# PART 4
# SPECIALIST REPORTS

- Stormwater management plan
- Civil engineering report
- Hydraulic impact assessment
- Ecological site assessment
- Rehabilitation management plan
- Vegetation management plan
- Bushfire risk assessment and risk mitigation compliance report
- Traffic and Transport Assessment
- Acoustic report

MCU, ROL & OPW

2 KARINGAL DRIVE, PIMPAMA

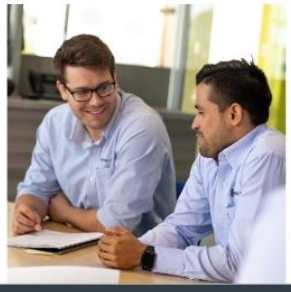
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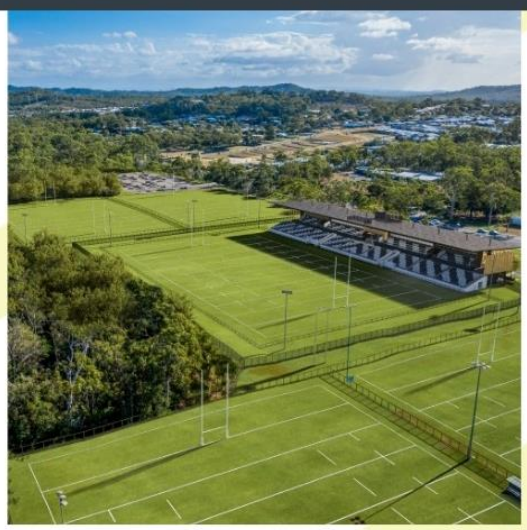
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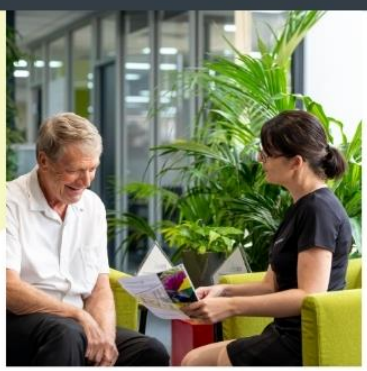


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# 2 Karingal Drive, Pimpama
# Conceptual Stormwater Management Plan

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-CSMP-01 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
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| Date: | 13/03/2026 |

| | |
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| Date: | 13/03/2026 |

| Version No. | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 00 | Initial Issue | 7/01/2021 | FL | JC |
| 01 | Updated Layout | 13/03/2026 | JM | RB |

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# Executive Summary

This Conceptual Stormwater Management Plan (CSMP) has been prepared for Bosform Pty Ltd, the proponent of this Development Application. The proponent is seeking Development Approval for a proposed 57 lot multi-unit development over 2 Karingal Drive, Pimpama properly described as Lot 19 on RP 152380 (the subject site).

The subject site is situated within the City of Gold Coast Local Government Area (LGA) and is zoned by the City of Gold Coast City Plan Version 13 as '*Medium Density Residential'*.

**Stormwater Quantity**

- The Lawful Point of Dishcharge for the site has been defined as the existing waterway on the site's eastern property boundary.
- Stormwater runoff from Catchment A1 will be conveyed to a detention tank, where it will be released at the LPD in a controlled manner to ensure that there is non-worsening peak flow in the post-developed scenario. The detention tank A1 will have a 1% AEP volume of 469m$^3$.
- There is a 141.69 ha external catchment which is conveyed through the site via an existing waterway, no development is proposed within this waterway;
- Peak discharge from the developed catchment will be that of or less than the pre-developed scenario.
- As the site is within the Woongoolba flood mitigation scheme catchment area, peak outflows and timings have been assessed for Q2, Q5 and Q10 for rainfall events up to 72 hours and does not change as a result of development

**Stormwater Quality**

- To achieve the City of Gold Coast's Water Quality Objectives, it is proposed to use a mix of bioretention systems and proprietary devices to treat stormwater runoff. These bioretention systems will be private infrastructure, owned and maintained by the body corporate.
- The required treatment for catchment A1 will be 8 ATLAN Stormsacks and 8 ATLAN Filters.
- The bioretention device positioned within Catchment A2 will have a total filter media footprint of 40m$^2$.

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Appendix A – Proposed Plans of Development
Appendix B – Time of Concentration and Rational Method Calculation
Appendix C – XP-SWMM Input Parameters
Appendix D – MUSIC Input Parameters
Appendix E – Burchills Engineering Solutions Conceptual Stormwater Management Drawings
Appendix F – Burchills Engineering Solutions Preliminary Civil Engineering Drawings

# 1. Introduction

This Conceptual Stormwater Management Plan (CSMP) has been prepared for BJS Gets Richer Pty Ltd, the proponent of this Development Application. The proponent is seeking Development Approval for a proposed 57 lot multi-unit townhouse development over 2 Karingal Drive, Pimpama properly described as Lot 19 on RP 152380 (the subject site).

The subject site is situated within the City of Gold Coast Local Government Area (LGA) and is zoned by the City of Gold Coast City Plan Version 13 as '*Medium Density Residential'*.

## 1.1 Background

## 1.2 Regulatory Requirements and Technical Guidelines

The strategies proposed in this CSMP have been developed to address the requirements of the City of Gold Coast City Plan Version 13, and have also been prepared in accordance with the following guidelines:

- SC6.9 City Plan Policy – Land Development Guidelines (CoGC, 2019);
- *State Planning Policy July 2014* (DSPIP, 2014)*;*
- Queensland Urban Drainage Manual (QUDM) Fourth Edition (IPWEAQ, 2017);
- Australian Rainfall & Runoff: A Guide to Flood Estimation (Ball J, 2016);
- Australian Government – Bureau of Meteorology (Bureau of Meteorology, n.d.);
- MUSIC Modelling Guidelines (Water By Design, 2019);
- WSUD Technical Guidelines for South East Queensland – Version 1 (Healthy Waterways, BCC, MBWCP, 2006);
- Concept Design Guidelines for Water Sensitive Urban Design - Version 1 (Water By Design, 2009);
- Urban Stormwater Quality Planning Guidelines 2010 (DERM, 2010); and

## 1.3 Purpose

The main objectives of this CSMP have been established from the criteria set out in the City of Gold Coast City Plan Version 13 and are summarised as follows:

- Avoid the creation of nuisance flow or hazard problems;
- Protect the quality of surface and ground waters during construction and operation of new development;
- Maintain the natural hydraulic behaviour of catchments;
- Protect existing natural features and ecological processes; and
- Integrate stormwater management infrastructure carefully in the urban and natural landscape.

## 1.4 Scope

To achieve the above-mentioned objectives, this CSMP details the following:

- Site description including:
  - Topography;
  - Existing Land Use; and
  - Vegetation.
- Stormwater Quantity:
  - Assessment of the peak flow rates discharging the site to ensure no adverse external impacts (up to the 1% Average Exceedance Probability (AEP)).
- Stormwater Quality:
  - Methods to ensure quality objectives of the receiving waters are achieved.

## 1.5 Site Details

Important information about the subject site has been included in Table 1.1, and a site locality map is presented in Figure 1.1. Further detail regarding the proposed development layout, please refer to the complete and latest development plans attached within Appendix A.

**Table 1.1 Site Details**

| Subject | Description |
|---|---|
| Address | 2 Karingal Drive, Pimpama |
| Lot / Plan | Lot 19 on RP 152380**Error! Reference source not found.** |
| Local Government Area | City of Gold Coast |
| Zoning | Medium Density Residential |
| Existing Land Use | The site is currently vacant and is vegetated with grass and tree cover. |
| Topography | There is an existing waterway traversing diagonally through the site, entering the site in the southern corner, and exiting the site in the northern corner. All portions of the site generally fall towards this central waterway that splits the site into two (2) catchments. The highest points in the site are at RL 10.0m AHD in the north-west corner, and RL 8.0m AHD in the south-east corner of the site. |

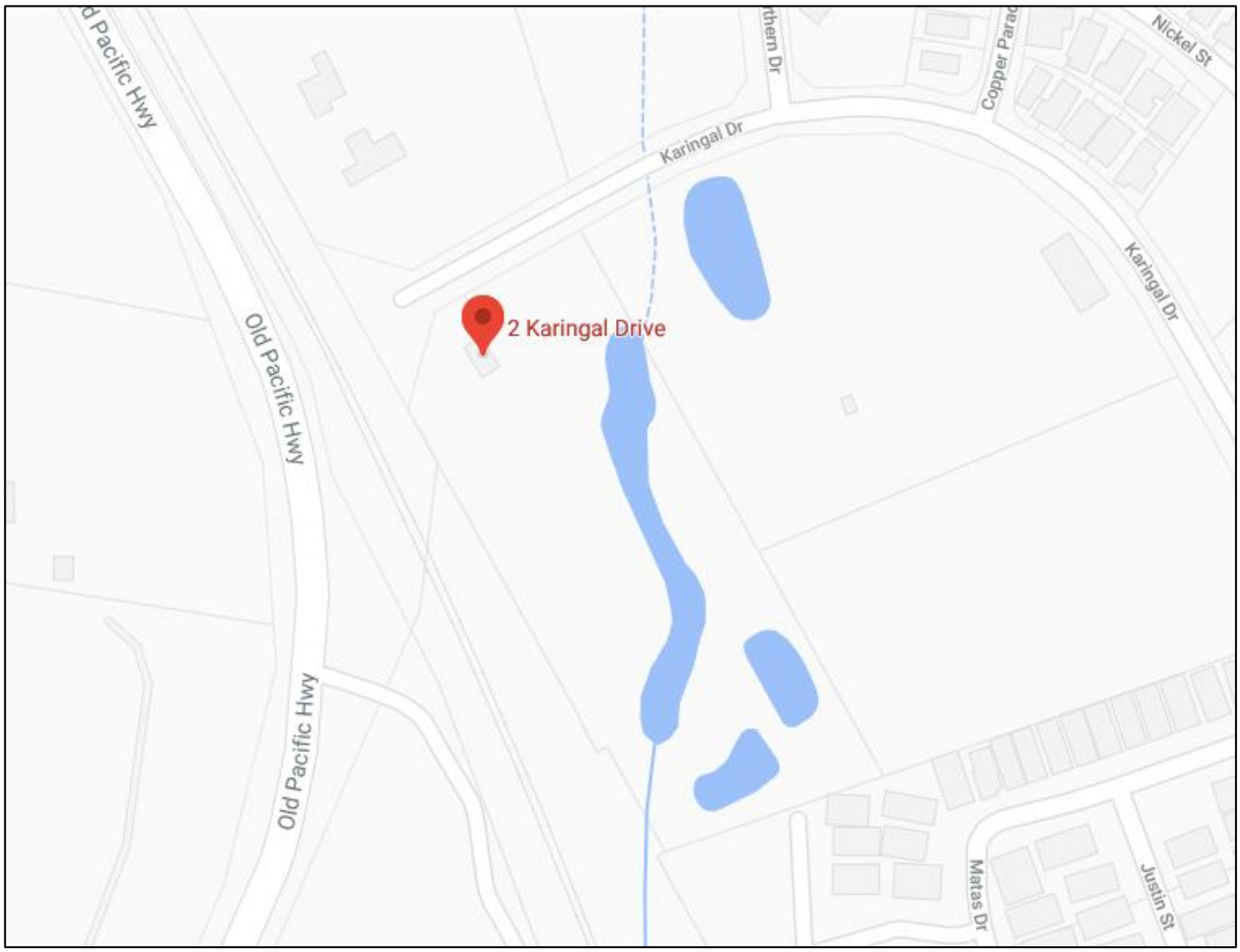



**Figure 1.1 Site Locality Map (CoGC, 2020)**

## 1.6 Proposed Development

The proposed development is seeking Council approval for Material Change of Use (multiple dwellings), Reconfiguring a Lot (2 management lots and a park Lot) and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

For further details, please refer design drawings prepared by MPS Architects attached in Appendix A of this report. Figure 1.2 below provides an excerpt taken from the development's site plan.

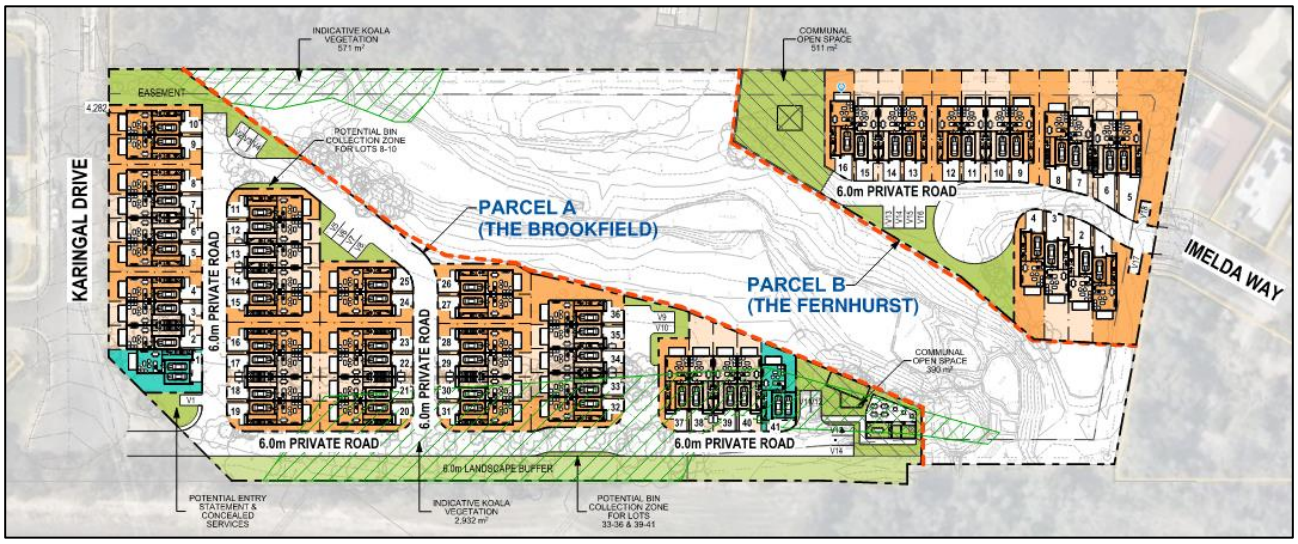



**Figure 1.2 Proposed Site Layout**

# 2. Stormwater Quantity Management Plan

## 2.1 Overview

The following section of this report outlines the measures required to meet the above-mentioned objective in regard to stormwater quantity. In order to meet these objectives, it is necessary to ensure that post development discharge from the site will not create a worse situation for downstream property owners than that which existed prior to the development (i.e. non-worsening) (IPWEAQ, 2017).

Due to the increase in impervious areas within the proposed development, peak stormwater flow rates will increase. In order to mitigate these flow rates from the developed site it is proposed to implement an On-Site Detention (OSD) system. OSD systems temporarily store stormwater runoff and release flows at a controlled rate that is no greater than the pre-developed peak flow rate.

## 2.2 Drainage Catchment Parameters

Drainage catchments have been delineated using site survey, aerial imagery and development plans in the post developed scenario. Pre and post development catchment parameters are summarised in Table 2.1. Catchment plans are provided in Appendix E.

**Table 2.1 Catchment Parameters**

| Scenario | Catchment ID | Total Area (ha) | Impervious % | Catchment Slope (%) |
|---|---|---|---|---|
| **External** | Ext A | 141.69 | 20 | 4.0 |
| **Pre-developed** | A | 2.455 | 16 | 4.8 |
| **Post-developed** | A1 | 1.081 | 70 | 4.8 |
| | A2 | 0.498 | 70 | 4.8 |
| | A3 | 0.877 | 24 | 1 |

### 2.2.1 Conveyance of Flows

Important information about the conveyance of flows for the pre-development and post-development scenarios are included in Table 2.2 below.

**Table 2.2 Conveyance of Flows**

| Subject | Description |
|---|---|
| Lawful Points of Discharge (LPD) | One (1) Lawful Point of Discharge (LPD), defined as the discharge point of the waterway that discharges to the neighboring allotment immediately east of the subject site. |
| Pre-development | The Site Catchment (A) is conveyed via overland flow to the existing waterway which forms the site's LPD.<br>Pre-development catchment plans are included in Appendix E (Drawing No. N200 and N201). |
| Post-development | Runoff over Catchment A1 is conveyed through the proposed drainage system to Detention Tank A1 (which also contains an ATLAN Filter treatment system) which then discharges to the adjacent waterway (the LPD) in a controlled manner. The stormwater piped system will be designed to convey the 1% AEP runoff into the detention tank.<br>Runoff over Catchment A2 is conveyed through the proposed drainage system to proposed Bioretention System A2 which then discharges to the adjacent waterway (the LPD) in a controlled manner. |

| | |
|---|---|
| External Catchments | The External Catchment (Ext A) enters the site on its western boundary via the adjacent railway culverts where it is conveyed through the site via the existing waterway. The proposed development has been designed to minimise its encroachment on the waterway. |

### 2.2.2 Lawful Points of Discharge

The site's Lawful Points of Discharge (LPD) has been identified at the site in LPD A, where the existing waterway exits the site.

In accordance with the City of Gold Coast Land Development Guidelines, stormwater discharging the site will not cause any actionable nuisance, environmental or property damage. This will be achieved by the inclusion of an onsite stormwater detention device.

## 2.3 XP-SWMM Analysis

XP-SWMM (version 2026.1) software was utilised to model the performance of the proposed stormwater quantity control measures. This modelling software is a link-node model capable of performing hydrology and hydraulics of stormwater drainage systems simultaneously.

Laurenson's Hydrology has been adopted as the runoff routing method within XP-SWMM. Sub-catchment routing in this method is carried out using the Muskingum procedure, which is a storage routing method based on the storage equation.

Details of the assumptions and input parameters used within the XP-SWMM model inputs are included in Appendix C.

### 2.3.1 Rational Method Comparison

The Rational Method has been used to gain an initial understanding of the relative impact of the proposed development on peak flow rates at the site's LPD. The Rational Method is a basic method for assessing peak flow rates and is considered suitable given the catchment area is less than 500 ha and the time of concentration within the contributing catchments is less than 30 minutes (IPWEAQ, 2017).

It should be noted that although the Rational Method has been used as an initial estimate of site peak flows, it has not been used for the design of any mitigation measures nor has been used for calibration of the runoff XP-SWMM model. A comparison between the peak discharge values obtained using the Rational Method and the XP-SWMM model for the 1% AEP event at catchment discharge points is contained in Table 2.3 below.

**Table 2.3 Rational Method vs XP-SWMM Generated Peak Discharges**

| Scenario | Catchment ID | Rational ($m^3/s$) | XP-SWMM ($m^3/s$) | Difference (%) |
|---|---|---|---|---|
| **Pre-developed** | Ext A | 39.57 | 34.62 | 13 |
| | A | 0.97 | 0.96 | 1 |
| **Post-developed** | A1 | 0.62 | 0.62 | 0 |
| | A2 | 0.29 | 0.29 | 0 |
| | A3 | 0.36 | 0.28 | 22 |

The peak discharges generated by XP-SWMM and the Rational Method compare well and are considered acceptable for this assessment.

## 2.4 XP-SWMM Results

### 2.4.1 Performance of OSD

To confirm the performance of the proposed OSD system, a pre and post-development model was constructed. These models compare the discharge hydrographs for a range of storm durations at the existing Lawful Points of Discharge. A full range of events have been simulated for critical events.

A summary of the modelling results for different ARI events is contained in Table 2.4. Results of the modelling indicate the proposed system is capable of maintaining the pre-development peak discharges for the all storm events up to the 1% AEP event at LPD A.

A plot of the pre-development vs post-development (mitigated) hydrographs at LPD A (including flows from Ext A) for the 1% AEP event is included as Figure 2.1. The detention sizing was optimised to achieved peak flow requirements.

The critical temporal patterns for the XP-SWMM model are based off the 2019 AR&R Rainfall Data and the max median event of each duration is selected as the critical storm.

**Table 2.4 Pre-Development vs Post-Development (Unmitigated) Peak Discharges at LPD A**

| AEP Event (%) | Pre-Development | | Post-Development | |
|---|---|---|---|---|
| | Critical Duration | Peak Discharge ($m^3/s$) | Critical Duration | Peak Discharge ($m^3/s$) |
| 1 | 120min TP9 | 35.52 | 120min TP9 | 35.54 |
| 2 | 90min TP5 | 31.22 | 90min TP5 | 31.31 |
| 5 | 120min TP7 | 28.16 | 120min TP7 | 28.39 |
| 10 | 120min TP4 | 22.32 | 120min TP4 | 22.39 |
| 18 | 120min TP9 | 16.39 | 120min TP9 | 16.44 |
| 39 | 120min TP9 | 11.11 | 120min TP9 | 11.13 |

Table 2.5 Pre-Development vs Post-Development (Mitigated) Peak Discharges at LPD A

| AEP Event (%) | Pre-Development | | Post-Development (Mitigated) | |
|---|---|---|---|---|
| | Critical Duration | Peak Discharge ($m^3/s$) | Critical Duration | Peak Discharge ($m^3/s$) |
| 1 | 120min TP9 | 35.52 | 120min TP9 | 35.48 |
| 2 | 90min TP5 | 31.22 | 90min TP5 | 31.22 |
| 5 | 120min TP7 | 28.16 | 120min TP7 | 28.09 |
| 10 | 120min TP4 | 22.32 | 120min TP4 | 22.14 |
| 18 | 120min TP9 | 16.39 | 120min TP9 | 16.39 |
| 39 | 120min TP9 | 11.11 | 120min TP9 | 11.09 |

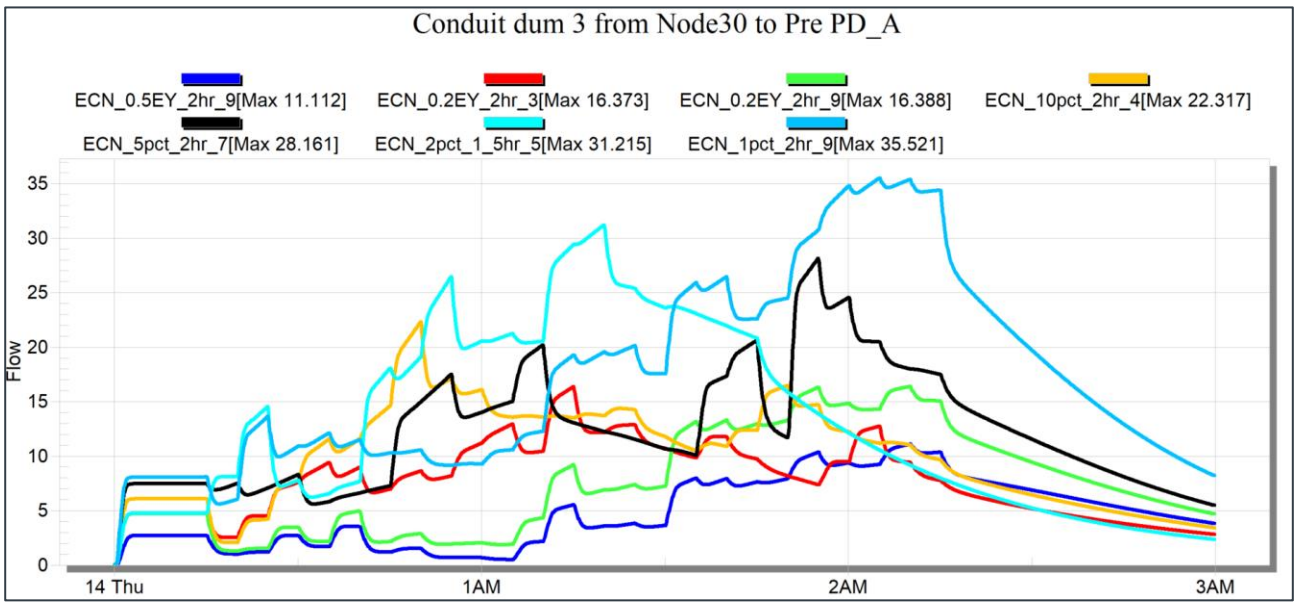



Figure 2.1 Plot of Pre-Development 1% AEP Hydrographs at LPD A

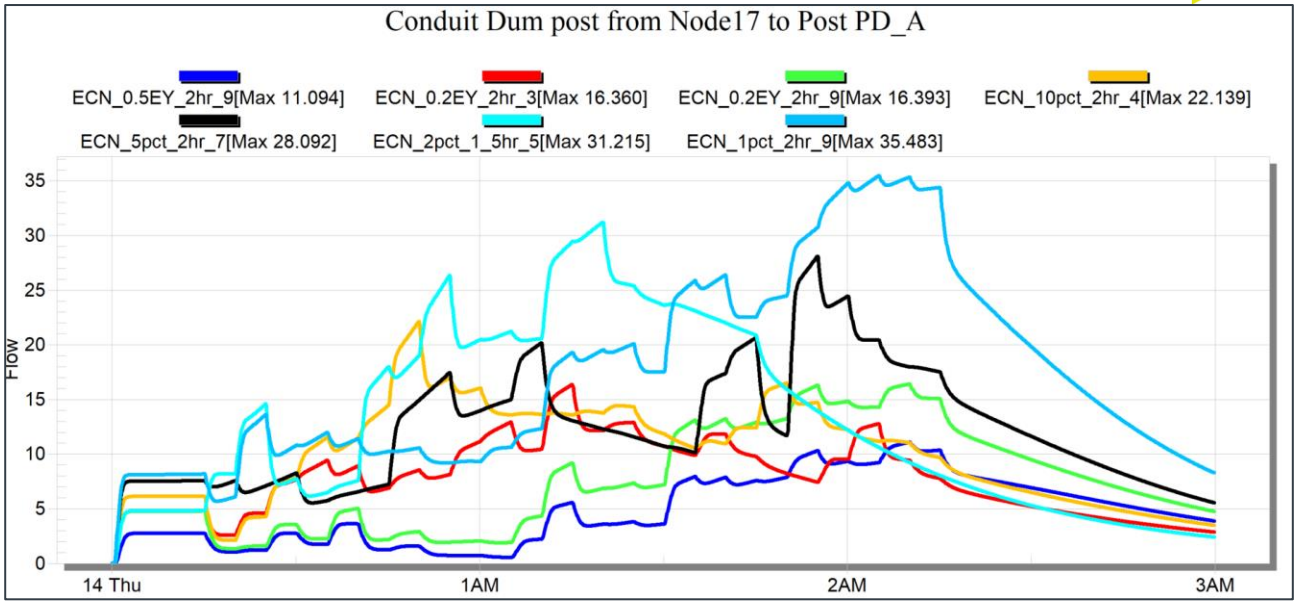



**Figure 2.2 Plot of Post-Development Mitigated 1% AEP Hydrographs at LPD A**

## 2.5 Woongoolba Flood Plain Mitigation

As the site is located within the Woongoolba flood mitigation scheme catchment area, the proposed development is required to demonstrate that peak flow rates will also be maintained in rainfall event up to that of 72 hours for 0.5EY, 0.2EY and 10% AEP events.

The results provided in Table 2.6 below indicate that the proposed detention system is capable of maintaining pre-development discharges in all durations up to the 72-hour storm event.

**Table 2.6 Pre-Development vs Post-Development Peak Discharges at LPD – Woongoolba Flood Mitigation Catchment**

| Woongoolba Flood Mitigation Catchment | | | |
|---|---|---|---|
| **AEP Event (%)** | **Critical Duration** | **Pre-Developed Peak Discharge ($m^3/s$)** | **Post-Developed (Mitigated) Peak Discharge ($m^3/s$)** |
| 39% (0.5EY) | 6hr TP4 | 8.82 | 8.81 |
| | 9hr TP5 | 9.12 | 9.11 |
| | 12hr TP4 | 6.96 | 6.94 |
| | 18hr TP1 | 5.72 | 5.73 |
| | 24hr TP5 | 6.57 | 6.56 |
| | 30hr TP10 | 5.03 | 5.03 |
| | 36hr TP5 | 4.99 | 4.99 |
| | 48hr TP9 | 6.95 | 6.94 |

| | | | |
|---|---|---|---|
| | 72hr TP1 | 3.47 | 3.47 |
| 18% (0.2EY) | 6hr TP6 | 12.51 | 12.47 |
| | 9hr TP5 | 13.04 | 13.02 |
| | 12hr TP4 | 10.16 | 10.13 |
| | 18hr TP1 | 8.76 | 8.75 |
| | 24hr TP5 | 9.53 | 9.51 |
| | 30hr TP1 | 7.31 | 7.31 |
| | 36hr TP5 | 7.13 | 7.13 |
| | 48hr TP9 | 9.83 | 9.83 |
| | 72hr TP10 | 5.12 | 5.12 |
| 10% | 6hr TP8 | 16.78 | 16.78 |
| | 9hr TP9 | 13.99 | 13.99 |
| | 12hr TP10 | 12.75 | 12.72 |
| | 18hr TP6 | 9.16 | 9.16 |
| | 24hr TP8 | 9.55 | 9.52 |
| | 30hr TP7 | 11.26 | 11.26 |
| | 36hr TP3 | 7.73 | 7.73 |
| | 48hr TP3 | 8.69 | 8.68 |
| | 72hr TP4 | 6.31 | 6.31 |

## 2.6 On Site Detention (OSD) Details

The proposed OSD systems are to be implemented to ensure a non-worsening of peak discharges at LPD A.

Table 2.7 below contains the details of the proposed OSD systems within the subject site.

**Table 2.7 OSD Details**

| Detention ID | Outlet Structures | | | | 1% AEP Detention Volume ($m^3$) |
|---|---|---|---|---|---|
| | Orifice 1 | Orifice 2 | Pit | Outlet Pipe | |
| Detention Tank A1 | 0.15m x 0.2m @ base | 0.15m x 0.5m @ 0.65m from base | 0.6m x 0.6m (1.8m weir length) @ 1.0m above base | 375mm dia. RCP @ base | 469 |

## 2.7 Detention Tank Configuration

Shown below in Figure 2.3 is Drawing N401, the detention tank section. Refer to Appendix E for more information.

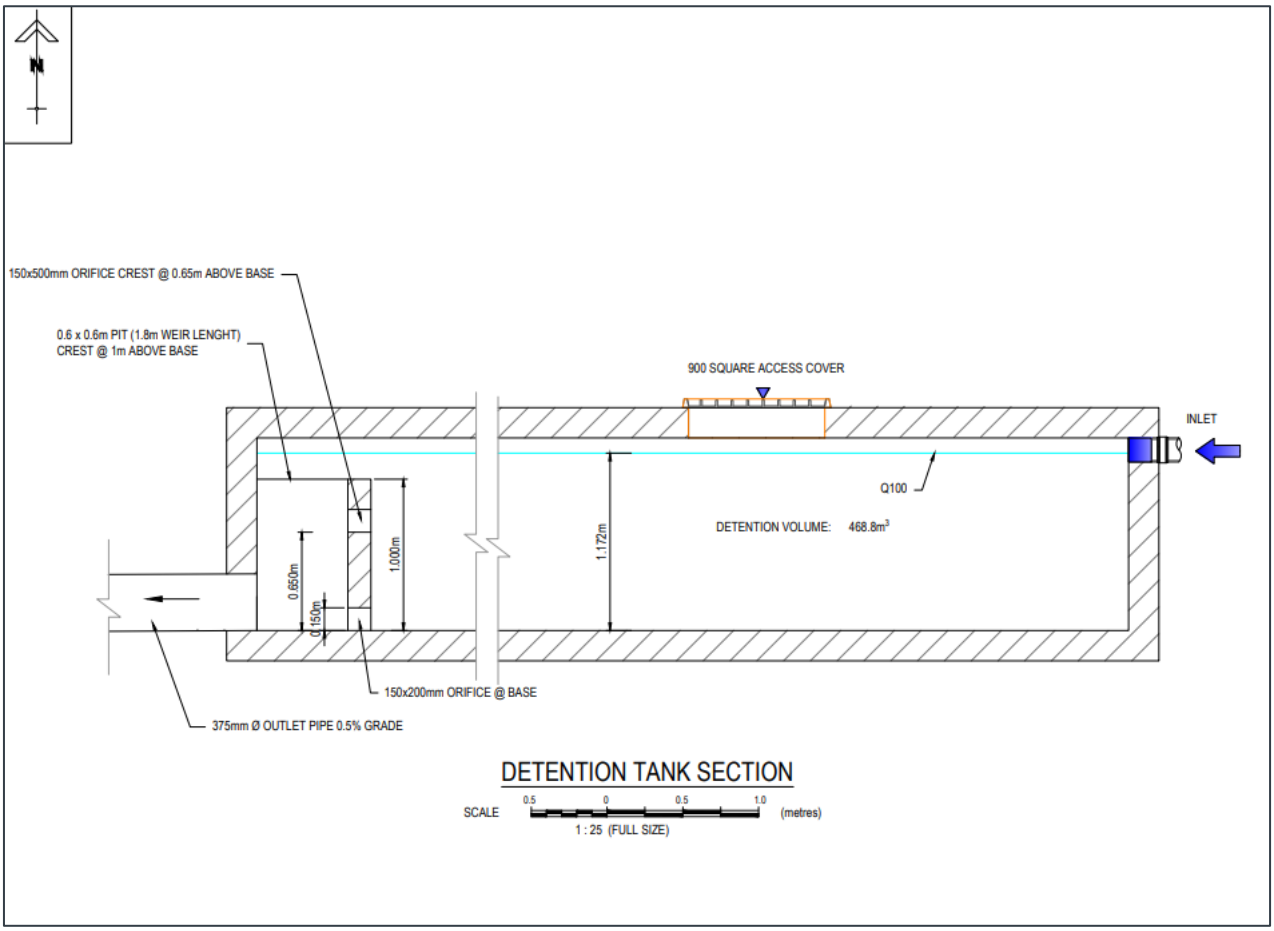



**Figure 2.3 Operational Control Plan Section Details**

# 3. Stormwater Quality Management

In accordance with the City of Gold Coast City Plan Version 13, the total effect of permanent water quality control measures are to achieve reductions in the mean annual load generated by the development site at a minimum of:

- 90% for Gross Pollutants (>5mm);
- 80% for Total Suspended solids (TSS);
- 60% for Total Phosphorus (TP); and
- 45% for Total Nitrogen (TN).

This will ensure the environmental values of the downstream receiving waters are maintained and have been chosen as the WQO for the development.

## 3.1 MUSIC Model

To ensure the above WQOs can be met at the site's LPD, a treatment train was proposed for the developed site and modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software. The model was constructed to demonstrate that the load-based reduction targets can be achieved. Details of the MUSIC model input parameters used are included in Appendix D.

## 3.2 Treatment Train Details

A separate treatment train has been proposed for Parcel A (Catchment A1) and Parcel B (Catchment A2), shown below is a summary of the required treatment for each parcel.

### 3.2.1 Treatment Train – Parcel A

It is proposed to utilise ATLAN filters within proposed Detention Tank A1 , further detail of the input parameters used within MUSIC are included in Appendix D. The location of the proposed treatment train elements are included in the Operational Control Plan within Appendix E. The recommended filter and storm sack configuration is as follows:

- Catchment A:
  - 8 x Full Height ATLAN Filter Cartridges
  - 8 x ATLAN Stormsacks

A typical section of an ATLAN Filter has been included in Figure 3.1. The stormwater treatment system has been designed and will be installed by ATLAN.

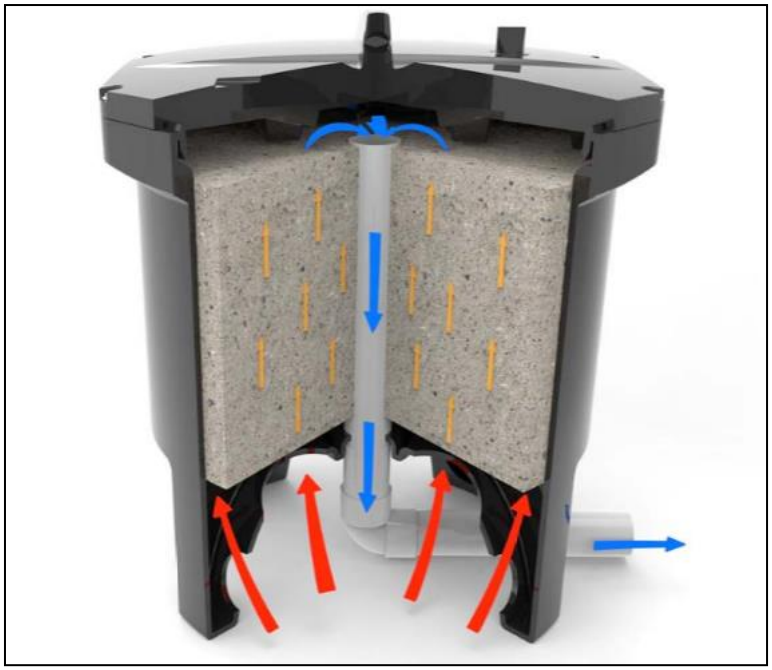


**Figure 3.1 Typical ATLAN Filter (ATLAN, 2025)**

The conceptual parameters of the proposed treatment trains are presented in Table 3.1, and further detail of the input parameters used within MUSIC are included in Appendix D.

### 3.2.2 MUSIC Results – Parcel A (Catchment A1)

Results of the MUSIC modelling for the treatment train effectiveness are summarised in Table 3.1. The results indicate the 80%, 60%, 45% & 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

**Table 3.1 Treatment Train Effectiveness**

| Pollutant | Inflows (kg/yr) | Outflows (kg/yr) | Reduction Achieved (%) | Water Quality Objective (%) |
|---|---|---|---|---|
| TSS | 1700 | 325 | 80.8 | 80 |
| TP | 3.32 | 0.859 | 74.1 | 60 |
| TN | 17.5 | 8.05 | 53.9 | 45 |
| GP | 201 | 0 | 100 | 90 |

NOTE: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results is presented in Figure 3.2

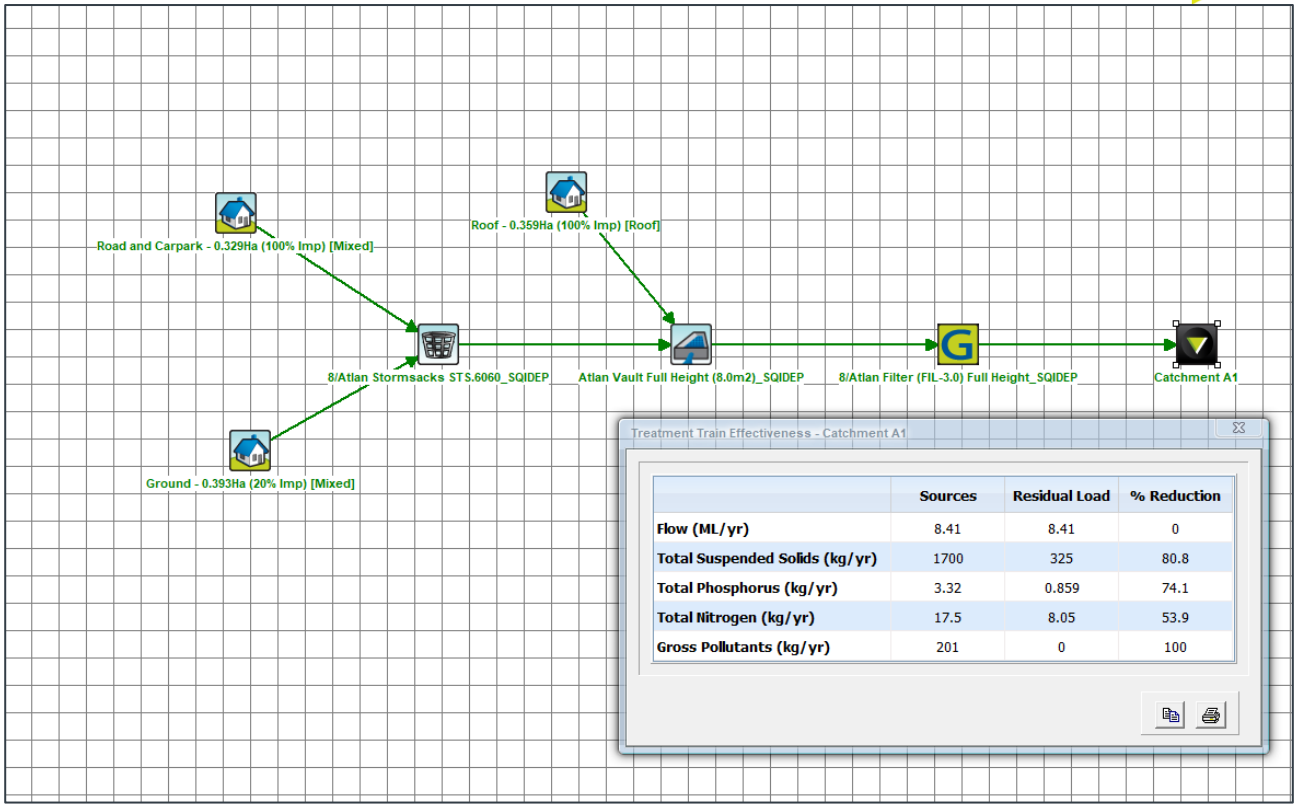



**Figure 3.2 Treatment Train Layout & MUSIC Results**

### 3.2.3 Treatment Train – Parcel B (Catchment A2)

It is proposed to utilise a bio-retention basin to treat run off from Parcel B, further detail of the input parameters used within MUSIC are included in Appendix D. The location of the proposed treatment train is included in the Operational Control Plan within Appendix E. The required bio-retention filter area is as follows:

Typical sections of a bioretention basin have been included in Figure 3.3, Figure 3.4. The bioretention system will be designed in accordance with the Water By Design Bioretention Technical Design Guidelines during the detailed design phase of the development (Water By Design, 2014).

