NATURE AND ARCHITECTURE: AN URBAN LIBRARY

A study of the process of designing a new type of public architecture in the urban park context.

Master Thesis Explanatory Document
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"I have always imagined that Paradise will be a kind of library." - Jorge Luis Borges
ABSTRACT

Since the beginning of the industrial revolution, the architecture industry has experienced an enormous revolution of its own. The application of new materials and industrialized production methods created plenty of architecture with new functional typologies. Numerous architecture projects were constructed as monuments, and gradually the public come to see architecture as a profession that created symbols reflecting power and wealth. Now, it seems that architects have forgotten the modern architecture’s essential role that it should reflect people’s needs and bring them pleasure.

This problem appears to be more prominent in contemporary cities. With the great increase in population, large areas of urban space have been taken for high-rise buildings. People’s feeling about architecture is monotonous. Facing this phenomenon, some questions should be asked. How many places can be kept for people to reminisce? How many buildings in a city are designed based on citizens’ expectation? Is there a type of architecture that can offer the citizens a new spatial experience by building a close connection with its context and engage with landscape?

The exploration of a new type of public building can be considered as a reflection and a remedy for the existing problem in current public architectural design. This project reconsiders public architectural design to develop a new design process to accomplish an innovative urban library. By designing this building, this research explores the way architecture integrates with its natural context, and also the effect on people’s spatial experience. Within the building, it is intended to create a relaxing, diversified atmosphere for the benefit of users. Through experiencing these spaces, the public’s spiritual needs can be addressed. To design this architecture, attention should be paid to proper scale and proportion; secondarily, the building should be intimately related to its natural context. Finally, the building should meet the needs of users, by allowing their needs to dominate the building.
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1.0| INTRODUCTION

The conflict between human beings and nature has developed clearly since the development of human culture and civilianization. One of the biggest technical achievement of human civilianization has been the mastering of building technology. Ancient people learn ways of building to protect themselves from the harshest climates. The history of architecture start from this point, and it has been developed for a few thousands of years. In comparison to modern architecture, such ancient architecture allowed rich relationships to happened between the shelter built by these people and its natural environment, partly because the shelters are crude and unstable.

The final outcome of this project is designing an innovative library in Western Park, Ponsonby, Auckland. This research seeks to explore:
1. The possibilities of enriching the relationship between architecture and nature.
2. The way architecture includes natural phenomenon.
3. The way architecture infiltrates natural phenomenon.
4. How does this natural relationship effect the emotional feeling of the users of such an architecture.

1.1| RESEARCH QUESTIONS

In an urban park context, how to design a library that will includes and infiltrates its natural surroundings by all ways.

And how to bring people a unique atmosphere of reading and studying, through the interaction and integration between architecture and nature.

1.2| AIMS AND OBJECTIVES

In the Information Age, it is ironic to see that the traditional library system is in decline, because of the development of digital technology. Though library always holds a central position in the provision of information since it was established, it is undeniable that the traditional library system has been subjected to an enormous challenge. People are talking more and more about the importance of the mobility of information, and as a result, traditional paper books are gradually being undermined by electrical devices.

In fact, even people seem to be tired of the traditional ways of getting information. However, one of the roles of library can't be replaced. Library, as a public facility, is the only equitable and convenient place for all the public to be educated outside.
schools. Library is unreplaceable because it can offer a physical environment for communication, information exchange.

The data of 2013 Census shows that the population growth continues to occur across the entire Auckland. There were particularly large proportions of residents aged under 40 years in Auckland, which reflects its role as the largest centre of employment and education. A city like Auckland with such large number of young people needs a new central library that designed for 21st Century.

The first objective of this project is to explore the new social roles of a physical library in the 21st century, to let the library back to be attractive to the public. It would explore a brand new library spatial atmosphere; the second objective is to redefine the relationship between artificial environment and natural environment. It would explore how does the integration happens between architecture and nature.

1.3| OUTLINE OF THE PROJECT

The first stage of this project explores the characters of the spatial environment inside of a library and its surround context, and also discuss the effects that caused by different spatial atmosphere on human's behave and emotion. The next stage explores how to enhance the experience of those spatial characters, and then the way of integrating the interior and exterior spaces together.

To contextualise this investigation, I will generally present the current situation of my site and the current situation of Auckland library system. All my explorations that will be produced in the rest of my document is unveiled by this two status.

The Brief Analysis of Current Situation of Site

Western Park is located on the perimeter area of Auckland CBD, at the east end of Ponsonby Rd. In Western Park, there is large area of land coved by greenery is not used by public very often. It is an unusual scene for an urban park in Auckland that be less attractive to public.

To explain this situation, the analysis of its location is important. Western Park is at the perimeter of city centre, which means it is only accessible for people who works and lives at this particular segment of the perimeter ring. Compare to Albert Park in city centre that is surround by universities, office buildings and apartments, Western Park’s location is not ideal. As is known to all, the main function of a park is providing citizens a place for leisure and recreation. However, this single function of Western
Park isn't attractive enough for public to visit. Based on the statement above, bring this park a new function seems to be the best way to make it popular.

Consider the current situation of the traditional library system, creating a new reading experience is a potential way that can encourage more people to use library. Besides, library is equitable for everybody at all ages and all backgrounds. People with different background bring different stories, which makes the park feel more welcome to the public.

To avoid destroying the natural environment in Western Park, this building must be designed properly. To let people feel that the building is moulded into the site, lots of aspects need to be considered during the design process. First of all, the basic design idea should have a powerful theoretical background. Researching on the existing literature and precedents helps with forming up the design ideas. Filter out the impracticable information, and then make the conclusion. The contents of research should focus on the design of “architectural boundary” that separate the space inside and the outside context. The boundary decides the relationship between people and the building context by different ways. The boundary can exist both physical and intangible, it can be designed differently from the aspects like: forms, transparency of material, the weight of material or the colour.

Ideally, this boundary should be “breathable” just like our skins, which means it doesn’t act like a solid barrier that separates the interior from exterior. It should allow some of the spatial atmospheres and physical mass exchange each other, there’s no absolute inside and outside.

Figure 1.3.1 The View in Western Park
State of Knowledge of the Field

There are three the most important literature that support most of my research, I’ll make a short interview in the following paragraphs.

“21st CENTURY LIBRARIES: CHANGING FORMS, CHANGING FUTURES” written by Ken Worpole

This literature talks about the history of library, the current situation of library system, what need to be improved in 21st century library, and list some examples of the innovative libraries. This report as a guideline for me through my research and design, because it clearly and systemically pointed out the problems exist in the current traditional library system, future more, it also indicated the future trends of 21st century library.


This paper summarized the discussions about the health benefits stemming from the exposure to natural environments. The sections talking about the natural environment and neurophysiology in this paper provides a strong argument point to prove that staying in a natural environment can improve people’s learning ability.

