Attachment 3 – Infill Design Study – Background Report for Bellingen Shire Housing Strategy 2020-2040

Delivering Housing Diversity for Our Community

How do we ensure good quality housing and protect local character?

Design Principles for infill development in Bellingen Shire

Bellingen Shire
Homes for
our future

Bellingen Shire
Infill Design Study
July 2019

Contents

INFILL HOUSING SERIES

#1 Infill Capacity Study – How many additional houses can we accommodate in our towns?

#2 Infill Design Study – How do we ensure good quality housing and protect local character?

A note on data

This document is a draft for public comment. It should not be used by anyone as a basis for investment or other private decision-making purposes about land purchase, land use or development proposals. The data provided in this publication is of a general nature and should not be construed as specific advice or relied upon in lieu of appropriate professional advice. This study contains hypothetical development designs intended for discussion purposes only, to inform a Shire-Wide Housing Strategy. Data or designs cannot be used to assume site-specific development potential, and figures referred to in this publication cannot be taken as guaranteed development potential. If you want to discuss the potential of your block contact a planning professional or speak to Council.

What is good design?

Good design provides comfortable, healthy and efficient homes that save residents' energy, water and money. Good design makes better places by respecting and enhancing features that make these places special and authentic. Poor design can undermine what makes places unique and valued by producing generic or defective buildings or through overdevelopment.

Design is a creative act. Design is both a process (problem-solving, coming up with ideas to address challenges and opportunities, the process of creating something) and an outcome (e.g. a well-designed building).

A well-designed home provides comfort for its occupants year-round and also considers its setting, cleverly providing a level of privacy for residents and neighbours and not overwhelming the streetscape with bulk or monotony. Good home design is not all about looks; it is about providing functional spaces in a home built to last and adding to a sense of place. Well-designed and well-built homes are more likely to age well and hold their value over time.

Many people do not know what to look for to determine whether a home maximises comfort and lifestyle benefits. Others simply accept design flaws to reduce costs. Sometimes good design elements like adequate light and ventilation are taken for granted and more value or emphasis is placed on the number of bathrooms or trendy style of kitchen benchtop. Some people argue that commenting on design is only about how something looks and is therefore "subjective". This is not the case as there is nothing subjective about making sure a house is designed to receive good ventilation and light and will not get mouldy!

Protecting character does not mean excluding new development. Good design can help to make new housing fit in with the overall look and feel of an area. Often, a lot of opposition to new development can be traced back to poor design. In many cases an improved design can address legitimate concerns about development.

All places evolve over time and Bellingen Shire has homes of all different ages and a variety of architectural styles, an eclectic mix of historic and modern. Good design is not about replicating existing development, but about taking cues from the surrounding environment and producing homes that are similar in scale and bulk to surrounding homes and that complement the area. Clever design can lessen impacts of new development in established neighbourhoods or near heritage buildings. Well-designed places have the potential to link new and old, are more efficient, healthier, and support social cohesion. Also better design will support sustainability goals and prepare us better for climate change impacts.

Tips for good design in Bellingen Shire:

- Reduce building bulk and make buildings the same or similar scale to neighbouring buildings. Development that is excessive in terms of bulk and scale leave little area for landscaping and privacy.
- Use space efficiently and do not make spaces bigger than they need to be, or include rooms that will not be used much.
- Include sufficient landscaped area. Homes that take up too much space on the block and sacrifice landscaped or open space areas will appear out of character.
- Design landscaping to soften the look of buildings, and include a variety of plants and trees that add interest and green the neighbourhood
- Reduce the amount of hardstand area (e.g. concrete) for development and use materials that are durable and suited to the surrounding landscape.
- Connect the inside of homes with the outdoors and design for the local climate.

Source: Better Placed — an integrated design policy for the built environment in NSW

What can Council do to ensure good design?

Produce a Local Strategic Planning Statement (LSPS) that will allow community members to contribute to and understand the future direction of land use in their area.

The recent planning reforms by the NSW State Government have elevated the importance of respecting local character. All Councils are required to adopt Local Strategic Planning Statements by 2020. These will describe the special character features of an area to be preserved and how new development can add to local character. This means more than ever before, developments will need to focus on design processes and design measures to manage change.

Produce place-based Character Statements to help guide the design and assessment of new development.

Protecting desirable aspects of neighbourhood character is important, but describing and agreeing on what needs protecting and how can be quite difficult. Character Statements will help with interpreting how local character can best be protected and enhanced. Every neighbourhood is different, so design responses for each proposal should consider the relevant Character Statement and cater to individual circumstances.

Simplify planning controls and include clear objectives for each control to make them easier to understand and apply. Include graphics, pictures, factsheets and example designs to make planning controls easier to understand for everyone.

Planning controls are important, especially for homes on smaller lots. Planning controls make sure homes provide sunlight, air flow, privacy, green space and maximise occupant comfort whilst minimising impacts on neighbours. Having a large number of complex planning controls can unintentionally stifle good design, discourage innovation and encourage sameness.

Promote conservation and use or adaptive reuse of heritage items and buildings.

It is evident in the streetscapes, town centres and rural properties of Bellingen Shire that generations of landowners and residents have preserved and maintained heritage properties. This level of care for our historical buildings and places has become a real asset and unique drawcard. Many of the heritage listed houses in Bellingen and Dorrigo are sited on large blocks with substantial rear gardens and rear lane access. These sites can present opportunities for ongoing conservation of the existing home as well as some infill development (e.g. new homes in the rear yard) provided the designs of new homes are sympathetic to their surrounds and sensitive, heritage context.

Nurture the Shire's creative and design-focused culture; provide links to good design resources; provide early design advice for proposals; espouse the benefits of good design and celebrate good examples.

The design process is vital to achieving a quality built environment that respects the Shire's unique features. Council will support good design. Many people claim the process of designing buildings well is too expensive, adds construction costs and is not what homebuyers want. However the only costs counted are the up-front initial costs. Most of a buildings lifetime costs relate to maintenance (operating costs). Good design can reduce ongoing costs substantially.

What you told us

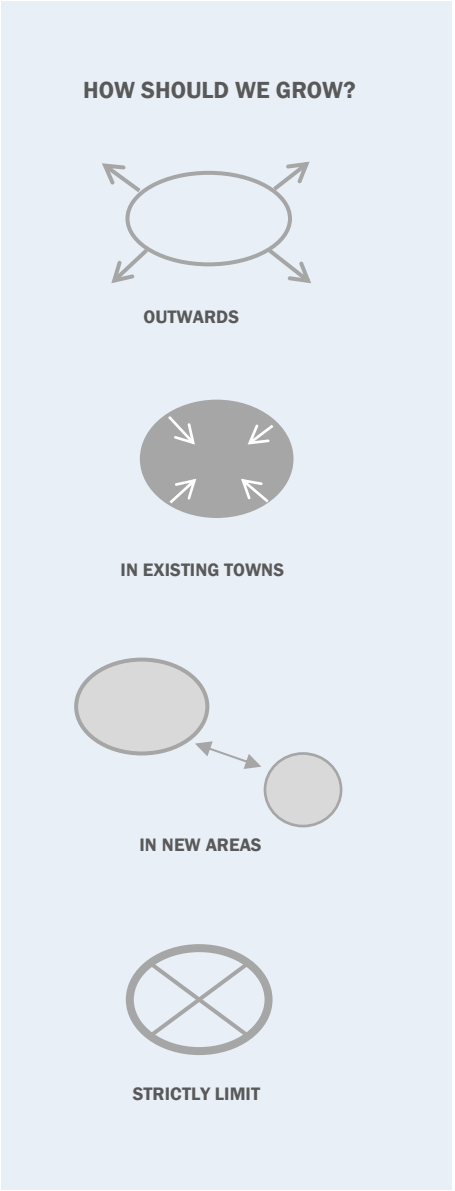
During the *Homes for Our Future* Engagement Council spoke too many people who identified aspirations to grow in socially and environmentally affirming ways. A series of choices about how we could grow were presented and a **strong preference** for **infill housing** (growing in existing areas) was evident. Comments about infill stressed the need for good design and a variety of housing types, and highlighted concerns about loss of trees and parking.

Many people highlighted the need to grow and live in ways that minimise impacts on the natural environment and support better resource management. The main area of concern related to improving the design and performance of buildings to use resources (e.g. water, energy, and space) better. Some current building trends were seen as environmentally insensitive (inefficient house design, and limited backyard and green space). In the comments collected, people criticised the homogenising effect of some new suburban development across cities and towns in NSW. Opposition to "cookie cutter" housing and urban sprawl was strong.

Many comments supported greater encouragement of solar power, battery storage, rainwater tanks, electric vehicles, composting toilets, greywater systems, recycled renewable/sustainable materials and stormwater capture and treatment (water sensitive urban design). Living simply in modest homes, reducing consumption, planning for climate change and planting more trees were common subthemes.

Most people agreed that protecting local character is a high priority when managing future impacts of growth. Protecting character is about adding to a **sense of place**. This means designing new development that is sensitive to the physical attributes of the Shire and also through understanding and respecting the social values of our places. The character of the Shire was often expressed as natural beauty and geographical features, the country town and rural feel and landscapes, an eco-conscious population, heritage and historical links and the unique features of the built environment.

Supporting community connections was the third most popular subtheme mentioned overall. This shows how strongly people value being part of their local community, and the benefits they reap from living in a place with strong social networks. Future housing needs to acknowledge these social values, and designing for social sustainability and community wellbeing is vital to maintain the Shire's community-mindedness and encourage social cohesion.



Your quotes

A Vision for the future: Our Shire is creative, inclusive, self-reliant, entrepreneurial and local. We have an innovative, sustainable approach to development, food production and we care for country. Shire residents help each other. Money circulates within the local economy as much as possible. We strive to live lightly and do more with less.

Larger houses could be converted to duplex with minimal increase in footprint. Landscaping and biodiversity should be maintained through adequate built footprint: deep soil ratios and minimum sized gardens for decent sized trees.

Need different housing types to suit different ages including town houses, and medium density housing with sustainable facilities such as solar power and ability for a community garden.

As backyards get smaller, playgrounds need to get bigger.

Bellingen Shire has many unique geographical and cultural qualities. Affordable housing is lacking, and urban development is often "suburban" in terms of design and characteristics. By this I mean, much development seems to be a brick and tile house on a small lot overlooking other properties and fence lines, with the lots not necessarily optimised for best environmental outcome, rather for maximising the commercial gain of the developer.

Adopt a softer approach to car parking within Conservation Areas and heritage items to ensure that it does not have a cumulative adverse impact on the streetscapes and settings. Solutions of car sharing, cycling walking, better public/community transport models will ultimately develop.

Bellingen can grow as long as the growth is sustainable. Most current housing models are unsustainable in at least one if not all important resources of water, energy, biodiversity and soil conservation. Future growth would have to be rather different to current models.

And let's not forget: Only 200 years ago the land which we call our Shire now, was nearly one big rainforest. The very long Aboriginal history should be seen more, felt more, taught more, remembered more and respected more.

Prioritise sustainable water management. Water is our most precious resource. Ensure water efficiency, re-use and recycling must be practiced. Protect river headwaters and wetlands.

With infill, how to ensure urban tree cover % stays same (or goes up)?

[We] Need to look at options that create diversity – one of the key features of the character of Bellingen, Hippies / farmers / young families / elderly / surf culture / alternative all co-existing. I moved from Sydney 15 years ago – my eldest child said the main difference at school was the tolerance of each other and this flows to the whole feel of the community. Therefore we need to avoid monoculture and this means providing options other than those driven only by market forces

Bellingen Shire is distinguished by its natural beauty and its inventory of traditional and attractive built forms. In discussions with other residents on the way forward for a Shire that believes it needs to grow, I have distilled one common concern: what is it going to look like?... Beauty is the Bellingen way. Let's not spoil that.

Design principles

Design principles are a list of aspirations that guide development design and decision-making. They are educational and practical. The purpose of Design Principles is to ensure development considers and respects what makes our places distinctive.

Design principles can be used by Council and other government agencies (and the Land and Environment Court) to shape planning priorities, inform planning controls and when making development decisions, i.e. assisting merit-based development assessment. Design Principles can be used by the property and development industry to inform development decisions and guide design, inspire delivery of high quality buildings and recognise and reward best-practice development.

These design principles reflect the community's priorities as presented in the *Homes for Our Future Engagement Report* and have regard to the *NSW Government Architects Urban Design for Regional Areas* guide.

