

# Rockingham Beach Height Study





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## GENERAL INTRODUCTION

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The City of Rockingham engaged Mackay Urbandesign to undertake a Building Height Study, with the aim of helping to determine an appropriate scale of development for the precinct, and to review the Policy guidelines to manage the height and massing of buildings that may be constructed on land along Rockingham Beach Road and Kent Street within the Waterfront Village Sector.

The study considered the appropriateness of taller buildings in the urban environment in relation to a range of factors that include:

- The broader landscape context.
- Strategic planning objectives such as the relationship to desired urban consolidation and the sustainability agenda.
- Local townscape and environmental impacts such as streetscape character, building overshadowing and overlooking.
- Community sentiment and community benefit.
- Development economics, and economic impact.

For the purpose of the study, the Rockingham Beach precinct is defined by Rockingham Beach Road, Patterson Road, Kent Street and Wanliss Street. The precinct is illustrated in **Figure 1: Study area** below.



**Figure 1: Study area**

The study area is effectively what was the original Rockingham town centre prior to the development of the new Rockingham city centre further inland.

The methodology for the study consisted broadly of two parts. The first part of the study includes the preparation of three papers that provide background on the above considerations. The second part of the study involved the modelling of a series of built form scenarios for the precinct to explore the impact of development at various intensities and scale of development.

The scenarios consisted of:

- Scenario 1, being the current 'business as usual' development controls for the precinct, to establish a base line for the comparison of the subsequent scenarios.
- Scenario 2A and 2B, being a combination of traditional urban building forms and towers on podiums, with Scenario 2A being developed to a greater height and intensity.
- Scenario 3, being development at the highest conceivable intensity for the precinct.

Following a series of workshops with City of Rockingham planning officers, Scenario 2A was considered to be the most appropriate of the development scenarios presented for the precinct, and is referred to as the 'preferred scenario' in the report.

## **1. DISCUSSION PAPER 1 – BUILDING HEIGHT IN THE LANDSCAPE CONTEXT**

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### **1.1 Introduction**

This is the first of the three discussion papers and, as a starting point, explores the relationship between development and its landscape context, particularly the context of a coastal environment and, specifically, the coastal context of Rockingham.

### **1.2 The landscape characteristics of the Rockingham Beach context**

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Rockingham Beach is located at the southern end of Cockburn Sound with a north-western beach aspect. The characteristics of the broader Rockingham Beach landscape context are:

- A relatively low and flat topography consistent with the Swan Coastal Plain.
- Suburban development of varying intensities and residential density to the west, south and east of the Rockingham Beach area, with varying degrees of tree cover in parks, streets and gardens.
- Industrial and port infrastructure to the northeast of the Rockingham Beach area
- The waters of Cockburn Sound to the west with the Garden Island navel base to the west.
- A significant road causeway structure to the west that leads from Point Perron to Garden Island.
- Point Perron – a largely undeveloped headland with modest elevation to the northwest, although it is partially obscured from Rockingham Beach by the causeway.

The characteristics of the local Rockingham Beach landscape context are:

- A well-landscaped foreshore area used extensively for passive recreational activity.
- A sheltered sandy beach with a north-western aspect.
- Significant planting of tall Norfolk Island trees in the foreshore area.
- Two jetties to the west of the precinct that afford public views from over the water.
- A 'main street' element along the western portion of Kent Street to the south of the precinct.
- Areas of parkland and sporting infrastructure (tennis and bowling clubs) further to the south across Kent Street.
- Commercial and residential development that varies from one to nine storeys (including several buildings of eight storeys or more within the precinct).

There are some significant areas of natural environment with high landscape values in the Point Perron Reserve and around Lake Richmond to the west, and on Garden Island. In the case of Point Perron, the areas of high landscape value face largely westwards towards the ocean. In the case of Lake Richmond, the landscape values are already compromised by the surrounding residential development, and Garden Island is not publicly accessible.



In summary, the overall landscape characteristic of the Rockingham Beach precinct is developed rather than natural, with a mix of suburban, commercial, urban, industrial and port infrastructure uses; in other words, it would be unreasonable to describe it as a natural environment. Therefore, it is reasonable to conclude that any additional development in the Rockingham Beach precinct needs to be considered in the context of a significantly modified landscape.

### **1.3 Relationships between buildings and landscape**

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The relationships between buildings and landscape are highly varied depending on the building and the setting.

In a rural setting, individual buildings or clusters of buildings become minor elements of the landscape – in some cases, they blend seamlessly into the landscape by virtue of their size, colour and material, in other cases they contrast significantly to announce their presence in a broad landscape; in either case, the built elements are always subservient to the landscape.

In a suburban setting, buildings and landscape become more or less equal elements of the landscape. It is often difficult to say whether suburbia is landscaped environment populated by buildings or a built environment with generous landscaping.

The suburban landscape is also typified by the extent of its coverage and high degree of consistency of its scale. Whilst there may be localised pockets of individuality, the suburban environment is predominantly homogeneous and for visitors to a suburban area, there is little in the way of landmarks to navigate or distinguish location.

In an urban setting, the built form predominates and the role of the landscape becomes either that of the surrounding frame that defines the extent of a city, or it provides local decoration, shade and visual relief.

In an urban environment, the architecture of buildings, whether by virtue of their size or architectural detail, provides clues for navigation and creates a sense of place. In an urban environment, the scale of buildings also provides a clue as to the function and hierarchy of different places. Typically, in the modern world, buildings are larger in CBDs, activity centres and other places of public importance and can be readily discerned from their surrounding and predominantly residential suburbs.

If GPS were the sole means of navigating around a city then, arguably, building height would not be an issue. However, there is more to a city than a street network, and building height literally adds another dimension to a city and describes which places are more publicly important than others.

In the context of Rockingham, the Rockingham Beach precinct is one of the most important destinations in the region. It is the principal coastal destination between Fremantle and Mandurah; a place with a long-standing tradition as a place of relaxation and pleasure and of socialising with other people. In other words, it is a place where the regional community comes together. For that reason, it deserves a built form that clearly announces its function and location.

#### **1.4 The social and economic role of coastal activity centres**

Coastal activity centres are important public places that provide a range of social and economic benefits and opportunities. Far more than only a place to sit on the beach, a coastal activity centre is:

- A destination for meeting friends and family and for visitors.
- An access point to the beach for people who don't have a car (on the assumption that most major coastal activity centres are served also by public transport).
- An attractive place for visitors from other places to stay and enjoy a coastal and eco experience that is not otherwise available to them by virtue of geography or climate.
- A 'hot spot' for food and beverages that provides diversity of choice.
- A source of employment in the tourism and hospitality industry.
- A place with a range of opportunities for passive recreation.
- A place with a range of active recreation opportunities (in the case of Rockingham Beach this includes sailing, tennis, bowls, swimming, walking, windsurfing, paddle-boarding etc.).
- A place that provides an opportunity to escape the monotony and day-to-day life of suburbia, and be somewhere different and do something different.
- A place that is pleasantly cooler than the inland suburban areas of the Swan coastal plain in summer.
- A place that offers a diversity of activities for family members of all ages in one place.
- A place to live or retire with the potential for a sea view from the balcony of an apartment and a coffee shop on the ground floor.
- A lock-and-leave lifestyle for people with extensive travel commitments.
- A place than meets the needs of younger generations and immigrants whose experience overseas has led to an expectation of a typical Australian 'beach experience', however with one that offers more than only the beach.

### 1.5 Examples of tall buildings in a coastal landscape context

There are many examples of tall buildings in the context of coastal landscapes throughout Australia. For example:

**Cairns:** A highly desirable tropical destination in Far North Queensland where a growing collection of apartments, mixed-use buildings and hotels, some up to 16 storeys in height, frame the foreshore area in the vicinity of the Boardwalk and the Cairns Lagoon and which together form the social epicentre of the region. The majority of the taller buildings are located on the Esplanade, which, like Rockingham Beach Road, is separated from the ocean by a modest foreshore reserve.



**Cairns**

**Manly Beach:** One of the two main beachside centres in the Sydney metropolitan area (the other being Bondi Beach). Manly Beach is a very popular and complementary destination to Sydney's central and riverside centres, with a majority of visitors originating from within the Sydney metropolitan area and visiting as day-trippers. At Manly, mixed-use and apartment buildings rise up to 14 storeys sporadically along the length of North and South Steyne, which is separated from the beach by a modest foreshore planted with Norfolk Island Pines.



**Manly Beach**



**St Kilda/Port Melbourne:** The principal beachside playground of the Melbourne metropolitan area, the St Kilda/Port Melbourne coastal strip is characterised by intensive urban activity at the St Kilda end and a more relaxed residential character at the Port Melbourne end of the strip.

Building heights vary considerably from two to 16 storeys, however, the grouping of the taller buildings close to the St Kilda town centre and the Beacon Cove development in Port Melbourne provide a clear indication of where the activity is in the centres.



**Port Melbourne**

**Glenelg:** In the same way as Manly and St Kilda are for Sydney and Melbourne, Glenelg functions as a principal coastal destination for Adelaide. Glenelg has developed considerably in recent years and is recognisable from a considerable distance in the surrounding area with a cluster of buildings up to 13 storeys rising from a suburban coastal landscape that is every bit as flat as that of Rockingham.

As with all of the previous examples, Glenelg offers a wide range of recreational activities, food and beverage outlets, a choice of accommodation in hotels, apartments and houses and the place is well-served by public transport.



**Glenelg**

**Gold Coast:** No discussion on urban coastal development in Australia would be complete without mention of Queensland's Gold Coast. With buildings up to 80 storeys in height, the Gold Coast is often cited as an example of what not to do by people

opposed to coastal development (and in many of those cases, by people who have never been there). The Gold Coast has its drawbacks: the lack of a meaningful foreshore and numerous buildings that cast shadows on the beach in the afternoon (neither of which are issues for Rockingham Beach), and a glitzy style of commercialism that is beyond the taste of more conservative people.

However, it should be noted that the Gold Coast has been very successful. Since the 1950's it has grown from virtually nowhere into Australia's sixth largest city. Of particular note is that the Gold Coast and its hinterland has a population roughly equivalent to the population projected in *Perth and Peel @ 3.5m for the Southern Metropolitan and Peel region*. Given the limited capacity for coastal development in Fremantle and other places between Rockingham and Scarborough, Rockingham Beach and Mandurah will, between them, need to serve a catchment greater than the Gold Coast - such a task will require extensive development.



**Gold Coast**

Internationally, many of the world's most famous beaches are not isolated 'getting away from it all places' but they are in a distinctly urban context. For example: South Beach in Miami; Copacabana Beach in Rio de Janeiro; the beaches of Nice and Cannes in the south of France; and Venice Beach in Los Angeles. In all cases, the beach is backed with an urban strip that meets the needs of a large regional catchment, and in many cases, the beach is framed with buildings of considerable height.



**Copacabana Beach**

In the Perth context, the coastal centres are significantly less developed than in most other Australian cities. Whilst Fremantle remains the principal, most central and coastal destination in the Perth metropolitan area, its capacity is heavily restricted by heritage considerations. To the north, Scarborough is emerging as an important coastal centre, whilst in the southern part of the Perth and Peel region, Rockingham and Mandurah are the principal coastal centres and will continue to be so.

Given the anticipated population growth of the Perth and Peel regions and the limited opportunities for coastal development, it is evident that the coastal centres such as Scarborough, Rockingham and Mandurah will need to work hard to perform their roles as regional coastal destinations.

### **1.6 The social context of Western Australia and public perceptions**

There is a long-standing community view that life in Western Australia is characterised by 'getting away from it all', and that the beach is the ultimate 'getting away from it all' by virtue of being at the very edge of the continent.

There is merit in preserving the 'getting away from it all' experience in the cases of beaches that provide that experience. Given that WA has over 20,700km of coastline; that should be reasonably easy to achieve.

Whilst the dream of a spot on a secluded beach remains strong in some older people who were raised in a less populous and more isolated WA, the aspirations of the younger generation, a growing and increasingly active older generation, visitors and immigrants from overseas have been influenced by experience of overseas resort towns, the 'coffee culture', and a greater desire for entertainment, nightlife, food, drinks and social interaction. In short, things are changing and, as a result, there is a need to accommodate WA's social diversity and provide a greater range of coastal urban and ecological experiences.

As identified in Section 2 above, Rockingham Beach is far from being a wilderness environment and the experience of the beach is influenced by surrounding urban and suburban development, industry and port infrastructure, including an extensive road causeway. As such, it is appropriate to recognise that Rockingham Beach cannot offer the 'getting away from it all' experience and should, therefore, focus on offering an alternative for those people who are looking for an urban coastal experience – a 'beach with a diversity of benefits'.

### **1.7 Visual impact of development in the Rockingham Beach precinct**

The long-standing view of many older people in the community that beaches are places to 'get away from it all', commonly manifests itself in an opposition to coastal development, particularly if it is of a scale and height that increases the visual prominence of the built environment (and, thus, dilutes or negates the perception of wilderness), or results in more people using the beach (and diluting the experience of 'getting away from other people).

Given that such opposition is commonly founded on broad matters of principle rather than an evaluation of the actual visual impact of development, it is worthwhile exploring the visual impact of redevelopment of the Rockingham Beach precinct at various scales of development.



The following visual analysis is based on a series of popular locations along the Rockingham coastline and estimates the overall building mass of a collection of buildings resulting from widespread redevelopment of the Rockingham Beach precinct.

The visual analysis investigates two scenarios:

Scenario A: Development at a scale and form consistent with the current planning framework and recently constructed development, with a notional height of up to eight storeys.

Scenario B: Development at a height up to 16 storeys in a form based on a combination of towers up to 16 storeys and conventional 8-storey urban buildings.

The images of the above scenarios are based on a series of photographs taken at various locations along the Rockingham coast, which are identified on the accompanying maps. The photographs are taken at a depth of field equivalent to the human eye, but it should be noted that the images cover a much smaller field of vision than the human eye.

The series of images are included in Appendix A.

From the images, it is clearly apparent that from most of the locations, including the ones from relatively close to the Rockingham Beach precinct, the extent of visible development is a small proportion of the image (and a much smaller proportion of the human field of vision). This is in part due to the fact that the precinct is elongated and lies parallel to the coast, thus, presenting its shortest side to the view along the coast.

The visual impact was not considered from the beach directly in front of the Rockingham Beach precinct because:

- a) the development would be directly behind the viewer when looking out to sea from the beach and only in peripheral vision looking along the coast; and
- b) the development would be largely obscured by the extensive coverage of tall Norfolk Island Pines within the foreshore area.

