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A Better Way to Live
Community and Collaboration

EXPLANATORY DOCUMENT

A Research Project submitted in partial fulfilment of the requirements for the degree of Master of Architecture (Professional)
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Abstract

This research project is about researching and designing a community focused, housing scheme near a CBD and natural urban context. This brings forth an opportunity to explore ways in which dwellers can live efficiently together while enhancing the liveability for the occupants through its accessibility to neighbouring urban amenities.

The site of the design project is based at an existing parking lot across the Waikato River from the Hamilton CBD. The Hamilton CBD being so close to the site provides a greater level of well-being to the occupants from its provision of amenities and urban networks. This research design project I am proposing will offer opportunities of connection to the Hamilton CBD and the Waikato River.

Private housing typologies in Hamilton and the rest of New Zealand mainly focus on housing for the individual or individual families. These range from stand-alone dwellings to apartments of a condominium building. A common approach that these housing typologies have, is they are all designed for individuality and separation. My design project will propose a living condition that maintains an adequate level of privacy, outdoor connection and density (according to its location) but adds the elements of community and sociability to allow a higher level of neighbourhood interaction and efficient use of outdoor spaces that can be shared. This is carried out through the process of architecture.

The project will include precedent studies on existing communal/group housing projects, different methods in which people and spaces work together, and site analysis of the chosen site with a specific focus on the Hamilton Operation District Plan requirements. The research and design will explore potential networks for pedestrian and cycle accessibility to the reduce vehicle usage, driveways and parking.
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INTRODUCTION

Project Background
Private housing typologies in Hamilton and the rest of New Zealand mainly focus on housing for the individual or individual families. These range from stand-alone dwellings to apartments of a condominium building. A common approach that these housing typologies have, is they are all designed for individuality and separation. My design project will propose a living condition that maintains an adequate level of privacy, outdoor connection and density (according to its location) but adds the elements of community and sociability to allow a higher level of neighbourhood interaction and efficient use of outdoor spaces that can be shared. This is carried out through the process of architecture.

In addition to having an efficient housing collaboration, the things that are happening and/or available around your home are very important in providing a rich living environment as well. The location of the housing project located right next to a CBD and natural urban context provides a greater sense of connection from a residential environment to an urban and natural environment. "The accessibility and convenience of urban amenities contribute to the quality of urban life experiences... As society changes and evolves, so too, do people's quality of life requirements and aspirations."1

Project Outline
This research project is about researching and designing a community focused, housing scheme near a CBD and natural urban context. This brings forth an opportunity to explore ways in which dwellers can live efficiently together while enhancing the liveability for the occupants through its accessibility to neighbouring urban amenities.

The site of the design project is based at an existing parking lot across the Waikato River from the Hamilton CBD. The Hamilton CBD being so close to the site provides a greater level of well-being to the occupants from its provision of amenities and urban networks. This research design project I am proposing will offer opportunities of connection to the Hamilton CBD and the Waikato River. The project investigates how individual housing can be collaborated to promote community interaction within the site and outside of the site.

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Aims and Objectives
The aims and objectives of my project are to research and design a community focused housing situation that explores spatial efficiency, encourages social interaction and develops communal relations. The architectural problem of the project is exploring the tension between well-being and density.

Well-being and Density –
• Aim for a dwelling density level in respect of planning requirements.
• Optimise outdoor space usage and sharing.
• Increase social interactions.
• Promote communal growth and urban relations.

Urban Amenities –
• Enhance the liveability of residents.
• Reduce vehicular transportation requirements.
• Provide balance to the Live - Work - Play cycle.
• Promote communal growth and urban relations.

I am aiming and envisioning the housing outcome to be low-rise and individual units. This is to maintain the qualities of individual well-being while providing each individual dwelling unit with the opportunities of direct access to grounded natural outdoor spaces. This will reflect the existing character of the neighbourhood and Hamilton-wide housing and provide the balance between the tension of well-being and density.

Research Question

Can housing in Hamilton, promote community interaction and enhance individual well-being, when designed to the minimum density requirements of the Hamilton Operative District Plan?

Figure 1 – Typical Housing in Hamilton.
Scope and Limitations
This research project is about researching and designing a community focused, housing scheme near a CBD urban and natural context. It is an architectural design project that explores methods in which housing can collaboratively and efficiently be grouped together to create a social and harmonising housing condition while aiming to achieve minimum density. The project will result in a design presentation for the examination with the collaboration of all the research, data analysis and design process documented into this explanatory document. The research document will include literature reviews, precedent studies, site analysis, other related research data and design work.

The project focuses on housing and living conditions on a site and how it reflects and responds to its surrounding urban amenities. The housing this project is investigating and designing, are the housing of private ownership and designation, therefore does include student housing, refuge housing or any other type of sole managed housing typologies. The site itself does not focus on mixed-use opportunities that include commercial and/or recreational facilities. The research project will not be about achieving maximum density as this loses the qualities of well-being and outdoor spatial opportunities. Building construction, methods, services, and compliance are not key drivers for this project, but the final product can be assumed compliant and structurally sound.

Main Focuses –
• Site Response
• Spatial Design
• The balance between quality vs quantity living
• Urban relation opportunities

Non-Main Focuses –
• Materiality and construction
• Sustainability
• Maximising density opportunities
• Building compliance
State of knowledge in the field
This research project is about researching and designing a community focused, housing scheme near a CBD and natural urban context. This brings forth an opportunity to explore ways in which dwellers can live efficiently together while enhancing the liveability for the occupants through its accessibility to neighbouring urban amenities.

This project aims to research and explore a housing collaboration proposal that provides an alternative solution to the current housing typologies that are commonly existent in Hamilton today. Existing housing in Hamilton mainly focuses on the housing for the individual and how the building should be conditioned for its individual site. My project aims to look beyond this and explore opportunities on ways in which housing can be situated close together within one site to allow opportunities for social interaction and community growth. In addition to this, the housing development needs to look beyond the site to identify the potential networks and urban amenities that are available around it. Having an efficiently collaborated housing scheme in response to its surrounding amenities will enhance the well-being of the occupants even more.

The state of knowledge in the field I will investigate are:
1. Quality of well-being from housing density typologies
2. Importance of urban amenities
3. Architectural methods in achieving different spatial conditions
4. Regulatory environment guidelines

Precedent Reviews
I will investigate two international precedent projects that share similar design objectives to my project:
1. Jorn Utzon, Kingo Housing – Helsingor, Denmark.
2. Charles Correa, Incremental Housing Project – Mumbai, India.

State of knowledge on the site
1. Background and context of Hamilton City
2. Housing in Hamilton
3. Site condition and analysis
Methods

Research
1. Present research proposal to start research project.
2. Address feedback and meet with supervisor.
4. Continue meetings with supervisor to converge on research question and design intent.
5. Find a site, analysis site, visit site and take photos.
6. Prepare PowerPoint presentations for critiques.
7. Present PowerPoint presentation to Tutors and record feedback.
8. Apply feedback into design.

Design
1. Plan out site layout iterations on paper.
2. Sketch building forms to place on site.
3. Present designs to the supervisor and obtain feedback.
4. Develop the design with precedent application.
5. Develop design to scale.
6. Apply refined design onto a computer assisted design program.
7. Work towards a design presentation.
8. Build a 3D Model to assist drawings.

Results of the Research
The aim of this research project was to determine whether housing in Hamilton can promote community interaction and enhance well-being, when designed to the minimum density of the Hamilton Operative District Plan.

