Arden
URBAN DESIGN & BUILT FORM ANALYSIS
SEPTEMBER 2021

Victorian Planning Authority

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Victorian Planning Authority

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1.0 EXECUTIVE SUMMARY

The *Arden Urban Design and Built Form Analysis* has been undertaken by the Victorian Planning Authority to inform and complement work undertaken by other contributors following the *Arden Vision* and the *Draft Arden Structure Plan* (the Draft Plan).

The development of the Metro Tunnel Project and the new Arden Station afford greater accessibility for North Melbourne and a unique opportunity for renewal of at least 10 hectares of government railway and industrial land catalysing change in the broader Arden precinct. Arden's future urban structure and design outcomes must respond to the existing character of the broader precinct and surrounding area, while also meeting the precinct's vision as a future innovation and technology precinct aspiring to accommodate approximately 34,000 jobs and around 15,000 residents.

The Planning Policy Framework seeks to develop the objective for planning in Victoria (as set out in the *Planning and Environment Act 1987*) to foster appropriate land use and development, planning policies and practices that encompass relevant environmental, social and economic factors. As such, planning can be understood as the balancing of the requirements of strategic support of development, protection of amenity, and general fit within the particular context.

Plan Melbourne 2017–2050 Metropolitan Planning Strategy is of particular relevance to the Arden Urban Renewal Precinct given the importance of the inner city in the context of the commercial and residential growth of Melbourne and more broadly Victoria. Specifically, Direction 1.1 of Plan Melbourne identifies initiatives including to *"create a city structure that strengthens Melbourne's competitiveness for jobs and investment"*. The overarching objective is also supported by Policy 1.1.2 which seeks to *"plan for the redevelopment of major urban renewal precincts in and around the central city to deliver high-quality, distinct and diverse neighbourhoods offering a mix of uses"*. The Arden Urban Renewal Precinct is identified as an area where increased development is anticipated.

Strategically the precinct has an important role to play in accommodating growth, however, this should not be at any cost and should protect the valued attributes (existing and proposed) within the precinct.

High quality places support the social, cultural, economic and environmental wellbeing of our communities, and are critical to the development of competitive and efficient cities and towns. New development and changes in land uses should respond to their context and enhance places of value to the community. Good urban design delivers places that are safe, healthy, functional and enjoyable[1].

The report analyses the *Draft Arden Structure Plan*, work undertaken by Hayball and Global Wind Technology Services, and undertakes complementary built form analysis to conclude with the proposed built form controls to deliver in Arden.

Critically it takes the Draft Plan and the principles established and analyses:

- the existing structure
- the proposed spatial plan, and
- the pattern of development approved within and surrounding the precinct and other similar precincts.

This analysis, combined with the consideration of Ministerial Practice Notes and Guidelines to recommend a range of built form controls which provide flexibility and certainty of outcomes to deliver the vision for Arden.

Consideration of the strategic aspirations for Arden, including its significance as an identified renewal area within the Melbourne Planning Scheme, and providing a recommended suite of built form controls will balance place quality with the desired strategic land use aspirations for the precinct.

The range of built form measures are broadly consistent with the Draft Plan including street wall height, setbacks above street wall (both to the street and to side and rear boundaries), building height, and solar protection. The recommended controls also include floor area ratios which have been refined following built form testing. The recommended controls refine these elements, define a measure for setbacks which were not previously specified in the Draft Plan, and also complements the controls with wind effect requirements.

The built form testing undertaken by the Victorian Planning Authority was to ensure that flexibility of outcomes and uses are successfully delivered across the precinct.

1 *Urban Design Guidelines for Victoria*, 2017

There is a clear link between building typology and floor area ratio. Retaining a range of heights is useful in denoting the variance in site size and geometry throughout the precinct. Linking typological requirements with the range of heights and floor area ratios provides a way to distinguish not all sites are the same size, therefore the same height is unlikely to be achieved in every instance and diversity in overall building height will add to the skyline.

Flexibility in the controls allows for a variety of uses, to respond to the innovation sector needs and responds to the preference for performance-based planning scheme to accommodate variation, innovation and unforeseen uses and developments or circumstances for site specific response. This is consistent with Practice Note 59.

Proposed built form parameters

The following proposed built form parameters have been informed by the peer review and built form analysis and provide guidance in determining the built form proposition and implementation of the *Arden Structure Plan*. It is recommended that the Planning Scheme Amendment includes built form guidance on the following topics (with specific measures outlined in **Chapter 5.0**) as follows:

1. Street interface
2. Building setbacks (including to street and to side and rear boundaries)
3. Building height and floor area ratio
4. Solar protection
5. Wind effects
6. Public interface and design detail (including laneways, through block links and pedestrian and cycling connections, active street frontages, traffic conflict frontages, weather protection)
7. Adaptable buildings.

2.0 INTRODUCTION

The *Arden Urban Design and Built Form Analysis* has been undertaken by the Victorian Planning Authority to inform and complement work undertaken by other contributors following the *Arden Vision* and the *Draft Arden Structure Plan* (the Draft Plan).

The establishment of Arden as a successful innovation precinct requires the delivery of a high-quality built form and public realm which provides the amenity required to attract major public and private investment. The expectations for the precinct should be commensurate with its inner-city location and policy objectives, where built form outcomes balance Arden as an attractive investment opportunity and as a precinct of high quality presentation.

The Victoria Planning Provisions provide an overarching framework to support both the strategic setting for renewal areas and urban design. Clause 11.02-2S (Structure Planning) seeks to facilitate the orderly development of urban areas with strategies including to *"undertake comprehensive planning for new areas as sustainable communities that offer high-quality, frequent and safe local and regional public transport and a range of local activities for living, working and recreation"*.

The new Arden Station is currently under construction as part of the Metro Tunnel Project. It will be served by the Sunbury, Pakenham, and Cranbourne lines. The station will have a direct link to Melbourne Airport in 2029 via Melbourne Airport Rail.

Arden Station, as shown in **Figure 1**, will set the tone for urban renewal. Its design will reference Arden's rich industrial history using materials such as clay brick, bluestone, timber, steel and glass. The design features 15 soaring brick arch segments, featuring more than 100,000 bricks that were manufactured in Victoria. The station will include a café with terraces for outdoor dining. Public seating, garden beds and lawn areas will provide a new gathering place for locals and passengers to enjoy. Due to flooding constraints in the precinct, the station entrance is raised 1.5 metres above the existing surface level.

A generous public realm surrounds the station offering view lines to this new landmark and gateway into Arden via the Metro Tunnel.

Figure 1 Render of Arden Station looking from Laurens Street at the corner of Barwise Street. Source: Metro Tunnel.

Laurens Street will be upgraded to become a more pedestrian and public transport-oriented street with additional tree planting. Barwise Street will be transformed into a greener, more pedestrian-friendly laneway while maintaining access for existing properties.

The Arden urban renewal precinct is envisaged to be a world-class innovation and technology precinct which is catalysed by the new Arden Station scheduled to open in 2025. This station will connect the digital technologies, life sciences, health and education sectors in Arden with Victoria's growing knowledge economy.

Arden will be an exemplar mixed-use urban renewal precinct at the forefront of sustainable and inclusive development with quality urban realm, a thriving network of open spaces and community facilities.

Inclusive growth will occur by providing affordable housing options and creating educational, employment and other opportunities for low-income residents of the city.

The precinct will have its own civic heart and character. It will remain connected to its Aboriginal and industrial heritage as it changes to support a diverse resident and worker population. It will become a new neighbourhood of Melbourne with quality and affordable housing, active transport links, adaptable community facilities, schools and workspaces.

Arden aspires to accommodate approximately 34,000 jobs and around 15,000 residents by 2051.

2.1 Purpose of this report

The *Arden Urban Design and Built Form Analysis* report forms the strategic justification for the built form controls for the Arden Precinct.

The report:

- Establishes the urban design requirements for this precinct to ensure consistent, high quality and context-sensitive urban design outcomes for Arden
- Details the urban design changes since the release of the Draft Plan in June 2020
- Provides the strategic justification for proposed changes
- Ensures proposals are developed with collaborative, multi-disciplinary, integrated design thinking across all elements of the precinct
- Provides the framework for a performance-based assessment against the built form parameters.

This document provides the recommendations for built form controls that should be included to frame the appropriate delivery of the policy aspirations, strategies and framework to guide development within Arden.

2.2 Structure of this report

This report assists with recommendations in support of the Planning Scheme Amendment including:

- Introduction
- Policy and strategic context
- Development activity analysis
- Built form analysis
- Proposed built form parameters.

2.3 What is urban design?

Urban design is the practice of shaping the built environment to improve the quality and overall liveability of cities and towns. While urban design is often tailored for a specific project, the dynamic and evolving nature of urban environments means that realising urban design outcomes is a long-term process.

Urban design is about more than just the appearance of the built environment. It also relates to the functional, environmental, economic and social outcomes of a precinct.

Urban design operates on a variety of scales, from the macro scale of urban structures such as city-wide transport networks, to the micro scale considering elements such as materials and finishes and integration of services within a building.

Good urban design employs a multidisciplinary approach to create integrated and considered environments and involves many areas of expertise.

Urban design is important because of its potential to significantly influence:

- The functionality, character and identity of public places for individuals and communities
- Active and public transport connections and user behaviours
- The levels of comfort, accessibility, safety and inclusiveness of places
- The expression of social and cultural values associated with places
- The socio-economic composition, diversity and economic vibrancy of urban areas
- The sustainability and resilience of urban environments
- Community connectedness, health and wellbeing, and pride of place.

2.4 Urban design in Arden

Arden is a significant and complex precinct that will alter the urban fabric of part of North Melbourne. Urban design has the single greatest influence on a project of this scale and is essential to positively shape the city. Urban design is integral to achieving the highest standards in design with an iterative and collaborative design process.

The built form within Arden must continue to support Melbourne as a diverse and liveable city. Embedding urban design thinking at the outset of the planning and design process for Arden will ensure the wider social and environmental benefits of the project are achieved.

Arden will provide an enduring positive legacy, connecting North Melbourne to the Central City via the Parkville National Employment and Innovation Cluster (NEIC). The precinct will integrate with the existing areas of North Melbourne, West Melbourne and Kensington immediately, and to the broader municipality.

Arden will provide high quality public realm outcomes, with a focus on sustainability, sustainable modes of transport and walkability.

Arden will piece together distinct sub-precincts and connect Arden with neighbouring areas to help attract new businesses and residents to the precinct. The new streets and spaces will be framed by high quality architecture – as the expectation rather than the exception – to help deliver the key directions of exemplary urban design in Arden.

Key recommendations from the Draft Plan include:

Built form and character

- Deliver a range of built form typologies in Arden to meet the needs of different uses and users with a layered mix of low-, mid- and high-rise and hybrid typologies (such as perimeter blocks with slender towers)
- Require spacing between taller buildings to create a skyline of separate forms, rather than a continuous wall of built form
- Ensure buildings are setback sufficiently from front, side and rear boundaries (based on the height of a building) to help deliver comfortable wind conditions, enable adequate sunlight and daylight in streets, allow for views to the sky, to not overwhelm the public realm and achieve privacy
- Locate taller buildings to have minimal impact on surrounding areas. Important views into and out of the precinct will be created by responding to local topography
- Create a distinct, varied and architecturally interesting skyline for Arden that establishes a strong sense of place at a local and city scale
- Facilitate the transition of scale between buildings fronting Dryburgh Street and Laurens Street
- Require development directly abutting heritage built form to respond with a respectful and contextually appropriate design
- Design of service areas are required to adopt best practice design to integrate and positive contribute to the street environment.

Access and movement

- Provide new, direct and convenient pedestrian connections that align with other streets, laneways or walking routes in new development
- Deliver appropriate built form interfaces to street, avoiding service frontages of greater than 10 metres
- Ensure the site layout of development responds to the function and character of adjoining streets, laneways and open spaces.

Public realm

- Maximise safety through activation of the ground floors around open spaces
- Provide comfortable wind conditions in the public realm
- Ensure a high level of amenity within new developments and consider amenity impacts on neighbouring development
- Ensure new development does not cast any additional shadow to that cast by buildings built to the maximum street wall to the new neighbourhood park in Arden Central from 11:00am to 2:00pm from 21 June to 22 September
- Ensure new development does not cast any additional shadow to that cast by buildings built to the maximum street wall to Clayton Reserve, North Melbourne Recreation Reserve and the new open space park in Arden North from 11:00am to 2:00pm on 22 September.

3.0 POLICY & STRATEGIC CONTEXT

This chapter articulates policy and strategic context with a built form focus.

3.1 Arden Vision

The *Arden Vision* guides the precinct's future land use vision and urban structure. It underwent public consultation in 2016 and was finalised in 2018. Key directions 1 and 2 are key to informing the built form proposition:

Transforming Arden

Arden will advance Melbourne's strengths as a progressive, innovative and connected local and global city. The new North Melbourne Station [now known as Arden Station] *will catalyse Arden's transformation into a new employment hub. There will be significant opportunities for better and diverse ways of working, living and learning, as it evolves from an industrial area into an innovation precinct.*

Designing a distinctive place

Arden will be shaped by exemplary urban design and built form, anchored by the valued characteristics that make the suburbs of North and West Melbourne special to its residents and workers. Public areas will respond to the existing environment and strengthen the evolving identity of the precinct.

3.2 Draft Arden Structure Plan

The *Arden Structure Plan* supersedes the *Arden–Macaulay Structure Plan* (2012) prepared by the City of Melbourne. It was released as a draft in June 2020 for public consultation and has been updated to reflect feedback and further technical work undertaken since this time.

The *Arden Structure Plan* translates the vision for Arden into objectives and strategies to guide how the precinct should develop in the short-, medium- and long-term along economic, physical and social dimensions.

The Draft Plan included preliminary design recommendations (**Chapter 3: Designing a Distinctive Place**) to inform the draft built form proposition and spatial plan. These included:

- A range of built form typologies and uses layered in low-, mid- and high-rise developments
- Locating taller buildings to have minimum impact on surrounding areas and in response to local topography
- To create a varied and distinct skyline
- Site layout of development to respond to the function and character of adjoining streets, laneways and open spaces
- Encourage fine grain ground floor shop fronts, lobbies and service areas
- Ensure solar protection of open spaces to varying performance criteria.

These preliminary design recommendations provide the foundation for changes from the Draft Plan to the final Arden Structure Plan.

3.3 Plan Melbourne

Plan Melbourne 2017–2050 (Plan Melbourne) is the Victorian Government's strategic planning policy for greater Melbourne. It identifies Arden as a major urban renewal precinct, with the purpose to take advantage of under-utilised land close to employment, services and public transport infrastructure and to provide new housing, jobs and services.

Outcome 4 of Plan Melbourne is to support Melbourne as a distinctive and liveable city with quality design and amenity.

Policy 4.3.1 *Promote urban design excellence in every aspect of the built environment*

Plan Melbourne outlines urban design principles and guidelines to be considered when assessing the design and built form of development and infrastructure to create places that are:

- accessible, safe and diverse
- enjoyable, engaging and comfortable to be in and move around
- accommodating of people of all abilities, ages and cultures
- celebrations of the city's social, cultural and natural heritage.

The policy direction also supports the state government taking leadership in design review and design excellence.

3.4 Planning Policy Framework

The following state standard provisions are relevant to Arden and have informed the built form analysis:

15.01-1S Urban design: To create urban environments that are safe, healthy, functional and enjoyable and that contribute to a sense of place and cultural identity.

15.01-1R Urban design – Metropolitan Melbourne: To create a distinctive and liveable city with quality design and amenity.

15.01-2S Building design: To achieve building design outcomes that contribute positively to the local context and enhance the

15.01-3S Subdivision design: To ensure the design of subdivisions achieves attractive, safe, accessible, diverse and sustainable neighbourhoods.

15.01-4R Healthy neighbourhoods – Metropolitan Melbourne: Create a city of 20-minute neighbourhoods, that gives people the ability to meet most of their everyday needs within a 20 minute walk, cycle or local public transport trip from their home.

15.03-1S Heritage conservation: To ensure the conservation of places of heritage significance.

15.03-2S Aboriginal cultural heritage: To ensure the protection and conservation of places of Aboriginal cultural heritage significance.

3.4.1 Urban Design Guidelines for Victoria

The *Urban Design Guidelines for Victoria* was prepared by DELWP to assist in delivering good design and built form outcomes. They provide advice on the design of public spaces, building design in relation to a building's interface with public spaces, and the layout of cities, towns and neighbourhoods.

The *Urban Design Guidelines for Victoria* is a background document in all planning schemes through the State Planning Policy Framework.

3.5 Local Planning Policy Framework

3.5.1 Municipal Strategic Statement

The following local planning policies are relevant to Arden and have informed the built form proposition:

21.06 Built environment and heritage: The policy outlines the City's vision for built form and heritage, including that development must add positively to Melbourne's public realm and contribute to making it safe and engaging for users.

- **Objective 1** – To reinforce the City's overall structure
- **Objective 4** – to ensure that the height and scale of development in appropriate to the identified preferred built form character of an area
- **Objective 5** – To increase the vitality, amenity, comfort, safety and distinctive City experience of the public realm
- **Objective 6** – To improve public realm permeability, legibility and flexibility
- **Objective 7** – To create a safe and comfortable public realm

21.14-2 Proposed urban renewal areas – Arden–Macaulay: In line with local policies of growth, settlement and housing, this area is specifically designated as an area of change that will accommodate the future workers and residents of the City of Melbourne. The urban design response should be proportionate to this growth.

3.5.2 Local planning policy

22.01 Urban Design within the Capital City Zone

Clause 22.01-2 sets out the building design objectives for buildings within the central city. The Arden precinct is not part of the Hoddle Grid or Southbank, but the principles applied here can inform the future built form proposition for Arden.

22.02 Sunlight to Public Spaces

This City of Melbourne policy is based on sunlight access to public open spaces, and states that:

> *Development should not unreasonably reduce the amenity of public spaces by casting additional shadows on any public space, public parks and gardens, public squares, major pedestrian routes including streets and lanes, open spaces associated with a place of worship and privately owned plazas accessible to the public between 11:00am and 2:00pm on 22 September measured on 22 September between 11:00am and 2:00pm.*

22.17 Urban Design Outside the Capital City Zone

Clause 22.17 sets out the city's policy for accommodating growth and change outside of the Capital City Zone. Where the built form character of an area is established and valued, new development must respect this character and add to the overall quality of the urban environment.

In areas where built form change is more substantial, a new and equally attractive environment must be created. The Municipal Strategic Statement identifies areas where there is a desire for built form change and a preferred new built form character.

3.5.3 Central Melbourne Design Guide

The City of Melbourne has prepared the *Central Melbourne Design Guide*. The purpose of this guide is to support the interpretation of urban design in the central city and Southbank areas of the City of Melbourne. The design guide's focus is to achieve good quality urban design in the areas of highest density in the city.

The design guide has prepared objectives and strategies to six key elements of urban design:

- Urban structure
- Site layout
- Building mass
- Building program
- Public interface
- Design detail.

The *Central City Design Guide* has informed proposed amendment C308 to the Melbourne Planning Scheme to update and review Schedule 1 of the Design and Development Overlay across the central city.

4.0 DEVELOPMENT ACTIVITY ANALYSIS

Permit analysis has been undertaken to assess recent and emerging patterns of built form within and adjacent to the precinct.

Development applications demonstrate a baseline and benchmark for development within the local context. The developments are also a good indicator of development feasibility, particularly those under construction.

VPA obtained planning permits within the North Melbourne and Kensington areas from both the City of Melbourne and DELWP (where the Minister for Planning is the responsible authority). A detailed review of the developments within the precinct and beyond was undertaken by the VPA and is detailed in the following sections. It is noted that the analysis is based on the information available and reflects plans at a point in time. Any subsequent updates to plans, including those endorsed in compliance with conditions of approval will not be reflected in the analysis to follow.

4.1 Development within Arden

There are only two permit applications (one approved, one under consideration) with the precinct boundary of relevance. The analysis of permit applications surrounding the precinct demonstrate trends where the trends relate to the nature of the built form controls (typically within a Design and Development Overlay).

86–108 Laurens Street, North Melbourne

Permit PA1800338 was issued by the Minister for Planning on 10 April 2019 for the construction of a multi-storey building and use of the land for office (including medical centre) and a reduction in the associated car parking requirement.

Max height (storeys)	51 metres (13 storeys)
Street wall height	2–3 storeys
Setback ground floor	Yes: cantilevered envelope above
Setback upper levels	Yes: 2.65–25.5 metres
Through block link	Southern boundary 3m width partly open to sky, partly enclosed, void 2–3 storeys)
Car parking	315 basement spaces
Gross floor area	23,402m² above ground
FAR	8.7:1

287–313 Macaulay Road, North Melbourne

Permit Application TP-2021-53 is currently before the City of Melbourne. The site is currently affected by the interim controls of the Macaulay Structure Plan but sits within the precinct boundary of the Arden Structure Plan.

The development conforms to the built form provisions within DDO63.

Proposed land use	Residential: 120 apartments Retail: 2,048m²
Apartment mix	10% 1 bedroom (12) 65% 2 bedroom (78) 25% 3 bedroom (30)
Max height (storeys)	45.4 metres (12 storeys)
Street wall height	2 storeys retained fabric where development setbacks at Level 3 and where the envelope cantilevers back to frontage above
Setback ground floor	Yes: cantilevered envelope above
Setback upper levels	Yes: 2.65–25.5 metres
Through block link	Southern boundary
Car parking	104 basement spaces
Gross floor area	17,912m² above ground
FAR	9.2:1

4.2 Development outside Arden

4.2.1 Macaulay urban renewal area

There is a cluster of developments permitted in Macaulay, north of Arden. The image at right is taken from council's Development Activity Model, which demonstrates an intensity of development in the block bounded by Racecourse Road (north), CityLink (west), Boundary Road (east) and Sutton Street (south).

The development followed Amendment C190 gazetted on 23 October 2017 enabling the rezoning of the land and the introduction of built form controls. Design and Development Overlay – Schedule 63 (DDO63) is due to expire on 30 September 2021.

A detailed analysis of the development can be found at **APPENDIX A**.

Figure 2 The Macaulay cluster's proposed (blue) and approved (green) developments.

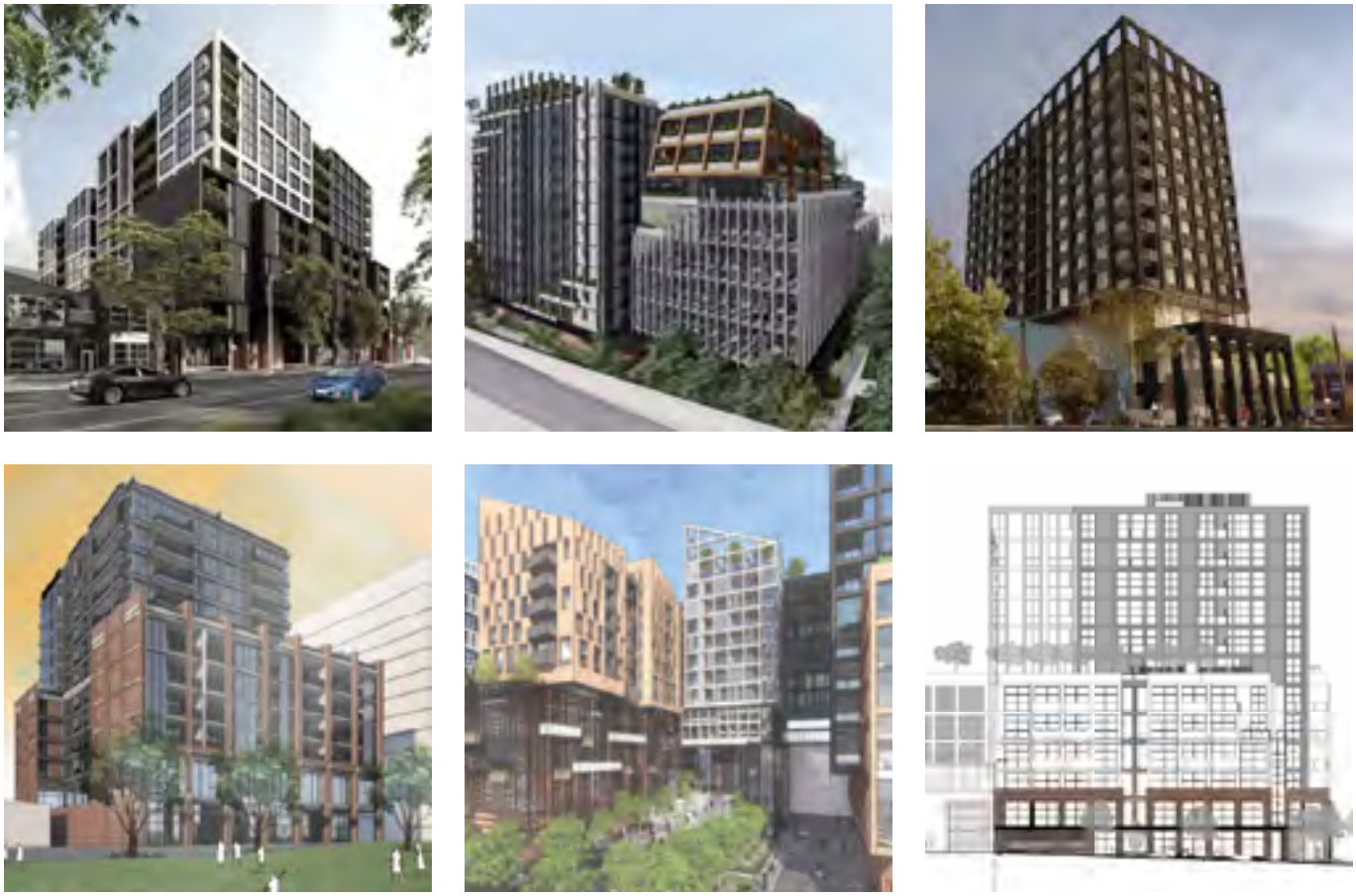


Figure 3 Some of Macaulay's proposed and approved developments.

