

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Mandogalup East

Suburb: Mandogalup

State: WA

P/code: 6167

Local government area: City of Kwinana

Description of the planning proposal: Subdivision Application

BMP Plan / Reference Number: 59774 (SPG19312.01)/133,291

Version: R01 Rev 3

Date of Issue: 11/11/2020

Client / Business Name: Satterley Property Group

Reason for referral to DFES

	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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?
N/A.

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Zac Cockerill	Level 2	37803	31/08/2021
Company		Contact No.	
Strategen-JBS&G		9792 4797	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner



Date 11/11/2020

Satterley Property Group
Bushfire Management Plan (Subdivision Application)

Mandogalup East Subdivision
Mandogalup

11 November 2020

59774 (SPG19312.01)/ 133,291 (Rev 3)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

Table of Contents

1.	Proposal details	1
1.1	Background.....	1
1.2	Site description.....	2
1.3	Purpose.....	3
1.4	Other plans/reports.....	3
2.	Environmental considerations.....	8
2.1	Native vegetation - modification and clearing.....	8
2.2	Revegetation / Landscape Plans.....	10
3.	Bushfire assessment results	12
3.1	Assessment inputs.....	12
3.1.1	Vegetation classification	12
3.1.2	Effective slope.....	12
3.1.3	Summary of inputs.....	13
3.2	Assessment outputs	17
3.2.1	Bushfire Attack Level (BAL) contour assessment.....	17
4.	Identification of bushfire hazard issues.....	21
4.1	Bushfire context	21
4.2	Bushfire hazard issues	22
5.	Assessment against bushfire protection criteria	23
5.1	Compliance table.....	23
5.2	Discussion of management strategies.....	26
5.2.1	On-site staging buffers.....	26
5.2.2	Indicative APZ setbacks.....	26
5.2.3	Two vehicular access routes and staging of access	27
5.2.4	Fuel management within cleared vacant lots.....	27
5.2.5	Road verge fuel management.....	27
5.2.6	Lots impacted by temporary BAL-40/FZ requiring temporary quarantining.....	27
5.2.7	Notification on title.....	28
5.2.8	Building construction standards	28
5.2.9	BAL compliance and/or individual lot BAL assessment at future stages	28
5.2.10	Vulnerable land uses.....	28
5.2.11	Landscaping plan.....	29
5.2.12	Compliance with annual firebreak notice.....	29
6.	Responsibilities for implementation and management of the bushfire measures.....	30

7. References	31
8. Limitations	32

List of Tables

Table 1: Summary of environmental values	8
Table 2: Proposed landscaping approach and exclusion status under AS3959.....	10
Table 3: Summary of post-development vegetation classifications, exclusions and effective slope	13
Table 4: BAL contour assessment results.....	17
Table 5: Compliance with the bushfire protection criteria of the Guidelines	23
Table 6: Indicative APZ setback to achieve BAL-29.....	26
Table 7: Responsibilities for implementation and management of the bushfire measures	30

List of Figures

Figure 1: Plan of subdivision	4
Figure 2: Site overview (north)	5
Figure 3: Site overview (central).....	6
Figure 4: Site overview (south)	7
Figure 5: Post-development vegetation classification and effective slope (north).....	14
Figure 6: Post-development vegetation classification and effective slope (central).....	15
Figure 7: Post-development vegetation classification and effective slope (south).....	16
Figure 8: BAL contour map and bushfire management measures (north).....	18
Figure 9: BAL contour map and bushfire management measures (central).....	19
Figure 10: BAL contour map and bushfire management measures (south).....	20

List of Plates

Plate 1: Map of Bush Fire Prone Areas (DFES/WALGA 2020)	2
---	---

Appendices

Appendix A	Staging Plan
Appendix B	Landscape Plan
Appendix C	APZ standards (Schedule 1 of Guidelines)
Appendix D	Vegetation plot photos and description
Appendix E	City of Kwinana email correspondence – Reserve management
Appendix F	Vehicular access technical standards of the Guidelines
Appendix G	Water technical standards of the Guidelines
Appendix H	City of Kwinana Fire Notice (2020-21)
Appendix I	Infrastructure and cost sharing agreement Mandogalup

1. Proposal details

1.1 Background

Following subdivision approval of the Mandogalup East site under WAPC Ref. 158176, issued 9 April 2020, Rowe Group, on behalf of Satterley Property Group, is seeking to lodge a revised subdivision design to address various site constraints, including a more appropriate development design in response to bushfire issues. The proposed subdivision comprises Lots 9000, 9002 and 9006 Hoffman Road, Lot 9033 Rowley Road, Lot 1404 (north/south section of Peel Main Drain) and Part Lot 8018 on Deposited Plan 77243, Mandogalup (Mandogalup East, the project area), located in the City of Kwinana. The revised Plan of Subdivision (Figure 1) identifies:

- 573 residential lots
- one grouped housing site
- internal public road network
- eight Public Open Space (POS) areas
- primary school and playing fields
- Peel Main Drain (PMD) extending along a portion of the eastern project area boundary and crossing through the centre of the project area
- Dampier to Bunbury Natural Gas Pipeline (DBNGP) easement (extending through the southern part of project area)
- High Voltage Powerline Easement (located adjacent to the northern boundary of the project area; Lot 51)
- proposed primary and secondary public road connections between the adjacent east Apsley Estate site and Stage 1 of the development
- temporary Emergency Access Way (EAW) easement connecting Stage 1 of the development to Hoffman Road in the south.

Strategen-JBS&G has had recent involvement in facilitating the bushfire compliance process for the neighbouring Apsley Estate to the west. As discussed in subsequent sections of this BMP, it is expected that the ongoing development of Apsley Estate will ensure compliance is achievable for the project area with regards to resolving temporary BAL impacts from the west and staged vehicular access requirements given multiple connections are proposed between both development sites as development staging progresses from north to south. Strategen-JBS&G has ensured that mapping of classified vegetation and effective slope throughout the project area is consistent with that undertaken for the adjacent Apsley development site where applicable.

The approach to development staging has changed from that identified at the Structure Plan stage based on the servicing requirements of the site. This was reflected in the previous version of this BMP prepared to support subdivision approval over the site (WAPC Ref. 158176) and is further reiterated in this updated BMP prepared to support the revised subdivision design. Aligning staging with the WAPC subdivision approval for the adjoining Apsley Estate (i.e. from north to south) presents a far more practical planning and development outcome. It is also a more feasible and safer way of managing bushfire risks across both sites in a consistent and coordinated manner. A staging plan has been included in Appendix A for reference purposes.

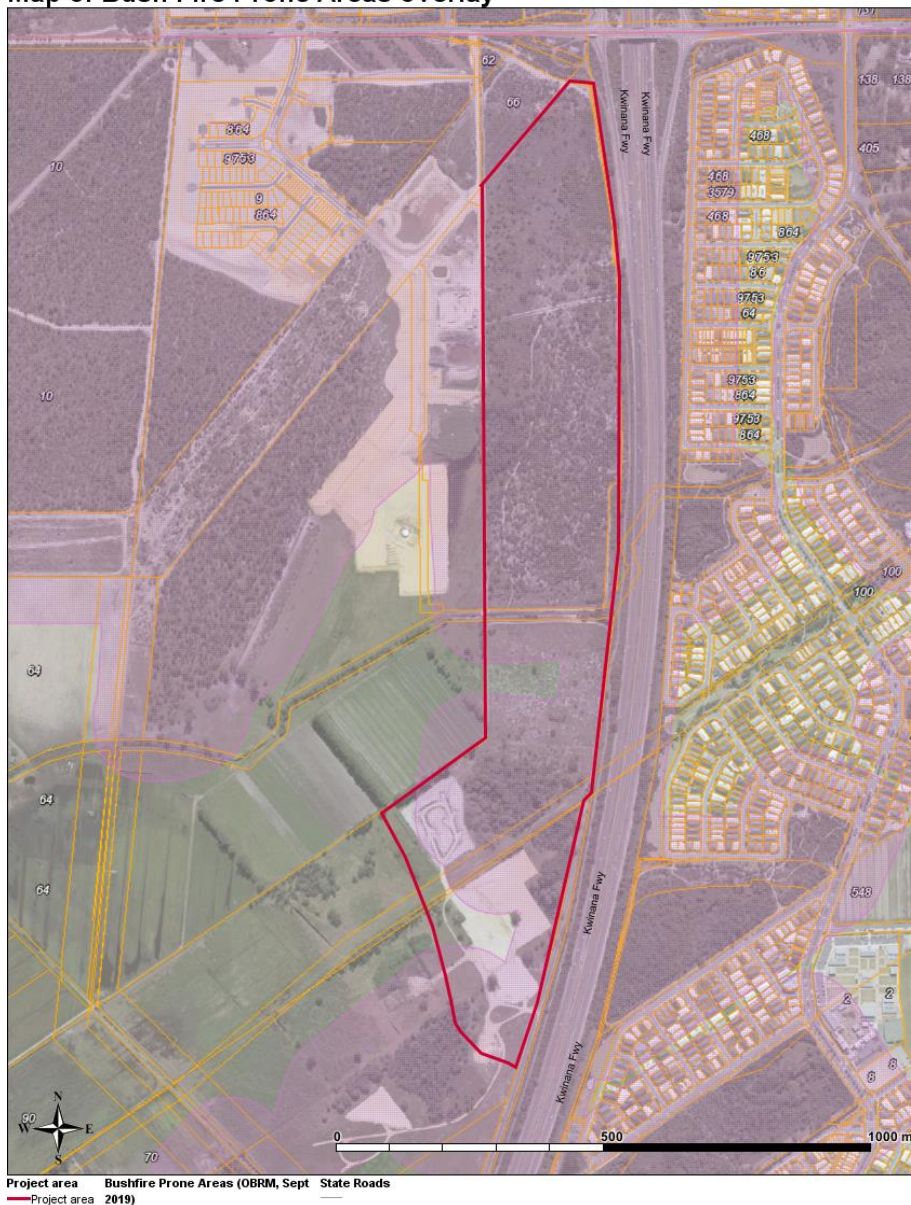
1.2 Site description

The project area comprises Lots 9000, 9002, 9006, 9033, Lot 1404 (north/south section of Peel Main Drain) and Part Lot 8018 and is surrounded by (see Figure 2, Figure 3 and Figure 4):

- High Voltage Powerline Easement (Lot 51), Rowley Road, Vivente Estate and vegetated lots zoned for 'Development' and 'Special use' to the north
- irrigated agriculture and remnant vegetation to the south
- Kwinana Freeway, Honeywood Estate and remnant vegetation to the east
- irrigated agriculture, remnant vegetation, a limestone quarry and ongoing development stages Apsley Estate to the west.

The majority of the project area is designated as bushfire prone on the Map of Bush Fire Prone Areas (DFES 2020; see Plate 1).

Map of Bush Fire Prone Areas overlay



Map Printed from WALGA LGmap on Wed Nov 11 12:31:35 AWST 2020

Plate 1: Map of Bush Fire Prone Areas (DFES/WALGA 2020)

1.3 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measure 6.4 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2017).

1.4 Other plans/reports

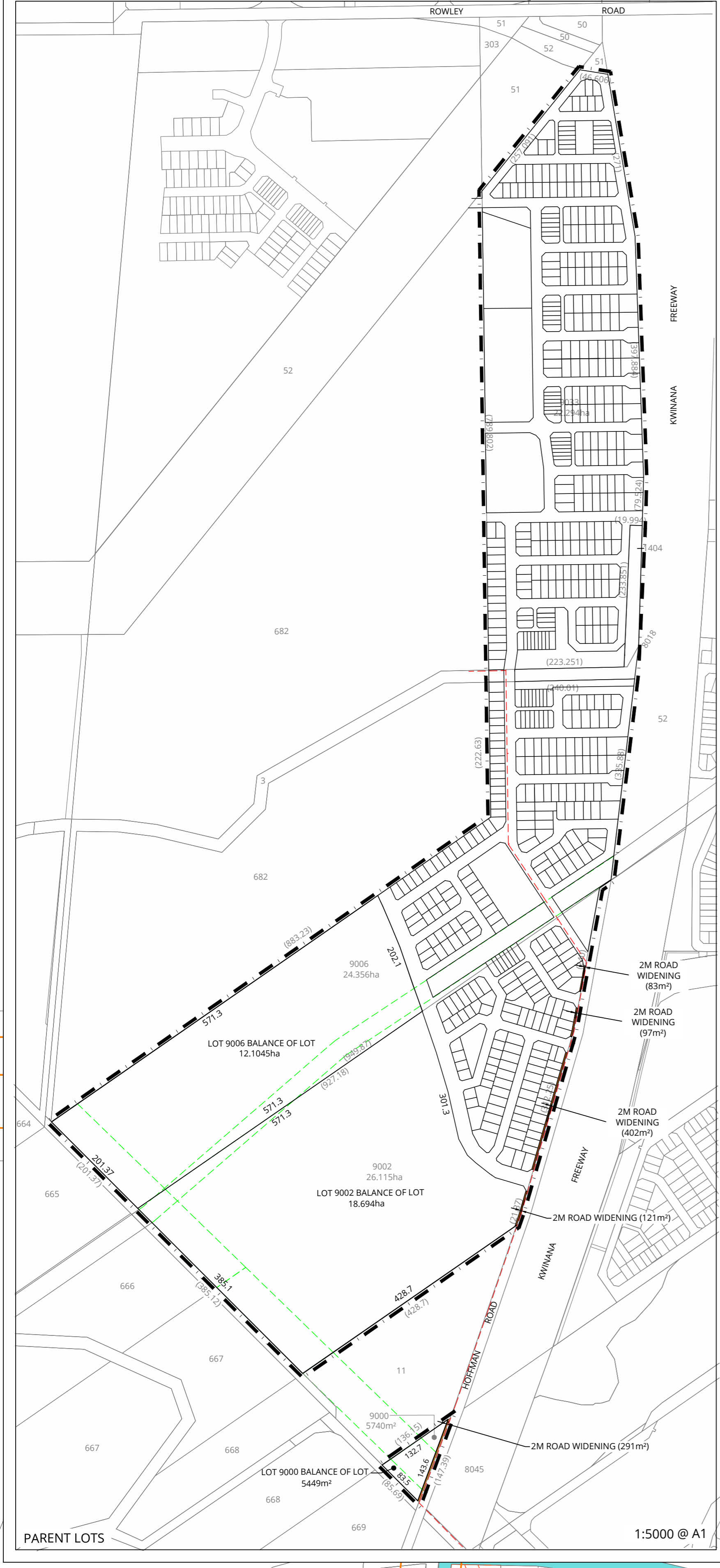
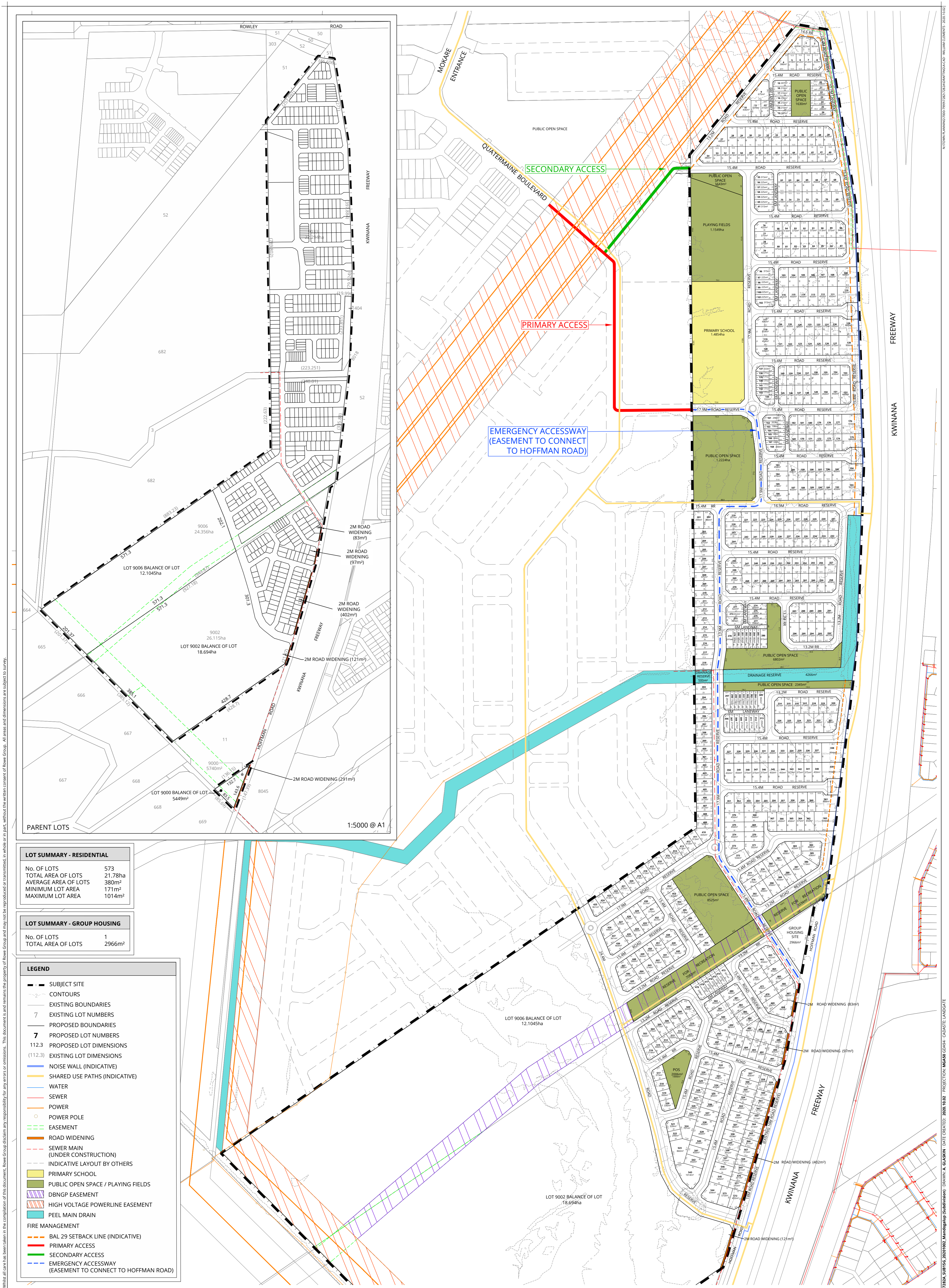
Other reports that have been prepared by Strategen-JBS&G for the project area include:

- Bushfire Management Plan: Mandogalup East Local Structure Plan (Strategen [now Strategen-JBS&G] 2017, Ref: SPG16422_01 R001 Rev 2)
- Environmental Assessment Report: Supporting document to Mandogalup East Local Structure Plan (Strategen [now Strategen-JBS&G] 2017, Ref: SPG13027_01 R002 Rev 5).

Other reports relevant to the project area include:

- Subdivision Application Lots 200, 9002 and 9006 Hoffman Road, Lot 9033 Rowley Road and Hoffman Road reserve (land ID No, 312256) Mandogalup (Rowe Group 2019, Ref: 7282)
- Environmental Assessment Report, Residential Rezoning, Satterley Landholdings Lyon Road Wandii/Mandogalup (RPS 2009)
- Vegetation and Flora Report, Proposed Urban Development Area, Wandii/Mandogalup (RPS 2010)
- Landscape and Public Open Space Strategy: Mandogalup East Local Structure Plan Part Lots 9002, 9006 and 11 Hoffman Road, Lot 9019 Rowley Road, Mandogalup (Emerge 2017, Ref: MA-01-LSP).

This BMP has maintained a consistent approach and methodology with the Local Structure Plan BMP (Strategen [now Strategen-JBS&G] 2017) where appropriate. This BMP has also aimed to address development constraints posed by the various vegetated interfaces, as identified through the previous version of this BMP prepared to support the subdivision approval (WAPC Ref. 158176).



LOT SUMMARY - RESIDENTIAL	
No. OF LOTS	573
TOTAL AREA OF LOTS	21.78ha
AVERAGE AREA OF LOTS	380m ²
MINIMUM LOT AREA	171m ²
MAXIMUM LOT AREA	1014m ²

LOT SUMMARY - GROUP HOUSING	
No. OF LOTS	1
TOTAL AREA OF LOTS	2966m ²

LEGEND	
	SUBJECT SITE
	CONTOURS
	EXISTING BOUNDARIES
	EXISTING LOT NUMBERS
	PROPOSED BOUNDARIES
	PROPOSED LOT NUMBERS
	PROPOSED LOT DIMENSIONS
	EXISTING LOT DIMENSIONS
	NOISE WALL (INDICATIVE)
	SHARED USE PATHS (INDICATIVE)
	WATER
	SEWER
	POWER
	POWER POLE
	EASEMENT
	ROAD WIDENING
	SEWER MAIN (UNDER CONSTRUCTION)
	INDICATIVE LAYOUT BY OTHERS
	PRIMARY SCHOOL
	PUBLIC OPEN SPACE / PLAYING FIELDS
	DBNGP EASEMENT
	HIGH VOLTAGE POWERLINE EASEMENT
	PEEL MAIN DRAIN
FIRE MANAGEMENT	
	BAL 29 SETBACK LINE (INDICATIVE)
	PRIMARY ACCESS
	SECONDARY ACCESS
	EMERGENCY ACCESSWAY (EASEMENT TO CONNECT TO HOFFMAN ROAD)

PLAN OF SUBDIVISION
 LOTS 9000, 9002 & 9006 HOFFMAN ROAD, LOT 9033 ROWLEY ROAD AND PART LOT 8018 ON DEPOSITED PLAN 77243
 MANDOGALUP

SCALE @ A1: 1:2500
7282A-SUB-15-G



While all care has been taken in the compilation of this document, Rowe Group disclaims any responsibility for any errors or omissions. This document is and remains the property of Rowe Group and may not be reproduced or transmitted, in whole or in part, without the written consent of Rowe Group. All areas and dimensions are subject to survey.

