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EcoStudents
A Green Building for Student Living

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“Thesis completed in part fulfilment of requirements for the Master of Architecture (Professional) degree at the University of Auckland, 2013.”
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Alhamdulillah for everything that I have received in my life so far. Faith, health, family and friends.

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ABSTRACT

The university life is an important chapter in the development of a student. This is the time when a person matures and takes a direction that would carry on throughout their lives. The academic life is only one aspect of the whole spectrum, whereas equally important is the development of a wholesome personality that is influenced by the environment; physically, socially and culturally. Learning and shaping therefore does not only occur within the walls of university classrooms but in the dwellings and common rooms of the students.

Many student accommodation designs are commercial solutions that are economical without considering a philosophy that would reflect students. They should be “fun” and embody the “student spirit”; at the same time presenting them with the realities of life and the need to be responsible towards oneself, the community and the environment.

Auckland has experienced a major growth in the last decade and will continue to increase in size; presenting an opportunity to rethink and question our way of life as we face critical problems such as the lack of student accommodation, pressure to sustenance of food supply, safety, waste management and issues of conservation such as cultural diversity and the lack of green spaces.

This design thesis is an exploration of embodying the “EcoStudent” as a philosophy by designing a student accommodation that promotes the student spirit through the green living concept. With elements of food growing and other forms of sustainable living such as rainwater recycling, using food waste as compost for food growing and passive heating and cooling systems, the EcoStudent concept breathes soul into the building and creates a milieu not just for students to live but for the development of a healthy environment.
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INTRODUCTION
Students are future generations that shape the world. They develop personality, character and ideas during this period. They are like a sponge that would absorb everything poured at them. They are like clay that can be moulded into a fine sculpture. With so much stimuli surrounding these young generations, it is hardly surprising that students nowadays are becoming less interactive, facing the computer for hours and developing a shell around them. This unhealthy lifestyle presents a waste period when the energy could have been channelled to a healthier and beneficial activity.

Having a green accommodation to live in would influence how they understand nature; and would grow up to be responsible citizens that believe in the idea of each person having a role to play in. By living green, students can grow they’re own food; while inhabiting an environment that utilises passive design, water and waste recycling and using low impact materials. When people understand that you can actually grow your own food, and don’t have to use a heater during winter or turn on the air-conditioner during summer, or even use stairs rather than lifts, it would create a whole new understanding of what sustainable and responsible living is. It is a lifestyle that needs to be trained, and I believe architecture plays a huge role in developing this new lifestyle.

Auckland City has been facing an influx of new residence every year, offering a place desired by many around the world. One of these groups is students, looking for a decent place to stay during their university life. With property values increasing every year, these students face a problem of finding affordable housing which results in some of them sharing rooms or living far away from the city, compromising with living conditions that would affect the performance of their studies.

Practical solutions that are economical tend to be the first thing designers think of when dealing with housing problems. This however must not deter us from the importance of providing student housings that have a strong philosophy. The empowerment of human capitals would promote new generations that continue to churn innovative ideas that are not deterministic.

This scenario has challenged me to explore the conditions of student housings, and to develop an accommodation that centres around the student spirit through the development of a wholesome, healthy and responsible cultural beings.

This thesis has four chapters. The introduction touches on key aspects of this research. Chapter one analyses the contextual scope; student accommodation, green architecture and culture in architecture. The second chapter is divided into two, firstly looking at case studies involving famous student accommodations and a comparison of two similar programs in Auckland and the US. Secondly is looking at urban farming and why it is important in today’s environment. The third chapter is the design proposal of the student accommodation and finally the last chapter is the reflection and conclusion of this thesis.
CHAPTER ONE
Contextual Analysis
1.1 STUDENT ACCOMMODATION

1.1.1 Students as the inhabitant

Most people would agree that the period of university life is an important chapter in the development of a person. This is the time when a person matures and takes a direction that would carry on throughout their lives. During this period, the student would spend most of their time living in a hostel, hall of residence, flat or student accommodation, the few different names given. The purpose of a hostel or student accommodation is to provide, in a world where mobility is rapidly increasing, a way of life for special circumstances and for individuals and groups thrown upon their own resources – for people of all types, age groups, and social and cultural backgrounds. Students require many types of residence, such as living alone or in groups. Hostels or student accommodation in this sense means those who are not able to get the facilities of a family home. When looking at the preferences, many factors emerge. For some, hostels provide an enjoyable way of life. For others, it is simply getting out of the house and exploring a more independent living. In contrast, there are also people who, because of circumstances live in hostels though they do not want nor like the way of life. While there are different types of student accommodation provided, regrettably not all student accommodations provide agreeable living. It is essential to inter-relate the physical environment, including the aesthetical qualities of provision, with personal and social considerations and convenience.

“The student body as an entity may be thought to possess characteristic qualities of personality, ways of interacting socially, types of values and beliefs, and the like, which are passed on from one ‘generation’ of students to another…We contend, in fact, that this culture is the prime educational force at work in the College, for…assimilation into the student society is the foremost concern of most new students.”


1.1.2 Student accommodation program

There are different types of student accommodation, ranging from “housing” to “hotel”, and the middle range “hostel”. They are clearly identifiable, usually from the labels and the scale of the building. They also come in different standards, from minimum furnishing and equipment and considerable ‘do it yourself’ to fully furnished residential accommodation with a full house-keeping and catering service. University do not need to provide all these types of housing to meet different groups, but it is important that they recognise the requirements and situations to ensure optimal learning experience. This is so as each university have different student groups. Below is an exploration of basic student accommodation set up:

In terms of floor plans, student accommodations are usually designed with short rectangles due to economical reasons as it reduces exterior wall lengths and heat loss. Traditionally, the pattern would be an open or closed quadrangle, with wings arranged in “T”, “H” or ‘X” plans. With
this shape, common-use and service facilities are placed at the core to separate study and sleeping and prevent noise from spreading to unwanted areas. In terms of size, experienced housing officers indicate that a student accommodation should be small enough for each member to know the others as more than casual acquaintances. Usually, institutions would group students from 35 to 50 people, but there are tentative indications that group of 8 to 20 works better as a community and therefore some colleges or universities would plan their housing units for student groups in this size range.5

As student room arrangement are the fundamental aspect of student housing, circulation automatically becomes an important aspect to consider. The most common and logical order would be the ‘corridor plan’, series of rooms allocated next to each other and a corridor in the middle, like a hotel. If both sides are occupied, it is called a double-loaded corridor. This arrangement poses perennial noise; but few solutions have been implemented such as offsetting the corridor to give a turn or a jog to interrupt sight and sound about midway into the structure. Another solution is to use a single-loaded corridor. This arrangement could give an opportunity to widen the area and include informal lounge and meeting space, with student rooms and other facilities. Many student accommodations use balcony-type exterior corridors that simplify plans, permit ventilation and daylight, reduce cost of constructing and maintaining corridors and provide a second fire exit.6

In the Hume Hall design, an uninterrupted typical double-loaded corridor can look like a tunnel and sound chaotic. Jog corridor reduces the distance sight and sound must travel. The offset also provides location for common spaces.7

In the Residence Hall, the rooms are arranged on one side of the corridor instead of two, cutting the noise sources. The passage is widened to double as a lounge, and window wall breaks the visual monotony and makes the narrow lounge seem more spacious.8

Figure 1.1: Typical floor plans of student housing in the 1970s
Figure 1.2: Plan of Hume Hall, University of Florida

Figure 1.3: Plan of Residence Hall, Thompson Point Development, Southern Illinois University
The addition of kitchens and kitchenettes to suites (rooms with toilets attached) would make them become apartments. This type of housing unit is rarely used for student accommodation especially when dealing with undergraduates as it is difficult to supervise and will eliminate the need for common lounges and meeting rooms, and therefore fragmenting the living groups which are the essential goal of a student accommodation. However, it is also important to make sure that the communal kitchen is comfortably within reach of the students as to make them feel more at home than in an institutionalized environment.

