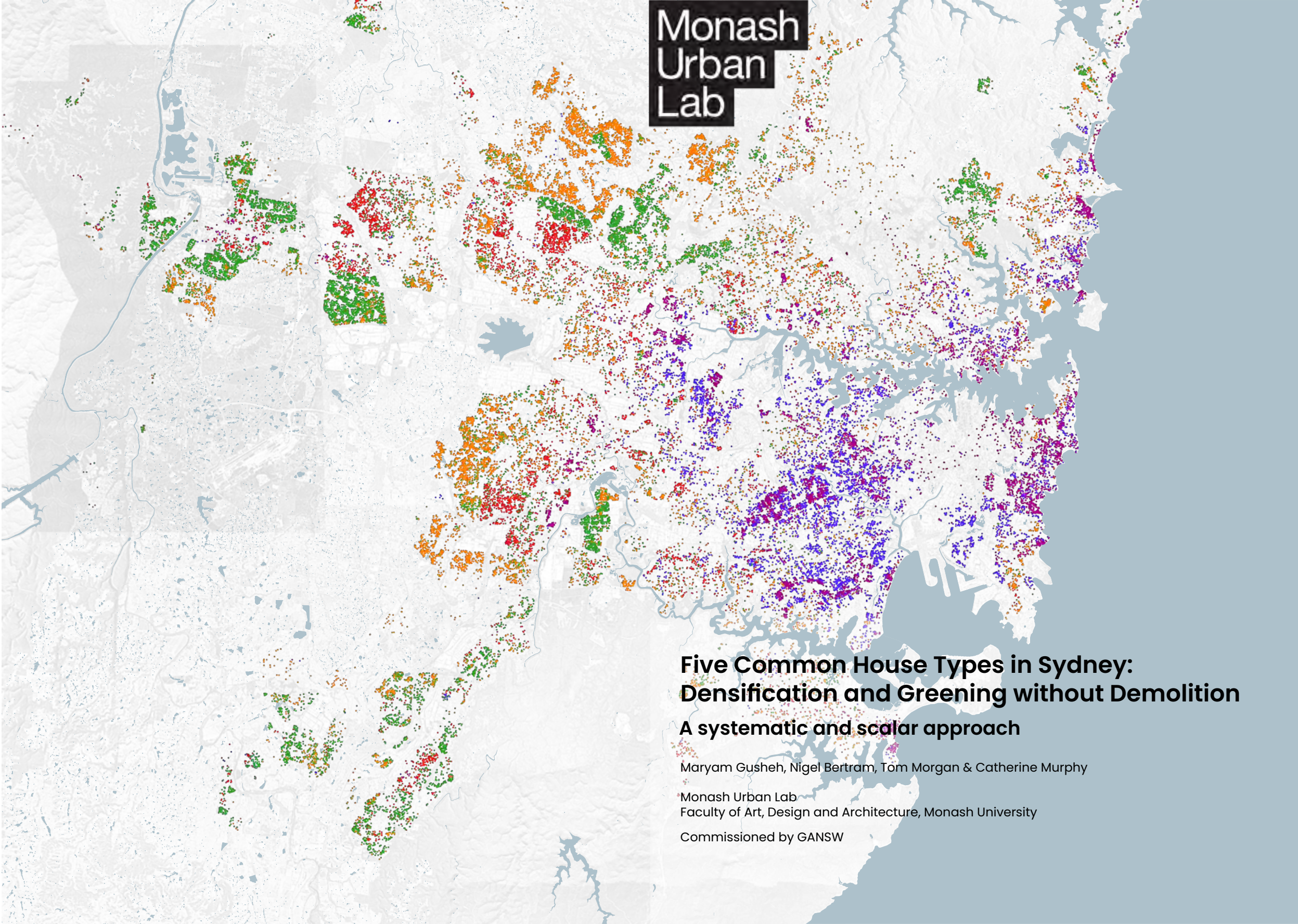


A map of Sydney, Australia, showing the distribution of five common house types. The map is overlaid with a grid of colored dots: green, orange, red, purple, and blue. The dots are concentrated in the central and eastern parts of the city, particularly around the harbor and in the inner suburbs. The map also shows the coastline, major roads, and some green spaces.

Monash
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Five Common House Types in Sydney: Densification and Greening without Demolition

A systematic and scalar approach

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Commissioned by GANSW

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Introduction

Project Summary

This project presents a typological analysis of five common housing types – Cottage, Bungalow, Six-Pack, Villa and Mansion – that can be found in large numbers across Sydney’s established suburbs. We have applied a systematic approach to cataloguing the characteristics of each type and mapping their quantities and locations, as a first step in considering their potential strategic contribution to the densification and greening of the city. The project contends that there is an embedded environmental, economic and social value in this existing urban fabric that is under-noticed and under-valued, and as a consequence, readily removed. This contention is supported by a review of literature on Sydney housing undertaken as part of this project, which confirms a gap in knowledge about common housing types.

Positing a dialogue about an alternative, incremental, soft density approach in Sydney’s established suburbs, this project begins this process by rendering the five common house types visible and knowable. Building on this, the project undertakes some preliminary design work on how this housing stock could be retained, rather than demolished, through replicable strategies for densification and greening – by adapting, extending and adding dwellings and landscaped areas. In so doing, this pilot study draws attention to this under-recognised asset, which, if viewed strategically and systematically, could offer significant benefits by increasing Sydney’s housing supply, retaining accrued value and addressing the impacts of climate change.

Strategic potential of existing housing

Our study has been structured around two propositions. The first is that common housing types have inherent architectural and urban characteristics, like quality construction, large plot sizes, and established trees and landscapes, all of which could be leveraged for incremental densification and greening. The second proposition is that this stock could be retained and leveraged in a sensitive way, in contrast to current infill delivery, which is negatively impacting suburbs through the loss of fine-grain typological and neighbourhood character, and canopy cover, and an increase in hard surfaces, through damaging demolition and re-building.

With these propositions in mind, we ask: How might we identify which dwellings could have the most potential for adaptation, where are they, and in what numbers? What if we adopted a hybrid approach whereby the ‘soft’ and incremental intensification and urban greening of common house types was incentivised alongside strategic infill and new builds?

This report considers these questions through a synthesis of typological study and city mapping, in a language and format that is intended to be productive for both design and policy work. In what follows, we briefly describe the policy context that has informed our investigation, our methodological approach and findings.

Densification and Greening: Policy Context

There are major imperatives for more housing and more greening to be rolled out at speed and in a sustainable way. Greater Sydney needs to accommodate rapidly growing populations, to be cooled in a warming climate, and to reduce its carbon footprint. However, the city is currently underperforming in relation to targets that aim to address these imperatives. This section briefly discusses issues relating to these targets, to establish the argument that we need new approaches to city making.

Densification Targets

“...at the heart of the problem is the fact we just haven’t built enough homes to meet the needs of a growing population, especially homes in places where people most want to live – that is, in established suburbs close to jobs, transport, schools, and other amenities.”¹ Brendan Coates, 2023

The NSW Government sets housing targets to accommodate projected population growth. For two decades there has been a failure to deliver on these targets, with infill housing supply hampered for reasons including high interest rates, supply chain issues, and shortages in labour, along with a complex planning system.² In a recent policy initiative, the NSW government is introducing new planning controls to build 138,000 new homes in established areas near train stations, as part of its commitment under the National Housing Accord to build 377,000 well-located homes across the state. However, it has been speculated that only 11,400 of these well-located homes are likely to be completed in that period.³ The impacts of this under-supply are being felt through increased property prices and high rents, as well as other impacts like Sydney’s youth moving away due to a lack of housing options and affordability. While the NSW Government is engaging with planning reform, based on industry and government predictions, it will take considerable time to meet supply demands through new builds alone.⁴

Greening Target

“To reach the 40 per cent target, the public domain and private lots need to be radically reconsidered...Space is equally critical in older suburbs, especially in those leafier areas of the city going through an infill boom and experiencing the greatest canopy loss. Local government needs support and integrated planning and delivery to consider the space required to establish and maintain large canopy trees.”⁵ Jan Orton and Sophie Moore, 2024

The NSW Government has targeted policies towards the critical role that trees, vegetation and green infrastructure play in making cooler and shadier neighbourhoods that are protected from extreme heat. The government has established a target to increase tree canopy cover across Greater Sydney from 22% to 40%, through initiatives such as The Greener Neighbourhoods Guide, The Greening Our City Program and Tree Canopy Data.⁶ However, according to Hurley et al, only eighteen of thirty-three LGAs in Greater Sydney’s councils had an increase in canopy area between 2019 and 2022 – many of these were in Western Sydney where tree canopy is low, while in the more established suburbs in the Sydney’s east, in which infill is targeted, canopy cover was lost.

Carbon Footprint Targets

“Architecture needs to shift from automatically building new buildings to thinking more about reuse and redesign. Keeping the structure and becoming increasingly creative about building around it, is a design strategy with big CO2 savings.” Phillip Oldfield, 2023

The construction industry is responsible for 18.1 per cent of Australia’s carbon footprint, with up to 70% of greenhouse gas emissions being attributed to the construction, maintenance and demolition of buildings, known as ‘embodied carbon’. The NSW Government’s new sustainability standards, the Sustainable Buildings State Environmental Planning Policy, encourages the design and construction of more sustainable buildings across NSW. This standard requires architects and developers to measure the embodied carbon in their designs, as NSW shifts towards a low-carbon built environment. This policy, involving an incremental change in the residential building sector, aims to assist in achieving the NSW Government’s target of a reduction of emissions by 35% by 2030, and net zero emissions by 2050. A critical strategy in reducing embodied carbon is to build less by maximising the use of existing assets: as Carl Elefante says, “the greenest building is the one that already exists”.¹⁰

Intensification and Greening: Existing Housing Stock

“The existing city fabric, with carbon already spent on its production, will provide the base from which we can build, demanding an end to demolition culture and a shift towards regenerative urbanism.”¹¹ Joe Giddings, 2023

As of 2021, Sydney has 2,076,284 dwellings with an average of 2.7 people per household.¹² These dwellings will continue to be around for a long period of time – the average lifespan of a brick home in Australia is 88 years and a timber home 58 years (with many homes lasting much longer than this). On average, each house will be occupied by 8-13 different households.¹⁴

Much of this fabric comprises the common housing stock that sit in clusters across the vast swathes of Sydney’s suburbs. These are the types that have been built in large volumes in response to different eras and policy and economic frameworks: Georgian houses, Victorian terraces, Art Deco semi-detached houses and apartments, pre-war bungalows, soldier settlement cottages, six-pack walk-ups, modernist apartment blocks, villas and mansions, and town and rowhouses – with more recent contributions of medium and high-density apartment blocks that are densely packed in.

While some older stock, like Victorian terraces and Art Deco semi-detached houses and apartment blocks, has heritage restrictions, most common housing types have no protection and can be removed on a whim. But herein also lies the strategic potential of some of these less ‘desirable’ types – the lack of restrictive rules that apply to them make them ideal candidates for strategic moves towards densifying and improving them without demolition.

Before we can consider the project of non-demolition, however, we need to understand what is there and how to act on it.

Gaps in Knowledge

There is a wealth of research on housing types from national, NSW and Sydney perspectives. These predominantly fall into two categories: architectural history and heritage studies, which focus on the development of architectural movements within Australia and NSW and Sydney; and policy and housing analysis studies, which chart the political, sociological and economic drivers that gave rise to differing development strategies from a wider, urban perspective. In section two of this report, we provide a catalogue of existing research pertaining to this field. Notwithstanding the significance of the available body of work, there remains a dearth of information about the architectural and urban characteristics of common housing types, with a focus on physical form, rather than stylistic trends or historical factors. The typological approach adopted in study works within this gap with a view to inform both design and policy.

A Typological Approach

“Architects must take to the heart of the city with surgical precision, realising the accretive value of the existing built environment.” Joe Giddings, 2023

We have adopted a typological approach to understanding, describing and valuing what exists and to find patterns within it, that could lead to action for systematic and scalar change without unsustainable demolition. This process has been structured as several steps comprising of selection, description, testing and mapping of housing typologies.

Selection

We began with a broad array of housing types, and narrowed the selection according to the following criteria:

- Dwellings that can be identified as part of a particular era of housing development;
- Small to medium-sized dwelling on large block, that could be reconfigured and extended, and subdivided for additional dwellings;
- Large buildings on small or large block, that can be subdivided internally, and/or with additional new dwellings added on ground or above in an apartment block;
- Plot size and shape that can increase tree canopy;
- Properties not restricted by heritage value.

Applying these selection criteria, along with local knowledge and information gleaned from GANSW staff and local architecture/housing experts, along with selected literature, we narrowed the selection to five common housing types that could be categorised according to the period of their build: 1930/40s Bungalows, 1950/1960s Cottages, 1960/70s Six-Packs, 1960s/1970s, Villas and 1990s/onwards Mansions.⁵

Description

A research-led Master of Architecture Study Unit (Monash, 2023) provided the framework for early data gathering. Using prescribed methods for locating five common housing types in Sydney's suburbs, students compiled information from real estate sites, Nearmap, Google Maps and other avenues. This documentary work was followed by on-site inspection of the selected house types as these proliferated along suburban train lines in Sydney, utilising this suburban infrastructure as an additional way to categorise periods of development across the city.

Following the teaching period, further studies drew on the existing literature, and other sources, to understand the material, construction and spatial characteristics of each type. We studied multiple versions of each type – its 'family' – to establish common patterns, such as materials, dimensions, layouts, position on block, plot shape and setbacks. Architectural drawings documented these generic characteristics, as well as differences, of the subtypes within the 'family'.

From this forensic work, we selected a representative case study of each type – an actual dwelling in a suburb. This dwelling and its plot were analysed and documented for its organisational, spatial and material order through architectural drawings of axonometrics, plans, sections and elevations. While the representational type is one only example of many variations within the 'family', this detailed study enabled a deeper exploration of the type's material and spatial characteristics.

Testing Potential

Detailed representation of the existing condition was used for design speculation and testing. We developed preliminary strategies to consider the potential for systematic soft densification and urban greening with at-scale application. We were interested to consider whether there could be common strategies for making these homes both denser and more diverse for a range of uses, and at the same time, greener. This involved a testing of concepts for reconfiguration, subdivision and extension of existing dwellings, the subdivision of plots and the addition of new volumes for living and shared amenity.

The proposed strategies, for example, included the reuse of the existing garage and internal rooms to increase dwelling numbers, extending the dwelling to increase entries and dwelling options, and adding one or more new volumes through subdivision along the width and length of the block. The proposed strategies further explored the possibility of amplifying urban greening through more landscape and trees. This was achieved through direct increase in vegetation, as well as consolidation of car parking and utilities like rubbish bins. These design propositions were drawn diagrammatically to scale, enabling an estimation of the increase of dwellings and numbers of trees. While schematic and elementary, these studies point to a potential for significant impact if they were to be rolled out in a systematic way and at scale.

Mapping

A mapping framework was established to find the five common house types across the suburbs of Sydney. It established rules around building form and urban characteristics to search for and identify the locations, distribution and concentrations of common house types across metropolitan Sydney.

These maps plot the locations of each type across the Sydney metropolis, visualising their concentration and frequency in particular areas. Our intention was to identify sites with potential – that is, where the dwellings/plot type have not yet been significantly developed or modified – and with spatial characteristics that allow the intensification and greening strategies to be applied with minimum modification to the original dwelling. (It should be noted that in the case of the bungalow type, the Lakemba Case Study was not an area of high concentration – this anomaly was created because the dwelling was selected before the mapping process began.)

The mapping involved a process that integrated building footprint information and building height, zoning information and dimensions were derived from lot boundaries. A simple setback calculation from the street was also employed – as well as a check that compares the area of the primary building to any other structures on the site. In some circumstances, additional checks relating to strata title, number of addresses on the premises, or the Deposited Plan Number was used to narrow search results. These simple checks can readily be undertaken on consumer-grade hardware.

The resulting series of colour-coded maps, across three scales – a micro precinct scale, a meso neighbourhood scale and a macro city scale – identify the common house types within their urban environment. A key motivation for exercise was also to communicate the potential for impact of incremental intensification and greening if systematically delivered.

There are limitations and obvious outliers in this process. The survey identifies sites by building form – not by 'type' – and there may be occasional examples where an outlier with similar spatial characteristics to the type is included. At the same time, the survey reveals useful, consistent clustering of types – and is effective at surfacing smaller 'islands' of types in otherwise indistinct urban fabrics and forms.

Further development would focus on a more explicit tool for establishing age of stock, and the development of further setback analysis to consider side and rear setbacks in the selection criteria. Finally, the addition of analysis of fall across nominated sites – especially important in a context like Sydney's – would tighten the assessment of re-developable areas.

Next stage

In this project, we have adopted a synthesised typological and mapping analysis to understand and describe a selection of Sydney's common housing types, and their architectural and urban attributes to ascertain their potential for intensification and greening without demolishing. We tested this possibility through schematic design studies that, while speculative and elementary, capture the potential for incremental intensification and greening. These speculative studies when combined with the numeral count of urban mapping paint a picture of significant intensification and greening potential: 146,000 new dwellings and over 1 million m2 new tree canopy.

While the speculative nature of this study lies outside direct application, it provides a compelling case for further practice-led research to develop a systematic and integrated design, planning and economic framework to incentivise the retrofit and soft densification of common building types and plots through generic systems with at-scale application. This may include multimodal research that integrates:

- an analysis of current planning and economic limits and controls and their potential to incentivise new patterns of soft densification and greening;
- an analysis of material and assembly systems that can facilitate rapid and cost effective construction processes that boost economic imperatives for development while minimising impact on existing residents; and
- a detailed interrogation of variety within common typologies to investigate the potential for generic adaptation.

Among the building types considered in this report, we have identified the Six-Pack as productive typology for such pilot study.

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- ¹ Brendan Coates, *Housing will Only Be Affordable Once It's Abundant in NSW*, (Grattan Institute: 2023): <https://grattan.edu.au/news/housing-will-only-be-affordable-once-its-abundant-in-nsw/>.
- ² The Treasury, Australian Government, *Intergenerational Report*: <https://treasury.gov.au/taxonomy/term/40>
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- ⁴ Brendan Coates, Housing will only be affordable once it's abundant in NSW, 2023: <https://grattan.edu.au/news/housing-will-only-be-affordable-once-its-abundant-in-nsw/>.
- ⁵ Jan Orton and Sophie Moore, Tree canopy in Greater Sydney, how are we doing? 2024: <https://thefifthestate.com.au/columns/spinifex/tree-canopy-in-greater-sydney-how-are-we-doing/>.
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- ⁷ Hurley et al, Benchmarking Urban Vegetation Cover: Melbourne, Sydney and Perth, 2020: <https://researchrepository.rmit.edu.au/esploro/outputs/9921903789301341>.
- ⁸ Bienert, Sven; Kuhlwein, Hunter; Schmidt, Yannick; Gloria, Benedikt; Agbayir, Berivan (2023): Embodied Carbon of Retrofits. Ensuring the Ecological Payback of Energetic Retrofits, Wörgl, Austria.
- ⁹ NSW Government, Sustainable Buildings SEPP, <https://www.planning.nsw.gov.au/policy-and-legislation/buildings/sustainable-buildings-sepp>
- ¹⁰ Phillip Oldfield, "Embodied Carbon in Buildings: a New Frontier in Greenhouse Gas Reduction, UNSW, Sydney 2023: <https://www.unsw.edu.au/newsroom/news/2023/09/embodied-carbon-in-buildings-a-new-frontier-in-greenhouse-gas-r#:~:text=The%20aim%20is%20for%20all,zero%20embodied%20carbon%20by%202050>.
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- ¹⁴ Diego Ramirez-Lovering, "The space of dwelling: An investigation into the potential for spatial flexibility to improve volume housing in Australia" (PhD Monash University, 2012).
- ¹⁵ Most existing housing can be effectively retrofitted for better energy efficiency and environmental performance, with substantial research devoted to how this can be achieved. This emphasis has not been the focus of this study.

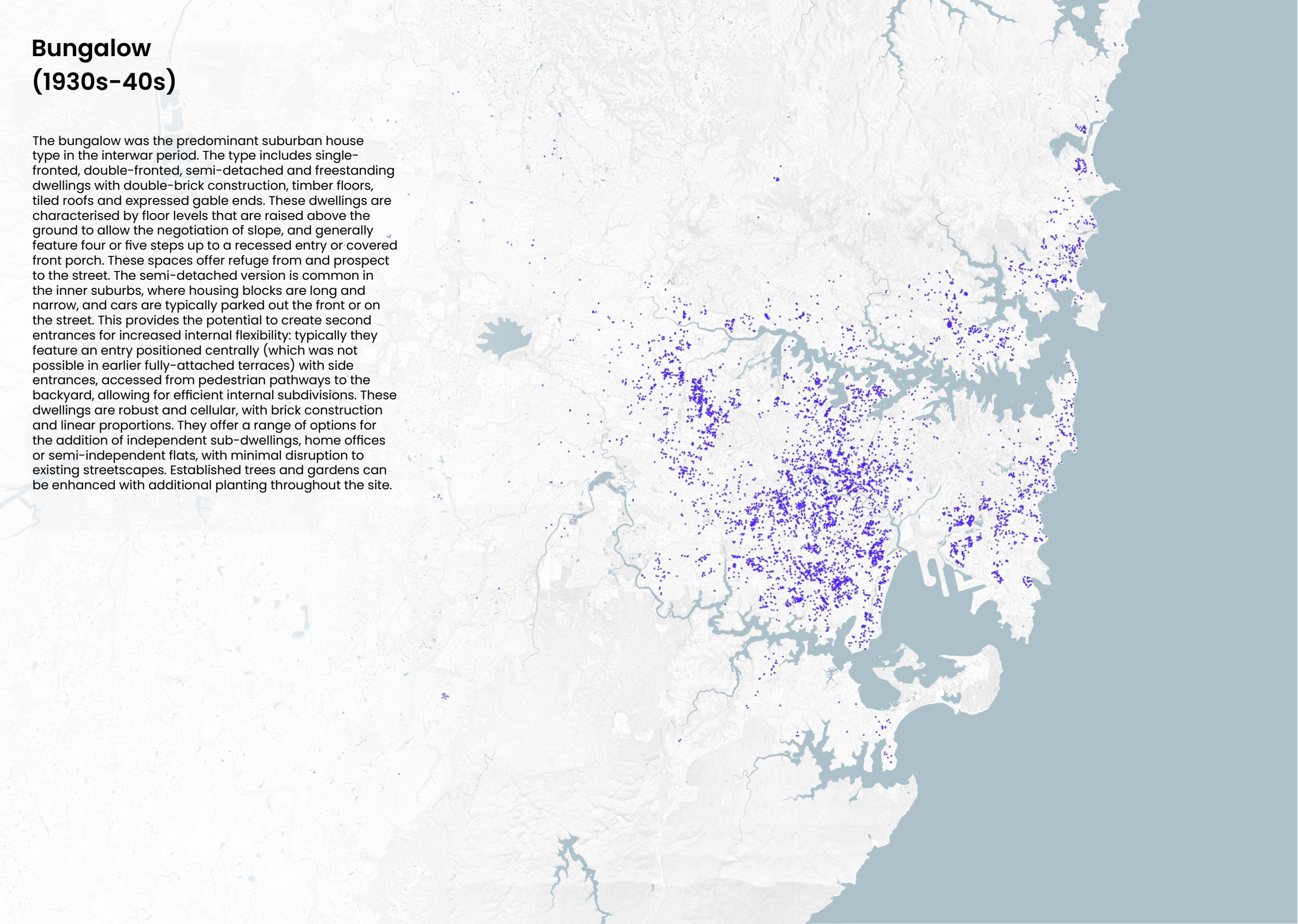
Section 1

Five Common House Types in Sydney

- Bungalow
- Cottage
- Six-Pack
- Villa
- Mansion

Bungalow (1930s–40s)

The bungalow was the predominant suburban house type in the interwar period. The type includes single-fronted, double-fronted, semi-detached and freestanding dwellings with double-brick construction, timber floors, tiled roofs and expressed gable ends. These dwellings are characterised by floor levels that are raised above the ground to allow the negotiation of slope, and generally feature four or five steps up to a recessed entry or covered front porch. These spaces offer refuge from and prospect to the street. The semi-detached version is common in the inner suburbs, where housing blocks are long and narrow, and cars are typically parked out the front or on the street. This provides the potential to create second entrances for increased internal flexibility: typically they feature an entry positioned centrally (which was not possible in earlier fully-attached terraces) with side entrances, accessed from pedestrian pathways to the backyard, allowing for efficient internal subdivisions. These dwellings are robust and cellular, with brick construction and linear proportions. They offer a range of options for the addition of independent sub-dwellings, home offices or semi-independent flats, with minimal disruption to existing streetscapes. Established trees and gardens can be enhanced with additional planting throughout the site.



