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Blacktown City Council
108 Burdekin Road Schofields

Urban Design review of proposed development

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108 Burdekin Road Schofields

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Executive Summary

The development application by Landcom at 108 Burdekin Road, Schofields is significant in urban design terms as it has been developed to be a 'Greener Streets' demonstration project, a project that Landcom hope will create a precedent for the inclusion of green streets and diversity of housing typologies for new development in Western Sydney.

It is in recognition of the significant impact of this replicable demonstration project on the design landscape of Western Sydney that the Sydney Central City Planning Panel (Panel) has highlighted that the design needs to achieve urban design excellence and high levels of amenity.

In light of concerns regarding the urban design excellence and amenity of the 'battle axe block' based demonstration precinct, the Panel has requested an independent urban design review be undertaken of the design with a particular focus on:

Housing typologies – how the design addresses the missing middle, including comparison to other subdivision typologies including a perimeter block design typology.

Cooler climate streetscape – how this is achieved with the proposed design

Street address and amenity – with the battle axe lot typology

Design Guidelines – how these could be taken up and applied to other developments

DCP – whether battle axe blocks should be encouraged.

While generally formatted based on the Panel's list above, the review is divided into two parts:

1) Comparison of outcomes of different subdivision typologies

– We compared the proposed 'battle axe lot demonstration project' to other low-rise medium density housing projects both locally and overseas that are considered successful.

– This work identified two significant points:

  - Firstly, the battle axe design is predominantly a retrospective design solution for large existing allotments and not a large-scale urban design master plan solution.
  - Secondly, the projects that have been considered most successful in creating liveable streets have developed strategies to remove or minimise vehicle crossovers in the public domain. Typically, this has involved the introduction of rear lane access for cars.

2) Review of the Landcom subdivision outcomes

The second part of the report acknowledges Landcom's vision to create a 'greener' form of development while also exploring different 'missing middle' typologies than those more typically provided for in the Growth Centres. This analysis also acknowledges that the proposed 'Shared driveway optimisation' battle axe block design complies with the planning controls for the site.

The focus of this work was to assess the positive and negative aspects of the proposed design. The review includes recommendations in relation to the proposed Design Guide and the site specific DCP controls that would maintain the positive aspects of the design and address some of the potentially negative aspects of the design.

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1. Introduction

1.1. Panel comment

This independent urban design review of Development Application (DA) by Landcom at 108 Burdekin Road, Schofields, has been undertaken at the request of the Sydney Central City Planning Panel following consideration and deferral of the DA by at its meeting on 28 May 2020.

The Panel's requirements for this assessment, as extracted from its decision, are as follows:

- "The Panel is strongly in support of the application's intention to support cooler climate design and address housing affordability, residential diversity and the creation of liveable streets. The Panel also notes that the application is generally compliant with Council's requirements, including a Site Specific DCP. Nevertheless, as the proposal is for a 'demonstration project', intended to be replicable in developing suburbs, the Panel considers urban design excellence to be essential, along with high levels of amenity as well as servicing feasibility.
- As the majority of the Panel is not confident that these factors are adequately demonstrated by the current Masterplan, it considers that further review and resolution of the proposal is required. The Panel requires the following listed matters in particular to be further resolved.

A. Urban design

1. Housing typologies

The Panel notes the demonstration project's intention to address what has been termed the 'missing middle' of housing typologies. This housing type is defined on the Department of Planning, Industry and Environment's website as "low rise, medium density housing".

Further explanation is sought as to how this typology has been applied to the Masterplan. The Panel suggests that the density of the demonstration project should be compared to test cases where low-rise medium density housing is applied in a perimeter block design layout, without battle-axe low-density homes in the middle of the block, in relation to urban design considerations including:

- Housing yield/density
- Private open space/soft landscaping
- Amenity and street address.

The Panel also suggests comparing the demonstration project to successful housing projects both locally and overseas, rather than to adjoining lots, in relation to the above urban design considerations.

2. Streetscape

The Panel supports the intention to achieve a 'cooler climate' streetscape on the central street (Rugby Street extension), and observes that this appears to have been achieved primarily by introducing shared driveways on the south side of the central road (extension of Rugby Street), and landscaping between parallel street parking on the northern side of this road.

Concerns are raised that for the Grima and Lerida Street extensions which also form part of the demonstration project, there appear to be no plans for increased landscaping, shared streets or other interventions that will support cooler climate planning. Rather the street frontages on each of these streets of the demonstration project appear to have up to 15 individual driveways, with little room for landscaping.

3. Address and amenity

The Masterplan and urban design report do not currently adequately demonstrate how access to each lot is to be achieved, and how privacy, private open space and noise amelioration is to be provided for the small central lots set within the street block in particular, noting that each the battle axe lots will interface with the private rear spaces of 5-7 neighbouring properties.

It is also noted that the absolute minimum rear setbacks appear to have been provided for all lots, which may result in poor amenity outcomes for the majority of lots. Further investigation into privacy, noise and access to private open space is requested.

Concern is also raised regarding the absence of a street address for the centrally located small homes, which also lack clear public frontages and private rear yards, each of which are recognised and respected urban design principles.

4. Design guidelines

The Panel notes the Applicant's intention to provide detailed design guidelines for the demonstration project to ensure that the intended outcome is achieved. Noting however that the project is intended to be replicable, the Panel seeks further explanation as to how less motivated developers would be expected to take-up, and apply, the proposed design guidelines.

5. Architecture

The Panel supports the light coloured roofs proposed in the application, and the diverse range of house types that illustrate the Urban Design Report, but notes that the street view illustrations for Grima Street and Road No.2 (West) included in Appendix 5 (pg. 2) are repetitive and not suggestive of diverse housing types. Indicative streetscapes illustrated in Attachment 5 (pg. 3), and façade illustrations (pg. 6) also suggest little diversity despite a minor variation in materials.

B. Servicing and Subdivision

(Not the subject of this urban design assessment)

C. Site Specific DCP

The Panel notes that the Alex Avenue Site Specific DCP related to the application is an annexure of the primary Growth Centres DCP for the area. The Panel is cognisant that where the Growth Centres DCP aims to limit battle-axe blocks, the Site Specific DCP encourages this form of development. In view of the comments above, the Panel suggests that further independent urban design testing of and consultation with Council is undertaken to address the issues described above and to determine if battle axe-blocks should be encouraged."

1.2. Document review

This independent urban design review included examination of the following documents:

- Decision of Sydney Central City Planning Panel on 3 June 2020.
- Assessment report considered by the Panel on 28 May 2020, including all of its attachments.
- Blacktown Growth Centre Precincts Development Control Plan 2020
- Site-specific amendment to Blacktown Growth Centre Precincts Development Control Plan 2020, adopted by Council on 29 April 2020.
- Media release about project dated 10 November 2019 and quoting the Minister for Planning and Public Spaces, the Hon. Rob Stokes MP.
- Submission by Landcom dated 10 June 2020, in response to the Panel's decision.
- Schedule 1 (Alex Avenue Precinct) of the Blacktown Growth Centre Precincts Development Control Plan 2020
- Greener Places, GANSW 2020 and Green Grid, GANSW 2017
- Low Rise Housing Diversity Design Guide for Complying Development, DPIE 2020
- Low Rise Housing Diversity Design Guide for Development Applications, DPIE 2020
- SEPP (Exempt and Complying Development Codes) 2008, Part 3B Low Rise Housing Diversity Code 2020
- SEPP (Sydney Region Growth Centres(2006.

The work included

- Site visit
- Interviews/meetings with relevant Council staff and the applicant (Landcom), undertaken separately
- Review of various design guides produced for other demonstration projects, annual reports, and any relevant media.

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1.3. Overview of the Proposed Demonstration Precinct - 108 Burdekin Rd Schofields

The Urban Design report prepared by Place Design Group notes that the development is a 'Demonstration Precinct', the key objectives for the Precinct being to:

- reduce urban heat island effect
- provide housing diversity and affordability
- focus on missing middle housing
- create liveable streets.

The 4.09 hectare site is rectangular in shape and is within the Alex Avenue Precinct of the North West Growth Area. The site is bordered by Burdekin Rd to the south and Grima Street to the east. The land to the north is under construction and will include residential flat buildings. To the east of the site is an existing residential subdivision approved by the Land and Environment Court.

The proposed DA is for a demonstration Precinct subdivision creating 88 Torrens Title residential lots and construction of 24 abutting dwellings, roads and landscaping. The design is based on a site specific DCP that was lodged by Landcom at Council's request to support wider footpaths and landscaping 'green streets' and battle axe lots, and was adopted on 25 May 2020.

Staged development will result in a variety of lots from 172m2 to 704m2.

- Lots 225m2–300m2 have Building Envelope Plans to prove that the lots are capable of accommodating the dwellings
- Lots 125m2–225m2 have Building Plans.

The masterplan prepared by Place Design Group (below) illustrates the key features of the Precinct.

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Part 1

2. The missing middle

2.1. Panel comment

Further explanation is sought as to how the 'middle missing' typology has been applied to the Masterplan.

2.2. Discussion

The term 'missing middle' was first used on the NSW Planning (now DPIE) website in 2016 in connection with a design competition for high quality, innovative design solutions for low-rise medium density housing. The competition had three categories of building: terraces, dual occupancies and manor homes. Also illustrated (although not part of the competition) are two adjoining dwellings on separate titles (refer diagram below).

The DPIE website[1] notes that the Low Rise Housing Diversity Code (formerly the Low Rise Medium Density Housing Code) and accompanying design guides "address housing choice by encouraging more variety in the form of dual occupancies, manor houses and terraces" (up to two storeys). Low rise diverse housing is development that contains two or more dwellings and is no more than two storeys in height. The Low Rise Housing Diversity Design Guide for complying development (2020) covers the three types above; and the Low Rise Housing Diversity Design Guide for development applications (2020) also covers town houses and villas.

Landcom's vision statement in the DCP strongly promotes this as a demonstration project for "excellence and innovation by supporting housing diversity through a range of lot shapes and sizes that will also showcase 'missing middle' housing typologies". This is reinforced by Development Principle 1, Housing Diversity: "The Growth Centre areas are visibly missing low-rise medium density housing options. This Precinct will target 'Missing Middle' typologies, more compact housing forms and innovative low scale apartments." Interestingly, however, the manor house is the only type nominated in the Code and Design Guides that is relevant to this application. The Landcom development does not include dual occupancies or terraces. It comprises 103 dwellings at a density of 25.4 Dw/Ha on lots ranging in size from 226m2 to 703m2, with the following mix of housing typologies:

- 36 x detached dwelling (24 street-fronting, 12 mid-block)
- 47 x 'abutting'
- 5 x manor homes, each with 4 dwellings (total 20 dwellings).

The subdivision is arguably skewed to a more conventional product, with mostly abutting and some detached houses. There is a relatively small number of strata titled lots (the manor houses, construction of which is not proposed under this DA), and the introduction of battle axe lots down the centre of each block (called "compact housing" in the Urban Design Report[2] accompanying the application). The 'missing middle' in the Code and Design Guides does not include development on battle-axe lots or the creation of new battle-axe lots which require "a frontage to a public road" for new development[3]. The subdivision has resulted in a yield at the low end of the medium density range (25 – 35 Dw/Ha), which is promoted as supporting larger areas of deep soil both for public domain streetscape and private domain landscape planting.

[1] https://www.planning.nsw.gov.au/Policy-and-Legislation/Housing/Low-Rise-Housing-Diversity-Code/The-Low-Rise-Housing-Diversity-Code

[2] Schofields Demonstration Project, DA Urban Design Report, Place Design (August 2019)

[3] Low Rise Housing Diversity Design Guide for complying development, DPIE (2020), p.2. Interestingly the Code and Guides do not nominate the 'two dwellings' shown on the 2016 missing middle competition entry.

2.3. Findings

- The fundamental question remains: is this a 'missing middle' project in the sense that it is replicable?
- The answer for us is that parts of it are, in particular the green street with widened, uninterrupted verges with space for canopy trees and contiguous areas of deep soil. The shared driveway approach is positive but as it stands the resulting range of typologies is narrow and the public domain benefits not equitably spread across the whole development. More than 20 allotments are detached dwellings that sit outside the definition of 'missing middle', and the lowest density type (single detached houses) front the 'Green Street' where ideally the highest density would be located next to the best landscape.
- If a broader range of housing types with a more varied grain across the development could be provided along with the benefits of the green street, this would enhance the 'middle missing' offering.

3. Subdivision and housing typologies

3.1. Panel comment

Density of the project should be compared to test cases where low-rise medium density housing is applied in a perimeter block design layout, without battle-axe low-density homes in the middle of the block, in relation to urban design considerations including:

- Housing yield/density
- Private open space/soft landscaping
- Amenity and street address.

3.2. Discussion

We appreciate that the drivers for the subdivision pattern and resulting building typologies were a combination of the Indicative Land Plan (ILP) adopted for the broader Alex Avenue Precinct with Council's and Landcom's seemingly irreconcilable positions on the provision of laneways. The ILP determines the road layout and has resulted in block depths of 65-67m, which would support mid-block laneways. Council is open to a laneway subdivision but would not adopt the laneways as public roads – in other words they would remain as community title. Landcom preferred a Torrens title development and in addition was interested in exploring an alternative layout to the laneway type. Landcom made the point to us that the subdivision is compliant with the site-specific DCP which is the result of a process that has involved DPIE, GANSW and Blacktown City Council.

The Urban Design Report prepared by Place Design Group for Landcom provides an important analysis comparing 'streetscape issues' related to the 'typical front loaded residential approach' and the proposed 'shared driveway optimisation (battle axe) approach'. Unfortunately, a third analysis of 'rear laneway approach' was not undertaken on the basis that '*Options to deliver public rear laneways are not available in the Blacktown Government Area'* [4]. Given the importance of the laneway precedents analysed, we felt a more complete review should include a design exercise that analysed the streetscape issues and urban design / amenity outcomes of a laneway-based perimeter block design, to form part of a comparative analysis with the proposed 'Shared driveway optimisation (battle axe)'.

[4] Landcom letter dated 10 June 2020

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3.3. Analysis

We tested the Burdekin Road site itself as a perimeter development with laneways as a direct comparison with the battle axe layout.

