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Breen Resources Pty Ltd

EMBELLISHED MARANG PARKLANDS PLAN
Landscape Master Plan

S20-0039

Issue 0 • 12/03/2021



Cover Image:
Existing lookout platform looking north toward Botany Bay and Sydney CBD

Inside Cover:
Cronulla State Park looking east toward Boat Harbour Park and Cronulla Beach

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EMBELLISHED MARANG PARKLANDS PLAN
LANDSCAPE MASTER PLAN

Client:
Breen Resources Pty Ltd

BREENRESOURCES

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The existing public lookout to the southeast of the site.

Towra Point Nature Reserve

Kurnell Boarding Stables (Private)

Bonna Point Reserve

Weeney Bay

Quibray Bay

Charlotte Breen Memorial Park

Cronulla State Park

Don Lucas Reserve

Wanda Reserve

CAPTAIN COOK DRIVE

20 MINS WALK

30 MINS WALK

40 MINS WALK

50 MINS WALK

Banks Soland

Muru Track

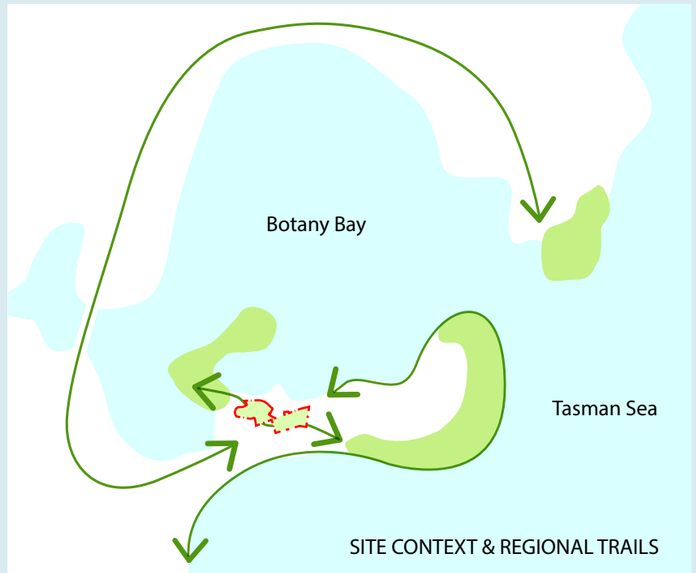
YENA TRACK

CAPE BAILY TRACK

Kamay Botany Bay National Park

Bate Bay

CRONULLA ESPLANADE



SITE CONTEXT & REGIONAL TRAILS

KEY

- Project boundary
- Publicly accessible green space
- Publicly accessible recreation
- Strategic connections
- Informal pathway
- Controlled access
- Existing regional trail
- Future regional trail
- Train Station
- Road
- 9 Toilet / amenities
- 6 Children's playground
- 5 Hiking track
- 5 Picnic shelter
- 4 Football / soccer
- 4 Barbecue areas
- 3 Disabled access
- 3 Open space (for sport + fitness)
- 3 Lookout
- 2 Cricket / golf
- 1 Horse-riding
- 1 Windsurfing
- 1 Surfing

KEY POINTS

- The site forms a strategic link between publicly accessible open space and regional trails.
- There is a limited range of existing recreation opportunities at the heart of the peninsular.

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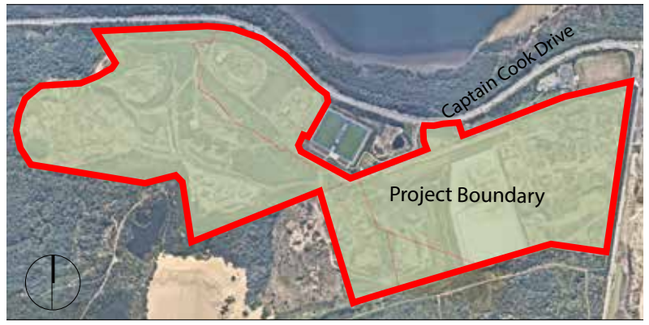
PARKLANDS EMBELLISHMENT PLAN • Kurnell

RECREATIONAL CONTEXT

Figure 1

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INTRODUCTION



BACKGROUND
Breen Resources operates a waste management and landfill facility at 330 Captain Cook Drive in Kurnell NSW. The current facility was approved in 1990 by Sutherland Shire Council under DA 269/90.

State Significant Development Application (SSDA) 10412 will cover the consolidation of existing facilities and the establishment of an integrated resource facility to receive specific waste materials, and for the restoration and rehabilitation of the land utilising recovered resources.

A Voluntary Planning Agreement (VPA) covers the future provision of regional level recreational facilities and parklands to be developed on a part of the site.

The SSDA is seeking approval to move and consolidate the various waste management activities within the site to a single facility to allow for the delivery of the Embellished Marang Parklands. Relocating the facility will allow for the timely construction of the Embellished Marang Parklands and playing fields that have been committed to the community as part of the VPA.

The Kurnell area is undergoing change, with an expanding residential population and a desire to improve the general level of amenity and associated recreation facilities. To that end the parklands will form a recreational and environmental link from Botany Bay to Bate Bay.

SITE AND LOCATION
The site is located on the southern side of Botany Bay on the Kurnell Peninsula approximately 15km south of the Sydney CBD and 3km to the north east of Cronulla town centre. It is currently accessible from Captain Cook Drive which lies on its northern boundary.

The site is bounded to the north by wetlands and mangroves on the Botany foreshore and to the south by higher dunes and coastal dune vegetation. The site itself has historically been utilised for sand extraction and more recently for waste management purposes.

HERITAGE CONTEXT
The Kurnell Peninsula as a whole is a highly significant area for Aboriginal people for cultural and historical reasons. At the eastern end of the peninsula, within Kamay Botany Bay National Park, is the place where Aboriginal people first encountered Europeans in 1770, but that is just one part of a much larger story. Aboriginal people had been living across the peninsula for thousands of years before this, as sites from across Kurnell have shown. For more detail, refer to the Aboriginal Cultural Heritage Assessment Report by Coast History and Heritage.

RECREATIONAL CONTEXT
Located at the very centre of the 'land bridge' that connects the Kurnell Peninsula with Cronulla, the Embellished Marang Parklands will play a pivotal role in completing the recreational and environmental link from Bay to Bay (Botany Bay to Bate Bay). The Embellished Marang Parklands will offer walks, trails and circuits as well as a variety of distinct spaces suitable for a range of activities from relaxation, exercise, picnics and family celebrations to community events and spectacular sweeping views to the Sydney CBD and down the coastline. (see Figure 1).

PLANNING CONTEXT
The site is currently operated by Breen Resources as a waste management facility. Breen has entered into a Voluntary Planning Agreement (VPA) with Council for the future use of part of the site.

The design proposals for the adjacent sportsfields (by JMD Landscape Architects) were submitted to Council by the parties to the VPA and approved in 2012.

MASTERPLAN PROPOSAL
The rehabilitation of this landscape provides an opportunity to establish a parkland that not only responds to the original morphology and natural dune ecology of the area, but also greatly extends the recreational opportunity and amenity for the local community.

This masterplan provides the following benefits to the community and Council:

- A range of new recreational opportunities - through walking, running and cycling tracks, flexible open spaces, viewpoints, play, event spaces and exercise trails
- Improved ecological diversity – through the rehabilitation of the landscape that will incorporate Kurnell Dune Forest and Coastal Heath plant communities
- Opportunities for learning – through interpretation of the natural environment and cultural heritage of Kurnell
- Improved access - through more entry points into the park, accessible friendly grades on paths and additional dedicated car parking and drop-off space
- A more sustainable park – through the use of materials such as blended recycled soils, crushed recycled aggregates and native planting
- Minimised maintenance – through selection of robust and enduring materials, use of low water demanding dune species and defined mown grass areas, that can be readily accessed and maintained
- Opportunities for community involvement – through bush rehabilitation schemes, events and clubs that can use the facilities.

SITE ACCESS AND CAR PARKING STRATEGY
An important part of creating a new recreational destination at the Embellished Marang Parklands will be to provide safe and convenient access to the public.

Walking - The parkland will be accessible on foot via a number of local and peninsula-wide routes linked to Cronulla via parks such as Don Lucas Reserve and Charlotte Breen Memorial Park. Walking times from Cronulla will be 40-50 minutes, whilst closer residential areas such as Shearwater Landing will be approximately 20-30 mins walk away.

Bicycle - The site is accessible by bicycle along Captain Cook Drive which provides a dedicated cycle lane from the adjacent residential developments at Shearwater Landing and Greenhills Beach.

Bus - A bus service (987) from Cronulla to Kurnell stops directly outside the location of the park entry off Captain Cook Drive and the journey takes approximately 10 mins from Cronulla Station.

Car Parking - The master plan includes a public parking area specifically dedicated to the Embellished Marang Parklands. This will comprise a parking area adjacent to the large open lawn and a drop-off area within the Project Boundary. This car park will cater for approximately 200 cars.

It is envisaged that these parking spaces would be sufficient to cope with the day-to-day demand for the park facilities and that some of the additional 720 spaces provided for the adjacent sportsfields would also be used by people/families/groups accessing both facilities.

The parkland has the potential to be used for planned events from time to time. It is envisaged that if such an event were planned during a time at which the additional parking at the sportsfields was in high demand (such as weekend mornings) then a remote parking strategy park-and-ride service could be employed. This would involve a bus service between a designated off-site public parking and the dedicated drop-off and turning area located adjacent to the large lawn space.



LEGEND

Project Boundary

Landscape Boundary

Masterplan site area

Existing and Future Sports Fields

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PARKLANDS EMBELLISHMENT PLAN • Kurnell

Figure 2

CONTEXT DIAGRAM

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SITE OVERVIEW AND CONTEXT

SITE OVERVIEW AND CONTEXT

The site of the Embellished Marang Parklands offers unique opportunities due to its location and physical geography. The parklands are situated within the peninsula connecting Cronulla to Kurnell, making the park a crucial link between the two. (See Figure 3).

Additionally, the site's past sand quarrying and waste recycling have modified the landform dramatically, resulting in large mounds which can be reworked to create sweeping views over Botany Bay, Sydney Airport and further in the distance to Sydney's CBD.

The new parklands will also play an important environmental role in providing be the missing link in reconnecting Kamay Botany Bay National Park with Towra Point Nature Reserve.

The parklands will also allow for the opportunity to reclaim part of the site from its past uses and increase environmental benefits through improved natural systems connectivity, creating green corridors and re-establishing native vegetation within the site, providing habitat and contributing to the biodiversity of the area.



Figure 3. Embellished Marang Parklands wider context.

SITE APPRECIATION AND VIEWS ANALYSIS



Viewpoint Location map



View 1 Existing Breen Resources carpark entry



View 2 Outside existing hockey fields amenity building



View 3 Future (Proposed) sports fields



View 4 From existing lookout platform

SITE APPRECIATION AND VIEWS ANALYSIS



View 5 From existing lookout platform



View 6 From existing soccer field opposite the Greenhills Skate Park



Viewpoint Location map



View 7 From Captain Cook Drive roundabout to along Lindum Road



View 8 From private land across Lindum Road

OPPORTUNITIES AND CONSTRAINTS



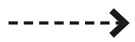
Figure 4. Opportunities and Constraints.

OPPORTUNITIES AND CONSTRAINTS

LEGEND


Existing road


Surrounding connection & entry points (Vehicle and cycling)


Surrounding connection & entry points (Pedestrian)

Looped path network


Entrance areas


High point - lookout opportunity


Potential event locations


Car park

Open spaces / lawn


Sports fields (Existing and future)


Re-established Coastal Heath and Dune Forest

Resource Recovery Facility


Strong southerly winds

Existing heritage dune

OPPORTUNITIES

- Open Space: Consider connections along the peninsula linking Cronulla to Kurnell, design the park to accommodate the existing and future network of users and visitors.
- Trails: Review potential access points from surrounding path networks and cross roads to provide a number of minor entries to improve permeability of the site and integrate the experience of the site into existing networks.
- Active Recreation: Sporting and play facilities within the site provide opportunities for structured and unstructured sport, mostly of a local/district nature. Large circulation networks of shared paths offer walking, bicycle and jogging recreation opportunities.
- Passive Recreation: Opportunities for passive recreation options with bush walking trails, lookouts, picnic.
- Events: Opportunities for community, public, commercial small and large scale events of a local and district nature. Providing a basic range of permanent event infrastructure including bump-in and bump-out access will allow for a more seamless integration of events with less impacts on other parkland users.
- Learning: Opportunities for learning – through interpretation of the natural environment and cultural heritage of Kurnell as well as the regeneration of former industrial land.
- Lookouts: Opportunity for a series of lookouts and viewpoints to take advantage of the elevated topography of the site. Lookouts must not negatively impact the features or experience of the site.
- Ongoing Maintenance: Potential opportunities to reduce ongoing maintenance requirements of the site. A long-term or staged plan for the development of the park offers opportunities to ensure a built-in flexibility in the design to reduce management and maintenance for the park.
- Plan of Management: Opportunity to develop a Plan of Management to establish the objectives and preferred uses of the park especially in relation to safety, amenity and events.
- Vegetation: A significant opportunity exists for native planting and bush regeneration that re-introduces the endemic Dune Forest and Dune Heath ecosystem within the site.
- Slide: Opportunity to introduce a long slide element in recognition of the popular informal Kurnell 'dune surfing'.

CONSTRAINTS

- Facilities: The large and dispersed nature of many of the site's attractions will call for carefully considered location of facilities. A number of facilities have already been constructed as part of the ongoing development of the site. The continued staged implementation of facilities (building, amenities, etc) as per the agreed delivery of facilities as part of the VPA, should align with thresholds of growing visitor numbers and recreation options at the park.
- Access: The large size of the site and level changes while providing an interesting and unique landform will require careful design to ensure the circulation within the site can be used and enjoyed by all members of the community. Grouping recreational and leisure facilities at key access nodes will assist in this regard.
- Future Uses: The sensitive nature of the site will require careful siting of varying appropriate activities. Active sporting facilities, quiet enjoyment and serenity and adventure recreation must be designed to retain and enhance the unique character of the site and the visitor experience.
- Bushfire Risk: A detailed bushfire assessment has been carried out as part of this application, to minimise and manage potential risks relating to bushfire.
- Wind: Strong southerly and northeasterly winds affect the site and call for landform and planting to create both exposed and sheltered spaces.
- Waste: The requirement to cap areas of the site precludes opportunities for including water bodies in the parklands.