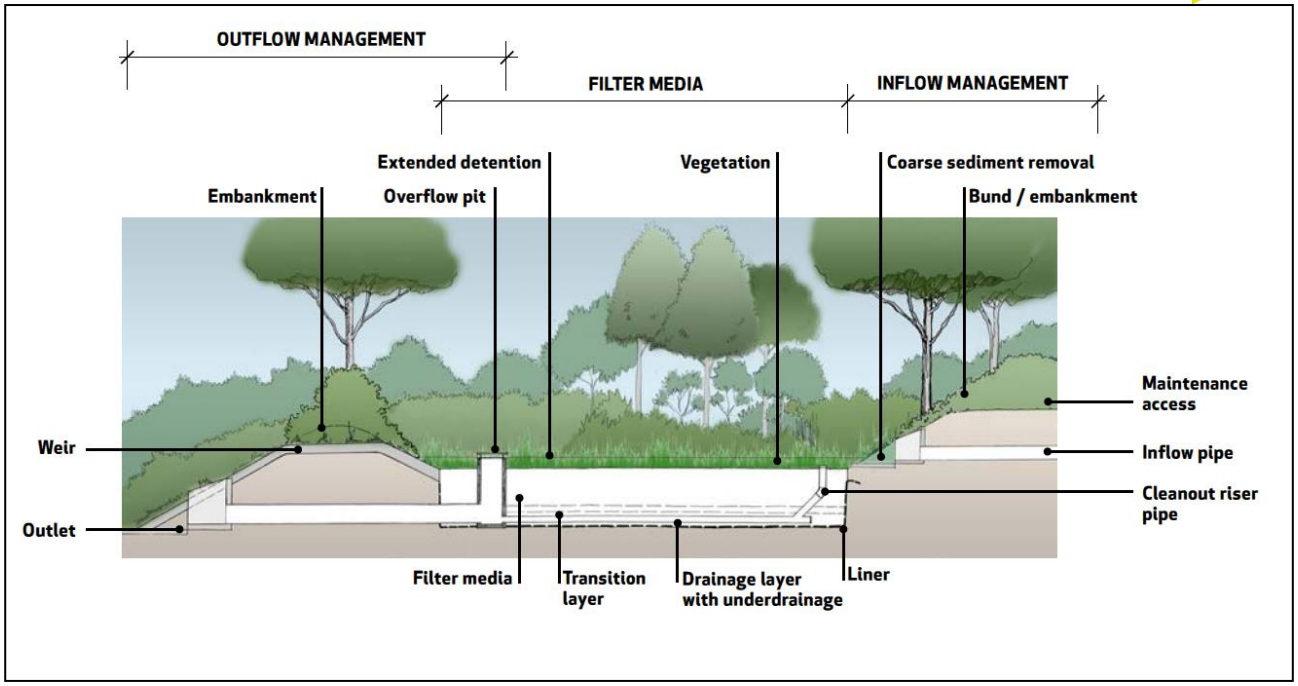



**Figure 3.3 Typical Bioretention Basin Invalid source specified.**

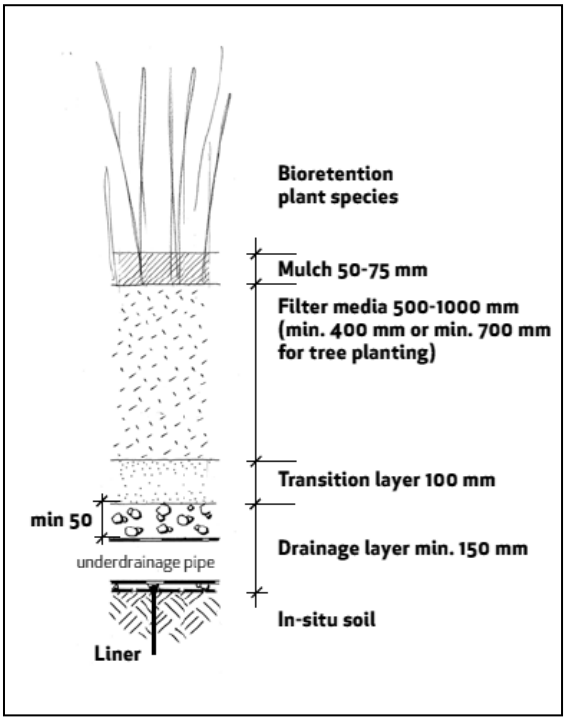



**Figure 3.4 Typical Lined Bioretention Drainage Profile (Water By Design, 2014)**

Table 3.2 Proposed Bio-Retention Basin Parameters

| Basin ID | Parameter | Value |
|---|---|---|
| A | Extended Detention Depth | 0.3m |
| | Filter Media Area | 40m$^2$ |
| | Filter Media Depth | 0.5m |
| | Transition Layer | 100mm |
| | Drainage Layer | 150mm |

### 3.2.4 MUSIC Results – Parcel B (Catchment A2)

Results of the MUSIC modelling for the treatment train effectiveness are summarised in Table 3.1. The results indicate the 80%, 60%, 45% & 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

Table 3.3 Treatment Train Effectiveness

| Pollutant | Inflows (kg/yr) | Outflows (kg/yr) | Reduction Achieved (%) | Water Quality Objective (%) |
|---|---|---|---|---|
| TSS | 807 | 153 | 81 | 80 |
| TP | 1.54 | 0.407 | 73.5 | 60 |
| TN | 8.1 | 4.14 | 48.8 | 45 |
| GP | 97.4 | 0 | 100 | 90 |

NOTE: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results is presented in Figure 3.5.

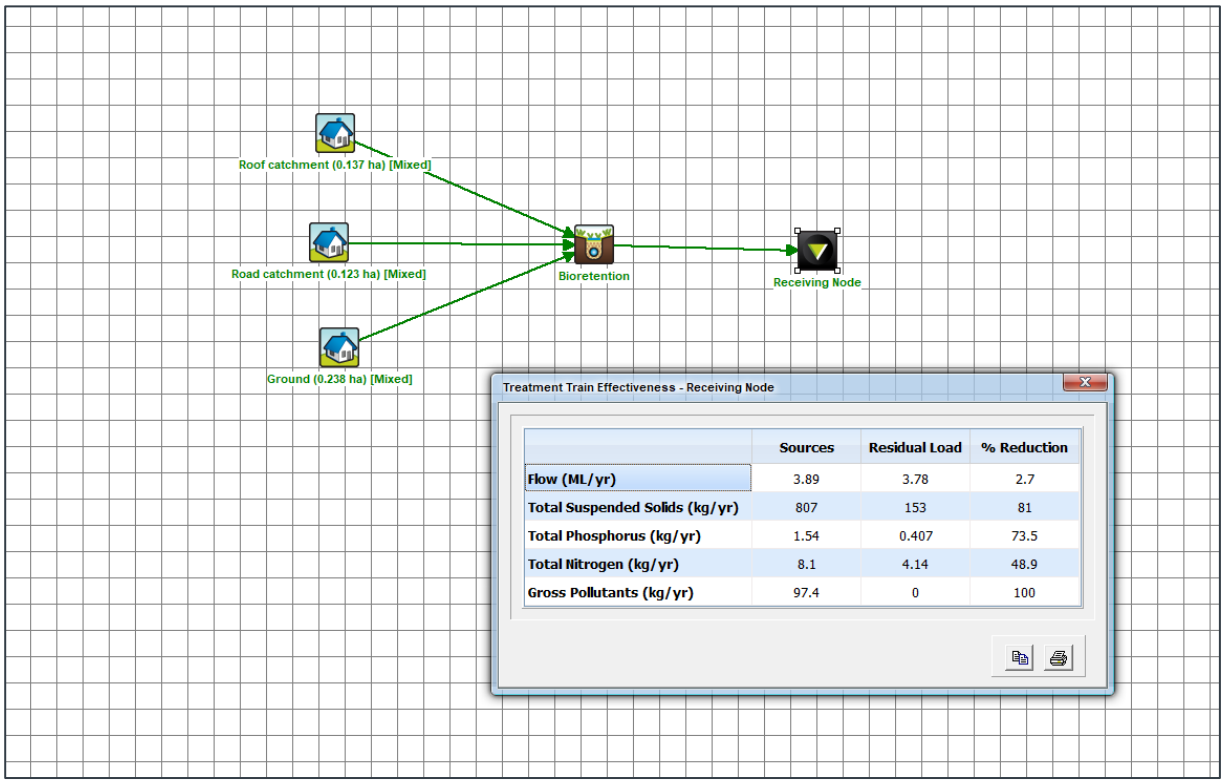



Figure 3.5 Treatment Train Layout & MUSIC Results

# 4. Conclusions

This Conceptual Stormwater Management Plan (CSMP) has been prepared for Bosform Pty Ltd the proponent of this Development Application. The proponent is seeking Development Approval for a proposed 57 lot multi-unit townhouse development over 2 Karingal Drive, Pimpama properly described as Lot 19 on RP 152380 (the subject site). The following is a summary of the report findings:

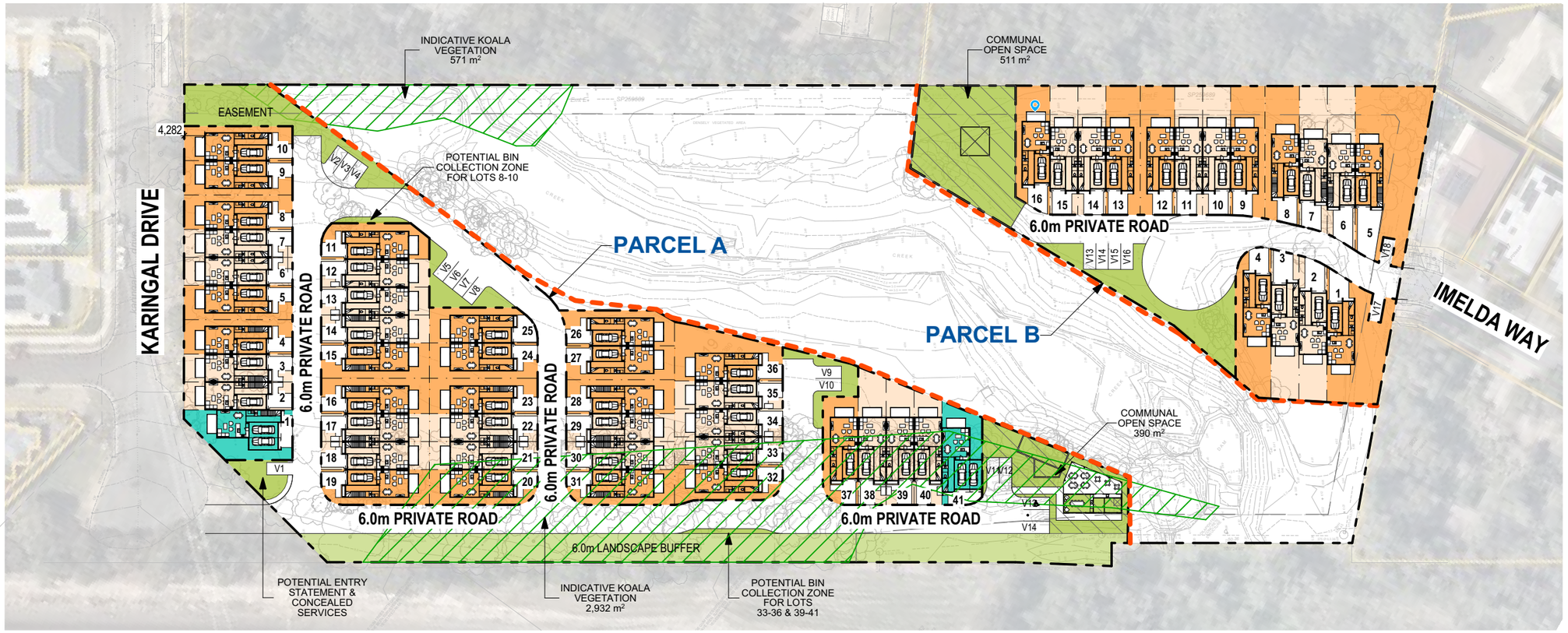
**Stormwater Quantity**

- The Lawful Point of Dishcharge for the site has been defined as the existing waterway on the site's eastern property boundary.
- Stormwater runoff from Catchment A1 will be conveyed to a detention tank, where it will be released at the LPD in a controlled manner to ensure that there is non-worsening peak flow in the post-developed scenario. The detention tank A1 will have a 1% AEP volume of 469m$^3$.
- There is a 141.69 ha external catchment which is conveyed through the site via an existing waterway, no development is proposed within this waterway;
- Peak discharge from the developed catchment will be that of or less than the pre-developed scenario.
- As the site is within the Woongoolba flood mitigation scheme catchment area, peak outflows and timings have been assessed for Q2, Q5 and Q10 for rainfall events up to 72 hours and does not change as a result of development

**Stormwater Quality**

- To achieve the City of Gold Coast's Water Quality Objectives, it is proposed to use a mix of bioretention systems and proprietary devices to treat stormwater runoff. These bioretention systems will be private infrastructure, owned and maintained by the body corporate.
- The required treatment for catchment A1 will be 8 ATLAN Stormsacks and 8 ATLAN Filters.
- The bioretention device positioned within Catchment A2 will have a total filter media footprint of 40m$^2$.

## Appendix A – Proposed Plans of Development




## PARCEL A - THE BROOKFIELD
**2 KARINGAL DRIVE**

### SITE SUMMARY
APPROX. NET SITE AREA 1.073 ha
APPROX. NET DENSITY 38.21 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 19 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 20 |
| **SPECIAL B**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 2 |
| **TOTAL** | 41 |

## PARCEL B - THE FERNHURST
**60 IMELDA WAY**

### SITE SUMMARY
APPROX. NET SITE AREA 0.491 ha
APPROX. NET DENSITY 32.59 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **TOTAL** | 16 |

**NOTE:** GCCC

LOT BOUNDARIES AND AREAS ARE BASED OFF PDF PLAN AND ARE INDICATIVE ONLY SIZES TO BE CONFIRMED

INDICATIVE KOALA VEGETATION AREA

INDICATIVE BUILDABLE PAD AREA (BURCHILLS)

PRODUCT TO BE MODIFIED. TERRACE IN EASEMENT

# STRUCTURE PLAN

0 10 20 30 40 50m
Scale 1:1000 @ A3

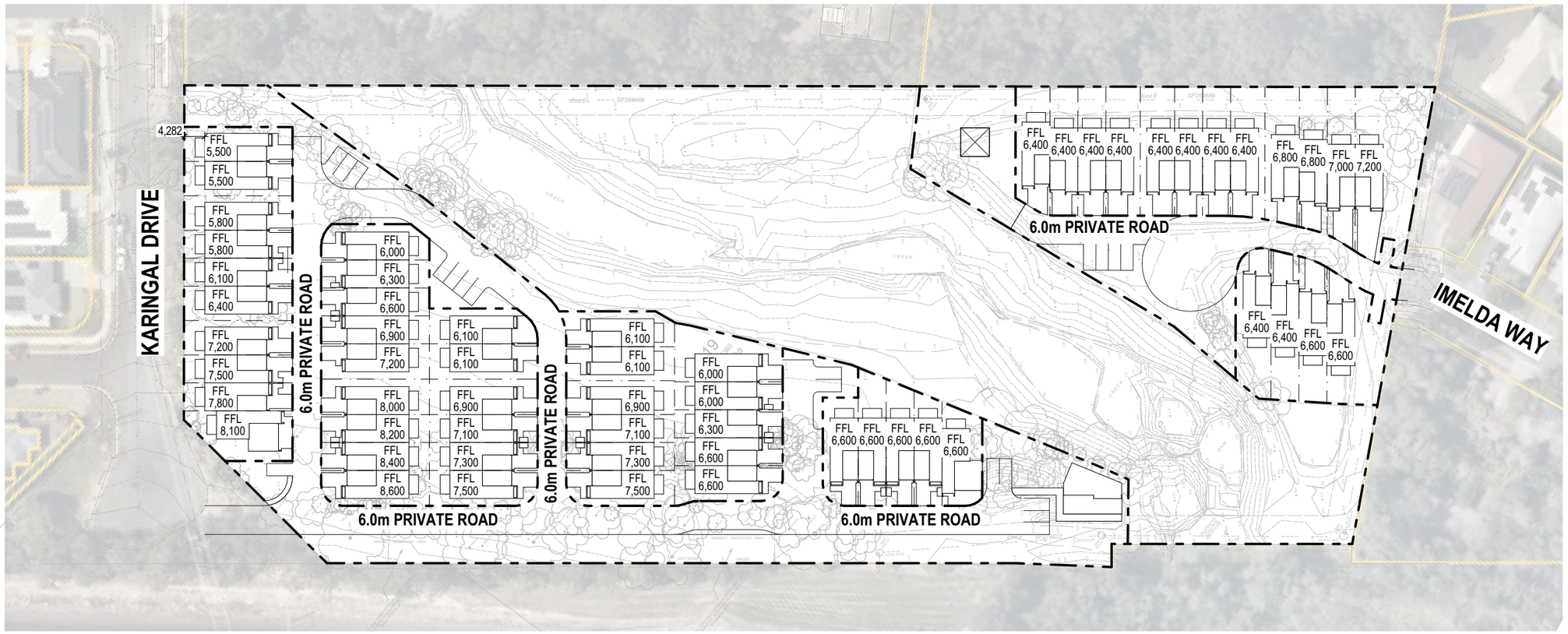
F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY
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# INDICATIVE SITE PLAN

0 10 20 30 40 50m

Scale 1:1000 @ A3

F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY

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## Appendix B – Time of Concentration and Rational Method Calculation

### Pre-Development Hydrology

The natural hydrology of the site has been assessed in accordance with QUDM (IPWEAQ, 2017) Section 4.1. The time of concentration for all catchments has been determined using Friend's Equation as per QUDM Section 4.6.6, combined with a channel time flow calculation.

*Friend's Equation* $tc = (107nL^{0.333})/S^{0.2}$

Table C.1 presents a summary of the catchment parameters used within Friend's Equation and the calculated time of concentration for the pre-development scenario.

**Table C.1 Time of Concentration for Pre-Development Scenario**

| Catchment ID | Ext_A | Pre_A |
|---|---|---|
| **Standard Inlet Time** | - | - |
| **Overland Flow** | | |
| Estimated Sheet flow Length (Table 4.06.3) | 50 | 100 |
| Horton's Roughness Value | 0.06 | 0.06 |
| Slope (%) | 10 | 5 |
| tc (minutes) | 14.90 | 21.56 |
| **Channel/Creek Flow** | | |
| Length of Channel Flow (m) | 1350 | 75 |
| Velocity (m/s) – assumes 1.5 | 0.7 | 0.9 |
| tc (minutes) | 32.14 | 1.39 |
| **TOTAL tc (minutes)** | **47** | **23** |

### Post-Development Hydrology – Unmitigated

Table C.2 presents a summary of the catchment parameters used for the calculated time of concentration for the post-development scenario. The time of concentration for the external catchment is presented in Table C.1 above.

**Table C.2 Time of Concentration for Post-Development Scenario**

| Catchment ID | Post A1 | Post A2 | Post A3 |
|---|---|---|---|
| **Standard Inlet Time** | 15 | 15 | |
| **Overland Flow** | | | |
| Estimated Sheet flow Length (Table 4.06.3) | | | 100 |
| Horton's Roughness Value | | | 0.045 |
| Slope (%) | | | 1 |
| tc (minutes) | | | |
| **Channel/Creek Flow** | | | |
| Length of Channel Flow (m) | | | 150 |
| Velocity (m/s) - assumes 1.5 | | | 1.5 |
| tc (minutes) | | | 2.78 |
| **TOTAL tc (minutes)** | **15** | **15** | **22** |

Design storm event flows across the site were derived using the Rational Method as per the above-mentioned manuals. This involved:

- Determination of a C10 value (derived in accordance with QUDM Table 4.05.3(b) and Council guidelines). A value of 0.66 was applied to the pre-development catchment and 0.83 was applied to the post-development catchment;
- Adoption of design rainfall using BoM IFD data; and
- Calculation of design flows through the site for Q100, Q50, Q20, Q10, Q5, Q2, and $Q3_{month}$, where $Q3_{month}$ is deemed to be 50% of Q1.

Summaries of the hydrologic calculations are contained in Table C.3 and Table C.4 for pre and post-development (un-mitigated) scenarios respectively.

**Table C.3 Pre-Development Hydrology**

| Catch. | Area (ha) | tc (min) | $I_{100}$ (mm/hr) | C | $Q_{100}$ ($m^3/s$) | $I_{50}$ (mm/hr) | C | $Q_{50}$ ($m^3/s$) | $I_{20}$ (mm/hr) | C | $Q_{20}$ ($m^3/s$) | $I_{10}$ (mm/hr) | C | $Q_{10}$ ($m^3/s$) | $I_5$ (mm/hr) | C | $Q_5$ ($m^3/s$) | $I_2$ (mm/hr) | C | $Q_2$ ($m^3/s$) | $I_1$ (mm/hr) | C | $Q_{3month}$ ($m^3/s$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ext A | 141.69 | 47.00 | 118.00 | 0.85 | **39.569** | 105.00 | 0.82 | **33.743** | 88.90 | 0.75 | **26.085** | 77.00 | 0.71 | **21.517** | 66.30 | 0.67 | **17.601** | 52.80 | 0.60 | **12.541** | 42.10 | 0.57 | **9.412** |
| Pre A | 2.46 | 23.00 | 169.00 | 0.84 | **0.968** | 153.00 | 0.81 | **0.840** | 131.00 | 0.74 | **0.657** | 115.00 | 0.70 | **0.549** | 99.70 | 0.67 | **0.452** | 80.10 | 0.60 | **0.325** | 63.90 | 0.56 | **0.244** |

**Table C.4 Un-Mitigated Post-Development Hydrology**

| Catch. | Area (ha) | tc (min) | $I_{100}$ (mm/hr) | C | $Q_{100}$ ($m^3/s$) | $I_{50}$ (mm/hr) | C | $Q_{50}$ ($m^3/s$) | $I_{20}$ (mm/hr) | C | $Q_{20}$ ($m^3/s$) | $I_{10}$ (mm/hr) | C | $Q_{10}$ ($m^3/s$) | $I_5$ (mm/hr) | C | $Q_5$ ($m^3/s$) | $I_2$ (mm/hr) | C | $Q_2$ ($m^3/s$) | $I_1$ (mm/hr) | C | $Q_{3month}$ ($m^3/s$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Post A1 | 1.08 | 15.00 | 207.00 | 1.00 | **0.619** | 187.00 | 0.95 | **0.536** | 162.00 | 0.8715 | **0.424** | 142.00 | 0.83 | **0.354** | 123.00 | 0.79 | **0.291** | 98.90 | 0.71 | **0.210** | 78.90 | 0.66 | **0.157** |
| Post A2 | 0.50 | 15.00 | 207.00 | 1.00 | **0.285** | 187.00 | 0.95 | **0.247** | 162.00 | 0.8715 | **0.195** | 142.00 | 0.83 | **0.163** | 123.00 | 0.79 | **0.134** | 98.90 | 0.71 | **0.097** | 78.90 | 0.66 | **0.072** |
| Post A3 | 0.88 | 22.00 | 173.40 | 0.85 | **0.359** | 157.20 | 0.82 | **0.312** | 135.00 | 0.7455 | **0.245** | 117.80 | 0.71 | **0.204** | 100.40 | 0.67 | **0.165** | 74.16 | 0.60 | **0.109** | 65.66 | 0.57 | **0.091** |

## Appendix C – XP-SWMM Input Parameters

### Laurenson Routing Parameters

In this study, the "Laurenson" routing method was applied to XP-SWMM for hydrograph generation. To enable this method to be used, each catchment must be split into pervious (undeveloped) and impervious (developed) portions. Adopted parameters for the Laurenson routing method included:

The fraction impervious has been determined by analysis of aerial photographs and the proposed development layout;

Manning Roughness coefficient (n):

- Pervious portion: 0.03; and
- Impervious portion: 0.014.

Initial Loss (IL) and Continuing Losses (CL) have been applied to the hydrologic model. Details of IL and CL parameters applied in the XP-SWMM model are presented in tables below.

### Adopted Initial & Continuing Losses

| Impervious Area | | Pervious Area | |
|---|---|---|---|
| IL (mm) | CL (mm/hr) | IL (mm) | CL (mm/hr) |
| **1** | 0 | 10 | 2.5 |

Analysis of the catchment has been undertaken to determine the average slope, with the results of this being applied to the model.

### Pre-Development Catchment Parameters

| Catchment | Impervious Area | | | Pervious Area | | |
|---|---|---|---|---|---|---|
| | Area (ha) | Fraction Impervious (%) | Slope (%) | Area (ha) | Fraction Impervious (%) | Slope (%) |
| **Pre A** | 0.044 | 100 | 2.83 | 0.012 | 0 | 2.83 |

### Post-Development (Unmitigated) Catchment Parameters

| Catchment | Impervious Area | | | Pervious Area | | |
|---|---|---|---|---|---|---|
| | Area (ha) | Fraction Impervious (%) | Slope (%) | Area (ha) | Fraction Impervious (%) | Slope (%) |
| **Post A** | 0.046 | 100 | 2.83 | 0.01 | 0 | 2.83 |

# Appendix D – MUSIC Input Parameters

## Rainfall and Evapotranspiration Parameters

MUSIC modelling was based on 6-minute interval data obtained from the Bureau of Meteorology (BOM) for rainfall station 40406 Beenleigh, as summarised in Table D1

**Table D1 Meteorological and Rainfall Runoff Data Reporting Table**

| Input | Data Used in Modelling |
|---|---|
| Rainfall station | 40406 BEENLEIGH |
| Time step | 6 minute |
| Modelling period | 1-01-1990 to 31-12-1999 (10 years) |
| Mean annual rainfall (mm) | 1152 |
| Evapotranspiration | 1491 |
| Rainfall runoff parameters | Residential |
| Pollutant export parameters | Residential |

## Catchment Parameters

Based on the proposed land uses within the development, the subject site has been modelled as commercial land use as detailed in Table D2. The site has been divided into roof, road and ground level source nodes as per the architectural drawings included in Appendix E.

**Table D 2 Land Use Parameters**

| Catchment ID | Area (ha) | Land use | Total Impervious (%) |
|---|---|---|---|
| A1 - Roof | 0.366 | Mixed | 100 |
| A1 - Ground | 0.388 | Mixed | 30 |
| A1 - Road & Carpark | 0.327 | Mixed | 100 |
| A2 - Roof | 0.137 | Mixed | 100 |
| A2 - Ground | 0.238 | Mixed | 30 |
| A2 - Road & Carpark | 0.123 | Mixed | 100 |

The pollutant loads and runoff parameters for each source node have been based on the data from the Water by Design MUSIC Modelling Guidelines (Water By Design, 2019), as summarised in Tables below.

Table B.5 Rainfall Runoff Parameters

| Parameter | All Nodes |
|---|---|
| Landuse | Residential |
| Rainfall threshold (mm) | 1 |
| Soil storage capacity (mm) | 500 |
| Initial storage (% capacity) | 10 |
| Field capacity (mm) | 200 |
| Infiltration capacity coefficient a | 211 |
| Infiltration capacity exponent b | 5 |
| Initial depth (mm) | 50 |
| Daily recharge rate (%) | 28 |
| Daily baseflow rate (%) | 27 |
| Daily deep seepage rate (%) | 0 |

Table B.6 Pollutant Load Parameters

| Urban Residential | Total Suspended Solids (log mg/L) | | Total Phosphorous (log mg/L) | | Total Nitrogen (log mg/L) | |
|---|---|---|---|---|---|---|
| | Mean | Std Dev. | Mean | Std Dev. | Mean | Std Dev. |
| Storm Flow Concentration | 1.30(1)<br>2.43(2)<br>2.18(3) | 0.39 | -0.89(1)<br>-0.30(2)<br>-0.47(3) | 0.31 | 0.26 | 0.23 |
| Base Flow Concentration | 0(1)<br>1.0(2,3) | 0(1)<br>0.34(2,3) | 0(1)<br>-0.97(2,3) | 0(1)<br>0.31 | 0(1)<br>0.20(2,3) | 0(1)<br>0.20(2,3) |

NOTE: (1) Values applied to “Roof” areas
(2) Values applied to “Road” areas
(3) Values applied to “Ground” areas

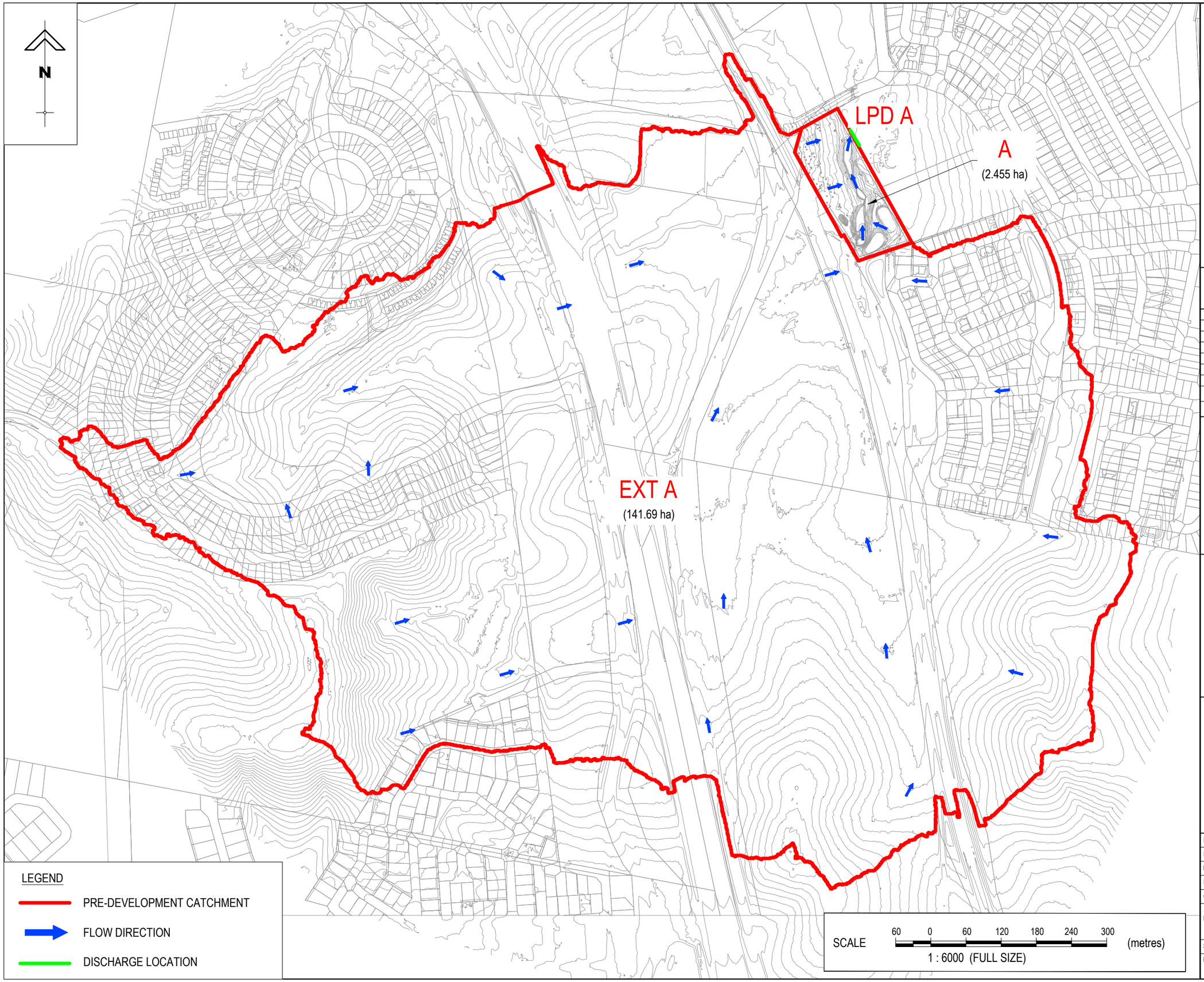
**Treatment Node Parameters**

The following sections describe the modelling parameters applied to MUSIC for each of the treatment nodes included as part of the water quality assessment.

**Table B.5 Bioretention Parameters Bio A1**

| Parameter | Bio A1 |
|---|---|
| High Flow Bypass ($m^3/s$) | 100 |
| Surface area ($m^2$) | 45 |
| Extended detention depth (m) | 0.3 |
| Filter area ($m^2$) | 40 |
| Unlined filter media perimeter (m) | 0.01 |
| Filter Depth (m) | 0.50 |
| Exfiltration Rate (mm/hr) | 0.00 |
| Is the base Lined? | Yes |
| Overflow Weir Width (m) | 4 |
| Underdrain present? | Yes |
| Submerged zone with carbon present? | No |
| Confirmation that K and C* remain default? | Yes |

# Appendix E – Burchills Engineering Solutions Conceptual Stormwater Management Drawings




PROJECT NAME

2 KARINGAL DRIVE, PIMPAMA

FOR

CLIENT

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

| VER. | DESCRIPTION | APPR. | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| A | ORIGINAL ISSUE | | 15.12.20 |

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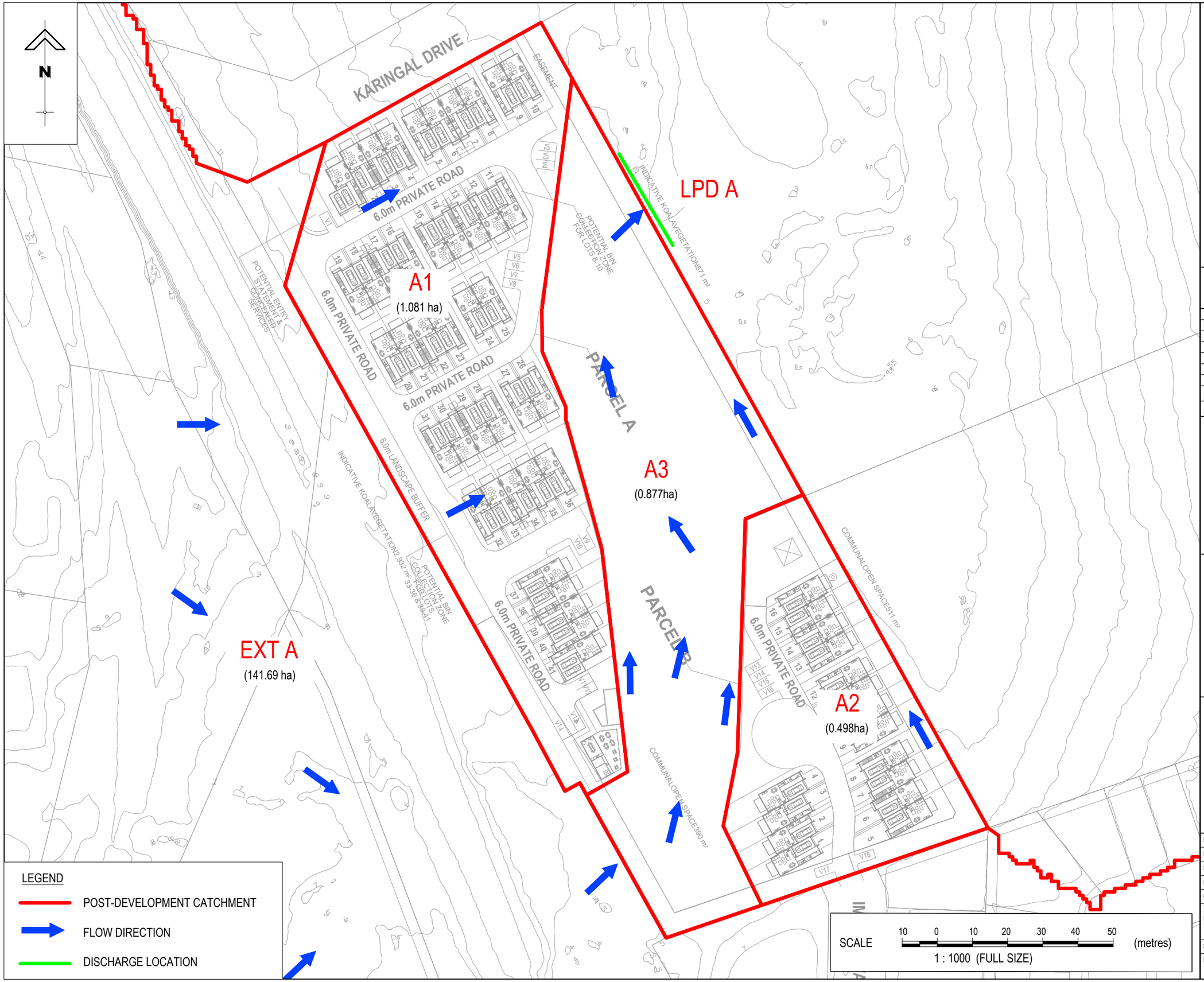
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Email: admin@burchills.com.au
**Coote Burchills Engineering Pty Ltd**
ABN 76 166 942 365

DRAWING TITLE :

# PRE-DEVELOPMENT CATCHMENT PLAN

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 15.12.20 |
| PROJECT LEADER : JH | |
| DESIGNER : JH | |
| DRAFTSPERSON : TP / LD | |
| CHECKED : | |
| APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 | |
| RPEQ No. : | |
| SCALE : 1:6000 | DATUM : / FULL SIZE : A3 |
| PROJECT No.: BE200223 | DRAWING No. : N200 / VERSION: A |




PROJECT NAME

2 KARINGAL DRIVE, PIMPAMA

FOR

CLIENT

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

| VER. | DESCRIPTION | APPR. | DATE |
|---|---|---|---|
| A | ORIGINAL ISSUE | | 15.12.20 |

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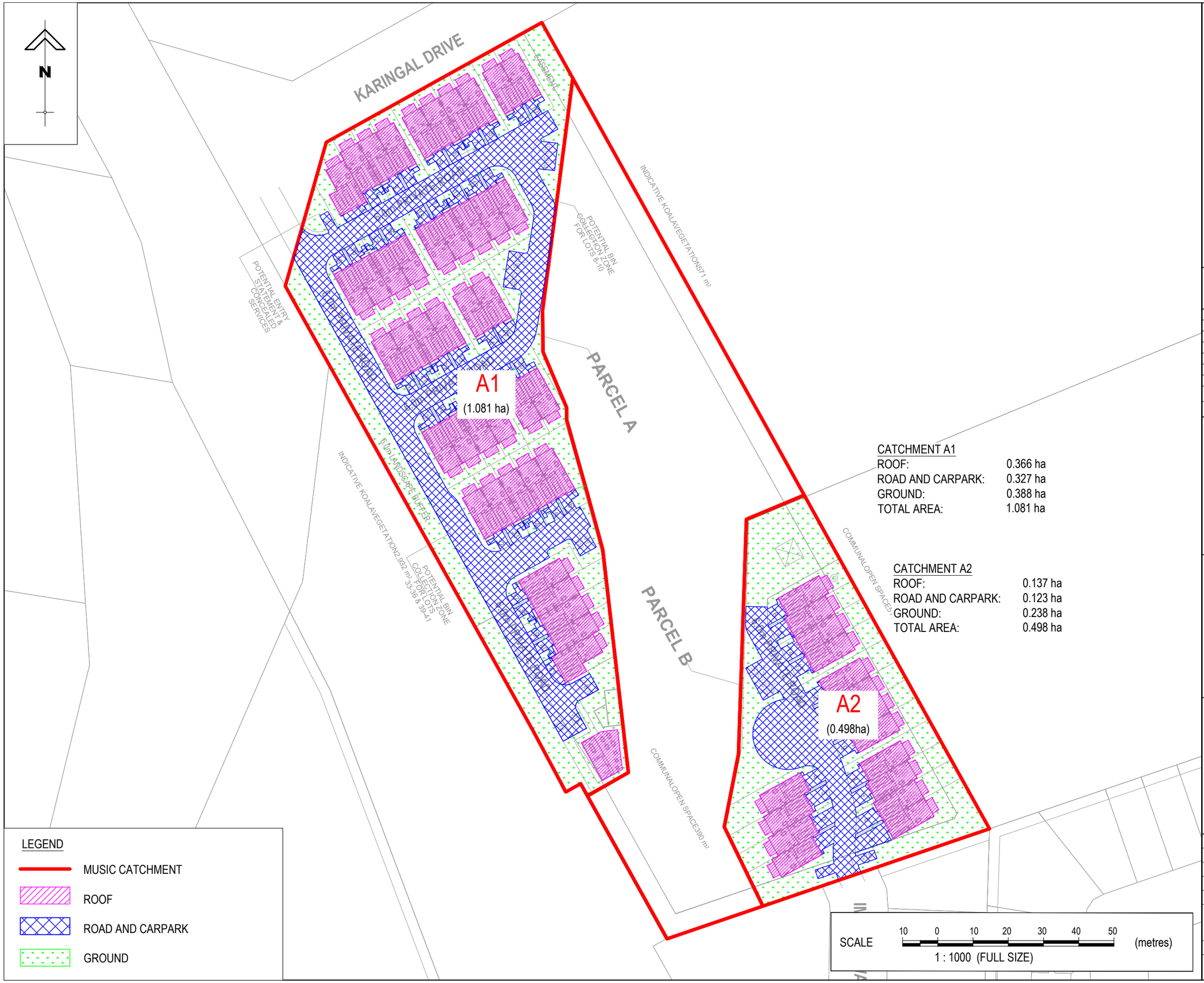
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**Coote Burchills Engineering Pty Ltd**
ABN 76 166 942 365


DRAWING TITLE :

POST-DEVELOPMENT CATCHMENT PLAN

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 15.12.20 |
| PROJECT LEADER : JH | |
| DESIGNER : JH | |
| DRAFTSPERSON : TP / LD | |
| CHECKED : | |
| APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. : | |
| SCALE : 1:1000 | DATUM : FULL SIZE : A3 |
| PROJECT No.: BE200223 | DRAWING No. : N201 VERSION: A |




# PROJECT NAME

## 2 KARINGAL DRIVE, PIMPAMA

## FOR

## CLIENT

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

| VER. | DESCRIPTION | APPR. | DATE |
|---|---|---|---|
| A | ORIGINAL ISSUE | | 15.12.20 |

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Email: admin@burchills.com.au
**Coote Burchills Engineering Pty Ltd**
ABN 76 166 942 365


DRAWING TITLE :

# MUSIC CATCHMENT PLAN

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 15.12.20 |
| PROJECT LEADER : JH | |
| DESIGNER : JH | |
| DRAFTSPERSON : TP / LD | |
| CHECKED : | |
| APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 | |
| RPEQ No. : | |
| SCALE : 1:1000 | DATUM : / FULL SIZE : A3 |
| PROJECT No.: BE200223 | DRAWING No. : N202 / VERSION: A |

N

KARINGAL DRIVE

DETENTION TANK A1:
DETENTION AREA: 400 m²
DETENTION VOLUME: 468.8 m³

LPD A

A1
(1.081 ha)

A3
(0.877ha)

A2
(0.498ha)

EXT A
(141.69 ha)

PARCEL A

PARCEL B

6.0m PRIVATE ROAD

6.0m PRIVATE ROAD

6.0m PRIVATE ROAD

8m PRIVATE ROAD

SOUTH PRIVATE ROAD

6.0m LANDSCAPE BUFFER

INDICATIVE KOALA HABITAT SEGMENT 2 932 m² 32-36 & 39-41

INDICATIVE KOALA HABITAT SEGMENT 571 m²

POTENTIAL BIN COLLECTION ZONE FOR LOTS 8-10

POTENTIAL BIN COLLECTION ZONE FOR LOTS 32-36 & 39-41

POTENTIAL ENTRY STATEMENT & LANDSCAPED SERVICES

COMMUNAL OPEN SPACE 390 m²

COMMUNAL OPEN SPACE 311 m²

EASEMENT

BIORETENTION BASIN A2:
FILTER AREA: 40 m²

LEGEND

- POST-DEVELOPMENT CATCHMENT
- SW — PIPE DRAINAGE
- BIORETENTION SYSTEM
- ON-SITE DETENTION
- PIT

SCALE 10 0 10 20 30 40 50 (metres)
1 : 1000 (FULL SIZE)

# PROJECT NAME

2 KARINGAL DRIVE, PIMPAMA

FOR

CLIENT

ORIGINAL SCALE BEFORE REDUCTION
A3 0 10 20 30 40mm.

