

# SUBURBAN DREAM

*Reinterpreting the suburban dream in  
Auckland's medium density housing*

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# SUBURBAN DREAM

Reinterpreting the suburban dream in  
Auckland's medium density housing

by Henry Read

A 120-point thesis submitted to the Victoria University of Wellington  
in partial fulfilment of the requirements for the degree of  
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# ACKNOWLEDGEMENTS

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*Firstly I would like to thank my supervisors, Mark and Tane. Your guidance and enthusiasm throughout my time at Victoria University, and especially this project have been invaluable.*

*To my friends, you have made this five years in wellington fly by. Thanks for all your help, and the great times both in and out of studio.*

*Mum and Dad, thank you not only for the trips south throughout the year, but also for your continual encouragement and interest.*

*And finally to Kelly. Your support and energy has made this last five years far more rewarding than I could have ever imagined – Thank you so much.*









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# ABSTRACT

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The suburban dream has defined the Kiwi lifestyle since early European settlement. However, New Zealand's growing cities are making this form of living increasingly unobtainable.

The Auckland City Plan is aiming to create the world's most liveable city. To achieve this, their Unitary Plan has proposed accommodating up to 70% of population growth within existing urban limits. A large proportion of new density is to be achieved through medium-density housing around existing suburban centres. However, current medium-density housing typologies fail to support the kiwi lifestyle. The combination of high growth and revision of Auckland's new development strategy has created an opportunity to explore how medium-density housing can be reinvented to appeal to the kiwi lifestyle.

This thesis proposes an approach to suburban intensification which can achieve Auckland's required density, as well as the ideals of New Zealand's preferred suburban dream.

Initial explorations highlight three key ideals from the suburban dream; independence, expansiveness, and community. These ideals are compromised in current medium-density housing, and form key criteria for architectural critique throughout this research.

The work of Atelier Bow-Wow and their theory of behaviourology highlighted the need for a human dimension within architecture, and informed a methodology to drive individuality of dwellings throughout the design investigations. An iterative design methodology explored how the relationships between, and configuration of dwellings could efficiently utilise both ground and vertical conditions to strengthen the key suburban ideals. Further investigations explored how architectural elements could generate gradients of privacy, to reduce the distance required between dwellings. The expansive suburban yard was used to test how shared space could be articulated, and how its relationship to the dwelling can reinforce all suburban ideals. The final stage of the design extended the scope of the investigation to the surrounding context, highlighting significant findings and further opportunities for development.

Overall, the research suggests a methodology for designing medium-density housing which not only achieves ideals of the suburban dream, but demonstrates that medium-density housing can provide a lifestyle which addresses and exceeds suburban expectations.







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# INTRODUCTION

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1.0

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Fig.1.1 | Stand alone housing along Wanganui River, 1841.



Fig.1.2 | Imagery promoting the paradise of New Zealand, 1912. Source: New Zealand High Commission.

The suburban dream defines the kiwi lifestyle for the majority of New Zealanders. Such a lifestyle is currently maintained by sprawling the limits of our cities. The growth of New Zealand's cities, combined with compact city plan strategies, have made this form of living increasingly unobtainable.

Founded on a pioneering spirit, New Zealand was regarded as a paradise. It attracted settlers from overcrowded rural towns of the United Kingdom with *"declining financial circumstances and the fear of imminent poverty and hunger"* (Phillips 5). The availability of land, prosperous economy, and immigration initiatives made New Zealand an attractive place for many young couples and families hoping to get a head start. Figures 1.1 and 1.2 illustrate advertisements and imagery used by the New Zealand Company to promote the "rural paradise" of New Zealand (Phillips 23).

Development patterns of the early settlers fostered suburban development. The availability of land and timber meant the ideal standalone house for each family could be achieved. Derby, a New Zealand historian, stated: "Single storey homes on their own section were the rule, even in the hearts of the cities" (1)



Fig.1.3 | Auckland Post war suburban development.

Large scale suburban development grew after the Second World War, creating suburbia as it is today (Fig 1.3 and 1.4). The motor car became affordable making vast quantities of land beyond the tram lines suitable for suburban development.

*New Suburbs gave thousands of New Zealand families their first opportunity to own their own house on their own land ... A privately owned house on its section became established as the ideal way of life for almost all New Zealanders (ibid 3).*



Fig.1.4 | Stand alone family home as norm, 1950.

In 1972 Austin Mitchell, a British political journalist who lived in New Zealand for thirty years, wrote a humorous book about the kiwi culture and lifestyle called *The Half-Gallon Quarter-Acre Pavlova Paradise*. Mitchell describes New Zealand culture at this time and its interconnection with the suburban nature of the country:

*The home is the focus of the nation's life ... Kiwi homes are so much bigger, better and more beautiful, veritable peoples' palaces that the occupants don't want to leave ... The home is the venue for the most popular form of entertainment ... It's also a hobby you inhabit (Mitchell 110).*

Figure 1.5 shows Mitchell's description of the suburban kiwi lifestyle where the suburban home is not a retreat but a buzzing metropolis of life. His final comment reflects on the young nature of New Zealand's culture and development, which arguably can be said to retain ideals of the early European settlers. "New Zealand is as near to a people's paradise as fallible humanity is likely to get" (ibid 179).

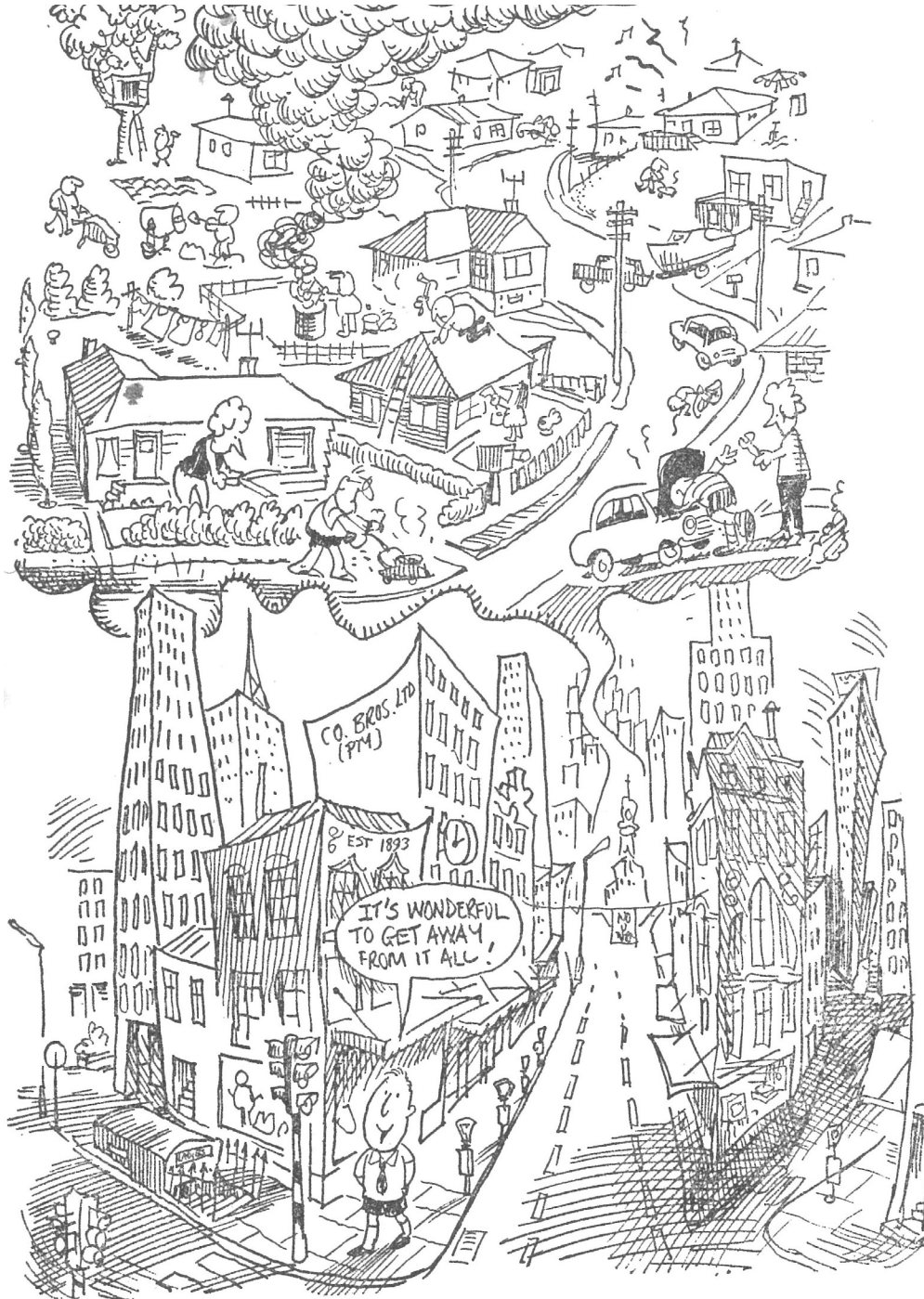


Fig.1.5 | Illustration for Austin Mitchell's text, describing the suburban condition in the 1970's.



However, the future of the suburban dream in New Zealand's growing cities is diminishing. Auckland's City Plan is proposing to accommodate growth of up to one million new people over the next 30 years while creating "the world's most liveable city" (Auckland Council, "The Auckland Plan" A.1) The Unitary Plan, which stipulates how the city is developed, is proposing up to 70 % of future growth, 280,000 dwellings, to take place within the existing metropolitan urban limit (a 59% increase of dwellings from census 2013). To achieve this infill density while creating "the world's most liveable city", the Unitary Plan has focused densification around existing suburban centres and transport hubs to reduce the city's dependence on private vehicle infrastructure.

The inadequacy in supply of attractive new medium-density housing has significantly contributed to the average price of existing suburban typologies increasing by 37% for the three years up to the first of August 2014 (QV.co.nz).

A comprehensive report for the Centre for Housing Research, Aotearoa New Zealand (CHRANZ) completed in 2011 explored the reasons why New Zealanders lack interest in higher density housing (CityScope Consultants and Curious Research). Besides highlighting an "overwhelming preference for detached housing" (11), the report covers an extensive range of findings into New Zealanders' housing ideals. These findings have been used to create architectural criteria, which have been referenced throughout this thesis to critique the ability of design explorations to respond to the ideals of the suburban dream.

The three main architectural criteria, and limitations associated with current medium-density housing, are related to:

- Independence due to; a lack of privacy, limited opportunities for outdoor living, monotonous exterior with little opportunity to personalise, and an inability to alter with changing lifestyle.
- Expansiveness due to; a restricted outlook, a lack of site permeability, limited natural light, a lack of connection to the landscape, and little connection to place.
- Community as although residents live closer, they often do not have a great opportunity to interact with people living around them.

These three criteria will form the basis for design explorations to develop a medium-density infill housing solution which meets the suburban ideals and kiwi lifestyle.



Fig. 1.6 | Suburban medium density housing in Auckland.



## **INDEPENDENCE**

- PRIVACY
- PRIVATE OUTDOOR LIVING
- SELF GOVERNANCE
- PERSONALISATION
- SENSE OF PLACE
- INDIVIDUALITY
- FLEXIBILITY



## **EXPANSIVENESS**

- OUTLOOK
- PERMEABILITY
- NATURAL LIGHT
- CONNECTION TO GROUND
- CONNECTION TO PLACE



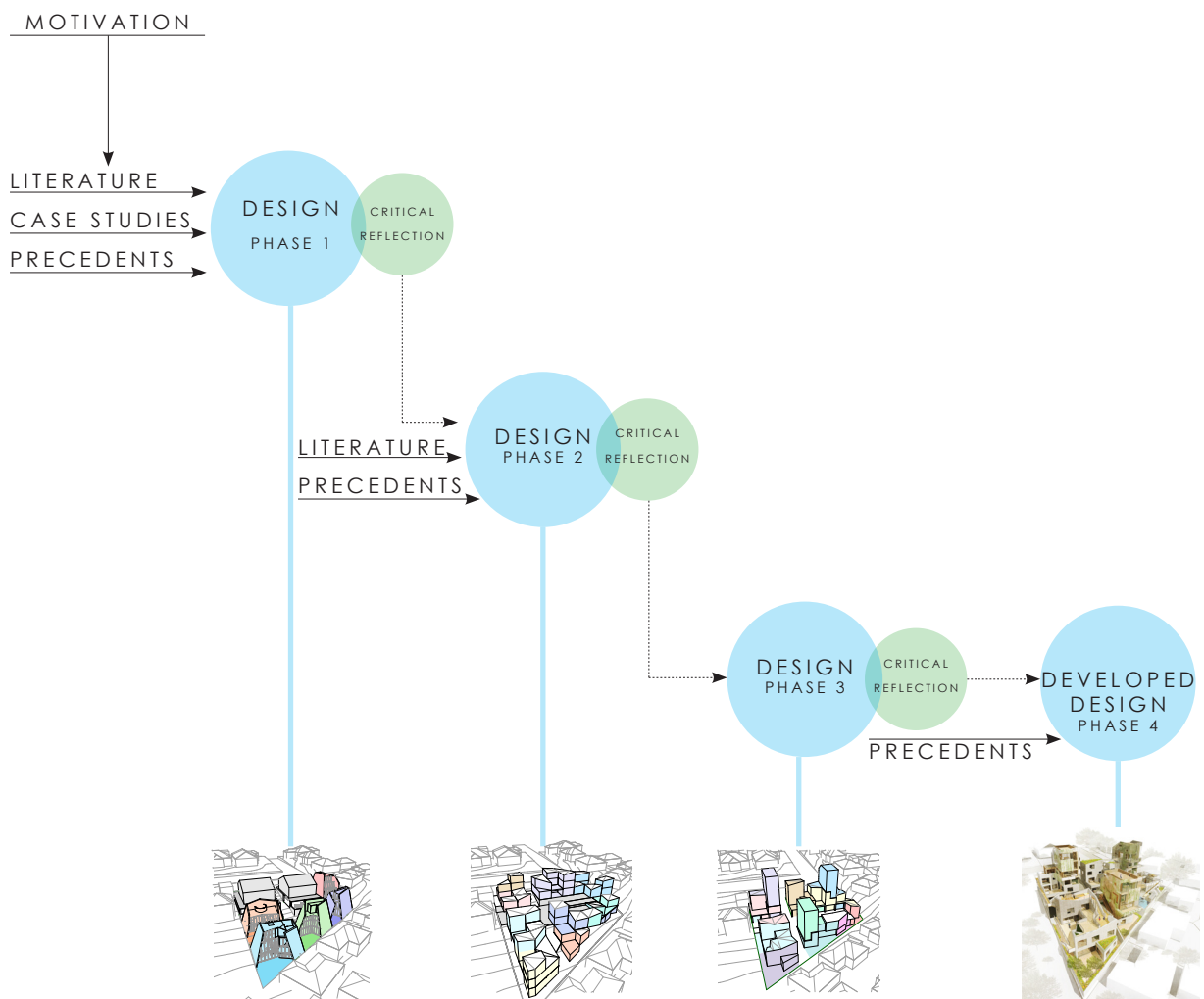
## **COMMUNITY**

- PART OF NEIGHBOURHOOD
- OPPORTUNITY FOR INTERACTION

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# METHODOLOGY

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This design-led research project has been developed through multiple iterations over four design phases in pursuit of a rigorous developed design.

An initial overview of the current examples of medium-density housing in New Zealand highlighted three key architectural criteria which restrict kiwi's interest in higher density housing. These criteria are derived from the kiwi suburban dream and used as a reference to critique and augment each phase of design.

Although the final design best demonstrates how to achieve an architecture which fosters the kiwi lifestyle and suburban dream, the earlier design iterations are important to illustrate how constraints and opportunities have augmented the developed design.

This project has been designed specifically for a site and its context in Auckland's Mt Albert, however the methodologies and findings are relevant to any suburban medium-density housing project throughout New Zealand.

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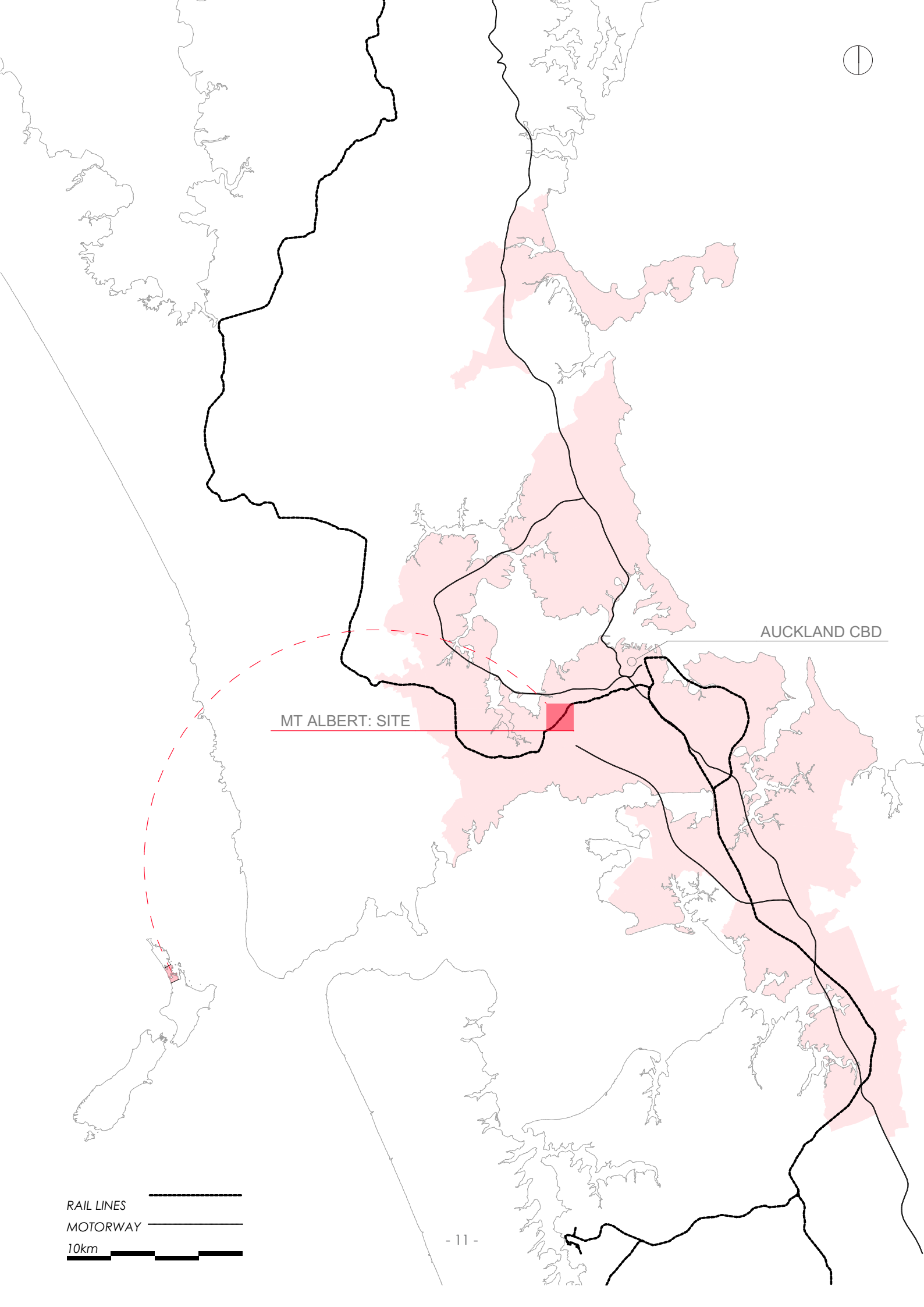
# S I T E

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2 . 0

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AUCKLAND CBD

MT ALBERT: SITE

RAIL LINES   
MOTORWAY   
10km 

## SITE SELECTION

Mt Albert is an existing suburban centre, seven kilometres south west of the central business district, which has been allocated for densification under the proposed Unitary Plan (fig 2.2-2.4). Located along the western rail line with a gradient of single house suburban to apartment living, it is an historic suburb that will see significant change over the next 30 years. This research has focused on the mixed urban zone which does not impose density restrictions on larger sites, allowing for medium-density housing typologies. The site chosen to test explorations is on Benfield Ave and within walking distance of the Mt Albert town centre. Figure 2.4 illustrates its location and proximity to:

1. Train Station
2. Town centre
3. Tennis Courts
4. Super Market
5. Unitec University



Fig.2.2 | Unitary Plan Auckland.

	Single House
	Mixed Housing Suburban
	Mixed Housing Urban
	Terrace Housing and Apartment Buildings
	Large Lot
	Rural and Coastal Settlement
	Neighbourhood Centre
	Local Centre
	Town Centre
	Metropolitan Centre
	City Centre
	Mixed Use
	Special Purpose

Fig.2.3 | Unitary Plan key.

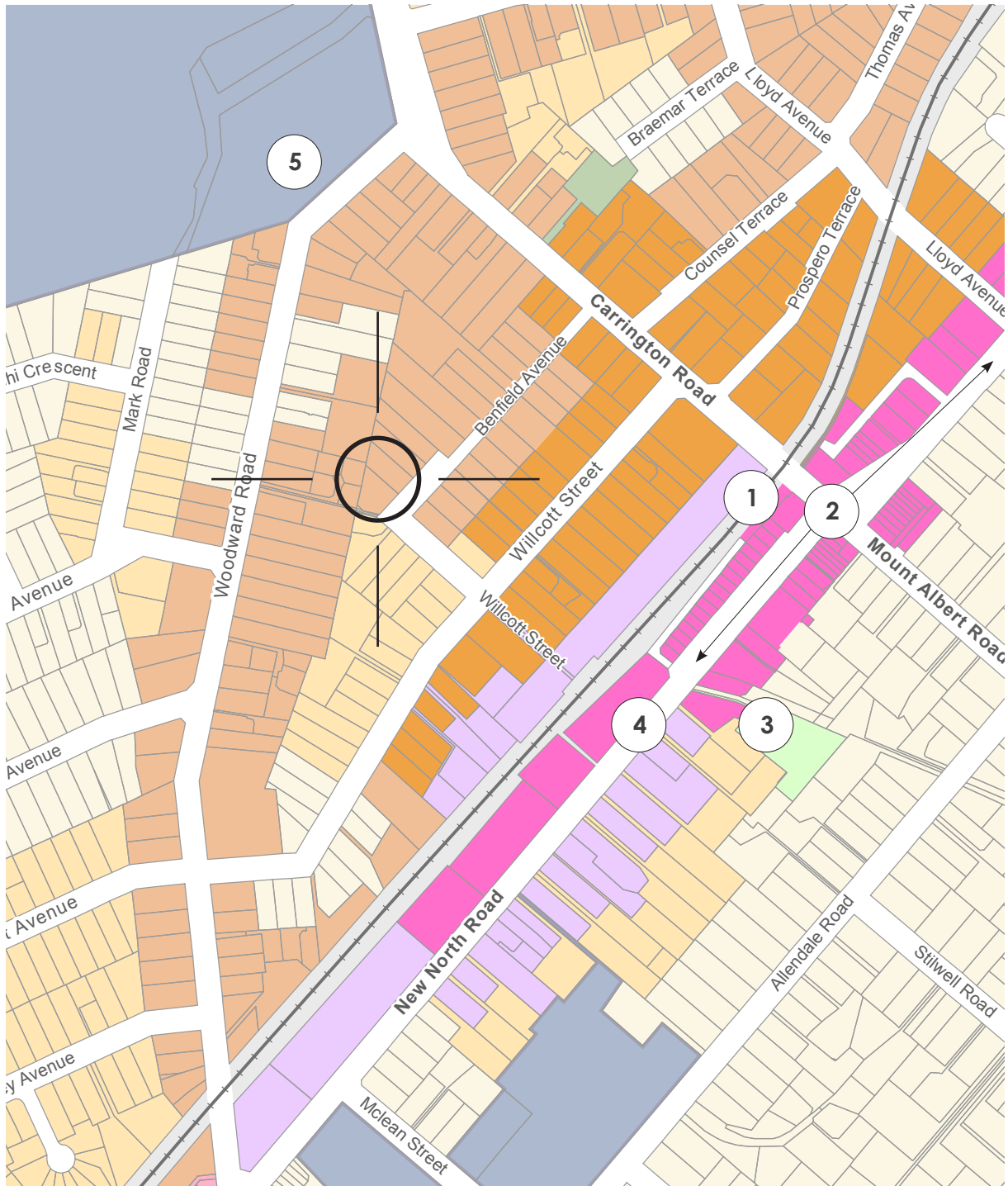


Fig.2.4 | Unitary Plan Mt Albert.

19-21 BENFIELD AVE  
MT ALBERT  
AUCKLAND

100m 200m

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## SITE

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Fig.2.5 | Selected Sites.



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# EXISTING ARCHITECTURAL TYPOLOGY

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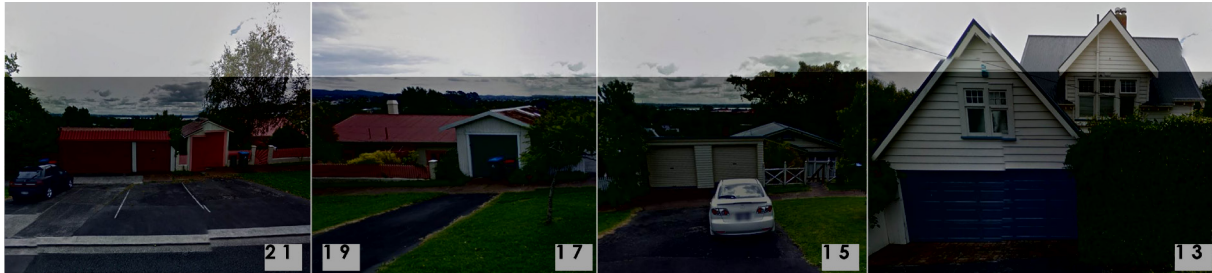


Fig.2.6 | Northwestern street elevation.

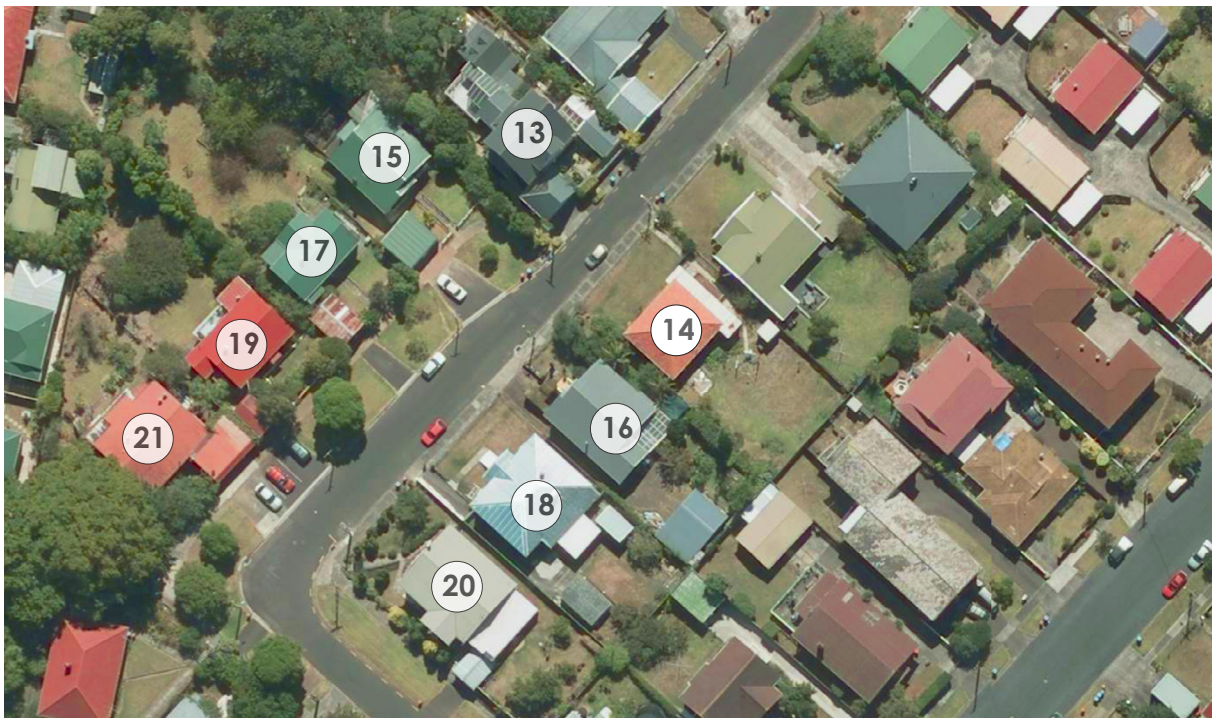


Fig.2.7 | Street plan.



Fig.2.8 | Southeastern street elevation.

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# INDIVIDUALITY

## DESIGN PHASE ONE

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3.0

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*The intent for this first phase of design was to create infill architecture that maintained ideals of the kiwi suburban dream within a higher density context.*





DENSITY = 51 DPH

Fig.3.1 | Concept model.



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# JAPANESE INFILL PRECEDENTS

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## HOUSE AND STUDIO ATELIER BOW-WOW

The confinement of Tokyo provides an attractive precedent for how architecture could be configured in response to Auckland's densifying suburbs. Although different cultural perceptions of closeness exist, these buildings successfully work with issues of individuality and expansiveness common to the New Zealand suburban dream.

Atelier Bow-Wow are Japanese architects, renowned for their work on compact infill housing. Their architecture is based on a philosophy of Behaviourology – where the architecture is the “central node” between people and place (Tsukamoto and Kaijima 10). Behaviourology is a theory transposed into architecture by Atelier Bow-Wow. It is used to define architectural expression through the understanding of the complex relationship between humans, natural elements and the built environment. “When one is surrounded by and synchronized to the liveable rhythms embedded in different behaviours - there is no experience quite so delightful” (Tsukamoto and Kaijima 15).

Atelier Bow-Wow House and Studio (fig 3.2-3.5) works as both a home and architecture studio. Designed around split level spaces, which create circulation, this house generates privacy and expansiveness through a spatial continuum. “The avoidance of heavy partition walls soften even further the distinction between surrounding [context] and interior and, within this, between house and office” (Tsukamoto and Kaijima 70). The vertical circulation creates a range of spatial connectives, generating a gradient of privacy for living, relaxing and working (fig 3.4-3.5).



Fig.3.2 | 3.4. Clockwise. Access illustrating infill condition. Expansive roof deck. Split level circulation creating Expansiveness.

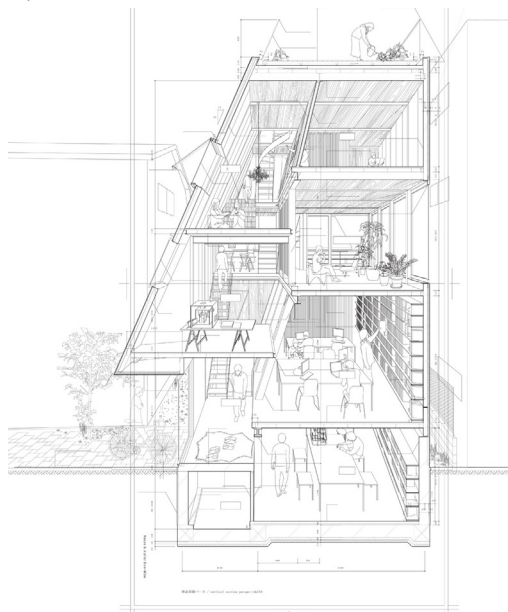


Fig.3.5 | Section of Atelier Bow-Wow's House and Studio highlighting the continuum of spaces.



## JUICY HOUSE

### ATELIER BOW-WOW

Juicy House is a home and workplace for a family of three. Living, workshop and study spaces are stacked vertically, allowing independent occupation with a central void and stair connecting all three spaces. The main living level is the primary family space; throughout the day it is used by the artisan wife for baking and entertaining. Reflecting the wife's "cheerful fashion sense" (Tsukamoto and Kaijima 62) the living area is painted entirely orange, spilling various gradients of orange light though the house and street, which Atelier Bow-Wow describe as "augmenting the sequence of occupancy" (Tsukamoto and Kaijima 62) (fig 3.6-3.8).

Through focussing the behaviours of clients, natural elements and surrounding context, Atelier Bow-Wow have been able to create a range of dwellings which generate their own independent character and expansiveness within extreme confinement, while engaging with their larger urban condition.

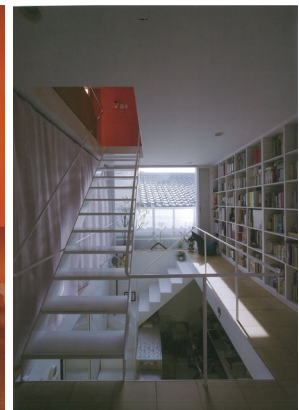


Fig.3.6 | -3.8. Clockwise. Street facade. Home office. Living area.

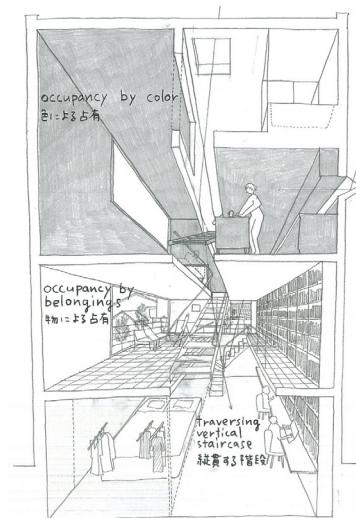


Fig.3.9 | Section of Juicy House.

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## INITIAL EXPLORATIONS

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The initial development of the site looked at how a typical development would occur. In line with the Unitary Plan rule 3.I.3, sites in the mixed urban housing zone below 1200m<sup>2</sup> have a restricted minimum density of one dwelling per 250m<sup>2</sup>. Each site must also have a minimum street width of 7.5m. Under these rules, 21 Benfield Ave is able to be sub-divided into three narrow lots (Auckland Council, “The Proposed Auckland Unitary Plan” 3.I.3).

An initial design exploration of site 2 and 3 (fig 3.11-3.12) utilised common walls for the first 10m, allowing the full height to be realised with lower height development on the northern end of the site. Each 250m<sup>2</sup> lot was able to accommodate a full four bedroom house plus studio over multiple levels with large outdoor amenity, resulting in a density of 40dph. This design test revealed that elements of the suburban dream can easily be achieved at the density set out in the Unitary Plan for a single lot. Therefore a higher density needs to be explored.



Fig.3.10 | Initial exploration site plan for 21 Benfield Ave.



Fig.3.11 | Initial exploration concept - Site 2.



Fig.3.12 | Initial exploration concept - Site 3.

The second design exploration looked to make use of the opportunity of dual sites set out in the Unitary Plan. Rule 3.1.6 voids density limits and street frontage restrictions when four or more dwellings are proposed on a site greater than 1200m<sup>2</sup>. Combining both 19 and 21 Benfield Ave increases total site area to 1396m<sup>2</sup> allowing greater flexibility of density and site configuration.

Increasing the density provided an opportunity to retain the existing bungalows by utilising the space around them. Figures 3.13-3.15 illustrate a proposal which divides the site into seven lots, accessed via a laneway between the original houses.

To increase site efficiency this design utilises zero lot line developments, a method of building along the boundary line. It has been highlighted for its efficient utilisation of small lots by increasing levels of privacy between dwellings, improving solar gain and generating usable outdoor space (Brown 25).

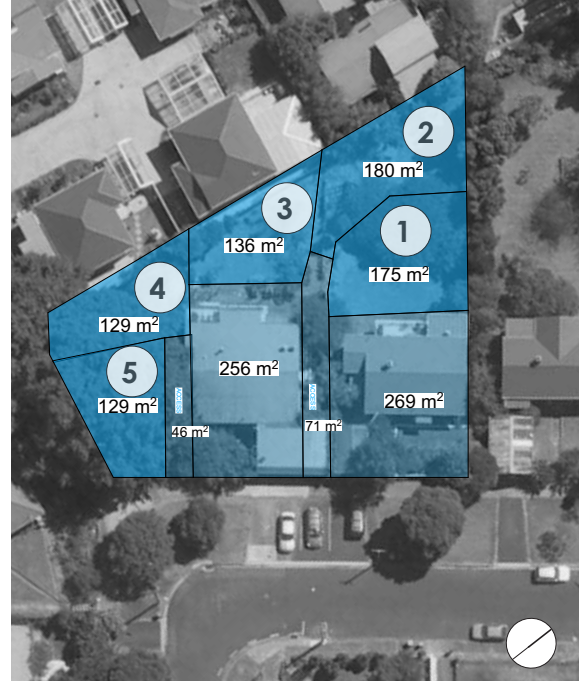


Fig.3.13 | Initial exploration site plan 19-21 Benfield Ave.