SOUTH DISTRICT:
THE GREEN GRID PROJECT OPPORTUNITIES

PROJECT OPPORTUNITIES	DOMINANT GRID LAYER
1. The Cooks River Open Space Corridor	HYDROLOGICAL
2. Wolli Creek Regional Park and Bardwell Valley Parklands	ECOLOGICAL
3. The Coastal Walk: Botany Bay Foreshores	RECREATIONAL
4. Illawarra Rail Line: Wolli Creek to Sutherland	TRANSPORT
5. M5 Motorway Open Space Corridor	TRANSPORT
6. East Hills Rail Line Open Space Corridor	TRANSPORT
7. Bankstown to Sydenham Open Space Corridor	RECREATIONAL
8. Salt Pan Creek Open Space Corridor	HYDROLOGICAL
9. Sutherland to Botany Bay Open Space Corridor [F6 Corridor]	RECREATIONAL
10. Sutherland to Cronulla Cycleway and Pedestrian Link	RECREATIONAL
11. The Coastal Walk: Kurnell to the Royal National Park	ECOLOGICAL
12. Georges River Parklands incl. Chipping Norton Lakes	ECOLOGICAL
13. Cronulla Beaches and Peninsula Walk	RECREATIONAL
14. Kia'Mia Way River Foreshores Walk	HYDROLOGICAL
15. Woronora Pipeline and Loftus Open Space Corridors	ECOLOGICAL
16. Green Links to Cronulla Beaches	RECREATIONAL
17. The Boulevarde Green Link	RECREATIONAL
18. Freight Rail Line Chullora to Canterbury	TRANSPORT
19. Bankstown CBD Green Links	RECREATIONAL
20. Bankstown to George River Parklands Links	RECREATIONAL
21. Sutherland to Waterfall Active Transport Corridor	RECREATIONAL
22. Still Creek and Bushland Trails, Menai	ECOLOGICAL
23. Mill Creek and Bushland Trails, Alfords Point	ECOLOGICAL
24. Como, Kareela and Oyster Bay Gullys and Open Space	HYDROLOGICAL
25. Yowie Bay, Buraneer Bay and Port Hacking Open Spaces	HYDROLOGICAL
26. Open Space Links from Port Hacking Bays to Urban Centres	RECREATIONAL
27. Boat Harbour, Greenhills and North Cronulla Beaches	HYDROLOGICAL
28. Towra Point Nature Reserve and Woolooware Bay Foreshore	ECOLOGICAL
29. Oatley Memorial Park to Como Pleasure Grounds	RECREATIONAL
30. Kurnell to La Perouse Ferry	RECREATIONAL
31. Gannons Park, Lime Kiln Bay and Gungah Bay Open Spaces	RECREATIONAL
32. Padstow to Sutherland Cycle Link	RECREATIONAL
33. Heathcote and Royal National Parks Trails	ECOLOGICAL
34. Inter Rail Line Green Links	RECREATIONAL
35. Georges River Green Links to Stations and Centres	RECREATIONAL

Corridors most relevant to the site

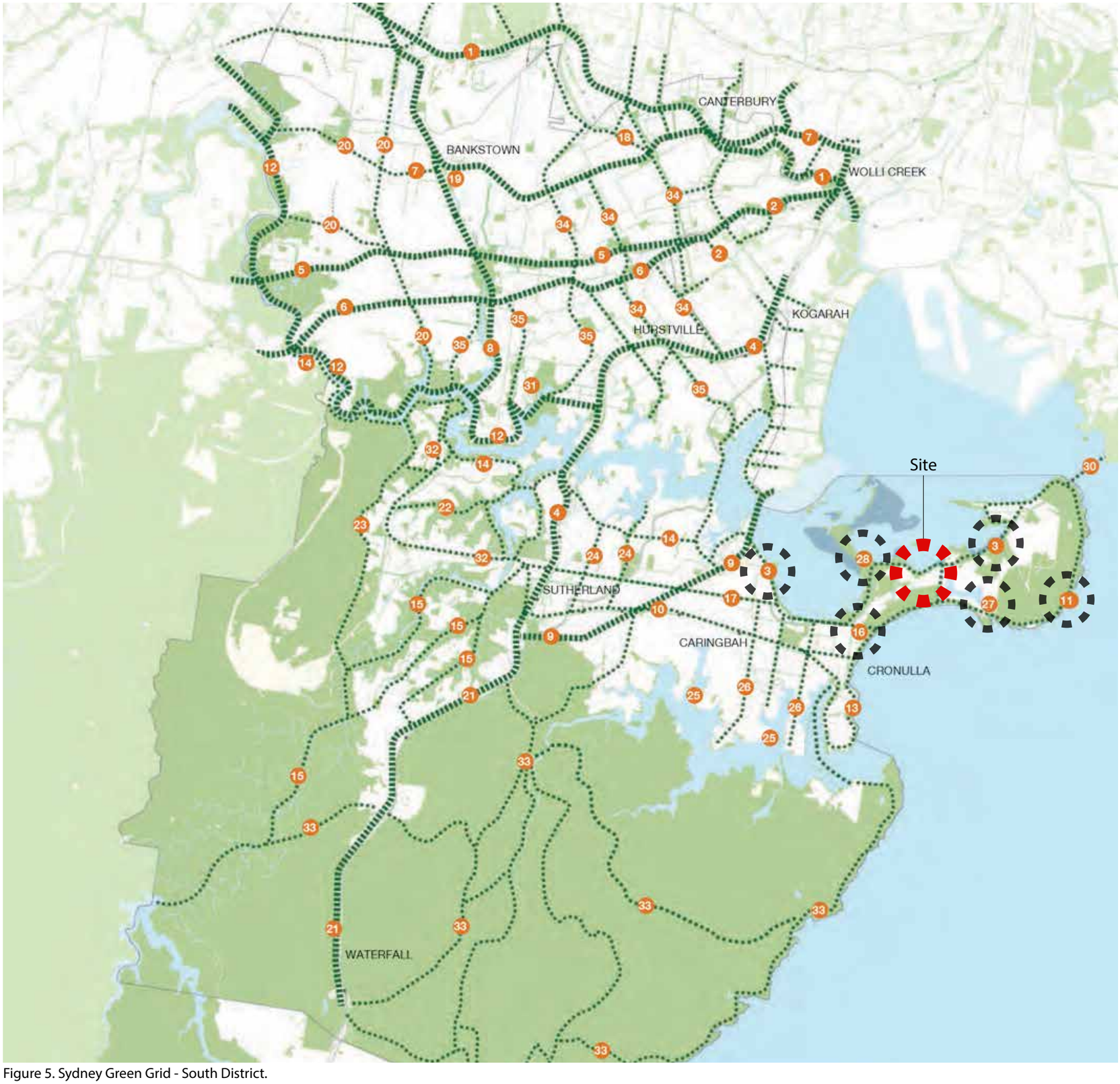


Figure 5. Sydney Green Grid - South District.

PLANNING CONTEXT

THE SYDNEY GREEN GRID

The Sydney Green Grid was published in 2017 by the Government Architect's office of NSW (GANSW) to document the network of natural corridors (coastal foreshore, rivers, creeks and bushland) and built form corridors (rail, road, canal, service infrastructure) that should also serve as recreational corridors for walking and cycling. The three aims of the Green Grid are, in summary, to:

- conserve, improve and expand Sydney's strategic network of open spaces
- reinforce a sense of place within Sydney's subregions
- safeguard and plan the green infrastructure of Sydney.

The relevant section of the Green Grid (City South District) and its relation to the project site is illustrated in Figure 5. The corridors of most relevance to this project include:

- The Coastal Walk: Botany Bay Foreshores (3)
- The Coastal Walk: Kurnell to the Royal National Park (11)
- Green Links to Cronulla Beaches (16)
- Boat Harbour, Greenhills and North Cronulla Beaches (27)
- Towra Point Natural Reserve and Woolooware Bay Foreshore (28)

At present the above-mentioned are the most significant Green Infrastructure corridors. They not only offer an extensive open space network around the centre of the project site, but also connect a suite of parks, sports facilities and bushland reserves, all within 5km of the site.

'GREENER PLACES' - GREEN INFRASTRUCTURE POLICY

The recently released draft policy document Greener Places (GANSW 2020) outlines the essential role of Green Infrastructure in the delivery of sustainable landscapes and communities.

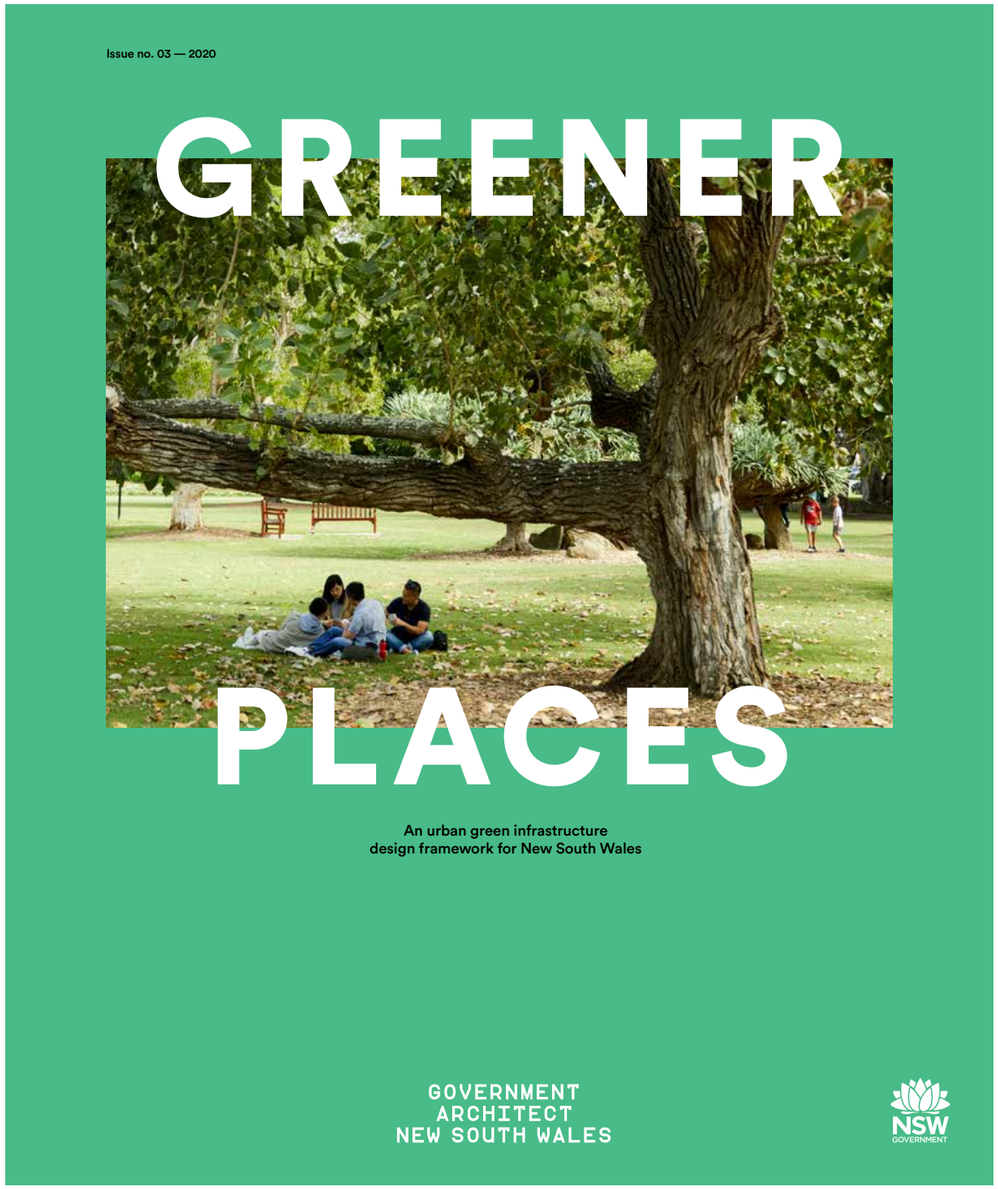
It is comprised of three parts:

- Open space for recreation
- Urban canopy
- Bushland and waterways

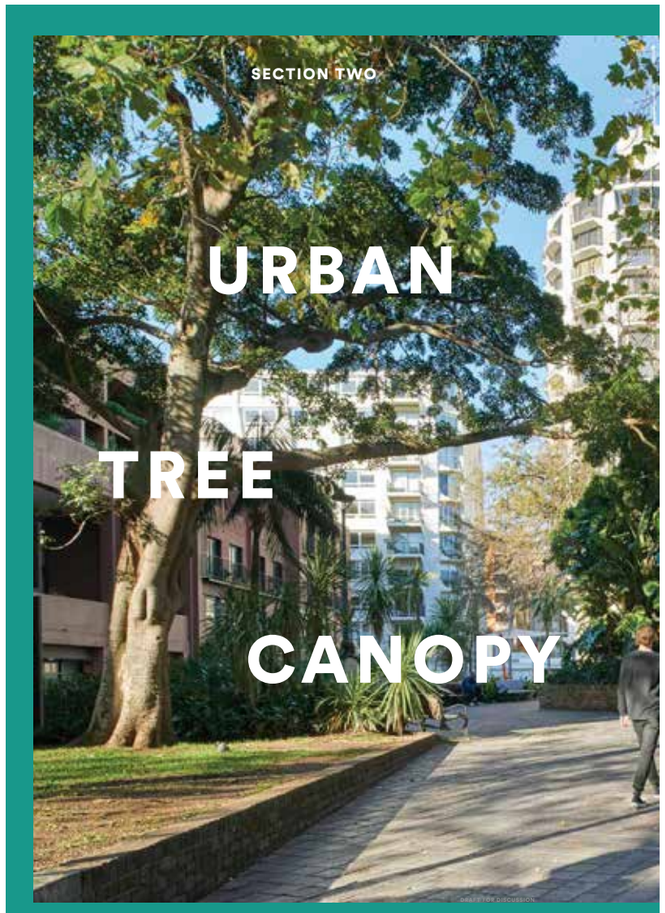
Greener Places proposes a design approach for urban environments that promotes nature as a key driver and the policy cites four core principles in realising that objective:

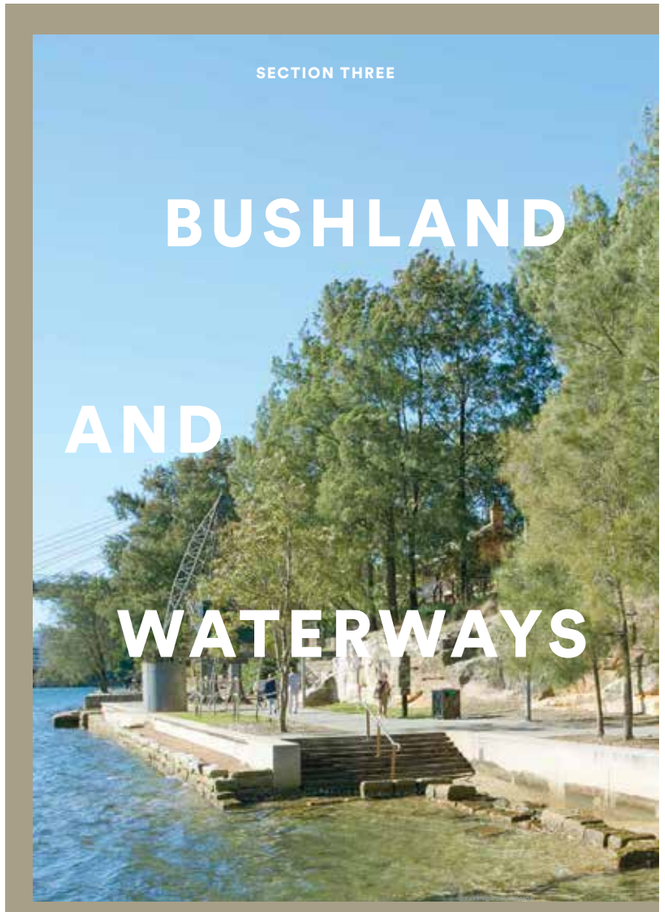
- Integration: combine Green Infrastructure with urban development and grey infrastructure
- Connectivity: create an interconnected network of open space
- Multi-functionality: deliver multiple ecosystem services simultaneously
- Participation: involve stakeholders in development and implementation.