The Proposal – battle axe layout

Yield / density:

- 4.09Ha
- 88 lots
- 103 dwellings
- 25.2 Dw/Ha

Mix:

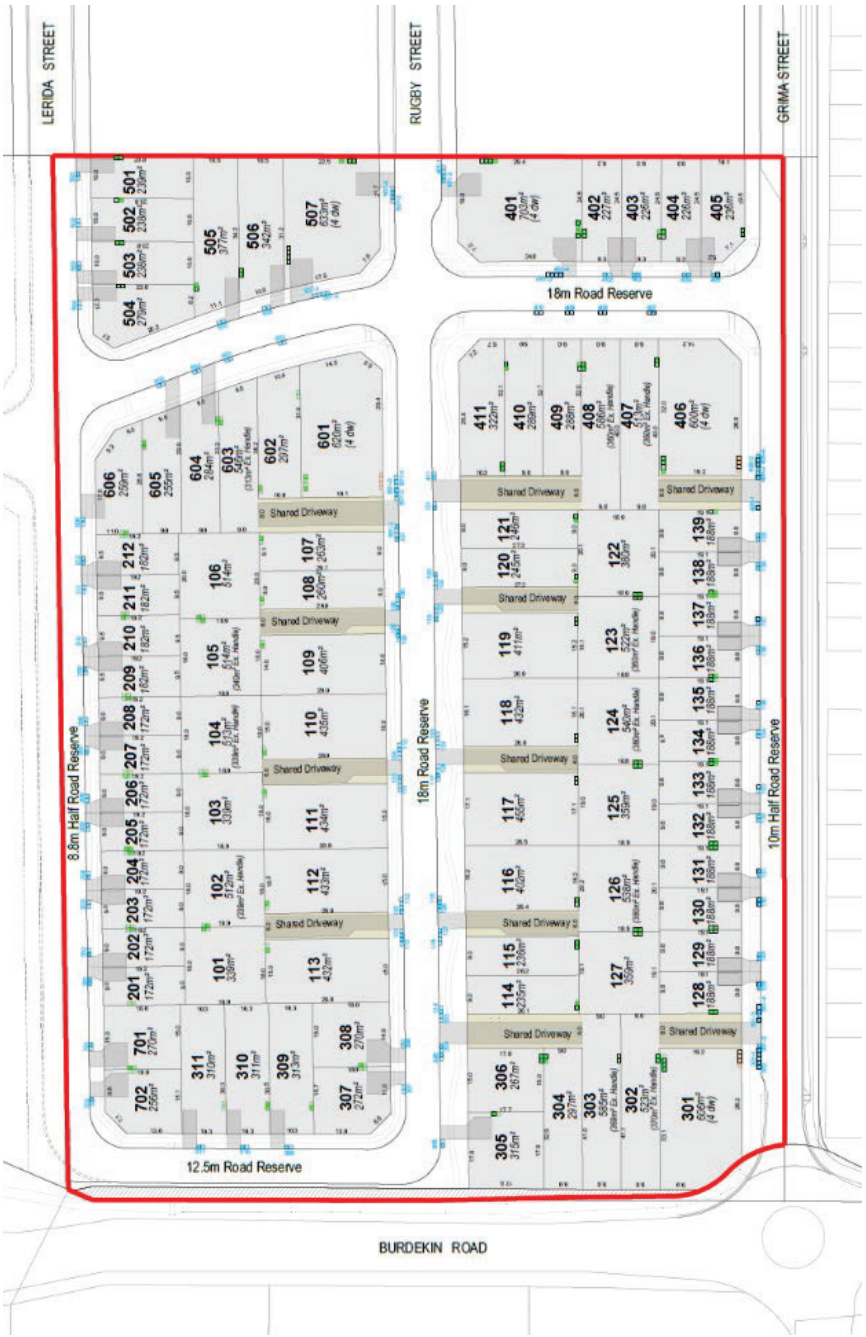
- 27% detached street fronting
- 14% detached battle axe
- 53% abutting
- 6% manor house

Streetscape (in total):

- Landscaped verge and footpath (excluding driveways): 2,390sqm or 5.9% of total development area
- Shared driveway: 2,180 sqm
- Shared driveway crossings: 11
- Private driveway crossings: 55

Green street (north-south, main block):

- Shared driveway crossings: 9
- Uninterrupted verge (maximum between driveways): 30m
- No. of dwellings fronting the street: 21



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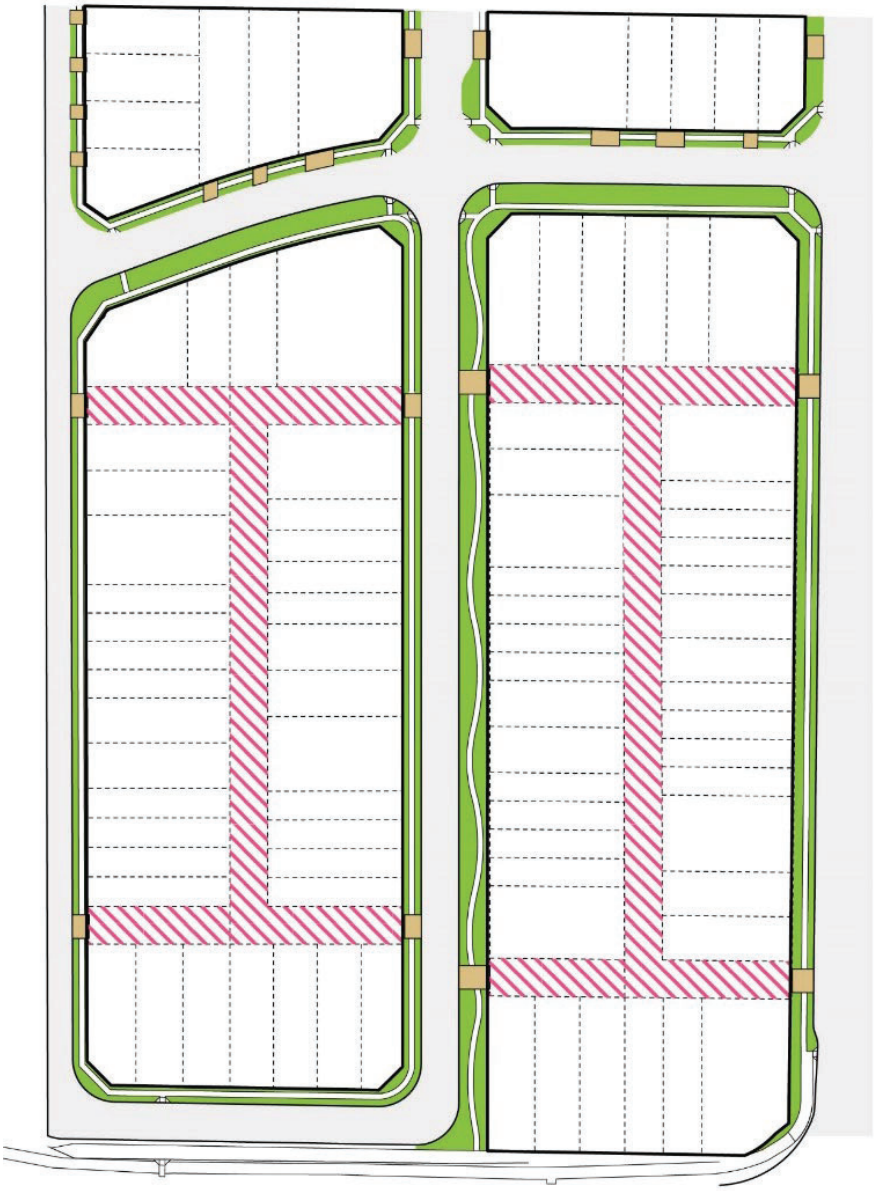
Perimeter block / rear lane layout

Yield / density:
- 4.09 Ha
- 89 lots
- 104 dwellings
- 25.6 Dw/Ha

Mix (indicative):
- 22% detached street fronting
- 36% abutting
- 36% terrace house
- 6% manor house

Streetscape (overall):
- Landscaped verge and footpath (excluding driveways): 3,255 sqm or 8%
- Uninterrupted verge (maximum between driveways): 100m
- Shared driveway/lane: 3,865 sqm
- Shared driveway crossings: 8
- Private driveway crossings: 13 (all in northern non-laneway portion)

Green street (north-south, main block):
- Shared driveway crossings: 0
- Uninterrupted verge (maximum between driveways): 100m
- No. of dwellings fronting the street: 30 (indicative)



3.4. Summary findings from the analysis

- The perimeter/laneway subdivision layout results in some 30% more uninterrupted verge area over the whole site
- A positive for the masterplan layout is that the amount of hard surface within the block is considerably less than for a laneway, with the shared access driveways taking up just over half the amount of space (around 55%)
- The masterplan has around 3.5 times the number of private driveway crossings, outside the central green street
- The perimeter layout permits of a variety of lot widths along a street (and therefore a range of housing types)
- Overall, the analysis clearly indicated that a perimeter development *as a subdivision typology* is better able to deliver successful outcomes for landscape area and street address for the same (or even greater) yield. The 'pros' outweigh the 'cons' – which means the battle axe typology has to work harder. It is important to note that the Landcom proposal has delivered one notable benefit, which is the reduction in hard surface mid-block and the associated potential for more landscaping. Delivering on the potential to 'green' the whole area – public and private space – will be key to the success of the development.

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3.5. Research

We also researched a range of built and approved subdivisions with low rise medium density housing in Australia and New Zealand. The most relevant examples were:

3.5.1. Laneway subdivisions

Hobsonville Point, Auckland NZ

Density – example block

- Area: 0.85ha
- Dwellings: 30
- 34.5 Dw/Ha

Housing / subdivision

- Lot sizes range between 130–300sqm, lot frontages from 4.5–15m and 15–30m lot depths
- Hobsonville Point is a 167Ha suburb that was enabled through Housing New Zealand to establish 3,400 homes. It was masterplanned in 2007 and is still being developed.
- Incorporates a mix of attached and detached typologies and dwelling sizes (2–4 bedroom), including detached, terrace, duplex, triplex, walk-ups, apartments. Terraces range from 2–4 storeys, detached houses 2 storeys usually with 1 storey component to the side or rear
- Includes controls around privacy and overlooking, including blank walls and openings

Streetscape / amenity

- Central green street, Buckley Avenue incorporates large verges, frequent pedestrian crossings, no driveway crossings (rear lane access), WSUD swales and rain gardens
- Creation of 'homezones', a communal laneway designed as a shared surface and fronted by buildings on both sides
- Use of rear lanes to reduce driveway crossings and increase verge depth and safety for pedestrians
- Significant landscaped zones to sides of rear lanes.

Quality control mechanism

- Superblocks are each developed by a different 'preferred building partner', with designs submitted and reviewed by a design review panel for consistency against a Design Framework for the whole area.

Measures of success

- Multiple awards for landscape, urban design and architecture
- Measured against the (internal) Sustainable Development Framework annually since 2008,
    - 32% of all homes sold to date are classified as affordable
    - 25% less electricity and 32% less water used than an average Auckland home
    - Over 90% of residents report positive contact with neighbours, rate the public domain quality as very good, feel safe, and over 98% say it's a great place to live.

Factors for success

From the beginning Hobsonville Point's stated mission was to create quality, accessible and environmentally responsible urban development. The underlying philosophy is 'less private land, more public land' where smaller lots are offset by more public space and a 'coherent green character' is provided. The ability to masterplan a whole suburb meant that public parks, reserves, walkways and cycleways were able to be designed in, and connected to the wider networks and waterfront. Each block (like the example above) benefits from its location close to these neighbourhood amenities. There were established trees that were retained and incorporated in to the design. This is obviously a condition that is difficult to replicate for smaller developments but nevertheless the consideration of green links and spaces – and planting trees in advance of buildings, where possible – is important.

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Laneways are a feature of the suburb, with the broad approach being to consolidate street tree and landscape planting in wide verges, with rear access to garages where possible. Not unlike the Landcom proposal, a central spine / green street sets up the street hierarchy and helps with intuitive wayfinding. Block lengths are limited so that side streets intersect with the green / main street frequently for walkability and movement choice; and blocks are deliberately varied in size and shape to mimic how older suburbs have developed organically. Carriageways are narrow to reduce vehicle speed and create a more pedestrian friendly character. Not every precinct is a laneway type – there are some blocks with either detached or courtyard housing or apartments fronting streets and whose rear boundaries run mid-block. These typically feature deep verges with planting to soften the effect of driveways. Street parking is always within bays separated by trees. 'Homezone' shared accessways are designed as shared spaces; importantly these are fronted by buildings on both sides, with windows placed to overlook and activate these areas. Front setbacks are encouraged to vary (within a range) and the streetscapes are also enlivened by architectural variety – even if the homes have a similar floor plan. This variety includes not just materials and colours but also roof forms, building articulation and window treatment. It is one of the distinctive aspects of the development and has enabled (encouraged?) architects to design small clusters of housing types that achieve 'diversity within unity' and also to orient and design buildings to be responsive to site layout, sun access and street relationship.

Overall, the success of Hobsonville Point comes from both process and product: a well-considered masterplan; a strong design philosophy embedded in the Framework and secured through the Design Review process; and the competition between different builder partners and their architects to engage the market (and win awards). The aspects of the development that deliver the urban amenity and streetscape outcomes also sought by Landcom are: sufficient public space for generous and continuous landscaping including large canopy trees, variety in housing types and in the architectural treatment within those types; activation / overlooking not just of 'front' streets but also shared accessways to rear laneways and parking; and a high quality palette materials and finishes.

White Gum Valley, Fremantle WA

Density – excluding apartments

- Area: 0.85ha
- Dwellings: 34
- 40 Dw/Ha

Housing / subdivision

- Lot sizes range from 270–355sqm for single title lots, frontages in the range 8–11.7m, 25.2–29.2m lot depths
- Mix of typologies including detached, semi-detached, terrace housing, apartments and maisonettes and 'Australia's first Baugruppen' targeting affordable housing
- Targets liveability, with a focus on variety in housing size and typology and compact/efficient dwellings
- Demonstration project

Streetscape/amenity

- A rear lane is used to remove driveways from the streetscape, enhancing verge depth.
- Deep terraced verges used to traverse steeper topography, enhance urban greening and create privacy, particularly on the central road and perimeters of the block to help 'screen' the project.
- Multiple formal and informal communal spaces are provided
- Tree canopy covers 30% of the site
- Low water use landscaping and WSUD contributes to the integrated water management strategy, aiming to achieve 70% reduction in mains water consumption across the project

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Design guidelines/ quality control

- As all single title lots are to be developed as self-build projects, they are subject to a "Design Guideline for Single Lots" to ensure built form "respects and enhances the proposed character…and encourage residents to use climate appropriate design". This document incorporates objectives, controls and design guidance to ensure the project vision is met across all lots.
- Designs must be submitted to and endorsed by the WGV Estate Architect prior to the submission of the DA to the City of Fremantle Council.