“ARCHITECTURE AND LANDSCAPE: THREE MODES OF RELATIONSHIP” written by Reuben M. Rainey.

This article discussed the three basic modes of relationships between architecture and landscape: contrast, merger, and reciprocity. In this article, contrast, merger, and reciprocity are talked according to the progressive relationship, they are the base of my future exploration about my library’s relationship to

Figure 1.3.2 The Greenery in Western Park


the nature. It gives me theoretical support for the five layer of relationship that I created for my building and its context.

In the next two paragraphs, I will show two architecture precedents that inspired my design.

THE ANGKOR WAT

“The Angkor Wat”, a temple complex in Cambodia, is the largest religious monument in the world. I was inspired by the picture that shows the inside of Angkor Wat, the roots of the tree are growing into the building. The building was originally founded as the symbol of the revere of Khmer Empire’s government.

However, after hundreds of years’ experience of nature baptism, it was devoured by nature. The facts reminds me that nature is always the master of everything, architecture and nature are supposed to be in the same body. This imagery wanders in my mind, which probably be my initial motive to designing an architecture integrates with nature.

LI YUAN LIBRARY

Li Yuan Library is located at the rural area of Beijing, China, designed by an architecture professor in Tsinghua University who has the vision of creating a quiet reading place away from the noisy city. The library is built up with tree branches that were used as firewood by the local people. Also, there is no electricity and water supply in this building, the natural daylight is the only light resource. The library’s opening time is various during a year, it changes depending on the sunrise and sunset time.

The choice of material and the primitive way of lighting strongly reflect designer’s idea of moulding the architecture with nature. I was affected by the idea of leaving the noisy world and read in the peace. The appearance of this building reminds me that even a “crude” architecture can still be beautiful if it started with a sobering idea.

Figure 1.3.3 The View in the Courtyard of Angkor Wat

Methods

The approach of my research stage is to summarize the existing knowledge and then choose the information that most related to my project. Read and study the related literature that can provide me theoretical background for my arguments. With these theoretical support, my arguments could be convincing, which is my first step. Knowing this knowledge is easy, however, how to apply them into the design is hard. Analysis of the precedents is the next step, learn the practical approach of how to applying theories into my design from precedents that are designed with a similar theory.

The following process was used in my design stage, listed in order:

1. Site context analysis, including traffic analysis and context building typology analysis.
2. Site topology and vegetation analysis.
3. In-site circulation analysis.
4. Functional layout by using bubble diagram.
5. Building shape design.
6. Function organise in a plan.
7. The design of the boundary between the interior and the natural context.
Within the overall design process, some particular aspects still need to be designed in detail.

**Results of the Research**

The final results of this research are to achieve the two objectives as I introduced at the beginning of the chapter “1.2| AIMS AND OBJECTIVES”. The final outcome will be a series of architectural drawings that present the finalised library building design. The library design involves the ideas that reflect all the literature and precedents research. All the outcome drawings are shown in the section “4.0| DESIGN OUTCOME”.
2.0 | EXISTING KNOWLEDGE

2.1 | LITERATURE SURVEY

2.1.1 | Library’s Roles and Its Challenge in 21st Century.
Since the first library been established, it has always held a central position as the heart of a civilized society both symbolically and in terms of its physical placement.\(^5\)

As the “gateway of knowledge and culture”\(^6\), they offer to the society particular resource and services. They create opportunities for learning, support literacy and education, and help shape the new ideas and perspectives that are central to a creative and innovative society.\(^7\) They also help ensure an authentic record of knowledge created and accumulated by past generations.\(^8\)

Even though traditional physical libraries playing such these irreplaceable social roles, it is a fact that the development of digital technologies poses enormous challenges to the traditional library system. Take the example of State Library of Victoria: while in 2006-07, there were just over one million visits to the buildings of library, in the same year, there were more than double that number of visits to its website.\(^9\)

An Australian study undertaken for the Libraries Working Group of the Cultural Ministers’ Council in 1994 (Mercer, 1995) found that 53 percent of library non–users and roughly 90 percent of library users would automatically use the library if they wanted to find something out.

In contrast, a study undertaken by the Pew Internet & American Life Project in 2007 (Wells, 2008) found that almost 60 percent of respondents would consult the Internet when they needed to address problems, while just over 10 percent would consult the public library.\(^10\)

The data shows above reflected how big the impact that digital technology brings to the physical library. There is an obvious question: once people had the option of using their digital device anywhere in the city, why would they need to go to the library? The answer is straightforward: because “library is the only centralized location where new and emerging information


\(^{7}\) Ibid.

\(^{8}\) Ibid.


\(^{10}\) Ibid.
technologies can be combined with traditional knowledge resources in a user-focused, service-rich environment that support today's social and educational patterns of learning, teaching, and research. Whereas the Internet has tended to isolate people, the library, as a physical place, has done just the opposite.  


2.1.2| Objective of Physical Library Space.

Physical library are designed and foremost as places to collect, access, and preserve print collections. Although digital technology has changed our usual way to collect information, physical library still stands an essential position in the academic society. Library isn't just a place for people to searching the information, there are also many emotional interactions between physical library spaces and people.

In the college, library always be seen as an extension of the classroom that provides a learning and research environment. Library is the facility that can offer students a place to make cooperative studies. Internet changed the way of doing research, people can easily get the result from internet anywhere and anytime. However, internet tends to isolate people's mind from direct verbal communication with other people's mind. The idea exchanges happened among different minds is an efficient and double-way learning process, which can never be replaced by the internet. So, library's primary role is to advance and enrich the people's educational experience by creating the collaborative learning environment. Students are expected to use library thinking analytically, rather than simply searching for information.

Figure 2.1.1 The Old Drawing that Shows the Scene Inside Alexandria Library in Egypt.

12 Ibid. 9.
13 Ibid. 10.
14 Ibid.
Secondly, library provides the space for immersion learning. Library are designed as a place with minimum distractions that can only be used for studying. It is a common sense for a library space that students are focusing on the books in the front table that surrounded by book shelves. Library are designed with inviting spaces that honour study to encourage students to study longer. The pure learning atmosphere lets the students learn by immersion, every element in the immediate environment contributes powerfully to learning. It is a fact that human are a social species and hunger for places to come together for conversations and learning, activities that have intrinsic value for us. Like one student said: “I really like the library. The boring environment forces me to pay attention to my work, since there is nothing else to do.”

2.1.3 Future Library Trends

“Whether you build a new library or transform an existing one, do not build the beat library of the previous century”

Today’s library as a place for social interaction and quite reading are busier and more popular than ever. It becomes more like a community cultural centre, not a simple repository for books.

