Landscape Sub(Vert.)Urbanity

a model for integrating gardens, as an architectural device, into higher density housing to encourage New Zealanders to live in the inner city

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a model for integrating gardens, as an architectural device, into higher density housing to encourage New Zealanders to live in the inner city

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A 120 point thesis submitted to the School of Architecture, Victoria University of Wellington, in partial fulfilment of the requirements for the degree of Masters of Architecture [Professional]

Victoria University of Wellington

2014

Acknowledgements

Thank you firstly to Kerstin Thompson, my continually inspirational and insightful supervisor; this project would not be what it is but for your guidance.

On a whole other scale, my greatest appreciation must go to the people of my life - my friends, family, lecturers and ever humorous (cum helpful) peers - who over the last five years have supported me with learning, laughter and love:

I am ever grateful. Thank you.

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Landscape:

1. *(noun) all the visible features of an area of land, often considered in terms of their aesthetic appeal.*
2. *(verb) to improve the landscape of.*

Sub:

1. *(prefix) situated under or beneath.*
2. *(verb) replace or be replaced; substitute.*

Vert:

1. *(adjective) a dark bright green.*
2. *(abbreviation) vertical.*

Urbanity:

1. *(noun) the quality or state of being urban.*

Urban:

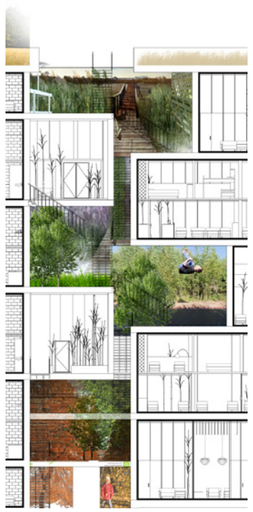
1. *of, pertaining to, or designating a city or town.*
2. *living in a city.*
3. *characteristic of or accustomed to cities.*

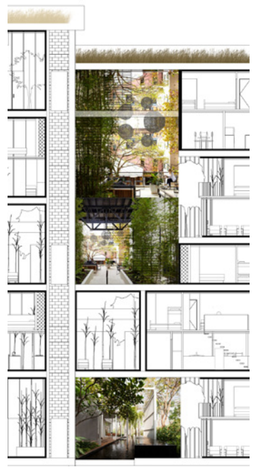
Subvert:

1. *(verb) to overthrow (something established or existing).*

Sub*(vert)****urban****ity:*

1. *(adjective) pertaining to, inhabiting, or being in a suburb or the suburbs of a city or town.*
2. *(adjective) characteristic of a suburb or suburbs.*





TARGET DENSITY

250

D W / H A

130 dwellings in this half hectare development

high-density

ACHIEVED DENSITY

259

D W / H A

134 dwellings in this half hectare development

high-density

Abstract

New Zealanders continue to resist higher density housing as a way of living. The detached house in the suburbs remains the preferred housing choice for most.

This proposal addresses the key attributes required for higher density living adoption as identified by the Centre for Housing Research, Aotearoa New Zealand (2011). Furthermore, this central Wellington proposal includes additional design features that increase the desirability of this type of housing to the suburban market.

Combined, these and other drivers create a new typology of higher density housing in which vertical and other garden types bring a verdant living option to inner city Wellington.

Key considerations include creating high levels of amenity: gardens, solar access and privacy to produce a vertical neighbourhood that balances collective and private amenity.

The proposal provides three housing typologies (maisonettes, terraces, park

houses) to accommodate household diversity to target various stages of the family cycle.

This inner city proposal also demonstrates how public amenity access can be used to offset the (perceived) loss of amenity when moving from the suburbs. By drawing from the public amenity-rich city, the need for private amenities is minimised. Furthermore, just as the surrounding city contributes amenity to these dwellings, this proposal illustrates that this kind of development can in turn contribute back to the city.

Directory of Content

Part 1

SEARCHING FOR A QUESTION

What architecture can solve?

Figure 0.0.01 A 1949 image of the state house quoted by CHRANZ that: "Either by design or accident the state housing sector has reinforced the sense of entitlement to single unit housing in the public mind"

←

Introduction

Single detached houses are the preferred housing type of New Zealanders. This preference is rooted in the 'kiwi quarter acre dream'; part of a complex home ownership, child rearing and cultural condition present in New Zealand (CHRANZ, 2011, p. 3). This has led to a continued resistance to higher density housing as an alternative to suburban living. This results in the sprawl of New Zealand cities, causing problematic and inefficient use of land and municipality resources, un-walkable neighbourhoods and disjointed localities (Lindstrom & Bartling, p. 5).

Higher density cities are capable of countering these problems but can only do so if the resistance to them is answered. It is a common 'kiwi' perception that it is not possible to raise a family in an urban environment. However, through the considered design of structures and landscape, architecture can begin to address this perception.

By designing high density buildings with integrated landscape elements this proposal seeks to illustrate that it is possible to create suburban like desirability in urban situations. This is achieved by balancing the public, common and private amenities of inner city living against the private amenity afforded by the suburbs.

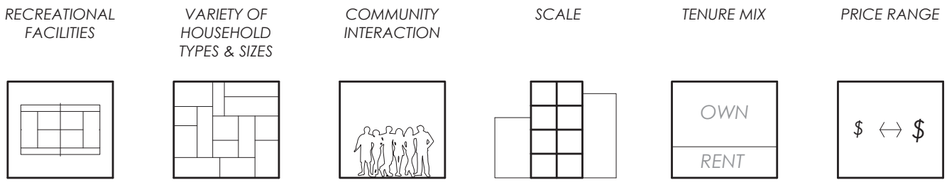
Primary Literature Reference: Improving the Design, Quality and Affordability of Residential Intensification in New Zealand (CHRANZ, 2011)

"New Zealanders have a long standing cultural preference for detached housing on individual sections." (CHRANZ p. i)

Originally this research focussed on confronting the design quality of many higher density developments. The remnants of this are visible in the challenging density target that seeks to recognise New Zealand's developer driven market, and aims to give the scheme an element of plausibility.

A target density of 250 dwellings/hectare (DW/HA) was established based upon international definitions of high density and remained a fix variable in every design test (Mozas & Fernández, p. 6). In comparison to New Zealand, where over 50 DW/HA gross neighbourhood is defined as high density (Auckland Regional Growth Forum, 2003), this target seeks to prove the design through an extreme scenario.

Domain attributes that require addressing



Complex / Exterior attributes that require addressing

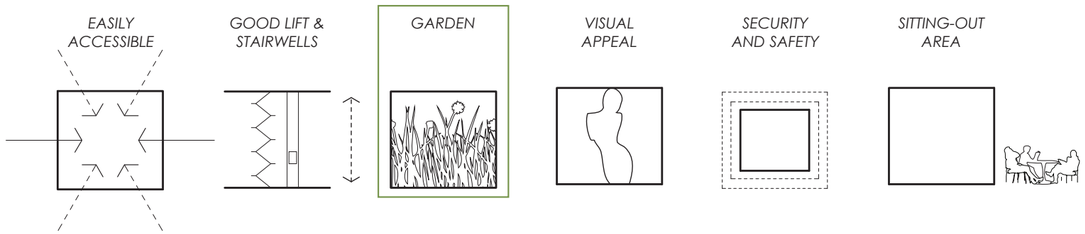


Figure 0.0.02 Attributes that need to be addressed. Adapted from Table One: Desirable Attributes Identified by Medium Density Housing Residents

CHRANZ Domain Definition:

"Encompasses the area over which day-to-day social relations are formed and regular or lower order transactions take place. This corresponds broadly with suburb or neighbourhood, and may include elements of the medium density complex itself" (p. i)

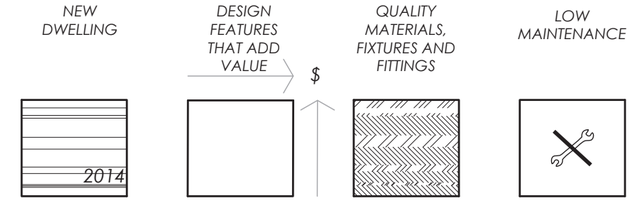
Domain attributes that require addressing

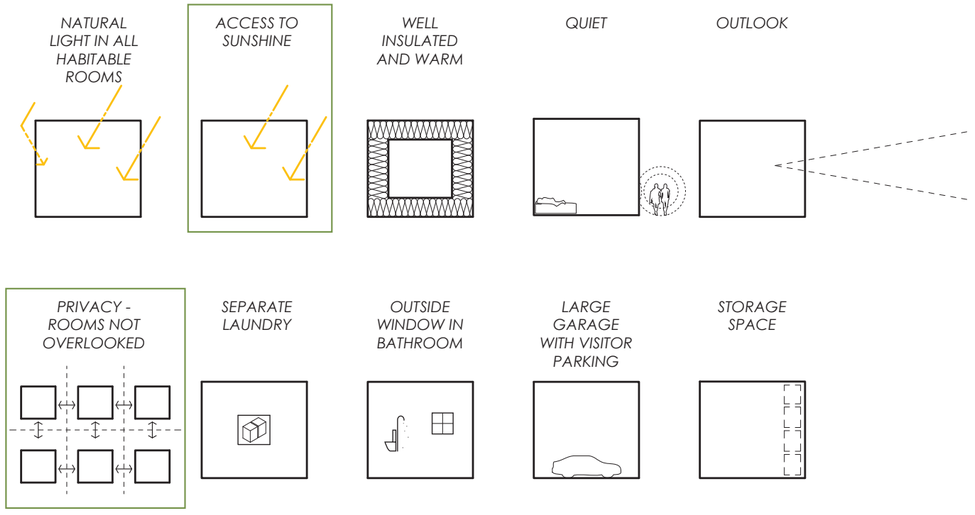
1. *Recreational facilities, including parks*
2. *Scale: Conceivable number of households in the development*
3. *Community interaction: Networks and strength of ties/Ethnic diversity and predominant nationalities*
4. *Varied household types and sizes*
5. *A price range*
6. *Tenure mixes*

Complex/Exterior attributes that require addressing

1. *Good stairwell and lift spaces in apartments*
2. *Safe access roads/ Easily accessible*
3. *Appropriate trees and gardens in appropriate places*
4. *Visual appeal*
5. *Security and safety*
6. *A sitting-out area*

Sanctuary attributes that require addressing





In 2011 the Centre for Housing Research Aotearoa New Zealand (CHRANZ) produced a report outlining 29 key attributes that need to be addressed before New Zealanders consider adopting medium or higher density housing solutions (CHRANZ, 2011, p. VI). These attributes, illustrated on the opposite page, have been used as primary and defining parameters to drive design tests (Figure 0.0.02 - Figure 0.0.03). Of these, three were prioritised after design test two to structure and drive design-research decision making: garden, sunlight and privacy.

Furthermore, six additional design considerations were identified as worthy of address in the design proposal, aiming to give the scheme an uncommon

Figure 0.0.03 Attributes that need to be addressed. Adapted from Table One: Desirable Attributes Identified by Medium Density Housing Residents

CHRANZ Sanctuary Definition:

"Refers to the dwelling, and may be influenced by the relationship of the dwelling to the complex and the immediate neighbourhood" (p. i)

Sanctuary attributes that require addressing

1. *A new dwelling*
2. *Design features that add value*
3. *Quality fixtures and fittings*
4. *Low maintenance*
5. *Ratio of bathrooms*
6. *Kitchen and bathroom cupboard space*
7. *Size of rooms and a sense of space*
8. *Natural light in all habitable areas*
9. *Access to sunshine*
10. *Well insulated and warm*
11. *Quiet*
12. *Nice outlook*
13. *Privacy, rooms not overlooked*
14. *Separate Laundry*
15. *Outside window in bathroom*
16. *Large garage with visitor parking spaces*
17. *Storage space*

"Home buyers want sections for children, a spacious 3-4 bedroom home and good insulation" (CHRANZ p. v)

250 *DW/HA*

(130 dwellings in this half hectare development)

h i g h - density

Target density established from A&T's 'Density' where 200-300 DW/HA is defined as 'high density' (p. 6)

Additional Design Attributes

1. *Civic contribution*
2. *Liveable*
3. *Relationship to street*
4. *Iconic*
5. *Kiwi*
6. *Flexible*

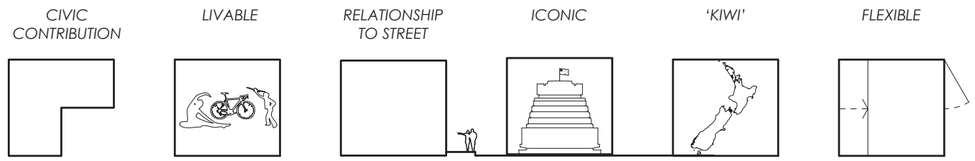


Figure 0.0.04 Additional design attributes to be designed for to incentivise adopting higher density modes of living

generosity: civic contribution, liveable, relationship to street, iconic, kiwi and flexible (Figure 0.0.04). Together with the 29 CHRANZ attributes, iterative designs tests are developed to provide gardens, other amenities and housing choice to families living at high densities.

Additionally, this proposal draws upon and critiques applicable design research within the discipline using New Zealand and international built examples as case studies. These are introduced throughout the thesis as they arise between design tests. They also relate to the final part of this exegesis where this research is contextualised with further reflections and ties are made to similar existing models.

Primarily this research aims to be propositional about the merits of city living in order to suggest an alternative to encourage suburbanites into living in the inner city.

0.1 Methodology

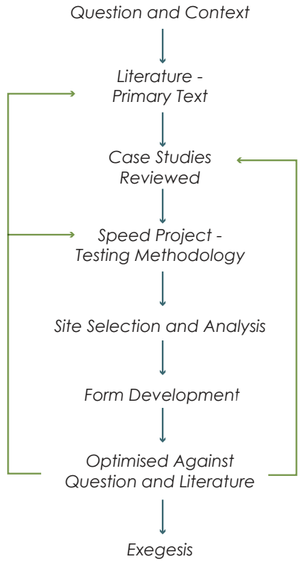
This thesis employs a process of design-led research in which multiple generated design solutions are tested against a framework, then reworked and resolved to develop a comprehensive design solution (Downton, 2003). This process was followed consistently throughout, with each iteration accompanied by a reflection on its value.

Extending over three design phases and one reflection phase, this thesis is presented in respective 'parts' (Figure 0.1.01 - Figure 0.1.03). The design phases encompass five iterative design tests and six case studies, all used to cross critique, which further develop solutions and contextualise the research within current knowledge of the discipline.

Literature is a fundamental driver of these design iterations, both written and built. Prior to commencing this research, the primary text by CHRANZ, 'Improving the Design, Quality and Affordability of Medium Density Housing in New Zealand' was examined to deduce the aforementioned 29 key design checks.

The CHRANZ text, in combination with the 250 DW/HA density target and site conditions, established a framework for the design process. This framework was adapted when problems with initial design tests were identified during phase one, leading to a review of both the design and testing framework. Framework revisions were considered against New Zealand and international case study reflections to gain an understanding of

Original Methodology



Resulting Process

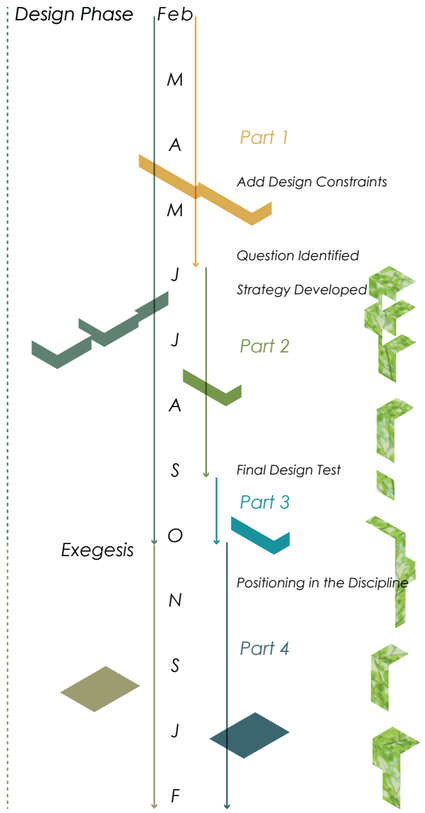


Figure 0.1.01 Original Methodology, as expected at beginning of thesis

Figure 0.1.02 Methodology developed over the thesis period

practice solutions. As a result additional design constraints were added, namely, six further attributes and three amenity priorities, resulting in the development of a robust framework to design within.

Phase one was catalysed by a 'speed project' in which the 250 DW/HA density and 29 key attributes were first grappled with; although on a different central Wellington site (Figure 0.1.04 - Figure 0.1.09).

In phase two further design tests were used to developed strategies and solutions within the framework. This led into phase three, the final design phase, which is primarily the presentation of the design's final evolution.

The final phase (phase four), is a reflection on this work within the wider discipline where conclusions on the work's discoveries and relevance are drawn.

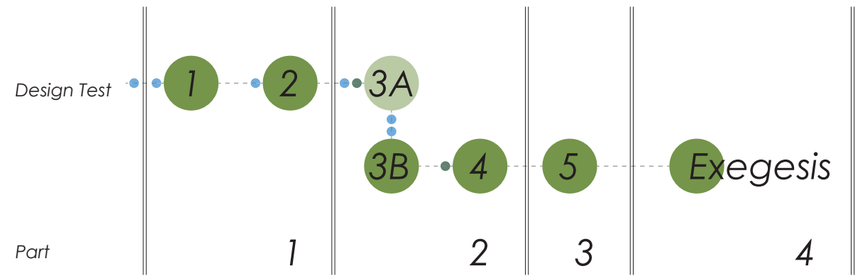
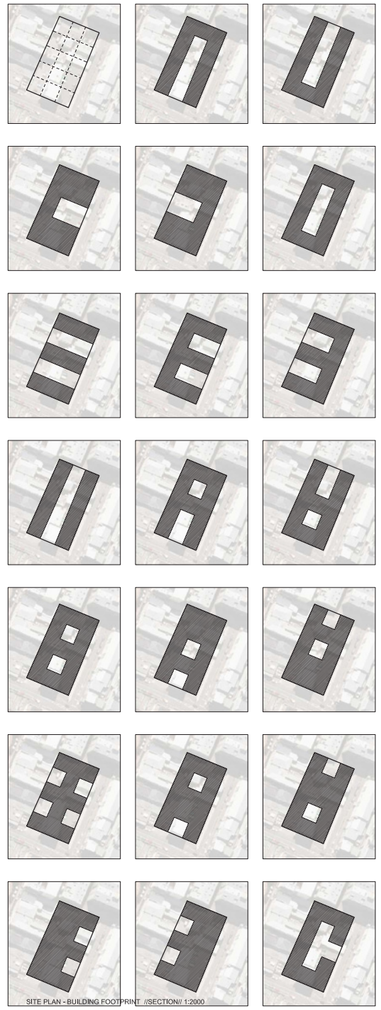


Figure 0.1.03 Thesis time line summary

CHEWS LANE PLAN 1:2000

MONDRIAN APARTMENTS SITE PLAN 1:2000

PORTER HOUSE SITE PLAN 1:2000



SITE PLAN - BUILDING FOOTPRINT //SECTION// 1:2000

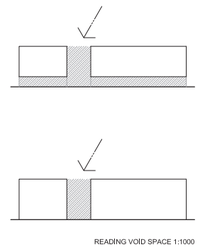
Figure 0.1.04 Early case studies laid over test site to get an indication of expected scale of scheme

Figure 0.1.05 Test of footprint options on site. Each 'zone' is 10x12m. Each experiment is optimised to solve one CHRANZ disincentive

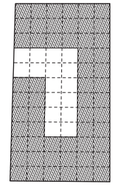
Figure 0.1.06 Architectonics study followed by calculations of massing required for 250 DW/HA

Figure 0.1.07 Floor plate footprint over site with proposed demographic and associated apartment types

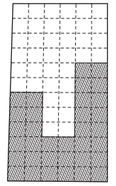
Figure 0.1.08 Selected design diagrams



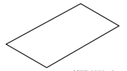
READING VOID SPACE 1:1000



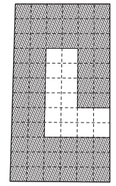
LEVEL 4 RESIDENTIAL 1:2000



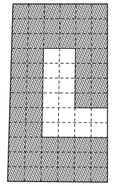
LEVEL 5 RESIDENTIAL 1:2000



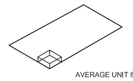
SITE 2370m²



LEVEL 2 RESIDENTIAL 1:2000

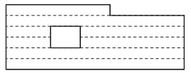


LEVEL 3 RESIDENTIAL 1:2000

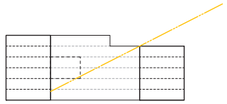


AVERAGE UNIT 82.5m²

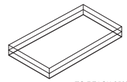
GHUZNEE STREET ELEVATION 1:1000



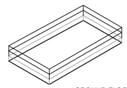
LEEDS STREET ELEVATION 1:1000



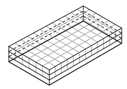
WINTER SOLSTICE SUN ANGLE (27°) SECTION 1:1000



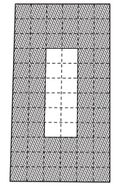
TO REACH 250Dw/Ha
60 UNITS ARE REQUIRED
TOTALING 4950m²



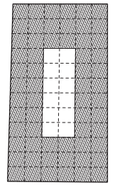
GROUND FLOOR
RETAIN/MIXED USE



MODULE MASSING CALCULATIONS 1:2000



LEVEL 0 RETAIL/OFFICE 1:2000



LEVEL 1 RESIDENTIAL 1:2000

DEMOGRAPHIC

Mixed Use Philosophy:

3adults	10%
2adults	30%
2adults 2children	20%
2elderly	5%
1adult	5%
Other Programmes	30%
Home office	
Retail	

APARTMENT TYPES

9	3adults UNITS
25	2adults UNITS (17 young / 8 old)
18	2adults2children UNITS (9young / 9 old)
4	elderly UNITS
4	bachelor/ette UNITS

60 UNITS IN TOTAL (250 Dw/Ha)

Figure 0.1.09 First 'pocket yard' in EW section of 'speed design'. Use of double height apartments to control proportions and scale

0.2 Site Selection

Complex trade-offs, including social, economic, life-stage and geographic considerations, are assessed by New Zealanders when selecting a dwelling (CHRANZ, p. 39). Local amenities affect the value of each consideration. In higher density housing choosing reduced private amenities (as compared to the typical suburban dwelling), balanced against access to larger common and public amenities, is a significant factor (p. 39).

These concepts of alternative amenity access were applied at an urban scale during the site selection process. For this, Richard Roger's London study 'Towards an Urban Renaissance' (Urban Task Force, 1999) formed the basis of selection. Rogers cites the maximum ideal distances to amenities that people accept as convenient for use (Figure 0.2.04). These distances were critiqued and adapted for the New Zealand condition and generation. Sharing a similar housing culture (CHRANZ, p. II), although in a different technological age, some maximum distances were adjusted (e.g. post office doubled to 1000m) and an additional '200m to public transport' parameter was introduced.

Every Wellington amenity was mapped, modelled and overlaid by category to find an amenity-rich site (Figure 0.2.01, Figure 0.2.03 - Figure 0.2.09). Some amenities were identified as transferable and capable of introduction into a

Figure 0.2.01 A map produced by mapping adapted Rogers, R. *Towards an Urban Renaissance* amenity distances over Wellington central. Done as a developer might do, establish the ideal site. The clearer the area in this map, the more amenities the site has access to. The selected site has two missing amenities; a crèche and a green. These are to be incorporated into the project brief and used to give something back to the city as well as invite people onto the site

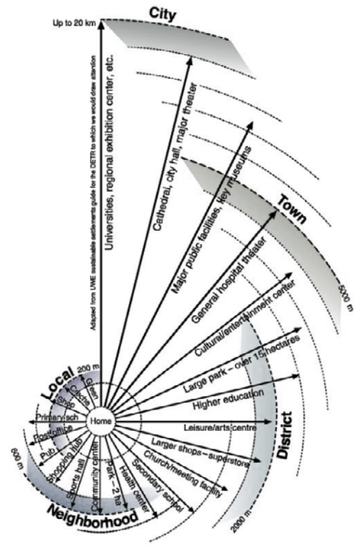
Figure 0.2.02 Panorama from site identifying significant landscape elements

housing scheme's brief: green, crèche, shop and pub. The non-transferable amenities were prioritised to guide site selection; this would apply for studies of other cities (Figure 0.2.08).

The selected site of 5170m^2, on Cambridge Terrace between Courtenay Place and Alpha Street, was found to be missing a crèche and green, both of which were brought into the project brief (Figure 0.2.09).

This site is on the cusp of an area of high density residential development, with views and amenity access out to the Mount Victoria green belt, 'high city' and Port Nicholson (Figure 0.2.02, Figure 0.2.10). It is also on the threshold of the western course grained high rise residential part of the city, and the eastern fine grained residential area of Mount Victoria so, like the programme, the form too can serve as a mediator between these two states. For these reasons this site is well suited to a propositional design.

The benefit of Wellington's amenity study means the scheme can also offer something valuable back to the public realm - the two identified missing amenities: a crèche and green. This recognises that higher density housing has the potential in itself to be an amenity to the city, bringing in people and providing opportunities for supplementary programmes to activate the area.

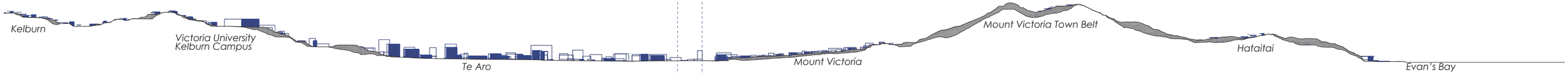


Church/meeting Facility 300m - Wellesley Church
Larger Shops/superstore 300m - Tory Street Warehouse Complex
Arts Centre 700m - Wellington Arts Centre
Higher Education 50m - Yoobee School of Design
Large Park <15ha 600m - Wellington Town Belt

Town/District amenities

Green 300m - Elizabeth Street Playground — Amenity Issue
Creche 400m - Early Years Tory Street — Amenity Issue
Shop 50m - Fix Courtenay Place
Primary School 700m - Clyde Quay School
Post Office 250m - Reddings Cinema Complex

Local amenities



Cultural/entertainment Centre 600m - Michael Fowler Centre
Hospital 1700 - Wellington Hospital
Major Public Museum/facilities 350m - Te Papa Museum of New Zealand
Major Hall 680m - Wellington Town Hall
University 600m - Massey University Wellington Campus

City amenities

Pub 30m - Establishment
Shopping Hub 30m - Courtenay Place
Sports Hall 900m - Wellington High
Park <2ha 600m - Waitangi Park
Health Centre 150m - Capital Care
Secondary School 730m - Wellington College

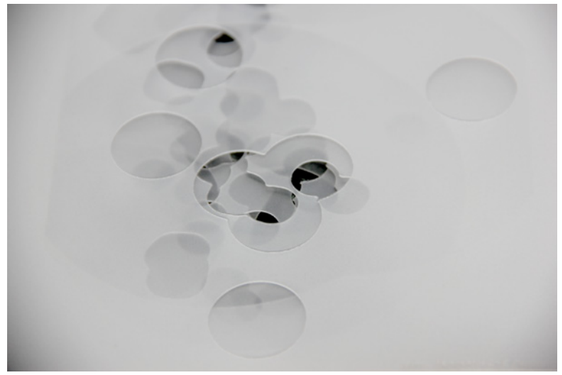
City amenities

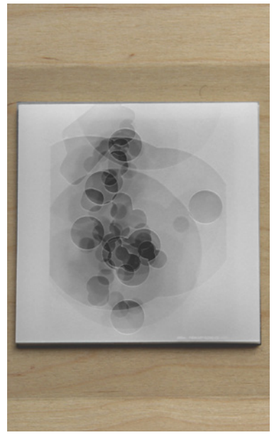
Distance to amenity from site
Distace to amenity recommended by Rogers

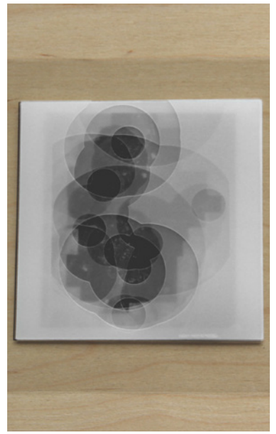
1:10,000

Figure 0.2.03 City transect amenity study: showing true distances to highlighted amenities mapped against adapted

Figure 0.2.04 (Inset) Roger's distance to local amenity to achieve optimal use of civic amenities.







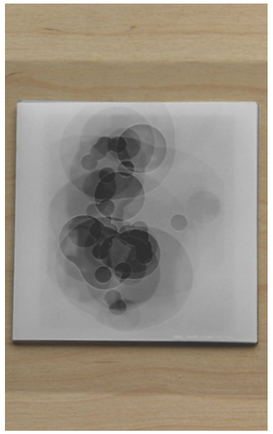


Figure 0.2.05 Site model close up showing layering of amenities

Figure 0.2.10 Local amenities and local grain of built fabric highlighted. View shafts to sea, central business district and Mount Victoria shaded out

Figure 0.2.06 Detail call outs of amenity layers

Figure 0.2.07 Site model with all amenities overlaid. Clear = amenity rich

Figure 0.2.08 Site model with 'transferable' amenities removed: green, crèche, shop, pub

Figure 0.2.09 Site model with crèche and green amenities removed

0.3 Icon in Architecture

The framework used for assessing a scheme's icon-value was introduced following an interview with Sam Kebbell. In combination with ideas relating to the Bilbao effect, value, and desirability, a framework was developed defining four categories of building: good-weird, good-normal, bad-normal and bad-weird (Jencks, p. 5).

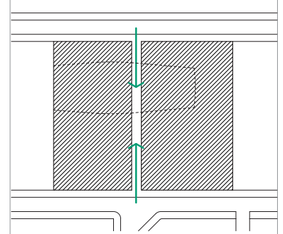
A direct relationship between icon and desirability exists (Jencks, p. 7). Consequently, to help attract suburbanites to inner-city living, it is helpful if this propositional design is iconic or 'good-weird' under the Kebbell classification. Although these classifications are somewhat subjective and only used in this case to assess external appearance they are useful in evaluating case studies and design tests.

Good-weird (Iconic)	*Unusual, in one significant or multiple aspects, yet appealing architecture*	*e.g. SHoP Porter House, Jeanne Hachette, 8 House*
Good-normal	*Architecture that is well designed for its users and context, and not unusual*	*e.g. Mondrian Apartments*
Bad-normal	*Architecture that is poorly designed for its users and/or its context, and not unusual*	*e.g. Sanctum Apartments*
Bad-weird (Iniconic)	*Architecture that is bad; doing something unusual without success*	*e.g. Chews Lane (residential tower)*

0.4 Case Study : Chews Lane

Architect	*Athfield Architects*
Location	*Wellington*
Date	*2009*
Programmes	*Residential, Commercial, Retail, Parking*

210 DW/HA



Parti Diagram

Perspective

Readers Note:

Case studies are presented in blue before their first relevant thesis section. Lessons learnt from existing built works are applied to further design test development.

Figure 0.4.01 Parti diagram

Figure 0.4.02 Perspective

Chews Lane balances civic contribution (activating the existing lane with shops and offices) with common and private amenities (including gardens, balconies and views) to produce a popular high density Wellington scheme. Reaching 840 DW/HA over the residential tower's footprint, it is 210 DW/HA over the whole development's area.

This scheme includes a common garden on the northern podium's roof. Although the garden has much potential to add to the residents' lifestyles if integrated well, its dwarfed size and difficult access renders it unoccupied.

The visually dominating bridging residential tower illustrates an attempt at iconic architecture, but is unsuccessful due to its clunky proportions and heavy articulation (bad weird) (Figure 0.4.02). However, despite this, the scheme remains desirable for its superior access to most amenities.

Scheme Typology	*Mixed-used development, Podium building with residential Tower*
Circulation Type	*Internal*
Dwelling Typologies	*Apartments -single storey (typically single aspect)*
Garden Typologies	*Recessed balconies, Common rooftop garden*
Amenities	*Garden* ✓ *Variety of Unit Types* ✓ *Sunlight* ✓ *Visual Aspect* ✓ *Privacy* *Iconic Value*
Adaptability	*Strict structure of tower makes unit plan alterations difficult*
Kebbell Classification	*Bad-weird (residential tower)*

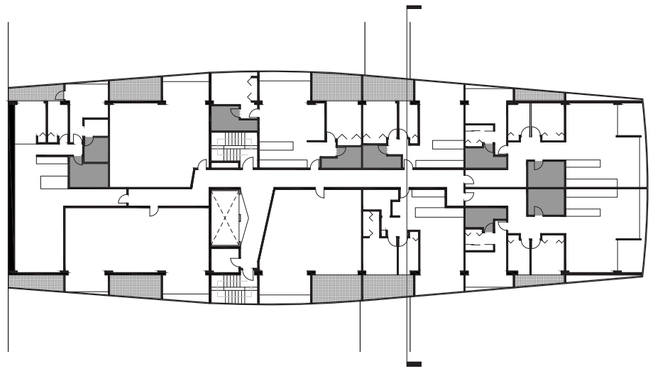


Figure 0.4.03
Typical Floor Plan
1:500

Points of Innovation	• *Mixed-use development provides greater immediate amenity access* • *Improves existing lane condition*
Points of Limitation	• *Inefficient unit plans, often with large amounts of circulation in small units* • *Bridged tower form has iconic potential, though is 'bad-weird' due to 'heavy' proportions and articulation* • *Unconventional and difficult connections between access corridor and living spaces* • *Garden is difficult to access and thus a token gesture*

Figure 0.4.04
Exploded
Axonometric

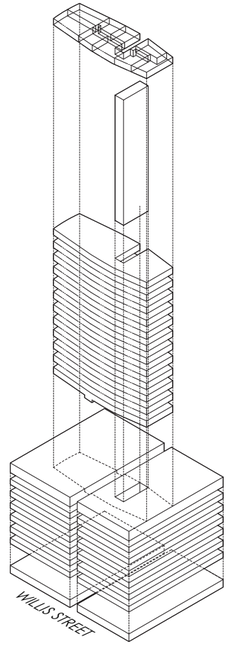
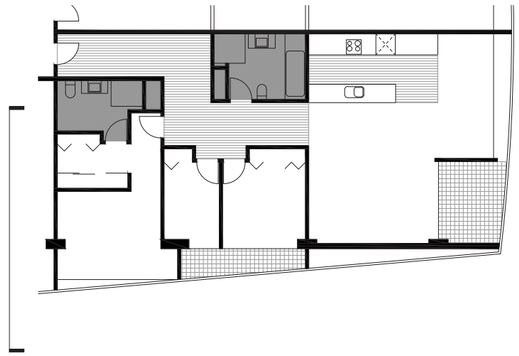
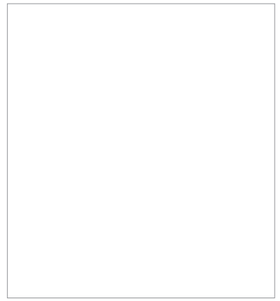
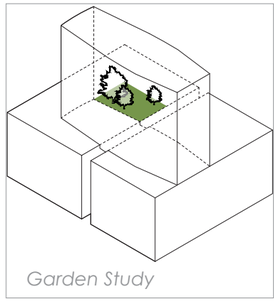


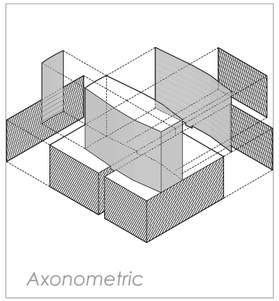
Figure 0.4.05
Typical Unit Plan
1:200







Garden Study



Axonometric

Why this project was selected as a case study and what further lessons it exposes

- *Example of high density housing in New Zealand*
- *Suggests required plot size, feeding back into site selection*
- *Illustrates expected private amenities within units*
- *Attractive to a few small professional families, although none with children of school age, the kind of families that might otherwise live in suburbia (Dekker, 2012)*
- *Models how common amenities incorporated within a housing scheme can help offset the perceived amenity loss of the suburbs*
- *Demonstrates how public amenity access ties directly to the on-going desirability (and ensured retention of property value) of a centrally located development.*
- *Shows the potential for residential developments to enhance the city; in this case by developing existing lane and activation of street edges*

Figure 0.4.06 Garden Study

Figure 0.4.07 Axonometric

Figure 0.4.08 Key section through lane 1:500 ⟶

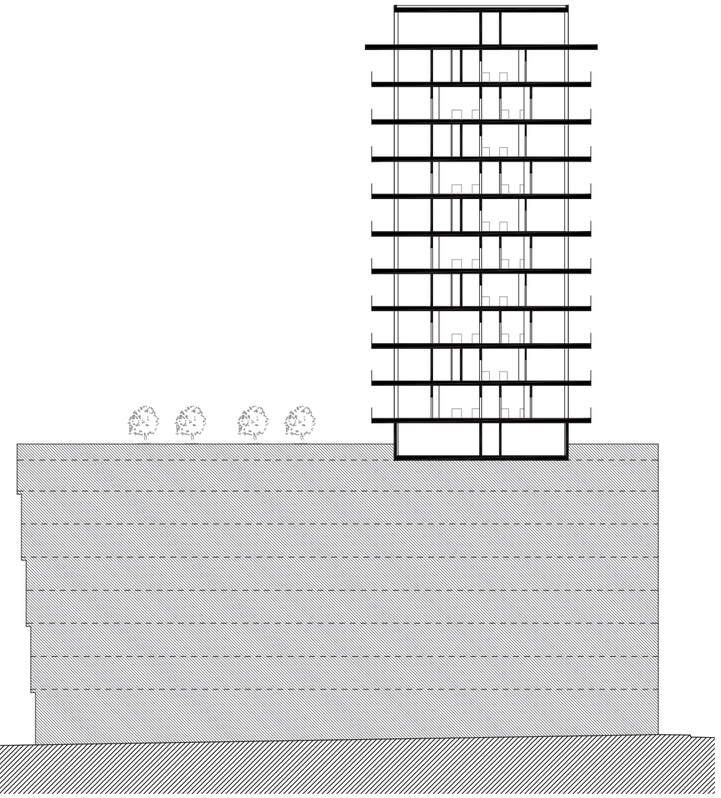
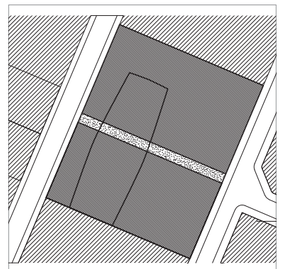


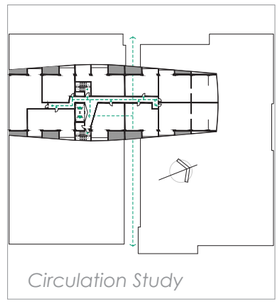
Figure 0.4.09 Public Private Common Study

Figure 0.4.10 Circulation Study

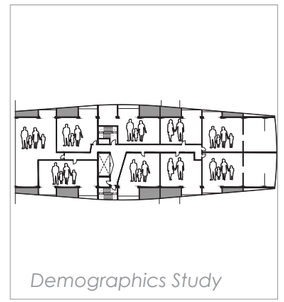
Figure 0.4.11 Demographics Study



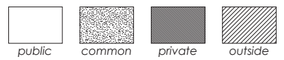
Public Common Private



Circulation Study



Demographics Study



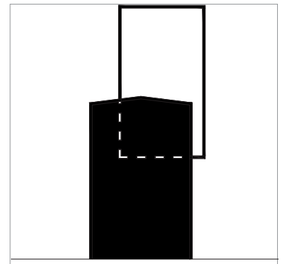
CHAPTER 1

Design Test

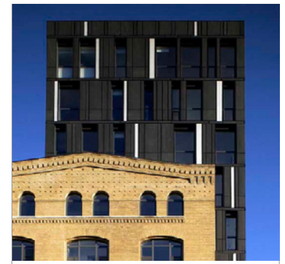
One

1.0 Case Study : Porter House

Architect	*SHoP Architects*	**450** *DW/HA*
Location	*New York*	
Date	*2003*	
Programme	*Residential, Commercial*	



Parti Diagram



Perspective

Porter House is an iconic work of apartment architecture, 'desired for its beautiful design, confident identity, and the reflection these have on unit owners' (Malnar & Vodvarka, p. 179).

It is interesting to note that the penthouse apartments are not on the top storey, but are instead defined by their garden access and situated midway up the building (Figure 1.0.10).

These gardens do not feed directly into the building's iconic value though would be significant in affecting desirability in New Zealand, aiding adoption of the apartment type .

Figure 1.0.01 Parti diagram

Figure 1.0.02 Perspective

Scheme Typology	*Adaptive reuse and extension of historic warehouse*
Circulation Type	*Internal*
Dwelling Typologies	*Apartments - triple aspect; Studio apartments - single aspect*
Garden Typologies	*Two luxury units at junction between historic and new have private rooftop gardens, A third of units feature a recessed balcony*

Amenities

	Garden	✓	*Variety of Unit Types*
✓	*Sunlight*		*Visual Aspect*
✓	*Privacy*	✓	*Iconic Value*

Adaptability	*Floor plans include built in furniture making rooms difficult to adapt for alternative uses*
Kebbell Classification	*Good-weird*

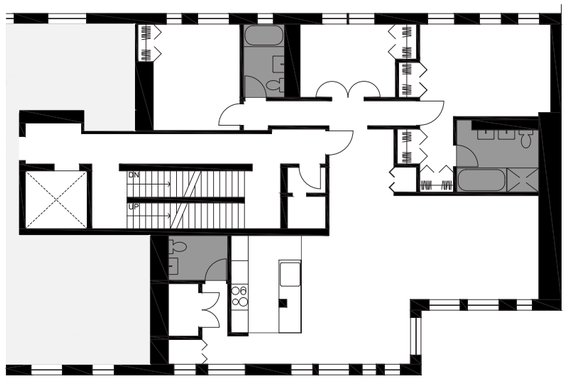


Figure 1.0.03
Typical Unit Plan
1:200

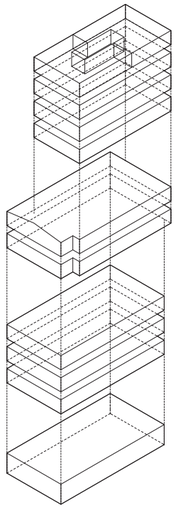


Figure 1.0.04
Exploded
Axonometric

Points of Innovation	• *Iconic architecture created through an unusual yet striking overall form* • *Iconic architecture enhanced through unusual articulation of static and dynamic form* • *Iconic architecture enriched through contrasting materials* • *Cantilevered and lowered new extension optimises available space for residential units* • *Contextual relationships drawn between building and New York's traditions of sky scrapers and historic retrofits (Figure 1.0.09)*
Points of Limitation	• *Adaptive re-use developments are often difficult to make financially viable in New Zealand as they typically involve expensive restructuring and retrofitting in locations not as valuable as Manhattan Island* • *Exclusive private garden access for only two unit owners. It is likely that the remaining units will not appeal to suburban New Zealand buyers* • *Desirable parking spaces not included thus not suitable to New Zealanders*

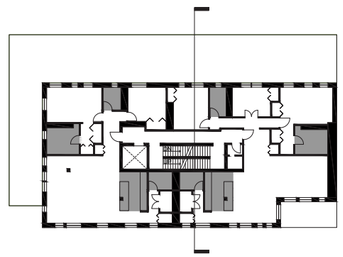
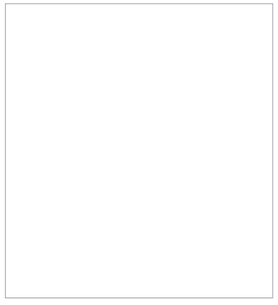
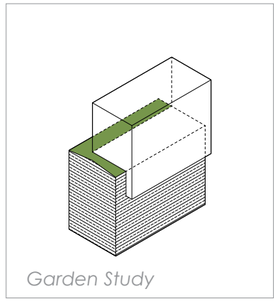
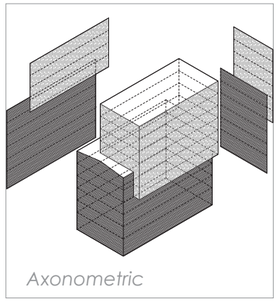


Figure 1.0.05
Typical Extension
Floor Plan 1:500





Garden Study



Axonometric

Why this project was selected as a case study and what was learnt

- *Typifies how the 'architect as developer' role prevents the sacrifice of design quality and icon value*
- *Illustrates the influence of iconic architecture on the desirability of the development*
- *Demonstrates the value added through an icon design; proven when units sold for three times more than comparable units (SHoP, 2012)*

Figure 1.0.06 Garden Study

Figure 1.0.07 Axonometric

Figure 1.0.08 Key Section 1:500

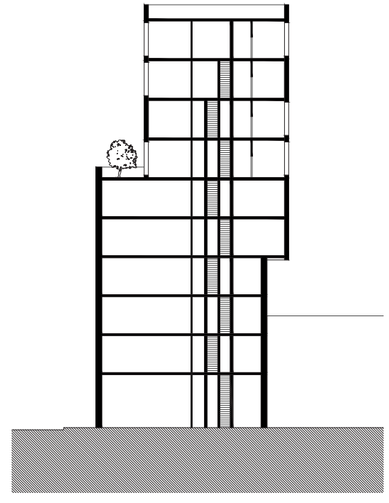


Figure 1.0.09 Warehouse/Sky-scraper relationship

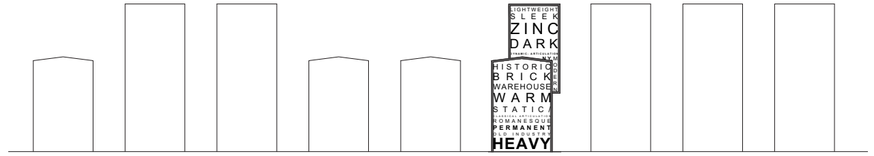
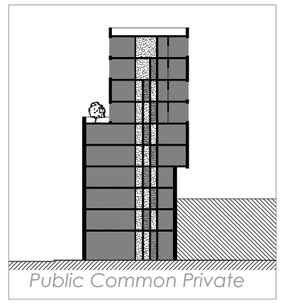


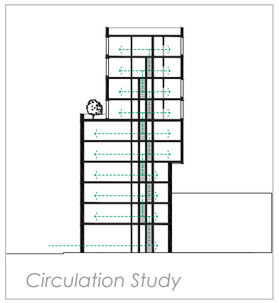
Figure 1.0.10 Public Common Private Study

Figure 1.0.11 Circulation Study

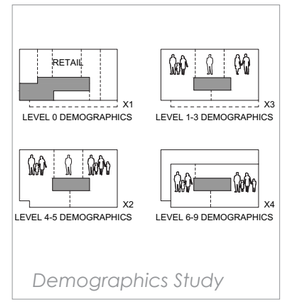
Figure 1.0.12 Demographics Study



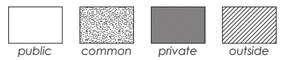
Public Common Private



Circulation Study



Demographics Study



1.1 Design Test One Review

Design Development Mediums	*Gold foam models, Hand drawing, Digital modelling*
Project Date	*Month 3 (May)*
Key Drivers	• *Achieving solar access into the central courtyard and all apartments year-round* • *Understanding volume and scale required to produce targeted 250 DW/HA yield* • *Familiarisation of site and site conditions* • *Developing a design methodology* • *Designing with reference to the 'Kebbell classification'*
Programmes	*Residential, Ground floor retail*

210 *DW/HA*

Design test one uses case study reflections and intuition to respond to the initial brief: addressing all 29 CHRANZ attributes and achieving the 250 DW/HA density target on site. Although not all goals are met, a benchmark is established for further iterations to improve upon.