Findings

The developments shown above and outlined below in further detail maximise building footprints in accordance with DDO63, in particular, the developments conform to the mandatory maximum height control, and street wall height.

Conversely, the developments show limited setbacks to adjoining site boundaries and separation between buildings on site, as a result of DDO63 not referencing any specific requirements for side and rear setbacks. This results in a homogenous building mass, street wall heights, and has not been successful in encouraging building diversity, or variety.

Of note, there is no floor area ratio control affecting land within Macaulay.

When considering this cluster, the average FAR was 5.7:1 to the mandatory height of 12 storeys. Due to the residential nature of the use, generally represent 0.5:1 ratio of FAR:height.

The Design and Development Overlay seeks pseudo 'uplift' requirements to exceed the preferred requirements to the mandatory maximum. More recently, development PA1900705 at 59-101 Alfred Street, North Melbourne was considered and determined by the Victorian Civil and Administrative Tribunal. Preceding the merits review of the permit application it was determined, on a question of law, that the wording contained with DDO63 to exceed the preferred height to the mandatory maximum height by:

> *A demonstrable benefit to the broader community that includes, among others:*
>
> - *Exceptional quality of design*
> - *A positive contribution to the quality of the public realm*
> - *High quality pedestrian links where needed*
> - *Good solar access to the public realm .*

It was determined that these words do not act as a mandatory requirement, that is, it is not necessary for development to demonstrate benefits as set out to exceed the preferred maximum height. Instead, these should be seen as providing guidance to consider the application of discretion to exceed the maximum height[1].

1 VCAT 1102 and VCAT 1462.

4.2.2 Parkville and other developments

The below analysis demonstrates that the nature of the developments within the surrounding area generally respond to the built form controls (commonly found in the form of a Design and Development Overlay). None of the developments are affected by floor area ratio (FAR) provisions.

Findings

The following is evident in the analysis:

- Development with City North and Parkville NEIC represented more intensive forms of development with greater heights and resulting FARs. These developments represented heights around 20 storeys with FARs of 13:1 to 16:1
- Institutional uses require larger floorplates (evident in CSL headquarters shown at right)
- Developments almost always build to the theoretical capacity of the site, accounting for setback and height control limitations (or lack thereof) and where these were discretionary, the preferred limits were commonly exceeded
- Maximised site coverage results in a representation of a FAR of 1:1 with height
- Residential development in excess of 8 storeys generally introduced setbacks from the street and side and rear boundaries, otherwise limited setbacks appeared at or below this height, and
- Developments generally exceeded discretionary heights where these were applied.

CSL headquarters, 611–681 Elizabeth Street, Melbourne

Proposed land use	Research & development
Max height (storeys)	19
Street wall height	18
Setback ground floor	No
Setback upper levels	Yes
Gross floor area	53,828m²
FAR	7.2:1
Land use areas	Research & development: 34,484m² Retail: 615m²
Floorplate average	2,833m²

4.3 Conclusions

Analysis of recent development activity within and outside of Arden was undertaken to assess recent and emerging patterns of built form and development applications in the adjacent area, including development outcomes with institutional development around Parkville NEIC.

The analysis demonstrated varied built form outcomes with clear links to the underlying controls.

Specifically, in most instances, a heavy reliance on mandatory height controls results in forms which meet the maximum with limited to no setbacks to streets or adjoining properties. Conversely, mandatory built form provisions for street wall heights, setbacks and overall heights result in forms which maximise the envelope.

In all instances, except for one permit application within the Laurens Street sub-precinct, all other applications are driven by built form controls and not by floor area ratios (FARs).

Recommendations

Arden's built form controls should include:

- Side and rear setbacks to boundaries to consider amenity protection to the development site and development opportunities for the adjacent site(s) as these do not appear in a number of the developments analysed and leads to limited setbacks and amenity protection
- Street wall height and overall height ranges to encourage diversity of built form outcomes, and
- FARs to assist in moderating the intensity of development relative to the site size.

5.0 BUILT FORM ANALYSIS

This chapter includes the built form analysis in support of the proposed controls. It addresses the built form outcomes and performance measures of the Draft Plan, reviews existing and preferred outcomes for the precinct and provides recommendations for built form and urban design controls.

The analysis follows built form testing undertaken by Hayball (see **5.1: Built form testing & peer review**) which then informs suitable built form controls.

The analysis considers the built form elements identified in the Draft Plan and how that translates into the following measures:

- Street interface
- Building setbacks
- Building heights & floor area ratios
- Solar protection
- Wind effects
- Laneways, through block links, and pedestrian and cycling connections
- Active street frontages, traffic conflict frontages and weather protection
- Adaptable buildings

This chapter also articulates whether these built form controls are mandatory or discretionary, having regard to the relevant Ministerial Guidelines and Practice Notes.

5.1 Built form testing & peer review

Hayball was engaged to undertake built form testing with consideration of the Draft Plan. Hayball tested 10 key sites throughout the precinct (refer **Figure 4** below) to consider their application and whether these could be optimised.

Analysis & findings

Hayball's report, *Arden Built Form Testing* dated 23 April 2021, resulted in the following findings:

- The Draft Plan specifies a range of heights and building typologies throughout, however these should be moderated and simplified to provide clearer guidance in their application
- FARs are strongly supported as they provide flexibility to accommodate site-specific design responses including inclusion of site open space and links
- Where applied, built form controls will influence envelope outcomes more directly and it is recommended that these are not overly prescriptive
- The built form outcomes for the sub-precincts will be heavily influenced by lot patterns and microclimatic considerations for example:
  - **Arden North:** sites to the edges and north of major open spaces will be particularly exposed to wind effects. Where mid-rise heights (defined in the Draft Plan as 7–15 storeys) are proposed, mitigating wind and solar impacts and compliance with Clause 58 (Apartment Developments) may drive podium/tower solutions
  - **Arden Central:** Large format typologies within the innovation precinct and solar protection of the central spaces will heavily influence built form solutions
  - **Laurens Street:** the edge of Laurens Street precinct may not require prescriptive setback controls due to smaller site sizes and lower FARs.
- Further articulation of the lane hierarchy and function is required for each sub-precinct to assist in defining how servicing of sites and parking provision can be accommodated without impacting pedestrian zones

Figure 4 Test sites across the Arden precinct.

- The fine grain network shows a number of links where testing should consider the appropriateness of the width and seek to consider floorplate efficiency and activation, where in some cases consideration of widening of these laneways to address overlooking between sensitive uses at podium level
- Built form controls should emphasis the need for mixed-use/commercial schemes to achieve the commensurate internal amenity which will futureproof buildings for changing uses over time
- The ratio of approximately 0.5:1 or 1:1 street wall to street is a scale consistent with many inner-city precincts, however, suggests that higher street holding forms could be comfortably accommodated on wider streets if offsite wind and shadow impacts can be managed
- Lot depths of 64 metres suggest this is readily achievable with full sleeving of above ground car parking
- Testing indicates this will be achievable within proposed heights where upper forms are well setback above street wall heights
- Further consideration of lot sizes and consolidation is recommended as this directly impacts the ability to achieve other elements such as full sleeving of above ground car parking
- The limited opportunity for basement car parking is a significant constrain on development (due to ground conditions and construction costs)
- Street wall heights measurements have increased due to raised finished floor levels to respond to inundation
- Perimeter block configurations for mid-rise forms may be constrained by wind requirements requiring setbacks to upper levels
- Clause 58 (*Apartment Developments*, better known as *Better Apartments*) requirements for residential schemes (for example solar access to communal open space) may promote podium solutions with setback upper tower elements
- Mid-rise forms will typically require setbacks to meet public realm criteria to minimise shadow impacts which may lead to greater use of podium tower solutions
- Clarity around requirement for side setbacks above street walls for mid-rise forms will be required to promote typologies and support development of narrow sites
- A minimum separation distance of 10 metres to address amenity interfaces has been established in the Central City. Additional spacing requirements to achieve sky views is less clearly defined. Where tower separation metrics are included in the built form controls, it is recommended that these are discretionary to allow for site-specific solutions
- Shadow times and periods have been specified in the Draft Plan, however, clarification above whether these are mandatory or discretionary, and
- Winter shadow will inevitably limit development potential but can be managed when applied as a criterion for key open spaces only.

Recommendations

Key recommendations made from Hayball's built form testing include:

- Methodology of discretionary built form controls and FAR
- Hierarchy and function of streets and lanes to resolve site servicing and pedestrian zones
- Parking strategy and how to resolve built form outcomes when considered car parking on site
- Consideration of shaping of forms where sites contain multiple buildings is suitable in order to moderate separation distances and pinch points
- Consideration of minimal setbacks to low amenity interfaces such as the rail corridor
- Marginal encroachments of shadowing of open spaces to avoid significant underdevelopment of sites
- The suitability of street holding forms subject to wind engineering advice
- Moderating the building height range and FARs in each sub-precinct to provide greater clarity on the desired built form outcomes
- The preferred built form outcomes for each sub-precinct should be clearly articulated in the controls to better understand the built form typologies being sought in each sub-precinct.

The above was considered further within the relevant built form elements which follow in **Chapter 5.2 to 5.8** inclusive.

5.2 Street interface

The quality of the public realm in Arden is important to the success of the precinct achieving the vision as a distinctive place. Building design and the interface with the streets, laneways and open spaces, especially at ground level, assist the ability to generate activity and provide a safe and engaging public realm.

Key design recommendations from the Draft Plan for how the built form should interface with the public realm and access and movement network are:

- Deliver contextually appropriate built form interfaces to streets with regard to street width and lower street wall heights on narrower streets
- Ensure buildings along Arden Street have a positive street address to both Arden Street and Barwise Street
- Encourage fine grain ground floor shop fronts, lobbies, and service areas.

The Draft Plan proposes 6 storey street wall heights with 4 storeys nominated to sensitive transition interfaces for Munster Terrace, Stawell Street, Dryburgh Street and Fogarty Street.

Analysis & findings

There is an important proportional relationship between street wall heights and street widths which supports a comfortable pedestrian scale and experience. The urban design principles underpinning this strategy seek a street and laneway width-to-height ratio of 1:1 because this is considered to provide an appropriate degree of enclosure. This consideration is particularly pertinent on wider 20 and 30 metre-wide streets.

The quality of the public realm in Arden is important to the success of the precinct achieving the vision as a distinctive place. Building design and the interface with the streets, laneways and open spaces, especially at ground level, assist the ability to generate activity and provide a safe and engaging public realm.

In *Cities for People* (Gehl, 2010) Jan Gehl argues that 5 storeys is considered the maximum height at which humans can read and experience the details of a building from ground level. The concept of human scale is not height *per se*, but visual interest offered at walking pace.

Street widths vary across the precinct as shown in **Plan 1** from 30 metres or greater at Arden Street and Queensberry Street, to narrower streets of 15 metres with some wider streets within the existing sub-precincts of Arden North and Laurens Street. In detail, the street widths generated by the spatial plan include:

- 50 per cent at 10 or less metres in width (any street less than 9 metres in width is considered a laneway)
- 33.3 per cent at more than 10 metres and less than 20 metres in width
- 12.5 per cent at more than 20 metres in width and less than 30 metres in width, and
- 4.2 per cent are wider than 30 metres.

For the main civic spines of Fogarty Street and Laurens Street an urban design response is required which creates a relationship between the street and built form that is fine grain and legible providing a continuously active edge to priority pedestrian areas. Controls should also be flexible enough to support different typologies and see a variation in the street wall height and finish which will provide part of the visual interest required for street level activation.

Fogarty and Laurens Streets are 15 to 20 and 30 metre-wide streets which would support an approximate street wall height of 4–6 storeys (differing depending on residential or commercial floor heights).

Taller or lower street wall heights may be suited to different building typologies, for example campus style buildings that require large floor plates to the boundary while tower and podium typologies may be more flexible in how the podium and tower are arranged in relation to the street and can be adapted to respond to the street and developing context.

Providing for preferred minimum and maximum street wall heights relative to street width is considered to be appropriate. This should consider greater street wall heights in support of innovation uses which require larger floorplates over fewer floors.

The street wall heights are recommended to incorporate heights which facilitate innovation uses, where a 4 metre floor-to-floor is encouraged.

There is precedent for street wall heights within the Melbourne Planning Scheme within the following Design and Development Overlay schedules as follows:

- Schedule 2 (Special Character Areas), Schedule 10 (General Development Area), Schedule 60 (Southbank Special Character Areas), Schedule 61 (City North) (in part), Schedule 62 (Bourke Hill), Schedule 71 (Former Peter McCallum Centre, East Melbourne) specifies a street wall height of 20 metres
- Schedule 33 (CBD Fringe, West Melbourne) specifies a street wall height of 16 metres
- Schedule 61 (City North) specifies a street wall height varying from 14 metres, 24 metres, 32 metres and 40 metres
- Schedule 63 (Macaulay) specifies varied street wall heights relative to street width ranging from 3 storeys to 6 storeys.

Schedule 67 (Fishermans Bend) includes a preferred street wall height of 4 storeys and a mandatory maximum of 6 storeys. A range of heights support variation to the street wall to create visual interest to pedestrians. Consideration of a greater variation in support of mid-rise innovation sector uses is also considered to be appropriate where overall height is limited to 10 storeys. This should also be considered when immediately adjacent proposed open spaces.

The street wall heights should support street walls ranging from 3 storeys to 6 storeys, and heights up to 8 storeys where overall height is limited to 10 storeys.

Given the need to meet wind and solar criteria, it is unlikely many buildings will be able to avoid street walls within the preferred range, however, discretion to consider street holding forms in excess of 6 storeys provides for site specific responses which have the potential to support varied streetscapes and typologies as demonstrated in **Figure 5** below.

Development will need to consider how any raised finished floor levels, required to manage potential flooding risk, impact on the pedestrian experience as well as ensure that frontages of buildings are:

- Pedestrian orientated and add interest and vitality to the adjacent public spaces.
- Contribute to the safety of the area by addition lighting and activity.

For raised finished floor levels or on sloping sites, the street interface considerations should include provision of a direct connection at grade to usable space within the ground level, with level transitions contained within the building envelope.

Figure 5 58–66 Dorcas Street, Southbank. An example of variation in street wall height from five to seven storeys in the same development. Vertical articulation of façade also contributes to streetscape character.

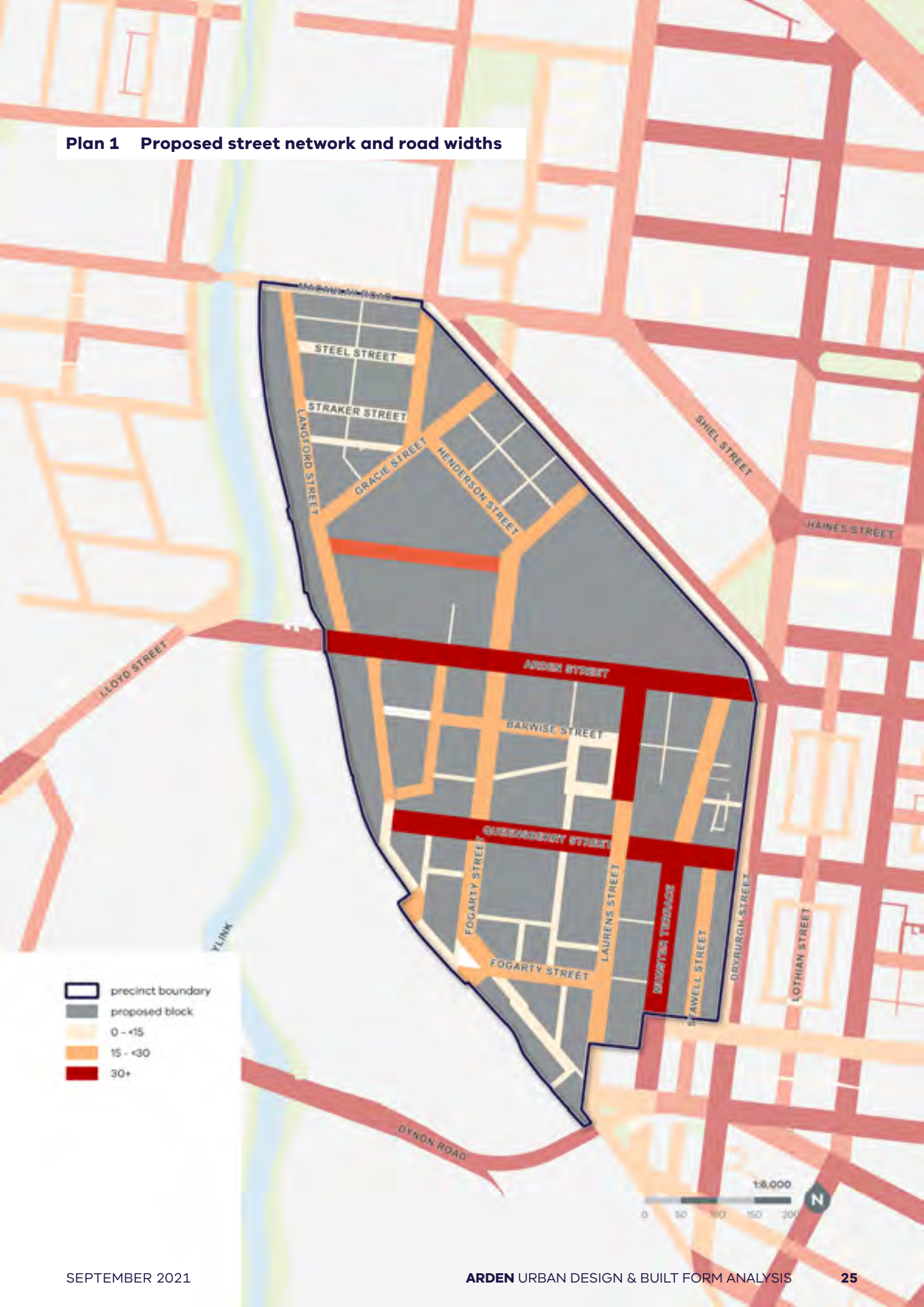
Recommendations

Street wall heights should include the following minimum and maximum street wall heights as follows:

Table 1 Street wall height

Street width	Building height	Minimum street wall height	Maximum street wall height
0 to 9 metres	None specified	12m	17m
Greater than 9 metres	Up to and equal to 41m	17m	33m
	In excess of 41m	17m	25m
Immediately adjacent to a proposed open space	Up to and equal to 41m	17m	33m
	In excess of 41m	17m	25m

Plan 1 Proposed street network and road widths



5.3 Building setbacks

5.3.1 Setback above the street wall height

This section is to further explore and detail the aspirations of the Draft Plan to include setbacks above street walls in support of different building typologies and responses to urban conditions.

Analysis & findings

The need to protect the public realm from negative built form impacts is important as the usage increases with greater population and activity. Attracting people to Arden relies on the economic, social and environmental success of the precinct including streets and public transport infrastructure, open spaces, useable spaces between buildings and providing space for social interaction and commercial exchange.

Setbacks above street walls assist in providing:

- Human scale
- Mitigation of wind downdrafts
- Views to sky between taller buildings
- Modulation and articulation that can create visual interest or mitigate potential shadow impacts.

When a lack of street wall and sufficient upper-level setbacks are pursued, buildings may read as extruded forms resulting in visual domination of the street and lack of human scale.

The Draft Plan recommended setbacks above street wall but did not specify a metric in support of that setback. The development analysis above demonstrates that if no setback is specified it can result in extrusion of forms without setback which contributes to visual bulk.

There is precedent for a setback above street wall within the Melbourne Planning Scheme within the following Design and Development Overlay schedules as follows:

- Schedule 2 (Special Character Areas) within the Central City which requires a preferred setback of 5 metres,
- Schedule 10 (General Development Areas) within the Central City which requires a mandatory minimum 5 metres,
- Schedule 33 (CBD Fringe) within West Melbourne which requires a preferred setback of 4 metres and 6 metres
- Schedule 60 (Special Character Areas- Built Form Southbank) which requires a preferred setback of 5 metres,
- Schedule 61 (City North) which requires a preferred setback of 6 metres,
- Schedule 62 (Bourke Hill) which requires a preferred setback of 5 metres, and
- Schedule 63 (Macaulay) refers to a setback of 1 metre for every metre of height above the street wall. This equates to a 3 to 4 metre setback for every storey of height.

The above setback requirements appear within Urban Renewal Areas identified within the Melbourne Planning Scheme, where there is a recognised desire to provide human scale within streetscapes. A setback is a straightforward way to achieve this.

Whilst extruded forms may be appropriate in some instances, such as located on a corner, or supporting campus-style building typologies (i.e. for innovation sector development which is the aspiration for Arden), generally a setback should be considered for buildings with greater height. The Draft Plan largely recommends heights between 16 and 40 storeys, which is considered to be high-rise.

High-rise development needs to have regard to building mass, bulk, relationship to the site area and to adjoining land, and how the mass can be articulated.

Generally a 5 metre setback supports habitable uses.

Supporting alternative built form responses, in particular campus-style building typologies should be enabled. As discussed in **5.2 Street interface** consideration of greater street wall heights for limited overall height could be provided for as demonstrated in the developments shown in **Figure 6** and **Figure 7**. These buildings include shaping and setbacks offered in the form of tapering the form to adjacent sites and minor setbacks from the façade. These examples demonstrate mid-rise development on 30 metre wide streets.

Recommendations

A 5 metre setback above the street wall should be provided and that this is discretionary, to support alternative approaches which demonstrate an ability to mitigate wind downdrafts, provide sky views between taller buildings and avoid bulk.

Figure 6 DKO development – 109 Wellington Street, Collingwood.

Figure 7 John Wardle Architects: 61–71 Wellington Street, Collingwood.

5.3.2 Setback above the street wall to side and rear boundaries and building separation

This section focusses on the relationship of development between contiguous developable parcels. It further explores the aspirations of the Draft Plan to include side and rear boundary setback controls.

Rear and side setbacks contribute to the visual delineation between the lower street wall and upper levels of a building, assisting responding to character and providing a human scale as discussed in **Chapter 5.2**.

In addition, inclusion of this type of controls limits views between habitable spaces of adjacent buildings on adjoining lots or between buildings within the same site. This is of particular importance when considering the future density of Arden.

Spacing between buildings in conjunction with street wall height and solar controls can also respond to the design principle encouraging variation in built form outcomes.

Analysis & findings

Minimising building bulk is a key factor informing the inclusion of rear and side setback controls in Arden. Discussion on existing permit applications within Macaulay highlights the risk of homogenous built form outcomes as a result of not specifying side and rear setbacks which provides space between buildings. Introducing side and rear setback requirements is to ensure that reasonable space between buildings is achieved regardless of use.

Recommendations from the Draft Plan require

> *"spacing between taller buildings to create a skyline of separate forms rather than a continuous wall of bulk when viewed from within Arden (particularly from the new neighborhood park and Capital City Open Space), and from surrounding areas, including those travelling on the adjacent rail lines or on the elevated CityLink freeway"*

also speaks to the need for controls, particularly in areas with sensitive uses and interfaces.

The existing context in Arden is characterised by buildings with high site coverage. Continuing this pattern of development is appropriate, however it is important to improve permeability of the precinct. Where large building mass reduces the ability for servicing or convenient and accessible pedestrian movement, laneways should be provided in the strategically identified locations shown on the plan.

Clause 58 (*Apartment Developments*, better known as *Better Apartments*) requirements for residential development may promote podium solutions with setback of upper tower elements, which is driven by the maximum apartment depth limit of 9 metres which influences floorplates to be limited to 18–22 metres in depth. This floorplate limitation also requires setbacks from side and rear boundaries in order to provide privacy, outlook and daylight to habitable rooms.

While the built form typology and future land use proposed for Arden may negate the need for increased side and rear setbacks at lower levels, achieving the desired public interface outcomes, taller buildings require greater separation at higher levels This is driven by consideration of the effects of the following:

- Comfortable wind effects within the public realm
- Adequate daylight and sunlight to public spaces
- Sunlight and daylight to and outlook from habitable rooms in existing and potential developments on adjoining sites
- Views to the sky between buildings
- Articulation of building mass to alleviate bulk associated with greater building height
- Taller buildings to not appear as a continuous wall when viewed from street level.