Measures of success

- First Australian residential project to achieve international endorsement as a One Planet Community through One Planet Living Factors for success
- Multiple awards for sustainability, landscape, urban design and architecture
- Monitoring to date as part of a four year long research partnership with Charles Curtain University, has found 70% less grid energy use and 65% reduction in mains water use when compared to the average per dwelling in Perth

Factors for success

WGV at White Gum Valley's project vision was to create an innovative and sustainable infill 'innovation through demonstration' development that delivers options for diverse, compact affordable housing and climate responsive design. The project achieves higher density and amenity through incorporating a range of lot sizes, tenure and housing types where smaller single title lots and innovative dense housing types (baugruppen) allow for more public space and green character treatments. To achieve higher density within an established low density suburban context required careful consideration of built form height scale and bulk, streetscape and landscaping treatment and community spaces. A common challenge with masterplanned infill development is that community space is internal to the block creating a private or semi-private character (as in the example of Liberty Grove, discussed below). To combat this the design locates public spaces on the external edges for legibility and access within the wider community.

The development features three distinct road types with varying treatment including a central local road, a shared street and a rear laneway:

- The central local road acts as north-south connection for vehicles and pedestrians, decreasing maximum block length from 230m to 130m and increasing walkability.
- The rear laneway provides vehicle access to most of the single dwelling lots, enabling the consolidation of street trees and deep landscaped verges to the lot frontages with rear access garages preferred. A narrower carriageway width of 5m to the laneway effectively reduces vehicle speed to create a more pedestrian-friendly character. The laneway is fronted by buildings on both sides, with windows placed to overlook and activate these areas.
- The shared street provides access to the higher density housing types within the site, including two apartments buildings and the baugruppen. Removal of kerbs and road surface markings provides flexibility and allows the street to be multifunctional.

Deeper landscaped verges and street greening are provided equitably across the project, functioning to provide amenity to both internal and external streets. Incorporation of deeper landscaped verges to Yalgoo Avenue (existing) enhances and responds to existing landscape character, provides screening of the project from existing residents and provides increased amenity. On-street parking is limited to the central street and shared zone, minimizing impact on public spaces and limiting traffic through the centre of the development.

WGV is a 'living laboratory', the subject of a four-year research project in partnership with Curtin University to collect and assess design performance, technology choice and occupant behaviour on energy use and carbon emissions across the development. Each lot within the subdivision has been tested to ensure that climate responsive design can be achieved across the project. Overall, its success is a result of strong design philosophy and sustainability initiatives embedded throughout the design process and delivered across the majority of the site. The aspects of the development that deliver urban amenity and streetscape outcomes comparable to those sought by Landcom include:

- housing affordability delivered through variety in lots sizes, housing type and housing density,
- 'green streets' including deep landscaped verges with large canopy trees and
- sensitive architectural response to streetscape rear laneways and parking spaces to increase 'overlooking' of these spaces.

Success is not guaranteed or complete, however. Despite the project vision, some "typical approaches" to suburban building have reportedly appeared even with mechanisms put in place (design guidelines and sustainability incentives) to ensure design quality throughout the precinct. In an interview with Densityxdesign[5] the Mayor of Fremantle, Brad Pettit, suggested that the solution lies at the interface between local and state governments: that **minimum design standards to achieve project goals need to be mandated within the planning conditions, particularly for demonstration projects, to ensure that sub-par development is prevented from occurring.**

[5] https://densitybydesign.com.au/wgv/ is a series of videos that track the design, building and occupancy outcomes of the development

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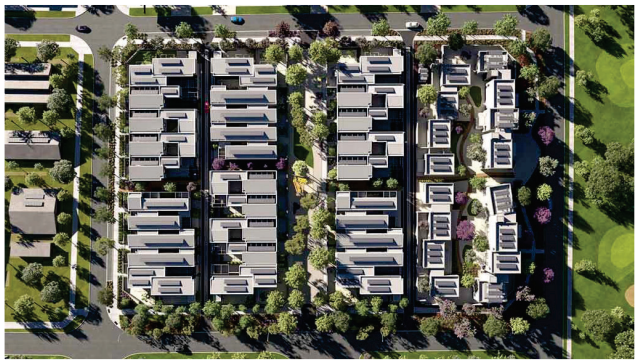
East Village, Knutsford WA



Density – terrace houses

- Area: 1.15ha
- Dwellings: 36
- 31.3d/ha

Housing / subdivision

- 7-9m frontages, 29m lot depth with lot sizes ranging between 194 and 261sqm (excluding apartment sites)
- Terrace houses on narrow lots (6m frontage) with apartments included to increase affordability
- Rear lane used to remove driveways from the street
- Battle axe lots in combination with micro lots (194sqm) used on corners to address the street and retain density

Streetscape

- Central green street is a pedestrianised zone, with street tree planting and a linear park
- Built form is arranged to address streets rather than laneways
- Pedestrian links provided midblock to encourage walkability
- Deeper verges are provided on the perimeter streets.

Measures of success

- Multiple awards for sustainability, landscape, urban design and architecture
- Through a partnership with Charles Curtain University the design will be part of a 3 year long 'living laboratory' research project to monitor and assess design outcomes against sustainability performance.

Factors for success

As a project under construction, the assessment of success factors at East Village can only consider the design intent rather than assessing achieved built outcomes. This is an 'innovation through demonstration project' intended to follow the success of WGV by delivering a different model of compact housing while embracing the same sustainability initiatives through the One Planet Living framework. The project is strata titled, for both the two apartment sites on the eastern sub-block and a set of 36 'turn-key' townhouses to the centre and east. While the apartments will be delivered by a third party developer, they will be required to integrate One Planet' living principles throughout the development.

The development features a grid-like structure of roads and laneways dividing the site into three main 'zones', with a 15m wide pedestrianised central green spine flanked by rear laneways which provide vehicle access. Community space is provided along the central street which features a linear 'park', creating a central hub for community activities designed to encourage a unique 'village' atmosphere. Narrow mid-block pedestrian links are provided across the site to improve walkability. Similar to WGV, the project provides equitable distribution of street greening to both internal and external faces of the block, incorporating deeper landscaped verges and large canopy trees to screen the project and provide increased amenity to external streets. Battle axe blocks are used on corner sites to create two smaller lots both with street address, with rear vehicle access provided via a 6m wide laneway. In partnership with Charles Curtin University EVK will be monitored and assessed by a 3 year long on-site 'living laboratory', a physical learning space that will feature meeting spaces, a commercial kitchen and real time data display.

Overall, the success of EVK will be dependent on how the design philosophy and sustainability initiatives are mandated throughout the design process to ensure consistent delivery across the site. The main aspects of the development that align with the urban amenity and streetscape outcomes sought by Landcom are, as for White Gum, housing affordability and green streets.

108 Burdekin Road Schofields

Liberty Grove, Sydney NSW

Density – excluding apartments

- Area: 0.76ha
- Dwellings: 28
- 36.8 Dw/Ha

Housing / subdivision

- Lot sizes range from 130–250sqm, frontages in the range 7–12m, and 20-30m lot depths
- Overall, 788 dwellings in masterplanned 15 Ha brownfield site
- Townhouses, courtyard homes and apartments (3 storey and 10 storey)
- Community facilities, walking and cycling paths

Streetscape/amenity

- Rear lanes / narrow public streets, partly vegetated
- Houses front and overlook shared (internalised) open space.
- Measures of success
- UDIA excellence award 1998, followed by others for innovation, masterplanning, construction
- Gazettal as a suburb

Factors for success

Liberty Grove is run by a Community Association; regardless of strata or Torrens title, all property is subject to a community scheme with common property owned by the Association. This, with on-site estate management, has resulted in the estate establishing and maintaining the public domain and landscaping to a high standard. All roads are under community title with a speed limit of 20kph and no L plate drivers permitted. Liberty Grove benefits from proximity to the ferry on Parramatta River and to other public transport (rail and bus) but is sandwiched between the rail line and Homebush Bay Drive which has limited vehicle access to only two points. It feels like a gated community rather than a suburb.

Liberty Grove's subdivision pattern is deliberately 'inside out' with significant areas of open space being internal to blocks, and therefore having a private or semi-private character. It includes 'dead end' accessways off the main street (Thorpe Avenue) and pedestrian-only paths through the centre of blocks past the front doors of homes. The design of some of the laneway shared access as 'mews style' homes, where the houses each side do not have side fences (see photo above) works well, especially where the laneways have windows opening to the area and there are also landscaped car courts set behind the houses. This increases the sense of 'eyes on the street' and the shared space character, In addition, the narrow carriageways and deep verges, and the amount of consolidated space given over to deep soil and landscape, is significant. Because the scale of buildings is mostly two storeys, as the trees have matured they are taller than the rooflines. Both the main streetscapes and the resulting outlook for residents edging the mid-block gardens are green and pleasant.

108 Burdekin Road Schofields

Hunterford Crescent Oatlands, Sydney NSW

Density – excluding apartments

- Area: 5.34ha
- Dwellings: 114
- 21.3/ha

Housing / subdivision

- Detached housing, Townhouse, Courtyard housing, Duplex and apartments

Streetscape/amenity

- Lot sizes range from 230 – 550sqm, 8–18m lot frontages, 26–35m lot depths
- Rear lanes / narrow public streets, partly vegetated
- Shared laneway access street 'The Grove'
- Double storey dwellings overlook rear laneways.

Factors for success

The Hunterford Crescent development comprises three loosely 'half-concentric' streets grouped round a central public space including a swimming pool. The two outer streets (Hunterford Crescent and The Terrace) have dwellings fronting them while the inner street ('The Grove') is designed as an access road for parking for those dwellings. The Grove is surfaced differently with the intention of denoting that it is to be shared with pedestrians. At the intersection with Hunterford Street is a small pocket park with trees that presumably give the street its name, but this gives way quickly to unrelieved concrete.

What is generally successful about this project is the balance achieved between the rather hard laneway treatment to the rear and the front outlook to a green street or public space. All houses benefit from this. The scale of dwellings to the lane is mostly single storey (garages), with the occasional house having either a one or two storey element built to the rear boundary. Where there is a dwelling and windows at the rear (lane) these have been carefully offset from the opposite properties to minimise any privacy issues from directly facing dwellings. The 'green' character is moderate rather than dominant: Hunterford Street has mostly exotic trees (jacarandas feature) set within approximately 1m deep grass verges. Interestingly, what softens the street even more is the preponderance of hedges as front fences, and planting within front setbacks. The Terrace does not have any street trees or hedges to manage the interface between the houses and the street, although it fronts the public space and Treetop Park at the edge of the subdivision has a good group of remnant eucalypts on the skyline.

3.5.2. Battle axe subdivisions

We were unable to source any contemporary projects with battle axe layouts planned (as opposed to occurring as the result of later subdivision of large lots). For completeness, we reviewed some established areas with battle axe lots to understand the comparative yield and to identify what was or was not working well.

108 Burdekin Road Schofields

Blacktown, NSW

Density – noting not all of the mid-block is taken up

- Area: 4.88ha
- Dwellings: approximately 71
- 14.5 d/ha

Housing / subdivision

- Orthogonal street and block pattern, traditionally street fronting with deep lots

Factors for success

A desktop review of this area shows that where the subdivisions have been piecemeal – that is, where only some properties have been subdivided – there is still a reasonable amount of green space and what appear to be mature trees in some of the back gardens. Where subdivision has resulted in a new 'rear to rear' condition with the battle axe homes both close to the mid-block boundary it suggests that there would be privacy issues from their proximity to each other. The access handles are also typically 'hard', further reducing the ability for consolidated landscape areas, and most of the rear dwellings are tucked behind the front ones, lacking any visual relationship to the street.

Pakuranga, NZ

Density

- Area: 3 Ha
- Dwellings: approximately 50
- 16.6 d/ha

Housing / subdivision

- Curvilinear street pattern following topography, resulting in large areas of 'leftover space' mid-block
- Battle-axe lots irregularly shaped with varying degrees of proximity to neighbours.

Factors for success

This area is typical of much of Auckland's suburban spread since the 1960s. There are often two (sometimes more) battle axe lots at the rear of a single deep lot ('section' in NZ), with access driveways side by side or consolidated, cutting into the front section's garden area. The layout results from a loose arrangement of arterial and primary roads following the contours and intersecting infrequently, with very large, deep blocks of irregular shape and size containing what would have been generous lots. As the population has grown, they have been filled in more and more.

The success of these subdivisions for tree canopy, streetscape and residential amenity generally is almost entirely incidental – that is, it is a function of ad hoc development on a particular block rather than any controls or guidance around desired outcomes. Where they work best in Auckland, the battle axe lots are on sloping sites so that each property looks over rather than into its neighbours (view sharing as well as reduced privacy impacts) and the irregular shape of the lots means there are areas unsuitable for building which therefore have retained deep soil and in some cases remnant mature trees. These subdivisions also have deep front setbacks often with no or very low front fences or planting to establish the property boundary, and the original houses are single storey, creating open, low-scale and well vegetated streetscapes. Where there starts to pressure on residential amenity is where more and more homes are crammed in and space and landscape buffers are lost. This is exacerbated if the new rear dwellings' bulk and scale is significant (eg. unrelieved two-storey massing with single large roofs).

3.6. Findings

Achieving good urban design in a medium density residential context depends on a combination of factors. The planned subdivisions we reviewed all had a stated intent to provide 'liveable' neighbourhoods. The developments discussed in this report in more detail also had in common greener streetscapes, sustainable / energy efficient development, more compact housing types on smaller lots and a commitment to at least a component of affordable housing – as does Landcom's proposal.

Generally speaking, the success of green streets depended on the depth of verge as well as the ability to have continuous deep soil (ie. uninterrupted by driveways). Narrow verges were seen to be supporting street trees but these trees were either smaller species or still young (the jacarandas on Hunterford Crescent will likely become a problem in years to come). Supplemented by front setbacks in the 3-5m range with planting and hedging, streetscapes with regularly spaced trees work well. Parking interspersed with street trees (as opposed to kerbside) also allows for visual narrowing of the carriageway and canopy closure overhead. The subject site's 'liveable green streets', with deep verges on one site for large trees, is likely to compare well with the built and planned laneway projects' green streets. Where deeper verges can support low shrubs and ground covers this is even better. The 'business as usual' streets either side (Road No. 2 and Grima Street) are less able to deliver a green streetscape character.

Where the perimeter block / laneway type subdivisions were particularly successful was in the flexibility this gave to the lot width and therefore the building typologies and streetscape variety and interest. We appreciate that with the need for shared access between houses fronting the green street, and in order to allow enough space around the battle axe houses, there are constraints on the lot widths in the subject site; however, with some greater variety in the housing types (refer Section 8 below) the Burdekin Road development could go further towards emulating this aspect of Hobsonville Point and White Gum Valley.

Compared to the density of 25.4Dw/Ha for the subject site, the perimeter block layouts were able to deliver densities of up to 40 Dw/Ha while still delivering green streets that could be equitably spread across dwellings. This was mostly through smaller single title lot sizes and the incorporation of a wider variety of medium density housing types including apartments. The traditional (ad hoc) battle axe developments we reviewed were typically around 15 Dw/Ha, partly as a result of only partial subdivision of the block. Were the whole of the blocks to be subdivided, the yield would of course increase but the residual amenity and landscape area would decrease accordingly.