## **1.8 Summary and conclusions**

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From the above discussion, the following observations are of particular note:

- The coastal landscape of the surrounding area is not a natural wilderness but is heavily modified with man-made structures.
- Rockingham Beach is an existing urban coastal centre that already has 7 developments of eight storeys or more and it serves a large regional catchment.
- Urban coastal centres provide for a broad range of social and economic opportunities for a diverse range of people.



- There are a limited number of places where an urban coastal experience can be provided along the coastline of the Perth and Peel region.
- Whilst there is some opposition, as a matter of principle, to intensive coastal development amongst some of the community, there is a growing proportion of the community that values a more social and diverse urban coastal experience over a 'getting away from it all' experience.
- There are numerous examples around Australia of successful and popular urban coastal centres, many of which have buildings up to 13 to 16 storeys in height (or up to 80 storeys in the case of the Gold Coast).
- Publicly important urban centres benefit from being taller than their surrounding predominantly residential suburban areas so they can be readily identified from afar.
- Given the limited extent of the Rockingham Beach precinct and its parallel alignment with the coast, the visual impact of further development within the precinct will be limited in regard to visual amenity along the coastline.

The above observations suggest that there is a growing need for more intensive urban coastal centres in the Perth and Peel region and that Rockingham Beach is well placed to function as one of the principal urban coastal centres.

Given the relatively small footprint of the Rockingham Beach precinct, and the fact that it is constrained to the north by Cockburn Sound and to the south by existing parkland and sporting facilities, there is a strong argument for development to go upwards. The other alternative is for the precinct to grow outwards into the suburban areas immediately along the coast to the east and west, which likely may be more unpalatable to the communities that live there.

The implications of a taller built form on the urban environment within the Rockingham Beach precinct will be explored in ***Discussion Paper 2: Building height in the local urban context.***

## **2. DISCUSSION PAPER 2 – BUILDING HEIGHT IN THE LOCAL URBAN CONTEXT**

### **2.1 Introduction**

This is the second of the three discussion papers and explores a range of considerations in regard to built form and, in particular, considerations related to building height and where to put it and in what form.

### **2.2 The role of building height in shaping the built form**

Building height can play an important role in ‘shaping’ the overall form of an urban centre or precinct and make it more legible or ‘understandable’. There are a number of considerations in ‘shaping’, or giving a three-dimensional form, to an urban area. These include:

***Intensity of built form at the centre:*** From the perspective of giving shape to an urban area, there is a general understanding that the development in cities increases in intensity in centres or other publicly important places, and that greater intensity of development and activity generally translates to greater building height.

***Stepping down at the edge:*** There is an also a general understanding that areas of a city, such as centres, have a finite extent and that at the edges of a high-rise precinct, the built form needs to step down and transition towards the lower scale of the surrounding area. Failure to so do inevitably results in dissatisfaction in the local community as residents and landowners in small buildings with limited development rights, find themselves living adjacent to, and in the shadow of, tall buildings where the neighbouring landowners made significant financial gain from the higher development rights conferred upon them.



***Example of greater height in a centre and buildings stepping down to meet the suburbs***

***The footprint of the precinct:*** The two-dimensional footprint of a taller and more intensive urban precinct is driven by the function of the precinct. In the case of a transit-orientated precinct, the defining driver of the precinct's footprint is likely to be walking distance to a railway station or other significant element of transport infrastructure, where development is at its most intense within a 400m walk of the point of transit access, and may extend in a less intensive form for up to 800m from the point of access to transit. If there are no significant constraints to development, the overall footprint of the precinct is likely to be roughly circular or, more specifically, a jagged diamond shape.

In the case of a beachside coastal centre, the footprint of an intensive precinct with taller buildings is likely to be linear in its form and run parallel to the coast as a response to maximising the number of people living close to, and having views of, the beach and the ocean.

Likewise, an activity centre based on a traditional main street is also likely to result in an elongated precinct as it stretches along the length of the main street. However, a precinct based on a main street is likely to be wider than a beach-based precinct as development occurs on both sides of the main street whereas development only occurs on the landside of the beach. It is for this reason that beachside precincts tend to be longer to compensate for their single-sided nature.

***European or New World?*** More intensive urban development comes in two main forms, which can be described as 'European' or 'New World'. European style describes the traditional perimeter block and courtyard forms of development that can be found in most European cities. Perimeter block development generally follows the street pattern and consists of buildings that are built side-to-side, effectively forming a single large block surrounded by streets on all sides. The centre of the block commonly consists of a courtyard or a series of courtyards. Building heights generally range from five to eight storeys in height. Above that, perimeter blocks appear bulky given that the width and length is equivalent to an entire street block.



***Examples of 'European' built form***



New World style of built form generally consists of taller and more slender towers, which may stand alone in a landscaped setting on a site or the tower will be located on top of a low-level podium. Tower heights vary considerably depending on the place, the demand for floorspace, and the flexibility of planning controls. Typically, towers might range anywhere from eight storeys to 80 storeys or more. In the case of podium and tower combinations, the podium is most likely to contain ground level commercial land uses, car-parking decks, or a combination of both.



*Example of 'New world' built form*

In places where there are onerous height limits and a healthy demand for floorspace, a European style of built form is best able to deliver the desired development yield, however this may be potentially at the expense of occupant amenity such as access to views.

Where height limits are less onerous, and particular in a place that offers desirable views, developers will tend to gravitate to a New World style of built form because a slender tower form offers more opportunities for views and has a highly repetitive floor plate that can be more efficient to design and construct.

**Planner's Vernacular:** A common approach in places that lack the confidence found in well-established cities is what could be termed 'Planner's Vernacular'. This approach is often found in places where the community is struggling to come to terms with the transition from the relative comfort of a low-intensity and low scale suburban area to a higher intensity, larger scale urban area. Planner's Vernacular is a building form that has a greater use of setbacks to step taller buildings back from the street and from other adjacent buildings. A typical Planner's Vernacular building limits the height of the building adjacent to a street to something akin to the height of existing buildings. In Subiaco, for example, the limit is two storeys with any additional storeys being set further back and sometimes in a tiered formation.





**Example of 'Planner's vernacular' built form**

Whilst Planner's Vernacular delivers a more politically acceptable solution to assuage public concern about taller buildings, it can result in awkward and poorly proportioned buildings with limited visual attraction.

In planning an intensive urban precinct, such as a centre, a transit-orientated precinct or a coastal centre, all of the above needs to be taken into consideration.

### **2.3 The benefits of building height**

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Taller buildings can deliver a range of benefits, including:

- The potential to retain more of a development site as open space or landscaping.
- The potential for more floorspace to enable a larger residential population in activity centres, which may otherwise be devoid of people after normal business hours.
- More opportunity for views and in the case of apartment buildings, views from multiple rooms of an apartment.
- Greater opportunity for cross-ventilation of apartments and north-facing apartments, whereby a slender tower naturally has a high proportion of corner apartments that allow for cross-ventilation. Furthermore, through careful placement of the lift and stair core, south-facing apartments can be minimised and north-facing apartments can be maximised, subject to other site constraints.
- Greater degree of privacy for the building's occupants, where in the case of a tower, people look out to the distance rather than into a communal courtyard space.

- More opportunity for architectural expression, where architects can exploit the tower shape and its visibility from a distance to create a strong sculptural shape, or the verticality of the building can be designed in a well-proportioned manner with a clear base, middle and top.
- Greater access to sunlight at street level. It may sound counter intuitive to say that taller buildings offer the potential for more sunlight, however a series of slender towers with significant distance between them would allow more low-angle winter sunlight to reach the street level than a continuous run of bulkier buildings of up to eight storeys in height.
- More opportunity for views for other people. Again, it may sound counter intuitive to say that taller buildings offer greater potential for views for other people, however for the same reason as above, slender towers with gaps between them create view corridors that would not be available with a continuous run of bulkier buildings up to eight storeys in height.
- Something to look at in the distance. For example, properties with a view to the city towers of the Perth CBD commonly command a significant price premium over those that don't.
- Greater legibility in the suburban landscape. As mentioned in Discussion Paper 1, a cluster of taller buildings associated with an activity centre or other publicly significant destination acts as a beacon in the broader landscape, helping people to find the centre of activity.

## **2.4 The impacts of building height**

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Whilst taller buildings can provide a range of benefits, they can also create a range of negative impacts, including:

- Greater degrees of overlooking of other properties as a result of higher viewing angles that enable looking down into rooms and spaces, and as a result of less-obstructed viewing points.
- Greater degrees of overshadowing of streets or adjacent properties where taller buildings are wide or contiguous with each other.
- The redirection and funnelling of wind down the positive-pressure side of a tall building towards pedestrians on the street below.
- The placement of residents at higher levels where wind flows are higher and less obstructed than at ground level, including a corresponding 'suction' effect on balconies and windows on the negative-pressure side of a tall building.
- The longer reach of shadows, although the further parts of a tower's shadow moves more quickly the taller the building is and the lower the sun angle.

- Visual intrusion into streets and other spaces that have an intimate landscape character and that provide a sense of sanctuary from the urban environment.
- A reduced sense of containment and enclosure of streets and other urban spaces such as plazas.
- Fewer opportunities to conceal services and other visually unappealing building elements, particularly at ground level, because towers are seen 'in the round' from the surrounding area.



***Example of poor ground floor interface***

- The potential to result in large areas of exposed blank walls.
- Fewer opportunities to 'sleeve' above-ground car parking with other uses in the case of taller and more slender buildings because of their smaller footprint.
- Greater vehicle movement resulting from potentially higher resident or worker populations in taller buildings.
- Greater costs associated with more elaborate fire safety measures and more expensive forms of construction and site supervision.

In summary, there are numerous benefits and drawbacks associated with building height and there is no conclusive argument to say that taller buildings are absolutely better than smaller buildings.

The reality is that the height of any proposed development needs to be considered in its unique context, taking into account the overall form of the precinct in which it is located; considering the opportunities that the location affords; and addressing any negative impacts that might arise.



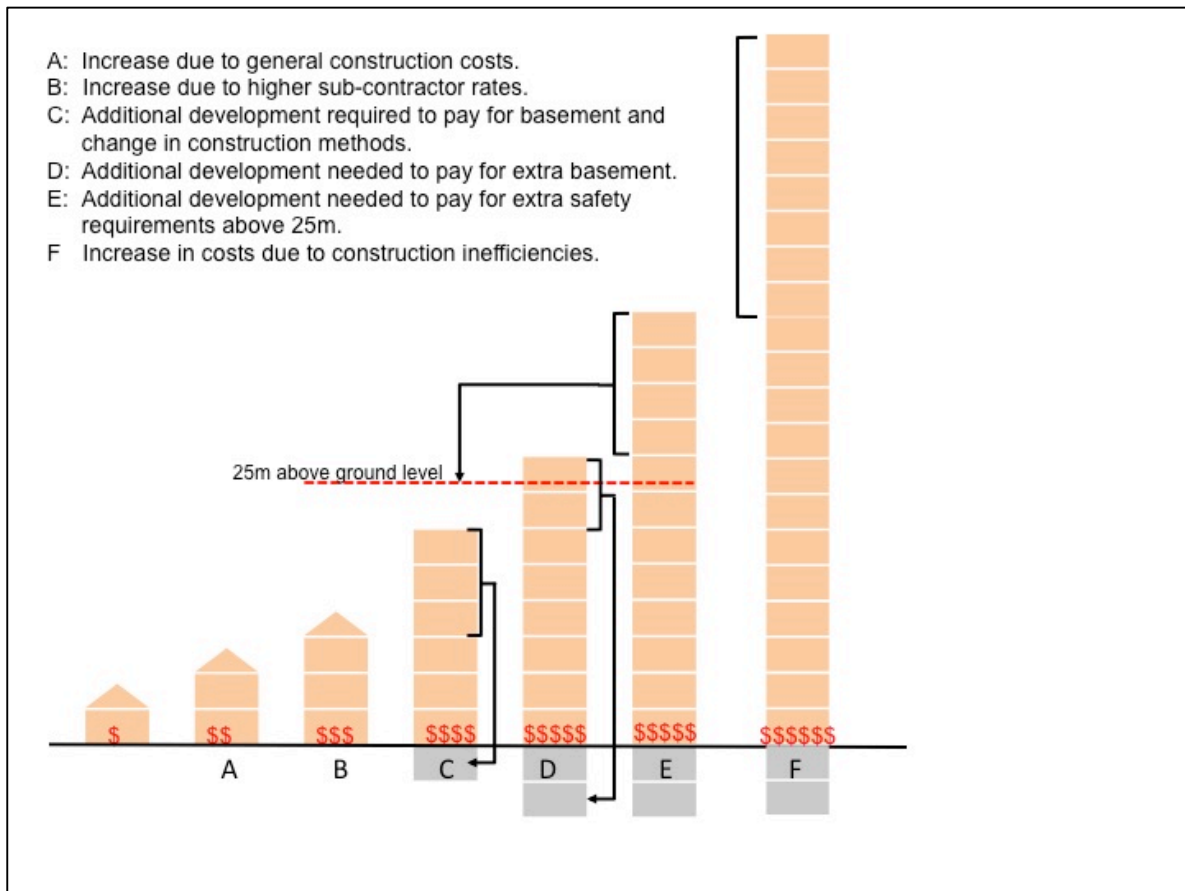
## **2.5 The economics of development and building height**

In addition to the broader planning intent for the precinct in which a development site may be located, and consideration of the potential benefits and impacts arising from the site's location, the economics of development also need to be taken into account.

The economics of development have a significant bearing on building heights. The following point provide general rules of thumb on construction costs for residential buildings:

- Single storey development is by far the cheapest form of construction; however, it is very inefficient in regard to land use. Single-storey makes sense in a price-sensitive market where land values are low, which is why many of the suburban areas in the Perth metropolitan area have been developed at a single storey.
- The per-square-metre rate of double-storey houses is between 1.3 and 2 times the cost of single storey construction and makes sense for single dwelling lots where land values are somewhat higher than the norm (for example, a more desirable suburb or street or a place with a view), or for apartments in places with lower land values where additional dwelling yield (achieved through additional height) is not required to offset land costs.
- Three-storey buildings are a cost-effective means of providing apartments in that the construction techniques are similar to the widely used techniques for single housing, which is the bread-and-butter product for Perth's building industry. At three storeys, car parking can be provided usually at ground level thereby avoiding the expense associated with basement or decked car parks.
- Four-storey apartments lead to the first significant jump in construction costs, because at this point a lift is required for vertical circulation.
- At five storeys, there is commonly a significant increase in construction costs, because this tends to be the threshold where the construction technique moves from simple load-bearing construction to a framed structural system. At five storeys, either a basement car park is required, or a first-floor parking deck in addition to ground level car parking.
- The next major increase in construction costs occurs at between eight to ten storeys when apartment buildings no longer meet the 'BCA 25m height rule', which requires more onerous and costly fire safety measures when the top floor is more than 25m above ground level. At around this height, apartment buildings will generally require an additional level of car parking which further adds to the cost. In most cases, development will need to extend to between 12 and 16 storeys in height to cover the additional cost.
- Beyond 16 storeys, the construction cost gradually rises as the logistics of construction become more complicated – materials need to be lifted further up the building, which takes time, and it becomes costlier to supervise workers when they are spread over numerous floors.