Initially this design is model driven, in the physical realm, then later refined digitally, to quickly experiment with design strategies.

Twelve initial physical (goldfoam) models are documented and weighed to give an indication of their expected volume. This ensures models are within the correct massing range for the target density and appropriate for digital development (Figure 1.1.03 - Figure 1.1.15).

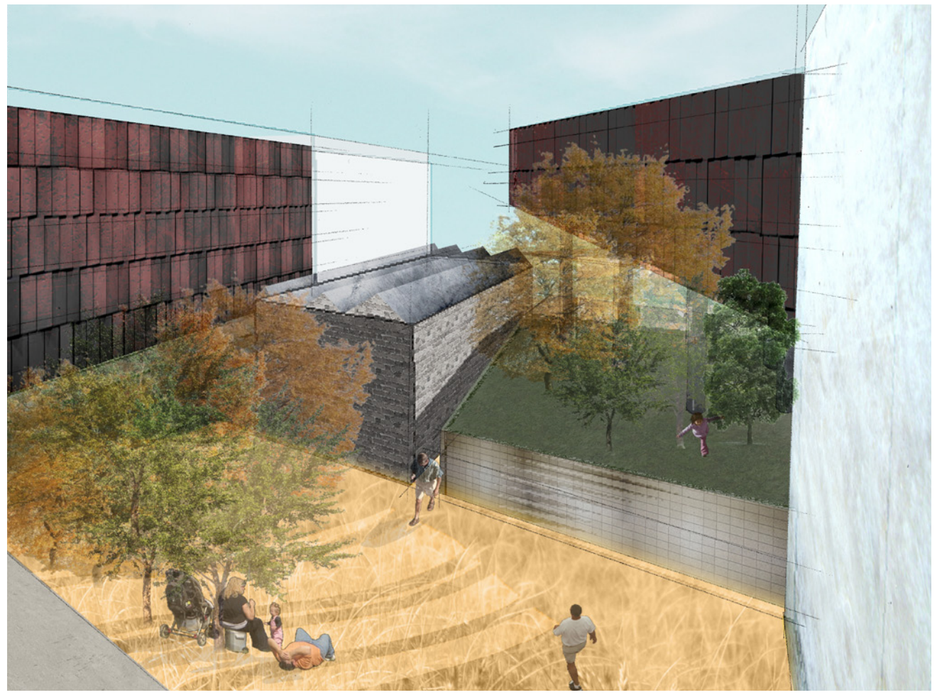
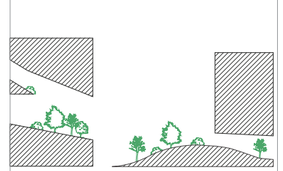
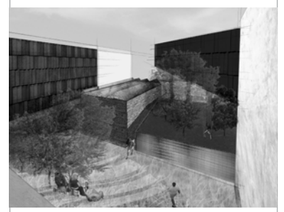


Figure 1.1.01 Parti diagram

Figure 1.1.02 Perspective from a unit overlooking the central area



Parti Diagram



Perspective

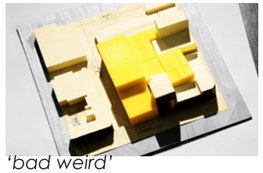
Scheme Typology	*Infill perimeter block*			
Circulation Type	*NA*			
Dwelling Typologies	*Apartments, Maisonettes*			
Garden Typologies	*Common courtyard, Void garden*			
Amenities	✓	*Garden*	NA	*Variety of Unit Types*
	✓	*Sunlight*	✓	*Visual Aspect*
	✓	*Privacy*	✓	*Iconic Value*
Adaptability	*NA*			
Kebbell Classification	*Good-weird*			

'good normal'
model weight = 8.03 g
therefore 9,920 m2 @ 1:1
Figure 1.1.03 'Welcomed'

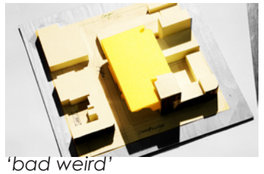
'good normal'
model weight = 12.11 g
therefore 15,000 m2 @ 1:1
Figure 1.1.07 'Journey Through'

'good normal'
model weight = 9.33 g
therefore 11,500 m2 @ 1:1
Figure 1.1.11 'Fine Settlement'

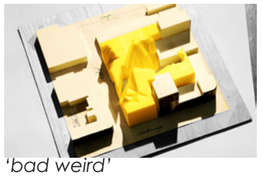
'good weird'
model weight = 9.98 g
therefore 12,300 m2 @ 1:1
Figure 1.1.04 'Drama'



'bad weird'
model weight = 11.44 g
therefore 14,100 m2 @ 1:1
Figure 1.1.08 'Score 3D'



'bad weird'
model weight = 10.67 g
therefore 13,200 m2 @ 1:1
Figure 1.1.12 'A Void Space'

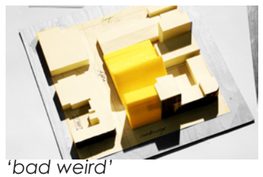


'bad weird'
model weight = 13.04 g
therefore 16,100 m2 @ 1:1
Figure 1.1.05 'Scar'

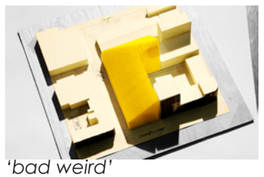
'bad weird'
model weight = 13.22 g
therefore 16,300 m2 @ 1:1
Figure 1.1.09 'Cutting Off'

Figure 1.1.13 'Lighting Affect'

'bad weird'
model weight = 7.99 g
therefore 9,870 m2 @ 1:1
Figure 1.1.06 'Perimeter Context'



'bad weird'
model weight = 8.46 g
therefore 10,500 m2 @ 1:1
Figure 1.1.10 'Reflective State'



'bad weird'
model weight = 12.46 g
therefore 15,400 m2 @ 1:1
Figure 1.1.14 'Intuition onto Context'

Target Density

250DW/HA

site area = 3230m^2

minimum area required for 250 DW/HA: **12,000 m^2**

Early list of potential design drivers

- Atmosphere
- Emotional reaction
- Perception
- Symbolism
- Philosophy
- Structure
- Proportion
- Materials
- Finances
- Playfulness
- Environment
- Context
- Behaviour
- Time
- Memory
- Metaphor
- Light and Shadow
- The Gap/not built

'Lighting Affect'
'good-weird'

model weight = 10.66 g
therefore 13,200m2 @ 1:1

Figure 1.1.15 'Lighting Affect' Close Up

Summary:
- Light is brought into the courtyard all year round
- Structural development will alter shadow patterns and wind breakdown
- Challenges height restrictions in a respectful way to existing context
- Enhanced views
- Dwelling possible in void spaces
- Iconic building

Floor area requirements met

Council height limit restrictions met

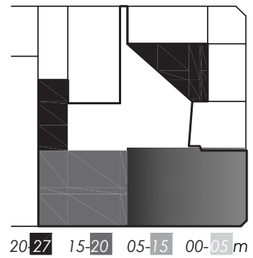


Figure 1.1.16 'Lighting Affect' heights across site

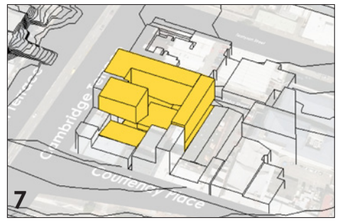


Figure 1.1.17 Raised internal platform in western corner to increase winter morning sunlight access to the central common area.

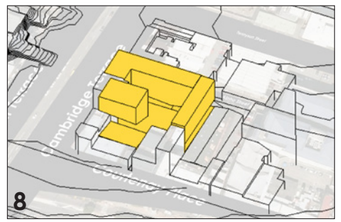


Figure 1.1.18 Raised internal platform over the entire area; does not increase the amount of sunlight to the area.

Figure 1.1.19 Lowering of perimeter buildings to properly respect the existing fabric.

Of the goldfoam models the preferred design, 'lighting affect', is selected for further digital development. Chosen as a 'good-weird' propositional icon it also acknowledges the symbolic role of garden in New Zealand housing. This goldfoam study creates opportunities for a range of striking naturally lit moments formed by cutting voids through the building envelope to create evocative and memorable human scale spaces filled with garden.

High quality light is not often associated with high density housing, yet this design achieves it year round. In the digital realm the concept is explored with accurate solar studies to realise its feasibility (Figure 1.1.17 - Figure 1.1.20, Appendix page 239). The optimised massing is then retrofitted to suit the 29 CHRANZ criteria.

Figure 1.1.20 Image of workbooks feature complete model studies

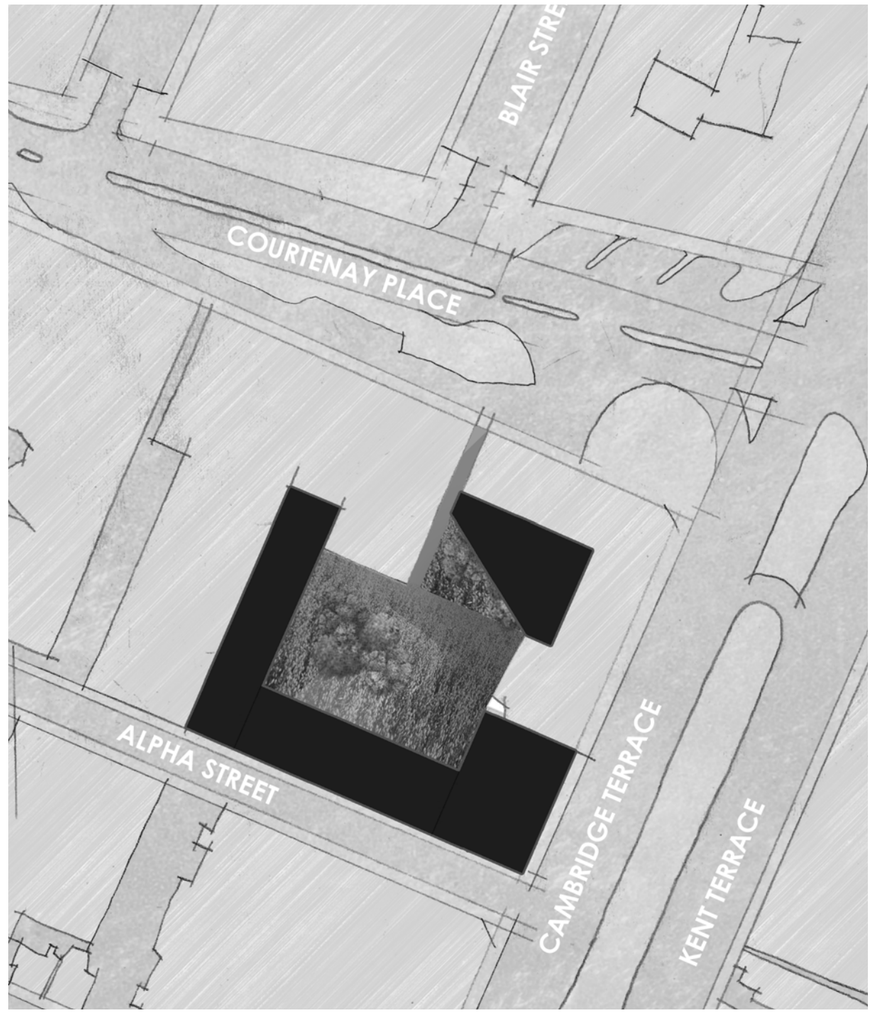


Figure 1.1.21 Site Plan of Design Test One as presented at reviews in May

1:500

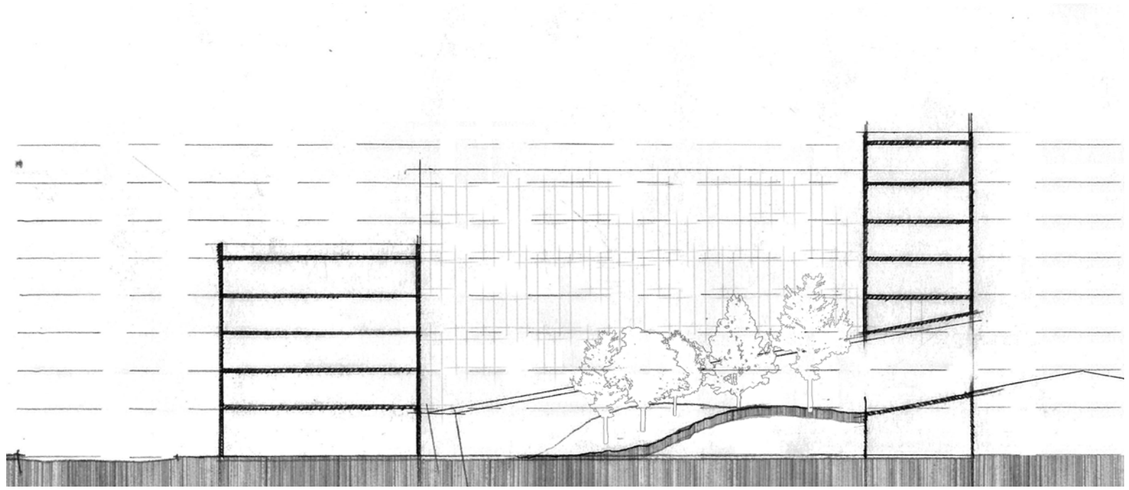


Figure 1.1.22
East-West section showing raised ground plane in courtyard

Figure 1.1.23
Render from Blair Street illustrating Iconic potential

This design test is the first with garden space, an element that runs through each consecutive design as an intuitive and later formalised response to what would make this desirable to New Zealanders, and forms part of a 'good-weird' design solution.

Figure 1.1.24
Street elevation Cambridge Terrace

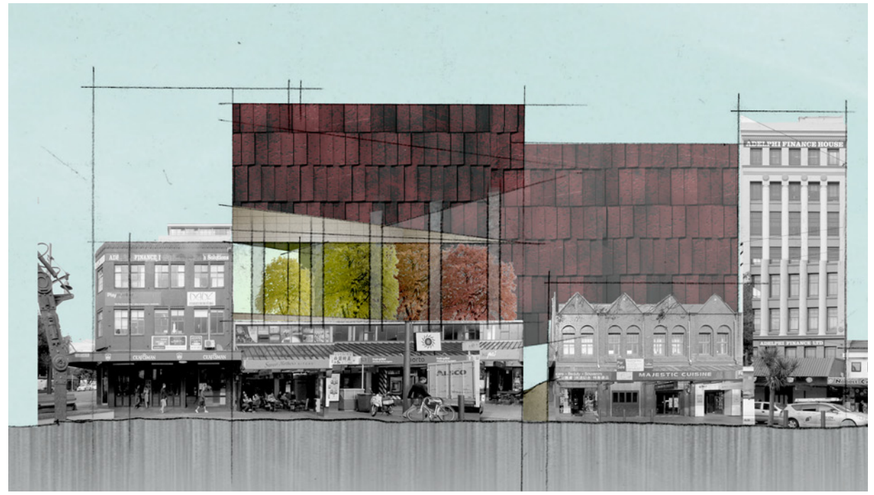


Figure 1.1.25
Street elevation Courtenay Place

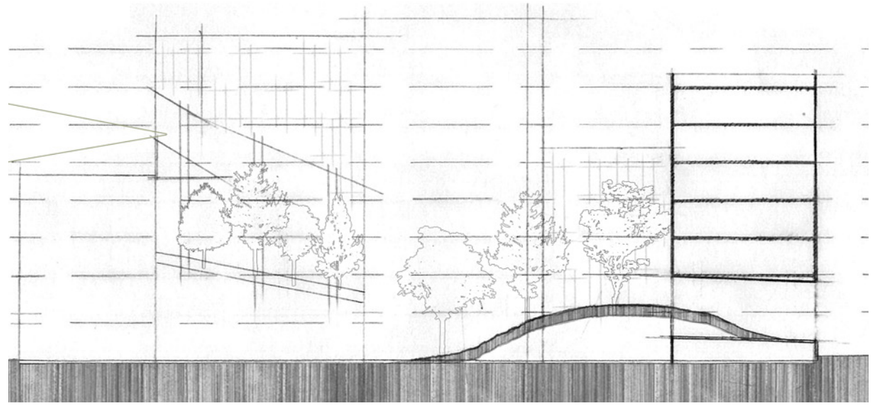
Points of Innovation

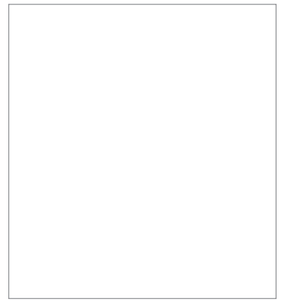
- *Planning optimises solar access into central courtyard and units*
- *Lifting ground plane to face the sun improves courtyard solar access*
- *Creating voids in the building envelope introduces an opportunity for garden within these*
- *Garden void architectural language offers potential for iconic architecture*
- *Internalising views to large common garden reinforces symbolic role that connection to nature plays in defining house and home*
- *Alpha Street activation through master planning public thoroughfare of site*
- *Year round sunlight to courtyard space and all units*

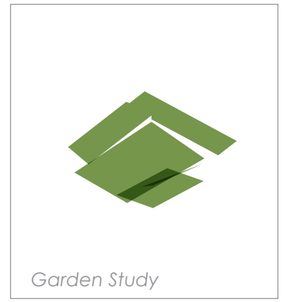
Limitations to Address in Next Design Test

- *Garden and void types have potential for vertical integration*
- *Circulation yet to be considered in this initial design test*
- *Unit layouts require rule formalisation to help solve for key attributes*

Figure 1.1.26 North-South section showing cuts through masses and garden interventions within →







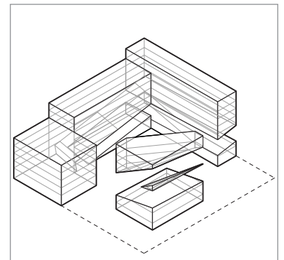
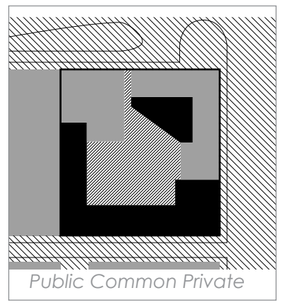


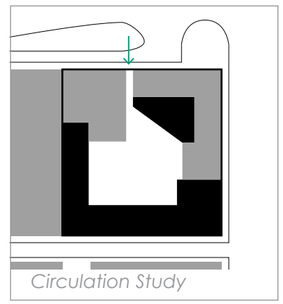
Figure 1.1.27 Axonometric

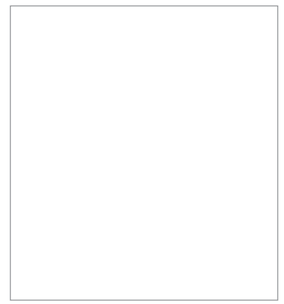
Figure 1.1.28 Garden Study

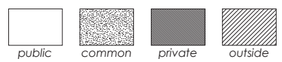
Figure 1.1.29 Circulation Study

Figure 1.1.30 Public Common Private









CHAPTER 2

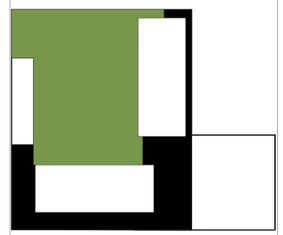
Design Test

Two

2.0 Case Study : Sanctum Apartments

Architect	*Warren and Mahoney Architects*
Location	*Wellington*
Date	*2000*
Programmes	*Residential, Parking*

175 DW/HA



Parti Diagram

Perspective

Figure 2.0.01 Parti diagram

Figure 2.0.02 Perspective

Wellington's Sanctum Apartments is selected as a case study to help establish what contributes to enduring apartment desirability (as indicated by its consistently high unit prices).

Double storey apartments (maisonettes) feature in two thirds of unit cases, a characteristic more commonly associated with detached housing (Leupen, et al., p. 142). Each unit enjoys a recessed balcony offering private outdoor space which helps to increase its desirability to New Zealanders.

Including a large common garden space, secure solar access and privacy, all positive CHRANZ attributes, Sanctum prioritises similar amenities to later design tests.

This project helps gain an understanding of local desirable architecture and presents an uncommonly efficient circulation system which is applied during design test two.

Scheme Typology	*Two residential slab blocks, arranged to define a courtyard*
Circulation Type	*Internal - every alternate storey*
Dwelling Typologies	*Maisonette - double aspects, Studio apartments - single aspect*
Garden Typologies	*Courtyard, Ground floor units with private gardens, Recessed balconies on upper levels*
Amenities	✓ *Garden* ✓ *Variety of Unit Types* ✓ *Sunlight* *Visual Aspect* ✓ *Privacy* *Iconic Value*
Adaptability	*Flexibility in the double bay structural system allows potential variety in unit compositions*
Kebbell Classification	*Bad-normal*

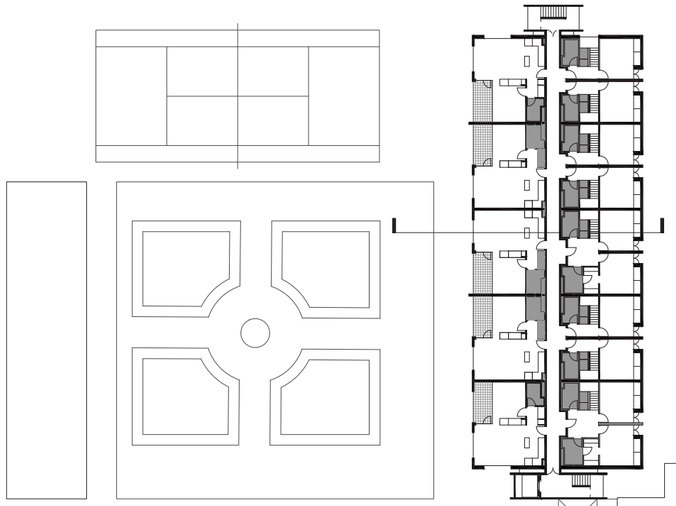


Figure 2.0.03
Typical Floor Plan
1:500

Points of Innovation	• *Efficient circulation network on every alternate storey* • *Proven high resale values* • *Designed for the New Zealand market; prioritising sunlight and privacy to individual units* • *Double bay structural system allows for flexibility of unit arrangements in the appropriate ownership situations*
Points of Limitation	• *Set apart from its surroundings, with only a parking building along the street edge, the scheme does not contribute positively to its urban context* • *Floor plans include inbuilt furniture rendering the rooms difficult to adapt for alternative uses* • *Garden courtyard is infrequently used due to its visual exposure to the complex, rather it serves purely as a visual aspect and orientation device* • *Units with balconies are sometimes home to families, although none with children between three and nine (Dekker, D)*

Figure 2.0.04
Exploded
Axonometric

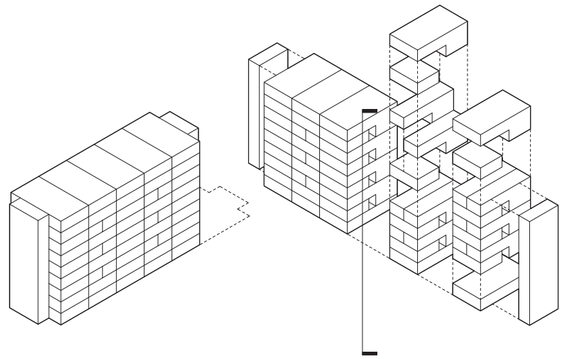
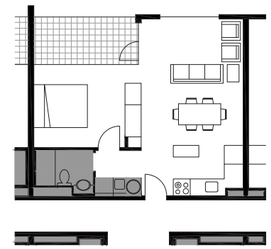
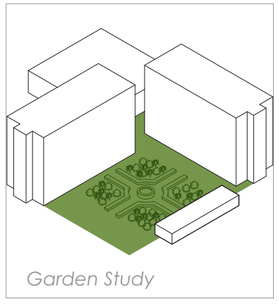
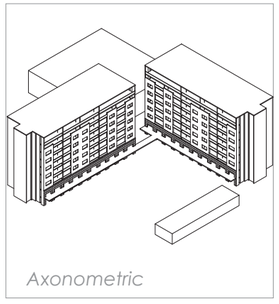


Figure 2.0.05
Typical Unit Plan
1:200





Garden Study



Axonometric

Why this project was selected as a case study and what was learnt

- *Introduces a circulation strategy with reduced corridor area, and associated unit layout options, allowing larger units or a reduced volume for the same sellable area*
- *Responds directly to sunlight and privacy concerns, two design drivers prioritised following design test two (Chapter 2.1 page 79). Garden, the final prioritised driver, is also addressed although not integrated successfully*
- *Confirms on-going desirability in relationship between prioritised design drivers and high resale value*
- *Implies a relationship between 'occupiable garden' and the absent 'family with young children' demographic*

Figure 2.0.06
Garden Study

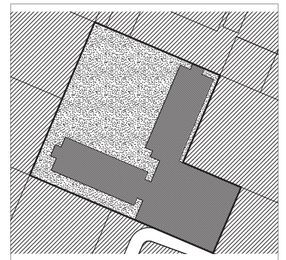
Figure 2.0.07
Axonometric

Figure 2.0.08 Key
Section 1:500

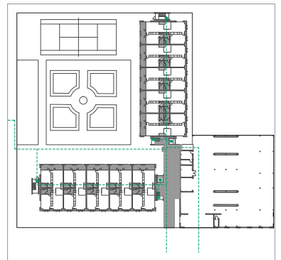
Figure 2.0.09
Public Private Common Study

Figure 2.0.10
Circulation Study

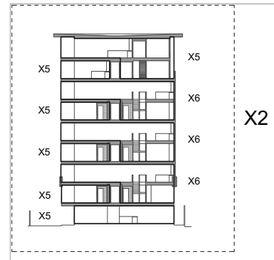
Figure 2.0.11
Demographics Study



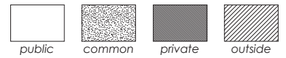
Public Common Private



Circulation Study



Demographics Study

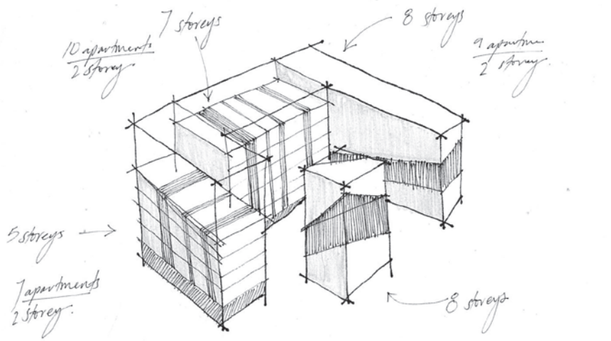


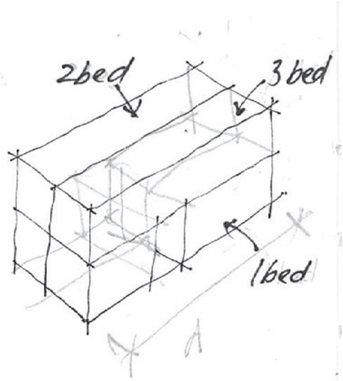
2.1 Design Test Two Review

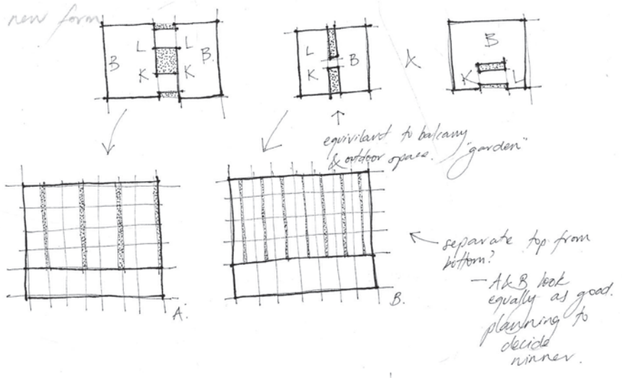
Design Development Mediums	*Hand drawing, Digital modelling*
Project Date	*Month 4 (June)*
Key Drivers	• *Testing different circulation and unit arrangements* • *Developing design rules to achieve high levels of natural light amenity to all units: 'double aspect' or 'shallow north facing' floor plans in response to CHRANZ amenity requirements* • *Introducing garden aspects to all dwellings*
Programmes	*Residential, Ground floor retail*

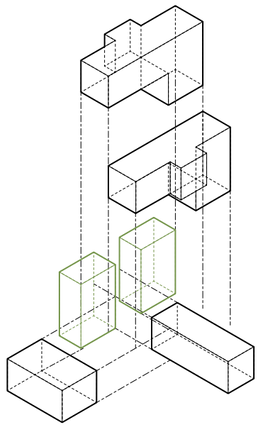
Design test two integrates iconic vertical garden stratifications to balance the hardness of high density housing with the softness of garden spaces and establishes how massing can be informed by garden.

Garden is used as the primary organisational device to optimise unit space and circulation layout. These three elements were kept separate but intersected to provide sequential relationships to each (Figure 2.1.03, adapted Sanctum (Chapter 2.0)).









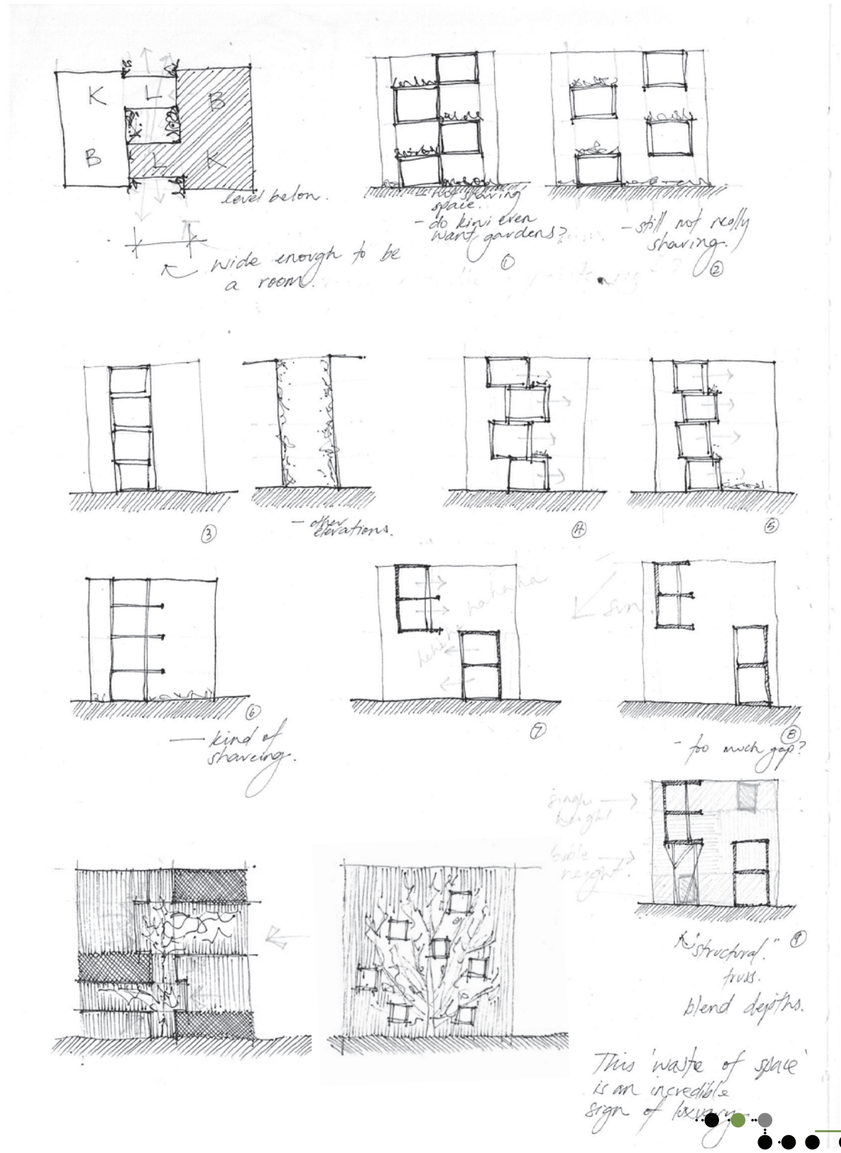
Studying how narrow a garden can be before it becomes uninhabitable, and before it cannot be used as a screening device, establishes this design test's 2-4m vertical garden strata borders (narrower end of screening). These borders provide light and privacy between the units within the 13m deep floor plate.

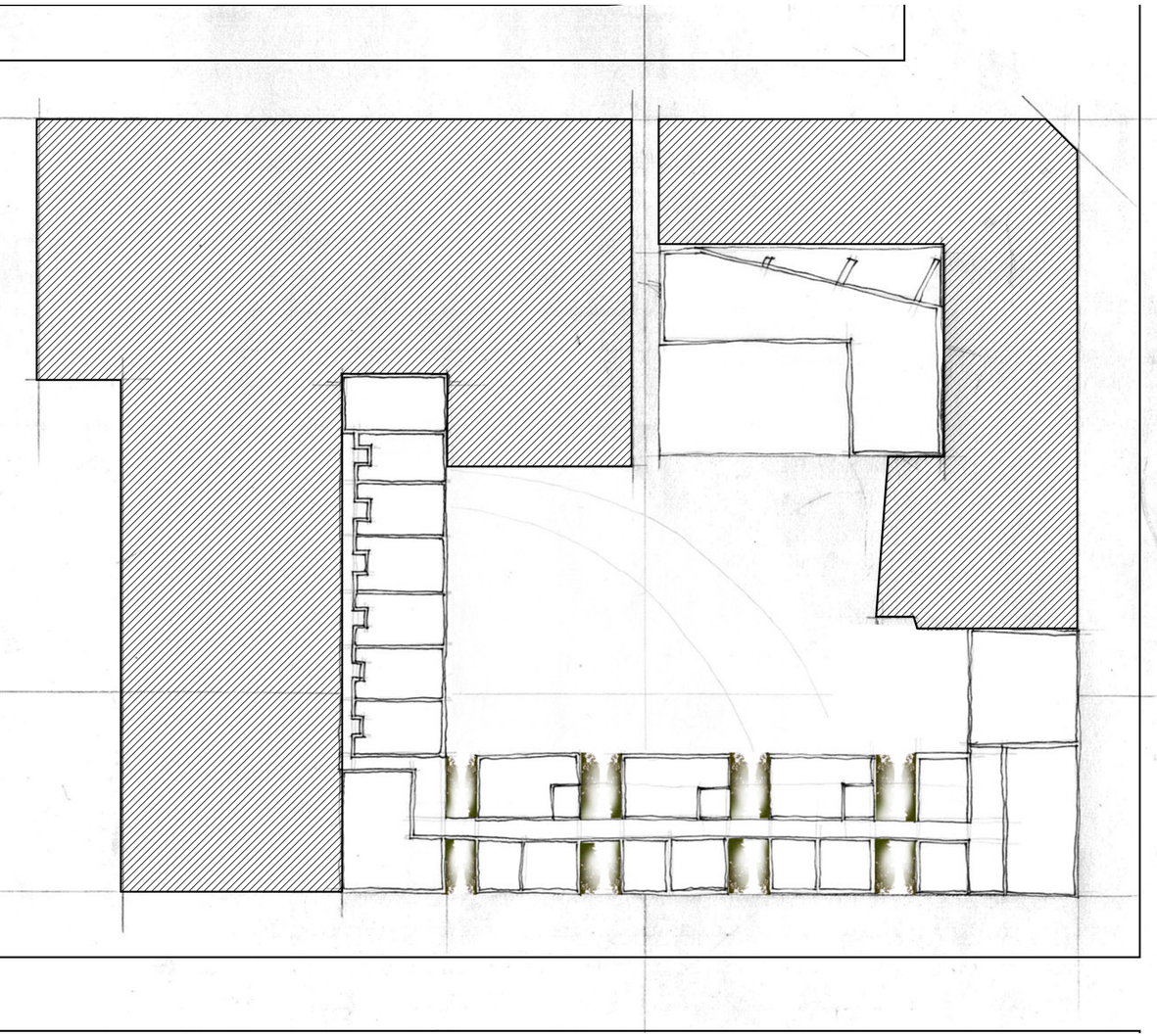
Figure 2.1.01 Initial studies integrating a higher portion of garden with direct access from units

Figure 2.1.02 Circulation to unit study

Figure 2.1.03 Diagram of circulation, garden and unit relationship

Figure 2.1.04 Vertical garden section studies for inserting between each unit stack

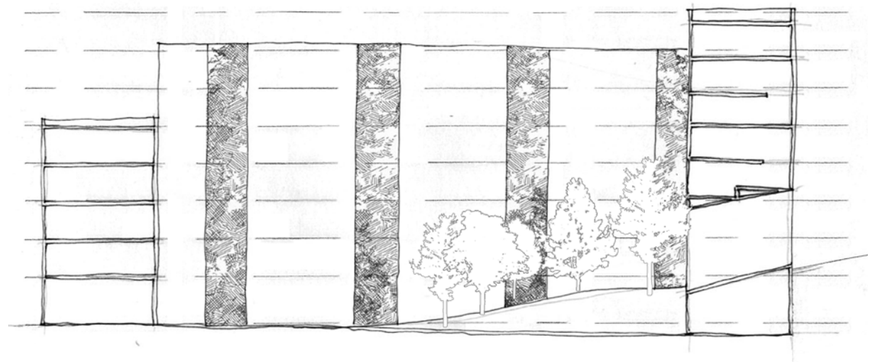




1:500

Figure 2.1.05
Typical floor plan as presented in June

Figure 2.1.06
East-West section/ elevation showing vertical garden interventions



*"Must have parameters people look for in their sanctuary are much the same in medium density as in conventional housing: a safe and secure environment, **privacy**; space, **light**, and warmth; and flexibility in how it may be used."*
(CHRANZ p. i)

"Indoor-outdoor living is also important, both for the sense of space it offers and to meet a desire for good light and sunshine, on the one hand, and access to the outdoors on the other."

(CHRANZ p. 57)

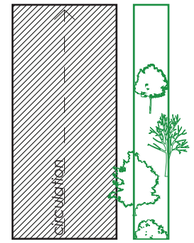
*"**Gardens** remain a significant priority for many people. This may be to do with a sense of self-sufficiency, the satisfaction that creating and tending a garden brings, or aesthetics and the ability to create something personal"*

(CHRANZ p. 57)

Balancing 29 CHRANZ aspects, six additional incentives, site constraints and a 250 DW/HA density criteria simultaneously proves to be challenging. Thus a prioritisation of design constraints is introduced following this design test. Returning to the primary text, three design criteria are brought forward above the others to be used to design all further iterations: the desire for garden space, sunlight and privacy.

Figure 2.1.07 Parti diagram

Figure 2.1.08 Perspective from within vertical garden



Parti Diagram

Perspective

Scheme Typology	*Infill perimeter block*	
Circulation Type	*Internal - every alternate level*	
Dwelling Typologies	*Apartments, Maisonettes*	
Garden Typologies	*Common courtyard, Void garden, Vertical gardens, Recessed balconies*	
Amenities	✓ *Garden*	✓ *Variety of Unit Types*
	✓ *Sunlight*	✓ *Visual Aspect*
	✓ *Privacy*	✓ *Iconic Value*
Adaptability	*None*	
Kebbell Classification	*Good-weird*	

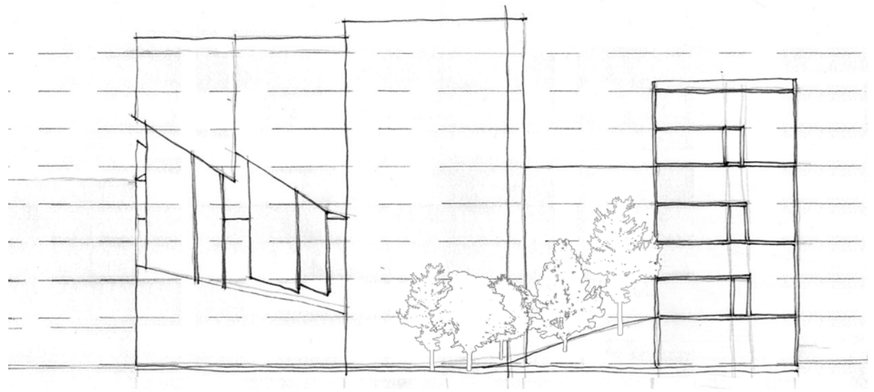
Points of Innovation

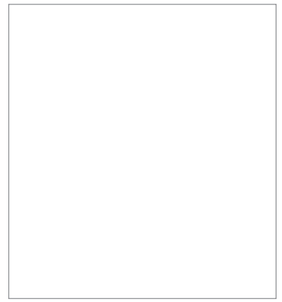
- *Iconic potential in vertical gardens*
- *Horizontal circulation spaces have multiple relationships with vertical gardens*
- *Units with openings into vertical gardens provide individual verdant connections for all*
- *Efficient circulation network operates on every alternate storey*
- *Accurate understanding of project's yield/volume relationship*

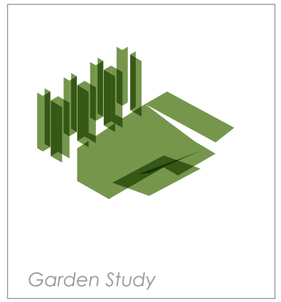
Points of Limitation

- *Scheme has lost public permeability reducing its capacity to activate Alpha street and give back to its surroundings*
- *Potential for future development on adjacent western site not addressed. If this site is built out to the council's height limit, solar access and privacy of proposal is compromised, and the western block's solar access defined form becomes redundant*
- *Relationships of units and circulation spaces to garden is limited to aspect only with no potential for individual engagement*

Figure 2.1.09 North-South section showing maisonette and apartment units stacking about a central corridor







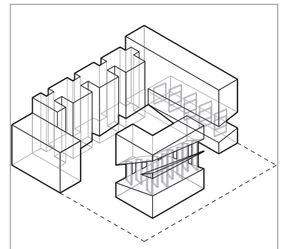


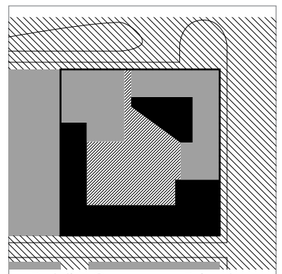
Figure 2.1.10 Axonometric

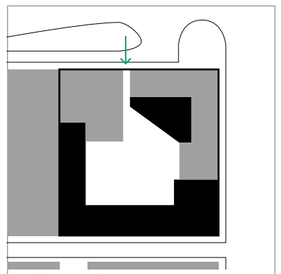
Figure 2.1.11 Garden Study

Figure 2.1.12 Circulation Study

Figure 2.1.13 Public Common Private

Figure 2.1.14 Perspective from northern garden void





2.2 Question Identified

Garden, sunlight and privacy are established as the primary desirable amenities of any New Zealand dwelling. In an effort to attract suburbanites away from single detached homes these amenities may be reconfigured at urban densities to make this type of living more desirable.

The question posed for this research is as follows:

"How can a high density housing scheme that responds with prioritised garden, sunlight and privacy amenity be used to develop a desirable inner city housing model?"

Part 2

RESEARCHING AN ANSWER

Solving using architecture

CHAPTER 3

Design Test
Three

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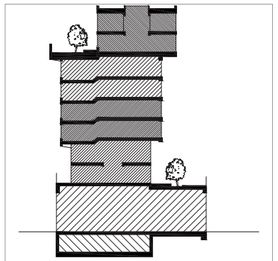
03

3.0 Case Study : 8 House

Architect	*Bjarke Ingels Group Architects*
Location	*Copenhagen*
Date	*2009*
Programmes	*Residential, Office, Parking, Cafe*

228 *DW/HA*



Parti Diagram

Perspective

Figure 3.0.01 Parti diagram

Figure 3.0.02 Perspective

The 8 House is a highly significant built work that includes many innovative and contemporary responses to modern and traditional issues from built form through to lifestyle.

The block's morphology reinvents the perimeter block to achieve higher density and a more interesting architectural form in this mixed use development.

Lifestyle is considered in the notion of 'Neighbourhood Street', facilitated by inviting a broad footpath ('Street in the Sky') to meander through the development catalysing community interaction. Additionally this footpath provides external access to apartments, a garden walk and vistas to the country beyond, the latter two 'borrowed landscapes' (Chapter 7 page 205).

Desirability is further enhanced through Bjarke Ingels' name, a famous Danish architect, attracting a demographic of design conscious residents.

