Department of **Biodiversity, Conservation and Attractions**

SWAN CANNING RIVERPARK

Form 1 – Application for Approval of Development

Swan and Canning Rivers Management Act 2006 – Part 5 – section 72(1)

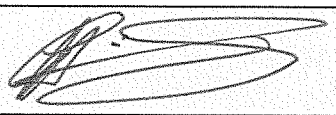
1. Applicant details

The applicant is the person with whom the department, on behalf of the Chief Executive Officer, will correspond, unless an authorised agent has been appointed to act on behalf of the applicant, in which case correspondence will be sent direct to the agent.

Name	George Hajigabriel				
Position (if applicable)	Director				
Organisation (if applicable)	Rowe Group				
Contact person	George Hajigabriel				
Postal address	Level 3, 369 Newcastle Street				
Town/Suburb	Northbridge	State	WA	Postcode	6003
Telephone	Work (08) 9221 1991	Mobile	0412 498 503		
Email	george.hajigabriel@rowegroup.com.au				

I give authority for an agent (as identified at item No. 3) to act on my behalf during the assessment of the application ☐ YES ☑ NO

If 'YES', please provide Agent's details at item No. 3

Applicant signature  Date

2. Landowner details

All owner(s) of the land **must sign this application**. Where land is owned by the Crown or has a management order granted to a local government or other agency, this application must be signed by the relevant landowner or management body as required under section 72(5)(a) of the Act. If there are more than two landowners, please provide the additional information and signature(s) on a separate page.

Details of first landowner

Name	State of WA (refer to attached letter of consent)				
Position (if applicable)					
Organisation (if applicable)	Department of Planning Lands and Heritage				
Contact person	Conor Noone (A/Project Officer Land Management Metropolitan & Peel)				
Postal address					
Town/Suburb		State		Postcode	

I consent to this application being made.

First landowner signature refer to attached letter of consent Date

Details of second landowner (if applicable)

Name					
Position (if applicable)					
Organisation (if applicable)					
Contact person					
Postal address					
Town/Suburb		State		Postcode	

I consent to this application being made.

Second landowner signature Date

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

SWAN CANNING RIVERPARK

3. Authorised agent details (if applicable)

The applicant must sign the form and tick the authorisation under item No. 1 to provide authority for an appointed authorised agent to act on their behalf.

Details of authorised agent

Name	N/A				
Position (if applicable)					
Company/agency (if applicable)					
ACN/ABN (if applicable)					
Postal address					
Town/Suburb		State		Postcode	
Telephone	Work		Mobile		
Email					
Authorised Agent signature		Date			

4. Location of proposed development

Certificate of title information	Volume	LR3000	Folio	431
	Diagram/plan/deposit plan no.	35070		
Lot No.(s)	8378			
Location				
Reserve No.(s) (if applicable)	24959			
Street No.(s) and name	Jutland Parade			
Town/Suburb	Dalkeith			
Nearest road intersection	Adlema Place			

5. Details of proposed development

Please provide a written description of the proposed development (refer to the Development Application Guidelines for further details on what information to include in this section).

Estimated cost of development	Stairway - less than $50,000
Current use of land	Stairway
Proposed development	Foreshore works, including stairway access (refer to attached letter and Design Report prepared by Josh Byrne and Associates).

Checklist

Information to include in your Part 5 development application

- ☑ Completed application form, including written consent of the landowner(s). (DBCA will organise landowner consent for the River reserve)
- ☑ Additional information including details of the proposed development (including the existing and proposed use of the site and proposed hours of operation) and addressing any relevant issues identified in the policies.
- ☑ Plans and specifications of the proposed development showing:
  - ☑ current and proposed levels (contours at no greater than 1 metre intervals), including retaining structures and fill requirements
  - ☑ the location, metric dimensions, materials, finishes and type of all existing and proposed structures, including services
  - ☑ sections through the site
  - ☑ the nature and extent of any open space and landscaping proposed
  - ☑ proposed external lighting and signage
  - ☑ any watercourse flowing through the site
  - ☑ position of any large trees or on-site vegetation, clearly marking vegetation to be retained and removed
  - ☑ the existing and proposed means of access and movement for pedestrians and vehicles
- ☑ Plans, elevations and sections of any building or structure proposed to be erected or altered and/or any building or structure to be retained.
- ☑ Site plan of the lot showing the development location in relation to:
  - ☑ adjacent roads
  - ☑ rivers, creeks, springs and wetlands
  - ☑ nearby conservation areas and/or Bush Forever sites
  - ☑ floodway and floodplain boundaries
  - ☑ land reserved for Parks and Recreation under the Metropolitan Region Scheme
- ☑ Information on the availability of drainage and sewer.

☐	Information on any impacts to heritage sites or protected areas and subsequent approvals (if required).
☐	Information regarding potential acid sulfate soils and/or contamination.
☐	If the proposed development is likely to disturb potential and/or actual acid sulfate soils or a contaminated site, a preliminary investigation is required, and the results included with this application.
☑	Details of the proposed construction methodologies.
☑	Geotechnical information.
☐	Operational details (where relevant) e.g. for a proposed café.

Larger developments should also include:

☑	photo montages showing the development in relation to the river and foreshore landscape
☐	information on the impacts of parking, noise and traffic generated by the proposal
☑	details of stormwater management incorporating water sensitive urban design principles
☐	details of any dewatering proposed during construction including the expected volumes, water quality, method of disposal and sampling regimes in accordance with DBCA's Policy 50 – Planning for dewatering affecting the Swan and Canning Development Control Area
☑	any specialist studies and/or management plans required to support the application such as traffic, heritage, environmental, engineering, landscaping or urban design studies.

If insufficient information is provided with the initial application, further information will be sought from the applicant. If the required information is not provided, the application will be returned. DBCA cannot process the application without the completed (and correct) application form.

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Planning, Lands and Heritage**

Our ref: Case: N/A; File: 03013-1957.
Enquiries: Conor Noone
Email: Conor.Noone@dplh.wa.gov.au
Phone: (08) 6552 4445

Rowe Group
Level 3 369 Newcastle Street
Northbridge WA 6003

Sent via email to: Ashleigh.Maple@rowegroup.com.au
Cc: George.Hajigabriel@rowegroup.com.au

Dear Ashleigh,

REQUEST FOR LANDOWNER CONSENT TO LODGE DEVELOPMENT APPLICATION IMPACTING STATE LAND – LOT 8378 ON DIAGRAM 35070 BEING RESERVE 24959 – CITY OF NEDLANDS

I refer to your email dated the 29th of February 2024 where you requested landowner consent to lodge an application for development approval which impacts land owned by the State of Western Australia. The impacted land is Lot 8378 on Diagram 35070, being part of Crown Reserve 24959 (the Land), which is managed by the City of Nedlands (City) for the purpose of "Recreation". The land is detailed in Attachment 1.

Given the reserve is under the full care, control and management of the City this is a matter for the City to consider. We write to grant consent, as landowner, to the lodgement and progression of the enclosed Application for Development Approval for foreshore works.

This letter of consent has been provided to facilitate only the processing of this application. No endorsement, undertaking or assessment is made or intended, and this should not be taken as approval to carrying out the proposed development or to any modification of the tenure of the State land.

This Department will not incur any of the application fees or associated costs with the preparation of plans or development in association with the foreshore works. The applicant will be responsible for all costs associated with the proposal.

The applicant is advised that this Letter of Consent has been signed subject to the following conditions:

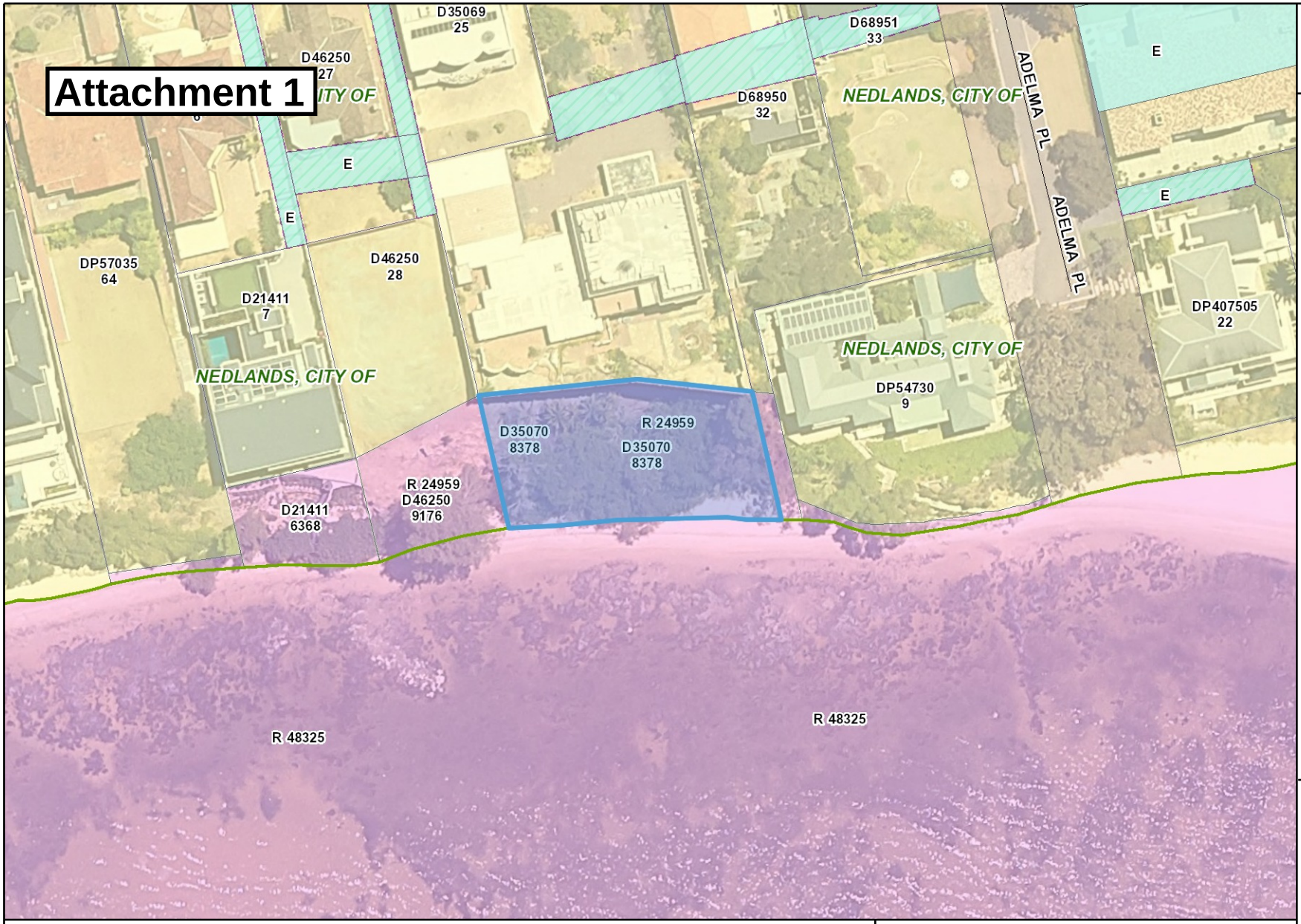
1. The applicant preparing a foreshore management plan and obtaining any approvals or permits, as required from the Department of Biodiversity, Conservation and Attractions for any proposed development over the Land in accordance with the *Swan and Canning Rivers Management Act 2006*.
2. The applicant adhering to any requirements, conditions and/or maintenance agreement imposed by the City of Nedlands.

Please do not hesitate to contact Conor Noone, Acting Project Officer – Land Management Metropolitan & Peel at the Department of Planning, Lands and Heritage on (08) 6552 4445 or at Conor.Noone@dplh.wa.gov.au should you require further information.

