HIGH STREET

By Alexandra Maria Sawicka-Ritchie

HIGH STREET

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by Alexandra Maria Sawicka-Ritchie

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Fig. 1 : Rendered Perspective from High Street's Colonnade looking toward Wellington Harbour

ABSTRACT

High Street addresses the problem of disconnection between high-rise buildings and the life of the street. High-rises are often adopted as an efficient means of creating more usable space per square meter. However, their height also isolates them from the urban milieu below. This thesis investigates how to unite the two typologies by elevating the street through the high-rise. As more people are living in cities, the high-rise has become the most prevalent building type to accommodate this increasing urban density. It is important to continue to address how the built environment can enhance urban life architecturally.

This proposition investigates externalising the circulation of a ten storey apartment building in central Wellington in a way that encourages the pedestrian to come above the ground plane and gives the resident a direct connection to the outdoors. In doing so elevating the street challenges the norms of circulation design in high-rise buildings. This thesis draws on the observations of Jan Gehl, Jane Jacobs and Richard Sennett to develop a circulation space that acts a social condenser (Koolhaas 73) for the resident and the pedestrian. A series of formal experiments and case study analyses were used to further the design solution through comparison and critique. The research process revealed the tension between the need for efficiency and humaneness in the design solution and analysis showed that circulation design in high-rise buildings is often underdeveloped as a social condenser.

High Street creates a solution which three-dimensionalises the city from a pedestrian perspective and simultaneously improves the communal spaces of high-rise living. The elevated street redefines the connection between built environment and the public infrastructure of the city and a means by which the pedestrian can traverse it.

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TABLE OF CONTENTS

ABSTRACT	V
ACKNOWLEDGEMENTS	VII

THE INTRODUCTION	XI
The High-Rise	Xii
The Street	15
The Proposition	15
The Method	16
Scope Of Research	16
Thesis Structure	16
 A BRIEF OVERVIEW	 18
 THE CONTEXT	 40
Site Location	42
The High City	49
Connectivity	51
History And Culture	56
 THE APPROACH	 59
Positioning	60
Formal Investigation	68
Comparative Grid Analysis	94
 THE ASSEMBLAGE	 101
Assemblage	103
Defining The Street	105
Preliminary Design	108
High-Rise Circulation Types	112
Setting The Framework	114
Human Scale	120
Case Study : Gifu By Seijima Nishizawa	124
 THE ELEVATED STREET	 127
The Zigzag	135
Case Study: Unité D'Habitation	141
Process	142
Establishing A Baseline	146
The Zigzag	153
The Weave	155
Case Study: Justus Van Effen Complex	156
Case Study: Fundação Iberê Camargo	158
Setting The Rhythm	164
Case Study: Robin Hood Gardens	170
The Stoop	174
The Portico	178
Investigations Into Other Entrance Ways	179
Case Study: 8 House	180
 THE APARTMENT	 185
Apartment Design	186
Levels	186
The Living Level	188
The Sleeping Level	190
The Laundry	192
 IN CONCLUSION	 195
The Method	196
In Favour Of <i>The Street</i>	196
Further Questions	196
A Wider Perspective	196
 BIBLIOGRAPHY	 198
 LIST OF FIGURES	 200
 APPENDIX	 202

01

THE INTRODUCTION

1.1 The High-Rise

1.2 The Street

1.3 The Proposition

1.4 The Methodology

1.5 The Scope

1.6 Thesis Structure

Fig 2 : Volume Comparison

THE HIGH-RISE

The high-rise is an economically and spatially efficient building typology for urban areas because of its height to footprint ratio (fig 2). It is a typology that is predominantly found in cities, largely because of its economic rationality and its efficient use of limited space in the city. This creates a high-density urban environment. The significance of the high-rise for this thesis is its volumetric compactness, the focus being ameliorating the disadvantages that go with this typology.

There are many examples of well-designed high-rises, which create pleasant environments to live or work in. The Met by WOHA is one such example (fig 3). The building has a plot ratio of 10:1, making it a high-density living environment. The design maximises the tropical climate of Bangkok by creating breeze-ways and cross ventilation. Within the building are indoor and outdoor facilities, which the residents can use. The focus was on delivering “a better lifestyle for central city living...” (Archdaily “The Met/WOHA”).

However with the high-rise a problem of scale also emerges. Although it is

the height of the high-rise that makes it efficient, it is also what disconnects it from the surrounding urban milieu and the street. As the height increases, the connection with the street and the surrounding built environment decreases, and so verticality becomes problematic for the inhabitants that accept it as a necessity.

Paradoxically the high-rise allows more people to live in closer proximity and at the same time promotes increasing isolation for them.

Fig 3 : The Met by WOHA

Fig 4 : Streets Of The World

...[The city's order] is a complex order. Its essence is intricacy of sidewalk use, bringing with it a constant succession of eyes. This order is all composed of movement and change, and although it is life, not art, we may fancifully call it the art form of the city and liken it to the dance — not to a simple-minded precision dance with everyone kicking up at the same time, twirling in unison and bowing off en masse, but to an intricate ballet in which the individual dancers and ensembles all have distinctive parts which miraculously reinforce each other and compose an orderly whole. The ballet of the good city sidewalk never repeats itself from place to place, and in any one place is always replete with new improvisations. (Jane Jacobs 50)

THE STREET

In the current urban environment the street is our only way of traversing the ground plane. It connects us to one another and to the buildings that surround us. It is our primary means of infrastructure and while it enables people and vehicles to get from A to B, it is also a platform that provides meaningful connections as well as pure movement. It is the warp and the weft, the web which creates and connects the urban milieu. It is a means of exploring the city and its citizens. This work draws on the ideas of eminent urban designer and architect, Jan Gehl and urban theorist Jane Jacobs, who are both advocates of the importance of the street.

Fig 5 : Jane Jacobs And Jan Gehl

THE PROPOSITION

The typologies of the high-rise and the street play an important role in the shaping of our cities. This thesis looks at how we can mitigate the isolation the high-rise creates and three-dimensionalise the city by reconnecting the two typologies.

If the city is thought of as a volume, verticality creates multiple layers in the built and urban environment on top of the topographical fluctuations. These layers pose a problem when there is no means of traversing between them. By elevating the street we have a chance of creating a better connection between these different layers, thus we can create a more three-dimensional city. The thesis will investigate the ideas proposed here through the design of an apartment building on Plimmers Steps, Wellington.

Fig 6 : Connecting the layers and creating a three-dimensionally traversable city

THE METHOD

To scrutinize this proposition the thesis will use design-led-research methods outlined on the page adjacent. Design-led research begins with the design first rather than a theoretical idea applied to a design. In other words once the site is selected formal experimentation is used to generate critique. Whether the results are successes or failures these are fed back into the design in an iterative process. Secondary architectural research grounds the process in the discipline and the resulting knowledge is also fed into the design, when it is appropriate. The epistemological justification for such an approach is that it begins by grappling with the tectonics of architecture and is therefore a more empirical method for an architectural thesis.

SCOPE OF RESEARCH

This research approach is intended to provide a precedent, which can be used by others as an impetus for the design of elevated streets. It is assumed that in design-led-research the focus is on the discoveries made as a result of the research process. Hence it is the principles established in this process, not the final design that will be the contribution that this thesis makes to the discipline.

Designing the project on Plimmers Steps will give it a site-specific solution from which general lessons in designing buildings, which mix public and private circulation, can follow. Despite its residential focus, the research will also generate knowledge, which can be applied to other high-rise building programmes, like offices.

As the design is a hypothetical test case, it has been designed to a plausible level, but not to the level of resource consent. The focus of the research is on how to bring the street through an apartment building, consequently construction detail is out of

scope. It is assumed that economic efficiency is a given because of the high plot ratio of this typology. As the exact cost is not the focus, but the humane conditions of the circulation, the construction cost of the building is also beyond the scope of the thesis.

THESIS STRUCTURE

High Street follows a design-led research approach and is structured accordingly. The design is introduced in the beginning of the thesis and the key elements are discussed in the following chapters (the body of the text). Because the argument is made through the design solutions, the case studies and scholarly references are inserted within the chapter they are applicable to.

The writing acts as a narrative to guide the reader through the drawings, essentially creating an annotated argument that an elevated street can improve connection the high-rise.

- - - Research
- Research Method Sub-Type
- Sequential Process
- ↔ Cyclical Process

A BRIEF OVERVIEW

High Street is a high-rise apartment building, sited in a high density urban area. The building has an external-ised corridor, '*The Street*', which acts as the means of access for the building.

The Street winds up the western facade of the high-rise to a pocket park on the rooftop, providing access to the building for both the resident and the pedestrian. It forms a loop around the building, which gives a shifting outlook of the city and harbour.

The block is 10-storeys high and houses 70 apartments, which vary from studio size to 3 bedrooms. Each apartment is two floors high and has a balcony. Front door access for each apartment is via *The Street*, with a service elevator and corridor at the rear of the building.

There are several communal areas spaced along *The Street*, including a communal laundry for residents, a coffee stop and bar or restaurant space on the rooftop, which has space for a function or meeting room for the residents.

1 Henceforth my circulation design will be referred to as *The Street* or *The Elevated Street*.
18

Fig. 7 : View toward Plimmers Steps

Fig. 8: View of High Street from Willeston Street

Fig, 9 : Level -01 @ 1:200 @ A3

Fig. 10 : Level 00 @ 1:200 @ A3

Fig. 11 : View toward Boulcott Street from side access

Fig. 13 : Level 02 @ 1:200 @ A3

Fig. 14 : View of the central Atrium

Fig, 15 : Level 03 @ 1:200 @ A3

Fig, 16 : Level 04 @ 1:200 @ A3

Fig. 17 : View from the upper Switchback

Fig 17

Fig. 18 : Level 05 @ 1:200 @ A3

Fig. 19 : View toward Plimmers Steps and the Wedge

Fig 19

Fig. 20 : Level 06 @ 1:200 @ A3

Fig. 21 : Level 07 @ 1:200 @ A3

Fig. 22 : Level 08 @ 1:200 @ A3

Fig. 23 : View toward Boulcott Street

Fig, 24 : Level 09 @ 1:200 @ A3

Fig, 25 : Level 10 @ 1:200 @ A3

02 THE CONTEXT

2.2 Site Location

2.3 The High City

2.4 Connectivity

2.5 History and Culture

Plimmers Steps

Fig. 26 : Aerial View of Wellington

SITE LOCATION: Wellington City, New Zealand
41° 17' 20" S, 174° 46' 38" E

Wellington is a small city with a population of 400,000 people. It is located at the bottom of the North Island. Porirua and the Hutt Valley are two satellite settlements that feed into Wellington Central, the urban hub of the Wellington Region. The city itself sits adjacent to the harbour's mouth, surrounded by hilly ranges, which its suburbs have spread over.

Fig. 27 : Siting Wellington CBD

Fig. 28 : Wellington Contours

Fig. 29 : Wellington Suburbs

Wellington is topographically challenged, or some might say blessed. The steep land formation the city sits on has led to **urban development** in the flattest areas of the city, which are also closest to the harbour's edge. These geographical constraints have provided the conditions to produce a volumetrically dense and compact urban environment.

The majority of the cities' residents live in the rolling **suburbs** surrounding the **central city** and commute into the city for work and leisure.

Fig. 24 : Movement from Suburb to City

Recently there has been a shift toward urban living and away from the suburban dream of a villa and backyard, a typology which dominates New Zealand housing stock. Since the year 2000, there has been more than fifty multi-unit apartment buildings built in the central city, with six of currently under con-

struction. These buildings are spread throughout the central city and vary from 4-15 storeys. All of these factors set Wellington up to be a viable area in which to explore the high-rise and the street.

Fig. 25 : Constructed Building Comparison

Fig. 26 : Proportional Representation of the number of apartment buildings under construction and constructed

PLIMMERS STEPS

Fig. 28: Site Map of Wellington CBD with axis

SITE: PLIMMERS STEPS, WELLINGTON CBD

The project is located on Plimmers Steps, a pedestrian access route at the centre of the city's North/South, East/West axis.

East to West Axis:

In this direction the city shifts from a suburban to urban area. Running from Kelburn to the harbour's edge, the axis highlights the steep topographical nature of the city in relation to the placement of its surrounding suburbs. The abrupt changes in the height have allowed for low-density suburban areas and high-density urban areas to grow in close proximity to one another, creating a swift

transition from suburbia to the central city.

This fluctuating ground plane makes the perfect place to site a high-rise building which can with bring the street off the ground plane and three-dimensionalise the city.

Fig. 29: East to West Axis in section and plan @ 1:10000

Fig. 30 : Site Map of Wellington CBD with axis

NORTH TO SOUTH AXIS: LOW TO HIGH CITY

The cityscape shifts from the old industrial area and current entertainment precinct in the southern part of the urban area to the central business district in the north.

Plimmers Steps is located in the CBD, the high-density area of the city sandwiched between the hills and the harbour, shown in the first section.

The area in this vicinity is predominantly filled with office towers, packed closely together. Shops occupy the ground floor of the majority buildings, especially those on the main streets.

Fig. 31 : North to South Axis in section and plan @ 1:1000

Fig. 27 : Figure Ground and locations of access along The Terrace

THE HIGH CITY

Fig. 28 : Lane ways in the Lambton Quarter

There are two main streets that run through the CBD: The Terrace and Lambton Quay. Plimmers Steps is one of the access ways that provide a pedestrian connection between them. The Terrace sits on land that was seismically uplifted above Lambton Quay and the rest of the CBD. There are approximately fourteen pedestrian access ways that link the two main streets, the majority of which are underdeveloped as public urban spaces.

Each access way creates a horizontal connection, following the ground plane. In one of the reviews, the site

selection was questioned and more research was done into the other access ways (see appendix 1). The conclusion was that this thesis is not about improving the access ways of the city, although it is a novel idea, but about mitigating the isolation of the high-rise through circulation design, therefore contributing factors for the site selection were: change in altitude, density, relation to the surrounding areas.

Plimmers Steps is one of the most spatially dynamic laneways. It was primarily chosen for its steep topography and fluctuating ground plane.

Other deciding factors were its visual and physical connections to the surrounding area; visual because it will attract people to *High Street*, and physical because it brings more people through the access way. The high density environment, shifting scales, greenery and close connection to suburban and urban areas gave the site more potential as a successful space.

Fig. 29 : Existing site plan @ 1:1000

CONNECTIVITY

As a pedestrian access way, Plimmers Steps connects three main streets: Boulcott Street and The Terrace, and Lambton Quay. Off the main walkway is Dominion Lane, which cuts around 3 Plimmers Steps, also known as Plimmers's Emporium. Off the main route are a series of internal arcades and links which connect several of the surrounding buildings (See fig 33).

80s the middle of the access way was redeveloped with curved glass canopy and planters.