7282A-SUB-15-G-20231002-PlanofSubdivision | DWYNYA-A-G435M | DATE CREATED: 2023-10-02 | PROJECTION: MGA55-GDA94-COASTAL LANGSATE

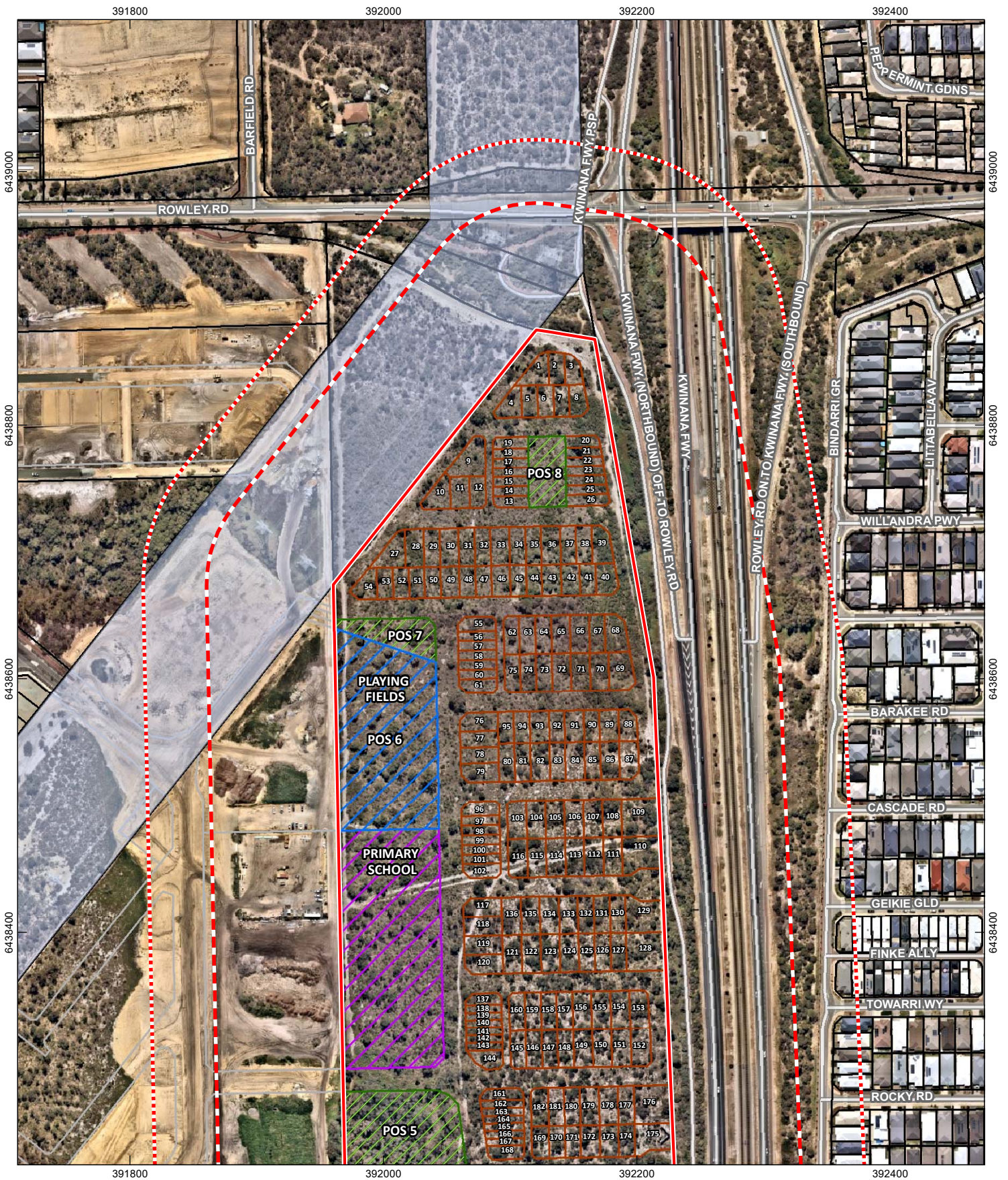
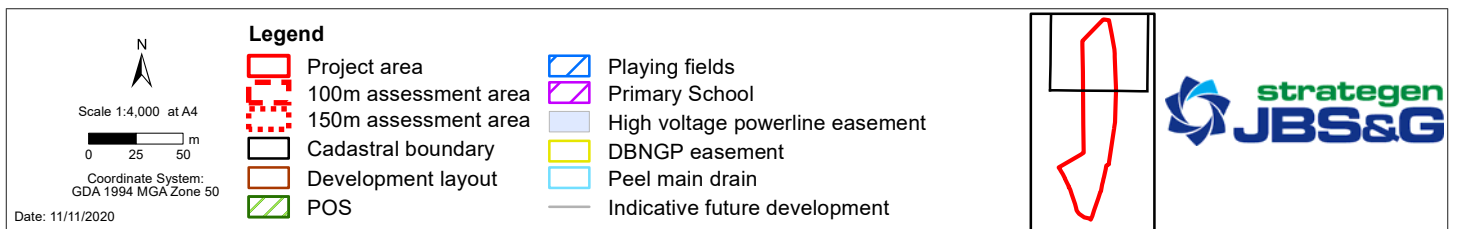


Figure 2: Site overview (north)



W:\Projects\1\Open\Satterley Property Group\Mandagalup\59774 Updated Mandagalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_02to4_SiteOverview_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Neamap: Aerial image, flown 09/2020. Client: Satterley Property Group. Site data 10/2020. Created by: jcrute

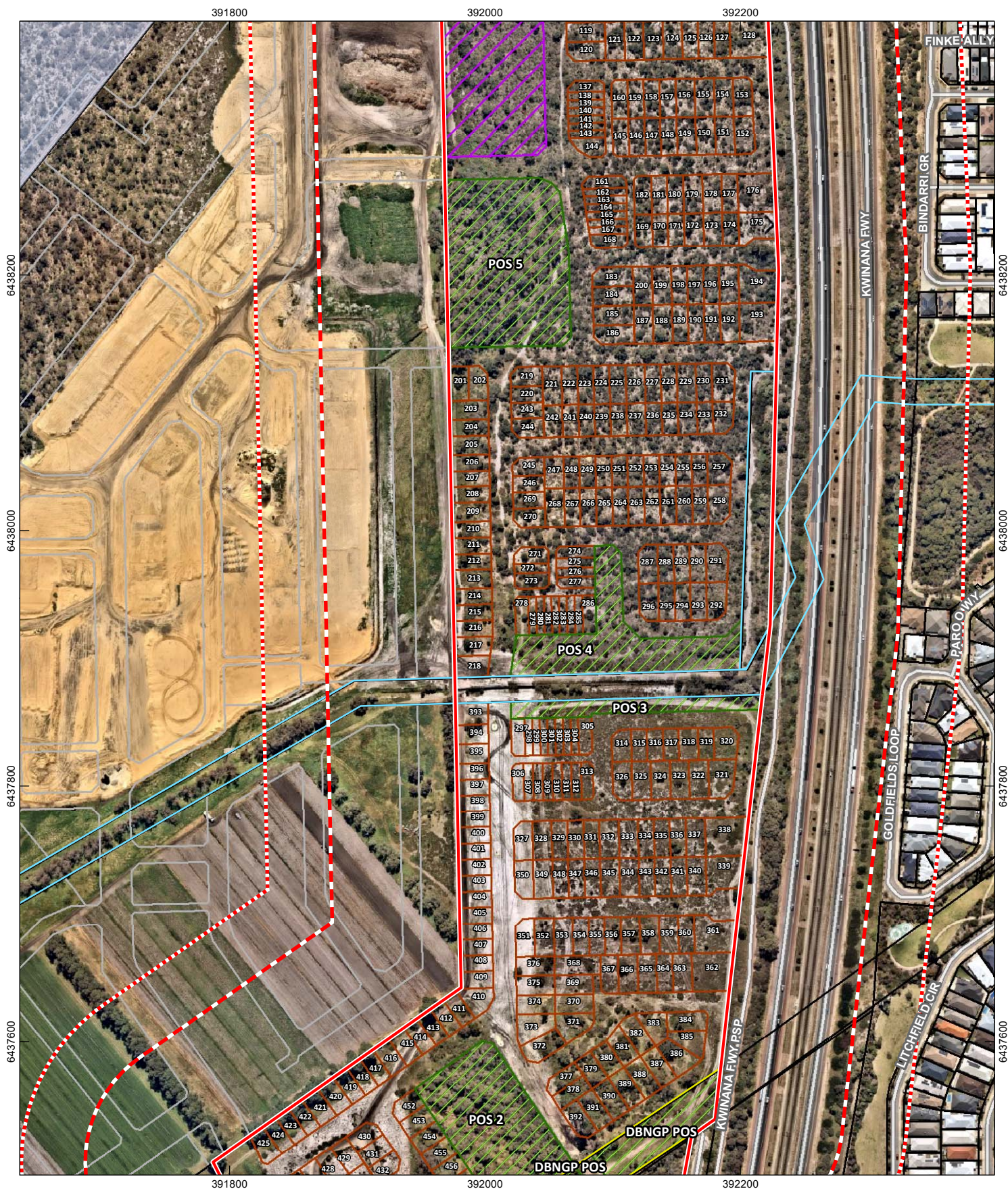
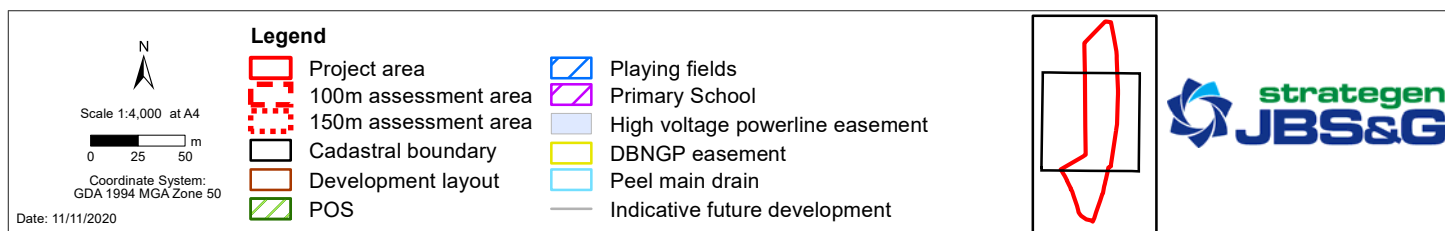


Figure 3: Site overview (central)



W:\Projects\1)\Open\Satterley Property Group\Mandogalup\59774 Updated Mandogalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_02to4_SiteOverview_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Neemap: Aerial image, flown 09/2020. Client: Satterley Property Group. Site data 10/2020. Created by: jcrute

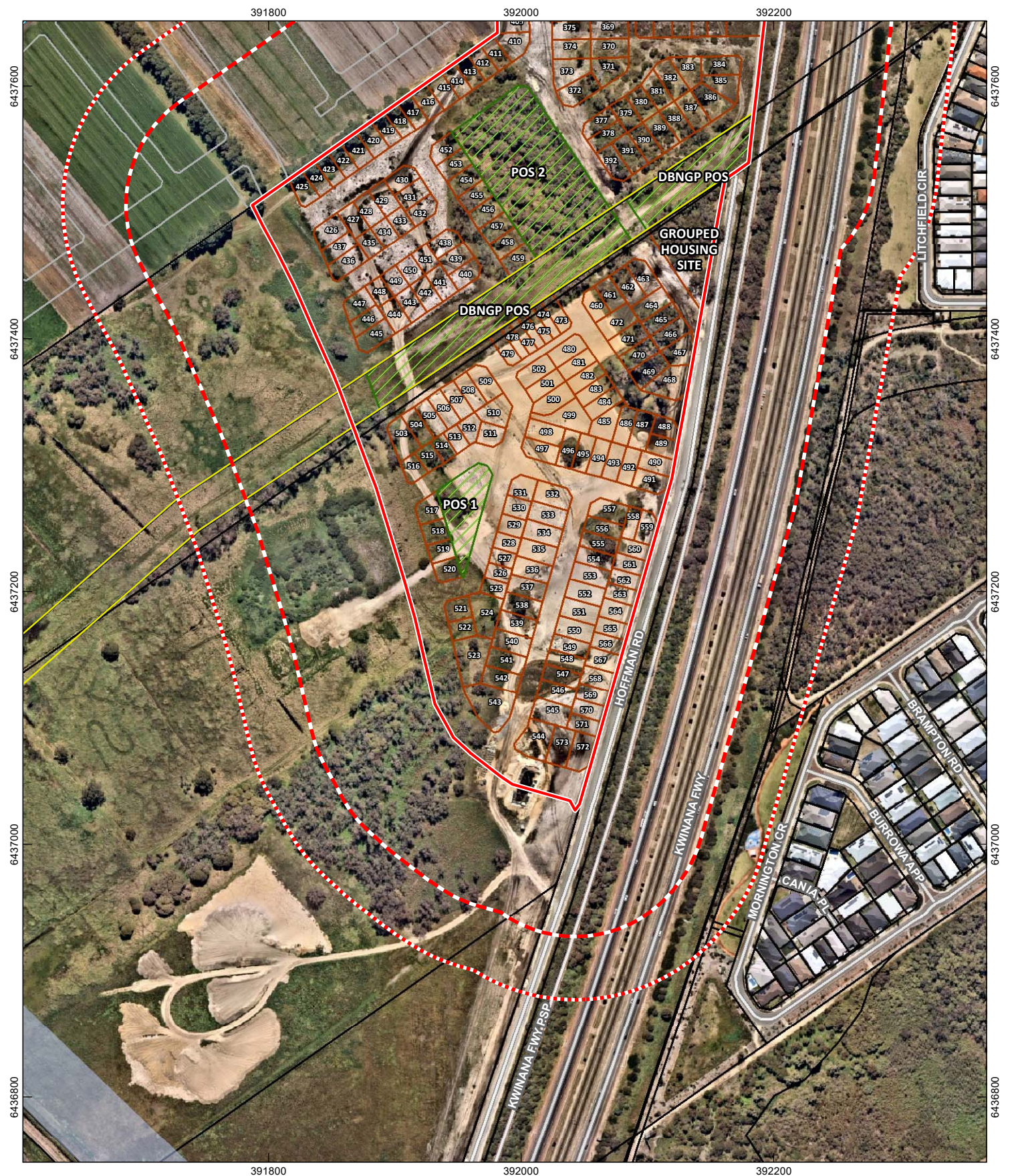
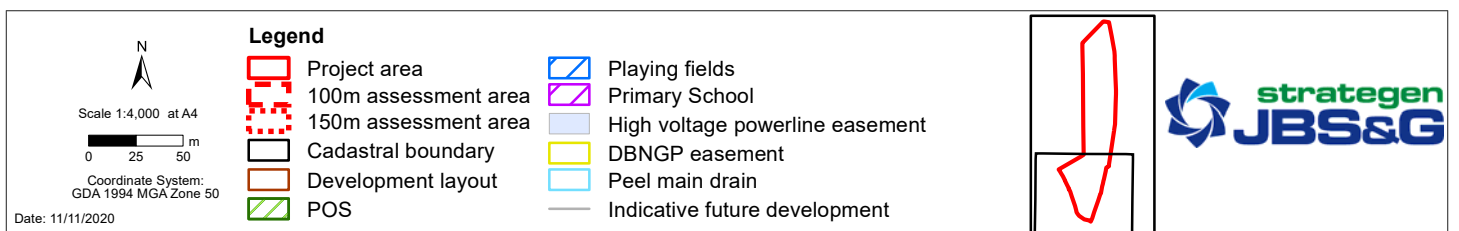


Figure 4: Site overview (south)



W:\Projects\11\Open\Satterley Property Group\Mandogalup\59774 Updated Mandogalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_02to4_SiteOverview_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Neemap: Aerial image, flown 09/2020. Client: Satterley Property Group. Site data 10/2020. Created by: jcrute

2. Environmental considerations

2.1 Native vegetation - modification and clearing

The project area is expected to be cleared in one single phase and be progressively developed thereafter on a staged basis, with low threat staging buffers to be maintained also on a staged basis where required. Classified vegetation is expected to be retained within POS 2 (temporary classification) and POS 5 (temporary classification) until such time that the applicable exclusions under Clause 2.2.3.2 of AS3959 can be achieved for these POS areas.

A search of publicly available environmental data relating to the project area has been undertaken and is summarised in Table 1.

Table 1: Summary of environmental values

Environmental value	Present within or adjacent to project area	Description
Environmentally Sensitive Area	Within and adjacent	An Environmentally Sensitive Area occurs over the northern part of the project area as well as a small portion of the eastern boundary. Environmentally Sensitive Areas exist more broadly adjacent to the project area including Jandakot Regional Park and Beeliar Regional Park, along with numerous other areas within a 3 km radius.
Swan Bioplan Regionally Significant Natural Area	N/A	There are no Swan Bioplan Regionally Significant Natural Areas located within or adjacent to the project area.
Wetlands	Ramsar wetlands: adjacent Geomorphic Wetlands: within and adjacent	Thomsons Lake is a Ramsar listed wetland, 3.4 km to the northwest of the project area. Geomorphic Wetlands of the Swan Coastal Plain occur within and adjacent to the project area. A Multiple Use wetland occurs within the project area, as well as a Resource Enhancement Wetland. Other Geomorphic wetlands (Conservation, Resource Enhancement and Multiple Use) occur within a 3 km radius of the project area.
Waterways	Adjacent	Thompsons Lake is located 3.4 km to the northwest.
Threatened Ecological Communities listed under the EPBC Act	Threatened Ecological Communities: within and adjacent Tuart Woodlands: adjacent Banksia Woodlands: likely to occur within and adjacent	Threatened Ecological Communities occur within and adjacent to the project area. Banksia Woodlands are mapped as likely to occur within and adjacent to the project area.
Threatened and priority flora	Adjacent	Threatened Flora species occur 1–2.5 km to the east and south of the project area, while Priority 4 species occur 3.5 km to the northwest and 2.5 km to the south. A Priority 3 species occurs 2.5 km to the south.
Fauna habitat listed under the EPBC Act	Carnaby's Black Cockatoo habitat: within and adjacent Quenda habitat: within and adjacent	The following information is recorded in relation to Carnaby's Black Cockatoo habitat: <ul style="list-style-type: none"> possible breeding areas occur 5.7 km to the east of the project area confirmed roosting areas occur within and adjacent to the project area potential feeding areas are mapped as occurring within and adjacent to the project area. Quenda habitat is mapped as potentially occurring within and adjacent to the project area.
Threatened and priority fauna	Within and adjacent	The buffer zone for three Priority Fauna species occurs in the northern portion of the project area. Adjacent to the project area, numerous Priority and Threatened Fauna species occur within a 3 km radius.

Environmental value	Present within or adjacent to project area	Description
Bush Forever Site	Adjacent	The following Bush Forever sites are recorded as occurring within a 3 km radius of the project area: <ul style="list-style-type: none"> • BF 492 • BF 392 • BF 393 • BF 267 • BF 266 • BF 347 • BF 269 • BF 270. BF 391 (Thomsons Lake) is 3.4 km to the northwest of the project area.
DBCA managed lands and lands and waters (includes legislated lands and waters and lands of interest)	Adjacent	The following DBCA managed lands occur adjacent to the project area: <ul style="list-style-type: none"> • Wandi Nature Reserve (1.5 km to the southeast) • Unnamed reserve 2 km to the south • Harry Waring Marsupial Reserve 2.4 km to the northwest • Thomsons Lake Nature Reserve 3.4 km to the northwest.
Conservation covenants	N/A	The project area is not affected by any conservation covenants.

Regional vegetation surveys and mapping of the Swan Coastal Plain indicates the project area and adjacent land is contained within the Bassendean Complex-Central and South. This vegetation complex is described as:

- ranging from woodland of jarrah (*Eucalyptus marginata*), sheoak (*Allocasuarina fraseriana*) and Banksia (*Banksia spp.*) to low woodland of paperbark (*Melaleuca spp.*) and sedgelands on the moister sites. This area includes the transition of jarrah (*Eucalyptus marginata*) to coastal blackbutt (*Eucalyptus tottiana*).

The Bassendean Complex - Central and South comprises vegetation that is generally consistent with on-site observations and vegetation classifications. Banksia woodlands are prevalent within and adjacent to the project area and paperbark woodlands are found throughout the wetland areas within and adjacent to the project area. Eucalypts such as jarrah exist mostly in isolation on the western side of the Kwinana Freeway, with the majority of intact eucalypts occurring to the east of the freeway.

No Registered Aboriginal sites are located within or immediately adjacent to the project area; however, one mythological site, Site 3427 (Mandogalup Swamp/spectacles), extends into the southern portion of the project area (Strategen [now Strategen-JBS&G] 2017).

Vegetation condition within the project area ranges from Excellent to Completely Degraded, with most remnant vegetation being in Very Good to Degraded condition (RPS 2010). The project area to the south of Peel Main Drain has been subject to historical clearing and grazing, and to the north of Peel Main Drain comprises areas of native vegetation. Weeds are common in the majority of bushland and cleared areas of the project area (RPS 2010).

The following summary from the Strategen [now Strategen-JBS&G] (2017) Environmental Assessment Report (EAR) outlines the key factors considered during development planning for the project area:

- the proposed development does not impact on known occurrences of threatened flora or TECs, although two Priority species were identified
- Carnaby's Black-Cockatoo, listed as Endangered under the EPBC Act, is likely to utilise the project area

- a significant tree physical assessment and an Engineering and Planning assessment in accordance with the City of Kwinana's Local Planning Policy No. 1 has resulted in:
 - the retention of 62 significant trees
 - the potential retention of an additional 13 significant trees subject to further design work associated with the education site, group housing site and road reserve
 - the removal of 97 significant trees of which 56 of these trees are of 'very low' retention value
- the project area is not considered to represent significant habitat for conservation significant fauna species.

Strategen-JBS&G understands that all relevant environmental/clearing approvals have/will be sought as part of ongoing/future development works.

2.2 Revegetation / Landscape Plans

On-site POS will be subject to landscape design, including landscaping within the PMD and DBNGP easements. The Landscape Plan (refer to Appendix B) demonstrates that any on-site vegetation retention or landscaping will result in an excludable vegetation extent for the PMD, the DBNGP easement and all POS cells except for POS 2 and POS 5 (temporary classifications). Some vegetation within POS 2 and 5 will remain to achieve drainage, amenity and/or environmental outcomes in accordance with the landscaping plan.

All on-site landscaping (including PMD and the DBNGP easements) will consist entirely or partially of low threat vegetation, managed gardens and street scaping in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines (refer to Appendix C). As previously stated, classification of retained vegetation within POS 2 and POS 5 is considered temporary until such time that the applicable exclusions under Clause 2.2.3.2 of AS3959 can be achieved, subject to detailed landscaping design and ongoing clearing and development within the adjacent west Apsley Estate.

Table 2 provides a summary of the proposed landscape planning approach across the project area (Emerge 2017).

Table 2: Proposed landscaping approach and exclusion status under AS3959

POS	Exclusion status under AS3959	Landscaping treatments
POS 1 (local park)	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • small playground • shelter • seating node • passive recreation (turfed area) • native shrub planting (managed gardens)
DBNGP easement POS	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • walking trail • passive recreation (turf areas) • native shrub planting (managed gardens) • existing vegetation is to be modified to be low threat vegetation in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines

POS	Exclusion status under AS3959	Landscaping treatments
POS 2 (neighbourhood park)	Temporarily classified due to proposed tree retention and proximity to classified vegetation within Apsley Estate. Future exclusion under either Clauses 2.2.3.2 (e) and (f) (subject to detailed landscape design), and/or Clause 2.2.3.2 (b) (subject to 100 m separation achieved to classified vegetation within Apsley Estate).	<ul style="list-style-type: none"> • raised boardwalk through existing melaleuca dampland • shaded crushed limestone picnic area • existing trees and vegetation to be protected and retained • swale/basin • small playground • shelter • seating node • BBQ • drink fountain • large playground • passive recreation • native shrub planting (managed gardens)
POS 3 and 4 (neighbourhood recreation, includes PMD and Lot 1404)	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • open living stream concept around drainage reserve • open turf area • stormwater drainage (compliant with low threat vegetation) • rock riffle and composite timber bridge • existing vegetation is to be modified to be low threat vegetation in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines • drink fountain • seating node • small playground • shelter
POS 5 (local nature park)	Temporarily classified due to proposed vegetation retention and proximity to classified vegetation within Apsley Estate. Future exclusion under Clause 2.2.3.2 (b) (subject to retaining less than 1 ha of vegetation and achieving 100 m separation to classified vegetation within Apsley Estate).	<ul style="list-style-type: none"> • raised boardwalk/deck through existing retained trees • nature play space • shelter picnic node • swale/basin • retained vegetation • seating node • BBQ • drink fountain • large playground • passive recreation • walking trail • flying fox • open turf area
POS 6 (playing fields)	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • open turf area
POS 7 (local park)	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • open turf area • shade trees • small drainage basin
POS 8 (neighbourhood recreation)	Entirely excludable under Clauses 2.2.3.2 (e) and (f).	<ul style="list-style-type: none"> • open turf area • drink fountain • small playground • swale/basin • seating node • shelter

The post-development vegetation extent following on-site clearing and landscaping is considered and identified in Section 3.

3. Bushfire assessment results

3.1 Assessment inputs

3.1.1 Vegetation classification

Strategen-JBS&G assessed classified vegetation and exclusions within the 150 m assessment area (depicted in Figure 5, Figure 6 and Figure 7) through on-ground verification on 30 May 2019 in accordance with AS 3959 and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix D.

