HALF A GOOD HOUSE ///////////////// \

FLEXIBLE HOUSING FOR WELLINGTON HOME BUYERS

**HALF A GOOD HOUSE / **

INCREMENTAL HOUSING FOR WELLINGTON HOME BUYERS

By

Joshua Hans-Jan Dubbeld

A 120-point thesis submitted to the

Victoria University of Wellington

in partial fulfilment of the requirements for the

degree of **Master of Architecture (Professional)**

Victoria University of Wellington

School of Architecture

2016

ACKNOWLEDGEMENTS /\

Steve, thank you for your never-ending love, encouragement, support and (more than a few) reality checks throughout the last six years. This process wouldn't have been possible without you.

For similar sentiments I would like to thank my family, friends and colleagues who have guided me through my time at university, as well as my supervisor Marc Aurel Schnabel who has been a great help in navigating this process of design research.

ABSTRACT / \
A FLEXIBLE APPROACH TO HOUSING

Increasing population and changing family demographics are driving the need for new and more sustainable housing solutions. Medium-density housing is recognised as a sustainable approach to accommodate future growth within urban centres, challenging suburban sprawl and creating efficient, affordable dwelling. This thesis explores a process to generate a more progressive approach to medium-density housing, favouring individual personalisation over inflexible environments that package the occupier.

Through the review of precedents, successful principles were used in a series of design studies that examined the potential for gridded spaces to satisfy flexibility and variation, opportunities for community interaction and integration beyond the site. The design resolution was reached through applying those principles on a residential site in Wellington New Zealand. The final design proposes a new approach to housing through the 'half a good house' mantra where the bounds of the home are defined volumetrically (the first half), but the internal spaces and walls are free for the occupier to continually adapt depending on their unique and changing needs.

The general principles of the design can be applied to other Wellington sites and contexts. They can also be applied in other cities with similar urban housing problems in New Zealand and Australia. If successful, the principles could be developed into a viable solution to the varying and changing needs in future housing.

THESIS STRUCTURE / \

01 // \	02 //// \	03 ////// \	04 //////// \	05 ////////// \
INTRODUCTION	**SITE**	**LITERATURE REVIEW**	**PRECEDENTS**	**PROGRAMME REVIEW**
	Wellington's suburb of Newtown	Origins of 'Half a Good House'	Friedman's Grow Home	What do Wellingtonians expect from housing?
			Oubrerie's Miller House	
			Talli Architects' Tila Housing	
			Chang's Suitcase House	
			Beaven's Pitarua Mews	
			SANNA's Gifu Kitagata	
			Next 21	
			Barber's Donnybrook Quarter	

CONTENTS / \

Fig 1.01.   // Auckland's Stonefields Development demonstrating a typical sprawling housing development.

01A /// CONTEMPORARY NEW ZEALAND HOUSING / \
IDENTIFYING ISSUES WITH THE CURRENT SITUATION

We are currently witnessing a trend in Wellington where the dream of property ownership is becoming a distant one for many. This is often credited to competition and demand from established property owners, wealthy immigrants and developers who drive the prices beyond what many can afford. Often overlooked is an emerging problem as shifting family demographics and a resultant shrinking in household size creates a demand for property far exceeding Wellington's projected rate of population increase. The problem then becomes one of not only providing new housing, but providing it in a manner that affords sufficient diversity and choice for a variety of household compositions.

New, detached housing developments are doing little to ease this housing shortage problem; developments are slow, and prices in many cases remain out of reach of the 'have nots'. These solutions are predominantly tailored towards the nuclear family and fail to acknowledge emerging social and housing needs and react to different life-styles, ages, family structures and cultural expectations. Furthermore, detached development is in many cases unsuitable in Wellington, where environmental and urban demands simply don't advocate for sprawling

Fig 1.02.   // Examples of monotonous medium-density housing in Wellington.

suburbia. New development therefore needs to be accommodated within the existing city fabric.

Infill housing, defined as the process of increasing urban density through the insertion of new housing in established suburbs, is recognised as an appropriate method for producing new housing in these situations. Designed and located properly, infill housing can satisfy a more diverse range of housing options, providing added social and environmental benefits such as improved personal safety, better local businesses, enhanced public transport, and better conservation of resources (Wellington City Council, 2007).

Unfortunately, Wellington's infill housing is too often represented by cost-driven, monotonous, identical units that advocate few positive benefits. There is therefore aptly placed negative stigma surrounding these housing types. Those who live in them see them as temporary solutions until something better is found. Those who live beside them fear a downgrading of social wellbeing, strains on resources and ill-fitting developments that are too dense and don't integrate with their neighbourhood (Wellington City Council, 2007).

It is the belief in this thesis that the physical environment provided by a dwelling only caters for half of what can be constituted as a 'home'; the other half should be provided by the inhabitant.

The question being answered therefore is:

How can more value be achieved in medium density housing so it may provide a wide range of diverse housing units, and respond to changes in the lifestyles and requirements of Wellington home buyers?

01B /// WORKING TOWARDS CHANGE / \
RESEARCH METHOD - PART A

This research has been undertaken in a parallel manner that seeks to explore multiple stages of possibilities that culminate in a final design. The first three stages focus on information collection relevant to housing shortage issues and examining potential solutions.

Stage One / Literature Review /

The literature review provides a platform for understanding housing issues within New Zealand and Australia. It then offers ideas to guide researching appropriate solutions.

Stage Two / Precedent Study /

Relevant precedents were selected for solving issues identified within the literature review. They are organised according to their relevance to issues of satisfying diversity through planning and internal flexibility or configuration; combining multiple houses in a dense manner; and integrating new, dense housing within an existing context.

Stage Three / Programme Study /

The programme study seeks to identify the existing nature, composition and layout of typical detached Wellington housing options. This stage asks the question - What do Wellingtonians expect from detached housing?

01C /// WORKING TOWARDS CHANGE / \
RESEARCH METHOD - PART B

The final three stages take conclusions derived
in Part A to develop targeted design approaches,
generating dense housing solutions with a focus
on flexibility, community and site integration.

Stage Four and Five / Flexibility and Planning
Exercises /

These stages strongly advocate for the provision
of diverse housing units that respond to changes
in the lifestyles of their occupants. They examine
the findings of the programme study and test this
New Zealand specific context against solutions
offered by the literature and precedent studies.

Stage Five / Integration and Site Specific
Response /

This stage identifies methods of collecting site
information deemed necessary to proceed with
integrating the findings of earlier exercises within
a specific context.

In negotiating and assessing the quality of the outcomes of the fourth and fifth stages of research, a list of criteria was developed based on findings from the literature, precedent and programme studies. This list is applied, where relevant, through the design development, guiding decisions and providing an overarching means by which to assess outcomes against the desired project goals and identify trends or conclusions that may aid in moving forwards with a new housing model.

Flexible Private Space /

1.   Allow for the provision of dense housing units.
2.   Allow for adaptive response to a variety of occupants' needs.
3.   Allow for changes that are not one directional or fixed.
4.   Provide access to a variety of outdoor spaces.

Mediating Public and Private Space /

1.   Provide shared amenity where possible.
3.   Provide access to semi-public shared outdoor space for neighbouring units.

Density /

1.   Create densities of approximately 14 du/acre.

01E /// WORKING TOWARDS CHANGE / \
RESEARCH SCOPE AND SIGNIFICANCE

Research Scope /

The research focuses on housing issues pertinent to the Wellington home buyer and culminates in a site-specific response within the city's fringe suburb of Newtown. Early stages are intended to be more general in their nature so that they may be applied to a variety of contexts.

In solving identified housing issues, the research focuses on outcomes that favour flexibility and variety for changing family demographics and compositions. Demographic groups are kept general; rather than developing specific solutions, ideas are intended to emphasise loose-fit variation that can accommodate wide-ranging needs. These ideas are presented in a variety of medium density formats. Research does not preclude potential solutions offered by housing projects presented in alternative scales, densities and typologies.

Research Significance /

The ideas within this research, particularly in the early stages can be applied beyond the final, site-specific outcome. Early research was conducted independent of site and therefore the general principles have wider applications in designing flexible housing solutions, particularly in cities within New Zealand and Australia that mimic Wellington's social and environmental platform and urban housing pressures.

The design tools and methods used in producing the final outcome could furthermore be used in creating comparable developments in sites that share similar characteristics to that examined, forming the beginning of a new medium-density typology in New Zealand.

01F /// WORKING TOWARDS CHANGE / \
CURRENT PRACTICE VS FLEXIBLE MEDIUM-DENSITY

The 'Nuclear' Family Model

The Changing Family Model

Typical Medium-Density Housing / Plan
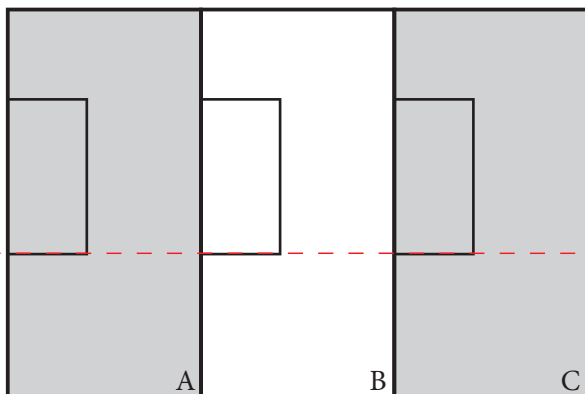
Diverse, Adaptable Medium-Density Housing / Plan
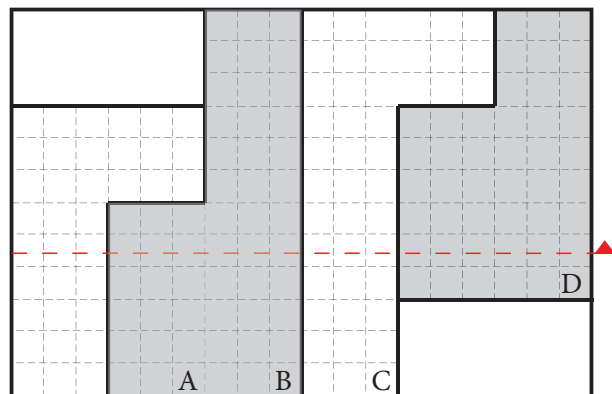
Typical Medium-Density Housing / Section
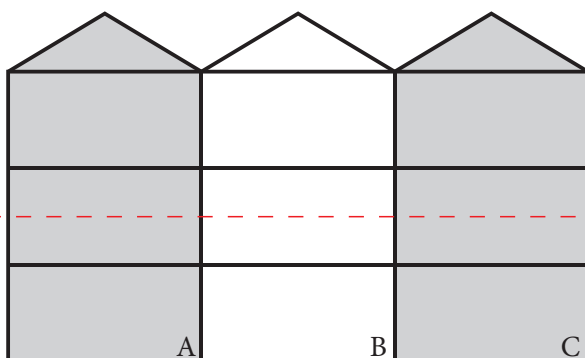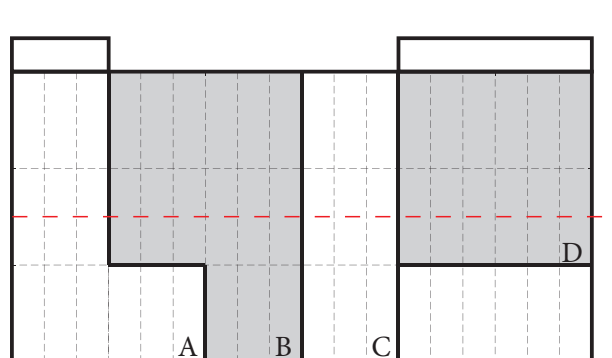
Diverse, Adaptable Medium-Density Housing / Section

Fig 1.03.   // Typical medium density housing practices vs. an adaptable approach that favours diversity.

02A /// WELLINGTON CITY / \
A CREATIVE PLATFORM FOR CHANGE

The project is located within New Zealand's capital city, Wellington. This city, with its steep, undulating landscape has evolved through slowly developing and occupying the limited land suitable for construction. Resultantly, this city, concentrated around its harbour, is inherently compact. Moving forward, there is little land left in reasonable proximity to its centre suitable for further development. This lack of ability to expand outwards defines Wellington as a place where higher density housing is a necessity, rather than an alternative to low-density suburban development.

A major consideration in this thesis is that the site is merely a conduit for applying and testing ideas of flexibility in medium density housing; site should be considered as secondary. However, the need for alternative housing solutions in Wellington, define it as the place most suited for testing, and will add the most poignancy, to these future focused ideas. Furthermore, Wellington's reputation as the "creative capital", mark it as an ideal platform for promoting alternative housing solutions to the rest of New Zealand.

Fig 2.01.   // View looking north towards Wellington's Central Business District and the suburb of Te Aro.
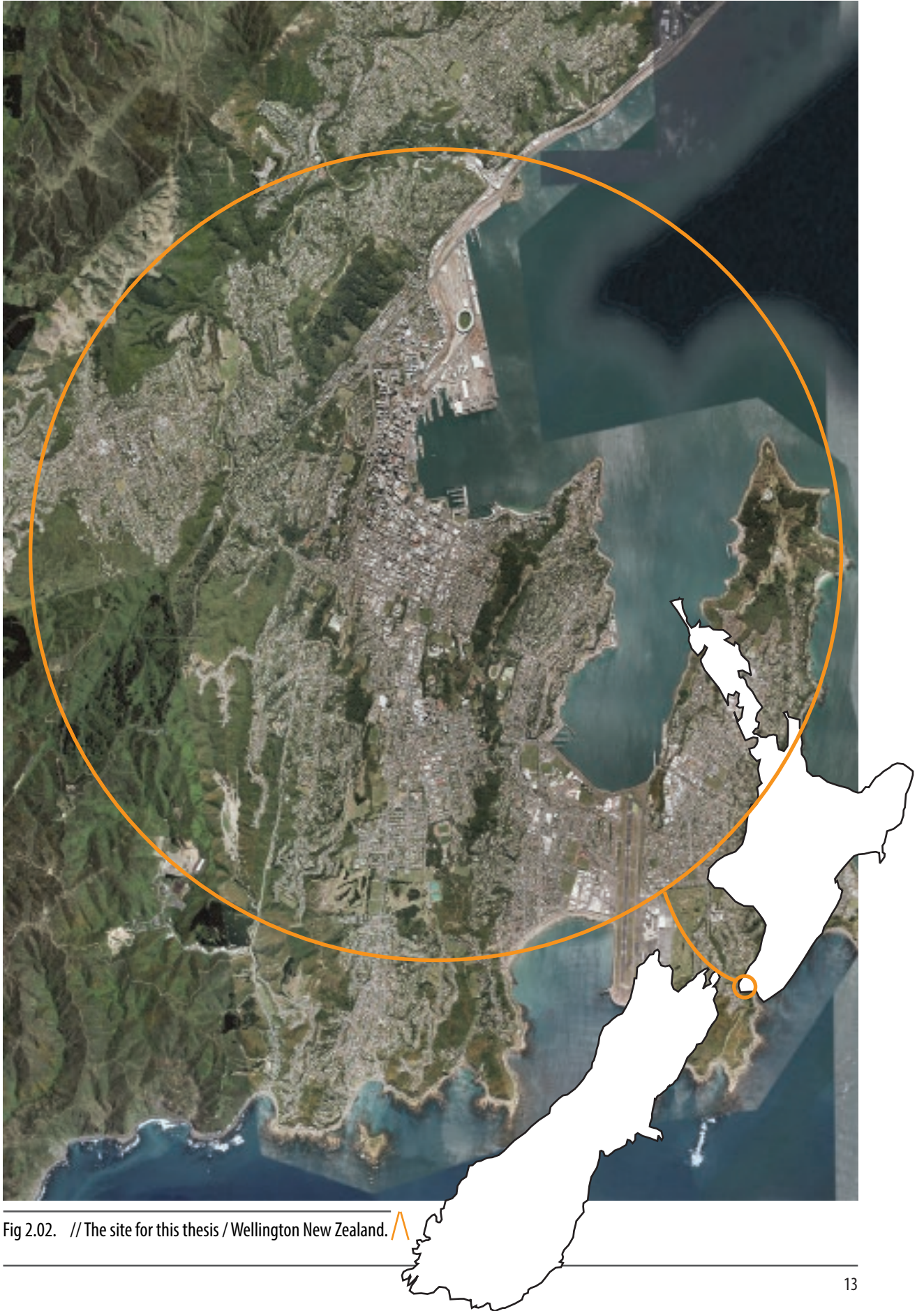
Fig 2.02.   // The site for this thesis / Wellington New Zealand.

02B /// ZOOMING IN / \
THE SITE IN THE SUBURB OF WELLINGTON

The Wellington suburb of Newtown occupies predominantly flat land and is in good proximity to the city centre. It is an historic area, having been well utilised for its suitability for construction in the early development of Wellington. The suburb has a strong local identity and due to further intensification and construction, a dense and fine structure. Newtown is both well serviced by local amenities, and public transport connecting it to the city. It is identified as suitable for higher-density living and reduced vehicle dependence.

Fig 2.03.   // The site is currently home to the remains of an old petrol station and a dated apartment building.

TO CITY

500M /////////////////////
WELLINGTON HOSPITAL

PUBLIC TRANSPORT ////
PEDESTRIAN LINK////////
KEY LOCATIONS//////////
SITE /////////////////////

900 M /////////////////////
MT VICTORIA / GREEN BELT

0M ////////////////
NEWTOWN VILLAGE

10M ////////////////////
NEAREST SUPERMARKET

TO
KILBIRNIE /
AIRPORT

600 M /////////////
WELLINGTON ZOO

TO ISLAND
BAY

TO BERHAMPORE /
ISLAND BAY

Fig 2.04.   // The site is well connected to local amenities and public transport, making it suitable for medium-density housing infill. Surrounded by a mismatched selection of retail, residential and light-commercial buildings, it also provides a unique opportunity for the architecture to consolidate and engrain itself within the local area.

03 ///////////////\

03 LITERATURE REVIEW

03A /// THE PROBLEM / \
INCREASING POPULATIONS AND CHANGING HOUSEHOLD DEMOGRAPHICS

An Increasing Population /

Current literature addresses that the dream of owning a home, particularly in urban centres, is becoming very difficult for many. This issue is not unique to New Zealand and is being witnessed internationally in Western societies where people are struggling to get their foot on the property ladder (Friedman, 2012).

A primary reason for new housing demand is created by ever increasing populations. In Wellington alone, the population is expected to increase by at least 8% between 2006 and 2026 to more than 204,500 people (Wellington City Council, 2007).

Changing Household Demographics /

An increase in population alone is enough to create a substantial demand for new housing. Changing family demographics in New Zealand and a resultant shrinking in household sizes however, is compounding the problem.

A leading mind on changing housing needs, Avi Friedman, credits urban housing shortages predominantly to a changing demographic composition (2012). As a result of changing societal norms, the 'nuclear family' model is in steady decline. Further demand is therefore put on housing supply as what were once large, multi-person households break down into smaller, couple-only, single-person and single-parent households. (BRANZ, 2007).

Friedman (2012) suggests that no longer can we expect to design every home for the nuclear family. New models of housing need to be innovative, not only so that they may be cheaper to build, but also flexible so that they may adapt to the changing demographics of their inhabitants.

HOUSEHOLD PROJECTIONS
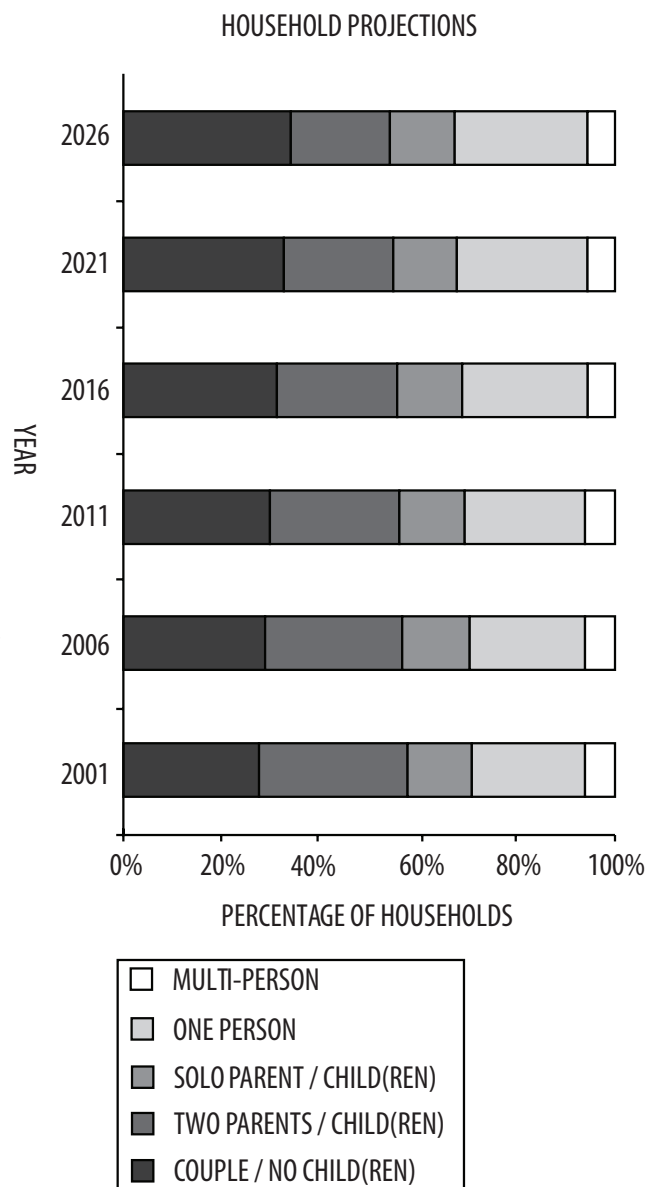
Fig 3.01.   // New Zealand's projected household demographics.

One could assume that shrinking family sizes would automatically create a desire for smaller dwellings. Indeed this appears to be an assumption that fuels the Wellington City Councils growth strategy, which predicts and plans for a substantial increase in intensive housing developments in the future (Wellington City Council, 2007). Literature would suggest however that the simple need for less space does not automatically lead to people seeking it (Wulff, Healy, & Reynolds, 2004).

Many households will in-fact choose to retain a house larger than necessary (BRANZ, 2007). The reasons for this vary but are typically associated with the need for extra space to accommodate a variety of non-essential or intermittent uses. Common examples of this include alternating custodies of children (Weidinger, 2010), people who work from home (Leupen & Mooij, 2011), or people who wish to accommodate visiting families or friends (BRANZ, 2007).

Friedman would advocate that single parent families, single people and childless couples simply don't possess the income to compete for the traditional detached housing model and these luxuries (Friedman, 2012). Additionally, he identifies that even in dual-income families,

the 'affordability gap' in recent years has seen house prices exceed household incomes. Freidman proposes that in moving forward, the affordability of smaller, denser dwellings will encourage people to abandon their dreams of the detached suburban home.

Moving beyond affordability, immigration merits exploration in considering housing needs differing from the 'nuclear family' model of low-density detached suburbia (Leupen & Mooij, 2011). Asian populations, for instance, are the fastest growing ethnic group within New Zealand and the fastest growing group of homeowners (BRANZ, 2007). These people come with their own dwelling customs and expectations, many of which have been shaped in higher density situations (Leupen & Mooij, 2011).

Other factors also resonate with a need for smaller dwellings. Childless couples and singles, for instance, often want to live in contemporary, efficient dwellings, which require little maintenance and are located within good proximity to jobs and urban recreation (BRANZ, 2007). In these situations, the idea of dwelling is often expanded outwards to include venues and services – such as cinemas, theatres, cafes and restaurants – that can be provided by their greater

environment. For these people the dwelling need provide little more than a long-term hotel room (Leupen & Mooij, 2011).

In addition, an ageing population has seen a rise in the need for dwellings that cater to older one or two-person households. Due to higher standards of living and longer life expectancies, many of these people's active lifestyles have led to a growing desire to change homes (Leupen & Mooij, 2011). Elderly people who wish to remain in a preferred suburb but no longer require, or can maintain a larger house may in many cases wish to downgrade to a compact, but efficient dwelling (Wulff et al., 2004).

FACTORS IN CHOOSING A NEW HOUSE

3 = VERY IMPORTANT
0 = NOT IMPORTANT
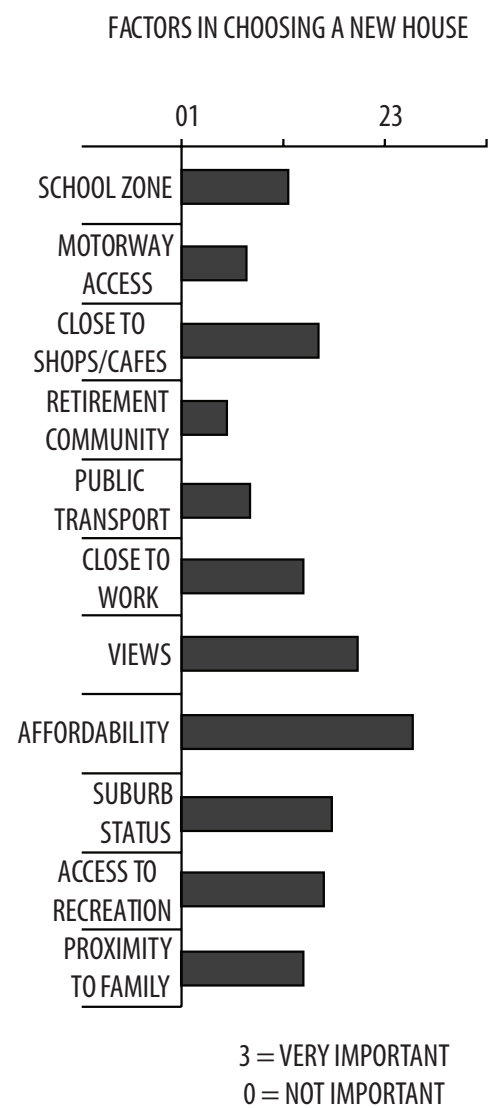
Fig 3.02.   // Factors important to home owners when selecting a new house.

The debate of density is complex. It is has no universal definition and applies to a wide range of disciplines, rendering it difficult to understand in the context of housing (Churchman, 1999). Reports on finding ideal residential density are varied, with specific contexts playing making it difficult to extract objective data (Wellington City Council, 2007).

Defining what constitutes high, medium or low residential density can therefore be viewed as somewhat arbitrary. Generally however, it is accepted that higher density housing development is fundamental in providing good urban form and well functioning cities (Jabareen, 2006). It generates efficient use of land, natural resources, infrastructure and public transport, and improves access to cultural and social activity for its inhabitants (Churchman, 1999).

Friedman (2012) advocates that in moving forwards with housing, the benefits in quality medium-density housing are many; "the small footprint that this style … occupies allows a sustainable high-density approach to habitation, slowing sprawl and creating energy efficient affordable living."

Conversely, low-density development is widely accepted to lead to fragmented cities and unsustainable growth (Jabareen, 2006). The wealth of literature supporting this argument can be summed up as follows:

- Detached houses require a lot of land.
- Large scale, costly infrastructure is required to connect the suburbs to other centres.
- Suburbia increases vehicle dependence.
- Urban form becomes fragmented and results in segregated communities and activities.

In Wellington, this type of growth is further made unsustainable because of the steep undulating typography and harbour side location which limits outwards growth (Wellington City Council, 2007).

In the context of this thesis, the definitions for population density are taken from Walton, Murray and Thomas (2008) who used these approximate definitions for the New Zealand city of Auckland; high-density is 17 units per acre; medium-density, 13 units per acre; and low-density, 5 units per acre.

03D /// THE SOLUTION / \
FLEXIBILE DWELLING

When considering the increasingly diverse household and the variation in housing required to meet their needs, it cannot be assumed that simply producing lots of small houses in high density concentrations will be an adequate solution (Bunker, Holloway, & Randolph, 2005).

Indeed, the literature identifies a number of internal layout criticisms from residents of higher density typologies. Frequently these complaints have a strong emphasis on internal layouts, deemed by inhabitants to be unsuitable for their needs (BRANZ, 2007; Syme, McGregor, & Mead, 2005).

Many medium-density housing developments utilise one unit that is repeated within the building envelope, reducing the diversity available to the building's residents. This is often seen in Wellington's medium-density housing offerings that are of very low quality as a result (Southcombe, 2014). If varying-sized units can be provided within a development however, resident choice is increased (Bunker, Gleeson, Holloway, & Randolph, 2002).

Careful arrangement of rooms, and planning that advocates against architecture that 'packages' the individual is a key consideration in providing a variety of habitation options (Leupen & Mooij, 2011). These objectives can be made more complex with attached housing but careful design can mitigate any negative effects (Rameriz-Lovering, & Murray, 2011). The restrictions inherent within it moreover create the ideal laboratory for creative possibilities (Friedman, 2012).

In creating this variation, vertically configured buildings have been identified as the most flexible and adaptable in providing variation. This has been recognised in the traditional London terraces, many of which have had a wide range of programmes and internal configurations in their lifetime (Ioannidis, 2005).

One creative application of variation in medium density housing, the work of Chilean architecture collective, Elemental, provides the title of this thesis. Through their investigative work in social housing in Chile, Elemental discovered that the changing needs of inhabitants had led to many ad-hoc extensions and alterations to their homes. Because these dwellings hadn't been designed to accommodate variation, the buildings were not able to efficiently accept these changes. Outcomes therefore had devalued the buildings and, in many cases, made them dangerous to inhabit. This left the inhabitants with worthless, undesirable property (Aravena & Iacobelli, 2012).

Elementals budget-driven solution was to plan smaller better quality buildings that only provided the core necessities of a house but were accepting of future expansion. Elemental marketed this process with the phrase "Half a good house ≠ One small house". The result: housing that became an investment, rather than a social expense. (Aravena & Iacobelli, 2012).

In the New Zealand context the housing situation is considerably less budget driven than the context in which Elemental developed this scheme. The 'half a good house' mantra is – in the framework of this thesis however – applied to the idea that housing should be an intimate and personal reflection of its inhabitants (De Botton, 2006). Therefore, the first half of the house is assumed to provide nothing more than basic concepts of dwelling. Through flexibility and adaptability however, variation can then be provided, personalising the dwelling and allowing it to become an intimate reflection of the people who live there. The inhabitants provide the second half.

"Half a good house is better than a whole bad one".
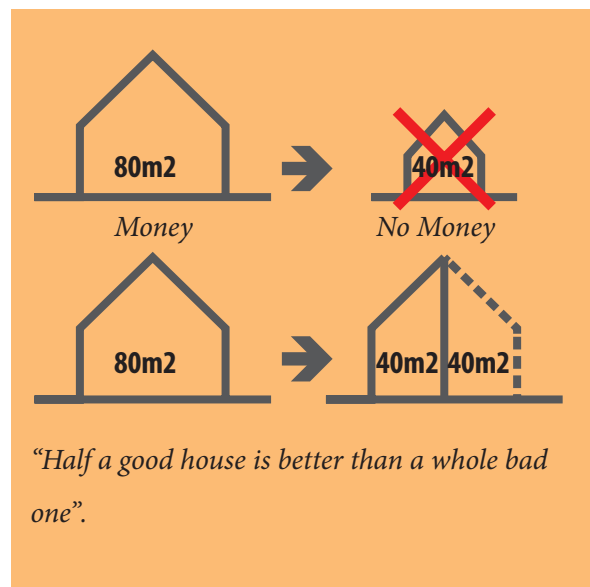
Fig 3.03.   // Elemental's incremental housing strategy.
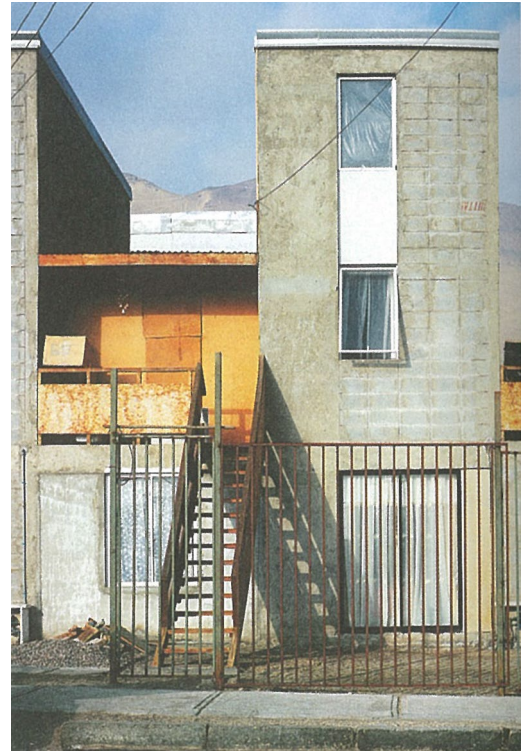
Fig 3.04.   // At initial completion Elemental's houses appear monotonous and repetitive. However, being accepting of expansion, these spaces quickly become personal and vibrant reflections of the inhabitants.

04A /// GROW HOME | MONTREAL | 1990-
///////// AVI FRIEDMAN | CANADA ///|

Friedman's Grow Home attempts to address housing affordability and variation in two stages. Firstly, allowing a finite number of pre-construction design alterations, and secondly, the allowance for incremental completion of internal partition walls. This allows for lower costs at the building's inception, but sanctions further construction and alteration as budgets and needs change, all while allowing for a greater level of customisation than would be seen in the standard 'nuclear' model.

Though one might identify merit in Friedman's argument, the determinate flexibility in his Grow Home is incongruent with the bi-directional flexibility advocated for in this thesis. This is of particular relevance to the lack of sanctioned removal and reallocation of partitions necessary to allow for meeting the needs of consecutive inhabitants and not just the original owners.

Fig 4.01.   // A row of Friedman's grow homes.

UU UPSTAIRS UNPARTITIONED
L LIVING
K KITCHEN
WC BATHROOM / TOILET
B BEDROOM
BA BASEMENT
WD WARDROBE
V VESTIBULE
CP CAR PARKING

BASE MODEL > GROWING COMPLEXITY
PARTITION WALLS, ROOFING AND
EXTERNAL CONFIGURATIONS ARE ALTERED AS
THE BUDGET ALLOWS
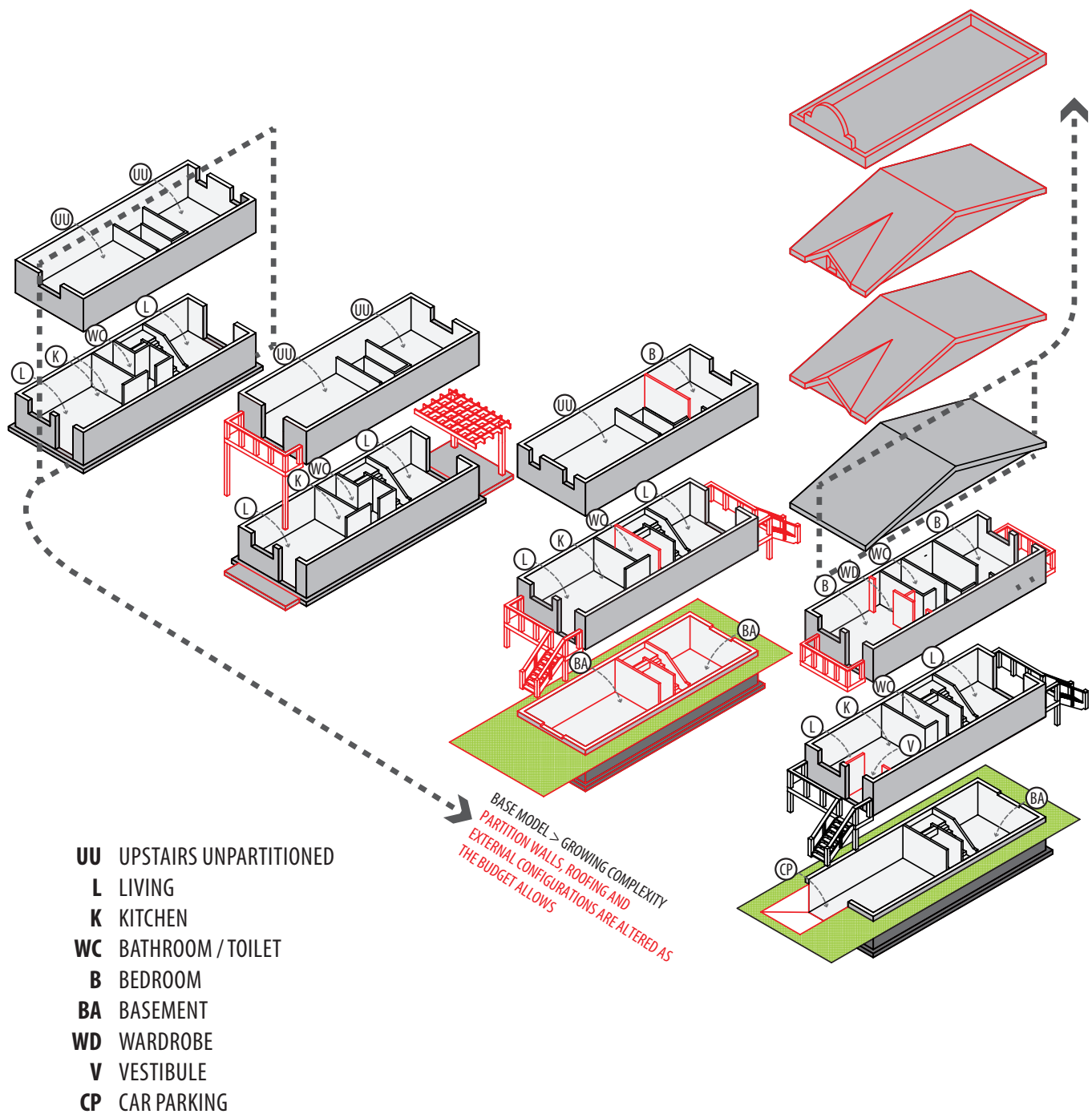
Fig 4.02.   // Changes applicable to the Grow Home's base model.

04B /// MILLER HOUSE │ LEXINGTON │ 1992
////////// JOSÉ OUBRERIE │ USA ////////

Oubrerie's Miller House combines multiple houses in one unified package, creating a flexible arrangement that relies on well-designed space, rather than adaptable construction systems. Following the deceptively simple idea of a nine-square grid house, Oubrerie treats the boundary between the private and the public as if it were representative of an unstable family structure contained within a communal environment. This results in a visually complex and unique house that offers an unconventional answer to urbanisation.

Fig 4.03.   // Oubrerie's Miller House.

Fig 4.04.   // A multitude of space-use options are possible within the house.

Second Floor

First Floor

Ground Floor
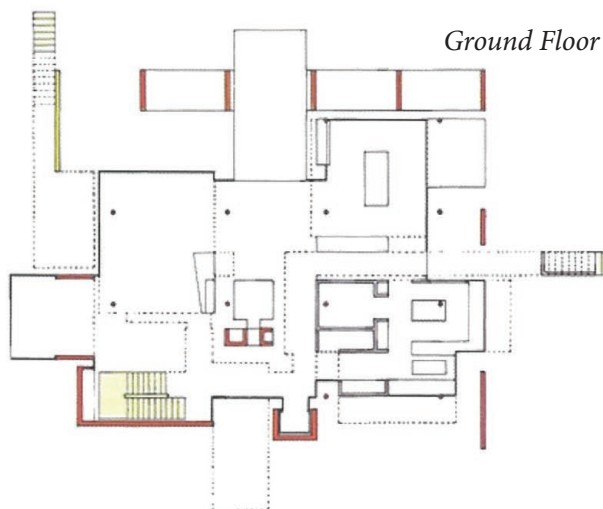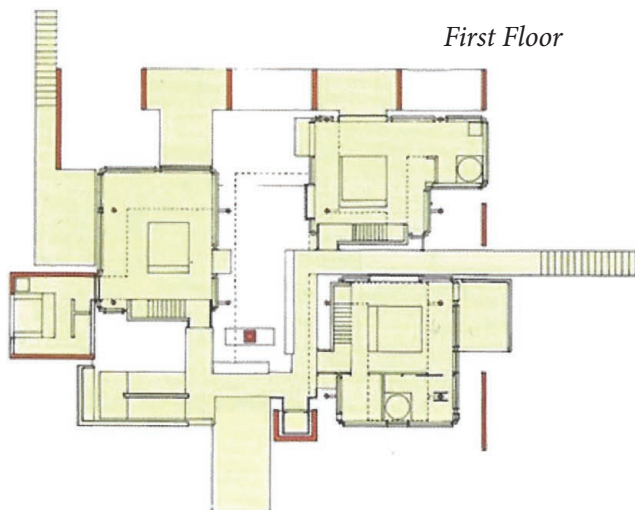
Fig 4.05.   // Following the standard characteristics of a nine-square grid house, the interior of Miller House is left open and communal. This light and accessible space is flanked by the closed, private spaces that begin at the first floor and dominate the top two levels. Containing three separate unique dwellings, these spaces distort and deform from the grid as they grow skywards and differentiate their more specific programmes from the homogenous and communal ground floor. This interaction with the common spaces allows for a sense of individual distinctiveness, while also acknowledging collective ownership. This relationship extends to the buildings exterior, which frames the unique interior arrangements through the use of a misaligned superstructure.

The Tila housing block combines principles of loft living and open residential building to create what the architects have called the 'neo-loft' (Kendall, 2014). This budget driven idea cites that the unpartitioned (aside from bathroom spaces) loft apartments within the building invite residents to mix multiple functions within a single space, making them occupiable at the moment of completion. Should residents desire more specific allocation of function however, the dimensions and construction of the apartments allow for the creation of an additional level and room partitions.

While theoretically habitable at the moment of completion, one could question whether the generously dimensioned spaces in the Tila housing would in-fact be pleasant and comfortable to occupy without additional partition. Could the architecture do more in a project such as this to provide a sense of space division, while still permitting flexibility and option for partition?

Fig 4.06.   // This large glass facade reveals the simplicity with which the interior units are stacked and arranged.
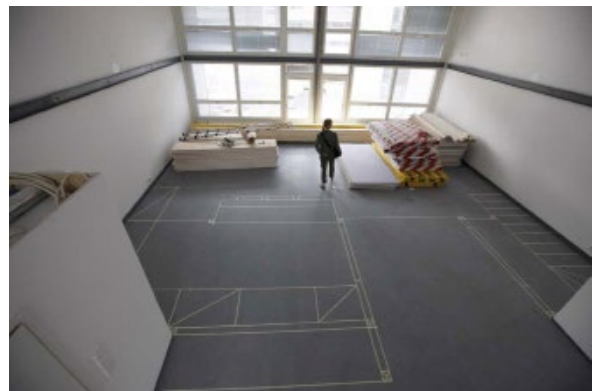
Fig 4.07.   // An open interior, marked out in preparation for owner completion.

Fig 4.08.   // The large variety of ways in which people have chosen to occupy the spaces all involve additional partition.

04D / SUITCASE HOUSE │ BEIJING │ 2007
//////////// GARY CHANG │ CHINA //│

Organised around ideas of customisable use stratification, the Suitcase House Hotel by Chang is defined by endlessly reconfigurable and fluid habitable spaces. Interiors initially deceive by appearing open and straightforward, but are quickly transformed as the multitasking surfaces and planes are put to use.

This is a building that is truly open-plan The lack of a prescribed initial programme and the associated liberation of furnishings create an architecture that doesn't package its users. Instead, it allows for a discrete choice making process in which the individual is permitted to pass through a sequence of guided architectural decisions. The result is a configured space that, while within the limitations of the building's possibilities, is truly personal and bespoke. A lot of value should be placed in this sort of perpetual flexibility.

Fig 4.09.   // Configuration of the building extends to the exterior where concealed teak panels and bi-fold windows foster a multitude of relationships between the building and its environment.
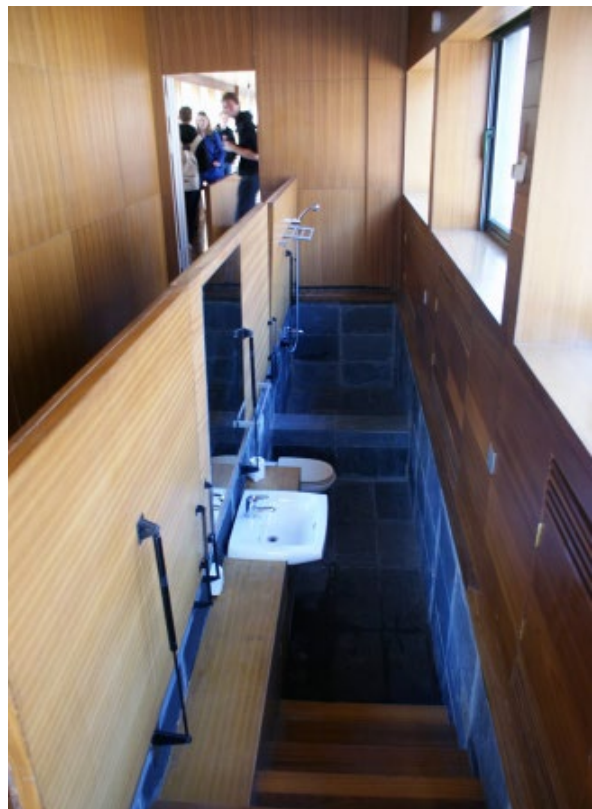
Fig 4.10.   // A select configuration of screens and panels reveals a discrete bathroom space.

Four Suites

Solo Retreat

Maximum Daytime Activity

Maximum Night-time Activity

Fig 4.11.   // Beneath the floor, pneumatic panels reveal a multitude of spaces. Above, sliding partitions interact with these newly organised spaces, adapting their chosen programme to the new relationships formed with the interior and the exterior. Programmes within concealed spaces vary in their definition, with some core services such as the kitchen, sauna and boiler room being fixed. Many however, are free in their definition, leaving the interpretation to the individual.

04E / PITARUA MEWS | WELLINGTON | 1976
/////////PETER BEAVEN | NEW ZEALAND

Located in the Wellington suburb of Thorndon, Peter Beaven's Pitarua Mews is a local example of successful medium density housing. While partly modular in construction, the staggering of units on the steep site and the variation in external embellishment means that each retains its own personality and uniqueness.

Inspired by high-density villages in Europe, units are shaped around a central court. This, along with shared off site car parking, facilitates human interaction and stimulates community within the development.

The enclosing of the space, and its location at the end of a cul-de-sac, could be seen to break down interaction with the neighbouring properties, suggesting it could be better integrated within the wider community.
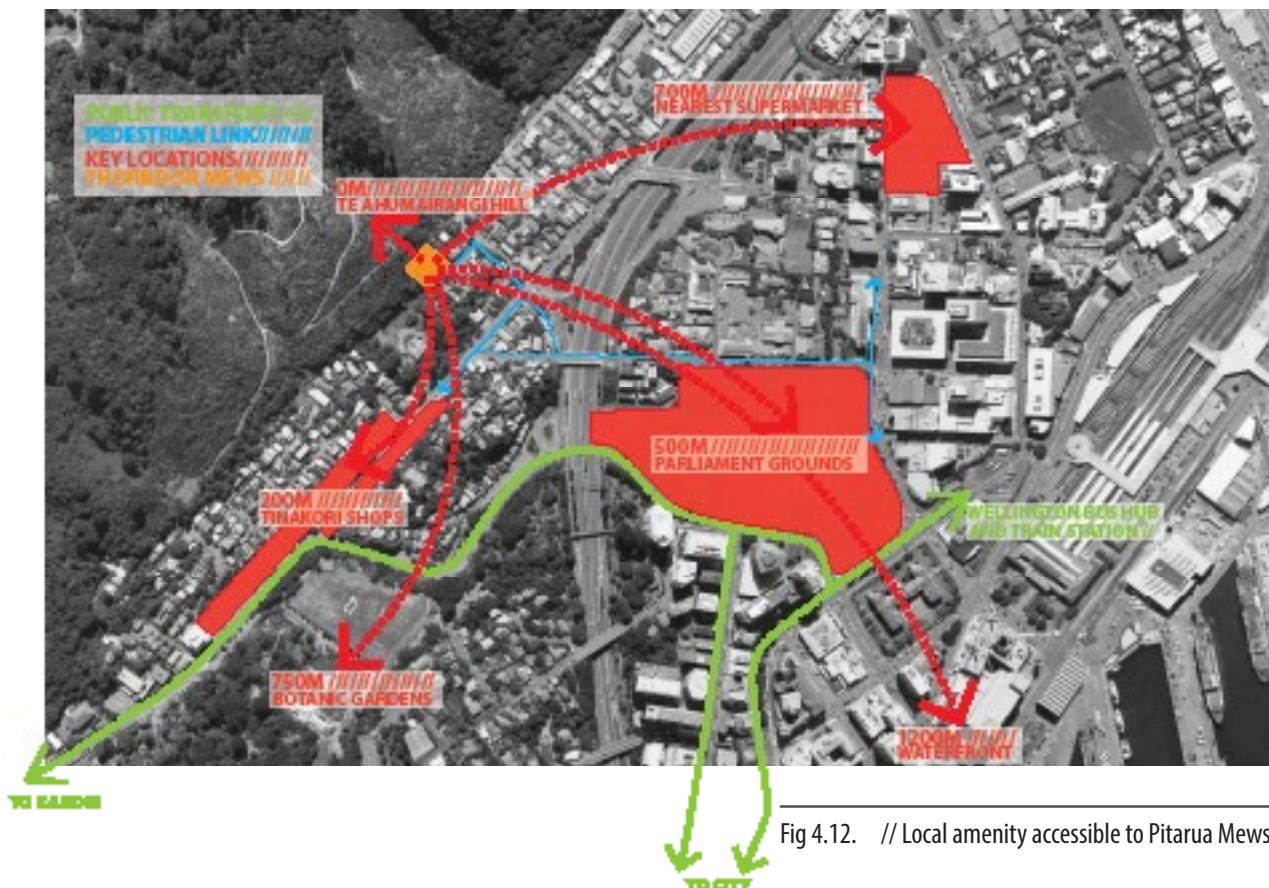
Fig 4.12.   // Local amenity accessible to Pitarua Mews.