The application of these four principles to the landscape design of the Parklands is outlined later in the Design Principles and Strategy section.




SECTION ONE
OPEN SPACE FOR RECREATION


SECTION TWO
URBAN TREE CANOPY


SECTION THREE
BUSHLAND AND WATERWAYS

PLANNING CONTEXT

BEST PRACTICE METRICS FOR OPEN SPACE (GREENER PLACES - OPEN SPACE FOR RECREATION)

Over the last thirty years in Australia and throughout much of the developed world a shift has occurred in the approach to planning of public open space that is characterised by a move away from a quantity based approach to a more balanced qualitative rationale, in which quantity still remains a key consideration.

The NSW State Government is currently preparing a suite of documents that will integrate best practice metrics for open space planning, see Greener Places - Open Space for Recreation. The following are some of the key performance indicators that are currently considered best practice in the field - here in Australia and overseas – and which have been adopted for the purposes of this plan:

- Quality - open space in urban developments should be of high quality and well designed to attract use and activation for a broad range of ages, backgrounds and abilities. The design of open space should focus on social needs and minimise user conflicts; it should also be of robust but appealing design to foster engagement, while catering for high levels of use.
- Diversity - while the culture of Sydney's population is highly diverse, for the most part people of all ages and backgrounds share a common desire for basic recreation needs. Accordingly, it is important to provide safe places to walk, to sit in shade or sun according to season, for play, for social interaction, for physical health and fitness and for contact with nature.
- Social Engagement - a well-planned open space is one of the key contributors to social and community cohesion. Features such as clear lines of sight within open space, places to sit and talk and 'offline' places from which to observe others without commitment to engagement are critical to fostering social capacity.
- Activation - the provision of community and cultural infrastructure will encourage community events, gatherings and activities that foster community capacity building. This infrastructure will allow the open space to be activation-ready, fostering social cohesion within the community.
- Contact with Nature - the direct links between the ecological services that open space can return to urban environments (wildlife corridors, water management, heat island mitigation etc) and the increasing awareness of the health and wellbeing benefits of contact with nature require an integrated approach and commitment to green infrastructure in our streets and open spaces, native planting and natural materials.
- Health and Wellbeing - the direct relationship between levels of lifestyle related diseases and accessibility or otherwise to quality open space are widely researched and documented. Ease of access, personal safety, quality and sense of place for public open space are the critical drivers in enhancing a community's wellbeing.
- Character and Identity - a clear sense of place for all public spaces that draws on the heritage and landscape character of a locality generates high levels of community ownership. District views, use of locally endemic planting and local materials as well as the integration of public art all assist in cementing a sense of local identity in the users and the wider community.
- Safety and Amenity - a sense of personal safety is critical to the use of open space; in that respect a central tenet of Crime Prevention Through Environmental Design (CPTED) is passive surveillance, both from within the public realm and from adjoining buildings. Clear lines of sight, active spaces and good night lighting with minimal shadows enhance a sense of safety. Likewise winter sun, summer shade and cooling breezes enhance amenity in public spaces.
- Green and Grey Infrastructure - increasingly the recreational values of natural and infrastructure corridors are being realised, especially for walking and cycling. Providing easy access to such corridors is shown to generate higher levels of recreation participation. The Sydney Green Grid provides a strong framework for such planning (see page Planning Context - The Sydney Green Grid).
- Walk and Cycle Friendly - pedestrian and cycle friendly streets and parks also encourage physical daily activity for commuting, social or recreation uses. Safety, shade and amenity are key design considerations in this regard.
- Heat Island Mitigation and WSUD - green open space is a critical contributor to moderating temperatures and humidity as well as in managing stormwater run-off. Extensive green canopy coverage has a direct impact on lowering temperatures as do areas of irrigated grass and planting. In the same vein, harvesting stormwater for reuse domestically and in irrigation reduces downstream volumes and impacts while reducing energy costs.

The core elements of these values and metrics are incorporated in this Parklands Embellishment Plan.

URBAN TREE CANOPY

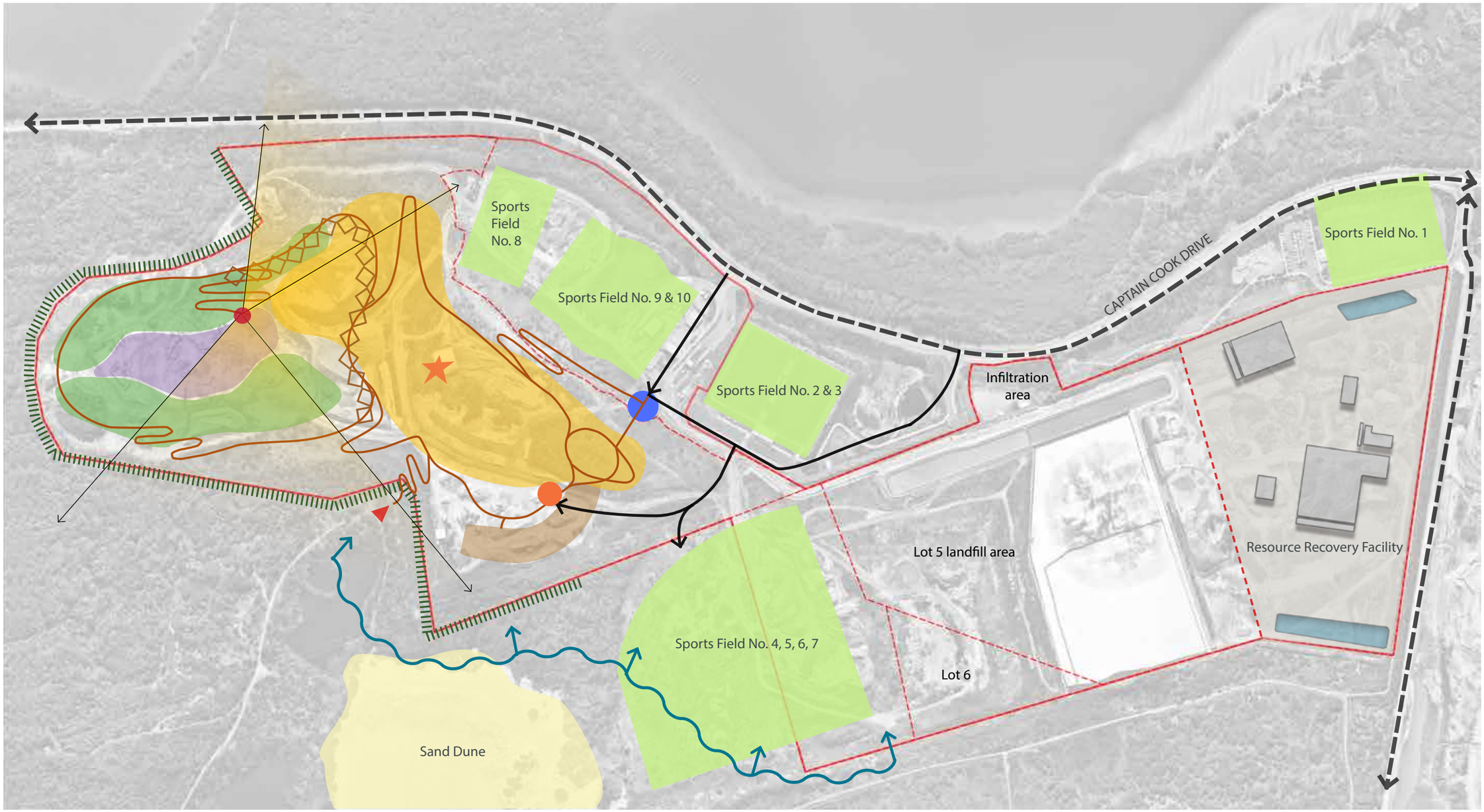
The second section of the Greener Places guide addresses goals for increasing urban tree canopy, with a target of 40% canopy cover across all of metropolitan Sydney.

The guidelines indicate that the capacity of different site uses to meet this target will vary. However, parklands should be considered critical contributors to increase urban canopy.

GREENER PLACES - BUSHLAND AND WATERWAYS

Bushland and Waterways is the third element in the Greener Places guideline. The following strategies have been identified:

- Protect and conserve ecological values - the protection and conservation of existing remnant ecosystems is crucial to the prevention of further habitat and biodiversity loss and the viability of green infrastructure. Remnant ecosystems provide important habitat resources for urban biodiversity, and community access to natural landscapes.
- Restore disturbed ecosystems to enhance ecological value and function - where ecosystems have been disturbed, restoration is the preferred option to improve habitat structure and function and support biodiversity. Restoration not only includes bush regeneration and weed management in the reserve system, which is statutorily required, but also refers to urban habitat corridors where the built form as well as gardens, street verges, parks, and large institutional properties etc. can all play a role in improving habitat through the way they are designed and managed. Specific actions will vary depending on location; condition; identified values; past, current, and anticipated pressures; and what is feasible and practical.
- Create new ecosystems - where habitat linkages are needed within a corridor in areas devoid of habitat, new ecosystems can be created. Green infrastructure and water-sensitive urban design elements, such as green roofs, wetlands, and bioswales, can provide habitats and ecosystem services. More effective urban green spaces can be created when the improvement of the space considers multiple benefits at the design stage including improved economic, social, and environmental outcomes.
- Connect people to nature - people connect with nature through sport, recreation, education, bushwalking, volunteer activities, and health-related activities. Daily exposure to nature can be improved using urban design features such as biodiverse green walls or street trees, and by providing infrastructure to facilitate access such as walking tracks, picnic areas, and lookouts. These connections are fundamental to benefit people but also the environment. Improving people's connection to nature may support longer term land management as people are motivated to care for and enhance their natural spaces.
- Connect urban habitats - Species diversity and genetic health relies on the total area of habitat, proximity of habitats, and the capacity of species to move between habitats. Corridors allow plants and animals to recolonise areas where they have become locally extinct so they can be enjoyed by future generations and have long-term viability. They also allow species to find alternative habitat in times of major disasters such as fire or flood, and escape major threats such as clearing or disease.



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DESIGN PRINCIPLES DIAGRAM

Figure 6

12/03/2021 Issue C

DESIGN PRINCIPLES

Illustrated in Figure 6 and set out below are the core design principles that inform the Embellished Marang Parklands Master Plan. These principles address both design and place making.

1. CREATE A MEMORABLE EXPERIENCE



Balance opportunities for exposure to coastal winds with sheltered spaces



Maximise the wide views to Botany Bay and the CBD to the north.



Provide a focal high point within the park as a walking destination for visitors.

2. CONNECT PEOPLE WITH PLACE



Use landform to create formations resonant of the dune landscape.

Consider the visual amenity of the existing heritage dune through development of a sympathetic landform.

Establish a series of connected and flexible open spaces that provide for a variety of activities from unstructured recreation and exercise to gatherings and events.



Educate the public about recycling and waste management through materials and public art.



Offer a variety of recreation opportunities that complement the site's natural values.



Provide for community and other events appropriate to the site.

3. OPTIMISE ACCESS AND CIRCULATION



Provide a strong connection between the sports fields and the new park.



Establish entrance areas that connect with other destinations through continuous pathways



Provide multiple connections to the wider trail network.

Provide continuous, safe and accessible looped path network connecting to all entrances.



Provide vehicle parking, drop-off and arrival space adjacent to the main facilities.



Connect into the existing (proposed) road network to minimise the requirement for additional hard infrastructure.

4. INTEGRATE SUSTAINABILITY

Establish planting and bush regeneration that re-introduces the endemic Dune Forest and Dune Heath ecosystem within the site.

Revegetate the landscape with species associated with the Kurnell Dune Forest and Coastal Heath.

Optimise canopy coverage

Employ recycled materials from the site wherever possible



LEGEND

- Project Boundary
- Landscape Boundary
- Landform contours
- Shared pathways
- Recycled sculptures/ Interpretive trail
- Kurnell Dune Forest
- Coastal Dune Heath
- Modified Kurnell Dune Heath (Low Heath)
- Informal native grass (Indicative Area)
- Managed native grass (Indicative Area)
- Trees
- Picnic shelters (x3)
- Picnic tables (x11)

KEY

1. Amphitheatre
2. Potential Art Installation
3. Village green
4. Drop off, turn around area & coach parking
5. Disabled parking
6. Pedestrian entry zone
7. Main plaza
8. Panoramic lookout
9. Stabilised embankment
10. Slide
11. Lookout / peak
12. General car parking
13. Open grassed picnic area
14. Nature play / trail connection
15. Playground
16. Vehicular access point
17. Pedestrian access points
18. Picnic facilities
19. Future amenities block
20. Existing amenities block
21. Infiltration area
22. Native revegetation*
23. Open lawn area*
24. Potential future connection*

* Lot 6 design to be finalised as part of Lot 5 works

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Client: BREENRESOURCES

1:5000 @ A3
0 40 80 120 160 200m

PARKLANDS EMBELLISHMENT PLAN • Kurnell

LANDSCAPE MASTER PLAN

Figure 7

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CONCEPT MASTER PLAN

THE CONCEPT

The proposed design for the Embellished Marang Parklands provides a high-quality recreational park to complement the adjoining sport fields and to draw on the unique character of the site's location, industrial past and dune landform.

The design provides connections through the sites and links to the existing walking and cycling paths which connect the park with the heritage dune to the south east and further south west to Cronulla Beach.

Additionally, the parklands will incorporate extensive areas of coastal heath and dune vegetation which will increase environmental benefits of the site and aid in establishing a stronger green link between Kamay Botany Bay National Park and Towra Point Nature Reserve.

The design for the parklands also takes into consideration the number of people that will likely be using it in the future. The parklands are of a scale and unique nature that they are likely to draw visitors not only from the immediate locality and district, but from a broader regional catchment across the Sydney metropolitan area.

To design for this, appropriate car parking has been provided, universal access throughout the site has been considered, as far as landform makes this practical and a variety of recreation activities have been catered for.

The parklands will include picnic tables and shelters, a playground, nature play, various informal kickabout spaces, a slide as well as various lookouts. This variety of activities and uses will make the parkland an exciting and inspiring space for everyone and will provide users with a memorable experience.

A network of primary and secondary paths provide access for visitors to the various amenities and activities available throughout the parklands. This path network has been graded to meet accessibility requirements to allow visitors of all levels of ability to fully experience the dramatic landform, scenery and views.

