Cross-Cultural Healing
An architectural response to Maori urban healthcare

Kaitlyn Elizabeth Callis
ID: 1425424

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Auburn University Exchange Student
Abstract:

As an exchange student, New Zealand was uncharted territory, both culturally and environmentally. With a growing interest in the people and place affected by architectural design, I decided a project deeply rooted in the place made sense. Because of this, I chose to design a Maori-centered healthcare center, which correlates to the aspirations of Maori and Auckland District Health Board. The project site is located in Manukau City, Auckland, where a large Maori population resides. The purpose of this project is to introduce a new conversation about contemporary cultural healthcare, something that differs from the standard healthcare typology. The design outcome is a strong visual building with cultural influences taken from the greater cultural landscape. The engagement with the natural environment, an important aspect to the Maori culture, is developed in several different stages of the overall design.
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1.0 Introduction

1.1 Research Questions

**How can [the connection to and creation of] natural environments provide a sense of place and healing for people in the city?**

*What is an appropriate architectural response to the cultural and medical needs of healthcare for the Maori community as they continue to migrate towards urban settings? How can the holistic connection of these needs be effectively met without disturbing the important traditional values of the people, either through architectural identity or spiritual values of healthcare?*

*While keeping traditional values in mind, how can the connection between the building and the natural environment be developed in a way that addresses the growing trend of research-based design in healthcare?*
1.2 Background Information

The indigenous people of Aotearoa New Zealand, known as Maori, comprise of 598,602 people according to the 2013 Census Report. In 1956, approximately 66 percent of these indigenous people lived in the rural areas of New Zealand. By 2006, the number of Maori people living in urban locations had exceeded 84 percent, according to the 2006 Census. Nearly a quarter of the total Maori population currently lives in the Auckland region. These numbers prove that there has been an ongoing shift in the movement and growth of the Maori population into more urbanized settings. Because of the relatively fast nature of this development, the urban environment has not caught up to the rising range in diversity, especially within the healthcare sector. A significant difference in life expectancy between Maori and non-Maori is one of many disconcerting statistics taken from the Auckland District Health Board. Because of the indisputable need to address this concern, Auckland DHB has recently begun programs like the “Maori Health Plan 2013/2014”, with a greater focus on cultural safety and acceptance within the healthcare community.
Maori people believe in a holistic approach to health, addressing four different, yet equally important, sides: physical, mental, family, and spiritual, according to ADHB. A more orthodox view, often associated with westernized medicine, does not address all of these views equally, if at all. The fast-paced, sterile environment of the more orthodox healthcare facilities may cause even further lack of understanding or acceptance for Maori people. One encompassing healing tradition within the Maori community is the use and protection of the land. Because the Maori people are seen as the guardians (kaitiaki) of the land, Maori healing envelops both the use of the land through medicinal plants, and also being physically present within the landscape. As urbanization continues to grow within Auckland, access to the natural landscape has become more difficult. Rongoa Maori, which is the practice of healing through medicinal plants, is becoming increasingly harder to access in urban communities, creating a greater divide between the urban Maori and their iwi roots.

Although these issues are specific to the Maori community, they address a larger issue noticeable through the world, as urbanization continues to grow in every country. This is creating a new movement within the architectural community to establish a connection between the natural environment and the building, through both literal connections as well as sustainable practices. Although these strategies have only recently been brought to the healthcare typology, the healing factor that the natural environment has on the human body has been established through years of research. This has resulted in a growing trend of research-based design in the healthcare community, with family-centered care becoming more commonly considered.


1.3 Aims and Objectives

Using these key social drivers for my design, I am proposing a community health center with a focus on holistic healing for a Maori community in South Auckland. The purpose of this project is to explore potential architectural responses to the growing need for Maori-centered healthcare in a community-oriented design that effectively satisfies the cultural and medical needs of local members. This suggests a need for layering multiple uses and conditions to positively engage the building and contextual environment, including Te Aranga design principles, evidence-based design, and sustainable strategies. In response to a need in the greater architectural community, the project also encompasses a connection between the built and natural environment, through the development of atrium and landscape spaces.
2.0 Influential Elements
2.1 Maori Design

2.1.1: History of Maori Architecture

Maori Pa sites are considered the fortified villages and forts of local tribes. In Auckland alone, there are 198 of these sites recorded, which are classified into five different categories:

1. Volcanic Hill Pa:
   The forty volcanic hill pa sites are the largest sites in Auckland, though 70% have been severely damaged due to quarrying. These sites are characterized as having terraced hill slopes which were used for draining. For defense, usually only the higher terraces were used to retreat.

Ancient Maori Pa Sites

Cliff Top Pa:
Cliff-top pa sites are usually recorded as being the smallest sites, with only one side used as protection. There are eleven of these sites recorded in Auckland, most being around the Manukau Harbor area.

Ridge and Hill Pa:
Ridge and hill pa sites provided elevated sites with natural protection, similar to the volcanic hill sites. These sites were typically terraced more extensively than the volcanic hill site, providing several ditches, storage pits, and artificial banks. These are most commonly found in the Waitakere Ranges in Auckland.

Coastal Headland Pa:
These pa sites were established through natural defenses through steep cliffs along two or three sides. This type of pa contributes a large number of pa sites for the Auckland area. Motutapu Island is one of theses sites that is still relatively preserved.

Island Pa:
Of the twelve island pa sites recorded in Auckland, most have been destroyed through marine erosion. Island pa sites provided the tribe with isolation as their main protection. One of the few preserved sites is Kauwahaia in the Waitakere Ranges.
Elements of the Wharenui (Carved Meeting House)

The wharenui (carved meeting house) is viewed as the most important building within the marae, or meeting grounds. The structural components of the house are considered to represent parts of the human body, and particularly represent an ancestor of the tribe. The wharenui structure is also used to represent other things including Maori health and the stories of Maori gods.

The human body part components are:
- Tekoteko (Carved figure at the top of the roof): Head
- Maihi (Front boards): Welcoming arms
- Amo (Short front boards): Legs
- Tahuhu (ridgepole): Spine
- Heke (rafters): Ribs

The structure of the Wharenui is also seen as representing the story of the separation of the “Sky Father” (Ranginui) and the Earth Mother (Papatuanuku). The son Tane separated his parents in order to fill the world with light, and the ridgepole within the wharenui represents this important connection.

Important symbols are also illustrated in the wood carvings (whakairo) within the wharenui. The spirals (koru) are used to symbolize new beginnings, hope, personal growth, awakening, purity, and peace. Double/Triple Twists symbolize a bond between different peoples or cultures, as well as the three baskets of knowledge.

Figure 2.1.6: Elements of the Wharenui

Figure 2.1.7: Spiritual Elements of the Wharenui
Traditional Building Materials

Pre-European buildings were typically built entirely out of the local flora. Structural and sheltering components alike were formed by thatching or trying the materials together. The more common materials used included Totara bark, the New Zealand palm (Nikau), Toetoe reeds and shoots (Pukakaho), and swamp reeds (Raupo).