The pedestrian access way is 108 metres long, and rises 41 metres. Its width varies from beginning to end, winding down the hillside in an L-shape. The current urban design and landscaping, seen below, is dated and incongruous. In the "Annex development" of the

At the centre of the walkway is a stand of mature trees and a poorly planted bank, whose stairs lead to a residential carpark above.

The top of the steps is marked with a fountain dedicated to Plimmers ship and links to Boulcott St via an underground walkway. Stairs lead up to the road edge.

Most of the access way is paved in brick tiling, bar some stairs that have a nonslip covering on steps as the bricks a slippery when wet.

An internal escalator system pushes store fronts back from street edge and reduces pedestrian numbers by adding multiple routes.

Planters divide steps and create a visual barrier

Fig. 30 : Original Drawings of the current Plimmers Steps landscaping

The steps cut through a high-density block of the city, giving pedestrians a unique view of the city. The dynamic shifting scales of the buildings crossed with the steep topography are reminiscent of Hong Kong and other such dense and hilly cities.

Framing the steps are five high-rise office blocks, three low-density mixed-use buildings from the early 20th century and one car parking building. All of the buildings are built within close proximity to one another. Several of those centrally located are only accessible on foot.

GRAND ANNEX (occupies site behind the steps)
Built: 1983
Style: Late Modern
Current Use:

BOOK HOUSE
Built: 1941
Style: Art Deco
Floors: 4
Current Use:

HIGH STREET
Floors: 11
Current Use:

80 BOULCOTT STREET
Built: 1983
Style: Late Modern/Brutalist
Floors: 10
Current Use:

AA MUTUAL BUILDING
Built: 1983
Style: Late Modern
Floors: 15
Current Use:

PLIMMERS EMPORIUM
Built: 1916
Style: Victorian
Floors: 3
Current Use:

- KEY:
- Offices
 - Commercial
 - Residential
 - Hotel
 - Car parking

Fig, 31 : Existing Contextual Section through Plimmers Steps @ 1:500

WILLIAMS CENTRE
 Built: 1974
 Style: Late Modern
 Floors: 30
 Current Use:

CARPARKING BUILDING
 Built: 1974
 Style: Late Modern
 Floors: 10
 Current Use:

PRUDENTIAL ASSURANCE
 BUILDING
 Built: 1934
 Style: Art Deco
 Floors: 12
 Current Use:

Fig. 32 : Existing Contextual Section @ 1:500

HISTORY AND CULTURE: A Contextual Map of Plimmers Steps

Plimmers Steps was named after John Plimmer, who leased the land in the 1800s. At the time he was a prominent businessman who helped shaped Wellington (WCC “Old Shoreline Trail” 38).

The steps were the main means of access over the narrow beach at Clay Point, the name for the area before the earthquake of 1855. They provided access between the business area of Te Aro and the Parliamentary end of the Lambton Quarter. The area is now a heritage site because of its significance to Wellington’s built environment (WCC “Appendix 3 - Heritage Areas” 22).

In the later twentieth-century the steps were also popular, with several famous nightclubs and cafes occupying Plimmers’s Emporium. Currently though there is little street life on Plimmers Steps, apart from the office workers and the commuters. While there are several shops at the lower end approximate to Lambton Quay, the spaces at the upper end lie vacant.

- HISTORIC BUILDINGS:
- 1 - Prudential Assurance Building, 1933
 - 2 - Plimmers’s Emporium, 1916
 - 3 - Bank of New Zealand Building, 1901
 - 4 - Stewart Dawson’s Corner, 1901

Fig. 33 : Contextual Plan of Plimmers Steps @ 1:500

Fig. 34 : The Approach to *High Street* from Lambton Quay

03 THE APPROACH

3.1 Positioning

3.2 Formal Investigation

3.3 Comparative Grid Analysis

3.4 Typology Study

POSITIONING

High Street has a simple form. It is a slab reminiscent of the superblock introduced in the 1950s. Then the typology was “a means of creating unity in diversity” (Hackmann and Schneider

149). For this project it was chosen for its ability to formally unify the varying layers of strata that occur in the city and for its straightforward configuration given the complexity of the site.

The building spans from Plimmers Steps to the vehicle access way located on the southern end of the site. The slab hinges in the middle cupping the stand of Oak trees, which are central to the steps.

The Street begins in the southern wing of the building and connects to both Boulcott Street and the end of Plimmers Steps, which stops 2 metres below street level.

By positioning the volume across the site, it gives the building a presence on Plimmers Steps, while making it visible from Boulcott Street, Lambton Quay, Willeston Street and The Terrace at the same time.

It’s close proximity to various buildings currently on the site sets up the possibility of creating connections between The Street and the A.A Mutual Building, Lower Plimmers Tower and 80 Boulcott Street. The last two buildings already have an internal access way that was previously discussed (p 51&57). If all the connections suggested were made then a very diverse network would be created for exploring all levels of the city.

Fig. 36 : Proposed Scheme @ 1:500

Fig. 36 : Diagram of access between buildings

The previous design for High Street had the building placed over Embassy Court. After revising the design the building was re-sited in the current position which meant that the new building could re-appropriate the structure of the Grand Annex building as the two buildings were of similar proportions. The majority of the surrounding buildings are tall towers, so the design needed to be approximately 30 metres tall to create a middle ground between *The Street* and the rooftops of the surrounding buildings. Consequently an additional 3 floors were added to the structure of the Grand Annex building. At this height the volume also clears the AA Mutual building because of

the drop in the site, giving a panoramic view of the harbour and city from the pocket park and parts of the southern wing of the building. At 30 metres, the top of the building is just out of range for people on the ground to register facial expressions of those in the building (max. distance being 20-25m), but low enough for them to see events (Gehl 71) (refer to Appendix 2 for further information). This should mean that *The Street* is a safe space and also more approachable as people will be able to gauge what is happening above them. The shift in positioning also meant that the eastern facade would get more daylight and direct sun in the morning. It allows for vehicle access

to the bottom of the building and means that the stand of trees in the centre of the site can be retained. This is an important consideration given the current research on biophilia and the historical significance of the plantings. Embassy Court, which now sits adjacent to the project, has been adapted to make way for the gently rising street, which the pulls away from the pavement and above the vehicle access way, up into the building.

Fig. 39 : Diagram showing the views from High Street

Fig. 40 : Section of High Street with grand annex beside it

Hovering over Plimmers Steps, glimpses of the building are visible from The Terrace, Boulcott Street, Lambton Quay, Willeston Street, the waterfront and Plimmers Steps. When approaching the building, the zigzagging street can be clearly seen from Boulcott Street and from the top section of Plimmers Steps. It has been carefully positioned this way so there are clear view shafts of the building from the pedestrian's perspective, which will encourage people to explore the space. This is in accordance with William H. Whyte's New York City Study, which Gehl quotes. He states, "...if people do not see a space, they will not use it." (97).

The position and form of the building have been designed with consideration of the existing urban fabric of the site, its density and *The Street*. As the area surrounding the site is a compact, dense urban environment, the building also needed to be large enough in order to be plausible, both economically and architecturally. Placing such a large mass on the site could disrupt the play of scales. Instead, placement of the building along the eastern edge of the site has made *High Street* an active back drop to Plimmers Steps and left the current street edge intact, as well as retaining the crisscrossing network of narrow paths, steps and slots between the buildings.

In order to make a connection between the current streetscape and the proposed pedestrian street, modifications to Book House were still necessary. A variety of different positions were explored including rotating it, pushing it backward, to the left and to the right, etc. Slicing the volume down the middle was the most efficient way to make room for *The Street* as it was a simple and less costly solution. The positioning of the cut right of centre means the building still retains half of its original apartments and leaves space for a series of studio apartments on the Southern side. The slice leaves a palimpsest of materials on the southern facade, reminding the passers-by of what was previously there and engaging them.

A high-rise can take many forms: a tower, podium, superblock, slab, terrace, etc. As this thesis looks at mitigating the isolation of the high-rise, the building's typology needs to be based on a structure, which a street could plausibly move through or around. Consequently the length to height ratio is critical as the balance between the buildings proportions and the site limitations are tight.

A series of iterations was used to explore which formal arrangement could best bring the high-rise and the street together, while working harmoniously on the site. The kinked slab was the end result of the 24 iterations developed as it best fitted the site and thesis hypothesis. In other loci, different typologies or formal arrangements would work better. Modelling was used as a technique to test different forms that could fit into the site and reconnect the high-rise and the street. Explicitly this meant that I was looking for a form that lent itself to housing a large number of apartments along with external circulation which attracted pedestrians. There were several main lines of inquiry into which the models have been grouped. Each of these iterations were roughly massed and placed in site to get a feel for how these forms might work in site.

There were several key factors that guided the research process and grew from the site-specific constraints in the quest to unify the street and the high-rise:

1. Restoring the city to a traversable three-dimensional volume

Fig. 42 : Typology Types

2. Developing a form which is of a sufficient scale to be considered as a high-rise building
3. Positioning the building so it has a visual presence from different ends of the site so it will draw the pedestrian onto The Street
4. As Plimmers Steps is not a green-field site the form must plausibly fit into the surrounding context as congruently as possible.
5. Creating a plausible form, both economically and architecturally.

Due to the density of the site, placing the entire building on an empty lot was not possible. As a consequence many positions were tested to see which had the least impact on the surrounding buildings while fitting within the listed parameters. The following possibilities were deemed to be implausible because of legal and physical constraints: cantilever-

ing the building, grafting it on to the facades of other buildings, and demolition.

Both the problems and solutions are discussed in depth on the following pages; first on a case by case basis and then comparatively between all the models. See Appendix 3 for additional typological exploration of building to street relationships.

KEY:

	TREES UNAFFECTED
	SOME TREES AFFECTED
	ALL TREES REMOVED
	BUILDING DEMOLISHED
	BUILDINGS INTACT

Model 01

Little to no direct sun for Embassy Court and the mass

Fig. 43 : Diagrammatic Plan and Section

Fig. 44 : Photo of Model 01

The following four iterations all explore the site from the Boulcott Street entrance. They take advantage of the upward slope allowing the mass to be smaller, while attaining a greater height than the buildings on Lambton Quay.

Model 01 builds up the corner site but the size of the smaller volumes would fit too few apartments to be plausible. The undulating mass is proportional to the surrounding buildings but not spatially and economically efficient with regards to the relative size of the building's footprint.

Model 02

Fig. 45 : Diagrammatic Plan and Section

Embassy Court

Fig. 46 : Photo of Model 02

Model 02 builds on the L-shape form of Model 01 by extending the end to give the mass presence on Plimmers Steps. It works well in plan because of its congruence with the surrounding buildings, however in elevation the mass wraps over Embassy Court, which is economically inefficient as it brings up more design issues than it solves (lighting, connection between the buildings, etc).

The cut outs in the mass break up the volume but lower the number of apartments in the building. The aesthetics of the design pose issues around palimpsest that are not related to the thesis proposition.

Model 03

Fig. 47 : Diagrammatic Plan and Section

Little or no sun for Embassy Court

Fig. 48 : Photo of Model 03

Like Model 01 and 02, Model 03 is well proportioned, its scale congruent with the neighbouring buildings. It uses similar undulating masses in an L-shape to test how it would work if the form was orientated toward Lambton Quay. However it has the same issues as the previous iterations but with a different end to the route of *The Street*. The mass wraps over less of Embassy Court but it still raises the same issues as wrapping over the whole of the building

Model 04

Push - Pull of the form relative to the fluctuation in the ground plane.

Fig. 49: Diagrammatic Plan and Section

Fig. 50 : Photo of Model 04

Model 04 is orientated similarly to Model 03 but it cuts between the Embassy Court and Book House instead. This allows daylight in but creates a privacy problem. The mass is essentially a 'gap filler' which occupies the interstitial space currently present. Consequently the scale is too small to be considered a high-rise and the proportions would be too narrow to function as an apartment building, therefore it was rejected as a possible solution.

The undulating form of Model 03 follows the topography of the site. This is redundant as the movement of the form does not have any relation to articulating *The Street*.

Model 05

Fig. 51 : Diagrammatic Plan and Section

Fig. 52 : Photo of Model 05

Models 05-09 play with form of the podium. Model 05 extends the podium into the interstitial space at the centre of the steps. Despite not having any street frontage the height of the tower would have an urban presence in other parts of the city. The scale of the tower dominates the surrounding buildings on the site, which is not the intention of the thesis proposal.

Model 06

Fig. 53 : Diagrammatic Plan and Section

Fig. 54 : Photo of Model 06

Model 06 scales down the extrusion to a more congruent size but its positioning behind the A.A. Mutual Tower means it does not have any presence on Plimmers Steps.

In both Models 05 and 06 the extension of the podium gives more space for The Street to move through but there is still a lack of connection between the forms which is undesirable. The result is just as formally separate as a conventional podium is from its tower. The route of The Street would be limited to the geometry of the tower. This would confine The Street to a more homogenous trajectory that would become repetitious given the height of the tower.

Model 07

Fig. 55 : Diagrammatic Plan and Section

Fig. 56 : Photo of Model 07

Model 07 takes the form of Model 06 and staggers it to create more connection between the tower and its podium, which essentially works. The thickness of its width increases the number of apartments in the building without creating a much bigger footprint and its extension toward the Steps would give the building more street frontage.

Despite the improvements on the previous two iterations this model was rejected because of its lack of congruence with the site as it blocks the views of A.A. Mutual Building and would create privacy problems.

Model 08

Fig. 57 : Diagrammatic Plan and Section

Fig. 58 : Photo of Model 08

Model 08 extends from Plimmers Steps through to Lambton Quay increasing its pedestrian presence two-fold and creating a logical route through the site. Its form builds on the pitfalls of Model 07 but because of its position it is narrower which would lower the number of apartments possible.

The line of the building divides the current interstitial space awkwardly and although the massing is more staggered in this iteration, there is still some disconnection from the tower.

Model 09

Fig. 60 : Photo of Model 09

Formally Model 09 regresses to the earlier iterations of the extended podium, but with an extra wing that affords the building two entrances. Creating more than one route could be successful but it could also reduce the pedestrian traffic by creating too many options. At the end of the building is a tower, which rises from a lower point in the site. This is an interesting proposition as it creates a three-dimensionality to the connectivity of the mass. Unfortunately the tower is too tall for this to increase the connection by much. Reducing the tower would reduce the buildings presence in the city and also the number of apartments it can hold.

Model 10

Fig. 62 : Photo of Model 10

Model 10 tries another route through the site that frames the southern side of Plimmers Steps. This gives the mass presence on Boulcott Street and the steps. The three masses are staggered in ascending order to build up the height of the building for *The Street* to run through. This forms a logical route through the site. However, proportionally the final cantilevered mass would not be wide enough for the apartments to fit in. As a solution, this iteration was rejected because it would not fit congruently with the site or create a logical framework for the apartments.