In the following pages further detail of the concept design is provided including:



- Landscape Detail Plan
- Pedestrian Access / Path Hierarchy Plan
- Vegetation Plan
- Contour Plan and Section Locations
- Materials Plan 1 of 2
- Materials Plan 2 of 2
- Section A, B, C, D, E, F, and G
- Amphitheatre Details and Sections
- Planting Detail Plan
- Typical Parking Details and Sections
- Playground Design Plan
- Design Materials
- Wind Swept Dune Vegetation - Ecotone
- Proposed Native Plant Species
- Proposed Native Plant Species: Sample Palette
- VPA Comparison Tables
- Resource Recovery Facility

KEY

1. Amphitheatre
2. Potential Art Installation
3. Village green
4. Drop off, turn around area & coach parking
5. Disabled parking
6. Pedestrian entry zone
7. Main plaza
8. Panoramic lookout
9. Stabilised embankment
10. Slide
11. Lookout / peak
12. General car parking
13. Open grassed picnic area
14. Nature play / trail connection
15. Playground
16. Vehicular access point
17. Pedestrian access points
18. Picnic facilities
19. Future amenities block
20. Existing amenities block

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1:2500 @ A3

0 80 160 240 320 400m

PARKLANDS EMBELLISHMENT PLAN • Kurnell

LANDSCAPE DETAIL PLAN

Figure 8

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Lot 6 design to be finalised in conjunction with Lot 5 to ensure seamless transition across the development stages

KEY
1. Native revegetation*
2. Open lawn area*
3. Potential future connection*

* Lot 6 design to be finalised as part of Lot 5 works

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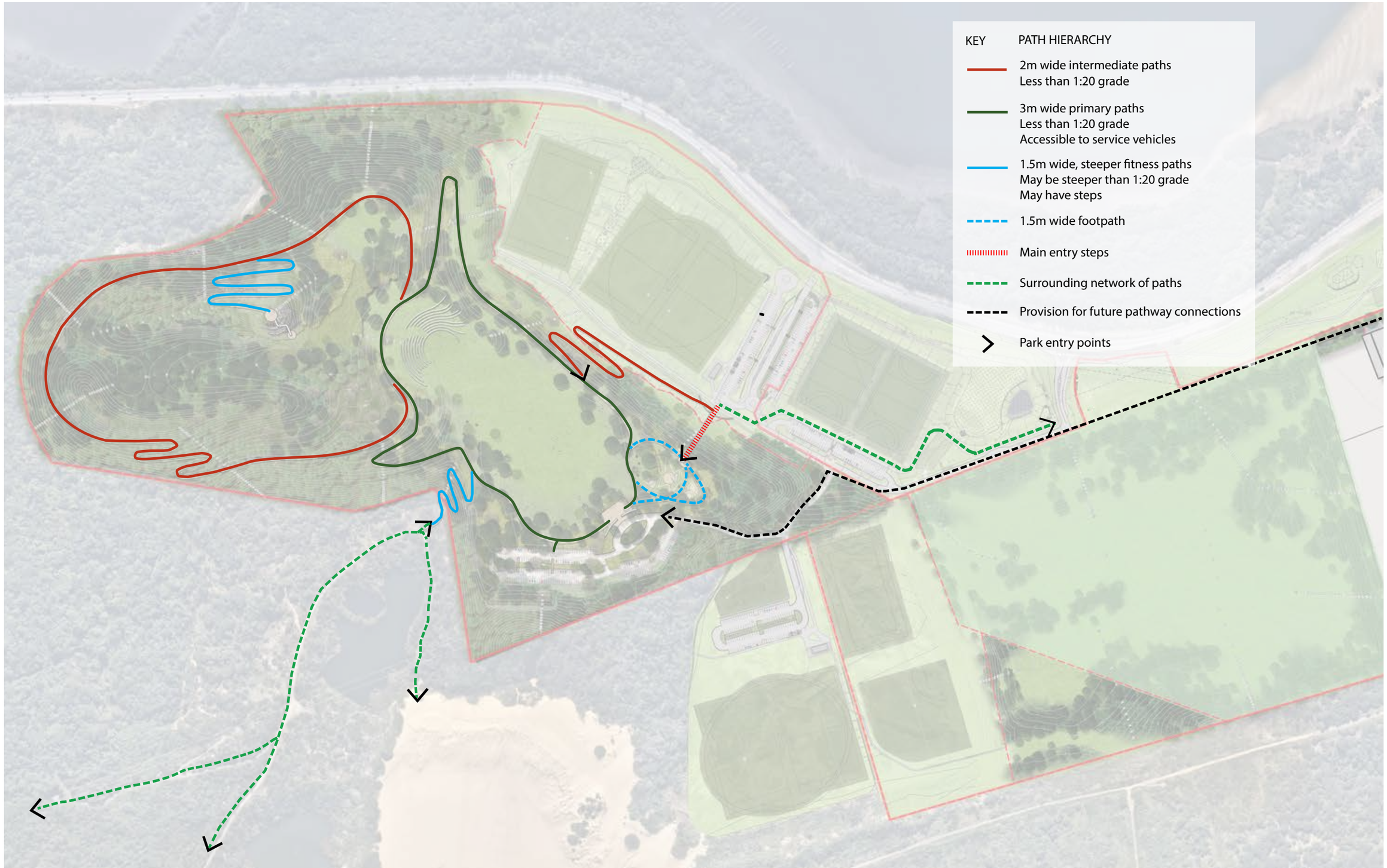
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0 80 160 240 320 400m

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LANDSCAPE DETAIL PLAN

Figure 9

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1:4000 @A3

0 50 100 200m

PARKLANDS EMBELLISHMENT PLAN • Kurnell

PEDESTRIAN ACCESS/PATH HIERARCHY PLAN

Figure 9

12/03/2021 Issue C

KEY VEGETATION TYPE

- Dune Forest - 1200mm min. soil profile
- Dune Heath - 500mm min. soil profile
- Dune Low Heath - 500mm min. soil profile
- Featured Low Heath - 500mm min. soil profile
- Grassland - 200mm min. soil profile
- Managed Grassland - 200mm min. soil profile
- Canopy Trees - 1200mm min. soil profile
- Stabilised Embankment

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1:4000 @A3

0 50 100 200m

PARKLANDS EMBELLISHMENT PLAN • Kurnell

VEGETATION TYPE PLAN

Figure 10

12/03/2021 Issue C

KEY

Canopy Tree

MATERIALS

- Appropriate paving material for playground
- Crushed compacted brick/ concrete pathway
- Bioswale
- Soil for planting
- Crushed recycled material
- Slope stabilisation
- Sandstone log structures

FURNITURE/ FIXTURES

- Shelter (x3)
- Picnic Table (x11)

Match Line (Refer to opposite page)

Elevated pathway



Giant slide





Crushed brick/ concrete walkway

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1:2000 @A3

0 50 100 200m

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MATERIALS PLAN 1 OF 2

Figure 10

12/03/2021 Issue C

Match Line (Refer to opposite page)



Amphitheatre (See also Drawing Figure 22





Stone entry walls



Stairs to steep paths

Bioswale refer to Drawing No. Sk22

Location for future pathway connection

Refer to Typical Parking Detail & Section Drawing



Large flexible managed grass fields





Stone entry walls

KEY

Canopy Tree

MATERIALS

- Appropriate paving material for playground
- Crushed compacted brick/ concrete pathway
- Bioswale
- Soil for planting
- Crushed recycled material
- Slope stabilisation
- Sandstone log structures

FURNITURE/ FIXTURES

- Shelter (x3)
- Picnic Table (x11)

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Client: BREENRESOURCES

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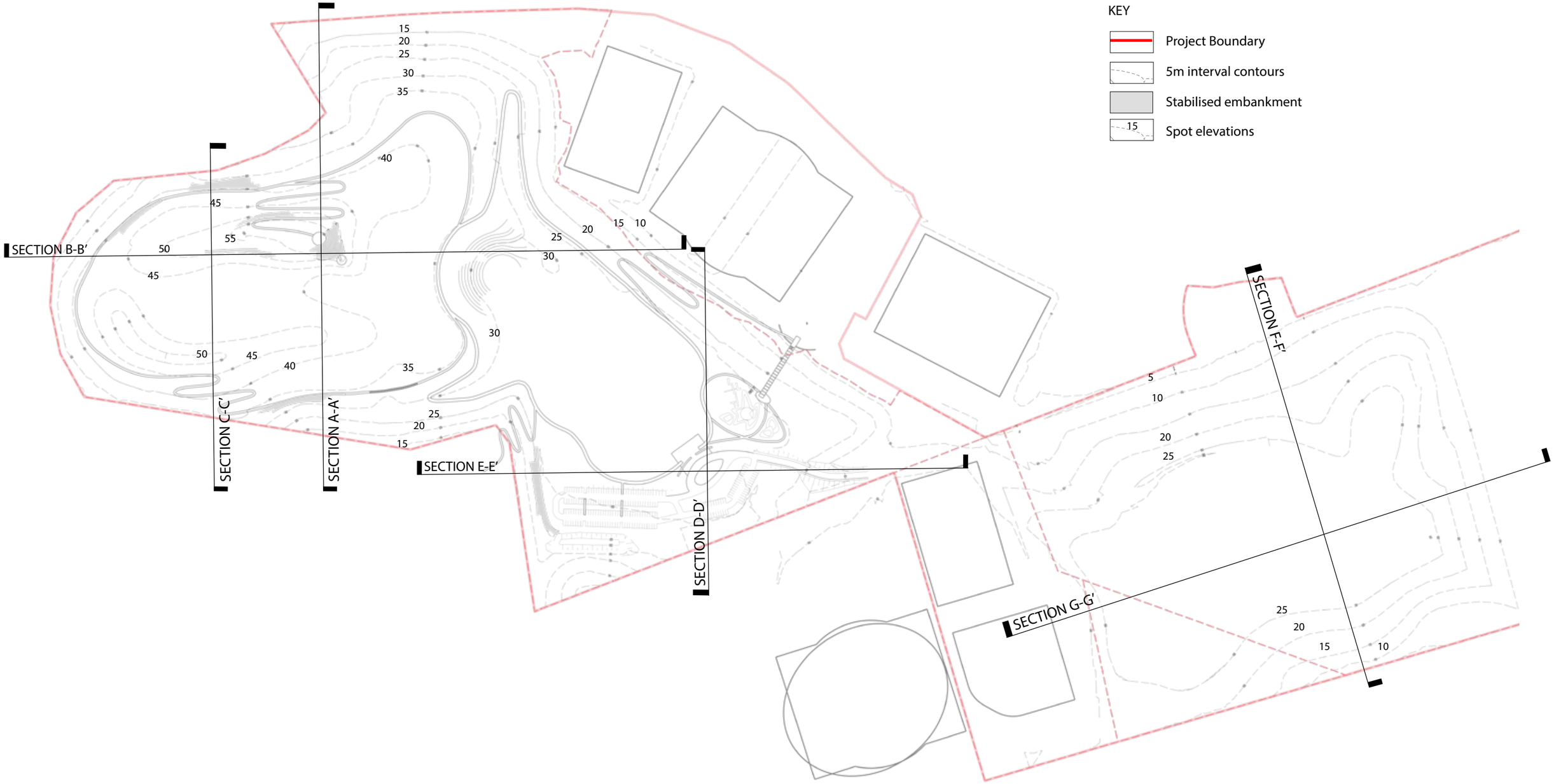
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PARKLANDS EMBELLISHMENT PLAN • Kurnell

MATERIALS PLAN 2 OF 2

Figure 11

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Client: BREENRESOURCES

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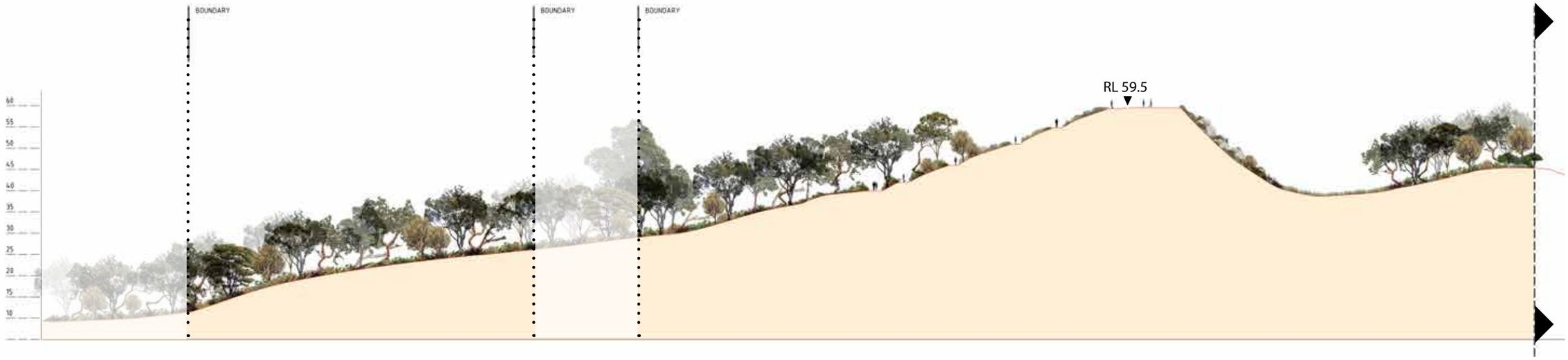
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PARKLANDS EMBELLISHMENT PLAN • Kurnell

Figure 12

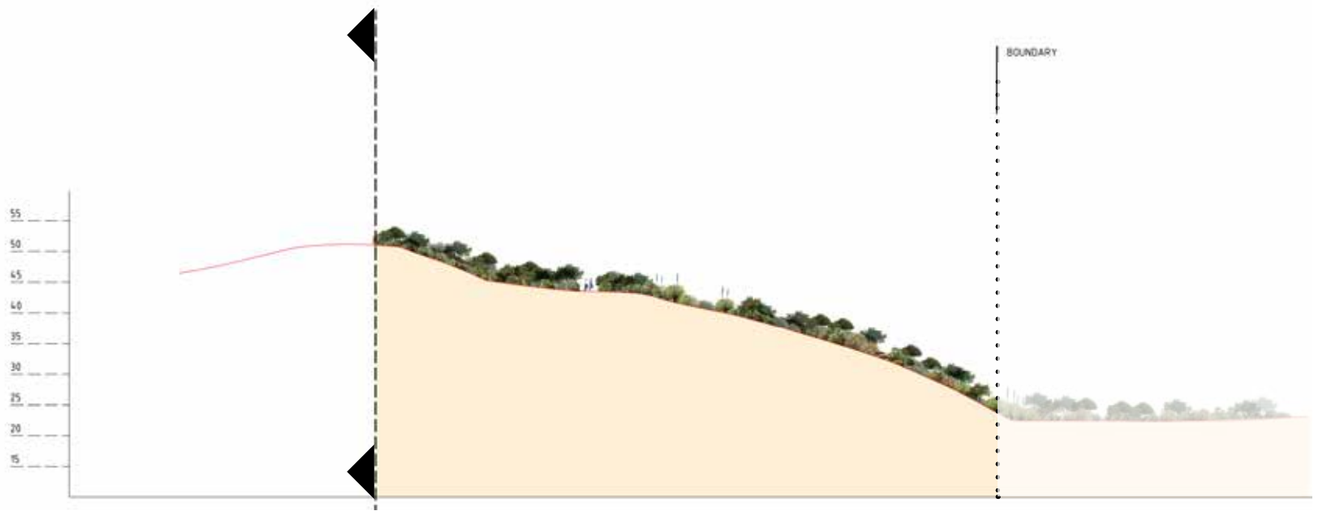
CONTOUR PLAN & SECTION LOCATIONS

12/03/2021 Issue C



A

Dune Forest | Pedestrian Footpath | Dune Forest | Planting Banding | Heath Grassland | Planting Banding | Panoramic lookout | Boulders | Grassland | Dune Forest