The Landcom proposal will deliver more consistently positive results than an ad hoc battle axe subdivision – notably because of only two rear dwellings off a shared accessway; the accessway being limited in length; the requirement for the battle axe entry to be visible from the main street; and the size of the lots being able to support reasonable setbacks. Going forward, these lots can, we believe, provide a reasonable level of amenity but only if the houses themselves are carefully and site-specifically designed. In other words this should not necessarily be seen as a typology that can be rolled out across any site, but rather (in the spirit of Landcom's proposal) a demonstration project to be evaluated for its performance before being replicated. Nor should this typology be provided at the expense of the streetscape and residential amenity of the more conventional streets either side of the 'liveable street'.

108 Burdekin Road Schofields

Part 2

4. Solar access

The urban design report prepared by Place Design Group provides shadow diagrams for the masterplan envelopes which show that all lots receive the minimum 3 hours' solar access at the winter solstice and comments that "more sophisticated detail design of dwelling floor plans and layouts in accordance with Landcom design guidelines will ensure further resolution of internal layouts to maximise individual lot opportunities". It is noted that the Place Design analysis assumed single storey battle axe dwellings. However based on the current DCP controls for the site we note that two storey dwellings are permissible.

On this basis, we have assessed the solar access for the site based on a two storey battle axe lot dwelling.

4.1. Analysis

A solar access analysis was undertaken to test the maximum development envelope possible under the Blacktown City Council Growth Centre Precincts DCP (BCC GCP DCP) and the Site Specific DCP against solar access requirements for Primary Private Open Space (PPOS). Both DCPs require PPOS to receive a minimum of 3 hours of sunlight to 50% of the area at winter solstice (June 21) between the hours of 9am and 3pm.

- Three areas within the project site were selected for testing to investigate the variation of possible outcomes due to orientation within the block, with particular focus on the impact of the mid-block battle axe lots.
- The abutting developments on Grima and Lerida Streets and lots where an envelope plan has been provided were modelled as drawn in the DA submission to test outcomes for these lots in relationship with their context.
- 1.8m high fences were included in the modelling.
- An image demonstrating overshadowing was produced for each of the three locations at 1 hour intervals between 9am and 3pm on 21st June. These, with summaries totalling the cumulative hours of sunlight received at each lot, are attached (Appendix: Solar Analysis).

4.2. Findings

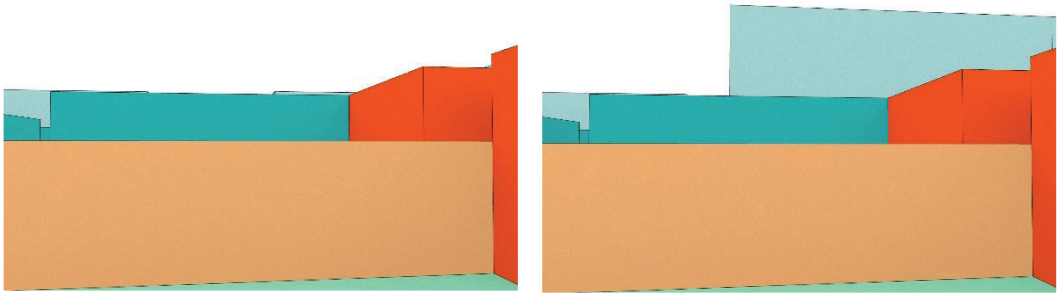
- Broadly, if there were two storeys on the mid-block battle axe lots this would not significantly impact solar access to the PPOS of adjoining properties (note: impacts on privacy and outlook are discussed under a separate heading below).
- Some lots do not appear meet the solar access requirement (refer Appendix for details):
    - The proposed envelope plans for lots 602-606 (2-3 hours of sunlight). These dwellings would only have enough solar access to PPOS if it is located at the front (on the street), facing north, rather than at the rear
    - The proposed envelope plans for lots 702 and 307 (1-2 hours of sunlight)
    - The proposed abutting developments on Grima and Lerida streets, where the current locations of PPOS for the northern dwelling of each pair (shown in the block layout plans submitted as part of the DA) appear to receive between 1-2 hours of sunlight to 50% of the PPOS area.
- Some of the lots that we found to be non-compliant would comply if fencing was not considered; it is important therefore that solar access compliance requires fences as well as the buildings themselves to be modelled.

5. Outlook and privacy

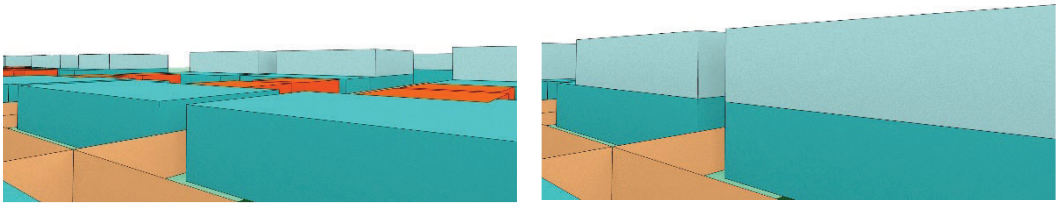
5.1. Analysis

The battle-axe properties have 5-6 neighbours. We were interested in three things that would make a difference to the amenity outcomes in this situation: the height and bulk of neighbouring buildings; their proximity; and the openings (windows). We identified that although the master plan indicates single storey dwellings on these lots, two storeys are permissible and indeed the Site Specific DCP identifies a two storey condition in discussing rear setbacks. We modelled the envelopes based on the DCP controls and the building plans at representative locations, to also get a sense of what it feels like to be in the development, under different conditions. This is necessarily high level but we found it very useful. For example:

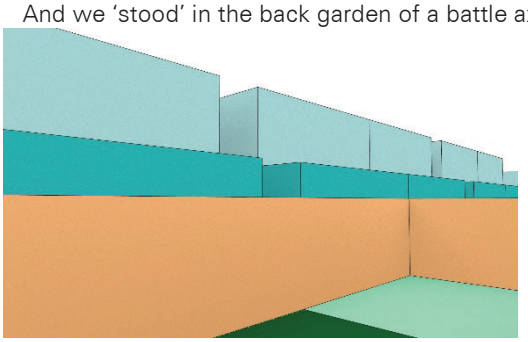
- We compared the view from the rear PPOS of a detached house in the western block towards the mid-block battle axe lots,



- We compared the outlook from the second storey of an abutting dwelling towards the battle axe lots, depending whether the battle axe was one or two storeys:



- And we 'stood' in the back garden of a battle axe lot (western block) and looked towards the rear of the abutting dwellings.

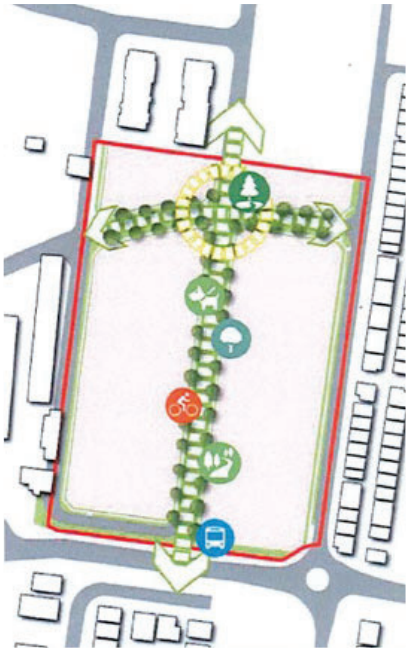


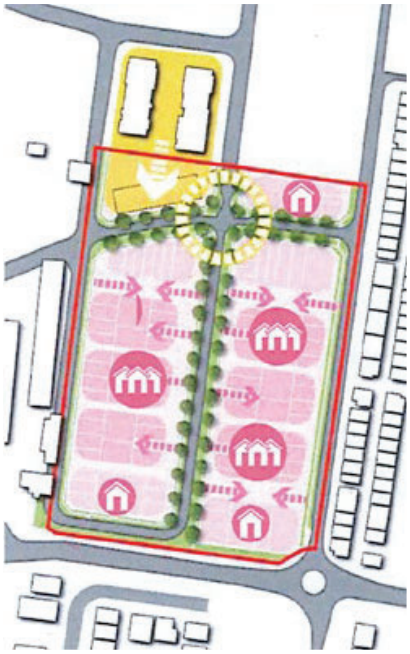
5.2. Findings

- One of the primary issues with the battle axe lot design typology is that it ignores the fundamental urban design principle of a clearly delineated front and back (public/private) space. Sleeving a battle axe lot into what would be the rear private gardens of other lots therefore has to be carefully designed.
- This point is recognised in the Urban Design Report by the Place Design Group which shows only single storey dwellings in the battle axe lots – the best case scenario in relation to amenity overlooking impacts and overshadowing. The images above indicate the impact of having a two story building on the battle axe lots (permitted under current control). We consider that (as indicated in the Place Design Group masterplan) the maximum height for the battle axe lots should be one storey, ideally controlled or protected by way of the SSDCP.

6. Streetscape

The diagram below left, taken from the Place Design Group urban design report, represents the design approach to green liveable streets for the demonstration project. It shows wider, landscaped streets on the central north south street (extension of Rugby Street) and the northern east-west road.





The 'liveable street' character of the north south extension of Rugby Street is supported by limiting the vehicle crossovers to nine shared driveways (see diagram above right). It is noted that a traditional subdivision would have generated 28 vehicle crossovers to serve the same number of allotments.

The primary concern with this design approach is that the roads to the east and west of the primary north-south green street consist of traditional abutting allotments all with individual (shared) driveways that significantly limit opportunities for tree planting and safe liveable streets. Further, the central green street has predominantly detached dwellings on larger allotments while the traditional streets have smaller lot, abutting dwellings. This effectively creates a hierarchy of streets in terms of house value and landscaping, with residents fronting the green streets benefiting the most. The urban design report focused on compelling images of the liveable streets with little mention of these other, 'non-liveable' streets.

6.1. Findings

- Where they have been proposed, the introduction of 'green / liveable streets' in the demonstration project is supported and appears to be well considered with the exception of the potential impacts of hard stand area in the nature strip to service the garbage requirements of the battle axe lots. However, the issue remains that the battle axe lots typology creates a 'liveable street' on one side of the block and a 'business as usual' street on the other side of the block – a 50% successful outcome.
- Should the adjoining land to the west be developed by Landcom, we suggest that Road No. 2 (the western half-road in this DA) also be designed with a deep verge and canopy trees on the other (western) half of the road, to create a greener, more liveable street.
- There is a strong reliance in the masterplan and the design vision and principles in the SSDCP on the contribution of landscape areas in shared driveways to the overall amenity and useable space for residents. While we appreciate the level of design thinking and detail shown in the plan, sections and landscape plan, we are concerned that as these areas will be in shared, private ownership, the outcomes will be diluted over time (as appears to have happened within the adjacent Bathla development).
- The (approximately) 3m wide planting area between Burdekin Road and the new internal road at the southern boundary of the site is in our view a very important opportunity to buffer the development and also create a pleasant edge to the shared path. We recommend this be sized and designed to support large canopy trees as part of the 'greening' of the Precinct. This would also respond to / extend the attractive character of Stanhope Parkway.

7. Design Guidelines

7.1. Panel comment

The Panel notes the Applicant's intention to provide detailed design guidelines for the demonstration project to ensure that the intended outcome is achieved. Noting however that the project is intended to be replicable, the Panel seeks further explanation as to how less motivated developers would be expected to take-up, and apply, the proposed design guidelines.

7.2. Discussion

We have not been provided with design guidelines for this site, although Landcom did send us examples from a previous project,[6] which provide design principles for different housing typologies, block plans that cover form and fencing, and additional guidance for roofs, windows and doors, balconies, verandahs and entries for character areas.

In the Development Application are:

- Building plans (with elevations, sections, landscape plans) for the abutting lots on Grima Street and Road No. 2 (west), these being under 225m2 and proposed to be constructed as part of the DA
- Building envelope plans for lots between 225m2 and 300m2
- No plans for lots greater than 300m2 (ie. none for battle axe lots).

We were particularly interested to understand, from Landcom, the likely outcomes for the battle axe lots in the absence of either plans or design guidance in the DA. However, Landcom have advised that "the designs and schematics for the battle axe lots were high level and prepared to inform the servicing design, including the location of sewer and establishment of the drainage levels" and referred us back to the urban design report. Pages 40-41 of that report discuss the 'Central block module and shareways', describing the mid-block lots as a "unique downsizer opportunity" and illustrating in indicative development outcome (block plan) with "minimum 8m separation from the front and back of mid-block dwellings".

We consider that while Landcom are clearly committed to high quality design for 108 Burdekin Road, in the absence of detail embedded in the DA and by extension in the site-specific DCP there is a risk of the development falling short. While Landcom are confident that their delivery model will result in a high quality outcome it is difficult to evaluate this without more detail – either for this particular site subdivision or for future developments that would also use the mid-block model. Taking the model forward, tighter controls earlier would help prevent a less skilled developer relying on a 'one size fits all' approach and delivering generic, poor amenity outcomes. After all, design guidelines work well when they are strongly aligned to a developer's vision and effectively describe what the developer is already committed to doing; they work less well when there is not the will to adopt them.

Further, even for this particular site there are some areas of uncertainty around the designs. While in a traditional (street fronting) typology it makes sense to have increasingly detailed controls as the lots get smaller, we consider building plans essential for the battle axe lots, given the number and proximity of neighbours, to secure the outcomes Landcom are promoting. We do not see this as a level of detail post-DA, but integral to evaluating the subdivision pattern.

7.3. Recommendations

- Require design guidelines to be included with the DA
- Provide building plans for battle axe lots, ideally as part of the DA, including:
    - Internal layout
    - Dimensions (setbacks to all sides)
    - Location of openings for primary habitable spaces
    - Location of Primary Private Open Space (PPOS) in relation to living room
    - Shadow diagrams showing the above.