Scheme Typology	*Perimeter Block*		
Circulation Type	*External 'Street in the Sky', Internal stairs and lifts*		
Dwelling Typologies	*Terrace house, Apartment*		
Garden Typologies	*Terraces, Courtyards*		
Amenities	✓ *Garden*	✓	*Variety of Unit Types*
	Sunlight		*Visual Aspect*
	Privacy	✓	*Iconic Value*
Adaptability	*None*		
Kebbell Classification	*Good-weird*		

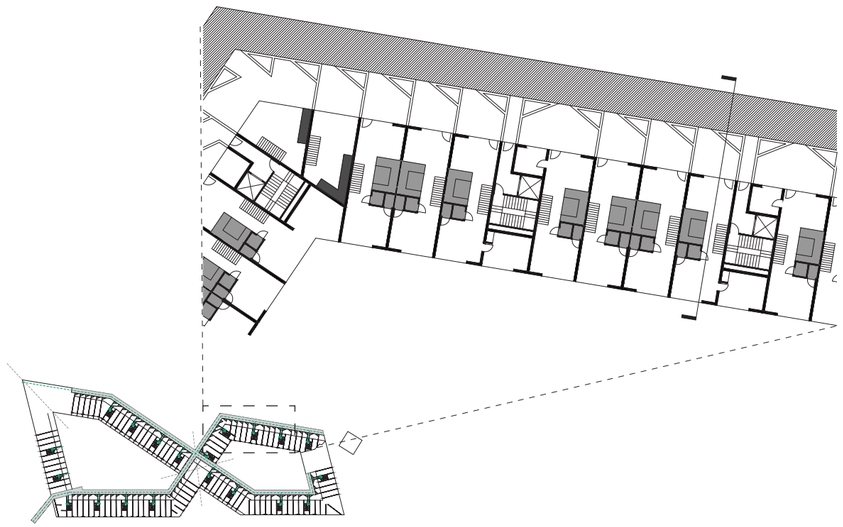


Figure 3.0.03
Typical Row House
Level Floor Plan
1:500

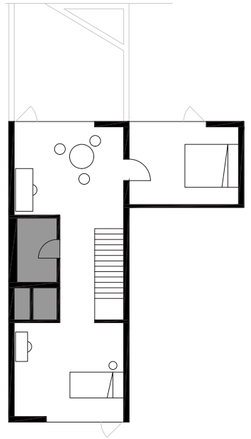


Figure 3.0.04 Unit Upper Level Plan 1:200

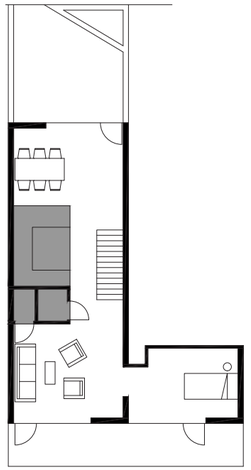


Figure 3.0.05 Unit Lower Level Plan 1:200

Figure 3.0.06
Exploded Axonometric

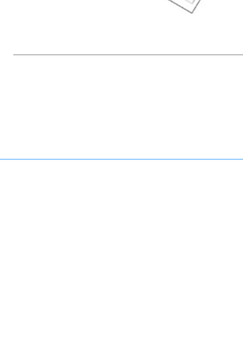
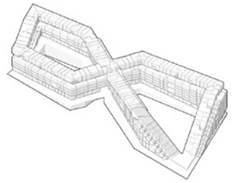


Figure 3.0.07
Assembled Axonometric

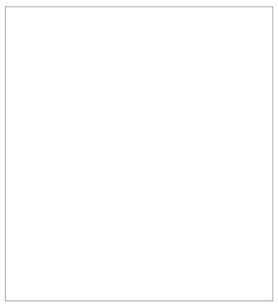


Points of Innovation

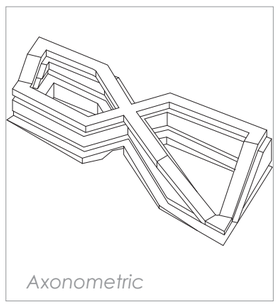
- *External garden based circulation ('Street in the Sky') creates a pleasant pedestrian, cycle friendly and occupiable circulation area that uses planting as a privacy screen*
- *Garden used as screening to provide privacy between common circulation and private garden areas and units*
- *Mixed-use development provides greater immediate amenity access*
- *Common amenities including a cinema, cafe and courtyards, add value to the neighbourhood*
- *Variety of unit types ranging from 2 to 6 bedrooms over three different typologies (terrace, apartment and penthouse). Units vary between 58m² and 181m² with gardens of up to over 30m² each. This housing variety helps create a diverse community and suits all stages of the family cycle.*
- *Iconic, simple and innovative design preposition based on twisting a perimeter block. This block typology is consistent with its Copenhagen context*

Points of Limitation

- *Plans are forced into an unusual overriding form causing inefficient use of internal space. These are often challenging to furnish, compounded, in smaller units, by space restrictions*
- *This development is in a newly released section of Copenhagen land with very little neighbourhood infrastructure so cannot draw upon local amenities*



Garden Study



Axonometric

Why this project was selected as a case study and what was learnt

- *With public access provided through the site, and a similar target density, the public, common, private boundaries can be applied in future design tests*
- *External circulation network shows how much space is required to produce an effective, and social, common space*
- *Complex unit stacking options demonstrating possibility for diverse floor plan options*

Figure 3.0.08
Garden Study

Figure 3.0.09
Axonometric

Figure 3.0.10 Key
Section 1:500

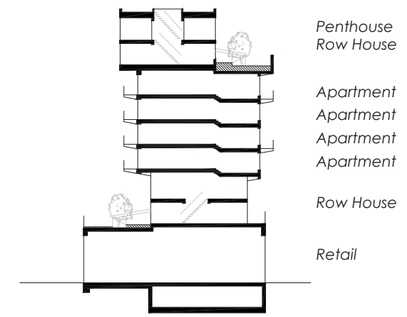
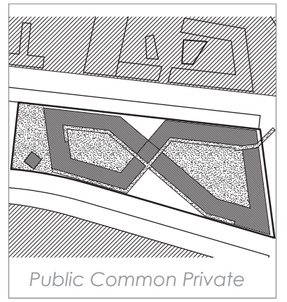


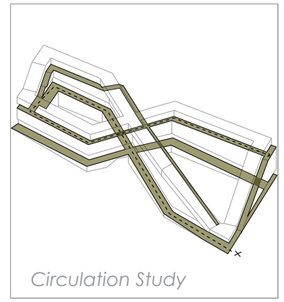
Figure 3.0.11
Public Private Common Study

Figure 3.0.12
Circulation Study

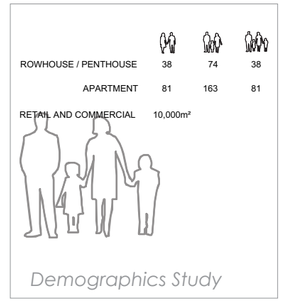
Figure 3.0.13
Demographics Study



Public Common Private



Circulation Study



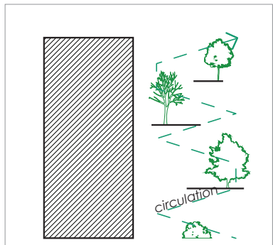
Demographics Study

3.1 Common Green Network

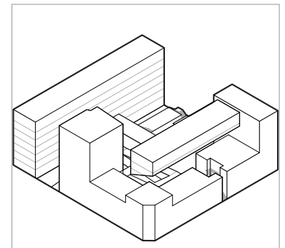
To structure and combine the priority amenities a 'common green network' driver was introduced. Conceptually, external landscapes are integrated as the primary circulation and privacy screening device to provide garden, sunlight and privacy for all dwellings.

The concept's initial application in design test three (A) provided public garden, courtyard and play-area platforms, overlaid and offset, circulating up a central area to rooftop level. However, the platforms required numerous stairs and bridges to connect units which compounded a solar access issue, did not address all amenities and looked awkward (bad-weird).

3.1A Design Test Three A (3(A))



Parti Diagram



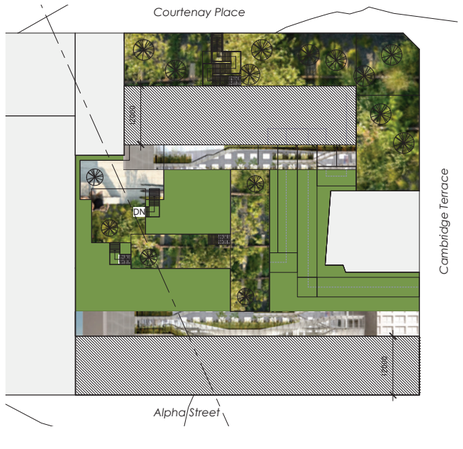
Axonometric

Design Development Mediums	*Physical modelling, Digital modelling, Digital collage*
Project Date	*Month 5 (July)*
Key Drivers	• *Providing access through site at an elevated level* • *Giving public access to rooftop gardens upon existing buildings along Courtenay Place* • *Retaining secured solar access to all units*
Programmes	*Residential, Ground floor retail, Public greens*

NA DW/HA

Figure 3.1.01 Parti Diagram

Figure 3.1.02 Axonometric



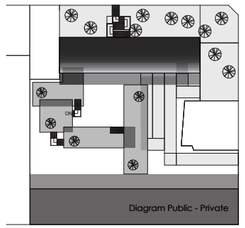


Figure 3.1.03 Site Plan rendered to show overlaying platforms in first iteration of the Common Green Network

Figure 3.1.04 Public, Common, Private diagram. Light grey = public through to dark grey = private

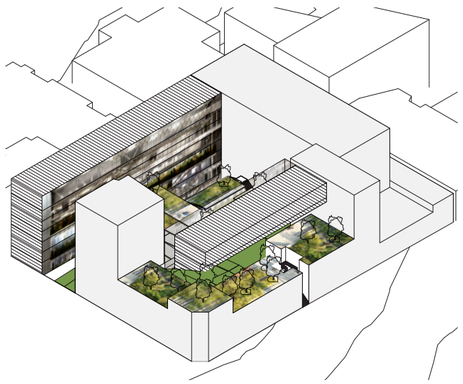


Figure 3.1.05 Rendered isometric of first iteration of Common Green Network in context

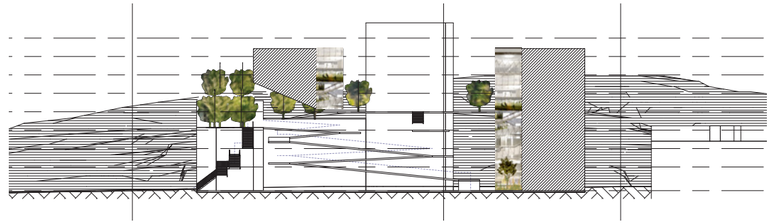


Figure 3.1.06 North-south section rendered showing ambulant access to public roof gardens on the existing buildings

Figure 3.1.07 East-west section rendered showing vertical platform locations. These produced large shows negatively affecting the lower apartments and street level courtyard area

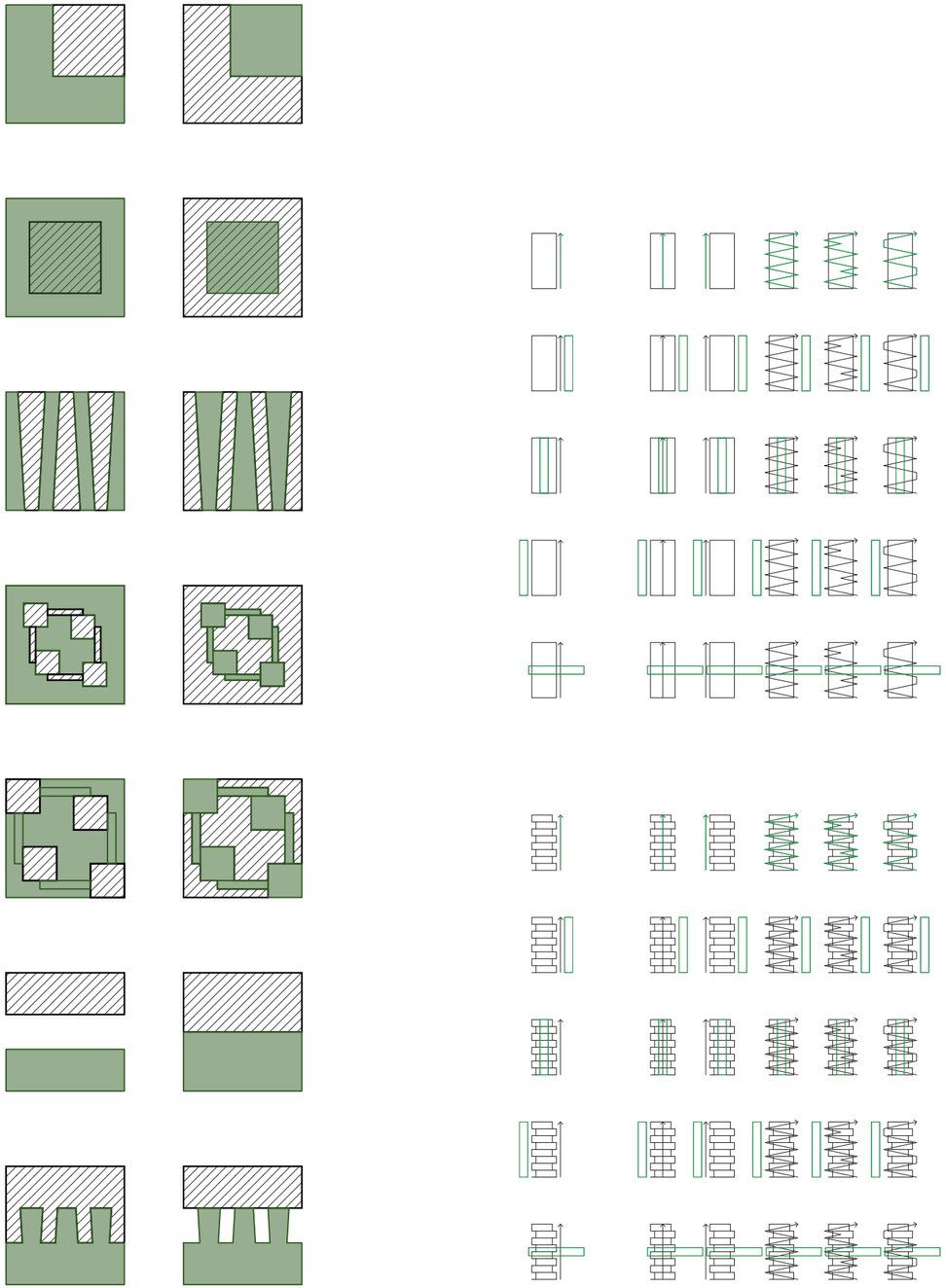


Figure 3.1.08
Building to green space relationship tests

Figure 3.1.09 Initial study of circulation in relation to green space where green represents landscape, and an arrow represents circulation location

To address the solar and articulation problems of the common green network's first iteration, two seductive collages of urban and suburban environments are produced (Figure 3.1.10 - Figure 3.1.11). These suggest a means of façade integration and an attractive vision for tying the prioritised amenities together. In combination with scale studies of garden/built form relationships and case studies these tests lead the concept to the articulation of design test three (B) (Chapter 3.4 page 121).

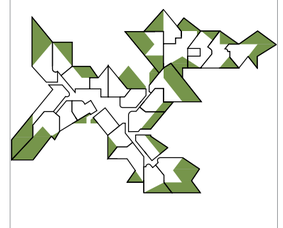
Figure 3.1.10
Urban Vision for Living. Developed as a mechanism for integrating landscape and circulation into the same organising feature

Figure 3.1.11
Green Vision for Living. Developed to indicate the desired affect the garden spaces would have on the scheme

3.2 Case Study : Jeanne Hachette

Architect	*Jean Renaudie*
Location	*Paris*
Date	*1975*
Programmes	*Residential, Retail, Commercial, Parking, Cinema*

61 DW/HA



Parti Diagram

Perspective

Named after the heroic Burgundian battle-woman of 1456, Jeanne Hachette defies 1969-1975 French housing standards to provide individual gardens and units for 39/40 households.

Over the entire development footprint these dwellings reach a density of 61 DW/HA. However, with a 6481m² shopping hub and 4770m² of offices on the four broader lower stories, the mixed use development brings an intensity of people and amenities to the area.

Gardens and individuality, Renaudie demonstrates and argues, are a social and human right issue, offering freedom to the individual and collective spirit.

Figure 3.2.01 Parti diagram

Figure 3.2.02 Perspective

Scheme Typology	*Whole block development*		
Circulation Type	*Internal*		
Dwelling Typologies	*Terrace*		
Garden Typologies	*Private terraces*		
Amenities	✓ *Garden*	✓	*Variety of Unit Types*
	Sunlight		*Visual Aspect*
	✓ *Privacy*	✓	*Iconic Value*
Adaptability	*None*		
Kebbell Classification	*Good-weird*		

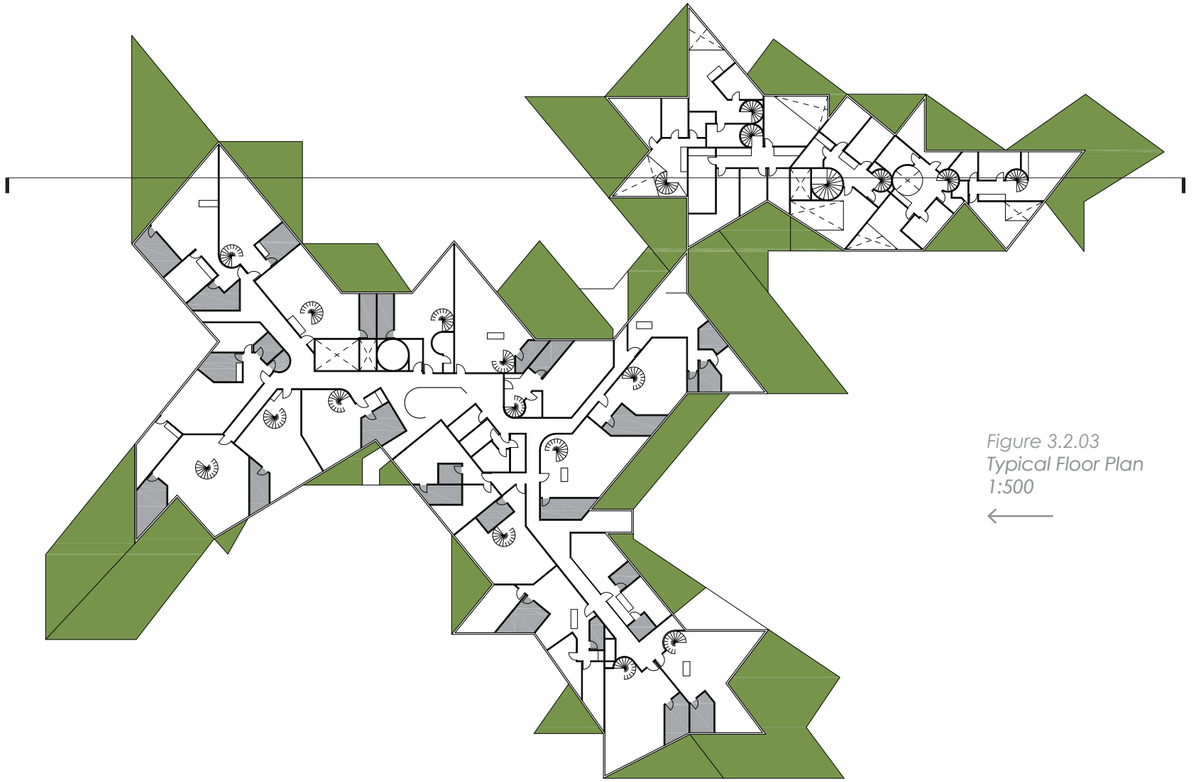


Figure 3.2.03
Typical Floor Plan
1:500

Points of Innovation	• *Key to this design is the provision of a substantial garden for every unit*
	• *The presence of garden is felt in each unit, integrated into daily lives*
	• *Designed for individual identity, with no unit the same and each garden customised by its residents*
	• *Mixed-use development provides greater immediate amenity access*
Points of Limitation	• *The cost premium of building an irregular social housing design created tense political issues during construction (Scalbert, p. 47)*
	• *Irregular plans are sometimes difficult to furnish with much wasted space in triangulated areas*
	• *Internal circulation, predominantly artificially lit, is not particularly welcoming*

Figure 3.2.04
Exploded
Axonometric

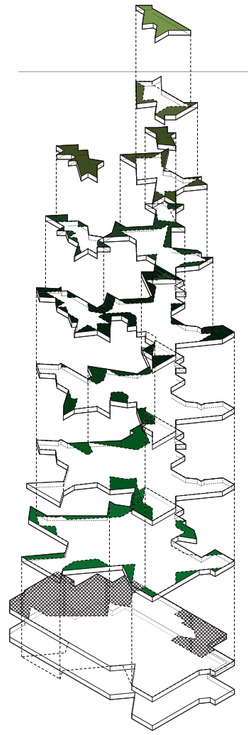
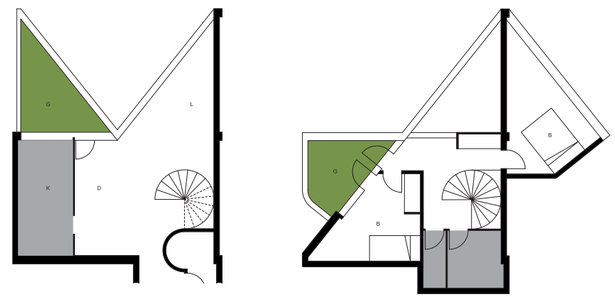
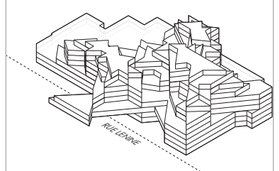


Figure 3.2.05
Example Unit Plan
1:200



Garden Study



Axonometric

Why this project was selected as a case study and what was learnt

- *Demonstrates it is possible to achieve quality gardens at high densities*
- *Foregrounds garden and geometry resulting in the creation of an iconic building*
- *Illustrates highly complex tessellation of units to produce individuality in each apartment while also allowing garden spaces to stack*
- *Renaudie's design technique of overlaying papers to quickly design offers a method for design test development*
- *Political slight aside, the existence of this building proves feasibility of gardens at high density*

Figure 3.2.06 Garden Study

Figure 3.2.07 Axonometric

Figure 3.2.08 Key Section 1:500

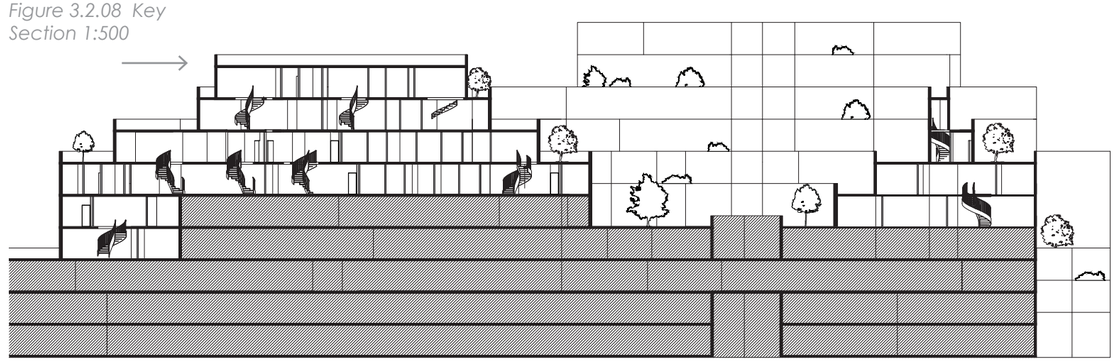
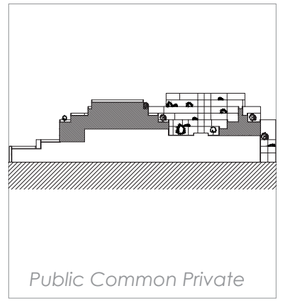


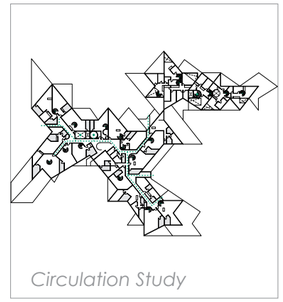
Figure 3.2.09 Public Private Common Study

Figure 3.2.10 Circulation Study

Figure 3.2.11 Demographics Study



Public Common Private



Circulation Study

Bedrooms	Internal m^2	Garden m^2
4	104	64
4	130	27
3	112	140
1	38	0

Each unit different, exteremes illustrated

Demographics Study

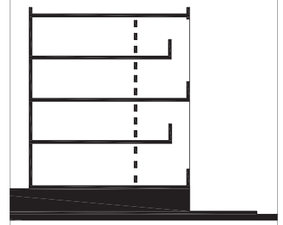
public common private outside

primary access secondary access bisected access

3.3 Case Study : Mondrian Apartments

Architect	*Stanisic Associates*
Location	*Sydney*
Date	*2002*
Programmes	*Residential (including parking), Public park*

260 DW/HA



Parti Diagram

Perspective

Mondrian Apartments demonstrate a liveable apartment lifestyle facilitated by multiple double storey, double aspect, amenity rich apartment designs with large private external double and single height outdoor spaces.

These external spaces can be controlled by closing large louvres to provide solar or wind protection. Often these spaces are further customised to feature pot plants of tropical trees furthering privacy and garden relationships for units.

The scheme is also generous to its context, giving over a public planted park to the scheme's north which, as with the common planted areas, provide garden interaction for all residents as they access their units.

Figure 3.3.01 Parti diagram

Figure 3.3.02 Perspective

Scheme Typology	*Four slab blocks arranged forming courtyards and common areas (Figure 3.3.10)*
Circulation Type	*Internal*
Dwelling Typologies	*Apartments, Maisonettes*
Garden Typologies	*Courtyards, Recessed balconies, Public park*
Amenities	✓ *Garden* ✓ *Variety of Unit Types* ✓ *Sunlight* ✓ *Visual Aspect* ✓ *Privacy* *Iconic Value*
Adaptability	*Apartments awarded sustainability prizes for operable elements that use passive cooling and watering techniques*
Kebbell Classification	*Good-normal*

Figure 3.3.03
Typical Floor Plan
1:500

Points of Innovation	• *Generous double height private outdoor spaces* • *Large external louvres operable allowing control over balcony spaces* • *Semi-common planted courtyards between each slab block contribute to smaller sub-neighbourhood atmospheres* • *Contextual; sets a new environmental and aesthetic standard for apartment developments in Sydney (de Vulder, S; et al.)* • *Well-proportioned façade, achieved through double height apartments, defined by louvred balconies, that effectively reduce the apparent building scale*
Points of Limitation	• *Due to differences in Sydney's and Wellington's climate, not all innovations can be directly applied to the New Zealand context* • *Dark central areas of units due to deep and narrow floor plans* • *Although efficiently planned using open planed techniques, much room is taken up with internal stairs (up to 10% of the total area in some units)*

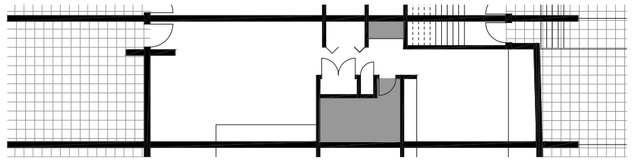
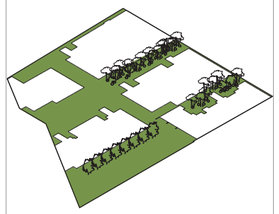
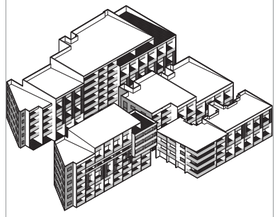


Figure 3.3.04
Typical Lower Level
Unit Plan 1:200



Garden Study



Axonometric

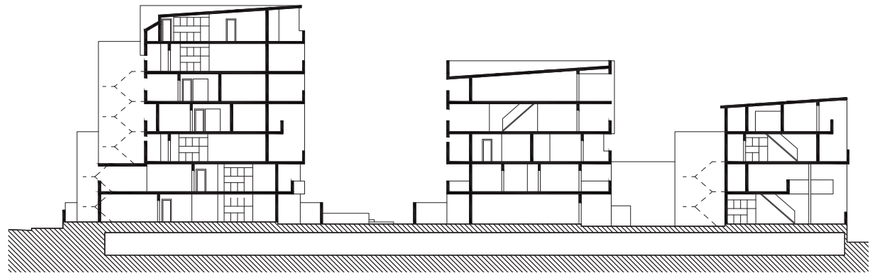
Why this project was selected as a case study and what was learnt

- *Facilitates outdoor living at high densities through double height balconies and units*
- *Encourages sub-neighbourhoods through semi-common gardens*
- *Suggests an alternative to the perimeter arrangement that achieves high density and high amenity*
- *Makes apartments attractive and liveable in a country with similar lifestyle values as New Zealand*

Figure 3.3.05
Garden Study

Figure 3.3.06
Axonometric

Figure 3.3.07 Key
Section 1:500

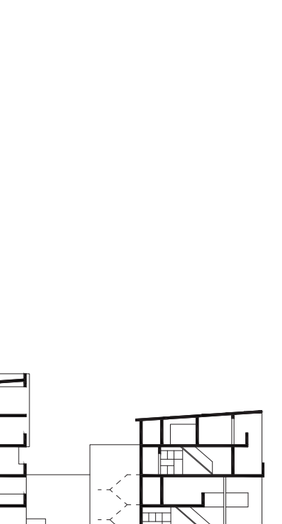


Public Common Private

Figure 3.3.08
Public Private Common Study

Circulation Study

Figure 3.3.09
Circulation Study



Exploded Axonometric

Figure 3.3.10
Exploded Axonometric

3.4 Design Test Three B (3(B)) Review

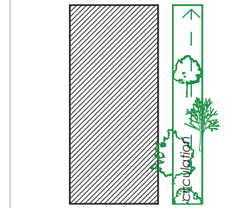
Design Development Mediums	*Physical modelling, Digital modelling, Digital collage*
Project Date	*Month 5 (July)*
Key Drivers	• *Providing access through site at an elevated level* • *Giving public access to rooftop gardens upon existing buildings along Courtenay Place* • *Retaining secured solar access to all units*
Programmes	*Residential, Ground floor retail, Public greens*

N A DW/HA

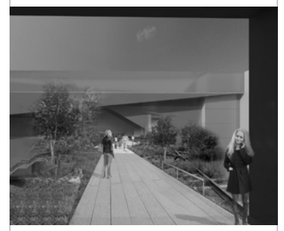
Design test three (B) uses the common green network urban collage as inspiration to combine circulation and garden in a feasible way. With a layering technique, developed in built models and diagrammatic studies, it delivers unit access and private gardens.

However, to achieve the collage's effect, a deep building envelope is required to allow the space under the network's circulation to be of a useful size for utilisation. Yet with a deepening floor plate a reduction in unit sunlight (priority amenity) occurs.

This façade network is used in combination with a 'high line' intervention to connect to Courtenay Place. Existing buildings are retrofitted with rooftop gardens to become part of the network, connecting the development in a cohesive way.



Parti Diagram



Perspective

Scheme Typology	*Infill perimeter block*			
Circulation Type	*External - with vertical circulation paths along the building face planted, and a 'high line' through the complex*			
Dwelling Typologies	*Apartments, Maisonettes*			
Garden Typologies	*Common Courtyard, Vertical Circulation Gardens, Private attached Gardens, Rooftop Gardens*			
Amenities	✓	*Garden*	✓	*Variety of Unit Types*
		Sunlight	✓	*Visual Aspect*
		Privacy		*Icon Value*
Adaptability	*NA*			
Kebbell Classification	*Good-weird*			

Figure 3.4.01 Parti diagram

Figure 3.4.02 Perspective

Figure 3.4.03
Design test physical model study

Points of Innovation

- *'Common green network' concept proved feasible way to integrate the primary garden, sunlight and privacy amenities*
- *External circulation provides direct engagement with garden for all residents*
- *Removing western building volume and designing as if the adjacent plot is built out secures sunlight*
- *Private gardens integrated into the units adjacent to the common circulation areas further enhances garden aspect*

Points of Limitation

- *Privacy is compromised in this design test to achieve the common green network; a more verdant screening option could help solve this problem*
- *Although solar access is secured by the building volume, the 'high line' and circulation overhangs reduce sunlight to some units*
- *Circulation is not designed through the entire scheme thus many potentially difficult areas, such as the block's corners, remain unresolved*

Figure 3.4.04
North-south section showing large 'high line' through from rooftop gardens retrofitted on existing buildings to new apartments

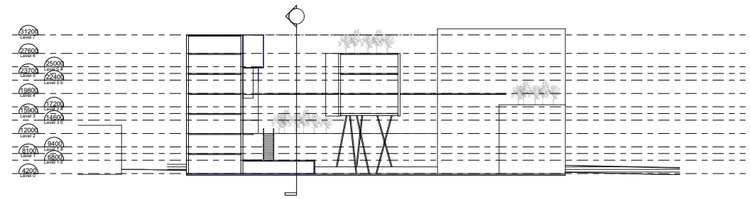
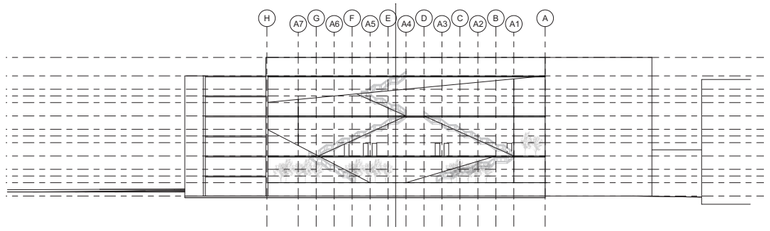
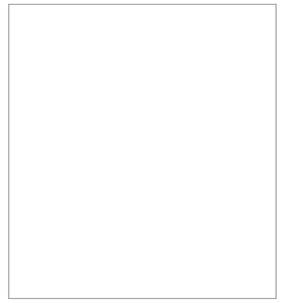
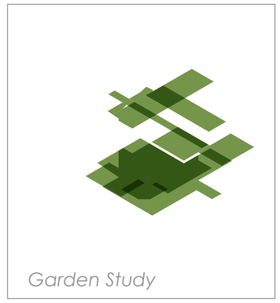


Figure 3.4.05 East-west section showing the carved out mass of the Alpha Street building







Garden Study

Axonometric

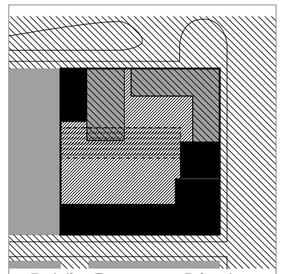
Figure 3.4.06
Axonometric

Figure 3.4.07
Garden Study

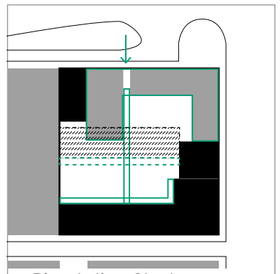
Figure 3.4.08
Circulation Study

Figure 3.4.09 Public Common Private

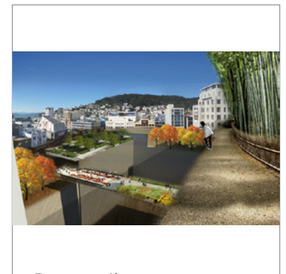
Figure 3.4.10
Perspective



Public Common Private



Circulation Study



Perspective

CHAPTER 4

Design Test Four

04

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4.0 Landscape Taxonomy

Reviewing landscapes through the lens of taxonomy aids understanding and inspires hybrid landscape solutions. Over the course of the thesis landscape images were collected, which are now ordered and categorised in relation to shared characteristics. Presented on the following pages, in order of size, are exemplary images of each landscape typology (Figure 4.0.01 - Figure 4.0.10).

As with unit typologies, where different types suit different situations, landscape types also create and suit different situations (Figure 4.0.11).

Maisonette and apartment situations suit internalised gardens such as balconies or conservatories. A terrace house suits an intermediate scale of garden which backs onto the dwelling, such as a conservatory or terrace.

A terrace has two definitions in landscape architecture:

1. *A level paved area or platform next to a building.*
2. *Stepped flat areas made on a slope, used for cultivation.*

A terrace (garden) in this thesis fits into the crossover area in these definitions, a raised paved or cultivated area next to a (terrace house) unit.

Balcony

External (open sides)
Typically private
Attached to dwelling
Borrowed landscapes, pot plants

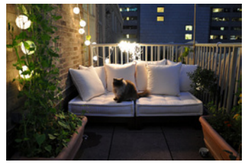
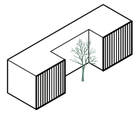


Figure 4.0.01
Balcony examples

Conservatory

Internal (glazed)
Typically private
Attached to dwelling
Planted, pot plants, borrowed landscape

Figure 4.0.02
Conservatory examples



Courtyard

External (open roof)
Typically private/common
Within dwelling
Planted

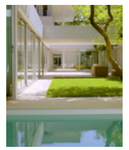
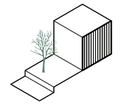


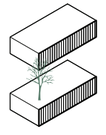
Figure 4.0.03
Courtyard examples



Terrace Garden

External (raised)
Typically private
Attached to dwelling
Planted (and paved), borrowed landscape

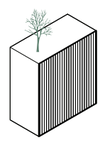
Figure 4.0.04
Terrace garden examples



Garden Void

External (within building mass)
Typically common/public
Not related to individual dwelling
Planted, borrowed landscape

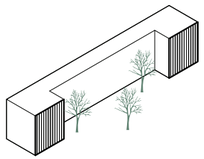
Figure 4.0.05
Garden void examples



Rooftop Garden

External (atop mass)
Often common/public
Not related to individual dwelling
Planted, pot plants, borrowed landscape

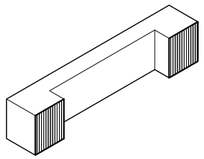
Figure 4.0.06
Rooftop garden examples



Green

External (open on all sides)
Typically common/public
Not related to individual dwelling
Planted

Figure 4.0.07
Green examples



Plaza

External (open on all sides)
Typically public
Not related to individual dwelling
Planted occasionally (paved)

Figure 4.0.08 Plaza examples

Pot plant

External/internal (portable)
Private
Not occupiable
Planted

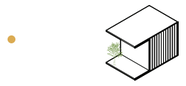
Figure 4.0.09 Pot plant example

Figure 4.0.10 Path example

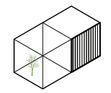
Path

External (narrow proportions)
Public, common or private
Circulation device
Borrowed landscape

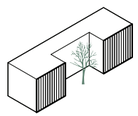
Figure 4.0.11 Typological relationship summary



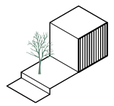
Balcony



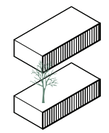
Conservatory



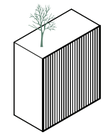
Courtyard



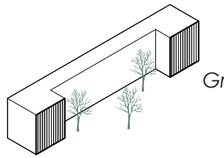
Terrace Garden



Garden Void



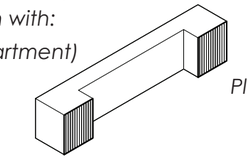
Rooftop Garden



Green

works in combination with:

- *Maisonette (or apartment)*
- *Terrace House*
- *Park House*



Plaza

Later, as every unit in the development is planned (Chapter 5), a 'park house' typology emerges which is defined as a dwelling typology with a direct relationship onto larger common and public spaces.

Landscape in all situations is what comes to define the topology of units.

A further observation is made from these landscape typology studies; the circulation method of landscapes, paths, has the potential to be applied to architecture. This would work especially well in conjunction with the terrace house typology, where a raised terrace garden could secure (the primary amenity of) privacy above a common path.

The final garden type referenced is the pot plant and planter type. Suitable for use in conjunction with any garden type as soil is provided above floor level, this typology has the potential to be used extensively in all areas of the development.

4.1 Design Test Four Review

Design Development Mediums	*Diagrammatic studies, Hand drawing, Digital modelling*
Project Date	*Month 7-8 (August-September)*
Key Drivers	• *Offering a variety of unit types linked through a 'common green network'* • *Integrating circulation with landscape as an organisational device* • *Delivering privacy, sunlight and other amenities for all units* • *Providing public access and amenity in the form of rooftop gardens and block permeability*
Programmes	*Residential, Ground floor retail, Hospitality in retrofitted historic buildings, Public plaza*

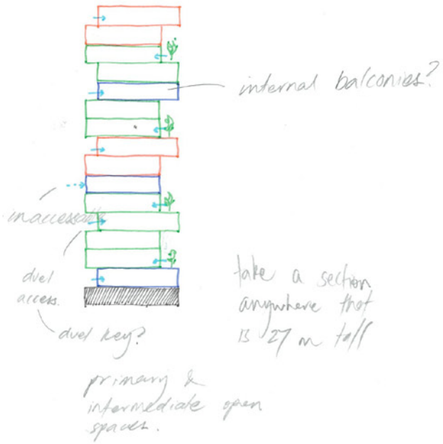
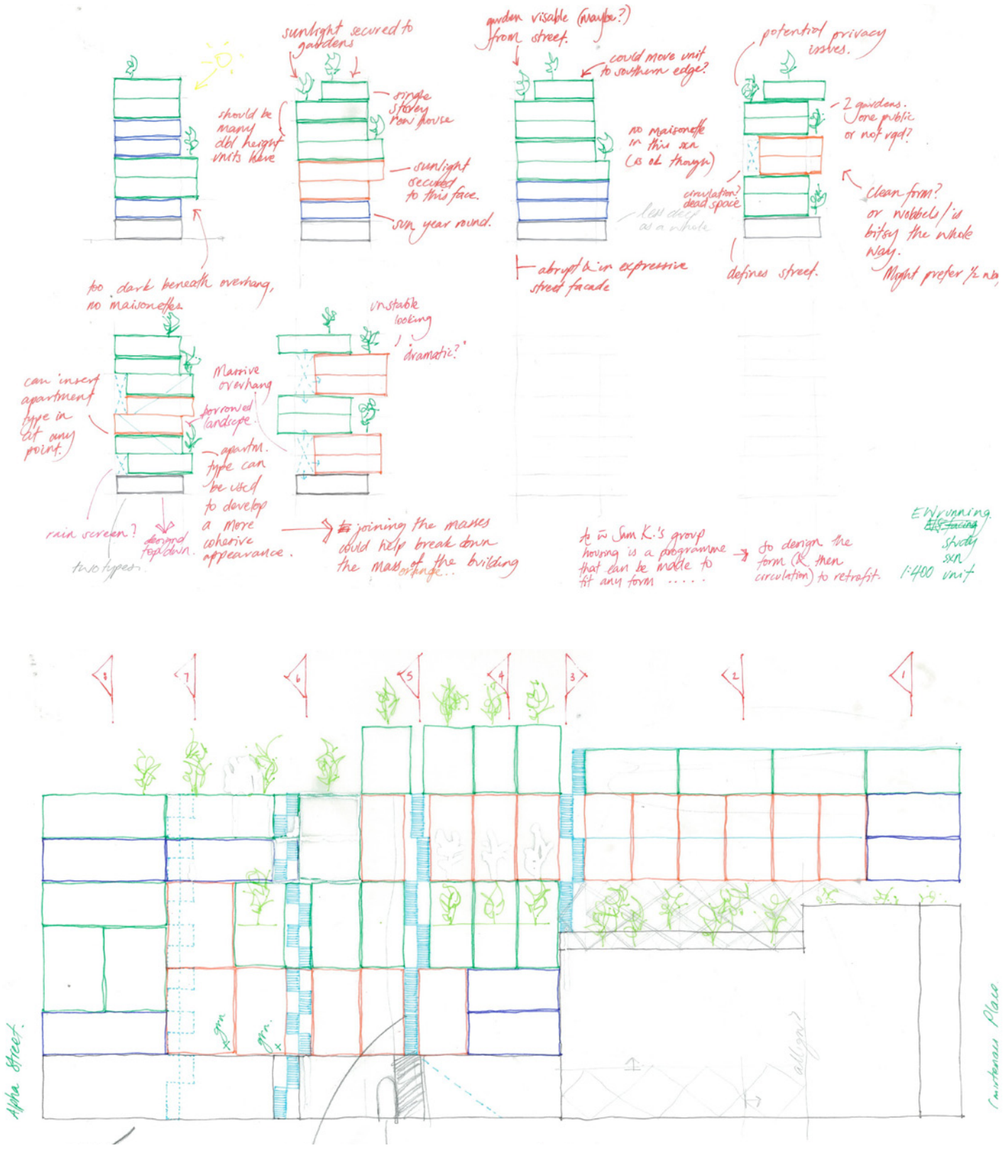


Figure 4.1.01 Unit to circulation experiment in section

Design test four aims to provide circulation via a series of external landscapes that weave through the building and then knit themselves back to the ground and into the city.