Another important aspect to consider is the placement of study rooms or libraries. These facilities are important because due to economic reasons, it will eliminate the need for study facilities within the student’s room. The size of room should be enough to accommodate small numbers, as to differentiate to a common room or lounges where more interaction is expected.

The main lobby and lounge is the first point
of entrance, as such it sets the tone for the entire building. As with most old student accommodations, the lobby is a formal space which makes it uninviting to the inhabitants or the visitors. The lobby is usually for circulation, communications, and entertainment of parents and other visitors.

Last but not least, are the pockets of private spaces for students within the building. This is an easy yet always excluded space in a student accommodation program. While the ethos of student accommodation is the collective living of student “spirit”, it is essential to provide private areas for meditation and retreat. A small area away from public traffic, not necessarily enclosed will have a special connection to the students living there. The space can be equipped with adequate furnishings for its intended purpose.

1.1.3 The importance of having a quality student accommodation

We need to understand that the aim of a comfortable living environment, as of a good family home, is to cope with the demands made on it, to provide people with inspiration and support, and to assist them in being ‘wholesome and cultivated human beings.’ This is a starting point for students to develop their own further arrangements for living according to their own developing powers.\(^\text{10}\) How the building adds to the education of the students who live in them is a testimony of how quality it is.\(^\text{11}\) One way is to create an environment closely to a home feel, rather than institutionalised. A research conducted has shown that students are aware of how contextual issues and architectural elements such as colours, materials, and spatial solutions either supported an institutional character or supported a feeling of home.\(^\text{12}\) In the end, the critical factor of a successful student accommodation is not the dollars spent, but an imaginative design.\(^\text{13}\) In the context of Auckland city, there has been a continual increase of students arrival; demanding quality student accommodations. This has been supported by Auckland’s two biggest universities, University of Auckland and AUT University. As of 2001, University of Auckland students have increased from 29465 to 40784 in 2012, while the number of AUT University students is recorded at 26243 in 2012. In 2001, the number of full time students living in the city accounted for 15%, and has definitely risen since. This number is not taking into account part time students, and the statistic done showed that 25 percent of inner city apartment dwellers are aged between 20-24 years old, the age of university students.\(^\text{14}\) Due to this, the city has been facing with the shortage of housing for students and this is reflected in the cost of rental which has been increasing every year.
1.2 TOWARDS A GREEN ARCHITECTURE

1.2.1 Definitions of important terms

Green Building

The term “green” is one of the most poorly defined terms in architecture today. It is used as a money term to sell developments and for designers to feel good on a project that have probably taken so much from nature. While the terms “green,” “sustainable,” and “ecological” are often used interchangeably to describe environmentally responsive architecture, in reality each term carries its own history and socio-political connotations, as well as its own architectural meanings, use and operation. It involves a combination of values—environmental, social, political and technological—and thus seeks to reduce the negative environmental impact of buildings by increasing efficiency and moderation in the utilization of building materials, energy, and development space. All in all, green architecture is the umbrella term, and understanding the following terms are essential to understand and define green architecture.

Sustainability

The term “sustain” in Oxford Dictionaries means to keep in existence, to strengthen or support a condition. It is mostly used to address environmental and climatic concerns due to the ecological roots of the term. In 1970s, the term sustainability was first introduced by Brundtland Commission as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. Therefore, there are different approaches and definitions to sustainability, depending on the context. While ecologically, it is defined as the ability of an ecosystem to maintain ecological process, function, biodiversity and productivity into the future, in architectural context, sustainability is defined as economically affordable, environmentally healthy, and technologically efficient and high-performance buildings.

Sustainable Architecture

Designing a sustainable architecture has become an increasingly important element as humans continue to search for an efficient way of life. Sustainable architecture means a building that is technologically, materially, ecologically and environmentally stable. This is established, for example being materially stable by considering its durability, maintenance level, and recyclability. Consideration should also be taken towards construction, profitability and building stock value to become economically stable. On the other hand, being resource stable means considering site condition, cost-effectiveness of the operational and life cycle of the building, accessibility and favourable natural forces. Finally, creating a healthy, habitable and safe environment with social and institutional capacity should be the primary focus for environmental sustainability. The architect’s challenge, thus, is finding a balance among technological and materials considerations, resource availability and environmental sustainability.

1.2.2 The need to be Green

Green is an abstract concept, which requires the inclusion of the terms: sustainability, ecology
and performance. While the sub-terms are categorically related, each category is nonetheless independent and mutually exclusive. This is to say, a building can be sustainable but not ecological or green, whereas a green building must be sustainable, ecological and performative.

The level of greenness is determined based on the level of interaction of these three categories. Due to its abstract nature, it is difficult to assess the greenness of a building. Therefore, the three categories that make up the green concept—sustainable, ecological and performance have been defined operationally. The taxonomy provided in Figure 1.6 is an excellent way to show how green architecture is considered; it is not sequential, but rather works primarily from the bottom up.

For any building to be considered as green, it should include all the categories in various degrees. For example, if a building uses only durable materials, is affordable and is healthy, but does not include the rest of the criteria, then the building is barely sustainable and goes to the bottom of the sustainability scale. If one of the subcategories is missing, even with the sustainable qualities, it cannot be considered as a sustainable building.\(^\text{18}\)

1.2.3 Green Architecture in New Zealand context

Auckland is a beautiful city, situated on the north island of New Zealand, flanked by the Hauraki Gulf and Waitemata Harbour. The Auckland region is surrounded by more than fifty volcanoes, all considered extinct. These are turned into parks, ‘recreational open space’ and nature sanctuaries. New Zealand’s commitment to preserving its natural environment has made it a world’s treasure with the tagline “100% pure. This care towards nature therefore means development in the region should be sensitive to the environment, hence the need to promote green buildings. By providing a student accommodation that is green, we can teach students to live green, and this way of life will be a starting point for them to carry on for the rest of their lives. It requires effort and knowledge; to engage students to grow their own food from the garden features provided, and to make them aware of how architecturally responsive design such water and waste recycling and passive ventilation and lighting can make them a green community and thus improve their lives.
Figure 1.6: The Green Architecture diagram
1.3 CULTURE IN ARCHITECTURE

Auckland is home to many cultures. While the majority of inhabitants claim European-predominantly British and/Irish descent, there is a substantial amount of Maori, Pacific Islander and Asian communities. In fact, Auckland has the largest Polynesian population of any city in the world and a higher proportion of Asian origin people than the rest of New Zealand. Auckland is the country’s most metropolitan city, with ethnic groups from all corners of the world being present. \(^{19}\) The influx of many cultures encourage a diverse and vibrant city. While this is important, it is also necessary to maintain cultural integrity by making sure its original culture is not lost, especially, the indigenous cultures of Maori. As the city move towards a modern environment, we must not forget the rich history that ties all together. Appreciating history makes New Zealand different from the rest of the world, and this could be done by taking cultural elements into building design.