Remnant vegetation within the project area and adjacent land is predominantly a mixture of grassland, scrub, banksia/paperbark woodland and isolated eucalyptus forest. The on-site remnant vegetation extent will be largely reduced following clearing of the project area, with the predominant vegetation remaining within POS cells 2 and 5 in the form of Class A Forest.

The Strategen [now Strategen-JBS&G] (2017) BMP for the Mandogalup East LSP was prepared with the following assumptions relating to vegetation classification:

- PMD and DBNGP easements will be modified and maintained in a low threat state (i.e. as managed gardens/parklands) in perpetuity, or be non-vegetated areas.

Since preparation of the BMP supporting the LSP, it has been confirmed that PMD and DBNGP easements will both be landscaped and managed in a low threat state by the developer initially, and, once ceded to City of Kwinana, the City will assume ongoing management and maintenance to a low threat state in perpetuity. This is consistent with the existing management approach for portions of PMD and DBNGP traversing the Honeywood estate on the eastern side of Kwinana Freeway. City of Kwinana has confirmed their agreement to this approach and accepted the ongoing management responsibility (see Appendix E). Based on the above, vegetation within both these areas has been excluded from classification.

Furthermore, ongoing exclusion of Hoffman Road reserve and associated road verges from classification will be achieved as part of the necessary road upgrades to service the site and ongoing maintenance thereafter.

A description of the existing and proposed exclusions is provided below and summarised in Table 3:

- excluded under Clause 2.2.3.2 (e) including non-vegetated areas (i.e. built form, roads, residential dwellings, firebreaks, paths, bare earth cleared areas)
- excluded under Clause 2.2.3.2 (f) including low threat managed areas (i.e. residential managed gardens, areas dominated by *Carpobrotus virescens* [pigface], POS managed/landscaped to achieve a low threat state [POS areas 1, 3-4 and 6-8]).

3.1.2 Effective slope

Strategen-JBS&G assessed effective slope under classified vegetation within the 150 m assessment area through on-ground verification on 30 May 2019 in accordance with AS 3959. Results were cross-referenced with DPIRD 2 m contour data and are depicted in Figure 5, Figure 6 and Figure 7.

The project area and the adjacent land to the west is generally flat or upslope. Land to the south was observed to have a slight downslope into a wetland area (downslope >0-5 degrees). Land to the north sloped upwards towards Rowley Road and is then generally flat opposite Rowley Road. Land to the east is generally flat, characterised by the Kwinana Freeway reserve. A minor down-slope (>0-5 degrees) occurs along a section of the freeway reserve approximately halfway down the development interface.

3.1.3 Summary of inputs

Figure 5, Figure 6 and Figure 7 illustrate the anticipated post-development vegetation classifications and exclusions following completion of subdivision works and implementation of low threat landscaping throughout the project area. The post-development vegetation classifications/exclusions and effective slope are summarised in Table 3.

Table 3: Summary of post-development vegetation classifications, exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class A Forest	Flat/upslope (0°)	Various locations within and adjacent to the project area where a eucalypt canopy exists over a tiered shrub and understorey. Includes POS 2 and 5 where existing vegetation will be retained (noting these POS areas comprise a temporary classification).
2	Class A Forest	Downslope >0–5°	To the southeast of the project area with eucalyptus canopy over tiered shrub and understorey.
3	Class B Woodland	Flat/upslope (0°)	Various locations adjacent to the project area consistent with banksia or paperbark dominant woodland vegetation.
4	Class B Woodland	Downslope >0–5°	To the south of the project area and along the freeway interface, consistent with sparse eucalyptus canopy over grasses or typical banksia/sheoak woodland.
5	Class D Scrub	Flat/upslope (0°)	Predominant vegetation structure adjacent to the project area, particularly to the north and within the freeway reserve to the east.
6	Class D Scrub	Downslope >0–5°	Occurs within a section along the freeway interface.
7	Class C Shrubland	Downslope >0–5°	Single area of low shrubs less than 2 m in height to the south of the project area.
8	Class G Grassland	Flat/upslope (0°)	Cleared agricultural land (uncultivated), predominantly to the west of the project area and in small sections along the freeway interface.
9	Class G Grassland	Downslope >0–5°	Cleared agricultural land (uncultivated) to the south.
10	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])	N/A	Area to be modified and managed to a non-vegetated/low threat state within the project area.
11	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])	N/A	All other existing excluded areas (non-vegetated and low threat managed) within and adjacent to the project area.

391800

392000

392200

392400

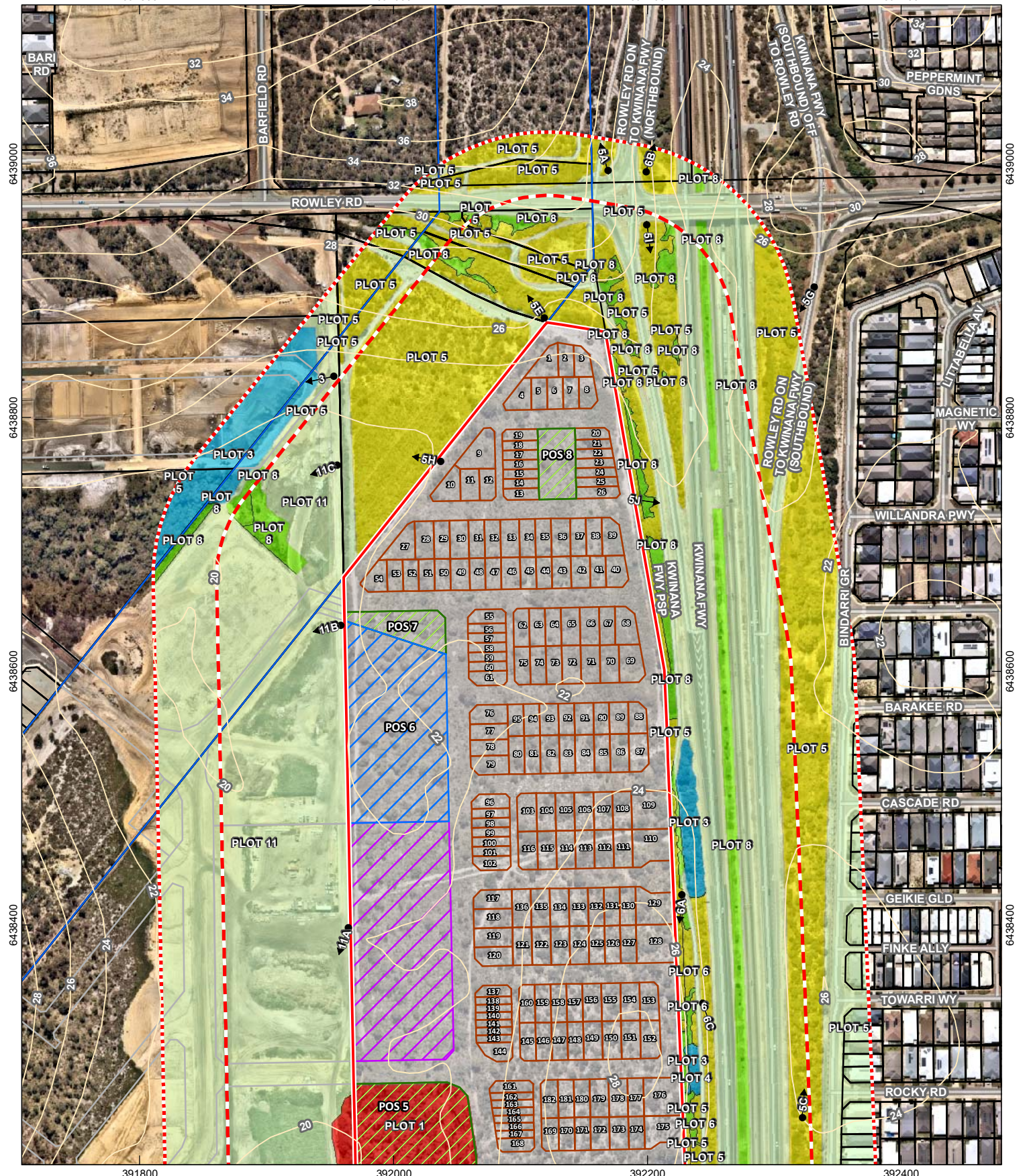


Figure 5: Post-development vegetation classification and effective slope (north)

<p>Scale 1:4,000 at A4</p> <p>Coordinate System: GDA 1994 MGA Zone 50</p> <p>Date: 11/11/2020</p>	<p>Legend</p> <ul style="list-style-type: none"> Project area 100m assessment area 150m assessment area Cadastral boundary Development layout POS Playing fields Primary School DBNGP easement Peel main drain (PMD) High voltage power easement PMD and DBNGP to be modified to low threat vegetation Topographic contours (mAHD) Photo point and direction Indicative future development Roads (MRWA) 	<p>Vegetation classification</p> <ul style="list-style-type: none"> Class A Forest Class B Woodland Class D Scrub Class G Grassland Excluded under Clauses 2.2.3.2 (e) & (f) Area to be modified to a non-vegetated or low threat state 	
	<p>W:\Projects\1\Open\Satterley Property Group\Mandagalup\59774 Updated Mandagalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_05to07_VegClass_Mapbook.mxd</p> <p>© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.</p> <p>Service Layer Credits: Neamap; Aerial image, flown 09/2020. Client: Satterley Property Group. Site data 10/2020. Created by: jcrute</p>		

W:\Projects\1\Open\Satterley Property Group\Mandagalup\59774 Updated Mandagalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_05to07_VegClass_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Neamap; Aerial image, flown 09/2020. Client: Satterley Property Group. Site data 10/2020. Created by: jcrute



Figure 6: Post-development vegetation classification and effective slope (central)

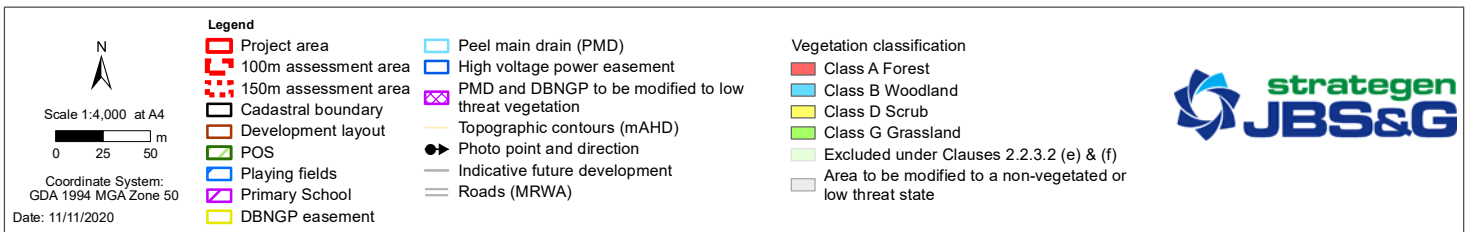
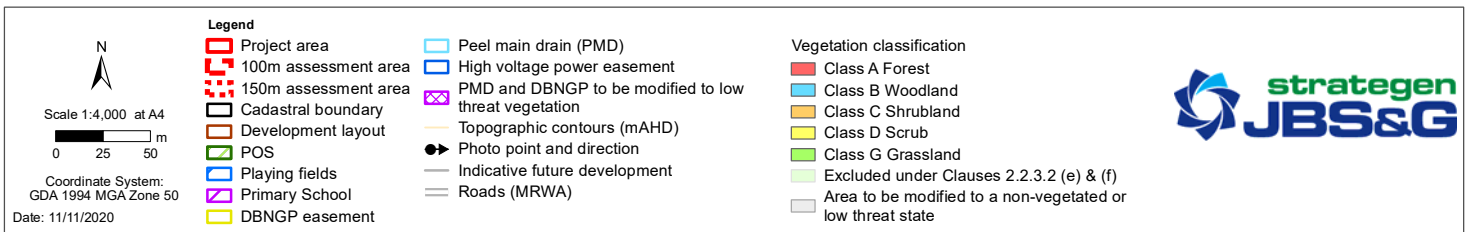




Figure 7: Post-development vegetation classification and effective slope (south)



W:\Projects\1\Open\Satterley Property Group\Mandalgup\59774 Updated Mandalgup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_05to07_VegClass_Mapbook.mxd
 © 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property Group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

3.2 Assessment outputs

3.2.1 Bushfire Attack Level (BAL) contour assessment

Strategen-JBS&G has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for the project area (Figure 8, Figure 9 and Figure 10). The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- classified vegetation
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts and/or achieve compliance with relevant bushfire protection criteria of the Guidelines. The BAL contours are based on the vegetation classification and effective slope observed at the time of inspection as well as consideration of the proposed on-site clearing extent, low threat landscaping and resultant vegetation exclusions/separation distances achieved in line with the plan of subdivision. Results of the BAL contour assessment are detailed in Table 4 and illustrated in Figure 8, Figure 9 and Figure 10. The highest BAL applicable to the external boundary of the proposed lots is BAL-FZ. Through the implementation of a variety of enforcement mechanisms, including APZ building setbacks and temporary quarantining of lots (as detailed in Table 6), the highest modified BAL applicable to the proposed lots is BAL-29.

Table 4: BAL contour assessment results

Method 1 BAL determination					
Plot	Vegetation classification	Effective slope	BAL contour width (m)	Highest BAL (to lot boundary)	Modified BAL (with APZ building setbacks/temporary quarantining (see Figures 8-10))
1	Class A Forest	Flat/upslope (0°)	<16	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29 and Section 5.2.6 for temporary quarantining measures)
2	Class A Forest	Downslope >0-5°	20-<27	BAL-40	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29)
3	Class B Woodland	Flat/upslope (0°)	<10	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29)
4	Class B Woodland	Downslope >0-5°	<13	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29)
5	Class D Scrub	Flat/upslope (0°)	<10	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29)
6	Class D Scrub	Downslope >0-5°	<11	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29)
7	Class C Shrubland	Downslope >0-5°	22-<100	BAL-12.5	N/A
8	Class G Grassland	Flat/upslope (0°)	<6	BAL-FZ	BAL-29 (explained in Section 5.2.2 for indicative APZ setbacks to achieve BAL-29 and Section 5.2.6 for temporary quarantining measures)
9	Class G Grassland	Downslope >0-5°	20-<50	BAL-12.5	N/A
10	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A
11	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A

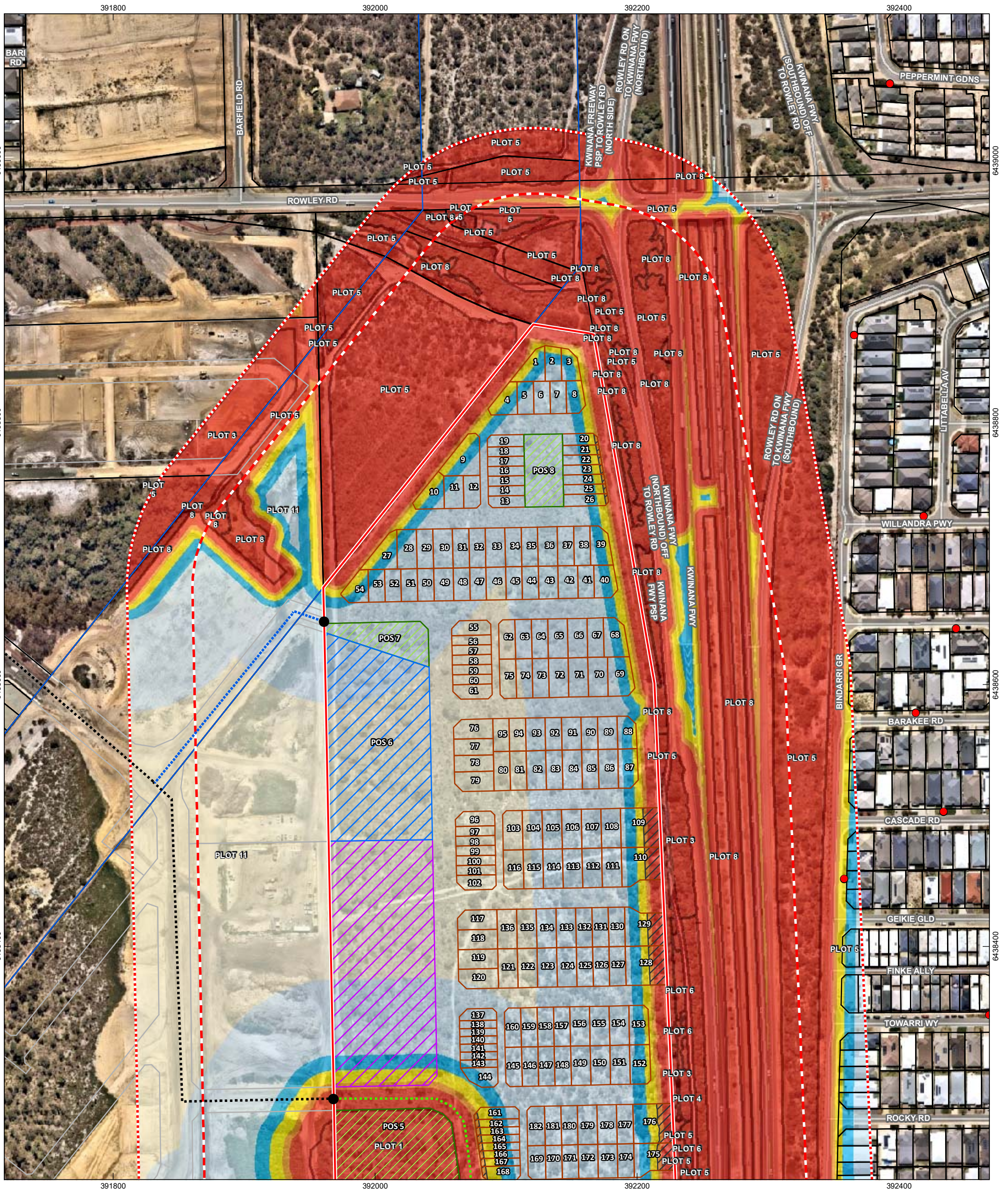
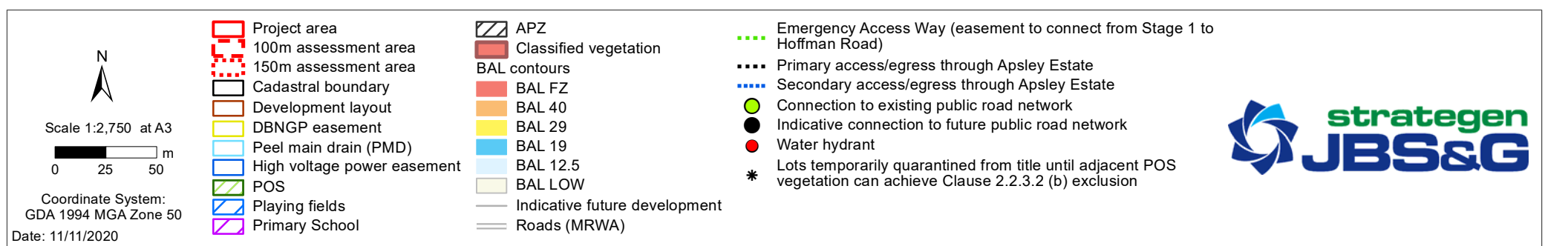


Figure 8: BAL contour map and bushfire management measures - North



W:\Projects\1)Open\Satterley Property Group\Mandagalup\59774 Updated Mandagalup East Subdivision BMP\GIS\Maps\RO1_Rev_A\59774_08to10_BALs_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Nearmap: Aerial image, flown 09/2020. Client: Satterley Property group. Site data 10/2020. Created by: jcrute

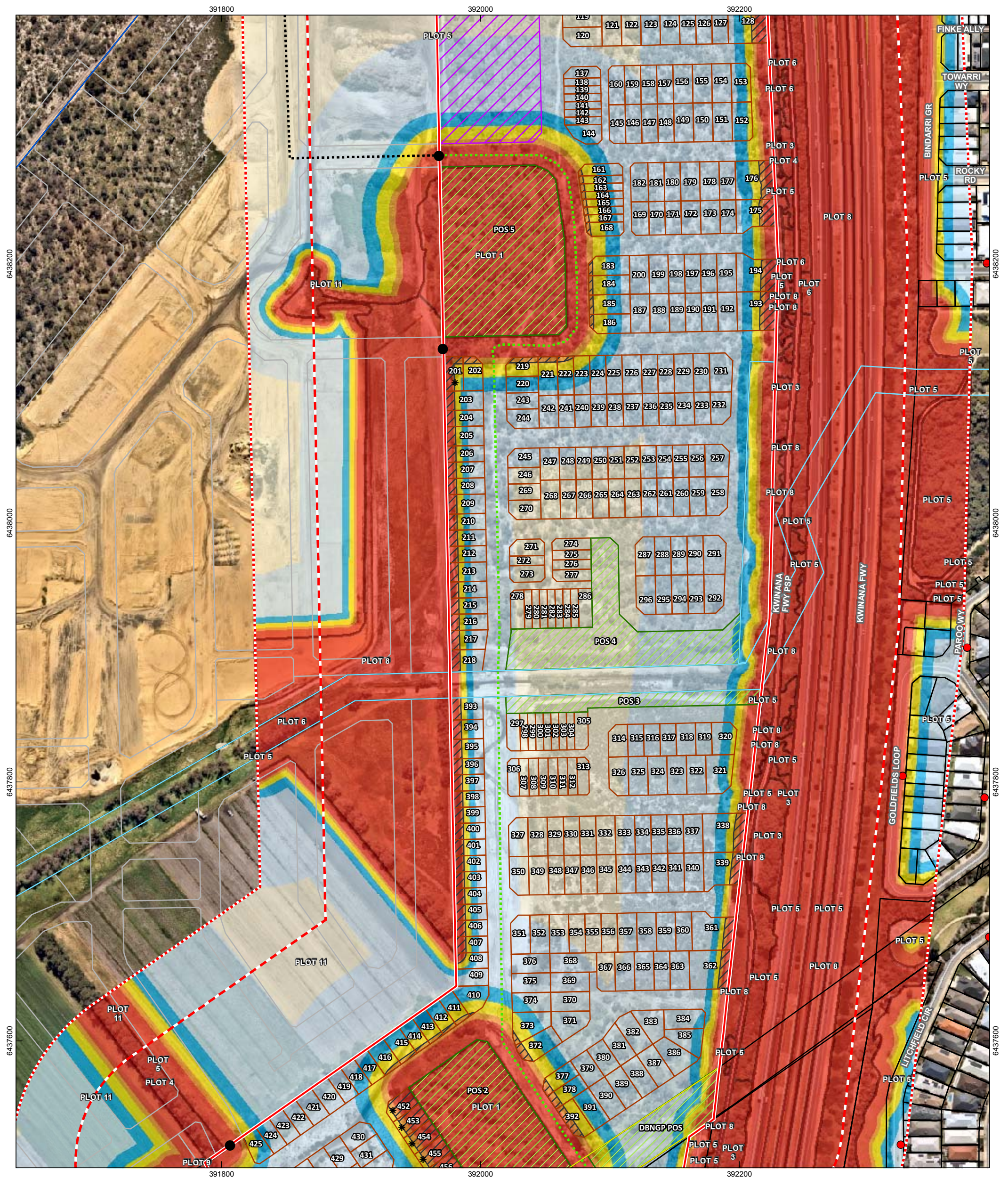
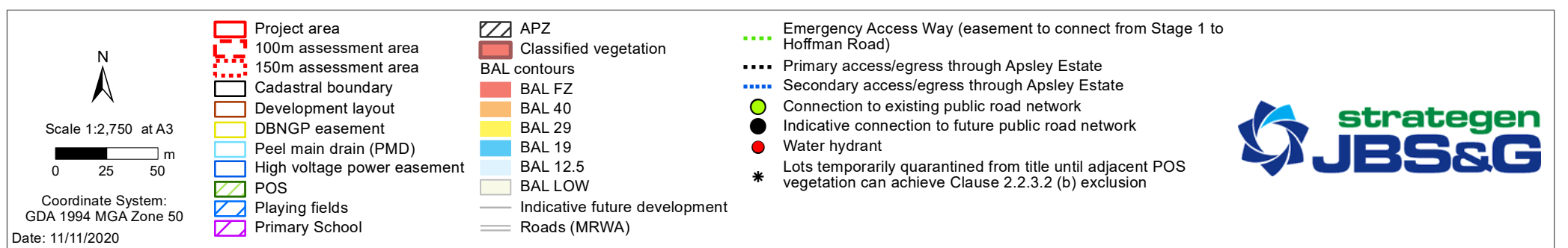