Yours sincerely

Zoe James
A/Assistant Manager
Land Use Management – Metropolitan and Peel
Department of Planning, Lands and Heritage

21 March 2024



Department of **Planning, Lands and Heritage**

GOVERNMENT OF WESTERN AUSTRALIA

Legend

- Local Government Area
- Cadastre (View 1)
- Easements and Other Interests
- Roads
  - Minor
- Land Tenure Large Scale ALL
  - Easements
  - Other Interests
  - Crown Lease
  - Crown Reserve
  - State Forest; Timber Reserve
  - Marine Park
  - Water Isolation
  - Public Road
  - Unallocated Crown Land; Closed Road
  - Miscellaneous (Type 3)
  - Crown Allotment (Type 2)
  - Building, Survey Strata Lots
  - Lot on Survey (Type 1)
- Land Tenure Large Scale 16K
  - Easements
  - Other Interests
  - Crown Lease
  - Crown Reserve

Notes:

* The data that appears on the map may be out of date, not intended to be used at the scale displayed, or subject to license agreements. The map should only be used in matters related to Department of Planning, Lands and Heritage business.

* This map is not intended for measurement purposes.

Map was produced using DPLH's InQuiry.

Lot 8378 on Diagram 35070, being Reserve 24959 (outlined blue)

DPLH BUSINESS USE ONLY

Internal Spatial Viewer

N

0 0.02 0.04 Kilometres

1: 1,000 at A4

Projection: WGS 1984 Web Mercator Auxiliary Sphere

Graticules (if visible): GDA 1994 Latitude/Longitude

Date produced: 20-Mar-2024

ROWE GROUP

Level 3
369 Newcastle Street
Northbridge 6003
Western Australia

p: 08 9221 1991
f: 08 9221 1919
info@rowegroup.com.au
rowegroup.com.au

Job Ref: 9824
26 March 2024

Chief Executive Officer
City of Nedlands
PO Box 9
NEDLANDS WA 6909

Attention: Ms Aviva Micevski – Coordinator Statutory Planning

Dear Aviva,

APPLICATION FOR DEVELOPMENT APPROVAL – LOT 8378 JUTLAND PARADE DALKEITH – FORESHORE WORKS

Rowe Group acts on behalf of Mr and Mrs Fry being the landowners of No.26 (Lot 24) Jutland Parade Dalkeith. We have been instructed by our Client to prepare an lodge an application for Development Approval for works in the foreshore reserve which is directly adjacent to their land. The works are proposed to be located on Lot 8378 Jutland Parade Dalkeith, being Reserve 24959 (the 'subject site'), on land owned by the State of Western Australia and located within the Development Control Area identified by the *Swan and Canning Rivers Management Act 2006 ('SCRM Act')*.

To enable this Application to be processed, the following documentation is enclosed:

- Completed and signed Metropolitan Region Scheme ('MRS') Form 1;
- Copy of the Landowner Consent provided by an authorised officer of the Department of Planning Lands and Heritage (DPLH);
- Copy of the current Certificate of Title; and
- Design Report prepared by Josh Byrne and Associates (includes Development Plans and several Appendices).

The subject site is contained within the 'Parks and Recreation' reservation of the Metropolitan Region Scheme (MRS). As such, the development application is to be determined by the Western Australian Planning Commission (WAPC), on advice from the City of Nedlands and the Department of Biodiversity, Conservation and Attractions. Under the provisions of Clause 29 of the MRS, the Local Authority is to forward a copy of the application to the WAPC within seven (7) days of receipt of the application. The Local Authority may then

provide recommendations to the WAPC in respect of the application within forty-two (42) days of receipt of the application. Please note that a development application fee is not required for this application given the subject land is reserved under the Metropolitan Region Scheme (MRS).

LOCATION AND SITE DESCRIPTION

The subject site is located within the City of Nedlands in the suburb of Dalkeith. The subject site has an area of 893m^2 and is located abutting the Swan River adjacent to No.26 (Lot 24) Jutland Parade Dalkeith. The site currently contains a brick staircase providing access to the Swan River however the staircase is currently unsafe and in a state of disrepair. The foreshore area is currently overgrown with Pepper Trees, weeds and grasses. The site comprises Reserve 24959, more fully described as Lot 8378 on Diagram 35070.

The City of Nedlands issued approval on the 30 January 2024 for a single house on No.26 (Lot 24) Jutland Parade, Dalkeith (DA23/88242). Although the works in the foreshore area which form part of this application did not form part of the application for No.26 (Lot 24) Jutland Parade, Dalkeith, the works and the intent to submit a separate formal application for them, was foreshadowed to the City during the course of assessment of the single house application.

Refer to **Attachment 1 – Certificate of Title**.

PROPOSED DEVELOPMENT

This Application seeks approval to undertake works within the foreshore area to provide access from No.26 (Lot 24) Jutland Parade, Dalkeith to the water level of the Swan River. The proposed development incorporates the following:

- A new replacement staircase providing direct access from No.26 (Lot 24) Jutland Parade, Dalkeith to the river foreshore, including:
    - Installation of a Bondek landing built to the northern boundary of the reserve to connect to a pedestrian access point from No.26 (Lot 24) Jutland Parade;
    - Installation of a 'Light Touch' aluminium walkway structure, including a Surefoot piling system, aluminium floor grate platforms, stairs to negotiate level changes and balustrading;
    - Installation of a Terraforce retaining wall part way down the slope to accommodate the level change of the stairs and structural integrity of the structure;
    - Installation of limestone rock revetment to the back of the shoreline, to protect against erosion in high tides and storm surge events;
- Site clearing and weed management, surface preparation and erosion control measures;
- Revegetation planting including planting of endemic species, monitoring and maintenance of the foreshore area by the owners of No.26 (Lot 24) Jutland Parade, Dalkeith.

Development Plans are contained within the Design Report prepared in support of the proposal, by Josh Byrne and Associates. Refer to **Attachment 2 – Foreshore Design Report**.

TOWN PLANNING CONSIDERATIONS

The subject site is reserved under the Metropolitan Region Scheme ('MRS') for the purposes of 'Parks and Recreation'. Refer to **Figure 1 - Metropolitan Region Scheme**.

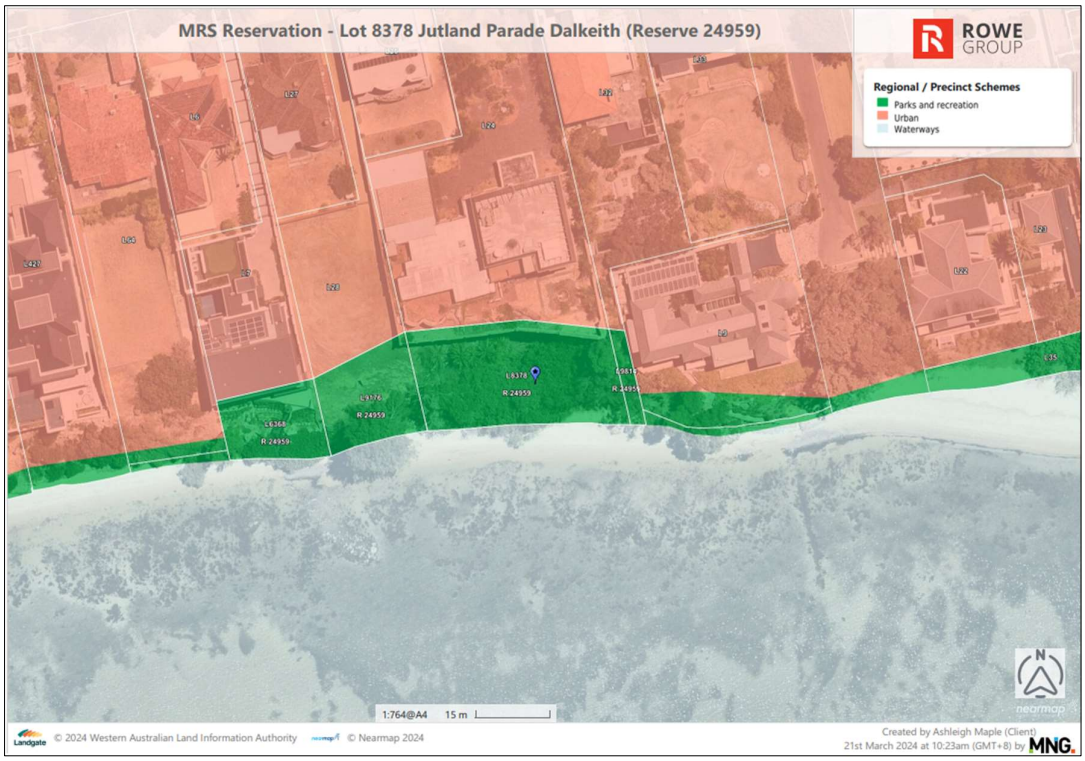


Figure 1 – Metropolitan Region Scheme

In accordance with Clause 28 and 29(1)(a)(i) and (ii) of the MRS, the Application is required to be referred to the Western Australian Planning Commission ('WAPC') for determination, following a recommendation being provided by the City of Nedlands.

The subject site is also located within the Swan River Trust Development Control Area identified by the *SCRM Act* and therefore referral to the Department of Biodiversity, Conservation and Attractions is required as part of the application process.

OTHER CONSIDERATIONS

In preparing the design for the foreshore access, consideration has been given to slope stabilisation, erosion control, revegetation, monitoring and maintenance of the site, structural integrity, coastal risk, tide and water

levels. The Foreshore Design Report prepared by Josh Byrne & Associates includes the following relevant technical reports prepared to inform the design process:

- Survey – prepared by MNG
- Geotechnical Report – prepared by Galt Geotechnics
- Revegetation Management Plan – prepared by Tranen Revegetation Systems
- Technical Note on Dynamics and Design Considerations – Prepared by Seashore Engineering

Refer **Attachment 2 - Foreshore Design Report.**

State Planning Policy 3.7 – Planning in Bushfire Prone Areas

The subject site is not identified as being bushfire prone by the Department of Fire and Emergency Services Map of Bushfire Prone Areas and as such, no further action is required in this regard.

Draft State Planning Policy 2.9 – Planning for Water

Draft State Planning Policy 2.9 – Planning for Water ('Draft SPP 2.9') seeks to ensure that planning and development considers water resource management and includes appropriate water management measures to achieve optimal water resource outcomes. The proposed development responds to section 7.1 and 7.7 of Draft SPP 2.9 which includes various general policy measures and specific policy measures for the Swan Canning River system, as follows:

- The proposed development includes the removal of existing weed species present on the reserve and the planting of endemic species to increase vegetation coverage and stabilise the slope;
- Provides sufficient separation between the structure and the 1:10 year flood level;
- Replaces a dilapidated, unsafe structure with an improved outcome for the site, maintaining and improving access to the River that would otherwise be inaccessible;
- The proposed development is compatible with its riverine environment and provides access to the foreshore for the adjacent land;
- The proposal enhances the natural landscape character through the design of the stairway and revegetation works which will remove an invasive weed and replace it with natural vegetation.

CONCLUSION

The Application seeks approval for a new access to the river foreshore to replace the existing stairway access. The proposed development is considered consistent with the State and Local planning framework for the following reasons:

- The proposed development improves the existing, dilapidated walkway and stairway access, removes existing weed species and unmanaged landscaping;
- The proposed development would improve activation and amenity of the immediate area and provide a useable space for the occupiers of No.26 (Lot 24) Jutland Parade, Dalkeith; and

- The proposed development provides an opportunity to improve the reserve through removal of non-native plant and invasive weed species, planting of endemic species to regenerate and enhance the ecological environment while improving stability for the metastable slope.

On the basis of the above and attached, we respectfully request the WAPC support the proposed development and that the Development Approval is granted.

Should you require any further information or clarification in relation to this matter, please contact George Hajigabriel on 9221 1991.