The final presentation involved a visual pin-up and verbal presentation of the design project. The final design resulted in a collaboration of multiple multi-storey attached housing units on a single site, that allowed individual households to live comfortably together and efficiently use shared outdoor spaces through the promotion of community interaction. This was located at a site across the Waikato River from the Hamilton CBD, which allowed for further opportunities of well-being through the accessibility to urban amenities. The Hamilton Operative District Plan was a key research component in the design project, as it defined an objective dwelling density to achieve and provided a compliant and practical concept on what could be developed in Hamilton to promote community interaction and enhance well-being.

I believe the result of the research was achieved in the final design. The primary aim of the research question was achieved, as the final design resulted in a housing condition that promoted community interaction and enhanced well-being on a site that could fit a density of 50 dwellings per hectare as per the Hamilton Operative District Plan. However, further opportunities to connect to the river could have been explored. Opportunities for more activities on-site could have been developed further to enhance social interaction.
6.1 – Housing Density Typologies
HOUSING DENSITY TYPOLOGIES

Introduction
Residential buildings in New Zealand (including Hamilton) come in different density typologies. These range from stand-alone dwellings to high-rise apartment buildings. This design project looks at designing residential buildings that enhance well-being and community interaction, while still maintaining an economical density level for the site. This section investigates the three main housing density categories, and what qualities they have in providing for well-being and community interaction. Proposed research investigates the housing’s qualities rather than its quantity data. The categories are detached dwellings, terrace housing, and apartments, as per the Auckland Design Manual.²

Detached Dwellings

![Figure 2 – Detached Dwelling](image1)

![Figure 3 – Example Detached Dwelling](image2)

Description
A detached dwelling, sometimes known as a stand-alone dwelling, is a single unit free-standing residential building situated on its own site. Commonly occupied by one family.

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger interior spaces</td>
<td>Higher cost</td>
</tr>
<tr>
<td>More outdoor area</td>
<td>Less economical</td>
</tr>
<tr>
<td>Optimal privacy</td>
<td>Poor sociability</td>
</tr>
<tr>
<td>Sense of individuality</td>
<td>Less compatible with urban growth</td>
</tr>
<tr>
<td>Opportunities for extension</td>
<td>More site maintenance</td>
</tr>
<tr>
<td>Optimal natural lighting and ventilation</td>
<td></td>
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</tbody>
</table>

Terrace Housing

Description
Terrace housing, sometimes known as multi-unit dwellings, is a residential building that contains more than one individual household unit. This housing typology is the common range for Medium-Density Housing. The term: ‘Medium Density Housing’ as per the Ministry for the Environment has an average density of no less than 350m² per unit. This equates to approximately 29 Dwellings per hectare, which is lower than the propose goal of achieving 50 dwellings per hectare. This housing typology differs from apartment buildings due to its vertical separation of units rather horizontal.

Pros
- Communal outdoor interaction
- Economical site-use
- Higher density
- Adequate degree of natural lighting and ventilation
- Less site maintenance

Cons
- Shared driveways
- Less open space
- Fire and noise issues
- Poor privacy
- Lack of uniqueness

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Apartments

![Figure 6 – Apartments](image1)

![Figure 7 – Example Apartment](image2)

**Description**
An apartment building is a residential multi-storey building. An apartment building is mainly used for residency but can also accommodate other recreational facilities and be shared with commercial facilities within the same building block. The key differentiation between an apartment building in comparison to terrace housing is apartments include horizontal separations between residential units as well as vertical separation.6

**Pros**
- Highest density
- Accessibility to urban amenities
- Low maintenance
- Shared facilities
- Better elevated views

**Cons**
- Size and compactness
- Lack of storage
- Less natural lighting and ventilation
- Poor connection to ground
- Closeness to parking
- Fire and noise issues
- Shared entry to building

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6 Ibid
6.2 – Urban Amenities
**URBAN AMENITIES**

**Introduction**
A key aspect in creating a liveable housing environment is its relationship to its surrounding context and neighbouring urban amenities. The accessibility to urban amenities from a dwelling is just as important as the design of the house itself because what is happening around your home plays a bigger role in the transition from living to working and social leisure.

**Main Literature Review: ‘Understanding the Importance of Urban Amenities: A Case Study from Auckland’ By Natalie Allen**
This piece of literature is an article explaining the importance of urban amenities and how they affect the living standard to home dwellers. The article covers the aspects of convenience via pedestrian accessibility and transportation, work life and children necessities, and different development pattern and issues regarding living near urban amenities.

Major New Zealand cities have enacted and/or are striving towards an urban growth development plan. These are based on two key notions. To achieve liveable well-being and maintain optimal density. These notions require the input of higher density residential architecture to be developed within the context of an existing suburban environment. These concepts will enable networks to connect neighbourhoods together, promote urban growth and enhance the urban liveability for the residents. Therefore, “the urban amenities in a neighbourhood play an important role in providing a sense of liveability for residents.”

**Urban Amenity Definition:**
**Urban** - in, relating to, or characteristic of a town or city.9
**Amenity** - a desirable or useful feature or facility of a building or place.10

From this literature review, I will be identifying how urban amenities can affect and improve the living quality to a housing project. This will open my project up to explore the surrounding context and how it feeds back to the site, by establishing networks, accessibility and urban growth opportunities.

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8 Ibid, 85.
Types of Urban Amenities
Two types of urban amenities are mentioned in the literature. These are the urban amenities of the public sector and the private sector.

Public Sector Amenities
Public sector urban amenities are amenities that are provided by the local council. These include but are not limited to public transportation, parks, playgrounds, public squares, libraries and/or recreation facilities.  

Private Sector Amenities
Private sector urban amenities are amenities that are provided from private entities. These include but are not limited to cafes, restaurants, malls, supermarkets and other goods and service providers.

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12 Ibid, 87.
Transportation / Pedestrian / Convenience
One of the key drivers on why urban amenities increase the liveability of home dwellers is the convenience it provides to its residents. Being close to an urban context means home dwellers can easily and quickly access the public and/or private urban amenities they desire and/or need to go to. This convenience helps to improve a healthy well-being as people adapt to a pedestrian lifestyle which also improves on traffic and parking issues that all busy cities have.

Lesser traffic and higher pedestrian activity help promote a more efficient public transportation system which would result in the lesser use of cars. This, in the long run, will help improve the atmosphere of a pedestrian orientated urban environments and promote a healthier ecological system from the reduction in motor vehicles. These can be all achieved through a “promotion of networks of higher density mixed-use development clustered around walkable town centres”.

The convenience of the resident’s accessibility to the city means an increase to the livelihood of a city. When the city is busy and fully engaged, a person’s daily activities and habits liven up, which will then contribute to their quality of life.

Work / Family
Many new and present day urban literature on urban amenities indicate that if you want to draw professional workers into its area and, promote economic growth and development. You need to establish local amenities. This can directly relate back to the point of the convenience workers have if they lived near their work. One of stresses workers have when going to work is the commuting part. The issues include the morning traffic, finding parking and paying for parking. If you could walk/cycle to work every day or if there was a useful and efficient public transportation system, then these would solve the transportation issues mentioned above. If amenities help attract workers to an urban environment, then businesses and amenity productivity will increase, meaning growth to the city, engagement to and from the people and success in the architecture.

Family occupancy groups are an important source for economic stability and social vibrancy in an urban environment as opposed to young professional workers (hot industry) that come and go. Families tend to stay longer in areas and provide a wider range of diversity to the area meaning more types of urban amenities can be available. Three key elements in drawing families to live closer to the city are adequate sized individual housing, accessibility to schools and the design of public realms for children. The public realms need to be designed for people of all ages. If it is suitable for the young and the old, then it would be suitable for adults too.