A new approach is developed, where circulation, garden and unit type are studied in unison (Figure 4.1.01). To begin some parameters are set which are



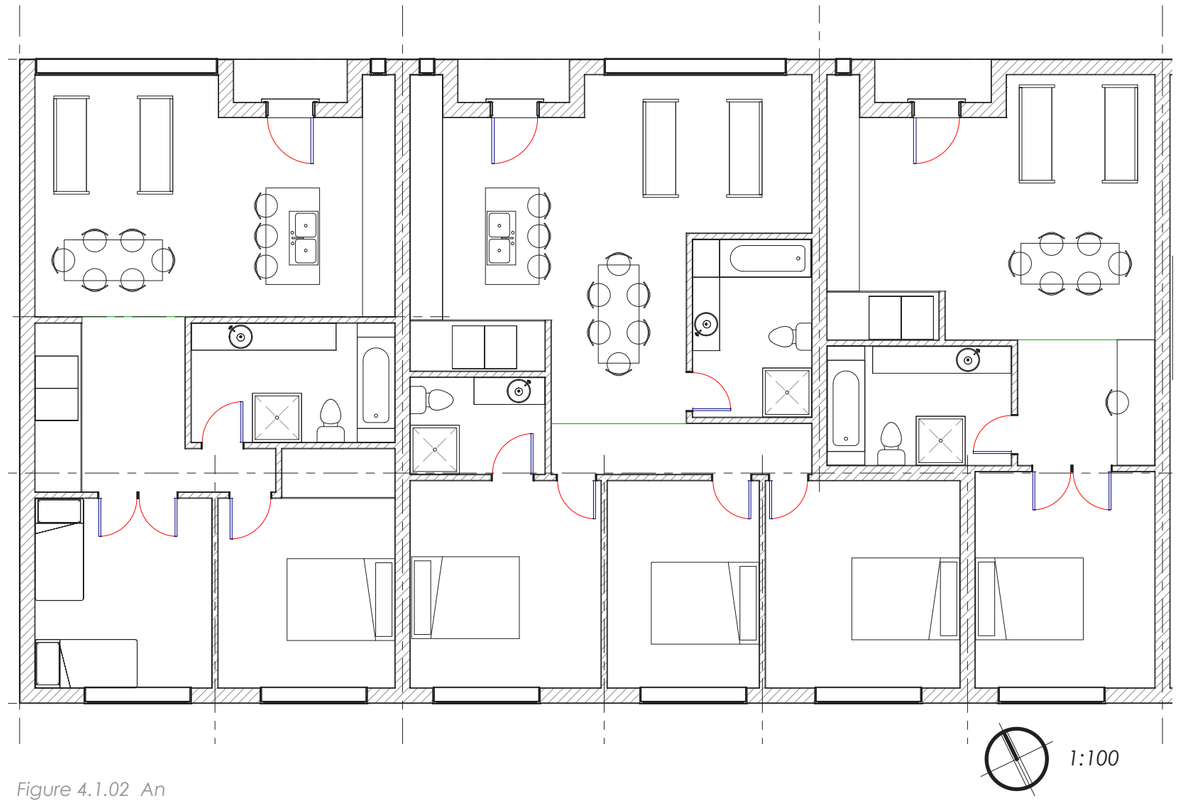


Figure 4.1.02 An example of the types of sectional, plan and 3D 1:500 diagrammatic studies undertaken to produce design test four

Figure 4.1.03 An example of the types of sectional, plan and 3D 1:200 diagrammatic studies undertaken closer to the design's resolution

Figure 4.1.04 Early unit plans testing how comfortably small a unit may be

reviewed regularly to assess their on-going relevance. Initially 50% of the units are set as terrace houses (single or double storey units with a private garden linked to the common green network [green]), 25% of the units are set as apartments (single storey garden-less units [blue]) and 25% are set as maisonettes (double height garden-less units [orange]).

Each unit type is assigned a colour and studied in plan, section and elevation to develop a 'salt and peppered' model, where units are grouped by type and dispersed throughout the volume. These studies (Appendix 4.1) quickly clarify intuitive design decisions about building footprint location. These studies also introduce asymmetric voids through the volume for vertical movement to work in combination with the horizontal 'boardwalk' paths.

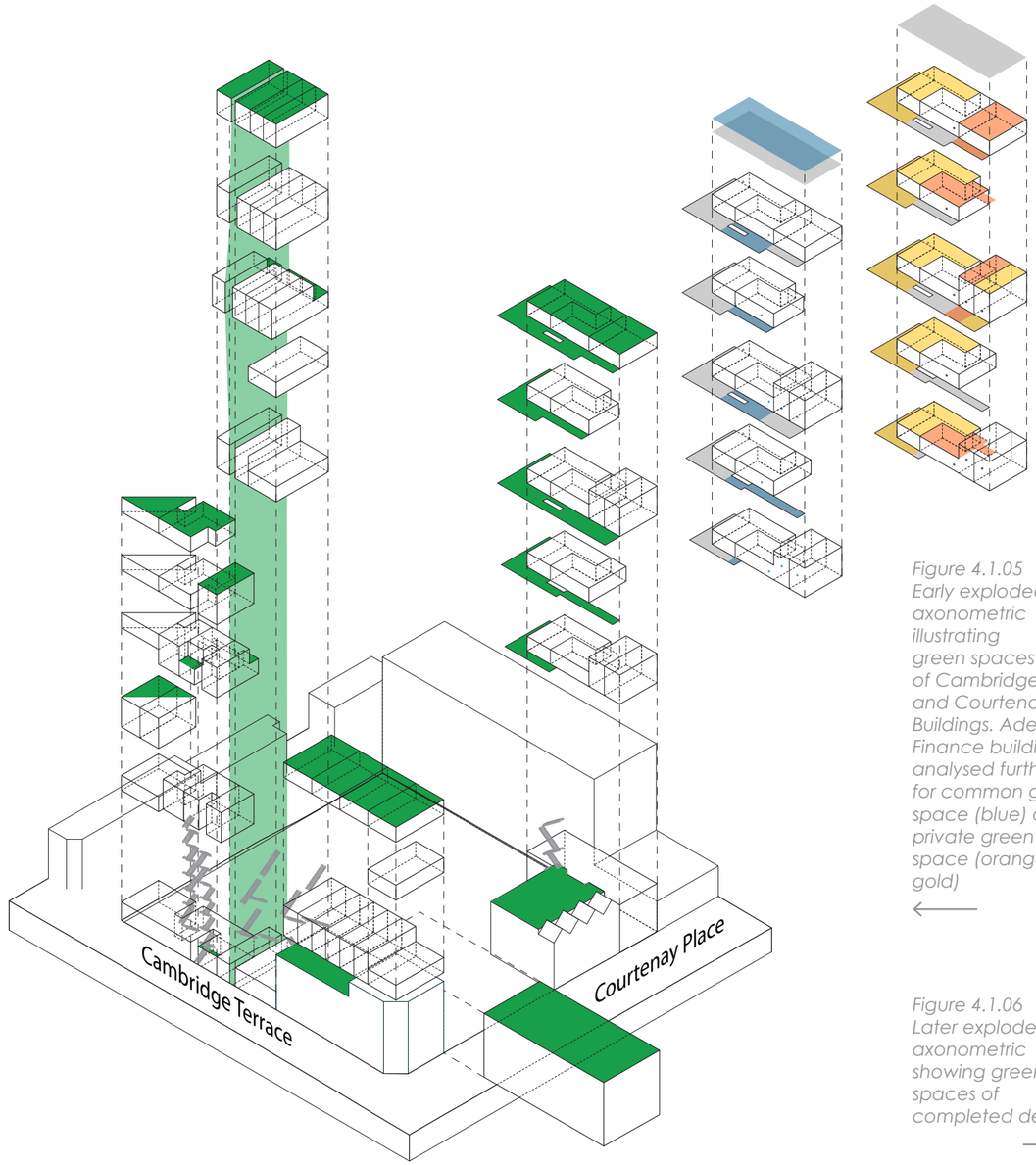
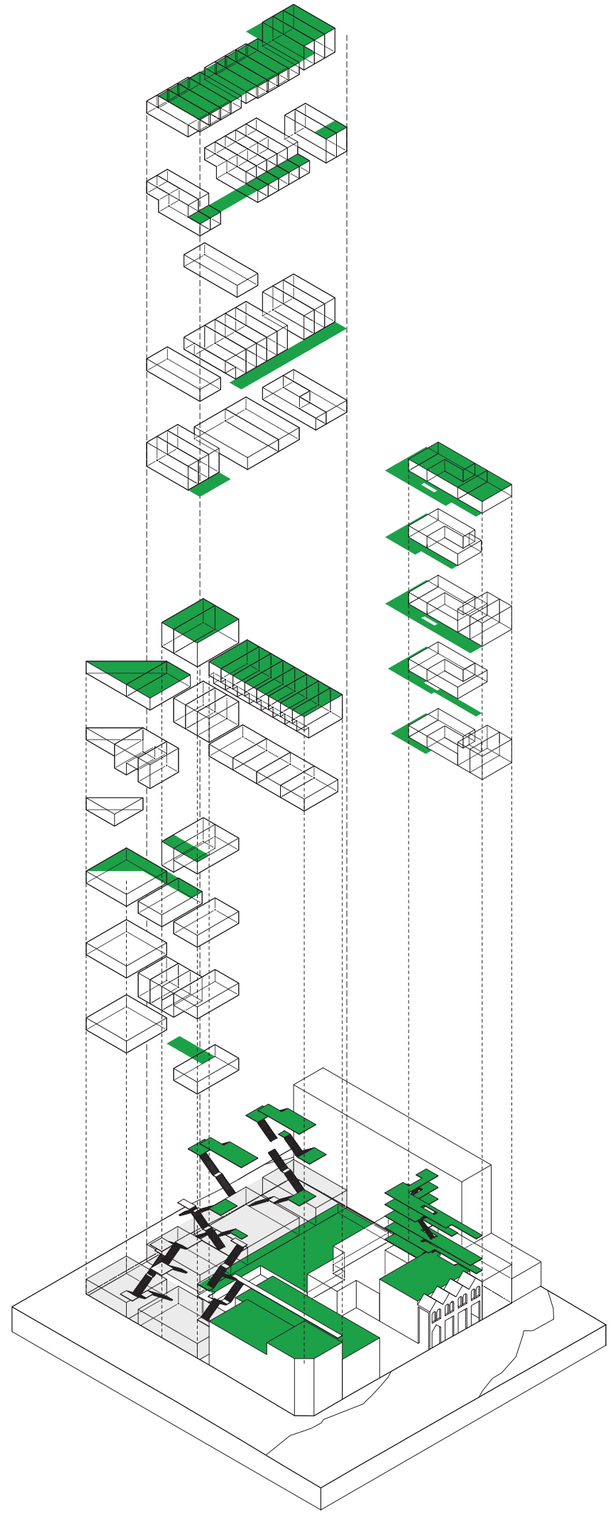


Figure 4.1.05 Early exploded axonometric illustrating green spaces of Cambridge and Courtenay Buildings. Adelphi Finance building analysed further for common green space (blue) and private green space (orange/ gold)

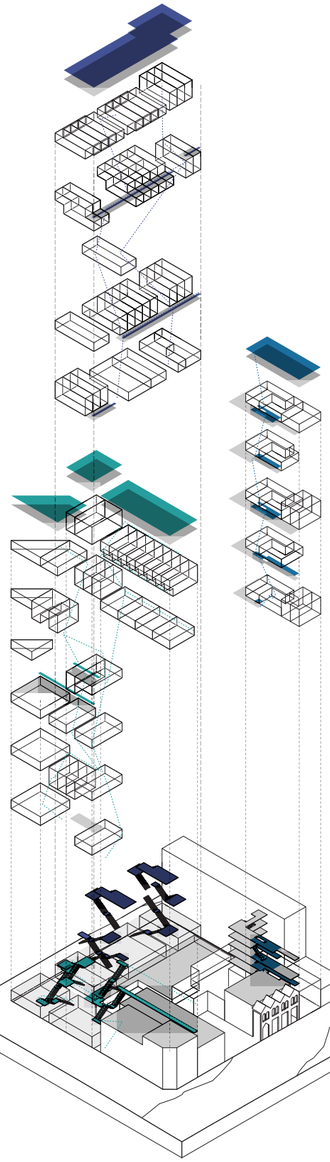
Figure 4.1.06 Later exploded axonometric showing green spaces of completed design



A further move to demolish existing buildings that do not have heritage value on the Wellington City Council register is taken. Design testing around these buildings sacrifices solar access and density. Additionally it makes the design less propositional and applicable to other locations due to its site specificity.

In this scheme the presentation and communication methods begin to develop. Renders and exploded isometrics showing garden spaces successfully communicate the complex nature of the common green network.

Despite being formed from diagrammatic studies this design test is in fact more nuanced, even in renders where unit definitions are visible. This is partly due to the sophisticated and extensive diagramming process, and partly due to its response to site conditions, especially the continued presence of selected existing buildings, creating a good-weird relationship between the two.



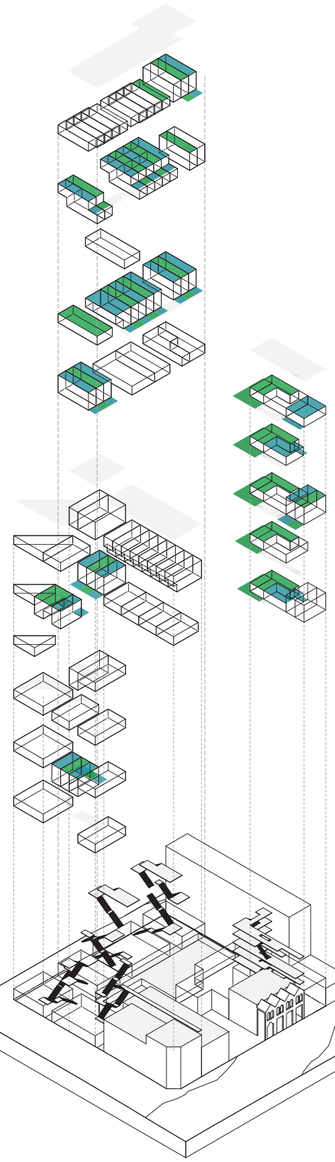


Figure 4.1.07
Later exploded axonometric showing common green spaces of completed design

Figure 4.1.08
Later exploded axonometric showing private green spaces of completed design

Figure 4.1.09 Site plan showing large public plaza and building footprint

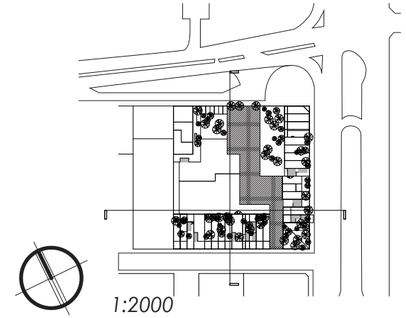


Figure 4.1.10
Rendered axonometric showing site massing assembled

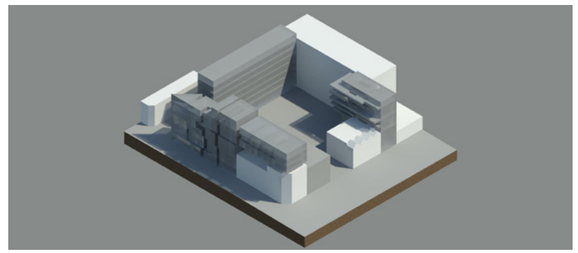


Figure 4.1.11
Screen shot of circulation design process

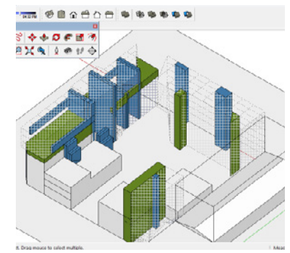
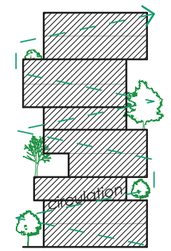


Figure 4.1.12
Internal draft render massing scale of gardens and circulation

Figure 4.1.13 Parti diagram

Figure 4.1.14 Perspective draft render from Cambridge Terrace testing icon potential from a key view



Parti Diagram

Perspective

Scheme Typology	Infill partially open perimeter block	
Circulation Type	External - woven through scheme with vertical and horizontal circulation paths planted	
Dwelling Typologies	Terrace houses, Apartments, Maisonettes	
Garden Typologies	Public plaza, Common courtyard areas, Horizontal circulation gardens, Vertical circulation gardens, Private attached gardens, Rooftop garden	
Amenities	✓ Garden	✓ Variety of Unit Types
	✓ Sunlight	✓ Visual Aspect
	✓ Privacy	✓ Natural Light
Adaptability	None	
Kebbell Classification	Good-weird	

Points of Innovation

- *Design process is well documented providing a clear record of design decisions*
- *Design test responds directly to, and offers a solution for, all three prioritised aspects, amongst other amenity provisions*
- *Entire external circulation network is planted and landscaped in various ways to create different relationships and spaces for differing uses*
- *Morphology for circulation paths is developed. Carved and woven voids, that are light and planted, provide vertical and horizontal circulation*
- *Vertical garden voids are visible from inside and outside the development. These create a strong, distinctive image for the building with much potential icon value*
- *'Salt and peppering' of different unit types throughout the development helps create diversity in the community as well as the built form*
- *The design research process is comprehensive, using iterations of hand drawn explorations in plan, section and axonometric to develop a sophisticated approach to a common garden network*
- *Design test begins to take on preferred proportions and form*

Points of Limitation

- *Solution does not respond to all 29 previously identified design criteria from CHRANZ, nor the six additional parameters, in particular those solved at a unit plan level*
- *Design is too site specific because it is built around existing buildings limiting the model's possible applications to alternative situations*
- *Fenestrations and other elements required for dwelling, that have a dramatic effect on a building's appearance, are not studied*
- *Ground floor requires development so as not to detract from the ideas of this housing study.*

Figure 4.1.15 North-South section through plaza illustrating selected apartment stacking technique →

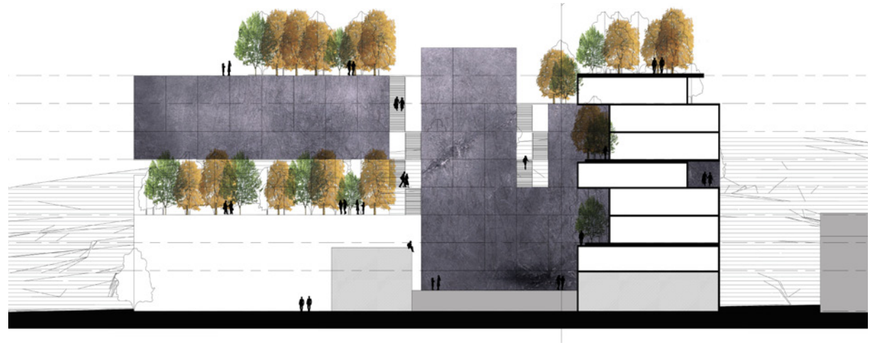
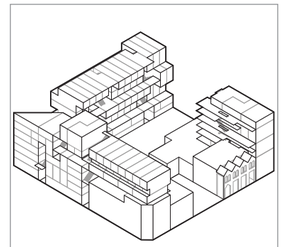


Figure 4.1.16 Rendered axonometric →

Garden Study



Axonometric

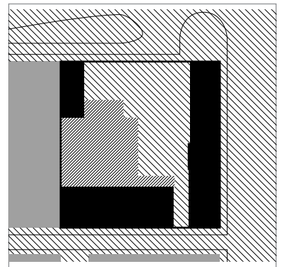
Figure 4.1.17 Axonometric

Figure 4.1.18 Garden Study

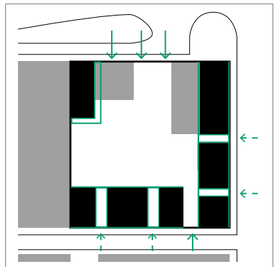
Figure 4.1.19 Circulation Study

Figure 4.1.20 Public Common Private

Figure 4.1.21 Perspective



Public Common Private



Circulation Study

Perspective

public common private outside

primary access secondary access bisected access

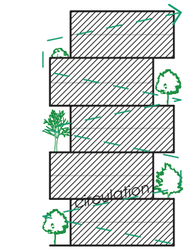
Part 3

FINAL DESIGN TEST PRESENTATION

CHAPTER 5

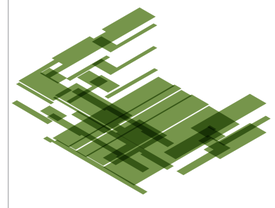
Design Test Five

5.0 Design Test Five Review

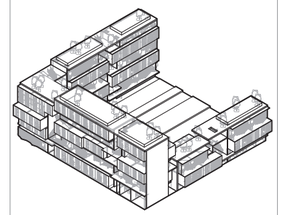


Parti Diagram

Perspective



Garden Study



Axonometric

Design Development Mediums	*1:500 and 1:200 studies, Hand drawing, Digital modelling*
Project Date	*Month 8-9 (September-October)*
Key Drivers	• *Flexibility for evolving family situations and household makeups* • *Creating a plausible scheme that responds to all design criteria including CHRANZ amenities, six additional amenities, site requirements and density*
Programmes	*Residential, Ground floor retail, Public courtyard and raised garden, Ground floor crèche*

259+ DW/HA

Figure 5.0.01 Parti diagram

Figure 5.0.02 Perspective from circulation void

Points of Innovation	• *Solution responds to 28/29 CHRANZ design criteria* • *Solves for the six additional design parameters, the targeted 250DW/HA density and site requirements such as height restrictions* • *Scheme also provides missing public and common amenities identified during site selection (crèche and public green - Chapter 0.3, Figure 5.4.05)* • *Flexible structure developed using a mega-structure that allows two to three apartments to be arranged within a larger frame* • *'Sliding' architectonic developed to refine the appearance of the design* • *'Park house' typology discovered - defined by direct access onto larger common areas such as those beside the vertical circulation shaft or tiered roof garden* • *High percentage of terrace houses totalling 77/134 (57% - highest of all design tests)* • *Propositional design created by removing all existing buildings, thus site specificity does not complicate lessons so they can easily be transferred as a model to different sites and conditions*
Points of Limitation	• *See 'Further Research Directions' (page 201)*

Scheme Typology	*Perimeter block*
Circulation Type	*External - woven through scheme with vertical and horizontal circulation paths planted*
Dwelling Typologies	*Terrace houses, Verte maisonettes, Park houses*
Garden Typologies	*Public courtyard, Horizontal circulation gardens, Vertical circulation crevasse gardens, Private attached terrace gardens, Rooftop gardens, Herbaceous screens, Loggias, Balconies*
Amenities	✓ *Garden* ✓ *Variety of Unit Types* ✓ *Sunlight* ✓ *Visual Aspect* ✓ *Privacy* ✓ *Icon Value*
Adaptability	*Double bay and double height structural system allows for a variety of internal unit arrangements that can be retrofitted as family situations change*
Kebbell Classification	*Good-weird*

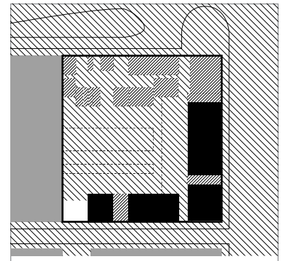
Figure 5.0.03 Garden Study

Figure 5.0.04 Axonometric

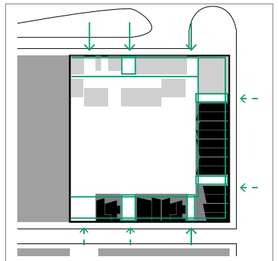
Figure 5.0.05 Public Private Common

Figure 5.0.06 Public Circulation Study

Figure 5.0.07 Perspective

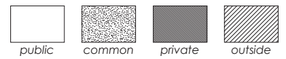


Public Common Private



Circulation Study

Perspective



5.1 Final Design Presentation

Design test five is the conclusion of a design-led research process that combines knowledge gained in early experiments into a cohesive scheme. This scheme contributes to the architecture profession new and propositional thoughts on housing. With the combination of many design drivers a new typology of higher density housing is created, in which vertical and other garden types combine, bringing a verdant living option to inner city Wellington.

This scheme had an earlier iteration with similar ideas, massing and structure, designed with a 'stacking' architectonic. However this 'stacked' design had a visual heaviness to it which led to the development of a preferred 'slid' architectural language (Figure 5.1.01).

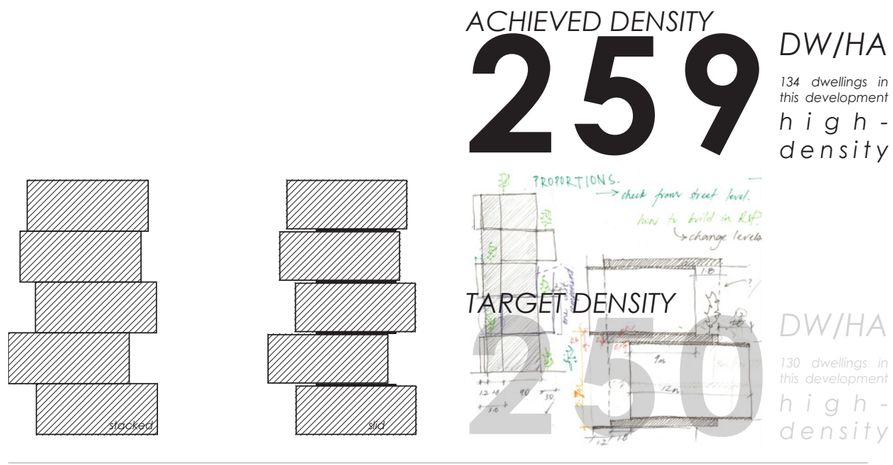
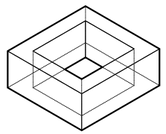
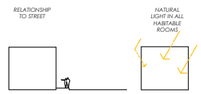


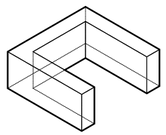
Figure 5.1.01
Stacked vs sliding architectonic



Perimeter Block Typology Built to Maximum Height

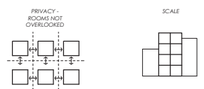
- *double aspect rule established for sunlight and daylight*
- *reaction to street condition*

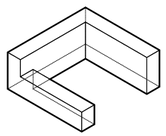




Privacy Addressed in Reaction to Future Developments

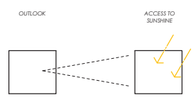
- *future proofs double aspect rule*
- *reaction to external condition*

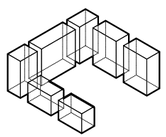




Northern Edge Lowered

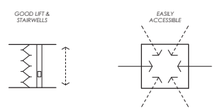
- *ensures sunlight to central common area*
- *ensures sunlight to all apartments for at least three hours each day*
- *allows views out of the development to the sea*

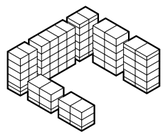




Access and Block Permeability for Vertical Circulation

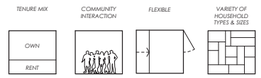
- *access from the street at crucial points to break mass into identifiable sub blocks*

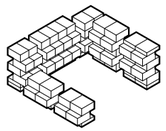




Salt and Peppering of Unit Types

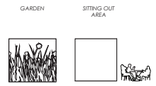
- *offers a diversity of housing types from terrace houses with attached private gardens, to maisonnettes and apartments with no private garden*
- *develop a flexible double storey structure*

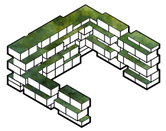




Slide Out Areas for Gardens and Horizontal Circulation

- *north orientated blocks terrace:maisonette 1:1; east/west orientated terrace:maisonette 9:1*





Landscape

- *shuffle massing and apartment layout within circulation spaces to give the development an overall cohesive look from the outside*

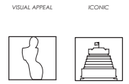


Figure 5.1.02 Concise summary of design moves (not chronologically accurate)

Figure 5.1.03 Parti diagram (Plan) Linking landscapes

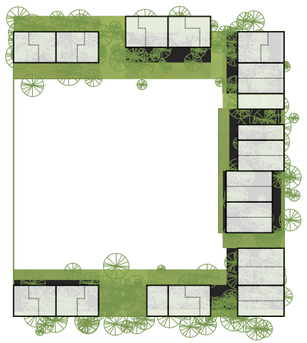
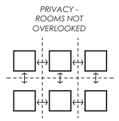


Figure 5.1.04 Parti diagram (Plan) Privacy showing orientation and distance



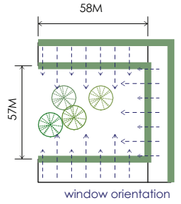
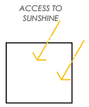
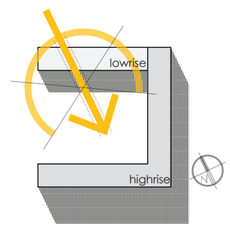


Figure 5.1.05 Parti diagram (Plan Solar access showing typical midday shadow





Site Plan

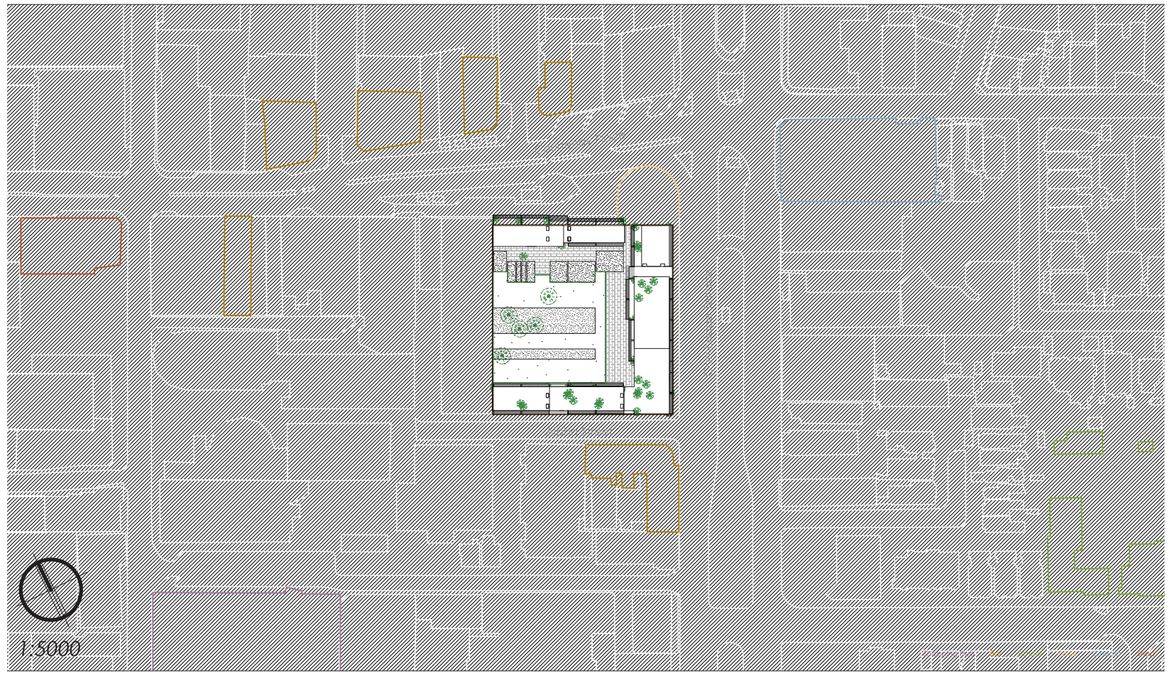
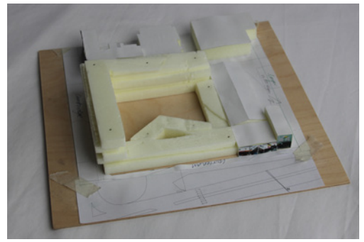
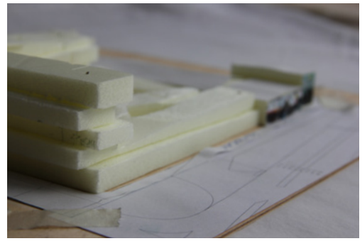


Figure 5.1.06 Site plan with exceptional local amenities highlighted





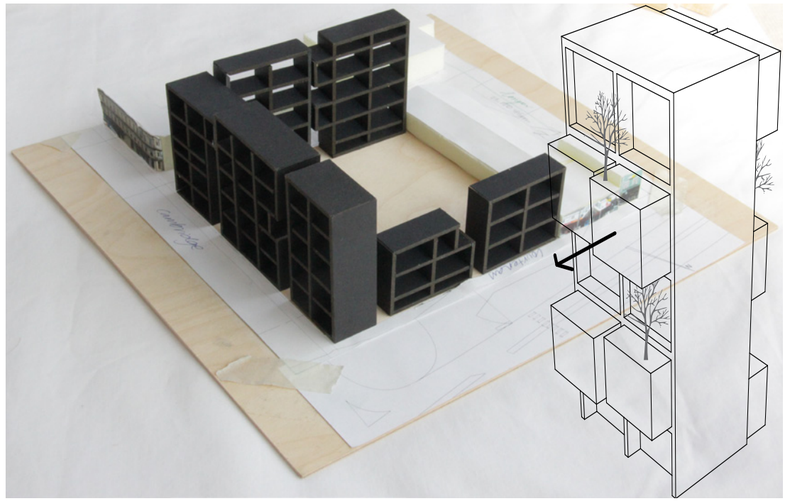


Figure 5.1.07 Initial stacking model with central courtyard break down

Figure 5.1.08 Stacking detail

Figure 5.1.09 Framework for sliding model with increased flexibility

The site is master-planned similarly to previous design iterations, integrating with and activating the public realm in the following ways:

- *A public courtyard and plaza is made via the 'sliding out' masses along Courtenay Place (Figure 5.1.09)*
- *Level one includes a raised public garden along Courtenay Place, with double storey landscape features (primarily trees) extending from ground level*
- *Retail and office spaces on portions of the ground and first floor further invite the public to the site*
- *Access to the central public park is designed to be inviting (yet bottlenecks at some entries discourage public thoroughfare through the entire site)*

5.2 Linking Landscapes

'Linking landscapes' illustrates the common green network concept's articulation, demonstrating how landscape infrastructure ties the scheme together physically and conceptually. Within the network various landscape typologies exist (Chapter 5.3), including unusually shaped vertical garden voids derived from early forays into salt and peppering unit types, and roof greens which are formalised as part of the circulation routes. These increase the permeability of the network and facilitate access for residents to large common outdoor areas suitable for families to 'break-out' in as well as creating a verdant iconic feature.

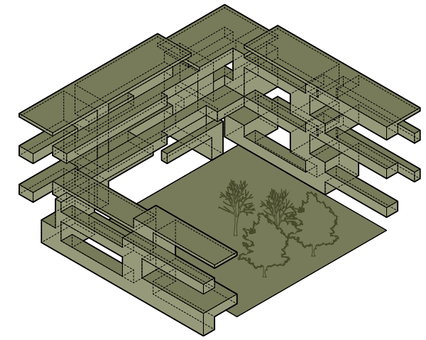


Figure 5.2.01 Built volume with only circulation routes highlighted

"This creates a collective domain shared by all the individual users, where they run into one another and, if they wish, spend time together. The design of the access creates conditions that invite people, to a greater or lesser degree, to use it as a space for collective habitation." Fernández Per, A., Mozas, J., & Ollero, A. S. 171

Note for digital readers: page designed for print. Fold out page section for all large format exploded diagrams

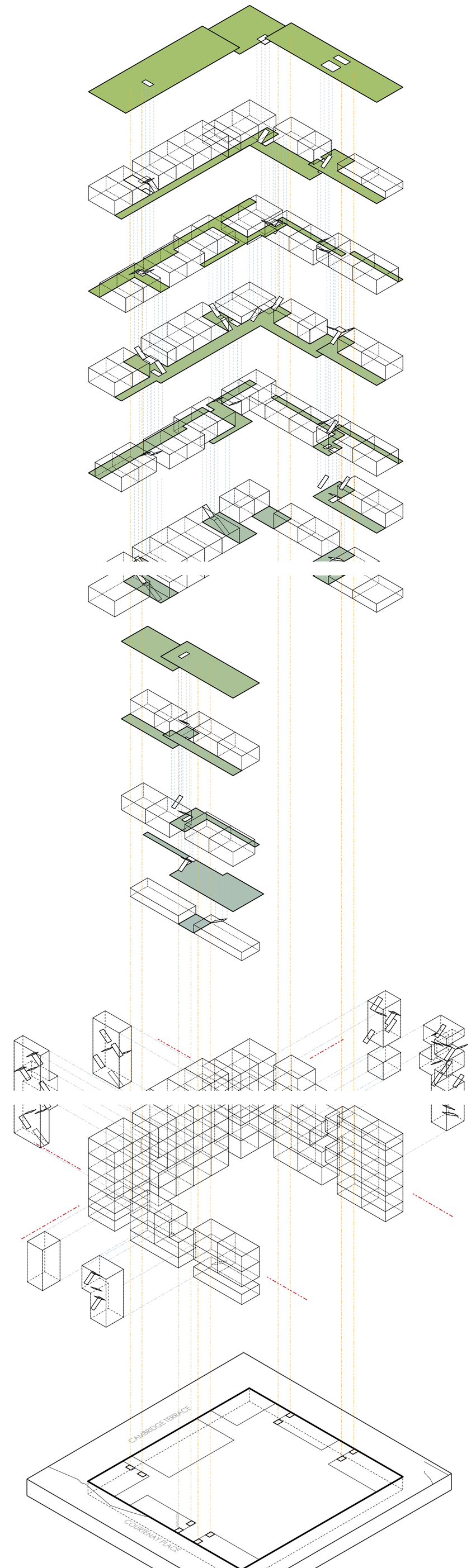


Figure 5.2.02 'Linking Landscapes' exploded isometric showing the building assembled with drawn out vertical zones, and then exploded upwards with highlighted horizontal circulation elements functioning as the primary organisational mechanism

Figure 5.2.03 North South Section 1:500 Large common circulation areas, both vertical and horizontal, highlighted

Figure 5.2.04 East West Section 1:500 Large common circulation areas, both vertical and horizontal, highlighted

5.3 Landscape Typologies

Knitted through this development are six primary landscape typologies located in relation to different parts of the built form.

1. Public Green

Located at street level this green is gifted to the public as a city amenity in a generous response to site selection observations in which a 'green' was identified as absent in this area of Wellington (Chapter 0.3).

Accessed from the public plaza, Courtenay Place and Cambridge Terrace/Alpha Street corner (and common vertical circulation gardens), the space is large and landscaped with large trees and level changes. This produces intimate moments that have the potential for temporary division if desired.

2. Vertical Garden

Vertical gardens are the planted short moments of narrower stair spaces between pocket yards (Figure 5.3.02). With climbing plants forming vertical garden walls these narrow circulation spaces contrast in sequence with the large pocket yards they connect.

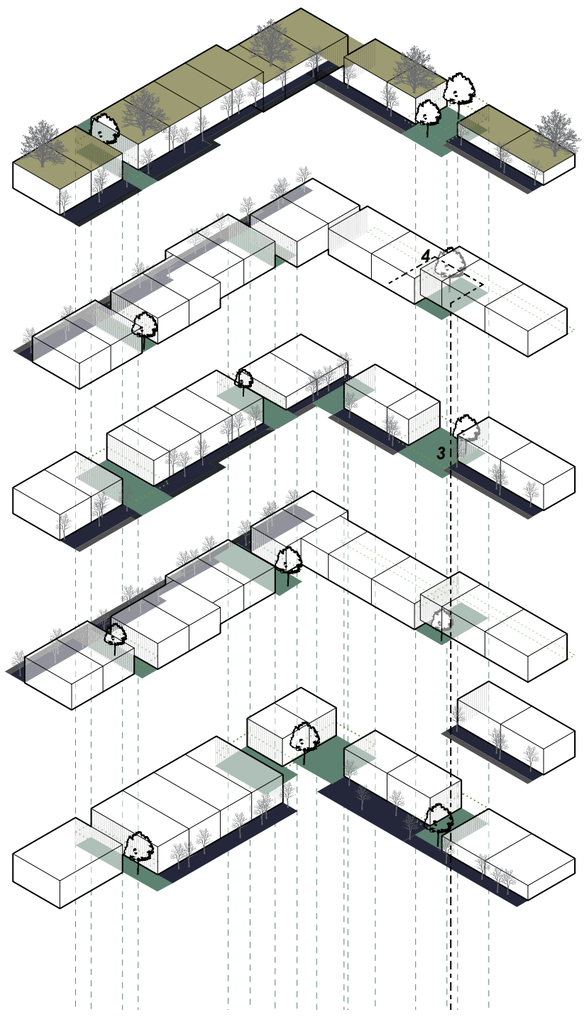


Figure 5.3.01 'Landscape Typologies' exploded isometric showing the defining ownership and location parameters

Figure 5.3.02 Landscape terminology diagram

3. Pocket Yard

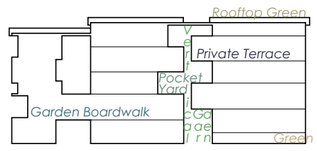
Pocket yards are larger double storey spaces that occur within the vertical circulation voids. Functioning as planted landings these spaces can be used for neighbourhood type activities: trampolines and tree climbing, a place for making daisy chains or hosting a child's birthday party.

4. Boardwalk

Double height boardwalks connect between vertical circulation voids to provide access to all units via 1.2m wide paths which weave around and through the building mass. The boardwalks use borrowed landscape ideas, where background landscape is incorporated into the composition of a garden. Particularly borrowed landscape references are made to the public green, Mount Victoria or Port Nicholson depending on which side of which block it is positioned. In each scenario the boardwalk also relates to the level it is attached to, sitting 400mm below the adjacent private planted terrace gardens (to ensure privacy) and 'borrowing' their landscape also. In the situation where the boardwalk is located on the southern side of the building it is louvred off to protect residents from the prevailing southerly winds but allow light in to facilitate the growth of shade-loving plants.

5. Private Terrace

Private terraces occur as part of the terrace house typology on the building's northern, eastern and western façades. Here, under the supervision of the family, lawn, shrubs and trees of up to 6.5m can grow. This gives the opportunity for kitchen herb gardens, strawberry plants, Monarch butterflies on Swan Plants and deciduous trees giving shelter from the summer sun. A variety of garden sub-typologies were developed for use in these areas and are applied in terrace house unit types (Chapter 4.0, 5.4)



6. *Rooftop Green*

The common rooftop green brings further permeability to the scheme's circulation network. It offers a large breakout space for children to run around, learn to ride a bike on, or walk the dog in a secure environment. Landscaped to appear 'light' from the street, the bulk of the infrastructure required to grow trees and planting is set back from the edge over different levels. The shifting of massing is used to create sub-spaces, further defined by vegetative screens, to offer exciting and diverse rooftop landscapes.

Figure 5.3.03 Collage render of pocket yards and common roof garden

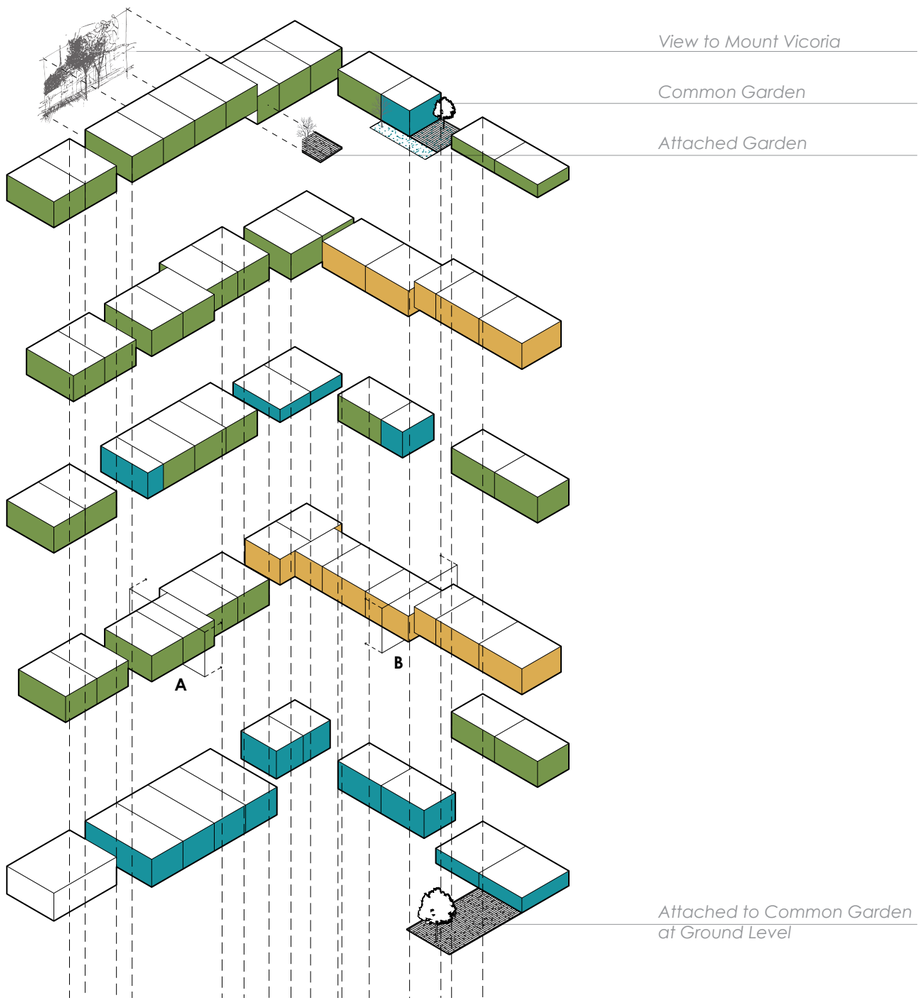
5.4 Unit Typologies

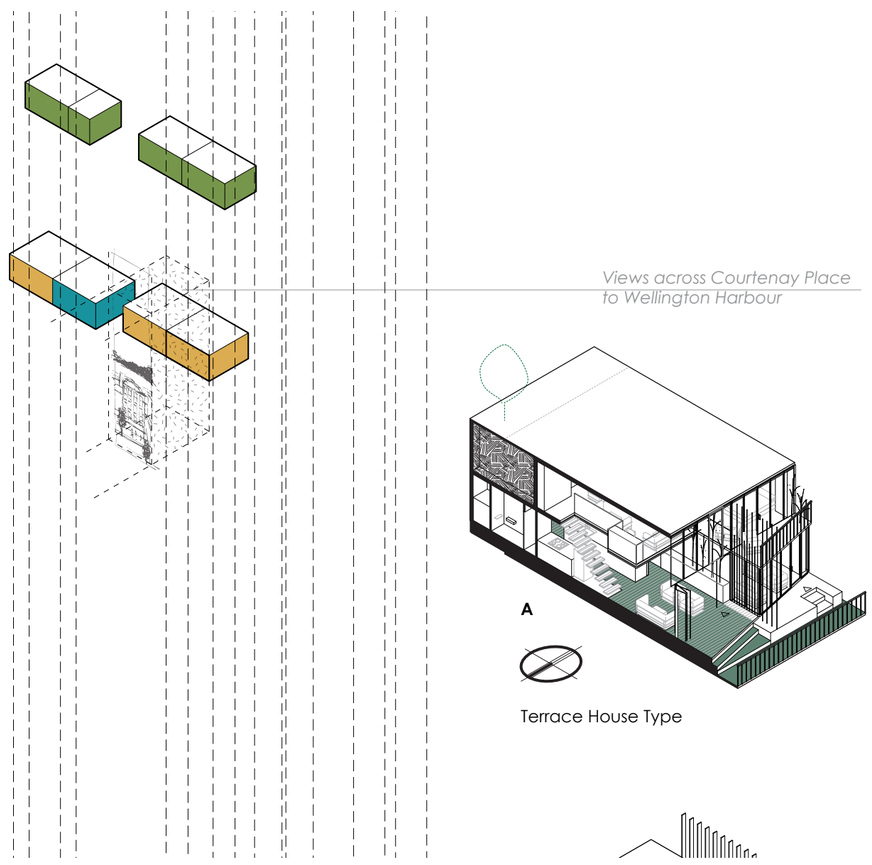
In an effort to emulate suburban housing's desirable trait of adaptability, a framework for flexibility is developed in this design iteration. Using a 'mega-structure', where every second storey is structural with up to three units fitting along a bay, the volume is freed up for division in multiple ways. In providing a range of unit types and sizes, a variety of unit prices exist and a diverse community has the opportunity to develop.