Provide diversity in housing to provide residents with greater housing choice	*New infill homes should look to fill the gaps in Bellingen Shire's housing market. For example, Bellingen Shire has a shortage of one and two bedroom homes, medium density housing types (e.g. villas, townhouses, small walk-up flats) and homes that are accessible for people with a disability. Detached homes with three bedrooms or more will remain popular and should be compact and space-efficient in design. Developments that propose multiple dwellings on a site should seek to contribute to housing mix, and include more two (or one) bedroom homes.*
Provide high-quality, well-designed housing that is affordable to construct and live in	*The majority of home designs should be modest in size and pitched to the more affordable end of the market, without compromising on design quality or occupant comfort. Affordability is relative, but in this context affordable means practical, space-efficient and built to last. Homes should be designed to reduce ongoing maintenance costs, including energy and water bills.*
Respect neighbourhood character and support community connections	*Infill house designs should consider the rural town context of Bellingen Shire, and be compatible with existing neighbourhood character. Housing design needs to respond to the setting, recognising geographic differences (e.g. a house design for Dorrigo will be different to a house in Urunga due to differences in climate, architectural vernacular etc.).* *Community connections and neighbourliness are highly valued by the Bellingen Shire community. Housing should positively impact on public spaces such as the street and offer opportunities to socialise whilst retaining adequate levels of privacy.*
Encourage walking and cycling	*Homes should be designed to encourage walking and cycling and reduce the need for local private vehicle trips. For example, garages, car parking spaces and vehicle circulation areas should be rationalised and not visually prominent. Given the regional context of Bellingen Shire, at least one off-street car parking space per dwelling is to be provided, unless an innovative arrangement (e.g. car sharing and bike infrastructure) can reasonably provide for the mobility needs of the residents.*
Include environmentally sustainable design features	*House design should include cost-effective measures to reduce ecological footprints, for example through passive design that considers the microclimate of the area. Impervious surfaces should be minimised where possible, and pervious or landscaped areas should be generous. Opportunities to incorporate sustainable technologies such as renewable energy, greywater reuse etc. should be included where budgets allow. Existing mature trees on suites should be retained wherever possible, with modifications made to house design to accommodate vegetation retention, and additional trees and shrubs planted.*

What infill could look like – Professionally-designed infill solutions for Bellingen Shire

Bellingen Shire Council engaged two local building design professionals to develop concept plans for infill housing for two hypothetical sites. Infill is providing housing in existing built up areas, in towns such as Dorrigo, Urunga and Bellingen. Providing visual examples of what infill housing could look like helps the community understand infill and recognise elements of good design.

Current planning controls allow for infill development in our town areas. However, there has been limited uptake of infill housing across our towns in recent years. The examples include testing of hypothetical planning controls so Council can:

1. Test whether the current planning controls are barriers preventing people building more homes in our town areas and,
2. Better understand the built form possibilities and implications of proposed changes to different planning controls.

Planning Controls

Two scenarios were provided to the design teams, the first based on existing planning controls. The second was a hypothetical scenario, where some of the planning controls were changed slightly, to test the difference in built form outcome possibilities. The hypothetical planning controls were based on controls benchmarked from other NSW Councils.

For people who do not work in the planning or property industry, it can be difficult to interpret some planning and design controls. For more information about planning controls and what they mean, please refer to the Draft Housing Strategy and Action Plan.

The key planning controls for the design scenarios are:

Controls	Scenario 1: Existing Controls	Scenario 2: Hypothetical Controls
Front Setback	4.5m	4.5m
Rear Setback / Secondary Road/Lane	3 m	3 m
Building Height 10m 10m	10 m	10 m
Building Height Plane Envelope	Defined by a plane projected at an angle of **35 degrees** over the land to be built upon, from a height of **3m** above the ground level at the boundary of the site.	Defined by a plane projected at an angle of **45 degrees** over the land to be built upon, from a height of **4m** above the ground level at the boundary of the site.
Site Area required per dwelling (density control)	1 dwelling allowed per 300m²*	**No restriction** on number of dwellings per site (density controlled via landscaped area)
Landscaped Area	**100m²*** per dwelling	**40%** of lot area, min width 1.5m
Private Open Space	**24m², 4 m** min width	**16m², 3 m** min width
Car Parking	1 space per dwelling	1 space per dwelling
Universal Design	Silver Level	Silver Level
Solar Access	50% Private Open Space receives 3 hours sunlight during winter solstice	50% Private Open Space receives 3 hours sunlight during winter solstice

*based on control for Density Locality 3 – refer to Locality Density Maps

Infill Sites

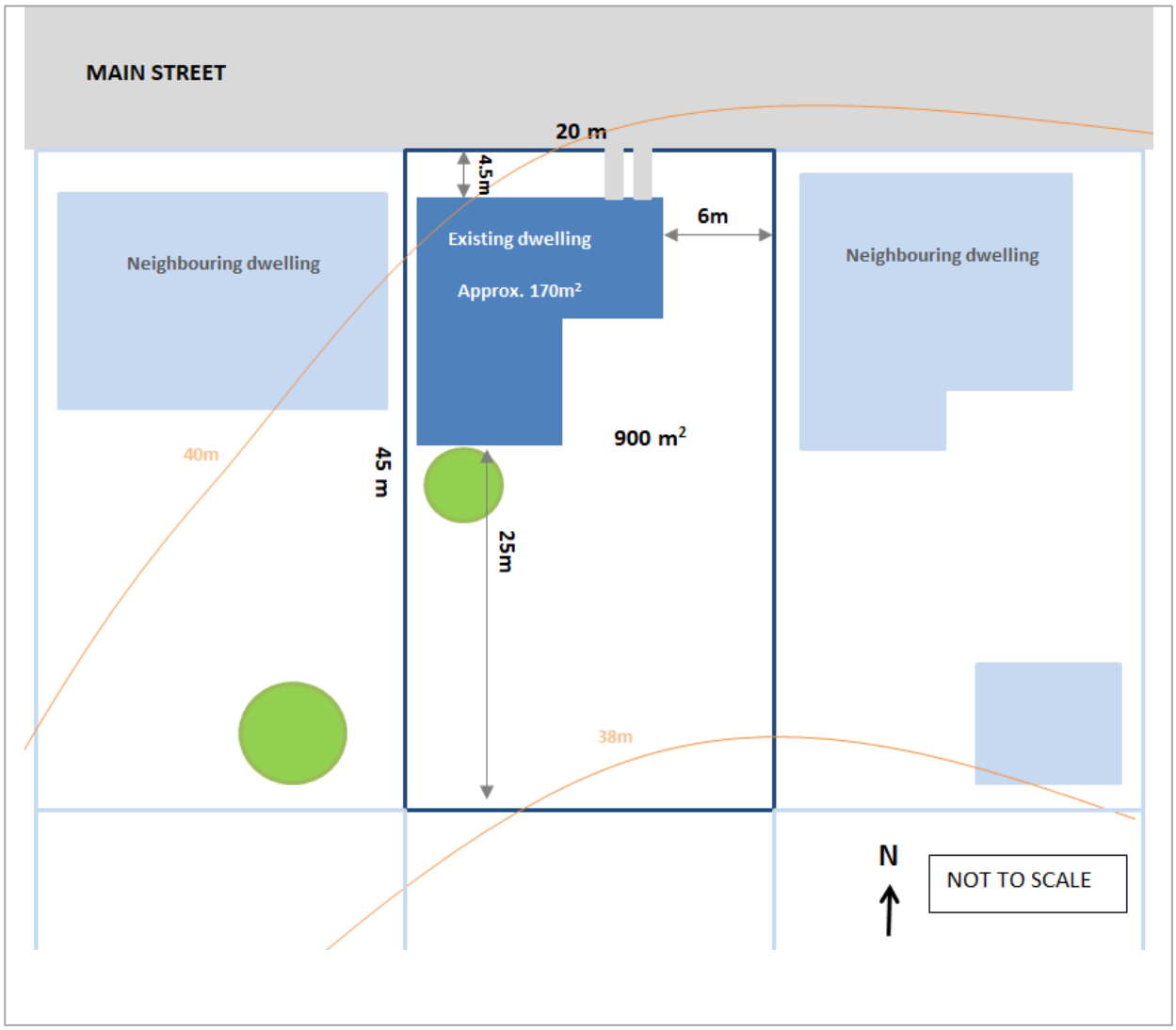
Site 1

The site is located within walking distance to a town centre. The site has an area of 900m^2 with a 20 metre wide road frontage.

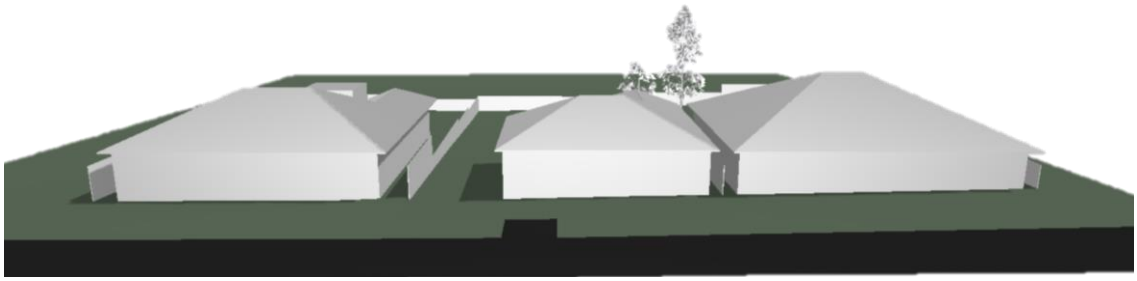
The block is 45m deep and contains an existing 3 bedroom dwelling with a single garage. The block slopes away to the south-east with a 5% slope. The site has a north-south orientation and is located on the south side of the road. The site is not constrained by flooding, bushfire or heritage. The site is zoned R1 General Residential.

Neighbouring development consists of low density housing, predominantly single-storey dwellings with large backyards.

Dwellings on the street display a variety of building styles and materials and the street has an eclectic character, although there are a number of notable older weatherboard cottages and very few modern homes/recent builds. Water and sewer lines run along the primary road frontage and the block is not obstructed by any existing easements.

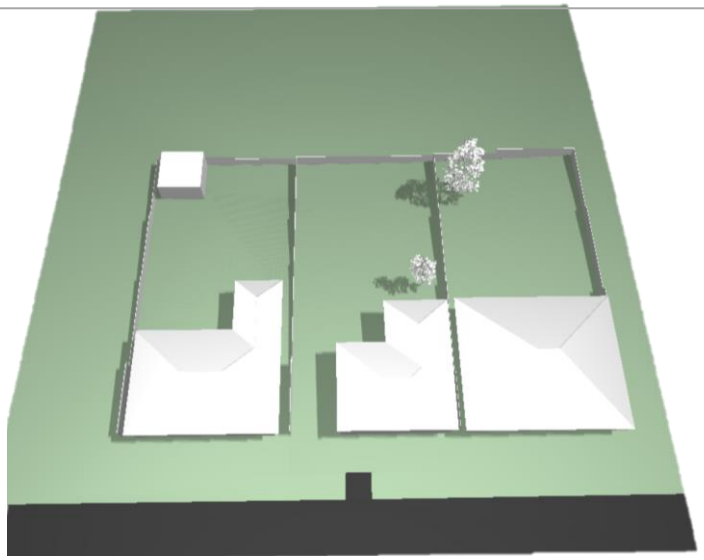


Site 1 – 900m^2 with no rear lane



View from the street (north elevation)

View from backyard (south elevation)



View from the sky (plan view)