Figure 9: BAL contour map and bushfire management measures - Central



W:\Projects\1)\Open\Satterley Property Group\Mandalgup\59774 Updated Mandalgup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_08to10_BALs_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Nearmap: Aerial image, flown 09/2020. Client: Satterley Property group. Site data 10/2020. Created by: jcrute

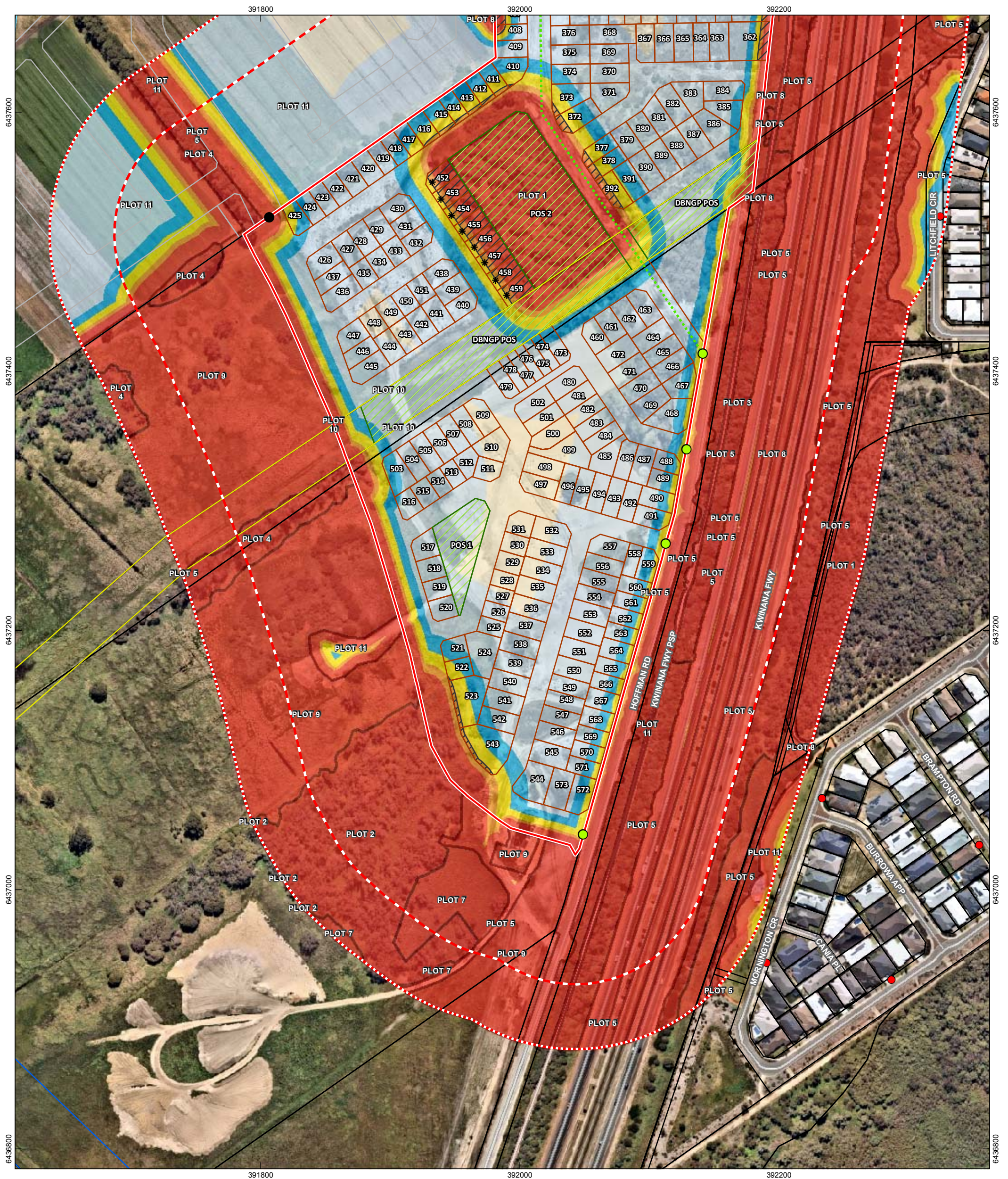
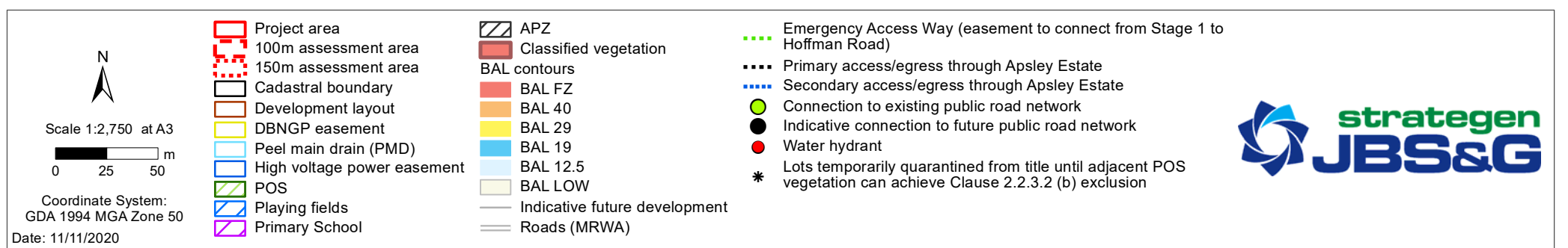


Figure 10: BAL contour map and bushfire management measures - South



W:\Projects\1)\Open\Satterley Property Group\Mandagalup\59774 Updated Mandagalup East Subdivision BMP\GIS\Maps\R01_Rev_A\59774_08to10_BALs_Mapbook.mxd

© 2020. Whilst every care has been taken to prepare this map, Strategen JBS&G & Satterley Property group makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Service Layer Credits: Nearmap: Aerial image, flown 09/2020. Client: Satterley Property group. Site data 10/2020. Created by: jrcute

4. Identification of bushfire hazard issues

4.1 Bushfire context

Remnant vegetation within the Mandogalup locality is isolated from other areas of intact vegetation on a landscape scale through the broad extent of urban development and agricultural land uses in the area. Ongoing development of Honeywood Estate in Wandi to the east has reduced the remnant vegetation extent in this direction. There are vast irrigated crops to the south of the project area which fragment classified vegetation in this direction. Apsley Estate to the west is currently undergoing development, which has significantly reduced the remnant vegetation extent in this direction. Vivente Estate to the north is also being developed and has reduced the remnant vegetation extent in this direction. The surrounding road network, including Kwinana Freeway to the east, Anketell Road to the south and Rowley Road to the north have further resulted in fragmentation of remnant vegetation and act as sizeable buffers and access ways at the proposed development interface. This level of adjacent development and fragmentation of the bushfire hazard presents a very low residual risk of bushfire impacting the Mandogalup East site.

Larger areas of intact scrub, woodland and forest fuels exist in the following nearby reserves; however, given the extent of separation to these hazards, only minor levels of ember attack could possibly impact the project area dependent on prevailing wind conditions/direction:

- Thomsons Lake Nature Reserve and Harry Waring Marsupial Reserve approximately 1.4 km to the northwest with a collective fire run of over 5 km through intact vegetation
- Frankland Park approximately 600 m to the northwest with a fire run of over 700 m
- Jandakot Regional Park, Modong Nature Reserve and Wandi Nature Reserve approximately 1.2 km to the east with a potential fire run of over 4 km
- Beelihar Regional Park approximately 1.2 km to the south with the potential to support a fire run of over 2.5 km.

Further to the above, the project area is expected to be cleared in one single phase and be progressively developed thereafter on a staged basis, with low threat staging buffers to be maintained also on a staged basis where required to mitigate the risk of on-site temporary hazards.

The post-development vegetation extent will present bushfire hazards from:

- undeveloped stages of Apsley Estate to the west (temporary hazards only)
- fragmented scrub vegetation between the project area and Rowley Road, primarily within the Lot 51 powerline easement to the north
- Kwinana Freeway reserve
- unmanaged grassland within irrigated agriculture to the south and southwest (temporary hazards only)
- forest vegetation within POS cells 2 and 5 (noting that these POS cells comprise temporary classifications and will be excluded under relevant Clauses of AS3959 subject to detailed landscaping design and ongoing clearing and development within the adjacent west Apsley Estate).

4.2 Bushfire hazard issues

The BAL contours depicted in Figure 8, Figure 9 and Figure 10 indicate that the majority of the proposed residential lots can achieve a rating of BAL-29 or lower based on the anticipated post-development vegetation extent without additional control mechanisms. The following points describe the potential bushfire hazard issues presented by the proposed development and the potential management responses to these issues:

- the BAL-40/FZ impact identified in the BAL contour mapping will be addressed through a variety of enforcement mechanisms including minor building setbacks enforced through APZs (refer to Section 5.2.2) and temporary quarantining for a small selection of lots (refer to Section 5.2.6)
- both perimeter roads and increased lot depths at the interface with the Lot 51 powerline easement and Kwinana Freeway vegetation have been incorporated into subdivision design to enable future habitable development to reasonably occur when considering the required BAL-29 setback/APZ widths
- bushfire suppression capability at the vegetation interfaces within and adjacent to the project area will be provided by a reticulated water supply in addition to the nearby Mandogalup Fire Station and Jandakot Volunteer Bushfire Brigade
- compliant vehicular access will be delivered from Stage 1 onwards (as discussed in Section 5.2.3 through a combination of public roads and EAWs) and this access network will be enhanced as development staging of the project area and the adjacent Apsley Estate progress (indicative development layout over Apsley Estate has been included in the BAL contour mapping to illustrate the multiple connections that will eventually be established to the west)
- although on-site vegetation will be cleared in one phase, low threat staging buffers will be established around active stages of development where required to ensure lots are not impacted by an unnecessary temporary BAL impact (discussed in Section 5.2.1)
- proposed landscaping will not result in the introduction of any new classified vegetation to the site and the modification of existing vegetation in the PMD/DBNGP easements and POS will be carefully controlled via detailed landscape planning to ensure landscape outcomes are commensurate with low threat vegetation exclusions under AS3959/Schedule 1 of the Guidelines
- in addition to the abovementioned management measures, a BAL impact of BAL-29 or lower imposed on any lot will be managed through compliant levels of BAL-rated construction in accordance with AS 3959, which will reduce potential impacts of ember attack and radiant heat on future residential buildings (discussed in Section 5.2.8).

The key bushfire hazard issue for the development is those lots affected by temporary BAL-40/FZ, where an APZ building setback would be too restrictive to facilitate an appropriately sized dwelling. This applies to proposed Lots 201 and 452–459. The enforcement mechanism to ensure no future habitable development is situated in areas of BAL-40/FZ is to temporarily quarantine the creation of these lots until such time that it can be demonstrated that the lots can be developed to achieve BAL-29 or lower through future removal/exclusion of the adjacent vegetation extent. Lot 201 has a combined BAL-40/FZ impact from Apsley Estate to the west (grassland impact) and POS 5 to the north (forest impact); and Lots 452–459 are impacted by POS 2 to the east (forest impact). The current grassland extent within Apsley Estate will eventually be removed as part of ongoing development and in doing so, both POS 2 and POS 5 will become excludable under Clause 2.2.3.2 (b); thereby removing the full extent of both sources of BAL impact and releasing the lots for compliant development.

5. Assessment against bushfire protection criteria

5.1 Compliance table

An acceptable solutions assessment against the bushfire protection criteria is provided in Table 5.

Table 5: Compliance with the bushfire protection criteria of the Guidelines

Bushfire protection criteria	Method of compliance Acceptable solutions	Proposed bushfire management strategies
Element 1: Location	A1.1 Development location	<ul style="list-style-type: none"> The BAL contour assessment identifies that Lot 201 and Lots 452–459 are subject to temporary BAL-40/FZ impacts (see Figure 9 and Figure 10). The identified lots are to be temporarily quarantined until such time that it can be demonstrated that the lots can be developed to achieve BAL-29 or lower through future removal/exclusion of the adjacent vegetation extent, as previously discussed. A number of lots located at the interface with Kwinana Freeway, POS 5, POS 2, Apsley Estate and adjacent undeveloped land to the south are subject to BAL-40/FZ impacts. However, the BAL-40/FZ encroachment onto many of the lots is minimal and there is sufficient room within each lot for future habitable development to achieve BAL-29 or lower. To ensure development of these lots will not occur within areas of BAL-40/FZ, each affected lot has a designated APZ setback to provide separation between future habitable development and the fringing bushfire hazards. The remainder of the proposed lots will be sufficiently separated from classified vegetation by low fuel road reserves, POS and adjacent cleared land to achieve BAL-29 or lower without any additional APZ provisions.
Element 2: Siting and design	A2.1 Asset Protection Zone	<ul style="list-style-type: none"> The BAL contour assessment identifies the lots requiring APZ setbacks for future habitable development to achieve BAL-29 or lower (see Figure 8, Figure 9 and Figure 10 and Table 6). APZ setbacks can be enforced via Local Development Plans (LDPs) post-subdivision approval and/or restrictive covenants on title as part of subdivision approval conditions. APZs are to be established and subject to ongoing management in accordance with standards outlined in the Guidelines (see Appendix C). APZ setbacks may be reassessed at the BAL compliance stage and modified as required to address any changes in site conditions/detailed design.
Element 3: Vehicular access	A3.1 Two access routes	<ul style="list-style-type: none"> On completion of development, a combination of existing perimeter roads and the proposed internal vehicle access network will provide all occupants with the option of travelling in two different directions to more than two different destinations at all times, including a through connection that will be established from Rowley Road in the north to Hoffman Road in the south. Both Rowley and Hoffman Roads provide eventual access to Kwinana Freeway (north and south), as well as east and west via Rowley Road and Anketell Road. Due to proposed staging of the development (see Appendix A), access staging mechanisms will need to be employed to ensure two access routes are available from Stage 1 onwards, for each development stage, until such time that a formal connection with Hoffman Road (or other appropriate alternative) is available.

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
		<ul style="list-style-type: none"> • A primary and secondary public road connection will be established to Apsley Estate as part of Stage 1 development (refer to Figure 8, Appendix A and Figure 1). Additional access will be established as part of Stage 1 development via a temporary EAW easement between Stage 1 and Hoffman Road to the south (also displayed in Figure 8, Figure 9, Figure 10, Appendix A and Figure 1). The proposed vehicular access network will ensure all occupants are able to travel in two different directions to two different destinations as part of Stage 1 development. • Vehicular access staging is discussed in further detail in Section 5.2.3. The above responses will ensure two access routes will be available for all stages of development at all times.
	A3.2 Public road	<ul style="list-style-type: none"> • All public roads will be constructed to the relevant technical requirements of the Guidelines (see Appendix F)
	A3.3 Cul-de-sac (including a dead-end-road)	<ul style="list-style-type: none"> • The proposed development includes three compliant cul-de-sacs that have been included in the development design to improve amenity by minimising the visual impact of the noise barrier wall adjacent to Kwinana Freeway and the effect of a long linear road running parallel to the wall. The proponent has engaged in consultation with the City about maintaining connectivity throughout the public road network, especially in proximity to the school site. As a result of these discussions, inclusion of the three cul-de-sacs is a compromise arrangement that is considered to achieve the shared objectives of both visual amenity and internal connectivity. The cul-de-sacs will be compliant in length, being less than 200 m, and will have a compliant turn around head at the eastern terminus (as per technical requirements specified in Appendix F). Due to the short length/compliant nature of the cul-de-sacs and proximity of public connector roads providing access options in at least two directions, the cul-de-sac arrangements are considered suitable for the level of bushfire risk associated with the project area. • Any temporary cul-de-sacs required as part of staging will be less than 200 m in length, will include minimum 17.5 m diameter turn-around heads and will be constructed to the relevant technical requirements of the Guidelines (see Appendix F).
	A3.4 Battle-axe	<ul style="list-style-type: none"> • N/A – No battle-axe lots are proposed within the subdivision design and the development is not serviced by an existing battle axe.
	A3.5 Private driveway longer than 50 m	<ul style="list-style-type: none"> • All proposed single dwelling lots are of a size where all future habitable development will be located within 50 m of a public road. In this regard, private driveways for these lots will not be required to comply with technical requirements of the Guidelines. • There is potential for habitable development within the proposed Group Housing site to be located more than 50 m from a public road. Therefore, this site may require a compliant private driveway or network of private driveways (refer to Appendix F).
	A3.6 Emergency access way	<ul style="list-style-type: none"> • No permanent Emergency Access Ways (EAWs) are proposed for the development. • As previously stated, a temporary EAW easement will be established as part of Stage 1 development linking the Stage 1 public road network with Hoffman Road in the south (refer to Figure 8, Figure 9, Figure 10, Appendix A and Figure 1). The temporary EAW will exceed the permitted 600 m length as per Guideline requirements; however, this access option has been recommended by WAPC as per Condition 33(a) and 34 of subdivision approval over the site (WAPC Ref. 158176) and is reflected as part of the updated subdivision design accordingly. The EAW is to be constructed to the relevant technical requirements of the Guidelines (refer to Appendix F).

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
		<ul style="list-style-type: none"> If further staging decisions result in a vehicular access configuration that requires any additional temporary EAWs, these are also to be constructed to the relevant technical requirements of the Guidelines (see Appendix F).
	A3.7 Fire service access routes (perimeter roads)	<ul style="list-style-type: none"> N/A – no fire service access routes (FSARs) are proposed or required to service the site given the extent of existing and proposed public roads that will surround the development.
	A3.8 Firebreak width	<ul style="list-style-type: none"> Given that all lots will be cleared and developed, lot boundary firebreaks will not be required for the proposed lots. However, balance land will be required to meet the relevant requirements of the City of Kwinana annual firebreak notice (see Section 5.2.12 and Appendix H).
Element 4: Water	A4.1 Reticulated areas	<ul style="list-style-type: none"> The proposed development will be connected to reticulated water supply via extension of services from surrounding development in accordance with Water Corporations Design Standard 63 requirements. This will deliver compliance with reticulated water supply technical requirements of the Guidelines, as outlined in Appendix G. Existing water hydrants are located throughout surrounding development, as depicted in Figure 8, Figure 9 and Figure 10 .
	A4.2 Non-reticulated areas	<ul style="list-style-type: none"> N/A – the proposed subdivision is located within an existing reticulated area.
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	<ul style="list-style-type: none"> N/A – the proposed subdivision is located within an existing reticulated area.

5.2 Discussion of management strategies

A discussion of the bushfire management recommendations is included in the below subsections.

5.2.1 On-site staging buffers

Development is proposed to occur on a staged basis (see Appendix A) and although site clearing will occur as part of one phase, maintenance of low threat staging buffers around each active stage of development will need to occur to ensure building construction is not inhibited by a temporary vegetation extent located within adjacent development stages yet to be cleared. This can be achieved by ensuring that each approved stage subject to construction is surrounded by a 100 m wide, on-site cleared or low threat buffer to development (not including vegetation proposed to be retained). Once the buffers are created, they will need to be maintained on a regular and ongoing basis by the developer in accordance with AS 3959 Clause 2.2.3.2 (f), including the management of grassland at 100 mm or lower, to achieve a low threat minimal fuel condition all year round until such time that the buffer area is developed as part of the future development stage. This will assist in managing the current on-site temporary vegetation hazards.

5.2.2 Indicative APZ setbacks

Table 6 details the indicative APZ setbacks required for each of the lots impacted by a BAL-40/FZ rating where the building setback will not adversely affect the building footprint within each of the proposed lots (as depicted in Figure 8, Figure 9 and Figure 10). APZ setbacks may be reassessed at the BMP compliance stage and modified as required to address any change in site conditions, particularly noting that any APZ requirements for lots adjacent to POS 2, POS 5 and Apsley Estate will be temporary.

Table 6: Indicative APZ setback to achieve BAL-29

Affected lots	Indicative APZ building setback to achieve BAL-29
20-26	2.3 m front setback
109-110, 128-129, 175-176 and 193-194	13 m rear setback from eastern lot boundary
161-168 and 183-186	3.1 m front setback
Primary school	3.1 m setback from southern lot boundary
201-202	5.6 m front setback
219	4.1 m side setback from northern lot boundary
221-223	4.1 m front setback (truncated for Lot 223)
203-218 and 393-408	8 m rear setback from western lot boundary (truncated for Lot 408)
338-339 and 361-362	8–9 m rear setback from eastern lot boundary
372-373 and 377-378	5.6 m front setback (truncated fore Lot 373)
392	5.6 m side setback from western lot boundary
410-417	3.1 m front setback (truncated for Lots 410 and 417)
425	1 m side setback from western boundary
522-523 and 543	2.6 m front setback (truncated for Lot 522)

5.2.3 Two vehicular access routes and staging of access

The adjoining Apsley Estate and Mandogalup East sites need to be viewed in concert as assisting each other in delivering compliant staging outcomes. This was specified as a key management provision in Structure Plan and subdivision stage BMPs for both sites.

Apsley Estate provides an existing public road connection to Rowley Road in the north via Mokare Entrance and Quartermaine Boulevard. Due to development staging (as depicted in Appendix A), the proposed access strategy will provide a primary and secondary public road connection to Apsley's existing public vehicular access network as part of Stage 1 development. These connections will occur to the north and south of the future primary school/playing fields (as depicted in Figure 8 and Figure 1), these being the future Throsby Road and Mueller Grove extensions off Quartermaine Boulevard. These connections are depicted in the Infrastructure and Cost Sharing Agreement between QUBE and Satterley (Appendix I), which also contains the legally enforceable landowner agreement to ensure these access connections are provided. In the event that the Apsley public road network has not been progressed up to the Satterley boundary to deliver the necessary primary/secondary access points for Stage 1, then the cost sharing agreement between QUBE and Satterley (as provided to DoPLH) enables provision and construction of these dedicated public roads in advance for Satterley if required.

Further to the above, at the request of WAPC, a temporary EAW easement will be provided as part of Stage 1 development, linking the Stage 1 public access network to Hoffman Road in the south. Although exceeding the compliant 600 m EAW length provisions (as per Guideline requirements), this access option has been recommended by WAPC as per Condition 33(a) and 34 of subdivision approval over the site (WAPC Ref. 158176) and has been reflected as part of the updated subdivision design accordingly.

Execution of this strategy will ensure that two different public access routes are provided as part of Stage 1 development, and all additional stages thereafter.

5.2.4 Fuel management within cleared vacant lots

Cleared vacant lots are to be managed on a regular and ongoing basis by the developer until sale of lots after which time landowners will be responsible for ongoing management. Maintenance is to be in accordance with the City of Kwinana firebreak notice (see Appendix H), which specifies that all matter including long grass and weeds must be slashed/mowed/trimmed to a height no greater than 50 mm across the entire property.

5.2.5 Road verge fuel management

Existing/proposed road verges that have been excluded as low threat are to be managed to ensure the understorey and surface fuels remain in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Ongoing road verge management is the responsibility of the City.