Bungalow Case Study

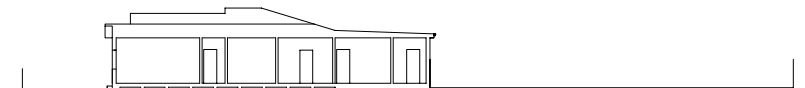
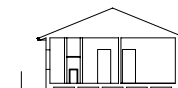
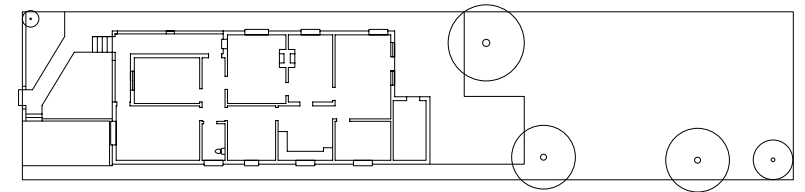
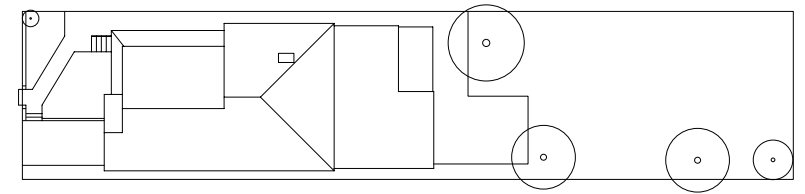
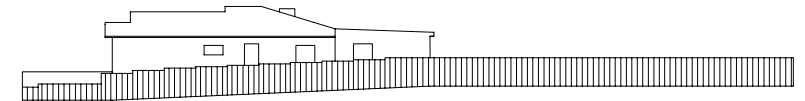
0 0.5 1km



0 2.5 5m

0 5 10m





- Construction Type**
- Double brick external walls
 - Raised timber floors
 - Timber-framed roof
 - Single-skin brick or lightweight internal walls

Floor Area
151m²

Site Dimensions
11 x 48.8m (536.8m²)

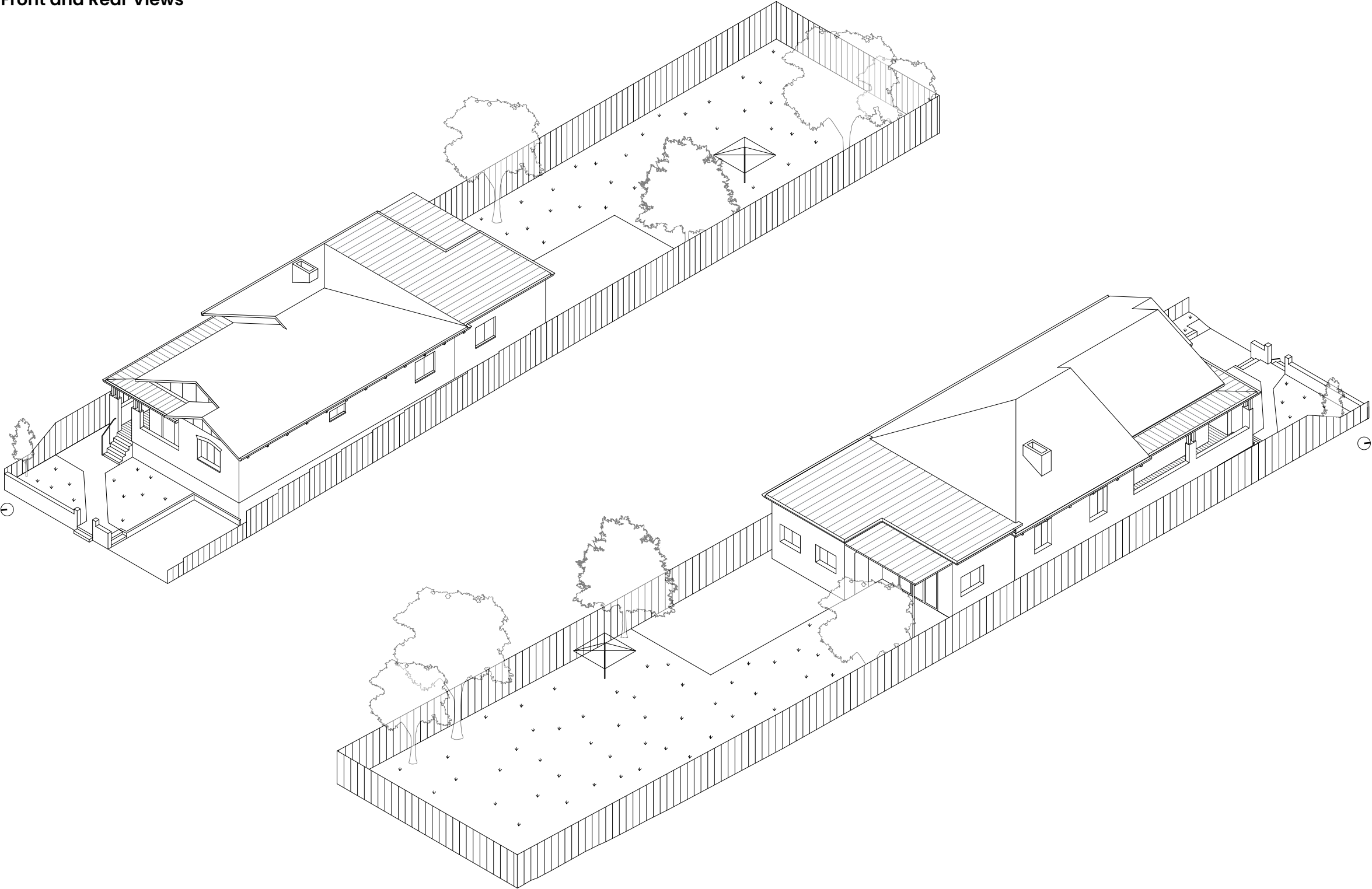
Density
18.6 dw/Ha

Facade Area : Floor Area
1.42 : 1

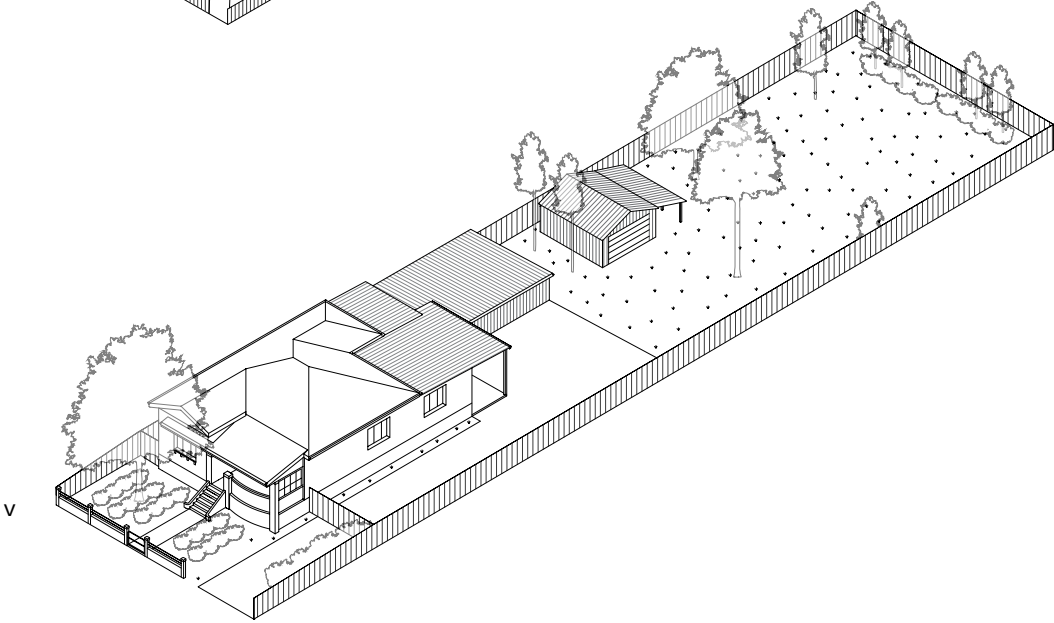
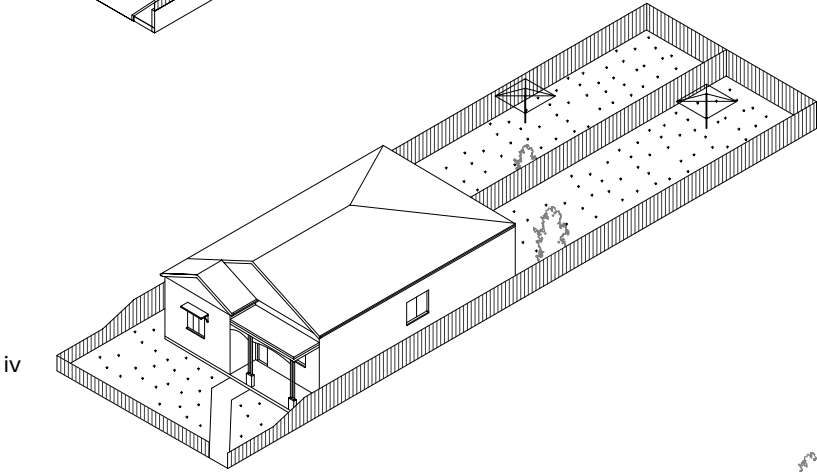
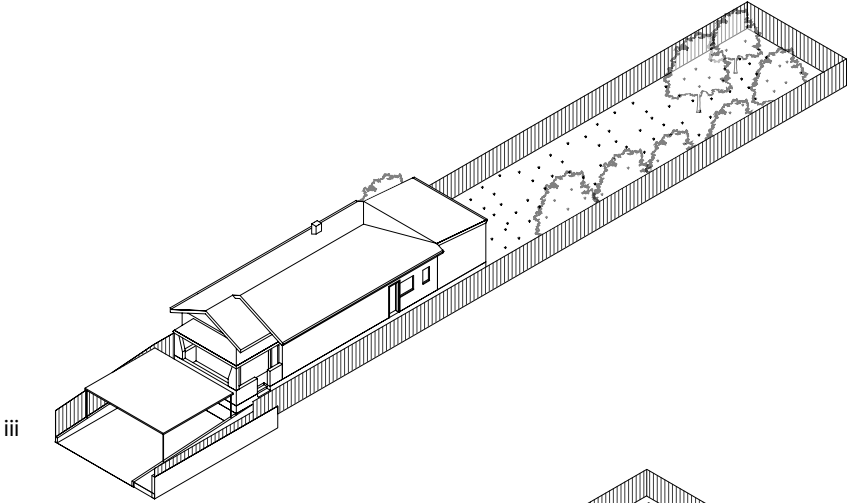
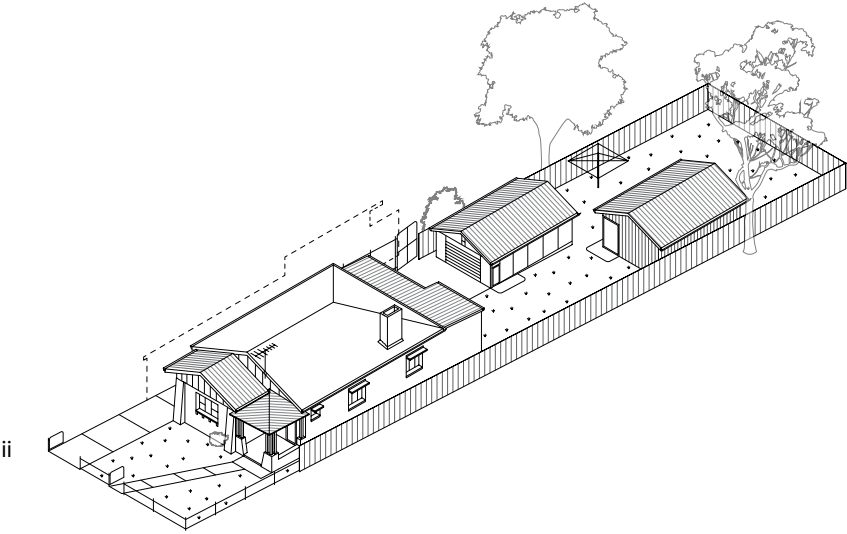
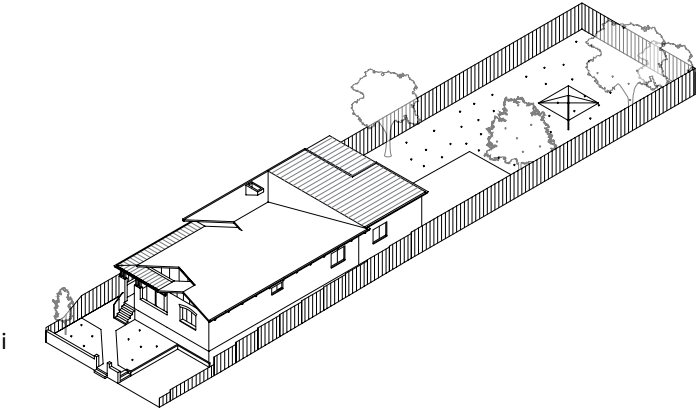
Site Coverage
36%

0 2.5 5m

Front and Rear Views



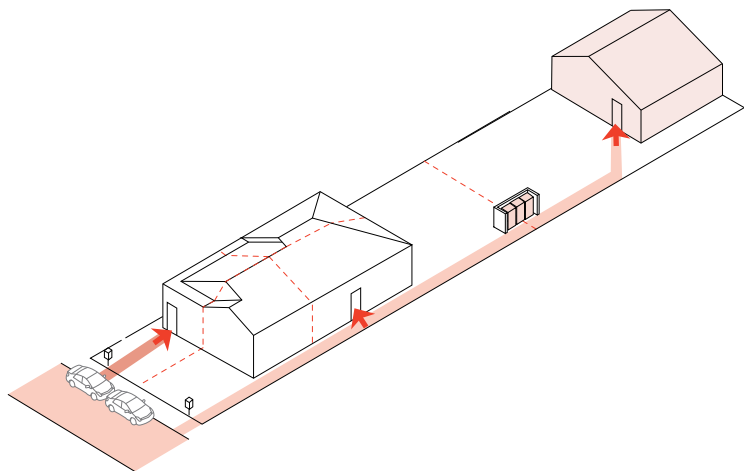
Bungalow Variations



- i Case Study
11 x 48.8m
- ii Variation
11.4 x 36.8m
- iii Variation
7.4 x 56.1m
- iv Variation
14 x 46m (subdivided)
- v Variation
15 x 60m

Bungalow Case Study

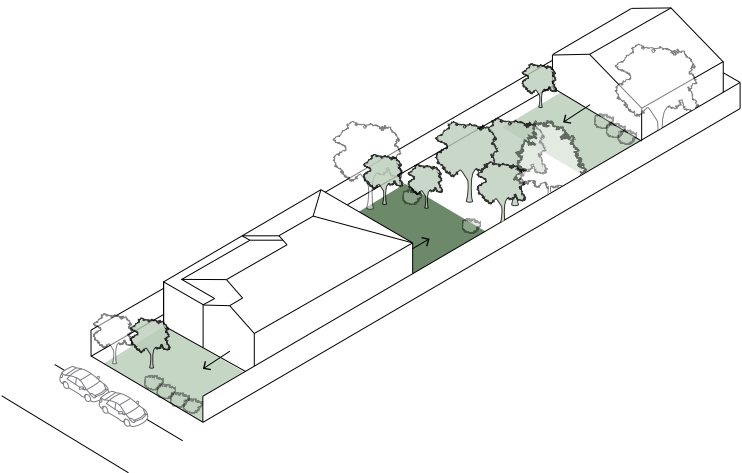
Potential for Densification and Greening



Soft Density

Long and narrow plots enable subdivision across the block with the addition of a small or large dwelling, with dual pedestrian entry. On wider blocks, a single dwelling can be converted into two dwellings with independent entries. Double blocks with two existing houses provide in-between passage for multiple pedestrians entries to a larger new dwelling.

Dwelling Increase: 1-2



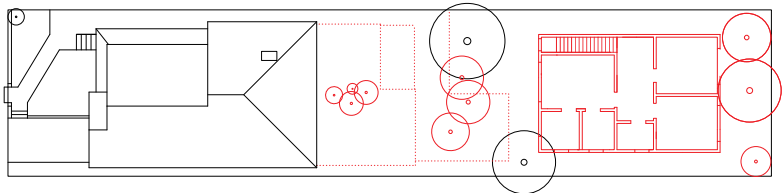
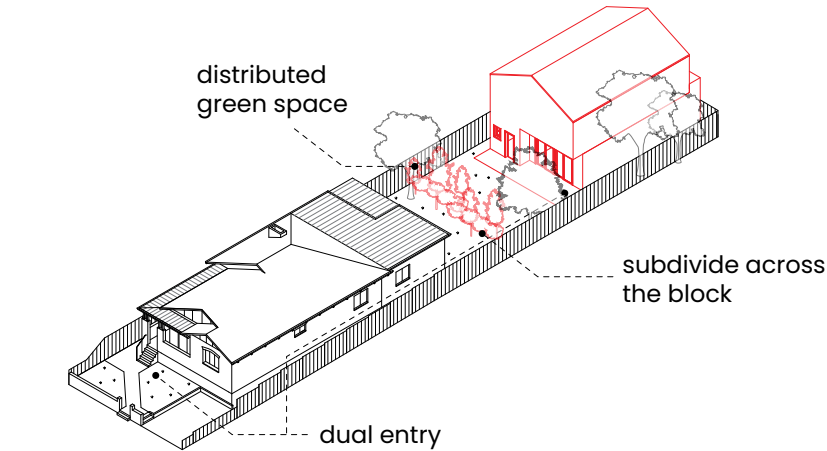
Urban Greening

More permeable ground and distributed trees and vegetation create a cooler and more biodiverse environment. Car parking is provided at front and on street.

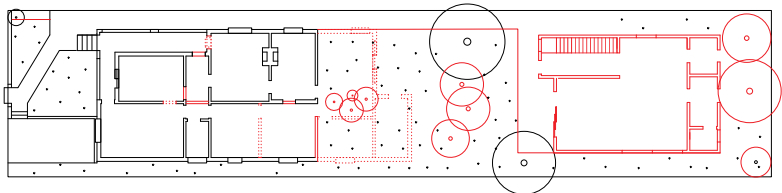
Canopy Increase: 13m²
3 medium trees | 4 small trees

Bungalow Case Study

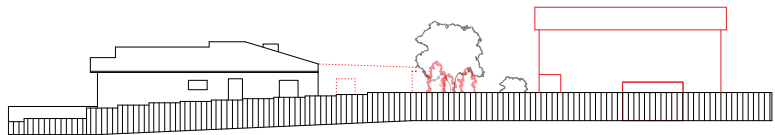
Diagrammatic Illustrations - Single Block



First Floor Plan

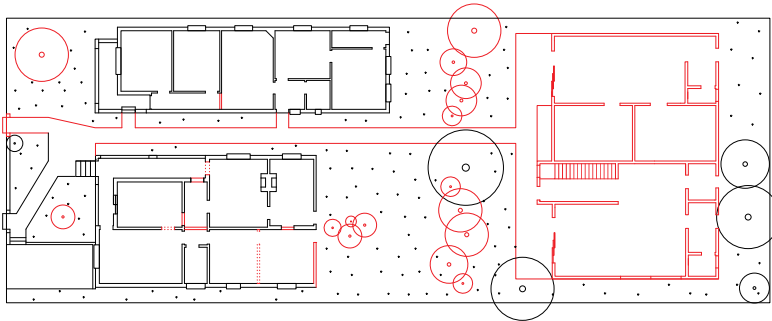
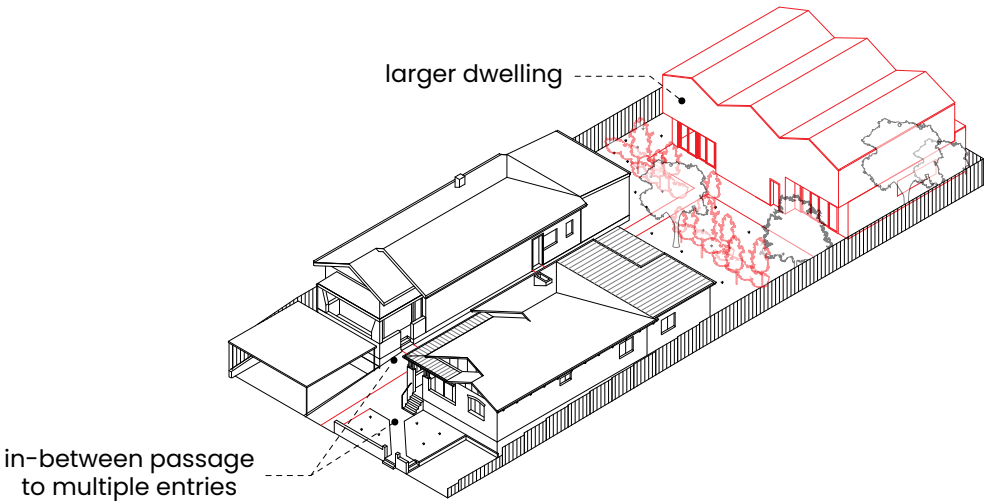


Ground Floor Plan

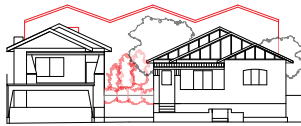


West Elevation

Diagrammatic Illustrations - Double Block



Ground Floor Plan



Street Elevation



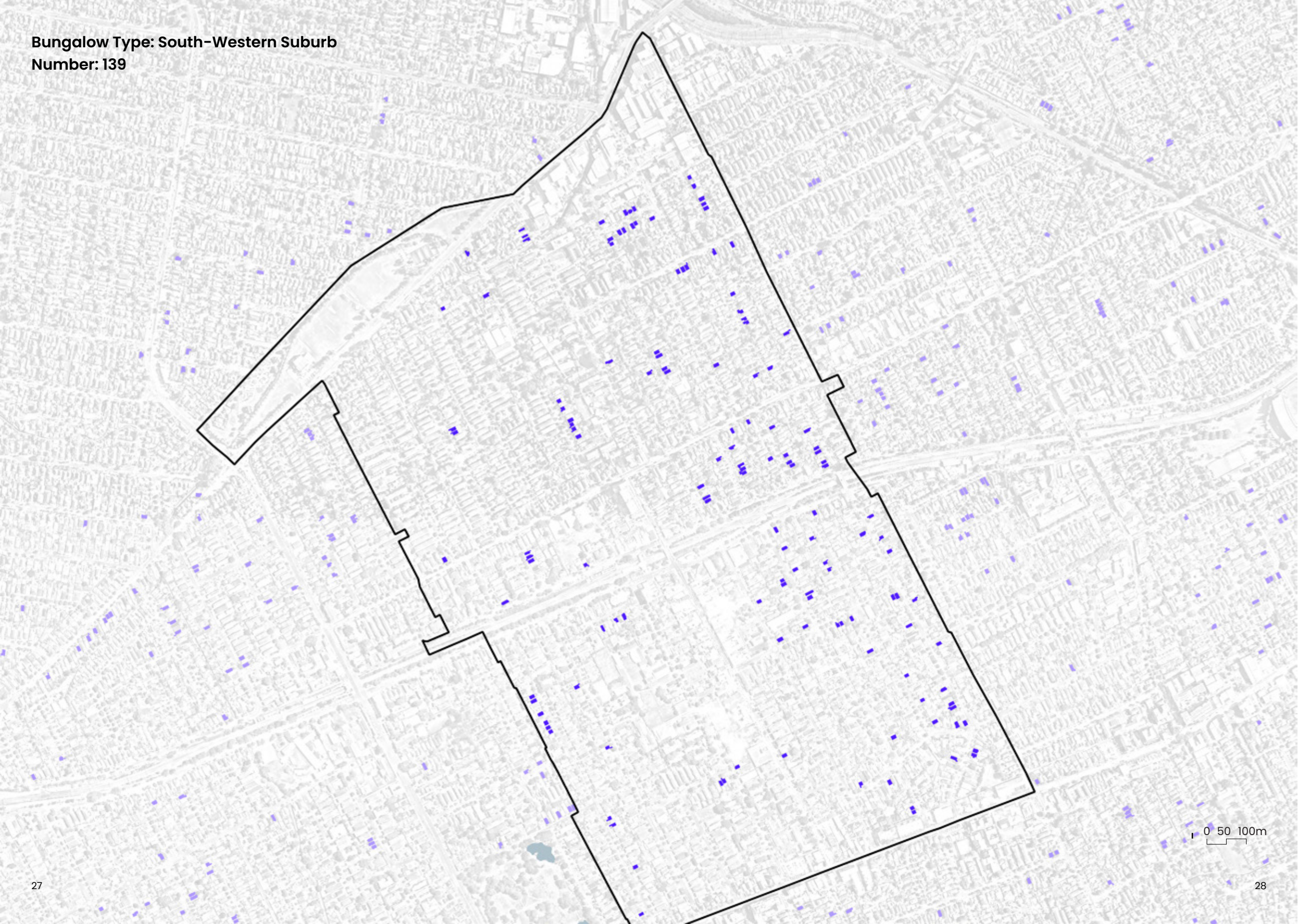
North-South Section

Type: Precinct
Bungalow Type: Precinct



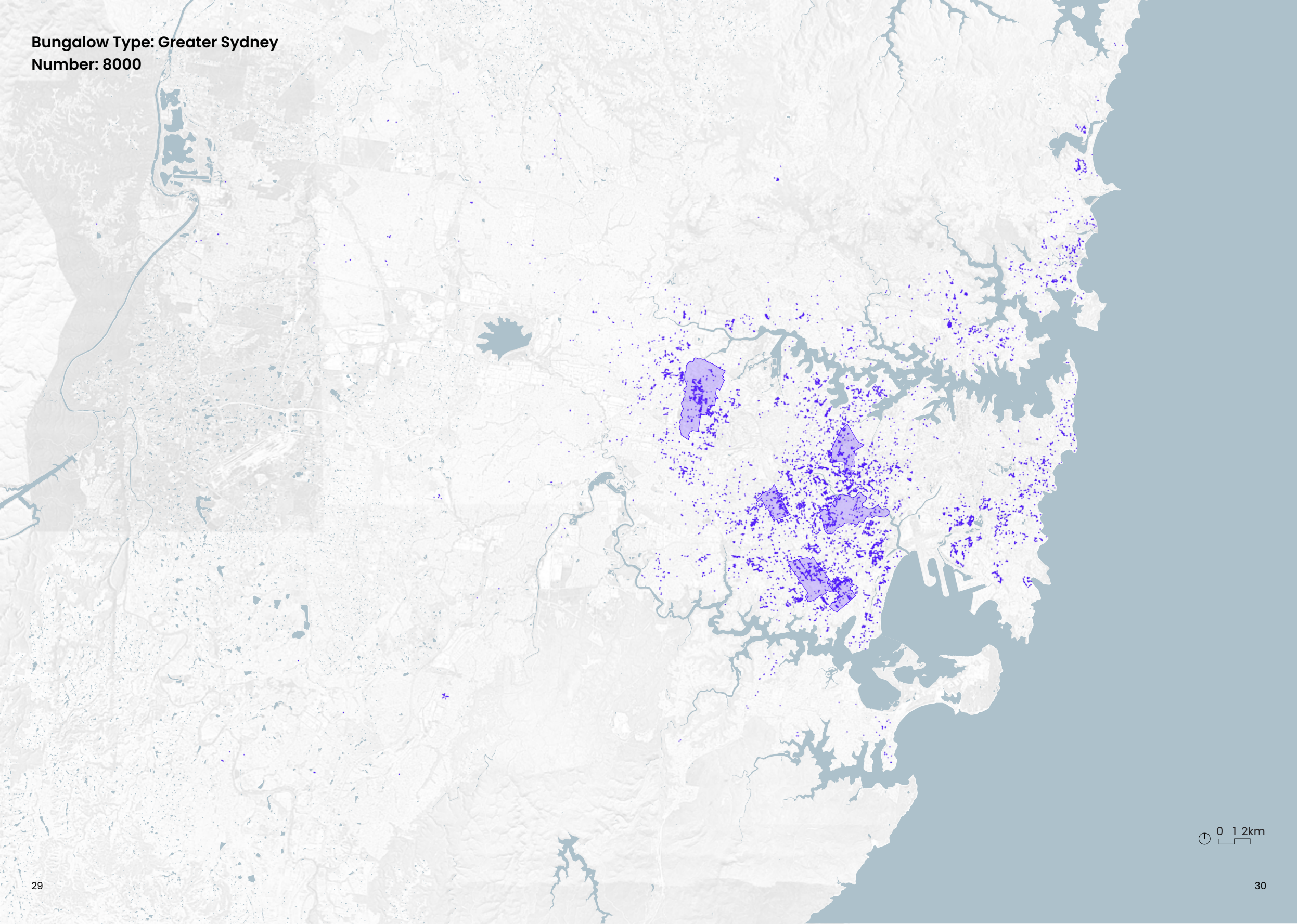
0 5 10m

Bungalow Type: South-Western Suburb
Number: 139



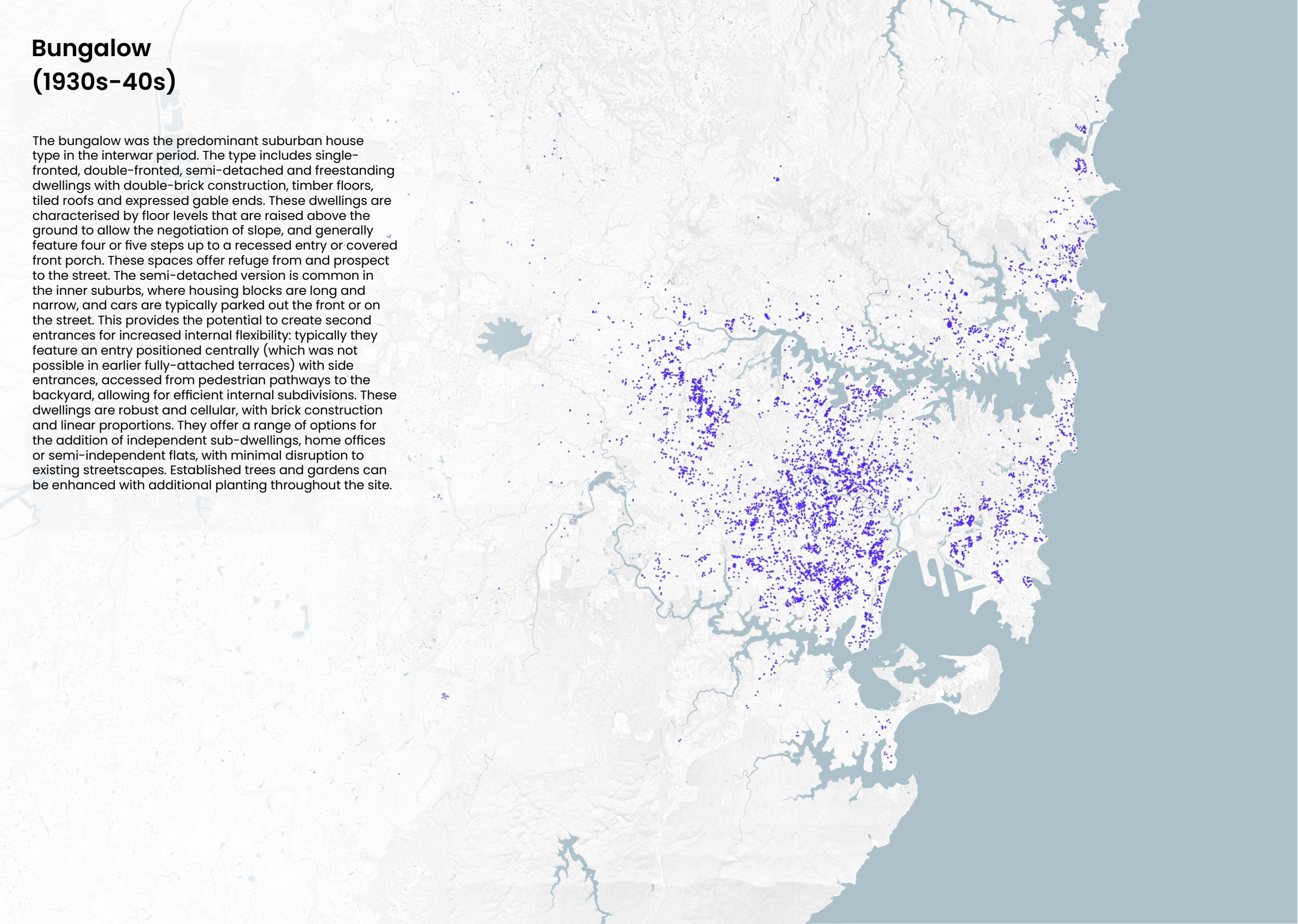
Bungalow Type: Greater Sydney

Number: 8000



Bungalow (1930s–40s)

The bungalow was the predominant suburban house type in the interwar period. The type includes single-fronted, double-fronted, semi-detached and freestanding dwellings with double-brick construction, timber floors, tiled roofs and expressed gable ends. These dwellings are characterised by floor levels that are raised above the ground to allow the negotiation of slope, and generally feature four or five steps up to a recessed entry or covered front porch. These spaces offer refuge from and prospect to the street. The semi-detached version is common in the inner suburbs, where housing blocks are long and narrow, and cars are typically parked out the front or on the street. This provides the potential to create second entrances for increased internal flexibility: typically they feature an entry positioned centrally (which was not possible in earlier fully-attached terraces) with side entrances, accessed from pedestrian pathways to the backyard, allowing for efficient internal subdivisions. These dwellings are robust and cellular, with brick construction and linear proportions. They offer a range of options for the addition of independent sub-dwellings, home offices or semi-independent flats, with minimal disruption to existing streetscapes. Established trees and gardens can be enhanced with additional planting throughout the site.



