Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lots 808, 809 Albany hwy and Lot 3430 Attfield Road, Maddington

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 28th Month November Year 2023

Report author or reviewer: Mike Scott

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 27795 Accreditation expiry: Month February Year 2024

Bushfire management plan version number: 1.0

Bushfire management plan date: Day 30th Month November Year 2023

Client/business name: Dynamic Planning and Development

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✔
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		✔

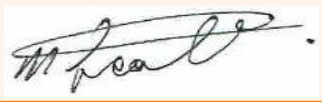
Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use		✔
Vulnerable land-use		✔

None of the above ☑

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 30th November 2023

BUSHFIRE PRONE PLANNING

Bushfire Management Plan (BMP)

Produced to meet the relevant requirements of STATE PLANNING POLICY 3.7 Planning in Bushfire Prone Areas & Guidelines

Lots 808, 809 Albany Highway & Lot 3430 Attfield Road Maddington

City of Gosnells

Subdivision Application

30 November 2023

Job Reference No: 190433

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

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DOCUMENT CONTROL

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VERSION HISTORY		
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1.0	Original	30 November 2023
-	Select	

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Reegan Cake	reegan.cake@dynamicplanning.net.au	1.0		☐	☒
		-		☐	☐

Limitations: *The protection measures that will be implemented based on information presented in this Bushfire Management Plan are minimum requirements and they do not guarantee that buildings or infrastructure will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating.*

This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required protection measures (including bushfire resistant construction) and any other required or recommended measures, will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.

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SUMMARY STATEMENTS

THIS DOCUMENT – STATEMENT OF PURPOSE

The Bushfire Management Plan (BMP)

The BMP sets out the required package of bushfire protection measures to lessen the risks associated with a bushfire event. It establishes the responsibilities to implement and maintain these measures.

The BMP also identifies the potential for any negative impact on any environmental, biodiversity and conservation values that may result from the application of bushfire protection measures or that may limit their implementation.

Risks Associated with Bushfire Events

The relevant risks are the potential for loss of life, injury, or destroyed or damaged assets which results in personal loss and economic loss. For a given site, the level of that risk to persons and assets (the exposed elements) is a function of the potential threat levels generated by the bushfire hazard, and the level of exposure and vulnerability of the at risk elements to the threats.

Bushfire Protection Measures

The required package of protection measures is established by *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, its associated *Guidelines* and any other relevant guidelines or position statements published by the Department of Planning, Lands and Heritage. These measures are limited to those considered by the WA planning authorities as necessary to be addressed for the purpose of land use planning. They do not encompass all available bushfire protection measures as many are not directly relevant to the planning approval stage. For example:

- Protection measures to reduce the vulnerability of buildings to bushfire threats is primarily dealt with at the building application stage. They are implemented through the process of applying the Building Code of Australia (Volumes 1 and 2 of the national Construction Code) in accordance with WA building legislation and the application of construction requirements based on a building's level of exposure - determined as a Bushfire Attack Level (BAL) rating); or
- Protection measures to reduce the threat levels of consequential fire (ignited by bushfire and involving combustible materials surrounding and within buildings) and measures to reduce the exposure and vulnerability of elements at risk exposed to consequential fire, are not specifically considered.

The package of required bushfire protection measures established by the Guidelines includes:

- The requirements of the bushfire protection criteria which consist of:
    - Element 1: Location (addresses threat levels).
    - Element 2: Siting and Design of Development (addresses exposure levels of buildings).
    - Element 3: Vehicular Access (addresses exposure and vulnerability levels of persons).
    - Element 4: Water (addresses vulnerability levels of buildings).
    - Element 5: Vulnerable Tourism Land Uses (addresses exposure and vulnerability as per Elements 1-4 but in use specific ways and with additional considerations of persons exposure and vulnerability).
- The requirement to develop Bushfire Emergency Plans / Information for 'vulnerable' land uses for persons to prepare, respond and recover from a bushfire event (this addresses vulnerability levels).
- The requirement to assess bushfire risk and incorporate relevant protection measures into the site emergency plans for 'high risk' land uses (this addresses threat, exposure and vulnerability levels).

Compliance of the Proposed Development or Use with SPP 3.7 Requirements

The BMP assesses the capacity of the proposed development or use to implement and maintain the required 'acceptable' solutions and any additionally recommended bushfire protection measures - or its capacity to satisfy the policy intent through the justified application of additional bushfire protection measures as supportable 'alternative' solutions.

THE PROPOSED DEVELOPMENT/USE – BUSHFIRE PLANNING COMPLIANCE SUMMARY		
Environmental Considerations		**Assessment Outcome**
Will land with identified environmental, biodiversity and conservation values limit the full application of the required bushfire protection measures?		No
Will land with identified environmental, biodiversity and conservation values need to be managed in the implementation and maintenance of the bushfire protection measures - but not limit their application?		Yes
Required Bushfire Protection Measures The Acceptable Solutions of the Bushfire Protection Criteria (Guidelines)		**Assessment Outcome**
Element	The Acceptable Solutions	
1: Location	A1 Location	Fully Compliant
	A1.1 Development location	Fully Compliant
2: Siting and Design of Development	A2 Siting and Design of Development	Fully Compliant
	A2.1 Asset Protection Zone (APZ)	Fully Compliant
3: Vehicular Access	A3 Vehicular Access	Fully Compliant
	A3.1 Public roads	Fully Compliant
	A3.2a Multiple access routes	Fully Compliant
	A3.2b Emergency access way	N/A
	A3.3 Through-roads	Fully Compliant
	A3.4a Perimeter roads	Fully Compliant
	A3.4b Fire service access route	N/A
	A3.5 Battle-axe legs	N/A
	A3.6 Private driveways	N/A
4: Water	A4 Water	Fully Compliant
	A4.1 Identification of future water supply	N/A
	A4.2 Provision of water for firefighting purposes	Fully Compliant

Other Documents Establishing Bushfire Protection Measure Variations or Additions	Assessment Outcome
A 'Planning Approval' which contains 'Conditions' to be met.	Fully Compliant
A DPLH/WAPC 'Position Statement'	Fully Compliant
Bushfire Management Plan Guidance for the Dampier Peninsula (DPLH 2021 Rev B)	N/A

1 PROPOSAL DETAILS AND THE BUSHFIRE MANAGEMENT PLAN

1.1 The Proposed Development/Use Details, Plans and Maps

The Proposal's Planning Stage For which certain bushfire planning documents are required to accompany the planning application.	Subdivision Application (condition of approval) Items 37 to 41
The Subject Land/Site	Lots 808 Albany Highway and 3430 Attfield Road, Maddington
Number of Additional Lots Created	60 residential lots, 4 reserves, and roads.
The 'Specific' Land Use Type for **Bushfire Planning** When applicable, this classification establishes a requirement to conduct assessments and develop documents that are additional to this Bushfire Management Plan.	N/A
Description of the Proposed Development/Use	
This Bushfire Management Plan is to accompany the amended plan of subdivision for Lot 808 Albany Highway and Lot 3430 Attfield Road, Maddington. This Bushfire Management Plan supercedes the existing Bushfire Management Plan by RUIC Fire (Version 1.4 September 2018). This BMP addresses: • The amended Wetland and Landscape Development Management Plan for Lots 808 and 809 Albany Highway Maddington (Oversby Consulting Pty Ltd – November 2022), and the resultant bushfire attack levels for the proposed lots, once the landscaping plan is implemented. • The revised lot layout per the Subdivision Concept Plan dated 2nd March 2023. • The bushfire planning requirements stated in the WAPC Approval Subject to Conditions Application number 155487 Items 37 to 41.	
Description of Planned Staged Development and the Management of Potential Bushfire Planning Issues	
Where the proposed development is staged, each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas (v1.4), and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance. Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.	

Figure 1.1

Proposed Subdivision Site Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

ATTFIELD ST
RIVER AV
RIVER AV
ATTFIELD ST
PINOT ST
ALBANY HWY
ALBANY HWY
Canning River
Canning River

8001 8002 8003 8004

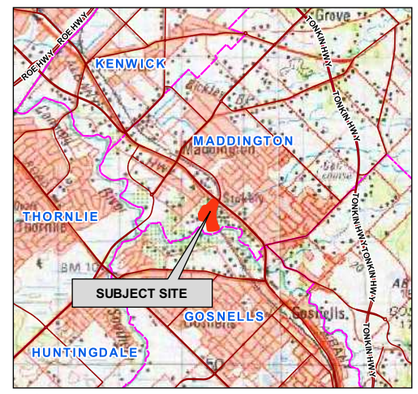
200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259

------ LEGEND ------

Proposed Lots
Subject Site
Cadastre

0 20 40 60 80 100 120
Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 15-03-2023
SCALE (A3): 1 : 1800

BUSHFIRE PRONE PLANNING

Figure 1.2

Proposed Subdivision Location Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

------ LEGEND ------

- Subject Site
- Cadastre
- Reserves
- Bush Forever Sites

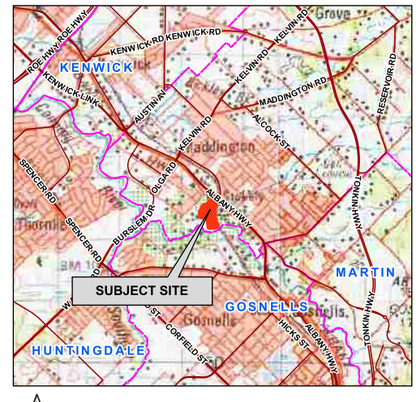
DBCA Legislated Lands and Waters

- SCRM Act - River Reserve

0 100 200 300 400 500 600

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 10000

BUSHFIRE PRONE PLANNING

Figure 1.3

Proposed Subdivision Bushfire Prone Areas Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

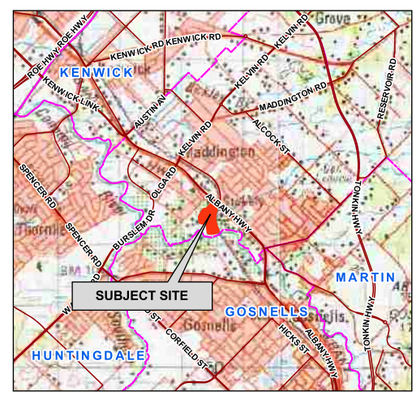
------ LEGEND ------

- Bush Fire Prone Areas 2021
- Subject Site
- Cadastre

0 100 200 300 400 500 600

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 10000

BUSHFIRE PRONE PLANNING

1.2 The Bushfire Management Plan (BMP)

1.2.1 Commissioning and Purpose

Proponent:	Dynamic Planning and Developments
Bushfire Prone Planning commissioned to produce the BMP by:	Dynamic Planning and Developments
Purpose of the BMP:	To satisfy conditions of planning approval.
BMP to be submitted to:	WA planning Commission (WAPC)

1.2.1 Other Documents with Implications for Development of this BMP

This section identifies any known assessments, reports or plans that have been conducted and prepared previously, or are being prepared concurrently, and are relevant to the planned proposal for the subject. They potentially have implications for the assessment of bushfire threats and the identification and implementation of the protection measures that are established by this Bushfire Management Plan.

Table 1.4: Other relevant documents that may influence threat assessments and development of protection measures.

RELEVANT DOCUMENTS					
Document	Relevant	Currently Exists	To Be Developed	Copy Provided by Proponent / Developer	Title
Bushfire Management Plan	Yes	Yes	N/A	Yes	Bushfire Management Plan, Lots 808 & 809 Albany Highway, Lot 3430 River Avenue, Maddington Version 1.4 (RUIC Sept 2018)
Implications for this BMP: This BMP will replace the previous BMP and will address the requirements of the Guidelines for Planning in Bushfire prone Areas v1.4, and Items 37 to 41 of the WAPC Conditional Approval dated 30th August 2018.					
Landscaping and Revegetation Plan	Yes	Yes	N/A	Yes	Wetland and Landscape Development Management Plan for Lots 808 and 809 Albany Highway Maddington (Oversby Consulting Pty Ltd – November 2021)
Implications for the BMP: The BMP will assess the resultant Bushfire Attack Levels affecting the proposed lots once landscaping and revegetation reach maturity.					
Land Management Agreement	Yes	No	Yes	No	-
Implications for the BMP: The developer will landscape, revegetate and maintain the proposed public open space areas and 30 metre CCW buffer for a set period of time. After which responsibility reverts to the City of Gosnells.					

2 BUSHFIRE PRONE VEGETATION – ENVIRONMENTAL & ASSESSMENT CONSIDERATIONS

2.1 Environmental Considerations – 'Desktop' Assessment

This 'desktop' assessment must not be considered as a replacement for a full Environmental Impact Assessment. It is a summary of potential environmental values at the subject site, inferred from information contained in listed datasets and/or reports, which are only current to the date of last modification.

These data sources must be considered indicative where the subject site has not previously received a site-specific environmental assessment by an appropriate professional.

Many bushfire prone areas also have high biodiversity values. Consideration of environmental priorities within the boundaries of the land being developed can avoid excessive or unnecessary modification or clearing of vegetation. Approval processes (and exemptions) apply at both Commonwealth and State levels.

Any 'modification' or 'clearing' of vegetation to reduce bushfire risk is considered 'clearing' under the ***Environmental Protection Act 1986*** (EP Act) and requires a clearing permit under the ***Environmental Protection (Clearing of Native Vegetation) Regulations 2004*** (Clearing Regulations) – unless for an exempt purpose.

Clearing native vegetation is an offence, unless done under a clearing permit or the clearing is for an exempt purpose. Exemptions are contained in the EP Act or are prescribed in the Clearing Regulations (note: these do not apply in environmentally sensitive areas).

The ***Department of Water and Environmental Regulation*** (DWER) is responsible for issuing 'clearing' permits and the framework for the regulation of clearing. Approvals under other legislation, from other agencies, may also be required, dependent on the type of flora or fauna present.

Local Planning Policy or Local Biodiversity Strategy: Natural areas that are not protected by the above Act and Regulation (or any other National or State Acts) may be protected by a local planning policy or local biodiversity strategy. Permission from the local government will be required for any modification or removal of native vegetation in these Local Natural Areas (LNA's). Refer to the relevant local government for detail.

For further Information refer to Guidelines v1.4, the Bushfire and Vegetation Factsheet - WAPC, Dec 2021 and https://www.der.wa.gov.au/our-work/clearing-permits

A site visit has been conducted on 28th November 2023. All vegetation within the site, and within 150 metres of the site, has been classified.

Environmental considerations for the proposed subdivision have been addressed by qualified professionals in other documents related to this project. See the Wetland and Landscape Development Management Plan for Lots 808 and 809 Albany Highway Maddington (Oversby Consulting Pty Ltd – November 2022) in Appendix E.

Excerpt plans for proposed revegetation are shown in Figures 2.1 and 2.2 below.

Figure 2.1

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY

NOT FOR CONSTRUCTION

SCALE

0 10 20 30 40 50

SCALE 1:2000

NORTH

CLIENT

CLAYMONT

DISCLAIMER

ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE. NOT FOR CONSTRUCTION UNLESS STAMPED BY CERTIFYING AUTHORITY

Oversby Consulting

PROJECT

CANNING RISE MADDINGTON

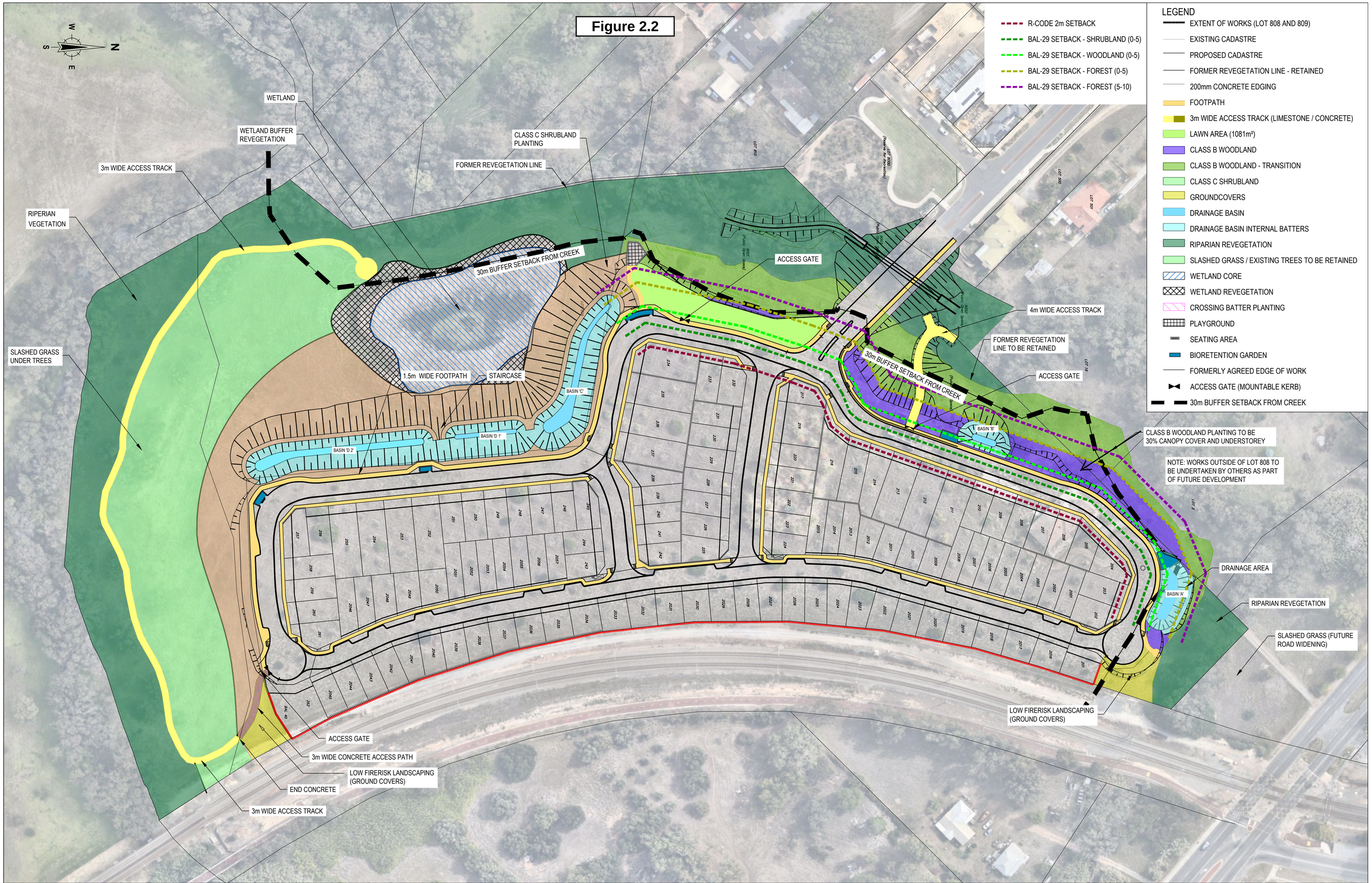
STORMWATER AND LANDSCAPE MANAGEMENT

DRAWING TITLE

OVERALL LANDSCAPING AND REVEGETATION PLAN

PROJECT No.	DRAWING No.	REVISION
B21015	L001	5

Figure 2.2



REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

SCALE 1:750 @ A1 1:1500 @ A3

NORTH

CLIENT

CLAYMONT

DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE. NOT FOR CONSTRUCTION UNLESS STAMPED BY CERTIFYING AUTHORITY

Oversby Consulting

PROJECT

CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

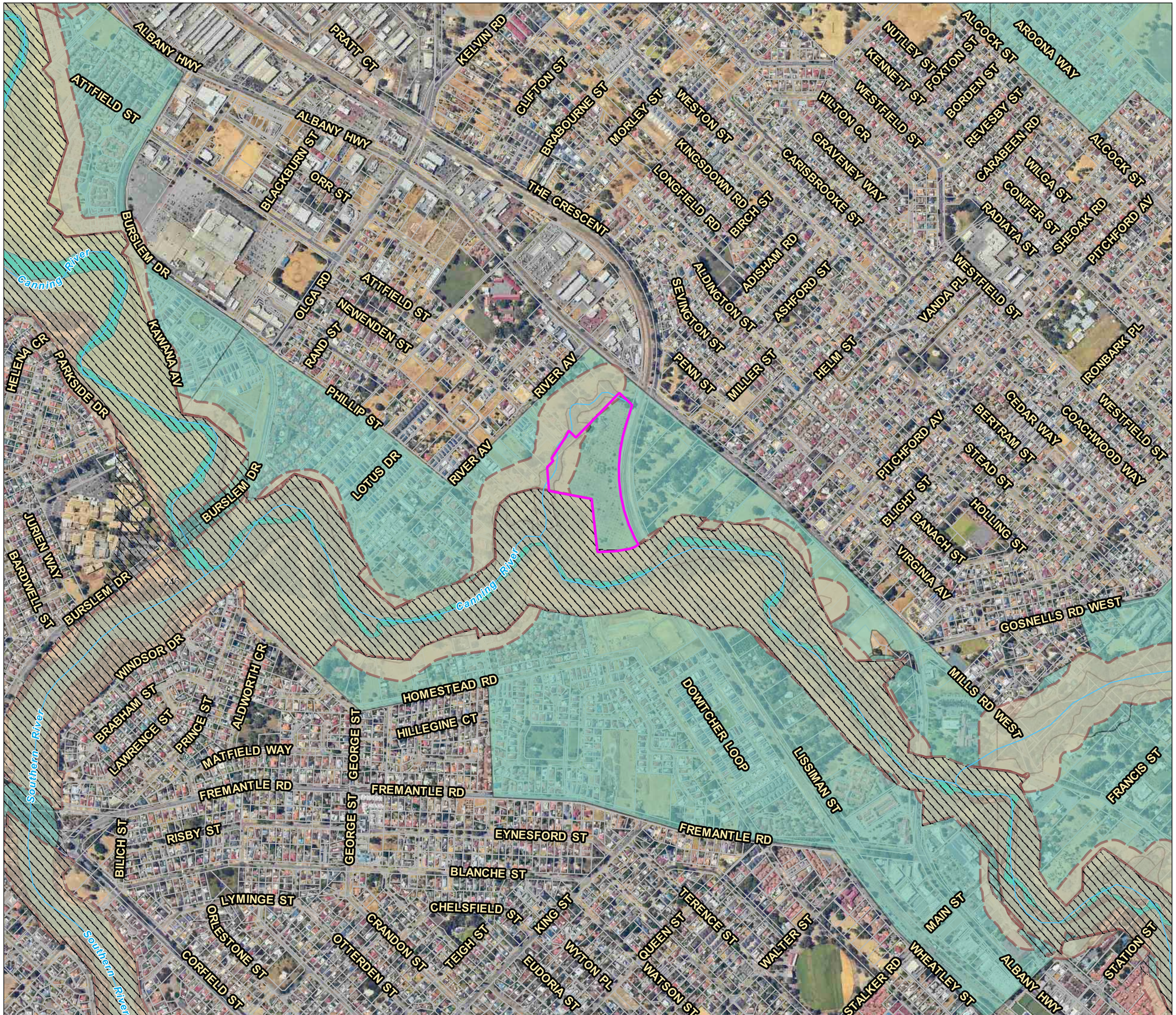
BUSH FIRE ATTACK LEVEL (BAL) PLAN

PROJECT No.	DRAWING No.	REVISION
B21015	L003	5

Figure 2.3

Proposed Subdivision Environmentally Sensitive Areas Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS



0 100 200 300 400 500 600

Metres

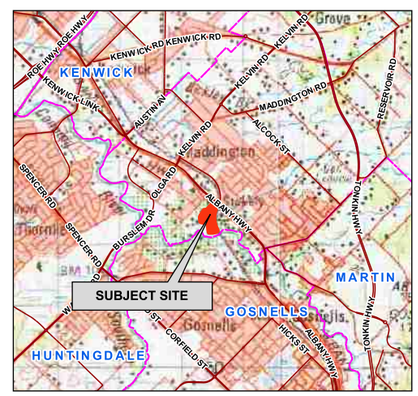
LEGEND

- Subject Site
- Cadastre
- Bush Forever Sites
- Clearing Regulations

Geomorphic Wetlands Swan Coastal Plain

- Dampland
- Floodplain
- Palusplain

LOCALITY



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 10000

BUSHFIRE PRONE PLANNING

2.1.1 Declared Environmentally Sensitive Areas (ESA)

IDENTIFICATION OF RELEVANT ENVIRONMENTALLY SENSITIVE AREAS							
ESA Class	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Wetlands and their 50m Buffer (Ramsar, conservation category and nationally important)	Yes	Yes - Significant	DBCA-010 and 011, 019, 040, 043, 044	☒	☐	☐	None
Bush Forever	Yes	Yes - Significant	DPLH-022, SPP 2.8	☒	☐	☐	None
Threatened and Priority Flora + 50m Continuous Buffer	Unknown	Possible	DBCA-036	Restricted Scale of Data Available (security)	☐	☐	Confirm with relevant agency
Threatened Ecological Community	Unknown	Possible	DBCA-038		☐	☐	Confirm with relevant agency
Heritage Areas National / World	No	N/A	Relevant register or mapping	☐	☐	☐	None
Environmental Protection (Western Swamp Tortoise) Policy 2002	No	N/A	DWER-062	☐	☐	☐	None

DESCRIPTION OF THE IDENTIFIED ENVIRONMENTALLY SENSITIVE AREAS:

The subject site contains classified wetland areas, and Bush Forever areas abut the southern boundaries of the site.

2.1.2 Other Protected Vegetation on Public Land

IDENTIFICATION OF PROTECTED VEGETATION ON PUBLIC LAND							
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Legislated Lands (tenure includes national park/reserve, conservation park, crown reserve and state forest)	Yes	Yes - Minor	DBCA-011	☒	☐	☐	None
Conservation Covenants	Possible	Possible	DPIRD-023	Only Available to Govt.	☐	☐	Confirm with relevant agency
National World Heritage Areas	No	N/A	-	☐	☐	☐	None
Designated Public Open Space	Yes	Yes - Significant	-	☐	☒	☐	Confirm with relevant agency

DESCRIPTION OF THE IDENTIFIED AREA(S) OF VEGETATION

Areas of Public Open Space are planned for the proposed subdivision. These areas are to be revegetated per the Landscape and Revegetation Plan.

2.1.3 Response of Proposed Development to Identified Environmental Limitations

Consideration of the implications that identified protected areas of vegetation (i.e., those with environmental and subject to conservation) have for the proposed development.

PROPOSED DEVELOPMENT RESPONSE TO IDENTIFIED 'PROTECTED' VEGETATION	
The existence of 'protected' areas of vegetation has implications for the ability of the proposed development to reduce potential bushfire impact through modification or removal of vegetation.	Yes
Application of Design and/or Construction Responses to Limit Vegetation Modification or Removal	
Modify the development location to reduce exposure by increasing separation distance.	N/A
Redesign development, structure plan or subdivision.	Yes
Subdivision layout is designed to accommodate bushfire protection requirements to the fullest extent whilst allowing for environmental limitations.	
Reduction of lot yield where this can increase available separation distances.	Not required
The proposed road layout, along with the revegetation requirements of this BMP and the Wetland and Landscape Development Management Plan (Oversby Consulting Nov 2022), will provide acceptable separation distances for future buildings on the proposed lots from classified vegetation.	
Cluster development to limit modification or removal of vegetation.	Yes
The proposed subdivision layout allows for revegetation within the Stokely Creek 30 metre CCW buffer and further landscaping on the subject lots 808 and 809.	
Construct building(s) to the requirements corresponding to higher BAL ratings to reduce required separation distances.	N/A

2.2 Bushfire Assessment Considerations

2.2.1 Planned Onsite Vegetation Landscaping

Identification of areas of the subject site planned to be landscaped, creating the potential for increased or decreased bushfire hazard for proposed development.

PLANNED LANDSCAPING	
Relevant to Proposal:	Yes
A Wetland and Landscape Development Management Plan is created for this proposal (See Figures 2.1 and 2.2 above and Appendix E).	

2.2.2 Planned / Potential Offsite Rehabilitation or Re-Vegetation

Identification of areas of land adjacent to the subject site on which re-vegetation (as distinct from natural re-generation) will or may occur and is likely to present a greater bushfire hazard for proposed development.

POTENTIAL RE-VEGETATION PROGRAMS		
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Description
Riparian Zones / Foreshore Areas	No	
Wetland Buffers	Yes	Revegetation of the 30 metre Stokely Creek CCW buffer is planned.
Legislated Lands	No	
Public Open Space	Yes	The Public Open Space areas on Lots 808 and 809 will be revegetated and landscaped.
Road Verges	Yes	Portions of road verges abutting the POS areas will be landscaped.
Other	No	

2.2.3 Identified Requirement to Manage, Modify or Remove Onsite or Offsite Vegetation

Identification of native vegetation subject to management, modification or removal.