Fig 4.13. // Pitarua Mew's site composition and interior arrangement.

While its monolithic appearance may at first suggest that the apartments within Gifu Kitagata are regular and stacked, further exploration will reveal that they are anything but. The building in fact offers a variety of unique housing types and configurations, all of which largely liberated of defined functions or boundaries.

Individual unit plan and design takes precedence in the apartment building, followed by groupings of units. Overall design is the final consideration and manifests in four housing blocks shaped around an internalised semi-public courtyard. This method of apartment design advocates for design outcomes that are uniquely individual as well as flexible and adaptable rather than monotonous, repetitive and fixed.

Fig 4.14.   // The irregular penetrations visible from Gifu Kitagata's exterior provide a glimpse into the irregular nature of the interior spaces.

Fig 4.15.   // Residual space from the stacking and linking of irregular spaces leaves behind interesting outdoor areas that are well utilised by the inhabitants.

2.5m

2.3m

∨

T + B + J + D =

T / TERRACE   **B /** BEDROOM   **D /** DINING ROOM   **J /** TRADITIONAL JAPANESE ROOM

D B T J

B J
D T

B B J D T
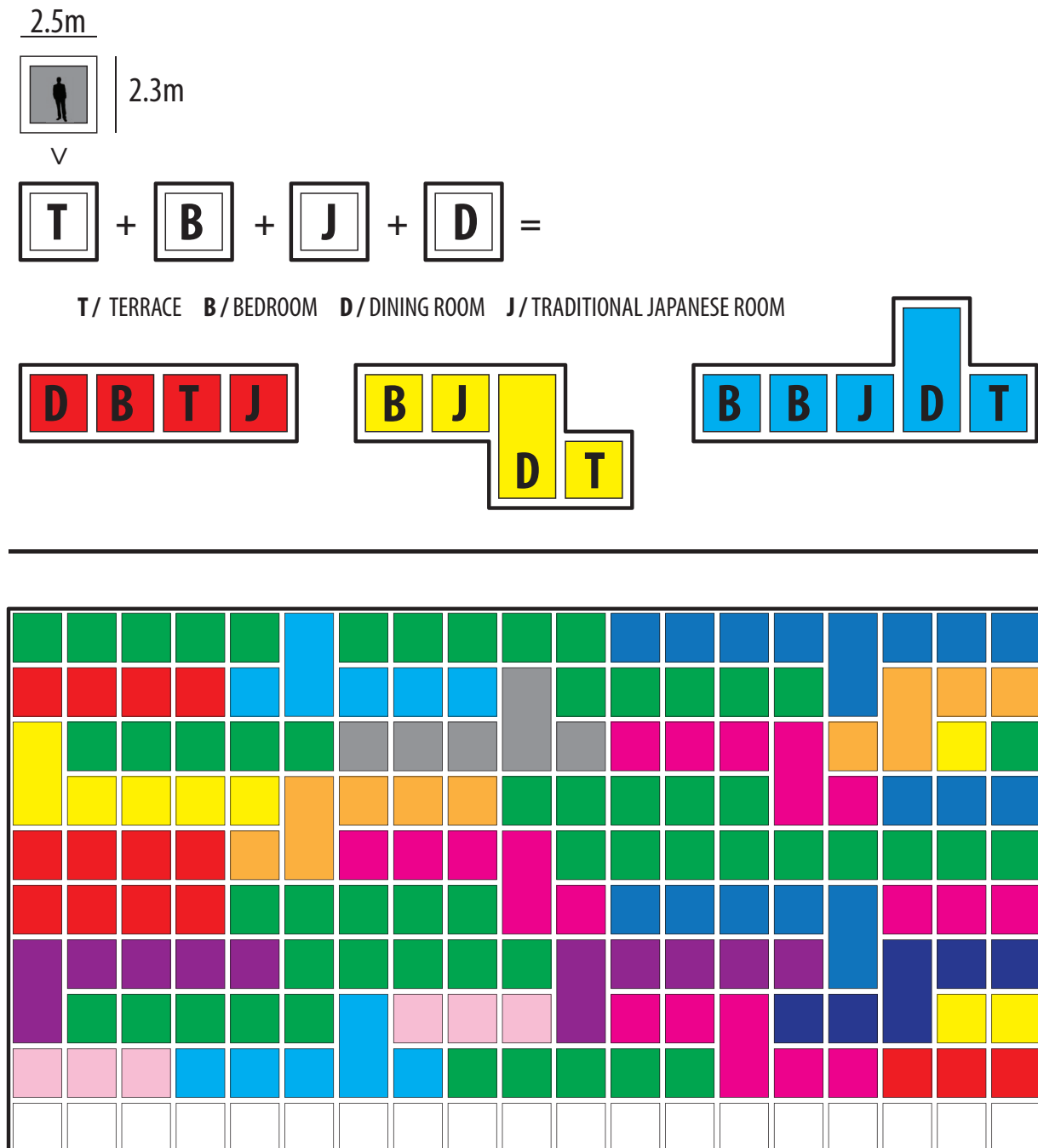
Fig 4.16.   // The gridded units that are stacked and linked inside the building's monolithic form.

04G / NEXT 21 ////// │ OSAKA │ 1994
VARIOUS ARCHITECTS │ JAPAN / │

Next 21 is a future focused housing project that accommodates a great deal of flexibility and preference for the lifestyles and requirements of individual occupants. It follows a two-stage open building construction and design technique.

In the first stage, infrastructure and collective services are designed and completed. In the second, the structure is filled in and the building completed through collective agreement and individual preference.

Fig 4.17.   // The building's core infrastructure is articulated by the bold concrete construction.

Fig 4.18.   // Individual dwelling preference is visible from the building's exterior with surfaces articulated by irregular plans and customised wall, window and door arrangements.

The public street network
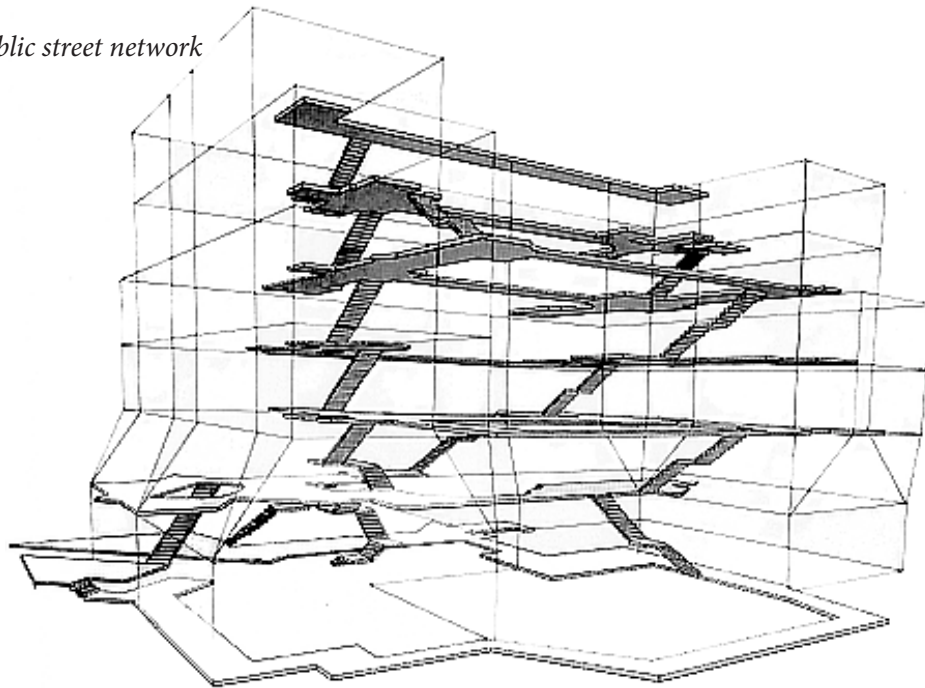
Fig 4.19. // The seven-storey building's core infrastructure is arranged around three zone types; house, street and public. The house zones define the primary organisation and, like the other zones, are manifested in a variety of configurations in order to accommodate the mixture of needs within the floor plate.

Fixed and flexible systems
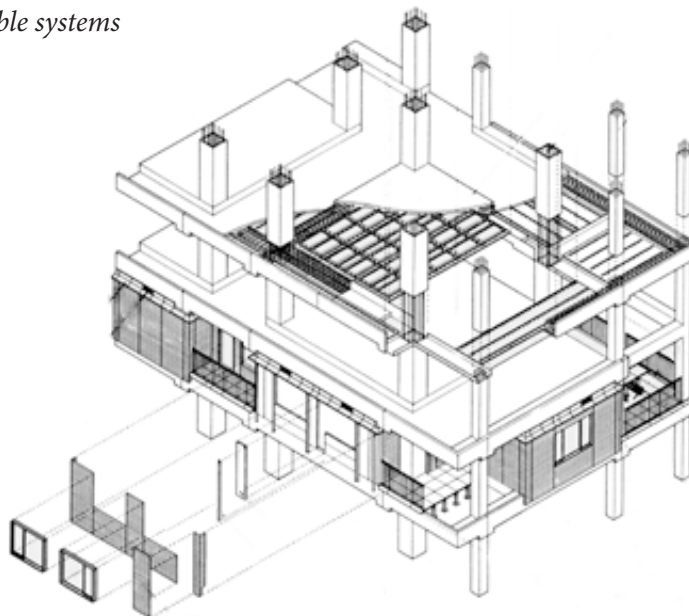
Fig 4.20. // All zones are organised around a 90cm grid. The filling in of zones is achieved through pre-designed subsystems that interact with this grid. This allows for an ongoing flexibility and space arrangements that can be altered as needs dictate.

Peter Barber's stark white Donnybrook Quarter stands out from the brickwork that is commonplace in its dense neighbouring buildings. Aimed to reinvent and reinvigorate the site, this mixed-use residential and retail project engages with the wider public; shop frontages on existing streets, shop lined laneways and an insulated traffic free environment invite both residents of the development and of the wider community to engage and interact within its public areas.
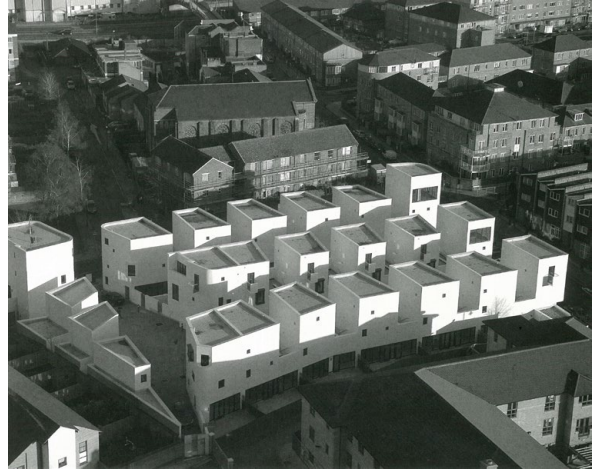
Fig 4.21.   // Donnybrook Quarter's stark white appearance makes it stand out from its historic neighbourhood. Careful planning however has integrated it well within this existing fabric.

Fig 4.22.   // All units have their own entrance and are able to engage directly with both the public laneways and their own private gardens. A staggering roofline and floor plate of three levels, and an eccentric plan helps to distinguish each individual building from the next. Individual identity and variety from the public facade is further enhanced by the differing tenancies below as well as the unexpected insertion – alongside dwellings and work spaces - of double height glass windows, placed to allow extra light into artists' studios behind them.
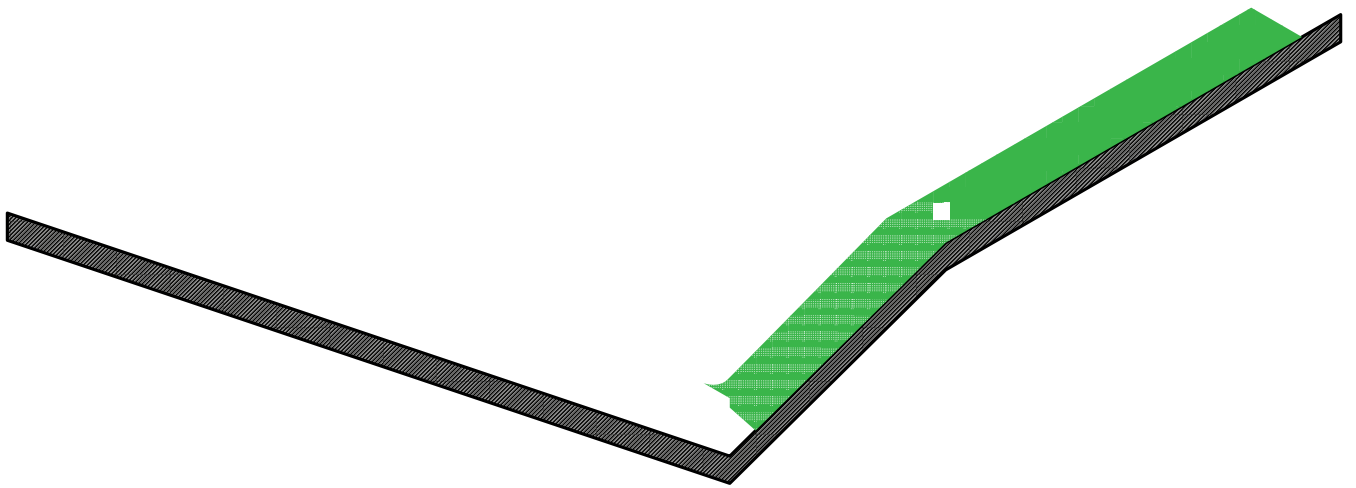
Conclusions /

Critical principles identified in the precedents are /

- allowing for flexibility and variation
- allowing for user participation
- prescribing space in volumetric terms rather than presumptive space use
- allowing for variety of community/public and private opportunities, and
- integration beyond the site

Precedents also indicate that a grid methodology might be a simple approach in attaining variability within individual dwellings, while permitting connections between multiple ones.

05A /// INTRODUCTION / \
NUCLEAR MODELS OF HOUSING IN WELLINGTON / A GOOD HOUSE?

The aim of this exercise is to see what Wellington homebuyers expect from the detached, 2-3 bedroom 'nuclear family' housing models identified as inappropriate for servicing the future needs of housing. It seeks any opportunities or clues that may aid satisfying these expectations in a different format or typology.

Samples are ordered chronologically, with each type being represented by a singular example deemed to be type-typical. Samples are analysed in terms of their specific location on site and are paired with a representative (non-matching) plan that describes the archetypal blueprint for that period of dwelling. Plans are explored to determine their organisational relationships, and presented in diagram form.

Fig 5.01.   // Typical models of detached housing in Wellington.

05B /// THE VILLA / \
1880 - 1910

Between 1880 and World War 1, new housing in New Zealand was almost always represented in the form of the villa (BRANZ, 2010). Wellington was no exception to this, with older suburbs characterised by this housing type.

Street facing verandas and bay windows, hipped roofs, sash windows, and weatherboard cladding are typical villa features. Usually timber in construction, houses were largely pre-designed with floor plans and embellishments chosen by the owner from a catalogue. Elements were then prefabricated before being shipped to site and assembled by the builder.

Fig 5.02.   // Villas photographed in the Wellington suburb of Newtown.

90m2
33.00%
BUILT/PRIVATE
COVERED AREA

300m2
67.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
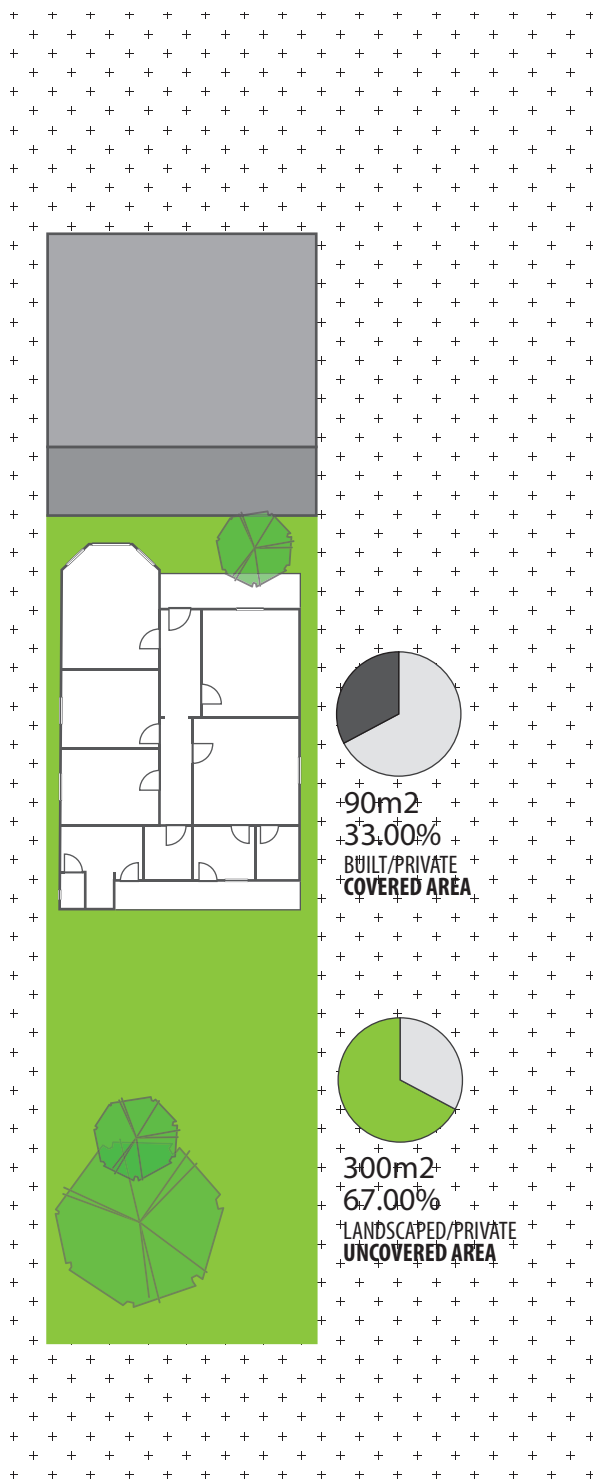
Fig 5.03.   // Alignment of the villa is usually towards the street with a small front yard in order to maximise useable property at the rear. In Wellington, scarcity of developable land means they are closely located together and side yards are usually small or non-existent. Original garages or car parking allocations do not feature.

Legend:

PUBLIC ————— PRIVATE CIRCULATION
1   5

B1 BEDROOM 1 // **B2** BEDROOM 2 // **B3** BEDROOM 3
BA BATHROOM // **H** HALL // **K** KITCHEN
L LIVING // **LA** LAUNDRY // **P** PORCH
PA PANTRY // **SC** SCULLERY // **WC** TOILET

STUD HEIGHT
3.6m
3.0m
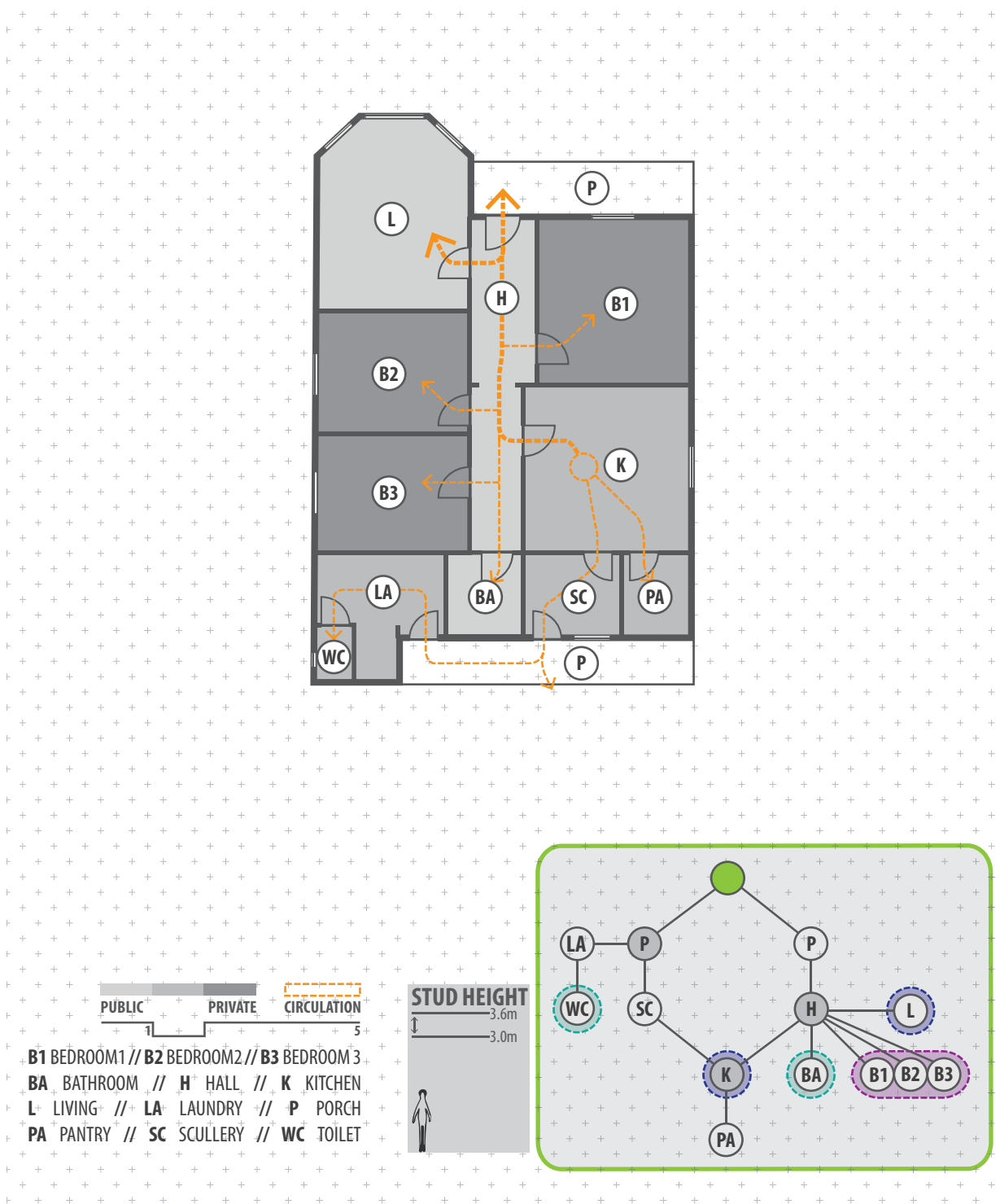
Fig 5.04.   // The villa plan usually features an entrance at the front centre of the building. Inside, a central corridor runs the length of the building before terminating at the service spaces at the rear. The two street facing rooms were often defined as the master bedroom and the living room, whereas the middle of the building usually saw the placement of one or two supplementary bedrooms. Service spaces consisted of a bathroom, kitchen and scullery and were housed in a lean-to at the building's rear. As the villa evolved, these spaces grew to include the toilet and laundry, however in early models these two spaces were located outside of the primary building.

05C /// THE BUNGALOW / \
1910 - 1930

The bungalow follows the villa as the most common type of housing in New Zealand, becoming popular in the 1910s, before gaining the title between the early 1920s and the early 1930s (BRANZ, 2011). Wellington suburbs developed between these periods are generally defined by the bungalow style.

The bungalow style can be seen firstly in small elements that are used in the design of the villa before emerging as a style all of its own. Firstly, in transitional villas, old villa arrangements were changed to incorporate a lower pitched, 'pyramid' style roof, wider exposed eaves, and a reduction in decorative embellishment. Plans were often made less formal, and connections to the outdoors increased. The distinctive bungalow style grew to include an even lower roof pitch; deep, large verandas; and extended bargeboards.

Fig 5.05.   // Bungalows photographed in the Wellington suburb of Miramar.

100m2
22.00%
BUILT/PRIVATE
COVERED AREA

450m2
78.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
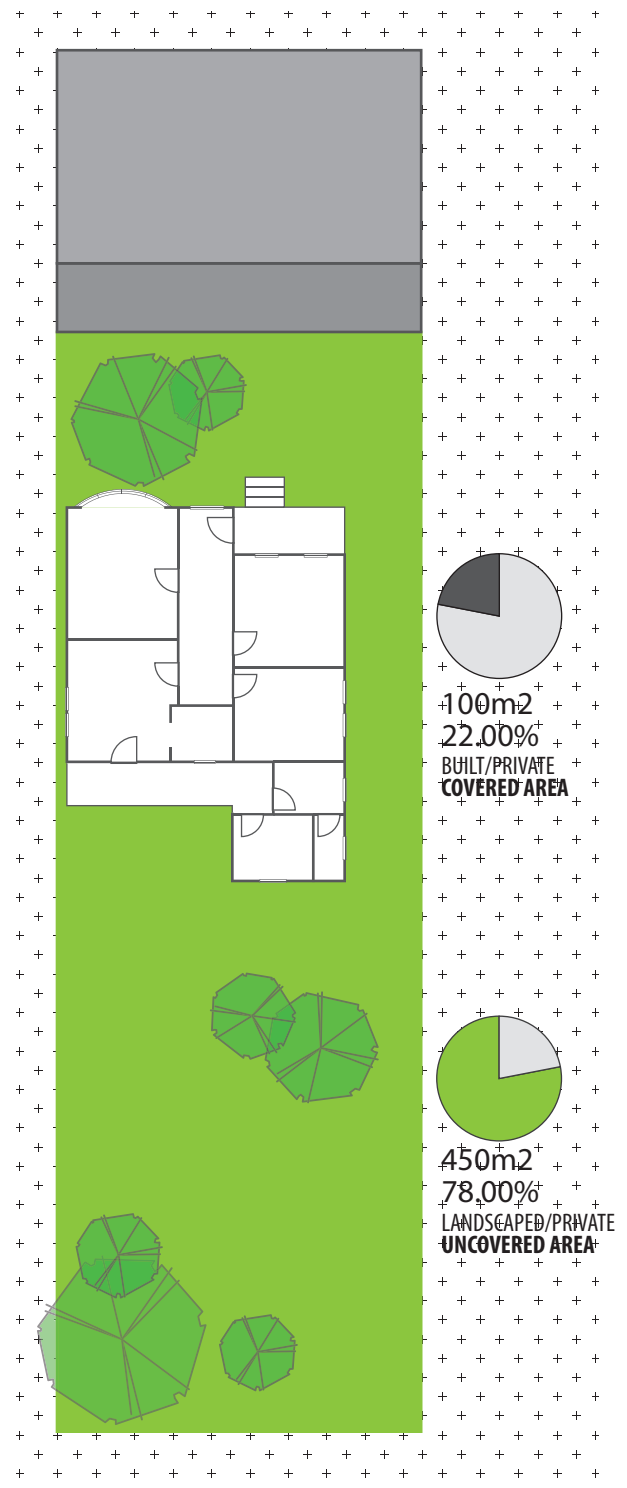
Fig 5.06.   // Bungalow site placement was decidedly less dense than the villa. The housing type in Wellington is paired with larger sections and greater space between buildings. Like villas, bungalows were often oriented in relation to the street, however buildings were not offset as closely towards it as their earlier counterparts.

PUBLIC ▭ **PRIVATE** ▭ **CIRCULATION**
1 — 5

B1 BEDROOM1 // **B2** BEDROOM2
BA BATHROOM // **H** HALL // **K** KITCHEN
L LIVING // **LA** LAUNDRY // **P** PORCH
SC SCULLERY // **WC** TOILET

STUD HEIGHT

2.7m
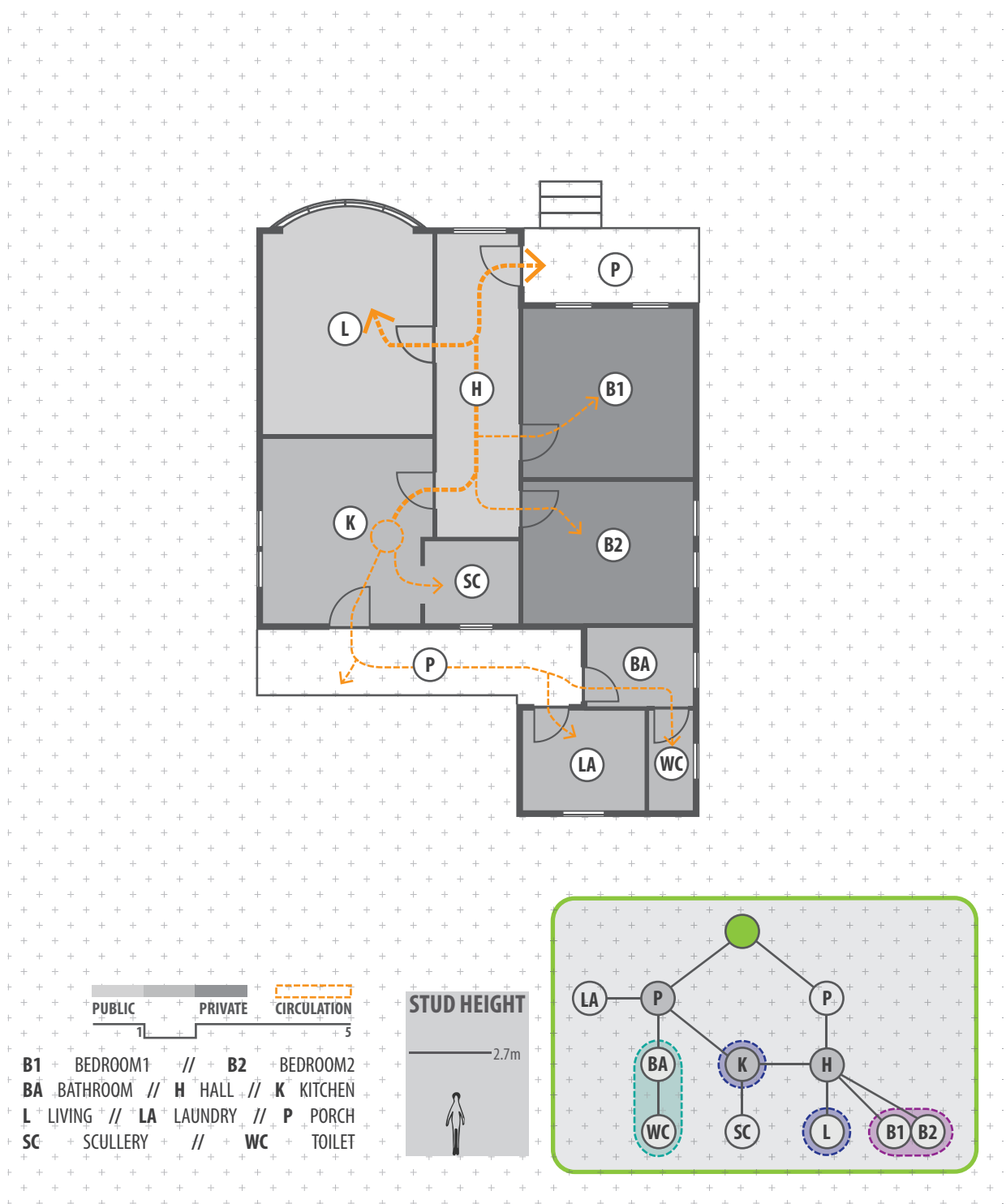
Fig 5.07. // The somewhat less formal plan of the bungalow shares many of the elements of the villa. Entry is usually through the front porch where one is met by a central hallway that extends the length of the house. Flanking the hallway, street facing rooms are often the living room and main bedroom. Supplementary bedrooms are usually located at the sides or at the rear of the building. Access to the bathroom could in some plans be gained directly from the hallway, but in many cases it would be found alongside the toilet and laundry by first passing through the rear kitchen to access it from the rear porch.

05D /// ART DECO / \
1930s

While less common in Wellington, the art deco housing style marks a meaningful departure from the housing styles preceding it. In the 1930s, this style symbolised a move away from the ornate, formal domestic building, instead promoting modern ideas of honesty to construction and functionality (BRANZ, 2010). Art deco houses were characterised by simple, smooth, often cubic forms and typically featured parapet walls concealing flat roofs, stucco cladding, rounded building corners and minimal use of exterior decoration.

Fig 5.08.   // Art Deco housing photographed in the Wellington suburbs of Strathmore (above) and Hataitai (below).

110m2
17.00%
BUILT/PRIVATE
COVERED AREA

650m2
83.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
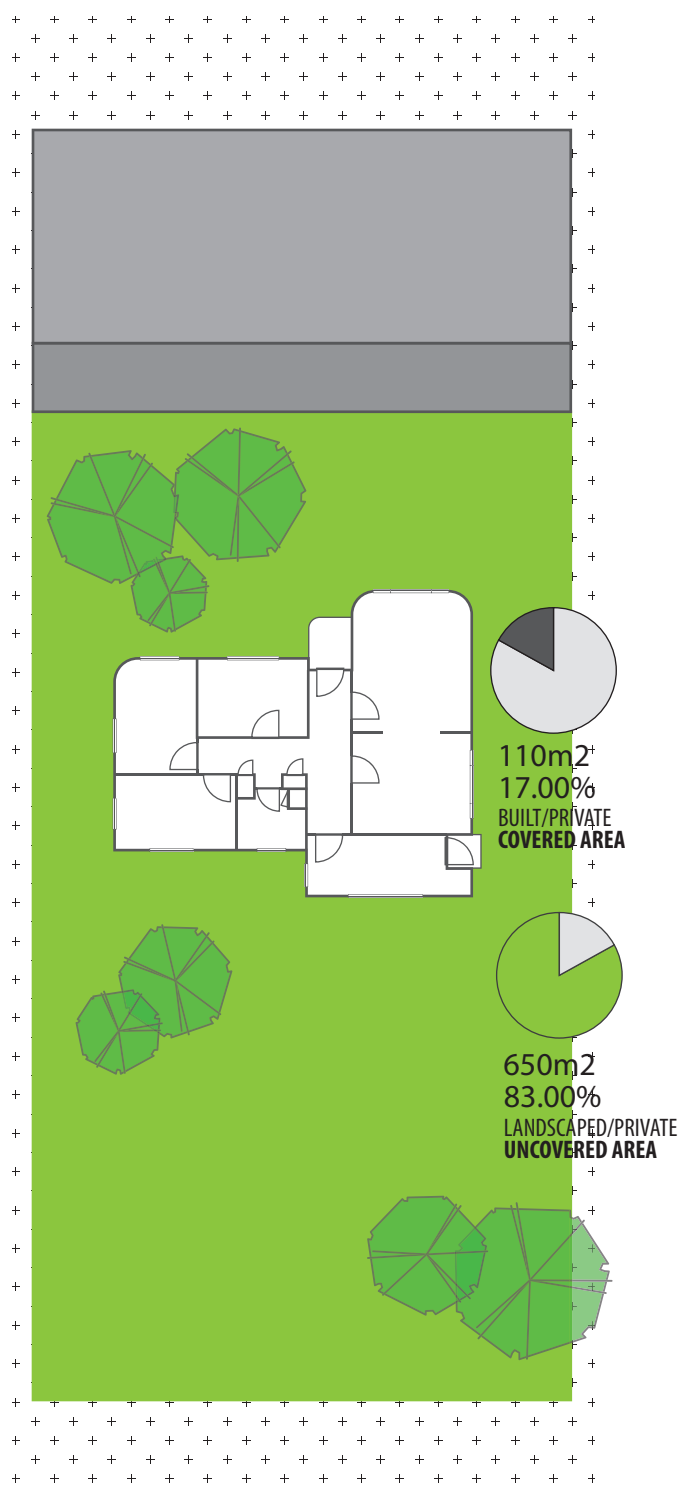
Fig 5.09.   // Site placement and section size changes were also
heralded with the move towards the modern art deco house.
There was massive increase in car usage in the 1930s, meaning
houses were oriented to allow for a carport or garage to share
the site. Larger site sizes were also common during the period.

PUBLIC — **PRIVATE** — **CIRCULATION**

1 — 5

STUD HEIGHT

3.2m
2.7m

B1 BEDROOM 1 // **B2** BEDROOM 2 // **B3** BEDROOM 3
BA BATHROOM // **D** DINING // **H** HALL //
K KITCHEN // **L** LIVING // **P** PORCH
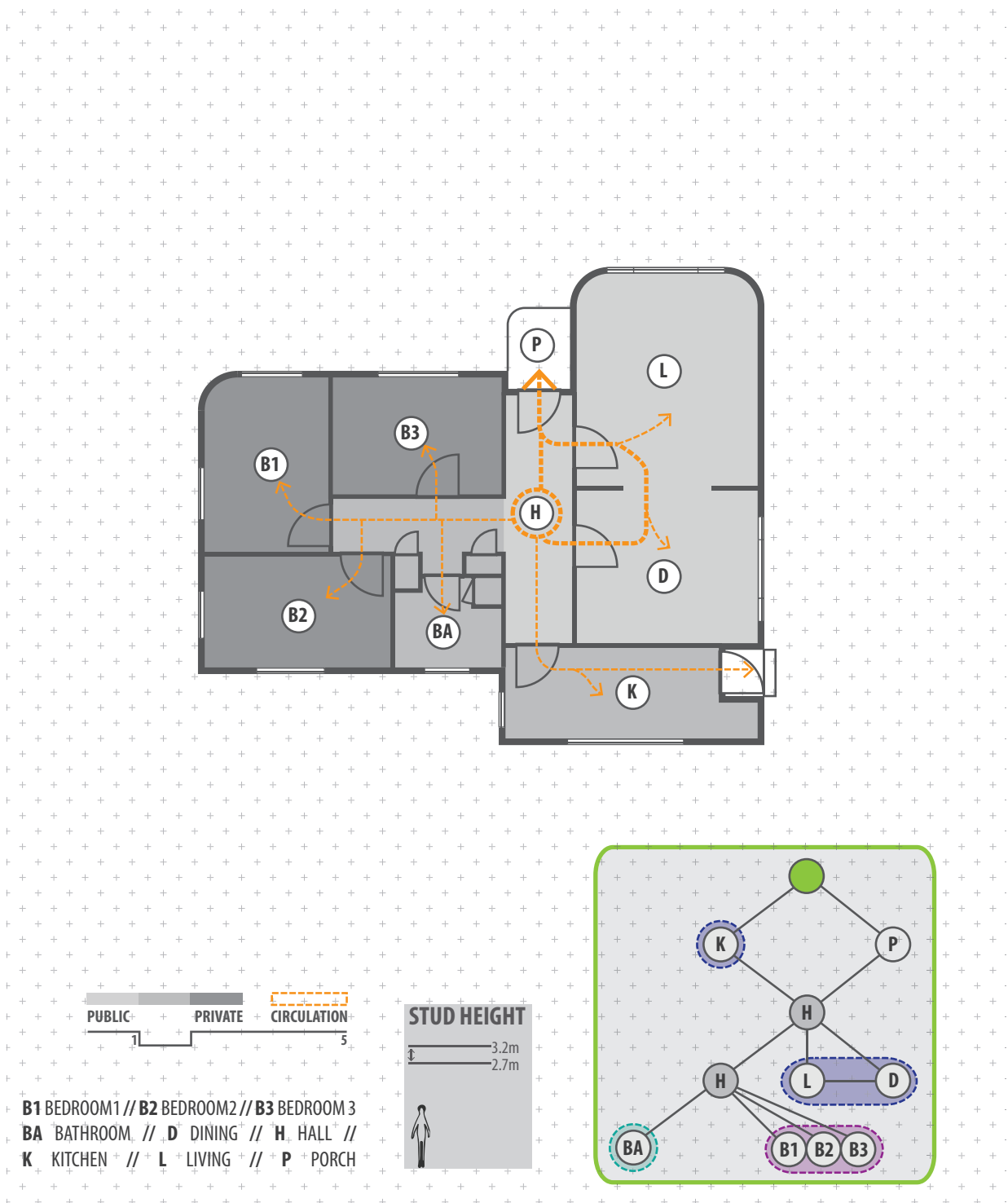
Fig 5.10. // While the exterior of the art deco house was significantly changed during the period, interiors followed a similar format to former styles, with the entrance leading to a central hall flanked by various rooms. A major change was the more distinct grouping of rooms according to their use, with the hallway bridging the gap between private and public spaces. Furthermore, in many cases a door was created between the formal dining room and living room, allowing discrete access between these two spaces.

05E /// THE STATE HOUSE
1930 - 1960

Between the 1940s and 1960s, housing in New Zealand took a turn toward the simple and efficient. Fuelled by major housing shortages due to World War II and the associated economic issues, the state house was designed and constructed on a massive scale. The housing type is now one of the most distinctive in New Zealand, with many cities being graced with large suburbs of state provided housing from the period. Wellington is no exception to this.

Efficient use of material combined with a desire for high-quality dwelling has meant that while many state housing styles exist, almost all are defined by simple, small, almost-square plans with basic pitched roofs and casement windows.

Fig 5.11.   // State Housing photographed in the Wellington suburb of Miramar.

100m2
22.00%
BUILT/PRIVATE
COVERED AREA

450m2
78.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
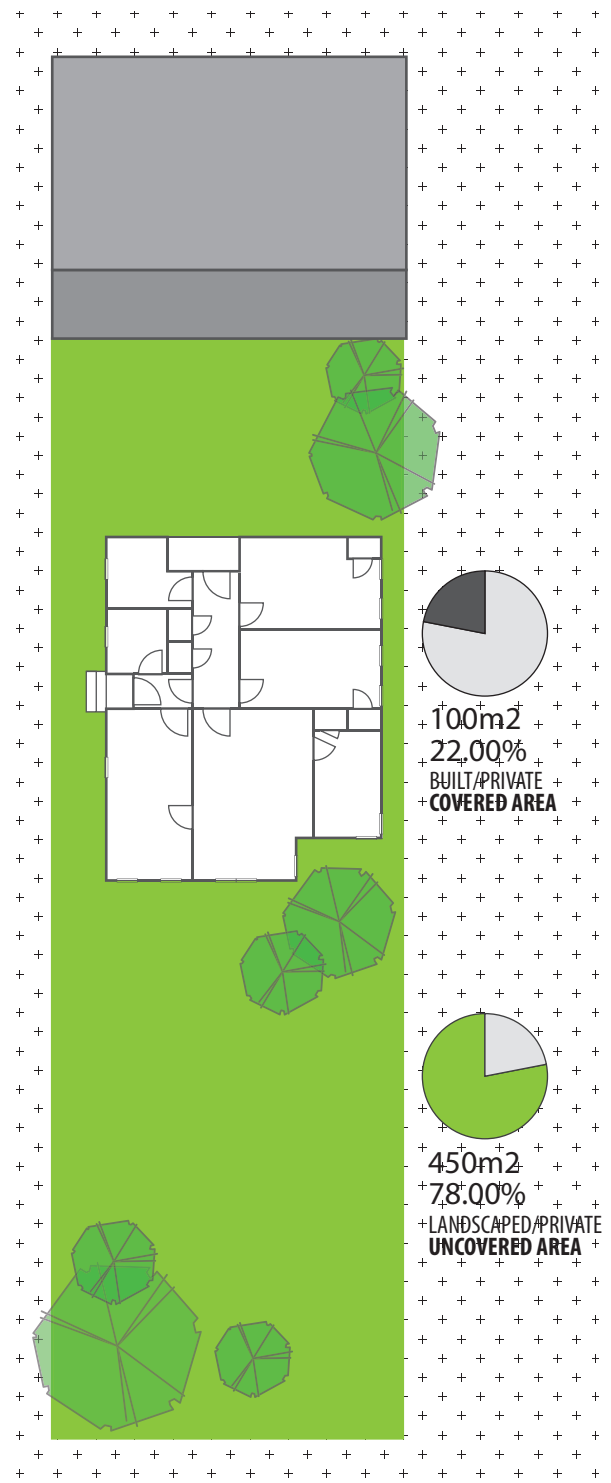
Fig 5.12. // Site placement is usually oriented towards the sun to increase passive solar gain, and houses located towards the front of the boundary. Most state housing sites are substantial at around 1000m2, the size contributing to what people now consider the ¼ acre dream (BRANZ, 2010).

STUD HEIGHT

2.7m
2.4m

PUBLIC　PRIVATE　CIRCULATION

1　　　　5

B1 BEDROOM1 // **B2** BEDROOM2 // **B3** BEDROOM3
BA BATHROOM // **D** DINING // **H** HALL // **K** KITCHEN
L LIVING // **LA** LAUNDRY // **P** PORCH
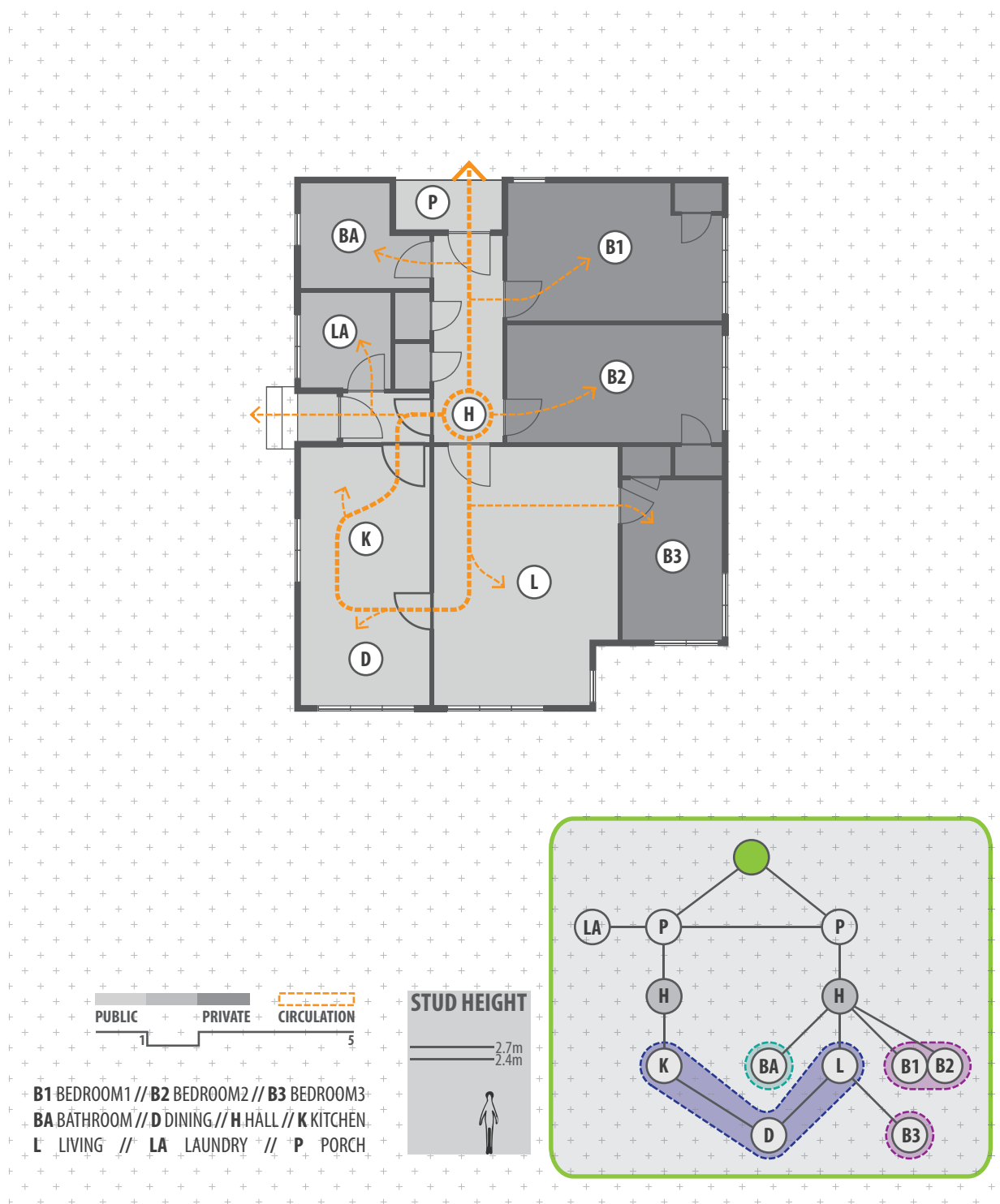
Fig 5.13.　// Many plans for state houses were created but typically it was desired that the living room received the most sunlight followed by the kitchen, which should receive morning light and the bedrooms, morning or afternoon light. Many reductions in size and scale were made in order to increase efficiency, particularly with reference to the hallway, which was either narrowed or removed entirely, and the dining room, which was either reduced in size or combined in open-plan format with the kitchen. Otherwise, the arrangements of these spaces typically followed those of the art deco period.