The changes of roles have affected the spatial needs in a library

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18 Ibid.
20 Ibid.
building. In order to meet these changes, a library building space should be designed with the character requirements bellow:

1. The flexibility and transparency among spaces become important in a contemporary library. Comparing with a series of isolated spaces in traditional library layout, the large open space has more potential to accommodate the large event. It's also more flexible to accommodate the future requirements with the large open space. Another benefit of large open space is that librarians are more accessible to all areas, which makes the management is more efficient.

2. The connection to the outdoor space is another requirement. Compare to the traditional architecture, architecture in nowadays has lots of different treatments when dealing with the relationship between indoor and outdoor space. Architects today are paying more attention to the way of making building engage with its natural environment, by creating a particular facade, applying the new materials, or changing the building form. The connection to the outdoor brings the user relaxing and unique reading and studying experience, which will help to relieve the stress.

3. Library, as a public facility, should be more accessible for public. To achieve the convenience, library building should have multiple access. Visitors coming from all directions can find the nearest entry without circling around the building to find the only access.

2.1.4 Library Knowledge Organisation System.

It is universally known that humans are the inherent organizer. After centuries developing, the existing Knowledge Organisation System has been adapted by most of libraries all over the world. A proper KOS is one of the indispensable elements that make a successful library. As the important role of KOS plays in the library management, it is necessary for designers to know some common types of Knowledge Organisation System. They are grouped into three general categories:

- Term list, which emphasize lists of terms often with definitions
- Classifications and categories, which emphasize the creation of subject sets

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22 Ibid.
Relationship lists, which emphasize the connections between terms and concepts.

2.1.5 | The Relationship between landscape and architecture.
The fit between architecture and the land is a perennial issue since architecture in its broadest. From the general sense, landscape can be referred to nature. "Landscape" as explained on Wikipedia, includes the physical elements of landforms, water bodies, living elements of land cover, human elements, and transitory element. The concept of landscape architecture is introduced at the beginning of Renaissance, it means the design of outdoor environment to achieve an aesthetic outcome. The landscape can be seen as the extension of human's aesthetic in natural environment. Landscape architects define their own expertise as a designer of outdoor space, anything in the human environment which is not a building.

As Reuben discussed in his article "Architecture and Landscape: Three Modes of Relationship", there are three categories of relationship between architecture and landscape throughout history of landscape, namely: contrast, merger, and reciprocity.

Contrast: contrast happened in the era of classicism, in this era, architecture and landscape are in a distinct oppositional relationship. There are no transitional gardens or terraces to act as a bridge, so the resulting contrast between building and landscape accentuates the intrinsic qualities of each. Such example of contrast was the New York's Central Park.

Merger: merger is the totally opposite to Contrast, the building

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23 Ibid.
is made to appear an integral part of its natural or cultural landscape.\textsuperscript{28} It reflects that the building form is designed with the consideration of surrounding context, such as topography, vegetation and water body. Merger is in an intensified development in the later phases of Modernism.\textsuperscript{29} The examples of merger are: Frank Lloyd Wright's Fallingwater, and Mies van der Rohe's Farnsworth House.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{FallingWater}
\caption{The Falling Water Designed by Frank Lloyd Wright.}
\end{figure}

\textit{Reciprocity:} reciprocity can be seen as the combination of contrast and merger, it occurred in recent two decades. In it, buildings and landscape modify on another- each once to some degree is reflected in the other.\textsuperscript{30} The building and landscape are fused together, some buildings are designed as an artificial landscape on its own.\textsuperscript{31} The common design method for this kind of building is to use the hills, slopes, and other features and spatial phenomena borrowed from landscape\textsuperscript{32} to replace walls, floor slabs or roofs. The examples of this category are: Rolex Learning Centre by SANAA, Villa VPRO Hilversum Terminal by MVRDV.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{FarnsworthHouse}
\caption{Farnsworth House Designed by Mies van der Rohe.}
\end{figure}

\textsuperscript{28} Ibid.
\textsuperscript{32} Ibid.
2.1.6 The Psychological Impact of Greenery.

It’s an era of rapid urbanization, over half of the world population now resides in the urban environment. The increase of the size and density throughout the cities in worldwide threatens the resilience of remaining city landscape. Although urbanization can provide a lot of solutions for - education, housing and employment crisis. More and more scientists have argued that human beings were once psychologically closer to natural than the artificial urban environment. It is an undeniable fact that there are strong connections between greenery and mental health, which has been proved by lots of research.

For office and school, having quality landscaping and vegetation in and around the places where people work and study is a good investment. It helps to restore the mind and alleviate mental stress and illness, so that the job and school performance can be improved. The contact with greenery can be achieved both visually and physically, in another words, looking at greenery and being within the greenery have the same effect. A study at the University of Michigan organised two groups of student, group A was asked to walk through an urban arboretum, while group B


walk on city streets. The result shows the Group-A students were found to score higher than Group-B students who walked on city streets. When the roles of the two student groups were reversed a week later, the students who walked through the arboretum again scored higher.\textsuperscript{35}

For children, having a quality landscaping and greenery in their growing environment seems to be more important. Lots of researches have provided that being contact with nature helps children to develop cognitive, emotional, and behavioural connections to their nearby social and biophysical environments.\textsuperscript{36} For example, in a study done by the American Institutes for Research, a group of sixth graders attended outdoor school for six weeks, while other group did not. At the end of the programme, the students, teachers and parents were surveyed. The group that did the outdoor education rated better in self-esteem, conflict resolution, relationship with peers, problem solving, motivation to learn and behaviour in class.\textsuperscript{37} There are more than one studies reflects that nature experiences are important for encouraging imagination and creativity, cognitive and intellectual development, and social relationships.\textsuperscript{38}

Overall, these evidences have important implications for architects that design a architecture has close contact with greenery is the future trends, it is not only concerns about eco protection, it is more about human mental health.

2.1.7 Data Analysis of Census in Auckland 2013

Auckland is the biggest and most developing city in New Zealand, and also the city that has the largest population in this country. Until 2013, the growth of Auckland’s population remains high in the seven years since the previous census. Based on the data of census in 2013, the usually resident population count for Auckland was 1,415,550, constituting 34% of New Zealand’s population. This is a significant increase from the previous census in 2006, where Auckland had a population of 1,337,238, constituting 32% of New Zealand’s population.


\textsuperscript{37} Vidya Hattangadi, \textit{Why Greenery is Important for Our Life}, \url{http://drvidyahattangadi.com/why-greenery-is-important-for-our-life/#VtHU_mnpBc}, (accessed March 26, 2015).

\textsuperscript{38} Mental Health & Function, \url{https://depts.washington.edu/hhwb/Thm_Mental.html}, (accessed April 29, 2015).
Zealand total population. This was an increase of 110,589 people in the seven years since the previous census.  

By analysing the data of population ages, Auckland’s population is relatively young. Looking at the Figure 2.1.7.1, Auckland’s age structure is markedly different than the rest of New Zealand, and reflects its role as a large centre of employment and education.  
A large number of young population in Auckland gives us a signal that there are more potential library users in Auckland. Another series of data (see Figure 2.1.7.2) shows that the number and proportion of adults with higher educational qualifications are increasing.  