Interestingly, stone and earth were not recorded as being used in the traditional Pre-European buildings of Maori. 1

Traditional Construction Methods

Because Maori believe strongly in living in a state of balance with the environment around them, the gathering of local materials for construction was done carefully and sustainably. Because of this, different tribes used different materials and construction methods depending on their location and what resources were available to them. 1

The different names and construction types most commonly used were:

- Karapi (ceiling panels of toetoe)
- Tuahuri (insulated roof covering of raupo)
- Aranati (roof covering of raupo)
- Aratuparu (roof covering of toetoe)
- Arawhiuwhiu (external/final roof covering)
- Tupuni (external wall covering of raupo)
- Tukutuku (decorative internal wall panels)

2.1.2: Holistic Maori Design

As Maori continue to migrate to more urbanized settings, their traditional design principles and frameworks are beginning to reappear as well. Not only do these design principles provide a cultural connection for the people, but they also provide important environmental and economical solutions to growing modern problems.

Important environmental features, such as the use of greywater, solar passive design strategies, and native vegetation not only revitalize the sense of place for Maori in the community, but also suggest important solutions to the growing need for holistic sustainable development.

These strategies, which provide a sense of place for Maori, are critical to re-establishing their identity in the greater community.

Several people, including Shad Rolleston, Ngarimu Blair, and Dr. Kepa Morgan, have developed Maori-influenced design initiatives and principles for new urban development.

Both Blair and Rolleston helped establish important traditional values to be considered in contemporary Maori design. These include:

- Rangatiratanga (self-determination)
- Whanaungatanga (social/family relationships)
- Whakapapa (genealogical connection)
- Kaitiakitanga (sustainable environmental management)

Blair and Rolleston explained the importance of these traditional values to be used alongside the commonly used environmental and economic strategies in contemporary architecture. Rather than simply taking the Maori design strategies that relate to environmental design, to innovate sustainable practices, all of the traditional values should be considered.

Dr. Kepa Morgan also addressed the importance of holistic design strategies for Maori-influenced design, suggesting that it was needed to avoid "narrow analysis of the problems identified and the subsequent suggestion of solutions that may not be well suited to the metaphysical situation within which the engineering challenge is being addressed" (Morgan, 2006).

Through his research, he developed the mauri model to help as a decision-making tool in the design process. Although this model was created with environment (landscape) design intentions, it establishes important criteria for any Maori-centered design approach.

The importance of the mauri model is the affect our design decisions have on the mauri of the area. Mason Durie defines mauri as "the binding force between the physical and spiritual," (Durie, 1998). According to Morgan, mauri can be significantly affected by human interaction, through either degradation or enhancement.

Through the model, Morgan addresses four different aspects that impact mauri: Cultural, Community, Economic, and Ecosystem. 2

### Cultural:
- Barriers to Cultural Experiences
- Consultation
- Cultural Employment
- Food Gathering
- Heritage Protection Measures
- Importance of Culture to National Identity
- Inclusion of Local Knowledge
- Kaitakatanga
- Mahinga Kai
- Maori Speakers
- Resource Gathering
- Sacred and Spiritual Places
- Tikanga Maori
- Traditional Rituals

### Ecosystem:
- Air Quality
- Fertility of Land
- Fish Biodiversity
- Impact on Fauna
- Impact on Flora
- Impact on Waterways
- Land Use
- Pollution Levels
- Resources Used
- Waste Generation
- Water Levels
- Water Quality

### Community:
- Access to Community Centres
- Access to higher level schooling
- Access to Sports Fields
- Aesthetic Appeal
- Amount of Land Used
- Inconvenience to Affected Community
- News media response
- Perceived safety of area
- Perception (Tourism)
- Private Land Use
- Public Land Use

### Economic:
- Access to Technology
- Average Income Levels
- Clean-up Cost
- Cost of Labor
- Cost of Living
- Cost to Locals
- Employment Availability in Area
- Employment Created
- Impact on Local Businesses
- Impact on Taxpayer
- Maintenance Cost
- Repair Costs
- Unemployment Rate
- Removal Cost
2.1.3: Te Aranga Design Principles

Te Aranga Design Principles were established to recognize the continued development of Auckland City and its impact on the Maori people and land, so that new development would better engage with the design interests of the greater community. The design principles are meant as a tool to provide an outcome that enhances the environment with Maori cultural values in mind. It states, “the key objective of the principles is to enhance the protection, reinstatement, development and articulation of mana whenua cultural landscapes enabling all of us (mana whenua, mataawaka, tauiwi, and manuhiri) to connect to and deepen our sense of place.” In order to avoid misrepresentation or confusion, the definitions of the principles are taken directly from the guidelines. 

"As Maori we have a unique sense of our cultural landscapes. It includes past, present and future. It includes both physical and spiritual dimensions. It is how we express ourselves in our environments, it connects whanau, whenua, awa, and moana through whakapapa, it includes both urban and rural, it is not just where we live it is who we are," (Te Aranga Maori Cultural Landscape Strategy 2006).

**Whakapapa: Names and Naming**

Ancestral names of Maori are meant to be recognized and celebrated; and traditional names of specific places should be used to provide better signage and wayfinding.

**Tohu: The Wider Cultural Landscape**

Important Maori landmarks should inform the design development. The protection of these landmarks are critical. If visual connections to these landmarks are pre-existing on the site, they should be preserved. Spatial orientation can be developed through these landmarks and the narratives associated with them.

**Taiao: The Natural Environment**

The local flora and fauna should be included within the design as landscape features for areas being modified, especially in urban settings. Local biodiversity should be reestablished where possible. Indigenous flora should be planted in public spaces, and also encourage the planting in private spaces.

**Ahi Ka: The Living Presence**

Natural resources should maintain their ease of access when possible. Also, it is important that the community roles are maintained or enhanced with the new design developments.

**Mauri Tu: Environmental Health**

A conservative approach should be taken when addressing the use of water, energy and the local material resources. Consideration should also be given to daylighting strategies as well as the installment of waterways. Use of water should include passive design strategies such as grey-water systems and the collection of rainwater. Building materials with high cultural value should be used and locally sourced when possible.

**Mahi Toi: Creative Expression**

Cultural narratives should be reflected in the design environment, allowing a sense of place to be created through the local identity. This can also be established through the inclusion of public Maori art.
2.2 Developments in Healthcare Design

2.2.1: Affects the Built Environment has on Health

The idea that the built environment affects our health is not a new concept, yet is only starting to become popular in the architectural community. In the medical field, the understanding of this concept came to the forefront in 1984 when Dr. Roger Ulrich conducted a study on patients undergoing gall bladder surgery. In his study, he found that patients with views to the outside recovered, on average, a day sooner than those patients with views to a brick wall, as well as needing significantly less pain medication. Since then, Dr. Esther Sternberg has developed several research papers and books on the affect place has on the body’s ability to heal. In her book, Healing Space, she discusses how the brain reacts to different aspects of the built environment, through all of the senses. One of the main reasons the body is able to heal in certain environments is because of the amount of stress associated with the place. For example, in white sterile hallways typically found in hospitals, a patient associates this environment to stress. Typically, natural environments like parks and green spaces are associated with meditation and healing, allowing the brain to elevate stress and begin to naturally heal.