5.2.6 Lots impacted by temporary BAL-40/FZ requiring temporary quarantining

Lots 452–459 abutting POS 2

Lots 452–459 are proposed to adjoin potentially classified retained vegetation within POS 2, which will result in temporary BAL impacts on these lots of BAL-40/FZ (refer to Figure 10). Vegetation within POS 2 has been temporarily classified as Class A Forest until such a time that the POS is either fully modified to a low threat state under Clauses 2.2.3.2 (e) and (f) (subject to detailed landscaping design), and/or the adjacent grassland classification within Apsley Estate located within 100 m of the POS vegetation is removed enabling POS 2 to become fully excluded under Clause 2.2.3.2 (b) of AS 3959 due to the size of the remnant vegetation being less than 1 ha and not within 100 m of classified vegetation.

These lots will be subject to a condition of subdivision stating the following (or similar wording):

Proposed lots 452-459 are not to be titled until it can be adequately demonstrated, via a suitably qualified bushfire consultant, that the lots can be developed to a rating of BAL-29 or lower. (Western Australian Planning Commission).

Whilst the temporary land quarantining and associated condition of subdivision precludes the titling of lots, it does not preclude the land from being subject to subdivisional works (e.g. clearing, earthworks, installation of services, noise attenuation, etc).

Lot 201 abutting Apsley Estate

Lot 201 currently shares a direct interface with Apsley Estate to the west and is currently subject to temporary BAL-40/FZ impacts from this grassland hazard, as well as an APZ setback requirement from the adjacent north POS 5, as depicted in Figure 9. The combined impact will preclude dwelling construction within the lot to BAL-29 or lower. Whilst the APZ setback from the northern POS 5 is manageable via built form response, the combined impact from BAL-40/FZ intrusion from the west will not allow a sufficiently sized building envelope to be developed within the lot to BAL-29 or lower. Therefore, Lot 201 is proposed to be temporarily quarantined until such time that the adjacent west vegetation is removed. Lot 201 will be subject to a condition of subdivision stating the following (or similar wording):

Proposed lot 201 is not to be titled until it can be adequately demonstrated, via a suitably qualified bushfire consultant, that the lot can be developed to a rating of BAL-29 or lower. (Western Australian Planning Commission).

It is noted that BAL impacts from both Apsley Estate and POS 5 are temporary and will ultimately be removed over time subject to ongoing clearing and development of both sites. As previously stated, whilst the above temporary quarantining and associated condition of subdivision precludes the titling of lots, it does not preclude the land from being subject to subdivisional works (e.g. clearing, earthworks, installation of services, noise attenuation, etc).

5.2.7 Notification on title

Notification is to be placed on the Title of proposed lots subject to BAL-12.5 or higher (either through condition of subdivision or other head of power) to ensure landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and that bushfire management measures and increased building construction standards may apply.

5.2.8 Building construction standards

Future Class 1, 2, 3 and associated 10a buildings proposed in areas subject to BAL-12.5 or higher are required to comply with the bushfire specific construction requirements of AS 3959.

5.2.9 BAL compliance and/or individual lot BAL assessment at future stages

A BAL compliance report will be prepared following subdivisional works and prior to issue of lot title to validate and confirm the accuracy of BAL assessment depicted in this BMP or to demonstrate any change in the assessed BAL or other management measures documented in this BMP, which may occur as a result of changes in building location, vegetation classification or bushfire management approach.

5.2.10 Vulnerable land uses

Vulnerable land uses are those where persons may be less able to respond in a bushfire emergency. The Guidelines specify that vulnerable land uses included:

- land uses designed to accommodate groups of people with reduced physical or mental ability (such as the elderly, children, sick or injured) in dedicated facilities (e.g. nursing homes, childcare centres and hospitals)

- facilities that, due to building or functional design, offer limited access or the number of people accommodated may present evacuation challenges (e.g. prisons and detention centres)
- short stay accommodation uses that involve people who are unaware of their surroundings and may require assistance or direction in the event of a bushfire (e.g. bed and breakfasts, caravan parks, camping grounds, holiday houses and accommodations, home businesses, tourist development and workers' accommodation).

The proposed school site is considered to constitute a vulnerable land use and is subject to the requirements of Policy Measure 6.6.1 of SPP 3.7 which requires vulnerable land uses located in areas of BAL–12.5 to BAL–29 to be accompanied by a Bushfire Management Plan (BMP) and Bushfire Emergency Evacuation Plan (BEEP) at development application stage.

5.2.11 Landscaping plan

The BAL contour assessment is reliant on all landscaping being implemented and maintained as low threat vegetation (with the exception of POS 2 and 5, which have temporary Class A forest classifications) in accordance with the landscaping plan (Appendix B). Detailed landscaping plans will be provided for the PMD and DBNP easements and all POS areas as part of relevant clearance processes and will be assessed as part of the BAL compliance process prior to titling of lots to confirm the relevant exclusions and APZ setback requirements. Responsibility for establishment and maintenance of low threat landscaping is discussed in Section 6.

Peel Main Drain and DBNGP easements

Both the PMD and DBNGP easements dissect the site and both these parcels will be landscaped to a low threat state in accordance with AS 3959 Clauses 2.2.3.2 (e) and (f) and Schedule 1 of the Guidelines (refer to Appendix C). This land will then be ceded to the City of Kwinana for the ongoing management and maintenance to a low threat state in perpetuity. This is consistent with the existing management approach undertaken for the portions of the PMD and DBNGP traversing Honeywood Estate on the eastern side of the Kwinana Freeway. City of Kwinana has confirmed their agreement to this approach and has accepted the ongoing management responsibility (refer to Appendix E).

5.2.12 Compliance with annual firebreak notice

The developer/land manager and prospective land purchasers are to comply with the current City of Kwinana annual firebreak notice as amended (refer to Appendix H).

6. Responsibilities for implementation and management of the bushfire measures

Implementation of the BMP applies to the developer, prospective landowners and the City to ensure bushfire management measures are adopted and implemented on an ongoing basis. A bushfire responsibilities table is provided in Table 7 to drive implementation of all bushfire management works associated with this BMP.

Table 7: Responsibilities for implementation and management of the bushfire measures

Implementation/management table	
Developer – prior to issue of titles	
No.	Implementation action
1	Construct public roads, reticulated water supply and network of hydrants to the standards stated in the BMP.
2	Install any temporary (staging) on-site cul-de-sacs (and EAWs if required), to the standards stated in the BMP.
3	Ensure land to be temporarily quarantined is done so in accordance with condition of subdivision.
4	Provide enforcement for APZ setbacks within residential lots through LDPs/restrictive covenants on title.
5	Establish on-site low threat staging buffers as required to the standards stated in this BMP.
6	Prepare detailed landscape plans as required for the PMD and DBNP easements and relevant POS to achieve the relevant vegetation exclusions outlined in this BMP.
7	Undertake BAL compliance assessment on a staged basis as part of the lot title/subdivision clearance process.
8	Provide two public road connections to Apsley Estate as part of Stage 1, as well as the temporary EAW easement between Stage 1 and Hoffman Road.
Developer – until sale of lot	
No.	Implementation action
1	Maintain on-site staging buffers as required to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm.
2	Maintain APZs in accordance with Schedule 1 of the Guidelines and all cleared vacant lots in a low threat state to achieve compliance with the firebreak notice, including slashing/mowing of grassland and weeds to height of less than 50 mm.
3	Maintain the PMD and DBNP easements and relevant POS in a low threat state in accordance with the detail landscape plans and provisions of this BMP.
4	Maintain all road reserves and verges as low threat minimal fuel condition under Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm.
5	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including establishment and maintenance of boundary firebreaks on balance land.
Developer/future proponent – at the development application stage	
No.	Management action
1	Prepare a BMP accompanied by a Bushfire Emergency Evacuation Plan (BEEP) for any proposed vulnerable land uses (i.e. primary school).
Landowner/occupier – prior to building construction and ongoing	
No.	Management action
1	Maintain building setback APZs to the standards stated in the BMP, as enforced via LDP provisions and/or restrictive covenants on title.
2	Maintain cleared vacant residential lots in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 50 mm.
3	Lodge building permit with an accompanying BAL certificate where required (provided under the relevant BAL compliance report)
4	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954, including establishment and maintenance of boundary firebreaks on balance land.
Builder/building surveyor – during and following construction	
No.	Management action
1	Construct buildings to the applicable BAL ratings where required.
Local government – ongoing management	
No.	Management action
1	Maintain excluded areas of road reserves, the PMD and DBNP easements and POS in a low threat state to achieve exclusion Clause 2.2.3.2 (f) of AS 3959, including slashing/mowing of grassland and weeds to height of less than 100 mm.
2	Ensure developer/landowner maintains balance land in accordance with the firebreak notice.

7. References

Department of Fire and Emergency Services (DFES) 2020, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<https://maps.slip.wa.gov.au/landgate/bushfireprone/>, [19/10/2020].

Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth.

Emerge Associates (Emerge) 2017, *Landscape and Public Open Space Strategy: Mandogalup East Local Structure Plan Part Lots 9002, 9006 and 11 Hoffman Road, Lot 9019 Rowley Road, Mandogalup*, Perth.

Rowe Group 2019, *Subdivision Application Lots 200, 9002 and 9006 Hoffman Road, Lot 9033 Rowley Road and Hoffman Road reserve (land ID No, 312256) Mandogalup*, Perth.

RPS 2009, *Environmental Assessment Report, Residential Rezoning, Satterley Landholdings Lyon Road Wandj/Mandogalup, report to Satterley Property Group*, Perth.

RPS 2010, *Vegetation and Flora Report, Proposed Urban Development Area, Wandj/Mandogalup, report to Satterley Property Group*, Perth.

Standards Australia (SA) 2018, *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

Strategen Environmental (Strategen [now Strategen-JBS&G]) 2017, *Bushfire Management Plan: Mandogalup East Local Structure Plan*, Strategen, Bunbury/Perth.

Strategen Environmental (Strategen [now Strategen-JBS&G]) 2017, *Environmental Assessment Report: Supporting document to Mandogalup East Local Structure Plan*, Strategen, Bunbury/Perth.

Western Australian Local Government's Association (WALGA), *LGMap*, Western Australian Local Government's Association, Perth

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire Prone Areas*, Version 1.3 August 2017, Western Australian Planning Commission, Perth.

8. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

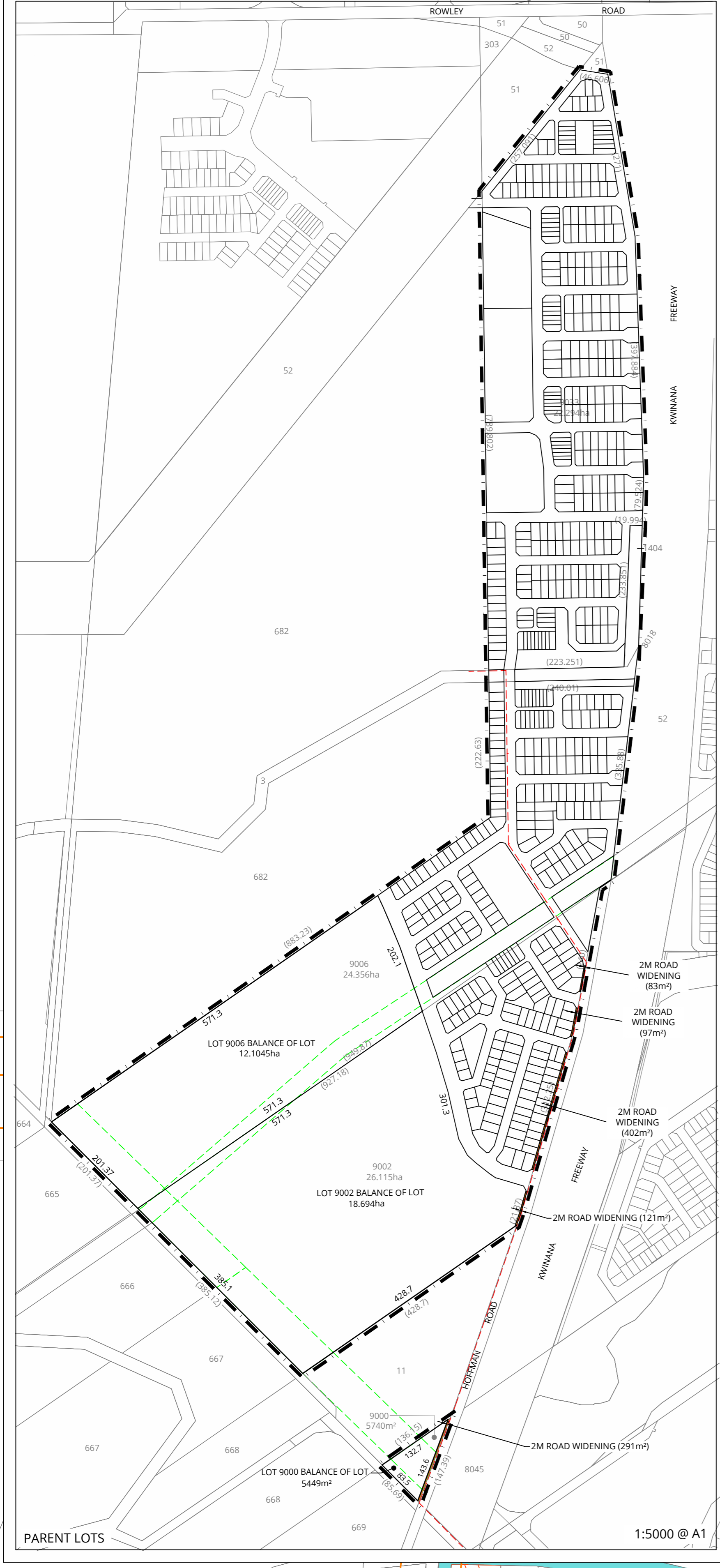
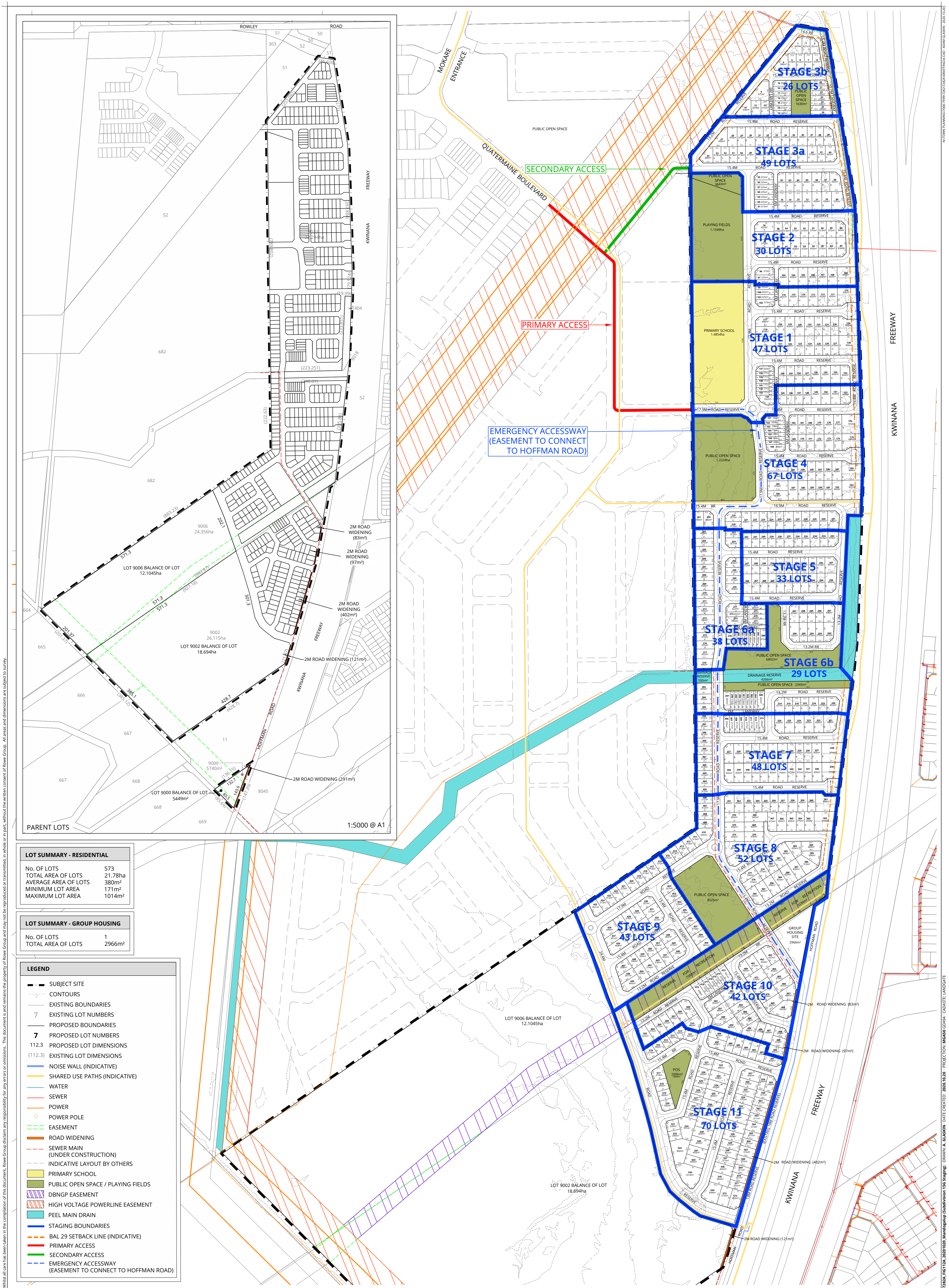
Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

Strategen-JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by Strategen-JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Appendix A Staging Plan



LOT SUMMARY - RESIDENTIAL

No. OF LOTS	573
TOTAL AREA OF LOTS	21.78ha
AVERAGE AREA OF LOTS	380m²
MINIMUM LOT AREA	171m²
MAXIMUM LOT AREA	1014m²

LOT SUMMARY - GROUP HOUSING

No. OF LOTS	1
TOTAL AREA OF LOTS	2966m²

LEGEND

- SUBJECT SITE
- CONTOURS
- EXISTING BOUNDARIES
- EXISTING LOT NUMBERS
- PROPOSED BOUNDARIES
- 7 PROPOSED LOT NUMBERS
- 112.3 PROPOSED LOT DIMENSIONS
- (112.3) EXISTING LOT DIMENSIONS
- NOISE WALL (INDICATIVE)
- SHARED USE PATHS (INDICATIVE)
- WATER
- SEWER
- POWER
- POWER POLE
- EASEMENT
- ROAD WIDENING
- SEWER MAIN (UNDER CONSTRUCTION)
- INDICATIVE LAYOUT BY OTHERS
- PRIMARY SCHOOL
- PUBLIC OPEN SPACE / PLAYING FIELDS
- DBNGP EASEMENT
- HIGH VOLTAGE POWERLINE EASEMENT
- PEEL MAIN DRAIN
- STAGING BOUNDARIES
- BAL 29 SETBACK LINE (INDICATIVE)
- PRIMARY ACCESS
- SECONDARY ACCESS
- EMERGENCY ACCESSWAY (EASEMENT TO CONNECT TO HOFFMAN ROAD)

PLAN OF SUBDIVISION - STAGING BOUNDARIES
 LOTS 9000, 9002 & 9006 HOFFMAN ROAD, LOT 9033 ROWLEY ROAD AND PART LOT 8018 ON DEPOSITED PLAN 77243
 MANDOGALUP

While all care has been taken in the compilation of this document, Rowe Group disclaims any responsibility for any errors or omissions. This document is and remains the property of Rowe Group and may not be reproduced or transmitted, in whole or in part, without the written consent of Rowe Group. All areas and dimensions are subject to survey.

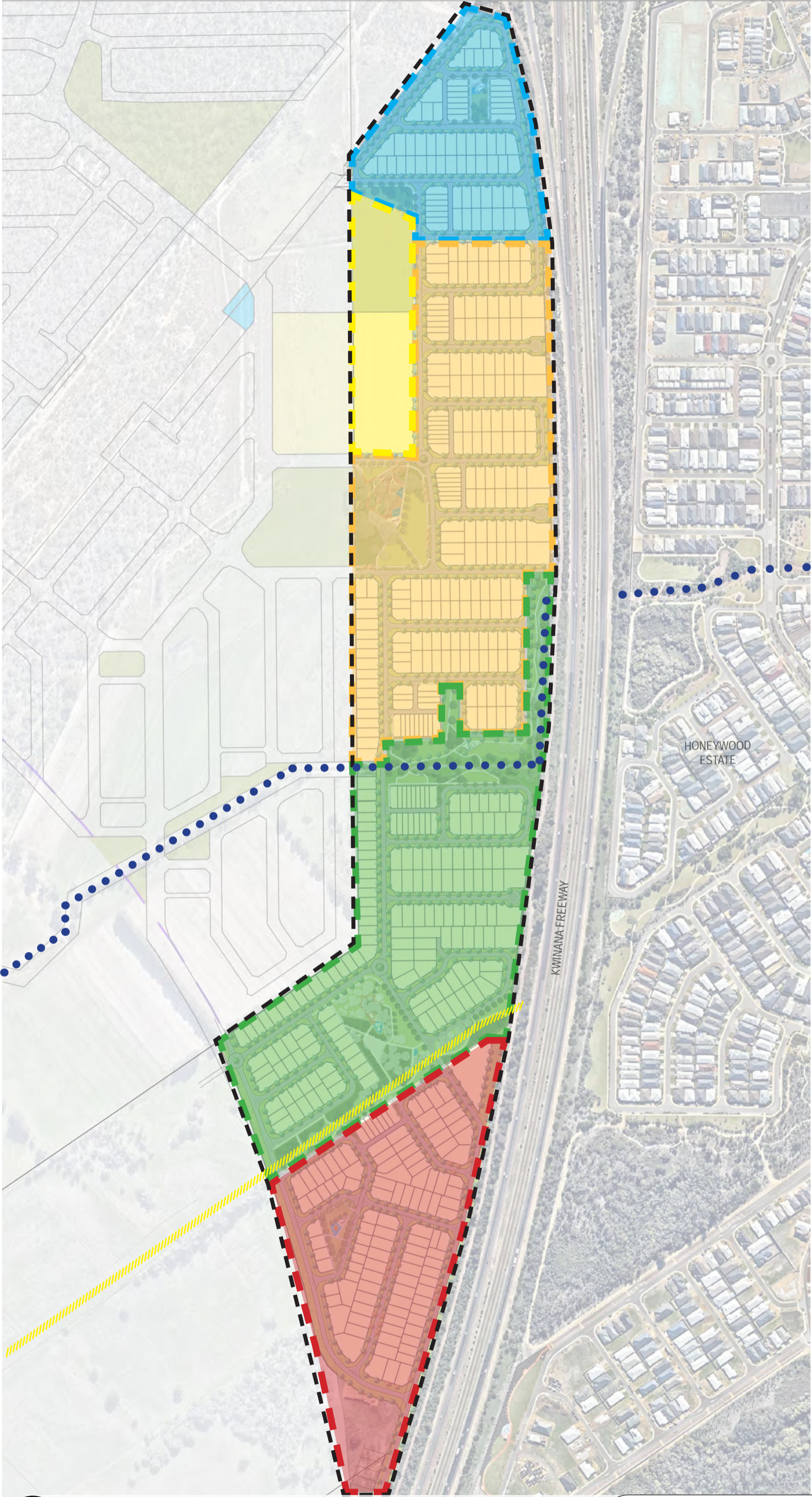
17282A-FIG-112-20201020_Mandogalup_Subdivision_156_Stage11_A_GUD545N DATE CREATED: 2020.10.20 PROJECTION: MGRS GDA94 CADASTRE LANGGATE