Yours faithfully,

George Hajigabriel
Rowe Group

Encl. Certificate of Title
Foreshore Design Report

Cc. Client
Josh Byrne and Associates

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
LR3000	**431**

RECORD OF QUALIFIED CERTIFICATE OF CROWN LAND TITLE

UNDER THE TRANSFER OF LAND ACT 1893
AND THE LAND ADMINISTRATION ACT 1997

The undermentioned land is Crown land in the name of the STATE OF WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 8378 ON DIAGRAM 35070

STATUS ORDER AND PRIMARY INTEREST HOLDER:
(FIRST SCHEDULE)

STATUS ORDER/INTEREST: RESERVE UNDER MANAGEMENT ORDER

PRIMARY INTEREST HOLDER: CITY OF NEDLANDS

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. RESERVE 24959 FOR THE PURPOSE OF RECREATION
MANAGEMENT ORDER. CONTAINS CONDITIONS TO BE OBSERVED.

Warning: (1) A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.
(2) The land and interests etc. shown hereon may be affected by interests etc. that can be, but are not, shown on the register.
(3) The interests etc. shown hereon may have a different priority than shown.

----------END OF CERTIFICATE OF CROWN LAND TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	D35070
PREVIOUS TITLE:	LR3000-431
PROPERTY STREET ADDRESS:	LOT 8378 JUTLAND PDE, DALKEITH.
LOCAL GOVERNMENT AUTHORITY:	CITY OF NEDLANDS
RESPONSIBLE AGENCY:	DEPARTMENT OF PLANNING, LANDS AND HERITAGE (SLSD)

NOTE 1: K630802 CORRESPONDENCE FILE 03013-1957-01RO

JOSH BYRNE & ASSOCIATES

26 JUTLAND PARADE, DALKEITH

FORESHORE DESIGN

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02 INTRODUCTION

The owners of 26 Jutland Parade Dalkeith have appointed Josh Byrne & Associates (JBA) to develop a design for the setback area designated in the Development Control Area (DCA).

This response will accompany the Development Application for the lot.

Document Status

Date of issue	Rev No.	Reason for Issue	Author	Reviewed By	Approved by
29/02/2024	A	Issue to Client	PV/NK/MC	PV/MC	PV
08/03/2024	B	Issue to Client	PV/NK/MC	NK	PV
08/03/2024	C	Issue to Client	PV/WN	PV	PV
20/12/2024	D	Issue to Client	PV/WN	PV	PV
27/02/2025	E	Issue for DBCA approval	PV/WN	PV	PV

This document is intended to be printed at A3.

03 BACKGROUND RESEARCH

JBA has conducted site analysis and reviewed relevant reports and policy guidance documents.

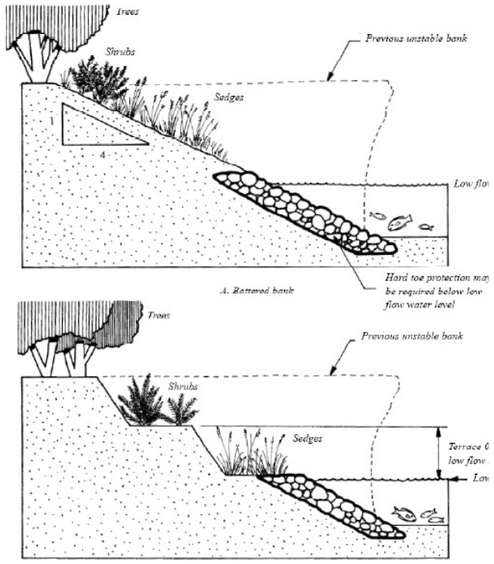
Key documents reviewed include:-

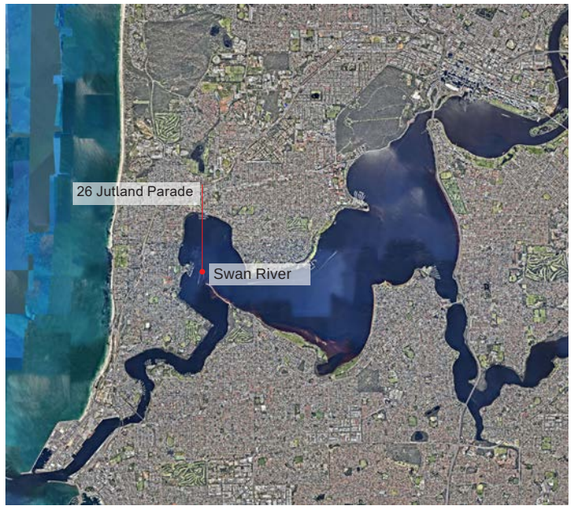
- Swan and Canning Rivers Foreshore Assessment and Management Strategy (Swan River Trust, March 2008)
- Swan Canning River Protection Strategy (Department of Parks and Wildlife, September 2015)
- Swan Canning River System Development Control Procedures (Swan River Trust, 2020)
- Swan River System Landscape Description (Swan River Trust, 1997)
- Corporate Policy Statement 48 - Planning for Development Setback Requirements (Department of Parks and Wildlife, June 2016)
- Point-Resolution-Management-Plan (City of Nedlands, March 2014)
- Potential Impacts of Climate Change on the Swan and Canning Rivers: Summary Paper (Swan River Trust)
- Best Management Practices for Foreshore Stabilisation - Approaches and Decision Support Framework (Swan River Trust, December 2009)
- Best Management Practices for Foreshore Stabilisation - Direct Shore Stabilisation Approaches (Swan River Trust, December 2009)
- Best Management Practices for Foreshore Stabilisation - Erosion Control Matting (Swan River Trust, December 2009)
- Swan River System Landscape Description Precinct 4 (Department of Parks and Wildlife)
- Soils and Landforms of the Perth Area (Department of Agriculture & Food)

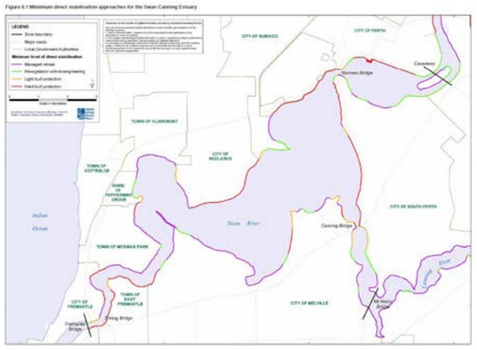
Seashore has assessed the water levels on through analysis of Barrack Street tide gauge data set (1988-2021). Use of tidal planes is limited in the Swan River region. High water levels in the river occur almost exclusively within May-July and low water levels occurring from December-February. 1.65mCD (0.9m AHD) is typically reached about once per year.

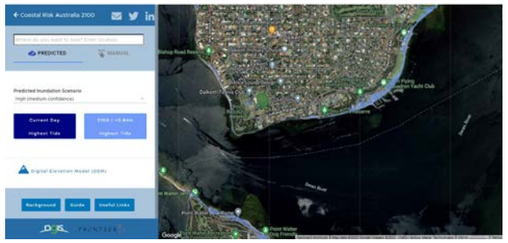
Coastal Risk Australia indicate potential high tides increasing by another 0.84m by 2100. These factors need to be considered when designing the foreshore interface in this location.

The Foreshore Stabilisation, Approaches and Decision-Support Framework Report (Department Parks and Wildlife, December 2009) identifies a minimum direct hard treatment stabilisation approach for this foreshore area.



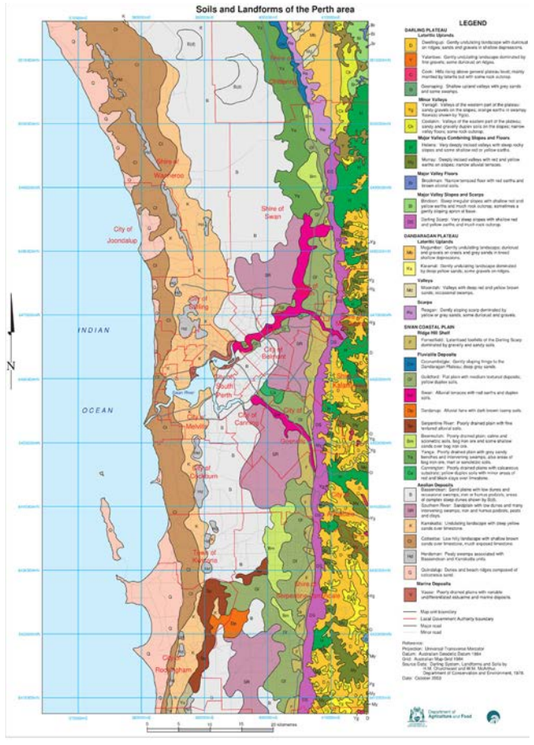






TIDAL PLANE	ABBREVATION	LEVEL (MAHD)	LEVEL (MCD)
Est. 100-yr Recurrence Level	100yARI	1.2 mAHD	1.95 mCD
Est. 10-yr ARI	10yARI	1.1 mAHD	1.79 mCD
Est. 1-yr ARI	1yARI	0.9 mAHD	1.65 mCD
Highest Astronomical Tide	HAT	0.5 mAHD	1.29 mCD
Mean Higher High Water	MHHW	0.3 mAHD	1.03 mCD
Mean Sea Level	MSL	0.0 mAHD	0.75 mCD
Mean Lower Low Water	MLLW	-0.3 mAHD	0.46mCD
Lowest Astronomic Tide	LAT	-0.5 mAHD	0.30 mCD

Table: Barrack Street tide gauge data set (1988-2021)



04 SITE CONTEXT AND CHARACTER

The site is located between Otto Point reserve and Point Resolution Reserve on the Swan River foreshore at Dalkeith.

Geology series mapping contained in Fremantle Part Sheets 2033 I & 2033 IV, Perth Metropolitan Region, Environmental (Gozzard, 1983) indicates that the natural geology of the site comprises limestone. Visual observation also confirms indications of limestone outcropping in the setback area. The river interface of the adjacent lots also displays limestone outcroppings.

The site has very steep grades from the river edge at 0 AHD up to approximately 14.5 AHD. The northern edge of the setback is bordered by the client's house retaining wall, an impressive series of seven brick vaults approximately 8m high. The current path to the river is in a poor state. The brick path and stairs on the steep, sandy slope has been undermined and is unstable. Towards the river and to the western side of the existing brick stair are several limestone outcrops.

