Infusing Wellness

Rejuvenation Centre: A threshold from industrial to natural realm

"An architectural research project exploring the elements of well-being provided by architecture and nature"

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Abstract

The meaning of wellness is defined as a healthy balance of mind, body and spirit, responsible for the mankind's holistic well-being.[1] Architecture and the built environment have the potential to influence the individual's well-being. Nature, similarly, functions as a booster to our wellness as it engages with the multiple senses and thereby provides physical, mental, and spiritual healing.[2]

The focus of this project is a "Rejuvenation Centre" within Highbrook Business Park in East Tamaki, Auckland, which aims to heighten the level of well-being in all people engaged with a busy life style inside the business area, in order to raise awareness towards the "holistic wellness" concept which engages not only the body, but also, mind and spirit. This project is a response to the envisaged major growth of both businesses and population within the precinct,[3] to provide a healthy meeting place for business workers and the near-by communities. The project investigates and learns from the healing elements provided by architecture and nature; as identified and analysed by Christopher Day [4] and Carol Venolia [5] who both suggest methods and ways on how these elements can be altered in order to bring mental and physical therapy in to the built environment. These elements, however, include light, colour, material, texture, and vegetation. The project has also looked at Feng-Shui's theory which suggests engaging the built environment with the harmony of nature, using concepts such as: Yin/Yang, the five elements, and the environmental energy (Qi).

Design intention, however, (involved the focus on sensory, experience, therapy and thermal comfort) will focus on the sensory and therapeutic experience provided by the elements mentioned above. The design will also look at the concept of zoning, in order to engage each activity with a distinct atmosphere that is inspired by the five elements of nature (earth, water, wood, fire, and metal).

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[1] Ben Zimmer, "Wellness, " *The New York Times Magazine*, April 18, 2010, 20

[2] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts,1988), 2

[3] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012, http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf

[4] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004)
Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002)

[5] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts,1988)

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1.0 Introduction

1.1 Background of the project

Architecture and the built environment have a major potential to promote the individual's well-being; buildings have the power to generate atmospheres that interact with the human senses (sight, sound, smell and touch) and then trigger the emotional response which influence our wellness level in either a positive or a negative way.

However, Individuals' wellness nowadays is being disrupted by numerous factors that are becoming inseparable from the daily routine; life-work balance in the modern workplaces is getting more challenging with the increase of workloads, raising the stress levels of workers and therefor causing a negative impact on health and productivity.[6] Moreover, the consumer culture that exists today has made it difficult for people to maintain a healthy lifestyle; technology, for instance, has influenced a shift from physical to mental work and promoted the sedentary behaviour.

The meaning of wellness is defined as a healthy balance of mind, body and spirit, responsible for the mankind's holistic well-being.[7] However, physical and emotional aspects of a healing environment include elements that can either enhance or take from the spaces' therapeutic values, such as the level of comfort resulted by design.[8] Nature, on the other hand, has healing characteristics that can be utilised within the built environment; nature lives in balance and provides the universe with a harmonious energy that architecture must learn and benefit from, in order to generate therapeutic atmospheres.

[6] Theo T. Cary C., *Doing the Right Thing: The importance of Wellbeing in the Workplace* (Basingstoke : Palgrave Macmillan, 2011), 21,22

[7] Ben Zimmer, "Wellness, " *The New York Times Magazine*, April 18, 2010, 20

[8] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 20

1.2 Project Outline

The project comprises a "Rejuvenation Centre" designed at "Highbrook Business Park" in East Tamaki, Auckland, acting as a threshold between the industrial and nature realm. The project is a response to the envisaged major growth of both businesses and population within the precinct,[9] and aims to provide a healthy meeting place for business workers and the near-by communities.

1.3 Aims/objectives of the project

-To heighten the level of wellness in all people engaged with a busy and stressful life style within the business area, raising awareness towards the "holistic wellness" concept which engages not only the body, but also the mind and spirit.

-To provide a unique gathering hub that takes workers away from the industrial atmosphere, and instead, engages them with a sensory experience that targets positive emotions, as well as rejuvenates the minds.

-To gain an understanding of the healing elements provided by architecture and nature, and implement them into the Centre's design, rather than just facilitating wellness programmes.

-To Investigate and learn from architecture-nature connection, and develop an architectural solution that responds to this relationship.

[9] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012,http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf

1.4 Research question

How might a “Rejuvenation Centre” be developed as a threshold between the industrial and natural realm?

1.5 Scope and limitations

The project focuses on the following elements:

-The notion of therapy in architecture, and the architectural elements that can facilitate and enhance the therapeutic value of the built environment which include: light, material, vegetation, colour, texture, and silence.

-The relationship between the built environment and nature, and learning from The Organic Architecture, and Feng-Shui concepts which both state that building form should blend with the surrounding nature, as well as responds to the life forces available on site (topographical changes, wind movement, sun orientation) in order to deliver a beneficial energy into the building interior.

-The five elements (earth, wood, water, fire, metal) available in nature and mentioned in Feng-Shui’s concept as essential elements with different characteristics which together have the ability to provide us with a harmonious energy that is essential to our well-being, as they target our multiple senses by delivering different smells, materials, colours, and textures.

-The relationship between humans’ senses (sight, hear, smell, touch, warmth) and the built environment, and providing atmospheres that please and satisfy all these senses.

However, this project, although it considers aspects relate to Organic Architecture, it is not looking at being fully organic, instead, utilising organic form and land relationship. The project also doesn’t engage with every single detail of the Chinese philosophy (Feng-Shui), but rather, investigates and responds to its major theories which include: (Yin/Yang), the five elements, Qi (energy) movement within the environment.

1.6 State of knowledge in the field

The project has learnt from the following literatures:

-Christopher Day
-Places of the Soul: Architecture and Environmental Design as healing Art.[10]
-Spirit and Place: Healing our Environment.[11]

In both books, healing elements in architecture have been analysed and identified by Day, describing that our well-being is highly affected by the built environment. Day states that acknowledging the human’s multiple senses (sight, hear, smell, touch, and warmth) is necessary in architecture, as healing sensation is only achieved when all senses are satisfied. Moreover, Day suggests methods and ways on how architectural elements can be altered in order to provide mental and physical therapy.

-Carol Venolia
-Healing Environments: Your Guide to Indoor Well-Being.[12]

This book also identifies elements that assist with the healing factor of the built environment, but with more focus on the interior, the use of colours, the quality of light, the use of vegetation, and the control of noise.

Relevance: introducing wellness through architectural elements where architects have control on, moreover, identifying elements with distinct characteristics (colours, materials, textures, light, and vegetation) to be developed in such ways where they promote and enhance the healing experience of the building.

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[10] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004)
[11] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002)
[12] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts, 1988)

-David Pearson
-New Organic Architecture: The Breaking Wave. [13]

Pearson identifies the main principles that describe Organic Architecture, stating that nature is the most influential element that drives its forms, as well as being site responsive, where building shape responds to the dynamic forces of site (orientation, wind direction, topographical changes).

-Simona F. Manini
-Feng Shui for Architecture. [14]

Architecture should learn from nature's principles in order to generate a healing environment. These principles include:
- Yin/Yang (dark/bright): our built environment should respond to this universal balance by allowing yin (dark/night) and yang (bright/ day) equally into the building.
- The five elements found in nature (earth, water, wood, fire, and metal) enjoy different characteristics which makes each element able to provide our senses with a distinct sound, smell, sight, and touch experience, and together these elements provide us with a harmonious energy, essential to our well-being.
- Qi (energy) flow in the environment: which suggests methods on how buildings should be approached to allow a beneficial energy in and block the harmful ones out.

Relevance: Introducing wellness through form-site relationship where building can respond to beneficial energy. Moreover, utilising the five elements found in nature to deliver distinct sensory experience by each element.

Precedents, on the other hand, included:

-Therme Vals-Peter Zumthor:
sensory experience and self-mindfulness: engaging sight, smell, touch, hear, and warmth through the control of light and views, the expansion and compression of body movement, the floral and humidity smell, and the contrast of human skin and the rough stone texture.

-House of culture and movement-ADEPT Architects
Atmospheric changes: each activity implies distinct atmosphere that is emphasised by colour and materiality to encourage movement within the spaces.

-Centre for Wellness-Ikon. 5 Architects
Topography and nature connections: utilising the topographical changes of site to develop an earth-like experience that is emphasised by the use of earthy materials.

-Myall Coast wellness and community centre- BAC Group Architects
Outdoor-inspired social area: utilising nature with in the main gathering area in order to provide a healing and healthy environment to the heart of the building.

Relevance: introducing wellness through acknowledging the individuals' multiple senses by providing atmospheric changes (examples 1 and 2), or, through engaging buildings with natural elements (examples 3 and 4). However, the project will benefit from both approaches and will apply atmospheric changes that are generated by natural elements.

[13] David Pearson, *New Organic Architecture: The Breaking Wave* (London: Gaia Books Limited, 2001)
[14] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004)

1.7 Methods

The first stage has involved research for design; studying the current state of knowledge in the field (including literature and precedents), as well as understanding the chosen site and context.

Elements related to architecture and therapy were researched first to gain some knowledge about the ways architecture can heal, which then influenced the inclusion of nature as a healing aid. Precedents' analyses of wellness architecture have developed an understanding on how therapeutic elements can be implemented into the built environment, and how nature can increase from the healing value of the building.

The site and context analysis, on the other hand, have included:
-looking at the envisaged growth of the East Tamaki precinct, targeting population and business.
-looking at types of amenities available on site, in order to ensure the viability of the proposed intervention.
-looking at the Auckland Council's development plans, in order to work with the current and the future proposals of the area.
-looking at (age, ethnicities, family types) statistics during the period of 2006 and 2013 of East Tamaki and the neighbouring communities to help with choosing the right programmes for the intervention.

The second stage, however, included research through design, which has involved utilising the knowledge and understandings gained from stage one and implementing them into design. However, design process stages included the following:

-Site was modelled at an early stage to understand the nature of land and its topographical movement. The model was generated digitally and in 3 dimensions after gaining the accurate land information from Auckland City Council website.[15]

-Building forms were also generated digitally at an early stage of the design, placed and tested on site model after cutting multiple sections in order to understand land-form relationship (since building form was concluded to play a significant role in providing the therapeutic experience).

-Constant changes were applied on form as a response to zoning and planning.

-Roof shape, on the other hand, was a response to the floor plans' movement, and it was changing according to plans.

-Atmospheres were developed to be implemented in each activity, using different approaches for each zone. However, in some atmospheres, models were used to test light quality coming from the façade systems. Other atmospheres, on the other hand, were designed and tested using photo collaging and computer rendering in order to test and understand light, materials and colours relationship, and whether they deliver the desired atmosphere.

-Sections, however, were produced in each zone to test roof-wall relationship and understand the air flow and thermal comfort within each space.

-3d sketches were also produced at each stage of the design to understand plan-roof relationship, and indoor-outdoor connection. Since the emotional feel of a place is considered essential to deliver therapy.

[15] Auckland Council, "GIS Map Viewer," accessed September 2nd, 2015, http://maps.aucklandcouncil.govt.nz/aucklandcouncilviewer/

2.0 Architecture and Therapy

2.1 The notion of therapy

Good health was defined by the World Health Organization (in 1946) as: *"a state of complete physical, social and mental well-being, and not only the absence of disease"* [16]

Christopher Day's vision about man-made environments is that all of them have the possibility to provide therapy. He also states that therapeutic concept in architecture is somehow disappearing nowadays, due to the ways that forms and spaces are approached which tend to disregard people's comfort.[17]Day suggests that therapeutic architecture should bring back and learn from the healing qualities found in old concepts such as: Feng-Shui (more details in chapter 4), which provides 'man-made' healing atmospheres.[18]Thus, people's health is a condition of harmony, rejuvenation, and improvement.[19] This means places need to be examined and manipulated carefully in order to deliver a harmonious environment that rejuvenates the self.

Gesler states that healing and place cannot be detached from one another, as people experience healing unconsciously once they are inside a place (people need the places in order to experience therapy). [20] Furthermore, classification has been made on the types of settings that can enhance therapy within places which include: [21]

-Natural: believing in nature and its therapeutic power.
-Built: enhancing the sense of protection and safety.
-Symbolic: respecting traditions and delivering meanings.
-Social: acknowledging the significance of community and its ability to heal the self.

It is strongly believed that nature has a great potential in delivering therapy, as it engages with the mankind's senses and provides physical, mental, and spiritual healing. [22]

Not only Day and Gesler emphasise the importance of therapy in architecture, but also, Carol Venolia who suggests integrating the characteristics of nature within the interior environment and maximize connections with the outdoor areas, as well as avoiding boundaries that separate people from nature.[23] However, Physical and emotional aspects of the built environment include elements that can either enhance or take from the space's therapeutic value;

Physical aspects include:

-The level of comfort resulted by scale, temperature, colours, and materiality.[24]

-Physical context and its influence on people's sensations, stating that entries and journey towards buildings should deliver ease and joy in order to achieve a 'therapy first reaction'.[25]

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[16] World Health Organization, "health," accessed September 1st, 2015, http://www.who.int/trade/glossary/story046/en/
[17] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 7
[18] Ibid.
[19] Ibid, 181
[20] Wilbert M. Gesler, *Healing Places* (Lanham: Roweman & Littlefield Publishers Inc, 2003), 8
[21] Ibid.
[22] Ibid, 2
[23] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts,1988), 21
[24] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 20

Emotional aspects include:

-The relationship between our feelings and the built environment, as people relate feelings to their stress levels, and when places feel pleasing, they become less stressful. Stress, however, has a psychological impact that is directly linked to people's health.[26] This makes the built environment highly responsible on either decreasing or increasing the stress level of individuals. Buildings become convenient and less stressful when they provide comfortable atmospheres, where noise, colours, materials, light and warmth are approached thoughtfully.

-The relationship between nature rhythms and people's life, stating that humans live in cycles that are similar to the ones found in nature. And to provide therapy, the built atmospheres should respond to these human cycles by engaging with the changes of their activities (living, working, sleeping).[27] For instance, bed room's atmosphere should involve more relaxing elements than the living room's atmosphere.

[25] Ibid, 25
[26] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 186
[27] Ibid.

2.2 Elements of therapy in architecture

"Colour, harmony, and multi-sensory delight support our feeling life, particular moods redressing personal and situational imbalances. Journey sequences, beauty and care-imprinted environment can nurture our spiritual development. Buildings built upon these principles are buildings to nurture the whole human being". [28]

2.2.1 The Senses

Senses in people play a major role in experiencing architecture. The built environment needs to acknowledge its influence on people's reaction by providing pleasing atmospheres that are welcomed by all senses.

The sense of sight dominates the other senses when it comes to the atmospheric response; eyes do not see objects and forms, instead, colours, tones and movements. Colour usually have a great influence on our feelings, keeping in mind that the overuse of bright and loud colours lowers our reaction to the soft ones and makes us depreciate the relaxing atmospheres.[29]

Touch, however, requires physical connection with objects; people usually touch in order to understand what they see. Some textures have the ability to stimulate the human's senses without being physically touched, such as the rough stone textures which can be felt from a distance, giving an outdoor feel and connecting the senses with earth. [30]

[28] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 187
[29] Ibid, 214
[30] Ibid.

Day states that textures develop different reactions by people according to their preference and taste, adding that most people treat soft textures as being more inviting than the rough ones.[31]

Hearing, on the other hand, results from the acoustic power of a space to allow interaction between human ears and sound, in order to evoke a sound image in the mind, for instance, our voice's echo inside an empty house may translate the image of a new house. Pallasma says:

"Sight makes us solitary, whereas hearing creates a sense of connection and solidarity."[32]

Smell, another significant sense with a high potential to trigger and activate our feelings. Buildings should express scents that are pleasant to human's senses, as people react to smell faster than any other sensory stimulus. [33] Buildings are large sources of smells, material smell can contribute to people's mood, for instance, wood smell may draw an image of a forest in user's mind, causing mood enhancement. Whereas unpleasant smell results uninviting and harmful atmospheres, such as smells derived from smoke or dirt.[34]

Warmth is also classified as another essential element that should be acknowledged when dealing with therapeutic environments. Day refers to warmth as a health and wellbeing factor for its potential to rejuvenate and stimulate the body. [35]

Thus, a complete therapeutic quality of the built environment cannot be achieved by the sense of sight only; the other body senses (sound, smell, warmth and touch) are still as important as sight and should not be underestimated. [36]

[31] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 73
[32] Juhani Pallasmaa, "An Architecture of the Seven Senses," *in Questions of Perception: Phenomenology of Architecture,* eds. Steven Holl, Juhani Pallasmaa, and Alberto Perez-Gomez, (San Francisco: William Stout Publishers, 2007), 29
[33] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 73
[34] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 215

[35] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 73
[36] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 214

2.2.2 Light and therapy:

"The more living the light the more appealing the places" [37]

It is commonly known that sunlight is highly beneficial to human's health. The majority of people nowadays experience low exposure to sunlight, as most professions require workers to stay indoors.[38]

Organs responsible for hormonal regulation also benefit from daylight and when it lacks, depression and other physical and social issues start to develop. Natural light and interior lighting have a major impact on human's feelings, and the control of light is considered essential in order to promote a healthy environment.[39]

The built environment needs to utilise natural lighting by providing architectural elements that bring light into the interior, such as skylights, courtyards, and atriums, in order to maximise interaction between building users and sunlight. Moreover, daylight, when approached correctly, brings energy and joy into buildings, keeping in mind that the amount of light varies from activity to another.[40] For instance, social and gathering spaces can accept a higher amount of daylight than a library space.

Daylight, as known, is time dependent; it changes over the day and over the seasons. Buildings should be aware of the direction and the angles of sun in order to control its orientation. For example, North orientation should be utilised when building in the southern hemisphere to allow for direct sun exposure, stating that south facing rooms will not be exposed to direct sun light and their interior environment might feel dull and cold. [41]

It is worth mentioning that daylight when entering the building is exposed to other factors that may change its perception, such as colours and textures of surfaces. The way we perceive daylight is dependent on these elements which contribute in enhancing moods and senses.[42]

Figure 2.1 Modern courtyard for residence

Figure2.2 Courtyard in hospitals

Figure 2.3Urban Office with windows and skylights

Figure 2.4Skylight in industrial building

[37] Ibid, 202
[38] Ibid, 193
[39] Ibid, 201
[40] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts,1988), 54

[41] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 201
[42] Ibid, 204

2.2.3 Materials and therapy:

Each material has its own unique characteristics, for instance, wood and brick materials represent warmth as they both enjoy the warm tones and originate to nature. Steel on the other hand, may be referred to the power of machines, and may represent coldness (when in good condition) or warmth (when rusty). Concrete however, symbolises solidity, while plastic expresses an unnatural texture. Materials and their properties propose diverse options for the built environment, and thus add to their atmospheric value.

Usually, humans feel more attached to spaces constructed from nature-related materials than machine-made ones.[43] Moreover, materials have the ability to contribute in building's thermal comfort, stating that each material behaves differently towards temperature changes; masonry, for example, has a higher potential in storing heat than timber.

Figure 2.5 Timber use in mind-body retreat

Figure 2.6 stone use in spas

[43] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 168

2.2.4 Vegetation and therapy:

Garden spaces encourage people to interact with the beauty of nature, another way of improving health and providing therapy though obtaining fresh air and sun, therefor, gardens should be always utilised in buildings for their healing and therapeutic power.[44]
Vegetation, apart from giving visual aesthetics, has other benefits such as being a great source of oxygen, as well as a sound and dust absorber. Vegetation and gardens in general, are very therapeutic for humans whether used in maintaining the overall well-being, or, in the recovery phase of ill people.[45] A good example of a therapeutic garden is the one found at the Cancer Care Centre (Maggie's Gartnavel), designed by OMA, Rem Koolhaas's practice.

The building is designed as a series of interconnected spaces that sit around a central garden courtyard, as well as surrounded by external gardens.

Figure 2.7 Maggie's Gartnavel courtyard and skylight

Figure 2.8 Maggie's Gartnavel model

[44] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts, 1988), 130
[45] Wilbert M. Gesler, *Healing Places* (Lanham: Roweman & Littlefield Publishers Inc, 2003), 2

2.2.5 Colour and therapy:

Colour has the power to influence brain activity, heart rate, muscular tension and other functions related to the nervous system. It also produces emotional and aesthetic responses that can be either therapeutic or harmful. [46] It is essential to understand that different emotions are triggered by different colours, and in order to enhance the level of people's well-being, we need to be able to distinguish the spectrum of colours and their effects on human health, [47] for instance:

-Red: brings warmth and excitement. It enhances blood circulation and pressure, and can be beneficial at the physical exercise places, but, it should be kept away from the calming and relaxation areas such as meditation rooms and study spaces.[48]

-Yellow: brings happiness and mental creativity. It can help with issues related to depression, tension, mental and nervous exhaustion. Yellow can be beneficial at libraries and study areas.[49]

-Blue: brings stillness, serenity and faith. It reduces blood pressure, heart beat and brain waves. Blue can be used in calming environments such as meditation, but it isn't useful in social and communal areas.[50]

-White: brings purity, positivity and innocence. It is believed that white has the power of enhancing the spiritual characteristics when added to any colour. White suggests coolness and cleanliness.[51]

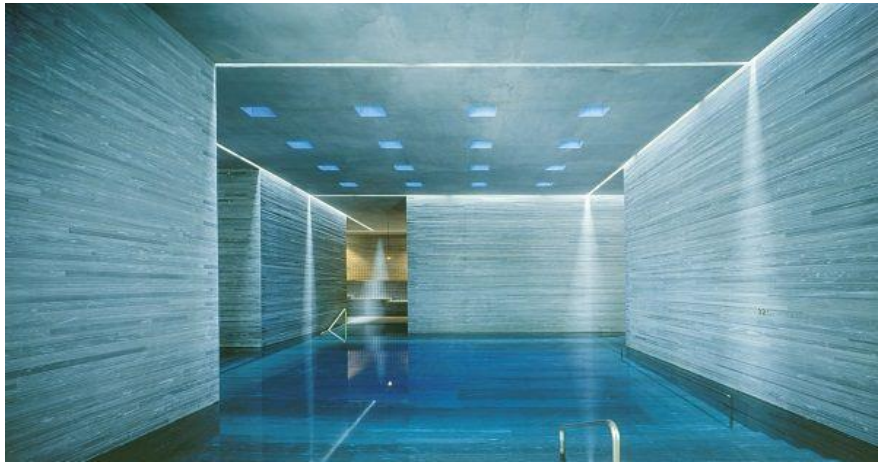

Figure 2.9 Blue in Therme Vals

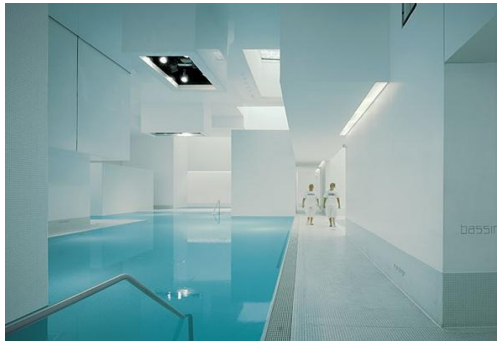

Figure 2.10 White in aquatic Centre by Jean Nouvel

Figure 2.11 Yellow in spa interior

[46] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts, 1988), 58
[47] Ibid, 57
[48] Ibid, 63
[49] Ibid, 64
[50] Ibid
[51] Ibid, 67

2.2.6 Texture and therapy:

Textures can be recognized by seeing and/or touching. In fact, when we look at textured surfaces we first distinguish light patterns being reflected on them, and from these reflections our eyes perceive whether these surfaces have rough or smooth textures. Touching, however, provides another way to experience and identify textures. Touch becomes beneficial in therapeutic buildings, as it conveys a sense of experience which then stimulates the senses. The Therme Vals by Peter Zumthor is a great example on atmospheres driven by textures, as Zumthor uses the roughness of stone to contrast with the smooth human skin and water surface, in order to create a memorable experience and deliver self-mindfulness. Day states that integrating textures into buildings can generate an uplifting environment, as well as give some individuality.[52]

Figure 2.12 Contrast in texture and appearance of the polished wood and the rough stone when exposed to sun

Figure 2.13 Therme Vals texture-atmosphere relationship

[52]Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 217

2.2.7 Silence and therapy:

Silence is also considered a therapeutic element, for being able to provide tranquil and serene environments, and silence here is the absence of any unnatural and harmful sounds. People, however, are becoming unaware of how much noise is taking from their comfort level.[53]
Architecture, on the other hand, may employ few elements in order to control the amount of noise entering the building, such as:
-Landscaping the surroundings; earth embankments and rows of thick trees absorb and reflect sound before it reaches the inside of buildings. Acoustical plantings however contribute not only in absorbing noise, but also in cooling down and cleaning the surrounding air. Moreover, trees contribute in providing healing sounds, as they attract birds.[54]
-Construction techniques and building materials; Concrete and masonry for instance, has a better sound absorption quality than timber. Also, double skin façade or cavity wall can assist with noise control. [55]

Figure 2.14 Sketch of noise reduction in an urban zone

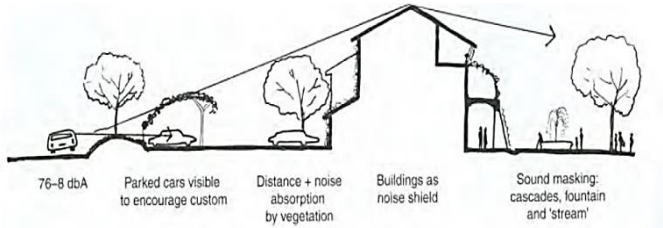

Figure 2.15 Secondary facades made from perforated anodized aluminium panels

[53] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 204
[54] Carol Venolia, *Healing Environments: Your Guide to Indoor Well-Being* (Berkeley: Celestial Arts, 1988), 52
[55] Ibid, 91

2.2.8 Water and therapy:

The healing quality of water has been very significant in the Ancient Civilizations. Cultures in the early days have used water as an element to promote hygiene, spirituality, therapy, and sociability for their communities, as they have developed various methods to allow for physical connection with water.[56] These methods, however, reflected the attitude and the living environment of each culture, leading into diverse approaches but with similar aims (hygiene, therapy, mind education, spirituality and sociability).[57]

Bathhouses were established as places to promote the concept of "holistic healing" through water, including other mind-body rejuvenation activities.

Greek, Roman, Turkish, and Japanese bathhouse cultures have evaluated health and wellness with prioritizing certain activities over others; Greeks for instance, have paid more attention to their gymnasiums and educational facilities than bathing,[58] while bathing for Romans was a luxury and necessity, used after exercising and before socialising.[59]

"When the fusion of architecture and water is treated carefully and creatively, the potential for meaningful expression is practically limitless" [60]

Water, when integrated with architecture, can majorly enhance the sensory experience. It has the power to deliver different sounds that trigger different emotions depending on its speed and intensity, for instance, water with a high speed flow delivers the sense of excitement, while its low speed brings a calming sensation. As a result, water sound can be utilised to develop distinct atmospheres for different zones to emphasise diversity and promote a memorable experience within the building.[61]

The general approach that architecture and water can be interacted is through: rivers, oceans, fountains, pools.[62]

Rivers and oceans have a major impact on cities and town planning. They also influence architectural design decisions when dealing with views, orientation, and physical connections. Pools and fountains, on the other hand, can be integrated into the built environment, which architects have more control on. Fountains can be used in multiple ways in order to generate different effects. They are believed to be hypnotic from psychological perspectives, as they produce healing sounds, and promote visual changes through light reflections and refractions. [63]

[56] Alev Lytle Croutier, *Taking The Waters: Spirit, Art, Sensuality* (New York: Abbeville Press, 1992), 13
[57] Ibid, 77
[58] Fikret K Yegül, *Baths and Bathing in Classical Antiquity* (New York: The MIT Press, 1992), 23
[59] Ibid, 4

[60] Charles W. & Jane Lidz Moore, *Water and Architecture* (London: Thames and Hudson, 1994), 22
[61] Ibid.
[62] Ibid, 20
[63] Ibid, 46

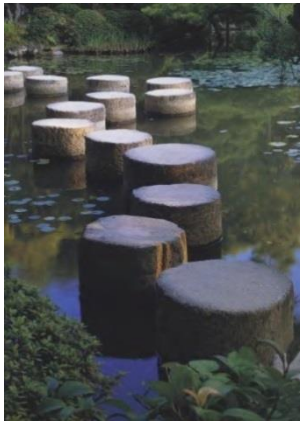

Figure2.16 stepping stones above water to encourage water-man interaction, a great de-stressing approach

Figure2.17 water feature garden pond with stone wall, Como Shambhala Estate, Bali

Figure 2.18 Tivoli Villa d'Este fountains, creative approach and integration with nature

Pools and ponds, unlike fountains, represent still water within a horizontal reflective surface. This reflection characteristic can be utilised in design, creating images from the surrounding environment and reflecting it back to viewers as colours and figures. [64]

Figure2.19 reflecting water pond enhances the green of the trees and the white of the clouds

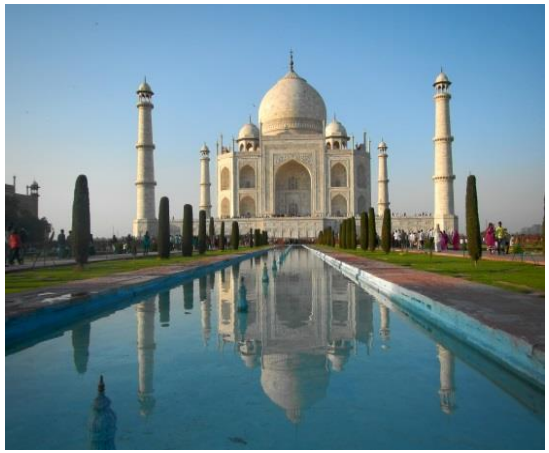

Figure 2.20 Taj Mahal, water pond reflects building elements and sky colours, experienced at the outdoor gardens.

[64] Ibid, 124

3.0 Organic Architecture and therapy

"For some, organic is curved, organic is asymmetrical, organic is natural materials, organic is individualistic, organic is holistic."
Sidney K. Robinson [65]

The environmental architect, David Pearson explains that Organic Architecture is majorly influenced by nature, life, natural and biological forms. He describes that this type of architecture is being sensitive to human mind, body, and spirit.[66] Perhaps, for its ability to allow interaction between human and nature; as human senses get drawn into the smell of natural materials, texture, and also colours.

Characteristics:

Organic Architecture hasn't got a definitive rule or shape; rather, it forms and evolves according to the influential site or concept, all inspired by nature. Pearson identifies the main principles that describe this type of architecture which include:

-Building as Nature

Nature, as the most influential element, where the building itself is seen as part of nature, growing from the inside out to achieve a successful design that is in harmony with its natural environment. This harmony involves not only the building form, but also its interior function. [67]

Figure 3.1 The Savill building, Organic roof approach

- Continuous Present

Another principle that Organic Architecture enjoys is being constantly changing and renewed, its concept is always fresh and should never be repeated; Antonio Gaudi philosophy of work is a great example on that where he derives his concept from the site environments. [68]

- Form follows Flow

Dynamic forces of the surrounding nature on site are used to project building forms. Pearson states that working with these forces is essential in order to avoid negative energies that may occur when designing against these forces. Thus, buildings' shapes should respond to these flows and be inspired by them. However, these forces or energies were classified as wind, temperature, earth and water movement, and structural forces. And following these curvilinear shaped energies develop an organic architecture that enjoys a fluid and unique form.[69]

[65] David Pearson, *New Organic Architecture: The Breaking Wave* (London: Gaia Books Limited, 2001), 28
[66] David Pearson, *New Organic Architecture: The Breaking Wave* (London: Gaia Books Limited, 2001), 8
[67] Ibid, 10

[68] Ibid, 12
[69] Ibid, 14

- Of the People

Functionality and comfort are other two essential elements that Organic Architecture considers. Buildings are for people and communities, and design decisions should be taken to suit their requirements. Pearson emphasises the significance of developing sensitive and caring architecture that adjusts to peoples' needs.[70]

- Of the Hill

Building-site relationship is crucial; Organic Architecture should read as it was projected from the site itself and not just been placed on it. Frank Lloyd Wright, for instance, uses the approach "of the hill" instead of "on the hill" and utilise from site characters to influence his forms. Pearson believes that challenging and awkward sites provide the opportunity for more skilful and creative design.[71]

- Of the Materials

Organic Architecture suggests that building materials should celebrate their own natural characteristics rather than being disguise by paint or colour, in order to give the spirit of nature. Traditional materials are classified to be the best materials used for Organic Architecture, such as wood, earth, and straw, keeping in mind that material choices need to be ecologically sound and free from any negative impact on health. [72]

- Youthful and unexpected

The style that carries brand new designs, feels youthful, playful and unusual, with deep underlying use of symbolism and concepts. [73]

[70] Ibid, 16
[71] Ibid, 18
[72] Ibid, 20
[73] Ibid, 22

4.0 Feng-Shui philosophy and therapeutic architecture

Feng-Shui is known as a Chinese philosophy, design method, and an architectural approach that involves understanding human and nature relationships, and being able to live in harmony with the surrounding environment.[74] Feng-Shui covers some fundamental theories that can be implemented in this project to enhance the healing qualities of the built environment. Those theories include:

4.1 Yin/Yang action: The universe in perfect balance

Yin/Yang, opposite and complementary forces available within nature. Yin represents darkness, coldness, quietness, softness, while Yang represents brightness warmth and expression.[75]

The entire universe is made of Yin and Yang which are generated together, and when one element appears, the other one is created correspondingly. An example of a Yang element is day and its corresponding Yin is night.[76] Yin/Yang suggests that our built environment should follow and learn from this universal balance to achieve building comfort, stating that, buildings with too much Yang can result a stressful atmosphere, while having too much Yin can cause a depressing and dull environment. [77]

Figure 4.1 Yin-Yang (The law of contrast)

[74] Judith Wendell, "Incorporating Feng Shui principals into building design, " *Real Estate Weekly*, May 16, 2007, 30
[75] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004), 78, 79
[76] Ibid, 79
[77] Ibid, 83,84

4.2 The Five Elements: Constant energy transformation

Qi is recognised as a dynamic biological energy that helps with enhancing our physical, emotional, and spiritual well-being.[78]Feng-Shui explains that every element in this universe enjoys a constantly changing energy (which is hard to create or change ourselves), stating that each element carries distinct characteristics with the ability to provide our senses with different sound, smell, sight, and touch experience.[79]

These elements are specified as: wood, fire, earth, metal, and water which their cycle generates an invisible Qi (energy).[80]However, the five elements experience a constant conversion controlled by nature cycles (constructive and destructive).

Constructive cycle involves: water feeds wood; wood burns and results fire; fire then produces ashes; ashes feed the earth; metal is produced from earth; metal's low temperature condenses air and water is then generated.[81] Destructive cycle, on the other hand, activates when the elements level become inadequate, giving the signal that their energy balance is out. As a result, elements start to work against each other to gain the balance back, as water puts off fire; fire melts metal; metal cuts wood; wood penetrates earth; earth finally absorbs water and prevents it from flooding.[82]

The five elements can be utilised in architecture to express different themes and deliver positive and balanced emotions, taken from the harmonious energy that is produced by their cycles.

[78] Ibid, 84
[79] Ibid.
[80] Ibid.
[81] Ibid, 86
[82] Ibid, 86,87

Elements can be represented by colours, shapes, materials or even images. Wendell suggests that Wood can create a theme that involves green colours, tree-like structure, vertical and rectangular shapes, with wood flooring finishes. Water, on the other hand, can be represented by the use of blue and black shades with water-like movement systems. Furthermore, fire can utilise from upward movement and red colours and so on. [83]

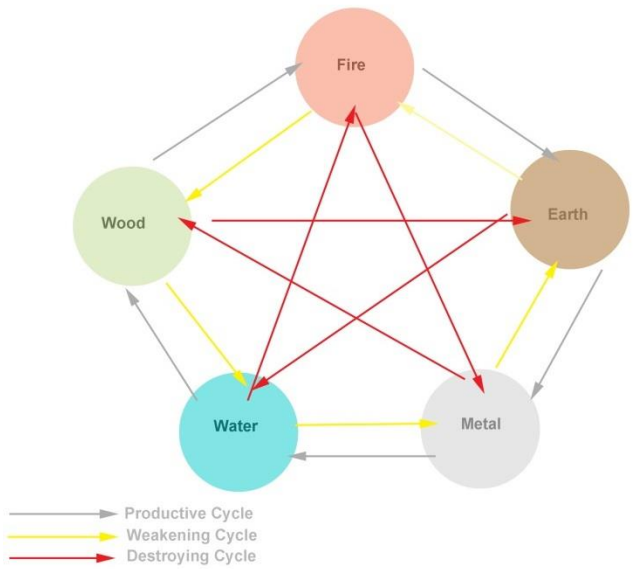

Figure 4.2 The five elements cycles

[83] Judith Wendell, "Incorporating Feng Shui principals into building design, " *Real Estate Weekly,* May 16, 2007, 30

4.3 Qi (energy) flow in the environment and site selection

Building interior environments can be either healing or harmful to human's health. It is important to realise that delivering the right energy (Qi) type into our interior is a key towards 'healing atmospheres'. Fung-Shui explains that we need to understand the 'Three powers' of "Qi" in order to work with them and not against them when designing our buildings, and these include:

-Heavenly Qi: Energy coming down from heaven which influences earth changes, such as weather and time.[84]

- Earthly Qi: Earth reaction to heaven Qi, affecting mountains, rivers, and topography formation.[85]

- Human Qi: The personal life force of people, influenced by elements such as, culture, family history and education. Physical body is regarded as being made from earthly Qi, with a lot more complexity when compared with a physical object. [86]

Visible and Invisible Qi: [87]

Visible Qi is the type of energy force that can be predicted from the way tangible objects are placed around us. For instance, when looking at a T shaped road with a building on its end, we can tell that this building is going to receive a strong Qi coming from the long street.