There is precedent for side and rear setbacks within the Melbourne Planning Scheme, albeit in a limited fashion, these are outlined in the following schedules of the Design and Development Overlay, as follows:

- Schedules 2, 60 and 62 (Special Character Areas of the Central City) which specifies a setback of 5 metres
- Schedule 10 (General Development Area of the Central City) which specifies a setback of 5 metres up to 80 metres in overall height and a setback which is 6 per cent of the overall building height above 80 metres
- Schedule 19 (St Kilda Road Area) which specifies a setback of 4.5 metres to side and rear boundaries
- Schedule 33 (CBD Fringe Area, West Melbourne) which specifies 6 metres to side and rear boundaries and 2 metres to laneways, and

- Schedule 35 (Royal Park and Royal Parade) and Schedule 36 (Royal Parade Central) which specifies 6 metres from side boundaries.

Consideration of separation distances between buildings on the same site has also been given. **Figure 8** below from Hayball's *Built Form Testing Report* demonstrated that with irregular site geometry, having 'pinch' points and greater setbacks alleviates walled effect. The greater degree of control of the interrelationship between buildings on the same site provides a greater degree of consideration of managing this interface, therefore lesser setbacks between buildings on the same site is warranted. A reduction of approximately 25 per cent is considered to be appropriate and is consistent with relevant precedent within the Melbourne Planning Scheme within Design and Development Overlay Schedule 10, which varies the 6 per cent setback requirement to a mandatory minimum of 10 metres.

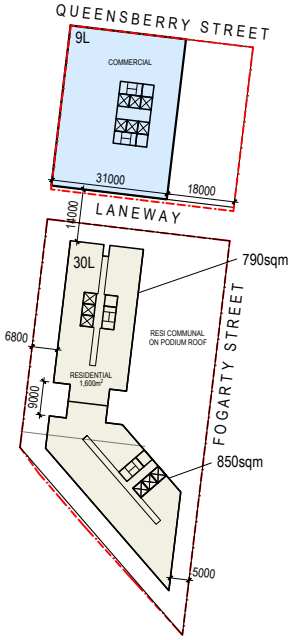
It is considered that the building setback requirements should be updated to consider:

Low-rise (up to 6 levels) – side and rear setbacks are not required and are dependent on typology and site interfaces.

Mid-rise (7–15 levels) – side and rear setbacks again depend on typology but for tower forms above a street wall or podium, a minimum 7.5 metres from side and rear boundaries to achieve a building separation of 15 metres.

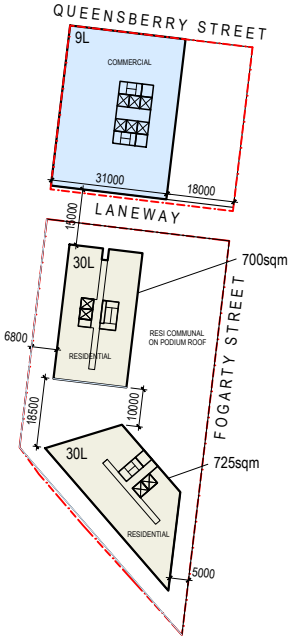
High-rise (16+ levels) – proportional to overall height to establish appropriate minimums building setbacks from side and rear boundaries of 10 metres from side and rear boundaries to achieve a building separation of 20 metres for heights above 64 metres up to 81 metres, and 12.5 metre setbacks from side and rear boundaries for any building above 81 metres in height to achieve building separation of 25 metres.

SINGLE TOWER



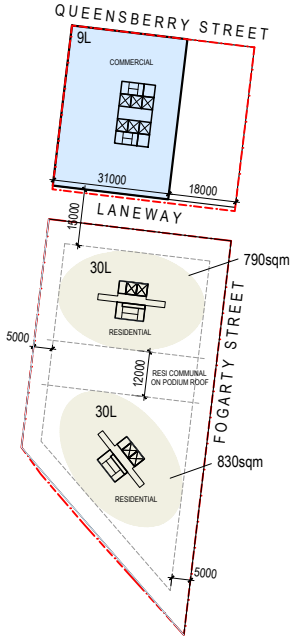
– Creates a continuous wall of building
– Continous tower with façade breakup
– Potential cross ventilation limitation
– Wind mitigation not addressed

SEPARATE TOWERS



– Further tower separation
– Pinch point of 10m (consistent with central city minimum tower separation
– Cross ventilation enabled
– Wind mitigation not addressed

SEPARATE TOWERS



– Non-rectilinear forms
– Pinch point of 12m provides improved access to sky views
– Cross ventilation enabled
– Wind mitigation considered in building forms
– Higher GFA but potentially inefficient apartment layouts

Figure 8 Tower separation distances study. Source: Hayball.

Recommendations

Relating setbacks and tower separation to height addresses some of the anomalies associated with much higher buildings being able to be developed for commercial use compared with residential development that have the same floor area ratio.

For sites with multiple buildings, a reduction of the separation distance is considered to be acceptable and should represent a reduction of approximately 25 per cent for multiple buildings on site. Therefore, the setbacks to side and rear boundaries and to multiple buildings on the same site is recommended as follows:

Table 2 Setbacks and separations

Height	Preferred minimum setback to side or rear boundary	Minimum separation distance for multiple buildings on the site
Above the street wall height and up to 64 metres	7.5 metres	12 metres
Above the street wall height and greater than 64 metres up to 81 metres	10 metres	14–16 metres
Above the street wall height and greater than up to 81 metres	12.5 metres	18 metres

5.4 Building height and floor area ratio

The Draft Plan included a number of building heights and floor area ratios throughout the precinct. The purpose of these is to guide development with a range of heights to create visual interest and depth while helping avoid solid walls of development.

Analysis & findings

Melbourne Planning Scheme – Strategic Context for Heights in Arden

Arden is identified as an Urban Renewal Precinct at Clause 21.14-2 (proposed Urban Renewal Areas) and 21.04 -1 (Growth Area Framework) of the Melbourne Planning Scheme.

The Melbourne Planning Scheme *Growth Area Framework* categorises areas of the municipality to target development.

The framework divides the areas into five categories reflective of the area's capacity for targeted growth and renewal:

- The original city (Hoddle Grid)
- Urban renewal areas
- Proposed urban renewal areas
- Potential areas, and
- Stable residential areas.

Urban renewal areas are considered optimal for providing higher density built form due to their proximity to the central city and benefit of existing infrastructure.

Arden–Macaulay is considered to, at present, have *"some degree of land under-utilisation given its potential in relation to its proximity to the central City"* and as such is identified as an existing urban renewal area under the scheme.

The completion of the Metro Tunnel station at Arden is expected to further change Arden and the surrounding area.

As evident in **Figure 9** below Arden is defined as a growth area adjacent to other renewal precincts and stable areas of the municipality. Development is expected to be more intense within this growth areas compared to the stable areas.

Areas immediately to the west of Arden in North Melbourne are *stable residential areas*. These areas are expected have limited capacity for infill or renewal type development and as they are valued for their existing built form character.

The topography of the precinct also influences the built form and its transition to areas beyond. The significant falls into the precinct require consideration of the appropriateness of what is a transitional height, rather than relying on the literal transition from height controls affecting land outside of the precinct.

The areas adjoining Arden are subject to height controls with existing built form of varied heights.

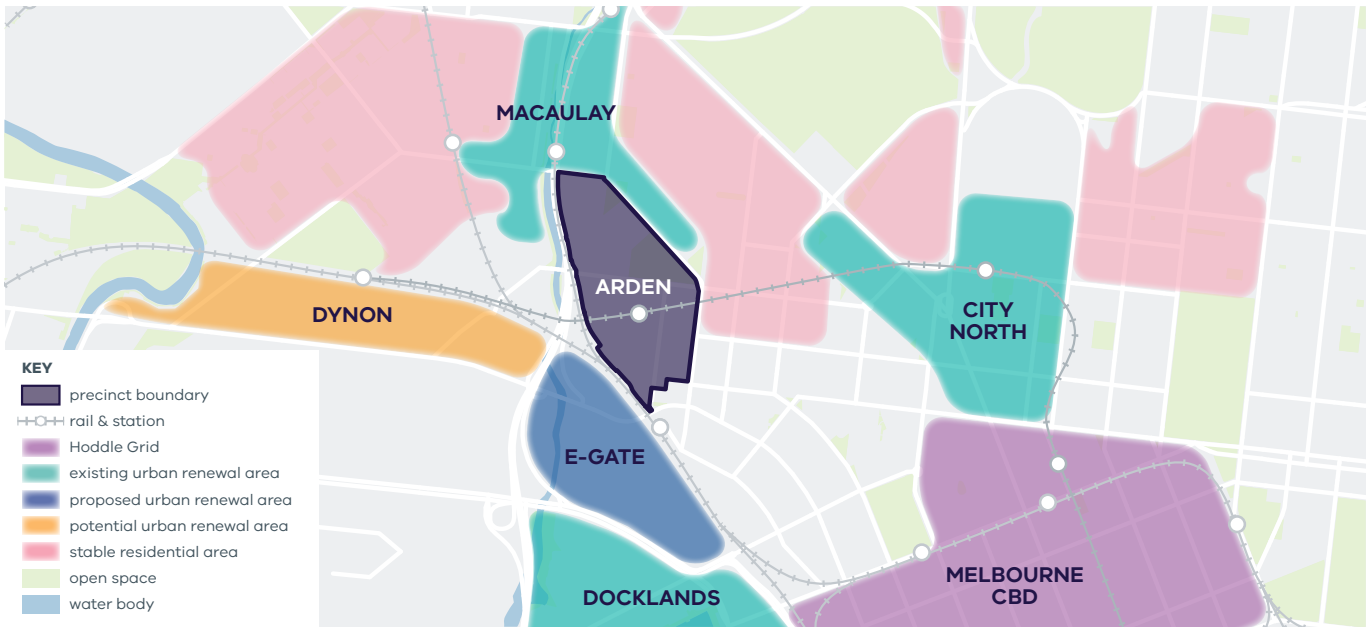


Figure 9 Arden's strategic setting and heights, based on Figure 1 – Growth Area Framework Plan, Melbourne Planning Scheme.

As seen on **Plan 2**, the Design and Development Overlays already applying to Arden and Macaulay urban renewal areas largely affect land outside of the Arden precinct. Most of these controls include mandatory height controls.

DDO63 includes both a preferred maximum height and an absolute maximum control to ensure scale of built form is consistent with the established context (A1–A8). A permit cannot be granted to exceed the absolute maximum height.

Table 3 DDO63 – building heights

Area	Preferred maximum height	Absolute maximum height
A1	3 storeys	4 storeys
A2	4 storeys	6 storeys
A3, A4	6 storeys	8 storeys
A5	8 storeys	N/A
A6	6 storeys	8 storeys
A7	9 storeys	12 storeys
A8	9 storeys	12 storeys

DDO31 and DDO32 affect the easternmost land within the Laurens Street sub-precinct. Both include mandatory maximum heights as follows:

Table 4 Building height

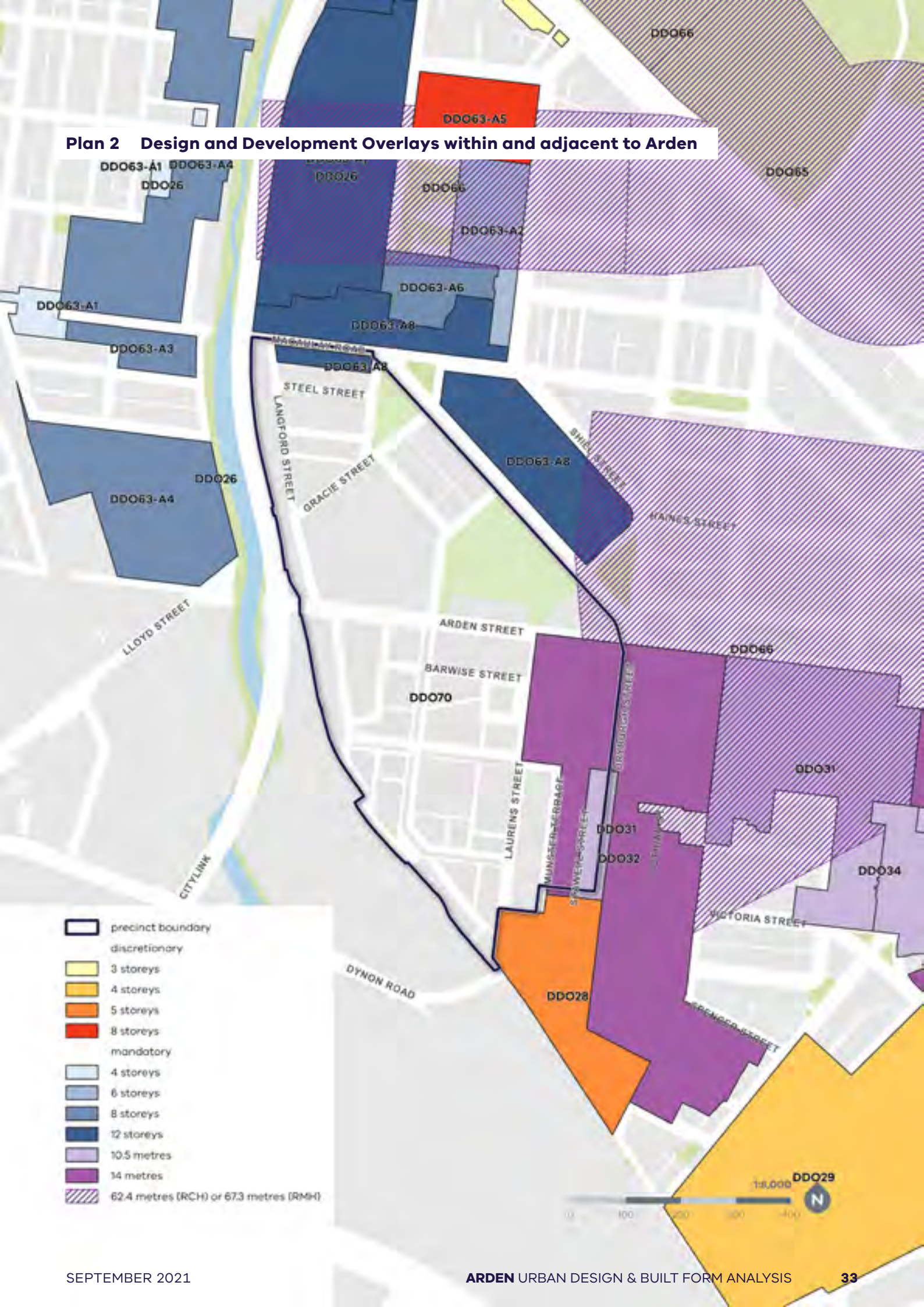
Area	Preferred maximum height	Absolute maximum height
DDO31	N/A	10.5 metres
DDO32	N/A	14 metres

DDO28 (North Melbourne Station) is immediately south-east of the Laurens Street sub-precinct and forms part of the West Melbourne Structure Plan. DDO28 includes a mandatory 5 storey height control.

The West Melbourne Structure Plan seeks to modify DDO28 by introducing:

- Street wall height of between 4 and 8 storeys
- Preferred maximum building height of 8 storeys
- Adaptable floor to ceiling heights including 4 metres at ground level and 3.3 metres for all non-residential uses on other floors
- Active street and laneway frontages
- Provision of laneways, pedestrian and cycling connections at regular intervals to provide links at approximately 100 metre intervals
- mandatory FAR of 5:1, and
- Ability to exceed the mandatory FAR with bonus floor area, which is considered as 50 per cent of the pre-demolished gross floor area of a Special Character Building (identified heritage buildings) that is retained.

Plan 2 Design and Development Overlays within and adjacent to Arden



5.4.1 *Draft Arden Structure Plan* proposed character

Objective 5 of the *Draft Arden Structure Plan* is to:

> *Introduce density and built form controls that help transform Arden into a world-leading urban renewal precinct and innovation precinct while celebrating the precinct's existing assets and surrounding neighbourhoods.*

Strategy 5.1 of the *Draft Arden Structure Plan* outlines the preparation of a design guide and planning scheme amendment to implement the relevant strategies of the plan. This design guide will follow and implement the design recommendations, floor area ratio controls and built form controls.

The main elements of the proposed built form character as outlined in the *Draft Arden Structure Plan* for each precinct are:

Arden Central

- Low to mid-rise development within the core surrounding the new open spaces and the heart of Arden, with denser and taller buildings layered around the edge. A range of typologies will be required to respond to the controls, specific land use needs and the opportunity for taller built form in the south-west area.

Arden North

- Mid to high-rise developments on larger sites and a hybrid of perimeter blocks and slender towers to avoid significant overshadowing of Clayton Reserve, North Melbourne Recreation Reserve and the new integrated stormwater management open spaces in Arden North.

Laurens Street

- Predominantly low to mid-rise developments with some opportunities for additional upper levels that are visually recessed from the street and provide appropriate solar access to streets. Some high-rise development as appropriate near the new Arden Station.

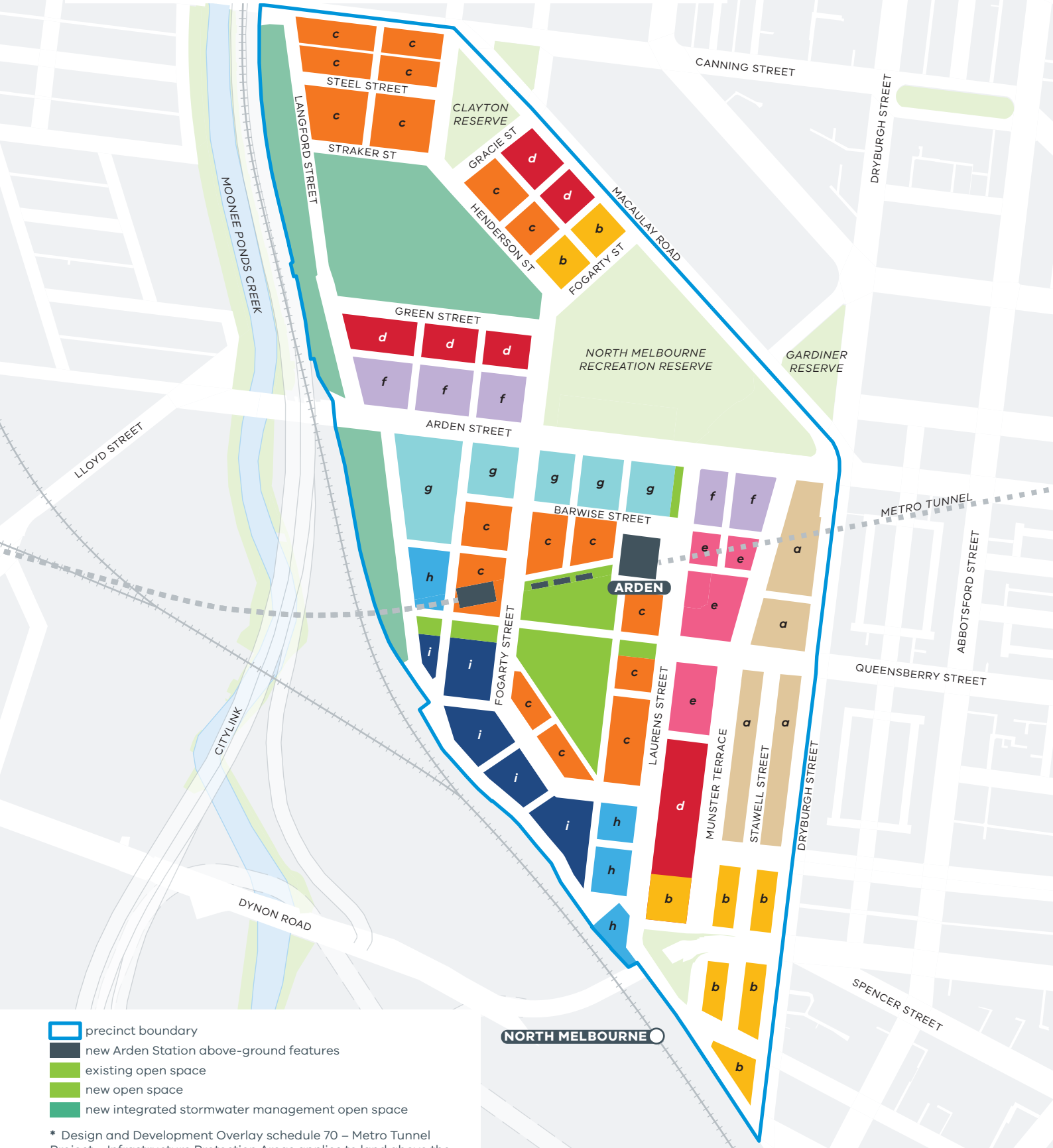
Analysis & findings

The *Draft Arden Structure Plan* sought to incorporate an urban structure where the network of streets and open spaces respond to the existing context, including surrounding buildings and topography, and to provide a framework for the future development and transformation of Arden.

The anticipated built form is shown in Figure 20 and subsequently in Plan 6 of the *Draft Arden Structure Plan*, shown at **Plan 3** overleaf.

Figure 10 Concept plan for key moves that have informed the new urban structure.

Plan 3 Figure 20 and Plan 6 of the *Draft Arden Structure Plan*



* Design and Development Overlay schedule 70 – Metro Tunnel Project – Infrastructure Protection Areas applies to land above the Metro Tunnel. The maximum height of buildings within DDO70 will be subject to the design clearance and loading allowance of the tunnel.

Note: Further built form analysis will be carried out for the Final Arden Structure Plan to test and refine the FARs and how they work with the proposed height and other built form controls.

The *Draft Arden Structure Plan* defines:

- **Low-rise:** up to 6 storeys
- **Mid-rise:** 7–15 storeys
- **High-rise:** 16 storeys and above

The intention is to provide built form transition from the established lower scale of North Melbourne towards the higher density development in Arden Central and around the new Arden Station while also ensuring appropriate sunlight access to new and existing open spaces.

Arden is anticipated to provide for the anticipated growth in the municipality over the next 20 years, where Arden is supporting the Central City expansion (Clause 21.04-2 of the Melbourne Planning Scheme).

Arden is recognised as an area in transition where the Metro Tunnel Project will lead to major change within this precinct (Clause 21.14-2 of the Melbourne Planning Scheme).

Arden transitions to adjacent areas in differing ways:

1. Laurens Street sub-precinct to the stable residential areas of North Melbourne to the east and the transitioning West Melbourne Structure Plan to the south-east
2. Arden North sub-precinct to the Macaulay Urban Renewal Area to the north and west.

When consideration is given to Arden and its transition to the stable residential areas of North Melbourne immediately to the east, regard also needs to be given to the topography of the land, which includes a five storey fall at its southern end between Laurens Street and Dryburgh Street (see **Figure 11** below).

Building heights of 16–18 storeys are considered appropriate in a punctuated form in this part of the precinct. This enables greater height on the Laurens Street spine as the degree of transition to the lower scaled buildings. Further, any higher forms will likely be positioned on larger sites where setbacks and building breaks can be achieved. Such forms would also occur with a diversity of building forms and heights in the Laurens Street sub-precinct where there is a mixed character. This mix of forms will serve as a foreground to the higher forms positioned in Arden Central thus providing transition overall from the established areas to the east.

The existing context and emerging patterns of development in the Macaulay Urban Renewal are key factors when considering the transition between Arden North and established areas to the north and west of the precinct.

The analysis considers both existing and permitted built development in Macaulay. There is a topographical fall from Macaulay to Arden so any development in Arden will read as comparable in scale to the existing taller development on Macaulay Road. Further, the permitted heights of up to 12 storeys in Macaulay will provide a suitable transition and relationship with new development in Arden. Collectively there is anticipated to be a diversity of form and scale.

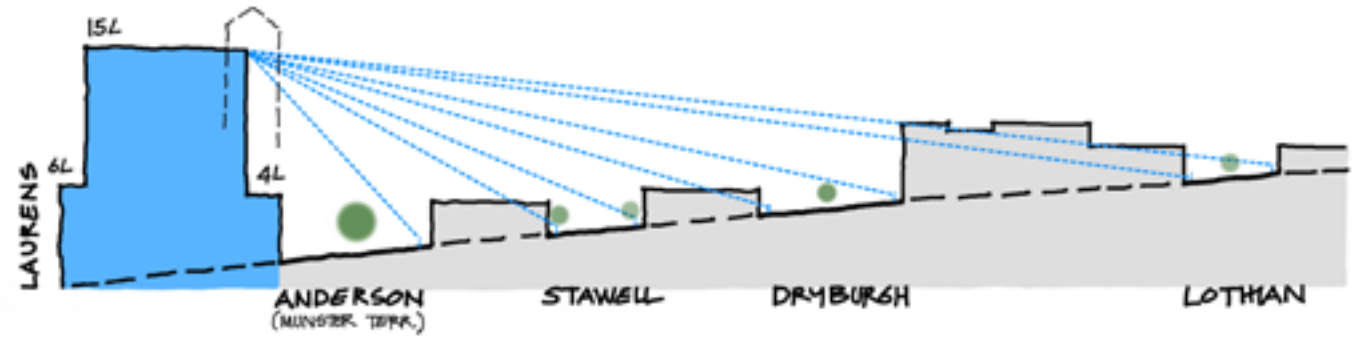


Figure 11 Height transition from North Melbourne to Laurens Street through the Laurens Street sub-precinct.