Dr. Sternberg also addresses different aspects the built environment can help with healing, including labyrinths and fractals. Labyrinths are useful in promoting meditation and reducing stress triggers when patients walk along them like a path. Fractals, patterns found in nature, are visually useful to promote healing and reduce stress as the brain is able to associate these patterns with the natural environment. Fractals are found in the structure of tree branches as well as the inside of a kiwi fruit.

Just as the built environment has the ability to promote healing, it also has the ability to increase stress. The proven elements of a stressful environment include noise, mazes, crowding, and too much or too little light. Beyond just the feeling of anxiety that is associated with stress, it also has several detrimental affects on health. The chart on the right, taken from Dr. Sternberg’s Ted-Talk in 2013, shows the affects an imbalance of stress can have to the body. One of the most stressful spaces within a healthcare center is the waiting rooms, which also are found to be the areas with the most limited views.
2.2.2: Evidence-Based Design Strategies

Evidence-based design strategies, taken from the Center for Health Design, provide easy-to-follow recommendations for improving western healthcare facilities. Using research-baked findings, like that of Robert Ulrich, healthcare facilities can be designed to better impact a patient's safety and stress, as well as for staff and visitors.  

Access:

__ Incorporate all necessities into the clinic area
  (lab, x-ray, dental, behavioral, medical, pharmacy)
__ Provide nature distractions that are positive stress-reducers
__ Keep future expansion in mind when designing circulation
__ Connections to the natural elements should be easily accessible
__ Separate public-treatment-staff areas

Waiting:

__ Consider different waiting areas
  (outside, inside, and overflow areas)
__ Lighting variety should be considered
  (controlled, natural, and skylights)
__ Patient spaces should be able to accommodate family

Exam/Consulting:

__ Inclusion of multiple caregivers should be considered
__ Circular layout in the pharmacy can help increase more efficient work patterns
__ Group care rooms should be incorporated
__ Connections to the natural environment to reduce stress
__ Standardize equipment in treatment rooms

Staff Areas:

__ Decentralized nursing stations
__ Team Spaces should be close to individual work spaces with visual connections, to improve collaboration
__ Connections to the natural environment
__ Adequate illumination


2.3 Maori Healthcare Model (from ADHB)

2.3.1: He Korowai Oranga

He Korowai Oranga is the updated Maori Health strategy from the Auckland District Health Board, as of June 2014. The new plan takes an important stance on providing Maori healthcare that fits their current needs, as well as looking to the future. It looks at the importance in the pae ora (healthy future) of Maori, and considers a holistic approach to achieving this goal. There are three main elements that have been established in this strategy:

1. **Wai Ora: Healthy Environments**
   Wai Ora translates literally to water, and is used here to reference an importance resource and element to a health sustained life. This element not only looks at the literal environmental features that affect Maori health, but also the importance of community support and programs.

2. **Whanau Ora: Healthy Families**
   This establishes the importance of family for Maori health, as they are seen as the driving source of identity and support in the Maori community. Family is also considered one of the four main pillars of Maori health.

3. **Mauri Ora: Healthy Individuals**
   This addresses Maori as health service consumers, and their immediate and futures needs being met within this service. Because of past concerns with the comfort Maori had with health services, this is an important aspect that must be met through this updated plan, including a lack of discrimination in the care being provided.

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Figure 2.3.2: The updated Maori Health Model from ADHB
2.3.2: Rongoa Maori: Traditional Healing

The natural environment carries an important weight to the Maori community, as it is believed that they share a common ancestor with the trees and plants. As outlined in the Te Aranga design principles, Maori see themselves as guardians of the land, as they are decendants of Tane, the god of the forest. Because of this, an important balance between the community and the natural environment is vital in establishing Maori health. As Maori take care of the land, so does the land in healing the people.

Rongoa Maori is traditional Maori healing which uses elements of the natural environment, such as trees and plants. The healers of a tribe would use different plants to heal different ailments. It is important to understand the holistic view of health for Maori people, as the physical component provides only one aspect. Maori believe that physical, mental, spiritual, and family health are needed to secure optimum health. If any of these elements are out of balance, in either the community or person, Maori health is diminished. Because of this, the plants that are used in Rongoa Maori are not only used because of their chemical reactions, but also the connection they have with the environment to heal.

Unfortunately, Maori fear that Rongoa Maori will be used to commercialize herbal medicine, without understanding the multiple layers of healing and spiritual connection that is needed. Because of this, Rongoa Maori is slowly becoming less accessible, which is only further created through the urbanization of Maori communities. The Maori teachers of Rongoa do not believe in teaching unless the students are fully immersed in the ideas behind Rongoa, and not just the idea of herbal medicine. In the continued pursuit of a comprehensive and affective Maori health plan, Rongoa Maori is hoped to regain its healing significance in the Maori community. Interestingly, there has been a recent resurgence in the desire for Rongoa Maori, amongst the Maori and European community, due to the disinterest in antibiotics and the inexpensive qualities of Rongoa.

3.0 Precedent Architecture
3.1 Nga Purapura Health Facility

Architects: Tennent + Brown
Location: Otaki, New Zealand
Area: 3000 sqm

The Nga Purapura health facility, is based on the ‘Te Whare tapa Wha’ model of health, relating to the four equal sides (physical, mental and emotional, social, and spiritual). In an attempt to empower the local Maori community to become more physically active, as well as engage in their culture, the design encompasses a gymnasium, as well as offices and administration spaces. One of the more engaging and interesting spaces in the design is the “seed” in the void/entrance space. The structure is planted in the center of the design as being the reflection space, allowing for meditation and spiritual guidance. Shaped much like a seed, the inside brings a sense of calm and introspection, with dim lighting and curved walls.  

Program:
- Multi-Purpose Indoor Sports Courts
- Classrooms
- Cafe
- Showering / Changing Facilities
- Staff Areas
- Mezzanine viewing platform

1. http://www.tennentbrown.co.nz
3.2 Pyjama Visitor Center

Architects: MVRDV
Location: Veldhoven, The Netherlands
Area: 1500 sqm

The Pyjama visitor center is located adjacent to the Maxima Medical Centre, providing public programmatic elements, such as the restaurant and conference center. Because these require less hygiene control and sterile environments, the design was able to provide more dynamic arrangements. The building acts as a greenhouse, encasing local flora as well as structural components. MVRDV states, “the atrium will be the first step in re-fashioning the hospital as a sea of glass with lush gardens year-round, a green salve for an otherwise, white wound.” They address the growing conversation of greenery being a healing component in healthcare centers and hospitals. There is more freedom of movement in this area of the hospital, taking away the narrow and dark corridors.