Invisible Qi however, involves both; Heaven and earth energy forces, that become integrated within the building once it's constructed. This Qi can be accurately measured and therefore helping architects to make the right assumptions about the delivered energy and the level of comfort of each building during the early design stage.

Site, on the other hand, becomes another factor that can either deliver a beneficial or harmful Qi, as it has the ability to allow and block Qi.
An ideal building- site relationship (as suggested by Shui) is when the building takes 'the arm chair position' with a mountain or a building behind it at a reasonable distance (for security), and with low height buildings on each side (also at a reasonable distance), as well as facing good views.[88]

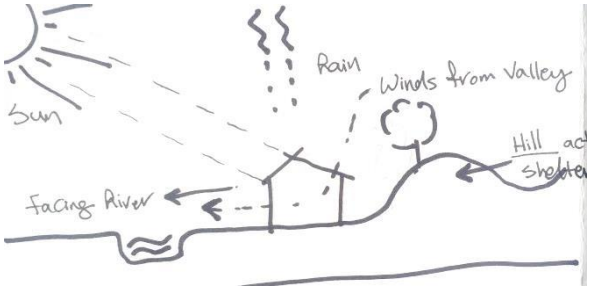

Figure 4.3 site building relationship as suggested by Feng- Shui

[84] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004), 70
[85] Ibid, 71,72
[86] Ibid, 72
[87] Ibid, 73,74

[88] Judith Wendell, "Incorporating Feng Shui principals into building design," *Real Estate Weekly*, May 16, 2007, 30

5.0 Precedents Study

5.1 Therme Vals, Switzerland, Peter Zumthor, 1996

-Sensory experience and self-mindfulness

"Good architecture should receive the human visitor, should enable him to experience it and live in it, but should not constantly talk at him" [89]

Self-mindfulness is developed through the control of light, and the use of masses, as they are organized in a way that provides expansion and compression to human's body (experienced with movement). Hearing sense develops once peoples' ears engage with the sound of water, footsteps, and voices.
Touch is encouraged with the contrast of textures (human's smooth skin against the building's rough stone).The sense of smell, however, experiences the humid air first which then develops into a floral scent as moving towards the floral pool.

Additionally, the variation in pools' temperatures and types add to the sensual experience value, as they continuously stimulate distinct feelings.

Figure 5.1 Therme Vals exterior

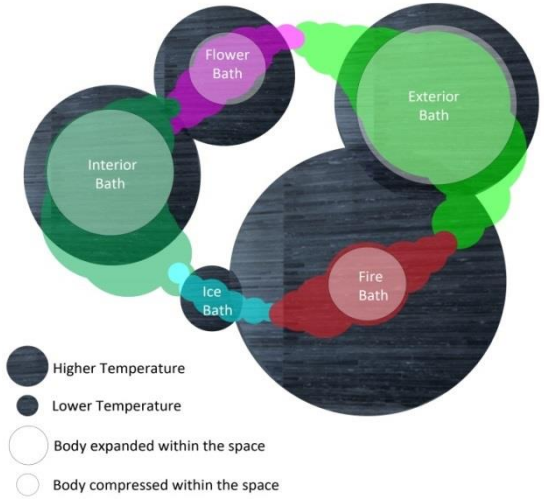

Figure 5.3 body-form relationships

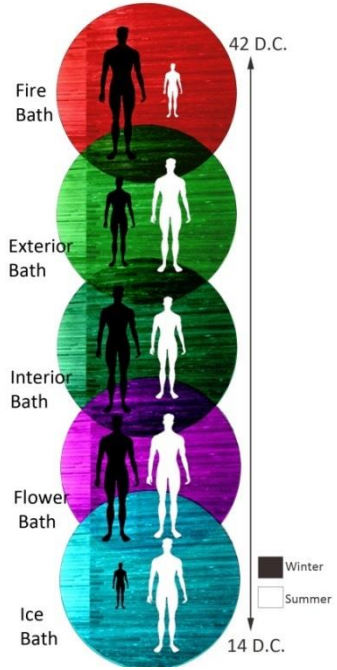

Figure 5.2 Temperature gradient

[89] Dean Hawkes, *The Environmental Imagination: Technics and Poetics of the Architectural Environment* (USA: Taylor and Francis, 2008), 215

Figure 5.4 Therme vals light control

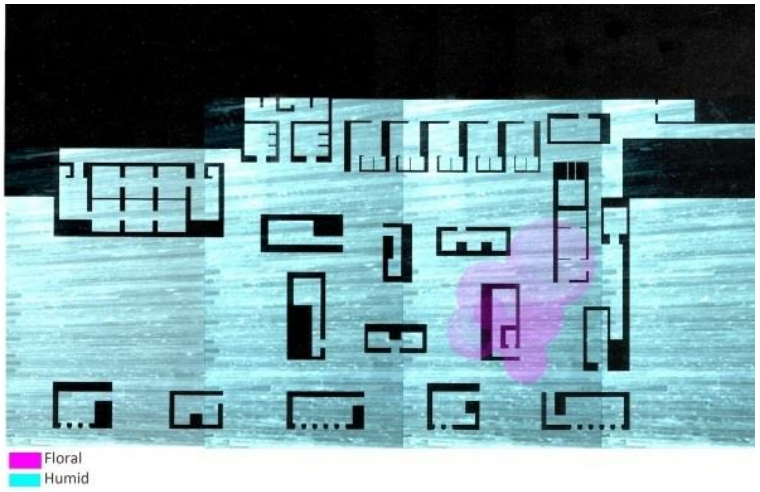

Figure 5.5 Nasal experience

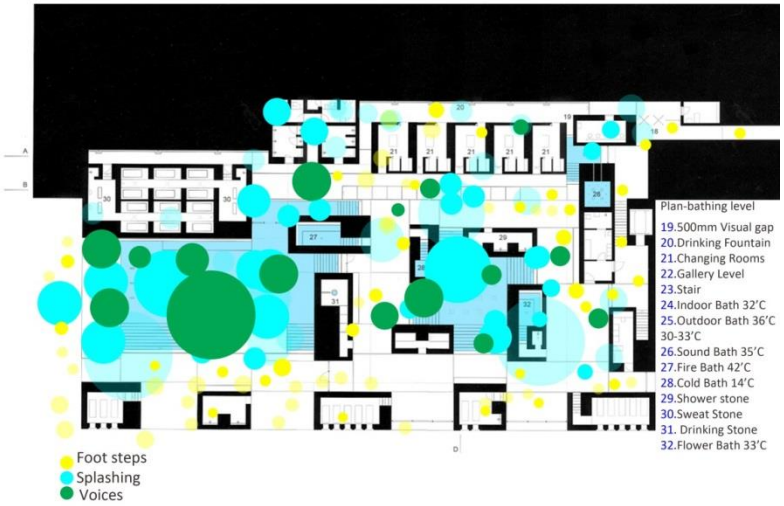

Figure 5.6 sound experience

5.2 House of Culture and Movement, Frederiksberg, Denmark- MVRDV and ADEPT Architects, completion in 2015

-Atmospheric changes

Building's aim was to encourage the use of health and wellness facilities through engaging communities with an active design and constantly changing atmospheres.

The building enjoys a rectangular form with programmes organised vertically, and connected through a flexible lobby space which is utilised for multiple activities. The vertically organized programmes involve: a theatre, health space, food area, Zen area, study centre and exhibition hall, activity centre, wellness and an administration area. Zones seem to be contained in differently shaped volumes with distinct approaches to light and colours, allowing a playful experience.

This example emphasises the change of atmospheres in each zone- another way to attract and encourage people moving and discovering each facility. Physical separation, however, is accompanied by visual connection to keep zones somehow connected. Also, circulation routes are vital and movement is encouraged by the openness of the in-between space.

Figure 5.7 Building exterior, located within the public

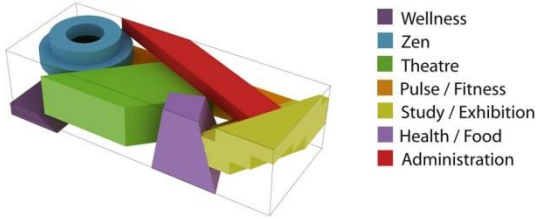

Figure 5.8 Building zones inspired by playground

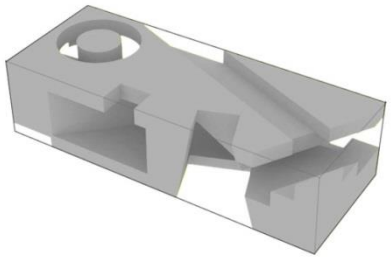

Figure 5.9 Masses integration

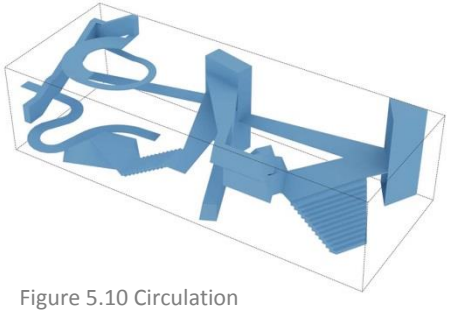

Figure 5.10 Circulation

Figure5.11 Entrance to lobby area

Figure 5.12 The in- between space on the upper level

Figure 5.13 the in- between space walking past administration

Figure 5.14 Playing area next to theatre

Figure 5.15 Zen area

Figure 5.16 Theatre space

5.3 Centre for Wellness – The College of New Rochelle, New York- Ikon. 5 Architects, 2008

-Topography and nature connections

Built within the New Rochelle campus to serve students and the near-by community. The centre aim was to provide a 'holistic' wellness experience that engages not only the body, but also the mind and the soul.

The building merges within the land topography at some parts and cantilevers above it at other parts, providing an earth-like experience that is emphasised by the earthy materials on its interior and exterior.

Pool area is embedded within the earth's surface and connected to sky through skylights that sit above the roof garden. Meditation hall, on the other hand, cantilevers above the land in order to enjoy the green views which are accentuated by full height glazing.

Basketball court also seems to take the advantage of contours, as it is placed on a low level with high windows to feed the interior with natural daylight.

Figure5.17 Building-earth relationship from exterior

Figure 5.18 Basketball court

Figure 5.19 Skylights viewed from roof garden

Figure 5.20 Meditation hall with full height glazing

Figure 5.21 Swimming hall with skylights above

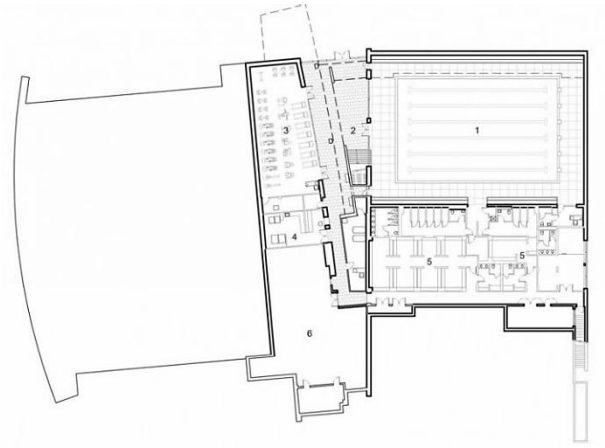

Figure 5.22 Lower level plan

1. Natatorium 2. Concourse
3. Fitness 4. Equipment
5. Lockers 6. Mechanicals

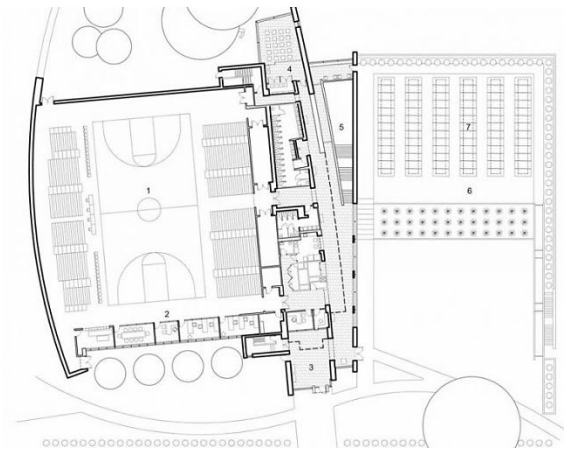

Figure 5.23 Higher level plan

1. Gymnasium 2. Offices
3. Lobby 4. Meditation Room
5. Concourse 6. Roof Garden
7. Skylights

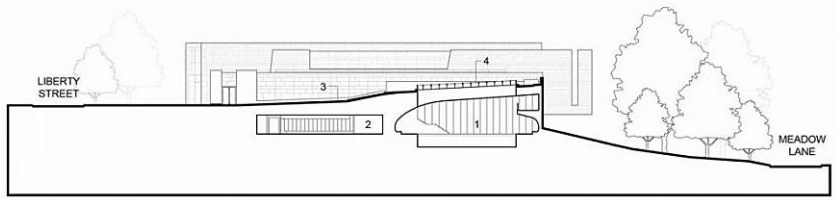

Figure 5.24 Cross section

1. Pool 2. Locker rooms
3. Roof garden 4. Skylights

5.4 Myall Coast Wellness and Community Centre, NSW, Australia- BAC Group Architects

-Outdoor-inspired social area

Building's aim was to provide the near-by community with a social space that would deliver positive emotions and enhance the level of well-being. The building includes life-enhancing and communal activities, organized around a central pavilion. This north facing pavilion acts as the Centre's heart (visually, physically, and environmentally); from this pavilion, people chose their paths towards the assigned activities which are organized in pods (health support pod, commercial pod, administration pod, child care pod, recreation pod, and community hall pod)

Moreover, the pavilion enjoys a relaxing and destressing environment where plants, water, and people interact. This man-made atmosphere brings nature elements into the interior to generate a therapeutic and healthy space.

Figure5.24 Myall Coast Wellness Centre exterior

Figure 5.25 Pavilion sketch

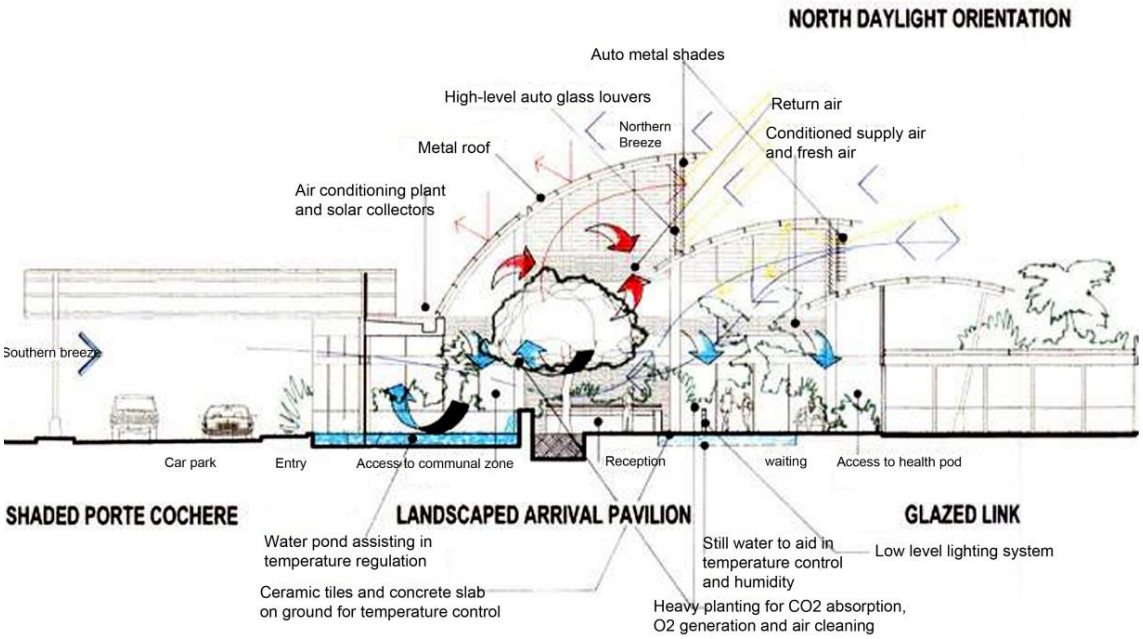

Figure 5.26 Pavilion section and thermal comfort

5.5 Savill Visitor Centre, Windsor Great Park, Surrey, England- Glenn Howells Architects, 2007 [90]

-Organic & timber gridshell roof system

The building utilises an organic shape roof, formed as a tree leaf which tend to blend magnificently with the landscape. The structure involves gridshell timber strips (80x50mm), organised in 4 layers grid; the lower 2 layers were set at 1m spacing and manipulated until the right shape was achieved, then bolted together. The Top grid was then fixed above. And thus, the layering system of the grid results a 300mm deep gridshell, covered with 2 layers of birch plywood panels@12mm thickness. These panels are fixed in a cross motion (the lower ones were diagonal to the upper ones to achieve strength) through butt joints, then strengthened with steel strips in order to transfer the tensile forces within the surface.

The roof surface is then topped with a vapour control layer, insulation @200mm, an aluminium seam roof, and finished with oak rain screen boards. Roof load, however, is transferred to ground through the tubular steel beam which runs along its perimeter and fixed to the steel quadruped columns which take the load down to ground.

Figure 5.26 Savill building exterior

Figure 5.27 Timber gridshell system

Figure 5.28 Gridshell- tubular beam connection

Figure 5.29 Roof interior

Figure 5.30 Roof overhang (4.5m), and beam- column connection

[90] Architecture Today, "Glenn Howells Architects: Savill Building, Windsor Great Park," last modified February 2, 2007, http://www.architecturetoday.co.uk/?p=7210

5.6 Coastlands Aquatic Centre, Kapiti Coast, New Zealand - ASC Architects, 2013 [91]

-Pool area roofing (timber gridshell and ETFE membrane)

The roofing system above the pools area consists of a glulam timber gridshell, with 3 layers of ETFE membrane that contains a pattern of dots (frits) used to reflect the unwanted sun and prevents it from entering the building. Moreover, the skin contains a UV-resisting layer to keep the interior environment safe and free from any radiations that may cause melanoma.

Building's temperature was promised to stay within the 'convenient' temperature rate at about 96 percent of the time, due to the clever membrane system and the automatic windows which should allow for a continual air flow.

Figure 5.31 Coastland Aquatic Centre exterior

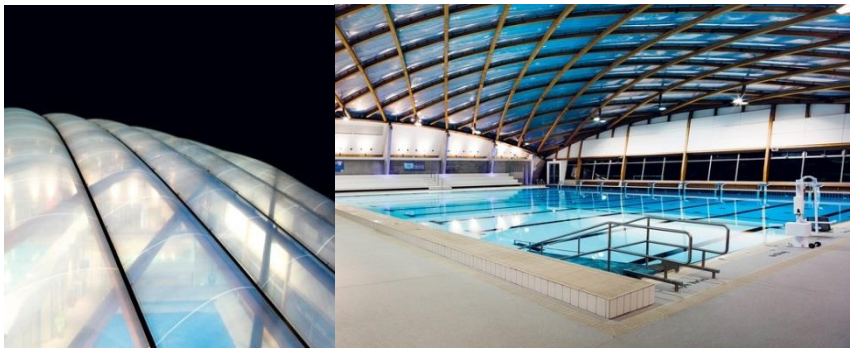

Figure 5.32 Timber gridshell and ETFE membrane roof

[91] ARCHITECTURE NOW, " Coastlands Aquatic centre," last modified April 1, 2014, http://architecturenow.co.nz/articles/coastlands-aquatic-centre/

6.00 Site Investigation and Analysis

6.1 Site Location and Description

East Tamaki is located in the Southeast side of Auckland with a vital district that is linked to the airport, port, city central, and other business zones within the region. The district was originally a Greenfield and has developed into a strong business attraction spot with local and foreign businesses.

East Tamaki is considered being a very profitable manufacturing and trading region, with activities specialized in production, all-inclusive, organizational, support and high-tech businesses.[92]

Highbrook Business Park is located within East Tamaki and on the Waiouru Peninsula. Highbrook Drive extends across the park and connects the Business Park with the State Highway1 (between the Otahuhu and East Tamaki interchanges). [93]

Key driving distances from the business park are: [94]
1 km to motorway, **18** km to Auckland CBD, **16** km to Auckland International Airport, and **5** km to Botany Downs.

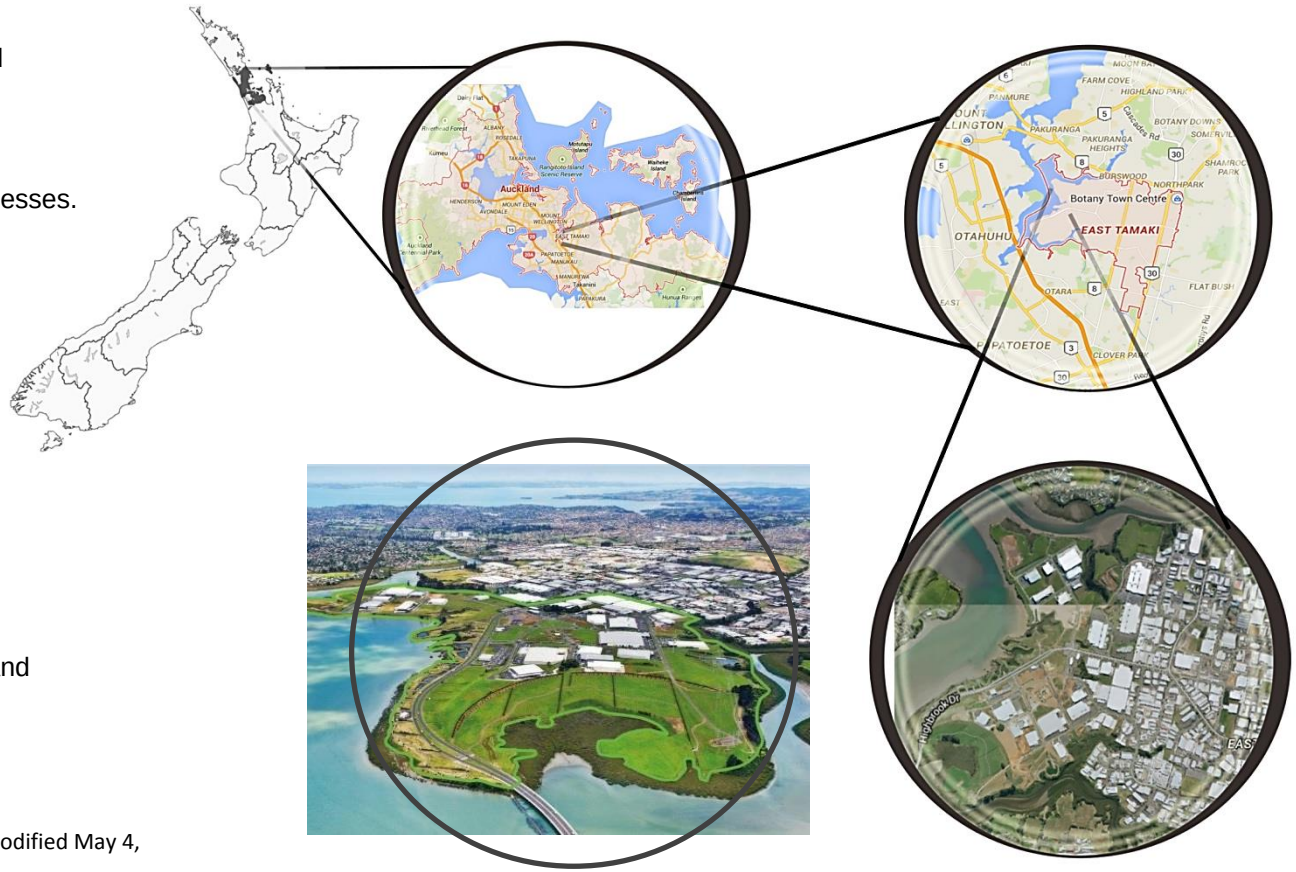

Figure 6.1 site Location

[92] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012, http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf
[93] Goodman Property Trust, "Highbrook-Vision," accessed April 8, 2015, http://www.highbrook.co.nz/vision/history
[94] Ibid.

6.2 Site Selection Criteria

Highbrook Business Park was chosen for the following reasons:

-Site analysis and demographics have revealed that a wellness-related intervention would be highly beneficial for business workers and the surrounding communities who are engaged with a busy life style. Furthermore, there is a limited number of health-related buildings within the area, and if they exist, they are segregated from each other, relatively small in size, and mostly influenced by the industrial theme of the surroundings buildings.

-Land availability.

-The envisaged growth of population and businesses.

-Location near the Tamaki River which is beneficial for the proposed therapeutic spaces.

-Location on the busy Highbrook Drive and intersection, as well as being visually and physically connected with the existing social hub.

-Easily accessed by business workers, pedestrians, and cyclists.

6.3 Site Zoning

Zoning system of East Tamaki is represented by retail, housing, and industrial which are connected by roads and drive ways. The overall area is considered metropolitan with the careful subdivision of each zone.

Zoning criteria emphasises the separation between residential and industrial zones. However, metropolitan and retail are located at the Far East, while light industrial is pushed towards the far west. The chosen site is situated within the “light industrial” zone which makes it less exposed to noise, but far from metropolitan and entertainment area.

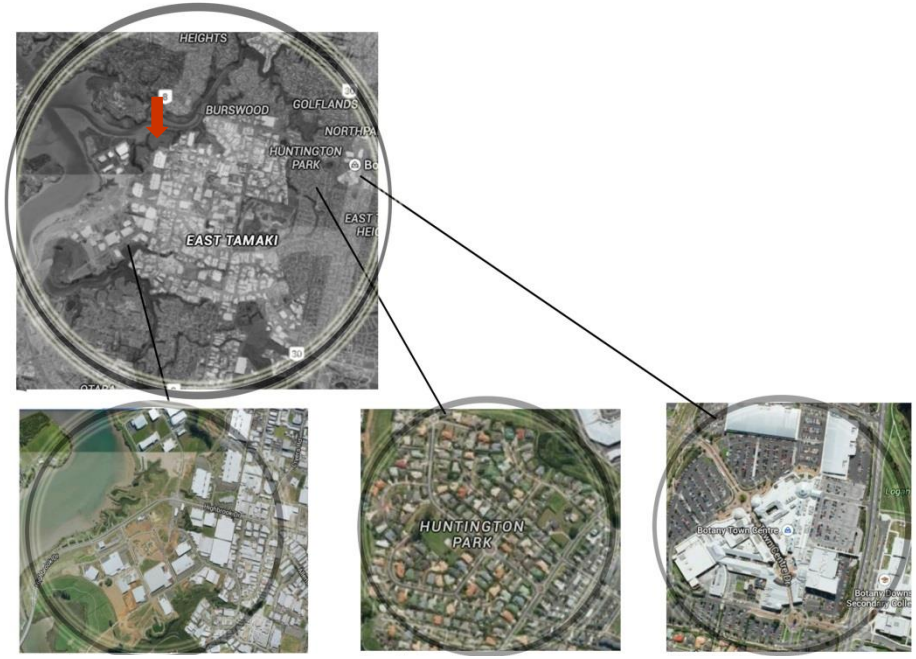

Figure 6.2 East Tamaki zoning system

Figure 6.3 East Tamaki zoning system coloured

6.4 Highbrook Business Park historical background [95]

1960-1990 It was the home of the well-known industrialist Sir Woolf Fisher and his partner. The meadow was used for racehorse preparations whose guests included significant figures, such as, Prince Charles and the Queen Mother. Soon after, with the evolution of Auckland, the Fisher family decided to sell and invest their land.

1998 landscape architect Peter Walker has finalised the award winning landscape scheme.

2004 Goodman Group has bought a 75 per cent share, while the estate of Sir Woolf Fisher maintained a 25 per cent profit.

2006 Goodman Property Trust bought a 75 per cent profit in certain finalised and initiated enterprises at Highbrook. Moreover, Highbrook Business Park Ltd was established at the same year.

2007 Highbrook motorway intersection was completed and in use.

2009 More than 22.5 hectares of lands have housed completed projects.

2011 Highbrook Business Park received the famous Supreme Award from the Property Council of New Zealand. At the same year, the construction of "The Crossing" began; a mixed use development to become the main focal point for the Business Park.

Figure 6.4 The Queen Mother and Sir Woolf Fisher, 1966

Figure 6.5 Sir Woolf Fisher and Prince Charles, 1966

Figure 6.6: Highbrook Business Park befor development

Figure 6.7 Highbrook Business Park after been developed and still developing

[95] Goodman Property Trust, "Highbrook-Vision," accessed April 8, 2015, http://www.highbrook.co.nz/vision/history

6.5 Demographic Study

6.5.1 East Tamaki business workers[96]

There was a noticeable 61% increase in employee's number during (2000-2010). This represents a total net increase of 10,446 workers, and an annually regular increase percentage of 4.88 %.

More than half the precinct (wider East Tamaki)[97] employees (aprox.55 %) work in either production or all-inclusive services. The production subdivision records the highest within the precinct's employment; it comprises nearly 37 % of all employment in the precinct.

The Business district attracts 35% of its workers from within 5km of the area and 70% from within 10km. Most employees, however, come from its east and south.

6.5.2 Wider East Tamaki [98] residents[99]

During 1996 and 2006, community of wider East Tamaki area has raised from 37,000 to 64,000.

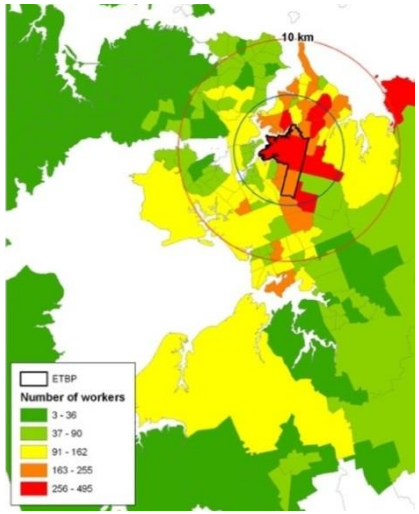

Figure 6.8 Spatial Density of people working within East Tamaki Business Precinct, 2006 (Auckland Council Website)

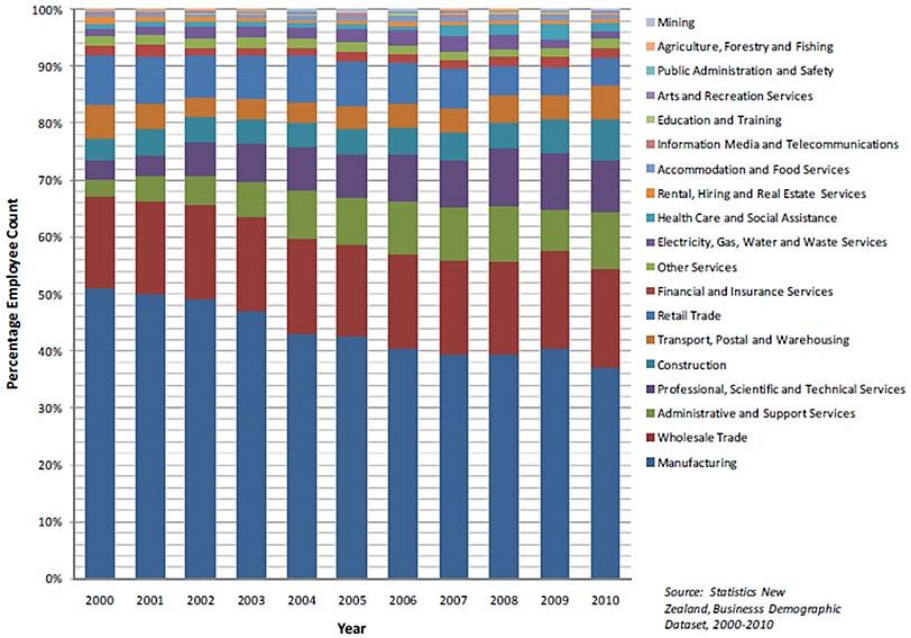

Figure6.9 Employed Employment Occupation Group for the Wider East Tamaki Area, Auckland and New Zealand (2000-2010)

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[96] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012, http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf

[97] The wider East Tamaki area is defined by; Clover Park, Donegal Park, Dannemora, East Tamaki, fergusson, Golfland, Millhouse, Ormiston, Otara East, Otara West, Otara North, Otara South, Point View, Redoubt North, Flat bush and Burswood.

[98] Ibid.

[99] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012,http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf

This is a total increase of 73 per cent within ten years. However, a prediction of 3 per cent community increase within the upcoming 20 years associate to an extra 56,590 residents and a total of 125,000 dwellers by 2031.

According to 2006 census, the area showed:

-Median age of 29 years old and 28 per cent younger than15 years old.

-Ethnicities involve 32 per cent Pacific Islanders, 27 per cent Europeans, 24 per cent Asians, and 11 per cent Maori.

This explains that the area has a high cultural diversity and the majority of residents are from the independent group.

East Tamaki

Age Group and Sex,2006		
65 and over	male	7%
	female	9%
15-64	male	74%
	female	74%
Under 15	male	21%
	female	19%

Ethnic Groups, 2006 Census	
European	46.8%
Maori	5.8%
Pacific	4.4%
Asian	40.5%
Middle Eastern	
Latin, American/African	3.7%
Other	6.5%

Family Types, 2006 Census:	
Couple without child(ren)	39.4 %
Couple with child(ren)	45.3%
One parent with child(ren)	15.3%

Otara-Papatoetoe

Age Group and Sex,2013		
65 and over	male	8.6%
	female	8%
15-64	male	68%
	female	69%
Under 15	male	26%
	female	23%

Ethnic Groups, 2013 Census	
European	20.7%
Maori	15.6%
Pacific	45.7%
Asian	30.9%
Middle Eastern	
Latin, American/African	1.1%
Other	0.1%

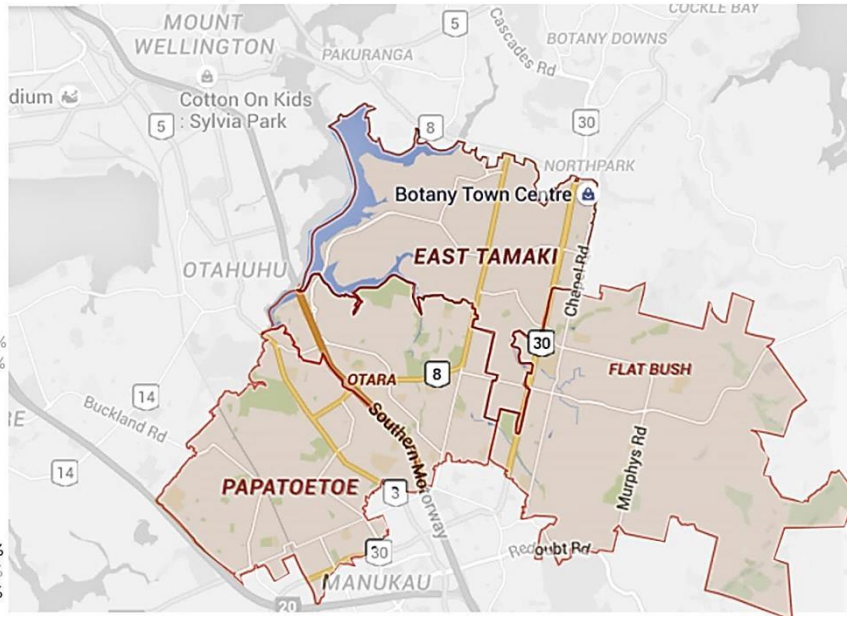
Family Types, 2013 Census:	
Couple without child(ren)	23%
Couple with child(ren)	49%
One parent with child(ren)	28%

Flat Bush

Age Group and Sex,2006		
65 and over	male	9%
	female	12%
15-64	male	68%
	female	69%
Under 15	male	25%
	female	22%

Ethnic Groups, 2006 Census	
European	9.5%
Maori	20.2%
Pacific	73.6%
Asian	8.9%
Middle Eastern	
Latin, American/African	0.4%
Other	0.6%

Family Types, 2006 Census:	
Couple without child(ren)	13.4%
Couple with child(ren)	50.3%
One parent with child(ren)	36.9%



6.5.3 The envisaged growth of businesses

According to the current community increase forecast, there will be an extra 156,000 careers in Auckland by 2031, and most of them will be occupying business zones such as East Tamaki, as it is a significant trade area within Auckland and provides 4.5% of the domain's total enrolment, (In only 2010, the precinct has employed 27,580 people).[100]

6.5.4 Conclusions and observations

Demographic studies have included the near-by areas (Otara, and Flatbush) as a response to statistics which showed that most of the precinct's workers are drawn from its east and south sides.