Location Plan N.T.S

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Client: BREENRESOURCES

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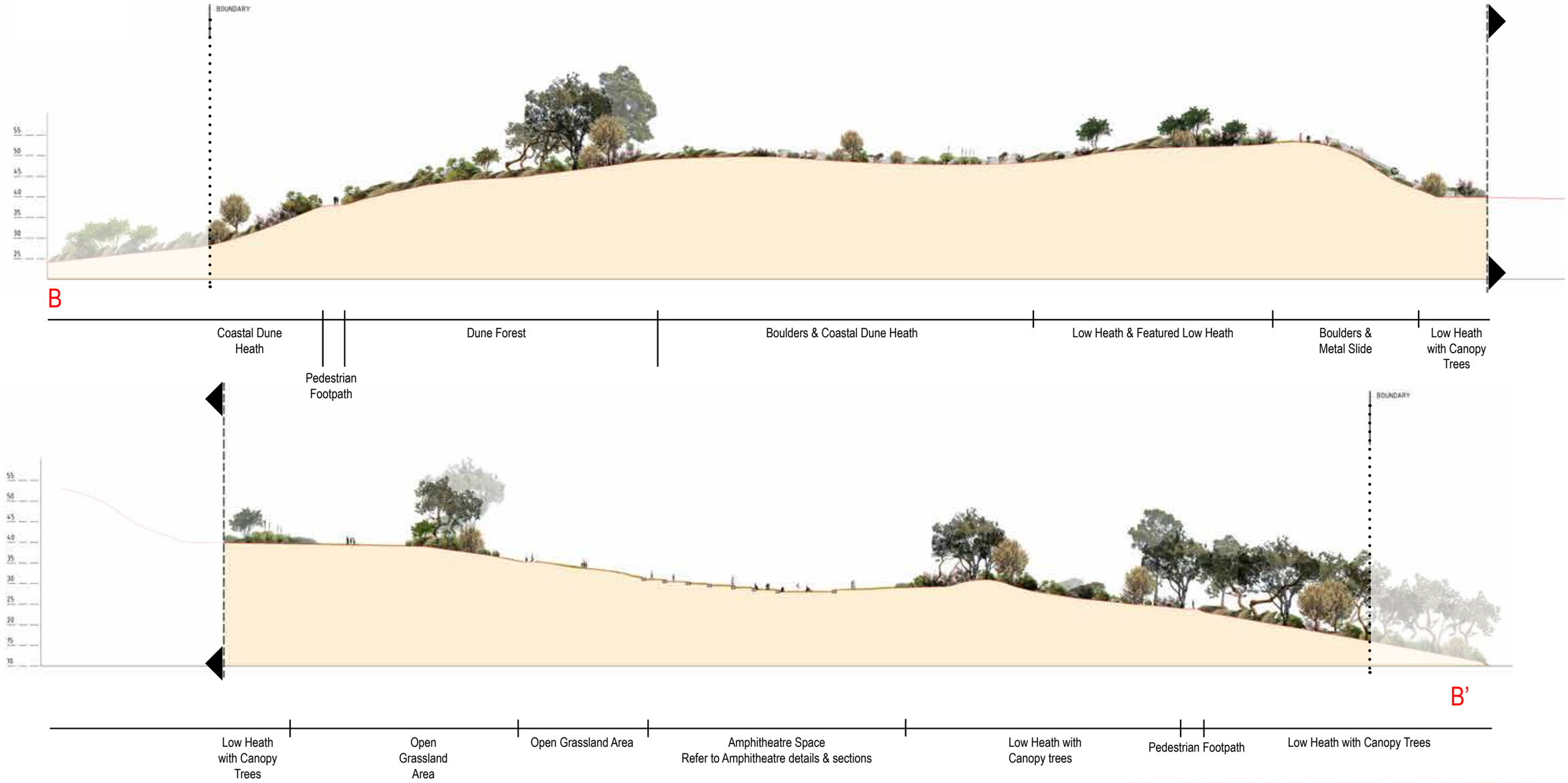
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PARKLANDS EMBELLISHMENT PLAN • Kurnell

SITE SECTION A-A'

Figure 13

12/03/2021 Issue C





Location Plan N.T.S

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Client: BREENRESOURCES

1:1000 @A3
0 10 20 30 50m

PARKLANDS EMBELLISHMENT PLAN • Kurnell

SITE SECTION B-B'

Figure 14

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Location Plan N.T.S

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Client: BREENRESOURCES

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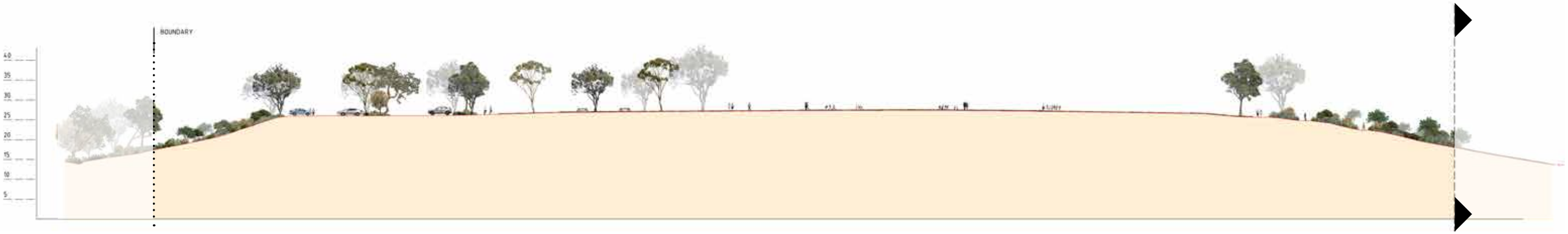
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PARKLANDS EMBELLISHMENT PLAN • Kurnell

SITE SECTION C-C'

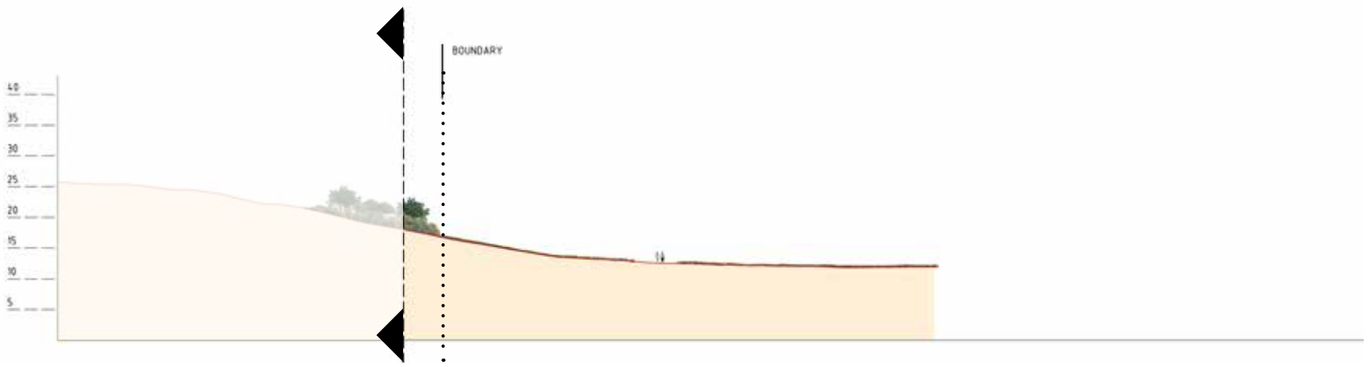
Figure 15

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D

Dune Forest | Heath | Parking Area with Trees | Pedestrian Footpath | Picnic Area with Trees | Open Grass Area | Pedestrian Footpath | Heath Grassland



D’

Open Grassland Area | Pedestrian Footpath | Open Grassland Area



Location Plan N.T.S

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Client: BREENRESOURCES

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SITE SECTION D-D’

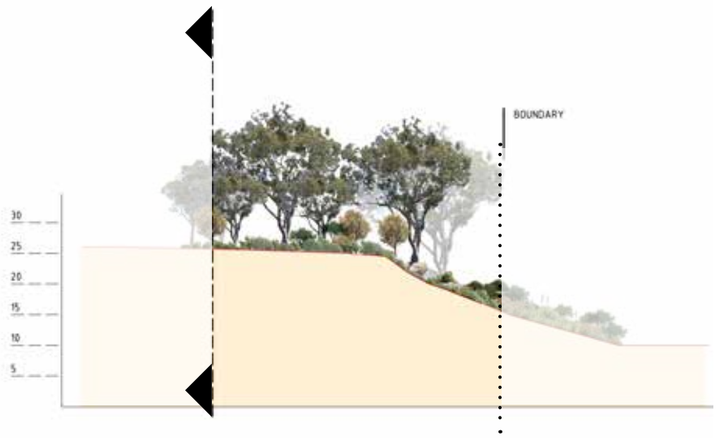
Figure 16

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E

Sports Field | Coastal Dune Heath | Parking Area with Trees | Coaches and Drop Off Area | Pedestrian Entry Zone | Picnic Area | Pedestrian Footpath | Low Heath with Canopy trees



E’

Low Heath with Canopy trees | Existing Vegetation



Location Plan N.T.S

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Client: BREENRESOURCES

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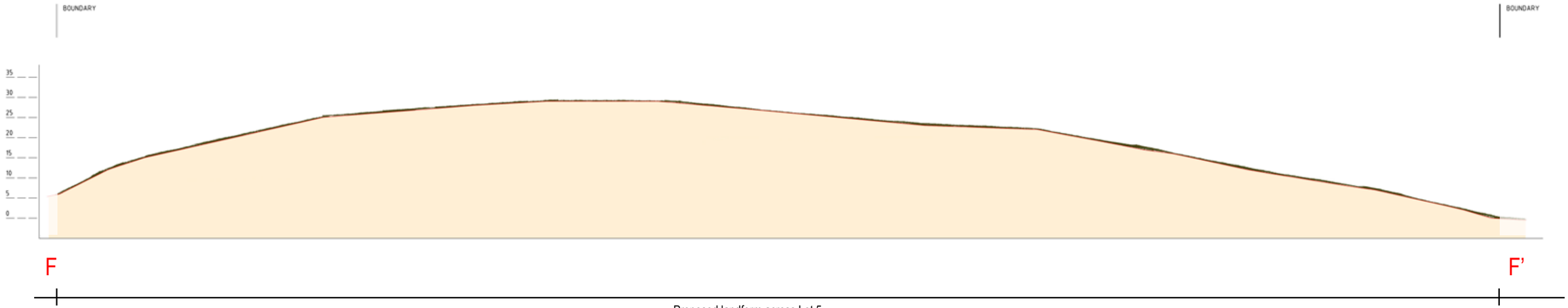
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SITE SECTION E-E’

Figure 17

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Proposed landform across Lot 5



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1:1000 @A3

0 10 20 30 50m

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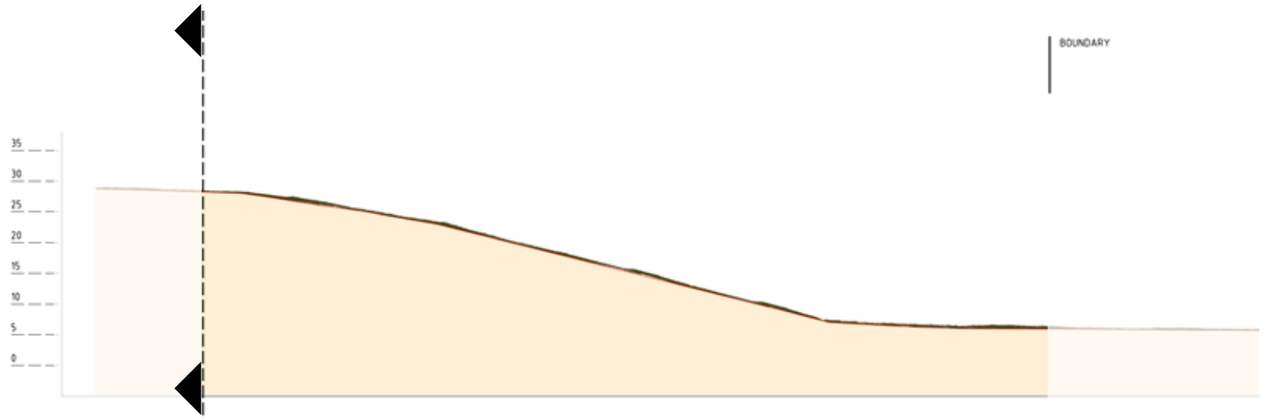
Figure 20

SITE SECTION F-F'

12/03/2021 Issue C



Proposed landform across Lot 5



Proposed landform across Lot 5



Location Plan N.T.S

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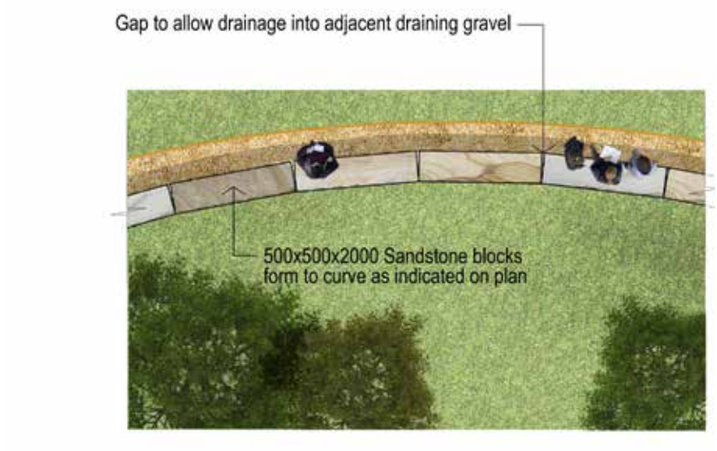
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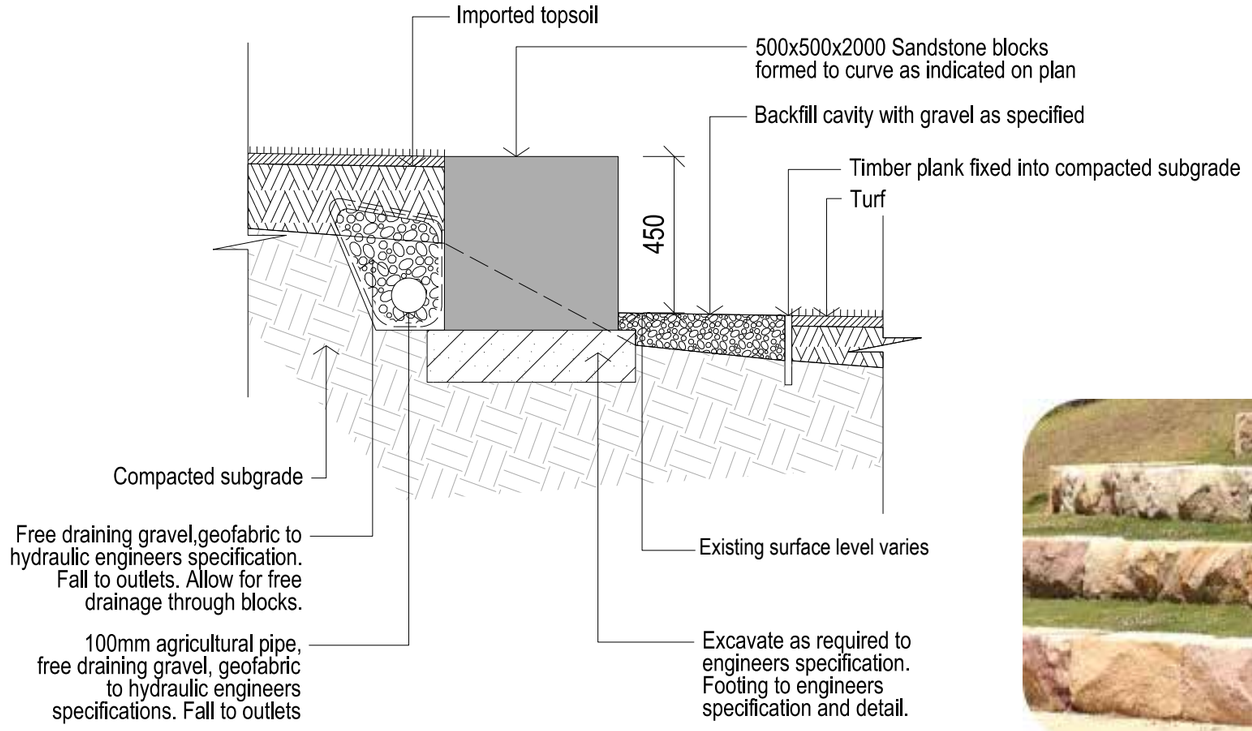
PARKLANDS EMBELLISHMENT PLAN • Kurnell