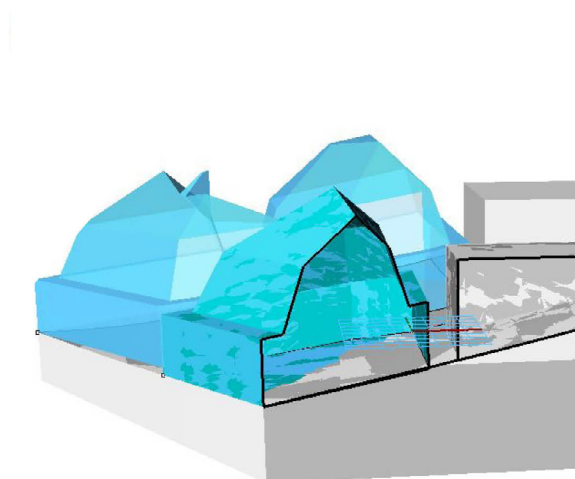


Fig.3.14 | Parametric massing section - Lot 3.

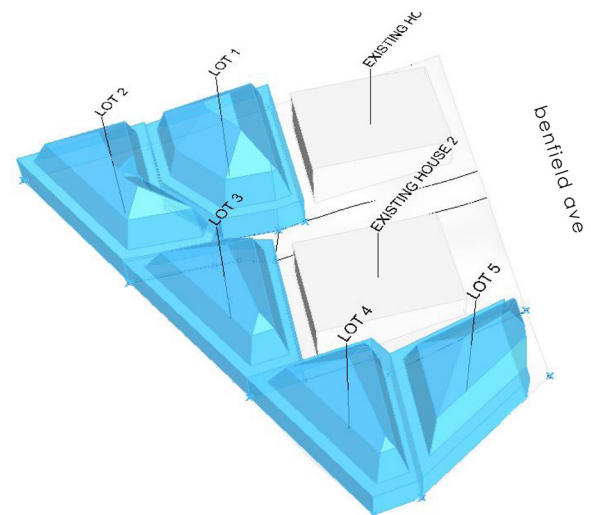


Fig.3.15 | Parametric massing - maximum building envelope.



To efficiently design housing on these sites a maximum volume was created based on the Unitary Plan's permitted height in relation to boundary limit (fig 3.16). This was developed into a building by depicting spaces, from which the volume was subtracted. The result was a range of complex geometries, capable of accommodating a capacity comparable to a medium sized suburban house with a compact private outdoor space (fig 3.17-3.19).

#### Summary

- 7 dwellings (51dph).
- A high level of privacy can be achieved by using a zero lot line development.
- Although this site is close to the rail station and other public transport, vehicles are a crucial part of the suburban dream as they allow a greater sense of independence. Therefore future iterations should accommodate vehicles.
- Initial parametric tests were developed with the intention of computationally generating a range of unique dwelling configurations (fig xx). However, it was an unsuccessful methodology to achieve a range of infill housing due to its lack of specific site considerations. Parametric design could provide opportunity to add richness to specific aspects of the design.

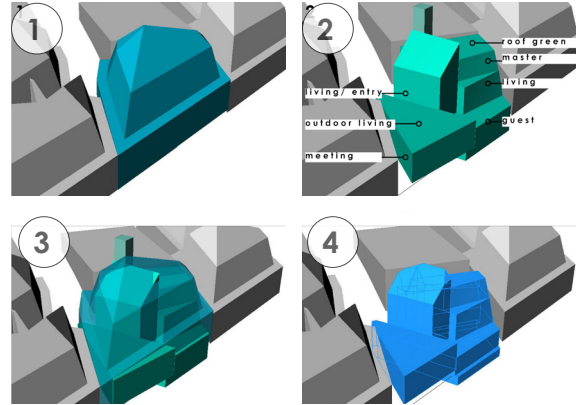


Fig.3.16 | Parametric massing process.

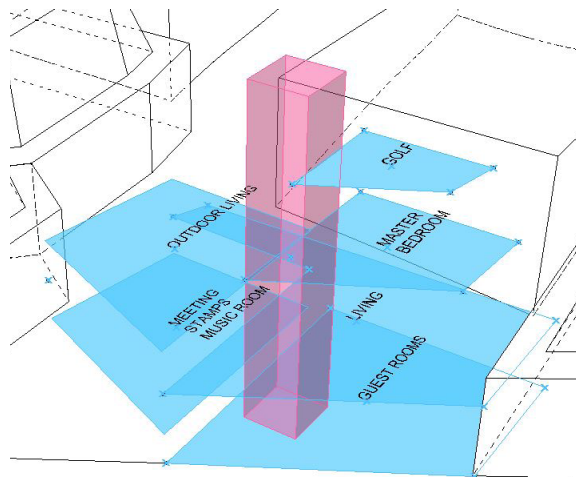


Fig.3.17 | Parametric concept - Lot 3.

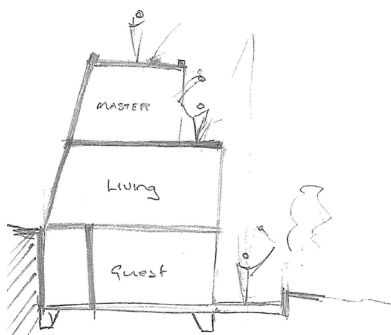


Fig.3.18 | Short section of parametric concept.

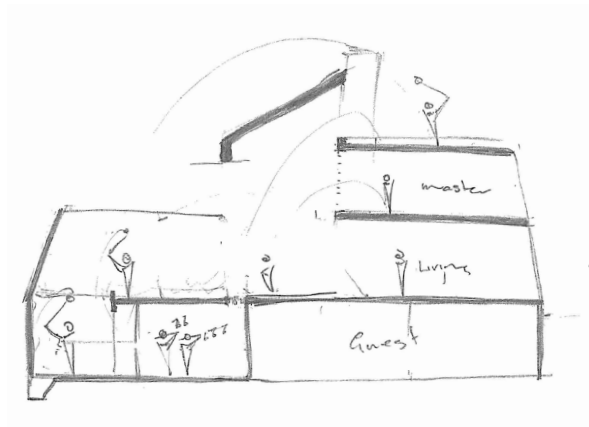


Fig.3.19 | Long section of parametric concept.

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## FORM EXPLORATIONS

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Using the developed lot division, modelling was used to test how alternative forms could retain independence while improving the expansiveness of each dwelling. The first exploration (fig 3.20) employed a shell derived from the Unitary Plan recession planes. The shell allowed each dwelling to focus their main view in one direction, a valuable characteristic for reducing overlooking in higher density housing (Turner et al 85). By increasing privacy on the southern elevations, the northern and western elevations can express a greater expansiveness. The leaning shells created the opportunity for the rear dwelling's yard to expand over the front dwellings shell.

The second exploration (fig 3.21) looks at how the shell could be fractured to create opportunity for the rear neighbour's yard and view to expand past the front dwelling, increasing the sense of expansiveness. Fig xxx shows how the overall form of each dwelling began to merge together, losing the sense of independence. This individuality was further lost when it was developed into a functional living configuration.

The first of the two explorations, therefore displayed a greater ability to reinforce the concepts of independence and expansiveness within the context of an infill house. The shell works as a framework, encasing the various dwellings and ensuring a cohesive collection, rather than a random collection of diverse objects (fig 3.22).



Fig.3.20 | Physical modelling exploration 1.



Fig.3.21 | Physical modelling exploration 2.







Fig.3.22 | Physical modelling exploration 1.

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## COMBINING DIVERSITY

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Suburban communities are composed of a diverse range of people and family structures. Existing medium-density housing in New Zealand has been regarded as unattractive due to its “monotonous” and “unidentifiable” nature (CityScope Consultants and Curious Research 11). The previous massing explorations (fig 3.20-3.21) were at risk of being monotonous if repeated on multiple sites. Therefore, lacking the character and individuality of the preferred suburban alternatives.

In response to this critique, the design development tested a Combining Diversity methodology to address the human dimension of Atelier Bow-Wow’s theory of behaviourology. A series of personas were created representing a range of people who might aspire towards the suburban condition (fig 3.23). These personas were used to inform decisions around layout, areas, relationships and material articulation, ensuring ideals of the suburban dream were maintained.





YOUNG FAMILY



ASTRONOMER



RETIRED COUPLE

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# MASTER PLAN

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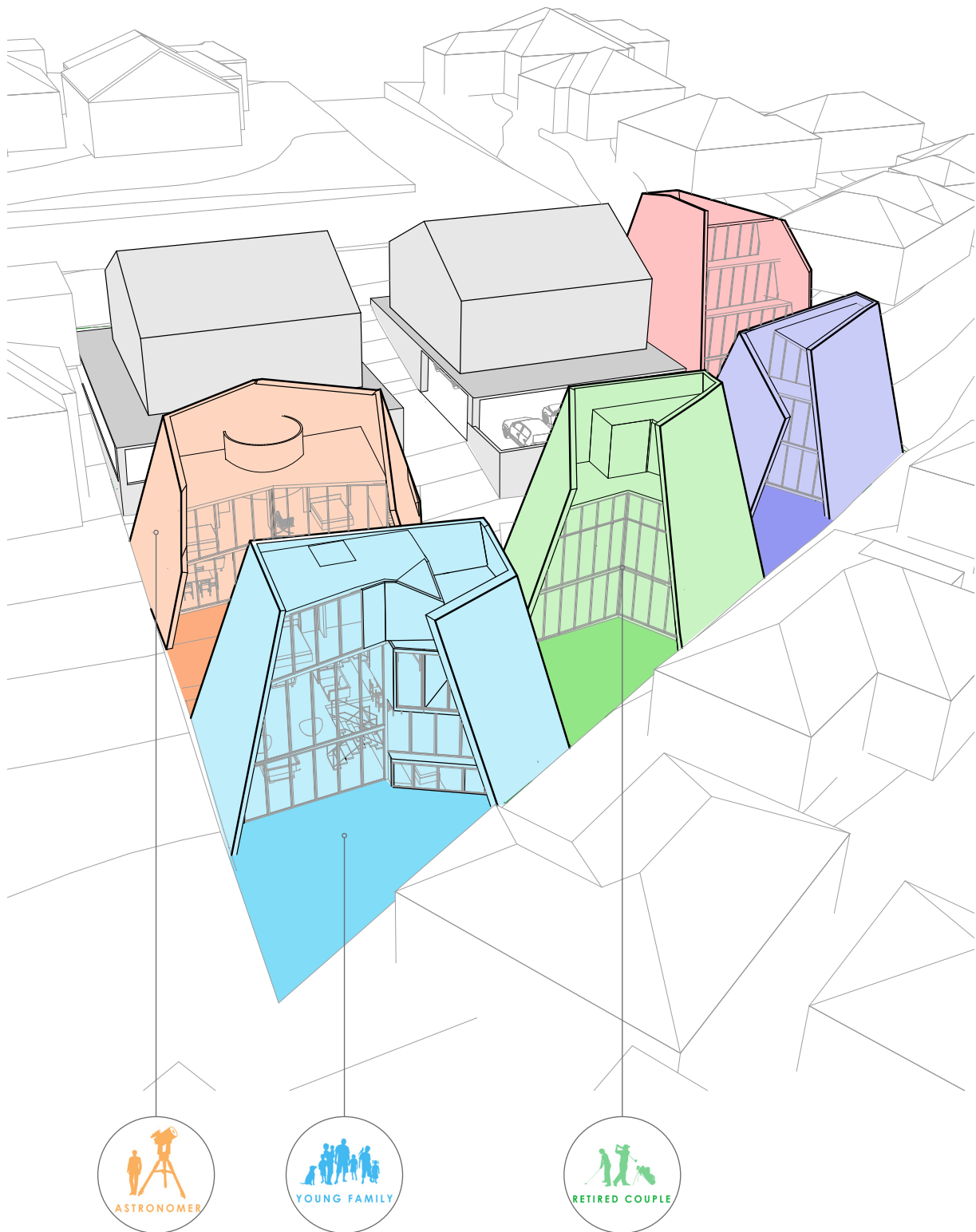


Fig.3.24 | Master plan perspective.

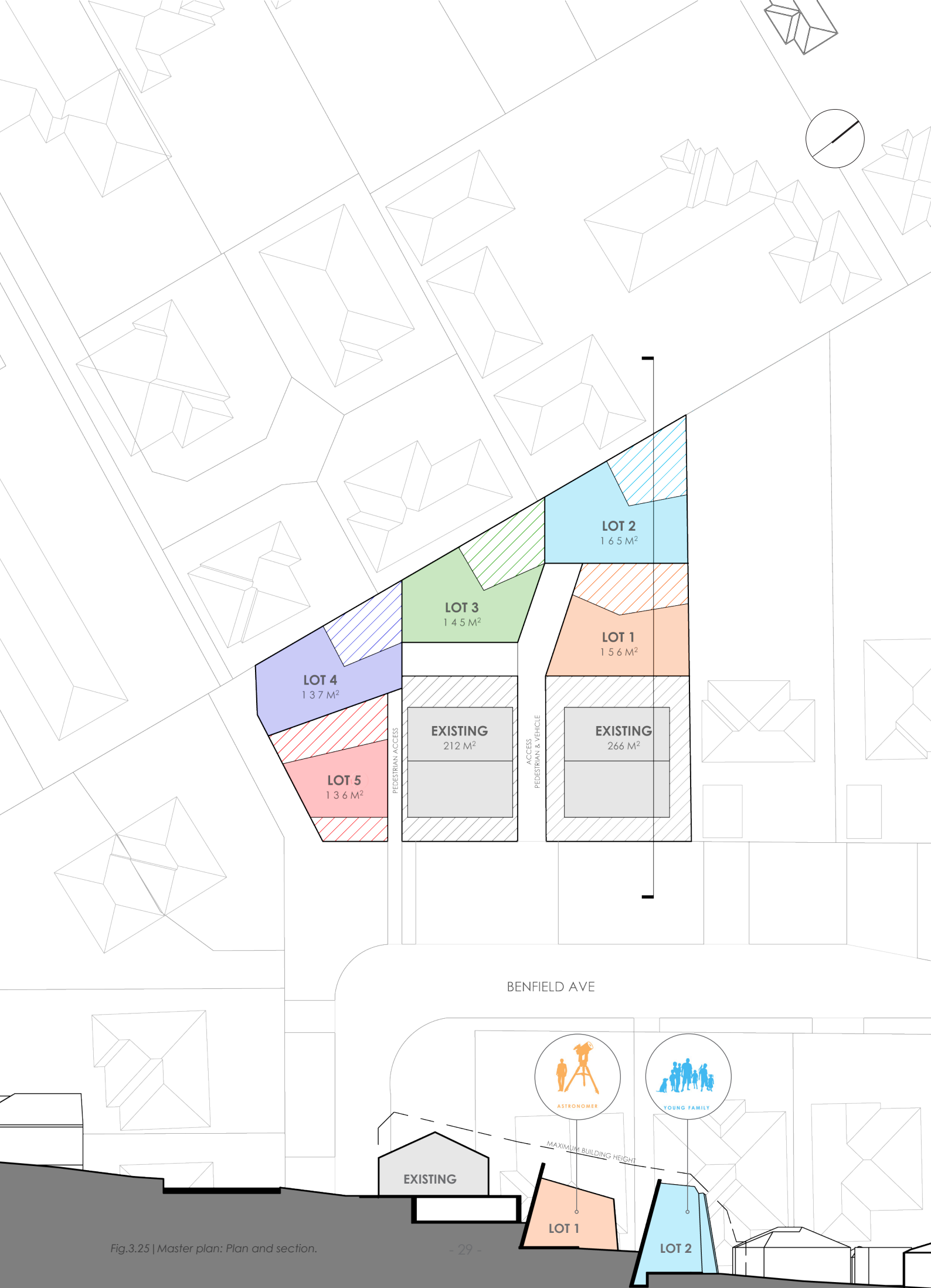


Fig.3.25 | Master plan: Plan and section.



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# HOUSE FOR SEVEN

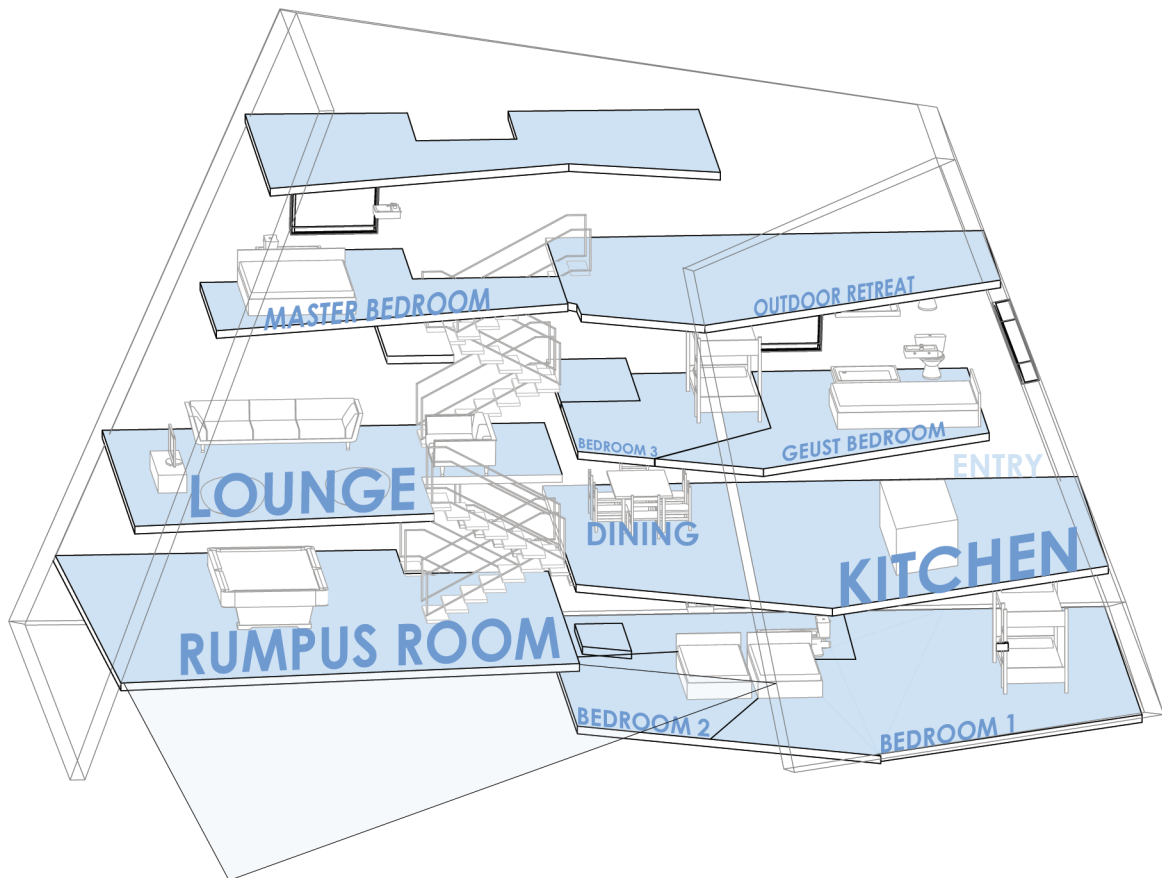
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## YOUNG FAMILY



To maximise living spaces, for a large family home on a 165m<sup>2</sup> lot, the private spaces were arranged throughout the volume with living spaces in between. This arrangement (fig 3.27) fostered a split level configuration, similar to Atelier Bow-Wow's House and Studio, where the living areas develop a continuum of circulation throughout the volume. This is further

accentuated where the rectilinear private spaces meet the slanted shell. The resulting interstitial spaces bring light into the space below, increasing expansiveness without comprising privacy. Each room of the house looks out to the private yard without overlooking neighbours, increasing the sense of independence.

Fig.3.26 | (Opposite) House for Seven perspective.

Fig.3.27 | (Top) House for Seven program diagram.

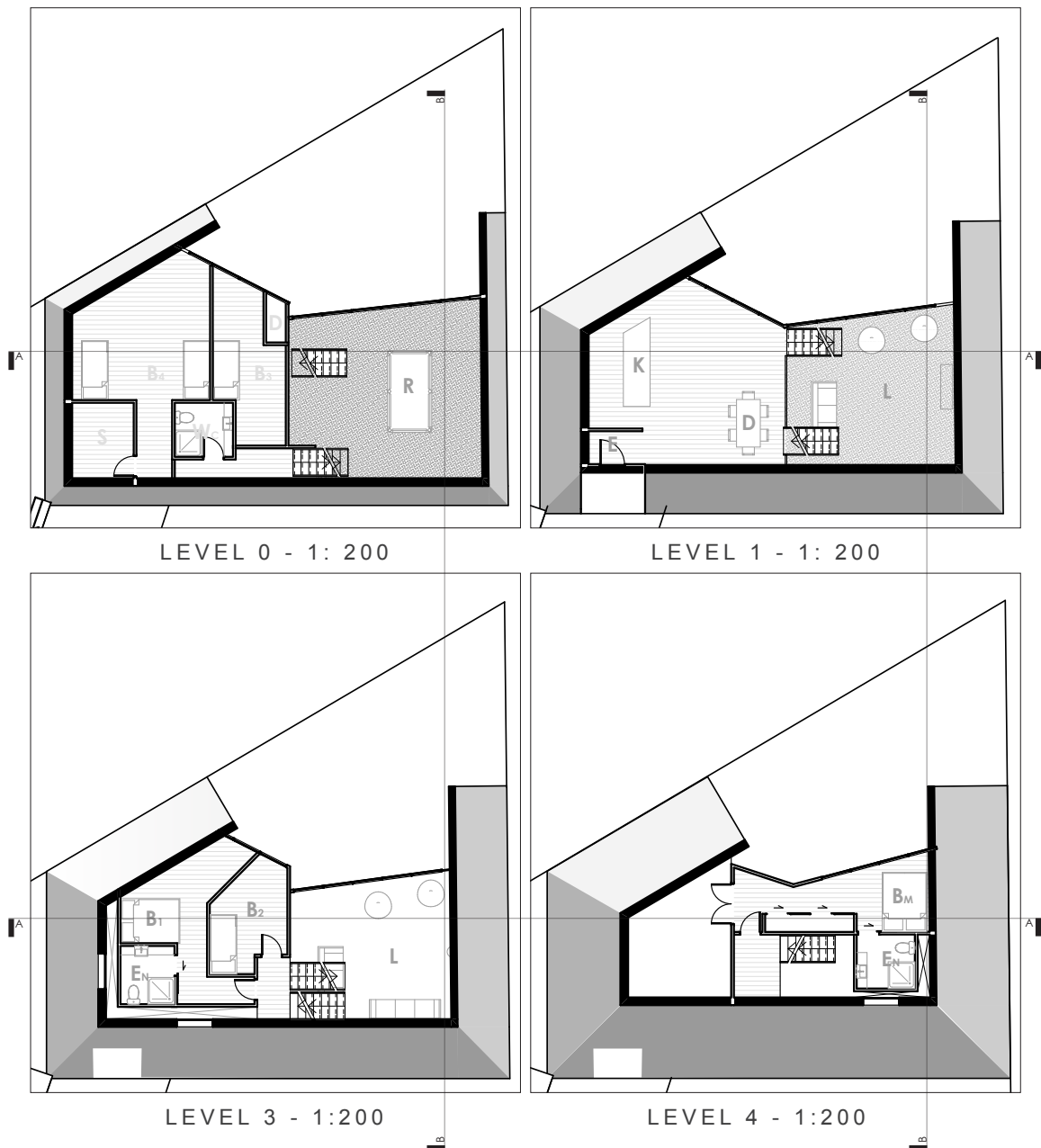


Fig.3.28 | House for Seven plans.

KEY	
<b>B</b>	BEDROOM
<b>B<sub>M</sub></b>	MASTER BEDROOM
<b>D</b>	DINING
<b>E</b>	ENTRY
<b>E<sub>N</sub></b>	ENSUITE
<b>K</b>	KITCHEN
<b>L</b>	LOUNGE
<b>O</b>	OBSERVATORY
<b>R</b>	RUMPUS ROOM
<b>S</b>	STORE
<b>W</b>	WARDROBE
<b>W<sub>C</sub></b>	BATHROOM



Fig.3.29 | House for Seven Section AA.



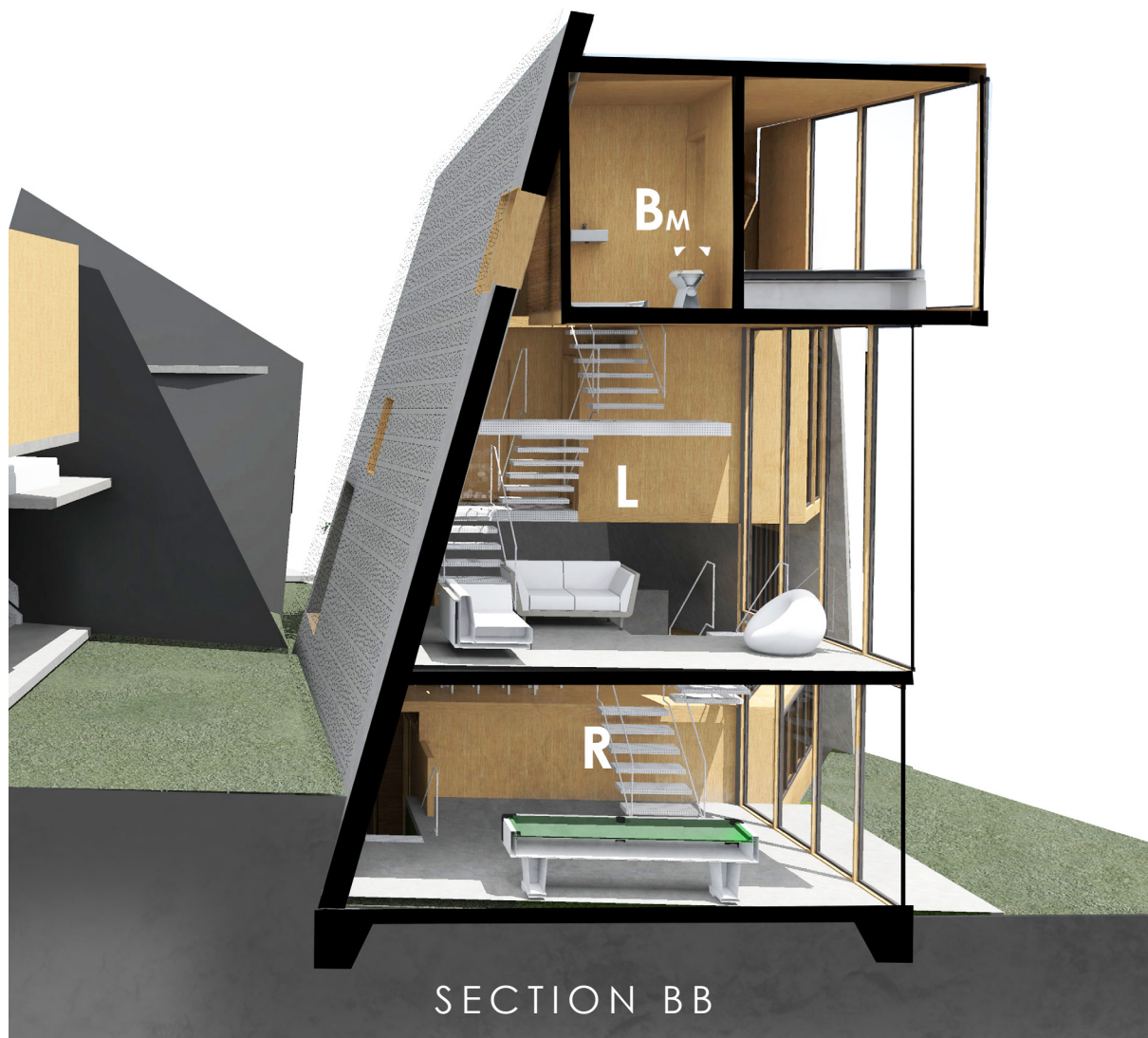


Fig.3.30 | House for Seven Section BB.

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## THE SHELL

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The shell is a defining architectural element of each house. A range of tests were conducted to explore how different patterning could be used to articulate light and views from different angles. The aim was to bring light into the interior through multiple surfaces, like a suburban house, without compromising the privacy and independence each shell creates. The prominence of the shells also creates an opportunity to express the independent nature of each dwelling.

Initial design tests (fig 3.31-3.34) considered how a Moiré pattern could control views. Moiré patterns are created through twisting two identical offset patterns to create a visual illusion of another pattern. Employing a moiré pattern on the shell created an overall pattern which was activated by the movement of an onlooker, drawing attention to the shell rather than the interior. The pattern would provide opportunity to create privacy while retaining views and openness from the interior.

These explorations highlighted the lack of opportunity to alter geometries making it difficult to create a range of effective solutions for the multiple dwellings. The shells prioritised privacy of the interior, but privacy to the yards of other dwellings also needed to be addressed.

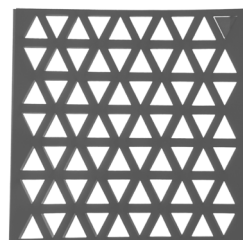


Fig.3.31 | Shell test A.

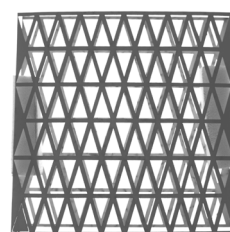
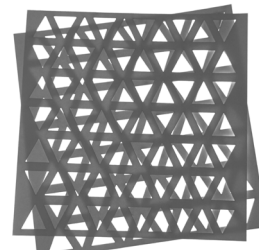


Fig.3.32 | Shell test B.

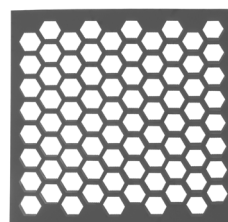
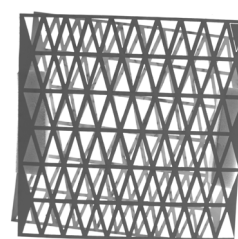


Fig.3.33 | Shell test C.

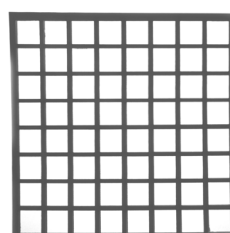
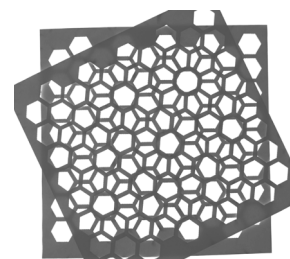
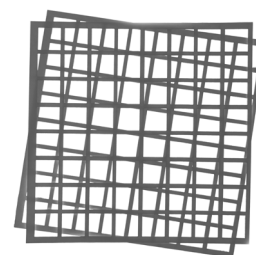


Fig.3.34 | Shell test D.



# HOUSE FOR SEVEN SHELL

These tests highlighted how dual skin patterns can be utilised to direct or restrict views. Figures 3.35 and 3.36 illustrate a range of screen compositions for the house shell design. The combinations of different screens allow a range of opacities to be achieved. Adjusting the alignment of the screens further enables views to be directed, giving a greater sense of independence to dwellings on both sides of the shell.

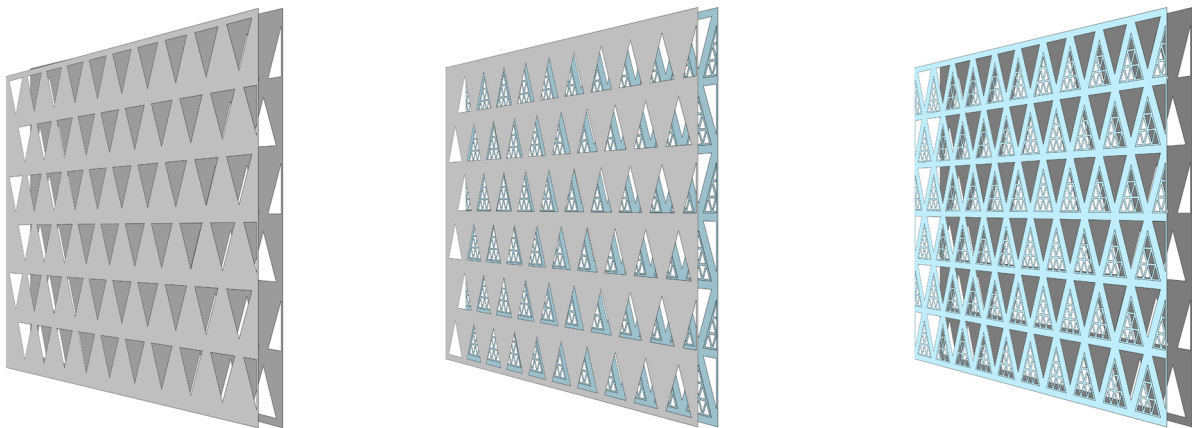


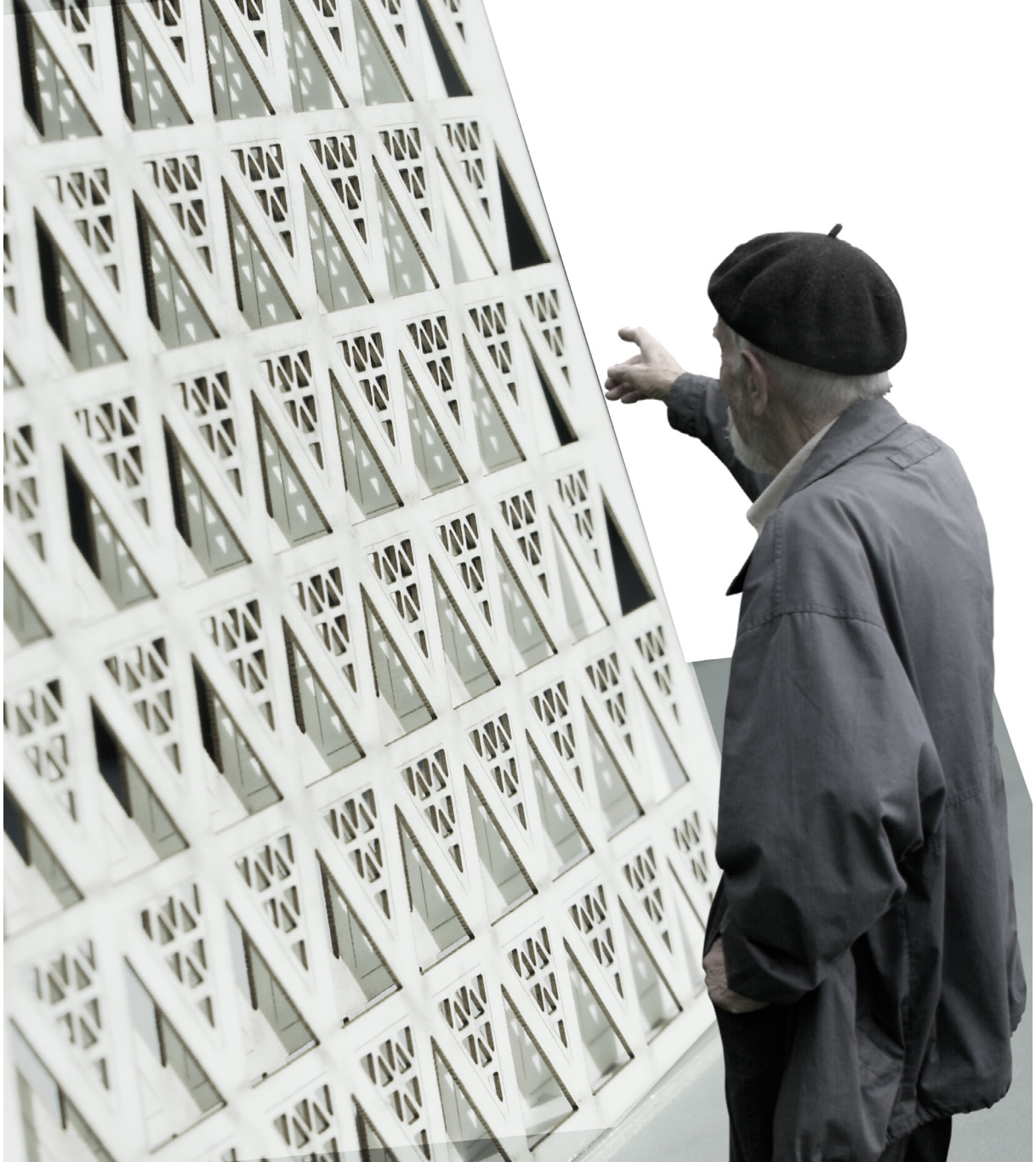
Fig.3.35 | Dual screen configurations.