Program: Conference Center
Library
Restaurant

Figure 3.2.3: Use of columns in hallway

Figure 3.2.4: Upper level condition

Figure 3.2.5: Floorplan
3.3 William Jefferson Clinton Children’s Center

Architects: HOK Architects  
Location: Port-au-Prince, Haiti  
Area: 560 sqm

The structure references the local kapok tree, with a branching diagrid for the balcony system. A bamboo ‘boundary layer’ helps protect the walkways and vertical surfaces from direct sunlight, but also provides natural ventilation. The roof garden provides foliage, establishing additional green space above the ground level and helps with the solar energy system of the building. A water collection system is used along the roof through funnels, which travel to the underground sitem for both treating water and use for the landscape.

Program:  
Orphanage  
Central Courtyard  
Kitchen and Dining Areas  
Ground-level “Safe Zone”  
Roof Garden

Figure 3.3.1: Perspective  
Figure 3.3.2: Layering elements
3.4 Gardens by the Bay

Architects: Wilkinson Eyre Architects
Location: Singapore
Area: 20,000 sqm

The two conservatories on the “Gardens by the Bay” site in Singapore are considered the largest climate-controlled conservatories existing in the world today. The purpose of these two sites is to bring different climates and plant life into the area. The main piece, an indoor waterfall, connects different elements and provides views as circulation interacts through and around. The reason for the curvilinear shape is to enhance the passive climate control techniques that Wilkinson Eyre implement in the fabric of the skin. The passive design strategies range from sunshading, rainwater collection, irrigation systems, use of natural air movement and breeze, as well as releasing the warm air through “super trees”. This project provides a clear connection to the natural environment, while still providing new climate and mechanical systems that provide an interesting effect.1

Program:
- Two separate biodomes
- Waterfall Tower
- Cafe/Restaurant

4.0 Design Process

4.1 Site Analysis
4.2 Sustainable Explorations
4.3 Program Area Analysis
4.4 Previous Explorations
4.5 Cultural Landscape
4.1 Site Analysis

4.1.1: New Zealand

New Zealand is considered a small country, but offers several unique aspects of place, unlike anywhere else. The geographical features range from thermal hot springs to volcanic islands to glaciers near the sea. With the Tasman sea on the West and the Pacific Ocean on the East, New Zealand offers astonishingly different terrains on either side, sometimes only being less than an hours drive apart. The unique mountainous geographical features also offer New Zealand its fruitful farmland and fresh water supply.

Because New Zealand is separated into two main islands, the weather and climate are considered drastically different between the far North island and the South island. Aside from these two extremes, the weather is considered relatively mild. Because of the lack of heavy pollution in New Zealand, the UV rays are much stronger than most other countries. The figure on the left illustrates the average temperatures and rainfall in Auckland, New Zealand. Because of the proximity to the exchange University (UNITEC) and the urban environment relating to the project objectives, Auckland was considered the ideal location for the building site, making this analysis more applicable than the entire country’s averages.

Figure 4.1.1: Auckland Weather
4.1.2: Manukau City, Auckland

The Manukau area in South Auckland was one of the first settled areas for Maori in New Zealand. According to Maori tale, around 1350 AD, the Tainui canoe sailed through the Manukau Heads. Because of the fertile soil from the volcanic cones in the region, Maori food gardens were extensively plotted. Unfortunately, due to quarrying in the region, little remains of the Maori settlements in the region, especially the two significant volcanic cones of the region, Matukuturaia and Wiri Mountain. Both sites are now declared as culturally sensitive, but they no longer resemble the geographical presence they once were. Today, Manukau City resembles a busy city center much like Auckland central. Due to Auckland’s “supercity” plan, Manukau is technically no longer considered a city center. Nonetheless, Manukau proves to be self-reliant and resilient, becoming a main business and cultural hub for the city. As plans remain to continue the urban growth of the area, the Manukau City Plan establishes the importance of keeping the cultural heritage relevant and protected.
4.1.3: Specific Site Selection

The specific site selection for this project is within the Manukau city center, directly across the street from Hayman park. With several public transportation depots near by, and other community facilities within the area, this site location provides access and support. A challenge that the site posed on the design was the general feel of the urban environment, associating the site to overwhelming shadows from surrounding buildings, a fast-paced movement of urban dwellers, and an overall sense of grunge that is usually associated with urban cities. But because the project hopes to address the idea of healing centers in urban settings, it made sense that this was a concern worth resolving.
4.1.3: Specific Site Selection

One of the main reasons this site was selected for this project is its proximity to public transportation. There is a main train station located in the park across the street, providing transportation to and from Auckland CBD, as well as other South Auckland stops. The several bus stations surrounding the site provide access to different rural areas outside of the Manukau city center, as well as transport to the domestic and international airport. Because of this ease of access, this site helps address the need for local Maori to be able to access comfortable and culturally significant healthcare.
Figure 4.1.5: Developing green space at Manukau mall

Figure 4.1.6: View of site from park
4.2 Sustainable Explorations

4.2.1: Passive Solar Design in New Zealand

Because New Zealand is located in the Southern Hemisphere, passive solar design requires different strategies and analysis from what is effective in the United States. Using strategies outlined by New Zealand’s Ministry for the Environment, the following principles helped guide the design of the building’s form and function.  

Building Form:

- The shape of the building should allow as much daylight into the floor plate as possible, usually best through long or narrow sections
- North and South exposures are preferable to East or West orientation
- The use of atria, clerestories and light-wells are other alternatives to providing optimum daylighting
- Room depths are considered best when 1.5-2 times the window height, in order to balance the light distribution
Room Features:
___ Programmatically, spaces that require higher light levels should be located along the perimeter or within the core areas, where windows are more frequently used.
___ When using wall partitions, using clear or translucent materials along the higher portion of the wall allows for the distribution of natural light, even when programs require higher privacy.
___ The recommended surface reflection according to NZME:
   Ceilings:   >80%
   Walls:  50-70%
   Floors:  20-45%
___ Sloped ceilings increase the distribution of natural light within the rear of the space when pushing the duct work to the back.
   (Higher ceiling means higher windows)

Window Systems:
___ Each window orientation requires different design strategies:
   North facades allow for strong illumination but this varies throughout the day. Because of this, it requires shading devices.
   South facades are considered the best orientation because they provide high quality lighting through consistency and minimum heat gain. Thermal loss occurs during the cooler days.
   East and West facades require shading because of the intensity of the daylighting as well as the lower sun angles.
___ Consideration should also be given to the type of glazing used depending on whether the window is for views or for maximum lighting.
   Lower-transmission window glazing helps reduce the glare.

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4.2 Sustainable Explorations

4.2.2: Shading Strategies

Overhangs and Sidefins:
Sidefins are generally only used for morning and afternoon low-angle sun orientation (East/West). Alternatively, overhangs are best used on North-facing windows because they provide shade from high-angle summer radiation, but allow the low-angle winter sun to pass through, helping reduce the heat gains in summer months.