Except from school, library could be the place for them to accomplish their self-improvements.

Young people are not the only group that uses the library often, in fact, library is also a place for older people to spending time. Even Auckland’s older population is smaller than other places, however, the number is growing in the recent years. Auckland experienced a 26.9 per cent increase in the number of usual residents who were aged 65 years and over between 2006 and 2013. Building a library can benefits the older people in the nearby community, offers them another choice for enjoying their time.

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40 Ibid. 15.
41 Ibid. 23.
42 Ibid. 16.
2.2 | PRECEDENT SURVEY

In the information era, it is obviously that some of the traditional library building cannot meet people’s requirement for gathering information. Numbers of new type of library buildings has been designed and built around the world. Architects start to applying innovative ideas into their design and ended with fantastic buildings that serving us in this era. “Whether you build a new library or transform an existing one, do not build the best library in previous century.”\(^43\) All types of architecture should be designed to serve this century, rather than designed to serve the previous century with the obsolete knowledge.

Environmental issues and human psychological issues are drawing more attention from architects. At the same time, more and more architectures focus on the ways that building engages with natural.

Those analyses seek to summarize the different ways that the precedents laying out the spaces to meet people’s requirement of gathering information in 21st century, and the ways that the precedents build up relationship between building and natural context.

The following pages will analyse the success of selected precedents to foster an awareness of reorganising the physical library layout in order to let the library building emerge into natural, so that people’s reading and learning experience can be enhanced.

Precedent .1| Seattle Public Library

Introduction:
Location: The library is located on Fourth Avenue in downtown Seattle, Washington, United States.

The Seattle Public Library is designed by Rem Koolhaas, OMA. It is an impressive building that combines futuristic lines with the functionality of a library. Looking the library from the outside, it is a large glass building with clear intersect frame line on it, people can see large blocks at different level stick out (see Figure 2.2.3). The library attracts lots of tourism, which becomes a new economic activity for Seattle city.

To design the library, Koolhaas met with representatives of Microsoft, Amazon and the other organizations to discuss the future of books and the library. Finally, Koolhaas use the “spiral” way to deliver books to customers within the building. There is a spiral structure rises four floors, provides a continuous ramp with sides shelves that offer different themed collections (see Figure 2.2.1).

To avoid the flatness, one of the disadvantages of traditional library organization, the library departments are organized according to floor plans. Each department inside of the building been visually separate by different floor platform blocks (see Figure 2.2.2).

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Figure 2.2.1 the Continuous Ramp With Side Shelves that Collect Books.

Figure 2.2.2 the Diagram that Shows the Relationship between Floor Levels and Functions.

Figure 2.2.3 The Exterior of OMA’s Seattle Public Library.
Introduction:

Location: Daegu Gosan Public Library is located in Daegu Metropolitan City, South Korea.

This project is been described by the architects as “Between Books and Trees”, which means the building act as an media that melt the boundary between park and library. The library merges the exterior and interior through a series of spatial transition. The existing site is adjacent to a wide park strip that protect the library from the nearby traffic and cityscape (see Figure 2.2.4). This unique quality of green space provides an opportunity for the library to explore the meaning of architecture and nature.

Looking from the elevation view, the building is like an upside-down pyramid, with the tall columns support the top cantilevered level (See Figure 2.2.6). The columns act as a transition from green space to interior space, which blur the boundary between interior and exterior. This upside-down pyramid shape make the tree more approachable from the higher level, with the full glazed wall (see Figure 2.2.5), allowing significant transparency to outside nature environment. This transparency lets the park defines the interior space of library and provide sufficient natural light at the same time.

Nowadays, the main function of a library is being a public space that welcomes cooperative learning and community creativity. Because of the particular shape of Daegu Gosan Library, there is a large open space at the ground (see Figure 2.2.7).

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Precedent .2| Daegu Gosan Library by JAJA Architects

Figure 2.2.5 The Interior Rendering of Daegu Gosan Library.

Figure 2.2.6 The Physical Model Shows the Sectional Relationship of Daegu Gosan Library.

Figure 2.2.7 A Series of Sectional Diagrams Shows the Relationship of Trees and Building, Facade of Books, Book Atrium, and Public Space.
Precedent.3| “The River” Underway in Connecticut by SANAA Architects

Introduction:
Location: “The River” designed by SANAA, built on a 75-acre preserved land at Grace Farms in New Canaan, Connecticut.

Function: The building includes a 700-seat amphitheatre, a library, a dining room, children’s spaces, a coffee bar, a welcome centre, a gymnasium and a multi-purpose space (see Figure2.2.10)

This building gets its name “The River” from the way it meanders through the park’s greenery. From an aerial view (see Figure2.2.9), the building has a river-like roof. Structurally, the whole building that built by glass, concrete, steel and wood is covered by a continuous roof. Its translucent glass facade sitting under the canopy roof that supported by round steel column, like a river flowing naturally thought the hill and greenery (see Figure2.2.8).

Kazuyo Sejima, co-founder and co-principal of SANAA “Our goal with the River is to make the architecture become part of the landscape. We hope that those who are on the property will have a greater enjoyment of the beautiful environment and changing seasons through the spaces and experience created by the River.”
Figure 2.2.8 The Exterior Rendering of "The River" Underway.

Figure 2.2.9 The Areal View of "The River" Underway.

Figure 2.2.10 The Floor Plan of "The River" Underway.
**Precedent.4| Fuji Kindergarten by Tezuka Architects.**

**Introduction:**

**Location:** Fuji Kindergarten located in the Tokyo suburb of Tachikawa, it is the largest kindergarten in Japan.

Fuji Kindergarten wins multiple architectural design awards is because the most celebrate and captivating aspect-its “doughnut ring” rooftop that enclose an internal courtyard space (see *Figure 2.2.11*). Designed the school like a circle, which gives a kind of endless circulation. Without building any walls in this no dead end space, there are no hidden places in this kindergarten. Even the directors only have a corner to work. Because of the disappearance of the closed hidden room, there is no bullying problem happened here.

The design based the school’s Montessori philosophy, so it give the students a building without walls. The most effect of Fuji’s design concept is a learning environment that fosters the individual development and expression of all its pupils. The building built around the trees, to protect the trees already on the land without cut the roots. They added safety net, so the tree becomes a toy for children, give the kids another way to play (see *Figure 2.2.13*).

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46 Fuji Kindergarten: Japan’s most beautiful kindergarten. https://educationinjapan.wordpress.com/2010/04/06/fuji-kindergarten-japans-most-beautiful-kindergarten/

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Takaharu Tezuka: “We designed the school as a circle, with a kind of endless circulation. When we started, I had no preconceived notions. Studying other kindergartens was like looking in the rearview mirror of a car: Even if you look very closely, you can’t see anything in front.”