| VER. | DESCRIPTION | APPR. | DATE |
|---|---|---|---|
| A | ORIGINAL ISSUE | | 15.12.20 |

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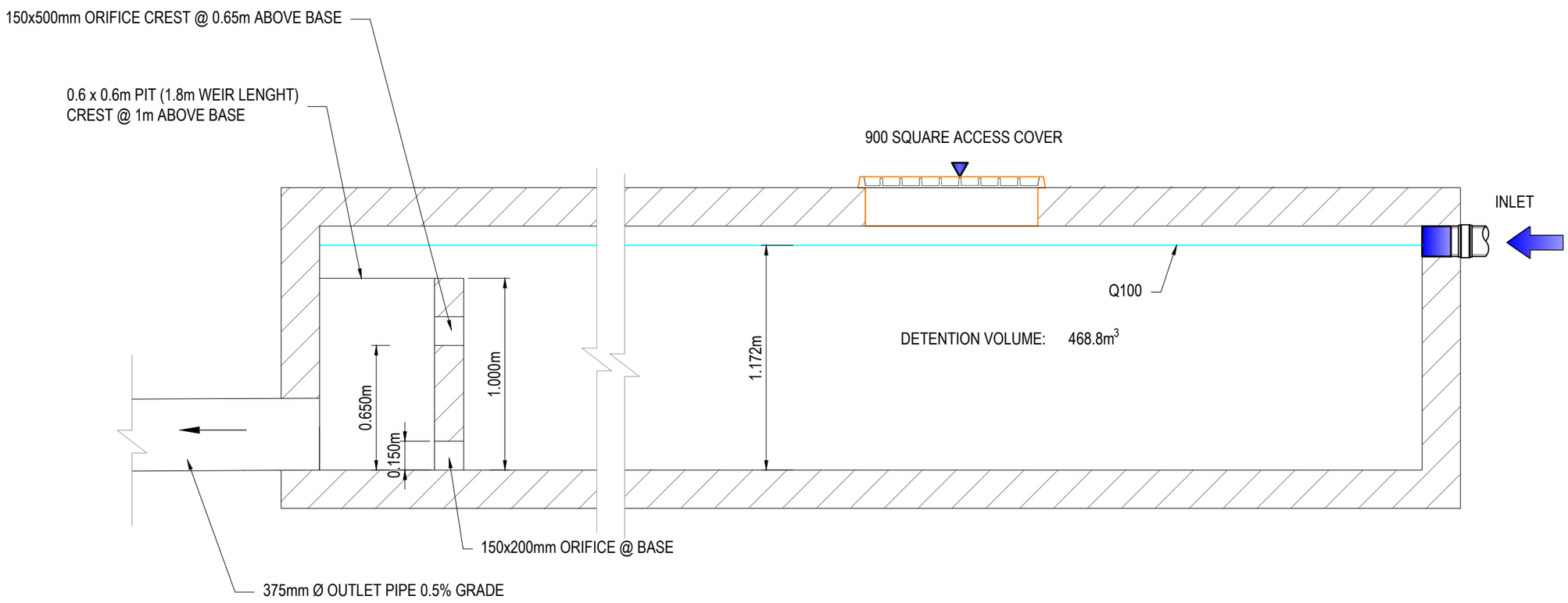
BURCHILLS ENGINEERING SOLUTIONS

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Email: admin@burchills.com.au
**Coote Burchills Engineering Pty Ltd**
ABN 76 166 942 365


DRAWING TITLE :

# OPERATIONAL CONTROL PLAN

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 15.12.20 |
| PROJECT LEADER : JH | |
| DESIGNER : JH | |
| DRAFTSPERSON : TP / LD | |
| CHECKED : | |
| APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 | |
| RPEQ No. : | |
| SCALE : 1:1000 | DATUM : FULL SIZE : A3 |
| PROJECT No.: BE200223 | DRAWING No. : N400 VERSION: A |




# DETENTION TANK SECTION

SCALE 0.5 0 0.5 1.0 (metres)

1 : 25 (FULL SIZE)

PROJECT NAME

2 KARINGAL DRIVE, PIMPAMA

FOR

CLIENT

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

| VER. | DESCRIPTION | APPR. | DATE |
|---|---|---|---|
| A | ORIGINAL ISSUE | | 15.12.20 |

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**Coote Burchills Engineering Pty Ltd**
ABN 76 166 942 365

DRAWING TITLE :

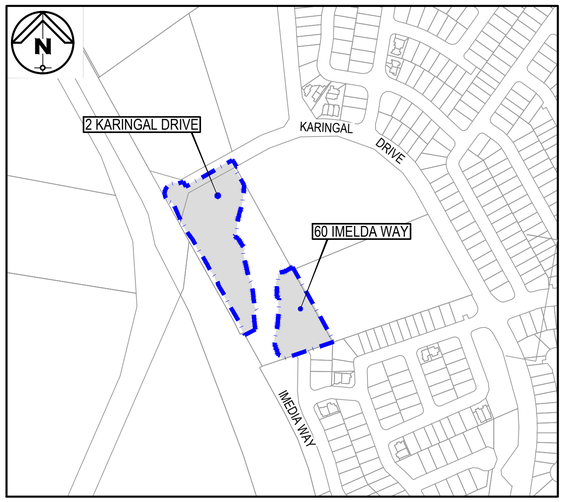
OPERATIONAL CONTROL DETAILS

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 15.12.20 |
| PROJECT LEADER : JH | |
| DESIGNER : JH | |
| DRAFTSPERSON : TP / LD | |
| CHECKED : | |
| APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. : | |
| SCALE : 1:1000 | DATUM : / FULL SIZE : A3 |
| PROJECT No.: BE200223 | DRAWING No. : N401 / VERSION: A |

# Appendix F – Burchills Engineering Solutions Preliminary Civil Engineering Drawings

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

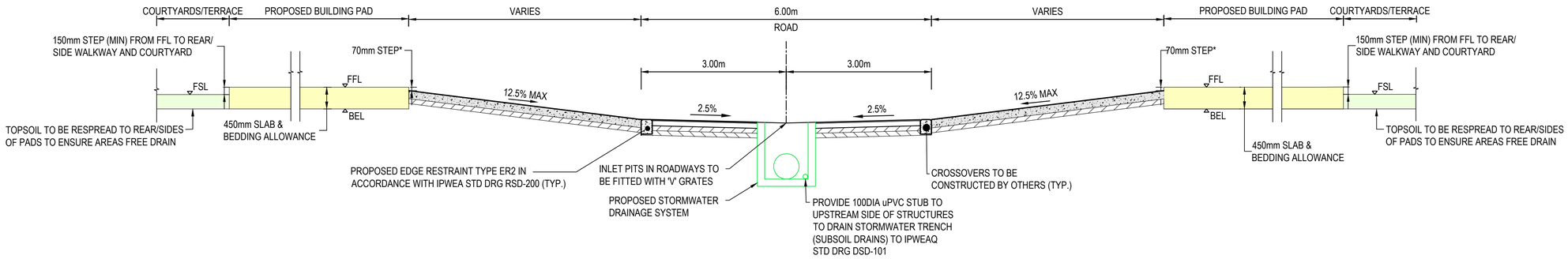
BOS

PREPARED BY

BURCHILLS ENGINEERING SOLUTIONS

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

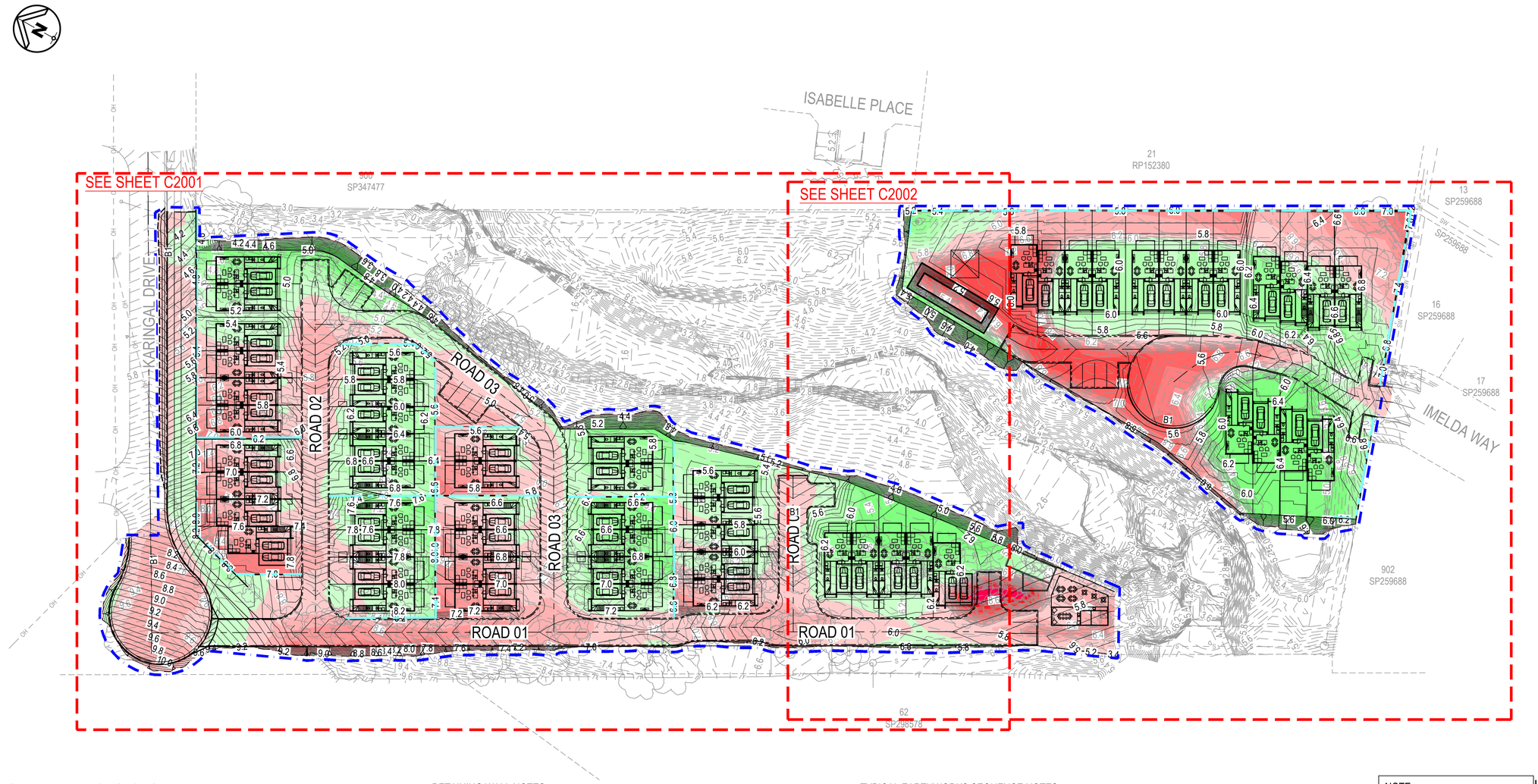
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

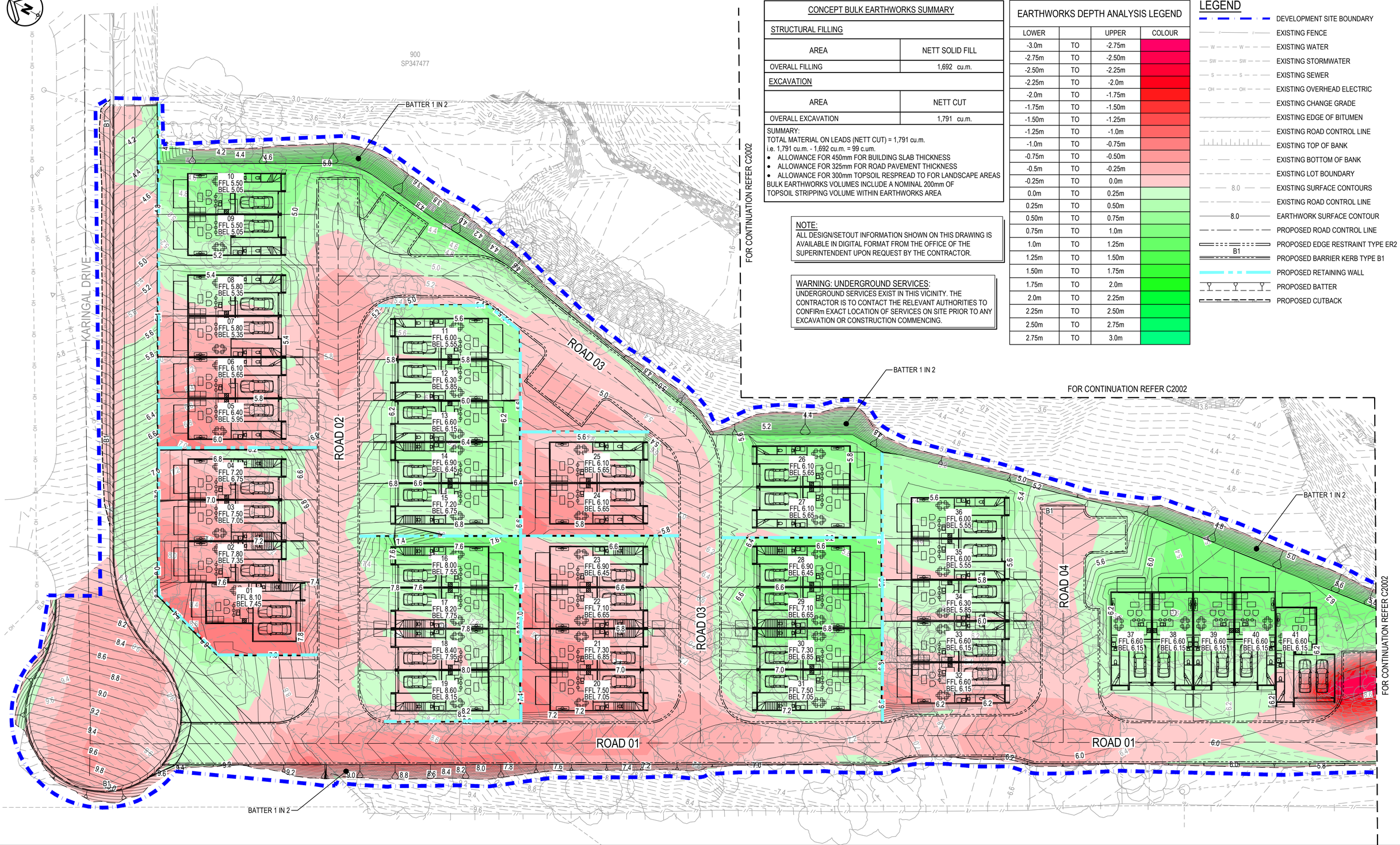
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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| A | ORIGINAL ISSUE | 11-03-26 |


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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |


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GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

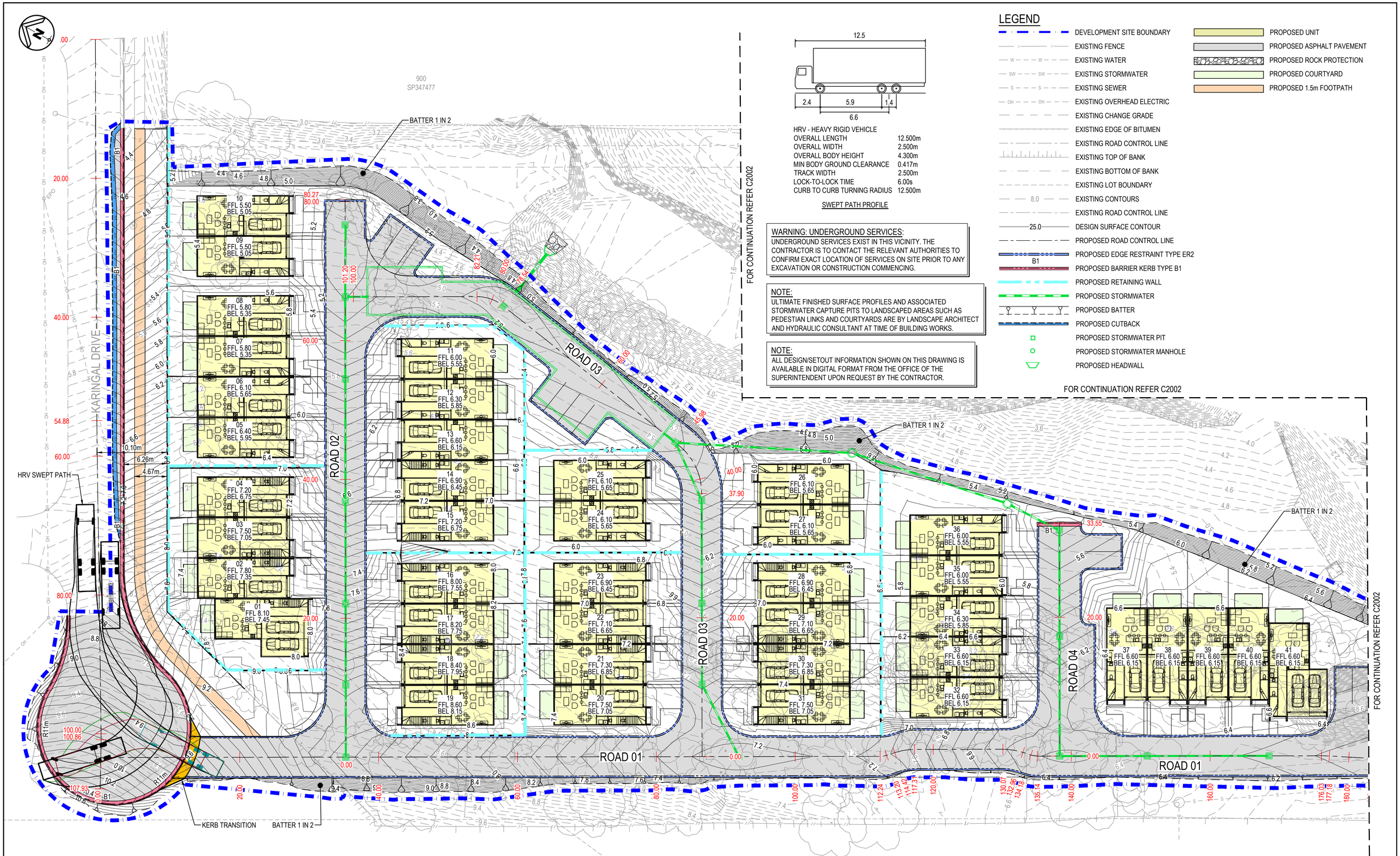
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3000 | A |




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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3001 | A |




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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT :
BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

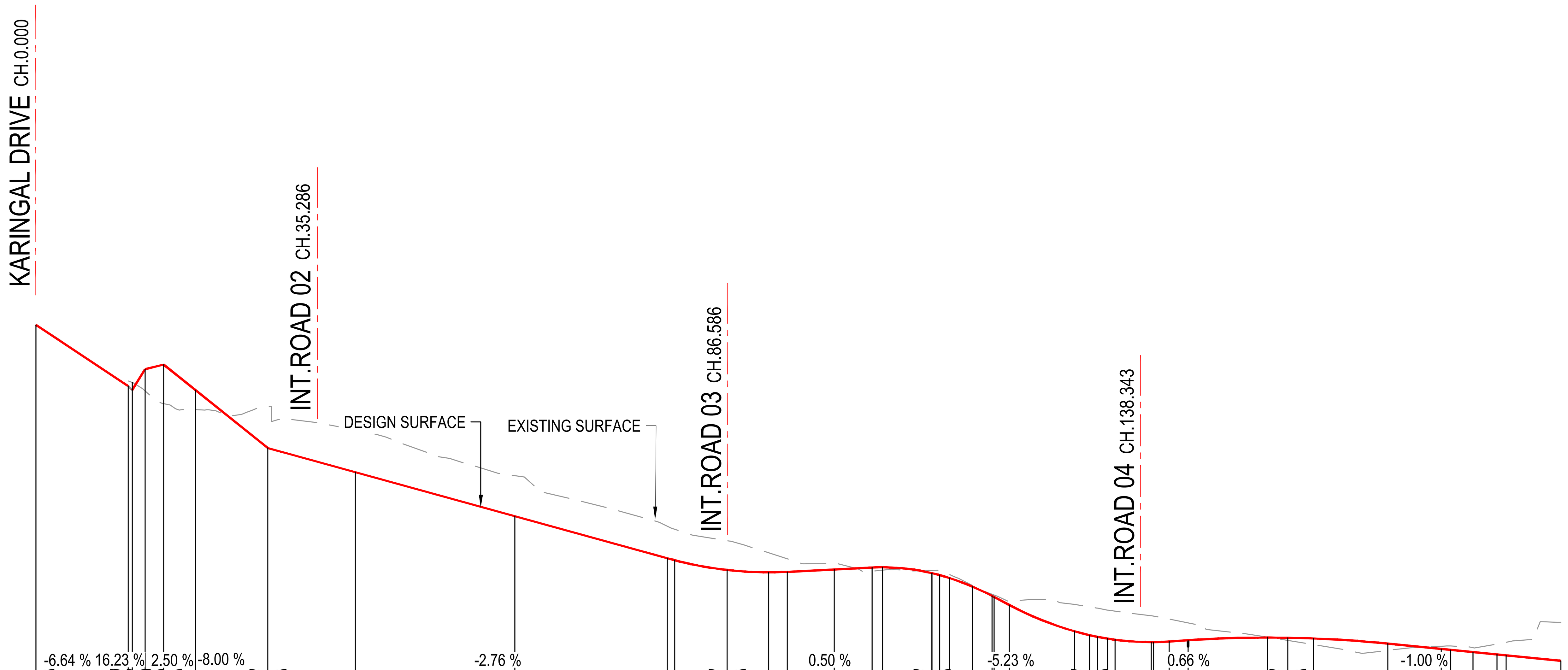
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |




VERTICAL GRADE (%): -6.64 % | 16.23 % | 2.50 % | -8.00 % | -2.76 % | 0.50 % | -5.23 % | 0.66 % | -1.00 %

VERTICAL CURVE LENGTH (m): 15mVC R=460.1 | 15mVC R=261.84 | 20mVC R=339.56 | 25mVC R=1504.77

DATUM R.L. 5.00

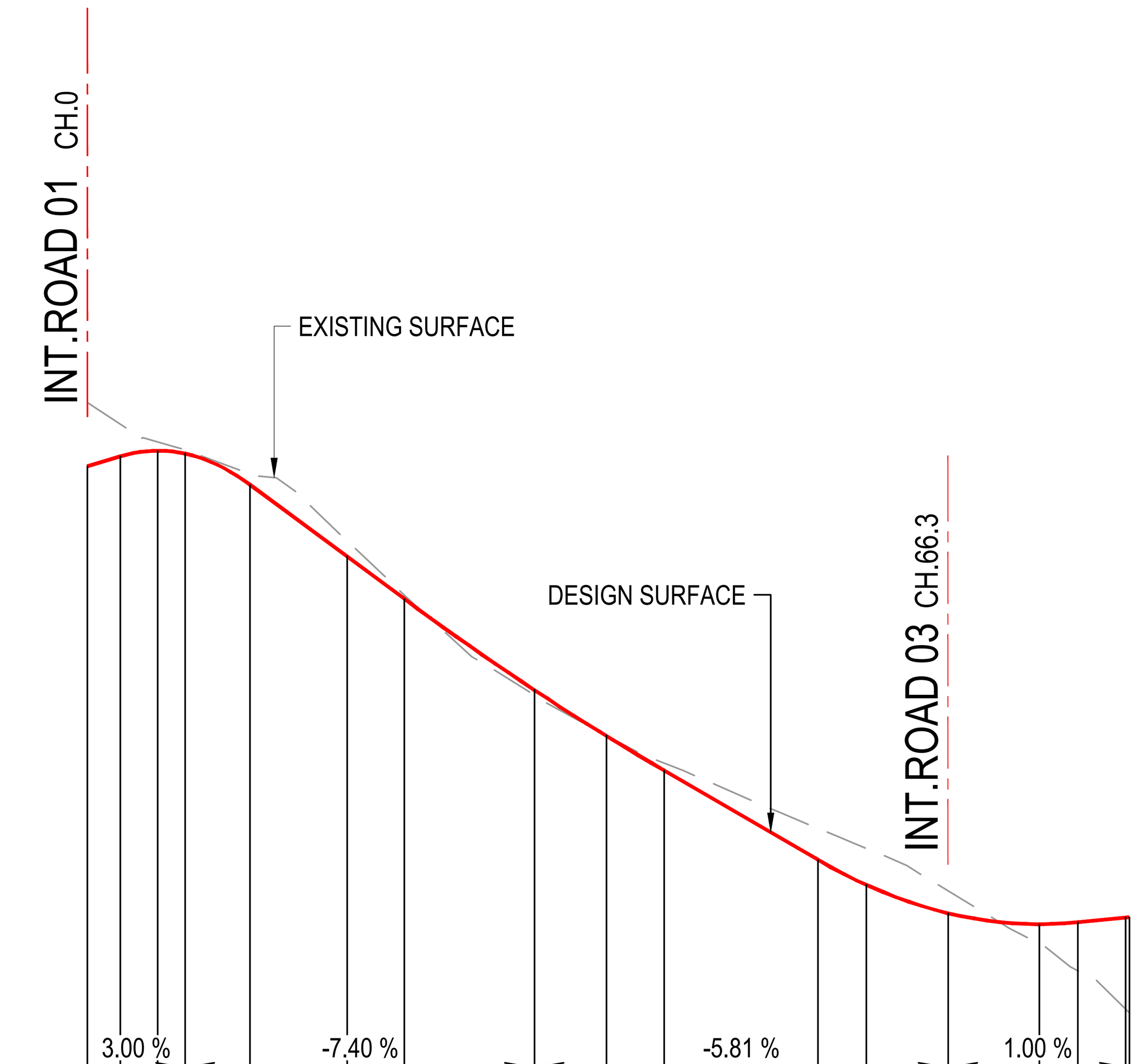
| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | 0.000 | 10.252 | 10.252 |
| 11.575 | 0.007 | 9.483 | 9.476 |
| 12.065 | -0.097 | 9.434 | 9.531 |
| 13.674 | 0.270 | 9.695 | 9.425 |
| 16.000 | 0.490 | 9.753 | 9.263 |
| 20.000 | 0.241 | 9.433 | 9.192 |
| 29.066 | -0.518 | 8.708 | 9.226 |
| 40.000 | -0.532 | 8.406 | 8.938 |
| 60.000 | -0.508 | 7.854 | 8.362 |
| 79.086 | -0.401 | 7.327 | 7.728 |
| 80.000 | -0.387 | 7.303 | 7.690 |
| 86.586 | -0.366 | 7.181 | 7.548 |
| 91.784 | -0.244 | 7.152 | 7.396 |
| 94.086 | -0.164 | 7.158 | 7.322 |
| 100.000 | -0.077 | 7.187 | 7.264 |
| 104.736 | 0.044 | 7.211 | 7.166 |
| 106.045 | 0.035 | 7.214 | 7.179 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 113.201 | -0.054 | 7.116 | 7.170 |
| 114.416 | -0.042 | 7.080 | 7.122 |
| 117.312 | -0.013 | 6.972 | 6.985 |
| 119.736 | -0.020 | 6.856 | 6.876 |
| 120.000 | -0.024 | 6.842 | 6.866 |
| 121.932 | -0.050 | 6.741 | 6.792 |
| 130.067 | -0.335 | 6.414 | 6.749 |
| 131.932 | -0.354 | 6.366 | 6.720 |
| 132.963 | -0.357 | 6.344 | 6.701 |
| 134.178 | -0.356 | 6.322 | 6.678 |
| 135.143 | -0.356 | 6.308 | 6.663 |
| 139.686 | -0.331 | 6.277 | 6.608 |
| 140.000 | -0.326 | 6.277 | 6.603 |
| 141.932 | -0.282 | 6.285 | 6.566 |
| 144.300 | -0.219 | 6.300 | 6.519 |
| 154.254 | -0.005 | 6.333 | 6.339 |
| 156.800 | 0.033 | 6.331 | 6.298 |
| 160.000 | 0.076 | 6.322 | 6.246 |
| 169.300 | 0.085 | 6.258 | 6.173 |
| 176.025 | -0.036 | 6.191 | 6.226 |
| 177.175 | -0.048 | 6.179 | 6.227 |
| 180.000 | -0.057 | 6.151 | 6.208 |
| 182.986 | -0.132 | 6.121 | 6.253 |
| 184.136 | -0.166 | 6.110 | 6.276 |
| 191.003 | -0.486 | 6.041 | 6.527 |

HORIZIONTALGEOMETRY

R-3.00m R9.00m / 0.97m 2.90m | R9.00m R-3.00m / 2.90m 0.97m | R20.00m R-20.00m / 1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES: 5 0 5 10 15 20 25 — 1 : 500 HORIZ.; 0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE) (metres)




VERTICAL GRADE (%): 3.00 % | -7.40 % | -5.81 % | 1.00 %

VERTICAL CURVE LENGTH (m): 10mVC R=96.15 | 20mVC R=1256.83 | 20mVC R=293.74

DATUM R.L. 3.00

| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | | 8.536 | |
| 2.535 | -0.248 | 8.612 | 8.859 |
| 5.419 | -0.068 | 8.655 | 8.723 |
| 7.535 | -0.026 | 8.632 | 8.658 |
| 12.535 | -0.083 | 8.392 | 8.475 |
| 20.000 | -0.123 | 7.839 | 7.962 |
| 24.434 | -0.030 | 7.511 | 7.541 |
| 34.434 | 0.040 | 6.811 | 6.771 |
| 40.000 | -0.004 | 6.456 | 6.460 |
| 44.434 | -0.056 | 6.190 | 6.246 |
| 56.300 | -0.243 | 5.501 | 5.745 |
| 60.000 | -0.281 | 5.309 | 5.591 |
| 66.300 | -0.173 | 5.090 | 5.264 |
| 73.363 | 0.150 | 5.006 | 4.855 |
| 76.300 | 0.373 | 5.020 | 4.648 |
| 80.000 | 0.708 | 5.057 | 4.349 |
| 80.266 | 0.737 | 5.060 | 4.322 |
| 80.274 | | | 4.322 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES: 5 0 5 10 15 20 25 — 1 : 500 HORIZ.; 0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE) (metres)

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PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

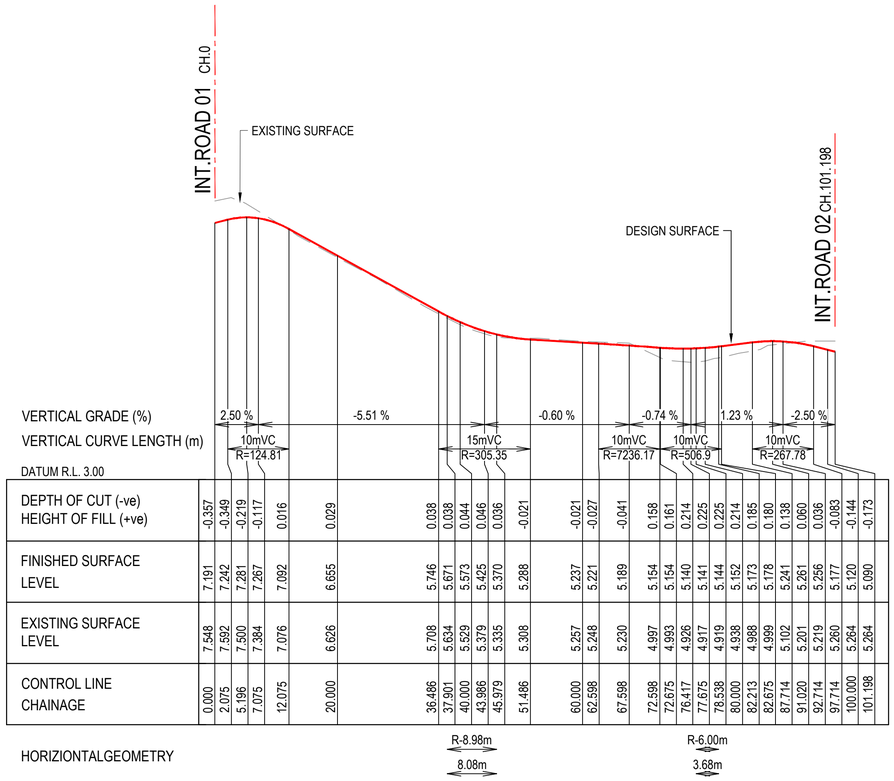
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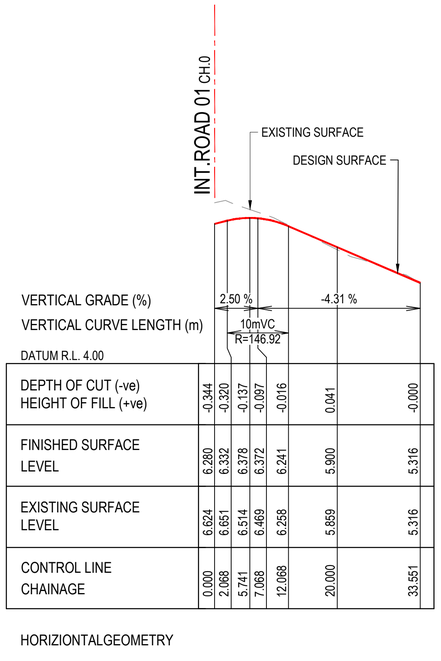
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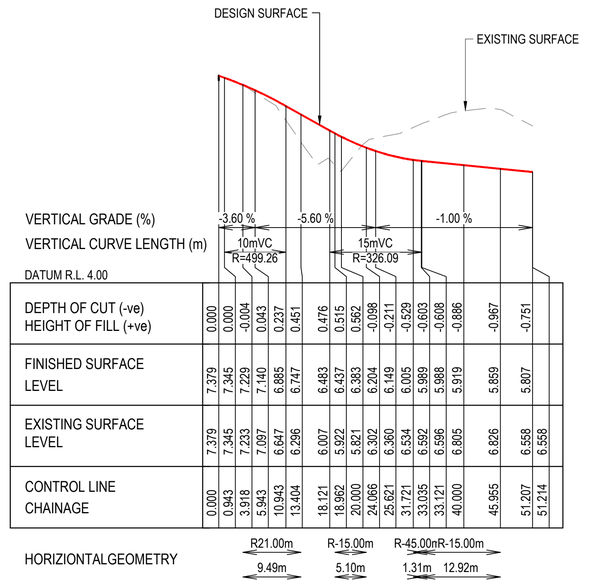

## ROAD 03 LONGITUDINAL SECTION

SCALES
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0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
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0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)

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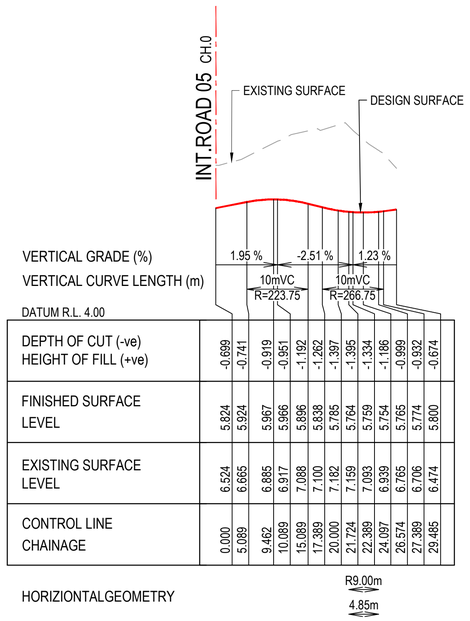
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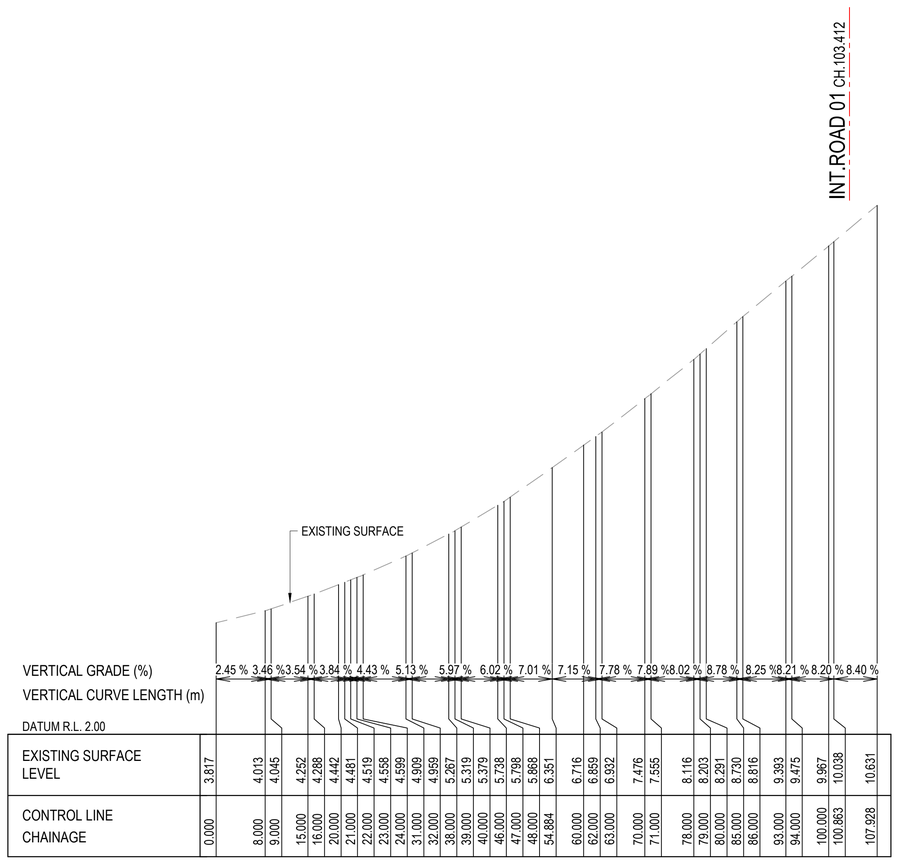
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## ROAD 06 LONGITUDINAL SECTION

SCALES
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(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
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0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)


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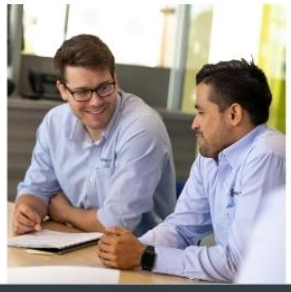
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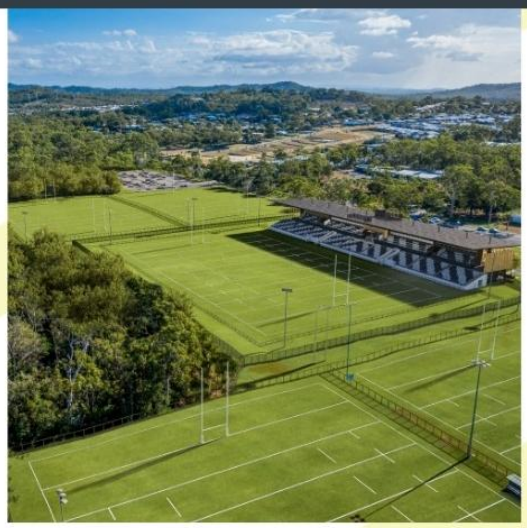
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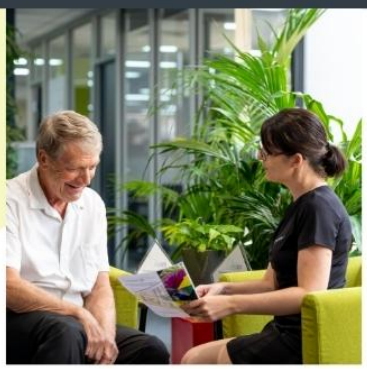


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# 2 Karingal Drive, Pimpama
# Civil Engineering Report for DA Submission

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-CER-01 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
|---|---|
| Prepared by: | Armand Beukes |
| Position: | Civil Engineer |
| Signed: |  |
| Date: | 19/03/2026 |

| | |
|---|---|
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| Position: | Principal Civil Engineer |
| Signed: | |
| Date: | 19/03/2026 |

| Version No. | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 00 | First Issue | 8/01/2021 | FL | JC |
| 01 | Revised Issue | 19/03/2026 | AB | RB |

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Appendix A – Development Concept Plans

Appendix B - Detailed Site Survey

Appendix C - Burchills Engineering Solutions Drawings

# 1. Introduction

Bosform Pty Ltd has engaged Burchills Engineering Solutions to prepare a Civil Engineering Report to be considered as part of a Development Application to the City of Gold Coast Council, for a proposed 57 lot multi-unit development at 2 Karingal Drive, Pimpama.

This report has determined that the site is suitable for the proposed development, in terms of those matters particularly relating to civil engineering design parameters and site constraints. The development can be undertaken in accordance with the current City of Gold Coast guidelines, SEQ Water Supply and Sewerage, Design and Construction Code and best management practices.

## 1.1 Scope of Report

This report describes the existing physical conditions of the site, and suitability for the proposed development with particular respect to:

- Site Earthworks;
- Roadworks, Access and Traffic;
- Stormwater Drainage;
- Water Supply;
- Sewer Reticulation;
- Electricity Supply;
- Telecommunications Supply.

This report represents an assessment of the facts and circumstances pertaining to these matters, as they are known to the writer at the time of preparation.

## 2. Project Identification

### 2.1 Real Property Description

The site is legally described as Lot 19 on RP 152380 and is situated between Karingal Drive and Imelda Way. The total site area is approximately 2.459 Ha.

The site is to be developed as shown on the Site Layout Plan prepared by MPS Architects, which is included within Appendix A of this report. A detailed site survey has been completed by Michel Group Services and is included within Appendix B of this report. The location of the subject site is shown on Figure 2.1 below.




**Figure 2.1 Site Locality Plan**

## 2.2 Physical Description

The site is currently accessed from Karingal Drive bounding its northern property boundary. The end stub of Imelda Way also bounds the sites southern property boundary, however is not currently utilised for access purposes.

There is an existing waterway traversing diagonally through the site, entering the site in the southern corner, and exiting the site at the northern corner of the site. The extents of this waterway are depicted within the Detailed Site Survey included within Appendix B.

All portions of the site generally fall towards this central waterway that splits the site into two (2) catchments. The highest points in the site are at RL 10.0m AHD in the north-west corner, and RL 8.0m AHD in the south-east corner of the site. The site is currently vacant and is vegetated with grass and tree cover, where various material stockpiles are also scattered throughout the site.

The site is bounded by the following existing land uses:

North: Karingal Drive;

East: Vacant Land (mapped as medium-density residential);

South: Imelda Way, Residential Dwellings, and Conservation Land;

West: Railway Corridor.

## 3. Proposed Development

The proposed development is seeking Council approval for Material Change of Use (multiple dwellings), Reconfiguring a Lot (2 management lots and a park Lot) and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

The proposed Site Layout Plan is shown below in Figure 3.1, in reduced form and a full-scale drawing is included within Appendix A of this report.