Bungalow Case Study

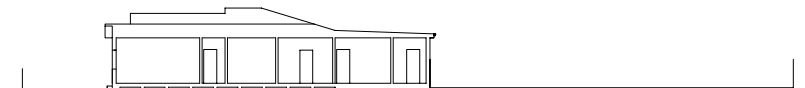
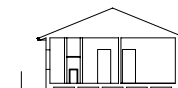
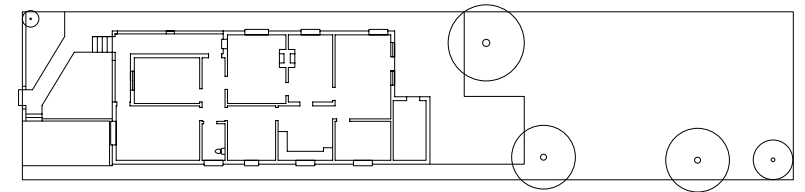
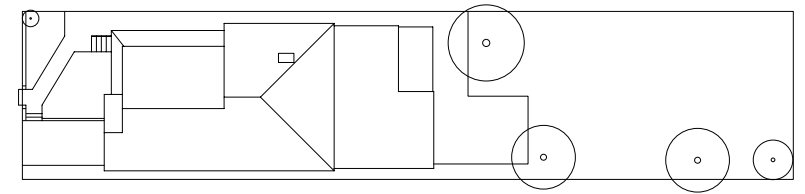
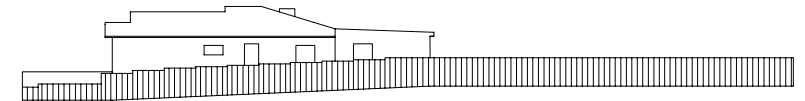
0 0.5 1km



0 2.5 5m

0 5 10m





- Construction Type**
- Double brick external walls
 - Raised timber floors
 - Timber-framed roof
 - Single-skin brick or lightweight internal walls

Floor Area
151m²

Site Dimensions
11 x 48.8m (536.8m²)

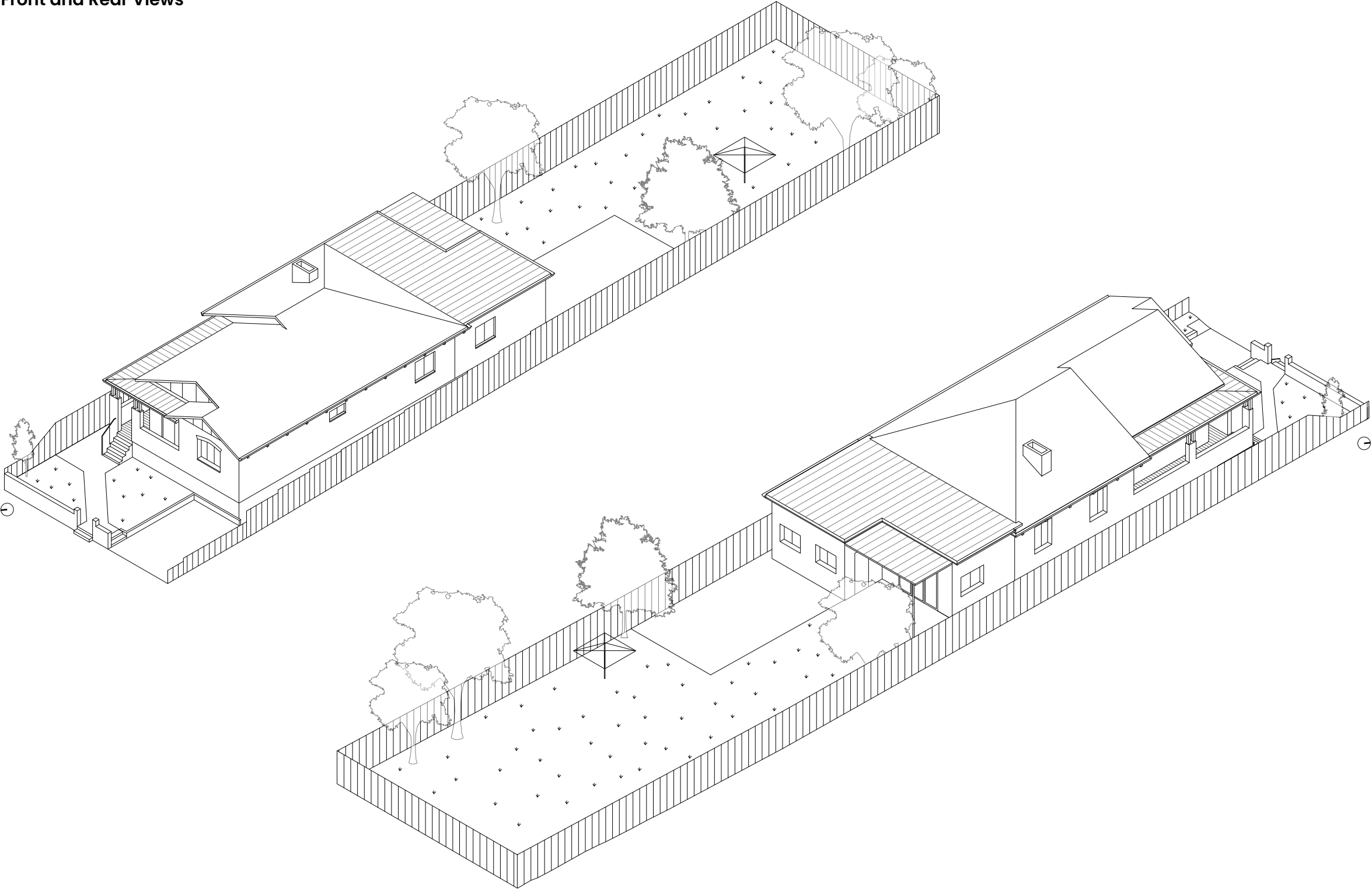
Density
18.6 dw/Ha

Facade Area : Floor Area
1.42 : 1

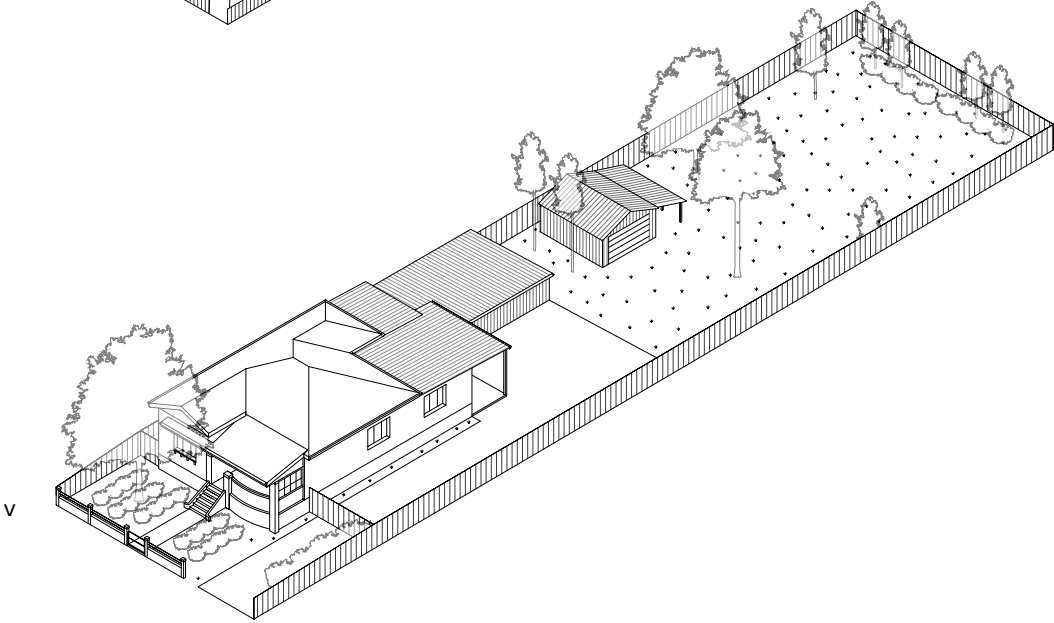
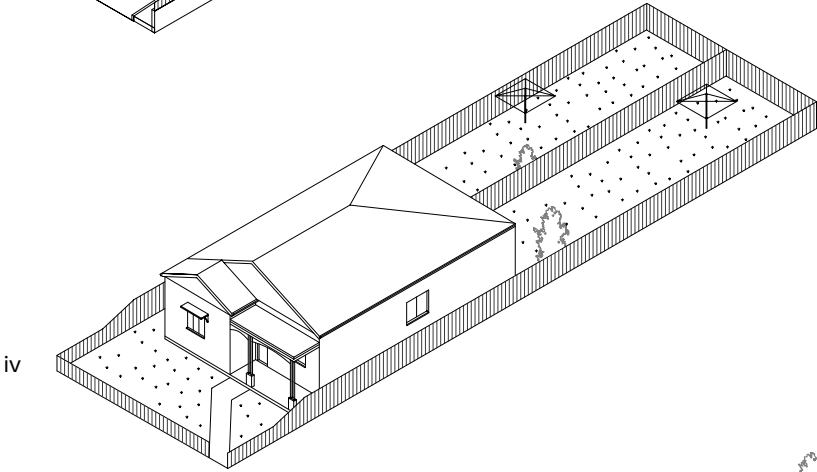
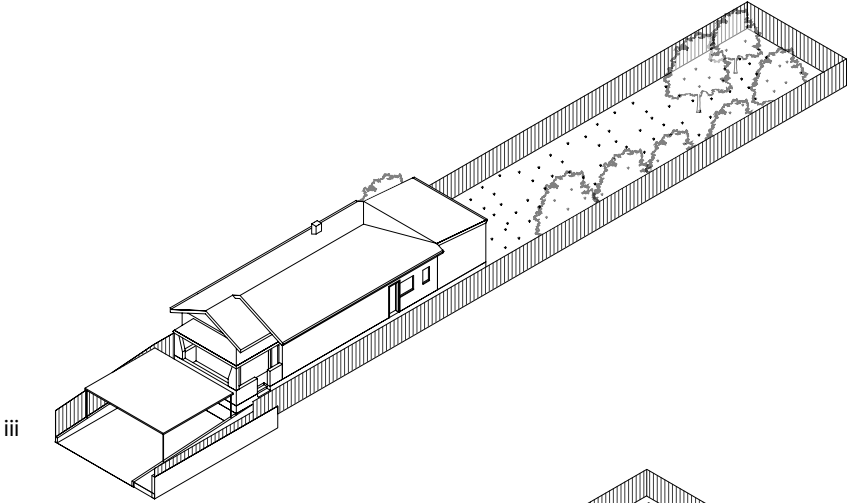
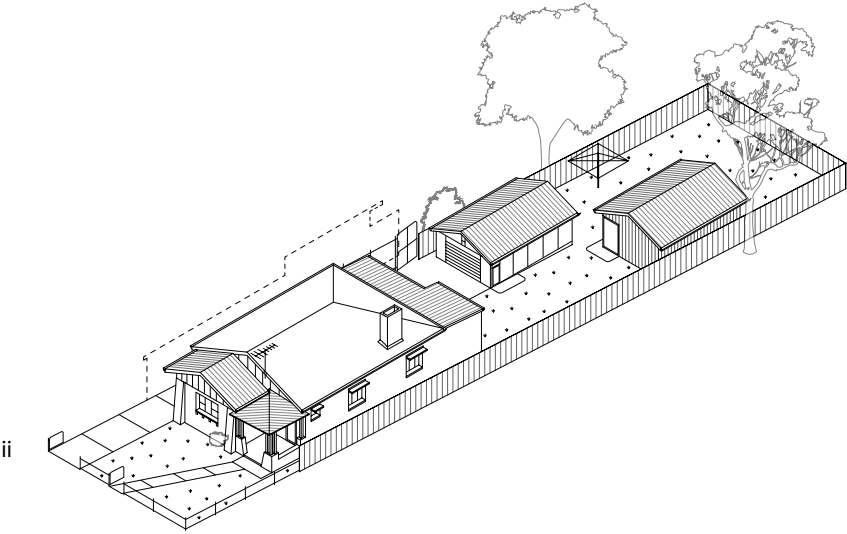
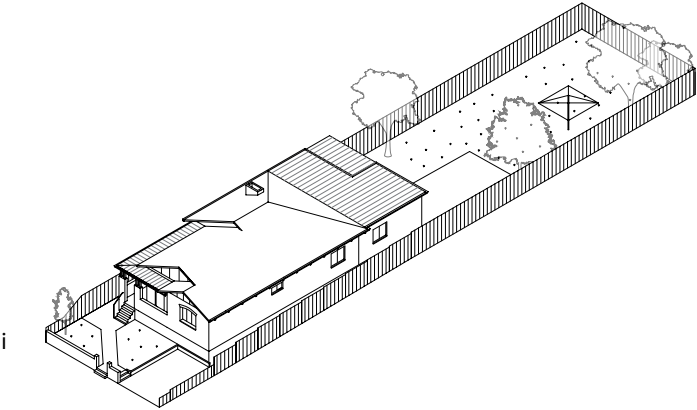
Site Coverage
36%

0 2.5 5m

Front and Rear Views



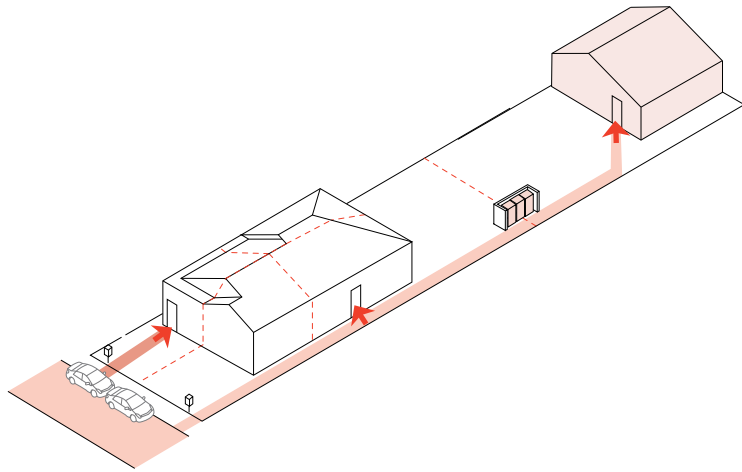
Bungalow Variations



- i Case Study
11 x 48.8m
- ii Variation
11.4 x 36.8m
- iii Variation
7.4 x 56.1m
- iv Variation
14 x 46m (subdivided)
- v Variation
15 x 60m

Bungalow Case Study

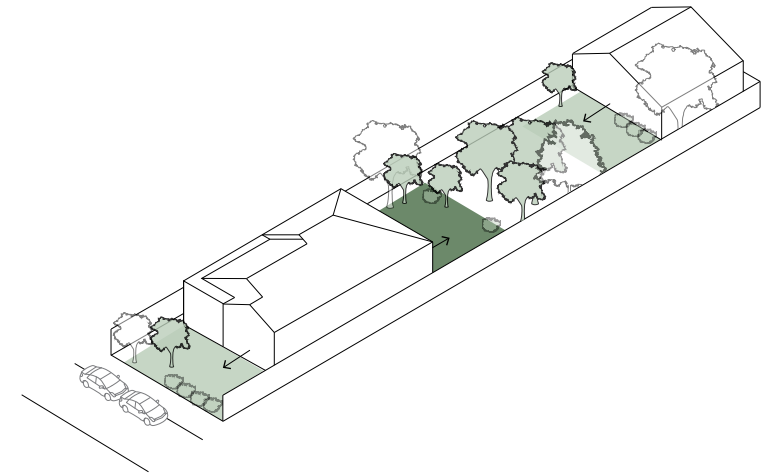
Potential for Densification and Greening



Soft Density

Long and narrow plots enable subdivision across the block with the addition of a small or large dwelling, with dual pedestrian entry. On wider blocks, a single dwelling can be converted into two dwellings with independent entries. Double blocks with two existing houses provide in-between passage for multiple pedestrians entries to a larger new dwelling.

Dwelling Increase: 1-2



Urban Greening

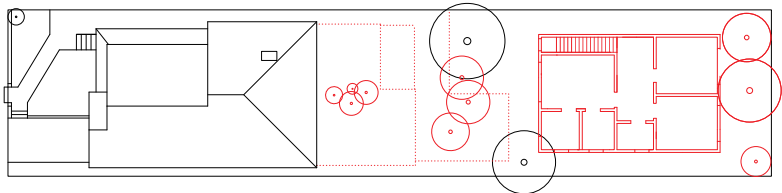
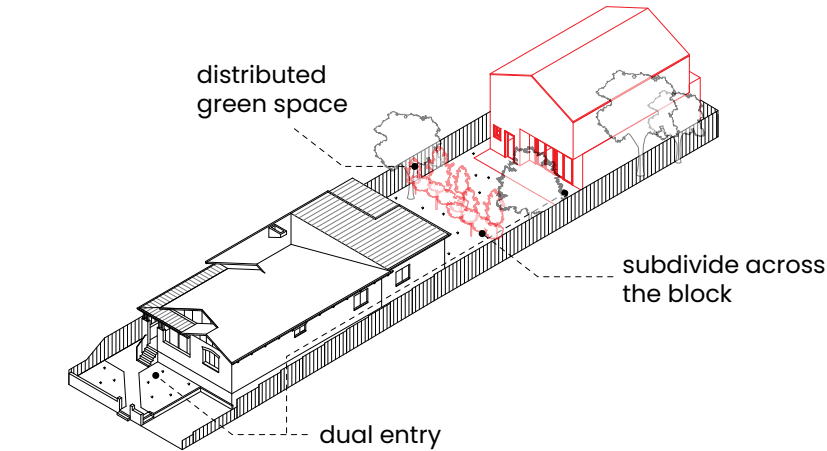
More permeable ground and distributed trees and vegetation create a cooler and more biodiverse environment. Car parking is provided at front and on street.

Canopy Increase: 13m²

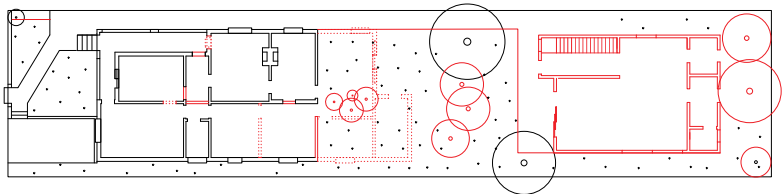
3 medium trees | 4 small trees

Bungalow Case Study

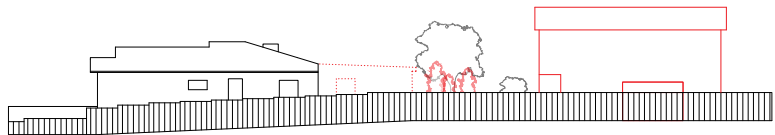
Diagrammatic Illustrations - Single Block



First Floor Plan

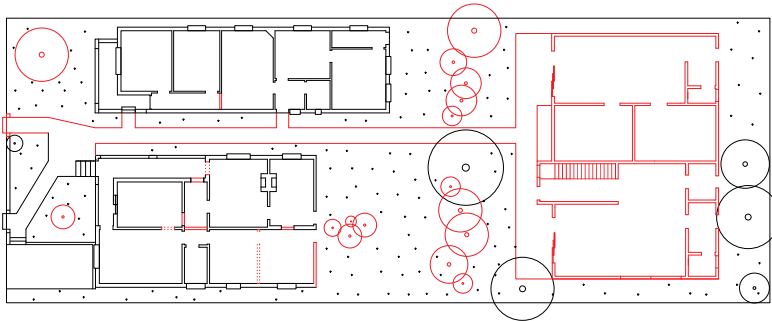
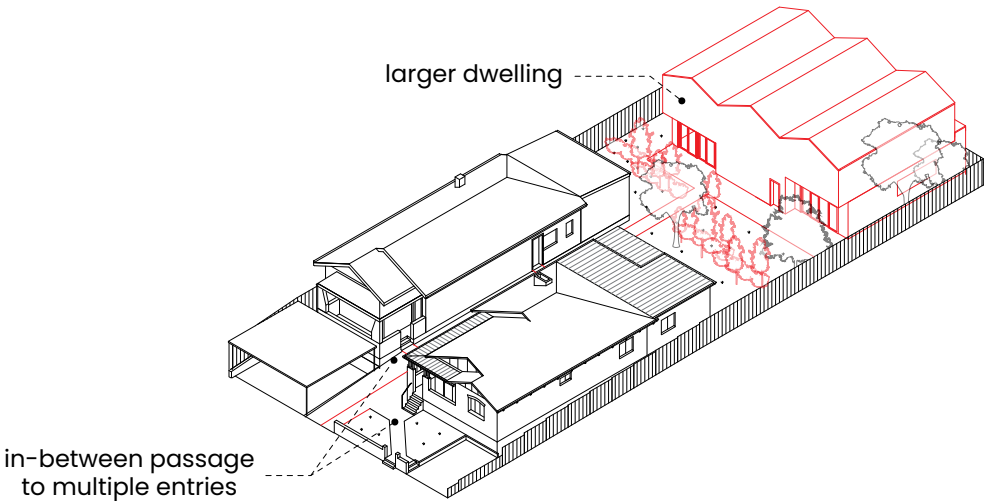