Appendix B Landscape Plan

PRECINCT ZONING












LEGEND

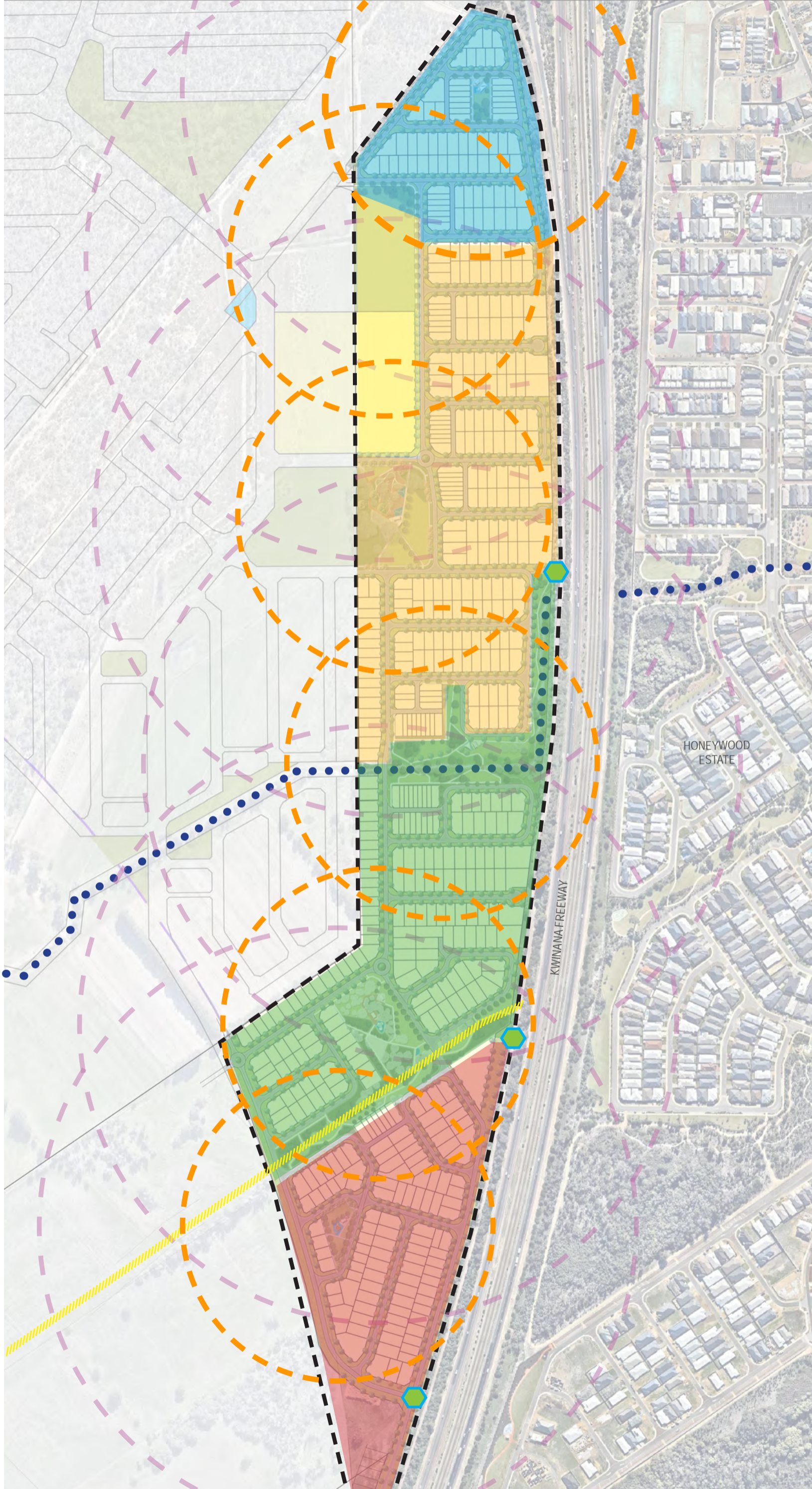
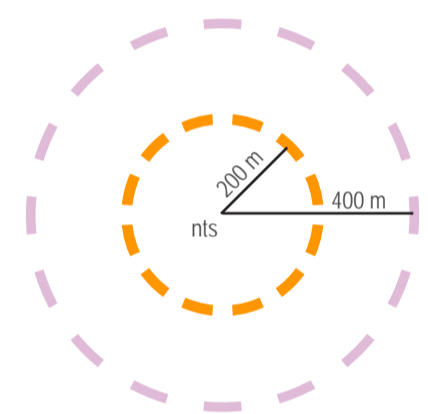
- MANDOGALUP EAST LSP BOUNDARY
- NORTHERN POCKET PRECINCT
- EDUCATION PRECINCT
- URBAN PRECINCT
- PARKLAND PRECINCT
- DISPLAY PRECINCT
- PEEL MAIN DRAIN
- ////// DBNGP EASEMENT



400 METRE POS WALKABILITY













LEGEND

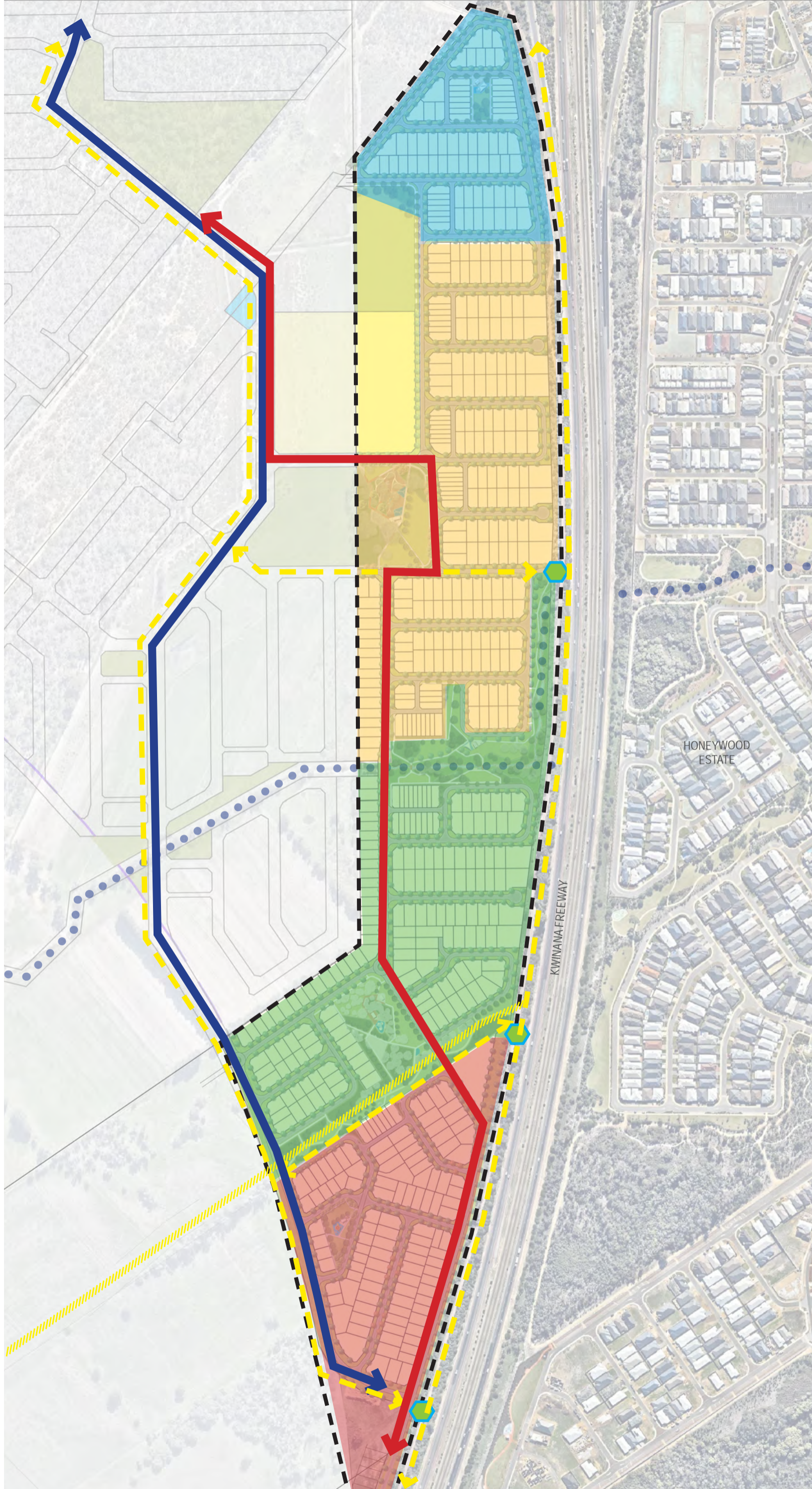
-  MANDOGALUP EAST LSP BOUNDARY
-  NORTHERN POCKET PRECINCT
-  EDUCATION PRECINCT
-  URBAN PRECINCT
-  PARKLAND PRECINCT
-  DISPLAY PRECINCT
-  PEEL MAIN DRAIN
-  DBNGP EASEMENT
-  200m WALKABILITY
-  400m WALKABILITY
-  CYCLE ACCESS TO CYCLE WAY



MAJOR MOVEMENT CONNECTORS












LEGEND

-  MANDOGALUP EAST LSP BOUNDARY
-  NORTHERN POCKET PRECINCT
-  EDUCATION PRECINCT
-  URBAN PRECINCT
-  PARKLAND PRECINCT
-  DISPLAY PRECINCT
-  PEEL MAIN DRAIN
-  DBNGP EASEMENT
-  NEIGHBOURHOOD CONNECTOR
-  NORTH SOUTH SPINE ROAD
-  CYCLE NETWORK
-  CYCLE ACCESS TO CYCLE WAY



POS SPATIAL ACTIVITY PLAY

SYMBOL KEY

-  PLAYGROUND (LARGE)
-  PLAYGROUND (SMALL)
-  DRINK FOUNTAIN
-  BBQ
-  SEATING NODE
-  RETAINED VEGETATION
-  SHELTER
-  LOOKOUT
-  ENTRY SIGN
-  WALKING TRAIL
-  PASSIVE RECREATION
-  SWALE / BASIN



LANDSCAPE MASTERPLAN

SYMBOL KEY

-  LSP BOUNDARY
-  PROPOSED PLAYING FIELDS
-  PROPOSED SCHOOL
-  PRIVATE LOT
-  PLAY SPACE WITHIN POS
-  TURF WITHIN POS
-  EXISTING TREES TO BE RETAINED



PEEL MAIN DRAIN AND DBNGP EASEMENT POS TO BE MODIFIED TO LOW THREAT VEGETATION IN ACCORDANCE WITH AS3959 CLAUSE 2.2.3.2(6) AND SCHEDULE OF THE BUSHFIRE GUIDELINES (APZ STANDARDS)

POS ONE [1]



POS TYPOLOGY

- Local Park

SIZE

- POS 1: 1,999m² + verge.

CONCEPT

- Provide an passive recreation POS with flat grassed areas for informal recreation.
- Path network to disability codes which links into the greater development.

FUNCTIONS / MATERIALS

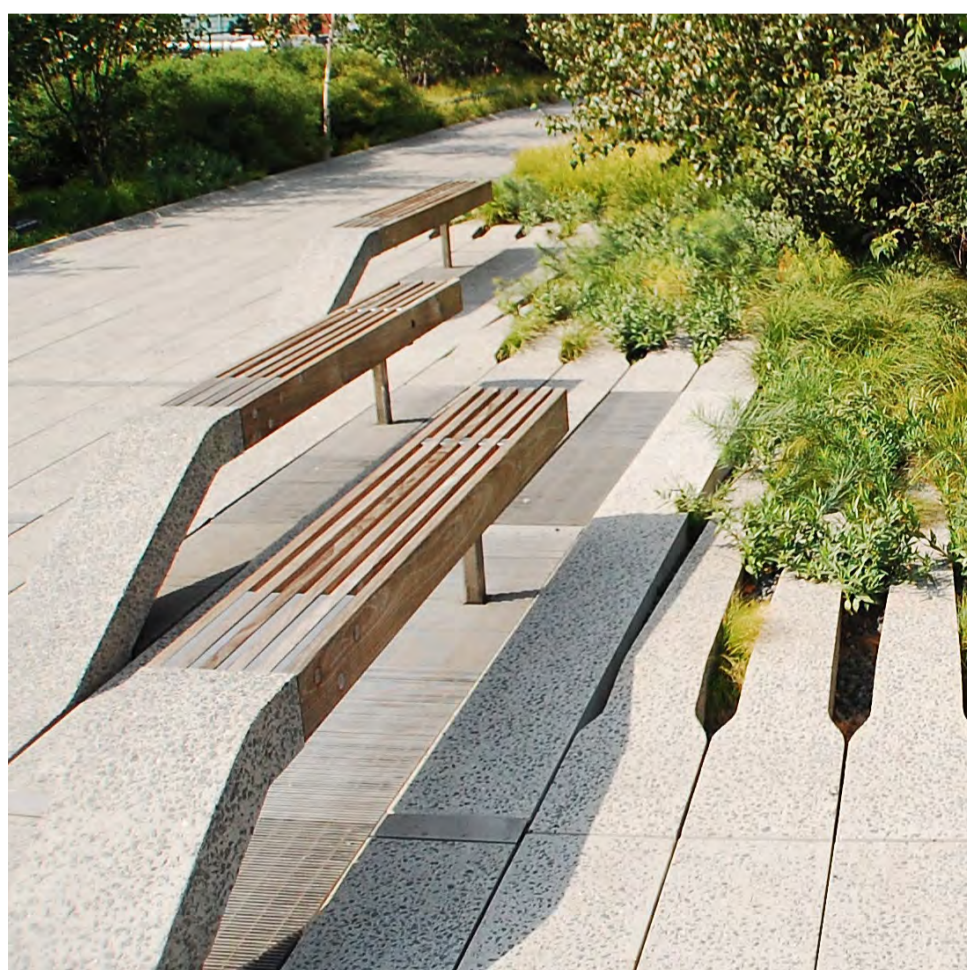
- Provide for informal passive recreation uses within a central turf area with surrounding planted edges.

ENVIRONMENTAL CONSIDERATIONS

- Waterwise Plant Strategy.
- Hydrozoning of plant species.
- Controlled fertiliser application to landscape areas.
- Retain existing trees (where possible).

DRAINAGE CONSIDERATIONS

- Temporary drainage basins located outside Structure Plan area





POS TYPOLOGY

- Neighbourhood Park

SIZE

- POS 2: 8,525m² + verge.

CONCEPT

- Provide an active recreation POS with flat grassed areas for informal recreation.
- Provide two gathering nodes with picnic and shade structure.
- Retention of melaleuca dampland.
- Path network to disability codes which links into the greater development and future adjoining development.
- Provide visual interest with feature artwork on street axis.

FUNCTIONS / MATERIALS

- Provide for informal passive recreation uses within a central turf area with surrounding planted edges

ENVIRONMENTAL CONSIDERATIONS

- Waterwise Plant Strategy.
- Hydrozoning of plant species.
- Controlled fertiliser application to landscape areas

DRAINAGE CONSIDERATIONS

- Temporary drainage basins located outside Structure Plan area

**PARKLAND
PRECINCT
POS TWO [2]**





DBNGP EASEMENT

POS TYPOLOGY

- DBNGP Easement POS

SIZE

- 1.04ha

CONCEPT

- Fitness circuit and broader development
- Picnic opportunities.
- A open turf kicking area, surrounded by trees
- Provides active recreation with shade.

FUNCTIONS / MATERIALS

- Turf space for active recreation
- Connected path to open space perimeter, with connections to the broader path network.
- Provide clear and easy maintenance access for gas easement.

ENVIRONMENTAL CONSIDERATIONS

- Water wise native planting
- Source local materials where possible to minimise transport requirements and provide local employment.
- Consider long term maintenance requirements
- Low fuel bushfire species



Existing trees to be retained

Proposed native trees



PEEL MAIN DRAIN AND DBNGP EASEMENT POS TO BE MODIFIED TO LOW THREAT VEGETATION IN ACCORDANCE WITH AS3959 CLAUSE 2.2.3.2(6) AND SCHEDULE OF THE BUSHFIRE GUIDELINES (APZ STANDARDS)



PARKLAND PRECINCT POS THREE [3] & POS FOUR [4]



POS TYPOLOGY

- Neighbourhood Recreation.

SIZE

- POS 4 - North: 6,803m² + verge.
- POS 3 - South: 2,345m² + verge.
- Drainage Reserve: 4,266m²

CONCEPT

- Provide an passive recreation POS with flat grassed areas for informal recreation.
- Gathering Node with picnic and shade structures overlooking children's playground
- Path network to disability codes with links into the greater development.
- Create a Living Stream around drainage reserve
- Retain existing trees for shade and biodiversity

FUNCTIONS / MATERIALS

- Provide for informal passive recreation uses within a central turf area with surrounding planted edges.
- Continue Peel Main Drain with native waterwise low fuel groundcovers
- Materials to be locally sourced and low maintenance.

ENVIRONMENTAL CONSIDERATIONS

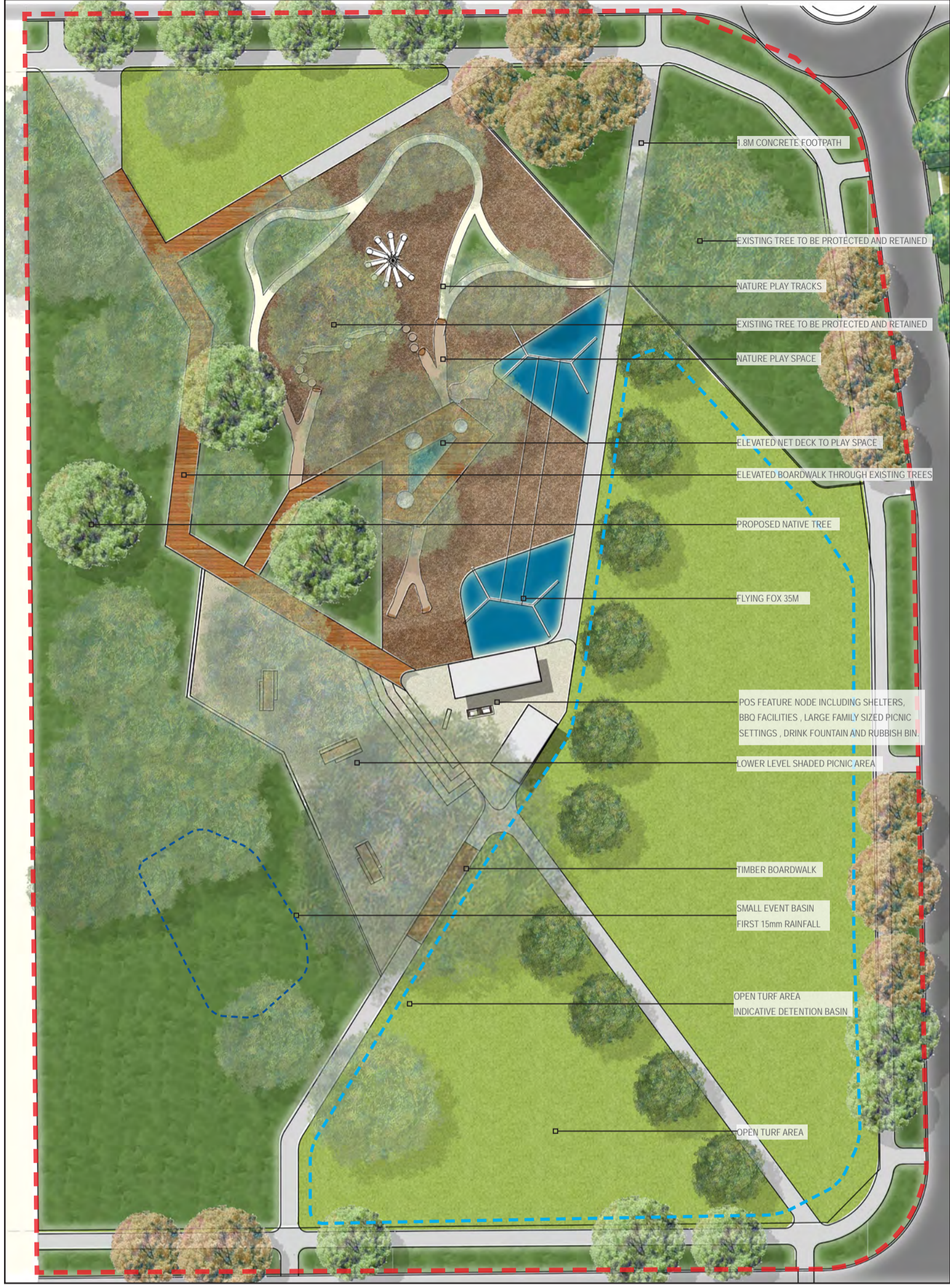
- Waterwise Plant Strategy.
- Controlled fertiliser application to landscape areas.
- Retain existing trees (where possible).
- Low fuel bushfire species

DRAINAGE CONSIDERATIONS

- First 15mm Rainfall 480m² (145m³) and 55m² (20m³)
- 1:100ARI 4375m² (2950m³) and 970m² (495m³)



URBAN PRECINCT POS FIVE [5]



POS TYPOLOGY

- Local Nature Park.

SIZE

- POS 5: 12,224m2 + verge.

CONCEPT

- Provide an active recreation POS with a flat grassed area for informal recreation.
- Provide a gathering node with picnic and shade structure.
- Retention of existing Eucalyptus rudis vegetation.
- Path network to disability codes which links into the greater development and future adjoining development.
- Provide visual interest with feature artwork

FUNCTIONS / MATERIALS

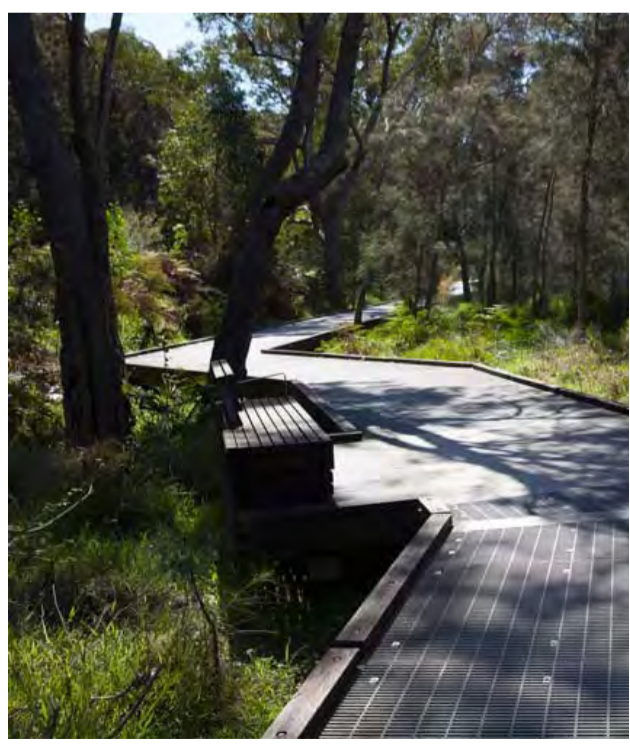
- Provide for formal nature play & passive recreation uses within a central turf area with surrounding planted edges.

