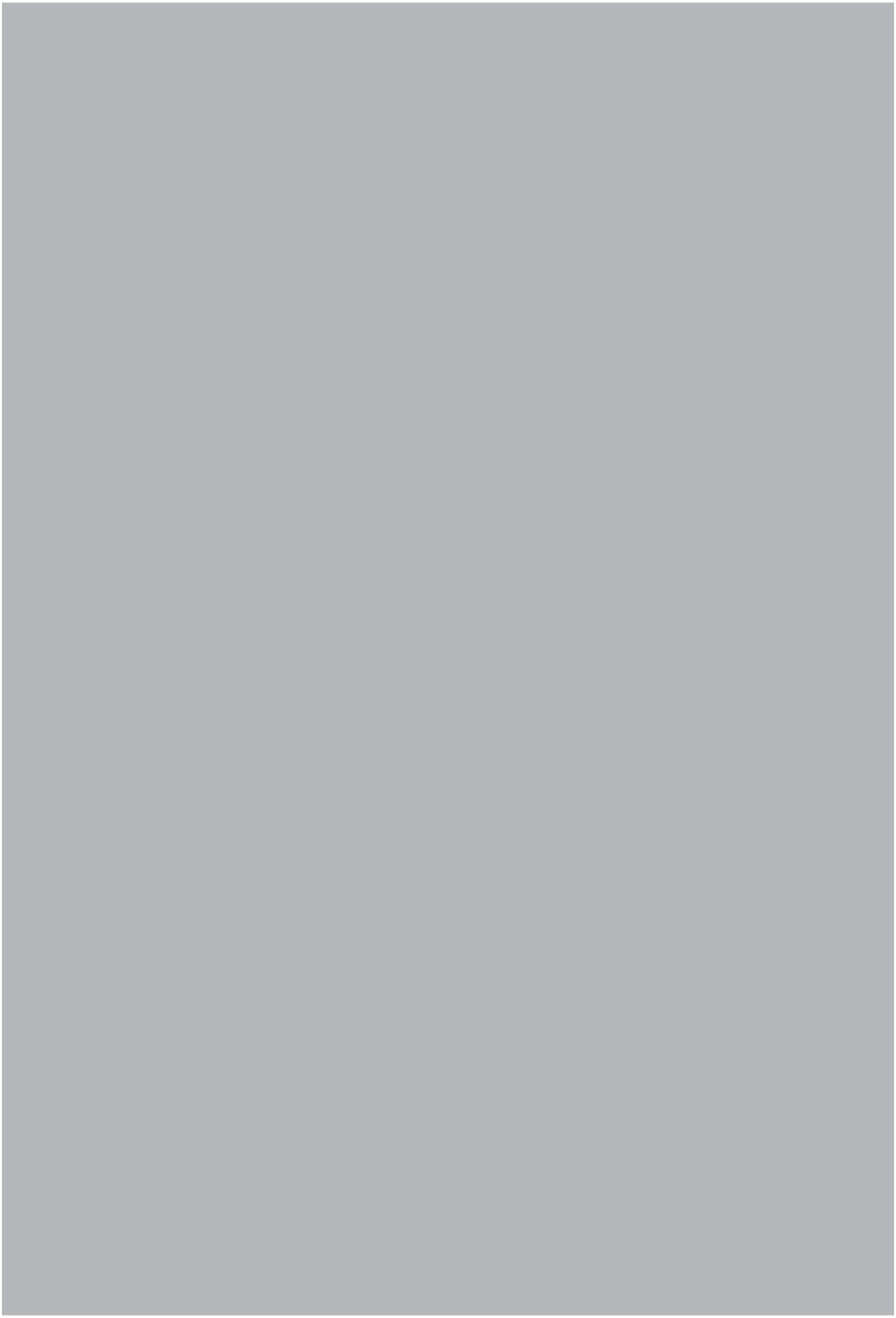


Reflection.

The analysis of Kahn's design methodology proved instrumental in the development of my design proposal for the Temple to Nature. I feel however this analysis of methodology is more beneficial to the understanding of my personal design processes and tendencies. I believe I have established a personal design methodology that revolves around the constant interplay between analogue and digital methods. Prior to my thesis year I developed a reliance on digital design due to my competence in the use of computer software. I feel my understanding of quality building design has been influenced by this reflection on personal design processes.



