

Thornton: North Penrith 21st Century Living



UrbanGrowth NSW is working with builders and developers to create a range of compact lot and specialised housing options across Sydney.

Our aim is to improve the delivery of quality housing on smaller lots and increase housing diversity in new developments.

21st Century Living



21st Century Living at Thornton



21st Century Living at Thornton

The creation of sustainable places is one of UrbanGrowth NSW's overarching objectives and housing diversity is a key component.

In recent years the planning and development professions have focussed either on the design of medium to high density apartments or on detached homes on larger lots.

There is however, a gap in the delivery of quality housing on smaller lots that contribute to overall housing diversity, meet the increasing demands of smaller households, improve the sustainability of communities and deliver improved housing affordability.

Through our 21st Century Living Program, UrbanGrowth NSW is encouraging the supply of this type of housing. We are looking at developing new and adapted housing types for lots within the 150m² to 350m² range.

We have also identified a need to provide specialised housing that caters for people with disabilities and to future proof housing so that people can age in place within their own homes.

The 21st Century Living Program

UrbanGrowth NSW has programmed to deliver up to 2,000 diversified lots over the next three to four years with more to come, in sites such as Edmondson Park, Oran Park Town, Potts Hill and at Thornton in North Penrith.

Through the 21st Century Living Program, we are developing a range of smaller and specialised housing options into our projects, targeting:

- Compact housing forms, comprising:
 - 'cottage lot' detached dwellings
 - 'zero lot' detached dwellings
 - terraces and townhouses
 - duplexes or semi-detached dwellings
 - triplexes and 'manor homes'
 - 'secondary dwellings' and studios
- Specialised housing forms, comprising:
 - 'universal housing', and
 - housing for disabled people

We are currently working with builders and developers to assist with the roll out of the program. More information on the housing types featured in the Program is provided overleaf.

Compact lot housing types

'Cottage lot' detached dwellings

These are single storey detached homes on small lots, designed to integrate seamlessly into a traditional residential streetscape. 'Cottage lots' may be similar in width to traditional lots, but have a shallower depth. Alternatively, they may have a narrower frontage.

'Zero lot' detached dwellings

'Zero lot' detached dwellings have one or more walls adjoining the boundary with the next lot. When designed carefully, 'zero lot' housing can offer the amenity benefits of traditional detached dwellings while using land much more efficiently. The 'courtyard' houses at Thornton are an example of 'zero lot' detached dwellings.

Terraces and townhouses

Terraces and townhouses deliver a more urban solution to medium density housing. They often include rear garages that are accessed by a rear lane. While most contemporary terraces have a 7.5m to 8.5m frontage, a narrower terrace lot may also be suitable in more urban locations.

Duplexes or semi-detached dwellings

Duplexes or 'semis' can blend easily into relatively low density residential suburbs. When designed well, duplexes can be of a similar scale and character as a typical detached family house but will be difficult to differentiate from detached homes. The 'patio' houses at Thornton are an example of this housing type.

Triplexes and 'manor homes'

Triplexes and 'manor homes' are groups of three or four homes that are combined into one building of a similar scale and character as surrounding residential homes. They are often designed to look like one large house. Parking is a key design issue here and these dwellings often benefit from rear lane access and corner locations, which reduce the visual impact of garages.

Secondary dwellings and studios

Secondary dwellings provide a small, self-contained living space that is either attached or separate from the principal dwelling. Garage-top studio apartments are highly sought after by homeowners. An important evolution of the secondary dwelling concept is the ability to strata title the dwelling, enabling it to be purchased separately from the principal dwelling. The 'garden' and 'loft' apartments at Thornton are examples of this.

Specialised housing types

Specialised housing types include 'universal housing' and housing that is specifically designed for people with disabilities.

Universal housing refers to homes that meet the needs of people of different ages and abilities over time. These houses are designed to be useable by most people over their lifetime, without the need for major adaptation or specialised design, and include many of the features specified in the Australian Standard for Adaptable Housing. 'Disabilities accommodation' refers to group homes and villas that provide accommodation for people with a disability.

For more details on each of these housing types refer to our **Housing Diversity Guide** at:

<http://www.urbangrowthnsw.com.au/news/publications-reports/landcom-publications.aspx>



21st Century Living

The Thornton Project

The Thornton project at North Penrith is adjacent to both a regional centre and train station. This 41ha strategic site will eventually accommodate over 1,100 dwellings.