13 Ibid, 86.
14 Ibid, 94.
15 Ibid, 87.
17 Ibid.
Development / Issues
The availability of urban amenities creates advantages to the urban environment that sustain the activity, growth, and stability of the economy and the population it is in.\textsuperscript{18} In addition to having different age group diversities in the city, it is also important to have different ethnic diversities. “Increasing ethnic diversities through globalisation also contributes to urban trends as new city residents bring their own understandings of intensification and the relationship between urban amenities and the perceived quality of life.”\textsuperscript{19} Developing urban growth and urban amenities through the adaption of international conditions will help promote a world-class city and branch amenity networks to a world-wide scale.

Housing design and preferences can become an issue when it comes to living near a CBD urban context. Families tend to want to have their own stand-alone dwellings, where they can achieve space, peace, and quietness. To have space to allow their pets to run around, have a garden and have space for storage. To have access and the potential opportunities to do more activities in and around the house, which you can’t achieve in lesser living scenarios.\textsuperscript{20} On the other side of the spectrum, some people have more of a preference for medium to higher density housing typologies. To achieve security and a low-maintenance nature. They would prefer somewhere that is clean and tidy, and not want outdoor spaces such as gardens that are neglected and unused.\textsuperscript{21}

The other issue of housing development near an urban context is the Planning and Guidance regulations. Present-day residential zoning rules are usually in conflict when urban amenities are integrated into a suburban area as there are usually distinguished separations between the two zones. Additional research is required around this issue.\textsuperscript{22}

\textbf{Figure 12 – Housing Illustration}

\textsuperscript{19} Ibid, 87.
\textsuperscript{20} Ibid, 94.
\textsuperscript{21} Ibid, 95.
\textsuperscript{22} Ibid, 96.
Summary of Literature Review
This piece of literature has been very insightful in showing the importance of urban amenities and how they affect the liveability to a residential environment. Having urban amenities so conveniently accessible provides better values in health, income, and safety. This in turn, leads to freedom, enjoyment, and fulfilment. To achieve an enriching living standard, one must look beyond their own home and consider what is around the site, the networks, the opportunities, and the urban amenities.

With my project, I will aim to find an appropriate balance between quality housing and how the surrounding urban amenities can improve the liveability to the residents of the site. To promote pedestrian accessibility and convenience, while reducing the necessity for vehicles.

Figure 13 – Photograph of CBD from Site Access
6.3 – Architectural Methods
ARCHITECTURE METHODS

Introduction
The previous research explores the conditions of a surrounding context and how it could affect, provide opportunities and respond with the site. This section of the literature review will allow me to gain research and knowledge on how the architecture itself could be explored and manipulated into achieving an efficient and community interactive housing scheme within the site.

The term architecture is generally understood as the process of designing, visualising and building something in response to a specific set of conditions. These conditions may be purely functional in nature or could be reflecting the varying spectrum of social, political and economic climates of life. From this, we can determine that the existing set of conditions – ‘the problem’ is unsatisfactory. Therefore, a new set of conditions – ‘the solution’ being applied to the existing set of conditions – ‘the problem’ would make the situation more desirable. From this logic, we can conclude, that architecture is problem-solving or a design process.23

Main Literature Review: Architecture – Form, Space & Order (Third Edition) By Frank Ching
‘Architecture – Form, Space and Order’ by Frank Ching is a book that provides visual reference and guidance, on architectural design principles and techniques to achieve various effects. The book is organised in an architectural system that covers the architecture of space, structure, and enclosure, experienced through movement in space-time, achieved by means of technology while accommodating a program and its compatibility to a context.24

Content
The main architectural focus of this research project is about exploring the spatial qualities and relationships for its occupants. The following design techniques from the book will be represented here and summarised to include the points that are relevant to my project:

1. Planes
2. Vertical Elements
3. Spatial Relationships
4. Spatial Organisation
5. Circulation

23 Frank Ching, Architecture – Form, Space & Order (Third Edition), (New Jersey: John Wiley & Sons, Inc. 2007), IX.
24 Ibid, X.
Planes
Plane elements in architecture help define the three-dimensional volumes of mass and space. The size, shape and the spatial relationship from one plane to another can help determine the visual attributes of the form it defines and the atmosphere of the space it encloses.

Overhead Plane
The overhead plane can be either the ceiling plane that forms the upper enclosing surface of an interior space, the separation plane between two levels or it can be the overhead roof plane that provides overhead shelter to the building from climatic conditions.25

Wall Plane
The wall planes are the vertical planes that are involved in defining a space. Its vertical orientation makes it active in our normal field of vision and is vital to the shaping and enclosure of an interior space.26 Wall planes provide separation, privacy, and the enclosure of additional individual spaces.

Base Plane
The base plane can either be the floor plane that forms the bottom surface of a space we walk upon, or it can be the ground plane that serves as the physical foundation and visual base of building structures. 27

26 Ibid, 19.
27 Ibid, 19.
Horizontal Planes

Base Plane
The base plane is the most basic of horizontal planes. It is a plane that is laying as a figure-ground on a contrasting background that defines a simple field of space. It is from this plane where we can manipulate from and explore different horizontal plane opportunities.

Elevated Base Plane
This horizontal plane is the base plane being elevated higher from its surrounding plane. It establishes vertical surfaces around its edges that create a visual separation from its field and the surrounding ground. Having an elevated base plane allows for privacy and security separation. It also creates an atmosphere of hierarchy between the two levels.

Depressed Base Plane
The depressed base plane is the horizontal plane that is depressed into the ground plane enclosing a volume of space below the floor level. This creates an enclosing atmosphere that draws attention to a focal point like those of theatres. It also provides shelter from vertical forces such as wind.

Overhead Plane
The overhead plane is the horizontal plane that sits above an area creating a volume of space between itself and the ground plane. This creates a sheltered environment that draws people together to define its own space without the need for walls. The overhead plane also begins to define the form of an architectural building.

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28 Ibid, 103.
**Vertical Elements**
Vertical elements help define space and have a greater effect on our visual field in comparison to horizontal planes. They form the structural supports of a building and provide a climate moderator from exterior to interior. Vertical elements serve an important role in creating a sense of enclosure and privacy.\(^{29}\)

**Vertical linear Elements**
Vertical linear elements envelope and define the perpendicular edges of a volume of space. Although not walled off and freely accessible to and from the space, a space created by vertical elements still allow the space to appear isolated.

**Single Vertical Plane**
A single vertical plane defines the space directly in front of it. This gives off the effect of a barrier or protection from external to internal.

**L-Shape Plane**
An L-Shape configuration of vertical planes creates a volume of space aiming outwards from its internal corner. This type of configuration provides a small degree of privacy and begins to allow an isolation of designated individual zones.

\(^{29}\) Ibid, 125.
Parallel Planes
Two vertical planes spaced parallel apart articulate a space in between the two planes. The open ends provide a sense of direction to the space. This can be useful in defining a road or pathway.

U-shaped Plane
The U-shape configuration of planes envelopes a volume of space with the orientation of direction pointed towards the open end. This configuration provides a greater level of enclosure and protection than the L-Shape configuration.

Four Planes: Closure
Four vertical planes conjoining together complete a volume of space up to the height of its vertical planes. This configuration clearly distinguishes exterior space from interior space. This enclosure can be related to interior courtyards where the internal outdoor space and external outdoor spaces are separate.

The height of the vertical plane and distance between vertical planes can also define the level of connection, privacy and safety between different realms.
Spatial Relationships\textsuperscript{30}

**Space within a Space**
An individual volume of space can be situated within a larger volume of space. This spatial relation provides the inner space with greater privacy, security and protection. It also provides an additional sequence of spaces to get from exterior to the most interior.

**Interlocking Spaces**
A volume of space may be able to overlap with the field of another space. This spatial relation allows two primary spaces to be linked together to create a connection between the two spaces. This technique can merge two spaces together to become one or even define an additional space where they overlap.