Source: 3D Model created by Tricia Helyar Architect, 2019

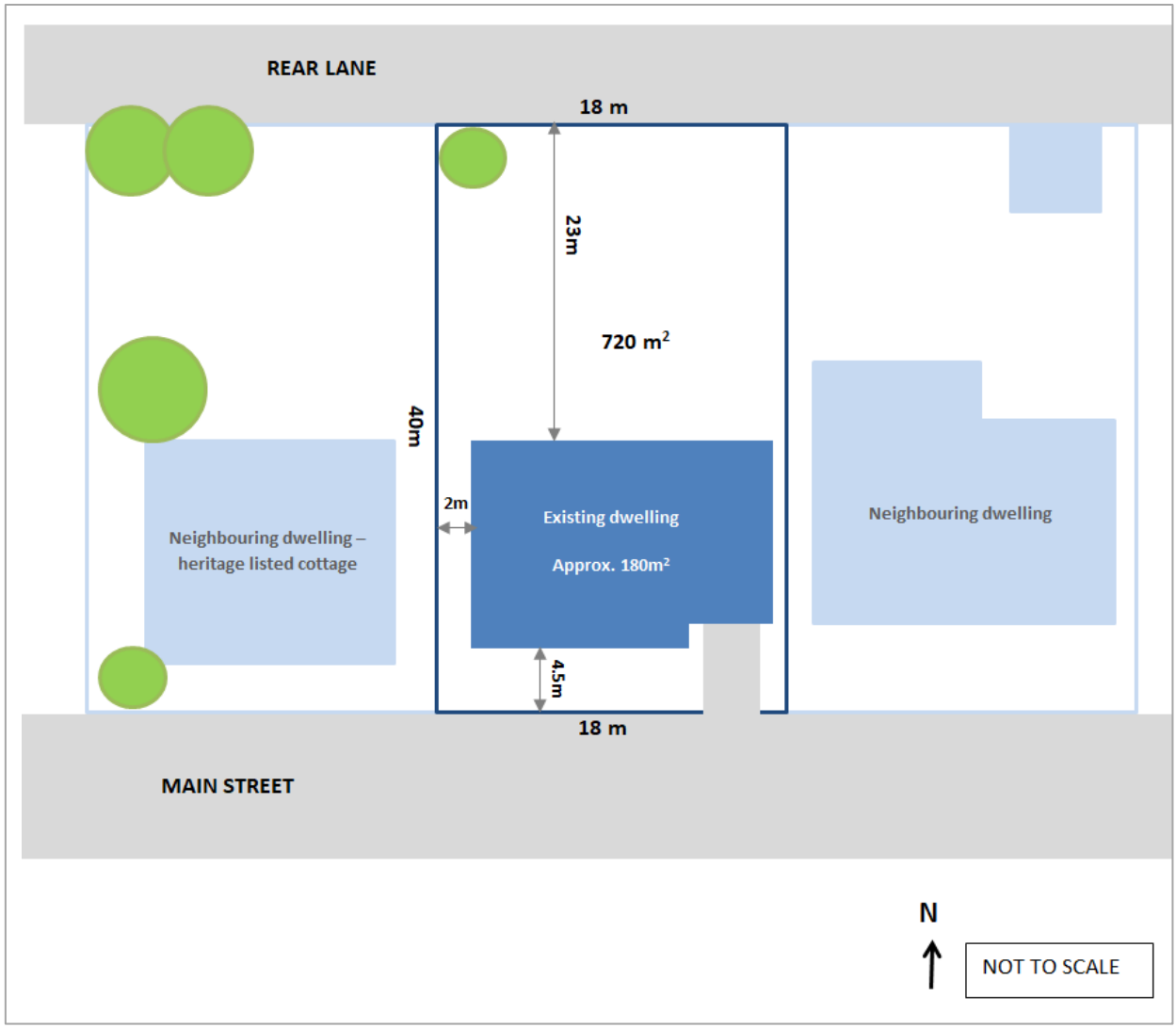
Site 2

The site is located within walking distance to a town centre.

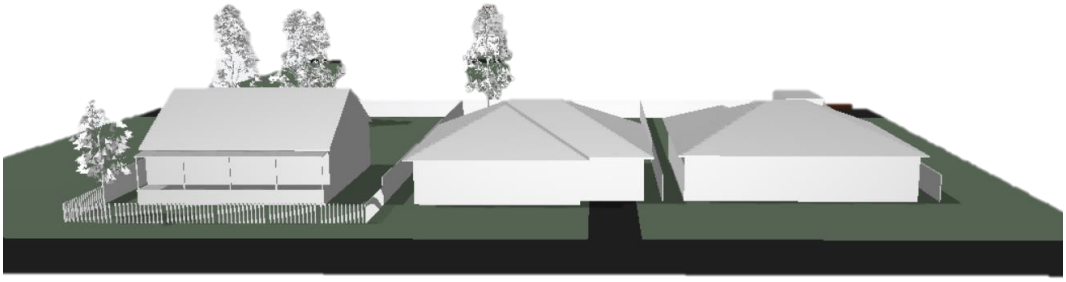
The site has an area of 720m^2 with 18 metre wide road frontage. The block is 40m deep and contains an existing single storey 3 bedroom dwelling with an (attached) single garage.

The block is practically flat. The site has a north-south orientation and has access to a rear lane.

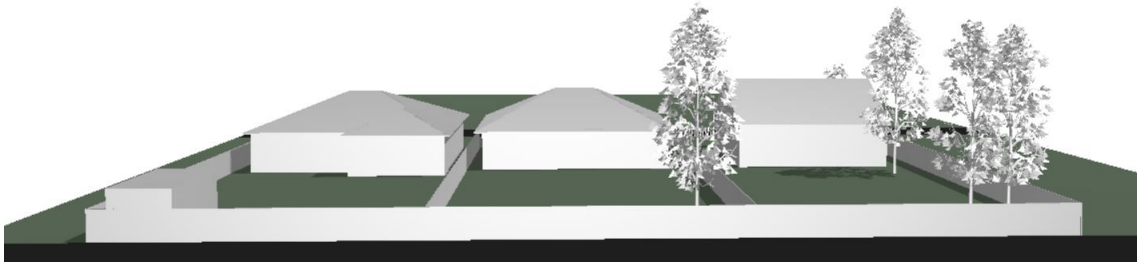
The existing dwelling is located on the north side of the street. The neighbouring cottage to the west is heritage listed and single storey. The site is not constrained by flooding or bushfire. The site is zoned R1 General Residential. Water and sewer lines run along the primary road frontage and along the laneway and the block is not obstructed by any existing easements.



Site 2 – 720m^2 with rear lane



Site #2 – View from the street (north elevation)



Site #2 – View from the rear lane (south elevation)

Site #2 - View from the sky (plan view)

Source: 3D Model created by Tricia Helyar Architect, 2019

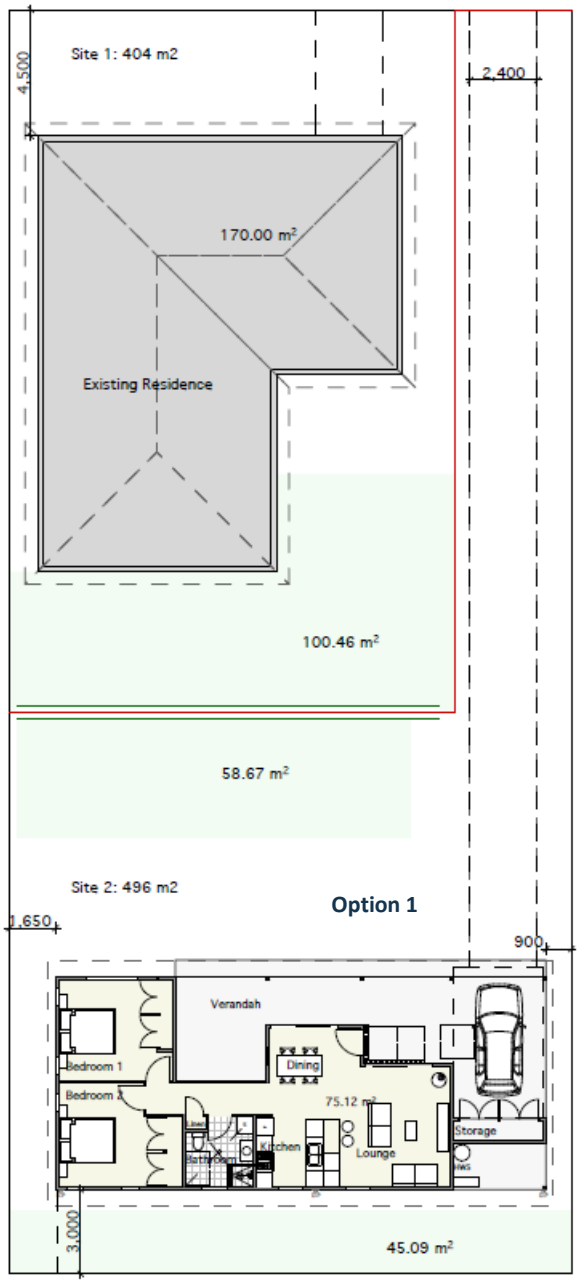
Design Concepts

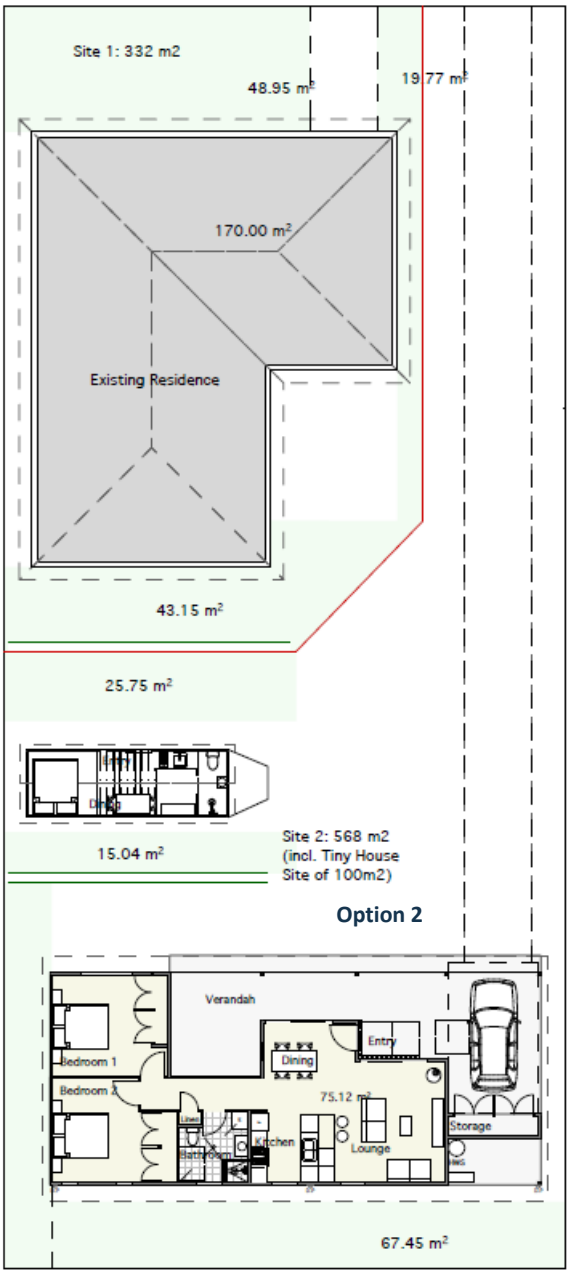
KDH, Kalang Design House, Guido Eberding

KDH Site 1, Scenario 1 **(900m2, no laneway, *existing* planning controls)**

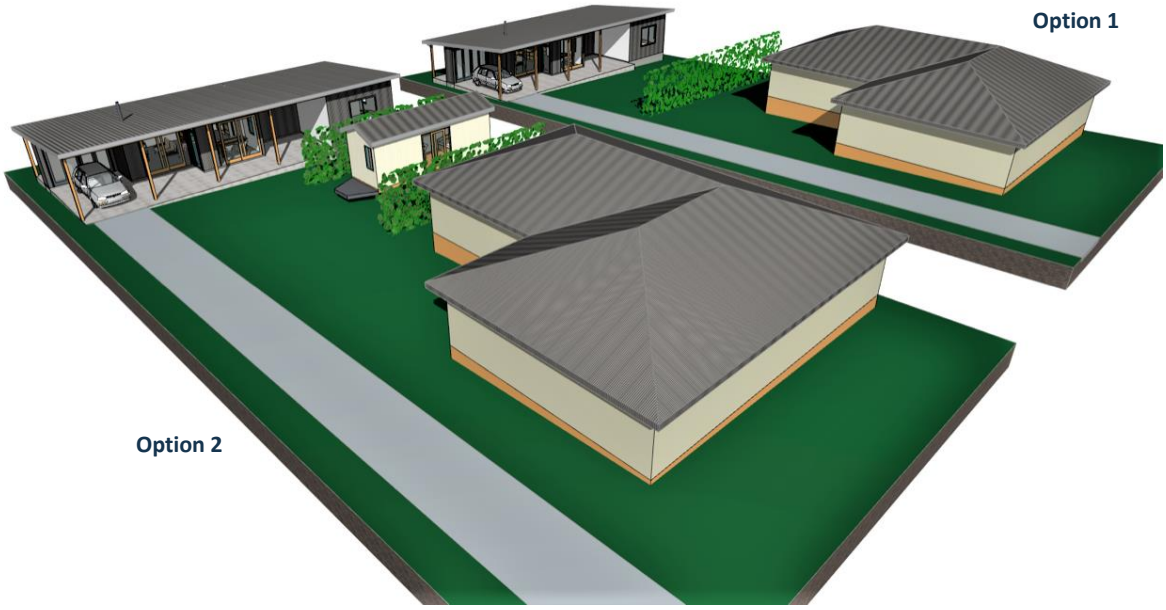
These designs keep the existing house and add a single-storey, solar passive home at the rear of the block. The rear two-bedroom home measures 75m^2 internally, and features a north-facing verandah. The home meets the Silver Level Liveable Housing Design requirements (for adaptable, accessible homes). Each home has a single carport and driveway. A small turning area would be required for the rear home to allow a vehicle to safely exit the long driveway in a forward direction.