The objectives of the project include:

- providing housing diversity with a range of price points and dwelling types
- creating a transit-orientated development with increased amenity, landscaping, open space, recreational and social facilities, employment opportunities and a community hub
- creating up to 770 direct jobs on the site in addition to construction jobs, with over 1,100 flow-on jobs
- providing a town centre with retail, commercial and community uses which complements and does not overly impact Penrith City Centre
- interpreting European heritage significance and retaining important indigenous heritage elements
- improving access for the community by integrating rail and bus transport within the masterplan.



North Penrith masterplan

A demonstration of 21st Century Living

A key objective of the project is to provide housing diversity with a range of price points. We undertook market research that showed there was a strong demand from potential buyers who wanted more compact low maintenance homes, preferably Torrens titled.

To deliver this range of housing at an appropriate price point for the market, we needed to work closely with the home building industry to produce it in a cost effective way by:

- creating a flexible set of planning controls
- designing a range of compact housing types
- construct the housing, and
- introducing a system that might be replicated by the building industry within the project.

The planning process allowed for flexibility and innovation. Design Guidelines were produced that had basic controls like solar access and setbacks as well as a Design Kit that set parameters for architectural style, landscape, fencing, colours and materials.

The project team used compact house typologies to

produce four product types:

- Terrace homes
- Patio homes (similar to duplex or semi detached dwellings)
- Courtyard homes (zero lot detached dwellings)
- Loft/garden apartments (similar to 'fonzie flats' or studio dwellings).



