



Redland City Council

Cleveland Centre

MASTER PLAN DEVELOPMENT

Relationships between built form and the street
July 2010



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Purpose Of Report



1.1 Context for the report

As Cleveland begins to grow, in line with the direction set by both the Local Growth Management Strategy (LGMS) and the proposed master plan, the nature of development in the Centre will change.

The LGMS described the desired future urban form and character of Cleveland as including:

- Increased integration between precincts through improved design of public spaces and through generous and safe pedestrian linkages with particular emphasis on strengthening the link between the retail core, harbour, performing arts centre and railway station
- Low height podium design and activated street level uses including dining and retail premises shall be promoted to reinforce the pedestrian focused 'main street' character of the centre
- The maintenance and enhancement of urban open space in and around the Cleveland Centre providing a significant green gateway to the centre and a parkland facility in proximity to the Raby Bay Harbour
- Substantial civic spaces, around the existing community facilities and the centre of town, linked with generous shaded promenades
- New residential development promoting quality sub-tropical urban design and the provision of active building frontages at street level throughout the centre.

The design direction set by the master plan embeds these principles within a strategy to guide development, and seeks to sensitively accommodate the required increase in development volume, of commercial, retail and residential floorspace in the Centre, in a way that maintains the attractiveness and distinctiveness of this popular urban 'village'.

Characteristic with cities and towns across Australia the predicted increase requires a new built form, with mixed use, medium and high density development essential to the delivery of sustainable land use patterns and infrastructure efficiencies to accommodate this change.

This report has been produced, in support of the broader suite of documents that make up the Cleveland Centre Master Plan (see diagram opposite), to begin to explore some of the design issues and opportunities' that will emerge as Cleveland evolves into a key regional Centre over the next twenty years.

1.2 Purpose of the report

This report has been produced to support, and provide an additional level of design guidance to underpin the Cleveland Centre Master Plan.

The document seeks to understand and explore in more detail some of the key issues and opportunities relating to the design of built form edges and the adjacent public realm. It provides high level design guidance and presents best practice examples to ensure appropriate design responses can be adopted in the future to ensure Cleveland maintains its position as a distinctive and attractive place to live, work and play.

Document Map

Vision



Master Plan Visualisation

Strategies



Urban Design Analysis and Issues Discussion Paper Vol II



Cleveland Centre Master Plan project volume 1: Master Plan and Implementation Plan



Landscape Strategy

Detailed Considerations



Master Plan Development : Built Form and Public Realm



Cleveland Centre : An exploration of concept designs for Bloomfield Street





S02 Contemporary Urban Forms - design considerations

2.1 Introduction

Density and land use are key determinates of our experience of towns and cities; they influence the life and vibrancy of the streets, dictate the character and scale of buildings, as well as the nature and use of public space.

In Cleveland the density and activity in the Centre is set to change, with an anticipated increase in population and diversification of commercial, retail and residential land uses planned for over the next twenty years.

2.2 Considerations

This change will bring about a natural evolution in the character and appearance of Cleveland's urban form and, in anticipation of this change, the new characteristics of the Centre; its buildings, open spaces and streets, need to be explored and understood to ensure they continue to contribute to its attractiveness as a place to live work and play.

Key Opportunities

- More efficient use of land
- More compact development
- An increase in the number of residents living in close proximity of, and therefore able to make use of and support community services and facilities
- Supports development patterns that encourage walking and cycling, rather than vehicular use, and provides opportunities to reduce carbon emissions and improvements to air quality as alternative forms of transport become preferable and the need for daily travel reduces
- Contributes to improvements in residents general health and fitness due to increased pedestrian mobility
- Increases the opportunities for social interaction as a result of more active and attractive streets and more residents using them
- Activation of the Centre, creating a vibrant and diverse hub of community activity
- Increased activity on the street, leading to improvements in the safety and security of the centre at all hours
- Greater numbers of residents able to support a viable public transport system
- A reduction in the impact of development on the natural environment, due to greater and more efficient use of land and a reduced environmental footprint
- Diversification of the available residential housing

Key Issues

- Possible loss of traditional township character and scale
- Likely loss of solar access from increased building height
- Increased risk of wind tunnelling between tall buildings
- Community angst towards negative impacts of higher density development
- Potential for increased anti social behaviour with a higher density population
- Probable rise in property prices within the Centre
- Increased pressure on existing public open spaces as the number of people living in apartments without private backyards increases

2.3 Key Design Considerations

Increased density within the centre has the potential to support sustainable economic and social activity, as well as deliver environmental improvements if carefully planned and managed. Well considered design is required to ensure development minimises any potential unwanted impacts on the attractiveness, character and amenity of the Centre.

An increase in the permitted development density generates requirements for the consideration of a number of new urban conditions; associated to changes in building heights, new building typologies, and an increase in vehicular and pedestrian activity as well as changes in the diversity and patterns of land use.

Once understood, the implications of these issues can be addressed and factored into design considerations to provide principles to guide the delivery of more sustainable urban design in the Centre.

Key areas for design consideration include:

- Climatic Responsive Design
- External Spaces
- Street Edges
- Built form

Climatic Responsive Design

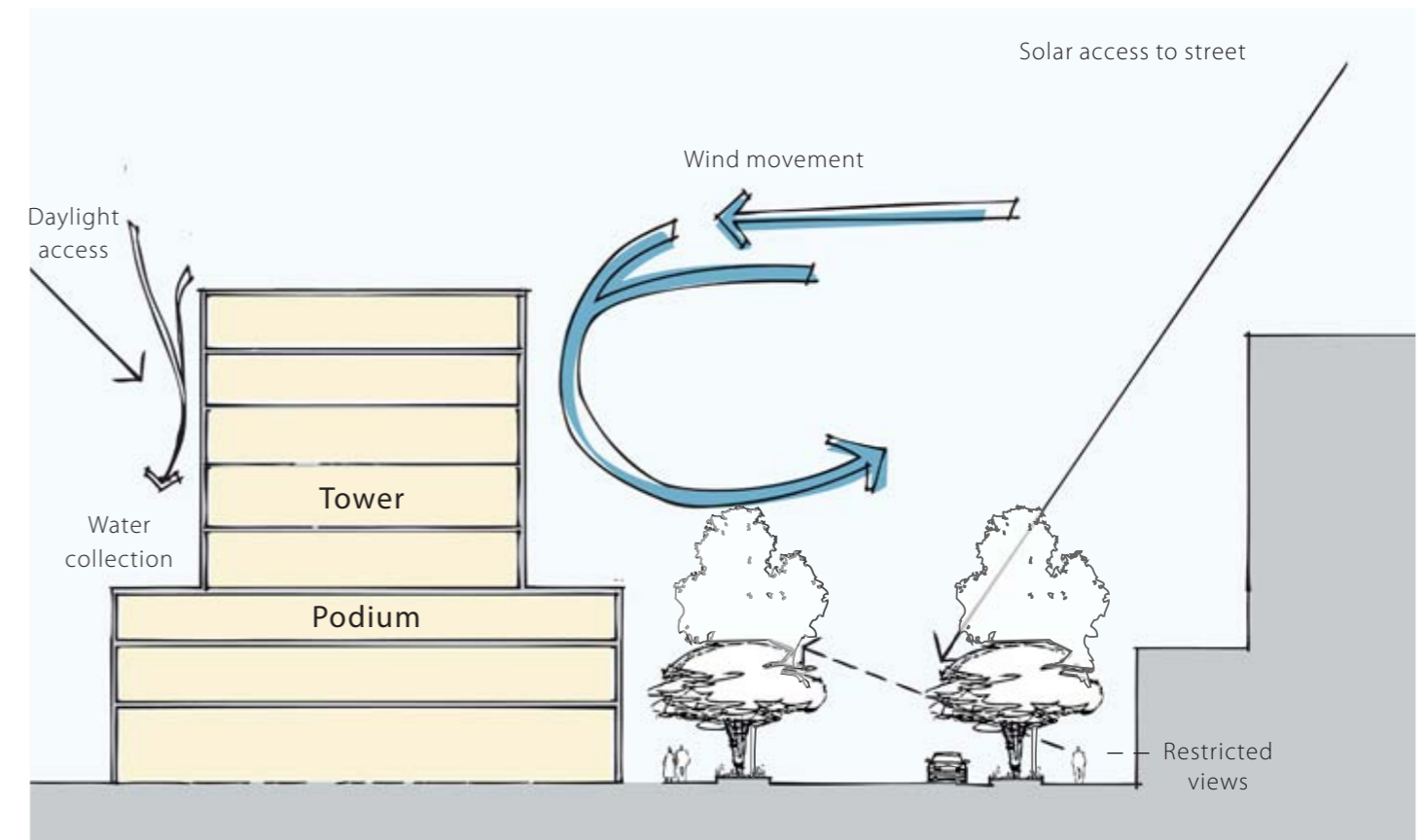
Climate responsive design considers the impact of building design on the local microclimate; the effects of wind and rain, sunlight and shadowing, and reflection and glare. Design elements can include:

- Optimise access to natural light from within the building, particularly for habitable rooms, through consideration of building orientation, depth of floorplates and general massing
- Maximise opportunities in the design to deliver natural ventilation to indoor areas
- Seek to limit the negative effects of wind tunnelling on the public realm and neighbouring buildings through the use of awnings, a well designed podium element and careful building massing.
- Explore opportunities for planting in communal areas, 'urban gardens' as an integral part of balcony spaces and the incorporation of green roofs which will contribute to an improved urban biodiversity, micro climate and building insulation
- Create opportunities to collect and reuse water including irrigation for landscape areas
- The appropriate Green Star accreditation should be sought, dependent upon building use, to achieve best practice sustainable design solutions, particularly in relation to building efficiencies. An absolute minimum Green Star rating of four stars should be pursued
- Consider the total 'lifecycle' cost of the building.