- The construction cost of taller buildings also increases every time there is a need for an additional level of parking as the number of apartments and occupants increases, and when there is a need to add an additional lift shaft.



**Summary of factors that influence building cost**

In addition to building height, development economics is also influenced by other built form considerations, including:

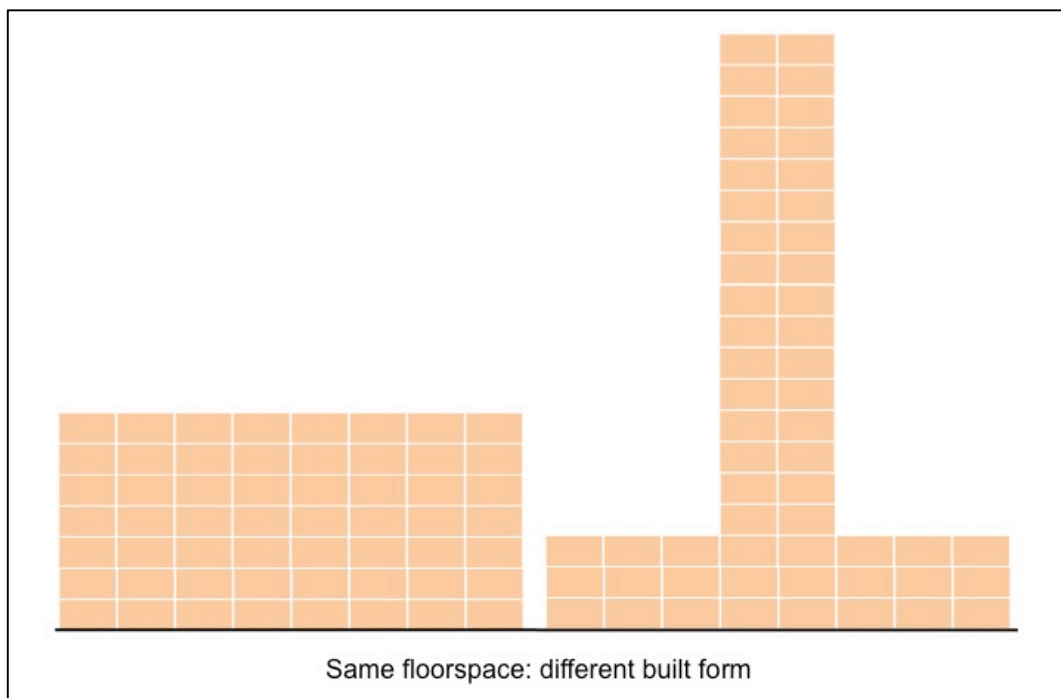
**The size and shape of a development site:** As a rule, the larger the site, the more efficiently it can be developed because car parking can be more easily accommodated and because less of the site is taken up by setbacks. Likewise, a regular and rectangular site will be more efficient to develop than an irregular-shaped site, and a squarer site will be more efficient to develop than a long thin site.

**Site frontage:** A site with two or more street frontages will generally result in a more efficient apartment development outcome than a similar-sized site with a single street frontage, because the street affords the opportunity to include windows without having to accommodate setbacks for privacy - this rule of thumb doesn't apply to single-storey buildings.

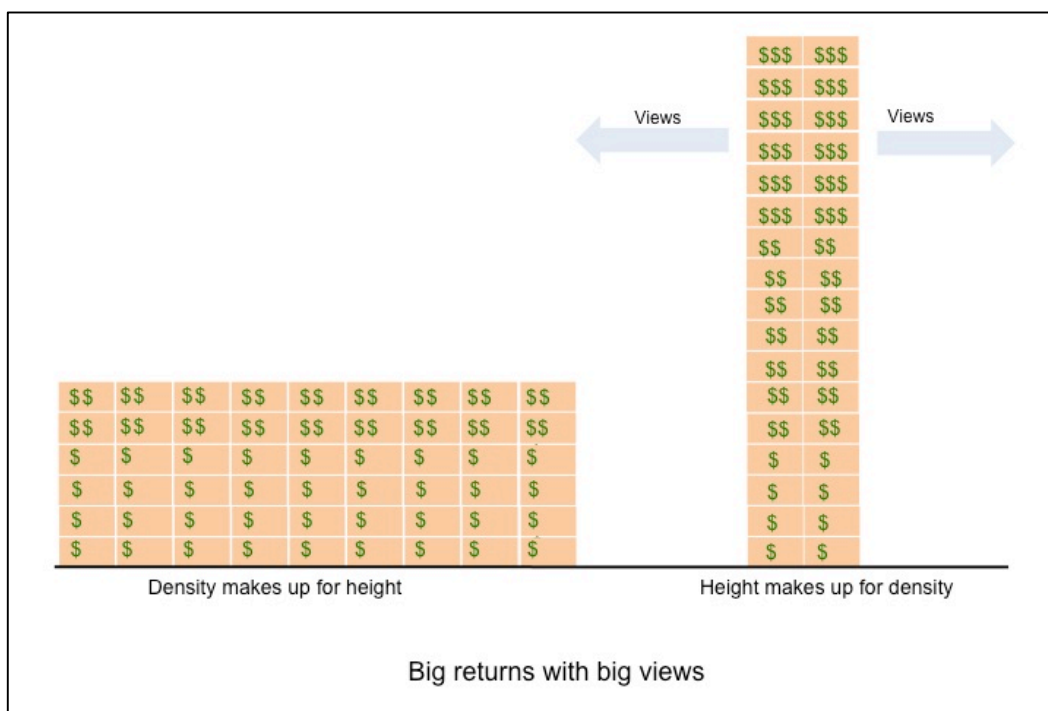
**Building typology:** Whilst tall 'New World' style towers have cost constraints, as discussed previously, 'European' style building forms also have inherent cost implications. For example, when the footprint of an apartment building expands, it will reach a point where additional stairwells are required, at a cost, to meet fire safety regulations.

Furthermore, if long corridors are to be avoided from a design perspective, then the alternative in a 'European' style building is to construct multiple lift and stairwells, which also comes at a considerable cost.

It should also be noted that a 'New World' built form will not necessarily deliver a greater density despite the additional height.



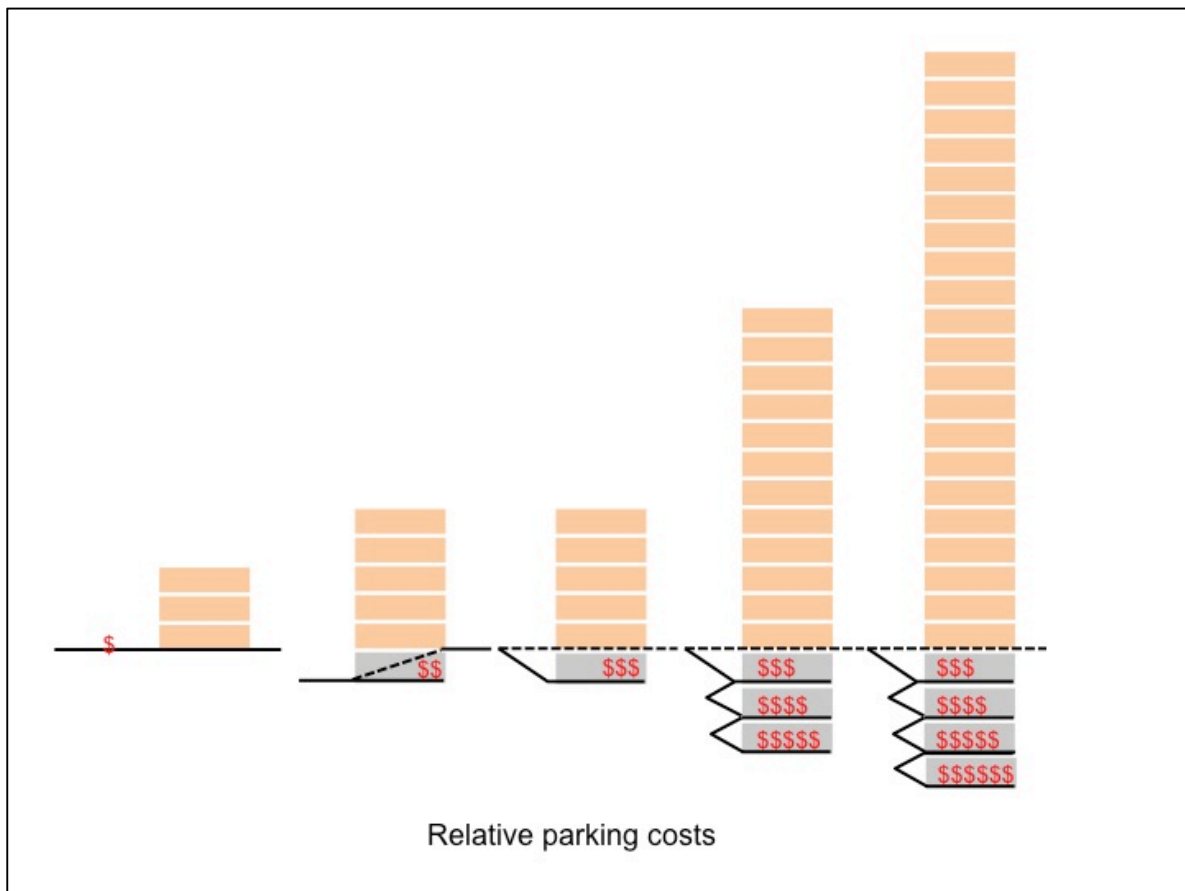
***'European' and 'New World' built form comparison 1***



***'European and 'New World' built form comparison 2***



However, where there are views available, the 'New World' built form has the potential to achieve higher values in sales to outweigh additional cost.



**More basement = more cost**

**Extent of basements:** Basements are expensive, and the deeper they are, the more expensive they become. In addition to the construction cost, full depth basements require the additional and on-going expense of mechanical ventilation.

**Land use mix:** Buildings with different uses in them can also introduce additional costs. For example, in the case of a mixed-use building, the commercial and residential components are likely to require separate entry lobbies, car-parking areas, and bin stores. Likewise, buildings with residential and short-stay apartments are likely to require similar separation between the permanent and short stay components.

In summary, development economics is a complicated interaction of numerous considerations, many of which relate to building height. From a planning perspective, it is important to understand the implications of development economics as there is a risk in setting development controls that don't allow sufficient floorspace (either through plot ratio, height or both) to adequately cover construction costs. Likewise, there is a risk that planning controls may be set a threshold that cannot be viably achieved (for example, ten storeys) or a threshold that is overly ambitious, and sites may then not achieve their full development potential.

## **2.6 Principles for managing the height of built form outcomes**

From all of the above, it is possible to draw out some basic planning and design principles in regard to building height. These principles include:

- Establish an overall built form shape, and footprint, for an intensive urban precinct that is derived from the function and role of the precinct.
- Use building height to establish legibility in the broader landscape and signify where intensive urban precincts, such as centres of activity and other major destinations, are located.
- Use building height to accentuate the primacy of a centre's core.
- Step building heights down at the edges of an intensive urban precinct to meet the interface with less intensive development.
- Match built form typologies that are appropriate to the location and function of the precinct.
- Identify the economic context for development and either match development controls to the likely scale of development or provide sufficient flexibility to enable viable development.
- Identify existing, or future, viewing opportunities through the precinct and establish view corridors with open areas or low-rise buildings between taller buildings to maintain views if required.
- Manage building heights to maintain a reasonable degree of winter solar access to active streets and other public spaces.
- Consider a built form that 'maintains a pedestrian scale at street level' where there is community anxiety about the impact of taller buildings.
- Consider the use of additional building height as a trade-off for the delivery of publicly accessible open space or quality landscape at ground level.
- Utilise a built form that reduces adverse wind impacts from taller buildings.
- Manage building heights to avoid extensive overshadowing of active public spaces and existing dwellings and their outdoor areas for long periods of time.
- Establish a built edge to streets and public space that is high enough and contiguous enough to provide a sense of containment and enclosure without being over-bearing.
- Introduce architectural elements that sculpt taller building and provide visual interest.

- Break up the scale of taller buildings in a manner that is well proportioned, articulate and visually pleasing, with a clear base, middle and top.
- Avoid the establishment of large areas of exposed blank walls.

The above principles provide a foundation for design guidance on managing the built form of taller buildings. The third discussion paper will build upon these principles and combine them with widely acknowledged urban design principles for urban buildings generally; this approach will help to establish a ‘planning and design brief’ for the preparation of development scenarios for the Rockingham Beach precinct.

## **2.7 Summary and conclusions**

In summary, building height is a complex issue with numerous benefits and drawbacks – too complex to reduce into a simple argument about whether ‘x’ number of storeys is too high.

The appropriateness of building height needs to be considered firstly in the context of the place in which a development is located, both in regard to the nature of the place it is in and where it is within that place.

Building height also needs to be considered in regard to what the most appropriate built form typologies might be for a place – whether tall slender towers that offer views or a more modest perimeter block that provides a sense of enclosure. In addition, the most appropriate built form and height may also be a function of development economics.

In providing a pathway through the complexity of the issues surrounding the appropriateness of building heights, it is possible to identify a suite of principles that provide guidance on managing the built form of taller buildings.

These guiding principles can then be combined with widely acknowledged urban design principles for urban buildings generally to create a comprehensive planning and design brief for development in intensive urban precincts such as activity centres and primary coastal centres, such as Rockingham Beach. This will be explored in greater detail in ***Discussion Paper 3: Urban design guidance for managing taller and more intensive development.***

### 3. DISCUSSION PAPER 3 – URBAN DESIGN GUIDANCE FOR MANAGING TALLER AND MORE INTENSIVE BUILT FORMS

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#### 3.1 Introduction

This is the third of the three discussion papers and explores what detailed urban design guidance should be applied to the Rockingham Beach precinct, particularly in the event that the City of Rockingham decides to enable the development of taller and more intensive development within the precinct.