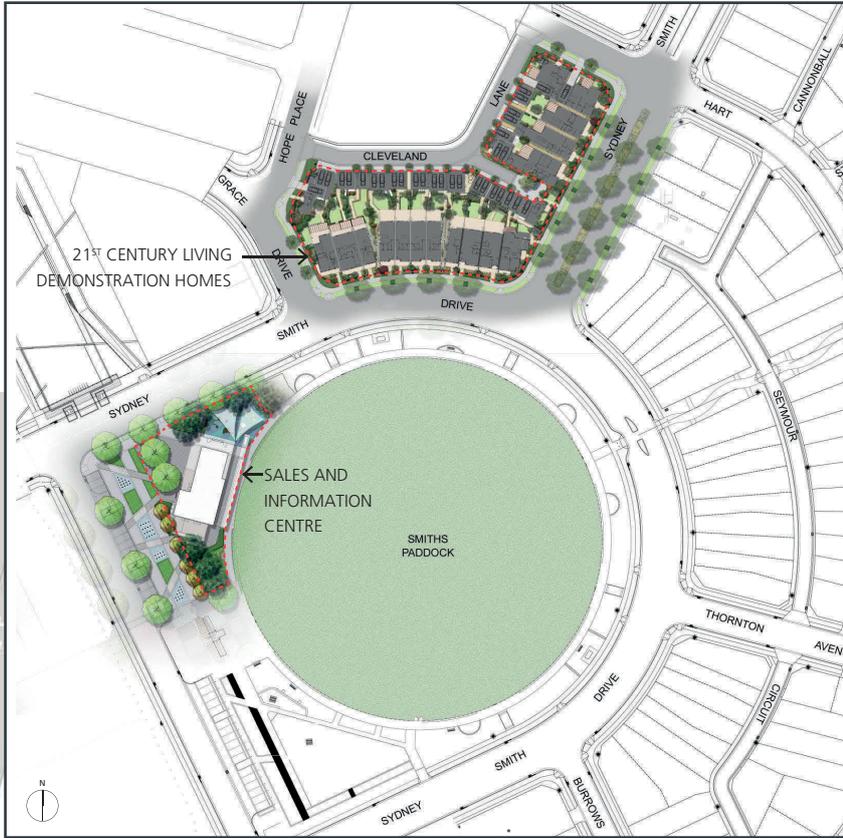
21st Century Living at Thornton

Housing types

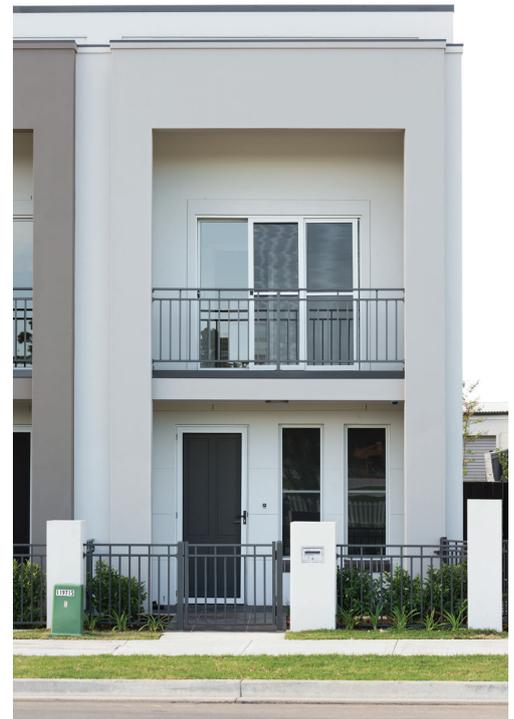
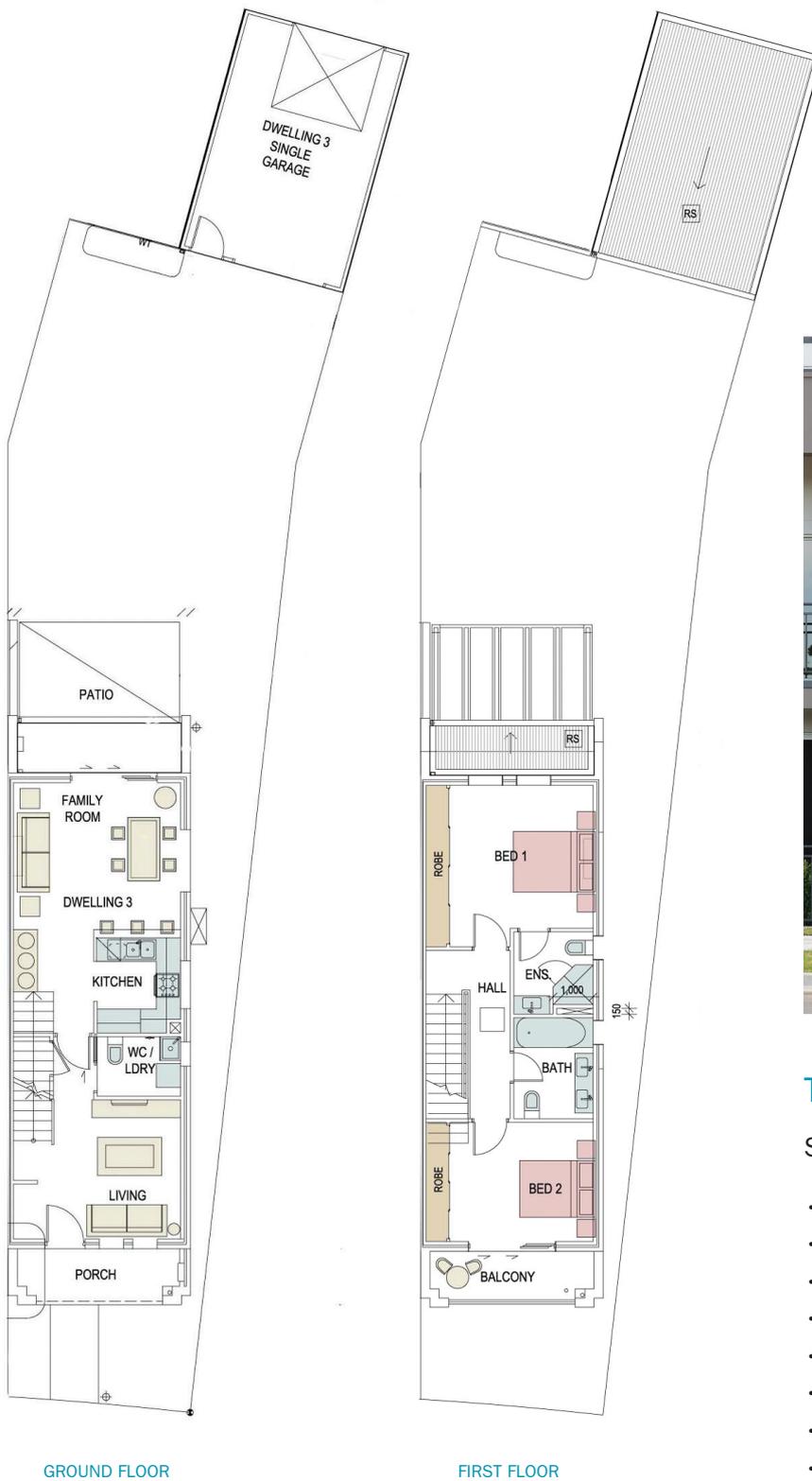
The “21st Century Living Demonstration homes” at Thornton include five standard house and lot types - terrace, patio, courtyard, detached and loft/garden apartment homes. The main features of these housing types are summarised below.