The house of the 1970s marks the beginnings
of the contemporary, developer driven, spec-
housing model (BRANZ, 2011). Heavily
influenced by architecture design of the decades
preceding it, offerings were tailored towards
stylised ideas of 'ideal' homes. While many
designs were offered, typical trends in this period
are defined by an increase in house size, increase
in garaging, and a use of new materials such as
aluminium windows.

Fig 5.14. // 70s housing photographed in the Wellington
suburb of Churton Park.

150m2
38.00%
BUILT/PRIVATE
COVERED AREA

400m2
62.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
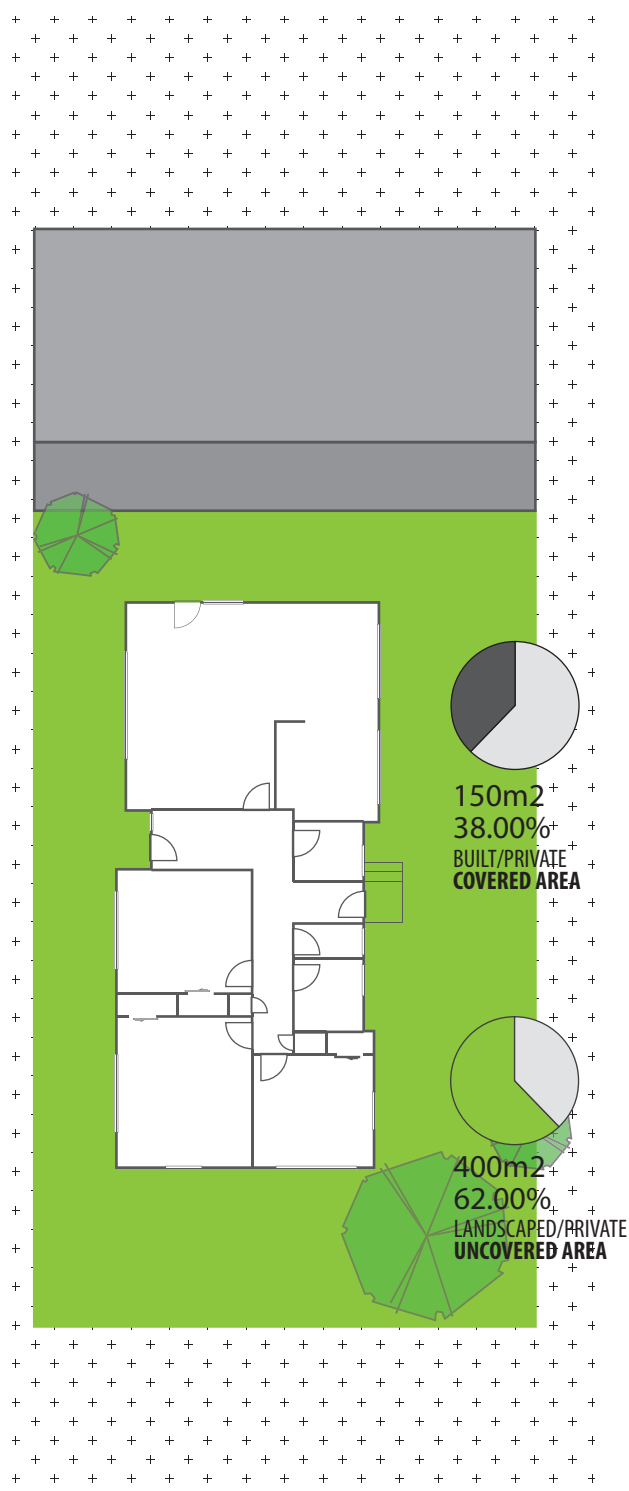
Fig 5.15.   // Site orientation, especially with spec models, is often poor. This is commonly seen in Wellington, where a lack of flat, flexible land meant that standard plans were often not suitable for getting the most from the site. In less standard houses however, many construction and design innovations were made to make the most of the site.

PUBLIC **PRIVATE** **CIRCULATION**

1 _____ 5

STUD HEIGHT

_____ 2.4m

B1 BEDROOM1 // **B2** BEDROOM2 // **B3** BEDROOM3
BA BATHROOM // **CP** CAR PORT
H HALL // **K** KITCHEN
L LIVING // **LA** LAUNDRY // **WC** TOILET
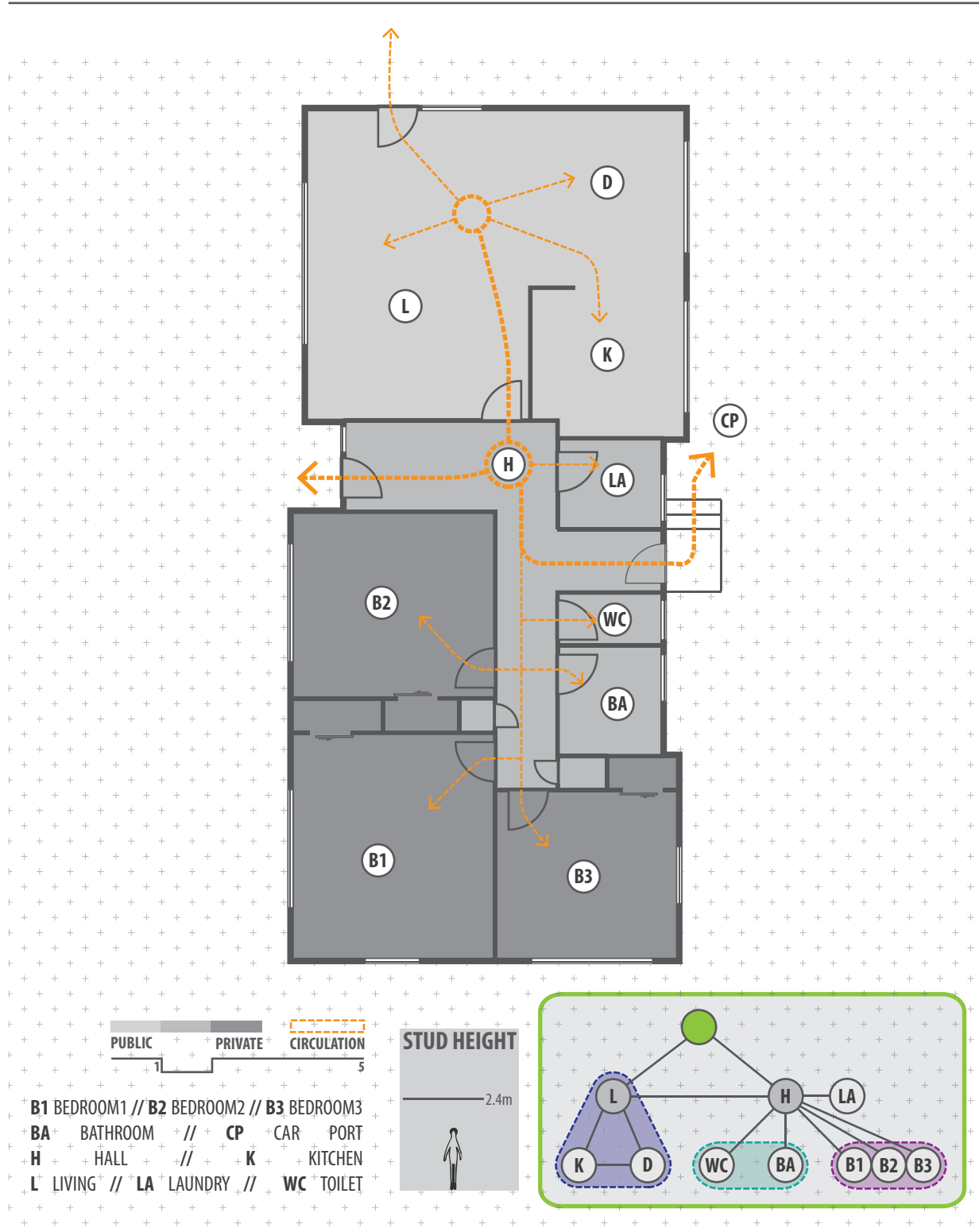
Fig 5.16. // Houses of the 1970s saw a shift towards open-plan living with respect to the grouping of living, kitchen and dining spaces. Internal, or separate access to garaging or car parking also became common, as did separate, specific access to outdoor entertaining areas.

05G /// CONTEMPORARY HOUSING / \
1990 -

Much like the house of the 1970s, contemporary housing in Wellington is often represented by somewhat customisable, but predominantly pre-defined offerings. These vary in size and specification, but are usually defined by an open-plan living, dining and kitchen area separated from the bedroom spaces by a hallway.

Fig 5.17.   // Contemporary housing photographed in the Wellington suburb of Churton Park.

130m2
37.00%
BUILT/PRIVATE
COVERED AREA

350m2
63.00%
LANDSCAPED/PRIVATE
UNCOVERED AREA
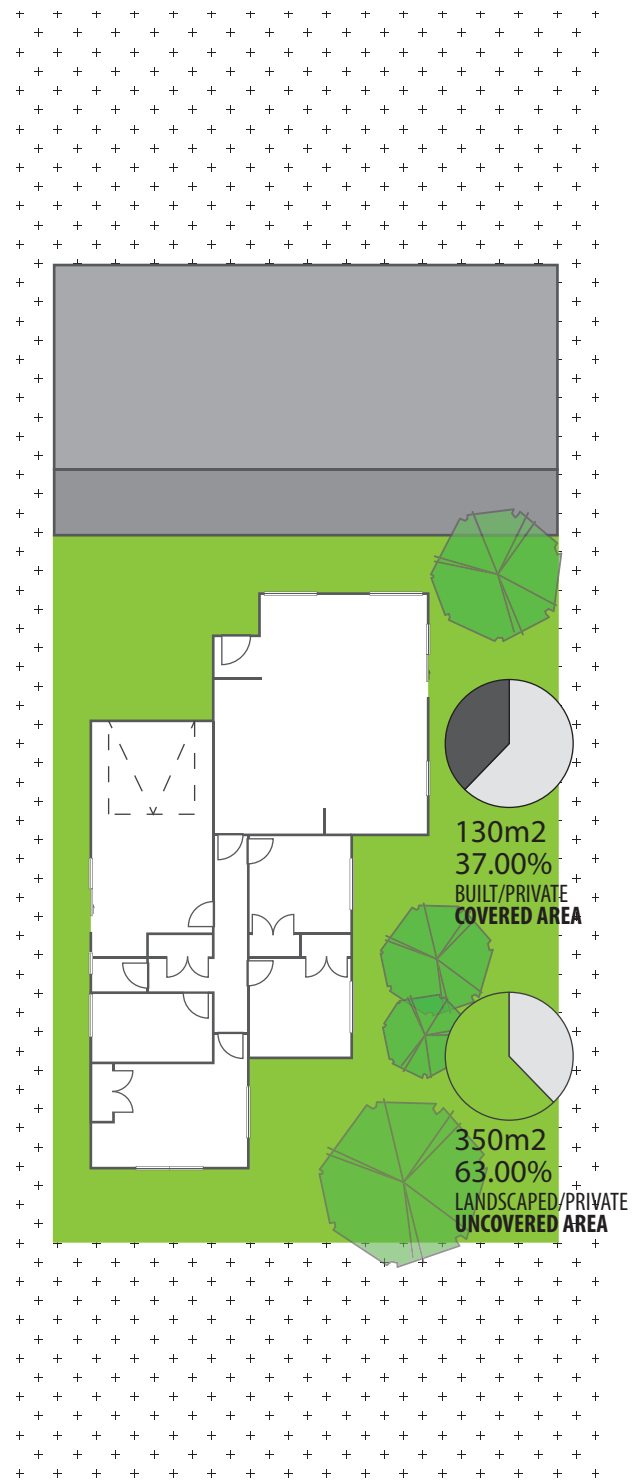
Fig 5.18. // Site placement and orientation is usually resolved with solar gains in mind, but restrictions in section size and the desire for larger housing will often mean these houses are placed close together with reduced access to outdoor space than that seen in earlier examples.
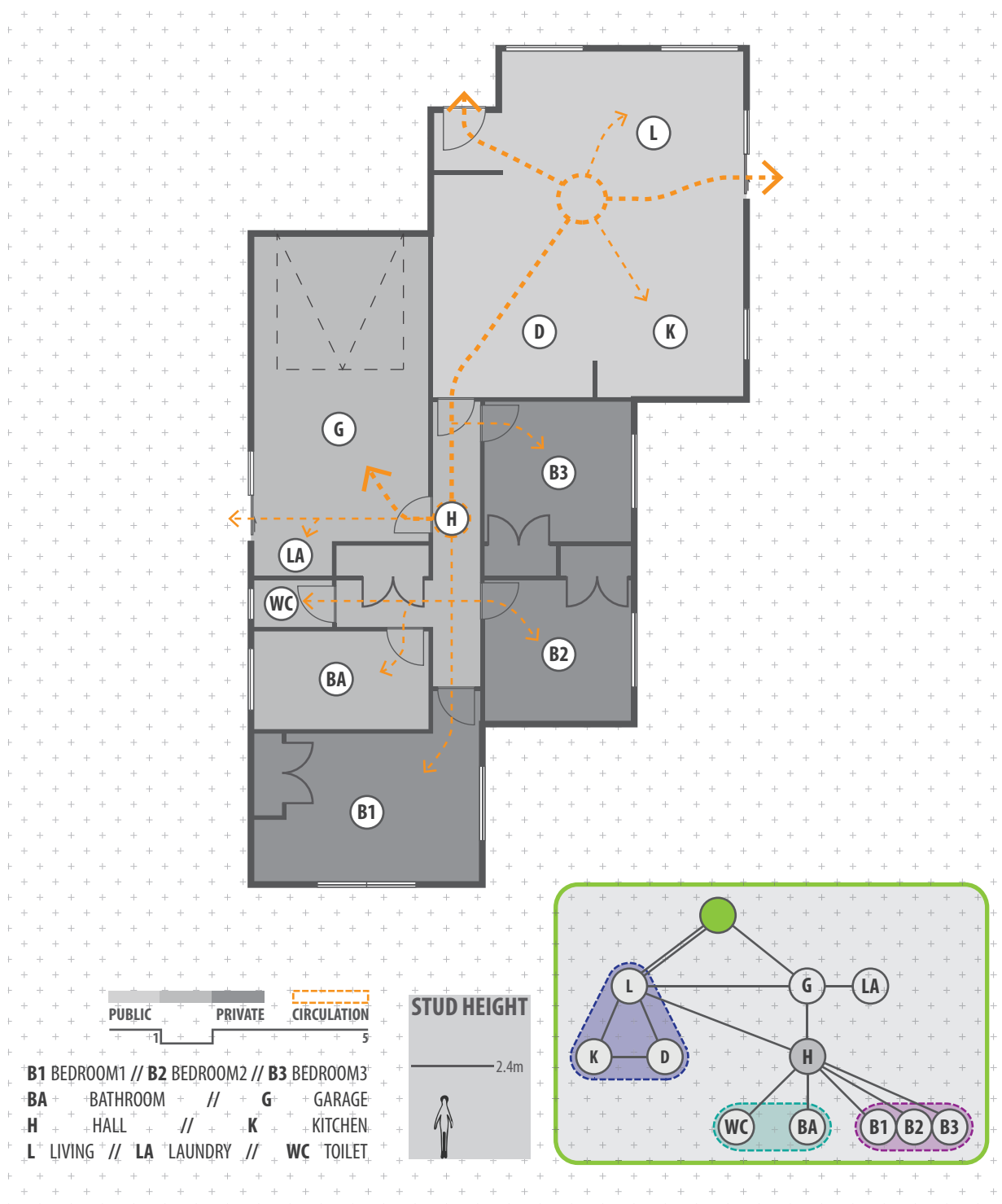
Fig 5.19.   // Often the public entrance will open directly into the living space, but will in larger examples open into a central hallway. Secondary entrances are common between the open-plan space and back yard, as well as between the hallway and an internally accessible garage.

Comparing the evolving models of the common New Zealand house, the following trends were derived:

-       Orientation and site placement has moved from satisfying formal aesthetics to increasing passive solar gain and efficient site use.

-       Orientation and site placement has shifted towards allocation for private, off street, car parking.

-       Housing plans have become less formal, with a rationalisation of spaces that have led to open plan living and a separation of private and public spaces. Half of the house is therefore now prescribed volumetrically.

-       Access to the outdoors, and the relationship between the house and the garden has increased. This is particularly relevant to the open plan living space.

-       House sizes have increased.

-       Site sizes have reduced.

-       Construction methods and materials have become more varied and specialised.

One could suggest that changing trends in the most common of New Zealand's housing offerings for the last century have been predominantly market driven. It should therefore be difficult – especially with reference to earlier models – to compare historic housing requirements to the very different cultural and societal expectations of the contemporary New Zealander. It is perhaps of interest then to observe that while organisational requirements have changed, the constituent parts of the common New Zealand house generally have not. Furthermore, organisational changes appear to have evolved through the rationalisation of historic concepts, rather than being born out of creating new or innovative types of living.

Perhaps then, this exercise aids in substantiating the notion that contemporary practices following this model are dated in their approach. Nevertheless, this exercise is interesting in exploring what the general market has historically required. Even if the market today is too varied to continue to deliver prescriptive models of housing creation, there is value in understating what people desire from their dwellings.

06A /// A GOOD HOUSE? / \
EXAMINING A TYPICAL MEDIUM-DENSITY HOUSE IN WELLINGTON

In order to progress with exploring a new model of medium-density housing in Wellington, it is necessary to first examine the shortcomings of typical existing offerings in the city. A representative example in the suburb of Thorndon has been selected for this analysis. This example is representative of negative typological traits such as being repetitive and monotonous, prescriptive, poorly oriented and with poor access to outdoor space.

This thesis would argue that this example of medium-density housing is simply a repackaged typical detached model, made to satisfy the 'nuclear' family. In addition to being incongruous with the needs of changing household demographics (Wellington City Council, 2007), this medium-density reconfiguration of detached housing elements can be further seen to eradicate

Fig 6.01.   // Thorndon housing example selected for analysis .

many of the positive and desirable organisational and private-public relationships that are seen in its lower density counterparts. Of particular interest is the lifting of the living spaces necessary in order to provide private car parking, leading to a loss of access to outdoor space at ground level. Combined with the space required for vehicular circulation leading to the car parks, this results in a lack of personalised garden space and the associated soft, semi-private boundaries that these provide. The effect of this is boundaries that are provided by walls instead of fences, and little external embellishment that aids in identifying one property from another.

Internally, organisational relationships remain similar to a detached housing model; Access to the house is made through the open-plan living, kitchen and dining spaces; In place of a hallway, the stairs act as the semi-private buffer, providing access to the two bedrooms and the bathroom upstairs; At ground level, private car parking is provided, alongside a third bedroom/sleep out. Packaged in a smaller envelope and arranged in a terraced fashion means that unlike typical detached dwellings, these offerings lack the flexibility to be extended or reconfigured. Orientation of the grouped houses has been achieved based on maximum efficiency, rather than orientation to light and amenity.

B1 BEDROOM1 // **B2** BEDROOM2 // **B3** BEDROOM3
BA BATHROOM / / **BL** BALCONY
D DINING / / **E** ENTRY / / **G** GARAGE
H HALL / / **K** KITCHEN // **L** LIVING //
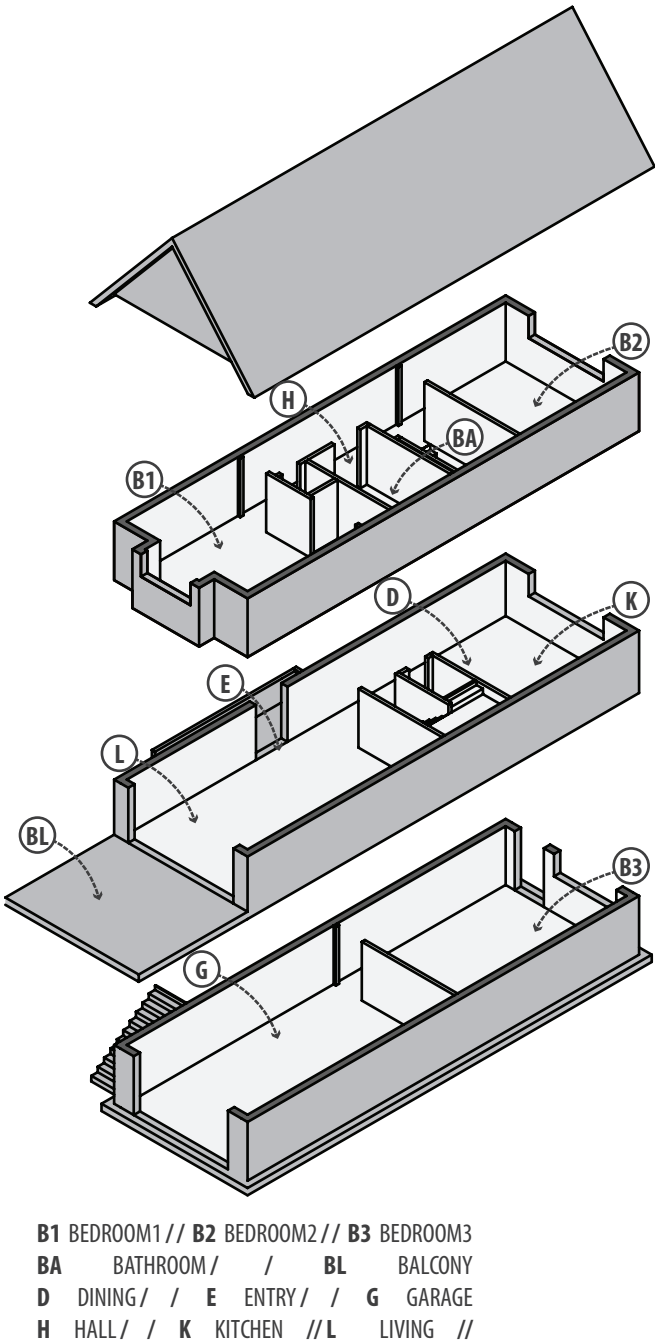
Fig 6.02. // Thorndon housing example interior configuration.

06B /// FURTHER RATIONALISATION / \
CONTINUING THE TREND

In the programme study of typical detached models of housing in Wellington, an evolutionary theme was identified where a lessening of formality and an associated reduction in specific room requirements has led to the rationalisation of less private spaces in a house to form 'open plan' living. In satisfying an increasingly varying household demographic, one could suggest that a logical step therefore is to continue this process of rationalisation – after all, fulfilling multiple needs within one housing solution almost by definition requires a reduction in specificity and space use prescription.

In reducing the number of defined rooms within the housing envelope, opportunities for reintroducing these amenities in a shared format also provide occasion for neighbourly interaction and community stimulation. It has been well recognised that the grouping and sharing of intermittently used amenities not only provides efficiency of space use and materials, but aids significantly in community development (Southcombe, 2014).

The following process is applied to an existing unit plan from the Thorndon housing example and then reimagined in a conceptual terraced arrangement:

1.   Remove individual car parks and group together in a shared arrangement.
2.   Remove vehicular circulation and replace with shared pedestrian circulation and outdoor amenity.
3.   Group private outdoor spaces together to provide one large space at ground level.
4.   Remove excess bedrooms – assume a base household of a single or childless couple.
5.   Reintroduce intermittently used spaces as communal amenity.

B1 BEDROOM1 **//** **B2** BEDROOM2 **//** **B3** BEDROOM3
BA BATHROOM **//** **BL** BALCONY
D DINING **//** **E** ENTRY **//** **G** GARAGE
H HALL **//** **K** KITCHEN **//** **L** LIVING **//**
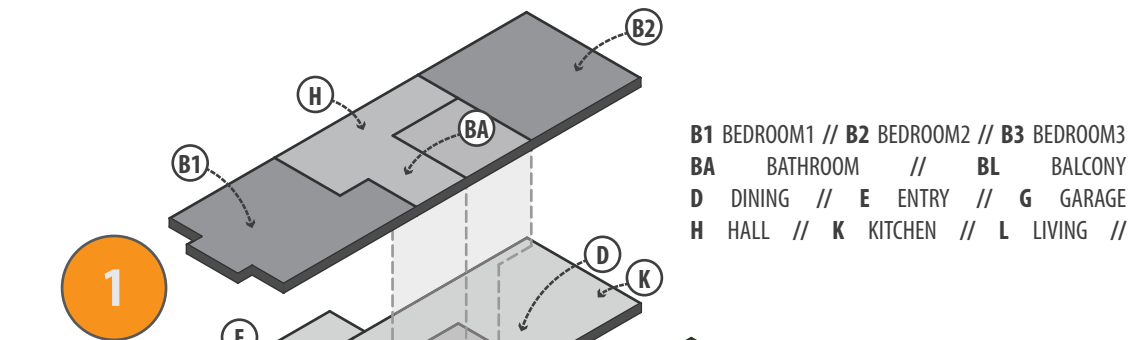
Fig 6.03.   // This example of housing displays poor connections with the outdoor and segregated bedrooms.

B1 BEDROOM1 **//** **B2** BEDROOM2 **//** **B3** BEDROOM3
BA BATHROOM **//** **D** DINING **//** **E** ENTRY **//**
G GARAGE **//** **H** HALL **//** **K** KITCHEN **//** **L** LIVING
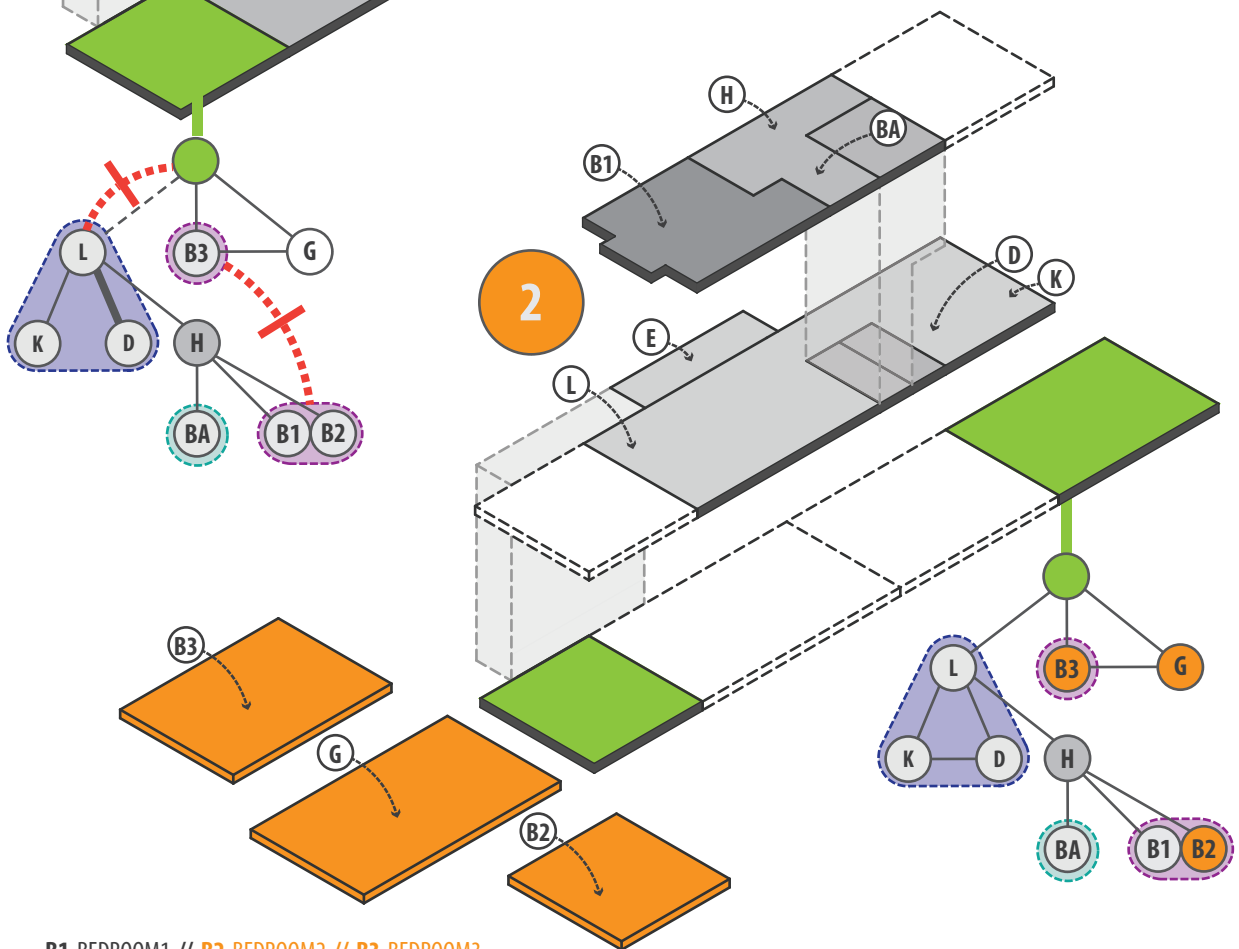
Fig 6.04.   // The removal of the garage space allows for a direct connection between living and outdoor spaces.
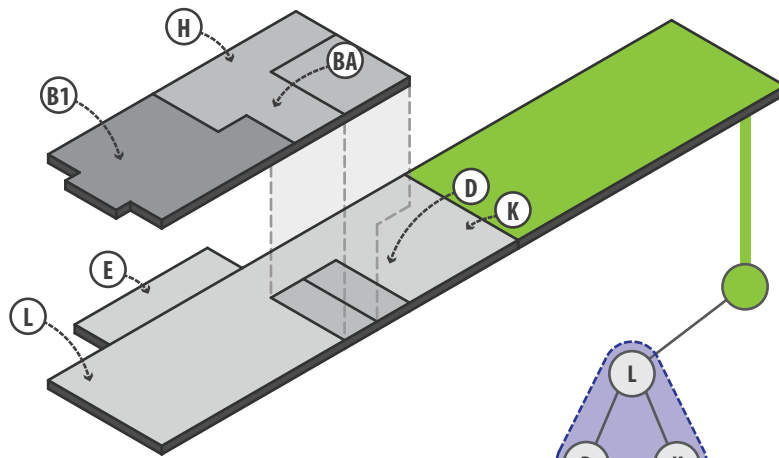
B1 BEDROOM1 // **BA** BATHROOM // **D** DINING
E ENTRY // **H** HALL // **K** KITCHEN // **L** LIVING

Fig 6.05. // Consolidating the private outdoor spaces.
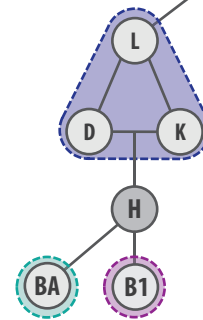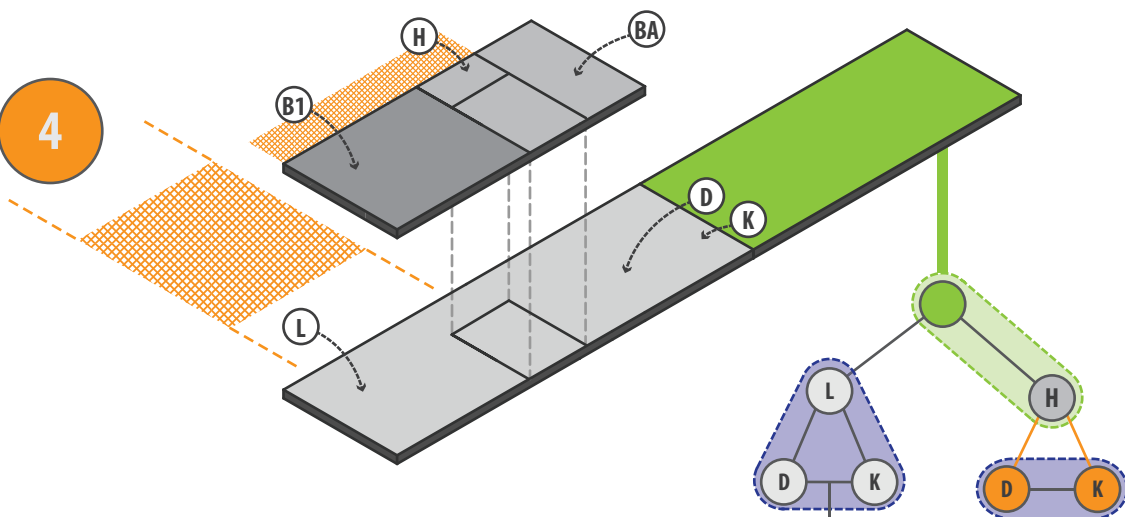
B1 BEDROOM1 // **BA** BATHROOM // **D** DINING
E ENTRY // **H** HALL // **K** KITCHEN // **L** LIVING
B2 BEDROOM2 // **D** DINING // **K** KITCHEN

Fig 6.06. // Reintroducing intermittently used space as shared amenity.

ENTERTAINING UNIT
SHARED SPACE ////

GUEST ROOM ///
SHARED SPACE

BA

B1

K

D

L

SECONDARY ENTRANCE
PRIVATE SPACE /////////

PRIMARY ENTRANCE ///
FORCED INTERACTION
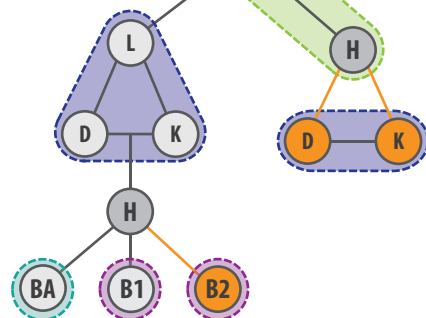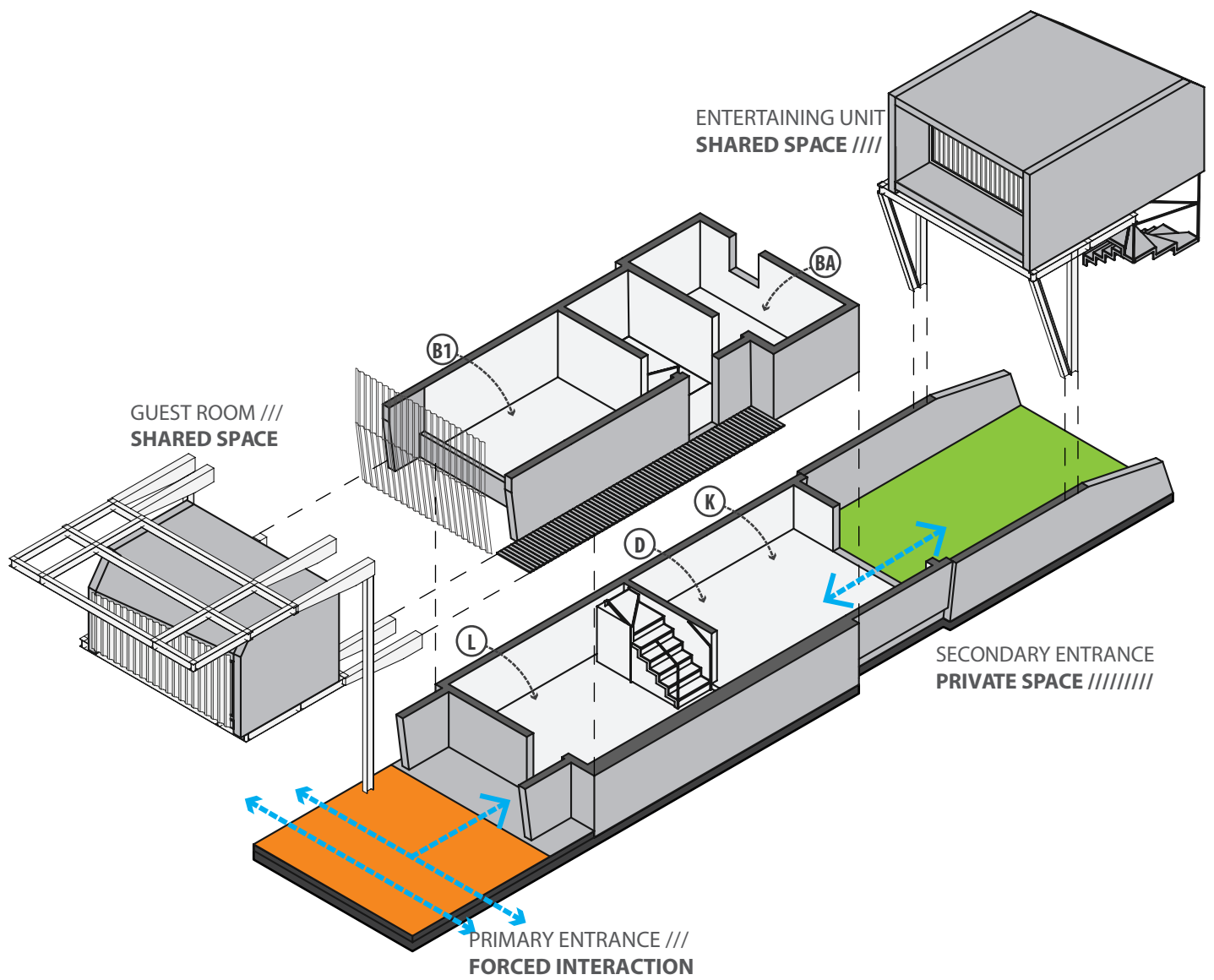
Fig 6.07.   // Conceptual dwelling showing access to shared amenity.

1 CAR PARK ////
PER DWELLING

100 % ///////////////
SHARED / COVERED
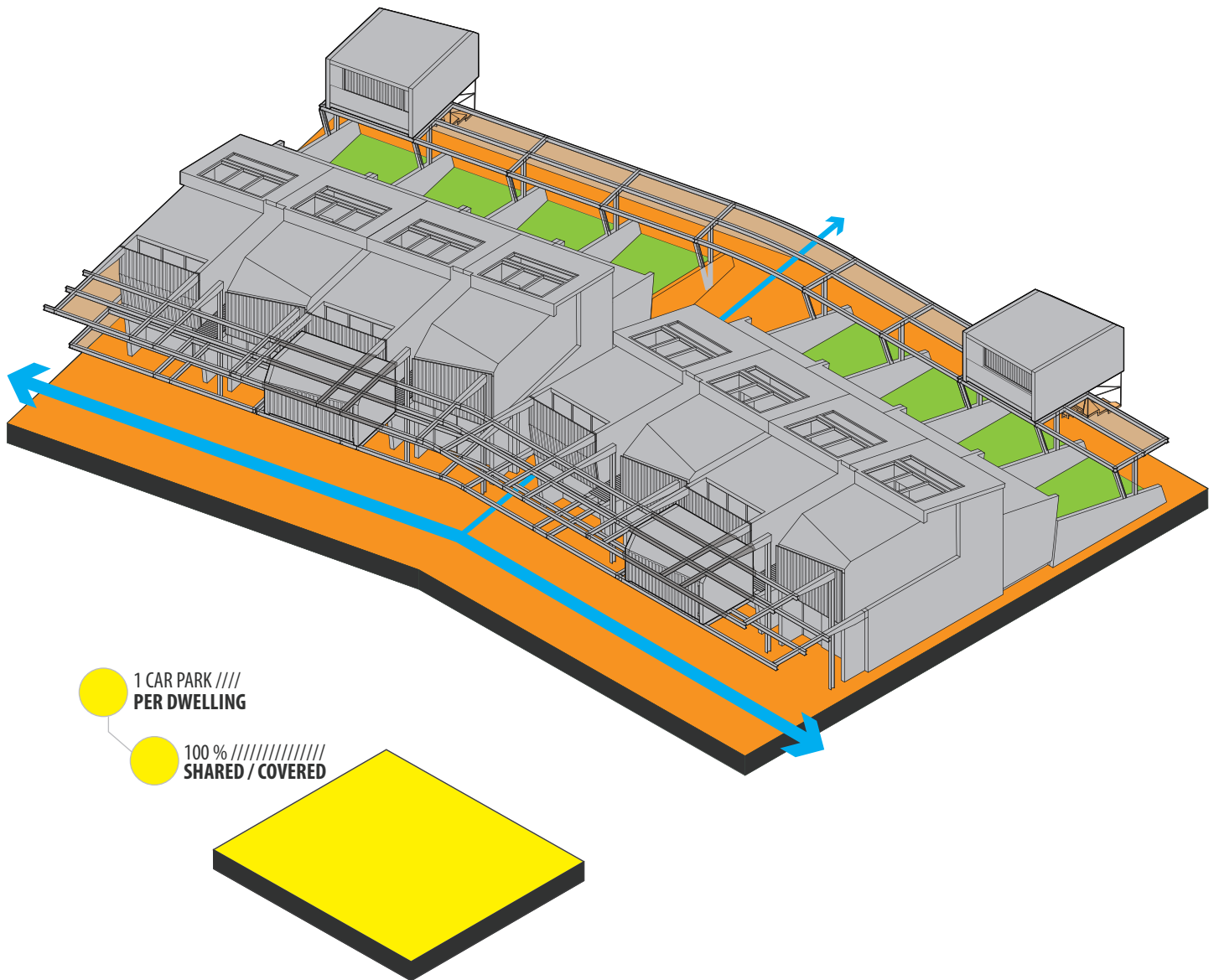
Fig 6.08.   // A terraced arrangement of conceptual dwellings.
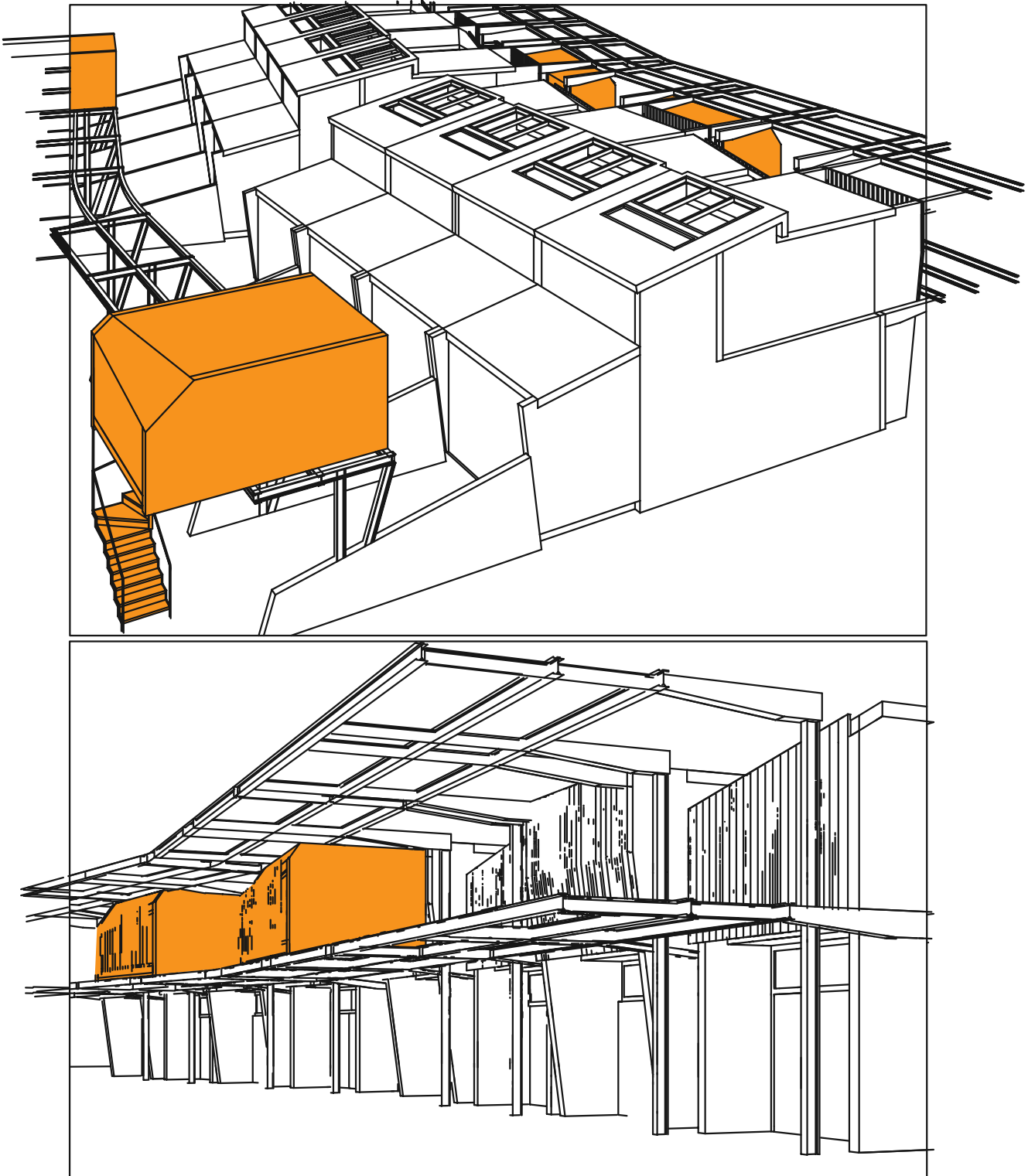
Fig 6.09.   // Shared amenity is distributed to the houses through a railing system.
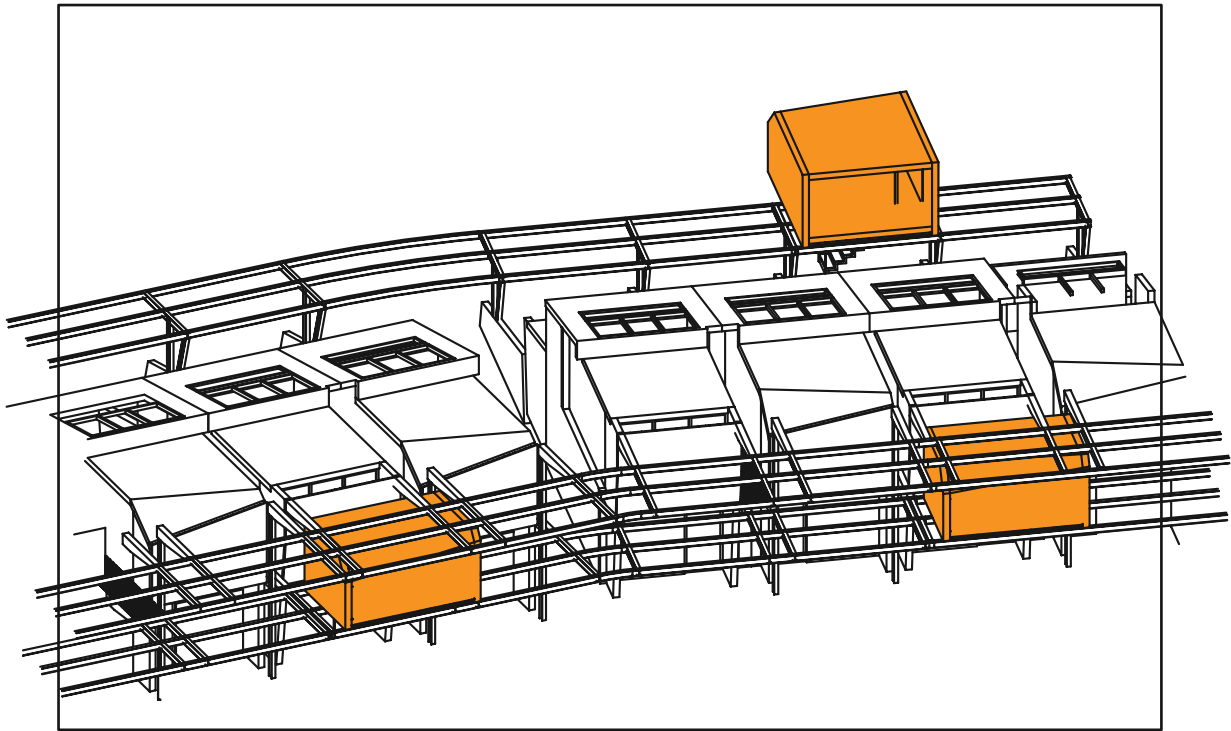
Fig 6.10.   // Shared amenity is distributed to the houses through a railing system.