Fixed Louvres:
Louvres are usually only useful when eliminating any undesirable sunlight. To do this, horizontal louvres are best for Northern facades, because the sun tends to be higher, while vertical louvres are best for East and West facades to deter the lower sun angles. Also, horizontal louvres are ineffective on East and West facades, as the sunlight will pass directly through them during the intense daylight hours. A disadvantage of the louvres is their potential to block external views.
When used to one’s advantage, screens can provide optimum shading while also creating a positive aesthetic affect. Screens are able to provide an even amount of shading throughout the facade, rather than the louvre strategy. Depending on the screen transparency, views to the exterior can be maintained for occupants. “Green screens” provide a visual impact to the environment while also creating optimum shading and cooling. This requires using a climbing plant and reinforced metal mesh.

Double Skin Facade

Double skin facades are best applied along the Northern facing side of the building in order to also provide natural ventilation. The main disadvantage of this strategy is the expense, as it increases the glazing required for the building skin. When blinds and lightshelves are integrated into the skin, it allows the light to be more efficiently diffused.

4.2 Sustainable Explorations

4.2.3: Green Wall

Green walls, or living walls, are becoming increasingly more popular in the design community, as sustainable practices become more essential. Not only are they considered aesthetically pleasing, but they also provide several building advantages as well. External green walls are able to protect the building structure from rain, sunlight, and temperature differences, which becomes a huge reduction in maintenance and time costs. Additionally, it can help reduce the storm water runoff. These walls also act as an additional insulation layer as well as protecting from the wind. Internal green walls are able to act more like air filters, removing the dust particles and toxins from the air, while continuously producing oxygen. Because plants use transpiration to create their own evaporative cooling, they are able to control the indoor temperature at a comfortable level. There are several different systems and structure types available to create green walls, both indoors and outdoors.


4.2.4: Water Collection and Gray-Water Use

Gray-Water systems reuse water from sinks, showers and laundry in a sanitary environment. Unlike water from toilets and urinals, which is considered black water, gray-water can safely be reused for other purposes such as flushing toilets or irrigation systems. For a gray-water system to work beneficially, it requires settling tanks, disinfectants and filters in order to remove any health hazards. In order to avoid having it mistaken as drinking water, it is often mixed with food coloring to be more easily recognizable.

Another sustainable water-use practice is the harvesting of rainwater. This system uses rainwater that is collected from the site or roof of the building. The water that is collected from this strategy can be used for multiple services similar to gray-water including irrigation and toilet use. Although the water from the roof is considered “clean” it is not considered safe for drinking or more sterile requirements because it has not been treated the same way as the water supply. Because the project is a healthcare center, the differentiation of water collection and water from the city water supply will be necessary to provide sterile, safe water for healing tasks. 

Figure 4.2.10: Water systems in section

Figure 4.2.11: Relationship of sustainable systems
4.2.5: Passive Ventilation Strategies

Passive ventilation strategies are one of the most commonly used sustainable practices in architectural design. It is considered the use of natural external air movement and pressure changes to cool the building as well as provide natural ventilation. These strategies are able to reduce mechanical building loads through the movement of air without fans as well as cooling the building without air conditioning units.

Stack ventilation is an example of passive ventilation, which uses air pressure differences to circulate air throughout the building. Solar radiation in taller spaces helps the effect of stack ventilation, making it ideal for atrium spaces.  

Figure 4.2.12: Air reactions through stack ventilation

Figure 4.2.13: Ventilation strategies creating building form
4.3 Program Area Analysis

4.3.1: What is Place?

After deciding on a site, addressing what a “sense of place” meant became necessary to understand the goals of the project. Looking at the context of the site, the people, and the healthcare typology, four key attributes became clear: healing, ease of access, environmental strategies, and the culture/sociability of the place. The blue areas represent the “intangibles” or ideas associated with the attributes. The outer layer, or green area, shows the strategies that can be implemented to achieve the ideas. This model is used to help guide the project, keeping the initial goals and objectives clearly instated.
4.3.2: Australasian Guidelines

Because this project is within the healthcare typology, it is important to use specific guidelines and requirements for the building. As a building that aspires to heal, it is essential that it does not hurt. By using the Australasian guidelines, which are used by architecture firms throughout New Zealand and beyond, the design can better attribute to the healing process. Australasian provides "considerations" for different programmatic elements within the design, as well as required area scheduling. These beginning considerations include: optimum internal relationships, external entries, acoustic consideration, non-standard components and functional zones. The following lists come from the Australasian guidelines:

Optimum Internal Relationships:
- Reception and administration areas should have line of sight to the main entry and waiting areas and be visible from adjacent staff areas. There should be easy access to stationery and health care records. Reception areas may provide a barrier, controlling access between waiting and treatment areas, dependent upon the range and nature of services.
- Consultation, examination and interview rooms should be readily accessible from the main entry/reception area as well as the staff area.
- Meeting and group/activity rooms should be adjacent to the main entry/reception area so they can be accessed after-hours, with the rest of the Centre safely secure.
- Staff areas designed to enable staff to move between the main entry and patient area. Staff offices and amenities should be separate from client and public areas to provide privacy and a quiet work environment.
External Entries:
__ There should be a single public entry point to the Centre that is easily identifiable. Selected services may require an alternate entry point. The main entry should have weather protection and allow for drop-off.
__ A dedicated staff entry is desirable, especially in larger Centres. This entry may be in use out-of-normal business hours so the location in relation to car parking requires consideration.
__ Depending on the size and services profile of the Centre, a dedicated access for deliveries and collection of waste will be required.

Acoustics Considerations:
__ Carefully planned location of services, such as toilets located next to stairwells or external walls, and not adjacent to consult or interview rooms
__ Careful consideration of reception soundproofing materials to ensure that patients can hear staff when required.

Non-Standard Components (Unit Specific):

Entry Canopy:
An entry canopy is required to provide undercover access to the building from vehicles. Provided at the main entry to the building.

External Areas:
Outdoor areas, such as drought resistant gardens, courtyards and terraces should (where feasible) be provided to give a pleasant setting for the building. Consideration should be given to the cultural needs of the local community.

Main Entry:
Should display clear signage and information for visitors and clients
Should have weather protection and may incorporate an airlock space
Doors that open automatically should be provided for easy access

Waste Holding Areas:
As an alternative to a disposal room, waste may be held in a secure bay on the periphery of the facility. This area would be caged to prevent unauthorized access.
Close by the service entry/loading bay

4.3.2: Australasian Guidelines

The following are different area flow diagrams from the Australasian guidelines. These were used throughout the design process, to continuously keep in mind the importance of clear circulation and wayfinding. Wayfinding is necessary in healthcare design in order to for the building to be safe and efficient for patients, visitors, and staff. Also, these diagrams illustrate private versus public areas, and how these should interact. Especially when considering Maori design, the interaction between spaces is exceedingly important, creating the need for semi-public and semi-private spaces as well.