House Type	Typical lots & access	Lot Siting	Example
Terrace	WIDTH 4.5m, 5.1m, 6.6m, 7.5m DEPTH 30m ACCESS rear		
Patio	WIDTH 15-18m DEPTH 15-20m ACCESS rear, front or side tandem single garage		
Courtyard	WIDTH 8.0m or 10.0m DEPTH 30m ACCESS rear		
Detached	WIDTH 12.50m DEPTH 30m ACCESS front		
Apartment	WIDTH 9-10m DEPTH 6-7m ACCESS rear or side		

21st Century Living at Thornton Site Plan



Featured demonstration homes



Terrace No.3

Smallest terrace house

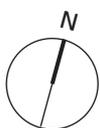
- 4.5m wide (4.1m internal)
- 12m deep building
- 3m setback, 1.5m articulation zone
- 2 storey
- 2 bedrooms, 2.5 bathrooms
- 2 living areas (one north facing)
- Alfresco
- Single garage (rear lane access)





Terrace No.1A

- 6.6m wide (6.1m internal)
- 12m deep building
- 3m setback, 1.5m articulation zone
- 2 storey
- 3 bedrooms, 2.5 bathrooms
- 2 living areas (one north facing)
- Alfresco
- Double garage (rear lane access)





GROUND FLOOR

FIRST FLOOR



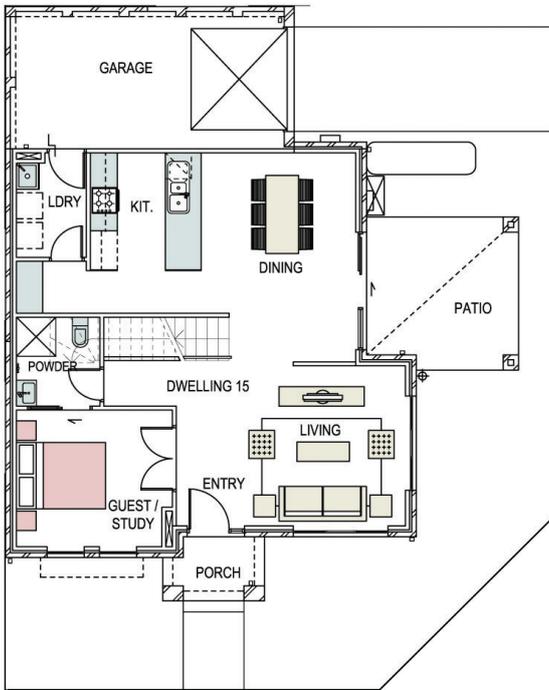
Terrace No.2

Largest terrace house

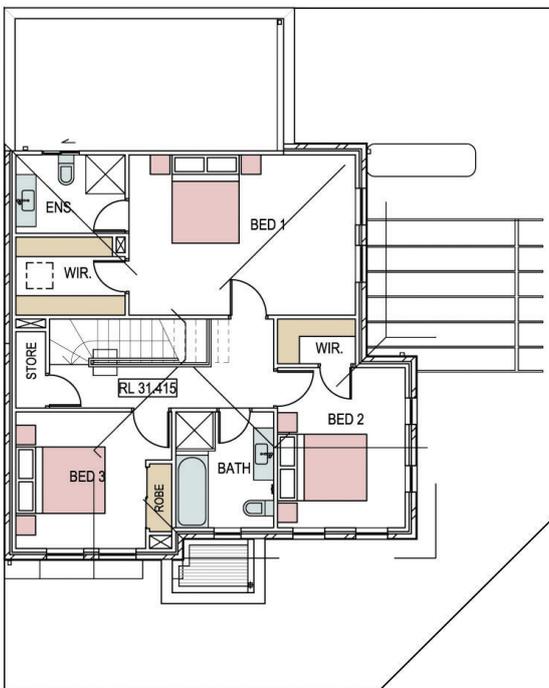
- 7.5m wide (7.1m internal)
- 12m deep building
- 3m setback, 1.5m articulation zone
- 2 storey
- 4 bedrooms, 2.5 bathrooms
- 2 living areas (one north facing)
- Alfresco
- Double garage (rear lane access)