Ground Floor Plan

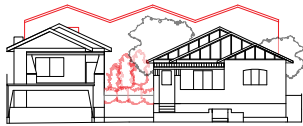


West Elevation

Diagrammatic Illustrations - Double Block



Ground Floor Plan



Street Elevation



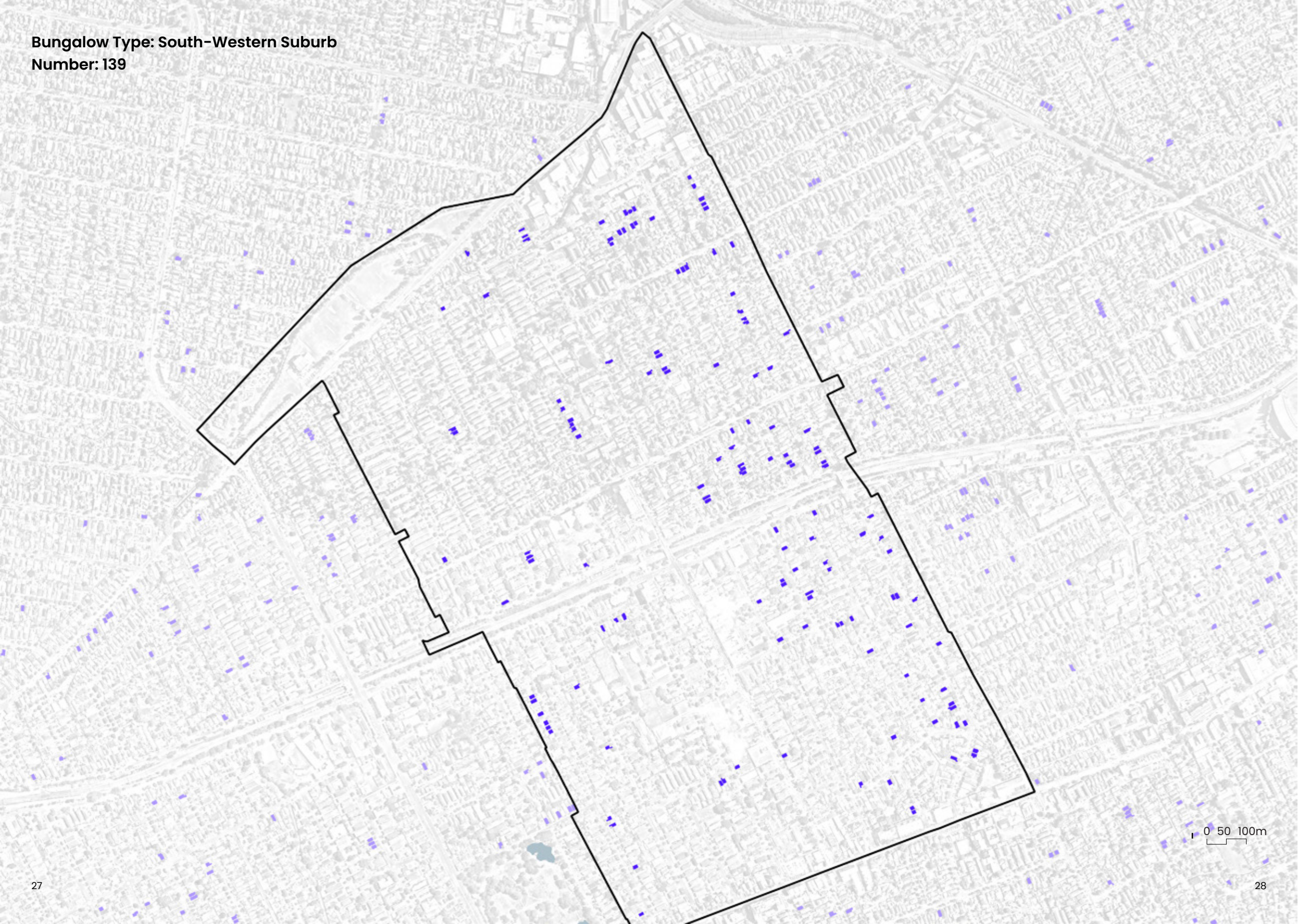
North-South Section

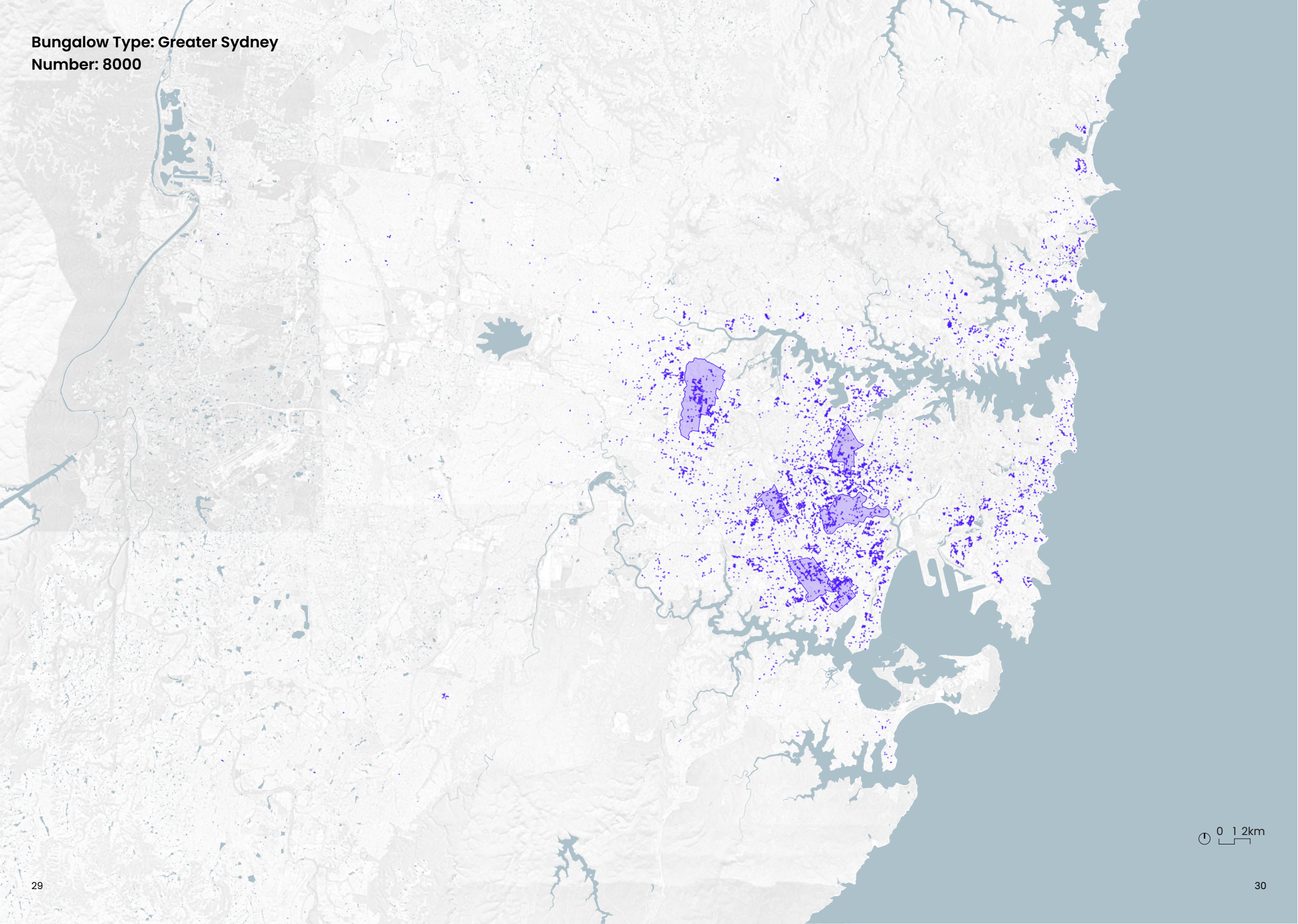
Type: Precinct
Bungalow Type: Precinct



0 5 10m

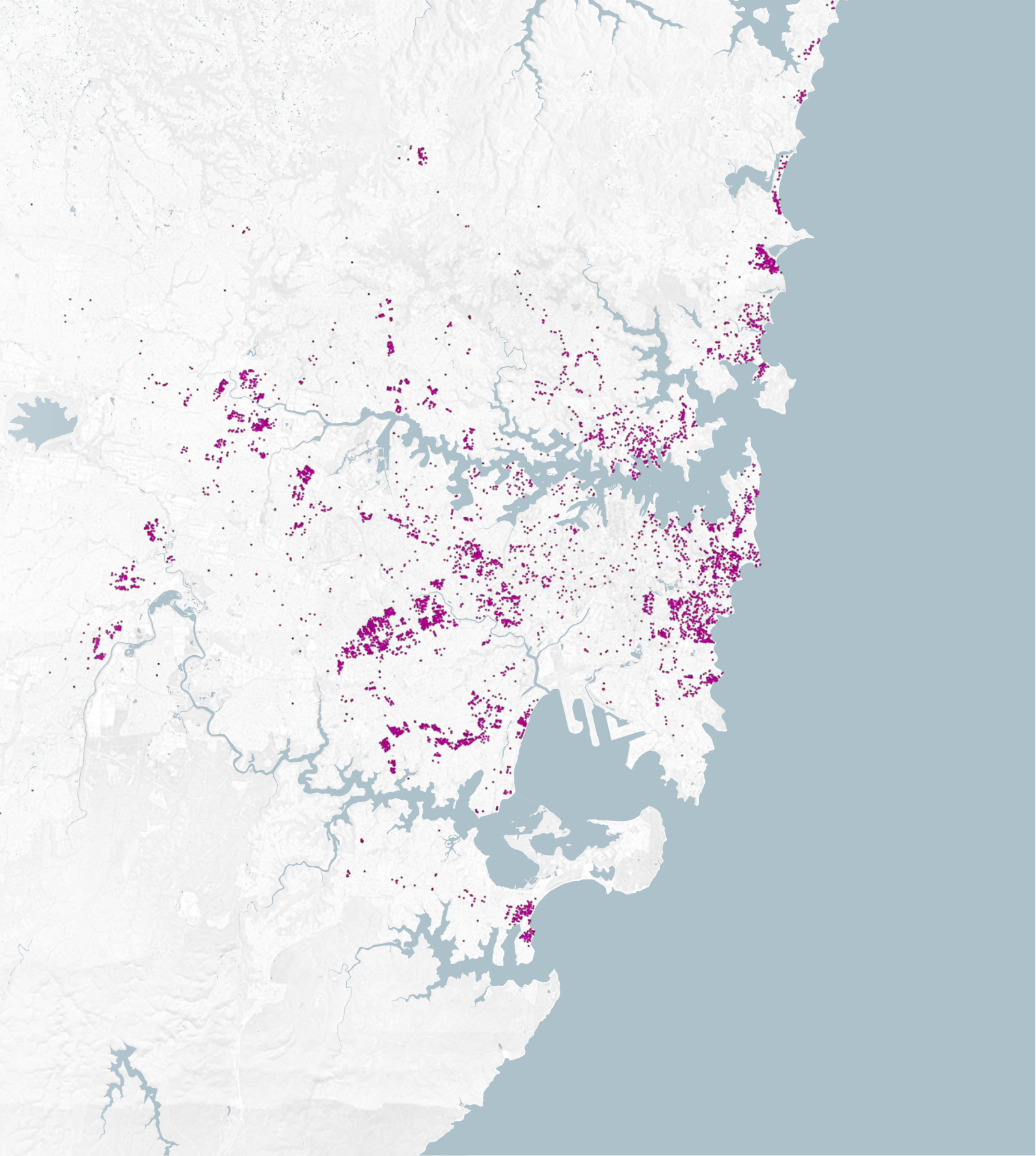
Bungalow Type: South-Western Suburb
Number: 139



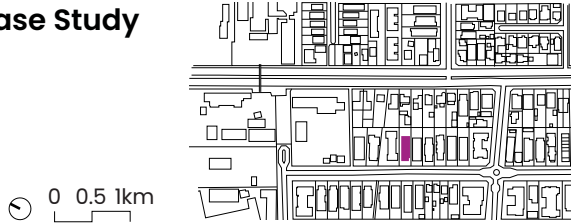


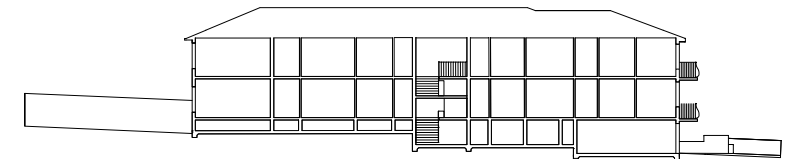
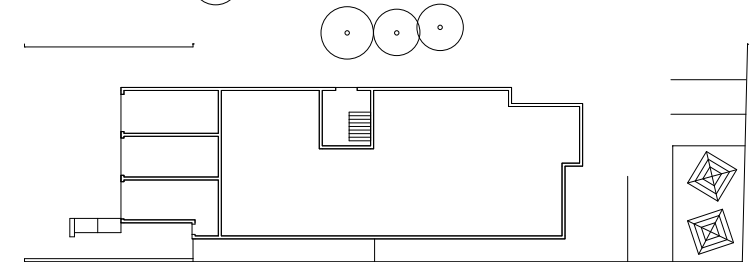
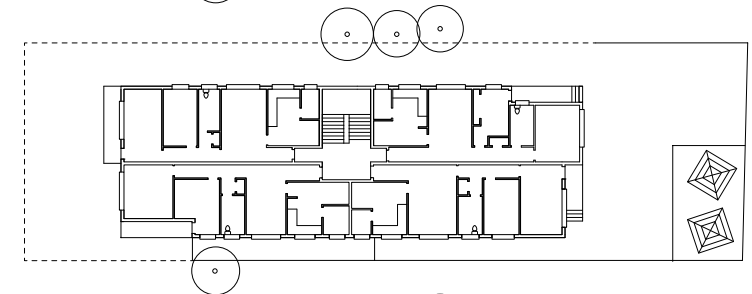
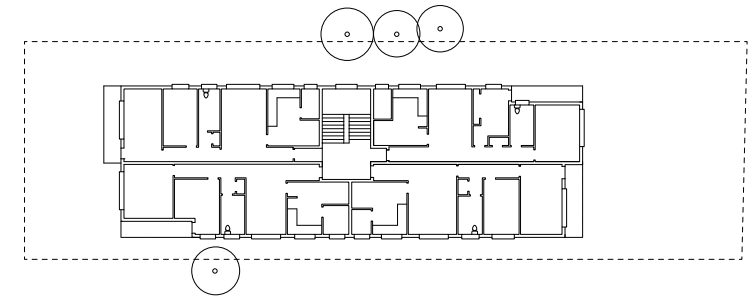
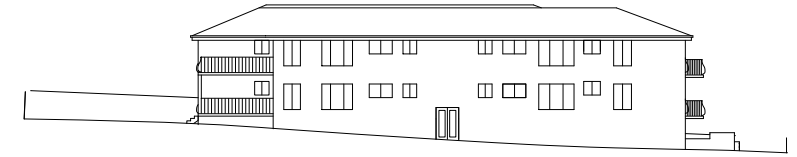
Six-Pack (1960s-70s)

Developed for common suburban allotments, these small, walk-up apartment buildings are a lesson in efficient housing delivery. Their proliferation is testament to the historical profitability of this model that responds to the demand for more affordable housing options in inner- and middle-suburban locations that are otherwise dominated by freestanding 'family' homes. Extremely basic and lacking in external landscape amenity, this common type nevertheless offers considerable potential for sustainable uplift, as they generally feature solid construction, efficient internal floor plans, good surface area and cross-ventilation. They are typically on two-levels (sometimes three or four due to slope) with surface parking and concrete driveways. Retrofitting opportunities include increasing landscape amenity, enabling site permeability, and adding a lift for universal accessibility. This can be combined with and potentially funded by additional level/s. Typically on single allotments, an advantage of their comparatively small size is that agreement and co-operation between six to eight owners generally presents fewer logistical hurdles than larger body-corporate structures. Nevertheless, the potential for improved yield and amenity increases if two or more adjacent six-packs are upgraded simultaneously, as this allows for increased efficiency through shared facilities such as driveways, services and bin enclosures. The location of many of these buildings in established suburbs close to services and public transport allows for the reduction of parking allocation to free up land for other uses.



Six Pack Case Study





Construction Type

- Double brick external walls
- Suspended concrete floors supported on single-skin brick internal walls
- Timber-framed roof

Floor Area

335m²

Site Dimensions

50 x 15m (750m²)

Density

104.5 dw/Ha

Facade Area : Floor Area

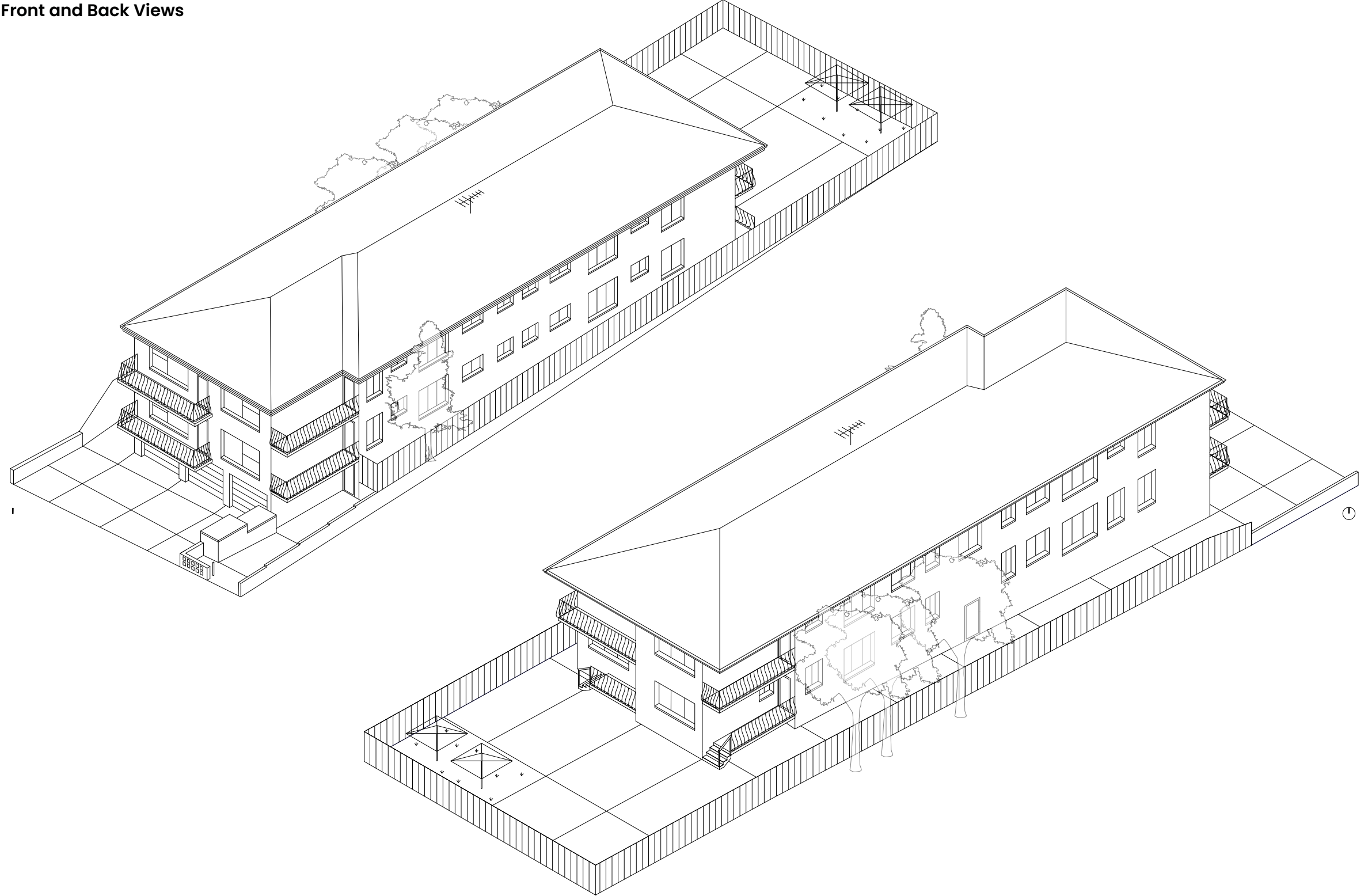
1.62 : 1

Site Coverage

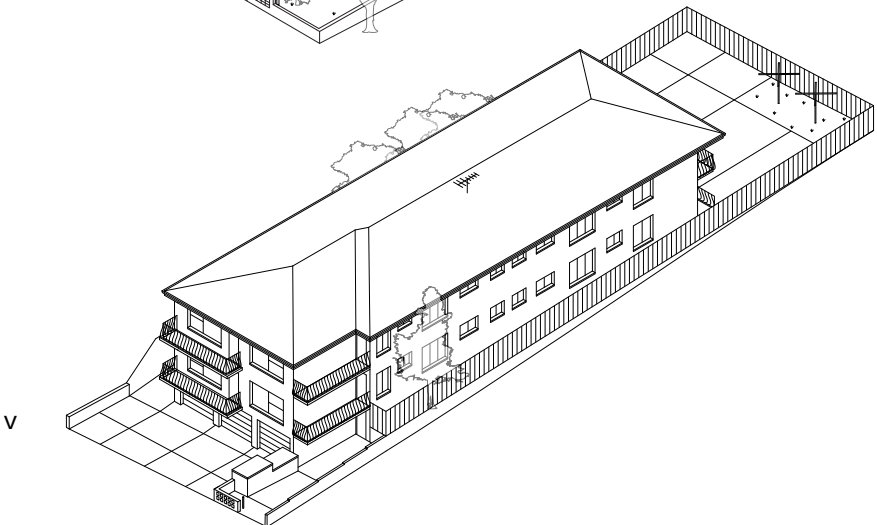
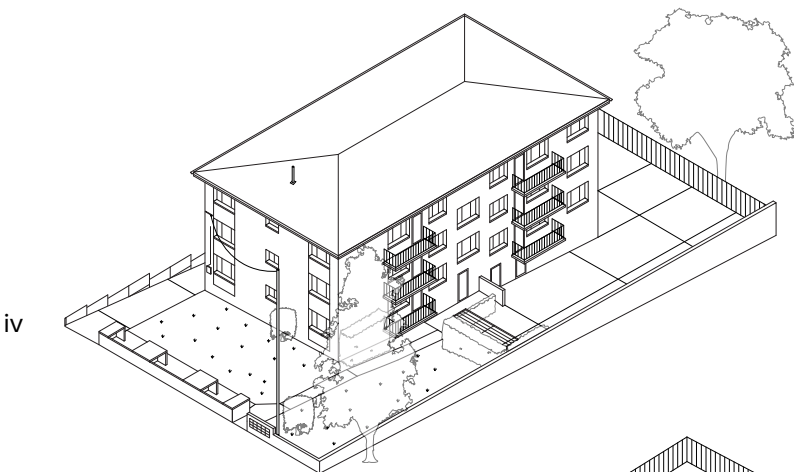
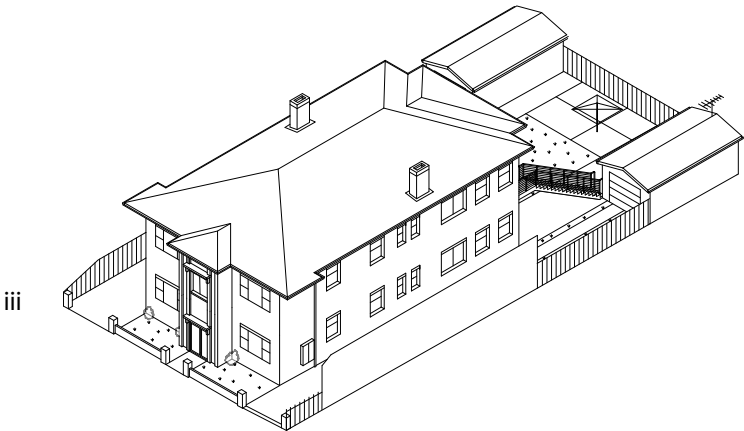
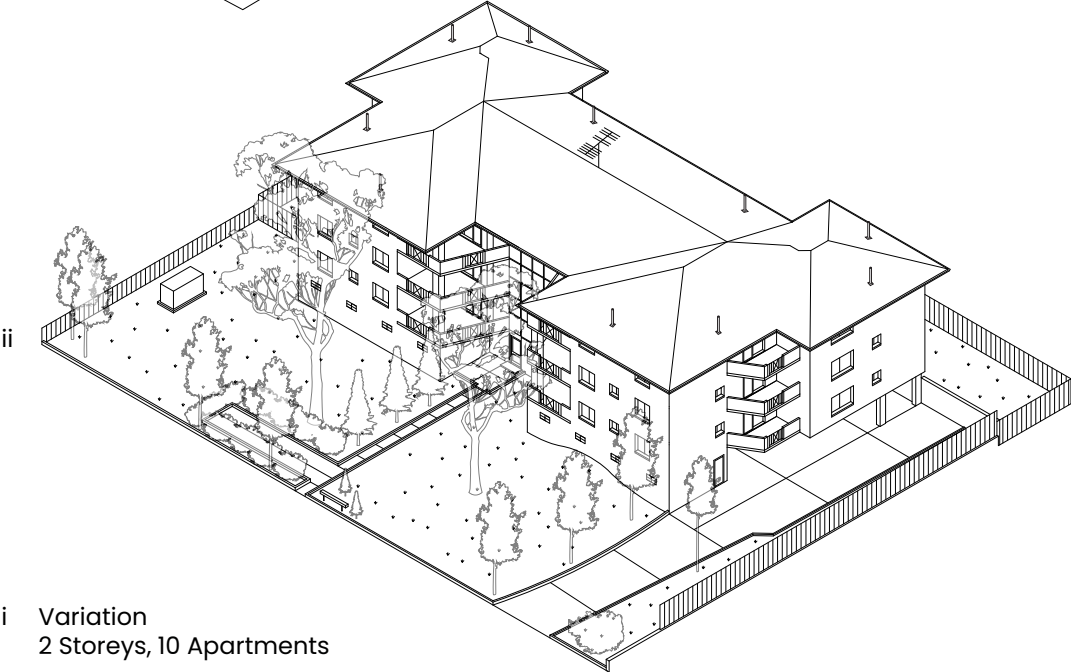
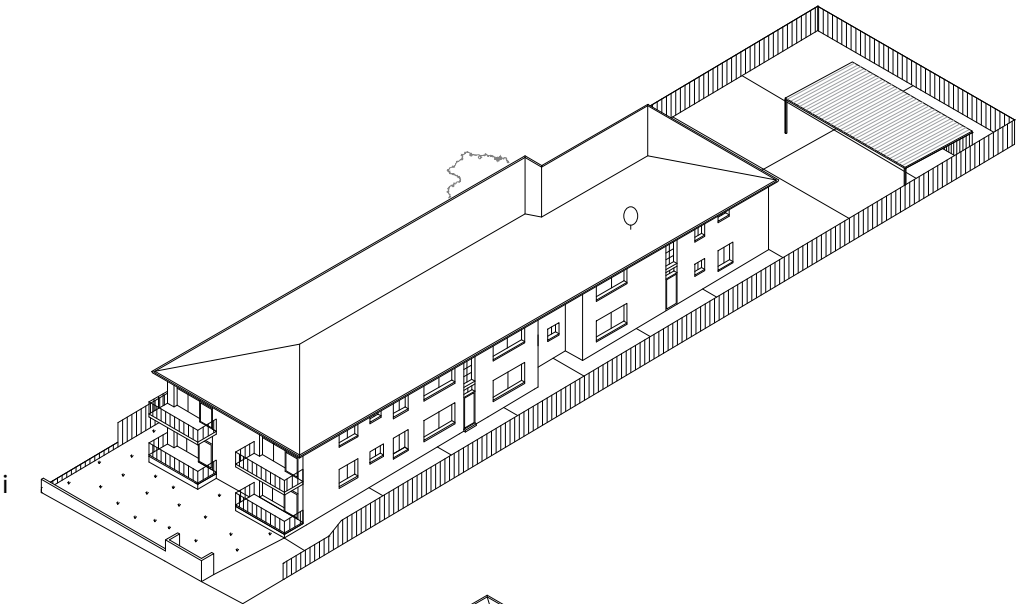
43.7%

0 2.5 5m

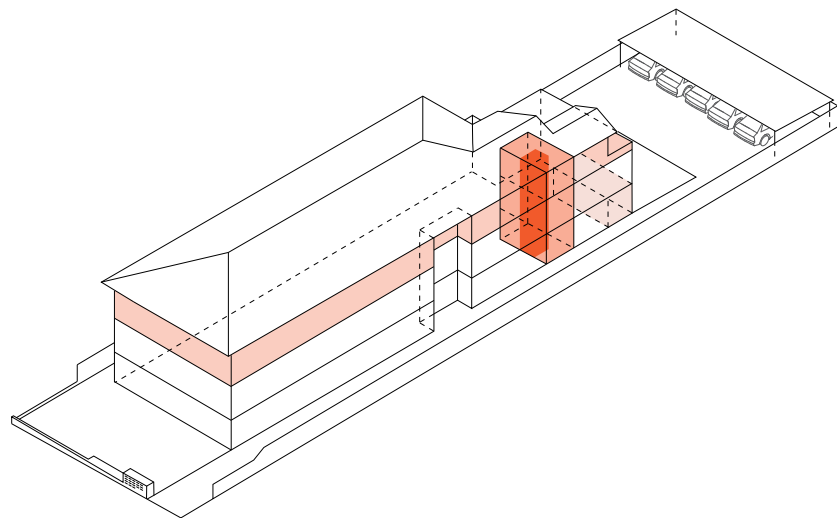
Front and Back Views



Six-Pack Variations



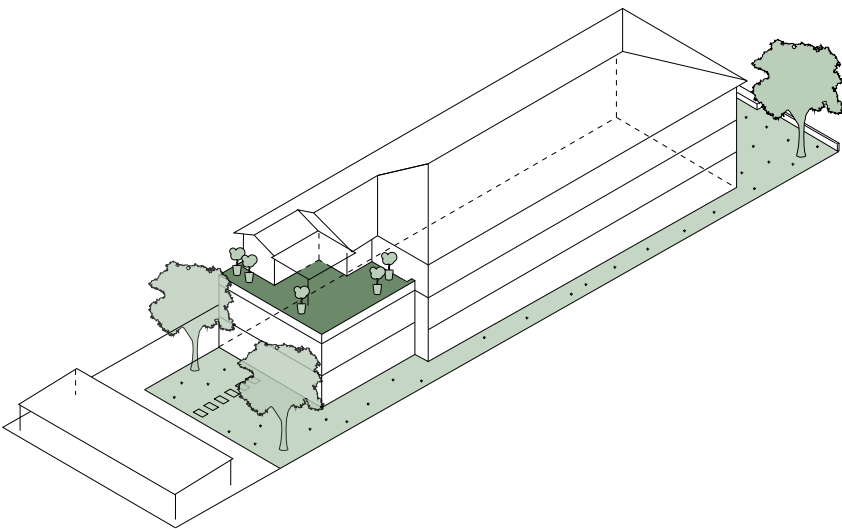
- i Variation
2 Storeys, 10 Apartments
- ii Variation
3 Storeys, 15 Apartments
- iii Variation
2 Storeys, 4 Apartments
- iv Variation
3 Storeys, 12 Apartments
- v Case Study
2 Storeys, 8 Apartments



Soft Density

Robust and direct construction systems can typically support the addition of a floor level in light-weight construction. The integration of a lift, within the existing circulation or as a plug-in, increases overall accessibility and supports access to the new level.