Figure 4.3.4: Flow Diagram of Pharmacy

Figure 4.3.5: Flow Diagram for a Multipurpose Service Unit
The program for this building was one of the many design stages that continued to develop. Because this project proposes a different type of healthcare program from the typical typology, the program required precision in order to be taken seriously. While not diminishing the importance of orthodox medicine practices, the blending of both forms of healing provides the Maori community with options and proximity to both practices. From my interactions with multiple healthcare systems in New Zealand, there have been people who agree with this idea that both practices can be blended. Both types of healthcare are meant to heal. By including the Maori healing strategies in the program, it allows the idea of holistic healing to regain its meaning, thus providing the community with all four sides of the healthcare that is important to them. Also, to engage with the hopes and aspirations of Auckland District Health Board, the inclusion of women's health is particularly important, as this was one of the many disparities found between Maori and non-Maori health.
This flow diagram is one of many conceptions of how the different programmatic elements should be connected, both visually and physically. The proximity of Rongoa to both the pharmacy and the educational/community component recognizes that Maori believe that Rongoa is not just about physical herbal medicine, but also incorporates the spiritual and family aspects of Maori health. Also, by associating Rongoa with the classrooms, it allows for the regaining of Rongoa knowledge for the Maori community. This is considered especially important because of the disconnect Maori have with their culture when moving to more urban environments. By suggesting Rongoa to be educational, it allows for the resurgence of Rongoa knowledge. Also, this alleviates the fear that Rongoa in healthcare centers would mean a commercialization of the healing practice.
Waiting and Reception Area

<table>
<thead>
<tr>
<th>Room Space</th>
<th>Qty x m²</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Canopy</td>
<td>30</td>
<td></td>
<td>Allows for Ambulances</td>
</tr>
<tr>
<td>Airlock Entry</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Entry</td>
<td>12</td>
<td></td>
<td>Directly adjacent to reception and waiting area</td>
</tr>
<tr>
<td>Reception/Clerical</td>
<td>20</td>
<td></td>
<td>Up to 4 staff</td>
</tr>
<tr>
<td>Store-File</td>
<td>20</td>
<td></td>
<td>Active medical records, secure, ready access</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>from reception and clinical areas</td>
</tr>
<tr>
<td>Store-File</td>
<td>15</td>
<td></td>
<td>Archived medical records, secure, may be remote</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>from main work areas</td>
</tr>
<tr>
<td>Office- 4 person shared</td>
<td>20</td>
<td></td>
<td>Administration (may be combined with reception</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>function)</td>
</tr>
<tr>
<td>Office- Single person</td>
<td>9</td>
<td></td>
<td>Centre Manager. Adjacent to reception and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>administration areas</td>
</tr>
<tr>
<td>Waiting</td>
<td>30</td>
<td></td>
<td>20+ clients, information display, view from</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>reception, adjacent to child play area</td>
</tr>
<tr>
<td>Play Area</td>
<td>10</td>
<td></td>
<td>Should relate to sub-waiting areas, especially</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for Child and Family Services</td>
</tr>
<tr>
<td>Parenting Room</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilet-Public</td>
<td>3</td>
<td></td>
<td>Near Waiting Area</td>
</tr>
<tr>
<td>Toilet- Accessible</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bay- Wheelchair Park</td>
<td>4</td>
<td></td>
<td>Wheelchairs, prams etc.</td>
</tr>
</tbody>
</table>

194 m²

Developed Program and Area Diagram

The following tables are modified area schedules from the Australasian guidelines. The development of these area schedules has allowed for a better understanding of the project conditions and the different programmatic elements required within each section. Because this project is a healthcare facility, these guidelines are critical in accessing the effectiveness of the design. While the flow diagrams provide a better understanding of the relationship between different programmatic elements, these schedules give more detail and understanding into the rooms and spaces required within the more generalized forms. Also, by establishing these guidelines, the total square meters that each section requires provides a better understanding of the conditions along each floor level.

## Patient Areas

<table>
<thead>
<tr>
<th>Room Space</th>
<th>Qty x m²</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult Room</td>
<td>12</td>
<td></td>
<td>14 for child-related services</td>
</tr>
<tr>
<td>Interview Room</td>
<td>12</td>
<td></td>
<td>For therapy and counseling services</td>
</tr>
<tr>
<td>Treatment Room</td>
<td>14</td>
<td></td>
<td>Multi-functional, ready access from waiting areas</td>
</tr>
<tr>
<td>Meeting Room</td>
<td>20</td>
<td></td>
<td>Up to 15 people</td>
</tr>
<tr>
<td>Meeting Room</td>
<td>Up to 40</td>
<td></td>
<td>1 x external access for after-hours use</td>
</tr>
<tr>
<td>Pantry</td>
<td>8</td>
<td></td>
<td>For (large) meeting room</td>
</tr>
<tr>
<td>Toilet-Patient</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>110 m²</td>
<td></td>
</tr>
</tbody>
</table>

## Clinical Areas

<table>
<thead>
<tr>
<th>Room Space</th>
<th>Qty x m²</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay-Handwashing</td>
<td>1</td>
<td></td>
<td>Distribute as required</td>
</tr>
<tr>
<td>Bay-Linen</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bay-Resuscitation Trolley</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaner’s Room</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Utility</td>
<td>14</td>
<td></td>
<td>Also for medications</td>
</tr>
<tr>
<td>Dirty Utility</td>
<td>12</td>
<td></td>
<td>Optional provision</td>
</tr>
<tr>
<td>Disposal Room</td>
<td>8</td>
<td></td>
<td>May instead be a secure waste holding area located outside</td>
</tr>
<tr>
<td>Store-Equipment</td>
<td>20</td>
<td></td>
<td>More than one may be required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63.5</td>
<td></td>
</tr>
</tbody>
</table>

## Staff Areas

<table>
<thead>
<tr>
<th>Room Space</th>
<th>Qty x m²</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet-Staff</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shower-Staff</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office-Single Person</td>
<td>9</td>
<td></td>
<td>Depends on staffing and operational policies</td>
</tr>
<tr>
<td>Office-Workstation</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Room</td>
<td>25</td>
<td></td>
<td>May include library/resources</td>
</tr>
<tr>
<td>Property Bay</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store-Photocopy/Stationary</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>55.5 m²</td>
<td></td>
</tr>
</tbody>
</table>
4.4 Previous Design Explorations

4.4.1: Beginning Sketches

Below is a selection of sketches drawn at the beginning of the design process, to generate some different building forms and layout schemes potentially worth pursuing.
The images on this page show sketches of the first design iteration from the year. After exploring with several sketches on building form and layout, a common theme began to unfold, showing a trend towards the progression from orthogonal geometries to more organic shapes. The sketches of both plan and elevation attempt to represent this theme diagrammatically. In this attempt, the focus was placed heavily on the visual aesthetic of the building in its primal form, through the blending of shapes. This design strategy incorporates three separate bars that programmatically represent different elements. The bar along the North edge of the site suggests a more orthogonal geometry, representing the more orthodox healthcare practices. The South edge provides more organic forms and shapes, suggesting the more Maori healing (less orthodox) side. The bar in the middle is the atrium, suggesting a completely transparent slice through the building.