1.3.1 The Koru concept

The Koru concept is a symbol that fascinated me. As I searched for a strong element to represent New Zealand, I came across this symbol and concept. It is a strong shape of a spiral that at the same time represents gentle movement towards the centre. The more I researched about it, the more I realized of its existence, and this is to no wonder as it is the most commonly used Maori symbol in New Zealand. In Maori, the word Koru means “loop” and the shape is taken from the unfurling fern frond. It is usually included in the complex pattern of Kowhaiwhai, with other symbols. The circular shape conveys the idea of perpetual movement, and its inward coil suggests a return to the point of origin. Like life, it both changes and stay at the same time. It also symbolises new life, growth, strength and peace. \(^{20}\) With this concept, I felt the connection with my whole theme of designing a green building for students. Being green means to be able to be sensitive to mother earth, to give back what we have taken and to facilitate the cycle of birth and regrow. With the implementation of gardens for food farming and the use of rainwater recycling, I believe the Koru concept can be applied in the design. Not just as a form, where it closely resembles the ‘Golden Mean’ shape, a form architects have used for centuries; but the whole commitment to new life and growth to the community. \(^{21}\) The unfurling nature also represents an idea of opening to new ideas, new ways and new opportunities in life. It brings hope and possibilities. I envision the student accommodation to be a starting point for students to live a sustainable life, to learn how to appreciate Mother Nature and more importantly

Figure 1.7: The unfurling of silver fern frond
to carry these principles in life and influence the community.
1.4 CONCLUSION OF CONTEXTUAL ANALYSIS

This chapter has brought up an interrelated tripartite critical issue that would lead to my design development. First of all is the need for new student accommodations in Auckland. As the number of students continue to rise, so to must the development of housing for these groups. The next critical issue is the development of green buildings. Because Auckland is New Zealand’s largest city, there exist pressures to meet the demand of expansion. While constructing new buildings, we should not only consider cost but also its impact towards the environment. This is even more important coming from New Zealand, one of the cleanest and most beautiful countries with its slogan “100% Pure”. By using Green building strategies, for example making sure buildings comply with GreenStar requirements, we can ensure efficient clean buildings are constructed. The last issue to be addressed is the importance of cultural awareness in architecture. I consider myself to be a global citizen, having being brought up in different countries and observing different cultures. The idea of building a sustainable city does not only mean meeting the demand of housing and being a green building but also to respect the social context. We should try to minimise the idea of “International Style” and to encourage the development of creativity through understanding the rich local culture. This includes language, art, symbol and history. This project is an exploration to condense these three issues into one overwhelming program, and achieve a successful student accommodation.
2.1 STUDENT ACCOMMODATION AROUND THE WORLD

Students nowadays are different to students back in 1940s. During that time, it is different in a sense that students who enter university are considered elites; they have an air of “egoness” and “proudness” as they feel they are contributing to society. These days students are more quite and feel that university is a place to develop their character, hone their skills and get a good job later on. In Britain, before the formal ending of in loco parentis, (which meant in place of a parent; referring to the legal responsibility of a person or organization taking over a parent role) there is a strong regulatory basis for residence in hall, whether in Oxford or other civic universities. This is due to the fact that these halls provided numerous benefits to the growing number of students after World War two, especially those coming from tough conditioned places. The number of student grew rapidly from 50 000 in 1938 to 80 000 in 1947, and 90 000 in 1956. In the mid 1990s there are roughly 1.5 million university students. As the numbers grew rapidly, so did the expectation of halls and also the interest in independent living. Institutions are under pressure to recruit students, locally and internationally and during the 1970s, the influx of students without equivalent residential accommodation brought the country to crisis. Students are put in unoccupied university premises and offices are turned into temporary accommodations.

“The student experience was therefore often dominated by accommodation questions, including those of cost and alternatives, preference, dissatisfaction with the early new halls, and fluctuating interest in independent, off-campus living.”

The underlying message of understanding the history of students post-World War Two and later on is that each period presented different types of students. Right after the war finished during the 1950s, it is safe to say that most students came from the same condition; rough and in need of just a decent place to live. There is not much consideration towards energy saving, using sustainable materials or providing an exciting living condition to students. Rather, it is just a roof to keep them covered and a bed to sleep. In the new millennium that followed, although a lot of the culture remains, it is important to understand that students are no longer from the same background. There is an increasing difference of personality, culture, and even courses which mean we can no longer adhere to the old design of student halls. There is a need to capture the dynamic lifestyle of students, as they are presented with new choices, opportunities and pressures, not available during the old days. Architects should inject excitement to the living conditions and therefore student accommodation should not only be a place to live, but a place to learn and develop characters that would help them carry themselves in the future.
2.2 COMPARISON OF PRECEDENT STUDENT ACCOMMODATION

2.2.1 Famous student halls

**MIT Baker House Dormitories, Alvar Aalto, 1948**

The Senior House, later changed its name to Baker House in remembrance of Everett Moore Baker, Dean of Students who died in a plane crash, is completed in 1948 and operated the following year. It was designed by Finnish architect Alvar Aalto who is the visiting professor at the Massachusetts Institute of Technology (MIT) where it is placed. It is not only a dormitory that placed students but is an architectural wonder that reflected many of Aalto’s ideas of formal strategy. The house is made out of 43 rooms with 22 different room shapes that required distinct designs for the placement of built-in furniture. It provided beds for 350 students; some rooms accommodating one, two and three students. Aalto’s main drive for the design is to have a maximized view of the Charles River. Due to MIT’s requirement to have as much rooms as possible, he adapted a strategy which is parallel blocks in echelon, fan-shaped ends and “giant gentle polygon” resolving itself into a sinuous curve.25 His serpentine form is argued to have more rooms bearing towards the sun than any other system, and a desire to break
from “the powerful and inhuman monotony” of “the ground-plan of a normal American city with its checkerboard netting”. 26

There are three aspects that made Baker House stand out, at least when it started operating in 1949. First of all, it is not white. During that period of “International Style”, whatever building it might be, would be white. While his own previous work is white, Baker House came to surprise even his fans with a heavily textured red New England brick. In the student’s review of the building, some said that while the rooms are slightly smaller than the old dormitories, the Baker House was somewhat more organised in its furniture placement and that the red warm brick walls are way more welcoming than the normal thick paint-coated walls. Secondly, Baker House is not symmetrical or monumental. While a formal understanding of a big important building is to place the entrance on the axis or at least on a path perpendicular to their mass, Aalto went to respond to the site; where the entrance is not only from the “back” but at an angle.