Understanding shading

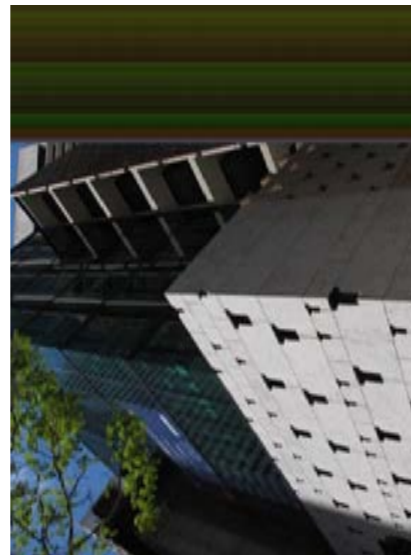
Taller buildings can cause shadowing over surrounding buildings and public spaces and consideration should be given to the effect of shadowing throughout the year.

As a further exercise in understanding the climatic impact of taller built forms in Cleveland Centre a simple 'sun path' model has been generated. This model translates the maximum built form permitted with regards to building height, across the Centre, and demonstrates a worst case scenario in terms of areas of anticipated shade. In the diagrams the extent of shadowing of the public realm can be seen based on a day in mid summer and a day in mid winter. (see diagrams on following page).



Street Section illustrating climatic considerations for design in response to medium and high density development typologies

Sun shading



Architectural treatment of solar shading, as an integral part of Commercial Office development design

Awnings designed as an integral element of the building and utilised to create identity and interest within the street

Renewable energy

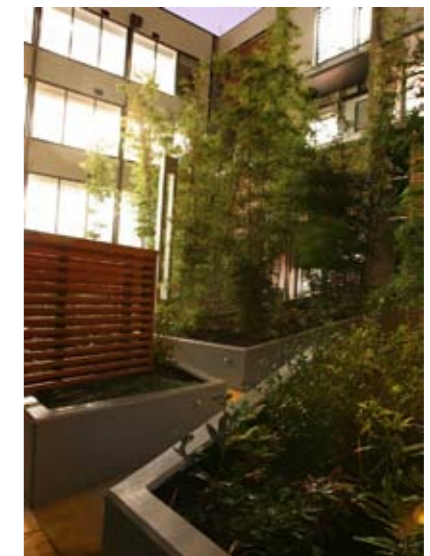


Renewable energy technologies can have strong visual qualities that, if considered as an integral part of the design of a building, can add distinctiveness as well as demonstrate green credentials

Urban gardens



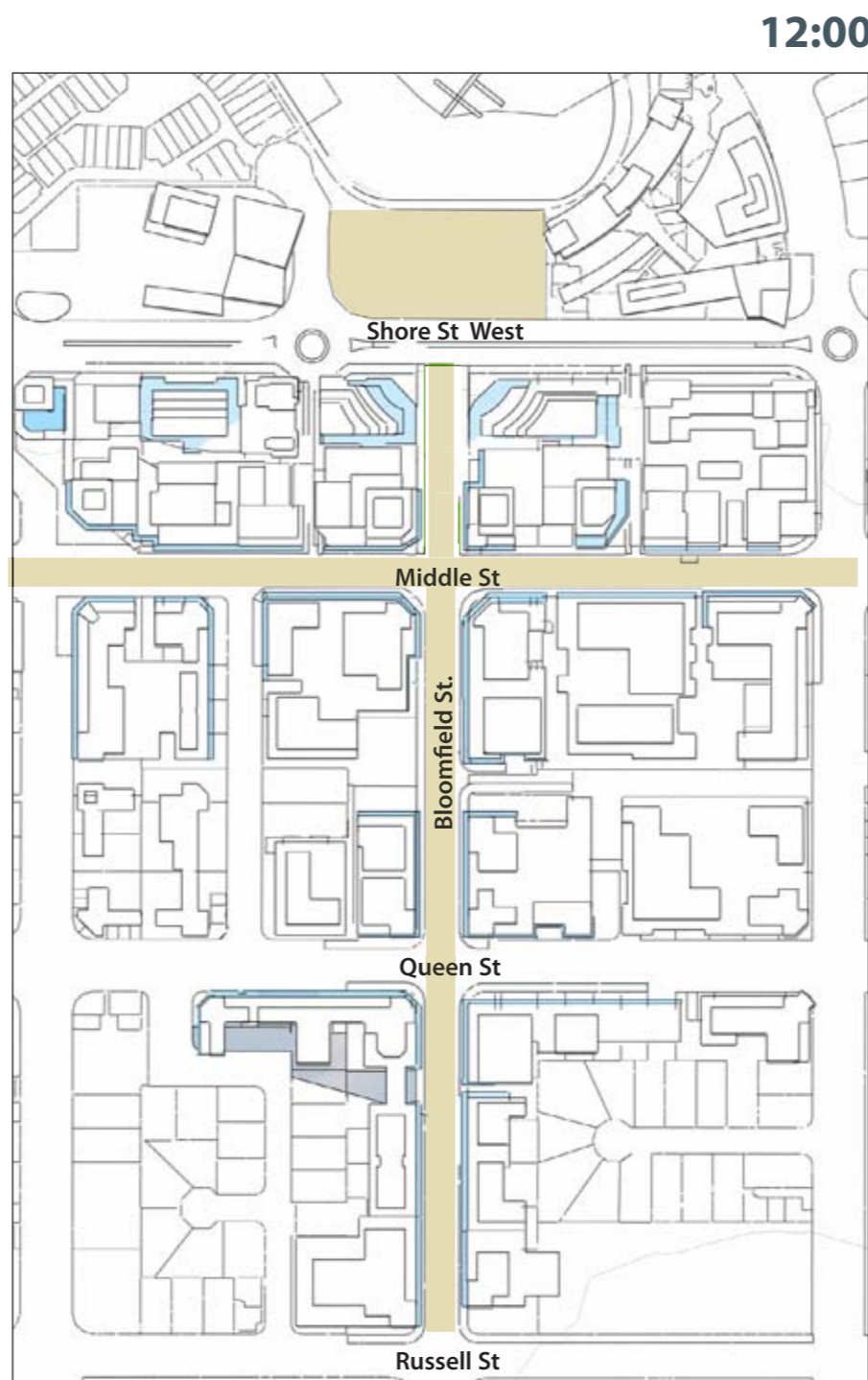
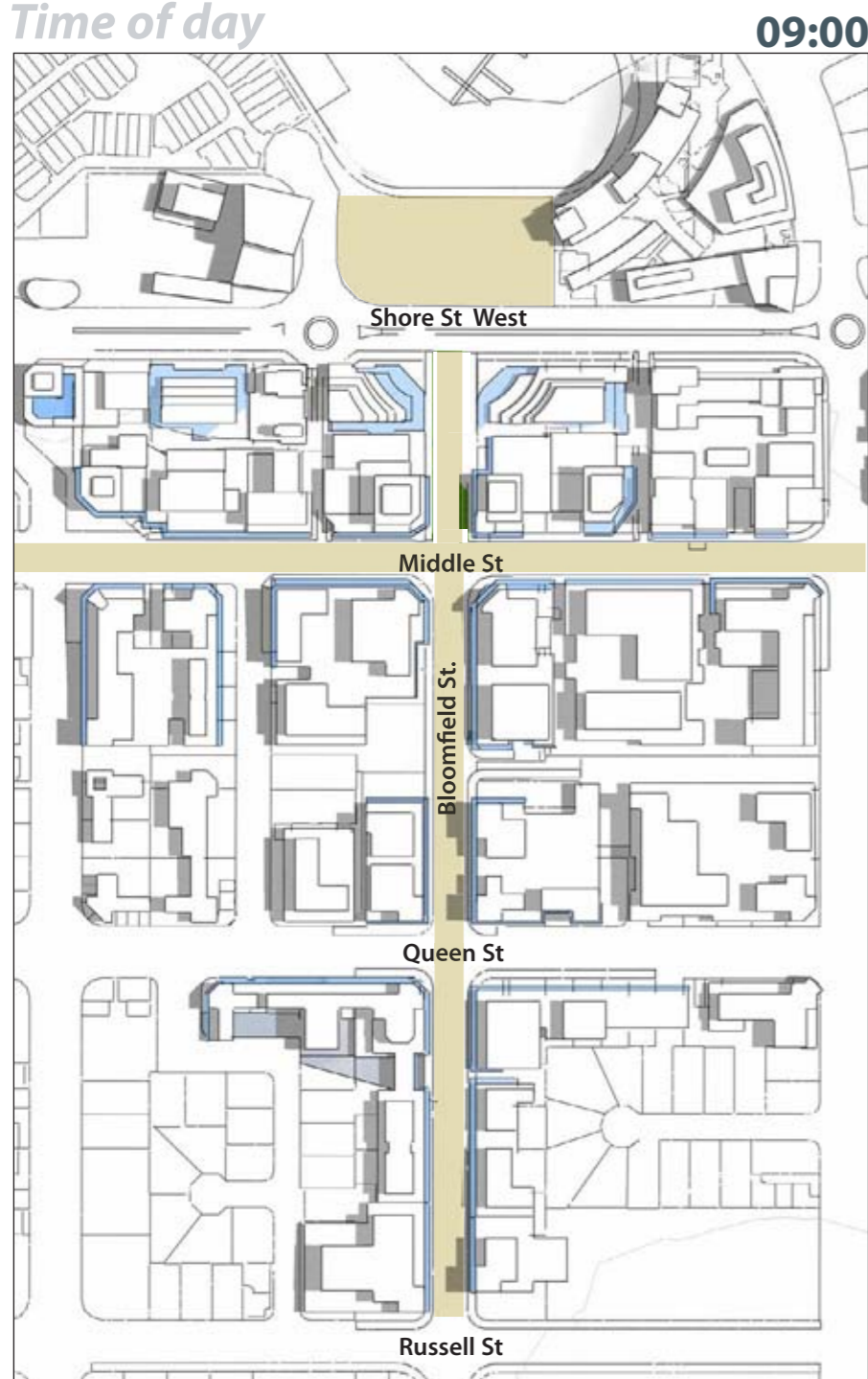
Dense landscape planting, as an integral element of the design creates a distinctive sense of place and pleasant environment for workers, residents and visitors alike