A new system of ownership is devised to optimise the flexibility. In this instance it is expected that one party would purchase a whole structural bay that is capable of division into one, two or three units. These units are then designed by a project architect to this owner's wishes. This allows the owner to dwell in a primary unit and rent the remaining unit(s). The unit can then be adapted to be dual key as family or living situations change. Also, as the infill is non-structural, the unit can be entirely rebuilt to suit a new situation.

Allowing for a high proportion of owners and long term tenants in a development aids in establishing a core 'community', bringing the network a positive quality of suburban life (CHRANZ, p. 61).

Designing for flexibility requires a return to the initial design assumptions, where terrace houses, maisonettes and apartments are used to develop the proposition. The double height structure facilitates the first two typologies easily, yet the apartment type (single storey), is more difficult to design for. While not





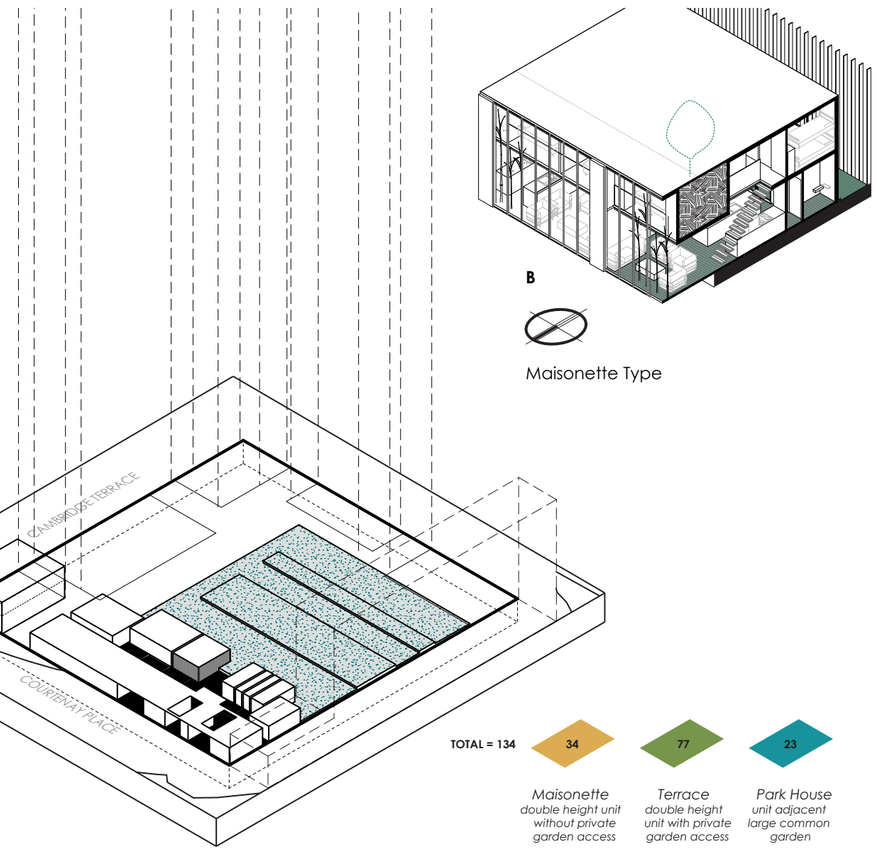
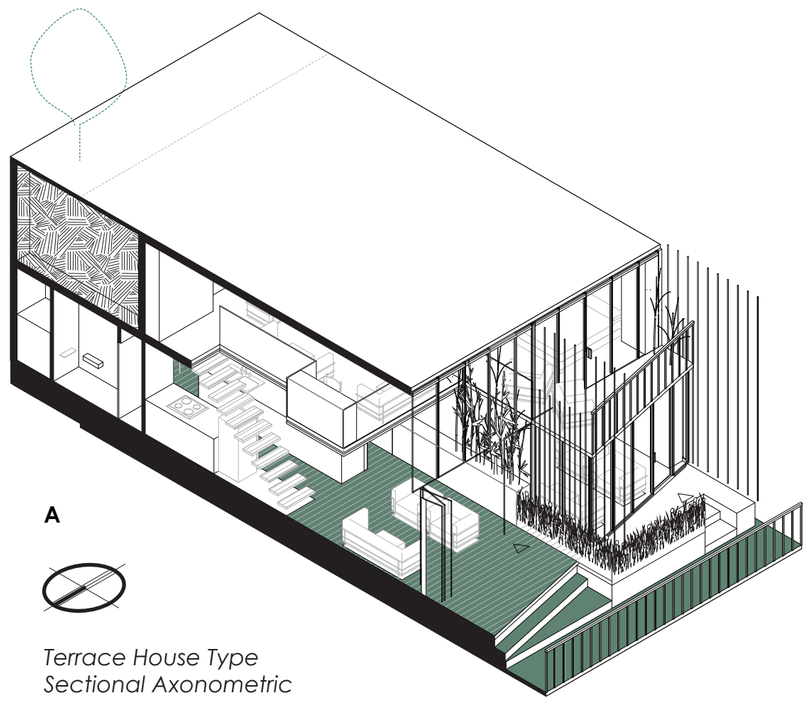


Figure 5.4.01 'Unit Typologies' exploded isometric showing each unit's type of relationship to landscape

Figure 5.4.02 Sectional isometric insets highlighting level changes and green connections into units

Figure 5.4.03 Sectional isometric terrace house detail



Terrace House Type Sectional Axonometric

impossible to incorporate, stacked atop each other in a structural bay, apartments are removed as a form driver because they undermine the flexibility of the system and circulation which occurs every second level on alternating sides.

Upon reassessment a third typology becomes apparent: the park house. As with the other typologies, park houses are defined in terms of their relationship to garden and are specifically located adjacent, with direct access onto, the common garden spaces. They appear, as the other units do, to be salt and peppered throughout the development offering further diversity (Figure 5.4.01).

Examples are shown on the following pages of each of the unit types, interlocked in different ways to suit a range of family situations.

LEVEL 0 1:500

Figure 5.4.05
Ground floor plan illustrating primary public and residential access points as well as green and crèche locations 1:500

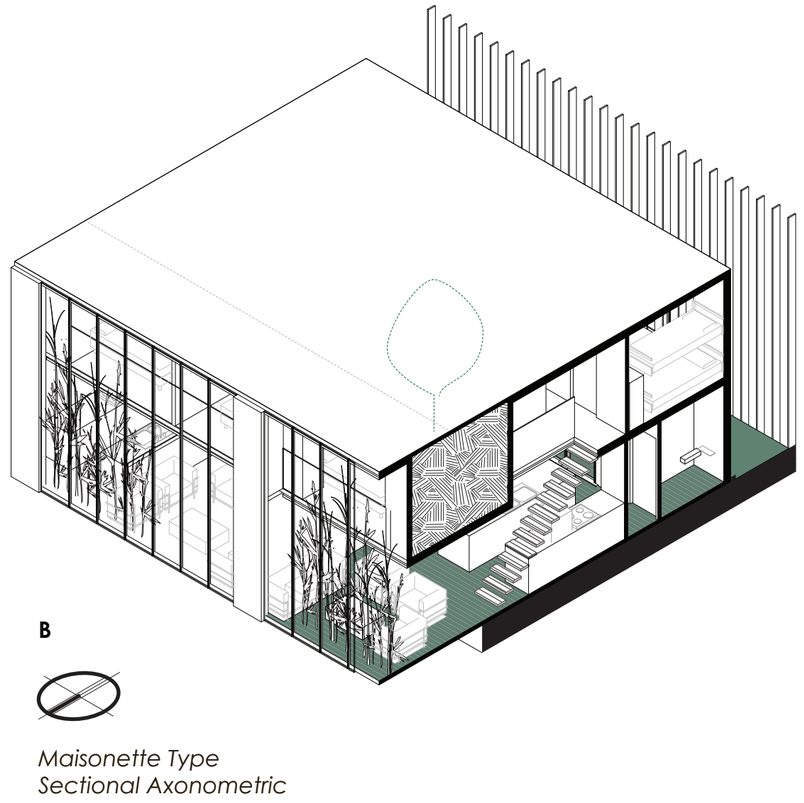


Figure 5.4.04
Sectional isometric maisonette detail

Maisonette Type
Sectional Axonometric

Figure 5.4.06
Typical east-west and north-south section demonstrating unit typology arrangement

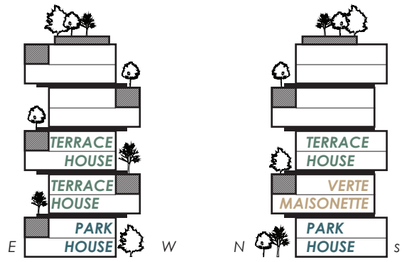


Figure 5.4.07
East-west and north-south section through deep soil planters

Due to the offset section of the east/ west orientated units, a deep soil planter is imbedded in their upper storey to service as the garden for the unit above. In blocks with north-south orientated units, deep soil planters are only required in the maisonette type apartments offset toward the northern edge to service the alternate level terrace houses (Figure 5.4.07). These planters give the units an unusual void relationship to the landscape.

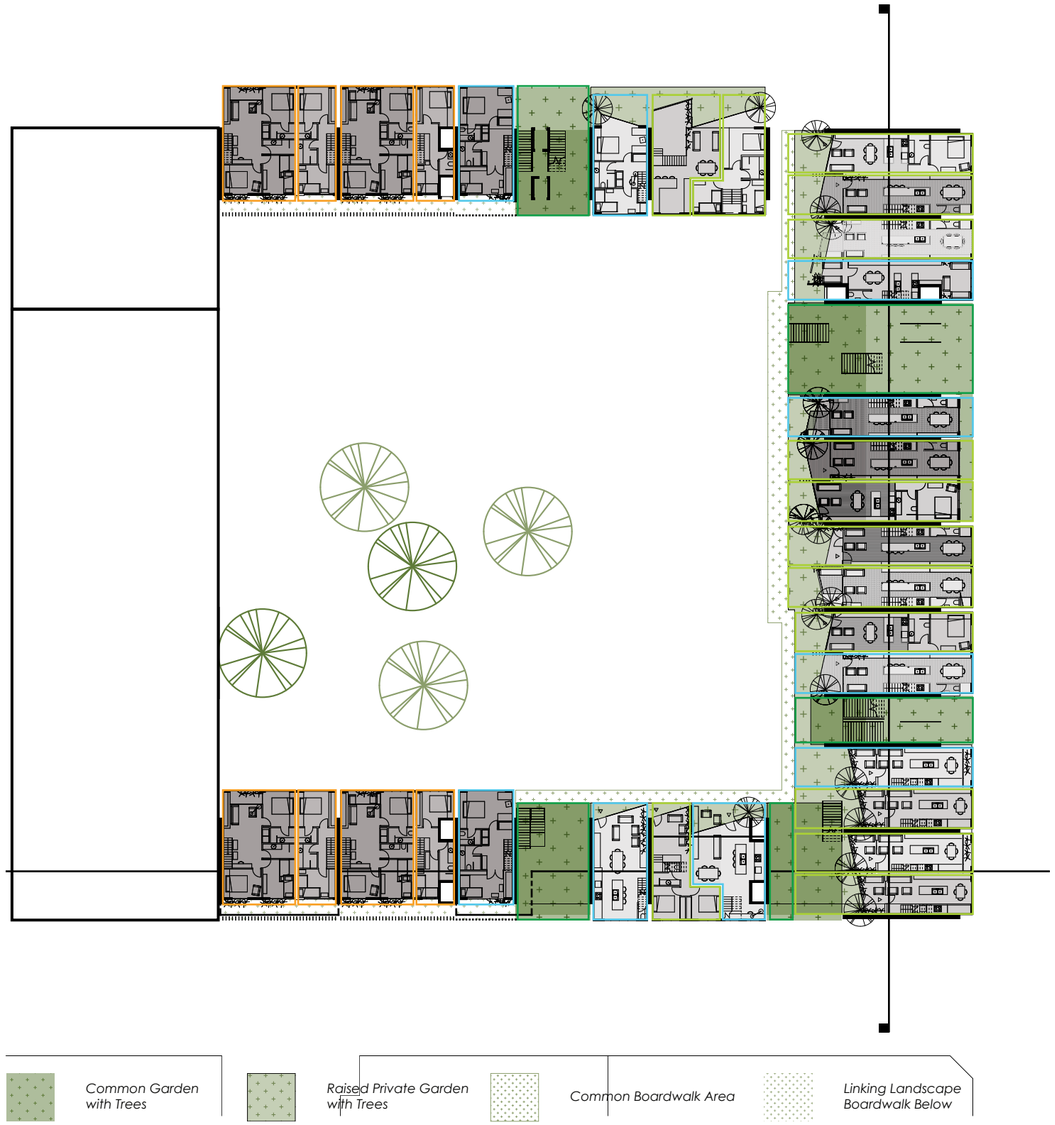


Figure 5.4.08 Typical Lower Type Level (level 04 showing linking landscape and salt and peppering of unit types) 1:500

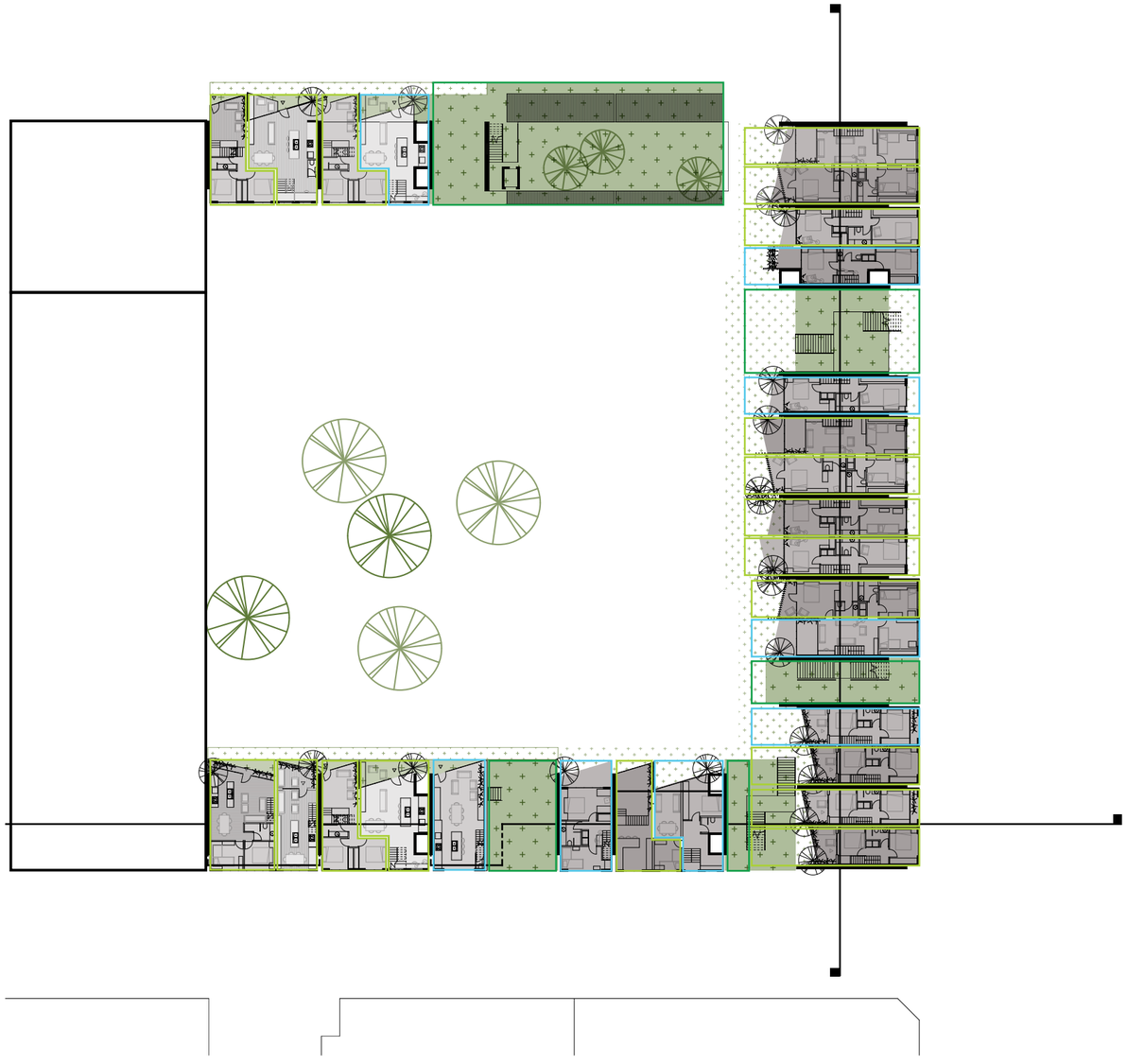


Figure 5.4.09 Typical Upper Type Level (level 05 showing linking landscape and salt and peppering of unit types) 1:500

Because each of these bays can be divided into a different number of units the dwellings per hectare of this design is calculated under the assumption that there will be an average of two dwellings per structural bay, giving a total of 259 DW/HA. However, this could easily be lower or higher, ranging from a minimum of 130 DW/HA to a maximum of 388 DW/HA.

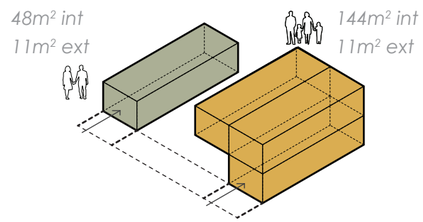
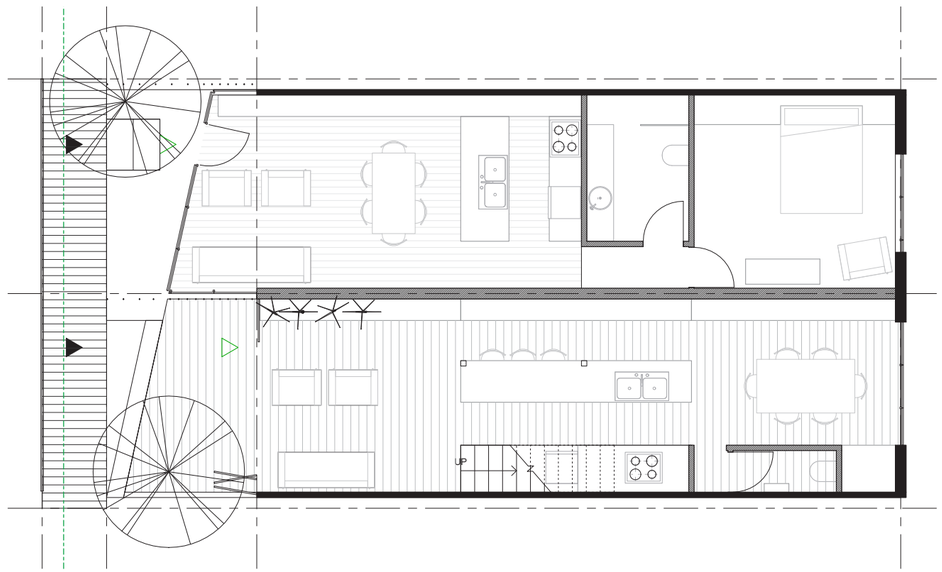


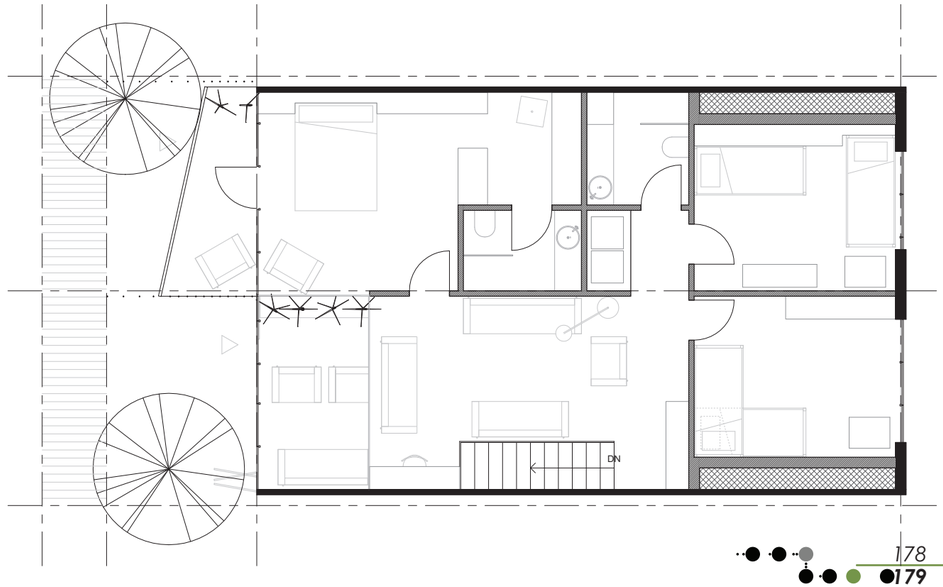
Figure 5.4.12 Isometric structural bay breakdown

Figure 5.4.10 Level A



Example of East West orientated terrace house. One unit a studio for a couple with a winter garden. One unit for a family with a deck type garden area and an upper level balcony garden with double height planting between levels

Figure 5.4.11 Level B



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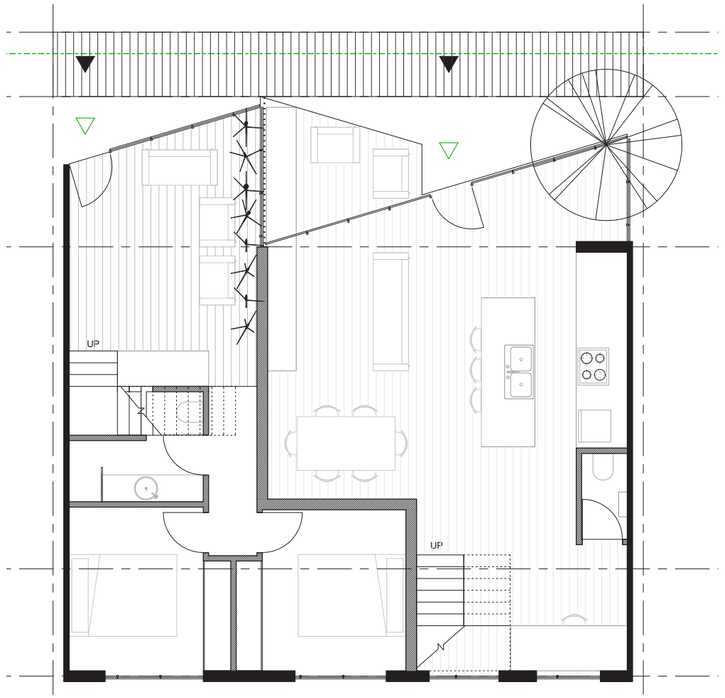


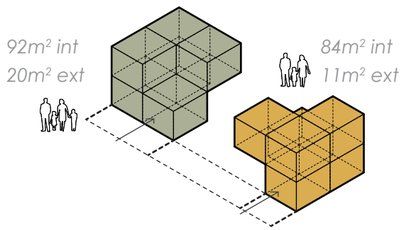
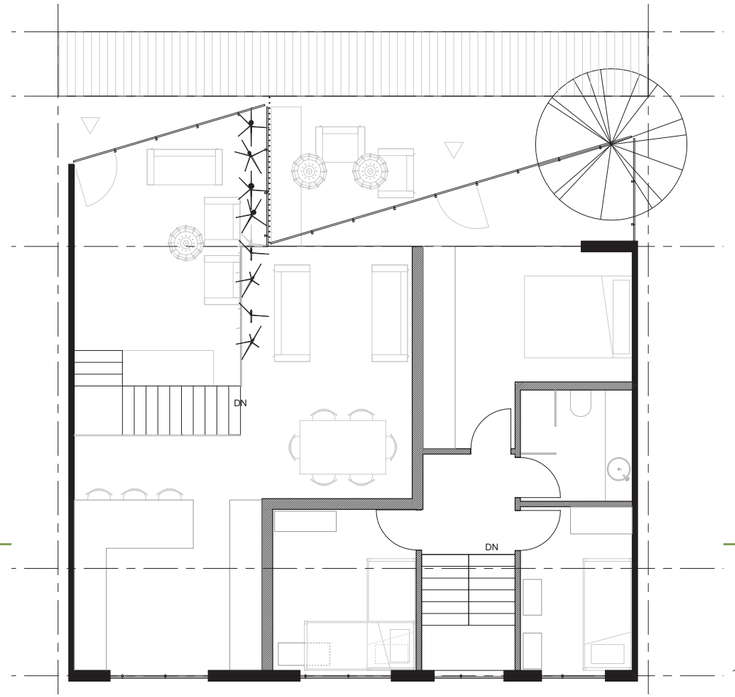


Figure 5.4.13
Isometric structural bay breakdown

Figure 5.4.14 Level A



Example of North South orientated terrace house. One unit suitable for a young family. One unit suitable for a larger family. Both incorporating garden within their interlocking forms

Figure 5.4.15 Level B

1:100

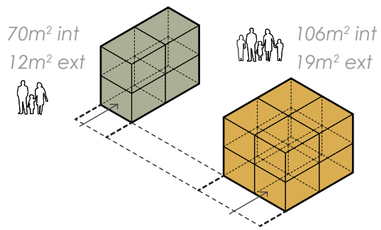
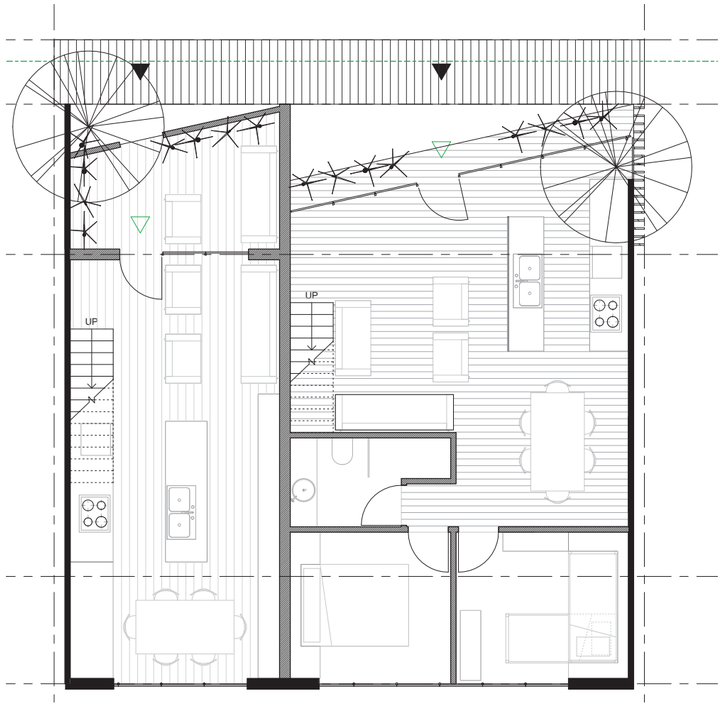


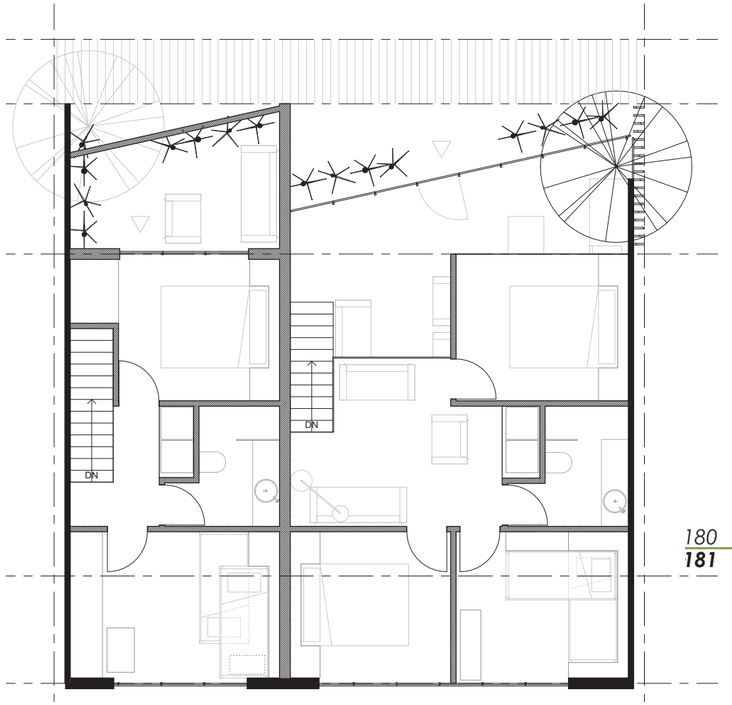
Figure 5.4.16
Isometric structural bay breakdown

Figure 5.4.17 Level A



Example of North South orientated large and small terrace house. One unit suitable for a young family. One unit suitable for a larger multi-generational family with lower level sleeping options for elderly. Both incorporating garden within their forms

Figure 5.4.18 Level B



NORTH SOUTH ASPECT ORIENTATION

Maisonette House Type

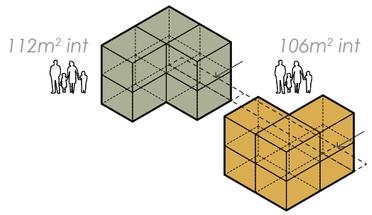
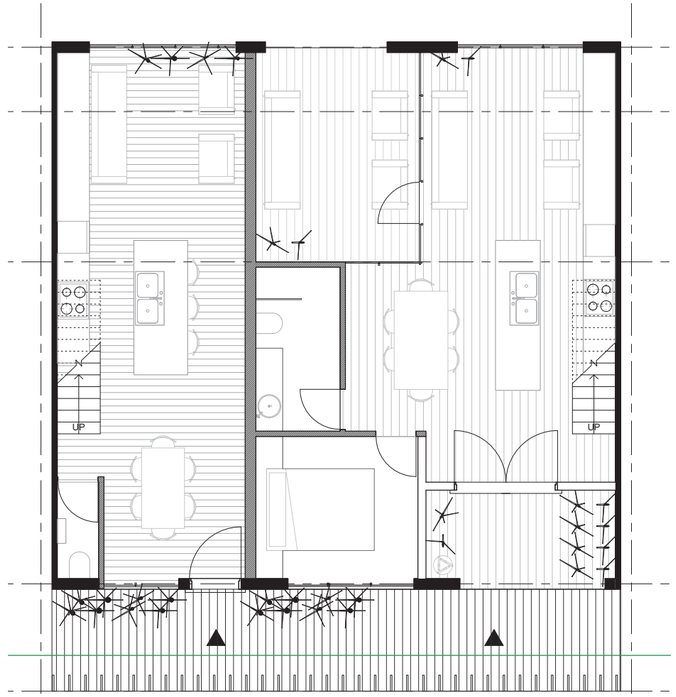


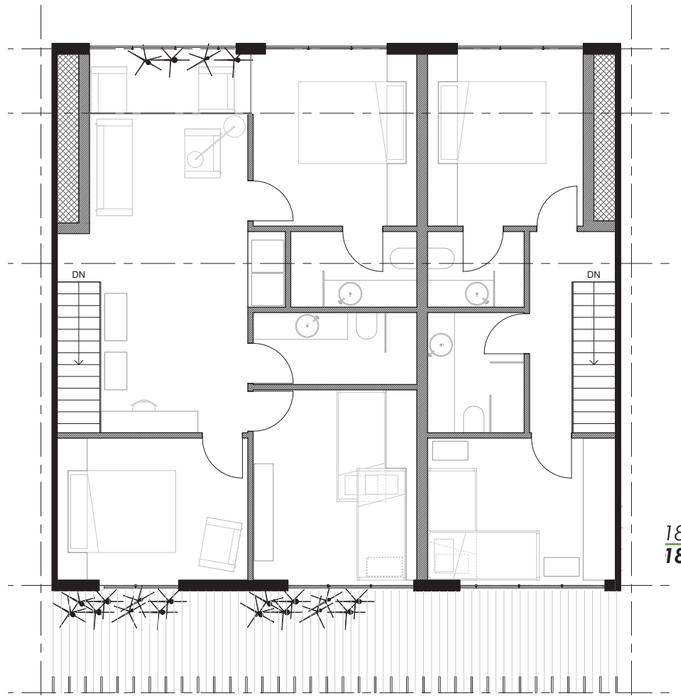
Figure 5.4.19
Isometric structural bay breakdown

Figure 5.4.20 Level A



Example of North South orientated interlocking maisonette, accessed from the south with garden elements on the north and south aspects. One unit suitable for a nuclear family. One unit suitable for a larger multi-generational family with lower level sleeping options for elderly and a northern facade loggia for outdoor living

Figure 5.4.21 Level B



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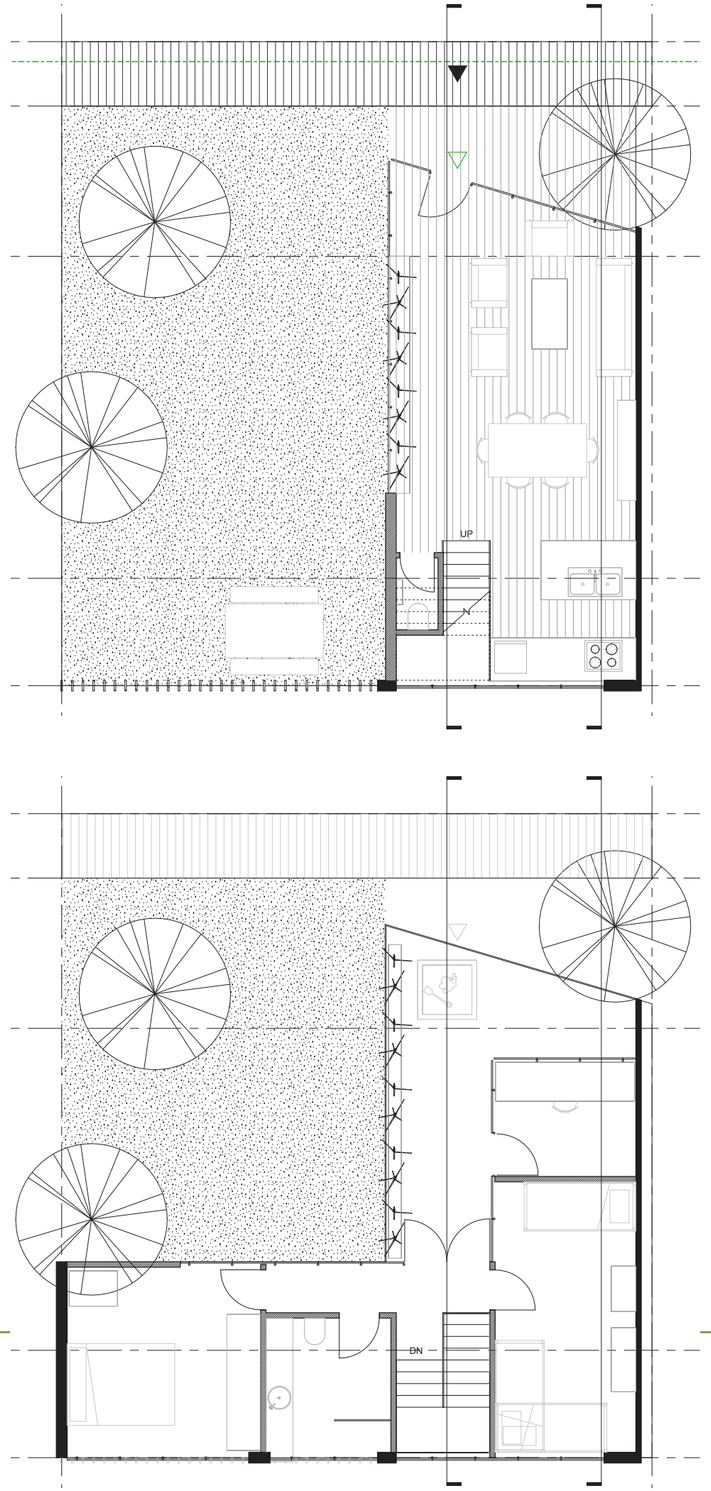


NORTH SOUTH ASPECT ORIENTATION

Park House Type

88m² int
24m² ext (private)

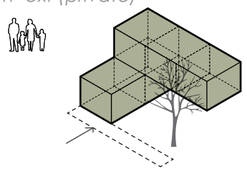


Figure 5.4.22 Isometric structural bay breakdown

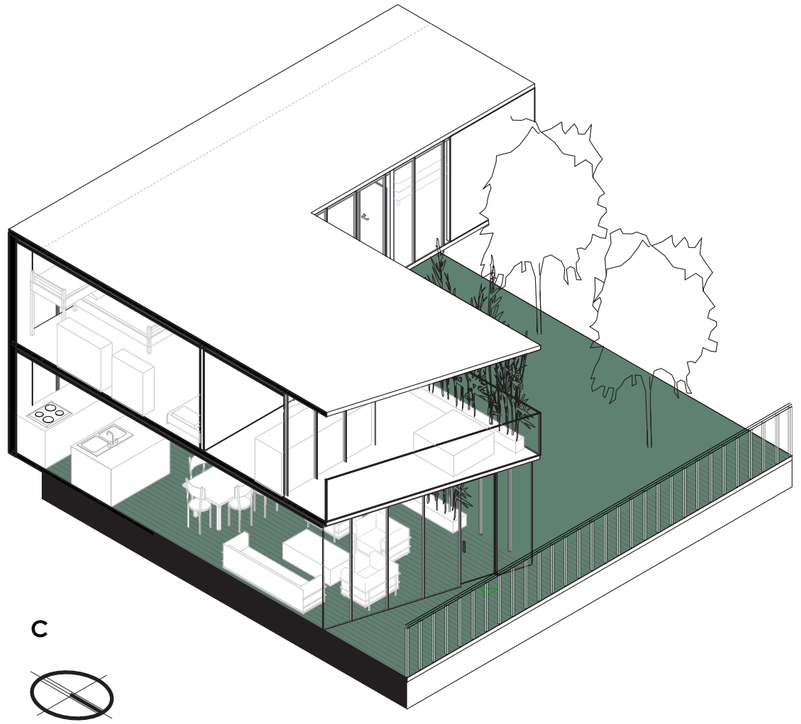
Example of a park house where one unit and one common garden space is provided. This park house provides a pocket yard on level 8 linking in to an adjacent vertical circulation garden. Internal planting provides additional screening between the two areas. The common pocket yard is directly accessible from the unit's private garden. This particular unit suits a nuclear family.

1:100

Figure 5.4.23 Level A ←

Figure 5.4.24 Level B ←

Figure 5.4.25 Park House Section →



C

Park House Type
Sectional Axonometric

5.5 Vision For Living

Images of landscapes, urban moments, suburban ideals and New Zealand families collected over the thesis period are used to drive the development of design in perspective. The collaging of these images occurs at different scales conceptually to integrate landscape from the city into individual units; weaving their way between them to bring a cohesive and iconic look to the development.

These drawings also explain the livability of the scheme, illustrating the atmosphere and liveliness of the design. The sectional perspective through a sample of the north-south orientated block, featuring a terrace house atop a maisonette, shows a variety of landscape types in their

Figure 5.5.01 Sectional Perspective through the north south orientated terrace and maisonnette houses. In the terrace unit pictured an indoor-outdoor deck with bi-folding doors extends the garden feature indoors. This is continued with double height plantings that function as screens and imbed the sense of garden into the unit. In the lower maisonette unit garden is integrated in a more subtle way. South aspect planting helps mediate the more abrupt boundary between the common and the private realms while still allowing light into the rear rooms. To the north a loggia is sectioned, to extend the family's living space and provide sheltered outdoor living to maisonette dwellers.

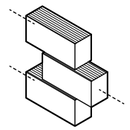


Figure 5.5.02 Architectonic

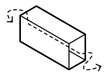


Figure 5.5.03 Constrained along two axis, free in the third

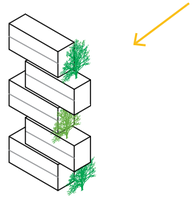


Figure 5.5.04 Double height units for solar access and green interventions

reality (Figure 5.5.01). The flow between these landscape typologies bleeds into the unit typologies, with garden features present within all units to varying degrees.

These units are designed to be liveable; an easy and seductive journey for suburbanites from their original 'quarter acre' ideal to the garden units of the city.

Figure 5.5.05 Common Roof Garden Space

Figure 5.5.06 Indoor Outdoor Connection of Terrace House oriented toward Mount Victoria

Figure 5.5.07 View of Park House From Pocket Yard

Figure 5.5.08 View From Vertical Circulation Void

Figure 5.5.09 View From Verte Maisonnette

Figure 5.5.10 View of Green from Southern Public Entry

Figure 5.5.11 Evening Render from Circulation Route overlooking Scheme and Green

Part 4

RESEARCH POSITION

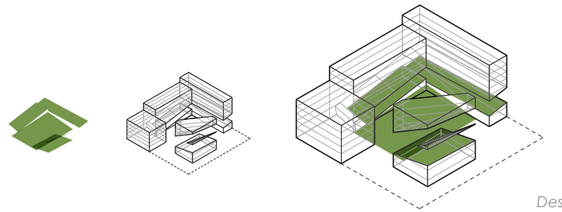
6.0 Further Research Directions

The concept of a common green network is applied to this particular site as a perimeter block type. On other sites other scheme typologies with alternative massing strategies may be more suited. Similarly, on alternate sites a lower density might be targeted giving more flexibility in form whilst still maintaining sunlight, privacy and garden amenity as key drivers.

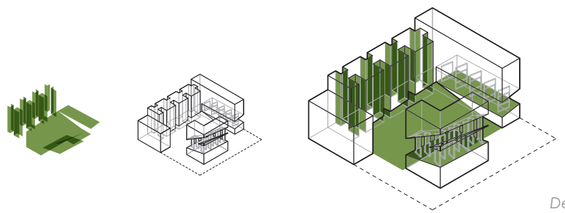
Refocusing to prioritise design around the six additional identified attributes has the potential to increase the uniqueness and 'good-weirdness' of the scheme. Having illustrated it is possible to solve when focussing on the CHRANZ attributes, focusing on the additional attributes could also further the scheme's generosity. Integrating more facilities such as a tennis court, skate park or BBQ area will likewise increase desirability.

In optimising for the number of terrace houses design test five restricts true diversity. Re-balancing the proportions of each unit typology (particularly park houses) could develop a more varied community. With diversity of dwelling, including some smaller and more affordable dwellings, the scheme will move towards greater social diversity.

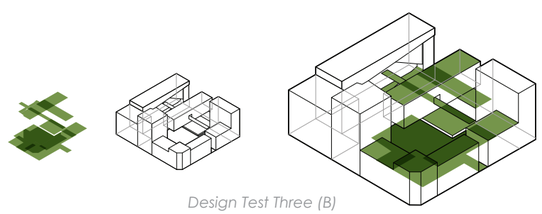
This design is deliberately propositional with lessons and approaches applicable to multiple sites. Necessarily, the design tests are not overly site specific; however, improved site specificity would increase the concept's appeal. In a further phase this might involve responding to the



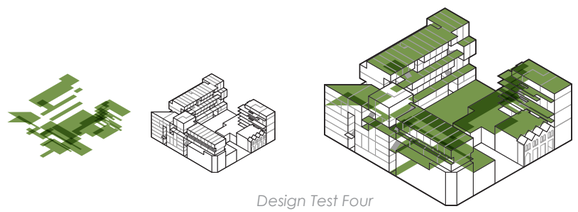
Design Test One



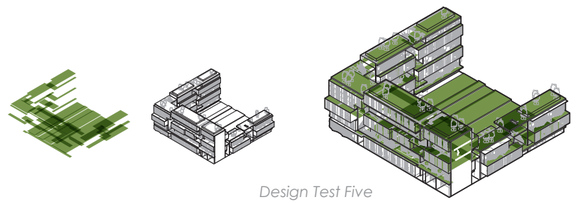
Design Test Two



Design Test Three (B)



Design Test Four



Design Test Five

downtown 'grittiness' and playfulness of the area to develop a rich design to be presented to the public, primarily in perspective.

Further research is required into the cost premium associated with garden integration at an elevated level. Providing structure for such heavy infrastructure is expensive, however, initial research finds that in London having a private roof/attached garden can add 10-15% to the asking price (Bailey, 2012). Establishing the market's receptiveness to this concept in New Zealand, and the construction cost premium, would aid in assessing the feasibility of this design proposition.

A further expected cost premium lies in the complex servicing of a flexible design. It is not clear how much added value 'flexibility' has. Typically a custom architecturally designed houses have higher property values than others. Thus using a project architect as required by 'flexibility', as well allowing redesign for evolving family situations (under the innovative ownership model), will increase property values to offset this cost premium.

Finally, recent housing policy reforms in New Zealand also have the potential to impact on this project. The 'Housing Restructuring and Tenancy Matters Amendment Act 2013' allows any public or private organisation to provide social housing and receive income related rent subsidies, which if applied appropriately could provide an even greater diversity of families. Land subsidies might also be available through the 'Housing Accords and Special Housing Areas Act 2013' which aims to enhance housing affordability by facilitating an increase in land and housing supply in places with significant supply or affordability issues. Both new laws endorse and fast-track housing projects increasing the feasibility of such a scheme. However, being so new, their potential impact is as yet unknown.

Using gardens as an integral component of vertical housing has the ability to change what New Zealanders, politicians, and developers consider possible and desirable. This research illustrates the potential architecture has to provide a solution to the ever resisted higher density city.