The majority of East Tamaki residents are Europeans and Asians, with a high number of independents. Couples with and without children rate is shown very close.

Flat Bush area has the majority of its residents from the pacific and Maori ethnicities; couples mostly have children with a relatively high number of single parents.

Otara-Papatoetoe area also shows a high percentage of a Pacific Islands race and most couples had children.

The current and the envisaged increase of both businesses and population are very significant. Interventions that aim to bring those people together are needed, and perhaps promoting wellness within such interventions is essential.

On the other hand, life-work balance for employees is becoming more and more challenging. However, bringing wellness activities close-by may encourage its use by workers. Conclusion made is that for the intervention to be viable, it should respond to workers and communities' needs;

Workers:
manufacturing and office employees are the two main dominant groups; manufacturing workers are physically active at work, while office workers are considered less active. As a response, the proposed wellness programmes will involve a variety of ordinary physical and hydrotherapy physical (which offers less pressure on joints and better for people experiencing muscle tensions). Moreover, sociability for workers is regarded beneficial from health perspective and business success, keeping in mind motivation will be a significant factor too.

Communities:
-Recreational and physical activities are essential in order to bring people together (European, Maori and pacific cultures love and appreciate their family time, especially during the weekends)
-Meditation and yoga ,on the other hand, are significant activities practised mostly by the Asian group to rejuvenate the mind, body, and soul.
-Hydrotherapy pools, spas and massages as healing and therapeutic facilities for both; healthy people who want to maintain their health or people with issues relate to: joint mobility, sport injury...etc.

[100] Auckland Council, "East Tamaki Business Precinct Plan (DRAFT)," last modified May 4, 2012,http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf

6.6 Site Mapping

6.6.1 Existing conditions and future potentials of East Tamaki

The draft map was developed by the Council officers during 2011-2012 in order to increase the value of the district.[101] Activity hubs, local and regional cycling routes, and pedestrian routes seem to take a large focus in the plan. Locations of the activity hubs, however, are showing on the busy drive ways and intersections where they are mostly visible to workers and commuters who drive past every day.

Site selection was made after acknowledging the existing and the future conditions of the area, as well as land availability. Moreover, working with the activity hub (as marked) on Highbrook drive intersection was a key to utilise from the current and the future busy traffic.

Legend:

[101] Ibid.

6.6.2 Health and wellness amenities within the large context

6.6.3 Amenities within Highbrook Business Park

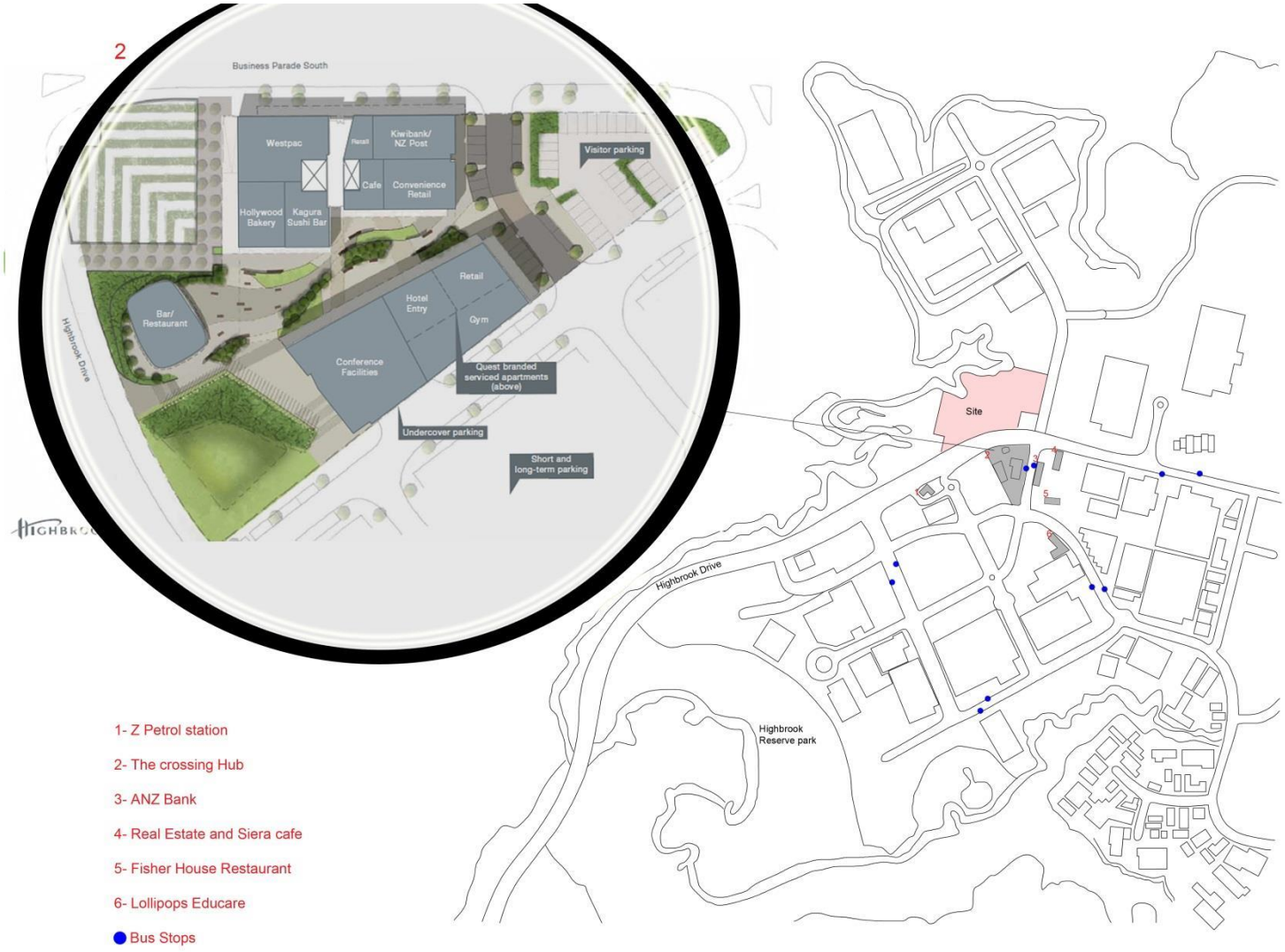


Figure 6.10 Highbrook amenities

6.6.4 Passive recreation, roads & parking, and walking distances

Figure 6.11 Highbrook passive recreation, Roads and parks, and walking distances

6.6.5 Noise frequency and pedestrian densities

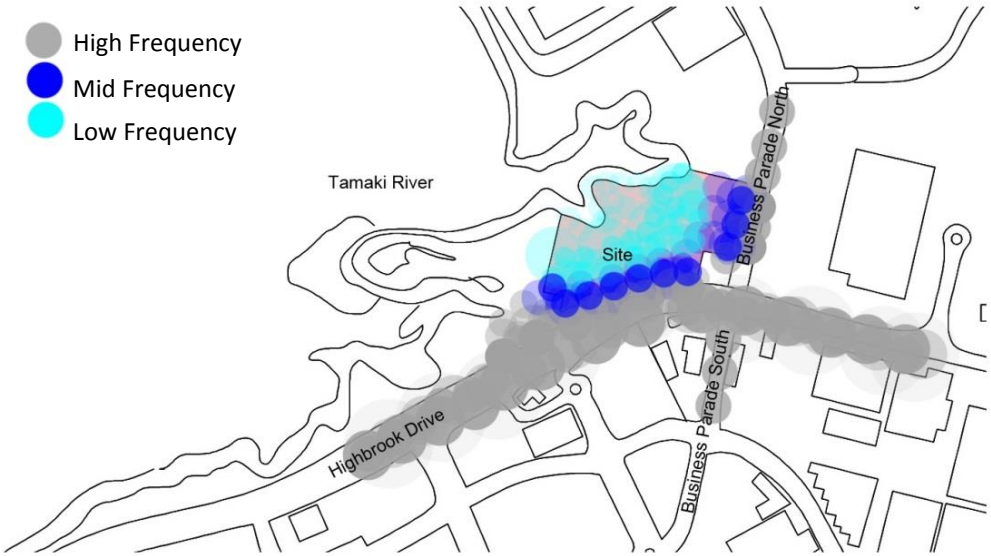


Figure 6. 12 Highbrook noise and pedestrians' density

6.7 Site Images

6.8 Topographical study

The southern and eastern ends on Highbrook Drive and Business Parade North slope down by 4.5 meters towards the North West where the Tamaki River is. The site is mostly viewed from its highest ends (Highbrook Drive and Business Parade North), and mostly experiencing a relatively flat surface.

Conclusion and aspects to consider

-The topography slope offers an opportunity to access the site from high levels.
-Site is highly visible from the Highbrook Drive, Business Parade North, and the social hub.
-Site boundary does not include the river edge, as it is reserved for public access.
-The walking, cycling track runs through the site and it needs to be acknowledged.
-The river doesn't run along the edges that face the northern boundaries of site, as the area contains high levels of mud and vegetation.

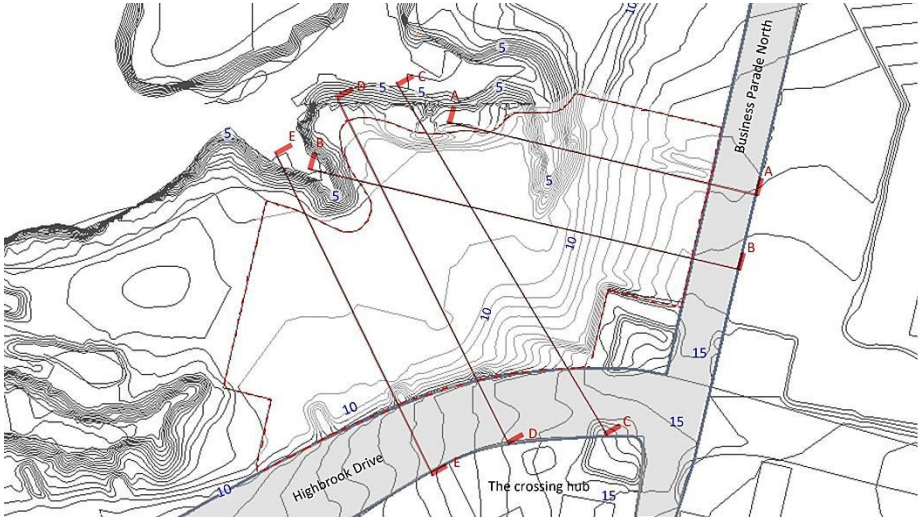


Figure 6.14 Highbrook Land and topography plan

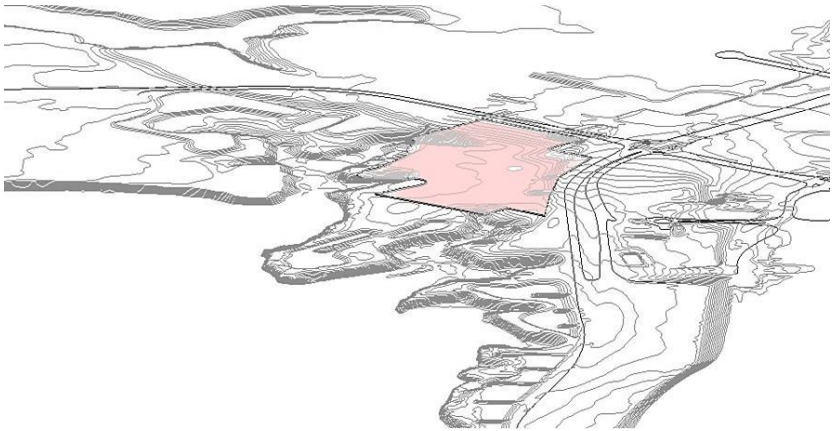


Figure 6.13 Highbrook Land and topography in 3d

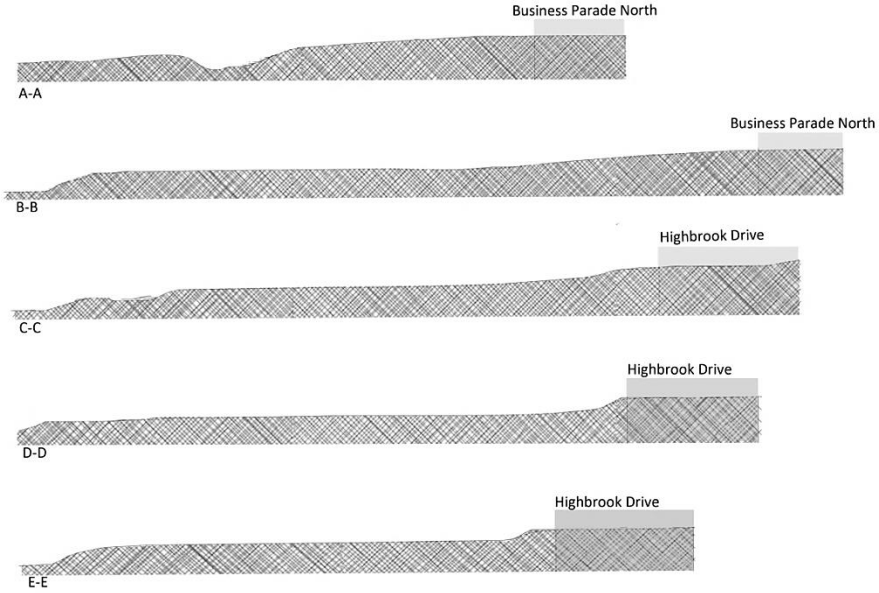


Figure 6.15 Highbrook Land and topography sections

7.0 Design Process

7.1 Design Brief

The proposed programme is a “Rejuvenation Centre” within Highbrook Business Park for workers and the near-by communities, operating seven days a week to provide wellness programmes, practised by mixed age groups who seek for health and wellness.

7.2 Spatial Requirement:

Building main programmes were chosen as a response to the ‘wellness’ concept (mentioned earlier) which emphasises the healthy balance of mind, body, and spirit. Furthermore, other activities were added responding to site needs.

Social Zone:
-Help desk
-Café
-Small retail
-Health education (24 people)
-Entertainment and recreation (table tennis, billiard, rock-climbing, and -basketball court)
-Toilet

Aquatic Zone (active and tranquil)
- active:
. 25m long x18m wide lap pool
. 2x learning pools for adults and kids
-Tranquil:
. 2x steam rooms,
. 3x sauna rooms,
. 6x pools (3 hot and 3 indulging)

Fitness Zone
-Consultation and booking
-Group exercise rooms (2x small)
-Group exercise room (1x large)
-Exercise room with machines(x4)
- Running track (with interior-exterior connection)
-Toilet

Yoga and Meditation Zone
-Reception and booking
-Meditation and yoga rooms (x6)
-Message and therapy rooms (x4)

Business-related Zone
-Help desk and booking
-Conference rooms (theatre style) x2
-Small lounge
-Large training rooms (x3)
-Small meeting room
-Large meeting room
-Toilet

Clinic
-Helpdesk and booking
-Waiting area (20 people)
-Pharmacy, health advice and retail
-Small consultation rooms(x2)
-Consultation and check-up rooms(x4)
-Group consultation(x1)
-X-ray and lab
-Toilet
Others:
-Staff, library, childcare, changing rooms and lockers with showers

Outdoor Recreation (football field 45m widex90m long)

7.3 Centre Usage Terms and Conditions

Conditions were set at an early stage of design to assist with the configuration of circulation.

The intervention includes certain activities made available for public and business workers to be used for free of charge, while providing other specialized programmes that require either membership or entry charges.

As a result, conditions will be:

-Free access is allowed to the social zone and library. Clinic, on the other hand, allows free entrance to pharmacy and health retail only.

-Aquatic, fitness, yoga and meditation zones require memberships or normal hourly charges. The charges, however, are expected to be lower for East Tamaki residents and business workers. In fact, workers' fees might be partially or fully subsidised by their employers.

-Business-related zone is used by businesses only with either membership or hourly charges.

-Outdoor and indoor recreation (football field and basketball court) can be used by anyone, and for small charges. (Bookings and reservations are needed)

-Childcare service is made available for people using the Centre.

7.4 Phase One- Initial form concept and early exploration

Form intention was to contrast the box-like buildings available on site, and instead, integrating a fluid and dynamic form that responds to site contours and the fluid motion of the Tamaki River, in order to achieve an organic shaped building. This was a response to Feng-Shui philosophy which suggests that buildings need to work in harmony with the life forces (Qis) and not against them, in order to deliver an advantageous Qi (energy) into building interior.[102] Form has first responded to Earthly Qi (contours and river movements) by mimicking and replicating contours and the river flow, which offers the form an east-west axis and north orientation.

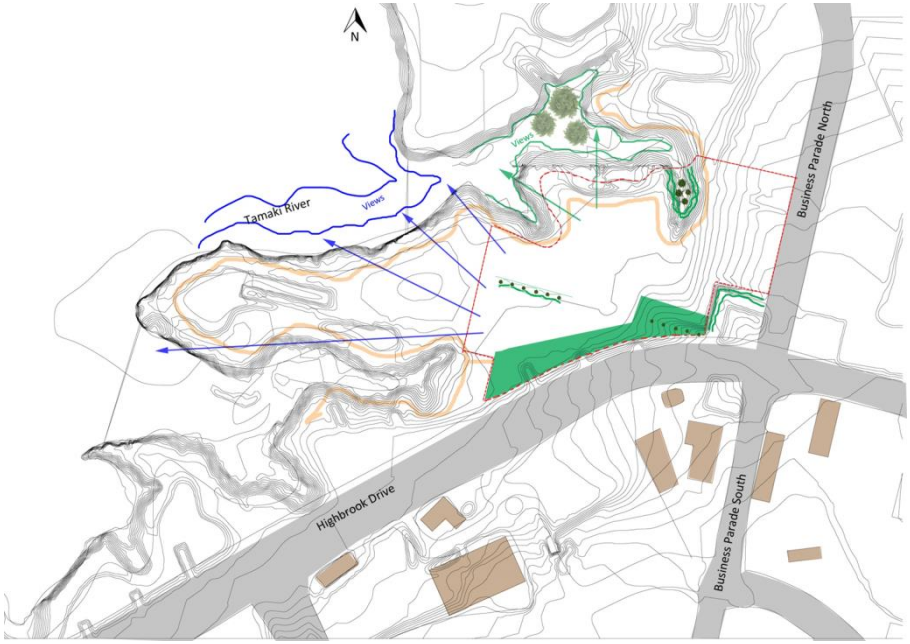


Figure 7.1 Site with views and vegetation connections

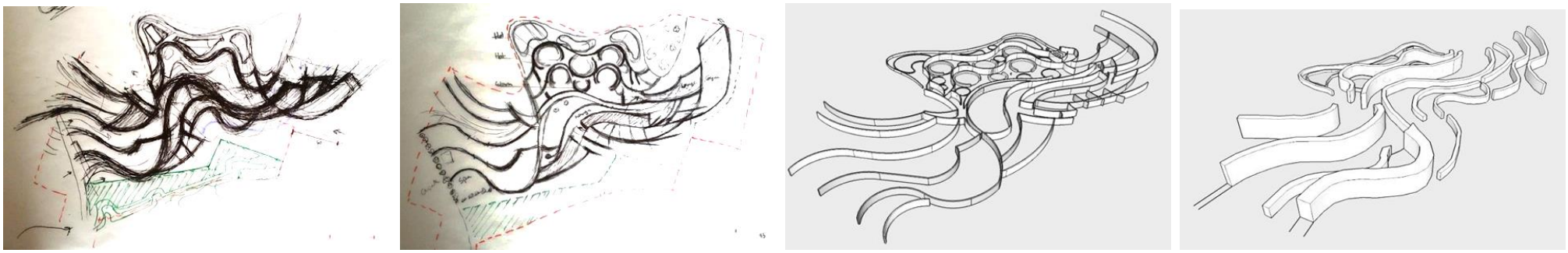


Figure 7.2 early attempts- form exploration

[102] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004), 60

Form was developed in 3D then placed within the chosen site which was also modelled in 3 dimensions after the exact land and topography information was obtained from the GIS website[103] in order to test and examine the resulted building form and site relationship. The sloped contours on the Highbrook Drive side and Business Parade North were left unbuilt so views to river can still be experienced by pedestrians and motorists. Moreover, outdoor seating, and green pathways leading from the high roads to the proposed building are still to be integrated with these sloped contours at a later design stage.

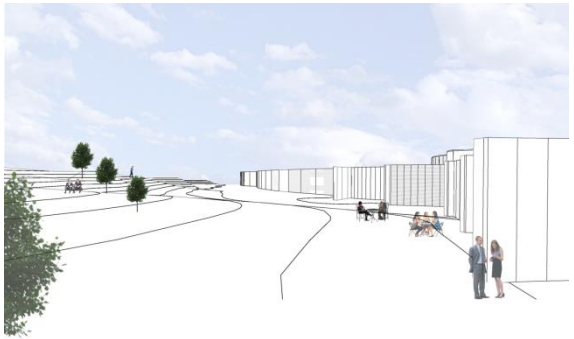


Figure 7.3 building viewed from Business Parade North

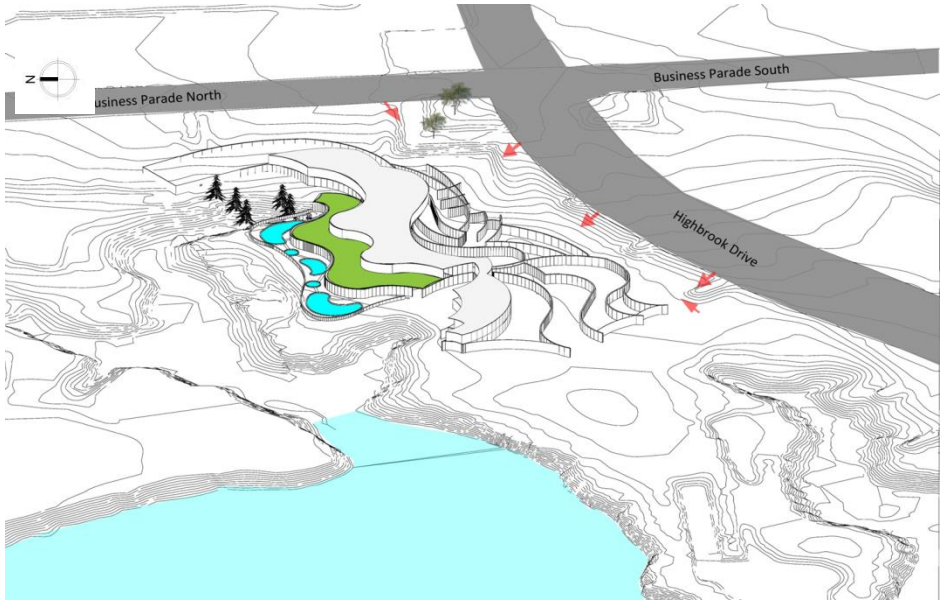


Figure 7.4 building axon-1

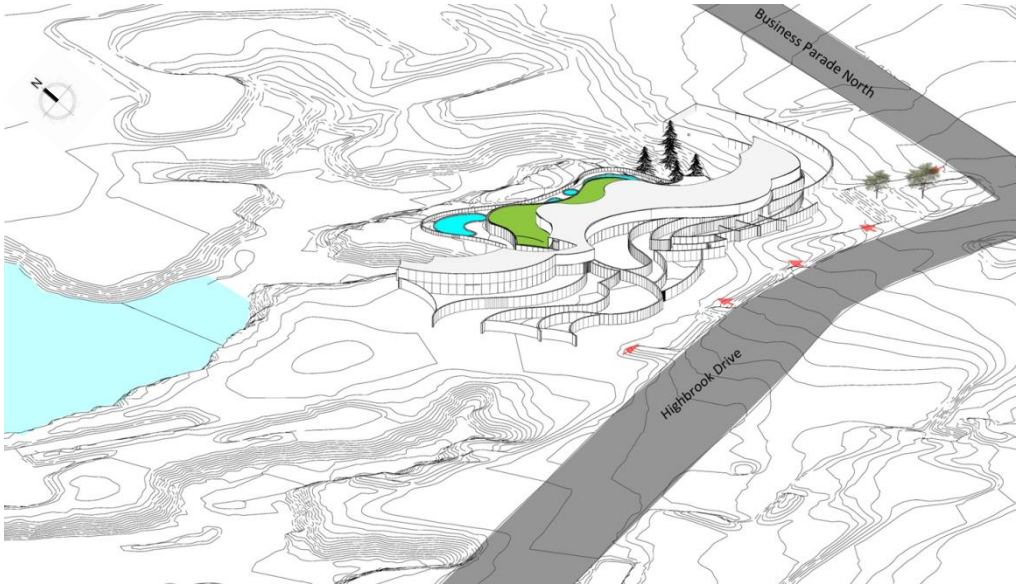


Figure 7.5 building axon-2

[103] Auckland Council, "GIS Map Viewer," accessed September 2nd, 2015, http://maps.aucklandcouncil.govt.nz/aucklandcouncilviewer/

Zones were then integrated into the building form to test how activities may relate to each other, and how they might connect with site. These zones were located according to views, noise level, and proximity to the river from one side and Highbrook Drive from the other side. An upper level was suggested to house yoga, relaxation lounge with roof terrace, small clinic, and business-related zone. This level was approached as a reasonably narrow strip that runs along the northern edge to obtain views.

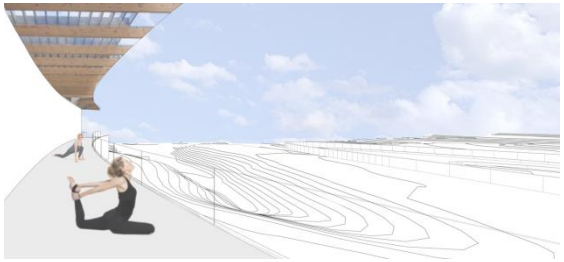


Figure 7.6 Yoga outdoor view

Figure 7.7 view from roof terrace

Figure 7.8 view from outdoor pools

Critique: This early exploration has mainly focused on generating the fluid form, with disregarding its scale. However, occupying the entire site wasn't a good idea. It was suggested that form can be broken up into smaller masses which green spaces can grow in between and face the river, rather than being surrounded by the building itself. It was also suggested to engage with the sloped contours on the Highbrook Drive side and integrate its effect into the building.

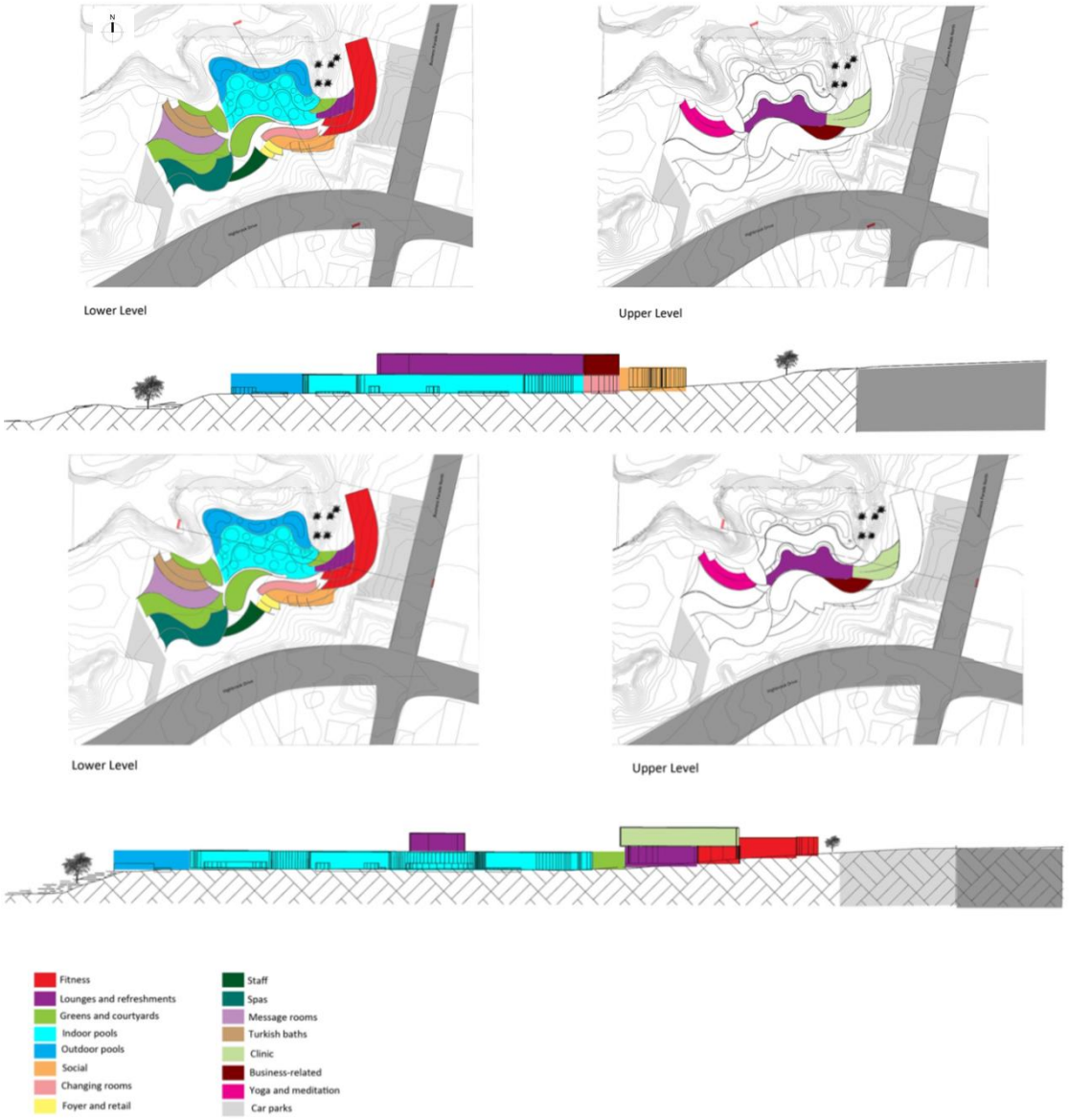


Figure 7.9 early exploration plans and sections within the site

7.5 Phase Two- Form development-1-

This exploration has looked at reducing building scale, opening up to greens, defining shapes of each zone, as well as introducing ramps to be used as the main circulation paths which separate zones by levels and not by walls.

Figure 7.10 sketch plan of form development-1

Outdoor football field was introduced on the west side, in order to blend in with the reserved green land (on its left), as well as preserve the Tamaki River views when looking down from Highbrook Drive, and when people make their journey towards the building. Christopher Day describes that paths and journeys towards buildings should be associated with pleasing views in order to achieve a 'therapy first impression'.[104]

2x car parks were allowed; small one next to the recreational field (of Highbrook Drive where a drive way already exists) to be mainly used by people engaged with the football field. Also, a large car park accessed from Business Parade North and located close to the main building entrance.

From the main entrance, people chose their paths through either the private ramp (on the north side) which leads to activities that require fees, or the public ramp that feeds into public social space. The third ramp, however (Far East), leads to more formal activities (staff, business, clinic).

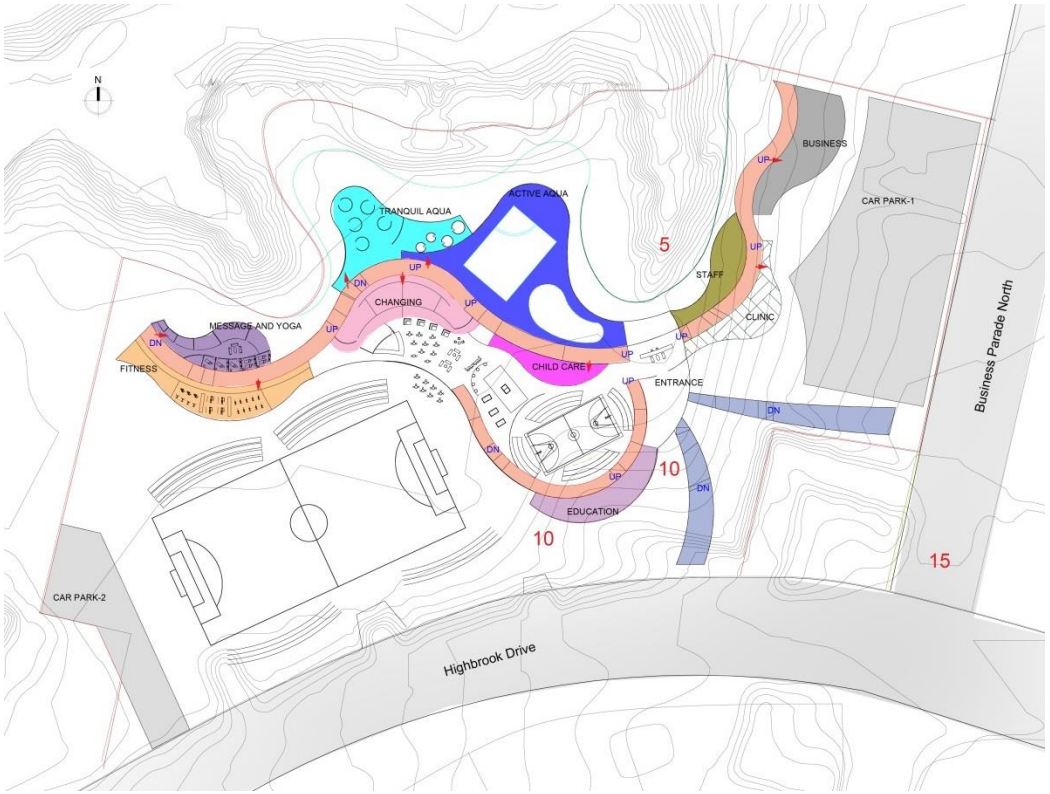


Figure 7.11 schematic plan-form development-1

[104] Christopher Day, *Places of the Soul: Architecture and Environmental Design as healing Art* (Oxford: Architectural Press, 2004), 25

Figure 7.12 Outdoor recreation and topography relationship

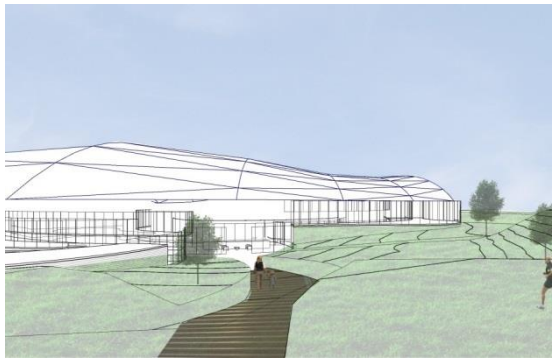


Figure 7.13 Outdoor path to entrance coming down from Highbrook Drive

Figure 7.14 Outdoor path to entrance coming down from Business Parade Noth

Change of levels was also explored during this phase. The concept involved lifting each activity at a certain height responding to views and contours.

The way these floors were lifted was utilising the existing topography at some parts and integrating a system of columns at others. For instance, activities on the east side are lifted and supported by land, while the ones on the north and west sit on a flat land and therefore some support is needed (Concrete columns were suggested). However, the dominant site surface sits on contour 8 (8 meters above sea level) which introduces the flatness of site.

After exploring the levelling system, it was decided that roofs could also utilise the same language and undulates responding to floors, so the physical and visual movements of people can experience similar motions as progressing from activity to another.