Figure 21

SITE SECTION G-G'

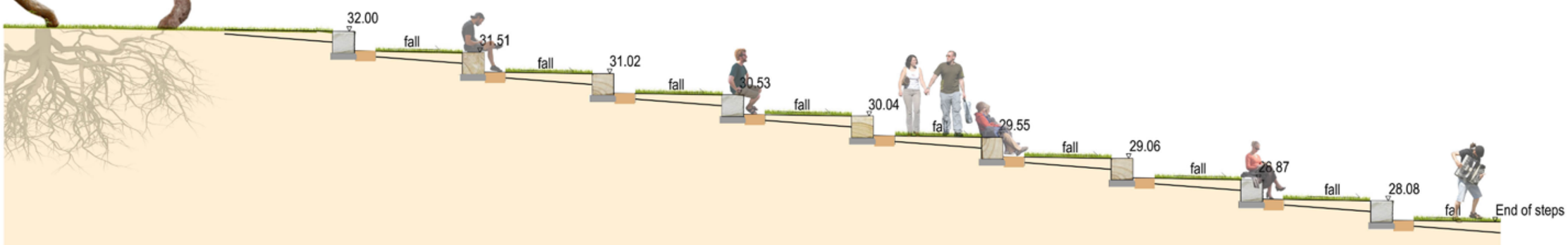
12/03/2021 Issue C











A
-
STEPS TYPE 1 - AMPHITHEATRE
1:100 @ A3 - SECTION

Note: All areas between steps to be graded at 1:40 unless stated otherwise. Distance between steps, refer to plan .

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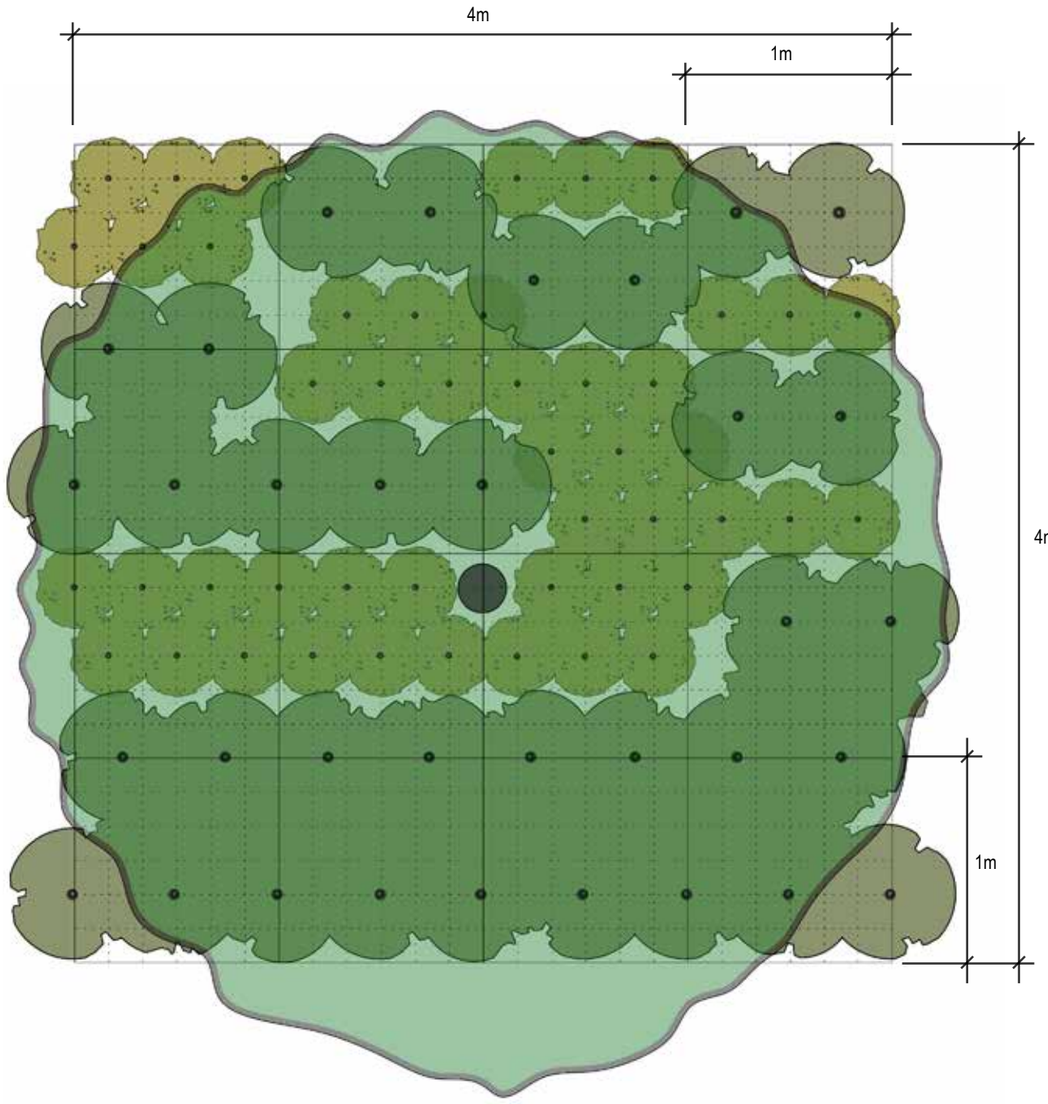
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PARKLANDS EMBELLISHMENT PLAN • Kurnell

AMPHITHEATRE DETAILS & SECTIONS

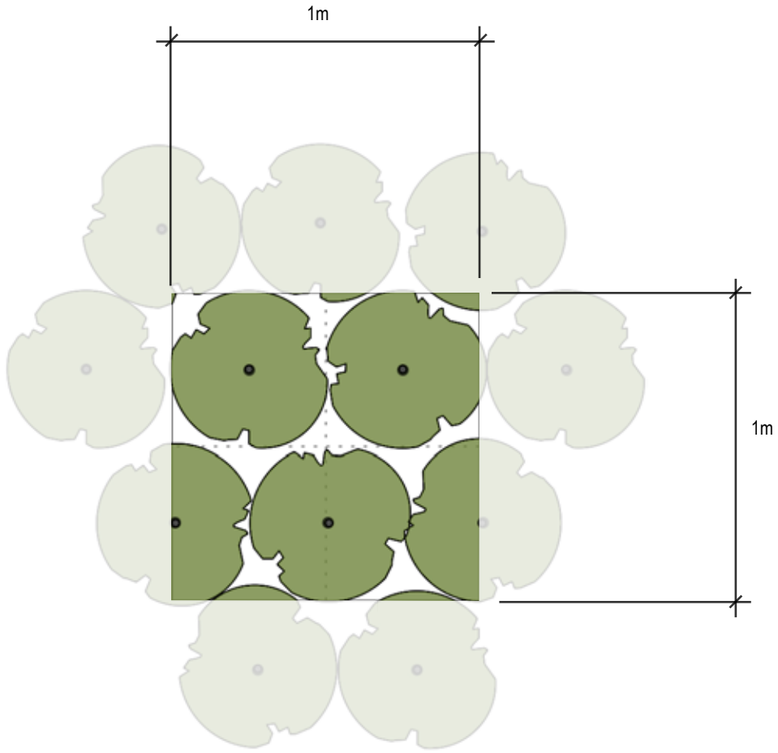
Figure 22

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Kurnell Dune Forest - Typical Arrangement

Vegetation Type	Quantity	Area Coverage	% of Total Coverage
Trees	1	1 per 16m^2	n/a
Shrubs	32	2 per 1m^2	40%
Grasses & Groundcovers	48	3 per m^2	60%



Kurnell Dune Heath - Typical Arrangement

Vegetation Type	Quantity	% of Total Coverage
Shrubs	4 tubestock per 1m^2	50%
Grasses & Groundcovers		50%

General Notes for Planting:

- Refer to "Proposed Native Plant Species List" (Figure 28) for typical species selection.
- Tubestock to be used for all proposed plants.

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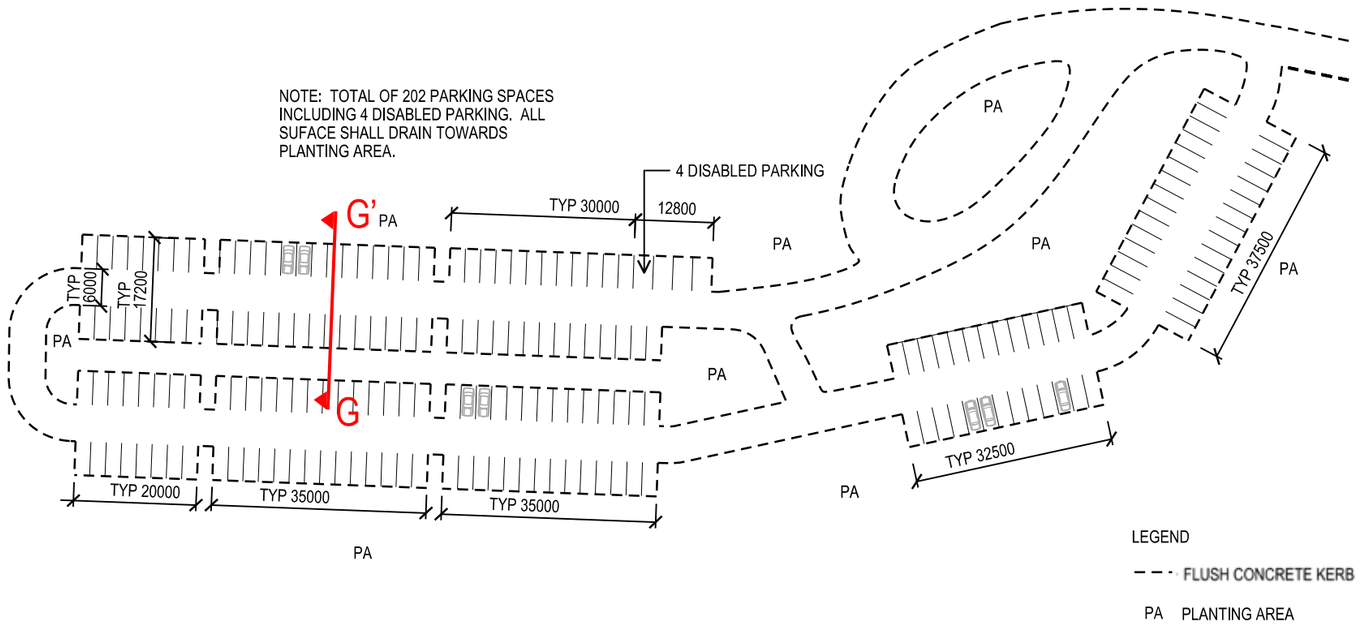
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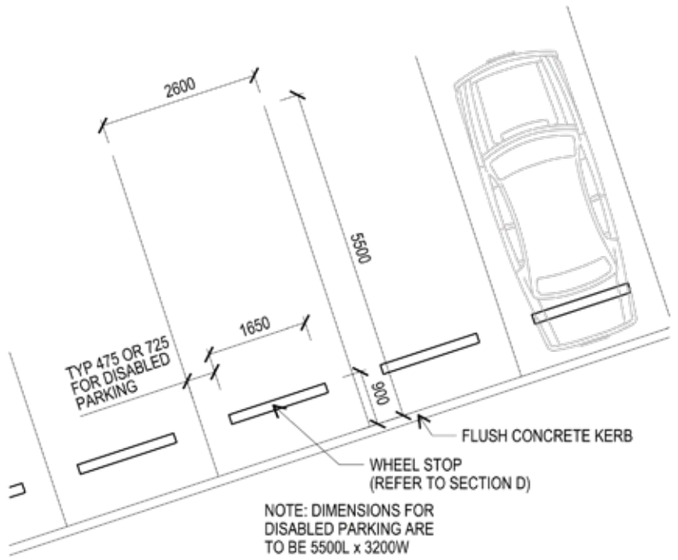
PLANTING DETAIL PLAN

Figure 23

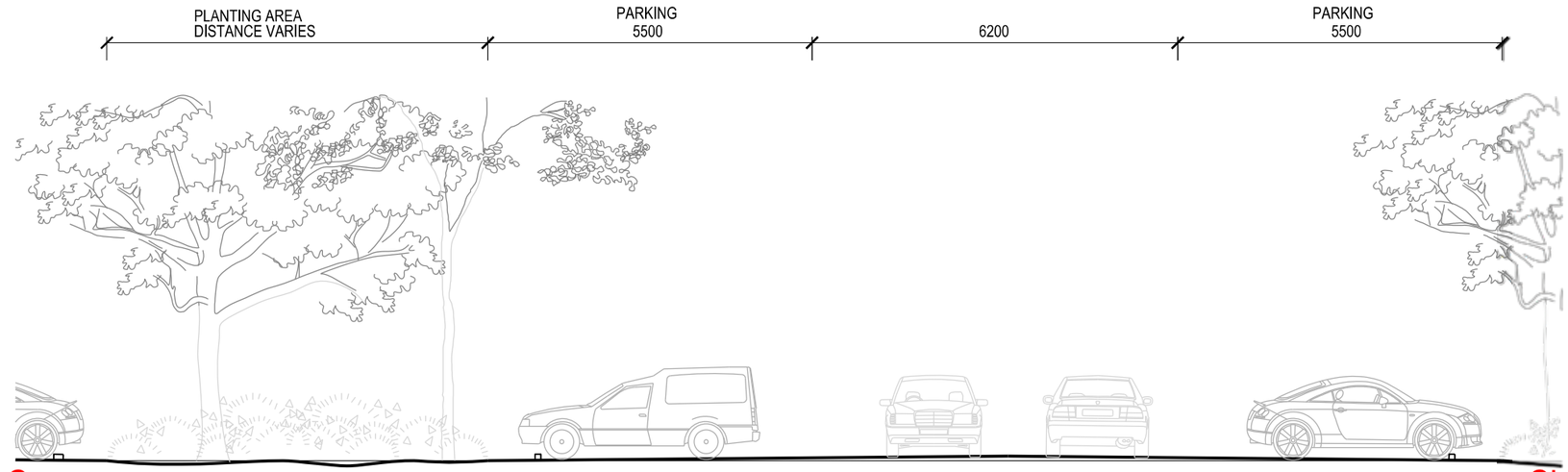
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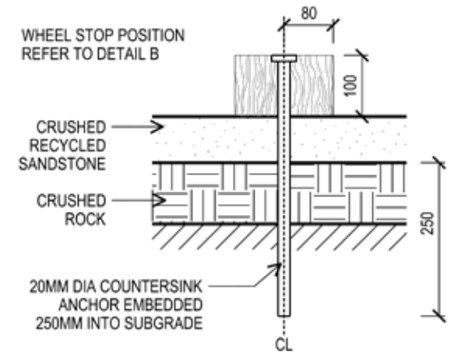
A PARKING ARRANGEMENT PLAN
1:1000 @ A3



B PARKING DETAIL PLAN
1:100 @ A3



C PARKING SECTION
1:100 @ A3



D WHEEL STOP SECTION
1:10 @ A3

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PARKLANDS EMBELLISHMENT PLAN • Kurnell

TYPICAL PARKING DETAILS & SECTIONS

Figure 24

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PARKLANDS EMBELLISHMENT PLAN • Kurnell

PLAYGROUND DESIGN PLAN

Figure 25

12/03/2021 Issue C

DESIGN MATERIALS PALETTE



Material: Crushed compacted sandstone / brick sand
Location: Look outs, main plaza



Material: Crushed recycled concrete / brick
Location: parking areas, pathway, walkway



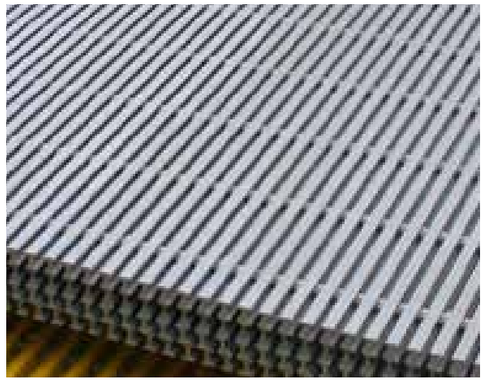
Material: Mulch
Location: Playground (soft fall)



Material: Sandstone log
Location: Amphitheatre, retaining walls at entry zones, stairs & steps



Material: Bitumen
Location: Vehicular driveway & drop off



Material: Reinforced fibre glass grates
Location: Boardwalk surface on certain trail sections



Material: Stone
Location: Stabilisation to steep slopes



Material: Grasses
Location: Across entire site

MATERIAL SELECTION

The objective of creating a semi-natural parkland experience focused on a costal dune and heath landscape, calls for a simple palette of materials that will perform well without detracting from the visitor experience.