Conclusions /

- The outcome is too technical in its approach.
- Neither the outcomes, nor the methods employed provide a good platform for driving the design.
- The process still generates a prescriptive approach to medium density housing. The spaces have merely been reduced in their size and quantity.
- Ideals of communal amenity are still valid and should still be applied to the final outcome.
- Rationalisation and reduction needs to be further explored from an internal planning perspective.

07A /// THE FLEXIBLE DWELLING / \
PLANING FOR PERPETUAL ADAPTATION

With a similar interest in self-motivated, impulsive space use, the desires of this thesis could be seen to resonate with the writing of Rowe and Slutsky (1963). Their manifesto discusses two ways of dividing a space – through literal or phenomenal transparency. While literal transparency is achieved through material properties, i.e. translucent screens, phenomenal transparency is instead conceptual and is achieved through the organisation of spaces and volumes.

Literal and phenomenal transparency can be further understood as looking vs. reading – the former engages the eye, whereby the latter engages the mind, leading to a deeper and more intimate understanding and interaction with space. Careful use of this, such as in Adolf Loos' Villa Muller, can lead to a layering of multiple

habitation options within one space, and truly flexible open-plan living.
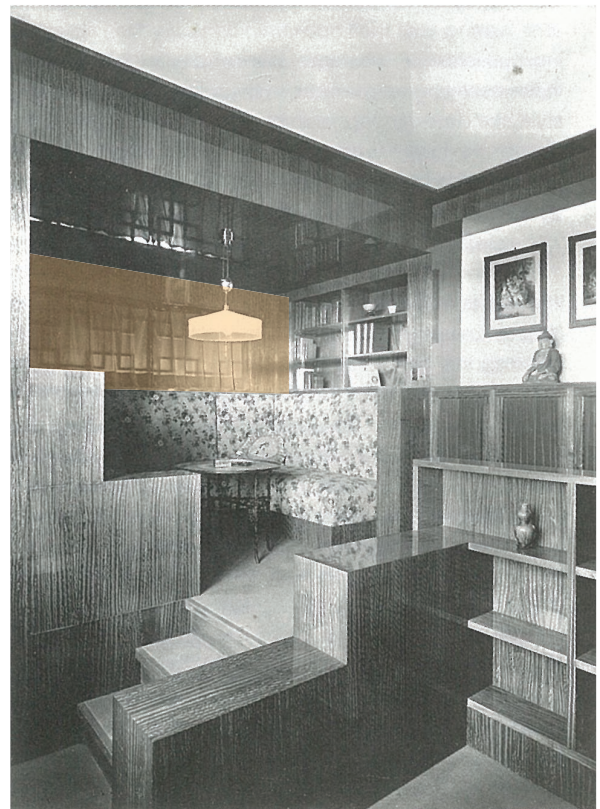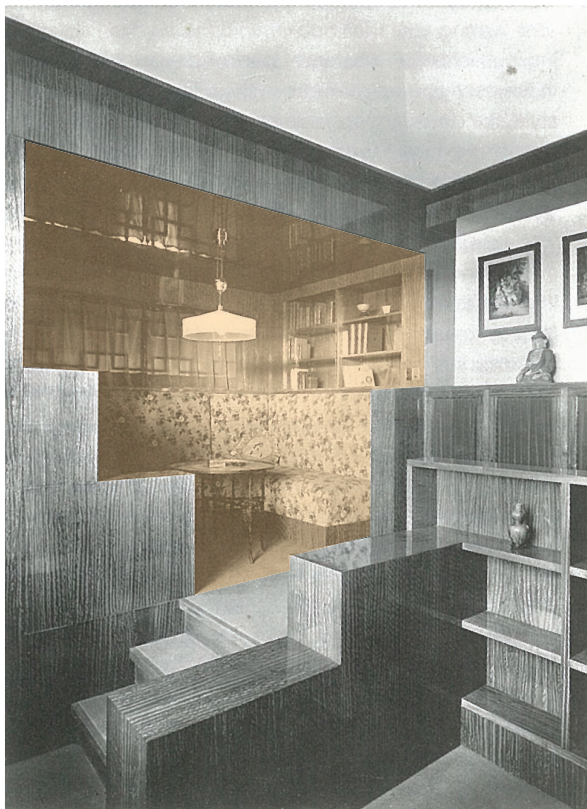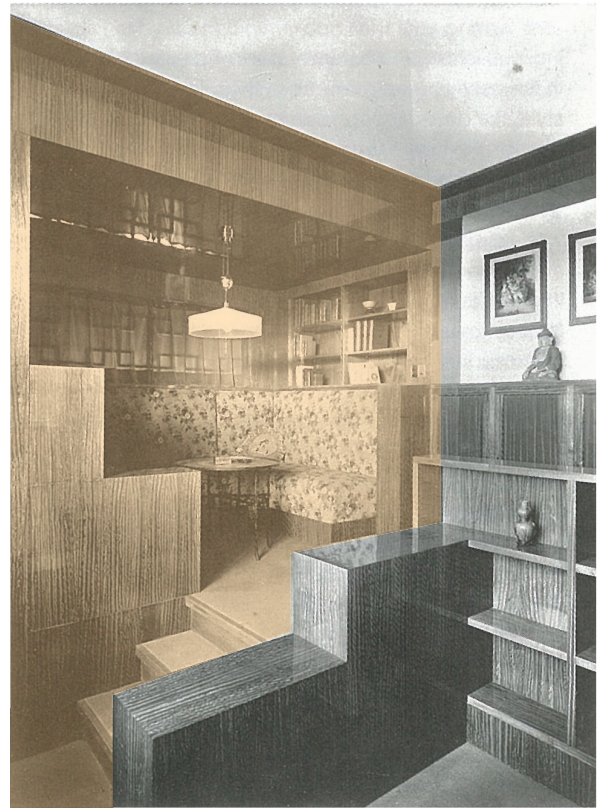
Fig 7.01.   // The layering of space in Loos' Villa Muller.

This thesis acknowledges two ways in which phenomenal transparency could be applied within the dwelling; firstly, in the arrangement and division of fixed spaces; and secondly in dynamic and changeable building systems, with a preconceived understanding of the system's spatial effects. In José Oubrerie's Miller House (see Chapter 4) elements of the building may be fixed but multiple uses and relationships can be formed within his nine square grid arrangement. Chang's Suitcase House Hotel (see Chapter 4) however, is physically dynamic in its approach. The systems within the architecture reduce and partition the large open spaces with moving panels and sliding walls, changing the relationships between spaces, allowing them to suit a range of needs and desires.

In this thesis, neither approach to flexibility is regarded as being inferior to the other. The system merely needs to be perpetual in its flexibility so that it may cater to either the changing needs of an existing family, or the successive needs of another, allowing for the houses to be completed by the occupiers in a continual variety of bespoke arrangements.

Fig 7.02.   // José Oubrerie's Miller House

Fig 7.03.   // Gary Chang's Suitcase House Hotel

Physical Transparency Only /
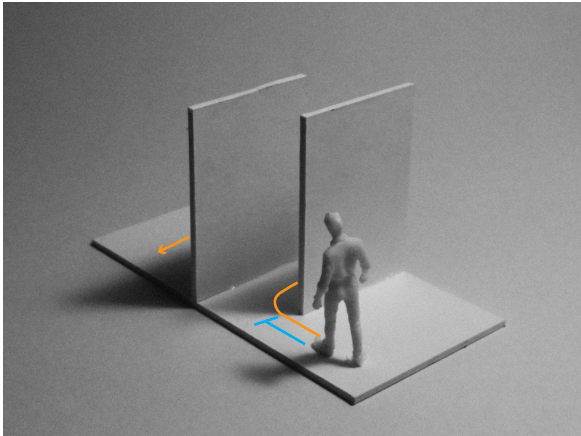
Visual Transparency Only /
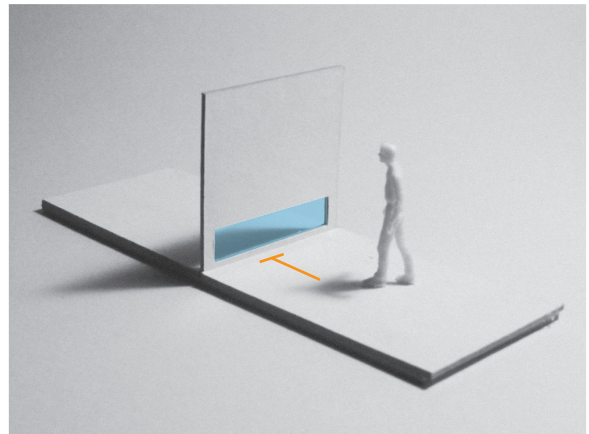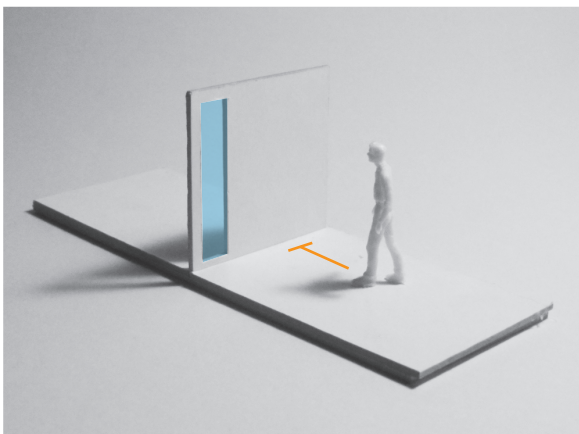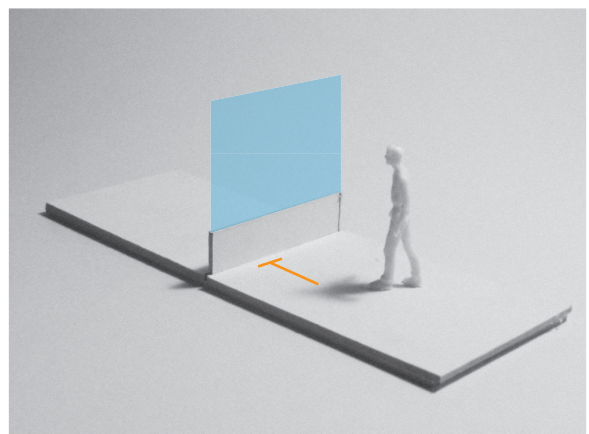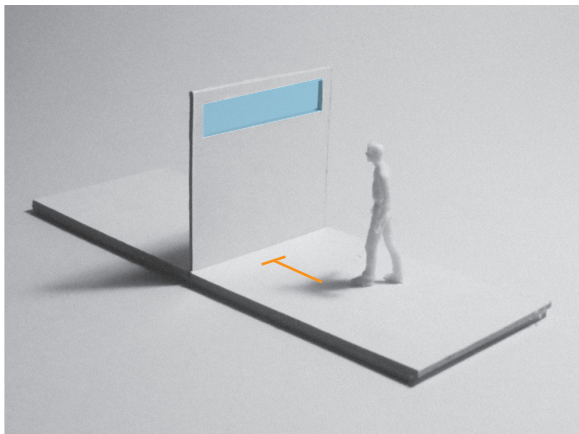
Fig 7.04.   // Simple barriers dividing space.
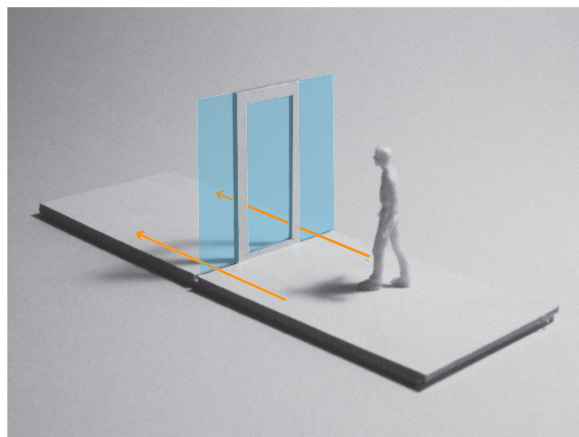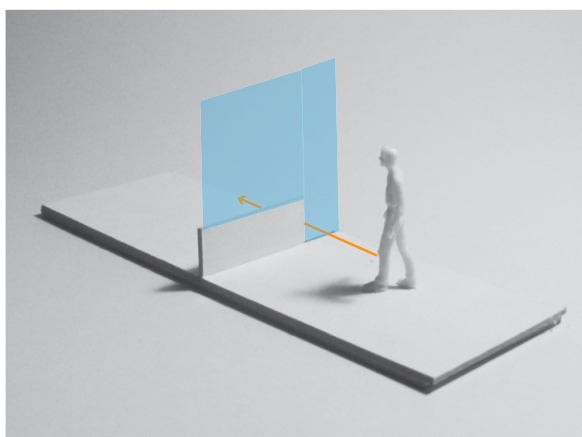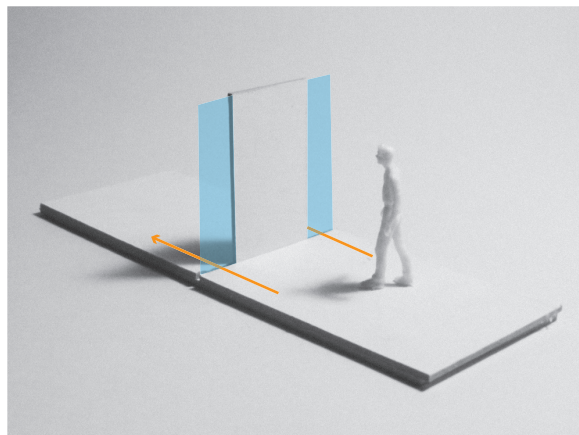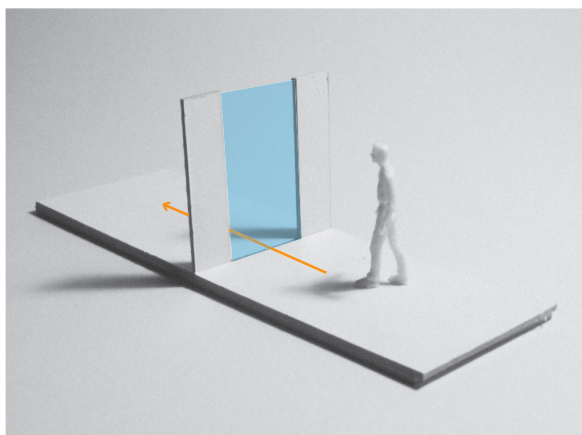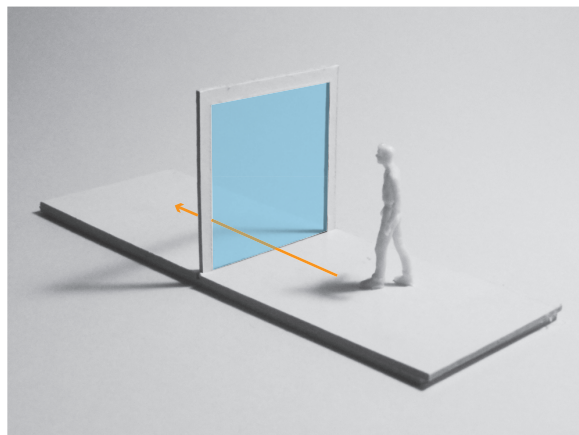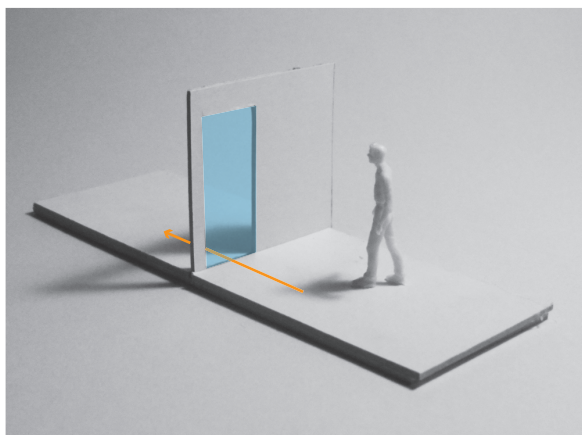
Fig 7.05.   // Simple barriers dividing space.

Full Division /
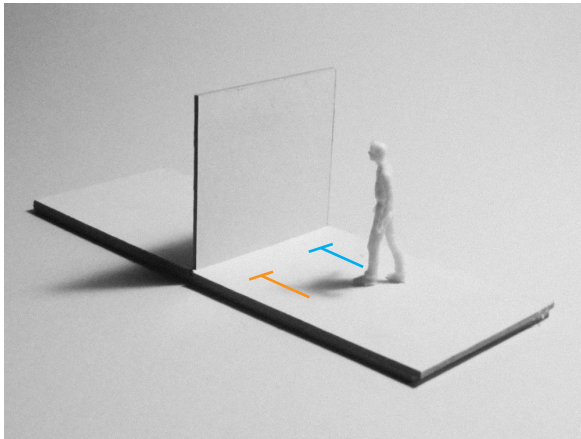
Changing Floor Levels /
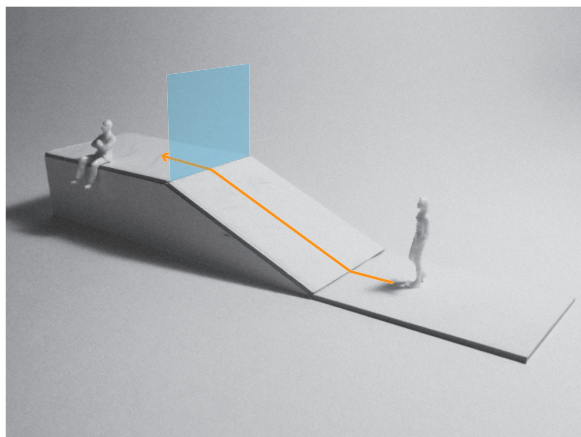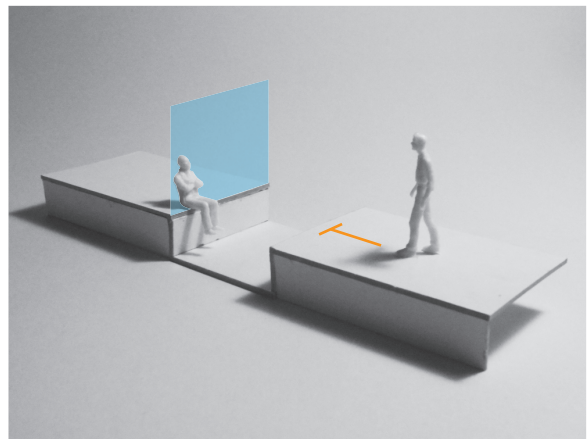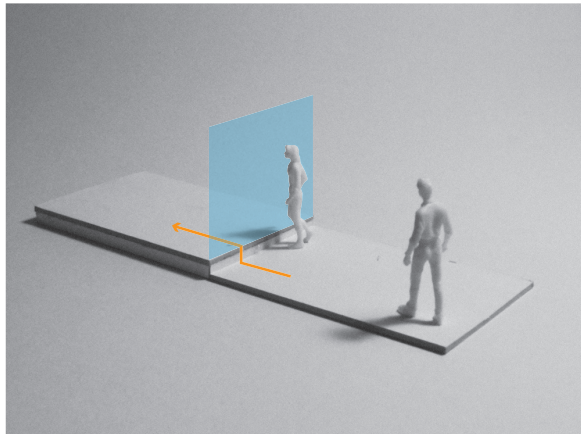
Fig 7.06.   // Dividing space.

07C /// THE FLEXIBLE DWELLING / \
THE GRIDDED HOUSE

The nine-square-grid design exercise was a common introductory architecture studio problem from the 1970s to the 1990s. Created by John Hejduk, the exercise is intended to free students from uninformed design assumptions by shifting focus to architecture as an autonomous discipline (Love, 2003). Students are motivated to explore pure spatial relationships through manipulating a 'kit of parts'. This kit is comprised of the frame that provides the platform for further architectural operations, i.e. the nine square grid and the reductive elements that can be added to the frame as defined by the brief, i.e, walls-as-planes and piers. The outcome of combining these elements is a simple geometric order that is slowly transformed, resulting in a complex spatial arrangement.

The aim of the exercise is contradicted when starting to consider form in the contexts of function, program and construction. Nevertheless, the nine square grid provides a useful platform for exploring means of minimising programmatic definition in housing.
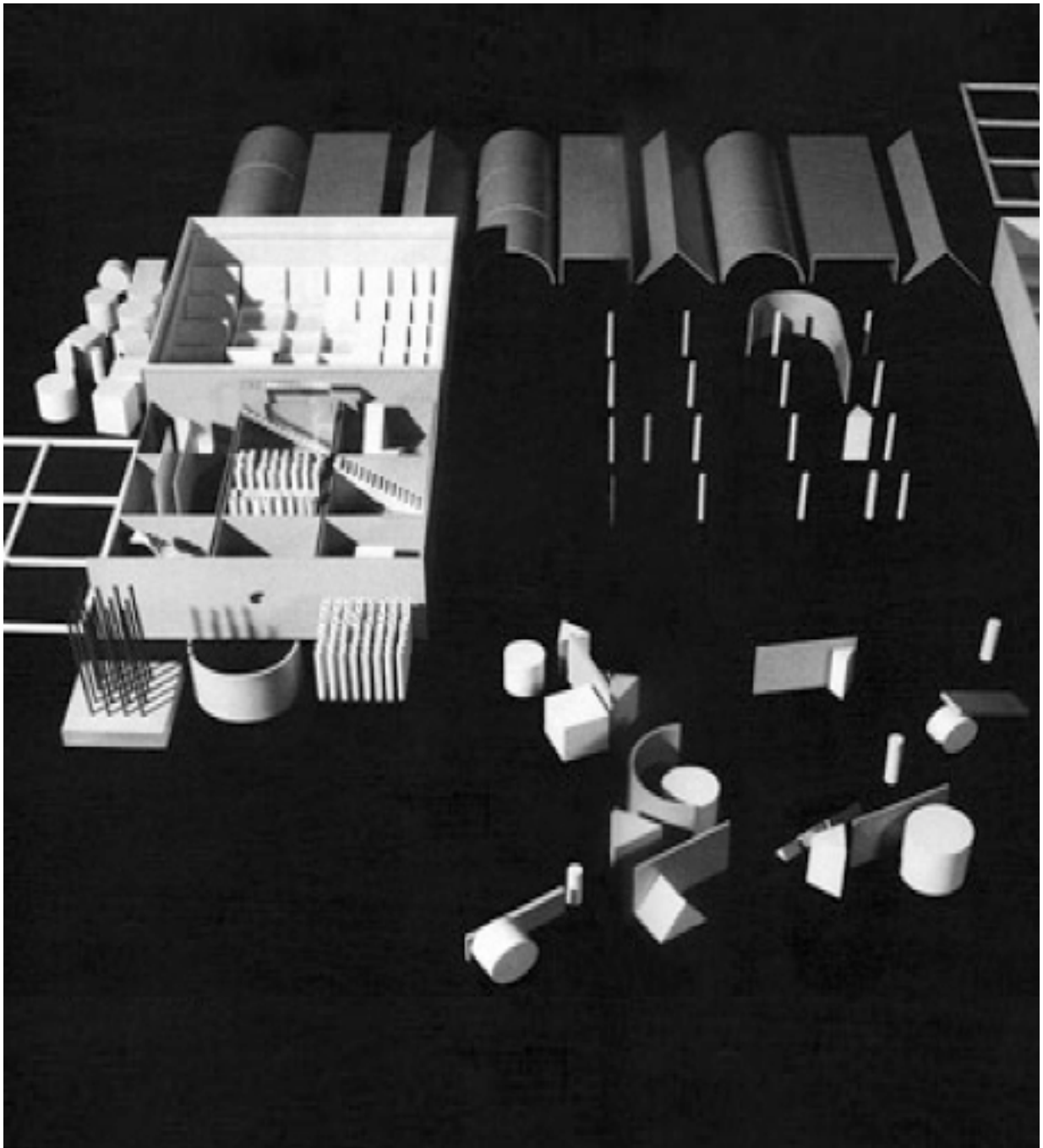
Fig 7.07.   // The 'Kit of Parts' for a nine square grid exercise.

07D /// THE FLEXIBLE DWELLING / \
DIVIDING THE GRIDDED HOUSE WITH FLOOR PLANES

The following process is applied to a gird comprised of nine 4m x 4m squares:

- With exception to the building's core, spaces are divided based on their level or privacy, rather than being given a specific task.
- Privacy is varied based on floor level and ceiling height.
- Ground level spaces are assumed to be suitable for allocation of living, kitchen and dining, whereby the upstairs spaces are suited to being the bedroom(s). This is with exception to the 'flexible' spaces identified on both floors.

- 'Flexible' spaces are highlighted throughout the grid. These spaces are identified as the most able to fulfil the full range of space allocations required within a dwelling.
- In maintaining the basic relationships, many deviations of this grid house can be created, enhancing variation between houses.
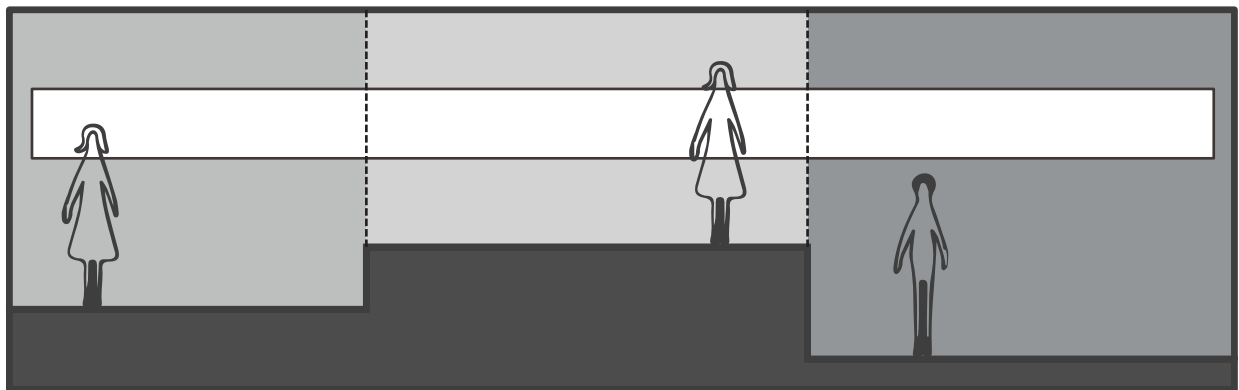
Fig 7.08.   // Changing floor levels and the effect on interior-exterior privacy
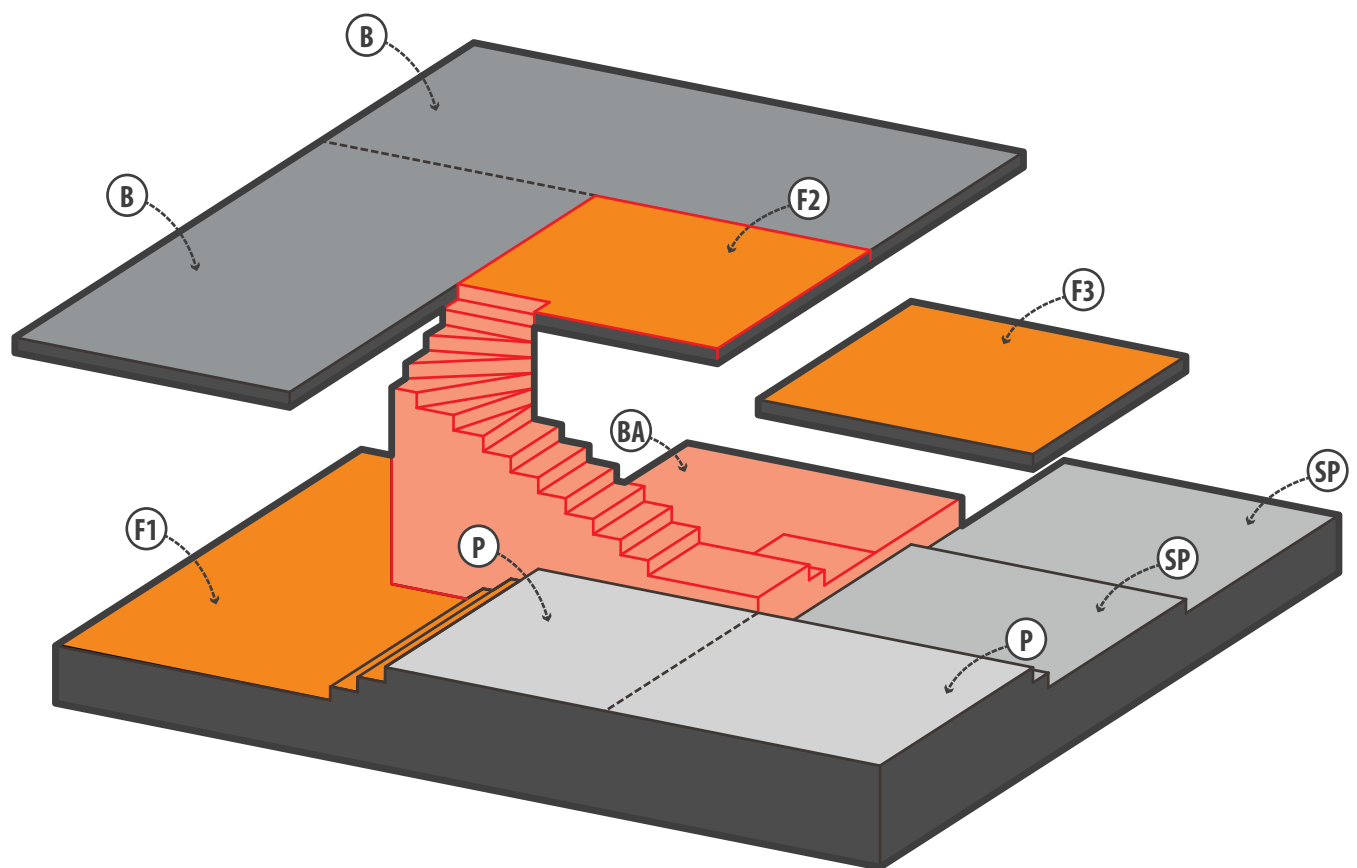
P PUBLIC // SP SEMI-PUBLIC // B PRIVATE
SC SERVICE CORE // BA BATHROOM //
F1 FLEXIBLE ONE // F2 FLEXIBLE TWO // F3 FLEXIBLE THREE

Fig 7.09.   // The basic gridded house / The grid core is allocated to vertical circulation and fixed services such as plumbing. The remaining space around the core is quasi-open-plan – fully connected, but never able to be experienced holistically as it is obscured by the core. In conjunction with the divisions provided by the changing floor level, this generates a multitude of space use options within the same fixed arrangement, thus providing multiple layers of habitation options and experiential, variety driven dwelling.
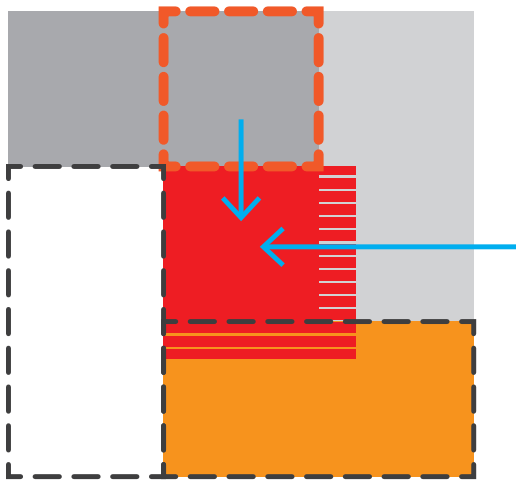
Fig 7.10. //The basic gridded house / Diagrammatic plan.

Downstairs Components /
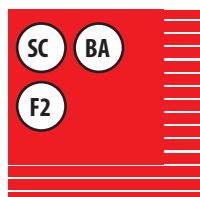
Upstairs Components
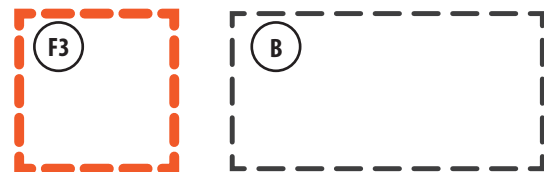
P PUBLIC // **SP** SEMI-PUBLIC // **B** PRIVATE
SC SERVICE CORE // **BA** BATHROOM //
F1 FLEXIBLE ONE // **F2** FLEXIBLE TWO // **F3** FLEXIBLE THREE

Core /

Fig 7.11. // The basic gridded house / Components.
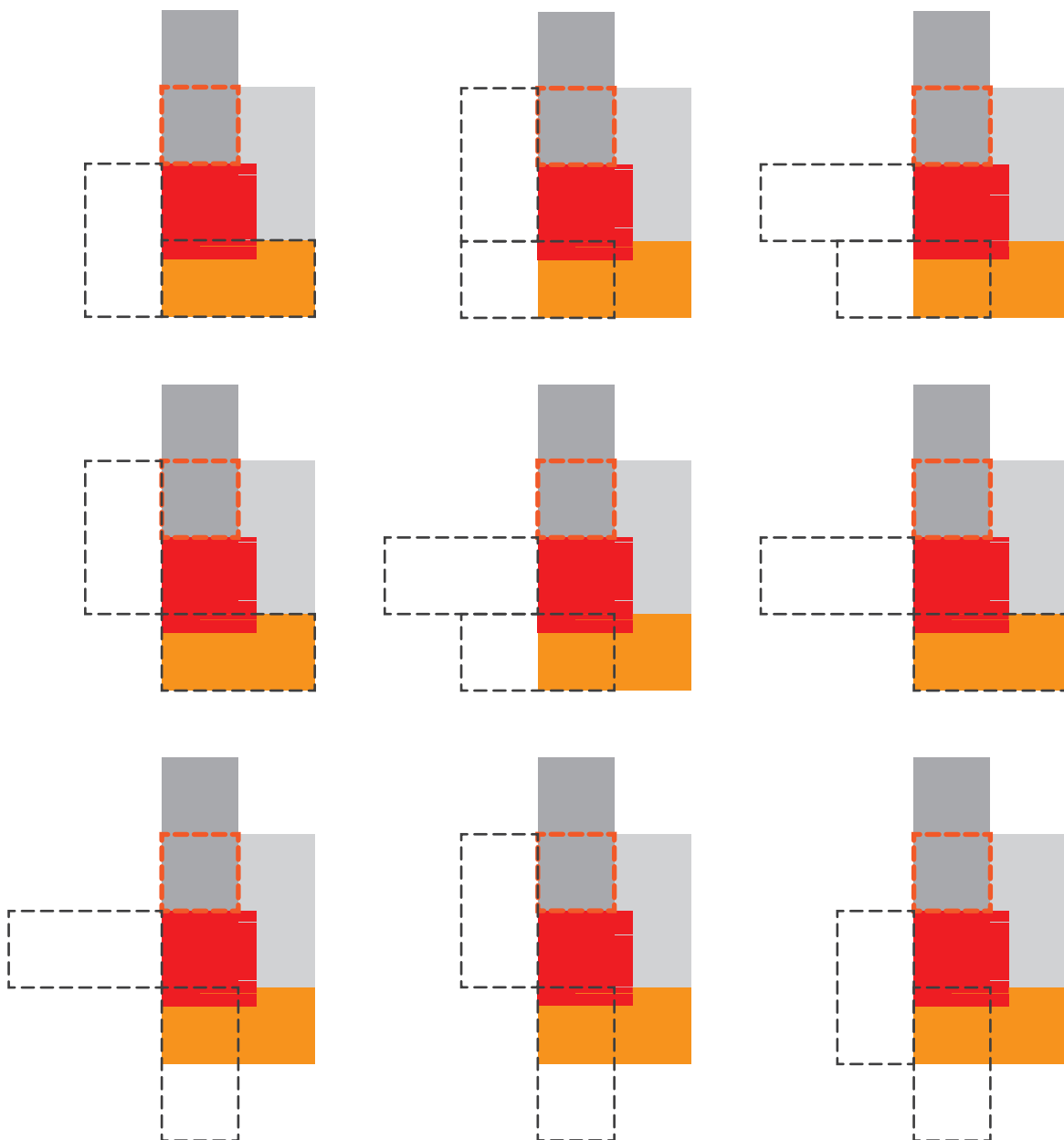
Fig 7.12.   // Gridded house variations.

Fig 7.13.   // Gridded house variations.
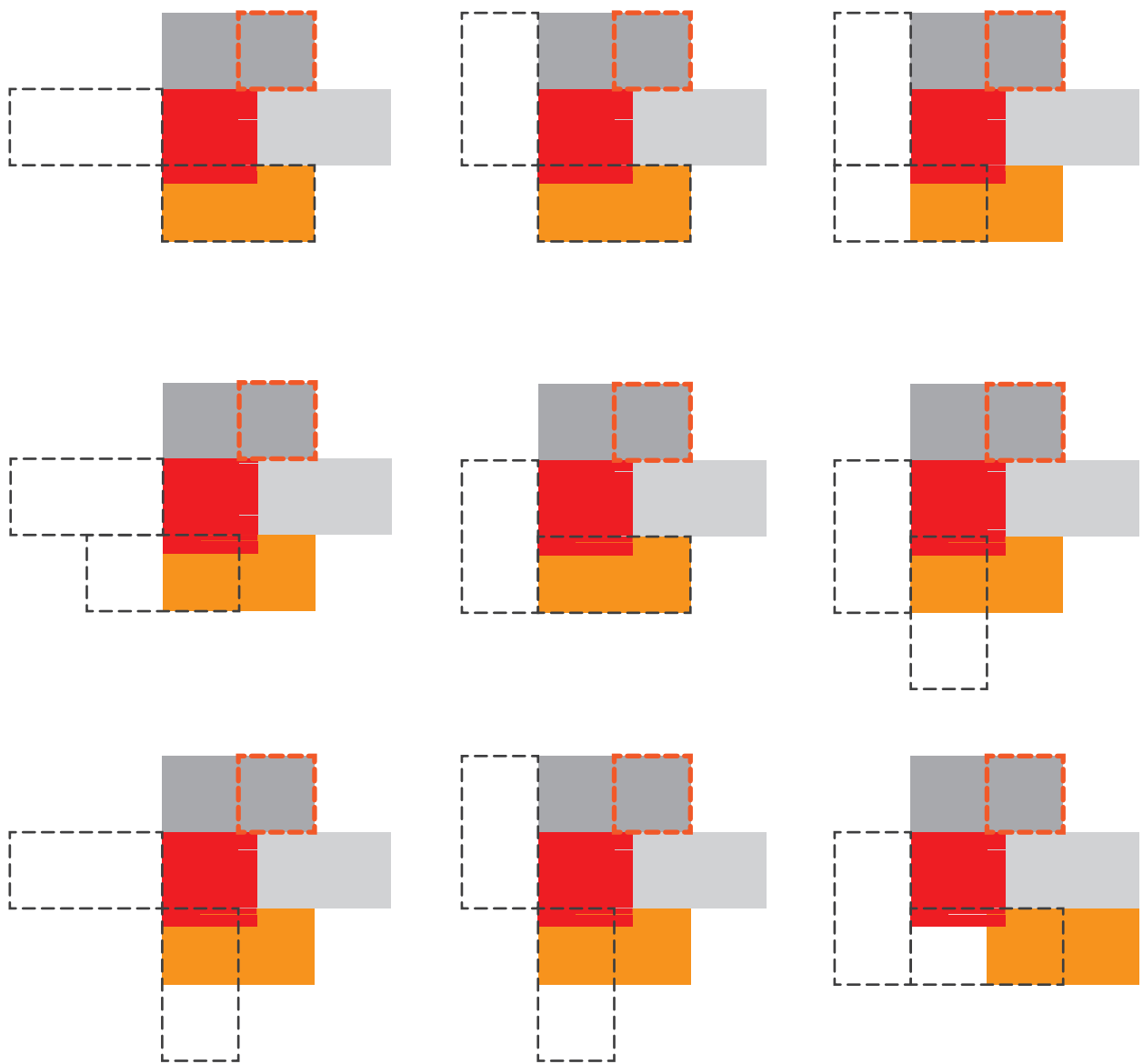
Fig 7.14.   // Gridded house variations.
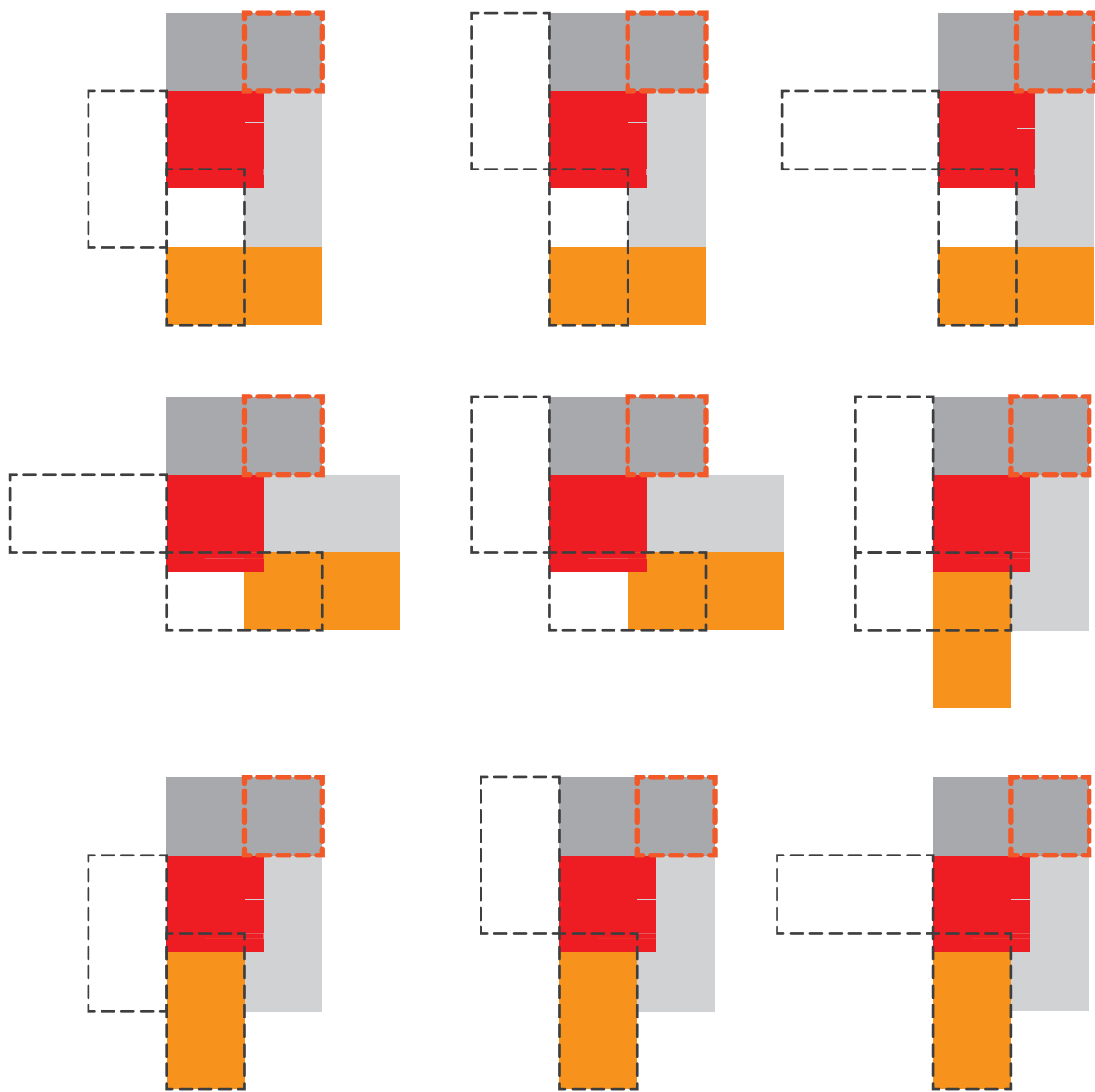
Fig 7.15.   // The gridded house / Variations of the basic model.
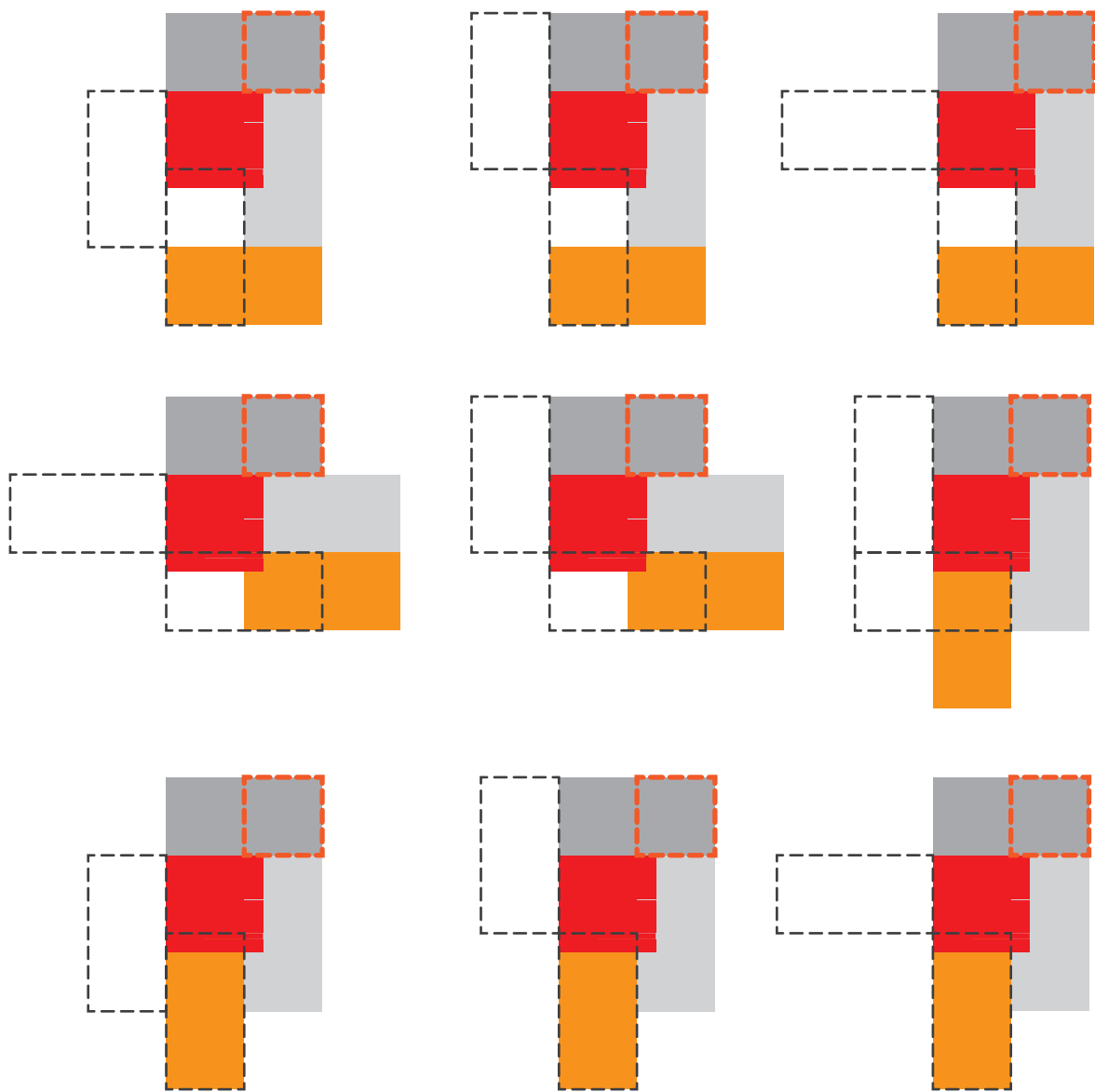
Fig 7.16.   // The gridded house / Variations of the basic model.