Img: Drone view looking north across the existing site

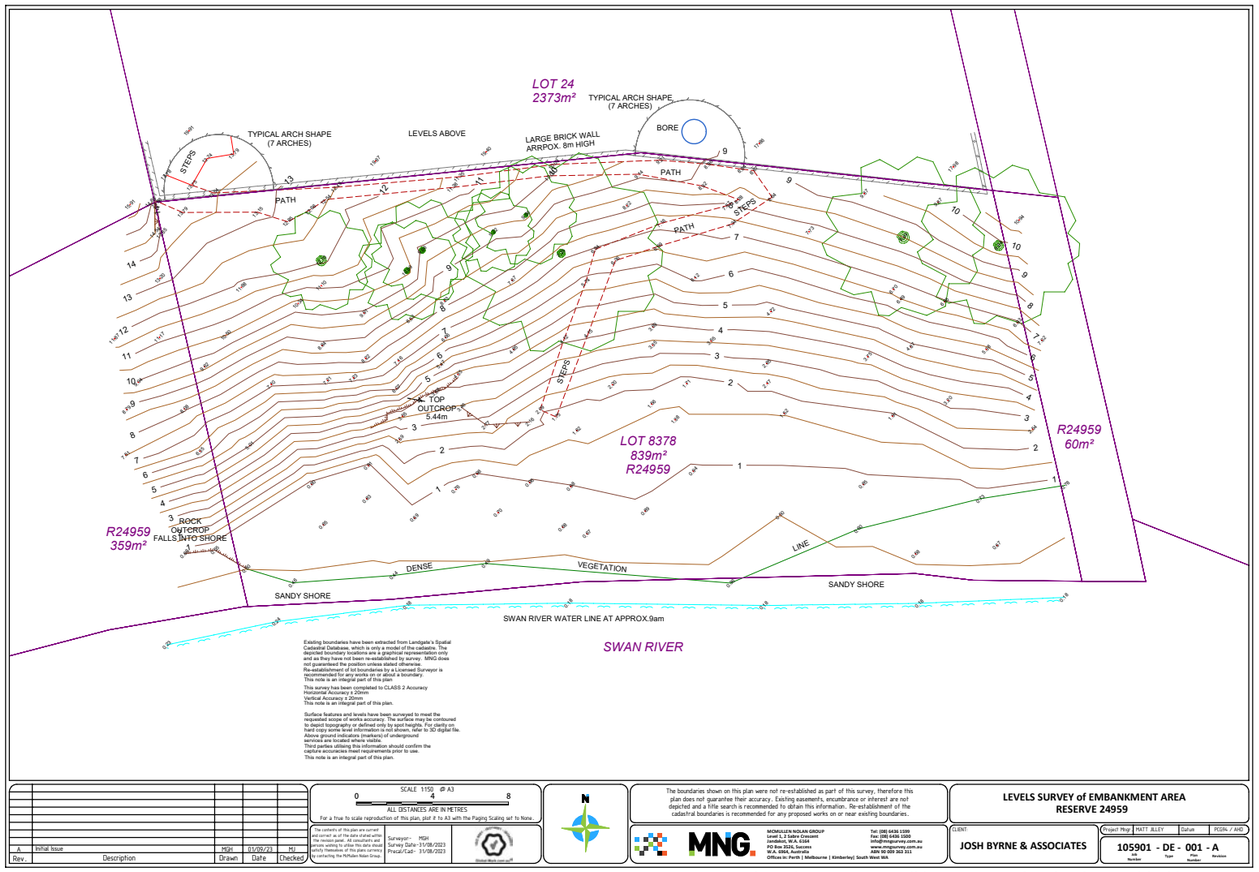
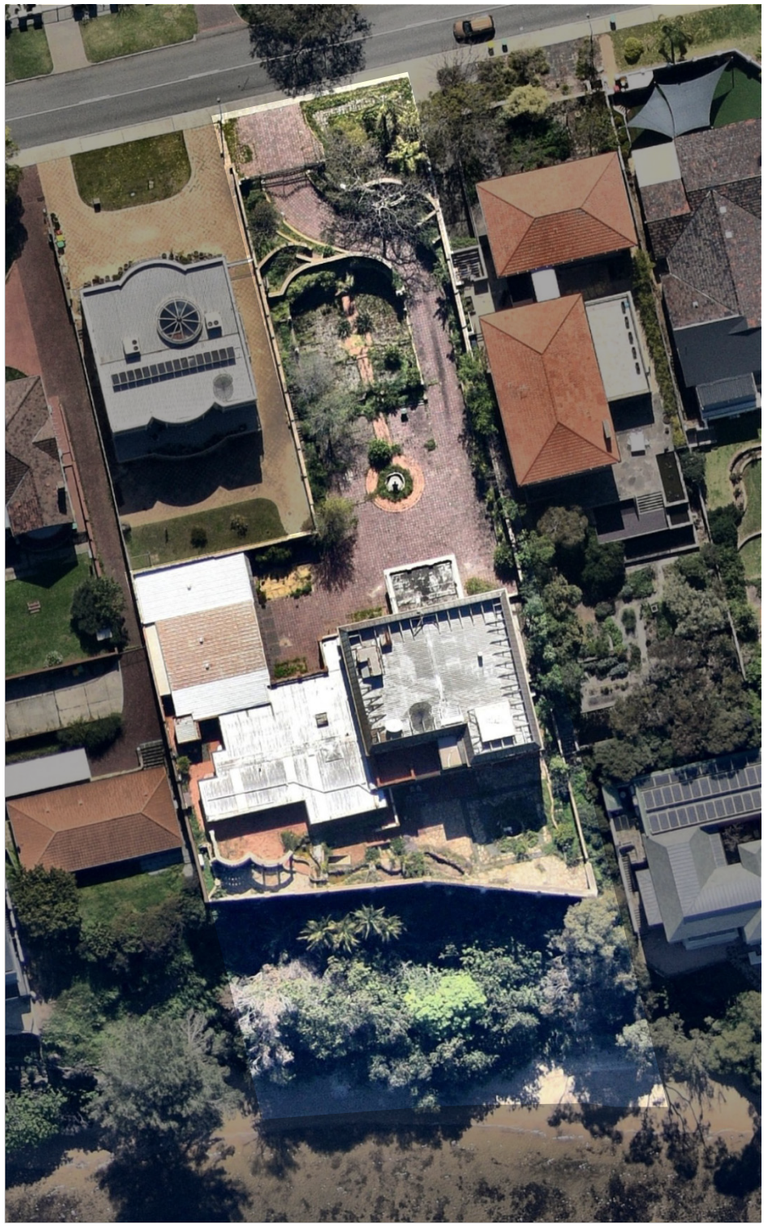


Fig Below: Pre Demolition Survey of setback. Provided by MNG.

05 SITE CONDITIONS



img: Nearmaps

Fig: Site from foreshore, overgrown with weeds

Fig: Limestone rock outcrop and invasive weeds

Fig: Bore and degraded walkway

Fig: Brick stair and walkway undermined

Fig: Undermined walkway and yellow sandy fill

Fig: Staircase entrance to site, graffitied

Fig: Remnants of irrigation, weeds and grasses

Fig: Rubbish, weeds and limestone outcrop

Fig: Limestone outcrop, site from foreshore

06 DESIGN RESPONSE

The design response to the site's challenging topography involves supporting and maintaining the integrity of the "metastable" slope and fulfilling the requirement to create a compliant pathway to the foreshore, whilst also removing non-native plant and invasive weed species and regenerating and enhancing the ecological health of the site.

The design approach focuses on the integration of landscape and structural elements with a "light touch". Incorporating recommendations from structural engineer Terpkos Engineering (Terpkos), coastal engineer Seashore Engineering (Seashore) and environmental consultant Tranen Revegetation Systems (Tranen), our proposal addresses both functional and aesthetic considerations to deliver a resilient, sympathetic and visually appealing foreshore inter-face.

Collaboration and Consultation:

Collaboration with Terpkos, Seashore, and Tranen will continue throughout detailed design and implementation to ensure structural integrity, strong ecological outcomes, and regulatory compliance.

Clearing and Revegetation:

The site contains a recognised environmental weed species, the Brazillian Pepper, along with a number of other non-native plant species. The aim is to remove all Brazillian Pepper by means of cutting down and treating with a chemical herbicide, and to strategically remove all other non-native species. The root systems of the Brazillian Peppers will remain insitu to stabilise the embankment until the revegetation of local species can establish.

The site will be reassessed after clearing in order to tailor the revegetation strategy to the resulting site conditions.

The revegetation strategy will reflect the original ecology of the site, and include the replanting of trees and plants from the Karrakatta vegetation complex, along with appropriate rushes and sedges to the foreshore interface. The re-introduction of local native species will enhance local biodiversity and provide habitat for local wildlife, promoting a positive ecological outcome and assisting with the long-term health and resilience of the surrounding foreshore and broader river system.

Foreshore Access Design:

The proposal is a foreshore access walkway from a supported Bondek landing entry at the top of the slope through a series of level changes, negotiated by stairs, linked by planes of metal floor grating. The base of the slope sits between 1.0 - 1.7 mAHD and rises to 13.6 mAHD. The lower portion of the stair will be a cantilevered landing, on pads set in and protected from coastal erosion by targeted rock revetment and softened with endemic sedges, rushes and shrubs. This design will mitigate large-level changes whilst providing a visually appealing amenity landscape.

The foreshore rock revetment interface will consist of graded limestone armour placed on geotextile, providing stability and resilience against river dynamics. The revetment will be designed to accommodate climate-related river level rises.

Exposed limestone will be utilised to stabilise and bench the interface between the shoreline and proposed house pad levels, creating a natural appearance in harmony with the surroundings.

Construction and Materiality:

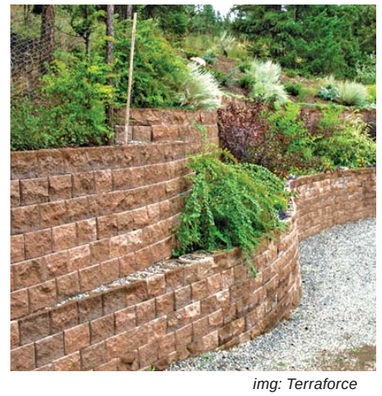
The construction approach adheres to relevant standards and guidelines, prioritising low-impact methods and materials where feasible. Light-touch materials such as aluminium grates and structural members will minimise visual intrusion whilst ensuring durability and compliance with regulatory requirements.

A combination of structural support methods will be used including a surefoot piling system and limestone retaining wall supporting a bon dek structural decking landing at the top entry, Terraforce retaining blockwork at the mid node, and where necessary, concrete footings as slab on piling. The lower stairs will cantilever from pads shored up by a rock strategic placement of rock revetment, providing scour protection to the structure and slope.

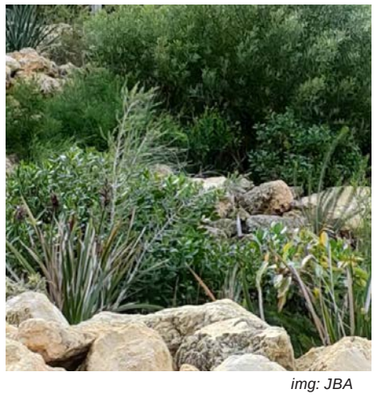
The design will allow for the construction of the primary structure to be placed on site while environmental remediation and clearing works commence in parallel. The walkway flooring metal grating, will be easily installed into the primary structure.