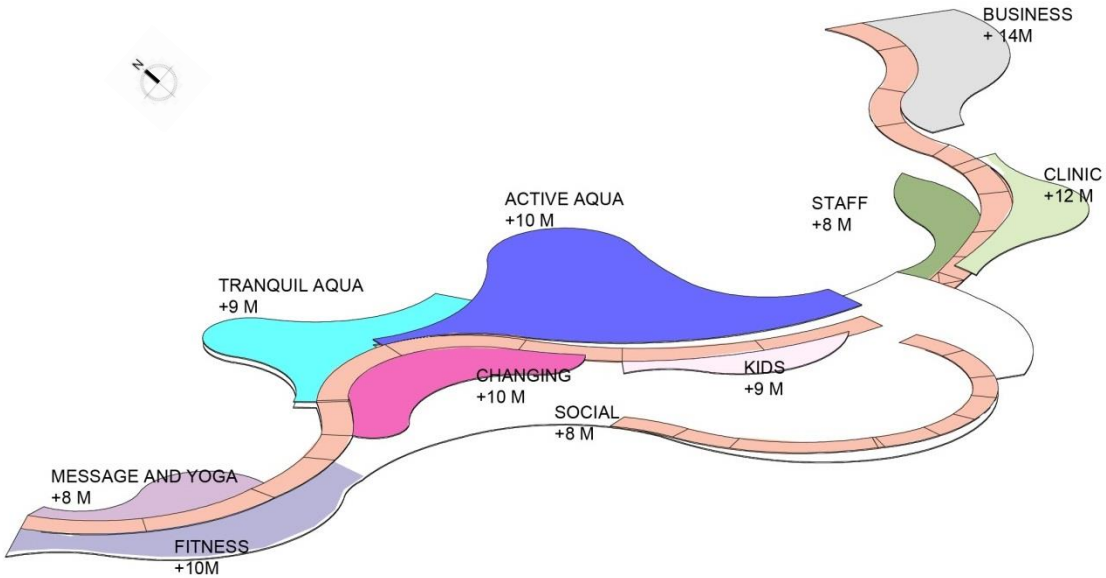


Figure 7.15 Level changing

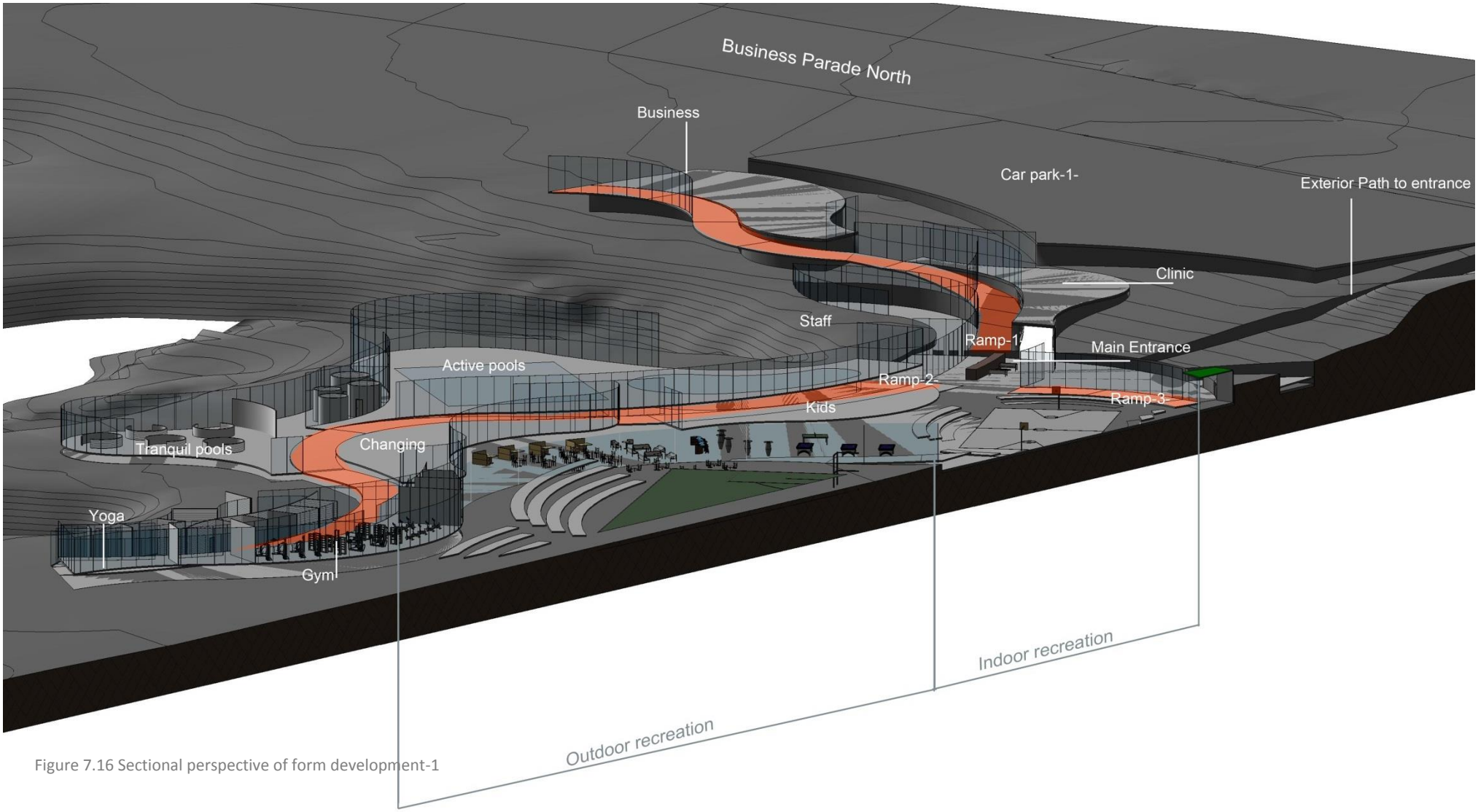


Figure 7.16 Sectional perspective of form development-1

7.6 Phase Three- Roof exploration

At an early stage, it was decided that roofing system could utilise a tree-like structure to develop a roof form that consists of canopies, branches, and columns. The idea was explored using Grasshopper and Rhino soft wares to develop a more mathematical ways when configuring roof surface and its support system. It was concluded that this approach works in contradiction with the fluid plan concept as the branching system and the triangular panels started to give a more geometrical impression, ruled by certain angles. Furthermore columns required short spans in order to allow roof surface some movement.

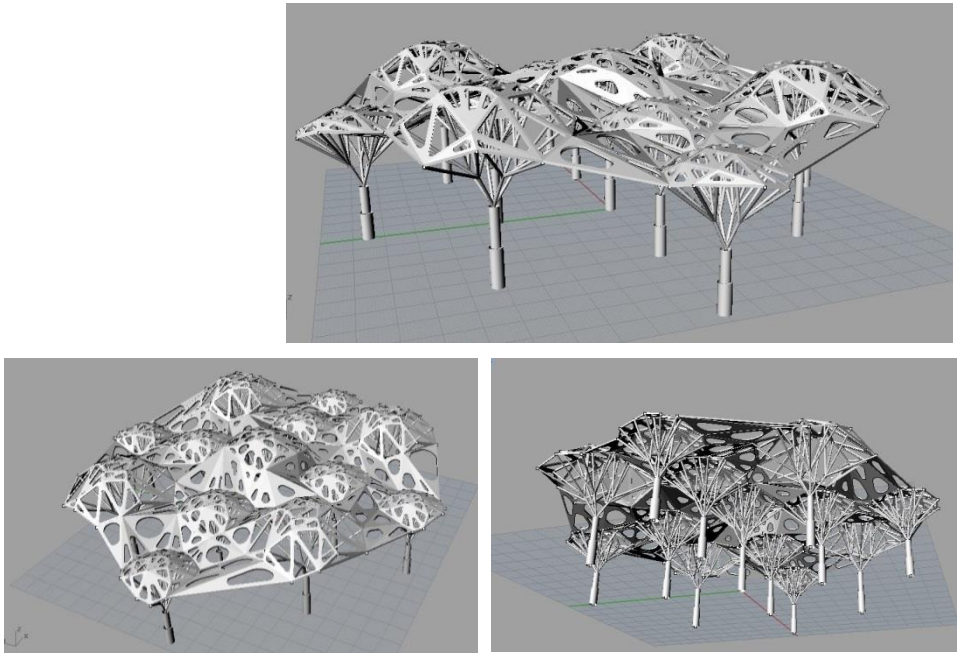


Figure 7.17 Roof exploration- Computer generated model of a Tree-like structure

As a result, tree-like roof structure was then developed into a gridshell system which was concluded to be more suitable for the flowy form, as it can offer a column free space, and can be shaped and undulated responding to floor levels. This roof structure was suggested to implement strategies learnt from the Savill building (precedent-5-) which involves the use of timber gridshell supported by a steel ring beam that runs around the building's perimeter and supported by steel columns mainly located outside the building.

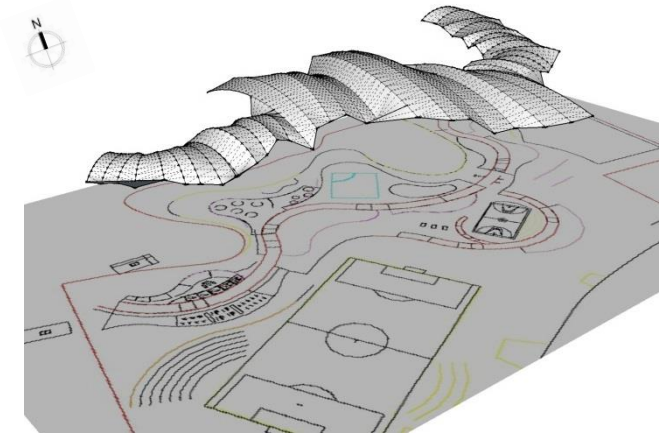


Figure 7.18 developed gridshell roof and plan relationship

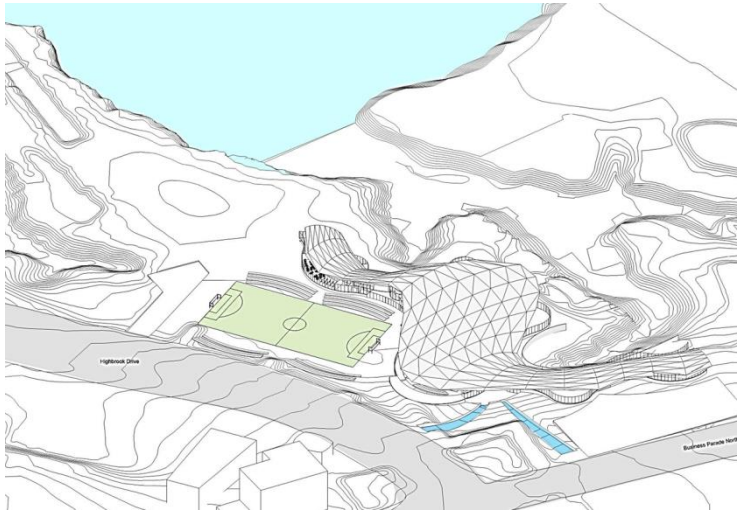


Figure 7.19 developed gridshell roof and site relationship

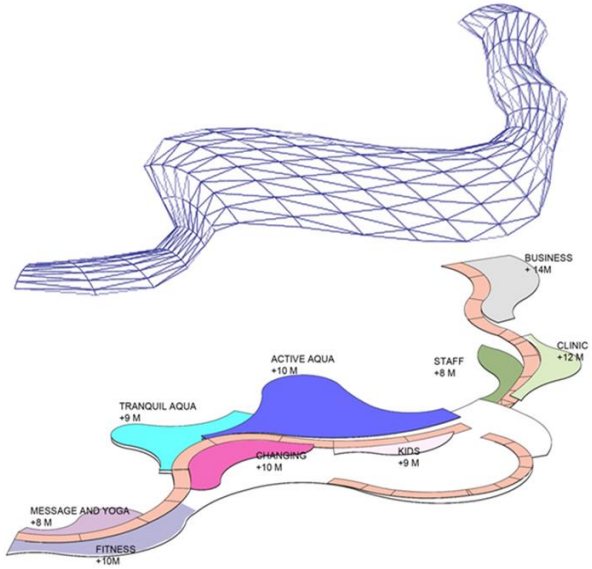


Figure 7.20 developed roof and levels relationship

7.7 Phase Four- Form development-2-

This stage has looked at integrating the river's meandering concept after seeing its potential in development-1. This was a response to the irregularly shaped zones which have caused some waste in space. Also, the ramping system needed some re-configuration to make it read as it was descending down from a high point, rather than landing at a low entrance then moving up to zones, then down again.
The approach has involved using semi-circular shaped forms (meanders-like) to produce more efficient forms and minimise any wastage in floor area. The ramp is now acting as a river stream that splits into two in order to feed into the private and public zones, as well as linking all these meanders (zones) together.

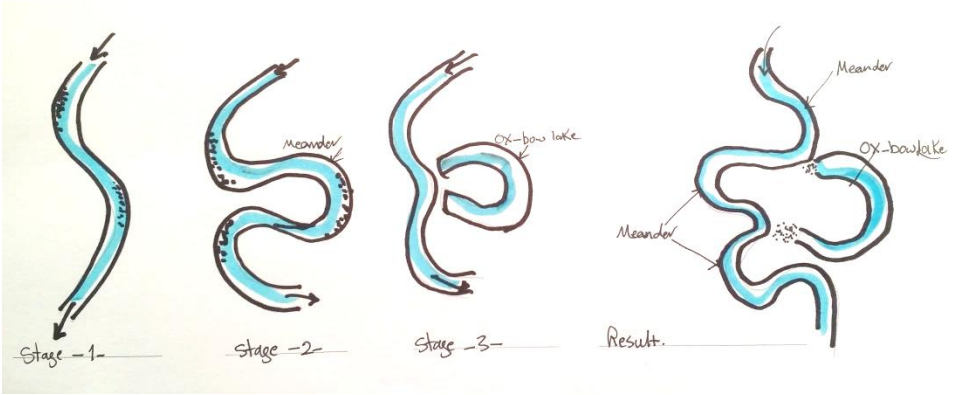


Figure 7.21 meander stages sketch

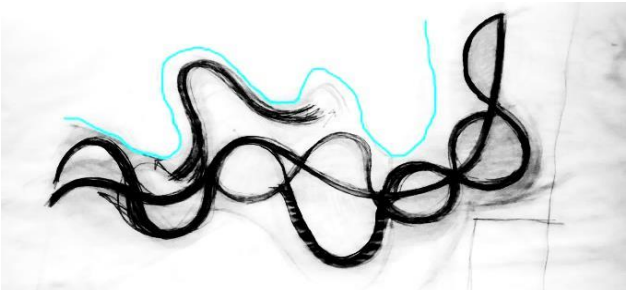


Figure 7.22 Meander development sketch-1

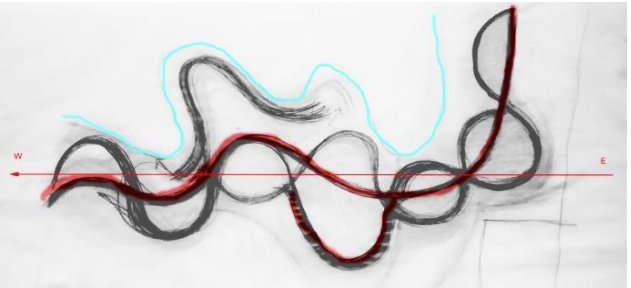


Figure 7.23 Meander development sketch-2- Axis

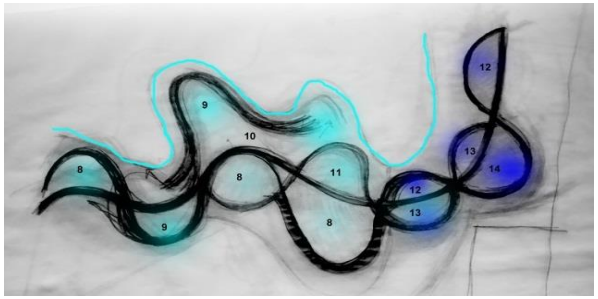


Figure 7.24 Meander development sketch-3 levels

The generated meander-like plan employs east-west axis, and it was tested on site to ensure that each activity gets sufficient sunlight, considering daylight as an essential healing factor (classified under Feng-Shui's Heavenly Qi[105]). Masses, at this stage, were also integrated into land to figure out form-site relationship, and ensure that forms are working with 'Earthly Qi' and not against it in order to obtain healing energy.[106]

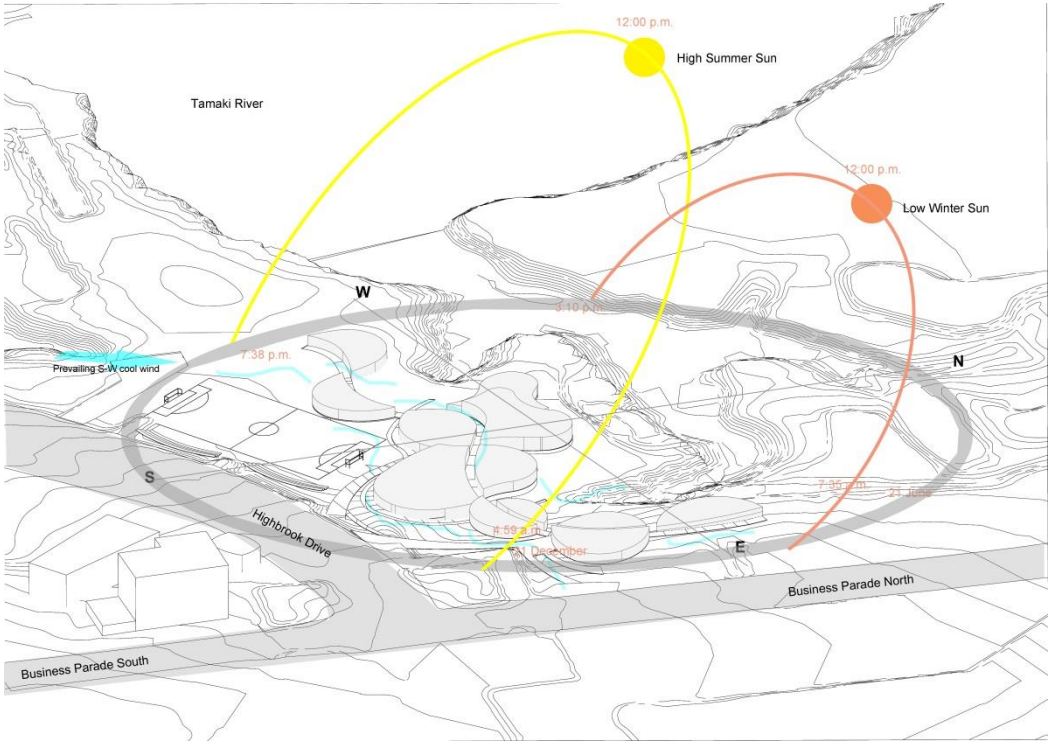


Figure 7.25 form development-2 with summer, winter sun diagrams and prevailing SW cool winds

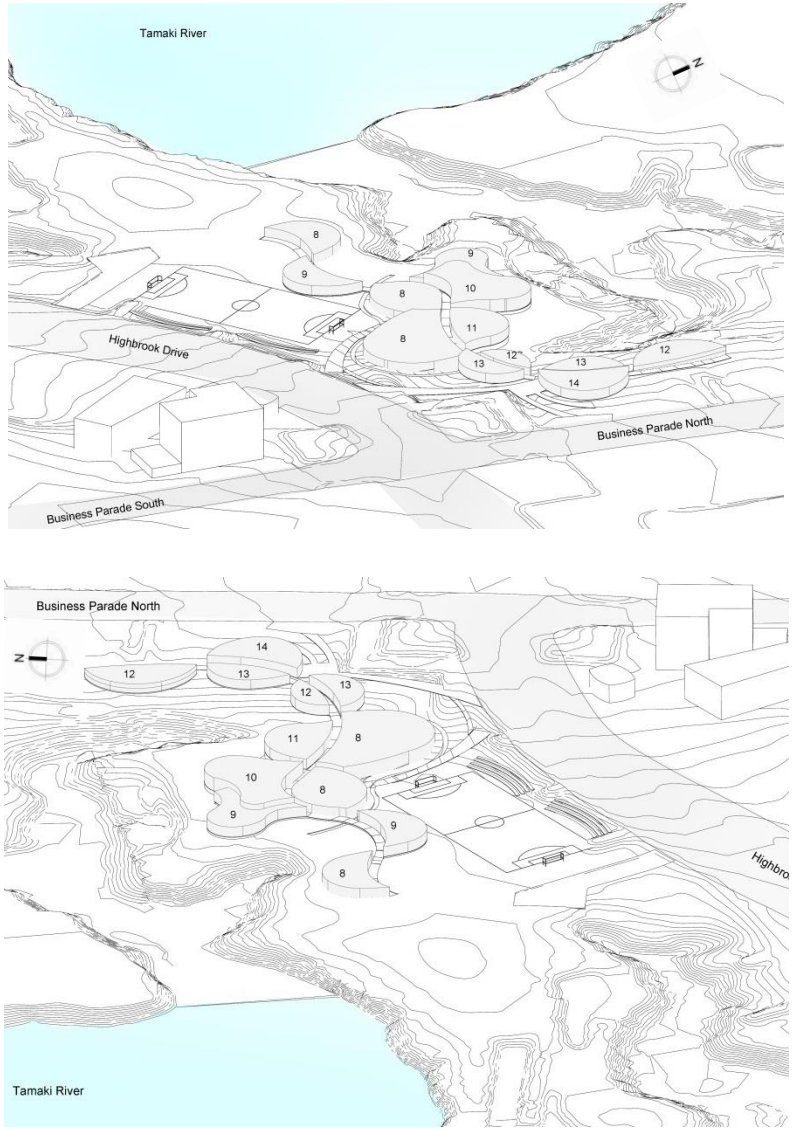


Figure 7.26 form development-2 and site relationship

[105] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004), 60
[106] Ibid.

7.8 Phase Five- Circulation and ramping system development

Ramps' ratios were used at 1:17 and 1:15 to ensure a convenient walk. The development includes: starting at a high level (contour 14) when first arriving the ramp, then making the journey down to levels 13,12,11,10,9,8 (private north), or to levels13,12,8 (public south), or 14 to 12 (public north).

The development has also considered engaging people constantly with the outdoor views when they are using the ramps, by carefully opening up to site views where healing vegetation, trees, and river can be seen. This results a visual experience that alternate between the outdoor nature and the indoor activities.

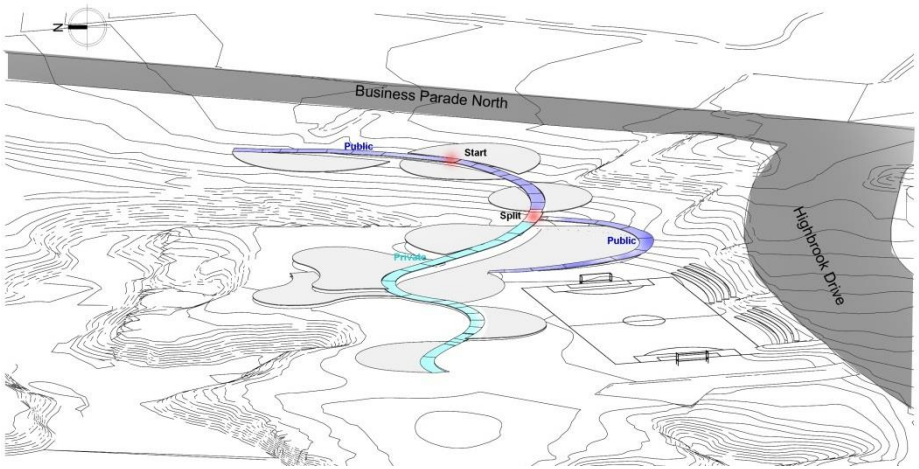


Figure 7.27 Ramp, levels and site relationships

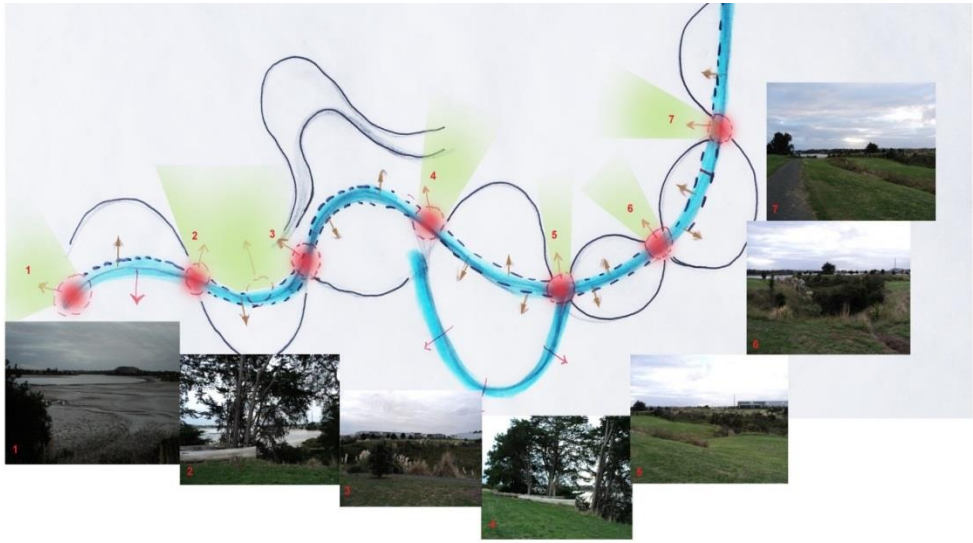


Figure 7.28 Ramp Journey and site views

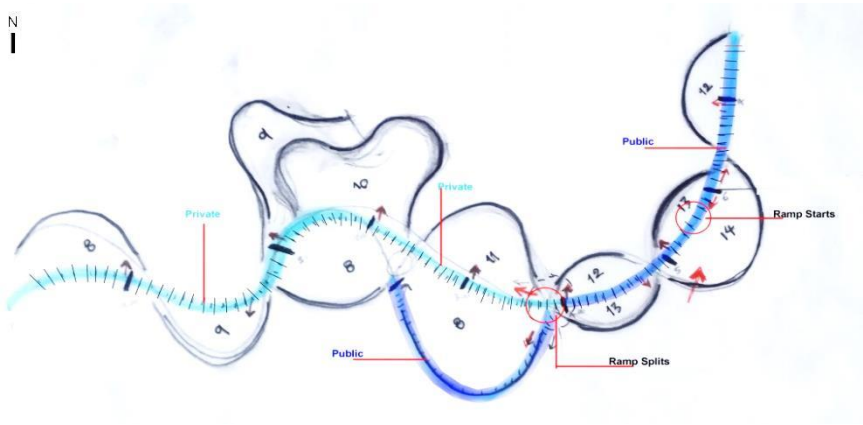


Figure 7.29 Public-private Ramping system

7.9 Phase Six- Zoning consideration and activities' relationships

This phase has looked at the concept of zoning, and the activities housed in each zone after circulation paths (ramps) were determined. This stage was a continuation to phase-five where it applies physical separation between public and private, while keeping them visually connected. As a result, activities accessed by members were located along the private path, whereas publicly accessed zones were integrated with the public path.

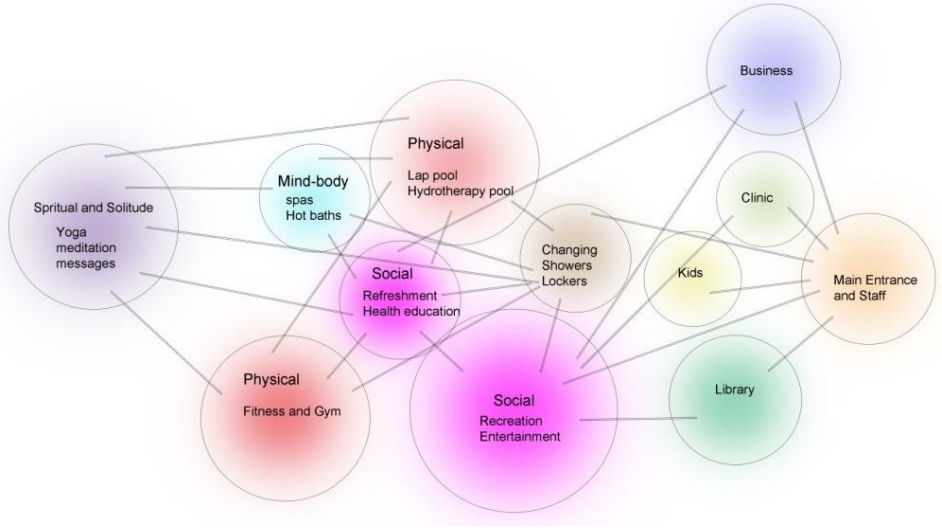


Figure 7.30 Activities' relationship

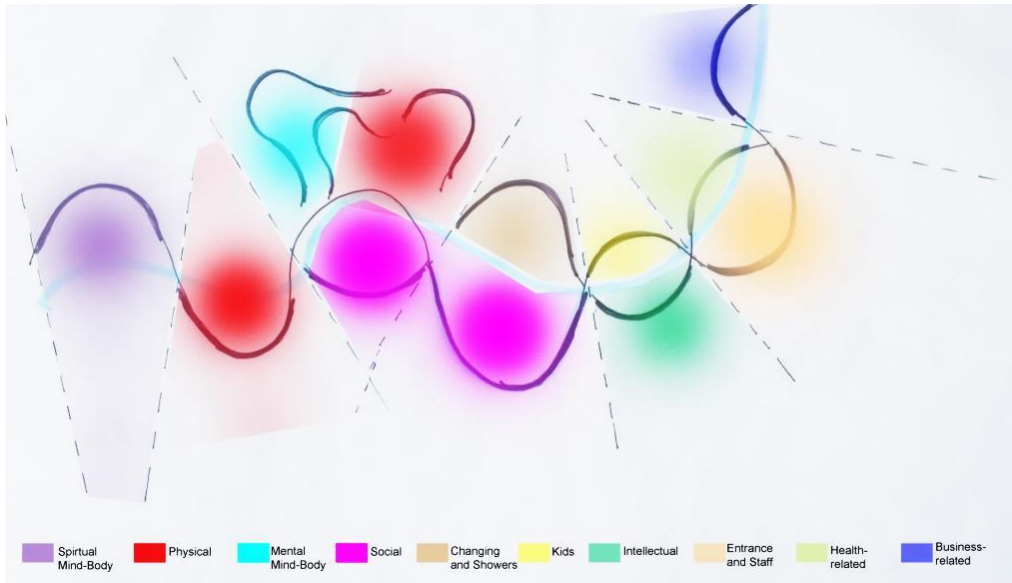


Figure 7.31 zoning system

7.10 Phase Seven- Implementing Fenq-Shui's five elements

This stage has looked at engaging each zone with a distinct atmosphere in order to enhance the sensory experience of the building. At an early stage of this research, it was learnt that peoples' senses react to atmospheres differently (depending on the use of colour, material, texture, and smell), some elements offer excitement, while others can be upsetting, and as a result, our hormonal system is triggered by the level of exposure to those elements.

However, one of the main aims of this project was to learn from the therapeutic elements found in nature. Thus, the zoning concept has looked at implementing the five elements of Feng-Shui's (earth, water, wood, fire, metal) into the building's atmospheres, in order to establish a 'harmonious sensory experience' resulted by these natural elements. Feng-Shui theory states that each element enjoys distinct features with the ability to provide us with different sound, smell, sight, and taste experience.[107]

The five elements were assigned to fit within different zones based on the chosen activities and the on-site surroundings. For instance, fire element was chosen for the fitness zone where energy and excitement are needed, whereas earth subtle element was chosen for the social zone and blended with the natural topographical changes. Metal, however, cool and quiet element, was chosen for the educational, and staff zones, acting as a continuation to the industrial theme on the Highbrook Drive and the Business Parade north Road. Wood and water, on the other hand, are assigned to clinic, aqua and meditation zones, facing the Tamaki River and the intense site vegetation on the northern side.

Figure 7.32 Feng-Shui the five elements and building zones

[107] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004), 84

7.11 Phase Eight- Design Development

7.11.1 Earth- Social zone exploration and development

This zone occupies the central part of the building with activities that serve business workers, members, and the near-by community. It is designed to offer an earth-like experience, through utilising certain aspects such as: connecting with the natural landscape, opening to views where they engage with nature the most, as well as using earthy materials, colours and textures in order to deliver the desired atmosphere.

Access and outdoor connections: Internal access is allowed from the main entry at the far east of the building next to carpark -1. In this case, building users will experience a journey that starts with metal zone, facing wood, and passing by water zone, then entering the social zone (earth) using the public ramp.

Figure 7.36Entry paths to social zone

Figure 7.33 Sketch of the exterior path from Highbrook Drive to social zone

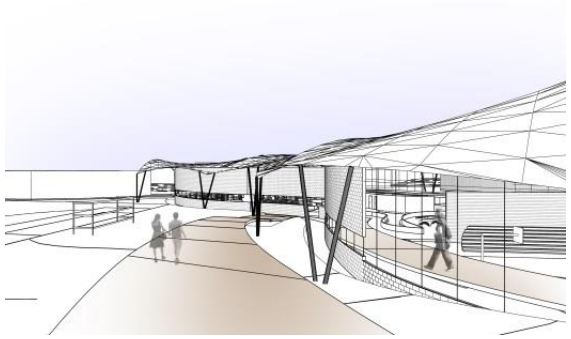


Figure 7.34 Sketch of walking track wrapping around the social zone

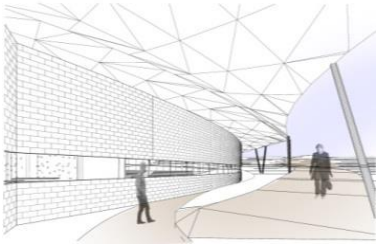


Figure 7.35 Sketch of exterior path and walking track close to entrance

External access, on the other hand, is located on the southern side, facing the proposed football field, linked to the existing walking/running track from one end and the Highbrook Drive from the other end. The intension of having this entrance on a low level was to make people aware of the topographical movement once they are on site, as well as allowing them to experience the river views. It was decided that having two accesses is essential in order to invite more people in and engage them by default with the health-related programmes. Moreover, a shortcut to refreshment areas becomes necessary for the outdoor field's users, and also, for business workers during the morning rush. Walking track, however, is connected visually and physically with this zone and the entire site, as it wraps around the building, and takes its shelter from the roof overhang on the southern end.

Planning and spatial organization:

The plan is developed to house a help desk, refreshment, recreation, entertainment, small retail, and an educational zone that holds public talks and health seminars. However, having the café at the northern end is to utilise from the Tamaki River views, as well as allowing an indoor- outdoor connection on that side. Floors, on the other hand, are arranged around water streams and linked by walkways; people are invited to use the timber bridges to cross over from activity to another. This is to generate an outdoor atmosphere where building users are engaged with the main earth elements (water, stone, wood, and vegetation).

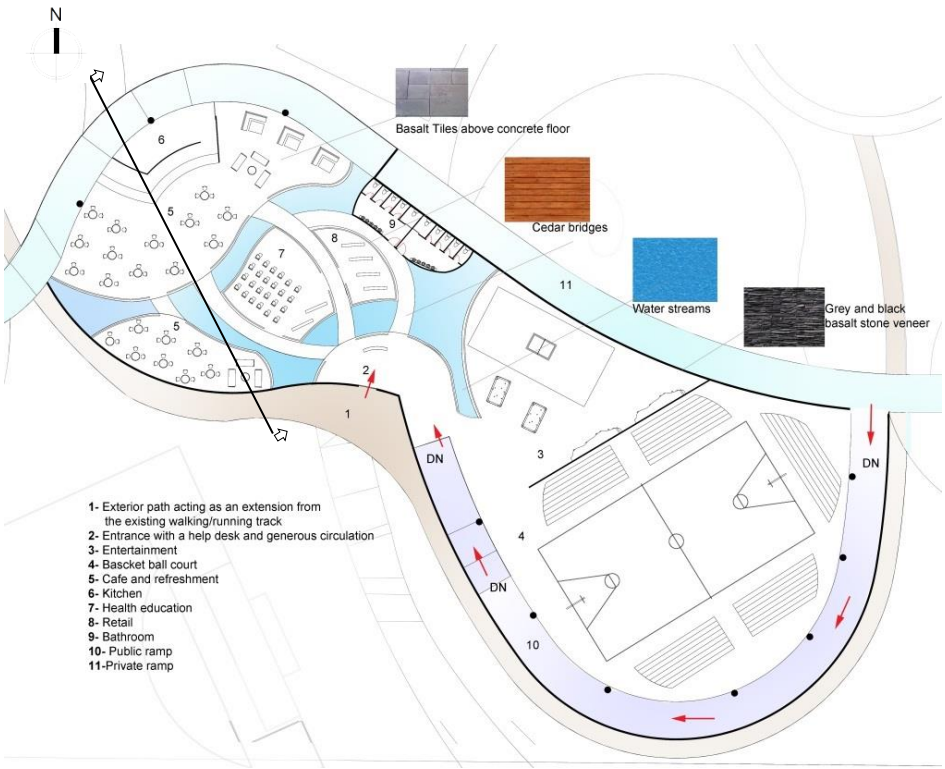


Figure 7.38 schematic plan of the social zone

Figure 7.37 sketch looking from the active entertainment

Internal full height walls were avoided, and 3000mm transparent partition walls were used instead around retail (for security) and educational (for noise control). Moreover, rock climbing wall @3000mm height was also used at the entertainment area to absorb the basketball court noise.