Fig.3.36 | Dual screen model photographs.

LOWER POROSITY ..... HIGHER POROSITY





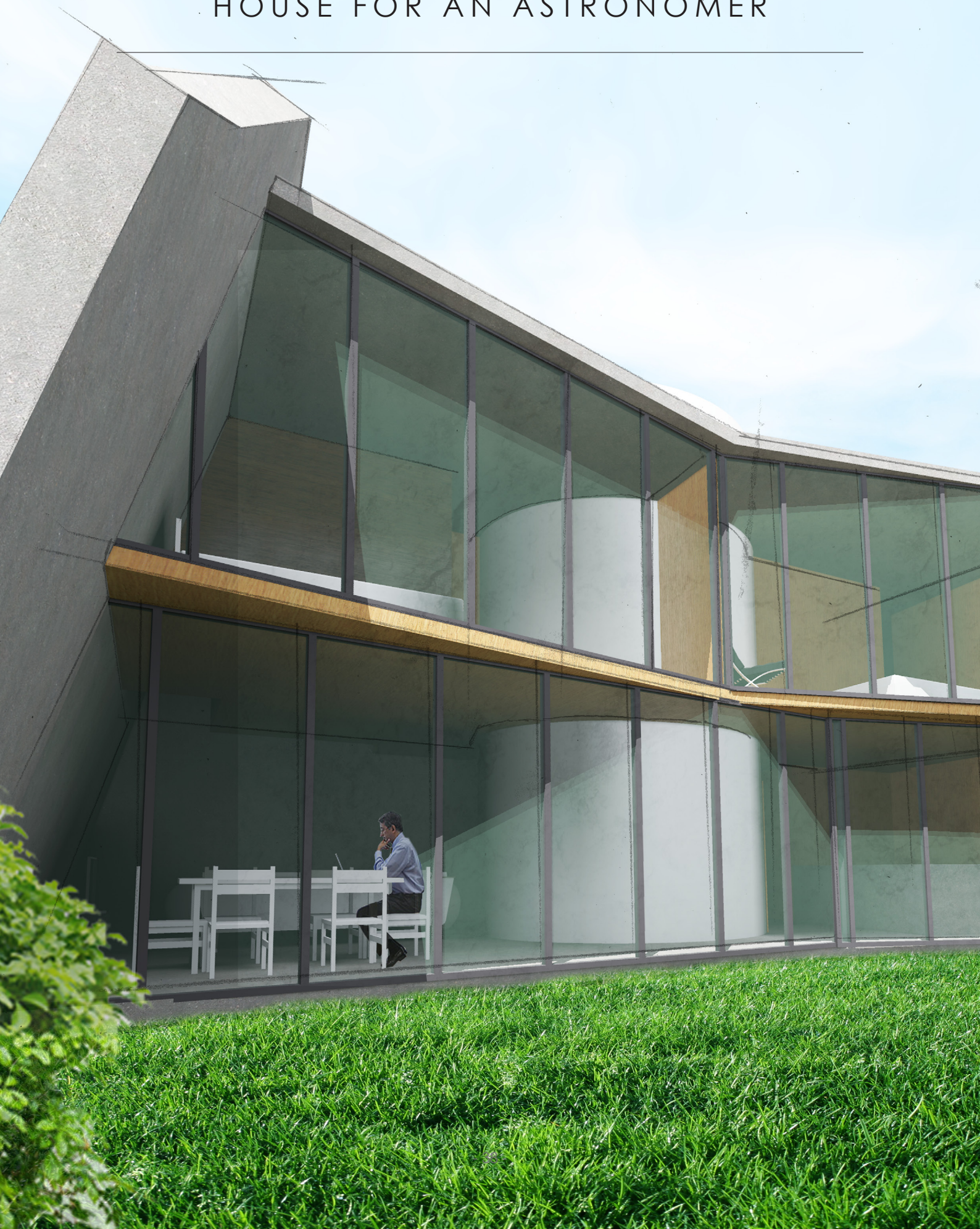
*Fig.3.37 | Dual screen experience from adjoining house.*



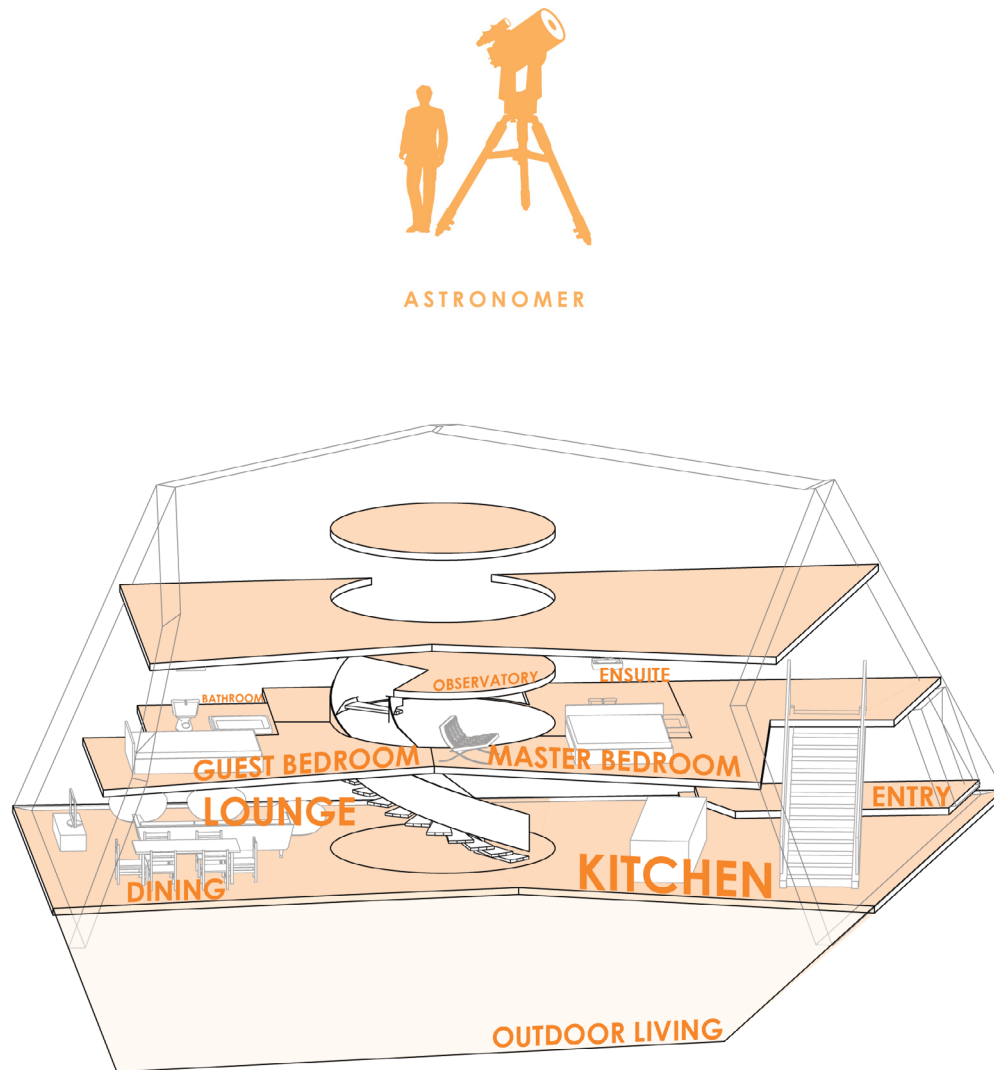
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# HOUSE FOR AN ASTRONOMER

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The astronomer's house was developed to explore how design decisions from the House for Seven could be reinterpreted for a 45 year old single male with a passion for astronomy. This design explores how the relationship between these two diverse households is configured, ensuring the suburban ideals are enhanced within the higher density setting. The observatory forms the heart of this home. Protruding through the roof for programmatic reasons, the space cuts through the entire house, dividing the floor plates and forming the primary circulation route. The presence of the circular observatory influences every space in the house (fig 3.38).

The ground level accommodates the main living spaces. Kitchen, dining and living are separated by the observatory volume to create a series of smaller spaces. Living areas flow onto a level threshold private outdoor area, where the yard adjoins the House for Seven's shell. There are no direct lines of sight between the homes and at night the surfaces are illuminated creating a fluctuating sculptural surface. The first floor accommodates a guest room accessed from the observatory stair. The observatory's location half a level above the first floor, allows it to operate as a third bedroom or study. The master bedroom is a private independent space, accessed from a secondary stair behind the kitchen. The stair traces the internal edge of the shell, enhancing the independent nature of the master bedroom.



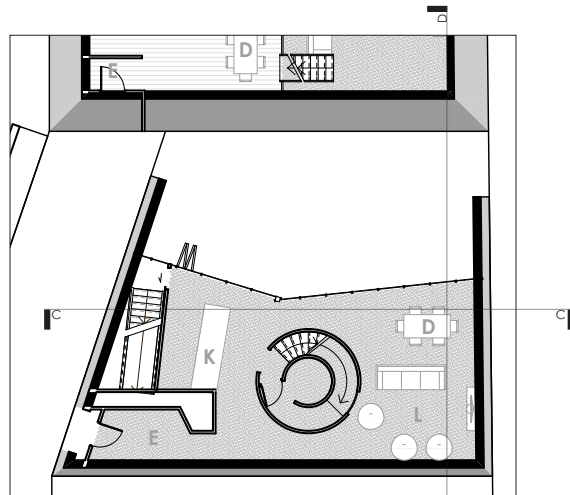


Fig.3.40 | Astronomers house section CC.

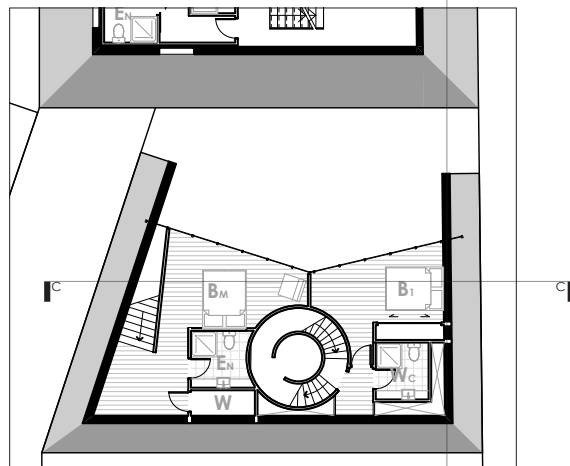


Fig.3.41 | Astronomers section DD.

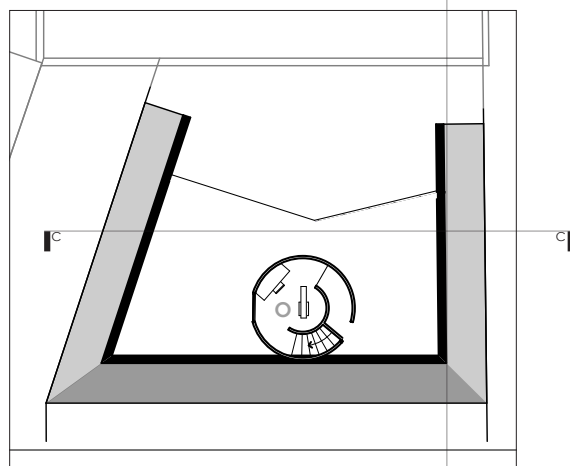
- KEY**
- B** BEDROOM
  - B<sub>M</sub>** MASTER BEDROOM
  - D** DINING
  - E** ENTRY
  - E<sub>N</sub>** ENSUITE
  - K** KITCHEN
  - L** LOUNGE
  - O** OBSERVATORY
  - R** RUMPUS ROOM
  - S** STORE
  - W** WARDROBE
  - W<sub>C</sub>** BATHROOM



LEVEL 1 - 1:200



LEVEL 2 - 1:200



LEVEL 2.5 - 1:200

Fig.3.42 | Astronomers house plans.



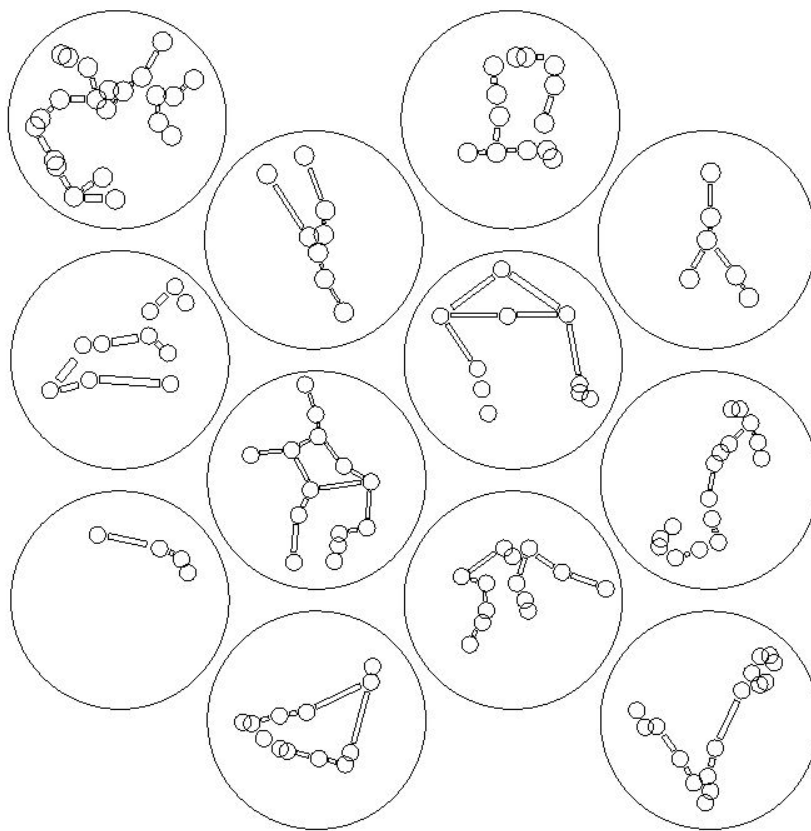


Fig.3.43 | Astronomers Shell option - Constellations.

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## REFLECTION

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The use of personas as a design methodology successfully generated the human dimension of Atelier Bow-Wow's theory of Behaviourology within the development. To give the methodology more relativity, future explorations should create a rule on how the personas are developed in relation to the suburban dream.

To ensure a composed development the characteristics of the various personas proved the best way to generate planning and internal finishes specific to varying needs. At the same time they created a controlled variation of the exterior, ensuring independence was retained without creating chaos.

This design phase explored how the existing buildings could be retained and improved to accommodate the changing condition. However, the existing bungalows were compromised through plot densification. Upon reflection it is clear that any significance these buildings had, in portraying a sense of the suburban dream, resulted in the opposite effect. They highlighted the tight spatial confines this smaller plot size affords. Removing these buildings would increase density by providing two additional dwellings that could respond appropriately to the higher density condition.

The predominantly individual nature of the site development has led to reduced expansiveness. During the external review it was highlighted that this design was like a mini suburbia – it had cut out all the things we love about the suburban house without offering much more, other than the cost savings of purchasing a smaller plot. Further design explorations will push how this design is extending the experience of the suburban dream.

Developing a connection to place is a key component of the 'community' aspect of the suburban dream. Mt Albert is a suburb comprising of bungalows set amongst established planting. Integrating planting and green spaces would help re-affirm the place of this new development within the established setting.

The shell worked effectively as a framework for the site, allowing the internal spaces to be personalised and configured to meet the needs of a diverse population. The single directional orientation successfully enhanced privacy. This worked particularly well in this application as the surrounding context has also adopted this orientation to capture the available views.

The use of dual screen shells worked well, allowing negotiated levels of privacy and exposure between units as a fixed design-based response. This could be extended further by developing a parametric-based response which configures rule-generated patterns of the designed states of privacy.

During the external review the hardness and form of the screens were critiqued for reading in an urban manner which is inconsistent with the suburban context and intent. It was also suggested that manually operated privacy devices on the exposed facades would improve the flexibility and comfort of the new dwellings.

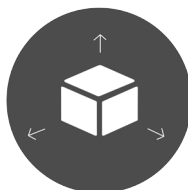
The boundary of the shell creates a strong threshold defining the limit of each site. The boundary is important in suburban typologies, exhibiting the vast ownership of land each family has. It is a space holding their ideas of leisure and future ambitions. Strongly representing this notion in a higher

density setting has the opposite effect instead representing the limit and compromise of this form of living. Further design explorations should test how boundaries could be dissolved and expanded to create a sense of ownership and expansiveness which stretches beyond the physical limitations of the site.

The split level internal configuration of the House for Seven worked well to create expansiveness in tiny Japanese lots. However, New Zealanders expect a connection to the outdoors, reminiscent of the countryside, to create a relaxed environment removed from the busyness of their working lives (Davison). The split level treats the outdoor space as an area to look over rather than a continuous threshold common in New Zealand suburban houses.



**INDEPENDENCE**



**EXPANSIVENESS**



**COMMUNITY**



---

# GROUND HUGGER

## DESIGN PHASE TWO

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4.0

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*In response to the previous design phase, this phase sought to strengthen suburban ideals through:*

- *Merging thresholds by redefining the boundaries and spaces between dwellings.*
- *Enhancing sense of place by establishing a relationship to context.*



DENSITY = 64 DPH

Fig.4.1 | Ground Hugger interior.



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## MERGING THRESHOLDS

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### N HOUSE SOU FUJIMOTO

The N House explores the use of three nested shells to choreograph a relationship between the house and the street. The shells create a gradient of privacy, which is altered in relation to porosity and distance from the street, with the most private spaces elevated and drawn back from the street edge. The range of porosity and distance allows the private spaces to still enjoy a sense of expansiveness without compromising privacy. The N House is described by Naomi Pollock, an architect and writer specialising in Japanese work, as “expressing the riches of what are between houses and streets” (100).



Fig.4.2 | N House street elevation.

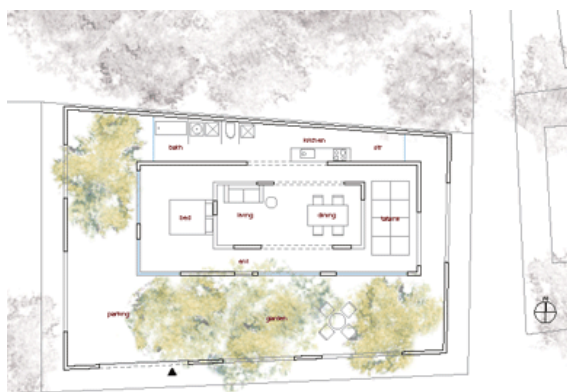


Fig.4.3 | N House plan.

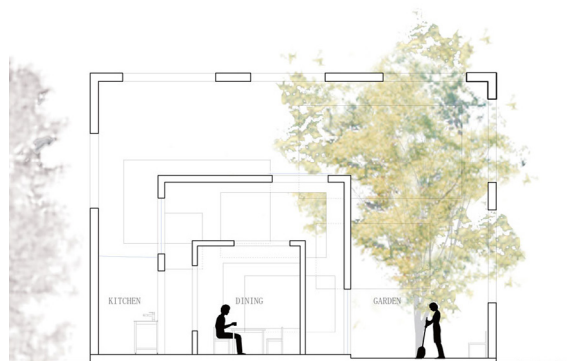


Fig.4.4 | N House section.



# MORIYAMA HOUSE

RYUE NISHIZAWA

The Moriyama House was designed to accommodate multiple tenancies. Ryue Nishizawa uses seven architectural elements to describe his design process for this house. Three of these architectural elements are significant to achieving expansiveness through merging thresholds:

- Creation of an environment; By dismantling the programs and dispersing them into several buildings clusters are formed and the concept of an environment or landscape begins to emerge (Nishizawa 88).
- Transparency; Gaps and sight lines intersect the built volumes to increase visual permeability. Large windows open directly into the alley, merging lighting conditions between the interior and exterior. “The landscape and architecture blend together and the interior lifestyle connects with the garden lifestyle” (Nishizawa 93).
- Absence of borders; “The alleys in this neighbourhood don’t necessarily serve as passages . . . Life cannot be contained within a single lot. Peoples’ sense of living expands beyond it, effectively erasing all borders” (Nishizawa 98).



Fig.4.5 | Moriyama house.



Fig.4.6 | Moriyama house between house and garden.



Fig.4.7 | Moriyama house street elevation.

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# ARCHITECTURE AND PLACE

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## CROCKER TOWNHOUSES

CLAUDE MEGSON

Densifying an existing suburban setting often evokes a negative response. The existing form, scale and perceived density are highly connected with current residents' perception of place. If these attributes are reinterpreted into the design they can merge the new form into the existing grain and give the future residents a sense of place within both the new development and the existing neighbourhood. Mt Albert, and particularly Benfield Ave, is largely composed of early 1900s bungalows on individual sites. The site context shown in the earlier site chapter shows (Fig xx –xx) a range of timber and masonry bungalows set amongst established planting.

Claude Megson was an Auckland architect and academic who produced a select few highly regarded residential projects around Auckland City. His Crocker Townhouses (fig 4.8-4.9) are a local precedent in Freemans Bay which addresses densification within an existing suburban context.

*These town houses are one of Megson's finest projects. They are a grouping of four town houses in an existing Victorian suburb. The design is fundamentally different to the neighbours, but is totally respectful of them. Megson was a master of context.... He re-interpreted forms, element and details in a modern context (Ken Crosson).*

After 40 years these town houses can still be regarded as a successful example of suburban densification, winning the 2014 NZIA Enduring Excellence Award.

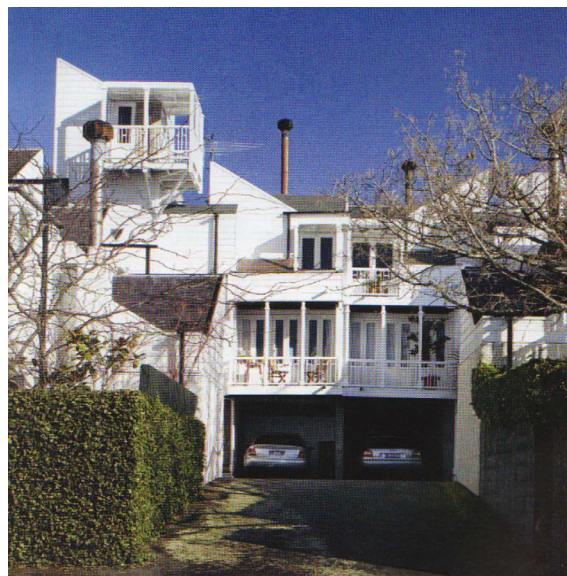


Fig.4.8 | Crocker Townhouses - Street Elevation.



Fig.4.9 | Crocker Townhouses.

## MFO PARK

BURCKHARDT + PARTNER  
AND RADERSCHALL  
LANDSCHAFTSARCHITEKTEN

MFO Park is a structure between high-density residential buildings. The design explores how large scale planting can be used to enhance the space between residences by altering views and softening edges (fig 4.10-4.11). The climbing plants create a precise architectural space where placement can be choreographed to develop relationships between dwellings and communal space, and from dwelling to dwelling. This structured use of planting could work to enhance a sense of place in Mt Albert while creating privacy.



Fig.4.10 | MFO Park.



Fig.4.11 | MFO Park depth of screens.



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## DEVELOPING A TYPOLOGY

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Design Phase One indicated that at a density of 51dph, the experience of suburban ideals are significantly compromised. To increase density and reduce these compromises, treatment of the boundaries and relationships between dwellings needed to be reconsidered. Based on the previous findings a revised design needs to:

- Contain some shared surfaces
- Adapt to suit a diverse range of living configurations and be able to accommodate varying site geometries.
- Provide the opportunity to merge part of the indoor and outdoor living on one level
- Integrate planting to enhance connection to outdoor space.

The above criteria, and previously introduced personas, ruled out a fixed repeating geometry which is often utilised in medium-density housing.

The concept of Ground Hugger as shown in figure 4.14, explores how individual buildings may morph into their specific context, and grow or shrink to meet different needs. Each dwelling occupies one major storey, creating the opportunity for single level living around central courtyards. Courtyards are used to merge interior and exterior living and allow the landscape condition to be recreated at higher levels. This provides a conceptual connotation to the stand alone suburban house and section. Green screens, similar to those used in the MFO Park project (fig 4.10), choreograph the visual relationship between dwellings and engrain the development within Mt Albert's established context.

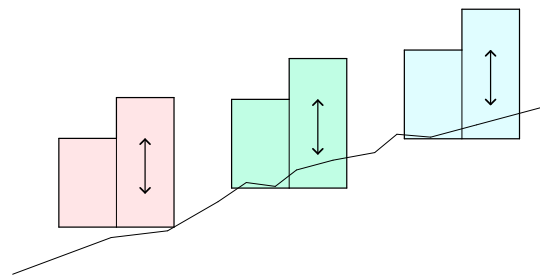


Fig.4.12 | Typical vertical configuration.

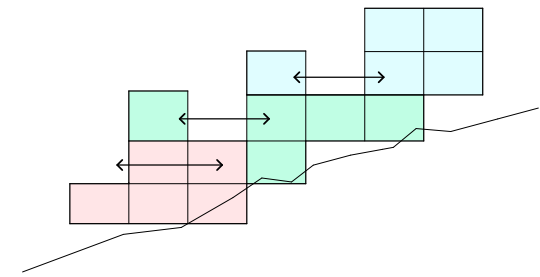


Fig.4.13 | Proposing an overlapping horizontal + vertical.

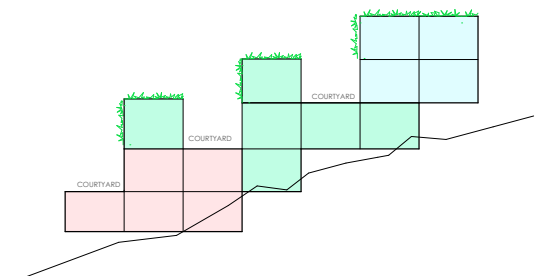


Fig.4.14 | Courtyards and growing elements to blend interior condition with landscape.

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## COURTYARD HOUSES

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Figures 4.15 to 4.17 illustrate three award winning Auckland suburban houses that use courtyards to blend interior and exterior atmospheres. The second two use larger volumes around the interstitial boundary with additional glazing and screens to blend the spatial qualities, generating a greater sense of expansiveness.



Fig.4.15 | - Misaligned House.



Fig.4.16 | Franklin Road House.



Fig.4.17 | S House.

Big Mountain House showed in figure 4.18 is a Danish multiunit residential housing development which is described as “suburban living in urban density” (Bjarke Ingles Group Architects). This building uses a similar configuration to the typology developed on the previous page (fig 4.12-4.14) to recreate the ground plane. It overcomes issues of overlooking by integrating deep planting boxes along the edge of the outdoor space. The depth of the boxes creates privacy for the lower unit without restricting the above unit’s view (fig 4.19).

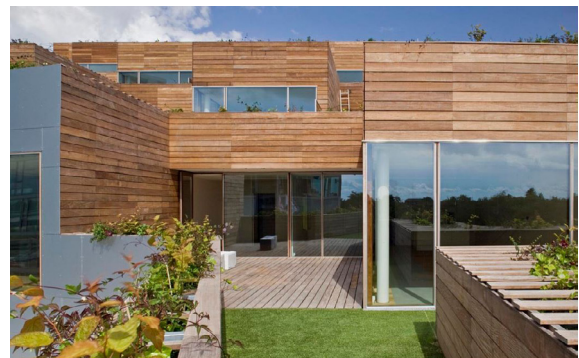


Fig.4.18 | Mountain House, private ‘suburban’ courtyard.

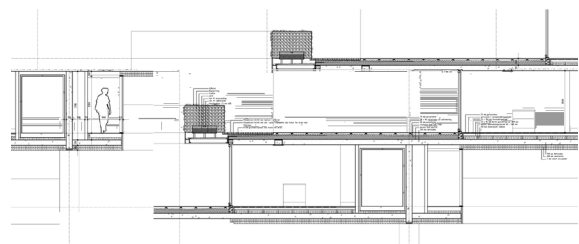


Fig.4.19 | Mountain House section.

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## SITE DEVELOPMENT

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To derive a form for the development, the Ground Hugger typology was tested iteratively in relation to site. It considered the potential layout of spaces with regard to courtyards, neighbouring courtyards, views, and light (fig 4.20). The experiments highlighted that the Ground Hugger dwellings most efficiently interlock around the edge of the site allowing apertures on both the internal and external façades. Additionally the site's topography allows each dwelling to look over the dwelling to the northwest, gaining views out to the harbour. Like the previous design phase, the Ground Hugger has maintained a primary view to ensure privacy, but also creates the opportunity to have secondary views in multiple directions.

The perimeter formation of the Ground Hugger creates the opportunity for shared space in the centre of the site (fig 4.21). Integrating shared outdoor space adjacent to dwellings reduces the size of individual outdoor space required, without unduly compromising the suburban lifestyle.

Vehicle parking can be pulled onto the site below street level. The shared space in the centre is large enough to double as vehicle manoeuvring space. Parking is best located below the southern wing in lower value space. Retaining parking to one side will aid in reducing the vehicle dominance of this space which is to be developed primarily as a private shared space (fig 4.22).

An axis developed between the site entry and shared space was extended to the edges of the site to increase the sense of expansiveness (fig 4.23). These axis frame views beyond the site and help to dissolve boundaries created by the perimeter development.

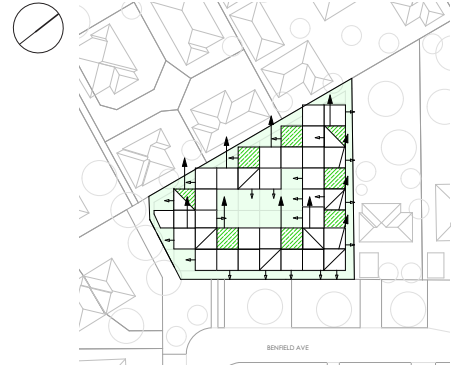


Fig.4.20 | Articulation of Ground Hugger on site.

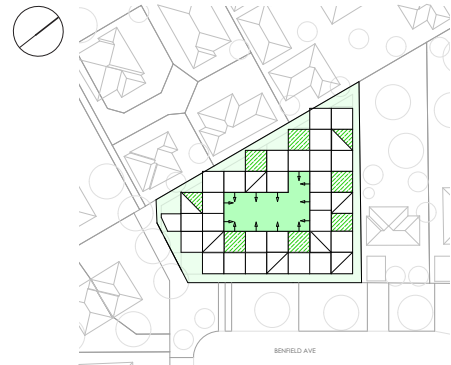


Fig.4.21 | Internal shared space.

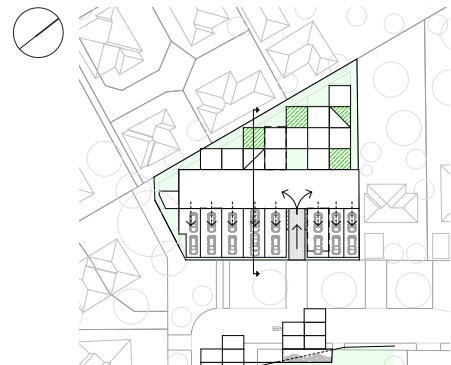


Fig.4.22 | Garages opening onto shared space.

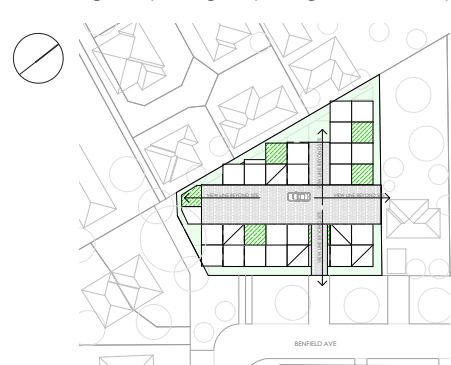
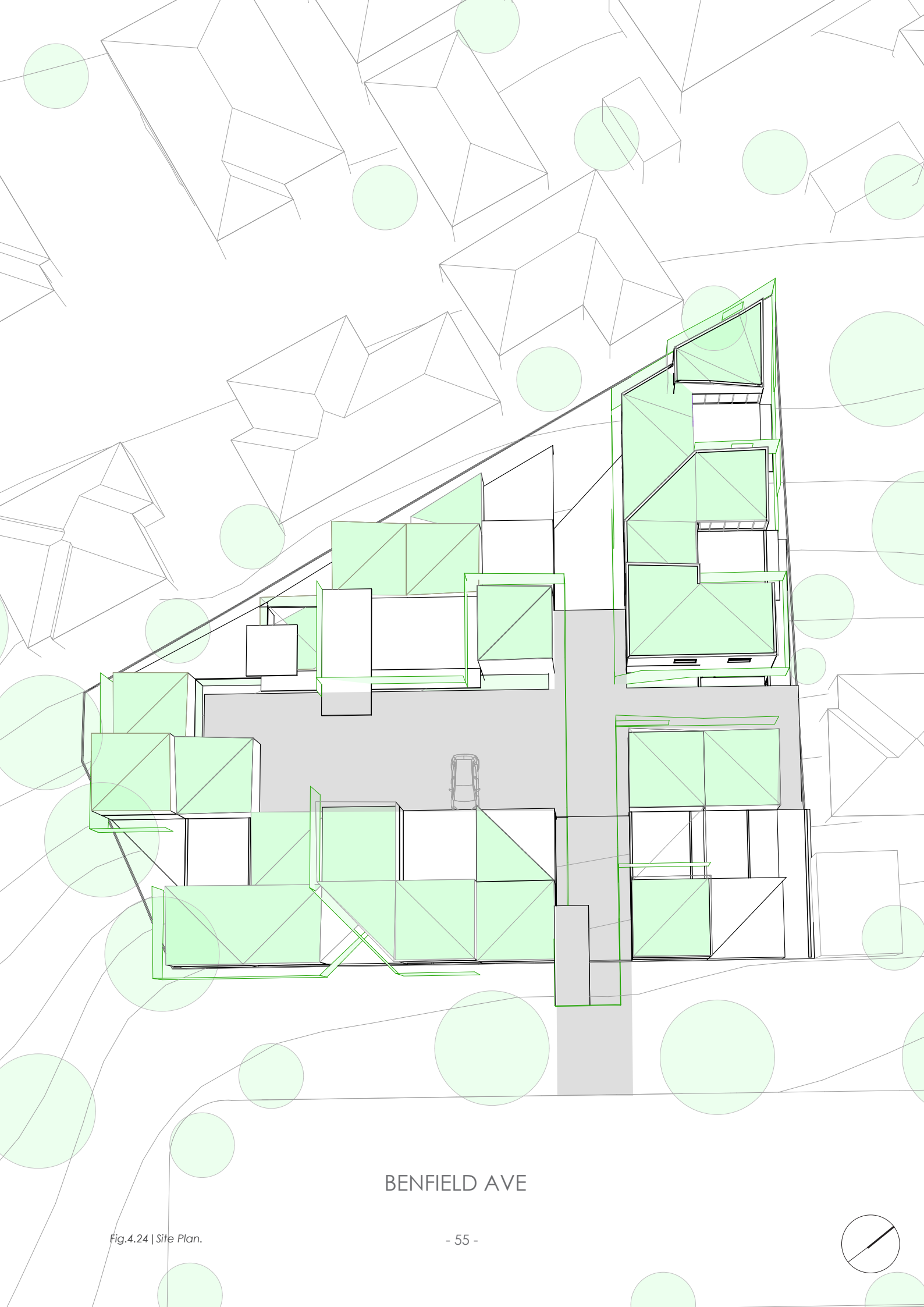


Fig.4.23 | Axis through site.





BENFIELD AVE

Fig.4.24 | Site Plan.