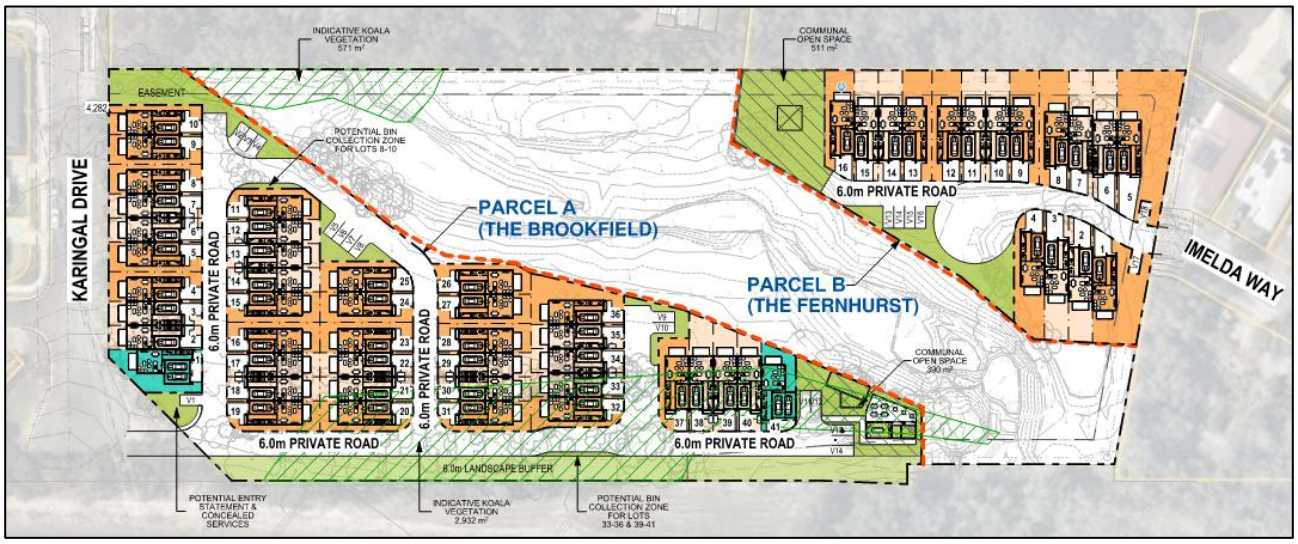



**Figure 3.1 Site Layout Plan**

Based on the SEQ Water Supply and Sewerage Design & Construction Code, the Equivalent Tenements (ET) and Equivalent Population (EP) for the proposed development are shown below in Table 3.1.

**Table 3.1 Development Summary**

| Use | Unit | Total Units | ET's/Unit | EP's/ET | Total ET | Total EP |
|---|---|---|---|---|---|---|
| 3 Bedroom Multi-Unit Residential | Dwelling | 57 | 0.9 | 2.73 | 51.3 | 140 |
| **Total Proposed** | **-** | | **-** | **-** | **51.3** | **140** |

# 4. Site Earthworks

Site earthworks associated with the proposed development will be limited to general shaping and profiling of building platforms associated with the development, construction of internal roadways, and excavation for services trenches. The proposed earthworks are shown on the Earthworks Layout Plan, Drawing BE200233-C2000-C2002 Rev A, prepared by Burchills Engineering Solutions and included within Appendix C of this report.

## 4.1 Sediment and Erosion Control

The best management practices will be implemented according to the IECA Best Practice Erosion and Sediment Control (2008) guidelines.

The following is a procedure of water quality controls to be implemented for the construction stage of the development.

### 4.1.1 Phase 1 – Stripping & Bulk Earthworks

- Identify and erect exclusions zones.
- Prior to any demolition, stripping or bulk earthworks on site, sediment fences, inlet traps, gully protection and entry/exit pad shall be put in place.
- A wash-down area and entry/exit pad will be provided at the construction site entrance to minimise the amount of sediment being tracked off the site.
- The wash-down area will be drained to a suitable sediment capture device installed downstream of the construction entry.
- Sediment fences are to be installed along the downstream property boundaries prior to stripping and earthworks commencing.
- Construct an appropriately-sized sediment basin for the development.
- If refuelling of machinery is to occur on site, appropriate absorbent products for cleaning oil spills will be provided.
- Provide bins on site for the disposal of waste and building debris.
- If it is anticipated that stockpiled material will not be used for a period of two weeks or more, a polythene cover (or equivalent) shall be used to prevent sediment transport by rain during wet periods. Conversely, during dry spells a cover shall be used to prevent fine sediments becoming airborne.
- The contractor shall provide on-going monitoring and maintenance of sediment and erosion control devices around the site.
- The contractor is to stage all works so that disturbed areas remain exposed for as short a period as practical.

Measures to minimise airborne pollutants during construction in the form of dust during dry and/or windy weather shall include the following:

- Exposed soils shall be kept damp to prevent particulates becoming airborne; and
- Stockpiles exposed for more than two weeks shall be covered to prevent wind erosion.

### 4.1.2 Phase 2 – Infrastructure, Building & Roadworks

- The site stormwater pipes and pits shall be installed with drop inlets provided to all pits.
- Provide sediment fences, sandbags or fine mesh cover to all gully pits.
- Monitoring of new stormwater pipes and infrastructure (including the stormwater quality improvement devices) to ensure they are free of sediment and debris.
- Maintain shake-down and wash-down area at site entry/exit.

- All disturbed areas are to be surfaced or landscaped/grassed (maintained to minimum 70% ground cover) as soon as practicable after completion of localised works.

### 4.1.3 Phase 3 – Finishing Works & Defects Liability Period

All erosion and sediment control measures, including sediment fences and inlet traps shall be maintained until completion of surface finishes, including landscaping and turfing:

- Maintain sediment fences.
- Tend to landscaped areas to maintain ground cover.

## 5. Roadworks, Access and Traffic

Access into the development is proposed from two locations; one being a new vehicle crossover from Karingal Drive that links to the internal private roadway that services The Brookfield Parcel; the other being an extension of Imelda Way that links to the internal private roadway that services The Fernhurst Parcel.

Note that all internal roadways and carpark areas under this proposal are intended to remain private infrastructure, under the ownership and control of the body corporate.

Design and grading of the internal roadways and carpark areas will generally be in accordance with the City of Gold Coast Land Development Guidelines, along with AS/NZS 2890 – Parking Facilities.

The general concept for the proposed access roads and carpark areas is shown on the Site Layout Plan prepared by MPS Architects and contained within Appendix A of this report.

## 6. Stormwater Drainage

All site stormwater runoff within the development footprint (excluding waterway) will be collected via stormwater drainage lines within the roadways, and conveyed to an OSD tank and filtration system for The Brookfield Parcel and a bio retention basin for The Fernhurst Parcel which will be positioned adjacent to the waterway.

The proposed stormwater drainage layout is shown on the Roads and Drainage Layout Plan prepared by Burchills Engineering Solutions, which are included in Appendix A of this report.

A Conceptual Stormwater Management Plan (CSMP), Report No. BE200223-RP-CSMP-01, has been prepared by Burchills Engineering Solutions. This study reviews the hydrology and hydraulics of the site for pre-development and post-development conditions.

Based on this study, the following recommendations have been made:

*Stormwater Quantity*

- The Lawful Point of Discharge for the site has been defined as the existing waterway traversing the site.
- Stormwater runoff from Catchment A1 will be conveyed to a detention tank, where it will be released at the LPD in a controlled manner to ensure that there is non-worsening peak flow in the post-developed scenario. The detention tank A1 will have a 1% AEP volume of 468.8m3.
- There is a 141.69 ha external catchment which is conveyed through the site via an existing waterway, no development is proposed within this waterway;
- Peak discharge from the developed catchment will be that of or less than the pre-developed scenario.
- As the site is within the Woongoolba flood mitigation scheme catchment area, peak outflows and timings have been assessed for Q2, Q5 and Q10 for rainfall events up to 72 hours and does not change as a result of development

*Stormwater Quality*

- To achieve the City of Gold Coast's Water Quality Objectives, it is proposed to use a mix of bioretention systems and proprietary devices to treat stormwater runoff. These bioretention systems will be private infrastructure, owned and maintained by the body corporate.
- The required treatment for catchment A1 will be 8 ATLAN Stormsacks and 8 ATLAN Filters.
- The bioretention device positioned within Catchment A2 will have a total filter media footprint of 40m2.

## 7. Flood Storage Requirements

The overall flood storage balance for the site has been assessed and achieved in accordance with City of Gold Coast requirements, as part of the overall site bulk earthworks.

A Hydraulic Impact Assessment, Report No. BE200223-RP-HIA-01, has been completed by Burchills Engineering Solutions and is intended to accompany this Development Application. Further detailed flood-storage modelling will be carried out under the detailed design phase for this development.

# 8. Water Supply

There is an existing 150mm water main on Imelda Way bounding the southern boundary of the site. The Fernhurst Parcel of the development will gain its potable water supply via connection to this main.

There is an additional 150mm water main on Karingal Drive on the northern side of the road. The Brookfield Parcel of the development will gain its potable water supply via connection to this main.

Being a private development, the sites will be serviced via a master water meter and connection to the Council-owned main on Imelda Way as well as Karingal Drive; where the internal reticulation will be owned by the development Body Corporate.

The Overall Sewer and Water Reticulation Plan prepared by Burchills Engineering Solutions, depicts the proposed internal water reticulation and is contained within Appendix A of this report.

Sizing of the development's water connection, master-meter and internal reticulation is to occur at the detailed design phase of the development.

## 8.1 Water Demand Calculation

To determine suitable pipe sizing for the proposed development, water demands are calculated according to the intended new development. The water criteria and design parameters are based on the following references:

- Gold Coast Water (GCW) Desired Standards of Service (DSS);
- SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code); and
- Water Services Association of Australia – WSA 03-2013 Water Supply Code of Australia, Part 1: Planning and Design.

The service mains internal of each building will be designed and constructed in accordance with AS/NZS 3500.1:2003 Plumbing and Drainage – Water services (Standards Australia, 2003).

The water flow parameters shown in Table 8.1, Table 8.2 and Table 8.3 required to meet Council's Standards of Service and have been based on Single Supply (Drinking Water Only) Network parameters shown in SEQ Design Criteria Table 4.1.

**Table 8.1 Potable Water Supply Demand and Peaking Factor**

| Property Type | Average Day Demand L/EP/day | Non-Revenue L/EP/day | Peaking Factors | | |
|---|---|---|---|---|---|
| | | | MDMM | PD | PH |
| Commercial | 220 | 20 | 1.06 | 2.07 | 2.32 |
| Multi-Unit Residential | 220 | 20 | 1.27 | 2.05 | 2.97 |

Notes:

MDMM Mean Day Maximum Month Demand

PD Peak Day Demand

AD Average Day Demand

PH Peak Hour Demand

Table 8.2 Potable Water Pressure Parameters

| Item | Pressure Parameter |
|---|---|
| Minimum Service Pressure | 22 metres (adjoining the property boundary) |
| Maximum Service Pressure | Target 55 metres (at the property boundary)<br>Max. 80 metres (subject to installation of pressure reducing valves) |

Table 8.3 Fire Fighting Parameters

| Item | Pressure Parameter |
|---|---|
| Minimum Residential Mains Pressure (Emergency Fire operating conditions) | 12 metres at the main at the property boundary<br>9 metres elsewhere |
| Fire Flow Urban Residential | 15 L/s for a duration of 2 hrs |
| Fire Flow Commercial | 30 L/s for a duration of 4 hrs |
| Background Demand | 2/3 x Peak Hour demand (not less than Average Day demand) |

The calculated water supply demand for the proposed development is shown in Table 8.4.

Table 8.4 Water Supply Demand Calculations

| Use | EP | AD Flow | Non-Revenue | AD (L/s) | PH (L/s) |
|---|---|---|---|---|---|
| Proposed 3-Bedroom Multi-Unit | 140 | 220 | 20 | 0.39 | 1.09 |
| **Total Proposed** | **140** | | | **0.39** | **1.09** |

Calculations of maximum peak demand and demand multiplier for the residential aspect of the development are based on an allowance of 220 L/EP/day and a peak hour factor of 2.97 while applying the Non-Revenue flows of 20 L/EP/day, as follows:

Maximum Hour Demand = PHF x Demand Rate x EP's + NR

= 2.97 x 220 x 140 + 20 x 140

= 94.28 kL/day

= 1.1 L/s

Demand Multiplier = Maximum Demand / EP's

= 0.008

# 9. Sewerage Reticulation

There is an existing 375mm trunk gravity sewer main within the site that traverses along the boundary of the site. It is anticipated that wastewater generated from the development will be conveyed via internal private gravity sewer to this existing trunk main.

The Overall Sewer and Water Reticulation Plan prepared by Burchills Engineering Solutions, depicts the proposed internal sewerage reticulation and is contained within Appendix A of this report.

Sizing of the development's sewerage reticulation is to occur at the detailed design phase of the development.

## 9.1 Sewer Demand Calculation

The sewer criteria and design parameters are based on the following references:

- Gold Coast Water (GCW) Desired Standards of Service (DSS)
- SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code); and
- Water Services Association of Australia – WSA 02-2014 Sewerage Code of Australia, Part 1: Planning and Design.

The sewer flow generation, pipe design parameters, minimum sewer pipe grades and maximum capacity are shown below in Table 9.1, Table 9.2 and Table 9.3. The following parameters are based on a Reduced Infiltration Gravity System (RIGS):

**Table 9.1 Sewer Flow Generation Parameters**

| Flow | Parameter |
|---|---|
| Average Dry Weather Flow (ADWF) | 200 L/EP/d |
| Peak Dry Weather Flow (PDWF) | $C_2$ x ADWF where $C_2 = 4.7 \times (EP)^{-0.105}$ |
| Peak Wet Weather Flow (PWWF) | 5 x ADWF |

**Table 9.2 Pipe Design Parameters**

| Flow | Parameter |
|---|---|
| Mannings 'n' | 0.013 |
| Minimum velocity @ PDWF | 0.7 m/s |
| Depth of Flow @ PWWF – Existing system | Up to 1.0 m below MH cover level and no spillage through overflow structures |
| Depth of Flow @ PWWF – Proposed sewers | Max flow depth shall not exceed ¾ pipe full (75% d/D). |

**Table 9.3 Minimum Pipe Capacity – New Sewers Flowing ¾ Full**

| Pipe Size (mm) | Min Pipe Grade (1 in x) | Capacity (L/s) |
|---|---|---|
| 150 | 180 | 10.4 |
| 225 | 300 | 23.6 |

The total development yield has been taken into account, not just the increase in equivalent persons on the subject site. The calculated sewer demand generation for the proposed development is shown in Table 9.4.

Table 9.4 Sewer Demand Calculation

| Use | EP | ADWF Rate | ADWF (kL/d) | ADWF (L/s) | PWWF (kL/d) | PWWF (L/s) |
|---|---|---|---|---|---|---|
| Total Proposed | 140 | 200 | 28.0 | 0.32 | 140 | 1.6 |

The calculations indicate that the total post development demand at PWWF will be approximately 1.6 L/s. The existing trunk sewer main therefore has the capacity to service the proposed development. A detailed sewer reticulation layout for development will be prepared under the detailed civil design phase.

## 10. Electrical and Communications

A detailed site survey has been prepared by Michel Group Services and is included within Appendix B. A Dial Before You Dig search has also been completed.

The survey indicates that there are existing electrical and telecommunications services in the vicinity of Imelda Way and Karingal Drive. It is envisaged that adequate power supply can be provided to the site from the existing infrastructure. However, a specialist electrical consultant will need to be engaged to provide advice in relation to internal electrical reticulation requirements, to prepare detailed designs and to liaise with the relevant authorities.

## 11. Conclusion

The findings of this Civil Engineering Report support the proposed site use outlined in this Development Application to the City of Gold Coast Council.

Site earthworks associated with the proposed development will be limited to general shaping and profiling of building platforms, construction of internal roadways, and excavation for service trenches required to accommodate essential infrastructure.

Access to the development is proposed via two locations. The first comprises a new vehicle crossover from Karingal Drive, providing connection to the internal private roadway servicing the Brookfield Parcel of the development. The second consists of an extension of Imelda Way, which will connect to the internal private roadway servicing the Fernhurst Parcel of the development.

Stormwater runoff generated within the development footprint will be collected via stormwater drainage infrastructure located within the internal roadways and conveyed to a detention tank positioned adjacent to the waterway within the Brookfield Parcel as per CSMP Report No. BE200223-RP-CSMP-01.

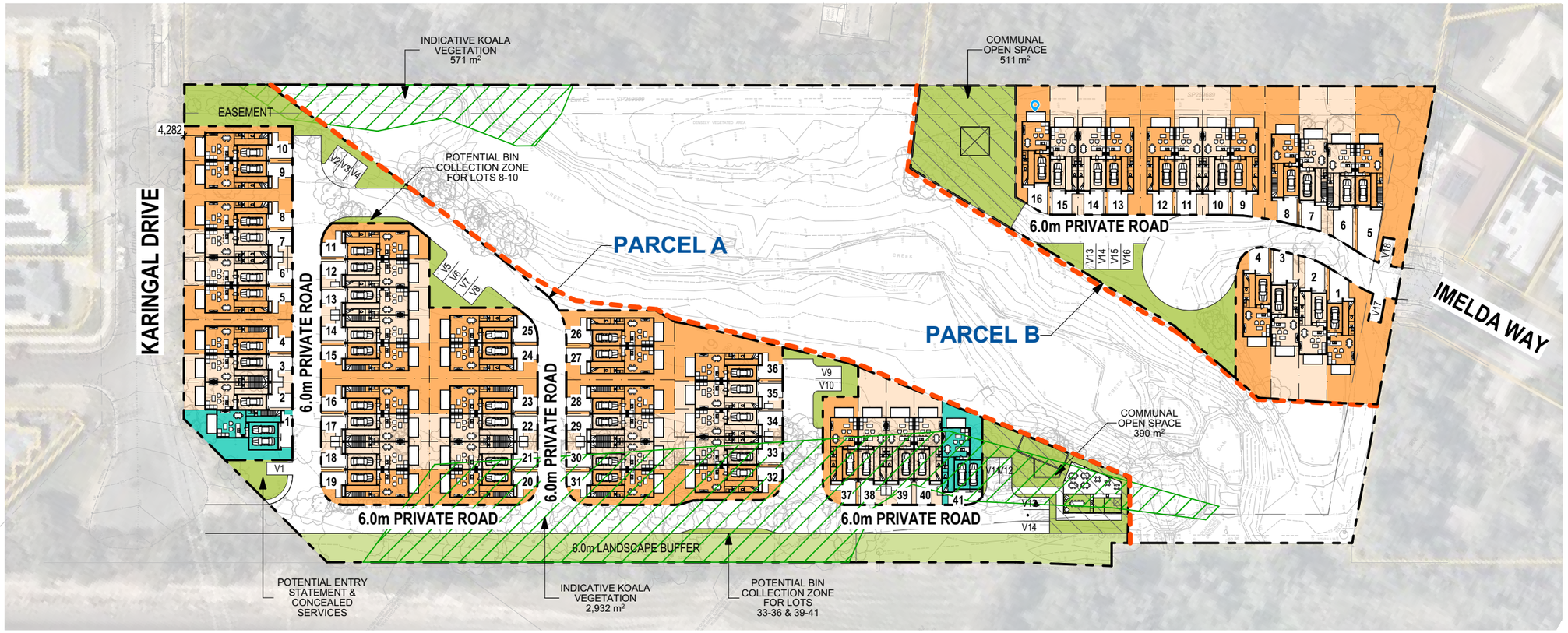
Potable water supply will be provided via existing water infrastructure surrounding the site. A 150 mm water main is located in Imelda Way along the southern boundary of the site, with an additional 150 mm water main located in Karingal Drive. The Brookfield parcel will be serviced from the Karingal Drive main, while the Fernhurst parcel will be supplied from the Imelda Way main, as shown on Drawings BE200233-C4500 to C4502 Rev A prepared by Burchills Engineering Solutions (refer Appendix C).

Wastewater generated by the development will be conveyed via internal private gravity sewer infrastructure to an existing 375 mm trunk gravity sewer main that traverses the boundary of the site as per Drawing BE200233-C4500-C4502 Rev A, prepared by Burchills Engineering Solutions (refer Appendix C).

All required essential services can be suitably provided to the development, including:

- Stormwater Drainage;
- Reticulated Water Services;
- Reticulated Sewerage Services;
- Electricity Supply;
- Telecommunications Supply.

# Appendix A – Development Concept Plans




## PARCEL A - THE BROOKFIELD
**2 KARINGAL DRIVE**

### SITE SUMMARY
APPROX. NET SITE AREA 1.073 ha
APPROX. NET DENSITY 38.21 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 19 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 20 |
| **SPECIAL B**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 2 |
| **TOTAL** | 41 |

## PARCEL B - THE FERNHURST
**60 IMELDA WAY**

### SITE SUMMARY
APPROX. NET SITE AREA 0.491 ha
APPROX. NET DENSITY 32.59 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **TOTAL** | 16 |

**NOTE:** GCCC

LOT BOUNDARIES AND AREAS ARE BASED OFF PDF PLAN AND ARE INDICATIVE ONLY SIZES TO BE CONFIRMED

INDICATIVE KOALA VEGETATION AREA

INDICATIVE BUILDABLE PAD AREA (BURCHILLS)

PRODUCT TO BE MODIFIED. TERRACE IN EASEMENT

# STRUCTURE PLAN

0 10 20 30 40 50m
Scale 1:1000 @ A3

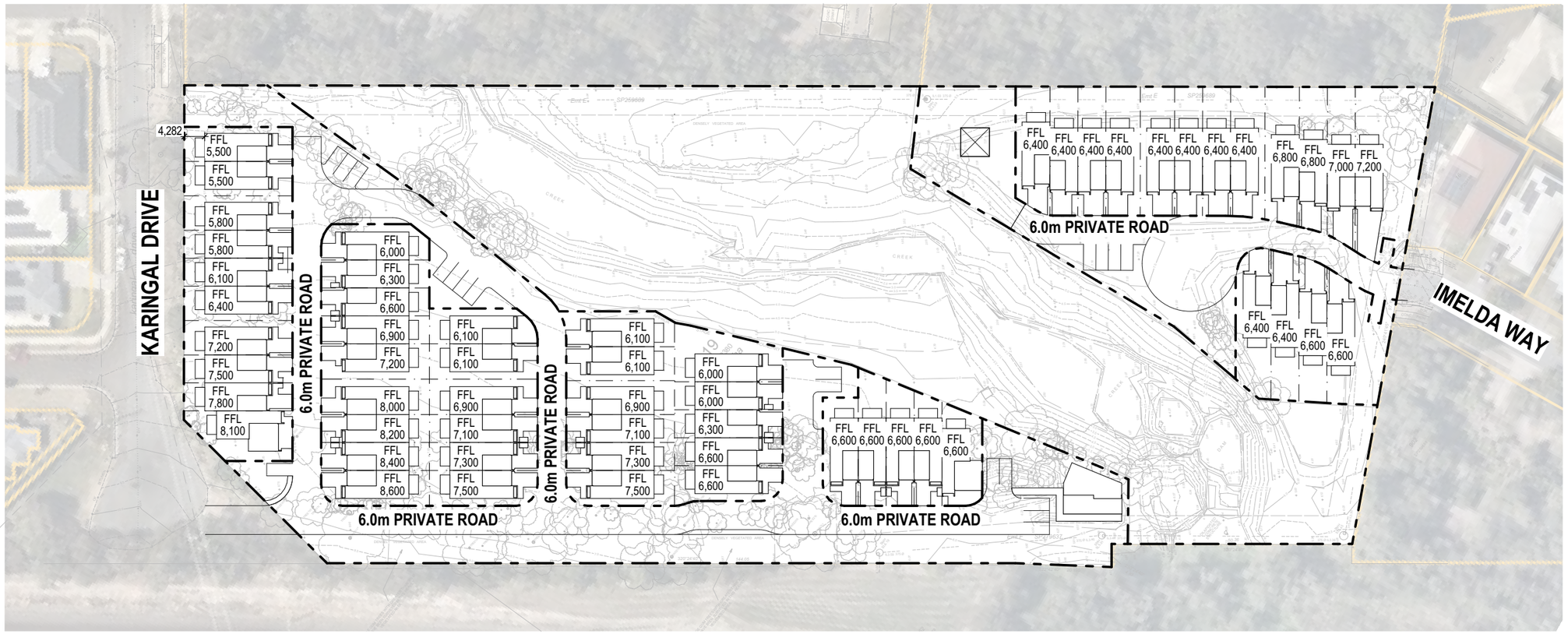
F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY
## PIMPAMA

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# INDICATIVE SITE PLAN

0 10 20 30 40 50m

Scale 1:1000 @ A3

F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY

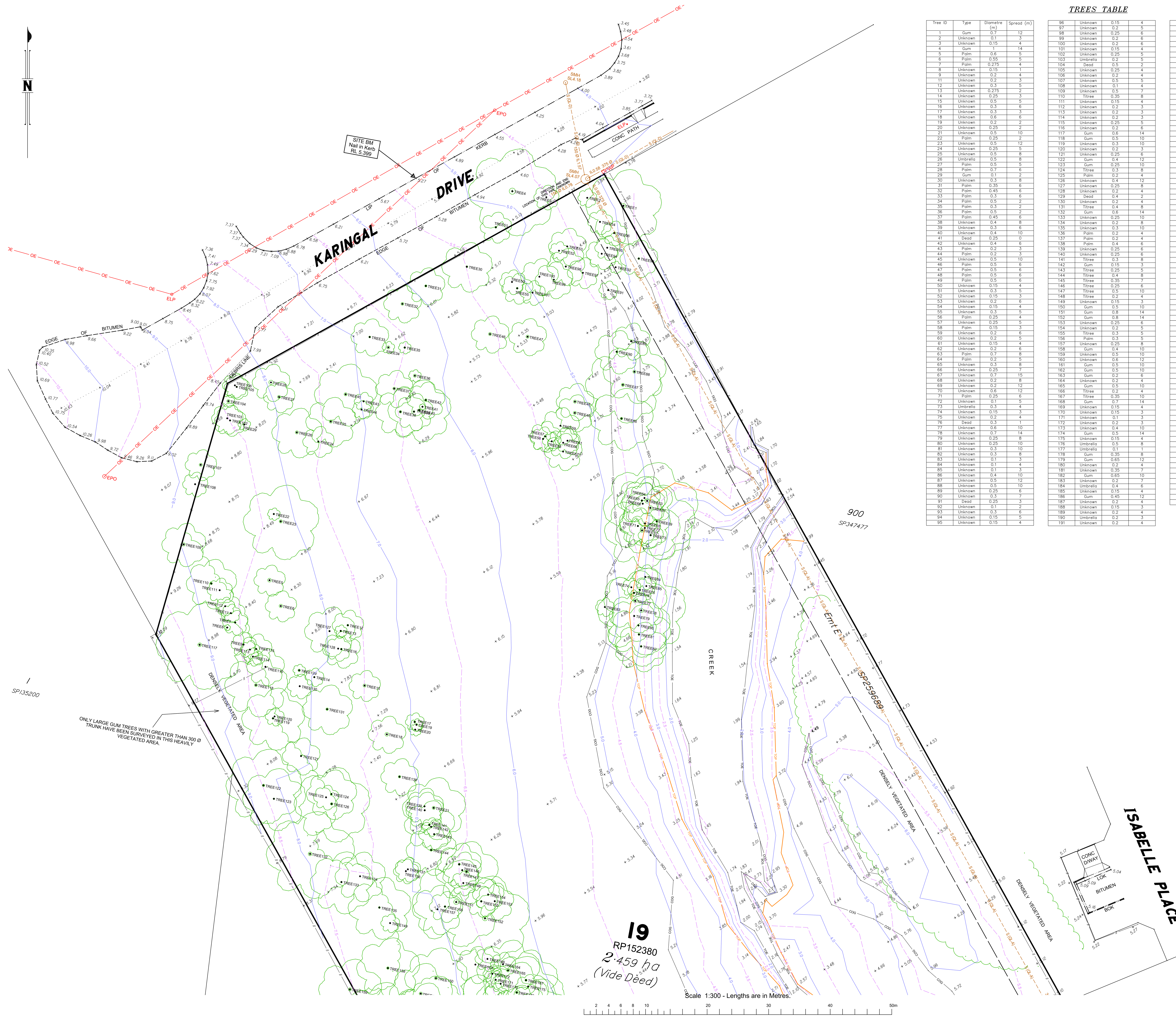
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## Appendix B - Detailed Site Survey



Scale 1:300 - Lengths are in Metres.

## TREES TABLE

| Tree ID | Type | Diametre (m) | Spread (m) |
|---|---|---|---|
| 1 | Gum | 0.7 | 12 |
| 2 | Unknown | 0.1 | 3 |
| 3 | Unknown | 0.15 | 4 |
| 4 | Gum | 1 | 14 |
| 5 | Palm | 0.6 | 5 |
| 6 | Palm | 0.55 | 5 |
| 7 | Palm | 0.275 | 4 |
| 8 | Unknown | 0.15 | 1 |
| 9 | Unknown | 0.2 | 4 |
| 11 | Unknown | 0.2 | 3 |
| 12 | Unknown | 0.3 | 5 |
| 13 | Unknown | 0.275 | 2 |
| 14 | Unknown | 0.25 | 3 |
| 15 | Unknown | 0.5 | 5 |
| 16 | Unknown | 0.3 | 6 |
| 17 | Unknown | 0.3 | 3 |
| 18 | Unknown | 0.6 | 6 |
| 19 | Unknown | 0.2 | 2 |
| 20 | Unknown | 0.25 | 2 |
| 21 | Unknown | 0.5 | 10 |
| 22 | Palm | 0.25 | 2 |
| 23 | Unknown | 0.5 | 12 |
| 24 | Unknown | 0.25 | 5 |
| 25 | Unknown | 0.5 | 8 |
| 26 | Umbrella | 0.5 | 8 |
| 27 | Palm | 0.5 | 5 |
| 28 | Palm | 0.7 | 6 |
| 29 | Gum | 0.1 | 2 |
| 30 | Unknown | 0.3 | 8 |
| 31 | Palm | 0.35 | 6 |
| 32 | Palm | 0.45 | 6 |
| 33 | Palm | 0.3 | 6 |
| 34 | Palm | 0.5 | 2 |
| 35 | Palm | 0.3 | 2 |
| 36 | Palm | 0.5 | 2 |
| 37 | Palm | 0.45 | 6 |
| 38 | Unknown | 0.4 | 8 |
| 39 | Unknown | 0.3 | 6 |
| 40 | Unknown | 0.4 | 10 |
| 41 | Dead | 0.25 | 0 |
| 42 | Unknown | 0.4 | 6 |
| 43 | Palm | 0.2 | 3 |
| 44 | Palm | 0.2 | 3 |
| 45 | Unknown | 0.5 | 10 |
| 46 | Palm | 0.5 | 6 |
| 47 | Palm | 0.5 | 6 |
| 48 | Palm | 0.5 | 6 |
| 49 | Palm | 0.5 | 6 |
| 50 | Unknown | 0.15 | 4 |
| 51 | Unknown | 0.3 | 5 |
| 52 | Unknown | 0.15 | 3 |
| 53 | Unknown | 0.2 | 6 |
| 54 | Unknown | 0.15 | 4 |
| 55 | Unknown | 0.3 | 5 |
| 56 | Palm | 0.25 | 4 |
| 57 | Unknown | 0.25 | 5 |
| 58 | Palm | 0.15 | 3 |
| 59 | Unknown | 0.2 | 6 |
| 60 | Unknown | 0.2 | 5 |
| 61 | Unknown | 0.15 | 4 |
| 62 | Unknown | 0.2 | 6 |
| 63 | Palm | 0.7 | 8 |
| 64 | Palm | 0.2 | 5 |
| 65 | Unknown | 0.3 | 8 |
| 66 | Unknown | 0.25 | 7 |
| 67 | Unknown | 0.7 | 15 |
| 68 | Unknown | 0.2 | 8 |
| 69 | Unknown | 0.2 | 12 |
| 70 | Unknown | 0.6 | 12 |
| 71 | Palm | 0.25 | 6 |
| 72 | Unknown | 0.1 | 5 |
| 73 | Umbrella | 0.3 | 4 |
| 74 | Unknown | 0.15 | 3 |
| 75 | Unknown | 0.2 | 4 |
| 76 | Dead | 0.3 | 1 |
| 77 | Unknown | 0.6 | 10 |
| 78 | Unknown | 0.7 | 14 |
| 79 | Unknown | 0.25 | 8 |
| 80 | Unknown | 0.25 | 10 |
| 81 | Unknown | 0.3 | 10 |
| 82 | Unknown | 0.3 | 8 |
| 83 | Unknown | 0.1 | 3 |
| 84 | Unknown | 0.1 | 4 |
| 85 | Unknown | 0.1 | 3 |
| 86 | Unknown | 0.4 | 10 |
| 87 | Unknown | 0.5 | 12 |
| 88 | Unknown | 0.5 | 10 |
| 89 | Unknown | 0.25 | 6 |
| 90 | Unknown | 0.3 | 7 |
| 91 | Dead | 0.25 | 3 |
| 92 | Unknown | 0.1 | 2 |
| 93 | Unknown | 0.3 | 6 |
| 94 | Unknown | 0.15 | 5 |
| 95 | Unknown | 0.15 | 4 |
| 96 | Unknown | 0.15 | 4 |
| 97 | Unknown | 0.2 | 5 |
| 98 | Unknown | 0.25 | 6 |
| 99 | Unknown | 0.2 | 6 |
| 100 | Unknown | 0.2 | 6 |
| 101 | Unknown | 0.15 | 4 |
| 102 | Unknown | 0.25 | 5 |
| 103 | Umbrella | 0.2 | 5 |
| 104 | Dead | 0.5 | 2 |
| 105 | Unknown | 0.25 | 4 |
| 106 | Unknown | 0.2 | 4 |
| 107 | Unknown | 0.5 | 5 |
| 108 | Unknown | 0.1 | 4 |
| 109 | Unknown | 0.5 | 7 |
| 110 | Titree | 0.35 | 8 |
| 111 | Unknown | 0.15 | 4 |
| 112 | Unknown | 0.2 | 3 |
| 113 | Unknown | 0.2 | 3 |
| 114 | Unknown | 0.2 | 3 |
| 115 | Unknown | 0.25 | 5 |
| 116 | Unknown | 0.2 | 6 |
| 117 | Gum | 0.6 | 14 |
| 118 | Gum | 0.5 | 10 |
| 119 | Unknown | 0.3 | 10 |
| 120 | Unknown | 0.2 | 3 |
| 121 | Unknown | 0.25 | 6 |
| 122 | Gum | 0.4 | 12 |
| 123 | Gum | 0.25 | 10 |
| 124 | Titree | 0.3 | 8 |
| 125 | Palm | 0.2 | 4 |
| 126 | Unknown | 0.4 | 12 |
| 127 | Unknown | 0.25 | 8 |
| 128 | Unknown | 0.2 | 4 |
| 129 | Dead | 0.4 | 2 |
| 130 | Unknown | 0.2 | 4 |
| 131 | Titree | 0.4 | 8 |
| 132 | Gum | 0.6 | 14 |
| 133 | Unknown | 0.25 | 10 |
| 134 | Unknown | 0.2 | 8 |
| 135 | Unknown | 0.3 | 10 |
| 136 | Palm | 0.2 | 4 |
| 137 | Palm | 0.2 | 4 |
| 138 | Palm | 0.4 | 6 |
| 139 | Unknown | 0.25 | 6 |
| 140 | Unknown | 0.25 | 6 |
| 141 | Titree | 0.3 | 8 |
| 142 | Gum | 0.15 | 3 |
| 143 | Titree | 0.25 | 5 |
| 144 | Titree | 0.4 | 8 |
| 145 | Titree | 0.35 | 7 |
| 146 | Titree | 0.25 | 6 |
| 147 | Titree | 0.5 | 10 |
| 148 | Titree | 0.2 | 4 |
| 149 | Unknown | 0.15 | 3 |
| 150 | Gum | 0.5 | 10 |
| 151 | Gum | 0.8 | 14 |
| 152 | Gum | 0.8 | 14 |
| 153 | Unknown | 0.25 | 6 |
| 154 | Unknown | 0.2 | 5 |
| 155 | Titree | 0.3 | 5 |
| 156 | Palm | 0.3 | 5 |
| 157 | Unknown | 0.25 | 8 |
| 158 | Gum | 0.4 | 10 |
| 159 | Unknown | 0.5 | 10 |
| 160 | Unknown | 0.6 | 12 |
| 161 | Gum | 0.5 | 10 |
| 162 | Gum | 0.5 | 10 |
| 163 | Gum | 0.2 | 6 |
| 164 | Unknown | 0.2 | 4 |
| 165 | Gum | 0.5 | 10 |
| 166 | Titree | 0.2 | 4 |
| 167 | Titree | 0.35 | 10 |
| 168 | Gum | 0.7 | 14 |
| 169 | Unknown | 0.15 | 4 |
| 170 | Unknown | 0.15 | 3 |
| 171 | Unknown | 0.1 | 3 |
| 172 | Unknown | 0.2 | 3 |
| 173 | Unknown | 0.4 | 10 |
| 174 | Gum | 0.5 | 14 |
| 175 | Unknown | 0.15 | 4 |
| 176 | Umbrella | 0.5 | 8 |
| 177 | Umbrella | 0.1 | 1 |
| 178 | Gum | 0.35 | 8 |
| 179 | Gum | 0.65 | 12 |
| 180 | Unknown | 0.2 | 4 |
| 181 | Unknown | 0.35 | 7 |
| 182 | Gum | 0.65 | 10 |
| 183 | Unknown | 0.2 | 7 |
| 184 | Umbrella | 0.4 | 6 |
| 185 | Unknown | 0.15 | 4 |
| 186 | Gum | 0.45 | 12 |
| 187 | Unknown | 0.2 | 4 |
| 188 | Unknown | 0.15 | 3 |
| 189 | Unknown | 0.2 | 4 |
| 190 | Umbrella | 0.2 | 3 |
| 191 | Unknown | 0.2 | 4 |
| 192 | Unknown | 0.25 | 5 |
| 193 | Unknown | 0.45 | 8 |
| 194 | Unknown | 0.2 | 3 |
| 195 | Unknown | 0.15 | 3 |
| 196 | Unknown | 0.1 | 3 |
| 197 | Gum | 0.6 | 10 |
| 198 | Unknown | 0.15 | 3 |
| 199 | Unknown | 0.2 | 5 |
| 200 | Unknown | 0.2 | 5 |
| 201 | Unknown | 0.5 | 9 |
| 202 | Unknown | 0.3 | 10 |
| 203 | Unknown | 0.15 | 2 |
| 204 | Unknown | 0.2 | 6 |
| 205 | Unknown | 0.15 | 5 |
| 206 | Gum | 0.7 | 14 |
| 207 | Unknown | 0.2 | 4 |
| 208 | Unknown | 0.2 | 5 |
| 209 | Unknown | 0.3 | 8 |
| 210 | Unknown | 0.5 | 9 |
| 211 | Gum | 0.9 | 16 |
| 212 | Unknown | 0.1 | 4 |
| 213 | Gum | 0.6 | 10 |
| 214 | Gum | 0.8 | 15 |
| 215 | Unknown | 0.25 | 8 |
| 216 | Gum | 0.4 | 10 |
| 217 | Ironbark | 0.9 | 15 |
| 218 | Gum | 0.4 | 12 |
| 219 | Unknown | 0.2 | 8 |
| 220 | Unknown | 0.2 | 7 |
| 221 | Unknown | 0.4 | 10 |
| 222 | Unknown | 0.25 | 6 |
| 223 | Unknown | 0.2 | 4 |
| 224 | Unknown | 0.2 | 4 |
| 225 | Unknown | 0.35 | 12 |
| 226 | Unknown | 0.2 | 6 |
| 227 | Unknown | 0.25 | 9 |
| 228 | Unknown | 0.45 | 6 |
| 229 | Unknown | 0.4 | 10 |
| 230 | Gum | 1 | 22 |
| 231 | Palm | 0.25 | 6 |
| 232 | Unknown | 0.3 | 10 |
| 233 | Unknown | 0.15 | 6 |
| 234 | Unknown | 0.2 | 7 |
| 235 | Unknown | 0.15 | 7 |
| 236 | Gum | 0.4 | 10 |
| 237 | Unknown | 0.2 | 8 |
| 238 | Unknown | 0.1 | 6 |
| 239 | Unknown | 0.2 | 6 |
| 240 | Unknown | 0.45 | 12 |
| 241 | Unknown | 0.2 | 6 |
| 242 | Unknown | 0.1 | 6 |
| 243 | Unknown | 0.35 | 5 |
| 244 | Unknown | 0.1 | 4 |
| 245 | Unknown | 0.1 | 3 |
| 246 | Unknown | 0.4 | 15 |
| 247 | Unknown | 0.1 | 4 |
| 248 | Unknown | 0.25 | 8 |
| 249 | Unknown | 0.25 | 8 |
| 250 | Unknown | 0.35 | 10 |
| 251 | Titree | 0.4 | 10 |
| 252 | Unknown | 0.15 | 6 |
| 253 | Unknown | 0.2 | 8 |
| 254 | Titree | 0.15 | 4 |
| 255 | Unknown | 0.15 | 5 |
| 256 | Unknown | 0.15 | 5 |
| 257 | Gum | 0.1 | 4 |
| 258 | Gum | 0.15 | 5 |
| 259 | Gum | 0.35 | 14 |
| 260 | Unknown | 0.15 | 4 |
| 261 | Titree | 0.2 | 5 |
| 267 | Unknown | 0.25 | 8 |
| 268 | Gum | 0.6 | 18 |
| 269 | Unknown | 0.4 | 10 |
| 270 | Unknown | 0.1 | 3 |
| 271 | Unknown | 0.1 | 3 |
| 272 | Gum | 0.25 | 10 |
| 273 | Unknown | 0.15 | 8 |
| 274 | Gum | 0.8 | 20 |
| 275 | Unknown | 0.15 | 10 |
| 276 | Unknown | 0.25 | 8 |
| 277 | Gum | 0.15 | 4 |
| 278 | Unknown | 0.1 | 4 |
| 279 | Gum | 0.5 | 14 |
| 280 | Unknown | 0.1 | 3 |
| 281 | Unknown | 0.15 | 4 |
| 282 | Titree | 0.1 | 3 |
| 283 | Dead | 0.1 | 3 |
| 284 | Unknown | 0.2 | 4 |
| 285 | Bloodwood | 0.5 | 14 |
| 286 | Unknown | 0.15 | 8 |
| 287 | Bloodwood | 0.4 | 12 |
| 288 | Unknown | 0.2 | 5 |

| ISSUE | SUBJECT | BY | DATE |
|---|---|---|---|
| A | TOP OF BANK ADDED | PG | 03/02/26 |

AMENDMENTS

## NOTES & DISCLAIMERS

1. This plan was prepared for BOSFORM PTY LTD from a combination of field survey and existing records for the purpose of DESIGN and must not be used for any other purpose, particularly demolition, excavation or construction.
2. The title boundaries shown on this plan were not surveyed as part of this survey and have been compiled from RP152380 and not by field measurement and therefore could be subject to error.
3. Services shown on this plan have been located where possible by field survey. If underground and not able to be so located, services have been plotted from the records (where available) of the relevant Authority and have been noted accordingly on this plan. Only Council records of Stormwater, Sewer & Water have been searched and shown as per records. No Dial Before You Dig (DBYD) have been searched or shown on this plan, services may therefore be incomplete and/or erroneous.
4. Contour Interval is 0.5m.
5. Refer to trees table on sheet 1 for tree information data. Tree information also contained in CAD file (turned off layer).
6. Only trees with greater than 100 mm Ø trunk located within the approximate stage boundaries have been surveyed.
7. Only large gum trees greater than 300 mm Ø trunk within heavily vegetated areas also within the stage boundaries have been surveyed.
8. Refer to CAD file for additional levels not shown on face of plan for clarity purposes.
9. This note is an integral part of this plan.