Planting adjacent to exterior walls can be used to absorb heat during the day

Extracts from Sun Path model for Cleveland Centre Master Plan illustrating the degree of shade within the public realm

Time of day

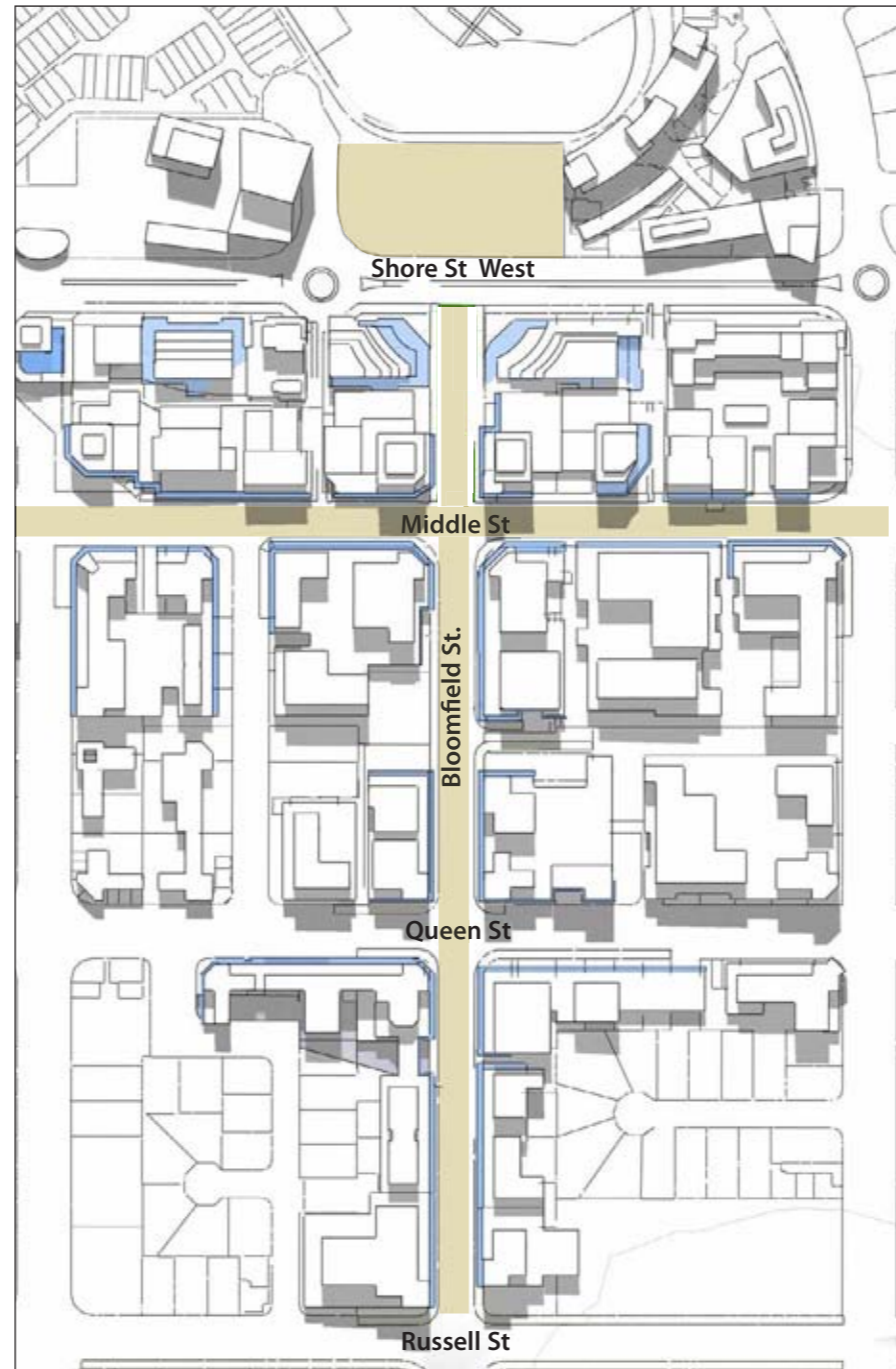


Summer

09:00

12:00

15:00



Winter

Key Elements of Cleveland's Public Realm
 (These are determined as those streets and spaces likely to attract the highest levels of use as a result of activity and amenity they offer)

External Spaces

- Provide areas for the inclusion of soft landscape in both the building and adjacent street wherever possible, to improve urban biodiversity and offer climatic comfort for both building users and pedestrians
- Provide private external space that is usable and offers reasonable levels of amenity for residents and visitors
- Clearly distinguish between public and private space to foster a sense of ownership, and present a clear message with regards to expected behaviour and use
- Design open spaces so that they can be easily and well maintained
- Make open spaces flexible so that they can support the needs of a wide range of users
- Orientate balconies, terraces and external spaces to optimise solar access
- All apartments should be provided with indoor/ outdoor space, with an accessible balcony the minimum acceptable provision.

Street Edges

- Locate active uses along the street edges to increase safety, use and interest on the street
- Maximise the number of windows and entrances at ground floor level to promote active frontages and natural surveillance
- Provide well defined and easily accessible pedestrian routes and establish desire lines through large urban blocks to encourage local pedestrian movement and the creation of walkable neighbourhoods
- Avoid creating blank walls and introducing recesses at ground floor that could allow for concealment and reduced activity on the street
- Use well designed architectural features and artworks to screen or disguise podium parking areas from the street
- Accentuate and identify building entrances so they are visually legible and physically accessible

- Create more rather than fewer entries to activate the street
- Avoid introducing entrances to car parks onto shopping streets
- Incorporate pedestrian access with car park entrances, or provide discrete car entrances.

Awnings

- At the interface between the building and street substantial awnings should be designed as an integral part of the building to provide comfort for pedestrians on the street
- Awnings can be used to give buildings visual distinctiveness
- Design open spaces so they offer an attractive and usable outdoor environment throughout the year; with specific consideration given to the need for shelter and shade

Building Layout and Design

- Design for a mix of dwelling types to cater for a diverse population mix; singles, family groups, students, the elderly, people with limited mobility and people on low to moderate incomes to ensure that a vibrant mixed community can be accommodated
- Design the internal layout of new higher density buildings to suit the site and surroundings as well as the occupants:
 - Consider views to and from the site
 - Orientation, prevailing winds and climate
 - The location of main street activity
 - External noise sources
 - Access and security
 - Natural day lighting and ventilation
- Consider multiple lifts and stair cores rather than single central cores in buildings with a larger foot print and that address more than one street.

Roof forms

- Design roof spaces to be used
- Facilitate opportunities to deliver green roofs with allowances made for deep planting to ensure vegetation has the optimum conditions for growth and success
- In roof garden design explore options to provide edible landscapes in community gardens
- Integrate servicing and lift over runs into the design of the building
- Taller buildings can enhance skylines and panoramas if their tops are well designed and visually striking. The tops of buildings can provide:
 - Identity and image
 - Reference and orientation
 - Visual incident
 - Urban sculpture
 - Landmark status.