There is already a range of urban design objectives and provisions within the City of Rockingham's local planning framework contained within *Development Policy Plan No.3.2.5 - Waterfront Village Sector* provides an overview of planning and urban design considerations, whilst the *Foreshore Precinct Plan* provides an additional level of guidance.

The area of design guidance is also changing rapidly in WA, with the recent release of the draft Design WA documents including *Apartment Design (Volume Two of State Planning Policy No. 7.3 Residential Design Codes Guidance for multiple-dwelling and mixed-use developments)*, which provides very detailed guidance on the planning and design of apartment and mixed-use buildings.

The intention of this discussion paper is to highlight a range of considerations, that can then be used to evaluate which elements of the existing local planning framework should be retained and where further detail should be included in any update of the policy framework. It also may be that, given a high degree of concurrence between the elements of this discussion paper and Design WA, the final form of Design WA also can be referenced in any updated local planning policy as a 'belt and braces' approach for achieving satisfactory design quality.

The principles of design guidance in this discussion paper are organised under a series of headings for clarity. These are:

- The overall shape, extent and function of the collective built form of the precinct.
- The site planning and built form of individual buildings.
- Appropriate building interfaces with adjacent streetscapes.
- Appropriate land uses and the provision of a high standard of internal and external occupant amenity.
- Vehicle access and parking.
- The location of services infrastructure for buildings.
- Landscape.
- Architecture and character.
- Environmental responsibility and resource conservation.

It should be noted that whilst the theme of the three discussion papers has been building height, a good urban design outcome cannot be achieved by simply focussing on height, and that the principles need to cover a range of other considerations in relation to the built form.



### 3.2 Collective built form

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***Principle: Development in the precinct should be coordinated to form a legible and distinctive built form composition.***

Reason: If the Rockingham Beach precinct is to be an identifiable place of character, it cannot be composed of a random collection of buildings and spaces of disparate appearances and no common architectural language. Therefore, the use of precinct planning and design guidance is essential.

***Principle: The collective built form should step down at the edge of the precinct.***

Reason: The focus of development should be within the core of the precinct, allowing the edges of the precinct to transition towards the planned height of the surrounding areas.

***Principle: Buildings should be a minimum of five storeys.***

Reason: The precinct is one of the metropolitan areas most significant regional coastal destinations and the scale of the built form should reflect that significance. Low-scaled development would be an under-utilisation of high value land in an activity centre. Furthermore, low-scaled development will be difficult to redevelop if it is strata-titled.

***Principle: Development within the precinct should seek to optimise density rather than simply maximising density.***

Reason: The pursuit of dwelling yield alone does not create good places. The quantity of dwellings achievable needs to be balanced against the quality of amenity that the dwellings provide for residents, and the amenity of the public realm at street level.

***Principle: The collective built form should contribute, wherever possible, to increased pedestrian permeability.***

Reason: The main destinations in the precinct are the Kent Street main street and the foreshore, however there is currently limited pedestrian connectivity between them.

***Principle: The pedestrian movement network within the precinct should be legible and connect the main pedestrian destinations.***

Reason: Successful places tend to be easily mind-mapped by residents and visitors and the most legible places offer direct routes.

***Principle: The collective built form should avoid contiguous buildings of more than eight storeys in height.***

Reason: Above eight storeys, a long contiguous wall of buildings becomes visually oppressive and will diminish public amenity of the foreshore, and reduce the potential for intensive development of land immediately inland of the wall of buildings by compromising the potential for views.

***Principle: The collective built form should be structured and coordinated to create or define identifiable public places.***

Reason: Successful and appealing places are more than a collection of individual development sites along streets, no matter how good the streetscape is. Successful and appealing places are largely characterised by well-defined places where people want to be.

***Principle: The collective built form should maximise the number of dwellings (or short stay accommodation units) that have a view to the foreshore and ocean.***

Reason: The foreshore and beach are the most significant landscape features of the precinct's location, and development that maximises views will maximise value, amenity and desirability.

***Principle: The collective built form should establish a clear and direct relationship with the foreshore.***

Reason: The foreshore and beach are the most significant landscape features of the precinct's surrounds and are the principal pedestrian destinations in the surrounding adjacent area.

### 3.3 Individual built form

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***Principle: Buildings should be designed to avoid extensive overshadowing of public spaces or other residential dwellings for prolonged periods of the day.***

Reason: Whilst shadow is an inevitable consequence of urban-scaled development, extensive and prolonged shadow diminishes the amenity of public spaces and other dwellings. Particular consideration needs to be given to the quality and amenity of alfresco areas, parks, plazas and outdoor living areas.

***Principle: Street corners should be expressed with a distinctive architectural element or treatment.***

Reason: Corners are important places where people make directional decisions when they orientate themselves through an urban area. Distinctive corners act as recognisable landmarks.

***Principle: Buildings on street corners shall treat each street as a primary street front and present a consistent quality of architectural treatment.***

Reason: Unlike suburban areas, there are no primary or secondary streets in an urban area, all the streets are important.

***Principle: Buildings shall incorporate architectural treatments to break up their perceived bulk.***

Reason: Modulation of the built form, horizontal banding, changes in material, colour or pattern assist in articulating and moderating building bulk and also provide visual interest.

***Principle: Tall 'tower' buildings should be treated as sculptural elements.***

Reason: Tall buildings are more likely to be seen from a distance, where fine architectural details cannot be seen. As such, treating the built form as a sculptural element enables it to provide visual interest from a distance.

***Principles: Buildings should be designed to maintain reasonable privacy for residents***

Reason: Because taller buildings have fewer visual obstructions (such as trees and fences) between them, visual privacy becomes a more pressing issue and requires separation distances between opposing habitable rooms that will limit detailed visibility from room to room.

***Principle: Vehicle entrances should be integrated into the design of a building and recessed to reduce their visual impact on the street.***

Reason: Vehicle entrances are generally unattractive and offer views into the less-appealing and utilitarian areas of a building. Integrating and recessing vehicle entrances reduces their visual impact.

### 3.4 Streetscape interfaces

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***Principle: Development should optimise the opportunities by people for passive surveillance from dwellings of the adjacent public realm.***

Reason: The more that passive surveillance by people is possible, the safer pedestrians are likely to feel in the streets and other public spaces.

***Principle: Buildings should have their primary access from a well-designed street, park, plaza or pedestrian right-of-way, rather than a laneway.***

Reason: Residents deserve a proper and clearly identifiable address. A primary access from a laneway for vehicle access and servicing, with no footpath or landscape, is unacceptable.

***Principle: Pedestrian movement should be prioritised over car movement wherever possible.***

Reason: If a place is designed for people, then people will use it. If a place is designed for cars, then the cars will dominate it. This is particularly relevant for potential pedestrian/vehicle conflict points such as driveway crossovers, and encourages the use of formal pedestrian crossings across streets.

***Principle: Buildings should be built to the street boundary for the majority of the frontage***

Reason: The quality of streetscape and sense of enclosure in an urban area is dependant on the largely contiguous nature of the building frontage. Gaps in the streetscape are like missing teeth in a smile.

***Principle: Ground-floor commercial uses with a street frontage should provide shade and shelter to the adjacent footpath***

Reason: The fundamental benefit of a commercial street interface is the engagement between pedestrians and the building. The provision of shade and shelter encourages pedestrians to walk close to the frontage and to experience the public realm in comfort.



***Principle: Commercial ground floor uses should have their main pedestrian access from the adjacent street.***

Reason: There is little benefit to the streetscape if a commercial tenancy is accessed from an internal mall or a car park.

***Principle: Buildings should establish a human-scaled experience at street level.***

Reason: Pedestrian movement is paramount in an urban area, and creating an environment with a human scale encourages pedestrians to use it. Whilst 'human scale' is commonly interpreted as setting back upper levels, it can be more effectively achieved by paying attention to the scale of openings, the use of fine-grained and textured materials, the horizontal layering, or 'ordering' of a building, and the provision of canopies, arcades and awnings that restrict views upwards adjacent to tall buildings.

### 3.5 Land uses and occupant amenity

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***Principle: The land use mix of new development should include commercial uses, such as food and beverage or retail at ground level to increase the range of local services.***

Reason: In an urban activity centre and tourist destination, the ability to walk to local services is an essential requirement that also can significantly reduce car use, which is an important consideration in areas of high residential density.

***Principle: Residential uses should be restricted to upper levels at the street interface.***

Reason: Ground floor apartments deliver poor residential amenity in a busy urban street unless there is an integrated home-office with large areas of commercial style glazing.

***Principle: Where there are no available views to the foreshore, the ocean, streets, parks or other public places, landscaped areas should be provided for visual amenity for residents.***

Reason: The precinct requires a consistently high quality of development that is commensurate with the intent of the precinct being one of Perth's principal coastal destinations. Without an appealing outlook, the value of development internal to the sites will diminish the ability to deliver an appropriately high standard of development.

**Principle: Development should seek to achieve a resort-style of living with generous outdoor areas.**

Reason: The precinct is a highly desirable location and emblematic of WA's relaxed coastal lifestyle. As such, opportunities for outdoor living should be generous and create a place where residents can feel as if they are on a permanent holiday.

**Principle: Development should incorporate sheltered outdoor areas to provide relief from strong sea breezes.**

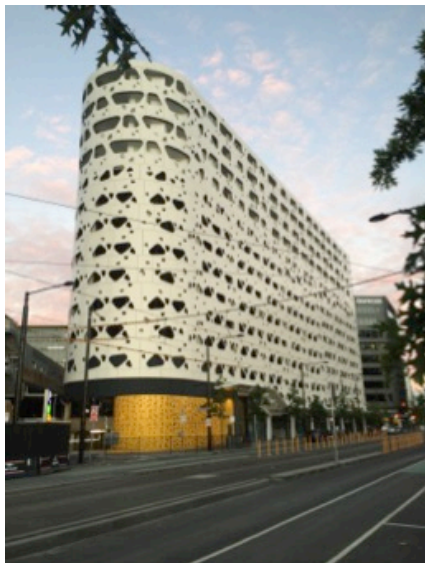
Reason: The coastal environment experiences strong winds at all times of the year. For residents, sheltered spaces become an essential retreat from the wind.

**Principle: All habitable rooms (bedrooms, living rooms etc.) shall have access to natural ventilation and daylight.**

Reason: Access to light and ventilation is environmentally responsible and an essential element to the quality of life of most people. A development should seek to maximise natural ventilation and access to daylight for access corridors to apartments and, where possible, to bathrooms.

### 3.6 Vehicle Parking and access

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**Principle: The number of vehicle crossovers should be minimised.**

Reason: Every crossover is a potential pedestrian-vehicle conflict point; furthermore, excessive vehicle crossovers tend to diminish the quality of a streetscape.

**Principle: The width of vehicle crossover should be minimised.**

Reason: Vehicle crossovers are pedestrian/vehicle conflict points and wider crossovers increases the time that pedestrians are exposed to risk.

***Principle: Garages, carports and off-street car parks should be located away from streets and other public places (other than service laneways) and should be screened from public view.***

Reason: Car parking infrastructure is largely unappealing and diminishes the quality of an adjacent streetscape or other public space. Car parking also precludes opportunities for passive surveillance by people in buildings and engagement between buildings and the public realm.

***Principle: On-street parking should be retained or accommodated wherever possible.***

Reason: On-street parking is the most efficient and most publicly accessible form of car parking possible. On street parking also provides 'friction' that reduces ambient traffic speeds.

***Principle: Existing on-street and foreshore car parking should not contribute to resident car parking.***

Reason: The existing car parking within the public domain is public parking for the benefit of all visitors to the Rockingham Beach precinct.

### 3.7 Service infrastructure

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***Principle: Mechanical equipment and associated ducting should be screened from views from the street and located so as not to cause nuisance to adjoining properties.***

Reason: Mechanical equipment is a visual blight and the source of a significant number of neighbour complaints in regard to noise.

***Principle: Service elements such as hydrant boosters, electrical transformers, and pump rooms if required, shall be integrated into the architectural design in a manner that minimises their impact on the adjacent streetscape.***



Reason: For larger and taller developments, elements such as hydrant boosters, electrical transformers, and pump rooms can take up a disproportionate amount of street frontage, along with car park entrances and waste collection.

**Principle: Air-conditioning plant should be located, wherever possible, in an undercroft, on the roof or within a dedicated plant area on each floor level.**

Reason: Air conditioning units are unsightly and when located on a balcony, can severely compromise the enjoyment of the balcony.

**Principle: Bin areas should be located to avoid noise and smell nuisance to residents, and be located conveniently for removal and collection.**

Reason: In larger and taller developments the nuisance associated with waste storage and collection is exacerbated because of the amount of waste as well as the nature and frequency of collection.

### 3.8 Landscape

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**Principle: Landscape planting should be native coastal vegetation or other water-wise and salt-tolerant vegetation**

Reason: Coastal vegetation is naturally more tolerant of the ocean-side environment and contributes to the sense of place.

**Principle: The use of upper-level landscape, such as roof gardens with deep soil zones for trees and balcony planters is encouraged.**

Reason: There is no reason why gardens should be at ground level only, as upper level gardens enable residents to enjoy the amenity along with offering a high degree of privacy and access to views.

**Principle: Existing street tree should be retained wherever possible.**

Reason: Existing trees are publicly-owned assets that contribute to a sense of place and help to provide a visual foil to adjacent development.

**Principle: Street trees should be planted at frequent intervals to maintain continuity of canopy cover at maturity.**



Reason: Street trees contribute to pedestrian amenity (in regard to shade and shelter), establish a sense of place, and help to provide an attractive visual foil to adjacent development.

### 3.9 Architecture and character

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***Principle: Buildings should be designed to provide a recognisable response to the coastal location.***

Reason: There is a community expectation that buildings on the coast should look like coastal buildings. As such, they should be expected to draw inspiration from traditional coastal forms, materials and other maritime references.

***Principle: Buildings should exhibit a common design character that is defined through detailed design guidelines.***

Reason: Developments with a recognisable 'sense of place' usually exhibit a strong commonality of building and open space elements, materials and colours, architectural details and landscape, with subtle variations only giving each building its unique identity.

***Principle: Buildings should be designed to endure a harsh maritime climate.***

Reason: The coastal climate can be harsh with strong winds, driving rain, high levels of UV and salty air, all of which can degrade construction materials if poorly selected. Buildings, therefore, should be durable, finished and detailed appropriately with a view to minimising maintenance and avoiding water ingress.

### 3.10 Environment

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***Principle: Buildings should be designed to enable cross ventilation to most dwellings.***

Reason: The advantage of a coastal location is the ability to utilise the sea breeze for natural cooling in hot summer months and reduce the extent of energy expended on artificial ventilation and temperature control.