^ **Figure 83.** *Final Proposal Model courtyard perspective.*

CONCLUSION.

The Temple to Nature presents a provocation for a new type of public architecture, one that involves a synergy of highway infrastructure and religious architecture types with nature. The synergy has been explored through an investigation into the architectural language of monumentality. This investigation arose due to the need for an iconic piece of architecture in Paraparaumu that established a currently missing link between the shop, beach front and Kapiti Island. The design aimed to recreate a piece of the island on the mainland, seeking to use the language of monumentality to evoke a sense of reverence towards nature as visitors made their way over. This is to ensure locals and tourists of the region understand through experience how precious the nature on the island is, in turn increasing biosecurity and plant and wildlife protection.

Through the thesis investigation I have uncovered possible links between highway infrastructure and religious architecture types that are typically separate. I believe a link arises when discussing the fundamental aspects of both infrastructure and religious architecture, both stem from the ideal of designing for the people. In my opinion religious architecture is defined by the people who inhabit it, as like infrastructure which is designed for the people it serves. I believe the journey through space is what develops the experience of religious architecture and creating a building that enhances this journey through public infrastructure is an interesting provocation.

This thesis explored the language of monumentality through form and plan analysis of Louis Kahn's buildings and design processes. After a series of experiments involving the typical monumental qualities mass, volume and symmetry I learnt specific formal and spatial aspects of monumental space. The relationship the building has with the human scale becomes instrumental in the development of monumentality, physical ques demonstrating scale help the inhibitor understand how grand the structure is evoking a sense of awe and empowerment. The way compositions of bold geometries create elegant forms and spatial planning effect the overall experience of the design. These geometries and forms can be derived from context in order to blend the building in with its surrounding landscape, helping the design become more relatable at the human scale. Through developing a building that focused on creating the essence of its context I believe the Temple to Nature embodies the region and its people creating an iconic tourist attraction.

The crux of the design experiments involved an understanding of form, as the process unfolded I learnt the value of the plan in development of monumental architecture. I constantly wrestled with masses and volumes exploring composition and proportion but it wasn't until I began to influence the form through plan design did the building really take shape. I believe this transition highlights my understanding of elegant design, I judged a design a success or failure based on the way one experienced the space and how this influenced the overall journey through the building. I feel this only happened once careful plan design fed into the overall form design, creating a building that was more responsive to the human scale. As a result, this thesis reinforces Kahn's perspective of design processes and value of the plan "An architects repeated tracing and retracing of lines amounts to more than a mere transfer of information, but is in and of itself a way of knowing, a meditative sinking into the plan, a kinaesthetic grooving and reviewing of its information: its spaces, its details, the topography which it occupies." (Merrill, 2010).

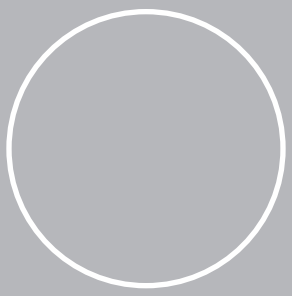
I feel this thesis also emphasises an issue the discipline constantly faces, how the relationship between traditional analogue methods and modern digital methods can continue to evolve. As technology rapidly advances design efficiency in practice does also, I feel this is where the value of traditional methods is challenged. In reflection I believe my thesis demonstrates the value traditional design methods has in the digital age, the precision in drawing opposed to the arbitrary selection in the digital produces designs with more elegance and clarity. I agree with Michael Merrill who states "while few of us would surrender our digital enablers for T-squares and triangles, longer looks at those older plans do intimate that something may have been left behind in the tempo change" (Merrill, 2010).

PERSONAL INSIGHTS.