**Adjacent Spaces**
Two spaces that adjoin at an edge and share a common wall. This spatial relation defines a clear separation of two spaces. There is clarity in the boundary and allotment of the individual spaces.

**Spaces Linked by a Common Space**
Two primary spaces can be connected via a secondary intermediary space. This provides a link between two spaces through a third space that can be a space itself or the pathway between spaces. This technique is good for the integration of communal spaces between private spaces.

\textsuperscript{30} Ibid, 185.
Spatial Organisation

Centralised Organisation
The centralised space is the centre primary space from a group of secondary spaces that surround it. A centralised space draws people towards its centre and unifies the building. It can also be depicted as the point of objective or the place marker of the area.

Linear Organisation
The linear organisation of spaces is a linear sequence of repeated spaces. A linear organisation is useful to group spaces to form a pathway of direction. Accessibility to each space can be achieved directly from the line of path it runs along.

Radial Organisation
The organisation of spaces revolve around a core point. The radial organisation combines both the elements of the linear and centralised organisation. Whereas the centralised organisation of space is an introverted element by focusing the space at its centre, the radial organisation is extroverted and branches its space outwards.

Cluster Organisation
The cluster organisation of spaces rely on a physical proximity to relate its spaces with another. It is usually a repetition of similar spaces that share common functions or visual traits. The cluster organisation is not bound to a geometrical rule; therefore, it is flexible to change and expand without compromising its organisational integrity.

Grid Organisation
The grid organisation are spaces organised in a uniform structural grid framework. The organisation of spaces in grid fashion provides the spaces with a systematic organisation for ordering, numbering and assigning. This system also works well in modular construction and prefabrication.

31 Ibid, 195.
Circulation\(^\text{32}\)

**Approach**
The approach to a building is the first phase of circulation. The approach is important as it determines whether a place appears inviting or rejecting. The pathway leading to the entrance also plays a part in how we engage the building. Is there an accent, barriers to pass through or a series of turns required?

**Entry**
The entry; sequence from outside to inside. This is the next phase of circulation. The type of entry can affect the senses of how we engage a building. The size and shape of the opening. Whether or not we can see where we are going. Or the conditions before and after an entrance.

**Configuration of Path**
The configuration of path; the sequence to spaces. This is the locality and placement of spaces. Is the route direct and how many turns are involved? The configuration of a path can moderate the amount of movement in certain areas and aid in privacy.

**Path-space Relationships**
This circulation element is about the nodes, edges and terminations of the paths. There is passing by spaces, passing through spaces and then terminating in a space. The relationship determines the experience one takes from start to finish.

**Form of the Circulation Space**
This circulation element defines the type and form of the pathway in which a person moves through. It is about the experience at the moment of transition. Examples of this include, hallways, corridors, stairways, bridges etc.

\(^\text{32}\) Ibid, 241.
6.4 – Precedent Reviews
Kingo Houses by Jorn Utzon

Introduction
The Kingo Houses designed by Jorn Utzon is a housing development located in Helsingor, Denmark. The Housing Development was constructed between the years 1957-1961.\textsuperscript{33}

The Kingo Housing development, also known as Romerhusene, is comprised of 60 15mx15m L-shape bricks houses built over 6.5 hectares of land.\textsuperscript{34} The Housing Project was based upon a design competition originally proposed for Sweden in 1953 but was not commissioned. The project was later realised by the Mayor of Helsingor at the time, who commissioned the project to be built in Helsingor instead.\textsuperscript{35}

The housing unit designs are based on traditional Danish farmhouses. The enclosure of the outdoor spaces is based upon the architecture from Islamic and Chinese dwelling courtyard designs.\textsuperscript{36} The overall site development is derived from Jorn Utzon’s additive approach. The additive approach is the repetition of additional buildings in a pattern or growing nature.\textsuperscript{37}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{kingo_houses.jpg}
\caption{Photograph of Kingo Housing}
\end{figure}

\begin{flushright}
36 Ibid.
\end{flushright}
Analysis of site layout

- The dwellings are built to reflect the contours of the site topography.
- The dwellings are built around a lake to generate a space of outdoor interaction.
- The repetition of the similar building design gives it a sense of community due to the similarity in style when approached.
- Design and construction would also be time and cost effective due to a repetitive design module.
- The additive approach in arranging the dwellings in a pattern gives the dwellings a sense of potential growth and linkage throughout the housing development.
- Accessibility is convenient due to access being provided from 4 different streets.
- Dwelling orientation has the courtyard space south facing to maximise solar gain.
- The development minimises individual site space to maximise communal outdoor space.
- Dwellings are joint together to minimise unusable outdoor spaces.
- Dwellings could be separated further apart to allow additional facades to gain natural light and ventilation.
- The provision of vehicle driveways into each dwelling make it less pedestrian friendly.
- There is a lot of vacant unused space on site. This could be re-purposed.
Figure 42 – Elevation and Plan drawings of a typical Kingo House

Analysis of building design

- Dwellings are single storey.
- Two wings from the building create an L-shape enclosed private outdoor space.
- The two wings also create two different interior zones; living spaces and private spaces.
- Majority of the windows are placed to the internal outdoor space for solar gain and to have open views to own private space.
- External exterior façade has minimal openings to cater to privacy and safety concerns.
- Internal spaces are also arranged to focus inwards rather than out. This is efficient for natural lighting and direct access to private outdoor space.
- Internal service spaces are placed at the junction where the two wings meet. This is efficient in terms of spatial layout as those spaces require minimal natural lighting and are also at a place of direct access.
- The dwelling is only focused on one point within a private site, giving fewer opportunities for other views.
- The provision of fencing around the private outdoor space provides an additional level of privacy.
Summary of Precedent Review
The Kingo house project was an interesting precedent to look into as it provided insightful ideas in dwelling arrangement and building space arrangement to create spatial relations from indoor to outdoor. This project relates to my project in the way that both projects are designing efficient dwelling spaces onto a large site that encourages communal interactions.

The dwelling arrangement on site for the Kingo House project is based on an additive approach that appears to follow the contours of the site without a focus for communal grouping. The density is also much lower compared to mine. The Kingo Housing project only has 60 Dwellings over 6.5 hectares of land whereas my project aims to fit 50 dwellings per hectare to provide a density-efficient housing development in Hamilton. The site layout of this project is considered different to my project as it aims to achieve different design objectives.

The dwelling design was found to be a more useful precedent in how private outdoor spaces could be achieved. The simple form of an L-shape enclosure is an efficient design technique in creating an outdoor space as it mainly relies on the form of the building without the need to create new additional spaces. The interior space separation of having the private and living spaces was an interesting feature as the two wings create two different privacy conditions. The idea of defining and distinguishing different privacy spaces is considered useful for my project in the design process.

Figure 4

Figure 43 – Google Aerial Map of Kingo Houses
Charles Correa - Belapur Incremental Housing

Precedent Review
‘Artist Village’: Belapur, India
Location: Belapur incremental housing located in Sector 8, Belapur, Navi, Mumbai, Maharashtra, India.
Year: 1983 - 1986
Architect: Charles Correa
A housing development proposed to cater for all income groups.

Introduction
The objective of the project was to create mass affordable housing in New Bombay to accommodate 550 families over 5.4 hectares of land. The housing was designed in clusters of 7 to 12 groups of dwellings arranged around communal courtyards. There was an absent for party walls to allow extension and individual adaption. Each family would have their own individual site and land. This project was a demonstration on how high-density living could be achieved in low rise clustered housing that is built from local materials at a human scale.