REQUIREMENT TO MANAGE, MODIFY OR REMOVE NATIVE VEGETATION	
Has a requirement been identified to manage, modify or remove **onsite** native vegetation to establish the required bushfire protection measures on the subject site?	Yes
Portions of the subject lots, public open space and wetland buffer, are to be revegetated and landscaped with native vegetation.	
Is approval, from relevant state government agencies and/or the local government, to modify or remove **onsite** native vegetation required? (Note: if 'Yes' evidence of its existence should be provided in this BMP).	Yes
Approval is required from the City of Gosnells and the DBCA with respect to revegetation and landscaping of proposed public open space and wetland buffer areas within the subject lots.	
Has a requirement been identified to manage, modify or remove **offsite** native vegetation to establish the required bushfire protection measures on the subject site?	No

Is written approval required, from relevant state government agencies and/or the local government, that permits the landowner, or another identified party, to modify or remove **offsite** bushfire prone vegetation and/or conduct other works, to establish an identified bushfire protection measure(s)? If 'Yes', appropriate evidence of the approval or how it is to be established, shall be provided in this BMP as an addendum.	No
Is a written management agreement required that states the obligation of the landowner, or another responsible party, to manage defined areas of **offsite** bushfire prone vegetation, in perpetuity, to ensure the conditions of no fire fuels and/or low threat vegetation and/or vegetation managed in a minimal fuel condition, continue to be met? If 'Yes', appropriate evidence of the agreement or how it is to be established, shall be provided in this BMP as an addendum.	No

2.2.4 Variations to Assessed Areas of Classified Vegetation to be Applied

FOR THE PROPOSED DEVELOPMENT SITUATIONS TO BE ACCOUNTED FOR IN ASSESSING THE POTENTIAL BUSHFIRE IMPACT (BAL)	
Area(s) of land will be subject to future vegetation rehabilitation or re-vegetation that will require a change to a higher threat classification of vegetation on that land to. (Note: this is not regeneration to the mature natural state which is accounted for in the 'existing state' assessment in accordance with AS 3959:2018).	Yes
The proposed public open space areas and 30 metre CCW buffer are to be revegetated and landscaped with native vegetation. Refer to Figures 2.1, 2.2 and Appendix E.	
Modification of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require a change to a lower threat classification (or exclusion from classification) for that area of vegetation.	No
Complete removal of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require an exclusion from classification for that area of vegetation.	No

3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

BUSHFIRE ATTACK LEVELS (BAL) - UNDERSTANDING THE RESULTS

The potential transfer (flux/flow) of radiant heat from the bushfire to a receiving object is measured in kW/m^2. The AS 3959:2018 BAL determination methodology establishes the ranges of radiant heat flux that correspond to each bushfire attack level. These are identified as BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

The bushfire performance requirements for certain classes of buildings are established by the Building Code of Australia (Vol. 1 & 2 of the NCC). The BAL will establish the bushfire resistant construction requirements that are to apply in accordance with AS 3959:2018 - *Construction of buildings in bushfire prone areas* and the NASH Standard – *Steel framed construction in bushfire areas (NS 300 2021),* whose solutions are deemed to satisfy the NCC bushfire performance requirements.

DETERMINED BAL RATINGS

A BAL Certificate can be issued for a determined BAL. A BAL can only be classed as 'determined' for an existing or future building/structure when:

1. It's final design and position on the lot are known and the stated separation distance from classified bushfire prone vegetation exists and can justifiably be expected to remain in perpetuity; or

2. It will always remain subject to the same BAL regardless of its design or position on the lot after accounting for any regulatory or enforceable building setbacks from lot boundaries as relevant and necessary (e.g., R-codes, restrictive covenants, defined building envelopes) or the retention of any existing classified vegetation either onsite or offsite.

If the BMP derives determined BAL(s), the BAL Certificate(s) required for submission with building applications can be provided, using the BMP as the assessment evidence.

INDICATIVE BAL RATINGS

A BAL Certificate cannot be issued for an indicative BAL. A BAL will be classed as 'indicative' for an existing or future building/structure when the required conditions to derive a determined BAL are not met.

This class of BAL rating indicates what BAL(s) could be achieved and the conditions that need to be met are stated.

Converting the indicative BAL into a determined BAL is conditional upon the currently unconfirmed variable(s) being confirmed by a subsequent assessment and evidential documentation. These variables will include the future building(s) location(s) being established (or changed) and/or classified vegetation being modified or removed to establish the necessary vegetation separation distance. This may also be dependent on receiving approval from the relevant authority for that modification/removal.

BAL RATING APPLICATION – PLANNING APPROVAL VERSUS BUILDING APPROVAL

1. **Planning Approval**: SPP.3.7 establishes that where BAL- LOW to BAL-29 will apply to relevant future construction (or existing structures for proposed uses), the proposed development may be considered for approval (dependent on the other requirements of the relevant policy measures being met). That is, BAL40 or BAL-FZ are not acceptable on planning grounds (except for certain limited exceptions).

   Because planning is looking forward at what can be achieved, as well as looking at what may currently exist, both determined and indicative BAL ratings are acceptable assessment outcomes on which planning decisions can be made (including conditional approvals).

2. **Building Approval:** The Building Code of Australia (Vol. 1 & 2 of the NCC) establishes that relevant buildings in bushfire prone areas must be constructed to the bushfire resistant requirements corresponding to the BAL rating that is to apply to that building. Consequently, a determined BAL rating and the BAL Certificate is required for a building permit to be issued - an indicative BAL rating is not acceptable.

3.1 BAL Assessment Summary (Contour Map Format)

INTERPRETATION OF THE BAL CONTOUR MAP

The BAL contour map is a diagrammatic representation of the results of the bushfire attack level assessment.

The map presents different coloured contours extending out from the areas of classified vegetation. Each contour represents a set range of radiant heat flux that potentially will transfer to an exposed element (building, person or other defined element), when it is located within that contour.

Each of the set ranges of radiant heat flux corresponds to a different BAL rating as defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour will vary dependant on both the BAL rating and the relevant parameters (calculation inputs) for the subject site. Their width represents the minimum and maximum vegetation separation distances that correspond to each BAL rating (refer to the relevant table below for these distances).

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain at the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed. Variations to this statement that may apply include:

- Both pre and post development BAL contour maps are produced; and/or
- Each stage of a development is assessed independently.

3.1.1 BAL Determination Methodology and Location of Data and Results

LOCATION OF DATA & RESULTS					
BAL Determination Methodology		Location of the Site Assessment Data			Location of the Results
AS 3959:2018	Applied to Assessment	Classified Vegetation and Topography Map(s)	Calculation Input Variables		Assessed Bushfire Attack Levels and/or Radiant Heat Levels
			Summary Data	Detailed Data with Explanatory and Supporting Information	
Method 1 (Simplified)	Yes	Figures 3.1.1, to 3.1.4	Table 3.2	Appendix A1	Table 3.1 BAL Contour Map
Method 2 (Detailed)	No	N/A	N/A	N/A	

The previous BMP by RUIC adopted a 1 degree slope for the assessed areas of forest vegetation along the adjoining creek lines (Vegetation Area 7 in this BMP).

Forest type vegetation exists in a narrow strip either side of the creek lines adjoining the subject site and extends partly into neighbouring lots. Some small area of woodland, grassland and scrub exist. The remainder of the surrounding land is developed residential and commercial lots.

The small creek bank slopes down into the creek and then up towards the subject site, the slopes are short, typically 5m - 20m and will not influence fire behaviour. Additionally, a bushfire in Vegetation Area 7 will either be a flanking fire, or a developing fire and will not affect the site with the full potential of a forest fire. For this reason the effective slope in this vegetation area is assess as flat.

3.1.2 Site Assessment Data Applied to Construction of the BAL Contour Map(s)

RELEVANT CLASSIFIED VEGETATION	
Identification of Classified Vegetation that is Relevant to the Production of the BAL Contour Map(s)	Relevant Vegetation Map
The relevant vegetation for the post-development BAL contour map will be any area of classified vegetation - both within the subject site (onsite) and external to the subject site (offsite) - that will remain at the intended end state of the subject development once earthworks, any clearing and/or landscaping and re-vegetation have been completed.	Figures 3.1.2 to 3.1.4
Supporting Assessment Details: Figures 3.1.2 to 3.1.4 are the post development vegetation maps created from the Overall Landscaping and Revegetation Plan by Oversby Consulting (See Figure 2.1).	

Table 3.2: The calculation inputs applied to determining the site specific separation distances corresponding to levels of potential radiant heat transfer (including BAL's).

SUMMARY OF CALCULATION INPUT VARIABLES APPLIED TO THE DETERMINATION OF SEPARATION DISTANCES CORRESPONDING TO RADIANT HEAT LEVELS [1]												
Applied BAL Determination Method		METHOD 1 - SIMPLIFIED PROCEDURE (AS 3959:2018 CLAUSE 2.2)										
The Calculation Variables Corresponding to the BAL Determination Method Applied												
Methods 1 and 2		Method 1	Method 2									
Vegetation Classification		FDI	Effective Slope		Site Slope	FFDI or GFDI	Flame Temp.	Elevation of Receiver	Flame Width	Fireline Intensity	Flame Length	Modified View Factor
			Applied Range	Determined								
Area	Class		degree range	degrees	degrees		K	metres	metres	kW/m	metres	% Reduction
1	(A) Forest	80	Downslope >0-5	N/A								
2	(G) Grassland		Downslope >0-5									
3	(G) Grassland		Upslope or flat 0									
4	(B) Woodland		Upslope or flat 0									
5	(A) Forest		Downslope >0-5									
6	(D) Scrub		Upslope or flat 0									
7	(A) Forest		Upslope or flat 0									
8	(G) Grassland		Downslope >0-5									
9	(G) Grassland		Upslope or flat 0									
10	(B) Woodland		Downslope >0-5									
11	(C) Shrubland		Upslope or flat 0									
12	(C) Shrubland		Downslope >0-5									
13	(C) Shrubland		Downslope >5-10									
14	(C) Shrubland		Downslope >10-15									
15	Excluded cl 2.2.3.2(e & f)		N/A									

[1] AI10I data and information supporting the determination of the classifications and values stated in this table and any associated justification, is presented in Appendix A.

Wher11e the values are stated as 'default' these are either the values stated in AS 3959:2018, Table B1 or the values calculated as intermediate or final outputs through application of the equations of the AS 3959:2018 BAL determination methodology. They are not values derived by the assessor.

Table 3.3: Vegetation separation distances corresponding to the radiant heat levels illustrated as BAL contours in Figures 3.2.1 to 3.2.3.

THE CALCULATED VEGETATION SEPARATION DISTANCES (METRES) CORRESPONDING TO THE STATED LEVEL OF RADIANT HEAT FLUX [1]									
Vegetation Classification		Bushfire Attack Levels						Specific Values	
		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW		
		Maximum Radiant Heat Flux							
Area	Class	>40 kW/m^2	40 kW/m^2	29 kW/m^2	19 kW/m^2	12.5 kW/m^2	N/A [2]	10 kW/m^2	2 kW/m^2
1	(A) Forest	<20	20-<27	27-<37	37-<50	50-<100	>100	N/A	
2	(G) Grassland	<7	7-<9	9-<14	14-<20	20-<50	>50		
3	(G) Grassland	<6	6-<8	8-<12	12-<17	17-<50	>50		
4	(B) Woodland	<10	10-<14	14-<20	20-<29	29-<100	>100		
5	(A) Forest	<20	20-<27	27-<37	37-<50	50-<100	>100		
6	(D) Scrub	<10	10-<13	13-<19	19-<27	27-<100	>100		
7	(A) Forest	<16	16-<21	21-<31	31-<42	42-<100	>100		
8	(G) Grassland	<7	7-<9	9-<14	14-<20	20-<50	>50		
9	(G) Grassland	<6	6-<8	8-<12	12-<17	17-<50	>50		
10	(B) Woodland	<13	13-<17	17-<25	25-<35	35-<100	>100		
11	(C) Shrubland	<7	7-<9	9-<13	13-<19	19-<100	>100		
12	(C) Shrubland	<7	7-<10	10-<15	15-<22	22-<100	>100		
13	(C) Shrubland	<8	8-<11	11-<17	17-<25	2-<100	>100		
14	(C) Shrubland	<9	9-<13	13-<19	19-<28	28-<100	>100		

[1] All calculation input variables are presented in Table 3.2.

[2] The BAL-LOW rating is not defined by the level of radiant heat flux. It applies when the vegetation separation distance is 100m or 50m for the Grassland vegetation classification.

Figure 3.1.1

Proposed Subdivision Existing Topography and Classified Vegetation Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
8	G	Grassland	>0-5
9	G	Grassland	0
10	B	Woodland	>0-5
11	Ex	Exempt	0

------ LEGEND ------

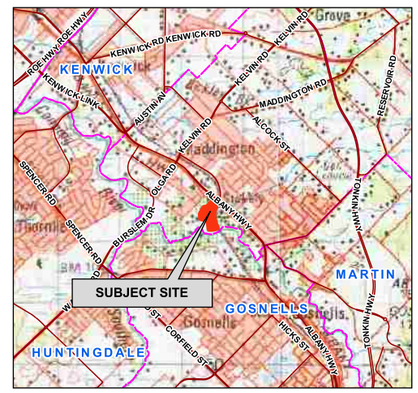
- Photos
- Elevation (m)
- Subject Site
- 150m_Assessment_Area
- Cadastre

Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125 150
Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 2800

BUSHFIRE PRONE PLANNING

Figure 3.1.2

Post Development Classified Vegetation Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

------ LEGEND ------

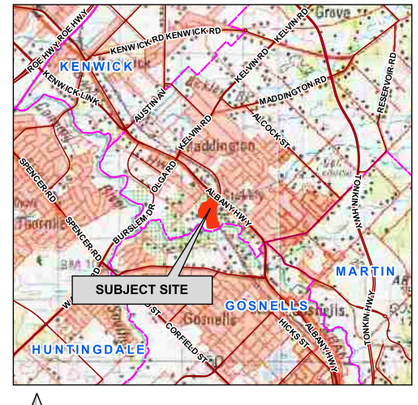
- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- 150m_Assessment_Area

Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class C - Shrubland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125 150
Metres

------ LOCALITY ------



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Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 30-11-2023
SCALE (A3): 1 : 2800

BUSHFIRE PRONE PLANNING

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

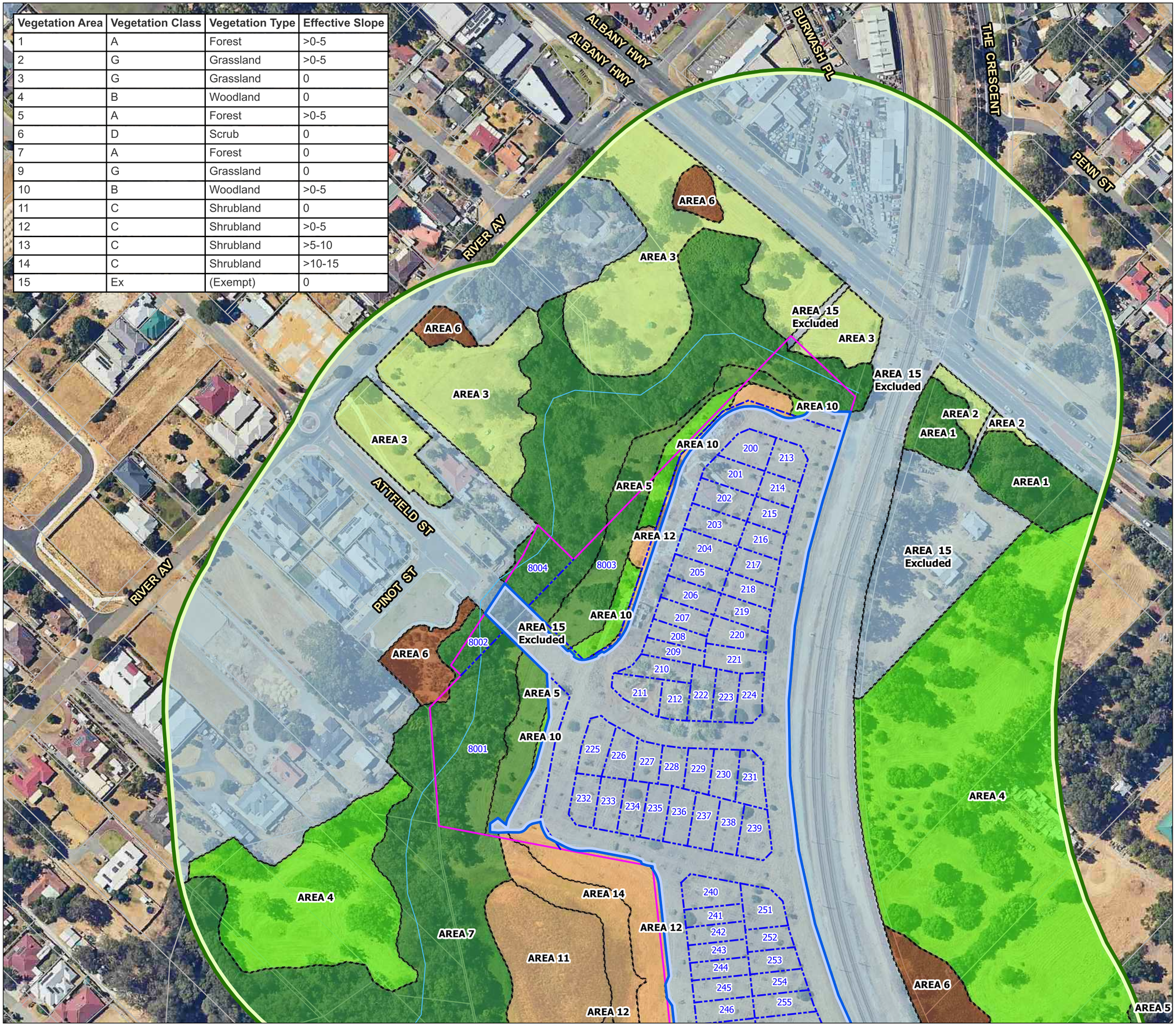


Figure 3.1.3

Post Development Classified Vegetation Map Enlargement 1

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

------ LEGEND ------

- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- 150m_Assessment_Area

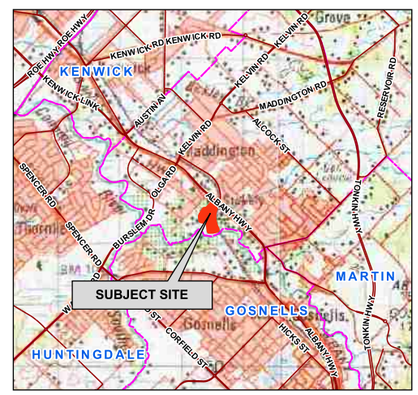
Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class C - Shrubland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125

Metres

------ LOCALITY ------



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Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 2000

BUSHFIRE PRONE PLANNING

Figure 3.1.4

Post Development Classified Vegetation Map Enlargement 2

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

------ LEGEND ------

- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- 150m_Assessment_Area

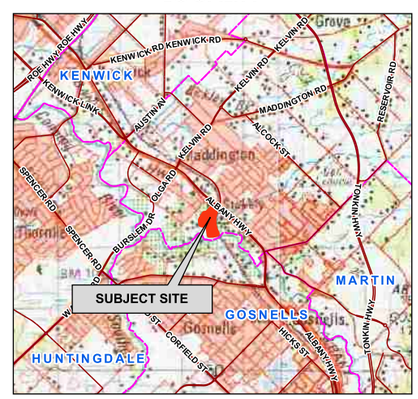
Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class C - Shrubland
- Class D - Scrub
- Class G - Grassland
- Exclusion 2.2.3.2

0 25 50 75 100 125

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 29-11-2023
SCALE (A3): 1 : 2000

BUSHFIRE PRONE PLANNING

Figure 3.2.1

Post Development BAL Contour Map

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

------ LEGEND ------

- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- Vegetation Outline

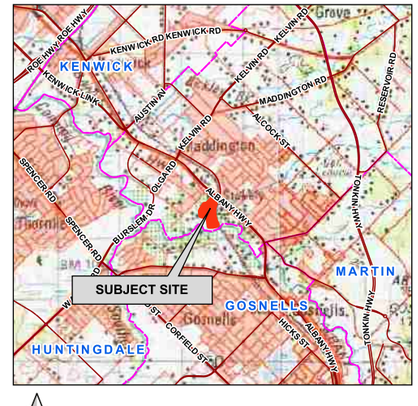
Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 25 50 75 100 125 150

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 30-11-2023
SCALE (A3): 1 : 2500

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

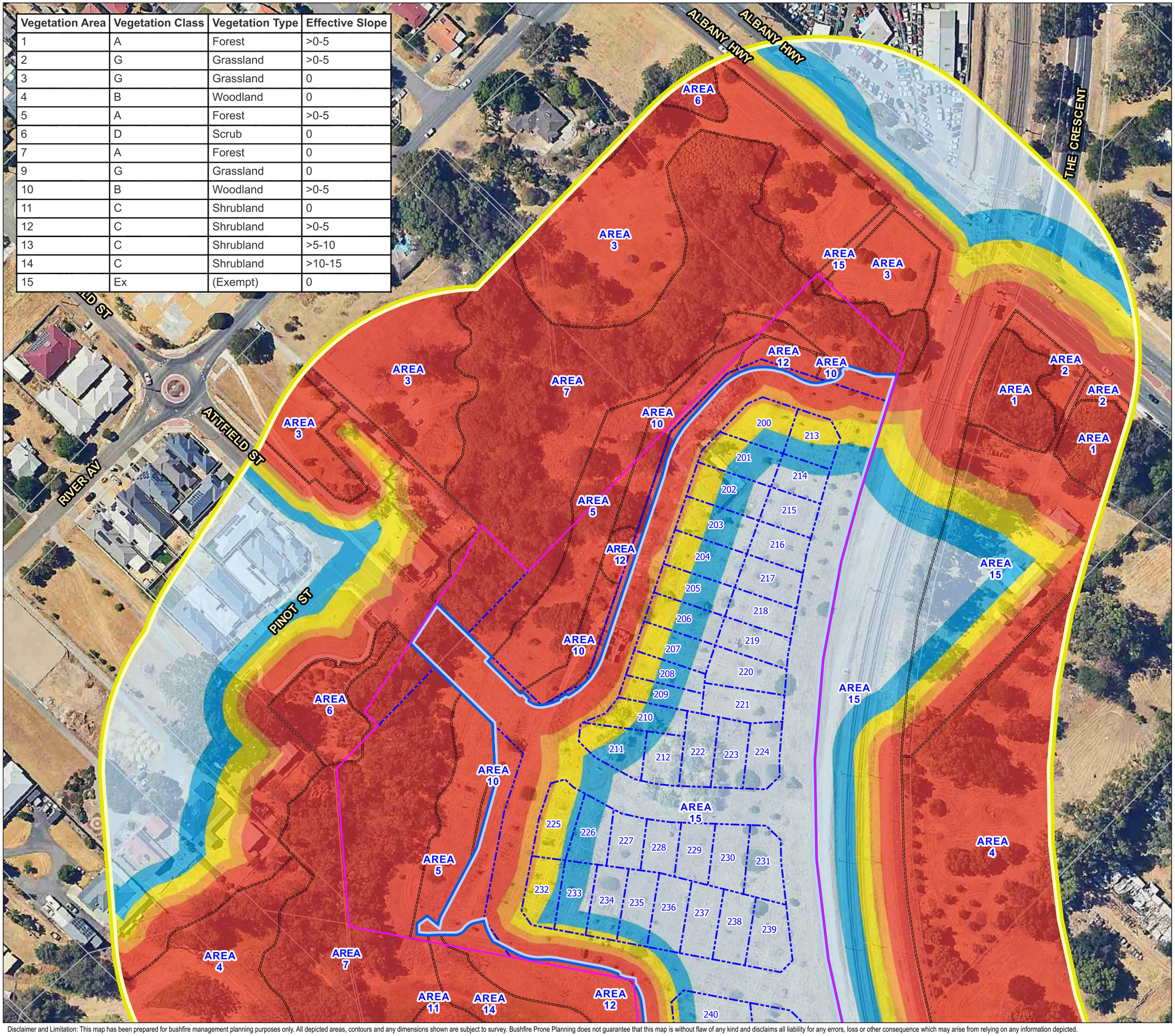


Figure 3.2.2

Post Development BAL Contour Map Enlargement 1

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

------ LEGEND ------

- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- Vegetation Outline

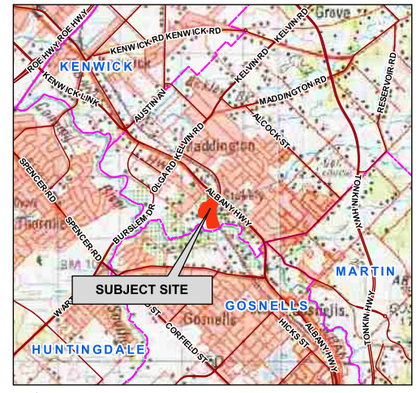
Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 10 20 30 40 50 60 70 80 90 100

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 30-11-2023
SCALE (A3): 1 : 1500

BUSHFIRE PRONE PLANNING

Figure 3.2.3

Post Development BAL Contour Map Enlargement 2

Lot 808 on Plan 31948
Lot 3430 on Diagram 64956
1993 Albany Highway
MADDINGTON
CITY OF GOSNELLS

Vegetation Area	Vegetation Class	Vegetation Type	Effective Slope
1	A	Forest	>0-5
2	G	Grassland	>0-5
3	G	Grassland	0
4	B	Woodland	0
5	A	Forest	>0-5
6	D	Scrub	0
7	A	Forest	0
9	G	Grassland	0
10	B	Woodland	>0-5
11	C	Shrubland	0
12	C	Shrubland	>0-5
13	C	Shrubland	>5-10
14	C	Shrubland	>10-15
15	Ex	(Exempt)	0

------ LEGEND ------

- Proposed Lots
- Subject Site
- Asset Protection Zone
- Cadastre
- Vegetation Outline

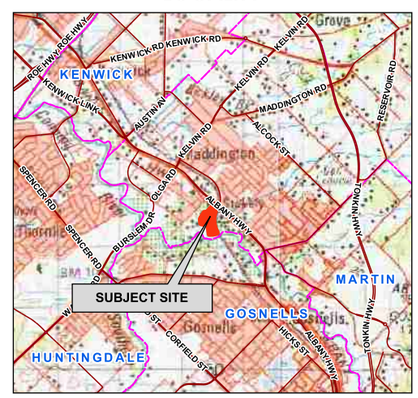
Bushfire Attack Levels

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 10 20 30 40 50 60 70 80 90 100

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: Ian Macleod 30-11-2023
SCALE (A3): 1 : 1500

BUSHFIRE PRONE PLANNING

190433 Lot 808 Albany Highway, Maddington BAL Nov 2023 Enlg 2.qgz

3.1.1 BAL Ratings Derived from the Contour Map

Table 3.4: Indicative and determined BAL(s) for future buildings/structures on the proposed lots.

BUSHFIRE ATTACK LEVEL FOR FUTURE BUILDINGS / STRUCTURES ON STATED LOT [1]	
Lot No.	Indicative BAL [2]
200 to 211	**See Table 3.5**
212	**BAL-19**
213	**See Table 3.5**
214	**BAL-19**
215 to 224	**BAL-12.5**
225	**See Table 3.5**
226	**BAL-19**
227 to 231	**BAL-12.5**
232	**See Table 3.5**
233 to 235	**BAL-29**
236	**BAL-19**
237 to 239	**BAL-12.5**
240 to 250	**BAL-29**
251 to 257	**BAL-12.5**
258 and 259	**BAL-29**

[1] The assessment data used to derive the BAL ratings is sourced from Table 3.3 and Figures 3.2.1 to 3.2.3.

[2] Refer to the start of Section 3 for an explanation of indicative versus determined BAL ratings.

Table 3.5: Building setback distances required to achieve target BAL.

TARGET BUSHFIRE ATTACK LEVELS FOR FUTURE BUILDINGS AND CORRESPONDING BUILDING SETBACK REQUIRED [1]						
Lot No./ID	Relevant Vegetation Area/s [2]	Relevant Lot Boundary [3]	Highest BAL Contour Impacting the Lot	Target BAL	Required Minimum Building Setback and its Components	
					Applied R-Code Setback	Setback Required [restrictive covenant]
					metres	metres
200	Area 10	West and North	BAL-40	**BAL-29**	2	2
201 -211	Area 10	West	BAL-40	**BAL-29**	2	2
213	Area 10	North	BAL-40	**BAL-29**	2	2
225	Area 10	West	BAL-40	**BAL-29**	2	2
232	Area 10	West	BAL-40	**BAL-29**	2	2

[1] The assessment data used to derive the information is sourced from Table 3.3 and Figures 3.2.1 to 3.2.3

[2] The vegetation area(s) that generate the highest BAL impacting the lot.

[3] This is the boundary adjacent to the relevant vegetation area for which the required building setback distance from the boundary) is being stated.

For the above lots a BAL-29 rating can be achieved 2 metres inside the' relevant' lot boundaries. The R-Code building setback requirements, along with the application of a Restrictive Covenant over these lots as required, will ensure that buildings cannot be constructed in areas on the lots having a BAL rating greater than BAL-29.