Material consideration of the floors has suggested using grey basalt tiles (dominant stone on site) over concrete flooring, in order to respond to the outdoor theme as well as keep connected with the basalt veneer walls.

Walls strategy:

Walls follow four different approaches on each side responding to earth relationship, outdoor connections, and views. The dominant concept was to use basalt stone veneer (available on site) over timber framed brick veneer walls, at the lower parts of most walls and open up to views at vision level 1200-1400mm using a strip of glazing that runs horizontally @1000 mm height.

Wall type-1-
Full height curtain wall system that is pushed towards the outer edge of the building, enclosing both: the social zone and the private ramp, and allowing an easy access to river views.

Wall type-2-
3000 mm high, supporting the ramp underneath, with a vision level glazing and a basalt stone finish.

Wall type-3-
6000 mm high, mostly basalt stone finish, with a strip of vision level glazing. The intention behind a high stone wall was to engage people (on the private side) with the earthy wall texture when using the private ramp on the opposite side.

Wall type-4-
6000 mm high, with basalt stone at the lower level and high glazing above. This is to connect building users on the lower level (recreation space) and the higher level with the topographical movement.

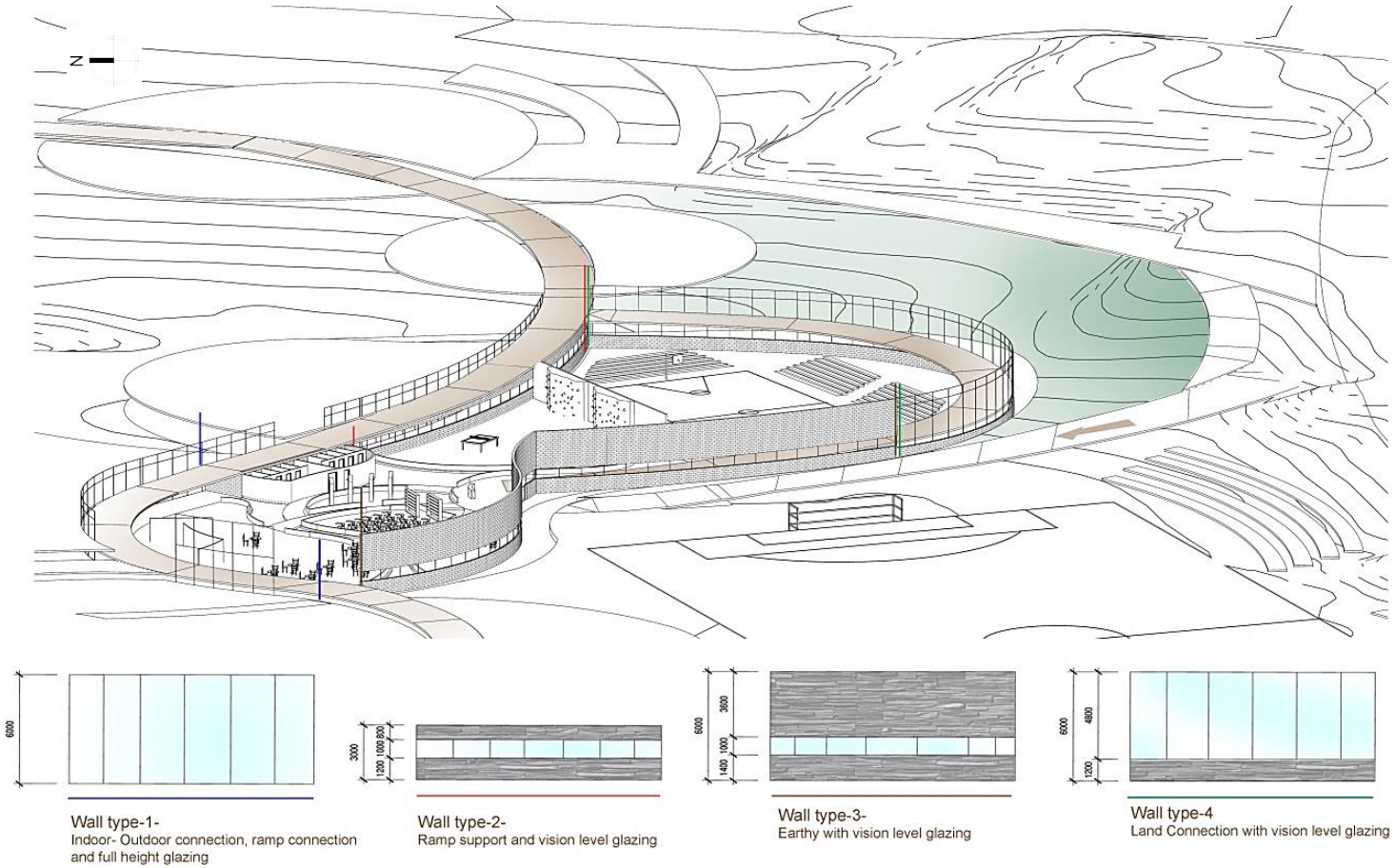


Figure 7.39 Social zone walls-earth relationship

Roof development above social zone:

As mentioned earlier, the roof concept involves using an organic form that blends in with the dominant nature of site. Roof perimeter, however, extends slightly beyond the outer edges of walls, in order to provide shelter underneath and introduce a column free interior. Thus, most columns will be arranged around building exterior which makes the roof structure read as the main dominant feature of the building.

The roof uses timber gridshell, constructed from 80x50 mm glue laminated strips in 2 interlocked layers. The grids are supported by timber arches, set on multiple heights to achieve the form undulation; these arches are connected to the 400mm tubular steel beam which is fixed to 200mm diameter V shaped steel columns (set at certain spacing). The intention was to use columns that are simple in shape and don't take the attention from roof surface (opposite to roof exploration-1- where columns seemed more dominant than roof)

The skin uses 2x layers of 12mm thick plywood sheets, fixed to the gridshell system in a diagonal way and strengthened by metal strips to help transferring tensile forces within the shell. Roof membrane is used under the 200mm roof insulation, metal standing-seam roof and cedar wood boards above (20mm thick) are suggested as finishing layers to give the organic impression on roof when seen from the exterior.

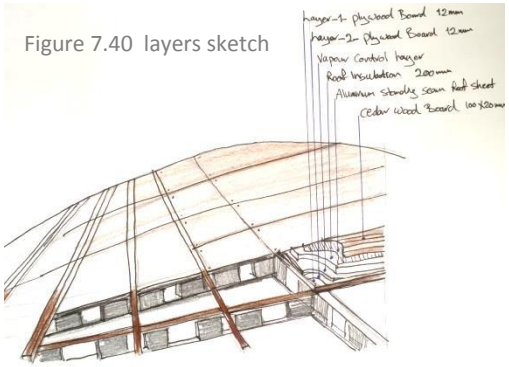
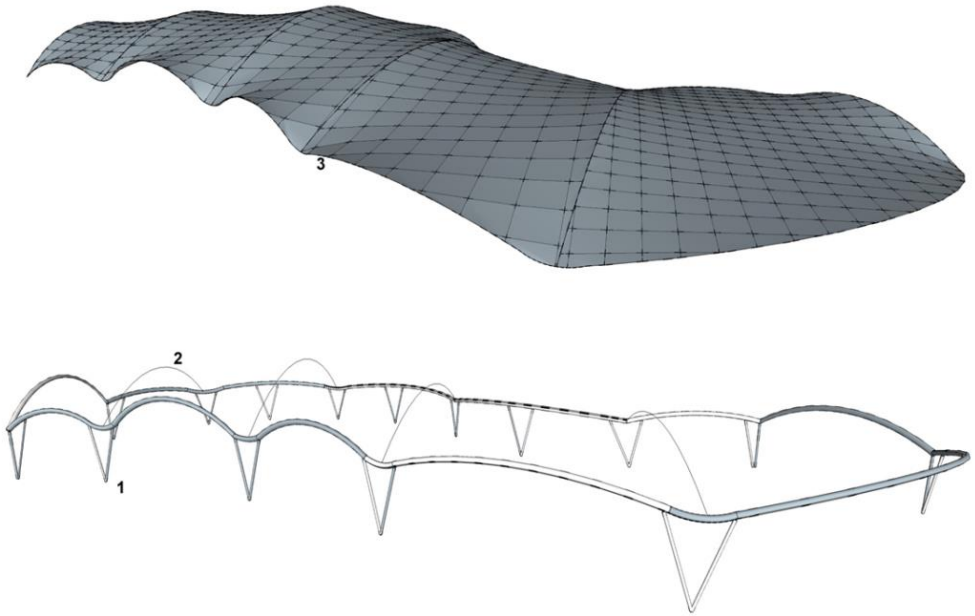


Figure 7.40 layers sketch

Thus, the main roof materials that are experienced from the interior would be the glue laminated gridshell and the plywood panels.



1- 200 mm diameter V shaped steel columns fixed to the 400mm diameter tubular steel ring beam

2-Timber arches fixed to the 400mm tubular steel beam and on different heights to support the timber gridshell and skin above.

3- Glue laminated timber gridshell (2x interlocked layers) consist of 80x50 timber strips with skin above. (skin consists of 2x layers of plywood boards in 12 mm thickness, Vapour control layer, 200mm roof insulation, aluminium standing seam roof sheat, cedar wood boards as finishing layer.

Figure 7.41 Social roofing system

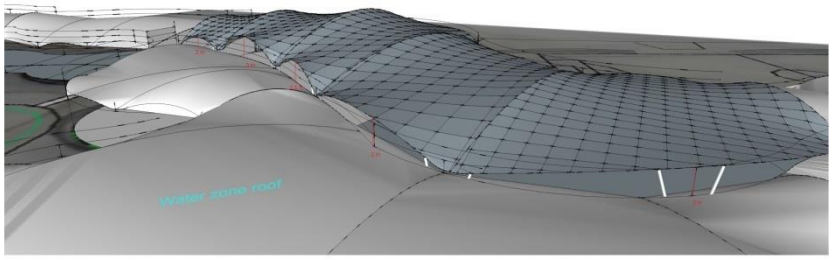


Figure 7.42 Social zone roof relationship with water zone

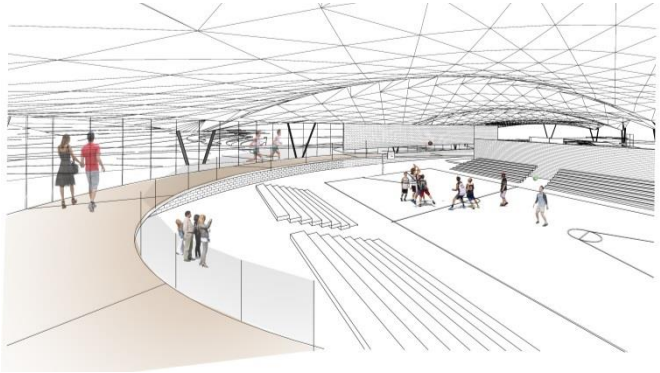


Figure 7.43 Social zone looking from public ramp

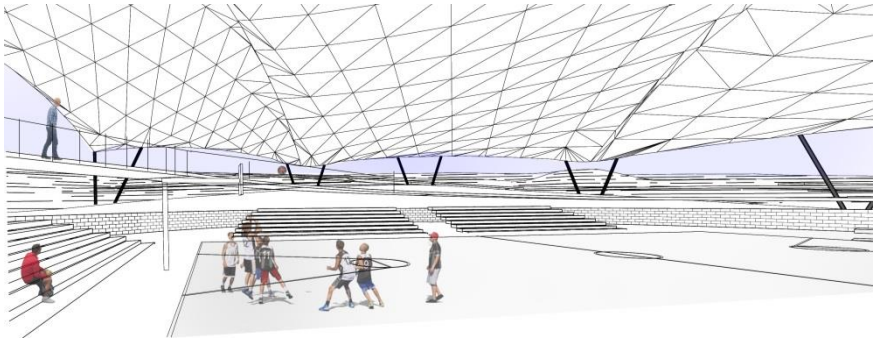


Figure 7.44 Social zone looking from indoor recreation

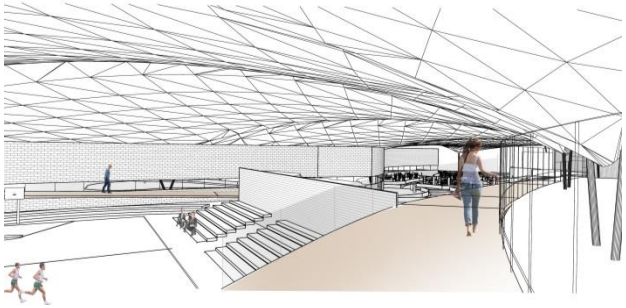


Figure 7.45 Social zone looking from private ramp

Thermal comfort of social zone:

This zone acknowledges using the visible and the invisible Qis (life force energies), which Feng Shui emphasises on, describing them as essential elements that should not be ignored in each design.

Visible Qi, (the one that can be predicted from the way we place our tangible objects) [108] is approached by allowing small low openings at the building's south-west side, and high openings at the northern side, keeping a reasonable distance between them in order to generate a smooth Qi flow, which is crucial for ventilation and thermal comfort.

Invisible Qi (a combination of heaven Qi[109] and earth Qi[110])[111], is approached by exploring both heaven and earth Qis in a way that delivers comfort to building interior. This includes methods such as; utilising from north by using large glazing with dynamic secondary skin to let sun in, as well as controlling its glare at the same time. Also, using high openings on the northern façade to allow north breezes in, and let the hot ones out. However, concrete slab is used for the flooring, in order to absorb heat from winter sun and releases it slowly during the afternoon. Other elements such as water ponds and vegetation are introduced to enhance the air quality of the interior and control its temperature.

Critique:

Social zone is accessed by an internal path on its east (next to the main car park), and an external path on its south (from Highbrook Drive). However, having two primary paths was critiqued as being confusing for the new building users and may cause frustration when trying to reach the zone. It was suggested that the external access (coming down from the Highbrook Drive) can be enhanced and used as the primary path that leads down to the main entrance. However, this path was prioritised over the internal one for being more interacting with the existing social hub, highly observed by motorists and pedestrians from the Highbrook Drive, as well as being close to the existing walking and running track.

[108] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004),73
[109] Energy coming down from heaven and interacting with earth, such as weather changes
[110] Earth features that responds to heaven Qi, such as topography changes.
[111] Ibid , 70,71

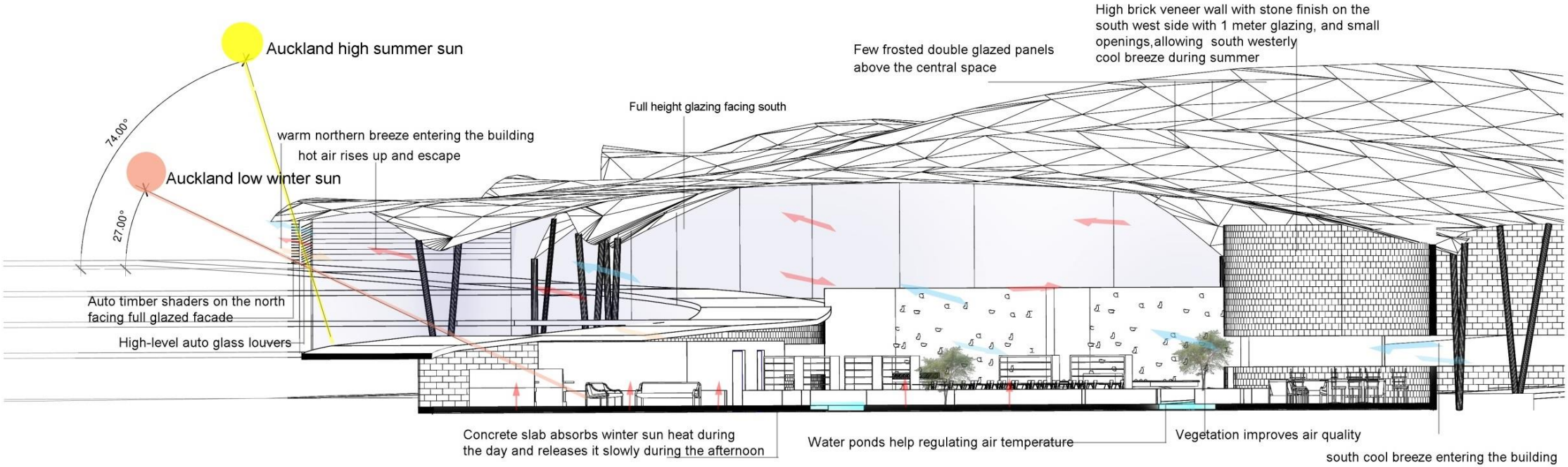


Figure 7.46 social zone section showing thermal comfort

7.11.2 Water- Aquatic zone exploration and development

This zone takes up the northern part of the building and faces the Tamaki River. It mainly houses the aquatic activities, changing rooms, and the kids' area. The zone, however, utilises the flowy and horizontal movements of water and reflects them onto floors, façade and roofing design. The roof, on the other hand, is cladded with ETFE membrane, in order to provide an outdoor like experience, as well as express the water theme, by mimicking its transparency and fluidity.

Planning and spatial organization:

The planning concept integrates 0.5m level changes within the pools' zones, in order to reflect the sense of movement, as well as divide the space into: adult active, family active, and tranquil. These pools' areas are connected by 2m wide ramp on its north side. The journey towards this zone begins when entering from the main private ramp (after exiting the changing area), landing into the adult active, passing by the family active, and ending by the tranquil area. It was concluded that having one entry that starts by the active zone will motivate most people to use the active pools before heading towards the tranquil ones.

Active area, however, involves: 25m long x18m wide lap pool, 2x learning pools for adults and kids.
Tranquil area, on the other hand, involves: 2x steam rooms, 3x sauna rooms, and 6x pools divided into:
-3x 'self-mindfulness' pools with hot temperatures (36,40, and 42 D.C.) placed in the middle and surrounded by 2m high partition walls, in order to provide the solitude and relaxing environment.
-3x 'indulgence pools', placed around the hot pools with views looking out to the Tamaki River, and they are: cold pool (14 D.C.), flower pool (33 D.C.), and herbal pool (33 D.C.).

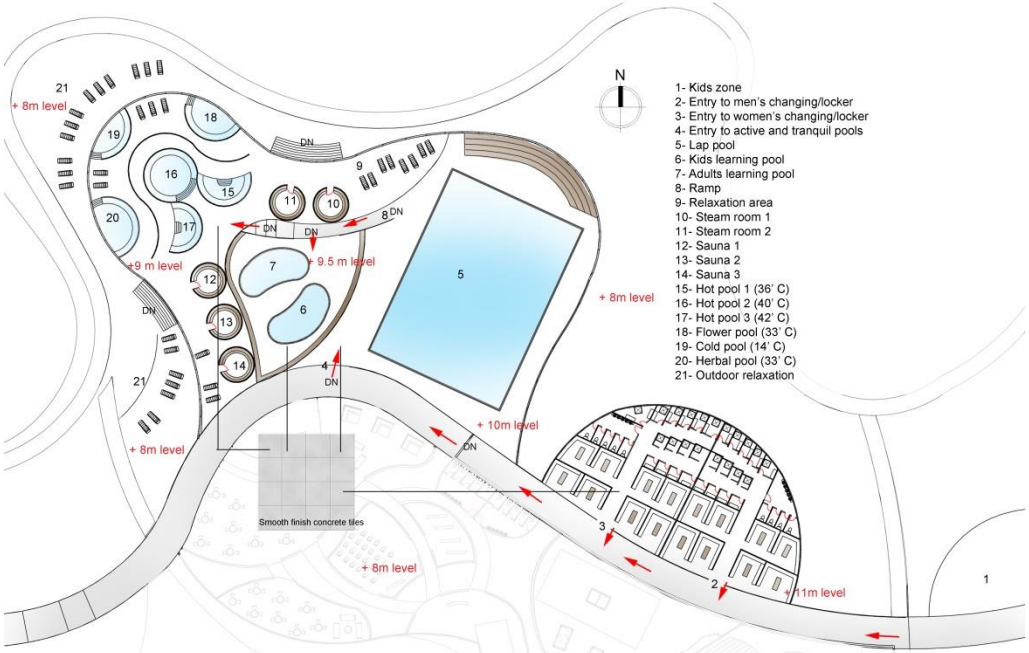


Figure 7.47 water zone schematic plan

The tranquil zone planning was a response to Zumthor's approach at the 'Therme Vals' in providing elements that help triggering the individual's multiple senses. For instance; using mass walls around the pools in order to turn the sight sense off and let the other senses experience the space. These walls, however, follow a strategy where human body experience compression and expansion when moving amongst pools (self-mindfulness effect), another way of healing the self and delivering comfort. Also, having herbal and flower baths help triggering the sense of smell and create a memorable experience.

Critique:

Horizontal movement within the water zone was approached by lifting the changing area and the pools' levels up using concrete columns. However, spaces underneath were suggested to house water tanks and services. This approach has mainly prioritised views over function, as the pools' north side contains high trees and an extensive amount of vegetation which tend to block the river views when building on the existing level. However, it was decided that this zone needs to be developed after realizing its contradiction with the Feng Shui and the Organic Architecture concepts which both suggest building of the hill and not on the hill; levels should be seen as integrated with the land rather than lifted above them. Hence, the levelling approach was adjusted at the later design stage.

Façade explorations:

The aim was incorporating some of water characteristics within the façade system, including the wave-like motion, and the transparency of water. The explorations have also looked at ways on how to encourage people moving within the zone in order to experience different views. Movement was approached through allowing views at some parts of the facade and block them fully and/or partially at others, using a pattern system that involves opaque, transparent, and translucent panels, placed in a rhythm that expresses the wave-like action.

Exploration-1-

Involves a fully glazed system, consists of panels with different transparencies. The opaque and transparent ones are positioned at the highest level where the high summer sun hits. Clear glazing, however, is allowed at the middle and the lower levels where they alternate with opaque and transparent panels. Opacity changes take the wave motion which let peoples' visions experience the same movement. Panels layout allows people to experience clear views (at the high level) and obscured views (at the lower level) when standing at one spot, and after moving few steps on the same level, clear-obscured views change to obscured-clear, giving that visual movement experience.

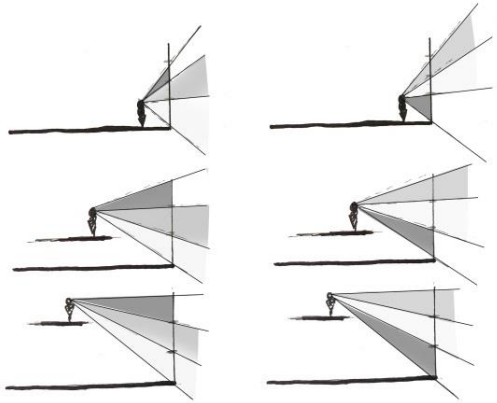
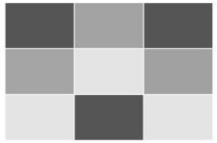


Figure 7.49 sections through façade system-1 Illustrating vision movement when walking along the facade



Opaque	Transparent	Opaque
Transparent	Translucent	Transparent
Translucent	Opaque	Translucent

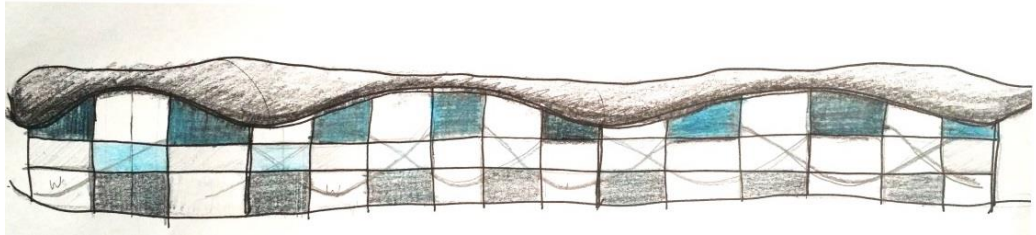


Figure 7.48 Water façade -1 transparency pallet and initial sketch

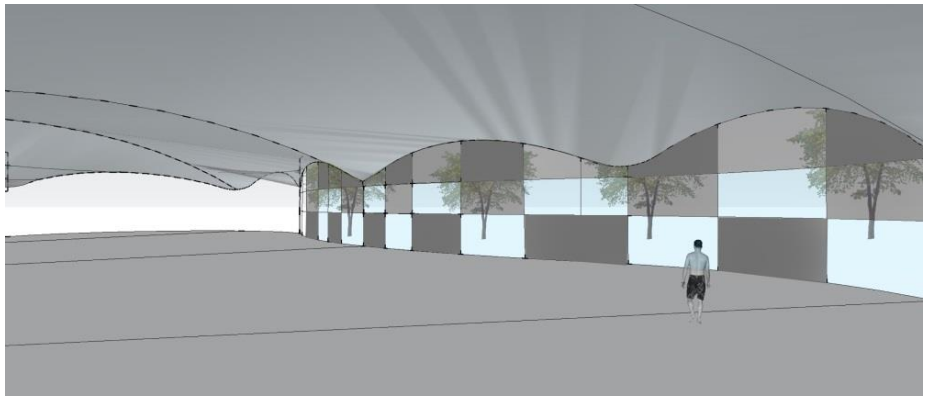


Figure 7.50 Water façade -1- test render

Exploration-2-

This exploration introduces the use of louvers as a second skin to veil 100% of the high translucent panels (where northern sun hits) and 20% of the lower translucent panels. This was a development to exploration-1- in order to control the high amount of sun coming from the northern facade (which the water zone mainly faces).

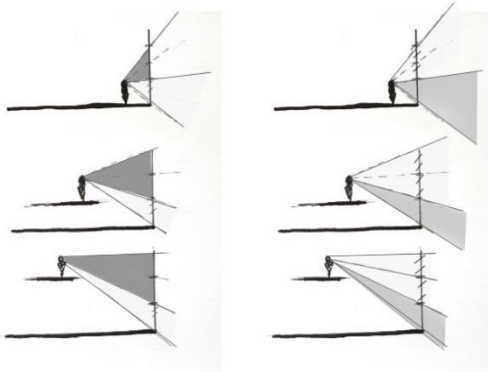
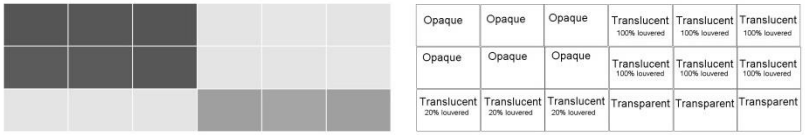


Figure 7.52 sections through façade system-2 Illustrating vision movement when walking along the facade



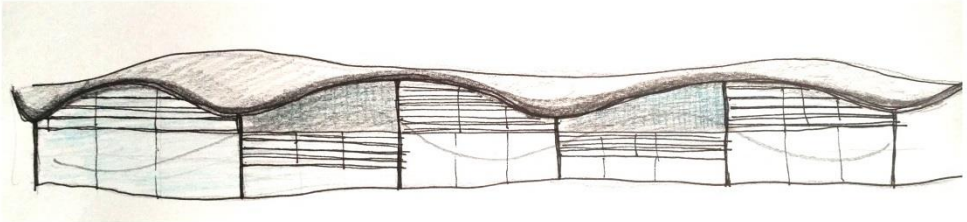


Figure 7.51 Water façade -2 transparency pallet and initial sketch

The façade panels are arranged in away where opaque and translucent panels alternate at the highest levels. Sunlight travels through the high clear glass which its light gets refracted by the louvers, creating shadow patterns that express movement. Translucent panels however are located at the lowest part, alternating with the transparent panels to allow views.

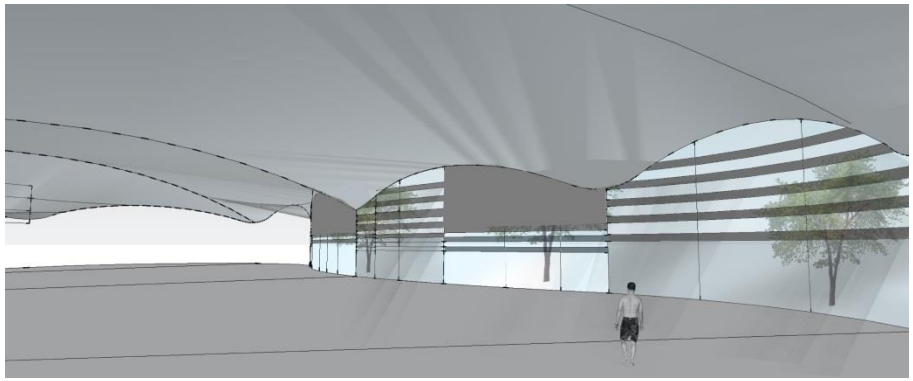


Figure 7.53 Water façade -2- test render

Exploration-3

Combines exploration1 and 2 to develop a façade system that utilises from opacity changing and the second skin concept, in order to gain control over the northern sun, as well as generate shadow patterns that express movement.

As a result, opaque and transparent panels are positioned at the highest level (where the high sun hits) while translucent and opaque take the lower level, opening to views in an alternative way. The panels' pattern in here still works with the wave-like effect.

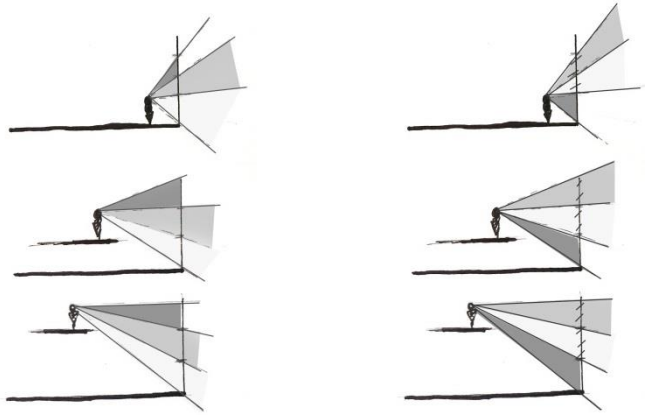
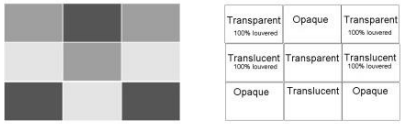


Figure 7.55 sections through façade system-3 Illustrating vision movement when walking along the facade



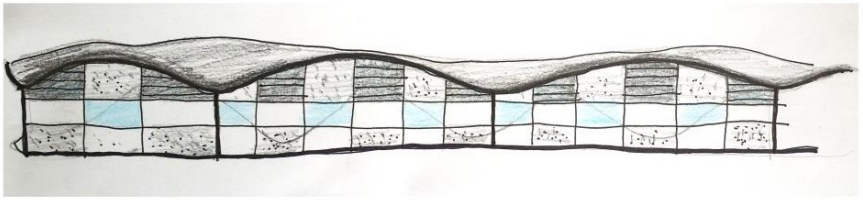


Figure 7.54 Water façade -3 transparency pallet and initial sketch

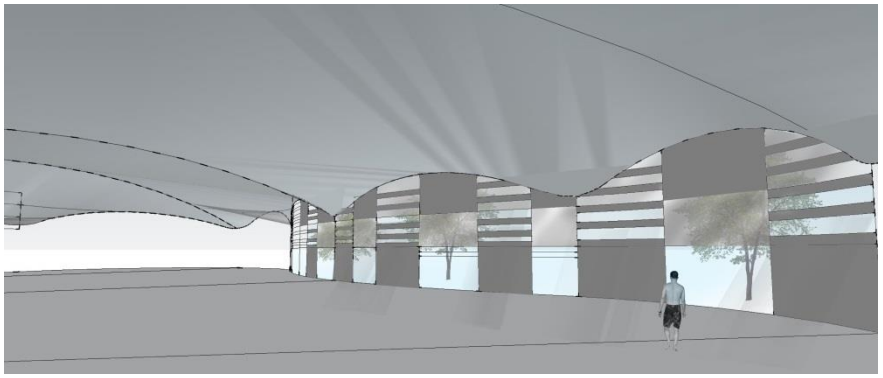


Figure 7.56 Water façade -3- test render

Critique and conclusion: Disregarding fully translucent facades and translucent panels on high levels was a response to Feng-Shui's Yin Yang concept which suggests a balance between the elements that provide yin and the elements that provide yang [112] (opaque panels and louvers provide yin, while translucent panels provide yang). The final development of the façade has looked at integrating a second skin to soften the northern sun (yang effect), as well as placing opaque and transparent panels at the high level (to soften yang and provide yin).

[112] Simona F. Manini, *Feng Shui for Architecture* (USA: Xlibris, 2004) P. ,83,84

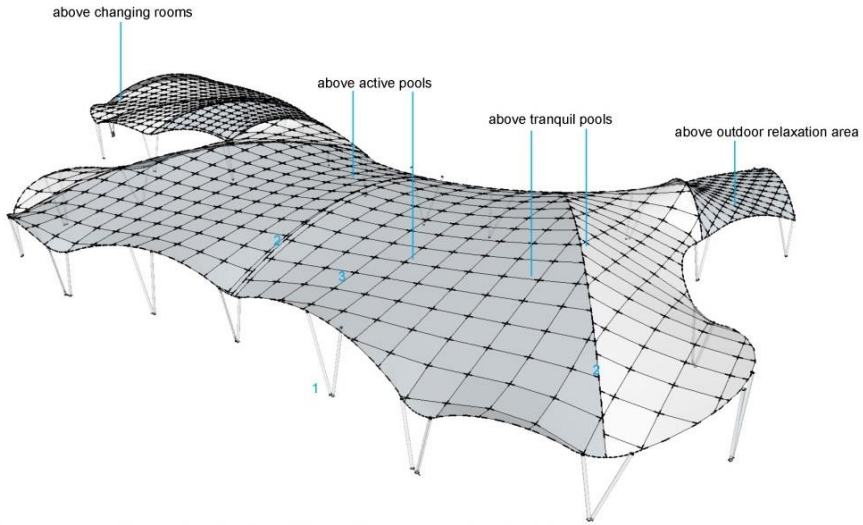
Roof development and ETFE material:

Roofing system of this zone uses timber grid shell with ETFE membrane, in order to engage with the water theme, as the material offers flexibility with a degree of transparency, providing connection with the blue and white sky colours.

The membrane utilises triple layers to avoid the overheating effect, and it contains frits (prints) to lower down the transparency level and control light transmission. Furthermore, a UV resisting layer becomes essential to block out UV rays. These implications were used in "Coastland Aquatic Centre", a local example on providing a safe and healthy interior environment when ETFE membrane is used.[113]

Figure 7.57 sketch looking from learning pool

Figure 7.58 sketch looking from active lap pool



1- 200 mm diameter V shaped steel columns fixed to the 400mm diameter tubular steel ring beam

2-Timber arches fixed to the 400mm tubular steel beam and on different heights to support the timber gridshell and skin above.

3- Glue laminated timber gridshell (2x interlocked layers) consist of 80x50 timber strips with triple-layer ETFE skin contains a modulated frit of dots to reflect the unwanted harsh sun, and a UV-resisting layer that prevents the cancerous rays from penetrating into the building.