Model 11

Fig. 63 : Diagrammatic Plan and Section

Fig. 64 : Photo of Model 11

Like Model 10, iteration 11 plays with ending The Street over the steps. The form works well with regard to most of the design limitations outlined at the beginning of the formal analysis, except for two things: the angle between the larger masses creates an awkward space for the internal organisation of the apartments and given the current context of the site the mass might be too high as it dwarfs some of the surrounding buildings.

Model 12

Fig. 65 : Diagrammatic Plan and Section

Fig. 66: Photo of Model 12

The route for Model 12 is more direct than Model 11 and cuts straight through the site. The design is focussed on cutting The Street through the building's mass. Despite the logical progression it creates for The Street the building was rejected because the formal arrangement of the volume created awkward spaces in the site and the form created an inefficient use of massing.

Model 13

Negotiates the site to create an interesting pedestrian experience

Fig. 68 : Photo of Model 13

The focus for Model 13 is directed by creating a dynamic 'street' that wove between the current built environment, unlike Model 12.

The mass fits elegantly between the buildings in plan, however the scale and proportions of the form were not well designed for the organisation of the apartments.

The sprawling nature of the form covers too many building plots to be a plausible solution despite the desirable options it creates for the route of *The Street*.

Fig. 67 : Diagrammatic Plan and Section

Model 14

Fig. 70 : Photo of Model 14

Model 14 leads on from Model 13 in its exploration of positioning the mass adjacent to Lambton Quay. Wrapping the mass over the Prudential Building creates an interesting rooftop connection with the existing fabric and a unique view down Lambton Quay.

It is a compact and elegant formal arrangement and the position into which it slots gives the mass a presence on Plimmers Steps but it does not create a logical route through the site. Nor is it logical to place the design on the lowest part of the site when the aim is to gain height through massing. The better solution is to use the natural slope of the site to gain height because it is more efficient.

Fig. 69: Diagrammatic Plan and Sections

Model 15

Fig. 71 : Diagrammatic Plan and Section

Fig. 72 : Photo of Model 15

The positioning of Model 15 is a simplification of the route formed by Model 13. It creates a loop through the building to Lambton Quay or to Boulcott Street. While this route shows the pedestrian the area in a different manner it essentially provides the same pedestrian connection that Plimmers Steps does which would reduce the pedestrian numbers. The positioning also means that the volume covers to many land titles to be plausible.

Model 16

Fig. 73 : Diagrammatic Plan and Section

Fig. 74 : Photo of Model 16

Models 16-18 build on Model 15 through the typology of slab, which is manipulated in various ways.

Model 16 kinks in the opposite direction to Model 15 so that *The Street* would not detract from Plimmers Steps and it enlarges the volume increasing the apartment numbers without increasing the footprint of the building.

However, to cantilever the volume over two buildings would be an expensive solution.

Model 17

Fig. 75 : Diagrammatic Plan and Section

Fig. 76 : Photo of Model 17

The only difference between Model 16 and Model 17 is that Model 16 is rectangular and still has the same desirable outlook as the previous design because it cantilevers over the steps.

Positioning Models 16 and 17, through the middle of the site divides the surrounding space poorly; on the eastern side the space would get little light, it creates privacy problems and given the demolition of Embassy House it does not use the space efficiently. If the mass was moved to the left the combined space would be much more valuable.

Model 18

Fig. 77 : Diagrammatic Plan and Section

Fig. 78 : Photo of Model 18

The end of Model 17 is angled, which is more congruent with the site. The width of the slab is thickened, which makes use of the empty space left by the demolition of Embassy Court. The added width increases the density of volume without increasing the footprint of the building by much.

The benefit of the slab is that the height and length creates an ample amount of space for *The Street* navigate through.

Compared to *High Street* the linearity of Models 17 and 18 poorly divide the interstitial space. *High Street* creates a space by curving around the oak trees, which providing the opportunity for a public space.

Model 19

Fig. 79 : Diagrammatic Plan and Section

Fig. 80 : Photo of Model 19

Like previous models, Model 19 plays with the podium type but the form follows the same direction as the slab iterations.

Formally it does not make any more connection than the other podium experiments and creates the same problems for the route of *The Street*. However the positioning works a lot better as the kink creates a congruous relationship between Plimmers Steps and Boulcott Street.

Model 20

Fig. 81 : Diagrammatic Plan and Section

Fig. 82 : Photo of Model 20

Model 20 takes the basic form of Steven Holl's *Linked Hybrid* and tests it at a smaller scale. The scale of the model does not achieve the desired density to fit the surrounding context or address the thesis proposal.

With a single series of linking bridges that finish above Plimmers Steps (like Model 19), there would not be enough connection between the towers to foster relations between the residents of the building like *High Street* does, even though the links would work well for *The Street*.

Model 21

Shadowing from surrounding towers

Fig.83 : Diagrammatic Plan and Section

Fig. 84 : Photo of Model 21

The following models look at different ways of ending the route of *The Street* above Plimmers Emporium as it creates a logical sequence with regard to the height of the site and choreography of the route.

Model 21 has a compact arrangement and sufficient height, but the size of the building would not be large enough to be feasible as a high-rise apartment building.

Its placement in the site is sympathetic to the surrounding urban fabric, however the open spaces around the mass become more awkward and hard to use.

Model 22

Shadowing on most of the building because of the heights of the surrounding building and low-lying bottom mass.

Fig. 85 : Diagrammatic Plan and Section

Fig. 86 : Photo of Model 22

Model 22 has the same density problem as number 21, especially given the relative size of the building's footprint. Despite the clear visual progression of the massing, a simple route for *The Street* would be harder to achieve because of the building's angles.

Model 23

Fig. 87 : Diagrammatic Plan and Section

Fig. 88 : Photo of Model 23

The massing of Model 23 has a good connection between the higher and lower parts of the volume. The form is relatively complex and its size too small, neither would work for the organisation of *The Street*.

Fig. 89 : An Historic Example ; the Mesoamerican Pyramid, AD 250-900

When researching ways to design buildings that elevated the street off the ground plane, a recent trend for 'extroverted buildings' was noted; a phrase coined by the author of archidialog.com. It was clear that there is a rising interest from the architectural community in creating public works that allowed people to climb over them. However, the trend is does not appear to be as prevalent in apartment design. Below are a few examples that exemplify this type.

Fig. 91 : Norwegian National Ballet and Opera by Snøhetta in 2000-2008

Fig. 90 : Danish Pavilion in 2010 Shanghai Pavilion by BIG

Fig. 92 : Kengo Kuma's design proposal for SUPSI

COMPARATIVE GRID ANALYSIS

The following pages delineate the formal iterations by grouping the volumetric nets of the models in various sequences, derived from different criteria as a means of comparative analysis.

The pages should be read either from the top left to bottom right or vice versa.

The first series is a comparison between the apartments and the street as the programmatic driver of the form.

The forms with the apartment organisation as the primary driver for the design are more simple and straightforward than the forms driven by *The Street*.

When the focus was on the street the form was dictated by creating the most interesting route through the site, hence the more complicated forms. Many of complex forms adjacent would have been too inefficient for the apartments, especially in conjunction with the complexity of the circulation.

Formal inquiry dictated by apartments:

Formal Inquiry driven by *The Street*:

Fig. 92 : Volumetric nets (p 94 - 98)

“Streets moderate the form and structure and comfort of urban communities.”

- Allan B Jacobs 03

O 4 THE ASSEMBLAGE

- 4.1 *Breakdown*
- 4.2 *Defining The Street*
- 4.3 *High-rise Circulation Types*
- 4.4 *Setting the Framework*
- 4.5 *Human Scale*
- 4.6 *Case Study: Gifu*

Fig. 93 : Night Render of Shutters

ASSEMBLAGE

The kinked slab discussed in The Approach provides the framework for the various programmes in the building. These are:

- Public and commercial space (pocket park, restaurant, bar, function, meeting room, coffee stop)
- Primary circulation (The Street – public)
- Secondary circulation (service entrance - private)
- Atrium
- The apartments
- Communal space for residents (laundry)

The primary circulation, referred to as *The Street* is the hinge around which everything is designed. It provides the resident with access to the apartments and an outdoor space. It forms a loop that gives the general public access to the rooftop pocket park and it defines the relationship between the different parts of the design. Thus *The Street* had to be defined so that the other elements could be articulated in relation to it.

5m 10m

Fig. 94 : Exploded Axonometric of the different programmatic spaces in the building

Comparison of the view of Plimmers Steps from different heights

Street View:
The built environment dwarfs the observer

From mid-level:
The built environment is relative to the observer

Bird's Eye View:
Objects appear to be small to the observer.

Fig 95 : Shifting perception of the urban fabric

Fig. 96 : Lusatian Lakeland
Architektur & Landschaft Stefan Giers, Susanne Gabriel

Fig. 97 : Rundetårn
Hans van Steenwinckel the Younger

DEFINING THE STREET

My argument for this design has been that high-rise is an isolating typology and my solution is 'a street', which affords the pedestrian varying perspectives of their surroundings, much like the lookout tower. The public purpose of *The Street* follows the same principles; it is a means by which pedestrians can understand their surroundings from a higher vantage point. Seeing the city from above or from a mid-ground alters the relationship between the pedestrian and The Street; instead of being dwarfed, the pedestrian is able to appraise their surroundings.

In many places lookout towers are used as landmarks and tourist attractions to get a different perspective on the surrounding area. By integrating this typology into an apartment building, a public platform is created that connects visually and physically to the surrounding high-rises. It makes the kinked slab into an extroverted building, which affords a three-dimensional perception of the city.

Fig. 98 : Section of Rundetaarn

Fig. 99 : Pedestrian and Vehicular Movement

The public function of the street has been rigorously refined as its purpose was questioned in one of the interim reviews. Often in the city *The Street* becomes another piece of infrastructure to permit motion between one point and another. It has a symbiotic relationship with the high-rise. Each typology needs the other in order to function: the high-rise is a stationary point from which people come and go and *The Street* allows people to get there.

The preliminary design followed this theory and used car parking as a reason for both residents and pedestrians to use *The Street*. The parking spaces were situated at the top of the building giving people a utilitarian purpose to get above *The Street* level. In hindsight the parking wasted the sunniest part of the building and squandered the expansive views on parked cars, since there is car parking building close by (for further working see appendix 4).

Fig. 100 : Preliminary design for October Review

RAMP ANALYSIS

CARPARKING ENTRANCE

To access the car parking ramps were tested but the site was too tight to be able to fit any of them easily. Internal ramps would work but take up too much space in the building.

Car elevators were also tried which just fit but were not financially viable or logical.

PARKING PLAN AS PER NEUFERT GUIDE

Fig. 103 : Carpark Design Iterations

Fig. 104 : Daylight simulation during winter solstice of the kinked slab with and without car parking:

The darkest areas show the most shadow and the lightest areas show the least shadow. Each time was picked according to usage. The bottom series was created after the car parking iteration to see if it was better placed on the northern side of the building, but this just shadowed the sunniest area more.

My research indicates that if urban planners and architects look at *The Street* as merely a means to locomotion (vehicular or pedestrian), then the space is in danger of losing its significance as a public place. Richard Sennett, the outstanding sociologist and humanist, succinctly outlines this point in *The Fall of Public Man*:

As public space becomes a function of motion, it loses any independent experiential meaning of its own ... The effect on public space, especially the space of the urban street is that the space becomes meaningless, or even maddening unless it can be subordinated to free movement (14).

Many scholars, Sennett included, argue that public space is a necessary part of social interaction. Indeed, the idea of the collective is driven by "... the necessity of open spaces and places of cohabitation to achieve our full social satisfaction (Davó 17)." If *The Street* is designed to acknowledge both its utilitarian and social functions it will become a thriving public space; it can encourage the pedestrian to explore the city, to stop and take in their surroundings. With these thoughts in mind, it was enough that *The Street* became a way of providing a proper three-dimensional experience of the city.

HIGH-RISE CIRCULATION TYPES

In a conventional high-rise the circulation is mostly internal. While there are different ways of designing the circulation, most examples use a **central core**, which contains an elevator and a staircase. It is efficient as it groups all the circulation together, as well as the services for the different floors. Internal corridors link the elevator or staircase to the individual apartments of the building. Alternatively **deck access** is used to join vertical circulation to the apartment. Less common but also used are **circulation towers**, which are partially connected to the building and link to the main volume and an internal corridor.

In most cases, both the horizontal (lobby and corridor) and vertical circulation (elevator and staircase) are the only communal space within the apartment (or office) building. They are normally internal, anonymous and mundane. Neither is conducive to conversing with one's neighbours. If designed well, **deck access** has the potential to make the corridor a place where people feel at home and can get to know their neighbours freely.

Fig. 105 : A homogenous internal corridor

TOWER
CENTRAL CORE

CIRCULATION ANNEX

SLAB

Fig. 106 : Circulation Types

Fig. 107 : Dixon St Flats

Fig. 108 : Aston Towers

In *High Street* the circulation has been extroverted so that both the vertical and horizontal constituents are externalised. The decision to create an external access way determined the way the rest of the programme was brought together. The main determinant was the connection between *The Street* and the apartments with the other parts of the programme slotting into the framework provided.

There are two ways in which the building could be configured: either *The Street* created a framework that the apartments come off, or the apartments created a framework, which *The Street* wove around.

It was decided that the building's volume would act as a container in which the apartments would be stacked, meaning *The Street* could move freely around the building and up the eastern facade. It was also the most efficient use of space, as having staggered apartments meant a loss of space on the top and bottom floors of the building.

Street cuts into the volume created by the apartments

Apartments are stacked on top of one another.

Street is able to wind around the volume

5M 10M

Fig. 109 : Exploded Axonometric of *The Street* and the apartments

Examples such as SURE Architecture's recent design in London uses a spiralling 'street', which shops come off. I decided this was unsuitable for *High Street* as it creates a repetitive route showing the same views of the surroundings at gradually increasing increments. It is also inefficient with regard to the length to height ratio of *The Street*. I wanted to prioritize social interaction and a three-dimensional understanding of the city, which this design lacks. These design decisions are discussed in detail in the following sections.

Stacked Framework allows for 70 2-storey apartments

Fig. 110: SURE Architecture's London Skyscraper

Spiralling Framework allows for 57 two storey apartments and 11 one storey apartments

Fig. 111 : Framework Comparison

High Street apartment configuration delineating apartment sizes in relation to floor levels

Number of bedrooms per apartment

Fig.112: Apartment Configuration for High Street

The secondary circulation (lift) sits on the western side of the building and provides service access for the resident. This arrangement has been configured so that there are no internal corridors; instead both circulation areas are open air.

Fig. 113 : Secondary and Primary Circulation Diagram

For the public, circulation around the city is mostly limited to *The Street* and for the pedestrian it's the pavement. Most of the built fabric is private offices or apartment blocks, with ground floor retail spaces (public buildings not-included). Mixed-use, or hybrid buildings, are becoming more common now and consequently so is access above the ground plane. Some buildings provide access for rooftop restaurants or bars or podium level spaces. In most cases these spaces are separated from the main programme by internal circulation.