Conclusions /

- More than likely the space use, with exception to the flexible spaces, would present in a prescriptive manner i.e. the public spaces would likely define the living room, the semi-public would likely be the kitchen and the private spaces the bedrooms.
- The flexibility created within this dwelling arrangement is too reliant on the buildings dwellings autonomously. Grouping in a terrace or other medium-density format would inevitably effect how the spaces would be inhabited.
- The shape and footprint is large, inefficient and lacking in variation when considering the grouping of buildings.
- The terracing of floor planes – while useful in creating division between rooms and varying levels of privacy – could be seen as an inefficient use of space. In smaller dwellings, changing floor levels will greatly inhibit the ways in which the space can be used.
- Variation from house to house is interesting and further aids in creating unique, experiential dwelling from place to place.
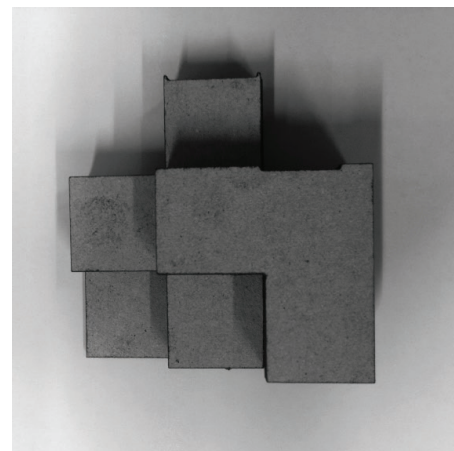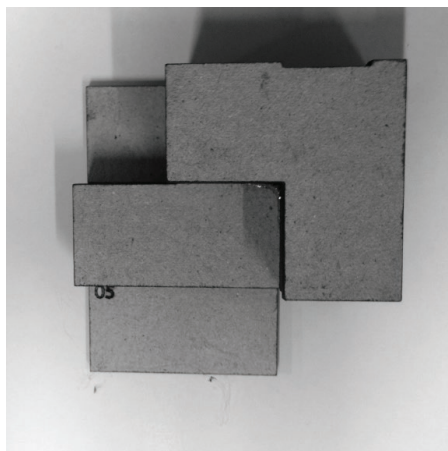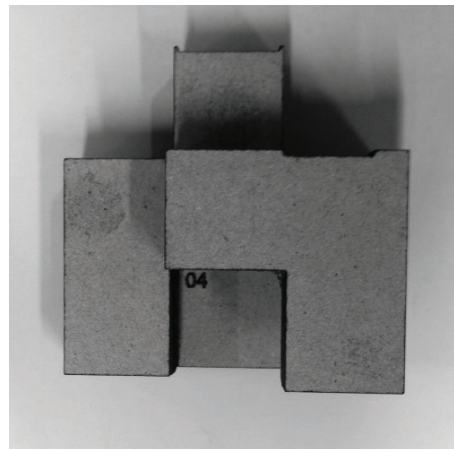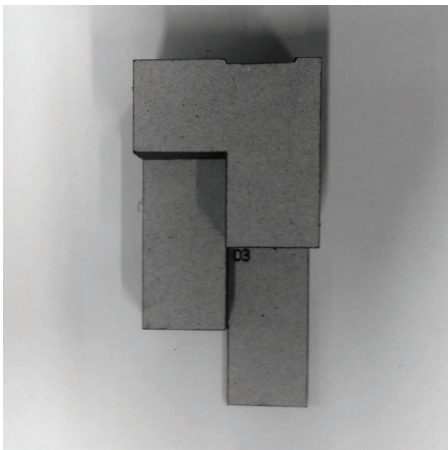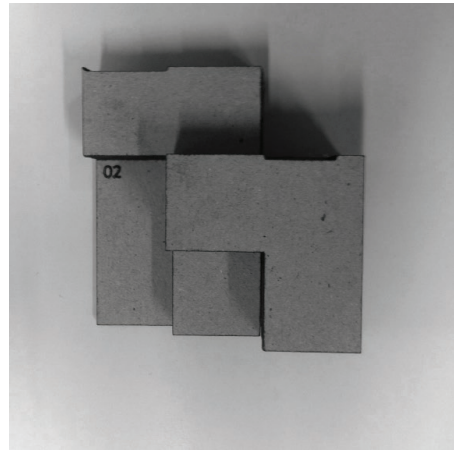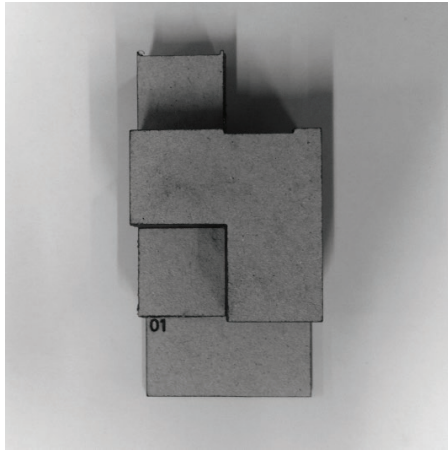
Fig 7.17.   // Variations of the compact gridded house.

In resolving the shortcomings of the nine square grid house, the following explores a smaller model of 'gridded housing'. This model's footprint, width, and somewhat more prescriptive space use are deemed to be more appropriate for arranging in a medium-density fashion. In this model, space divisions and the relationship between the flexible and the fixed are defined by ceiling height and physical partition. This allows for efficient use of floor space and a greater ability for amalgamation of the flexible and fixed, should that be desired.

As in the former exercise, the spaces are gridded. Unlike the nine square model however, this exercise is defined by five 4m x 4m squares below and three 4m x 4m squares above. On the ground level, two of these squares are given to the living room, which is directly connected to the single square kitchen as well as the single square lower flexible space. Indirect connection is provided between the living room and the single-square upstairs flexible space which can act as a loft accessible through the double-height space. This connection can be broken and the upstairs flexible space accessed independently via the model's core. Located upstairs is also two, single-square bedroom spaces.
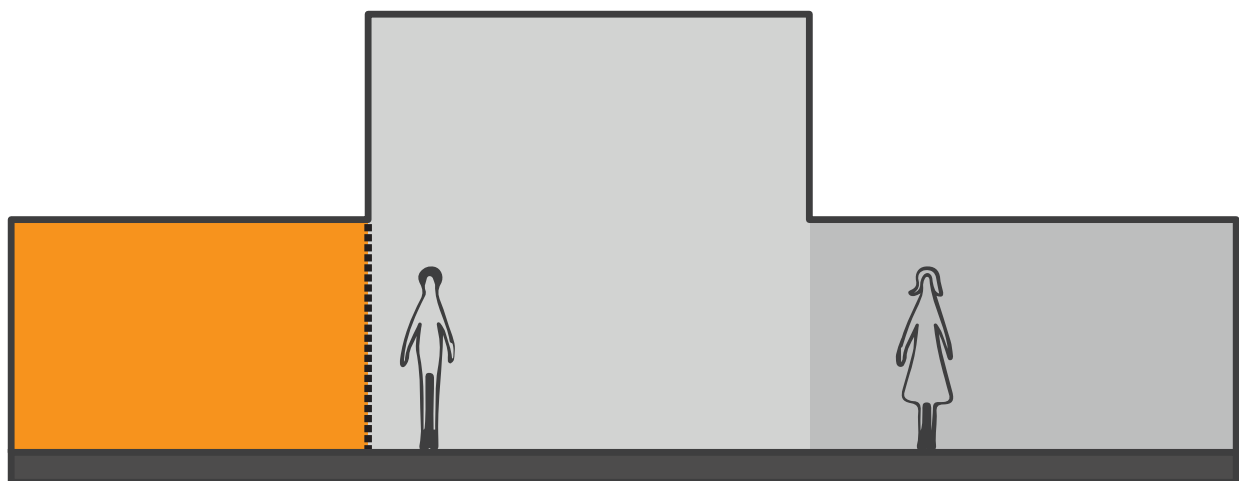
Fig 7.18.   // Flexible space provided through changing roof levels and physical barriers.

Basic Compact Gridded House /

LOW RISE TERRACED UNIT **BUILT FOOTPRINT** 80M2
TWO STORIES **OUTDOOR AREA** 32M2
 FLOOR AREA 120M2

L LIVING // **K** KTCHEN/DINING // **E** ENTRANCE //
BA BATHROOM // **B1** BEDROOM // **V** VOID
F1 FLEXIBLE ONE // **F2** FLEXIBLE TWO //
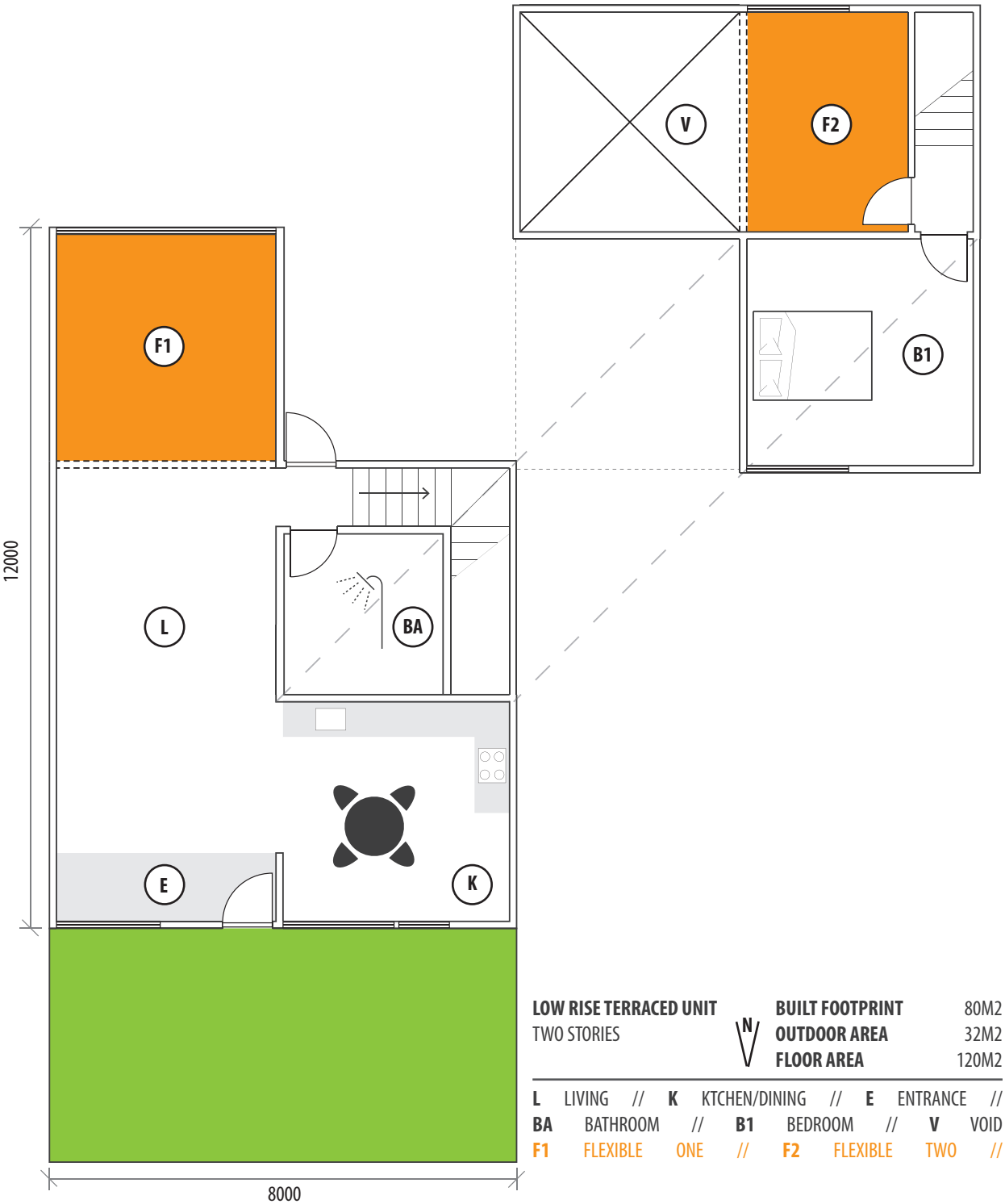
Fig 7.19. // The compact gridded house.
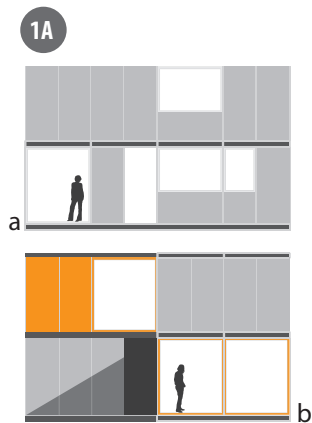
Fig 7.20.   // Elevation.
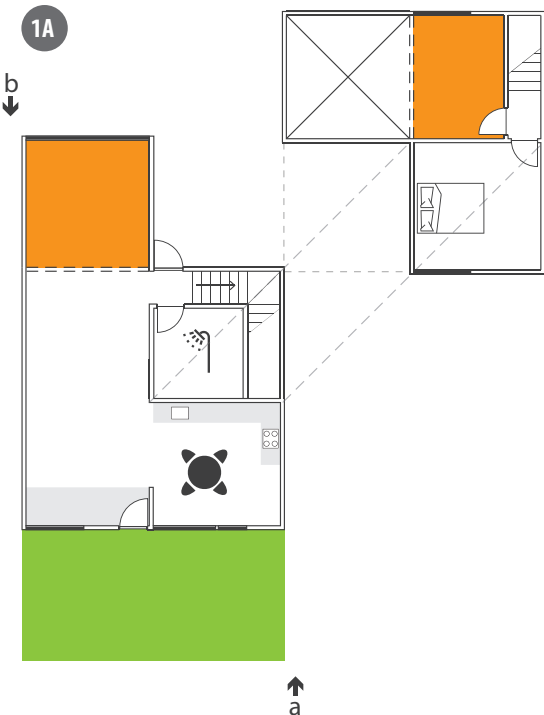
Fig 7.21.   // Plan.
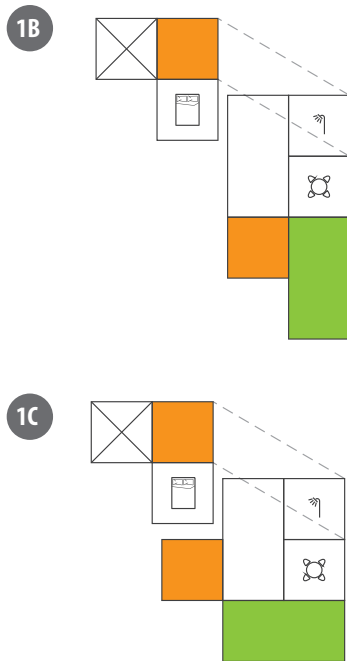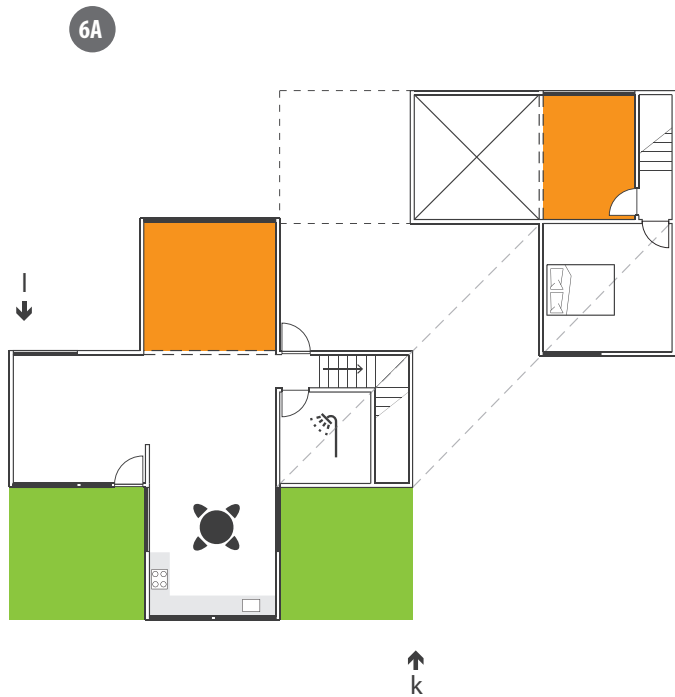

Fig 7.22.   // Alternative plans.
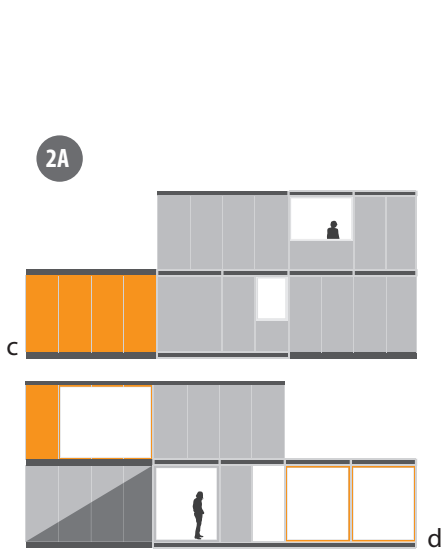
Fig 7.23.   // Plan.
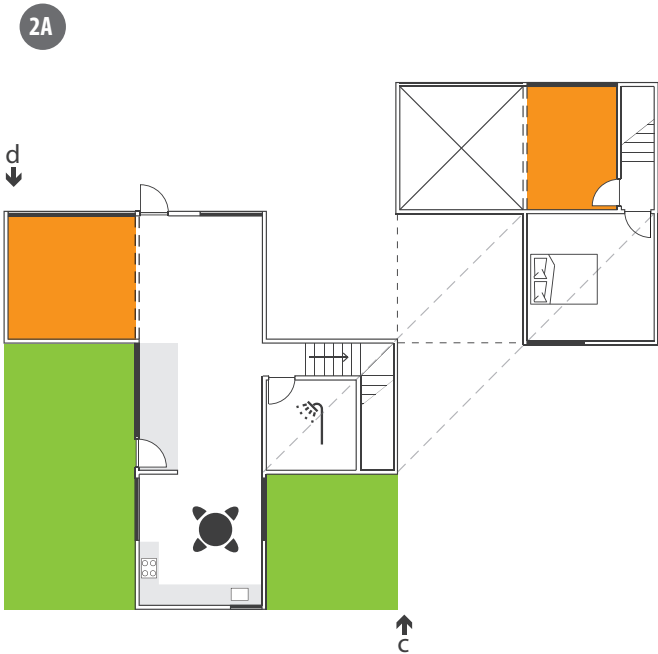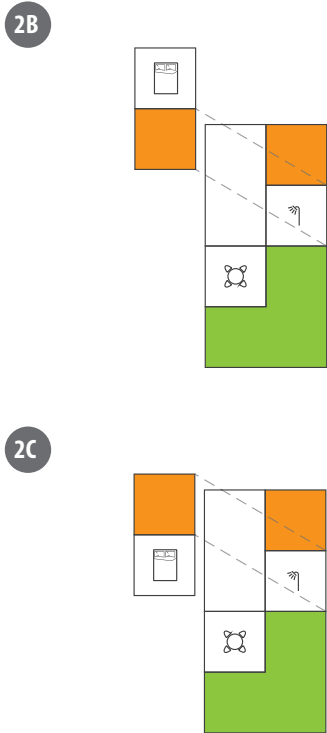
Fig 7.24.   // Plan.

Fig 7.25.   // Alternative plans.

3A

Fig 7.26.   // Elevation.

3A

Fig 7.27.   // Plan.

3B

3C
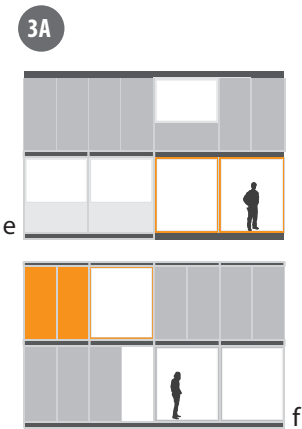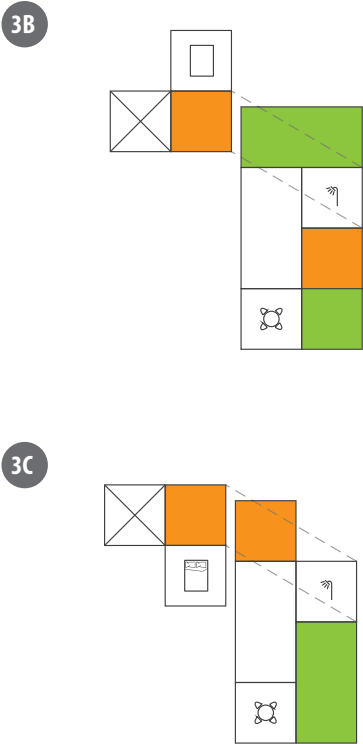
Fig 7.28.   // Alternative plans.

4A

Fig 7.29.   // Elevation.

4A

Fig 7.30.   // Plan.

4B

4C
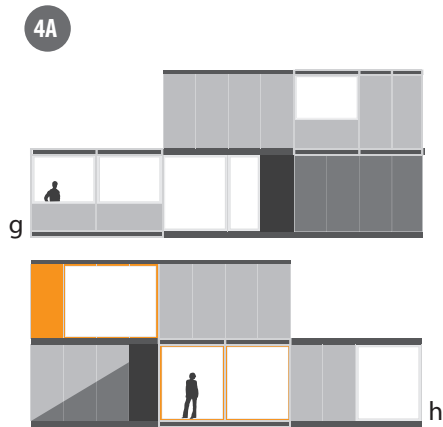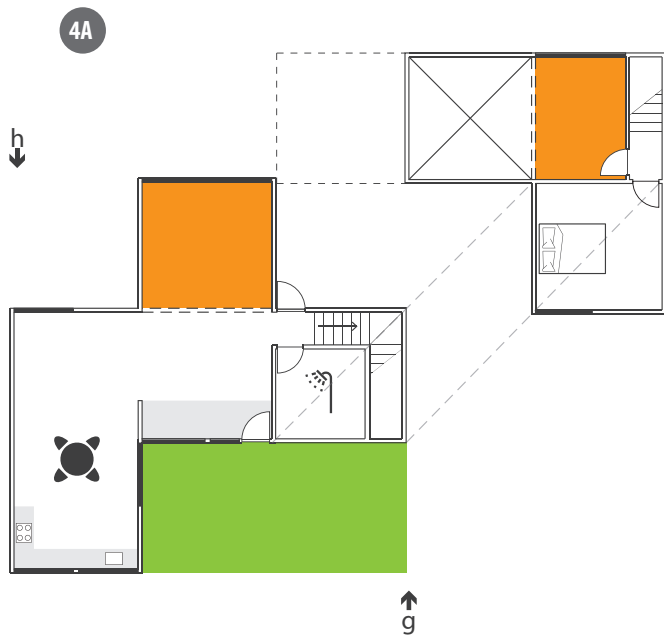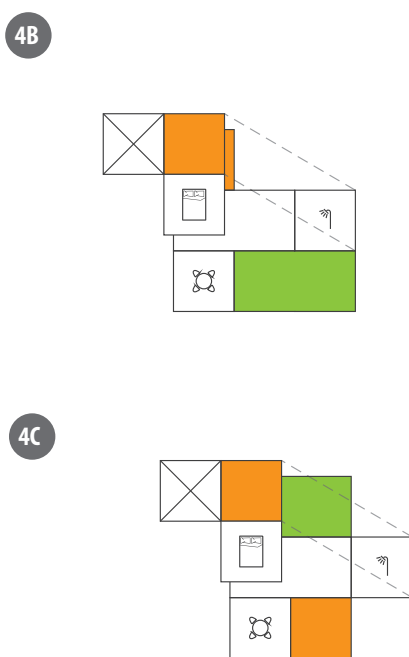
Fig 7.31.   // Alternative plans.

5A

Fig 7.32.   // Elevation.

5A

5B

5C
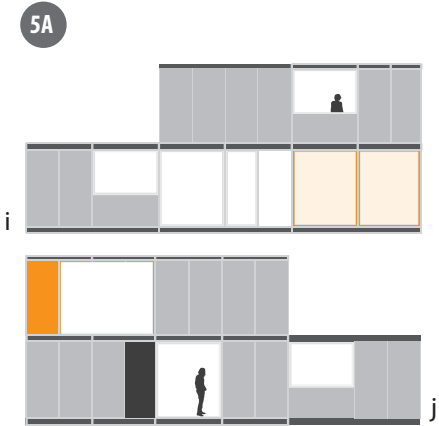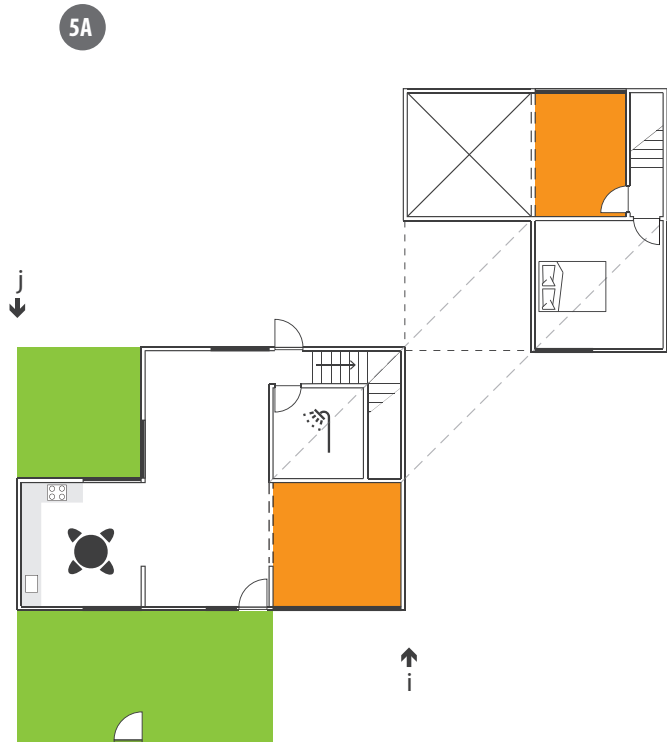
Fig 7.33.   // Plan.
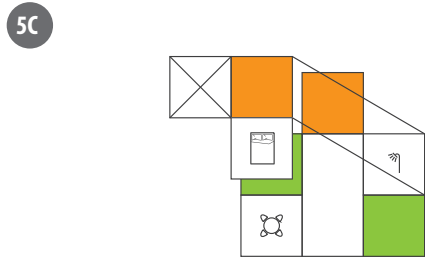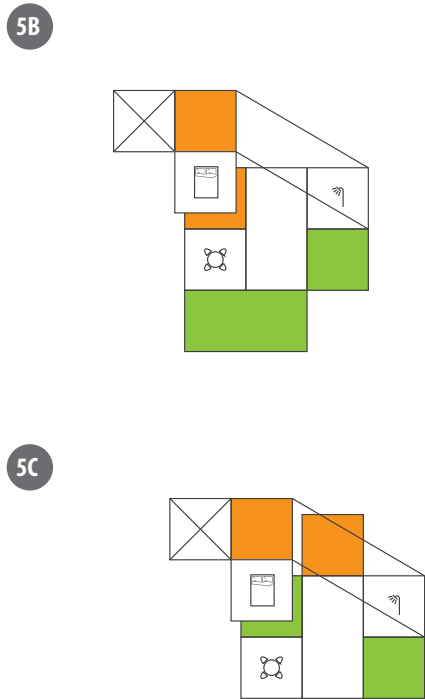
Fig 7.34.   // Alternative plans.

6A

Fig 7.35.   // Elevation.

6A

Fig 7.36.   // Plan.

6B

6C
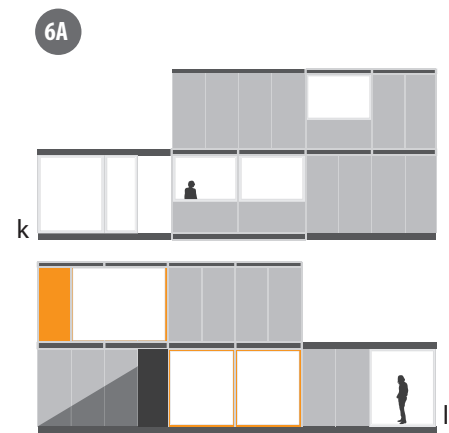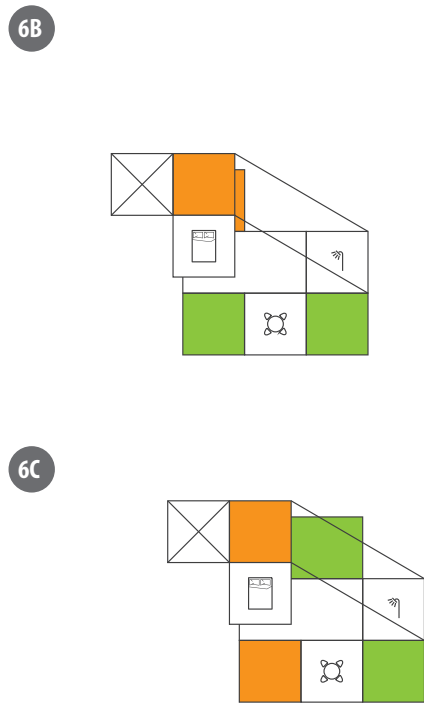
Fig 7.37.   // Alternative plans.

Conclusions /

- In contrast to the previous exercise, this exercise perhaps creates too much space use definition within the dwelling. Effectively the outcomes are three bedroom houses and while flexibility exists to allow two of these bedrooms to be repurposed, the architecture still very much packages the individual.

- While the exercise was aimed at generating difference between dwellings, and bespoke use of space, it did so independent of site. The connecting of multiple dwellings and the resultant effect on interior-exterior and private-public relationships will have a great effect on interior arrangements. An understanding of these effects will therefore be imperative in moving forward with resolving the flexible dwelling.

07F /// THE FLEXIBLE DWELLING / \
GRIDDED DWELLINGS THAT CONNECT

Architecture is not able to directly generate community; it can however strongly encourage its conditions. Emily Cockayne (2012) proposes that unfortunately this is not being realised in many higher-density dwelling arrangements. Cockayne identifies a lack of what she terms 'neighbourliness' in higher-density dwelling whereby an increase in proximity leads to withdrawal and retreat as neighbours seek their individual privacy.

In advocating for option and variety in medium-density housing, this thesis resonates with Cockayne's solution to generating 'neighbourliness'. She suggests we should be considerate of the spaces between dwellings and the configuration of living spaces, so that a greater spectrum of social or private behaviours may be realised. "A well designed building must not only compliment the street aesthetically but also help occupants to forge a healthy relationship with their neighbours by minimising sensory nuisances and enabling them to elect to be sociable or private" (Cockayne, 2012).

In using architecture to mitigate the habits of withdrawal identified by Cockayne, the challenge becomes to minimise the influence of closeness, while maintaining the physical distance between buildings. This thesis argues that thorough the layering and stratification of planes and spaces, the relational distance can instead be changed through application of phenomenal transparency. This rather more experiential grouping of dwelling can offer a sense of independence between neighbouring buildings, while allowing for a greater mix of potential connections between spaces, satisfying varying needs in privacy and community.

Fig 7.38. // José Oubrerie's Miller House employs a brise soleil to order a chaotic facade. This simple frame visually disconnects many physically joined elements, while homogenising others, offering variety in the perception of planes and spaces as one moved closer to the building.

This exercise considers the effects of placing diverse dwelling envelopes in a dense, collective arrangement. It aims to identify means for both expanding the relational distance between buildings, as well as opportunities for providing collective interaction.

Unlike previous exercises in flexibility, this is independent of interior resolution. It is argued that using undefined space is a more appropriate medium for exploring the potential connections between buildings as it permits outcomes free from constraints of pre-defined interior-exterior or inter-room connections.

Dwelling envelopes used to examine connections are similarly gridded to those in previous exercises and are comprised of combinations of 4m x 4m squares. More variation is provided by a greater range of configured shapes and sizes. This permits a greater potential for diverse interior arrangements and interior-exterior connections.
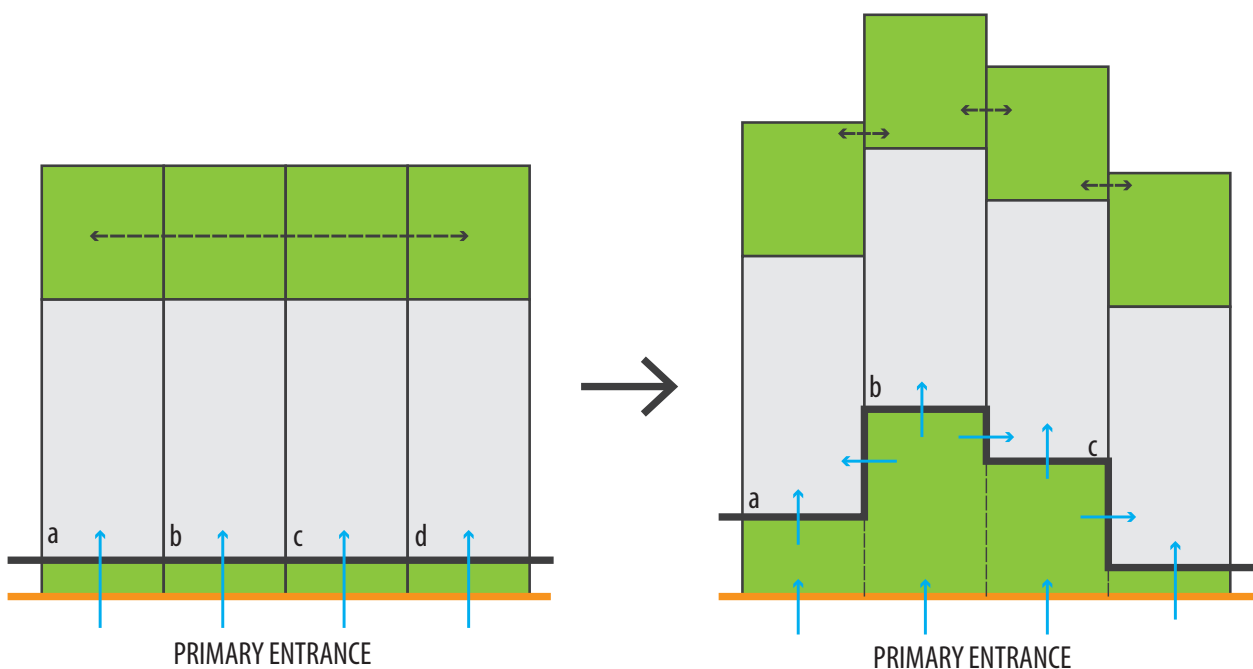
Fig 7.39.   // Providing greater options for use through a layered approach to grouping buildings / Plan.

Small space / 48m2 without terrace /
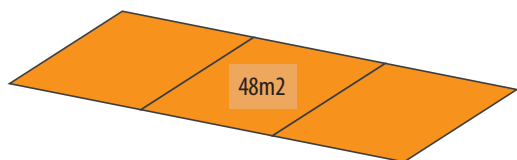
Small space / Example variation/

48m2
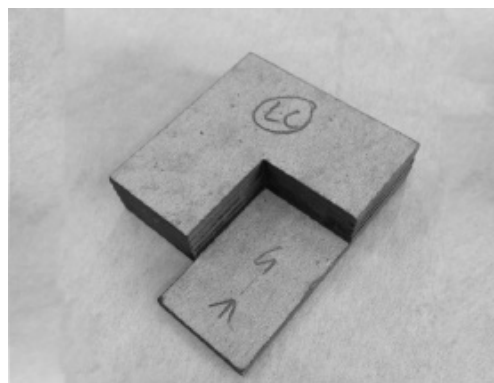
Medium space / 96m2 with 32m2 terrace /
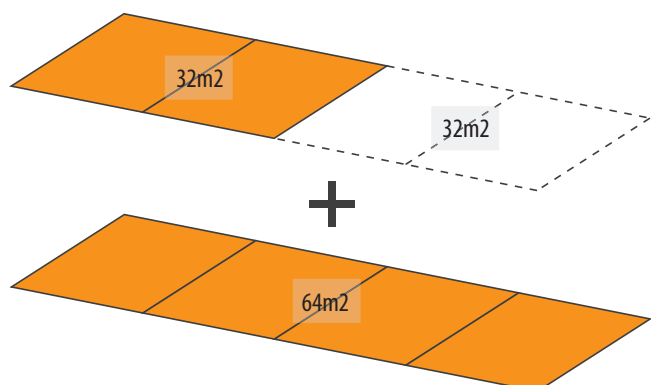
Medium space / Example variations /

32m2

32m2

+

64m2
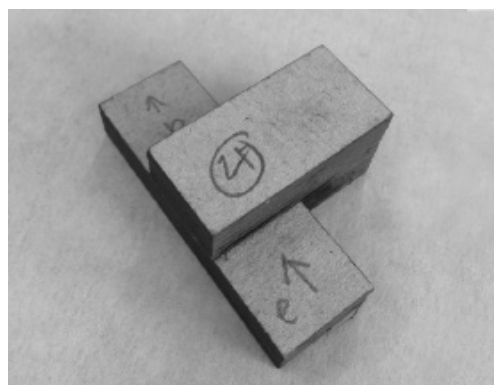
Fig 7.40.   // The constituent parts of a small and a medium connectable space and their example combinations.
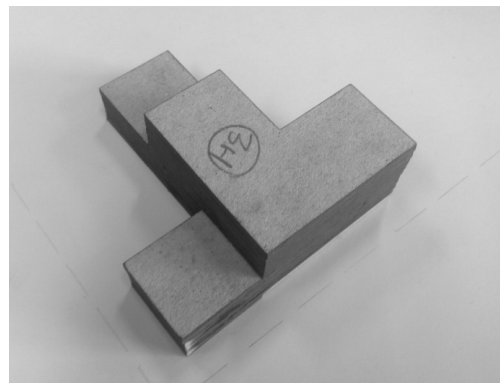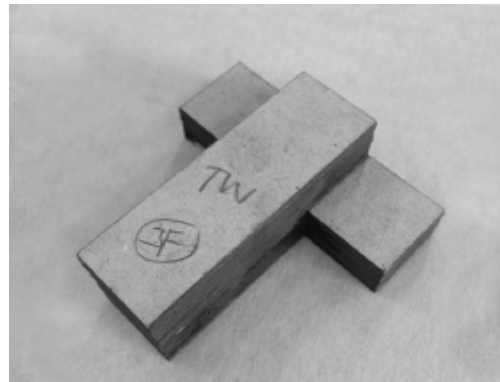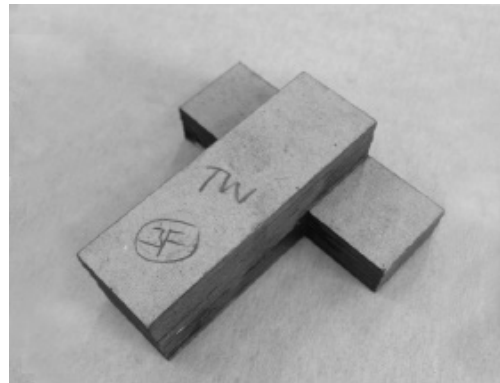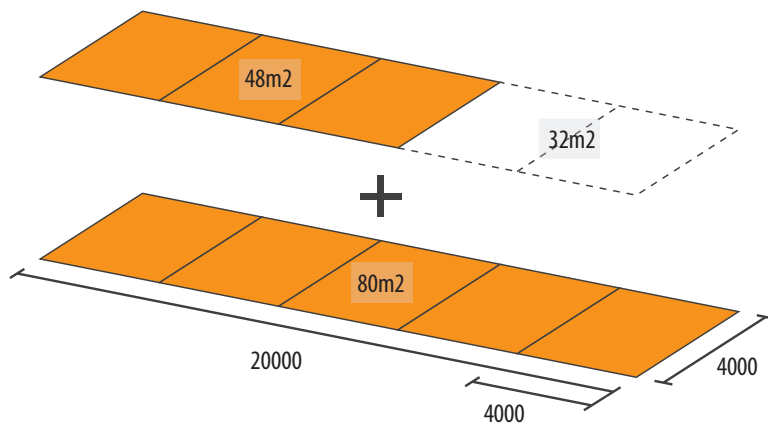
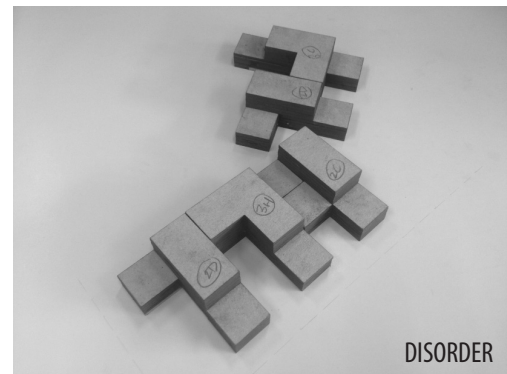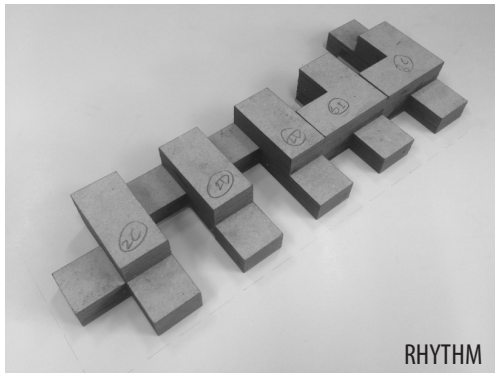Fig 7.41.   // The constituent parts of a large connectable space and its example combinations.

RHYTHM

NO RHYTHM

ORDER

DISORDER

MONUMENTAL SCALE

HUMAN SCALE

Fig 7.42.   // Connecting spaces in conventional qualities of townscape.

SYMMETRICAL

ASSYMETRICAL

BALANCED

UNBALANCED
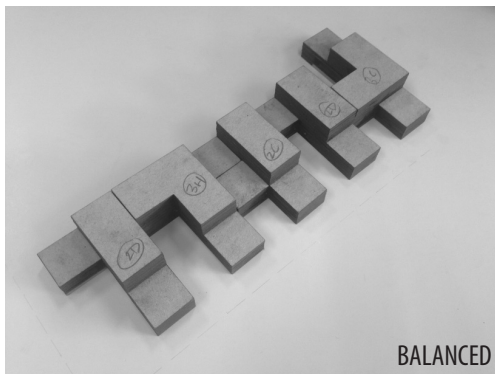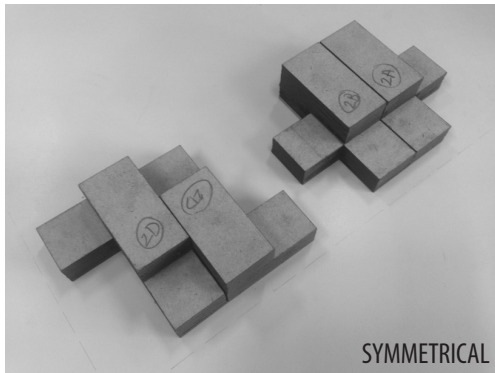
Fig 7.43.   // Connecting spaces in conventional qualities of townscape.
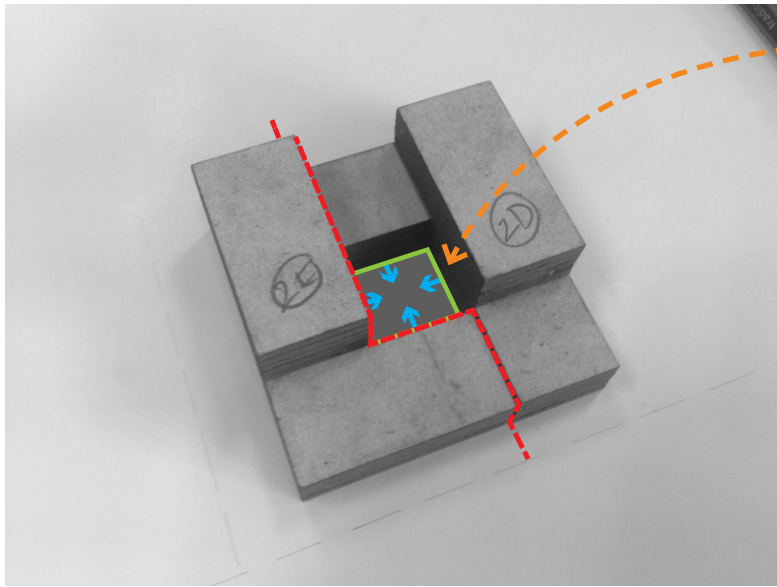
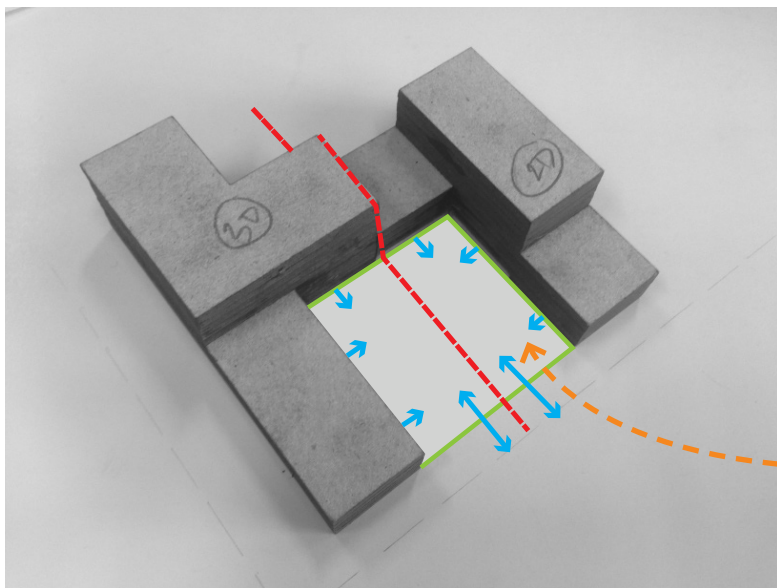**Closed, private shared space with ownership only provided to adjoining dwellings**
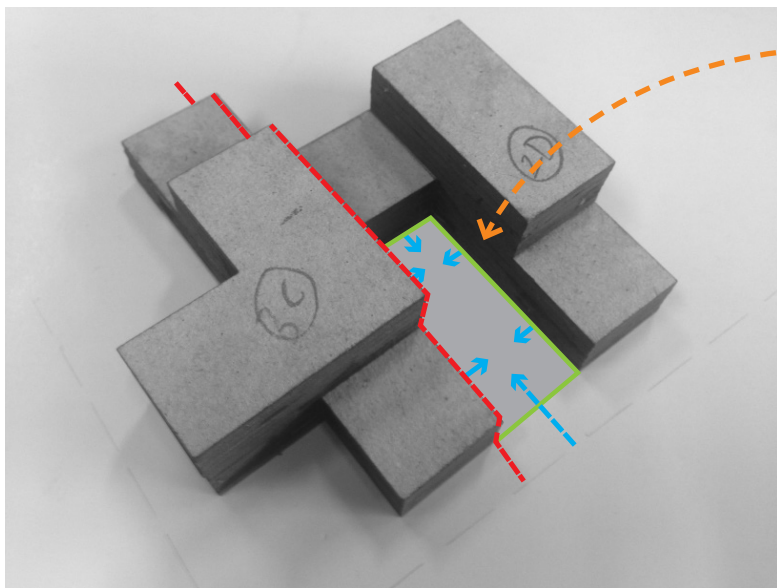
Open, semi-private shared space with ownership only provided to adjoining dwellings

Fig 7.44.   // Generating options for use at ground level.
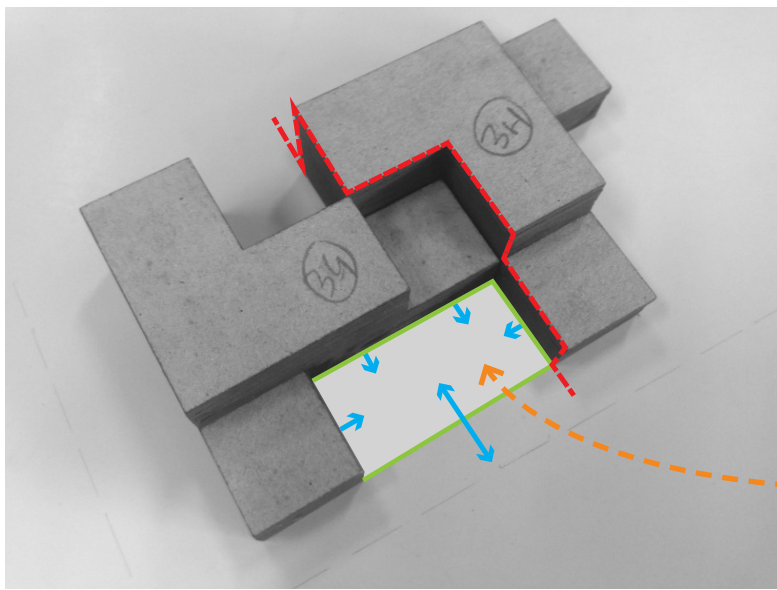
Open, public shared space with the potential for ownership to be extended beyond the adjoining dwellings
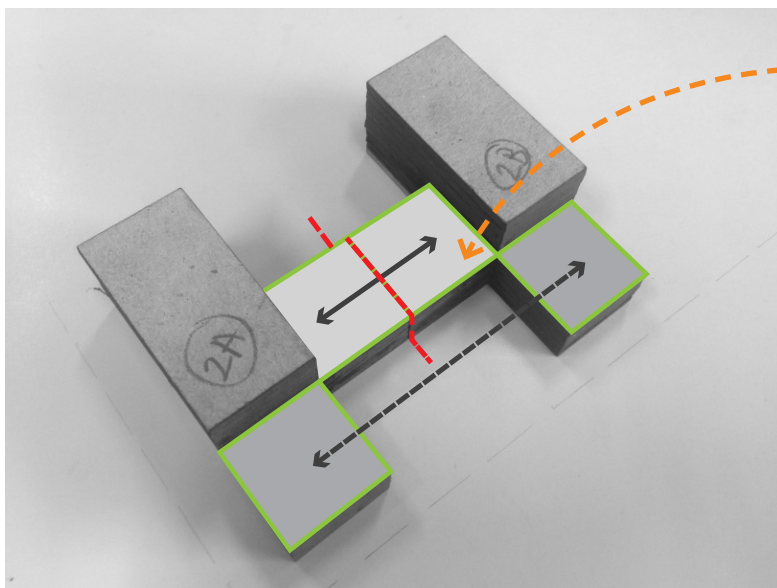

Open, public shared space with the potential for community gesture

Fig 7.45.   // Generating options for use at ground level.
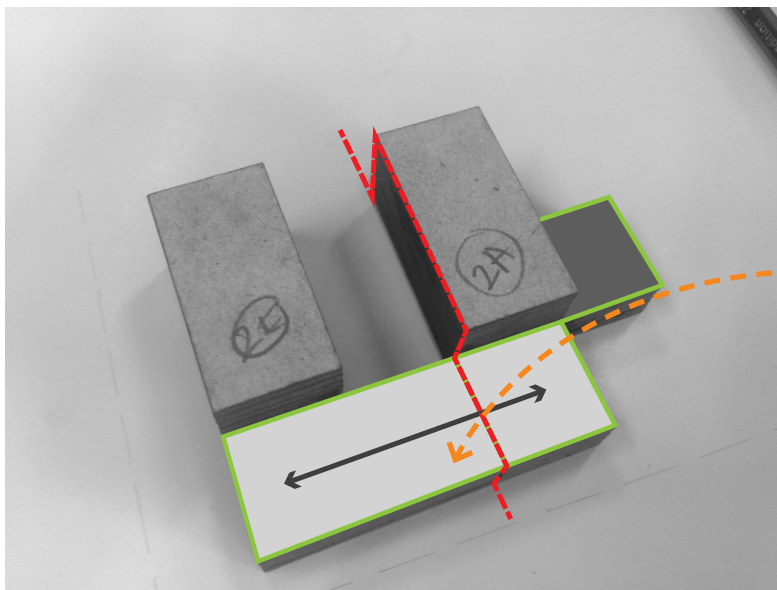
Dwelling 2E has a terrace that lacks privacy and choice. The neighbouring unit 2A however has a terrace split in two, permitting options of public or private outdoor space.