Figure 7.59 Water zone roof system

[113] ARCHITECTURE NOW,2015, http://architecturenow.co.nz/articles/coastlands-aquatic-centre/, accessed September, 1st, 2015

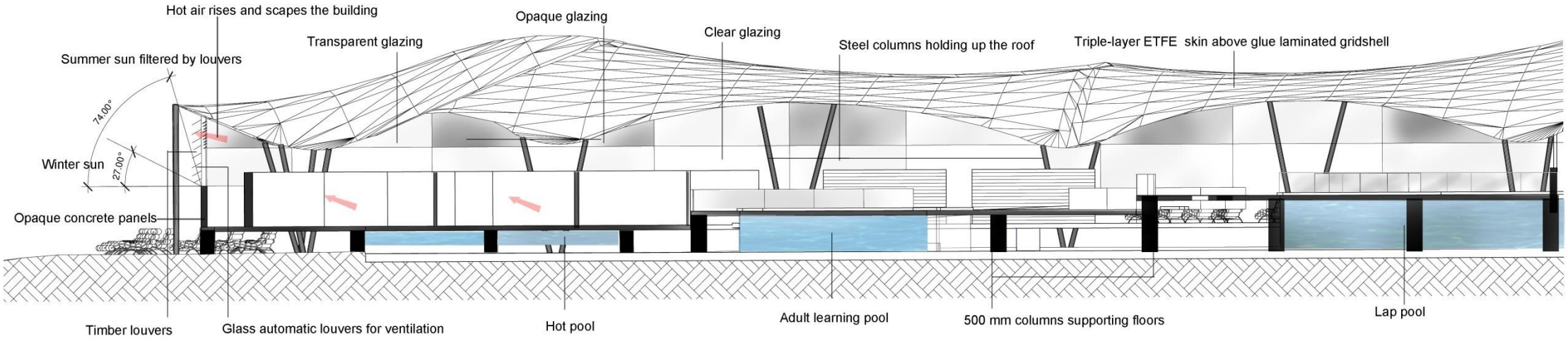


Figure 7.60 roof-levels relationship and thermal comfort within the pools

7.11.3 Wood zone exploration and development

Wood-inspired atmosphere is applied within 3 different activities including: business, clinic, and body-mind rejuvenation. It was concluded that these three activities will benefit the most from the de-stressing characteristics that wood provides such as: texture, colour, and smell. This zone's concept utilises elements that are found in wood environment, for instance, growing vertically in forests, carrying greens and surrounded by greens, exposed to refracted and diffused sun light. These elements were translated into a theme to be implemented within the activities mentioned above.

Explorations:

Exploration-1- Vertical louvers with activity-driven façade patterns

This exploration focuses on daylight control and connection with nature, using tall apertures to emphasise verticality within the interior. The approach was to integrate a secondary skin facade that consists of high vertical louvers with densities that increase and decrease, depending on how much light and views are needed by each activity. The approach results shadow patters that consist of tall strips, with full height views looking out on to the greens and the Tamaki River. The exterior facade, on the other hand, expresses patterns that are shaped by the interior activities.

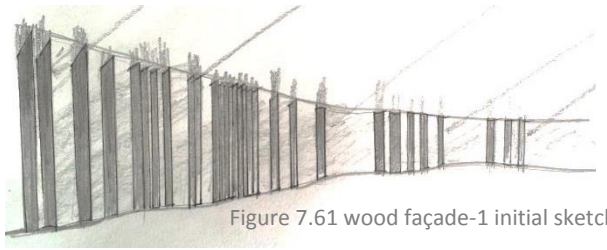
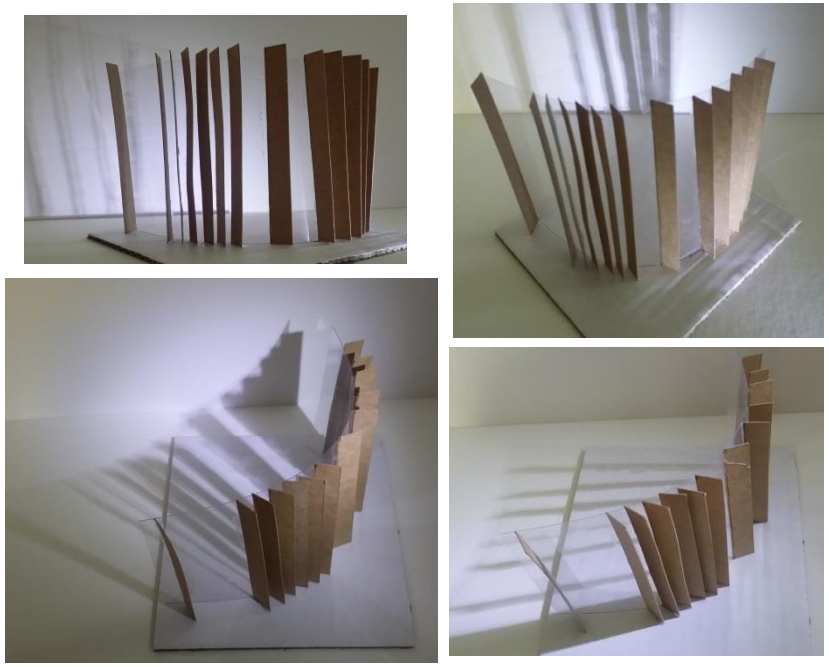


Figure 7.61 wood façade-1 initial sketch



Exploration-2- Folded skin with vertical voids

This exploration has looked at replacing the single louvers with a continuous folded timber skin that contains vertical and tall voids (apertures). This approach was aiming to achieve refraction in sunlight without conflicting with the verticality of apertures and the forest-inspired shadow patterns.

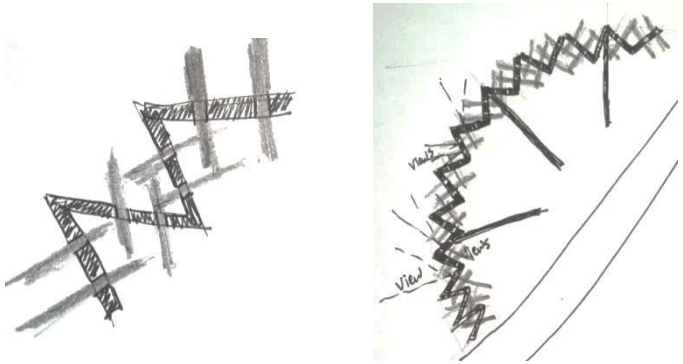


Figure 7.63 wood façade-2 initial concept sketches

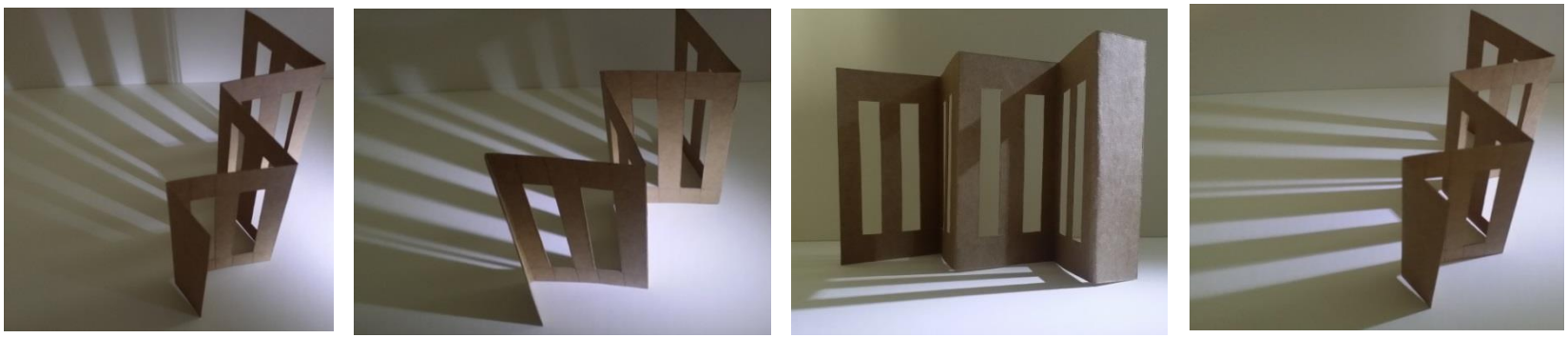


Figure 7.64 wood façade-2 exploration model

Exploration-3- Timber fins, vertical views, and light refraction

This exploration has looked at developing and learning from both explorations (1 and 2), by keeping the vertical tall apertures, and the refraction concepts. The folded skin of exploration-2 has been developed into timber fins that take the same folding motion but with a non-continuous way, which leaves timber fins (or partitions) with voids that can be walked through to look out on to nature. This approach provides vertical apertures in a way that views become framed by these fins. Furthermore, refracted shadow patterns will emphasise verticality, as well as lead people towards views. However, timber fins, placed on the outer perimeter, will be acting as part of the structure that provides great outdoor lookout areas where people are encouraged to engage with nature.

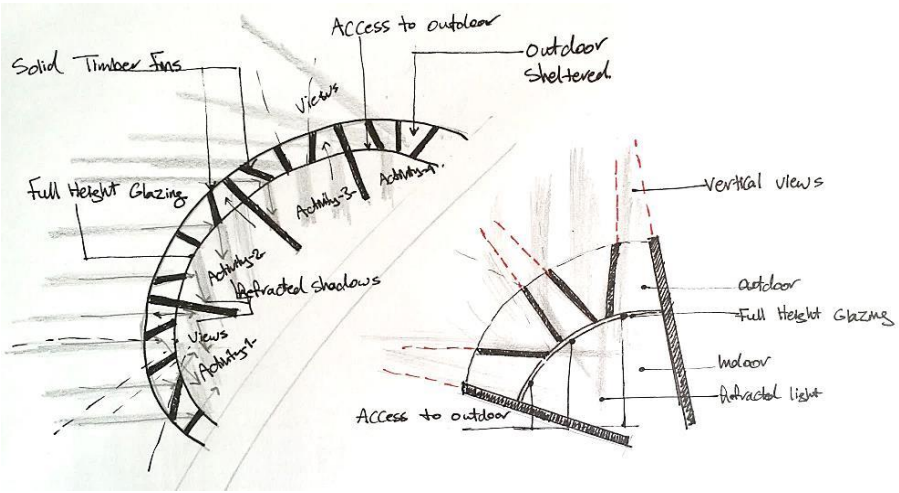


Figure 7.65 wood façade-3 initial concept sketches

Figure 7.66 wood façade-3 exploration model

Exploration-4- Light diffusion and vegetation

Light within wood zone was aimed to be refracted at some parts and diffused at others; this is to enhance the 'forest-like experience' of the interior spaces. However, after configuring the refraction methods in the previous explorations, it was decided that diffusion effect can be achieved through utilising from vegetation characteristics and their ability to scatter and filter sunlight. This approach suggests using thin metal or wire meshes, attached on to the inner side of curtain walls (on the higher parts), and housing the hanging vegetation. The vegetation in here will act as light diffusing elements, with the ability to enhance the physical connection with the greens as well.

Explorations 3 and 4 were then integrated into the planning of wood zones.

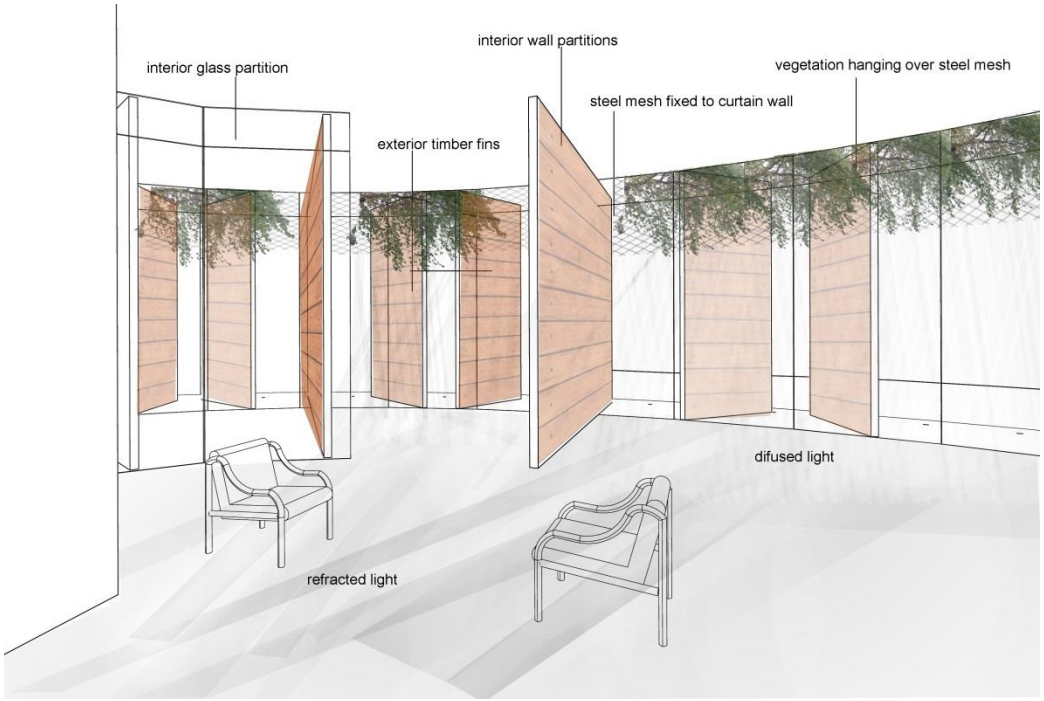


Figure 7.67 wood façade-4 test render

Wood zone-1- Yoga and Meditation

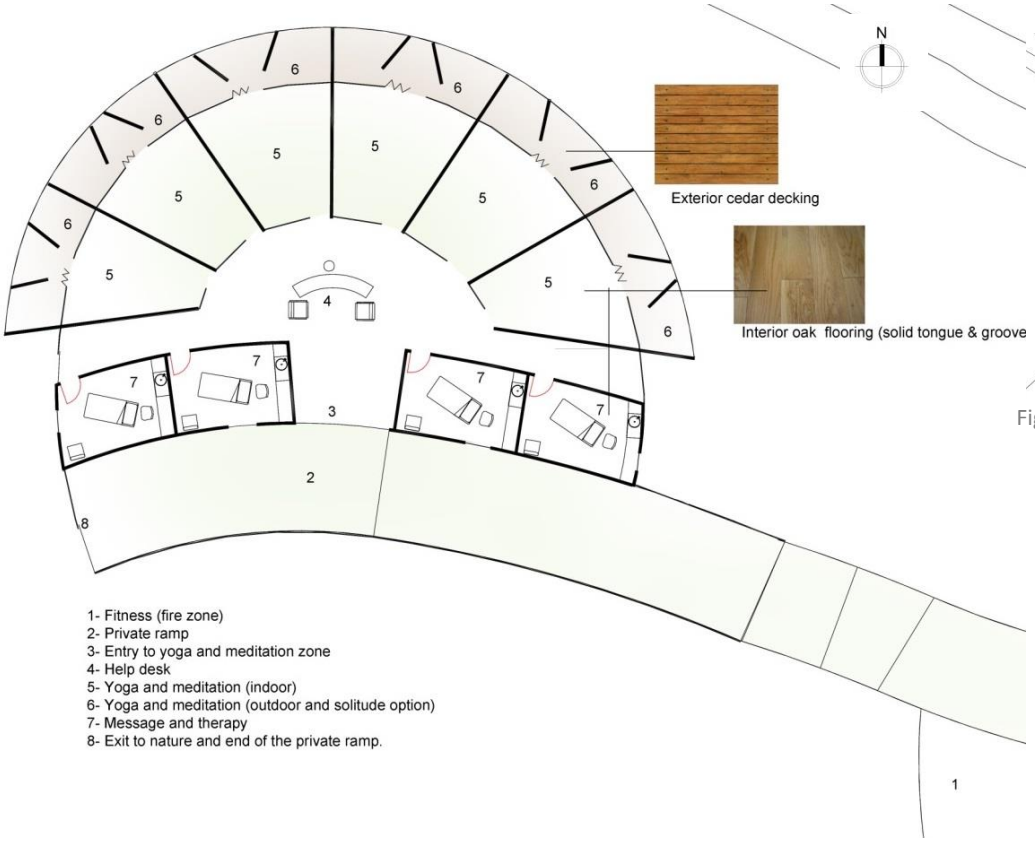


Figure 7.68 yoga and meditation plan

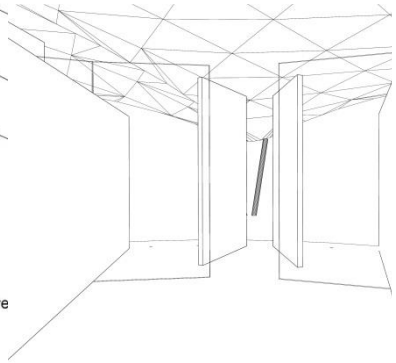


Figure 7.69 sketch - meditation room

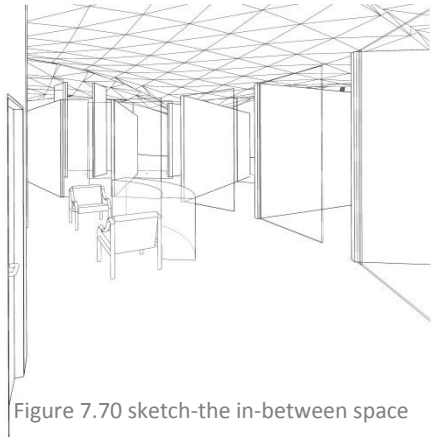


Figure 7.70 sketch-the in-between space

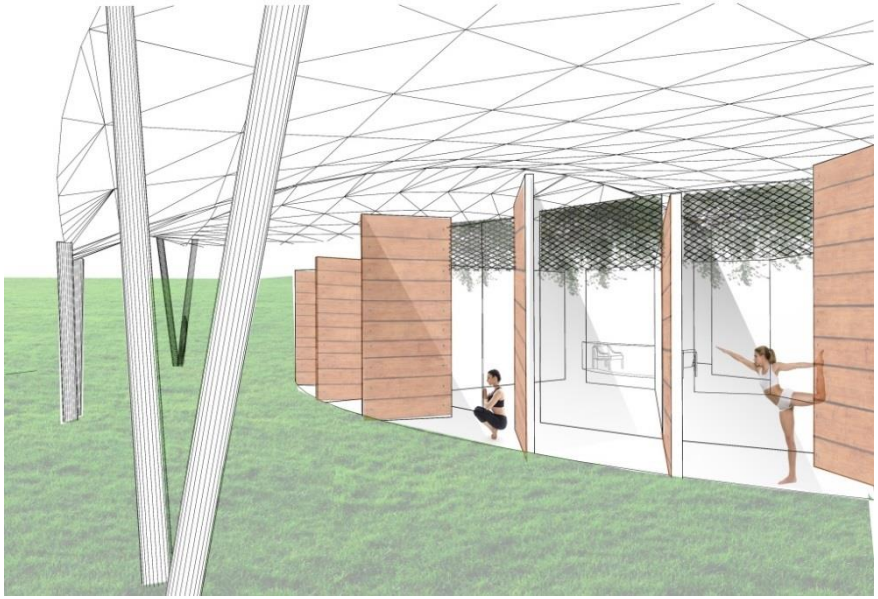


Figure 7.71 render-outdoor option

Wood zone-2- Business-related

Figure 7.72 business plan

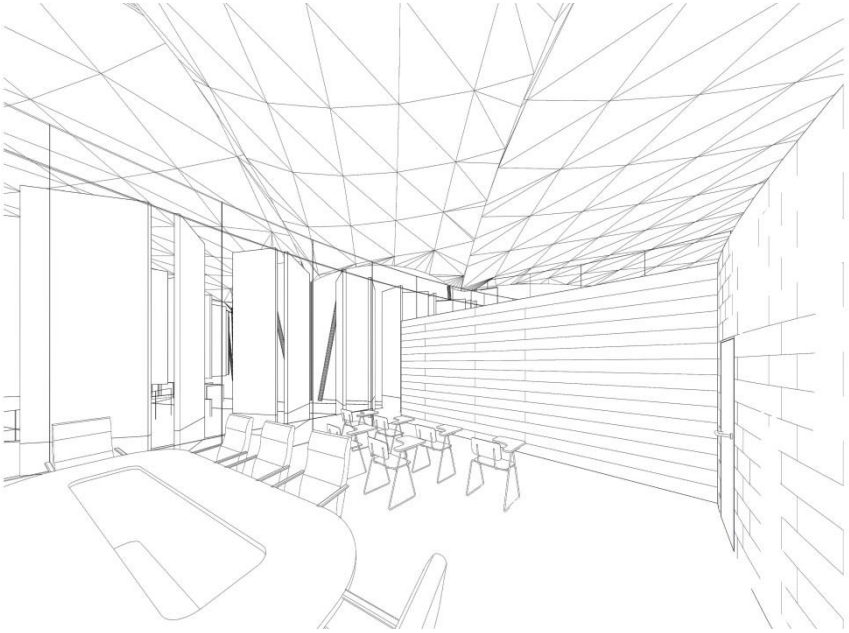


Figure 7.73 sketch- meeting room

Wood zone-3- Clinic

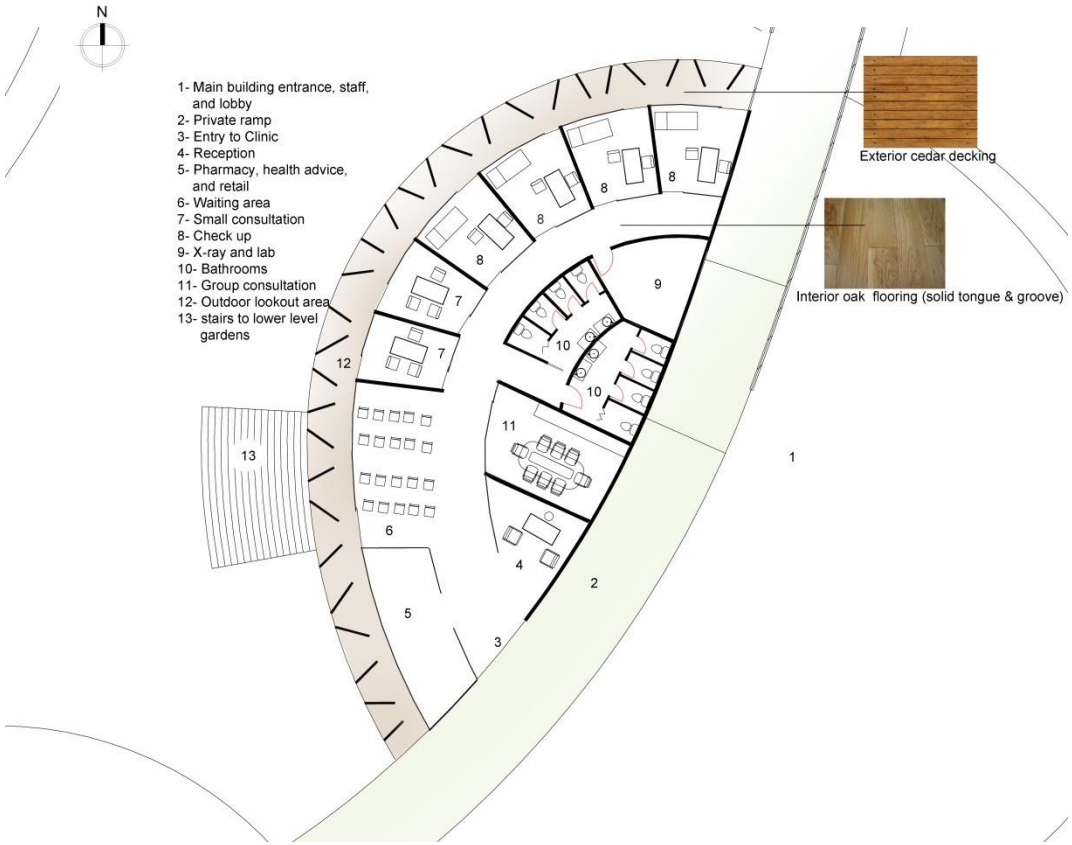


Figure 7.74 Clinic plan

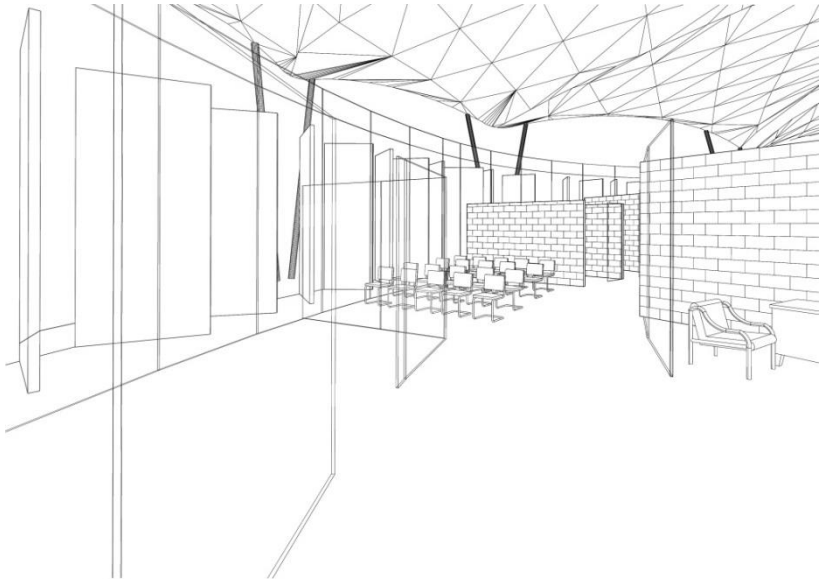


Figure 7.75 sketch- from entrance looking towards waiting area

7.11.4 Fire zone (fitness) exploration and development

This zone is located on the west (between earth and wood zones), housing fitness and sport activities. Fire atmosphere was approached through the 'active' planning, materiality, colour, and the glazing system. The aim was to engage the building users' five senses with the fire atmosphere, but, mainly focusing on the sight sense, in order to encourage movement. It was explained earlier that eyes don't recognise shapes and objects; instead, they see colours, shadows, and movements.[114] Furthermore, colours were identified as significant elements that could influence the way we feel.[115] Thus, colour choice becomes crucial within this energy stimulating zone, keeping in mind that the overuse of bright colours can impact peoples' reaction to the soft colours and make them underestimate the value of relaxing atmospheres[116].

Planning concept and development

The plan concept was to provide a sense of movement (physically and visually). Physical movement was approached through dividing the floor plan into multiple levels that ascend and descend by 500, 1000, 1500mm above the ground level. These levels are connected by an 'active path' which has stairs in between to allow for an active movement. Also, each level houses different activity so people are encouraged to use the active path. Bathrooms, on the other hand, were located closer to the end of the 'active path' for the same reason.

Furthermore, running track was also suggested to engage with the 'active planning' concept, located along the outer edge of the plan to utilise a larger perimeter, and being visually connected with the outdoor football field. The track was also linked with the on-site running track through allowing an exit from the main ramp that opens towards the existing path side on the north side.

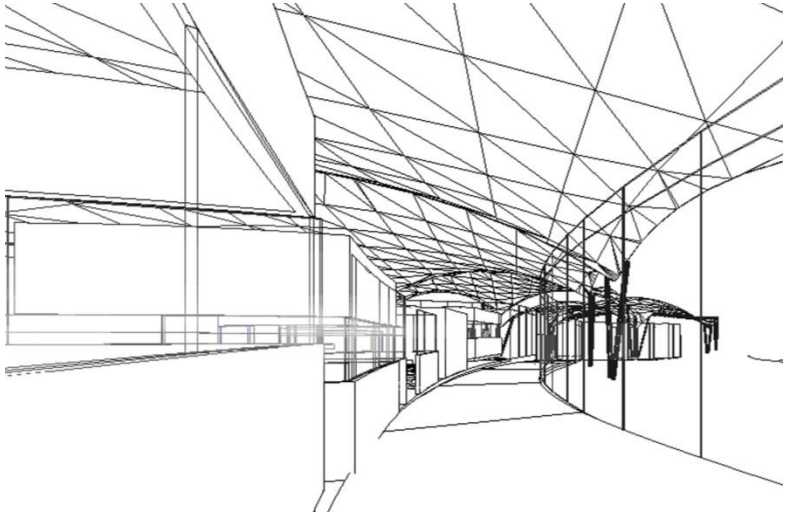


Figure 7.76 sketch- from private ramp to fitness on the left

[114] Christopher Day, *Spirit and Place: Healing our Environment* (Oxford: Architectural Press, 2002), 214
[115] Ibid.
[116] Ibid.

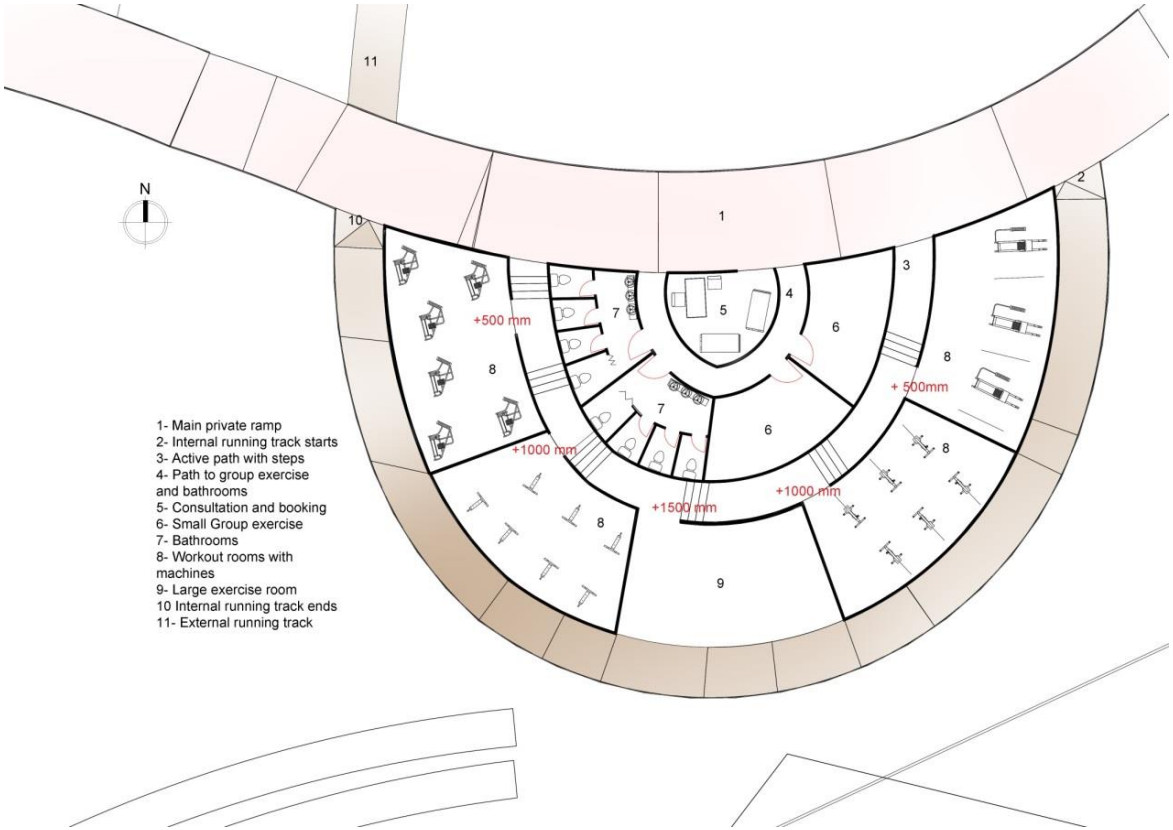


Figure 7.77 fitness zone plan

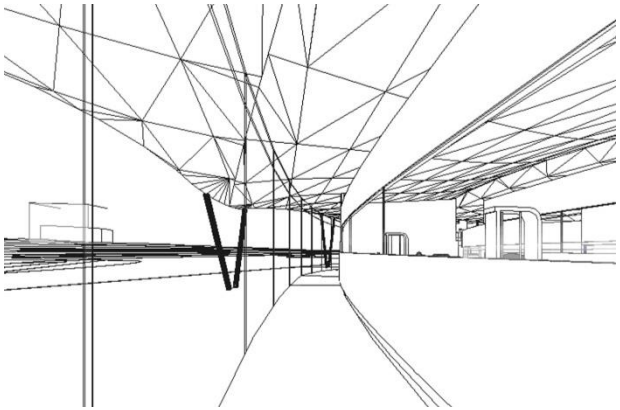


Figure 7.78 sketch- running track looking out to the soccer field on the left and visually connected with fitness activities on the right

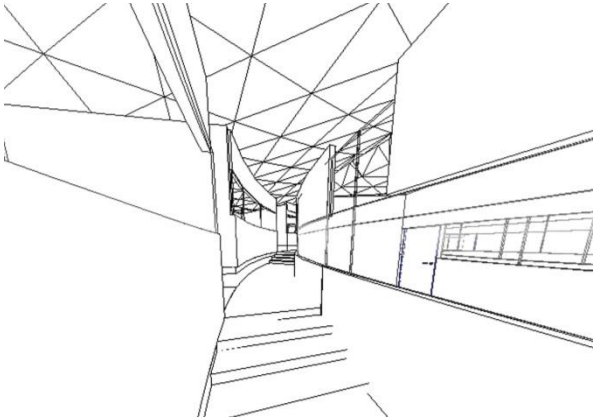


Figure 7.79 sketch- active path-

8.0 Conclusion:

Wellness means a healthy balance of mind, body and spirit, responsible for the mankind's holistic well-being.[117]Architecture, nature, and the built environment have a great potential to enhance the level of wellness in people. 'Infusing wellness' applies investigations on how architecture, built environment, and nature can be approached in order to provide therapy. These findings were then implemented into a Rejuvenation Centre design, located in Highbrook Business Park, within East Tamaki area, and used by business workers and the surrounding community who are engaged with a busy life style.

The first stage was to gain some knowledge on how therapy can be achieved in architecture; Christopher Day and Carol Venolia state that healing architectural elements can be manipulated and controlled in order to generate physical and mental healing. Day mentions that the multiple senses of humans (sight, smell, hear, touch, warmth) have a major influence on the way these architectural elements are perceived.

Organic Architecture, on the other hand, suggests that building forms must blend with their sites and follow the dynamic forces of the surrounding nature (wind, temperature, earth movement...etc), in order to allow a beneficial amount of energy (wind, sun) in to the built environment.

These life forces mentioned in Organic Architecture seemed to be influenced by Feng-Shui's theory, and therefore the research was extended to learn and understand these forces, in order to work with them and not against them, since they are considered essential for therapy.

However, precedents have been looked at have shown different approaches to the concept of wellness, as they either prioritise the elements of nature, or the sensory experience of the built environment.

The aim of this project was to investigate whether architecture and the built environment have the ability to enhance peoples' wellness, and whether the elements of nature can still add to the therapeutic value of a space. The concept of form influenced by site energies (Qis) (found in Organic Architecture and Feng-Shui) was implemented within the form generation process, allowing for better ventilation and orientation. However, during the design process stage, the role of architecture became crucial in defining and controlling the sensory experience of the building.

The emphasis on utilising distinct atmospheres for different activities has been largely successful, by integrating the five elements of nature (earth, water, wood, fire, and metal) into each zone. Each theme consists of certain characteristics with the ability to engage the five senses in different ways. However, the early design explorations have shown that each zone expresses a theme that is driven by one of these elements (earth, water, wood, fire, and metal). The developed design, on the other hand, suggests that each atmosphere should dominate one element, but should still include the others in a way that make their influence sensed by building users, in order to reflect this holistic experience inside each zone. For instance, the person entering the earth zone can still experience some of the metal, fire and water elements. In fact, this will target the human's physical, emotional, and spiritual state, and thereby offer a harmonious energy that is generated by the five elements, found in nature and used by design.

[117] Ben Zimmer, "Wellness," *The New York Times Magazine*, April 18, 2010, p.20

The final developed design has been adjusted and modified, in order to provide harmony within the built environment that can be felt in each zone. This harmony, however, is borrowed from nature and maintained by the five elements (earth, water, wood, fire, and metal). Harmony of the interior is expressed through the use of colours, materials, textures, and light, with respect to the yin/yang concept. Such as, the social zone expresses earthy and cool materials (stone walls, and concrete flooring), as well as woody and warm ones (timber flooring and ceiling panels), with a generous amount of daylight, allowed above the active space, through transparent skylights where building users are connected with the cool sky colours and the warm sun lights.

As a result, architecture that is designed to facilitate and enhance wellness in people is much more than a built environment with healing products and fitness machines. It becomes a source of therapy itself; it must speak to users with multiple languages, responding to their bodily emotions that need the yin/yang effect (tranquil, active) in a constant manner, in order to feel cured.