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38 Hasan-Uddin Khan, Belapur Housing, In Charles Correa, 70-75. (Singapore: Concept Media Ltd, 1987), 70.
40 Hasan-Uddin Khan, Belapur Housing, In Charles Correa, 70-75. (Singapore: Concept Media Ltd, 1987), 70.
Brief Requirements

- **Occupancy Type**: Originally designed for artist, now changed to mixed occupancy groups.
- **Activities on Site**: Residency, cleaning facilities, gardens, green spaces and playgrounds.
- **Accessibility**: Different modes of transportation and accessibility to amenities.
- **Services**: Provision of power, water supply and waste disposal.
- **Climate Response**: A deep sloping roof for heavy rainfall and the adaption to natural water sources for cooling.\(^{42}\)

Planning of Spaces

The design and planning of the spaces are based on a hierarchy of spaces. First, a private dwelling with outdoor space is established. Then these are arranged together to form a shared outdoor space. Then the small group units are grouped together to form a larger collection of dwellings that revolve around a larger collective outdoor area.\(^{43}\)

![Figure 45 – Hierarchy of Spaces](image)

Design Principles

- **Equity**: To achieve a quality of being fair and impartial.
- **Identity**: To achieve acknowledgement and familiarity with each family dwelling.
- **Pluralism**: To achieve a condition where two or more different conditions, systems and or groups can co-exist.
- **Incrementalism**: To be able to increase and/or add on to.
- **Income Generation**: To establish a source or method of a workflow.
- **Open-to-sky spaces**: To achieve sufficient natural lighting and ventilation to the dwellings.
- **Promenade**: To provide paved public walkways.\(^{44}\)

\(^{42}\) Ibid, 3-12.
\(^{43}\) Ibid, 5-12.
\(^{44}\) Ibid, 5-12.
Precedent Analysis

Figure 46 – Analysis 1

Figure 47 – Analysis 2
Limitations and drawbacks of the project

- Quality and consistency of materials and construction.
- Quality and quantity of spaces available.
- Adaption and changes to urban amenities.
- Insufficient provision of parking.
- Useable and unusable spaces.
- Administration and maintenance of shared spaces.
- The character of the buildings.
- Consideration of the practicality and efficiency of the design.
- The quality of life\textsuperscript{45}

\textsuperscript{45} Ibid, 12-12.
Summary of Precedent Review
Charles Correa’s Belapur incremental housing project has been an insightful project to investigate. This project has similar objectives on what I am aiming to achieve. The idea of grouping housing together and creating shared outdoor spaces. Especially on this precedence’s main point in planning the design through a hierarchy of spaces. It helps distinguishes realms from the public, to semi-public, to semi-private and then to private. This is a very helpful tool in providing privacy and security for its occupants.

An interesting aspect of this precedent project is the different condition the internal outdoor spaces have in comparison to the external outdoor spaces. The internal outdoor spaces provide turns and edges to creating interesting sub-spaces, whereas the external outdoor space is a flat linear façade, almost creating the effect of a barrier for privacy and protection.

The difference I see in this project in comparison to what I aiming to achieve, is a greater flexibility in accessibility for the occupants as I find the separate dwelling units in the precedence to be a labyrinth to circulate around. Another aspect in which I would amend to with my project is to increase the ratio of green spaces to reflect the natural environmental condition of a New Zealand housing condition. This project was designed for an Indian cultural and environmental condition, so the one I am aiming to design should reflect a New Zealand character.

Figure 49 – Photograph of Belapur Housing
6.5 – Hamilton City
General information
Hamilton is a city located near the northern part of Central North Island, New Zealand. It is approximately 130km south of Auckland (the most populous city in New Zealand) and approximately 100km west from Tauranga. Hamilton encompasses a territorial land area of 110km² that banks onto the Waikato River. Hamilton is an inland city that has the Waikato River running through its centre from the south to north axis. The Central Business District is located near southern central Hamilton and is situated right next to the River. Another key geological feature of the city is Lake Rotoroa aka the Hamilton Lake which is located near the CBD as well. Hamilton is the fourth most populous city in New Zealand with an approximate population of 141,612 people as per the 2013 Census. This was an increase of 12,024 people (9.3 %) since the 2006 Census (7 years ago).

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Economy
Hamilton was originally a land for agricultural services. Since then, it has evolved into becoming the third fastest growing urban area in New Zealand with a diverse economy in various industries.49

The Tainui tribe of the Waikato Region also have a great influence on the economy of Hamilton. The Tainui Holdings Group Ltd (The business sector of the Tainui Tribe) is one of the largest landowners and property developers of the city. The tribe owns land at Centre Place, The Warehouse Central, University of Waikato, Wintec, The Court House, Fairfield College, the Ruakura Agricultural Research Centre and The Base.50 These properties include two of the 3 largest shopping areas and the two main tertiary institutions of Hamilton.

Hamilton on average has over 40,000 tertiary students per year, that are mainly enrolled in the three main tertiary institutes of the city; Waikato Institute of Technology, Te Wananga o Aotearoa and the University of Waikato. Hamilton also has approximately 1,000 PhD scientists.51 Education and research are key drivers in Hamilton’s economy, especially in the agricultural sector.

The main source of revenue in Hamilton is provided from the dairy industry. The Waikato Region is the centre for New Zealand’s largest dairying area.52 Milk production and distribution in New Zealand is a huge market as it is one of the key necessities of New Zealand families. The New Zealand dairy industry is also one of New Zealand’s main growing exports to other countries.53 Manufacturing and retail are also important contributors to the local economy, including the provision to the health services.

![Figure 51 – Te Awa, The Base](image-url)

City Attractions

Hamilton features some interesting facilities and attractions that locals and tourist can visit. The Hamilton Gardens is one of Hamilton’s and the Waikato Regions most visited attraction with approximately one million visitors each year. The Hamilton gardens are currently free to visit and feature a variety of themed and cultural gardens. The Base Shopping Centre is another attraction of Hamilton. The Base is the second largest shopping centre in New Zealand and the Te Awa mall section of The Base holds a shopping centre award for being the second-best expansion in the Asia-Pacific region.

Other key attractions in Hamilton include the Skycity Casino, the Hamilton Zoo, the Hamilton Lake and the Waikato Museum. There is also the Claudelands Event Centre and Showgrounds for cultural and civic events, and the Waikato Rugby Stadium and Seddon Park for major sporting events.

Figure 52 - Hamilton Gardens

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Climate

**Topography:** Largely flat pastoral farmlands with some areas containing peat swamp.

**Rainfall:** Moderate rainfall – 1200-1600mm per annum.

**Sunshine:** Very high sunshine hours – approximately 2200 hours per year.

**Wind:** Low wind speed in the interior basin due to sheltering hills.

**Temperature:** Summer (dry) Max 25-28°C & Winter Max 12-15°C.

**Humidity:** Wet temperate.

**Atmospherics:** Occurrences of morning fog under anticyclonic conditions and morning frost from winter anticyclones.

**Geographical Plantation:** Rapid growth in grass, crops and ornamental plants.\(^{56}\)

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**Figure 53 – Climate Data for Hamilton**