Figure 2.2 Warm red bricks covering the walls of the rooms

Thirdly, it is not an entity. It is not even made of several entities put together. It had a curious angled shape on the campus side, and looking at one side gave you no hint to the character of the other. The building could not be identified as the same one just by looking at the two main elevations. He sees the action of packaging all functions into discrete geometric bundles as simplistic and forced. 27

The Baker House is a student favourite, and is applauded for its “spirit”. Little did they know that a large part of the atmosphere is carefully thought by Aalto. He divided the large toilets commonly done in student dormitories into smaller toilets that are spread out in the plan. The hallway became bigger leading up to the dining hall, in an attempt to transform it into a semi public-private space, as opposed to a public space that would be a sudden change from the private rooms of the students. While the rooms did not face northern sun in expense of river view, the stairway system is housed on the north side of the building that had unobstructed view of its surrounding. The dining hall had skylights that flood the area with natural light, and the main atrium became a focal point as all students had to cross this area, creating a lively “spirit”.

The solid limestone of the attached rectilinear common room on the other side acted as a static space in comparison to the movement of the dormitories, a juxtaposition of the sweeping curves. 28

The building went through several renovations, as would be expected of a 1950s building. Due
to insensitive solutions, the lounge area is renovated to add additional rooms, the originally natural wood grilles are painted white and the original pine cabinet-work are replaced by inappropriate rubbish of mahogany veneer and plastic laminate.

The Baker House is a solution from Aalto on the overwhelming and subdued International Style; an alternative path architecture might take. While breaking free from the norm might carry the seed of dangerous disorderliness in the hands of lesser designers, they also point to something positive: an architecture beyond formula, responding freely to the various determinants of given building situations. Personally, I do not agree with the solution of 22 room shapes, as to me this added more cost to the construction. It is also not fair to those who have smaller rooms with lesser facilities, which is even more of a problem as the management charged them the same. It is easy for an architecture student like myself to appreciate its boldness in stepping outside the box, to introduce a form not common to the people, but I am also inspired by Aalto’s attention to detail. His concerns on little things such as where the students would put their shoes, where they would gather and talk and what they would see from their window is as important as what they would see from the outside of the building. It shows that if you want a building to speak to its inhabitants, you have to care like an inhabitant.
Erdman hall dormitories, Bryn Mawr, Pennsylvania, Louis Kahn (1965)

The Erdman Hall Dormitories in Bryn Mawr College was built in 1960 and finished in 1965. It is designed by America’s famous architect Louis Kahn. The building is situated at the end of a suburban campus and accommodated 150 girls. In the design, Kahn came up with 3 square structures that are connected at the corner. His inspiration is clearly apparent throughout the building which is a modern Scottish castle. His concept of served and servant space is also included in the design. The walls of the halls became the servant spaces, with large hoods that rise above the roof to let in natural light. Individual rooms surrounded the hall to make up the periphery, and 4 bath units form the central space. This defined spaces are served as stairwells, balconies and passageways which are lit by skylights. If we look at back at Kahn’s served versus servant space, he believed that service spaces should be defined by those that are not. This includes spaces that generally contain mechanical, functional aspects and which habitant would be brief or impossible. Hence stairs would usually be separated from the main
spaces and by doing this introduces order. This is clearly evident in his other buildings such as the Salk Institute for Biological Studies and the Kimbell Art Museum.

Kahn has always been a master of arranging spaces, as he diligently work and rework on his plans. His cultivated architectural worlds came into being as a result of tension and complementarity by means of geometric patterning. He strived for harmony through the formation of forms, and believed that architecture begins as a room and in plan became a “society of rooms”, where it will help to convey a “spirit” to the others. Kahn has been quoted to
confess that the Erdman Hall Dormitories is one of the most difficult problems he had faced, as he struggled to find “the qualities that made a school great”. Through “thoughtful making of spaces”, he distinguished each space, each room as a single entity, not just a series of partitions”. In other words, Kahn is implying that a student’s room is a place of the mind, not necessarily an attachment to one’s home as a place of the hearth, but by means of the communal interior spaces in the dormitory complex, a substitute home for an alternative or extended family.32

Kahn has always had an affinity towards the medieval walled city and castles of Scotland on his European tour, and while during the early stages of his career followed the “International Style” discussed above, he later developed a more distinct style; a back-to-basic approach where it involved earlier modern movements idea. Kahn’s work on the Erdman Dormitories Hall is an excellent example of the different approach one might take to designing a student accommodation, much to my delight a contrast

Figure 2.6: The concrete walls and ceiling as a reference to old scottish castles
to the Baker House by Alvar Aalto, as a means to compare. While Aalto’s work is constantly connected to the site, I have not found any document of Erdman Hall Dormitories’ site drawing and how the building is placed in relation to the site. This showed how Kahn is more attentive to the form of the building and this is backed by many sketches of his plans. Indeed, by no means is Kahn’s work any less than Aalto, as he mesmerized me with his “fragments of Form”, and applied the concept of getting it as “close to pure Form: three cubes touching at the corners, advanced and recessed walls, creating side lights, a general rigid symmetry”. His intellectual clarity of his structures and planning proved prominent with the generic element of geometric form, but one can argue that the use of formal systems in complex compositions often caused an aggravating inflexibility. The enclosed rooms are a fixed entity emphasizing seclusion and isolation, which is not conducive to human wholeness. 33 Physicist Werner Heisenberg observed:

“we seem to inhabit a world of dynamic process and structure. Therefore, we need a calculus of potentiality rather than one of probability, a dialectic of polarity, one in which unity and diversity are redefined as simultaneous and necessary poles of the same essence.”34

Kahn’s manner of design may be called an attempt at “phenomenological seeing”, giving rise to a description of the building subject which reveals itself to the architect’s creative consciousness, thereby coming into existence, and creating a “world”. The dormitories’ view of the exterior are shut off, and the three blocks are mainly lit through light shaft, depriving the student’s room of sufficient daylight. This resulted in a student life which impaired a conducive study environment. This calls to mind Leddy’s previous quoted plea that “architecture should recognize the human need for wholeness”.35

“In a dormitory I’m doing for Bryn Mawr College, I had a feeling that the dining room, living room, reception rooms and entrance were different, in every respect, from the sleeping quarters. And I kept the sleeping quarters apart from these rooms, believing that I was expressing that one was different from another. But I discovered my mistake. I realized that a person sleeping in a room felt well about his house if he knew the dining room was downstairs. The same way with the entrance to the building. The sense of hospitality, or reception, of getting together must be part of the fabric of the house itself. I changed, much to my delight, the whole conception, and I made these spaces part of the fabric of the other spaces. To me, this is realization in form.”