The circulation for *High Street* is designed as a space, which connects the pedestrian to the city and the resident to the home. It also allows the pedestrian and resident to share the same space by carefully detailing *The Street* so that the infrastructure delineates between the public and private space.

The simplicity of the form works with the organisation of the building, bringing attention to the extroverted circulation and puts the emphasis on how *The Street* weaves through the facade. Because the slab is a singular mass it was more conceivable that the apartments and street could utilise the same volume efficiently than with other volumes (see iterations p 70-94), which created redundant and unusable spaces.

Fig. 114: Public Access in High-rise Buildings

HUMAN SCALE

As a single volume the kinked slab is large and monolithic, which can be formally segregating. Hence the treatment of the facade was carefully designed to mitigate separation and break up the volume so it is more on a human scale.

High-rise buildings use different methods of fenestration and facade treatment to alter the perception of the building. These include: *cladding, tiling, balconies, geometric extrusions, screens, shutters, windows and patterning*. The manner of detailing has an effect on perceived scale of the building and how isolating it is for the pedestrian, from outside and inside. The curtain wall is prominent in high-rises and as noted by Sennett, has a detrimental effect on the city:

“Lever house was the forerunner of a design concept in which the wall, though permeable, also isolates the activities within the building from the life of the street. In this design concept, the aesthetics of visibility and social isolation merge (13).”

Whether the glazing is reflective or transparent, curtain wall systems also have a visually dominant effect as there is little visual interruption in the facade to break up the volume. The Wellington City Council Design guide discourages use of reflective curtain walling because of this (24).

EXAMPLES OF FACADE TREATMENT

WINDOWS

BALCONIES

Windows:
SANAA
Zolverin School

Balconies:
Álvaro Siza
Terraços de Bragança

SHUTTERS

Shutters:
Herzog & de Meuron
Residential Building on Rue de Suisses

ACCESS

Access:
Atelier 5
Flamatt 3 Development

CURTAIN WALL

Curtain Wall:
Skidmore, Owings & Merrill
Lever House

GEOMETRY

Geometry:
Francisco Javier Sáenz de Oiza
Torres Blancas

PATTERNING

Patterning:
Herzog & de Meuron
M.H de Young Museum

TILING

Tiling:
Urbanus
Tulou

Fig. 116 : Eastern Elevation @ 1:500

Fig. 117 : Facade Design Iteration

To mitigate the potential of an isolating and dominating building the fenestration design, cladding materials and the protrusion of street have been used to split up the facade and break down the solidity of the volume.

On the western facade the building is broken up by *The Street* (see *The Zigzag*). On the eastern facade the window design and placement becomes more important because it does not have *The Street* for the eye to focus on. The windows are aligned and dimensioned to create a more or less regular grid that breaks up the facade. At every second level is an open access way, which connects the apartments to the elevator, giving depth to the surface. Depending on the configuration of the apartments

there are either one- or two-storey balconies for almost all apartments. Inevitable variation in shutter positioning will occur, breaking up the grid and window pattern.

Fig. 118 : Photos of the exterior of GIFU

Like in *High Street*, Kazuyo Sejima's design for the Gifu Housing Development externalises the vertical and horizontal circulation. All the circulation is on the northern facade of the building (fig 118) and creates a visual focus on that face that divides up the facade.

Terraces cut through the entire building breaking up the volume on the southern facade. All the windows are also on the southern facade making the circulation more dominant on the northern facade. While one sided fenestration may work in a very narrow building, for *High Street* the configuration of the plan means that windows are needed on both sides. Having no fenestration on the circulation side would create an unsafe street lacking vibrancy.

Fig. 119 : Diagrammatic Plan of GIFU

Fig. 120 : Apartment Designs in relation to circulation

The selection of the facade material is important for the experience of The Street as well as the apartments. In bringing a public space through a private building, the design needs to ensure that the residents feel secure and that the pedestrian feel safe scaling the side of a 30m high building. An Oamaru stone cladding was used to cover the exterior of the building and pave The Street, giving the feeling that The Street was carved out of the side of the building. A thick stonewall, despite only being clad in stone, gives the appearance of being strong and sturdy. The thickness of the walls makes the proximity of The Street seem less threatening as well as dampening any outside noise and from inside the apartments.

The cladding material contrasts with the surrounding buildings, enriching the tectonics of the urban environment.

Fig. 121 : External rain screen cladding system, using Oamaru stone panels stacked in a stretcher bond pattern. Dimensions dependant on supplier. Corners to be mitred.

“The collective and the private, society and the individual, balance and confront one another in the city.”

(Rossi and Eisenman 22)

05 THE ELEVATED STREET

- 5.1 *The Zigzag*
 - 5.1.1 *Case Study: Unite d’Habitation*
 - 5.1.2 *Process*
 - 5.1.3 *Establishing a Baseline*
- 5.2 *The Weave*
 - 5.2.1 *Constructing the Edge*
 - 5.2.2 *Case Study: Spangen Quarter*
 - 5.2.3 *Case Study: Fundação Iberê Camargo*
 - 5.2.4 *Breaking the Monotony*
 - 5.2.5 *Setting the Rhythm*
- 5.3 *Detailing The Street*
 - 5.3.1 *The Edging*
 - 5.3.2 *The Stoop*
 - 5.3.3 *The Portico*
 - 5.3.4 *Case Study : 8 house*

Fig. 122 : Western Elevation @ 1:500

THE ZIGZAG

The Street cuts around the southern end of the building, two storeys up, then hooks back through the atrium at the centre of the building to wind up the western facade. Two short zigzags give height to *The Street* at the beginning of the route, allowing a more gentle slope for the latter part of the route on the northern wing of the building therefore easing the climb for those walking. The descent is via a narrow loop that cuts down the eastern facade back to the switchback of the final zigzag. (See Appendix 5 for descriptive excerpt)

As a mechanism the Zigzag, allows for the length needed to get to the top of the building while simultaneously saving space in plan. With

careful manipulation it provides access to the apartments without making the pedestrian walk back-and-forth over every floor. Hugging the western side, *The Street* benefits from the afternoon sun, giving children a sunny space to play after school and adults a post-work sun-spot.

The hairpin-turns change the pedestrians' perceptions of their surroundings, giving them different views of the area and altering their spatial experience. The switchback brings people face to face, allowing some intimacy in the shifting orientation of the pathway, whereas other mechanisms always follow the same trajectory and deny these opportunities. The changes in trajectory of *The Street* allowed nodes to open up and form five pauses spaced along the route, allow for rests. These are:

1. The Switchback – on the second and third turns of the pathway.

2. The Wedge – an opening in the kink gives the pedestrian a reference to the atrium and a space to take a drink.

3. The 360 – a turn that juts out over Plimmers Steps, the same orientation as the pedestrian who began on the steps.

4. The Pocket Park – on the rooftop sits a small public space with views of the city, harbour and hills.

5. The Abyss – on the descent a small cantilever projects the pedestrian over the steps again this time looking toward Lambton Quay.

These pauses break up the journey into spatial sequences, which other more regular routes would not create. According to Jan Gehl, these pauses “make the journey more interesting and also psychologically seem shorter” (Gehl 141), which is important as people always try and take the shortest route if possible.

Fig. 123 : Exploded Diagram of the Pauses on *The Street*

The entire length of *The Street* runs 190m, rising 30 metres making the choreography of the route important in the perception of *The Street's* length. Gehl suggests that 400-500 metres is an acceptable walking distance for most, however if “a stretch of 500 metres is viewed as straight, unprotected, and dull [it] is experienced as very long and tiring, while the same length can be experienced as very short distance if the route is perceived in stages (141)”. The winding, twisting motion of the zigzag breaks down the route into clearly defined segments.

The zigzag also shifts the pedestrian's focus between the foreground (streetscape) and background (cityscape), as Jacobs notes:

An intimate foreground view helps people order the space around them and concentrate on it – a background view can be overwhelming and belittling. (378)

In *Park Hill Housing*, noted architectural historian Reyner Banham discusses the street decks of Park Hill designed by the Smithsons and describes them as follows:

...While the street deck never offers grandiose perspectives, but keeps down to a domestic scale of views along its length, the act of walking along one is a serial scenic experience, punctuated by irregular spatial constrictions, that is continuously fascinating. (408)

This project attempts to evoke a similar experience for those who live in high-rise or who use *The Street*, but offering more expansive views that incorporate a shifting perception of the city around them as they work their way up through the building. Interestingly, Banham goes on to say that “dramatic emphasis is laid on the exposition of circulation as the uniting factor of the design”, stemming from a desire to revise the work of Le Corbusier and his *rue intérieure* (one of the first forays into the ‘street in the sky’) (411).

The dispersion of the stairs along *The Street's* pathway has been designed based on Gehl's (141) advice: *Gradual short ascents and descents are less difficult to move about on than long, sharp ones. A long, steep stairway is felt to be tiring, while a number of short flights of steps, interrupted by landings, comparable to a street with small squares, is psychologically more manageable.*

Within the confines of the site and volume of the building, landings were placed between flights of stairs that were as generous as possible, as per As1 4.3

Gehl outlines ways in which architects can promote or prevent isolation or contact (91). Some of these have been used to mediate the articulation of street in relation to the apartments, creating a careful play between the ‘publicness’ of *The Street* and the privacy of the home. Those relating to contact will be discussed below and those on isolation will be discussed in the section on the apartments.

The methods selected promote connectedness for the resident and the pedestrian:

1. Short distances - discussed above
2. Low Speeds - as *The Street* is for pedestrians the main mode of transport will be on foot, up hill, inducing a strolling amble. The twists and turns, will slow down the thrill-seekers on bikes and other means of transport.
3. Orientation towards others – discussed above.

Fig. 124: The Switch-back : brings people face to face that would normally end up following one another (see previous page)

Fig. 125 : Exploded Axonometric of *The Street*

Fig. 126 : SUNPATH DIAGRAM

Sunlight hits the **eastern facade** in the morning and the **western facade** in the afternoon.

Creating a predominantly external access way helps mitigate problems relating to safety on *The Street* for all pedestrians and residents. According to Jane Jacobs “the reason that the corridors of high-rise housing projects are problematic is because anyone can use them and as they are internal they are hidden from the public eye” (42). In *The Death and Life of Great American Cities*, she iterates the importance of the public eye as a means to prevent crime and promote a feeling of safety for users. Contact, however small, leads

to a web of public trust, respect and therefore safety in the street (56). This was one of the deciding factors in externalising *The Street*. Having an outdoor ‘corridor’ also means natural lighting, direct sunlight, maximisation of the floor plan for the apartments and a closer connection to the surrounding urban environment, adding considerable advantages to the design.

Also, having a street that protrudes from the facade helps to add human scale to the facade. Because the

pathway breaks up the volume, the human eye can relate to the outcome more than the monolithic block, whose scale can be incomprehensible. This is important because “when there are large, impersonal spaces in the city there is less pedestrian traffic (Gehl 31)”.

Fig. 127: Photos of Unité d'Habitation: external + rue intérieur

CASE STUDY: Unité d'Habitation

Architect: Le Corbusier
Site: Marseille, France
Construction Date: 1952
Height: 18 Storeys
337 Apartments

Two storey maisonettes which wrap around the horizontal circulation Le Corbusier called “Rue Intérieur”- interior street.

Vertical and horizontal circulation is separated from one another. In High Street, these are brought together meaning that there is more chance of interacting with everyone in the building.

Fig. 128 : Sections, transverse and longitudinal

Fig. 129 : Unité d'Habitation Plan

Height which *High Street* needs to get harbour views

Footprint within which *The Street* needs to sit

Fig. 130: Site constraints for *The Street*

PROCESS

The western facade of the building hosts the winding protrusion of *The Street*, which divides up the volume in the same manner as the windows and balconies on the eastern facade. To be feasible *The Street* needs to attract the pedestrian and also be functional for the resident. There are five salient design considerations that lead to the form of *The Street* as it is in the final design:

- Height to length ratio : *The Street* has to rise high enough to connect visually with the surrounding area, within a certain volume because of the site restrictions
- Mundanity : to engage the pedestrian the route of *The Street* needs to be stimulating

- Efficiency : *The Street* may deter the resident or pedestrian if it is too long or steep
- The right spatial tension between apartment size and street. *The Street* needed to be woven into the building without increasing the building's footprint or overly encroaching on the apartment space.
- Connection: *The Street* needs to connect to as many of the apartments as possible.

The Zigzag was selected as the most viable solution. Several other iterations were investigated, which follow.

Fig. 131 : Diagram showing how the stair dispersion is dictated by *The Street*. See Appendix 6 for working

RAMP

Slope: 1:12
Maximum Rise Between Landings: 750mm
Landing Length: 1200mm

Fig. 132 : Comparison between the length of the street as a ramp or as stairs

STAIR:

Maximum Rise between Landings 2500mm
Maximum Riser: 180-190mm
Maximum Tread: 280-310mm

ESTABLISHING A BASELINE

The first three design iterations were testing the parameters of the design. In other words, eliminating the routes that would not work and creating a baseline from which further design development could be done. To begin with cutting straight up the building, whether through the middle or up the side, highlights the conditions that are not desirable when designing a pedestrian street and can immediately be ruled out. As Jane Jacobs observes, “Long straight streets, avenues that stretch into the distance create an impression of anonymity and endlessness (378)”, neither of which relevant for this space. Iteration 02 and Iteration 13 established the range for the experiment. Iteration 02 being the minimum and Iteration 13 being the maximum length that *The Street* could be, as one was entirely stairs and the other ramped.

Fig. 133 : Diagrams of the potential routes of the street (p 140-147)

INTERNAL

ITERATION 01

Creating a completely internal or even mostly internal staircase up to the rooftop, whether covered or uncovered would isolate the pedestrian from the surrounding buildings and create a potentially unsafe space within the building.

STRAIGHT

ITERATION 02

Iteration 02 tests how long *The Street* would be if it were just stairs. As the building is 30 metres tall *The Street* would be very steep. The number of staircases would discourage pedestrians from getting to the top. Instead of being leisurely, it would become a hike.

ITERATION 03

This iteration is slightly longer than the previous one making *The Street* less steep. Both iterations are west facing, which means that the pedestrian has no *foreshadowing* of the view that they will get or a complete perspective on the surrounding site.

STACKED

ITERATION 04

Another simple technique for creating circulation is by creating a spiralling ramp. It doesn't take up much space in plan because it is stacked, but it does isolate the volume inside it. In this position the residents at the other end of the building would all have a long way to walk to get to the vertical circulation. See p 116 for more about the spiral.

ITERATION 05

Iteration 05 places the spiral at the other end of the building and adds a ramp that leads up to it. This gives the pedestrian more external connection to the surrounding site and views from three of the facades. It still divides the building into two volumes and like the previous iterations the ramp begins at right angles to *The Street*.