Design Detail

- Consider materials as an integral part of the design response to reflect local context and also sustainable choices
- Use external lighting to enhance the building design
- Integrate building signage and graphics within the building design
- To mitigate any potential risk of contributing to the urban heat island affect no reflective glass facades should be considered

Circulation and services

- Consider rear lane access for podium parking
- Clearly mark access into, and movement through car parks with signage
- Clearly identify parking spaces for specific dwellings/ offices
- Make provision for loading and unloading of services
- Provide adequate parking facilities for visitors
- Ensure the main entry and individual dwelling entries allow for delivery and removal of large furniture items
- Ensure lifts can accommodate large furniture
- Ensure emergency services have easy access to the building
- Consider the visual and noise impact of air-conditioning condensers and provide discrete locations for them
- Provide a clear method for refuse sorting and disposal.

Articulation of building facades and corners



In a commercial street the ground floor maximises visual access to internal space and entrances are clear and front directly onto the street



Ground floor set back provides space for outdoor use, with the upper storey providing shade and planting included as an integral part of the building design

Awnings



Ensure buildings on corners address the street well, with opportunities to introduce distinctive elements of design to assist with way finding and animate the street with ground floor uses



Mixed use



The strong visual and physical relationship between the residential balconies and the street delivers high levels of natural surveillance and safety with ground floor commercial use activating the street.

Street edges



Building set backs extend the area available for all fresco dining and awnings provide shade

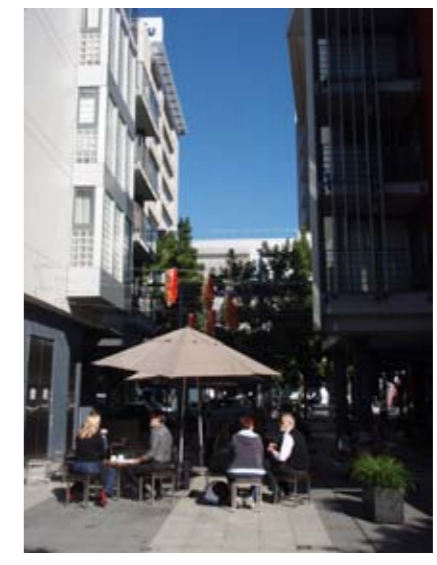


An articulated building edge creates a strong relationship with the street

Lane ways



Streets and laneways can be used to frame important vistas, with activated edges ensuring a vibrant pedestrian focused street is created and architectural elements used to provide climatic comfort and safety for pedestrians



2.4 Yield Analysis

7.3 Plot Ratios

The following tables indicate the various plot ratio scenarios relative to building height and were produced in testing the proposed Master Plan.

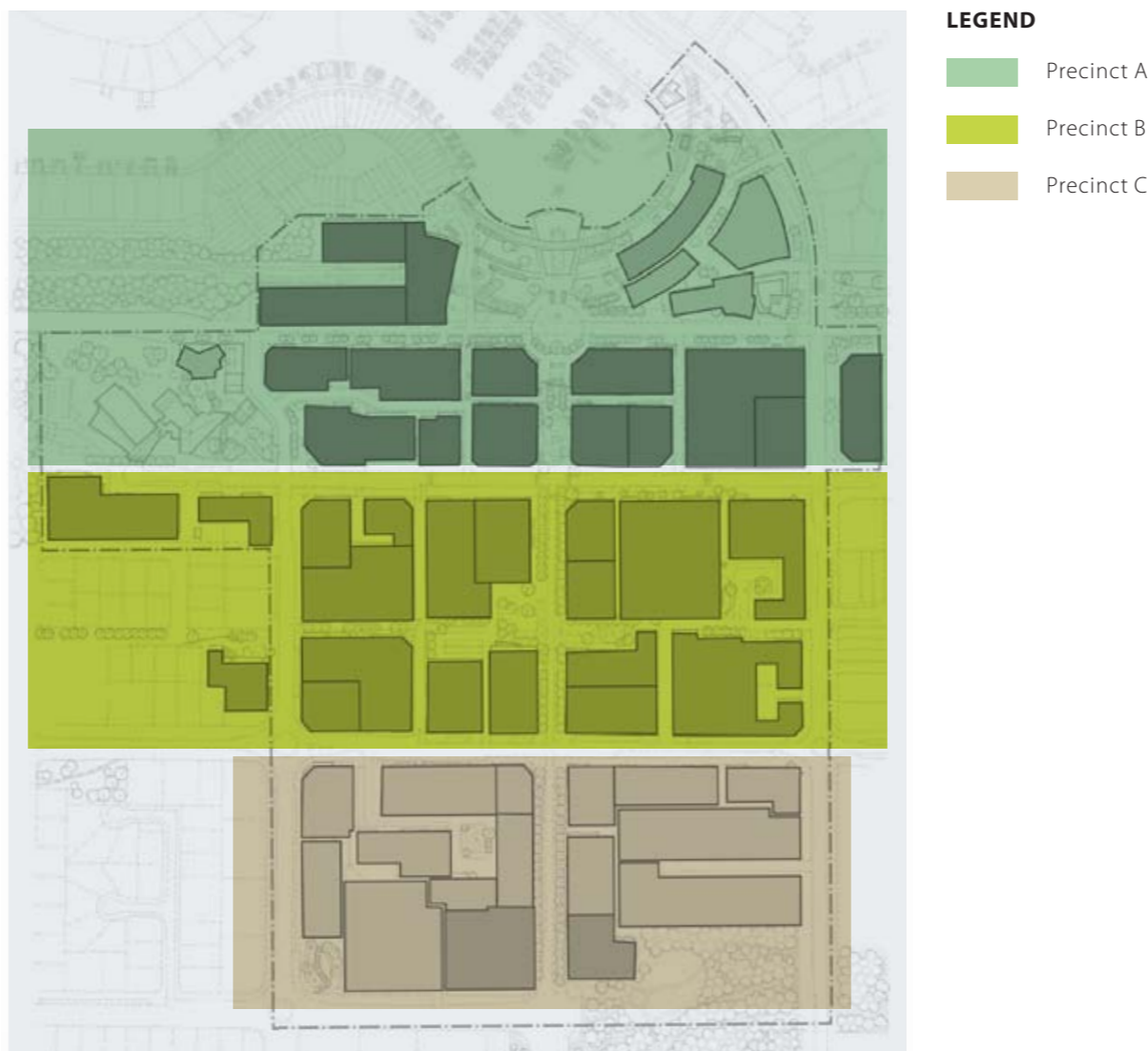


Figure 37: Precincts for Plot Ratio Allocation

MODEL 1

Assumptions: As per plot ratio table and all buildings ground floor retail, 1st and 2nd floors commercial and basement carpark and remainder residential

All car parking provision is thus assumed to be met in basements

Precinct A

plot ratio Table		
Site Area m ²	Plot Ratio	Height
<1,000	0.75	3
1 - 1,999	1.25	4
2,000 - 3,499	1.5	5
3,500 - 5,999	2	7
6,000 +	2.5	8

Precinct B

plot ratio Table		
Site Area m ²	Plot Ratio	Height
<1,000	0.75	3
1 - 1,999	1	4
2,000 - 3,499	1.25	5
3,500 - 5,999	1.5	6
6,000 +	2	7

Precinct C

Plot Ratio Table		
Site Area m ²	Plot Ratio	Height
<1,500	0.75	3
1,500 - 2,499	1.25	4
2,500 +	1.5	5

MODEL 2

Assumptions: As per plot ratio table and all buildings ground floor retail, 1st floor car parking, 2nd and 3rd floors commercial and remainder residential

Car parking provision is at one floor of the building only - this reveals potential shortfalls for residential, commercial and retail

Precinct A

Plot Ratio Table		
Site Area m ²	Plot Ratio	Height
<1,000	0.75	3
1,000 - 1,999	1.25	4
2,000 - 3,499	1.5	5
3,500 - 5,999	2	7
6,000 +	2.5	8

Precinct B

Plot Ratio Table		
Site Area m ²	Plot Ratio	Height
<1,000	0.75	3
1,000 - 1,999	1	4
2,000 - 3,499	1.25	5
3,500 - 5,999	1.5	6
6,000 +	2	7

Precinct C

Plot Ratio Table		
Site Area m ²	Plot Ratio	Height
<1,500	0.75	3
1,500 - 2,499	1.25	4
2,500 +	1.5	5

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Illustrative Studies



3.1 Introduction

In order to understand, and explore further, how the design considerations and opportunities presented in this summary study might be translated in Cleveland Centre, a series of illustrative cross sectional studies have been produced.