Furthermore, the nature of the remediated site, with its capped landform limits any in-ground works to the finishes above the capping layer.

These constraints can be turned into an opportunity by creating an appealing simple landscape, focused on its natural values and using materials with mostly low embodied energy.

PLANTING STRATEGY

The Embellished Marang Parklands provide an ideal opportunity to re-establish native plant communities that would have been present on this dune landscape prior to the mining era.

The planting strategy therefore focuses on an integration of coastal heath and Kurnell Dune Forest communities, employing canopy species to provide shelter over time that will foster further natural revegetation.

The resulting landscape will comprise areas of tree canopy (probably windswept in form) informally framing open areas of the coastal heath planting and open lawn areas.



Westringia fruticosa



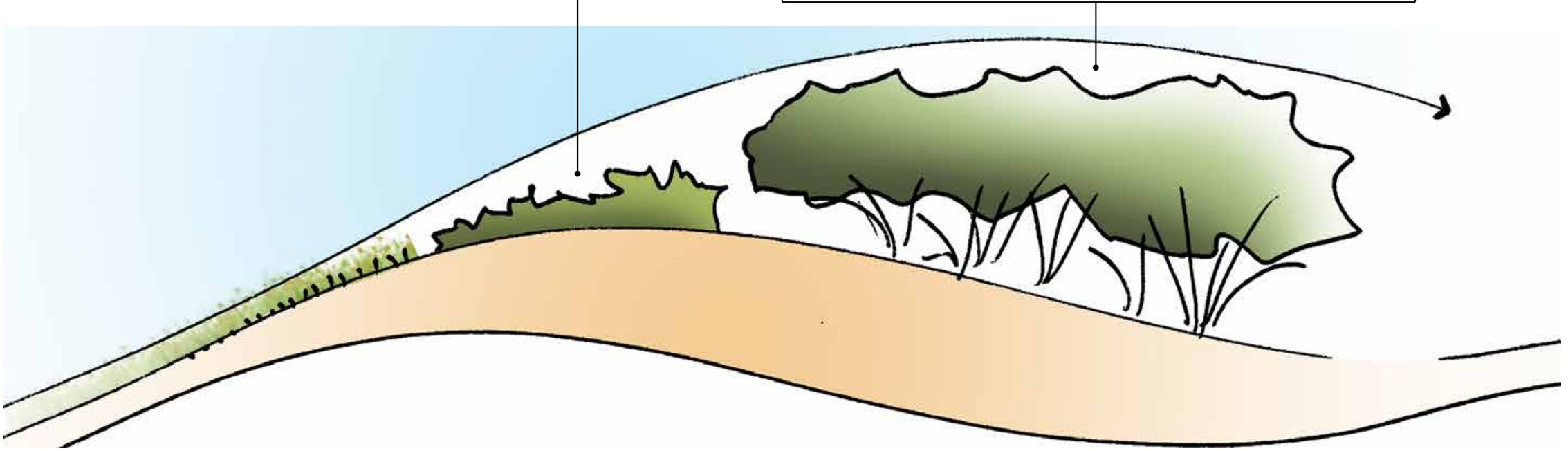
Banksia integrifolia



Eucalyptus botryoides



Eucalyptus sp.



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Figure 27

WINDSWEPT DUNE VEGETATION - ECOTONE

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Kurnell Dune Forest Coastal Dune Dry Schlerophyll Forest & Associated Plant Communities

Botanical Name	Common Name	SC	B & S	CPB	CBR	CA
TREES						
Acmena smithii	Lillypilly				✓	✓
Allocasuarina littoralis	Black She-oak		✓	✓	✓	✓
Angophora costata	Sydney Red Gum	✓	✓	✓		✓
Banksia serrata	Old Man Banksia		✓	✓	✓	✓
Banksia integrifolia	Coastal Banksia		✓	✓	✓	✓
Casuarina glauca	Swamp Oak			✓		✓
Corymbia gummifera	Red Bloodwood		✓			✓
Cupaniopsis anacardioides	Tuckeroo	✓		✓	✓	✓
Elaeocarpus reticulatus	Blueberry Ash	✓				✓
Endiandra sieberi	Hard Corkwood	✓				✓
Eucalyptus botryoides	Bangalay	✓		✓		✓
Eucalyptus pilularis	Blackbutt					✓
Eucalyptus robusta	Swamp Mahogany			✓		✓
Glochidion ferdinandi	Cheese Tree	✓		✓		✓
Livistona australis	Cabbage Palm		✓			✓
Melaleuca quinquenervia	Broad Leaved Paperbark			✓		✓
Rapanea variabilis	Muttonwood	✓			✓	✓
Syzygium oleosum	Blue Cherry					✓
Syzygium paniculatum	Magenta Brush Cherry					✓
SHRUBS						
Acacia longifolia	Coastal Wattle		✓	✓	✓	✓
Acacia myrtifolia	Red-stemmed Wattle			✓		✓
Acacia sophorae	Coastal Wattle			✓	✓	✓
Acacia suaveolens	Sweet Scented Wattle		✓	✓		✓
Acacia terminalis	Sunshine Wattle		✓		✓	✓
Acacia ulicifolia	Prickly Moses		✓	✓		✓
Aotus ericoides	Eggs and Bacon	✓	✓	✓		✓
Banksia ericifolia	Heath Banksia	✓	✓	✓		✓
Breynia oblongifolia	Coffee Bush	✓	✓		✓	✓
Clerodendrum tomentosum	Downy Chance	✓			✓	✓
Correa alba	White Correa		✓			✓
Correa reflexa	Native Fuchsia		✓			✓

Botanical Name	Common Name	SC	B & S	CPB	CBR	CA
SHRUBS						
Epacris longiflora	Native Fuchsia Heath		✓			✓
Dillwynia retorta	Egg and Bacon Pea					✓
Dillwynia glaberrima	Smooth Parrot Pea					✓
Eustrephus latifolius	Wombat Berry	✓			✓	✓
Leptospermum laevigatum	Coastal Tea-Tree	✓	✓	✓	✓	✓
Leucopogon lanceolatus	Lance Beard Heath					✓
Leucopogon parviflorus	Coast Beard Heath	✓			✓	✓
Macrozamia commuis	Burrawang		✓			✓
Monotoca elliptica	Heath Broom	✓			✓	✓
Notelia longifolia	Native Olive	✓			✓	✓
Pimelia linifolia	Slender Rice Flower	✓	✓	✓	✓	✓
Ricinocarpus pinifolius	Wedding Bush		✓			✓
Xylomelum pyriforme	Woody Pear		✓			✓
Xanthorrhoea glauca	Grass Tree					✓
Zieria pilosa	Hairy Zieria		✓			✓
FERNS, GROUNDCOVERS AND HERBS,						
Actinotus helianthi	Flannel Flower	✓	✓			✓
Commelina cyanea	Scurvy Weed		✓		✓	✓
Dichondra repens	Kidney Weed			✓	✓	✓
Geranium homeanum	Northern Cranesbill		✓		✓	✓
Gonocarpus teucrioides	Germander Raspwort					✓
Pteridium esculentum	Bracken		✓		✓	✓
Scaevola calendulacea	Scented Fan Flower		✓		✓	✓
GRASSES AND GRASS-LIKE PLANTS						
Dianella caerulea	Blue Flax Lily			✓		✓
Imperata cylindrica	Blady Grass			✓		✓
Hypolaena fastigiata	Tassle Rope Rush					✓
Lepidosperma laterale	Variable Sword Sedge	✓				✓
Lomandra longifolia	Spiny-headed Mat Rush	✓	✓	✓	✓	✓
Lomandra glauca	Blue Mat Rush		✓			✓
Oplismenus imbecillis	Basket Grass				✓	✓
Microlaena stipoides	Weeping Grass				✓	✓
Themeda australis	Kangaroo Grass			✓	✓	✓

Botanical Name	Common Name	SC	B & S	CPB	CBR	CA
CLIMBERS						
Cissus antarctica	Kangaroo Vine	✓			✓	✓
Cissus hypoglauca	Water Vine	✓				✓
Clematis aristata	Old Man's Beard	✓				✓
Clematis glycinoides	Old Man's Beard				✓	✓
Hardenbergia violacea	False Sarsaparilla		✓	✓	✓	✓
Hibbertia scandens	Twining Guinea Flower	✓	✓	✓	✓	✓
Kennedia rubicunda	Dusky Coral Pea		✓	✓	✓	✓
Maclura cochinchinensis	Cockspur Thorn	✓			✓	✓
Pandorea pandorana	Wonga Wonga Vine	✓	✓		✓	✓
Parsonsia staminea	Monkey Vine	✓			✓	✓
Smilax australis	Lawyer Vine	✓				✓
Stephaniajaponicavar.discolor	Snake Vine	✓			✓	✓

KEY:

SC Scientific Committee final destination of Kurnell Dune Forest Characteristic Species.

B&S Joseph Banks & Dr Daniel Solander original plant species list

CPB Cronulla Business Park (Sutherland Shire Council recommended plant species list)

CBR Charlotte Breen Reserve (Sutherland Shire Council recommended plant species list)

CA CLOUSTON Associates recommended plant species list

Coastal Dune Heath & Associated Plant Communities					
Botanical Name	**Common Name**	**B&S**	CPB	CBR	CA
SHRUBS					
Acacia sophorae	Coastal Wattle		✓	✓	✓
Acacia suaveolens	Sweet-scented Wattle	✓	✓		✓
Allocasuarina distyla	Scrub She-oak	✓			✓
Aotus ericoides	Eggs and Bacon	✓	✓		✓
Astroloma pinifolium	Pine Heath	✓			✓
Banksia aemula	Wallum Banksia				✓
Banksia ericifolia	Heath Banksia	✓			✓
Banksia serrata	Old Man Banksia	✓	✓	✓	✓
Bossiaea ensata	Sword Bossiaea				✓
Bossiaea heterophylla	Variable Bossiaea	✓			✓
Ceratopetalum gummiferum	Christmas Bush				✓
Darwinia fasicularis	Clustered Scent Myrtle	✓			✓
Dillwynia retorta	Egg and Bacon				✓
Epacris longiflora	Native Fuchsia Heath	✓			✓
Hakea teretifolia	Dagger Hakea	✓	✓		✓
Kunzea ambigua	Tick Bush		✓		✓
Lambertia formosa	Mountain Devil	✓			✓
Leptospermum laevigatum	Coastal Tea-Tree	✓	✓	✓	✓
Leucopogon lanceolatus	Lance Beard Heath				✓
Leucopogon parviflorus	Coast Beard Heath				✓
Monotoca elliptica	Heath Broom			✓	✓
Ricinocarpus pinifolius	Wedding Bush	✓			✓
Sprengelia incarnata	Pink Swamp Heath				✓
Westringia fruticosa	Coastal Rosemary	✓	✓		✓
Woollsia pungens	Snow Wreath	✓			✓
Xanthorrhoea resinosa	Grass Tree				✓

Botanical Name	**Common Name**	**B&S**	CPB	CBR	CA
HERBS,					
Actinotus helianthi	Flannel Flower	✓			✓
Actinotus minor	Lesser Flannel Flower	✓			✓
Dampiera stricta	Blue Dampiera	✓			✓
GRASSES AND GRASS-LIKE PLANTS					
Aristida ramosa	Wiregrass				✓
Caustis flexuosa	Curly Sedge				✓
Caustis pentandra	Thick Twist Rush				✓
Caustis recurvata var. recurvata	Caustis				✓
Dianella caerulea	Blue Flax Lily		✓		✓
Dianella revoluta	Blue Flax Lily				✓
Egrostis brownii	Common Love-grass				✓
Entolosia stricta	Wiry Panic		✓	✓	✓
Hypolaena fastigiata	Tassle Rope-rush				✓
Imperata cylindrica	Blady Grass		✓	✓	✓
Lepidosperma laterale	Variable Sword Sedge				✓
Lomandra longifolia	Spiny-headed Rush	✓	✓	✓	✓
Poa labillardiera	Tussock Grass			✓	✓
Themeda australis	Kangaroo Grass		✓	✓	✓
GROUNDCOVERS AND CLIMBERS					
Carpobrotus glaucescens	Pig Face			✓	✓
Cissus antarctica	Kangaroo Vine			✓	✓
Cissus hypoglauca	Water Vine				✓
Clematis aristata	Headache Vine				✓
Clematis glycinoides	Old Man's Beard			✓	✓
Commelina cyanea	Scurvy Weed	✓		✓	✓
Hibbertia scandens	Twining Guinea Flower	✓	✓	✓	✓

KEY:

B&S Joseph Banks & Dr Daniel Solander original plant species list

CPB Cronulla Business Park (Sutherland Shire Council recommended plant species list)

CBR Charlotte Breen Reserve (Sutherland Shire Council recommended plant species list)

CA CLOUSTON Associates recommended plant species list

NOTE:

Some species are not commonly commercially available and would need to be propagated from local provenance seed.