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## COMBINING DIVERSITY

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Further to findings from the first design phase, the use of personas were explored as a methodology for designing the individual Ground Hugger dwellings. To accurately test the density that this typology was able to achieve, the entire site needed to be fully designed with individual dwellings. To determine the range of personas that would be typical in New Zealand, a random number generator was used to select a range of professions from Statistics New Zealand's Occupation Classification ("Occupation - Statistics New Zealand"). Some of these were paired up, forming couples with a range of ages, family structures and interests, reflecting typical New Zealand suburban demographics (fig 4.25). This methodology is intended to develop an alternative to the monotonous nature common in higher density housing schemes. This process is intended to create an architecture which draws on ideas of independence, a critical aspect of the suburban dream. The availability of a variety of dwelling sizes and configurations allows residents to remain within the same neighbourhood as their space requirements change, ensuring a strong sense of community (Marcus 42).



Fig.4.25 | Persona diagrams.



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# CONFIGURING DIVERSITY

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The established personas were distributed around the site with regard to attributes each persona would value most:

- Views (fig 4.26)
- Connection to the street (fig 4.27)
- Established vegetation (fig 4.28)
- Low cost space (fig 4.29)

There was a trade-off between views and space. Areas with views would be worth more and therefore only attainable by personas interested in spending significantly more on their home, while other personas would favour space with less views at a lower cost. Fig xx illustrates how the personas have been arranged around the site in regard to spatial requirements and the above considerations.

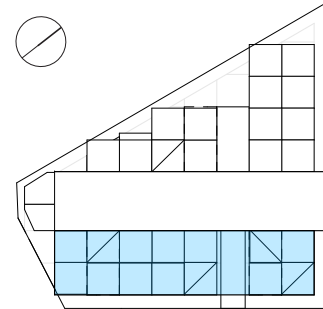


Fig.4.26 | Views.

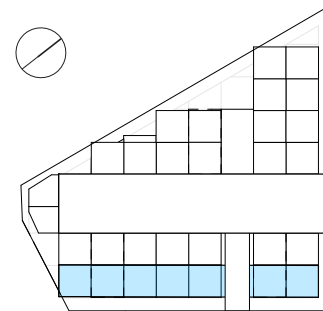


Fig.4.27 | Street.

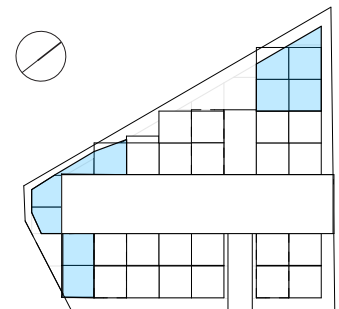


Fig.4.28 | Vegetation.

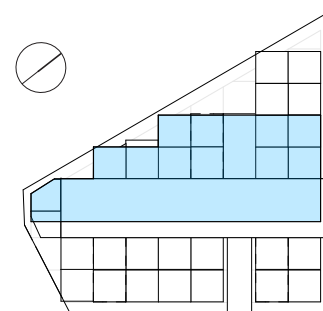


Fig.4.29 | Space.

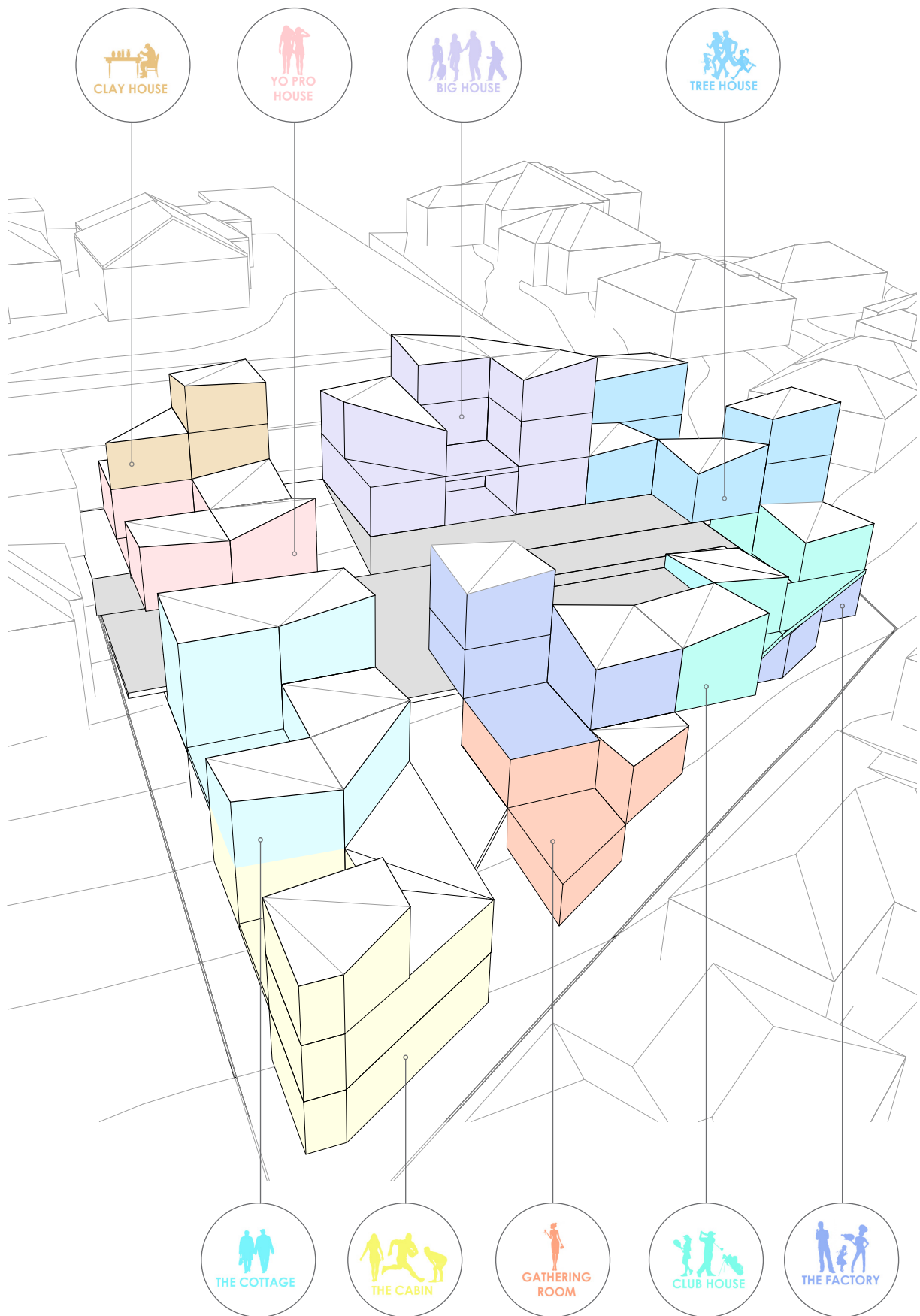


Fig.4.30 | Configuring personas.

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## THE COTTAGE

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The use of personas as a methodology to create diversity and meet suburban ideals were explored in finer detail through the interior of The Cottage (fig 4.31). Here, materials of the living area blend into the courtyard. Openings combined with the double height space bring light, air, and sound back into the internal living spaces, degrading the interstitial boundaries.

The growing screens, which encase the exterior of the building, create privacy between dwellings by aligning openings in the screen with apertures, selecting views that do not compromise either dwellings privacy. The green roof folds around the exterior of the study to merge into the outdoor living area as a continuous plane. The combination of the green screens and roof recreate the condition of landscape by establishing visual connections with vegetation in the surrounding context. This connection to landscape is particularly important to the persona of the retired farmer. Timber materials typical of farm buildings were used on the majority of surfaces to enhance the farmer's ideal of home.

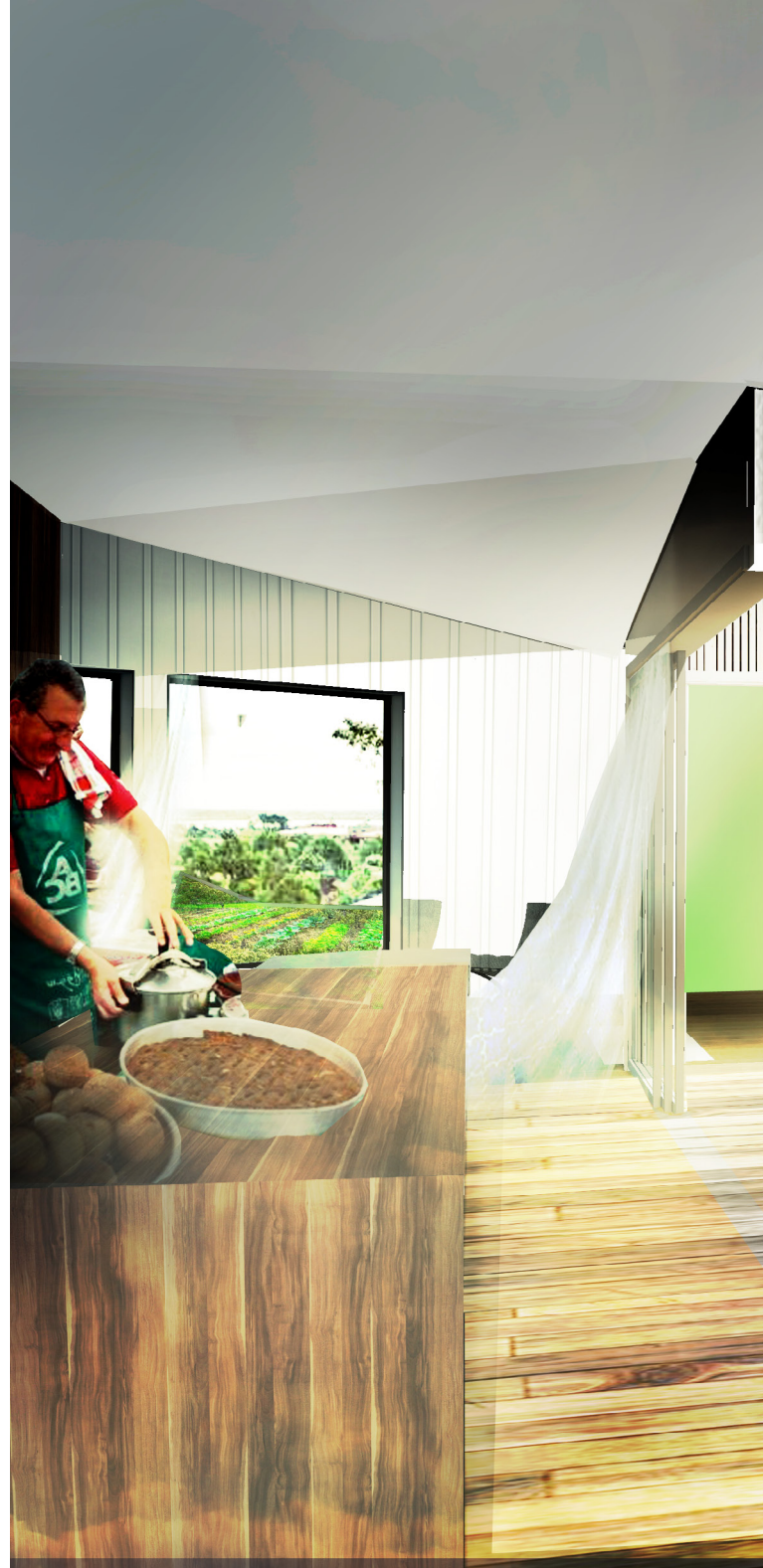


Fig.4.31 | Interior Perspective of The Cottage.





# PROGRAMME

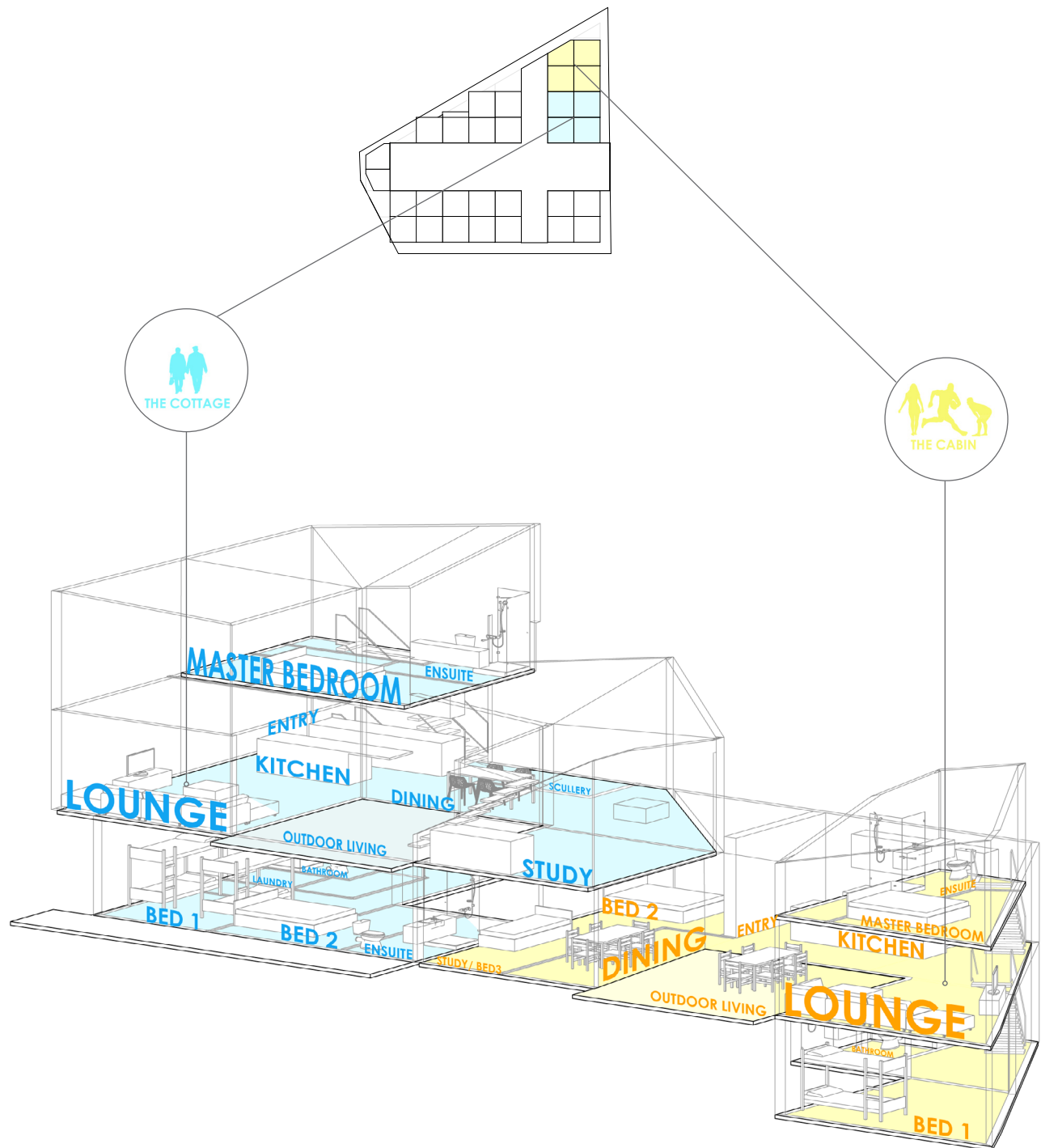
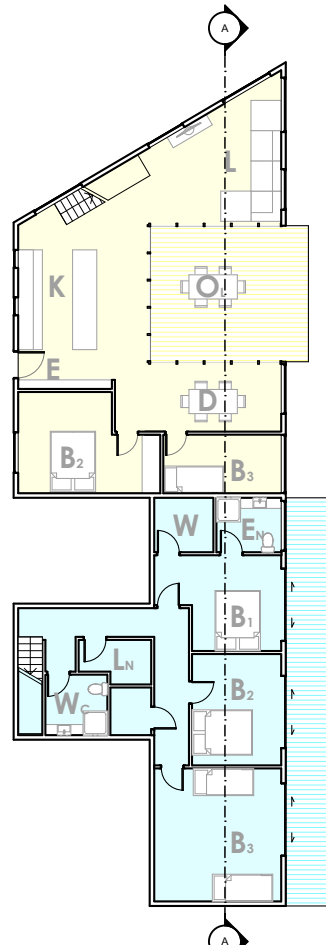


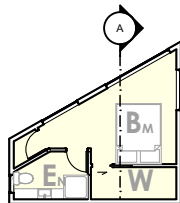
Fig.4.32 | Program configuration diagram - The Cottage + The Cabin.



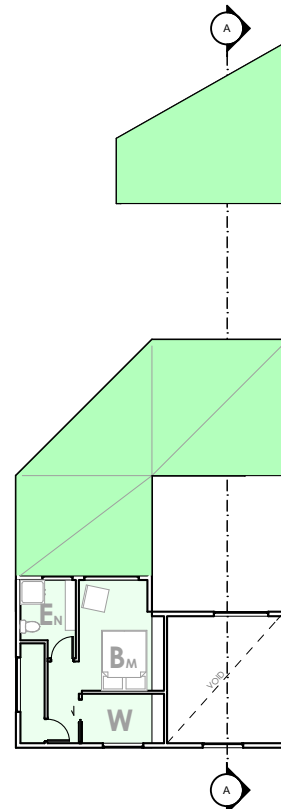
LEVEL 0 SCALE 1:250



LEVEL 1 SCALE 1:250



LEVEL 2 SCALE 1:250



LEVEL 3 SCALE 1:250

# KEY

- B** BEDROOM
- B<sub>M</sub>** MASTER BEDROOM
- D** DINING
- E** ENTRY
- E<sub>N</sub>** ENSUITE
- K** KITCHEN
- L** LOUNGE
- O** OBSERVATORY
- R** RUMPUS ROOM
- S** STORE
- W** WARDROBE
- W<sub>C</sub>** BATHROOM



Fig.4.33 | Plans - The Cottage + The Cabin.



# GARAGE

Accommodating vehicles is a priority for retaining independence – one important aspect of the suburban dream. Garages are often a critical element to the function of the suburban house, their flexible nature suits a range of programmes commonly including:

- Games room
- Laundry
- Workshop
- Studio
- Start-up business

Additionally, garages provide a large storage space allowing the main residence to operate efficiently. Therefore independent garages were prioritised over flexible parking space. Single width 10m long garages create the opportunity for flexible use, including the possibility to park two vehicles. This would be attractive for people moving from suburban housing, where their current lifestyles are heavily dependent on the private vehicle. The garages were kept independent from the houses to enhance the quantity of pedestrian movement through the shared space, aiding interaction amongst residents.

To foster the development of other programmes within the garage space glazed bi-fold doors were used, allowing light into the space and the ability to have the doors partly open. Glazing at ground level would also help activate the communal space. Figures 4.34 and 4.35 explore various possible configurations for the garage.

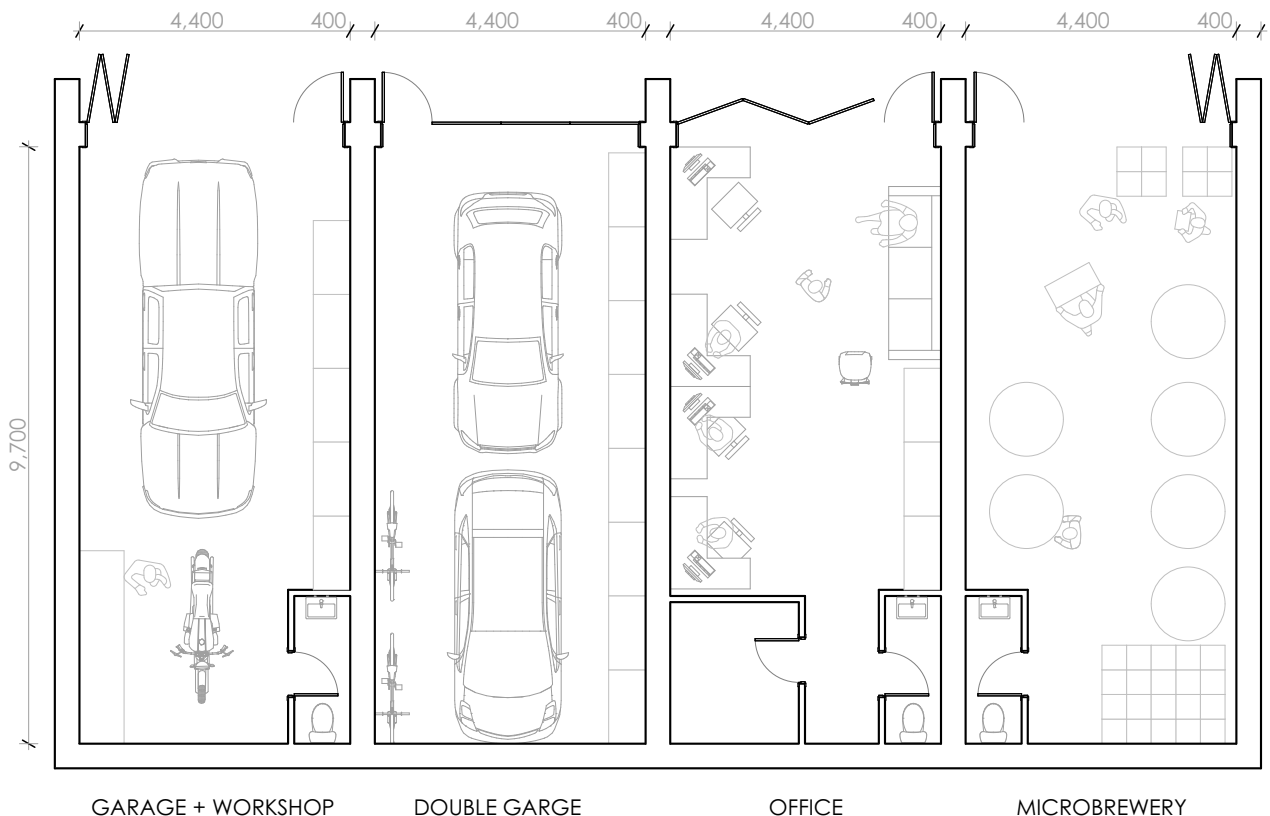


Fig.4.34 | Plans - Garage configuration 1.

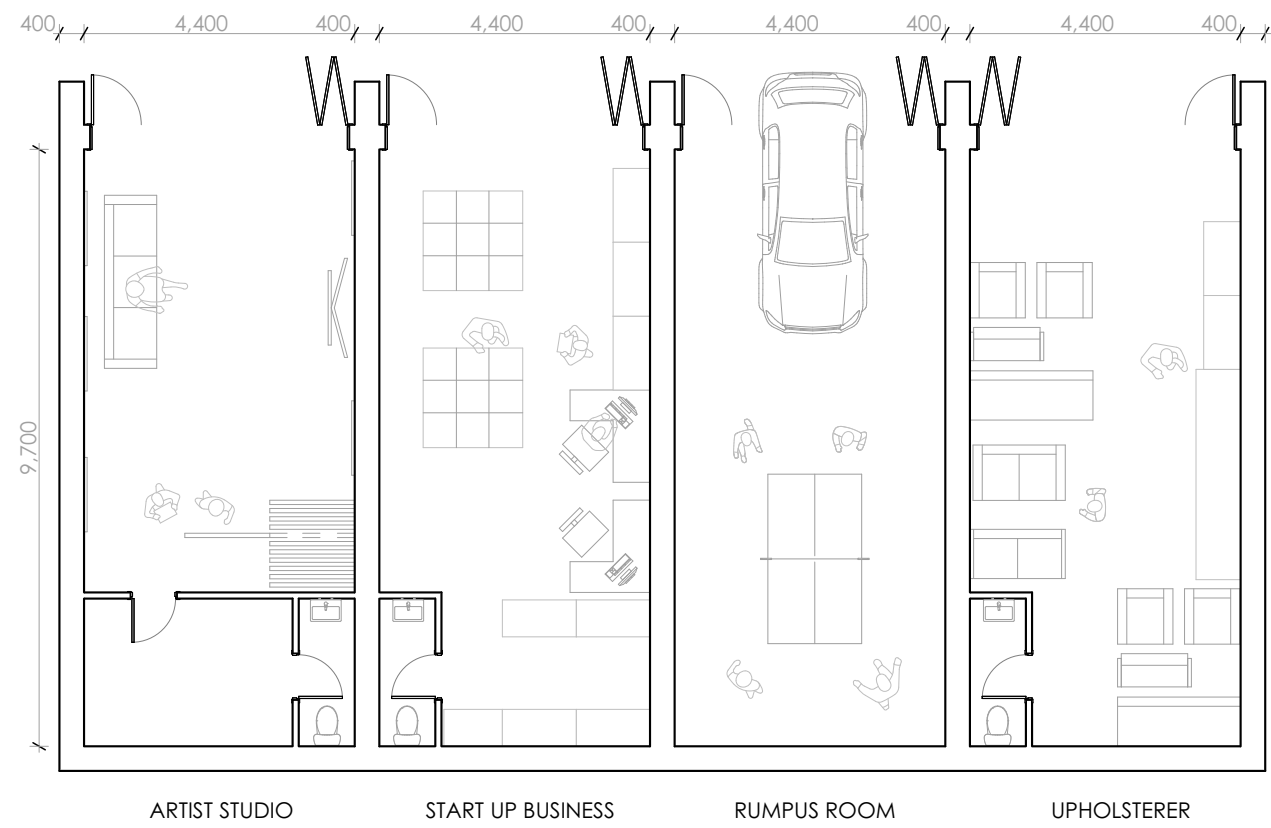


Fig.4.35 | Plans - Garage configuration 2.

SECTION AA  
1:200

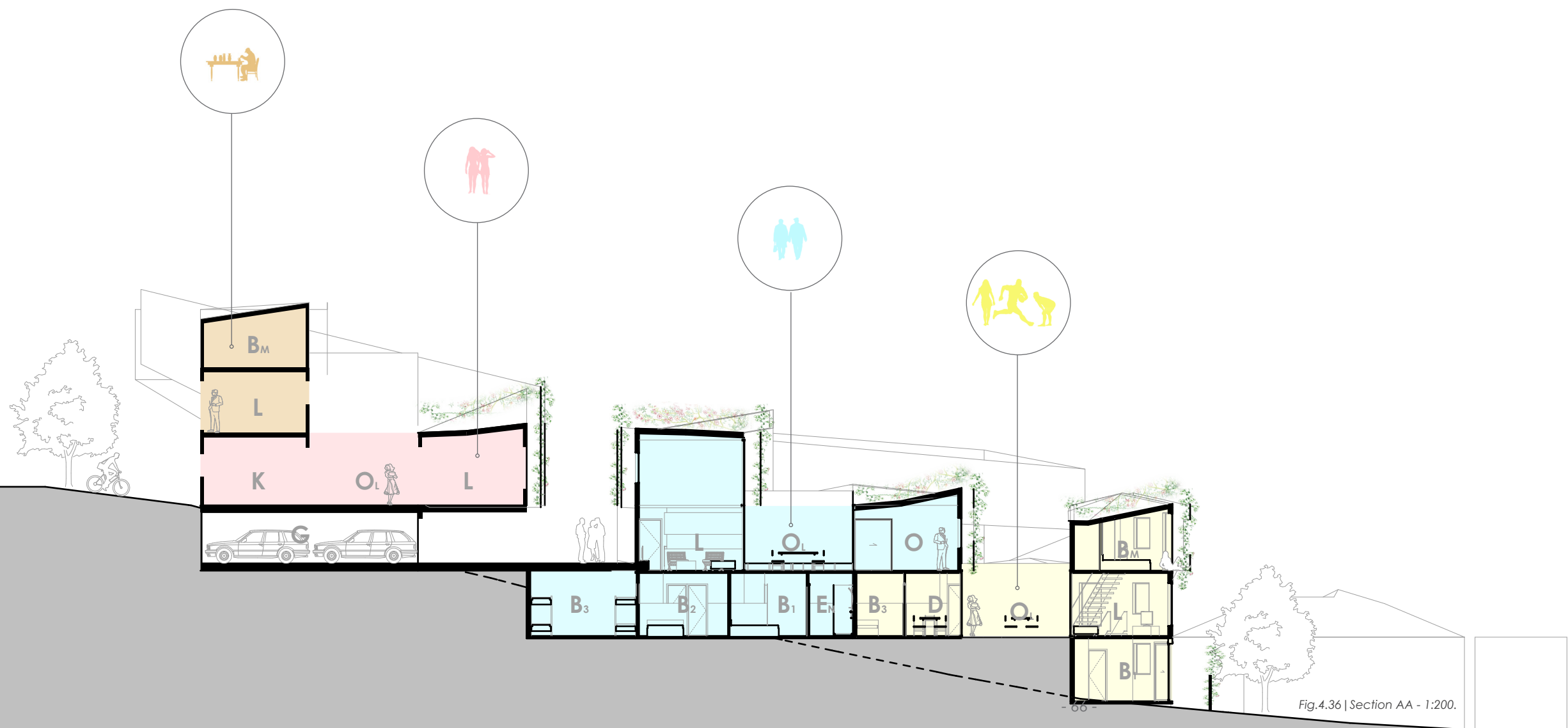


Fig.4.36 | Section AA - 1:200.



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## REFLECTION

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This design phase strengthened the ideals of the suburban dream by reconsidering the interstitial spaces whilst simultaneously achieving an intensified density of 64dph.

The modular configuration of the Ground Hugger created an effective tool to efficiently utilise specific site variations and provided a high level of flexibility, critical to the development of individualised dwellings.

The private courtyard with one exposed elevation was a key component of the Ground Hugger living configuration. This was developed from the work of Ryue Nishizawa's Moriyama House where courtyards enable spatial qualities of the interior and exterior to blend, generating a connection to the landscape and an increased sense of expansiveness.

Building on the findings from Design Phase One, the use of personas as a methodology to generate diversity in individual dwelling design was effective. This could be explored further to manage diversity of the exterior design, a characteristic of suburban environments.

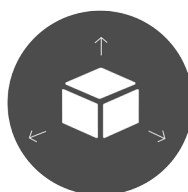
Integrated shared space in the middle of the site offered an extension to the more compact private outdoor spaces. Merging shared space with the vehicle manoeuvring area created efficiencies and increased activity within the courtyard. Priority to pedestrian activity and leisure use of the shared space has potential for further development.

Feeding the garages off the shared space and creating provision for other use of the garages, increased the opportunity for community development while retaining the valued independence of the garage space.

The sense of interconnection with context was addressed through the work of Claude Megson. Similar to his Crocker Townhouses, geometry and material were extracted from the surrounding bungalows. Developing a dialogue between the new and the existing, links the new higher density to its surrounding historical suburban context. The landscaped screens were effective mechanisms to soften an otherwise hard interstitial space while forming connections to the established planting on surrounding sites.



**INDEPENDENCE**



**EXPANSIVENESS**



**COMMUNITY**

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# CLOUD BUSTER

## DESIGN PHASE THREE

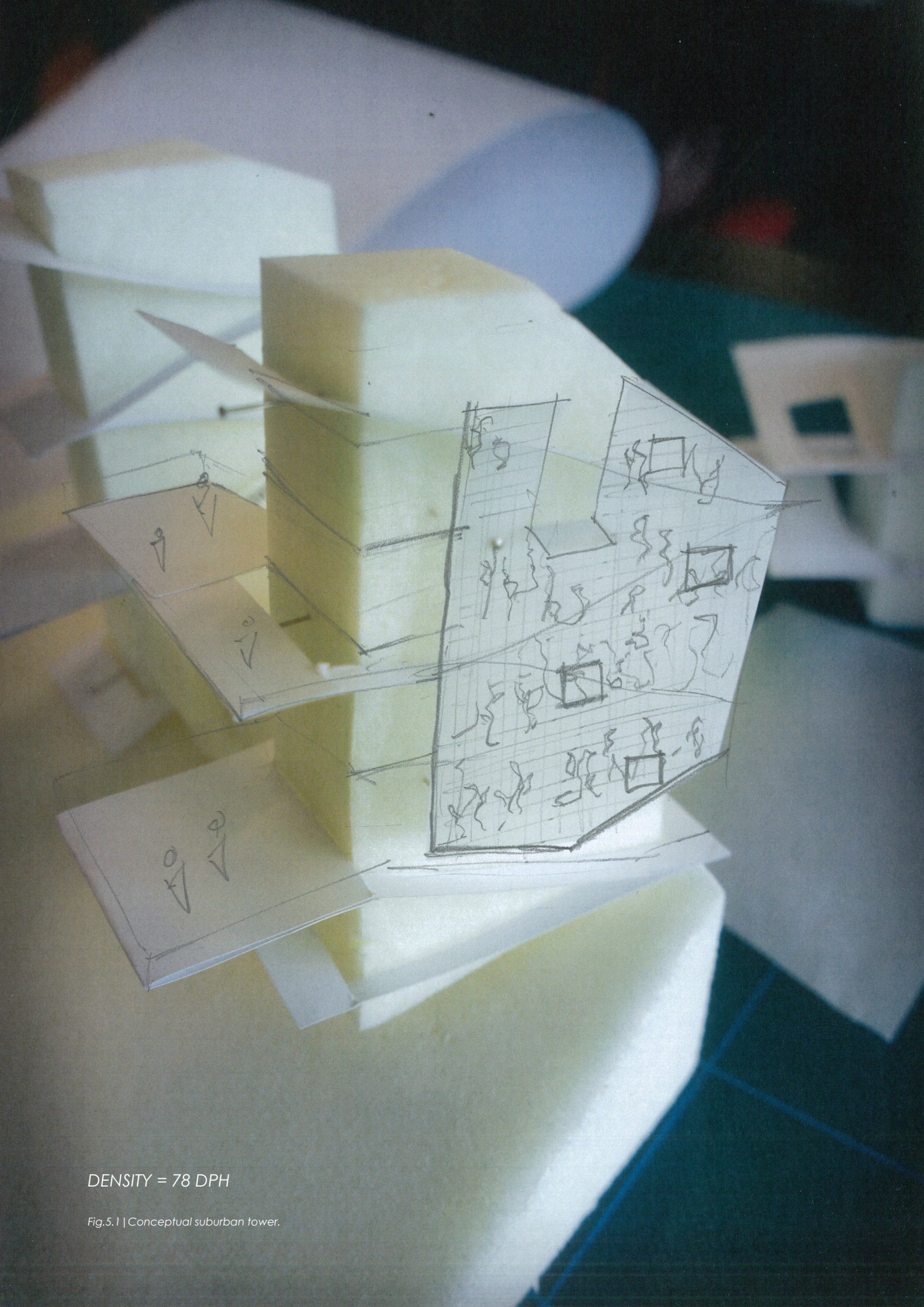
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5.0

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*This design phase explores how the ground plane can be redesigned to support vertical living while enriching ideals of the suburban dream.*





DENSITY = 78 DPH

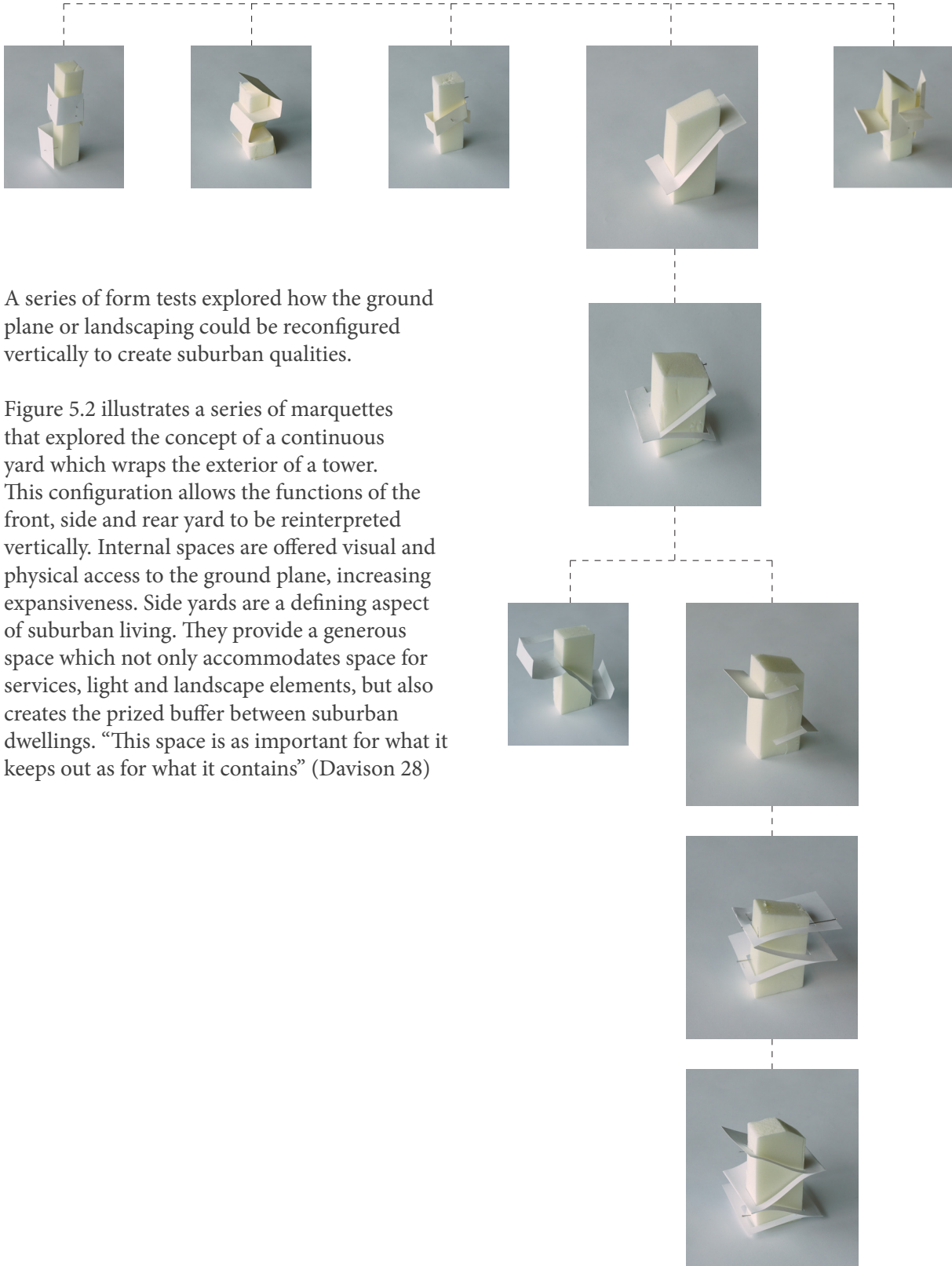
Fig.5.1 | Conceptual suburban tower.