***Principle: Buildings should be designed to maximise beneficial solar access and avoid detrimental solar access.***

Reason: Glazing with a northerly aspect enables passive solar heating in cooler winter months, thus reducing the extent of energy expended on artificial heating, whilst western summer sun needs to be restricted.

***Principle: The number of apartments with only a south-facing aspect should be minimised.***

Reason: South facing apartments have limited access to the benefits of winter solar gain and are more expensive to heat in winter.

***Principle: Roofs and wall surfaces with significant exposure to summer sun should be predominantly light in colour.***

Reason: Light colours reduce solar absorption and energy use associated with cooling.

***Principle: PV cells and other energy-efficiency measures shall be integrated wherever possible.***

Reason: A reduction in household energy consumption is a global concern and new large strata-titled developments are an opportunity to achieve reductions for a large number of households in an efficient manner.

### 3.11 Summary and conclusions

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If the City of Rockingham reviews its local planning policy framework for the Rockingham Beach precinct, whether it is to enable buildings of greater height or simply to update the current provisions to provide a more holistic set of guidelines for high quality architecture and urban design, then there is a range of considerations that need to be taken into account.

These considerations are summarised as a suite of planning and design principles that also form the basis of more specific design controls.

The planning and design considerations cover issues such as:

- The overall shape, extent and function of the collective built form of the precinct.
- The site planning and built form of individual buildings.
- Appropriate building interfaces with the adjacent streetscapes.
- Appropriate land uses and the provision of a high standard of occupant amenity.
- Vehicle access and parking.
- The location of service infrastructure for buildings.
- Landscape.
- Architecture and character.
- Environmental responsibility and resource conservation.

It should be noted that not all of the considerations relate directly to building height, because a focus on building height alone will not provide a satisfactory built outcome.

The principles identified provide a good foundation for further investigation into the development capacity of the Rockingham Beach precinct. It is important that any analysis of the potential built form is not undertaken in isolation of the many ingredients that make great urban places.



## 4. EXISTING CONDITION

### 4.1 Precinct description

For the purpose of the study, the Rockingham Beach precinct is defined by Rockingham Beach Road, Patterson Road, Kent Street and Wanliss Street. The precinct is illustrated in **Figure 1: Study area** below.



**Figure 1: Study area**

The precinct is characterised by a range of building forms of different ages, that range from one to nine storeys in height. Some lots are vacant or significantly underutilised, whilst others have been developed in recent years to a scale that makes it very unlikely that they will be redeveloped in foreseeable future.

The lots facing Rockingham Beach Road have an ocean outlook that favours them from a developer's and apartment purchaser's perspective, whilst all of the streets have the conditions required to support ground floor commercial activity.

The precinct also has deep lots that have the capacity to accommodate the car-parking required to support more intensive redevelopment. There is also a Right-of-Way network in the western part of the precinct that provides access deep in to the precinct.

Whilst the precinct lends itself readily to delivering a functional ground level for mixed-use development, the major planning and urban design challenge is in the delivery of apartment buildings that include the higher density accommodation to support the precinct whilst working with the existing buildings and in building forms that provide high levels of amenity for both residents in their apartments and for the public in the surrounding streets and open spaces.



## 4.2 Likelihood of development

The following diagrams provide an indication of the likelihood of development for properties within the Rockingham Beach precinct based on a wide range of considerations such as the age, intensity, condition and tenure of the existing building stock, existing uses, lot size and length of street frontage and access to ocean views.



Where a lot has been defined with a low or no likelihood of development, the existing built form has been retained and integrated into the scenario modelling.





### 4.3 Existing development controls

The existing development controls contained within the current planning policy framework were modelled in 3D to illustrate the development potential at present. As with all of the modelled scenarios, the model illustrates the allowable building envelope. The reality is that the actual achievable built form would have a lesser bulk than what is modelled.



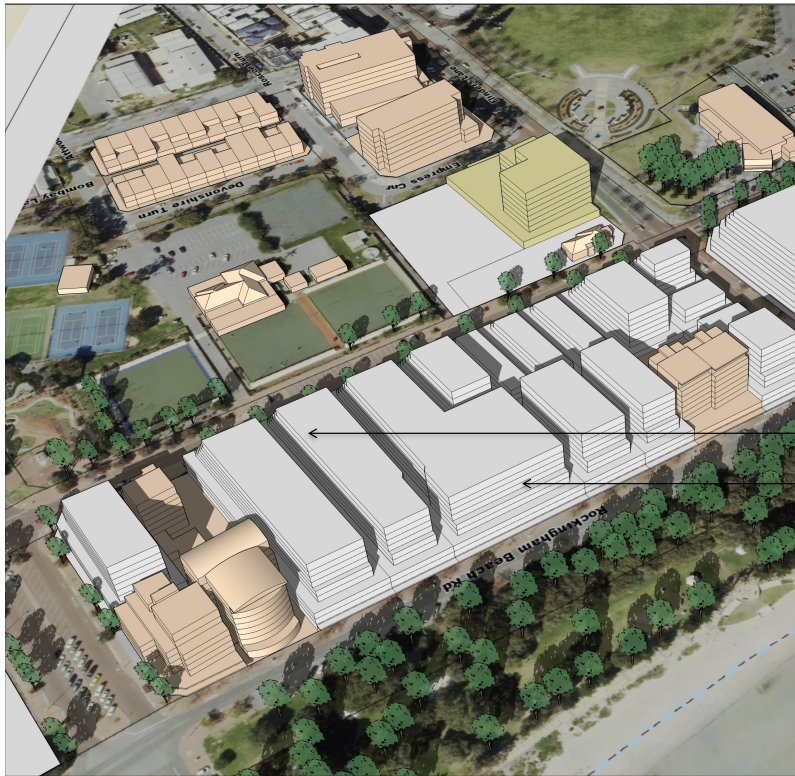
View from the West



View from the East



## Observations on the existing development controls



No constraint on building depth may result in poor occupant amenity in the centre of the block.

Middle setback for the 4<sup>th</sup>/5<sup>th</sup> level is difficult to design and construct.

**View from the North**



Envelope for the Hotel site is overly flexible and provides little certainty of built form or amenity for residents in the centre of the block.

Typically 9-storey buildings with a 3-storey street front podium.

Ziggurat forms are expensive and impractical to design and construct – therefore, envelopes are inefficient.

Shadows fall well short of the opposite footpath on Kent Street – therefore, greater capacity for building height.

**View from the South**

### ***Visual impact from the foreshore***



### ***Visual impact from the civic centre***





## Midwinter shadows (21<sup>st</sup> June)



## Midsummer shadows (21<sup>st</sup> December)



## 5. SCENARIO DEVELOPMENT

In addition to modelling the existing policy provisions for the precinct (Scenario 1) a number of other built form scenarios were modelled to gauge the potential development yield and the potential impact of each of the scenarios on the surrounding area. The development scenarios that were modelled were:

### 5.1 Scenario 2a: Tower/European combination – moderate intensity

In Scenario 2a, the precinct was envisaged with a built form that is characterised by buildings along Rockingham Beach Road with a 'New World' 'tower on podium' form (refer to Discussion Paper 2) that consists of a podium of up to 3 storeys that could be built to the site boundaries, which in all likelihood would accommodate commercial activities, car parking, and some residential units. Above the podium the buildings would take the form of towers, which would be set back from the site boundaries to enable light, views and ventilation for the likely residential uses in the tower.

Along Kent Street, the built form was envisaged as a more 'European' built form (refer to Discussion Paper 2) with building that are built from side boundary to side boundary up to a general height of five storeys, with a further 2 attic storeys set back, in the manner of buildings in European cities.

The maximum heights of buildings in the precinct were largely determined by a desire to avoid overshadowing of any non-podium building or the southern side of Kent Street at 12pm mid-winter. A cap of 12 storeys was also placed on all buildings except where additional height could be granted to encourage community benefit, such as pedestrian connections through a site from Kent Street to Rockingham Beach Road.

The net effect of the controls was an overall built form with a relatively high degree of modulation that was subtle enough to look as if the existing taller buildings were part of the planning intent.

Having been determined as the preferred outcome, Scenario 2a is described in greater detail in Section 6 of this report.

### Scenario 2a views



View from the West



View from the East



## 5.2 Scenario 2b: Tower/European combination – greater intensity

Scenario 2b was, in many respects, similar to Scenario 2a in that the precinct was also envisaged with a built form that is characterised by buildings along Rockingham Beach Road with a 'New World' 'tower on podium' form (refer to Discussion Paper 2) that consists of a podium of up to 3 storeys that could be built to the site boundaries, which in all likelihood would accommodate commercial activities, car parking, and some residential units. Above the podium the buildings would take the form of towers, which would be set back from the site boundaries to enable light, views and ventilation for the likely residential uses in the tower.

As with Scenario 1, Along Kent Street, the built form was envisaged as a more 'European' built form (refer to Discussion Paper 2) with building that are built from side boundary to side boundary up to a general height of five storeys, with a further 2 attic storeys set back, in the manner of buildings in European cities.

The main point of difference to Scenario 2a was that, in addition to maximum heights being largely determined by a desire to avoid overshadowing of any non-podium building or the southern side of Kent Street at 12pm mid-winter, a cap of 16 storeys was placed on all buildings except for the Hotel site where additional height was deemed appropriate to encourage the development of a high-quality hotel.

The net effect of the controls in Scenario 2b was an overall built form that could potentially have relatively little and with buildings height that were double that of the existing taller buildings in the precinct.

### Scenario 2b views



View from the West



View from the East



### Scenario 3: High-intensity tower development

Scenario 3 was developed to investigate the maximum development potential of the precinct without overshadowing of any of the buildings or footpath on the southern side of Kent Street at 12pm mid-winter.

In this Scenario, all of the buildings to both Rockingham Beach Road and Kent Street were envisaged as a built form characterised by buildings with a 'New World' 'tower on podium' form (refer to Discussion Paper 2) that consists of a podium of between 3 to 5 storeys that could be built to the site boundaries, which in all likelihood would accommodate commercial activities, car parking, and some residential units. Above the podium the buildings would take the form of towers set back from the site boundaries to enable light, views and ventilation for the likely residential uses in the tower.

The net effect of the controls in Scenario 2a was an overall built form that was substantially higher than the existing taller buildings, with heights generally up to 25 storeys along Rockingham Beach Road and up to 9 storeys along Kent street, albeit with the upper 6 storeys set well back from the street.

#### Scenario 3 views

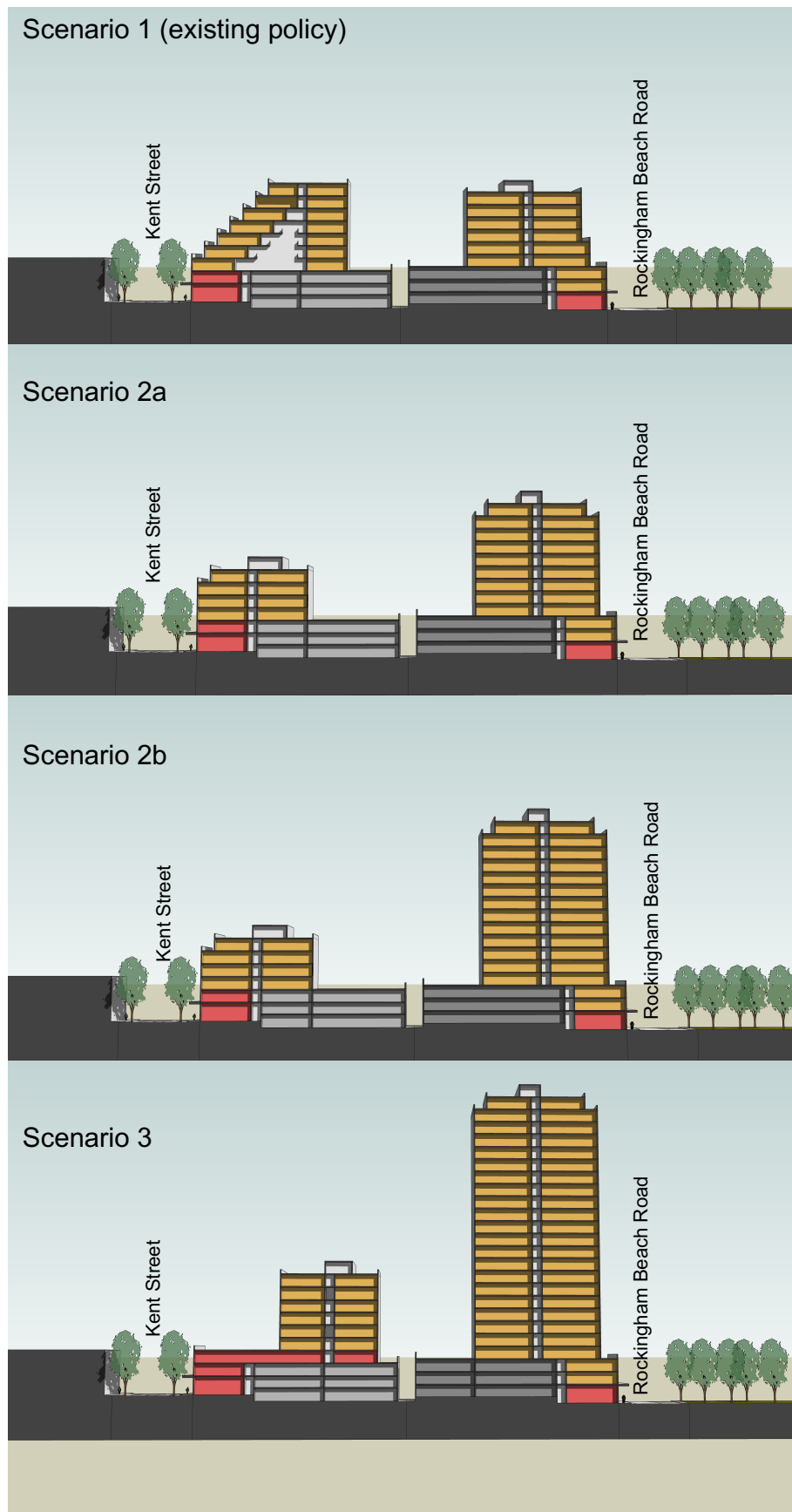


View from the West



View from the East

The three scenarios are illustrated in section in the following diagram along with the current policy provisions to demonstrate the relative heights and setbacks of each scenario. The cross-section is a typical cross section taken through the precinct between Kent Street and Rockingham Beach Road.