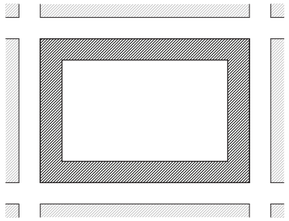
Figure 6.0.01 Design test axonometric summaries

7.0 Typological Ties

Typology has been used in architecture since the age of enlightenment (first defined by de Quincy in Encyclopedie 1789) where analysis of built fabric first formalised a number of dwelling and morphology types. Since then the word has undergone two evolutions; post WWII during the European mass state funded housing era the concept suffered a loss of significance, reduced to 'stereotype'. However, a re-emergence of the significance of type and typology is seen post 1950s, reflected especially Aldo Rossi's writings, mainly The Architecture of the City (1982) (Güney, p. 1).

This project can be positioned in the architecture discipline in relation to a number of built works. Discipline knowledge can be ordered through typology. This chapter starts by mapping established typologies that design test five relates to, then draws attention to developing typologies where relationships exist, showing each type to be rich in architectural and/or social history.

7.1 Scheme Typology



Perimeter Block (established typology)

In combination with the existing buildings of the block this scheme forms a perimeter block with internalised public space, a development of the typology that has become more common since the 1980s (Leupen, et al., p. 216). A typical significant issue of the perimeter block, solving for reduced solar access and limited relationship with internal space at the corners (p. 216), was solved by breaking the block there simultaneously solving for this and public access to the central green.

This typology has much potential in Wellington because it can be included in the piecemeal development of the city. It may draw upon many European precedents for design solutions which can be successfully adapted to New Zealand conditions.

"[The perimeter block's] essential feature is a continuous line of buildings along every side of the city block. The outer side of these buildings therefore defines the streets and public spaces, while the open space inside the block is shielded from the activity of the city." (p. 216)

Figure 7.1.01 Perimeter block diagram ←

Figure 7.1.02 8 House, Bjarke Ingels Group, 2009 ←

Figure 7.1.03 Sanctum Apartments, Warren and Mahoney, 2000 ←

Figure 7.1.04 The Whale, Frits van Dongen, 2000 ←

7.2 Housing Typology

Figure 7.2.01 Terrace house diagram →

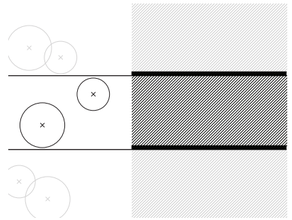


Figure 7.2.02 Siedlung Halen, Atelier 5, 1960 →

Figure 7.2.03 Mountain Dwellings, Bjarke Ingels Group, 2008 →

Figure 7.2.04 Jeanne Hachette, Jean Renaudie, 1975 →

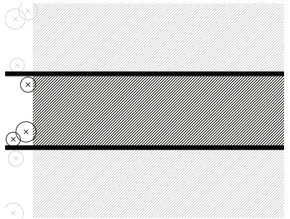
Figure 7.2.05 Vertical Forest, Boeri studio, 2014 →

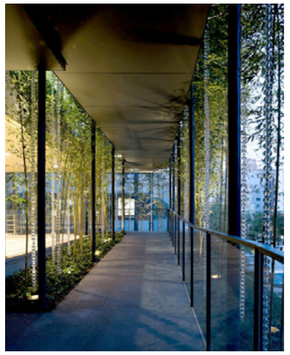
Figure 7.2.06 Ibid →

Terrace House (established typology)

In this scheme the terrace house is adapted so it appears the same in plan as a standard terrace house, but in section finds itself within a larger building, much like an apartment with a garden. Apartments with gardens imply a high-rise attached external garden unit (not to be confused with the existing low-rise garden apartment typology).

In this scheme adapting the terrace typology provides a 'street' connection and garden for these units, and a borrowed garden for the common circulation areas.





Verte Maisonette (developing typology)

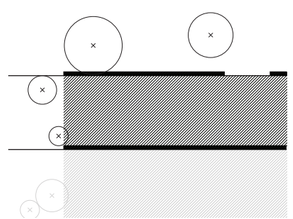
The verte maisonette typology is titled 'verte' after (feminine) green in French and the English word 'maisonette' taken from French 'little house'. In this scheme these units are typically accessed from the south and double storey with a marginally larger floor area than a terrace house. Although these units do not have private outdoor gardens, as the terrace houses do, they use private internalised garden typologies such as balconies, planted loggias, internal planter boxes and green screens as well as borrowed landscapes to maintain a desirable garden connection.

"The word maisonette means 'little house' in French, making its essential feature immediately evident: a miniature house, a dwelling with multiple storeys, incorporated into a residential building."

Figure 7.2.07 Verte Maisonette diagram ←

Figure 7.2.08 Avelaine Barbier Balcony ←

Figure 7.2.09 Ekouin Nenbutsudo Temple, Yutaka Kawahara, 2014 ←



Park House (developing typology)

The park house is a typological invention. Defined by direct access onto a common pocket yard, these have to be specially designed to balance privacy of the unit with the comfort of pocket yard users. Often with secondary more private access options from the boardwalks, and superior solar access afforded by the adjacent common garden, these units have a generosity of garden and sunlight, which helps offset a perceived privacy loss due to the proximity of common space.

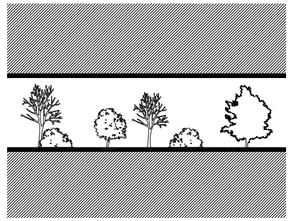
Figure 7.2.10 Park House diagram →

Figure 7.2.11 Park House close up render →

Figure 7.2.12 Park House external render →

Figure 7.2.13 Park House internal render →

7.3 Morphology Typology



Void Garden (developing typology)

This developing typology has a large effect on the icon value of a development. Externally visible and instantly desirable, these gardens create an atmosphere of intermediate scaled intimacy especially suitable for common, or neighbourhood interaction, a further desirable feature. When used in combination with circulation these spaces are catalysed by continual use. The costs of providing such large planted void space means they are rare, with each example either public or common thus optimising access to the iconic feature.

"The design of the access creates conditions that invite people, to a greater or lesser degree, to use it as a space for collective habitation. At the same time, how the collective area relates to the privacy of the individual dwelling is a vital consideration."

Figure 7.3.01 Void garden diagram ←

Figure 7.3.02 Harbour Rocks Hotel, SJB, 2012 ←

Figure 7.3.03 Parkrand, MVRDV, 2006 ←

Figure 7.3.04 Parkroyal, WOHA, 2013 ←

Figure 7.3.05 Stacked/Slid diagram →

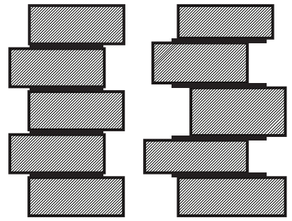


Figure 7.3.06 Axis Viana Hotel, VHM, 2008 →

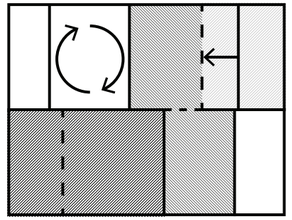
Figure 7.3.07 Habitat 67, Moshe Safdie, 1967 →

Figure 7.3.08 Edificio Palmas (office), Juan Sordo Madaleno, 1975 →

Stacked/Slid Building (developing typology)

A stacking or slid architectonic is used in a number of projects to create an iconic look in conjunction with useful void spaces. Slid buildings have a striking look about them achieved through engineering innovation and well worked proportions. The resultant void spaces give the building texture and can, as in this scheme, be used as outdoor living or circulation areas. Used across multiple scales, down to furniture and joinery, the slid detail gives increased interest and associated icon potential.

7.4 Design Strategies



Flexibility (developing typology)

Designing for flexibility typically requires either uncommon ownership systems, to utilise all space at all times (as in this design proposal), or large units that are subdivided or rooms merged internally as required. Flexible buildings do not typically look any different externally, as in both situations the building envelope is fully formed. MaxHaus is purchased by the 70m² apartment, which can be merged into 140, 210, 280, or 560 m² units that can be created and recreated as required (MaxHaus, 2013). Lakua Social Dwellings use the second method of flexibility, where a standard unit's room spaces can be subdivided or merged over time (French, p. 177). Design test five employs a hybrid system different to both, allowing for a flexible housing situation (Chapter 5.4). These design solutions look to the future to propose innovative and sustainable housing solutions for a changing society.

Figure 7.4.01 Flexibility diagram ←

Figure 7.4.02 Lakua Social Dwellings, Ercilla & Campo Arquitectura, 2002 ←

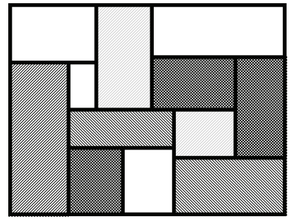
Figure 7.4.03 MaxHaus, MaxHaus, not yet completed ←

Figure 7.4.04 Salt and peppering diagram →

Figure 7.4.05 Mirador Apartments, MVRDV, 2005 →

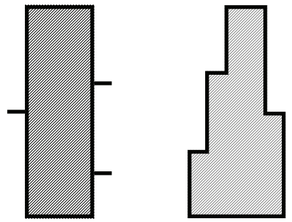
Figure 7.4.06 Chip building, Alsop Architects, 2002 →

Figure 7.4.07 Silodam, MVRDV, 2003 →



Salt and Peppering (developing typology)

Salt and peppered designs disperse type clusters throughout the building mass. In this case the terrace house and verte maisonette types were arranged in horizontal rows which were stacked, although initial experiments clustered them more randomly. As well as reading interestingly, with each unit type clearly articulated as a type (especially visible from the internal courtyard), this helps provide unit diversity while maintaining structural efficiencies. In each unit typology the different amenities that attract different occupants bringing diversity to the development community. These buildings often express their internal differences to create a further iconic look.



Street in the Sky (redeveloping typology)

Following criticism of the Robin Hood Gardens (1961) and other modernist buildings for their ghetto-like external circulation paths the profession has returned to an adapted form of gallery. These new versions are flooded with light and offer passive surveillance, a community platform and an extension to the private dwelling. The earlier Justus van Effen Complex (1922) even had milk delivered on the upper street level which helped to develop a community and proved its use in the neighbourhood (Fernández Per, Mozas, & Ollero, 2013). This circulation typology is re-establishing itself with good design as a viable and community focussed alternative to internal circulation solutions.

Identified in relation to Justus van Effen Complex, the elevated external street is as a solution "that reaffirms the street as an element which links not only the elements built into the section but also collective living units and the residents of the housing complex." (Fernández Per, Mozas, & Ollero p. 12)".

Figure 7.4.08 Street in the sky diagram ←

Figure 7.4.09 Justus van Effen Complex, Brinkman, 1922 ←

Figure 7.4.10 8 House, Bjarke Ingels Group, 2009 ←

Figure 7.4.12 Iroko Housing, Haworth Tompkins, 2004 ←

Figure 7.4.11 The High Line, James Corner Field Operations, 2006 ←

7.5 Typology as a Tool

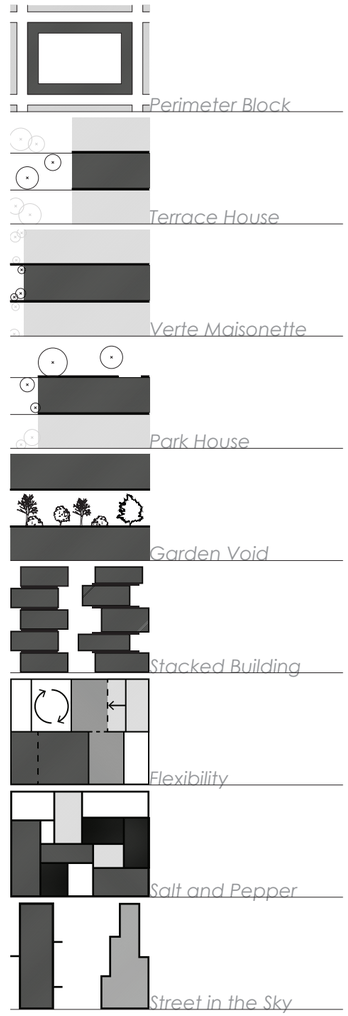


Figure 7.5.01 Diagrammatic summary comparison →

The use of 'type' as a tool in the design process led to new developments in the project which may be relevant to the residential design and development industry. The process of analysing types is especially valuable when types are understood and then adapted to different situations, as demonstrated in this thesis. When an understanding of the strengths and weaknesses of each typology is gained it is possible to apply and adapt them ad infinitum. In some instances typologies were the start point (as in unit and landscape types), and in others finding relationships with enough built examples spurred the identification of new types. Equally the project can be positioned in relationship to other ideas, processes or forms to order new knowledge in different ways.

8.0 Conclusion

For reasons relating back to New Zealand's early settlement, New Zealanders have an on-going feel of entitlement to their 'own house, on their own land'. Generations of New Zealanders have grown up in suburban single detached houses, with childhoods spent in the prided front and back gardens of suburbia .

Early attempts to encourage adoption of alternative higher density housing types were not successful, and then as now, compounded by recent failures in the construction industry, are seen as inferior (CHRANZ p. iv).

This thesis commenced with a study of the Centre for Housing Research Aotearoa's 2011 study that highlights 29 disincentives needed to be overcome before New Zealander's consider adopting medium or higher density housing. These were set as design parameters and subsequently solved for.

Further to these, six additional design parameters were used as incentives to increase the desirability and acceptance of the higher density way of living.

This proposal is also an architectural study in density; targeting 250 DW/HA. While this is high by New Zealand standards the target was used to give the project an element of feasibility acknowledging the developer driven market in New Zealand. It also tests the application of concepts at a local extreme.

Using garden, this project demonstrates how it is possible to incorporate substantial landscaped spaces into higher density developments. In this development a generous 'common green network' is used as the primary circulation device. This study of an alternative circulation method allows for space appropriation and full utilisation of common ground and a symbolic and physical connection between residents.

A variety of landscape typologies are used to regulate people from the public to the private realm. The different mixes of public, common and private landscapes are of different scales and plantings - and provide screening from one zone to the next. Within this scheme private gardens are provided for in a substantial proportion of units, giving significant characteristics of suburban style living to vertical housing dwellings.

This propositional design suggests a new way to encourage New Zealand suburbanites to live in the city. The desire for space enough for a child to learn to ride a bike or roll around on a lawn is part of the reason why Kiwis retreat to the suburbs to have families. The scheme provides large common open spaces to offset the smaller, as compared with traditional suburban sections, private gardens attached to the units. The reduced 'section size' is balanced against substantially larger and more easily accessible common areas to create a delightful place to live and raise a family.

The scheme balances access to amenities provided by the city and supplements its missing elements by incorporating them into the public or common realm. It provides all of the private amenities afforded by suburban housing, as well as immediate access to those provided by the central city. It recognises the city as rich in amenities, and housing as a city amenity whilst consciously giving something back to the city itself. The identified missing amenities, a crèche and green, are used to help integrate and knit the development into the city. This helps to supplement the neighbourhood with additional amenities, ones identified as missing, and in turn aids in developing a community within and outside of the scheme.

The possible application of the common green network strategy extends wider than this site, amenity study or city.

This thesis project offers a model for residential development distinguished by an embedded extensive green infrastructure, that, when introduced into urban situations such as Wellington's, can deliver benefits not only to the occupants but also to the city.

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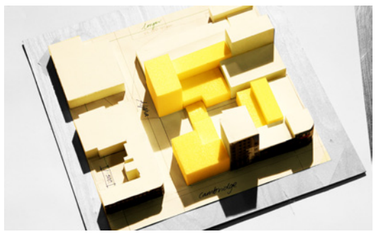
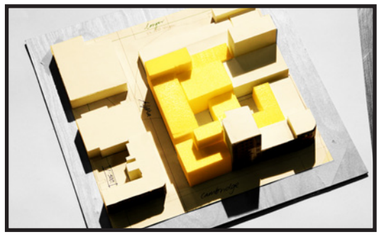
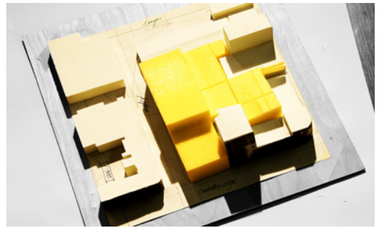
Figure Reference List

Appendix Figures

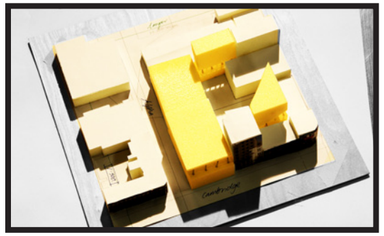
Appendix

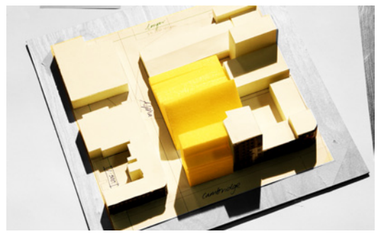
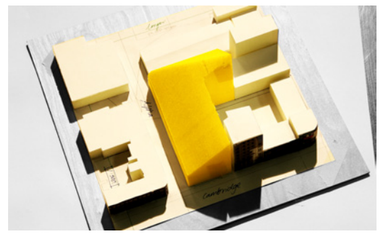
A.1.1.i Design Test One Goldfoam Massings





EARLY LIST OF POTENTIAL FORM DESIGN DRIVERS

- *Atmosphere*
- *Emotional reaction*
- *Perception*
- *Symbolism*
- *Philosophy*
- *Structure*
- *Proportion*
- *Materials*
- *Finances*
- *Playfulness*
- *Environment*
- *Context*
- *Behaviour*
- *Time*
- *Memory*
- *Metaphor*
- *Light and Shadow*
- *The Gap/not built*

Figure A.01 This series of twelve models were produced as the first experimental and intuitive responses to density and site. They were assessed against Kebbell classification standards to decide on the strongest concept, the most 'good weird', for further development. The Kebbell classifications are discussed later. Most of these design solutions fall into the 'bad weird' category, although the design highlighted in bold, is 'good weird' especially compared with the other highlighted 'good normal' solutions.

ALTERNATIVE MASSING DESIGNS

Fine Settlement

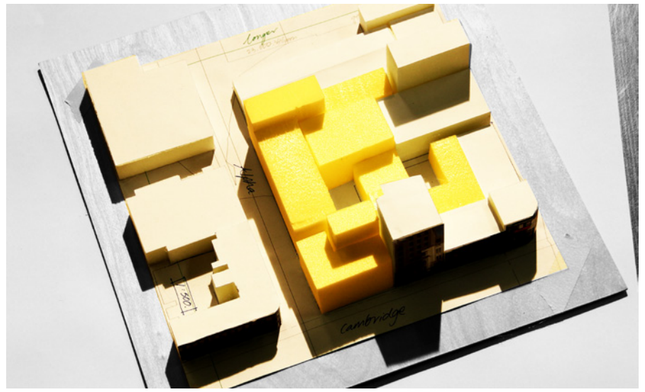
'good normal'

model weight = 9.33 g
therefore 11,500 m² @ 1:1

Critique & Development Opportunities

This massing was developed by assessing and comparing the lot size and footprints of adjacent buildings and that of neighbouring blocks. It proposes a way to respect the site's heritage context but acknowledge the intensification in the area with the mosaicing of lots. This massing represents a gradient or bridge from past to future through footprint and massing scale.
Alpha street is respected in this model, and the Cambridge hotel's footprint is used across Alpha Street to ensure sunlight reaches this historic building. The articulation of the corner suggests a primary entrance which would be ideal for retail or hospitality at street level.
Access through the site is formalised in this scheme, forcibly breaking down the scale of the site. This lane could be named to give a personal more 'house - like' connotations of ownership and address to the apartments

Summary:
Based on lot sizes and building footprints
A gradient across the block from low to higher density/old to new scale
Primary entrance suggested at Alpha - Cambridge corner
Lane formalised though site, and named to give ownership/personal street addresses to residents



Journey Through

'good normal'

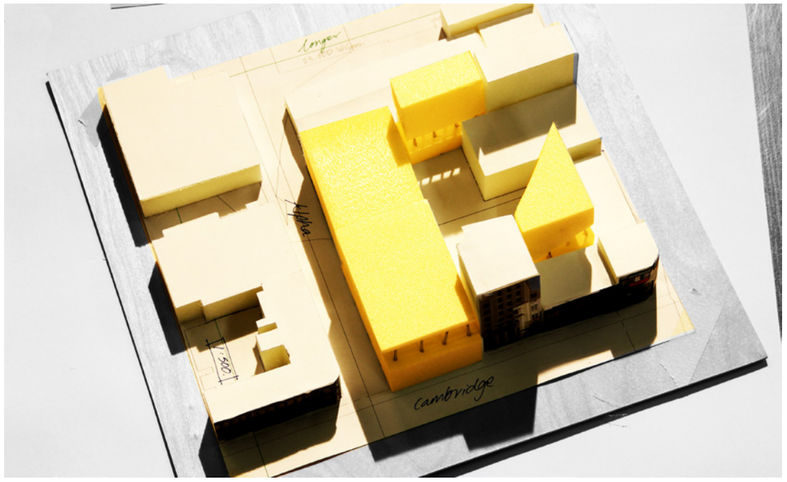
model weight = 12.11 g
therefore 15,000 m² @ 1:1

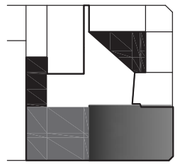
Critique & Development Opportunities

Continuing on from the studies of Fine Settlements this model adds the concept of journey to the site instead of a lane with the same respect for context and heritage. The journey conceived as a private experience for residents where the concept would be extended into the internal circulation and apartment spaces.
This journey leads through two courtyards from Alpha Street to Courtenay Place. The differences in public space of each of these will help serve as a point of orientation for occupants in each area of the development. However it does risk splitting the occupants if one courtyard is conceived as generally better, rather than different, than the other. A further risk lies in occupants potentially only feeling allowed to use the courtyard closest their apartment.

Summary:
Journey created through site, and extended into apartments
Massing responsive to site and context
Multiple courtyards with different atmospheres envisaged
Adds identity to bordering apartments but risks splitting the development

Figure A.02
Detailed studies of good-normal design tests





TargetDensity 250DW/HA

site area = 3230m²

1:5000 Plan Diagram Key 20-27 15-20 05-15 00-05m

SKETCH MODELS

'Kebbell Classification'

minimum area required for 250 DW/ha: **12,000 m²**

Defining 'Kebbell Classification'

good weird	• *what people really want; uniqueness in a good way*
good normal	• *done well but nothing outstanding bad weird*
bad weird	• *what people don't want; too unique, rude or some other failing*

See appended massing models for full discussion

Summary:

- *Light is allowed into the courtyard all year round*
- *Structural development will alter shadow patterns and wind breakdown*
- *Challenges height restrictions in a respectful way to existing context*
- *Enhanced views*
- *Dwelling possible in void spaces*
- *Iconic building*

Figure A.03
Detailed study of good-weird design tests

LIGHTING AFFECT

'good weird'

model weight = 10.66 g
therefore 13,200 m² @ 1:1

Critique & Development Opportunities

Light and shadow were used to develop this dramatic form. It aims to get light into the courtyard all year round despite building height on the northern edge of the site. The courtyard is open to everyone so all residents can view the success of the development, and enjoy the quality environment it creates.

The articulation of the void space, including angles of cut and structure density can allow the mass to be read as either solid or void, or both at different angles or times. With different void cuts developed from different seasons sun angles it may even be possible to get more sunlight in winter than summer in the courtyard. Pictured aside, lit from the north-west, is a representation of an afternoon summer sun.

The structural density may also offer wind protection to the central space in the harsh Wellington climate.

This development also challenges the council's height restriction with only 27meters solid fill but reaching the 32-36meter heights of the existing context in a passive response heritage. This increased height also affords better views out to the harbour to the north, Mount Victoria to the west and to the CBD and ranges to the east of the site.

This design has possible circulation issues which may disrupt the purity of the form.

There is potential to dwell in the void spaces, or plant it in deciduous trees, making a common space for residents.

The design also has a steeple like element to it as seen from Blair Street bringing iconic status to the building.

A 1.1.ii Design Test One Site Solar Studies

INITIAL SITE SOLAR STUDY

Figure A.04 Initial site solar study including all the existing buildings

SITE SUMMARY

Winter morning sun is limited to the site with only one small patch falling on the southern edge of the site at the equinox. This is due to the tall historic registered post office building to the east of the site. To protect this sunlight nothing new can be built to the east of this chink which comes over the low historic buildings on Courtenay Place.

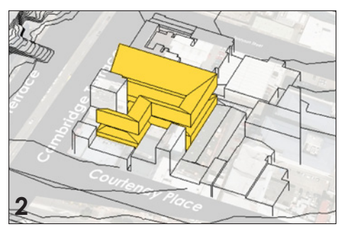
The northern edge of the site is bordered typically by the two to three storey historic buildings of Courtenay Place. There is one tall and deep building, Adelphi Finance House, due north of the site's centre that casts a shadow that in winter is deep enough to divide the site at noon.

On winter afternoons the site is shaded by the Telecom development to the west. In summer the western edge is shaded by the much lower Courtenay Muse on the adjacent site.

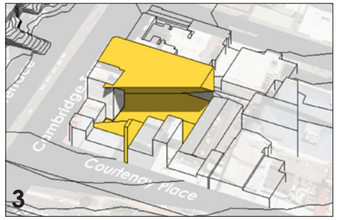
Summer sun rises and sets well south of due east/ west casting unusual shadows in the northern direction.

'LIGHTING AFFECT' DESIGN DEVELOPMENT

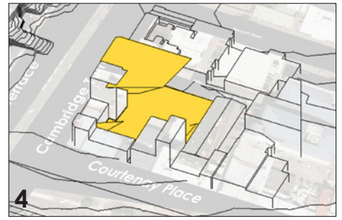
Cantilever to the west to allow low afternoon sun into a central common area.



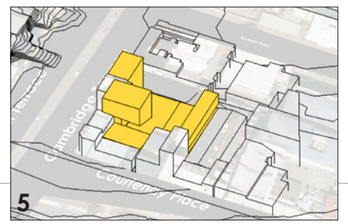
Swept profile around the perimeter designed based on mid morning sun angles at the solstices' and the equinox.



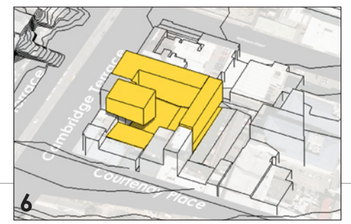
Maximum building envelope with a void extrusion cut based on the northern equinox sun angle.



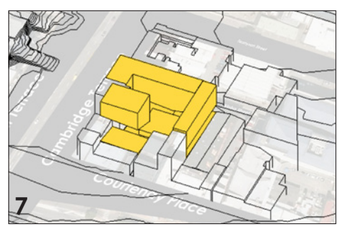
Continuing on from 3, a double cantilever designed to allow afternoon sun in too.



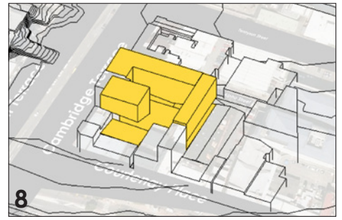
Experimenting with void cuts in buildings to the north and west that allow out sun.



Raised building to the west and new building to the south to increase number of dwellings.



Raised internal platform in western corner to increase winter morning sunlight access to the central common area.

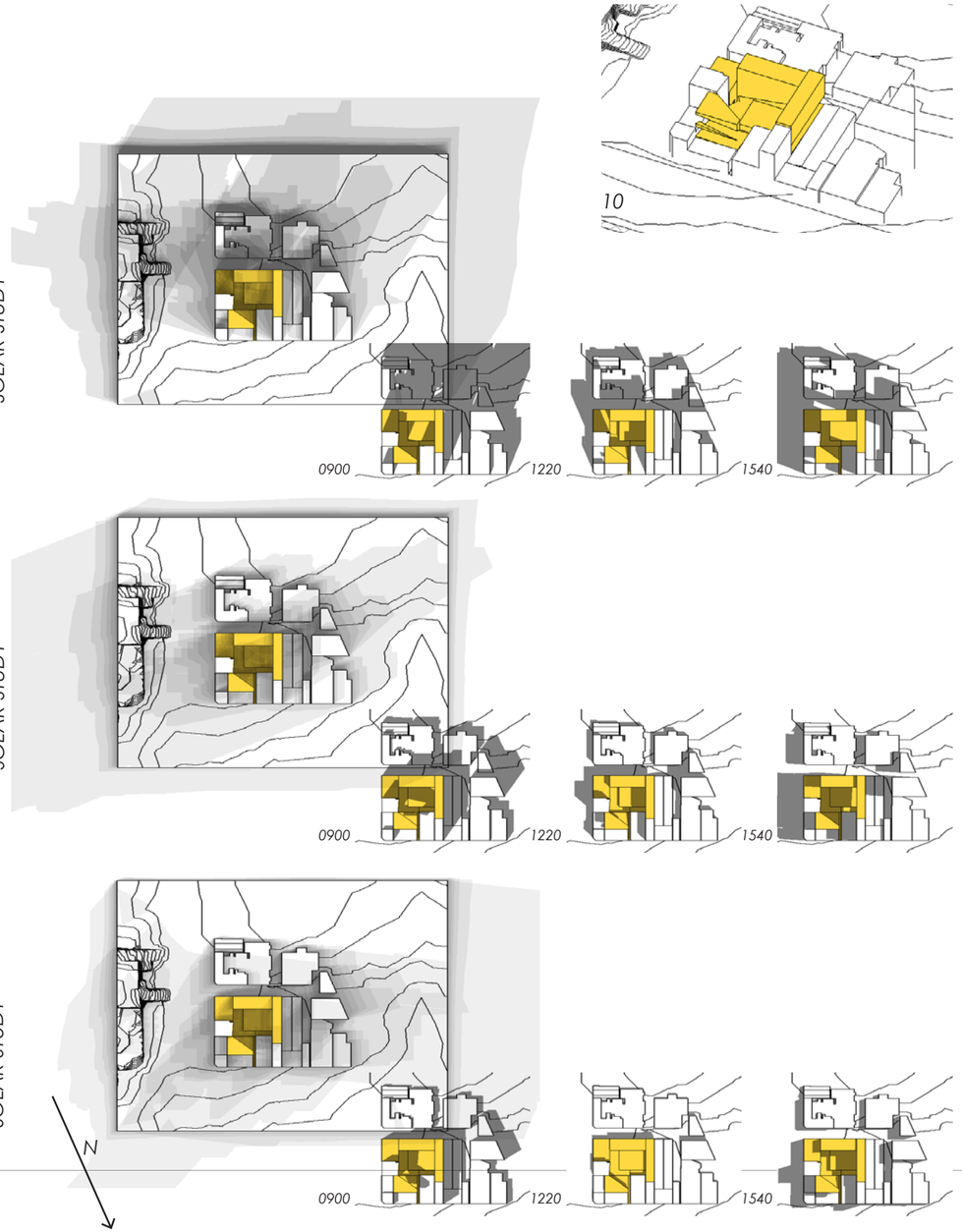


Raised internal platform over the entire area; does not increase the amount of sunlight to the area.

Lowering of perimeter buildings to properly respect the existing fabric.

See appended massing models for full discussion

Figure A.05
Sequential massing development of design iteration one

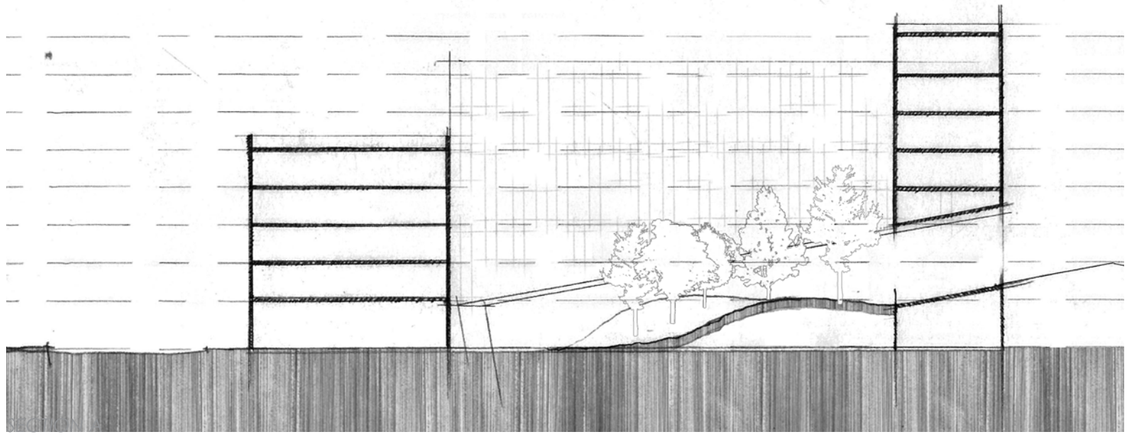


SUMMARY

- *Privacy addressed within the development*
- *Iconic*
- *Dramatic*
- *Staggered massing heights along Alpha Street are respectful to the existing context*
- *Lowered northern building, while still maintaining year round sunshine into the design, completes a successful context response*
- *Raised platform/park*
- *Within correct volume range to create high density housing*
- *Natural access points suggested from Alpha Street and Courtenay Place*

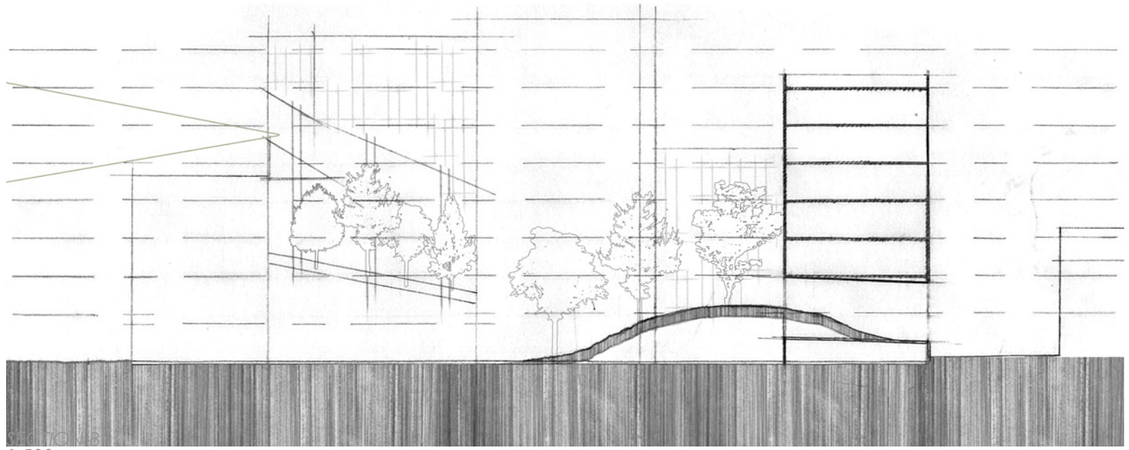
Figure A.06 Final massing for design iteration one tested year and day round. Great solar access achieved in courtyard and all apartments

A.2.1 Design Test Two Additional Drawings



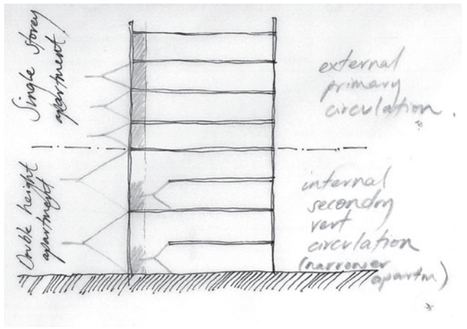
1:500

Figure A.07
Section cut East-West through the site showing ground plane rising to increase solar access to the central planted courtyard area



1:500

Figure A.08 Section cut North-South through the site revealing plantings and raised gardens within the northern most building.



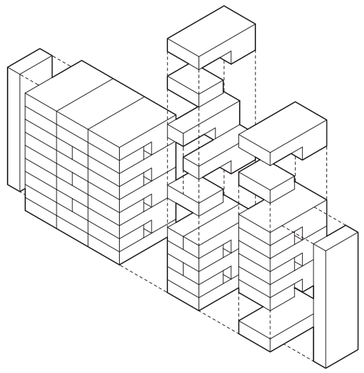


Figure A.10
Circulation in relation to unit storeys

Figure A.11
Exploded isometric of circulation system adopted in this scheme

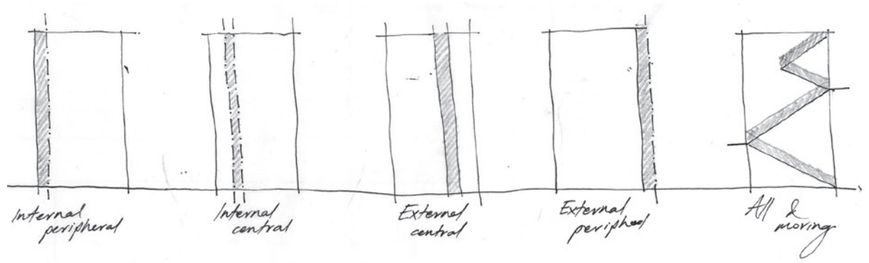


Figure A.09
Circulation studies of alternative options

Figure A.14 Upper level plan showing green spaces in relation to units and circulation

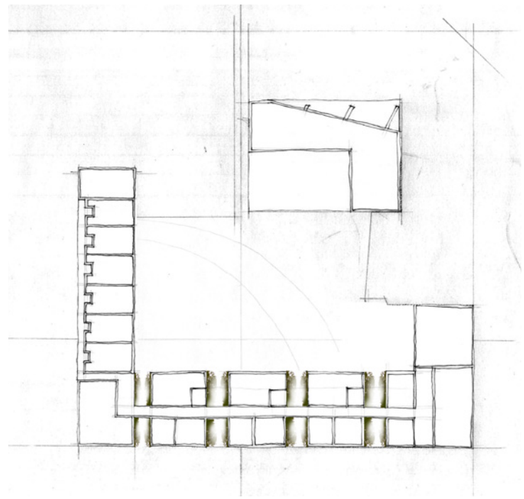


Figure A.13 Lower level plan showing continuation of vertical green spaces in relation to units and circulation

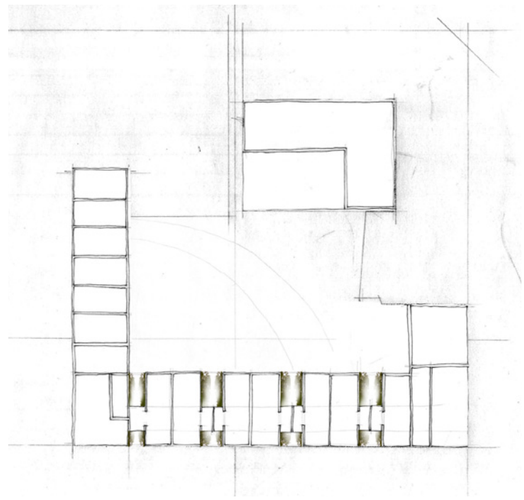
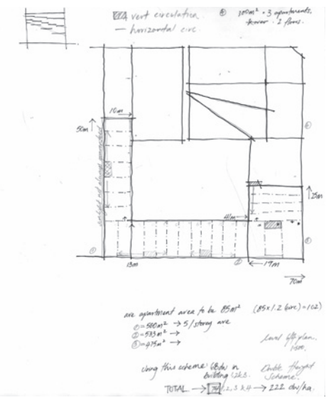


Figure A.12
Typical floor plan study, testing the relationship between unit and circulation



LOWER LEVEL PLAN 1:500

A.4.1 Design Test Four Butter Paper Design Development

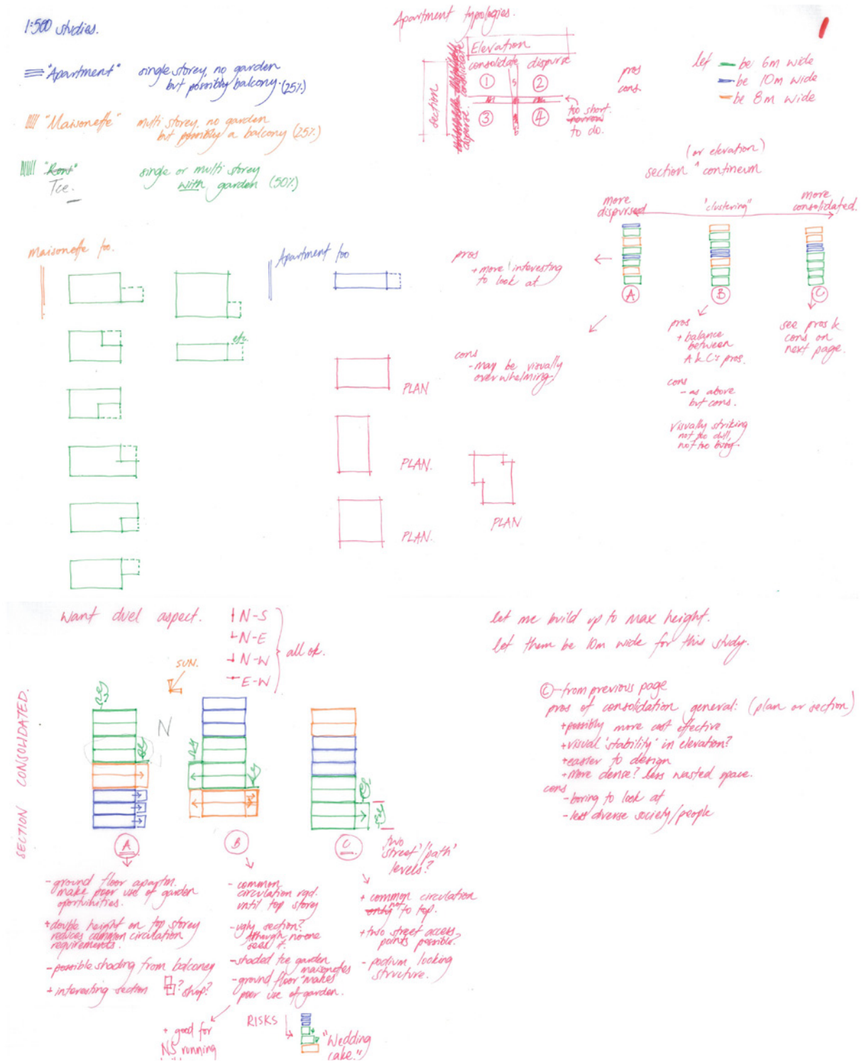


Figure A.15 Establishing the testing parameters, setting some things now, to be reviewed later

←

Figure A.16 Initial section studies consolidated in alternative orders

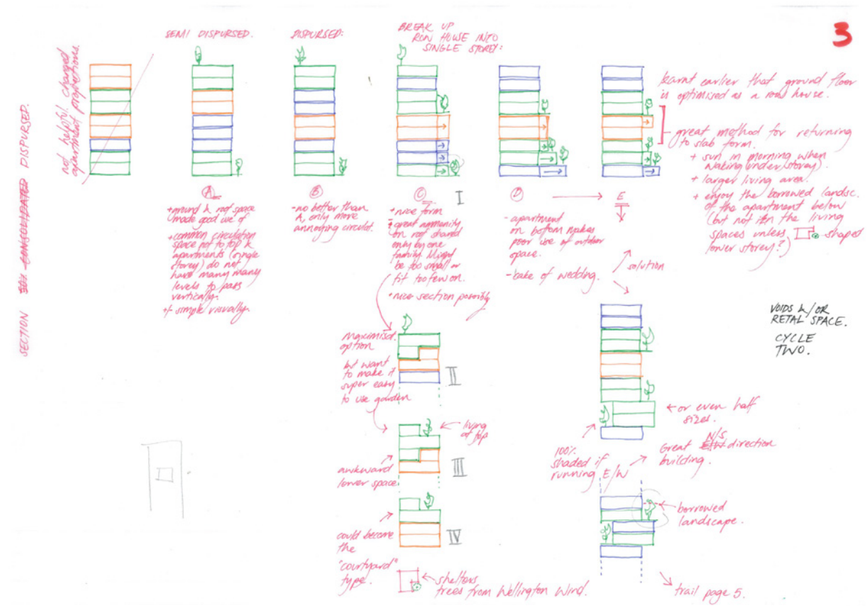
←

Figure A.17 Design Rules:

- *Single aspect units acceptable when orientated to the north*
- *Acceptable double aspect options: N&S, E&W, N&E and N&W*
- *50% of dwellings to have "private green space" as part of the dwelling*
- *All dwellings to have easy access to larger common or public "green space"*
- *Design Priorities: Density, High quality "green spaces", Sunlight to all dwellings, Privacy within the complex, dwellings and green spaces*

Figure A.18 Initial section studies with dispersed sections in various arrangements

→



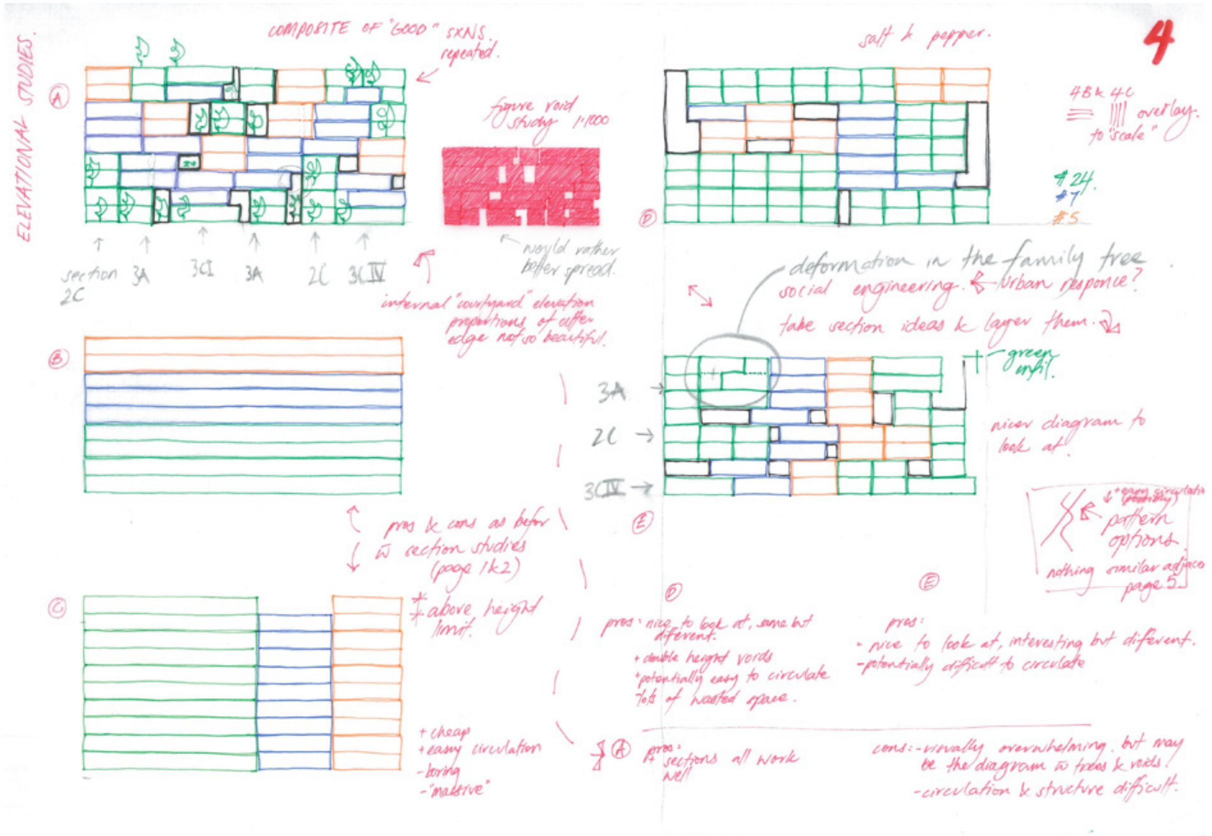


Figure A.19 Initial elevation studies of how unit types might be arranged in a consolidated, salt and pepper and later dispersed with voids highlighted in black.