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## FORM TESTING

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A series of form tests explored how the ground plane or landscaping could be reconfigured vertically to create suburban qualities.

Figure 5.2 illustrates a series of maquettes that explored the concept of a continuous yard which wraps the exterior of a tower. This configuration allows the functions of the front, side and rear yard to be reinterpreted vertically. Internal spaces are offered visual and physical access to the ground plane, increasing expansiveness. Side yards are a defining aspect of suburban living. They provide a generous space which not only accommodates space for services, light and landscape elements, but also creates the prized buffer between suburban dwellings. “This space is as important for what it keeps out as for what it contains” (Davison 28)

Fig.5.2 | Conceptual tower maquettes.

## SITE CONFIGURATION

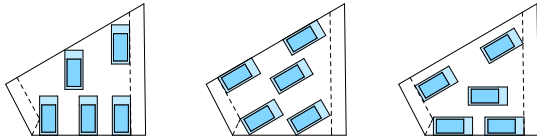


Fig.5.3 | Site configuration - Five towers - Ten dwellings - 71dph

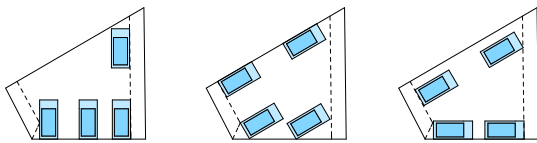


Fig.5.4 | Site configuration - four towers - Eight dwellings - 57dph

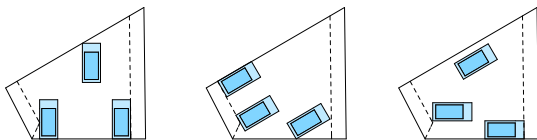


Fig.5.5 | Site configuration - four towers - Six dwellings - 42dph

The tower, like a suburban house requires a large buffer around it to generate expansiveness. Figures 5.4 and 5.5 illustrates how the site is only able to accommodate 3 – 4 towers without enclosing them. With two dwellings per tower, stacked vertically, the site was only capable of achieving 57dph (a lower density than the earlier ground hugger). The width of the single dwelling tower typology enabled the additional height to be utilised without excessive detriment to the surrounding sites or character.

Design Phase Two illustrates how the Ground Hugger typology can efficiently adapt to site variations on the ground, however it was weak at achieving vertical density. The opposite is true for the Cloud Buster. Combining these two complimentary typologies into a vertical duplex was explored. The combination allowed the densities of each typology to be slightly reduced, while significantly increasing the overall development density (fig 5.6).

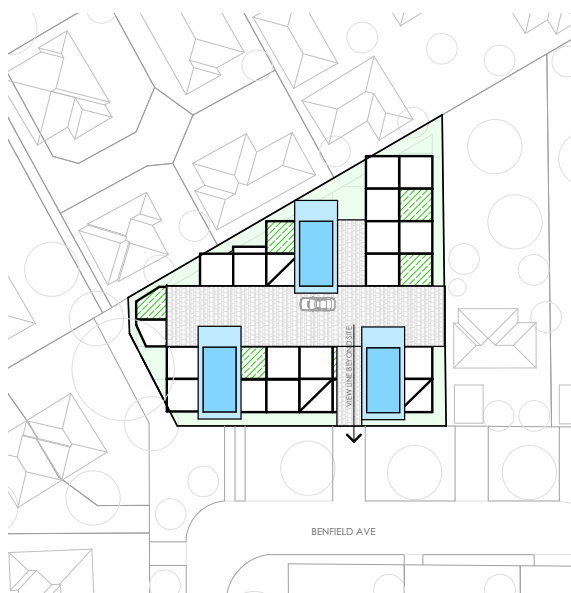


Fig.5.6 | Site configuration combined Ground Hugger, Cloud Buster Eleven dwellings - 78dph

## SHADING

Solar access is an important aspect of the suburban dream, particularly in relation to achieving a sense of expansiveness. Considering the effects of shading into the site configuration ensured the towers were not overbearing. Shading analysis was conducted to determine the configuration and number of towers the site could accommodate. Priority was given to solar access in the outdoor area during the middle of the day and afternoon.

Figures 5.7-5.10 shows the final configuration, illustrating how two towers are easily accommodated along the street edge away from surrounding houses, with one tower located to the northwest boundary of the site. Retaining lower development to the northern edge of the site improves solar access to dwellings along the street edge. The configuration of shared space from the second design exploration (fig 4.24) still maintained a successful way to arrange the site in regards to solar access to all dwellings.



Fig.5.7 | Analysis of the effect of densification on surrounding context - Summer solstice, 5pm.





SUMMER SOLSTICE

MARCH EQUINOX

WINTER SOLSTICE

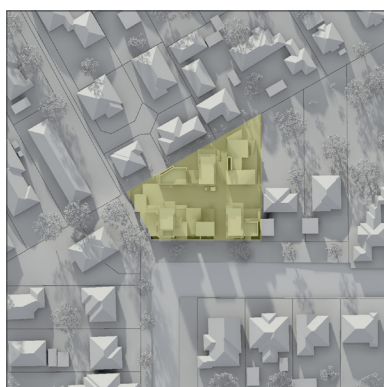


Fig.5.8 | Analysis of the effect of densification on surrounding context.

0 20 50m



SUMMER SOLSTICE

MARCH EQUINOX

WINTER SOLSTICE

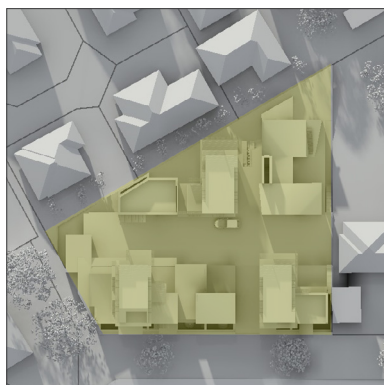
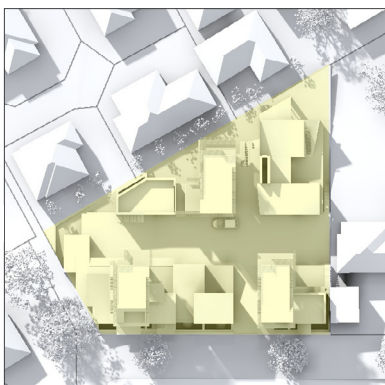
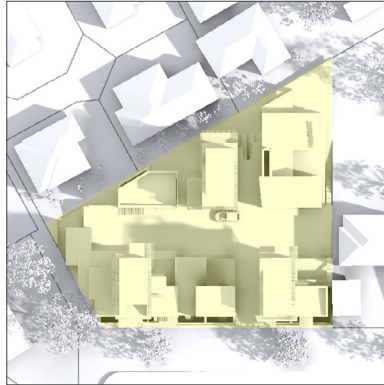


Fig.5.9 | Analysis of the effect of shading within development.

0 20 50m





Fig.5.10 | Analysis of the effect of shading within development  
- Summer solstice, 5pm.  
Areas highlighted in green illustrate courtyards and outdoor areas accessed directly off living areas.



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## CLOUD BUSTER

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The Cloud Buster as conceptualised in the previous formal studies (fig 5.2), reinterprets the standalone suburban house through the use of front, back, and side yards (fig 5.12). Figure 5.13 illustrates how the yard was reinterpreted in a compact setting to circulate the exterior of the tower. The Continuous Yard was adjusted in relation to the internal programme, recreating the major and minor spaces of the suburban house (fig 5.14). A vegetated screen wraps the Continuous Yard, reminiscent of the suburban boundary garden and fence. Openings and gradients of porosity select views beyond (fig 5.15).

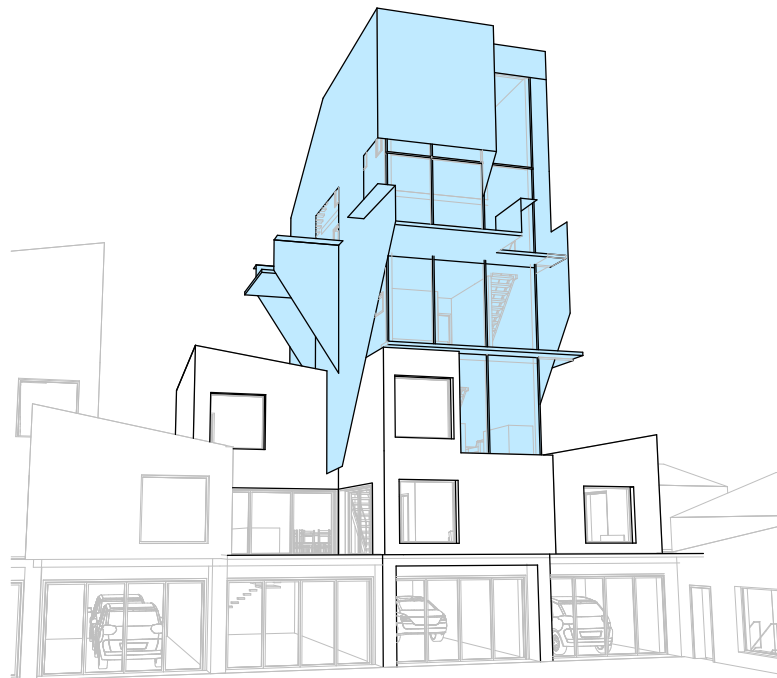


Fig.5.11 | Cloud Buster.

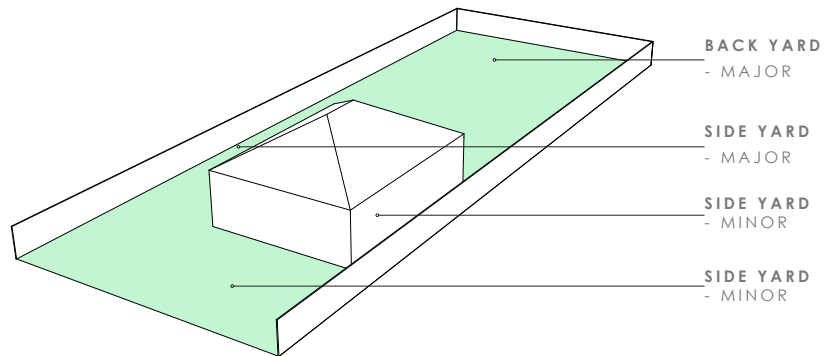


Fig.5.12 | Quarter acre suburban dream.

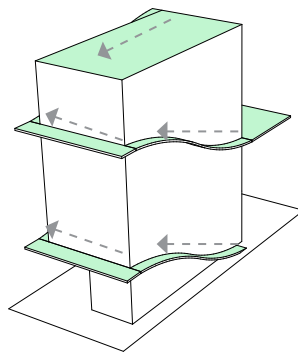


Fig.5.13 | Continuous yard.

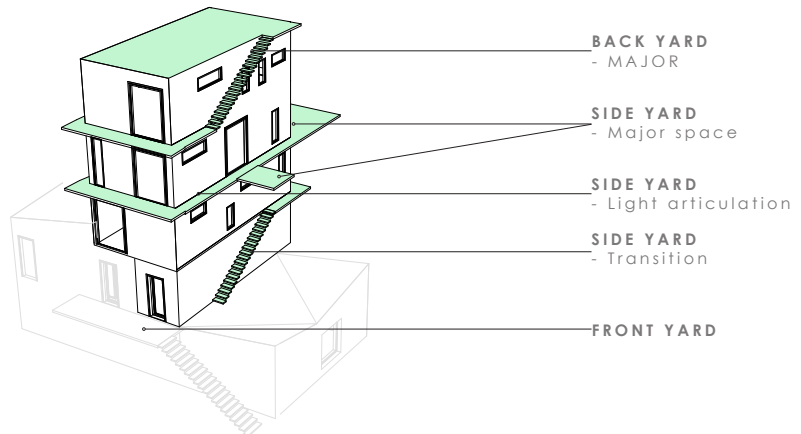


Fig.5.14 | Responding to internal program.

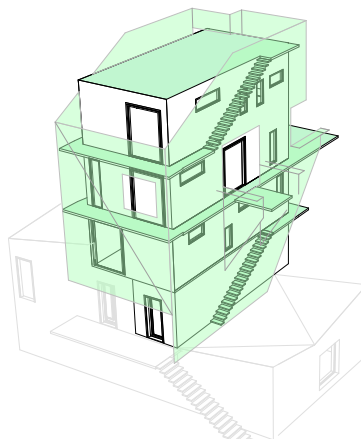


Fig.5.15 | External screen.

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## [RE] GROUND HUGGER

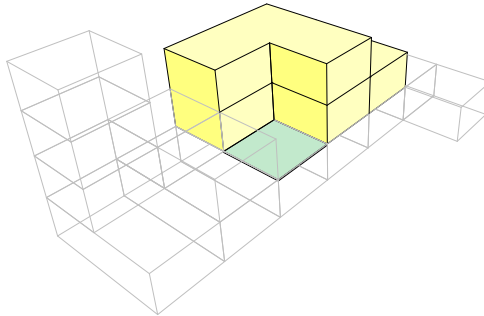
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Figures 5.17-5.20 illustrate how the Ground Hugger typology has been reconfigured to interlock with the Cloud Buster. Fig 5.17 illustrates how the Ground Hugger retained the courtyard configuration of the previous design phase. Fig 5.18 describes how the courtyard had been extended to provide a ground plane for all internal spaces to access. Fig 5.19-5.20 illustrates how the Cloud Buster intersects the Ground Hugger at street level. Each typology retained half of the street level floor plate to create a front entry and primary access to their main living spaces.

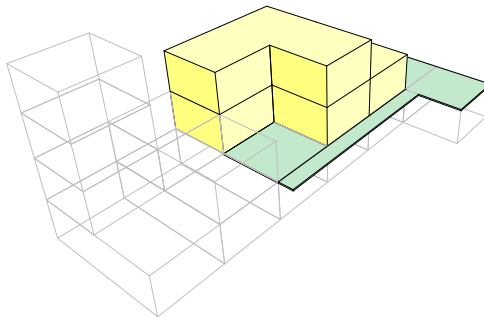


Fig.5.16 | Ground Hugger.

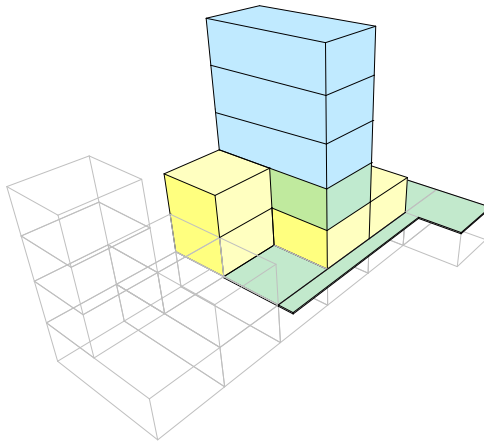




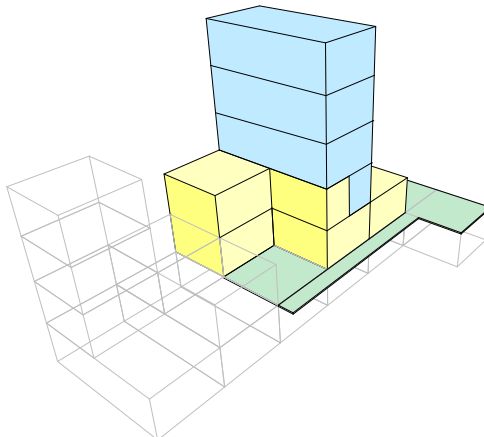
*Fig.5.17 | Ground Hugger with courtyard.*



*Fig.5.18 | Private yard extended - access from every room.*



*Fig.5.19 | Intersected with Cloud buster at street level.*



*Fig.5.20 | Street level floor plate halved.*

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## COMBINING DIVERSITY

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Combining the two typologies increased the density to 78dph. Two additional dwellings were created, and generated by the personas of:

- Construction worker: requiring a one bedroom dwelling with a full sized living and kitchen area
- Couple who are teachers: requiring a comfortable two bedroom plus study with generous living, kitchen and outdoor amenity

Space was prioritised over views for both, so they would generate the lower cost Ground Huggers to the northwest boundary of the site.

The real-estate agent, surgeons and accountant are personas of higher financial capacity and therefore these were used to generate the higher value Cloud Buster typologies. The forestry worker's wife ran a beauty salon from home, and to attain direct street access they were used to generate the Ground Hugger below the surgeons (fig 5.22).

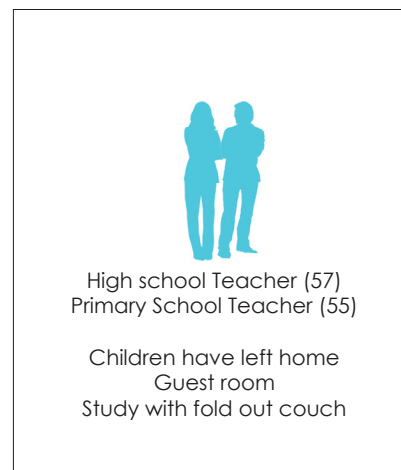


Fig.5.21 | Additional personas.

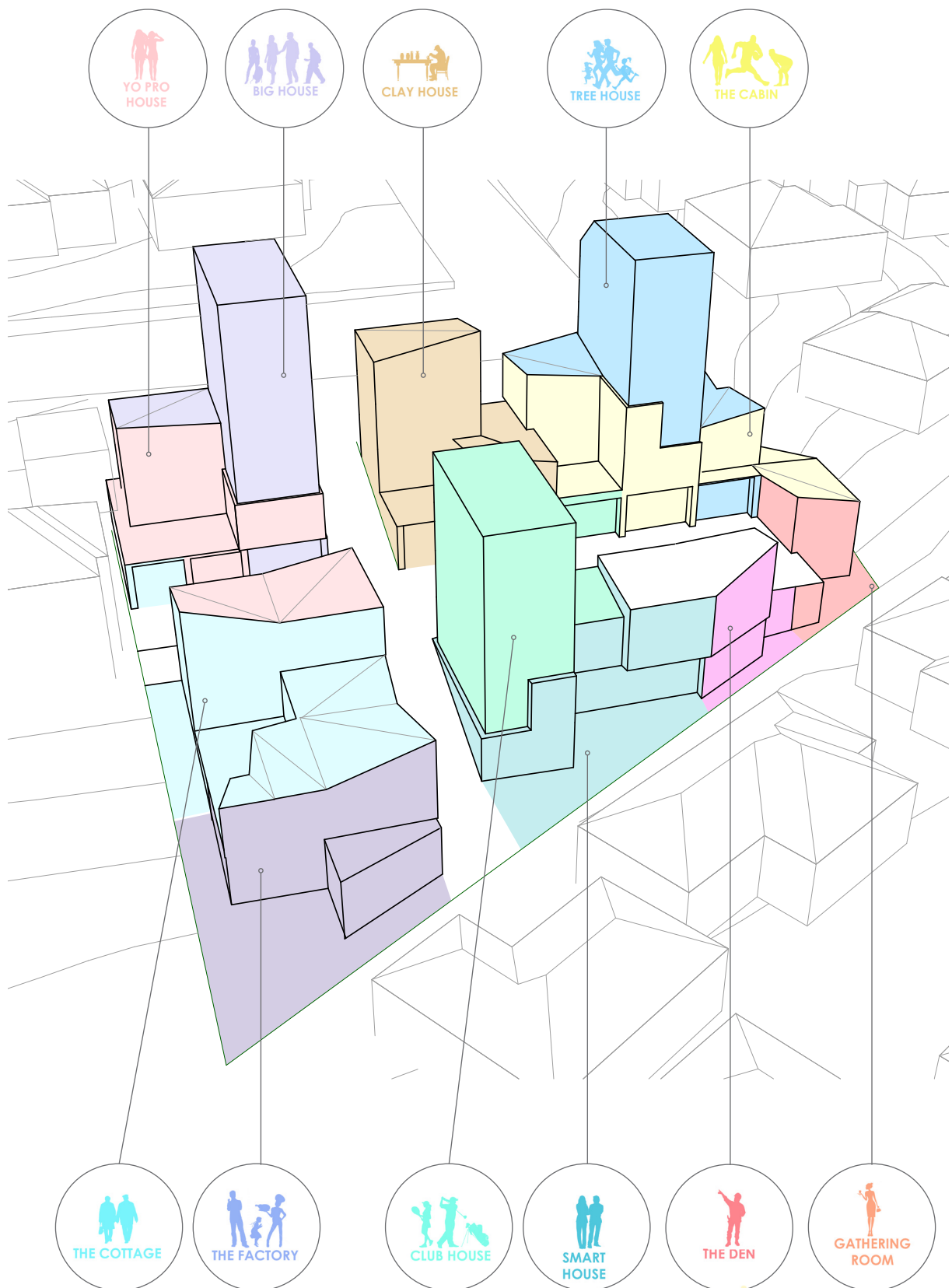


Fig.5.22 | Configuring personas diagram.



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# MATERIAL

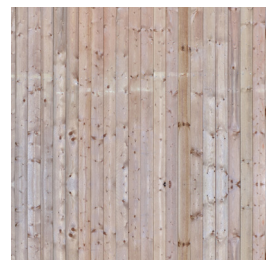
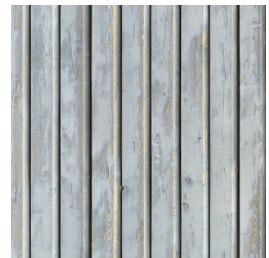
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The surrounding bungalows are clad in an infinite variation of timber or masonry. Although only two materials, the variations create character, referencing the individual ownership structures which create a diverse yet cohesive streetscape.

The material pallet for this scheme was adopted from the surrounding bungalows. The lower Ground Hugger typologies were clad in a range of white finished brickwork (fig 5.23), while the upper Cloud Busters feature stained timber claddings (fig 5.24). The two materials created a cohesive composition while referencing the irregular individual dwelling configurations (fig 5.25).



*Fig.5.23 | Ground Hugger material pallet.*



*Fig.5.24 | Cloud Buster material pallet.*



Fig.5.25 | Materiality.



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# SCREENS

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The screens encasing the Cloud Busters are reminiscent of the garden space and fence surrounding the suburban house. In this role they:

- Provide opportunity for visual and acoustic interactions between neighbours
- Conceal services and storage
- Introduce light into side rooms

Design Phase One explorations into dual screens (fig 3.35), developed privacy between dwellings while maintaining expansiveness. These dual screens were developed into the Cloud Buster by treating the windows of the building as one surface and the screen as the offset surface. Window and screen openings were aligned to define views and retain the privacy of adjacent dwellings. Each screen responded to the internal planning and surrounding context of each dwelling (fig 5.26-5.29).

Outdoor living spaces protruded through the screen to develop quirky characteristics which break the rectilinear form of the development. These variations highlight the independent nature of each dwelling, creating a distinction from the perceived “monotony” of medium-density housing (CityScope Consultants and Curious Research).



Fig.5.26 | Screen responding to main aspect.



Fig.5.27 | Narrow geometry to accentuate the towers narrowness.



Fig.5.28 | Screen to create additional shading on main aspect.

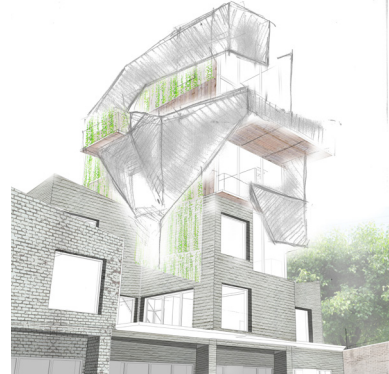


Fig.5.29 | Alternative configuration.





Fig.5.30 | Design Phase Three - Density = 78dph.



# LEVEL 1

1:250

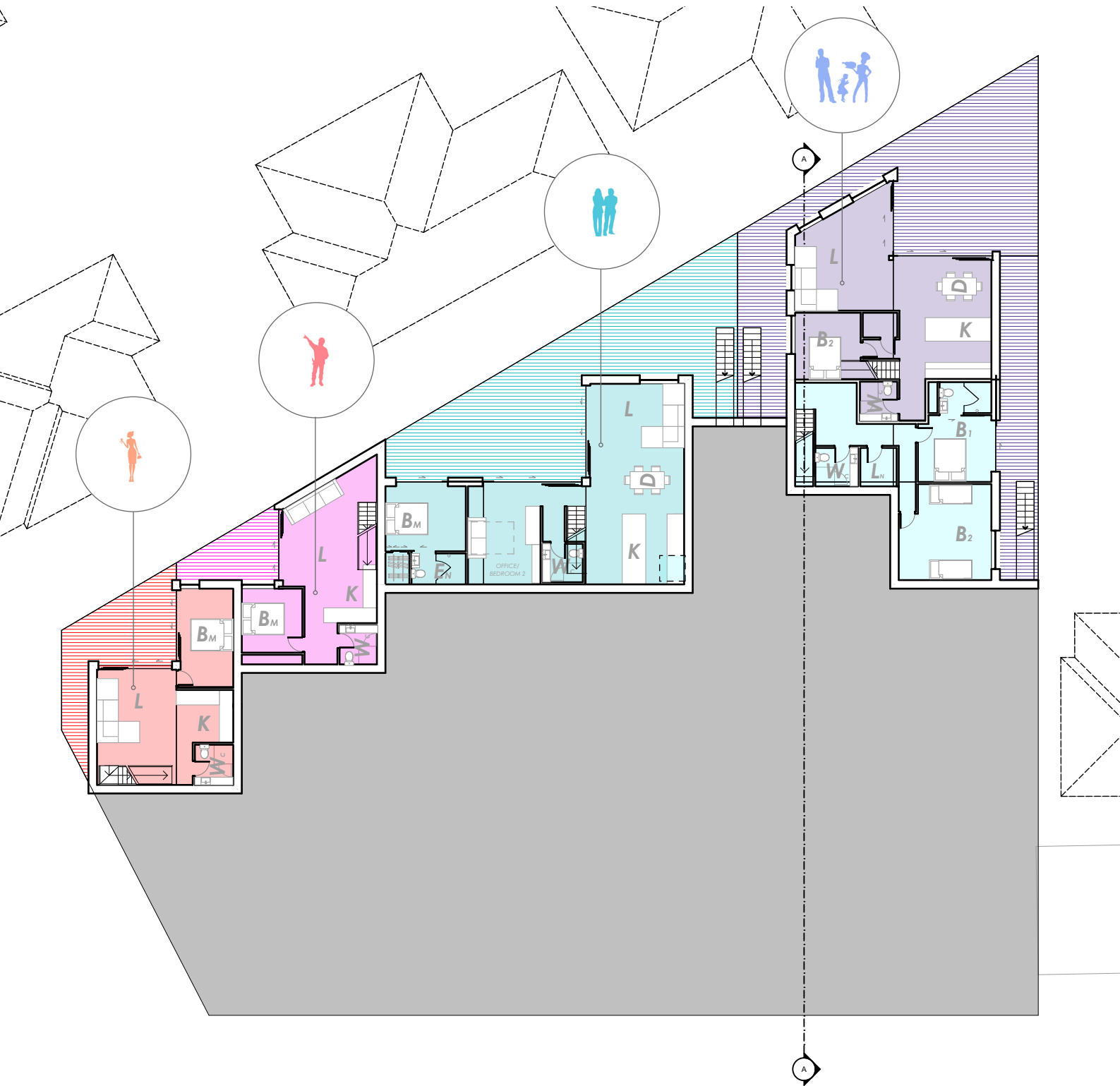


Fig.5.31 | Plan Level 1.

## LEVEL 2

1:250

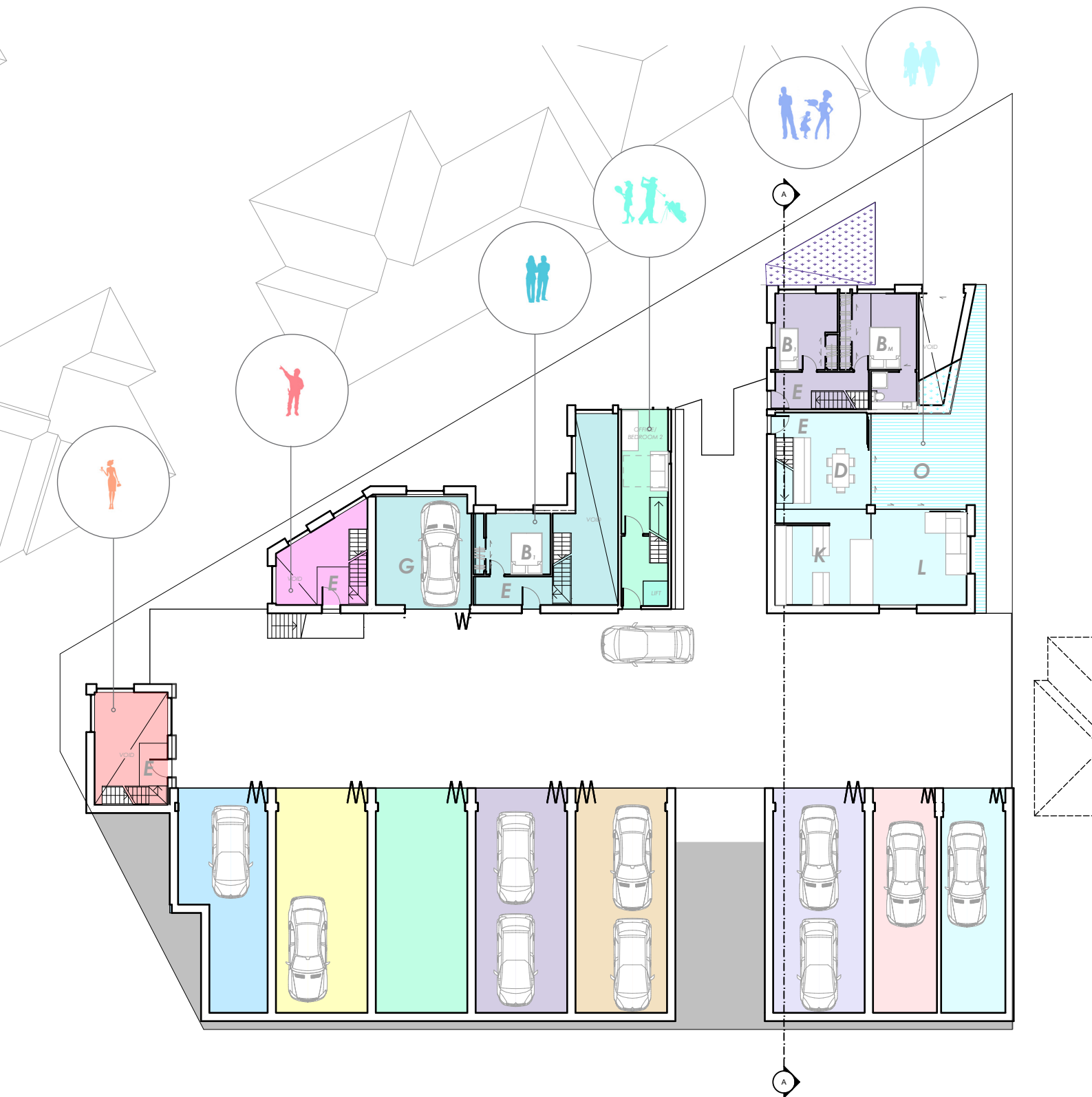


Fig.5.32 | Plan Level 2.



# LEVEL 3

1:250

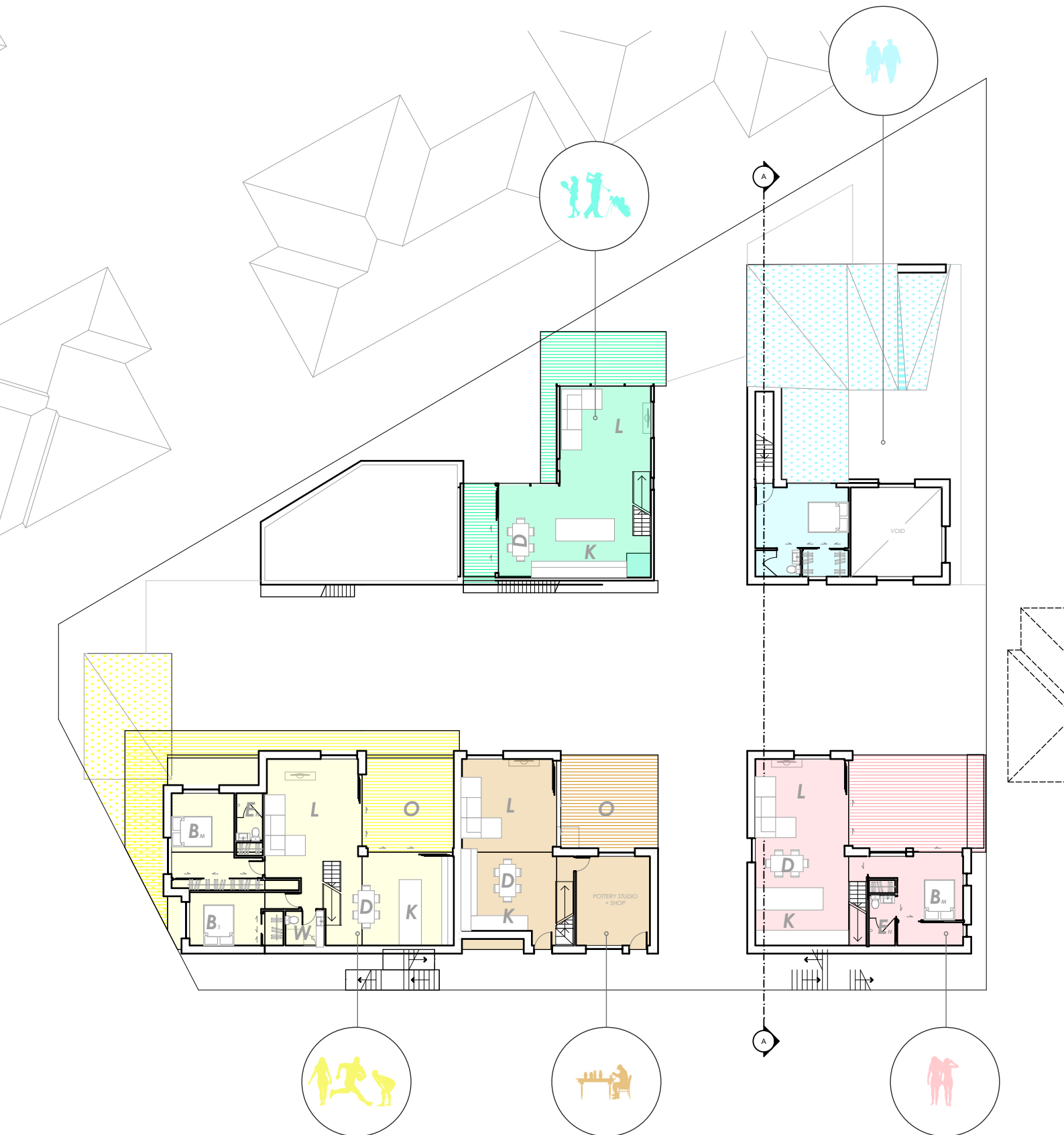


Fig.5.33 | Plan Level 3.