## Scenario evaluation

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The modelling of each of the development scenarios was evaluated through discussion with the City of Rockingham planning officers through a workshop process.

The evaluation of the development scenarios reached the following conclusions:

- Scenario 2b and 3 were both considered as excessive and would result in a visual disconnect between the scale of the existing towers and new towers.
- Because the development potential was maximised, Scenario 3 lacked incentives to encourage community benefits by awarding height bonuses.
- Both Scenario 2b and 3 were considered to have an overly high degree of consistency to the building envelopes that could result in a lack of visual interest and 'shape' to the precinct.
- The intensity of development in Scenario 3 raised concerns about the cumulative impact on the movement network within and around the precinct.
- Whilst there was some concern about whether there was sufficient development potential in Scenario 2a to encourage timely redevelopment, Scenario 2a offered the greatest potential to offer incentives to encourage community benefits by awarding height or plot ratio bonuses.
- The scale of potential new buildings in Scenario 2a was not considered excessively different to the scale of existing taller buildings within the precinct and, as such, the existing taller buildings were likely to look as if they were part of the planning intent.



## 6. PREFERRED SCENARIO (SCENARIO 2A)

### 6.1 Description

The preferred scenario (Scenario 2A) seeks to maintain a well-modulated overall form to the precinct that enables greater height for key lots along Rockingham Beach Road, whilst incorporating the existing taller buildings into the overall built form composition.

The heights of the new buildings are constrained by limiting the overshadowing on buildings on other lots and on the southern footpath of Kent Street.

This scenario envisages a more 'European' built form to Kent Street with mid-rise buildings rather than towers on podiums that are the preferred building typology for the lots along Rockingham Beach Road.

To achieve the desired outcome, the planning framework will require more prescriptive building envelopes than at present.



View from the West



View from the East





View from the North



View from the South





**View from the North**

- 'European built form to Kent Street.
- Tower shadows fall short of the 25m prescribed building depth above podium along Kent Street.
- 3m setback for all uppermost floors.
- Typically 12 storeys max.
- Setbacks = 8m (4m + 4m) min separation between towers.
- Pedestrian link through site.
- 3-storey max podium.

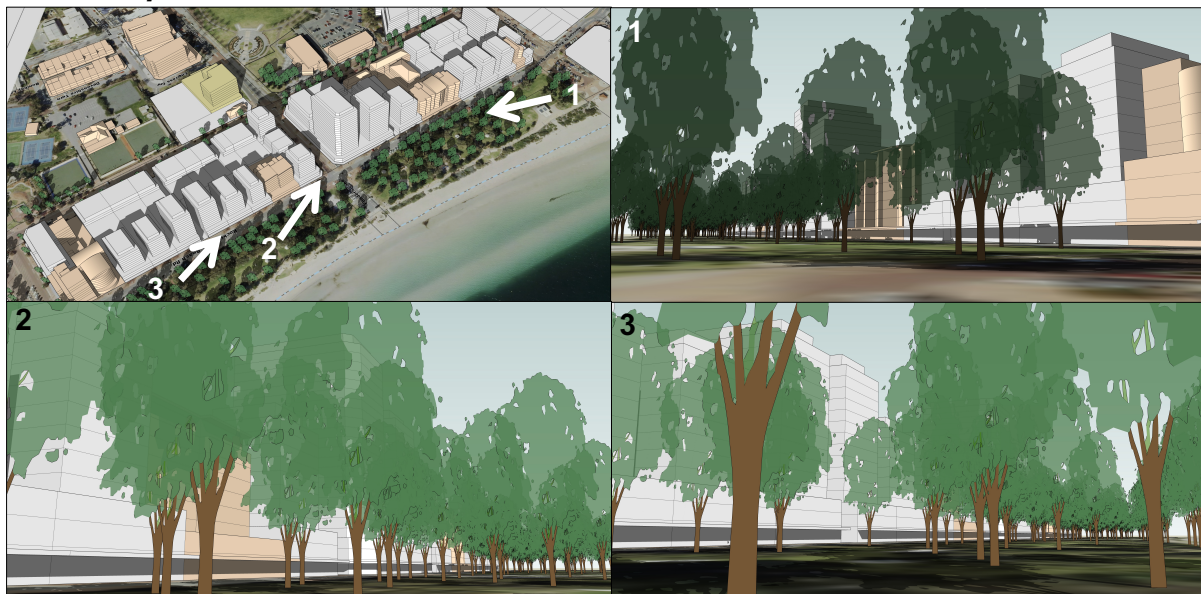


**View from the South**

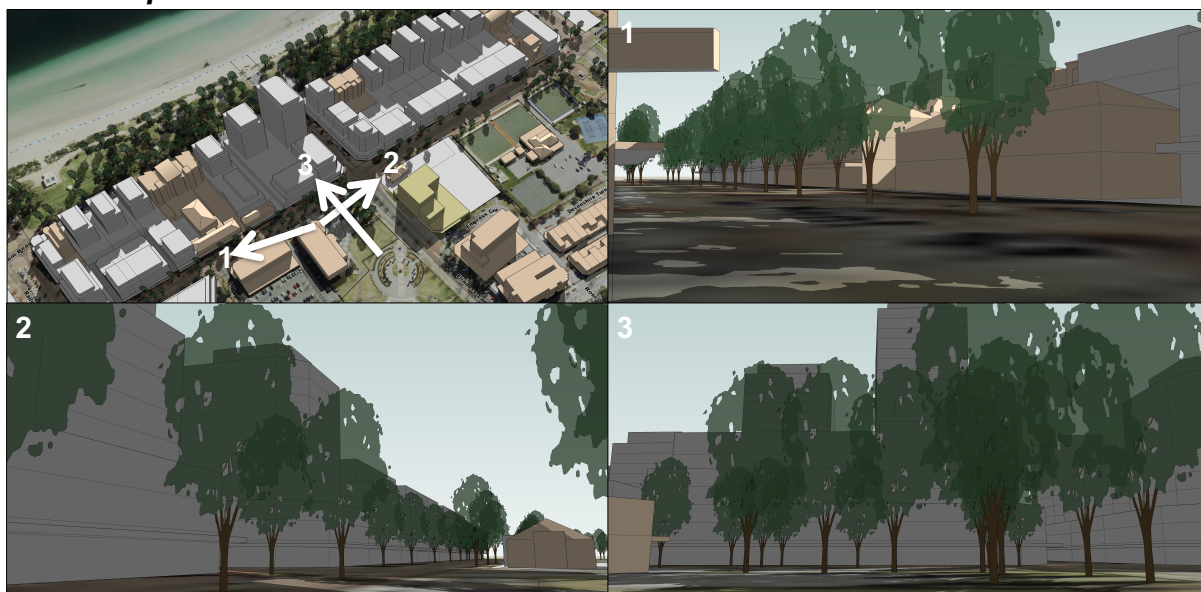
- Notionally 24 storeys on corner of hotel site.
- 12m min separation between towers on same site.
- Pedestrian link through site.
- 3m setback for all uppermost floors.
- Typically 12 storeys max.
- Setbacks = 8m (4m + 4m) min separation between towers.
- Unique solution for corner lot.
- Prescribed max depth for floors above podium.
- 'European built form to Kent Street.
- Shadows falls just short of the opposite footpath on Kent Street at 12pm 21/6 to maintain pedestrian amenity.



### ***Visual impact from the foreshore***



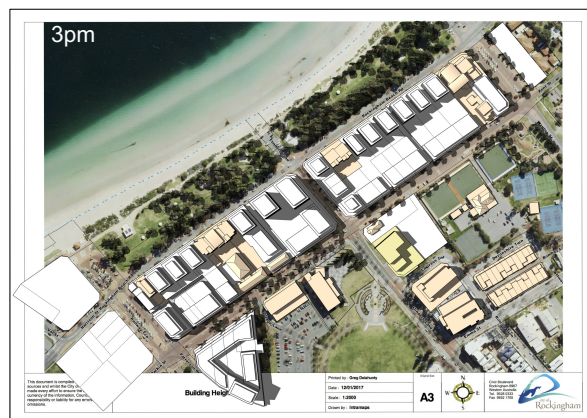
### ***Visual impact from the civic centre***



## Midwinter shadows (21<sup>st</sup> June)



## Midsummer shadows (21<sup>st</sup> December)





## 6.2 Rationale

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The rationale for the preferred scenario includes the following reasoning:

- Given the slow rate of redevelopment and changing development economics over the last decade, the existing development controls are clearly not delivering the desired outcome for a revitalised and vibrant Rockingham Beach precinct, with very little development having occurred within the precinct over the last 10 years. It is, therefore, arguable that there needs to be greater incentive to encourage redevelopment through the use of planning controls that enable development viability and building forms that are more efficient to design and construct.
- The existing taller buildings are long-term fixtures of the urban environment and must be considered as elements in the overall built form composition. As such, if the general height of development is overly large, the existing towers will look out of place and read as gaps in the overall streetscape and shape of the precinct. The preferred scenario maintains the height of development, generally, to no more than a 33% increase in the current permissible height.
- Large underutilised sites, such as the Hotel site, are vital potential catalysts to the overall revitalisation of the precinct and their redevelopment should be encouraged through development controls that deliver a high level of feasibility to offset the inherently high risk associated with larger developments.

It is noted that the current policy supports the development of a major hotel(s) to the precinct to reinforce Rockingham's role as a regional destination. Specifically, the current policy envisages a Hotel with a minimum of 160 rooms, being a 4-star full service internationally or nationally branded hotel, with a bar and bistro, restaurant, room service, meeting and conference facilities, a function room with a minimum capacity of 300 guests, and Leisure facilities e.g. pool, gym, spa, steam room sauna.

It is also noted that in practice, the economics of such a development would be under-pinned with the provision of residential apartments either above the hotel floors or in a separate tower(s).

In the context of the preferred built form for the precinct, a development of this scale could be reasonably expected to accommodate the support functions in three podium levels, with 160 hotel rooms requiring 12 floors with 14 rooms per floor assuming a typical gross floor area for a tower of 700sqm. This would require a minimum building height of 15 storeys for the hotel component with either additional floors for residential apartments or a separate residential tower(s).

There are currently two sites within the precinct that have the capacity to support a development incorporating a 160-bed hotel, and the preferred scenario recognises that by providing additional development potential on these sites for such a development to be enabled.



- Providing too many overly generous development controls is counter-productive in that it may result in community discontent and deliver development opportunities that are so large that they become too expensive and risky to develop in anything other than a booming market. Furthermore, if development controls are excessive, it reduces the potential for the planning framework to include incentives for developers to include community benefits that they are not otherwise obliged to.
- A variety of building heights will create a more pleasing urban composition than highly repetitive building forms.
- The contexts of Rockingham Beach Road and Kent Street are very different and demand different built form responses. Rockingham Beach Road has a superb ocean outlook and a well-vegetated foreshore that suits tower forms that provide views without resulting in an excessive visual presence, whereas Kent Street is a more intimate environment with limited outlook that demands a more traditional relationship between buildings and the street.
- Kent Street is the main street of Rockingham Beach and the amenity of the main street needs to be protected from overshadowing from excessively tall buildings.
- Greater pedestrian connectivity between Rockingham Beach Road and Kent Street is essential to establish an integrated urban precinct and assist in the viability of local businesses. The larger development sites are the best opportunities to secure additional pedestrian connections through the redevelopment process, and through the use of development bonuses, in the form of increased height and/or plot ratio controls, to specific sites.

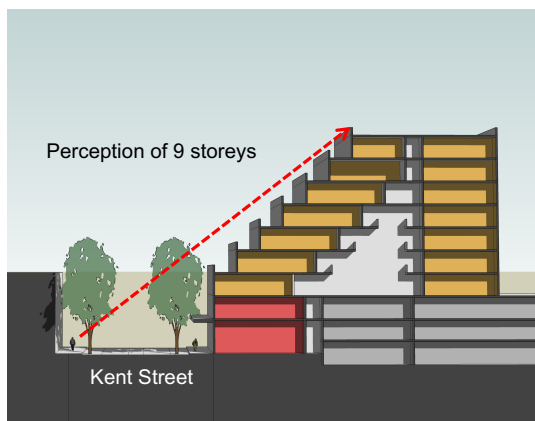
As such, the preferred scenario identifies four locations where a mid-block pedestrian connection is considered as desirable. Two of those sites are those that would readily support a hotel development so any height incentives for provision of a pedestrian connection have been contained within the height incentives for encouraging a hotel development. As for the remaining two locations, the policy should enable some flexibility to either incentivise the provision of pedestrian connections through either reasonable height or plot-ratio bonuses provided that the broader objectives of the precinct are met.

- The current upper floor setbacks result in a ‘ziggurat’ building envelope that is inefficient and makes apartment layouts difficult to plan, and should be rationalised to create building envelopes that are more buildable and useable.

The ‘ziggurat’ building envelopes form part of the current suite of policy provisions for the precinct, with the intent of maintaining a ‘human scale’ of development at the street level. Whilst such an approach certainly limits the height of the building interface with the street, it does so at the cost of buildability and the sense of spatial containment to the street, and in the context of best-practice urban design globally, is an example of overkill in regard to development control.

In reality, the exceptionally appealing streetscapes of European cities are not the result of planning policy that forces buildings to set back in a ziggurat form. Most European cities have a street interface of between 3 and 7 storeys before utilising setbacks from the street, and as a consequence deliver streets that are well-defined and architecture that is visually interesting.

In the context of Kent Street, enabling a building to street interface of 5 storeys with additional storeys set back would create a European-scaled street with the uppermost 2 floors barely visible from the street below, and with no difference in overshadowing to either the near or far footpaths of the street.



Existing policy – impractical building envelope, all 9 storeys seen from the street and limited containment of the street space.



Preferred scenario – practical building envelope, only 5 storeys seen from the street and good containment of the street space. Note: similar sight line to the top of the building.

Furthermore, through the use of good urban design principles such as providing canopies over footpaths and creating a high degree of visual interest at ground level, pedestrians' eyes are not drawn upwards to the upper levels of buildings.

In the context of Rockingham Beach Road, the heights of the podiums have been capped at 3 storeys as a counterpoint to the allowance of greater height in the towers, and to emphasise the difference between the tower and podium elements.

### 6.3 Principles

The rationale for the proposed built form of the preferred scenario, and the proposed development controls suggested below, are based on the principles previously outlined in Discussion Paper 3.

### 6.4 Development controls

To encourage the desired built form, the local planning framework should be reviewed to provide the following guidance:

#### ***Preferred built form***

For lots with a frontage to Kent Street, the preferred built form is for 'European' urban buildings that are built to side boundaries, with the uppermost storey set back by a minimum of 3m to reduce their visual presence and create a transition between the street wall and the skyline. The lots with a frontage to Kent Street should have a prescribed Building Zone for the first 25m from the street boundary beyond where development is limited to three storeys.