Dwelling Increase: 4

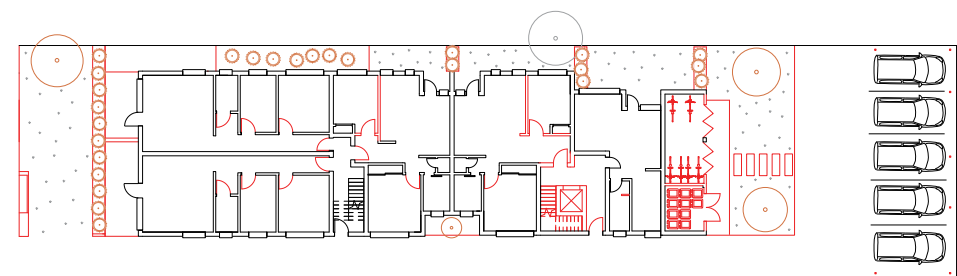
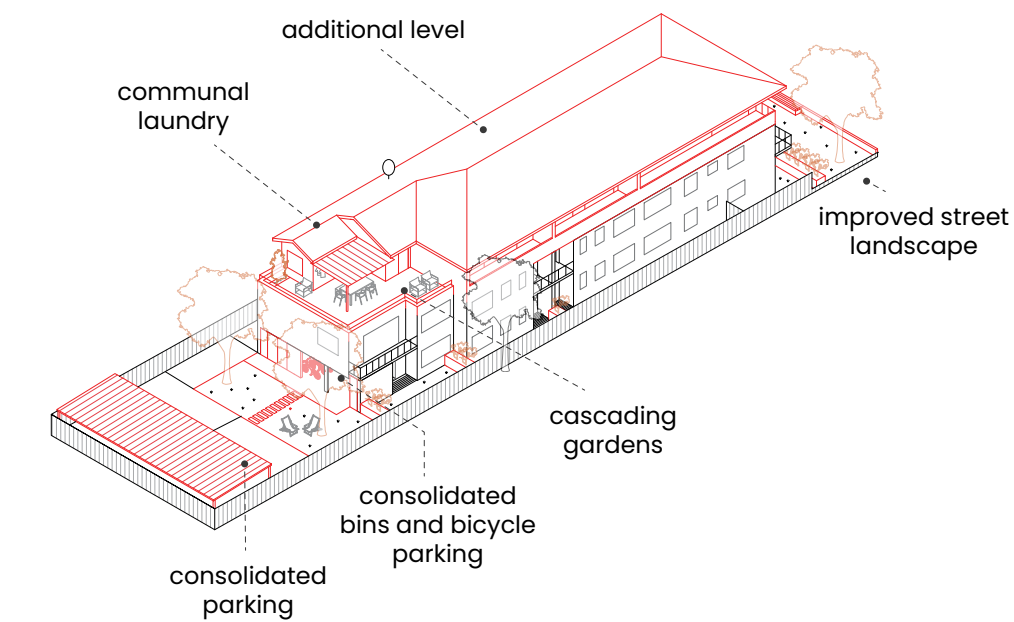


Urban Greening

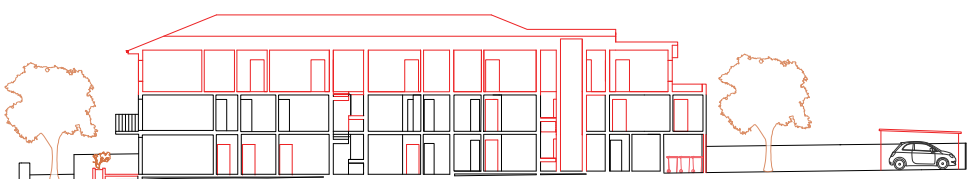
Driveways and hard surfaces are replaced with landscape, improving site permeability, shade and amenity. Mature trees are maintained and private balconies add plants. Services and car parking are consolidated at front and rear. Removing fences between properties creates shared driveways, allowing more room for tree zones.

Canopy Increase: 24m²
3 large trees

Six-Pack Case Study
 Diagrammatic Illustrations - Single Block

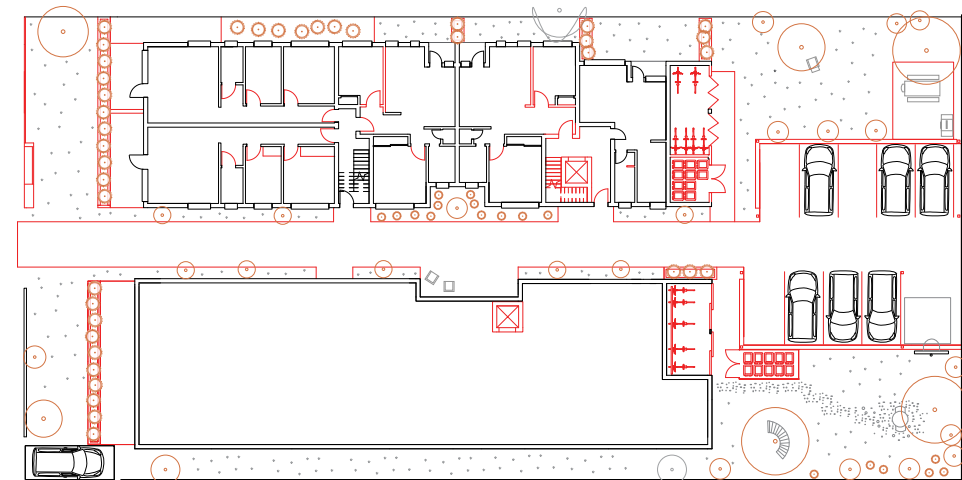
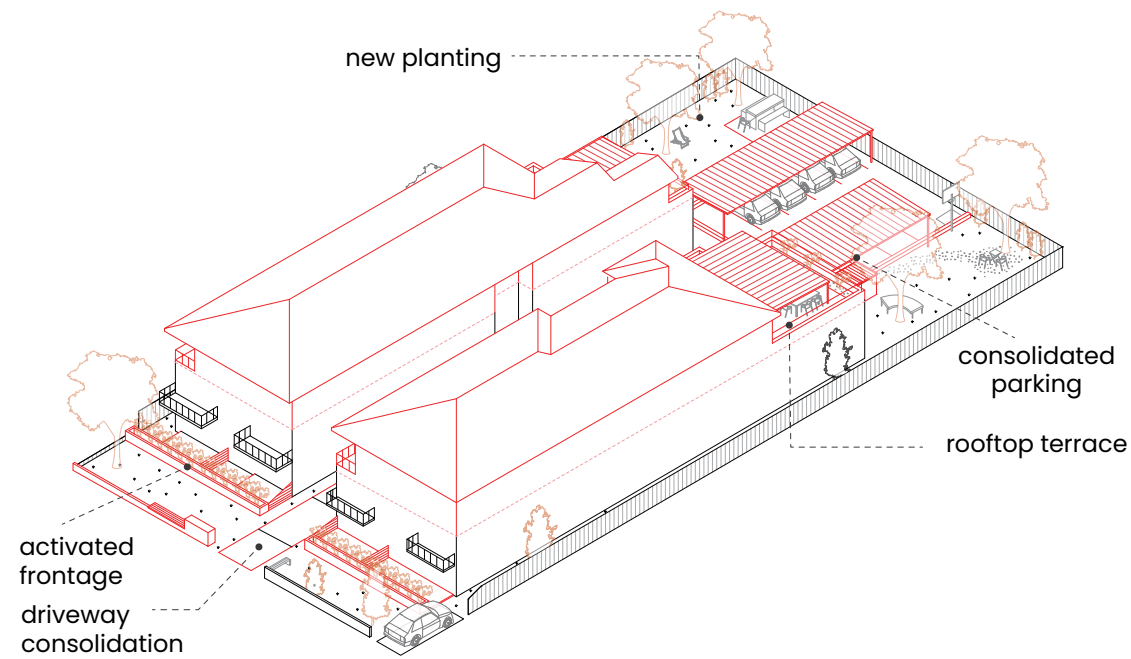


Ground Floor Plan

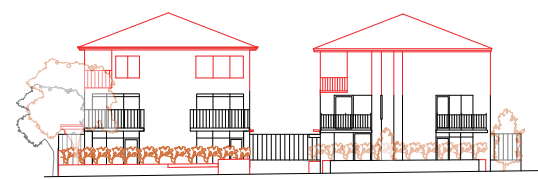


North-South Section

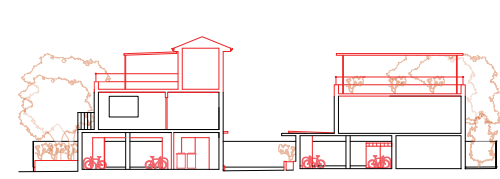
Diagrammatic Illustrations - Double Block



Ground Floor Plan



Street Elevation



East-West Section

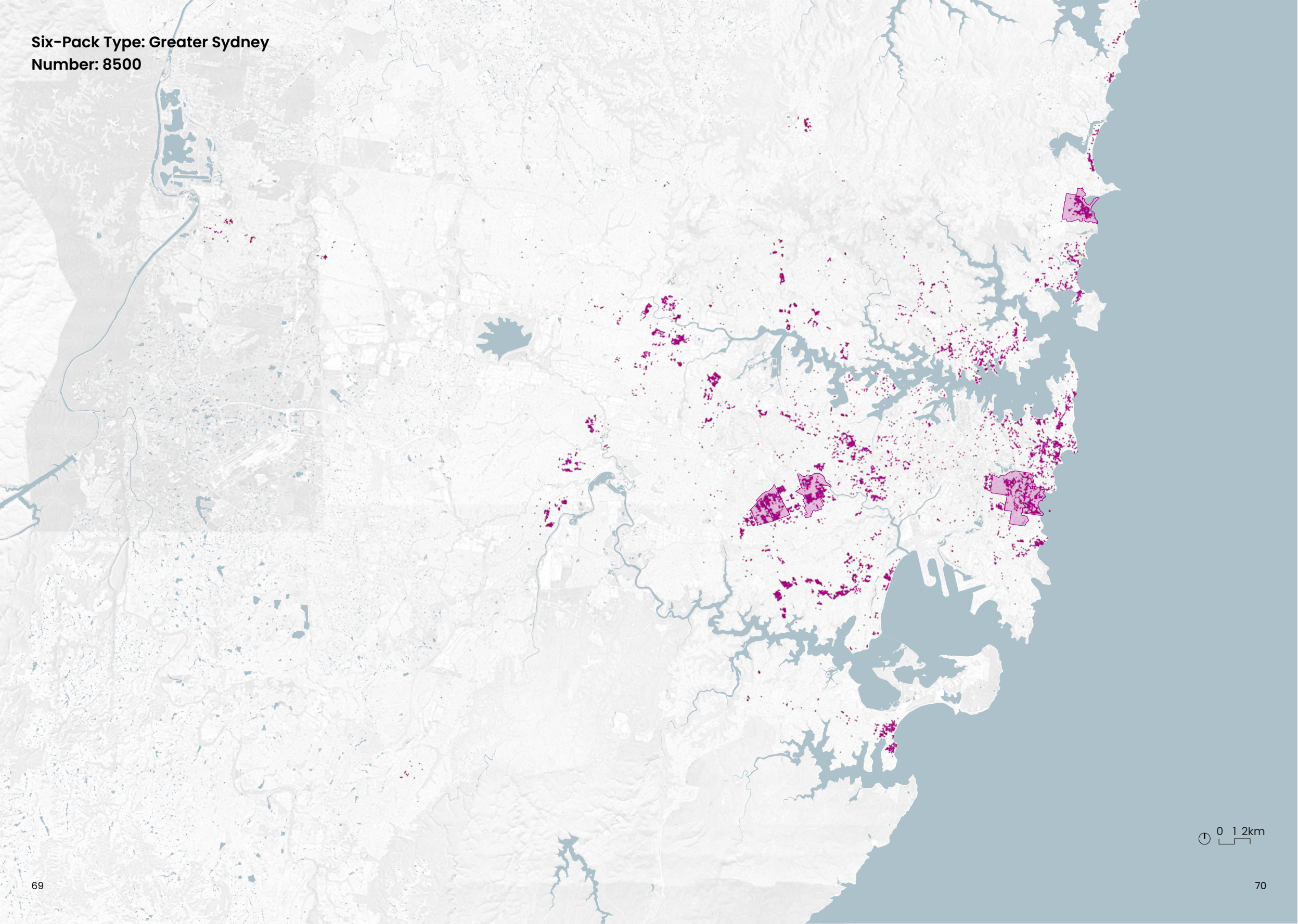
0 2.5 5m





0 50 100m

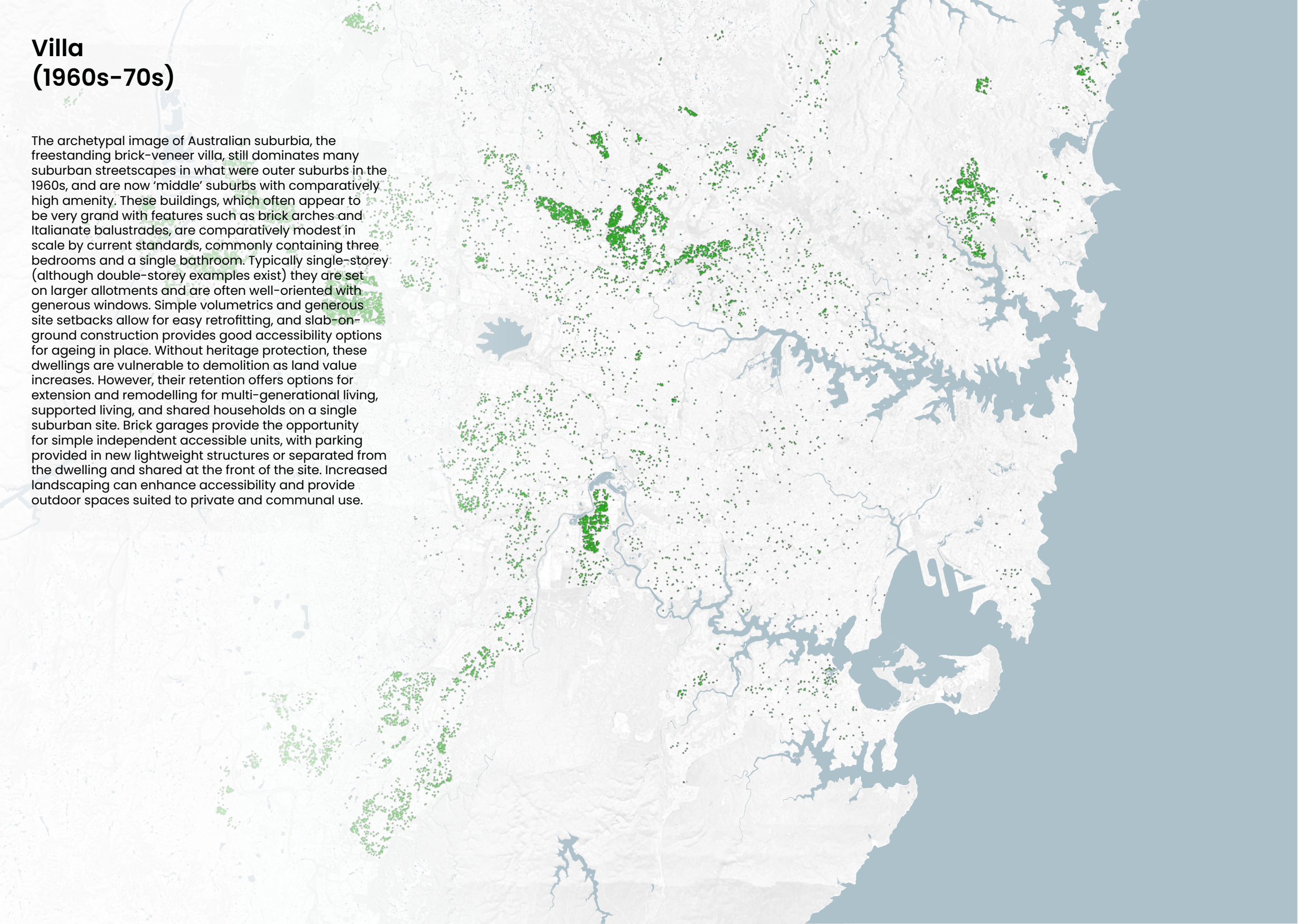
Six-Pack Type: Greater Sydney
Number: 8500



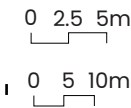
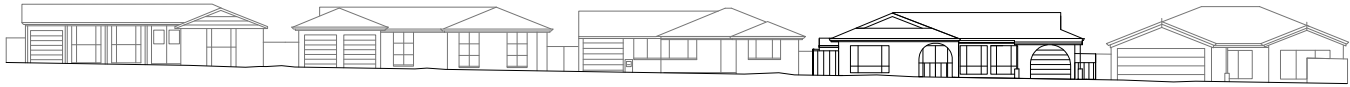
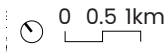
0 1 2km

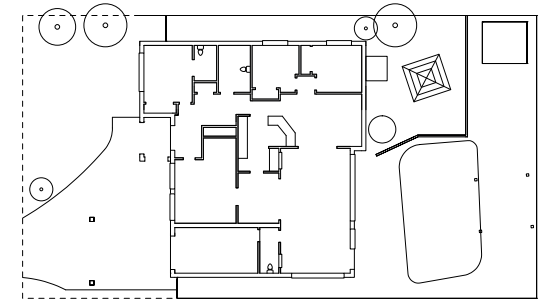
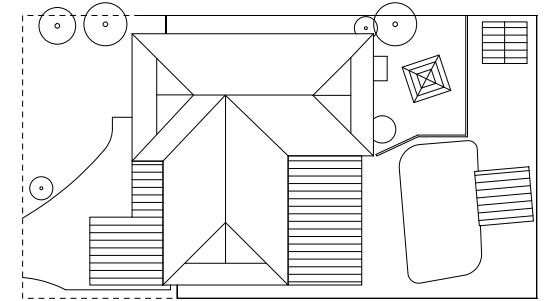
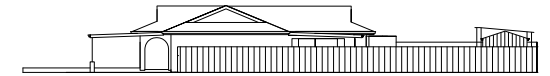
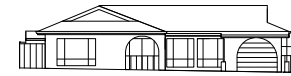
Villa (1960s–70s)

The archetypal image of Australian suburbia, the freestanding brick-veneer villa, still dominates many suburban streetscapes in what were outer suburbs in the 1960s, and are now 'middle' suburbs with comparatively high amenity. These buildings, which often appear to be very grand with features such as brick arches and Italianate balustrades, are comparatively modest in scale by current standards, commonly containing three bedrooms and a single bathroom. Typically single-storey (although double-storey examples exist) they are set on larger allotments and are often well-oriented with generous windows. Simple volumetrics and generous site setbacks allow for easy retrofitting, and slab-on-ground construction provides good accessibility options for ageing in place. Without heritage protection, these dwellings are vulnerable to demolition as land value increases. However, their retention offers options for extension and remodelling for multi-generational living, supported living, and shared households on a single suburban site. Brick garages provide the opportunity for simple independent accessible units, with parking provided in new lightweight structures or separated from the dwelling and shared at the front of the site. Increased landscaping can enhance accessibility and provide outdoor spaces suited to private and communal use.



Villa Case Study





Construction Type

- Brick veneer external walls (occasionally double brick)
- Timber internal walls
- Concrete slab on ground
- Timber-framed roof

Floor Area

242m²

Site Dimensions

18.5 x 35m (647.5m²)

Density

104.5 dw/Ha

Facade Area : Floor Area

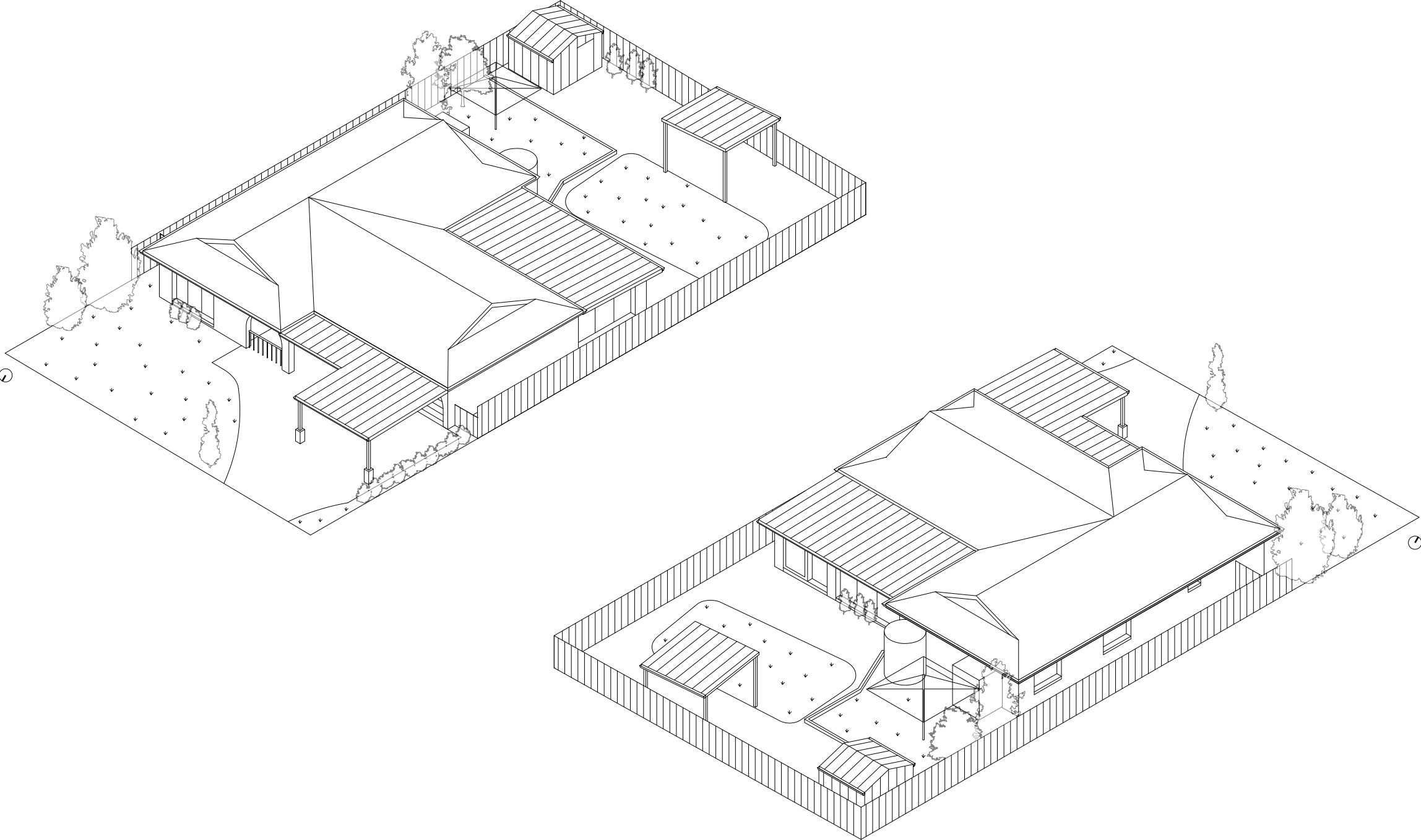
1 : 1.55

Site Coverage

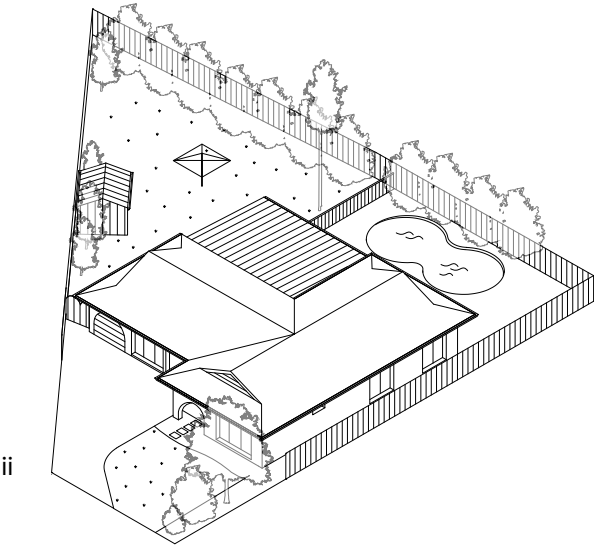
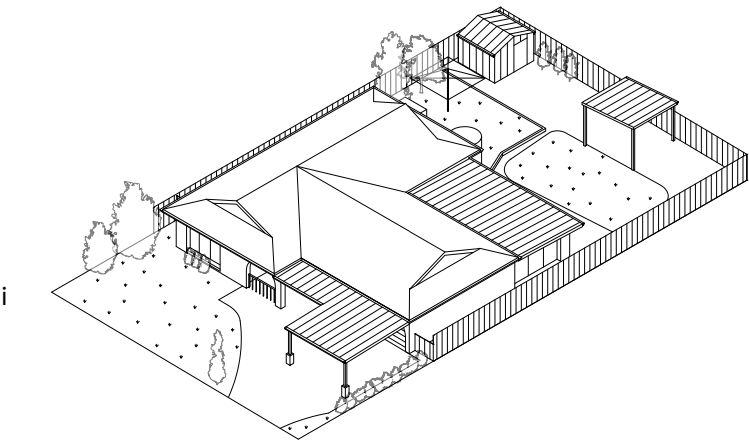
46.2%

0 2.5 5m

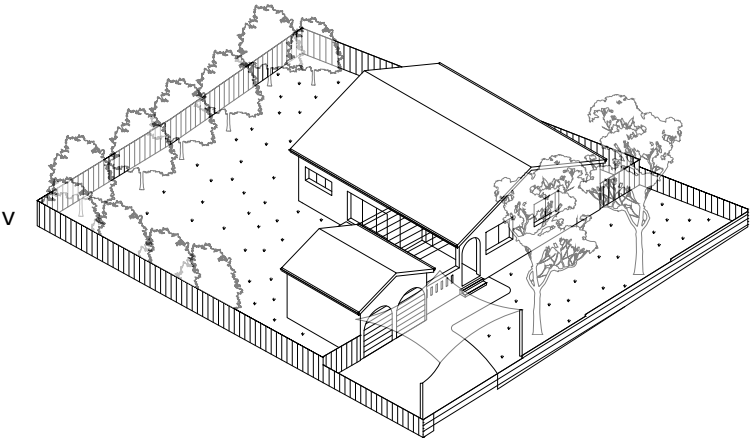
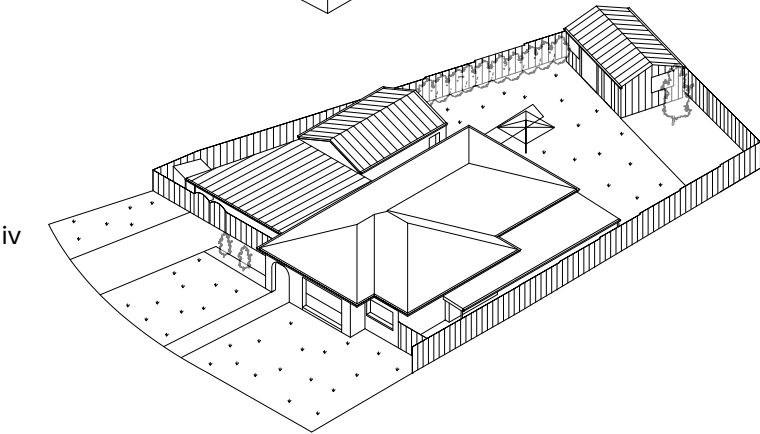
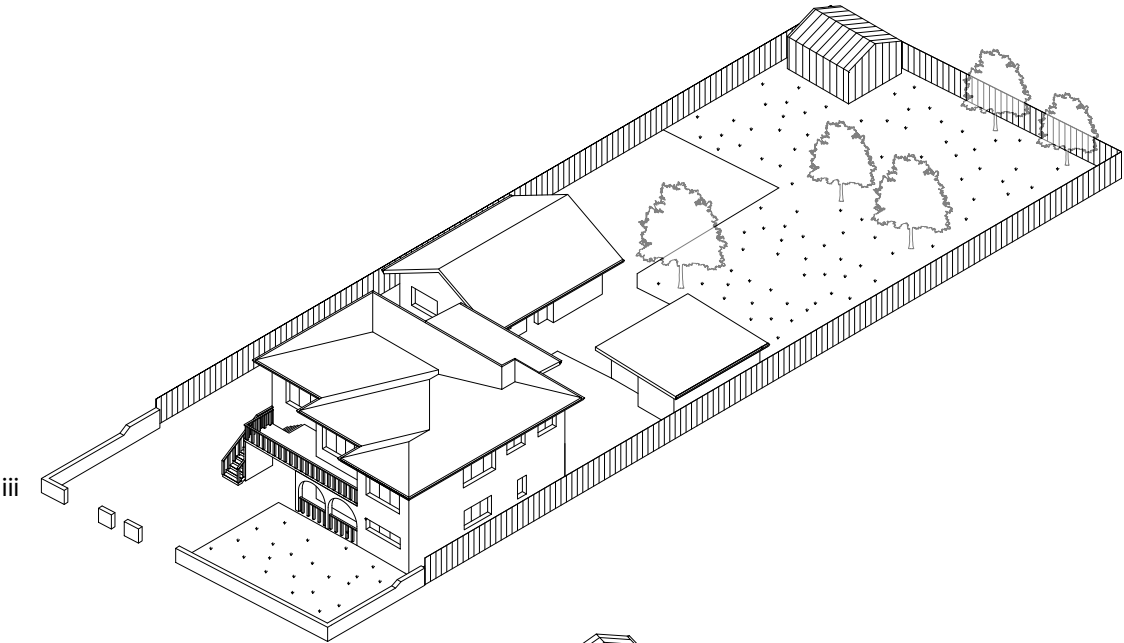
Front and Rear Views