# LEVEL 4

1:250

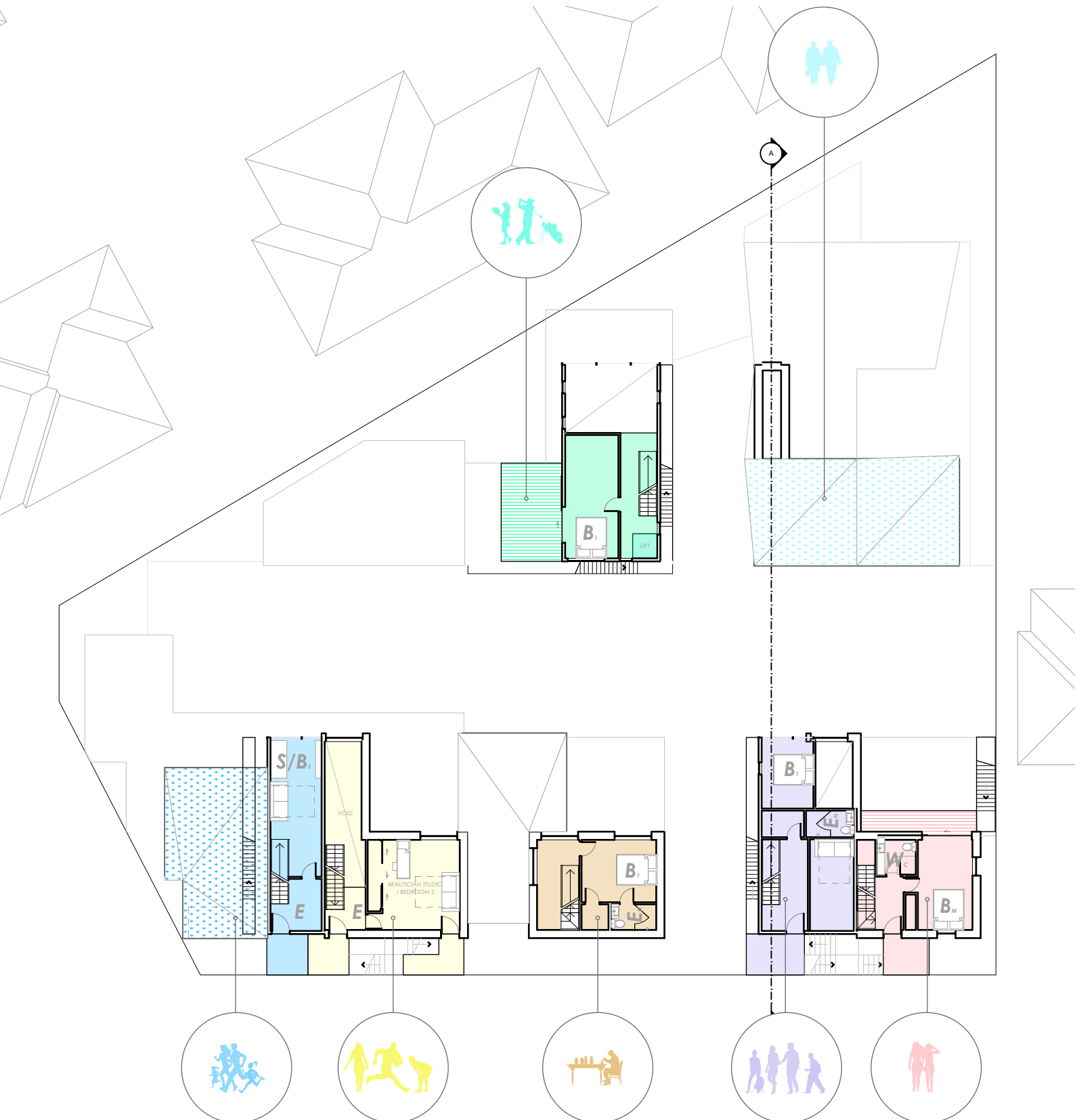


Fig.5.34 | Plan Level 4.

# LEVEL 5

1:250

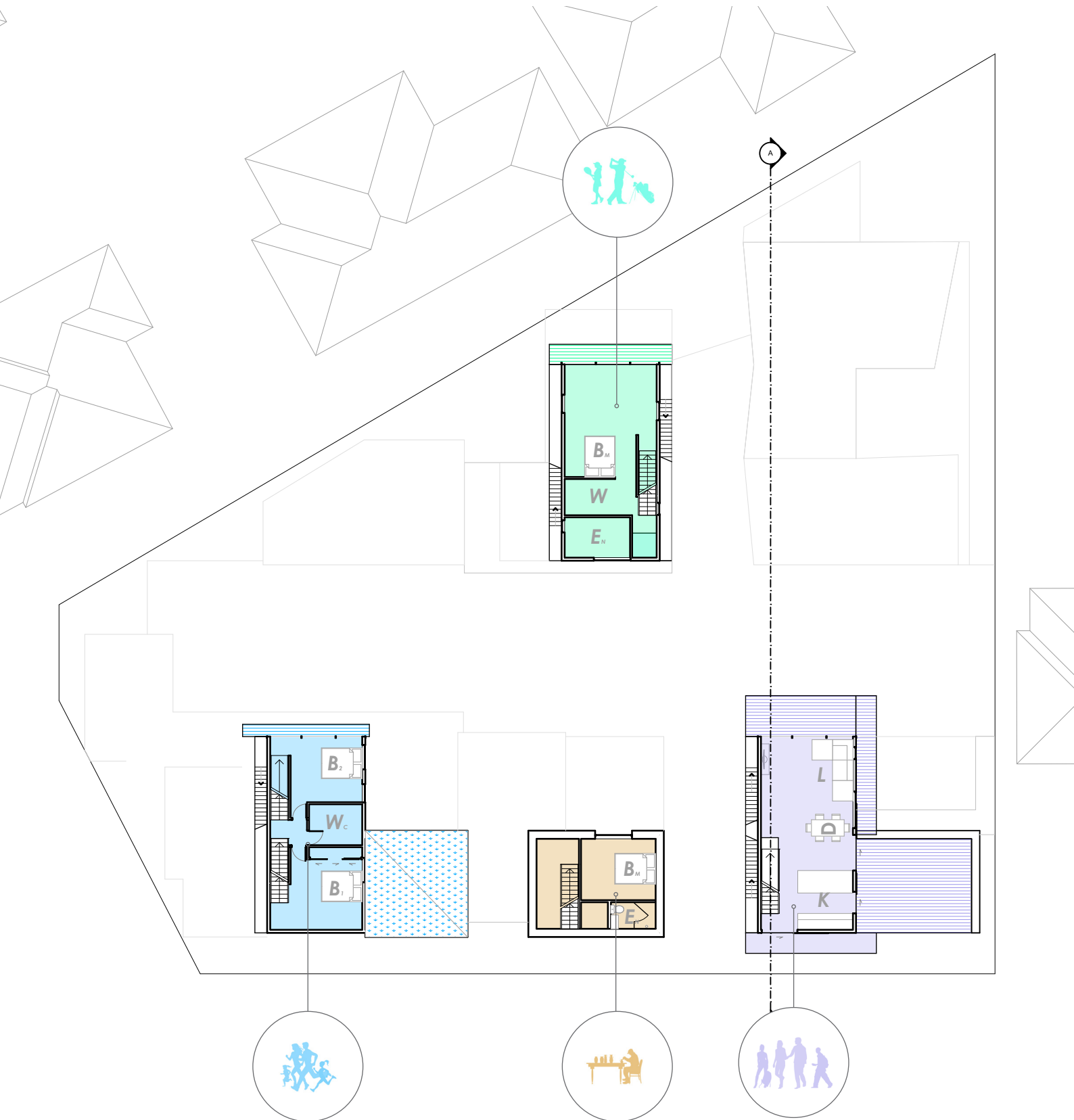


Fig.5.35 | Plan Level 5.



# LEVEL 6

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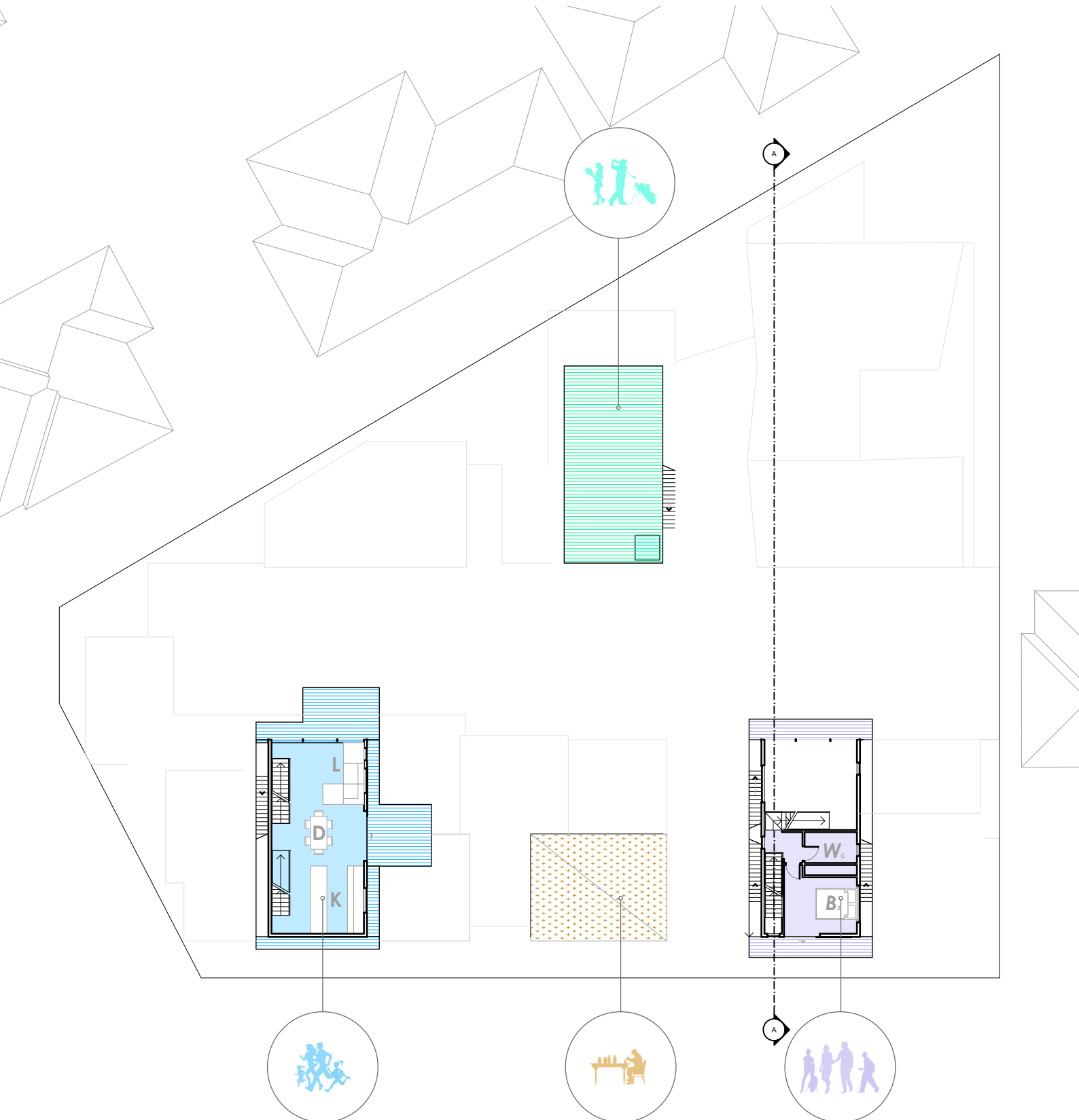


Fig.5.36 | Plan Level 6.

# LEVEL 7

1:250

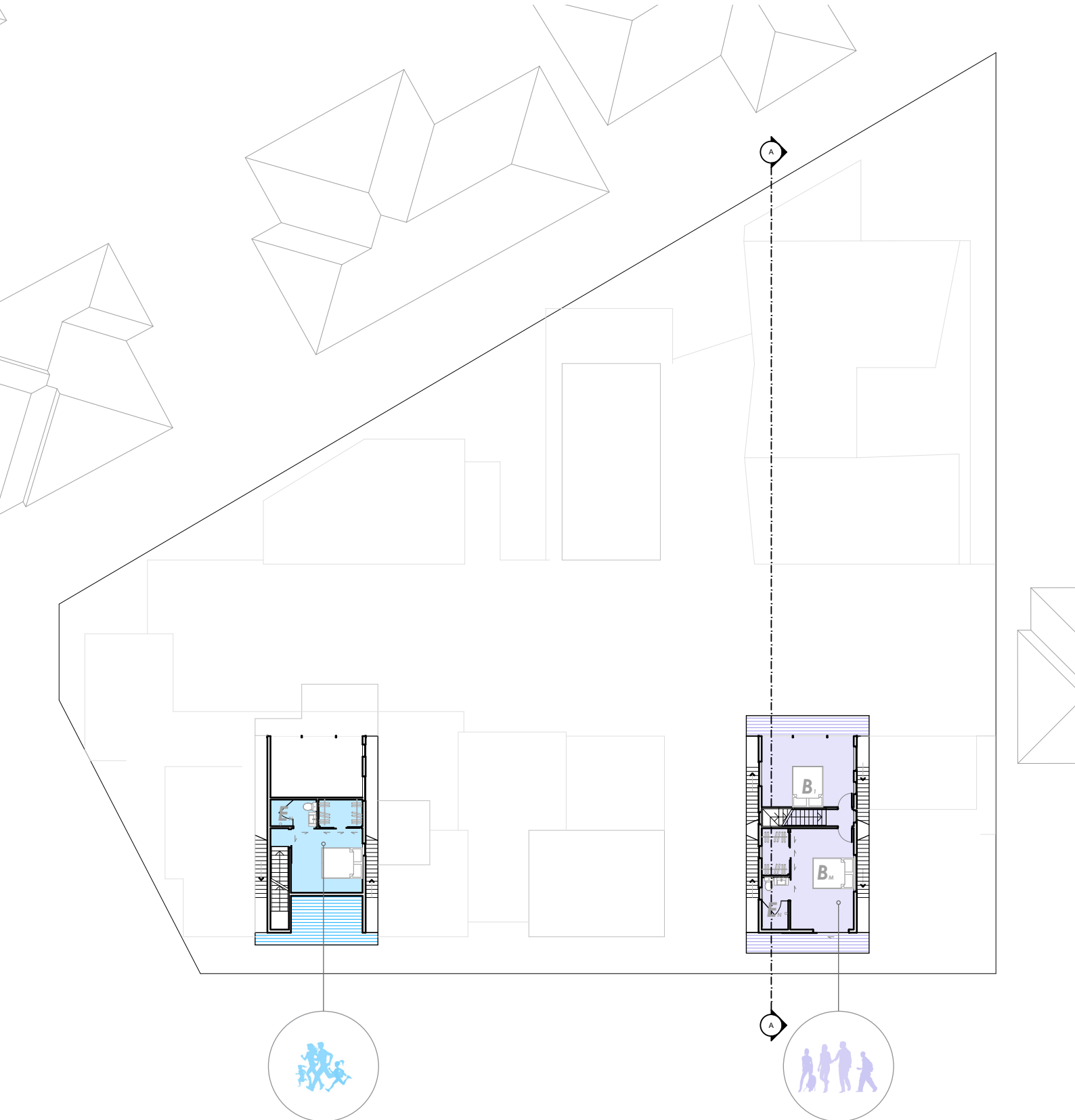


Fig.5.37 | Plan Level 7.

SECTION AA  
1:200

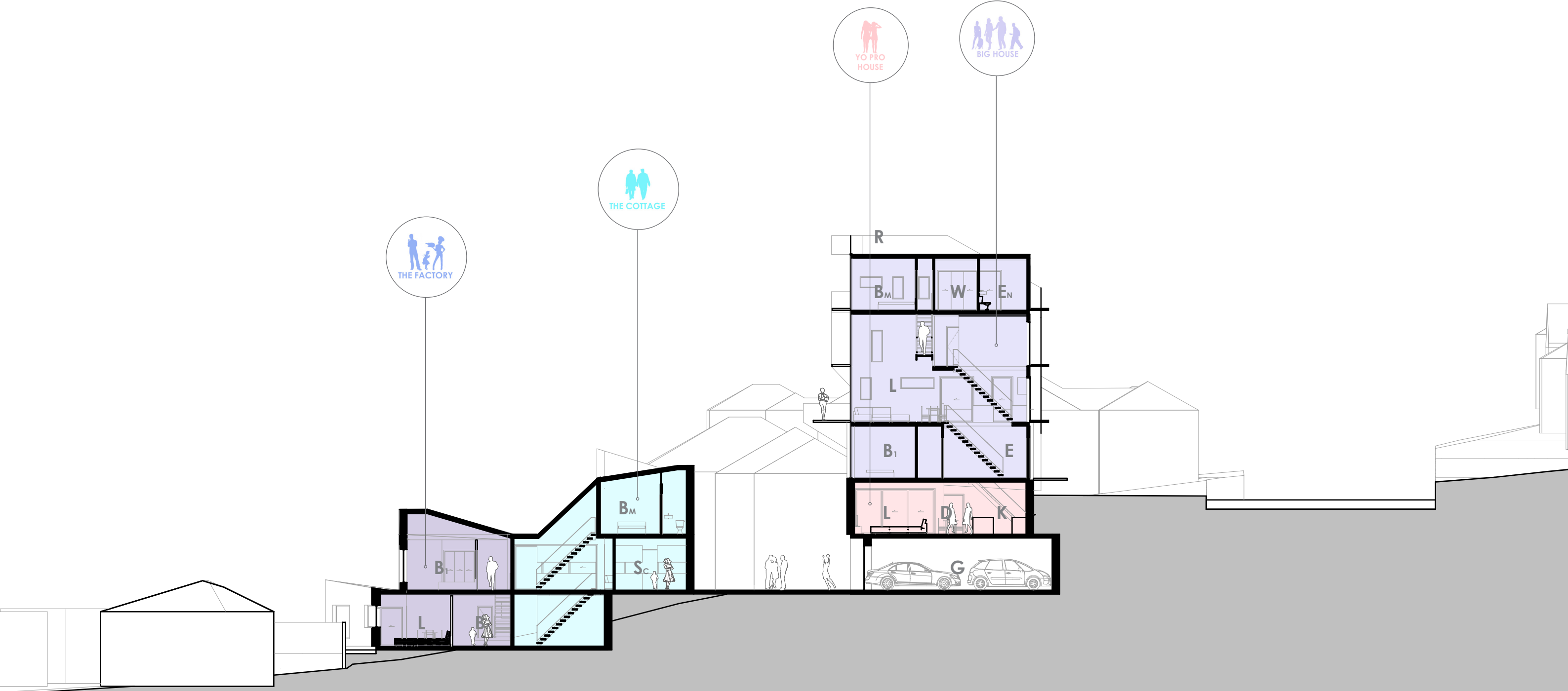


Fig.5.38 | Section AA.



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## CRITICAL REFLECTION OF PHASE THREE

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Introducing the concept of a Continuous Yard and screen to the vertical configuration proved a successful tactic to reinforce the suburban ideals within a high density typology. The Cloud Buster reinforces the suburban ideals through:

### Independence

- Unique and quirky identities for the three Cloud Buster dwellings
- Privacy gradients created through aligning openings between the external wall and shell

### Expansiveness

- The Continuous Yard connects every internal space to the created landscape.
- The Continuous Yards provides space to introduce natural light, air and outlook.

### Community

- The screen provides a surface to negotiate interactions between neighbours, similar to the function of the boundary fence.

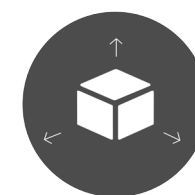
Creating a hybrid from the two typologies proved a successful way to increase density. Each typology was able to efficiently respond to either the ground or vertical condition, maintaining the suburban ideals in a manner not possible in previous design tests. Efficient site use allowed permeability and expansiveness to be retained while densifying the site. The two typologies also accentuated a diverse range of dwellings, providing capacity to accommodate large high value dwellings, single bedroom dwellings, live and work spaces, and anything inbetween.

Reflection at the end of Design Phase Three highlighted the potential to develop how:

- The new street edge responds to the existing condition.
- The space between the buildings is developed to foster a greater sense of community.
- Activities common in the yard are practised in this higher density setting.
- The neighbouring context is specifically addressed to retain the privacy and function of both new and existing dwellings.



INDEPENDENCE



EXPANSIVENESS



COMMUNITY

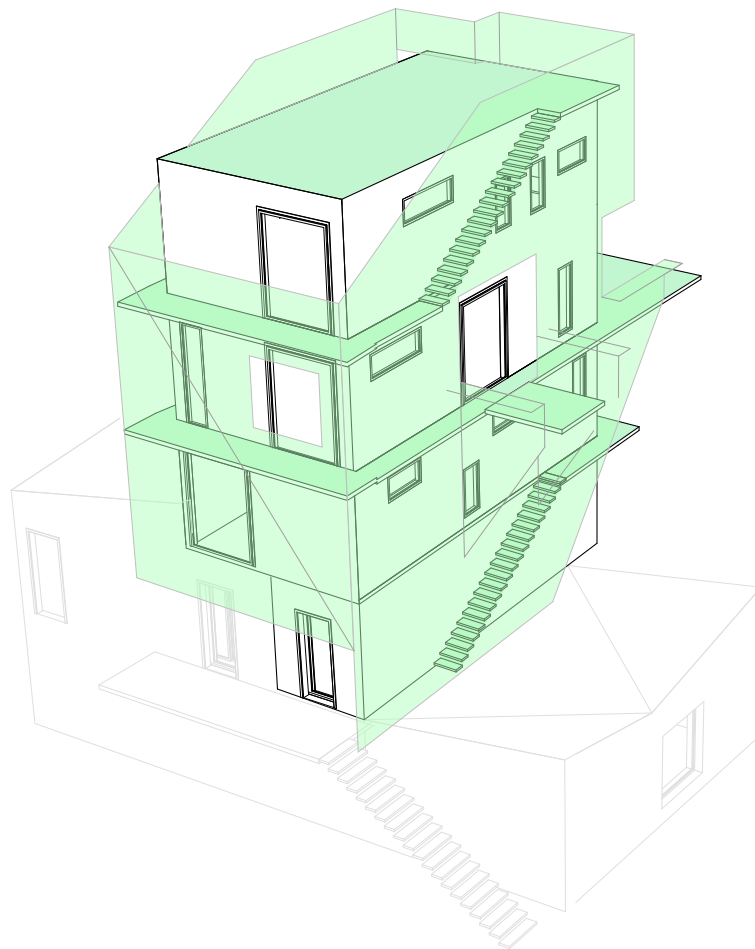


Fig.5.39 | Cloud Buster development diagram.

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# DEVELOPMENT

## DESIGN PHASE FOUR

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6.0

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*This phase explores how the design can be developed to strengthen a lifestyle that aligns with the suburban dream. It responds to the issues which arose from the reflection on Design Phase Three, and explores how aspects of the suburban dream can further inform a design outcome.*





DENSITY = 78 DPH

Fig.6.1 | Developed design - Scheme perspective.



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# INTEGRATING SHARED SPACE

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The back yard is a critical aspect of the kiwi suburban dream. It provides the flexibility to accommodate an expansive range of programmes. However, the yard is one of the first suburban elements to be reconsidered during residential intensification.

BIGyard Project (fig 6.2-6.8) is a high density development in Berlin by Zanderroth Architekten. This project explored how the yard could be reinterpreted into a gradient of shared spaces. The three typologies all offer a small private yard and access to the larger, expansive shared yard (fig 6.2). This shared nature allows

the yard to accommodate a range of amenities which exceed those common to a private suburban plot. Although the level of privacy achieved would be regarded as insufficient within a New Zealand context, their use of a gradient of privacy through multiple yard spaces resonates with the New Zealand suburban ideals of independence, expansiveness and community.

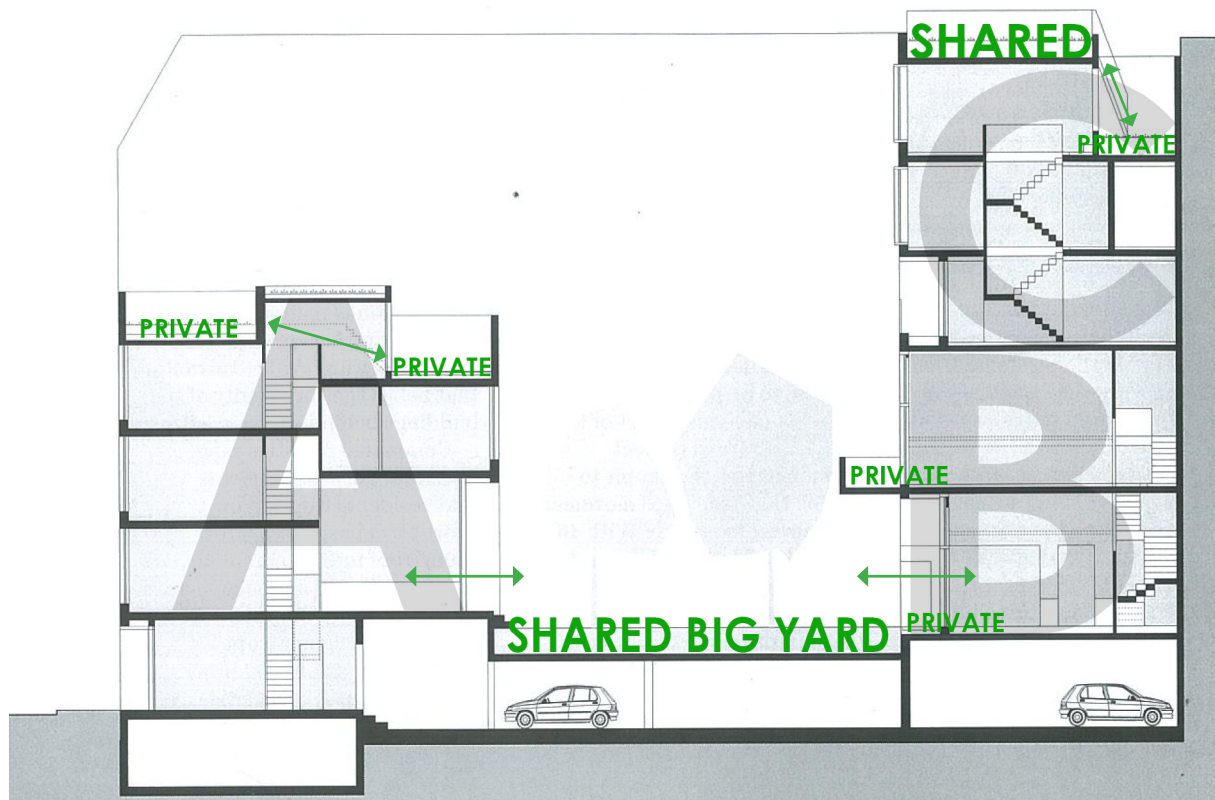


Fig.6.2 | BIGyard Project Section highlighting the connection between public and private outdoor space for each typology.



Fig.6.3 | Central shared space.



Fig.6.4 | (Left) Typology A, main living floor.



Fig.6.5 | (Right) Typology A, private roof terrace.



Fig.6.6 | (Left) Typology B, main living floor.

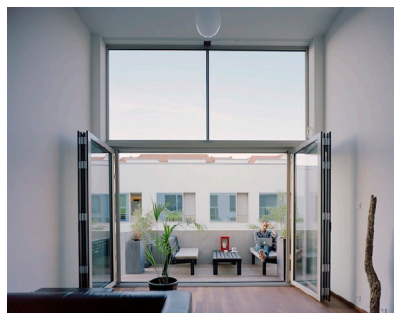


Fig.6.7 | (Right) Typology B, private outdoor area.

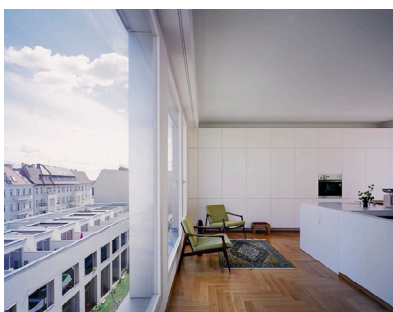


Fig.6.8 | (Left) Typology C, main living floor looking over city.

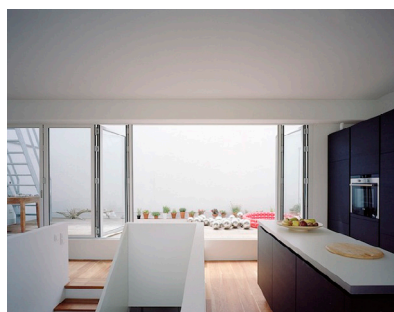


Fig.6.9 | (Right) Typology C, private outdoor area connected to main living space.

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## RECREATION

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A shared big yard, dubbed the Recreation Loop, was proposed and works in addition to the previously refined private outdoor space (fig 6.10). A range of tests explored the configuration of the yard which:

- Utilised underused roof space
- Connected to individual outdoor space
- Retained privacy of individual houses
- Increased permeability of site
- Extended to the perimeters of the individual sites
- Integrates with existing shared spaces.

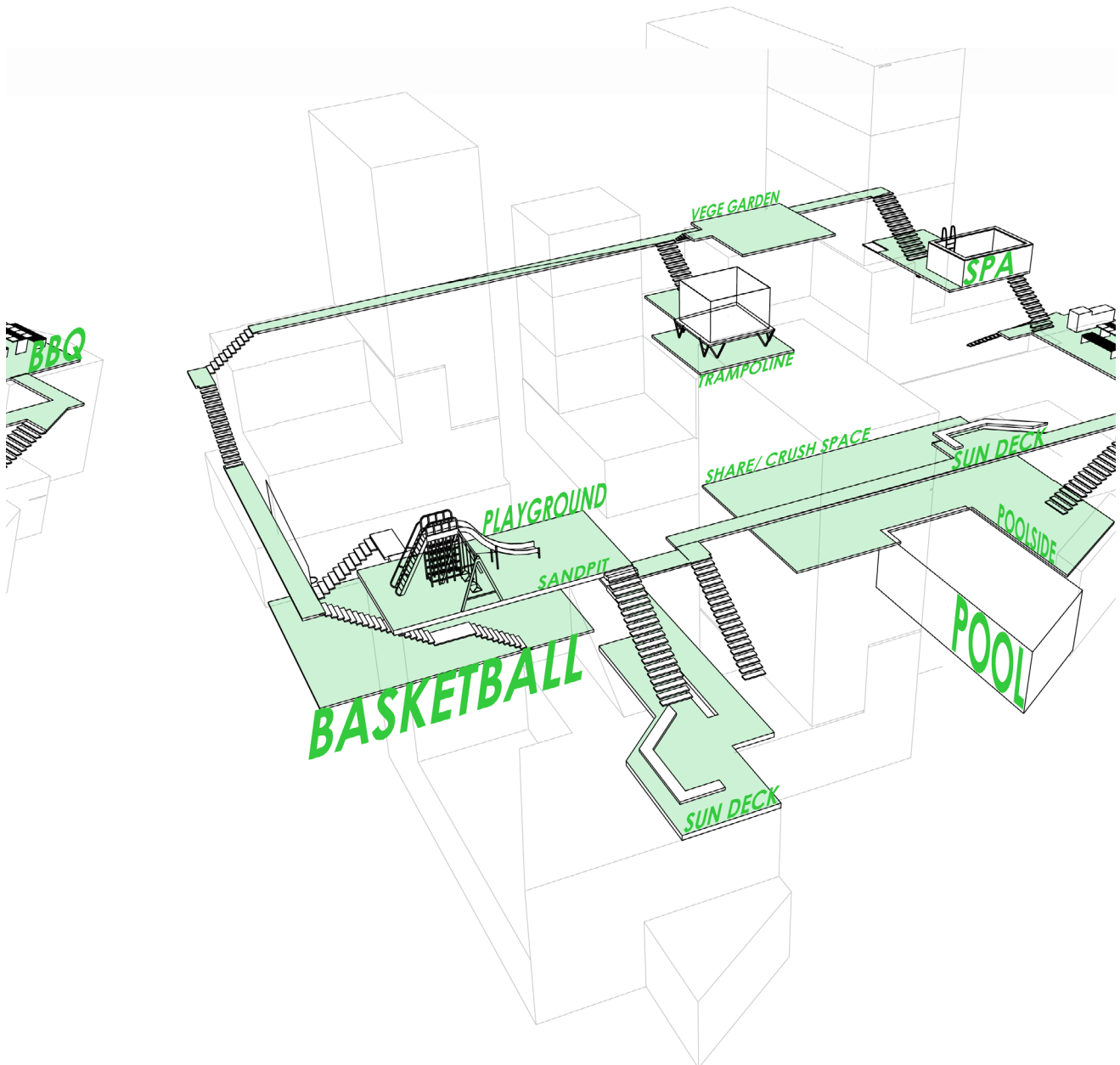


Fig.6.10 | Recreation loop program diagram.



The Recreation Loop was designed to connect previously underutilised green roofs. Each space contains a different programme drawn from the suburban back yard which collectively appeal to the full range of age groups accommodated. The Recreation Loop was articulated around the site avoiding the main aspects of all dwellings to maintain their privacy and independent nature.

The Sprawling Yard of the Ground Hugger and Continuous Yard of the Cloud Buster connect their private yard directly to the shared Recreation Loop. This spatial organisation is derived from the suburban house, meaning residents will be familiar with the arrangement, strengthening it as a suburban configuration.

The Recreation Loop also contains a range of sub-spaces, each within a close proximity to access points. These provide a breakout space where residents could sit in the sun with a coffee, creating opportunities to meet neighbours.

The Recreation Loop stretches to each property boundary creating a purpose for all residents to navigate the entire site. This will develop a sense of ownership extending past the direct boundaries of each dwelling and create an increased sense of expansiveness and residents' awareness of each other. These ideas develop a greater sense of community.

The Smart House and The Den were adjusted to create an area adjacent to the main shared space which could accommodate a pool and bathing area. Locating these elements on the same level as the shared space allowed their materiality to extend into the shared space, reinforcing its primary role as a leisure area, that also accommodates vehicle manoeuvring (fig 6.11).

The connection between the shared Recreation Loop, private outdoor living, and home arguably fosters a lifestyle beyond the capacity of the suburban dream.



Fig.6.11 | Recreation loop from BBQ area.