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
</tr>
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<tr>
<td>Average high °C (°F)</td>
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<td>24.3</td>
<td>22.7</td>
<td>16.9</td>
<td>16.6</td>
<td>14.3</td>
<td>13.8</td>
<td>14.7</td>
<td>16.5</td>
<td>17.9</td>
<td>19.8</td>
<td>21.9</td>
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<tr>
<td>Daily mean °C (°F)</td>
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<td>17.1</td>
<td>14.5</td>
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<td>11.6</td>
<td>13.2</td>
<td>14.9</td>
<td>16.9</td>
<td>13.8</td>
</tr>
<tr>
<td>Average low °C (°F)</td>
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<td>13.2</td>
<td>11.4</td>
<td>9.1</td>
<td>6.8</td>
<td>4.7</td>
<td>4.0</td>
<td>4.9</td>
<td>6.7</td>
<td>8.4</td>
<td>9.9</td>
<td>11.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Average precipitation mm (inches)</td>
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<td>68.7</td>
<td>79.4</td>
<td>60.3</td>
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<td>103.4</td>
<td>91.9</td>
<td>85.0</td>
<td>100.7</td>
<td>1,108.2</td>
<td></td>
</tr>
<tr>
<td>Average precipitation days (≥ 1.0 mm)</td>
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<td>6.2</td>
<td>7.7</td>
<td>8.4</td>
<td>11.6</td>
<td>12.8</td>
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<td>11.7</td>
<td>10.7</td>
<td>10.5</td>
<td>12.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average relative humidity (%)</td>
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<td>84.3</td>
<td>84.7</td>
<td>86.4</td>
<td>89.6</td>
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<td>79.9</td>
<td>85.0</td>
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<td>Mean monthly sunshine hours</td>
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<td>165.1</td>
<td>138.3</td>
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<td>126.4</td>
<td>144.1</td>
<td>147.5</td>
<td>174.8</td>
<td>167.1</td>
<td>207.1</td>
<td>2,019.6</td>
</tr>
</tbody>
</table>

Source: NIWA\(^{56}\)

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**Figure 54 – Image of Hamilton**

\(^{56}\) Hamilton Climate, accessed September 25, 2018, [https://www.niwa.co.nz/static/Waikato%20ClimateWEB.pdf](https://www.niwa.co.nz/static/Waikato%20ClimateWEB.pdf).
Housing in Hamilton

Housing in Hamilton has evolved similarly to other housing in other major New Zealand cities. Housing in Hamilton began with the housing styles of the Villa in the 1800’s followed by the bungalow, art deco, 1940-60’s style and then 1970’s style housing which have continued onto the present day. Stand-alone dwellings are the most common housing in Hamilton which sprawl all over the city, but the city does have developments in multi-unit dwellings and apartment buildings that are developed in higher density areas as well. Multi-unit dwellings aka town housing has been increasing in Hamilton over the past decade due to residential intensification. Apartment building development is still quite low in its statistics and has not occurred in substantial growth due to its lesser demand.

Figure 55 – Residential Consents from 2005-2017

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The two images above show two different stand-alone dwellings in Hamilton. Fig. 56 is an older Art Deco Style house located in central Hamilton and Fig. 57 is a more modern house located in a new residential suburb in northern Hamilton.

A recently new multi-unit block located near the Waikato University area. This area is subject to residential intensification. A standard linear row housing design with parking to the front.

An older apartment building located on London Street, CBD Hamilton. Low-rise construction.

Ibid, 11.
6.6 – Site Analysis
SITE

Location: Secure Parking Sonning (Existing Parking Lot), located at the intersection of River Road and Claudelands Road, Hamilton.
Area: Central Business District
Address: 197 River Road, Claudelands, Hamilton 3214.
Site Area: Approx. 9,760m$^2$
Land Use: Car parking (Existing)$^{60}$

Figure 60 – Location of Site in Hamilton

Description of Site
The chosen site is located across the river from the Hamilton CBD, but under the Hamilton Operative District Plan, it is zoned under the Central City Zone like the CBD area. This makes it an interesting site as it’s zoning designates this specific site to have the same activity and zoning requirements as the CBD rather than its immediate suburban context which has residential designation instead.

The site is currently an open outdoor parking lot owned by Hamilton City Council. The topography of the site is relatively flat within its boundaries and has a steep declining slope at the river bank falling towards the river. Vehicle and pedestrian access is provided from River Road. There is also a pedestrian bridge that connects onto the Claudelands Bridge. The site also has a range of different sized trees and vegetation.

The river bank situated next to the site is publicly owned. A public promenade could be proposed to provide a connection from the site down to the river edge. Claudelands Road leads onto a bridge which also provides direct pedestrian access from the site to the main CBD area. Running parallel to Claudelands Road Bridge is a train track that runs along the southern boundary of the site. The immediate surrounding neighbours are mainly one to two storey stand-alone residential dwellings.

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Site Visited in July 2018. 
Photos taken by Kevin Su 
Refer to following page for site photos.
Refer site photos to Aerial Image.

1. Across the River from Site
   Figure 63 – Site Photo 01

2. Across the Road from Site
   Figure 64 – Site Photo 02

3. Looking towards CBD
   Figure 65 – Site Photo 03

4. Looking down onto Site
   Figure 66 – Site Photo 04

5. Looking up towards Bridge
   Figure 67 – Site Photo 05

6. Looking towards Riverbank
   Figure 68 – Site Photo 06
Site Photos continued.

7. Looking in from Entrance  
*Figure 69 – Site Photo 07*

8. Looking at Entrance  
*Figure 70 – Site Photo 08*

9. Looking over from River Road  
*Figure 71 – Site Photo 09*

10. Other side of River  
*Figure 72 – Site Photo 10*

**Site Visit Report**

The site was visited two times on 18th and 20th July 2018. All photos were taken from public grounds.

The visit on the 18th was around mid-day, the sky was cloudy at the time with rain following on later in the day. Photos 1 - 9 was taken on the 18th. The site visit was approximately 30 minutes long. Pedestrian and vehicle traffic was minimal. One cargo train went by at the time.

The visit on 20th was after 5 pm on a weekday. The sky was clearer than the visit on the 18th but slowly getting darker due to winter sunset. Photo 10 was taken on the 20th. The site visit was approximately 20 minutes long. As visit was after work hours, pedestrian and vehicle activity was slightly higher.
The contour map shows a deep slope at the riverbank edge falling to the river that follows on to the southern end of the map. River Road also slopes up to form a bridge that goes over Claudelands Road, which slopes down gradually and goes under River Road. The site itself is relatively flat.
Pedestrian Accessibility

Figure 74 – Walking Distance from Site

This diagram is based on an average human walking speed of 5km/h.63 A person can approximately walk 400m from the site in 5 minutes and 800m away in 10 minutes. There are minimal hills in the surrounding area, therefore walking journey can be considered continuous. Note: The age and type of walker may vary in walking speed and distance. The diagram shows what can be potentially reached within those distances and time frame.

Within this range, an occupant can gain walkable access to a large portion of the CBD in a 10-minute walk. The CBD side offers many local amenities such as retail, offices, food places, the Casino, Central Bus Station, Wintec, Hamilton Girls High School and many other goods and service providers. At the North East direction from the site, pedestrians can walk within 10 minutes to the Claudelands Event Centre and access the sub-urban amenities of that area as well.

Figure 75 – Bike Hamilton
Site Selection
This specific site was chosen due to its land area and proximity to the CDB; the main source of urban amenities. The size of the site being 9,760m² meant it will be suitable to house a great number of dwellings. The shape of the site also offered opportunities to arrange the dwellings in a manner that could promote communal interaction and sharing. The existing nature of the site being a building-less carpark was also a justifiable reason to build over it as well. A key driver of the project is to build more efficient living space, therefore the removal of parking to accommodate for dwellings meant the area is promoting a pedestrian orientated urban growth. The vacant nature of the parking lot meant there will be no need to demolish or be considerate of existing buildings. This will result in time and cost saving benefits.

The site located across the river from the main CBD section is also good in enhancing the liveability of the residents to allow peace, privacy and safety from the busy town centre environment. The river provides a good barrier zone for this and allows views to the city and connections to the river. Its location across from the river still retains a strong connection to main CBD area as the site has direct pedestrian access to a bridge that goes to the CBD. The site sharing the same zoning as the CBD also emphasises its relation.