In this design iteration, the focus of the atrium being the connecting piece between the two forms became a positive development to pursue further. As the design continued to develop, however, the scheme of the three separate bars became a less important focus. This was realized by the fact that one of the main goals of this project was to create a blending of the two healthcare models, and providing separate wings seemed to only reinforce the current separation between the two.
4.4.2: Atrium Development and Considerations

In the beginning stages of the design development, the atrium suggested a narrow linear form splitting the building into two separate parts. The atrium was seen to divide the health center, rather than integrate different spaces. It was left lifeless and unactivated. The concept of a transparent atrium space, visible from the street, was seen as a positive consideration for the continuation of the design. In this iteration, the space between the atrium and the entrance was programmed as waiting and reception space on the ground floor, and circulation spaces on the above levels.

In order to address the atrium’s affect on the spaces adjacent to it, I began looking at ways different sections of the building could interact around and within the space. These explorations included looking at additive, subtractive, and circulation strategies. The circulation strategies included ramps and stairs within the atrium space that allowed people to move within the atrium through to other parts of the building, as well as making the atrium a circulation hub. The issue with this strategy was that too many stairs and ramps seemed to take away from the aesthetically pleasing aspect of the atrium idea. Another concept was the idea of having the hallways that connected directly with the atrium wall to become open walkways within the atrium, providing fresh air without taking away from the existing views of the atrium from other levels.

For the additive strategies, I began looking at how certain areas and floorplates could protrude into the atrium space. By doing this, the interior of the atrium space became more dynamic, and allowed for different views into the atrium. The use of protruding spaces also seemed to suggest different uses of spaces, including an additive moss “green” wall within the atrium. Unfortunately, this also meant that other spaces along the atrium would have disconnected views. Through these explorations, the additive strategies seemed best used when protruding lightly into the atrium space, creating dynamic edges and views, while still allowing for other views to remain available throughout the building.

Because the atrium in this scheme already visually appears as a subtracted mass in the building, cutting through the different wings, the explorations of subtractive strategies seemed more applicable when used for circulation or open spaces. This is because the use of subtractive strategies, like pushing into the floorplates, required the pushing of programmatic spaces. Because of this, the subtractive elements that were found to be most appealing were courtyards on upper levels looking into the atrium space, as well as staircases that would otherwise be within the interior, closed-off spaces of the building.
Another way to make the atrium a more dynamic space was to look at an irregular form. This created different angles and visual movement within the space. By looking at something other than a narrow atrium space, circulation and gathering seemed to become more resolved, as the space felt less like a transition space, and more of a space to engage with.

By creating these different aspects, the space started to appear more active and engaged with the spaces around the atrium, but the literal separation of the two wings continued to suggest disassociation between the two program types. This created the question of, how can the aspect of holistic healing and the blending of cultural aspirations help inspire a holistic building design?

Another important development in the atrium design was the connection to the external natural environment. Through many different scheme iterations, the development of an internal and external courtyard became an important solution. By having two separate courtyards, internal and external, their relationship allows for a better blending of the natural elements incorporated in the design. This solution helps resolve one of the main design objectives is to create and connect natural environments in an urban setting. The way that these two spaces interact will continue throughout the building, allowing people who interact with the spaces to feel close to nature.

Also in this development, it became clear that all of the internal programmatic spaces should interact in some way with the interior atrium space. Because of this, the orientation and size of the atrium began to expand and contort to best fit this need. In certain areas, the internal courtyard extends to different floorplates, and in other areas the courtyard turns corners along the edge of a wall. Also the different floorplates began to shift in order to incorporate balconies and views from all levels of the building.

The development of sustainable strategies within the atrium was also a crucial part of the design development. Using stack ventilation as a passive design strategy seemed beneficial to the atrium design, allowing the plants and open air ventilation to provide cooling for the building. The plants would also be able to act as a shading element, reducing the effect of glare inside the building.

Figure 4.4.9: Ventilation strategies in the atrium
Figure 4.5.1: Cultural Landscape Map
4.5 Cultural Landscape

4.5.1: Background information

In the Te Aranga design principles outlined in the "Influential Elements" section, one of the main principles is the acknowledgement of the greater cultural landscape. Because my site is situated in Manukau’s city center, there are several areas nearby with cultural relevance to Maori. These areas include important bodies of water, Pa site locations, and relevant open green spaces. Although these elements have different resonance and meaning to Maori, they are equally important in plotting the cultural landscape map for the area.

The map on the left is the cultural landscape map that was developed using a 5 kilometer radius surrounding the building site location. The areas in red are the pre-existing and current Pa sites, the green areas represent the open green spaces in the area including public parks and open fields, while the blue areas represent the bodies of water including the Manukau harbor and rivers and streams.
4.5.2: Culturally Significant Sites

Culture: Pre-existing or Current Pa Site Locations

Matukutu Tururu (the bittern standing at ease):

Matukutu Tururu is named after a commanding chief who fell asleep while eel-fishing, causing his people and fort to be captured, occurring to Maori legend. It was once an important Pa site for the Maori people, but has since been quarried and drained.

Matukutureia (the vigilant bittern):

Matukutureia is the other Pa site located in Nga Matukuru, and is named after a commanding chief that saved his people. Although this site has also received heavy quarrying, the site still resembles the volcanic cone site it once was. Through the support of DOC, both this site and Matukutu Tururu are now protected as natural historic sites.

Pukaki Tapu: (The Sacred Spring of Poutukeka):

Pukaki Tapu contains one of the oldest Marae in the area, dating back to when the Tainui canoe first arrived in the Manukau harbor. Its rich ecological features include the Pukaki crater, as well as an estuary and creek. Although the original Marae was destroyed, in 2004 the local iwi were able to rebuild on the site.
Although the Pa sites are not actually visible from the selected building site, the acknowledgement of their cultural significance and site context are important aspects of the Te Aranga design principles. During the first stages of analyzing the cultural landscape map I developed, I created "cones of view" as a way of acknowledgement, to see the lines and shapes generated. These were developed to help guide the building form design and function, in a way that would best connect with the greater cultural landscape.


Water: Local significant bodies of water

The blue cones point out the bodies of water within a five kilometer radius. Although these points are also not visible from the ground of the existing site, they are still considered significant cultural and environmental features to acknowledge in the design development.

Figure 4.5.6: Significant Waterways
Open Green Areas

The only visible significant point from the proposed site location is Hayman park located across the street. This is represented by the largest green cone on the diagram above. The open green spaces, as indicated by this diagram and the overall cultural landscape map, are the most varied and prevalent within the five kilometer radius that was used.
4.5.3: Using the Lines to Define Building Form

After creating the "cones of view" for all three of the categories, the idea of using the lines to define the building form and layout helped resolve the issues in the previous design iterations. Instead of using the cones, as the views are not actually available from my site location, I drew lines from the significant sites to building site.