### SURVEY LEGEND:

EPO .... Electrical Pole
ELP .... Light Pole
TPT .... Telstra Pit
SVA .... Stop Valve
FHY .... Fire Hydrant
WAM .... Water Meter
SMH .... Sewer Manhole
SWMH .... Stormwater Manhole
FIN .... Field Inlet
GLY .... Gully Pit

### UNDERGROUND SERVICES EXPLANATION.

Underground line-styles explanation - examples provided below:

- DRAINAGE — D (QL-A) — = (+-0.050mm)
- COMMUNICATION — C (QL-B) — = (+-0.3Hx0.5V)
- GAS — G (QL-C) — = (+-0.300mm_2D)
- SEWER — S (QL-D) — = (EXISTING RECORDS)

### LINETYPE LEGEND:

Sewer — S (QL-A)
Sewer (Via Records) — S (QL-D)
Water (Via Records) — W (QL-D)
Stormwater (Via Records) — D (QL-D)
Overhead Electricity — OE
Fence — //
Kerb Line
Edge of Bitumen
Top of Bank — TOP
Toe of Bank — TOE
Change of Grade — COG


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T 07 5502 2500


PROJECT
**2 KARINGAL DRIVE PIMPAMA**

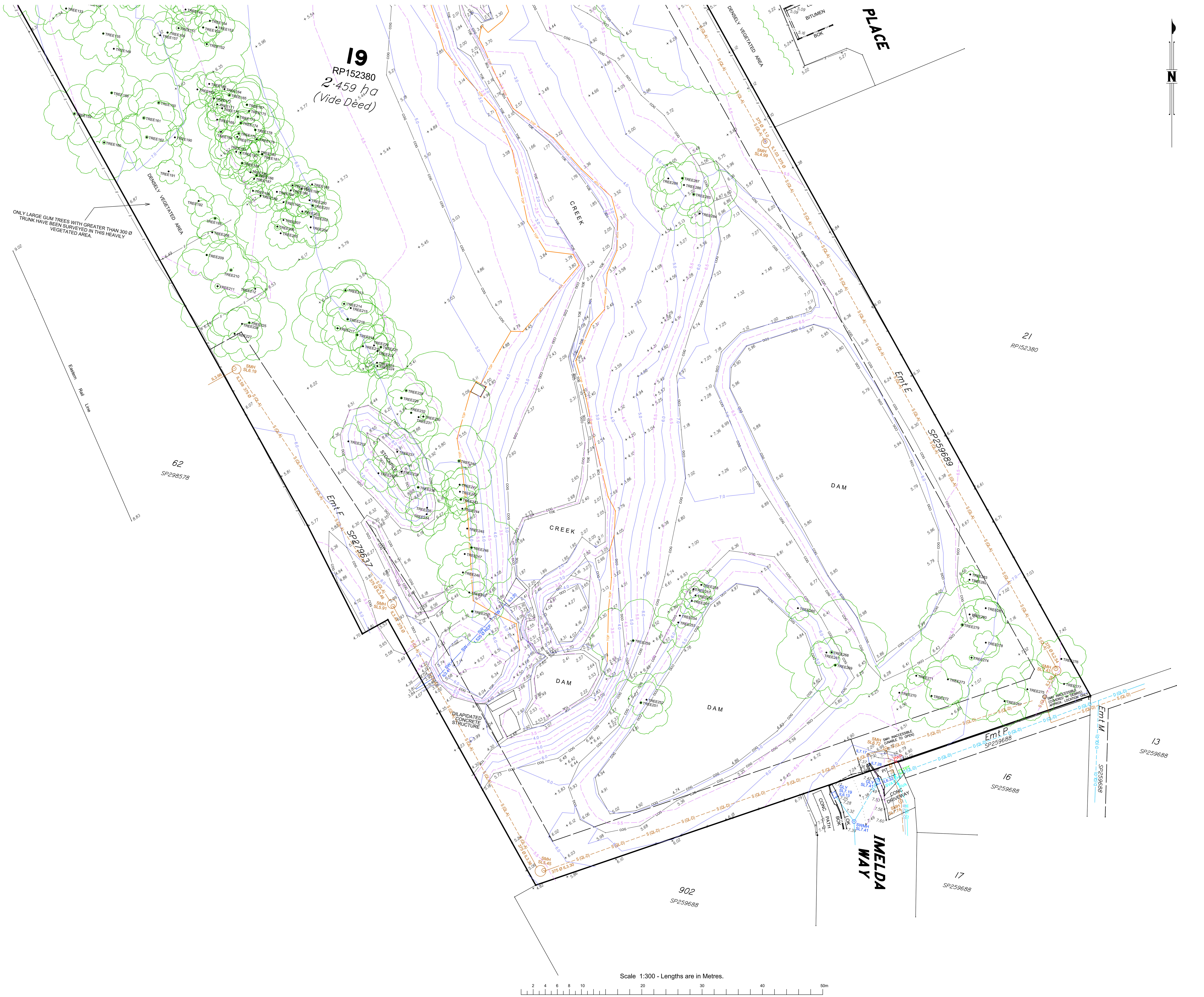
CLIENT
**BOSFORM PTY LTD**

DRAWING TITLE
**PLAN OF LEVEL & FEATURE SURVEY OF LOT 19 ON RP152380 ON MGA 2020 (PLANE) DATUM 2 KARINGAL DRIVE PIMPAMA**

| SCALE | DATE | DRAWN |
|---|---|---|
| 1:300 @ A1 | 30/01/26 | JW |
| LEVEL DATUM | LEVEL ORIGIN | ORIGIN RL |
| AHD | PM 197770 | 4.521 |
| AZIMUTH | CO-ORD SYSTEM | CO-ORD ORIGIN |
| RP152380 | MGA 2020 (PLANE) | PM 197770 |
| EASTING | NORTHING | SURVEYOR |
| 530231.803 | 6921727.958 | DA |
| AUTOCAD FILE | SURVEY FILE | JOB No. |
| 25218-2A | 25218009 | 25218-01 |
| CHECKED | QT | DATE IMAGED |
| DA | TC | 30/01/26 |

SHEET NUMBER 1 OF 2

PLAN No. **25218-2** ISSUE **A**




| ISSUE | SUBJECT | BY | DATE |
|---|---|---|---|
| A | TOP OF BANK ADDED | PG | 03/02/26 |

AMENDMENTS

## NOTES & DISCLAIMERS

1. This plan was prepared for BOSFORM PTY LTD from a combination of field survey and existing records for the purpose of DESIGN and must not be used for any other purpose, particularly demolition, excavation or construction.
2. The title boundaries shown on this plan were not surveyed as part of this survey and have been compiled from RP152380 and not by field measurement and therefore could be subject to error.
3. Services shown on this plan have been located where possible by field survey. If underground and not able to be so located, services have been plotted from the records (where available) of the relevant Authority and have been noted accordingly on this plan. Only Council records of Stormwater, Sewer & Water have been searched and shown as per records. No Dial Before You Dig (DBYD) have been searched or shown on this plan, services may therefore be incomplete and/or erroneous.
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6. Only trees with greater than 100 mm Ø trunk located within the approximate stage boundaries have been surveyed.
7. Only large gum trees greater than 300 mm Ø trunk within heavily vegetated areas also within the stage boundaries have been surveyed.
8. Refer to CAD file for additional levels not shown on face of plan for clarity purposes.
9. This note is an integral part of this plan.

### *SURVEY LEGEND:*

EPO .... Electrical Pole
ELP .... Light Pole
TPT .... Telstra Pit
SVA .... Stop Valve
FHY .... Fire Hydrant
WAM .... Water Meter
SMH .... Sewer Manhole
SWMH .... Stormwater Manhole
FIN .... Field Inlet
GLY .... Gully Pit

### UNDERGROUND SERVICES EXPLANATION.

Underground line-styles explanation - examples provided below:

- DRAINAGE — D (QL-A) — = (+-0.050mm)
- COMMUNICATION — C (QL-B) — = (+-0.3Hx0.5V)
- GAS — G (QL-C) — = (+-0.300mm_2D)
- SEWER — S (QL-D) — = (EXISTING RECORDS)

### LINETYPE LEGEND:

| | |
|---|---|
| Sewer | S (QL-A) |
| Sewer (Via Records) | S (QL-D) |
| Water (Via Records) | W (QL-D) |
| Stormwater (Via Records) | D (QL-D) |
| Overhead Electricity | OE |
| Fence | // |
| Kerb Line | |
| Edge of Bitumen | |
| Top of Bank | TOP |
| Toe of Bank | TOE |
| Change of Grade | COG |

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PROJECT
## 2 KARINGAL DRIVE PIMPAMA

CLIENT
**BOSFORM PTY LTD**

DRAWING TITLE
## PLAN OF LEVEL & FEATURE SURVEY OF LOT 19 ON RP152380 ON MGA 2020 (PLANE) DATUM 2 KARINGAL DRIVE PIMPAMA

| | | |
|---|---|---|
| SCALE 1:300 @ A1 | DATE 30/01/26 | DRAWN JW |
| LEVEL DATUM AHD | LEVEL ORIGIN PM 197770 | ORIGIN RL 4.521 |
| AZIMUTH RP152380 | CO-ORD SYSTEM MGA 2020 (PLANE) | CO-ORD ORIGIN PM 197770 |
| EASTING 530231.803 | NORTHING 6921727.958 | SURVEYOR DA |
| AUTOCAD FILE 25218-2A | SURVEY FILE 25218009 | JOB No. 25218-01 |
| CHECKED DA | QT TC | DATE IMAGED 30/01/26 |

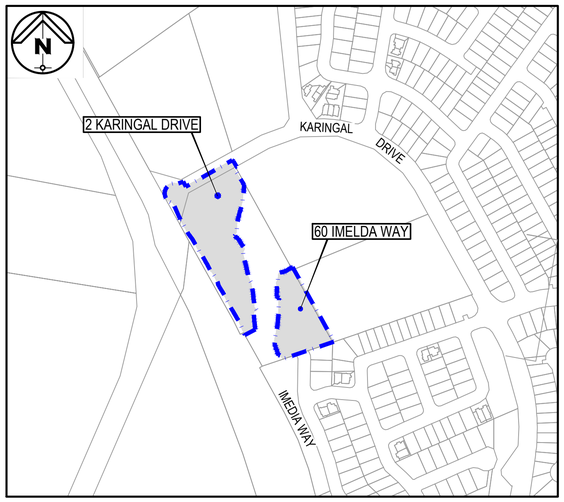
SHEET NUMBER 2 OF 2

PLAN No. **25218-2** ISSUE **A**

# Appendix C - Burchills Engineering Solutions Drawings

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

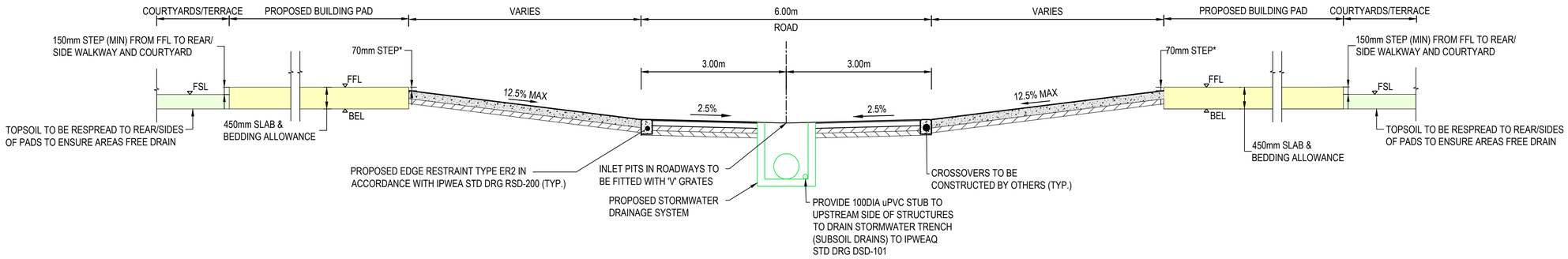
BOS

PREPARED BY

BURCHILLS ENGINEERING SOLUTIONS

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PHONE: +61 7 5509 6400
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ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

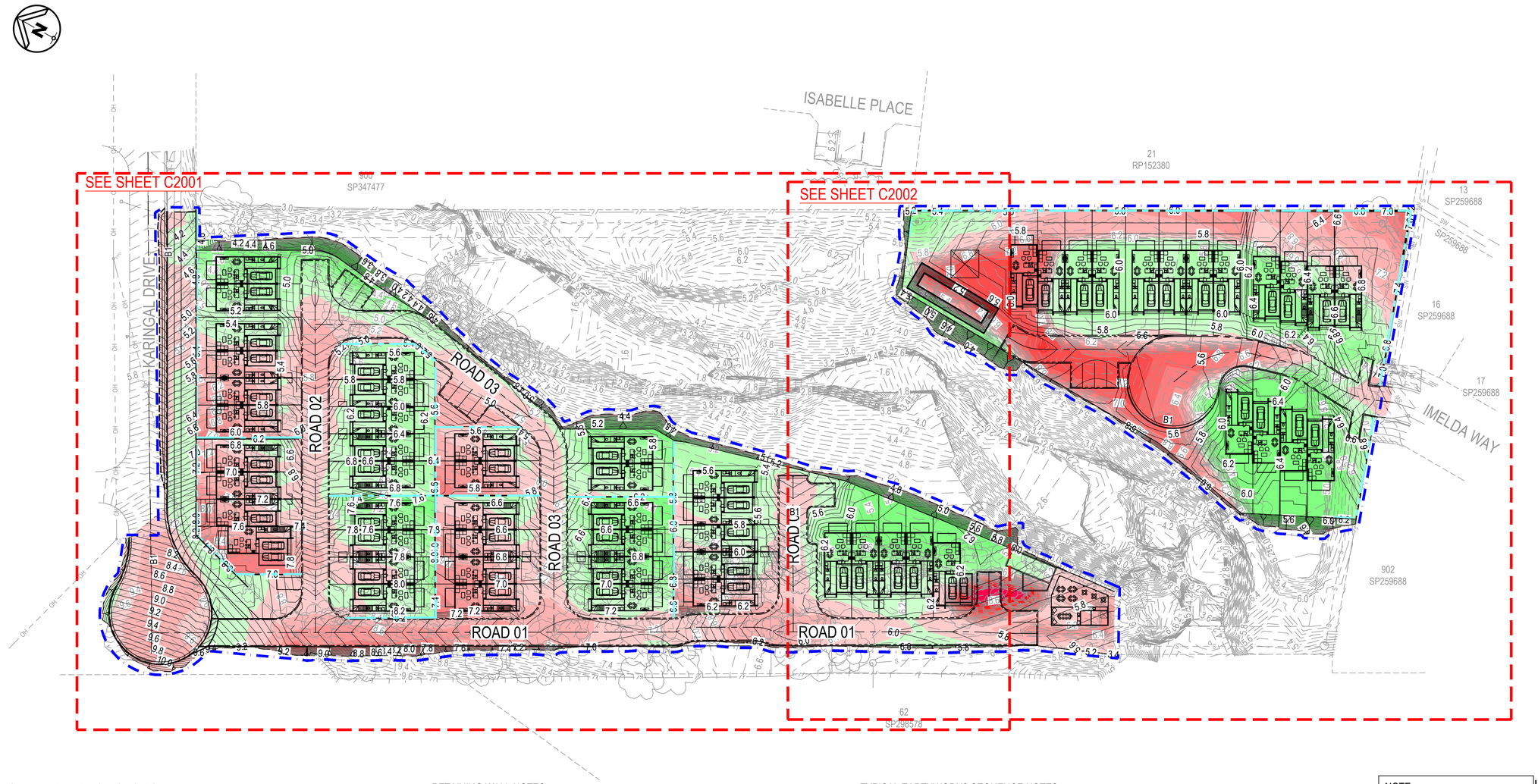
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRm EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

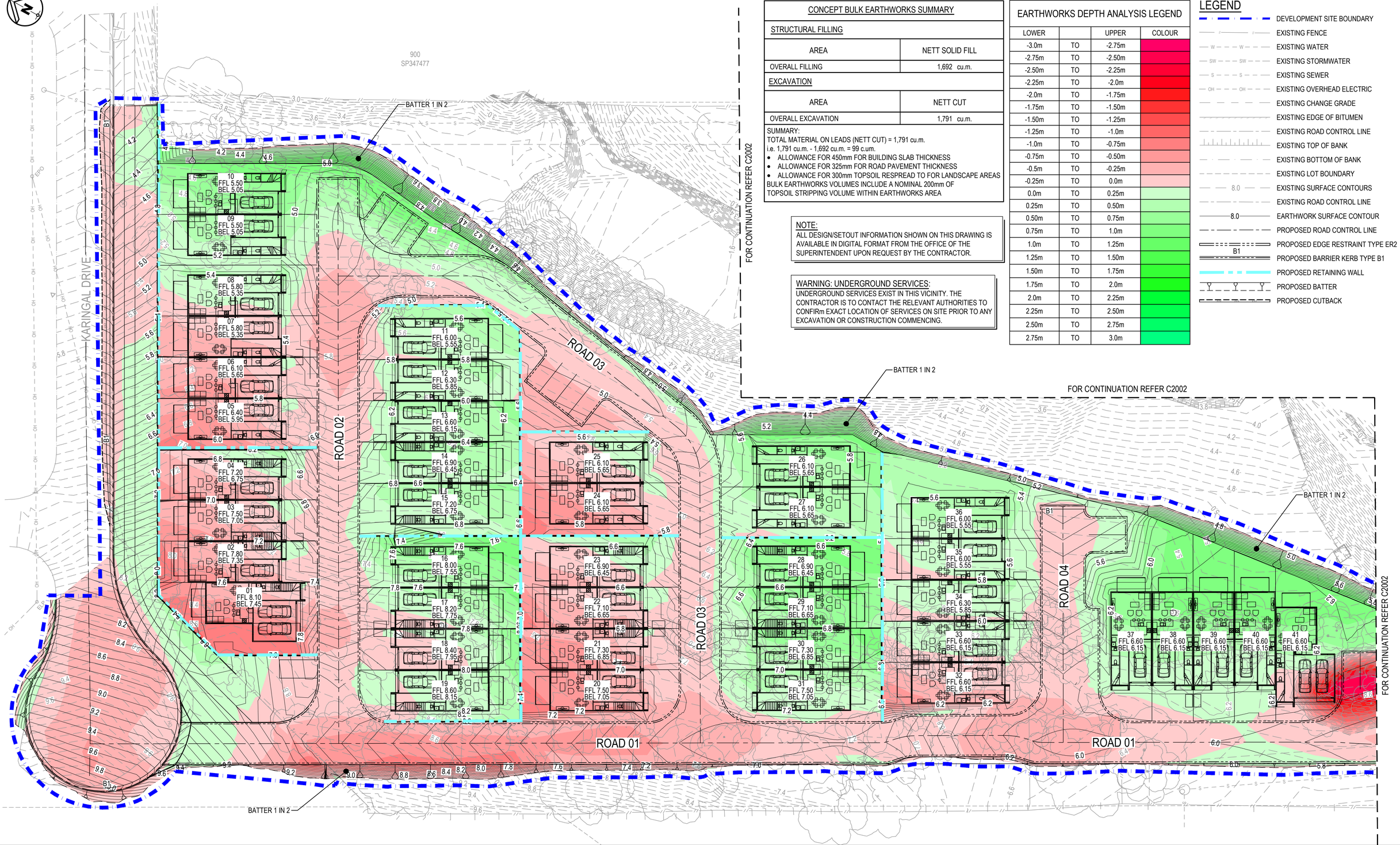
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRm EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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| A | ORIGINAL ISSUE | 11-03-26 |


BURCHILLS ENGINEERING SOLUTIONS
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

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BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

**WARNING: UNDERGROUND SERVICES:**
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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

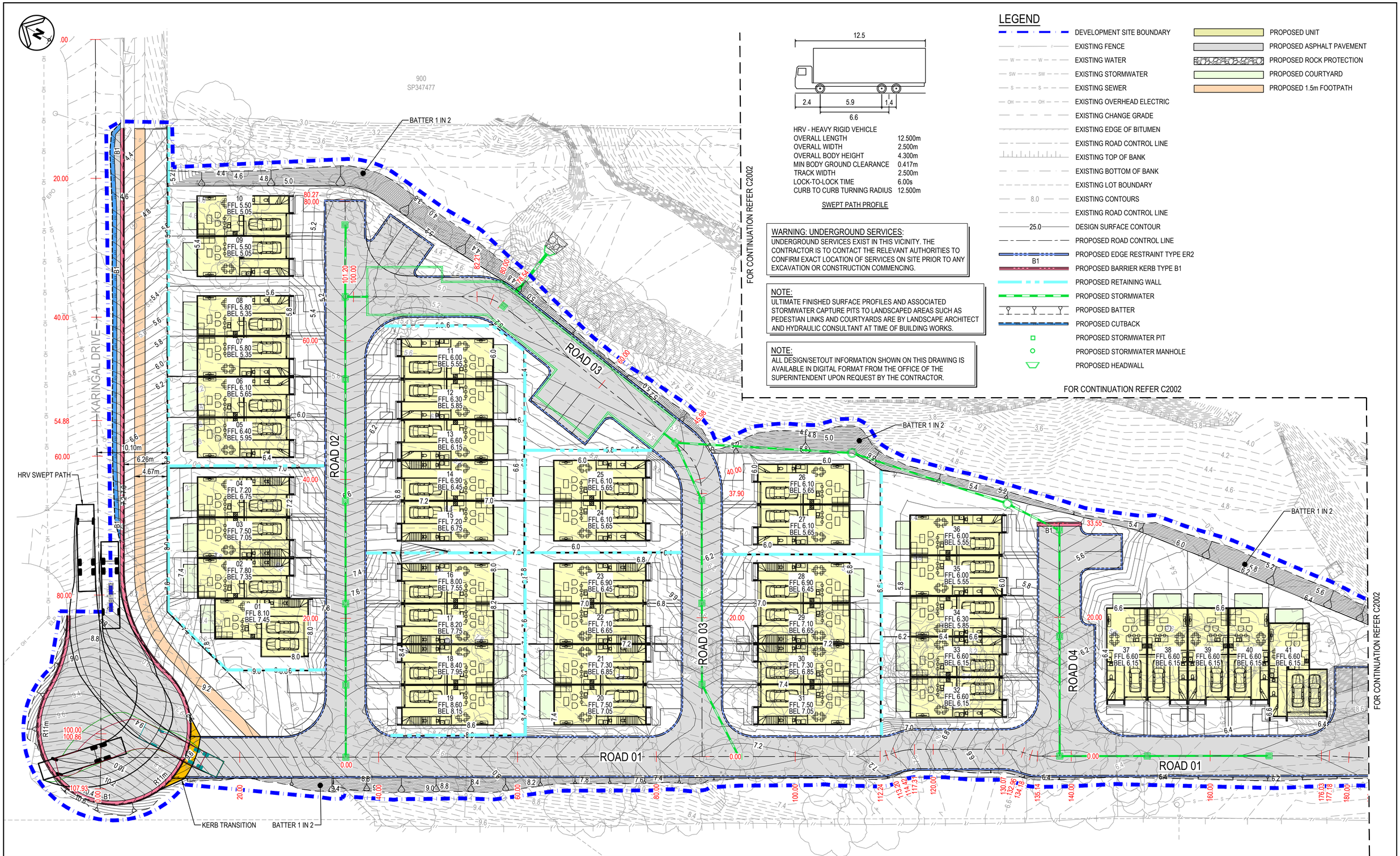
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3000 | A |




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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3001 | A |




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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT :
BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

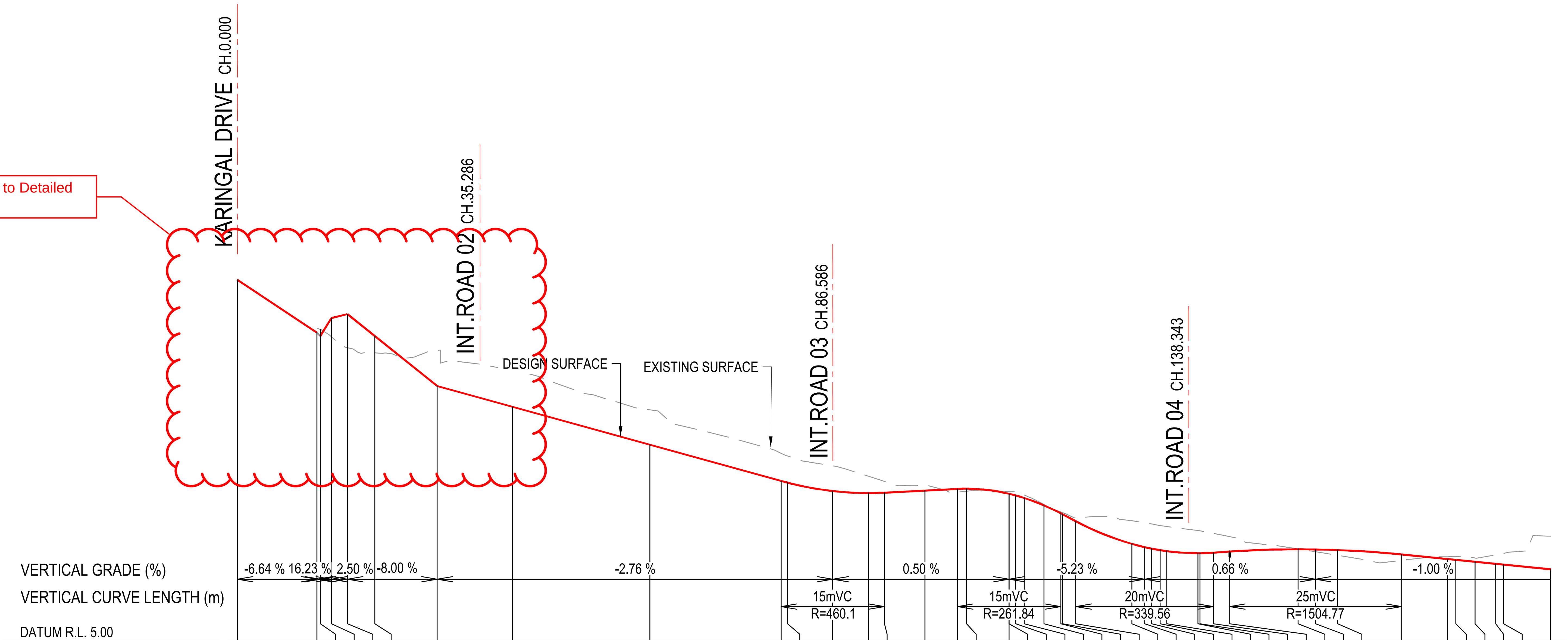
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |



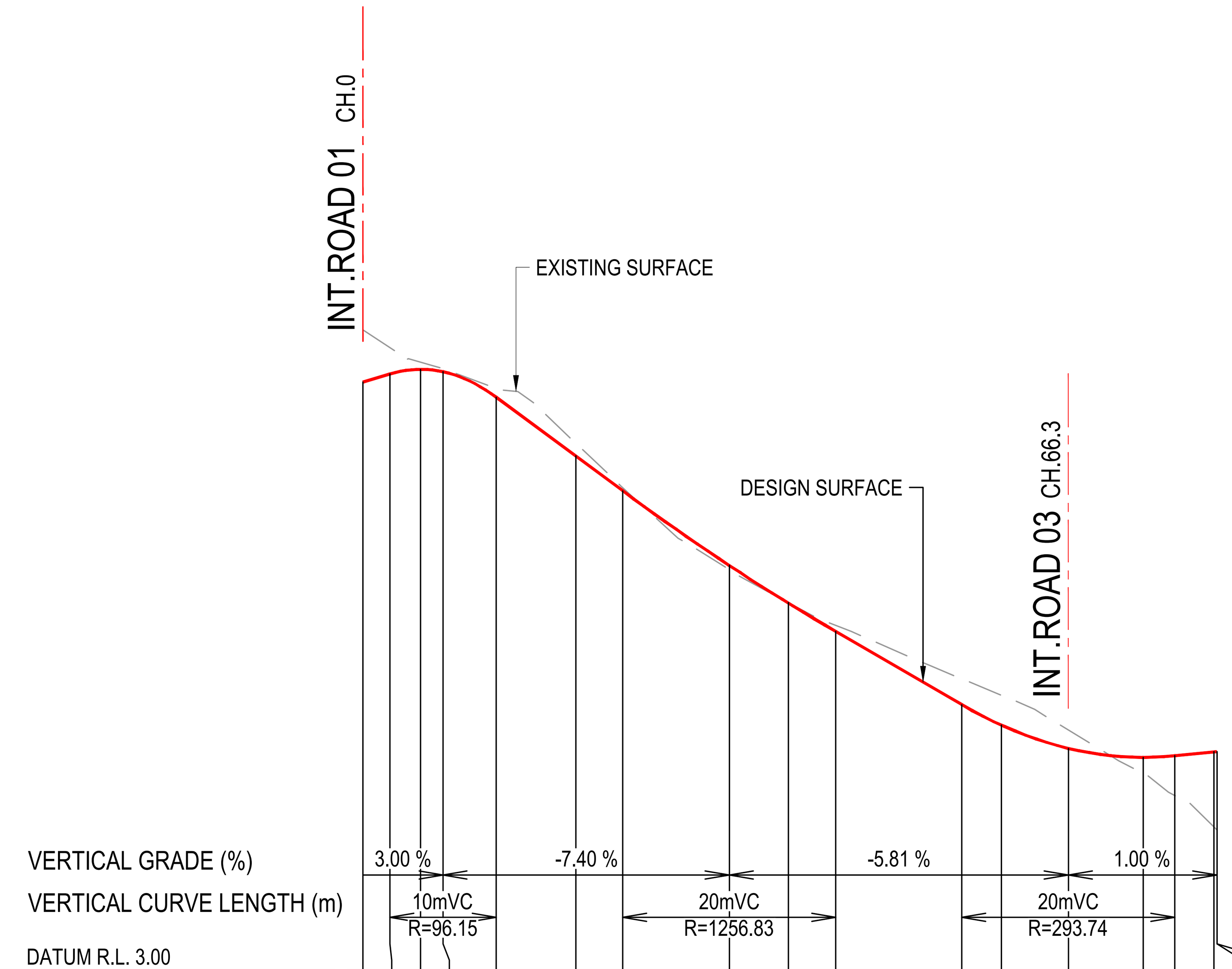

| DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL | CONTROL LINE CHAINAGE |
|---|---|---|---|
| 0.000 | 10.252 | 10.252 | 0.000 |
| 0.007 | 9.483 | 9.476 | 11.575 |
| -0.097 | 9.434 | 9.531 | 12.065 |
| 0.270 | 9.695 | 9.425 | 13.674 |
| 0.490 | 9.753 | 9.263 | 16.000 |
| 0.241 | 9.433 | 9.192 | 20.000 |
| -0.518 | 8.708 | 9.226 | 29.066 |
| -0.532 | 8.406 | 8.938 | 40.000 |
| -0.508 | 7.854 | 8.362 | 60.000 |
| -0.401 | 7.327 | 7.728 | 79.086 |
| -0.387 | 7.303 | 7.690 | 80.000 |
| -0.366 | 7.181 | 7.548 | 86.586 |
| -0.244 | 7.152 | 7.396 | 91.784 |
| -0.164 | 7.158 | 7.322 | 94.086 |
| -0.077 | 7.187 | 7.264 | 100.000 |
| 0.044 | 7.211 | 7.166 | 104.736 |
| 0.035 | 7.214 | 7.179 | 106.045 |
| -0.033 | 7.141 | 7.174 | 112.236 |
| -0.033 | 7.141 | 7.174 | 112.236 |
| -0.054 | 7.116 | 7.170 | 113.201 |
| -0.042 | 7.080 | 7.122 | 114.416 |
| -0.013 | 6.972 | 6.985 | 117.312 |
| -0.020 | 6.856 | 6.876 | 119.736 |
| -0.024 | 6.842 | 6.866 | 120.000 |
| -0.050 | 6.741 | 6.792 | 121.932 |
| -0.335 | 6.414 | 6.749 | 130.067 |
| -0.354 | 6.366 | 6.720 | 131.932 |
| -0.357 | 6.344 | 6.701 | 132.963 |
| -0.356 | 6.322 | 6.678 | 134.178 |
| -0.356 | 6.308 | 6.663 | 135.143 |
| -0.331 | 6.277 | 6.608 | 139.686 |
| -0.326 | 6.277 | 6.603 | 140.000 |
| -0.282 | 6.285 | 6.566 | 141.932 |
| -0.219 | 6.300 | 6.519 | 144.300 |
| -0.005 | 6.333 | 6.339 | 154.254 |
| 0.033 | 6.331 | 6.298 | 156.800 |
| 0.076 | 6.322 | 6.246 | 160.000 |
| 0.085 | 6.258 | 6.173 | 169.300 |
| -0.036 | 6.191 | 6.226 | 176.025 |
| -0.048 | 6.179 | 6.227 | 177.175 |
| -0.057 | 6.151 | 6.208 | 180.000 |
| -0.132 | 6.121 | 6.253 | 182.986 |
| -0.166 | 6.110 | 6.276 | 184.136 |
| -0.486 | 6.041 | 6.527 | 191.003 |

HORIZIONTALGEOMETRY

R-3.00m R9.00m
0.97m 2.90m
R9.00m R-3.00m
2.90m 0.97m
R20.00m R-20.00m
1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




| DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL | CONTROL LINE CHAINAGE |
|---|---|---|---|
| | 8.536 | | 0.000 |
| -0.248 | 8.612 | 8.859 | 2.535 |
| -0.068 | 8.655 | 8.723 | 5.419 |
| -0.026 | 8.632 | 8.658 | 7.535 |
| -0.083 | 8.392 | 8.475 | 12.535 |
| -0.123 | 7.839 | 7.962 | 20.000 |
| -0.030 | 7.511 | 7.541 | 24.434 |
| 0.040 | 6.811 | 6.771 | 34.434 |
| -0.004 | 6.456 | 6.460 | 40.000 |
| -0.056 | 6.190 | 6.246 | 44.434 |
| -0.243 | 5.501 | 5.745 | 56.300 |
| -0.281 | 5.309 | 5.591 | 60.000 |
| -0.173 | 5.090 | 5.264 | 66.300 |
| 0.150 | 5.006 | 4.855 | 73.363 |
| 0.373 | 5.020 | 4.648 | 76.300 |
| 0.708 | 5.057 | 4.349 | 80.000 |
| 0.737 | 5.060 | 4.322 | 80.266 |
| | | 4.322 | 80.274 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

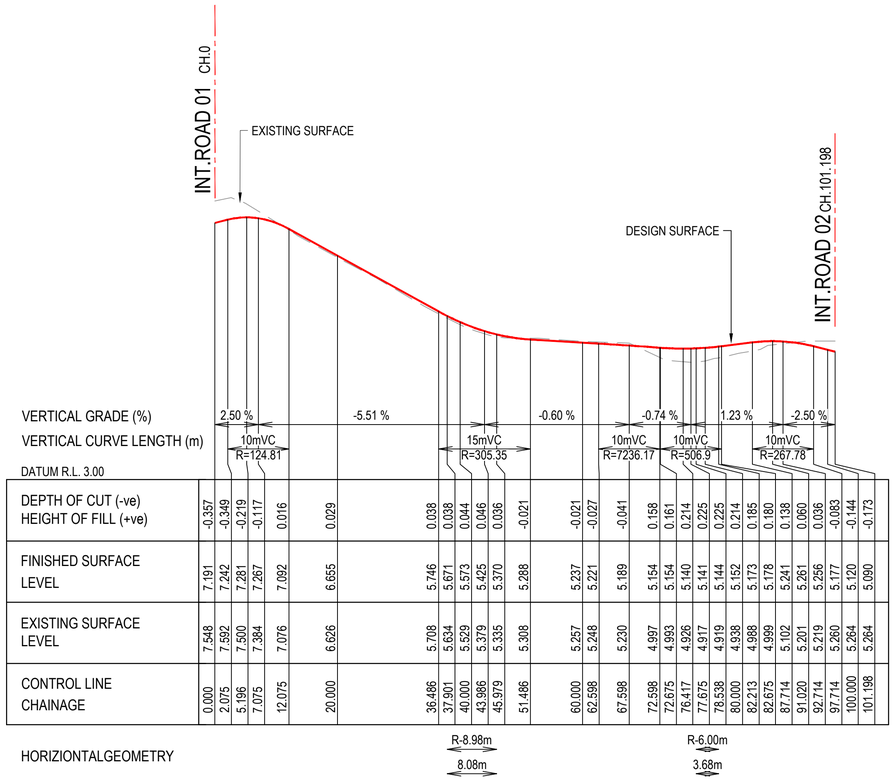
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

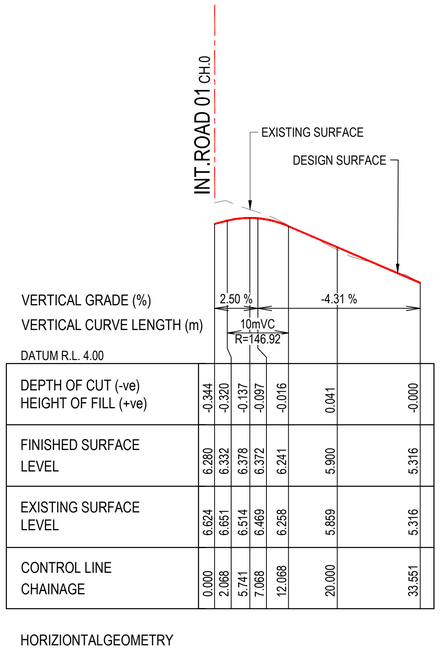
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE20023
DRAWING No. : C3200
VERSION: A



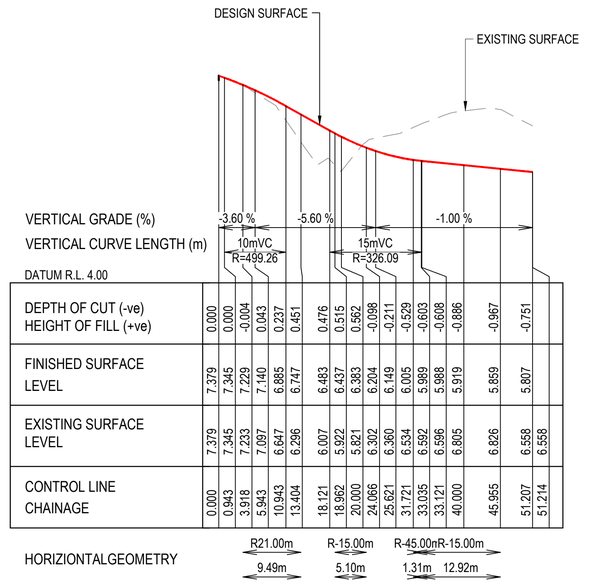

## ROAD 03 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
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(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

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(metres) (FULL SIZE)

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CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

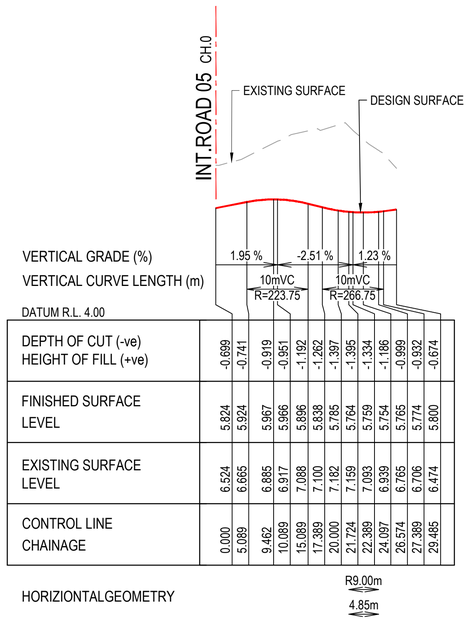
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PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

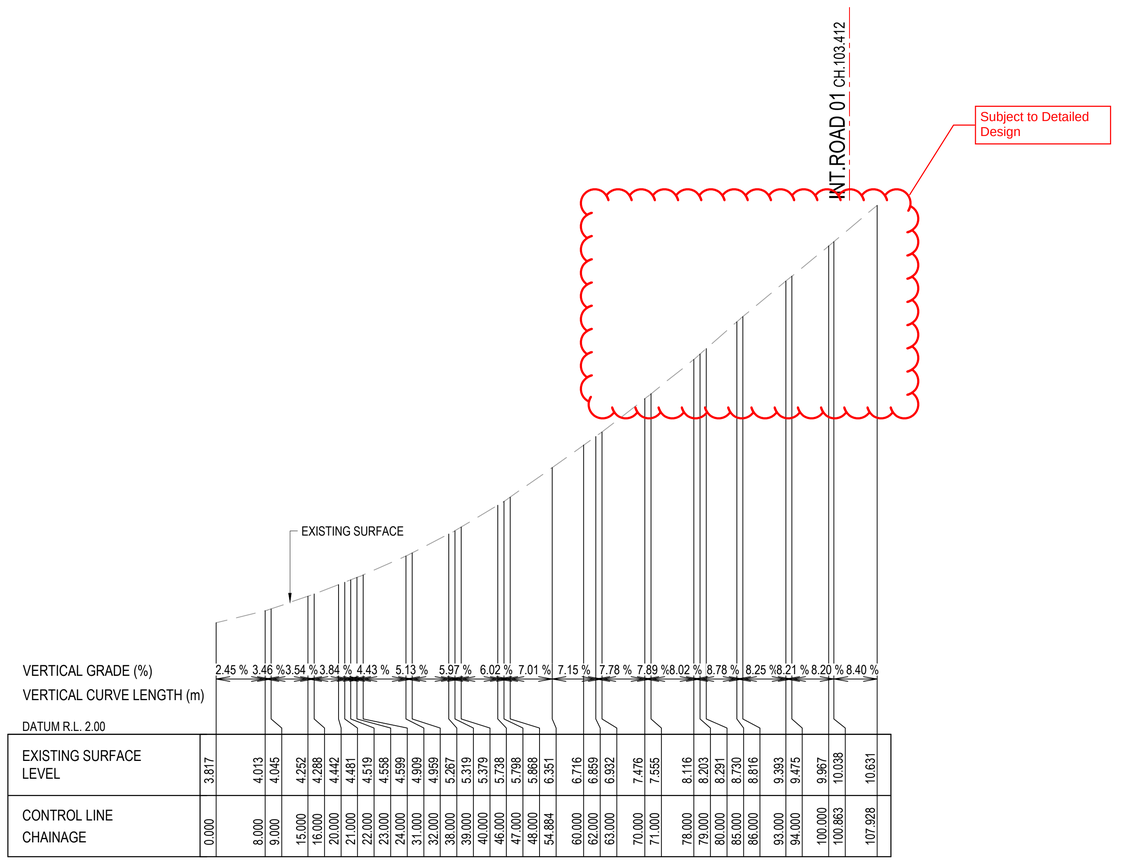
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## ROAD 06 LONGITUDINAL SECTION

SCALES
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0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
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(metres)

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CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