The western interface of Arden abuts the elevated CityLink freeway which buffers the precinct from established development in Kensington. This is a less sensitive interface where taller forms are appropriate.

When regard is given to specific sub-precinct aspirations set out in the *Draft Arden Structure Plan* there is general encouragement to support heights which avoid significant overshadowing of key open spaces.

Managing building heights can:

- Contribute to a varied and architecturally interesting skyline which is also a result of various lot sizes.
- Contribute to a diversity of building typologies and avoids repetitive built form.
- Limit impact on the amenity of the public realm as a result of overshadowing and wind.

Recommendations

Expressing heights in Arden as a range is useful to support a variety of typologies. Greater certainty regarding heights is achieved by expressing these in metres to clarify the anticipated scale throughout, particularly adjacent to open spaces, when managing solar protection.

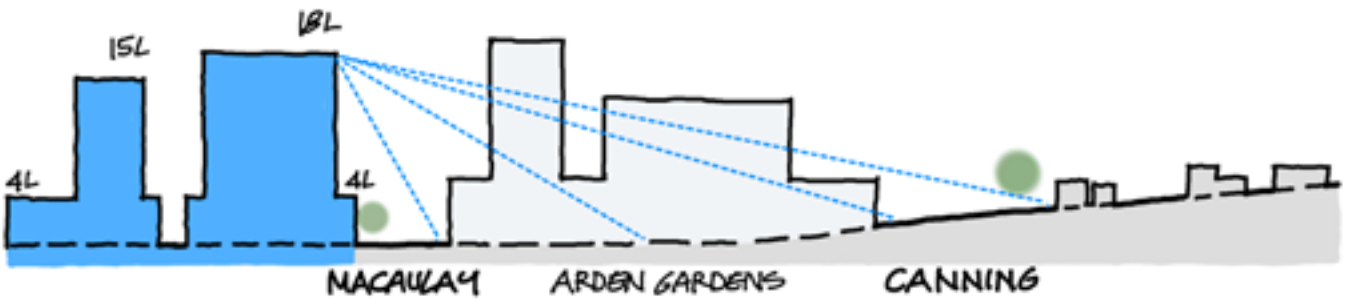


Figure 12 Height transition from Macaulay Structure Plan to Arden North.

5.5 VPA scenario testing

The VPA undertook further scenario testing ("modelling") following Hayball's testing and considers the land use mix as identified by the Structure Plan with detailed modelling to inform the proposed controls for Arden.

The testing applies the site-by-site recommendations from the built form testing undertaken by Hayball across the entire precinct to test the appropriateness of the proposed FARs and building heights.

The testing ensures that the FAR and heights align with all other elements (street wall heights, setbacks, overshadowing analysis) and is consistent with the land use vision for Arden.

The methodology, criteria and detailed outcomes of the modelling are recorded in **APPENDIX B**.

Consideration of this relationship has been given within Arden where a methodology was formulated. The relationship of floor area ratio (FAR) and built form derives the appropriateness of the FAR. In many instances the FAR is linked to typology and not to building height *per se*.

The methodology is demonstrated in **Figure 13** below. The analysis demonstrates that setting the FAR enables a maximum yield where street wall heights, overall building heights, setbacks from street, setbacks from side and rear boundaries (tower separation) and solar controls inform the extent of flexibility threshold enabled by the FAR.

The modelling undertaken reflects more nuanced outcomes, including:

- through block links
- floorplate area
- floorplate widths and depths
- floorplate efficiency
- street wall heights
- floor-to-floor heights
- setbacks to adjacent sites
- lower level setbacks
- building to building setbacks
- back of house and servicing
- site frontage width and narrowness 0.3:1 or less assumed to be straight extrusion to street wall height
- site consolidation, and
- site constraints (small site area with limited development opportunity unless significant lot consolidation takes place, strata-titled developments, affected by Heritage Overlay).

The VPA's 3D model is being presented for example sites in support of the controls as contained in **APPENDIX B**. It is noted that the built form controls support the variation which is anticipated for a site which may include alternative uses.

The testing carried out by the VPA demonstrates:

- appropriate levels of variation to support innovation sector uses, and
- multiple scenarios for the ultimate development of sites for a variety of uses.

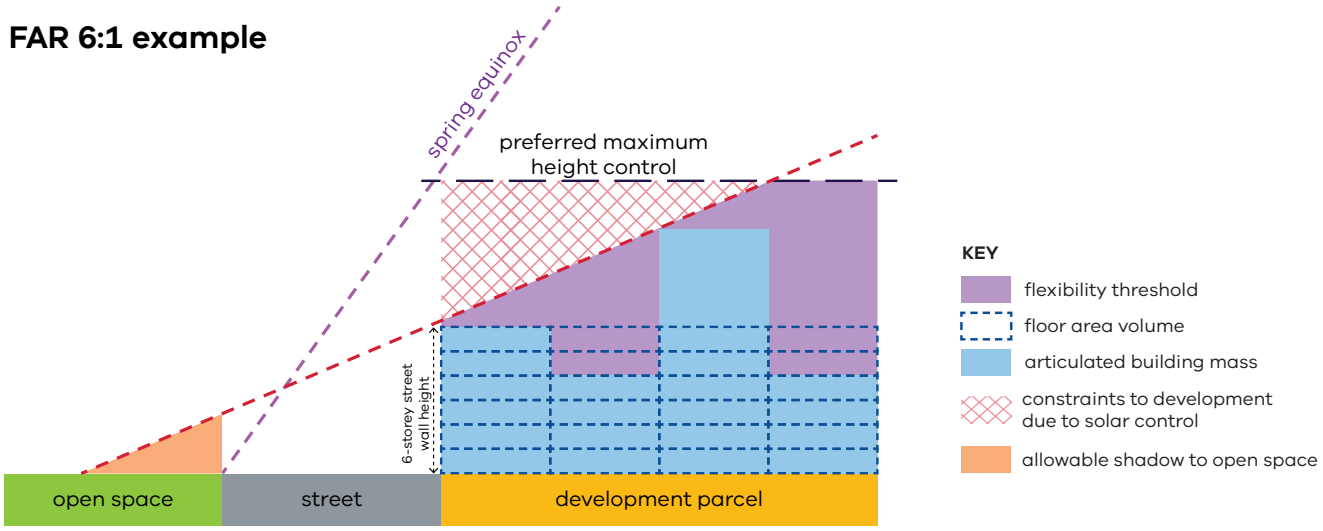


Figure 13 FAR methodology

Consideration of the updated spatial plan in combination with the above has resulted in formation of the following FARs and building heights.

The testing also confirmed moderating height ranges from the Draft Plan to provide clarity regarding anticipated outcomes, but also provides more detailed consideration of the impact of the findings regarding street wall heights, setbacks above street walls, and solar protection.

The range of heights support alternative land uses, whether the site delivers innovation sector uses, mixed-use buildings or residential buildings. Whilst the storeys between uses may vary, the overall height is comparable, for example a 10 storey commercial building is comparable to a 12 storey residential building.

The benefits of discretionary controls in the Victorian Planning Provisions is their tolerance for flexibility and adaptability. When applying built form controls, this is important for innovation precincts like Arden where variables including future land use, floor plate configuration, overall building typology and future sustainability or technology considerations aren't confirmed. With discretionary controls they can be considered within the existing controls without necessitating a planning scheme amendment.

The inclusion of setbacks supports greater height, however the ability to provide alternative responses is helpful in achieving a variety of land uses, typologies, forms and overall height, which will support the design excellence aspirations for Arden.

Consideration of discretionary built form controls typically support flexibility for various uses, but also as a means of supporting alternative typologies.

Supporting the flexibility anticipated, the Draft Plan at Objective 8 seeks to ensure design excellence is achieved for key strategic sites with an aspiration to consider a permit application following either a design competition or a design review panel. It is considered necessary in exercising discretion within planning controls, particularly if the majority of the proposed built form elements regarding street wall height, setbacks to street, setbacks to side and rear boundaries are discretionary to enable flexibility between various land uses.

The use of discretionary controls is appropriate if complemented by mandatory elements, such as solar protection of key open spaces and prohibition of unsafe wind conditions.

Floor area ratio – analysis and findings

A floor area ratio is a planning control that sets a specific amount of development that can occur on a site. The floor area ratio is the ratio of a new building's total floor area in relation to the size of the site it is being built on.

When combined with other built form controls, it allows for variation in the height and shape of buildings. This will help to ensure that new development is more responsive to its site and the characteristics of an area.

The diagrams shown in **Figure 14** and **Figure 15** explain the concept of floor area ratios and how it can result in different building types. For example, a floor area ratio of 4:1 allows for a total floor area up to four times the size of the site itself. This could be up to four storeys if 100 per cent of the site is developed or eight storeys if only half the site is developed.

Some of the benefits of floor area ratios are they:

- can often be aligned to the overall population or employment target for an area
- can help to deliver a range of building typologies, helping to deliver a range of uses and provide visual interest
- set realistic and clear expectations about the potential development yield on a site
- enable flexibility for an architect to choose how to organise their building layout and form on their site within a preferred built form envelope, and focus on design quality rather than yield
- can help deliver a mix of uses with requirements for minimum floor areas for a range of different uses
- provide a clear and consistent measure to support efficient decision making.

The relationship between a density control and built form outcomes is indirect as the total allowable gross floor area on a site could be delivered in a range of building typologies.

It is anticipated that the FAR encompasses all gross floor area above ground. It is noted that this measure differs from its application in other jurisdictions, particularly Sydney where the floor space ratio excludes floor space internal to the building including a range of elements such as open terrace balconies, voids, and car parking.

For the purposes of this analysis, it is considered that floor area ratio is the gross floor area above ground of all buildings on a site, including all enclosed areas, services, lifts, car stackers and covered balconies, divided by the area of the site. Voids associated with lifts, car stackers and similar service elements should be considered as multiple floors of the same height as adjacent floors or 3.0 metres if there is no adjacent floor.

The FAR is derived from the range of built form measures. In this instance, it is the consideration of street wall, setbacks (both to street and to adjoining boundaries), overall height, and solar protection.

As demonstrated below, the articulated modelling nuances land use, with an example of a:

- mixed-use development
- 100 per cent commercial scheme, and
- 100 per cent residential scheme.

In the examples shown in **Figure 14** and **Figure 15**, whilst the resulting FAR is consistent, the built form response is highly varied. In these examples, the:

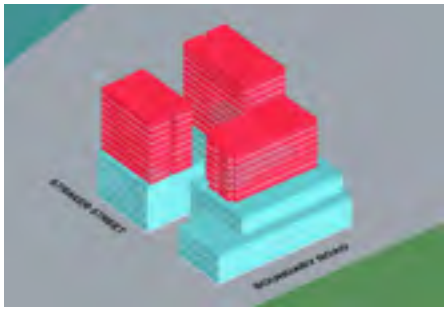
- building footprint and site coverage is varied
- street wall height varied dependent on use which is linked to typology and floorplate depths (as outlined in the modelling assumptions within **APPENDIX B**)
- setbacks to boundaries varied, including the extent of forms holding the street edge
- tower separation distances vary and rely on relative height with greater setbacks expected at greater heights, and
- the overall building heights were typically tallest for the commercial scheme, even though it generally included fewer storeys than the mixed-use or residential schemes.

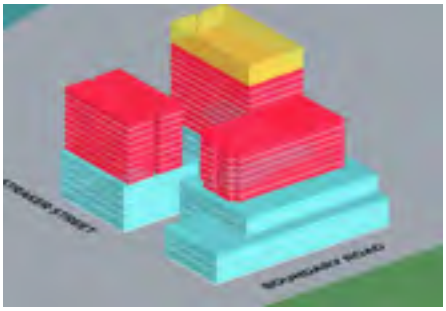
Figure 14 Modelling of differing typologies to 8:1

8:1 site testing – 5 Boundary Road, North Melbourne
Site area: 5,074m²

Mixed-use development

- **FAR: 7.28:1**
- Mixed-use to ground level (5 metres)
- Commercial to podium (4 metres per floor)
- Residential to towers (3.2 metres per floor)



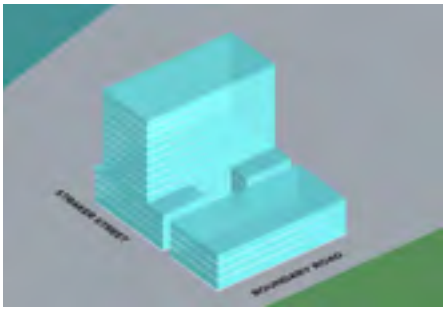


Maximum built form height (storeys)	Podium: 5 storeys Tower: 9 storeys
Maximum built form height (metres)	Podium: 21m Tower: 28.8m Total: 49.8m
Setbacks	2m to Straker Street 1.5m to Boundary Road 5m to Steele Street and adjacent site

Podium-to-podium distance	Minimum: 7m Maximum: 11m
Tower-to-tower distance	17m
Additional required to reach FAR (yellow)	
Additional floors	+5 storeys
Additional height	+16m (Overall height: 65.8m)

Commercial use only

- **FAR: 8:1**
- Mixed-use to ground level (5 metres)
- Commercial to podium (4 metres per floor)

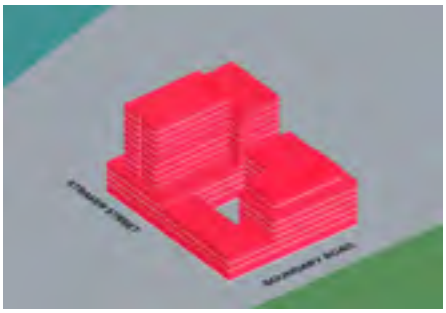


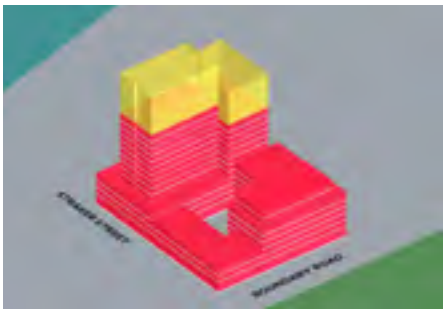
Maximum built form height (storeys)	Podium: 4 storeys Tower: 10 storeys
Maximum built form height (metres)	Podium: 21m Tower: 40m Total: 61m
Setbacks	5m to Straker Street, Boundary Road and Steele Street. Some straight extrusion of street wall tested to Straker Street and Steele Street

Podium-to-podium distance	Minimum: 5m Maximum: 15m
Tower-to-tower distance	20m
Additional required to reach FAR (yellow)	
Additional floors	Not required
Additional height	Not required

Residential use only

- **FAR: 6.4:1**
- Mixed-use to ground level (5 metres)
- Residential to towers (3.2 metres per floor)





Maximum built form height (storeys)	Mixed podium heights: max. 6 storeys Mixed tower heights: max. 10 storeys
Maximum built form height (metres)	Podium: 14.6–21m Tower: 32m Total: 46.6m
Setbacks	5m to streets. Minimum 2m setback to tested to Boundary Road for 2 storey tower

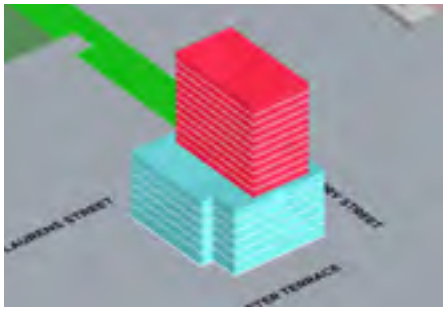
Podium-to-podium distance	Perimeter block tested, podium distances: 21m × 25m
Tower-to-tower distance	23m
Additional required to reach FAR (yellow)	
Additional floors	+6 storeys
Additional height	+19.2m (Overall height: 72.2m)

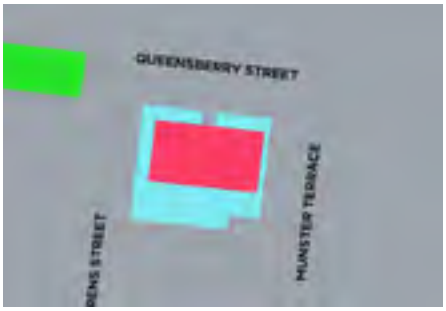
Figure 15 Modelling of differing typologies to 10:1

10:1 site testing – 110–124 Laurens Street, North Melbourne
Site area: 2,030m²

Mixed-use

- **FAR: 10:1**
- Mixed-use to ground level (5 metres)
- Commercial to podium (4 metres per floor)
- Residential to towers (3.2 metres per floor)

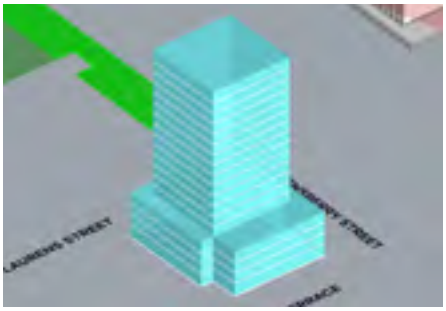




Maximum built form height (storeys)	Podium: 6 storeys Tower: 11 storeys
Maximum built form height (metres)	Podium: 25m Tower: 35.2m Total: 60.2m
Setbacks	5m setback tested all round
Podium-to-podium distance	None applied – shared boundary to adjacent property
Tower-to-tower distance	14m to southern boundary
Additional required to reach FAR (yellow)	
Additional floors	Not required
Additional height	Not required

Mixed-use

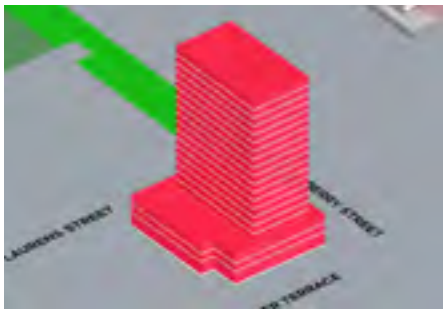
- **FAR: 10:1**
- Mixed-use to ground level (5 metres)
- Commercial to podium (4 metres per floor

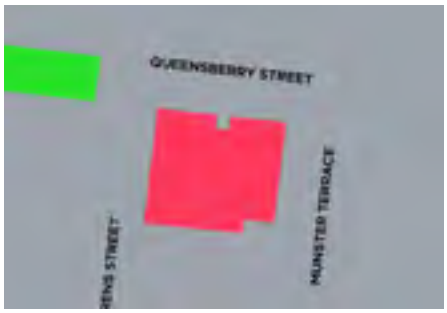


Maximum built form height (storeys)	Podium: 4 storeys Tower: 14 storeys
Maximum built form height (metres)	Podium: 17 metres Tower: 70 metres Total: 87 metres
Setbacks	5 metre setback tested all round
Podium-to-podium distance	None applied – shared boundary to adjacent property
Tower-to-tower distance	5 metres to southern boundary
Additional required to reach FAR (yellow)	
Additional floors	Not required
Additional height	Not required

Mixed-use

- **FAR: 9.9:1**
- Mixed-use to ground level (5 metres)
- Residential to towers (3.2 metres per floor)





Maximum built form height (storeys)	Podium: 3 storeys Tower: 17 storeys
Maximum built form height (metres)	Podium: 11.4m Tower: 54.4m Total: 65.8m
Setbacks	5m setback tested all round
Podium-to-podium distance	None applied – shared boundary to adjacent property
Tower-to-tower distance	14m to southern boundary
Additional required to reach FAR (yellow)	
Additional floors	Not required
Additional height	Not required

Including a FAR control in the suite of controls for Arden is critical to ensure development aligns with the *Arden Vision* and the Draft Plan. A mandatory FAR gives absolute certainty of potential overall yield from a development site, and the broader precinct. As outlined above, this certainty assists with ensuring design excellence across the precinct by re-directing the focus of a development to maximising good urban design outcomes.

Within the analysis, when considered balancing competing objectives and the directions contained within Practice Note 59, *The role of mandatory provisions in planning schemes* it is advised that mandatory FARs are pursued in areas of transition outside of the precinct. This is consistent with the practice note which advocated for performance-based planning and that mandatory controls should only be pursued to provide certainty and ensure that preferred outcomes are achieved.

The application of mandatory FAR in Arden North and for the part of the Laurens Street sub-precinct between Dryburgh Street and Munster Terrace is appropriate for the following reasons:

Arden North:

- Provide certainty to manage excessive overshadowing of the open spaces in Arden North, without the need to prescribe mandatory solar controls. It is considered that when balances against the public realm outcomes sought that mandating the FAR is more appropriate than solar protection controls which will limit built form variety.

Laurens Street:

- Given the limited development opportunities that are available within this land, combined with high coverage of sites within a Heritage Overlay, and mandatory height controls within adjacent areas, a mandatory FAR is considered to be appropriate. This will manage yield expectations and provide greater certainty to the exercise of discretion through built form controls where an idiosyncratic response is required due to the development pattern, and response to adjacent heritage values which vary from contributory to significant.

As demonstrated above, there is a clear link between typology and FAR. Retaining a range of heights is useful in denoting the variance in site size and geometry throughout the precinct. Linking typological requirements with the range of heights and FARs provides a way to distinguish not all sites are the same size, therefore the same height is unlikely to be achieved.

The FARs have been set to demonstrate the maximum capacity of the largest sites, where smaller sites, based on the combination of all other built form measures, will not reasonably achieve the maximum FAR.

Building heights and floor area ratios are intended to:

- Contribute to a varied and architecturally interesting skyline.
- Contribute to a diversity of building typologies and avoid repetitive built form.
- Limit impacts on the amenity of the public realm as a result of overshadowing and wind.

Within parts of the precinct where greater sensitivity is required, particularly transitioning to adjacent areas to Arden, it is considered that the introduction of mandatory FAR controls is an appropriate complementary built form tool, where greater certainty of outcomes is needed. This is evident in the Laurens Street sub-precinct and within Arden North.

In other instances, the retention of discretionary FARs is appropriate, particularly in Arden Central Innovation and Mixed-use sub-precincts where less sensitive interfaces appear, however should be complemented by mandatory solar protection in order to ensure that development does not erode important public realm qualities sought for Arden. The ability to challenge overall heights and FAR should be complemented by demonstration of design excellence and adherence to the built form requirements.

Design excellence is when a development provides high quality architecture, landscape architecture and urban design and demonstrates function, liveability, sustainability, and public contribution to buildings and urban spaces.

Consideration of how the application provides this, responds to the design objectives, and performance outcomes is critical including how the development addresses and provides high quality public realm outcomes through sunlight and mitigation of wind effects. A development which seeks to challenge the built form parameters should use a design review process or design competition to verify that the performance outcomes are met, whilst the measures may not.

Recommendations

Translate the proposed height ranges and FAR as outlined in **Plan 4** which show height in storeys as follows[1]:

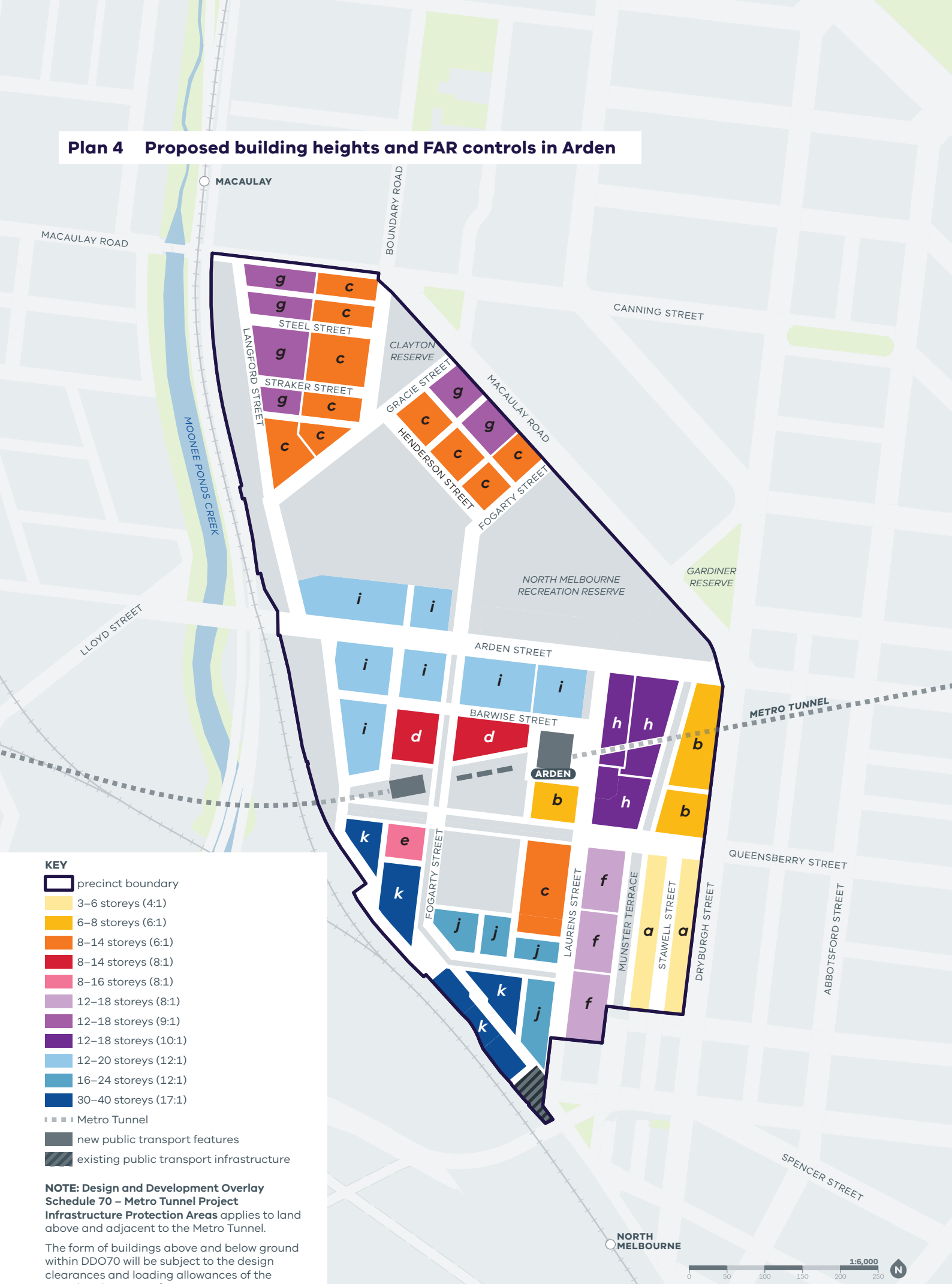
a	3–6 storeys	(4:1)	13–25 metres
b	6–8 storeys	(6:1)	25–33 metres
c	8–14 storeys	(6:1)	33–51 metres
d	8–14 storeys	(8:1)	33–57 metres
e	8–16 storeys	(8:1)	33–65 metres
f	12–18 storeys	(8:1)	49–64 metres
g	12–18 storeys	(9:1)	49–64 metres
h	12–18 storeys	(10:1)	49–64 metres
i	12–20 storeys	(12:1)	49–81 metres
j	16–24 storeys	(12:1)	65–83 metres
k	30–40 storeys	(17:1)	121–134 metres

Introduce clear guidance within the controls regarding design excellence both as application requirement and within the decision guidelines to ensure that clarity is provided to decision makers what is relevant in the application of discretion.