ENVIRONMENTAL CONSIDERATIONS

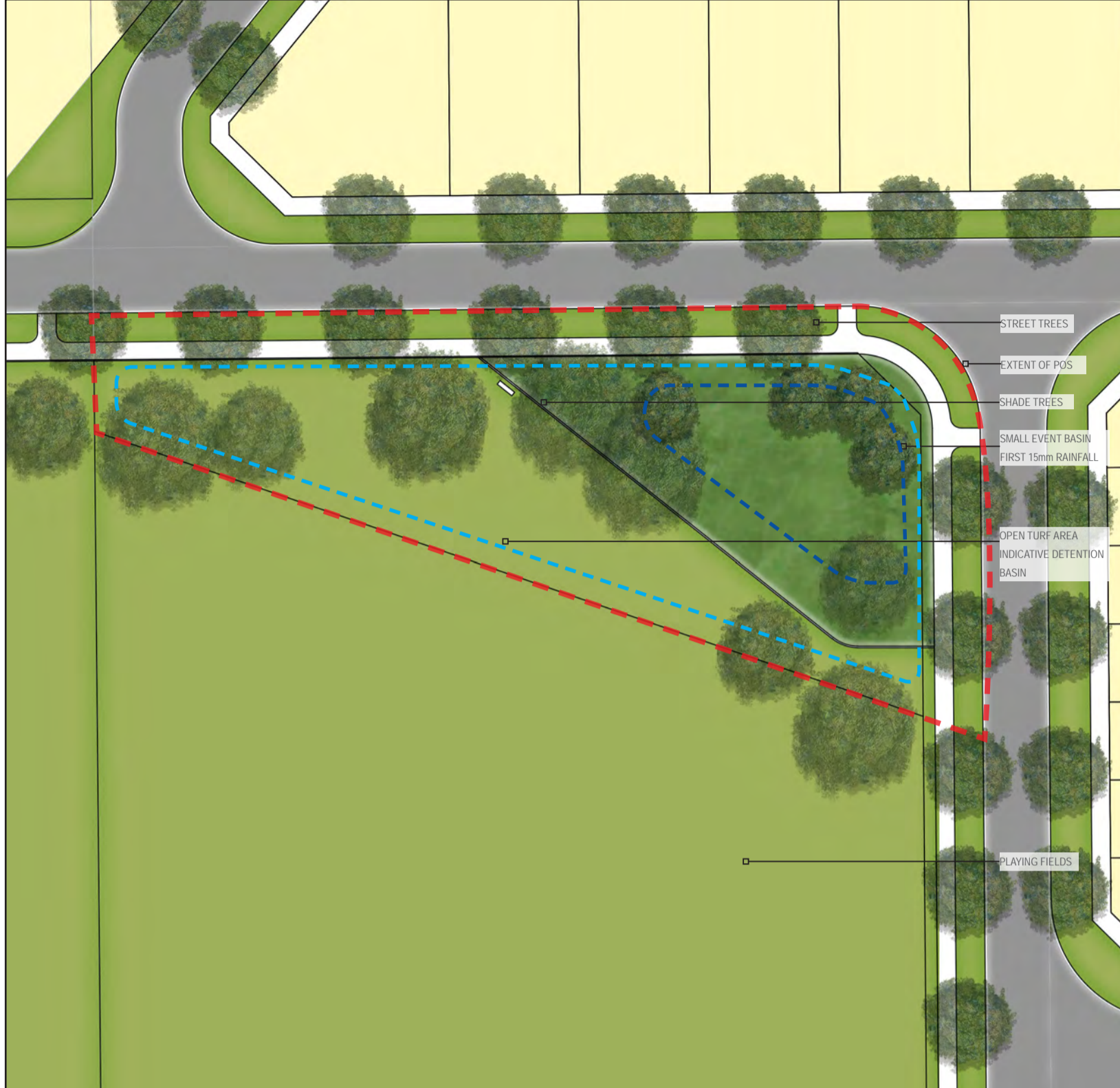
- Waterwise Plant Strategy.
- Hydrozoning of plant species.
- Controlled fertiliser application to landscape areas.
- Retain existing trees (where possible).

DRAINAGE CONSIDERATIONS

- First 15mm Rainfall 550m2 (160m3)
- 1:100ARI 4175m2 (3155m3)



NORTHERN POCKET PRECINCT POS SEVEN [7]



POS TYPOLOGY

- Local Park.

SIZE

- POS 7: 1,643m² + verge.

CONCEPT

- Provide an passive recreation POS with flat grassed areas for informal recreation.
- Path network to disability codes which links into the greater development.

FUNCTIONS / MATERIALS

- Provide for informal passive recreation uses
- Open turf area to tie into adjacent open space
- Drainage basin for small event rainfall
- Provide shade trees and seating areas

ENVIRONMENTAL CONSIDERATIONS

- Waterwise Plant Strategy.
- Hydrozoning of plant species.
- Controlled fertiliser application to landscape areas.

DRAINAGE CONSIDERATIONS

- First 15mm Rainfall 450m² (135m³)
- 1:100ARI 2280m² (1650m³)



NORTHERN POCKET PRECINCT POS EIGHT [8]



POS TYPOLOGY

- Neighbourhood Recreation.

SIZE

- POS 7: 1630m² + verge.

CONCEPT

- Provide an passive recreation POS with flat grassed areas for informal recreation.
- Path network to disability codes which links into the greater development.

FUNCTIONS / MATERIALS

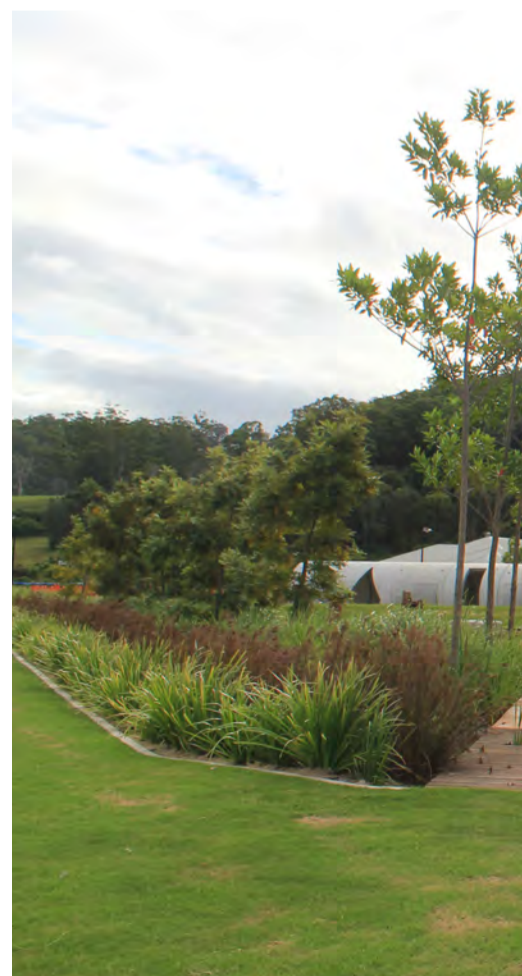
- Provide for informal passive recreation uses within a central turf area with surrounding planted edges.

ENVIRONMENTAL CONSIDERATIONS

- Waterwise Plant Strategy.
- Hydrozoning of plant species.
- Controlled fertiliser application to landscape areas.
- Retain existing trees (where possible).

DRAINAGE CONSIDERATIONS

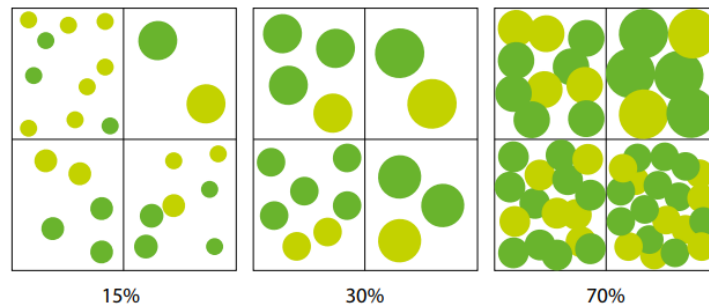
- First 15mm Rainfall 285m² (85m³)
- 1:100ARI 1230m² (855m³)



Appendix C APZ standards (Schedule 1 of Guidelines)

Schedule 1: Standards for Asset Protection Zones

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.



- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Appendix D Vegetation plot photos and description



Photo ID: 1a

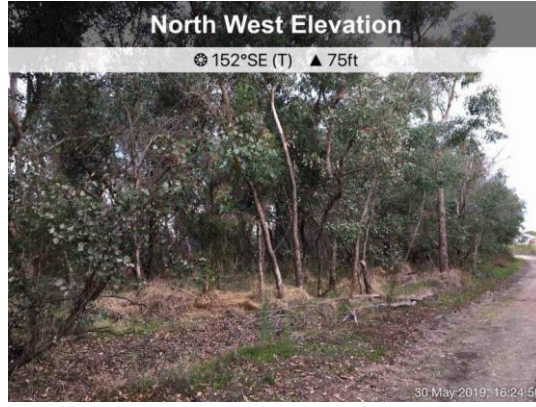


Photo ID: 1b



Photo ID: 1c

Plot number		Plot 1
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Dominated by trees 10-30 m in height at maturity with a shrubby understorey and greater than 30% canopy cover.



Photo ID: 2a



Photo ID: 2b

Plot number		Plot 2
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Dominated by trees 10-30 m in height at maturity with a shrubby understorey and greater than 30% canopy cover.



Photo ID: 3

Plot number		Plot 3
Vegetation classification	Pre-development	Class B Woodland
	Post-development	Class B Woodland
Description / justification		Trees greater than 10 m in height with a grassy understorey, lacking a multi-tiered fuel profile.



Photo ID: 4a



Photo ID: 4b

Plot number		Plot 4
Vegetation classification	Pre-development	Class B Woodland
	Post-development	Class B Woodland
Description / justification		Trees greater than 10 m in height with a grassy understorey, lacking a multi-tiered fuel profile.



Photo ID: 5a



Photo ID: 5b



Photo ID: 5c



Photo ID: 5d



Photo ID: 5e



Photo ID: 5f

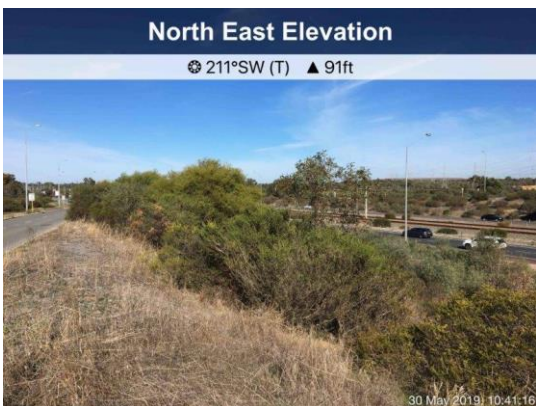


Photo ID: 5g



Photo ID: 5h



Photo ID: 5i



Photo ID: 5j



Photo ID: 5k



Photo ID: 5l



Photo ID: 5m

Plot number		Plot 5
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Shrubs greater than 2 m in height at maturity with a continuous vertical fuel profile, and Banksia woodland less than 6 m in height.



Photo ID: 6a

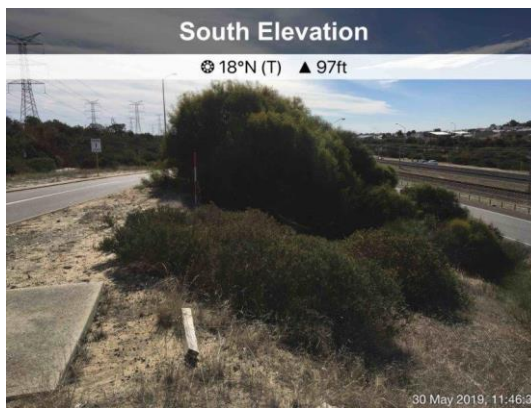


Photo ID: 6b



Photo ID: 6c

Plot number		Plot 6
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Shrubs greater than 2 m in height at maturity with a continuous vertical fuel profile, and Banksia woodland less than 6 m in height.



Photo ID: 7

Plot number		Plot 7
Vegetation classification	Pre-development	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Dominated by ferns less than 2 m in height at maturity with a continuous vertical fuel profile.



Photo ID: 8a



Photo ID: 8b



Photo ID: 8c

Plot number		Plot 8
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Dominated by grass, weeds and a fine fuel profile.



Photo ID: 9a



Photo ID: 9b

Plot number		Plot 9
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Dominated by grass, weeds and a fine fuel profile.



Photo ID: 11a



Photo ID: 11b



Photo ID: 11c



Photo ID: 11d



Photo ID: 11e

Plot number		Plot 11
Vegetation classification	Pre-development	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated & Low threat (Clauses 2.2.3.2 [e] and [f])
Description / justification		Non-vegetated and low threat areas including cleared land, areas dominated by pigface and irrigated crops which will not cure before being harvested.

Appendix E City of Kwinana email correspondence – Reserve management

Rebecca Thompson

From: Paul Neilson <Paul.Neilson@kwinana.wa.gov.au>
Sent: Friday, January 17, 2020 8:47 AM
To: Rebecca Thompson
Subject: Modified advice on Peel Main Drain and DBNGP easements (reserves)

Follow Up Flag: Follow up
Flag Status: Completed

Hi Rebecca,

I refer to your email below regarding the Peel Main Drain and DBNGP easements (reserves) .

I can advise that the City of Kwinana provides its principle agreement of Acceptance of Management for these reserves.

This is consistent with what was done through Honeywood, east of Freeway for both these reserves also. While in principle, Acceptance of Management can be provided, the City would not formally accept management until such time however as both reserves (as per the structure plan) have had works completed, are titled/reservation of land, and maintenance period undertaken by Satterley.

Kind regards, Paul Neilson

Good afternoon Maria and Paul,

As you are aware, we are currently progressing a subdivision application for the Mandogalup East Local Structure Plan area (Satterley landholdings), and have been working through the final outstanding matters to be resolved prior to the Department of Planning issuing a determination on application. Please find the attached Plan of Subdivision currently being considered by the DPLH.

One of the matters to be resolved is in regard to the fire management. The Department of Planning are seeking confirmation from the City that it agrees to take on the management of both the Peel Main Drain and the Dampier to Bunbury Natural Gas Pipeline easement (where it dissects the site) and maintain that land to a low threat (fire risk) landscaped state (following completion of works, Titling / reservation of the land, and the standard maintenance period by Satterley). This will be the same approach taken for the portions of the Peel Main Drain and DBNGP easement running through the Honeywood estate in Wandi, and whilst we understand the City has no objection, the DPLH are seeking evidence to this effect. The DPLH have advised this confirmation would be acceptable as an email, providing them sufficient comfort of the City's acknowledgment and agreement to this approach.

On that basis, we are writing to kindly request an email reply confirming the above approach, that is, confirming the City agree to take responsibility for the management and maintenance of the Peel Main Drain and DBNGP easement reserves to a low threat (fire risk) state, in perpetuity

We thank you in advance for your assistance in this regard.

Should you have any queries or require any further information, please do not hesitate to call.

I look forward to hearing from you.

Many thanks,
Rebecca

Rebecca Thompson
Senior Urban Planner



**ROWE
GROUP**
DESIGN

P: 08 9221 1991
M: 0447 162 966
W: rowegroup.com.au

Please note, I am not in the office on Thursdays or Fridays.



WHY NOT? No.4 CURTIN UNIVERSITY STUDENT COMPETITION [read more](#)

This email and any attachments transmitted with it are intended only for the use by the named addressee. This email is confidential and may contain privileged information. If you receive this email in error, please notify our Office immediately by return email or telephone on 08 9221 1991 and immediately delete it from your system. You must not distribute, copy or use any part of this email if you are not the intended recipient. Rowe Group is not responsible for any unauthorised alterations to this email or attachment to it. This email has been scanned for computer viruses prior to sending. Any recipient should check this email and any attachments for viruses prior to opening. Rowe Group does not accept any loss or damage that is the result of a computer virus or a defect in the transmission of this email or any attachment.

[Paul Neilson](#)

Manager Planning and Development



P 08 9439 0234
M 0437 883 271
W www.kwinana.wa.gov.au
A Corner Gilmore Ave & Sulphur Rd, Kwinana 6167
P PO Box 21 Kwinana WA 6966



Appendix F Vehicular access technical standards of the Guidelines

Public roads

Acceptable solution A3.2

A public road is to meet the requirements in Table 1, Column 1.

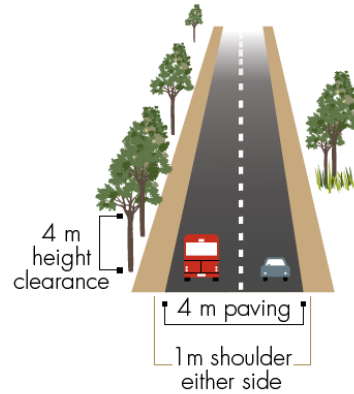
Explanatory note E3.2

Trafficable surface:

Widths quoted for access routes refer to the width of the trafficable surface. A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metre wide paving one metre wide constructed road shoulders. In special circumstances, where eight lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of 90 metres may be provided subject to the approval of both the local government and Department of Fire and Emergency Services.

Public road design:

All roads should allow for two-way traffic to allow conventional two-wheel drive vehicles and fire appliances to travel safely on them.



Cul-de-sac (including a dead-end road)

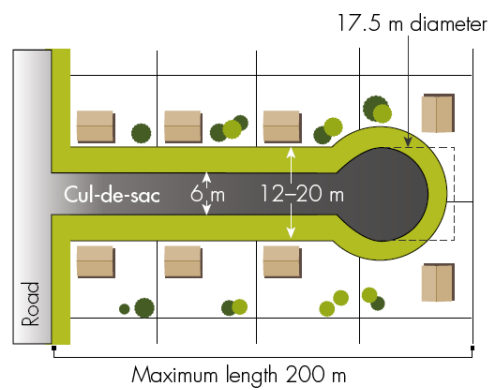
Acceptable solution A3.3

A cul-de-sac and/ or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/ or will need to be demonstrated by the proponent), the following requirements are to be achieved:

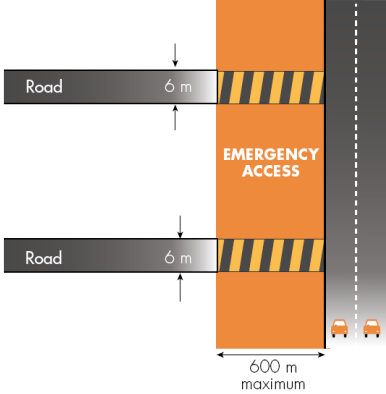
- Requirements in Table 1, Column 2
- Maximum length: 200 metres (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than eight lots are serviced and the emergency access way is no more than 600 metres)
- Turn-around area requirements, including a minimum 17.5 metre diameter head.

Explanatory note E3.3

In bushfire prone areas, a cul-de-sac subdivision layout is not favoured because they do not provide access in different directions for residents. In some instances it may be possible to provide an emergency access way between cul-de-sac heads to a maximum distance of 600 metres, so as to achieve two-way access. Such links must be provided as right of ways or public access easements in gross to ensure accessibility to the public and fire services during an emergency. A cul-de-sac in a bushfire prone area is to connect to a public road that allows for travel in two directions in order to address Acceptable Solution A3.1.



Private driveway longer than 50 metres	
Acceptable solution A3.5	<p>A private driveway is to meet all of the following requirements:</p> <ul style="list-style-type: none"> Requirements in Table 1, Column 3 Required where a house site is more than 50 metres from a public road Passing bays: every 200 metres with a minimum length of 20 metres and a minimum width of two metres (i.e. the combined width of the passing bay and constructed private driveway to be a minimum six metres) Turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres (i.e. kerb to kerb 17.5 metres) and within 50 metres of a house Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes All-weather surface (i.e. compacted gravel, limestone or sealed).
Explanatory note E3.5	<p>For a driveway shorter than 50 metres, fire appliances typically operate from the street frontage however where the distance exceeds 50 metres, then fire appliances will need to gain access along the driveway in order to defend the property during a bushfire. Where house sites are more than 50 metres from a public road, access to individual houses and turnaround areas should be available for both conventional two-wheel drive vehicles of residents and type 3.4 fire appliances.</p> <p>Turn-around areas should be located within 50 metres of a house. Passing bays should be available where driveways are longer than 200 metres and turn-around areas in driveways that are longer than 500 metres. Circular and loop driveway designs may also be considered. These criteria should be addressed through subdivision design.</p> <p>Passing bays should be provided at 200 metre intervals along private driveways to allow two-way traffic. The passing bays should be a minimum length of 20 metres, with the combined width of the passing bay and the access being a minimum of six metres.</p> <p>Turn-around areas should allow type 3.4 fire appliances to turn around safely (i.e. kerb to kerb 17.5 metres) and should be available at the house sites and at 500 metre intervals along the driveway.</p> <div style="text-align: center; margin-top: 20px;"> </div>

Emergency access way	
Acceptable solution A3.6	<p>An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet all of the following requirements:</p> <ul style="list-style-type: none"> Requirements in Table 1, Column 4 No further than 600 metres from a public road Provided as right of way or public access easement in gross to ensure accessibility to the public and fire services during an emergency Must be signposted.
Explanatory note E3.6	<p>An emergency access way is not a preferred option however may be used to link up with roads to allow alternative access and egress during emergencies where traffic flow designs do not allow for two-way access. Such access should be provided as a right-of-way or easement in gross to ensure accessibility to the public and fire emergency services during an emergency.</p> <p>The access should comply with minimum standards for a public road and should be signposted. Where gates are used to control traffic flow during non-emergency periods, these must not be locked. Emergency access ways are to be no longer than 600 metres and must be adequately signposted where they adjoin public roads.</p> <p>Where an emergency access way is constructed on private land, a right of way or easement in gross is to be established.</p> <div style="text-align: center; margin-top: 20px;">  </div>

Technical requirement	1	2	3	4	5
	Public road	Cul-de-sac	Private driveway longer than 50 m	Emergency access way	Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

Appendix G Water technical standards of the Guidelines

Reticulated areas	
Acceptable solution A4.1	The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.
Explanatory note E4.1	Water supply authorities in Western Australia include the Water Corporation, Aqwest and the Busselton Water Board. The Water Corporation's 'No. 63 Water Reticulation Standard' is deemed to be the baseline criterion for developments and should be applied unless local water supply authorities' conditions apply.

Appendix H City of Kwinana Fire Notice (2020-21)

BUSH FIRES ACT 1954

Fire Notice

City of Kwinana

September 2020

As a measure to assist in the control of bush fires and pursuant to Section 33 of the *Bush Fires Act 1954 (WA)*, all property owners and/or occupiers of land within the City of Kwinana are hereby served with a first and final Fire Notice (the Notice) and are required to comply with the requirements set out in this Notice in its entirety.

Failure to comply may result in a penalty of up to \$5,000

A person in default of the requirements of this Notice is also liable, whether prosecuted or not, to pay the costs of performing the work directed by the City of Kwinana or its Bush Fire Control Officer.

Any owner and/or occupier who engages a contractor to undertake works on their behalf, is responsible for ensuring that the works completed meet the requirements of this Notice.