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47 Ibid.
Figure 2.2.11 The Aerial View of Fuji Kindergarten.

Figure 2.2.12 The Interior of Fuji Kindergarten Shows There is No Wall.

Figure 2.2.13 Children Plays Around a Tree inside Fuji Kindergarten.
Precedent .5| Nature Centre by EFFEKT.

Introduction:
Location: Natural Centre is located in the forest of Hareskoven in Copenhagen.

Function: It is a 1000m² visitors centre, serves almost 1 million visitor that use the forest annually. Inside of the building has the function as cafe, exhibition space, rental, learning and research facilities and a caretaker’s residence.48

Looking the concept diagram (see Figure2.2.16) on the left page, it is shaped like a starfish extends its feet into the surrounding forest. Each wing contains a separate function, the star shape plan layout allows the independent of each function. The lobby is located at the centre of the building, visitors enter the building and be distributed into different wings.

The building also has a strong connection to its surrounding landscape by roof. In two of the five wings the roof slope down to the ground49 making it accessible from the ground (see Figure2.2.17), and the roof becomes a series of scenery platforms looking into the forest.

To provide visitors with the seamless contact with surrounding forest, the building envelop is designed as a three layer glass facade, which can achieve the maximum energy performance and transparency at the same time.50 Because the building is surrounded by forest, the density of tree leaves can prevent the overheating problem during summer time. The forest acts as a natural air conditioning system of the building.

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49 Ibid.
50 Ibid.
Figure 2.2.15 The Exterior Rendering that Shows Nature Centre Located in the Forest.

Figure 2.2.16 The Physical Model that Shows the Plan of Nature Centre.

Figure 2.2.17 The Elevation that Shows a Part of the Building Roof Slope down to the Ground.
Introduction:
Location: The building is in a woods in Madrid, Spain.

Function: It is an office designed by Jose Selgas and Lucia Cano for their own architecture practice.

Selgas Cano Offices is a tunnel like building designed with a pure and simple ideas. Looking from the outside of the building, it is like a tube placed into the ground with a large window that stretches alongside the entire side of the tube (see Figure 2.2.19). To prevent the high temperature in Madrid in the summer time, the building is placed halfway under the ground. The ground as a perfect heat insulation for the building, which eliminating the need for air conditioning. The leaves above the building cast a dense of shadow onto the building, and the sunlight coming through the leaves becomes smooth.

All the employees are very satisfied with the new working environment, working efficiency been improved. When the employees feel tired, they can easily access into a beautiful nature and relax.

Figure 2.2.19 The Exterior View of Selgas Cano Architecture Office.

Figure 2.2.20 The Interior View of Selgas Cano Architecture Office.

Figure 2.2.21 The Exterior View of Selgas Cano Architecture Office.
Figure 3.1 The View of the Site

Figure 3.2 The View of the Site
3.0 | DESIGN PROCESS

3.1 | BRIEF

The proposed programme, as specified previously, is to create a kind of library space that has the character that it exists both in the middle of a natural and artificial environment. To achieve this particular space, the programmes will integrate the interior building space with the outside greenery space dynamically. This library is designed with innovative ideas, by the integration of natural and artificial world, so that a unique studying experience can be created; people's studying experience will be enhanced. People using the library are invited to engage with the expansive natural surroundings.

In this library that is designed for 21st century users, there are all the functions that a normal library should have, and besides, there are also new spaces designed for digital information era. This library should become an information store where all media are presented. Various departments exist in the building, some particular departments are designed for unique needs, and on the other hand, some of them are designed for all population of all ages.

An efficient circulation area is required to connect all different departments, so that occupants can find their destination efficiently through circulation space.

The façade of this building should not have a solid boundary that totally separates interior from exterior, instead, it should blur the boundary between interior and the natural surroundings. People inside will have a great enjoyment of the beautiful natural surroundings, its façade acts as a medium to invite people merge into the natural. The building shape is designed deliberately, so that the architecture becomes a part of the landscape without drawing people's attention to itself.

Floor Area:

2500~3000 m²

Functional Requirements:
A public library with 24hr access is required. The library is different to the normal library. It can be thought as a place where people can share and exchange books. Different parts for different user groups. Public meeting rooms that can contain different kinds of activities. Lecture rooms/theatres rent for the public. Free exhibition/ performance spaces shared by the public.
Figure 3.1.1 The Location Plan of Western Park.
Figure 3.1.2 The Drawing that Shows All the Greenery Area Around the Centre of Auckland.
3.2 SITE ANALYSIS

3.2.1 The choice of site

The site that has been chosen is inside of Western Park that close to the intersection of Ponsonby Rd and Hopetoun St. Western Park in one of Auckland’s earlier parks, developed between 1873 and 1879, when it was opened to the public. Over the years, the park has served as an important gathering place for social and civic affairs and has close ties to its surrounding residential context. Furthermore, the natural features of the park including Tunamau (a stream in the park) and tree planting dating from the 1870s, as well as its archaeological sites or features have potential to play a significant role in enhancing public understanding of Auckland’s Maori and early European history and ways of life. The natural features of the park in combination with its informal design and views to the city underpin its aesthetic qualities.

Figure 3.1.2 in the front page shows all the public parks’ locations in the central area of Auckland. By reading the map, the greenery spaces are in a large proportion of Auckland central city area. Three major issues that I’ve taken into consideration during the site choosing process are listed as below:

Locality:
Locality should always be considered in the first place. The locality can have a great influence on the number of visitors. The library that I’m proposing will open to all public in Auckland, not only serves the community nearby, therefore, visitors from all part of Auckland should have a relative equal travelling distance to visit. So, the ideal location should be around the physical centre of Auckland which is the CBD area. Western Park is at the perimeter area of Auckland CBD, so it meets the “locality” requirement, offers equal travelling distance. The diagram below shows the locality of Western Park.

Transportation:
The transportation also can affect people’s desire to visit, the reduction of travelling time is an attraction point for public. A place with a convenient public transportation and an efficient road network always have a large people flow. Figure3.2.1.2 below shows the basic condition of road network around Western Park. Western Park is close to the conjunction point of motorway, which is convenient for people travel from the motorway. Traffic coming through motorway will merge...
into Ponsonby Road which is the major road located on the south of park. There is a complex road grid in the west area of the park through Ponsonby residential district. The roads that crossing the residential district are narrow, low traffic speed, and most of them are covered with greenery, which makes them become pedestrian friendly.

As a conclusion, there is a complex and convenient road network serving Western Park.

Surrounding Building Typology:
The surrounding building typology can reflect the conditions of the nearby population, in specifically, people's occupation, age, race and even hobby. The staff in the office building, students in the school and the seniors from residential villages, etc. It is those people with different backgrounds that contribute to a vibrant community. The variety of population is one of the successful urban centre's characteristics, because it can increase the possibility of making contact with different people. People tend to see and explore anything that is unfamiliar, like children always curious about the things around them.