These diagrams relate to the master plan and explore the application of a mixture of design techniques, at three locations in the Centre. They seek to illustrate the delivery of four key goals in the design of new urban forms:

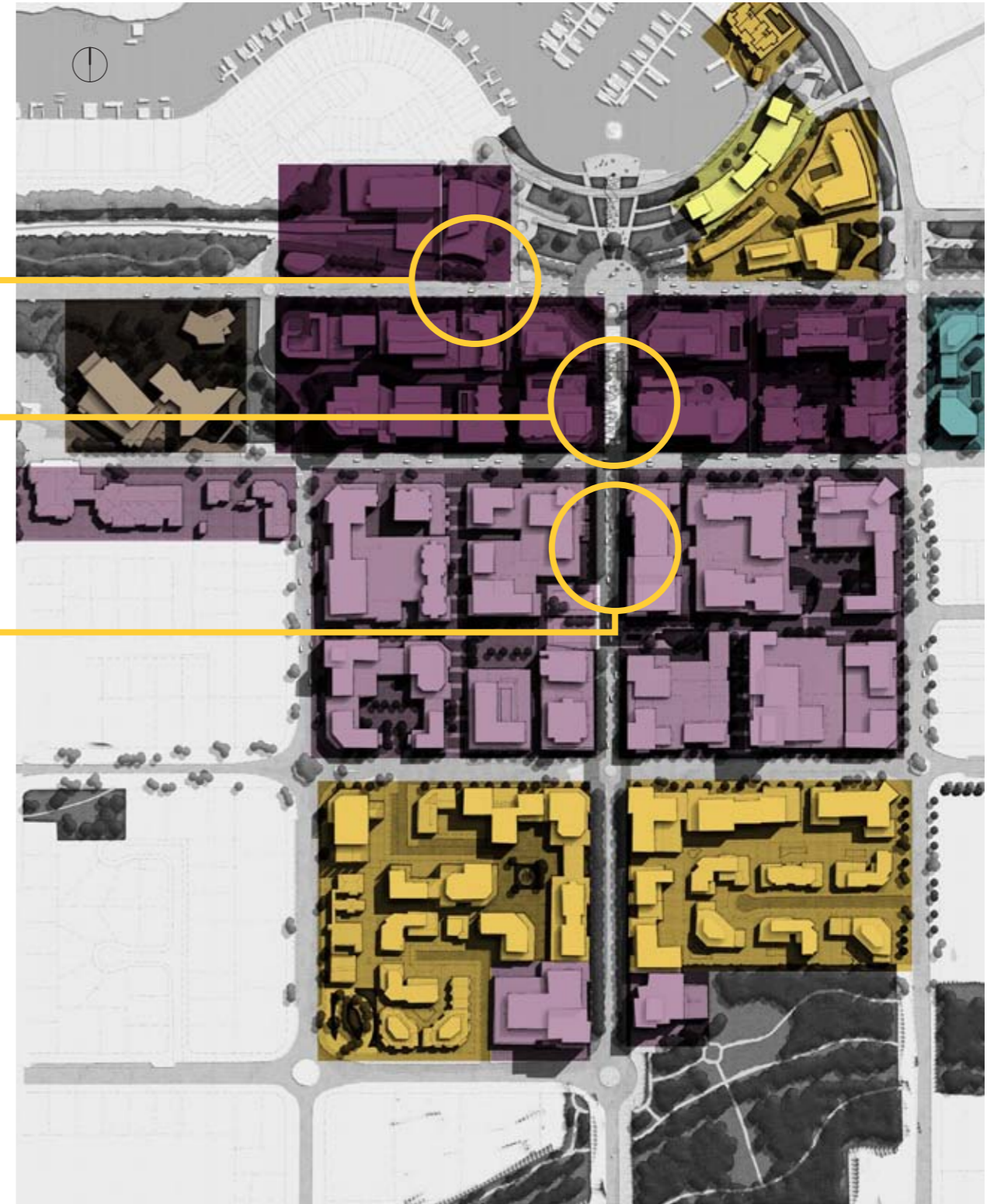
- Best practice solutions that contribute to the delivery of an attractive street scene
- Building elevations that help define distinctive and strong streets
- Ground floor treatments that ensure a lively, safe and attractive public realm are created
- The creation of a comfortable street environment for pedestrians.

Location of illustrative case studies:

Study C: Shore Street West > p 18

Study B: Bloomfield Street > p 16

Study A: Bloomfield Street > p 14



Master Plan Proposed Building Heights

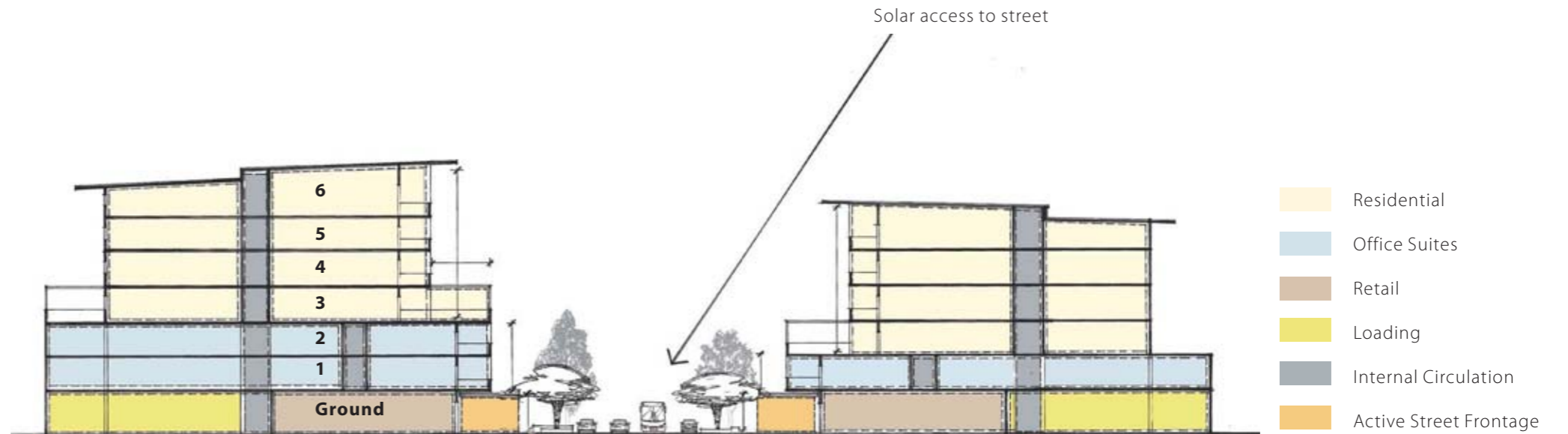
Study A: Bloomfield Street

Characteristics

In the proposed master plan, Bloomfield Street maintains its role as Cleveland’s key retail spine.

The master plan offers the opportunity to increase the size of buildings along either side of the street and presents opportunities to increase the diversity of retail and commercial activity along the corridor.

The proposed master plan envisages the street providing pedestrians with a vibrant experience, with opportunities for a rich mix of shops, cafes and restaurants fronting onto the street and spilling out onto a generous footpath where patrons can sit and dine or just simply watch the world go by.



Case study A: Bloomfield Street

Illustrative Option

The illustrated option explores a notional cross section profile near the junction of Middle and Bloomfield Street where new built form has been introduced, in line with the maximum permitted development height, and a built form introduced accommodating a mix of uses, focused on commercial and retail spaces in the podium with residential above.

Precedents



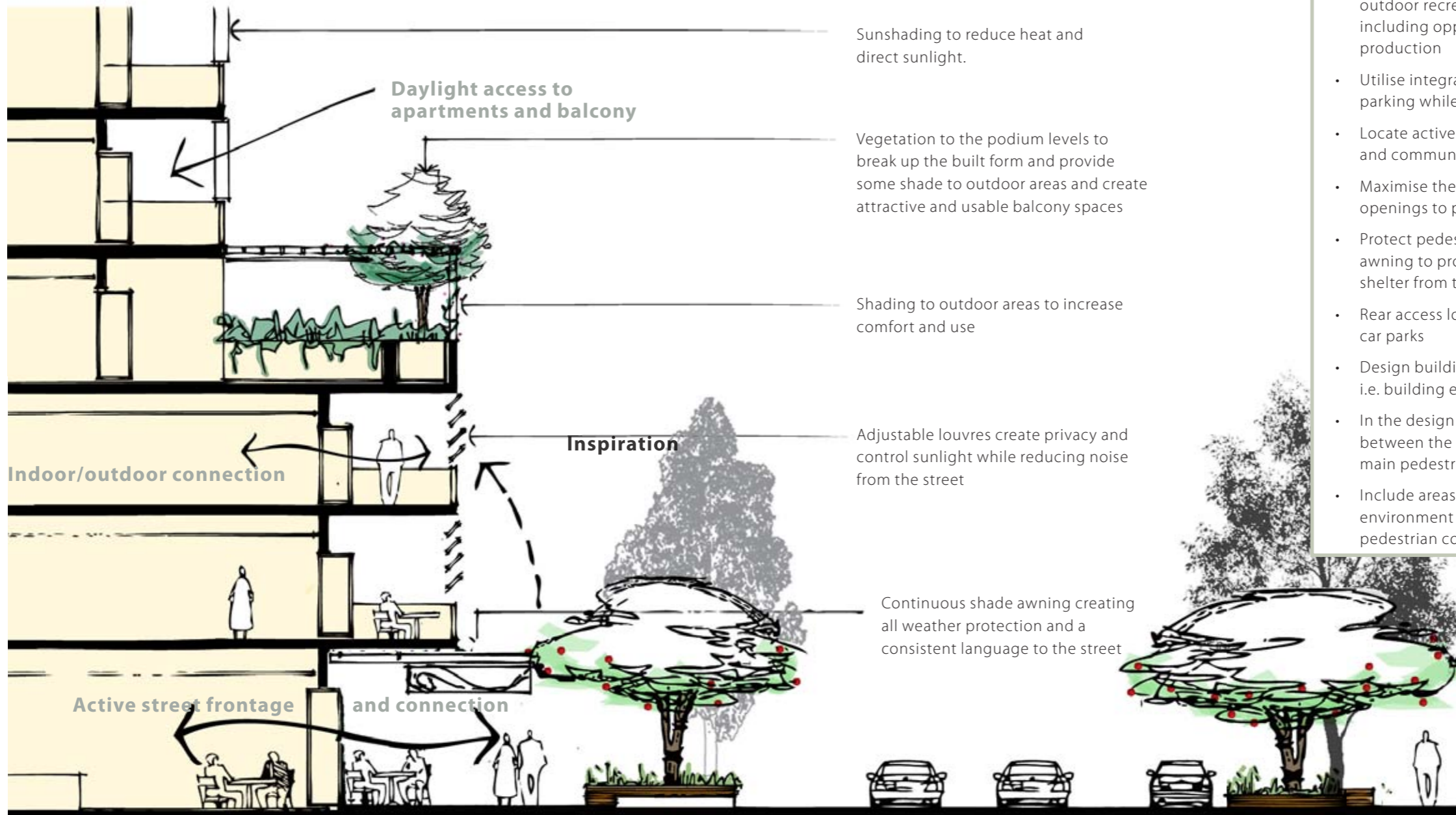
Car park accommodated in podium sleeved with office suites