img: Remiseparken / BOGL Landscape Architects

img: Jeffrey Longhenry



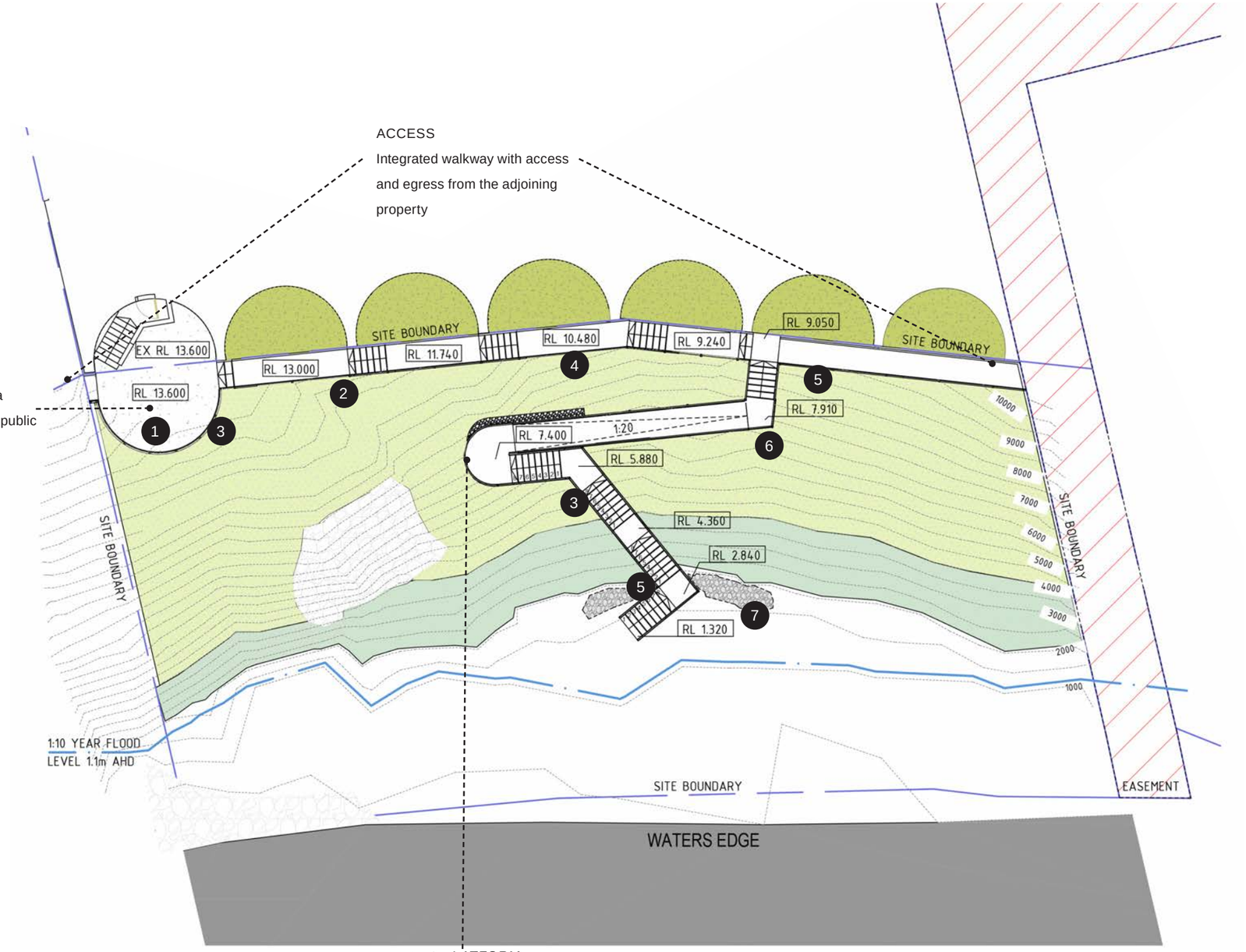
img: Terraforce



img: JBA

07 DESIGN RESPONSE

GENERAL ARRANGEMENT



KEY

1. Bondek Landing to retained top landing.
2. “Light Touch” Aluminium Walkway Structure
3. Surefoot piling system.
4. Aluminium floor grate platform.
5. Stairs used to negotiate large level changes.
6. Balustrade.
7. Limestone rock revetment to back of shoreline to protect against erosion in high tides and storm surge events.

   Proposed top of revetment as advised by the coastal engineer to be a minimum of RL +1.60 - +1.80 AHD.

PLANTING ZONES

DESIGNED GARDEN PLANTING ZONE
Consideration of southern aspect
Shaded with minimal water
Gravel mulch

SLOPE REVEGETATION
Karrakatta vegetation complex species plant species mix
Native shrub and groundcover planting to embankment
Strategic tree placements

RIVERBANK ZONE
Salt tolerant
Sedge planting utilised to visually soften revetment
Planted out of high water level

Planting to rear of shoreline interface with rock revetment to improve erosion control. Appropriate bioengineering to be used to protect the planting.

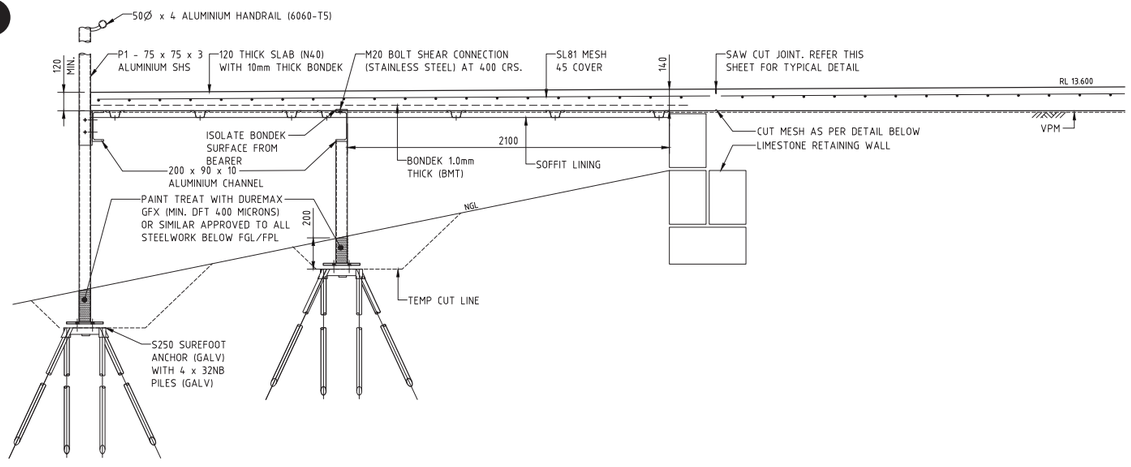
0 2 4 6 7 10m
Scale 1:200 @ A3

08 DESIGN RESPONSE

WALKWAY STRUCTURE & CONSTRUCTION METHODOLOGY

Construction methodology provided by Terpkos.
This should be read in conjunction with all consultant's documentation.

1



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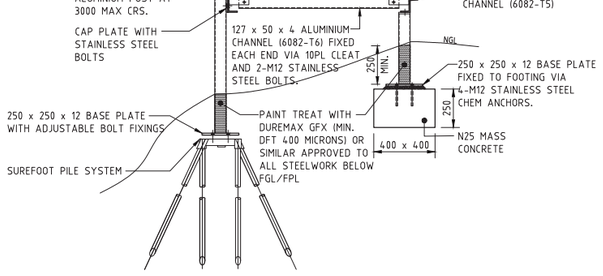

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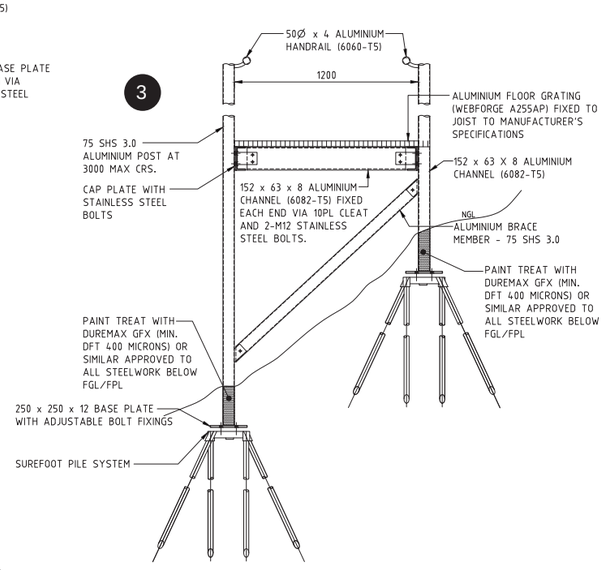

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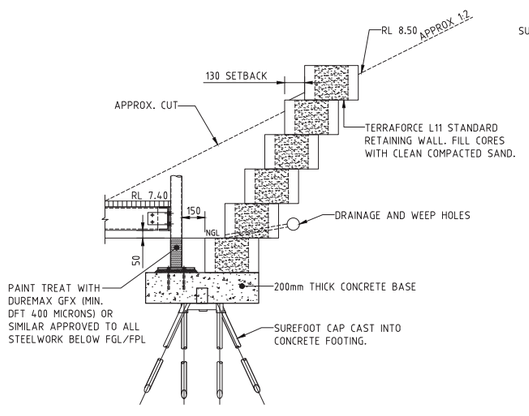


1. Cut back vegetation to slope in accordance with environmental consultants' requirements. Root systems must remain to limit movement in the upper surface of the slope. Seek direction from the consultant team if there is any concern with the slope stability.

2. After clearing the site, inspect the slope and re-survey it if necessary.

3. Demolish the existing path and stairs. Do not disturb the existing retaining wall to the main residence. Avoid placing construction loads or storing equipment at the top of the slope. If necessary, a 1.5kpa construction surcharge can be adopted for the works.

4. Locally cut back and excavate bases for Surefoot pile system and small concrete pads along the top of the walkway from platform RL 13.00 down to RL 9.05.

5. Surefoot piles are to extend a minimum of 3m below ground level. The contractor should note there is limestone rock at varying depths down the slope. Where piles hit rock, they are to be embedded a minimum 500mm into the rock in accordance with manufacturer's specification. The contractor must arrange for a representative from Surefoot to attend the site to provide advice for installing the first piles and to provide direction when piling into rock.

6. The walkway structure and mesh flooring can be installed along this upper length to allow greater access to the lower section of the platform. Maintain the 1.5 kpa construction surcharge limit while using the walkway for access.

7. Prepare bases for the remaining Surefoot piles for the lower section of the access walkway. Locally cut into slope to allow for Terraforce retaining wall footing. Install Surefoot piles as detailed and arrange the engineer's inspection prior to pouring.

8. Ensure protection of the slope during the works and provide temporary shoring as necessary. Prevent sand/debris from backfilling over Surefoot bases.

9. Install the remaining access walkway structure through to the platform at RL 7.40. Maintain the 1.5 kpa construction surcharge limit while using the walkway for access.

10. Coordinate construction and rock protection of the lower landing pad.

11. Install remaining Surefoot piles and access walkway structure as documented.

12. Arrange engineer's inspection to verify works.

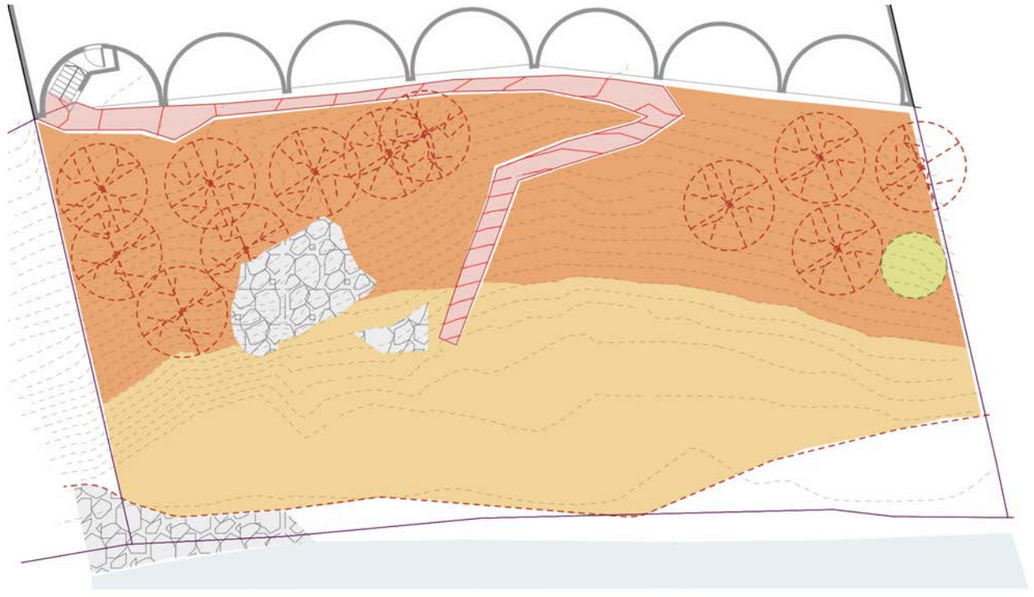
13. Revegetation consultant team to advise on future planting to maintain the stability of the upper surface of the slope.

Construction Methodology, provided by Terpkos. This should be read and followed in conjunction with environmental/revegetation specialist methodology and coastal engineer's documentation.

09 DESIGN RESPONSE

CLEARING, SLOPE STABILISATION & EROSION CONTROL STRATEGY

PHASE 1
SITE CLEARING & WEED MANAGEMENT
PROPOSED TO TAKE PLACE APRIL 2024



LEGEND

- Demolish existing brick path and stair
- Retain native species
- Cut & herbicide Brazillian Pepper
  Strategic removal of non-natives
  Retain roots for slope support
- Steep slope
  Harnessing requirements
  Backpack spraying
  Hand removal
- Hand removal and riverine appropriate herbicides.
  Dashed red line indicates surveyed extent of vegetation

The environmental consultant, Tranen has provided the clearing and revegetation methodology. This should be read and followed in conjunction with all consultant documentation.