In Option 1, the 900m^2 block is subdivided into two lots – the front at 404m^2, and the rear at 496m^2. Each lot has more than the required 100m^2 of landscaped area per dwelling. In Option 2, a tiny house is added to the rear lot (55m^2 internal area). The tiny house has no dedicated parking, consistent with exemptions for granny flats. The tiny home as a granny flat cannot be separately subdivided. The addition of the third dwelling has reduced the lot size for the front dwelling (332m^2) but provided an additional, more affordable one bedroom housing option on the rear lot (568m^2). The landscaped area has been reduced in the second option, the front home achieves the required 100m^2, and the two bedroom and one bedroom dwellings share the landscaped area at the rear.





KDH, Site 1: 900m^2



KDH Design, Site 1, Existing Controls: Option 1 in background (two homes and subdivision); Option 2 in foreground (three dwellings including one tiny house)

KDH Design, Site 1, Proposed Controls: Option 1 on the left (no rear lane); Option 2 on the right (with rear lane)

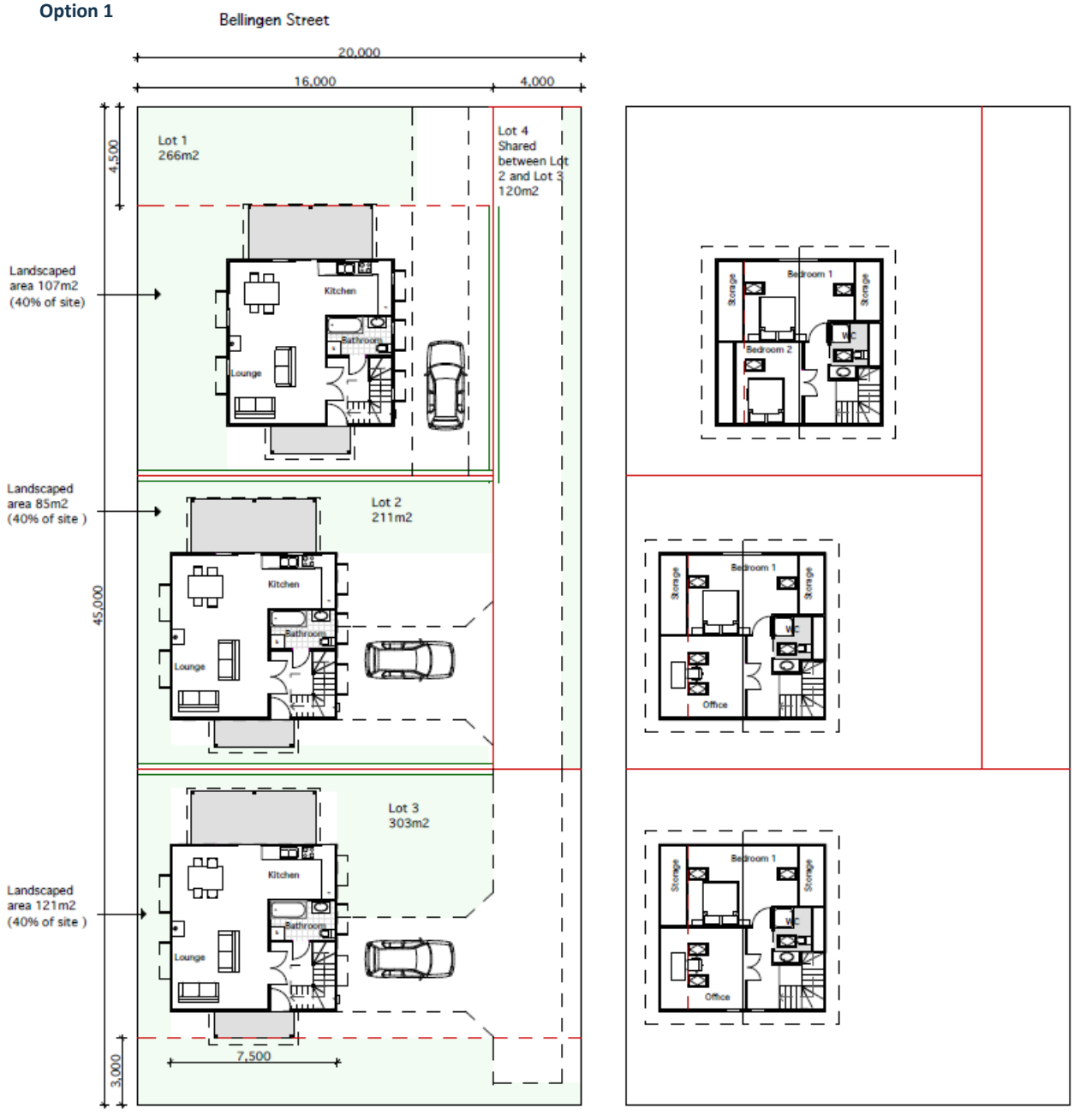
Source: 3D Model created by KDH, 2019 *(hardstand areas added to bottom graphic by author)*

KDH Site 1, Scenario 2 (900m², *hypothetical* planning controls. Option 1 no rear lane)

This design involves demolition of the existing home and construction of three (3) two-storey detached houses. The homes are modest (2 bedrooms or 1 bedroom with office), measuring approx. 100m² inside. They are solar-powered and maximise energy efficiency as they are designed according to solar passive principles. The homes have been designed to comply with the Silver Level Liveable Housing Design requirements. Each home has a dedicated car space.

The proposal includes subdivision into three small lots, the front lot at 266m², the middle at 211m² and the rear at 303m², with 120m² of space being utilised for shared access between the two rear lots. Each home is small, and contains the hypothetical required landscaped area (40% of each lot). The design provides small building footprints with space around each and landscaping opportunities. A more intensive development (e.g. attached dwellings/townhouses) may be possible. Whilst minimum lot size for subdivision controls were not specified as part of the design exercise, Council's current controls restrict Torrens Title subdivision to a minimum lot size of 230m² with approved home designs, meaning proposed Lot 2 does not comply with current controls (except as a strata subdivision).

Option 1



No Rear Lane

KDH Site 1, Scenario 2 (900m², *hypothetical* planning controls. Option 2 with rear lane)

This is a variation on the previous design. The rear lane provides each home with its own access, meaning driveways are not shared. Separate, shorter lengths of driveway are safer and with good landscaping and material choice are less visually prominent. Despite the middle lot having its own access, the length of an access handle (driveway) is not included in minimum lot size calculations so the middle lot measures 211m² (cannot be subdivided into Torrens Title under current controls which limit minimum lot size to 230m²).

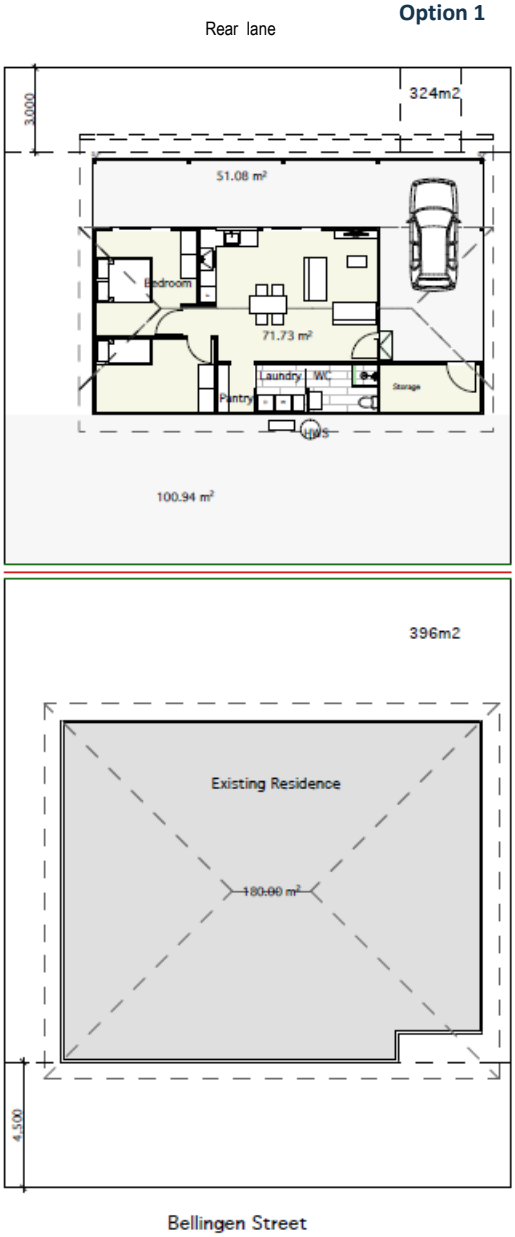
In this scenario, the hypothetical landscaping control (40% of the area of each lot) results in a greater amount of landscaped area than the current control. The current landscaping control for multi-dwelling housing (for a property in Locality Density #3) requires 100m² per dwelling regardless of lot size (and 40m² per dwelling in Locality #4). The requirement to make landscaped area proportionate to the size of the lot (rather than a blanket figure per dwelling) controls how much space buildings and hard surfaces can take up on the site. This type of control can provide smaller building footprints and increase opportunities for plants and trees. However, this can also incentivise two-storey buildings as single storey buildings cover a larger footprint and impacts such as overshadowing need to be addressed through design. The higher amount of landscaped area required can also affect the development yield – not as many homes may fit on the site as more area is required for landscaping.

KDH Site 2, Scenario 2 (720m2, rear lane. Option 1 *existing* planning controls. Option 2 *hypothetical* controls)

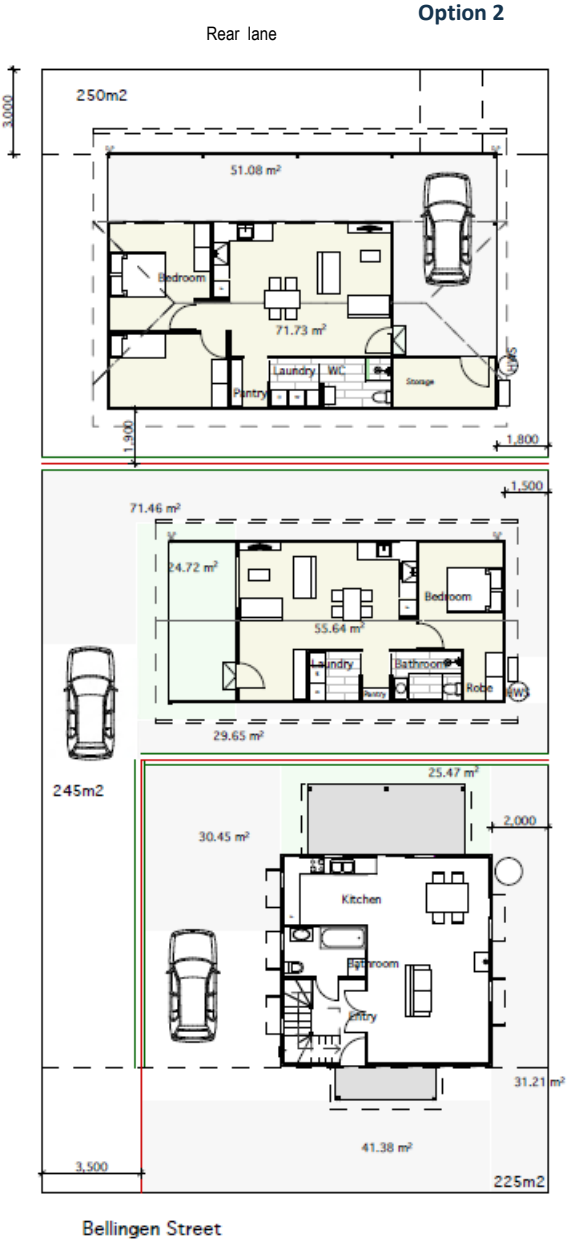
Option 1 on a 720m^2 site with a rear lane includes keeping the existing house and constructing a small two bedroom home facing the laneway. The new home has an internal area of ~72m^2, with a large front verandah and over 100m^2 of landscaped area. A larger home would be permitted, however the compact design is efficient and meets an identified need for smaller, more affordable homes in the Shire. There is one parking space provided and the home complies with the Silver Level Liveable Housing Design requirements for accessibility.

Option 2 shows a more intensive proposal, with three small detached homes on the site, each of a different design. The front dwelling is a one/two bedroom, two-storey home with one car space on a small lot of 225m^2. The hypothetical landscape control requires 40% site area to be landscaped or 90m^2. The middle lot contains a tiny home (at approx. 55m^2) on a 245m^2 lot inclusive of the driveway/access handle. The subdivision of these lots (Torrens Title) is not enabled by current planning controls (which require a minimum lot size of 230m^2 with approved dwelling design, excluding the driveway). The rear lot faces the laneway on a lot of 250m^2. In order to meet landscaped area requirements (of 40% of each lot size); the properties need to make use of all the land surrounding the house (all four sides, including some narrow areas) rather than the conventional front and rear yard arrangement. In this Option there are limited opportunities to retain, grow and maintain small trees for example.