Figure 76 – Image of the Waikato River and CBD

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6.7 – Hamilton Operative District Plan
HAMITLON OPERATIVE DISTRICT PLAN

Site Address: 197 River Road, Claudelands, Hamilton 3214.
Legal Description: Allot 465 Parish of Kirikiriirua and Lot 2 DP531617
Site Area: 9,760m², (Allot 465: 7,264m² + Lot 2: 2,496m²).
Land Use: Car parking (Existing)\(^{65}\)
Zoning: Central City Zoning – Downtown District

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\(^{65}\) Parking, accessed September 26, 2018,
http://hcc.maps.arcgis.com/apps/webappviewer/index.html?id=22856b4dce664824808c0de7965c5a5e.

Figure 77 – Zoning Map
The Waikato Bank Stability and Waikato Riverbank Gully Hazard Area overlay run pass the riverbank end of the site. This means there will be restrictions and cautions on constructing near the riverside. The surrounding dwellings are also part of the Claudelands West Dwelling Control Area. This special controls area means the neighbourhood buildings aim to maintain the similar pattern in building size, bulk, scale and density.\textsuperscript{66} This is something to consider for the design.

Figure 5-1: Central City Zone Precinct Plan

Figure 79 – Central City Zone Precinct Map
District Plan Design Guidelines

Site Address: 197 River Road, Claudelands, Hamilton 3214.
Legal Description: Allot 465 Parish of Kirikiriroa and Lot 2 DP531617
Zone: Central City Zone
Precinct: Downtown Precinct (Precinct 1)

- Activity Status:
  - Residential apartments: Permitted
  - Single dwellings: Non-Complying
  - Alternative multi-unit dwelling typology proposed in research project, to assume Resource Consent.67
- Maximum site coverage: 100%68
- Minimum permeable surfaces: Nil69
- Maximum building height: 16m (5-6 storeys)70
- Building setbacks:
  - Front boundaries: 0m
  - Side boundaries: 0m
  - Rear boundaries: 0m
  - Boundaries adjoining riverfront overlay: 5m71
- Minimum building density: 50 residential units per hectare72
- Minimum residential unit sizes:
  - Studio unit: Minimum 35m²
  - 1-bedroom unit: Minimum 45m²
  - 2-bedroom unit: Minimum 70m²
  - 3 or more-bedroom unit: Minimum 90m²73
- Parking: Vehicle parking for research project considered an alternative to the District Plan. To proposed one parking space per dwelling.

Note: Only the relevant District Plan Design Parameters were extrapolated for this project. These rules provide guidelines in designing to the local regulations in achieving a sense of practicality and response to its surrounding context.

68 Ibid 7-15.
69 Ibid 7-15.
70 Ibid 7-16.
71 Ibid 7-20.
72 Ibid 7-25.
73 Ibid 7-28.
6.8 – Design Process
DESIGN PROCESS

Design Parameters

Design Objectives
- Aim to achieve a minimum of 45-48 Dwellings on 9,760m² Site (Approx. 50 Dwellings Per Hectare)
- Consideration of the Hamilton Operation District Plan Design Parameters
- Provide a mixed range of dwelling sizes for a diverse range of occupants.
  - 1 – 4 Bedroom sized dwellings.
- Dwellings to range from 2-4 stories.
- To achieve consistency and quality in the dwelling designs.
- Driveways and vehicle parking to be in an isolated zone.

Site Consideration
- Response to the surrounding context.
- Connection to the river.
- Accessibility and circulation.
- Security and safety.
- Activities on site.
- Usable and unusable spaces.
- Shared spaces and private spaces.
- Administration and maintenance.
- Allow provision for parking, 1 carpark per dwelling.
- Bike accessibility and parking.
- Building around existing trees on site.

Building Programme
- Each dwelling unit is to have the following spaces:
  - Living space(s)
  - Kitchen
  - Dining
  - Sleeping space(s)
  - Bathroom(s)
  - Laundry
  - Storage
  - Private outdoor living/service spaces
- To ensure an optimal level of natural ventilation and lighting to each dwelling.
- Consistency and quality of building materials involved.
Early Design Concepts – STAGE 1

Figure 80 – Spatial Arrangement

An early sketch on space arrangement through a grid system.

Exploring different ways of privacy and sociability through spatial merging.

Dwelling units conjoint within one building and sharing common spaces...

Figure 81 – Spatial Conditions

Sectional drawing showing different conditions of spaces. Exploring how the spaces through horizontal separation and vertical elevation can relate with other spaces.
Initial concept design explores ways in which dwelling units could be merged from separate occupants/families to share internal communal spaces. This original idea was to increase internal sociability and minimise building footprint space. However, this has been reviewed to cause privacy, safety, security and maintenance issues. Further design concepts will need to look at ensuring adequate privacy, but still to retain a degree of sociability between occupants...

Taking precedence in the Kingo Housing Estate Project. The creation of two wings from a L-Shape building to enclose a private outdoor space.

The concept sketch above trials the idea of two separate dwellings conjoint to form one L-shape building sharing a communal outdoor space.

Figure 82 – Reinterpretation of the Kingo Housing Concept

Figure 83 – Kingo Housing
The starting point on designing on the site was the placement of buildings. At this stage, the overall site was to include the river bank as well and the proposal to keep the two largest trees on site.

Site layout iteration 01 mainly focused on the accessibility and flow of circulation through the site. Buildings were arranged at the two large open spaces of the site and the outdoor communal spaces were placed at the river bank end to provide a social connection to the river.
The second site layout iteration looked at how the buildings could respond to its surrounding context. Taller buildings were placed at the south and east roadside boundaries to shield off noise and provide privacy shelters to the site. The buildings on the north side would be at lower levels to allow sunlight to reach the south side buildings. The outdoor communal area is provided at the centre and flows down towards the river where the views could be achieved as well.
Concepts of Buildings – STAGE 3

This was the early stages of exploring building arrangements and configuration. Applying techniques from the Kingo Housing project and Frank Ching’s design principles on how two or more spaces could enclose a shared outdoor space. Privacy, accessibility and building connections were considered.

The concepts were developed to an idea of 4-8 separate units enclosing a courtyard space. This was driven by the idea of having a distinctive shared outdoor space between a small group of dwellings. From this stage, I was also considering methods of achieving individual private outdoor spaces. The unit blocks were extended to form wings that could shape addition spaces.

At this stage, I was beginning to move away from the idea of merging household units together. This was followed on from the early identification of privacy, security, safety and maintenance issues of sharing indoor spaces. The next stage of design involved developing a better balance between privacy, well-being and efficient space sharing....
Conceptualising how an internal space could be configured in relation to the building form. Two units per building form to create a 2-storey building with 3 bedrooms for each dwelling. The laundry facility is not provided to the dwellings as this was planned for a shared facility between all dwelling units.

From this concept, I could visualise how the dwellings could interact with the outdoor space and how it affects the views, accessibility and privacy.

The sharing of two dwelling units was identified to cause privacy issues to the bottom dwellings, especially to the private spaces (sleeping spaces). Accessibility at the entry points has also been identified to be inefficient in terms of privacy and equality of outdoor spaces. Further development is needed to address these areas...
As per the privacy and accessibility concerns identified in the prior drawing, the design has moved to only have a singular dwelling in one building form. The developed approach addresses the issues of privacy by allowing an elevated level for the sleeping spaces. Vertical manipulation to achieve different conditions of spaces.

More comfortable private outdoor spaces can be achieved from this development. Space for gardening and bike parking from the sheltered area and each dwelling could have its own balcony area.