Villa Variations

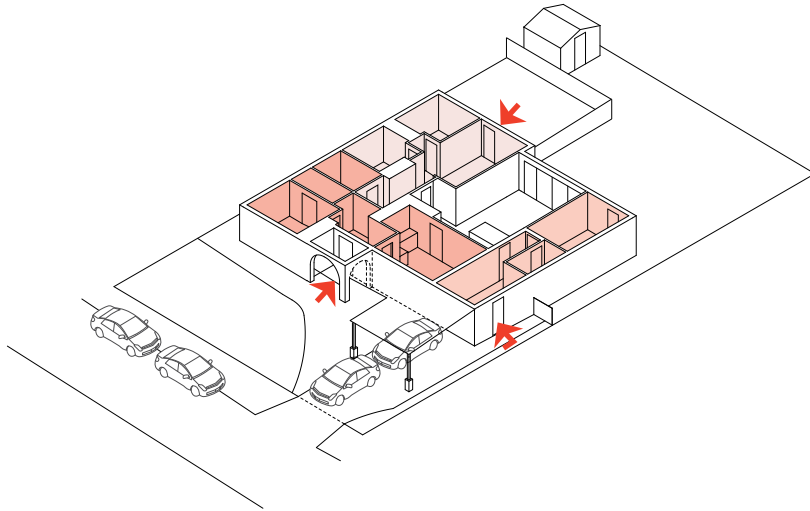


- i Case Study
3 Bed, 3 Bath, 3 Living, 2 Car
- ii Variation
3 Bed, 1 Bath, 3 Living, 1 Car
- iii Variation
8 Bed, 2.5 Bath, 2 Living, 1 Car
- iv Variation
3 Bed, 1 Bath, 2 Living, 4 Car
- v Variation
4 Bed, 2.5 Bath, 1 Living, 2 Car



Villa Case Study

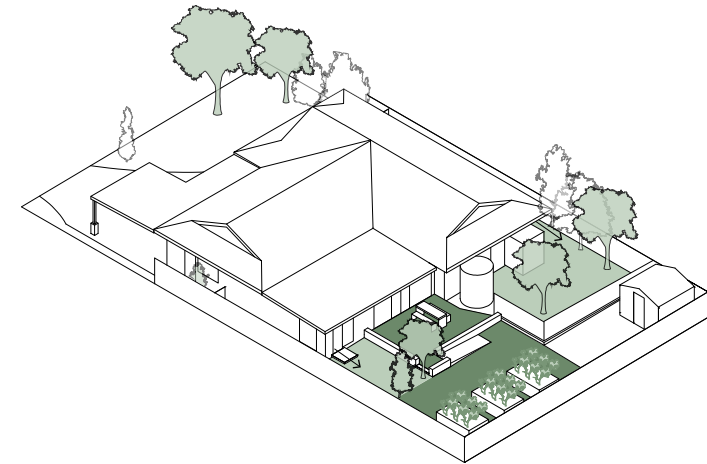
Potential for Densification and Greening



Soft Density

A large house on a big block is subdivided through internal remodelling and/or extending of existing building, creating multiple dwellings for shared or multi-generational households. Grouping existing bathrooms with private bedroom and living space, along with a kitchenette, creates a subdivision of new units within the larger property. Separate entries, like external staircases and additional doorways, enable independence and privacy. The garage offers the opportunity for conversion to a multi-purpose space.

Dwelling Increase: 1-2 + multi-use space

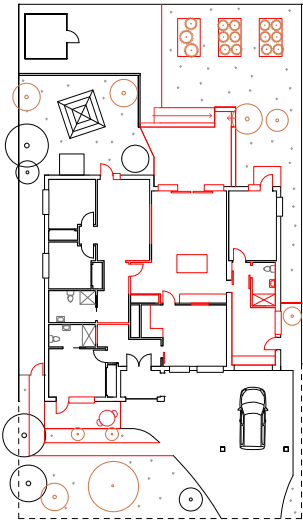
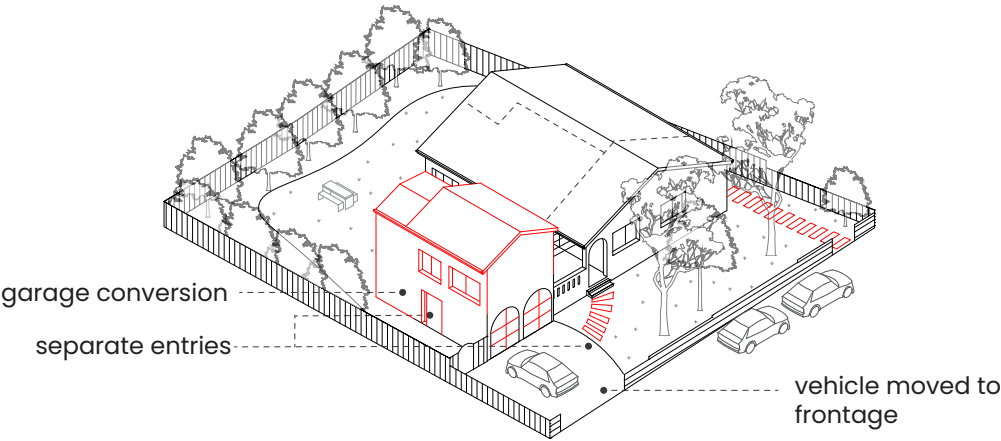
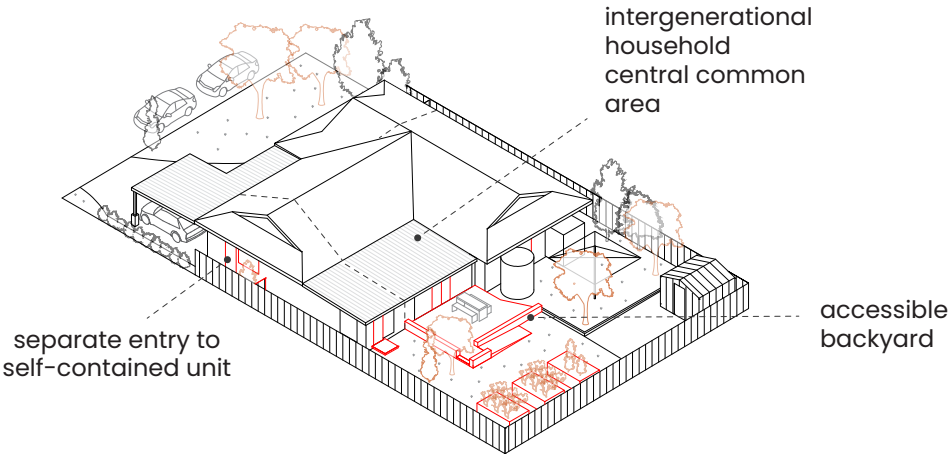


Urban Greening

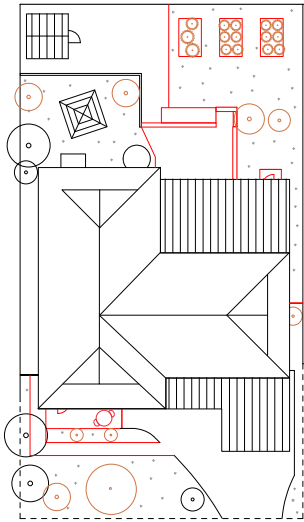
Where possible, hard spaces are replaced with permeable landscapes to enhance performance and amenity. Landscape design enhances accessibility and provides a range of outdoor spaces suited to private and communal use.

Canopy Increase: 16m²

1 large tree | 4 medium trees | 2 small trees



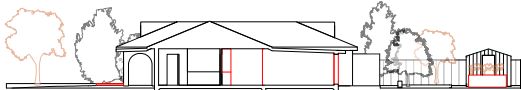
Ground Floor Plan



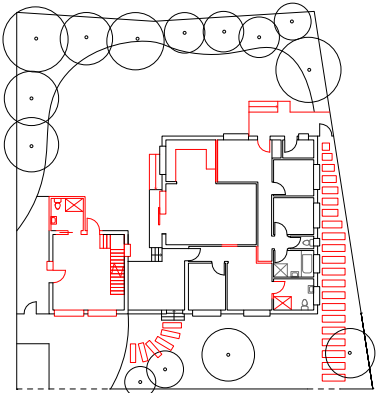
Site Plan



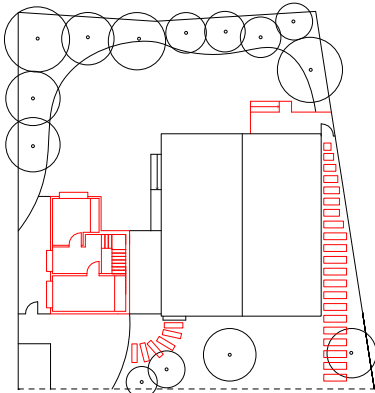
Street Elevation



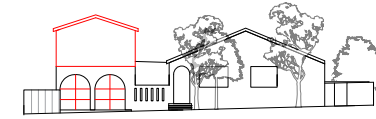
Long Section



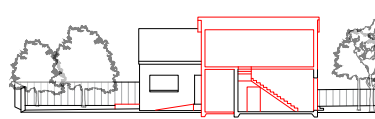
Ground Floor Plan



First Floor Plan



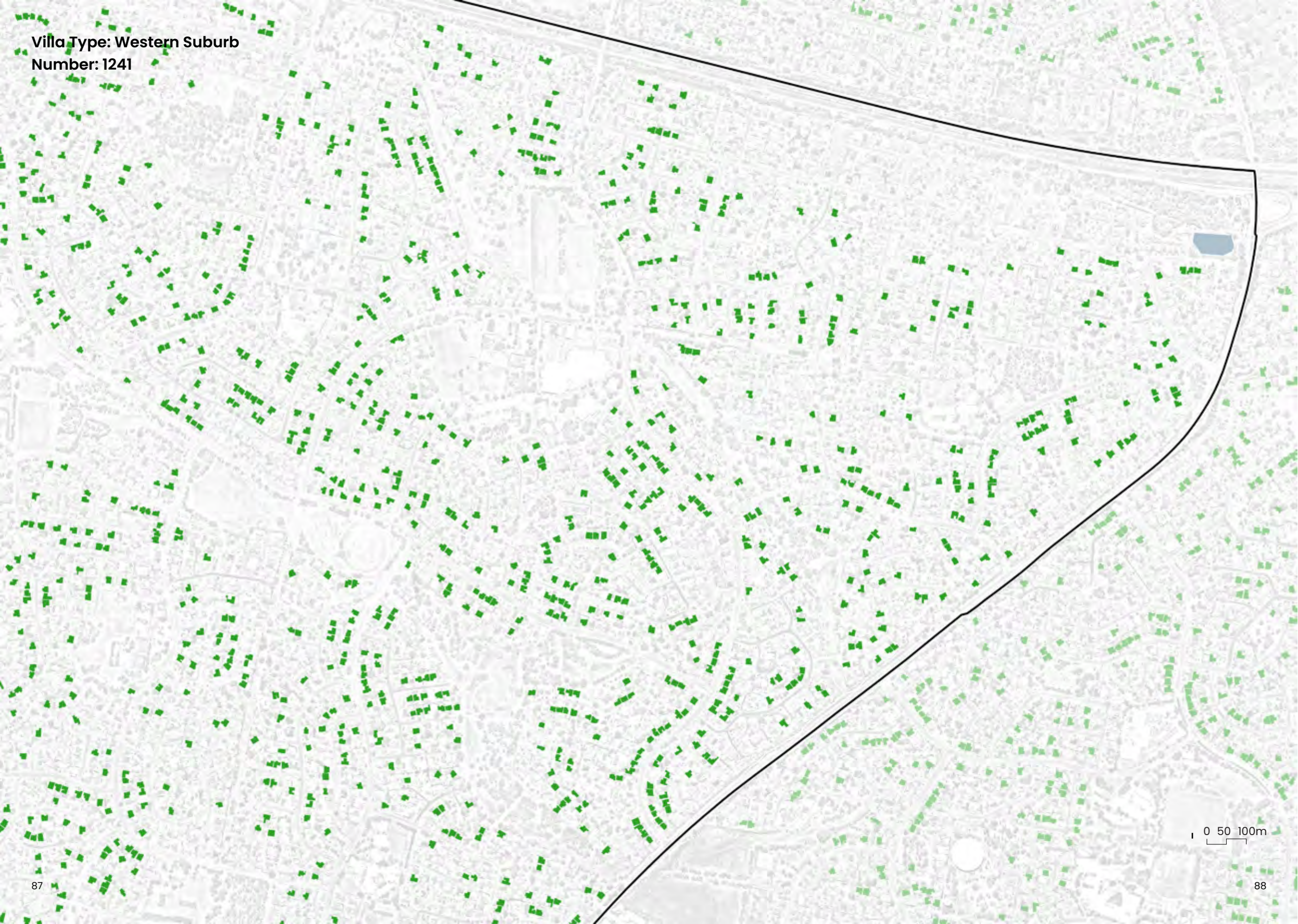
Street Elevation



First Floor Plan

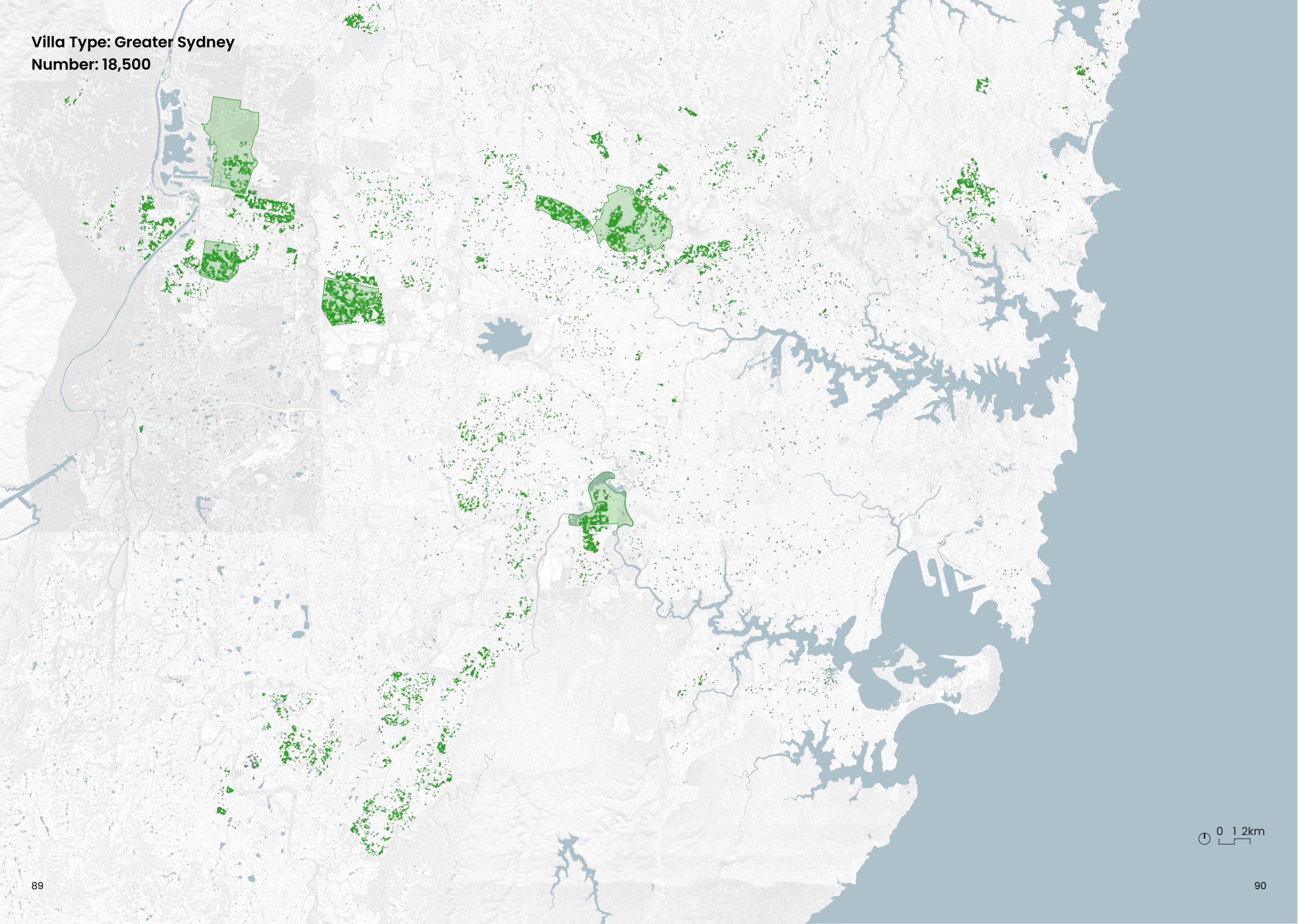


Villa Type: Western Suburb
Number: 1241



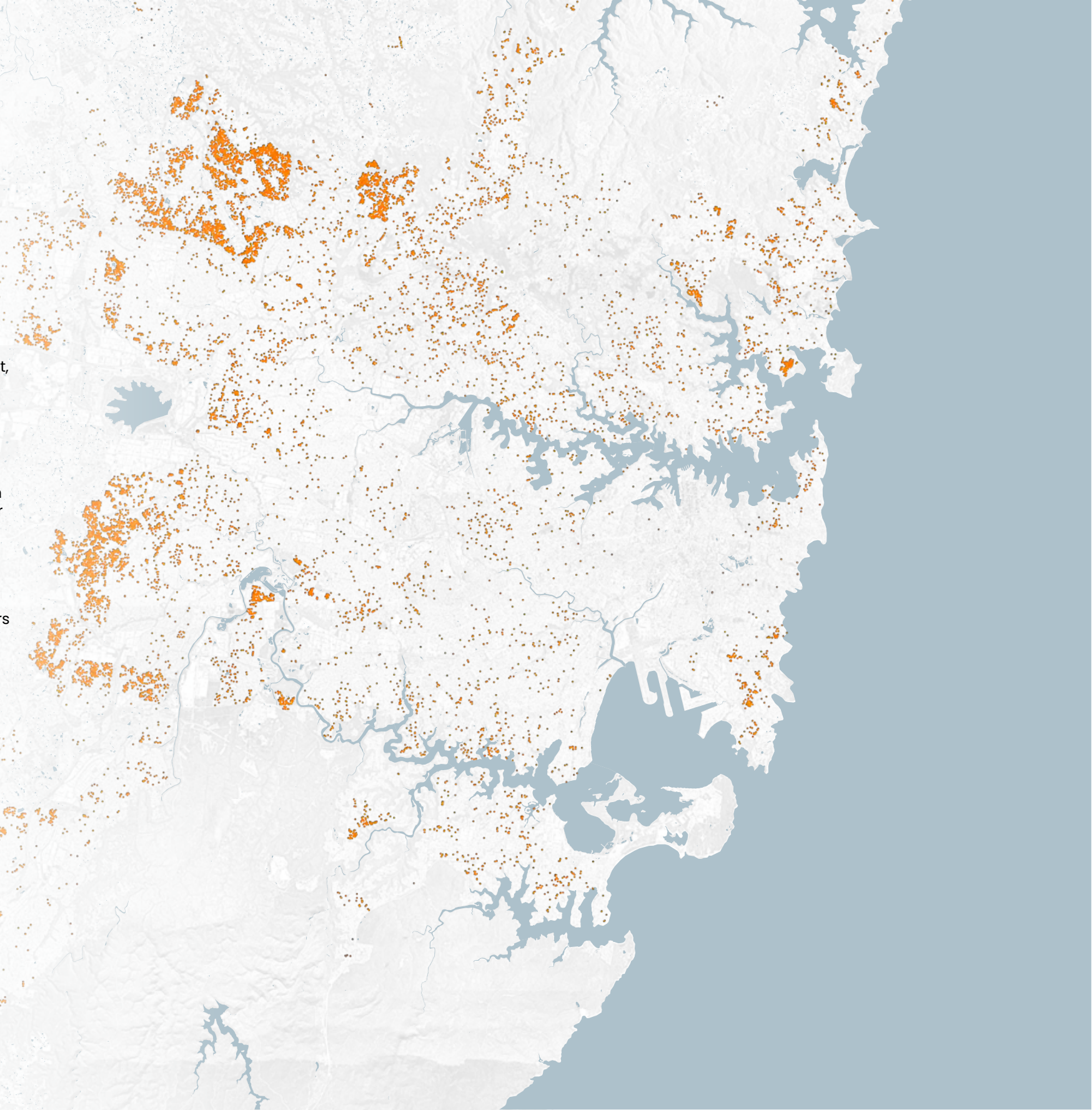
0 50 100m

Villa Type: Greater Sydney
Number: 18,500



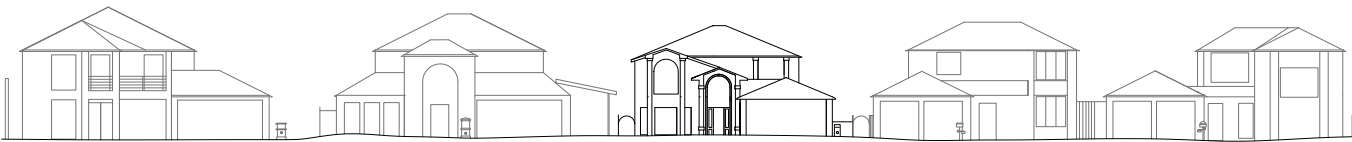
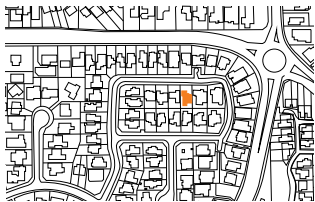
Mansion (1990s–Ongoing)

Compared to the suburbia of the 1960s and 1970s, most dwellings built more recently on greenfield estates are large and aspirational, earning the derogative nickname 'McMansions'. Since the 1990s these suburban houses have steadily increased in size while being built on smaller plots of land. This has resulted in narrow side and rear setbacks with dimensions that are more urban than 'suburban'. These large houses are typically one or two stories, with a double garage dominating the street frontage. The standardised double-garage dimensions, large internal floor area and building-in-the-round qualities lend themselves to many types of internal retrofit, in which density and diversity can be increased without dramatic formal or visual change to the exterior. Through redesigned carparking, entrances and wet areas, these buildings can accommodate a diversity of household types and uses within the one building volume with multiple entrances. Scenarios such as multi-generational living, share-housing, home businesses and co-living can be easily accommodated. Two-storey structures allow for connections between upper level balconies, gardens and other outdoor spaces for private and social use. Garages are already being used informally as small businesses; their prominent street frontage and easy access is well suited to a range of contemporary home-work activities such as hair and nail salons, dog grooming, sewing repairs and training gyms.