Mirrored arrangements such as this permit both dwellings the option of connecting half of their terrace space, while retaining the other as semi-private.

Fig 7.46.   // Generating options for use on the upstairs terrace.
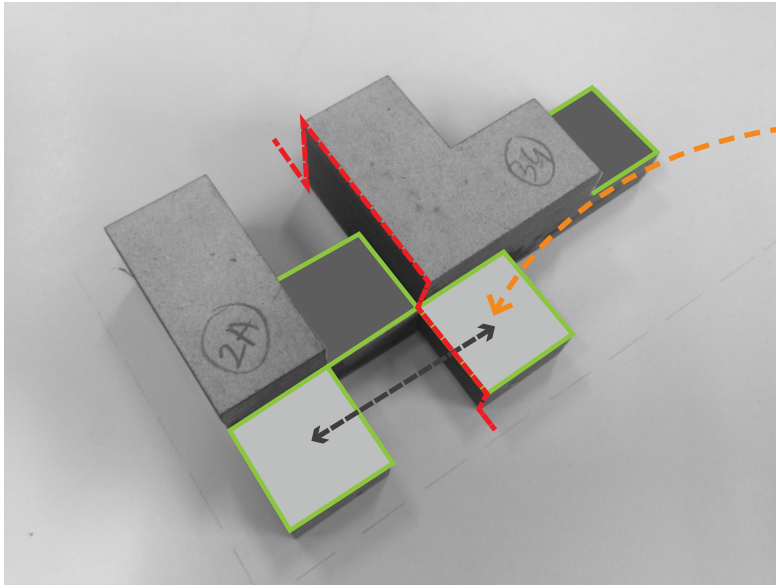
This arrangement sees two dwellings, each with the same options for terrace privacy.

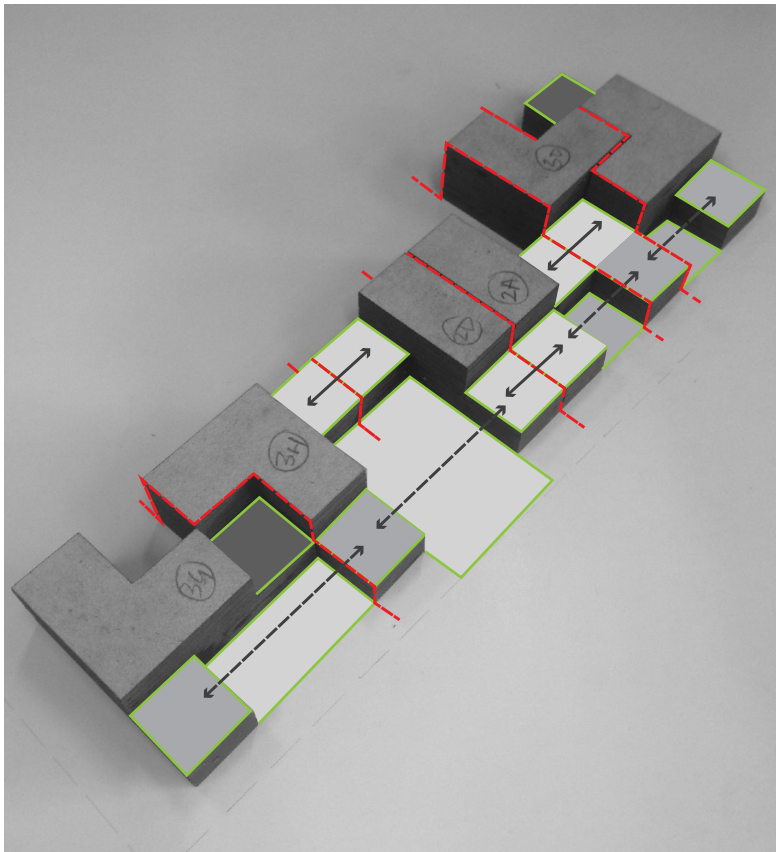Fig 7.47.   // Generating options for use on the upstairs terrace.

Fig 7.48. // Multiple options for outdoor use can be seen in this arrangement of six dwellings.

Conclusions /

- The exercise highlights the merit in providing a variety of built envelopes across a development. It expresses a valid means of generating multiple outdoor use options and some interactive variety for the user.

- The presentation of the varying spaces is too transparent and requires further intervention and exploitation in order to create a stratified experience.

- Generable outcomes are too limited by the system – the outcomes created are often through chance and this closed process limits the ability to respond to more intentional delineation of the relationship between parts.

08A /// **PLACEMENT ON SITE** / \
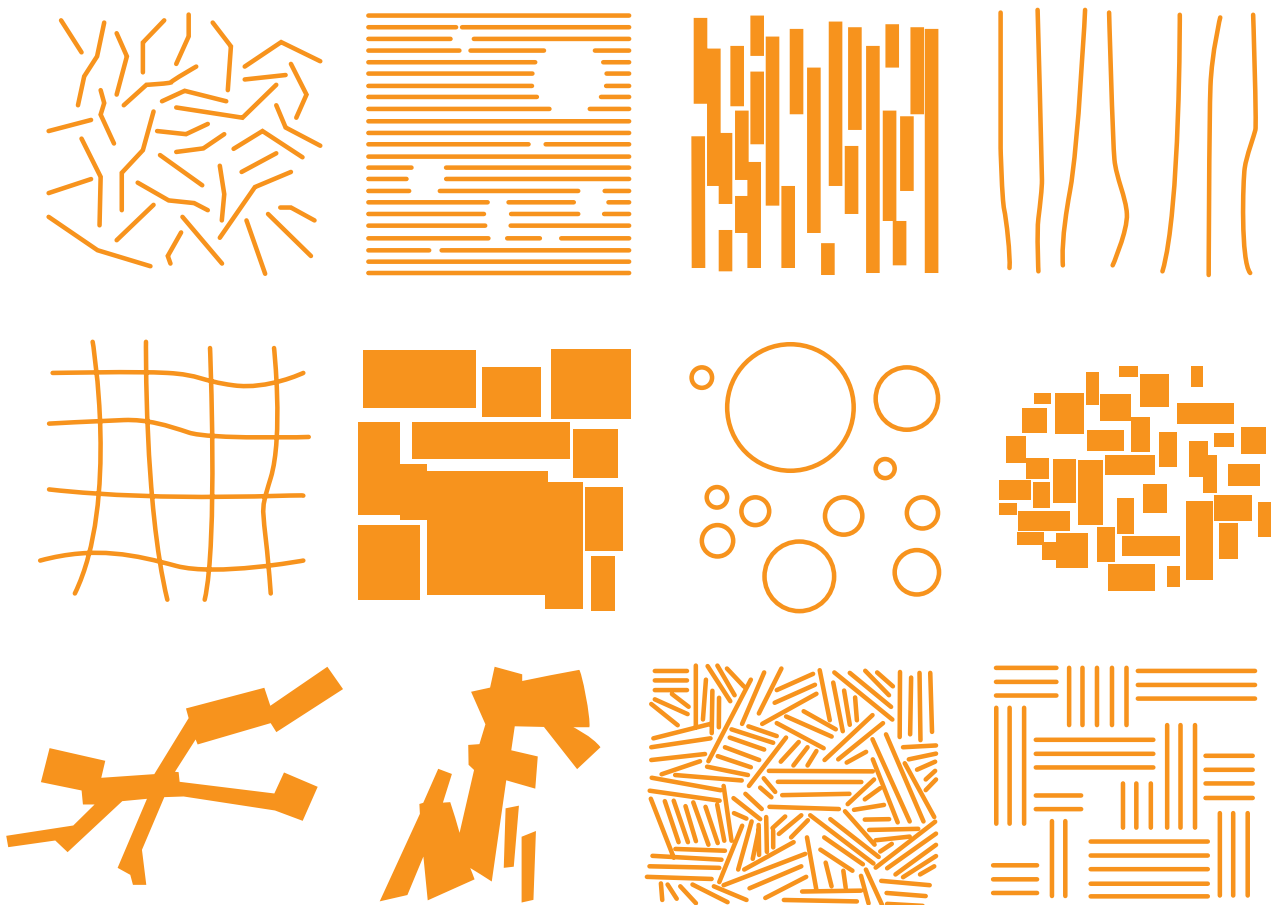INTERACTION WITH FIELDS

Fig 8.01.   // Stan Allen's Field Conditions.

Stan Allen's (1985) manifesto on field conditions recognises the complex relationships that can exist between constituent parts. Allen defines strategies for identifying and respecting the diverse and distinct character of multiple site conditions, before unifying them to extrapolate new and interesting effects. Site conditions may relate to pedestrian habits, patterns of use, or complex arrangements of existing urban frameworks, but all can be made to relate and interact through the field condition's grid-like composition.

An application of Allen's field conditions is identified as an apt solution to integrating dwellings with their site and the site with its surroundings. It is presented as a means for narrating the reduction in the project's environment as it moves from the broad to the intimate. This will aid in driving continuity of the stratified experience, while inviting engagement with the wider community.

There is a distinct discrepancy of both grain and usage that can be identified in the site's surroundings. Retail occupies the flat land to the east, which is comprised of predominantly Victorian buildings, ordered densely in a regular fashion. The undulating typography to west however, is occupied by irregularly placed low-density residential buildings and small-scale industrial offices. The field is used to consolidate these conditions. Exploration extends beyond the north of the site in order to ascertain whether better physical connections can be established.

Process /

1. Model the surrounding buildings.
2. Striate the connections between east and west.
3. Abstract the dominance of immediate buildings to generate a gridded site.
4. Link assemblies to extrapolate the areas of the site most occupied.
5. Consolidate nodes to define best-fit circulation.
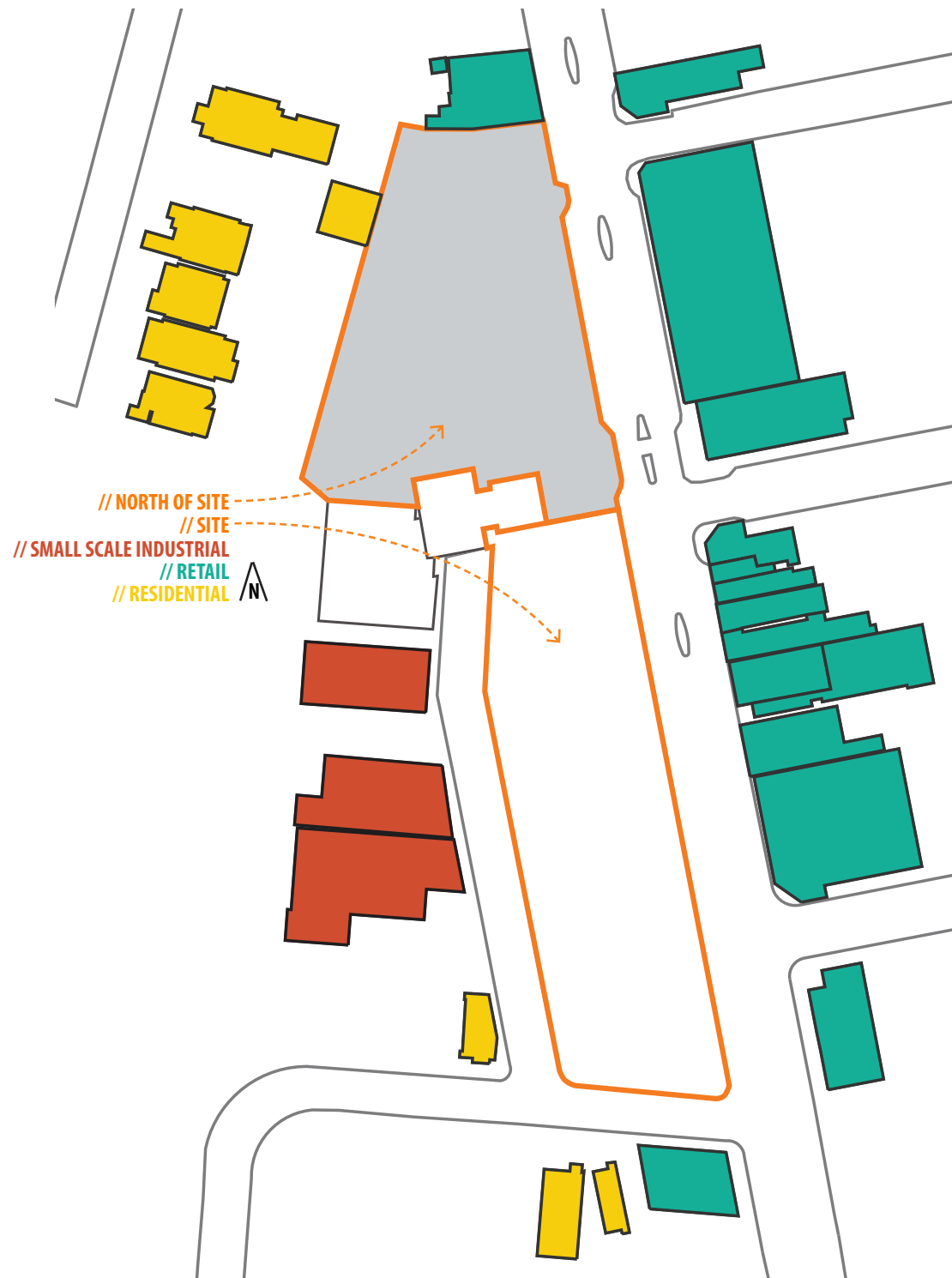6. Define the greater block composition.

// NORTH OF SITE
// SITE
// SMALL SCALE INDUSTRIAL
// RETAIL
// RESIDENTIAL

N

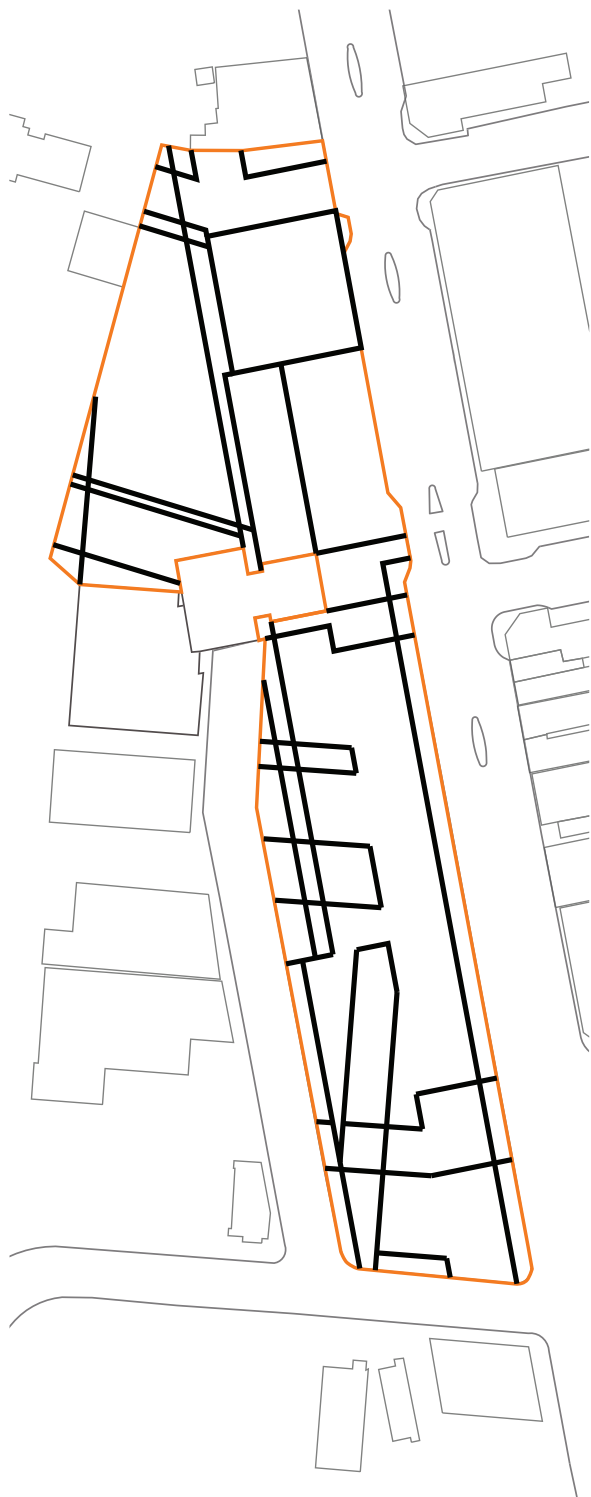Fig 8.02.   // The buildings surrounding the site.

Fig 8.03.   // Striated connections between surrounding buildings.
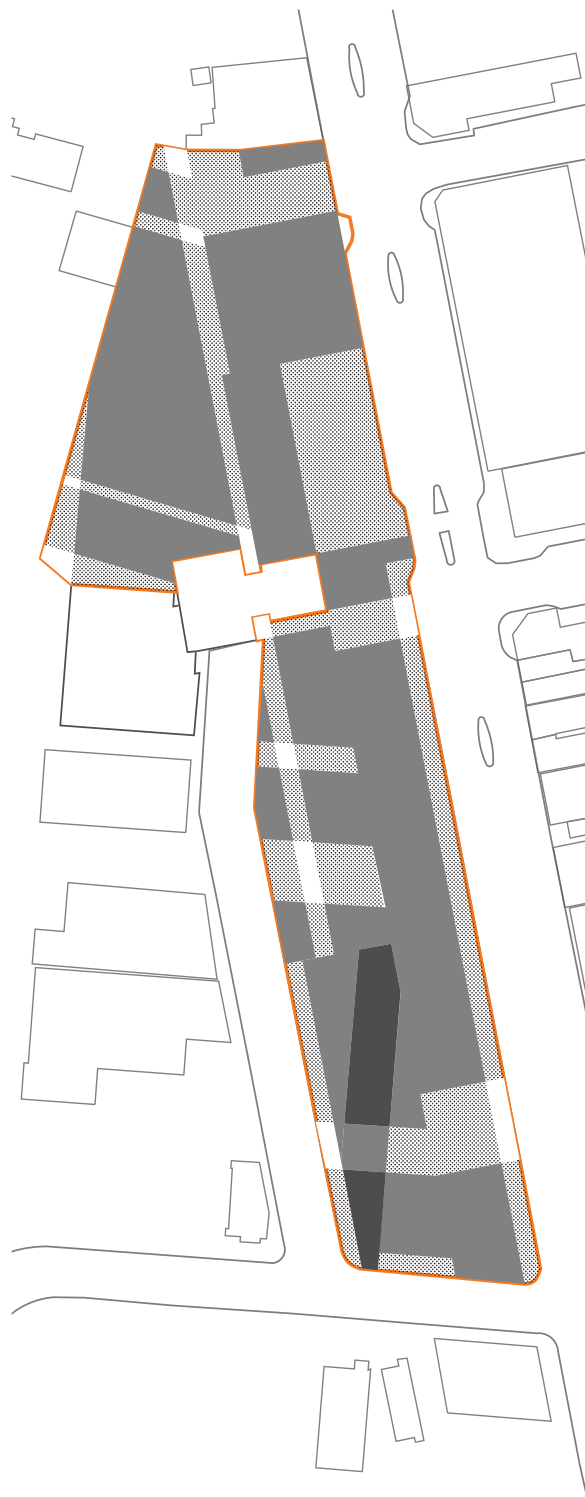
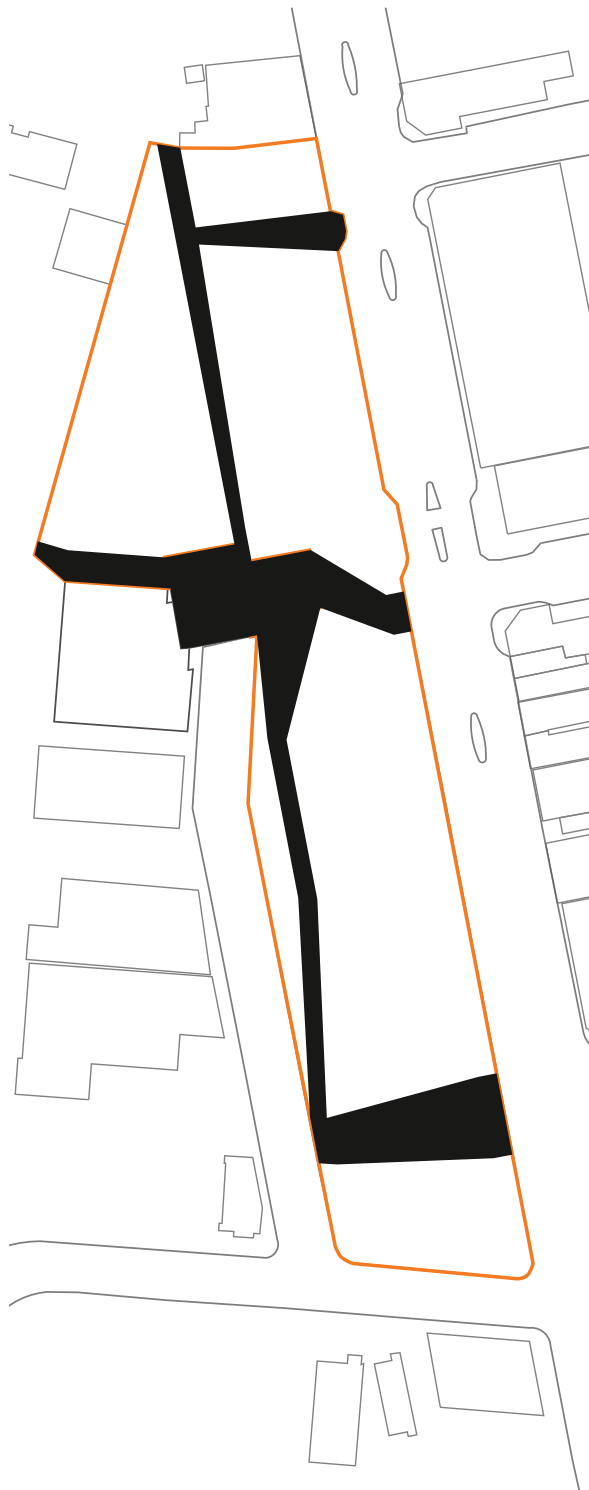

Fig 8.04.   // The gridded site.

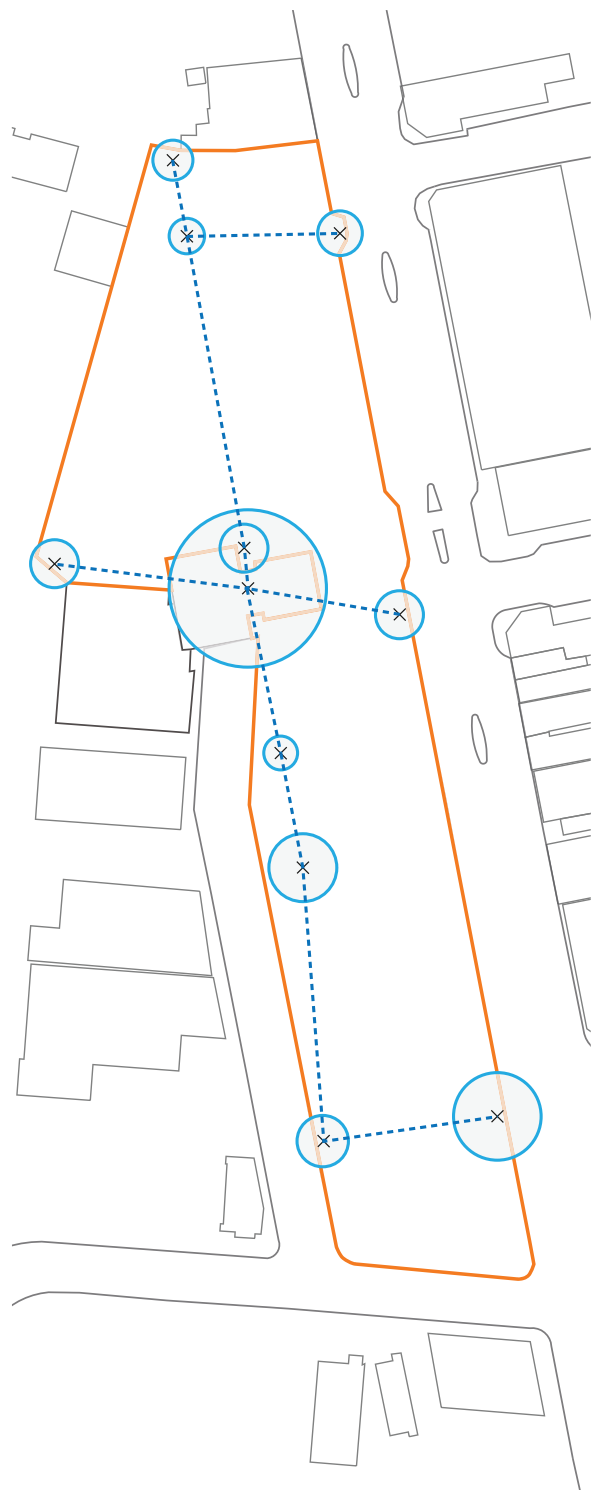Fig 8.05.   // Linked assemblies.

Fig 8.06.   // Nodal consolidation.

Fig 8.07.   // Local residential edge conditions.

Conclusions /

- The outcomes, particularly the nodal consolidation and circulation paths, do not identify much more beyond what could be assumed from examining the map.

- Striation effect shows promise in drawing attention through the site, the use of which may aid in extending a sense of 'transparency' to the wider community.

While site placement and large-scale form have been identified as derived through an understanding of local grains, a dismisssion of the distinctive scale and form of the surrounding buildings has the potential to degrade the local character and sense of place.

Rejection of a site's context is one of the main reasons for community opposition to residential intensification (Weidinger, 2010). Consequently, this thesis proposes to instead follow an inclusive design strategy in which the distinctive and abundant Victorian architecture surrounding the site can be understood, and elements reinterpreted in a contemporary manner.

A two-storey row of four densely placed Victorian houses to the south of the site was selected for analysis. Being in close proximity to the site, and contending with similar conditions, this example was deemed to contain elements pertinent to the immediate sense of place.

Fig 8.08.   // The Victorian houses selected for analysis.

Fig 8.09.   // The street façade is simple in its mass, and predominantly uniform. This is with exception to the entrance and the roof eaves, which as a result appear dominant in the composition.
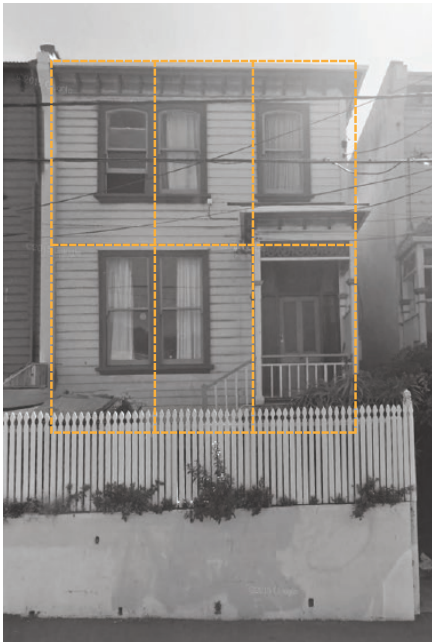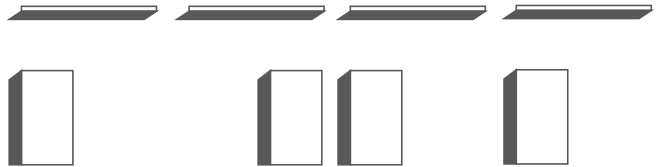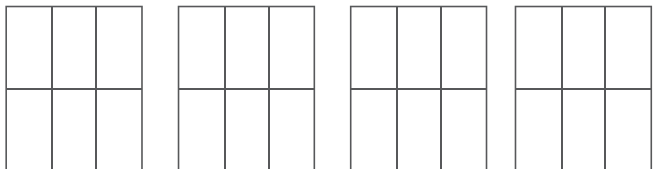
Massing /

Fig 8.10.   // Proportioning can be reduced to a system of 2:1 ratio rectangles, stacked two high and three across.
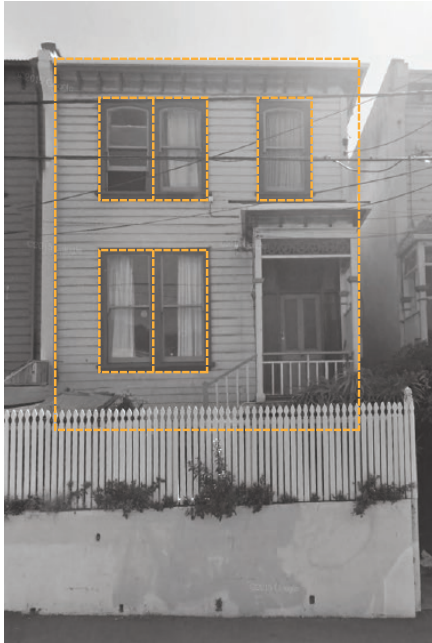
Proportions /

Fig 8.11.   // Fenestration is uniform in its placement, and follows a similar 2:1 proportioning ratio as the rest of the building. The arrangement typically manifests in double sash window (or bay window) occupying two thirds of the lower storey. A double sash window occupying the two thirds of the upper storey directly above, and a single sash window occupies the remaining third of the upper storey. While windows differ slightly in embellishment, all are the same size.
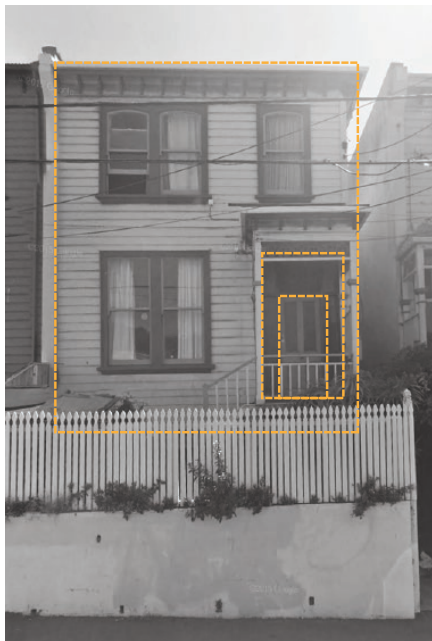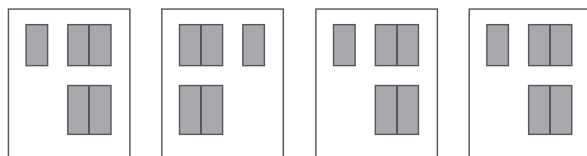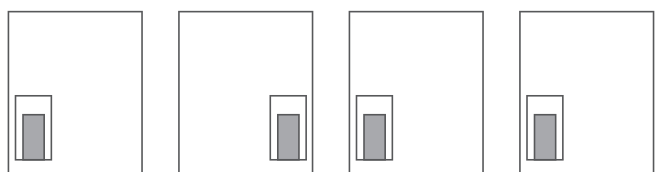
Fenestration /

Fig 8.12.   // The entrances dominate the façades from the street, each being defined by an extended portico or veranda. Each entrance is framed by supplementary fenestration, allowing it to precisely occupy one third of the bottom of the building.

Entrance /
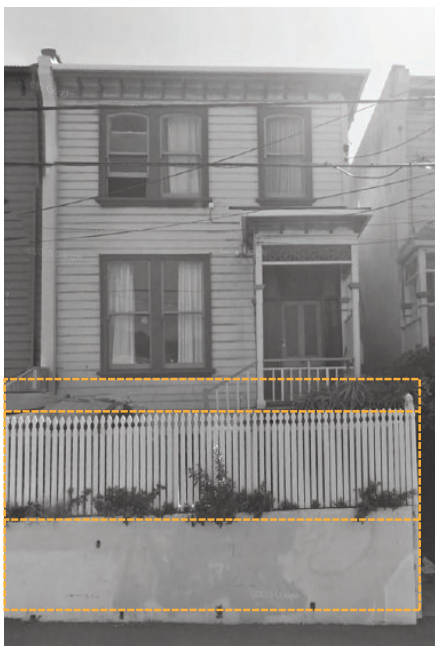
Fig 8.13.   // The street edges in these buildings are layered in their approach to revealing the façade. Solid retaining walls occupy the bottom third. This gives way to a semi-transparent fence that revels the garden. Above the fence, the garden gives way to reveal the dwelling.

Street Edge /
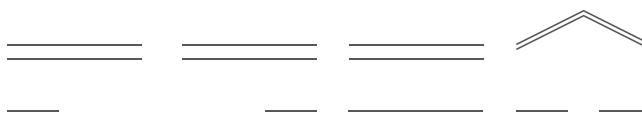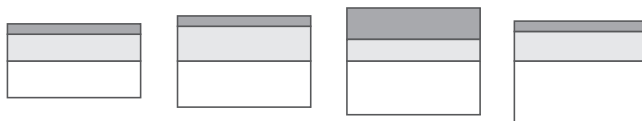
Roofline /

Fig 8.14.   // With exception to one, shallow pitched gable roof, the rooflines are experienced as predominantly flat. All have well defined, ornate eaves.

Conclusions /

-      This exercise identifies a number of useful architectural systems that could aid in providing continuity of sense of place.
-      The proportioning systems used in these Victorian buildings are of particular interest as they are easily applicable to the gridded approach to space creation explored in earlier exercises.

09A /// BRIEF / \
HALF A GOOD HOUSE

Fig 9.01.   // The medium-density housing outcome

Aims /

This medium-density housing project aims to achieve the following objectives; perpetually flexible dwellings that have the capacity for individual interpretation and personalised habitation; a variety of housing types and sizes to satisfy a range of household demographics; opportunities for 'neighbourliness'; and integration with the greater site's context.

Programme /

The dwellings are to be conceived through gridded spaces that offer a variety of programmatic use and habitation options. Allocation of space is to be volumetric, rather than specific in use, with the exception of the core service of the bathroom.

Individual dwellings are to maintain the attributes of a good house identified in the literature review and pre-design stages; open plan spaces that can respond a variety of occupants' needs; provision for change that is not fixed or one directional; access to a variety of outdoor space at all levels; multiple options for building entry; allocation of shared amenity throughout the development; and good orientation to sun and light.

This final stage of the design development applies the lessons learnt through the early stages of the design process within the framework of the site in Newtown. Eleven new dwellings, consisting of four different sizes, are conceived within this site, with a resulting density of approximately 14du/acre.

Limitations/

The final design is schematic in its approach. It develops the combined ideas outlined in the pre-design to create a singular, best-fit concept in the context of the site. Budgetary constraints and affordability, applications in reality, and adaptability to alternative contexts are generally assumed based on the findings detailed in the precedent and literature reviews, but are not explicitly resolved. The outcomes should therefore be viewed as independent from these aspects of the project.

09B /// RESOLVING FLEXIBILITY AND ADAPTABILITY / \
PLANNING FOR FUTURE USE

Open Residential Building /

The housing type deemed fit the aims of the brief most is the open residential building. This type of design allocates space in an open frame, leaving the resident to partition as they require. Similar in concept to the Elemental's 'Half a Good House', this strategy can provide dwellings which are fit for occupation at the moment of completion, while allowing for alteration as the owners' needs dictate. Unlike Elemental's design strategies however, open residential building acknowledges the somewhat more nomadic nature of the Western dweller, addressing this through design that permits perpetual adaptation.

One could argue that this bottom-up method of design is a perfectly apt solution to the future requirements of housing in Wellington. Rather than materialising in prescriptive, repetitive and non-personal dwellings, this method instead promotes buildings with frames that are bespoke to a site, addressing the interests of the wider community, while flexible inside, addressing the varied needs of the individual.

The design outcome of this project follows the basic principles identified as successful in the Tila Housing project (See Chapter 4). The

flexibility afforded with the lower density of this project however, is exploited to provide a greater deal of variety in the initial building frames, and a greater deal of implied transparency and stratification within the yet to be partitioned spaces. The design outcome of this thesis permits the owners to determine their own connections with the outdoor areas, allowing for outcomes that best fit the chosen interior configurations.
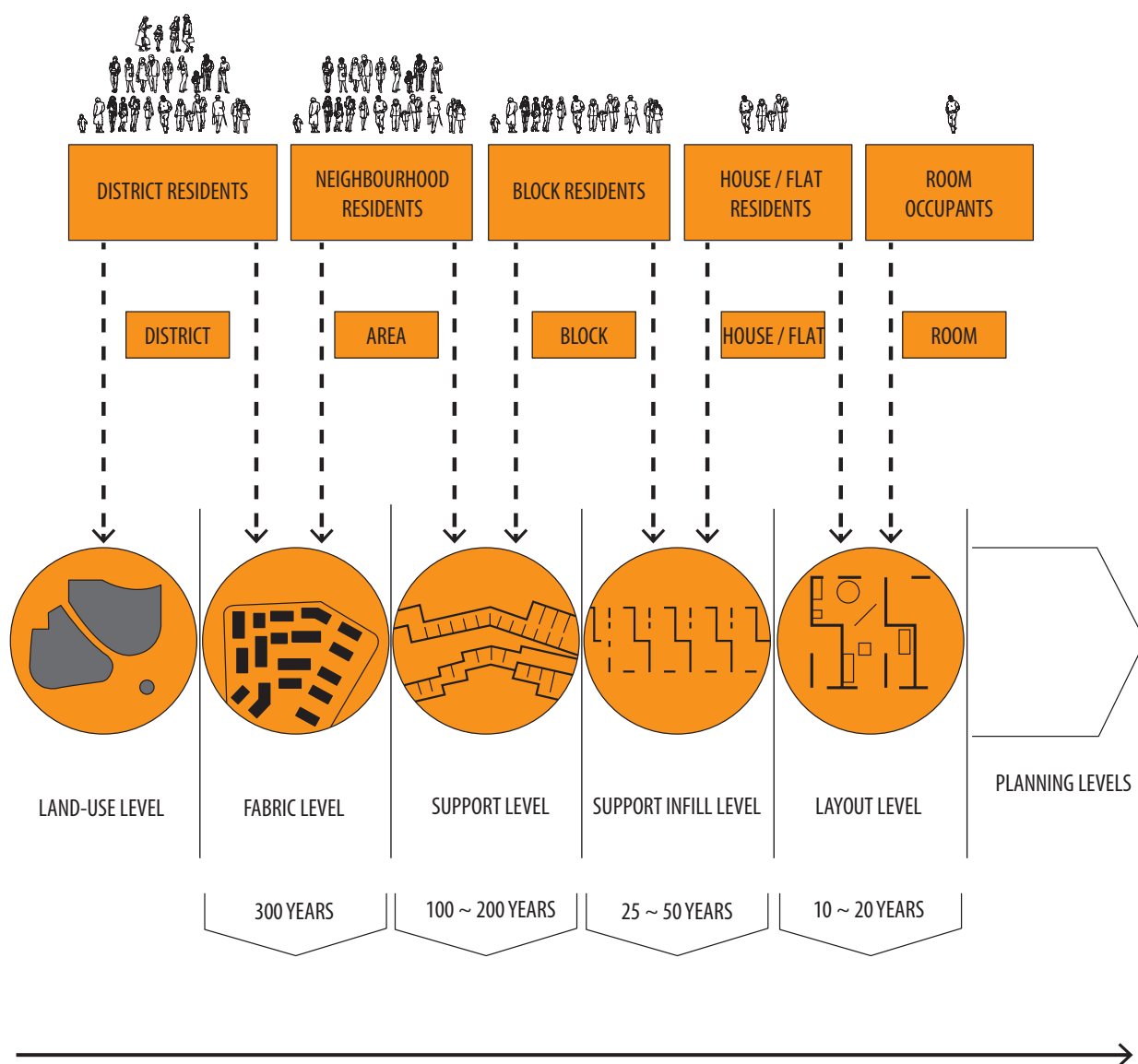
DISTRICT RESIDENTS   NEIGHBOURHOOD RESIDENTS   BLOCK RESIDENTS   HOUSE / FLAT RESIDENTS   ROOM OCCUPANTS

DISTRICT   AREA   BLOCK   HOUSE / FLAT   ROOM

LAND-USE LEVEL   FABRIC LEVEL   SUPPORT LEVEL   SUPPORT INFILL LEVEL   LAYOUT LEVEL   PLANNING LEVELS

300 YEARS   100 ~ 200 YEARS   25 ~ 50 YEARS   10 ~ 20 YEARS

Fig 9.02.   // The hierarchy of priorities in open residential building.

09C /// RESOLVING FLEXIBILITY AND ADAPTABILITY / \
PROVIDING DIVERSE DWELLINGS

The Gridded House /

The gridded house is maintained in the final
design outcome as earlier exercises determine it
as a capable means of providing variable spaces
that easily connect, are simple to inhabit, don't
waste space, and are simple to construct.

Each dwelling is considered as complete with
only a bathroom space. Provision for kitchens
and further bathroom space is addressed through
the multitude of service cavities that separate
the dwellings. All interior spaces are at least
5.6m in height, allowing for a second floor to be
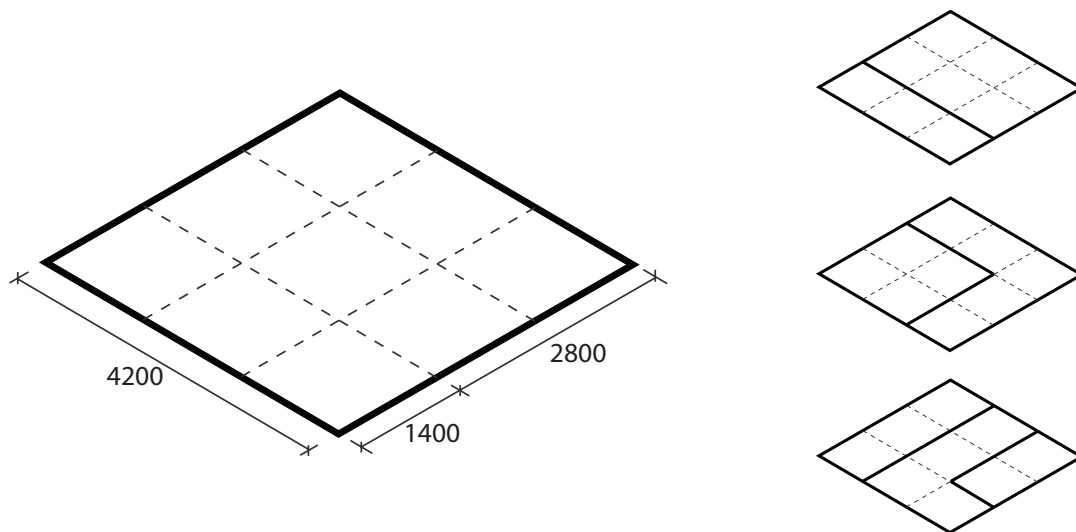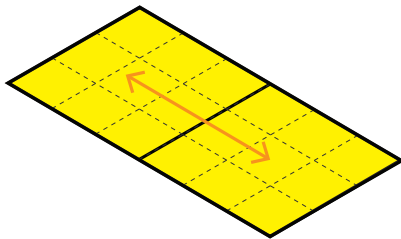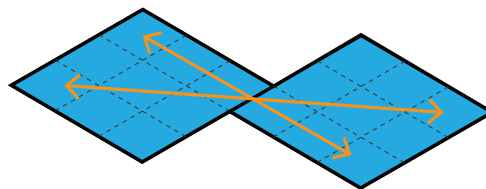constructed, should the inhabitants require it.