Car park accommodated in podium screened with artwork



Integrated artwork and building signage create a distinctive building elevation



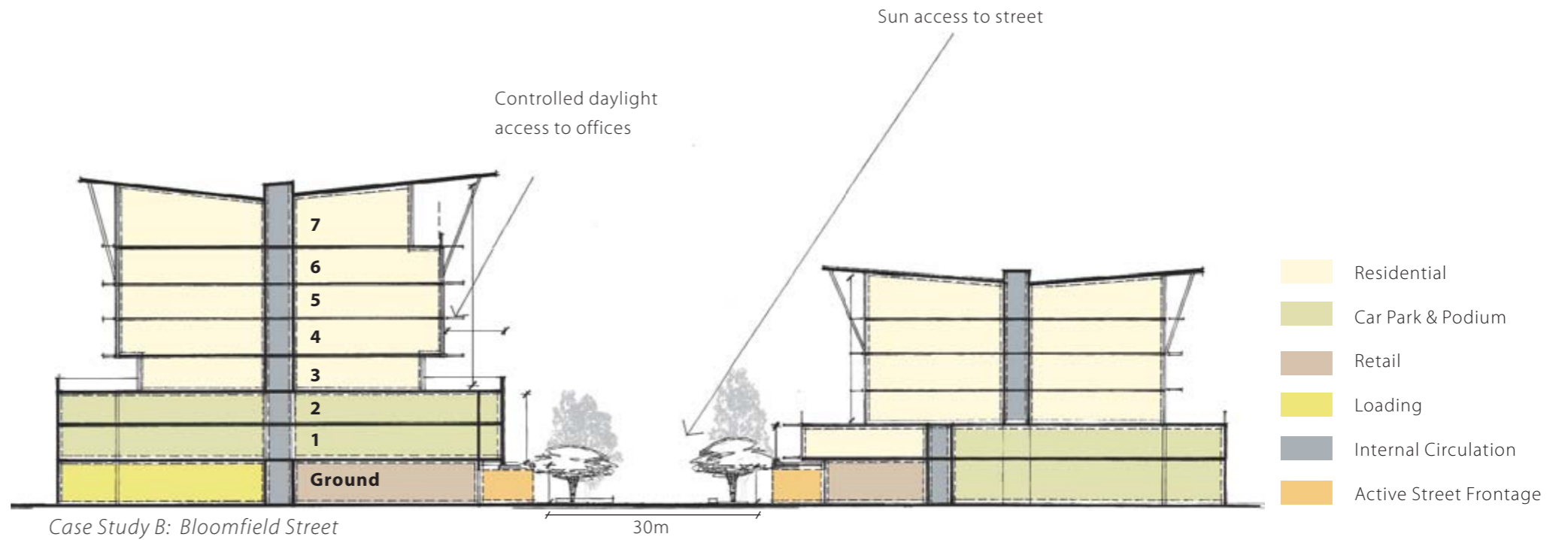
Design Considerations

- 6m setback to tower to limit overshadowing , reduce adverse wind effects and allow for access to daylight
- Podium Roof space utilised for rainwater collection, outdoor recreation and the provision of green space including opportunities for urban gardens and food production
- Utilise integrated podium artwork to screen car parking while creating an interesting public feature
- Locate active uses on the street, such as shops, cafes and community services
- Maximise the number of ground level entries and openings to promote active frontages
- Protect pedestrian connections with a continuous awning to provide climatic comfort for pedestrians; shelter from the rain, sun and wind
- Rear access loading zones and podium or basement car parks
- Design building to consider local climatic conditions i.e. building envelop design, sun shading devices etc
- In the design of buildings recognise the relationship between the building heights and solar access to main pedestrian street
- Include areas for landscape to soften the street environment and increase biodiversity and pedestrian comfort

Illustrative Street Edge Section

Study B: Bloomfield Street

PODIUM LEVELS



Characteristics

In the proposed master plan Bloomfield Street, at its northern end, maintains its role as a key point of transition between the retail heart of the Centre and its bay side address.

The master plan offers the opportunity to increase the height of buildings here, to create a landmark address and provide an architectural 'sign post' marking the gateway to the Bay. The proposed strategy also recognises the value of introducing a vibrant retail/commercial ground floor use in the area, with residential development above ensuring there is activity and overlooking of the adjacent space throughout the day.

The proposed master plan envisages the street providing pedestrians with a vibrant experience, with a rich mix of cafes and restaurants fronting onto a well designed park that leads down to the water front. The upper storeys of these buildings are focused on the provision of residential accommodation that maximise on their aspect out across the bay.

Illustrative Option

The illustrated option explores a notional cross section profile to the north of the junction of Middle and Bloomfield Street, where new built form has been introduced in line with the maximum permitted development height. The built form accommodates a mix of uses, focused on retail space at ground floor and residential space above. The illustrated section also demonstrates how any required parking, if necessary within the podium, could be screened to deliver an attractive built form outcome. However a preference will always be to include residential apartments overlooking public space.

Precedents



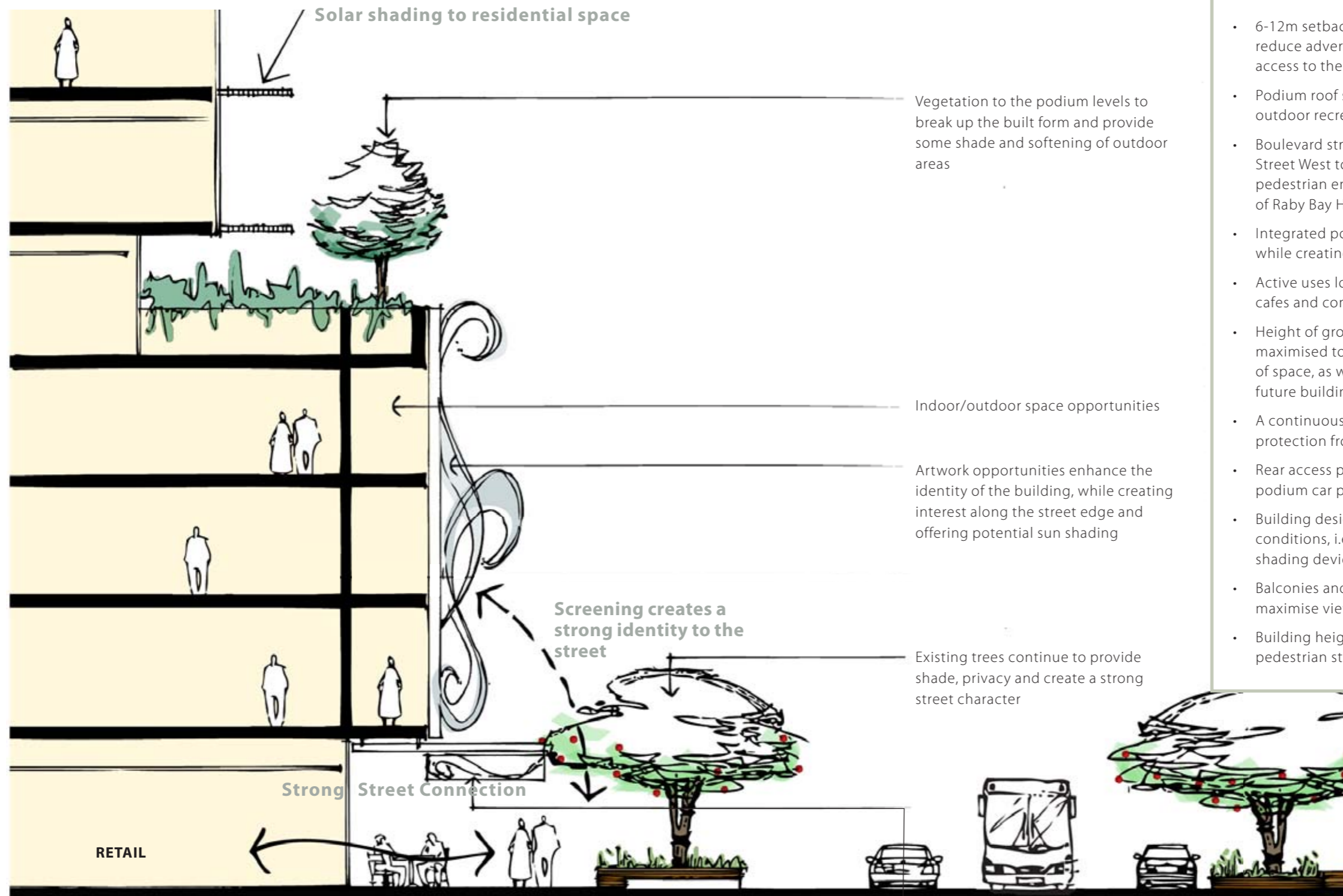
Residential studios sleeving podium car park provide natural surveillance of the adjacent street