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## STRUCTURE + SERVICES

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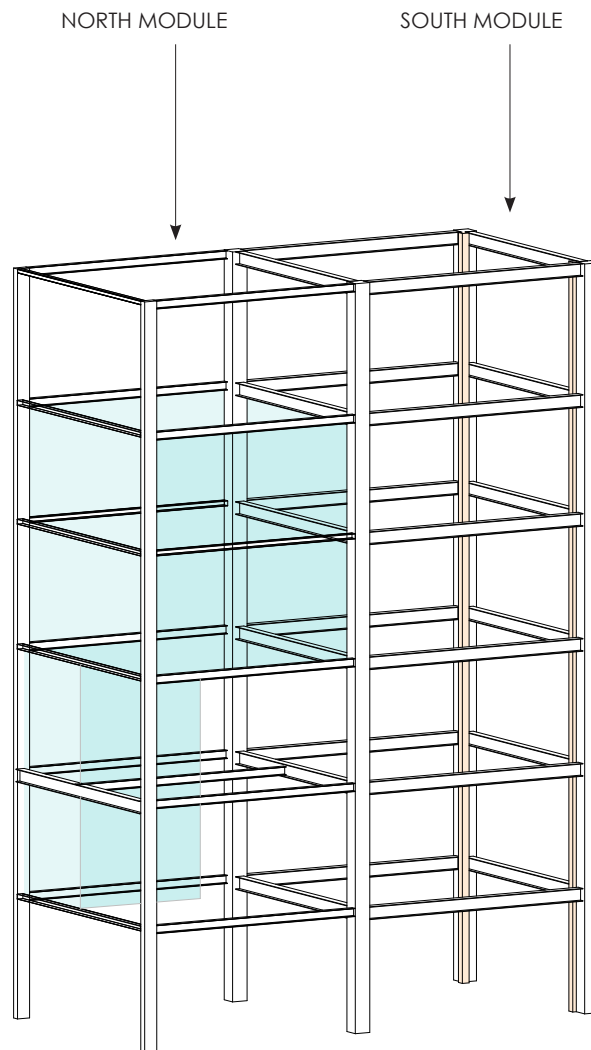
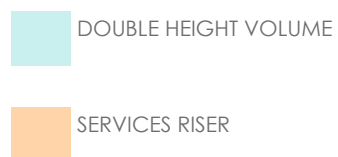


Fig.6.12 | Structures and services diagram.



Residential towers often require heavy structure and services to permeate each level of the building resulting in spatial qualities that contrast with the suburban condition. To reduce the effect of structure while retaining spatial flexibility the super structure for the towers was composed of a two way steel moment frame. A moment frame super structure allows all walls to be reconfigured easily if spatial requirements change. Moving the structural core to the southern module of the tower allowed each double height space to be free from large structural elements, accentuating the expansive light qualities of the space. To reduce eccentricity, the northern frame is increased in size to closer align the centre of mass and centre of rigidity. The centre of mass is south of the centre of the floor plate due to the decreased mass of the northern double height spaces.

The steel moment frames are constructed from SHS columns with fixed joints connected to I beams. Smaller concrete filled SHS form gravity columns which are used at the northern end of the tower, where they are able to be completely concealed within the wall framing.

The independent nature of each tower allowed ventilation services to be accommodated within the ceiling space of each floor, with air intake and extract air serviced directly to the outside. The only services which are not able to be concealed within the wall framing are drainage and sewerage. These have been located in risers adjacent to the southern columns where they are generally concealed within cabinetry, rendering their effect minimal.



# COMBINING DIVERSITY

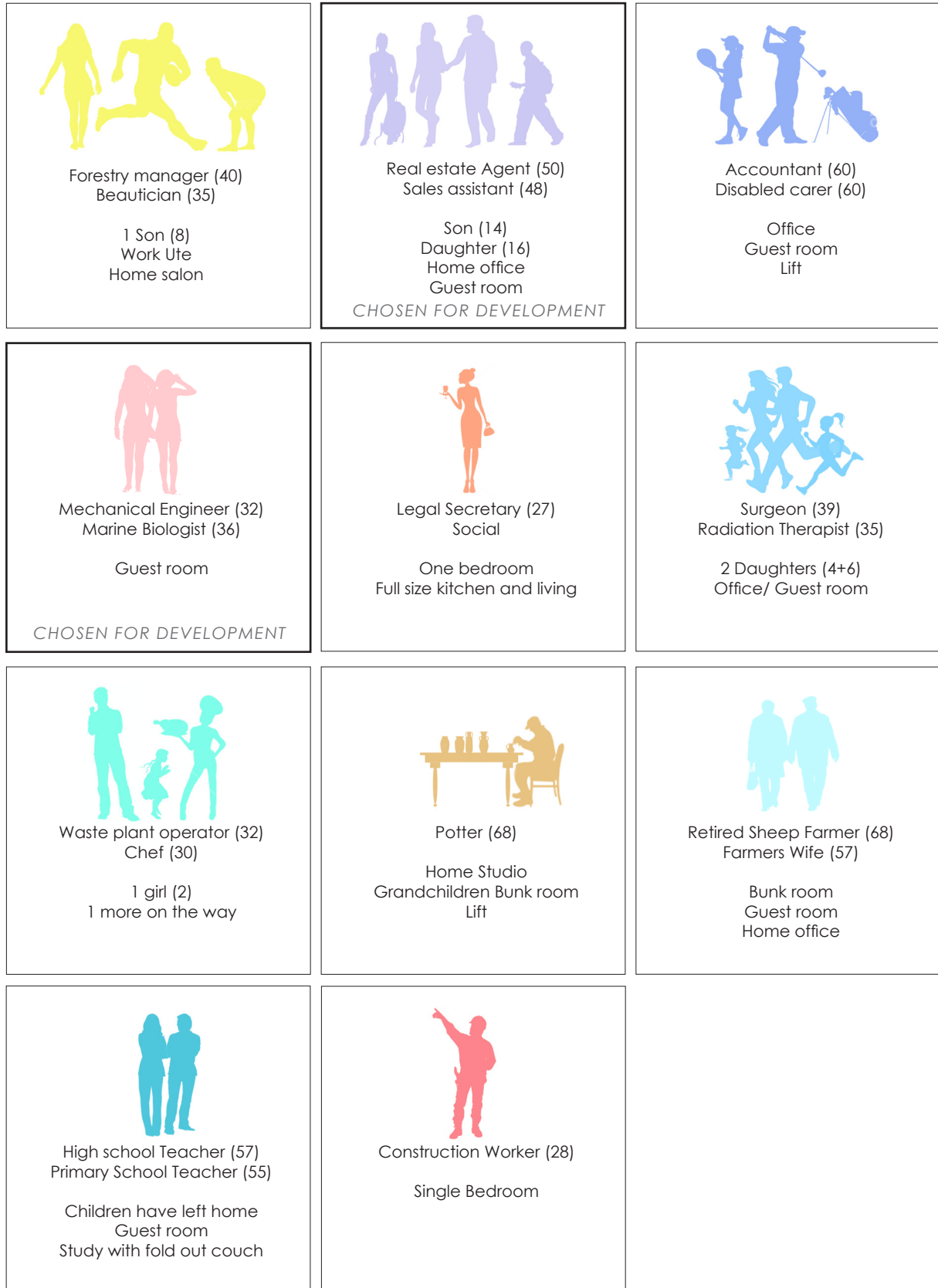


Fig.6.13 | Persona diagrams.

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# CONFIGURING DIVERSITY

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Fig.6.14 | Configuring diversity diagrams.

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# BIG HOUSE

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Fig.6.15 | Model photograph - Big House.



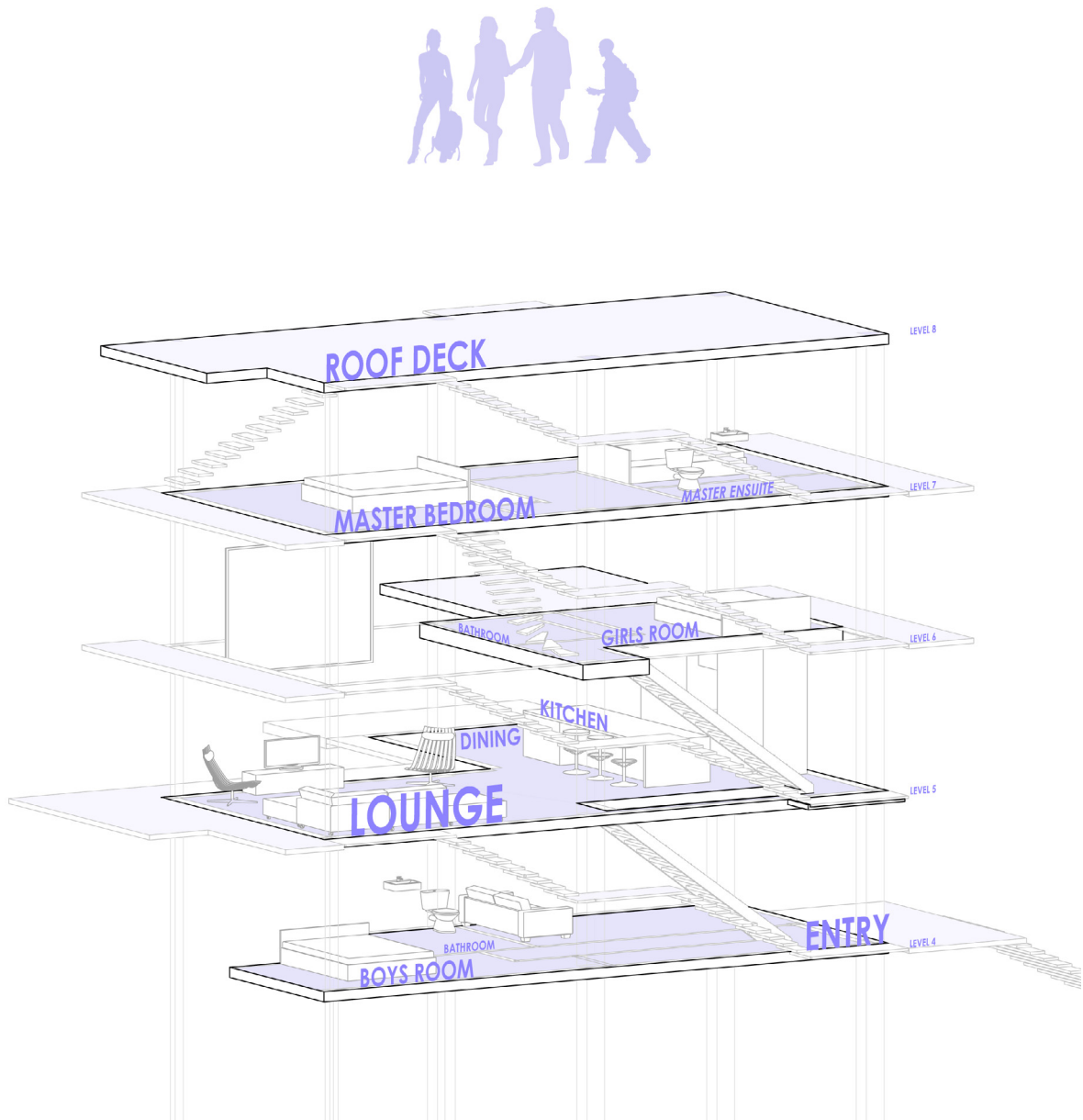


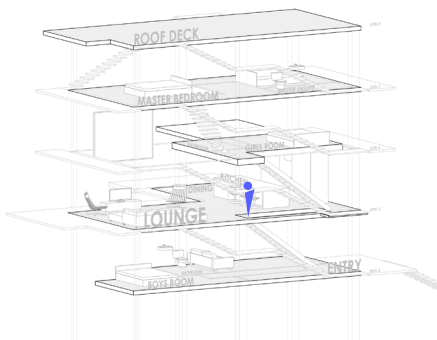
Fig.6.16 | Big House program diagram .

Retaining a connection to the street, the Big House was designed for a family of four as a mixed use typology where the real-estate agent could operate a home office, while being a part of the family's daily lives. The office looks over the street and is accessed from the entry space through a large surface sliding door. The living area extends from the street level entry to the first floor where the open plan living, dining, and kitchen areas support entertaining and capture views out towards inner Waitemata Harbour. A double height ceiling over the living area brings afternoon

light deep into the space and creates a focal point for the home. The children's bedrooms have been split, one above and one below the living area, creating expansiveness by spreading occupation throughout the house. The third floor of the dwelling, located on level seven of the development, is the most private. It accommodates a guest bedroom facing southeast and the master bedroom facing northwest, gaining views above the tree canopy. The fourth floor is a secluded open roof deck with an outdoor bath which can be accessed from all rooms via the private Continuous Yard.



Fig.6.17 | Double height living space showing light filtered by planted screens and capturing views out to the harbour.



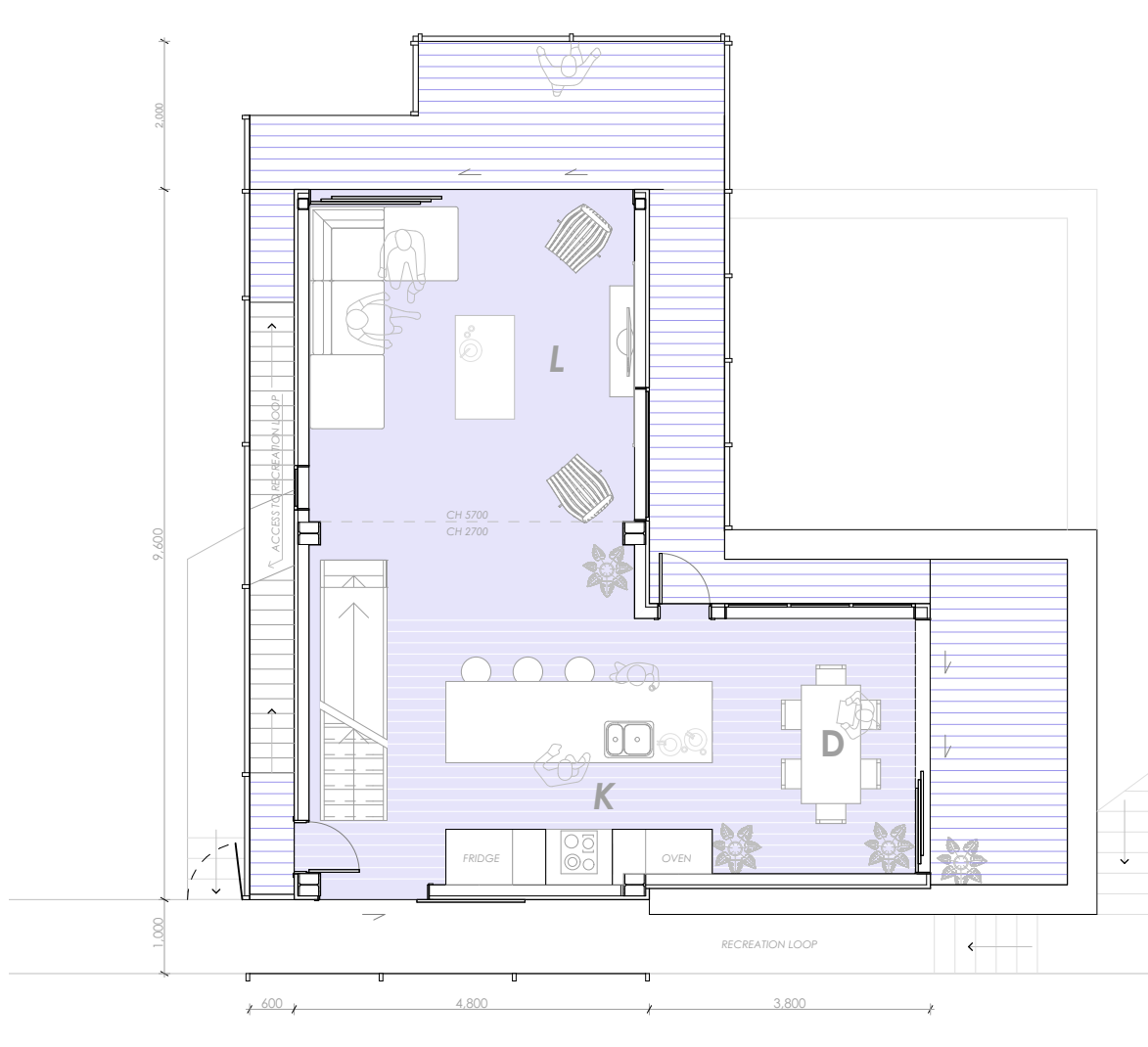


Fig.6.18 | Living area floor plan (5th floor) 1:100.





Fig.6.19 | View from street depicting the individual dwelling encompassed by a dematerialising screen.

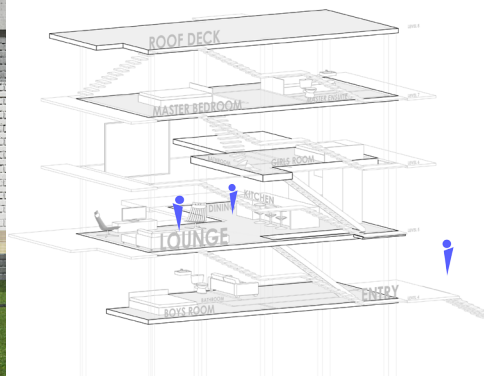




Fig.6.20 | Open plan kitchen linking dining and living spaces.

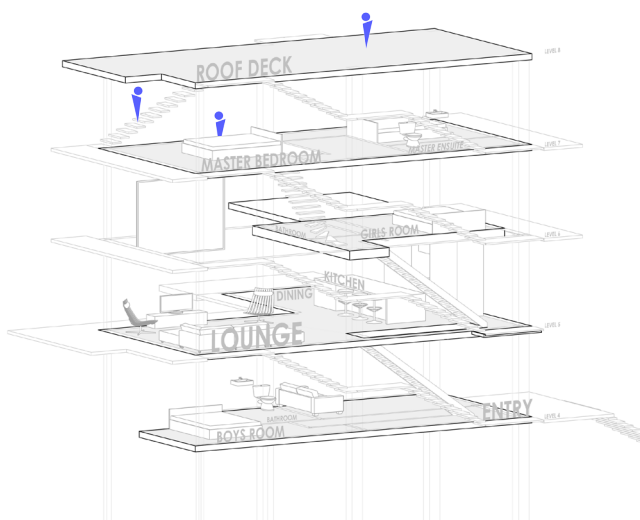


Fig.6.21 | Dining area blending with the exterior condition.

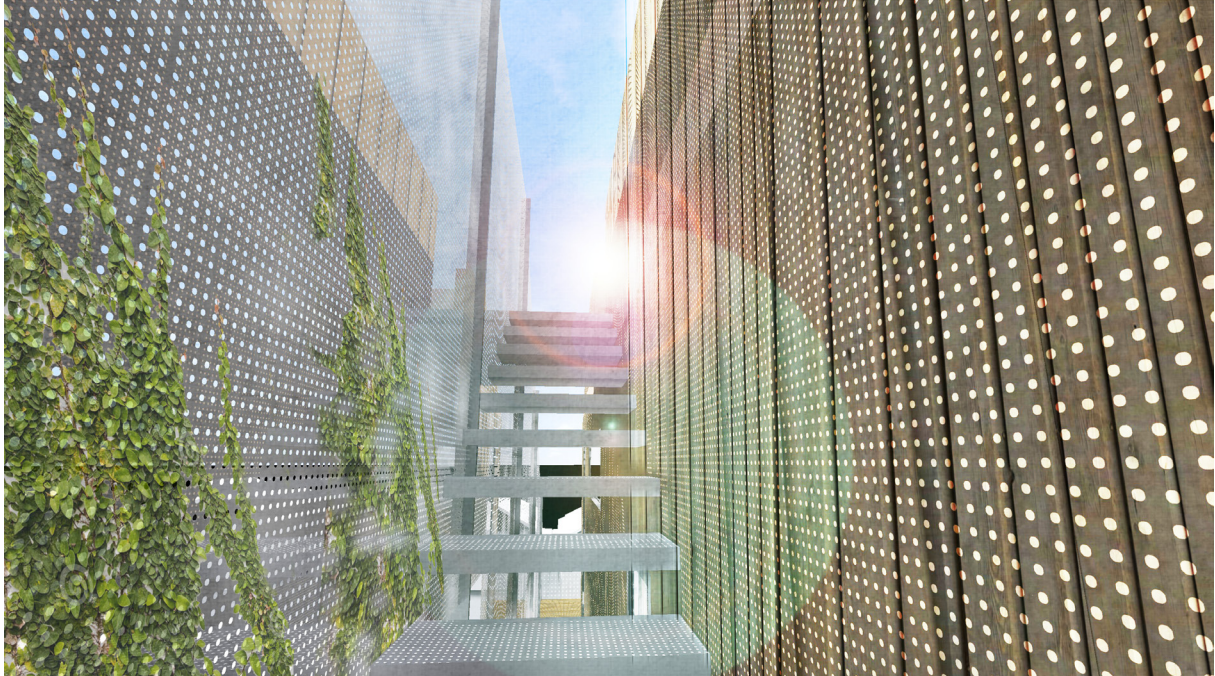




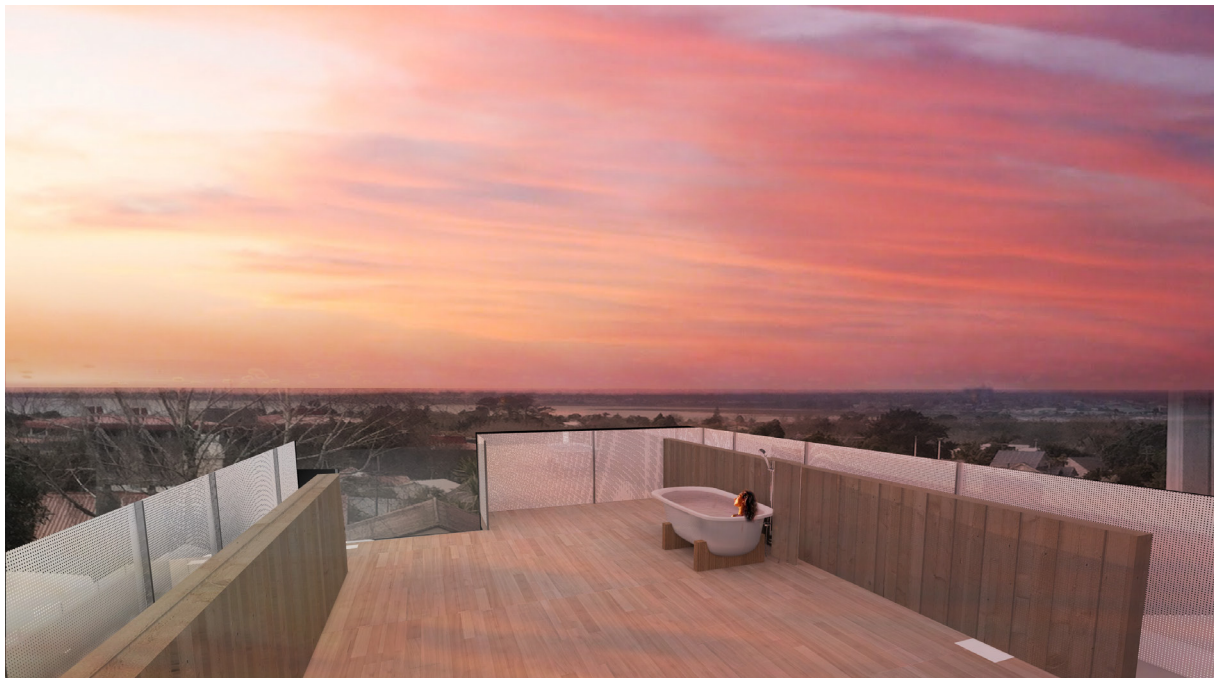
Fig.6.22 | Master bedroom as a private sanctuary looking out to the harbour.







*Fig.6.23 | Continuous Yard externally linking all spaces. The planted screen choreographs a relationship between neighbours.*



*Fig.6.24 | View from the private deck, capturing the last of Auckland's setting sun.*



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# YO PRO HOUSE

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Fig.6.25 | Photograph of model - Yo Pro House.

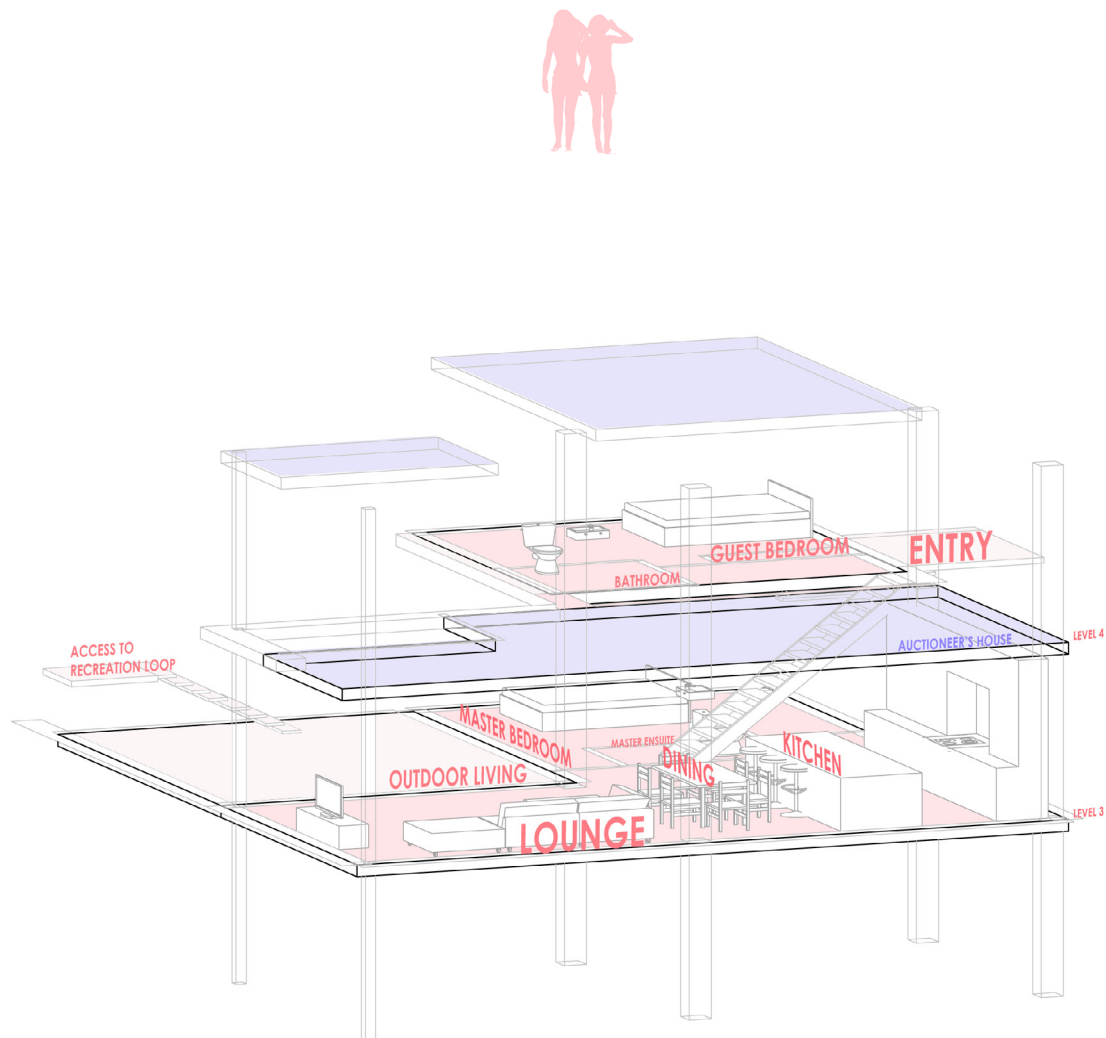


Fig.6.26 | Yo Pro House - Program configuration.

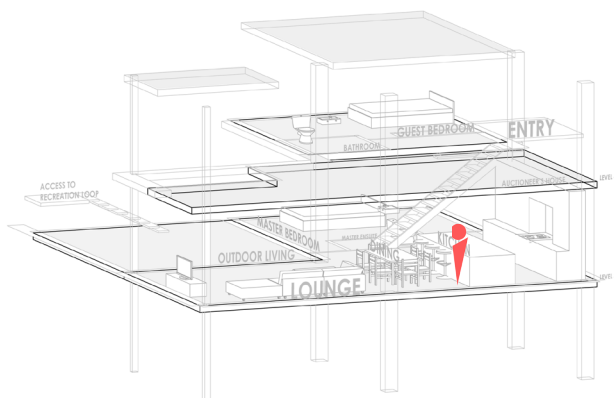
Designed for two young professionals - a mechanical engineer and a marine biologist - the Yo Pro House is a compact suburban home. The entrance is located next to the Big House at street level. The Yo Pro House drops down to the kitchen, dining, and master bedroom level which all open onto the courtyard. The main living area fosters entertainment, but also operates as a relaxed home for two. A double height space between the lounge and outdoor

area brings northern sun deep into the dining and kitchen area, merging the interior and exterior spatial qualities. The threshold formed by the ensuite between the master bedroom and living area creates privacy without closing this space off. A second bedroom and main bathroom are located on the upper floor by the entry. The deep masonry reveals reference the permanence of the surrounding masonry bungalows.





Fig.6.27 | Living space from the kitchen looking out over the lounge to the outdoor area.



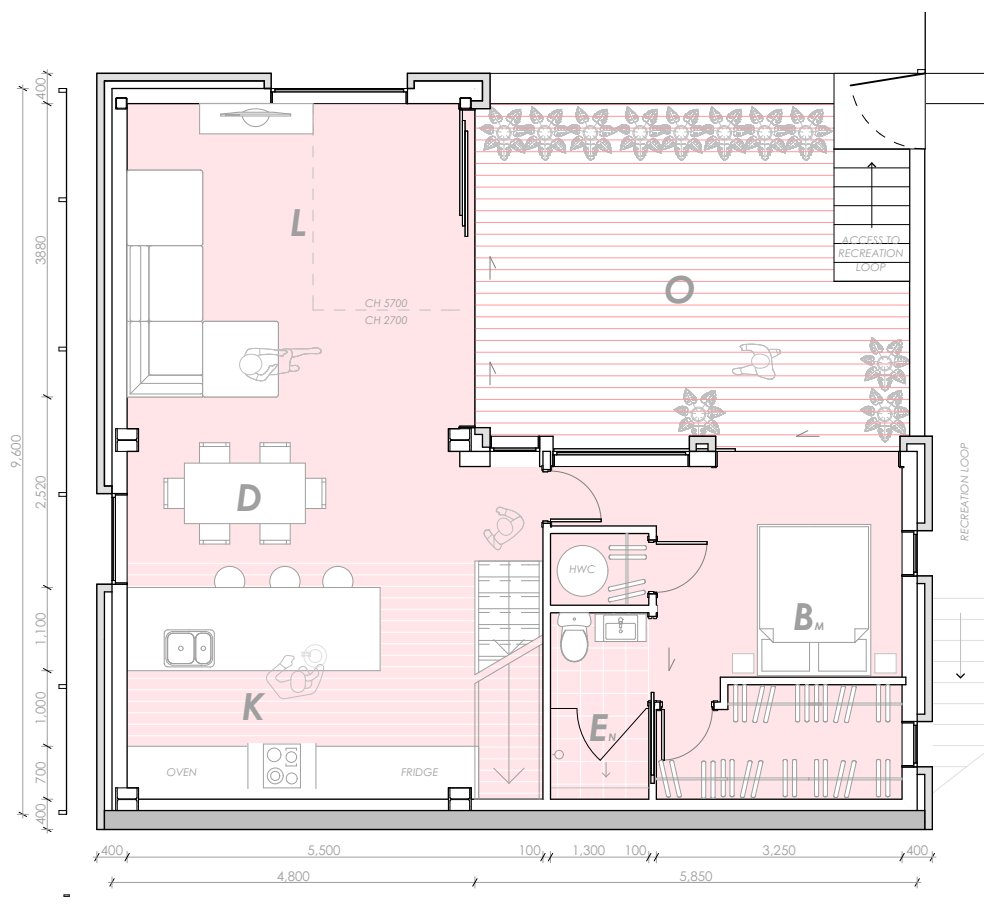


Fig.6.28 | Living floor plan (3rd floor) 1:100.

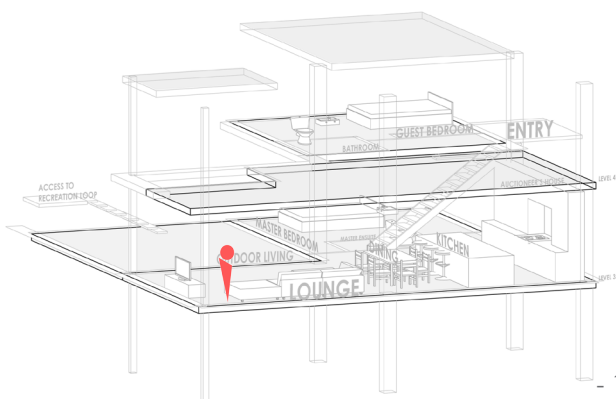


Fig.6.29 | (Top) Entry - Materiality depict the individual house and suggests it interlocks below the neighbouring Big House.

Fig.6.30 | (Bottom) A view back towards the entry showing a full sized kitchen.



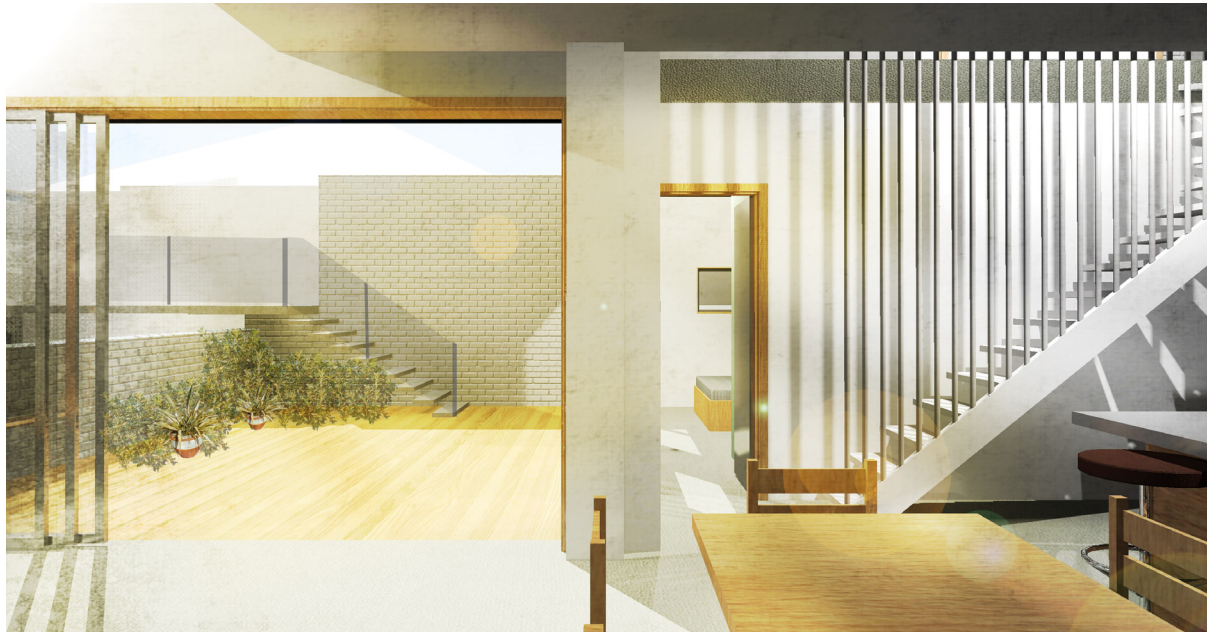
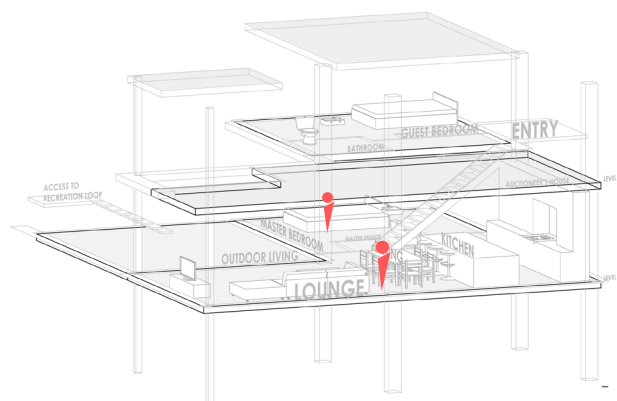


Fig.6.31 | (Top) Looking towards the outdoor space the compact but expansive organisation of the house is clear. All spaces merge around the central node and outdoor area.  
Fig.6.32 | (Bottom) View from master bedroom.





## STREET

In line with the surrounding suburban dwellings, the street façade references the independent ownership structures and internal configurations of the new development. Independence is expressed through both varying materiality and form. The form is accentuated by the towers, which create variety and permeability similar to the surrounding suburban condition where built relief is offered along the street edge.