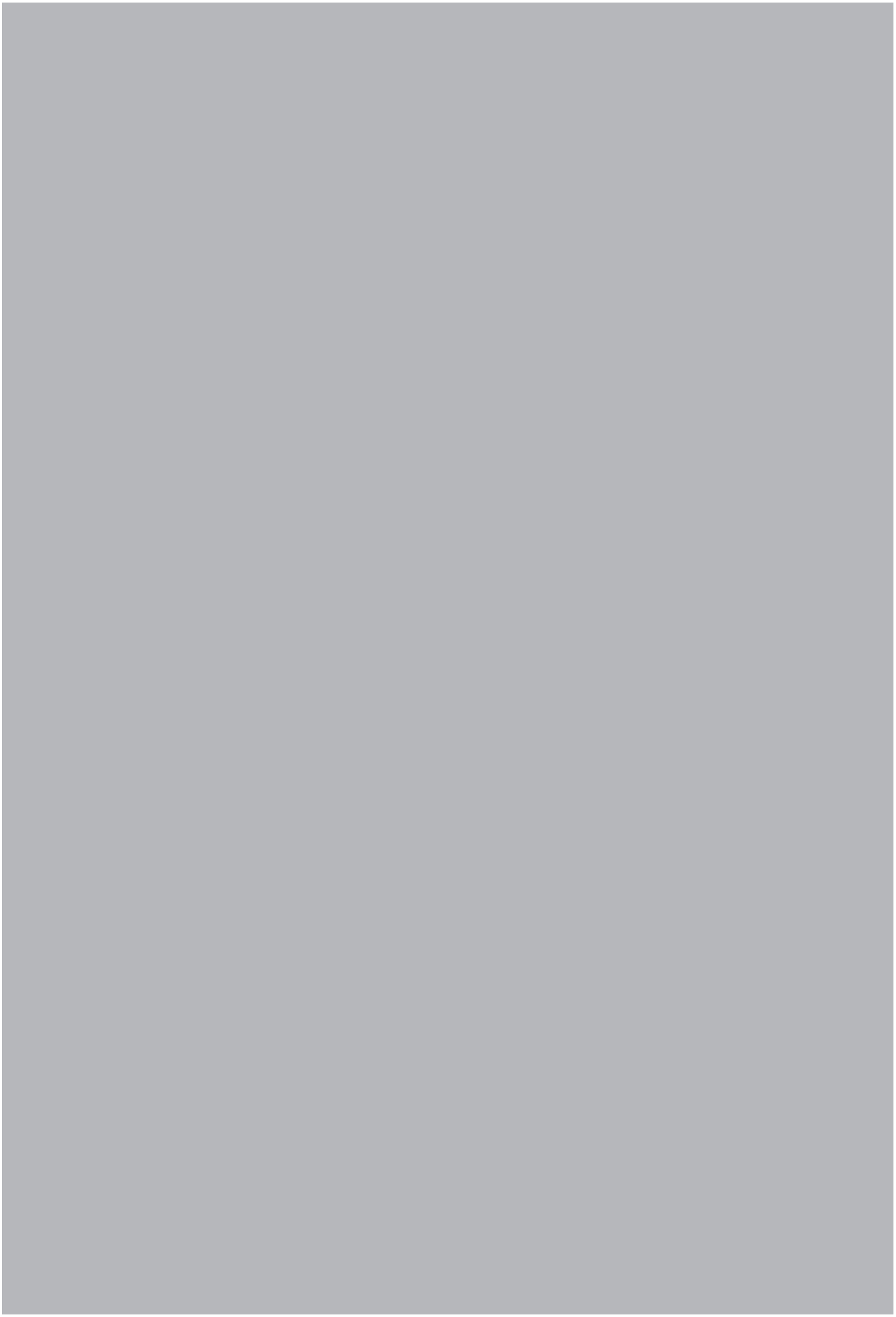
As mentioned in the conclusion the exploration was undertaken with intention to develop an understanding of monumentality but in doing so a personal tension between design methods was realised. A tension that I believe has positively influenced my design processes and tendencies that I can implement on future projects. I believe the designs I was completing in the computer lacked the same elegance and rigour attained in the hand drawing. This isn't to say I abandoned the computer as the design process unfolded, I learnt the limits of each method and how they can interplay in an effective manner. The drawing felt more organic, the transition from idea to design became more fluid through the hand.

This design could then be replicated in the computer and efficiently evaluated from multiple views, often spending majority of the time in the 3D perspective. This allowed me to view the building as a whole but then through drawing zoom back into specific parts of the design for further refinement. Overall I have found the computer becomes a tool complimenting the traditional design process, creating a more efficient delivery of design.

This personal insight is what I have found to be the most valuable extraction from my thesis year, one that I believe will aid me in the future.



Where to next?