Retail activity fronting onto the street activates the public realm



Architecturally articulated commercial offices sleeve car parking accommodated in podium



Design Considerations

- 6-12m setback to tower to limit overshadowing, reduce adverse wind effects and allow for daylight access to the rear
- Podium roof space utilised for rainwater collection, outdoor recreation and green space for residents
- Boulevard street character established along Shore Street West to create an interesting and dynamic pedestrian environment and extend the influence of Raby Bay Harbour Park
- Integrated podium artwork screens the car parking while creating a interesting public interface
- Active uses located on the street, such as shops, cafes and community services
- Height of ground floor entrances and opening maximised to promote active frontages and a sense of space, as well as increasing the flexibility of future building uses
- A continuous awning provides pedestrians with protection from rain, sun and wind
- Rear access provided to loading zones and the podium car parks
- Building designed to consider local climatic conditions, i.e. building envelop design, sun shading devices etc
- Balconies and outdoor space orientated to maximise views, daylight and breezes
- Building heights relate to sun access to main pedestrian street

Illustrative Street Edge Section

Integrated signage and awnings create a consistent street language while providing relief from the outdoor climate

Study C: Shore Street West

Characteristics

In the proposed master plan, Shore Street West will emerge as a key street in the Centre which, due to the emphasis placed on introducing activity along its frontage, will reconnect the commercial and retail heart of the Centre to the Bay.

The master plan offers the opportunity to increase the height of buildings here and also encourages the introduction of buildings that use Shore Street West as their 'front door', encouraging activation of the street and the creation of a strong and attractive southern edge to Raby Bay Harbour Park.

The proposed master plan envisages the street providing pedestrians with a vibrant mix of experiences, with the facility to introduce a rich mix of cafes and restaurants fronting onto an attractive and busy street. The upper storeys of these buildings are focused on the provision of residential accommodation that maximises aspect out across the bay and resident ownership and natural surveillance of the adjacent park and street.

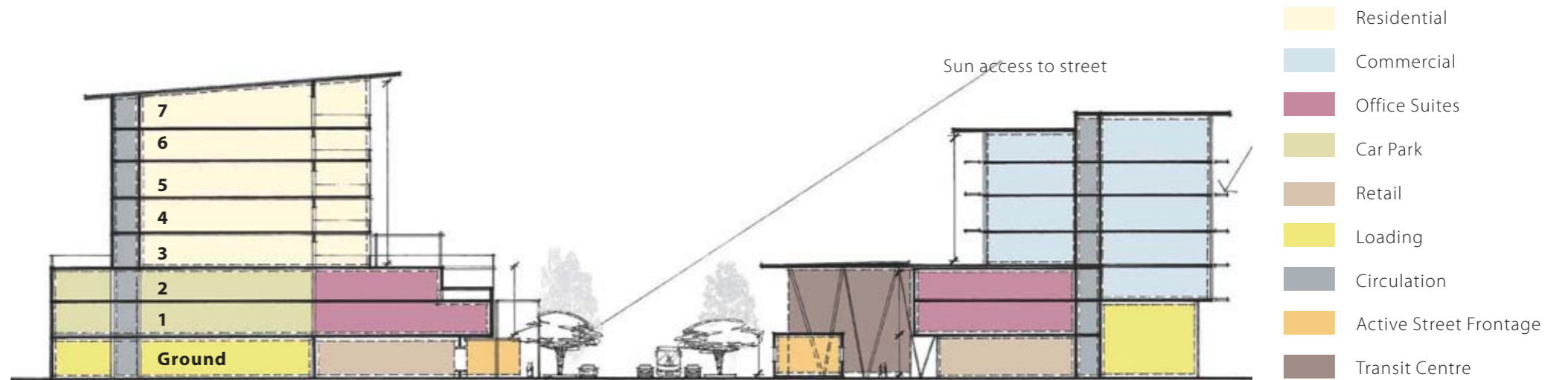
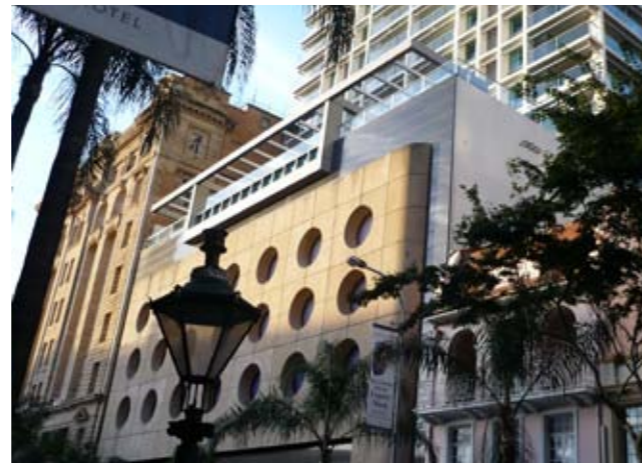


Figure 05: Case Study C: Shore Street West

Illustrative Option

The illustrated option explores a notional cross section profile at the eastern end of Shore Street West, opposite the enhanced multi modal transit centre. New built form is illustrated in line with the maximum permitted development height, accommodating a mix of uses, focused on commercial and retail space at ground floor and residential space above.