-Louise I. Kahn-36

Kahn’s work on the Erdman Dormitories Hall brought interesting strong lines and a stark contras in design and building materials. While I find the design depressing and not liveable to students, Kahn did bring a lot of good qualities for me to ponder. His spacious modernity is a forgiving escapist space for the students, and the strong wall of the dorm served as the peripheral edge of the campus, and provided academic fortification from the outside world. It might be that because this is a girl’s college, more security
CASE STUDY

Figure 2.7: Section showing the relationship between student rooms on the outer end of the building and the core in the middle which is connected by tall tower-like structures that provide sunlight and privacy is considered compared to the Baker House which is a male dormitory. In all aspect, both yielded different results which have helped me in my design exploration.
2.2.2 Comparison of Simmons Hall and Huia Accommodation

The following two buildings have been chosen as to compare between a new modern student accommodation and a current student accommodation being used in Auckland.

Simmons Hall, Massachusetts Institute of Technology

The decision to choose Simmons Hall is because it is made for MIT, just like Baker House and is the most expensive dormitory built after the Baker House. In other words, it is an important and influential building just as Baker House during the 1950s. The building is designed by American architect Steven Holl in 2002, accommodated 350 students on 140 meters long and 10 stories tall structure. It is made out of reinforced concrete, with 5500 square windows each measuring 0.60 meters perforating the façade. Unlike the Erdman Hall Dormitories, Simmons Hall received ample daylight and ventilation in a well-lit urban condition, even though it is completely enclosed. The wall depth at 0.46 meters is designed to be a thermal mass that allows winter sun to heat up the building, and provide shade during the summer without air-conditioning. Five large openings that consist of the main entrance, view corridors and outdoor activity terraces become the lungs, bringing natural light down.
and moving air up. Holl’s design symbolised the student life as a rehearsal for the future life of civil society, the building becomes a slice of the city life, with large corridors to transform the hallway into street-like environments. It provided unexpected openings, lounges and common halls. A collective space that provokes interaction and dialogue among students.\textsuperscript{37} There are few criticisms of the building. Many residents complain that aesthetics came as a higher priority than functionality. For example, residents from “A” tower must take two different elevators, or must walk the length of the building twice (more than an eighth of a mile) to reach the dining hall because neither the “A” elevator nor “A” tower staircases reach the first floor, where the dining hall is located. Other peculiarities included staircases that are not connected to all of the floors and custom-designed modular furnishing that are very heavy and lacked durability.\textsuperscript{38} The hallway is also enclosed, meaning the building still uses electric lighting all the time, as the large openings are only located at specific joints such as the entrance. The plan,
Figure 2.11: Simmons Hall Plan, using the double loaded corridor system although might seem rational, included curving curved walls. walls from the adjacent lounge which in some cases took up half of the room’s floor space. As students, it is common to move furniture around and this is not possible with the result of the
Figure 2.12: The site plan, showing the Simmons Hall’s relationship with its surrounding fabric

Figure 2.13: Use of artificial lighting in corridor

Figure 2.14: Curved stairways
Huia Accommodation, University of Auckland

Huia Accommodation is one of the six hall of residence offered at the University of Auckland, New Zealand. Personally I am quite familiar with the accommodation, as most of my close friends used to stay here during our first year, therefore I spent a lot of time in this accommodation. It is the cheapest university accommodation available, as such it can be seen as the “minimum” standard of student accommodation in Auckland. Huia Accommodation is one of the new student accommodation that is refurbished from an old building in 2008. It accommodated 321 students on 11 floors. It has two bathrooms, a small communal kitchen and a common room in each floor. In terms of its size, it is similar to Simmons Hall, and thus gave me a good position to compare them both.

The only good aspect of the building is its simple and rational plan. A long hallway that is divided into two; typical rooms flanking the core of the building which are the bathrooms, kitchens and common rooms. Apart from that, there are a lot more cons in this building that I have explored.
First of all, although it is a new refurbished building, it can easily be mistaken as a 1970s accommodation. The interior is tacky with rusty looking carpets. Secondly, the building has poor energy efficiency; there are only two openings at the end of the hallway, therefore required the use of electric lights at all times. To save cost, the lights are not turned at all during the day, resulting in a dark hallway. Apart from that, ventilation is poor and facilities such as the kitchen and toilets would have to depend on electric lighting. During the winter season, the building gets really cold as there are no close buildings to protect against wind exposure. Heater is centralised and turned on everyday, whether there are students or not in the room. This means high maintenance cost due to the inefficiency of the building. While it is the cheapest university accommodation, it is still considered expensive at 210 NZD per week, also considering how it has increased over the years from 175 NZD per week in 2008.
Figure 2.21: Huia Accommodation's plan. A rational solution with service programs in the middle and rooms on the outer edge of building.
2.3 URBAN FARMING

Agriculture has always been the backbone of New Zealand’s economy. It is so essential that it generates 70% of New Zealand’s merchandise export earnings and 12% of Gross Domestic Product. The country is blessed with fertile soil, suitable weather and vast land area to put them as global players of the world’s consumer demand. Locally, as Auckland continues to grow and develop, so will its demand for food. This will put pressure on the supply from rural areas, raising concerns on cost and more importantly its effect towards the environment. The idea of growing our own food is a legitimate way to help create food security, introduce productive lifestyle and develop a sustainable system for them to live. This will be explained below.

2.3.1 Growing food for security

As New Zealand continues to expand on agriculture, it will consequently increase its reliance to that sector. Due to the nature of agriculture, this is risky as if anything happens that would affect the production of it; not only will the economy suffer but also the supply for food from its own people as well. This is why it is important to develop the culture of growing our own food for the security of oneself.

2.3.2 Growing food to develop productive lifestyle

It is a common feeling that we do not have any control over the direction in which our world is headed. Challenges are no longer localized or broadly regional; they are interlaced web of planetary challenges. How, then, do we respond in the face of the impossible scale of issues such as global energy production, climate change, and the related political aggressions and instabilities that accompany them? One thing we can do is to act within our influence, and in this capitalist society, that would be our private property. Even though the students do not necessarily own the accommodation, it is a way to teach them that we are able to have freedom to create in some small measure the world in which we want to live in.