For all other locations, and especially the lots along Rockingham Beach Road, the preferred built form is a 'Tower and Podium'. Towers should either have the uppermost storey set back by a minimum of 3m or incorporate a unique and identifiable top to the tower component to create a transition between the tower wall and the skyline.

The use of Local Development Plans should be considered for key sites or sites with unique attributes that require a particular built form outcome.

#### ***Total building height***

The maximum height limits for each lot generally should be based on avoiding shadows cast at 12pm on the 21<sup>st</sup> June on the footpath of the opposite side of an adjacent street, or on living areas in the prescribed building zone for the lots on the northern side of Kent Street.

However, development storeys along Rockingham Beach Road also should have additional height controls for specific lots to vary building heights and encourage a modulated overall building form. These varied height controls apply to Lot 75 (9 storeys). Lot 99 (18-24 storeys) and Lot 267 (16 storeys).

Indicatively, overall building heights would range from 12 to 24 storeys along Rockingham Beach Road (typically 12 storeys) and from 6 to 8 storeys along Kent Street, other than for the lots with a second frontage to Railway Terrace, which range from 9-12 storeys.

#### ***Maximum podium and street wall height***

The maximum street wall height for Kent Street should be five storeys to maintain a comfortable 'European' scale to buildings.

Elsewhere, where a 'Tower and Podium' built form is envisaged, the maximum podium height should generally be three storeys. However, this could be increase to four storeys along Wanliss Street and Railway Terrace to establish a transition to the five-storey street wall along Kent Street. Additionally, there is capacity to allow an



additional storey in height to podiums within 20m of street corners to provide legibility and emphasis to the street corners.

### ***Setbacks for 'Tower and Podium' buildings***

The front setback for the podium levels should be a mandatory nil, except where a setback is provided for architectural articulation, an entry forecourt or al-fresco dining.

The front setback for floor levels above the podium should be a minimum of 3m.

Podium side setbacks should be a mandatory nil for the first 20m back from the front boundary, with nil setback permissible for the remainder of the side boundaries, to create a cohesive streetscape and optimise the use of the lower floor levels, such as for commercial uses and car parking.

Tower side setbacks could be a minimum of 4m if major openings are orientated away from the side boundary. Where major openings or balconies, are orientated towards the side boundary, the setbacks should be 6m.

Towers on the same lot should be separated by a minimum of 12m separation on the same lot to provide the same level of privacy as 2 x 6m boundary setbacks, and to enable some views from within the lot to the ocean.

### ***Setbacks for Kent Street lots***

The front setback for the first five levels (other than the uppermost storey) should be a mandatory nil, except where a setback is provided for architectural articulation, an entry forecourt or al-fresco dining.

The front setback to the uppermost floor should be 3m, or 6m if above the sixth level.

Side setbacks to Kent Street buildings should be a mandatory nil for the first 25m back from the front boundary, with nil permissible for the remainder of the side boundaries for the first five levels. The sixth level and any other floors above should have a 3m side setback where adjacent to a street or laneway, but may be built to the side boundary where there is an adjacent lot.

All buildings to Kent Street should setback the uppermost floor from the side boundary by 3m from the floor below.

All lots addressing Kent Street should have a prescribed building envelope with a maximum depth of 25m for floors above the first three levels to ensure that upper level apartment floors are constructed to address the street and to relate to the overshadowing rationale that determines the height of buildings along Rockingham Beach Road.

Lot 75 on the corner of Rockingham Beach Road and Railway Terrace is a unique condition insofar as it is a corner lot and immediately adjacent to a tall building that was constructed without apparent consideration of the development potential of the corner lots. As such, specific development controls should be developed to ensure that any development creates a good urban design without unduly compromising the amenity of the adjacent existing building.

In this context, it is suggested that development be limited to a maximum of 9 storeys, but with a 4-storey podium, consistent with the adjacent existing building. Furthermore, the tower component should be set back by 20m from Rockingham Beach Road.

### ***Pedestrian connectivity***

The policy framework should include the requirement for public pedestrian connections with a minimum width of 8m between Rockingham Beach Road and Kent Street for a number of locations within the precinct. The preferred locations for the pedestrian connections are on Lot 889, Lot 99, Lot 101 and Lot 267 and illustrated in the following diagram:

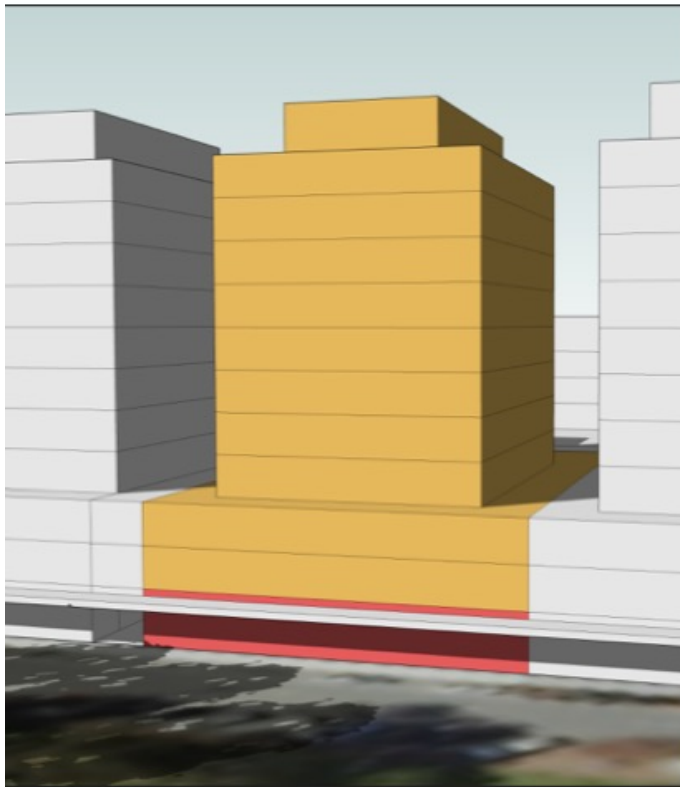


### ***Street interface***

The existing policy provisions to ensure a good urban design outcome at street level, such as active frontage, sufficient glazing to shopfronts and the provision of canopy cover, are largely adequate, however, there is some scope to further tighten the controls. Alternatively, the introduction of *Design WA* by the State Government would also further tighten controls in regard to how buildings contribute to the quality of the streetscape.

### ***Indicative yield***

The following diagram illustrates the building envelope defined by the above policy provisions for a typical lot along Rockingham Beach Road, with a brief assessment of the potential development yield if the building envelope were maximised.



**Typical site**

Notional site area: 1,285sqm

Typical height: 12 storeys

Notional PR residential floorspace: 3,902sqm

Notional Plot Ratio: 3.04

Notional residential yield: 46 du

***Planning statistics for a typical site on Rockingham Beach Road***



## 7. GENERAL SUMMARY AND CONCLUSION

In conclusion, the Rockingham Beach precinct was previously identified as a significant coastal node for the Perth Metropolitan Area, and a planning framework was established many years ago to enable a greater intensity of development.

Some development has occurred, albeit sporadically, and predominantly along Rockingham Beach Road. The current built environment has a somewhat 'gap tooth' and unfinished feel to it. Meanwhile, development economics and levels of risk in the development process have changed and the likelihood of the missing pieces being constructed has diminished.

However, the Rockingham Beach precinct could be given greater incentives for redevelopment, the most significant being greater height limits. Before the City of Rockingham decides whether to change the planning framework to provide more generous development controls, the two questions that need to be answered are:

1. Are taller buildings appropriate in the context of the surrounding landscape?
2. And, is a more intensive beachside centre appropriate in the regional context?

The answers from the first two discussion papers is clearly 'yes'. In which case, the next two questions are:

3. What are the planning and urban design principles to inform the greater intensification of the precinct?
4. And, what form of development is the most appropriate?

Question 3. is answered by the third discussion paper. Question 4. has been explored through a series of 3D modelling scenarios that investigated the overall built form for the precinct.

Through consideration of the various modelled scenarios, a preferred scenario selected that provided for:

- A modest increase in the development potential for the majority of the lots along Rockingham Beach Road.
- A more significant increase for larger sites that can act as the catalysts for the greater revitalisation of the precinct.
- A variety of maximum building heights to create a well-modulated overall built form.
- Greater pedestrian connectivity between Rockingham Beach Road and Kent Street.
- A more traditional 'European' scale of building for Kent Street.

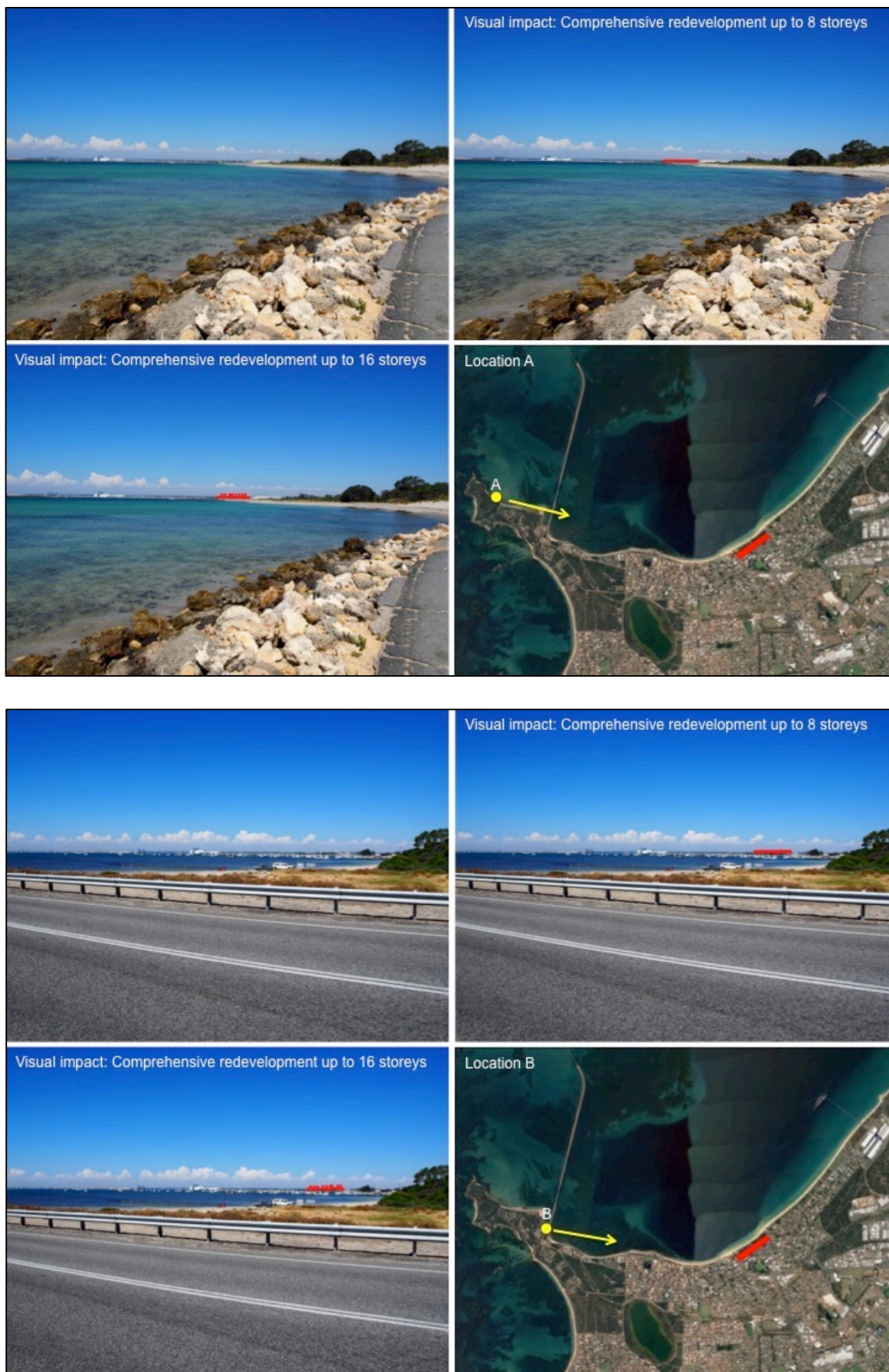
- A rationalisation of upper floor setbacks that are better suited to efficient and logical apartment floor plans.
- The retention of winter sun to the southern footpath along Kent Street.
- Tower building forms and locations that optimise access to views and minimise overshadowing of other apartments to the south.

The preferred scenario is believed to be the optimal outcome for the precinct; the scenario is one that carefully balances the benefits and outcomes of more intensive development and that could form the basis for a review of the current planning policy framework.