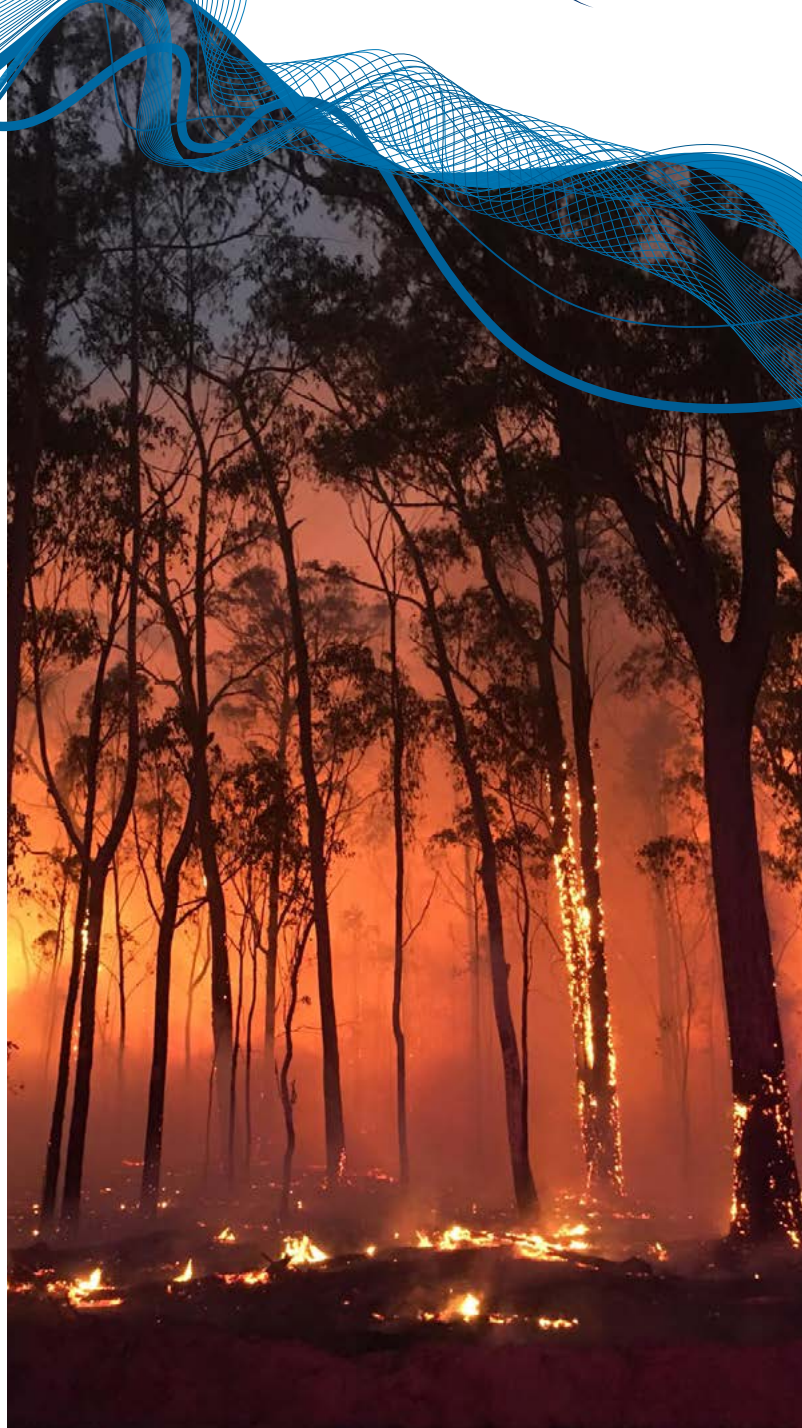
Fire Hazard Reduction

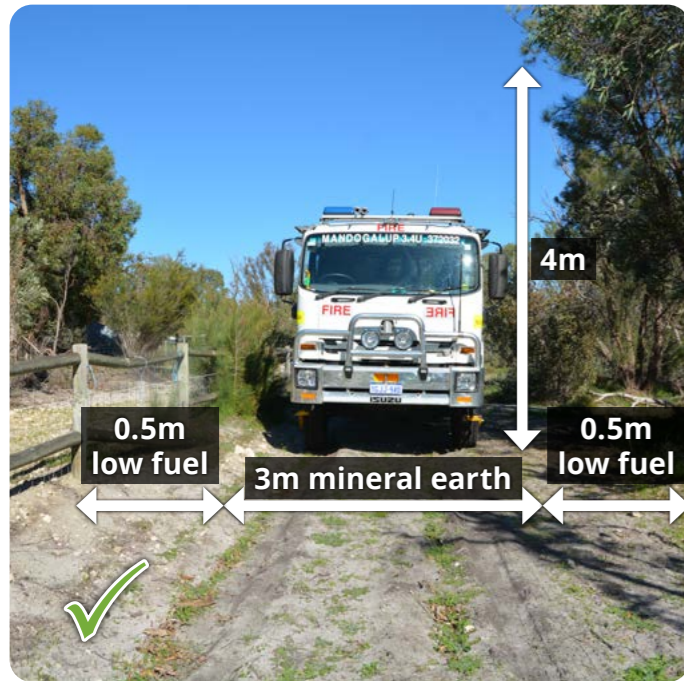
As a measure to assist in the control of bushfires, you have a legal requirement to carry out fire prevention works on your property.

The works outlined must be completed before the dates listed and must be maintained throughout as required by this Notice.

All land and buildings must be maintained for such duration and in such positions, dimensions and specifications as required by this Notice or as approved in writing by the City of Kwinana or its Bush Fire Control Officers.

Industrial Zoned Areas, as defined in this document, may require additional works as identified by Fire Control Officers during Fire Hazard Inspections.





Land with a total area of 3,501m² or greater

Note: Your property must comply from 1 December on one year and maintained throughout until 31 May the following year.

Owners and/or occupiers of land that is 3,501m² or greater are required to construct a firebreak:

- Inside and along all land boundaries in a continuous form or within 10 metres of property boundaries;
- Around all sides of all buildings on the land;
- On all driveways and access ways to houses, sheds and buildings on the land;
- On any land surrounding any place where, wood or timber piles, hay stacks, tyres, flammable liquids, chemicals and gas products are kept on the land;
- Construct these firebreaks in a manner so that they are trafficable, contain no dead ends and are wide enough for a heavy-duty fire vehicle or a emergency services vehicle to be able to turn the corner without the vehicle being obstructed in anyway;
- Maintain an asset protection zone around all buildings, infrastructure and fixed assets on the property; and
- Remove all flammable materials from all rooftops and gutters of buildings.

Land with a total area of 1,500m² to 3,500m²

The works outlined in this section must be maintained all year round and owners and/ or occupiers are required to maintain an asset protect zone around all buildings, infrastructure and fixed assets on the property by:

- Having all long grass, weeds, etc. slashed, mowed or trimmed down by other means to a height no greater than 50mm across the entire property; and
- Remove all flammable materials from all rooftops and gutters of buildings.



Land with a total area of up to 1499m²

The works outlined in this section must be maintained all year round and owners and/ or occupiers are required to:

- Having all long grass, weeds, etc. slashed, mowed or trimmed down by other means to a height no greater than 50mm across the entire property; and
- Remove all flammable materials from all rooftops and gutters of buildings.



Variations to Fire Notice

To request authorisation to use other methods of fire prevention on your land outside of this notice, please apply in writing together with an 'Application to Vary Location and Type of Firebreaks' form available on the City's website kwinana.wa.gov.au/fires.

Submit completed forms to the City of Kwinana no later than 31 October.

Additional Works

Regardless of land size and location, the City of Kwinana or its Bush Fire Control Officers may require owners and/or occupiers to undertake additional work on your property to improve access, and/or undertake further works to reduce a hazard that may be conducive to preventing the outbreak and/or the spread or extension of a fire.

Definitions

"Asset protection zone" means an area with a radius of 20 metres measured from the external perimeter of the building/s or as stated in your approved Bushfire Attack Level (BAL) assessment, within the boundaries of the lot on which the building/s is situated. Fuel loads in this zone shall be reduced and maintained to 2 tonnes per hectare or less.

"Bush Fire Control Officer" means an Officer appointed by the City of Kwinana to exercise the powers and duties of a Bush Fire Control Officer appointed under s38(1) of the Bush Fires Act 1954.

"Bush fire" means a fire or potential fire, however caused, and includes a fire in a building.

"Dead end" means a track, firebreak, road or access way that terminates without any means of escape or ability to turn around safely.

"Emergency access ways" are for emergency services vehicles only and are not to be considered as an escape route unless declared as such by the incident controller during an emergency.

"Firebreak" means a strip of land 3 metres wide of mineral earth with an additional 0.5 metre strip either side of low fuel area (meaning no grasses or shrubs higher than 50mm) effectively creating a 4 metre wide by 4 metre vertical axis high area that has been cleared of all trees, bushes, grasses, vegetation and all other objects.

This includes the trimming back of all overhanging trees, bushes, shrubs and any other objects on or over the firebreak area. Living Green Lawn may be accepted (without a Firebreak Variation) instead of mineral earth.

"Flammable material" means any bush, plant, tree, grass, vegetation, object, thing or material that may or is likely to catch fire and burn.

"Industrial Zoned Areas" means land on which manufacturing, processing, warehousing and related activities are undertaken, as defined in Metropolitan Region Schemes.

"Living green lawn" means soil covered land, planted with grasses or other durable plants, maintained green and less than 50mm in height.

"Mineral earth" means land clear of flammable material, consisting of ploughed or cleared soil, stone, hardstand or any mixture of these.

"Trafficable" means to be able to travel from one point to another in a fire vehicle on a firm and stable surface, unhindered without any obstruction that may endanger resources. The firebreak must not terminate without provision for egress to a safe place or a cleared turn around area of not less than a 21 metre radius (prior written approval may be required from the City of Kwinana if trees are to be removed).

All corners around the firebreak must be radiused.

"Vertical axis" means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak.

Burning of Garden Refuse

Prohibited burning periods only

During the declared Prohibited Burning Period, owners and/or occupiers must not undertake the burning of garden refuse, rubbish or for any other like purpose as defined within the Bush Fires Act 1954 section 24C.

Restricted burning periods only

During the declared Restricted Burning Period only, owners and/or occupiers may:

- Apply for a permit to burn the bush for bush fire risk mitigation purposes, by following the conditions imposed on a permit to burn as issued by a Bush Fire Control Officer;
- In areas zoned Rural you may undertake burning of leaves, tree branches, and other dry vegetation in piles no larger than 1.0m³ in size, without a permit to burn, subject to the following conditions:
 - No flammable material (other than that being burned) is to be within five (5) metres of the fire at any time while the fire is burning;
 - The fire is lit between 6pm and 11pm and is completely extinguished before midnight on the same day;
 - At least one person is present at the site of the fire at all times until it is completely extinguished; and
 - When the fire is no longer required, the person ensures that the fire is completely extinguished by the application of water or earth.

Unrestricted burn periods only

During the Unrestricted burning period, owners and/or occupiers in areas zoned Rural may burn garden refuse and set fire to bush on their land without a permit. Burning of the bush must be undertaken in accordance with all relevant State legislation and Local Government Local Laws.

No burning in areas defined as Urban

Pursuant to section, 24G (2) of the Bush Fires Act 1954, no burning of garden refuse is to be undertaken in areas defined as "Urban" without written approval by the City of Kwinana.

Wayne Jack,
Chief Executive Officer



For further information, please contact the City of Kwinana on 9439 0200 or view the City of Kwinana website, www.kwinana.wa.gov.au/fires.

Appendix I Infrastructure and cost sharing agreement Mandogalup

REFERENCE SCHEDULE

1. QUBE

Name	Qube Mandogalup Development Pty Ltd ACN 111 964 606, Greta White Pty Ltd ACN 601 674 631 and J J White Pty Ltd ACN 602 840 979
Address	all C/- Qube Property Group Pty Ltd Suite 3, Level 1, 437 Roberts Road SUBIACO WA 6008
Contact	Mark Hector
Email	mark@qubeproperty.com.au

2. WANDI

Name	Wandi Anketell Holdings Pty Ltd ACN 112 608 376 in its capacity as bare trustee for the owners of the Wandi Anketell Project
Address	c/- Satterley Property Group Level 3, 27-31 Troode Street WEST PERTH WA 6005
Contact	John Hirdman
Email	johnh@satterley.com.au

3. QUBE LAND

Together, the land located at:

- (a) Lot 682, Lot 52, Lot 663, Lot 791, Lot 664; and
- (b) Lot 668 and Lot 669,

as identified as Qube landholdings on the Plan and includes any other land acquired by Qube for the purposes of the Qube Project (including, if applicable, the Chan Land).

4. QUBE PROJECT

The Qube project includes:

- (a) obtaining a subdivision approval in respect of land that includes the Qube Land (**Qube Subdivision Approval**);
- (b) developing and subdividing the Qube Land; and
- (c) selling the separate Lots.

5. START DATE

The date of this document.

6. WANDI LAND

Together, the land located at:

- (a) Lot 9000, Lot 9002 and Lot 9006; and
- (b) Lot 9033,

as identified as Wandı (or SPG) landholdings on the Plan and includes any other land acquired by Wandı for the purposes of the Qube Project (including, if applicable, the Chan Land).

7. WANDI PROJECT

The Wandı project includes:

- (a) obtaining one or more subdivision approvals in respect of land that includes the Wandı Land (**Wandı Subdivision Approval**);
- (b) developing and subdividing the Wandı Land; and
- (c) selling the separate Lots.

8. WORKS

8.1 Qube Works

The **Qube Works** are:

- (a) the extension of the water main from Rowley Road to the infrastructure connection point at the Wandı Land boundary as referred to on the Cost Share Strategy Plan (**Water Supply Infrastructure Works**);
- (b) the provision of:
 - (i) road access from Rowley Road (excluding emergency and construction access road approved by relevant Authorities) to the infrastructure connection point at the Wandı Land boundary; and
 - (ii) emergency and construction access road approved by relevant Authorities from Rowley Road to the Wandı Land boundary,including contribution to the Rowley Road roundabout, acquisition of, subject to clause 5, the Chan Road Land, clearing and earthworking the road reserve, road pavement construction, installation of drainage, lighting, paths, signs and lines as referred to on the Cost Share Strategy Plan (**Qube Road Works**);
- (c) the works to extend power reticulation from Rowley Road to the infrastructure connection point at the Wandı Land boundary as referred to on the Cost Share Strategy Plan (**Power Works**);
- (d) the works to extend communication ducts and pits from Rowley Road to the infrastructure connection point at the Wandı Land boundary as referred to on the Cost Share Strategy Plan (**Communications Works**);
- (e) Preparation Works on:
 - (i) Qube Land; and
 - (ii) if Qube makes an election under clause 4.2(b), the Other Works that are the subject of that election, Wandı Land;
- (f) subject to clause 8.7, that part of the playing fields and other infrastructure adjacent to the school site as is identified as being located on Qube Land;
- (g) subject to clause 8.7, that part of the perimeter road around the school site as is identified as *School site perimeter road (QUBE)* marked on the plan at Annexure D;
- (h) if Qube makes an election under clause 4.1(a), 4.2(b), 4.3(b) or 4.4(a), the Other Works that are the subject of that election;
- (i) any other Works that the Owners agree, in writing, to be Qube Works (and which may include Works under clause 5).

8.2 Wandı Works

The Wandı Works are:

- (a) Preparation Works on:
 - (i) Wandi Land; and
 - (ii) if Wandi makes an election under clause 4.1(b), the Qube Land;
- (b) subject to clause 8.7, that part of the playing fields and other infrastructure adjacent to the school site as is identified as being located on Wandi Land;
- (c) subject to clause 8.7, that part of the perimeter road around the school site as is identified as *School site perimeter road (SPG)* marked on the plan at Annexure D;
- (d) the extension of a 300mm sewer reticulation main from the connection point at the Wandi Land boundary to the existing Wandi Pump station as referred to on the Cost Share Strategy Plan (**Wastewater Supply Works**); and
- (a) if Wandi makes an election under clause 4.1(b), 4.2(a), 4.3(a) or 4.4(b), the Other Works that are the subject of that election; and
- (b) any other Works that the Owners agree, in writing, to be Wandi Works (and which may include Works under clause 5),

but excluding the construction of the Wandi Signage on the Qube Land.

8.3 Other Works

The **Other Works** are:

- (a) the upgrades to the existing Thomsons Lake Type 90 Pump Station, including any associated upgrades to underground storage tanks, pumps and associated pressure mains as referred to on the Cost Share Strategy Plan (**Existing Pumping Station Upgrades**);
- (b) the construction of the ultimate Type 180 Pump Station, including land acquisition (if required) storage tanks, pumps and associated pressure mains as referred to on the Cost Share Strategy Plan (**New Pumping Station Works**);
- (c) installation of a power feeder on Anketell Road if required to augment the power supply to the Qube and Wandi developments as referred to on the Cost Share Strategy Plan;
- (d) road works that contribute for roads to Qube or Wandi's land where access is not otherwise available including clearing and earthworking the full road reserve, road pavement construction, installation of drainage, lighting, paths, signs and lines as referred to on the Cost Share Strategy Plan; and
- (e) any other Works that the Owners agree, in writing, to be Other Works (and which may include Works under clause 5).

Qube / Satterley Property Group Proposed Cost Share Strategy



- Cost share infrastructure items for Boulevard Road (April 2020):**
- Siteworks & Earthworks
 - Roadworks (including Roundabouts)
 - Drainage
 - Lighting
 - Footpath & DUP
 - Water, Power, Comms
 - Sewer connection
- Included infrastructure items for School Perimeter Road (April 2020):**
- Siteworks & Earthworks
 - Road
 - Drainage
 - Lighting
 - Footpath & DUP

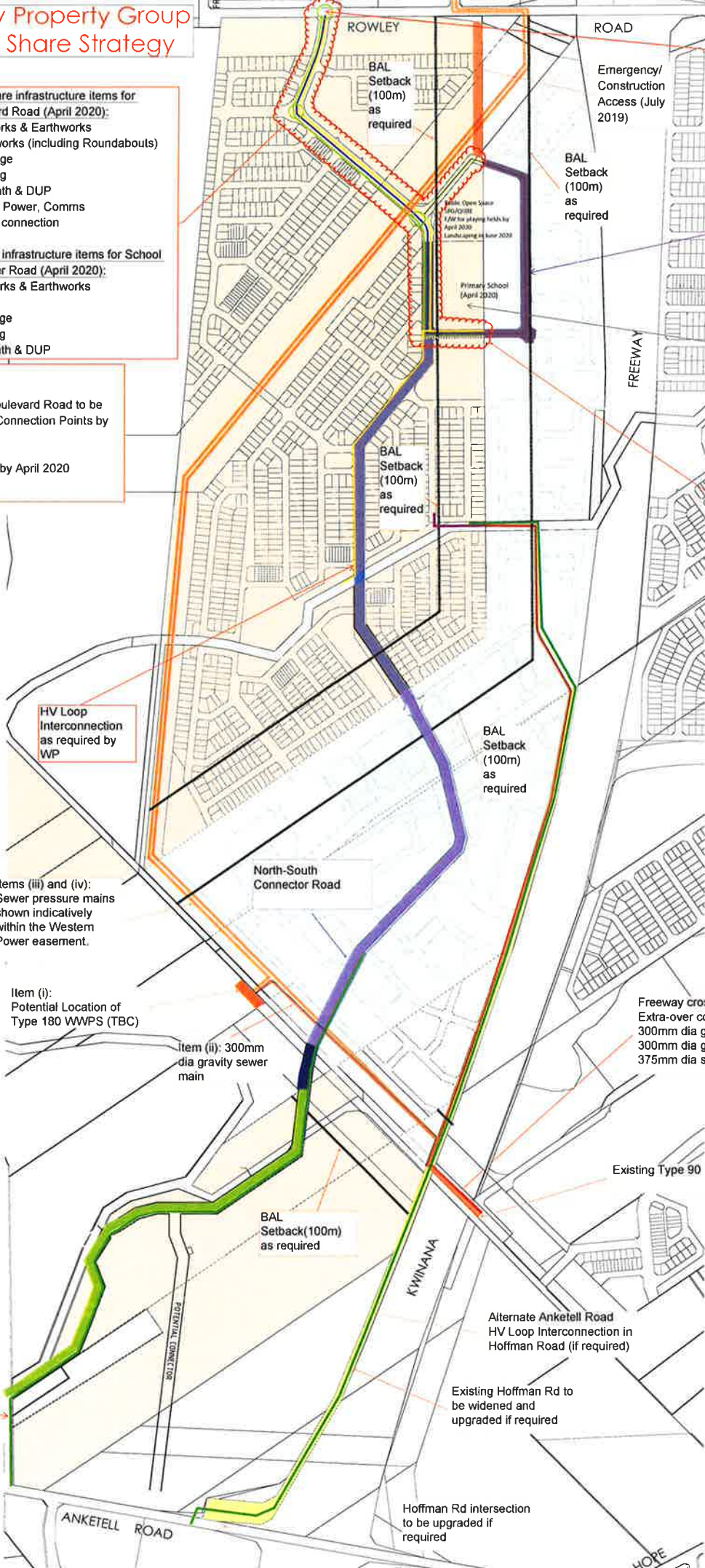
- Program Items:**
- Infrastructure items for Boulevard Road to be delivered to Infrastructure Connection Points by April 2020
 - DN300 Sewer completed by April 2020

- Legend**
- 250 dia Water Main
 - 150 dia Water Main
 - Power & Comms
 - Boulevard Road
 - Standard Road
 - Roundabout
 - 300 dia Sewer (SPG)
 - 300 dia Sewer (QUBE)
 - North-South Connector Road (Qube North)
 - North-South Connector Road (SPG)
 - North-South Connector Road (Chan Land)
 - North-South Connector Road (QUBE South)
 - School site perimeter road (QUBE)
 - School site perimeter road (SPG)
 - QUBE Landholdings
 - SPG Landholdings
 - Future Sewer Pressure Mains
 - Future Sewer from Thomsons lake Type 90 to ultimate Type 180
 - Power feeder off Anketell Road
 - Sewer Connection

Items (iii) and (iv): Sewer pressure mains shown indicatively within the Western Power easement.

Item (i): Potential Location of Type 180 WWPS (TBC)

Item (ii): 300mm dia gravity sewer main



Upgrade at existing roundabout to provide pedestrian crossing as requested by City of Kwinana (2 pram ramps and pedestrian refuge at existing traffic island)

School Perimeter Road and School Site within SPG development to be constructed by SPG for DoE to reimburse both parties (Qube/SPG)

School Perimeter Road and School Site within Qube development to be constructed by Qube for DoE to reimburse both parties (Qube/SPG)

Infrastructure Connection Point (April 2020)

Emergency/ Construction Access (July 2019)

BAL Setback (100m) as required

BAL Setback (100m) as required

BAL Setback (100m) as required

North-South Connector Road

Freeway crossing. Extra-over cost to bore under Freeway. 300mm dia gravity main 300mm dia gravity main 375mm dia sewer pressure main

Existing Type 90 Pumping Station

Alternate Anketell Road HV Loop Interconnection in Hoffman Road (if required)

Existing Hoffman Rd to be widened and upgraded if required

Hoffman Rd intersection to be upgraded if required

Anketell Road HV Loop Interconnection as required by WP

© JBS&G Australia Pty Ltd T/A Strategen-JBS&G

This document is and shall remain the property of Strategen-JBS&G. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Report version	Rev No.	Purpose	Author	Reviewed and Approved for Issue	
				Name	Date
Draft Report	Rev A	For client review	Brodie Mastrangelo (BPAD 45985, Level 1)	Zac Cockerill (BPAD 37803, Level 2)	21/06/2019
Final Report	Rev 0	Issued for use: to accompany subdivision application	Brodie Mastrangelo (BPAD 45985, Level 1)	Zac Cockerill (BPAD 37803, Level 2)	24/06/2019
Final Report	Rev 1	Issued for use: updated to address DoPLH comments	Zac Cockerill (BPAD 37803, Level 2)	Zac Cockerill (BPAD 37803, Level 2)	26/09/2019
Final Report	Rev 2	Issued for use: updated to address DoPLH comments	Zac Cockerill (BPAD 37803, Level 2)	Linden Wears (BPAD 19809, Level 3)	10/01/2020
Draft Report	Rev B	For client review	Louisa Robertson (BPAD 36748, Level 1)	Zac Cockerill (BPAD 37803, Level 2)	30/10/2020
Final Report	Rev 3	Issued for use: to accompany subdivision application (revised subdivision)	Zac Cockerill (BPAD 37803, Level 2)	Zac Cockerill (BPAD 37803, Level 2)	11/11/2020