Removing the garages from the street edge reduces the apparent density of the development and, like the existing bungalows, creates the appearance of a pedestrian focused development where each front entry is clearly expressed to the public.



Fig.6.33 | Street elevation.



Fig.6.34 | Street elevation.



## SECTION AA

A long section through the development illustrates how the dwellings interlock and their relationship with the existing context. The towers are situated between the established trees.





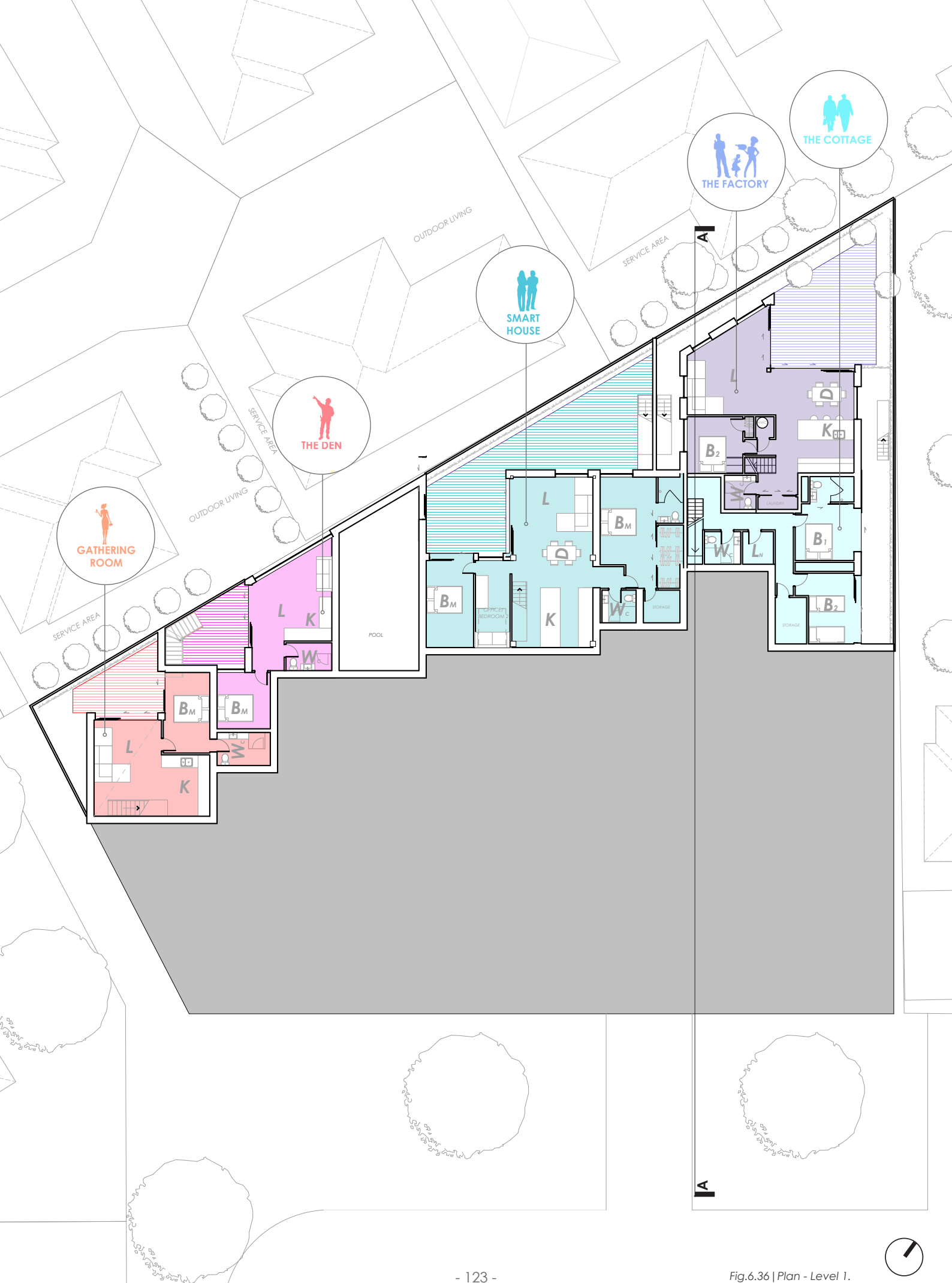
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## LEVEL 1

1 : 2 5 0

### SURROUNDING CONTEXT

The site is surrounded by established houses on three boundaries. To ensure the suburban ideals were created for the new development and retained for the existing context, their configurations were analysed to highlight problem areas. Fig xx shows a range of interventions incorporated along the boundary edge. The effect of the new development on the surrounding context was considered at the scale of the building mass during each previous design phase, however, fencing, vegetation, and walls still needed to be articulated.

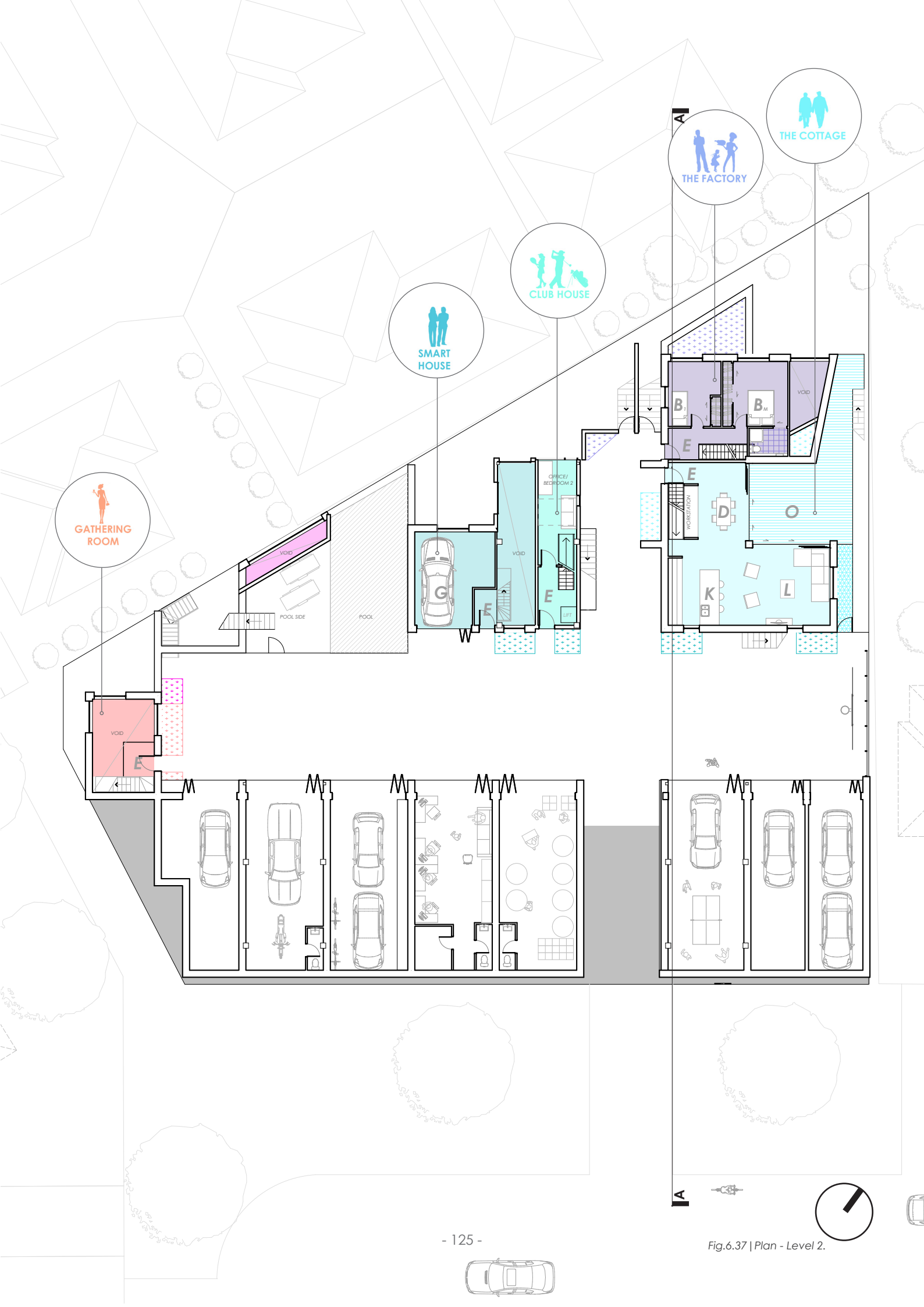


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## LEVEL 2

1:250

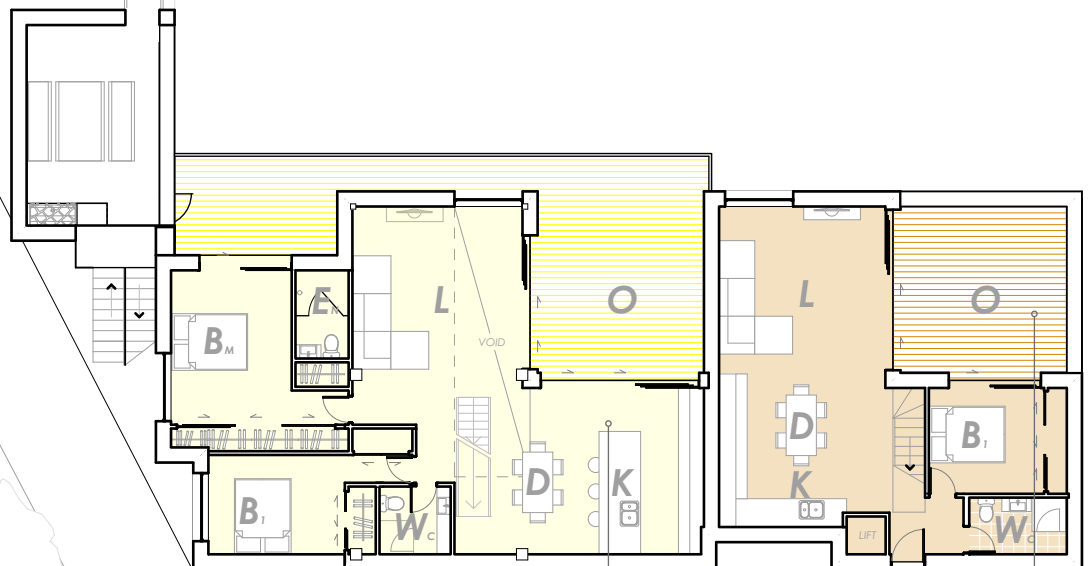
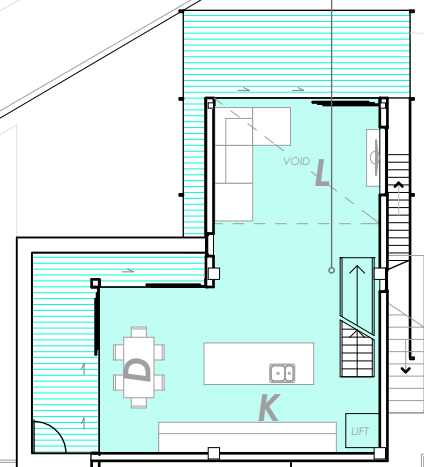


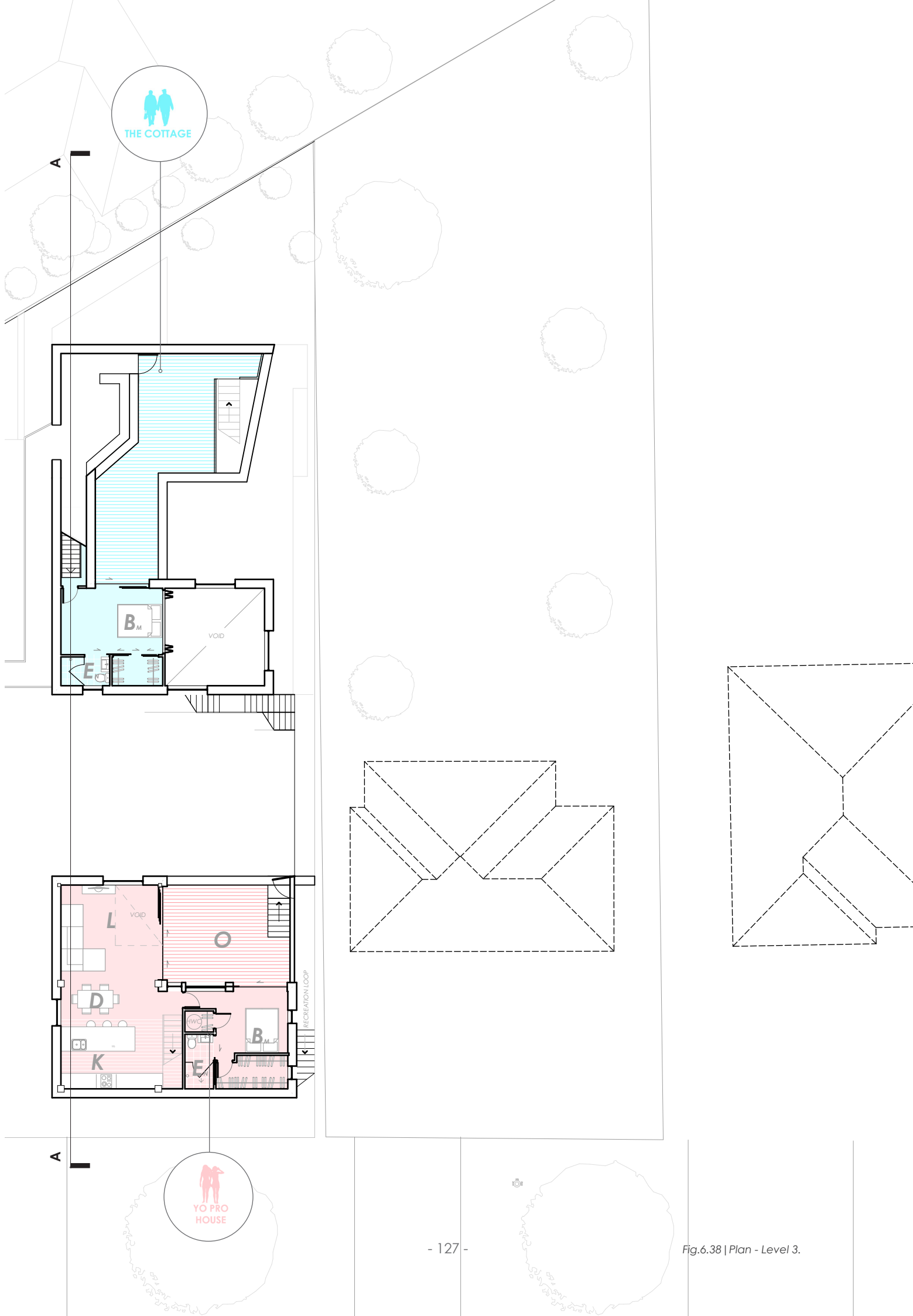




# - LEVEL 3 -

1:200



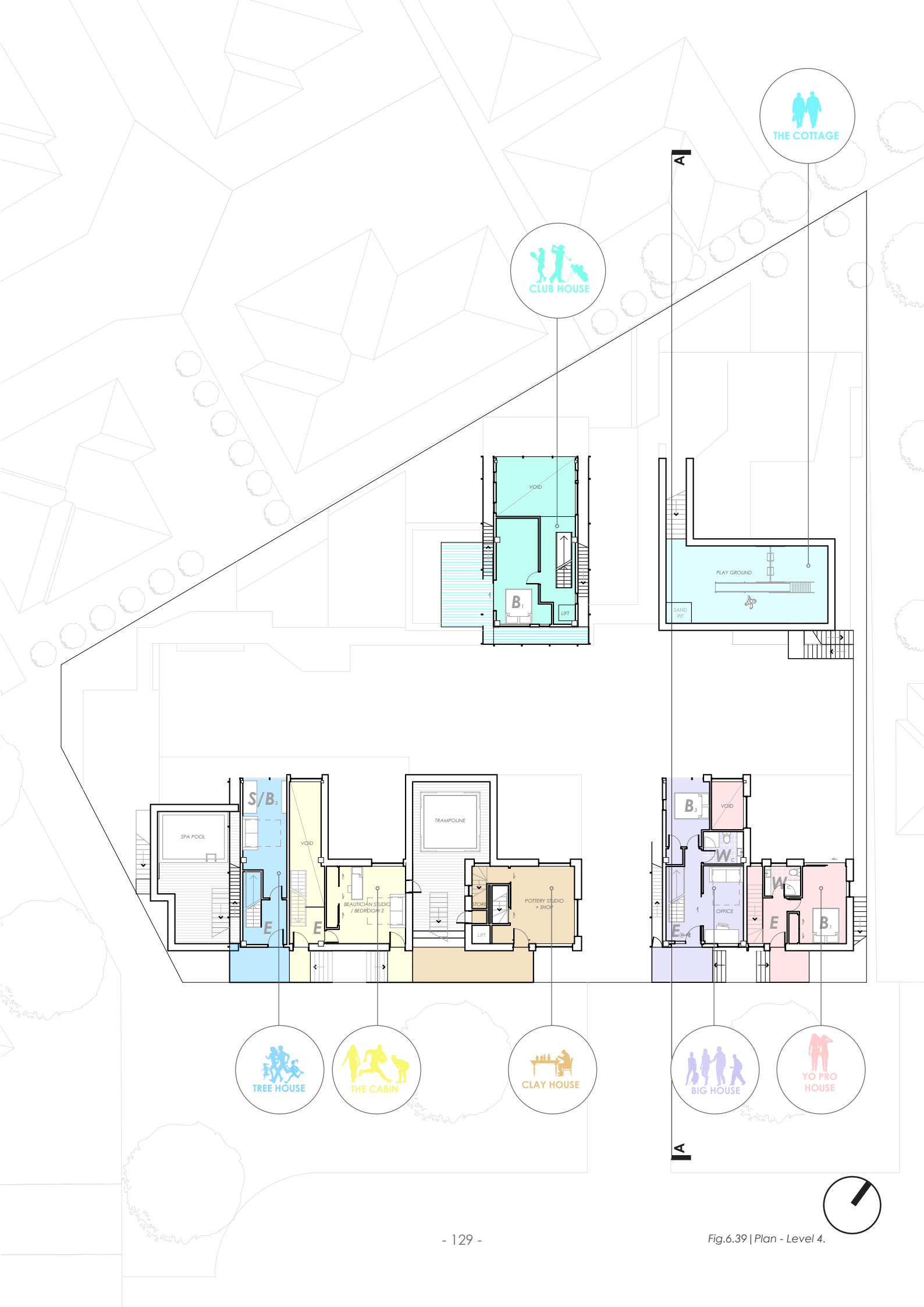




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## LEVEL 4

1:250

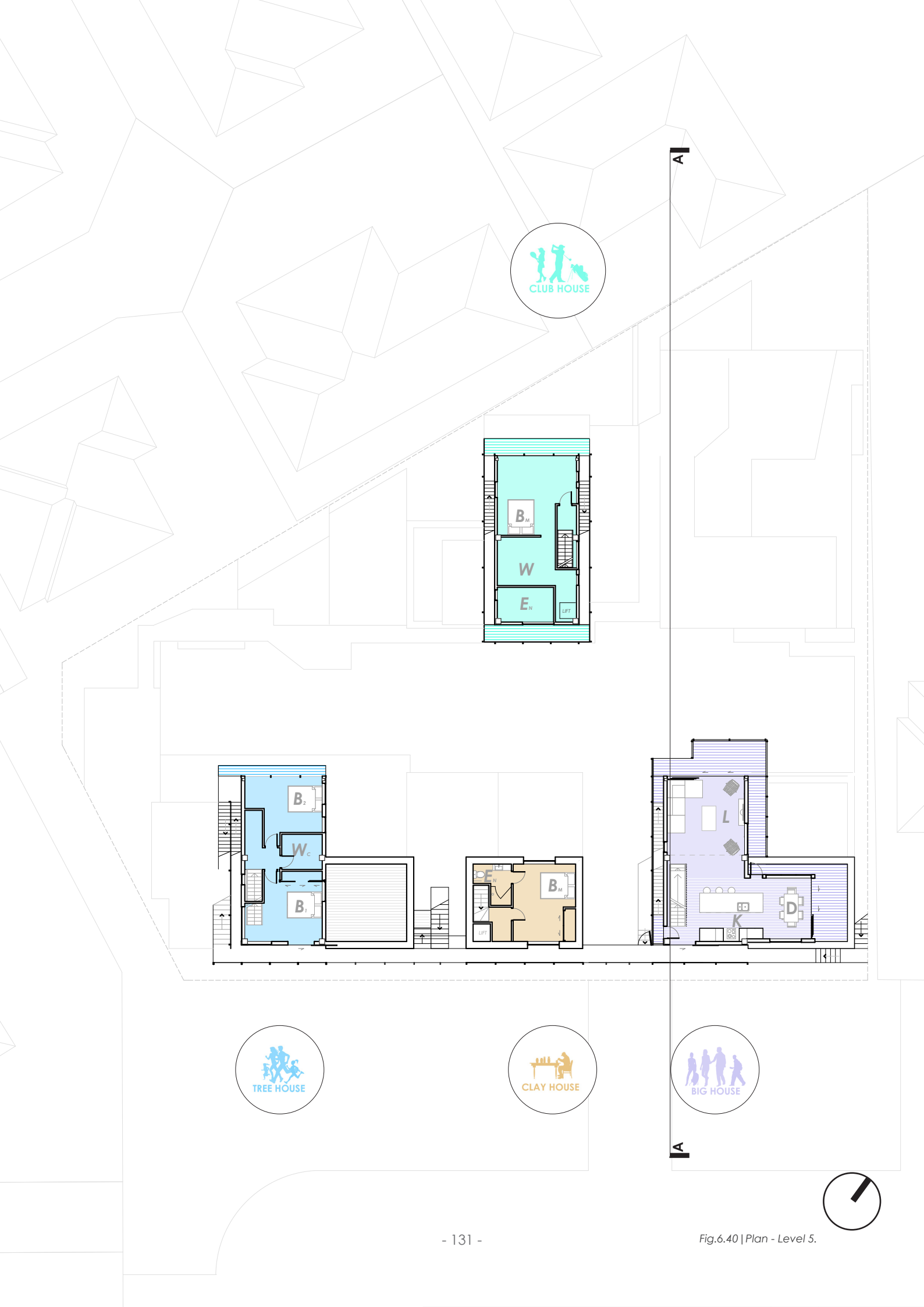


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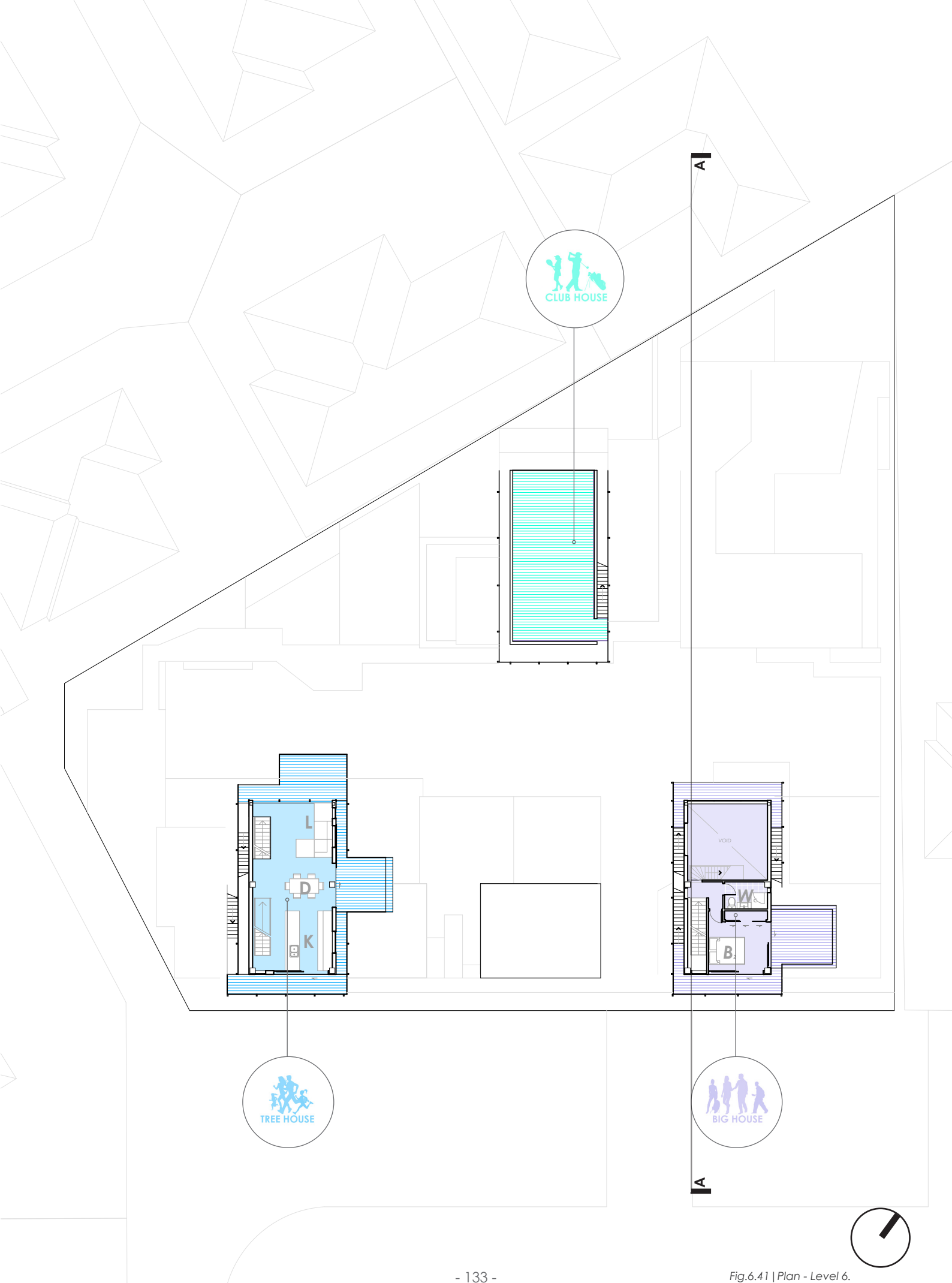




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## LEVEL 6

1:250





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## LEVEL 7

1:250



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## DEVELOPING SURROUNDING SITES

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6 - Fig.6.43 | Model - Proposed redevelopment of surrounding sites.



Within the context of the proposed Unitary Plan, the surrounding sites are subject to the same level of densification. This exploration aimed to examine the effects and opportunities when developing the surrounding sites using the same methodologies, and whether suburban ideals could be retained within that replicated context.

The surrounding sites were paired as dual sites with shared vehicle manoeuvring space created behind the first row of houses. This initially introduced three variations as the topography operates in different directions in relation to the street. Cloud Buster typologies were distributed throughout the new dual sites, accounting for shading and its effect on the surrounding context (fig 6.44-6.45). Areas below the Cloud Busters were developed with Ground Hugger typologies, utilising the available space.

Developing dual sites aims to reduce monotony at the street scale. Each site development is configured independently in relation to height and layout fracturing any grids established between sites (fig 6.43). The independent nature of each development fosters further form and materiality differentiation. Each site can vary the Ground Hugger material from white bricks to any range of material (fig 6.47). Diversity created by the articulation of form and material within an independent but repetitive framework is similar to the pattern and variation of the existing bungalows.

The prominent Cloud Buster typologies were oriented in relation to the street and laid out in relation to visual permeability and sun access, resulting in two along the street edge per dual site. This configuration also retains the underlying site grain of the existing bungalows (fig 6.47). Recreating the grain of the existing suburban typology helps to integrate old and new while reducing the perceived density of the area, enhancing permeability and expansiveness.

- **Existing:** 13 houses -14 dph



Fig.6.44 | Surrounding lots paired into dual sites.

- **Proposed:** 75 houses -78 dph



Fig.6.45 | Conceptual development of dual sites.

#### KEY





*Fig.6.46 | Development of surrounding sites - Model.*



Fig.6.47 | Benfield Ave - Proposed new suburbia.

- **Existing:** 13 houses -14 dph
- **Proposed:** 75 houses -78 dph







# CONCLUSIONS

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## 7.0

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The suburban dream defines the kiwi lifestyle for the majority of New Zealanders, however, this form of living is reliant on greenfield development and cannot be maintained within New Zealand's growing cities. Current medium-density housing meets the requirements for a compact city but fails to appeal to the majority of New Zealanders. Initial research highlighted a low attraction for current medium-density housing due to the lack of suburban ideals.

In response to the lack of appeal, this design-led research investigation explored how medium-density infill housing can foster ideals of the suburban dream, and ultimately the kiwi lifestyle. Three key ideals of; independence, expansiveness, and community, were highlighted as key architectural criteria for subsequent design explorations.

Design Phase One explored individuality through a study of Atelier Bow-Wow's Japanese infill housing and their theory of behaviourology. The research highlighted the lack of a human dimension in New Zealand's medium-density housing and explored the introduction of personas as a method to create individuality. The use of different personas for each house allowed a shift away from monotonous repetitive units, to achieve diversity and individuality despite multi-unit scale. The personas also drove a human scale and generated a cohesive character, expected of a suburb. The development of dual façade screens was another significant outcome of this design phase. They created a tool for addressing the interstitial boundaries that could increase expansiveness without compromising privacy.

Design Phase Two overcame the imposed confinement of a compact site, by exploring the concept of merging thresholds. Influenced by the work of Sou Fujimoto and Ryui Nishizawa, it looked at how gradients of privacy and blending interstitial boundaries were able to generate expansiveness. These findings were articulated in the design of a new typology, named Ground Hugger, which was designed to efficiently work with site and programme variations. The space between dwellings were developed to further generate expansiveness through shared spaces, and extension of private, independent house thresholds. Design Phase Two also explored how vehicles could be accommodated within the development. It successfully accommodated independent garages which open onto shared space. Their placement removed garaging from the street and ensured an active shared space. The garages were configured so their function could be easily adapted, in a similar way to a suburban condition. Integrating vehicles into the shared area created a level change, offering additional privacy to the dwellings whose primary aspect overlooks this space.

Design Phase Three looked to further increase density of the scheme by introducing a tower typology. Iterative physical and digital modelling highlighted the constraints and opportunities of the tower configuration. These findings informed the iterative design of a tower typology, named Cloud Buster. The Cloud Buster was able to successfully utilise airspace, enabling high value dwellings. However, the tower configuration required a large amount of space to generate expansiveness

making it inefficient, when compared to the Ground Hugger, on the lower levels. These two typologies were then combined, each being slightly reduced to improve expansiveness and significantly increase the overall density. Although the Cloud Buster typology exceeded the height restrictions for this zone, its articulation on a dual site references the grain of the existing bungalows. This combination creates expansiveness while significantly densifying and retaining a connection to the original suburban grain.

Design Phase Four further developed the space between buildings with particular focus on the relevance of these spaces to the suburban dream. Derived from the concept of a big back yard, this phase proposed a shared space named the Recreation Loop. This loop occupies previously underutilised areas of the site and accommodates a range of programmes derived from suburban back yards. The Recreation Loop; activates the space between buildings, provides opportunity for informal exchange, and extends the gradient of privacy to expand the individual dwellings private outdoor area through a secondary circulation route. The combination of these factors provide an amenity which far exceeds what is expected in suburbia and available in medium-density housing. Design Phase Four refined the design of the rest of the development and specifically addressed two houses in detail. The final stage of Design Phase Four explored the implications of methods established throughout this

research for more extensive development of the surrounding sites. It specifically highlighted opportunities and limitations which require further development.

This design-led research offers a significant new model for addressing infill suburban intensification in New Zealand's growing cities. It illustrates a methodology for developing medium-density housing which can provide a lifestyle which addresses and exceeds suburban expectations.



**INDEPENDENCE**



**EXPANSIVENESS**



**COMMUNITY**



## OPPORTUNITIES

Extending, altering and reconfiguring the suburban home is a significant aspect of the New Zealand suburban dream. These aspects have been considered within the building envelope, however, further research could explore the potentials for alterations and additions beyond this.

Part of Auckland's housing shortage issues have been attributed to the supply rate of the current construction industry. Exploring how this design could be adapted to suit efficient pre-fabrication methods would also provide further research opportunities.

This proposal has addressed one specific site. Each site and topography creates its own set of constraints and opportunities, opening a range of potential research possibilities which would further augment how the typologies are manipulated. The adjacent context study addressed in Design Phase Four, highlighted three different topographic conditions which all offer further research opportunities.

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ALL IMAGES ARE AUTHORS OWN UNLESS OTHERWISE STATED



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**5.27|** Narrow geometry to accentuate the towers narrowness.

**5.28|** Screen to create additional shading on main aspect.

**5.29|** Alternative configuration.

**5.30|** Design Phase Three - Density = 78dph.

**5.31|** Plan Level 1.

**5.32|** Plan Level 2.

**5.33|** Plan Level 3.

**5.34|** Plan Level 4.

**5.35|** Plan Level 5.

**5.36|** Plan Level 6.

**5.37|** Plan Level 7.

**5.38|** Section AA.

**5.39|** Cloud Buster development diagram.

## 6.0 DEVELOPMENT

**6.1|** Developed design - Scheme perspective.

**6.2|** BIGyard Project Section highlighting the connection between public and private outdoor space for each typology. (Green annotation by author)

*Allen, Isabel. "Berliner Format." Architectural Review 230.1376 (2011): 73–81, 4. Print.*

**6.3|** Central shared space.

*"BIGyard Zelterstraße 5." Thisispaper Magazine. N.p., n.d. Web. 15 Sept. 2014. <http://thisispaper.com/zanderroth-architekten-BIGyard-Zelterstrasse-5>*

**6.4|** Typology A, main living floor.

*Ibid*

**6.5|** Typology A, private roof terrace.

*Ibid*

**6.6|** Typology B, main living floor.

*Ibid*

**6.7|** Typology B, private outdoor area.

*Ibid*

**6.8|** Typology C, main living floor looking over city.

*Ibid*

**6.9|** Typology C, private outdoor area connected to main living space.

*Ibid*

**6.10|** Recreation loop program diagram.

**6.11|** Recreation loop from BBQ area.

**6.12|** Structures and services diagram.

**6.13|** Persona diagrams.

**6.14|** Configuring diversity diagrams.

**6.15|** Model photograph - Big House.

**6.16|** Big House program diagram .

**6.17|** Double height living space showing light filtered by planted screens and capturing views out to the harbour.

**6.18|** Living area floor plan (5th floor) 1:100.

**6.19|** View from street depicting the individual dwelling encompassed by a dematerialising screen.

**6.20|** Open plan kitchen linking dining and living spaces.

**6.21|** Dining area blending with the exterior condition.

**6.22|** Master bedroom as a private sanctuary looking

out to the harbour.

**6.23|** Continuous Yard externally linking all spaces.

The planted screen choreographs a relationship between neighbours.

**6.24|** View from the private deck, capturing the last of Auckland's setting sun.

**6.25|** Photograph of model - Yo Pro House.

**6.26|** Yo Pro House - Program configuration.

**6.27|** Living space from the kitchen looking out over the lounge to the outdoor area.

**6.28|** Living floor plan (3rd floor) 1:100.

**6.29|** Entry - Materiality depict the individual house and suggests it interlocks below the neighbouring Big House.

**6.30|** A view back towards the entry showing a full sized kitchen.

**6.31|** Looking towards the outdoor space the compact but expansive organisation of the house is clear. All spaces merge around the central node and outdoor area.

**6.32|** View from master bedroom.

**6.33|** Street elevation.

**6.34|** Street elevation.

**6.35|** Section AA - NTS.

**6.36|** Plan - Level 1.

**6.37|** Plan - Level 2.

**6.38|** Plan - Level 3.

**6.39|** Plan - Level 4.

**6.40|** Plan - Level 5.

**6.41|** Plan - Level 6.

**6.42|** Plan - Level 7.

**6.43|** Model - Proposed redevelopment of surrounding sites.

**6.44|** Surrounding lots paired into dual sites.

**6.45|** Conceptual development of dual sites.

**6.46|** Development of surrounding sites - Model.

**6.47|** Benfield Ave - Proposed new suburbia.

## 7.0 CONCLUSIONS

**7.1|** (Opposite) Developed design.