WINDING

ITERATION 06

The following four iterations look at different ways of winding *The Street* through the building, so it engages the pedestrian with the surrounding context on both sides of the building. The first iteration brings the pedestrian from the Eastern side up to the top of the western facade and onto the roof. Unfortunately the sunniest part of the building has the shortest length of *The Street*.

ITERATION 07

Iteration 07 moves from the eastern facade to the western facade using right angles. These create spaces into which apartments can easily fit and the pedestrian experiences different types of spaces (covered, external, etc) and views.

WINDING

ITERATION 08

Iteration 08 uses the same path but by curves *The Street*. The curving angles create a more gradual change in direction and give the eye a constant reference of what is coming next. However, the curves create awkward spaces within a rectilinear building and there is still too little exposure to the western side which gets the most sun.

ITERATION 09

This is similar but the more angular bends get more exposure to the exterior of the building, especially on the western facade. On the eastern side the pedestrian now gets a view of the harbour as it pushes past the Grand Annex building. However, the angularity creates more unusable space in the building than before.

WINDING

ITERATION 10

Iteration 10 changes the orientation of *The Street*, so it starts on the western side and moves to the eastern side, which is more logical if the Grand Annex is there to begin with. Internalising *The Street* in the northern wing however, creates awkward spaces which make organising the apartments more difficult.

ZIGZAG

ITERATION 11

Another conventional way of organising the circulation was the zigzag. In Iteration 11 the stairs were stacked up the western facade with each alternating zag being inside or outside the volume. One zag would be ramped the other flat.

ZIGZAG

ITERATION 12

Iteration 12 uses a staircase at each end of the building for vertical circulation and then *The Street* stretches between the two for the horizontal circulation. Both iteration 11 and 12 create very monotonous pathways for both the resident and pedestrian to walk up and are partially disconnected from the facade.

ZIGZAG

ITERATION 13

Iteration 13 tests how long *The Street* would be if it were just a ramp by creating a zigzag that is staggered instead of stacking on top of itself. However it takes up more space in the site, more of the floor plan than the apartments and has the same problem as the other iterations.

ZIGZAG

ITERATION 14

The last in the series of iterations was preliminary design 01, which combines the zigzag with the winding street. In plan it cuts up the western side of the building and swings back around to face the view of the harbour. It zigzags back and forth up the western facade getting most of the sun and then cuts through the volume, changing the spatial experience of *The Street*.

THE ZIGZAG

The Zigzag is a conventional mechanism for scaling hillsides and buildings. It came out as the most efficient method to reach the desired height of the building because of the given length of the volume; it was a simple and effective use of space.

Fig. 134 : Rendered perspective showing *The Street*

THE WEAVE - *Constructing the Edge*

The disconnection of the zigzag discussed in the previous section brought up an interesting dilemma; detachment from the apartments posed a problem but also an opportunity for *The Street* to move in and out of the facade, as well as up and down it.

In order to mitigate the complete and repetitious disconnection which occurs when the conventional zigzag crosses back on itself, each segment of the Zigzag weaves in and out of the facade by the full street's width (3m) on various angles. This creates an undulating weave, in and out, which gives the maximum connection to the facade and the apartments possible, while encroaching less on the space for the apartments. A formal dynamism is created in the streetscape through this warp and weft of *The Street*; the weft zigzags back and forth, changing the users' views of the city and the warp weaves in and out, enveloping and expelling *The Street*.

By consistently presenting the users with shifting spaces their awareness of the surrounding environment is increased. These spatial shifts break up the monotony of the zigzag and the minimal volume; the weave adds a welcome protrusion to the facade that creates spaces through the voids that open and close between *The Street* and the facade.

Fig. 135 : Diagram of the horizontal shift of *The Street* @ 1:500

Fig. 136 : Shift in view at *The Switchback*

Fig. 137 : Photo of the elevated street in Spangen Quarter

CASE STUDY: JUSTUS VAN EFFEN COMPLEX (Spangen Quarter)

Architect: Michiel Brinkman
Site: Rotterdam, The Netherlands
Construction Date: 1919-1921
Height: 4 storeys

The Justus Van Effen Complex is one of the earliest multi-unit housing blocks to use the elevated street as a means of circulation. Replacing the internal corridor has meant a re-evaluation of the vertical and horizontal arrangement of the housing block and affected the relationship between inside and outside spaces.

The apartments, which border the block, are orientated inwards so they

look onto a communal courtyard (see below). Running between all the apartments on the second level is the **elevated street**, which varies between 2.2 - 3.3m wide. It ...“is a non-stop one-kilometre walk, full of twists and turns, different widths, in which a series of small events – volumes, openings looking outwards, street views, encounter with the stairwell... -continually alter the perception of the setting”(Fernández Per 55).

This spatial and visual variety is important when looking at the elevated street in comparison to a public street as a successful semi-public space within a private building.

According to Aurora Fernández Per, Michiel Brinkman’s elevated street was successful. It’s criticism was its shadowing of the dwellings below it as the deck juts out from the main facade of the building (50).

Fig. 138 : Diagrammatic Plan of the Justus Van Effen Project

Fig. 139 : Exploration of positioning of the Street

Positioning *The Street* in relation to the facade is important in my building as it will either shade apartments below the deck (like in Brinkman’s block) or if it is recessed into the facade *The Street* itself will become shaded. Option 4 is the only option to eliminate the possibility of either shadowing the apartments or *The Street*, but this decreases the size of the plan by half. In the final design a variation of all four is used to minimise the amount of shading caused by overhang and also to vary the relationship of street to the building for the user.

The apartment design of the Justus Van Effen Complex places the kitchen adjacent to the elevated street with the lounge facing the external street and the bedrooms on the second floor. This gives more privacy to the bedroom and lounge spaces. Placing the toilet next to the elevated street seems to be an odd choice; however the placement of the other rooms of the apartment seems to work well for the privacy of the residents.

Fig. 140 : Plan of Spangen Quarter

Fig. 141 : Photo of Fundação Iberê Camargo

CASE STUDY: FUNDAÇÃO IBERÊ CAMARGO

Architect: Alvaro Siza
Site: Porto Alegre, Brazil
Construction Date: 2002 -2008
Height: 4 storeys

Alvaro Siza's Fundação Iberê Camargo provided a unique example of the relationship between circulatory spaces and activity based spaces. The following iterations for the design of the weave were explored after analysing Siza's work. Because of the programmatic differences *The Street* could not be as detached from the building as his was, however the basic idea was taken and sculpted to fit the building and site. Different arrangements were explored to find the right amount of zigzags relative to the amount of connection to the facade.

Fig. 142 : Section

Fig. 143 : Plan

Another space is created by the protruding circulation so both the main mass and the circulation define the entire volume of the building.

The circulation weaves in and out of the building making it prominent visually and also a key part of the experience of the museum

Fig. 144 : Circulation to volume relationship

BREAKING THE MONOTONY

The first two iterations focus on monotony that is implicit with a zigzagging access way.

SIMPLIFYING THE STREET

The second two iterations look at shortening *The Street* so it is simpler and quicker to ascend.
ITERATION 03:

ITERATION 01:

Horizontal circulation runs along every second floor with vertical circulation joining from the north end of the building to the southern end on levels 3, 5 and 7. The vertical circulation has been brought away from the facade to give the apartments more privacy. Each of the three vertical components changes in relation to facade, angling back and forth in varied patterns. The effect is a dynamic space between the crisscrossing members of *The Street* and facade.

ITERATION 02:

Similar in design to Iteration 01 except the both the recessed constituent and the suspended constituent climb up the building reducing the total length of *The Street*. The design still errs on the monotonous side and is still too long not to be a deterrent for both the resident and the pedestrian.

Three zigzags cross back and forth over the facade; two are recessed into the facade and one is suspended like the previous examples. The extension of *The Street* away from the facade in the middle switchback further limits the length of *The Street*, which gives access to the apartments within the building. In contrast, this iteration provides an insufficient amount of access to the apartments in order to lessen the length of the trek.

ITERATION 04:

Bringing the middle zag in toward the facade, creates a more subtle contrast between being grounded and hovering; *The Street* becomes more efficient length wise but still retains its more dynamic and stimulating spatial qualities.

Fig. 145-160 : Photos of Iterative Models (p 154-157)

INCREASING THE
CONTRAST:

The last iterations are about configuring how to weave *The Street* in and out of the facade.

ITERATION 05:

The Street zigzags back and forth the same amount of times as Iterations 03 and 04, however the suspension of *The Street* occurs where there is a switchback in the direction of *The Street*, allowing maximum accessibility to the apartments and increasing the contrast between the recession and extension of *The Street*. The cut into the facade is a consistent height all the way up the facade, mimicking Iteration 02.

ITERATION 06:

While very similar to Iteration 06 the recessions into the facade are cut horizontally, changing the height of the step back as the user circulates up the through the space.

Both solutions create spatial difficulties in plan; Iteration 05's diagonal cuts mean the volume in the apartments will become angular and inefficient spaces are created. While Iteration 06 cuts horizontally mitigating

the effect of spatially awkward volumes, the cuts are bigger causing shadowing on the apartments recessed into the facade.

ITERATION 07:

Unlike Iteration 04, when the middle zigzag switches back along the building it hugs the side of the facade providing more access throughout the entire route.

ITERATION 08:

Takes the previous experiments and weaves *The Street* width in and out of the facade on a more gradual angle. This creating less shadowing on the apartments from the recesses and extensions of *The Street*.

SETTING THE RHYTHM

The dimensions of *The Street* were determined by carefully set parameters, which allow for ease of movement and a range of activities to occur in the space simultaneously. The width of *The Street* was based on Jan Gehl's *Life between Buildings: Using Public Space*, which states that the width should be calculated on 10 to 15 pedestrians per minute per meter of width (134), which if *The Street* is 2.8m wide would appear to be quite generous for the amount of usage. However, the extra width is given for other activities to occur such as children playing, neighbours talking and people sitting. The entrances to the apartments also descend into this mix by approximately 1m, which narrows the main thoroughfare.

Fig. 161 : Section of street @ 1:100

Along the route an amalgamation of steps, ramps and stepped ramps are used to regulate the cadence of pedestrians as they ascend the building. So as the pedestrian moves further up the zigzag, the path becomes less steep and more gentle. The following dimensions are based on the widths and heights of the Victoria University School of Architecture atrium (see following page). A prime example of stairs as a social condenser, the stairs were frequented often by the author and gave a baseline for testing fitness and its effect on socialising. The measurements comply with recommendations of AS1 4.0.

Stairs have a 300mm tread and 180mm riser. Each flight is a maximum of 9 stairs if there are two flights following one another. Between each flight there is a landing, which has a minimum width of 1000mm.

Fig. 162 : Dimensions of the Stairs

Fig. 163 : Victoria University Architecture And Design School Atrium

The circulation works well as a social condenser because it is in a central open space that all the other studios, offices, etc come on to.

Fig. 164 : Dimensioned Plan of the atrium @ 1:500

Fig. 165 : Beaglehole Courtyard Entrance from Kelburn Parade

Fig. 166 : Diagrammatic Section showing the width of the steps in relation to the span of a persons stride

All stepped ramps are a minimum of 1.5m, after observations of the failings of the access up to the new quad at Victoria University from Kelburn Parade, a path which several pedestrians I have spoken to complain about. The length of the average person's step is 71.5cm means that if the natural walking gait is compromised and two restricted steps have to be taken between each step on the descent. After observing the space, it was noted that people either use the drive way or after starting up the stairs soon switched to the drive. The stepped ramps in the Plimmers Steps project are designed to be longer to account for this. They are an efficient means of attaining more height while still achieving a gentler angle than a flight of stairs.

DETAILING *THE STREET*

Once the route of *The Street* had been established, a closer look at its articulation as public walkway and access way to private residences was necessary. As the route of *The Street* had been designed around the human gait, the detailing of it needed to consider this. In *Life between Buildings*, Gehl discusses the relationship between the level of detail and speed of motion, stating that the faster someone is travelling the larger the representation of objects needs to be in order for them to be perceived (71). As pedestrian traffic is much slower than vehicular traffic, the articulation of *The Street* needs to be more detailed as pedestrians can take in more of their surroundings. The detailing of the streetscape and entrances to the apartments reflect this and aim to create an engaging space on a human scale and using materiality to evoke a tactile response.

In relation to Gehl's point, Juan José Tuset Davó states "...in the interventions within the new residential suburbs of the contemporary city, in the indefinite areas and those with a more generic character, the presence of the public is missing..." (17), affirming Gehl's point that a non-homogenous space that engages with the public, attracts more pedestrians. The irregularity of the entranceways to the apartments reflect this idea of creating a diverse and fluctuating streetscape to pull in and engage the public with.

As previously mentioned, the 'Blenheim House', was one of the safer 'Projects' built in New York according to observations made by Jacobs (43). Her view was that the building was safer because of the external access way. Unlike other residential towers such as Robin Hood Gardens by the Smithsons, the success of the deck access is due to other uses apart from circulation having been incorporated into the space; narrow porches were created for play space and also became 'picnic areas' (43). This increased neighbours' surveillance of the space making these areas safe and full of life. In contrast the fire exit and elevators were a problem because they were not so well observed

(43). By designing circulation that provides room for similar opportunities to 'Blenheim House' to occur, it is hoped that *The Street* will also be safe and full of life despite its elevation above ground level.

Fig. 167 : Photo of Robin Hood Gardens

CASE STUDY: ROBIN HOOD GARDENS

Architect: Peter and Alison Smithson
Site: London, England
Construction Date: 1972
Height: 7 - 10 storeys

Fig. 168 : Site Plan + location

Access faces the street not the internal park area

Fig. 169 : Apartment Arrangement

The recesses in plan create alcoves which create a nice depth to the access way and spaces for residents to sit but there is nothing to lean on.

Fig. 170 : Diagrammatic Plan of Recesses

Fig. 171 : View down street deck

There is less sun on the access way because it is recessed into the building making it less appealing to residents

The low height of the street deck makes it feel claustrophobic

Fig. 172 : Section through facade and street deck

The access to each apartment opens parallel to the street deck, so if people sit on their doorstep they cannot see other people on the street deck. This makes the space less conducive to social interaction.

Fig. 173 : Diagrammatic Plan showing entrances off the street deck

Running along the outer edge of *The Street* is a 1100mm high wall that serves as the railing, meant to evoke a hilltop town. The wall is made from the same material as the facade and is thickset at 200mm. At 900mm there is a handrail that is carved out of the stone. Curved and smooth, it contrasts with the rough finish of the wall giving the hand a surface to glide along. As the handrail is set 200mm below the top of the wall, the top can be used to lean on for those who want to stop and take in the view, or to chat on *The Street*.

THE MAIN DRAG

Is wider to create a comfortable distance for contact between strangers. There is direct visual contact between the pedestrian and resident. The planting creates soft barriers to signal a change from public to private space.