[6] Thornton Design Kit Supplement, Thornton Homes Brochure, 21st Century Living Thornton Brochure

108 Burdekin Road Schofields

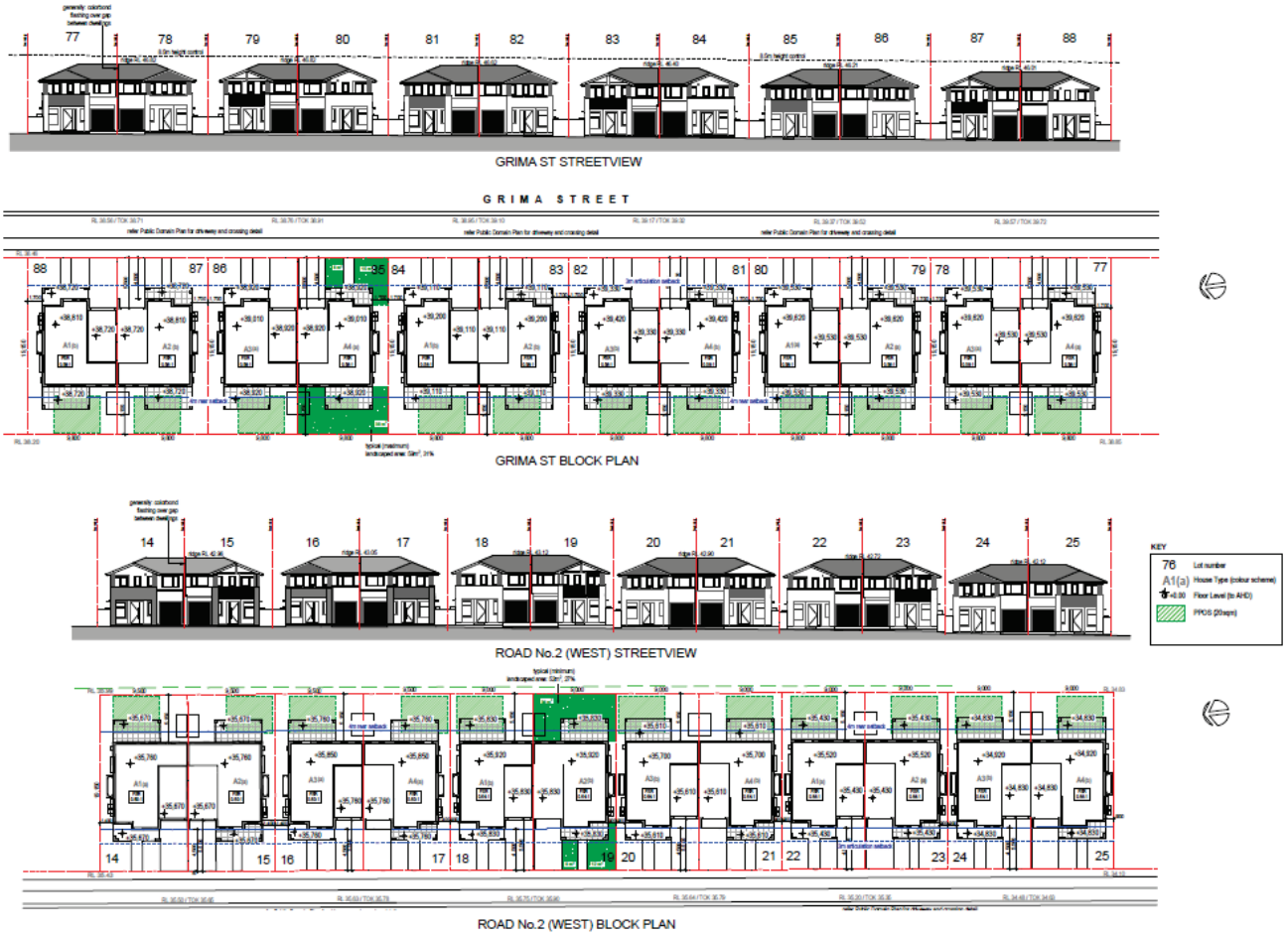
8. Architecture

8.1. Panel comment

The Panel supports the light coloured roofs proposed in the application, and the diverse range of house types that illustrate the Urban Design Report, but notes that the street view illustrations for Grima Street and Road No.2 (West) included in Appendix 5 (pg. 2) are repetitive and not suggestive of diverse housing types. Indicative streetscapes illustrated in Attachment 5 (pg. 3), and façade illustrations (pg. 6) also suggest little diversity despite a minor variation in materials.

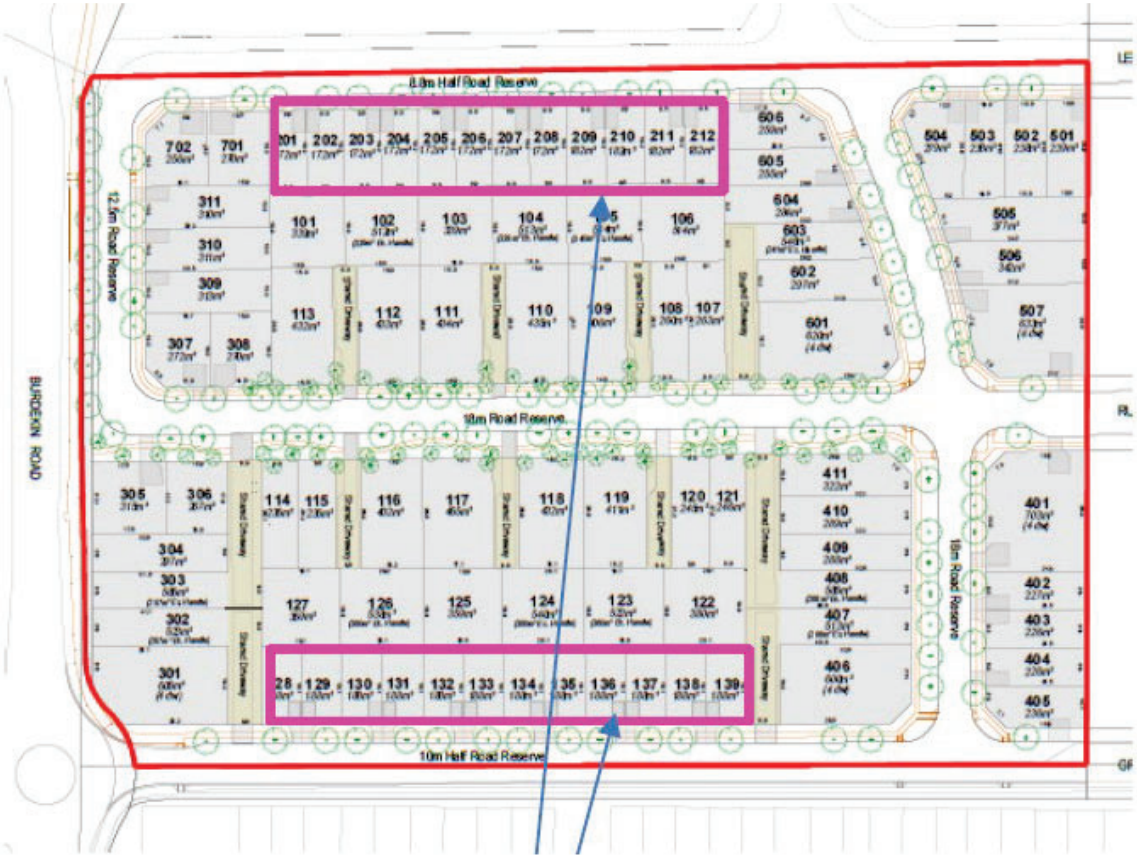
8.2. Housing type diversity

The street view elevations for Grima Street and 'Road No.2 West' referenced in the Panel's comments are provided below with related ground floor plans and a block context plan. The drawings show that the Grima and Road No.2 West streetscapes predominantly consist of abutting dwellings (twelve in each street). The abutting dwellings are mirrored in pairs (see plans below), providing six buildings in each streetscape. The drawings indicate that the floor plans and primary elements of the building facades do not vary from building to building. This results in a limited level of architectural diversity for the two streetscapes with each building being very similar to the next.



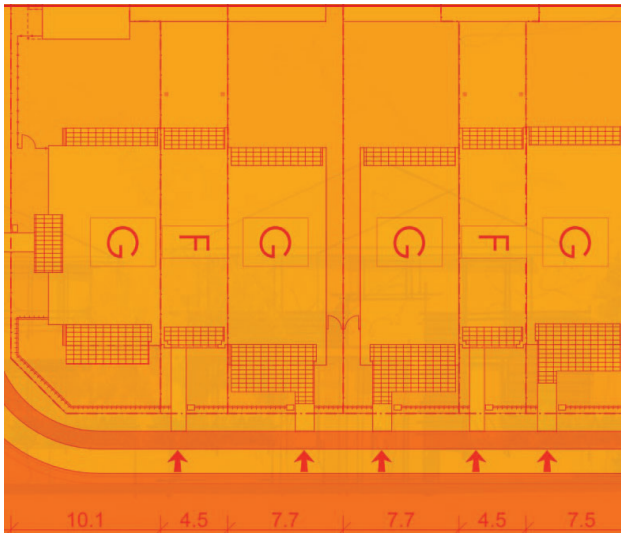
Street Views and Plans, Grima Street and Road 2 West - Landcom Demonstration Project, 108 Burdekin Rd DA (Drawing number A5.01)

108 Burdekin Road Schofields



Context Plan (abutting dwellings highlighted). Source - Sydney Central Planning Report SPP-19-00010 (Attachment 4 Page 3)

The repetitive use of the same house type and building form does not generate a diverse streetscape. One obvious solution to creating a more diverse streetscape is the introduction of a more diverse range of housing types. The housing types could remain abutting but could include a wide range of buildings including smaller dwellings. This approach would also support a more effective 'missing middle' outcome for the subdivision. The plan image below indicates the potential for a more diverse streetscape based on this approach. It includes a variety of lot sizes, lot widths and building position within the lots.

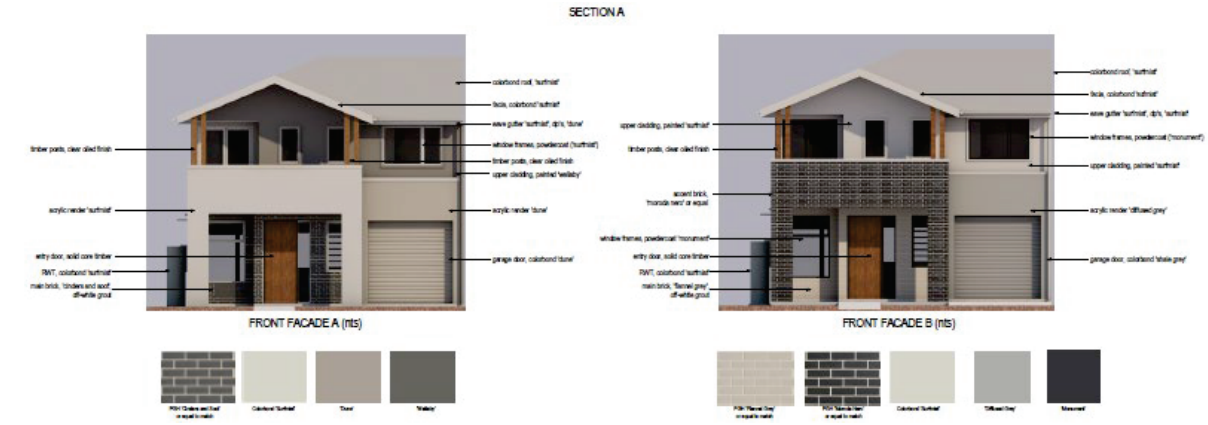


Housing Choice and affordability in growth areas (Cover Page): Dwelling Density Guide NSW DPI July 2013
https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/99efe0f31769ab18eb21044e6de0511961f26129/documents/attachments/000/010/063/original/P_I_-_Growth_Centres_Affordable_Dwellings_Guide.pdf?1396520611

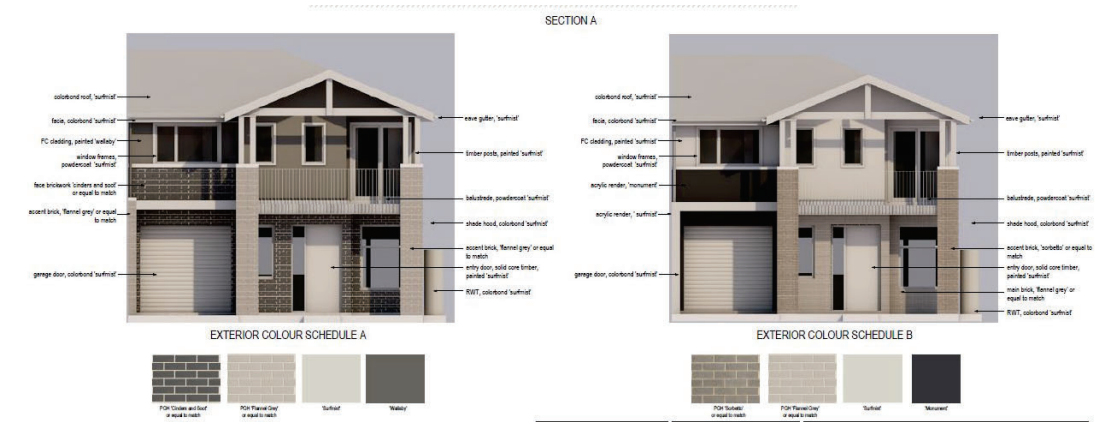
108 Burdekin Road Schofields

8.3. Materials and colour palette

We appreciate that attempts have been made to vary the presentation of the abutting dwellings through the use of a variety of materials and colour palette: the DA documentation includes the details of four abutting house types labelled A1 to A4. Each house type provides options for mixing materials and building elements colours, shown below.



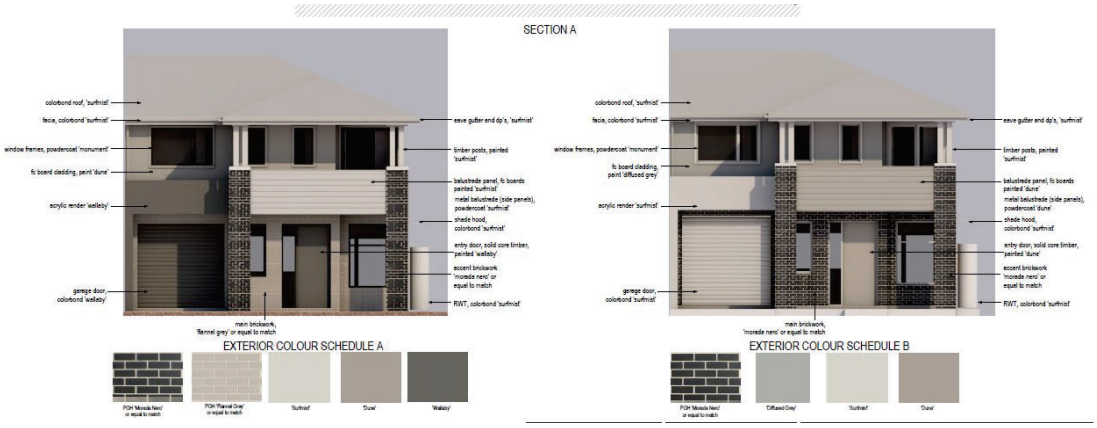
House Type A1 - Exterior Colour Schedule (Landcom DA drawing number A1.03)



House Type A2 - Exterior Colour Schedule (Landcom DA drawing number A2.03)

Figure 3.3 - House Type A3 Exterior Colour Schedule (Landcom DA drawing number A3.03)

108 Burdekin Road Schofields



House Type A4 Exterior Colour Schedule (Landcom DA drawing number A4.03)

However, the images above show that three of the house types (A1, A3 and A4) are similar in design, having an expressed solid portico entry element. House type A2 varies the portico design with an open balcony and open metal balustrade with brick piers. Colour for various aspects of the building facades varies within a limited palette from 'surfmist' (off-white) to 'wallaby'(mid dark grey), while the major shift in the use of materials relates to the solid portico framing the main entry to the dwellings (A1, A3 and A4).