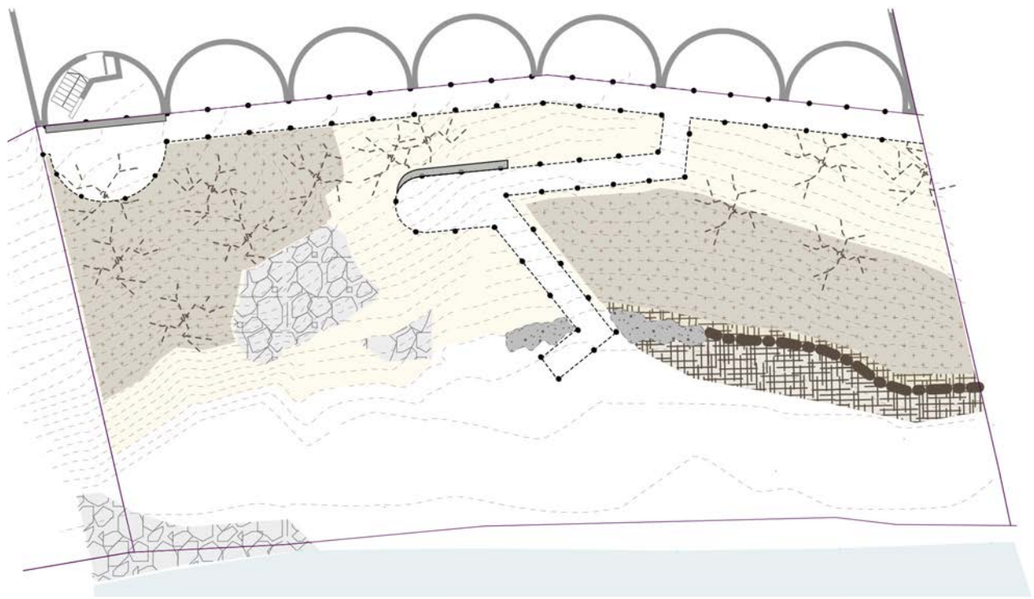
The base of the slope sits between 1.0 - 1.7 mAHD and rises to 13.6 mAHD. It is classed as “metastable” by Galt Engineering. Rope access and harnessing will be necessary during site clearing.

Strategic removal of non-native species to occur prior to planting. Root systems of some trees left in place. Erosion control measures will be implemented, assisting with soil stabilisation.

Weed control events are typically completed in winter, spring, and summer each year. The initial clearing will target main weed species in their growth period, including the systematic removal of the on-site Brazilian Pepper and other non-native vegetation. Some large Tuart trees were observed and will be retained.

Selective herbicides that are appropriate to the target species will be used. In close proximity to the river, only herbicides safe for use in these environments will be used.

PHASE 2
SURFACE PREPARATION & EROSION CONTROL



LEGEND

- Roots retained for slope support
- Retaining
  Limestone at top landing
  Terraforce at mid node
- Structure in place (diagramatic)
  Lower stairs to cantilever from pads
- Rock revetment where necessary

Where appropriate:

- Brush mattressing / much
- Coir logs
- Coir netting / geotextiles

The steep slope is identified as “metastable” by Galt Engineering, necessitating intervention to maintain its integrity. Non-native species will be strategically removed before revegetation planting, with some tree root systems left in place, reducing damage and erosion to the slope if removed, while providing structure for slope support.

Erosion control measures such as coir netting, coir logs, and brush fencing will be considered after clearing. Revegetation and stabilisation planting using native species will occur during winter, with surface preparation to mitigate runoff and improve plant survival.

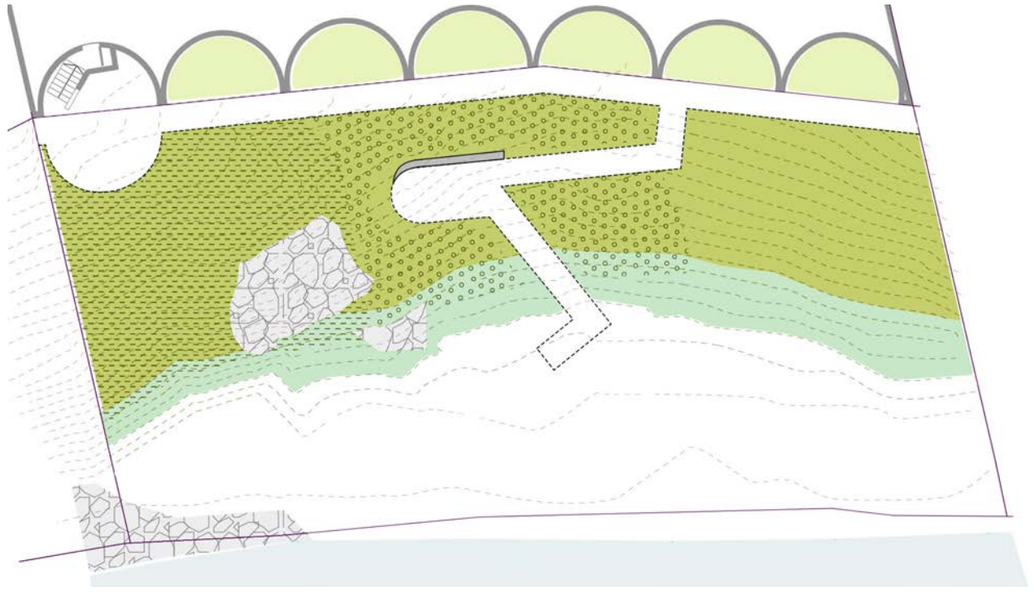
Stabilisation measures providing flexibility, such as brush mattressing and mulch may be required. The requirements for site surface preparation will be reviewed following vegetation removal and the re-assessment of site stability, with additional stabilisation options proposed if required.

Seashore Engineering will design the foreshore stabilisation, with particular consideration to the area surrounding the lower landing portion of access stairs. The design will include rock pitching with a geotextile layer for erosion reduction.

10 DESIGN RESPONSE

REVEGETATION, MONITORING & MAINTENANCE STRATEGY

PHASE 3
REVEGETATION & PLANTING



LEGEND

- **Karakatta Complex Planting Priority Areas:**
  - Fast growing, high density forestry and deep cell tubestock with fertiliser tablets
- Bare / exposed slope stabilisation
- Steep slope revegetation
- Riverbank Zone
- Designed Garden Zones

A nominal plant species list focusing on the Karrakatta Complex – Central and South has been developed by JBA and Tranen, prioritising fast-growing species for soil stability and cover.

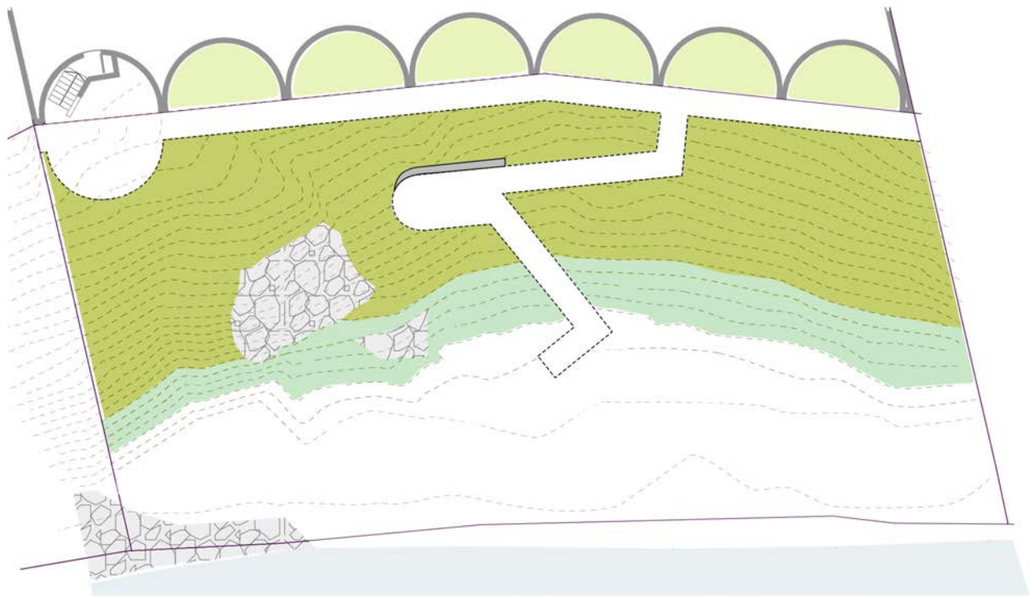
Tubestock, supplied in forestry tubes or deep cells, will be used for planting, ensuring hardy seedlings with developed root systems. Plant orders from native nurseries must be placed in advance, typically before September of the preceding year.

Due to steep slopes, planting may require abseiling with a kidney bucket and hand trowel, necessitating sturdy anchor points across the slope. Coordination with the contractor building the walkway can facilitate this process.

Planting on the slope is expected to occur during naturally wet months, with irrigation set up to enhance survival rates. Fertiliser tablets are recommended to compensate for nutrient deficiencies on slopes, as organic matter may be lacking, and tablets provide nutrients directly to seedlings while minimising weed interference. The Riverbank Zone will be planted prior to the winter storms and will include a selection of salt tolerant species.

The Designed Garden Zones will be addressed at a later stage.

PHASE 4
MONITORING & MAINTENANCE



LEGEND

- Karakatta Complex
- Riverbank Zone
- Designed Garden Zones

Two informal monitoring events per year are recommended during spring and autumn to assess growth. Results will determine if remedial actions like weed control and infill planting are needed.

Maintenance will continue for five years post-installation to establish a self-sustaining vegetation community.

Weed control and infill planting will follow the installation plan unless issues arise, such as poor species establishment or inadequate erosion control.

Completion criteria, including species richness and erosion control, will be developed after existing vegetation removal.

Ongoing weed control will be necessary throughout the maintenance period, with surface preparation and erosion control strategies devised after vegetation removal.

11 DESIGN RESPONSE

PLANTING PALETTE

Planting palette developed by Tranen and Josh Byrne & Associates.
This should be read in conjunction with all consultant's documentation.