1 It is noted that if heights are translated into metres that the:

- Lower end of the height range should be translated to accommodate innovation/ commercial/ institutional uses (5m floor-to-floor to accommodate commercial tenancy with a 1 metre raised floor-to-floor height to respond to flood condition with remaining floors at 4m), and
- Greatest building height, where earmarked as 'mixed-use' (Arden North, Arden Central – Mixed-use and Laurens Street) should accommodate innovation/commercial/ institutional uses at the lower levels (6 storeys, consistent with the preferred street wall height) with remaining floors to be calculated as residential floors of 3.2 metres. The figure is then rounded up to the nearest whole metre.

Plan 4 Proposed building heights and FAR controls in Arden



KEY

- precinct boundary
- 3–6 storeys (4:1)
- 6–8 storeys (6:1)
- 8–14 storeys (6:1)
- 8–14 storeys (8:1)
- 8–16 storeys (8:1)
- 12–18 storeys (8:1)
- 12–18 storeys (9:1)
- 12–18 storeys (10:1)
- 12–20 storeys (12:1)
- 16–24 storeys (12:1)
- 30–40 storeys (17:1)
- Metro Tunnel
- new public transport features
- existing public transport infrastructure

NOTE: Design and Development Overlay Schedule 70 – Metro Tunnel Project Infrastructure Protection Areas applies to land above and adjacent to the Metro Tunnel.

The form of buildings above and below ground within DDO70 will be subject to the design clearances and loading allowances of the tunnel and station infrastructure.

5.6 Solar protection

In order to deliver the vision for Arden as a *distinctive place* appropriate built form controls are required to ensure that spatial arrangement and built form are designed in a way that reduces impact of overshadowing on the existing and future context of the precinct.

Sunlight plays an important role in pedestrian comfort and is an important contributor to street activity. Access to sunlight in the public realm including streets, open-to-the-air laneways, civic spaces and neighbourhood parks is a crucial element to designing a space that is suitable for people to inhabit and enjoy throughout the year.

Some overshadowing in an urban infill context is unavoidable due to the density and spatial arrangement of the built form, however certain consideration for the times of day where solar access is required and to which areas this amenity is required the most is appropriate.

The Draft Plan includes the following design recommendations related to sunlight access and overshadowing:

- Ensure new developments have consistent building lines and sufficient height and mass to positively address key spaces and manage overshadowing – the core of Arden Central around the new neighbourhood park and Capital City Open Space will be of lower rise to ensure sufficient sunlight to these spaces and provide a human scale and layering of development.
- Ensure new development does not cast any additional shadow to that cast by buildings built to the maximum street wall to the new neighbourhood park in Arden Central from 11:00am to 2:00pm from 21 June to 22 September.
- Ensure new development does not cast any additional shadow to that cast by buildings built to the maximum street wall to Clayton Reserve, North Melbourne Recreation Reserve and the new open space park in Arden North from 11:00am to 2:00pm on 22 September.
- Ensure buildings are setback sufficiently from front, side and rear boundaries (based on the height of a building) to help deliver comfortable wind conditions, enable adequate sunlight and daylight in streets, allow for views to the sky, to not overwhelm the public realm and achieve privacy.
- Ensure appropriate building separation within a site to deliver high quality amenity within buildings having regard to outlook, daylight and overlooking.

Analysis & findings

Melbourne Planning Scheme Context

The Melbourne Planning Scheme contains various planning policies and controls in relation to the overshadowing of public spaces.

Local Policy, Clause 22.02 of the Melbourne Planning Scheme, Sunlight to Public Spaces, specifies general sunlight protection to public places between 11:00am and 2:00pm on 22 September. This is the only preexisting specification of a control period for the precinct.

Clause 22.02 includes the following objectives:

- To achieve a comfortable and enjoyable public realm.
- To ensure new buildings and works allow good sunlight access to public spaces.
- To ensure that overshadowing from new buildings or works does not result in significant loss of sunlight and diminish the enjoyment of public spaces for pedestrians.
- To protect, and where possible increase the level of sunlight to public spaces during the times of the year where the intensity of use is at its highest.
- To create and enhance public spaces to provide sanctuary, visual pleasure and a range of recreation and leisure opportunities.
- shadows cast by adjacent buildings.

Urban Design Guidelines – access to daylight and sunlight

Objective 5.1.3 of the *Urban Design Guidelines* of Victoria is *"To ensure buildings in activity centres provide equitable access to daylight and sunlight"*:

- Locate and arrange the building to allow daylight and winter sun access to key public spaces and key pedestrian street spaces.

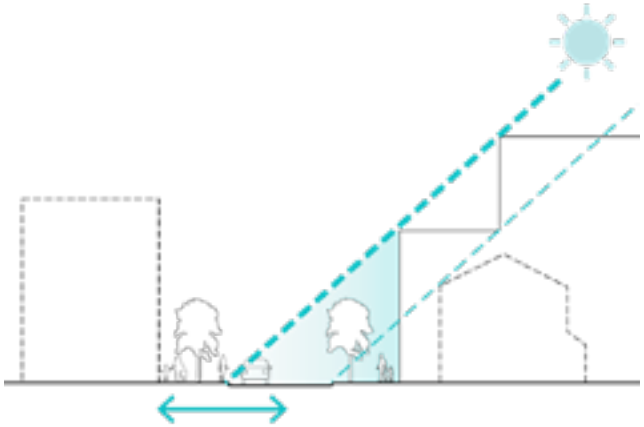


Figure 16 Objective 5.1.3 Urban Design Guidelines for Victoria

- Allow sufficient distance between buildings to allow access to daylight for neighbouring windows.
- Protect daylight and sunlight access to the private and communal open space of adjacent dwellings.

Analysis: purpose, methodology and scope

The purpose of the overshadowing analysis is to identity appropriate overshadowing provision for public spaces within the Arden precinct, through rigorous testing of overshadowing impacts using the Victorian Planning Authority's 3D model. The objectives of the overshadowing analysis include:

- To identify key public spaces that warrant a high level of sunlight protection based on their existing and/or future role, function, usage and relatively high level of existing solar access.
- To assess both current overshadowing and future overshadowing conditions, of developments with existing planning permits were built.
- To make recommendations regarding appropriate overshadowing controls for public spaces within the Arden Urban Renewal Precinct.

This analysis used the Victorian Planning Authority's Esri CityEngine 3D modelling platform and Lightwave 3D for the shadow diagrams. The model consists of the following elements:

- **3D digital elevation model** – based on VicMap 1 Metre contour
- **3D existing building context** – based on latest available City of Melbourne building footprint data from 2019
- **3D development pipeline** – based on latest available City of Melbourne Development Activity model data and is supplemented with discrete modelling of recently approved (unbuilt) Melbourne City Council permits (for developments of 5 storeys or more) and Ministerial permits for developments over 25,000m² gross floor area up until 29 January 2021.

Overshadowing studies have been generated by VPA from the 3D model for key public spaces for consecutive hours between 10.00am and 3.00pm on 22 September and 22 June.

They distinguish between existing and approved developments (blue) and future shadows from planning controls (green) – refer to **APPENDIX B**.

In addition to 3D modelling, VPA undertook site visits to observe the function and usage of key public spaces and reviewed relevant technical documents, strategic studies and the planning provisions and background documents of the Melbourne Planning Scheme.

Criteria for overshadowing testing

Testing dates and times

Control dates: The Spring Equinox (22 September) and Winter Solstice (22 June) should be considered when reviewing the spaces, due to the reach and wing of the shadow differing at those time periods. The *Draft Arden Structure Plan* also refers to the street wall height adjacent to the neighbourhood open space, which should also be considered.

Further consideration of the street wall adjacent to all open spaces should be given as the street wall height proposed is discretionary. It is considered appropriate to have regard to the extent of shadow cast by the street wall, which will also assist in defining whether there is additional shadows cast and assist in determining the appropriateness of shadowing to that space. This is illustrated in **Figure 17** to compare the control dates with and without the street wall.

Control times: The existing 11:00 am–2:00 pm control period should be tested for each key public space based on the role, function, usage and existing overshadowing conditions of the individual public space. Council's Amendment C278 to the Melbourne Planning Scheme seeks to introduce solar protection between 10.00am and 3.00pm on 22 June.

Existing overshadowing conditions have also been considered in order to consider the appropriateness of the control period.

Degree of overshadowing control

Limits for overshadowing of a public space can be specified in two ways: "no overshadowing" (at all); i.e. a prohibition, or "no additional overshadowing"; i.e. no additional overshadowing compared to that cast by the nominated street wall. This is an important point, as shadows are not compounding – that is, overlapping shadows will not be darker than a single shadow.

In the Arden context:

- There are shadows cast over existing open spaces which is attributed to development adjacent to the precinct boundary
- The low scale nature of the existing precinct results in no shadows being cast over the proposed open spaces. Therefore, an assumption regarding a street wall height must be maintained, otherwise any suggested controls which refer to "additional shadowing" would constrain the development of adjacent lots on that basis
- The Draft Arden Structure Plan refers to "additional overshadowing". Testing should evaluate the degree of overshadowing control that is warranted, including prohibition; mandatory additional overshadowing or discretionary additional shadowing.

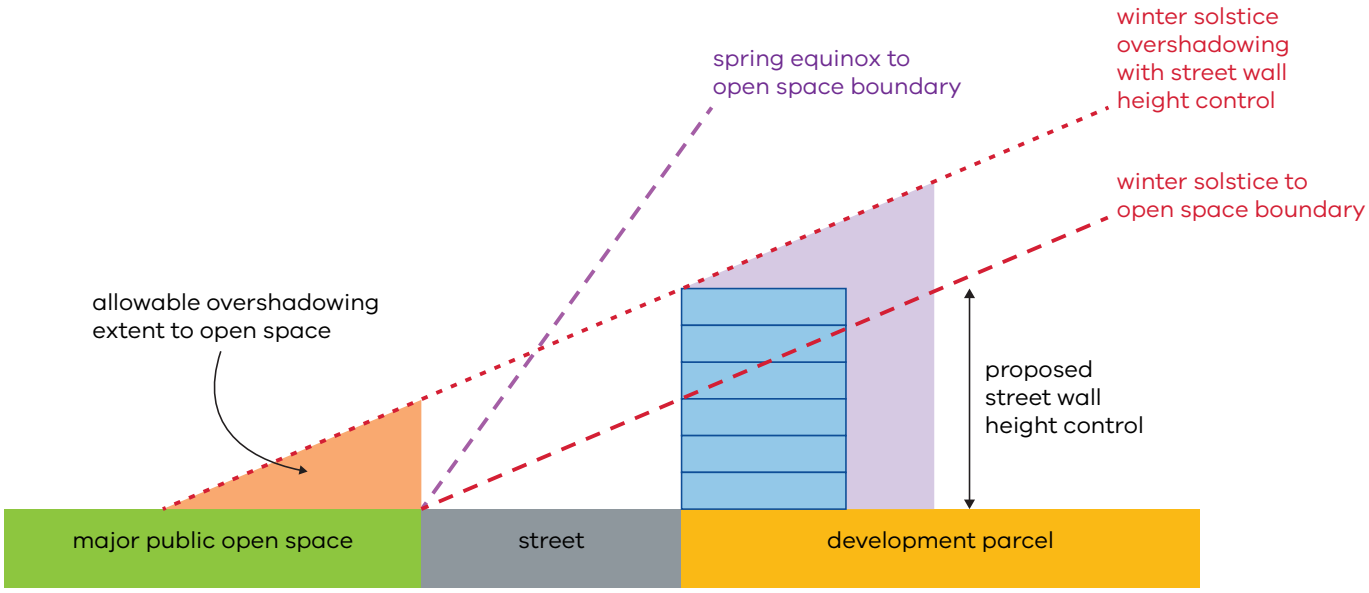


Figure 17 Comparing control dates.

The State Government Planning Practice Note '*The role of mandatory provisions in planning schemes, Planning Practice Note 59, Department of Environment, Land, Water and Planning, June 2015*' notes that mandatory provisions are the exception and will only be considered in circumstances where it can be clearly demonstrated that discretionary provisions are insufficient to achieve desired outcomes. The Practice Note identifies the following criteria: *"... to assess whether or not the benefits of any proposed mandatory provision outweigh any loss of opportunity and the flexibility inherent in the performance based system"* (p2):

- Is the mandatory provision strategically supported?
- Is the mandatory provision appropriate to the majority of proposals?
- Does the mandatory provision provide for the preferred outcome?
- Will the majority of proposals not in accordance with the mandatory provision be clearly unacceptable?
- Will the mandatory provision reduce administrative costs?

Testing should be undertaken to identify whether there are specific premier/iconic public spaces that warrant mandatory "no additional" overshadowing protection (applying the criteria in Practice Note 59), compared to those key spaces that warrant discretionary "no additional" overshadowing protection.

Key public spaces for overshadowing testing

Key public spaces within and adjacent to the study area were identified for specific overshadowing testing based on the following factors:

- **Usage** – well used space for sitting, stationary activities or gatherings
- **Strategic location** – adjacent to a significant 'drawcard' attractor/s; e.g. a rail station
- **Strategically supported** – mentioned in strategic documents such as Melbourne City Council's Places for People 2015, Walking Plan 2014-17, Open Space Strategy 2012
- **Ownership** – public open space, Crown Land i.e. non-privately owned, and privately owned open space but which has public access at least during lunchtime hours
- **Suitability** – currently receives enough available sunlight to warrant protection

The key public spaces identified for testing are:

- Arden Central City open space
- Arden Central neighborhood open space
- Arden North and Arden Central integrated stormwater management open space
- Clayton Reserve
- North Melbourne Recreation Reserve
- Linear park Queensberry Street (between Laurens and Langford Streets)
- Linear park – Munster Terrace
- Arden Station forecourt

The outcomes of the modelling are recorded in **APPENDIX C**.

Outcomes of modelling

The open spaces are considered further, including against Practice Note 59 as follows:

Capital City Open Space

The Capital City Open Space, while intended to be hardscaped and provide a differing function to the neighbourhood park (which is to have more soft landscaping), does provide a space for future workers and residents to use during the daytime period. This space also includes the skylights into the station platforms, where some degree of mandatory protection is warranted to ensure appropriate sunlight to the space itself, and the indirect benefit to the station platforms below ground which rely on daylight from this space.

Given the discretionary nature of the built form controls, consideration of mandatory solar controls is appropriate. This provides a high degree of built form flexibility, however, in order to provide certainty for place quality, it is considered appropriate to apply mandatory protection to this space on 22 September between 11:00am and 2:00pm.

Arden Station forecourt

The Arden Station forecourt is the entry and exit point for most future movements to the precinct. The public realm qualities are important to human experience of the space and sunlight is just a critical as wind effects to the overall experience. When balancing the desired intensification of development around the station, it is noted that two things are demonstrated in the analysis that, sunlight penetration to the forecourt was largely protected through the introduction of a setback from the existing title boundary to Laurens Street for the site immediately to the north, where

reasonably good sunlight is achieved between 11:00am and 2:00pm on 22 September except at 1:00pm where there is a degree of shadow. When compared to 22 June, where the angle of the sun differs, shadowing occurs at 1:00pm to a worser degree, however the forecourt does receive good daylight at 12:00pm and 2:00pm. Earlier and later hours do challenge the ability to provide sunlight to this space throughout. See *Overshadowing by articulated model – Arden Central new open spaces* on **page 86** and **page 87**

Given the strategic significance of this civic space, it is considered that protection is warranted on 22 September between 11:00am and 2:00pm, with the decision guidelines referring to 22 June in order to inform discretion as it is applied to this space.

Queensberry Street linear park

The overshadowing analysis demonstrates that this space is afforded protection due to its co-location with the neighbourhood park and the Capital City Open Space to its north. Good levels of sunlight are afforded during Spring Equinox.

It is recommended that the controls are discretionary on 22 September between 11:00am to 2:00pm.

Open spaces in Arden North

Given the local or municipal role of Clayton Reserve, North Melbourne Recreation Reserve and the integrated stormwater management space, it would be recommended that the control periods not be mandatory as these spaces are not considered to be of State significance.

Clayton Reserve is a fenced dog park, North Melbourne Recreation Reserve is a playing surface which is not publicly accessible at all times, and the integrated stormwater management open space may include playing surfaces associated with active recreation. Heavy use of this turf is an important consideration for sunlight protection.

The Panel report for Melbourne Amendment C278, *Sunlight to Public Spaces*, identifies that for areas such as Arden, sunlight protection can be revisited if strategically justified. It is noted that the amendment affected Clayton Reserve and North Melbourne Recreation Reserve in the Arden North sub-precinct only.

A detailed review of the modelling shows that 93 per cent of the playing surfaces proposed in Arden North will enjoy sunlight on 22 June with the application of Spring Equinox (22 September) controls. Balancing the strategic aspirations for Arden against the solar protection intended under C278, the application of Spring Equinox controls is justified and provides solar protection to playing surfaces within the Winter Solstice period.

It is recommended that the control period for these spaces is 22 September between 11:00am and 2:00pm, with consideration and regard to the playing surface during Winter Solstice (22 June) period to form part of the decision guidelines.

Figure 18 Winter solar carve demonstrating a six storey street wall and how the proposed building heights do not protrude within that carve, with the exception of a handful of buildings in the Henderson Street and Fogarty Street block, and one on the corner of Gracie Street and Langford Street.

Recommendations

Based on the analysis for the defined open spaces, it is recommended that the following solar control periods are applied:

Table 5 Open space solar controls

NO.	OPEN SPACE	SOLAR CONTROL PERIOD
1	New integrated stormwater management open space	11:00am to 2:00pm on 22 September
2	Clayton Reserve	11:00am to 2:00pm on 22 September
3	North Melbourne Recreation Reserve	11:00am to 2:00pm on 22 September
4	Arden Central Capital City Open Space	11:00am to 2:00pm on 22 September
5	Queensberry Street linear park (between Laurens Street and Langford Street)	11:00am to 2:00pm on 22 September
6	Arden Central neighbourhood open space	11:00am to 2:00pm on 22 June
7	Arden Station forecourt (Arden Central – Innovation)	11:00am to 2:00pm on 22 September

Figure 19 Open spaces and solar controls

5.7 Wind effects

Public realm amenity in streets, laneways and open spaces is essential for the success of a precinct like Arden with the anticipated worker and resident population.

Protection from negative wind impacts is important in all streets and open spaces, where people should be free to move comfortably.

Consideration of wind within the public realm contributes to pedestrian comfort as much as sunlight.

Analysis & findings

Global Wind Technology Services (GWTS) undertook a desktop analysis of the precinct using a computational wind engineering model to identify:

- general considerations on the built form within Arden
- the prevailing wind condition,
- the requirements for testing to be undertaken and
- other key parameters.

Within the report, it identifies the northern wind is the dominant wind with more than 25 per cent frequency as well as being the strongest wind direction. The south direction is the second most frequent and is dominated by the sea breeze. The east wind is the weakest and the least frequent direction. Thus, semi-enclosed spaces, closed to the north, south and west will likely have increased pollution concentration due to poor ventilation.

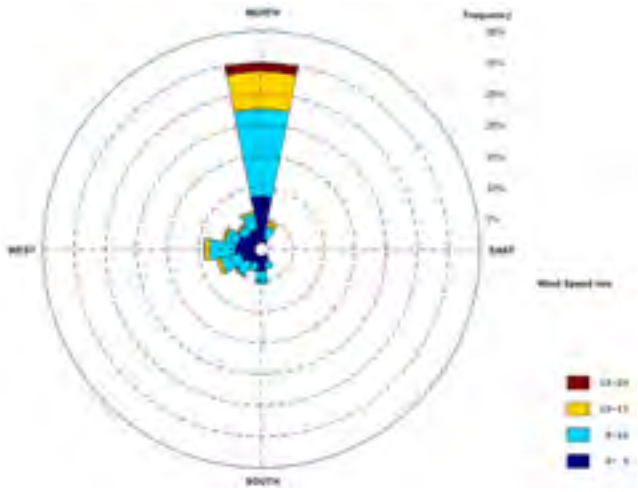


Figure 20 Dominant wind direction north then west in September.

Stringent wind effect requirements and built form requirements are proposed in Arden North to improve conditions across the entire precinct.

In December, the frequency of north and south winds is the same, with each slightly above 15 per cent. In January, the frequency of the south wind increases above 20 per cent while the north decreases below 15 per cent. The trend continues in February with a similar frequency as in January. To promote the sea breeze in streets and parks, opening to the south direction will help to increase ventilation and cooling during the summer months.

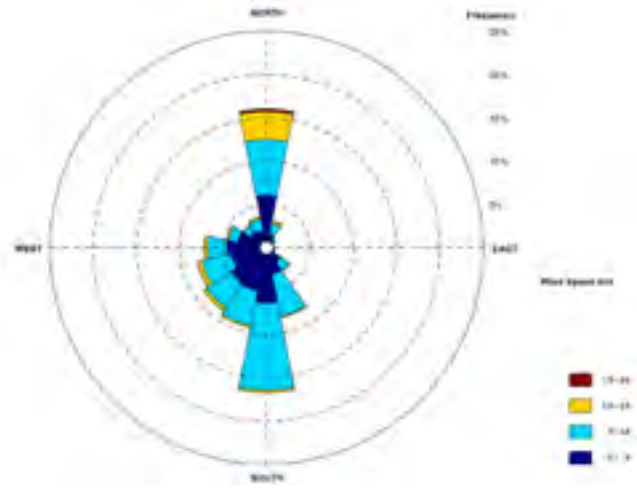


Figure 21 Dominant wind direction south in December.

The GWTS report identifies that building separation assists with flow of winds through the precinct where it is generally encouraged that the minimum separation distance should equal the widest dimension of the tower floor plate. Many parameters influence the appropriate separation distance between adjacent buildings, including the position of these, their size and orientation, shape, overshadowing, pedestrian level wind and relative height among others. A strong limitation for the separation distance in this case, is that the streets are already present. Therefore, utilising the tools and guidelines provided will help towards an appropriate design, and careful assessment of the development will yield their effectiveness.

Laurens Street suffers from high channelling potential due to its orientation parallel to the north wind direction, and the high level of exposure provided by the open expanse of the North Melbourne Recreation Reserve. The location of the station on the northern end of Laurens Street means that the channelling flow will retain its high energy by the time it reaches the station and will render conditions unsuitable.

Other comments for noting and further consideration include:

- The green open space (integrated stormwater management open space) in Arden North is exposed to the northerly wind direction. The buildings at the intersection of Gracie and Henderson Streets will require thorough scrutiny to consider the impacts to the open space (page 44)
- Fogarty Street, Queensberry Street and Munster Terrace include high potential for channelling and that tree-populated spines will assist with disrupting flow and improve conditions within these locations (page 51)
- Southern parcels within Arden Central experiences high corner acceleration, downwash and channelling (page 61)
- The degree of penetration of southern wind is important to provide passive cooling in the summer months (page 69).