2.3.3 Growing food for a sustainable accommodation system

When we grow our own food, we will pay a lot of attention to the organic earth cycle. Instead of the typical space of uniform grass, we are planting edible plants that would contribute to an abundance of biodiversity. When becoming gardeners; we will interact with the land and become more aware of what we take from it and what we put in. This is in line with the koru concept, a symbol of cycle and change. Every living thing would die, and some would reborn, as life continues. This is the law of nature which we should observe and respect. Previously, the effect of a town on the land around it is clearly evident within a radius of a few miles. For the most part the town depended on the materials, food, trades, and other resources that are available in the immediate region. The detritus of that consumption would stay within that same sphere of influence. Nowadays, due to globalization, we can no longer see the entire story of the impact of any city has become. We generate ignorance to cheap labour, foreign oil, circuitous water distribution systems, industrialized agriculture and remote landfills. The future generations
need to be exposed to the process of resources, for example food production. By keeping ourselves in touch with the by-products of our daily lives, we will be reminded of how it is all connected. As students start to grow their own food, they will realise that the climate plays a huge role in the development of the food. They will experience the weather and climate in a personal way; they have a direct impact on them. The subtleties of sun, wind, air, and rain become meaningful.\textsuperscript{13}

Figure 2.21: The Brooklyn Grange; the largest urban rooftop farm in the world, on two buildings with almost two acre (108,000 square feet) farm area servicing the local community with 40 000 lbs of organically produced vegetables and fruits weekly.
2.4 CONCLUSION OF CASE STUDY

The case study chapter provided a strong base for me to develop my design proposal. In order to design student accommodation that meets what I am aiming for, I studied the architecture of student accommodations, from post-World War era up to the recent ones built. The Baker House gave me the inspiration to step outside the box, literally, and to follow the contour of the site. The smooth undulating lines gave a strong perception of free student movement. However, too many room shapes meant more time is invested in constructing the building and gave an un-rational plan. Erdman Hall proved that while pragmatic and geometric plans are a great way to design a living space, the use of cold materials like concrete and the lack of openings mean the space felt unfriendly and static. I have also identified the important things to avoid, for example the placement of kitchen near student rooms (downstairs rather than on the other block) to make students feel more like home; as Louis Kahn found out. The Simmons Hall is an interesting student accommodation that oozes a vibrant lifestyle. Students who went to live there felt the “spirit”, as what Khan struggled to understand. Holl gave a balance of solid and void, opaque and transparent, being rational and also intuitive. To me, it is an accommodation that is closest to the true meaning of student living, being vibrant, fun, energy efficient and reflected its city campus. On the other hand, Huia Residence provided me with many points to avoid and what to improve from the standard that is in Auckland. The obvious question that revolved in all the projects is the search for a student ‘spirit’, a balance of excitement and practical spaces, and the need for the building to be energy efficient to cut maintenance cost. There is also a gap to bridge between being a student hall with institutionalized environment and an independent off-campus accommodation, as both offer different merits and demerits in terms of practicality, safety and privacy.

Lastly, the introduction of a farming program within the accommodation compound will give my project a different and unique proposal than the rest of the accommodation available at the moment. The need for an activity that connects the students in a healthy and productive environment will advance the idea of creating a wholesome and responsible student.
“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.”

-Wendell Berry, The Unsettling of America: Culture and Agriculture-"
CHAPTER THREE
Design Proposal
EcoStudents: A Green Building for Student Living
3.1 INTRODUCTION

The key element in this design, the driving force of the project is in achieving the student “spirit”. A good student accommodation should provide this support system that would enable a healthy social and cultural development within its inhabitants. To achieve this student spirit, a concept of sharing needs to be positioned, such as the sharing of purpose, commitment, relationship and responsibility. The strategy is to look at three major qualities which are the visual interaction, physical interaction and social interaction. Visually, the blocks of room should face each other and a continuous circulation around the building to create a sense of connection between the student rooms. Physically, students will have shared spaces that are provided in a normal student accommodation such as kitchen, toilet, study area and common rooms. In terms of developing social interaction, I have decided to put a farming garden that would be an activity that would unite and carry the student spirit. This is achieved by gathering likeminded responsible students that cares about the environment, farming and the desire to learn and achieve a sense of accomplishment in their university life.

Figure 3.1: Sharing Concept
Figure 3.2: Design Concept
Figure 3.3: Student Incentive

Basic process of farming
1. Soil preparation
2. Planting
3. Irrigation (where necessary)
4. Pest prevention / suppression
5. Harvest

Incentive

- Subsidies from government on rent to support project
- Students can buy vegetables at cheaper price than normal
- Profit from vegetables sold goes to cover farming cost
- EcoStudent branding to be put on cv

Interested students undergo an interview process to select those committed to the project.
EcoStudents: A Green Building for Student Living

1. Harmony
   - Building form
   - Scale: Gradient of scale so the eye is not drawn to a building by virtue of its size
   - Natural lines: Using nature as form of expression to avoid long expanses of straight walls
   - Blurred boundary: A soft connection between the building and earth so they appear physically related; the use of natural materials

2. Built environment
   - Allows/promotes student interaction with the natural environment
   - Landscaping with living plants
   - Shelter from wind
   - Control/access to sun/shade
   - Avoiding restrictive walls

3. Social arrangements
   - Adequate accommodations for activities comprising varying number of people and objects.
   - Small room numbers per floor
   - Central area for everyone to interact
   - Large spaces for group meetings

Figure 3.4: Design Consideration
3.2 SITE

The site chosen for the student accommodation is located at the edge of Auckland CBD, standing at the original area before the land up north is reclaimed. The triangle that connects Beach road, Stanley Street and Churchill Street takes up several lots, 11-17 Stanley Street and 10 Churchill Street. On the east is Parnell Rise which leads to the Parnell suburb, while on the south is The University of Auckland, just a 5 minute walk. The location of the student accommodation is very important, as it has to be close to the university as further away would result in students paying more for transportation. It is also very close to an Asian grocery and the Countdown supermarket is just a 15 minute walk. It is not in the centre of CBD which means the site would be relatively cheaper, and the view of Waitemata Harbour in the distance and the constantly working industrial port presents a fantastic backdrop to the site.

Historically, before the Europeans arrived, Maori had beached their wakas near this area and up until the late 20th century, this portion of land is reserved for them. As of now, the area consists of a depot for police vehicles and a large car park area. The building next to it is an old warehouse for a car rental company. At the back of the site on the west lies the steep Alten Reserve, a lush of greenery that rolls down to the site. It is a welcoming contrast to the busy Stanley Street, a main road that is connected to the North-Western Motorway.
Figure 3.5: (left) Map of Auckland CBD (right) Map of site
Figure 3.6: The site; a fantastic location that is undeveloped
Figure 3.7: Line shows the boundary of the original land, the site being at the edge of it.

EcoStudents: A Green Building for Student Living
Figure 3.8: Building Typologies
EcoStudents: A Green Building for Student Living

Figure 3.9: Average Building Height
3.3 DESIGN PROCESS

After gathering the information needed, I started designing using the Rhino software. This medium is the one I am most comfortable as it gave me the ability to be flexible with my design and enable quick iterations.

These are the first diagrams produced. It is clear that I am interested in the spiral form, having a continuous circulation from the bottom, flanked by student rooms and a core in the middle.

During the quickfire crit, one of the critics suggested an accommodation that is bigger than what we currently have in New Zealand, as a proposal to address the lack of student accommodation. Due to this, I came up with a building 20 storeys high, with pockets of green spaces that would be able to accommodate at least 800 students. The following shows the progression of my design.