The building typology that around Western Park will be mentioned in detail at section "3.2.4| Surrounding Functional Analysis". The three diagram (see Figure 3.2.1.3, 3.2.1.4 and 3.2.1.5) that analyse three different Auckland suburban centre shows some main characters of successful suburban centre. This diagrammatical analysis could become an argument that can support the choice of the site.

In these three diagrams, different colours are used, as shown in the legend, to indicate different building typologies. As a conclusion from these diagrams, all these three suburban centres have such elements as mentioned below: 1. convenient transportation system. 2. various building types. 3. high building density. 4. complex road networks. 5. large public natural area. 6. pedestrian friendly. 7. residential district surrounded.

Figure 3.2.1.1 The Drawing that Shows The Location of Western Park and Auckland CBD.
Figure 3.2.1.2 The Drawing that Shows the Road Network Around Western Park.
Figure 3.2.1.3 The Drawing that Shows the Building Typologies and Roads of Henderson.
Figure 3.2.1.4 The Drawing that Shows the Building Typologies and Roads of New Lynn.
Figure 3.2.1.5 The Drawing that Shows the Building Typologies and Roads of New Market.
3.2.2 Traffic and Public Circulation Analysis.

Western Park is located in a built-up area in Freemans Bay\textsuperscript{54}, the fringe of Auckland city centre. The park is in a “wedge shape”, on its west and north edges bounded by residential properties; Auckland Girls Grammar on its east edge and Ponsonby Rd on its south edge.

There is a major traffic flow at the south, which is Ponsonby Rd, the centre of Ponsonby, which going from west to east connected Freeman Bay and Newmarket. Hopetun Street passing by on east, that connects directly to the city centre. The road network at the west side of the park, connected the residential buildings together.

A number of asphalt path that weave sinuously throughout the park connected all the accesses. Those asphalt paths are the only way that people can walk through the park, because of the steep slopes in this park.

\textsuperscript{54} Draft Western Park Development Plan, (Auckland Council, March 2015), 18.
Figure 3.2.2.2 The close looking of the site.
3.2.3 | Physical Analysis.

The topography in Western Park is various, from sloping land and valley to flat ground. Overall, the park is on a land that is slope away from Ponsonby Rd down to Anglesea St (see Figure 3.2.3.1). When analysis it by sections cut along its short edge, we can clearly see a valley topography that is sloping away from its boundaries to its centre (see Figure 3.2.3.2).

A water pond is located at the bottom of the valley, where all the rain water flows into it, is at the physical centre of the park. The low-lying area is affected by the flooding, which is a serious problem for future planning.

The topography at the bottom of the park is flat and open (see Figure 3.2.3.3), where there is a football field and children's playground. This flat ground offers possible building site for a large scale building without causing too much damage to the existing topography.
Figure 3.2.3.1 The Section Cut Through Western Park Shows the Topography.
Figure 3.2.3.2 The Section Cut Through Western Park Shows the Topography.
Figure 3.2.3.3 The Section Cut Through Western Park Shows the Topography.
Figure 3.2.3.4 The Aerial View of Western Park from Ponsonby Road Side.

Figure 3.2.3.5 The Aerial View of Western Park from Auckland Girl’s Grammar Side.
3.2.4 | Ecological Analysis

The diversity of vegetation species in Western Park is high. The park has over 240 mature trees with many having significant historical and botanical values. Some of these trees were planted in the late 1800’s when the park was first established. Some of these plantings were based on gifts of plants and seed given by Sir George Grey, the then Governor of New Zealand.

The photos on next page show the existing vegetation in the park, from large specimen trees to formal boundary plantings. Most of those are naturally grown, part of them are artificial plantation and native revegetation.

The diagram on page 36 indicated the tree density and grouping conditions in the park. Some regularities about growing positions of the trees can be found by reading this diagram. The four regularities as described below:

1. Trees in Western Park are grown in groups.
2. In a typical group, trees are distributed as a radial shape. A large tree in the centre surrounded by other smaller trees.
3. Most of the distances (in a straight line) between two adjacent tree trunks are around 12m to 15m.
4. Most of the tree canopies are contacted with the adjacent trees, but not overlap each other. From the aspect of botany, it’s the outcome of trees’ competition for sunlight.

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56 Ibid. 10.
Figure 3.2.4.3 The Existing Vegetations in Western Park
Figure 3.2.4.4 The Analytical Diagram of Existing Vegetations in Western Park.
3.2.5| Surrounding Functional Analysis
As the drawing shown on the right, the surrounding urban context of Western Park is complex. It contains several of building types such as an educational building complex, office tower, local commercial building, and residential building in different densities.

Building density in this district is relatively high, which means there is a large population that could be the potential users of the library. As discussed in the chapter "3.2.1| the choice of site", the surrounding building typology can reflect the conditions of population nearby. For example, people's occupations, ages, races and even hobby.

The library would become an afterschool learning place for the school girls in Auckland Grammar School, the relaxing place for the residents around the park, and also the resting place for families that shop on Ponsonby Rd.

Figure 3.2.5.1 The Analytical Diagram Shows the Building Typologies Around Western Park.

3.3| DESIGN PROCESS
Figure 3.2.5.2 The Single Residential House Around Western Park.

Figure 3.2.5.3 The Office Tower Around Western Park.

Figure 3.2.5.4 The High Rise Apartment Building Around Western Park.

Figure 3.2.5.5 Auckland Girl’s Grammar Next to Western Park.
Figure 3.2.5.6 The Small Commercial Building on Ponsonby Road.

Figure 3.2.5.7 The Small Office Building on Ponsonby Road.

Figure 3.2.5.8 Another High Rise Apartment Building Around Western Park.
To complete this project, there are a few questions that need to be explored and answered in the design process. These questions are described below:

1. What is the most efficient and feasible layout options for the building?
2. What unique reading experience can be created inside this building?
3. What building form has the minimum visual impact on its natural environment?
4. How to maximally capture the natural through architectural means?
5. What features does the facade should have to blur the boundary between natural environment and interior space.

To answer these questions and complete the project, the entire design process is divided into the following design stages: functional layout, form designing, the development of the relationships to nature, building facade design, and circulation, roof, and floor slab design.

The design process applied for this project is conventional. It uses sketches and digital modelling. Hand sketches, as the main tool that visualized design ideas, play a very important role in every design stage. Alternative ideas can be quickly recorded on paper through sketches. Besides, the conversation between hand and brain could generate more inspirations. The making of digital model is also a very important way to develop the design. The observation and engagement of digital models can enhance the three-dimensional design ability, in particular stages like, form, facade and roof design stage.