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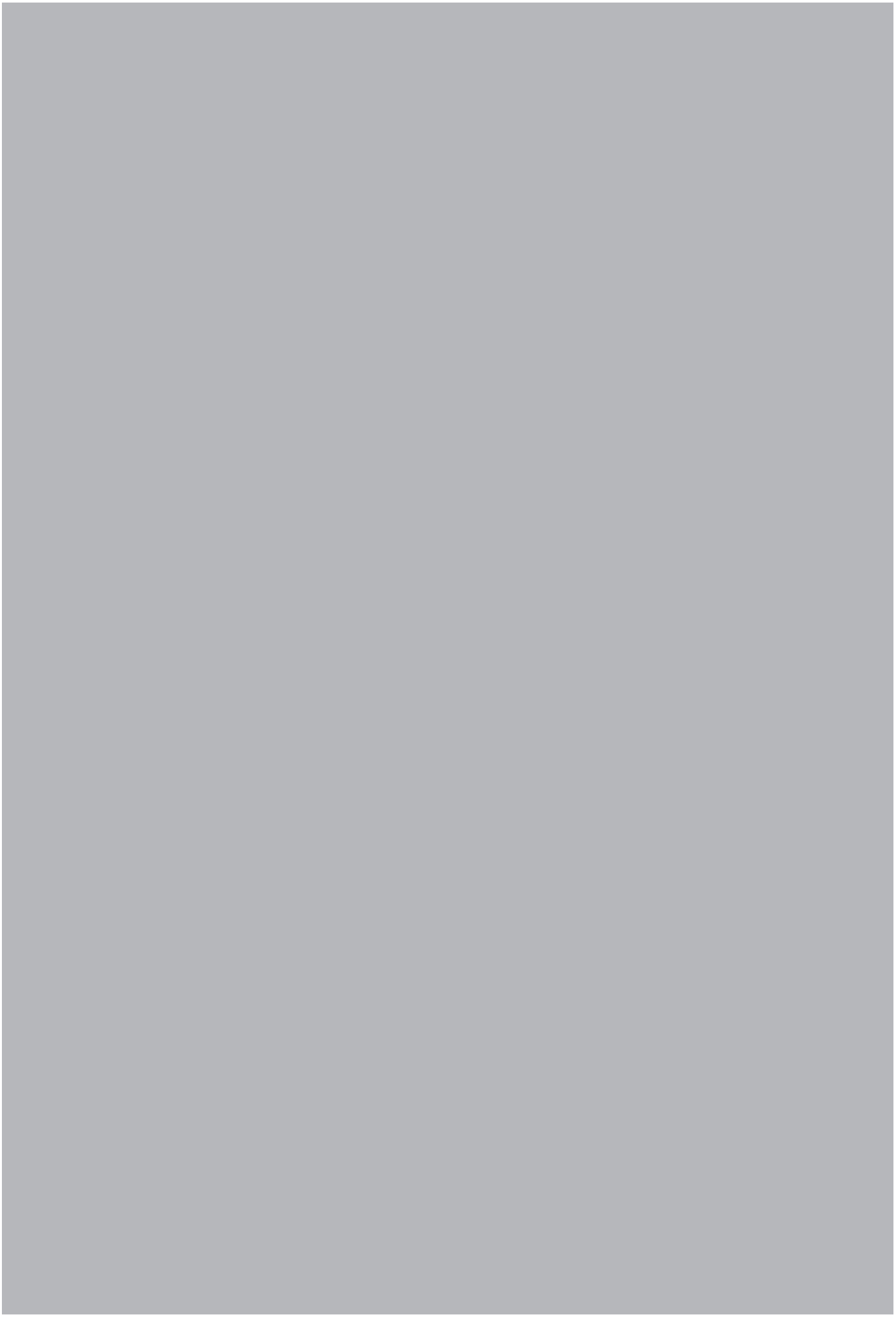

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Figure 50: Alba, E. (2016). Richard Serra - Torqued Ellipses 1994-1998 Lead. Retrieved from https://www.flickr.com/photos/alba/27144681196

Figure 51: Bumble, A. (2010). Richard Serra: Sculpture : Forty Years. Retrieved from https://azurebumble.wordpress.com/2010/07/07/richard-serra-sculpture-forty-years/

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