Mansion Case Study

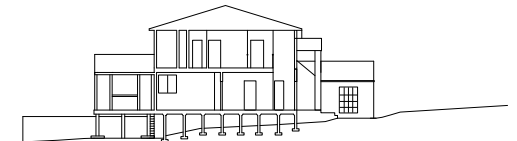
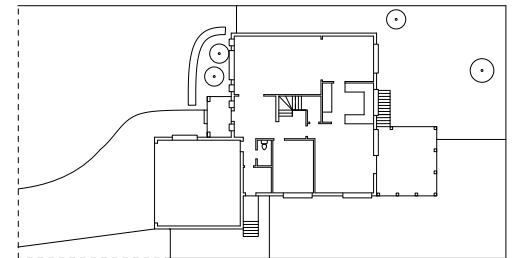
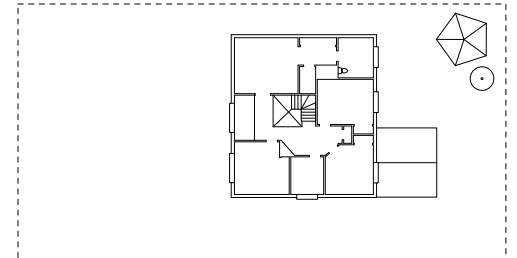
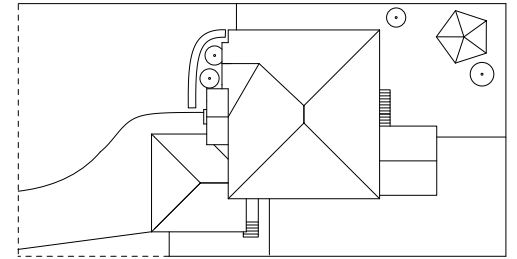
0 0.5 1km



0 2.5 5m

0 5 10m





Construction Type

- Rendered external walls (lightweight board or masonry in combination)
- Timber internal walls
- Slab on ground
- Timber-framed roof

Floor Area

297m²

Site Dimensions

15.75 x 32m (504m²)

Density

19.8 dw/Ha

Facade Area : Floor Area

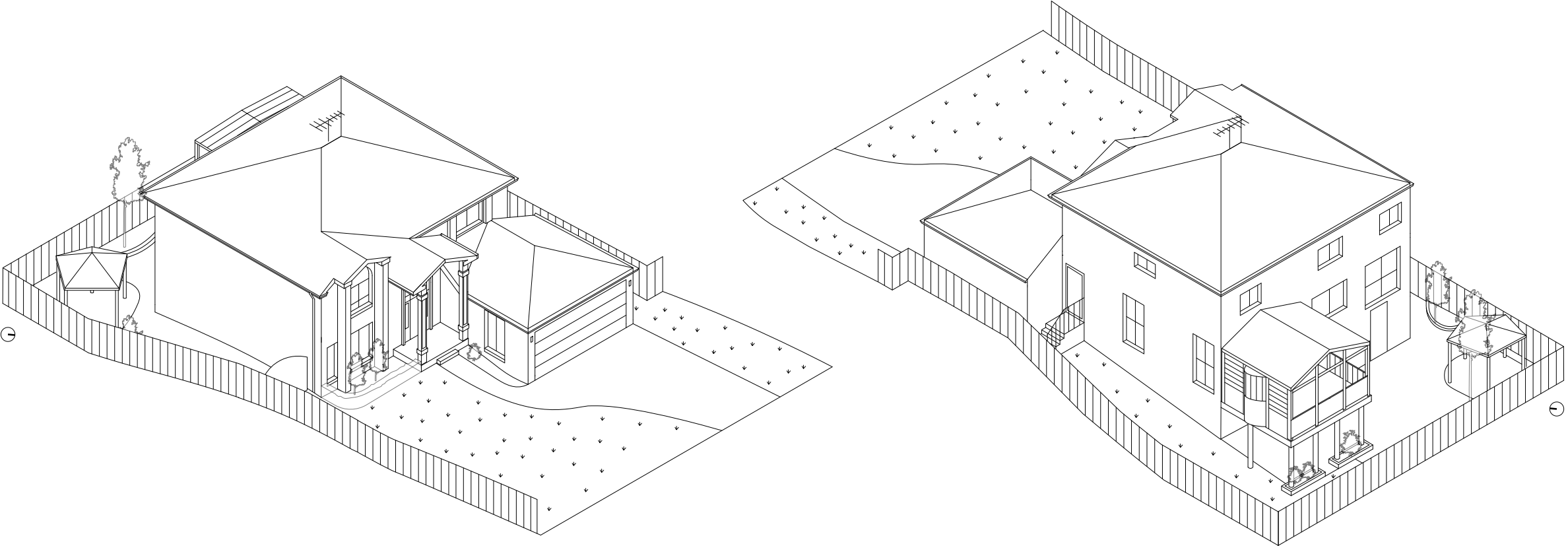
1.12 : 1

Site Coverage

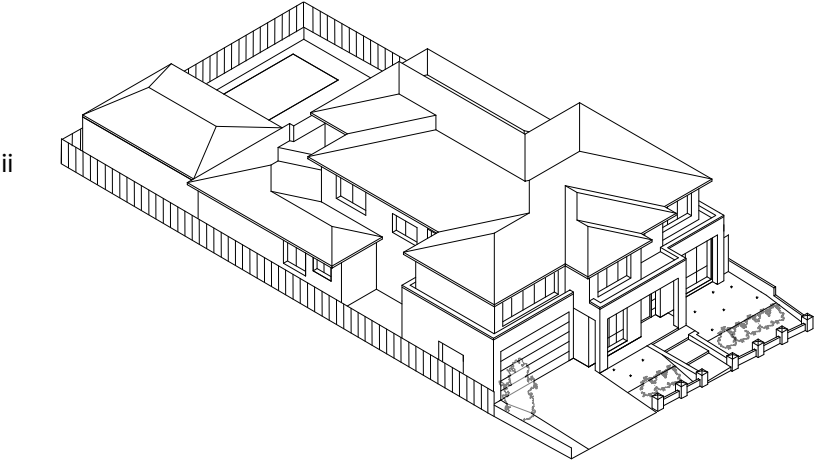
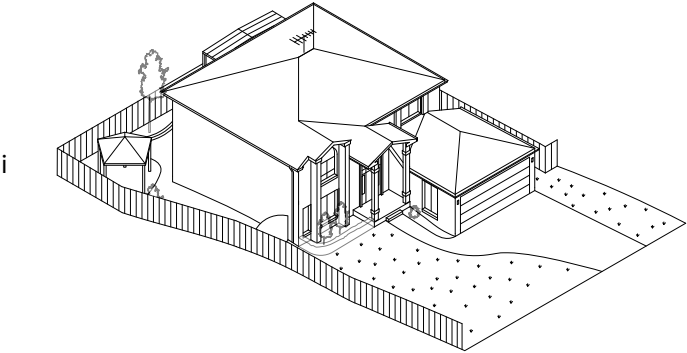
39%

0 2.5 5m

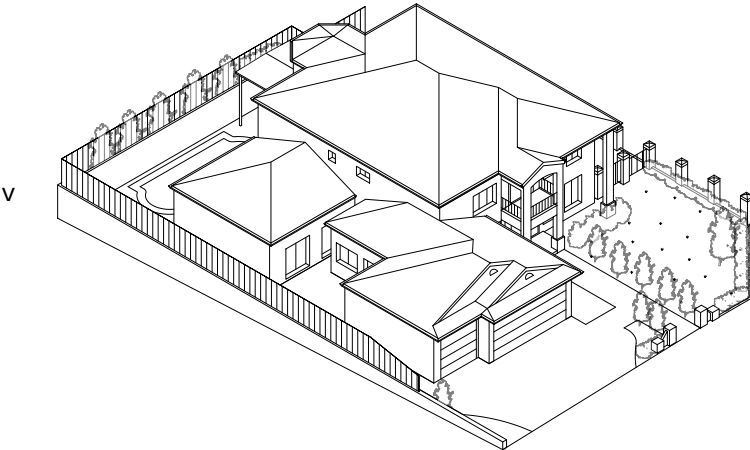
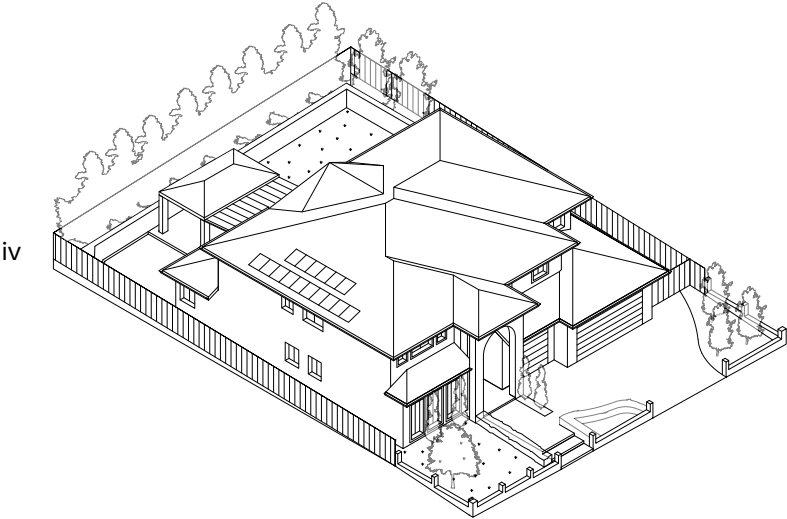
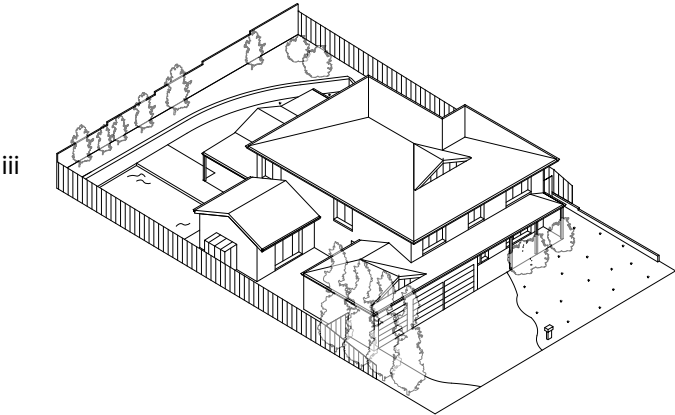
Front and Rear Views

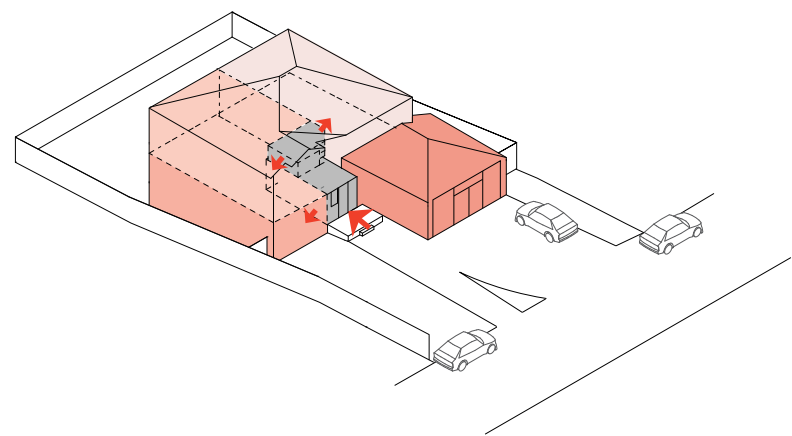


Mansion Variations



- i Case Study
5 Bed, 2.5 Bath, 2 Living, 2 Car
- ii Variation
5 Bed, 4 Bath, 6 Living, 2 Car
- iii Variation
5 Bed, 2.5 Bath, 3 Living, 3 Car
- iv Variation
5 Bed, 3 Bath, 4 Living, 3 Car
- v Variation
5 Bed, 3 Bath, 5 Living, 3 Car

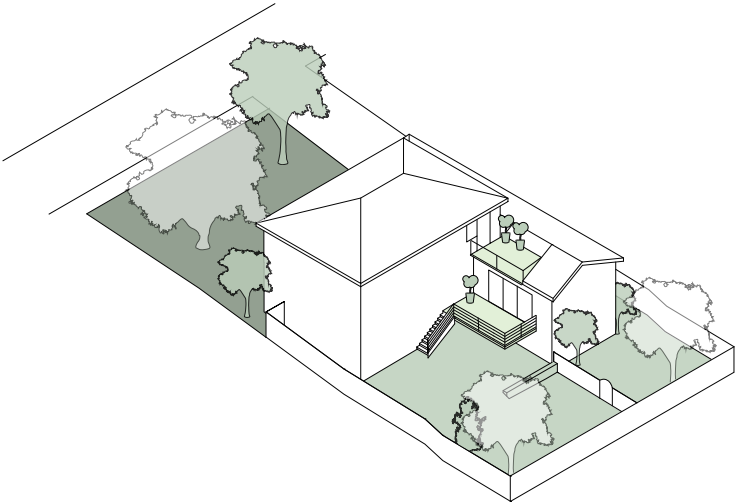




Soft Density

Like the villa, the mansion offers options for reconfiguration, particularly the larger, two-storey model with double garages. Multiple households are contained within the one building volume enabling multi-generational living and share housing with common amenities. The two-storey scale of the building allows the separation of the units across two levels, with more visual and acoustic privacy. The double garage on the street can be converted for a range of uses, like a studio, workspace or a home business.

Dwelling Increase: 2 + 1 multi-use space



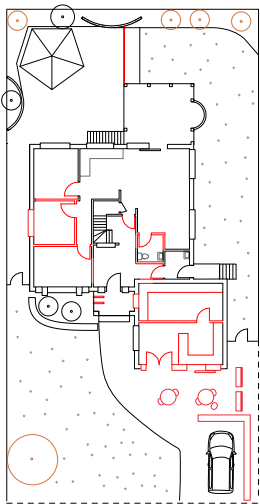
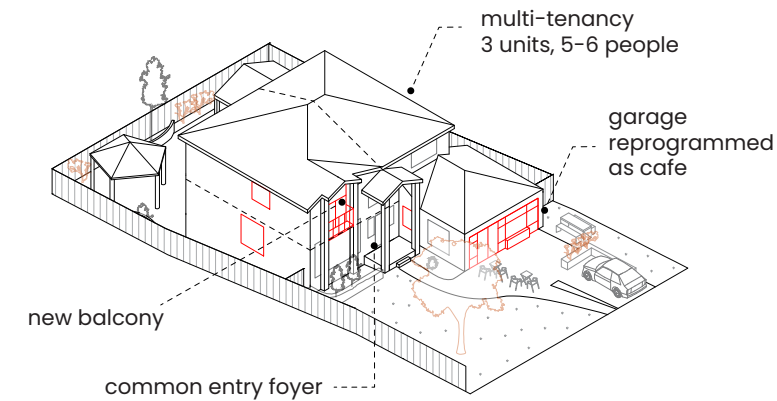
Urban Greening

The two-storeys of the homes create opportunity for connections between upper level balconies and garden. New enhanced landscape design creates more permeability and a range of outdoor spaces for private and social use. Combination of allotments increases landscape area and provides extra room for shared facilities.

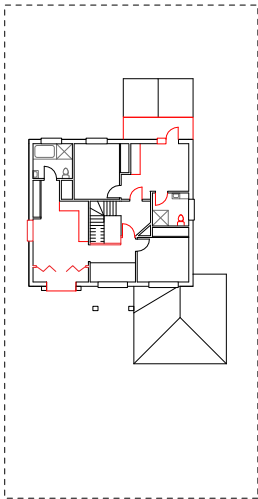
Canopy Increase: 14m²
1 large tree | 4 medium trees

Mansion Case Study

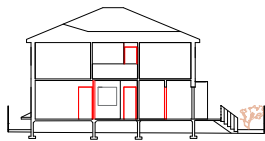
Diagrammatic Illustrations - Single Block



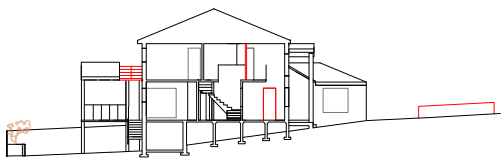
Ground Floor Plan



First Floor Plan

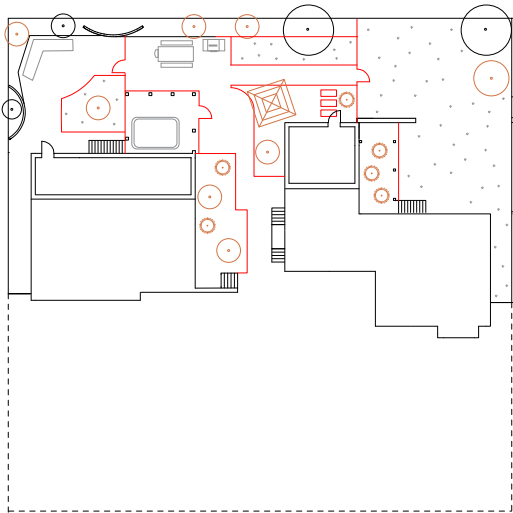
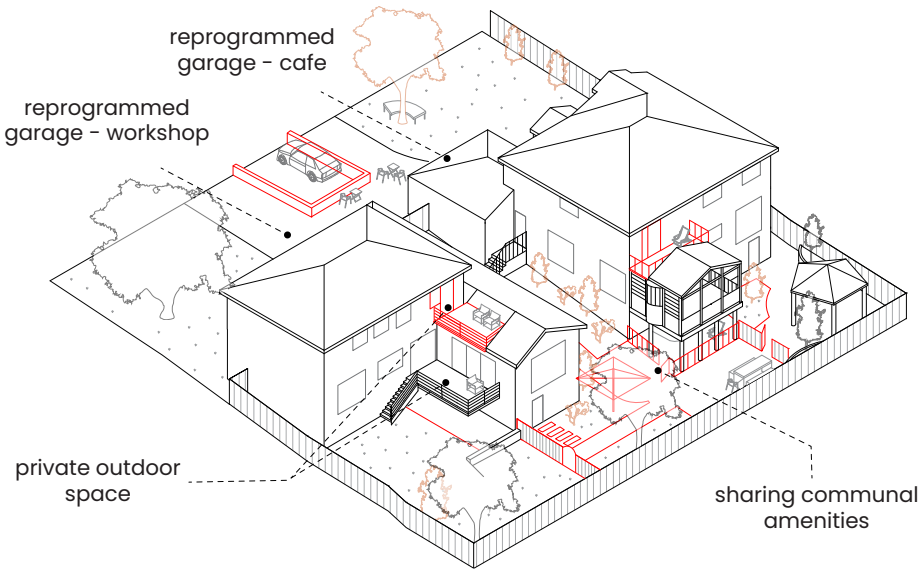


East-West Section

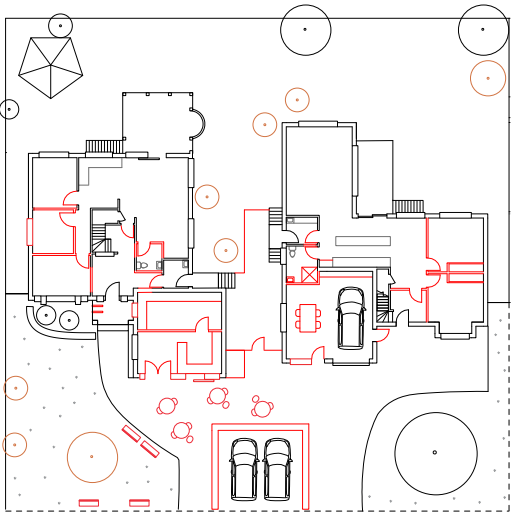


North-South Section

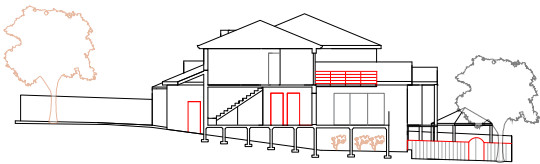
Diagrammatic Illustrations - Double Block



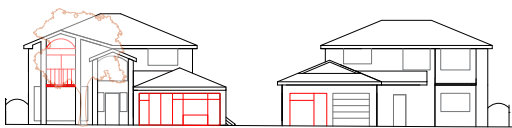
Undercroft Floor Plan



Ground Floor Plan

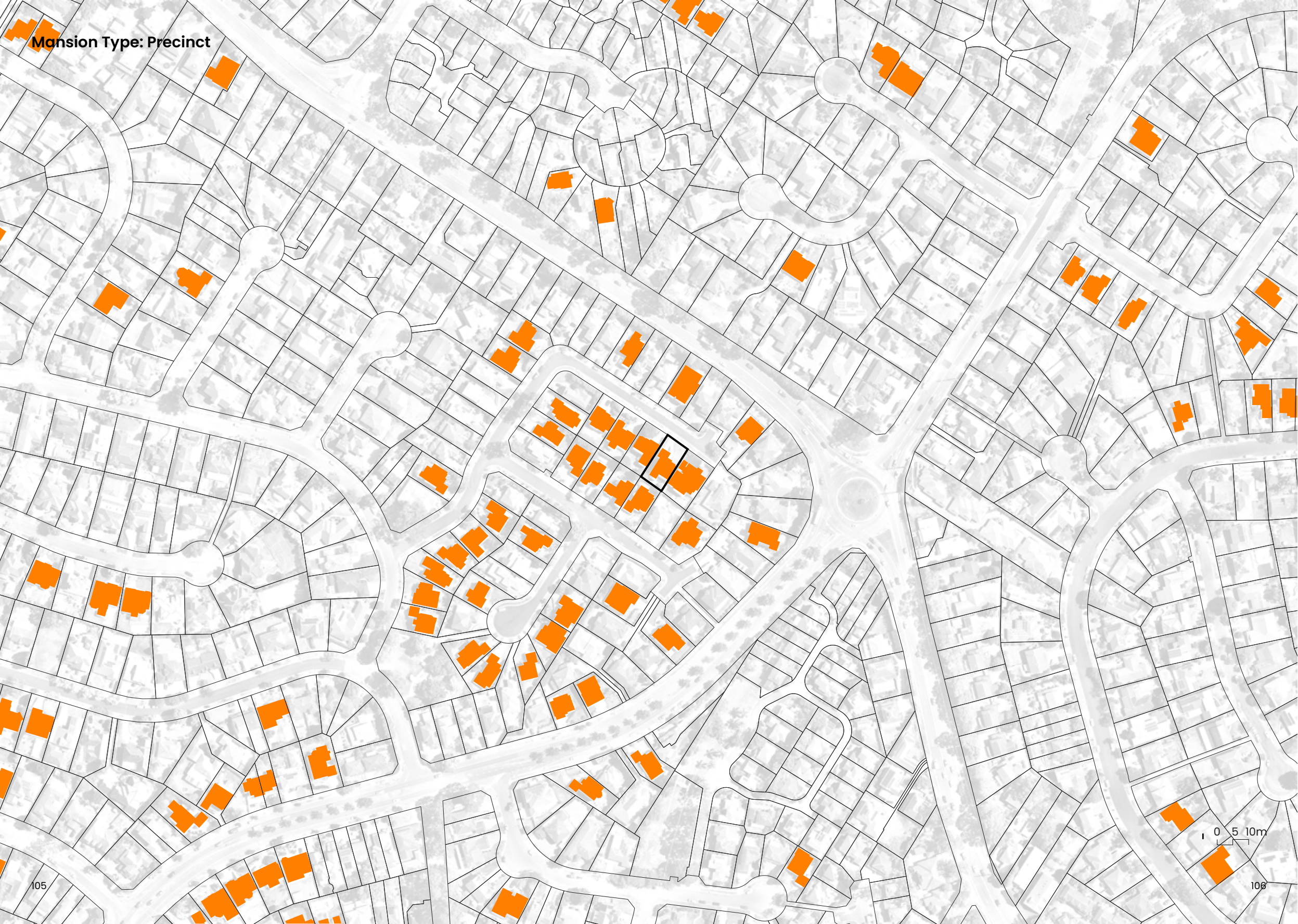


North-South Section



Street Elevation

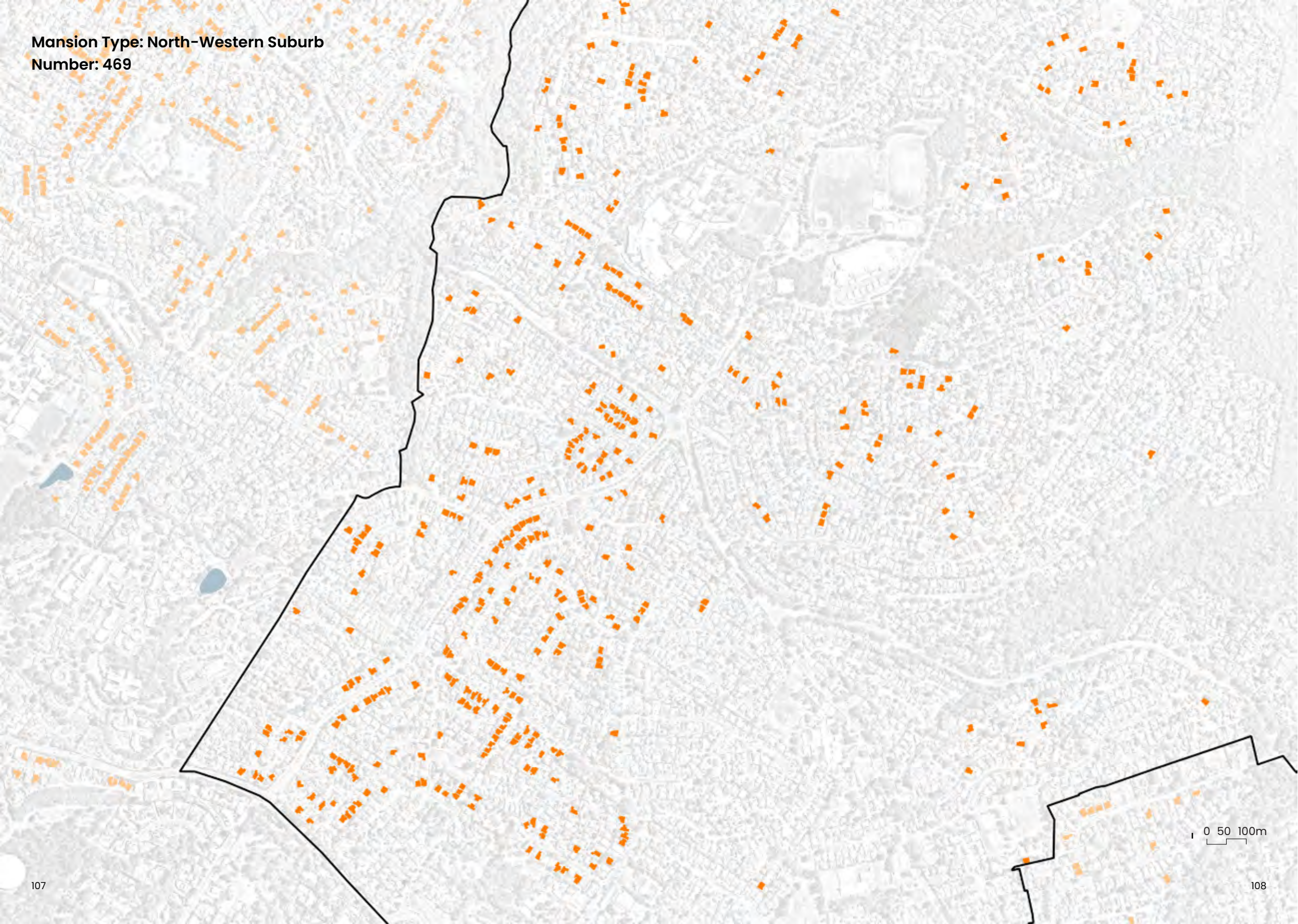
0 2.5 5m



Mansion Type: Precinct

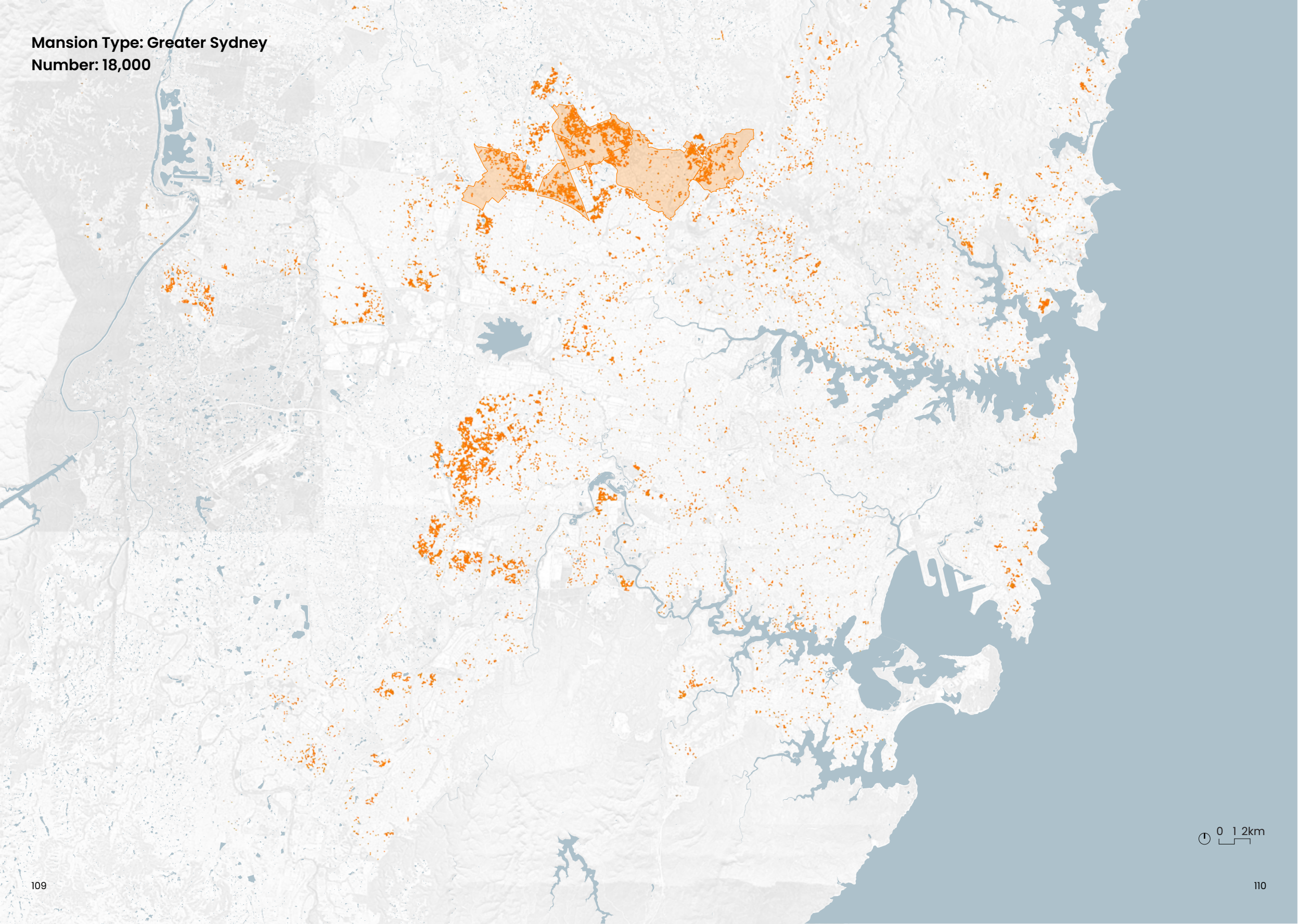
0 5 10m

Mansion Type: North-Western Suburb
Number: 469



0 50 100m

Mansion Type: Greater Sydney
Number: 18,000



Five Common House Types:
Potential Impact at Metropolitan Scale
Based on 100% Uptake of Proposal
Total Number of Buildings: ~ 60,500
Dwelling Increase: ~ 125,000
Canopy Increase: ~ 1,000,000m²

- Theoretical maximum development based on 100% uptake of proposal
- Bungalow: Numbers 8000 > 12,000 Dwelling Increase + 104,000m² Canopy Increase
 - Cottage: Numbers 7500 > 15,000 Dwelling Increase + 157,500m² Canopy Increase
 - Six-Pack: Numbers 8500 > 34,000 Dwelling Increase + 204,000m² Canopy Increase
 - Villa: Numbers 18,500 > 27,750 Dwelling Increase + 296,000m² Canopy Increase
 - Mansion: Numbers 18,000 > 36,000 Dwelling Increase + 252,000m² Canopy Increase

Map Parameters for House Types

Calculation Method + Data

The search and selection criteria use relatively simple checks and reviews through this joined dataset. The following sections outline key criteria shared across the queries – as well as specific checks or methods used within categories. This also unpacks and explains some of the decision making for employing these approaches in relation to the ‘spatial types’ and their associated strategies.