Option 1



Option 2



KDH Site 2: 720m^2

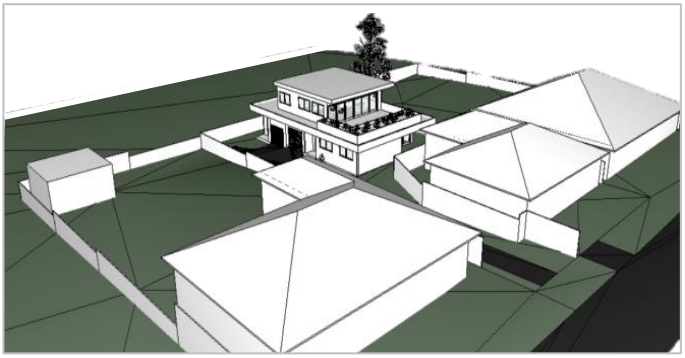
KDH Design, Site 2 (with rear lane) Option 1 in the foreground showing a possible design under existing controls; Option 2 in the background, showing a design using different planning controls.

THA, Tricia Helyar Architect, Tricia Helyar

THA Site 1, Scenario 1 (900m², no rear lane, *existing* planning controls)

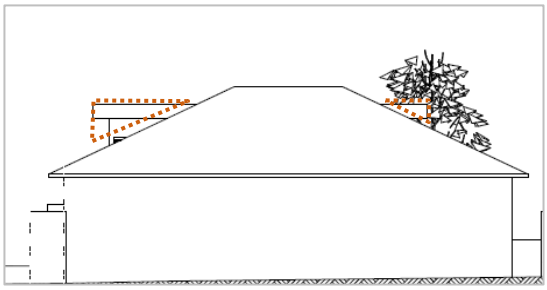
This design keeps the existing home and includes construction of a modern two-storey building at the rear. It appears as if the building is one house, but it is actually two separate homes attached to each other. The first home is a single level, two bedroom, 1 bathroom with a floor area of 98m². The second home is split over two storeys, containing two bedrooms, 2 bathrooms (126m² of floor area).

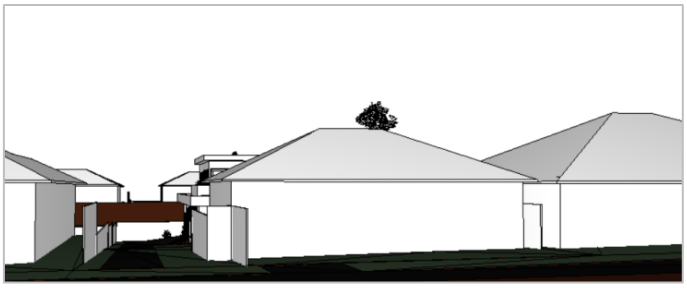
Each home has a single garage and north-facing private open space and each has more than the required 100m² of landscaping per dwelling. A small green roof area has been provided on the first floor balcony. The building complies with the existing height and building envelope controls. The building is similar in height to the front house and when viewed from the street the building is not prominent. The rear building increases the built upon area of the site by 320m² but provides two additional modestly-sized homes to the neighbourhood without major impacts upon the streetscape. Whilst this design cleverly provides two smaller homes in one building, meeting an identified need to provide smaller dwellings in the Shire, a large 4 bedroom, 3 bathroom house of this size and form would also be permitted under existing planning controls. Therefore there may be a need to guide the market (e.g. via incentives or controls) to encourage provision of smaller homes.



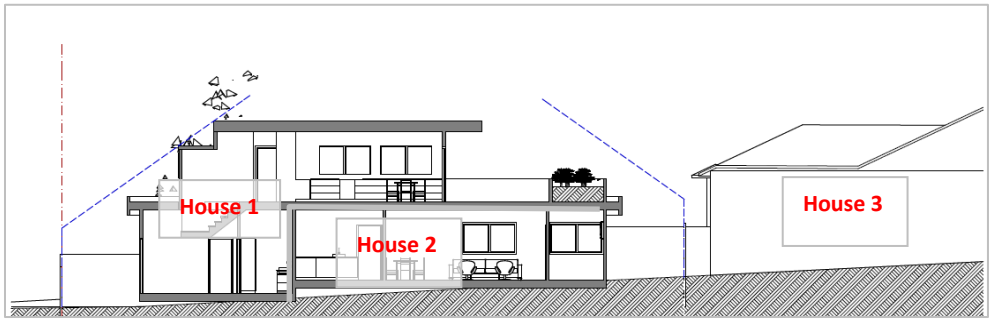
THA Design, Site 1: View from the sky (oblique view)
The rear building is two small homes attached to each other.

Side view – east elevation



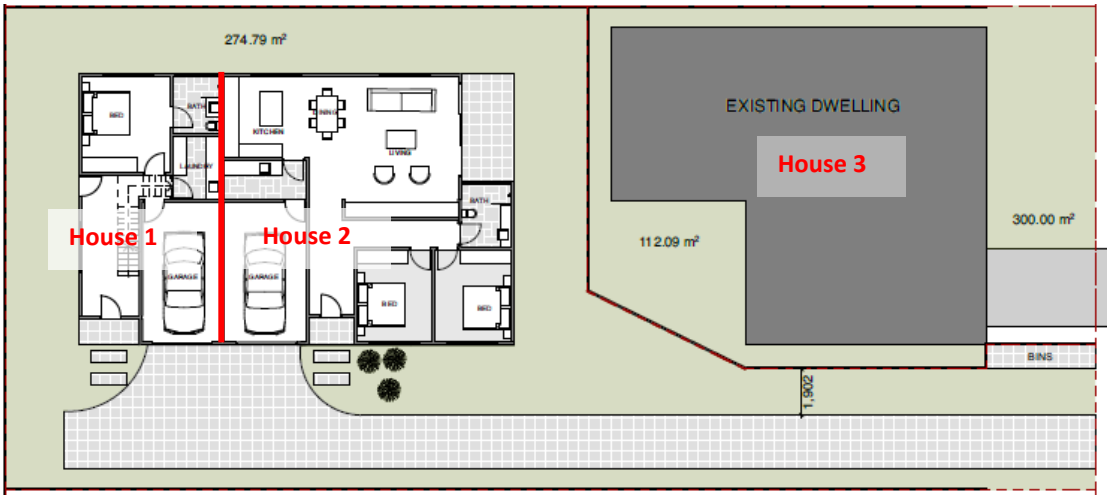


View from the street. **Front (north) elevation.** The proposed homes at the rear are hidden behind the existing house. Only small parts of the roofline are visible from the street (shown highlighted by the orange dotted line).

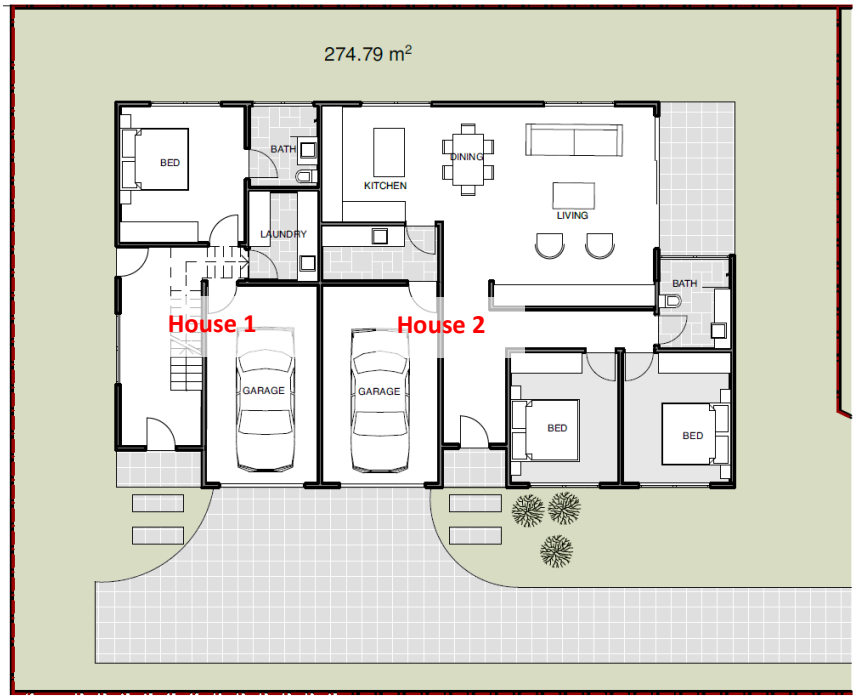


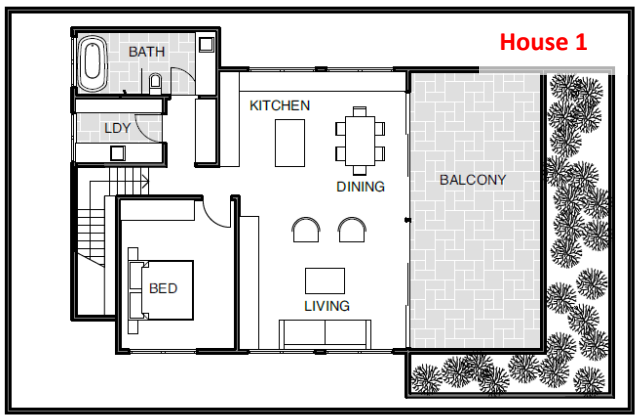
Section plan. This cross section shows how the stepped design complies with the building height controls (shown as the blue dotted line). The 6.9m high home is similar in height to the existing home (5.8m).

THA Site 1: 900m²



Floor Plan Ground Floor. The red line shows the separation of the two homes in the rear building.





Top: Floor Plan Ground Floor
Bottom: Floor Plan First Floor

THA Site 1, Scenario 2 (900m², no rear lane, *hypothetical* planning controls)

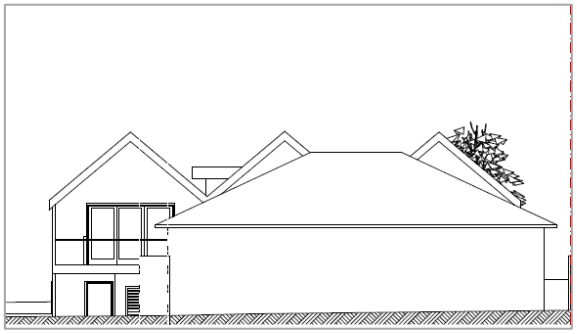
This design provides 5 homes on a 900m² site. The existing home is retained (House 5). The design provides 4 compact dwellings on the rear site, attached to each other in a terrace arrangement. The terraces consist of 2 three-bedroom homes with a single garage each (Houses 1 & 2); 1 one-bedroom with a single garage (House 4) and 1 granny flat with no parking (House 3). The roof has three ridges to reduce the scale of the building and to reflect the pitched roof character of the area. The first floor has north facing balconies for private open space, and some screening measure (dependant on the layout of the existing dwelling) may need to be introduced to minimise overlooking.

The subdivision proposes to excise the front home onto a 300m² lot. This design proposes 112m² of landscaped area for the front lot, just shy of the required 40% (120m²). The rear lot measures 600m² or ~500m excluding the access driveway. 246m² of landscaped area has been designed for the rear lot, compliant with the 40% of the lot area requirement. The terraces could be strata subdivided. Each dwelling has been provided with the hypothetical amount of private open space (16m²). The increased hypothetical building height plane control provides more opportunities for increased density on the site, however the architect has noted that a 3-storey design is possible and may be pursued by some developers, which would have greater impacts to neighbours and the streetscape.

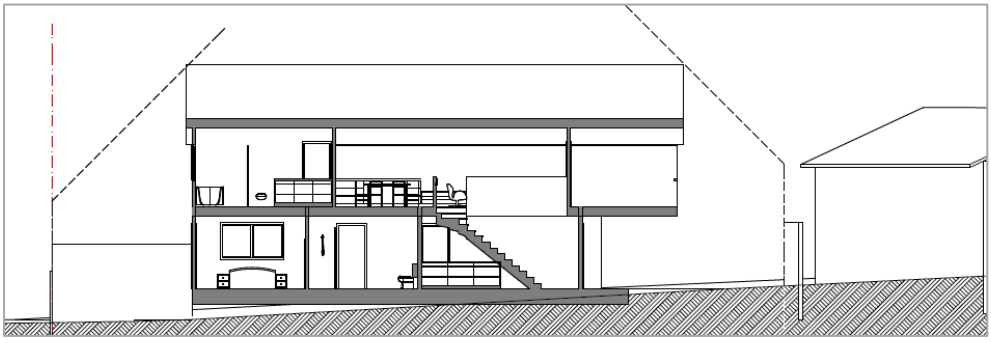
THA Design, Site 1: View from the sky (oblique view) Four homes have been constructed at the rear of the block.