- Type A1 – acrylic render to accent brick
- Type A3 - Brick to acrylic render
- Type A4 – Brick piers with balustrade panels constructed from fc boards.

The building envelopes, roof forms and siting of the buildings do not currently vary for any of the abutting house types.

8.4. Recommendations

We recommend Council provide conditions of consent requiring greater design variety in the abutting dwellings to 'Grima Street' and 'Road No.2 West' to create a more diverse and visually interesting streetscape.

- The use of a greater variety of materials and colour palette could assist in providing some visual diversity to the streetscape. However, this approach alone has limited impact, as indicated by the images above for Housing Types A1, A3 and A4 above. Where it is supported by greater articulation of the building facades (as shown in House Type A2 above) it is likely to be more successful. Consequently, the applicant should consider introducing variety into the housing type facades through a range of different facade elements. These could include varying front setbacks, varying roof lines and pitch, varying eaves overhangs, and / or use of differing verandah and balcony treatments, and different window sizes and proportions, as in these different streets at Hobsonville Point (below).

Semi-detached housing (left) and courtyard and detached homes (right) – variety in form as well as façade proportions and openings adds interest to the streetscape and a stronger sense of identity ("this is where I live") to peoples' homes

- In another example, the two images below of the same Clarendon Homes house type show how a combination of minor design changes with material and colour palette variations can create architectural variety and richness.

108 Burdekin Road Schofields

Zero Lot home (Clarendon Homes Kellyville, NSW) – same plan with alternative architectural resolution for variety (Source – Page 51, Dwelling Density Guide NSW DPI July 2013).

Therefore, the design of Housing Types A1, A3 and A4 should be developed to include modification of design details in addition to the proposed modification of material and color palette.

In doing so, the applicant could also consider opportunities to introduce a variety of 'sustainable' features – and not just to the front facade. As well as eaves projections over windows, other architectural projections such as sun hoods and screens to balconies could also assist with privacy issues. Given that with abutting house types, each one of the pair has a completely different relationship to sun access, we would suggest that any such features relate and respond to building orientation on the lot.

The other opportunity to provide variety to the streetscape relates to the potential to vary the design of front fencing and landscaping. As noted in our review of medium density developments elsewhere, the inclusion of hedging on streets where verges are narrower and space for tree planting somewhat limited can significantly soften the streetscape.

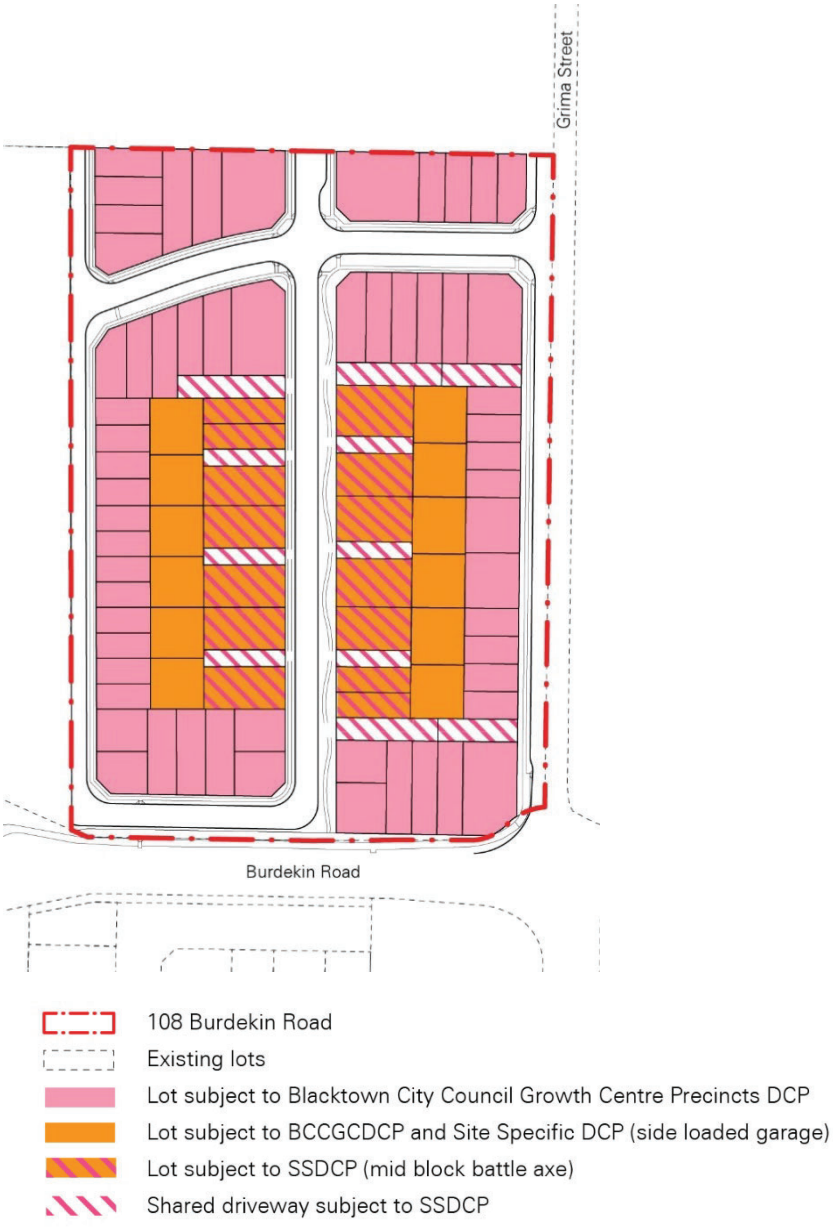
9. Site Specific DCP

9.1. Panel comment

The Panel notes that the Alex Avenue Site Specific DCP related to the application is an annexure of the primary Growth Centres DCP for the area. The Panel is cognisant that where the Growth Centres DCP aims to limit battle-axe blocks, the Site Specific DCP encourages this form of development. In view of the comments above, the Panel suggests that further independent urban design testing of and consultation with Council is undertaken to address the issues described above and to determine if battle axe-blocks should be encouraged.

9.2. Discussion

In approaching this, the 'big question', we assessed the relevant DCPs as well as the DA and masterplan. Lots fronting the liveable street with side loaded garages come under both the Site Specific DCP (for setbacks) and the Growth Centres DCP (for other controls). For clarity, the diagram below shows which lots are primarily assessed under which portion of the DCP.

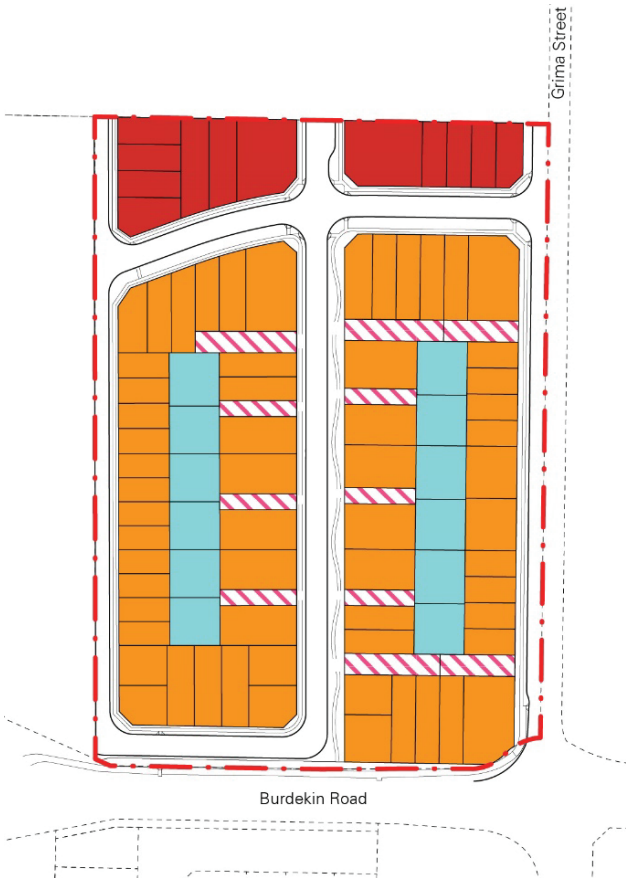


9.3. Recommendations

108 Burdekin Road Schofields

Overall, from our research and analysis, we do not actively encourage battle axe subdivision as a core typology for missing middle developments. We do however appreciate the intent to explore the potential for a hitherto (generally) unsuccessful typology to deliver better green streetscape outcomes that the Site Specific DCP and the Landcom DA masterplan are closely aligned and that changes to the DCP could result in a non-compliant DA.

The following suggestions are intended to assist the proponent and Council to match the built outcomes to the vision (which is supported) and to refine the housing types, not to 'throw the baby out with the bath water'. They could inform future DCP controls for this type of subdivision where it is permissible. They are presented as recommended additions or modifications to the Site Specific DCP controls.

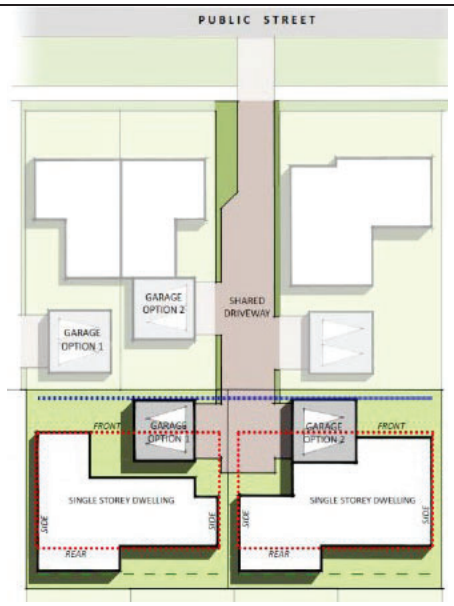
GENERAL CONTROLS		
Element	**Control**	**Recommendation**
Height in storeys	None in the Site Specific DCP. BCCDCP has maximum 3 storeys in density areas >/ 25 Dw/Ha (Tables 4-2 and 4-3)  	Include a height in storeys map to secure desired outcomes, with 1 storey to the battle axe lots and a transition from northern development through 3 storeys to the balance of the Burdekin Road site which is 2 storeys: 

108 Burdekin Road Schofields

Building separation	None	Provide an overlay that supports visual privacy / reduces overlooking for low rise medium density housing. Such controls have been standard for residential flat buildings since 2002 (RFDC) and in our view are appropriate to seek for any development with planned battle axe lots. They also address any issues with the 'mirroring' of abutting dwelling types whose windows are typically opposite each other. They would support terrace typologies as well as the types in this DA. Primary habitable space = living room, dining room, bedroom, study Secondary habitable space = kitchen, bathroom, laundry, entries No outlook = garages, blank walls	
		Recommended overlay controls	
		Primary habitable to primary habitable space	8m
		Primary habitable to secondary habitable	6m
		Primary to no outlook / blank wall	4m
		Secondary to secondary	4m
		Secondary to no outlook / blank wall	1.8m
		No outlook to no outlook	zero

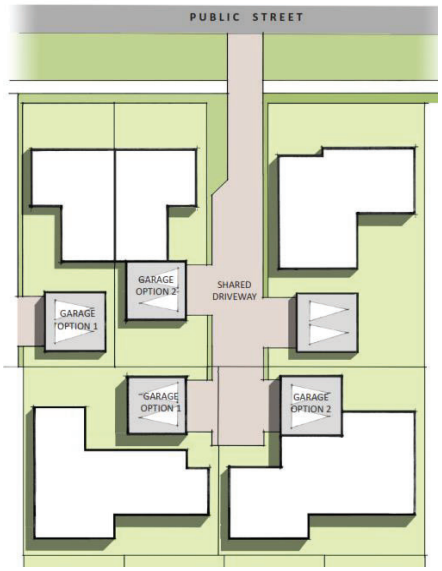
BATTLE AXE LOTS (Section 4.6.2 of the Site Specific DCP)		
Element	**Control**	**Recommendation**
Front setback	Min. 4.5 m to building façade line Min. 3 m to articulation zone Min. 0.9m for the garage	Remove the articulation zone allowance as the articulation zone is intended for street-fronting lots (to contain such things as entry porches that assist to interact with / overlook the street). Instead: Minimum 4.5m to building façade line with the only projections being eaves, fascias, sun hoods, gutters, down pipes, flues, light fittings, electricity or gas meters, air conditioning units, rainwater tanks and hot water units. Except for Minimum 0.9m for garages, with a maximum dimension of 6m along the adjoining property line with the front dwelling
Rear setback	Min. 4 m A reduced rear setback, up to a maximum 50% of the building length, may be permitted provided the building is single storey in height and provides a minimum 2 m setback (refer to Figure 4-20)	Minimum 4m setback UNLESS the building separation requirements are demonstrated to be met by way of building plans for the battle axe AND the adjacent lots, in which case a minimum setback of 2m may be applied [requires amendment to Figure 4-20]

108 Burdekin Road Schofields

		
Soft landscaped area Landscaping and permeable surfaces	Min. 25% of the allotment area Setbacks should provide opportunities for landscaping and permeable surfaces between properties.	Min. 25% of the allotment area, preferably as consolidated / continuous areas of deep soil rather than fragmented

LOTS WITH SIDE LOADED GARAGES (Section 4.6.3 of the Site Specific DCP)		
Element	**Control**	**Recommendation**
General	2. With the exception of setback controls, the development controls for these types of lots are summarised within Blacktown City Council Growth Centres Precinct Development Control Plan, Table 4-2 'Summary of key controls for lots with frontage width ≥ 4.5 m for rear accessed dwellings' and within Section 4.3 'Additional controls for certain dwelling types', where relevant.	Introduce additional overlay in the SSDCP where the BCCGCDCP requires a lesser amenity standard, for PPOS (see below)
Principal Private Open Space (PPOS)	In density areas ≥25dw/Ha: Min 16m^2 with minimum dimension of 3m. [Tables 4-2 and 4-3]	In density areas ≥25dw/Ha where lots adjoin battle axe lots: Min 20m^2 with minimum dimension of 4m.