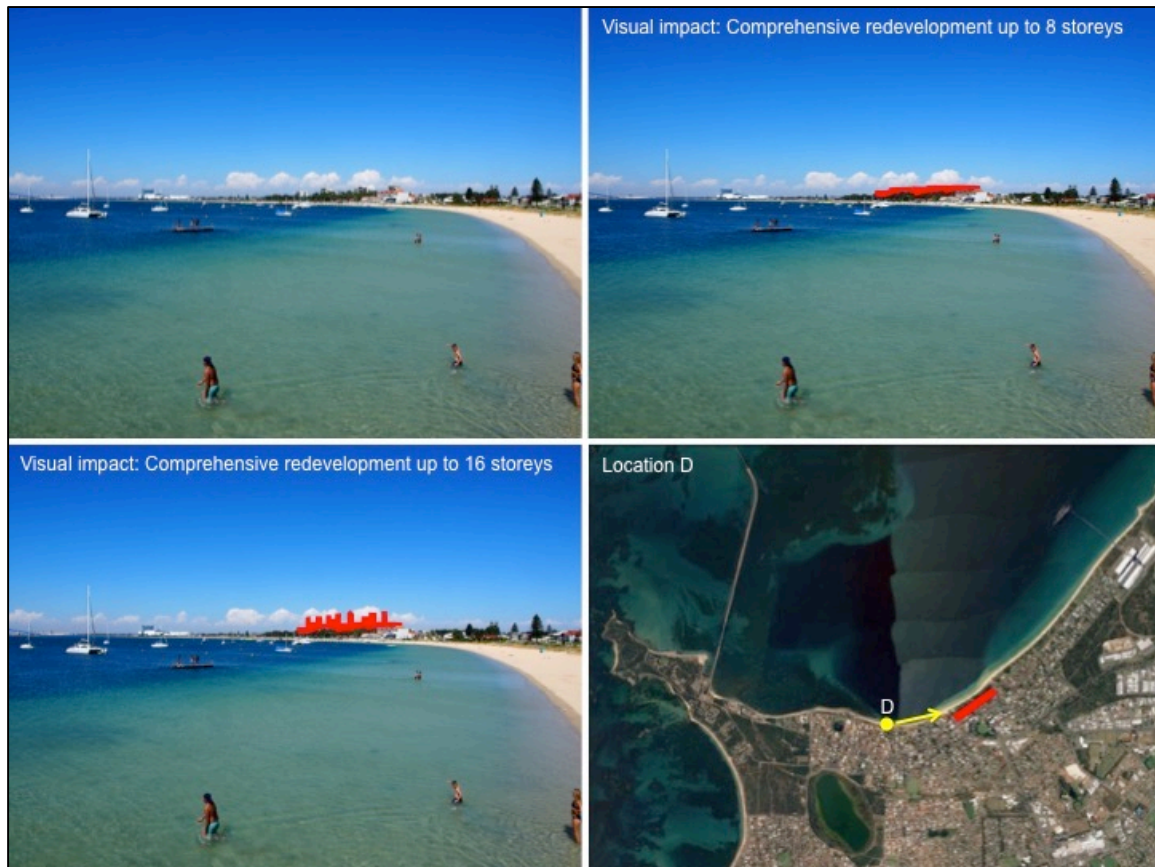
**Malcolm Mackay**  
Mackay Urbandesign

November 2017

## APPENDIX A: Visual analysis images

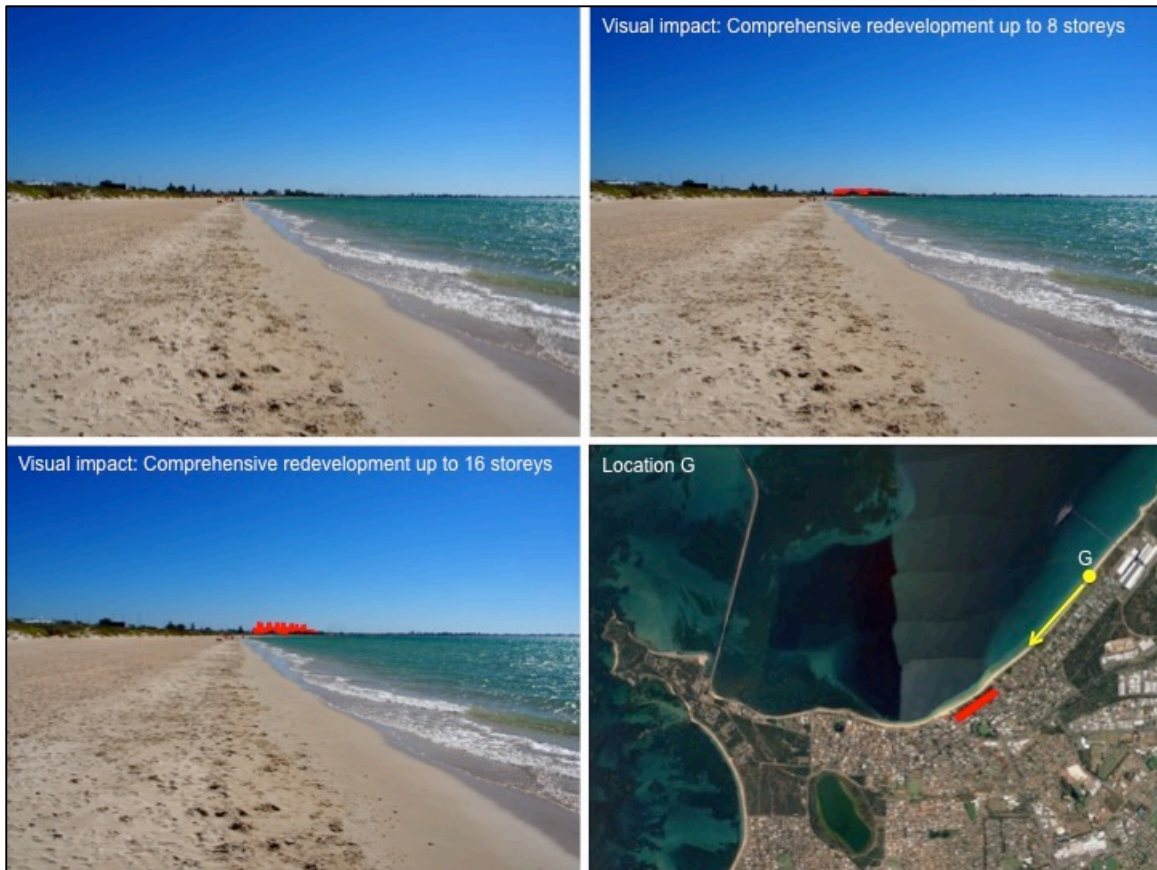














## APPENDIX B: SCENARIO 2B

### Scenario 2b: Tower/European combination – greater intensity

Height constrained only by shadowing on other buildings  
'European' built form to Kent Street  
Tower on podium forms elsewhere  
More prescriptive envelopes than at present

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 2b: Summary of assumed built form controls

- Preferred built form: 'European' form built to side boundaries along Kent Street. Tower over Podium for all other locations.
- Total building height: Specified limits for each lot generally based on extent of shadow cast on the footpath of the opposite side of an adjacent street at 12pm 21/6, or on living areas in the prescribed building zone for the lots on the north side of Kent Street. Ranges from 11-24 storeys along Rockingham Beach Road (typically 16 storeys) and 6-8 storeys along Kent Street.
- Maximum podium and street wall height: 4 storeys to Wanliss Street and Railway Terrace, and 3 storeys to all other streets, with additional storey within 20m of street corners.
- Maximum street wall height for Kent Street: 5 storeys.
- Podium side setbacks: 0m minimum.
- Upper floor setback to Kent Street buildings: 0m minimum.
- Front setback above podium: 3m minimum
- Front setback to uppermost floor: 6m minimum (or 3m behind the floor below).
- Tower side setbacks: 4m minimum.
- Tower separation on the same lot: 12m minimum.
- Prescribed building depth: Max depth of 25m above podium for lot frontages on the northern side of Kent Street:

#### Other:

- Unique controls for Lot ### on the corner of Rockingham Beach Road and Railway Terrace.
- Requirement for pedestrian connection between Rockingham Beach Road and Kent Street for Lot ### and Hotel site.

Street interface: Active frontage/ glazing/ canopy cover, etc. largely as per existing policy framework.

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 2b



View from the North

Rockingham Beach Height Study: V.2. April 2017

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Scenario 2b



View from the South

Rockingham Beach Height Study: V.2. April 2017

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Scenario 2b



View from the West



View from the East

Rockingham Beach Height Study: V.2. April 2017

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## Scenario 2b

### Comments



Notionally 24 storeys on corner of hotel site.

12m min separation between towers on same site.

Pedestrian link through site.

3m setback for all uppermost floors.

Typically 16 storeys max.

Setbacks = 8m (4m + 4m) min separation between towers.

Unique solution for corner lot.

Prescribed max depth for floors above podium.

'European built form to Kent Street.

Shadows falls just short of the opposite footpath on Kent Street at 12pm 21/6 to maintain pedestrian amenity.

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## Scenario 2b

### Comments



'European built form to Kent Street.

Tower shadows fall short of the 25m prescribed building depth above podium along Kent Street.

3m setback for all uppermost floors.

Typically 16 storeys max.

Setbacks = 8m (4m + 4m) min separation between towers.

Pedestrian link through site.

3-storey max podium.

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Scenario 2b: Visual impact on the foreshore



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Scenario 2b: Visual impact on the civic centre



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### Scenario 2b: Midsummer shadows (21<sup>st</sup> December)



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### Scenario 2b: Planning stats for a typical site on Rockingham Beach Road



#### Typical site

Notional site area: 1,285sqm

Typical height: 16 storeys

Notional PR residential floorspace: 5,582sqm

Notional Plot Ratio: 4.34

Notional residential yield: 66 du

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## APPENDIX C: SCENARIO 3

### Scenario 3: High-intensity tower development (not supported)

Height constrained by shadowing across Kent Street

Tower on podium forms generally

More prescriptive envelopes than at present

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3: Summary of built form controls

- Preferred built form: Tower over Podium.
- Total building height: Limits for each lot generally based on extent of shadow cast on the footpath on the south side Kent Street. Ranges from 24-30 storeys along Rockingham Beach Road (typically 27 storeys) and 9-12 storeys along Kent Street.
- Maximum podium and street wall height: 5 storeys.
- Podium side setbacks: 0m minimum.
- Front setback above podium: 3m minimum
- Front setback to uppermost floor: 6m minimum (or 3m behind the floor below).
- Tower side setbacks: 4m minimum.
- Tower separation on the same lot: 12m minimum.

#### Other:

- Unique controls for Lot ### on the corner of Rockingham Beach Road and Railway Terrace.
- Requirement for pedestrian connection between Rockingham Beach Road and Kent Street for Lot ### and Hotel site.

Street interface: Active frontage/ glazing/ canopy cover, etc. largely as per existing policy framework.

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3



View from the North

Rockingham Beach Height Study: V.2. April 2017

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Scenario 3



View from the South

Rockingham Beach Height Study: V.2. April 2017

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Scenario 3



View from the West



View from the East

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3

#### Comments



3m setback for all uppermost floors.

12m min separation between towers on same site.

Pedestrian link through site.

Typically 25 storeys max.

Setbacks = 8m (4m + 4m) min separation between towers.

Unique solution for corner lot.

Shadows falls just short of the opposite footpath on Kent Street at 12pm 21/6 to maintain pedestrian amenity.

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3

#### Comments



3m setback for all uppermost floors.

Typically 25 storeys max.

Setbacks = 8m (4m + 4m) min separation between towers.

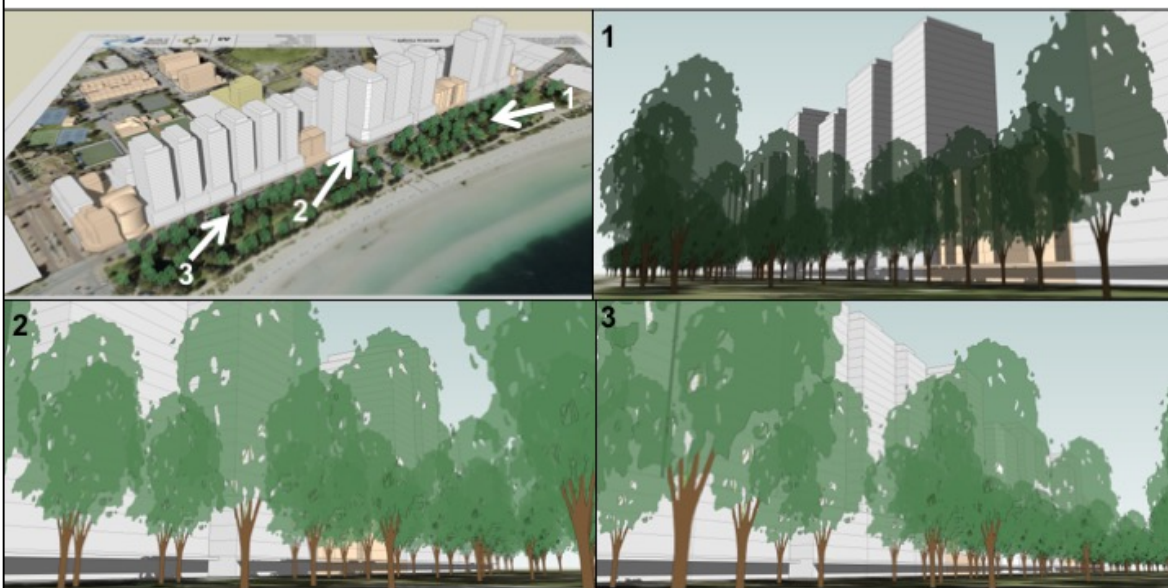
Pedestrian link through site.

5-storey max podium.

Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3: Visual impact on the foreshore



Rockingham Beach Height Study: V.2. April 2017

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### Scenario 3: Visual impact on the civic centre



Rockingham Beach Height Study: V.2. April 2017

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Scenario 3: Midwinter shadows (21st June)



Rockingham Beach Height Study: V.2. April 2017

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Scenario 3: Midsummer shadows (21st December)

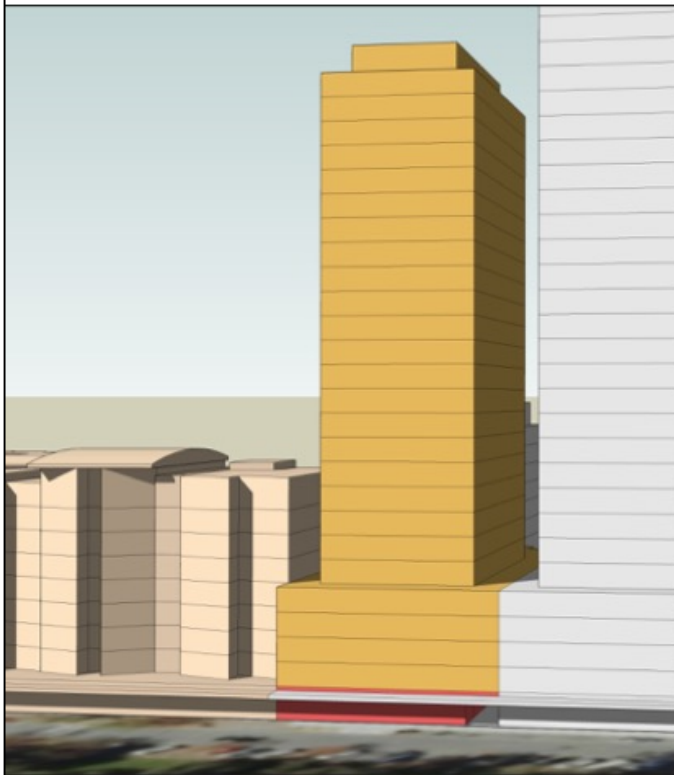


Rockingham Beach Height Study: V.2. April 2017

**mackay** urbandesign



### Scenario 3: Planning stats for a typical site on Rockingham Beach Road



#### Typical site

Notional site area: 1,285sqm

Typical height: 27 storeys

Notional PR residential floorspace: 9,650sqm

Notional Plot Ratio: 7.5

Notional residential yield: 113 du

Rockingham Beach Height Study: V.2. April 2017

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