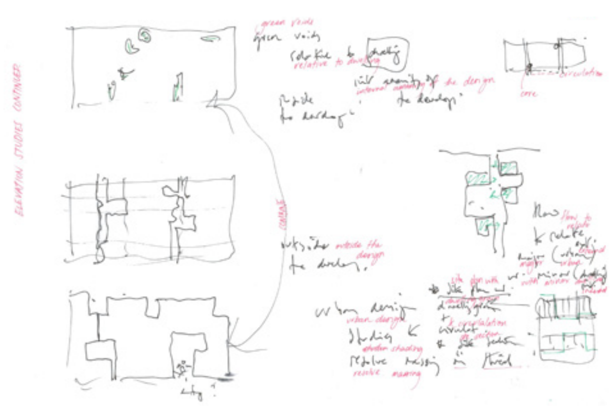


Figure A.20 Supervisor student conversation regarding circulation in green spaces

Figure A.22 Elevation studies of how unit types might be arranged with voids highlighted in black. Top right; the development of a 3D reading system where + means an offset towards, and - means an offset away to create the sections below

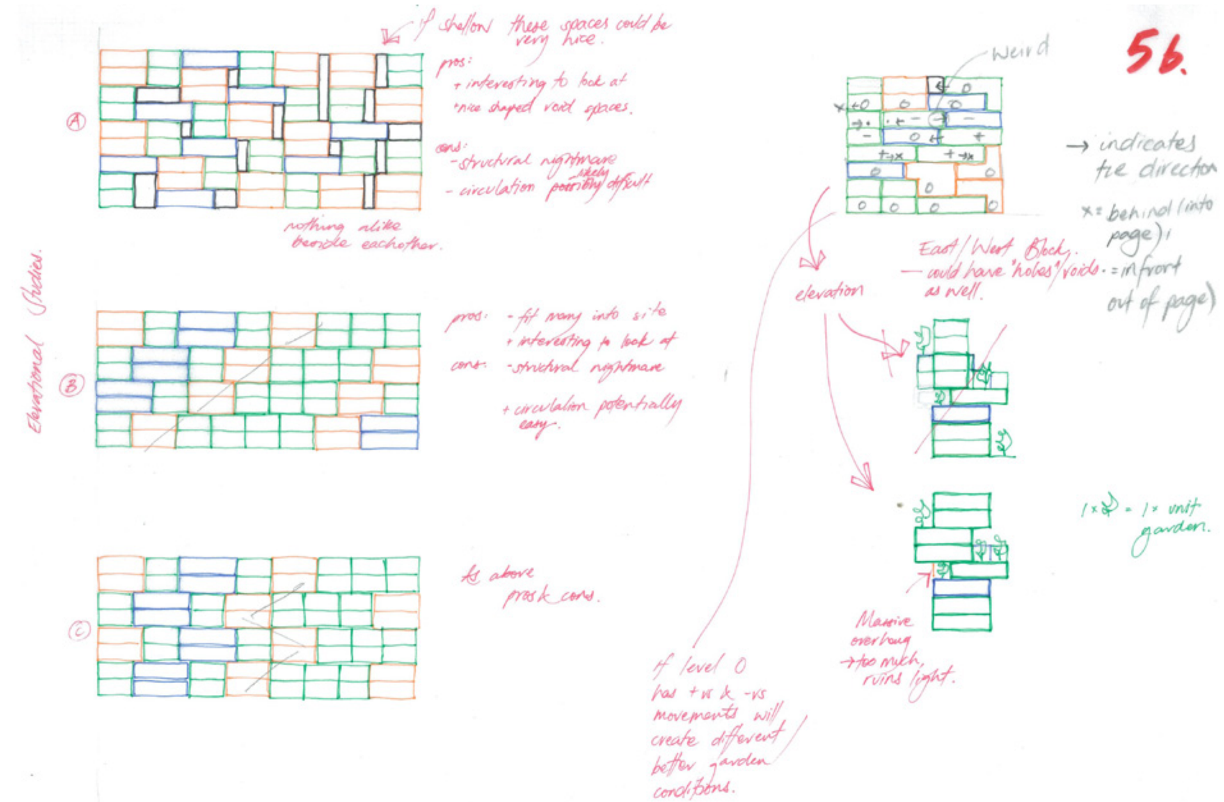
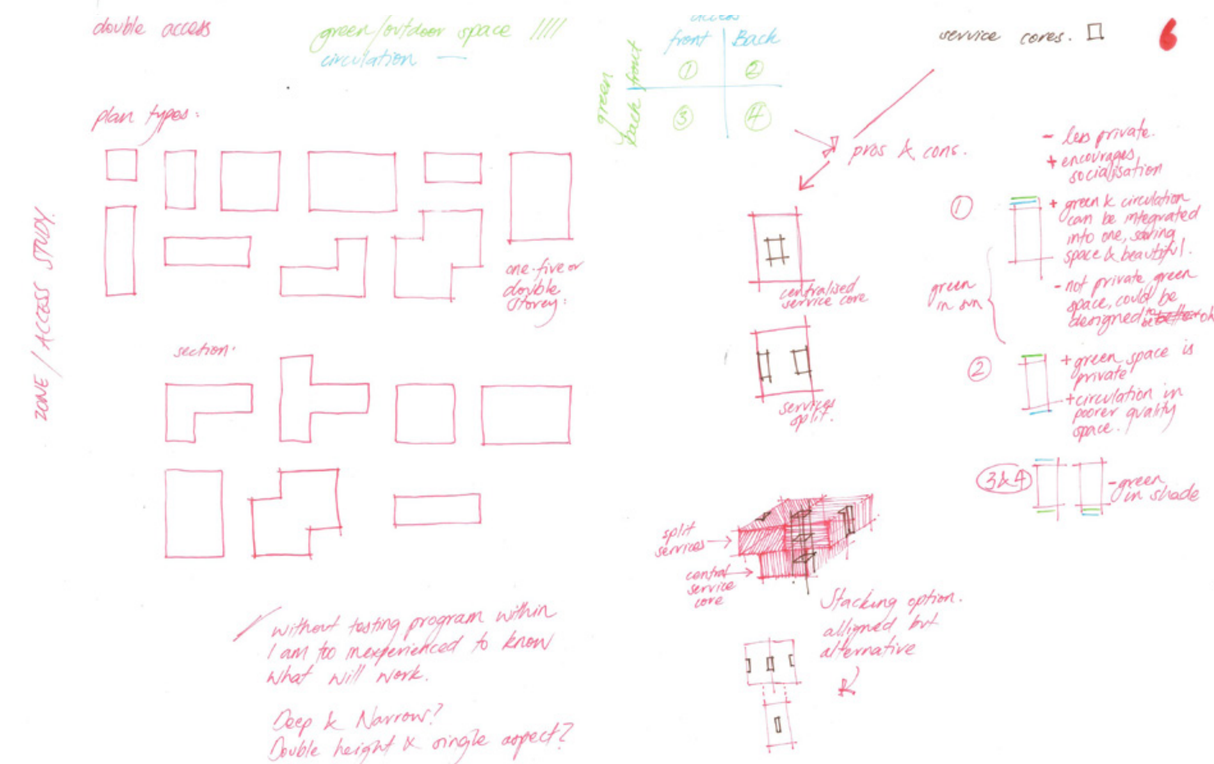


Figure A.21 Unit type observations in plan and section regarding services, circulation and green space relationships



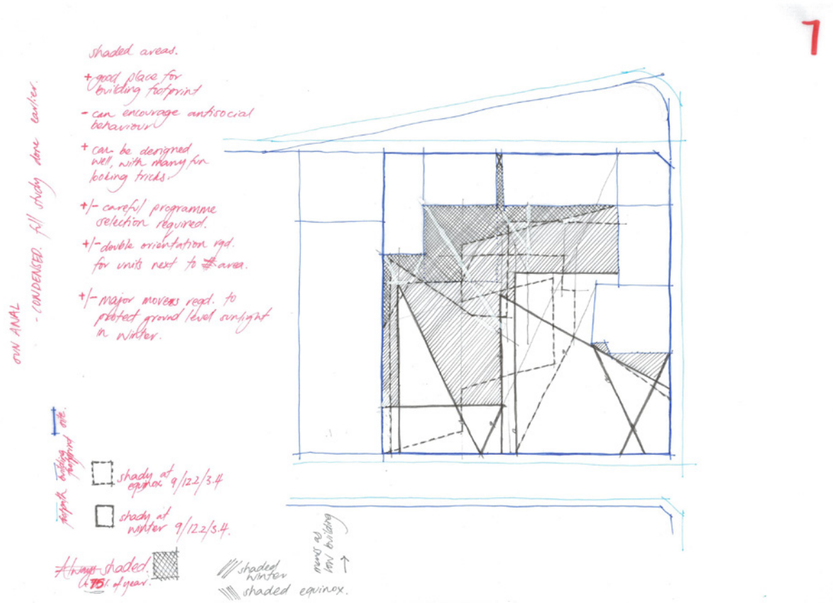


Figure A.23 Shadow plan of existing site solar study at 0900, 1220 and 1540 during the spring equinox and winter solstice

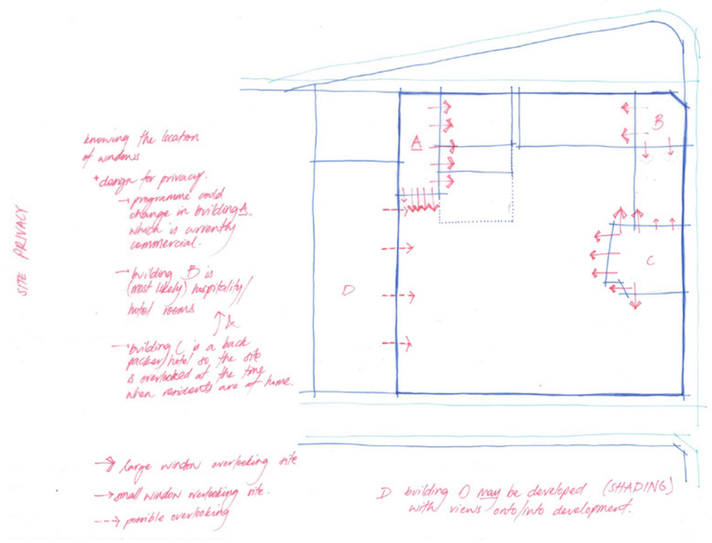


Figure A.24 Site privacy study highlighting views of site from adjacent buildings. Key concerns include building D as it may be built out to 27m too, building away from this edge will future proof units

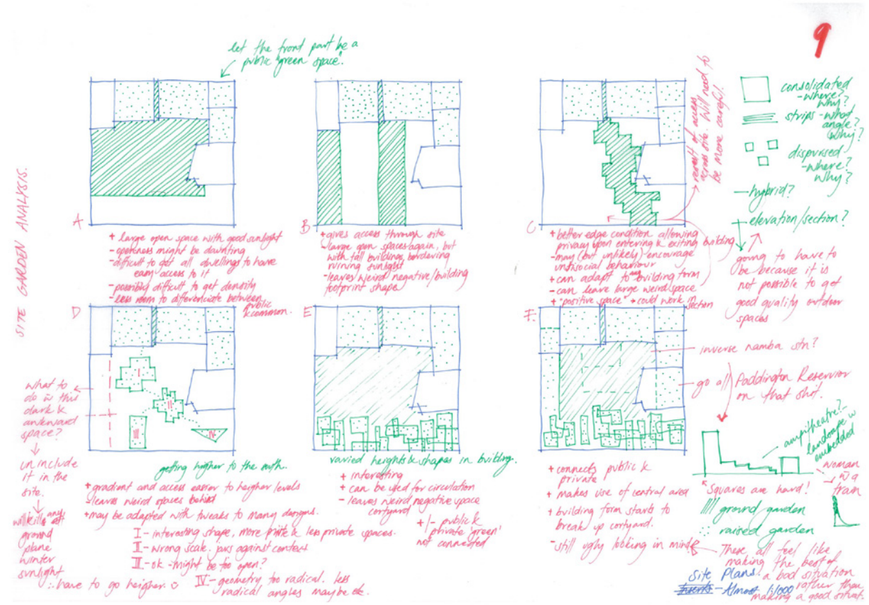


Figure A.25 Site garden arrangement options plan analysis

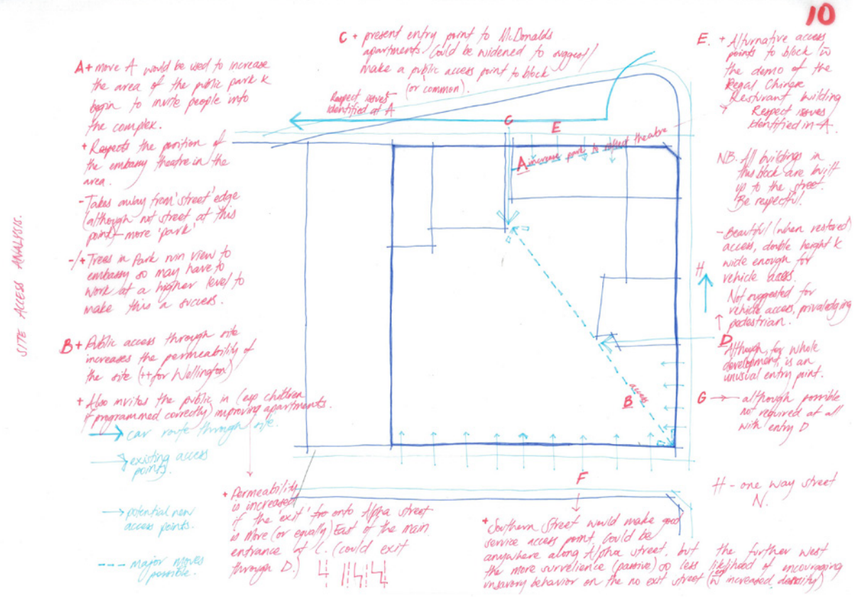


Figure A.26 Current and future site access opportunities

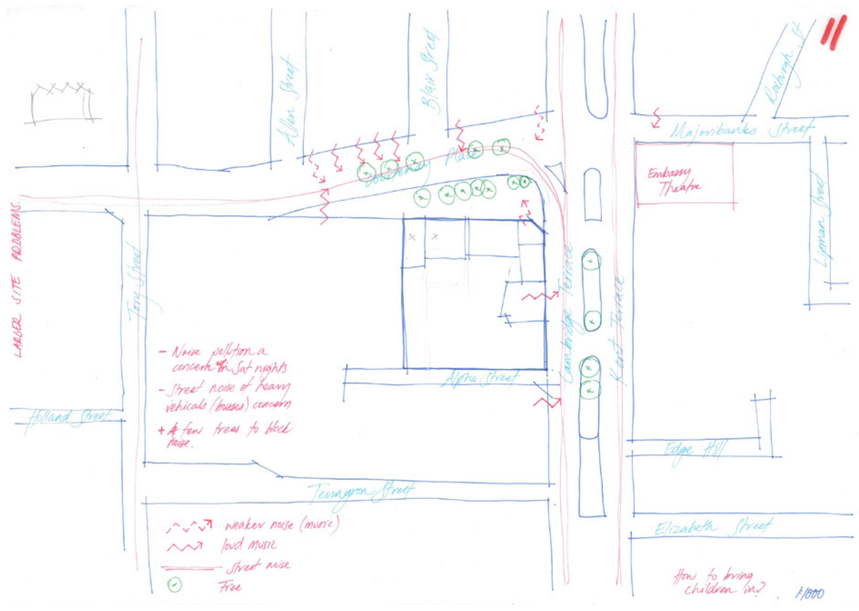


Figure A.28 Wider site audio privacy potential issues

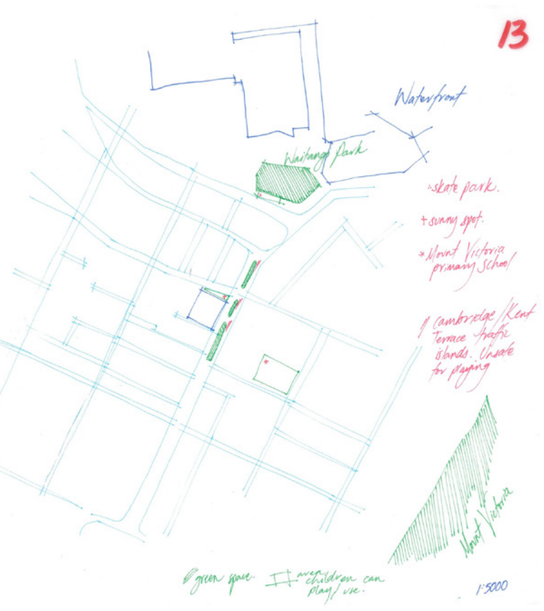


Figure A.29 Places for children and existing gardens in the vicinity mapped over same map

CHILDREN & GARDEN.

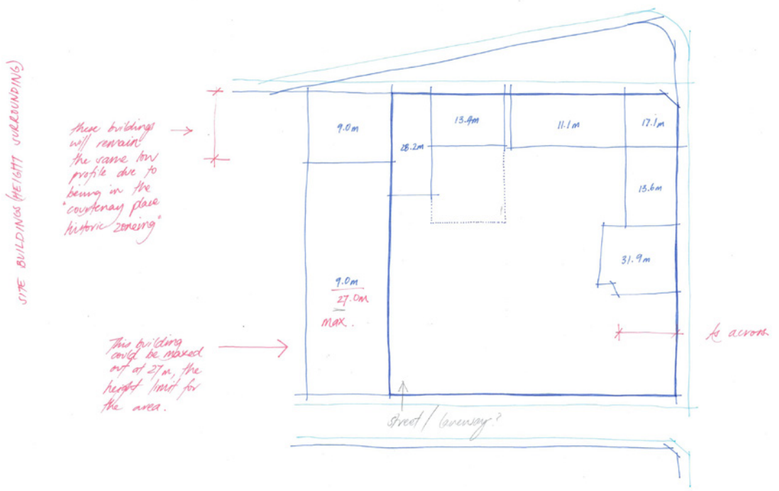


Figure A.27 Height of surrounding and existing site buildings

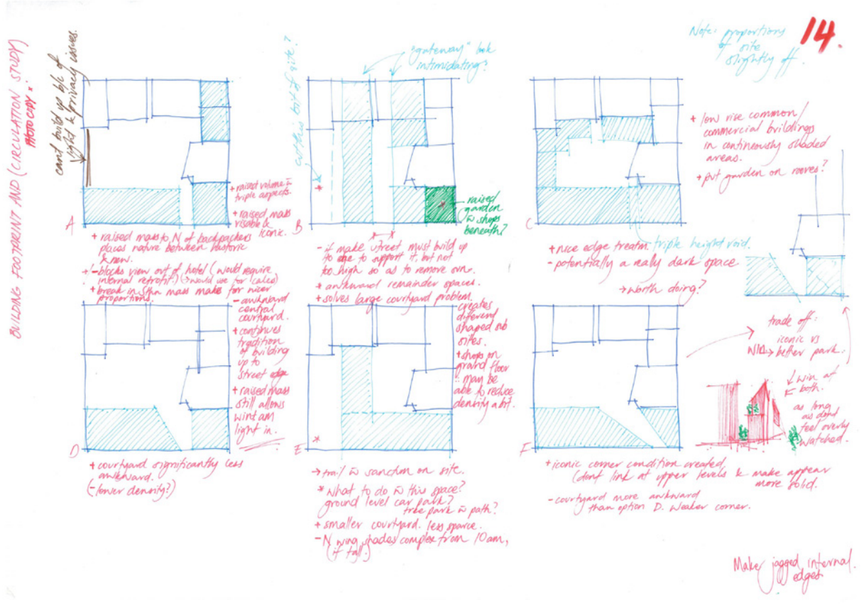


Figure A.30
Building footprint study nestled within the existing fabric

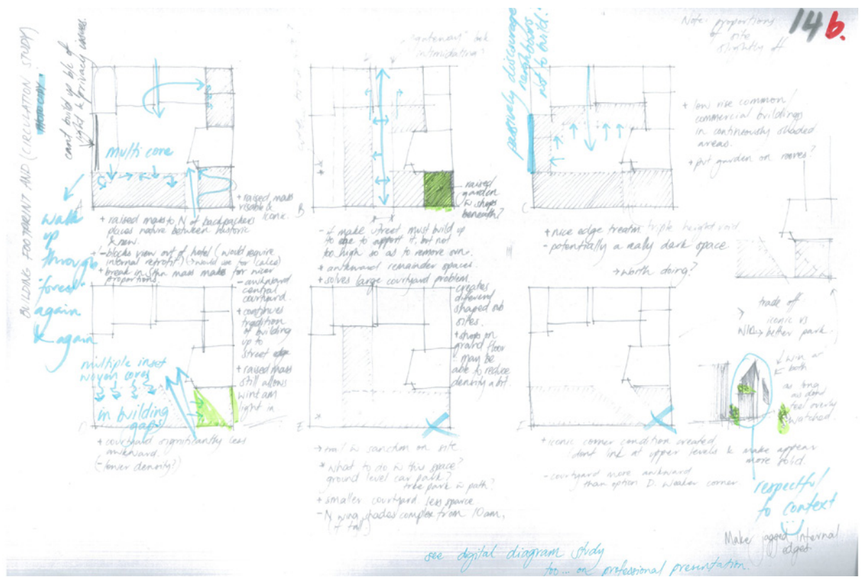


Figure A.31
Building footprint study in relation to circulation

Figure A.32
Detailed footprint study of selected design (design one page 14)

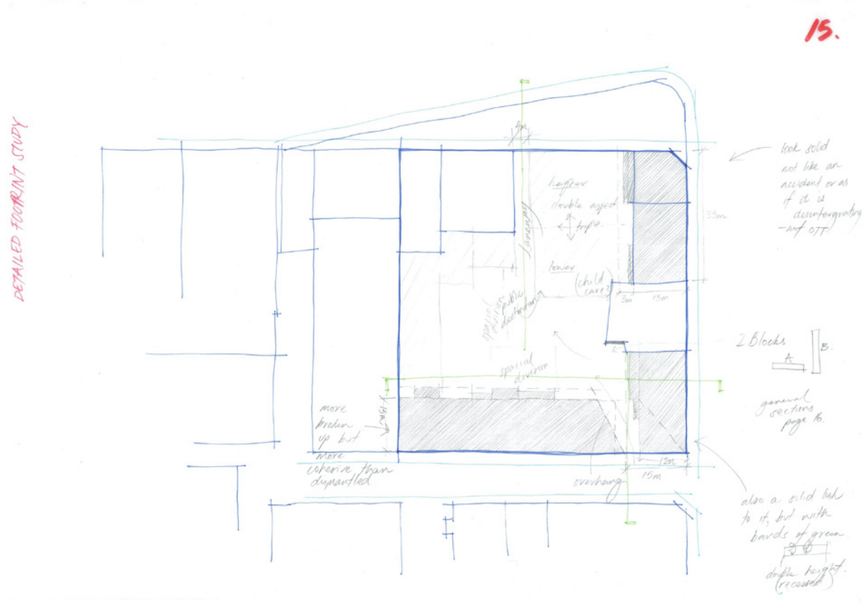


Figure A.33
Designing for an iconic moment that is respectful of context. View taken from Cambridge Terrace looking towards Courtenay Place

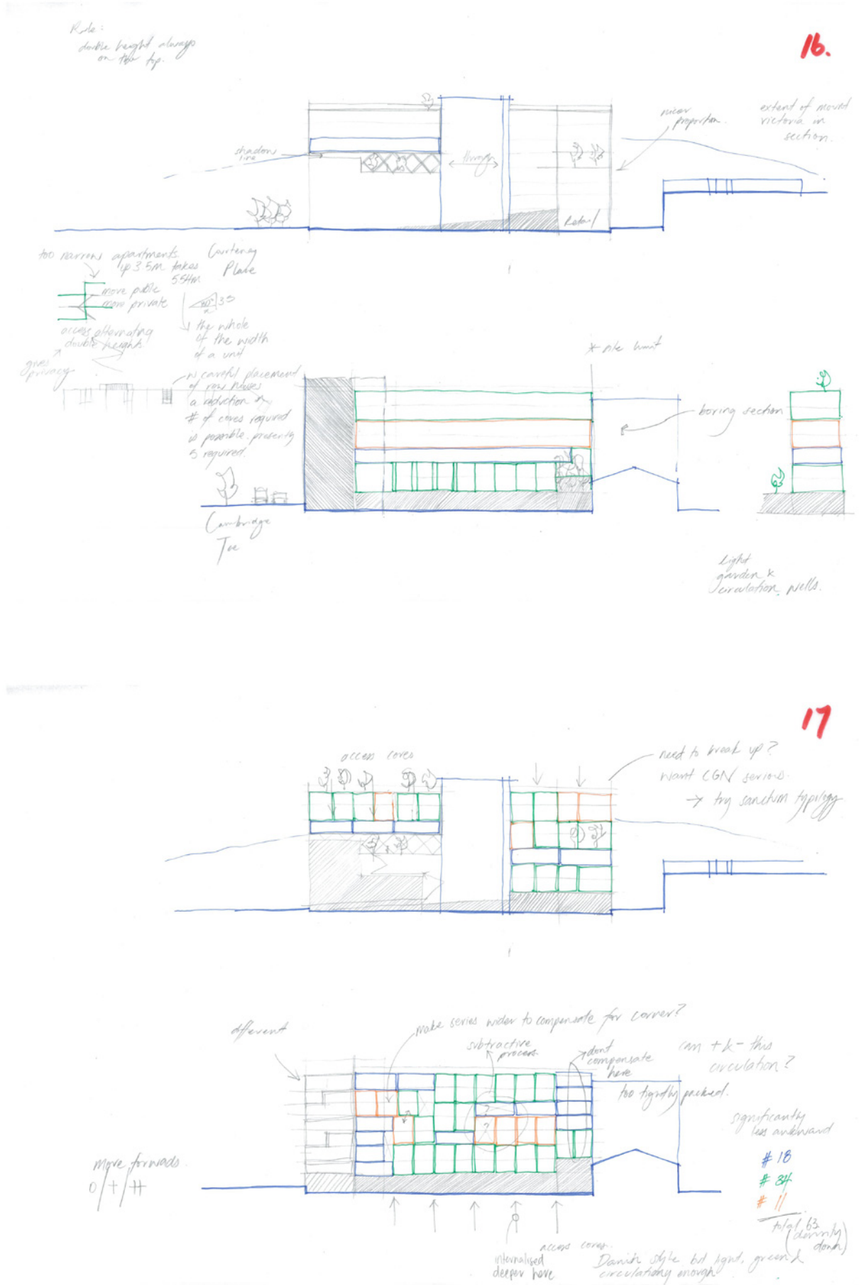


Figure A.34 Longitudinal and transverse study with simple layering of unit types in relation to surrounding built context 1:500 at A3

←

Figure A.35 Longitudinal and transverse study with salt and peppering of types in relation to surrounding built context 1:500 at A3

←

Figure A.36 Unit plan study testing external access with multiple cores and double height units. Circulation is dark, and there is lots of it forming a poor space ratio compared with unit space (m²) 1:100 at A3

→

Figure A.37 Inset of Manhattan Loft Gardens by SOM. Image source http://www.archdaily.com/248753/manhattan-loft-gardens-som/

→

Figure A.38 Study into Alternative plan options to provide interesting and more suburban like plans. Based off the 'Manhattan Loft Gardens' by SOM. Knowledge used to establish expected m² of each unit. This typology takes up much volume with fewer apartments performing poorly under the density criteria 1:100 at A3

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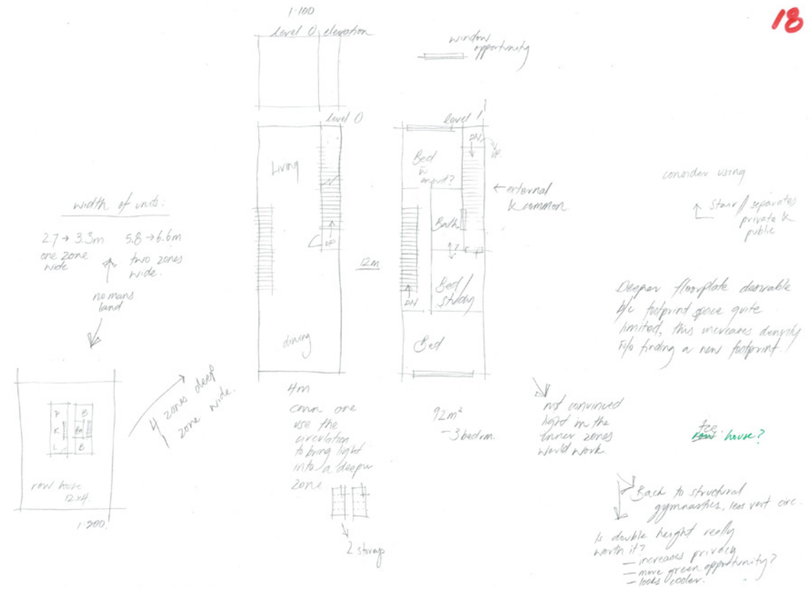


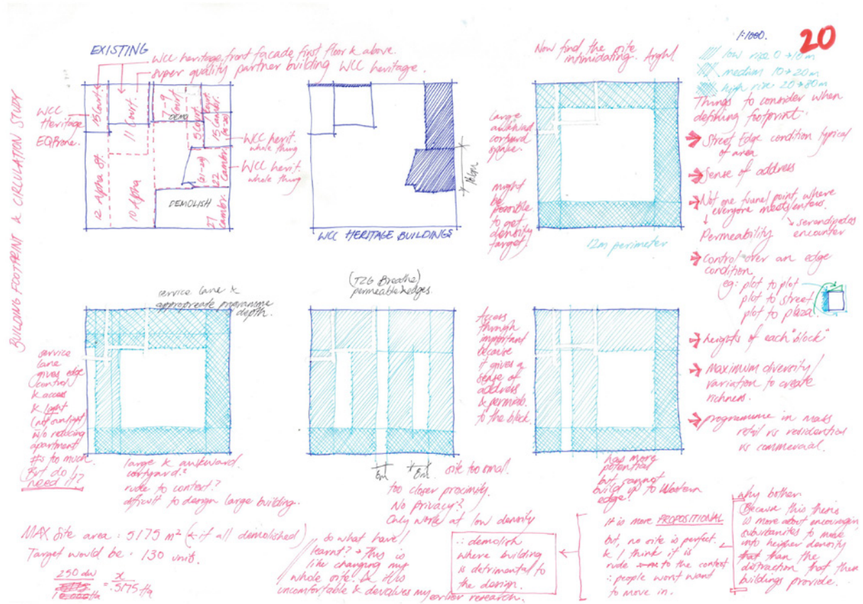
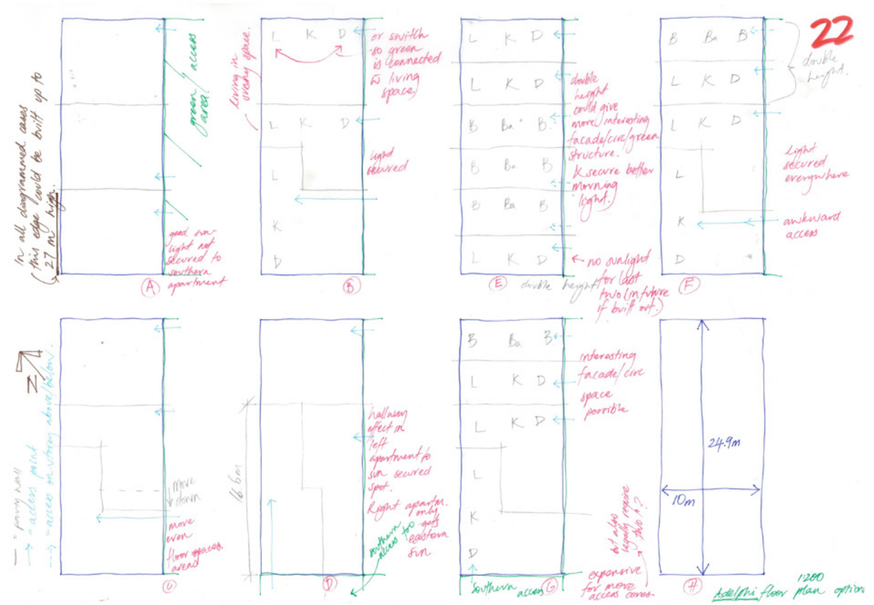


Figure A.39 Footprint study of site upon the demolition of existing buildings with reference to existing buildings

Figure A.40 Further building footprint and circulation studies



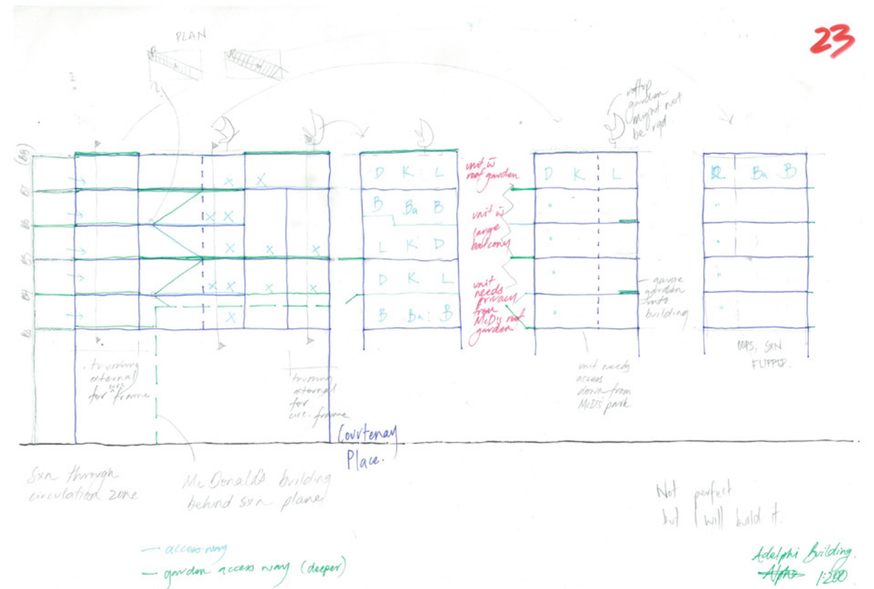


Figure A.41 Section studies through Adelphi Finance Building 1:100 at A3

Figure A.42 Take over of existing Adelphi Finance building on north eastern most plot of the site. Plan studies to establish different planning and circulation/access arrangements 1:100 at A3

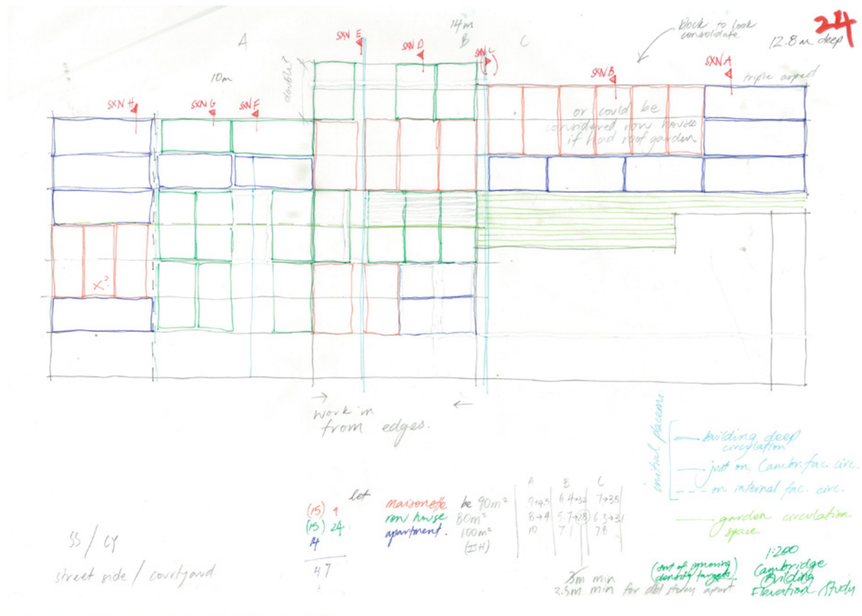


Figure A.43 Study of Cambridge Terrace block unit types layout 1:200 at A3

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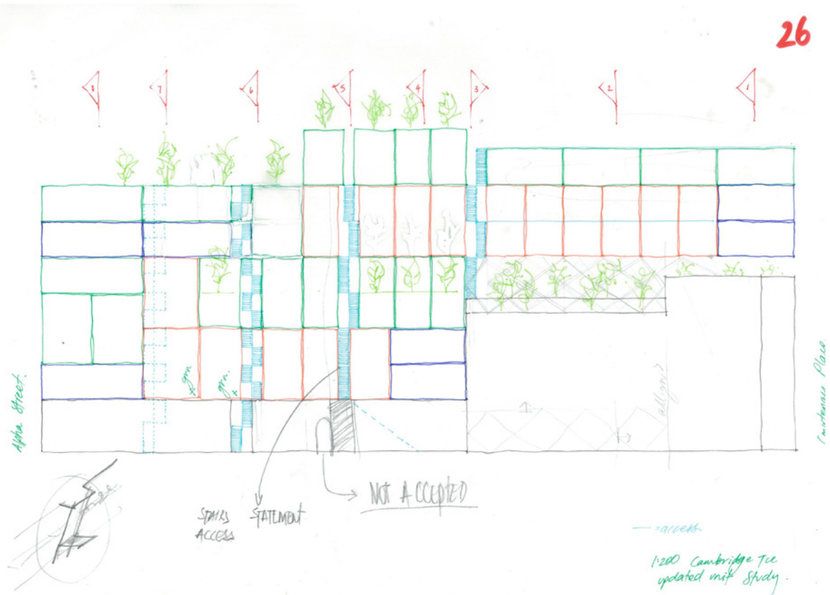
Figure A.44 Extrusions of the block in and out of the page to provide garden and circulation spaces to the salt and peppered units

←

Figure A.45 Development of Cambridge Terrace buildings to establish location of access and thus where gardens appear on the facade 1:200 at A3

→



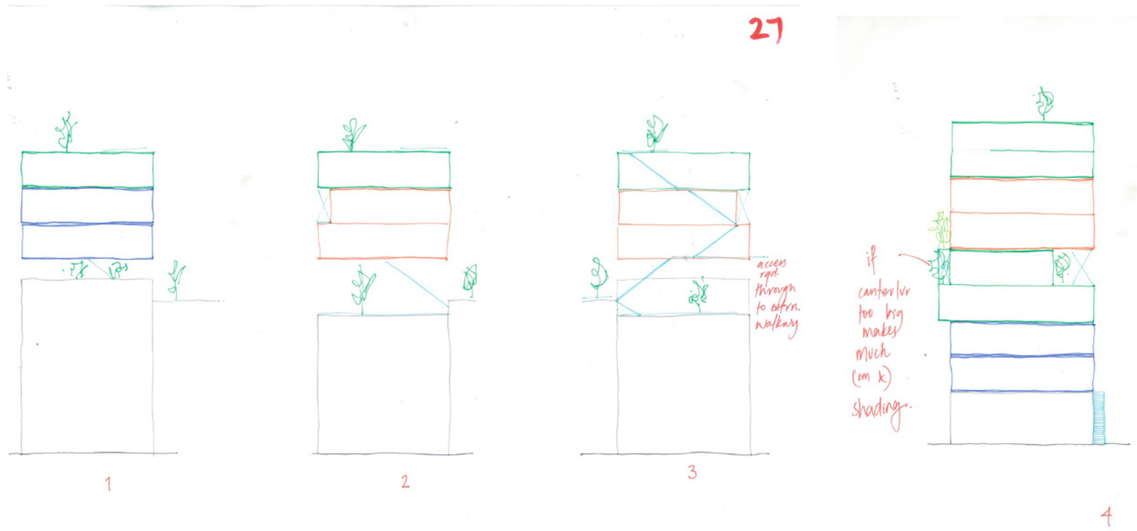


Figure A.46 Cambridge Terrace building sections developed to test the extrusion process of page 25 and establish if garden spaces and circulation will be of an appropriate size 1:200 at A3

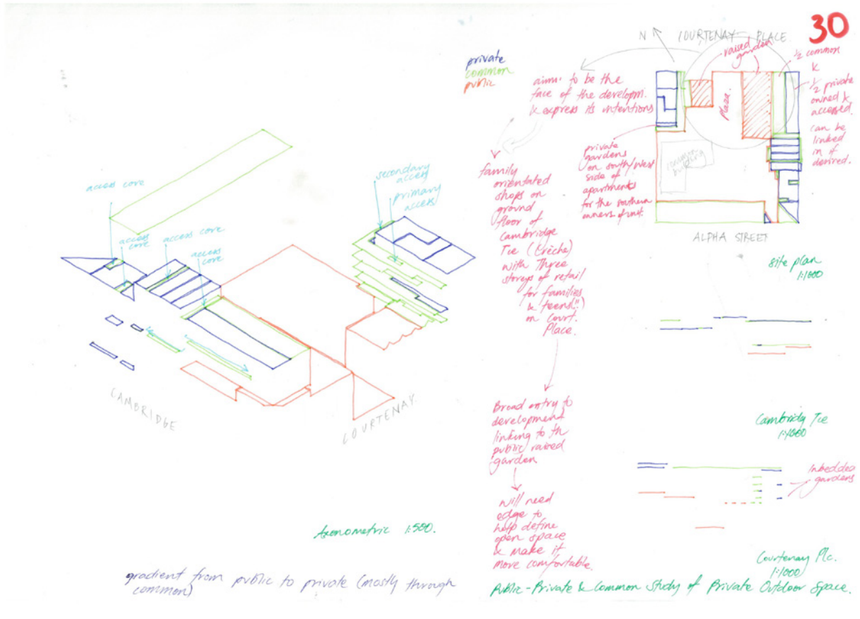


Figure A.47 Public, Common, Private study of site

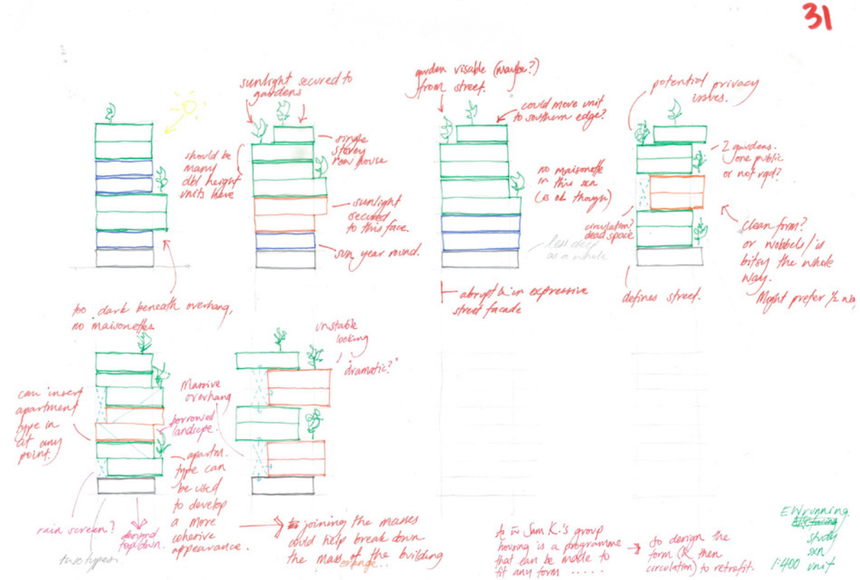


Figure A.48 Alpha Street buildings (sectioned in the north-south direction) unit layout options

Figure A.50 Initial studies of the interstices forming the vertical circulation spaces