108 Burdekin Road Schofields

	 Figure 4-21 from the SSDCP shows the preferred location of garages, including (left side) what appears to be PPOS at the rear, separated from the house.	The location of PPOS shown in Figure 4-21 is not preferred. Instead: Primary living spaces are to open directly onto and overlook PPOS
Rear setback	Zero lot line or minimum 0.9 m.	This is confusing. We suggest either clarification that this setback applies to garages only, or separate controls depending on whether the garage or part of the main dwelling is at the rear. For example: Minimum 4m to building façade line Minimum 0.9m for garages, with a maximum dimension of 6m along the adjoining property line with the rear dwelling
Garage setback from shared driveway	Minimum 0.9 m. However, turning paths must be provided to ensure that adequate manoeuvrability can be achieved for vehicles to access the garage in 2 manoeuvres or less. Where this cannot be achieved, the minimum side setback will need to be increased to ensure compliance	It might be useful to indicate that this should be a standard domestic vehicle.
Soft landscaped area	Min. 15% of the allotment area	Minimum 25% of the allotment area (in line with requirements for other types, and considered achievable after reviewing the plans provided with the DA)

Appendix: Solar access analysis

Summary of solar access to PPOS for the south of the western block

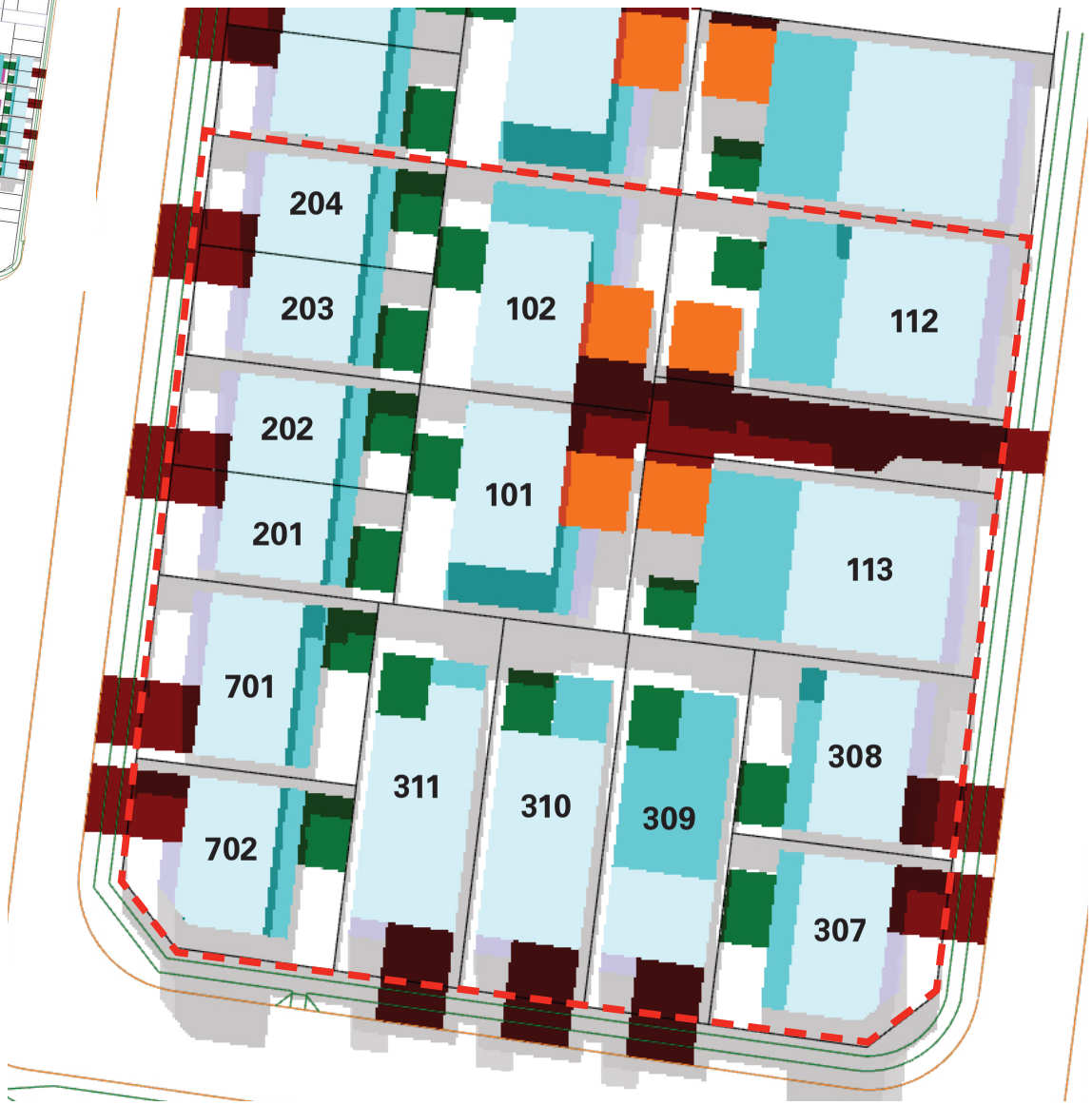
Assumptions:

- Analysis for lots within the red boundary shown opposite only
- All lots show maximum building envelope under the relevant DCP (BCC GC DCP and Site Specific DCP)
- All mid-block battle axe blocks for this portion of the analysis are 2 storey.
- Includes 1.8m high privacy fence

		Receives sunlight to minimum 50% of the PPOS							Cumulative hours of sunlight to 50% of the PPOS
Lot type	Lot number	9am	10am	11am	12pm	1pm	2pm	3pm	
Front loaded, abutting	201		●	●	●	●			3
	202			●	●				1
	203		●	●	●	●			3
	204			●	●				1
Mid-block, detached	101			●	●	●	●		3
	102			●	●	●	●		3
Side loaded, detached	112			●	●	●	●		3
	113			●	●	●	●		3
Front loaded, detached	307			●	●	●			2
	308			●	●	●			2
	309		●	●	●	●	●		3
	310		●	●	●	●			3
	311			●	●	●	●		3
	701			●	●	●			2
	702			●	●	●			2

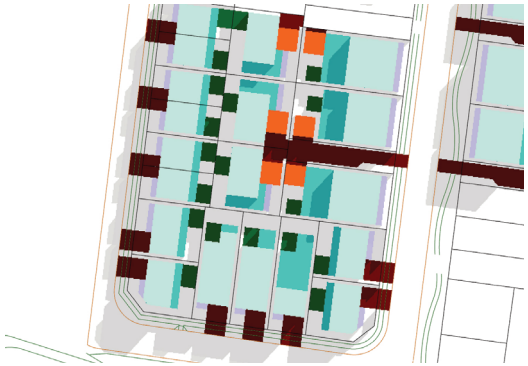
Key findings:

- Lots 202 and 204 do not meet the requirements for solar access to minimum 50% of the PPOS area between the hours of 9am-3pm when PPOS location is shown as per the block layout plans (DA)
- To maintain solar access to the PPOS of lot 307, Lot 309 has significantly reduced upper floor area or is single storey

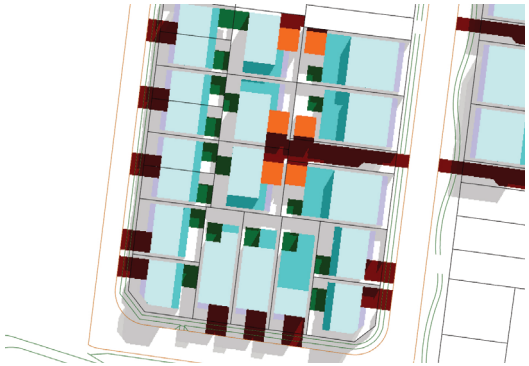


Appendix: Solar access analysis

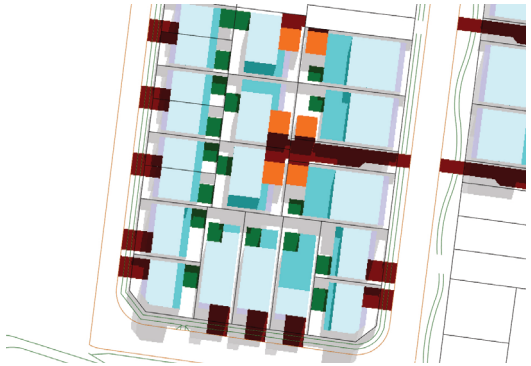
9am



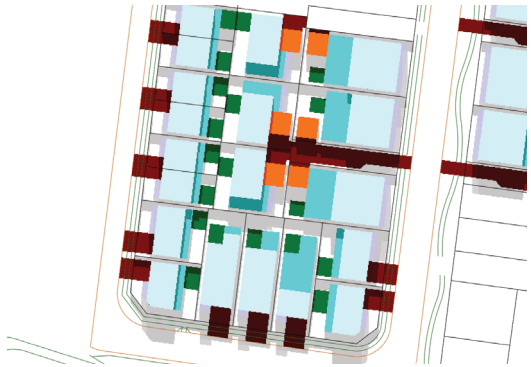
10am



11am



12pm



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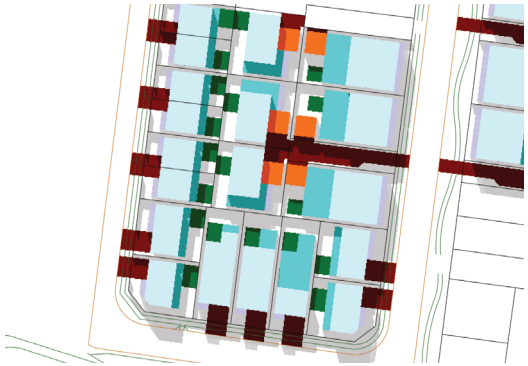

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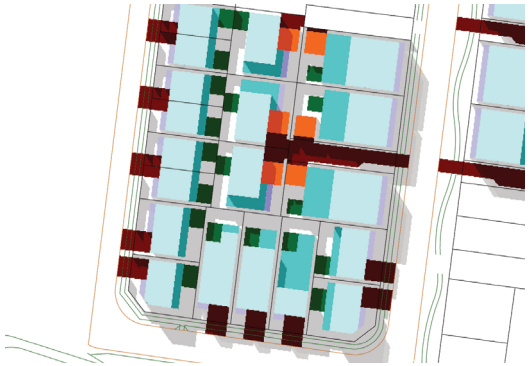

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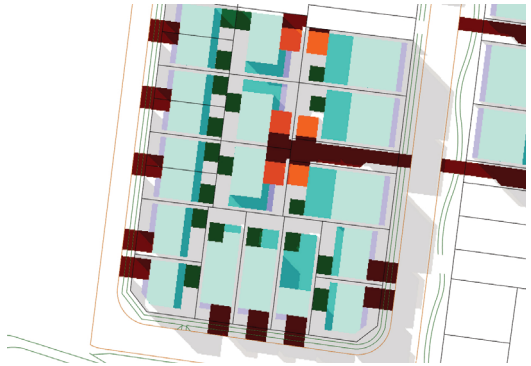


Analysis boundary
Lot
Articulation zone
First storey
Second storey
Garage
PPOS
Hardscape/driveways

Appendix: Solar access analysis

Summary of solar access to PPOS for the middle portion of the eastern block

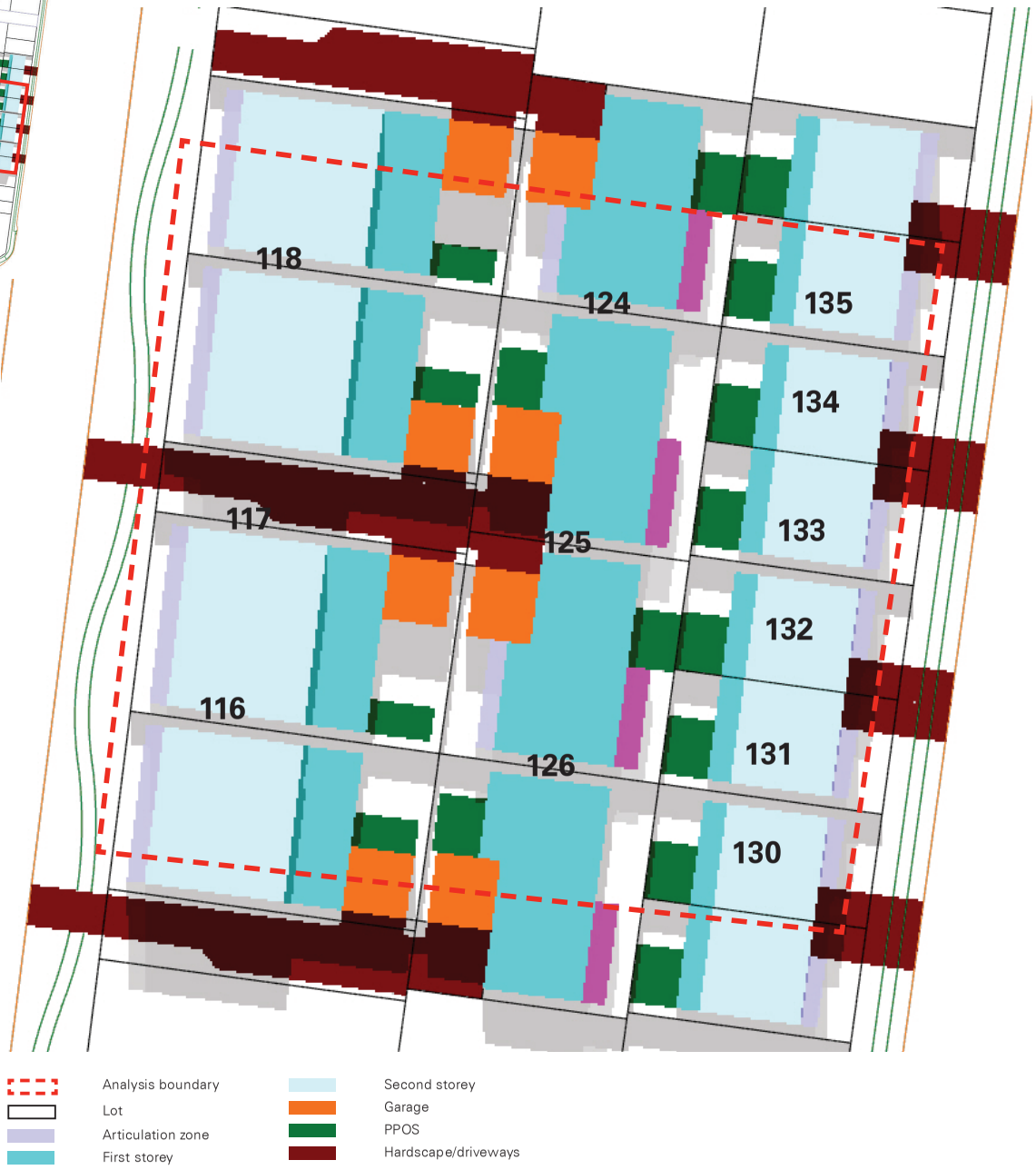
Assumptions:

- Analysis for lots within the red boundary shown opposite only
- All lots show maximum building envelope under the relevant DCP (BCC GC DCP or Site Specific DCP)
- All mid-block battle axe blocks for this portion of the analysis are 1 storey.
- Includes 1.8m high privacy fence

		Receives sunlight to minimum 50% of the PPOS							Cumulative hours of sunlight to 50% of the PPOS
Type	Lot number	9am	10am	11am	12pm	1pm	2pm	3pm	
Side loaded, detached	116	●	●	●	●	●			4
	117		●	●	●	●			3
	118	●	●	●	●	●			4
Mid block, detached	124			●	●	●	●		3
	125		●	●	●	●			3
	126			●	●	●	●		3
Front loaded, abutting	130			●	●	●	●		3
	131				●	●	●		2
	132			●	●	●	●		3
	133				●	●	●		2
	134			●	●	●	●		3
	135				●	●	●		2

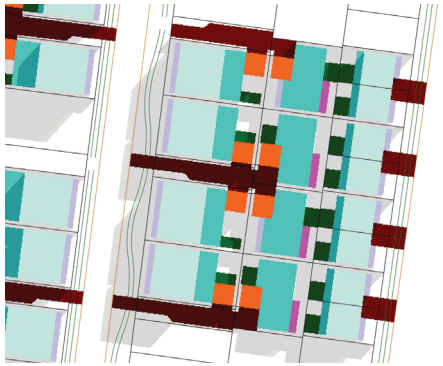
Key findings:

- Lots 131,133,135 do not meet the requirements for solar access to minimum 50% of the PPOS area between the hours of 9am-3pm when PPOS location is shown as per the block layout plans (DA).
  - » Plans need to consider location within the block and relationship with neighbours rather than being mirrored.