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-Figure 4.1 Yin-Yang (The law of contrast).
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-Figure 5.2 Temperature gradient
Produced by author

-Figure 5.3 body-form relationships
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-Figure 5.4 Therme Vals light control
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-Figure 5.5 Nasal experience (reproduced by author) after obtaining plans from **-Archdaily** "The Therme Vals / Peter Zumthor". Last modified 2009, http://www.archdaily.com/13358/the-therme-vals, (accessed May 5th, 2015)

-Figure 5.6 Sound experience (reproduced by author) after obtaining plans from **Archdaily** "The Therme Vals / Peter Zumthor".
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ARCHITECTURE NOW,2015, http://architecturenow.co.nz/articles/coastlands-aquatic-centre/, (accessed September 1, 2015)

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google map and modified by author

-Figure 6.4 The Queen Mother and Sir Woolf Fisher, 1966
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-Figure 6.6Highbrook Business Park before development
(http://www.highbrook.co.nz/vision/history)

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http://nz.goodman.com/property/property-portfolio/highbrook

-Figure6.8 Spatial Density of people working within East Tamaki Business Precinct, 2006
-Figure 6.9 Employed Employment Occupation Group for the Wider East Tamaki Area, Auckland and New Zealand (2000-2010)
Auckland Council website (2015),
http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/councilpolicies/easttamakibusinessprecinctplan/Documents/drafteasttamakibusinessprecinctplanjuneconsultation.pdf,
(accessed April 15, 2015).

-Figure 6.10 Highbrook amenities
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-Figure 6.12 Highbrook noise and pedestrians' density
Produced by author after information have been obtained from google map

-Figure 6.13 Highbrook Land and topography in 3d
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Produced by author after information have been obtained from Auckland GIS
Auckland Council, "GIS Map Viewer,"
http://maps.aucklandcouncil.govt.nz/aucklandcouncilviewer/ (accessed September 2nd, 2015)

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-Figure 11.6: Building envelope study
Goodman Property Trust, "Case Studies/Schneider Electric," accessed April 20, 2015, http://nz.goodman.com/property/property-developments/development-case-studies/schneider-electric-case-study

-Figure11.7:The open planned office space
-Figure 11.8:Gym facility
-Figure 11.9:The Light Horse Bar- exterior
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-Figure 11.12: The Light Horse Bar- interior
Produced by author

-Figure 11.13: OfficeMax Interior Circulation
Goodman Property Trust, "Case Studies/Office Max," accessed April 20, 2015,http://nz.goodman.com/property/property-developments/development-case-studies/officemax-case-study

-Figure: 11.14 OfficeMax envelope system
Goodman Property Trust, "Case Studies/Office Max," accessed April 20, 2015,http://nz.goodman.com/property/property-developments/development-case-studies/officemax-case-study Image was annotated and reproduced by author.

-Figure: 11.15 Staff breakout area (around the atrium)
-Figure 11.16: Informal visitors' area and reception. Offices are overlooking the atrium space.
-Figure 11.17: The café space features laminate bench seats and tables
Produced by author

-Figure 11.18 The Crossing Hub project
http://www.propbd.co.nz/category/neighbourhoods/south/highbrook/ (accessed April, 25, 2015)

-Figure 11.19 The crossing Hub after business hours
-Figure 11.20:The Light Horse Bar
-Figure11.22: Looking over the chosen site from the social crossing hub
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-Figure 11.28: One bedroom Typology
-Figure 11.29: Two bedrooms Typology
-Figure 11.30: Reception and lobby
Quest Serviced Apartments, accessed April 24, 2015, http://www.questapartments.co.nz/Accommodation/457/New_Zealand/Auckland_Suburbs/Quest_Highbrook/Welcome.aspx

-Figure 11.31 (A) View from southern motorway toward the entrance to Highbrook Business Park, Waiouru interchange and Manukau City
-Figure 11.32 (B) View into Pukekiwiriki Crater, foreground to Highbrook Business Park
-Figure 11.33(c) View of Highbrook Drive through the southern esplanade looking north along Highbrook development frontage
American Society Of Landscape Architects, accessed May 20, 2015, http://www.asla.org/awards/2003/highbrook_business park.htm

-Figure 11.34: Landscape and contours relationship
Produced by author

-Figure 12.1: Mater plan
Auckland GIS viewer and reproduced by author

-Figure 12.2: Main floor plan with level changes 1:250 @ A0 size paper
-Figure 12.3: Indoor-outdoor building circulation paths
-Figure 12.4: Schematic roof plan 1:500 scale @ A1 size paper
-Figure 12.5: Section A-A, 1:100 scale @ 1200mm long x 800mm high banner size
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-Figure 12.7: Exterior Perspective, looking down from Highbrook Drive towards the Tamaki River

-Figure 12.8: Interior perspective- Social zone, looking towards the basketball court from the public ramp
-Figure 12.9: Interior perspective- Social zone, looking towards the main entry, entertainment, and the café space
-Figure 12.10: Interior perspective- water zone, active pools.
-Figure 12.11: Interior perspective- Gym space
-Figure 12.12- Interior perspective, yoga and meditation
-Figure 12.13: Exterior perspective- walking towards the main entrance from the Tamaki River side
-Figure 12.14- Exterior perspective, Outdoor space, coming from the river side
Produced by author

11.0 Appendix-A-

Birth of Suburban Business Parks

Business or industrial parks in suburban zones originate back to the urban sprawl times, when businesses decided to make their moves to the suburbs with the attempts towards less cost lands and more flexible building strategies in comparison with urban zones.

BUSINESS PARK AND INDUSTRIAL DEVELOPMENT HANDBOOK (in its latest edition) defines the business park as “a multi-building development, planned to accommodate a range of uses, from light industrial to office space, in an integrated park-like setting with supporting uses for the people who work there. They can range from small parks on several acres to facilities of several hundred acres or more.” In general, business parks allow a mix of office types, warehouses, flex spaces, in order to please most occupants.[118]

ULI (Urban Land Institution) handbook emphasises the significance of amenities and services when locating business parks. It states that “The competitive advantage of a business park is enhanced by the availability of the near-by amenities and services, including restaurants, shops, hotels, day-care, fitness centres, and outdoor recreation facilities such as jogging tracks.”[119]

ULI handbook, however, shows its major attention to workers’ lives, raising the awareness towards making services available on site and easily accessed by workers. These facilities include; food suppliers and cafes, day-care facilities, walking and running tracks, recreational and health centres. The handbook also states that for the facilities to be feasible, attention to ratios of employees to building area need to be considered.[120]

Figure 11.1: Prime four business park, Scotland.
Carefully landscaped with the integration of open spaces (http://primefour.co.uk)

[118] Squamish Community Profile, accessed April 15, 2015, http://www.squamish.ca/assets/Development-Showcase/Sea-to-Sky-business-park/Commercial-Services-in-Industrial-and-Business-Parks.pdf
[119] Ibid.

[120] Ibid.

Business parks shift to suburban areas for several reasons, as seeking for larger spaces in a more competitive land value which becomes essential when comparing central business districts with suburban office parks. The relocation of those businesses depends on whether life quality of workers will still be achieved in those suburbs. [121]

Providing advantages over traditional business environment, suburban parks can succeed in targeting tenants and workers needs which include; larger office area for less cost, healthy working environment, life enhancing amenities. [122]

Thus, business parks environment in suburban areas needs to be highly considered, as working in a business park does not necessary mean an isolated environment; instead, they can be designed to deliver a quality experience by enhancing workers' health and wellbeing, which in turn influence their productivity at work.

Figure 11.2: Business workers' life enhancing amenities at prime four business park, Scotland
http://primefour.co.uk

[121] Michael J Ziatyk, "Office shift to suburbs continues," *Real Estate Weekly*, 1993, Vol.39(25), p.D8(1)
[122] Ibid.

On-site buildings' Case studies:

The idea behind studying some of the buildings was to understand the approach towards life quality of workers, and find out whether health – related activities are acknowledged within these buildings.

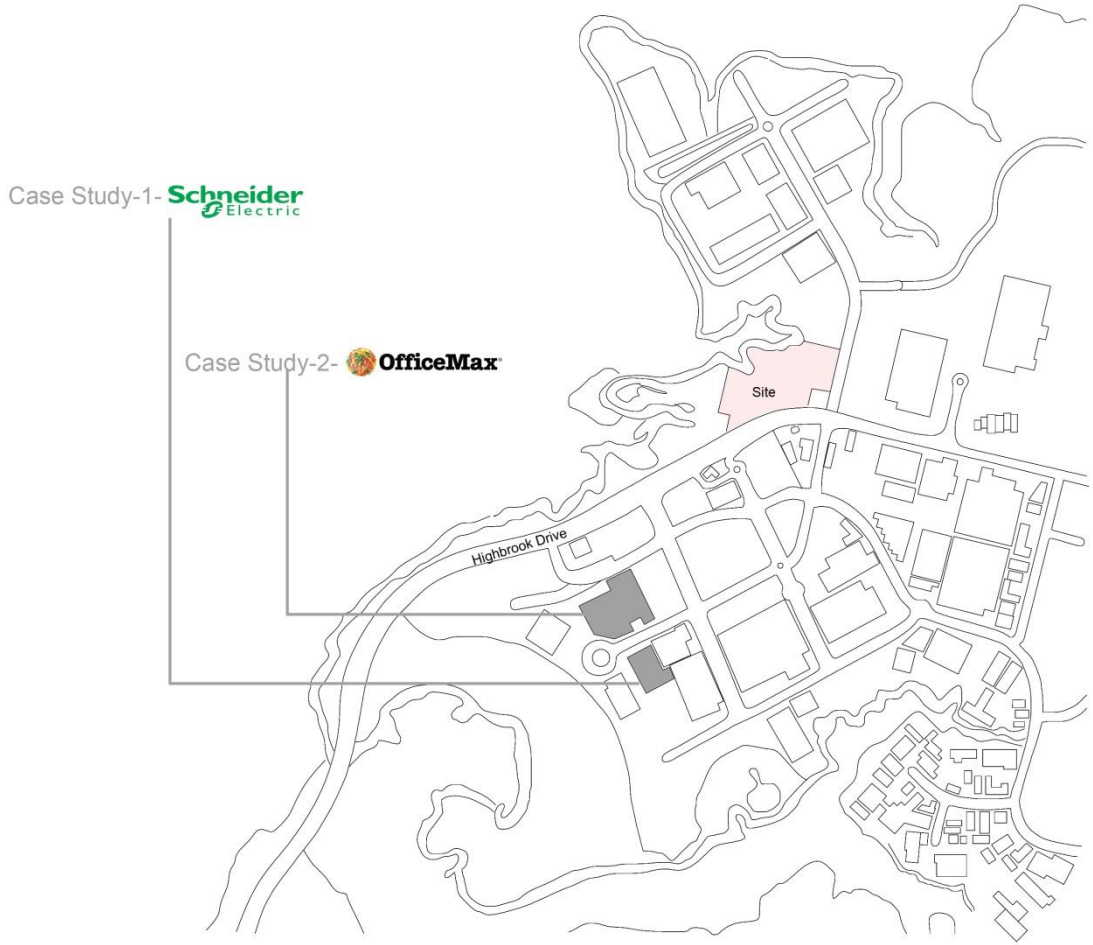


Figure 11.3: Buildings involved in case studies

Case Study -1- Schneider Electric

The Schneider Electric building is described as “highly successful development” for being energy-efficient and environmental-friendly that uses renewable materials and sustainable design elements. [123]

The office is featured as an open-planned space which enhances business workers interaction. The building also has an attached warehouse, loading yard and carpark area.

Figure 11.4: Future proof and high stud warehouse

Figure 11.5: Foyer wall has sound and echo absorption

Figure 11.6: Building envelope study

[123] Goodman Property Trust, “Case Studies/Schneider Electric,” accessed April 20, 2015, http://nz.goodman.com/property/property-developments/development-case-studies/schneider-electric-case-study.

Workers' life quality at Schneider Electric:

The business type requires team work and collaboration from different qualifications and expertise to provide energy-efficient solution plans for different clients.

The office space design reflects the intention of bringing workers together under one roof through an open plan strategy.

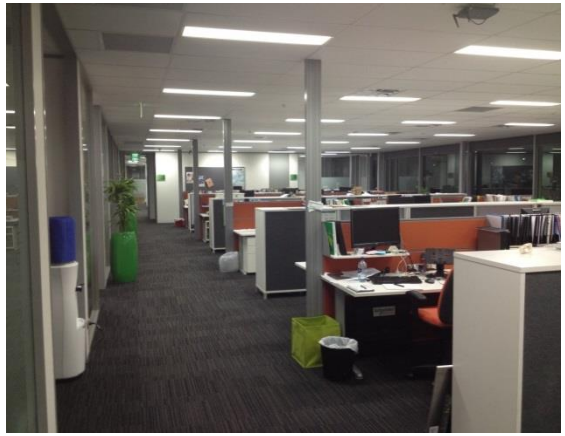


Figure11.7: The open planned office space

Amenities within the building:

Including Gym and shower facilities inside the building for staff use.

Figure 11.8: Gym facility

Engagement with the on-site amenities:

Workers tend to rely on the cafes and food stores available on-site when it comes to lunch time. After working hours, workers tend to use the "Light Horse Bar" or "Fisher House restaurant" when socialising, or when inviting local and overseas guests. Coffee machine however, is provided for workers which makes their morning visits to cafes less likely.

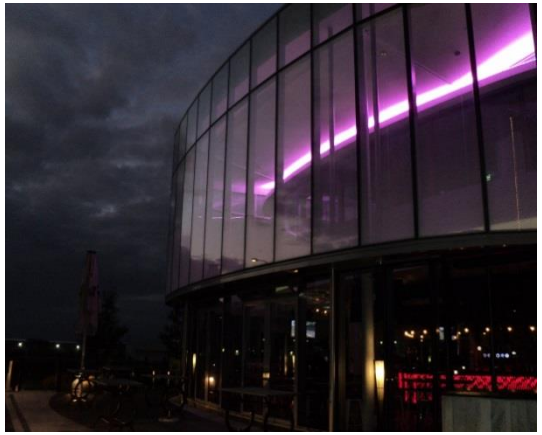


Figure 11.9: The Light Horse Bar- exterior

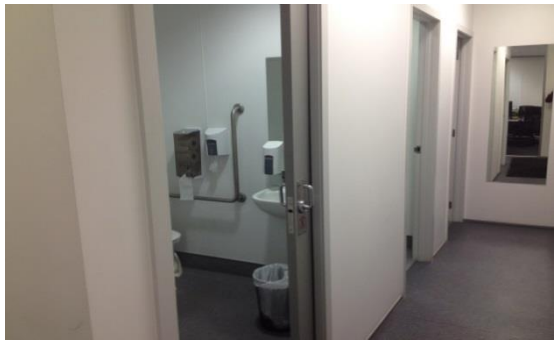


Figure 11.10: Shower facilities

Figure11.11: Gym equipment

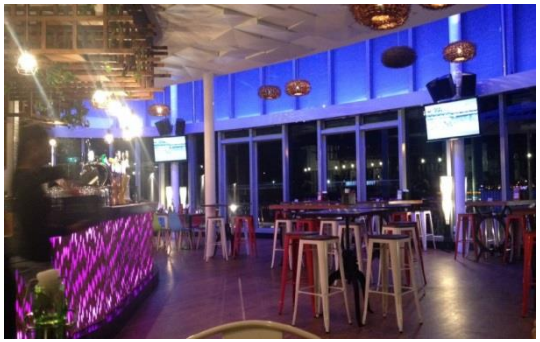


Figure 11.12: The Light Horse Bar- interior

Case Study -2- OfficeMax: [124]

Quality of working environment is enhanced by using sustainable materials and design elements. Materials were left unfinished to express their raw features. Building is orientated to face the north side with shallow and long floor plates to maximise its energy efficiency.

Full height and street-like central atrium was designed to form a social space where workers can enter, socialise and circulate around. Café is added within the building to provide workers with food and coffees.

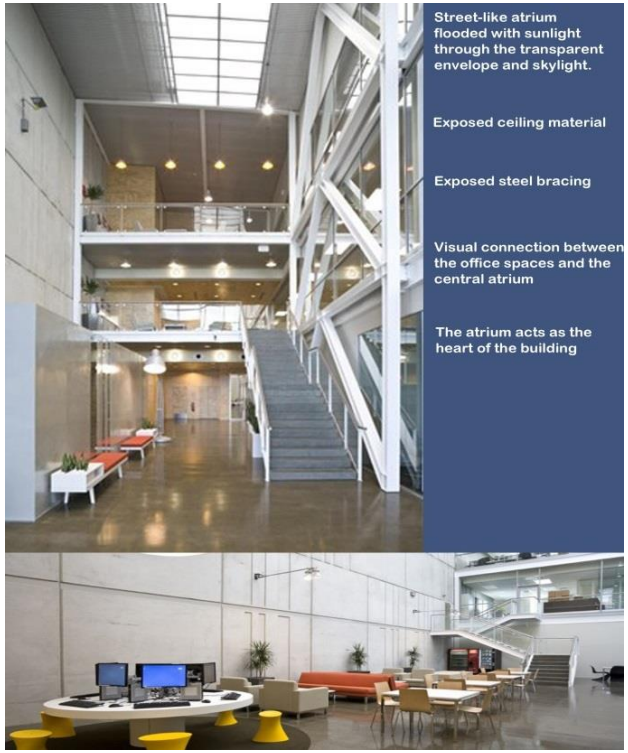


Figure 11.13: OfficeMax Interior Circulation

Number of employees in the building is 500 in 19,800 sqm of office and warehouse space

Figure: 11.14 OfficeMax envelope system

[124] Goodman Property Trust, "Case Studies/Office Max," accessed April 20, 2015, http://nz.goodman.com/property/property-developments/development-case-studies/officemax-case-study.

Workers' life quality at OfficeMax:

Building design aim was to unite employees from the distribution and the head office sides and maximize their social spaces. The result is a very open office with much more shared space, including a shared cafeteria and breakout zones with fewer separate offices.

Figure: 11.15 Staff breakout area (around the atrium)

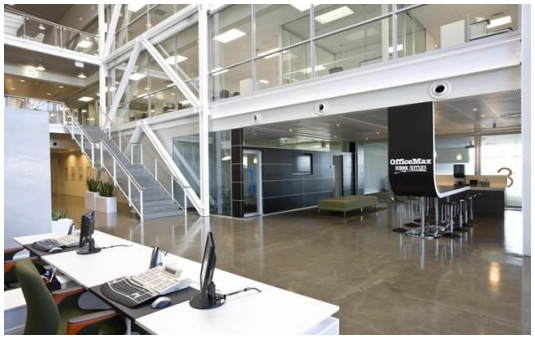


Figure 11.16: Informal visitors' area and reception. Offices are overlooking the atrium space.

Amenities within the building:

Transparent interior with open stair case, and breakout zones located around one open atrium to maximise the 500 employees' interaction. The building is provided with a special designed café that brings OfficeMax workers together during lunch time and coffee breaks

Engagement with the on-site amenities:

Staff are less likely to use the on-site cafes, unless after hours, or in the case of engaging with other activities such as, walking and exercising..etc.

Figure 11.17: The café space features laminate bench seats and tables

Other buildings on site

The Crossing Hub:

The crossing project consists of five buildings, placed around an open air plaza, acting as a focal point that brings business workers and public together during lunch time and coffee breaks on a daily basis.

The existing developments are mixed use; retail and cafes occupy the ground levels, while offices are kept above. The 24,700 sqm five buildings project is designed by CDA Architects (Quest Hotel), and Jasmax (the other four buildings).

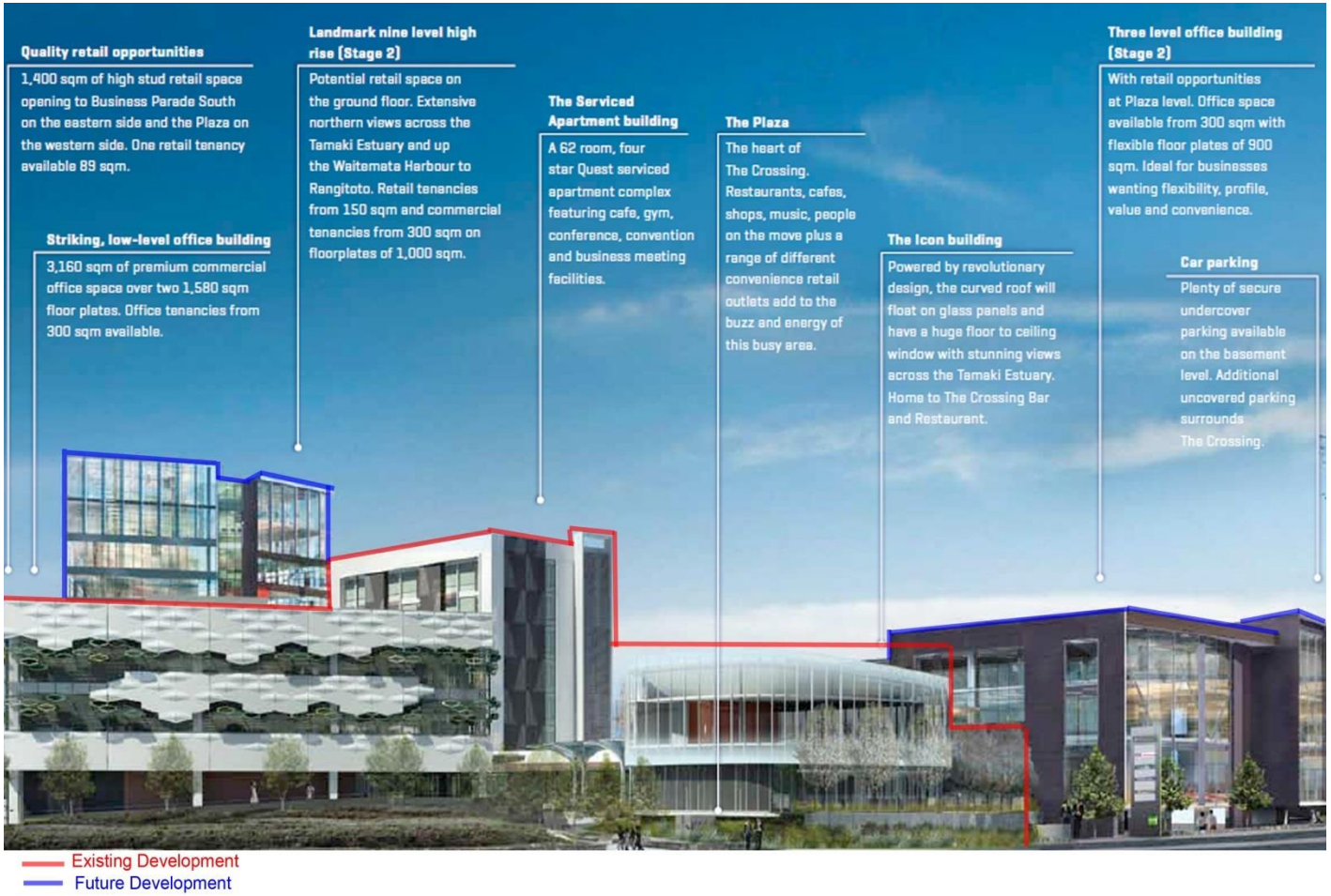


Figure 11.18 The Crossing Hub project

The Crossing Social hub after hours:

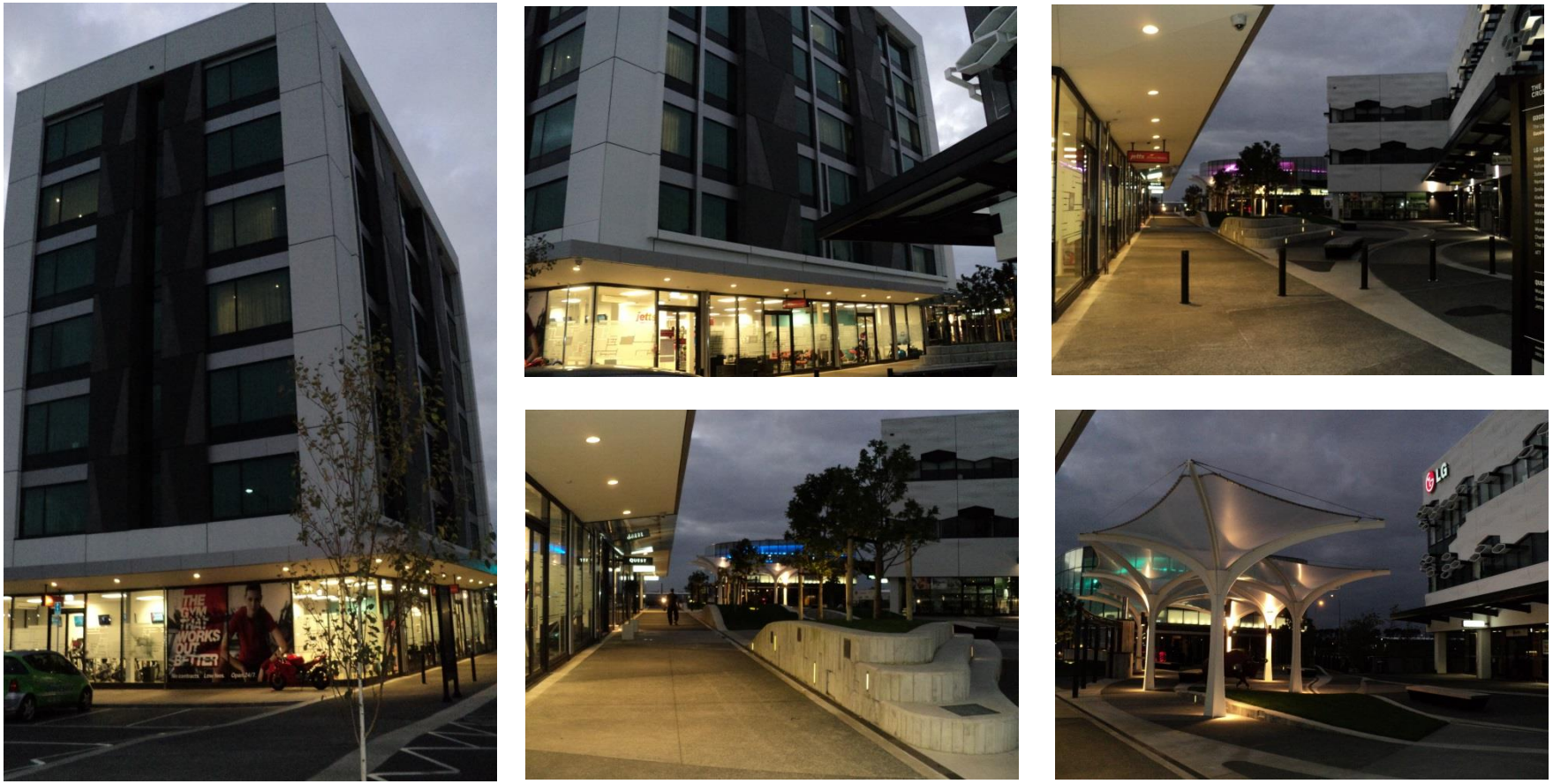


Figure 11.19 The crossing Hub after business hours

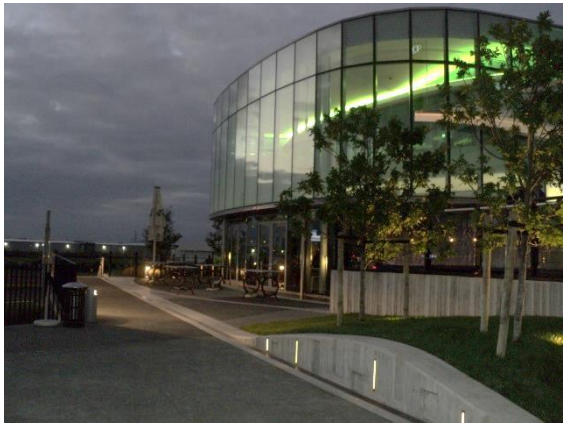


Figure 11.20: The Light Horse Bar

Figure11.22: looking over the chosen site from the social crossing hub. The hub is slightly elevated from the Highbrook Drive way, due to land contours. This maximises visual connection with the chosen site across the opposite side.

Figure 11.23: The Central plaza

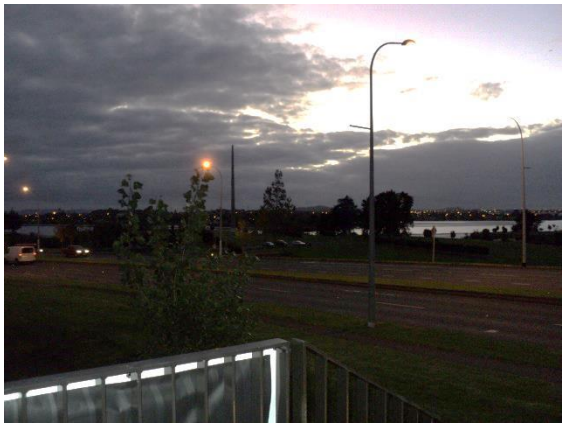
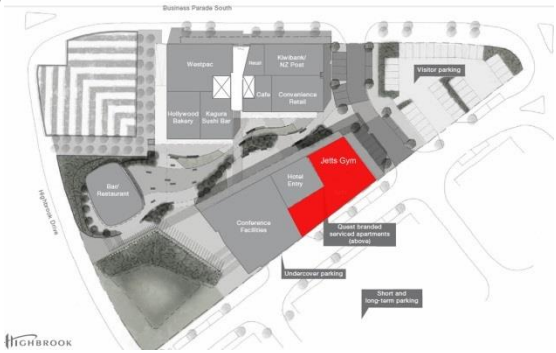


Figure 11.21: looking over the other side (Tamaki River)

Figure 11.24: Central plaza, walking past Jetts gym

Jetts Gym:

Located at the crossing hub and just below the Quest hotel building. The gym has 24 hour access with no socialising or other entertainment areas, it mainly depends on the cafes near-by, and on the outdoor plaza which feels busy and active during the day time, but this completely changes and becomes quiet after 5.00pm when businesses close.



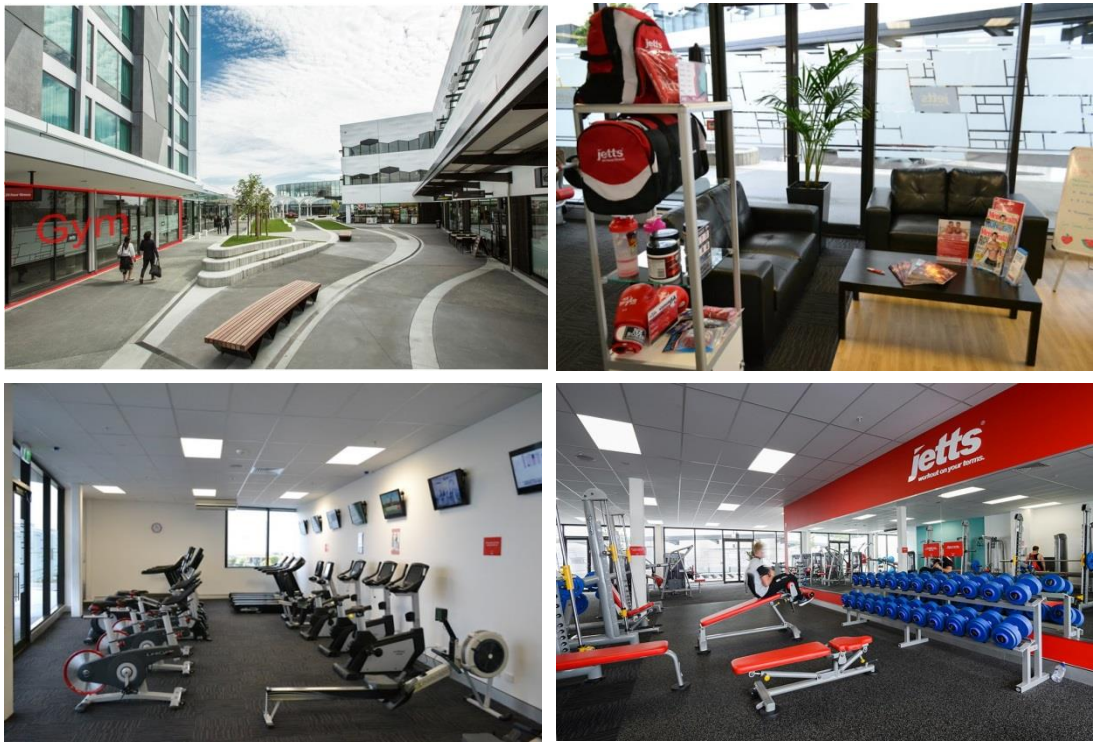


Figure 11.25: Jetts gym (interior and exterior images)

Quest Hotel (amenities within the rooms):

A 62 room, four star Quest serviced apartment complex, provides fully equipped kitchen, private laundry, internet access, TV and spacious living rooms for the one and two bedroom typologies.[125]

The hotel depends fully on the amenities near-by, such as the Jetts gym, Conference centre, cafes and restaurants. This keeps its options limited at night time or after business hours.

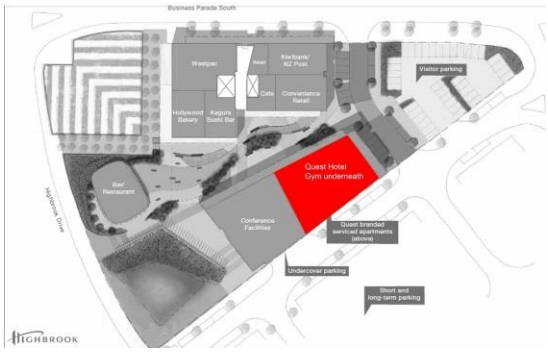


Figure 11.26 Quest hotel from the exterior

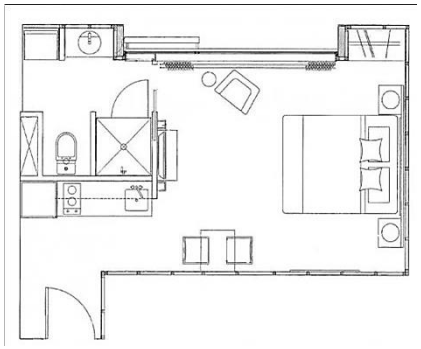


Figure 11.27: Studio Typology

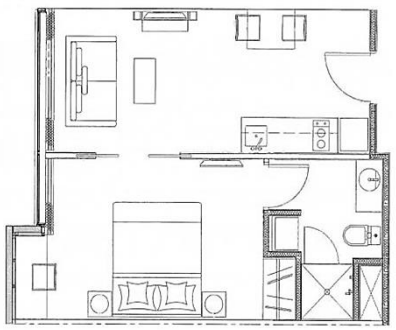


Figure 11.28: One bedroom Typology

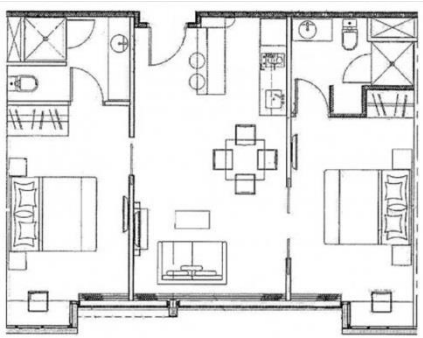


Figure 11.29: Two bedrooms Typology

Figure 11.30: Reception and lobby

[125] Quest Serviced Apartments, accessed April 24, 2015, http://www.questapartments.co.nz/Accommodation/457/New_Zealand/Auckland_Suburbs/Quest_Highbrook/Welcome.aspx.

Conclusion drawn from site analysis

Highbrook Business Park on-site amenities are more day time driven than night time, the crossing social hub's cafes and businesses shut by 5.00 pm on the weekdays, 2.00 pm on Saturdays and fully closed on Sundays. The only two places stay open are:
- The Jetts gym, 24 hour.
- The Light Horse Bar, 10 pm.

The reserve park however, closes as it gets dark for security reasons.
The majority of Businesses work from 8.30 am till 5.00 pm, leaving the area inactive and quiet after that time.

The site houses different businesses that are segregated from each other, segregation for some is emphasised by the provision of amenities within each building. For instance, OfficeMax cafe keeps its 500 employees away from the on-site cafes. However, the chances for employees from different businesses to meet are considered low during their lunch time, due to the short time frame. The potential is higher for those workers to socialise and practice other activities after work, but the lack of after-hours amenities keep the choices limited between either the gym, or the bar.

Health and wellbeing-related amenities (or recreational amenities) on-site are represented by the reserve park on its southern end and the gym facility at the social hub.

The reserve park walking/running track is mostly used by public during the day time and by workers after hours in summer time only. The park is closed by sunset which makes it not beneficial after hours in winter time.

The gym space however, is considered small for the large number of employees that are currently on-site. The newly built Quest hotel on the other hand, relies fully on the near-by amenities. (Gym, bar, cafes) which also makes its options limited to only gym and bar after 5.00 pm.

The envisaged population growth of Auckland tells us that, by 2031, 156,000 jobs will be provided to the growing population, and East Tamaki is expected to take a big portion of that number.