Kurnell Dune Forest Coastal Dune Dry Schlerophyll Forest & Associated Plant Communities


Leptospermum laevigatum


Macrozamia communis


Eucalyptus botryoides


Westringia fruticosa


Glochidion ferdinandi


Cupaniopsis anacardioides


Banksia integrifolia


Monotoca elliptica


Banksia ericifolia

Coastal Dune Heath & Associated Plant Communities


Acacia sophorae


Aotus ericoides


Xanthorrhoea resinosa


Hibbertia scandens

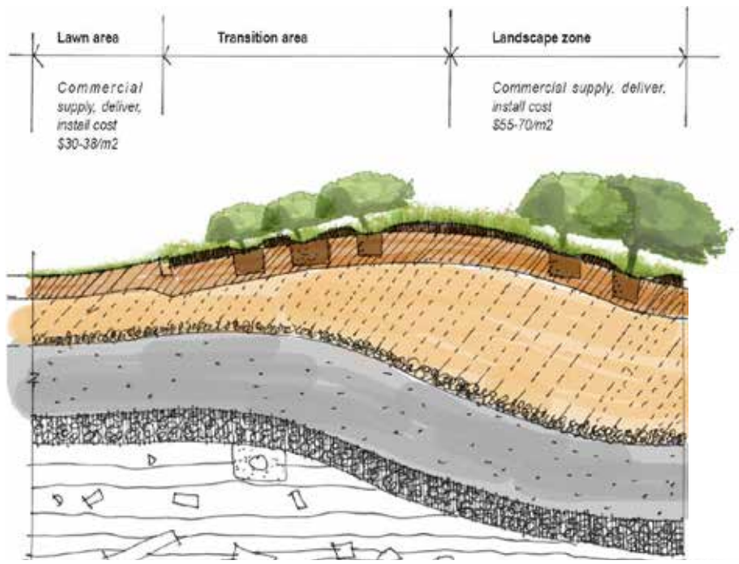

Carpobrotus glaucescens

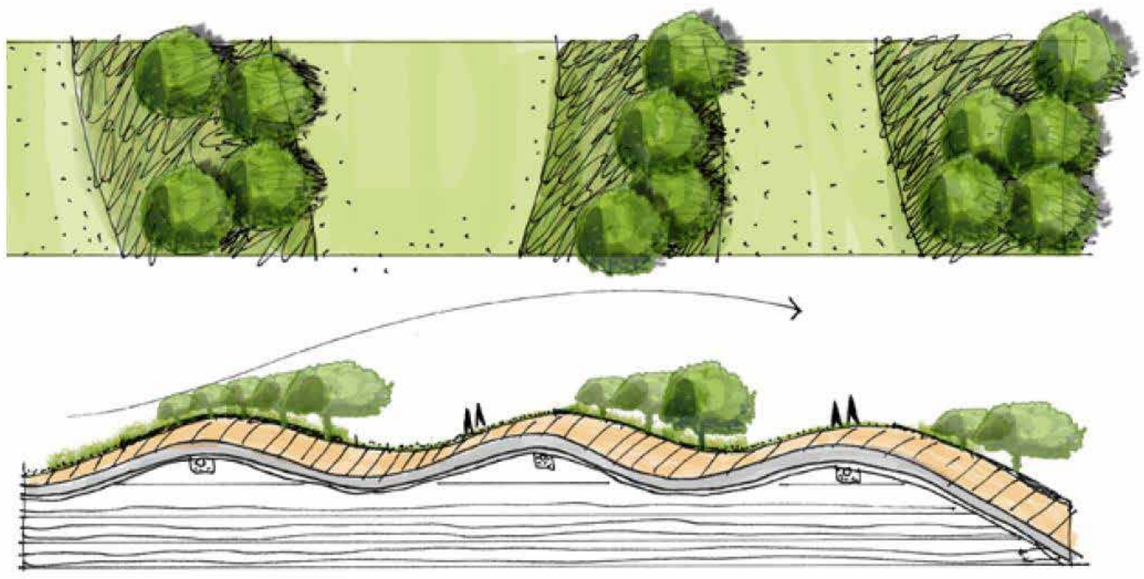

Lomandra longifolia


Westringia fruticosa


Dianella caerulea


Poa labillardiera





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PARKLANDS EMBELLISHMENT PLAN • Kurnell

Figure 30

PROPOSED NATIVE PLANT SPECIES: SAMPLE PALETTE

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The proposed Embellished Marang Parklands include the following improvements and benefits to the community over and above those contemplated by the 2010 VPA:

- A cleared 'Village Green' area in the middle of the parklands with amphitheatre, providing a place for the community to hold events and celebrations in a semi natural setting; and
- Associated picnic areas for all members of the local and wider community to use and enjoy; and
- A playground; and
- A network of accessible paths, including key pedestrian and cycle links between Quibray Bay and Cronulla Beach, to allow visitors to easily access the parklands for pedestrians and cycling, reinforcing the Sydney Green Grid; and
- An elevated landscape, including a panoramic look out in the western part of the parklands, that offers spectacular all-round regional views that will assist in a better understanding of the varied landscapes of this part of Sydney.

RECREATION Provide a greater range of genuine recreational opportunities			
VPA offering	Qty	Revised Master Plan in 2020 offering	Qty
Single loop shared path, crossing around half of the park area.	1.9km	Shared path, crossing around half of the park area.	2km
Random clumps of grassland for informal recreation.	4.9ha	Random clumps of grassland for informal recreation.	2.2ha
		Large open grassed area with amphitheatre providing flexible venue for a variety of social activities.	2.8ha
		Picnic areas with tables and seating	11

ACCESS Provide better access and allow all users to enjoy the park.			
VPA offering	Qty	Revised Master Plan in 2020 offering	Qty
Very limited access via a path of steep grades of up to 1:4, therefore not (DDA) compliant.		Accessible grade paths with maximum slope (1:20) to allow access for all users	2km
Four points of entry into the park from the surrounding region.	4	Four points of entry into the park from the surrounding region for both pedestrians and vehicles.	4
Poor access between the sports fields and car park directly to the park.	0	Improved connections between the sports fields and car park directly into the park through options of direct stair access or accessible path to connect/link parklands, sports fields and car park.	3

ECOLOGICAL BIODIVERSITY Provide increased biodiversity			
VPA offering	Qty (ha)	Revised Master Plan in 2020 offering	Qty (ha)
Coastal Dune Heath	11.86	Coastal Dune Heath	12.2
Kurnell Dune Forest (endangered ecological community).	7.75	Kurnell Dune Forest (endangered ecological community).	7.9
Native Grassland (providing habitat diversity)	3.56	Native Grassland (providing habitat diversity)	3.4
Managed Grassland (Lawn)	2.8	Managed Grassland (Lawn)	2.9
TOTAL	25.97		26.4

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VPA COMPARISON TABLES

Figure 31

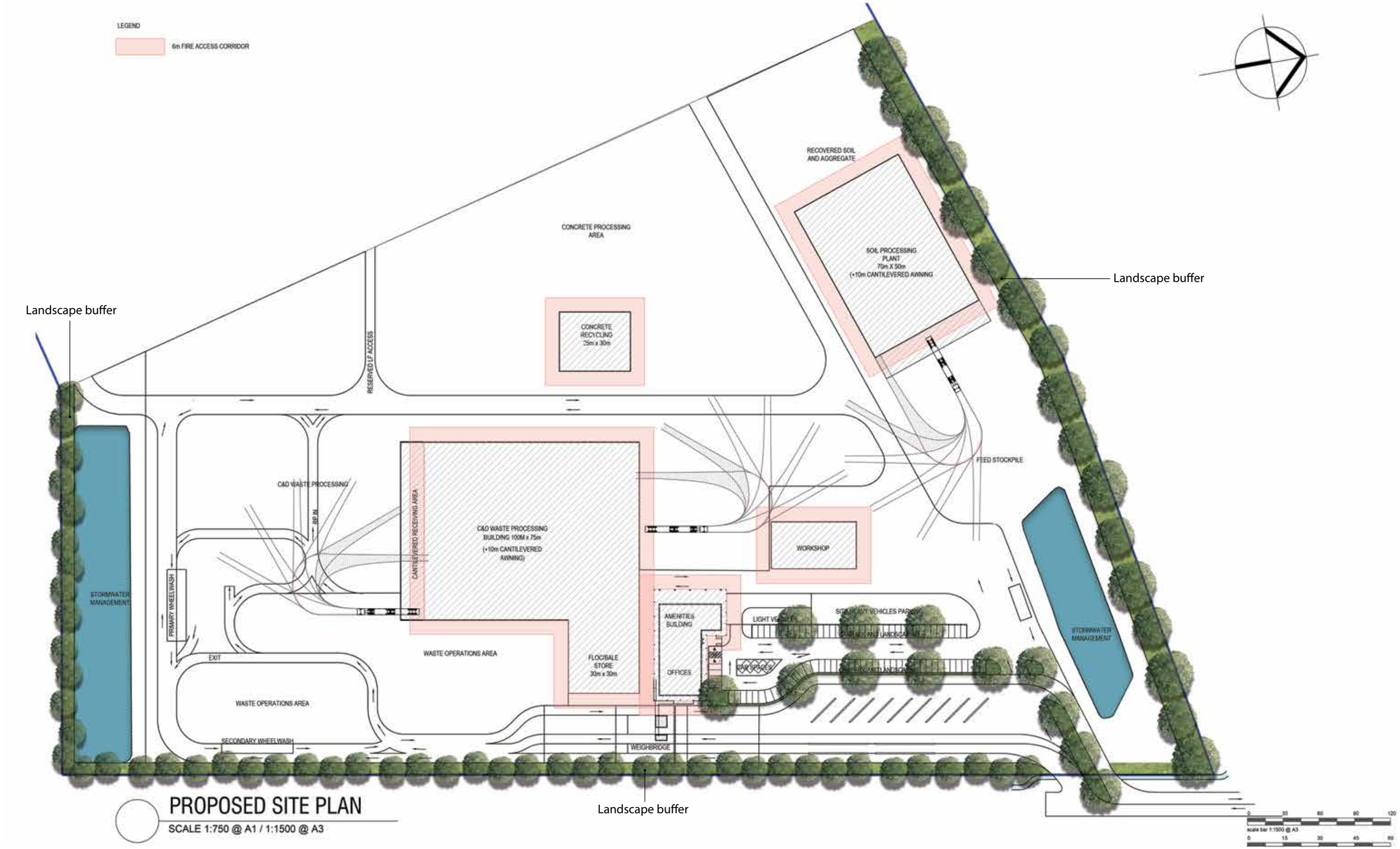
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MAINTENANCE Provide a park minimising maintenance requirements.			
VPA offering	Qty	Revised Master Plan in 2020 offering	Qty
Limited and steep access, of up to 1:4 slopes throughout the park.	1.6km	Utilize paths for maintenance access where possible, gentle gradients of paths provide easy access for machinery and workforce to different areas.	2km
Enclosed pockets of lawn areas, that are difficult to access and maintain.	4.9ha	Consolidation of intensively maintained lawn areas provides wilder character of planting with more use of native grasses requiring only biannual mowing regimes.	2.8ha

EDUCATION & INTERPRETATION Provide opportunities for learning			
VPA offering	Qty	Revised Master Plan in 2020 offering	Qty
None.		The creation of sculptural landforms that demonstrate the natural process of transgressive dunal systems. These landforms will consist of a range of windward and leeward slopes, with vegetation and can be explored by adjacent footpaths and lookouts.	n.a

SUSTAINABILITY Provide a more sustainable park.					
VPA offering	Qty	Proposed improvements	Qty	Revised Master Plan in 2020 offering - suggested improvements	Qty
VPA states "…priority must be given to the utilisation of recycled and other bulk materials sourced from Kurnell Land Fill Company,"	tbc	A commitment to ensure all fill material will be sourced from the Kurnell Land Fill recycled waste stream.	tbc	A commitment to ensure fill material, such as recycled/ manufactured soils will be sourced from the Breen Resource Recovery Facility where possible.	n.a
		Utilization of recycled & reclaimed materials to provide interpretative sculptural elements, seats and exercise stations along the walking trails.	tbc	Utilization of recycled & reclaimed materials for the proposed footpath etc.	n.a

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RESOURCE RECOVERY FACILITY

Figure 33

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BREEN RESOURCE RECOVERY FACILITY LANDSCAPE PLAN

FACILITY DESIGN

The proposed Recovery Facility will incorporate the following elements:

- Soil Processing Plant
- Recovered Soil and Aggregate Area
- Concrete Recycling Plant
- Concrete Processing Area
- C&D Waste Processing Building
- C&D Waste Processing Area
- Floc/ Bale Store
- Waste Operations Area
- Weighbridge
- Amenities Building
- Offices
- Workshop
- Car parks for both light vehicles and site heavy vehicles
- Detention Basins for stormwater management

A landscape buffer has been proposed along the eastern, southern and northern boundaries to mitigate visual impact and enhance visual character of the local context.



Existing soccer field opposite to Greenhills Skate Park looking toward Breen Resources Recovery Facility.
Source: Breen Resources Recovery Facility Visual Impact Assessment Issue A 12/10/2020



Private property to the east of the precinct looking toward Breen Resources Recovery Facility.
Source: Breen Resources Recovery Facility Visual Impact Assessment Issue A 12/10/2020

CONCLUSION

CONCLUSION

The Embellished Marang Parklands provides a once-in-a-generation opportunity to provide the growing community of Kurnell access to unique open space recreational facilities. The creation of a renewed dune landscape will provide an integrated parklands and sport complex precinct will be created to that reinforces the network of open spaces within the local and regional context.

The site which will hold the parklands has been in private ownership for many years, first as a sand mine and since 1990 as a resource recovery facility. The consolidation and relocation of the Resource Recovery Facility to the east of the site will separate and define the industrial activities from the new public open space.

The parklands will utilise current best practice in open space and landscape planning to provide passive and active recreation opportunities for all members of the community to use and enjoy. Returning the Parklands PCA of the site to public access also restores key pedestrian and cycle links through the parklands between Quibray Bay and Greenhills Beach.

The restoration of endemic dune vegetation on the site is another key aspect of the Embellished Marang Parklands development. The selection of indigenous plant species will allow the parklands to seamlessly integrate into the surrounding dune nature reserves and parklands and reestablishes a critical ecological link from Bate Bay to Towra Point.

Numerous recreation opportunities are to be discovered throughout the parklands. A network of accessible paths allow visitors to easily access the various opportunities including both passive and active recreational activities such as sportsfields, picnic facilities, informal kickabout spaces, walks, lookouts, a giant slide, events, nature play, playgrounds and an amphitheatre.

Parking facilities have been located to the edges of the site, in line with international best practice and a number of pedestrian and bicycle links have been proposed to connect the parklands into existing circulation networks.

The Embellished Marang Parklands will provide an exciting and memorable experience for the many local and regional visitors who will come to the site each year for the wide range of recreation opportunities. The Embellished Marang Parklands offers a rare opportunity to return a post-industrial landscape to a remediated parkland destination; an opportunity that reconnects people, nature, heritage and place.



View along Greenhills Beach from near the Breen Site.

REFERENCES AND APPENDICES

REFERENCE

Breen Resources Recovery Facility Biodiversity Development Assessment Report

Aboriginal Cultural Heritage Assessment Report

Ethos Urban 2020, State Significant Development Scoping Report

Government Architect New South Wales (GANSW) 2020, Draft Greener Places.

Government Architect New South Wales (GANSW) 2020, Draft Greener Places - Open Space For Recreation Guide, Urban Tree Canopy, Bushland and Waterways

APPENDICES

CLOUSTON Associates 2020, Breen Resources Recovery Facility Visual Impact Assessment.





PROJECT CREDITS

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