A 100mm wide gutter runs down each side of *The Street*, collecting runoff to water the plants that line the inner edge of the access way. The greenery is dispersed between benches which are placed sporadically along *The Street*, as suggested by Jan Gehl for public spaces (162). The planter boxes themselves can also be used to perch on. Placing the benches on the inner side of *The Street* allows the user to lean against the sun-warmed stone of the facade. This ties in with well-known American urbanist Whyte's observation that people do not like to stop in the middle of a large space, instead they like to stop at the corners and edges ("The Social Life of Small Urban Spaces"), allowing them to observe others and take in the surrounding area. Various types of grasses and flowering perennials natives will be planted, giving seasonal variation to the route. In between the benches and the planting are the entrances of the apartments.

Fig. 174 : Section AA through *The Street* and apartment @ 1:50

Fig. 175 : A stoop in Brooklyn, NY

THE STOOP

All of the front entrances to the apartments are based on the 'stoop': traditionally "...raised stairs of brownstone houses – a place where people sit, play, wait and watch (Jacobs 50)". This type has been adapted in various ways to fit between the streetscape and adjoining floor levels.

My intention in using the stoop was in alignment with Gehl's observations that "...distance (can be) used to regulate intimacy and intensity in social situations and to control the beginning and end of individual conversations..." (44). Gehl goes on to give dimensions of normal social distance between neighbours, friends

(1.30-3.75m) and for public distance between strangers (>3.75m) (6g). As there was not enough room to create an entrance that was 3.75m away from the street or as Gehl also suggests a front yard of 3.25 metres (6g), the stoop was as an appropriate alternative because it raises the entrance off *The Street* creating an intermediary space for people to sit and engage with others, but also gives residents distance from *The Street* for privacy if they want it.

Semi-public areas, such as the stoop, "make it easier, physically and psychologically, for residents and activities to move back and forth between private and public spaces, between in and out (Gehl 113)." And although the stoop is not the best entrance-type for ease of movement between inside and outside, as recommended by Gehl for promoting street use (187), providing this space was necessary as privacy is important in New Zealand culture and moreover in the confronting nature of the inner-city.

Placing public and private spaces adjacent to one another, at such close quarters, means the articulation of the interstitial spaces is key to ensuring that they function well for both the resident and the pedestrian. Using the stoop helps delineate between the public and private areas of the building by creating a semi-private outdoor intermediary space. In order to indicate a change to private space, the following architectural means were used :

1. Walls
2. Multiple Levels
3. Orientation away from others
4. Width: see page 184
5. Materiality: used to indicate continuity (from Plimmers Steps) or change in use (wooden doors and aluminium railings), as it gives visible and haptic clues to the pedestrian of the shifting space they are walking through.

Fig. 176 ; Section BB from *The Street* to The Balcony @ 1:100

The width of the stoop is 1 meter so that it is sufficient for residents to access their apartments and also to sit on the steps, whilst small enough not to encroach on the main thoroughfare.

The number of stairs varies from 1 to 10 depending on the height difference between *The Street* level and the apartment, with a minimum of one step to indicate a change from public to private space.

Most of the stoops on the main route have two entrance ways per stoop. This configuration was used so there would be fewer interruptions to *The Street*. Moreover it facilitated easier alignment between street, stoop and apartment. If the height difference between street and apartment is too large, the number of steps would be too great and impinge on *The Street*.

The orientation of the stoops is mostly front on, but two, because the height between street and apartment is too great. Instead these stoops are placed side on, in order to mitigate this. In these cases there is a small landing between the flight of the stairs of *The Street* and that of the stoop. The riser height for the stairs of both stoop and street are the same to make an easy transition between the two.

A powder-coated black iron handrail follows the edge of the stoop at height of 1100mm. The profile is circular, with the radius of 40mm to provide a comfortable support for the hand. Bolted brass L-plates connect the railing to wall and stair at each end.

Stairs of the stoop create a space which people can lean against and sit down on while interacting with others on *The Street*.

Fig. 178 : Elevation of the Stoop @ 1:50

THE PORTICO

The steps of the stoop lead onto a 1.5m wide portico that provides shelter for the residents. To the side of each apartment entrance is the number of the apartment and below that a slot, cut into the facade for mail. The letter box can be accessed by key from the portico through a 320 x 420 wooden opening. A small wall divider separates each apartment entrance. A recess at torso height has been carved out of this wall on which bags can be rested while searching for keys, alternatively the recess can be personalised with pot plants for example. The door sill is a step up from level of the portico. Both door and lip are made from walnut, finished with a dark satin polish. The door handle is made from brass, to match the L-plates of the railing, providing continuity.

“Most multistorey buildings have coming and going activities, but few stationary ones as it is too much effort to bring stuff down and outside (Gehl 184).”

Externalising the corridor and giving it a generous width can mitigate this problem. Gehl refers to the difficulties of transporting items, like toys, from apartments several stories above The Street level as a deterrent. Creating an external space that is less than 2m away from one’s front door increases the likelihood of children and adults using The Street for both stationary activities as well as a comings and goings, compared with moving down 10 floors.

Fig. 179 : Entrance way typologies

CASE STUDY: 8 HOUSE

Architect: BIG
Construction: 2010
Floors: 10

Fig. 180 : Site Plan @ 1:100

Fig. 181 : Access Ways through 8 House

Fig. 182 : Green Space and outdoor areas

Similarly to my proposal, BIG's 8 House uses a continuous open-air ramp, which loops around the hybrid building providing access to the various housing types and commercial spaces. The intention of the ramp was not only for access but also to provide the large-scale complex with a sense of community:

"Where social life, the spontaneous encounter, and neighbour interaction are traditionally restricted to the ground level, the 8 house allows them to expand all the way to the top." – Ingels (Gonchar 48)

While there is also stair and elevator access, 8 House steps away

from the corridor typology common in multistorey buildings, which ties public life to "the ground, flat as a pancake with everything upward privatized, (and instead) ... allows the city's social life to invade higher altitudes" (BIG, "8H - The 8-House). Essentially BIG's mammoth complex has the same purpose as this thesis: reconnecting the urban strata and at the same time providing a more communally orientated living environment for the inhabitants. The large scale of the building complex has meant BIG has more to play with, literally and figuratively.

Firstly, the ramp is a combination of stepped streets and 'mountain

paths', i.e. stairs. The mountain paths consist of 10 sets of 13 stair cases – a very steep climb, and probably somewhat of a novelty in the flat terrain of Copenhagen – in fact one of BIG's selling points is that citizens come there to experience the altitude.

Fig. 183 : Plan @ apartment level

Fig. 184 : Urban Connection

Fig. 185 : Section through lower side

Working with a 13m wide building, I have had to consider the steepness of *The Street* carefully. While New Zealanders, especially Wellingtonians, have a strong tradition of tramp-ing up mountainous terrain, in an urban residential context it may not be so appealing. Thus a careful combination of stairs and ramps to ease and encourage the pedestrian up the building is necessary, as there is no room for a dual ramp system.

BIG has cleverly delineated the difference between ramps by adding a cobbled pattern to the wheelchair accessible ramps (Gonchar 48), it doesn't however mark the difference between public ramps and private terrace gardens, one that would evidently appear important (fig 185). The surface between the two spaces instead flows uninhibited with a gently curved plane.

When designing the change between private and public space several factors were considered: the need for privacy, outdoor areas and community. This leads to a more segregated approach between public and private areas. On the eastern side of the building private balconies / gardens were given to each apartment and on *The Street* side of the building each entrance was given a raised portico, allowing for the neighbour interaction as well as privacy when needed.

While BIG's cobblestone ramps offer a humanistic reference to the medieval hill top village, the aluminium rain screen cladding gives the space a commercial emphasis. However the internal finishings are warm and inviting. Most apartments are exposed to the exterior on two sides like *High Street*, creating airy spaces with lots of light.

There are signs showing the potential of this community: the terrace furniture, people working and a busy café. The building has also become a destination for tour groups to visit (Gonchar 50).

Fig. 186 : use of fencing to delineate between public and private space

Fig. 187 : Photo showing contrast in materials

06 THE APARTMENT

- 6.1 *Apartment Design*
- 6.2 *Levels*
- 6.3 *The Living Level*
- 6.4 *The Balcony*
- 6.5 *The Sleeping Level*
- 6.6 *The Laundry*

APARTMENT DESIGN:

The apartments have been configured in relation to: the steps, the residents’ needs for privacy and to encourage interaction on *The Street*. All apartments are two stories high and span the width of the building, as the “narrow deep lots assemble more people and keep the street busy (Gehl 95)”. There are two basic types of apartments, which alternate along the length of the building (see diagram).

Within these two main types, there are slight differences due to the relative position of each apartment to the angled street. All apartments in the building have ‘street’ access, but there is also a ‘back entrance’ that can be accessed by lift via the eastern facade (discussed in The Zigzag). Depending where the apartment sits in relation to the position of the elevator determines whether it has a balcony or not. The range of apartment sizes and variations would appeal to a broader group of people and therefore create more diversity in the residential population of the building.

6M WIDE APARTMENT

4M WIDE APARTMENT

4M WIDE STUDIO APARTMENT

- TYPE
- BEDROOMS
- BALCONY TYPES

Fig. 188 : Different Apartment types in High Street

LEVELS:

Of the two levels in each apartment, one functions as the **living level** and the other as the **sleeping level**. These are interchangeable, the apartments being configured so the living level is the level closest to *The Street* and the sleeping level is the level above *The Street*.

Fig. 189 : Diagram showing alternating levels

Fig. 190 : Diagram showing sleeping/living arrangements of the apartments

THE LIVING LEVEL

This level consists of the kitchen, dining and lounge areas and in the larger of the two apartments there is also a toilet. If the apartment has a balcony it connects to the lounge.

KITCHEN:

The kitchen has been placed adjacent to *The Street* as the activities that occur in this space are the least private of the living spaces. The sink faces *The Street* so that adults can observe the goings on below, either of passers by or children. According to Jane Jacobs (76-77), streets are particularly good at assimilating children because adults watch over the street during their daily routine, especially if they are in the kitchen.

At one end of the kitchen bench is a reading nook for people to take in the street scene below. If it is a sunny day people may eat on the stoop, as the front door opens on to the kitchen allowing ease of movement between the two spaces. At the other end, the bench curves around the corner, forming a u-shape and dividing the kitchen from the dining area while still generating a feeling of openness. The fridge, sink and stove have been placed to create a working triangle.

DINING

The dining room sits between the lounge and the kitchen, in the centre of the space. As the entire living level is open plan, daylight penetrates through the space from both ends of the building depending on the hour. It gives light to a space that would otherwise have no natural illumination. In the larger of the two apartments there is a shelving divider, which separates the living space from the stairs and the toilet and provides in-built storage. All the shelving, cabinetry, etc are also finished in walnut veneer.

LOUNGE

At the eastern end of the living level, the end furthest from *The Street* (except on the first floor of the building) is the lounge. This gets the morning sun and daylight in the afternoon. A bifold door can be pulled across to separate the lounge from the dining and kitchen areas if more privacy is needed. If the apartment has a balcony, it is also located on the eastern facade beside the lounge. There is floor to ceiling fenestration, which lets in a maximum amount of lux and a sliding door, which opens out the space and lets fresh air circulate. There is also a hinged door if users do not want to open the space out. The plan of the living level has been orientated for privacy and the spaces divided so as to get the maximum amount daylight.

BALCONY

Depending on the configuration of the apartments the balcony is either single or double height. The balcony is recessed into the facade and uses the same Oamaru stone veneer for the finish of the walls and floor. Dark stained wooden shutters provide privacy and shelter from the wind. The slats in each shutter are orientated upwards to let sun in and also to lessen updraft coming off the facade of the building.

THE SLEEPING LEVEL

On the sleeping level are the bedrooms, the main bathroom and a study. The bedrooms are given preference to natural light so accordingly they have been placed at either end of the space.

THE LAUNDRY

Within the apartment building, there are also two laundry rooms for the residents, one on either side of the atrium. Residents have the option of drying their washing over the atrium as it is sheltered from the rain but has air circulation, or alternatively taking it back to their apartments to dry out of the window. Taking the laundry room out of the apartment generates more space within the apartments and also creates a functional communal space where residents can intermingle naturally.

No further 'communal' spaces have been designed, such as community meeting rooms, etc as Jacobs notes that they are used infrequently because people are forced to interact (60). Instead the communal spaces, i.e. *The Street* and the laundry room, both serve a necessary function and allow connections to occur naturally between people.

Within the public facilities in the building, there is the pocket park and café/bar, which has a functions room, which residents can use.

Fig. 193 : Plan of the laundry @ 1:100

“We have to accept that the skyscraper is inevitable and proceed to consider how it can be made healthy and beautiful....”

- Rem Koolhaas 119

07 IN CONCLUSION

7.1 The Method

7.2 In Favour Of The Street

7.3 Further Questions

7.4 A Wider Perspective

This thesis is based on the observation that high-rise buildings are an essential part of the modern city, but their limitation is that their utilitarian appeal (i.e. their height) creates a disconnection with the life of the street below them. The research illustrates the possibilities and limitations of bringing the ‘street’ and high-rise together and creating a three-dimensionally traversable urban fabric.

THE METHOD

The experimentation with form, analysis of case studies and secondary scholarly research on urbanism informed my design, which essentially became a test case. This approach allowed me to test and compare the insights gained from observation and analysis from a variety of perspectives. An iterative series of three formal experiments led to the design explored in the thesis.

Each form of research contributed to the analysis and development of the design and consequently creating a cyclical process. The first experiment generated a series of basic formal moves applying the research hypothesis to the site selected. This gave me a tangible basis from which to launch into the design research. The secondary research developed the detail of the design by informing pragmatic considerations such as dimensions and common human behaviour patterns. There were a number of recent publications, which supported the relevance and timeliness of my thesis proposition.

The case studies were treated as ‘past experiments’, which I was able

to analyse through observation, comparison and literary research.

Switching between different research methods while challenging, enabled me to gain a more thorough understanding of what could work or fail in the design and gave the design more academic rigor.

The research methods worked well formally, however more integration of the ‘humane’ design considerations throughout the research process would have improved the design outcome.

IN FAVOUR OF *THE STREET*

High Street offers an alternate solution to the way high-rise buildings connect to the city’s urban fabric, and also fresh approach to the design of circulation in apartment buildings. It is intended that this work be viewed, not as an iconic building, but as a new vernacular that sees high-rise development create a better connection to the city, as many high-rise buildings lack a connection to the city and user orientated circulation.

In designing *The Elevated Street*, it became evident that the configuration of the apartments in relation to the circulation design, has significant implications in determining the formal articulation of the building. Creating a narrow building with stacked apartments gave focus to the articulation of the circulation design. These parameters were partially influenced by the site, however having a long and narrow form, i.e. a slab type, lent itself to a more flexible design for external circulation.

The tension between the need for efficiency and humaneness became more apparent as the design research progressed. It formed a leitmotif, which became a key principle in articulating *The Elevated Street* and guiding the design research. The

result was a typology, in which the circulation played a key role in the connectedness of the residents and the pedestrians. Through elevating *The Street* an alternate solution, to the way in which circulation is currently designed in high-rise buildings, was created.