Fig 9.03.   // Four housing sizes have been developed based on a combination of 1.4m x 1.4m squares arranged in grids of 3 x 3, or 4.2m x 4.2m. These dimensions are balanced in terms of restricting the buildings footprint, while still being appropriate for future space partition.
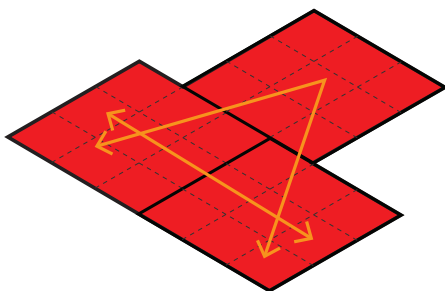
Small Dwelling

Medium Dwelling

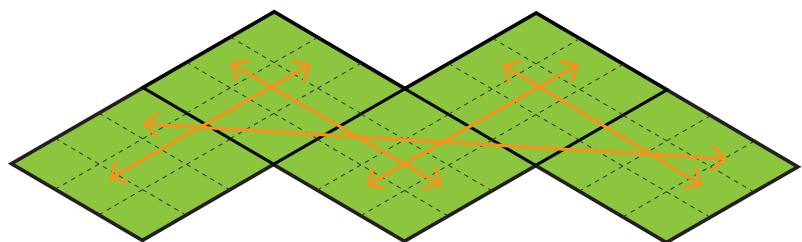*Medium Dwelling*

Large Dwelling

Fig 9.04.   // In earlier exercises, changing floor and roof planes, and obstructed site lines, were qualified as proficient in delivering opportunities for space stratification and experiential dwelling, independent of physical partition within the gridded space. The final design employs a distilled and simplified method of achieving these effects. Focusing predominantly on obstructed site lines, the design employed attains a layering of space through dividing the grid and reappropriating it in irregular arrangements. This method is deemed most appropriate as it allows for a balance of individual experience and interpretation, while not packaging the user with architecture that is too defined or prohibitively dimensioned.

Options for Indoor-Outdoor Connection/

The gridded and regular nature of the dwellings allows for the provision varied options for interior-exterior connection. With the exception of a main door, bathroom window and in some buildings, a rear bi-fold door, windows and doors are left undetermined. The structure however, has been designed to permit a variety of configurations of windows, doors and panels, to be chosen by the owners.

This, it is argued, permits a greater flexibility of interior arrangements, while allowing for a sense of individual ownership and personality to be portrayed externally – a feature frequently lacking in medium-density housing arrangements.
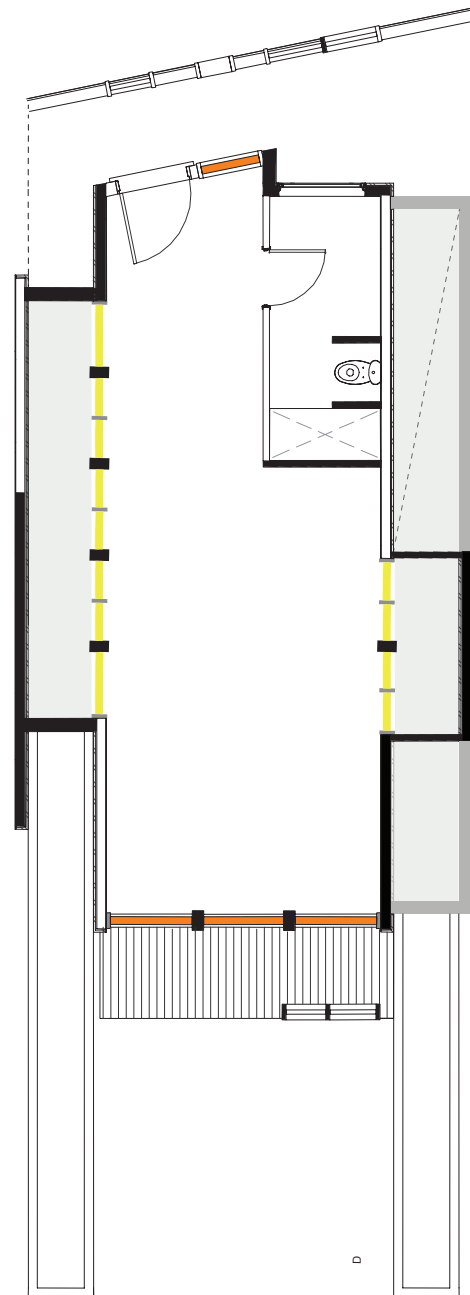
Fig 9.05.   // Interior-exterior connections are highlighted in orange, whereby interior light well connections are highlighted in yellow.
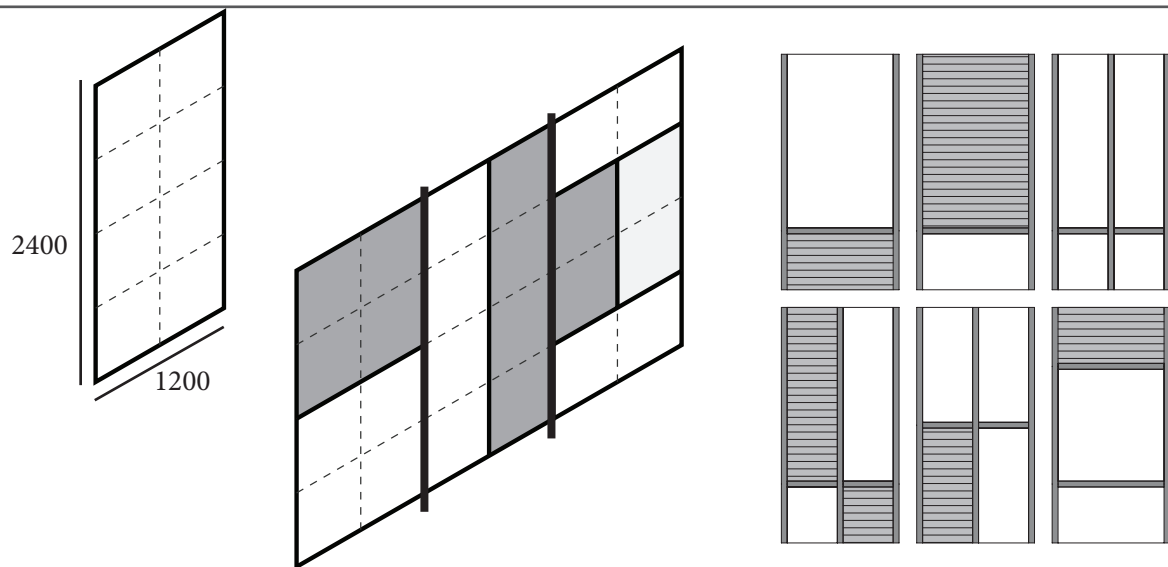
Fig 9.06.   // For consistency across the development, interior-exterior connections are governed in part by a regulated grid. Mullions can be placed at the grid and the resulting spaces filled or glazed, or the entire space filled with a solid or glazed door.

Fig 9.07.   // Interior-exterior connections are governed by a grid.

Fig 9.08.   // Internal connections with light wells are free to be configured as the owner pleases.
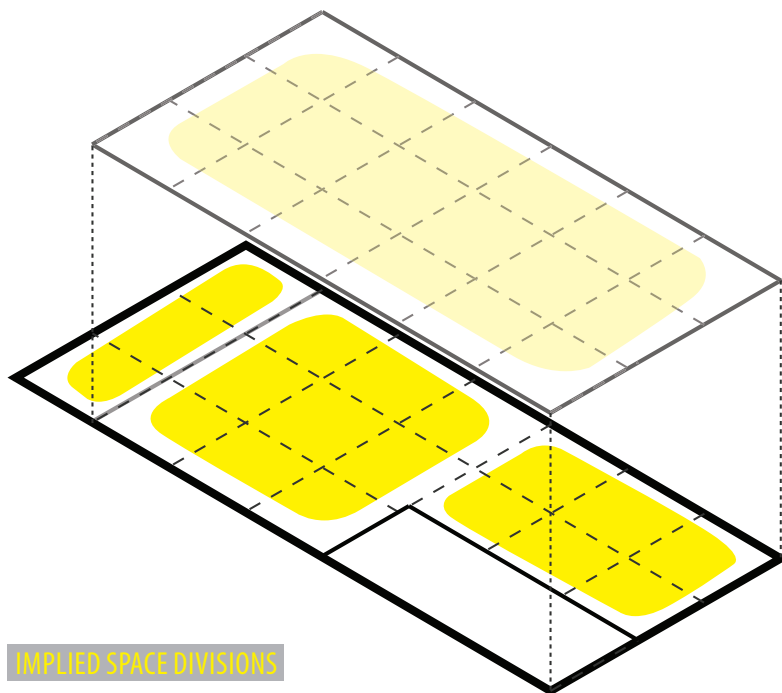
The Small Dwelling / Approx. 42m2 /

IMPLIED SPACE DIVISIONS

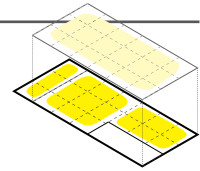Fig 9.09.   // The smallest of the four dwelling options is approximately 42m2 at completion with the possibility for a further 35m2 to be added with a second floor. This space is the most simple in plan as it is deemed to be the most efficient provision of space at this size. It is also the most shallow of the four building configurations, having the least external façade providing access to light.

Lower Floor/

Upper Floor/

Fig 9.10.   // The small dwelling / typical base plan.

Medium Dwelling Option One / Approx. 88 m2 /

IMPLIED SPACE DIVISIONS

Fig 9.11.   // This option is 88m2 at completion, but could be increased in size by a further 88m2. This options façade faces predominantly north-west, determining it as the most suitable of the two medium dwellings for the majority of space to be afforded to public/living spaces.
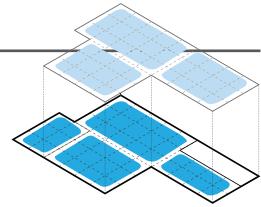
Lower Floor/
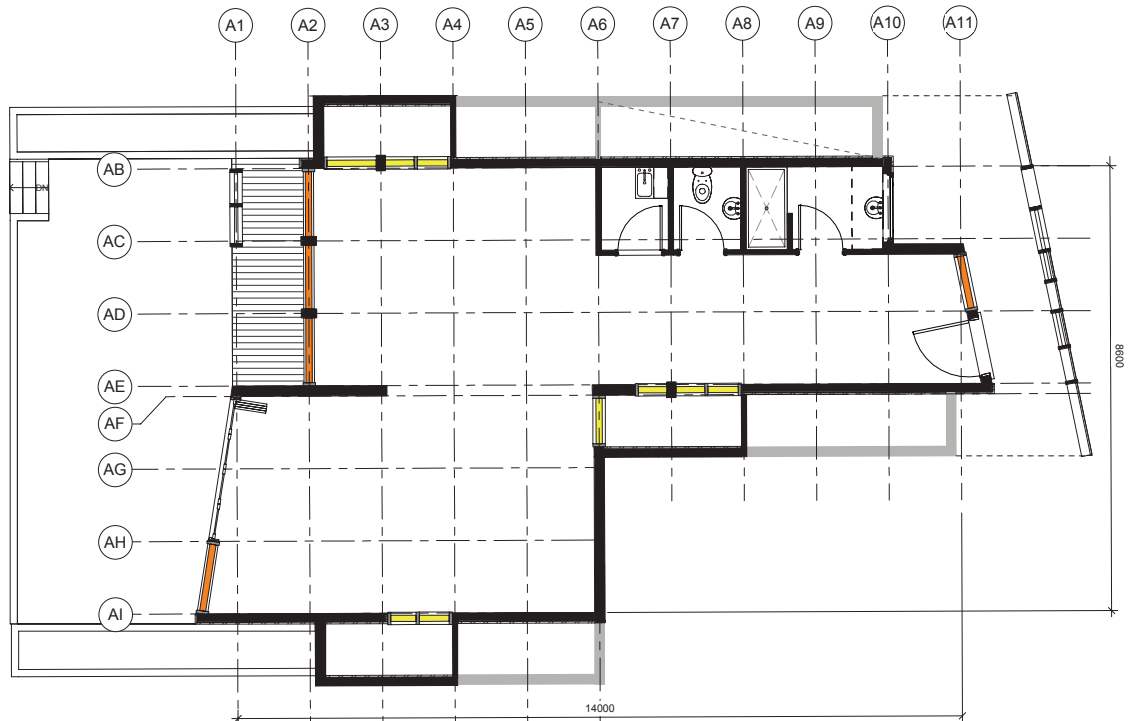
Upper Floor/
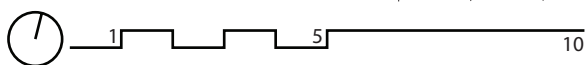
OPTIONS FOR FREE DIVISION
OPTIONS FOR GRIDDED DIVISION

Fig 9.12.   // Medium dwelling one / typical base plan.

Medium Dwelling Option Two / Approx. 88m2 /

IMPLIED SPACE DIVISIONS
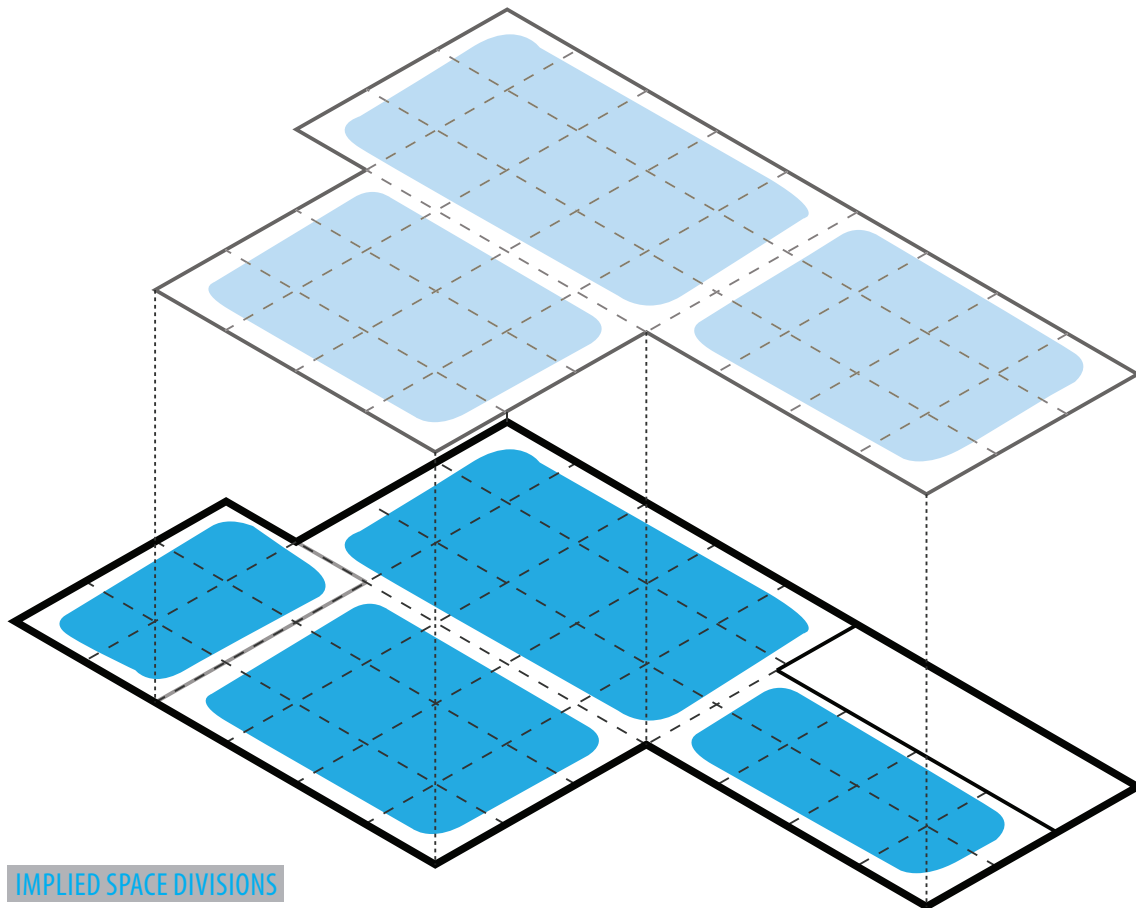
Fig 9.13.   // Similarly sized to the other medium sized dwelling, this option is 88m2 at completion, but could be increased in size by a further 88m2. This option, with the majority of the façade predominantly facing north-east is determined as the most suitable of the two medium dwellings for the majority of space to be afforded to private/bedroom spaces.

Lower Floor/

Upper Floor/

Fig 9.14.   // Medium dwelling two / typical base plan.

Large Dwelling Option / Approx. 105m2 /

IMPLIED SPACE DIVISIONS
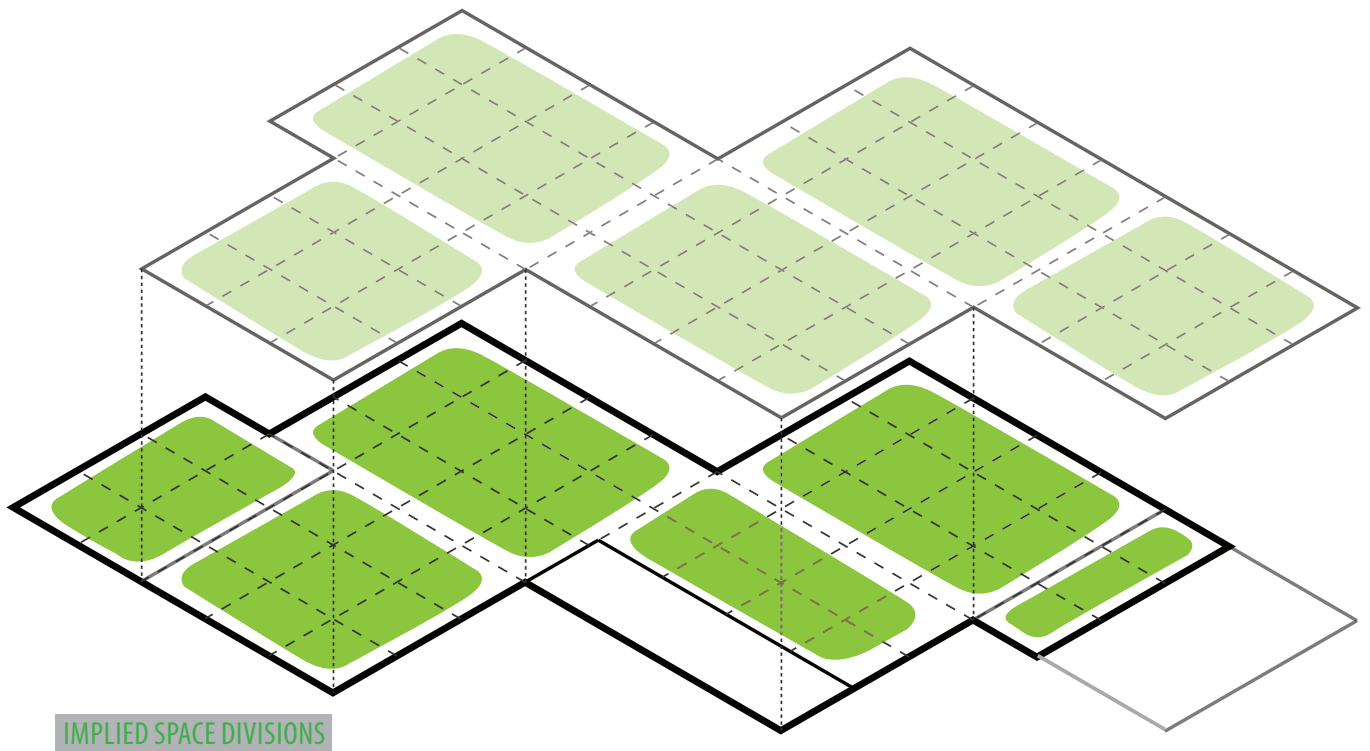
Fig 9.15.   // The largest of the four dwelling options, this space 105m2 at completion and could be increased a further 105m2 by the owner. This option is deemed to be suited to a range of inhabitation options, and has equal facade exposure to both the north-east and north-west.
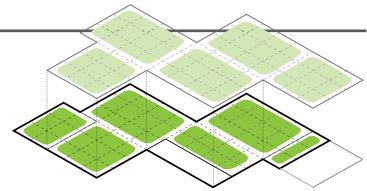
Lower Floor/
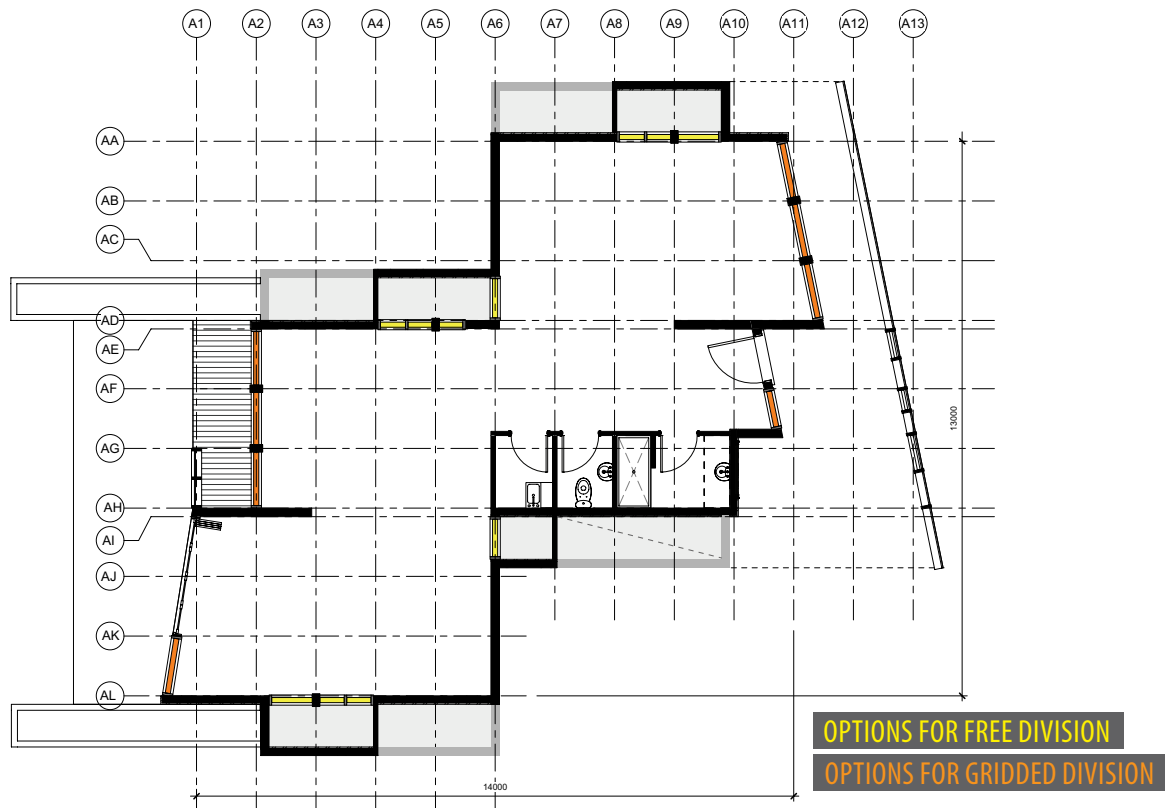
Upper Floor/
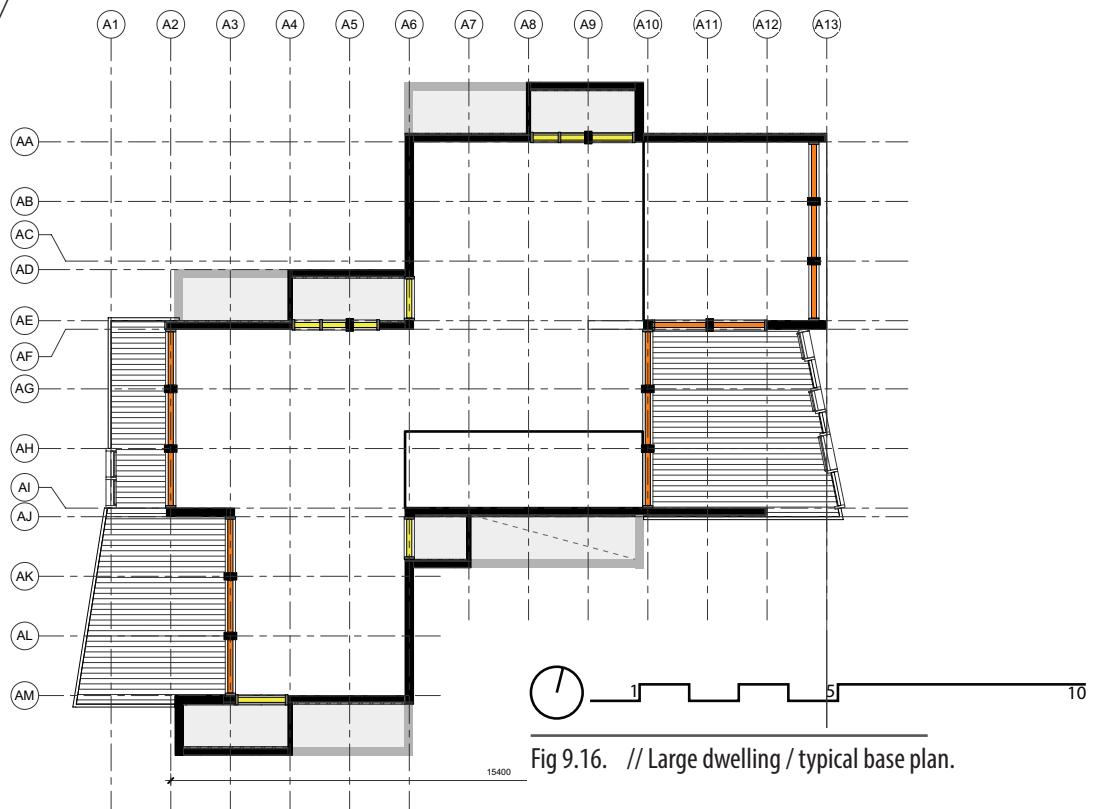
Fig 9.16.   // Large dwelling / typical base plan.
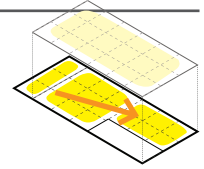
Fig 9.17. // The unpartitioned interior of the smallest dwelling.
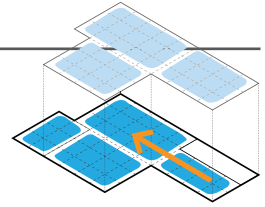
Fig 9.18.   // The unpartitioned interior of medium dwelling option one.
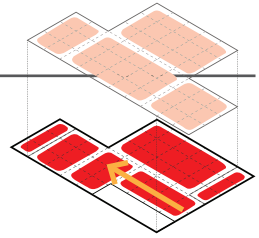
Fig 9.19.   // The unpartitioned interior of medium dwelling option two.
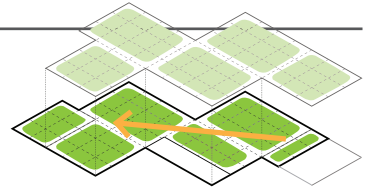
Fig 9.20.   // The unpartitioned interior of the largest dwelling.

09C /// CONNECTING DWELLINGS
NEIGHBOURLINESS AND RELATIONAL DISTANCE

One of the major issues with connecting dwellings in a dense manner is identified in Chapter 7. A lack of 'neighbourliness' can be the result of poorly designed medium-density dwelling arrangements, in which the increase in proximity can lead to habit of withdrawal as inhabitants seek their individual privacy. The identified challenge therefore is to increase the relational distance between buildings, as well as allow for the provision of a variety of outdoor space that satisfies a mixture of public-private needs.

Another challenge with connecting dwellings can be stimulated by the provision of diverse housing types, the irregular size and shape of which can be difficult to homogenise in a continuous arrangement.

Opportunities for satisfying these issues were identified in the gridded nature of the individual units. While predominantly designed to allow for unique interior spaces, the regular aspects of these spaces have been exploited in order to allow them to be grouped and joined easily in a terraced arrangement.

The grouping of the gridded dwelling furthermore permits service cavities to be placed between them. This, it is argued, aids in increasing the perceived distance between buildings, particularly from an internal perspective where there is an option of allocating these cavities as light wells.

Technically, the service cavities satisfy the needs of open building, separating service and structure, and permitting the placement of kitchen or bathroom spaces almost anywhere within the building.

Section AA/
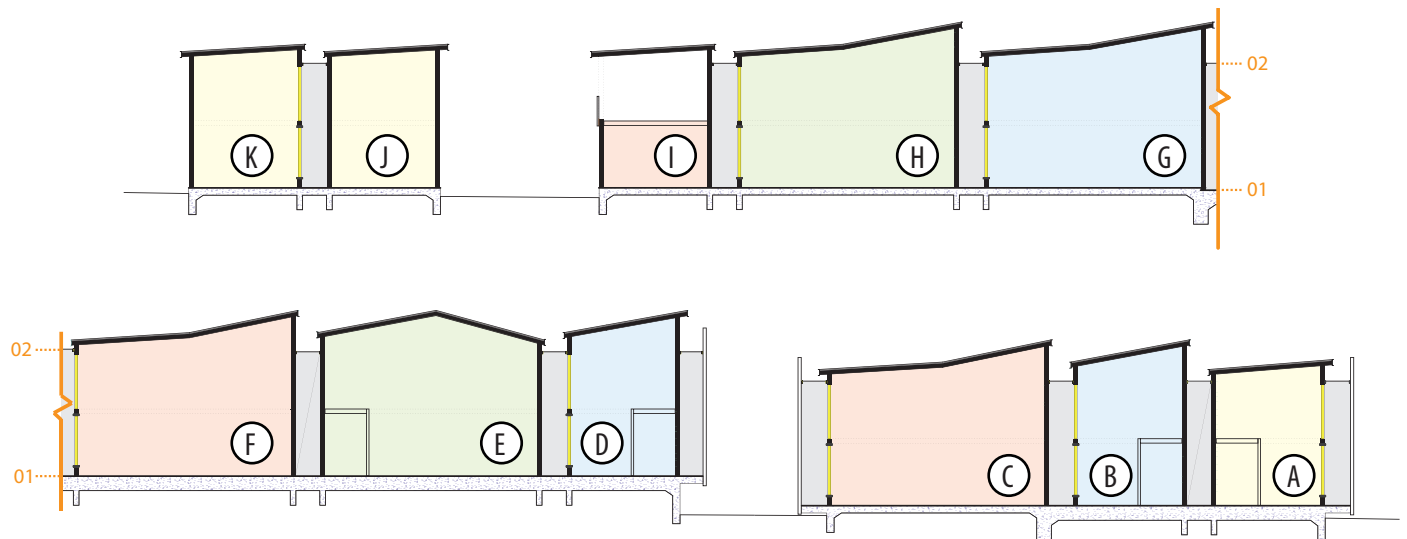
Section BB/
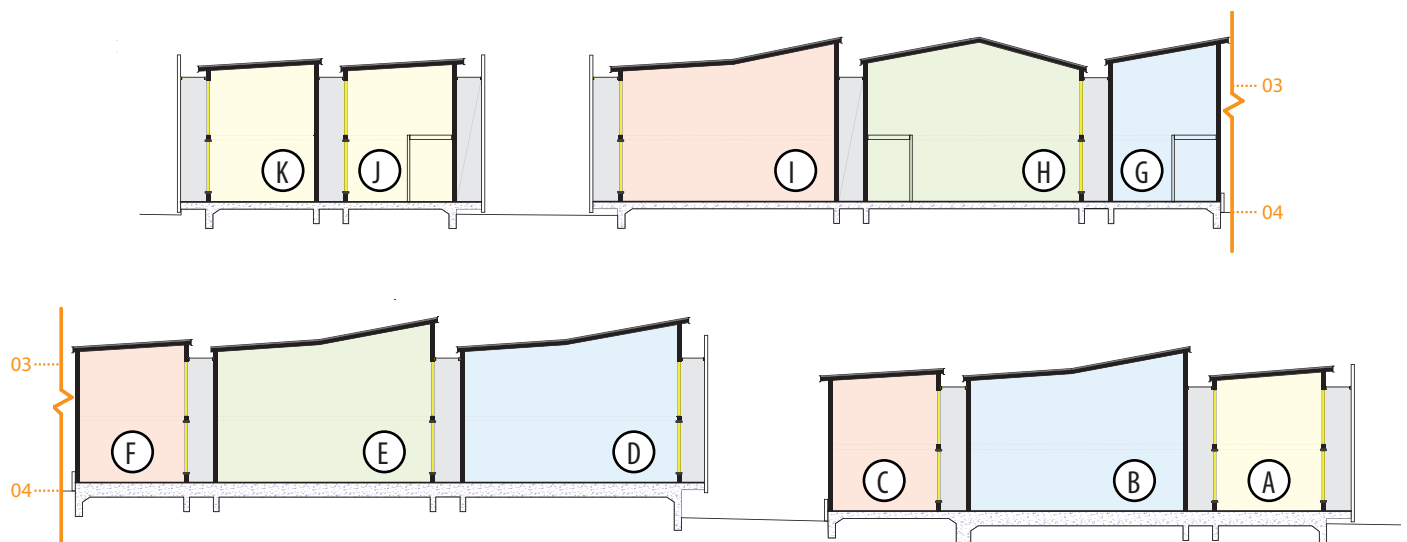
Fig 9.21.   // Sections through the grouped dwellings show the cavities that divide them.
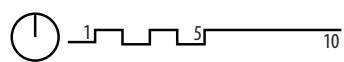
Fig 9.22.   // Ground floor plans displaying the uninhabited dwellings A-F.
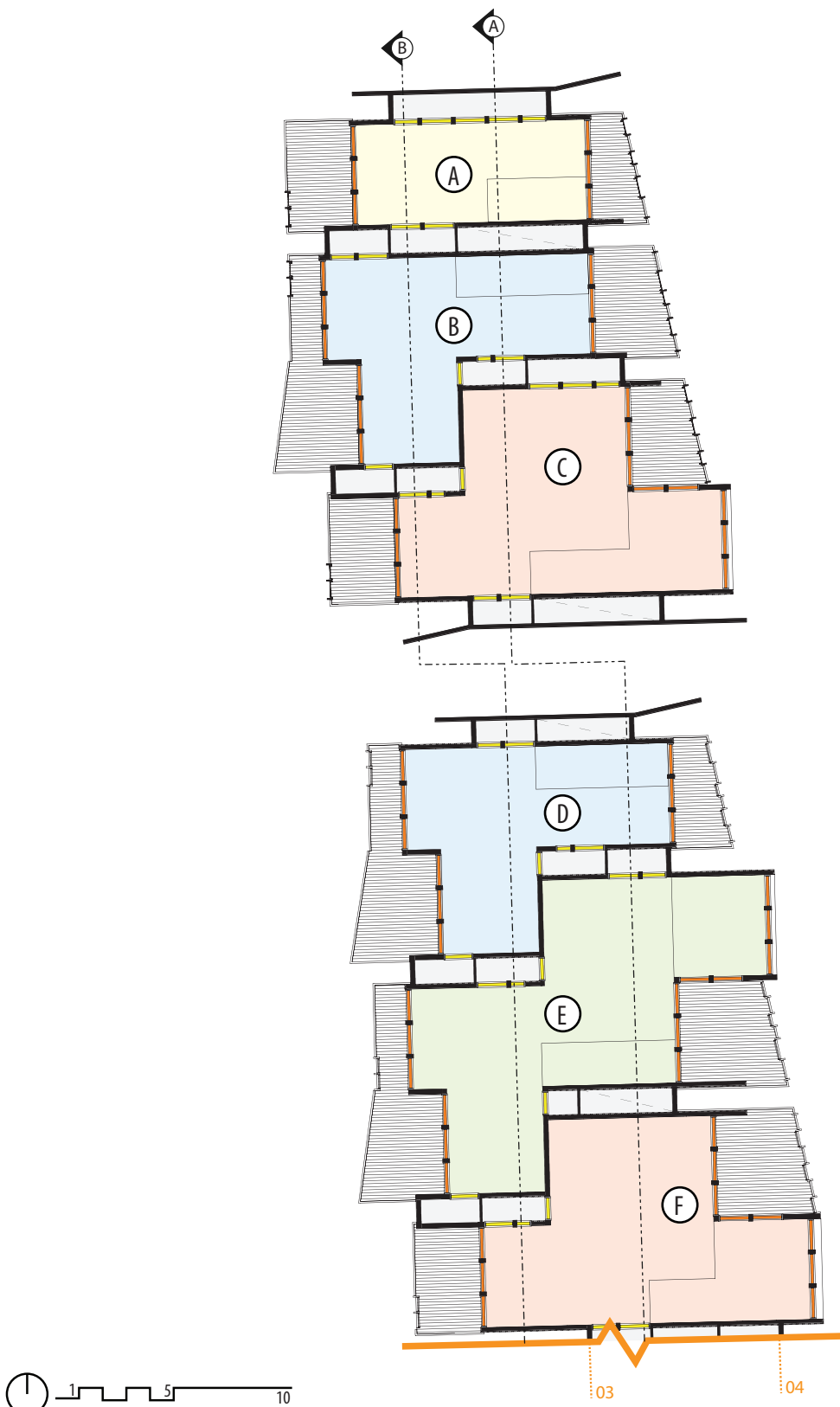
Fig 9.23.   // First floor plans displaying the uninhabited dwellings A-F.

Fig 9.24.   // Ground floor plans displaying the uninhabited dwellings G-K.
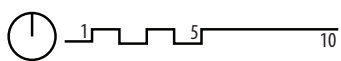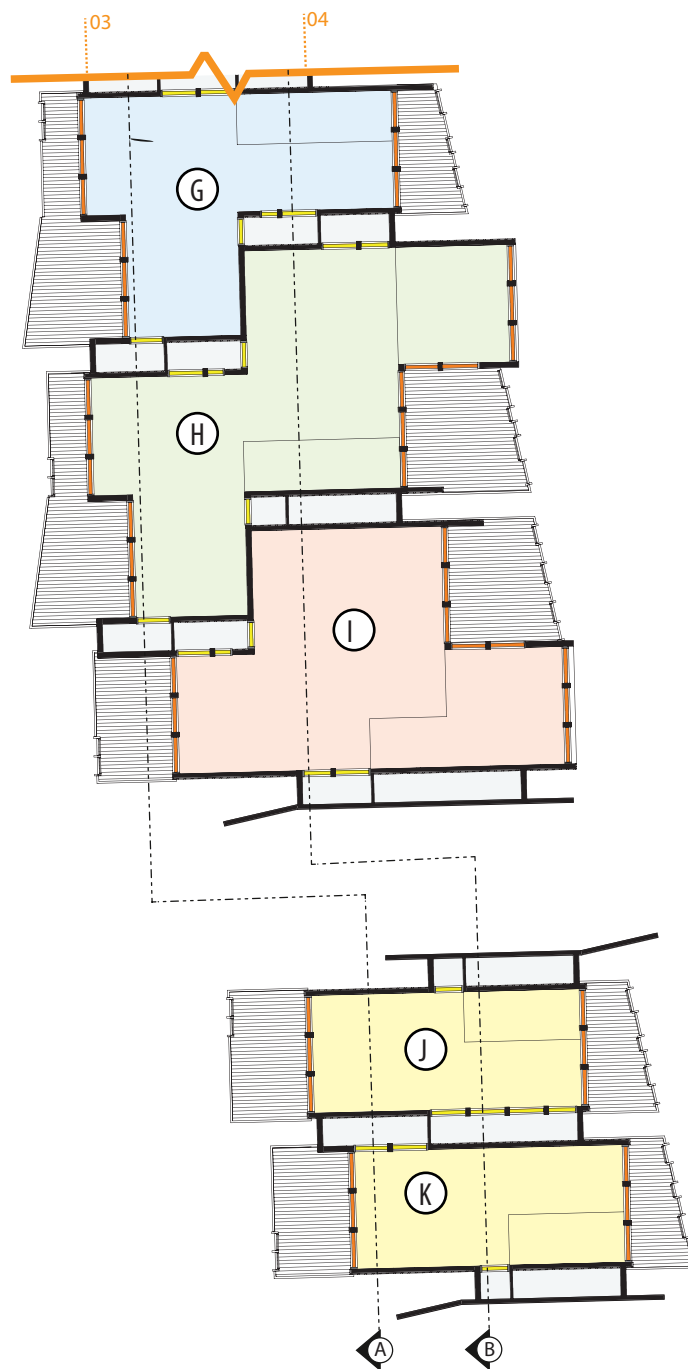
Fig 9.25.   // First floor plans displaying the uninhabited dwellings G-K.

Shared Amenity /

Shared amenity is identified as being an important tool for stimulating community development within a medium-density housing development. One of the methods of achieving this, shared car parking, has been employed in the final design.

Shared car parking at the rear of the buildings
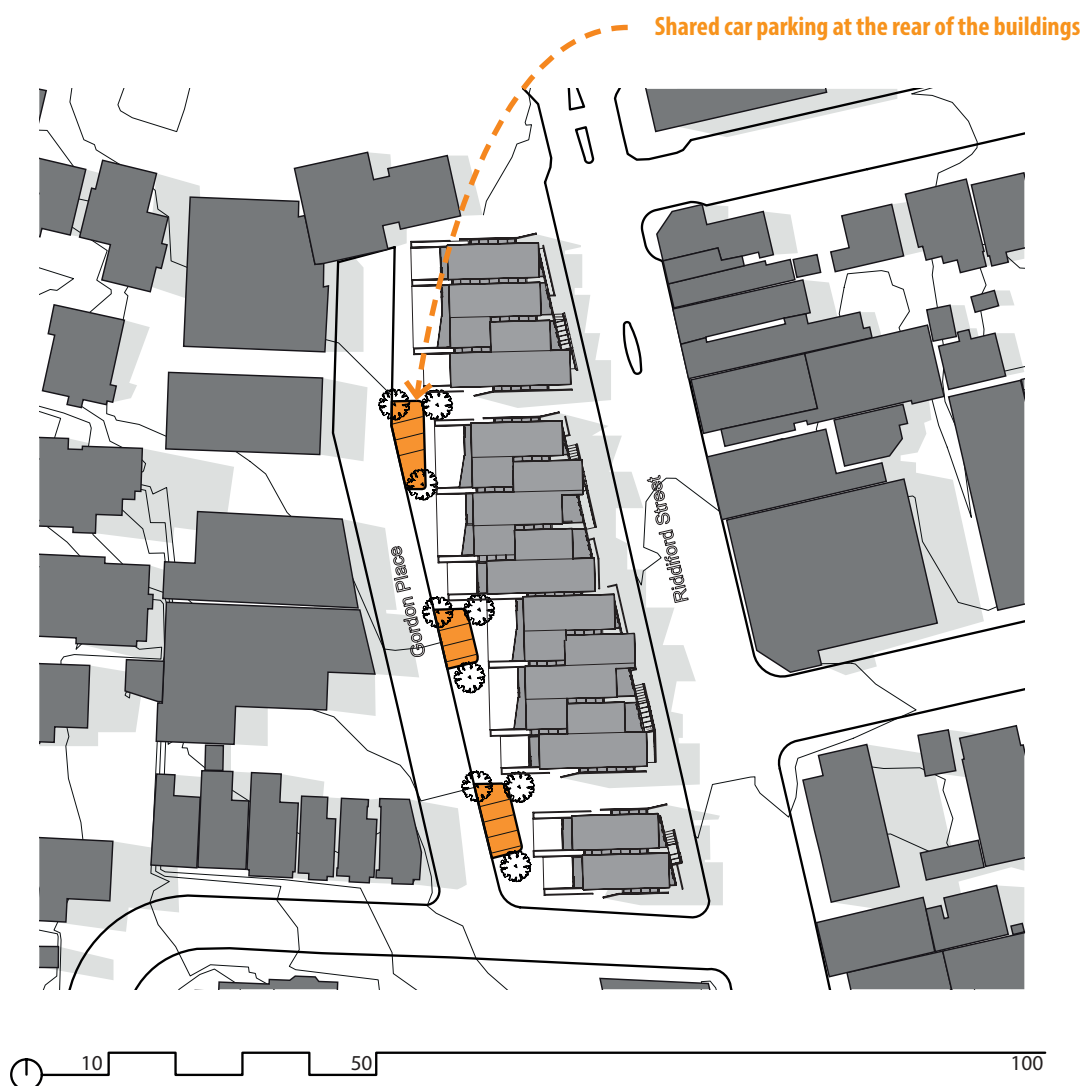
Fig 9.26.   // Due to the increase in dwelling density, the on-street car parking at the rear of the site was deemed to be inadequate at servicing the needs of the new housing development. Additional groups of car parks have therefore been provided on-site, both satisfying the needs for car parking, and providing opportunity for neighbour interaction.

Variation of Outdoor Spaces /

In satisfying the needs of varied public-private requirements for outdoor spaces, multiple outdoor areas have been provided at both levels of the dwellings. At ground level these spaces are similarly apportioned to the local Victorian dwelling; the buildings are placed close to the street with a publicly visible entrance, while a large, private outdoor space is provided at the rear. Upstairs, semi-private balconies are provided at both extents of the building.

The primary entrance for each dwelling
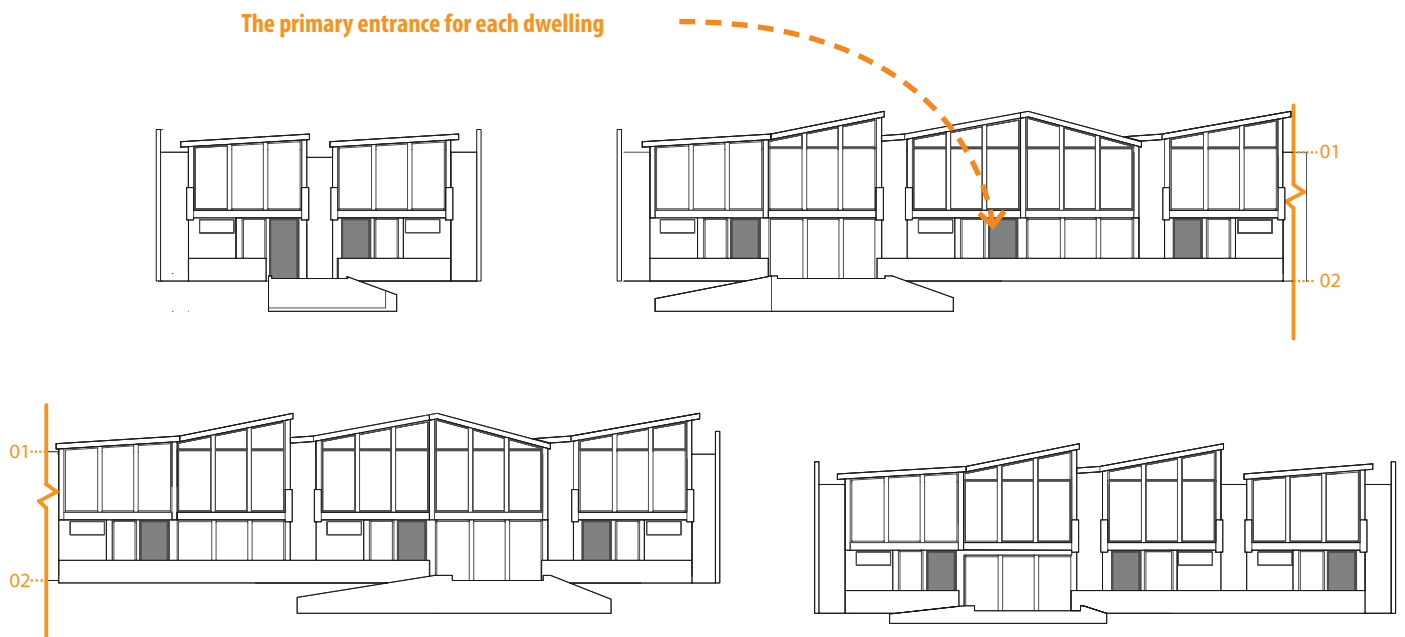
Fig 9.27.   // The primary entrances are located at the front of the dwellings.