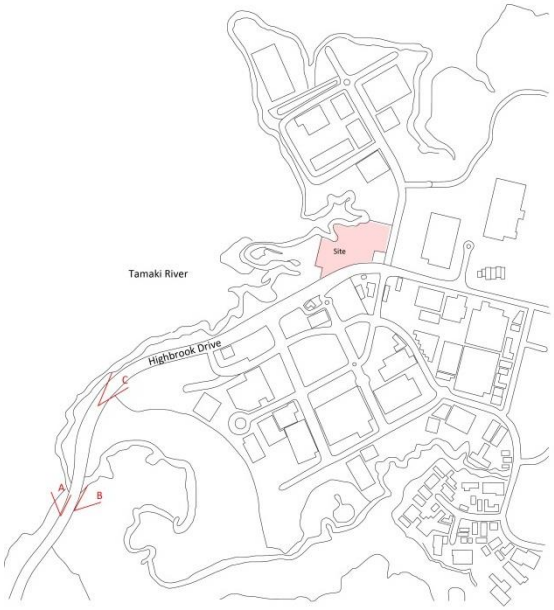
The relationship between landscape and site contours (the main distinctive feature of highbrook site).

Highbrook Business Park, designed by Peter walker, with the intention of protecting and utilising from the on-site natural, cultural, and aesthetic amenities.[126] Walker, in his plan, has used the existing hedgerows and wooden fences of the horse farm to subdivide the site, which seems to blend perfectly with the peninsula edges.[127] The main landscape concept was driven by the engagement with land contours and bringing back the farm character with the use of hedgerows, paddocks and fences.[128] This was to represent the typical New Zealand landscape and to give Highbrook its distinctive character. Buildings' lots on the other hand, were arranged according to grid lines been projected from the sight lines to Mount Wellington and the existing farm roads and paddocks. Trees, however, were placed parallel to buildings' view shafts in order to preserve the Tamaki River views.

Figure 11.31 (A) View from southern motorway toward the entrance to Highbrook Business Park, Waiouru interchange and Manukau City

Figure 11.32 (B) View into Pukekiwiriki Crater, foreground to Highbrook Business Park

Figure 11.33(c) View of Highbrook Drive through the southern esplanade looking north along Highbrook development frontage



[126] American Society Of Landscape Architects, accessed May 20, 2015, http://www.asla.org/awards/2003/highbrook_business park.htm
[127] Ibid.
[128] Ibid.

The expression of land contours is observed the most at the Tamaki River side. Walker design approach seems to be driven by the topography movement, allowing the nature of land to subdivide the site

Site contours on the River side seem to cluster in some parts creating land platforms which were utilised by Walker to establish a row of them facing the River, promoting visual connection with the River and site scenes for pedestrians.

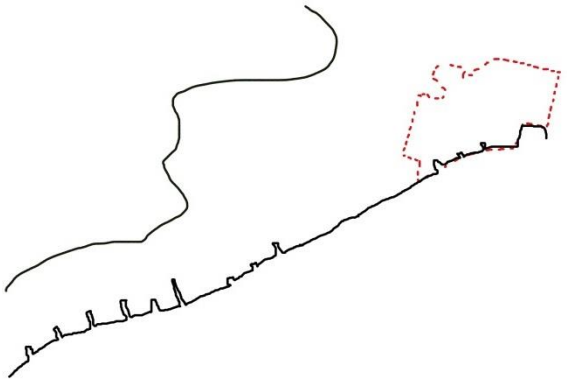


Figure 11.43: Land contours

Figure 11.34: Landscape and contours relationship

12.0 Appendix-B-

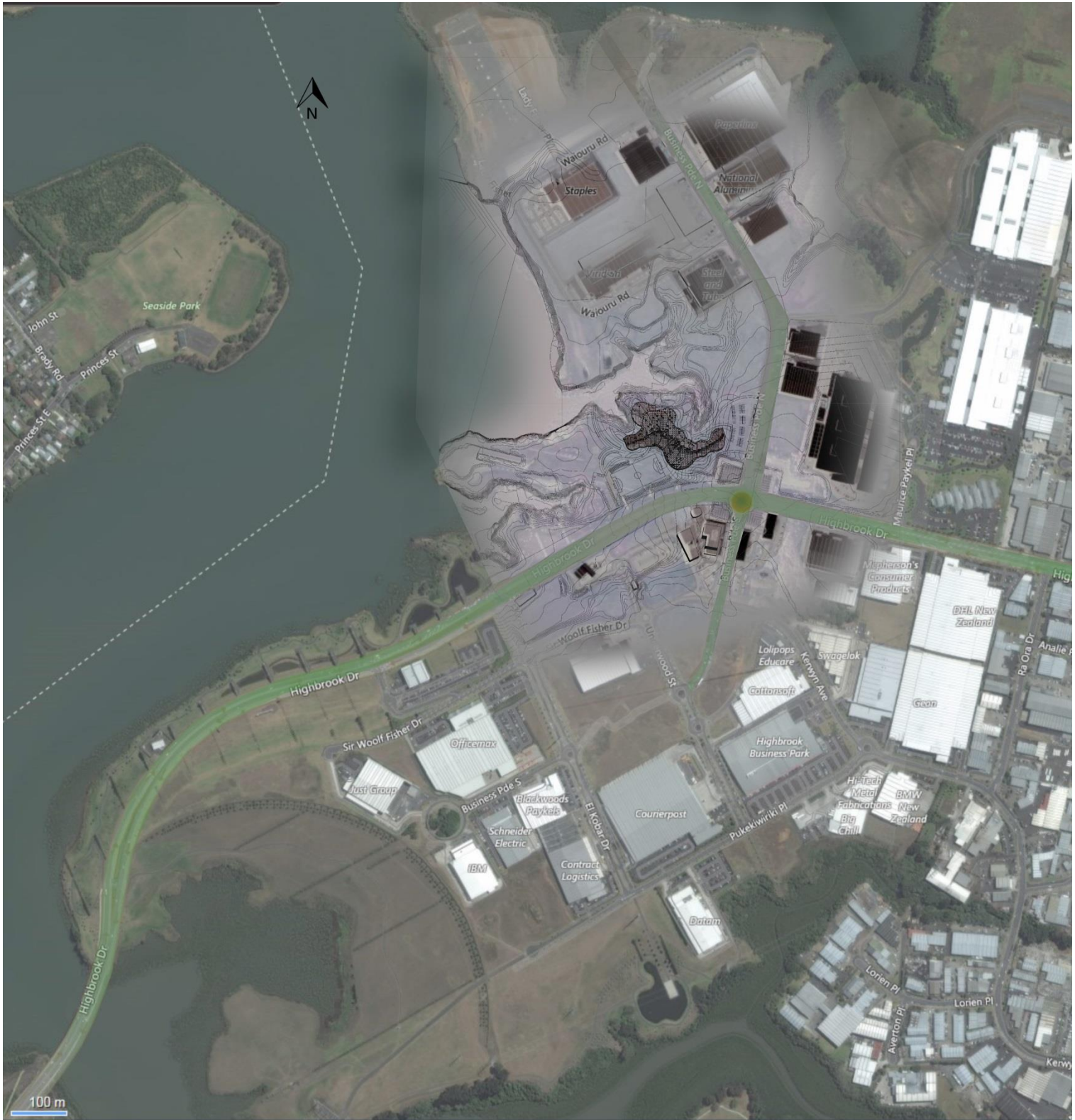


Figure 12.1: Mater plan

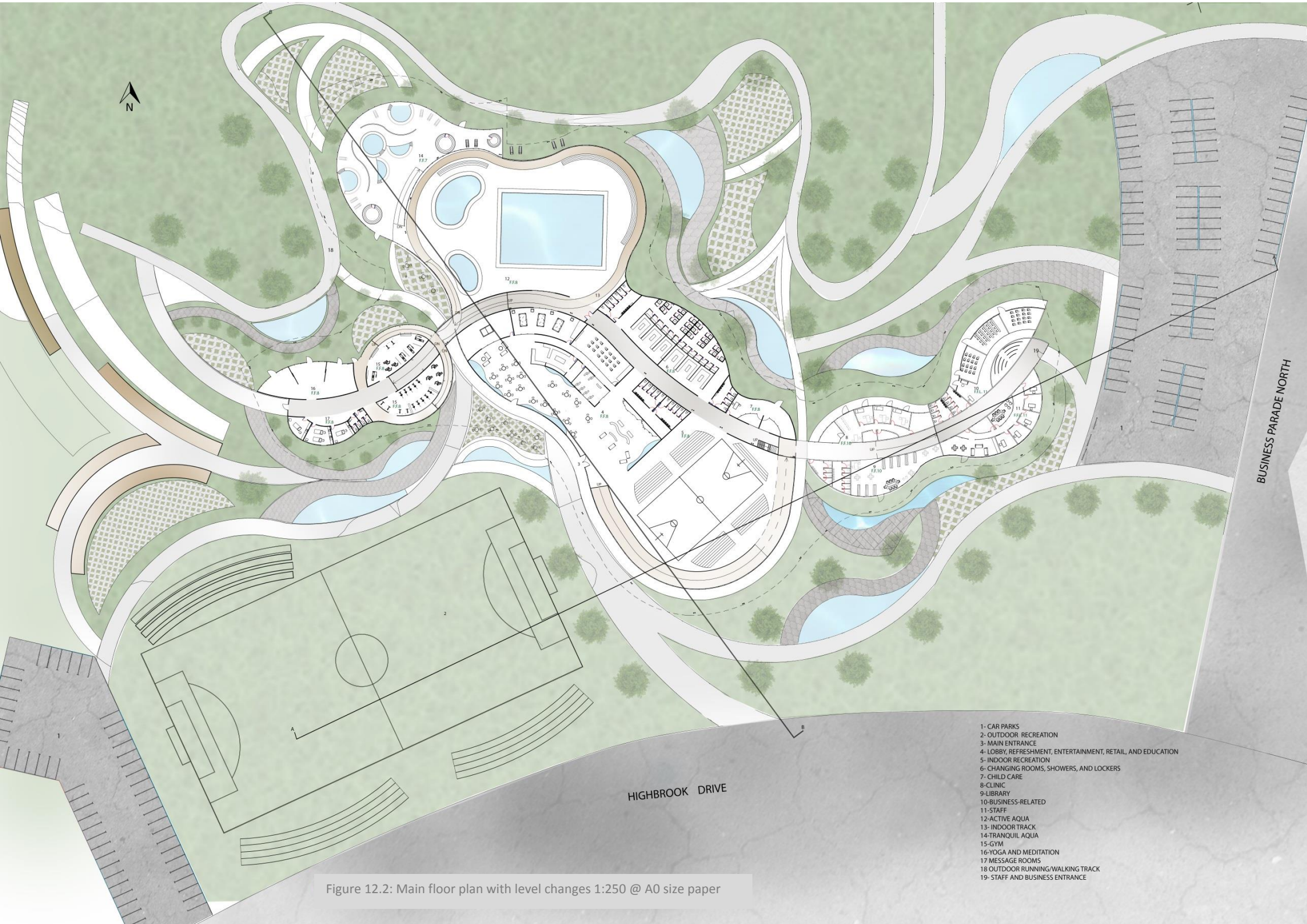
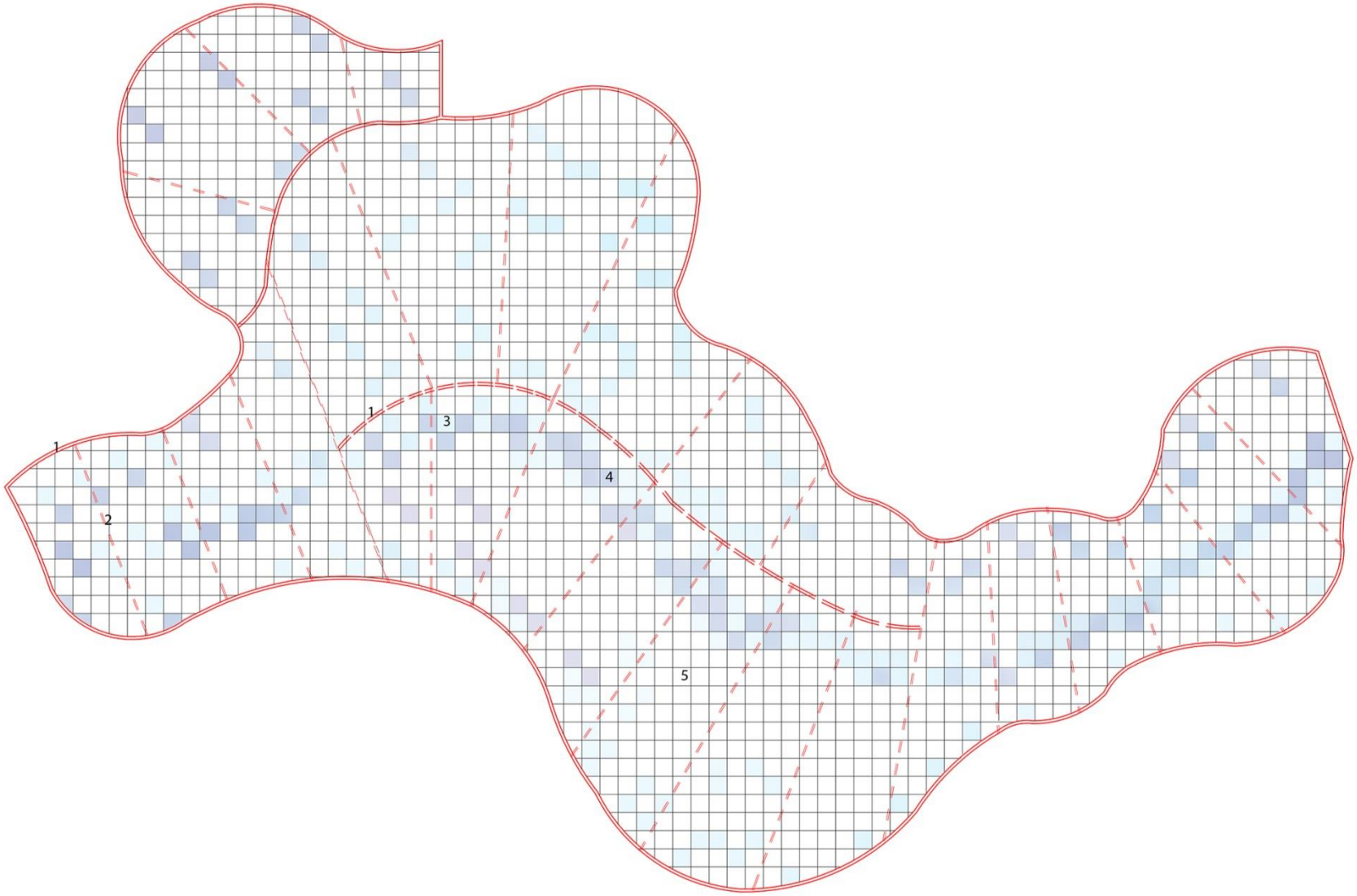


Figure 12.2: Main floor plan with level changes 1:250 @ A0 size paper

Figure 12.3: Indoor-outdoor building circulation paths



1- Tubular steel beam 400 mm Diameter
2- Timber ribs 200 mm Diameter
3- Low density ETFE
4- High density ETFE
5- Timber gridhell at 1000x 1000 mm spacing (drawing shows 2400 x 2400 mm spacing)

Figure 12.4: Schematic roof plan 1:500 scale @ A1 size paper

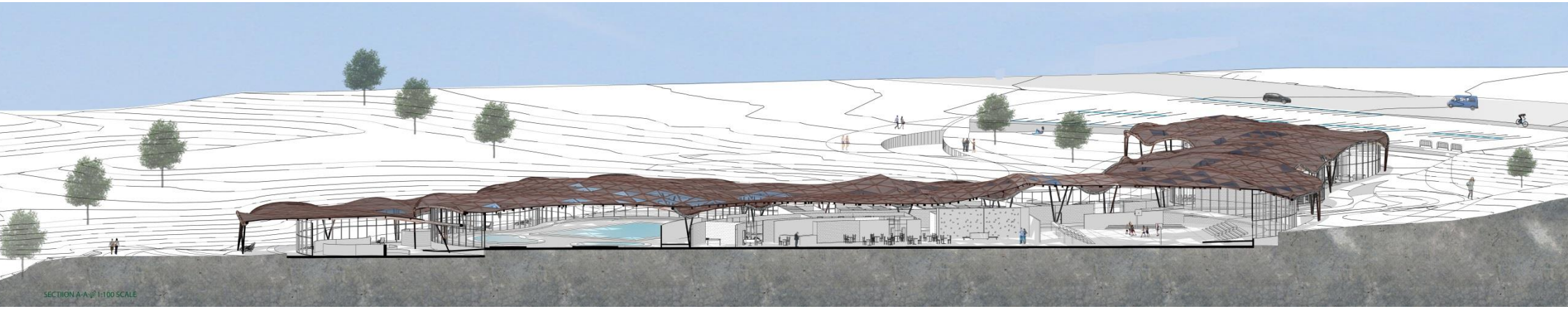


Figure 12.5: Section A-A, 1:100 scale @ 1200mm long x 800mm high banner size

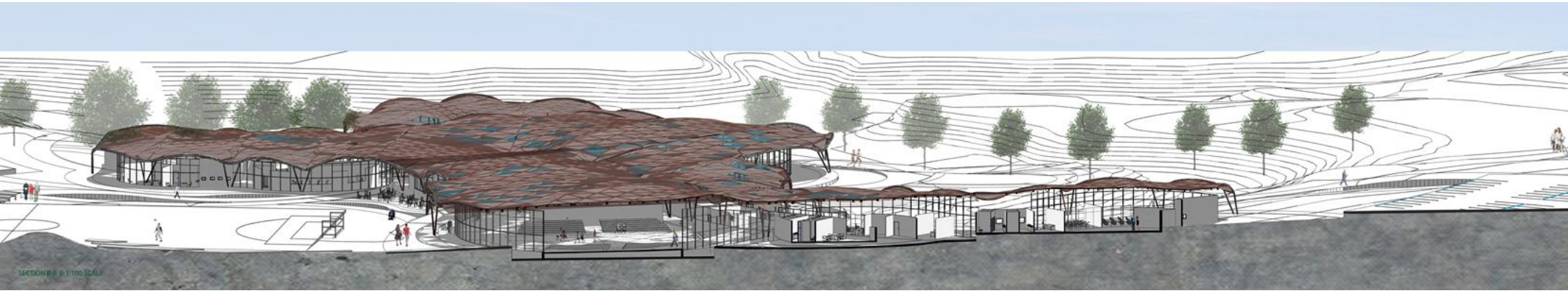


Figure 12.6: Section B-B, 1:100 @ 1200mm long x 800mm high banner size

Figure 12.7: Exterior Perspective, looking down from Highbrook Drive towards the Tamaki River

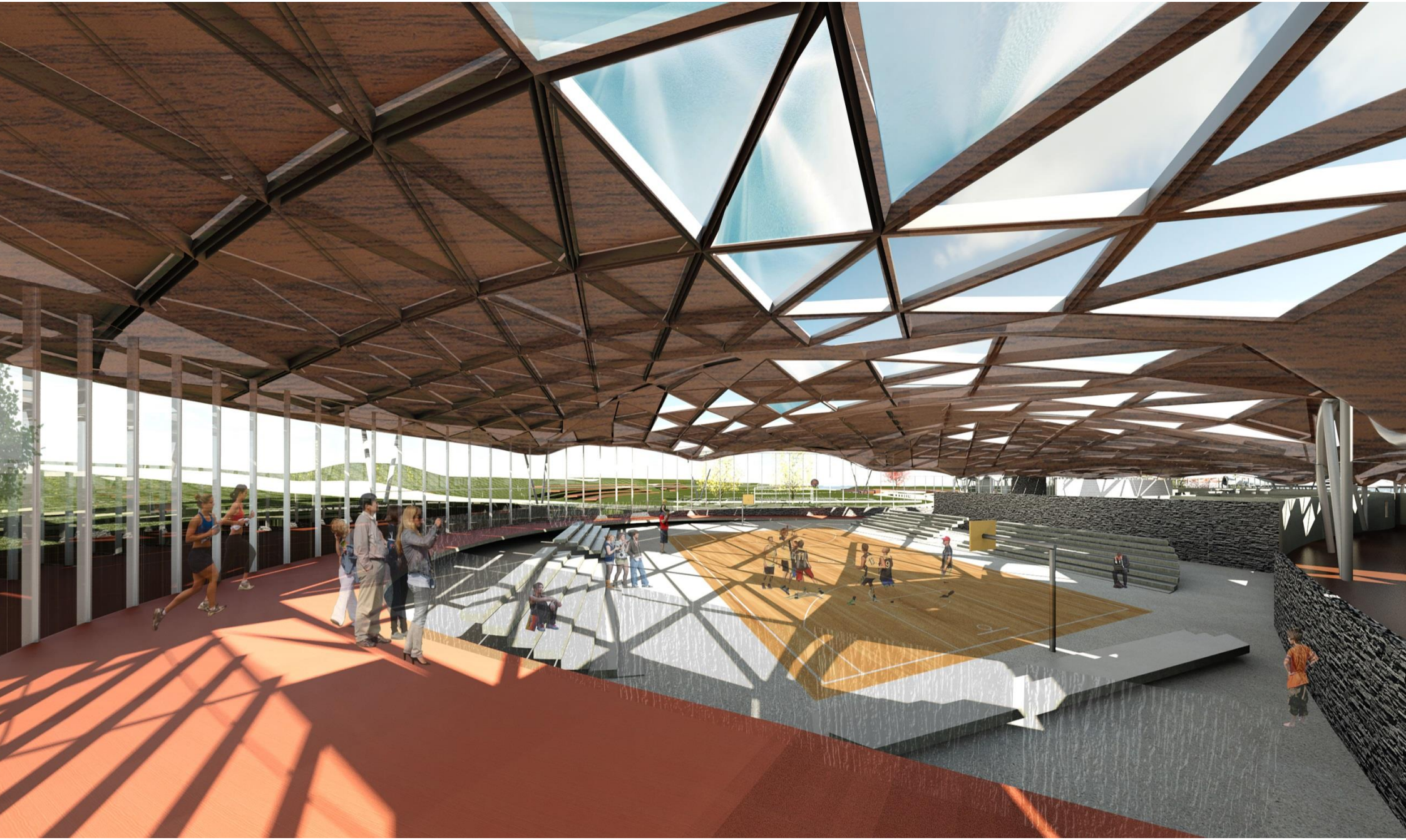


Figure 12.8: Interior perspective- Social zone, looking towards the basketball court from the public ramp

Figure 12.9: Interior perspective- Social zone, looking towards the main entry, entertainment, and the café space

Figure 12.10: Interior perspective- water zone, active pools.

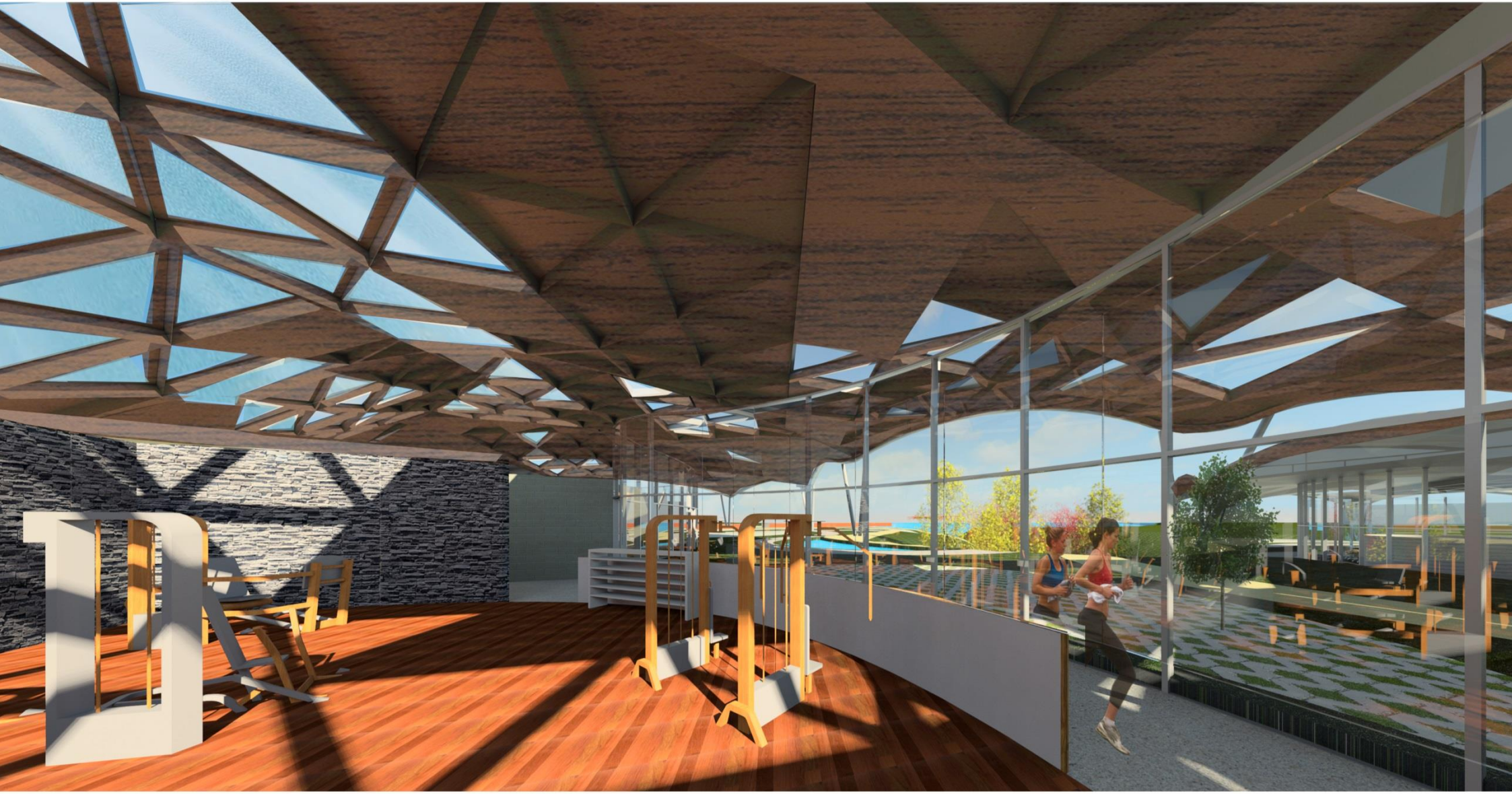


Figure 12.10: Interior perspective- Gym space

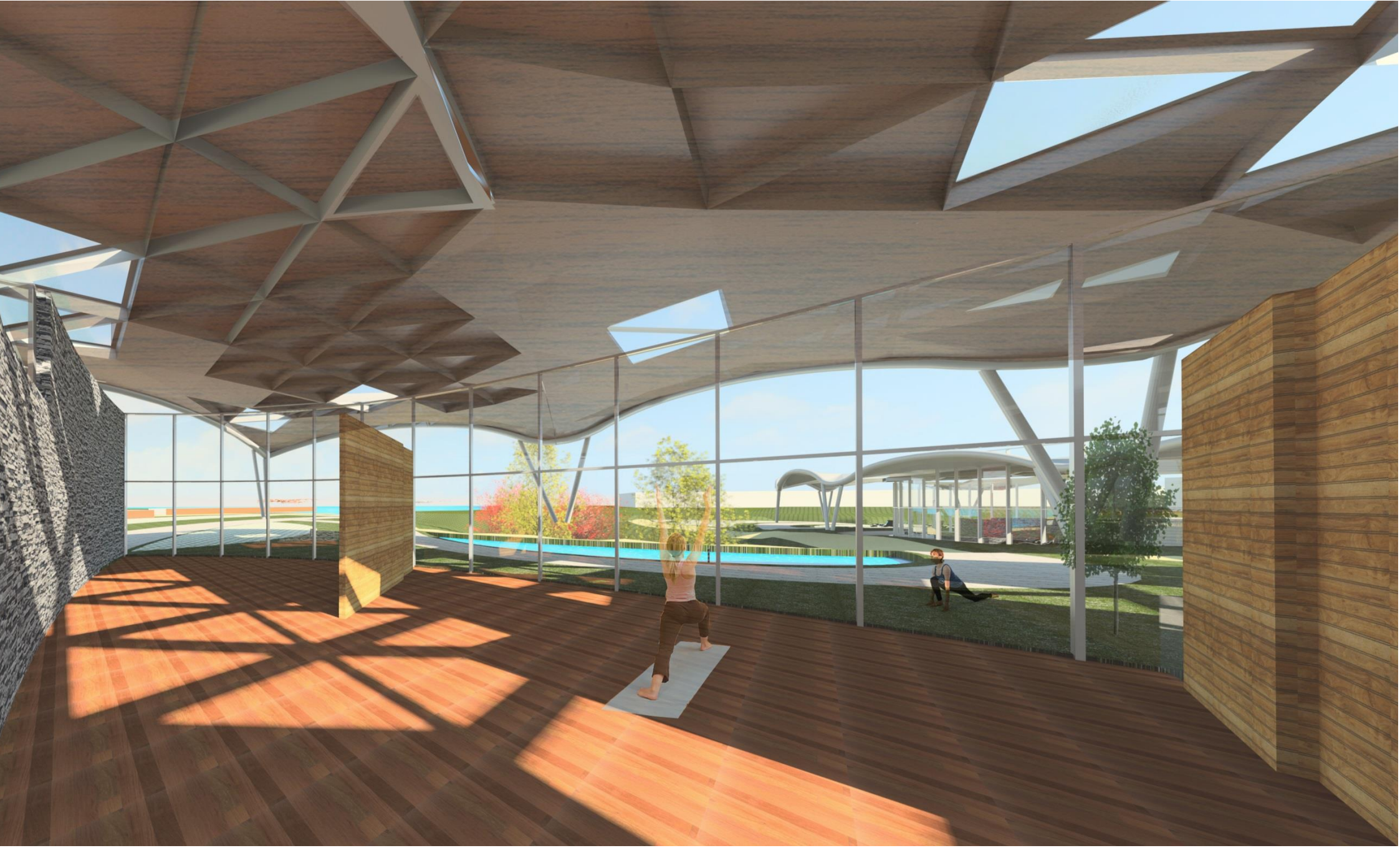


Figure 12.12- Interior perspective, yoga and meditation

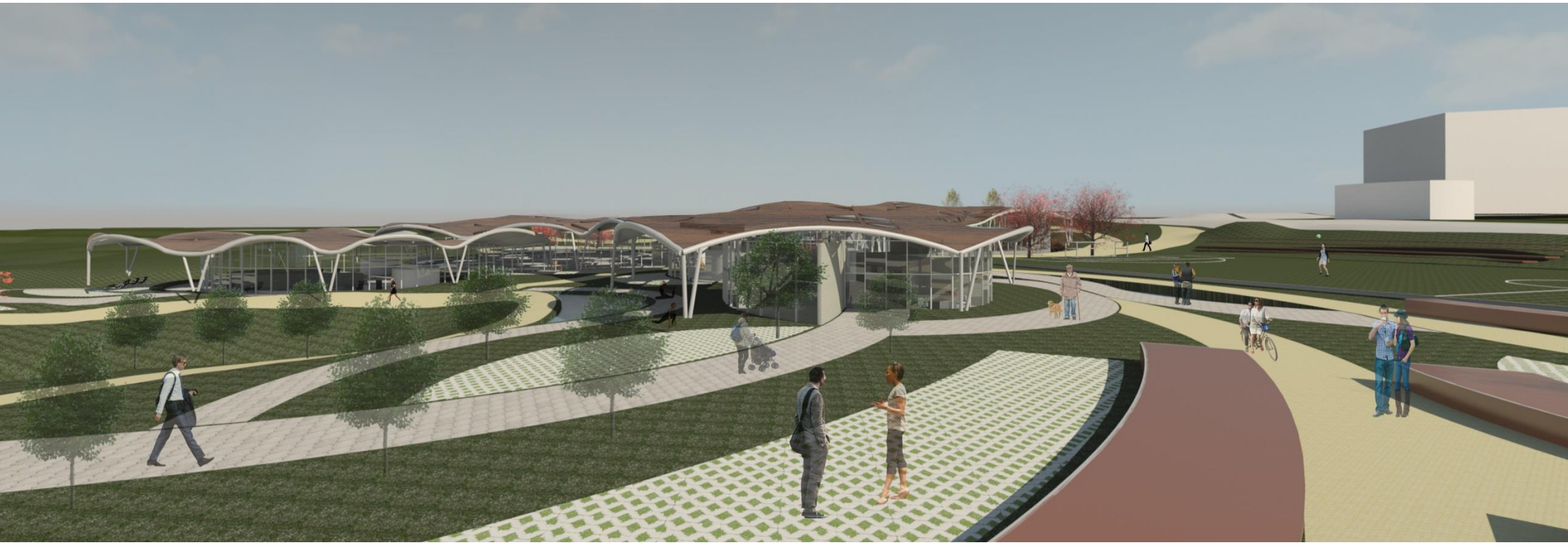


Figure 12.13- Exterior perspective, Outdoor space, coming from the river side

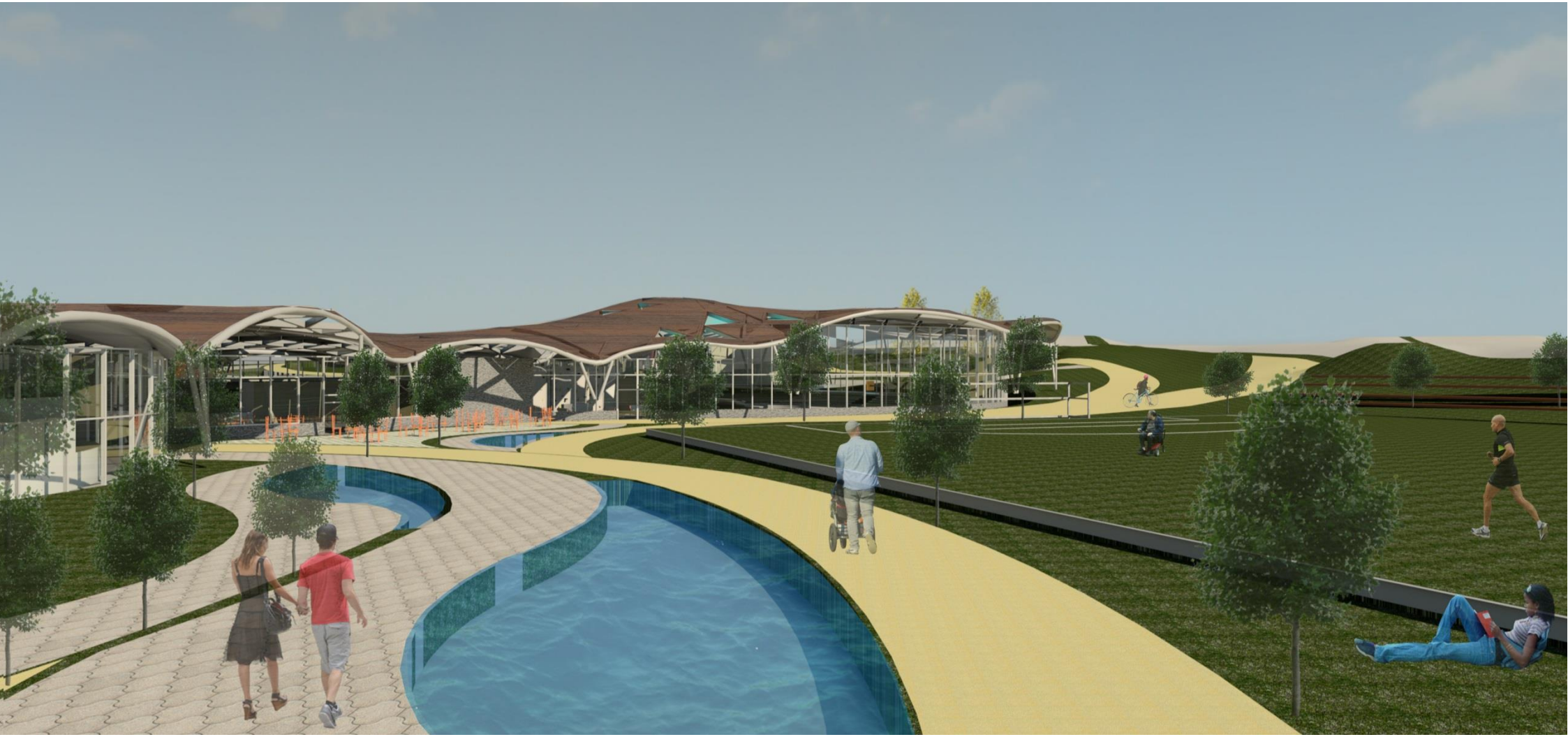


Figure 12.14: Exterior perspective- walking towards the main entrance from the Tamaki River side