To make the design plausible, efficient and humane, the design research focused on manipulating the relationship of the circulation to the apartments and appeal of the route for the user. The design of *The Elevated Street* created an efficient route up the façade of the building. Key moves, such as zigzagging and weaving the street into the facade, were used as solutions because they were efficient, plausible and enhanced the users experience of the city and building.

FURTHER QUESTIONS

Although the design has been well resolved in relation to the site, the experience of the pedestrian and the resident and the manner by which public circulation can work within the building (in this case the apartments), the articulation of *The Street* could be tighter in its composition relative to the facade. Further design research on the façade design could be used to emphasise the qualities of *The Elevated Street* and its relation to the other elements of the building, such as the fenestration design. With further refinement, the configuration of the stairs in relation to the landings and ramps could be better articulated aesthetically, while maintaining functionality. And the question of how aesthetics can fit into the articulation of efficiency and humaneness can be asked.

A WIDER PERSPECTIVE

Jane Jacobs, Jan Gehl and William H. Whyte note that elevated circulation can be unsafe and underutilized. However examples of public spaces,

such as the High Line and apartment designs, like Spangen Quarter create successful external circulation that is elevated above street level. In Whytes study, he notes that if sunken or elevated spaces are well-designed they will be used (“The Life of Small Urban Spaces”). This is seen in the extroverted building trend noted in the body of the thesis.

By incorporating observations Jacobs, Gehl and Whyte, *High Street*, although hypothetical, develops underlying principles, which create possibilities for the realisation of elevated streets and extroverted circulation. The advances made by *High Street* in vertical connectivity are applicable to the design of other high-rises in which socially connective circulation is desirable.

When the prime focus is on the economic efficiency of a building (for example when floor plans are replicated) then the result is often a lack of humaneness. My research indicat-

ed that many of the high-rise social housing developments like the ‘Projects’ in the USA and others in the UK, which exemplify this model, have created unsuccessful living arrangements leading to their demolition.

However the replication of floor plates is standard in high-rise buildings and for *High Street* this tenet was manipulated, which allowed for research relative to the standard high-rise and gave an emphasis to circulation design.

With large-scale replication, the result is often homogeneity, which can lead to anonymity. In *High Street*, the articulation of the circulation was focused on creating a heterogeneous experience for the pedestrian. An implication of this was variation it gave the apartment sizes and entrance locations, breaking the potential monotony of the stacked apartments.

In addition to replicating floor plans the current convention is to design

apartment buildings with internal corridors, which is an efficient solution with the same effect as replicating floor plans. Through my research it became clear that circulation is often not prioritized in high-rises and is one of the only communal spaces in apartment design and acts well as a social condenser. If we want to create more humane urban architecture with a communal intent, then circulation space is one area that architects need to focus on.

Contemporary architecture is created in the context of modern economies of the last 80 to 90 years with their focus on efficiency. Consequently the connection to public space is often overlooked in the design process as development is motivated by a return on investment. So, even when high-rise buildings are designed well and fit for purpose they may still fail to connect with the urban fabric they are part of. This thesis has attempted to provide a solution to this fundamental problem.

Fig. 193 & 194 The Highline By Diller, Scofidio And Renfro

Fig. 191 : View down The Loop.

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LIST OF FIGURES

Fig. 1 :	Rendered Perspective from High Street's Colonnade looking toward Wellington Harbour (Authors Own) Note: All renders have used people from http://skalgubbar.se/ . See <div ><span="" >cc="" >skalgubbar<="" >teodor="" <aref="license" (<a="" 3.0<="" a><="" a>)="" about="http://skalgubbar.se/" by="" commons="" creative="" div>="" emdén<="" for="" href="http://creativecommons.org/licenses/by/3.0/" javanaud="" liscence.<="" property="cc:attributionName" rel="cc:attributionURL" span>="" td="" xmlns:cc="http://creativecommons.org/ns#" xmlns:dct="http://purl.org/dc/terms/"><td>(Authors Own)</td><td>Authors own with adapted drawings from the Wellington City Archives</td><td>Fig. 55 : Diagrammatic Plan and Section Authors Own</td></div>	(Authors Own)	Authors own with adapted drawings from the Wellington City Archives	Fig. 55 : Diagrammatic Plan and Section Authors Own
Fig 2 :	Diagram of volume comparison (Authors Own)	Fig. 18 : Level 05 @ 1:200 @ A3 (Authors Own)	Fig. 33 : Contextual Plan of Plimmers Steps @ 1:500 Authors Own	Fig. 58 : Photo of Model 08 Authors Own
Fig 3 :	Griffith, Tim. The Met by WOHA, 2009. 02 October 2013. Web. archdaily.com	Fig. 19 : View toward Plimmers Steps and the Wedge (Authors Own)	Fig. 34 : The Approach to <i>High Street</i> from Lambton Quay Authors Own	Fig. 57 : Diagrammatic Plan and Section Authors Own
Fig 4 :	In clockwise order: a. Melbourne, 2011. 9 October 2013. Web. http://walkwalkmelbourne.blogspot.co.nz/2011_05_01_archive.html b. Giannone, Lino. Napoli. 2012 9 October 2013. Web. http://naples-italy.tumblr.com/post/23824816188/street-and-stairs-in-the-historical-center-of c. Prince, Lilly. Acorn Street, Boston. http://www.travelsages.com/boston-by-neighborhood/ 9 October 2013. Web. d. Sheung Wan, 2012. 9 October 2013. Web. http://randomwire.com/streets-of-sheung-wan/	Fig. 20 : Level 06 @ 1:200 @ A3 (Authors Own)	Fig. 36 : Proposed Scheme @ 1:500 Authors Own	Fig. 60 : Photo of Model 09 Authors Own
Fig 5 :	In clockwise order a. Stanziola, Phil. Jane Jacobs, 1961. 02 October 2013. Web. http://en.wikipedia.org/wiki/Jane_Jacobs#mediaviewer/File:Jane_Jacobs.jpg b. Jan Gehl. 02 October 2013. Web. http://streetswiki.wikispaces.com/Jan+Gehl	Fig. 21 : Level 07 @ 1:200 @ A3 (Authors Own)	Fig. 36 : Diagram of access between buildings Authors Own	Fig. 59 : Diagrammatic Plan and Section Authors Own
Fig 6 :	Diagram of connecting the layers and creating a three-dimensionally traversable city (Authors Own)	Fig. 22 : Level 08 @ 1:200 @ A3 (Authors Own)	Fig. 37 : Design Iteration 01 Authors Own	Fig. 62 : Photo of Model 10 Authors Own
Fig. 7 :	View toward Plimmers Steps (Authors Own)	Fig. 23 : View toward Boulcott Street (Authors Own)	Fig. 38 : Design Iteration 02 Authors Own	Fig. 61 : Diagrammatic Plan and Section Authors Own
Fig. 8:	View of High Street from Willeston Street (Authors Own)	Fig. 24 : Level 09 @ 1:200 @ A3 (Authors Own)	Fig. 39 : Diagram showing the views from High Street Authors Own	Fig. 64 : Photo of Model 11 Authors Own
Fig, 9 :	Level -01 @ 1:200 @ A3 (Authors Own)	Fig. 25 : Level 10 @ 1:200 @ A3 (Authors Own)	Fig. 40 : Section of <i>High Street</i> with grand annex beside it Authors Own with adapted drawings from Wellington City Council	Fig. 63 : Diagrammatic Plan and Section Authors Own
Fig, 10 :	Level 00 @ 1:200 @ A3 Authors Own)	Fig. 26 : Aerial View of Wellington Wellington Aerial View. 3 May 2013. Web. bing.maps.com	Fig. 41 : Approaching Book House + Original Floor Plan Authors Own with adapted drawings from Wellington City Archives	Fig. 66: Photo of Model 12 Authors Own
Fig. 11 :	View toward Boulcott Street from side access (Authors Own)	Fig. 27 : Siting Wellington CBD Geographic data adapted from koordinates.com	Fig. 42 : Typology Types Authors Own	Fig. 65 : Diagrammatic Plan and Section
Fig, 12 :	Level 01 @ 1:200 @ A3 (Authors Own)	Fig. 28 : Wellington Contours Adapted from koordinates.com	Fig. 44 : Photo of Model 01 Authors Own	Fig. 68 : Photo of Model 13 Authors Own
Fig 11 :	(Authors Own)	Fig. 29 : Wellington Suburbs Authors Own adapted from geographic data from koordinates.com	Fig. 43 : Diagrammatic Plan and Section Authors Own	Fig. 67 : Diagrammatic Plan and Section Authors Own
Fig, 13 :	Level 02 @ 1:200 @ A3 (Authors Own)	Fig. 24 : Movement from Suburb to City authors own adapted from geographic data from koordinates.com	Fig. 45 : Diagrammatic Plan and Section Authors Own	Fig. 70 : Photo of Model 14 Authors Own
Fig. 14 :	View of the central Atrium (Authors Own)	Fig. 25 : Constructed Building Comparison Authors own, adapted from geographic data from koorindates.com	Fig. 46 : Photo of Model 02 Authors Own	Fig. 69: Diagrammatic Plan and Sections Authors Own
Fig, 15 :	Level 03 @ 1:200 @ A3 (Authors Own)	Fig. 26 : Proportional Representation of the number of apartment buildings under construction and constructed Authors own, adapted from geographic data from koorindates.com	Fig. 48 : Photo of Model 03 Authors Own	Fig. 72 : Photo of Model 15 Authors Own
Fig, 16 :	Level 04 @ 1:200 @ A3 (Authors Own)	Fig. 27 : Figure Ground and locations of access along The Terrace Authors own, adapted from geographic data from koordinates.com	Fig. 47 : Diagrammatic Plan and Section Authors Own	Fig. 71 : Diagrammatic Plan and Section Authors Own
Fig. 17 :	View from the upper Switchback	Fig 28 : Lane ways in the Lambton Quarter Authors own, adapted from geographic data from koordinates.com	Fig. 50 : Photo of Model 04 Authors Own	Fig. 74 : Photo of Model 16 Authors Own
		Fig. 29 : Existing site plan @ 1:1000 Authors own	Fig. 49: Diagrammatic Plan and Section Authors Own	Fig. 73 : Diagrammatic Plan and Section Authors Own
		Fig. 30 : Original Drawings of the current Plimmers Steps landscaping Wellington City Archives. Plimmers Steps Planter Treatment, 1989. Print.	Fig. 51 : Diagrammatic Plan and Section Authors Own	Fig. 76 : Photo of Model 17 Authors Own
		Fig, 31 : Existing Contextual Section through Plimmers Steps @ 1:500 Authors own with adapted drawings from the Wellington City Archives	Fig. 52 : Photo of Model 05 Authors Own	Fig. 75 : Diagrammatic Plan and Section Authors Own
		Fig. 32 : Existing Contextual Section @ 1:500	Fig. 54 : Photo of Model 06 Authors Own	Fig. 78 : Photo of Model 18 Authors Own
			Fig. 53 : Diagrammatic Plan and Section Authors Own	Fig. 77 : Diagrammatic Plan and Section Authors Own
			Fig. 56 : Photo of Model 07 Authors Own	Fig. 80 : Photo of Model 19 Authors Own
				Fig. 79 : Diagrammatic Plan and Section