Precedents



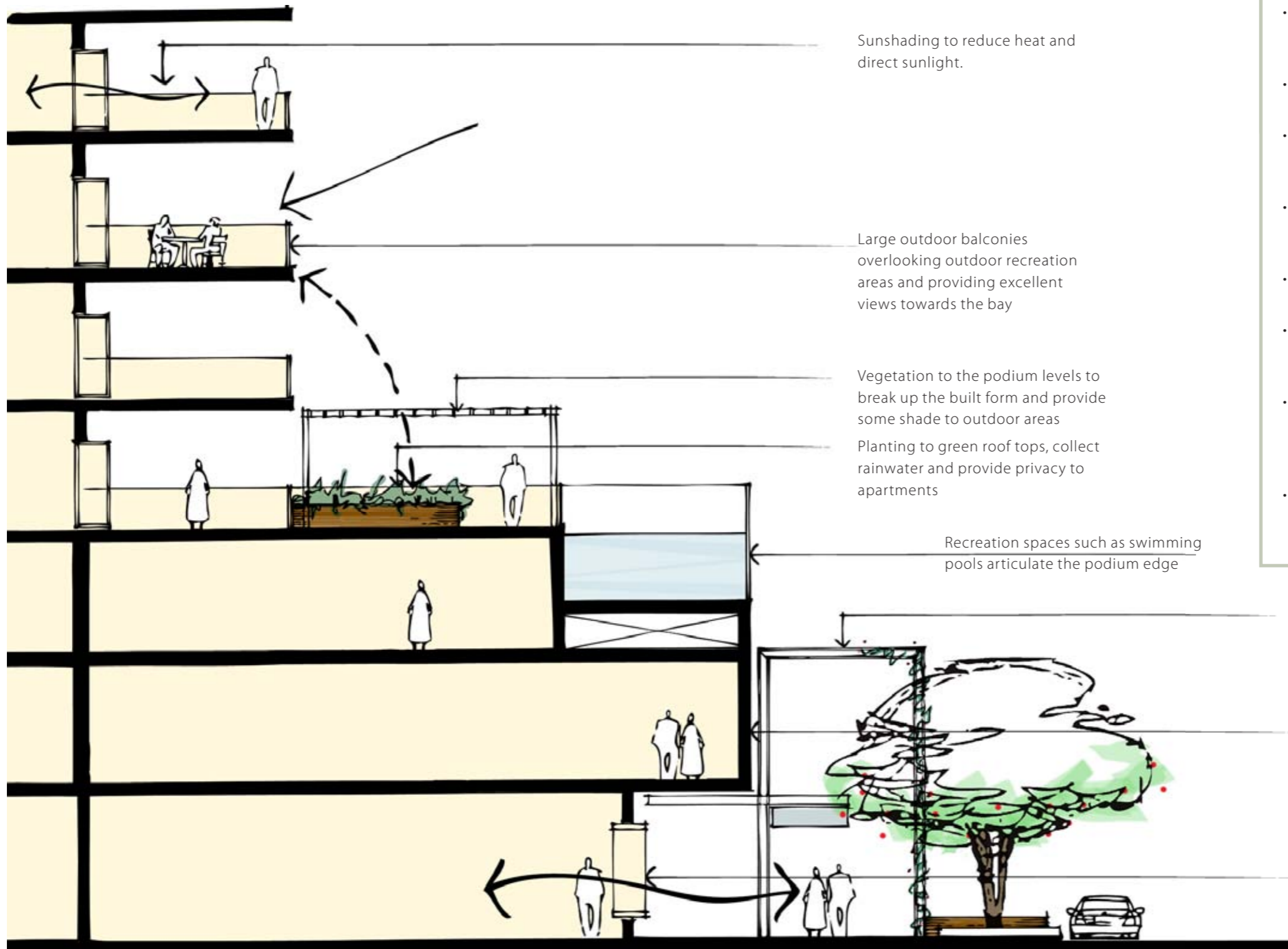
Car park podium screened with artwork



Active Streets with cafes and shade trees



Arbour providing identity and shade



Design Considerations

- 6m setback to tower in order to limit overshadowing, reduce adverse wind effects and allow for optimum access to daylight
- Podium roof space utilised for rainwater collection, outdoor recreation and garden space for residents
- Podium level residential accommodation designed to maximise opportunities for 'eyes on the street' and the delivery of a safe public realm
- Active uses such as shops and cafes located at street level, to activate the public realm and provide residents with attractive places to meet, greet and eat
- A continuous awning provided to protect pedestrian connections from rain, sun and wind
- Building designs consider local climatic conditions, i.e. building envelop design, sun shading devices etc for all units
- Adopt distinctive sub tropical design characteristics in the design of the built form, in particular opportunities to have indoor/ outdoor spaces as a key feature of the living accommodation offered
- Building heights relate to sun access to main pedestrian street.

Illustrative Street Edge Section



A

Appendix 1: Yield Analysis

Cleveland Centre Master Plan

MODEL 1

Assumptions:

As per PR table and all buildings ground floor retail, 1st and 2nd floors commercial and basement carpark and remainder residential
All car parking provision is thus assumed to be met in basements

Precinct A								Precinct B								Precinct C							
Sites	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail		
1	4800	2.5	12000	8	7500.00	3000.00	1500.00	7350	2	14700	7	8400.00	4200.00	2100.00	2900	1.5	4350	5	1740.00	1740.00	870.00		
2	6000	2.5	15000	8	9375.00	3750.00	1875.00	6700	2	13400	7	7657.14	3828.57	1914.29	5500	1.5	8250	5	3300.00	3300.00	1650.00		
3	7000	2.5	17500	8	10937.50	4375.00	2187.50	4200	1.5	6300	6	3150.00	2100.00	1050.00	10000	1.5	15000	5	6000.00	6000.00	3000.00		
4	8400	2.5	21000	8	13125.00	5250.00	2625.00	1500	1	1500	4	375.00	750.00	375.00	5500	1.5	8250	5	3300.00	3300.00	1650.00		
5	10000	2.5	25000	8	15625.00	6250.00	3125.00	4500	1.5	6750	6	3375.00	2250.00	1125.00	10200	1.5	15300	5	6120.00	6120.00	3060.00		
6	8200	2.5	20500	8	12812.50	5125.00	2562.50	9000	2	18000	7	10285.71	5142.86	2571.43	5000	1.5	7500	5	3000.00	3000.00	1500.00		
7	13250	2.5	33125	8	20703.13	8281.25	4140.63	2000	1.25	2500	5	1000.00	1000.00	500.00	2100	1.25	2625	4	656.25	1312.50	656.25		
8								3800	1.5	5700	6	2850.00	1900.00	950.00	6000	1.5	9000	5	3600.00	3600.00	1800.00		
9								15000	2	30000	7	17142.86	8571.43	4285.71	6000	1.5	9000	5	3600.00	3600.00	1800.00		
10								7000	2	14000	7	8000.00	4000.00	2000.00	5500	1.5	8250	5	3300.00	3300.00	1650.00		
11								4350	1.5	6525	6	3262.50	2175.00	1087.50	3820	1.5	5730	5	2292.00	2292.00	1146.00		
12								1500	1	1500	4	375.00	750.00	375.00	800	0.75	600	3	1800	0	0		
13								1500	1	1500	4	375.00	750.00	375.00									
14								3800	1.5	5700	6	2850.00	1900.00	950.00									
Totals	57650		144125		90078.13	36031.25	18015.63	72200		128075		69098.21	39317.86	19658.93	63320				38708.25	37564.50	18782.25		
Dwellings					900.78							690.98							387.08				
Employees						1801.56	360.31						1965.89	393.18					1878.23	375.65			

PR Table

Site Area m2	PR	Height
<1,000	0.75	3
1 - 1,999	1.25	4
2 - 3,499	1.5	5
3.5 - 5,999	2	7
6,000 +	2.5	8

PR Table

Site Area m2	PR	Height
<1,000	0.75	3
1 - 1,999	1	4
2 - 3,499	1.25	5
3.5 - 5,999	1.5	6
6,000 +	2	7

PR Table

Site Area m2	PR	Height
<1,500	0.75	3
1.5 - 2,499	1.25	4
2.5 +	1.5	5

Model 1 Totals

Dwellings	1978.85
Retail Employees	1129.14
Commercial Employee	5645.68

MODEL 2

Assumptions:

As per PR table and all buildings ground floor retail, 1st floor car parking, 2nd and 3rd floors commercial and remainder residential
Car parking provision is at one floor of the building only - this reveals potential shortfalls for residential, commercial and retail

Precinct A									Precinct B									Precinct C								
Sites	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail	Car Parking	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail	Car Parking	Site Area m2	PR	Total Flrspc	Height	Residential	Commercial	Retail	Car Parking		
1	4800	2.5	12000	8	6000.00	3000.00	1500.00	1500.00	7350	2	14700	7	6300.00	4200.00	2100.00	2100.00	2900	1.5	4350	5	870.00	1740.00	870.00	870.00		
2	6000	2.5	15000	8	7500.00	3750.00	1875.00	1875.00	6700	2	13400	7	5742.86	3828.57	1914.29	1914.29	5500	1.5	8250	5	1650.00	3300.00	1650.00	1650.00		
3	7000	2.5	17500	8	8750.00	4375.00	2187.50	2187.50	4200	1.5	6300	6	2100.00	2100.00	1050.00	1050.00	10000	1.5	15000	5	3000.00	6000.00	3000.00	3000.00		
4	8400	2.5	21000	8	10500.00	5250.00	2625.00	2625.00	1500	1	1500	4	0.00	750.00	375.00	375.00	5500	1.5	8250	5	1650.00	3300.00	1650.00	1650.00		
5	10000	2.5	25000	8	12500.00	6250.00	3125.00	3125.00	4500	1.5	6750	6	2250.00	2250.00	1125.00	1125.00	10200	1.5	15300	5	3060.00	6120.00	3060.00	3060.00		
6	8200	2.5	20500	8	10250.00	5125.00	2562.50	2562.50	9000	2	18000	7	7714.29	5142.86	2571.43	2571.43	5000	1.5	7500	5	1500.00	3000.00	1500.00	1500.00		
7	13250	2.5	33125	8	16562.50	8281.25	4140.63	4140.63	2000	1.25	2500	5	500.00	1000.00	500.00	500.00	2100	1.25	2625	4	0.00	1312.50	656.25	656.25		
8									3800	1.5	5700	6	1900.00	1900.00	950.00	950.00	6000	1.5	9000	5	1800.00	3600.00	1800.00	1800.00		
9									15000	2	30000	7	12857.14	8571.43	4285.71	4285.71	6000	1.5	9000	5	1800.00	3600.00	1800.00	1800.00		
10									7000	2	14000	7	6000.00	4000.00	2000.00	2000.00	5500	1.5	8250	5	1650.00	3300.00	1650.00	1650.00		
11									4350	1.5	6525	6	2175.00	2175.00	1087.50	1087.50	3820	1.5	5730	5	1146.00	2292.00	1146.00	1146.00		
12									1500	1	1500	4	0.00	750.00	375.00	375.00	800	0.75	600	3	1800	0	0	0		
13									1500	1	1500	4	0.00	750.00	375.00	375.00										
14									3800	1.5	5700	6	1900.00	1900.00	950.00	950.00										
Totals	57650		144125		72062.50	36031.25	18015.63	18015.63	72200		128075		49439.29	39317.86	19658.93	19658.93	63320				19926.00	37564.50	18782.25	18782.25		
Dwellings					720.63								494.39								199.26					
Employees						1801.56	360.31							1965.89	393.18						1878.23	375.65				
Car Parking								643.42								702.10								670.79		

PR Table

Site Area m2	PR	Height
<1,000	0.75	3
1 - 1,999	1.25	4
2 - 3,499	1.5	5
3.5 - 5,999	2	7
6,000 +	2.5	8

PR Table

Site Area m2	PR	Height
<1,000	0.75	3
1 - 1,999	1	4
2 - 3,499	1.25	5
3.5 - 5,999	1.5	6
6,000 +	2	7

PR Table

Site Area m2	PR	Height
<1,500	0.75	3
1.5 - 2,499	1.25	4
2.5 +	1.5	5

Model 2 Totals

Dwellings	1414.28
Retail Employees	1129.14
Commercial Employee	5645.68
Car Parking	2016.31