The GWTS report also outlines wind speeds of unsafe conditions for sitting, standing and walking areas. These definitions are consistent with relevant precedent within the Melbourne Planning Scheme contained within Design and Development Overlay Schedules 2, 10, 60, 62 and 67. It is advised this is also consistent with the updated *Better Apartments Design Standards*. It is considered appropriate to introduce wind effect controls within Arden as it will apply to all buildings, not only residential development, but it also provides clarity to what is mandatory and discretionary and that a wind tunnel test must be undertaken for development in excess of specific heights which vary throughout the precinct.

Recommendations

That controls be drafted to refer to:

- **Unsafe wind conditions** meaning the hourly maximum 3 second gust which exceeds 20 metres/second with probability of exceedance of 0.1 per cent from all wind directions combined
- **Comfortable wind conditions** meaning a mean wind speed from all wind directions combined with probability of exceedance less than 20 per cent of the time, equal to or less than:
  - 3 metres/second for sitting areas
  - 4 metres/second for standing area
  - 5 metres/second for walking areas.
- **Mean wind speed** meaning the maximum of:
  - Hourly mean wind speed, or
  - Gust equivalent mean speed (3 second gust wind speed divided by 1.85)

Incorporate a permit requirement to undertake wind tunnel testing for development in excess of the following heights:

- Arden North: 20 metres
- Arden Central: 30 metres
- Laurens Street: 40 metres.

5.8 Public interface and detail design

5.8.1 Laneways and through block links

The relationship between the width of the street and the height of the street wall contribute to the perception of place in an urban area.

It is the three-dimensional mass of each building which defines the public realm and that the building elevation and cross section of public spaces should be scaled to foster a sense of urbanism.

A key aim of the proposed draft plan spatial plan is the introduction of a hierarchy of streets and laneways, with Fogarty Street and Laurens Street as the two civic spines running through the precinct.

One way to achieve this aim is to provide a degree of spatial definition and enclosure to these streets through providing a street wall height relative to the street width. Specifically, street enclosure helps define a path which is easily distinguished by users and to bring out the relative functional importance of the path.

It should be noted the concept of human scale is not street wall height *per se*, but with visual interest offered at walking pace. This can be defined by the ratio between street width and street wall or other elements in the urban realm such as street trees which create a relatable scale for a person at street level.

Such spatial definition will also assist in establishing a logic for connecting open spaces throughout the precinct and distinguishing between pedestrian priority streets from less pedestrian oriented streets utilised for servicing.

Additional design consideration for these connections as outlined in the Draft Plan is to ensure the site layout of development responds to the function and character of adjoining streets, laneways, and open spaces.

A variety of block sizes is important to the development of the precinct to facilitate the proposed retail, commercial, residential and other sector uses.

It also helps realise the interconnected pedestrian network envisioned by providing regular links between street either through laneways or links within a building envelope.

Additional design consideration for these connections as outlined in the Draft Plan are:

- Provide new, direct and convenient pedestrian connections that align with other streets, laneways or walking routes in new development.

Analysis & findings

The updated spatial plan as shown in **Plan 5** provides new pedestrian connections with the following considerations:

- Where the average length of a street block exceeds 100 metres, except within 200 metres of a rail station where more frequent connections are desirable to manage high pedestrian volumes
- At least two pedestrian connections should be provided through street blocks exceeding 200 metres
- Centrally within the street block where possible, and less than 70 metres from the next intersection or pedestrian connection
- Connectivity which improves the walkability of the block
- Direct and convenient connections that align with other streets or laneways or are extending existing or proposed adjacent pedestrian connections.

The frequency of laneways and through block links is considered to reflect the aspirations of the Draft Plan.

Plan 5 Proposed block widths

Comparable analysis

When looking at other settings where redevelopment has taken place in a dense location, an innovation sector focussed space or a place with high pedestrian movements, consideration of case studies is shown on below in **Figure 21**.

The three case studies – Parkville, east end of the Central City and Forrest Hill (South Yarra) – each show a mix of development types including fine grain developments on small lots with block widths ranging from 20–100 metres.

Larger block widths across the three examples generally occurred in areas where the development type requires larger block sizes (e.g. University of Melbourne site) or in areas fronting major transport connections (e.g. Parliament station in the eastern end of the Central City and the elevated rail adjacent to the precinct known as Forrest Hill in South Yarra.

It should be noted that despite showing block widths of 100 metres or greater, both the University and Parliament station include through block links for pedestrian movement.

Given the aspirations of the Draft Plan spatial plan to provide a walkable and well-connected precinct as well as provide a variety of block sizes to support the intended sector uses, particularly in the Arden Central innovation sub-precinct, a pattern of development which avoids long continuous blocks where possible is sought.

It is considered that the Draft Plan proposes a variety of block sizes in the spatial plan to promote permeability and support a diversity of site sizes to suit the desired innovation typology specifically at Arden Central.

Further consideration of the laneway hierarchy was given including how this interacts with the traffic conflict frontages and active street frontages.

As indicated, the spatial plan is considered to address the needed permeability throughout the precinct. Creating a hierarchy, provides more opportunity to refine the width and function of these spaces and provide clearer guidance as to how these are anticipated to be delivered within the precinct.

Figure 22 Parkville, Eastern CBD and Forrest Hill block width case study.

Pedestrian connections should be of high quality, whether open to the sky or internal arcades and should provide:

- Direct, attractive, well-lit and provide a line of sight from one end to the other.
- Safe and free of entrapment spaces and areas with limited passive surveillance.
- Publicly accessible for extended hours, at ground level and appropriately secured by legal agreement.
- Adopt vertical proportions with a height greater than the width.
- Incorporate active frontages to the laneway.
- Incorporate high quality exterior grade materials and finishes to all surfaces including paving, walls, ceilings and lighting.
- Have highly legible entries including any doors or gates.

In response to the Built Form Testing and Peer Review undertaken by Hayball it is advised that further consideration of a hierarchy to the laneways has been given and is outlined in **Plan 6**. Further analysis of the aspirations for these laneways can be found within the diagrams overleaf.

Recommendations

The requirements for laneways, through block links and pedestrian and cycling connections (measured from the common title boundary or centreline of the laneway) be introduced requiring the following as identified in **Plan 6**:

- Pedestrian only laneways to be open to the sky and 9 metres in total width
- Shared laneways to be open to the sky and 8 metres in total width
- Internal links to be between 9 and 12 metres in width and include a proportional void commensurate with its width, and
- Through block links to be between 6 and 9 metres in width of high quality, whether open to the sky or internal arcades.

Plan 6 Future urban structure – laneways

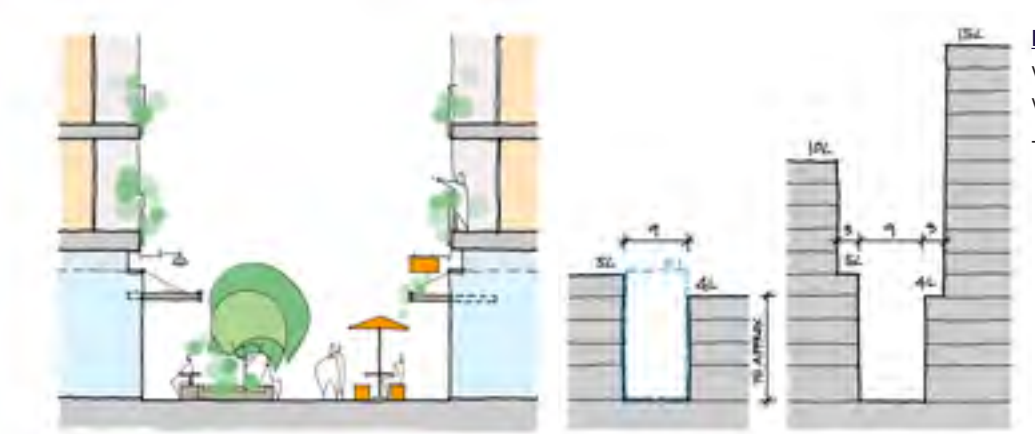
KEY

- precinct boundary
- Arden North– Mixed-Use
- Arden Central – Mixed-Use
- Arden Central – Innovation
- Laurens Street – Mixed-Use
- proposed government primary school
- community facilities
- local indoor recreation
- potential institutional use
- existing open space
- North Melbourne Recreation Reserve
- new open space
- ancillary open space (uncredited)
- Capital City Open Space
- new integrated stormwater management open space
- indicative through block link
- laneway 1 – pedestrian only: 9 metres
- laneway 2 – shared: 8 metres
- laneway 3 – internal 12 metres
- Metro Tunnel
- public transport facilities

NOTE: Design and Development Overlay Schedule 70 – Metro Tunnel Project Infrastructure Protection Areas applies to land above and adjacent to the Metro Tunnel.

The form of buildings above and below ground within DDO70 will be subject to the design clearances and loading allowances of the tunnel and station infrastructure.

Laneway 1 – Pedestrian only (9 metres)

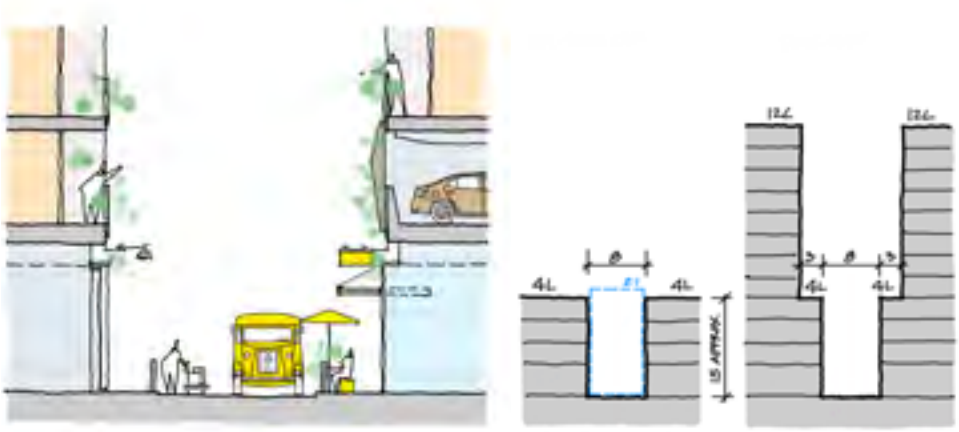


Pedestrian only will seek a width of 9 metres to the street walls.

This width will allow:

- tree planting
- a defined curtilage/ footpath
- opportunities for external seating
- mitigate the need for screening habitable rooms.

Laneway 2 – Shared pedestrian and vehicle (8 metres)



Shared zones will seek a width of 7–8 metres.

This width will allow:

- curbed footpath
- potential for external seating (in part)
- shared road space.

Laneway 3 – Internal laneway (9–12 metres)

Internal links will seek a width of 9–12 metres.

They can be open to sky or be internal with a generous void of three levels.

Internal links are appropriate where they:

- mitigate prevailing wind conditions
- provide appropriate views through the link
- provide appropriate connections which would otherwise include extensive servicing along its length.

Figure 23 Laneway studies.

5.8.2 Active & traffic conflict frontages and weather protection

The road hierarchy is intended to order the priority of pedestrians, cyclists and public transport capable corridors and encourage car and back of house functions in limited areas to balance the priority of the public realm and for people.

Plan 7, *Traffic conflict frontages and weather protection* considers the high capacity public transport and cycling corridors are the primary areas where car access is deterred. Secondary roads are also high priority spaces for people, where possible, vehicular access and egress should be avoided, however may contain ingress and egress where a site does not have access to a tertiary or back of house defined street.

Analysis & findings

Creating a hierarchy is useful for the following reasons:

- It creates a clear distinction of which streets anticipate higher pedestrian activity to avoid direct conflict with traffic
- It provides for active street frontages which do not need to accommodate ingress and egress where it can be avoided
- It seeks to minimise extent of building services visible to street
- It clarifies where back of house and service functions are anticipated

The road hierarchy in combination sets the anticipated benchmark for each space and provides clarity and certainty regarding outcomes for the precinct.

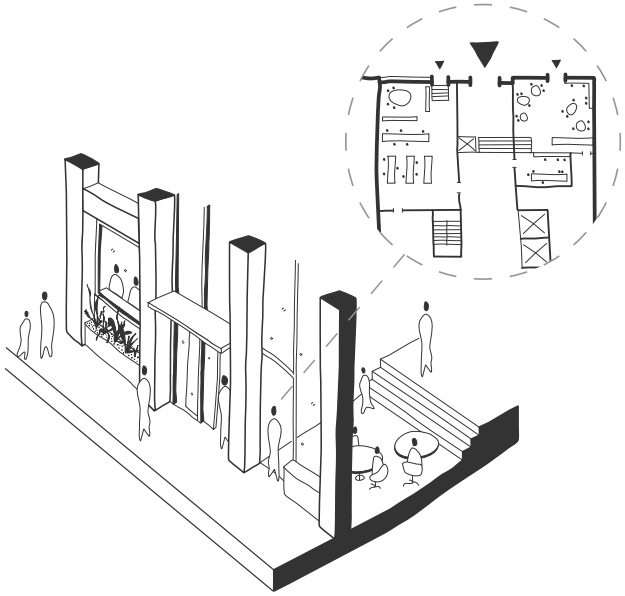


Figure 24 Maintaining active frontages in flood-prone areas. Source: Central Melbourne Design Guide.

Built form controls to require ground floor frontages address the street in a way that encourages pedestrian activity and movement.

Precedent for active street frontages is prevalent throughout the Melbourne Planning Scheme in Design and Development Overlay Schedules 1 (Active Street Frontages), 61 (City North) and 63 (Macaulay) and it typically encourages 5 metres or 80 per cent of the site frontage, whichever is greater.

To further support active street frontages, service cupboards should be limited to no more than 10 metres of the frontage length.

As Arden is subject to flooding, consideration should be made to incorporate the mitigating strategy into the scheme of the design without jeopardising a building's connection to the street (see **Figure 22**)

Figure 23 shows examples of an active frontage that positively addresses the streetscape. The ground floor treatment encourages pedestrians interact with the frontages while the upper levels define the space and provide passive surveillance.

Figure 25 Top, above: Nightingale Village's built form positively addresses the street with its active frontage.

Recommendations

Introduce active street frontage controls which specifies that ground floor frontages should include either 5 metres or 80 per cent, whichever is greater, of the building façade at ground level in an entry or display window to a retail premises. Any service area should not exceed a length of 10 metres. Within flood prone areas, transitions in floor levels should not rely on external stairs, ramps or platform lifts which disconnect interior spaces from the public realm.

The built form controls should include a traffic conflict frontage to discourage ingress and egress onto the key high capacity public transport and cycling corridors. Vehicle access, crossovers and entries to parking should not be provided as marked in **Plan 7**. Where ingress and egress is provided to a site it should include pedestrian refuges if the vehicle access or crossover is more than 6.1 metres wide.

Figure 26 Casba, Sydney – active frontage in a flood-prone area. Source: SJB Architects.

Figure 27 Top, middle, above: Examples of active frontages in flood-prone areas.

Plan 7 Traffic conflict frontages and weather protection

KEY

- precinct boundary
- existing rail & station
- traffic conflict/weather protection
- existing Strategic Cycling Corridor
- proposed Strategic Cycling Corridor
- local cycling corridor
- pedestrian priority zone
- pedestrian crossing – proposed
- pedestrian crossing – existing
- potential modal interchange
- existing intersection
- new or upgraded intersection
- indicative through block link
- laneway 1 – pedestrian only: 9 metres
- laneway 2 – shared: 8 metres
- laneway 3 – internal 12 metres
- open space
- public transport facilities

5.9 Adaptable buildings

The Draft Plan at Objective 7 encourages buildings to remain adaptable as uses change over time. Strategies associated with this include designing car parking areas to be adaptable over time and appropriate floor to ceiling heights.

The Hayball built form testing revealed on narrower sites that the ability to sleeve car parking above ground was challenging. Refer to **Figure 26** below which shows a development on a site along the rail corridor in the Arden Central – Mixed-use sub-precinct.

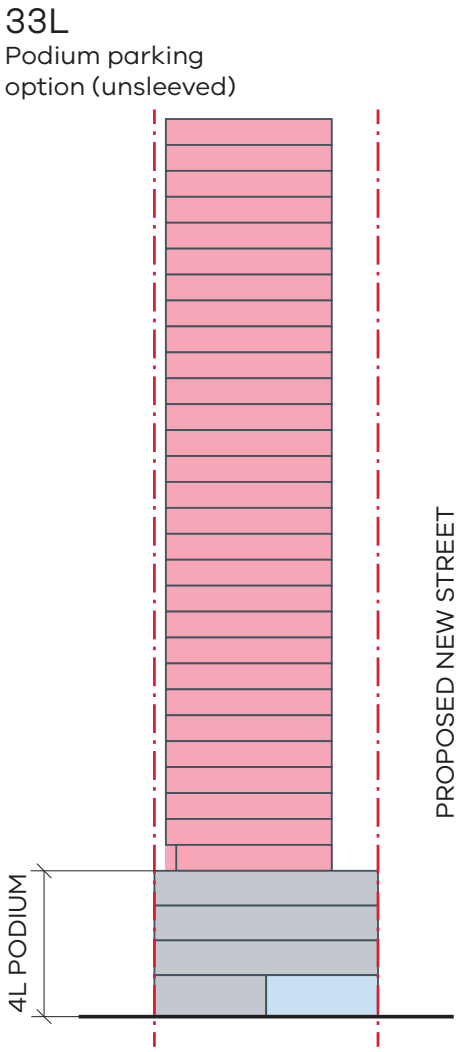


Figure 28 Unsleeved car parking; based on Hayball study.

Analysis & findings

Not all sites will rely on consolidated car parking within the precinct or rely on no car parking. Therefore, in the event that car parking is distributed on sites within the precinct, it is important that the car parking spaces can be converted to other uses.

There is precedent for this requirement within the Melbourne Planning Scheme in Schedule 67 to the Design and Development Overlay (Fishermans Bend).

Recommendation

1 Introduce adaptable building requirements to provide for the future conversion of those parts of the building accommodating car parking being able to adapt over time and required the lower levels (up to the height of the street wall) to provide:

- At least 5.0 metres floor-to-floor height at ground level
- At least 3.2 metres floor-to-floor height for other lower levels up to the height of the street wall associated with accommodation uses
- At least 4 metres floor-to-floor height for other lower levels up to the height of the street wall associated with office uses
- Car parking areas not located in a basement should provide:
  - Level floors
  - At least 2.8 metres floor-to-floor height
- Mechanical parking systems to reduce the area required for car parking.

6.0 PROPOSED BUILT FORM PARAMETERS

The following recommendations for the built form strategy and implementation via the planning scheme have been informed by the spatial layout, independent review and testing, and built form analysis.

It is recommended that the Planning Scheme Amendment including the following guidance for development within the precinct as follows.

Recommendations

Street wall height

Street width	Building height	Minimum street wall height	Maximum street wall height
0 to 9 metres	None specified	12m	17m
Greater than 9 metres	Up to and equal to 41m	17m	33m
	In excess of 41m	17m	25m
Immediately adjacent to a proposed open space	Up to and equal to 41m	17m	33m
	In excess of 41m	17m	25m

Setbacks above street wall: A five metre setback above the street wall should be provided. This is discretionary, to support alternative approaches which demonstrate an ability to mitigate wind downdrafts, provide sky views between taller buildings and avoid bulk.

Setbacks from side and rear boundaries: Introduce setback and separation distances as follows:

Height	Preferred minimum setback to side or rear boundary	Minimum separation distance for multiple buildings on the site
Above the street wall height and up to 64 metres	7.5 metres (separation of 15 metres to an adjoining site)	12 metres
Above the street wall height and greater than 64 metres up to 81 metres	10 metres	14–16 metres
Above the street wall height and greater than 81 metres	12.5 metres	18 metres

Building heights and FARs: Translate the proposed height ranges and FAR as outlined in Plan 8 which shows height in storeys (FAR) as follows:

ID	Storeys	FAR	height
a	3–6 storeys	(4:1)	13–25 metres
b	6–8 storeys	(6:1)	25–33 metres
c	8–14 storeys	(6:1)	33–51 metres
d	8–14 storeys	(8:1)	33–57 metres
e	8–16 storeys	(8:1)	33–65 metres
f	12–18 storeys	(8:1)	49–64 metres
g	12–18 storeys	(9:1)	49–64 metres
h	12–18 storeys	(10:1)	49–64 metres
i	12–20 storeys	(12:1)	49–81 metres
j	16–24 storeys	(12:1)	65–83 metres
k	30–40 storeys	(17:1)	121–134 metres

Introduce solar protection

No.	Open space	Solar control period
1	New integrated stormwater management open space	11:00am to 2:00pm on 22 September
2	Clayton Reserve	11:00am to 2:00pm on 22 September
3	North Melbourne Recreation Reserve	11:00am to 2:00pm on 22 September
4	Arden Central Capital City Open Space	11:00am to 2:00pm on 22 September
5	Queensberry Street linear park (between Laurens Street and Langford Street)	11:00am to 2:00pm on 22 September
6	Arden Central neighbourhood open space	11:00am to 2:00pm on 22 June
7	Arden Station forecourt (Arden Central – Innovation)	11:00am to 2:00pm on 22 September

Plan 8 Built form and overshadowing controls

KEY

- precinct boundary
- discretionary solar control
- mandatory solar control
- open space
- 3–6 storeys (4:1)
- 6–8 storeys (6:1)
- 8–14 storeys (6:1)
- 8–14 storeys (8:1)
- 8–16 storeys (8:1)
- 12–18 storeys (8:1)
- 12–18 storeys (9:1)
- 12–18 storeys (10:1)
- 12–20 storeys (12:1)
- 16–24 storeys (12:1)
- 30–40 storeys (17:1)
- Metro Tunnel
- new public transport features
- existing public transport infrastructure

NOTE: Design and Development Overlay Schedule 70 – Metro Tunnel Project Infrastructure Protection Areas applies to land above and adjacent to the Metro Tunnel.

The form of buildings above and below ground within DDO70 will be subject to the design clearances and loading allowances of the tunnel and station infrastructure.

That controls be drafted to refer to the following wind effect measures:

Unsafe wind conditions meaning the hourly maximum 3 second gust which exceeds 20 metres/second with probability of exceedance of 0.1 per cent from all wind directions combined.

Comfortable wind conditions meaning a mean wind speed from all wind directions combined with probability of exceedance less than 20 per cent of the time, equal to or less than:

- 3 metres/second for sitting areas
- 4 metres/second for standing area
- 5 metres/second for walking areas.

Mean wind speed meaning the maximum of:

- Hourly mean wind speed, or
- Gust equivalent mean speed (3 second gust wind speed divided by 1.85)

Incorporate a permit requirement to undertake wind tunnel testing for development in excess of the following height as follows:

- **Arden North:** 20 metres
- **Arden Central:** 30 metres
- **Laurens Street:** 40 metres

Laneways and through block links: The requirements for laneways, through block links and pedestrian and cycling connections (measured from the common title boundary or centreline of the laneway) be introduced as identified requiring the following:

- Pedestrian-only laneways to be open to the sky and 9 metres in total width,
- Shared laneways to be open to the sky and 8 metres in total width,
- Internal links to be between 9 and 12 metres width and include a proportional void commensurate with its width, and
- Through block links to be between 6 and 9 metres in width of high quality, whether open to the sky or internal arcades.

Active street frontages: Introduce active street frontage controls which specifies that ground floor frontages should include either 5 metres or 80 per cent (whichever is greater) of the building façade at ground level in an entry or display window to a retail premises. Within flood prone areas, transitions in floor levels should not rely on external stairs, ramps or platform lifts which disconnect interior spaces from the public realm.

Traffic conflict frontages and weather protection: The built form controls should include a traffic conflict frontage to discourage ingress and egress onto the key high capacity public transport and cycling corridors. Vehicle access, crossovers and entries to parking should not be provided as marked and should include pedestrian refuges if the vehicle access or crossover is more than 6.1 metres wide.

Adaptable buildings: Introduce adaptable building requirements to provide for the future conversion of those parts of the building accommodating car parking being able to adapt over time and required the lower levels (up to the height of the street wall) to provide:

- At least 5.0 metres floor-to-floor height at ground level.
- At least 3.2 metres floor-to-floor height for other lower levels up to the height of the street wall associated with accommodation uses.
- At least 4 metres floor-to-floor height for other lower levels up to the height of the street wall associated with office uses.
- Car parking areas not located in a basement should provide:
  - Level floors
  - At least 2.8 metres floor-to-floor height.

Mechanical parking systems to reduce the area required for car parking.