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The Guidelines for Planning in Bushfire Prone Areas (WAPC 2021 v1.4), Appendix 5, establish that the application of this section of the BMP is intended to support ***strategic planning*** proposals. At the strategic planning stage there will typically be insufficient proposed development detail to enable all required assessments, including the assessment against the bushfire protection criteria.

Strategic Planning Proposals

For strategic planning proposals this section of the BMP will identify:

- Issues associated with the level of the threats presented by any identified bushfire hazard;
- Issues associated with the ability to implement sufficient and effective bushfire protection measures to reduce the exposure and vulnerability levels (of elements exposed to the hazard threats), to a tolerable or acceptable level; and
- Issues that will need to be considered at subsequent planning stages.

All Other Planning Proposals

For all other planning stages, this BMP will address what are effectively the same relevant issues but do it within the following sections:

- Section 2 – Bushfire Prone Vegetation - Environmental and Assessment Considerations: Assess environmental, biodiversity and conservation values;
- Section 3 – Potential Bushfire Impact: Assess the bushfire threats with the focus on flame contact and radiant heat; and
- Section 5 – Assessment Against the Bushfire Protection Criteria (including the guidance provided by the *Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2'):* Assess the ability of the proposed development to apply the required bushfire protection measures thereby enabling it to be considered for planning approval for these factors.

Is the proposed development a strategic planning proposal?	No

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (GUIDELINES V1.4)

5.1 Bushfire Protection Criteria Elements Applicable to the Proposed Development/Use

APPLICATION OF THE CRITERIA, ACCEPTABLE SOLUTIONS AND PERFORMANCE ASSESSMENT

The criteria are divided into five elements – location, siting and design, vehicular access, water and vulnerable tourism land uses. Each element has an intent outlining the desired outcome for the element and reflects identified planning and policy requirements in respect of each issue.

The example acceptable solutions (bushfire protection measures) provide one way of meeting the element's intent. Compliance with these automatically achieves the element's intent and provides a straightforward pathway for assessment and approval.

Where the acceptable solutions cannot be met, the ability to develop design responses (as alternative solutions that meet bushfire performance requirements) is an alternative pathway that is provided by addressing the applicable performance principles (as general statements of how best to achieve the intent of the element).

A merit based assessment is established by the SPP 3.7 and the Guidelines as an additional alternative pathway along with the ability of using discretion in making approval decisions (sections 2.5, 2.6 and 2.7). This is formally applied to certain development (minor and unavoidable – sections 5.4.1 and 5.7). Relevant decisions by the State Administrative Tribunal have also supported this approach more generally.

Elements 1 – 4 should be applied for all strategic planning proposals, subdivision or development applications, except for vulnerable tourism land uses which should refer to Element 5. Element 5 incorporates the bushfire protection criteria in Elements 1 – 4 but caters them specifically to tourism land uses. (Guidelines DPLH 2021v1.4)

The Bushfire Protection Criteria	Applicable to the Proposed Development/Use
Element 1: Location	Yes
Element 2: Siting and Design	Yes
Element 3: Vehicular Access	Yes
Element 4: Water	Yes
Element 5: Vulnerable Tourism Land Uses	No

5.2 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions to recognise special local or regional circumstances (e.g., topography / vegetation / climate). These are to be endorsed by both the WAPC and DFES before they can be considered in planning assessments. (Guidelines DPLH 2021v1.4).	
Do endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the proposed development /use?	N/A

.

5.3 Assessment Statements for Element 1: Location

LOCATION					
Element Intent	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.				
Proposed Development/Use – Relevant Planning Stage	(Sb) Structure plan where the lot layout is known and subdivision application				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E1 Location				**Compliant:**	Yes
A1.1 Development location		**Applicable:**	Yes	**Compliant:**	Yes
ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES					
☑ ☐ ☐ The subdivision application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.					
Supporting Assessment Details: The proposed subdivision will provide an area of land within each proposed residential lot that can be considered suitable for development as BAL-40 or BAL-FZ construction requirements will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note. A portion of Lots 200 to 211, 213, 225 and 232 are subject to radiant heat levels corresponding to a BAL-40 rating. However, building cannot occur within this area as it falls within the R-Code setback distance applicable to the development site. Additionally, the building location within the lot can be controlled by the application of a restrictive covenant (129BA Transfer of Land Act 189) as per the WAPC Model Subdivision Conditions Schedule (June 2021) Code F3.					
ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)					
"Consideration should be given to the site context where 'area' is the land both within and adjoining the subject site. The hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context, including how a bushfire could affect the site and the conditions for a bushfire to occur within the site." **Strategic Planning Proposals:** Consider the threat levels from any vegetation adjoining and within the subject site for which the potential intensity of a bushfire in that vegetation would result in it being classified as an Extreme Bushfire Hazard Level (BHL). Identify any proposed design strategies to reduce these threats.					

Structure Plans (lot layout known) and Subdivision Applications: As for strategic planning proposals but within the subject site the relevant threat levels to consider are the radiant heat levels represented by BAL-FZ and BAL-40 ratings.

The Hazard Within the Subject Site

The proposed subdivision layout allows for revegetation within the Stokely Creek 30 metre CCW buffer and further landscaping on the subject lots 808 and 809 as required by the relevant authorities.

The proposed road layout provides separation from residential lots to the areas of revegetation. The Wetland and Landscape Development Management Plan (Oversby Consulting Nov 2022), will stipulate suitable plantings within the revegetation areas, and acceptable separation distances for this vegetation to future buildings on the proposed lots. Where necessary, maintenance schedules will be established.

The whole of the proposed residential lots will be managed to a low bushfire threat state per the requirements of the City of Gosnells Annual Fire Hazard Reduction Notice, and this BMP.

The Hazard Adjoining the Subject Site

A narrow strip of forest type vegetation runs along the banks of Stokely Creek to the north and west of the subject site, and Canning River to the south of the site. Further west and south are small remnant portions of grassland in residential built up areas.

A maintained 40 metre wide railway corridor adjoins the eastern boundary of the subject site. Further east is a strip of partly managed remnant small rural residential type lots with grassland and woodland vegetation, followed by built up residential areas.

With the exception of relatively small areas along the creek banks and in the remnant rural residential type lots, the surrounding area is built up residential or commercial lots. Although the creek and river banks provide a corridor for bushfire to travel along, the area is not large or wide enough to support extreme or landscape type fire behaviour. A bushfire affecting the subject site would either be a flanking fire, or if a direct fire, be unable to develop fully due to the short fire run.

5.4 Assessment Statements for Element 2: Siting and Design

SITING AND DESIGN OF DEVELOPMENT					
Element Intent	To ensure that the siting and design of development minimises the level of bushfire impact. (BPP Note: not building/construction design)				
Proposed Development/Use – Relevant Planning Stage	(Sb) Structure plan where the lot layout is known and subdivision application				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E2 Siting and Design of Development				**Compliant:**	Yes
A2.1 Asset Protection Zone (APZ)		**Applicable:**	Yes	**Compliant:**	Yes

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

A key required bushfire protection measure is to reduce the exposure of buildings/infrastructure (as exposed vulnerable elements at risk), to the direct bushfire threats of flame contact, radiant heat and embers and the indirect threat of consequential fires that result from the subsequent ignition of other combustible materials that may be constructed, stored or accumulate in the area surrounding these structures. This reduces the associated risks of damage or loss.

This is achieved by separating buildings (and consequential fire fuels as necessary) from areas of classified bushfire prone vegetation. This area of separation surrounding buildings is identified as the Asset Protection Zone (APZ) and consists of no vegetation and/or low threat vegetation or vegetation continually managed to a minimal fuel condition. The required separation distances will vary according to the site specific conditions and local government requirements.

The APZ dimensions stated and/or illustrated in this Report can vary dependent on the purpose for which they are being identified.

> *Note: Appendix B 'Onsite Vegetation Management' provides further information regarding the different APZ dimensions that can be referenced, their purpose and the specifications of the APZ that are to be established and maintained on the subject lot.*

THE 'PLANNING BAL-29' APZ DIMENSIONS

Purpose: To provide evidence of the development or use proposal's ability to achieve minimum vegetation separation distances. To achieve 'acceptable solution' planning approval for this factor, it must be demonstrated that the minimum separation distances corresponding to a maximum level of radiant transfer to a building of 29 kW/m^2, either exist or can be implemented (with certain exceptions). These separation distances are the 'Planning BAL-29' APZ dimensions.

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its sole purpose is to identify if an acceptable solution for planning approval can be met.

THE 'REQUIRED' APZ DIMENSIONS

Purpose: Establishes the dimensions of the APZ to be physically implemented by the landowner on their lot: These will be the minimum required separation distances from the subject building(s) to surrounding bushfire prone vegetation (identified by type and associated ground slope). These are established by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

> *Within this Report/Plan it is the **'Planning BAL-29' APZ** that will be identified on maps, diagrams and in tables as necessary – unless otherwise stated.*
>
> *The **'Required' APZ** dimension information will be presented in Appendix B1.1 and on the Property Bushfire Management Statement, when required to be included for a development application.*

ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES

☑ ☐ ☐	**APZ Width:** The future habitable buildings on the lots of the proposed development can be located within the developable portion of the lot and be surrounded by a 'Planning BAL-29' APZ of the required dimensions (measured from any external wall or supporting post or column to the edge of the classified vegetation), that will ensure their exposure to the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2.
☑ ☐ ☐	**Restriction on Building Location:** It has been identified that the current developable portion of some lots provides for a future building/structure location that will result in that building/structure being subject to a BA-40 or BAL-FZ rating. Consequently, it may be considered necessary to impose the condition that a restrictive covenant to the benefit of the local government pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of that portion of land (refer to Code F3 of Model Subdivision Conditions Schedule, WAPC June 2021 and Guidelines s5.3.2).
☐ ☐ ⊘	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated.
☑ ☐ ☐	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be partly established within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated. The balance of the APZ would exist on adjoining land that satisfies the exclusion requirements of AS 3959:2018 cl 2.2.3.2 for non-vegetated areas and/or low threat vegetation and/or vegetation managed in a minimal fuel condition.
☑ ☐ ☐	**APZ Location:** It can be justified that any adjoining (offsite) land forming part of a 'Planning BAL-29' APZ will: • If non-vegetated, remain in this condition in perpetuity; and/or • If vegetated, be low threat vegetation or vegetation managed in a minimal fuel condition in perpetuity.

☑ ☐ ☐	**APZ Management:** The area of land (within each lot boundary), that is to make up the required 'Landowner' APZ dimensions (refer to Appendix B, Part B1), can and will be managed in accordance with the requirements of the Guidelines Schedule 1 'Standards for Asset Protection Zones' (refer to Appendix B).
☑ ☐ ☐	**Staged Subdivision:** The subdivision proposes development in stages and each stage is to comply with the relevant bushfire protection criteria. A balance lot is created or classified vegetation within a subsequent stage will be removed and/or modified and/or be subject to ongoing management, to ensure that proposed lots within the current stage of the subdivision achieve a development site subject to 29 kW/m^2 or below. The planned approach for achieving the required outcome is described in the supporting assessment details below.
☑ ☐ ☐	**Firebreak/Hazard Reduction Notice:** Any additional requirements established by the relevant local government's annual notice to install firebreaks and manage fuel loads (issued under s33 of the Bushfires Act 1954), can and will be complied with.

Supporting Assessment Details:

Where lots are subject to a BAL rating of BAL-40, this portion of the lot is within the R-code building setbacks. A restrictive covenant should be placed on those lots having a BAL rating greater than BAL-29 to future proof any changes in R-Code standards.

The whole of the proposed residential lots will be managed to a low bushfire threat state per the requirements of the City of Gosnells Annual Fire Hazard Reduction Notice, and this BMP Addendum.

The proposed road layout provides separation from residential lots to the areas of revegetation. The Wetland and Landscape Development Management Plan (Oversby Consulting Nov 2022), will stipulate suitable plantings within the revegetation areas, and acceptable separation distances for this vegetation to future buildings on the proposed lots. Where necessary maintenance schedules are to be established to preserve vegetation in its planned state, so as not to change the bushfire vegetation classification, and possibly increase the BAL rating for future buildings.

Where the proposed development is staged, each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas, and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance.

Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.

ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)

Strategic Planning Proposals: "At this planning level there may not be enough detail to demonstrate compliance with this element. The decision-maker may consider this element is satisfied where A1.1 is met."

Structure Plans (lot layout known) and Subdivision Applications: "Provided that Element 1 is satisfied, the decision-maker may consider approving lot(s) containing BAL-40 or BAL-FZ under the following scenario.

BAL-40 or BAL-FZ levels of radiant heat are contained within the front setback of a lot(s) with road frontage that provides for hazard separation (as prescribed in a local planning scheme or the residential Design Codes).

For Lots 200 to 211, 213, 225 and 232 a BAL-40 contour extends up to 2 metres into the lot. However, the minimum R-Code setback for these lot frontages is 2 metres and therefore future buildings constructed on the lots will be setback a minimum of 2 metres, and will be located in an area assessed as having a BAL rating of BAL-29 rating or lower.

5.5 Assessment Statements for Element 3: Vehicular Access

VEHICULAR ACCESS					
Element Intent	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.				
Proposed Development/Use – Relevant Planning Stage	(Sb) Structure plan where the lot layout is known and subdivision application				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.* *The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices C and D. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E3 Vehicular Access				**Compliant:**	Yes
A3.1 Public roads			**Applicable**: Yes	**Compliant**:	Yes
☑ ☐ ☐ The technical construction requirements of vertical clearance and weight capacity (Guidelines, Table 6) can and will be complied with (Refer also to Appendix C in this BMP).					
☑ ☐ ☐ All other applicable technical requirements of trafficable width, gradients and curves, are required to be in "accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Ausroad Standards and/or any applicable standard in the local government area" (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP). The assessment conducted for the bushfire management plan indicates that it is likely that the proposed development can and will comply with the requirements. However, the applicable class of road, the associated technical requirements and subsequent proposal compliance, will need to be confirmed with the relevant local government and/or Main Roads WA.					
☑ ☐ ☐ A traversable verge is available adjacent to classified vegetation (Guidelines, E3.1), as recommended.					
Supporting Assessment Details: A footpath is provided along the side of the road bounding the proposed area of revegetation that may be used as a traversable verge. The proposed creek crossing is to have a minimum weight capacity of 15 tonnes.					

A3.2a Multiple access routes	Applicable:	Yes	Compliant:	Yes

☐ ☒ ☐	For each lot, two-way public road access is provided in two different directions to at least two different suitable destinations with an all-weather surface.
☐ ☒ ☐	The two-way access is available at an intersection no greater than 200m from the relevant boundary of each lot, via a no-through road.
☑ ☐ ☐	The two-way access is not available at an intersection within 200m from the relevant boundary of each lot. However, the available no-through road satisfies the established exemption for the length limitation in every case. These requirements are: • Demonstration of no alternative access (refer to A3.3 below); • The no-through road travels towards a suitable destination; and • The balance of the no-through road that is greater than 200m from the relevant lot boundary is within a residential built-out area or is potentially subject to radiant heat levels from adjacent bushfire prone vegetation that correspond to the BAL-LOW rating (<12.5 kW/m^2).

Supporting Assessment Details:

- Two way access is available from each lot within the proposed subdivision, as there are no cul-de-sacs. However, there is only a single access route into the proposed subdivision site, through an extension of the existing Attfield Street.
- Alternative access is not available to the site as it is bounded by a railway line to the east, the Canning River to the south and Stokely Creek to the west. Attfield Street is the only existing road reserve that provides access to the west. As stated in the previous BMP by RUIC, access north onto Albany Highway is not supported by Main Roads.
- Egress from the site along Attfield Street leads directly to the Maddington Central Shopping Centre which would be considered a suitable destination during a bushfire event.
- Exiting the proposed subdivision leads directly into a residential built up area with access in three different directions along River Avenue and Attfield Street at a distance of 145 metres from the existing southern terminus of Attfield Street.
- The acceptable solution in the Guidelines for Planning in Bushfire Prone Areas, with respect to a single access route, allows for travelling through a 200 metre section of road with exposure to landscape forest fire on both sides and onto a two way road surrounded by forest vegetation.
  For the proposed subdivision, the only portion of the internal road system that will be exposed to bushfire on both sides is the 70 metre section of Attfield Street that crosses Stokely Creek. After this Attfield Street travels north through a residential built up area.
  The remainder of the subject lot will be subdivided and become a residential built up area, with a road layout that provides multiple routes to the Stokely Creek crossing point, should any portion of the perimeter of the subdivision be affected by fire.
  While the distance from some lots within the subdivision to the Stokely Creek crossing will be greater than the 200 metres stated in the Guidelines, the overall bushfire exposure will be less than that allowed for in the Acceptable Solution as stated above.
  It is argued that the risk to future residents in the proposed subdivision is less than that allowed for in the Acceptable Solution and therefore the intent is met.

A3.2b Emergency access way	Applicable:	No	Compliant:	N/A

A3.3 Through-roads	Applicable:	Yes	Compliant:	Yes

☑ ☐ ☐	A no-through public road is necessary as no alternative road layout exists due to site constraints.
☐ ☒ ☐	The no-through public road length does not exceed the established maximum of 200m to an intersection providing two-way access (Guidelines, E3.3).

☑ ☐ ☐	The no-through public road exceeds 200m but satisfies the exemption provisions of A3.2a as demonstrated in A3.2a above.
☑ ☐ ☐	The public road technical construction requirements (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP), can and will be complied with as established in A3.1 above.
☐ ☐ ⊘	The turnaround area requirements (Guidelines, Figure 24) can and will be complied with.

Supporting Assessment Details:

- There is a single access/egress route to the proposed subdivision.
- This access/egress route satisfies the provisions a A3.2a.
- The internal road system will be constructed to the required standards.
- No cul-de-sacs will be created therefore turnaround areas will not be required.
- All lots will be provided with two way access/egress from their driveway.

A3.4a Perimeter roads	**Applicable**:	Yes	**Compliant**:	Yes

☑ ☐ ☐	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision) and therefore should have a perimeter road. This is planned to be installed.
☐ ☐ ⊘	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision). However, it is not required on the established basis of: • The vegetation adjoining the proposed lots is classified Class G Grassland; • Lots are zoned rural living or equivalent; • It is demonstrated that it cannot be provided due to site constraints; or • All lots have existing frontage to a public road.
☑ ☐ ☐	The technical construction requirements of widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.4a) can and will be complied with.

Supporting Assessment Details: A perimeter road, constructed to the technical requirements, is planned for the proposed subdivision.

A3.4b Fire service access route	**Applicable**:	No	**Compliant**:	N/A
A3.5 Battle-axe access legs	**Applicable**:	No	**Compliant**:	N/A
A3.6 Private driveways	**Applicable**:	No	**Compliant**:	N/A

5.6 Assessment Statements for Element 4: Water

WATER					
Element Intent	To ensure water is available to enable people, property and infrastructure to be defended from bushfire.				
Proposed Development/Use – Relevant Planning Stage	(Sb) Structure plan where the lot layout is known and subdivision application				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.* *The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices C and D. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⊘ Not relevant		
E4 Water				**Compliant:**	Yes
A4.1 Identification of future firefighting water supply		**Applicable:**	No	**Compliant:**	N/A
A4.2 Provision of water for firefighting purposes		**Applicable:**	Yes	**Compliant:**	Yes
☐ ☐ ⊘	A reticulated water supply is available to the proposed development. The existing hydrant connection(s) are provided in accordance with the specifications of the relevant water supply authority.				
☑ ☐ ☐	A reticulated water supply will be available to the proposed development. Hydrant connection(s) can and will be provided in accordance with the specifications of the relevant water supply authority.				
☐ ☐ ⊘	A static water supply (tank) for firefighting purposes will be installed on each lot that is additional to any water supply that is required for drinking and other domestic purposes.				
☐ ☐ ⊘	A strategic water supply (tank or tanks) for firefighting purposes will be installed within or adjacent to the proposed development that is additional to any water supply that is required for drinking and other domestic purposes. The required land will be ceded free of cost to the local government and the lot or road reserve where the tank is to be located will be identified on the plan of subdivision.				
☐ ☐ ⊘	The strategic static water supply (tank or tanks) will be located no more than 10 minutes travel time from a subject site (at legal road speeds).				
☐ ☐ ⊘	The technical requirements (location, number of tanks, volumes, design, construction materials, pipes and fittings), as established by the Guidelines (A4.2, E4 and Schedule 2) and/or the relevant local government, can and will be complied with.				

Supporting Assessment Details:

A reticulated water supply is not currently available to the proposed development. The closest hydrant by road is located on Attfield Street 94 metres north of the subject site.

Hydrants will be installed throughout the subdivision as required by the relevant authorities.

Refer to information contained in Appendix D for the firefighting water supply specifications and technical requirements.

5.7 Additional Assessment Notes

Additional Information and changes from RUIC BMP v1.4 made to the proposed subdivision.

- The proposed number of residential lots is reduced from 119 as shown in RUIC BMP v1.4 to 60 residential lots.
- A perimeter road is added to the subdivision layout in accordance with the Guidelines v1.4.
- The proposed site will not be subject to extreme or landscape type bushfires due to the size and arrangement of nearby classifiable vegetation, and the existence of surrounding built up residential and commercial lots.
- Due to the reduced potential extremity of a local bushfire event, it will be a viable option for residents to shelter inside their dwellings which will be built to bushfire standards.

6 RESPONSIBILITY CHECKLISTS FOR THE IMPLEMENTATION AND MANAGEMENT OF BUSHFIRE PROTECTION MEASURES

The following sections and their associated tables establish:

- The bushfire protection measures that shall be initially implemented and those requiring ongoing maintenance to the stated requirements;
- The persons responsible for the implementation and maintenance of the required bushfire protection measures; and
- The persons responsible and the timing for compliance certification when required.

The necessity for the BMP to contain this information is established by the *Guidelines for Planning in Bushfire Prone Areas* (Version 1.4, WAPC 2021) in Appendices 3 and 5.

6.1 Developer Responsibilities Prior to Issue of Certificates of Title for New Lots

TABLE 6.1(A) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)	
1	A notification, pursuant to Section 165 of the *Planning and Development Act 2005*, is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows: "*This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is/may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land.*" (Western Australian Planning Commission).
2	A plan is to be provided to identify areas of the proposed lot(s) that have been assessed as BAL-40 or BAL-FZ. A restrictive covenant to the benefit of the local government pursuant to section 129BA of the *Transfer of Land Act 1893*, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of land within areas that have been assessed a BAL-40 or BAL-FZ. Notice of this restriction is to be included on the diagram or plan of survey (deposited plan). The restrictive covenant is to state as follows: "*No habitable buildings are to be built within areas identified as BAL-40 or BAL-FZ*". (Local Government).
3	Construct the public roads to comply with the technical requirements referenced in the Guidelines for Planning in Bushfire Prone Areas (v1.4).
4	Construct any temporary emergency access ways and associated signs and gates to comply with the technical requirements referenced in the Guidelines for Planning in Bushfire Prone Areas (v1.4).
5	Construct any temporary cul-de-sacs to comply with the technical requirements referenced in the Guidelines for Planning in Bushfire Prone Areas (v1.4).

TABLE 6.1(A) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)	
6	Prior to issue of titles establish the Asset Protection Zone (APZ) as shown in Figures 3.1.2 to 3.1.4 and 3.2.1 to 3.2.3 of this BMP: • The APZ should comply with the standards established by the Guidelines DPLH, 2021 v1.4, Schedule 1, or as varied by the local government through their annually issued firebreak / hazard reduction notice when the variations have been endorsed by the WAPC and DFES as per s4.5.3 of the Guidelines. If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).
7	Prior to issue of titles, each individual lot is to be compliant with current version of the City of Gosnells Annual Fire Hazard Reduction Notice issued under s33 of the Bushfires Act 1954. This may include standards for asset protection zones that differ from Schedule 1 in the Guidelines DPLH, 2021 v1.4, with the intent to better satisfy local conditions.
8	Where the proposed development is staged, each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas, and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance. Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.
9	A compliance certificate/report for the BAL Contour Map relating to the approved subdivision is required to be completed to the satisfaction of the WAPC.

6.2 Developer / Landowner Responsibilities Prior To Sale

TABLE 6.2(A) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)	
1	Maintain the Asset Protection Zone (APZ) as shown in Figures 3.1.2 to 3.1.4 and 3.2.1 to 3.2.3 of this BMP: • The APZ should comply with the standards established by the Guidelines DPLH, 2021 v1.4, Schedule 1, or as varied by the local government through their annually issued firebreak / hazard reduction notice when the variations have been endorsed by the WAPC and DFES as per s4.5.3 of the Guidelines. If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).
2	Maintain each individual lot in compliance with current version of the City of Gosnells Annual Fire Hazard Reduction Notice issued under s33 of the Bushfires Act 1954. This may include standards for asset protection zones that differ from Schedule 1 in the Guidelines DPLH, 2021 v1.4, with the intent to better satisfy local conditions.
3	Maintain vegetation within the public open space areas to the bushfire vegetation classification standards stated in Figure 2.1 Overall Landscaping and Revegetation Plan • The areas noted as Class B Woodland on Figures 2.1 and 2.2 and Area 10 - Class B Woodland on Figures 3.1.2 to 3.1.4 and 3.2.1 to 3.2.3 is to be a minimum of 15 metres from the proposed residential lots. This area is to be maintained with a maximum 30% tree canopy cover at maturity and the ground cover understorey to a maximum 0.5 metres tall. The ground cover should be maintained free of dead fine fuels. (Note: this does not apply to the area in Figures 2.1 and 2.2 shown as Class B Woodland – Transition). • Areas shown as Class C Shrubland must have a maximum tree canopy coverage at maturity of 10%. Shrubs are to be no more than 2 metres tall at maturity. This is inclusive of the drainage basins and batters.
4	Where the proposed development is staged, each stage must comply with the requirements of the Guidelines for Planning in Bushfire Prone Areas, and this Bushfire Management Plan. This may require the creation of roads, temporary emergency access ways, management of land or installation of water supply lines outside that particular stage to achieve compliance. Vegetation on balance lot(s) may adversely affect the indicative BAL ratings of lots being developed. This should be assessed prior to the sale of the lots and the required vegetation on the balance lot managed and maintained until developed, or the indicative BAL ratings for the affected lots amended.

TABLE 6.2(C) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (NOT SUBJECT TO COMPLIANCE CHECK)	
1	Prior to relevant building work, inform the builder of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. The BMP may also establish, as an additional bushfire protection measure, that construction requirements to be applied will be those corresponding to a specified higher BAL rating. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). Other classes of buildings may also be required to comply with these construction when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).
2	Each property owner on sale of the allotment is provided with a copy of the BMP and informed of their responsibilities. A copy of the approved BMP should be attached to all contracts of sale for the lot.

6.3 Landowner / Occupier Responsibilities – Ongoing Management

TABLE 6.3 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	Maintain the Asset Protection Zone (APZ) as shown in Figures 3.1.2 to 3.1.4 and 3.2.1 to 3.2.3 of this BMP: • The APZ should comply with the standards established by the Guidelines DPLH, 2021 v1.4, Schedule 1, or as varied by the local government through their annually issued firebreak / hazard reduction notice when the variations have been endorsed by the WAPC and DFES as per s4.5.3 of the Guidelines. • If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).
2	Maintain each individual lot in compliance with current version of the City of Gosnells Annual Fire Hazard Reduction Notice issued under s33 of the Bushfires Act 1954. This may include standards for asset protection zones that differ from Schedule 1 in the Guidelines DPLH, 2021 v1.4, with the intent to better satisfy local conditions.
3	Maintain any areas nominated to be revegetated in accordance with the vegetation classification and management standards as specified in the BMP and/or Landscape Management Plan.
4	Ensure that builders engaged to construct dwellings/additions and/or other relevant structures on the lot, are aware of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended). As an additional bushfire protection measure, other classes of buildings may also be required to comply with these construction requirements when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The BMP may also establish that construction requirements to be applied will be those corresponding to a specified higher BAL rating. When applicable, these requirements will be identified in Section 5.7.
5	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: • The bushfire resistant construction requirements of the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), as established by the Building Regulations 2012 (WA Building Act 2011); and • Any additional bushfire protection measures this Bushfire Management Plan has established are to be implemented.

6	Ensure the ongoing implementation of the BMP, including providing successive landowners with a copy of the BMP and making them aware of the responsibilities it contains.

6.4 Local Government Responsibilities – Ongoing Management

TABLE 6.4 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	Monitor landowner compliance with the City of Gosnells Annual Fire Hazard Reduction Notice and with any bushfire protection measures that are: • Established by the RUIC Fire Bushfire Management Plan v1.4 – Lots 808 & 809 Albany Highway, Lot 3430 River Avenue, Maddington and this addendum; • Are required to be maintained by the landowner/occupier; and Are relevant to local government operations.
2	To be aware of the potential consequences of any significant changes in the local government's management of land, of which they have vested control (including re-vegetation), that could have an adverse impact on the BAL ratings that apply to adjacent future buildings.
3	To manage the vegetation within the adjoining public open space areas in accordance with the local government's written management agreement / statement of responsibility. In particular: • The area noted as Class B Woodland on Figures 2.1 and 2.2 and Area 10 - Class B Woodland on Figures 3.1.2 to 3.1.4 and 3.2.1 to 3.2.3 is to be a minimum of 15 metres from the proposed residential lots. This area is to be maintained with a maximum 30% tree canopy cover at maturity and the ground cover understorey to a maximum 0.5 metres tall. The ground cover should be maintained free of dead fine fuels. (Note: this does not apply to the area in Figures 2.1 and 2.2 shown as Class B Woodland – Transition). • Areas shown as Class C Shrubland must have a maximum tree canopy coverage at maturity of 10%. Shrubs are to be no more than 2 metres tall at maturity. This is inclusive of the drainage basins and batters.