Figure 3.10: Initial Concept Diagrams
Figure 3.11: Exploring the spatial form of spiral through models
Figure 3.12: Exploring the possibility of a tower form
Figure 3.13: Concept on 17 May 2013, the first model comprised of an 18 storey building with pockets of green spaces and green rooftop.
Figure 3.14: Concept on 14 June 2013, a more curvaceous form compared to the first one
Figure 3.15: Concept on 19 June 2013, exploring the idea of a calculated oval form, taking inspiration from the Colosseum. This scheme made me to think about how disconnected it is to the site, like an alien building.
Figure 3.16: Concept on 21 June 2013, the first scheme to be site specific and to acknowledge the boundary of the site. Blocks of towers that are connected by farming spaces and a continuous green roof.
Figure 3.17: Concept on 22 June 2013, the last scheme is thought to have lost the sense of the spiral koru form, so I went back to study the shape and explore more possibilities.
Figure 3.18: Concept on 26 June 2013, starting to incorporate both the towers that are offset by the site boundary, and combining it with the twist of spiral at the end.
Figure 3.19: Concept on 26 June 2013, studying more on the Koru shape and dividing towers into bigger but thinner blocks.
Figure 3.20: Concept on 26 June 2013, a form that is centered by a point. I never managed to figure out how to insert rooms and circulation spaces.
Figure 3.21: Concept on 09 July 2013, i went back with the two blocks idea. This scheme lacked site connection or a sense of community.
Figure 3.22: Concept on 17 July 2013, I revisited the scheme on 26 July and further detailed the rooms and farming garden.
Figure 3.23: Concept on 25 July 2013, the last iteration before the final form. This scheme really considered the site as a boundary and extended the building until the end of the site. I liked the elevation in how it rises smoothly from its starting point to the tip. However, the facade facing Stanley Street is too long, and rooms at the end have no sense of connection to the semi circular block. I decided to break the side to form a complete spiral with the farming garden being hugged by the student rooms.
3.4 DESIGN STRATEGY

Different schemes are tested, ranging from fluid and curved spaces to rigid boxes. The earlier designs showed a more free form, whereby towards the latter stages the building begins to respect and follow the shape of the site. The density also decreased until it is decided that there is too much storeys which meant a lot of aspects such as student comfort, privacy and passive design principles are compromised. As such, the building followed the surrounding area’s average height of five storeys, and the green area is moved from the roof top to the courtyard area.

It is long towards the design process that I started to realise the unique site shape and how it could help in informing my design form. On the east side of the site is Stanley Street, connected from the North-Western Motorway. This is the main street and is pretty busy during rush hour. I have also noticed heavy trucks heading to the port, and as such would result in noise and air pollution. As I intend to introduce farming for the students, it is vital to protect the crops from direct contact with the main road, and as such I have decided to put the farming garden on the inside of the accommodation while the main building would ‘hug’ and protect the green area. On the west side is a quiet street which is the Churchill Street; only used as parking spaces. The Alten reserve provided me with a starting point of my green structure, as I envision the nature of the greenery to slide and meet my building. The average height of buildings in the area is studied, and is thus decided that the building is to respect its surrounding neighbourhood. It is essential for the student accommodation to blend in with its surrounding, but still be a landmark for the community. The building starts with a modest two storey entrance, to interact with the human scale of people walking from The University of Auckland or driving from the motorway. It then rises gently up to five storeys, next to the Alten Reserve which then continues to rise up on a steep hill. The area provided me with ideas to curve the edges of the building and follow the lot shape, as done by several buildings in the area.
1. Form is generated from the outline of the side, with a setback of 6 metres to allow public movement next to the busy road.

2. A public space is decided to be in the middle, where students can have a visual and physical connection.

3. Farming Garden envelopes the public space but is protected by the student block from street pollution.

4. Student rooms are reformed to create a building that rises gently from 2 storey to 5 storey for better sun and view exposure.

5. The student rooms, farming garden and the public space are twisted to form a spiral shape that would connect these three elements.

6. The final form.

Figure 3.24: Form Concept
Figure 3.25: View from Churchill Street, into the main entrance of EcoStudent Accommodation
Figure 3.26: Exploded Axonometric showing the division of public, semi public and private spaces
The Plan

The EcoStudent Accommodation is a building that is divided into five blocks, each connected by a common room. Due to its long site, the blocks are further broken down to create a break in the façade, incorporating access stairs and to allow visual connection of the garden from outside. Block A and B caters for more mature students, with lower density to provide more space and privacy. These units come with en-suite toilet, single loaded corridor and have only two storeys for Block A and three storeys for Block B. Block C, D and E are catered for first years and undergraduate students. These units come in single bed rooms and shared toilets. It is more compact and the double loaded corridor provided more rooms and interaction within the students. To ensure the corridor does not become an isolated space, the blocks are broken in the middle and at the end which allows access to the farming garden. Natural ventilation and daylight is achieved which prevents the corridor relying heavily on artificial lights. Block E has a different layout than the rest, with its semi-circle shape. One of the main reasons for this form is to avoid having a building that is too rigid and straight. By adding a curve at the end of the building, a more soft and poetic language of the plan can be achieved. The building wraps the farming garden to attain a unification of two different programs.

The building follows hierarchy from public spaces at the bottom and private spaces on the top. Public spaces in the middle (farming garden) and semi-public spaces at the corners (common rooms). According to Louis Kahn in his Erdman Hall Dormitories, the location of kitchen at the bottom rather than at the end of a building provided a more “homey” feeling as you only have to go down to the kitchen rather than go to an isolated space at the end of the block. The kitchens are fully glazed to allow abundance of sunlight to pour in, and to achieve full transparency between the public space in the accommodation and the people on the outside. Passersby would be able to see students cooking, eating and farming while not compromising the privacy of their spaces upstairs.

Each floor is provided with extruded balconies which offers a private space within the semi private corridors. These small pockets of space is an idea to break the facade and to acknowledge that within the smooth curvaceous exterior there lies spaces that wants to break free, much like how students are encourage to break out of their comfort zone.

Access and Circulation

Stairs are used to access floors in Block A and B, since it is only two and three storeys. This prevented the need to have multiple lifts for such a big site. Two lifts are located in Block E for the rest of the blocks. However, each block is provided with its own stairs and students can also access each block and floors from the farming garden. This allows the farming garden to also be an access point and circulation area which would make sure the residents are always connected to them.
Figure 3.27: Ground floor plan with circulation and entry into each blocks

LEGEND
1. STUDENT ROOM
2. COMMON ROOM
3. KITCHEN
4. LAUNDRY
5. STUDY ROOM
6. MULTI HALL
7. GYM
8. UTILITY ROOM (GARDENING ROOM)
9. BICYCLE PARKING
10. OFFICE

EcoStudents: A Green Building for Student Living
LEGEND
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7. GYM
8. UTILITY ROOM (GARDENING ROOM)
9. BICYCLE PARKING
10. OFFICE

Figure 3.28: First floor plan
EcoStudents: A Green Building for Student Living

Figure 3.29: Pockets of spaces to offer private conversations
Figure 3.30: Second and third floor plan
Figure 3.31: Glazed kitchen and dining area on the ground floor allows the visual interaction between the students and the public

EcoStudents: A Green Building for Student Living
Figure 3.32: Fourth floor plan
Figure 3.33: Circulation diagram showing the location of corridors, stairs and lift.
Figure 3.34: Different room layouts to respond to different needs of undergraduates and more mature postgraduates
Figure 3.35: Single room facing the farming garden
Farming Garden

Yates is a New Zealand company that sells vegetables seeds for backyard plantation. These are examples of vegetables that can be grown and most of them would mature within 8-12 weeks, which means each student would be able to experience the whole growing process by the end of their minimum stay of one semester. This project can be fulfilling for students as they would be able to learn the whole growing cycle and the longer they stay, the more vegetables can be grown and the more knowledge can be attained.