Authors Own			
Fig. 82 : Photo of Model 20 Authors Own	Fig. 101 ; Preliminary Design Plan @ 1:500 Authors Own	cisco, 2012. 12 July 2014. Web. zenmindmaterialworld.wordpress.com.	stairs Authors own
Fig. 81 : Diagrammatic Plan and Section Authors Own	Fig. 102 : Preliminary Design Section @ 1:500 Authors Own	h. Urbanus, Tulou Urbanus. Guangzhou. Housing Plus. Wietzorrek, Ulrike. Basel, 2014. 329. Print	Fig. 133 : Diagrams of the potential routes of the street (p 140-147) Authors own
Fig. 84 : Photo of Model 21 Authors Own	Fig. 103 : Carpark Design Iterations a. Authors Own b. Authors Own c. Neufert, Ernst. Malden, Blackwell Science Publishers. 2000. Architects' Data. Print.	Fig. 116 : Eastern Elevation @ 1:500 Authors own	Fig. 134 : Rendered perspective showing <i>The Street</i> Authors own
Fig.83 : Diagrammatic Plan and Section Authors Own		Fig. 117 : Facade Design Iteration Authors own	Fig. 135 : Diagram of the horizontal shift of <i>The Street</i> @ 1:500 Authors own
Fig. 86 : Photo of Model 22 Authors Own	Fig. 104 : Daylight simulation during winter solstice of the kinked slab with and without car parking: Authors Own	Fig. 118 : Photos of the exterior of GIFU a. Gaash, Netta, Kitagata, 2007. 4 AUGust 2014. Web. gifuprefecture.blogspot.cm. b. Kitagata, 2010. 4 August 2014. Web. http://bahiatapg.blogspot.co.nz/2010_05_01_archive.html	Fig. 136 : Shift in view at The Switchback Authors own
Fig. 85 : Diagrammatic Plan and Section Authors Own	Fig. 105 : A homogenous internal corridor Piotrus. Apartment building in Pittsburgh, 2009. 3 August 2014. Web. http://commons.wikimedia.org/wiki/File:White_corridor.JPG	Fig. 119 : Diagrammatic Plan of GIFU Authors own adapted from Nishizawa, Seijima, Site Plan, 2001. Print.	Fig. 137 : Photo of the elevated street in Spangen Quarter Justus Van Effen Huizenblok. 1950. 8 October 2013. Web. http://people.zeelandnet.nl/deklaproos/map26.html
Fig. 88 : Photo of Model 23 Authors Own	Fig. 106 : Circulation Types Authors Own	Fig. 120 : Apartment Designs in relation to circulation Sejima, Nishizawa. Apartment Plan. 18 August 2014. Web. http://afasiaarq.blogspot.com/2011/12/sanaa.html	Fig. 138 : Diagrammatic Plan of the Justus Van Effen Project Authors own adapted from 41. Fernandez Per, Aurora and Javier Mozas. 10 Stories of Collective Housing: Graphical Analysis of Inspiring Masterpieces. Melbourne, Australia: a+t research group. Print.
Fig. 87 : Diagrammatic Plan and Section Authors Own	Fig. 107 : Dixon St Flats Sarnitz, August & Ottilinger, Eva. Ernst Plischke: The Complete Works: modern architecture for the new world. London, Prestel, 2004. Print.	Fig. 121 : External rain screen cladding system Authors own	Fig. 139 : Exploration of positioning of the Street Authors own, partially adapted from Fernandez Per, Aurora and Javier Mozas. 10 Stories of Collective Housing: Graphical Analysis of Inspiring Masterpieces. Melbourne, Australia: a+t research group. Print.
Fig. 89 : An Historic Example ; the Mesoamerican Pyramid Temple II 18 August, 2014. Web. http://people.wku.edu/darlene.applegate/newworld/webnotes/unit_3/images_civilizations/maya_tikal_temple2	Fig. 108 : Aston Towers Adapted from Google Street View. 10 July 2014. Web. maps.google.com	Fig. 122 : Western Elevation @ 1:500 Authors own	
Fig. 90 : Danish Pavilion in 2010 Shanghai Pavilion by BIG Baan, Iwan, Denmark Pavilion, 2010. 18 August 2014. Web. http://www.archdaily.com/57922/denmark-pavilion-shanghai-expo-2010-big/	Fig. 109 : Exploded Axonometric of <i>The Street</i> and the apartments Authors Own	Fig. 123 : Exploded Diagram of the Pauses on <i>The Street</i> Authors own	Fig. 140 : Plan of Spangen Quarter Authors own adapted from Fernandez Per, Aurora and Javier Mozas. 10 Stories of Collective Housing: Graphical Analysis of Inspiring Masterpieces. Melbourne, Australia: a+t research group. Print.
Fig. 91 : Norwegian National Ballet and Opera by Snøhetta in 2000-2008	Fig. 110: SURE Architecture's London Skyscraper SURE. London Skyscraper Render, 2014. 3 August 2014. Web. archdaily.com	Fig. 124: The Switchback Authors own	
Fig. 92 : Kengo Kuma's design proposal for SUPSI 93	Fig. 111 : Framework Comparison Authors Own	Fig. 125 : Exploded Axonometric of <i>The Street</i> Authors own	
Fig. 92 : Volumetric nets (p 94 - 98) Authors Own	Fig.112: Apartment Configuration for <i>High Street</i> Authors Own	Fig. 126 : Sun path Diagram Authors own	
Fig. 93 : Night Render of Shutters Authors Own	Fig. 113 : Secondary and Primary Circulation Diagram Authors Own	Fig. 127: Photos of Unité d'Habitation: external + rue intérieur a. Marseille, France. 8 May 2013. Web. http://www.studyblue.com/notes/note/n/ess-works-21/deck/6547010 b. Léone, Jacques. L'école maternelle de l'unité d'Habitation. Marseille, 2012.5 August 2014 Web. http://projets-architecte-urbanisme.fr/utopie-realisee-parcours-architecture-lyon-corbusier/	Fig. 141 : Photo of Fundação Iberê Camargo Bruscato, Grazielle. Porto Alegre, 2012 7 October 2013. Web. http://www.archdaily.com/2769/fundacion-ibere-camargo-in-porto-alegre-brazil-alvaro-siza/
Fig 95 : Shifting perception of the urban fabric Authors Own	Fig. 114: Public Access in High-rise Buildings Authors Own	Fig. 128 : Sections, transverse and longitudinal Authors own adapted from French, H. Key Urban Housing of the Twentieth Century: Plans, Sections and Elevations. Laurence King Publishing, 2008. Print.	Fig. 142 : Section Authors own adapted from Fundação Iberê Camargo via archdaily.com
Fig. 96 : Lusatian Lakeland Meinei, Udo. Lusatian Lakeland. 10 July 2014. Web. http://detail-online.com/inspiration/landmark-in-the-lusatian-lake-land-103411.html	Fig. 115 ; Examples of facade treatment in order of appearance a. SANAA, Zolverin School Authors Own b. Álvaro Siza, Terraços de Bragança Guerra, Sergio. Lisbon. Housing Plus. Wietzorrek, Ulrike. Basel, 2014. 219. Print c. Herzog & de Meuron, Residential Building on Rue de Suis Spiluttini, Margherita. Paris. Housing Plus. Wietzorrek, Ulrike. Basel, 2014. 367. Print d. Atelier 5, Flamatt 3 Development Du Fresne, Terence. Flamatt. Housing Plus. Wietzorrek, Ulrike. Basel, 2014. 287. Print e. Skidmore, Owings & Merrill, Lever House Stoller, Ezra. Lever House. New York, 1952. 12 July 2014. Web. www.npr.org. f. Francisco Javier Sáenz de Oiza, Torres Blancas Suzuki, Hisao, Madrid, Spain. Housing Plus. Wietzorrek, Ulrike. Basel, 2014. 415. Print g. Herzog & de Meuron, M.H de Young Museum Zen Mind, Material World. Another DeYoung Tower. San Fran	Fig. 129 : Unité d'Habitation Plan Authors own adapted from French, H. Key Urban Housing of the Twentieth Century: Plans, Sections and Elevations. Laurence King Publishing, 2008. Print.	Fig. 143 ; Plan Authors own adapted from Fundação Iberê Camargo via archdaily.com
Fig 97 : Rundtaarn Web. 7 August 2014. http://venturedenmark.com/rundetaarn#.U_SN3LySzXp		Fig. 130: Site constraints for <i>The Street</i> Authors own adapted from maps.google.com	Fig. 144 : Circulation to volume relationship Authors own
Fig. 98 : Section of Rundtaarn Authors Own, adapted from Donna. Rundtaarn Inside Sketch. Copenhagen,, 2012. 7 August 2014. Web http://alongtheway.com/category/travel/hej-copenhagen/		Fig. 131 : Diagram showing how the stair dispersion is dictated by <i>The Street</i> Authors own	Fig. 145-160 : Photos of Iterative Models (p 154-157) Authors own
Fig. 99 : Pedestrian and Vehicular Movement Authors Own		Fig. 132 : Comparison between the length of the street as a ramp or as	Fig. 161 : Section of street @ 1:100 Authors own
Fig. 100 : Preliminary design for October Review Authors Own			Fig. 163 : Victoria University Architecture And Design School Atrium Authors own
			Fig. 162 : Dimensions of the Stairs Authors own

- Fig. 164 : Dimensioned Plan of the atrium @ 1:500
Authors own

Fig. 166 : Diagrammatic Section showing the width of the steps in relation to the span of a persons stride
Authors own

Fig. 165 : Beaglehole Courtyard Entrance from Kelburn Parade
Authors own

Fig. 167 : Photo of Robin Hood Gardens
London. 05 August 2014, Web. http://www.baunetz.de/meldungen/Meldungen-Bedrohtes_Smithson-Gebaeude_soll_gerettet_werden_192738.html?bild=2

Fig. 169 : Apartment Arrangement
Authors own, adapted from French, H. Key Urban Housing of the Twentieth Century: Plans, Sections and Elevations. Laurence King Publishing, 2008. Print.

Fig. 168 : Site Plan + location
Authors own, adapted from maps.google.com

Fig. 170 : Diagrammatic Plan of Recesses
Authors own, adapted from French, H. Key Urban Housing of the Twentieth Century: Plans, Sections and Elevations. Laurence King Publishing, 2008. Print.

Fig. 171 ; View down street deck
London, 2008. 5 August 2014. Web. <http://www.skyscraper-city.com/showthread.php?t=511944&page=12&langid=5>

Fig. 173 : Diagrammatic Plan showing entrances off the street deck
Authors own, adapated from French, H. Key Urban Housing of the Twentieth Century: Plans, Sections and Elevations. Laurence King Publishing, 2008. Print.

Fig. 172 : Section through facade and street deck
Authors own, adapted from Smithsons. 1970. Web. <http://www.archdaily.com.br/br/01-37260/classicos-da-arquitetura-robin-hood-gardens-alison-e-peter-smithson>

Fig. 174 : Section AA through *The Street* and apartment @ 1:50
Authors own

Fig. 175 : A stoop in Brooklyn, NY
Eagle, Arnold. People Sitting on a Stoop. New York, 1935. 28 July 2014. Web. <http://collections.mcny.org/Collection/People-Sitting-on-a-Stoop-2F3XC5O364W.html>

Fig. 176 ; Section BB from *The Street* to The Balcony @ 1:100
Authors own

Fig. 177 : Section CC through the Stoop @ 1:20
Authors own

Fig. 178 : Elevation of the Stoop @ 1:50

Fig. 179 ; Entrance way typologies
Authors own

Fig. 180 : Site Plan @ 1:100
Authors own adapted from maps.google.com

Fig. 181 : Access Ways through 8 House
Authors own adapted from archdaily.com

Fig. 182 : Green Space and outdoor areas
Authors own adapted from archdaily.com

Fig. 184 : Urban Connection
Authors own adapted from archdaily.com

Fig. 185 : Section through lower side
Authors own adapted from <http://www.archdaily.com/83307/8-house-big/>

Fig. 183 : Plan @ apartment level
Authors own adapted from <http://www.archdaily.com/83307/8-house-big/>

Fig. 186 : use of fencing to delineate between public and private space
Engel, Villads. Still 6.12 Copenhagen, 2011. 17 January 2014. Web video. https://www.youtube.com/watch?v=YUlo_YZwvak

Fig. 187 : Photo showing contrast in materials
Engel, Villads. Still 3.38 Copenhagen, 2011. 17 January 2014. Web video. https://www.youtube.com/watch?v=YUlo_YZwvak

Fig. 188 ; Different Apartment types in *High Street*
Authors own

Fig. 189 : Diagram showing alternating levels
Authors own

Fig. 190 : Diagram showing sleeping/living arrangements of the apartments
Authors own

Fig. 191 : Plan @ 1:100 of the living level
Authors own

Fig. 192 : Plan of the Sleeping Level @ 1:100
Authors own

Fig. 193 : Plan of the laundry @ 1:100
Authors own

Fig. 194 & 195 The Highline By Diller, Scofidio And Renfro
a. Adapted from New York. 8 May 2013. Web. <http://www.topboxdesign.com/high-line-by-diller-scofidio-renfro-united-states/>
b. Authors own, adapted from http://www.dsrny.com/*/projects/

Fig. 195 : View down The Loop
Authors Own.

206

207

APPENDIX:

APPENDIX 01: LAMBTON QUAY AND THE TERRACE SITE ANALYSIS

Masons Lane

Lambton Quay Square Analysis

Farmers' Lift Access

Capital On the Quay Access Way

Cable Car Lane Access Way

James Cook Arcade and Hotel

THE GRAND INTERNAL ARCADE

TELECOM GEN-I BUILDING

CHURCH ST PEDESTRIAN ACCESS

DIXON ST STEPS

ALLENBY TCE STEPS

to assemble on one level – or disperse over several levels

Looking up to D

Looking up to C

Looking up to B

Looking up to A

Looking down from D

Looking down from C

Looking down from B

Looking down from A

Meaningful contact with ground level events is possible only from the first few floors in a multistory building. Between the third and fourth floors, a marked decrease in the ability to have contact with the ground level can be observed. Another threshold exists between the fifth and sixth floors. Anything and anyone above the fifth floor is definitely out of touch with ground level events.

Low buildings along a street are in harmony with the way in which people move about and the way the senses function. Tall buildings are not. (Street scene, Singapore).

OVERHANG

SET BACK

TERRACING

STRAIGHT ON - WIDE ST

STRAIGHT ON - NARROW ST

PODIUM

LOGGIA

ROUTE THROUGH THE BUILDING

PLAN @ 1:500 SHOWING APART-
MENT WIDTHS
- NOTED TO BE TOO SMALL

SECTION THROUGH THE SOUTHERN WING @ 1:500

VIEW OF STREET TOWARD BOULCOTT STREET

VIEW OF THE STREET TOWARD PLIMMERS STEPS

PLAN OF THE LIVING LEVEL

BALCONY DESIGN

PRIVACY

ACCESS BETWEEN BLOCKS

SUBTERRANEAN APARTMENT

POTENTIAL APARTMENT PLANS

VIEW FROM Boulcott STREET TESTING

OPTION 01

OPTION 02

The Pedestrian

The pathway peels off the main streetscape, rising gently to a colonnaded entrance that cuts into the kinked slab. The colonnade, turning around the southern edge of the building, brings the pedestrian up amongst the backs of buildings, vehicle access ways and views that cut through the urban tangle and out to Frank Kitts park, the harbour and Mt Victoria beyond. To the left, apartment entrances hover above the colonnade, their stoops running down to meet it. At it's end the kink carves a cavernous wedge, dividing the building in two. This luminous void draws the eye of the pedestrian up to the twinkling windows, issuing from them a sense of the inside of the building.

At the apex of the wedge, stairs wind up around the corner and out onto the stand of well-grown plane trees. A view toward Plimmers Steps, its towers and the Thorndon Hills beyond is offered to the pedestrian, and, to the right the facade of the slab rising upward. Following the path, the pedestrian zigzags up the face of the building, slowing, sometimes stopping at corners to take in the shifting views. At the seventh floor, a chink in the wedge lets the pedestrian look down into the atrium they were in moments before. Onwards they go, the towers getting closer, the toy town below and then reaching the pocket park –a coffee, a picnic, a drink on the roof. Contemplating the view, observing the people, watching a movie. And now winding back down through the building, narrow and intimate, the loop almost complete. Stop for a look down onto the steps, Lambton Quay and the Old Bank Arcade. Saunter down the way you came, it looks different, the views have

changed, the orientation is different.

The Office Worker:

Sitting at their desk on the 14th floor, the office worker takes a break, stops for lunch, ends their day. They take the lift, down five floors, two or six. Stop. They get out, out of the tower and onto the sky bridge, The Street. They are outside. Sun, breezes, noises. Walking up from the 8th floor: the pocket park – a packed lunch, a coffee, a drink. Stop. Wind down. Take it in. The day ends. Winding down The Street, reconnecting to the city. Sounds, smells, sights. No longer the isolated tower. People, chatter, the city's beat. Onto the bus, into their car, home for dinner.

The Resident:

The day begins. Breakfast on the balcony, awakening to the day, to the city. The life crawls into its streets. It's time to join the melee. Leaving for work the resident wander down *The Street* saying hi to neighbours, readying themselves for work and slowly submerging themselves into the urban jungle. For those that stay at home, the children come and go. Playing on *The Street*, meeting other children, assimilating themselves. The parents watch while preparing the lunch, the dinner, the snacks. They wash the dishes, still observing the scene. Coming home, up *The Street*, sunlight warming the stone steps, the backs of the people ascending the pathway. Again they stop, say hi, discuss their day. Home to their place.

Shopping bags are bursting, the elevator runs up the eastern facade. Quick fast. A narrow path, a neighbour's back door. And the harbour glints in the evening air. Dinner time. Relax, unwind. Enjoying the dying hum. People come and go, an evening jog, a neighbourly visit. Some just watch others, to and fro, known and unknown. To bed. Less people, just quiet.

ACCESS DIAGRAMS:
USED TO DEVELOP STREET ACCESS AND FIGURE OUT WHICH APARTMENTS HAVE NO CURRENT ACCESS

ENTRANCE ACCESS:

ELEVATIONS SHOWING WHERE ENTRANCES TO APARTMENTS SHOULD BE LOCATED FOR EASIEST ACCESS FROM STREET

CONFIGURATION FOR LIFT ACCESS