Semi-private balcony

Shared walkway providing primary building access

Fig 9.28.   // The street frontage of the design references the Victorian house through the treatment of edge conditions. Referencing the layered appearance of the garden, and the fence, the design employs front gardens and shuttered screens, obscuring the shared front balcony and dwelling entrances at ground level. Following the lessons in Josè Oubrerie's Miller House, it is argued that this layering of the most-public façade offers a variety in perception of planes and spaces, increasing the relational distance between buildings, and extending the experience of the architecture to the greater public.

Private balcony

Private garden

Fig 9.29.   // The rear of the building is predominantly private and defined by private gardens and well sheltered balconies.

09D /// PLACEMENT ON SITE
LOCAL FIELDS AND SENSE OF PLACE

The findings of the field analysis and the local
character assessment have been employed within
the final design. Manipulating the grouped
dwellings beyond their basic gridded state, this
process aids in cement the architecture within
its environment, and addresses its potential in
consolidating the varied conditions surrounding
the housing development.
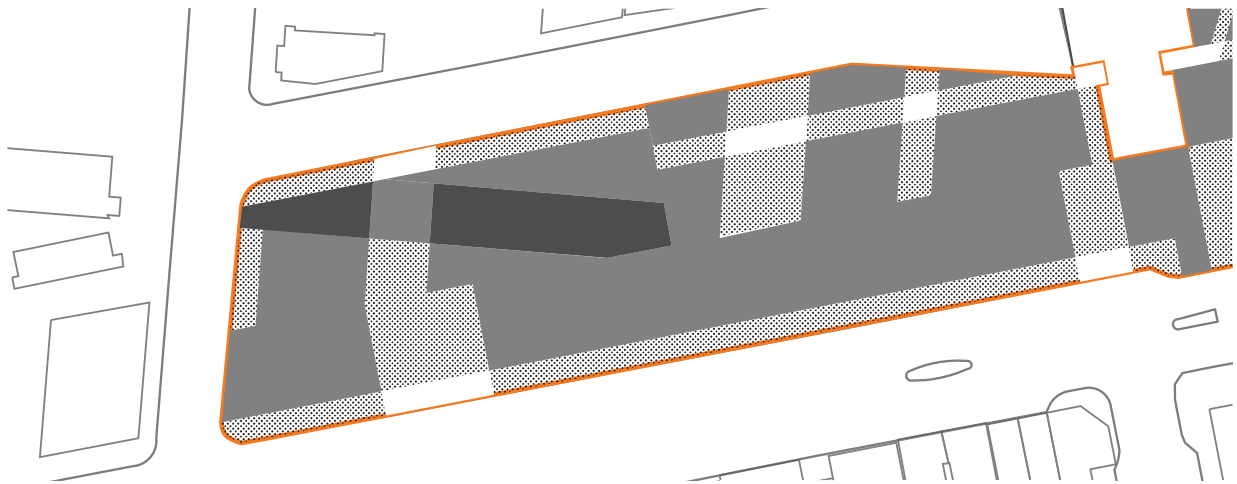
Fig 9.30.   // The gridded site.

Fig 9.31.   // Local Victorian housing.

Materials /

A variety of materials have been employed
the design of the gridded dwellings. Many of
these take inspiration from local contruction,
particularly brick and weatherboard which are
prevalent in the area.

Materials were selected based on their application
within the building, and are used to accentuate
the juxtaposition between the fixed and the
flexible. Parts of the building that are deemed
to be fixed and permanent for example, are
finished in brick, concrete, timber or roofing
iron which require little maintenance and can be
left to age and patina. Parts that are identified as
flexible however, are finished in plaster or timber,
allowing for renewal and personalisation as the
owners' needs dictate.

Fixed materials

Flexible materials

Fig 9.32.   // Materials used in the gridded dwellings.

Massing /

As identified, both the internal configuration
and the grouping of buildings have driven
the massing of the final design. The local
character and fields however have furthermore
manipulated these outcomes.
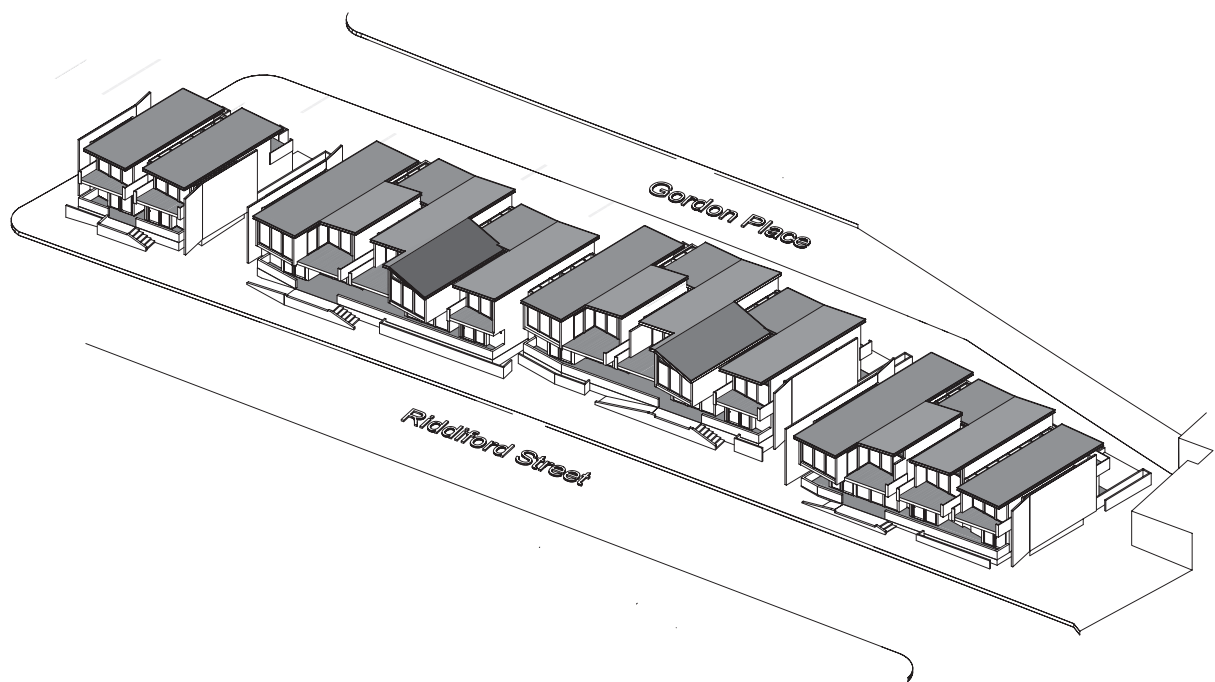
Fig 9.33.   // Addressing both the stepped edge of the local housing and the multitude of building orientations surrounding the site, both facades extrude and recess along their grid. While some of these discrepancies maintain the regularity of the internal spaces, many of the affected facades are manipulated to acknowledge the surrounding buildings, culminating in a variety of uniquely angled and individual dwellings.

Front

Rear

Fig 9.34. // Elevations depicting the massing of the collective dwellings.

Proportions /

Proportions follow the 2;1 ratio identified as commonplace in the local Victorian architecture. The customisable panels on both major facades and the shuttered screens facing the street both follow this proportioning system.
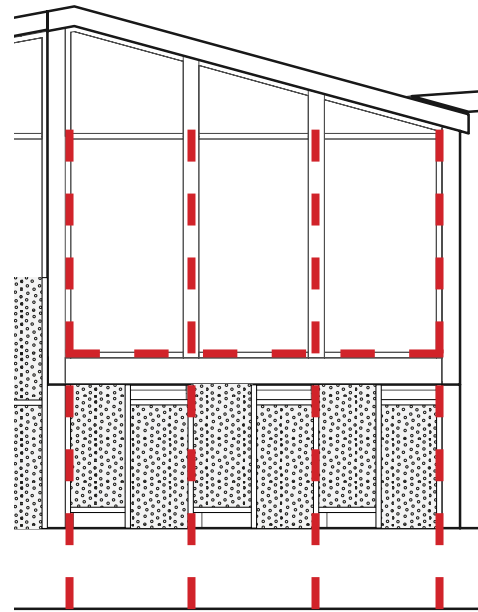
Fig 9.35.   // The 2:1 proportioning used in the design.
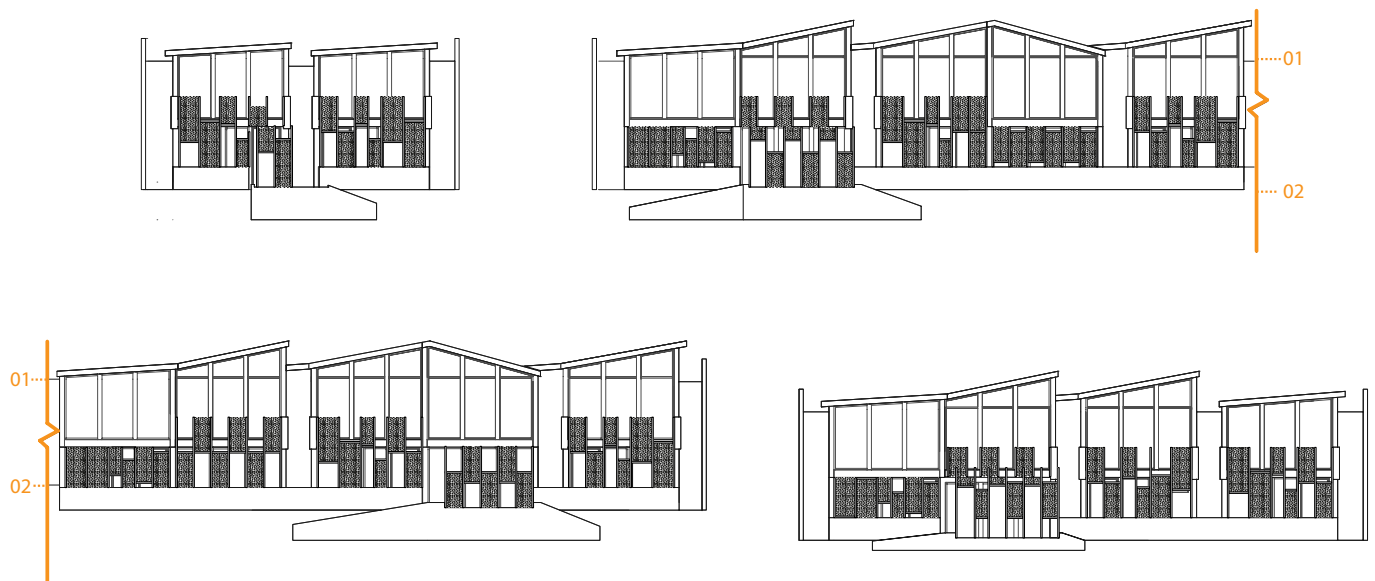
Fig 9.36.   // The proportioning in the front facade can be seen in both the core structure and the shuttered screens.

Roofline /

The combination of flat and pitched rooves
identified in the local Victorian housing is
reinterpreted in this design. The varied roof
forms therefore address the local character,
while allowing for fixed glazing to be introduced
at the top of the dwellings. The pitch changes
furthermore accentuate the implied space
divisions inside the dwellings.
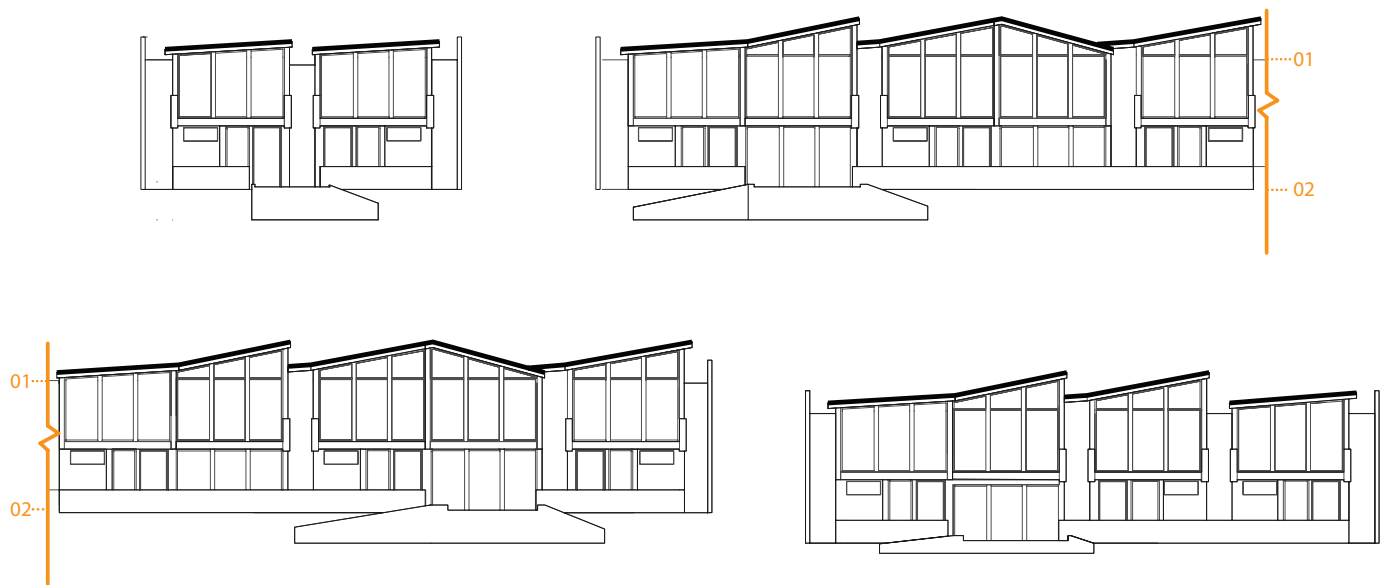
Fig 9.37.   // The staggered roofline as articulated at the front of the dwellings.

Articulation /

Due to their size and dark colour, the vertical members of both facades, as well as the roof edges are highly articulated. This consistent language along the length of the facades permits a clearer understanding and interpretation of the various angles, recessions and extrusions.
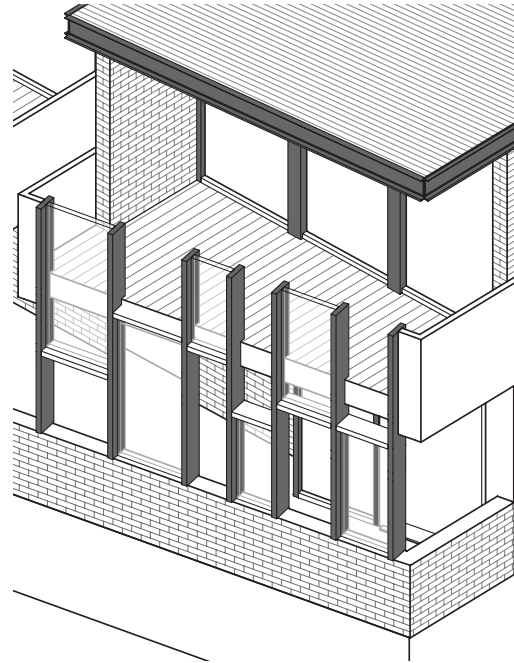
Fig 9.38.   // Articulation at the front of the dwellings is dominated by the repeating vertical members and prominent roofline.
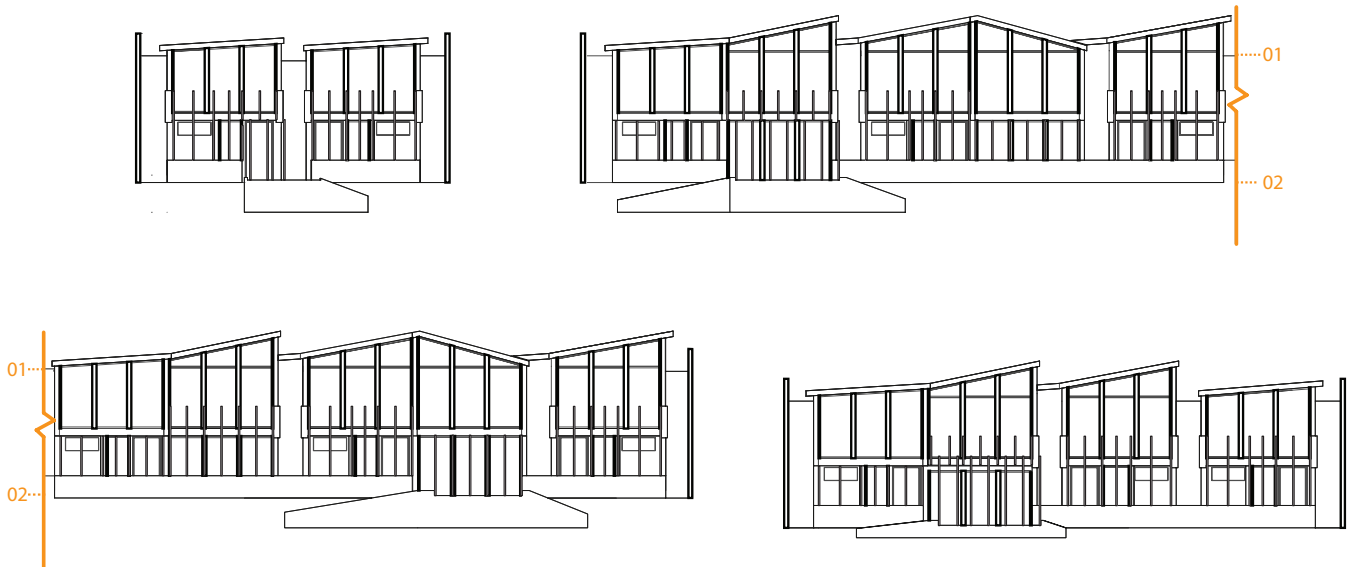
Fig 9.39.   // Vertical members dominate the front of the collected dwellings.

Fig 9.40.   // The rear of the dwellings post-occupation.

Fig 9.41.   // The dwellings as designed, pre-occupation and without internal-external partition.

Fig 9.42.   // The dwellings post-occupation, internal-external partition having been selected by the new inhabitants.

Fig 9.43.   // Ground floor plan depicting anticipated occupation and owner division for dwellings A-F.
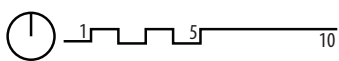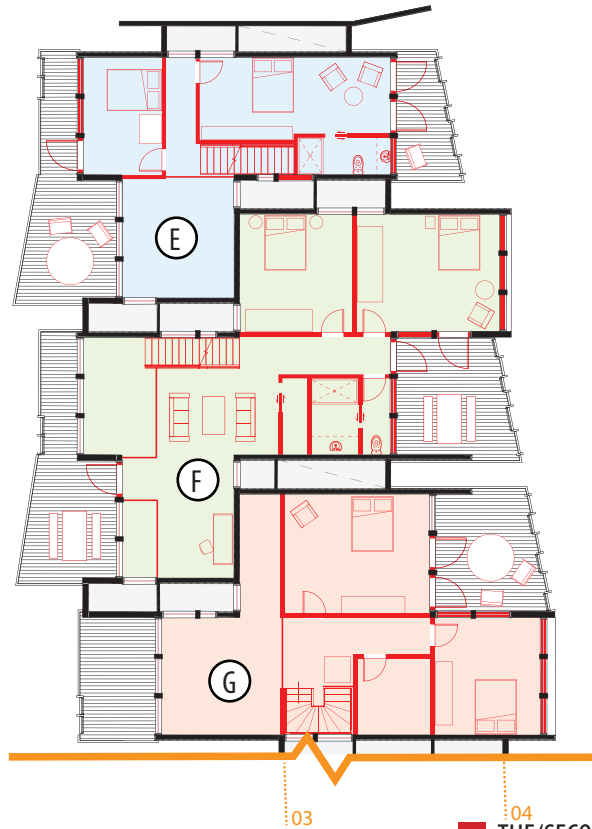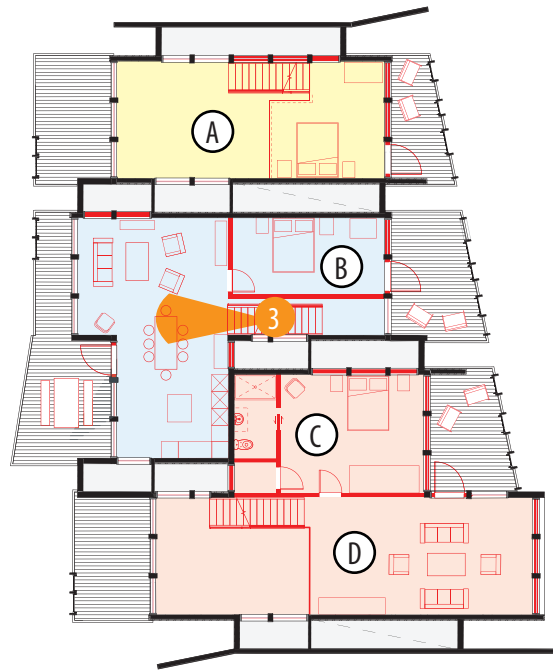
THE 'SECOND HALF' OF THE DWELLINGS
RENDER VIEWS

Fig 9.44.   // First floor plan depicting anticipated occupation and owner division for dwellings A-F.

173
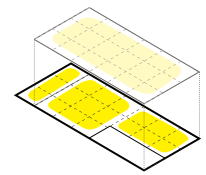
Fig 9.45. // Wanting a first house close to the city and not needing a lot of space, Tim and Annabel purchased one of the small dwellings. Not having a lot of money to partition the interior, the couple have opted for a simple open plan and mezzanine floor for their bedroom.
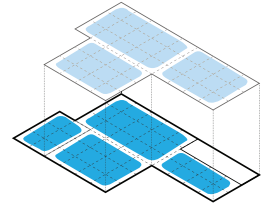
Fig 9.46.   // Operating a small architecture practice from home, Oliver has decided to dedicate a portion of his ground floor and garden area to a task specific office space.
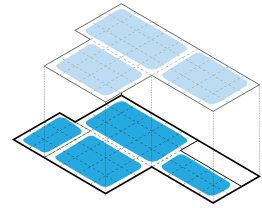
Fig 9.47.   // Wanting a large living/kitchen/dining space, Oliver has moved the public areas of the house to the first floor of his dwelling. These spaces now utilise the two generous balconies upstairs.
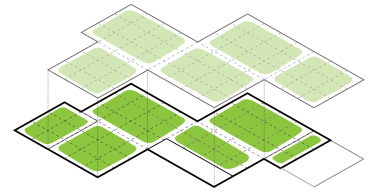
Fig 9.48. // Courtenay and Luke have three children. With Luke's father recently needing a new place to live, the family decided to purchase one of the large dwellings and partition the space to suit their large family.

Fig 9.49.   // The shared entrances at the front of the building provide opportunity for interaction between neighbours.

09D /// DESIGN CONCLUSIONS
STRENGTHS AND WEAKNESSES

The final design schematically responds to the preliminary exercises.
The outcome fulfils the initial aims of the brief and resolves the issues and opportunities outlined in the literature and precedent reviews, and programme analysis, by presenting them in a site-specific response to key principles.

Following these principles, the following points define this outcome's success /

- The dwellings are defined by single, open and unpartitioned spaces.
  Through staggering the grid, these spaces provide the ability for multiple interpretations and personalised experience. The interiors can be fully partitioned by the occupier, or left open plan. All changes are fully reversible.
- Multiple outdoor spaces are provided, satisfying a range of public-private options. The occupier, reinforcing their chosen application, can determine connections with these spaces.
- Light wells/service cavities have been introduced between all dwellings. This satisfies needs for natural light within the dwellings and allows services to be accessed from any part of the grid, while increasing the relational distance between neighbouring buildings.
- Options for community interaction have been provided in the form of shared car parking and primary entranceways.
- The buildings are well integrated with their environment. The massing addresses identified fields, and formal design principles address the character of local Victorian buildings.

A weakness of the design outcome is the low-level resolution of its application in reality. In many cases, success is assessed against presumptions based on existing research, but little is done to truly validate these outcomes within the New Zealand context. Further research could resolve this through exercises inviting New Zealanders to detail how they might inhabit a gridded space.

A further critique of its application in reality could be seen in the project's ability – or lack thereof – to act as a suitable offering for a range of family types and socio-economic groups. While the final design is considerably more flexible - and less prescriptive – than a comparable developer-driven model, there are still only a limited number of dwelling envelope options with a semi-prescriptive system in which they should be inhabited. Additionally, the quality of finish may be prohibitively expensive to certain people. A quantity list would be useful in understanding the project expenses to identify savings that could be made. Standardising the design around normal building dimensions and materials would also be beneficial in integrating the project in a real-world context.

Some resolution to discrepancies identified in the real application of this project would also aid in exploring the adaptability in different New Zealand contexts. Initial design studies deal with development of a building type, however the final outcome is only resolved in a single case. While this case outcome is successful, should this housing type be validated as a viable alternative to future housing in New Zealand, it would necessary to test it in alternative contexts.

10A /// COLLECTIVE CONCLUSIONS

Wellington's population growth is driving demand for more housing. Decreasing household sizes due to changing family demographics is further compounding the problem; as traditional 'nuclear' family units become less common, childless couples and singles, single parents and multi-generational families are emerging as the new norm, placing a demand on housing that extends far beyond the growing populace.

New, detached developments reinforce the 'nuclear' family unit and are slow and unsustainable. Furthermore, Wellington's steep typography and dense character limit the ability for outward growth. Medium-density infill is recognised as a sustainable approach to accommodate future growth within such urban centres, slowing suburban sprawl and creating efficient, affordable dwelling.

For medium density infill to be a viable future it needs to recognise the changing needs of households. Many existing medium-density developments replicate and repackage the detached house, failing to recognise opportunities in its limitations. Standard approaches advocate repetitive and autonomous outcomes leading to negative stigma and housing that suits everyone but satisfies no one.

The aim of this research was to generate a more progressive approach to medium-density housing, favouring individual personalisation over inflexible environments that package the dweller. It followed the mantra "half a good house is better than a whole bad one", interpreting the words to generate housing which is prescribed volumetrically, providing the first half. The residents, who can inhabit or partition these

dwellings as their needs dictate, provide the second.

Following the principles identified in the precedents, a series of design studies were undertaken. These examined the potential for gridded spaces to satisfy flexibility and variation, opportunities for community interaction and integration beyond the site. Key findings from these studies were combined and applied to a site in the Wellington suburb of Newtown.

The final design has adaptable spaces allowing for perpetual flexibility and variation. The grid-based concept allows people to fully determine the way in which they choose to inhabit their dwelling – spaces prescribed are volumetric and systems (static and dynamic) can be employed through the grid. The design allows for community interaction yet with obvious private spaces. Through field analysis and reinterpretation of local character it has been well integrated into its environment. The principles established here could all be applied to other sites. As such the site-specific design outcome itself is not intended to be replicated, but the underlying principles are.

Studies from a more urban focus would be beneficial to test the adaptability of the design principles in different contexts. Initial design studies deal with development of a building type, however the final outcome is only resolved here in a single case. While this case outcome is successful, urban form studies looking at the design across more suburbs (including hills) would provide an insight into the applicability of this design as a viable alternative to future housing: other cities could also be studied as similar housing issues exist in other New Zealand cities – and Australian cities are facing similar problems and are, socially, a similar culture.

Future research should explore the expectations of New Zealanders with respect to this design approach. The grid outcome was based on presumptions made using international precedents where higher density housing is more common. Further research needs to validate the applicability of this design outcome in a New Zealand context by detailing how New Zealanders might inhabit a gridded space.

Costs should also be addressed in future studies. As this design needs to meet the needs of a wide group of families and socioeconomic groups, the cost of the project is an important consideration, as the quality of finish used in this specific design may be prohibitively expensive to certain people. A quantity list would be useful in understanding the project expenses to identify savings that could be made. Standardising the design around normal building dimensions and materials would also be beneficial in integrating the project in a real-world context.

Increasing populations and household changes
have the potential to drive the
need for medium density housing as a
sustainable and diverse alternative to low density
development. This issue has been important to
resolve architecturally because housing supply
is a real and compounding issue. This thesis has
proposed a new approach to housing through
the 'half a good house' mantra where the bounds
of the home are defined volumetrically, but the
internal spaces and walls are free for the occupier
to continually adapt depending on their unique
and changing needs.

/\ WORKS CITED

Allen, Stan. (1985). *Points and Lines.* New York: Princeton Architectural Press.

Aravena, A., & Iacobelli, A. (2012). *Elemental.* Alemania, Germany: Hatje Cantz Verlag.

Building Reseach Association of New Zealand. (2011). *1970s.* Accessed from <http://www.renovate.org.nz/1940-60s/>

Building Research Association of New Zealand. (2007). *Changing Housing Need* (report). Building Research Levy, Building Research Association New Zealand.

Building Research Association of New Zealand. (2010). *1940-60s.* Accessed from <http://www.renovate.org.nz/1940-60s/>

Building Research Association of New Zealand. (2010). *Art Deco.* Accessed from <http://www.renovate.org.nz/art-deco/>

Building Research Association of New Zealand. (2010). *The Villa.* Accessed From: <http://www.renovate.org.nz/villa/>

Building Research Association of New Zealand. (2011). *The Bungalow.* Accessed from: <http://www.renovate.org.nz/bungalow/>

Bunker, R., Gleeson, B., Holloway, D., & Randolph, B. The Local Impacts of Urban Consolidation in Sydney. *Urban Policy and Research, 20*(2), 134-167.

Bunker, R., Holloway, D., & Randolph, Bill. (2005). Building the Connection Between Housing Needs and Metropolitan Planning in Sydney, Australia. *Housing Studies, 20*(5), 771-794.

Churchman, Arza. (1999). Disentangling the Concept of Density. *Journal of Planning Literature, 13*(4), 389-410.

Cockayne, Emily. (2012). Love Thy Neighbour. *Architectural Review.*

De Botton, Alain. (2006). *The Architecture of Happiness.* London: Penguin Books.

Friedman, Avi. (2012). *Town and Terraced Housing: For affordability and Sustainability.* Florence, Kentucky: Taylor and Francis.

Friedman, Avi. (Jun 6 2012). *Thinking Outside the Box on Affordable Housing.* (Video Recording). Vancouver: SFU Centre for Dialogue. Retrieved from: <http://www.youtube.com/watch?v=BlOWpmN6nXI>

Ioannidis, Konstantinos. (2005). *Decoding the London Terraced House.* (Masters thesis). University College, London.

Jabareen, Yosef. (2006). Sustainable Urban Forms: Their Typologies, Models and Concepts. *Journal of Planning, Education and Research, 26*, 38-52.

Kendall, Stephen. (2014). *Report on the Tila Open Housing Project in Helsinki.* Accessed from: <http://www.open-building.org/archives/TILA_OPEN_BUILDING_PROJECT_IN_HELSINKI.pdf>

Leupen, B., & Mooij, H. (2011). *Housing Design: A Manual.* Rotterdam: NAi Publishers.

Love, Timothy. (2003). Kit-of-Parts Conceptualism: Abstracting Architecture in the American Academy. *Harvard Design Magazine, 19.*

Ramirez-Lovering, D., & Murray, S. (2011). DASH –Designing Affordable Sustainable Housing. *Architecture Australia,* 57-59.

Rowe, C., & Slutzky, R. (1963) Transparency: Literal and Phenomenal. Perspecta, 8, 45-54. Southcombe, Mark. (2014). Translating Habitat: Revisiting Pitarua Court and Thorndon Mews. *Proceedings of the Society of Architectural Historians, Australia and New Zealand 31,* 839-850.

Syme, C., McGregor, V., & Mead, D. (2005). *Social Implications of Housing Intensification in the Auckland Region. Urban Form Design and Development.* Auckland: Auckland Sustainable Cities Program.

Walton, D., Murray, S., & Thomas, J. (2008). *Relationships Between Population Density and Perceived Quality of Neighbourhood.* Wellington: The Foundation for Research, Science and Technology.

Weidinger, H. (2010). Low Rise Housing Typology. *Detail, (3),* 235-258.

Wellington City Council. (2006). *Quantifying the growth spine; supply, demand and capacity for residential development in Wellington City* (report). Wellington: Wellington City Council.

Wellington City Council. (2006). *Urban development strategy; directing growth and delivering quality* (report). Wellington: Wellington City Council.

Wellington City Council. (2007). I*ntensification and the District Plan; Issues and Options for Wellington City* (report). Wellington: Wellington City Council.

Wellington City Council. (2007). P*romoting quality of place – a targeted approach to infill housing in Wellington City* (Urban development strategy). Wellington: Wellington City Council.

Wulff, M., Healy, E., & Reynolds., M. (2004). Why Don't Small Households Live in Small Dwellings? Disentangling a Planning Dilemma. *People and Place, 12*(1), 57-70.

/\ FURTHER READING

Batchelor, Emily. (2014). *Stepped-Ness in Medium Density Housing.* (Masters thesis) Victoria University of Wellington.

Biddulph, Mike. (2007). *Introduction to Residential Layout.* Oxford: Elsevier Ltd.

Brand, Steward. (1994). *How Buildings Learn.* London: Viking.

Carter, Emma. (2014). B*etter Building: The Desirable Affordable.* (Masters Thesis). Bartlett School of Architecture, London.

Danielsen, K., Lang, R., & Fulton, W. (1999). Retracting Suburbia: Smart Growth and the Future of Housing. *Housing Policy Debate, 10*(3), 513-540.

Davies, Colin. (2005). *The Prefabricated Home.* London: Reaktion Books Ltd.

Ebner, Peter. (2010). *Typology +.* Berlin: Birkenhauser.

Friedman, Avi. (2001). *The Grow Home.* Quebec: McGill-Queen's University Press.

Gannon, Todd. (2013). *Et in Suburbia Ego.* Columbus: Wexner Centre for the Arts.

Gast, Klaus-Peter. (2005). *Living Plans: New Concepts for Advanced Housing, Vol. 10.* Basel: Birkhauser.

Holmes, Celia. (2012). *The Adaptable Dwelling.* (Masters thesis). Victoria University of Wellington.

Kendall, S., & Teicher, J. (2000). *Residential Open Building.* London: E&FN Spoon.

Kronnenberg, Robert. (2007). *Flexible. Architecture That Responds to Change.* London: Laurence King Publishing.

Reve, Arc En. (2009). *New Forms of Collective Housing in Europe.* Berlin: Birkenhauser.

Salzaar, Jamie and Manuel Gausa. (2005). *Housing and Single Family Housing.* Barcelona: Birkhauser.

Schnieder, T., & Till, J. (2005). Flexible Housing: Opportunities and Limits. *Architectural Research Quarterly, 9*(2), 157-166.

Stiles, Rose. (2012). *Intensifying the Grid.* (Masters thesis). Victoria University of Wellington.

Strum, Joseph. (2014). *Plan Implementation and Medium Density Housing Outcomes.* (Masters thesis). Victoria University of Wellington.

Van Duzer, L., & Kleinman, K. (1994). *Villa Muller: A Work of Adolf Loos.* New York: Princeton Architectural Press.

Zee, Emma. (2013). T*owards Specific Adaptable Dwelling.* (Masters thesis). Victoria University of Wellington.

/\ IMAGES

1.01   *Stonefields Development Still Very Raw.* (2010). Retrieved from < https://commons.wikimedia.org/wiki/File:Stonefields_Development_Still_Very_Raw_III.jpg>

1.02   Author's image

1.03   Author's image

2.01   Arnold, Ben. (2009). *Wellington Panorama Cropped.* Retrieved from<https://en.wikipedia.org/wiki/File:Wellington_panorama_cropped.jpg>

2.02   Author's image. *Modified from Google Maps.*

2.03   Author's image.

2.04   Author's image. *Modified from Google Maps.*

3.01   Author's image. *Redrawn from* Building Research Association of New Zealand. (2007). *Changing Housing Need* (report). Building Research Levy, Building Research Association New Zealand.

3.02   Author's image. *Redrawn from* Building Research Association of New Zealand. (2007). *Changing Housing Need* (report). Building Research Levy, Building Research Association New Zealand.

3.03   Author's image. *Redrawn from* Aravena, A., & Iacobelli, A. (2012). *Elemental.* Alemania, Germany: Hatje Cantz Verlag.

3.04   Aravena, A., & Iacobelli, A. (2012). *Elemental.* Alemania, Germany: Hatje Cantz Verlag.

4.01   Friedman, Avi. (2001). *The Grow Home.* Quebec: McGill-Queen's University Press.

4.02   Author's image.

4.03   Gannon, Todd. (2013). *Et in Suburbia Ego.* Columbus: Wexner Centre for the Arts.

4.04   Gannon, Todd. (2013). *Et in Suburbia Ego.* Columbus: Wexner Centre for the Arts.

4.05   Gannon, Todd. (2013). *Et in Suburbia Ego*. Columbus: Wexner Centre for the Arts.

4.06   Kendall, Stephen. (2014). R*eport on the Tila Open Housing Project in Helsinki.* Accessed from: <http://www.open-building.org/archives/ TILA_OPEN_BUILDING_PROJECT_IN_ HELSINKI.pdf

4.07   Kendall, Stephen. (2014). R*eport on the Tila Open Housing Project in Helsinki.* Accessed from: <http://www.open-building.org/archives/ TILA_OPEN_BUILDING_PROJECT_IN_ HELSINKI.pdf

4.08   Kendall, Stephen. (2014). *Report on the Tila Open Housing Project in Helsinki.* Accessed from: <http://www.open-building.org/archives/ TILA_OPEN_BUILDING_PROJECT_IN_ HELSINKI.pdf

4.09   *Suitcase House.* (2016). Retrieved from <http://www.mimoa. eu/projects/China/Beijing/Suitcase%20 House/?abvar2&utm_expid=3171585-1.pFu_ x39wQKuggy22EudlKA.2>

4.10   *Suitcase House.* (2016). Retrieved from <http://www.mimoa. eu/projects/China/Beijing/Suitcase%20 House/?abvar2&utm_expid=3171585-1.pFu_ x39wQKuggy22EudlKA.2>

4.11   *Suitcase house by Gary Chang hides program beneath floor.* (2013). Retrieved from < http://www.designboom.com/architecture/ suitcase-house-by-gary-chang-hides-program- beneath-ground/>

4.12   Author's image. *Modified from Google Maps.*

4.13   Author's image.

4.14   Salzaar, Jamie and Manuel Gausa. (2005). *Housing and Single Family Housing.* Barcelona: Birkhauser.

4.15   Salzaar, Jamie and Manuel Gausa. (2005). *Housing and Single Family Housing.* Barcelona: Birkhauser.

4.16   Author's image. *Redrawn from* Collective Housing Atlas. (2000). *Gifu Kitagata Apartment Building by SANNA.* Retrieved from < https:// collectivehousingatlas.net/2013/07/12/gifu- kitagata-apartment-building-by-sanaa/>

4.17   Growing Urban Habitats. (2001). *Next 21 Experimental Housing.* Retrieved from <http:// faculty.virginia.edu/GrowUrbanHabitats/case_ studies/ca- se_study_010122.html>

4.18   Growing Urban Habitats. (2001). *Next 21 Experimental Housing.* Retrieved from <http://faculty.virginia.edu/GrowUrbanHabitats/case_studies/ca- se_study_010122.html>

4.19   Kendall, Stephen. (1994). *Next 21.* Retrieved from < http://www.open-building.org/ob/next21.html>

4.20   Kendall, Stephen. (1994). *Next 21.* Retrieved from < http://www.open-building.org/ob/next21.html>

4.21   Reve, Arc En. (2009). *New Forms of Collective Housing in Europe.* Berlin: Birkenhauser.

4.22   Reve, Arc En. (2009). *New Forms of Collective Housing in Europe.* Berlin: Birkenhauser.

4.23   Author's image.

5.01   Author's image.

5.02   Author's image.

5.03   Author's image.

5.04   Author's image.

5.05   Author's image.

5.06   Author's image.

5.07   Author's image.

5.08   Author's image.

5.09   Author's image.

5.10   Author's image.

5.11   Author's image.

5.12   Author's image.

5.13   Author's image.

5.14   Author's image.

5.15   Author's image.

5.16   Author's image.

5.17   Author's image.

5.18   Author's image.

5.19   Author's image.

6.01   Author's image.

6.02   Author's image.

6.03   Author's image.

6.04   Author's image.

6.05   Author's image.

6.06   Author's image.

6.07   Author's image.

6.08   Author's image.

6.09   Author's image.

6.10   Author's image.

7.01   Author's image. *Modified from* Van Duzer, L., & Kleinman, K. (1994). V*illa Muller: A Work of Adolf Loos.* New York: Princeton Architectural Press.

7.02   Gannon, Todd. (2013). *Et in Suburbia Ego.* Columbus: Wexner Centre for the Arts.

7.03   *Suitcase House.* (2016). Retrieved from <http://www.mimoa. eu/projects/China/Beijing/Suitcase%20 House/?abvar2&utm_expid=3171585-1.pFu_ x39wQKuggy22EudlKA.2>

7.04   Author's image.

7.05   Author's image.

7.06   Author's image.

7.07   Hejduk, John. (1999). *The Nine-Square Problem, Education of an Architect: A Point of view.* The Cooper Union School of Art & Architecture.

7.08   Author's image.

7.09   Author's image.

7.10   Author's image.

7.11   Author's image.

7.12   Author's image.

7.13   Author's image.

7.14   Author's image.

7.15   Author's image.

7.16   Author's image.

7.17   Author's image.

7.18   Author's image.

7.19   Author's image.

7.20   Author's image.

7.21   Author's image.

7.22   Author's image.

7.23   Author's image.

7.24   Author's image.

7.25   Author's image.

7.26   Author's image.

7.27   Author's image.

7.28   Author's image.

7.29   Author's image.

7.30   Author's image.

7.31   Author's image.

7.32   Author's image.

7.33   Author's image.

7.34   Author's image.

7.35   Author's image.

7.36   Author's image.

7.37   Author's image.

7.38   Author's image. *Modified from* Gannon, Todd. (2013). *Et in Suburbia Ego*. Columbus: Wexner Centre for the Arts.

7.39   Author's image.

7.40   Author's image.

7.41   Author's image.

7.42   Author's image.

7.43   Author's image.

7.44   Author's image.

7.45   Author's image.

7.46   Author's image.

7.47   Author's image.

7.48   Author's image.

8.01   *Author's image.* Redrawn from Allen, Stan. (1985). *Points and Lines.* New York: Princeton Architectural Press.

8.02   Author's image.

8.03   Author's image.

8.04	Author's image.	9.04	Author's image.
8.05	Author's image.	9.05	Author's image.
8.06	Author's image.	9.06	Author's image.
8.07	Author's image.	9.07	Author's image.
8.08	Author's image.	9.08	Author's image.
8.09	Author's image.	9.09	Author's image.
8.10	Author's image.	9.10	Author's image.
8.11	Author's image.	9.11	Author's image.
8.12	Author's image.	9.12	Author's image.
8.13	Author's image.	9.13	Author's image.
8.14	Author's image.	9.14	Author's image.
8.15	Author's image.	9.15	Author's image.
9.01	Author's image.	9.16	Author's image.
9.02	Author's image. *Redrawn from* Kendall, S., & Teicher, J. (2000). *Residential Open Building.* London: E&FN Spoon.	9.17	Author's image.
		9.18	Author's image.
9.03	Author's image.	9.19	Author's image.

9.20	Author's image.	9.37	Author's image.
9.21	Author's image.	9.38	Author's image.
9.22	Author's image.	9.39	Author's image.
9.23	Author's image.	9.40	Author's image.
9.24	Author's image.	9.41	Author's image.
9.25	Author's image.	9.42	Author's image.
9.26	Author's image.	9.43	Author's image.
9.27	Author's image.	9.44	Author's image.
9.28	Author's image.	9.45	Author's image.
9.29	Author's image.	9.46	Author's image.
9.30	Author's image.	9.47	Author's image.
9.31	Author's image.	9.48	Author's image.
9.32	Author's image.	9.49	Author's image.
9.33	Author's image.		
9.34	Author's image.		
9.36	Author's image.		

Alternative concept exploring the culmination of early exercises. All Images by Author.

SOUTH WEST CORNER //
GORDON STREET //

EAST FACADE //
RIDDIFORD STREET //
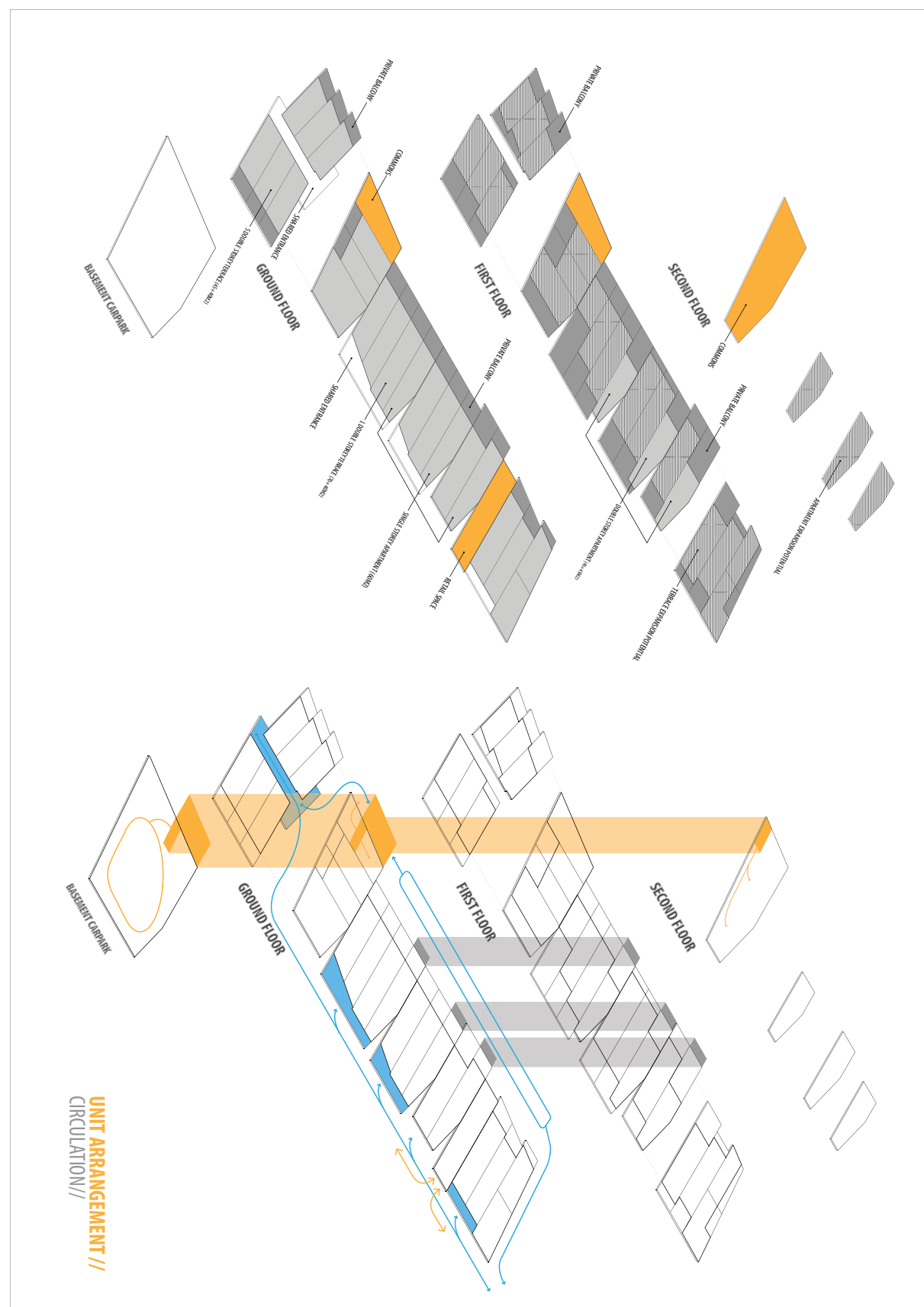
Alternative concept exploring the culmination of early exercises. All Images by Author.

Alternative concept exploring the culmination of early exercises. All Images by Author.

GROUPED UNITS //
EXPLODED GROUPED UNITS//