Figure 3.36: Yates planting season
Figure 3.37: South elevation
Figure 3.38: East elevation
Figure 3.39: North section
Figure 3.40: West section
3.5 BUILDING PERFORMANCE

Building Performance (GreenStar)

Achieving a building that is friendly to the environment is among the goals of this project. It is important that students realise that the usual lifestyle of wasting water and depending on electrical heating systems have to be changed for a more sustainable and environmental friendly lifestyle. From the diagram, one fourth of the demand for energy in residential and commercial buildings in the US is space heating. The second biggest factor is lighting, accounting one-fifth of the total, followed by space cooling and water heating.\(^{45}\)

To achieve a 6 Green Star rating, the building is equipped with perforated solar shading devices in each room that can be closed to filter sunlight but still allow ventilation during the hot season. During the cold season, the concrete floors used throughout the building would act as a thermal mass; where it is heated from sunlight during the day and then released at night to provide a passive heating system for the building. It is crucial in this project to not use electrical heating

Figure 3.41: Primary energy demand for U.S residential and commercial buildings.
system as it is the main contributor of energy use. I believe the passive system is adequate in providing a minimum level of comfort and the rest would be achieved by having a higher tolerance to coldness, such as closing the double glazed windows tight and wearing more layers of clothes. As a student, it is essential to learn how to save as much money as they can. The concept of recycling is heavily used in the EcoStudent Accommodation. Rainwater collected from the roof gutter would be kept in tanks inside the roof to be used for flushing and irrigation of the farms. Solar panels on the roof provide hot water for students. The use of timber cladding is because it easily available from sustainably locally sourced timber in New Zealand and has less embodied energy as a material.
Figure 3.42: Sectional perspective showing the utilization of passive design
3.6 FOOD CYCLE

The food cycle is the essence of this project. Student’s food waste would be dumped into the worm farm bins. These worms would then eat the waste and produce worm cast which would then be used for the farming purpose. The vegetables produced would go back to the students and community, continuing the cycle once again.

The student market not only develops entrepreneur skills within the students but is a form of contributing back to society. Nowadays there is no medium for students to interact with the community and thus this program becomes a platform for the community to be able to see how easy it is to grow your own food, with just a little bit of perseverance and commitment.

![Food Cycle Diagram](image-url)

**Figure 3.43:** The food cycle diagram
Figure 3.44: Farming garden in front of your room
Figure 3.45: Student market during harvesting season
Figure 3.46: Common rooms overlooking the farming garden
Figure 3.47: Student accommodation, a program that never sleeps
CHAPTER FOUR

Reflection
“We cannot hope to create a sustainable culture with any but sustainable souls.”
-Derrick Jensen, Endgame, Vol. 1: The Problem of Civilization-
As our urban environment continues to grow and change, we are being put in a crossroad. Do we continue to live in this generous lifestyle of energy consumption? Or do we strive to understand and commit to a change that is sustainable to our existence.

Ecostudents: A Green Building for Student Living explores the notion of students as an important generation that could change the way we live, into a healthier and sustainable lifestyle. The idea for students to grow their own food provided a platform for me to merge the concept of developing wholesome, responsible and proactive students that have the position to become a catalyst in urging the society to change their lifestyle.

As I look back at my journey of discovery, I came to understand the importance of really determining the core essence of a project. I came across two different priorities to focus on, either to accommodate as much students as possible within the site or to provide a comfortable living environment that would develop the students into a wholesome and healthy body of people. This affected in how I approached the project, and towards the end, I realised that if I am to develop a student accommodation with high density, the whole composition needed to be redeveloped. The site is not suitable for such height, and its location would mean I had to compromise passive design principles.

My point of inspiration, the spiral fern leaf or Koru became a big challenge in my design. The form is an interesting and powerful symbol which is related to the values I try to put in this project. However, due to the site constaints, I am unable to tap into its full potential. For example, because the site is small and became narrow at the end, I could only incorporate one loop. In the final crit, one of the critiques expressed how I could have developed a continuous ramp like the Solomon R. Guggenheim Museum by Frank Lloyd Wright. This enabled single loaded corridors throughout the design and emphasizes a stronger connection between the rooms in different floors and the

Figure 4.1: Sketches in responding to critics; with continuous ramps and green roof with a tower
Figure 4.2: The student, the farm and the environment
farming garden. The roof is suggested to be a green roof and to enable students to occupy the rooftop. Lastly, a more obvious apex to the spiral, like a tower would break away from the plan view of the Koru shape into a more threedimensional spatial composition.

In conclusion, to me this project is not a finished proposal, but rather a starting point to explore the concept of student accommodation, farming and student spirit. One major problem I have faced throughout this project is balancing between these tripartite ideas. However, I understand that design is never ending and there will always be trade-offs. It is therefore important to rigorously explore and prioritise certain elements. In my case, even though the design is not the most economical, it strives to save in other aspects that are not wasteful. I would end my reflection by looking at Le Corbusier’s quote on architecture:

“You employ stone, wood, and concrete, and with these three materials you build houses and palaces. That is construction. Ingenuity is at work. But suddenly, you touch my heart, you do me good, I am happy and I say: ‘This is beautiful.’ That is architecture.”

This project provides green living that is beautiful not just in terms of its building, but the values it promotes. I hope that my design would touch the heart and do good, to encourage student spirit towards a green generation that are responsible to the community and the environment. That philosophy, is my conception of the EcoStudents.
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ENDNOTES

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23 Ibid., 13.
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EcoStudents: A Green Building for Student Living

The step is university level, where new students are removed from their family and community environments. Some students struggle to adapt. Some students are unable to adjust to the fast pace of university life. The EcoStudents is an example of the breaking down of traditional student housing that appears to be totally rigid in its form. However, the housing is intended to be the student’s “home” and allows students to interact with the building and environment in a more harmonious, enjoyable and productive way.

**Program Analysis**

**Design Strategy**

**Plan**

- **Lobby LEVEL**
  - Common Room
  - Library
  - Laundry
  - Common Area

- **Private LEVEL**
  - Study Room
  - Kitchen
  - Common Room

- **Private LEVEL**
  - Toilet
  - Study
  - Kitchen

**Room Layout**

**Exploded Axonometric**

APPENDIX  113
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Appendix 3: Final Crit model with site
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