APPENDIX A: DETAILED BAL ASSESSMENT DATA AND SUPPORTING INFORMATION

A1: BAL Assessment Inputs Common to the Method 1 and Method 2 Procedures

A1.1: FIRE DANGER INDICES (FDI/FDI/GFDI)

When using Method 1 the relevant FDI value required to be applied for each state and region is established by AS 3959:2018, Table 2.1. Each FDI value applied in Tables 2.4 – 2.7 represents both the Forest Fire Danger Index (FFDI) and a deemed equivalent for the Grassland Fire Danger Index (GFDI), as per Table B2 in Appendix B. When using Method 2, the relevant FFDI and GFDI are applied.

The values may be able to be refined within a jurisdiction, where sufficient climatological data is available and in consultation with the relevant authority.

Relevant Jurisdiction:	WA	Region:	Whole State	Method 1	Applied FDI:	80
				Method 2	Applied FFDI:	N/A
					Applied GFDI:	N/A

A1.2: VEGETATION ASSESSMENT AND CLASSIFICATION

Vegetation Types and Classification

In accordance with AS 3959:2018 Clauses 2.2.3 and C2.2.3.1, all vegetation types within 100 metres of the 'site' (defined as "the part of the allotment of land on which a building stands or is to be erected"), are identified and classified. Any vegetation more than 100 metres from the site that has influenced the classification of vegetation within 100 metres of the site, is identified and noted. The maximum excess distance is established by AS 3959: 2018 Clause 2.2.3.2 and is an additional 100 metres.

Classification is also guided by the Visual Guide for Bushfire Risk Assessment in WA (WA Department of Planning February 2016) and any relevant FPA Australia practice notes.

Modified Vegetation

The vegetation types have been assessed as they will be in their natural mature states, rather than what might be observed on the day. Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its expected re-generated mature state. Modified areas of vegetation can be excluded from classification if they consist of low threat vegetation or vegetation managed in a minimal fuel condition, satisfying AS 3959:2018 Clause 2.2.3.2(f), and there is sufficient justification to reasonable expect that this modified state will exist in perpetuity.

The Influence of Ground Slope

Where significant variation in effective slope exists under a consistent vegetation type, these will be delineated as separate vegetation areas to account for the difference in potential bushfire behaviour, in accordance with AS 3959:2018 Clauses 2.2.5 and C2.2.5.

THE INFLUENCE OF VEGETATION GREATER THAN 100 METRES FROM THE SUBJECT SITE	
Vegetation area(s) within 100m of the site whose classification has been influenced by the existence of bushfire prone vegetation from 100m – 200m from the site:	N/A

VEGETATION AREA 1						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 2 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	Up to 4m	Tree Height	8 to 15m	
Dominant & Sub-Dominant Layers	Eucalypts, acacias, bamboo					
Understorey:	Sedges and grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil					

PHOTO ID: 1a

PHOTO ID: 1b

VEGETATION AREA 2						
Classification	**G. GRASSLAND**					
Types Identified	Tussock grassland G-22					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 2 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	N/A	Shrub/Heath Height	N/A	Tree Height	N/A	
Dominant & Sub-Dominant Layers	N/A					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil					

PHOTO ID: 2a

VEGETATION AREA 3						
Classification	**G. GRASSLAND**					
Types Identified	Tussock grassland G-22					
Exclusion Clause	N/A					
Effective Slope	Determined	u/slope 1 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	N/A	Shrub/Heath Height	N/A	Tree Height	N/A	
Dominant & Sub-Dominant Layers	N/A					
Understorey:	Sedges and grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil					

PHOTO ID: 3a

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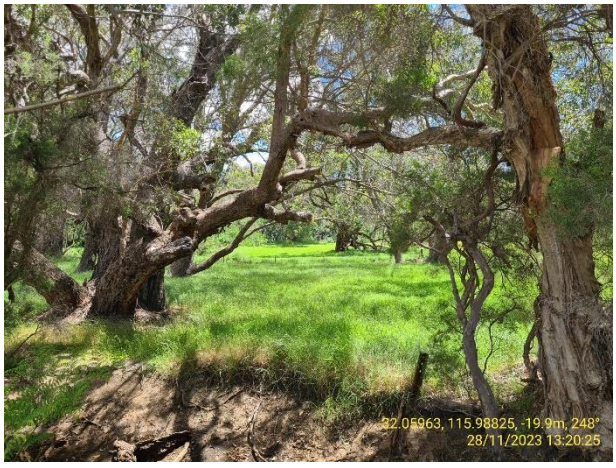
PHOTO ID: 3d

VEGETATION AREA 4						
Classification	**B. WOODLAND**					
Types Identified	Woodland B-05					
Exclusion Clause	N/A					
Effective Slope	Determined	u/slope 1 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	>30%	Shrub/Heath Height	Up to 5m	Tree Height	Up to 20m	
Dominant & Sub-Dominant Layers	Eucalypts, occasional scrub.					
Understorey:	Lupins and grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil					

PHOTO ID: 4a

PHOTO ID: 4b



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VEGETATION AREA 5						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	Up to 6m	Tree Height	Up to 20m	
Dominant & Sub-Dominant Layers	Eucalypts, saplings, bamboo, scrub, shrubs.					
Understorey:	Sedges and grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil					

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VEGETATION AREA 6						
Classification	**D. SCRUB**					
Types Identified	Closed scrub D-13					
Exclusion Clause	N/A					
Effective Slope	Determined	u/slope 1 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	N/A	Shrub/Heath Height	N/A	Tree Height	N/A	
Dominant & Sub-Dominant Layers	Small areas of bamboo or scrub.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Areas onsite to be removed.					

PHOTO ID: 6a

PHOTO ID: 6b

PHOTO ID: 6c

PHOTO ID: 6d

VEGETATION AREA 7						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	Up to 5m	Tree Height	Up to 20m	
Dominant & Sub-Dominant Layers	Narrow strip of forest vegetation alongside creek lines. River gums and other eucalypts, palms, bamboo, scrub.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Landscaping and revegetation.					

PHOTO ID: 7a

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PHOTO ID: 7c

PHOTO ID: 7d

VEGETATION AREA 7						
Classification	**A. FOREST**					
Types Identified	Open forest A-03					
Exclusion Clause	N/A					
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	30-70%	Shrub/Heath Height	Up to 5m	Tree Height	Up to 20m	
Dominant & Sub-Dominant Layers	Narrow strip of forest vegetation alongside creek lines. River gums and other eucalypts, palms, bamboo, scrub.					
Understorey:	Grasses, some creepers.					
Justification Comments	Not Required.					
Post Development Assumptions:	Landscaping and revegetation.					

PHOTO ID: 7e

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VEGETATION AREA 8						
Classification	**G. GRASSLAND**					
Types Identified	Tussock grassland G-22					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	<10%	Shrub/Heath Height	N/A	Tree Height	Up to 5m	
Dominant & Sub-Dominant Layers	Unmanaged orchard.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	To be cleared for development.					

PHOTO ID: 8a

PHOTO ID: 8b

PHOTO ID: 8c

PHOTO ID: 8d

VEGETATION AREA 8						
Classification	**G. GRASSLAND**					
Types Identified	Tussock grassland G-22					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	<10%	Shrub/Heath Height	N/A	Tree Height	Up to 5m	
Dominant & Sub-Dominant Layers	Open grassland areas, unmanaged orchard.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Onsite areas cleared for development.					

PHOTO ID: 8e

PHOTO ID: 8f

PHOTO ID: 8g

PHOTO ID: 8h

VEGETATION AREA 9						
Classification	**G. GRASSLAND**					
Types Identified	Tussock grassland G-22					
Exclusion Clause	N/A					
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover of Tallest Plant Layer	N/A	Shrub/Heath Height	N/A	Tree Height	N/A	
Dominant & Sub-Dominant Layers	Low wetland area.					
Understorey:	Reeds.					
Justification Comments	Not Required.					
Post Development Assumptions:	Nil.					

PHOTO ID: 9a

PHOTO ID: 9b

VEGETATION AREA 10						
Classification	**B. WOODLAND**					
Types Identified	Woodland B-05					
Exclusion Clause	N/A					
Effective Slope	Determined	d/slope 1 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	<30%	Shrub/Heath Height	N/A	Tree Height	Up to 15m	
Dominant & Sub-Dominant Layers	Eucalypts, saplings.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Landscaping and revegetation.					

PHOTO ID: 10a

PHOTO ID: 10b

VEGETATION AREA 11						
Classification	**EXCLUDED**					
Types Identified	Low bushfire threat vegetation.					
Exclusion Clause	2.2.3.2 (e) non-vegetated areas and (f) vegetation managed in a minimal fuel condition.					
Effective Slope	Determined	N/A	Applied Range (Method 1)	N/A		
Foliage Cover of Tallest Plant Layer	N/A	Shrub/Heath Height	N/A	Tree Height	N/A	
Dominant & Sub-Dominant Layers	N/A					
Understorey:	N/A					
Justification Comments	Non-vegetated areas, managed parkland, managed private property and managed railway reserve.					
Post Development Assumptions:	Nil.					

PHOTO ID: 11a

PHOTO ID: 11b

PHOTO ID: 11c

PHOTO ID: 11d

VEGETATION AREA 11						
Classification	**EXCLUDED**					
Types Identified	Low bushfire threat vegetation.					
Exclusion Clause	2.2.3.2 (e) non-vegetated areas and (f) vegetation managed in a minimal fuel condition.					
Effective Slope	Determined	d/slope 3 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover of Tallest Plant Layer	<10%	Shrub/Heath Height	N/A	Tree Height	Up to 5m	
Dominant & Sub-Dominant Layers	Unmanaged orchard.					
Understorey:	Grasses.					
Justification Comments	Not Required.					
Post Development Assumptions:	Managed railway reserve and managed private property.					

PHOTO ID: 11e

PHOTO ID: 11f

PHOTO ID: 11g

PHOTO ID: 11h

A1.3: EFFECTIVE SLOPE

EXPLAINING THE ASSESSMENT METHODOLOGY APPLIED BY BUSHFIRE PRONE PLANNING

DEFINITION: Effective slope is "the slope under that classified vegetation which most influences the bushfire attack" (AS 3959:2018, Clause 1.5.11).

"The effective slope under the classified vegetation is not the same as the average slope for the land surrounding the site of the proposed building. The effective slope is that slope which most significantly influences bushfire behaviour" (AS 3959:2018, Clause CB4).

The slope is described as upslope, flat or downslope when viewed from an exposed element (e.g., building) and looking towards the vegetation. It is measured in degrees.

[Note: Additional relevant guidance provided by AS 3959:2018 and NSW RFS, Planning for Bushfire Protection (2019) is incorporated into the applied assessment methodology and is presented at the end of this explanation.]

COMPOUND SLOPES UNDER VEGETATION AND DETERMINING SLOPE SIGNIFICANCE

Non-Linear Slopes: When the slope of ground under the vegetation out to the distance to be assessed (100 m or further if necessary), is not a straight line or nearly straight line slope, then it is made up of several different slopes i.e., it is a compound slope. The different slope angles and lengths must be factored into the determination of the effective slope value to be applied. Different slopes will potentially influence the bushfire rate of spread and intensity, both increasing and decreasing it.

Significant Slope: The AS 3959:2018 bushfire attack level determination methodology, with default inputs, models a fully developed bushfire. Therefore, a 'significant' slope is one that will significantly influence bushfire behaviour. To be 'significant' the length of the slope must be 'sufficient' to support a fully developed fire on that slope. The angle of a significant slope could be the determined effective slope for the area of classified vegetation if it is the one that 'most influences the bushfire attack'.

Sufficient Slope Length: Is a slope that will, as a minimum, allow the entire flame depth (flaming zone) of a fully developed fire (100m flame width) to exist on that slope.

The expected flame depth of a fully developed bushfire is a function of the length of time the flaming phase will exist on a section of the fuel bed (the 'residence time') and the bushfire's 'rate of spread'. For a given rate of spread, longer residence times result in greater flame depths. Greater flame depths are correlated with greater flame temperatures and greater flows of radiant heat.

The primary factors that will increase the residence time are:

- Heavier fine fuel loads of grass, leaf litter, twigs, bark etc less than 6mm in width and existing within the surface and near surface layers (and elevated fuel layers when contiguous with the base layers); and
- A greater percentage of larger fine fuels within the fuel load.

The primary factors that increase the rate of spread (apart from fire weather factors), include finer fuels, drier fuels, horizonal continuity of fuel and steeper upward ground slope in the direction of fire travel.

Example values:

- Residence Time: Grassfire 5 – 15 seconds, Forest fire 25 -50 seconds.
- Rate of Spread: Grassfires of a few km/hr are considered fast moving, 5-10 km/hr is common and fastest in the order of 25km/hr. Forest fire typically recorded in metres/hour with 1-1.5 km/hr being considered fast moving and fastest in the order of 3–4 km/hr.
- Flame Depth: More typically, a few metres for grasses to tens of metres for forest fires.

An Isolated Slope: For scenarios where there is a single significant slope (based on the above criteria) additional consideration would need to be given to the time and distance consumed by a bushfire still in its 'developing' phase. This will require due consideration be given to how it is potentially ignited i.e., from a single or multiple points, as this will influence the time and distance required to fully develop. For such scenarios, a normally significant slope may not be sufficiently long. It may be necessary to determine the potential bushfire impact more accurately by

justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width (using short fire run modelling).

Determined Effective Slope: Only a 'significant' slope can potentially be the effective slope by itself. In which case, for a defined area of classified vegetation area, the worst significant slope under that vegetation is to apply.

The table below presents Bushfire Prone Planning's considerations applied to assessing short and/or compound slopes in determining the effective slope.

Slope Length (m)	Considered a Significant Slope	Considerations in Determining the Effective Slope
< 5	No	Where these short slopes exist as part of a compound slope under an area of classified vegetation, they can be ignored as they will not influence the fire behaviour in that vegetation.
5-20	No	These slopes will have a range of influence on fire behaviour from very little to a degree of influence that must be accounted for to some extent by the determined effective slope that is applied (i.e., with a greater length apply to a greater extent). But the actual slope of these shorter slopes is likely not to be applied as it is not a 'significant' length.
20-30	Maybe	The same considerations applied to the 5-20m slope lengths should be applied here. However, more justification would need to be presented to support their assessment as not being 'significant' slopes. For these slope lengths, consideration must be given more broadly to the potential level of risks associated with a bushfire event in this location. The risk level will be a function of the bushfire hazard threat levels (direct attack mechanisms) within the immediate and broader assessment area as influenced by local topography, vegetation extents and types and the exposure and vulnerability of persons and/or buildings/structures to these threats. Higer risk levels require greater precaution meaning these slopes should be considered 'significant', and vice versa. Consider the potential for a bushfire on adjoining or nearby land be a source of ignition and/or pre-heating to vegetation on the subject slope. Consider if vegetation on the slope is likely be ignited by a single ignition point or is multipoint ignition possible from bushfire an adjoining slopes or the surrounding area. Single point ignition will require a fire to travel further before being fully developed (DFES considers less than 100m fire runs may be considered a short fire run for forest, woodland and scrub vegetation classifications, RFS NSW applies 150m). Isolated slopes of this length are less likely to be considered significant as compared to when part of a compound slope.
>30	Yes	Likely to always be a significant slope unless isolated (i.e., exists alone) – in which case, justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width, are approaches that may need to be applied.

BPP Approach - Slope Variation Within Areas of Vegetation

When multiple 'significant' slope lengths with large differences in degrees of effective slope (or different applicable slope ranges when AS 3959:2018 Method 1 is applied), exists under a single vegetation classification, these will be delineated as separate vegetation areas of classified vegetation to account for the difference in potential bushfire behaviour and impact, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

Effective Slope Variation Due to Multiple Development Sites

When the effective slope, under a single area of bushfire prone vegetation, will vary significantly relative to multiple proposed development sites (exposed elements), then the effective slopes corresponding to each of the different

locations, are separately identified. The relevant (worst case) effective slope is determined in the direction corresponding to the potential directions of fire spread towards the subject building(s).

AS 3959:2018 EFFECTIVE SLOPE DETERMINATION - GUIDANCE

The Standard presents a broad set of guidance statements that indicate the intent of deriving an effective slope value for use in calculations, rather than detailing the 'in the field' determination process. These include:

- Highlighting the importance of the value by stating "The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the severity of the fire and the ultimate level of radiant heat flux" (Clause C2.2.5). [Note: A common rule of thumb is that for every 10 degrees of upslope, a fire will double its rate of spread if moving in the direction of the prevailing wind].
- It may be necessary to consider the slope under the classified vegetation for distances greater than 100 m in order to determine the effective slope for that vegetation classification.
- "Where there is more than one slope within the classified vegetation, each slope shall be individually assessed, and the worst case Bushfire Attack Level shall apply" (Clause 2.2.5).

NSW RFS 2019, PLANNING FOR BUSHFIRE PROTECTION - APPENDIX A1.5 - ADDITIONAL DETERMINATION GUIDANCE

- "In identifying the effective slope - it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be justified".
- "Vegetation located closest to an asset may not necessarily be located on the effective slope".

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

The effective slopes determined from the site assessment are recorded in Table 3.2 of this Bushfire Management Plan. When their derivation requires additional explanation and justification, this is provided below.

Vegetation Area 7 is a narrow strip of forest vegetation running along the creek lines and perpendicular to the subject site. The slopes down into the creek and then up towards the subject site are short and will not influence fire behaviour. A bushfire in this vegetation area will either be a flanking fire, or a developing fire and will not affect the site with the full potential of a forest fire. For these reasons the effective slope in this vegetation area is assess as flat.

Vegetation Area 12 is generally located within proposed drainage basins where the slopes are short and variable. An average slope across the drainage basin from top to top is adopted in assessing the effective slope.

Vegetation Area 14 is the external slope of the drainage basins having a slope of between 10 and 15 degrees.

A1.4: SEPARATION DISTANCE

Measuring

The separation distance is the distance in the horizontal plane between the receiver (building/structure or area of land being considered) and the edge of the classified vegetation (AS 3959:2018, clause 2.2.4)

The relevant parts of a building/structure from which the measurement is taken is the nearest part of an external wall or where a wall does not exist, the supporting posts or columns. Certain parts of buildings are excluded including eaves and roof overhangs.

The edge of the vegetation, for forests and woodlands, will be determined by the unmanaged understorey rather than either the canopy (drip line) or the trunk (AS 3959:2018, clause C2.2.5).

Measured Separation Distance as a Calculation Input

If a separation distance can be measured because the location of the building/structure relative to the edge of the relevant classified vegetation is known, this figure can be entered into the BAL calculation. The result is a determined BAL rating.

Assumed Separation Distance as a Calculation Input

When the building/structure location within the lot is not known, an assumed building location may be applied that would establish the closest positioning of the building/structure relative to the relevant area of vegetation.

The assumed location would be based on a factor that puts a restriction on a building location such as:

- An established setback from the boundary of a lot, such as a residential design code setback or a restrictive covenant; or
- Within an established building envelope.

The resultant BAL rating would be indicative and require later confirmation (via a Compliance Report) of the building/structure actual location relative to the vegetation to establish the determined BAL rating.

Separation Distance as a Calculation Output

With the necessary site specific assessment inputs and using the AS 3959:2018 bushfire modelling equations, the range of separation distances that will correspond to each BAL rating (each of which represents a range of radiant heat flux), can be calculated. This has application for bushfire planning scenarios such as:

- When the separation distance cannot be measured because the exact location of the exposed element (i.e., the building, structure or area), relative to classified vegetation, is yet to be determined.

  In this scenario, the required information is the identification of building locations onsite that will correspond to each BAL rating. That is, indicative BAL ratings can be derived for a variety of potential building/structure locations; or

- The separation distance is known for a given building, structure or area (and a determined BAL rating can be derived), but additional information is required regarding the exposure levels (to the transfer of radiant heat from a bushfire), of buildings or persons, that will exist at different points within the subject site.

The calculated range of separation distances corresponding to each BAL rating can be presented in a table and/or illustrated as a BAL Contour Map – whichever is determined to best fit the purpose of the assessment.

For additional information refer to the information boxes in Section 3 'Bushfire Attack Levels (BAL) - Understanding the Results and Section 3.2. 'Interpretation of the BAL Contour Map'.

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

For the subject development/use the applicable separation distances values are derived from calculations applying the assessed site data. They are an output value, not an input value and therefore are not presented or justified in this appendix.

The derived values are presented in Section 3, Table 3.3 and illustrated as BAL contour maps in Figures 3.2.1 to 3.2.3.

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APPENDIX B: ADVICE - ONSITE VEGETATION MANAGEMENT - THE APZ

THE ASSET PROTECTION ZONE (APZ) – DESCRIPTION AND OBJECTIVES

Description: The asset protection zone (APZ) is the area of land surrounding a building or structure on which any combustible materials will be located and/or managed to reduce the potential impact of the direct and indirect attack mechanisms (threats) of bushfire, and therefore reduce the associated risks of building/structure damage or loss, to acceptable levels.

When cultivated and/or natural vegetation exists within the zone it must present low potential threat levels from the direct fire attack mechanisms of flame contact, radiant heat and ember attack and fire driven wind, and the indirect attack mechanisms of debris accumulation, surface fire, tree strike and consequential fire.

The required low threat levels will be achieved as the result of factors that include persistent higher fuel moisture contents, lower flammability and/or minimal fuel loads, due to either limiting the existence of these fuels through removal and/or modification, and the subsequent ongoing management (reduction) of fuel loads.

When a bushfire attack level (BAL) is required to be determined for a building/structure to establish its bushfire construction requirements, the condition of the vegetation within the APZ must satisfy the requirements established by *clause 2.2.3.2 of AS 3959:2018 Construction of buildings in bushfire prone areas* - to be excluded from classification.

For other combustible structures/materials within the APZ, lower threat levels will be the result of factors such as their appropriate use, lowered vulnerability and location relative to the primary building/structure to be protected.

Objectives: The primary objectives of establishing a low threat area surrounding buildings/structures are to create that performs the following functions:

1. To establish an APZ of specified dimensions ensure the building is sufficiently separated from the identified bushfire hazard to limit the impact of its direct attack mechanisms. The required dimensions of the APZ must:
    - Remove the potential for direct flame contact on the building;
    - Reduce the level of radiant heat to which the building is exposed. The APZ dimensions should ensure that the potential level of radiant heat impact corresponds to the level of vulnerability of the building/structure - as determined by the degree to which bushfire resistant construction has been applied (or not). For example, when constructed to the requirements corresponding to its determined exposure to radiant heat (measured as a bushfire attack level) in accordance with AS 3959 or the NASH Standard.
    - Ensure some reduction in the threat level of the ember/burning debris attack mechanism when higher threat vegetation types are present in the vicinity. Note, the reduction in some scenarios will be minimal given the produced quantity, type, survival time and consequent distance that certain embers/burning debris can travel.

      Be aware of that research has identified that consequential fire, ignited by embers, is the primary cause (>80%) of building loss in past Australian bushfire events. In bushfire prone areas, the importance of applying protection measures to prevent ember entry to buildings/structures and minimising the existence of consequential fire fuels cannot be overstated.
2. To ensure any combustible fuels (debris and structures) or trees that remain within the APZ will be managed and located to limit the potential impact of the indirect attack mechanisms of bushfire by:
    - Minimising the accumulation of debris on, within and around buildings/structures to limit this source of fuel for consequential fires that will result in the direct fire attack mechanisms of flames and greater radiant heat existing closer to the buildings/structures, even though the bushfire hazard exists at a greater distance away;
    - To prevent surface fire moving through the APZ and closer to buildings/structures than the fire in the bushfire hazard itself can;

- Prevent fire weakened or windblown trees/branches impacting buildings/structures and allowing ember/burning debris entry;

- To ensure other combustible materials that can result in a consequential fire ignited by embers/burning debris), within both the APZ and parts of the building, are eliminated, minimised and/or appropriately located or protected (the explanatory notes in the Guidelines provide some guidance for achieving this objective and other sources are available); and

3. To provide a defendable space for firefighting activities.

B1: Asset Protection Zone (APZ) Dimensions

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

THE 'PLANNING BAL-29' APZ DIMENSIONS

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its purpose is to identify if an acceptable solution for planning approval can be met i.e., can a specified minimum separation distance from bushfire prone vegetation exist.

An assessment against the Bushfire Protection Criteria is conducted for planning approval purposes. To satisfy 'A2.1: Asset Protection Zone', it must be demonstrated that certain minimum separation distances between the relevant building/structure and different classes of bushfire prone vegetation, either exist or can be created and will remain in perpetuity. These minimum separation distances determine the 'Planning BAL-29' APZ dimensions.

Dimensions: The minimum dimensions are those that will ensure the potential radiant heat impact on subject buildings does not exceed 29 kW/m^2. These dimensions will vary dependent on the vegetation classification, the slope of the land they are growing on and certain other factors specific to the subject site.

Note: For certain purposes associated with vulnerable land uses, the 'Planning BAL-29' APZ may be replaced with dimensions corresponding to radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.

Location: The identified 'Planning BAL-29' APZ must not extend past lot boundaries onto land the landowner has no control over either now or potentially at some point in the future. Limited exceptions include:

- When adjoining land is not vegetated (e.g., built out, roads, carparks, drainage, rock, water body etc.);
- When adjoining land currently or, will in the short term, contain low threat vegetation and or vegetation managed in a minimal fuel condition as per AS 3959:2018 cl. 2.2.3.2. It must be reasonable (justifiable) to expect this low threat vegetation and/or level of management will continue to exist or be conducted in perpetuity and require no action from the owner of the subject lot.

  Such areas of land include formally managed areas of vegetation (e.g., public open space / recreation areas / services installed in a common section of land). For specific scenarios, evidence of the formal commitment to manage these areas to a certain standard may be required and would be included in the BMP.

  These areas of land can also be part of the required APZ on a neighbouring lot for which the owner of that lot has a recognised responsibility to establish and maintain; and
- When there is a formalised and enforceable capability and responsibility created for the subject lot owner, or any other third party, to manage vegetation on land they do not own in perpetuity. This would be rare, and evidence of the formal authority would be included in the BMP.

The bushfire consultant's 'Supporting Assessment Detail', that is presented in the assessment against the acceptable solution A2.1, will identify and justify how any adjoining land within the 'Planning BAL-29 APZ will meet the APZ standards. Or otherwise, explain how this condition cannot be met.

THE 'BAL RATING' APZ DIMENSIONS

The applicable BAL rating will have been stated in the BAL Assessment Data section of the BAL Assessment Report or BMP (as relevant). The BAL rating can be assessed as 'determined' or 'indicative' or be 'conditional', dependent of the specific conditions associated with the site and the stage of assessment or planning. It is the eventual assessment of the 'Determined' BAL that will establish both the BAL rating that is to apply and its corresponding 'BAL Rating' APZ dimensions.

Dimensions: The minimum dimensions of the 'BAL Rating' APZ to be established and maintained will be those that correspond to the determined BAL rating for the subject building/structure that has accounted for surrounding vegetation types, the slope of the land they are growing on and certain other factors specific to the subject site and surrounding land.

Establishing the 'BAL Rating' APZ will ensure that the potential radiant heat exposure of the building/structure will be limited to the level that the applied construction requirements are designed to resist when that building/structure is required to be constructed to the standard corresponding to the Determined BAL.

> *Note: For certain purposes associated with vulnerable land uses, the 'BAL Rating' APZ dimensions may be replaced with dimensions corresponding to the specific radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.*

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

THE 'LOCAL GOVERNMENT' APZ DIMENSIONS

Some Local Government's establish the dimensions of the APZ that must be established surrounding buildings in their annual Firebreak/Hazard Reduction Notice. Or for a specific site they may establish a maximum allowable dimension (typically that corresponding to BAL-29). When established, the landowner will need to be comply with these.

THE 'REQUIRED' APZ DIMENSIONS

This is the APZ that is to be established and maintained by the landowner within the subject lot and surrounding the subject building(s). It will be identified on the Property Bushfire Management Statement when it is required to be included in this Report/Plan.