21st Century Living at Thornton
Patio House No.15



GROUND FLOOR



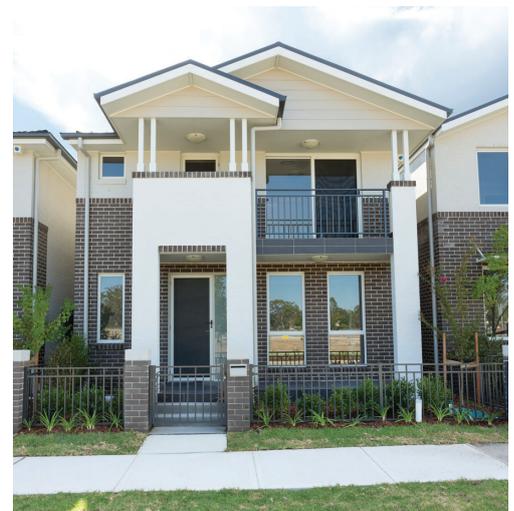
FIRST FLOOR



Patio House No.15

- Corner lot
- Zero lot on 2 sides
- 2 storey
- 4 bedrooms, 3 bathrooms
- 2 living areas (north facing)
- Alfresco
- Single garage + off street carspace

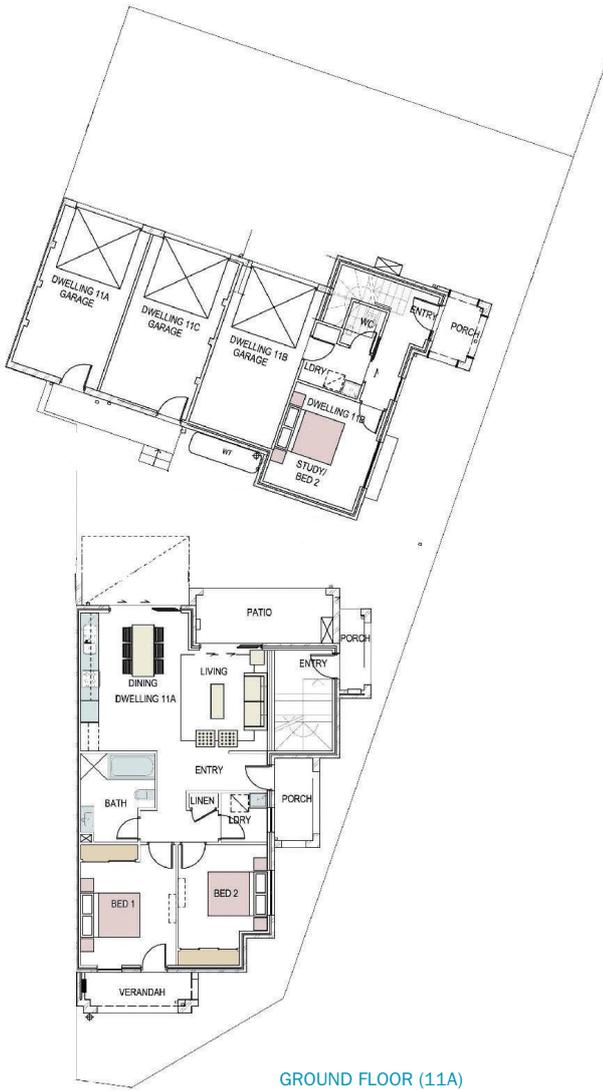




Courtyard House No.14

- Zero lot
- 2 storey
- 4 bedrooms, 3 bathrooms
- 3 living areas (north facing)
- Alfresco
- Double garage (rear lane access)

21st Century Living at Thornton
Loft/Garden Apartment Nos.11A & 11C



Loft/Garden Apartment
Nos.11A and 11C

- Either duplex (one up, one down) or over garage
- 2 bedroom, 1 or 1.5 bathrooms
- Balcony/patio
- Some with ground floor private open space

21st Century Living at Thornton

Lessons Learned

21st Century Living at North Penrith: the lessons learned

Lesson 1: Agree on the VISION

Lesson 2: DEMONSTRATE the product

Lesson 3: Enlist the power of PARTNERSHIPS

Lesson 1: Agree on the VISION

Vision comes before planning.