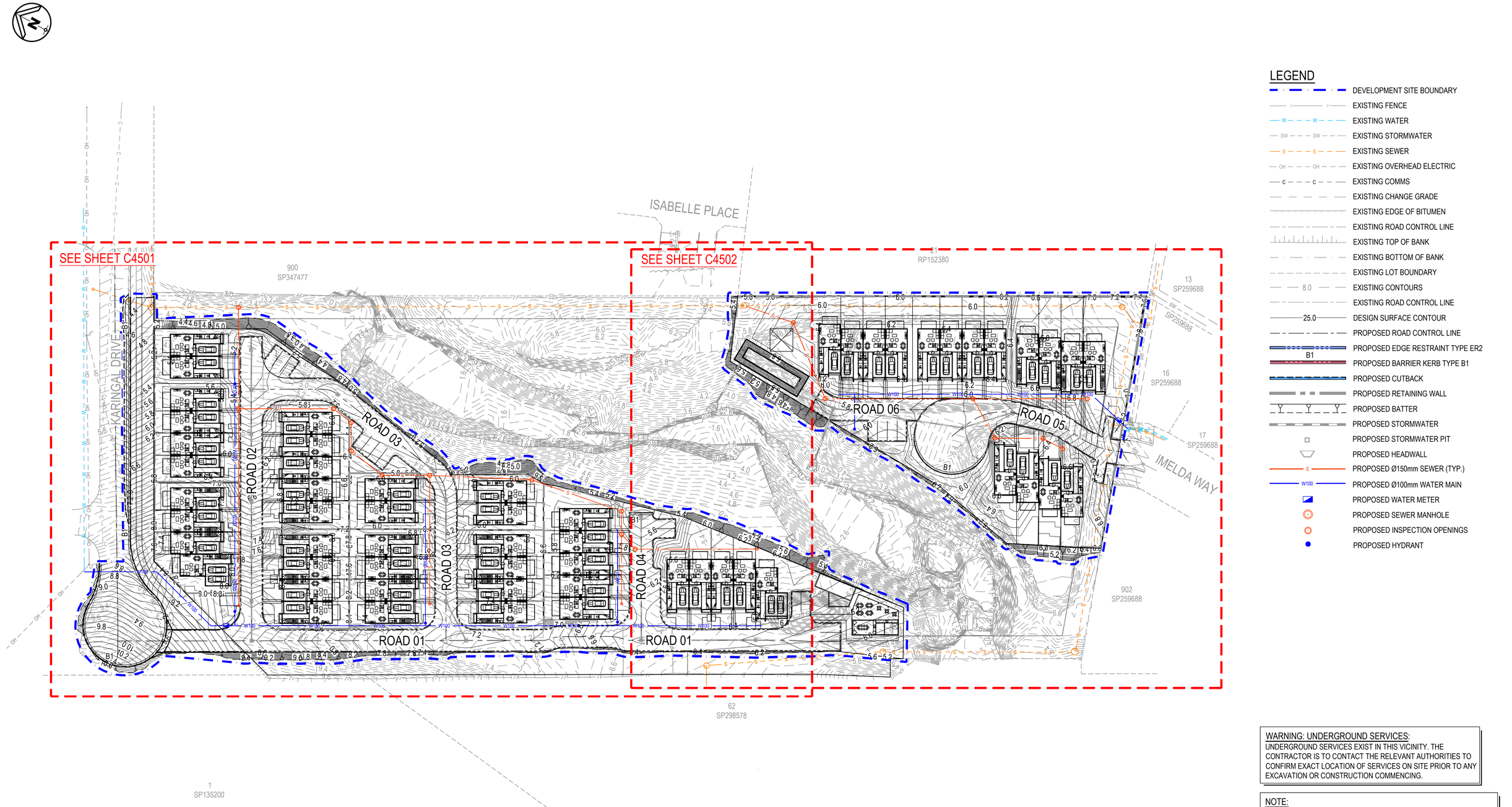
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PROJECT LEADER : - — DESIGNER : BNB
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| BE20023 | C3202 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED HEADWALL
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
- PROPOSED WATER METER
- PROPOSED SEWER MANHOLE
- PROPOSED INSPECTION OPENINGS
- PROPOSED HYDRANT

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

**NOTE:**
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : OVERALL SEWER AND WATER RETICULATION

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

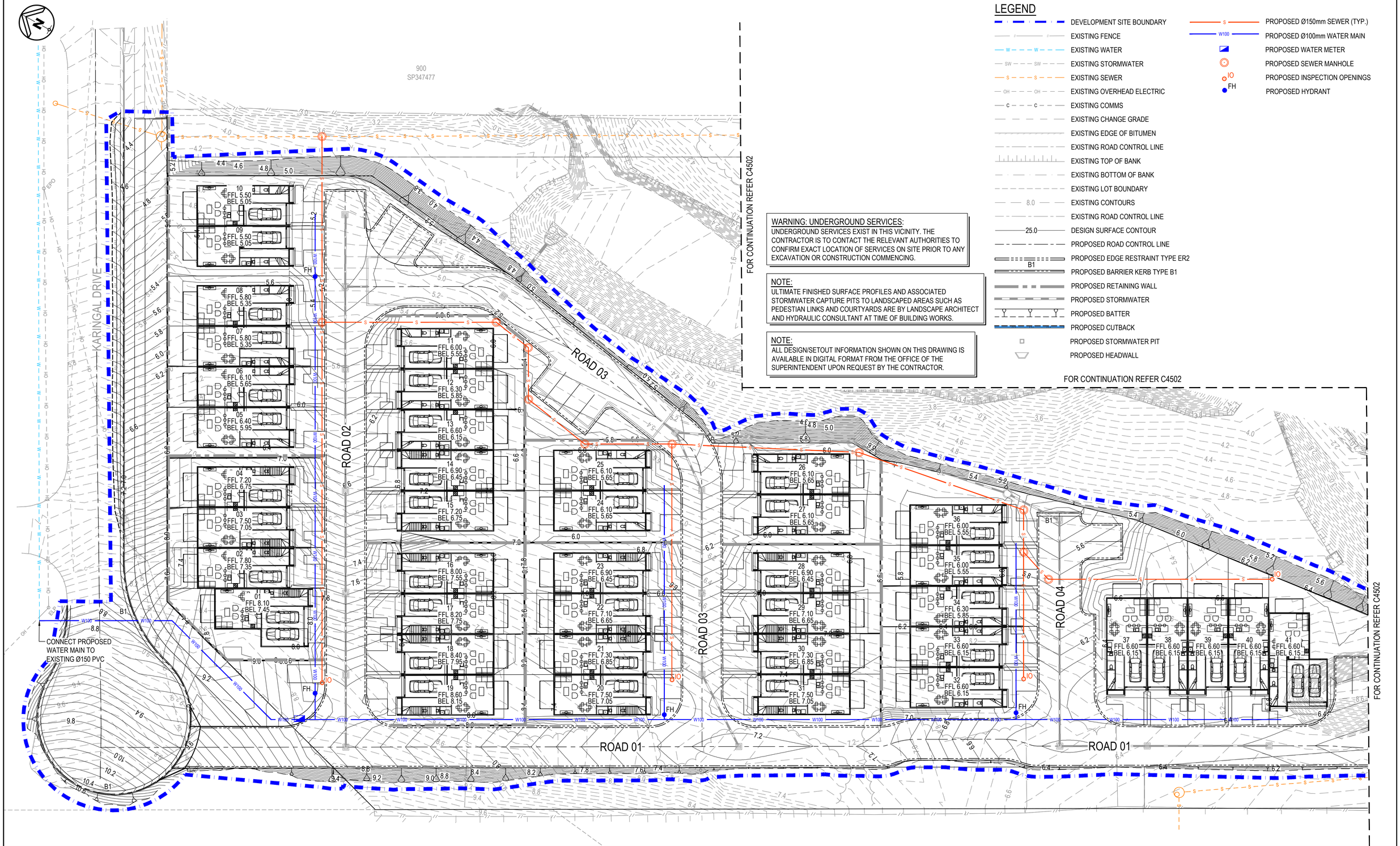
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

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1 : 500 (FULL SIZE)

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|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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CLIENT :

BOS

DRAWING TITLE :

SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 1 OF 2

PROJECT :

2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

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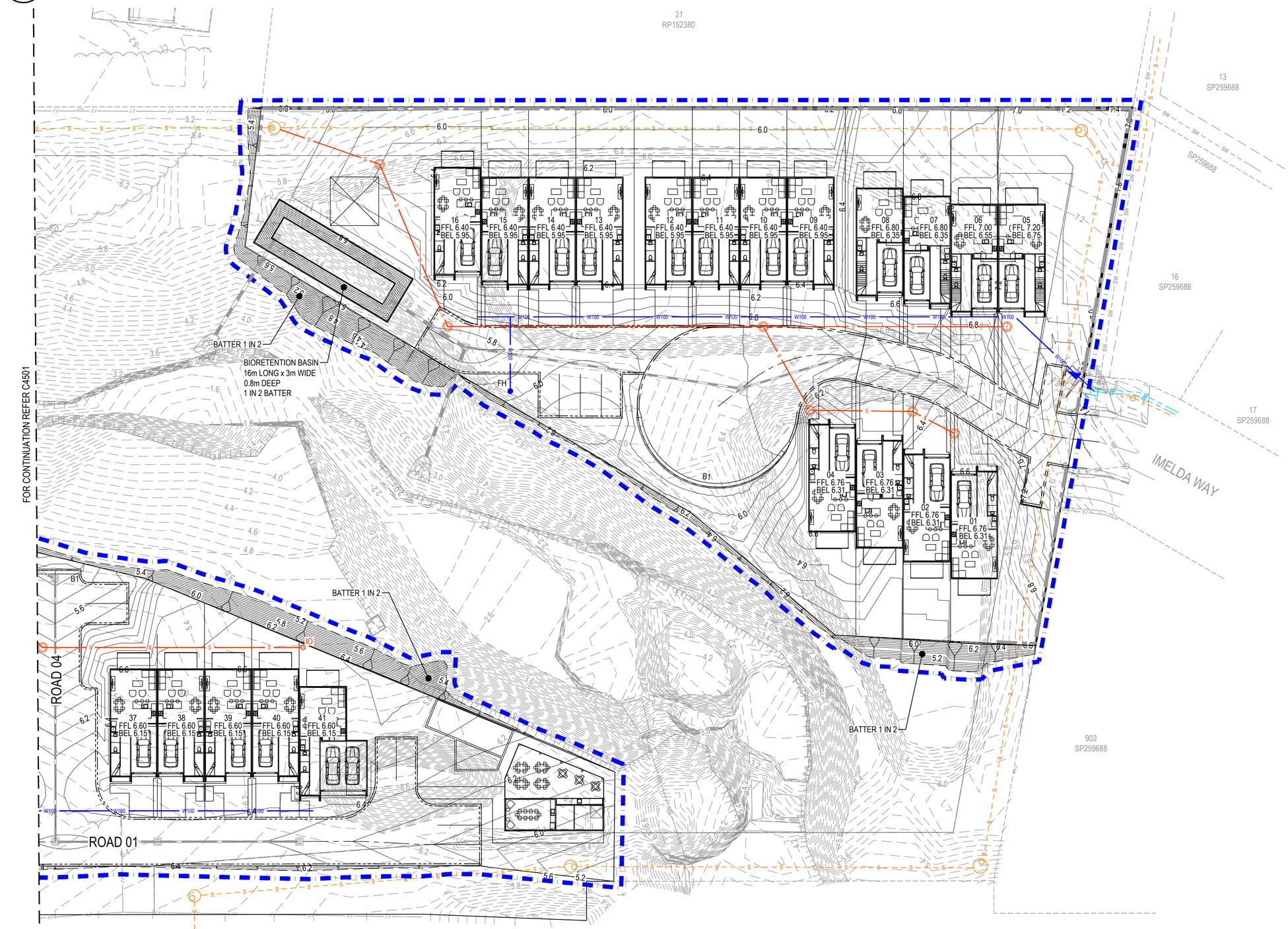
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## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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1 : 250 (FULL SIZE)

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|---|---|
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# QMS RISK & OPPORTUNITIES REGISTER
# SAFETY IN DESIGN – NORMAL DESIGN RISKS - CIVIL

| Design Element | Associated risks & opportunities | Raw risk assessment | | Raw risk rating | Treatment Measures to avoid, minimize or treat the risk. | Responsibility | Residual risk rating |
|---|---|---|---|---|---|---|---|
| | | Likelihood | Consequence | | | | |
| **CONSTRUCTION PHASE** | | | | | | | |
| **SITE ACCESS** | Unsafe site access and egress point, restricted access, flooding, unauthorised access from persons or animals | L | M | L-M | Prepare site specific Construction Traffic Management Plan and Workplace Health and Safety Management Plan | Principal Contractor | L |
| **CLEARING & DEMOLITION** | Removal of existing structures, decommision of services, vegetation clearing and fauna management | M | H | M-H | Contractor to obtain Demolition Permit, arrange all service disconnections with asset ownerand carry out vegetation works in accordance with Vegetation and Fauna Management Plan | Principal Contractor | L |
| **EXISTING SERVICES** | Distrub or damage existing services and infrastructure, overhead powerlines, work adjacent to existing services, existing service relocations | M | H | M-H | Client to commission detailed site survey and service potholing at critical locations. Contractor to undertake Dial Before You Dig and service verification with service authoritiy providers and undertake additional potholing prior to construction | Client and Principal Contractor | L-M |
| **EXCAVATION & TRENCHING** | Unstable existing slopes and landslip, steep cut profiles, deep trench excavations, working at heights, intercept water table, dispersive soils, acid sulphate soils | M | H | M-H | Client to commission a geotechnical investigation and contractors to undertake own investigations. Temporary and final earthworks profiles confirmed by client's geotechnical consultant. Tempory earthworks profile to be confirmed by Contractor's geotechnical consultant. Contractor to provide temporary benching, fencing, stabilisation and shoring. | Client and Principal Contractor | L |
| **MATERIALS HANDLING** | Manual handling, handling and disposal of sharps, repeative work processeds, hazardous substances | H | M | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including Material Safety Data Sheets | Principal Contractor | L |
| **PLANT & EQUIPMENT** | Operation of plant and machinery, site access by visitors, material deliveries and waste removal | M | H | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including register of operator machinery tickets. Contractor to maintain a site visitor register and provide site specific induction to all visitors | Principal Contractor | L |
| **OPERATIONAL PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | General road safety, flood free access, pedestrian and cyclist injuries, inadequate signage | L | H | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **STORWATER / FLOODING** | Hazard from storm and flood water depths and velocities, ponding and access to inlets, outlets and basins | M | H | M-H | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WATER & SEWER** | Blockages, contamination, interuption to service, access to fittings, confined space access | L | M | L-M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WALLS & FENCING** | Risk of falls, unauthoried access from persons and animals, structural failure | M | M | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **MAINTENANCE PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **REFURBISHMENT PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **DEMOLITION PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |


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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : HAZARD RISK REGISTER - DESIGN RISKS

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : | DATE : 11-03-26
PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

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| BE20023 | C9000 | A |

# Appendix D – Code Compliance Responses

# City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

**Please note:**

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

## 9.4.1 Change to ground level and creation of new waterways code

### 9.4.1.1 Application

This code applies to assessing operational work (change to ground level) and bulk earthworks undertaken as part of an operational work (works for infrastructure) application where indicated within **Part 5 Tables of assessment**.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5**.

Supporting information is prepared by a suitably-qualified person in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 8 – Engineering drawings, documents and reports** and/or **SC6.10 City Plan policy – Geotechnical stability assessment guidelines**.

### 9.4.1.2 Purpose

(1) The purpose of the Change to ground level and creation of new waterways code is to protect the environment from impacts of earthworks and the creation or expansion of waterways.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) Ground level changes are undertaken with geotechnically and ecologically sound practices.

**Note: For guidance on how to meet this overall outcome refer to SC6.10 City Plan policy – Geotechnical stability assessment guideline.**

(b) Development does not increase the risk of flood damage to life or property.

(c) Development does not increase the rate or volume of run-off during a flood.

(d) Soil disturbance and development of land containing potential and actual acid sulfate soils does not result in environmental damage.

(e) Construction phase erosion and sediment controls are implemented to minimise erosion and ensure total suspended solids in receiving waters meet the water quality objectives (*Environmental Protection (Water) Policy 2009*).

(f) Changes to existing ground levels, including the creation of new waterways do not adversely affect the amenity and landscape values.

(g) The environment and public safety are protected from impacts arising from the creation or expansion of non-tidal artificial waterways, such as urban lakes.

(h) Development does not adversely affect the quality of stormwater discharging from the development site.

(i) The drainage capacity of the Woongoolba Flood Mitigation Scheme Area for rainfall events up to 1 in 10 year, 72 hours is maintained (contained within the Scheme drains within a 4 day period) and this capacity is not eroded due to cumulative impact of development.

### 9.4.1.3 Specific benchmarks for assessment

**PART B – ASSESSABLE DEVELOPMENT BENCHMARKS**

**Table 9.4.1-1: Change to ground level and creation of new waterways code – for assessable development**

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Finished surface levels** | | | |
| **PO1**<br>The finished surface level is free draining and free from localised flooding. | **AO1**<br>Development is free draining and the surface gradient of the fill and/or excavated area is between 0.5% to 1.5%.<br>OR<br>For steep surface gradients, integration with the surrounding topography must be achieved so that the finished profile does not interrupt or materially change the surface water. | **COMPLIES** | |
| **Stormwater drainage** | | | |
| **PO2** | **AO2.1**<br>The change to ground level maintains flood conveyance through the site for flood events up to a 1 in 100 (Q100) year Average Recurrence | **COMPLIES** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| Development does not cause adverse stormwater drainage impacts on or off the site. | Interval (ARI) storm event using the drainage strategy in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards**. | | |
| | **AO2.2**<br>The change in ground level does not involve fill below the designated flood level, unless approved as part of a development approval for material change of use or reconfiguration of a lot. | **COMPLIES** | |
| | **AO2.3**<br>The change in ground level does not result in an alteration of overland flows onto other properties or create an increase in flood damage to other properties. | **COMPLIES** | |
| **Woongoolba Flood Mitigation Scheme Catchment Area** | | | |
| **PO3**<br>In the Woongoolba Flood Mitigation Scheme Catchment Area, shown on the **Water catchments and dual supply system area overlay map**, peak outflow and its timing for Q2, Q5 and Q10 for rainfall events up to 72 hours does not change as a result of development. | **AO3**<br>No acceptable outcome provided. | **COMPLIES** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Stormwater quantity** | | | |
| **PO4**<br>Development ensures that there is no impact on local drainage systems, so that no damage is caused to any property upstream or downstream of the site. | **AO4**<br>A site stormwater quantity management plan is prepared by a suitably qualified professional and demonstrates:<br>(a) achievable stormwater quantity control measures for discharge during both the construction and operational phases of development designed in accordance with the *Queensland Urban Drainage Manual (QUDM)* unless subject to specific requirements of **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design**; and<br>(b) on-site detention systems are designed to restrict peak outflows for Q2, Q5, Q10, Q20 Q50 and Q100 to pre-development conditions.<br>OR<br>A Site Stormwater Quantity Management Plan is consistent with that approved in a related development approval. | **COMPLIES** | |
| **Erosion and sediment control** | | | |
| **PO5**<br>All construction and operational work is designed and managed with specific regard to the density, scale, layout and staging of development. All reasonable and practicable measures are taken to protect the environmental values of waters and the functionality of | **AO5.1**<br>An assessment is undertaken in accordance with the criteria in **Table 9.4.1-2: Erosion hazard assessment**. | **COMPLIES** | |
| | **AO5.2**<br>**Where the Erosion hazard assessment has a risk score less than or equal to 10:** | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| stormwater infrastructure from the impacts of erosion, turbidity and sedimentation, on and downstream of the development site. | a deemed-to-comply report is prepared by a suitably qualified person for Council's approval, including conceptual location and design drawings of each treatment measure in plan and section views, in accordance with the criteria within the guidelines entitled: *Urban Stormwater Quality Planning Guidelines by the Department of Environment and Heritage Protection*.<br>OR<br>**Where the Erosion hazard assessment has a risk score greater than 10:**<br>an Erosion and Sediment Control Plan (ESCP) is prepared by a suitably qualified person for Council's approval in accordance with the: *Best Practice Erosion and Sediment Control International Erosion Control Association (ICEA) 2008, Australasia Chapter 2008* detailing the stormwater (quality and flow) treatment measure during the construction phase of development, demonstrating how the minimum design objectives in **Table 9.4.1-3 Summary of design objectives for management of stormwater quality – construction phase** are achieved including: | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | (a) measures to ensure that the release of sediment-laden stormwater for the nominated design storm are minimised when the design storm is exceeded;<br>(b) detailed design, installation, construction, monitoring and maintenance requirements of all approved proprietary products in accordance with local conditions and manufacturers recommendations;<br>(c) detailing how the ESCP accompanying the Operational work (change to ground level) aligns with the Reconfiguration of lot staging. | | |
| | **AO5.3**<br>Where development is on a lot less than 850m$^2$, provide an ESCP in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design** and **Section 8 – Engineering drawings, documents and reports**. | **NA** | |
| | **AO5.4**<br>Where development is on a lot equal to or more than 850m$^2$, provide an ESCP in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design** and **Section 8 – Engineering drawings, documents and reports**. | **COMPLIES** | |
| **Hydraulic considerations** | | | |
| **PO6** | **AO6** | **COMPLIES** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| Any change to the level of the land does not have adverse flooding and drainage impacts. | An Hydraulic report is prepared by a suitably qualified professional to accord with the Council's hydraulic requirements, demonstrating that the change to the level of the land does not:<br>(a) cause ponding on the site or nearby land;<br>(b) increase flooding which adversely affects the safety or use of any land upstream and downstream;<br>(c) adversely affect the flow of water in any overland flow path, or otherwise. | | |
| **Geotechnical fill** | | | |
| **PO7**<br>Material used as fill has the ability to adequately support future development of the land. | **AO7**<br>The fill material type, composition and source is geotechnically suitable and adequately compacted to support future development, in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 3 – Change to ground level standards**. | **COMPLIES** | |
| **Geotechnical stability** | | | |
| **PO8**<br>All earthworks are carried out in a location which is not at risk from geotechnical instability. | **AO8**<br>The site is free of compressible soils (e.g. soft clays underneath the site).<br>OR<br>Where the site is underlain by compressible soils, a Geotechnical stability assessment report is prepared by a suitably qualified professional demonstrating the treatment of compressible soils achieves a stable ground able to support future structures. | **COMPLIES** | |
| **Batters and retaining wall** | | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO9**<br>Batters and retaining walls do not create a negative visual impact on the area. | **AO9**<br>Batters and retaining walls are in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 3 – Change to ground level standards**. | **COMPLIES** | |
| **Local amenity, noise and emissions** | | | |
| **PO10**<br>Change to ground level or bulk earthwork activities do not impact on the amenity of the area. | **AO10.1**<br>Development work, which has the potential to generate dust is controlled by:<br>(a) daily water spraying of exposed areas;<br>(b) sealed roads;<br>(c) protective covering of exposed areas; and<br>(d) installing wind barriers. | **COMPLIES** | |
| | **AO10.2**<br>All earthworks on the site is undertaken within the following days and hours:<br>**Day** — **Hours**<br>Monday to Friday — between 6:30am and 6:30pm<br>Saturday — between 6:30am and 6:30pm | **COMPLIES** | |
| **Managing contamination risk** | | | |
| **PO11**<br>Any filling or excavation material does not result in the contamination of land. | **AO11**<br>All fill material is solid clean earth or clean inert material, free of organic, putrescible or refuse matter. | **COMPLIES** | |
| **Haulage activity and amenity** | | | |
| **PO12** | **AO12.1** | **COMPLIES** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| Haulage activities do not impact on the amenity of the area. | Where transportation of fill material to or from the site is involved, the following applies:<br>(a) loads are covered;<br>(b) spilled or wheel-tracked material is immediately cleaned from external roads; and<br>(c) heavy vehicle traffic is controlled. | | |
| | **AO12.2**<br>All waste material, including vegetation from the site is disposed of in an approved location. | **COMPLIES** | |
| | **AO12.3**<br>All haulage routes are approved:<br>(a) for declared main roads – by the Department of Transport and Main Roads;<br>(b) for all other roads – by the Council. | **COMPLIES** | |
| | **AO12.4**<br>All haulage to and from the site is conducted within the following days and hours:<br>**Day** — **Hours**<br>Monday to Friday — between 6am and 6pm<br>Saturday — between 7am and 6pm | **COMPLIES** | |
| **Created new waterways** | | | |
| **PO13**<br>The waterway contributes to the amenity of the development and the surrounding area. | **AO13.1**<br>Created waterways within an Operational work (change to ground level) application are designed and managed for any of the following end-uses: | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | (a) amenity, aesthetics, landscaping or recreation;<br>(b) flood management;<br>(c) stormwater harvesting within an integrated water-cycle management plan; and<br>(d) aquatic habitat. | | |
| | **AO13.2**<br>The end-use of the created waterway is designed and operated to protect water environmental values. | **NA** | |
| **PO14**<br>The created waterway location is compatible with the land-use constraints of the site protecting water environmental values in existing natural waterways. | **AO14.1**<br>The created waterway within the Operational work (change to ground level) application achieves the following:<br>(a) environmental values in downstream waterways are protected;<br>(b) groundwater recharge areas are not affected;<br>(c) the waterway location incorporates low-lying areas of a catchment connected to an existing waterway; and<br>(d) any existing areas of ponded water are included. | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | **AO14.2**<br>Created waterways:<br>(a) are located outside natural wetlands, waterways and associated buffer areas;<br>(b) avoid soil or sediment disturbance; and<br>(c) avoid alteration of the natural hydrologic regime in acid sulfate soil and nutrient hazard areas. | **NA** | |
| **PO15**<br>The created waterway's location is compatible with existing tidal waterways. | **AO15**<br>Where the created waterway is adjacent or connected to a tidal waterway by a weir, lock, pumping system or similar:<br>(a) there is sufficient flushing or a tidal range of >0.3m;<br>OR<br>(b) any tidal flow alteration does not adversely impact on the tidal waterway;<br>OR<br>(c) there is no introduction of salt water into freshwater environments. | **NA** | |
| **PO16**<br>Created waterways are designed and managed to support the legislated environmental values and water quality objectives within *Environmental Protection (Water) Policy 2009* of connected receiving water environments. | **AO16.1**<br>The created waterway within the Operational work (change to ground level) application is designed, constructed and managed by a suitably qualified Registered Professional Engineer Queensland (RPEQ) with specific artificial waterway experience. | **NA** | |
| | **AO16.2**<br>The created waterway within the Operational work (change to ground level) application is | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | supported by a Water Quality Management Plan, prepared by a suitably qualified professional, demonstrating the following:<br>(a) water quality of the created waterway is the same or higher standard as the existing water quality;<br>(b) long-term maintenance of the water quality standard is achieved; and<br>(c) breeding potential of biting insects is minimised. | | |
| | **AO16.3**<br>The created waterway does not have deep, isolated holes that stratify and increase the possibility of algal blooms occurring. | **NA** | |
| | **AO16.4**<br>Pumping from a created waterway to maintain water quality is avoided. | **NA** | |
| | **AO16.5**<br>The created waterway is designed with a suitable outlet to ensure that flooding is possible, if required. | **NA** | |
| | **AO16.6**<br>Stormwater is treated before any stormwater enters a created waterway. | **NA** | |
| **PO17**<br>Operational work does not cause geotechnical bank instability, erosion, bed scour or revetment wall collapse to existing or newly created waterway. | **AO17**<br>Edge treatments certified by a suitably qualified person are in place during and post-construction phase to strengthen the embankment and protect from damage. | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO18**<br>The waterway is managed and operated to achieve the water quality objectives *(Environmental Protection (Water) Policy 2009)* in natural waterways. | **AO18.1**<br>Monitoring and maintenance programs manage the waterway to achieve the water quality objectives downstream. | **NA** | |
| | **AO18.2**<br>Aquatic weeds are managed to achieve a low percentage (less than 10%) coverage of the water surface area. Pests and vectors are managed by avoiding stagnant water areas, providing for native fish predators, and, if necessary, other best practices for monitoring and treating pests. | **NA** | |
| | **AO18.3**<br>The created waterway is managed and operated under agreement by an appropriate entity for the life of the waterway. A Waterway Management Plan is incorporated within the Community Management Statement for the principal body corporate that: | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | (a) identifies the waterway;<br>(b) states the period of responsibility of the entity;<br>(c) states a process for transfer of responsibility for the waterway;<br>(d) states required actions for monitoring water quality of the waterway and receiving waters;<br>(e) states required actions for maintaining the waterway to achieve the policy outcomes of the *Environmental Protection (Water) Policy 2009* and approval conditions; and<br>(f) identifies funding sources for the above matters including bonds, headworks charges or levies. | | |
| **Access to new waterways** | | | |
| **PO19**<br>Created waterways are designed to provide maintenance access to revetment walls and cleaning of the waterway. | **AO19**<br>Access is provided to the waterways by:<br>(a) dedication of land to the Crown; or<br>(b) existing access arrangements. | **NA** | |
| **PO20**<br>Created waterways to be transferred to public ownership are supported by infrastructure to ensure public safety. | **AO20**<br>Created waterways are designed to create a safe public asset by including:<br>(a) warning signs; and<br>(b) fenced areas restricting access to steep-sided embankments or large drops. | **NA** | |

**Table 9.4.1-2: Erosion hazard assessment**

| Controlling factor | Points | Score |
|---|---|---|
| **Average slope of the whole site prior to operational works** | | |
| Slope less than 2% | 0 | |
| More than or equal to 2% but less than 5% | 1 | |
| More than or equal to 5% but less than 10% | 2 | 2 |
| More than or equal to 10% but less than15% | 4 | |
| More than or equal to 15% | 5 | High Risk |
| **Soil type (to be disturbed)** | | |
| Gravels and sandy soils | 1 | |
| Sandy loam | 2 | |
| Clays on flood plains | 3 | |
| Shallow soils on slopes | 4 | 5 |
| Clays on slopes greater than 5%/imported fill or untested | 5 | High Risk |
| **Anticipated duration of site disturbance** | | |
| Duration of 2 weeks or less | 0 | |
| More than 2 weeks and up to, and including 3 months | 2 | |
| More than 3 months and up to, and including 6 months | 4 | 4 |
| More than 6 months | 5 | High Risk |
| **Anticipated erosive rainfall risk during site disturbance** | | |
| Low (monthly average rainfall less than 45 mm) | 0 | |
| Moderate (monthly average rainfall 46 - 100 mm) | 1 | |
| High (monthly average rainfall 101 - 225 mm) | 2 | 2 |
| Very high (monthly average rainfall 226 - 1500 mm) | 4 | |
| Extreme (monthly average rainfall more than 1500 mm) | 5 | High Risk |
| **Off-site sediment control (down-slope of the soil disturbance)** | | |

| Controlling factor | Points | Score |
|---|---|---|
| Score 1 point if there is no purpose-built sediment trap (e.g. sediment basin, gross pollutant trap or purpose-built wetland). | 1 | 0 |
| **Run-off entering the site** | | |
| Score 1 point if stormwater run-off is not diverted from entering the site or away from soil disturbance. | 1 | 0 |
| **Extent of site disturbance** | | |
| Score 2 points if the building works requires reshaping of the ground surface. | 2 | 2 |
| **Total Score**<br>**Note: High erosion risk - if score 11 or greater, or 5 for any factor.** | | |

This Erosion Hazard Assessment form is adapted from the Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia), IECA 2008 Appendix H - Building Sites, the Brisbane City Council Erosion Hazard Assessment Form and Attachment 2 to the QDC Draft Part 16 Erosion and Sediment Control.

**Table 9.4.1-3: Summary of design objectives for management of stormwater quality – construction phase**

| Construction phase stormwater design objectives | Notes |
|---|---|
| **Drainage control** | |
| Design life and design storm of temporary drainage works:<br>(1) Disturbed area open for less than 12 months - 1 in 2 ARI.<br>(2) Disturbed area open for 12-24 months - 1 in 5 ARI.<br>(3) Disturbed area open for more than 24 months - 1 in 10 ARI. | • ARI = Average Recurrence Interval (see Engineers Australia document Australian Rainfall and Runoff).<br>• Design capacity excludes minimum 150 mm freeboard.<br>• A higher drainage design objective may be required for temporary drainage structures upslope of occupied properties.<br>• A revised drainage design storm may be required if these design objectives are found to be impracticable (e.g. in North Queensland). |
| **Erosion control** | |
| (1) Minimise exposure of disturbed soils at any time.<br>(2) Avoid or minimise large construction activities in the 'wet season'. | • 'Wet season' means the high rainfall months, e.g. the four highest rainfall months. |

| Construction phase stormwater design objectives | Notes |
|---|---|
| (3) Divert water run-off from undisturbed areas around disturbed areas.<br>(4) Use erosion risk ratings to determine appropriate erosion control measures. | • For point 4, determine the erosion risk rating using local rainfall erosivity, rainfall depth, or soil loss rate or other acceptable method. A rating scale such as very low, low, moderate, high, extreme should be applied. Such ratings should reflect the local area. Example ratings may be shown in local council guidelines or detailed in best-practice guidelines. |
| **Sediment control** | |
| (1) Use soil loss rates to determine appropriate sediment control measures.<br>(2) Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water run-off.<br>(3) Site discharge during sediment basin dewatering should not exceed 50 mg/L TSS and pH between 6.5 - 8.5. | • For point 1, surrogate determinations may be used such as monthly erosion or average monthly rainfall.<br>• For point 2, a commonly used design storm for basin sizing is 80th percentile five-day event. Depending on the settling characteristics of local soils, a higher 'operational' design storm can be achieved with chemical dosing operated in flow-through mode in a large storm with rainfall-activated auto-flocculent dosing, and advanced hydraulic efficiency features such as floating off-takes, and a sediment forebay.<br>• For point 3, TSS = Total Suspended Solids. Turbidity measurements (e.g. 60 Nephelometric Turbidity Units (NTU)) could be used; however, for accuracy, a site-specific relationship should be developed between turbidity and TSS. |

# City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

**Please note:**

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

## 9.4.2 Driveways and vehicle crossings code

### 9.4.2.1 Application

This code applies to assessing operational work for vehicle access works and material change of use for any development involving vehicle access works where indicated within **Part 5 Tables of assessment**.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5**.

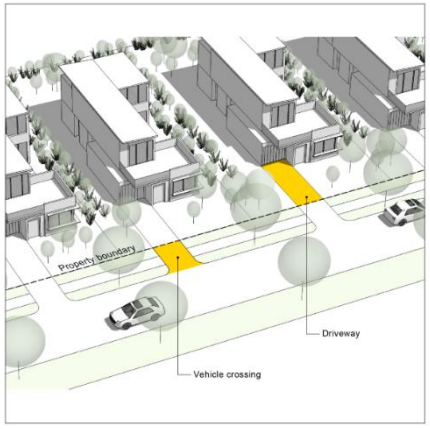



**Figure 9.4.2-1**

Illustration showing the driveway and vehicle crossing components of vehicle access works

### 9.4.2.2 Purpose

(1) The purpose of the Driveways and vehicle crossings code is to provide design standards for the construction, repair or modification to a driveway and/or a vehicle crossing.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) Vehicle crossings are designed to a standard in accordance with **SC6.12 City Plan policy – Land development guidelines** or with RPEQ certification to provide safe access for vehicles required to access the site from the edge of the road carriageway to the property boundary.

(b) Driveways provide safe access for all vehicles required to access the site from the property boundary to the on-site vehicle accommodation or standing area.

(c) Vehicle crossings avoid adverse impacts on City or utility infrastructure.

(d) Driveways and vehicle crossings are of an appropriate standard to meet the needs of the development.

(e) Vehicle crossings ensure that there is minimal loss of on-street car parking spaces.

(f) Driveways and vehicle crossings are designed and sited to maintain streetscape elements and retain space for the future planting of street trees.

(g) Vehicle crossings allow for the safety of all users of the existing and planned road and active transport networks.

(h) Driveways and vehicle crossings are designed such that vertical and horizontal alignments provide a continuous, smooth access of good rideability and clearance for all vehicles required to access the site.

(i) Driveways and vehicle crossings are designed and sited to mitigate stormwater drainage impacts.

### 9.4.2.3 Specific benchmarks for assessment

## PART B – ASSESSABLE DEVELOPMENT BENCHMARKS

### Table 9.4.2-2: Driveways and vehicle crossings code – assessable development

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome</th><th>Internal use</th></tr>
<tr><td colspan="2">Design</td><td></td><td></td></tr>
<tr><td>PO1<br>The driveway is designed in accordance with the applicable requirements in AS2890:2009 – Parking Facilities.</td><td>AO1<br>No acceptable outcome provided.</td><td>COMPLIES</td><td></td></tr>
<tr><td>PO2<br>Design of the vehicle crossing is certified by a RPEQ confirming compliance with:<br>(a) Disability Discrimination Act 1992;<br>(b) Applicable requirements in AS2890: 2009 – Parking Facilities; and<br>(c) QUDM (Queensland Urban Drainage Manual).</td><td>AO2<br>The vehicle crossing is designed in accordance with SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards.</td><td>COMPLIES</td><td></td></tr>
<tr><td></td><td>AO3<br>Vehicle crossings are separated from:<table><tr><th>Instance</th><th>Minimum distance</th></tr></table></td><td>COMPLIES</td><td></td></tr>
</table>

| Performance outcomes | Acceptable outcomes | | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|---|
| **PO3**<br>The vehicle crossing avoids damage to utility services, pathways, kerbs, road pavement and seal and other city infrastructure. | Traffic management devices and transport services, stormwater management devices, power supply services and telecommunication supply services | 1m | | |
| | Water and sewerage service assets on the surface (including water meter enclosures, sewerage inspection or maintenance pits, fire hydrants and valves) | 300mm (horizontal distance) | | |

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome</th><th>Internal use</th></tr>
<tr><td colspan="2">Maximum number of vehicle crossings</td><td></td><td></td></tr>
<tr><td rowspan="5">PO4<br>The number of vehicle crossings are minimised to avoid loss of streetscape elements and on-street car parking spaces and to prevent adverse interference with:<br>(a) the safety, capacity and operations of the existing or planned road network; and<br>(b) cycleways or pedestrian footpaths.</td><td>AO4<br>The maximum number of vehicular crossings per site, for the following land uses, is as follows:</td><td rowspan="5">COMPLIES</td><td rowspan="5"></td></tr>
<tr><td><table><tr><th>Land use</th><th>Maximum number of vehicle crossings</th></tr><tr><td>Dwelling house</td><td>1<br>OR<br>2 - when the road frontage at the kerb is at least 40m subject to achieving a minimum of 7m between the crossings</td></tr><tr><td>Dual occupancy<br>Multiple dwelling</td><td>1<br>OR<br>2 - where the road frontage at the kerb is greater than 20m subject to achieving a minimum of 7m between the crossings</td></tr><tr><td>Non–residential use</td><td>2</td></tr></table></td></tr>
<tr><td>Note: the maximum number of vehicle crossings and separation distance is shown above unless otherwise approved in a current development approval.</td></tr>
<tr><td colspan="2">Separation distances</td><td></td><td></td></tr>
<tr><td rowspan="2">PO5<br>Vehicle crossings are appropriately separated from other vehicle</td><td>AO5<br>Vehicle crossings are separated from:</td><td rowspan="2">COMPLIES</td><td rowspan="2"></td></tr>
<tr><td><table><tr><th>Instance</th><th>Minimum distance (m)</th></tr></table></td></tr>
</table>

| Performance outcomes | Acceptable outcomes | | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|---|
| crossings and side property boundaries to prevent interference with:<br>(a) the safety, capacity and operations of the existing or planned road network;<br>(b) adjoining properties; and<br>(c) cycleways or pedestrian footpaths. | Vehicle crossings on adjoining properties | 1m | | |
| | Any side property boundary: | | | |
| | • for residential development with approved built-to-boundary setback | 0.5m | | |
| | • for all other developments | 1m | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Location** | | | |
| **PO6**<br>Vehicle access to a public roadway is safe and does not compromise the efficiency, function, convenience of use or capacity of the road network. | **AO6.1**<br>The location of the vehicle crossing to a public roadway is consistent with the applicable requirements in *AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking* and *AS 2890.2–2002 Parking facilities Part 2: Off-street commercial vehicle facilities*. | **COMPLIES** | |
| | **AO6.2**<br>No new vehicle crossings are created on roads identified on the **Functional road hierarchy** as shown on the Zone maps or the **Pacific motorway service road types overlap map**. | **NA** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO7**<br>Driveways and vehicle crossings:<br>(a) ensure existing street trees within the verge are retained;<br>(b) provide an appropriate separation distance to existing street trees within the verge in accordance with *AS4970:2009 – Protection of trees on development site*; and<br>(c) retain space for the future planting of street trees within the verge in accordance with **SC6.13 City Plan policy – Landscape work**.<br>**Note: The location of the driveway and vehicle crossing is considered at the design stage of the development.** | **AO7**<br>No acceptable outcome provided. | **COMPLIES** | |
| **Sight distances and lines** | | | |
| **PO8**<br>Vehicle crossings are designed to provide safe travel for vehicles, cyclists and pedestrians. | **AO8**<br>Vehicle crossings are designed to provide sight distances and lines in accordance with *AS 2890.2-2002 Parking facilities Part 2: Off-street commercial vehicle facilities*. | **COMPLIES** | |

# City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

**Please note:**

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

## 9.4.15 Works for infrastructure code

### 9.4.15.1 Application

This code applies to assessing operational work for development where indicated in **Part 5 Tables of assessment – Operational work**.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5**.

### 9.4.15.2 Purpose

(1) The purpose of the Works for infrastructure code is to ensure that all works for infrastructure is designed and constructed with the City's best land development practices.

(2) The purpose of the code will be achieved through the following overall outcomes:

- (a) The design, construction, operation and maintenance of infrastructure is cost effective over its lifecycle, whilst providing an appropriate level of service;
- (b) Environmental and property impacts are avoided along with the potential for stormwater and ground water to enter the city's wastewater system;
- (c) The integrity of existing infrastructure is not compromised;
- (d) Movement networks are designed and constructed to be functional, safe and achieve good connectivity; and
- (e) A high standard of public health and safety is maintained.