View from the back (south elevation)

Front view (north elevation)

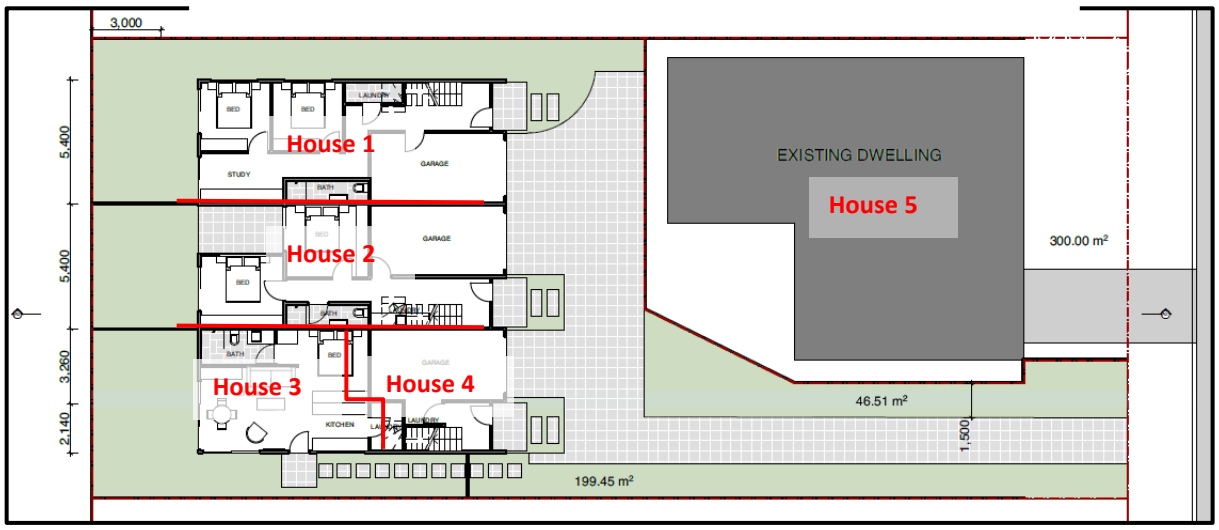


View from the street (north elevation)

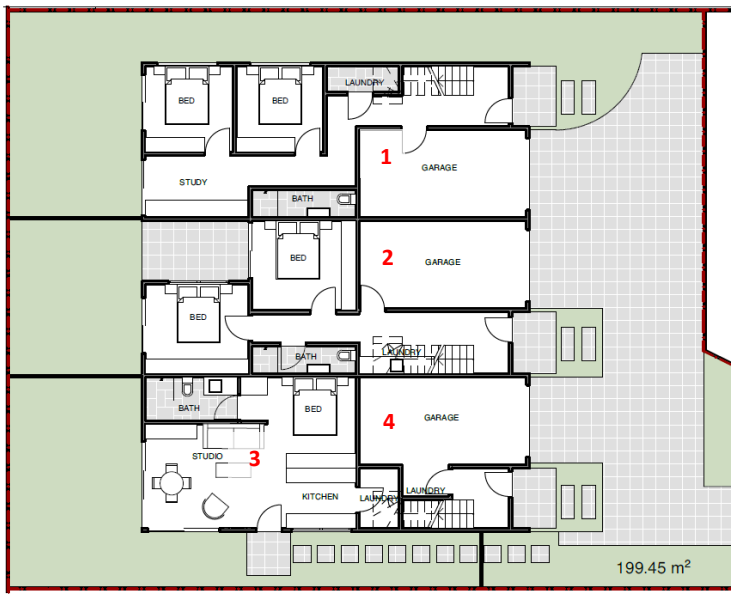


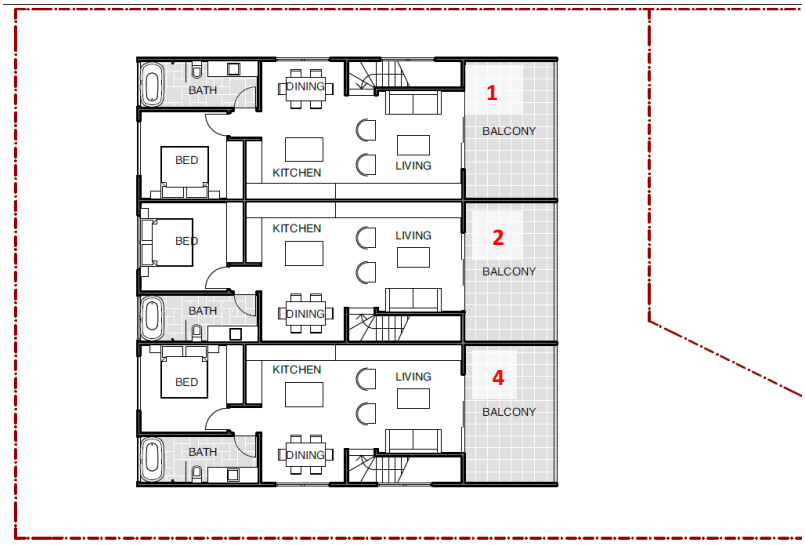
Section View. This cross section shows how the design fits within the hypothetical building height plane controls (shown as the black dotted line). The homes measure 7.3m high at the ridgeline, compared to the 5.8m of the existing home.

THA Site 1: 900m^2



Site Plan Ground Floor





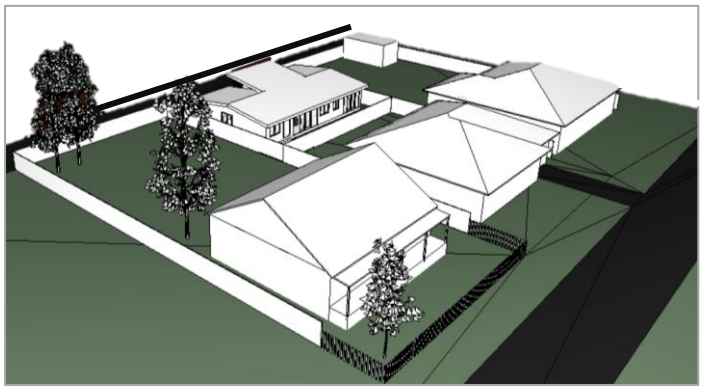
Top: Floor Plan Ground Floor

Bottom: Floor Plan First Floor

THA Site 2, Scenario 1 (720m^2, rear lane, *existing* planning controls)

Under the existing controls the new dwelling is sited on a new 300m^2 subdivided lot facing the rear lane. The existing home sits on the remaining 420m^2. The new home is a two-bedroom single storey dwelling. The building is well set back from the lane due to the site orientation with the north-facing living area on the laneway. The living spaces span the width of the building, allowing for cross ventilation and access to the landscaped areas on both sides of the building. The building would be fully adaptable for universal access. While more intensive development would be possible on the site, this dwelling was aiming to achieve a smaller, well-designed affordable dwelling with an internal floor area of 97m^2 (excluding garage).

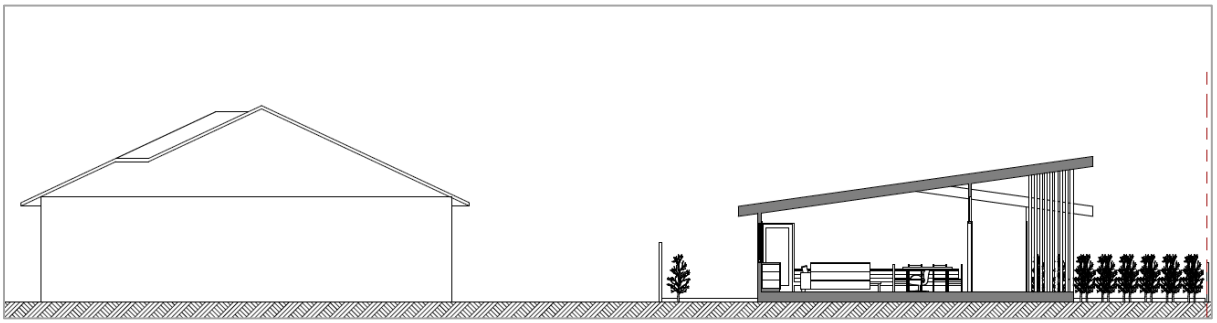
The hypothetical site neighbours a heritage-listed property with a cottage and established trees. The proposed design is respectful of this setting and is single-storey and remains hidden from view when looking from the main street.



THA Design, Site 2: View from the sky (oblique view).
One home facing the laneway has been constructed behind the existing home.

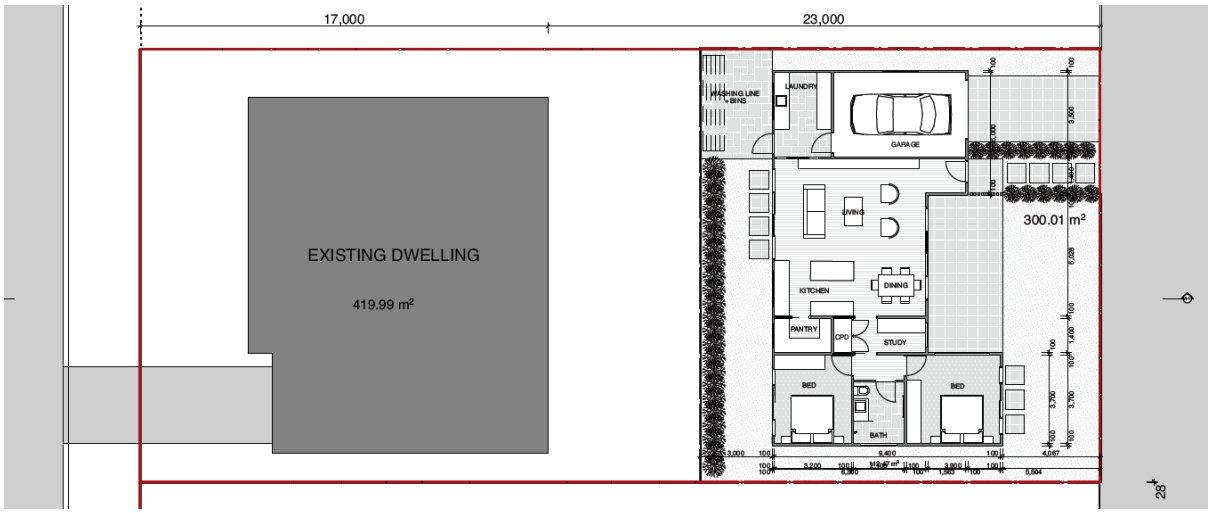
View from the lane (north elevation)

View from the street (south elevation)
The new home is barely visible from the street, and has negligible impact on the streetscape or neighbouring heritage cottage.

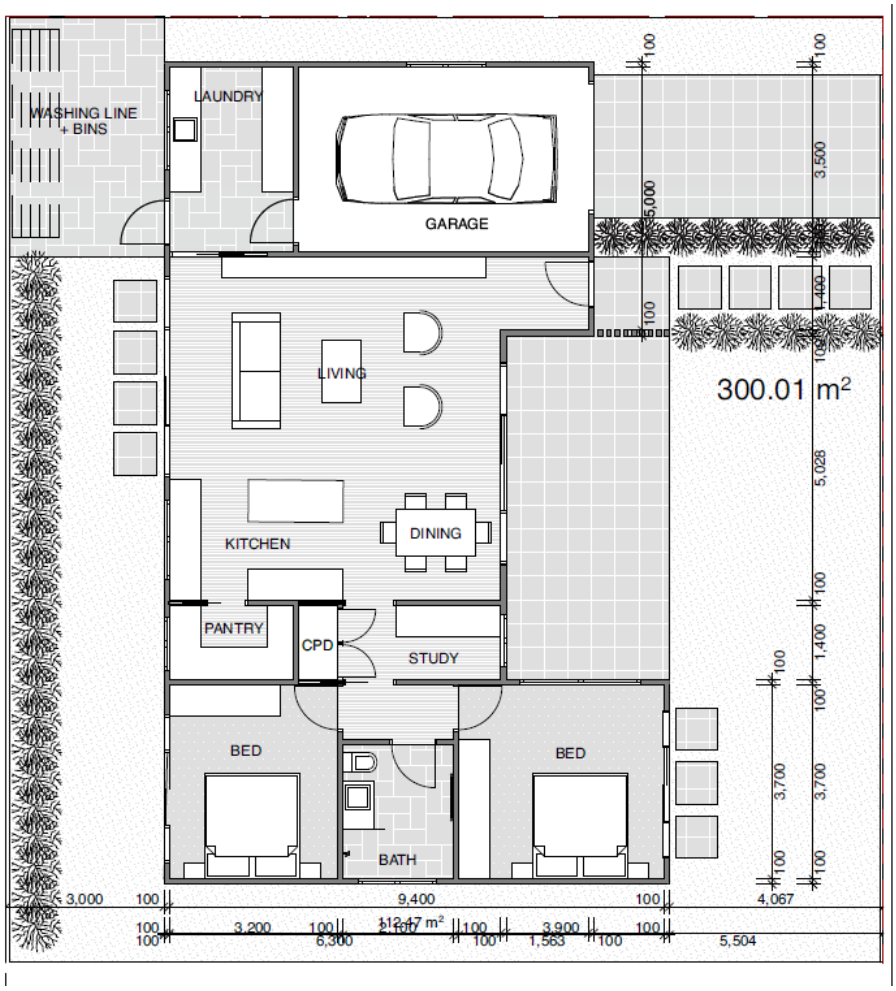


Section View. This cross section shows the new home is sensitively designed to be smaller than the existing home. The new home is 4.3m high (compared to 5.8m for the existing dwelling).