APPENDIX A DEVELOPMENT ANALYSIS

Macaulay cluster

139–149 Boundary Road North Melbourne

PA1900753

TP-2018-770 & TP-2019-196

Proposed land use	Residential / Mixed-use
Max height (storeys)	11
Street wall height	5
Setback ground floor	Front: No Side: Yes Rear: Yes
Setback upper levels	Front: Yes Side: No Rear: No
Gross floor area	23,605m²
FAR	5.2:1

68–102 Alfred Street North Melbourne

PA1900752

Proposed land use	Residential / Mixed-use
Max height (storeys)	Building A: 12 Building B: 9 Building C: 12 Building D: 12
Street wall height	Building A: 12 Building B: 5 Building C: 5 Building D: 5
Setback ground floor	Yes
Setback upper levels	Limited –does not meet DDO63 requirements
Gross floor area	42,591m²
FAR	5.6:1

102–115 & 115–117 Boundary Road, North Melbourne

PA1900619 (Building A)

Proposed land use	Residential / Mixed-use
Max height (storeys)	12
Street wall height	2
Setback ground floor	Limited: front & north side. No setback rear & south side
Setback upper levels	Limited: front & north side. Projecting over title boundary rear & southern side
Gross floor area	17,605m²
FAR	5.8:1

103–117 Boundary Road North Melbourne

PA1900619 (Building B)

Proposed land use	Residential / Mixed-use
Max height (storeys)	12
Street wall height	6
Setback ground floor	Yes
Setback upper levels	Yes
Gross floor area	17,605m²
FAR	5.8:1

59–101 Alfred Street North Melbourne

PA1900705 – Buildings C, D & E

Proposed land use	Residential / Mixed-use
Max height (storeys)	12
Street wall height	Building C: 5 Building D: 7 Building E: 7
Setback ground floor	Yes
Setback upper levels	Yes
Gross floor area	67,311m²
FAR	5.6:1

77–83 Sutton Street North Melbourne

PA2008981

Proposed land use	Residential / Mixed-use
Max height (storeys)	12
Street wall height	1 to 6
Setback ground floor	6.35–11.12m laneway north–south, 4.5m south
Setback upper levels	East & west: 9–9.4m South: 4.5m North: 9m
Gross floor area	21,927m²
FAR	6.3:1

87–105 Racecourse Road North Melbourne

TP-2018-770 & TP-2019-196

Proposed land use	Residential / Mixed-use
Max height (storeys)	3 towers × 12
Street wall height	2
Setback ground floor	Yes
Setback upper levels	Yes
Gross floor area	46,756m²
FAR	7.2:1

69–75 Racecourse Road North Melbourne

TP-2020-460

Proposed land use	Residential / Mixed-use
Max height (storeys)	12
Street wall height	12
Setback ground floor	Yes
Setback upper levels	No
Gross floor area	Total: 12,216m² (including basement); 10,146m² above-ground
FAR	9.7:1

Parkville and other developments

611–681 Elizabeth Street Melbourne

Proposed land use	Research & development
Max height (storeys)	19
Street wall height	18
Setback ground floor	No
Setback upper levels	Yes
Gross floor area	53,828m²
FAR	7.2:1
Land use areas	R&D: 34,484m² Retail: 615m²
Floorplate average	2,833m²

683–699 Elizabeth Street Melbourne

PA1900538

Proposed land use	Office
Max height (storeys)	23
Street wall height	20
Setback ground floor	No
Setback upper levels	Yes
FAR	16.3:1

101–133 Canning Street North Melbourne

2011008241

Proposed land use	Residential
Max height (storeys)	Tower A: 10 Tower B: 16
Street wall height	3–4
Setback ground floor	No
Setback upper levels	Yes
FAR	6:1

413–427 Macaulay Road Kensington

TP-2018-540

Proposed land use	Mixed-use
Max height (storeys)	6
Street wall height	6
Setback ground floor	No
Setback upper levels	No
FAR	4.7:1

114–116 Haines Street North Melbourne

TP-2014-914A

Proposed land use	Residential
Max height (storeys)	10
Street wall height	5
Setback ground floor	No
Setback upper levels	Yes
FAR	7.5:1

3 Shiel Street North Melbourne

TP-2014-1068

Proposed land use	Residential
Max height (storeys)	10
Street wall height	3.5
Setback ground floor	Limited
Setback upper levels	Yes
FAR	3.9:1

69 Hardiman Street Kensington

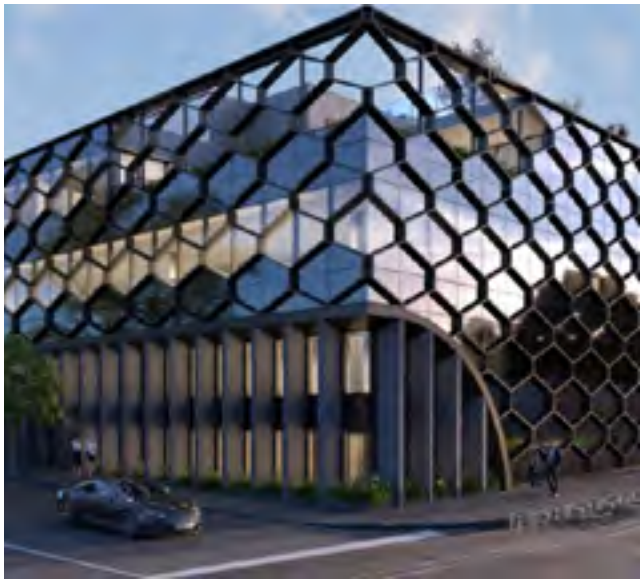
TP-2016-225

Proposed land use	Residential
Max height (storeys)	5
Street wall height	2
Setback ground floor	No
Setback upper levels	Limited
FAR	3.8:1

347–367 Macaulay Road Kensington

TP-2017-709

Proposed land use	Residential
Max height (storeys)	6
Street wall height	4
Setback ground floor	No
Setback upper levels	Yes (on one side)
FAR	3.6:1



644 Victoria Street North Melbourne

TP-2019-417

Proposed land use	Office
Max height (storeys)	4
Street wall height	4
Setback ground floor	No
Setback upper levels	No
FAR	3.8:1

393–399 Macaulay Road Kensington

TP-2018-360

Proposed land use	Residential
Max height (storeys)	8
Street wall height	2 to 4
Setback ground floor	No
Setback upper levels	Yes
FAR	6.2:1

513–521 Victoria Street West Melbourne

TP-2016-426

Proposed land use	Residential
Max height (storeys)	7
Street wall height	6 to 7
Setback ground floor	No
Setback upper levels	No
FAR	5.1:1

36–58 Macaulay Road North Melbourne

TP-2015-533

Proposed land use	Residential/Mixed-use
Max height (storeys)	13
Street wall height	1 to 3
Setback ground floor	Yes
Setback upper levels	No
FAR	7.5:1

346–350 Macaulay Road Kensington

PA1900727

Proposed land use	Mixed-use
Max height (storeys)	8
Street wall height	6
Setback ground floor	No
Setback upper levels	Yes
FAR	4.3:1

687 Queensberry Street North Melbourne

TP-2018-1171

Proposed land use	Residential
Max height (storeys)	4
Street wall height	3
Setback ground floor	No
Setback upper levels	No
FAR	2.3:1

14–26 Bruce Street Kensington

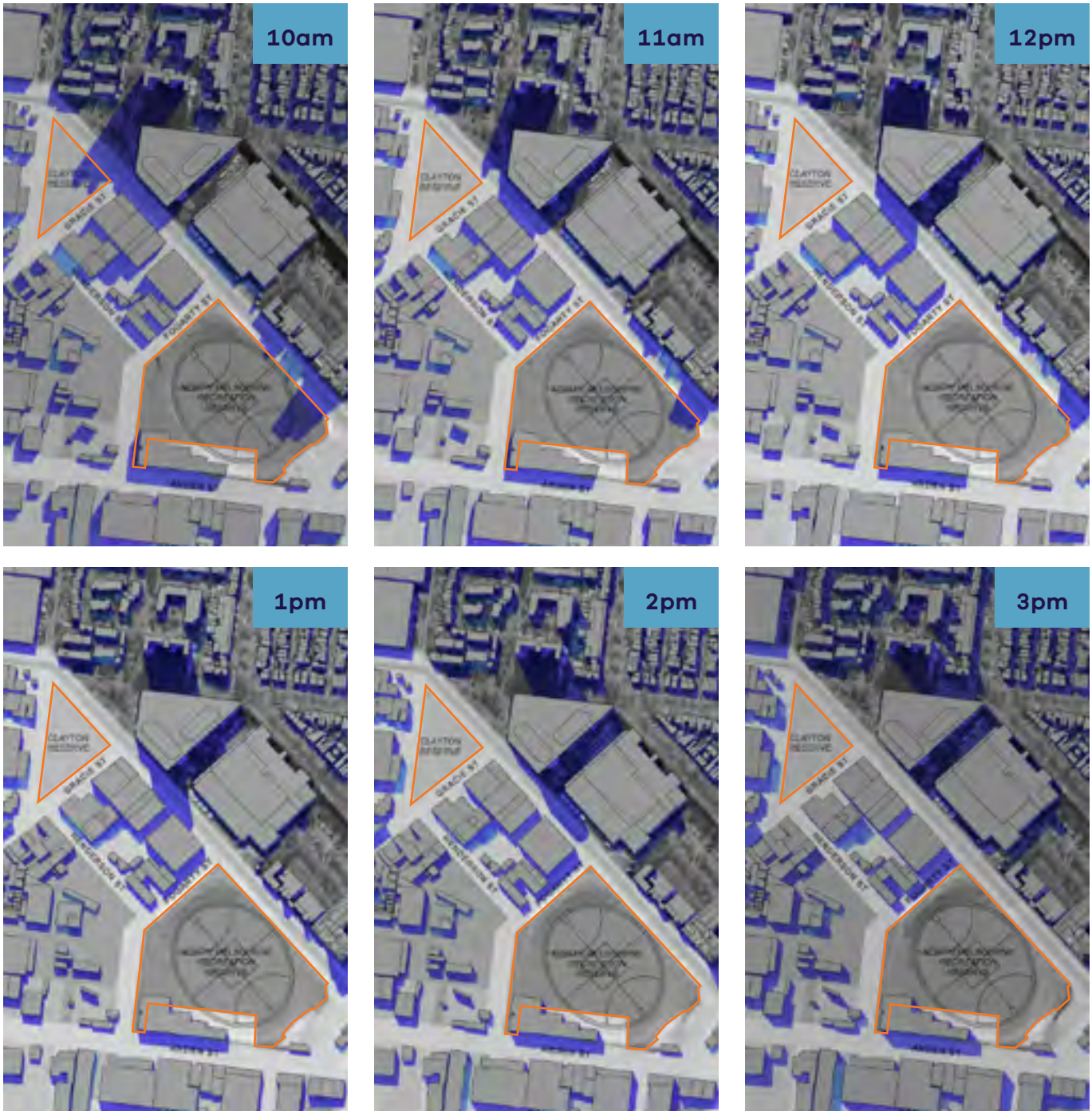
TP-2019-587

Proposed land use	Residential
Max height (storeys)	8
Street wall height	4
Setback ground floor	No
Setback upper levels	Yes
FAR	6.4:1

APPENDIX B BUILT FORM TESTING

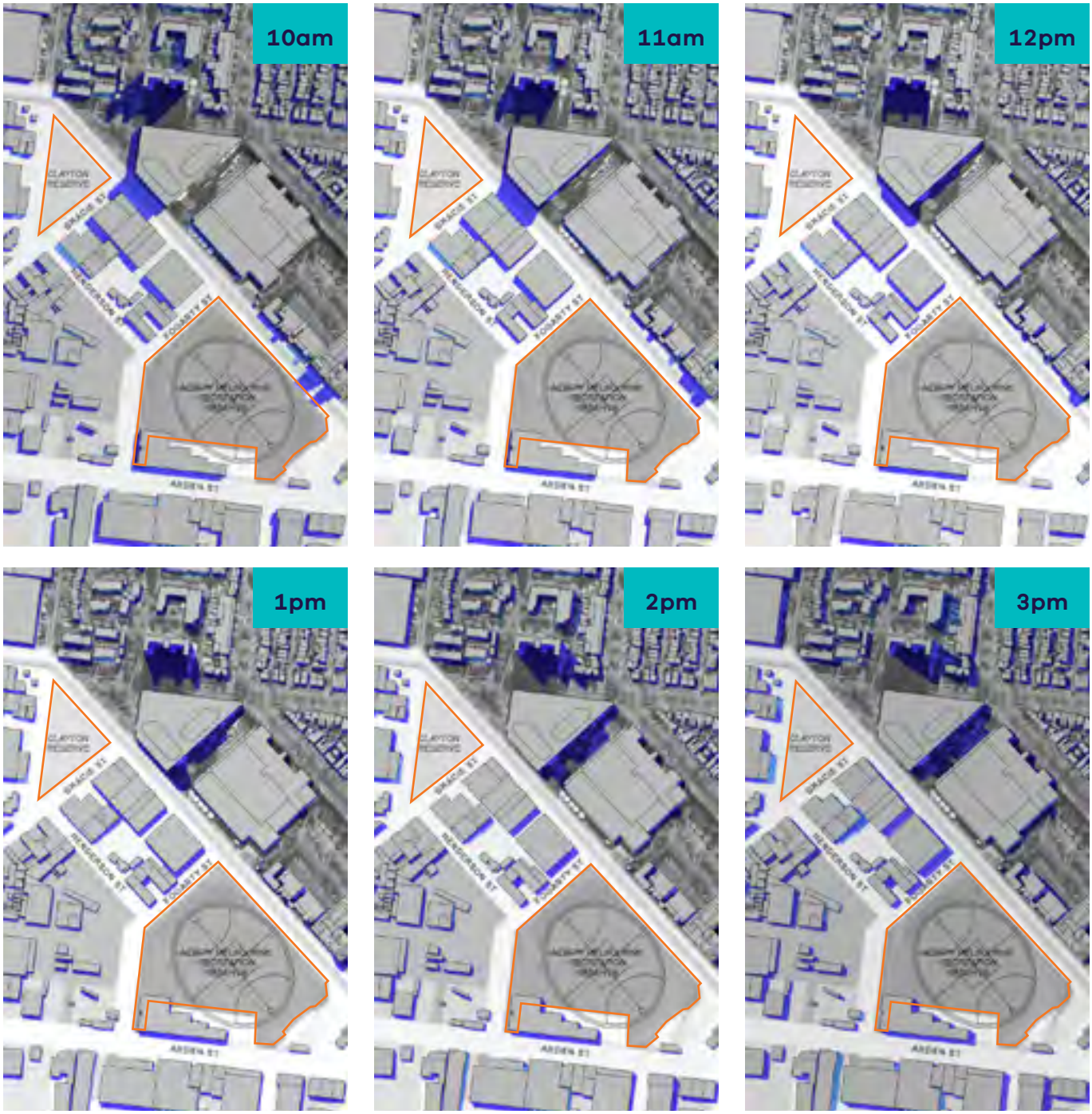
Existing built form shadowing to Clayton Reserve and North Melbourne Recreation Reserve

Winter solstice – 22 June



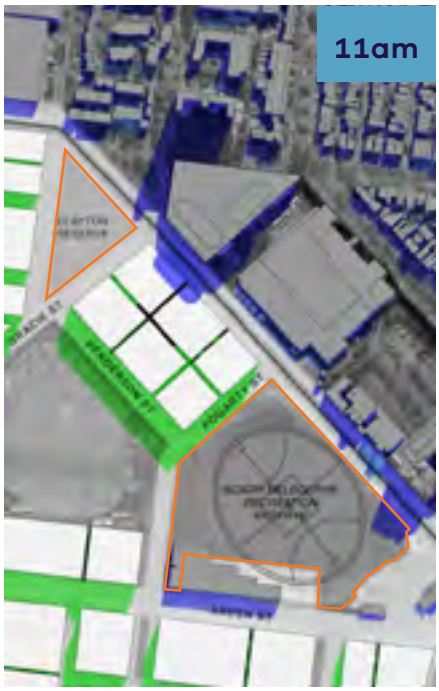
Existing built form shadowing to Clayton Reserve and North Melbourne Recreation Reserve

Spring equinox – 22 September



Overshadowing by street wall height (6 storey street wall – 25m) to Clayton Reserve and North Melbourne Recreation Reserve

Winter solstice – 22 June



Overshadowing by street wall height (6 storey street wall – 25m) to Clayton Reserve and North Melbourne Recreation Reserve

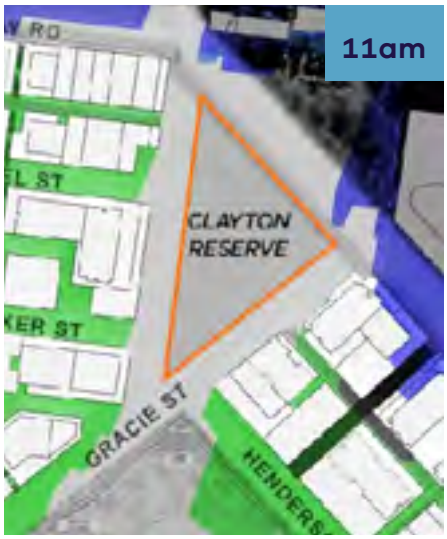
Spring equinox – 22 September

Overshadowing by articulated model – Clayton Reserve

Spring equinox – 22 September

Overshadowing by articulated model – Clayton Reserve

Winter solstice – 22 June



Overshadowing by articulated model – new integrated stormwater management open space

Spring equinox – 22 September

Overshadowing by articulated model – new integrated stormwater management open space

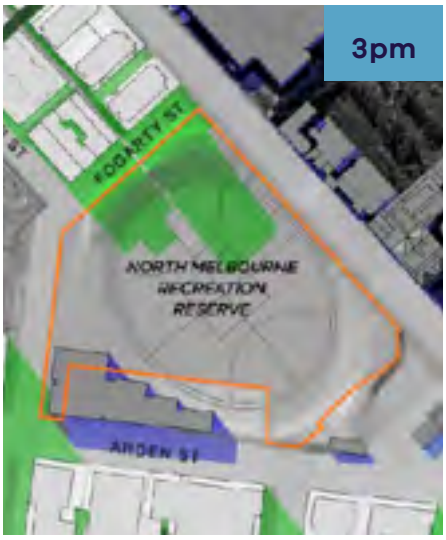
Winter solstice – 22 June

Overshadowing by articulated model – North Melbourne Recreation Reserve

Spring equinox – 22 September

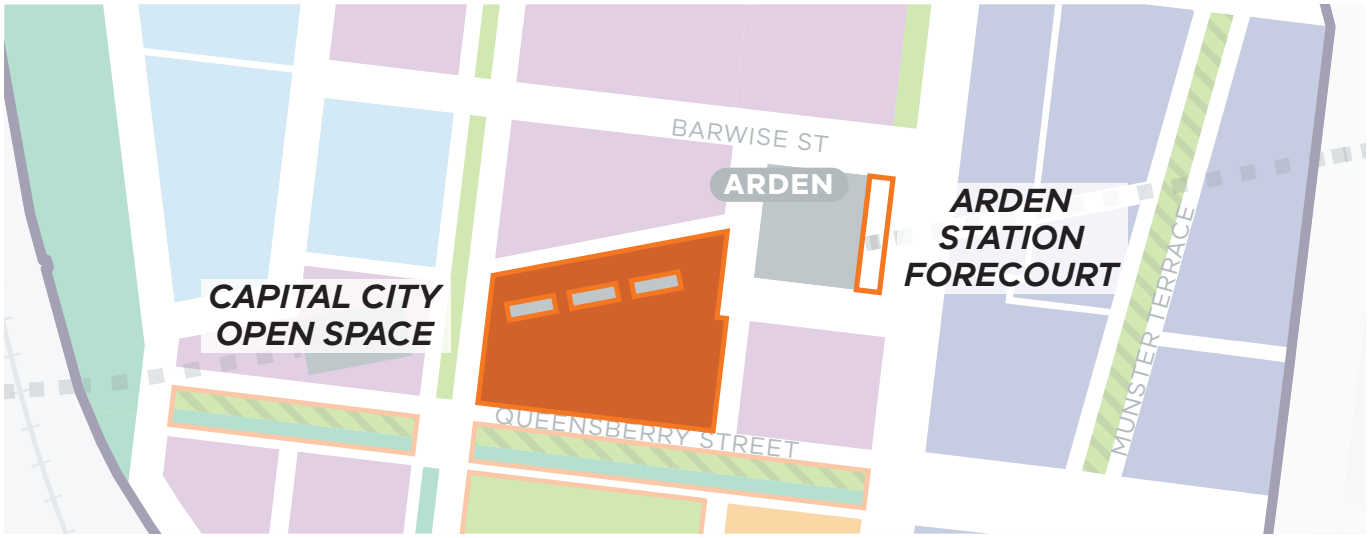
Overshadowing by articulated model – North Melbourne Recreation Reserve

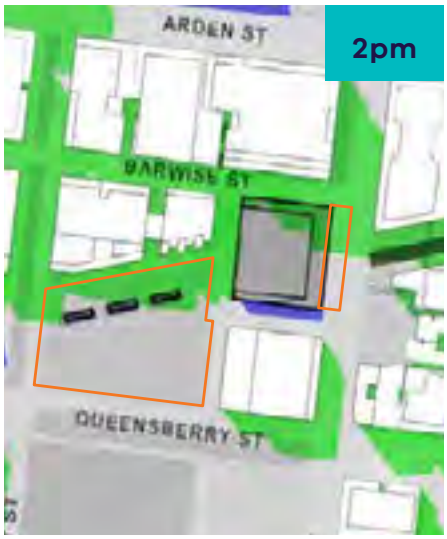
Winter solstice – 22 June



Overshadowing by articulated model – Arden Central new open spaces

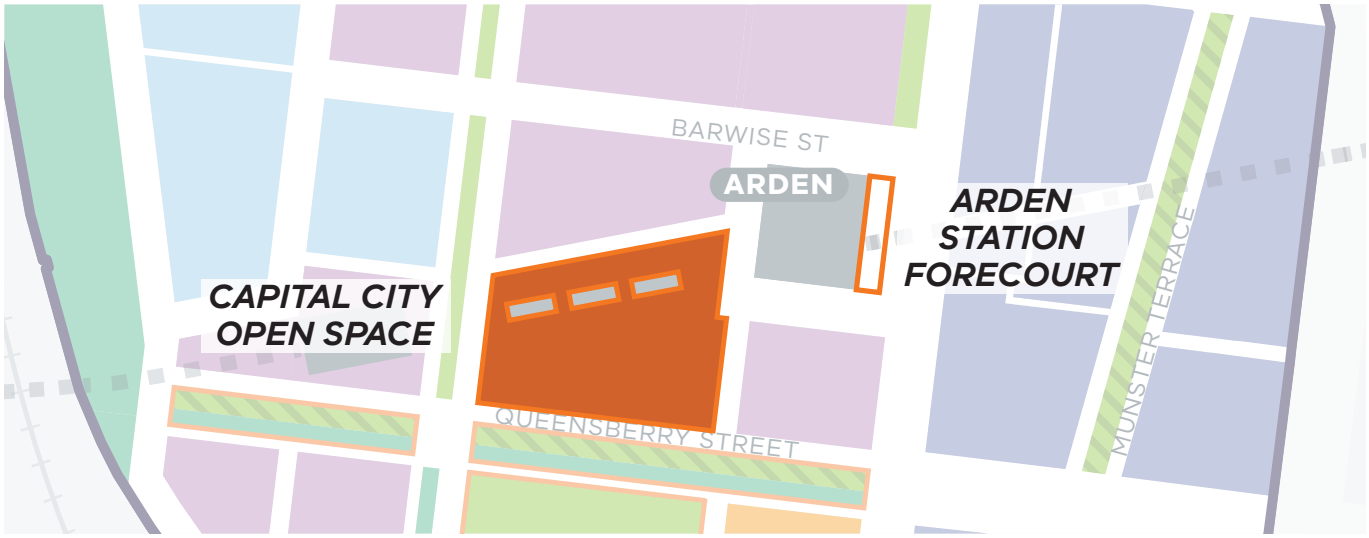
Spring equinox – 22 September





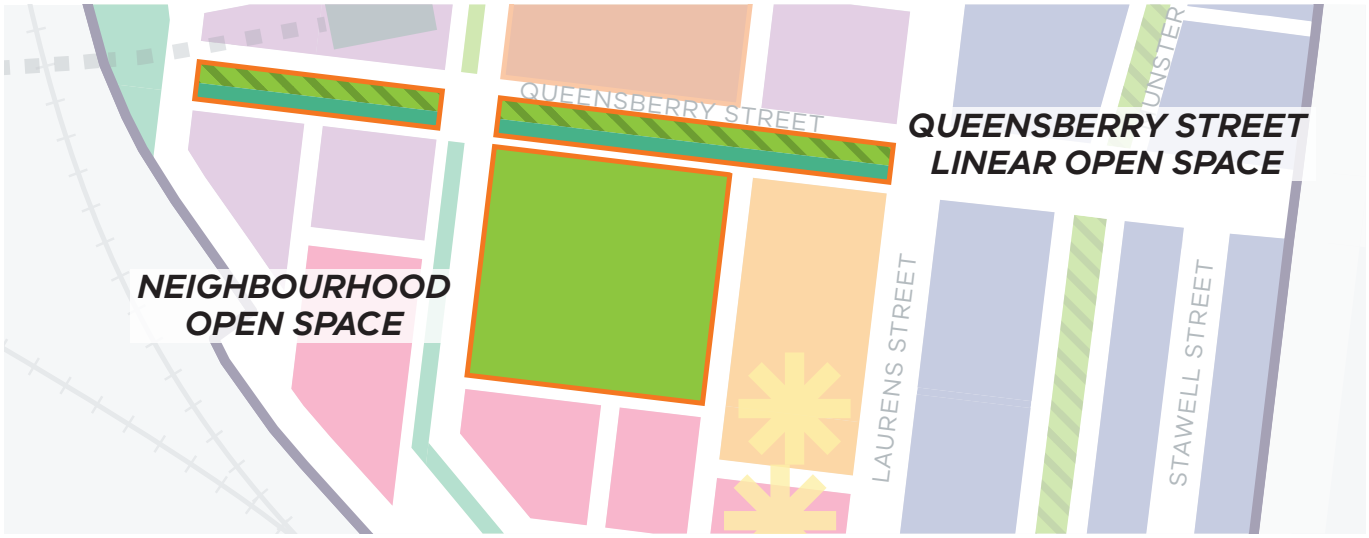
Overshadowing by articulated model – Arden Central new open spaces