### 9.4.15.3 Specific benchmarks for assessment

**PART B – ASSESSABLE DEVELOPMENT BENCHMARKS**

**Table 9.4.15-1: Works for infrastructure code – for assessable development only**

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Movement network design and construction** | | | |
| **PO1**<br>The movement network is designed and constructed to be functional, safe and achieve good connectivity. | **AO1**<br>The movement network is designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards**. | **COMPLIES** | |
| **Stormwater drainage design and management** | | | |
| **PO2**<br>Stormwater drainage is designed and constructed to:<br>(a) integrate hydrologic and hydraulic elements;<br>(b) demonstrate a feasible and functional drainage system; and<br>(c) not cause adverse stormwater drainage impacts. | **AO2.1**<br>The stormwater drainage system is designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design.** | **COMPLIES** | |
| | **AO2.2**<br>The stormwater drainage system connects to a lawful point of discharge. | **COMPLIES** | |
| **Street lighting** | | | |
| **PO3**<br>Street lighting is designed and constructed to enhance pedestrian and traffic safety. | **AO3**<br>Street lighting is designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards**. | **NA** | |
| **Water supply reticulation design** | | | |
| **PO4** | **AO4** | **COMPLIES** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| Water supply reticulation is designed and constructed to convey drinking water to all properties with adequate quality, pressure and volume of flow for household and fire fighting purposes. | Water supply reticulation is designed and constructed in accordance with the *South East Queensland Water Supply and Sewerage Design and Construction Code* as applicable to the City of Gold Coast. | | |
| **Sewerage reticulation design** | | | |
| **PO5**<br>Sewerage reticulation is designed and constructed to ensure adequate quality and minimise inflow, infiltration, health and environmental risks. | **AO5**<br>Sewerage reticulation is designed and constructed in accordance with the *South East Queensland Water Supply and Sewerage Design and Construction Code* as applicable to the City of Gold Coast. | **COMPLIES** | |
| **Open space and recreational facilities design** | | | |
| **PO6**<br>Open-space areas and recreational facilities are designed and constructed to an appropriate standard, having regard to their intended recreational use and environmental values. | **AO6**<br>Open-space areas and recreation facilities are designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 5 – Public open space standards**. | **COMPLIES** | |
| **Underground service conduits** | | | |
| **PO7**<br>Underground service conduits are designed and constructed in accordance with State/Federal guidelines to meet service provider's requirements. | **AO7**<br>No acceptable outcome provided. | **COMPLIES** | |

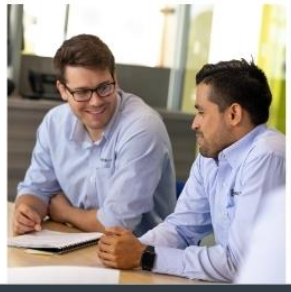
| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Assets – general provisions** | | | |
| **PO8**<br>Asset design, construction and maintenance achieves:<br>(a) delivery of high quality assets that are not a financial or resource burden, beyond reasonable expectations, to the community or the Council as the asset custodian;<br>(b) cost effective ongoing operation and maintenance of assets;<br>(c) no unreasonable financial or economic burden in the ongoing, long-term operation of the asset;<br>(d) maintenance of public health and safety;<br>(e) maintenance of health and safety for person/s maintaining and managing assets; and<br>(f) minimise adverse impacts to the environment (including the amenity of the local area) in the short and long term needs of users. | **AO8.1**<br>Design, construction, maintenance and transfer of assets are undertaken in accordance with **SC6.12 City Plan policy – Land development guidelines**. | **COMPLIES** | |
| | **AO8.2**<br>Life-cycle cost analysis of assets is undertaken in accordance with **SC6.12 City Plan policy – Land development guidelines**. | **COMPLIES** | |
| | **AO8.3**<br>Expected asset life, maintenance activities (including frequency) and resources are estimated and included in a maintenance and management plan in accordance with **SC6.12 City Plan policy – Land development guidelines**. | **COMPLIES** | |
| **Driveways and vehicle crossings** | | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO9**<br>Development does not compromise:<br>(a) existing or approved locations for driveways and vehicle crossings; or<br>(b) where (a) does not apply, the ability for a lot to achieve vehicle access that complies with **Part 9.4.2 Driveways and vehicle crossings code**.<br>**Note: Engineering plans showing indicative vehicle crossings for proposed lots is the method of demonstrating compliance with this performance outcome. Compliant offsets from services and vehicle crossings grades should be included on the plans.** | **AO9**<br>No acceptable outcome provided. | **COMPLIES** | |

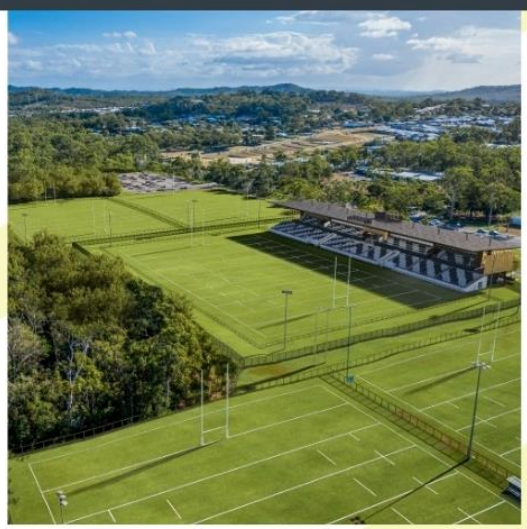
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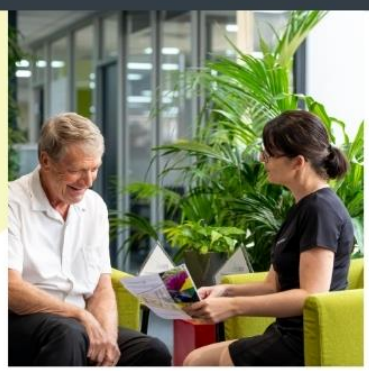


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# 2 Karingal Drive, Pimpama
# Hydraulic Impact Assessment

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-HIA-01 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
|---|---|
| Prepared by: | Joshua Micallef |
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| Date: | 19/03/2026 |

| | |
|---|---|
| Approved by: | Rod Barry |
| Position: | Principal Engineer |
| Signed: | RPEQ 7067 |
| Date: | 19/03/2026 |

| Version No. | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 00 | Initial Issue | 7/01/2021 | FL | JC |
| 01 | Updated Layout | 19/03/2026 | JM | RB |

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# Executive Summary

This Hydraulic Impact Assessment has been prepared for Bosform Pty Ltd the proponent of this Development Application. The proponent is seeking Development Approval for a proposed 57 lot multi-unit townhouse development over 2 Karingal Drive, Pimpama properly described as Lot 19 on RP 152380 (the subject site). Based on the hydraulic modelling results presented in this report, the following conclusions have been made:

- The proposed development maintains flood plain storage in the regional event
- The proposed development has generally maintains local catchment hydraulic conditions; and
- Afflux is generally contained within the subject site, with the exception of modelled increases in water level in the downstream neighbouring detention basin, were impacts are modelled to occur in the 1% AEP and 2% AEP and are in the order of approximately 24mm .
- Modelling indicates that Karingal Drive (in the existing and developed scenario) will be inundated by greater than 200mm in the 10% AEP event and larger events, this exceeds the depth limits outlined by QUDM.
- In the existing model (prior to any upgrade works on Karingal Drive) the Karingal Drive culvert crossing appears to be non-compliant with relation to allowable depth, however with the upgrade works included in the modelling it is expected that this immunity issue will be resolved. This is to be confirmed with further modelling.

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## Appendices

Appendix A – Further Information and Methods

Appendix B – Proposed Plans of Development

Appendix C – Time of Concentration and Rational Method Calculation

Appendix D – Hydraulic Model Features Map

Appendix E - Hydraulic Mapping Results

Appendix F - Burchills Engineering Solutions Preliminary Civil Engineering Drawings

# 1. Introduction

Burchills Engineering Solutions were engaged by Bosfrom Pty Ltd to prepare a Hydraulic Impact Assessment (HIA) for the design of the 57 lot multi-unit development over 2 Karingal Drive, Pimpama properly described as Lot 19 on RP 152380.

This HIA will detail the impacts of the proposed works on the existing flooding regime in relation to the proposed development.

## 1.1 Scope

This HIA has been undertaken in accordance with the following scope:

- Assessment of Existing Flooding Conditions
- Local Model Development
  - Construct a Hydrology model for contributing catchments;
  - Construct a TUFLOW model to asses the impact of the proposed works;
- Review of Model Results
  - Review of modelling results, including water level impacts, hazards and modelling inefficiencies.
- Report and Mapping
  - Presentation of pre-development and post-development flood extents, depths, and velocities (where applicable);
  - Impact assessment including afflux contours; and
  - Review of any impacts resulting from the proposal in the context of whether such afflux may give rise to changes in flood damage, risk or hazard.

## 1.2 Proposed Development

The proposed development is seeking Council approval for Material Change of Use (multiple dwellings), Reconfiguring a Lot (2 management lots and a park Lot) and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

For further details, please refer design drawings prepared by MPS Architects attached in Appendix A of this report. Figure 1.1 below provides an excerpt taken from the development's site plan.

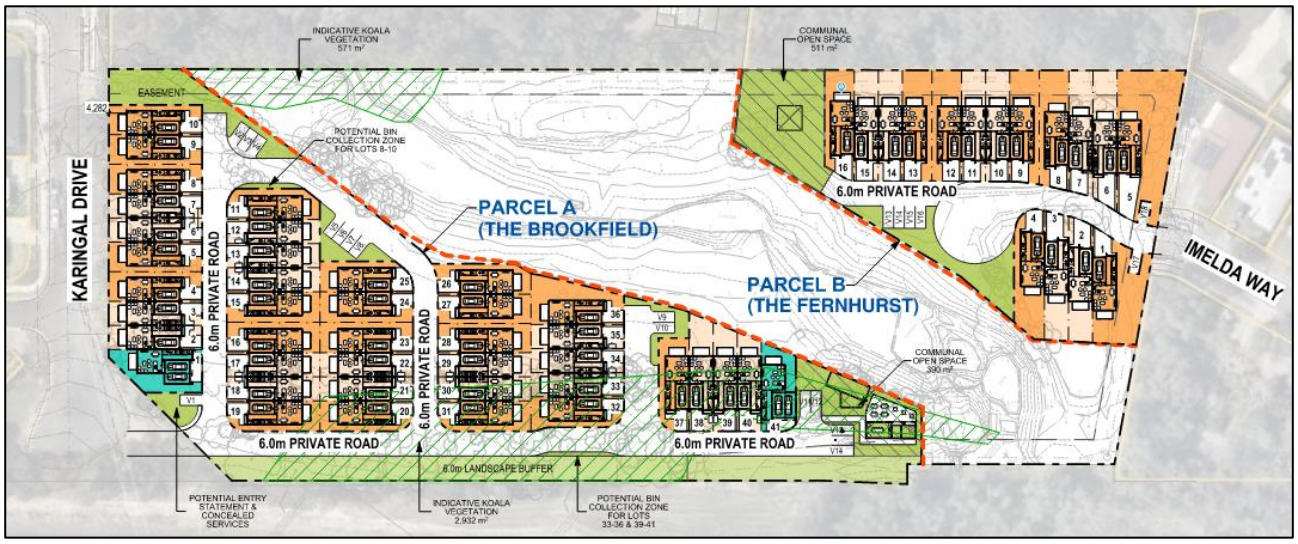



**Figure 1.1 Proposed Site Layout**

### 1.3 Designated Flood Level

Councils Defined Flood Level model is limited to the subject sites downstream boundary, to determine flooding extents over the site a hydrological model has been developed for the local upstream catchment and validated using the Rational Method to validate runoff from the sub-catchments. The hydrology was then used in a 2D TUFLOW model to establish peak flood levels across the site and assess impacts of the proposed development.

Figure 1.2 (below) provides an extract of the City Plan's Flood Overlay depicting the extent of flooding in relation to the subject site and the surrounding road network.

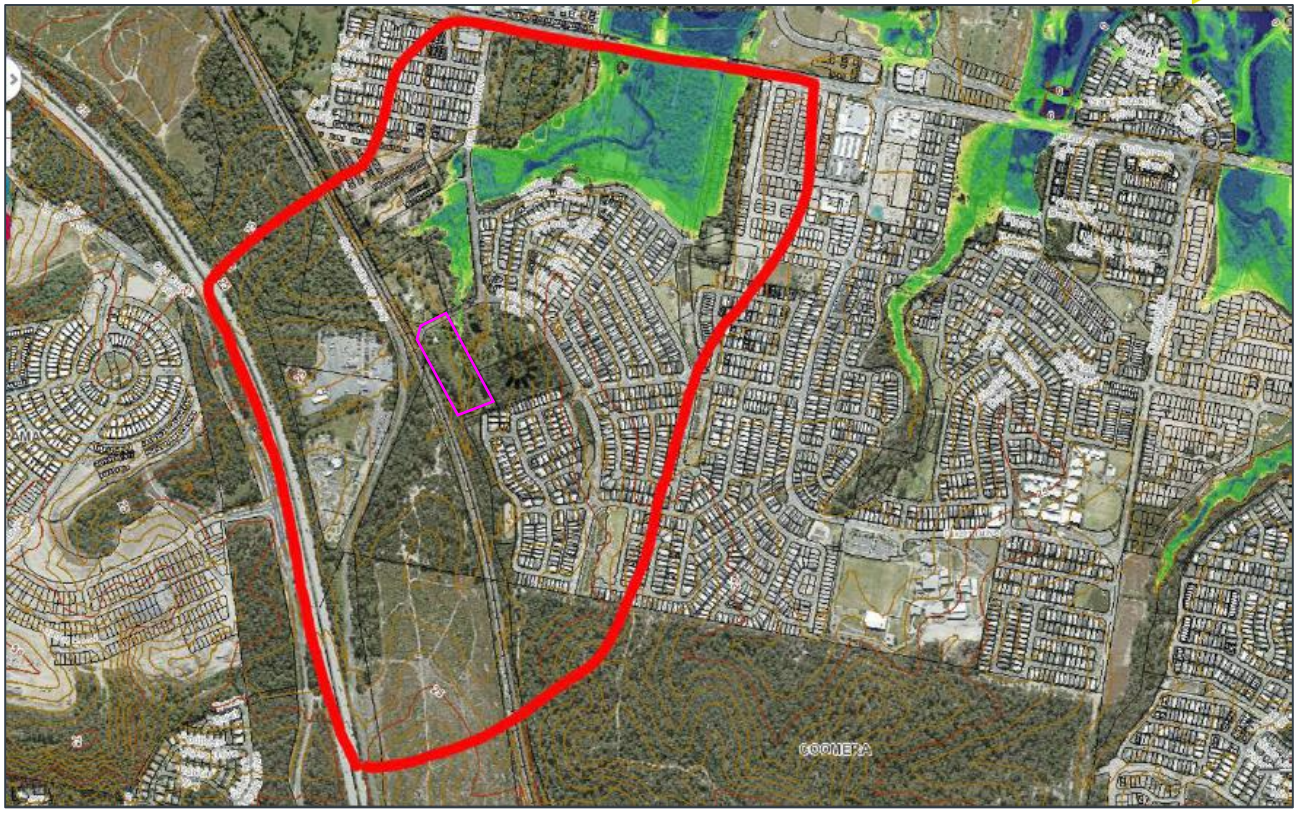



**Figure 1.2 Gold Coast City Plan Flood Depth Overlay Map**

## 2. Local Catchment Hydrology

A catchment plan for the local catchments have been prepared and presented in Appendix D.

Flows from the upstream catchments are conveyed to the site through a drainage system under the Pacific Motorway, Old Pacific Motorway and the Railway Line. The catchment details are summarised in Table 2.1 and Table 2.2 shows the comparison of XP-RAFTS and Rational Method peak flows from the 1% AEP event. The upstream catchment permeability has been set using the current land use plan published in the City Plan. A summary of rational method calculations have been provided in Appendix C.

A XP-RAFTS model runoff hydrologic model has been set up and compared against the Rational Method to validate runoff from the sub-catchments for the 1% AEP event.

**Table 2.1 Local Sub-Catchment Hydrology**

| Catchment Name | Percentage Impervious (%) | Catchment Slope (%) | Area (ha) |
|---|---|---|---|
| 1 | 58.8 | 2.7 | 5.42 |
| 2 | 13.6 | 3.3 | 3.37 |
| 3 | 11.9 | 7.2 | 5.72 |
| 4 | 53.3 | 4.4 | 9.67 |
| 5 | 3.0 | 4.3 | 16.90 |
| 6 | 30.0 | 10.4 | 16.01 |
| 7 | 15.0 | 3.5 | 12.74 |
| 8 | 5.6 | 5.8 | 15.33 |
| 9 | 3.0 | 6.7 | 13.90 |
| 10 | 0.0 | 2.1 | 7.58 |
| 11 | 39.4 | 3.6 | 4.00 |
| 12 | 15.0 | 7.9 | 15.77 |
| 13 | 17.4 | 5.7 | 13.24 |
| 14 | 60.0 | 4.6 | 8.49 |
| 15 | 7.6 | 9.0 | 13.65 |
| 16 | 60.0 | 6.8 | 4.44 |
| 17 | 2.9 | 5.7 | 3.41 |
| 18 | 11.6 | 5.9 | 25.54 |
| 19 | 65.0 | 5.7 | 14.97 |
| 20 | 60.0 | 2.9 | 15.29 |
| 21 | 41.3 | 4.4 | 11.08 |
| 22 | 50.0 | 4.1 | 12.22 |
| 23 | 7.0 | 0.6 | 8.38 |
| 24 | 18.4 | 2.9 | 7.12 |

Table 2.2 Comparison of XP-RAFTS and Rational Method Estimated Peak Flow Of 1%AEP

| Sub-Catchment | Estimated Peak Flow (m3/s) | | % Diff |
|---|---|---|---|
| | XP-RAFTS | Rational Method | |
| 1 | 2.75 | 3.22 | 14.6 |
| 2 | 1.20 | 1.32 | 9.1 |
| 3 | 2.45 | 2.58 | 5.0 |
| 4 | 4.39 | 5.51 | 20.2 |
| 5 | 5.09 | 6.11 | 16.6 |
| 6 | 7.70 | 8.87 | 13.2 |
| 7 | 5.64 | 4.49 | -20.4 |
| 8 | 4.99 | 4.64 | -7.0 |
| 9 | 4.37 | 4.55 | 4.0 |
| 10 | 2.17 | 2.26 | 4.1 |
| 11 | 1.71 | 2.04 | 16.0 |
| 12 | 6.97 | 6.13 | -12.1 |
| 13 | 5.16 | 4.37 | -15.2 |
| 14 | 5.17 | 5.31 | 2.7 |
| 15 | 6.03 | 5.93 | -1.8 |
| 16 | 2.52 | 2.95 | 14.4 |
| 17 | 1.11 | 1.38 | 19.6 |
| 18 | 7.58 | 9.12 | 16.8 |
| 19 | 7.98 | 9.61 | 17.0 |
| 20 | 7.06 | 8.63 | 18.2 |
| 21 | 4.66 | 5.65 | 17.5 |
| 22 | 6.39 | 6.83 | 6.5 |
| 23 | 1.32 | 1.17 | -11.1 |
| 24 | 2.50 | 2.32 | -7.0 |

The peak discharges generated by XP-RAFTS and the Rational Method compare well and are considered acceptable for this assessment.

# 3. Hydraulic Impact Requirements

## 3.1 Hydraulic Impact Assessment

The purpose of this report is to assess the hydraulic impact of the proposed 57 lot multi-unit development. The local flooding conditions within the catchment have been modelled to ensure that the proposed development results in no adverse impacts upon adjoining properties. When undertaking a HIA, the Gold Coast City Plan Flood Overlay Code specifies the following events to be modelled and assessed by an RPEQ when addressing the Performance Outcomes of **PO6** of the code:

**Table 3.1 Flood Events Required**

| | | |
|---|---|---|
| **AO6.2 a)** | Minimum Local Floods: | 50%, 20%, 10%, 5%, 2% and 1% Annual Exceedance Probability (AEP) for local flood events |
| **AO6.2 b)** | Minimum Regional Floods: | 5%, 2%, and 1% AEP floods |
| **AO6.2 c)** | Additional Regional Floods | 0.2% AEP (on Request by the Assessment Manager) |

The AEP's simulated for this HIA were the 39%, 18%, 10%, 5%, 2%, and 1% events for this development. As there is a plethora of potential event durations for each AEP, the critical durations for the respective regional floods were simulated. Due to the site's location, local floods (short durations) would directly drain to the main river and any drainage issues are generally addressed in a stormwater management plan.

The critical durations were determined by interrogating the result files from the TUFLOW model providing the event duration which produced the peak water level at site.

## 3.2 Regulatory Requirements and Technical Guidelines

This report assesses the proposed development against the requirements set out in the following City of Gold Coast City Plan Version 13 (Council) City Plan Codes:

- 8.2.8 Flood Overlay Code – The proposed development is situated within the flood assessment area and as such must meet all relevant requirements of the code.

The strategies proposed in this HIA have been developed to address the requirements of the Gold Coast City Plan, and have also been prepared in accordance with the following guidelines:

- Queensland Urban Drainage Manual (QUDM) – Fourth Edition (IPWEAQ, 2017); and
- Australian Rainfall and Runoff – A Guide to Flood Estimation (Ball, et al., 2016).

### 3.2.1 Flood Storage Balance

A requirement of City of Gold Coast as stated in the Flood Overlay Code, is that flood storage is to be maintained to the Regional Designated Flood Level (DFL) in the post-developed condition.

The proposed development will maintain regional flood storage up to the Regional Designated Flood Level (DFL) defined by the City of Gold Coast.

# 4. Hydraulic Model

## 4.1 Overview

The software package TUFLOW has been used to undertake the hydraulic modelling presented in this report. For further information about TUFLOW, please refer to Appendix A.

## 4.2 Hydraulic Modelling Parameters

The details of the parameters used for the TUFLOW model are presented in Table 4.1. The pre-development and post-development model feature maps along with roughness maps are presented in Appendix D.

**Table 4.1 Hydraulic Modelling Parameters**

| Parameters | Details |
|---|---|
| Scenarios | ▪ Pre-development; and<br>▪ Post-development. |
| Events and Critical Durations Modeled | ▪ 39% AEP – 3hr;<br>▪ 18% AEP – 3hr;<br>▪ 10% AEP – 3hr;<br>▪ 5% AEP – 3hr;<br>▪ 2% AEP – 1hr; and<br>▪ 1% AEP – 1hr. |
| Topography | Pre-Development<br>▪ 2014 1m LiDAR<br>o Vertical data: Spatial Accuracy: 0.15m @ 67 % CI (95% confidence level or 2 sigma)<br>o Horizontal Data: Spatial Accuracy: 0.40m @ 67 % CI (95% confidence level or 2 sigma)<br>▪ Site Survey – February 2026<br><br>Post-Development<br>▪ Civil Design DEM of the proposed site prepared by Burchills Engineering Solutions; (Please refer to Appendix F for further detail) |
| Initial Water Level | Pre-Development<br>▪ Lakes level survey in site. |
| 2D Resolution | ▪ 2m grid. |
| Timestep | ▪ Adaptive timestep. (HPC) |
| Inflows | ▪ Regional Catchment Inflows represented at 2D boundary conditions<br>o 2 inflows represented as flow-time boundary conditions – taken from XP RAFTS model<br>o 22 inflow represented from as a source area inflow – taken from XP RAFTS model |
| Downstream Boundary Condition | ▪ A normal depth condition with a slope of 0.003 was adopted for the TUFLOW's downstream boundary |
| Hydraulic Structures | ▪ 1D Link Network representing: |

| | |
|---|---|
| | ○ Total 23 culvert located in 2D model extent as presented in Appendix C |
| Surface Roughness<br>(reflected as Manning's 'n') | > n = 0.15 – Sugar Cane/Trees<br>> n = 0.030 – Water body<br>> n = 0.075 – Medium Trees<br>> n = 0.022 – Road<br>> n = 1.0 – Building<br>> n = 0.035 – Grass (Remaining/default model area) |

### 4.3 Model Limitations

As the majority of the topography across the model is based on 2014 LiDAR data, the following features have not been incorporated into the modelling, as identified through review of recent aerial imagery:

- Neighbouring development (immediately east); and
- Karingal Drive upgrade (culvert crossing)

It should also be noted that the flood results have been overlaid onto the latest aerial imagery (2025) and, as such, do not accurately represent flooding conditions over the neighbouring site immediately to the East.

# 5. Results

## 5.1 Flood Behaviour Pre-Development

Figure 5.1 to Figure 5.3 below show the maximum floodwater levels, depths and velocity for Q100 event.

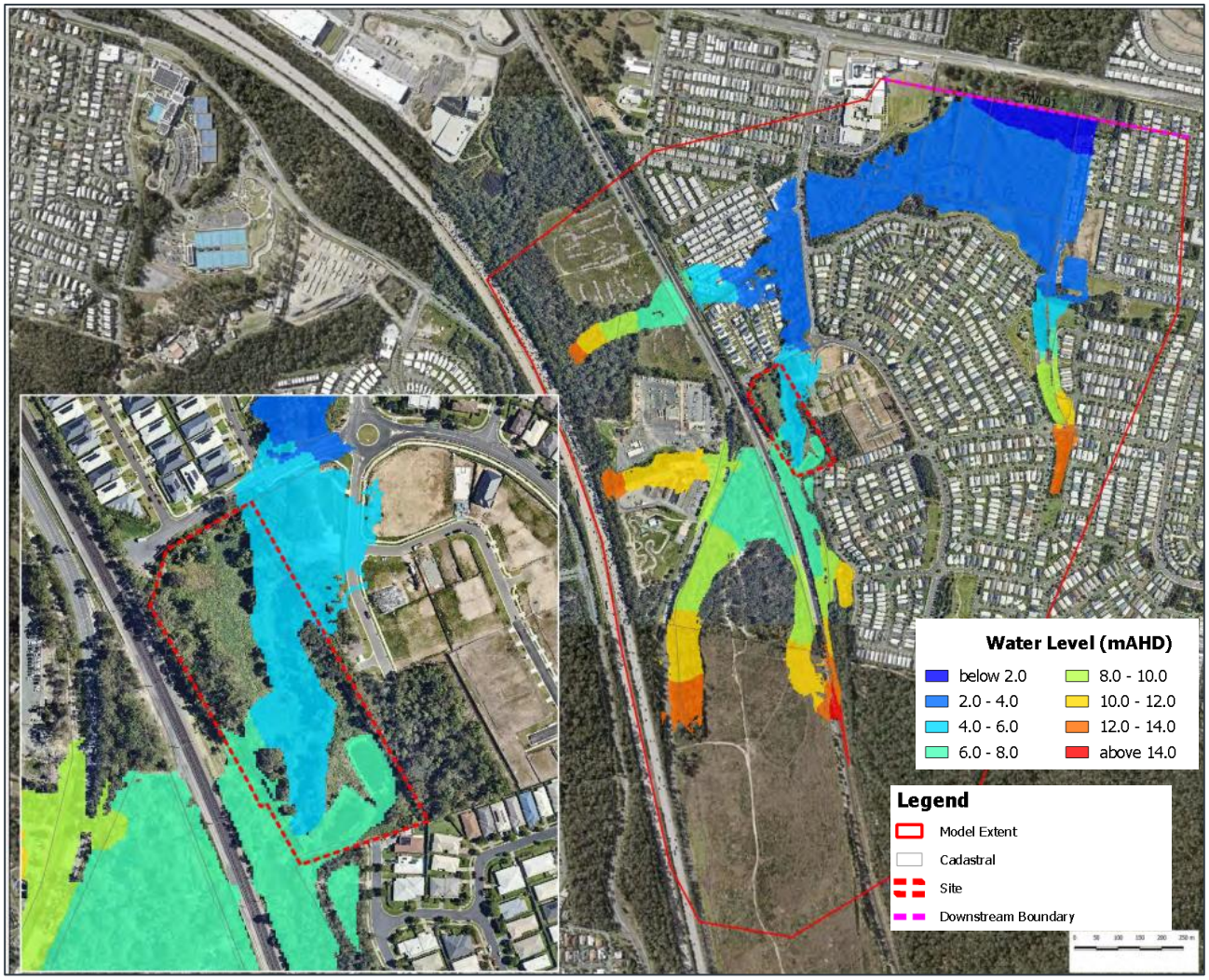



**Figure 5.1 Pre-Development 1% AEP Peak Flood Level**

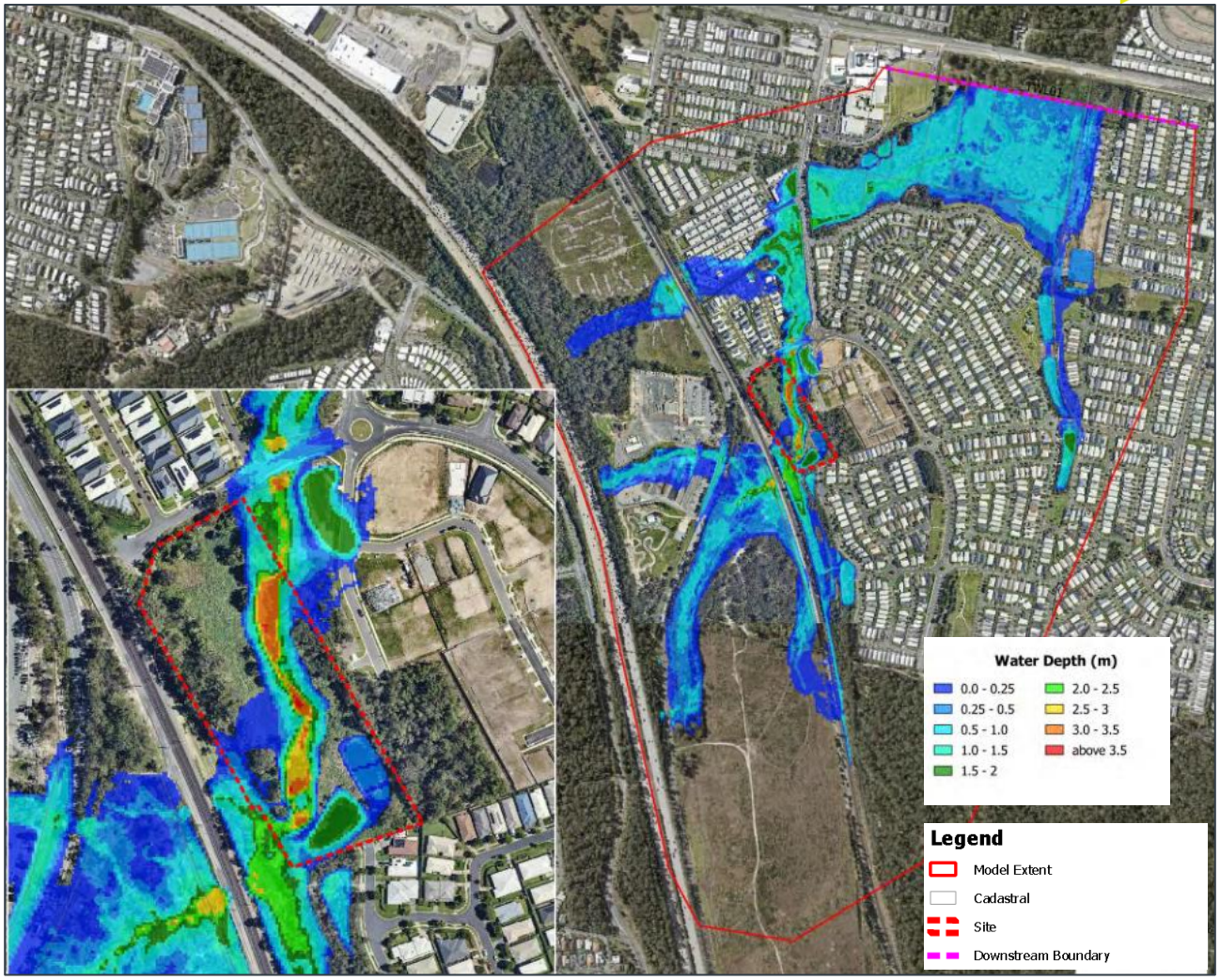



**Figure 5.2 Pre-Development 1% AEP Peak Flood Depth**

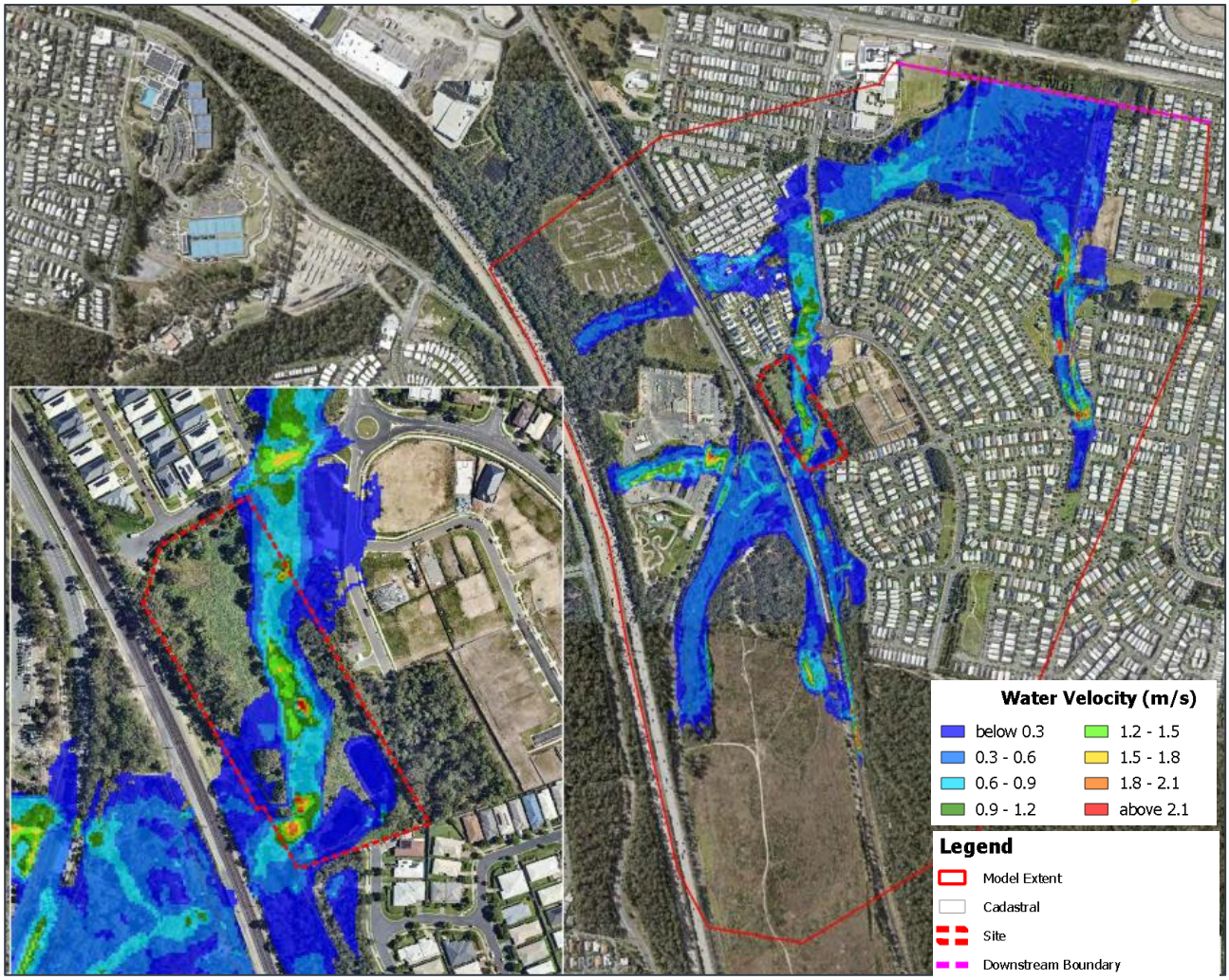



**Figure 5.3 Pre-Development 1% AEP Peak Flood Velocity**

## 5.2 Flood Behaviour Post-Development

The post development TUFLOW model was used to assess whether the proposed development causes any change to flood damage, risk or hazard.

Generally, the proposed development and earthworks is limited to the extent of the existing waterway and the flood behaviour in the post developed scenario is similar to the pre-developed. Shown below in Figure 5.4 is the post-developed 1% AEP flood depth map, all proposed lots have been designed to be flood free in the design 1% AEP event with an addition 300mm freeboard to finished floor levels. It should be noted that immediately downstream of the site is a council owned detention basin and recently developed residential development which has not been represented in the Hydraulic modelling due to it only being recently constructed.

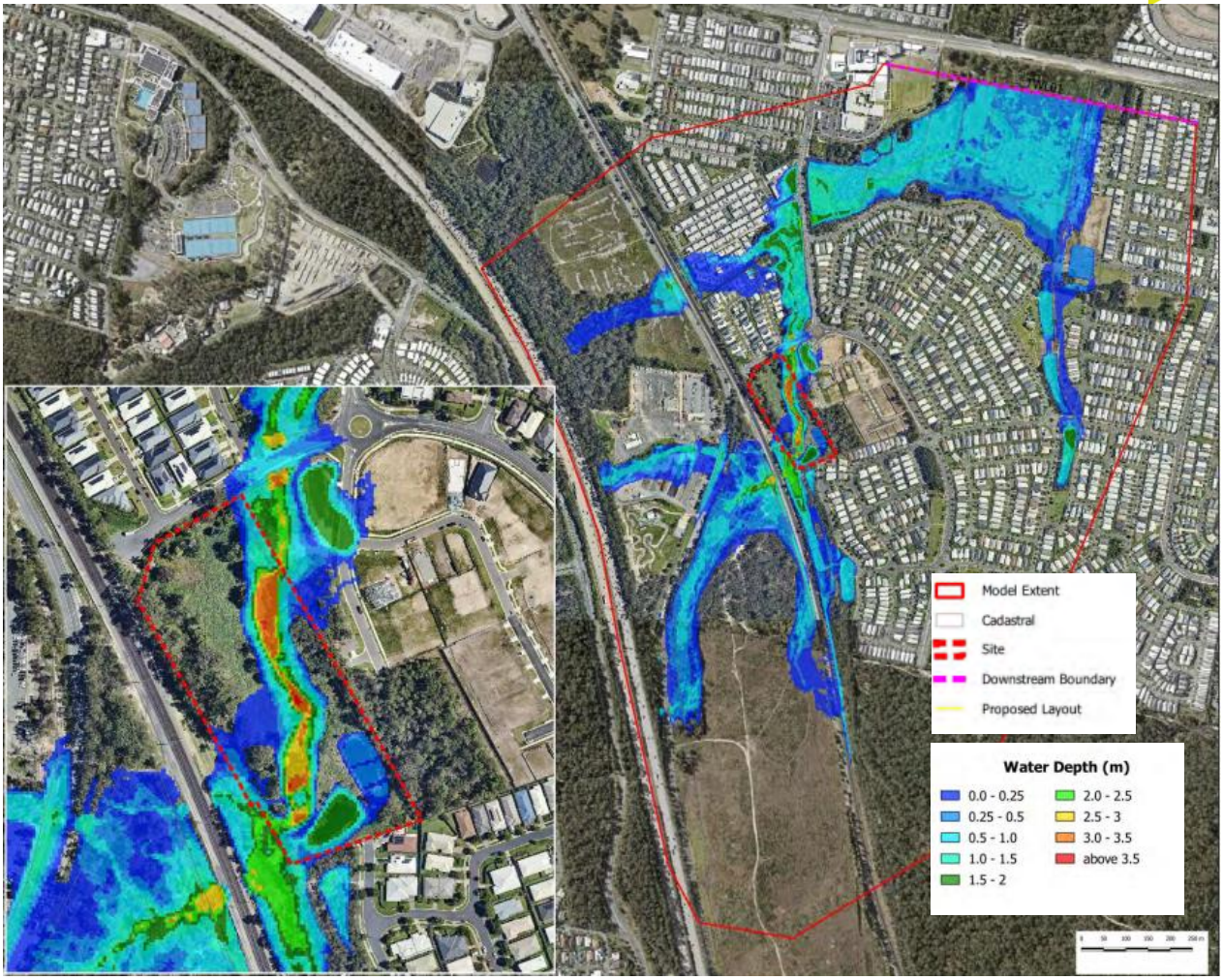



**Figure 5.4 Post-Development 1% AEP Peak Flood Depth**

### 5.2.1 Hydraulic Impact Mapping

Afflux maps (change in water level) have been prepared to depict impacts resulting from the proposed development, and are included within Appendix D. Table 5.1 presents an index of the afflux mapping prepared for proposed residential development and golf course redesign.

**Table 5.1 List of Hydraulic Impact Assessment Mapping**

| Appendix No. | Figure No. | AEP (%) | Critical Duration (h) | Result |
|---|---|---|---|---|
| Appendix E | C06 | 39 | 3 | Water Level Afflux |
| | C05 | 18 | 3 | Water Level Afflux |
| | C04 | 10 | 3 | Water Level Afflux |
| | C03 | 5 | 3 | Water Level Afflux |
| | C02 | 2 | 1 | Water Level Afflux |
| | C01 | 1 | 1 | Water Level Afflux |

No external increases in water level have been modelled to occur with the exception of the 1% and 2% AEP events. The external increase in water level is limited to approximately 24mm and is generally contained within the council owned drainage corridor. It should be noted that the base model topography does not match the updated aerial imagery and the impacts and depth mapping do not represent current day conditions.

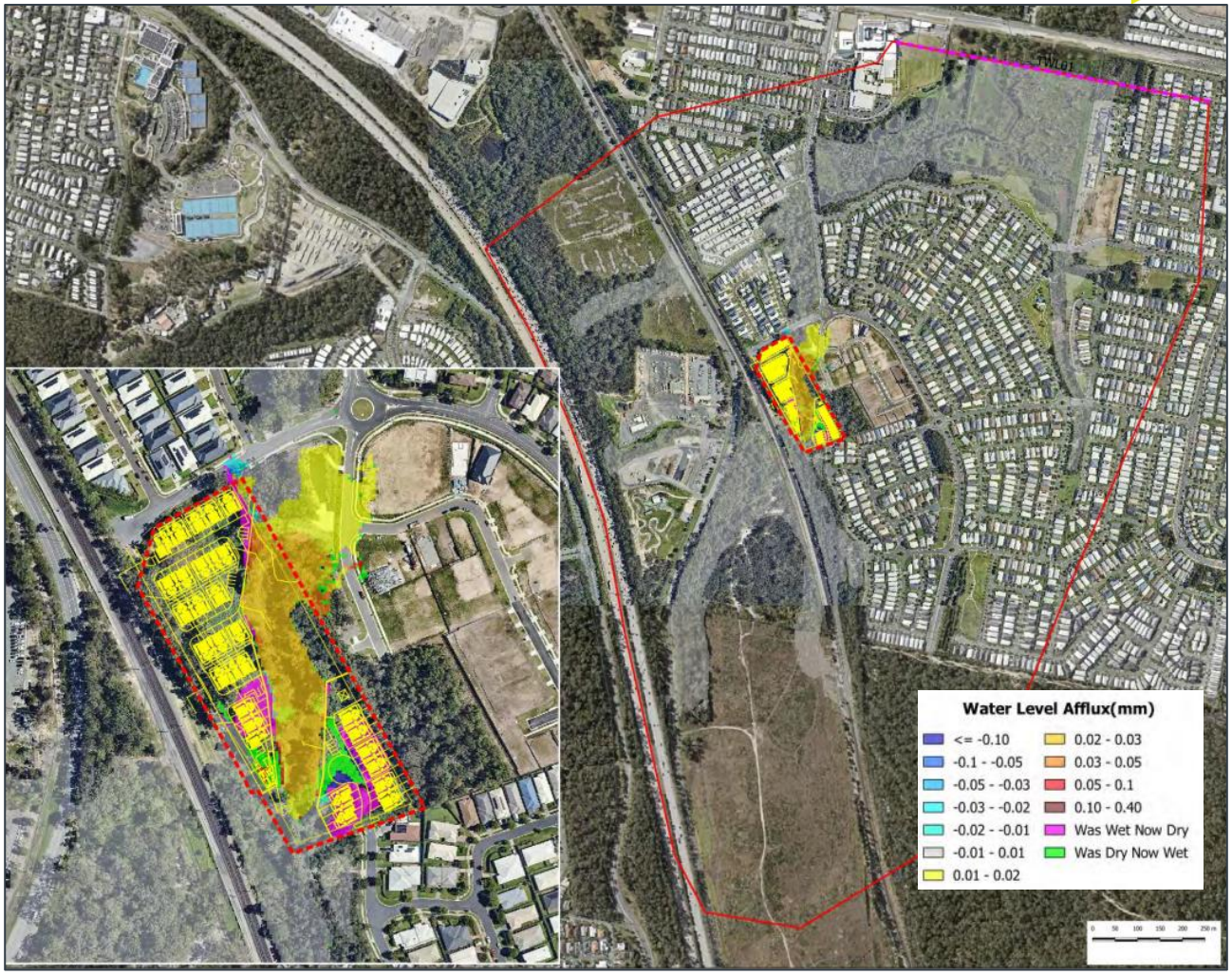



**Figure 5.5 Post-Development 1% AEP Flood Level Afflux**

## 5.3 Inundation of Karingal Drive

Modelling results indicate that in the existing (and post-developed scenario) depths over Karingal Drive at the culvert crossing immediately to the north-east of the site, exceed 0.5m of depth in the 1% AEP event and 0.2m of depth in the 10% AEP events at the crown of the roadway. These depths exceed the allowable flow depth limits prescribed by QUDM for flow over road crossings.