THA Site 2: 720 m^2



Site Plan



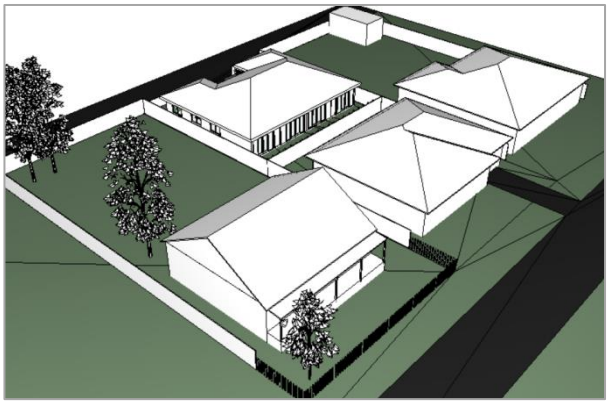
Floor Plan

THA Site 2, Scenario 2 (720m², rear lane, *hypothetical* planning controls)

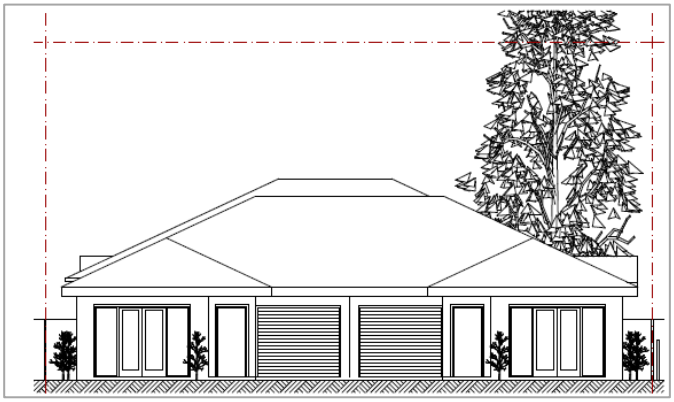
This design retains the existing home on a lot measuring ~350m2. The hypothetical controls do not limit the number of dwellings possible on the site and the design proposes construction of two additional dwellings (attached) at the rear, facing the laneway. The rear lot measures 344m². The new homes have 2 bedrooms each and a have a single garage. The building presents as one home, but provides two compact homes, with 76m² of internal floor area each (excluding the garages). The living areas and private open space face north with the garages between to provide separation between the dwellings.

226m² of the rear lot is built upon area, leaving 118m² for landscaped area (59m² for each dwelling). This is almost 20m² less than the required landscaped area of 137.6m² (68.8m2 per dwelling) which represents 40% of the lot area of 344m²). The landscaped areas along the sides of the dwellings do not count as landscaped area because they do not meet the minimum width of 1500mm (the side setbacks to the neighbouring boundaries are 900mm).

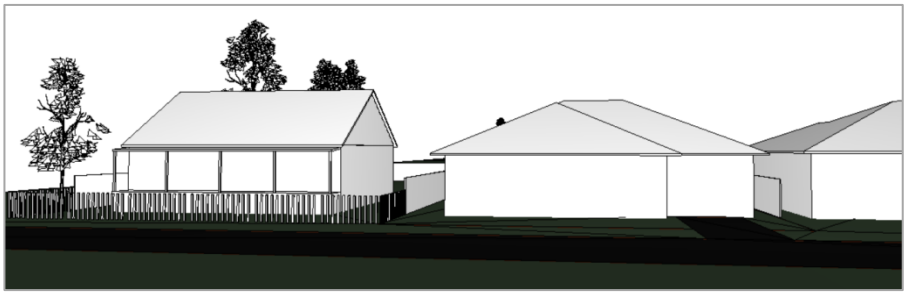
The home has been designed as single-storey at 5.4m high to suit the surrounds, although a stepped second-storey would be possible under the hypothetical building height plane controls.



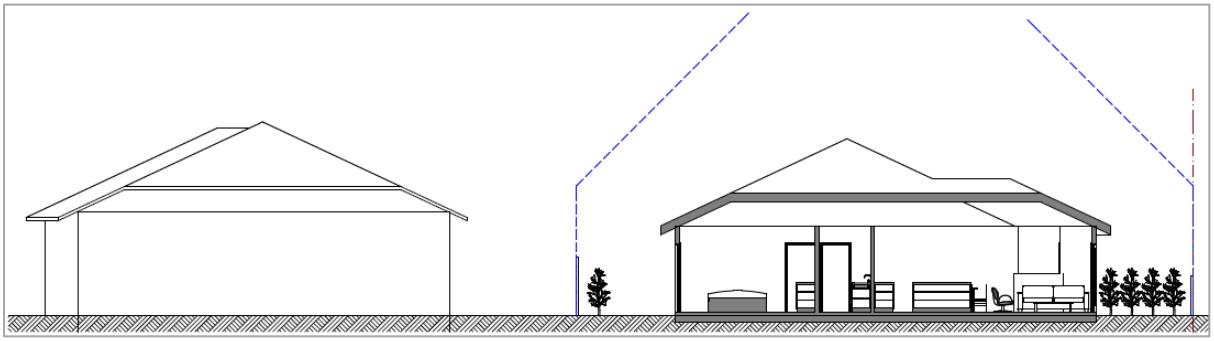
THA Design, Site 2: View from the sky (oblique view). Two attached homes facing the laneway have been built at the rear of the site.



View from the lane (north elevation)

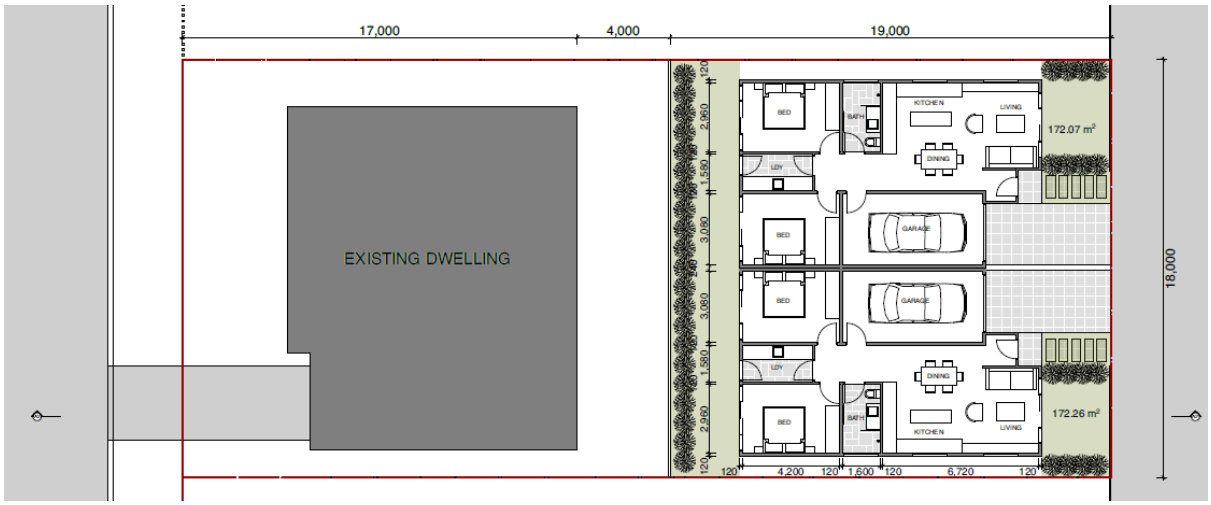


View from the street (south elevation). The proposed dwellings are not visible from the street.



Section View. This cross section shows the new home is sensitively designed to be as tall as the existing home. However the hypothetical building envelope (shown as a blue outline) shows a much larger building is possible.

THA Site 2: 720 m²



Site Plan

Floor Plan

Design Resources and Case Studies

There are many useful resources that promote quality housing design. The following list illustrates some easy-to-understand design guides (some include good case studies) for anybody wanting to learn more about the importance of good design.

NSW Government Architects Draft Urban Design for Regional Areas

https://www.planning.nsw.gov.au/Plans-for-your-area/Urban-Design-for-Regional-NSW

This draft guide builds on the objectives and values of *Better Placed — an integrated design policy for the built environment in NSW*. Critically, the guide provides a road map for local government decision-makers, development applicants and local communities to work towards addressing urban design priorities in their regions to ensure healthy built environments. It describes processes to achieve good urban design, and how to assess built environment outcomes against the Better Placed objectives. The NSW Government Architects has published a comprehensive series of guidance and draft guidelines on good design, as illustrated below.
https://www.governmentarchitect.nsw.gov.au/policies/better-placed

Your Home – Commonwealth Government Guide to Environmentally Sustainable Homes

http://www.yourhome.gov.au/

Your Home is a guide to building, buying or renovating a home. It shows how to create a comfortable home with low impact on the environment – economical to run, healthier to live in and adaptable to your changing needs. A good place to start is: http://www.yourhome.gov.au/you-begin/design-process

Josh's House

https://joshshouse.com.au/

After 20 years renovating other people's houses and gardens demonstrating sustainable design ideas, Josh Byrne (environmental scientist & well-known ABC TV Gardening Australia presenter) undertook the design and construction of his own 10 star energy efficient family home in the Fremantle suburb of Hilton.

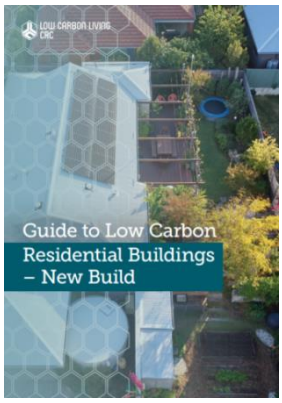
Tired of hearing that sustainable construction has to cost more, Josh and his colleagues set out to prove that resource efficient homes could be built at a comparable cost and timeframe to regular houses. What sets this project apart from many others is that the building designs have achieved a 10 Star NatHERS energy efficiency rating, while intentionally using conventional building materials and construction methods so they can easily be replicated by industry and the wider community. The project also demonstrates a more sensitive approach to residential subdivision that has considered maximising effective garden area around the homes to allow for natural shading, children's play spaces and local food production – important health and lifestyle benefits that are rapidly disappearing from our suburbs.

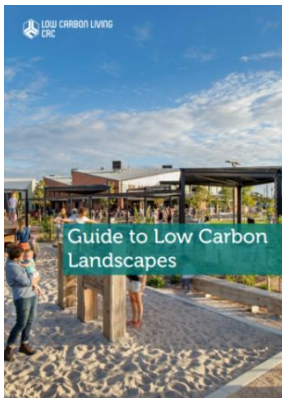
Construction commenced in November 2012 and was completed in June 2013. Now occupied as Josh's Family home, the house also functions as Living Laboratory where performance data is collected and reported in real time, new technology is tested and learnings are shared.

Built Better

http://builtbetter.org/lowcarbonguides

The CRC for Low Carbon Living has produced a series of practical guides summarising best practice in various phases of the building lifecycle—construction, retrofit and operations for different climates and household needs.



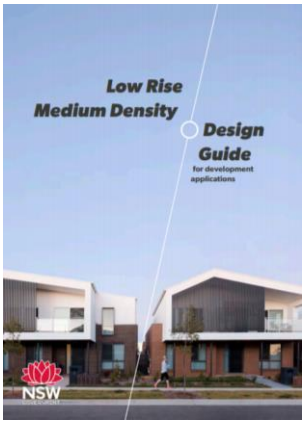


Low Rise Medium Density Housing Code – Design Guide and the "Missing Middle" Design Competitions

https://www.planning.nsw.gov.au/Policy-and-Legislation/Housing/Medium-Density-Housing/Design-Guides-for-Low-Rise-Medium-Density

Currently, most new homes built in NSW tend to fall into two categories; traditional freestanding houses and apartments. Low rise medium density housing provides an alternative, as a more affordable housing option.

The Low Rise Medium Density Housing Code is supported by the *Low Rise Medium Density Design Guide for complying development*. The Guide aims to improve the design of medium density housing by addressing key considerations, including layout, landscaping, private open space, light, natural ventilation and privacy.