Innovation requires leadership and a readiness to implement change. The best outcomes are the product of good design and agreement on principles. From that, standards, controls and process can be established.

A clear vision for the project was fundamental to build the confidence of stakeholders and allow them to support change.

UrbanGrowth NSW's vision for the 21st Century Living Demonstration Program at Thornton was to create and demonstrate an attractive range of compact homes that suit a variety of modern lifestyles.



Lesson 4: Understand the TRADE OFFS

Lesson 5: Think subURBAN

Lesson 2: DEMONSTRATE the product

Innovation is iterative:

- design - challenge the way it's been done previously
- research – what does the market want and need?
- redesign – adjust the design (within reason)
- cost control – can you afford to build it?
- build it
- demonstrate it.

UrbanGrowth NSW undertook considerable research with focus groups representing the target markets. These groups were shown various housing types and their feedback was incorporated into the house designs.

Innovative design that attempts to lead the market needs to be seen. Since many buyers are not plan literate, they needed to walk through the new homes and experience what was different. It was also considered important to display streetscapes so that buyers could visualise how the entire neighbourhood will look and feel.

Lesson 3: Enlist the power of PARTNERSHIPS

We had the support of a number of stakeholders who had committed to deliver the project's vision.

Both Penrith Council and the Department of Planning and Infrastructure recognised the importance of this project to demonstrate housing diversity in an urban context.

The building industry was also eager to work closely with UrbanGrowth NSW to deliver house products that were new for Penrith. Their support was essential to ensure the homes were designed appropriately and were cost effective.

The challenge for UrbanGrowth NSW was to develop standard house and lot types that could be replicated at scale to secure construction cost efficiencies capable of being passed on to the end consumer.

More is achieved working with partners who support the vision and have a commitment to innovate.

Lesson 4: Understand the TRADE OFFS

Early market feedback showed that buyers wanted their own home on their own block and that they preferred detached houses. Research also indicated that buyers would 'trade off' these preferences for a good location and good amenity at the right price. While we found that buyers will trade off yard space for amenity, there is still a strong preference for Torrens title homes.

Thornton is well located and offers quality public domain which supported the trade off in housing choice.

Lesson 5:- Think subURBAN

We established a set of planning controls that were flexible and encouraged innovation. This was essential to allow the creation of a range of new housing types.

The Design Guidelines used familiar controls like solar aspect and setbacks but were tailored for the infill nature of the site. Traditionally, these standards are suburban in nature however, in this case they were tailored to allow a more 'urban' outcome.

The Guidelines were supported by a 'Design Kit' that detailed the architectural style, external colour, landscaping and fencing requirements for each dwelling. All of these components working together are important for the quality, look and feel of the development.

Planning controls need to be re-thought to support 21st Century living. They need to be more flexible than suburban controls because 'traditional' solar and setback requirements fail at higher densities.



21st Century Living at Thornton

Terrace Houses: Lessons Learned

Terrace House Widths at North Penrith

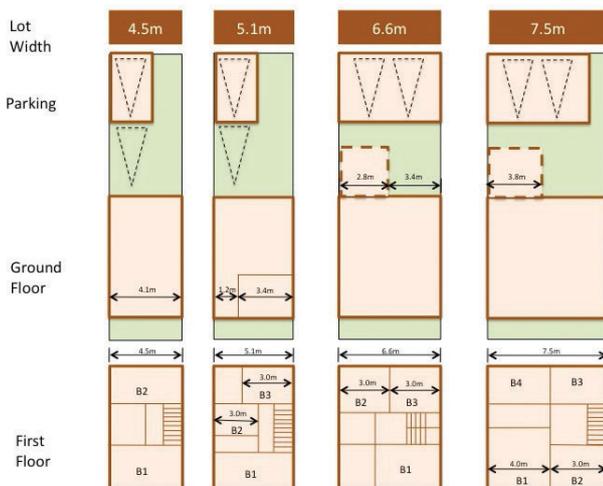
Why are there only 4 standard lot widths?

In the course of preparing the terrace designs at Thornton, a strong correlation was found between four precise 'step changes' in lot width and the level of accommodation capable of being provided. The four lot widths are: 4.5m, 5.1m, 6.6m, and 7.5m. We determined that lot widths that fall between these four standard widths don't deliver any more useable accommodation.