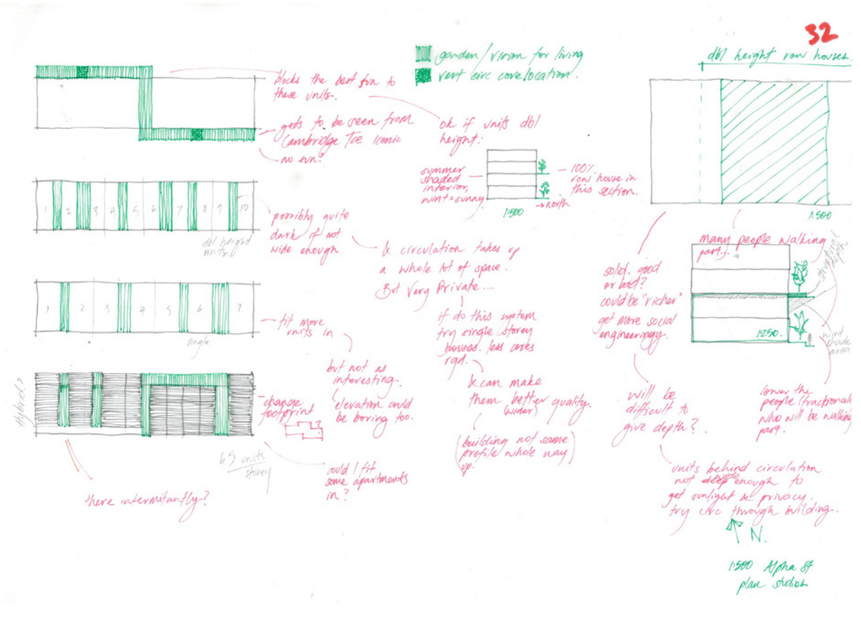
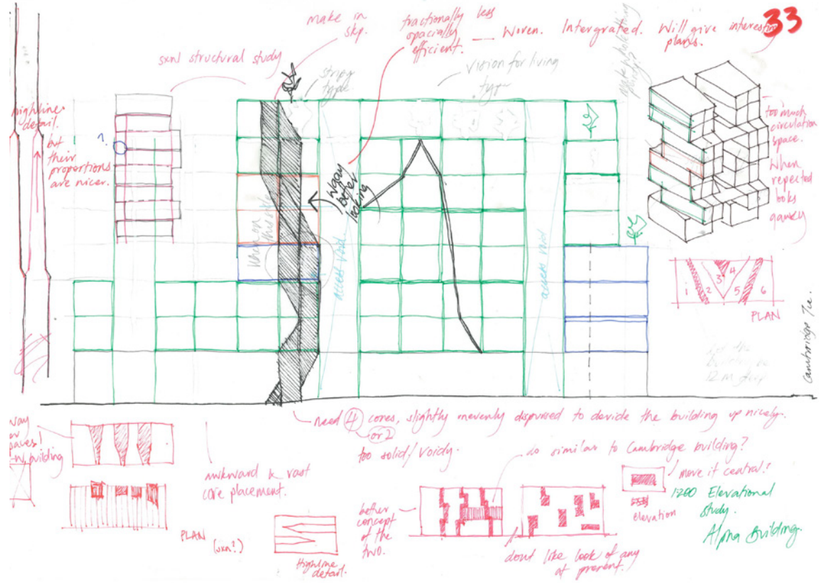
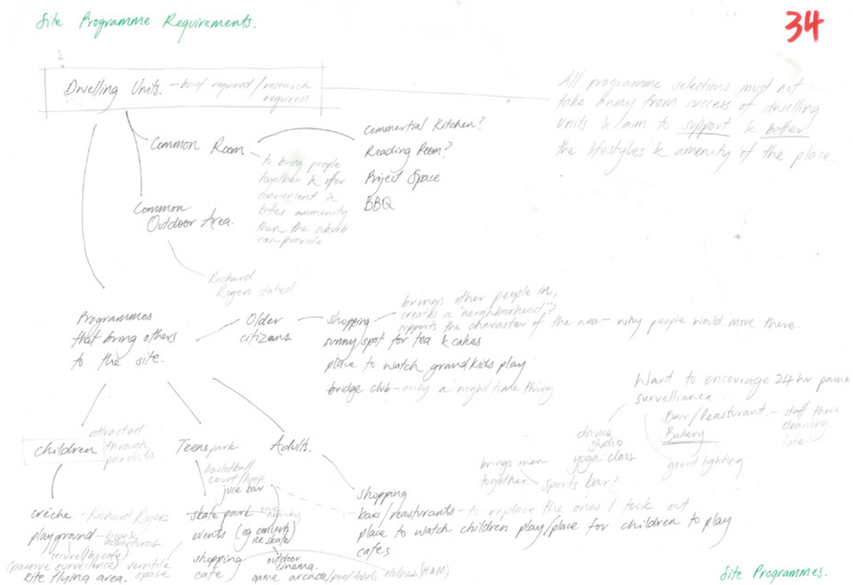


Figure A.49 Study looking at the articulation of circulation zones, with regard to solar access





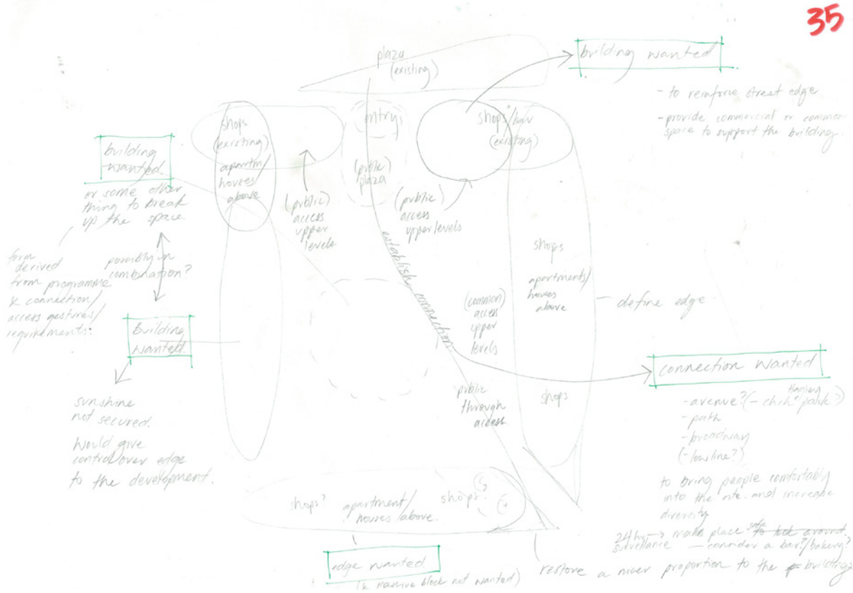
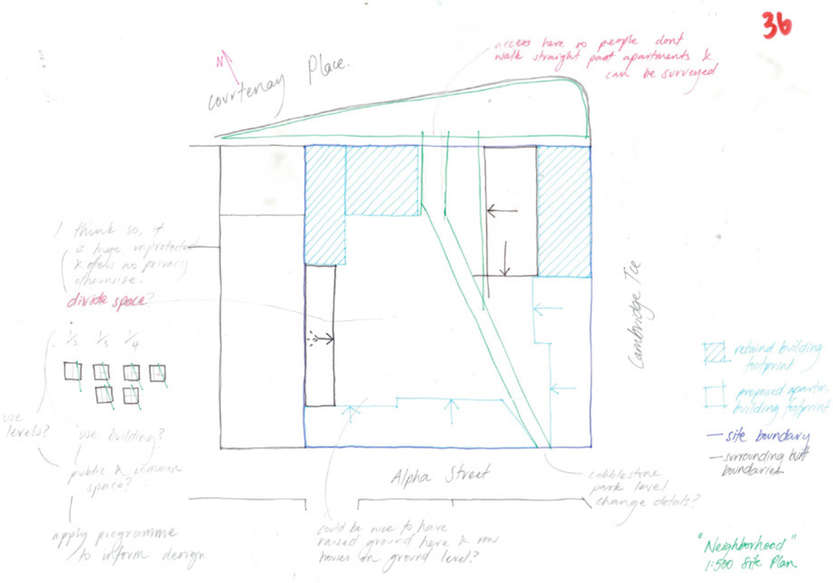


Figure A.51 Site plan study looking at the effect each building/massing move has on the site master plan

Figure A.52 Critiquing Rogers' 'Towards and Urban Renaissance' and looking to integrate more site specific programmatic requirements



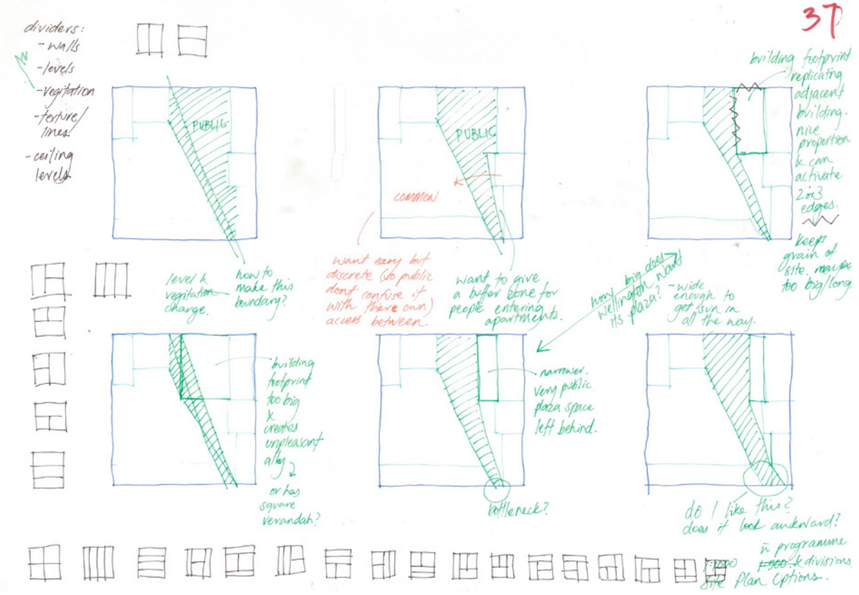


Figure A.53 A study of public access to the site and development permeability

Figure A.54 Breaking up the building masses' site footprint to make the site less large

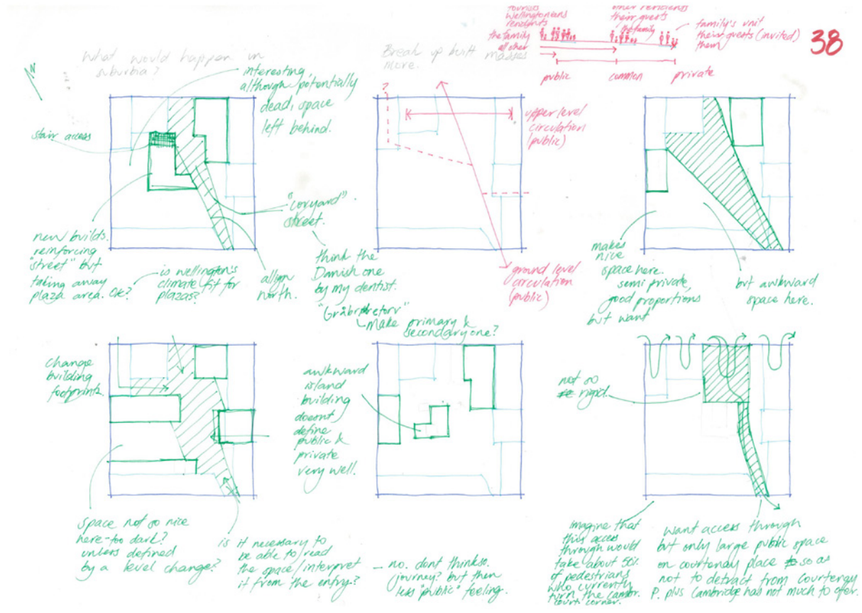


Figure A.55 Continuing the study of public access to the site and development permeability

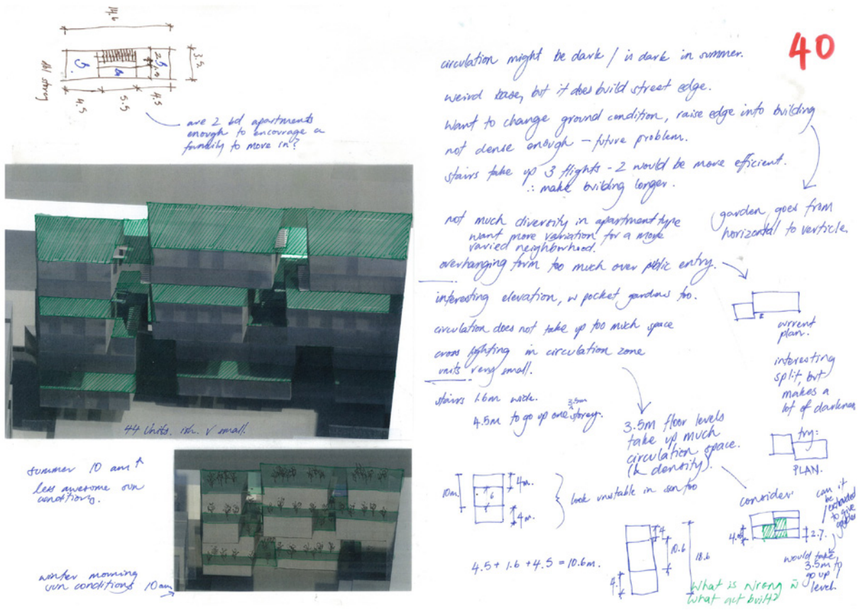


Figure A.57 Digital circulation study of the Alpha Street block

Figure A.56 Study of the subdivision options for the internal park

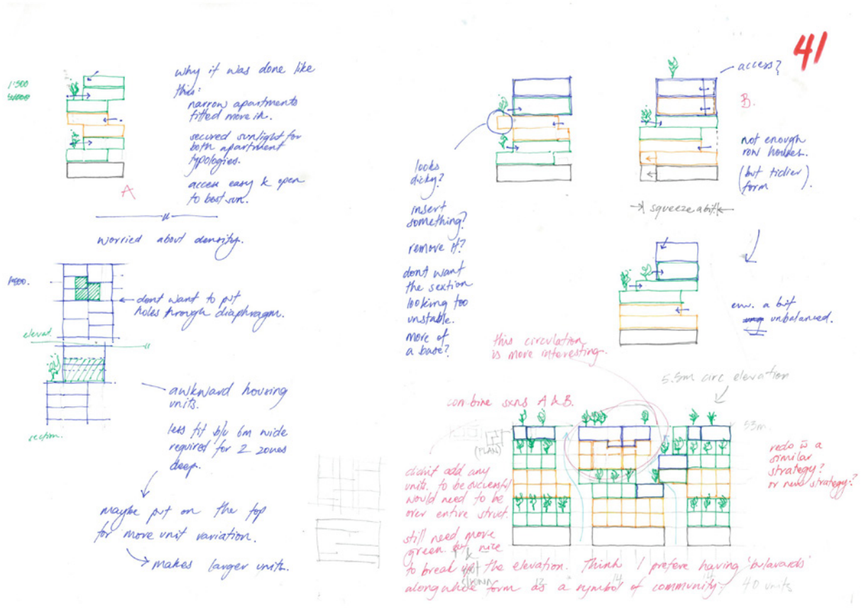


Figure A.58 Alpha Street design of vertical core shapes

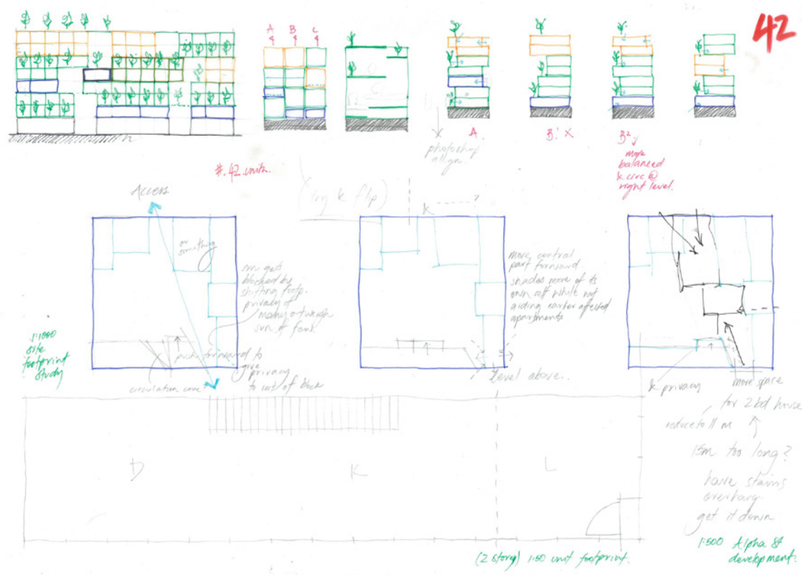
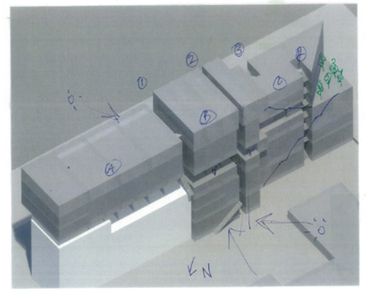


Figure A.59 Alpha Street building unit and site access study

Figure A.60 Cambridge Terrace circulation study and mass model



stair cases all too narrow. 1.6m min. (2250 - main school stair)
43
aim for 2m so people can stop & discuss/talk with neighbours.
Want to embed stair case (1) into P.O. building so the stairs are more grand & the reflected mass above is more "pure"
Can design truss for secondary building interphase
Stair (2) could be more interesting., or more 'pure' (in line with theft)
not preference
combine stair (3) & (4)? like the direct link stair 4 has to the garden.
Or put circulation less 'hidden' on exterior.
harder to service all apartments.
Or put at back bit (5) forward (West) & make green circ (as in Adelphi building) on West face.
↳ would make less "inner walkway".

Improvement Potentialities

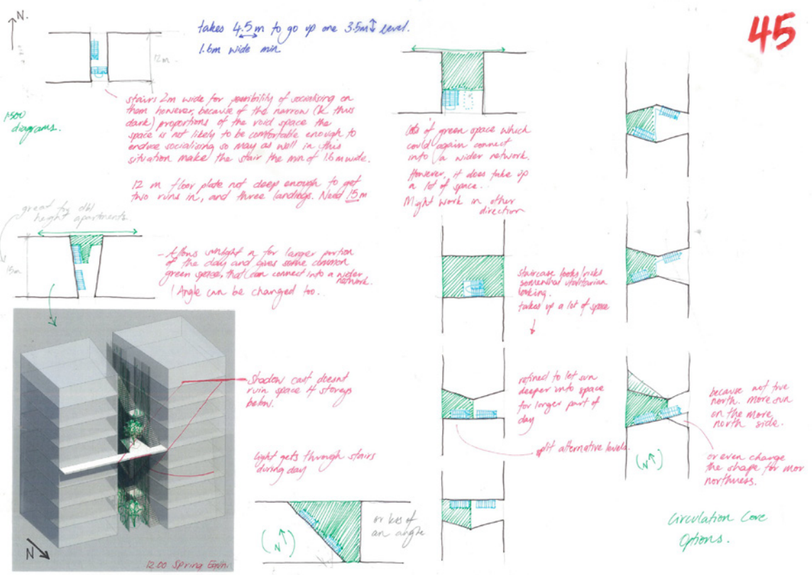


Figure A.61 Circulation core solar studies

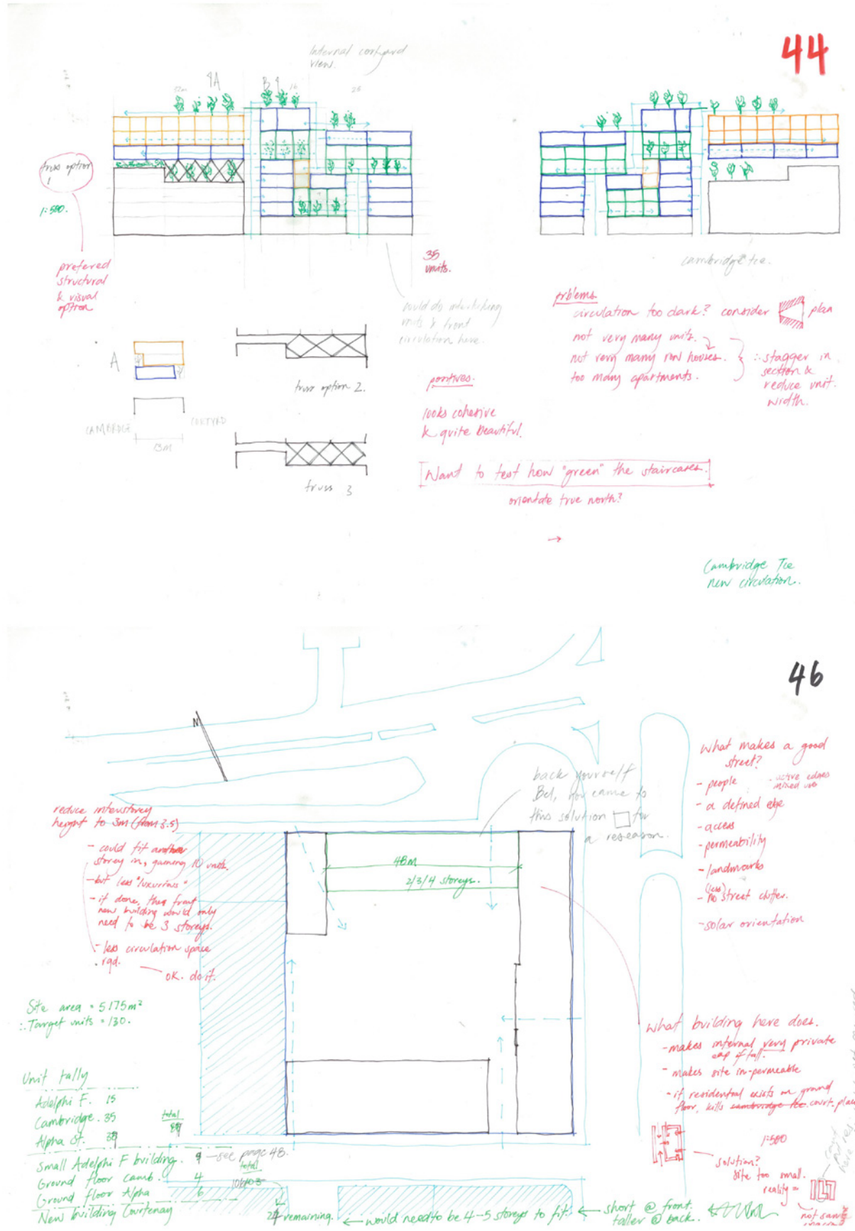


Figure A.62 Cambridge Terrace individual unit access studies

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Figure A.63 New Courtenay Place building options study

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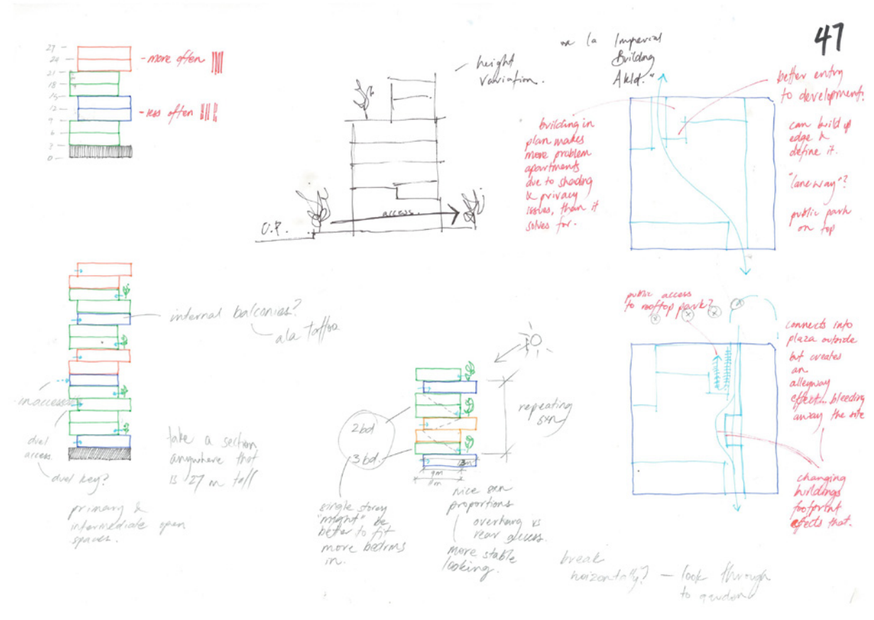

Figure A.64 Courtenay Place Building tectonics and unit stacking study

→

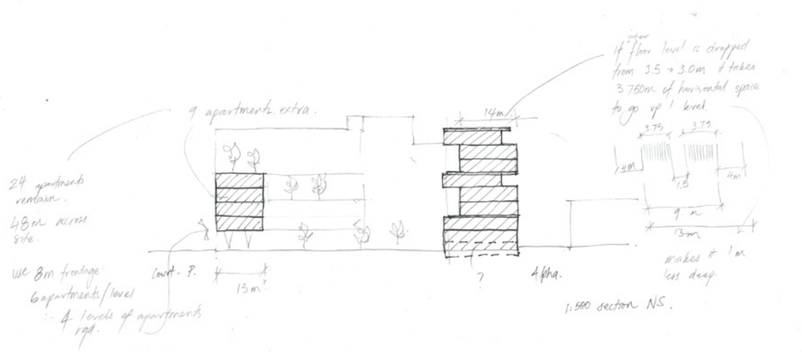

Figure A.65 Initial site section through new Courtenay place building. Discovered at this point a shadow plan will also be required to assess the northern intervention and aid the decision making process.

←

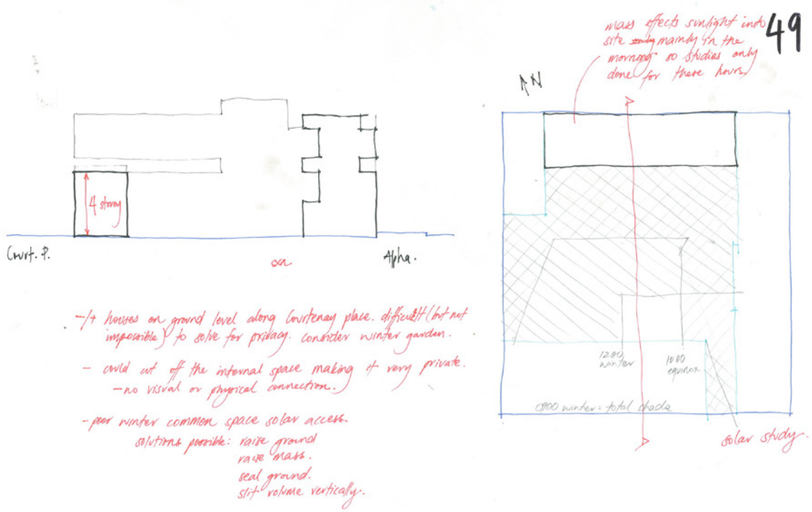

Figure A.66 Option one; a four storey bar building along Courtenay Place edge with associated shadow plan

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Figure A.67 Option two; an elevated four storey bar building with visual and physical access through to internal public courtyard

→

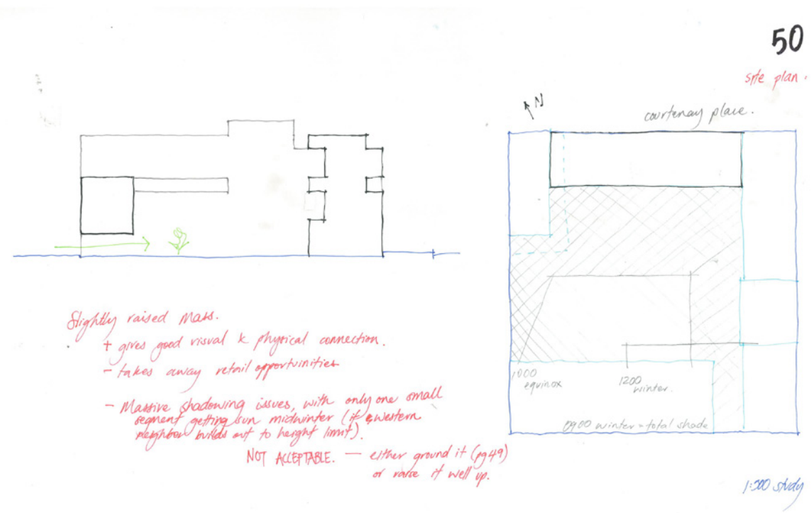

Figure A.68 Option three; a split building because raising the mass by one storey had a significant negative effect on the internal courtyard. This attempts to bring more winter sun into the courtyard between the building and the ground plane

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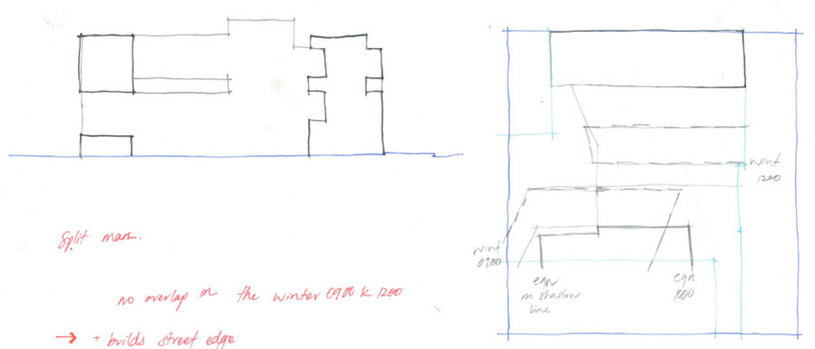


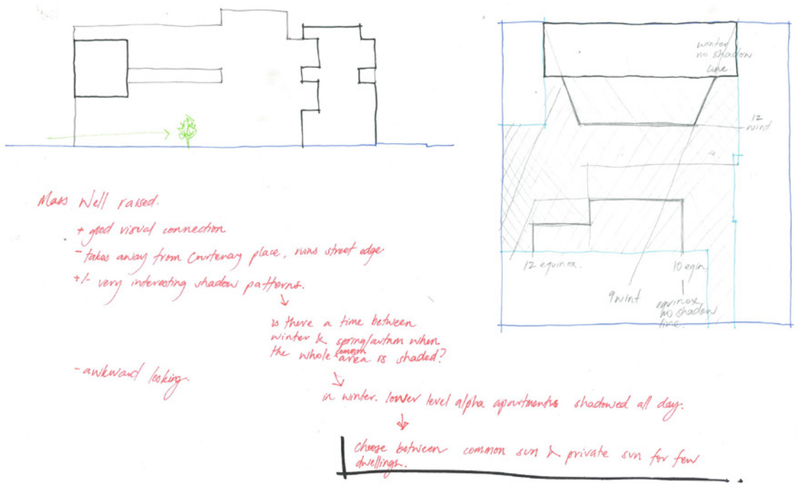


Figure A.69 Option four; a raised four storey building to increase solar coverage of courtyard area in winter

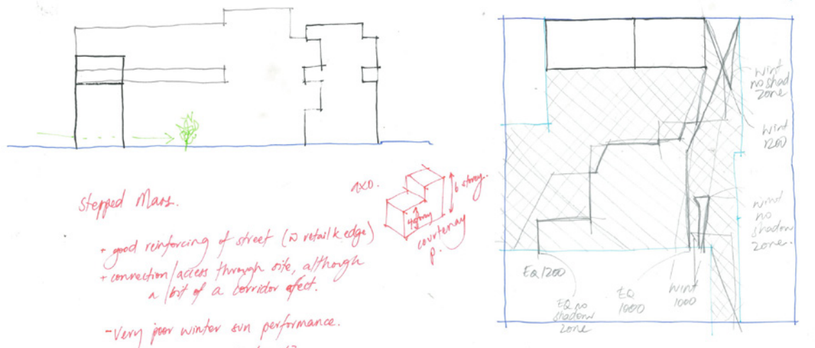


Figure A.70 Option five; a stepped mass, higher on the eastern edge, to move mass into an area that has the least effect on the building's solar performance

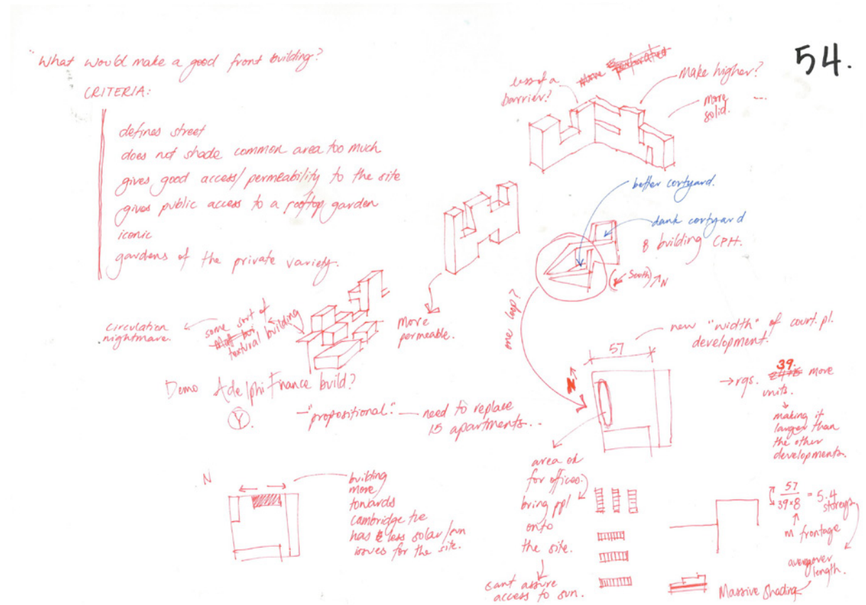


Figure A.71 Studies on the building as an object

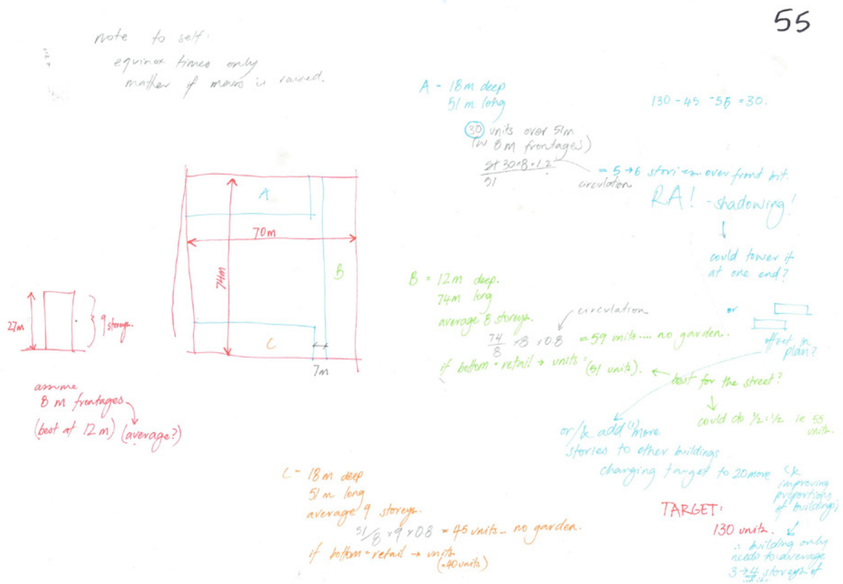


Figure A.72 Rough calculations of the expect units to come from each unit to ensure the targeted density will be met

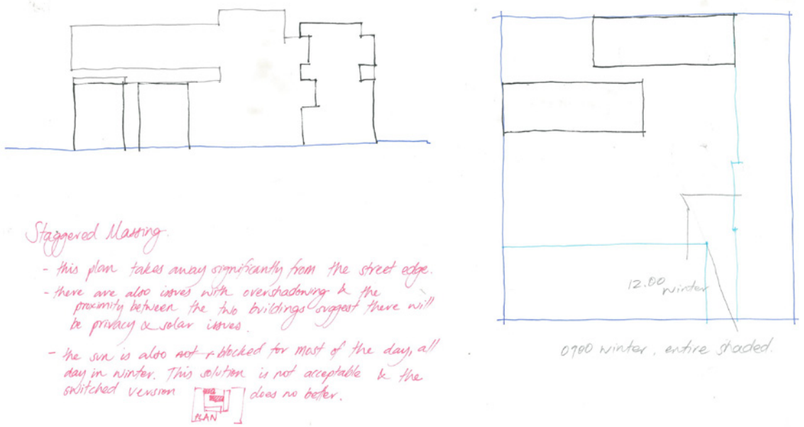


Figure A.73 Option six; staggered massing experiment to try and increase volume, while not building too high

Figure A.74 Option eight; a four storey bar building with visual access though to internal courtyard with a taller tower closer to Cambridge Terrace

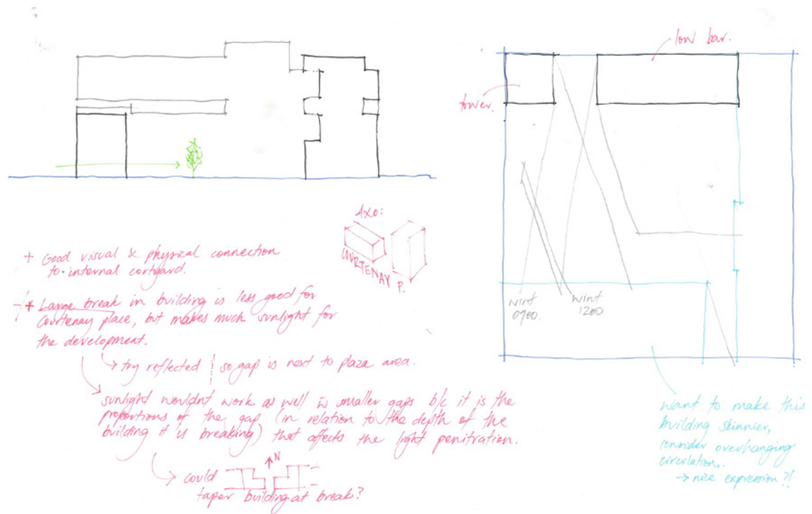


Figure A.75 Option seven; a four storey bar building with visual and physical access through to internal public courtyard

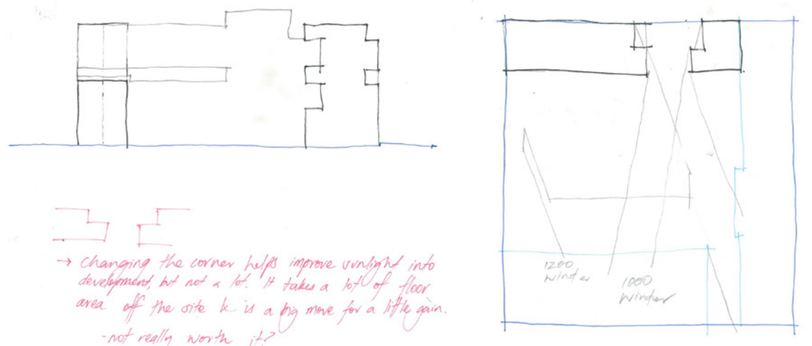
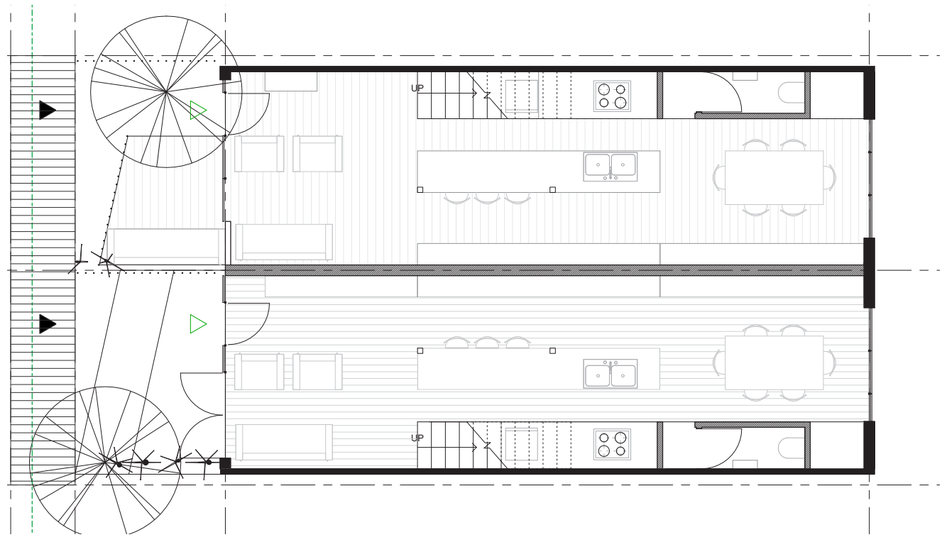
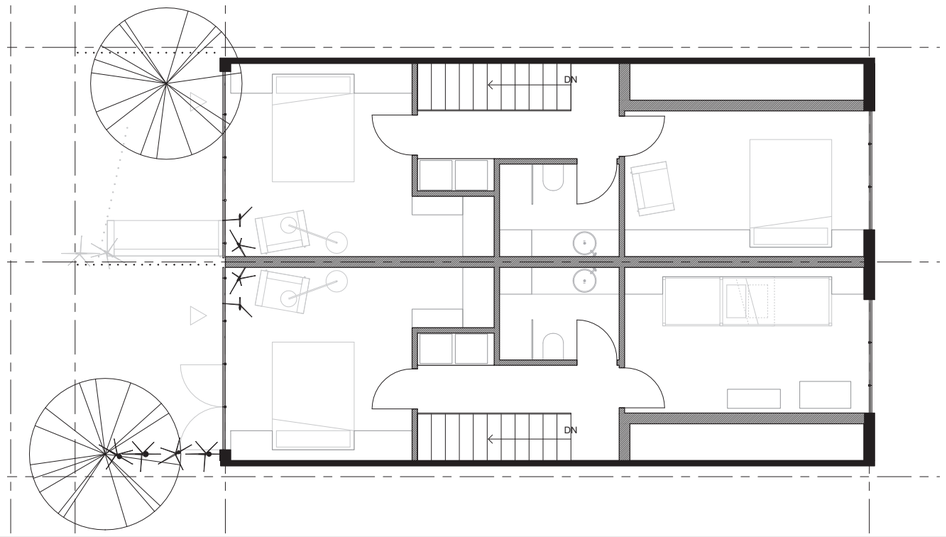


Figure A.76 Option nine; building on from option eight, but altering the articulation of the corners to allow more sunlight into the courtyard

A.5.4 Design Test Five Unit Type Studies





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EAST WEST ASPECT ORIENTATION
Terrace House Types

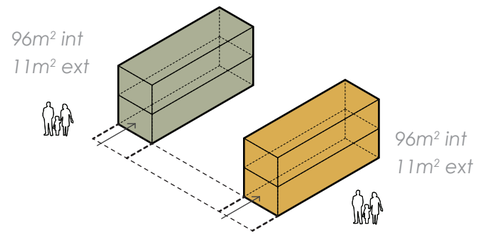
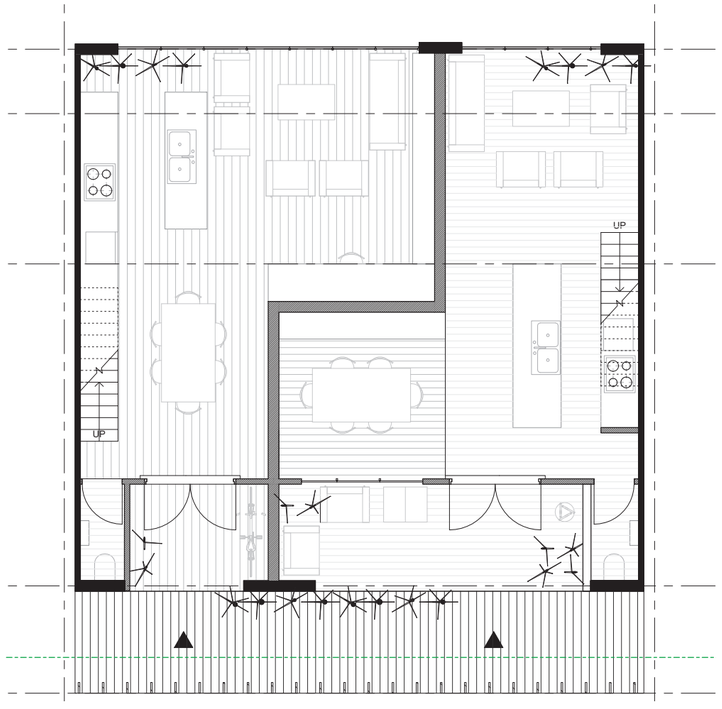
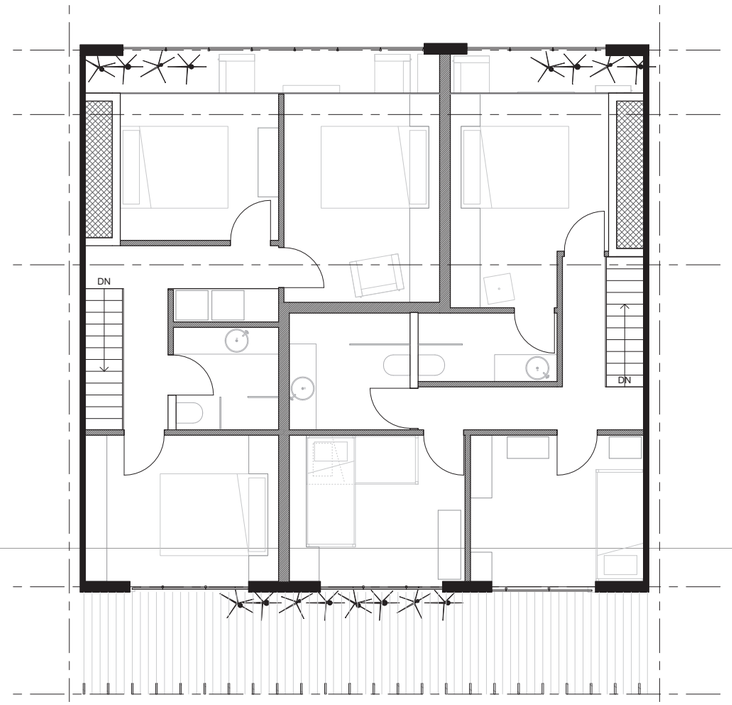


Figure A.77 Example of East West orientated terrace house :: Both suitable for a small family :: Both incorporating a variety of garden elements within their symmetrical double storey forms





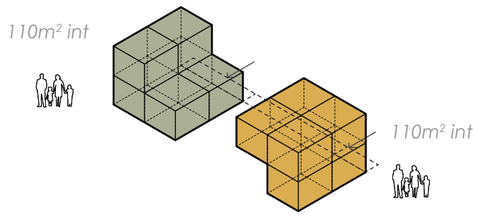


Figure A.78 Example of North South orientated maisonette :: Both suitable for large families :: Both incorporating garden within their interlocking forms

Architecture is not so much a knowledge of form, but a form of knowledge

-Bernard Tschumi