The NSW Government Architect's Office ran a 'Missing Middle Design Competition' to promote and test the controls in the draft Design Guide. The results of this competition can be found here: https://www.planning.nsw.gov.au/Policy-and-Legislation/Housing/Medium-Density-Housing

The Queensland State Government also ran a design competition; title "Density and Diversity Done Well". South-east Queensland housing designs are generally considerate of sub-tropical climatic conditions – similar to much of the Bellingen Shire climate. The results of this competition can be found here: https://www.hpw.qld.gov.au/aboutus/OQGA/Pages/DensityDiversityDoneWellOpenIdeaCompetition.aspx

The above examples provide inspiration and illustrate good design, albeit at a variety of scales (with the larger scale developments more suited to a city rather than regional context).

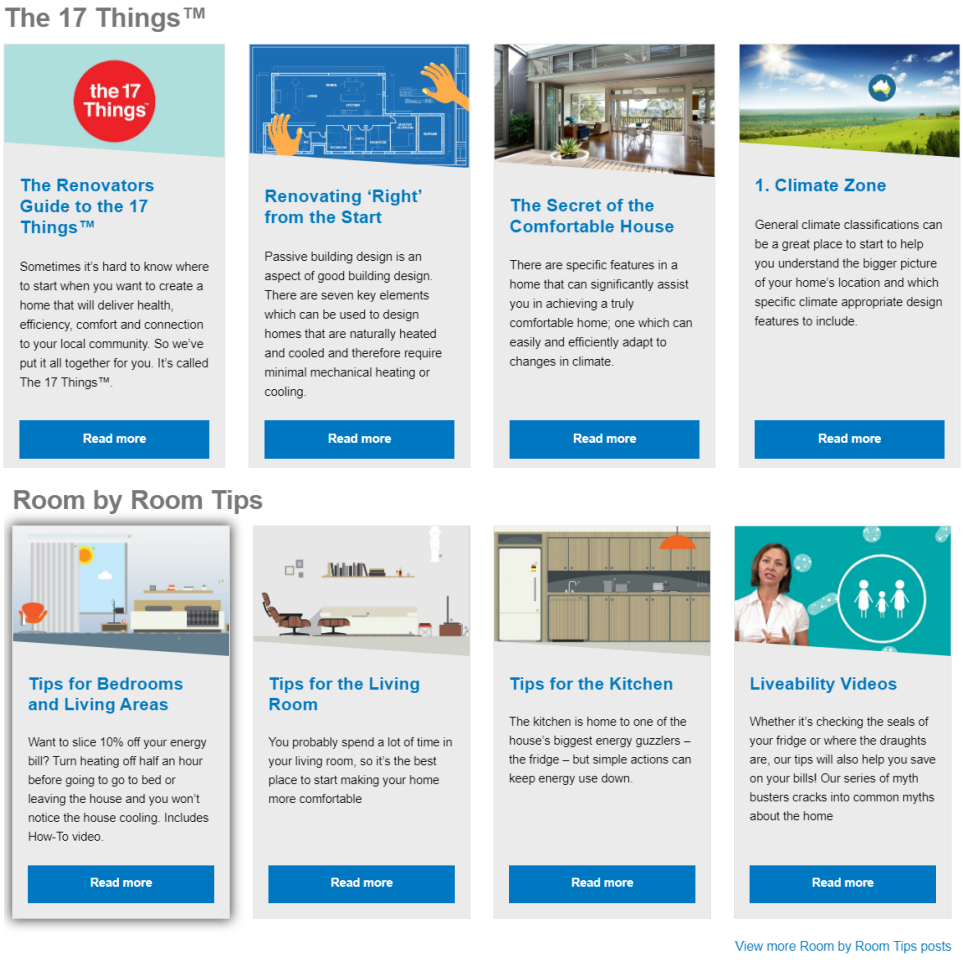
Separate house	Detached dual occupancy	Attached dual occupancy	Terraces and townhouses	Manor homes	Apartments (≥3 storeys)
LOW DENSITY	MEDIUM DENSITY – "THE MISSING MIDDLE"				HIGH DENSITY

Centre for Liveability Real Estate (CSIRO)

https://liveability.com.au/

Our mission is to provide support for everyone to create and find a better home, one that is healthy, efficient, comfortable and connected to community.

The Liveability Features Framework was co-developed by Cecille Weldon and CSIRO. It defines and verifies an important cluster of 17 property features for Australian homes which deliver the potential for reduced running cost and increased comfort, if used correctly. They cover aspects of good building design, energy and water efficiency, renewables and energy ratings.



Queensland Government Housing and Public Works – Resources for Sustainable Homes

https://www.hpw.qld.gov.au/construction/Sustainability/SmartSustainableHomes/SustainableHomeResources/Pages/Default.aspx

This website is a database of factsheets and short booklets and guides for homeowners, home buyers and builders as well as being useful for property industry professionals. The easy-to-read design guides include booklets on *Cost Efficiency, Indoor Air Quality, Safety and Security, The History of Sustainable House Design* (Queensland had an Act requiring sustainable house design in 1916!) and tips and factsheets for sustainability.

Conclusion

During the *Homes for Our Future* engagement, support for infill was frequently noted as a way to provide more homes to meet the housing needs of our changing community. However, questions such as 'what will infill look like?' and 'will it be compatible with our Shire's unique country-town character?' were also often expressed.

Infill housing already exists across the Shire, mostly harmoniously with surrounding development. In many instances infill housing is older (as in the walk-up flats in Urunga) or hidden from the street by landscaping or through design.

Some more recent examples of infill housing (such as duplex or townhouse development) in neighbouring areas and in Bellingen and Urunga have raised design-related concerns. For example common design concerns are buildings appearing too large and bulky, overlooking impacts on neighbours privacy, and properties having no or few trees, plants and lawns and too much built-up or concreted areas. Infill homes having insufficient parking was another concern, presenting a design challenge – how to balance enough parking area (essentially hard surfaces) and enough landscaped or green areas.

It is important to recognise sound *design processes* because it is at the beginning stages of planning and designing a home where challenges can be worked through and possible impacts minimised. Sometimes this design process is neglected, due to costs, time constraints, limited understanding of the benefits, lack of expertise and more. The planning system in recent times has been focused on quick supply of homes, although is now being reformed to include more consideration of design and built form outcomes.

It is important that these reforms include education around good design and also making sure good design can be delivered in a timely and cost-effective manner – well-designed homes should be accessible to everyone, e.g. for those living in the city or in the regions and for a wide range of budgets. Good design also supports sustainable living, which is very important to residents of Bellingen Shire.

A number of housing designs were created by local design professionals to show how current and hypothetical planning controls could be interpreted as new infill housing. These designs show the community what infill housing could look like. They also provide a basis to better understand building possibilities and how planning controls can be used to create different outcomes, including positive design elements and possible unintended consequences. The design teams included a short report and evaluation of current and hypothetical planning controls, to assist in understanding how the controls could be applied.

Often less desirable consequences of infill development result from poor design or limited investment in the design process, or from seeking to maximise development yields in order to make developments economically feasible (or more profitable). Cutting costs during construction can also lead to negative consequences and can compromise house design. The focus of providing new housing should move away from minimising costs to maximising value to future occupants and the community as a whole. Support for good design, that is accessible to the wider community, is fundamental to this shift.

Good design is not really about what a building or house looks like but about how comfortably it sits within its landscape and how it functions and supports the people using it over time. Whilst investing time and money in good design can cost more upfront, these costs are recouped over the life of the building – as a well-designed home built to last will save energy, water and money.

Recommendations

Combined with good policy, governance and investment in infrastructure, good housing design can support growth that retains the special character of a place. Planning strategies and controls can promote good design in a number of ways.

1. **Find and share more infill housing designs and real-life infill examples**

   To assist the community in understanding what infill housing could look like, more examples should be collected and shared. These examples can help inform continuing conversations about what good design means in our Shire. Infill examples can be used as inspiration and to stimulate new and innovative development that meets the housing needs of the community.

   It is important to collect and include regional examples of infill housing. Infill housing can be delivered at many different scales, at different densities, and in many different ways, so it is important to have designs that are relevant to the Bellingen Shire context.

2. **Community engagement and conversations about good infill design**

   The local infill designs and this study should be used during the public exhibition period for the Draft Housing Strategy to inform conversations about infill housing and good design across the Shire. The designs can be used to explore questions such as *what design aspects do people like?; what do they not like as much?; what can be improved?; and what should planning controls focus on and encourage?*

3. **Nurture creative and design culture of the Shire and education about good design**

   We all want to live in well-designed, comfortable homes and reduce our environmental impact, but don't always know how best to go about this, especially given we all have different housing needs and budgets. However, there are many people with skills and passions across Bellingen Shire who can provide expertise or share insights relating to good design. Bellingen Shire is lucky to have a strong creative ethos and a community that cares about good design. Nurturing this culture means making or strengthening links and sharing knowledge between the community, design professionals and Council. These links will provide productive ways to understand different perspectives and work to provide solutions to issues.

   Council should promote existing resources for people and groups wanting to learn about good design. In the longer term Council could also produce information and design guidance for local contexts.

4. **Prepare Character Statements for Dorrigo, Bellingen and Urunga**

   By July 2020, Council must prepare a *Local Strategic Planning Statement* (LSPS) to describe character features across the Shire and identify desired future character. Council should also prepare complementary Character Statements for Dorrigo, Bellingen and Urunga. These important new planning documents will draw upon what we heard during the *Homes for Our Future* community engagement as well as be informed by further community input. Character Statements will be used to inform planning controls and decisions and will also be an important resource for the design and development industry.

5. **Integrate design principles into planning controls**

   To ensure design is considered during the planning and development assessment process, planning objectives and controls should be updated to reflect the design principles on page 8. The NSW Government Architects *Draft Urban Design Guide for Regional NSW* also contains many useful design principles that should be integrated into the local planning system and used to encourage good design and inform decision-making.

6. **Use well-designed infill examples and refine planning controls to address common concerns about infill development**

Planning controls currently allow infill development and various housing types, in all areas zoned R1 General Residential. Infill development can be controversial, usually in circumstances where neighbouring residents did not expect it, where infrastructure is insufficient or strained or where the design has not adequately considered potential impacts.

Understanding common concerns about infill housing can help refine planning controls to foresee and mitigate issues. For example the community have told us that infill development should not change the landscape of the area from majority green space to majority hard surfaces, that on-site parking should be provided for homes and that environmentally sustainable design and living should be encouraged. Planning controls should seek to emphasise the design process (for example by stepping through site analysis and requiring a site analysis plan). Planning controls should also be outcomes focused and include objectives which explain the purpose and aim of each control.

Whilst the impacts of modelled infill housing development in a neighbourhood may be minimal or manageable, concern may arise where development occurs beyond what was expected or modelled, or much faster than expected (i.e. more people develop infill than expected) leading to cumulative impacts. In a low-growth area such as Bellingen Shire, there is time to proactively plan to manage infill growth impacts, but if the market changes, strategies and planning measures need to be re-evaluated to manage growth. Effective monitoring of housing growth will be necessary and planning strategies and controls need to be kept up to date, with regular policy reviews undertaken.

7. **Provide planning controls that provide for generous landscaped areas and encourage tree planting and landscaping, consistent with the local character of the Shire**

   An important and highly valued aspect of residential character across the Shire is the landscaping and sense of greenery. Even on small sites, in small areas or within multi-dwelling developments in the Shire, landscaped areas are prominent. Gardens of all types, shapes and sizes are notable features in most streetscapes. There are many opportunities to build upon a neighbourhood's sense of place through landscaping, as well as providing environmental and wellbeing benefits.

   Infill development can and should include generous landscaped areas. Infill benefits from landscaping in many ways, including by softening the visual impact of new buildings; providing visual interest and space for residents to use and relax within; supporting wildlife and pollinators; and moderating climate (providing summer shade, wind breaks, allowing water to percolate the soil etc.). Planning controls should consider how to encourage infill development that provides sufficient landscaped areas to maintain local character and encourage more planting and gardening. These controls could include requiring landscape plans as part of development applications, requiring a percentage of each lot area to be landscaped area (permeable, and not built upon) and requiring a small tree/s be planted on each new dwelling lot.

8. **Invest in infrastructure to promote infill development in desirable locations**

   Bellingen Shire Council has many current planning controls that encourage infill development. Relative to many other Council areas across NSW, these controls can be viewed as quite permissive. This suggests that there are other factors acting as barriers to infill development. Market research and community consultation indicates demand for infill housing products so it appears that infrastructure availability (the cost and ease of connecting to water, sewer, and utilities) is a significant barrier to infill. Planning controls relating to infrastructure provision for infill developments mean additional costs and limit viability of small-scale infill developments. Undertaking infrastructure network plans for desirable areas (e.g. infill focus areas) and investigating cost-sharing mechanisms is recommended.

Appendix – Infill Design Concepts – Architect's Drawings