Dimensions: The 'Required APZ' dimensions are the minimum (or maximum when relevant) distances away from the subject building(s) that the APZ must extend. These distances will not necessarily be the same all around the building(s). They can vary and are dependent on the different vegetation types (and their associated ground slope) that can exist around the building(s), and specific local government requirements. The dimensions to implement are determined by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

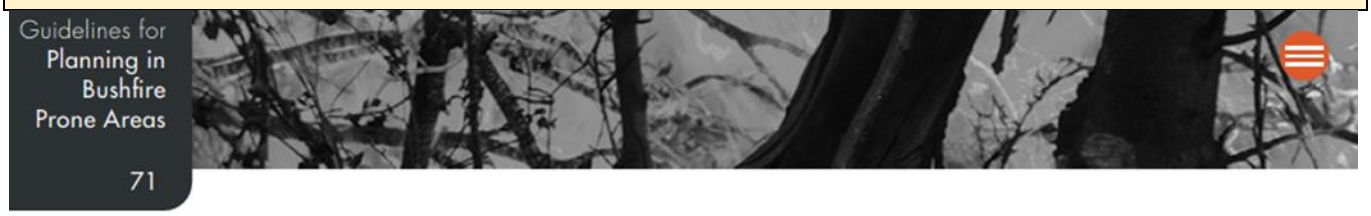
B1.1: THE APZ DIMENSIONS REQUIRED TO BE IMPLEMENTED BY THE LANDOWNER

DETERMINATION OF THE 'REQUIRED' APZ DIMENSIONS TO BE IMPLEMENTED AND MAINTAINED BY LANDOWNER WITHIN THEIR LOT										
Relevant Buildings(s)	Vegetation Classification [Refer to Fig 3.1]		Minimum Required Separation Distances from Building to Vegetation (metres)							
			Established by the 'BAL Rating' APZ Dimension					Established by the "Local Government' APZ Dimension		The 'Required' APZ Dimensions [see note]
			Determined Radiant Heat Impact	Stated 'Indicative' or 'Conditional' BAL				Firebreak / Hazard Reduction Notice	Maximum Allowed	
	Area	Class		BAL-29	BAL-19	BAL-12.5	BAL-LOW			
All Proposed Residential Lots	1	(A) Forest	N/A	27-<37	37-<50	50-<100	>100	The whole of each residential lot is to be managed to a low bushfire threat state.	N/A	The whole of each residential lot is to be managed to a low bushfire threat state.
	2	(G) Grassland		9-<14	14-<20	20-<50	>50			
	3	(G) Grassland		8-<12	12-<17	17-<50	>50			
	4	(B) Woodland		14-<20	20-<29	29-<100	>100			
	5	(A) Forest		27-<37	37-<50	50-<100	>100			
	6	(D) Scrub		13-<19	19-<27	27-<100	>100			
	7	(A) Forest		21-<31	31-<42	42-<100	>100			
	8	(G) Grassland		9-<14	14-<20	20-<50	>50			
	9	(G) Grassland		8-<12	12-<17	17-<50	>50			
	10	(B) Woodland		17-<25	25-<35	35-<100	>100			
	11	(C) Shrubland		9-<13	13-<19	19-<100	>100			
	12	(C) Shrubland		10-<15	15-<22	22-<100	>100			
	13	(C) Shrubland		11-<17	17-<25	2-<100	>100			
	14	(C) Shrubland		13-<19	19-<28	28-<100	>100			
Comment: The whole of each residential lot is to be managed and maintained to a low bushfire threat state.										

B2: The Standards for the APZ as Established by the Guidelines (DPLH, v1.4)

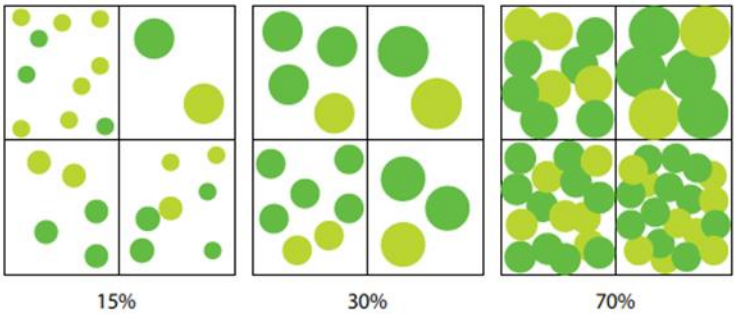
Within the Guidelines (source: https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas), the management Standards are established by:

- Schedule 1: Standards for Asset Protection Zones (see extract below) established by the Guidelines; and
- The associated explanatory notes (Guidelines E2) that address (a) managing an asset protection zone (APZ) to a low threat state (b) landscaping and design of an asset protection zone and (c) plant flammability.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity 

Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

B3: The Standards for the APZ as Established by the Local Government

Refer to the firebreak / hazard reduction notice issued annually (under s33 of the Bushfires Act 1954) by the relevant local government. It may state Standards that vary from those established by the Guidelines and that have been endorsed by the WAPC and DFES as per Section 4.5.3 of the Guidelines.

A copy of the applicable notice is not included here as they are subject to being reviewed and modified prior to issuing each year. Refer to ratepayers notices and/or the local government's website for the current version.

B4: Vegetation and Areas Excluded from Classification - Ensure Continued Exclusion

AS 3959:2018 establishes the methodology for determining a bushfire attack level (BAL). The methodology includes the classification of the subject site's surrounding vegetation according to their 'type' and the application of the corresponding relevant bushfire behaviour models to determine the BAL.

Certain vegetation can be considered as low threat or managed in a minimal fuel condition and can be excluded from classification. Where this has occurred in assessing the site, the extract from AS3959:2018 below states the requirements that must continue to exist for the vegetation on those areas of land to be excluded from classification (including the size of the vegetation area if relevant to the assessment).

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.

(d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

(f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

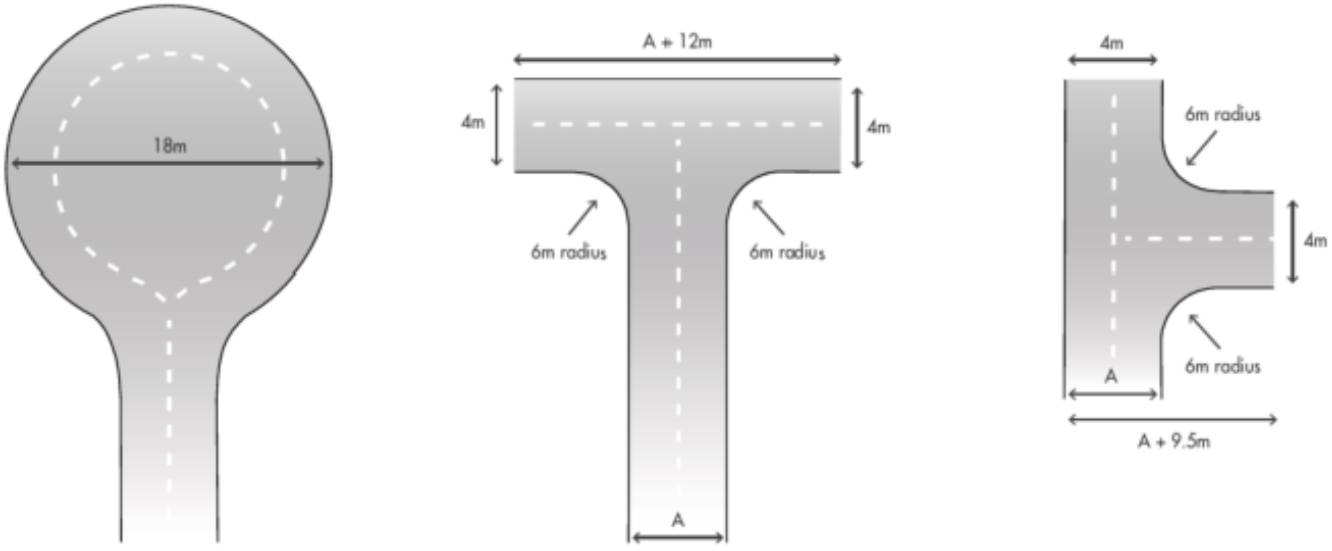
APPENDIX C: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

The design/layout requirements for access are established by the acceptable solutions of the Guidelines (DPLH, 2021 v1.4) Element 3 and vary dependent on the access component, the land use and the presence of 'vulnerable' persons. Consequently, the best reference source are the Guidelines. The technical requirements that are fixed for all components and uses are presented in this appendix.

GUIDELINES TABLE 6, EXPLANATORY NOTES E3.3 & E3.6 AND RELEVANT ACCEPTABLE SOLUTIONS

Technical Component	Vehicular Access Types / Components			
	Public Roads	Emergency Access Way [1]	Fire Service Access Route [1]	Battle-axe and Private Driveways [2]
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum Grade Unsealed Road [3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum Grade Sealed Road [3]		1:7 (14.3%)		
Maximum Average Grade Sealed Road		1:10 (10%)		
Minimum Inner Radius of Road Curves (m)		8.5		

Turnaround Area Dimensions for No-through Road, Battle-axe Legs and Private Driveways [4]



Passing Bay Requirements for Battle-axe leg and Private Driveway

When the access component length is greater than the stated maximum, passing bays are required every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum 6m).

Emergency Access Way – Additional Requirements

Provide a through connection to a public road, be no more than 500m in length, must be signposted and if gated, gates must be open the whole trafficable width and remain unlocked.

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% or 7.1 degree) entry and exit angle.

[4] The turnaround area should be within 30m of the main habitable building.

APPENDIX D: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER SUPPLY

D1: Reticulated Areas – Hydrant Supply

The Guidelines state "where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority."

The main scheme water suppliers / authorities in WA are The Water Corporation, AqWest – Bunbury Water Corporation and Busselton Water Corporation. Various local authority exists in other non-scheme and regional areas. However, most existing fire hydrants are connected to Water Corporation water mains.

Consequently, the hydrant location specifications from The Water Corporation's 'No 63 Water Reticulation Standard' (Ver 3 Rev 15) are provided in the extract below with the key distances relevant to bushfire planning assessments being highlighted. This Standard is deemed to be the baseline criteria for developments and should be applied unless different local water supply authority conditions apply. Other applicable specification will be found in the Standard.

Note: The maximum distance from a hydrant to the rear of a lot/building is generally interpreted as not applicable to large lot sizes where the maximum distance becomes an impractical limitation i.e., typically rural residential areas.

2.2.1.5 Appurtenances

c. Hydrants

Hydrants shall be screw-down hydrant with built-in isolation valve and installed only on DN100 or larger pipes. Hydrants shall be located:

- so that the maximum distance between a hydrant and the rear of a building envelope, (or in the absence of a building envelope the rear of the lot) shall be 120m;
- so that spacing (as measured by hose-run) between hydrants in non-residential or mixed use areas shall be maximized and no greater than 100m;
- so that spacing (as measured by hose-run) between hydrants in residential areas with lots per dwelling <10,000m² shall be maximized and no greater than 200m;
- so that spacing between hydrants (as measured by hose-run) in rural residential areas where minimum lots per dwelling is >10,000 m² (1ha) shall be maximized and no greater than 400m;
- centrally along the frontage of a lot to avoid being under driveways, unless the lot features a frontage 6m or less, in which case it shall be placed to the side opposite the driveway;
- at lots that have the widest frontage in the local area;
- where appropriate at the truncation of road junctions or intersections so that they can serve more than one street and can be readily located;
- on both sides of the major roads at staggered intervals where there are mains on both sides of the road;
- at major intersections on dual multi-lane roads, where two hydrants are to be sited on diagonally opposite corners;
- hydrants should be located at least 20m from traffic calming devices i.e., median slow points or chokers, chicanes, mini traffic circles, and intersection 'pop-outs' to ensure traffic is not impeded;
- in a position not less than 10m from any high voltage main electrical distribution equipment such as transformers and distribution boards, liquefied petroleum gas or other combustible storage;
- directly on top of the main using a tee unless proved to be impractical.

Oversby Consulting

Lot 808 & 809 Albany Highway, Maddington

WETLAND AND LANDSCAPE DEVELOPMENT MANAGEMENT PLAN

PREPARED FOR DANDENONG PROPERTIES PTY LTD

B21015 | 1 November 2022

Oversby Consulting Pty Ltd
ABN 41 887 270 403

DOCUMENT CONTROL

ISSUE	DATE	ISSUE DETAILS	AUTHOR
1	*18/04/2019*	*Preliminary Plan for Review (Calibre)*	*Brendan Oversby*
2	*25/02/2020*	*Submission for Approval – City and DBCA (Calibre) Up to Rev K*	*Brendan Oversby*
V5	15/11/2021	Re Submission for Approval – City and DBCA with new Company (Oversby Consulting)	Brendan Oversby
V6	22/11/2021	Minor update on plant setbacks for fire	Brendan Oversby
V7	30/09/2022	Update in response to Jan 2022 City comments	Brendan Oversby
V8	30/11/2022	Update in response to DBCA Nov 2022 comments	Brendan Oversby

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1 EXECUTIVE SUMMARY

1.1 GENERAL

This Wetland and Landscaping Development Management Plan (the Plan) has been produced for Lot 808 & 809 Albany Highway, Maddington as well as Reserve 3430. It also provides direction for surrounding lots that also interface with Stokely Creek. The works complement the works previously undertaken on Lot 26 River Avenue and a portion of Lot 3430 on Diagram 64956.

The report sets out the proposed works associated with the reserve areas and the associated waterways and wetlands. It details the types of plants, site preparation, pathways and other infrastructure and ongoing maintenance associated with these areas. It also considers the drainage infrastructure and fire management requirements.

The works outlined in this report are based on the approved Stokely Creek Wetland and Local Open Space Strategy by Tranen as well as the agreed draft landscaping concept in 2018, which considered the impact of bushfire. It also considers feedback from the Department of Biodiversity, Conservation and Attractions as well as the City of Gosnells in relation to the April 2019 version of this report. This report should be read in conjunction with the Stokely Creek Wetland and Local Open Space Strategy, where more detailed information on the predevelopment site characteristics and a context for works in the surrounding area are required.

1.2 PLANNING SUMMARY

The Plan cover's Lot 808 and Lot 3430 as per the subdivision conditions, while the works in the current Parks and Recreation Reserve (Lot 809) are undertaken as part of former agreements to use a portion of this land for drainage, recreation and ecological enhancement.

The Plan has been prepared to satisfy the subdivision conditions within WAPC Approval 155487 (Condition 31 - 35). The conditions read:

31. Prior to the commencement of subdivision works a Wetland and Landscape Development Management Plan is to be prepared, approved and implemented, to ensure the protection and management of the sites environmental assets to the specifications of the City of Gosnells in conjunction with the Department Biodiversity, Parks and Attractions – Rivers and Estuaries section. (Local Government)

32. Prior to the commencement of subdivision works a Revised Revegetation and Landscaping plan is to be prepared, approved and implemented, to the specifications of the City of Gosnells in conjunction with the Department Biodiversity, Parks and Attractions – Rivers and Estuaries section. (Local Government)

33. Suitable vehicle barrier/bollards are to be provided along the boundary or within the roads abutting the public Open Space areas to the satisfaction of the Western Australian Planning Commission (Local Government)

34. *Prior to the commencement of subdivision works a Foreshore Management Plan for works within the Swan Canning Development Control Area (Lot 809) shall be prepared, approved and thereafter implemented to the satisfaction of the Department Biodiversity, Parks and Attractions - Rivers and Estuaries section in consultation with the Department of Planning Lands and Heritage and the City of Gosnells.* (Department of Biodiversity, Conservation and Attractions)

35. Prior to commencement of subdivision works, drawings and specifications for the development interface with the Parks and Recreation and Public Open Space are to be prepared and approved to the satisfaction of the Western Australian Planning Commission, on advice of the Department Biodiversity, Parks and Attractions - Rivers and Estuaries section. (Local Government)

The following Conditions and Advice Notes have also been considered in the production of the Plan.
Conditions

36. *A management plan detailing how risk of erosion and sedimentation impacts into nearby water bodies will be minimised during subdivision is to be:*
    (a) prepared by the landowner/applicant and approved prior to the commencement subdivisional works; and
    (b) implemented during subdivisional works. (Department Biodiversity, Parks and Attractions - Rivers and Estuaries section)

Advice Notes:

8. *The applicant is advised that any works within the public open space reserve should be consistent with works proposed in the Parks and Recreation Reserve and address the ongoing management of the landscaping to minimise the impact of nutrient transport to the river and to provide a cohesive area of public open space. Landscaping should enhance the viewscape of the river and seek to minimise visual intrusion of the development on the landscape. The Department of Biodiversity, Conservation and Attractions advises the planting of local native species to reduce water and fertiliser requirements and provide habitat for native riparian fauna.*

9. *In regard to the Condition 32 the applicant is advised that the revised landscape management plan is to provide details on the species and rate of growth of the proposed low threat landscaped area adjacent. The landscape management plan shall be included as an appendix of the Bushfire Management Plan.*

10. *With regard to Condition 33, the Foreshore Management Plan for the works within the Swan Canning Development Control Area (Lot 809) shall include, as a minimum, those works outlined the revised Revegetation and Landscaping Plan. The Foreshore Management Plan will need to obtain the approval of the Minister for Environment under Part 5 of the Swan and Canning Rivers Management Act 2006. The Foreshore Management Plan shall be implemented to the specifications of the Department of Biodiversity, Conservation and Attractions (Rivers and Estuaries) and is required to address the ongoing care, maintenance and management responsibilities, including vesting arrangements, for the Parks and Recreation reserve*

11. *With regard to Condition 35, drawings and specifications should include, but not be limited to, details on any proposed development (including filling, battering, retaining, fencing) within 10 metres of the Swan Canning Development Control Area (DCA) boundary. Such specifications are to include details on heights and materials (which are required to be low fire threat). The development should demonstrate that the visual amenity of the interface between the development and the DCA is desirable when being viewed from within the public reserve and not increase bushfire threat.*

The Plan has also been prepared to satisfy the subdivision conditions within WAPC Approval 1036-18 (Condition 11). The condition reads:

11. *A management plan detailing how risk of erosion and sedimentation impacts into nearby water bodies will be minimised during subdivision is to be:*
    (a) prepared by the landowner/applicant and approved prior to the commencement subdivisional works; and
    (b) implemented during subdivisional works. (Department Biodiversity, Parks and Attractions - Rivers and Estuaries section)

1.3 SITE SUMMARY

The following is a summary of the site's characteristics and condition. Should it be required, more detailed background information can be found in the Urban Water Management Plan or the Stokely Creek Wetland and Local Open Space Strategy.

1.3.1 LOCATION

The subject land is comprised of Lots 808 & 809 Albany Highway and Lot 3430, Maddington within the City of Gosnells. Lot 808 is approximately 5.5403ha. Lot 809 is approximately 3.8085 ha and Lot 3430 is 1544m^2. The POS area in Lot 808 is approximately 12,254m^2. In addition, the adjoining portion of Lot 3430 is to be revegetated (which covers an area of 386.95m^2.)

The subject land is situated to the south west of Albany Highway and west of the Armadale Rail line reserve. To the south is the Canning River.

The Lot 3430 has a Land Management Order to the Water Corporation. An agreement is to be undertaken prior to handover to the City, for the revegetation in this reserve to be managed by the City of Gosnell's, as per the City's request. This is in keeping with prior understanding from the Lot 26 subdivision works.

1.3.2 LANDFORM

The future non-residential areas generally slope towards Stokely Creek within Lot 808, from a height of approximately 10-11mAHD down to 5mAHD. The main Stokely Creek channel is approximately 1-2m wide and meanders across the floodplain.

On the border of Lot 808 to 809, there is a steep embankment that falls to the floodplain of the confluence of Stokely Creek and Canning River. This floodplain sits at approximately 3mAHD – 4.2m AHD. This floodplain also includes a wetland depression area. The Canning River is a defined channel on the southern boundary.

1.3.3 FLORA

The upland portion of POS area contains virtually no native species. The flora here is mainly composed of pasture and garden plants as well as the remnants of a former citrus orchard. This area has been classified as Completely Degraded (Tranen 2013)

The majority of the native species are located along Stokely Creek and immediate embankments, although there is still a considerable weed presence in this area. The main native species are *Eucalyptus rudis, Melaleuca rhaphiophylla, Juncus pallidus* and *Corymbia callophylla.*

The weed species along the waterway included the declared species *Asparagus asparagoides* (Bridal creeper) and *Zantedeschia aethiopica* (Arum Lily).

The vegetation condition varies between Completely Degraded to Good.

The main weed species in the POS area are *Opuntia sp* – Prickly Pear, *Zantedeschia aethiopica* – Arum Lily, *Tulbaghia violacea* – Pink Agapanthus and grasses (*Cynodon dactylon* – Couch grass/ *Eragrostis curvula* – African Lovegrass in higher areas and *Pennisetum clandestinum* - Kikuyu in the lower sections).

A comparison of aerial photos from 2013 and 2021 were undertaken to determine if there was any significant change along Stokely Creek. Only two small new *E. rudis* were noted, adjoining the previous riparian vegetation and all within the area that is to be fully revegetated. These photos can be seen in Appendix C.

1.3.4 FAUNA

No detailed fauna assessments were undertaken for the subject area. Due to the degraded nature of the vegetation and its discontinuous nature, the likely fauna habitat and therefore population density and diversity is predicted to be low. There is some limited riparian habitat that may suit generalists species along the actual Stokely Creek channel. There is likely to also be generalist species using the remaining riparian vegetation along the Canning River.

1.3.5 WETLANDS

According to the Geomorphic Wetland Database the subject land is a palusplain wetland. The majority is considered multiple use (15768). A conservation category section UFI7796), is associated with Stokely Creek, while another Conservation Category Wetland (UFI 7652) is associated with the Stokely Creek and Canning River confluence and Canning River itself. A floodplain depression, predominately covered with Typha is also noted as further wetland habitat. This is currently covered under UFI 15768.
The wetland boundaries can be seen in Figure 1.

1.3.6 WATERWAYS

Stokely Creek adjoins the site to the north east, after it has passed under Albany Highway and the Armadale Rail line. Above the site the waterway has been converted to a drain (Helm Street Drain). This creekline flows in and out of Lot 808 before joining the Canning River southward to join the Canning River on the edge of Lot 809.

The Canning River forms the southern boundary of Lot 809. This section of the Canning River is above the Kent Street Weir, making it predominately a freshwater system.

1.4 PREVIOUS STUDY SUMMARY

The previous Stokely Creek Wetland and Local Open Space Strategy identified the sites characteristics and how the land should be developed in relation to social and environmental outcomes. From this, areas were identified where the main focus is to be the protection and enhancement of the Stokely Creek system. These areas have been identified as areas for weed control and revegetation.
Surrounding this area, POS spaces are to be landscaped so that they complement the adjoining revegetation while also providing opportunities for drainage management and public recreation. These areas are identified as areas for landscaping. The necessary detail of required works and the subsequent implementation, for each zone (eg revegetation /landscaping), necessitates that these two zones are treated separately. This study reflects this requirement.

This detailed plan follows on from the Concept Plans discussed by the City, WAPC and DBCA between December 2013 and March 2015. An updated version was agreed to by the City in February 2018 (Rev K) to address bushfire issues which provided directions for this final version.

Further negotiations were then undertaken in 2020 with the City, Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions. As part of this process, setbacks between habitable dwellings and different vegetation types were set and agreed to under Rev J of the Landscape Concept Plan by Calibre in 2020. This included a boundary footpath to assist with separation and modification of the vegetation areas to meet the required vegetation types. These negotiations continued, with a meeting in May 2021 to discuss the final design outlined in this report and associated figures. This included further modification of the vegetation types to meet bushfire requirements.

The basins and stormwater treatment areas have also been modified to provide water quality improvement, 1% AEP storage and maximise the setback to Stokely Creek. There have also been the inclusion of an access track for Water Corporation maintenance of the Stokely Creek crossing.

The most recent round of changes is outlined in more detail in the accompanying table of changes (email attachment).

2 MANAGEMENT COMMITMENTS

2.1 OBJECTIVES

The objective of the Plan is to detail the works and management practices that are to be undertaken both within the landscaping and revegetation areas of the POS and adjoining reserve. These practices will;

a) provide visual appeal within the development area,
b) complement the existing native vegetation within and adjoining the site, including providing fauna linkages
c) provide new habitat areas including riparian and upland habits plus wetland habitat within the bioretention basins.
d) complement the stormwater design, including treating stormwater for pollutants and managing flood events
e) provide opportunities for passive and active recreation
f) provide movement corridors for pedestrians
g) manage potential fire hazard associated with revegetation works

Works within both the landscaping and revegetation areas will contribute to these objectives. The works however will be different in each area and will reflect the primary objectives to be achieved for each location. Fundamentally the revegetation area is for protecting Stokely Creek and providing increased vegetated areas along the Canning River. It also covers enhancing the wetland located on the Lot 809 floodplain. Areas between the revegetation line along Stokely Creek and the perimeter road will be landscaped with native species. The main difference in this area, is that the species will be chosen so that the long term impact from bushfire is managed. This is fundamentally achieved through the height of the mature vegetation species chosen, along with a perimeter footpath. Within this zone, there are 4 drainage basins, which are also to be planted with appropriate native species. An area of more active recreation is located in Lot 808 that is composed of lawn and playground, which also assists with bushfire control.

Within Lot 809, the areas not being landscape planted or revegetated are to be composed of as slashed grass under existing vegetation, to assist with providing a low maintenance and passive recreation area. This is explained in more detail below. This area is also noted as being within the Swan Canning Development Control Area.

2.2 STRATEGY OVERVIEW

The overarching strategies that will be used to achieve the above objectives are as follows:

2.2.1 LANDSCAPING AREAS

- Establishing protected vegetated buffers around the revegetation area to increase biodiversity and fauna habitat;
- Controlling invasive weeds;
- Creating public access and amenities throughout the Local Open Space (LOS);
- Establishing active recreation areas in locations that will not significantly affect ecological functioning of the area;
- Incorporating environmental values into engineering design of the stormwater basin and surrounding roads;
- Minimising irrigation to essential areas only;
- Monitoring and maintaining the site to ensure the completion criteria are achieved at the end of the maintenance period; and
- Managing stormwater runoff into the revegetation areas and the adjoining waterways, so that flows are in keeping with predevelopment rates and are low in potential pollutants.

2.2.2 REVEGETATION AREAS

- Undertaking significant native vegetation restoration work within the mapped CCW watercourse area along Stokely Creek and floodplain wetland depression, including revegetation;
- Controlling all invasive and environmental weeds;
- Creating public access throughout the LOS;
- Incorporating environmental values into engineering design of the adjoining new roads; and
- Monitoring and maintaining the site to ensure the completion criteria are achieved at the end of the maintenance period.

2.3 DETAILED WORKS

2.3.1 LAWN

The lawn areas sit on the upland area adjacent to the 30m buffer of Stokely Creek, within Lot 808.

The lawn areas area is 1044m^2. The lawn species is to be *Pennisetum clandestinum* 'Village Green'. It is to be installed as role on.

The lawn area is to be earthworked so that the area has no slopes greater that 1:6 or less than 1:100. The fill will be clean, free draining topsoil stripped from within Lot 808. Weed control is then to be undertaken using a knock down and pre-emergent to minimise weeds within the turf area, prior to the turf being laid.

It will be irrigated by sprinklers. All irrigation systems are to be in keeping with the City of Gosnells Irrigation specifications.

A 2m concrete pathway or 200mm concrete strip (depending on location) will be used to separate the lawn from the planted landscaping areas.

2.3.2 DRAINAGE BASIN

The four drainage basins have been designed to manage all flows up to and including the 1%AEP events for the site, so that flows are released at predevelopment rates. Full details of its performance can be found in the UWMP and Engineering drawings.

The basins are to be vegetated with the species and densities outlined in *Section 2.3.6*. In general, there will be an understorey of sedges at 6 plants/m^2 on the base of the basins. There will also be a shrub midstorey, planted at 1 plant every 5m^2. This will provide a high water quality outcome as well as being aesthetically pleasing.

On the internal basin banks a sedge and groundcover mix of 5plants/m^2, combined with an overstorey layer of 1 tree or large shrub per 10m^2. These species are adapted to short term inundation. External basin batters will be planted at 4 plants/m^2, using a mix of groundcover rather than sedges and rushes. These densities are as agreed with the City of Gosnells.

Where relevant, all plantings are to be set 0.5m back from the path to minimise future maintenance required to keep the path clear. Smaller plants and those less likely to spread to cover the path are to be planted within 2m of the path.

The planting of each basin is to happen concurrently with the relevant Stage of development and seasonal requirements, with planting generally taking place in late winter/early spring once the majority of large winter rain events have likely passed. This will reduce the risk of plants being inundated too often while they are small. Should a basin be constructed ahead of the adjoining stage to take stormwater, then this basin is also to be planted out at the first planting season after construction is completed.

The outlet from each basin is to be mortared rocked pitched to dissipate flows during outflow events. Jute matting is also to be used to cover soil disturbed by works around the rock mortared outlet. This is to reduce the potential for localised erosion immediately after drainage works.

Pine Bark Mulch, 75mm thick, is to be applied on the basin down to 300mm vertically from the base. The base is left mulch free due to the regular inundation of this zone which will move the mulch. The outside of the basins is to have mulch applied over the entire batter area. The mulch is to assist with stabilisation of the banks and reduce weed growth.

All earthmoving, hard landscaping works and the bioretention media associated with the basin are covered under the civil works. This includes the nearby retaining walls.