SHRUBS AND STRAPPY PLANTS

Acacia cochlearis

Image: R Clark

Acacia cyclops

Image: honkeynuts.com.au

Acacia pulchella

Image: gardentags.com

Acacia rostellifera

Image: R Clark

Allocasuarina humilis

Image: friendsofqueensparkbushland.org.au

Calothamnus quadrifidus

Image: katanninglandcare.org.au

Dianella revoluta

Image: gardeningwithangus.com.au

Grevillea crithmifolia

Image: Plantrite

Hakea prostrata

Image: friendsofqueensparkbushland.org.au

Hardenbergia comptoniana

Image: greatoceanroadnursery.com.au

Hemiandra pungens

Image: oleantaseeds.com.au

Melaleuca huegelii

Image: honkeynuts.com.au

Melaleuca seriata

Image: honkeynuts.com.au

Olearia axillaris

Image: cottesloecoastcare.org

Patersonia occidentalis

Image: australianseed.com

Scaevola crassifolia

Image:Geographe Plants/R. Clark

Scaevola nitida

Image:Geographe Plants/R. Clark

Templetonia retusa

Image: australianseed.com

TREES

Melaleuca cuticularis

Image: Apace

Corymbia callophylla

Image: instanttreenursery.com.au

Eucalyptus gomphocephala

Image: Lucid Central

RUSHES AND SEDGES

Juncus kraussii

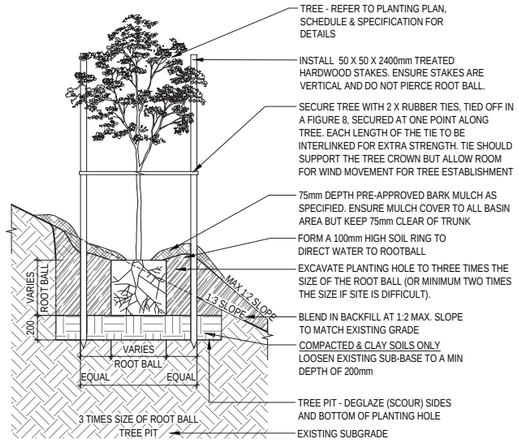
Image: Apace WA

Lepidosperma gladiatum

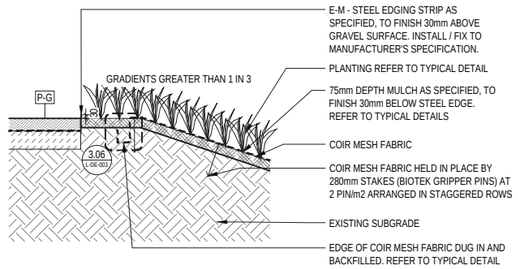
Image: rewildperth.com.au

12 DESIGN RESPONSE

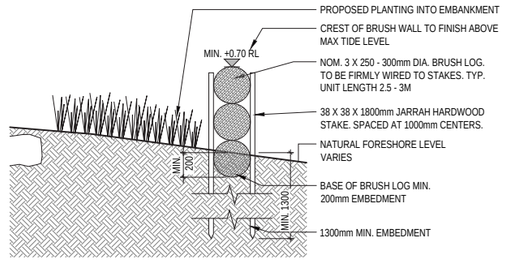
TYPICAL PLANTING DETAILS



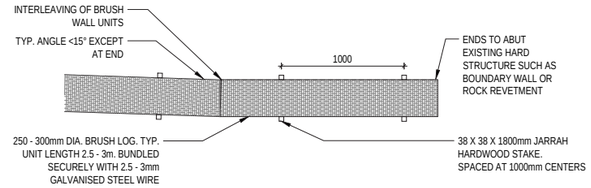
TYPICAL DETAIL - SEMI-ADVANCED TREE PLANTING ON EMBANKMENTS STEEPER THAN 1 IN 6



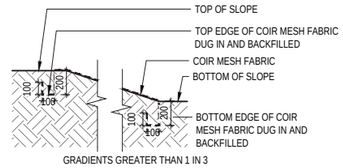
TYPICAL DETAIL - PLANTING ON SLOPE



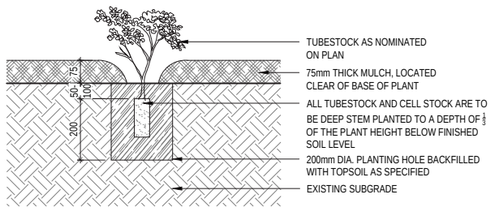
TYPICAL DETAIL - BRUSH WALLING



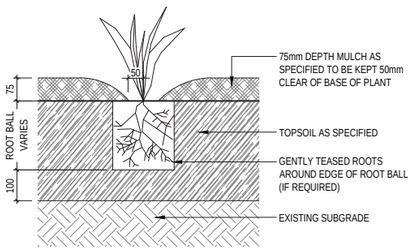
TYPICAL PLAN - BRUSH WALLING CONTINUOUS PLACEMENT



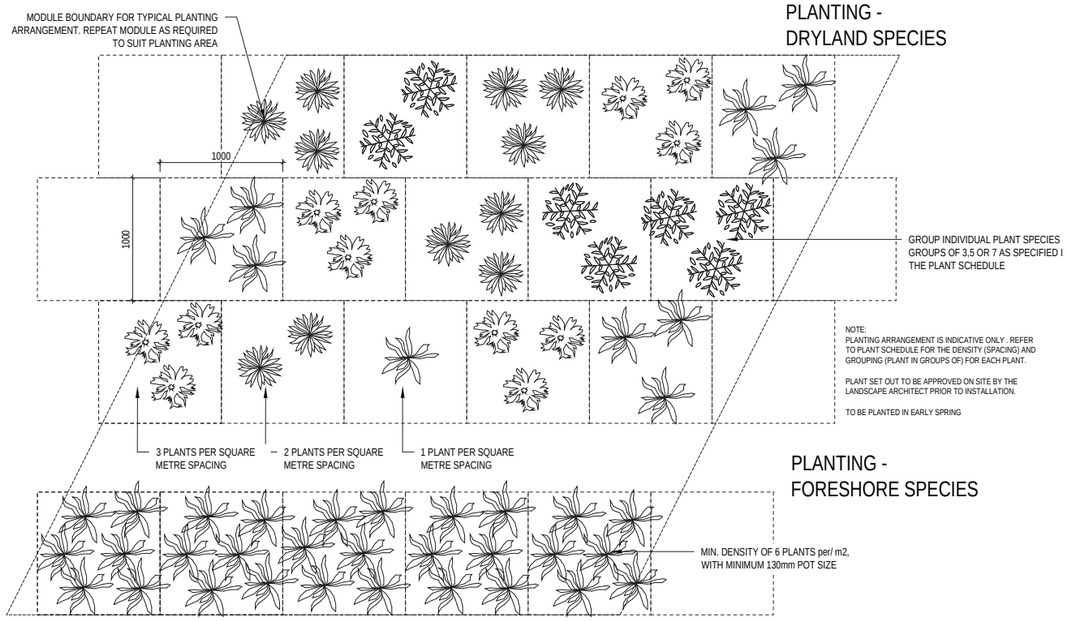
TYPICAL DETAIL - BIODEGRADABLE GEOTEXTILE FABRIC