A terrace built on a 6m lot width can only provide the same level of accommodation and internal layout as a 5.1m terrace because it's not wide enough to accommodate two secondary bedrooms side by side. There is no advantage in locating this type of terrace on a wider lot because it will still deliver the same layout but with slightly wider interior spaces.

What does each lot width deliver?

The relationship between the standard lot widths and the various floor plans that have been developed for them is shown below.



Room layouts and levels of accommodation are governed by four standard lot widths

4.5m lot widths

A 4.5m lot width achieves:

- an open plan living space 4.1m wide on the ground floor
- two bedrooms at first floor level, and
- a single garage with a rear gate.

5.1m lot widths

A 5.1m lot width achieves:

- enough room for a corridor and a separate room on the ground floor
- two to three bedrooms in a staggered layout on the first floor, and
- a single garage with a rear gate.

6.6m lot widths

A 6.6m lot width achieves:

- a flexible L shaped kitchen/dining wing for east/west orientations on the ground floor
- two 'minor' bedrooms side by side on the first floor and a master bedroom
- an optional 4th bedroom on ground floor, and
- a double garage across the entire block.

7.5m lot widths

A 7.5m lot width achieves:

- a flexible L shaped kitchen/dining wing for east/west orientations on the ground floor
- one 'minor' bedroom and the master bedroom side by side on the first floor, with overall potential for 4 bedrooms on the first floor, and
- a double garage with rear gate.

How to integrate underground services

Underground services in small lot housing developments significantly influence street design, lot configuration and the location of buildings. Greater care is needed in designing for them because the smaller lots, tighter dimensions and higher densities leave no room for error if designs or Council requirements change.

While this 'lessons learned' applies to the terrace developments at Thornton, the comments can also apply to other forms of compact lot housing where design tolerances are tight.

General design principles

Explore co-sharing opportunities

Always investigate opportunities for the co-sharing of trenches between service providers and take advantage of them.

Make use of the front road reservation first

Locate as many services as possible within the front road reservation in the first instance and avoid placing any services within the rear lane, where space will be at a premium.

Design house services early

Co-locate house connection services wherever possible and consider ways of integrating house metering units within the architectural features that are developed for the terrace facades.

Design principles for gravity fed services

Specific site characteristics usually dictate how and where gravity fed services can be located. While solutions can change from site to site, there are still some 'rules of thumb' which apply.

Sewer

Sewer design is the most complex and potentially expensive of all the underground services. The following priorities, in descending order of preference, should be considered when determining the location of the sewer:

1. If site circumstances permit, always locate the sewer within the front road reservation along with the other services.
2. If there isn't enough room within the front road reservation, consider locating the sewer within the 3m front setback area - but this comes with a disadvantages because the sewer will then be located on private property. Sydney Water

Corporation's 'zone of influence' and maintenance hole clearance requirements could impact on the development, result in more complex site constraints and extra cost. This complexity will increase on curved frontages with radial geometry, which requires more man holes and inspection pits.

3. A third option might be to locate the sewer in the rear private open space area between the dwellings and the garages. Once again, the extent of Sydney Water's 'zone of influence' will need to be considered, along with maintenance hole clearance requirements.

Stormwater

When it comes to locating stormwater services, the best solution will depend on the characteristics of the site, the design of the terraces and Council requirements. However, the following rules of thumb will be of assistance.

- The simplest option for roof stormwater is to discharge it from each lot directly to the street or the rear lane.
- Stormwater designs must accommodate a drainage solution for each backyard and this will be more complex if the yard is completely enclosed by buildings.
- When no overland flow path is available, stormwater infrastructure must be designed to cater for major storm events.
- Piping of stormwater under a dwelling or garage should be avoided because it represents a potential future maintenance issue.
- If it's not possible to discharge stormwater directly into the rear lane from each lot, the option of creating an inter-allotment stormwater system across several lots might be considered. However, title restrictions and potential future maintenance issues will be involved, along with higher costs to ensure that the system complies with Council's standards.
- If Council won't permit stormwater to be discharged into the rear lane, the only remaining alternative is to design roof structures (e.g. rear garages) so that they drain away from the rear lane.
- If cost, code or site constraints restrict all other alternatives, creating an inter-allotment system running across the rear private open space area of several lots may be an option, extending between the dwellings and the garages (although, the same title restrictions and potential future maintenance issues will be involved).

For further information on UrbanGrowth NSW's
21st Century Living Program, contact:

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