2.3.3 PATH SYSTEM

A 2m wide concrete pathway traverses the perimeter road of the development area and extends along to the existing pathway on Attfield Street. This includes a pathway on Attfield Street over the Stokely Creek Crossing. There is also a spur pathway to the playground within Lot 808. As noted partly above, the 2m wide path provides a barrier from the lawn to the surrounding landscape planting area in Lot 809 and 808, assisting with demarking the different management of these areas. The pathway detail can be seen in *Appendix A.*

A 3m wide concrete access way is to be constructed down the embankment from Lot 808 into 809. Once on the flatter floodplain area, this path coverts to a 3m wide crushed and compacted limestone pathway. This pathway is predominately to provide longterm safe access for maintenance onto the floodplain area within Lot 809, including the active POS area of lawn and playground. It will also provide an informal extension of the more formal pedestrian concrete path network, allowing residents to traverse the foreshore areas.

The pathway is relatively flat below the concreted section. This minimises the chance of erosion along or across the path.

A limestone access track is also to be conducted upstream of the Stokely Creek crossing. This track is to the requirements of the Water Corporation, so as to allow for maintenance of Stokely Creek and specifically the culvert system under the crossing. The pathways can be seen in Drawing L001.

2.3.4 IRRIGATION

Drilling and testing of groundwater for irrigation has been undertaken as part of the Lot 26 River Avenue development on the other side of Stokely Creek. This showed that the salinity was 2780ppm and there was very limited yield. Both aspects made the use of bore water unviable for Lot 26. Professional advice from drillers familiar with this area, suggests this situation is common locally and drilling on Lot 808 or 809 is likely to produce similar results. The water source is therefore to be from Mains supply. Only the lawn area is to be irrigated.

The irrigation layout is to be approved separately, as part of an irrigation report.

Annual irrigation volumes have been established. A breakdown can be seen in Table 1.

Table 1 Estimated Irrigation requirements

Location	Area	Irrigation rate m^2/ annum	Irrigation required/annum
Lawn	1034m^2	1500l/m^2	1550kl

2.3.5 FIRE MANAGEMENT

Fire Management is covered in detail with the report titled *Bushfire Management Plan Lot 808 & 809 Albany Highway, Maddington* by RUIC Fire. Through the assessment outlined in this fire management report, the existing fire hazard of the waterway vegetation and area of proposed revegetation and landscaping is identified as the dominant fire hazard. The revegetation area is generally to be planted to the City's revegetation guidelines, with a full suite of species.

To reduce potential fire impacts, lower fire risk plantings are to be planted close to the residential areas, as part of the landscaping areas. This is discussed in more detail in Section 2.3.6. In general, the proposed pathway, (in conjunction with the road network) assist with providing the necessary buffer to the proposed lots, which have a Bushfire Attack Level (BAL) of 29 or less. There is a small area of specific low threat landscaping in the areas where there is no road to separate the lots from the landscaping areas, specifically in the northern portion of the POS area and the area where the ROS adjoins the southern end of the residential areas. There is also a small strip associated with the woodland area and Basins A and B. near where they adjoin the road side path. In this location, a strip of groundcovers and plants up to 0.5m high, will be used eg solely between the flouro green line and the path. The majority of this area will be low plants (under 0.5m) solely to allow for longterm ease of maintenance along the path (eg minimise plants growing over the path). The area landscaped with groundcovers and other vegetation types in relation to the BAL setbacks and can be seen in Drawing L003.

2.3.6 REVEGETATION AND LANDSCAPE AREAS

IDENTIFICATION AND PROTECTION OF SIGNIFICANT NATIVE VEGETATION

The main significant vegetation is a small area of mature *Eucalyptus rudis* trees with isolated *Melaleuca rhaphiophylla* trees amongst them. There are also 2 *Corymbia calophylla* trees noted, one in Lot 808 and 1 in Lot 809, based on the survey undertaken and reported in the Stokely Creek Wetland and Local Open Space strategy. An aerial photo comparison was undertaken between the time the survey in 2013 and this year. There was no noticeable change in significant native trees. The comparison photos can be seen in Appendix C.

No native understorey was noted in the revegetation area. All native trees in the subject area will be marked prior to construction so that they are not damaged during construction activities. This marking will extend to the approximate drip line of the trees to minimise potential root disturbance. This marking will be via coloured tape and staking. All contractors will be advised of the need to avoid all potential damage to these trees. All significant vegetation is to be fenced to specifications outlined in AS 4970 prior to and during any adjacent subdivision and construction activities.

Given the size of the trees present and the types and dosage of herbicide present, there is no significant risk to the trees from herbicide applications, provided it is applied with care by experienced operators.
The wetland depression area is predominately dominated by *Typha orientalis*, which is now considered a native species.

INITIAL WEED CONTROL

All weed species are to be controlled from within the revegetation area. Weed control shall be achieved by a combination of chemical herbicides and physical removal as appropriate. The weed control will include:

- All 'woody' weed species being cut near ground level then painted with herbicide in areas where the ground will not be re-contoured;
- All woody weeds in areas to be re-contoured or with the future lawn area to be physically removed.
- All declared pest species being eradicated and no plants present after 2 year maintenance period; and
- Weed cover of remaining environmental weed species being maintained below 5% for the 2 year maintenance period

The physical removal will relate primarily to any remaining fruit trees in the upland areas. This will be done using a front-end loader/bobcat or similar, within areas that are to be re-contoured. Increased erosion from soil disturbance related to physical removal is not a major issue in this portion of the site as the land is to

fully re-contoured within the civil works scope and outside the foreshore area. It will be managed within the sediment and erosion control methods undertaken as part of these civil works. Any other woody weed removal in areas not being re-contoured, will be cut to ground level and appropriate woody weed herbicide applied by paint brush to the stump immediately. Small areas of agapanthus will also be dug up and removed. All of the weed plant material is to be removed from site.
Herbicides shall be selected for the target species, taking into account the surrounding environment and the constraints this may present.
In the clear areas, a glyphosate herbicide will be used to remove kikuyu, clumping grasses and broadleaf annual plants. Spraying will be after opening autumn rains, with follow up control as required. Kikuyu may also require control in November or after summer rains.
Fusilade or similar will be used to control Couch between October and December or after summer rainfall.
Arum Lily control will be by spot sprayed using Chlorsulfuron or Metsulfuron, with spraying between July and November
Close to the waterways, only herbicides considered safe for use in these environments will be applied, and alternative control methods will also be considered when water is present.
Herbicide spraying will only be conducted by operators:

- appropriately qualified and licensed in herbicide application;
- that have demonstrated experience in the ability to identify, and distinguish between native and weed species; and
- that are familiar with the most appropriate control measures, timing, herbicides, and application rates for the target species.

The revegetation sites shall be free of live weeds before planting commences. Weed control activities should ideally commence at least the spring prior to seedling planting, or earlier, but this may not be practical to implement. The growth periods of the weed species observed extend over the entire year and therefore an extensive pre and post installation weed control program is required. Post-installation weed control shall be undertaken at least each spring and autumn. Summer control may also be required to target some species as outlined above.

All weed control is to be undertaken by a qualified contractor as per the City of Gosnells Guideline *Policy 6.2.2 Retention, Rehabilitation and Revegetation of Natural Areas*. (Section 3.310.) This include that the:

- contractors must hold a current Pesticide Operators licence and be endorsed to supply and apply herbicides for reward
- contractors must be able to demonstrate an understanding of natural environmental and ecosystem issues and considerations
- contractors must be fully aware of relevant State and Federal legislation with regard to protected species, environmental harm, pollution and other issues pertinent to the carrying out of chemical weed control in natural areas
- all chemical agents are to be used strictly in accordance with the manufacturer's recommendations and in accordance with licencing provisions for that chemical
- any materials derived from manual control methods are to be removed from site by the contractor unless the City agrees to alternative arrangements
- the contractor shall effect control of the target weed species at a level of not less than 95% kill

Within the landscaping areas, 75mm of Pine Bark Mulch is to be applied post weed control, so as to suppress future weed growth. The mulch is to be certified disease free, including dieback.

ONGOING WEED CONTROL

During the Maintenance period, weeds are to be controlled on a need's basis and as per the City's Guideline To achieve compliance with the policy, there should be:

- No declared pest plants or weeds of National significance –
- Weed cover no greater than 10% across the entire site –
- Woody weeds have been removed or treated

The presence of newly planted native seedlings will need to be considered as part of the ongoing weed control program. Weed control shall be undertaken each spring and autumn at a minimum. Summer control

may also be required to target some species as outlined above. All weed control must consider the planted vegetation as well as other relevant native vegetation to be retained, so as to avoid potential damage. Weed control should be undertaken at least 3 times per year, as a minimum and prior to seed set.

The focus for monitoring and maintenance will be to make sure that the plants are establishing and that weeds are controlled. The bioretention basins and other detention basin areas are to be maintained weed free. Small weeds are to be hand pulled or sprayed with a Glyphosate bioactive herbicide or an appropriate broadleaf herbicide where applicable. Weeds higher than 100mm are to be physically removed.

REVEGETATION AND LANDSCAPE PLANTING DETAILS

Planting activities will be undertaken only when ground conditions are conducive to promoting long-term seedling survival. Typically, this will be in June after sufficient soil moisture from winter rains for most species with potentially later planting in August for sedges/rushes in the basin and bioretention bases (where there is a risk of inundation for young plants). In these areas planting of sedges should occur in late winter or at the beginning of spring when dormancy gives way to growth, should there be adequate soil moisture. Alternatively, sedges/rushes can be planted in late April to allow for establishment before the cooler winter weather, if there is an early break to the season and adequate moisture is present.
Watering will also be required to allow for good establishment (See section 3.4 for further details).
In the area under the existing native overstorey, the focus will be on replacing the understorey and midstorey. The clear areas will be planted with a full suite of plants.

The planting mix will be as follows, with full plant details outlined in Tables 2-5 below:

<u>Full Revegetation Area</u>
Wet areas

- Understorey – 6 plants / m^2;
- Midstorey – 1 plant / $2m^2$;
- Overstorey– 1 plant / $3m^2$;

Dry areas

- Understorey – 3 plants / m^2;
- Midstorey – 1 plant / $2m^2$;
- Overstorey– 1 plant / $3m^2$;

<u>Wetland Buffer</u>
The Typha area will be left as it currently is. A band of general wetland species will be planted around the boundary to provide extra protection and habitat protection. This band will be planted as follows:

- Sege/rush, planting density – 6plant / m^2;
- Shrub, and understorey planting density –1 plants / $3m^2$;

<u>Reduced Fire Risk Landscaping Area</u>
Class B woodland to new fire standards

- Understorey planting density less than 0.5m high – 3 plants / m^2;
- Overstorey – 1 plants / 10 m^2;
- *Note, in areas near the pathway, groundcovers only are to be used either within 2m of the pathway or out to the fluoro green BAL Woodland line – which ever is the greatest.*

Forest (*formerly Class B woodland planted to old standards*) (from marked setback)

- Understorey planting density – 2 plants / m^2;

- Midstorey shrubs – 1 plant/ 5m^2
- Overstorey – 1 plants / 10 m^2;

Class C Shrubland

- Understorey planting – 3 plants / m^2;
- Shrubs – 1 plants / 2 m^2;

Basins

Base

- Sedge/rush planting – 6 plants / m^2;
- Shrubs – 1 plants / 2 m^2;

Internal Sides

- Sedge/rush planting– 4 plants / m^2;
- Groundcover – 1plant/m^2
- Shrubs – 1 plants / 10 m^2;

Outer Batters

The outer basin batter areas will be planted with stabilising groundcovers and low shrubs up to 1.5m tall. Low plants will be used so as to not impact on the integrity of the batters, while the groundcovers and lower shrubs will assist with stabilising the soil. The planting will happen after weed control. The sides will be stabilised with hydromulch prior to planting to assist with early batter stabilisation. The planting will be at the following density:

- Groundcovers– 2plant / m^2;
- Low shrubs –2 plant / m^2;

Groundcover only planting

Understorey Groundcovers only at 3 plants/m^2

General

All understorey plantings are to be set 0.5m back from the path network, with tree and large shrubs to be set back a minimum of 2m from path. This is to minimise future maintenance required within keeping the path clear. Smaller plants and those less likely to spread to cover the path are to be planted within 2m of the path.

These planting mixes and density have been developed in consultation with the City of Gosnells and DBCA as part of the writing of the Stokely Creek Wetland and Local Open Space Strategy as well as follow up discussions on the WLDMP. The different areas of revegetation planting can be seen in *Appendix A.*

The Stokely Creek channel itself is not appropriate for revegetation, as the water depth and flow rates are such that plant establishment is not possible. Planting will occur as close to the banks as possible to encourage natural edge stabilisation over time. This is also the case for the Canning River, as this bank system has reached a relatively stable equilibrium.

Periods of inundation may occur in the flatter areas of the site during large storm events. This could potentially affect the survival of understorey species depending on the depth of flooding, period of inundation, and size of the plants. Should significant plant losses occur in this zone, making it difficult to achieve the completion criteria, the Developer will liaise with the City and DBCA to ensure an agreed resolution of difficulties. In general though, the idea will be to replant to achieve the criteria set out below:

- Target plant density after two years of 70% of initial planting density; and
- 80% of planted species represented.
- Replanting to achieve the above as required within the maintenance period

Around the disturbed area associated with the modified Stokely Creek channel, dense sedge and rush planting at 6plants/m^2 will be used outside of any mortared rock pitching. If required, these areas will be

covered with pinned jute matting to assist with early stabilisation of the banks. Wherever possible, sedges and rushes will be planted between rocks were loose rock pitching is used.

Outside of the basins and bioretention bases, planting is to include soil amendments to assist with plant establishment. This is to include:

- Terracottem universal (includes fertiliser) - 5gm per tube stock, dug into planting hole
- Soil wetter – 10ml/L broadcast over surface after planting
- Seasol with soil conditioner in following spring -5ml/10L applied to plant

2.3.7 SEDIMENT AND EROSION MANAGEMENT

As part of the landscaping and revegetation works, there will be a need to manage soil erosion and sediment control. The critical aspect is to minimise any soil erosion and to ensure no soil or other material enters Stokely Creek and/or the Canning River. A Sediment and Erosion Management Plan (SEMP) will be produced and implemented by the Civil Contractor, with the details adhered to by the Landscaping/Revegetation contractor. The following points provide guidance to assist with the production and implementation of the SEMP relevant to the landscaping and revegetation areas.

- Mulching of bare landscaping planting areas to minimise runoff
- Pinned jute matting on areas likely to receive flowing water, with tubestock planted within cut holes.
- Sediment curtains immediately downstream and around areas where weeds have been removed, especially woody weed removal
- Potential hydromulching of revegetation areas where there are slopes steeper than 1:3 to provide soil protection until plants grow
- Any riplines are to be constructed along the contour to minimise erosion along the rip line
- Vehicle movement not undertaken across revegetation and landscaping areas during wet weather or when soils are waterlogged, so as to not cause soil disturbance.

2.3.8 PLAYGROUND AREA

The Playground area will utilise proprietary play equipment. The Playground equipment is Forpark Australia Essential Timber SS3-3005. Details can be seen in Figure L006 and L007. The equipment is to be centred so that all necessary setbacks are achieved from the equipment to hard infrastructure. The play equipment is to be located in clean white sand, a minimum of 300mm deep. The edging is to be a 200mm wide concrete flat kerb to assist with maintaining the adjoining lawn and garden beds.

Seating is provided on a concrete apron adjoining the playground and connected to the concrete path network. The seating is to be an aluminium Exteria Parkway Seat or similar. The details can be seen in Figures L006 and L007

3 MONITORING AND MAINTENANCE

A schedule of works including the monitoring and maintenance can be seen in *Appendix B*. It includes all items of compliance that are to be monitored. The following provides more information on the monitoring and maintenance for each area. In general the works are to be in compliance with the City's Policy 6.2.2, which is outlined in Section 3.8 , with further details in Appendix B.

3.1 REVEGETATION AREA

Vegetation and weed monitoring will take place in revegetation areas each spring and autumn for the two year maintenance period. The results of the monitoring will be used to determine remedial action requirements for the following activity period. 5 quadrats will be established at a size of 5 m x 5 m. Quadrats will be marked using wooden or metal stakes that will be removed at the end of the maintenance period. Quadrat locations shall be recorded using GPS and photos, so that if they are disturbed they can be re-established in the same location.
Records of the following will be made in each quadrat at each monitoring event, to allow for quantitative evaluation against the established completion criteria:

- Native stem density;
- Native species present;
- Weed cover;
- Dominant weed species present; and
- Photographic record.

In addition to the quadrats, the entirety of the revegetation areas will be assessed to ensure that all woody weeds have been removed and declared pest species eradicated from site. General observations will also be made of factors that could potentially affect the outcome of the revegetation and weed management programs, so that pre-emptive action may be taken if appropriate. Weed cover for non woody or declared species is to be less than 5% for the 2-year maintenance period and less than 10% at handover (see Section 3.8 below).

3.2 PATHWAYS, LOW FIRE RISK PLANTING, PLAYGROUND AND BASIN AREA

The focus for monitoring and maintenance will be to make sure that the plants are establishing and that weeds are controlled. The bioretention basins and other detention basin areas are to be maintained weed free. Small weeds are to be hand pulled or sprayed with a Glyphosate bioactive herbicide or an appropriate broadleaf herbicide where applicable. Weeds higher than 100mm are to be physically removed.

All concrete pathways will be checked for cracking and movement, with repairs undertaken as required. The limestone pathway will be monitored for weeds and erosion. All weeds are to be removed and erosion points are to be rectified. The source of the erosion issue is to be considered as part of this rectification process, with modification undertaken as required. Plants will be trimmed to make sure that they do not impact on the useability of the pathway. Plants within the Landscaping and basin area are to be monitored for high growing species which could increase the fire risk above that designated. Tall plants are to be trimmed to the level necessary to meet the plant category, eg scrubland, woodland etc. or removed as necessary. Within the Landscape areas, the density and height of the plants are to be maintained in keeping with the Class C Shrubland and Class B Woodland so that the fire risk is not increased above the original design.

Within the basin outfall areas on Lot 808 monitoring and maintenance is to be undertaken for 2 years following Practical Completion. This will include noting and rectify any potential erosion as well as sediment build up. Any sediment is to be removed, and erosional areas stabilised. Should sediment from the catchment prove to be an ongoing issue, then temporary low bunding may be installed to capture sediment around the outlet point, so as to make capture of the sediment more concentrated to a single locality and minimise smothering of plants/ destruction of media. Short term bunding of the entry pits

may also be used near active sediment producing points, noting that this may run the risk of localised flooding.
The playground equipment is to be maintained to the manufacture's standards for the first 2 years and all broken/ damaged equipment is to be replaced. The sand area is to be kept weed free via physical removal and free of rubbish.

The City will become responsible for the above works after successful Handover has been achieved and the proposed reserve area is created, with a management order in favour of the City of Gosnells. A successful handover will require that all completion criteria have been met and an A-SPEC will need to be produced and submitted to the City.

3.3 A LAWN AREA

The irrigation system will need to be checked on a fortnightly basis to make sure that it is functioning as designed. Repairs will be undertaken as required. Irrigation rates may be modified subject to seasonal changes and conditions.

Mowing will be undertaken as required to maintain a neat and manageable surface for the period of establishment. As a minimum mowing should be undertaken fortnightly in spring, summer and autumn and monthly in winter.

Weed control using manual and selective herbicide methods will be undertaken as required to keep the lawn area weed free.

3.4 WATERING

All plants are to be watered during the first 2 years of establishment. Watering is to be via tankering. Watering is to generally be undertaken fortnightly during late spring (Oct/Nov) and autumn (Mar/April), with weekly watering over summer (or when temperatures regularly exceed 28C).

3.5 OTHER MONITORING

All rubbish should be removed from the site throughout the 2 year maintenance period. This is to be undertaken as a minimum 3 monthly. Unauthorised access issues and vandalism is also to be reviewed monthly, with action taken to reduce impacts, including fixing damage and reducing ease of access. General inspection is also to be undertaken to determine any other potential issues such as presence of pest species or prolonged inundation caused by localised trapping of stormwater. Immediate action is to be undertaken to rectify issues as they arise.

3.6 FORMER RESERVE 3430 MANAGEMENT AGREEMENT

A Management agreement was to be provided to the City of Gosnell's allowing them to continue with works within the portion of former Lot 3430, that adjoins the POS area. This was to allow for the longterm maintenance works associated with the revegetation undertaken when the land parcel was managed by the Water Corporation.

The land parcel is now Lot 3430 and is owned by Claymont Land. Revegetation works will be undertaken across this reserve, as per the process outline in Section 2. Lot 3430 will be handed over to the City of Gosnell as part of the overall POS area, as part of the subdivision process of Lot 808, with initial implementation works and 2 years of maintenance to be undertaken by Claymont Land.

3.7 REPORTING TO CITY AND DEPARTMENT OF BIODIVERSITY, CONSERVATION AND ATTRACTIONS

The monitoring results of the on-ground works are to be reported to the City of Gosnells on a 6 monthly basis throughout the entire developer maintenance period. The reporting is to be in keeping with the City's Policy 6.2.2 – Retention, Rehabilitation and Revegetation of Natural Areas, noting that the criteria needs to also take into account the bushfire management revegetation works within the foreshore areas. Any major issues are also to be reported, and if relevant, potential changes, solutions and contingencies are to be recommended to the City for consideration. The Department of Biodiversity, Conservation and Attractions will also be copied into correspondence relevant to the revegetation areas as well as Lot 809 works.

The monitoring is to consider plant health, plant density, species diversity, weeds and vandalism as well as other aspects that may be affecting the success of the revegetation and landscaping program. This includes providing an update as to how each of the completion criteria in Appendix B is being met.

3.8 COMPLETION CRITERIA

The following Completion criteria has been taken from the City's Policy 6.2.2 Rehabilitation and Revegetation of Natural Areas. This criteria will need to be met to achieve handover after the 2 years maintenance period from agreed Practical Completion. This criteria is specifically for the areas that are to be fully revegetated outside of the reduced fire risk landscaping. Further detail is also included in Appendix B.

Characteristic	Completion Criteria
1. Revegetation – initial and infill **Based on tubestock*	**1.1 Wetland, Buffers and Foreshore** - 5 plants per square metre (m²) with an additional 0.1 tree per m² - 50% species diversity representing the vegetation complex and strata - Proof of local provenance - Sourced from a Nursery Industry Accreditation Scheme accredited nursery
	1.2 Dryland - 4 plants per m² with an additional 0.1 tree per m² - 70% species diversity representing the vegetation complex and strata - Proof of local provenance - Sourced from a Nursery Industry Accreditation Scheme accredited nursery.
	1.3 Planting - Agreed species and of local provenance - Planted in correct vegetation zones and density - Healthy in root and foliage form, height and colour - Disease and pest free - Planted firmly and at correct level - Soil amendments applied - Protection measures in place

	1.4 Infill Planting - Established and in the ground for a minimum of one summer before handover
2. Rehabilitation	**2.1 Weeds** - No declared pest plants or weeds of National significance - Weed cover no greater than 10% across the entire site - Woody weeds have been removed or treated
	2.2 Sediment and erosion control measures - Installed correctly to specifications and plans - Functioning as intended - Water quality not negatively impacted
3. Significant Areas and trees	- Protected and fenced (if required) - No damage and no indications of decline
4. Fauna	- Habitat improvement and initiatives achieved - Elimination or reduction in undesirable species
5. Infrastructure	- Installed as per the City's specifications - In a stable and functioning state
6. Other	- Unauthorised access managed and controlled - Issues identified throughout the maintenance period have been rectified - Site free of rubbish and dumped materials
7. Handover	- Monitoring reports received - Temporary structures such as tree guards, stakes and fencing removed - Minimum of 70% of the site covered by healthy revegetated species and natural regeneration - Items 1 and 2 above - Rubbish and dumped materials removed - All mapping data provided, compatible to the City's systems and in agreed format - Dead plants, or parts of, removed - Vegetation impeding access pruned

4 REFERENCES

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5 PLANTING TABLES

Table 2 Reduced Fire Risk Landscape Planting – Natural Systems

Class C Shrubland Total Area 7728m^2

Species	Growth Form/ Height	Density	Total numbers
Midstorey and Understorey Dry Mix Planting			
Understorey		Random planting of the following species at 3 plants/m^2	
Eremophila glabra	Groundcover 0.2-0.4m		3800
Conostylis candicans	Grass like 0.3		3900
Darwinia citriodora prostrate	Low shrub 0.5-1m		3800
Acacia stenoptera	Shrub 0.2-0.7m		4000
Kennedia prostrata	Groundcover 0.25m		3900
Dianella revoluta	Herb 0.5-0.7m		3800
Understorey sub-total			*23200*
Low shrubs		Random planting of the following species at 1 plant/2m^2	
Babingtonia camphorosmae	Shrub 0.5m		540
Acacia pulchella	Shrub 0.3 -1.5m		500
Adenanthos obovatus	Shrub 0.6-2m		500
Allocasuarina humilis	Shrub 0.2-2m		500
Hibbertia stellaris	Shrub 1-1.5m		500
Darwinia citriodora	Shrub1.5-2.5m		500
Grevillea bipinnatifida	Shrub 0.2-1m		440
Hypocalymma angustifolium	Shrub0.3-2m		490
Low shrub sub-total			***3970***
Total Class C Shrubland Plants			**27170**

Class B Woodland Total area: Total area 5916m^2

Species	Growth Form/ Height	Density	Total numbers
Full Woodland Planting – outside BAL29 Forest line: 4397m^2			
Understorey Planting –			
		Random planting of the following species at 3 plants/m^2	
Eremophila glabra	Groundcover 0.2-0.4m		1100
Conostylis candicans	Grass like0.3m		800
Darwinia citriodora prostrate	Low shrub 0.5-1m		800
Acacia stenoptera	Shrub 0.2-0.7m		3500
Kennedia prostrata	Groundcover 0.25m		3500
Dianella revoluta	Herb 0.5-0.7m		3500
Understorey sub-total			***13200***
Mid and Overstorey Planting –			
Corymbia callophylla	Tree 15-30m	1 tree every 15m2	440
		Random planting of the following midstorey species at 1 plants/5m^2	
Viminaria juncea	Shrub 1-4m		290
Jacksonia furcellata	Shrub0.4-4m		200
Calothamnus quadrifidus	Shrub1.5-2.5m		390
Mid and Overstorey sub-total			*1320*
Total Class B Woodland plants outside BAL29 Forest line			**14520**
Fire Compliant Woodland Planting – inside BAL 29 Forest line: 1519m^2			
Understorey Planting –			
		Random planting of the following species at 3 plants/m^2	
Eremophila glabra	Groundcover 0.2-0.4m		400
Conostylis candicans	Grass like 0.4m		600
Lomandra odora	Herb 0.3m		560
Acacia stenoptera	Shrub 0.2-0.7m		1000
Kennedia prostrata	Groundcover 0.25m		1000
Dianella revoluta	Herb 0.5-0.7m		1000
Understorey sub-total			***4560***
Mid and Overstorey Planting –			
		1 tree every 30m2	
Corymbia callophylla	Tree 15-30m		40
Eucalyptus wandoo			10
Overstorey sub-total			*50*
Total Class B Woodland plants– inside BAL 29 Forest line			**4610**
Total Class B Woodland			**19130**

Table 3 Groundcover Low Fire Risk Landscaping

Groundcover landscaping: Total Area 750m^2

This landscaping area is composed of low groundcovers to minimise potential impact from fires on adjoining lots.

Low Fire Risk Species: Total Areas 471m^2	Height	Density	Total numbers
Northern area: 409m^2			
		3 shrubs/m^2 planted in groups of 5	
Eremophila glabra	Groundcover 0.2-0.4m		240
Grevillea thelemanniana (prostrate form)	0.1 – 0.3m		240
Hemiandra pungens Snakebush (mauve)	0.1m		350
Kennedia prostrata Running postman	0.1m		250
Conostylis candicans	Grass like 0.3		140
Northern subtotall			***4560***
Southern area:341m^2			
Eremophila glabra	Groundcover 0.2-0.4m		120
Grevillea thelemanniana (prostrate form)	0.1 – 0.3m		100
Hemiandra pungens Snakebush (mauve)	0.1m		300
Kennedia prostrata Running postman	0.1m		200
Scaevola variant – King Park Midnight	0.1m		300
Southern subtotal			***1020***
Total low fire risk plants			***5580***

Table 4 Bioretention Basin Planting

The following species mix reflects that the basins are within the area where they have a fire risk impact. As such they have been designed to be generally composed of sedges and rushes and shrubs less than 2m high to be compliant with Class C Shrubland characteristics.