Data Source:
Nearmap Aerial Imagery, 2024
NSW Land Parcel and Property, 2023
Geoscape Building Footprints, 2022
ABS Suburbs and Localities, 2021

Bungalow:

Lot Width: 6 – 15
Lot Area: 400 – 550
Building Area: 90 – 150

- Checks that total building footprint (including outbuildings) does not exceed twice the area of main building
- Checks that building is within 5m setback from street
- Employs Deposited Plan Number to identify parcels surveyed before the 1971 re-cataloguing of registered plans.

Cottage:

Lot Width: 15 – 20
Lot Area: 555 – 720
Building Area: 80 – 115

- Checks that total building footprint (including outbuildings or secondary dwellings) does not exceed 100m2 above area of main building
- Checks that building has at least 5m setback from street

Six-Pack:

Lot Width: 12 – 25
Lot Area: 500 – 1200
Building Area: 220 – 600

- Checks that building is taller than 2 storeys
- Checks that building contains multiple addresses
- Checks that building does not exceed 90% site coverage
- Checks that there is not significant additional built form on the site
- Eliminates complex forms

Villa:

Lot Width: 15 – 25
Lot Area: 625 – 740
Building Area: 160 – 280

- Checks that building height is single storey
- Checks that building has at least 5m setback from street
- Checks proportions of overall lot

Mansion:

Lot Width: 15 – 25
Lot Area: 500 – 750
Building Area: 140 – 300

- Checks that total building footprint (including outbuildings) does not exceed 100m2 above area of main building
- Checks that building height is 2+ storeys
- Checks that building has at least 5m setback from street
- Checks that there are not multiple addresses in building and that it is not strata title
- Employs Deposited Plan Number to identify parcels surveyed after the 1971 cataloguing of registered plans.

Density and Tree Canopy Calculations from Drawings

Increased density

Bungalow: 8000 x 1.5 = 12000 dwellings
Cottage: 7500 x 2 = 15000
Six-Pack: 8500 x 4 = 34000
Villa: 18500 x 1.5 = 27750
Mansion 18000 x 2 = 36000
Total additional dwellings 124750 (~ 125,000)

Increased tree canopy

Bungalow: 8000 x 13m2 = 104000
Cottage: 7500 x 21m2 = 157500
Six-Pack: 8500 x 24m2 = 204000
Villa: 18500 x 16m2 = 296000
Mansion 18000 x 14m2 = 252000
Total additional tree canopy 1,013,500 (~ 1,000,000)

Section 2
Selected Literature Review

Overview

This literature review catalogues a selection of studies of housing types from a national and NSW/Sydney perspective (1940s–present). The review predominantly falls into two categories: architectural history and heritage studies, which focus on the development of architectural movements within Australia and NSW/Sydney; and policy and housing analysis studies, which chart the political, sociological and economic drivers that gave rise to differing development strategies from a wider, urban perspective. These accounts are predominantly focussed on stylistic trends and cultural history, with a strong emphasis on detached housing.

Most historical accounts present a broad survey of the development of housing types within Sydney or Australia. These, such as John Archer, *Building a Nation: A History of the Australian House* (1987), Walter Bunning, *Homes in the Sun: the Past, Present and Future of Australian Housing* (1945), and Peter Spearritt, *Sydney's Century: A History* (2000) as well as *Australian House Styles* (1997) by Maisey and Ian Stapleton, present an overview of the development of these homes from a largely historical perspective. This is often situated within a widespread acknowledgement of national expectations of home ownership as a rite of passage, such as Susan Marsden's edited collection, *Our House: Histories of Australian Homes* (2001). This book identifies the intersections between the house as built form and the home, and the material, technological, economic, regional and cultural contexts which surround it, seeing to present the architectural typology within a sociological, cultural history lens.

In addition to these survey studies, several scholarly works have been produced which examine a specific typological exemplar more closely. These include Peter Cuffley's *Australian Houses of the Twenties and Thirties* (1989) and *Forties & Fifties* (1993), Ruth Thompson's PhD Thesis, *Sydney's Flats: A Social and Political History* (2010), Caroline Butler-Bowdon and Charles Pickett's *Homes in the Sky: Apartment Living in Australia* (2007), John Gregory's *New South Wales Public Housing Design: A Short History* (1996), Michael Zanardo's PhD Thesis, "Shaping Affordable Housing: An Architectural Investigation of Pre-World War II State Workers' Housing in Sydney" (2018), and Charles Pickett's *The Fibro Frontier: a Different History of Australian Architecture* (1997). Scholarly work which examines the architectural merits (and otherwise) of more contemporary suburban housing stock, specifically the so-called McMansions and other project homes produced in the last 20 years, is notably limited.

Published research in the fields of social science, planning, and cultural history is substantial and provides important accounts of the history of housing policy, urban development and cultural conditions. This is presented from both historical and more contemporary perspectives. Robert Freestone's, *Urban Nation: Australia's Planning Heritage* (2010) and Patrick Troy's, *Accommodating Australians: Commonwealth*

Government Involvement in Housing (2012) present comprehensive overviews of the role of policy in shaping urban outcomes. In the social sciences, research on housing affordability and diversity has largely focused on social and economic factors, as well as policy gaps. Contemporary commentators appear focussed on critiquing the state of housing and particularly suburbia from a sociological, environmental and ideological perspective, with little acknowledgment of architectural form. These critiques build on Robin Boyd's early criticisms with works such as Ian Mackay, Robin Boyd, John Mant, and Hugh Stretton, *Living & Partly Living: Housing in Australia* (1972), Jane Frances Kelly and Paul Donegan's, *City Limits: Why Australia's Cities Are Broken and How We Can Fix Them* (2015), Jim Kemeny, *The Great Australian Nightmare: a Critique of the Home-Ownership Ideology* (1983) and John Daley, Brendan Coates, and Trent Wiltshire's, *Housing Affordability: Re-imagining the Australian Dream* (2018), among others.

Alongside these critiques of the limitations and failures of suburban Sydney from an ideological, sociological and environmental perspective, some significant scholarly work has been undertaken in order to take account of and suggest strategies for the remediation of this condition. Among these, the report by Daniel Daly et al., *NSW Housing Typology Development Project: Final Report* (2016), produced from the Sustainable Buildings Research Centre, Wollongong, NSW, presents a rigorous account of existing building stock in NSW, identifying the range and characteristics of residential building types that are most prevalent in order to propose environmentally sustainable strategies for change. This report reflects a practice-based research approach in the way it connects typology to strategies.

It is also significant to note what is absent from the literature, such as a specific discussion and spatial analysis of urban and architectural aspects of housing and its contribution to current conditions, and the potential strategies to mitigate these effects. Accounts that bring together fields of knowledge in Australian housing studies, in particular through the lens of 'typology' are infrequent. Those which take account of this from an architectural perspective are particularly missing. Alicia Pozniak's more recent work, *S(w)elling Home: Questioning Australian Home Ownership Ideology and its Corresponding Housing Type* (2020), is a notable exception to this. This paper seeks to bridge this gap by examining Australian housing typologies, including more marginalised approaches to housing, to trace patterns within and between existing building stock in order to correlate house typology and ideological, cultural and political values that gave rise to their production.

The annotated bibliography presented here provides a selection of Australian literature on housing types with a focus on common house types in NSW and Sydney more specifically. Studies with national purview have been included where the discussion has a bearing on the NSW context.

Annotated Bibliography

Architectural and Urban History

Walter Bunning, *Homes in the Sun: the Past, Present and Future of Australian Housing* (1945)
[Architectural history, planning treatise, architectural types and design prototypes]
The book advocates for better designed homes and satellite suburbs, with an emphasis on post-war community planning and sensitivity to the Australian environment. A short history of Australian housing is integrated into the book, as well as an assessment of housing needs, associated typologies and design propositions for the future.

Jill Roe, *Twentieth Century Sydney: Studies in Urban and Social History* (1980)
[Interdisciplinary history, case study analysis]
In this book, Roe draws together a collection of essays from the Sydney History Group to evaluate the ways in which Sydney has evolved over the twentieth century, from both urban and sociological perspectives. The anthology includes an examination of Sydney's eastern suburbs in the 1920s, housing plans and the establishment of the Housing Commission in the 1940s, and the emergence of flats in the 1960s. It highlights the social, political and economic conditions that gave rise to each typology.

Robert Irving (ed), *The History & Design of the Australian House* (1985)
[Architectural history, thematic analysis]
This edited collection charts the influences of the Australian environment, climate, landscape and culture on a local approach to house design. The discussion contextualises the evolution of common house types within social and climatic frameworks.

John Archer, *Building a Nation: A History of the Australian House* (1987)
[Architectural history, chronological case study]
This book charts the chronological development of domestic accommodation in Australia ranging from the early Indigenous strategies for habitation that preceded colonial occupation, through to the 1980s. Viewed through an architectural and sociological lens, this account includes consideration of common house types from bungalows and cottages to more lavish housing.

Max Kelly (ed), *Sydney: City of Suburbs* (1987)
[Urban history. Case study analysis]
The papers collated by Kelly in this book outline the social and cultural imperatives that shaped Sydney as a suburban city. The case studies in the book consider suburban housing relative to larger social economic factors such as the complexity of home ownership, opportunities and constraints of rentals, and the evolution and impact of the Housing Commission. It includes a discussion of the suburban cottage in the 1920s.

Peter Cuffley, *Australian Houses of the Twenties and Thirties* (1989)
[Architectural history, thematic analysis]
This book presents a comprehensive account of architectural homes produced in Australia during the twenties and thirties. It provides an overview of Australian society during a period that shifted from 'austerity' to 'prosperity', thus situating housing design within the social and cultural context of the inter-war years. The book includes an extensive discussion of the bungalow and cottage as well as broader international housing types that appeared in Australia at that time.

Shirley Fitzgerald, *Sydney 1842-1992* (1992)
[Urban history, thematic and case study analysis]
Commissioned by the Council of Sydney, this book describes the development of the city of Sydney over a hundred and fifty years. This account is framed through the lens of significant political and cultural events, highlighting ongoing tensions between the State Government and City Council over the control of the urbanisation process. The discussion includes analysis of the impact of Council policy on twentieth-century slum removal and subsequent housing construction.

Peter Cuffley, *Australian Houses of the Forties & Fifties* (1993)
[Architectural history, thematic analysis]
This book presents a comprehensive account of architectural homes produced in Australia during the forties and fifties. It locates architectural housing typologies within broader economic and social frameworks, and demonstrates the correlation between architectural form and economic and cultural circumstances. The discussion includes consideration of the bungalow, cottage and walk-up flat typologies.

John Gregory, *New South Wales Public Housing Design: A Short History* (1996)
[Architectural history, case study analysis]
This book presents the development of public housing design in New South Wales over the course of a century. It includes a broad sample of pre-World War Two projects, organised by housing type and considered alongside more contemporary examples. The discussion invites a renewed appreciation of public housing for its design content and value.

Charles Pickett, *The Fibro Frontier: a Different History of Australian Architecture* (1997)
[Architectural history, thematic and case study analysis]
This book traces the emergence of fibro as a building material within Australia from the beginning of the twentieth century, charting its expanding use as an affordable and efficient means of creating housing. Pickett presents a variety of different social and cultural contexts in which fibro was extensively employed for housing, such as the fibro cottage and bungalow.

Julie Oliver, *The Australian Home Beautiful: from Hills Hoist to High Rise* (1999)

[Cultural and social history, thematic and case study analysis]

This book documents the history of the Australian Home Beautiful Magazine. While its primary focus is on the interior trends and illustrations that accompanied ideas about family life and the home, the book provides a useful account of attitudes and expectations that shaped home aesthetics. Accounts of domesticity allude to living patterns within several common building types, notably the cottage, the bungalow and walk-up flats.

Peter Spearritt, *Sydney's Century: A History* (2000)

[Architectural and sociological history, thematic and case study analysis]

This book presents a comprehensive account of the urban development of Sydney over the twentieth century. It traces the evolution of the city and the processes of suburbanisation through the lens of local history. Spearritt includes analysis of housing developments from the 1920s through to 2000, including early subdivisions of land, the emergence of flats and housing commission projects, and the development of post-war suburbia.

Susan Marsden (ed) *Our House: Histories of Australian Homes* (2001)

[Architectural history, case study analysis]

This edited book documents a series of typical Australian homes to demonstrate the relationship between income, class, housing type and amenities within each housing typology. Each case study describes the material, technological, economic, regional and cultural contexts that contribute to the built form of the house. Expert accounts and local and oral histories are used to present a pictorial housing history represented through contemporary and historical photographs, plans and images of 'people with their place'. This results in an account of each example as both architectural form and as spatial and personal experience.

Caroline Butler-Bowdon and Charles Pickett, *Homes in the Sky: Apartment Living in Australia* (2007)

[Architectural history, case study analysis]

This book offers the first comprehensive study of Australian apartment buildings and their impact on urban form and character within the state capital cities. The works examined extend from public housing apartments to luxury developments. The accompanying analysis situates the emergence of apartments as a significant building type within the broader social and cultural context and advocates for their preservation.

Charles Pickett, *The 'Six-pack':*

The Past and Present of Walk-up Flats (2009)

[Architectural history]

This conference paper presents a succinct summary of the attitudes that gave rise to the advent of walk-up flats including historical background, planning context and associated legislative frameworks. The paper contrasts the emergence of flats in Melbourne with those in Sydney, highlighting variations in material form and reception.

Robert Freestone, *Urban Nation: Australia's Planning Heritage* (2010)

[Historical urban planning analysis]

This book provides a comprehensive historical account of the impact of urban planning on Australian cities and landscape. A national and chronological overview is complemented with case study discussions about capital cities, planned towns, suburbs and public spaces. This planning history is contextualised within both international trends and local approaches to city-making. Housing typologies are discussed in relation to planning policy and strategies for suburban and urban development.

Steve Harfield and Jason Prior, 'A Bright New Suburbia? G.J. Dusseldorp and the Development of the Kingsdene Estate' (2010)

[Urban studies, case study analysis]

This academic conference paper traces the development of the iconic 1960s suburban development model, the Kingsdene Estate in Carlingford, Sydney, highlighting innovations in subdivision, design and marketing. It documents the housing context in which this suburban subdivision was produced, demonstrating how the design and development team negotiated ambitions for a repeatable and high quality housing model with established cultural values and expectations.

Ruth Thompson, *Sydney's Flats: A Social and Political History* (2010)

[Social and political history, thematic case study method, text, photographs, plans, data tables]

This doctoral dissertation charts the evolution of flats as a housing typology within Sydney, examining the interrelationship between the social, political and economic factors that gave rise to two flat-building booms: initially during the 1920s and 1930s, and the subsequent developer-led expansion in the late 1960s. The study charts and examines shifting attitudes that accompanied Sydney flat types.

Judith O'Callaghan and Charles Pickett, *Designer Suburbs: Architects and Affordable Homes in Australia* (2012)

[Architectural history, thematic analysis]

This book presents a historical account of the involvement of architects in the project home industry in Australia. It charts the evolution of Australian housing within a climate of commoditisation, home ownership and production. The analysis extends from the 1960s and 1970s – the period when the project home thrived – to the present day. The authors describe the evolution of 'McMansions' as an extension of earlier architecturally derived project homes.

Patrick Nichol Troy, *Accommodating Australians: Commonwealth Government Involvement in Housing* (2012)

[Urban planning history, case study analysis]

This book presents a critical account of the successes and failures of the Commonwealth Government's attempts to address the housing needs of the citizens which fall under its constitutional responsibility. In particular, it notes a lack of planning for the Indigenous population and their housing needs. The discussion outlines the political circumstances and strategies that gave rise to certain housing models or types and comments on their urban impact.

Michael Sebastian Zanardo, *Shaping Affordable Housing: An Architectural Investigation of Pre-World War II State Workers' Housing in Sydney* (2018)

[Architectural history, case study method]

This doctoral dissertation explores the emergence of affordable housing in Sydney through the lens of pre-World War Two state workers' housing, with the purpose of extracting intelligent strategies for contemporary design. The study includes the documentation and analysis of cottages, bungalows and flats.

Noni Boyd, 'Sunny Flats Will replace ... A Congested Slum Block: Sydney's Post War Housing Improvement Schemes' (2021)

[Architectural history, case study analysis]

This journal article focuses on the state-funded modern apartment typologies and rehousing initiatives that followed the post-war slum clearance programs in Sydney. The study traces the international precedents that informed these works and highlights their architectural and social merit. Noting the lack of research and detailed understanding of these building types, Boyd advocates for their significance and preservation.

Architectural/Urban Criticism and Theory

Ian Mackay et al., *Living & Partly Living: Housing in Australia* (1972)

[Architectural criticism, essay and case study analysis and prototypes]

This book is a compilation of four essays written by prominent architects and writers, Ian Mackay, Robin Boyd, John Mant and Hugh Stretton. The authors argue that economic drivers and poor housing policy have led to limited housing choices for Australians, both in terms of stock and context. A series of architectural case studies and prototypes are presented as possible solutions for what is described as housing 'failures'.

Peter Freeman and Judy Vulker (eds), *The Australian Dwelling* (1992)

[Architectural criticism, essay and case study analysis]

In this book, the editors collate a series of conference papers on Australian dwellings, including those focused on both historical and modern contexts. Phillip Harris's article, In Defence of the Tent: the Top-End as an analogue for the minimal house, examines the ideologies associated with the concept of the 'cottage' and contrasts these to notions of a tent in order to understand the motivations and assumptions that shaped the cottage as a common housing design style within the Australian context.

Sarah Ferber, Chris Healy and Chris McAuliffe (eds), *Beasts of Suburbia: Reinterpreting Cultures in Australian Suburbs* (1994)

[Urban studies and geography, thematic and case study analysis]

The essays collated in this book chart the chronological evolution of Australian suburbs through a variety of themes, including image-making, gender relations, spatial organisation, design, advertising, identity and the significance of the suburb in everyday life. The essays highlight the ways in which the notion of suburbia and its spatial manifestation has been drawn into the national consciousness and imagination. While predominantly focused on Melbourne, the examples cited can facilitate comparisons with Sydney.

Kristian J. Ruming, 'Developer Typologies in Urban Renewal in Sydney: Recognising the Role of Informal Associations between Developers and Local Government' (2010)

[Urban policy, data analysis]

This article examines the role and nature of developer-driven construction in the middle and outer-ring suburbs of Sydney and the informal relationships that facilitate this phenomenon. By analysing the relationships between developers and local council, the article identifies a gap between urban policy and formal frameworks that support implementation. The study identifies the conditions, context and production methods that facilitate the construction of mansion typologies.

Jane-Frances Kelly and Paul Donegan. *City Limits: Why Australia's Cities Are Broken and How We Can Fix Them* (2015)

[Architectural criticism, case study analysis]

This book presents a critical examination of contemporary Australian cities through a sociological perspective. Beginning with an assessment of policy failures and poor decision-making, the authors offer strategies to remediate urban inequities. The discussion around home ownership, values, expectations and affordability identifies a disconnect between the misplaced desire for a big, detached house with a garden and the value attributed to other qualities such as community, location and affordability.

Peter McManus, *Does Size Really Matter? Influences on the Evolution of McMansions* (date unknown)

[Town planning, qualitative and quantitative analysis]

This undergraduate dissertation examines the evolution of 'McMansion' typology in Sydney's western suburbs. It traces the origins and development of this house type in order to explain its emergence, despite smaller allotments. The research considers the influence of Councils and project home developers on McMansion proliferation.

Government Report/Urban Policy

Commonwealth Housing Commission, *Final Report 25 August 1944* (1944)

[Urban studies and policy outline]

This report outlines the Commonwealth position and strategy for housing and urban development following World War Two. It presents a brief historical survey before identifying national housing needs. Factors such as labour, materials, housing standards, size allotments, site coverage, room arrangement, dwelling types and strategies for slum clearance are described as significant drivers to the development of post-war housing stock.

Raymond Bunker et al., *'The Local Impacts of Urban Consolidation in Sydney'* (2002)

[Urban policy, case study analysis]

This report examines the local impact of urban consolidation through three Local Government Area (LGA) case studies within Sydney's outer suburbs, Campbelltown, Hurstville and Sutherland, between 1980 and 1999. The study outlines the mechanisms that impact urban consolidation, including market forces and local and state planning frameworks. It argues that strategies for urban consolidation must take account of local circumstances, housing needs and the social makeup of local communities. The study includes a discussion of five dwelling types including the villa.

Raymond Bunker, Darren Holloway and Bill Randolph, *The Expansion of Urban Consolidation in Sydney: Social Impacts and Implications* (2005)

[Urban policy, empirical analysis]

This report examines the social impact of urban consolidation through an empirical analysis of diverse households in Sydney and their housing choices of different kinds of attached dwellings. It argues that strategies for urban consolidation, while aiming to increase housing diversity, can lead to spatial polarisation and social disadvantage. The report recommends a localised and community-sensitive approach to urban consolidation. The study draws on the definitions of dwelling types used in the census, such as semi-detached houses (which includes some villas) and low-rise flats.

New South Wales Department of Planning and Infrastructure, *Housing Choice and Affordability in Growth Areas: Dwelling Density Guide* (2013)

[Planning Report, case study analysis]

This report presents successful examples of existing medium density and small-lot housing development, created with conventional construction and delivery methods. It considers ways in which these models can be combined to achieve both housing diversity and densification. This outcome is realised through typological design principles and guidelines for achieving higher densities in growth areas.

Daniel Daly et al., *NSW Housing Typology Development Project: Final Report* (2016)

[Investigative report]

This report examines the formal and typological characteristics of the eight common house types that are considered most prevalent in NSW. These are defined according to their material and construction methods.

Murad Safadi et al., *'Mapping for the Future: Business Intelligence Tool to Map Regional Housing Stock'* (2017)

[Engineering report, data analysis]

This report describes the structure and operation of an integrated database of housing stock for the Illawarra region, developed through a partnership between the University of Wollongong and the New South Wales Office of Environment and Heritage (OEH). The database is designed to create a better understanding of housing stock to support evidence-based policy. The model defines housing typologies according to specific building attributes, specifically those perceived to impact the sustainability performance of a building.

Chris Reiher, *Sydney's Inner Area: A Study of Six Inner Municipalities* (1980)
[Planning report, data analysis]

This report examines the census data from 1976 and 1978 relating to the localities of Ashfield, Botany, Leichhardt, Marrickville, South Sydney, and City of Sydney in order to review housing needs and availability. It provides a snapshot of dwelling stock, occupancy, economic status, and transport options for these areas in the late 1970s and notes declines in their economic and population growth.

Planning Institute of Australia, *Response to the NSW Housing Strategy Discussion Paper* (2020)

[Planning report, summary report method, text]

This report outlines the Planning Institute of Australia's response to the NSW Government's Housing Strategy Discussion Paper of May 2020 and considers the implications from a planning perspective. Structured as nine recommendations, the report proposes a series of action plans for place-based planning, beyond housing supply.

Catherine Gilbert et al., *Urban Regulation and Diverse Housing Supply: An Investigative Panel* (2020)

[Investigative report, data analysis method, text only]

This report explores the barriers and challenges that limit housing supply from within the housing sector. It identifies land zoning, financial constraints, the developer-dominated market and lack of government leadership as the primary obstacles to diverse, affordable and sustainable housing. The report highlights opportunities to increase the supply and diversity of housing. It maintains that the necessary precursor to impactful policy is a detailed understanding of existing housing stock and inherent housing gaps.

Inner West City Council, *'Building Typologies'* (2014, updated 2022)

[Appendix to Development Control Plan: case study analysis]

This report presents existing housing typologies within Leichhardt. These are categorised stylistically and described according to their primary defining architectural elements. The report suggests design approaches for the modification of the existing fabric while meeting the objectives of the Development Control Plan. Bungalows, cottages and walk-up flats are amongst the typologies described.

New South Wales Department of Planning, Industry and Environment, *Housing 2041: NSW Housing Strategy* (2023)

[Planning report]

This report outlines the twenty-year vision for housing in New South Wales, identifying the goals and ambitions to deliver innovative and research-led approaches to better housing outcomes. This strategy is broadly based on four pillars of supply, diversity, affordability, and resilience which fall within the wider remit of economic well-being, social wellbeing, and health. The study includes typological definitions for housing stock.

Architectural Description and Analysis

Maisy Stapleton and Ian Stapleton, *Australian House Styles* (1997)

[Architectural description and analysis]

This book documents the key architectural characteristics of common housing types in Australia over a 200-year period. Presented in the form of annotated architectural elevations with supplementary text, it provides an illustrated guide to Australian domestic architecture. Textual descriptions of each style are confined almost entirely to architectural description with little social, political or cultural context.

Alicia Pozniak, *S(w)elling Home:*

Questioning Australian Home Ownership Ideology and its Corresponding Housing Type (2020)

[Architectural description and analysis]

This conference paper examines the evolution of the detached single-family dwelling in the context of Sydney's housing affordability crisis. It charts the development of detached house types chronologically and through an examination of architectural context and form, including the size and configuration of the floor plan and material condition. The paper describes the imperatives that drive the expanded scale and footprint of detached homes.

Design Guide

David Tickle, *One Million New Homes, One Thousand Thriving Neighbourhoods* (undated)

[Architectural speculative project, case study analysis]

This report explores new models for design and delivery of housing across three cities: Sydney, Shanghai and London. The Sydney case study is advanced through a focus on walk-up flats including the limits of this typology and strategies for renewal. Auburn town centre is used as a case study to test the development potential of this typology at numerous scales, notably both as a neighbourhood-scaled model and on a single site.

Michael Whitehouse et al., *Guide to Low Carbon Residential Buildings – Retrofit* (2019)

[Best practice carbon retrofit guide]

This retrofit guide presents strategies for improving the environmental performance of existing house types. It categorises existing housing stock based on style, materials and building efficiency, and provides strategies to remedy poor performance. Assessments and strategies take account of geographic location and associated climatic conditions. cursory summaries of each typology and their environmental performance are presented, as well as suggestions about how to improve their performance.

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