When establishing the lines for the historic Pa sites, I began to connect them from a central point. By doing this, this point in the plan could provide a culturally significant program, and establish acknowledgement to all of the Pa locations from one central location. Because these are historic sites, a meditation or quiet space for family and friends of the community seemed appropriate, allowing for reverence. Also, the location of this point within the whole of the building suggested that it could become a visually wayfinding tool, using it to associate oneself within the building.

For the lines associated with the bodies of water, I felt they should be grounded in the plan. Also, in representing water, the lines should create movement. Because of this, they established the circulation patterns for the ground floor, where pathways through and into the building were formed. Instead of having these lines represent walls and structure, it made sense to use them as a sense of direction, rooted in the ground, like the rocks at the bottom of a stream.
The green lines were used to create a conversation between the red and blue lines. In doing so, they addressed the creation of walls and floorplates. Also, these lines informed the placement and shape of the atrium space. Because many of these lines appear in the center of the building, it allows the levels above ground floor to rotate and shift according to the lines to become more dynamic and converse with the atrium space below. Not only did these lines establish an indoor atrium green space, but they also formed an outdoor green space to transition into the interior space.
5.1 Building Conception

All of the previous elements and design explorations have led to the current building conception. The building acts as an unfolding natural environment, with exterior and interior courtyards. The room spaces within the building interact with the interior courtyard through shifts in the floorplates. The lines created from the walls of each floor are derived from the cultural landscape map. In order to avoid harsh corners and edges from using too many of the lines as walls, a series of columns are created. These columns allow people to visually experience the significant lines drawn from the wider cultural landscape, as well as provide more open-air spaces for people to enjoy. The circular space centrally located in the plan is the meditation or quiet space. It was taken from the cultural Pa site lines.

Also, the building was pushed out to connect with adjacent park, crossing over the existing street. This will cause traffic to go around the building, but also provides parking along the rear end of the building on the existing site. By pushing the building out to meet the park, the different natural environments are able to both physically and visually connect.
Figure 5.1.2: View of ground floor and column axis

Figure 5.1.3: South Elevation of Building Design
Figure 5.1.4: Ground Floor Plan
5.2 Space Planning

The layout of the building, though designed through the cultural landscape and atrium development, provides ease of wayfinding and programmatic logic throughout. Because the interior courtyard is centralized to the building, the different areas are easy to navigate no matter the location. Along the Western facing edge, the pharmacy is strategically placed on the ground floor so that it can easily be accessed for those only needing to use the pharmacy services. The Clean Eating Cafe is located on the second floor, for better views and outdoor seating, as well as being easily accessed from the exterior. The next two levels provide medical services for women and children’s health for more specialized service. And the highest level is dedicated to administration. All of these levels provide open-air balconies, transitioning from the exterior to the interior courtyard.

The Eastern wing of the building provides more community services, and can be accessed from the parking in the rear when the main building is closed. This is important for the multi purpose space, which may be used after hours by local community programs. The ground floor accommodates the general practitioner area, as well as staff and conference spaces. The conference spaces are left open to the courtyard to provide a sense of transparency and allow for larger families. There are two other meeting spaces beyond that which are for those having more intimate meetings, while still being able to see the greenwall and interior courtyard. The highest level on this side is dedicated to Rongoa Maori education, allowing for classrooms and interacting with the different levels of the indoor courtyard for plant study.
Figure 5.2.1: Program Diagram
5.3 Sequence of Spaces

Important for both Maori design and architectural design as a whole is the sequence of spaces when engaging with the building. The image at the top right shows the main entrance into the building. The row of columns visually engage with the street edge, as well as separate the outdoor courtyard with the path to the entrance. Although not so obvious to see for the person on the street, the columns also engage with the interior spaces by continuing the lines found in other spaces. This is illustrated in the image on the bottom right, showing more rows of columns used in the interior courtyard. These columns provide strong visual connections with the cultural landscape map and also provide a structural component for the overhanging floorplates. The columns measure 1.5 meters apart, allowing for people to easily walk through and around them.

A Figure 5.3.1: View from Street Corner

B Figure 5.3.2: View from Interior Atrium Space
5.4 Cultural Space Development

The space central to the building is cultural quiet room. The form of this room was developed from the different lines from historical Pa sites. Because of this reason, it will hold strong cultural relevance to Maori people. The space provide quiet meditation for those needing a moment away from the healthcare facility. It allows time to reflect for those experiencing hard news or to pray for a family member that is ill.

The concept for the design of the cultural space is using slats of wood to create a continuous circular shape, disrupted only where the shape breaks from the lands of the cultural landscape. The slats will bend out, creating different programmatic elements, including places to sit. Visually, the space will read as part of the natural environment. Because the space is two stories tall, it will feel visually powerful vertically.
5.5 Atrium Development

The atrium was developed using the green lines from the cultural landscape map. These lines are also represented through the rows of columns along the ground floor. Along the Southern edge, the atrium steps up to the second floor plate, creating a more dynamic environment, and allowing more views from different areas. Along the Northern wall is a green moss wall. The greenwall helps create clean air inside the building as well as become part of the water harvesting system. Because of the rotation of floorplates along the Eastern edge, views to the atrium can be obtained from all levels. Also, the Western side provides long balconies into the space.
The main objective of this project was to provide a solution to the current disparities in Maori healthcare. To do this, the project design was focused on being community-oriented towards the cultural and medical needs of the local members. In order to achieve this goal, it suggested the need for layering of different influential elements, such as the Te Aranga design principles and evidence-based design strategies. One of the main drivers for both of these principles is the incorporation of the natural environment. To do this required both an engagement with the existing natural environment around the site and also the creation of natural elements within the building design. Because of this, one of the main features in the design proposed is the extension of multiple natural environments: the interior courtyard, the exterior courtyard, and the park adjacent to the site. All of these different environments read as a connected force because of their physical and visual connection and also their different contributing elements. The exterior courtyard allows the building to blend into the natural landscape more successfully than a harsh brick block building. Also, the spaces around the natural environments are purposefully placed to provide maximum visual and physical interaction. In one area of the building, the floorplates "twist" in order to provide each level with space that directly connects with the atrium. Also, the greenwall along the North wall continues to blend the building into the natural environment, instead of using a general wall material from floor to ceiling. Because of these developments, I feel that the project successfully addresses the objective of using and creating natural environments to promote a sense of place.

Also, the development and use of the cultural landscape map provided a clear direction for the building form. This positively addresses the importance of Maori culture within the project design. By creating visual lines and view cones to the significant cultural landscape features, the building continues to promote a sense of place for Maori people, by engaging them with their cultural heritage. The cultural space in the center of the building will help allow people to find a place of peace and reflection in what could be a stressful time. Because of its cultural engagement, it also connects people to their spiritual healing. By incorporating different program elements, including Rongoa Maori and general practitioner space, the project also provides a business strategy that provides Maori with all four different aspects of health: physical, mental and emotional, spiritual, and family.

Further development will provide solutions for sustainable practices that the building should incorporate, as well as materiality of the building.

6.0 Conclusion
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