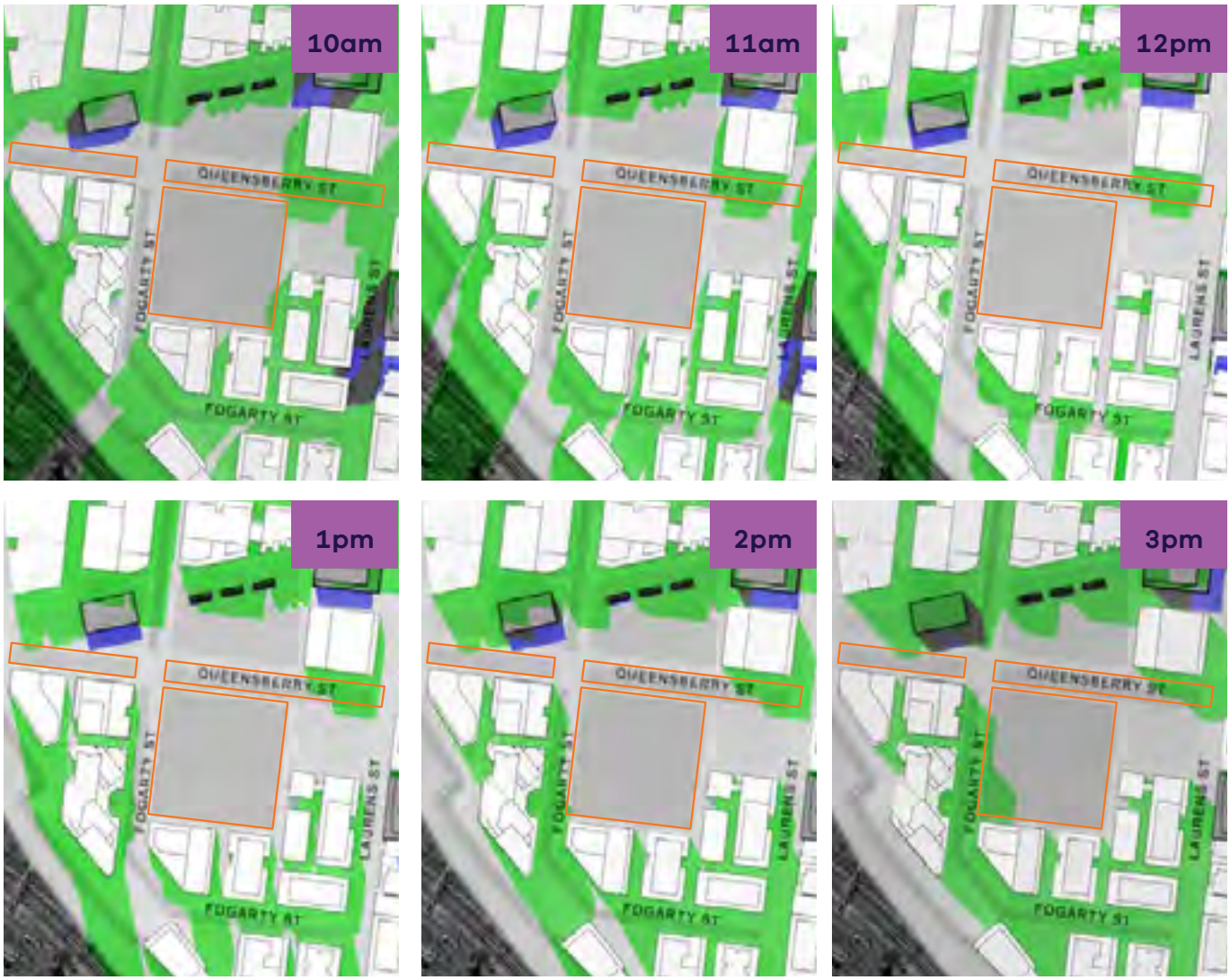
Winter solstice – 22 June



Overshadowing by articulated model – Arden Central new open spaces

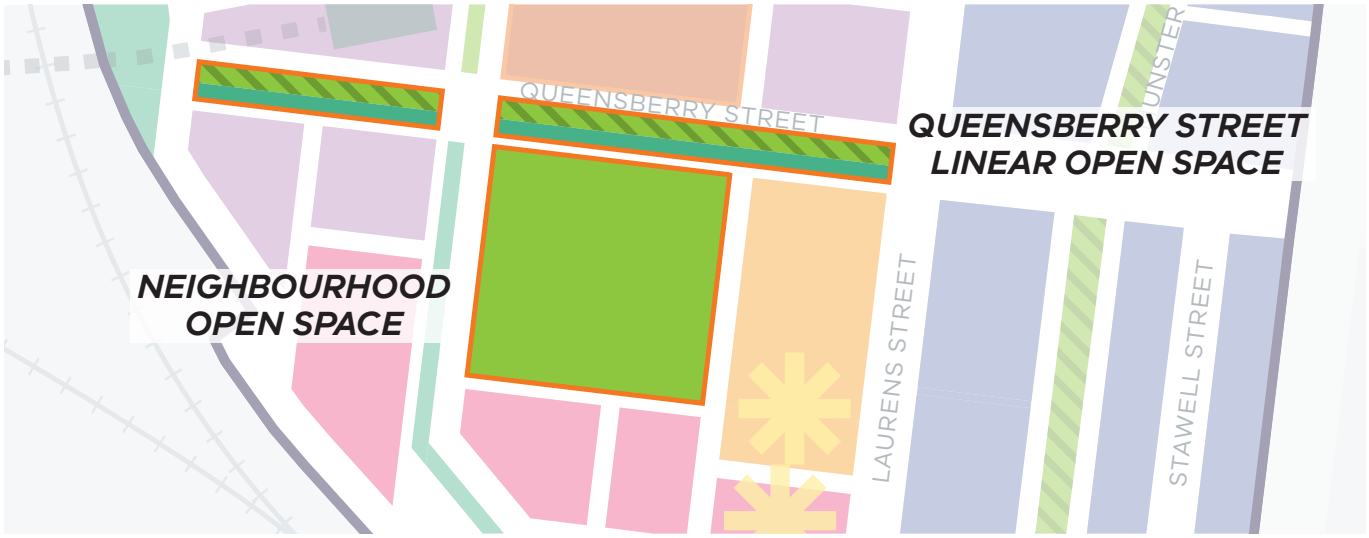
22 August





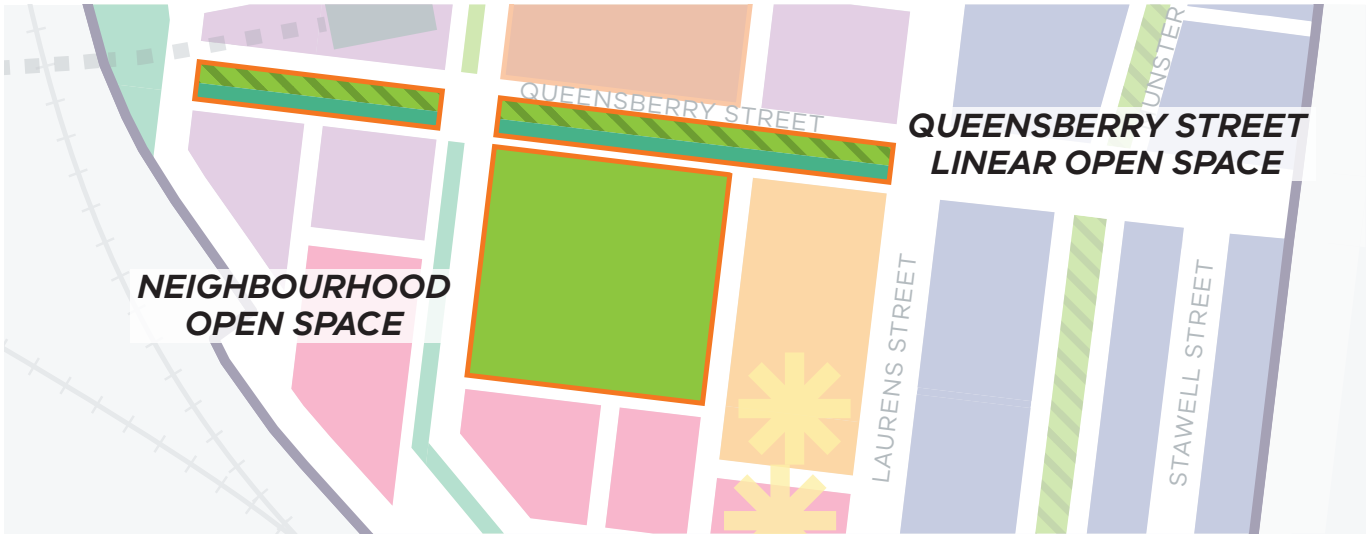
Overshadowing by articulated model – Arden Central new open spaces

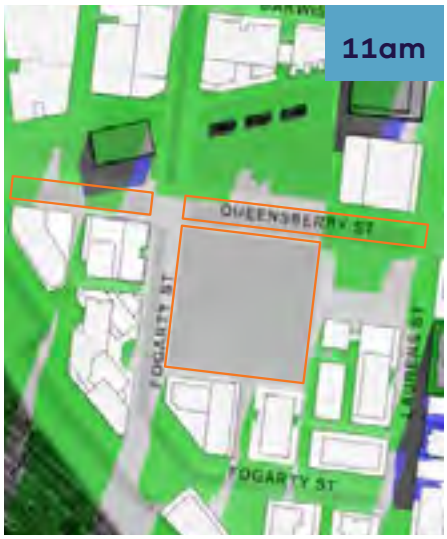
Spring equinox – 22 September



Overshadowing by articulated model – Arden Central new open spaces

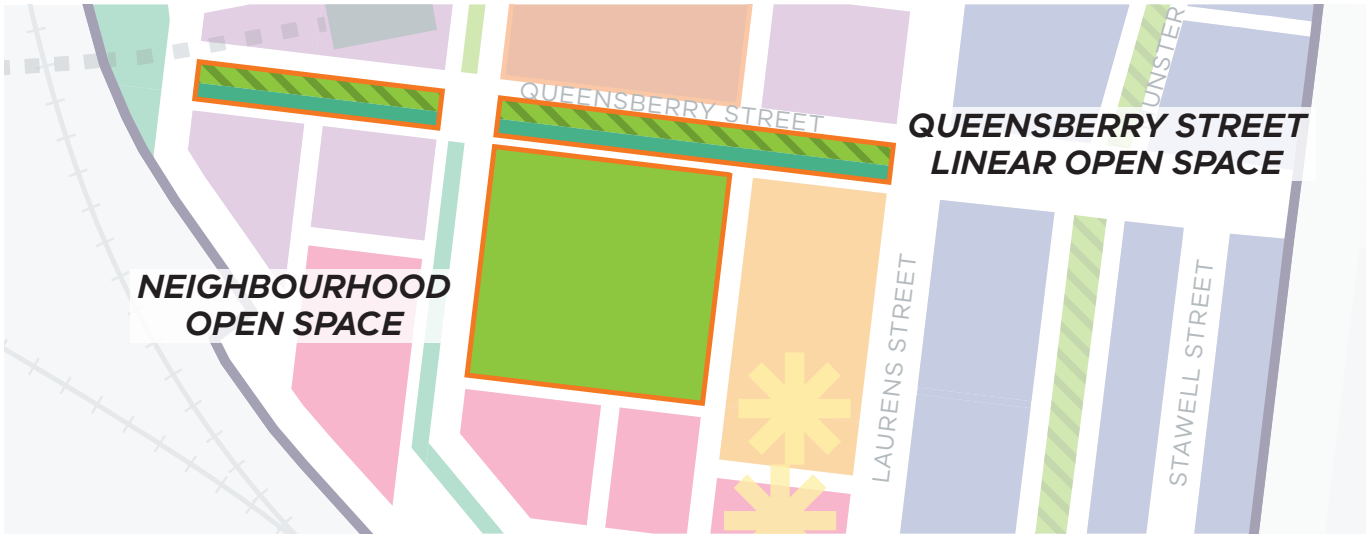
Winter solstice – 22 June





Overshadowing by articulated model – Arden Central new open spaces

22 July



APPENDIX C SOLAR PROTECTION OUTCOMES OF THE MODELLING

This report contains screen shots of the Victorian Planning Authority 3D model which has been used to demonstrate and define the built form parameters for Arden.

Table 6 Assumptions for built form parameters

Built form parameter	Built form assumption
Ground floor height	5 metres to ground floor
Floor-to-floor ceiling height	3.5 metres per floor (representative middle of standard 3.2 metres per residential floor, and 3.8 metres to 4 metres per commercial floor, reflective of Grade A offices)
Street wall heights	As per **Plan 9**
Setbacks	5 metre setback on all sides generally applied across all sites above the street wall height as defined in **Plan 9**, except for sites exceeding 20 storeys where 7.5 metre setbacks were applied. Some sites have been manually modified to have no setbacks to certain sides, due to narrowness of site.
Site coverage	100%
Limitation to yield	The model will build till it reaches one of the three scenarios: • Builds floorplates till it reaches as close to the FAR as possible. It will not build the next storey above if it pushes the site FAR past the specified control. • Solar controls for built form overshadowing protection to major open spaces, as specified in built form proposal, is not exceeded by the generative floorplate. • If FAR and solar controls are not reached, then the floorplate continues to build till it reaches the maximum height control.
Other	Amalgamation was assumed for sites where links (new roads/through block links) are shown. A limited number of new building envelopes, permit approvals and live permit applications were modelled from officially considered or endorsed plans supplied by the Department of Environment, Land, Water and Planning and Council (as the two relevant responsible authorities).

Table 7 Modelling general assumptions

Built form element	Built form assumption
Ground floor height	5 metres (assumed 4 metres commercial floor-to-floor with an additional 1 metre to accommodate anticipated raised finished floor levels in response to flooding conditions)
Floor-to-floor ceiling height	4m floor-to-floor (commercial) 3.2m floor-to-floor (residential)
FAR controls	As specified in built form proposal
Land use	As intended by the land use map in future urban structure and as specified by DDO controls
Setbacks	Initial assumption of applying a 5m setback past street wall height
Street wall height setbacks between sites	General assumption of full development of street wall (podium) to the block
Setbacks to side and rear boundaries	Above street wall: • 7.5 metres for buildings up to 64 metres • 10 metres for buildings greater than 64 metres to 81 metres • 12.5 metres for building greater than 81 metres
Through block links	Through-block links, as specified in the future urban structure, are assumed to remain open to the sky for this tranche of testing.
Street wall height	As specified in built form proposal
Ground floor assumptions	Retail + back-of house/servicing + other desired mixed-uses (gallery/studios/ commercial uses/bicycle parking)
Other assumptions	Assumption of back-of-house entries/servicing to sites

Table 8 Modelling assumption per land use type

Assumptions per land use type			
	Residential	**Commercial**	**Innovation**
General floorplate area	400–1,500m²	600–2,500m²	1,000–3,500m²
Floorplate widths and depths	Depth: • 18–22m (double-loaded apartment) • 11–14m (single-loaded apartment) Width: • 20–70m, generally aim for 35–45m	Depth: 20–30m Width: Generally 30–40m • Larger podiums attributed to commercial generally assume some form of sleeving	Depth: 20–50m Width: Generally 30–70m. • Larger floorplates generally indicate internal light core/atrium • Further investigation by BLP
Building efficiency	• 70–80 per cent (depends on narrow lots/heritage) • 75m² per bedroom, which assumes a 1BR/2BR/3BR mix	85 per cent, assumption depends on floorplate size	85 per cent, assumption depends on floorplate size
Street wall heights	Generally kept 3 to 4 stories to podium, reflective of surrounding typologies in West Melbourne. Larger sites assume commercial to podium; indication of mixed-use.	6 stories assumed, most larger sites assumed as sleeved developments	6 stories assumed, most larger sites assumed as sleeved developments
Floor-to-floor heights	General assumption of 3.2m, as advised by Hayball. General assumption of 5m applied to ground floor.	General assumption of 4m, as advised by Hayball. Can be changed to 3.8m. 3.8m to 4m assumed to be representative of Grade A office. General assumption of 5m applied to ground floor	Currently assumed to be 4m. Can be changed to assume higher floor-to-floor height. General assumption of 5m applied to ground floor
Setback to adjacent sites	• A blanket 5m setback assumed to sites • Shared boundaries maintained	• A blanket 5m setback assumed to sites • Shared boundaries maintained	• A blanket 5m setback assumed to sites • Shared boundaries maintained
Podium to podium setbacks	• Internal to site: 9–11m • Through block links: 3m • Shared boundary: none	• General assumption of 90–95 per cent site coverage (5 per cent BOH entry) • Through block links: 3m • Shared boundary: none	• General assumption of 90–95 per cent site coverage (5 per cent BOH entry) • Through block links: 3m • Shared boundary: none
Tower to tower setbacks	• Habitable to habitable: 15–20m • Non-habitable to habitable: 12–15m • Non-habitable to non-habitable: Minimum 6–12m	Minimum of 10m (5m setback requirement), except for possibility of shared boundaries.	Minimum of 10m (5m setback requirement), except for possibility of shared boundaries.

Table 9 Modelling other assumptions

Built form element	Built form assumption
Narrow sites	• Narrow sites (0.3:1 or less) assumed to be allowed to become a straight extrusion past street wall height control, due to lack of development flexibility
Narrow sites (light wells)	• Assumption of light wells to narrow sites, minimum width of 3m, minimum depth of 5m (general assumption of 8m)
Sites larger than 4000m²	• Sites larger than 4000m² assumed to have development separation. • Further testing have shown that these sites struggle to achieve FAR indicated due to limitations of floorplate requirements.
Hospital floor-to-floor heights	• Assumption of 4.5m
Consolidation of lots	• Lots, unless indicated to have common ownership, were designated a development per its single-ownership boundaries. • Lots in Arden North and Laurens Street sub-precincts can assume further consolidation.

Constrained sites	• Sites that have demonstrated some level of development constrained have been removed from this articulated modelling scenario. Constraints considered are:
	  • Small site areas – no development potential except for one additional dwelling, unless significant lot consolidation occurs
	  • Existing Heritage Overlay
	  • Recently developed in the past 10 years
	  • Developments that are strata-titled
	  • Currently under construction or has an existing approved permit

Site testing: Arden Central

17:1 SITE TESTING

30-40 Storeys

MIXED USE DEVELOPMENT

MIXED USE TO GROUND LEVEL (5m)
COMMERCIAL TO PODIUM (4m per floor)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 17.2:1 - 28 Storeys

8:1 SITE TESTING

8-16 Storeys

MIXED USE DEVELOPMENT

MIXED USE TO GROUND LEVEL (5m)
COMMERCIAL TO PODIUM (4m per floor)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 7.9:1 - 15 Storeys

8:1 SITE TESTING

8-14 Storeys

RESIDENTIAL FOCUS

INNOVATION TO GROUND (5m per floor)
INNOVATION PAST GROUND (4m per floor)

FAR 8.2:1 - 12 Storeys

Site testing: Laurens Street

8:1 SITE TESTING
12-18 Storeys

MIXED USE DEVELOPMENT
MIXED USE TO GROUND LEVEL (5m)
COMMERCIAL TO PODIUM (4m per floor)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 10:1:1 - 14 Storeys

10:1 SITE TESTING
12-18 Storeys

RESIDENTIAL FOCUS
MIXED USE TO GROUND LEVEL (5m)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 10:1 - 15 Storeys

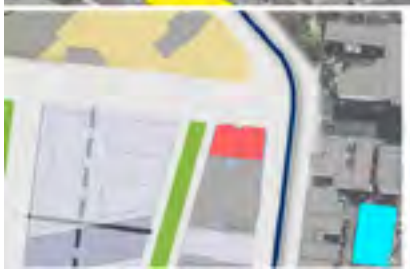
4:1 SITE TESTING

3-6 Storeys

RESIDENTIAL FOCUS

RESIDENTIAL TO GROUND (4m per floor)
RESIDENTIAL PAST GROUND (3.2m per floor)

FAR 4.1:1 - 5 Storeys



6:1 SITE TESTING

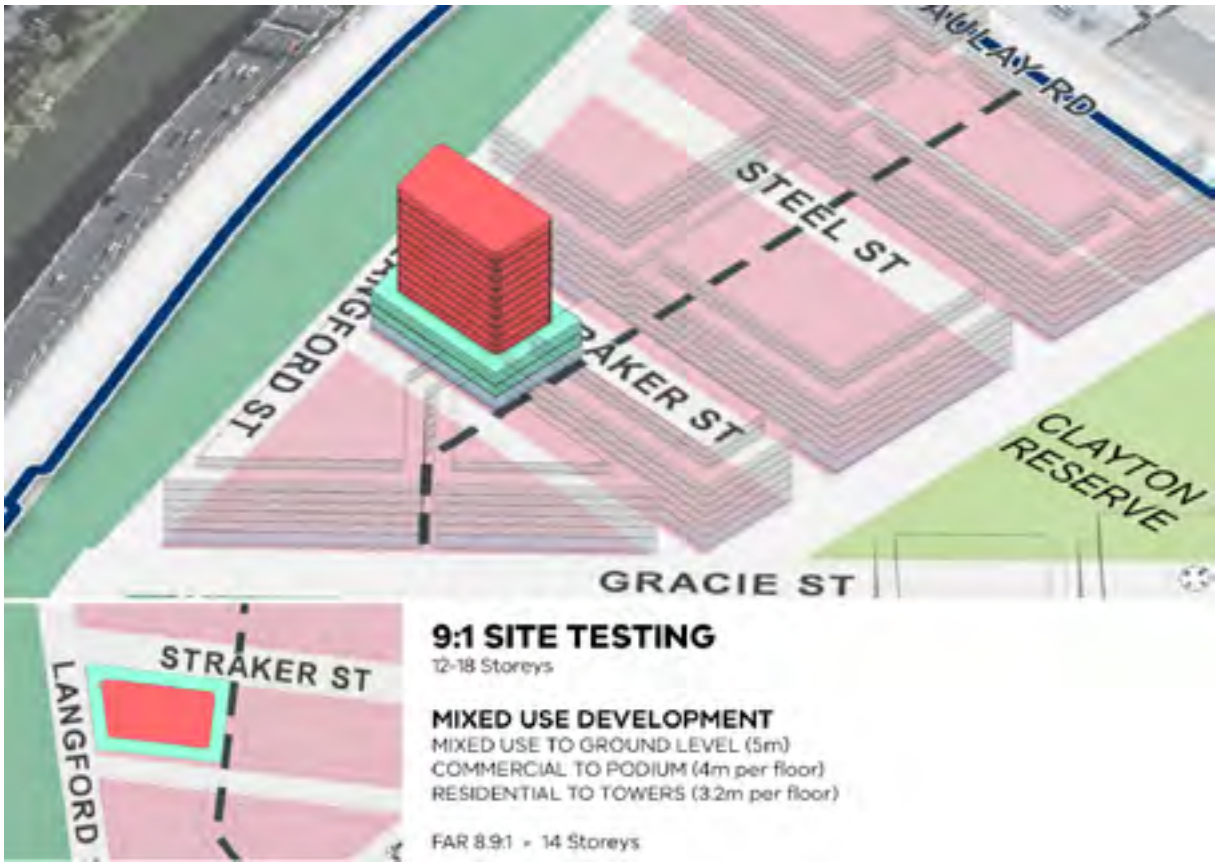
6-8 Storeys

RESIDENTIAL FOCUS

RESIDENTIAL TO GROUND (4m per floor)
RESIDENTIAL PAST GROUND (3.2m per floor)

FAR 6.3:1 - 7 Storeys

Site testing: Arden North



9:1 SITE TESTING
12-18 Storeys

MIXED USE DEVELOPMENT
MIXED USE TO GROUND LEVEL (5m)
COMMERCIAL TO PODIUM (4m per floor)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 8.9:1 - 14 Storeys

6:1 SITE TESTING
8-14 Storeys

MIXED USE DEVELOPMENT
MIXED USE TO GROUND LEVEL (5m)
COMMERCIAL TO PODIUM (4m per floor)
RESIDENTIAL TO TOWERS (3.2m per floor)

FAR 6.1:1 - 10 Storeys

Arden

URBAN DESIGN & BUILT FORM ANALYSIS

SEPTEMBER 2021

Victorian Planning Authority