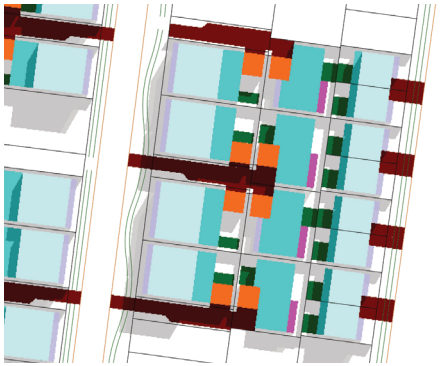


Appendix: Solar access analysis

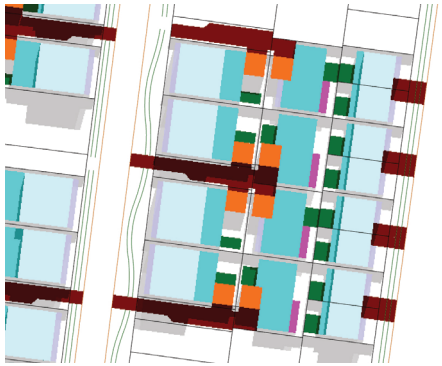
9am



10am



11am



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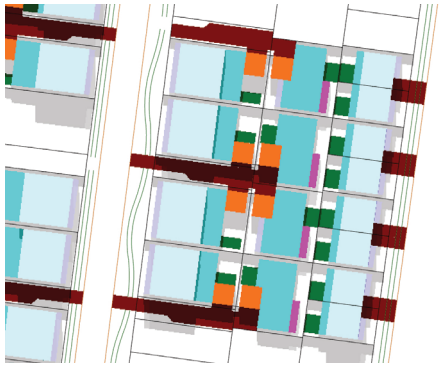

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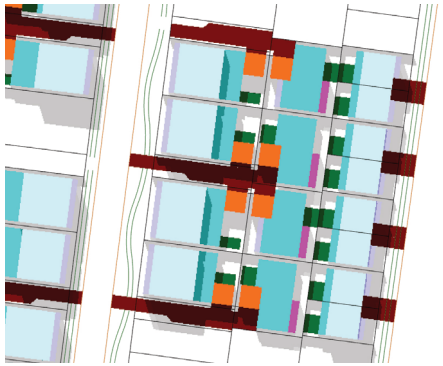

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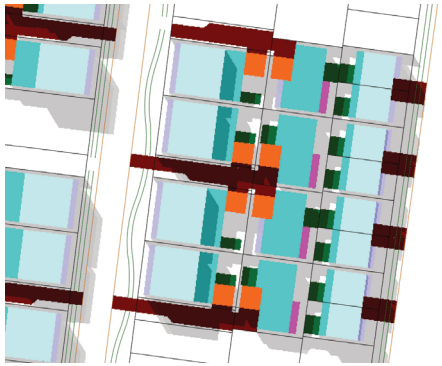

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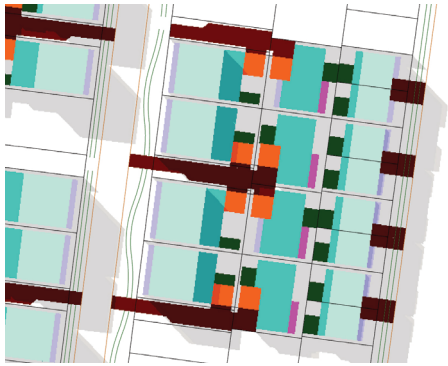


Analysis boundary
Lot
Articulation zone
First storey

Second storey
Garage
PPOS
Hardscape/driveways

Appendix: Solar access analysis

Summary of solar access to PPOS for the northern portion of the western block

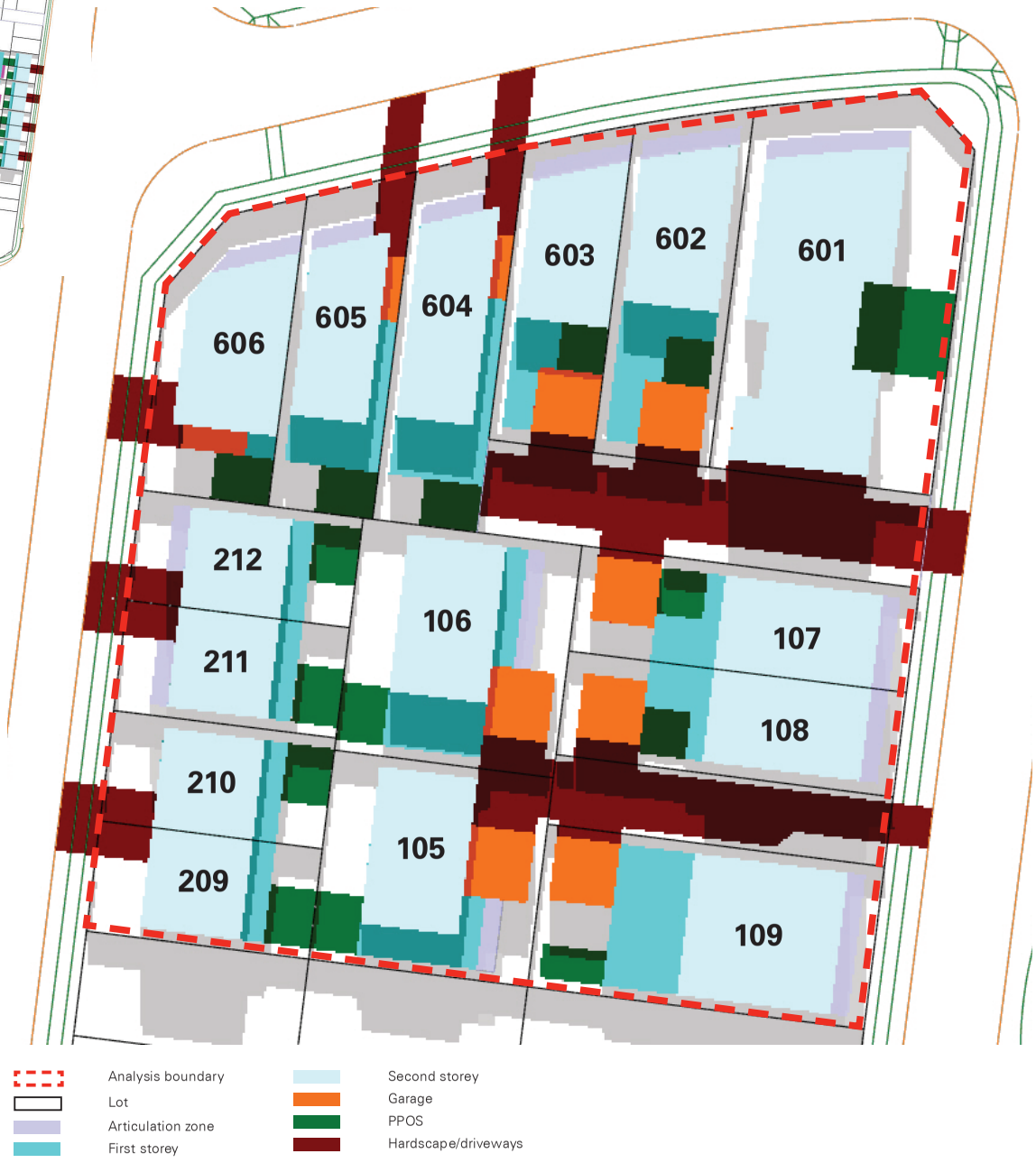
Assumptions:

- Analysis for lots within the red boundary shown opposite only
- All lots show maximum building envelope under the relevant DCP (BCC GC DCP and Site Specific DCP)
- All mid-block battle axe blocks for this portion of the analysis are 2 storey
- Includes 1.8m high privacy fence

		Receives sunlight to minimum 50% of the PPOS							Cumulative hours of sunlight to 50% of the PPOS
Type	Lot number	9am	10am	11am	12pm	1pm	2pm	3pm	
Manor house, rear loaded	601	●	●	●	●				3
Rear loaded, detached	602								0
	603								0
Front loaded, detached	604								0
	605								0
	606								0
Mid-block, detached	105			●	●	●	●		3
	106			●	●	●	●		3
Side loaded, detached	107			●	●	●			2
	108								0
	109			●	●	●	●		3
Front loaded, abutting	209		●	●	●	●			3
	210			●	●				1
	211		●	●	●	●			3
	212			●	●				1

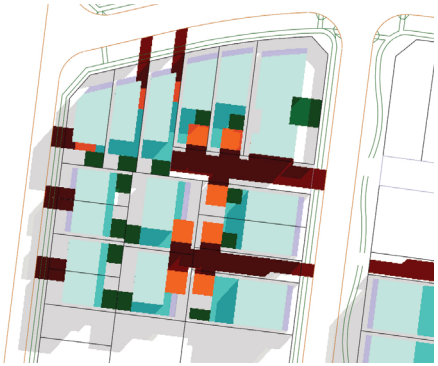
Key findings:

- The following lots do not meet the requirements for solar access to minimum 50% of the PPOS area between the hours of 9am-3pm when PPOS location is shown as per the envelope plans and block layout plans (DA).
  - » **Lots 602-606:** PPOS possibly needs to be accommodated within the northern portion of the block, noting that this would have impacts on privacy.
  - » **Lots 210, 212 and 107:** Plans need to consider location within the block and relationship with neighbours rather than being mirrored.

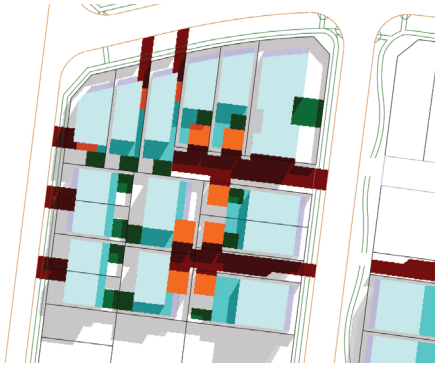


Appendix: Solar access analysis

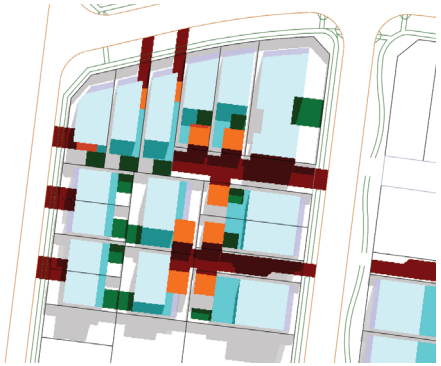
9am



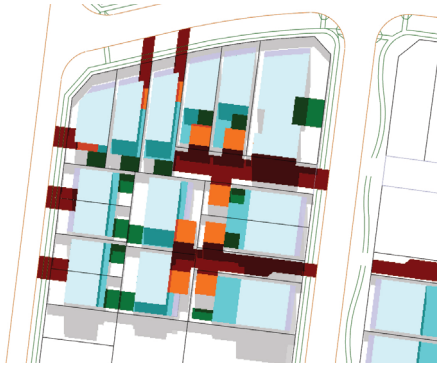
10am



11am



12pm



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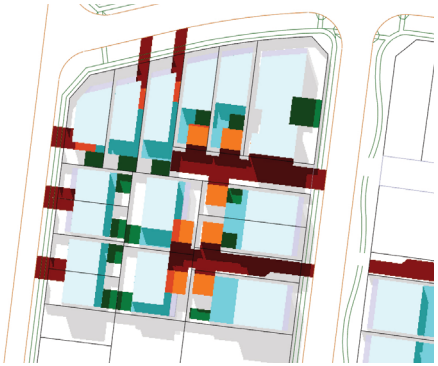

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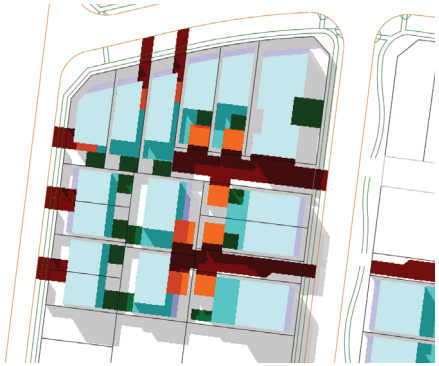

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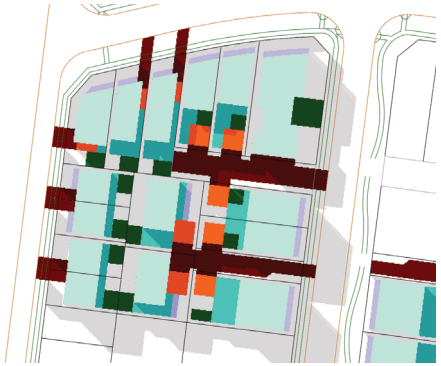

Analysis boundary
Lot
Articulation zone
First storey
Second storey
Garage
PPOS
Hardscape/driveways