Privacy is at a lesser concern to the main living spaces, but this can still be further enhanced to achieve a more peaceful and comfortable internal environment for the occupants. The arrangement of lower level spaces and provision of building side greenery can provide different levels of separation from private spaces to public/neighbouring spaces.
This site layout iteration is the placement of the building concepts onto the site. The buildings are arranged in a free flow pattern to represent that each small group cluster is separate from another and will provide indirect views from other dwellings to allow the additional level of privacy and separation. Larger open outdoor spaces were intended as social spots where additional plantation and seating could be placed. A communally shared laundry facility is provided at the centre of the site to provide an area where people can come together for a bit of social interaction when they are doing their washing.

This iteration was later reviewed to have many flaws that needed to be amended. The free flow arrangement of buildings needed an organisation system to allow all spaces on site to be utilised efficiently. The central laundry facility was unjustified as the social interaction of the communal facility was just a personal assumption and may not work efficiently. In consideration of the actual site ownership and boundaries and the district plan design parameters, the back-river side section of the site was decided to be left vacant and not built upon. This is to establish a clear boundary separation between the site and the riverbank.
Design Development – STAGE 5
The next stage in the design process was refining the layout of buildings on the site. To work at scale to identify the number of dwellings that can be fitted onto the site to achieve the design objective of having a minimum dwelling density.

A key development process in the design was the organising and arrangement of spaces to enhance the well-being to the occupants through the relation of indoor and outdoor spaces and how the outdoor spaces can communally enhance social interaction. The precedent project: Belapur incremental housing by Charles Correa was helpful in providing insightful ideas on achieving this. The Belapur project organised its spaces through a sequence and hierarchy of spaces to aid in the variation from the public to private spaces. The units were grouped in large groups and split into smaller shared groups to emphasise the idea of spatial hierarchy from a public realm to private realms.

The following design development took the applicable influences from the Belapur project and applied it to the design. Exploring the idea of the hierarchy of spaces and how outdoor and indoor spaces should be equally important.

The following design development looked at placing group clusters, where sub-groups could share small outdoor spaces together.

The density and proximity of building forms from another were trialled. This identified issues that needed to be addressed in further development. These were the issues of random residual unusable spaces leftover and the problems of accessibility and circulation to the occupants if those residual spaces were overfilled...

To find the balance between usable and an unusable space...

Figure 92 – Design Development on Space Arrangement
These further design development drawings establish what will be going on site. The site will keep the two main trees that are existing, including provision for parking and building away from the separate riverbank site at the lower end of the site.

The drawings above develop the issues of using space efficiency while providing adequate and efficient accessibility and circulation around the spaces. The bottom left-hand sketch in the figure above is a development of spaces to address key focal points on the site: the two trees and the remaining large space at the south-east end area of the site.

The other design consideration that needed to be addressed while arranging spaces on the site is to design the quality individual dwellings units that take up these spaces. The sketch on the top right of the figure, investigate staggering building units to allow more facades to gain natural lighting to the individual spaces while creating areas for private outdoor spaces. It also investigates an approximate dwelling footprint size and determines the number of levels to go above. Vertical private living and horizontal communal living.
This is the first scaled design layout in refining the design to a final stage. The dwelling units are designed to a footprint of 120m² and arranged in the linear orientation of the site. This scaled iteration follows on from the idea of focusing groups of dwelling units towards a focal point and uses the idea of staggering the building to provide more natural lighting and private outdoor spaces.

Certain design issues were identified after drawing this scaled design. The main issue is the minimum density that was aimed to be achieved and the amount of space that was available did not go as planned. More development would be needed in the footprint sizing and spatial arrangement. The second condition that was identified that may need exploring into, is the mixture of front and back yard conditions that resulted from the building stagger. As there are no driveways and all non-private spaces can be accessed, this may be not of a concern...
This second scaled design iteration investigated an alternative orientation of the buildings. The buildings were orientated to face north to maximise natural sunlight intake. This was efficient in terms of sustainable design but reduced the dwelling density to less than that of the previous scaled design iteration, even after the building footprints were reduced to 96m$^2$. The previous linear orientation was considered more efficient in terms of achieving the minimum density objective. This iteration also investigates a repetitive consistent stagger of the building units to define a clearer front and backyard condition to relate to its outdoor spaces.

The positive quality of this design is the organic flow of the building form that creates an organic flow of circulation and reflects an environmental imitation of building near the river. The organic form of the buildings also creates the focal communal spaces that are associated to the individual dwelling. However, the hierarchy of the spatial organisation is lost as the spatial design is mainly focused on the internal spaces. These needs modifying for the final design.

**Moving towards final design – STAGE 7**

The final design will aim to address all the ideas, conditions and issues identified in the design process. A mixture of dwelling sizes will be applied rather than one size to allow for a diverse range occupancy size. Achieving (near) minimum dwelling density will also need to be refined further in the final design.
Conclusion

The aim of this research project was to determine whether housing in Hamilton can promote community interaction and enhance well-being, when designed to the minimum density of the Hamilton Operative District Plan.

The final presentation involved a visual pin-up and verbal presentation of the design project. The final design resulted in a collaboration of multiple multi-storey attached housing units on a single site, that allowed individual households to live comfortably together and efficiently use shared outdoor spaces through the promotion of community interaction. This was located at a site across the Waikato River from the Hamilton CBD, which allowed for further opportunities of well-being through the accessibility to urban amenities. The Hamilton Operative District Plan was a key research component in the design project, as it defined an objective dwelling density to achieve and provided a compliant and practical concept on what could be developed in Hamilton to promote community interaction and enhance well-being.

Examiner 1 queries on the design approach of adopting the Hamilton Operative District Plan and how it limits my design. I would argue that designing to the Hamilton Operative District Plan provides a greater design challenge for a brand-new alternative housing proposal to an existing city such as Hamilton. Without these design parameters, designers could calculate and design whatever they want without the considerations of achievability, compliance and territorial factors which are very crucial to the final stages of a buildable design project. Examiner 1 also notes that the design project provides a good range of formal configurations to spatial layout. But the social configuration could do with more exploration. The question of who lives there, what can they do, and further considerations for social and economic diversity.

Both examiners note the response to the immediate surrounding context could have been explored further and incorporated in the overall design more considerately. Especially the Waikato River, as this has major cultural significance and was located right next to the site. Response to the Waikato River was a part of the research and design process, but due to design variable priorities and conflicts, the river was side-lined to lesser importance whereas the main priority was to refine the design project within the site. I agree with the examiners notes regarding this. Further response and consideration of the river, roads and neighbouring environments would have enhanced the social and environmental connection of the site to the surrounding context.

In conclusion, I believe the aim of the research question was fulfilled. Housing in Hamilton can promote community interaction and enhance well-being to a density of 50 dwellings per hectare, as per the Hamilton Operative District Plan. The idea provides a degree of societal benefits in enhancing the living standards and opportunities to the world. The final design may not have been to the highest standard and outcome in which I would have wanted. This was due to time constraints of finalising the design. I agree and thank the examiners for their advice and suggestions to the design project. The design project achieves the aims and objectives, but like all design projects, it can be developed and enhanced further.
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Appendix – Final Drawings

Visual Connection

Accessibility and Urban Amenities

Typical Unit Floor Plans - Scale 1:100

Typical Unit Sections - Scale 1:100

Kevin Su
November 2018

A Better Way to Live
Community and Collaboration
Research Question:
Can Housing in Hamilton, promote community interaction and enhance individual well-being, when designed to a minimum density?
Declaration

Name of candidate: Kevin Su

This Thesis/Dissertation/Research Project entitled: A Better Way to Live

is submitted in partial fulfillment for the requirements for the Unitec degree of

Principal Supervisor: Cesar Wignes

Associate Supervisor/s: Min Hall

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Candidate Signature: ................................................. Date: 11/10/2018

Student number: 1420638
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ORCID number (Optional): .................................................................

Full title of thesis/dissertation/research project ('the work'):

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