The following paragraphs will describe each design stage in detail.
3.3.1 | Function Layout

After the site location has been decided, the first step should be taken is thinking the best way that can reasonably organise every building function. Library is a public building with lots of functions inside, a proper layout will promote people’s visiting experience.

To achieve a proper layout between these functions, aspects like orientation, contour, surrounding tree conditions, near site people flow and noise will be considered.

Based on the requirements in the brief, the library has a youth area with tech room, one quiet studying area, one children area with reading room, two lecture rooms, a gallery, staff service rooms, a cafe, and several outdoor reading spaces.

The consideration of noise effect is the main principle that will be applied during the design. Following this principle, these functions will be divided into two groups, which are quiet areas and noisy areas. The noisy area includes: cafe, lecture rooms, children’s reading area and gallery; the quite area includes: youth area and quiet studying area. As an outcome, all the noisy functions are placed in the south part of building, while the quiet functions are placed in the north wing. There is a courtyard and the staff office in the middle that separates them.

The staff office and service centre are located in the centre of the building and facing the main entrance, so that librarians can have an equal walking distance to each part.

Figure 3.3.1.1 Bubble Diagram Shows the Functional Layout of Library.
3.3.2 | Initial Building From Design

After the functional layout been finalised, the design moved into the building form design stage. Before starting to sketch forms, some precedents survey was done, in order to investigate and learn the relationship between the building form and its natural context. It was important to find and develop an initial idea based on those precedents. In the section below, listed seven precedents with seven analytical diagram that people flow and their relationship to nature.

The first precedent is a building with simple ring shape. There are two natural systems exist, one is contained inside a courtyard, another surrounds it. Users of this building can engage with two natural systems at the same time.

The second precedent has the same shape as the first one, however it only have the trees that surrounding it. People inside

The third precedent is a simple tube shape building, people can flow from both side of the building. Because of the linear shape, so the building can have long facades with maximum contact to its nature environment.

The fourth precedent is a building complex with a random arrangement of linear form, people flow happens inside the building. The random arrangement created several enclosed

Figure 3.3.2.1 Analytical Drawing and the Physical Model of the First Precedent.

Figure 3.3.2.2 Analytical Drawing and the Aerial View of the Second Precedent.

Figure 3.3.2.3 Analytical Drawing and the Exterior View of the Third Precedent.
courtneys and half-enclosed yards. The interaction happens between the building and its nature is in various ways.

The fifth precedent is a building with a cloud form that permeates the space between trees. People can flow around the building. The cloud shape have a strong sense of interaction to the nature, the flowing shape allows the maximum contact to the nature as well.

The sixth precedent is a series of boxes, a complexity where people flow across the spaces between boxes. Each of the box are located separately, so each box can have four facades in

The seventh precedent is a snake shaped building, people walking on the building’s pathway. The strip building flows freely in the space between trees, the flowing shape also created series of courtyards and half-enclosed yards. The building has a maximum contact to its natural environment because of its long linear shape.
After analysing all these seven precedents, three initial building shapes were defined by combining some of the precedents’ ideas. The principle being followed when combining these forms was that of using the advantage of one to remedy another’s flaw.

The first initial form as Figure 3.3.2.8, it’s the combination of the fourth and sixth precedents. It has several irregular shaped spaces connected by a series of pathways that enclosed some courtyards of different sizes. It has big open spaces, and every space has rich relationship to nature. However these spaces are too separate, which will cause the inconvenience for managers. Besides, the polygonal shapes don’t looks harmonious on this site with its many curved topographical features. (see Figure 3.3.2.11 and 3.3.2.12).

The second initial form is the drawing below. It combines the first precedent’s idea with the second one, it is an arrangement of series of rings of different sizes. The basic loop shape looks harmoniously related to the curved surrounding topography. However, it has an obvious disadvantage that this layout doesn’t create enough of a big open space. Besides,
the circulation area takes too much interior space, which will destroy the integrity of each function and disturb the users. This may also cause the librarian inconvenience when managing the library.

The last initial form, in the drawing below, combined the idea of the first and fifth precedent. It permeates the trees like a cloud without any certain form. This building layout maximally uses the space between tree trunks and also creates the maximum contact with nature. This layout can also contain lots of big open spaces with strong connectivity between each other. Like the previous layout, it also looks harmonious in its context.

Figure 3.3.2.9 Drawing Shows the Second Initial Form.

Figure 3.3.2.10 Drawing Shows the Third Initial Form.
When making the final choice, the three initial ideas were evaluated. The criteria used were based on the future library trends concluded from previous researches, which are:

- Transparency among spaces.
- Larger and more varied spaces for children and teens.
- Daylight in all areas of the building.
- Connections to outdoor space.
- Flexibility to accommodate future requirements.
- Staff are more accessible to all areas.
- More accessible for public.

The green colour indicates the items have been addressed, the red colour indicates the items haven’t been addressed, and the blue colour means
- Transparency among spaces.
- Larger and more varied spaces for children and teens.
- Daylight in all areas of the building.
- Connections to outdoor space.
- Flexibility to accommodate future requirements.
- Staff are more accessible to all areas.
- More accessible for public.

- Transparency among spaces.
- Larger and more varied spaces for children and teens.
- Daylight in all areas of the building.
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- Staff are more accessible to all areas.
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- Transparency among spaces.
- Larger and more varied spaces for children and teens.
- Daylight in all areas of the building.
- Connections to outdoor space.
- Flexibility to accommodate future requirements.
- Staff are more accessible to all areas.
- More accessible for public.
3.3.3 | Building From Development.

As I discussed above, the form chosen for the future development is the cloud shape idea. This form will be amended according to the requirements of building function, circulation and topography. The building shape refining process is repetitive, it takes many refinements to make the building looks elegant, fits to the nature, and meets the functional requirement. The series of sketches below shows the refining process.

Figure 3.3.3.1 The First Developing Sketch Drawing.

Figure 3.3.3.2 The Second Developing Sketch Drawing.
Figure 3.3.3.3 The Third Developing Sketch Drawing.

Figure 3.3.3.4 The Fourth Developing Sketch Drawing.

Figure 3.3.3.5 The Fifth Developing Sketch Drawing.
The initial from is too ideal, only represents the idea. To make it practicable, the building function and circulation needs to be taken into consideration. In the next few paragraphs, each point is explained to demonstrate the design.

The gallery is placed that the south end. Considering the fact that most of the visitors will come from the south through the footpath, putting the most public-open function at the south end is reasonable. Public can walking through the gallery and then enter the library, which will bring people the sense of learning in advance. The gallery is stretched into a long narrow shape in order to meets the gallery’s circulation requirement that people can flow in a clear direction. This long and narrow shape also extends the touring time and items that can be displayed.