TYPICAL DETAIL - TUBESTOCK PLANTING METHOD

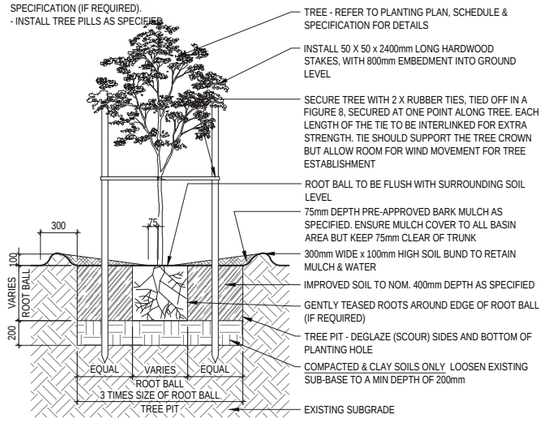


TYPICAL DETAIL - SHRUB PLANTING



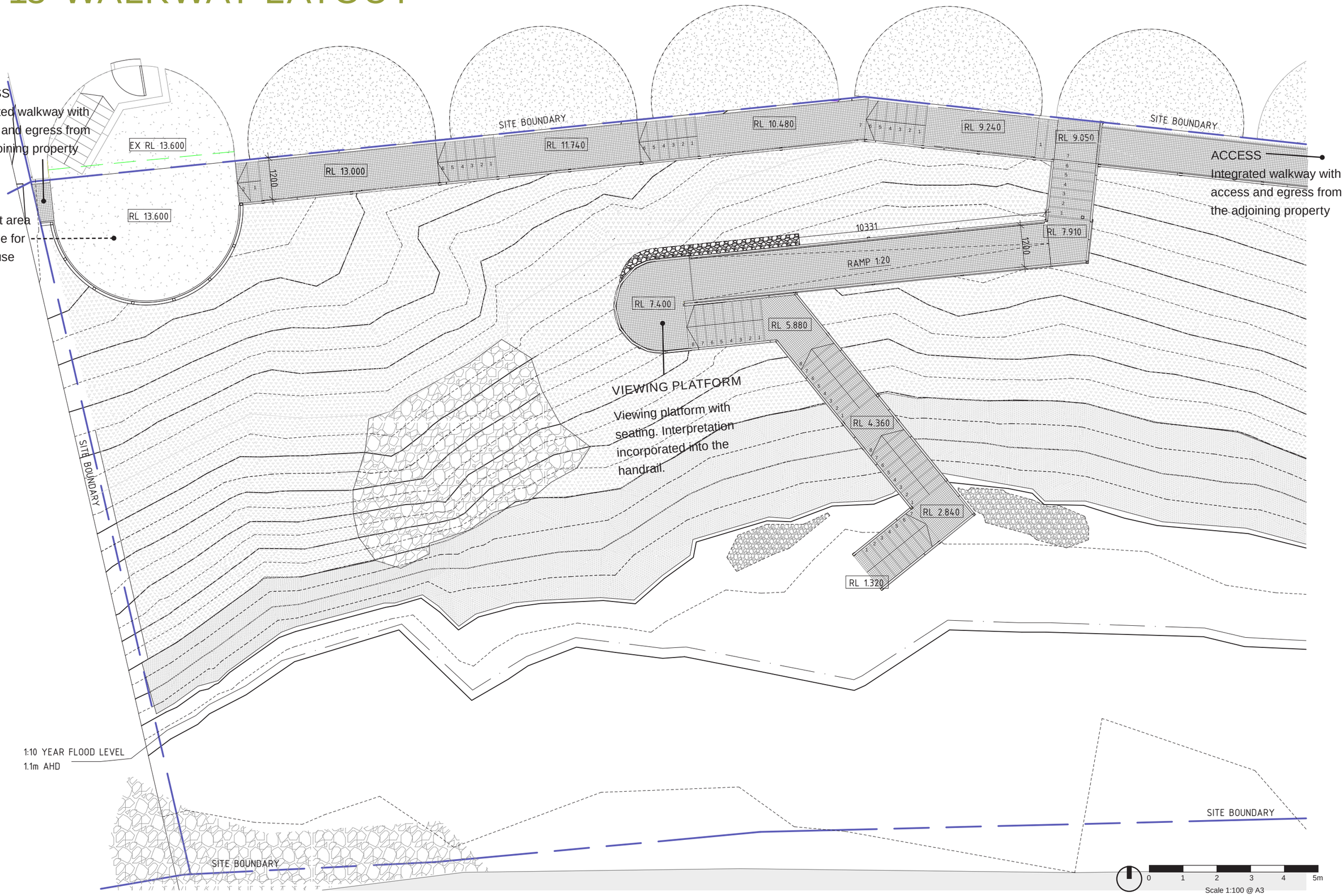
TYPICAL LAYOUT PLAN - PLANTING MIXES

TREE PLANTING NOTES
- IRRIGATION AS PER IRRIGATION SPECIFICATION (IF REQUIRED).
- INSTALL TREE PILLS AS SPECIFIED

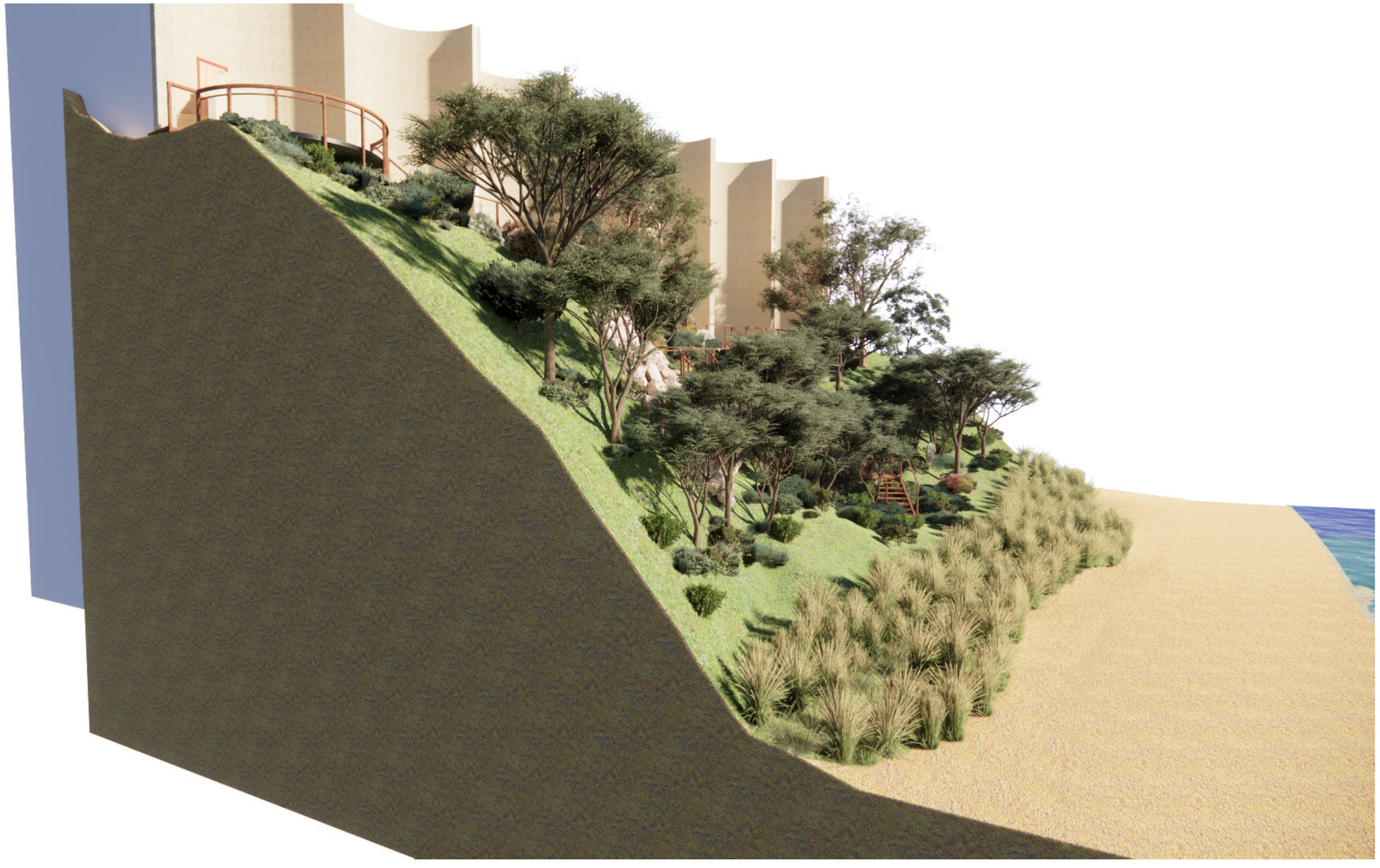


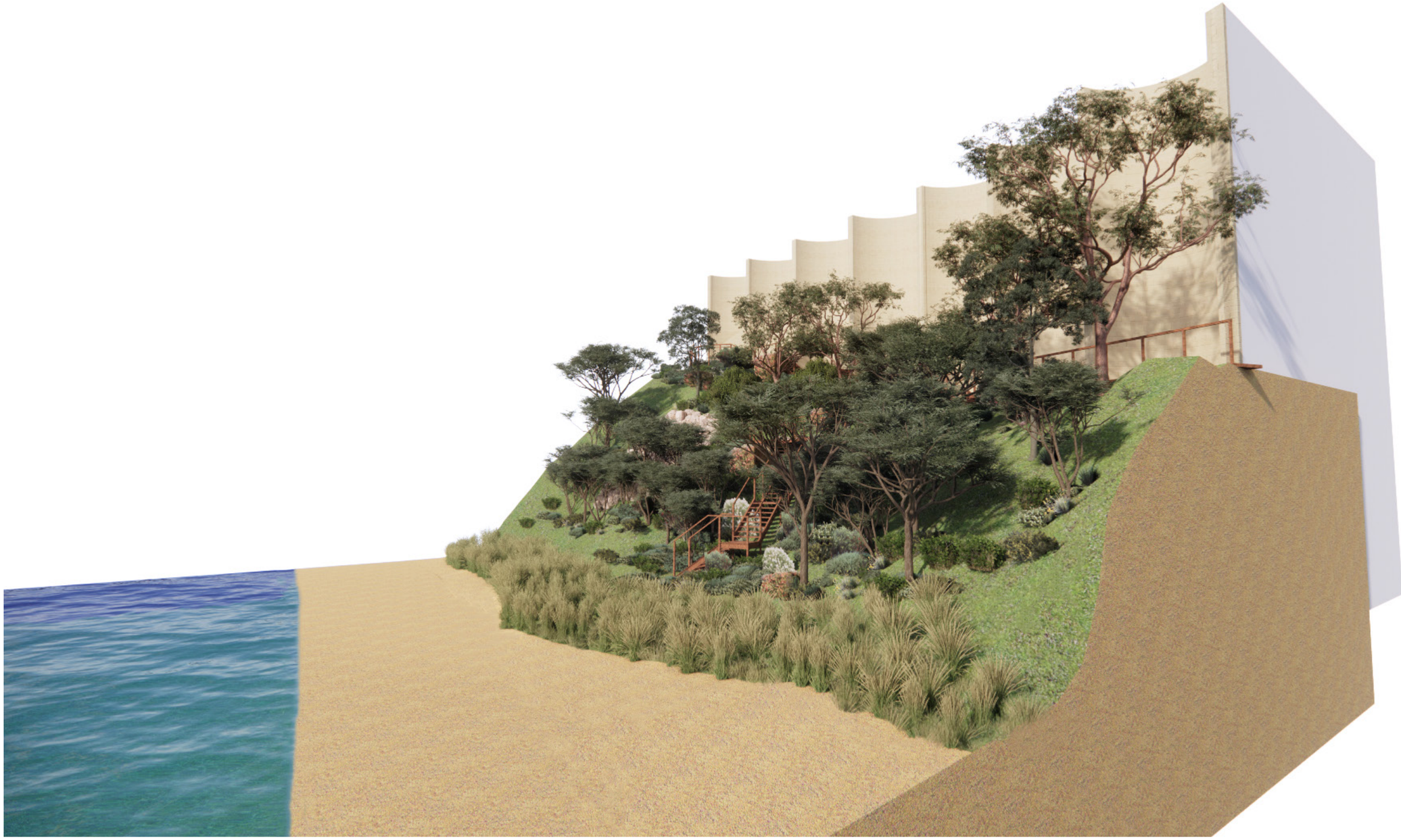
TYPICAL DETAIL - SEMI-ADVANCED TREE PLANTING

13 WALKWAY LAYOUT



14 RENDERS





JOSH BYRNE & ASSOCIATES

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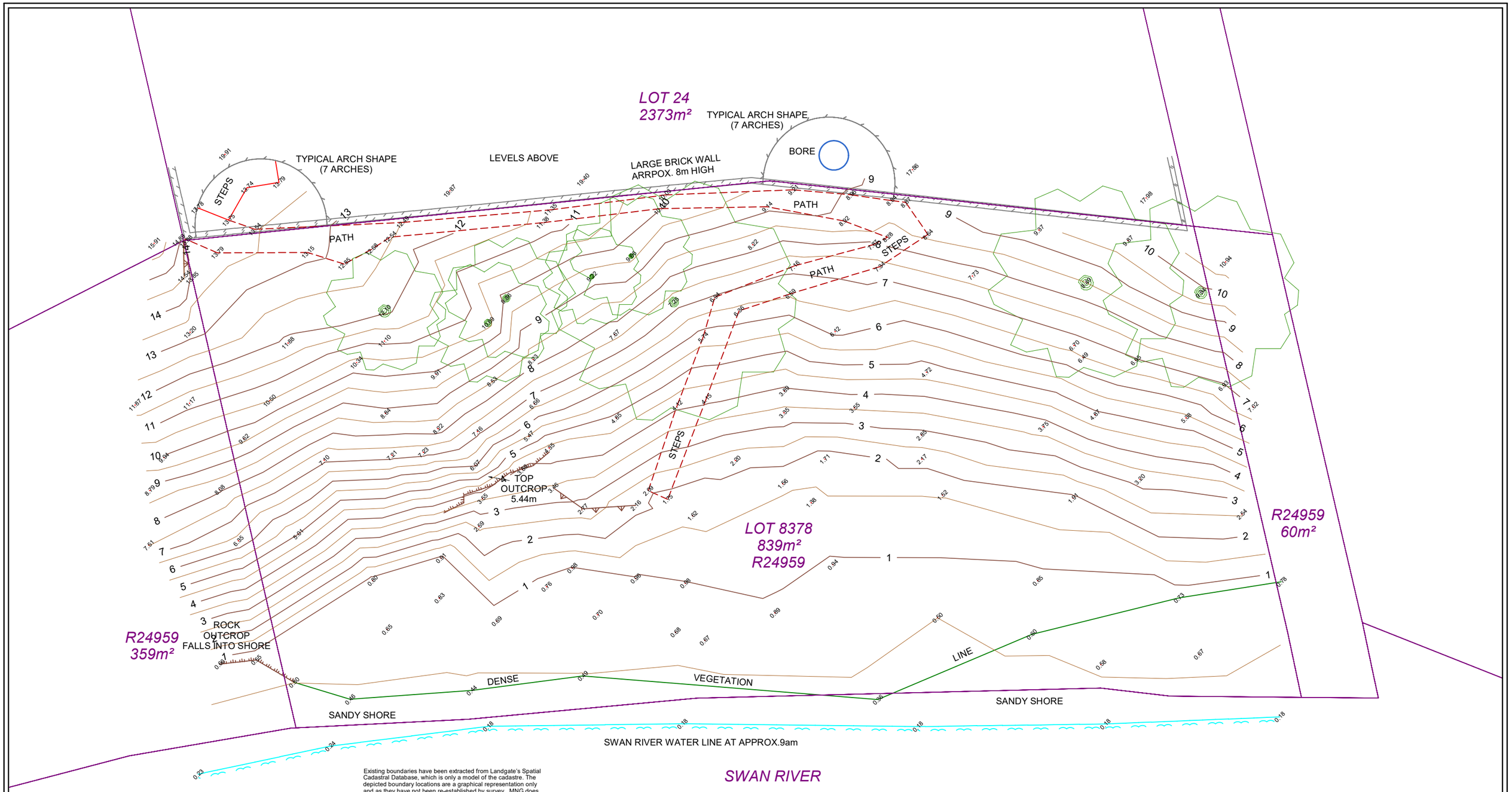

Existing boundaries have been extracted from Landgate's Spatial Cadastral Database, which is only a model of the cadastre. The depicted boundary locations are a graphical representation only and as they have not been re-established by survey. MNG does not guaranteed the position unless stated otherwise.
Re-establishment of lot boundaries by a Licensed Surveyor is recommended for any works on or about a boundary.
This note is an integral part of this plan

This survey has been completed to CLASS 2 Accuracy
Horizontal Accuracy ± 20mm
Vertical Accuracy ± 20mm
This note is an integral part of this plan.

Surface features and levels have been surveyed to meet the requested scope of works accuracy. The surface may be contoured to depict topography or defined only by spot heights. For clarity on hard copy some level information is not shown, refer to 3D digital file. Above ground indicators (markers) of underground services are located where visible.
Third parties utilising this information should confirm the capture accuracies meet requirements prior to use.
This note is an integral part of this plan.

Rev.	Description	Drawn	Date	Checked
A	Initial Issue	MGH	01/09/23	MJ

SCALE 1:150 @ A3
0 4 8
ALL DISTANCES ARE IN METRES
For a true to scale reproduction of this plan, plot it to A3 with the Paging Scaling set to None.

The contents of this plan are current and correct as of the date stated within the revision panel. All consultants and persons wishing to utilise this data should satisfy themselves of this plans currency by contacting the McMullen Nolan Group.

Surveyor:- MGH
Survey Date:-31/08/2023
Precal/Cad:- 31/08/2023

N

The boundaries shown on this plan were not re-established as part of this survey, therefore this plan does not guarantee their accuracy. Existing easements, encumbrance or interest are not depicted and a title search is recommended to obtain this information. Re-establishment of the cadastral boundaries is recommended for any proposed works on or near existing boundaries.

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LEVELS SURVEY of EMBANKMENT AREA RESERVE 24959

CLIENT:
JOSH BYRNE & ASSOCIATES

Project Mngr	MATT JILLEY	Datum	PCG94 / AHD

105901 - DE - 001 - A
Job Number | Type | Plan Number | Revision