Species	Height	Density	Total numbers
Basin A			
Basin Base *(approx. 100m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		200
Juncus subsecundus	0.5m		200
Carex appressa	0.5m		100
Baumea juncea	0.5m		100
Melaleuca incana – dwarf variety	1m		25
Melaleuca lateritia nana (dwarf variety	1m		25
Sub total			*650*
Basin Banks – *(approx. 331m²)*		4 sedges/rushes per m², 1 groundcover/m² and 1 Shrub every 10m²	
Ficinia nodosa	0.5m		700
Juncus subsecundus	0.5m		625
Eremophila glabra	Groundcover 0.2-0.4m		165
Conostylis candicans	0.3m		165
Calothamnus quadrifidus	1.5m		11
Melaleuca incana – dwarf variety	1m		11
Melaleuca lateritia nana (dwarf variety	1m		12
Sub total			*1689*

Species	Height	Density	Total numbers
Basin B			
Basin Base *(approx. 32.5m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		70
Juncus subsecundus	0.5m		65
Carex appressa	0.5m		30
Baumea juncea	0.5m		30
Melaleuca incana – dwarf variety	1m		8
Melaleuca lateritia nana (dwarf variety	1m		8
Sub total			*211*
Basin Banks – *(approx. 228m²)*		4 sedges/rushes per m², 1 groundcover/m² and 1 Shrub every 10m²	
Ficinia nodosa	0.5m		460
Juncus pallidus	0.5m		450
Dampiera diversifolia	Groundcover 0.2-0.4m		114
Scaevola aemula	Groundcover 0.4m		114
Calothamnus quadrifidus	1.5m		8
Melaleuca incana – dwarf variety	1m		8
Melaleuca lateritia nana (dwarf variety	1m		7
Sub total			*1161*

Species	Height	Density	Total numbers
Basin C			
Basin Base *(approx. 235m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		500
Juncus subsecundus	0.5m		500
Carex appressa	0.5m		200
Baumea juncea	0.5m		210
Melaleuca incana – dwarf variety	1m		58
Melaleuca lateritia nana (dwarf variety	1m		60
Sub total			*1528*
Basin Banks – *(approx. 853m²)*		4 sedges/rushes per m², 1 groundcover/m² and 1 Shrub every 10m²	
Ficinia nodosa	0.5m		1710
Juncus pallidus	0.5m		1700
Dampiera diversifolia	Groundcover 0.2-0.4m		430
Scaevola aemula	Groundcover 0.4m		420
Calothamnus quadrifidus	1.5m		25
Melaleuca incana – dwarf variety	1m		30
Melaleuca lateritia nana (dwarf variety	1m		30
Sub total			*4345*

Species	Height	Density	Total numbers
Basin D1			
Basin Base *(approx. 55m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		130
Juncus subsecundus	0.5m		120
Carex appressa	0.5m		40
Baumea juncea	0.5m		40
Melaleuca incana – dwarf variety	1m		13
Melaleuca lateritia nana (dwarf variety	1m		13
Sub total			*356*
Basin Banks – *(approx. 533m²)*		4 sedges/rushes per m², 1 groundcover/m² and 1 Shrub every 10m²	
Ficinia nodosa	0.5m		1070
Juncus pallidus	0.5m		1060
Dampiera diversifolia	Groundcover 0.2-0.4m		270
Scaevola aemula	Groundcover 0.4m		260
Calothamnus quadrifidus	1.5m		18
Melaleuca incana – dwarf variety	1m		18
Melaleuca lateritia nana (dwarf variety	1m		17
Sub total			*2713*

Species	Height	Density	Total numbers
Basin D2			
Basin Base *(approx. 316m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		750
Juncus subsecundus	0.5m		740
Carex appressa	0.5m		200
Baumea juncea	0.5m		205
Melaleuca incana – dwarf variety	1m		80
Melaleuca lateritia nana (dwarf variety	1m		80
Sub total			*2055*
Basin Banks – *(approx. 950m²)*		4 sedges/rushes per m², 1 groundcover/m² and 1 Shrub every 10m²	
Ficinia nodosa	0.5m		2000
Juncus pallidus	0.5m		1800
Dampiera diversifolia	Groundcover 0.2-0.4m		475
Scaevola aemula	Groundcover 0.4m		475
Calothamnus quadrifidus	1.5m		32
Melaleuca incana – dwarf variety	1m		32
Melaleuca lateritia nana (dwarf variety	1m		31
Sub total			*4845*
Total for all basins			

Table 5 Streetside bioretention gardens

Species	Height	Density	Total numbers
Basin Base *(approx. 671m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		1800
Juncus subsecundus	0.5m		1800
Carex appressa	0.5m		210
Baumea juncea	0.5m		300
Melaleuca incana – dwarf variety	1m		165
Melaleuca lateritia nana (dwarf variety	1m		165
Sub total			*4440*
Basin Banks – *(approx. 3091m²)*		4 sedges/rushes per m² and 1 Shrub every 3m²	
Ficinia nodosa	0.5m		6180
Juncus pallidus	0.5m		6180
Hypocalymma robusta	1.5m		260
Calothamnus quadrifidus	1.5m		260
Melaleuca incana – dwarf variety	1m		260
Melaleuca lateritia nana (dwarf variety	1m		250
Sub total			*13390*
Streetside Bioretention gardens – *(approx. 110m²)*		6 sedges/rushes per m² and 1 Shrub every 2m²	
Ficinia nodosa	0.5m		320
Juncus subsecundus	0.5m		140
Carex appressa	0.5m		100
Baumea juncea	0.5m		100
Melaleuca incana – dwarf variety	1m		25
Melaleuca lateritia nana (dwarf variety	1m		25
Sub total			*690*
Total Bioretention/Basin Plants			***18540***

Table 6 Waterway and Wetland Revegetation Planting

Species	Growth Form	Density	Total numbers
Stokely Creek Wet Areas: Total area 2,685m^2			
Understorey		Bunch planting of the following species at 6 plants/m^2 *eg all plants in a m^2 to be the same*	
Baumea juncea	Rush / sedge		3400
Baumea preissii	Rush / sedge		3000
Juncus pallidus	Rush / sedge		4000
Juncus subsecundus	Rush / sedge		4000
Lepidosperma longitudinale	Rush / sedge		1710
Understorey Total			*16110*
Mid Storey		Radom planting of the following species at 1 plant/2m^2	
Melaleuca lateritia	Shrub		300
Melaleuca preissiana	Tree		300
Melaleuca rhaphiophylla	Tree		600
Melaleuca viminea	Shrub		300
Hakea varia	Hakea varia		40
Taxandria linearifolia	Shrub		100
Midstorey Total			*1640*
Overstorey		Random planting of the following species at 1 plant/ 3m^2	
Eucalyptus rudis	Tree		300
Corymbia calophylla	Tree		200
Eucalyptus lane-poolei	Tree		100
Overstorey Total			*500*
Total wet area revegetation plants			**183250**
Stokely Creek and Canning River Dry Areas: Total area 13,651m^2			
Understorey		Random planting of the following species at 3 plants/m^2	
Acacia pulchella	Shrub		11000
Acacia stenoptera	Shrub		11000
Kennedia prostrata	Groundcover		10900
Dianella revoluta	Herb		10000
Understorey Total			*40900*
Mid Storey		Random planting of the following species at 1 plant/2m^2	
Viminaria juncea	Shrub		1200
Kunzea glabrescens	Shrub		1200
Melaleuca viminea	Shrub		1200
Jacksonia furcellata	Shrub		1100
Beaufortia purpurea	Shrub		1000
Calothamnus quadrifidus	Shrub		1100
Midstorey Total			*6800*
Overstorey		Random planting of the following species at 1 plant/ 3m^2	
Corymbia calophylla	Tree		4250
Eucalyptus wandoo	Tree		*300*
Overstorey Total			*4550*
Total Dry Revegetation Plants			**52250**

Wetland border revegetation– Planted as Class C shrubland. Total area 1359m^2			
Understorey		Bunch planting of the following species at 6 plants/m^2 *eg all plants in a m^2 to be the same*	
Juncus subsecundus	Sedge 0.5		2750
Lepidosperma longitudinale	Sedge 0.5-1m		2650
Juncus pallidus	Sedge 0.5-1.5m		2750
Understorey sub-total			*8150*
Low Shrub layer		Random planting of the following species at 1 plant/ 3m^2	
Calothamnus lateralis	Shrub 0.8-1.5m		100
Melaleuca thymoides	Shrub 0.5-2m		100
Melaleuca incana – dwarf variety	Shrub 1m		100
Melaleuca lateritia nana (dwarf variety	Shrub1m		150
Low Shrub sub-total			*450*
Total Wetland Buffer Plants			**8600**
Total Revegetation Plants			**60850**

Table 7 Specimen Trees

Species	**Growth Form/ Height**	**Density**	**Total numbers**
Corymbia calophylla	Tree – planted as 30L pot specimens	2 as per plan, next to playground area	2
Total Specimen Trees			**2**

Appendix A Plans and Detailed Design

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY

NOT FOR CONSTRUCTION

SCALE

0 10 20 30 40 50

SCALE 1:2000

NORTH

CLIENT

CLAYMONT

DISCLAIMER

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Oversby Consulting

PROJECT

CANNING RISE MADDINGTON

STORMWATER AND LANDSCAPE MANAGEMENT

DRAWING TITLE

OVERALL LANDSCAPING AND REVEGETATION PLAN

PROJECT No.	DRAWING No.	REVISION
B21015	L001	7

WETLAND EDGE

PLAYGROUND

FORMER REVEGETATION LINE

3m WIDE ACCESS TRACK

ROCK PITCHING AT INLET AND OUTLET TO BE MINIMISED. GROUND COVERS AND SMALL PLANTS TO BE INTERPLANTED BETWEEN ROCKS WHERE EVER POSSIBLE

SHRUB AND GROUND COVER PLANTING ONLY ON BANKS TO MINIMISE DAMAGE FROM ROOTS

SEATING

TREES x 2

30m BUFFER SETBACK FROM CREEK

200mm WIDE CONCRETE EDGING

4m WIDE ACCESS TRACK

FORMER REVEGETATION LINE TO BE RETAINED

ALL BATTERS OUTSIDE OF WETLAND

30m BUFFER SETBACK FROM CREEK

BATTERS OUTSIDE OF 30m SETBACK OF STOKELY CREEK

DRAINAGE AREA

EXISTING SLOPE RETAINED

3m WIDE CONCRETE ACCESS PATH DOWN EXISTING SLOPE

END CONCRETE

3m WIDE ACCESS TRACK (LIMESTONE) ON FLATS

LEGEND

- EXTENT OF WORKS (LOT 808 AND 809)
- EXISTING CADASTRE
- PROPOSED CADASTRE
- FORMER REVEGETATION LINE - RETAINED
- 200mm CONCRETE EDGING
- FOOTPATH
- 3m WIDE ACCESS TRACK (LIMESTONE / CONCRETE)
- LAWN AREA (1081m²)
- CLASS B WOODLAND
- CLASS B WOODLAND - TRANSITION
- CLASS C SHRUBLAND
- GROUNDCOVERS
- DRAINAGE BASIN
- DRAINAGE BASIN INTERNAL BATTERS
- RIPARIAN REVEGETATION
- SLASHED GRASS / EXISTING TREES TO BE RETAINED
- WETLAND CORE
- WETLAND REVEGETATION
- CROSSING BATTER PLANTING
- PLAYGROUND
- SEATING AREA
- BIORETENTION GARDEN
- FORMERLY AGREED EDGE OF WORK
- ACCESS GATE (MOUNTABLE KERB)
- CONTOURS (1.0m)
- CONTOURS (0.2m)
- 30m BUFFER SETBACK FROM CREEK
- DCA AND PARKS & REC RESERVE BOUNDARY

NOTE: WORKS OUTSIDE OF LOT 808 TO BE UNDERTAKEN BY OTHERS AS PART OF FUTURE DEVELOPMENT

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

SCALE 1:750 @ A1 1:1500 @ A3

NORTH

CLIENT

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Oversby Consulting

PROJECT

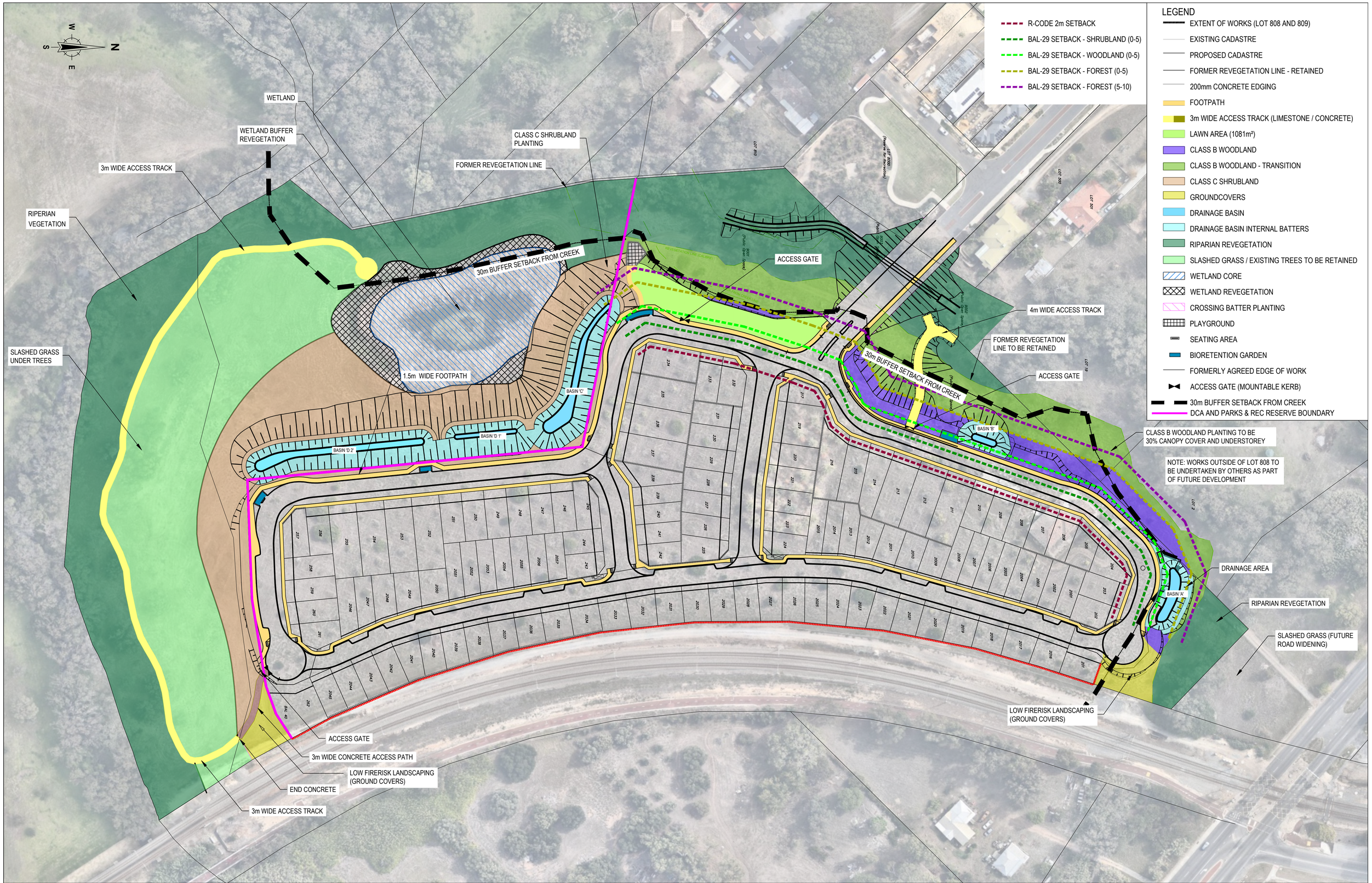
CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

EARTHWORKS

PROJECT No.	DRAWING No.	REVISION
B21015	L002	7



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7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
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SCALE

SCALE 1:750 @ A1 1:1500 @ A3

NORTH

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PROJECT

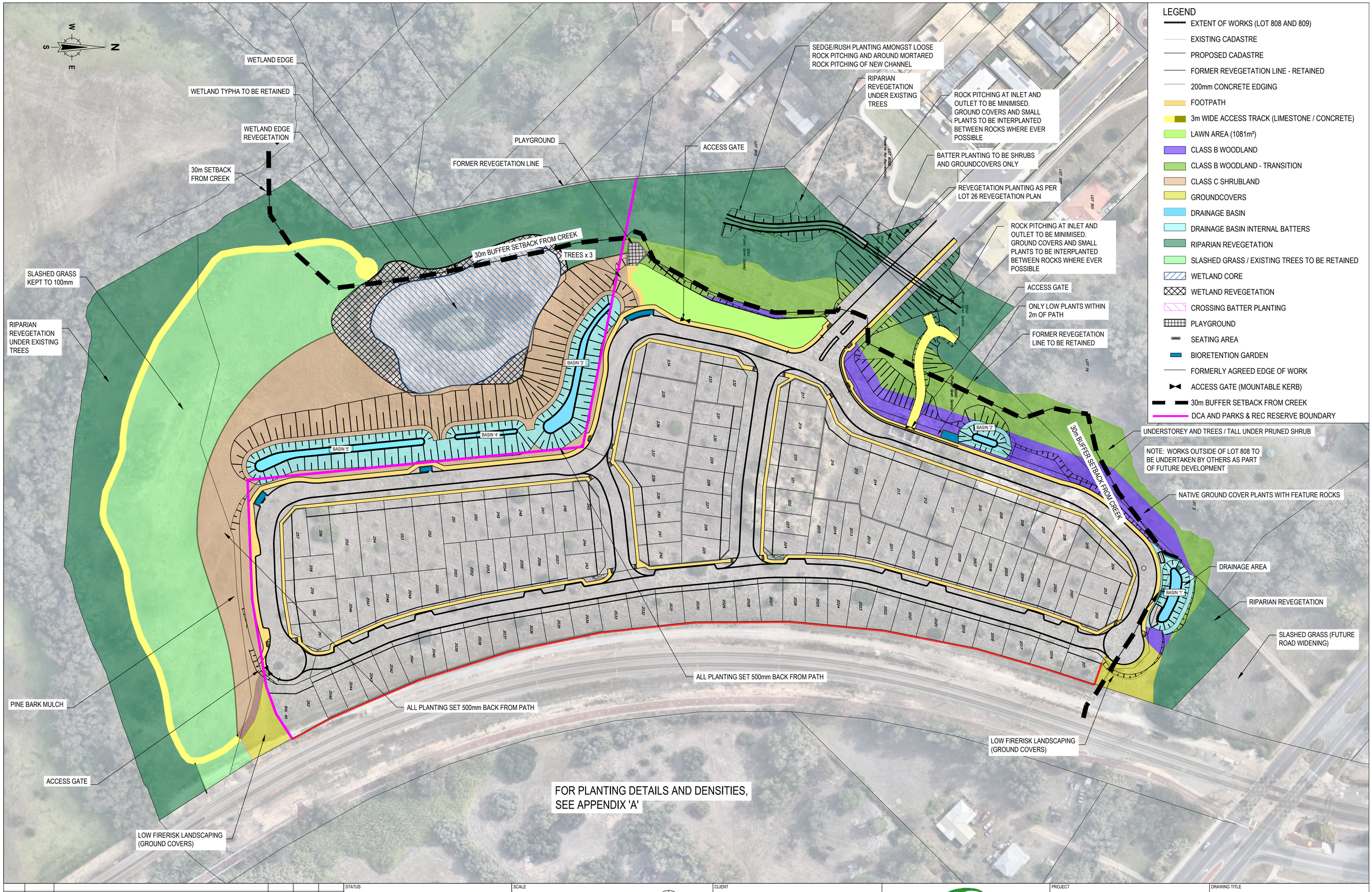
CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

BUSH FIRE ATTACK LEVEL (BAL) PLAN

PROJECT No.	DRAWING No.	REVISION
B21015	L003	7



REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
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SCALE

SCALE 1:750 @ A1 1:1500 @ A3

NORTH

CLIENT

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PROJECT

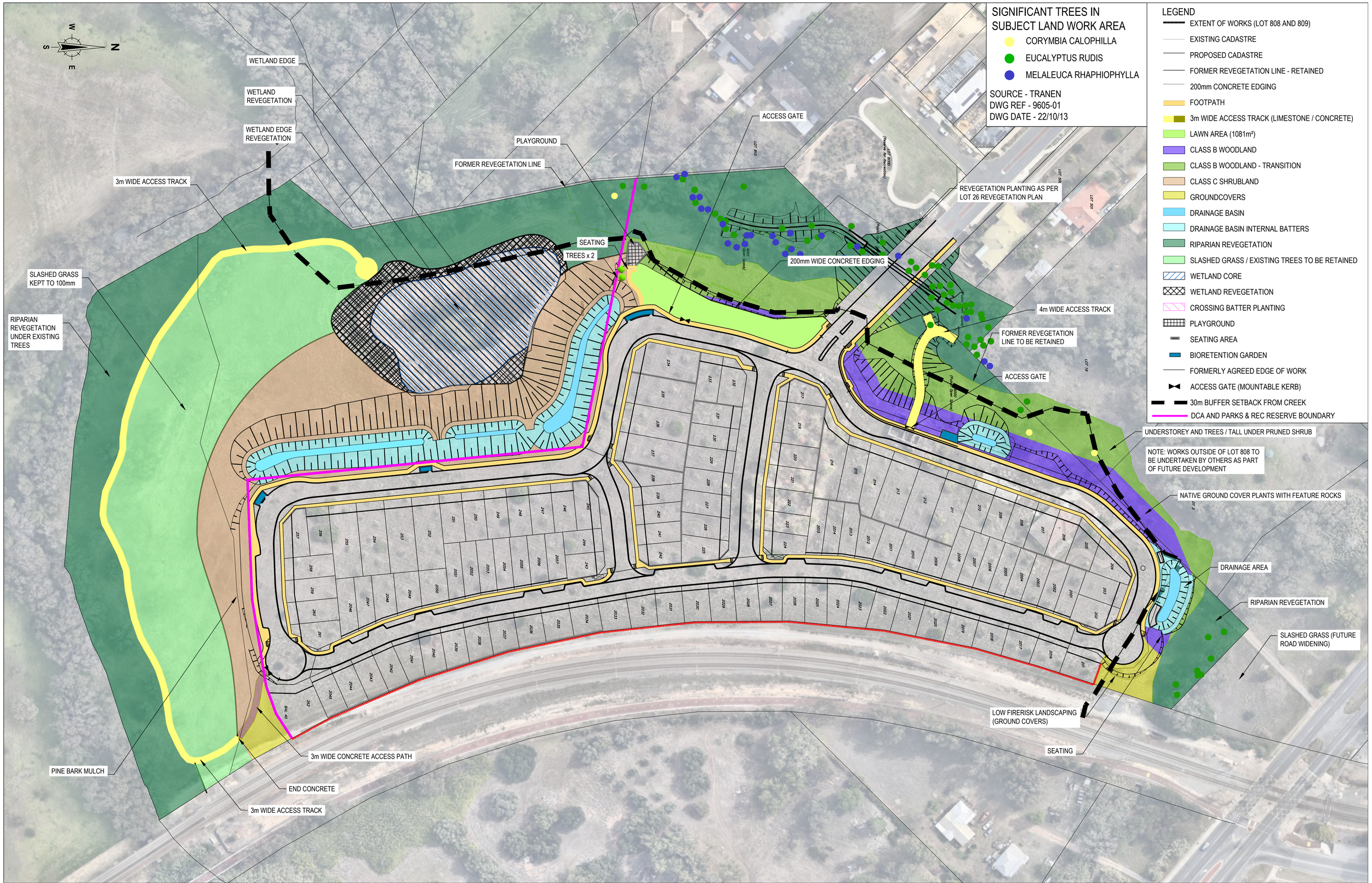
CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

PLANTING DETAIL

PROJECT No.	DRAWING No.	REVISION
B21015	L004	7



SIGNIFICANT TREES IN SUBJECT LAND WORK AREA

- CORYMBIA CALOPHILLA
- EUCALYPTUS RUDIS
- MELALEUCA RHAPHIOPHYLLA

SOURCE - TRANEN
DWG REF - 9605-01
DWG DATE - 22/10/13

LEGEND

- EXTENT OF WORKS (LOT 808 AND 809)
- EXISTING CADASTRE
- PROPOSED CADASTRE
- FORMER REVEGETATION LINE - RETAINED
- 200mm CONCRETE EDGING
- FOOTPATH
- 3m WIDE ACCESS TRACK (LIMESTONE / CONCRETE)
- LAWN AREA (1081m²)
- CLASS B WOODLAND
- CLASS B WOODLAND - TRANSITION
- CLASS C SHRUBLAND
- GROUNDCOVERS
- DRAINAGE BASIN
- DRAINAGE BASIN INTERNAL BATTERS
- RIPARIAN REVEGETATION
- SLASHED GRASS / EXISTING TREES TO BE RETAINED
- WETLAND CORE
- WETLAND REVEGETATION
- CROSSING BATTER PLANTING
- PLAYGROUND
- SEATING AREA
- BIORETENTION GARDEN
- FORMERLY AGREED EDGE OF WORK
- ACCESS GATE (MOUNTABLE KERB)
- 30m BUFFER SETBACK FROM CREEK
- DCA AND PARKS & REC RESERVE BOUNDARY

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS
PRELIMINARY
NOT FOR CONSTRUCTION

SCALE
SCALE 1:750 @ A1 1:1500 @ A3
NORTH

CLIENT
CLAYMONT

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PROJECT
CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE
SIGNIFICANT TREE PROTECTION AND WEED REMOVAL PLAN

PROJECT No.	DRAWING No.	REVISION
B21015	L005	7

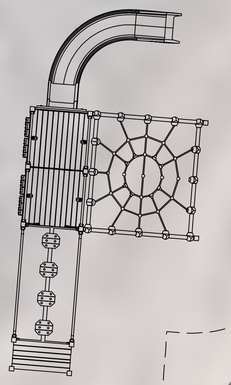
LEGEND

- FORMER REVEGETATION LINE - RETAINED
- 200mm CONCRETE EDGING
- 1.5m WIDE FOOTPATH
- LAWN AREA
- CLASS B WOODLAND TRANSITION
- CLASS C SHRUBLAND
- RIPARIAN REVEGETATION
- 30m SETBACK FROM CREEK
- DCA AND PARKS & REC RESERVE BOUNDARY

RETAINING WALL

RIPARIAN REVEGETATION

SAND AREA 67m²



CLASS 'B' WOODLAND TRANSITION

200mm wide concrete kerbing

30m setback from creek

Corymbia calophylla (30L staked tree)

SEATING

CLASS 'C' SHRUBLAND

Corymbia calophylla (30L staked tree)

LAWN AREA

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
7	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

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SCALE 1:750

NORTH

CLIENT

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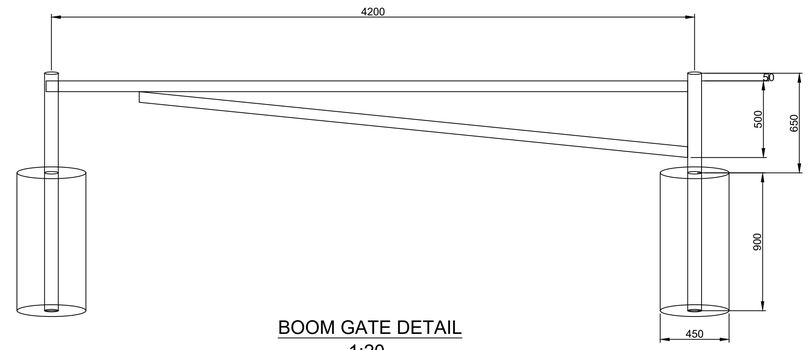
CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

PLAYGROUND AREA

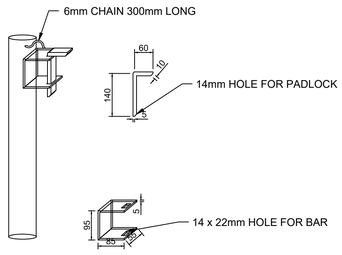
PROJECT No.	DRAWING No.	REVISION
B21015	L006	7