The main curved shape entrance is placed at the centre of the building, near the intersection of three footpaths. Because it is designed as the main entrance, so it must be placed as close as possible to the major people flow direction. Also the main entrance is designed as a big curve that creates a half-moon shaped front yard. The front yard functiones as a buffering area before entering the library, which offers visitors a place to wait, prepare, and gather. The large curve shape will also create the sense of welcoming.

The lecture room is placed at the west end that away from the major pathway, because lecture room needs a quiet environment. The traditional lecture room is usually a fan-shape in plan, compare to the square plan lecture theatre, it has better sound field and less visual interruptions. To keep the advantages of fan-shape lecture theatre, a water drop shaped lecture room is designed to imitate it.

A round courtyard is placed in the middle of the building, fully surrounded by a corridor (shown as F). The corridor becomes the main circulation loop that distribute people into different areas. Placing the transportation core in the middle helps minimise the disorder in circulation, which is the most efficient way to organise the people flow. The natural environment inside of the courtyard improves the interior environment of library, people can easily build up visual contact with the courtyard from all directions.
Figure 3.3.3.6 The Developing Plan of Library.
3.3.4| The Development of the Relationship to Nature.

In this design stage, the phrase “capturing the nature” is introduced, which means build up the relationship with the natural context from all aspects. The plan shape is similar to an amoeba. This microbe does not have a defined form. It keeps changing itself to adapt the environment. The image below shows an amoeba. When it is ingesting food, it will change a part of its body into pseudopods, and then the pseudopods will create an encirclement of its food until the food been fully eaten. The digestion of food happened inside of its body, after it, the excrement will be excreted.

The way that this building engages with nature is similar to the way the amoebas ingest their food. By comparing this building to the amoeba, the wings of this design can be thought of as the pseudopods. The “pseudopods” of the building extend themselves into the surrounding natural world, where they encircle the surrounding trees. The courtyard in the middle of the building can be seen as the process of “digestion” of nature. Nature is fully captured, becoming a part of the building.

There is a tree growing right through the building floor slab and roof in the child area, the trunk are designed to expose inside of the building. The idea is to creating another level of engagement with nature, which is making the nature tangible.
At this level, nature is moulded into the building.

In this project, five different levels are introduced that describe the relationships with nature (shown as the Figure 3.3.5.1). The relationships show in the diagram from left to right are: the natural environment, the grey space under the building canopy, interior of library, the nature inside of courtyard, the interior space with tree trunk, the grey space under the building canopy, and the natural environment again. These relationships are reflected in the library design as indicated on the next diagram that uses the same colour legend as the previous one.

As the explanation of these two diagrams, the building interior space and the natural environment are entangling, interacting and pervading. Through bringing those complex relationship in, the library can escape from the traditional way of the building engaging with its landscape.

3.3.5| The Design of Building Facade.

Even though the facade of a building normally functions as the barrier that separates the interior and exterior, however, the facade of this library acts as a skin. The skin performance of a natural creature acts as a barrier to protect the creature from external harm, and it also has such functions that expel the waste from the body and absorbs a small amount of nutrition. Likewise, the library facade should protect the interior from the external hazardous factors, but also allows the permeation happens at the same time. Using architectural systems, it is hoped that people outside can look through the entire building, having visual contact with inside events and nature on the other side of the building. Through this untrammelled vision, the atmosphere of green environment can be brought into the building, so that the indoor atmosphere will be intervened.

Considering the requirement mentioned above, the facade should have enough visual permeability. To achieve this goal, the facade should be designed as fully clear glass so that visitors can experience this transparency. Technically, consider
from the aspect of energy efficiency, all the glazing should be built with triple layer.

3.3.6 | Circulation, Roof and Floor Slab Design.

Circulation

As shown on Figure 3.3.6.1, the red line indicates the major people flows outside of the building, while the yellow indicates the circulation inside. As can be seen from the plan drawing, there are four entrance in the building. First is the main entry in the middle, the second one is at the south end of the galley, the third one is facing to the yard surrounded by open tech wing and youth area, and the last one is opened between cafe and youth area. All the four entrances are located adjacent to the footpath, which provides the visitors with easy access.

Inside of the building, people flows through the corridor that surrounds the inner courtyard. Visitors are distributed into different area in the most efficient way that minimise the disorder of circulation.
Roof and Floor Slab Design

Because of the topography of the site with a steep slope, it is difficult to organise the floor slab level to match the contour changes and meet the building functional requirement. Exploration with the computer program Revit quickly showed that, the gallery, staff office, bathroom, cafe and youth area should be placed at the bottom level on the flat ground. The functions like children’s area, lecture room, quiet study area are located on the upper level. The lecture room and quiet study area are classrooms that have lots of steps with desks and chairs, which have the characteristically sloping. So it is reasonable to build up those class rooms in steps that can follow the contour. The children’s area was also designed with some steps inside to follow the contour, which will bring lots of fun into the space making children interested and happy. The two draft sections on the next two pages will show the relationship between building floor slab and the site topography.
Figure 3.3.6.2 The Long Section Shows the Relationship Between the Library and Site Topography.
Figure 3.3.6.3 The Short Section Shows the Relationship Between the Library and Site Topography.
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4.0| DESIGN OUTCOME
5.0| CONCLUSION

In response to the fact that the traditional library system is in decline because of the digital technology, this is an innovative library that can give people a new experience. The new experience is going to be achieved by the integration of architecture and nature.

The first objective of this project is to explore the new social roles of physical library in 21st century, in order to let the library be attractive to the public. It would create a brand new library typology; the second objective is to redefine the relationship between artificial environment and natural environment. It would explore different ways of integration that happened between architecture and nature.

The research done includes the study of literature and examinations of related precedents. The first part of the research is about the roles of physical library and the library trends in 21st century. Through the research, it is clear that a library is still the most popular building type that can attract people to visit. The next part of my research is about studying the psychological impact of greenery. In this part of research, several studies were collected that result from work done by scientists to show that it is possible to improve people’s reading and cognitive ability by being related to the natural environment. The rest part of research is the examination of related precedents, which showed many design strategies about designing 21st century libraries and how to make the building integrated with nature.

The knowledge that learned from previous research was the foundation of the design process. In the design process, this was applied in the stages like: form design, functional layout, circulation design and facade design. Five layers of relationship were introduced between building and nature in my library to achieve the objective that redefine the relationship between artificial environment and natural environment. Some new functions were included in the library to make some improvements from traditional library. For example, the large open technology room to meet people’s requirements about digital reading; the large gallery space can be used to hold public events, which can bring new uses into the library; large open spaces in the reading area has flexibility to accommodate future requirements. It is those new functions that create this new library, furthermore, this new library re-explained the new social roles of physical library in 21st century.

As a conclusion, this library design is an architecture that
integrates with nature through particular designed form, facade and function. The building achieved all my research objectives with an elegant form, which made me believes that this library would be an enlightening landmark in Auckland.


7.0 | APPENDIX 1

7.1 | LIST OF FIGURES

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