LOCKING POST

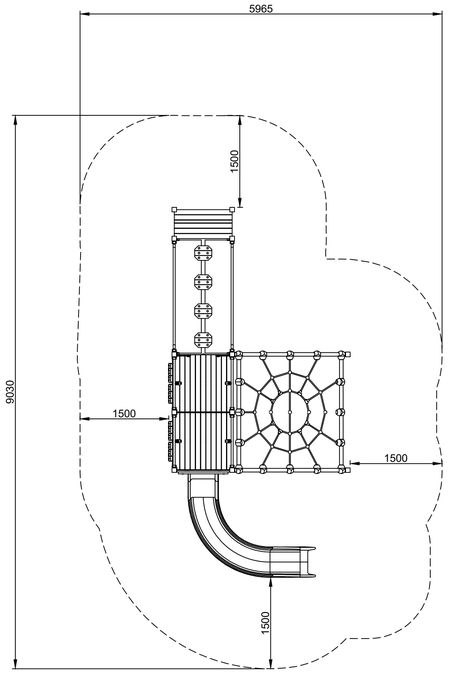
INTERNAL SWINGING POST

BOOM GATE DETAIL
1:20

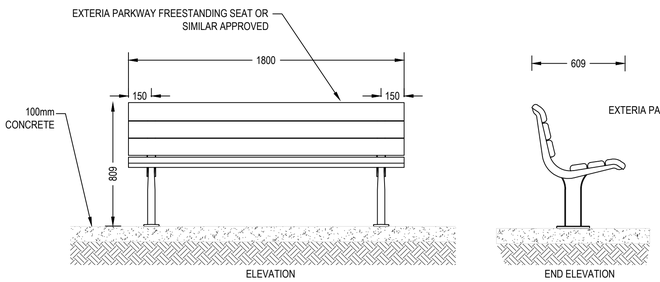


LOCKING DETAILS
SCALE 1:10

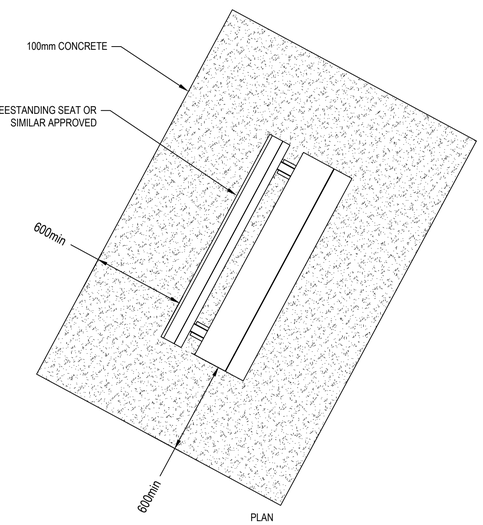
PLAYGROUND PERSPECTIVE

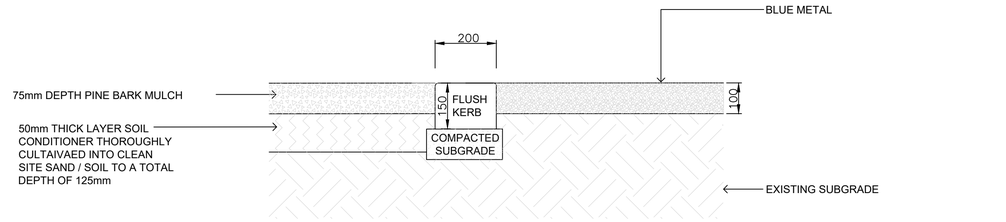


PLAYGROUND DETAIL - REFER B21015 L006
1:50

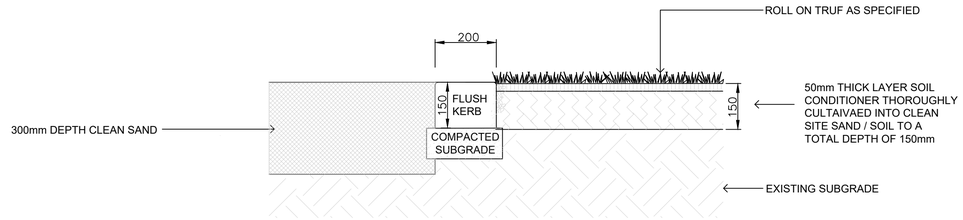


PARKWAY SEAT
TYPICAL DETAIL SCALE 1:20

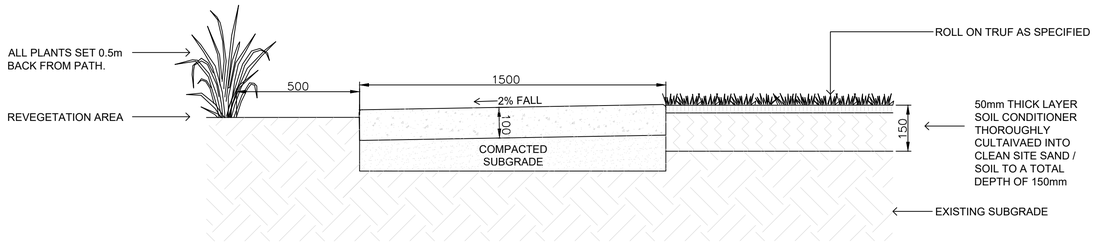




BLUE METAL, CONCRETE KERBING AND MULCH LANDSCAPING EDGE FOR TRANSFORMER SITES
1:10

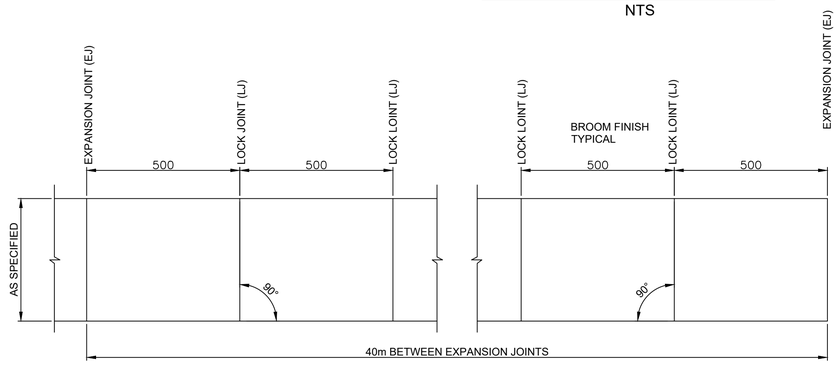


PLAYGROUND EDGE DETAIL
1:10



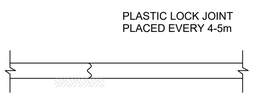
NOTES:
1) ALL TURF TO FINISH 15mm ABOVE TOP OF ANY ADJOINING SURFACE FINISH.

ROLL ON TURF, CONCRETE PATH EDGE
NTS

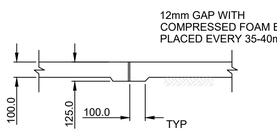


TYPICAL PATH JOINT LAYOUT
NTS

PROVIDE STEEL TROWEL FINISH TO BOTH LATERAL AND LONGITUDINAL EDGES TYP. 50mm WIDTH MINIMUM



TYPICAL LOCK JOINT
1:20



TYPICAL EXPANSION JOIN
1:20

NOTES:

1. FOUNDATION TO BE COMPACTED IN ACCORDANCE WITH THE SPECIFICATION.
2. ALL CONCRETE FOR PATH CONSTRUCTION TO BE A MINIMUM OF 20MPa, 20mm AGGREGATE AND MAXIMUM SLUMP OF 65mm.
3. BEDDING - SAND (100mm MINIMUM).
4. FINISH - BROOMED TO NON-SKID FINISH.

NOTES:

1. INTERNAL SWINGING AND LOCKING POST TO BE 90mm DIAMETER, 1600mm LONG WITH 900mm CONCRETED 50mm BELOW GROUND LEVEL.
2. THE BOOM IS TO BE 4200mm LONG, 35mm WIDE AND 70mm HIGH AND BE ABLE TO SWING FREELY AND WELDED TO THE INTERNAL POST.
3. THE SUPPORT BAR IS TO BE 3600mm LONG, 35mm WIDE AND 70mm HIGH AND WELDED TO THE BOOM AT ONE END AND TO THE SWINGING POST.
4. 25mm FLAT BAR TO BE CHAINED TO LOCKING POST WITH A 14mm x 22mm HOLE LOCATED AT THE END OF THE FLAT BAR AND TO HAVE A CoG G&M PADLOCK.
5. ALL POSTS AND BOOM ARE TO BE GALVANISED AND POWDERCOATED HERITAGE GREEN UNLESS AGREED OTHERWISE.

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

CLIENT

CLAYMONT

DISCLAIMER
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Oversby Consulting

PROJECT

CANNING RISE MADDINGTON

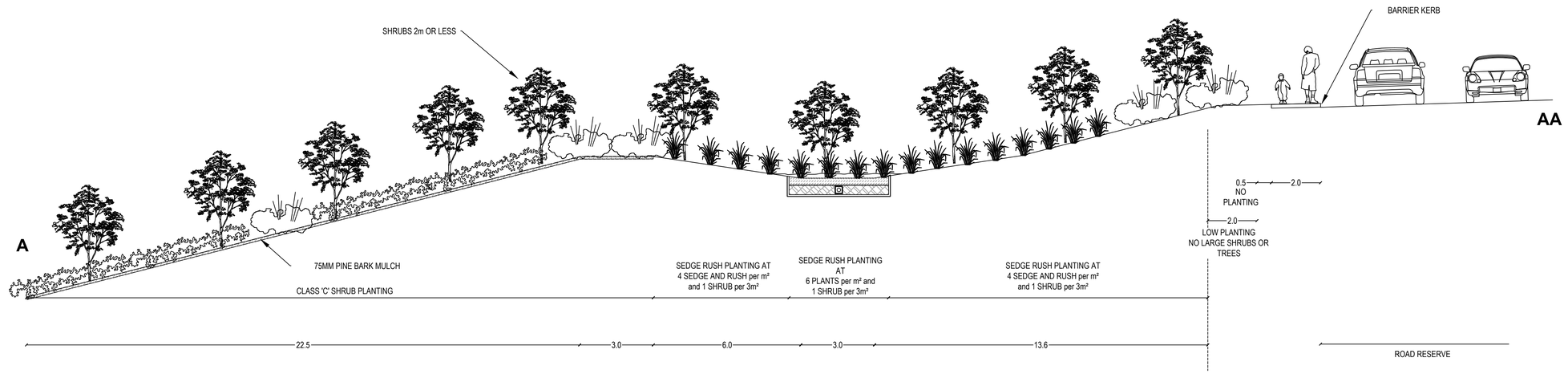
WETLAND & LANDSCAPE PLAN

DRAWING TITLE

DETAIL DRAWINGS
SHEET 1

PROJECT No.	DRAWING No.	REVISION
B21015	L007	6

BASIN 'D' 1 PLAN VIEW
1:750



BASIN TYPICAL SECTION
1:750

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS
PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

CLIENT
CLAYMONT

DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE. NOT FOR CONSTRUCTION UNLESS STAMPED BY CERTIFYING AUTHORITY

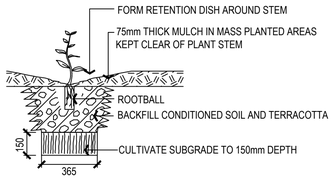
Oversby Consulting

PROJECT
LOT 808, 809 ALBANY HIGHWAY
MADDINGTON

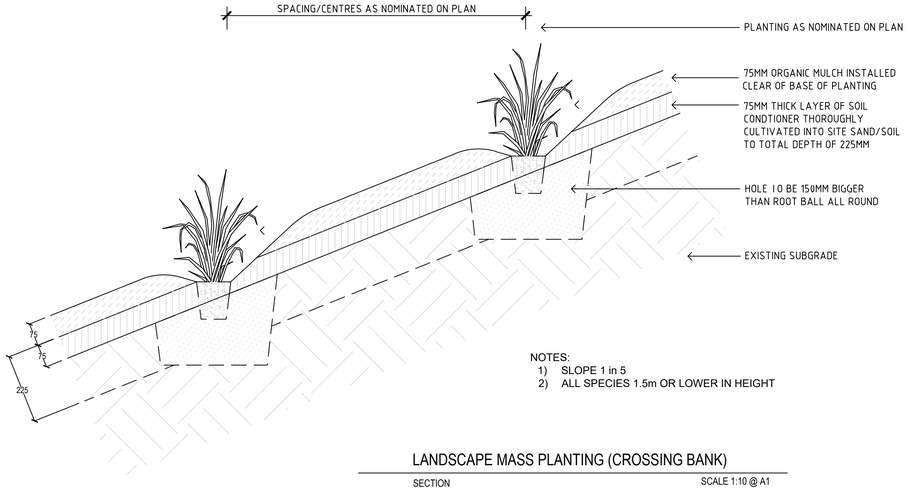
WETLAND & LANDSCAPE PLAN

DRAWING TITLE
DETAIL DRAWINGS
SHEET 2

PROJECT No.	DRAWING No.	REVISION
B21015	L008	6

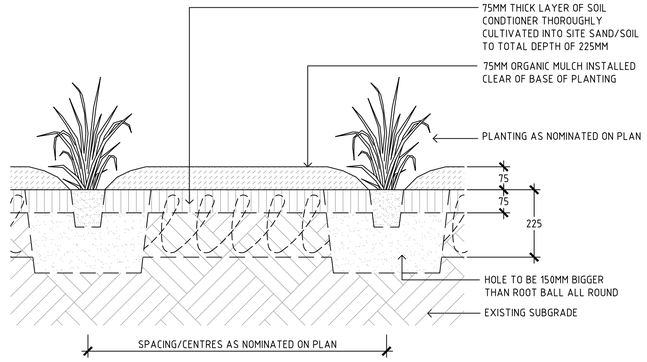


TUBESTOCK PLANTING IN LANDSCAPING AREA
1:10

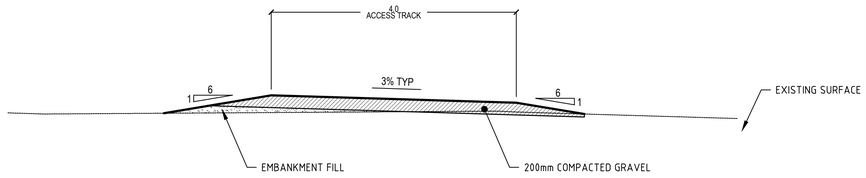


NOTES:
1) SLOPE 1 in 5
2) ALL SPECIES 1.5m OR LOWER IN HEIGHT

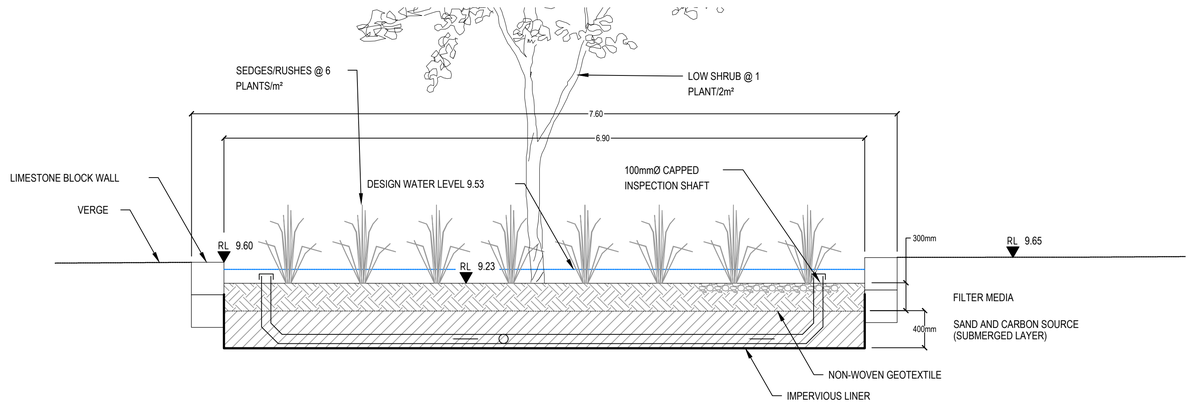
LANDSCAPE MASS PLANTING (CROSSING BANK)
SECTION SCALE 1:10 @ A1



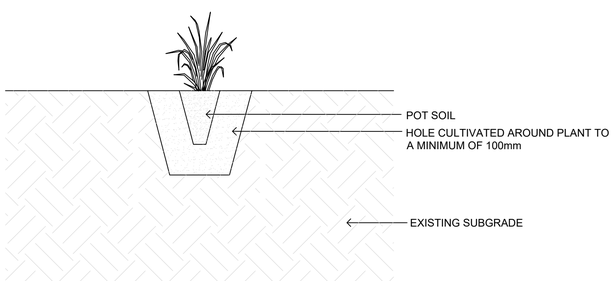
LANDSCAPE MASS PLANTING
SECTION SCALE 1:10 @ A1



WATERCORP ACCESS TRACK - TYPICAL SECTION
1:50

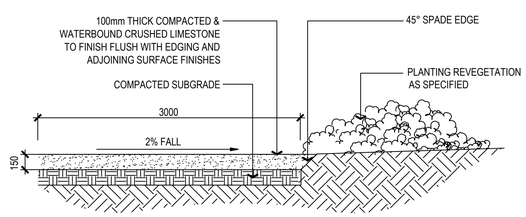


RAIN GARDEN SECTION - TYPICAL
NTS

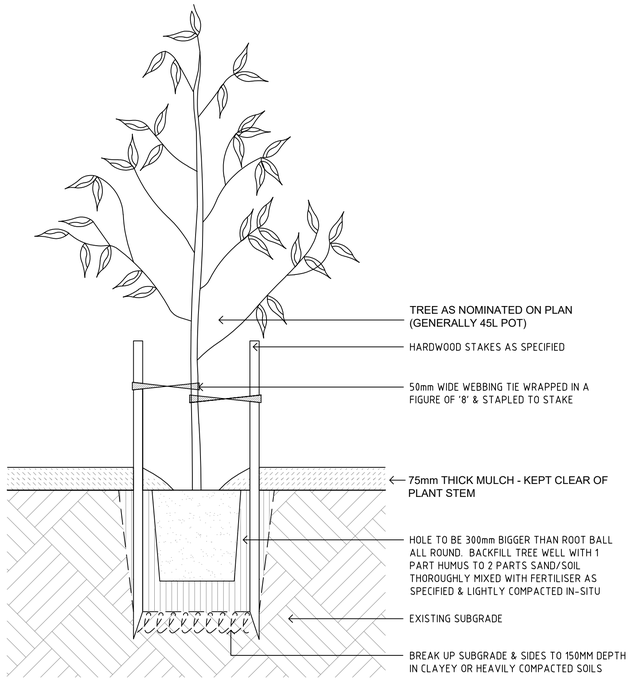


NOTES:
1) DISPOSE OF ANY SURPLUS SOIL AND STONES TO ENSURE THAT WATER IS NOT DEFLECTED FROM PLANTING POINT.
2) PLANTS IN REHABILITATION AREAS SHALL NOT RECEIVE SOIL PREPARATION.

TUBESTOCK REHABILITATION - REVEGETATION AREA
1:20



THICK CRUSHED LIMESTONE PATH
1:20



FEATURE TREE NEAR PLAYGROUND
TYPICAL SECTION SCALE 1:20 @ A1

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
6	4/10/22	ISSUED FOR FINAL APPROVAL	KJB	BO	BO
5	11/11/21	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS
PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

CLIENT
CLAYMONT

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Oversby Consulting

PROJECT
LOT 808, 809 ALBANY HIGHWAY
MADDINGTON

WETLAND & LANDSCAPE PLAN

DRAWING TITLE
DETAIL DRAWINGS
SHEET 3

PROJECT No.	DRAWING No.	REVISION
B21015	L009	6

LEGEND

- EXTENT OF WORKS (LOT 808 AND 809)
- EXISTING CADASTRE
- PROPOSED CADASTRE
- FORMER REVEGETATION LINE - RETAINED
- 200mm CONCRETE EDGING
- FOOTPATH
- 3m WIDE ACCESS TRACK (LIMESTONE / CONCRETE)
- LAWN AREA (1081m²)
- CLASS B WOODLAND
- CLASS B WOODLAND - TRANSITION
- CLASS C SHRUBLAND
- GROUNDCOVERS
- DRAINAGE BASIN
- DRAINAGE BASIN INTERNAL BATTERS
- RIPARIAN REVEGETATION
- SLASHED GRASS / EXISTING TREES TO BE RETAINED
- WETLAND CORE
- WETLAND REVEGETATION
- CROSSING BATTER PLANTING
- PLAYGROUND
- SEATING AREA
- BIORETENTION GARDEN
- FORMERLY AGREED EDGE OF WORK
- ACCESS GATE (MOUNTABLE KERB)
- POST DEVELOPMENT CATCHMENTS
- A POST DEVELOPMENT NODES
- DCA AND PARKS & REC RESERVE BOUNDARY

REV	DATE	ISSUE DESCRIPTION	DRAWN	DESIGN	CHECK
B	30/11/22	DCA AND PARKS & REC RESERVE BOUNDARY ADDED	KJB	BO	BO
A	3/10/22	ISSUED FOR APPROVAL	KJB	BO	BO

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE

0 10 20 30 40 50
SCALE 1:1000 @ A1

CLIENT

CLAYMONT

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Oversby Consulting

PROJECT

CANNING RISE MADDINGTON

STORMWATER & LANDSCAPE MANAGEMENT

DRAWING TITLE

POST DEVELOPMENT CATCHMENTS

PROJECT No.	DRAWING No.	REVISION
B21015	L010	B

Appendix B Implementation Schedule and Monitoring

Implementation Schedule for Landscaping/Foreshore Management Actions

Note; The dates are associated with Stage 1 works and may need to be reviewed for future stages.

Phase	Approximate Date	Basin	Revegetation Area	Landscaping	Lawn	Playground	Pathways/Edging/Seats
Before Construction		Implement sediment/erosion protection measures prior to any works starting	Mark all woody weeds to be removed by machinery. Mark all trees to be retained and inform Civil Contractors of the need to avoid these trees. Mark out wetland boundary to reduce chance of soil entering. Implement sediment/erosion protection measures prior to any works starting	Mark all woody weeds to be removed by machinery. Mark all trees to be retained and inform Civil Contractors of the need to avoid these trees. Implement sediment/erosion protection measures prior to any works starting	Mark any woody weeds to be removed by machinery.Implement sediment/erosion protection measures prior to any works starting	Implement sediment/erosion protection measures prior to any works starting	Implement sediment/erosion protection measures prior to any works starting
Work implementation as part of Civil Construction	**Spring 2023**	All basin construction and flow control structures to be finalised prior to planting.	Spray winter active species with herbicides in open areas, focusing on periods of active growth after winter rainfall has encouraged adequate germination.	Spray winter active species with herbicides in open areas, focusing on periods of active growth after winter rainfall has encouraged adequate germination.	Remove any woody weeds and spray other weeds .	Topsoil removed and lay down 200mm of clean playground sand. Install playground equipment. Install feature trees.	Install concrete pathways and edging. . Instal relevant seats.
Work Implementation at Completion of Civil Construction	**Spring/ Summer 2023**	Plant out basin and surrounding banks. Install temporary irrigation.	Undertake pre planting weed control.	Undertake soil improvement works. Install temporary irrigation. Spread mulch 75mm thick to suppress weed germination. Plant out landscaping area	Install permanent irrigation. Prepare subsurface soil with conditioner. Lay 100mm clean sand. Lay turf.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Install compacted limestone pathway.
	Summer 2023/24	Check for any erosion/sedimentation/ compaction,repair as required. Remove weeds as required. Inspect irrigation system and repair as required.	Undertake pre planting weed control.	Undertake pre planting weed control.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging and seats and repair as required.
	Autumn 2024	Check for any erosion/sedimentation/compaction and repair as required. Remove weeds as required. Inspect irrigation system and repair as required.	Undertake pre planting weed control.	Undertake pre planting weed control.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging and seats and repair as required.
	Winter 2024	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Inspect irrigation system and repair as required.	Plant out areas with native species. Mark out 5 monitoring quadrants (or proportional number depending on area revegetated).	Plant out landscaping area	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging and seats and repair as required.
Maintenance and Monitoring: Period 1	**September 2024 - December 2024**	Check for any erosion/sedimentation/ compaction, as required. Remove weeds as required. Inspect irrigation system and repair as required.	Control weeds with selective herbicides eg Fusillade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required. Monitor quadrants to determine plant survival and weed burdens.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control. Order plants for replanting to replace lost plants if needed. Inspect irrigation system and repair as required. Check for any erosion on slopes and rectify.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging and seats and repair as required.
Period 2	**January 2025 - April 2025**	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Order plants for replanting to replace lost plants if needed. Inspect irrigation system and repair as required.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control. Order plants for replanting to replace lost plants if needed.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control. Order plants for replanting to replace lost plants if needed. Inspect irrigation system and repair as required.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.
Period 3	**May 2025 - August 2025**	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Infill replanting as required. Remove temporary irrigation if plants are well established	Replant into areas where necessary. Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required.	Replant into areas where necessary. Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required. Remove temporary irrigation if plants are well established. Check for any erosion on slopes and rectify.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.
Period 4	**September 2025 - December 2025**	Check for any erosion/sedimentation/ compaction and repair as required. Remove weeds as required,	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees and check stakes.	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.
Period 5	**January 2026 - April 2026**	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Order plants for replanting to replace lost plants if needed.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control. Order plants for replanting to replace lost plants if needed.	Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control. Order plants for replanting to replace lost plants if needed.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees. Remove stakes.	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.
Period 6	**May 2026 - August 2026**	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Infill replanting as required.	Replant into areas where necessary. Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required.	Replant into areas where necessary. Control weeds with selective herbicides eg Fusilade or utilise spot spraying with Roundup Biactive and/or and manually remove weeds. Inspect site for signs of excessive grazing and undertake rabbit control as required. Trim plants if required to keep areas meeting the bushfire category. Check for any erosion on slopes and rectify.	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees .	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.
Works by City after completion of 2 year monitoring and maintenance period	**Ongoing**	Check for any erosion/sedimentation/ compaction, repair as required. Remove weeds as required. Infill replanting as required.	Weed Control and Revegetate as deemed necessary	Weed Control and Replant as deemed necessary	Monitor lawn growth and mow as required. Inspect irrigation and repair as required. Undertake weed control as required.	Undertake necessary maintenance of equipment. Control any weed encroachment. Check on health of trees a.	Monitor pathways, edging seats and repair as required. Trim any plants growing out onto pathway corridor.

Weed control is considered adequate if the weeds are in numbers low enough that they are currently not affecting the success of the revegetation/ existing native vegetation growth and it can be reasonably expected that they won't in the foreseeable future. For this to be the case it is assumed that weeds will cover less than 10% of the area on average in revegetation areas and 5% in landscape areas and no weeds in the basin or playground area.

MONITORING COMPLIANCE TABLE

Item	Compliance criteria	Review period
Revegetation Area		
Weed control	No declared weeds present	Quarterly and at PC and Handover
	All woody weeds removed	Quarterly and at PC and Handover
	All other weeds below 5% cover	Quarterly and at PC and Handover
Native Plant establishment	Understorey plants at 80% of initial planting density	
	Understorey plants at 70% of initial planting diversity/	Quarterly and at PC and Handover
	Mid and overstorey plants at 80% of initial planting density	Quarterly and at PC and Handover
	Mid and overstorey plants at 70% of initial planting diversity	Quarterly and at PC and Handover
	All rubbish removed	Quarterly and at PC and Handover
	All trees and areas of native vegetation are marked around the drip line prior to construction beginning and kept in place until PC	Prior to construction and weekly through construction
	Note: Total plant density is to be as per Policy 6.2.2 – Retention, Rehabilitation and Revegetation of Natural Areas	At PC and Handover
Landscaping Area, Including basins		
Weed control	No declared weeds present	Quarterly and at PC and Handover
	All woody weeds removed	Quarterly and at PC and Handover
	All other weeds below 5% cover	Quarterly and at PC and Handover
Native Plant establishment:- Fire Risk Planting areas	Understorey plants at 80% of initial planting density	Quarterly and at PC and Handover
	Understorey plants at 70% of initial planting diversity	Quarterly and at PC and Handover
	Mid and overstorey plants at 80% of initial planting density	Quarterly and at PC and Handover
	Mid and overstorey plants at 70% of initial planting diversity	Quarterly and at PC and Handover
	Dead plants removed	Quarterly and at PC and Handover
	All rubbish removed	Quarterly and at PC and Handover
	All trees and areas of native vegetation are marked around the drip line prior to construction beginning and kept in place until PC	Prior to construction and weekly through construction
Bushfire Management	All vegetation in areas being managed for bushfire are to be kept to agreed heights through pruning.	Prior to bushfire season and at PC and Handover
	Any extra plants self seeding in bushfire management areas are to be managed as per the approved bushfire Management Plan, including potential pruning or removal.	Prior to bushfire season and at PC and Handover
	The low fuel zones on the north and south portions of the site are to be managed to maintain groundcovers only.	Prior to bushfire season and at PC and Handover
Path network	All plants trimmed a minimum of 200mm from path edges and no plants blocking sight lines on curves.	Quarterly and at PC and Handover
	All footpaths to be in working order with no excessive cracking.	Quarterly and at PC and Handover
	All limestone tracks to be maintained so that they are free of vegetation	Quarterly and at PC and Handover
	Any erosion of the track is to be repaired.	Quarterly and at PC and Handover
Lawn	Reticulation system to be in full working order	Monthly over spring to autumn period and at PC and Handover
	Grass to be mowed and in a neat state	Weekly -monthly over spring to autumn period and at PC and Handover
	Weeds to be <1%	Quarterly and at PC and Handover
	Any lawn that has invaded surrounding revegetation/landscaping areas is to be removed.	Quarterly and at PC and Handover
Drainage		
(UWMP contains more detailed information in relation to drainage)	Any drainage outfalls are stable and not eroding	Quarterly and at PC and Handover
	Plants within flow dissipation areas are growing and at 80% or original density.	Quarterly and at PC and Handover
	Sediment is removed from dissipation areas	Quarterly and at PC and Handover
	Dissipation rocks are stable	Quarterly and at PC and Handover

Appendix C Comparison of 2013 and 2021 tree area

Comparison of 2013 and 2021 aerials to note changes since 2013 tree survey

2013

2021

Contact Details

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