In the existing model (prior to any upgrade works on Karingal Drive) it appears to be non-compliant however with the upgrade works it is expected that this immunity issue will be resolved. This is to be confirmed with further modelling.

## 6. Conclusion

This Hydraulic Impact Assessment has been prepared for Bosform Pty Ltd in support of a Development Application for a proposed 57-lot multi-unit townhouse development at 2 Karingal Drive, Pimpama, legally described as Lot 19 on RP152380.

Based on the hydraulic modelling undertaken for this assessment, the proposed development will generally preserve existing local catchment hydraulic conditions. Modelled afflux is largely contained within the subject site, with the exception of minor increases in water level within the downstream neighbouring detention basin. These impacts are predicted in the 1% AEP and 2% AEP events and are approximately 24 mm.

The proposed development will maintain regional flood storage up to the Regional Designated Flood Level (DFL) defined by the City of Gold Coast.

The modelling also indicates that Karingal Drive, under both existing and developed scenarios, is subject to inundation depths exceeding 200 mm during the 10% AEP event and larger events. This exceeds the depth limits outlined in QUDM. Under the existing scenario, prior to any upgrade works, the Karingal Drive culvert crossing appears to be non-compliant in terms of allowable flood depth. However, when the proposed upgrade works are incorporated into the modelling, it is anticipated that this immunity issue will be resolved, subject to confirmation through further modelling.

## 7. General Issues and Uncertainty

Design floods are hypothetical floods used for planning and floodplain management investigations. They are based on having a probability of occurrence specified either as:

- Annual Exceedance Probability (AEP) expressed as a percentage; or
- An Average Recurrence Interval (ARI) expressed in years.

This report uses the both ARI and AEP terminology. The table below provides a definition of AEP and the ARI equivalents mentioned in this report.

**Table 7.1 AEP and ARI Terminology**

| | AEP | ARI | Comments |
|---|---|---|---|
| Medium to Large Floods | 20% | 5 year | A hypothetical flood or combination of floods which is likely to have a 20% chance of occurring in any one year or, in other words, is likely occur once every 5 years on average. |
| | 10% | 10 year | A hypothetical flood or combination of floods which is likely to have a 10% chance of occurring in any one year or, in other words, is likely occur once every 10 years on average. |
| | 5% | 20 year | A hypothetical flood or combination of floods which is likely to have a 5% chance of occurring in any one year or, in other words, is likely occur once every 20 years on average. |
| | 2% | 50 year | A hypothetical flood or combination of floods which is likely to have a 2% chance of occurring in any one year or, in other words, is likely occur once every 50 years on average. |
| | 1% | 100 year | A hypothetical flood or combination of floods which is likely to have a 1% chance of occurring in any one year or, in other words, is likely occur once every 100 years on average. |
| Rare to Extreme Floods | 0.2% | 500 year | A hypothetical flood or combination of floods which is likely to have a 0.2% chance of occurring in any one year or, in other words, is likely occur once every 500 years on average. |
| Probable Maximum Flood | 0% | 1,000,000 year[1] | A hypothetical flood or combination of floods which represent a theoretical 'worst case' scenario. It is only used for special purposes (e.g. design of a dam spillway) where a high factor of safety is recommended, or in consideration of floodplain planning (e.g. evacuation and isolation of communities). |

The interpretation of the flood maps and other design modelling results presented in this report should be done with an appreciation of any limitations in their accuracy. While the points below highlight these limitations, it is important to note that the results presented provide an up-to-date reliable and accurate prediction of design flood behaviour. Key elements are:

- Recognition that no two floods behave in exactly the same manner;
- Design floods are a best estimate of an 'average' flood for their probability of occurrence;
- The DEM has been generated from ALS data with a reported vertical accuracy of +/- 0.25 metre and interpolated in areas of dense vegetation. As flood depths and flood extents are determined using the DEM, their accuracy should be interpreted accordingly;

- The results are based on available data and numerical tools at the time of this report. Changes in technology and improved data collection may provide more accurate modelling in the future.

The accuracy of the hydrologic and hydraulic computer models is dependent on the amount and range of reliable rainfall and flood level recordings for model calibration. An uncalibrated model's results have a greater error margin than a calibrated model. The error margin in this Hydraulic Impact Assessment is regarded as 'moderate' based on the following factors:

- The flood models were verified against another two events;
- The model parameters are generally typical of those used elsewhere; and
- The vertical accuracy of the ALS data used to develop the DEM.

## 8. References


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# Appendix A – Further Information and Methods

## A.1 TUFLOW

The 2D hydraulic modelling software package TUFLOW has been used to undertake the hydraulic modelling undertaken as part of this report.

TUFLOW solves the full 2D shallow water equations based on the scheme developed by Stelling (1984) and improved by Syme (1991) and Syme et al (1999). The solution is based around the alternating direction implicit finite difference method. A square grid is used to define the discretisation of the computational domain.

Improvements to the Stelling scheme (Stelling, 1984), including a robust wetting and drying algorithm and greater stability at oblique boundaries, and the ability to dynamically link a quasi-2D model were developed by Syme (1991). Further improvements including the insertion of 1D elements or quasi-2D models inside a 2D model, the modelling of constrictions on flow such as bridges and large culverts and automatic switching to upstream controlled weir flow have been developed subsequently.

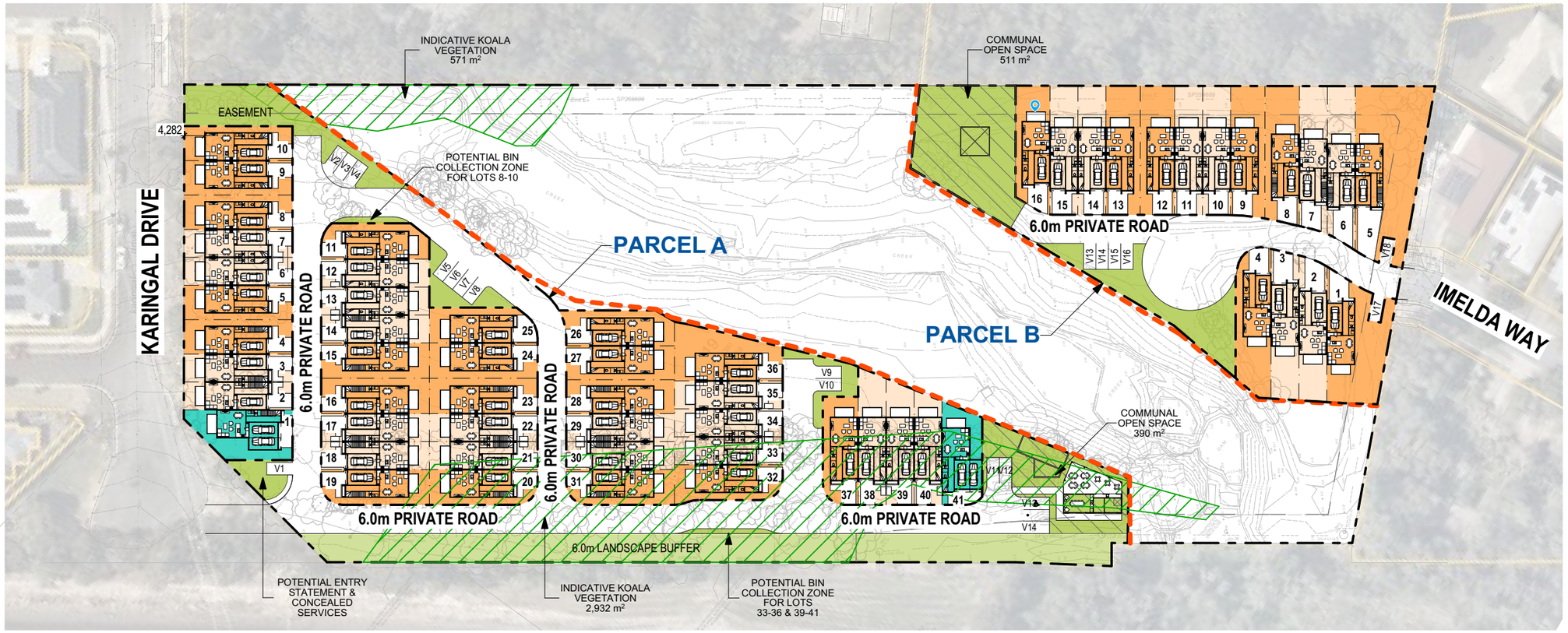
TUFLOW models have been successfully checked against rigorous test cases (Syme 1991, Syme et al 1998 and WBM 2000), and calibrated and applied to a large range of real-world tidal and flooding applications. TUFLOW has the capability to dynamically link 2D domains to quasi-2D models as well as having numerous 2D domains with varying grid sizes dynamically nested.

Hydraulic structure flows (i.e. through large culverts and bridges) are modelled in 2D and include the effects of bridge decks and submerged culvert flow. Flow over roads, levees, bunds, etc is modelled using the broad-crested weir formula when the flow is upstream controlled. For smaller hydraulic structures such as pipes, 1D elements can be inserted at any points inside the 2D model area. Flow over a bridge or culvert that is modelled in 2D can be represented using a 1D weir equation.

Setting up a hydraulic model involves:

- Determining appropriate model extents;
- Creating a DEM of the model domain using a combination of ALS data (DNRM, 2014) for the pre-development conditions including a detailed survey of the subject site;
- Incorporating the post development floodplain roughness values as well as the topographic conditions post development;
- Allocation of model flow boundaries; and
- Application of appropriate flow resistance values (Manning's Coefficient of Roughness).
- The manning's roughness coefficients are developed with respect to the information provided in Open Channel Hydraulics (Chow, 1959), Natural Channel Design (Brisbane City Council, 2003), and the Road Drainage Manual (DTMR, 2010).

# Appendix B – Proposed Plans of Development




## PARCEL A - THE BROOKFIELD
**2 KARINGAL DRIVE**

### SITE SUMMARY
APPROX. NET SITE AREA 1.073 ha
APPROX. NET DENSITY 38.21 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 19 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 20 |
| **SPECIAL B**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 2 |
| **TOTAL** | 41 |

## PARCEL B - THE FERNHURST
**60 IMELDA WAY**

### SITE SUMMARY
APPROX. NET SITE AREA 0.491 ha
APPROX. NET DENSITY 32.59 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **SPECIAL A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **SPECIAL A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **TOTAL** | 16 |

**NOTE:** GCCC

LOT BOUNDARIES AND AREAS ARE BASED OFF PDF PLAN AND ARE INDICATIVE ONLY SIZES TO BE CONFIRMED

INDICATIVE KOALA VEGETATION AREA

INDICATIVE BUILDABLE PAD AREA (BURCHILLS)

PRODUCT TO BE MODIFIED. TERRACE IN EASEMENT

# STRUCTURE PLAN

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Scale 1:1000 @ A3

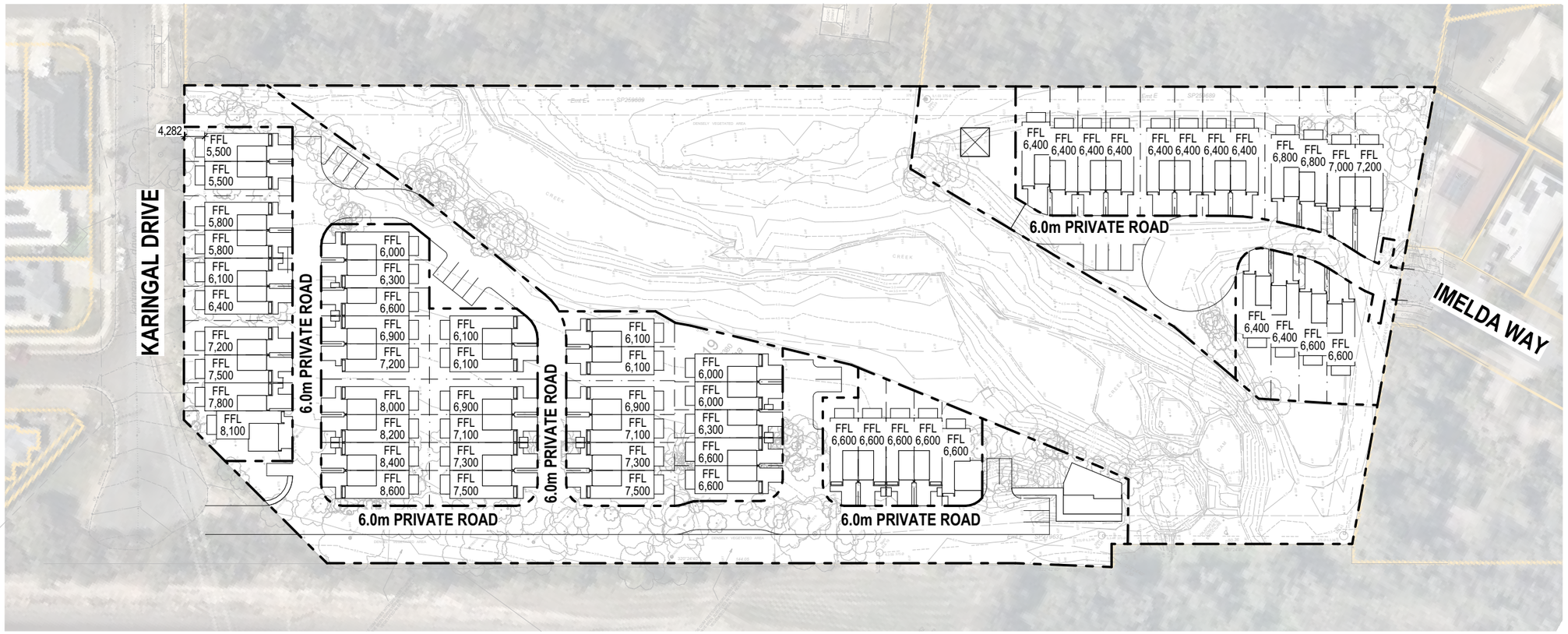
F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY
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# INDICATIVE SITE PLAN

0 10 20 30 40 50m

Scale 1:1000 @ A3

F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260218 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY

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## Appendix C – Time of Concentration and Rational Method Calculation

Design storm event flows across the site were derived using the Rational Method as per the above-mentioned manuals. This involved:

- Determination of a C10 value (derived in accordance with QUDM Table 4.05.3(b) and Council guidelines). A value of 0.66 was applied to the pre-development catchment and 0.83 was applied to the post-development catchment;
- Adoption of design rainfall using BoM IFD data; and
- Calculation of design flows through the site for Q100, Q50, Q20, Q10, Q5, Q2, and $Q3_{month}$, where $Q3_{month}$ is deemed to be 50% of Q1.

Summaries of the hydrologic calculations are contained in Table C.1 and for pre and post-development (un-mitigated) scenarios respectively.

**Table C.1 Pre-Development Hydrology**

| Catch. | Area (ha) | tc (min) | $I_{100}$ (mm/hr) | C | $Q_{100}$ ($m^3/s$) | $I_{50}$ (mm/hr) | C | $Q_{50}$ ($m^3/s$) | $I_{20}$ (mm/hr) | C | $Q_{20}$ ($m^3/s$) | $I_{10}$ (mm/hr) | C | $Q_{10}$ ($m^3/s$) | $I_5$ (mm/hr) | C | $Q_5$ ($m^3/s$) | $I_2$ (mm/hr) | C | $Q_2$ ($m^3/s$) | $I_1$ (mm/hr) | C | $Q_{3month}$ ($m^3/s$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre 1 | 5.42 | 17.00 | 195.00 | 0.94 | **2.746** | 177.00 | 0.90 | **2.388** | 153.00 | 0.82 | **1.885** | 134.00 | 0.78 | **1.572** | 116.00 | 0.74 | **1.293** | 93.30 | 0.66 | **0.931** | 74.40 | 0.62 | **0.698** |
| Pre 2 | 3.37 | 25.00 | 162.00 | 0.79 | **1.200** | 147.00 | 0.76 | **1.043** | 126.00 | 0.69 | **0.816** | 110.00 | 0.66 | **0.679** | 95.40 | 0.63 | **0.559** | 76.60 | 0.56 | **0.402** | 61.10 | 0.53 | **0.302** |
| Pre 3 | 5.72 | 17.00 | 195.00 | 0.79 | **2.452** | 177.00 | 0.76 | **2.133** | 153.00 | 0.69 | **1.683** | 134.00 | 0.66 | **1.404** | 116.00 | 0.63 | **1.155** | 93.30 | 0.56 | **0.831** | 74.40 | 0.53 | **0.624** |
| Pre 4 | 9.67 | 21.00 | 177.00 | 0.92 | **4.391** | 160.00 | 0.89 | **3.804** | 138.00 | 0.81 | **2.996** | 120.00 | 0.77 | **2.481** | 105.00 | 0.73 | **2.062** | 84.00 | 0.65 | **1.476** | 67.00 | 0.62 | **1.108** |
| Pre 5 | 16.90 | 35.00 | 137.00 | 0.79 | **5.094** | 123.00 | 0.76 | **4.383** | 105.00 | 0.69 | **3.416** | 91.40 | 0.66 | **2.832** | 79.00 | 0.63 | **2.326** | 63.20 | 0.56 | **1.665** | 50.40 | 0.53 | **1.249** |
| Pre 6 | 16.01 | 17.00 | 195.00 | 0.89 | **7.700** | 177.00 | 0.85 | **6.698** | 153.00 | 0.78 | **5.287** | 134.00 | 0.74 | **4.410** | 116.00 | 0.70 | **3.626** | 93.30 | 0.63 | **2.610** | 74.40 | 0.59 | **1.959** |
| Pre 7 | 12.74 | 16.00 | 201.00 | 0.79 | **5.635** | 182.00 | 0.76 | **4.889** | 157.00 | 0.69 | **3.851** | 137.00 | 0.66 | **3.200** | 119.00 | 0.63 | **2.641** | 96.00 | 0.56 | **1.906** | 76.60 | 0.53 | **1.432** |
| Pre 8 | 15.33 | 30.00 | 148.00 | 0.79 | **4.991** | 134.00 | 0.76 | **4.331** | 114.00 | 0.69 | **3.364** | 99.60 | 0.66 | **2.799** | 86.30 | 0.63 | **2.304** | 69.10 | 0.56 | **1.651** | 55.10 | 0.53 | **1.239** |
| Pre 9 | 13.90 | 32.00 | 143.00 | 0.79 | **4.374** | 129.00 | 0.76 | **3.782** | 110.00 | 0.69 | **2.944** | 96.10 | 0.66 | **2.450** | 83.20 | 0.63 | **2.015** | 66.60 | 0.56 | **1.443** | 53.10 | 0.53 | **1.083** |
| Pre 10 | 7.58 | 39.00 | 130.00 | 0.79 | **2.168** | 116.00 | 0.76 | **1.854** | 98.90 | 0.69 | **1.443** | 85.90 | 0.66 | **1.194** | 74.20 | 0.63 | **0.980** | 59.20 | 0.56 | **0.699** | 47.20 | 0.53 | **0.525** |
| Pre 11 | 4.00 | 23.00 | 169.00 | 0.79 | **1.486** | 153.00 | 0.76 | **1.289** | 131.00 | 0.69 | **1.008** | 115.00 | 0.66 | **0.843** | 99.70 | 0.63 | **0.694** | 80.10 | 0.56 | **0.499** | 63.90 | 0.53 | **0.375** |
| Pre 12 | 15.77 | 16.00 | 201.00 | 0.79 | **6.972** | 182.00 | 0.76 | **6.050** | 157.00 | 0.69 | **4.765** | 137.00 | 0.66 | **3.960** | 119.00 | 0.63 | **3.268** | 96.00 | 0.56 | **2.359** | 76.60 | 0.53 | **1.771** |
| Pre 13 | 13.24 | 21.00 | 177.00 | 0.79 | **5.155** | 160.00 | 0.76 | **4.466** | 138.00 | 0.69 | **3.517** | 120.00 | 0.66 | **2.913** | 105.00 | 0.63 | **2.421** | 84.00 | 0.56 | **1.733** | 67.00 | 0.53 | **1.301** |
| Pre 14 | 8.49 | 12.00 | 228.00 | 0.96 | **5.165** | 207.00 | 0.92 | **4.493** | 178.00 | 0.84 | **3.528** | 156.00 | 0.80 | **2.945** | 135.00 | 0.76 | **2.421** | 109.00 | 0.68 | **1.749** | 86.80 | 0.64 | **1.311** |
| Pre 15 | 13.65 | 16.00 | 201.00 | 0.79 | **6.034** | 182.00 | 0.76 | **5.236** | 157.00 | 0.69 | **4.124** | 137.00 | 0.66 | **3.427** | 119.00 | 0.63 | **2.828** | 96.00 | 0.56 | **2.041** | 76.60 | 0.53 | **1.533** |
| Pre 16 | 4.44 | 14.00 | 213.00 | 0.96 | **2.522** | 193.00 | 0.92 | **2.190** | 167.00 | 0.84 | **1.730** | 146.00 | 0.80 | **1.441** | 127.00 | 0.76 | **1.190** | 102.00 | 0.68 | **0.855** | 81.30 | 0.64 | **0.642** |
| Pre 17 | 3.41 | 30.00 | 148.00 | 0.79 | **1.111** | 134.00 | 0.76 | **0.964** | 114.00 | 0.69 | **0.749** | 99.60 | 0.66 | **0.623** | 86.30 | 0.63 | **0.513** | 69.10 | 0.56 | **0.368** | 55.10 | 0.53 | **0.276** |
| Pre 18 | 25.53 | 36.00 | 135.00 | 0.79 | **7.584** | 121.00 | 0.76 | **6.514** | 103.00 | 0.69 | **5.063** | 89.90 | 0.66 | **4.209** | 77.70 | 0.63 | **3.456** | 62.20 | 0.56 | **2.475** | 49.60 | 0.53 | **1.858** |
| Pre 19 | 14.97 | 17.00 | 195.00 | 0.98 | **7.981** | 177.00 | 0.94 | **6.942** | 153.00 | 0.86 | **5.479** | 134.00 | 0.82 | **4.570** | 116.00 | 0.78 | **3.758** | 93.30 | 0.70 | **2.705** | 74.40 | 0.66 | **2.030** |
| Pre 20 | 15.29 | 22.00 | 173.00 | 0.96 | **7.055** | 156.00 | 0.92 | **6.097** | 134.00 | 0.84 | **4.781** | 118.00 | 0.80 | **4.010** | 102.00 | 0.76 | **3.293** | 82.00 | 0.68 | **2.369** | 65.40 | 0.64 | **1.778** |
| Pre 21 | 11.08 | 24.00 | 166.00 | 0.91 | **4.658** | 150.00 | 0.87 | **4.034** | 129.00 | 0.80 | **3.167** | 112.00 | 0.76 | **2.619** | 97.50 | 0.72 | **2.166** | 78.30 | 0.65 | **1.556** | 62.40 | 0.61 | **1.167** |
| Pre 22 | 12.22 | 16.00 | 201.00 | 0.94 | **6.386** | 182.00 | 0.90 | **5.542** | 157.00 | 0.82 | **4.365** | 137.00 | 0.78 | **3.627** | 119.00 | 0.74 | **2.993** | 96.00 | 0.66 | **2.161** | 76.60 | 0.62 | **1.623** |
| Pre 23 | 8.38 | 47.00 | 118.00 | 0.48 | **1.319** | 105.00 | 0.46 | **1.124** | 88.90 | 0.42 | **0.869** | 77.00 | 0.40 | **0.717** | #N/A | 0.38 | **#N/A** | #N/A | 0.34 | **#N/A** | 42.10 | 0.32 | **0.314** |
| Pre 24 | 7.12 | 30.00 | 148.00 | 0.85 | **2.495** | 134.00 | 0.82 | **2.165** | 114.00 | 0.75 | **1.682** | 99.60 | 0.71 | **1.399** | 86.30 | 0.67 | **1.152** | 69.10 | 0.60 | **0.825** | 55.10 | 0.57 | **0.619** |

## Appendix D – Hydraulic Model Features Map

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# 2 Karingal Drive

FIG 01 CATCHMENT PLAN




Location of the site within the City of Gold Coast

**Legend**

- Cadastral
- Flowpath
- Site
- Sub_Catchment

**Surface Elevation (mAHD)**

| | |
|---|---|
| 0 | 40 |
| 10 | 50 |
| 20 | 60 |
| 30 | 70 |

| | |
|---|---|
| Project: | BE200223 |
| Date: | Oct 2020 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

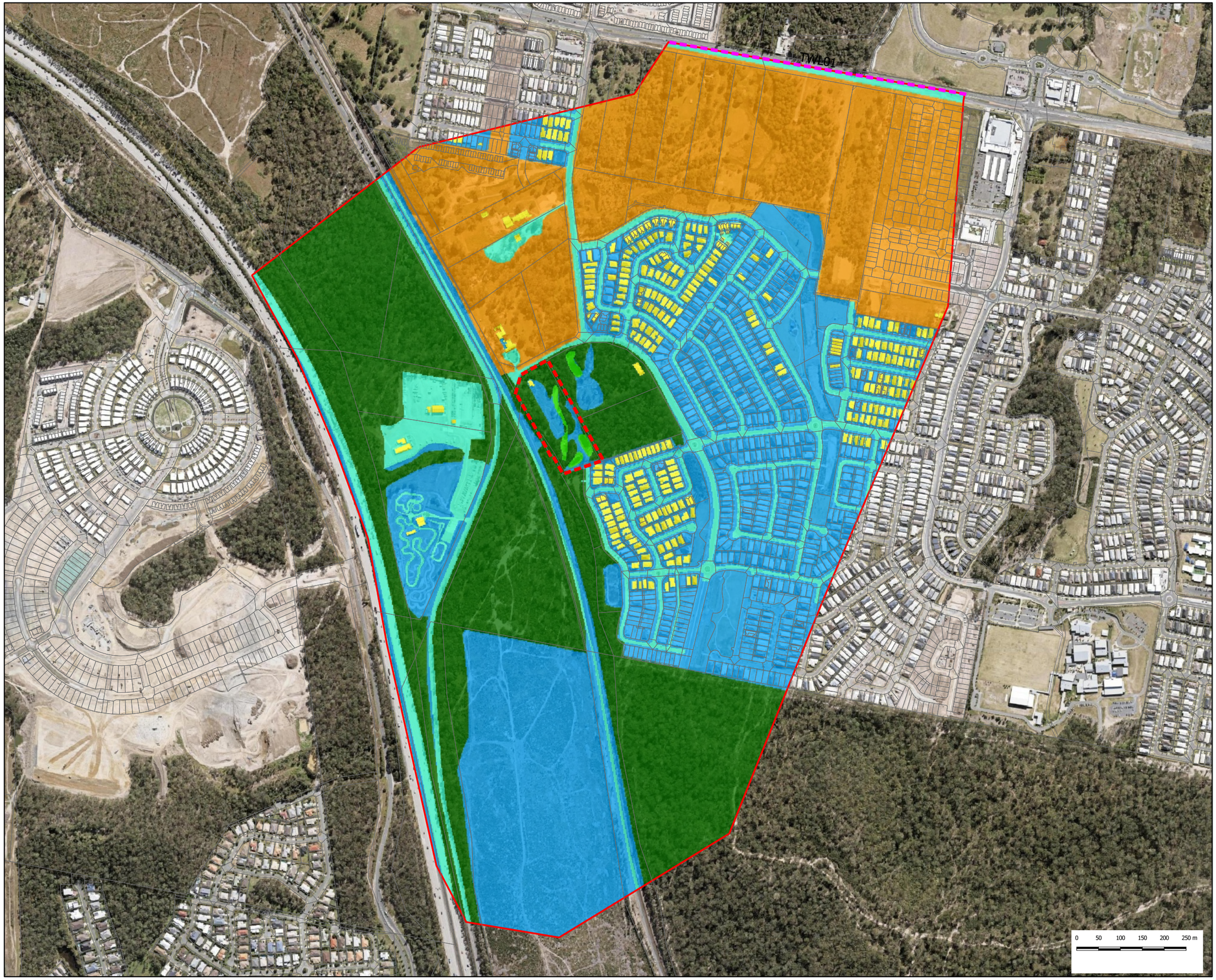
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# 2 Karingal Drive

FIG 03 PRE DEVELOPMENT
TUFLOW MANNING MAP

N



Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Manning Value**

- Sugar Cane/Trees (n=0.15)
- Water Body (n=0.03)
- Road (n=0.022)
- Buildings (n=1)
- Grass (n=0.035)
- Medium Trees (n=0.075)

Project: BE200223

Date: Dec 2020

Scale: 1:8000 at A3

Projection:

Data Sources:

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# 2 Karingal Drive

## FIG 05 POST DEVELOPMENT TUFLOW MANNING MAP




Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Manning Value**

- Sugar Cane/Trees (n=0.15)
- Water Body (n=0.03)
- Road (n=0.022)
- Buildings (n=1)
- Grass (n=0.035)
- Medium Trees (n=0.075)

Project: BE200223

Date: Dec 2020

Scale: 1:8000 at A3

Projection:

Data Sources:

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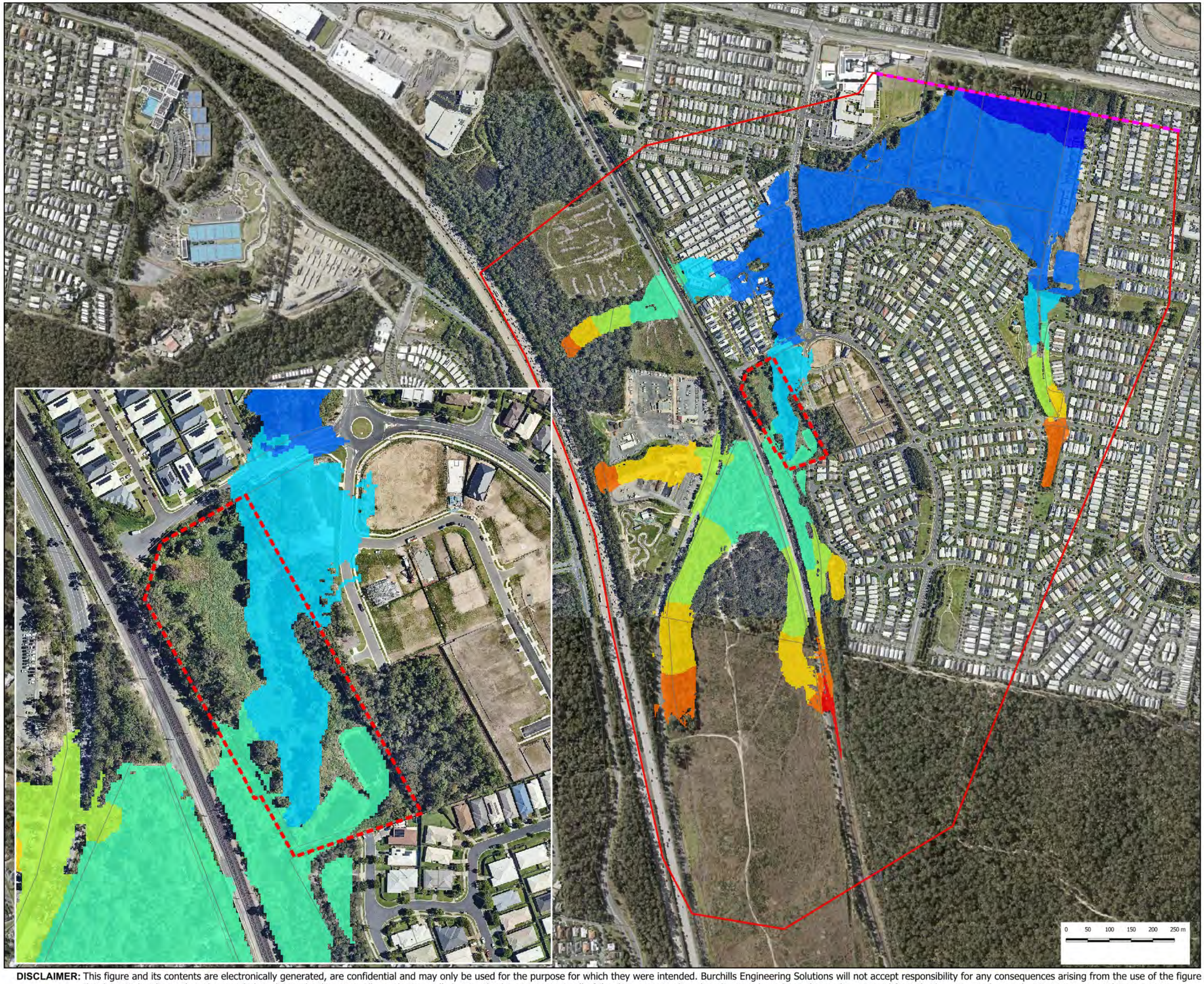
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# Appendix E - Hydraulic Mapping Results

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# 2 Karingal Drive

FIG A01 PRE DEVELOPMENT
1%AEP
FLOOD WATER LEVEL







Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary

### Water Level (mAHD)

| | |
|---|---|
| below 2.0 | 8.0 - 10.0 |
| 2.0 - 4.0 | 10.0 - 12.0 |
| 4.0 - 6.0 | 12.0 - 14.0 |
| 6.0 - 8.0 | above 14.0 |

Project: BE200223

Date: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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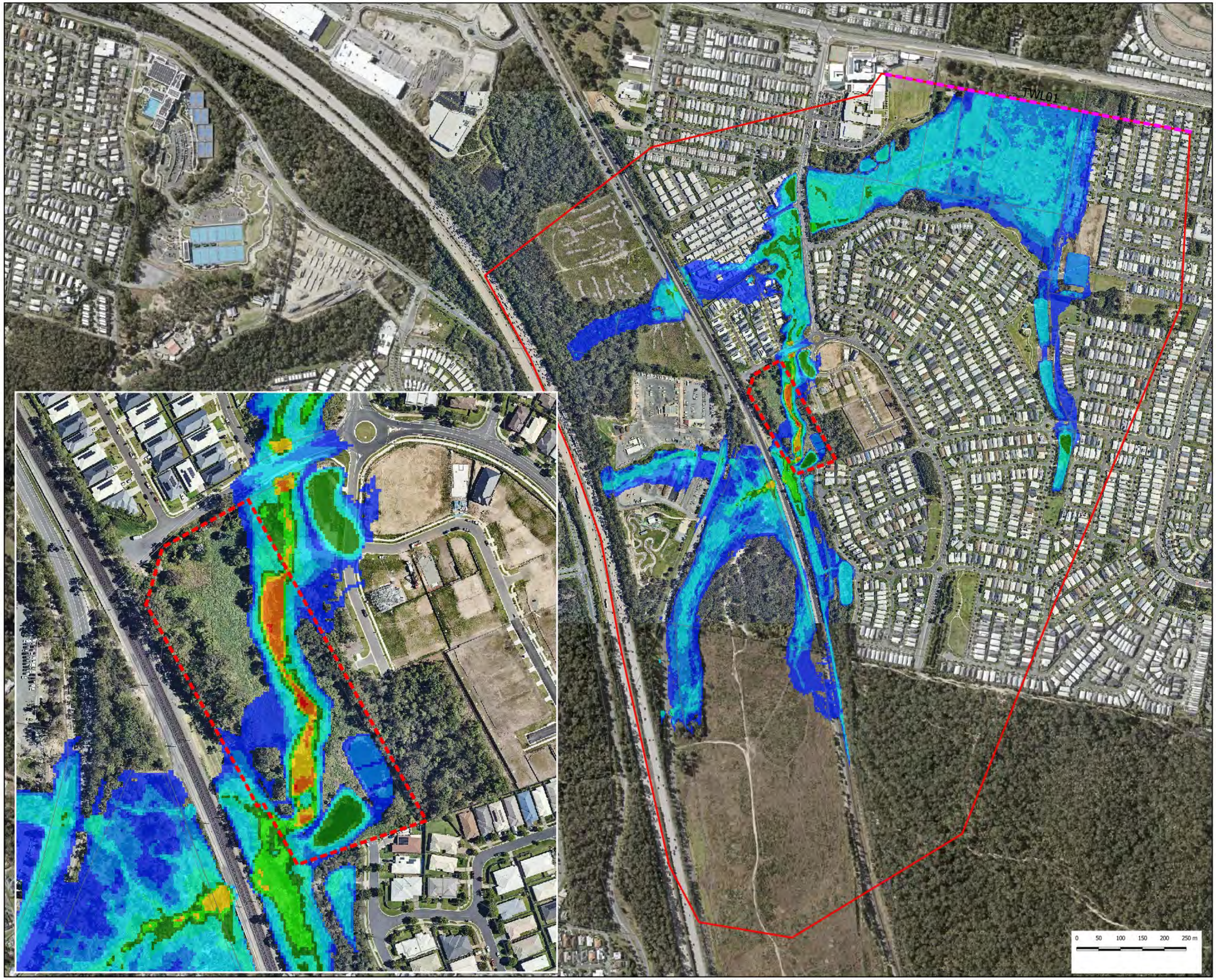
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# 2 Karingal Drive

FIG A02 PRE DEVELOPMENT
1%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

- 0.0 - 0.25
- 0.25 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2
- 2.0 - 2.5
- 2.5 - 3
- 3.0 - 3.5
- above 3.5

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG A03 PRE DEVELOPMENT
1%AEP
FLOOD WATER VELOCITY




Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Velocity (m/s)**

- below 0.3
- 0.3 - 0.6
- 0.6 - 0.9
- 0.9 - 1.2
- 1.2 - 1.5
- 1.5 - 1.8
- 1.8 - 2.1
- above 2.1

Project: BE200223

Date: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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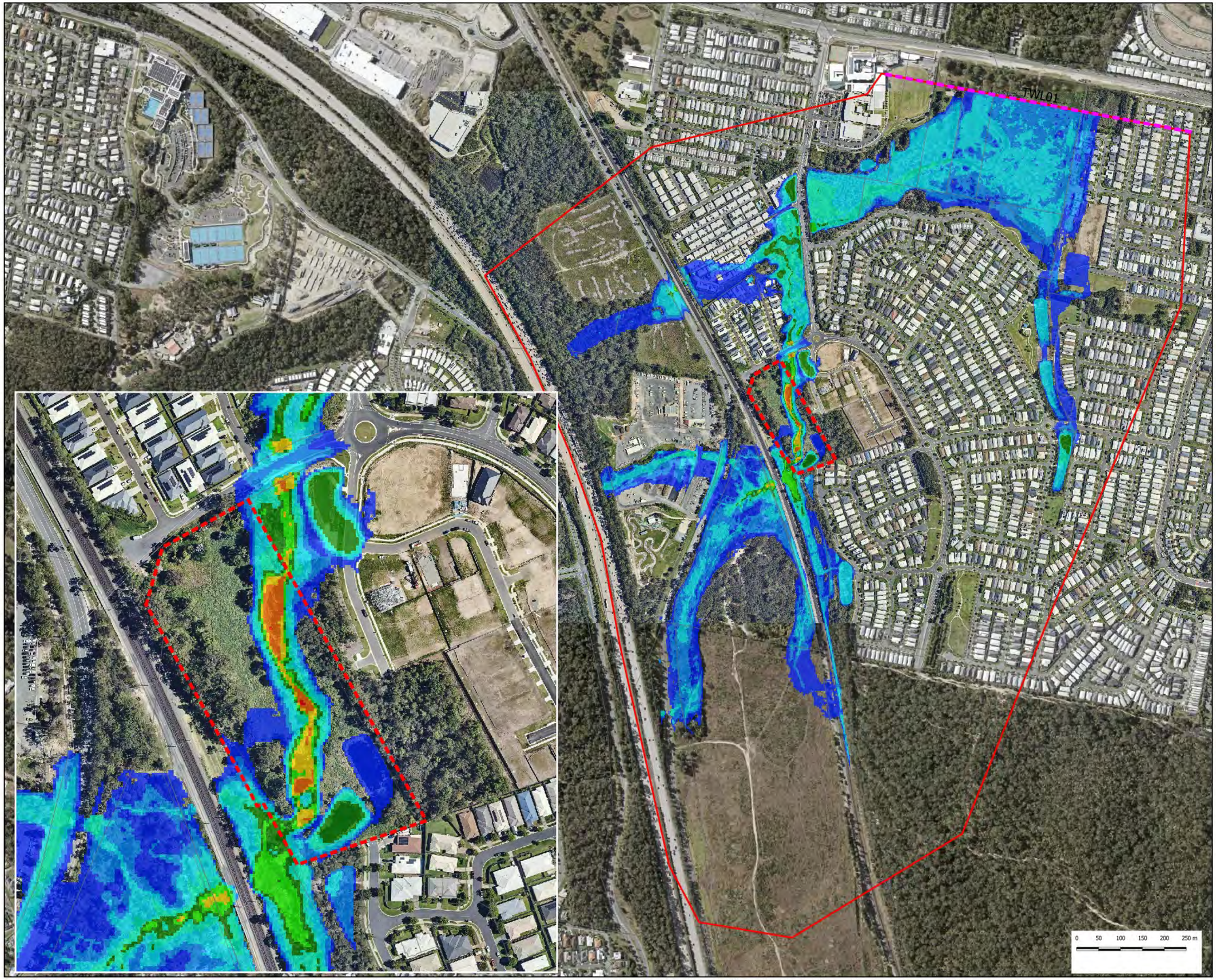
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# 2 Karingal Drive

FIG A04 PRE DEVELOPMENT
2%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

| | |
|---|---|
| 0.0 - 0.25 | 2.0 - 2.5 |
| 0.25 - 0.5 | 2.5 - 3 |
| 0.5 - 1.0 | 3.0 - 3.5 |
| 1.0 - 1.5 | above 3.5 |
| 1.5 - 2 | |

| |
|---|
| Project: BE200223 |
| Date: March 2026 |
| Scale: 1:8000 at A3 |
| Projection: |
| Data Sources: |

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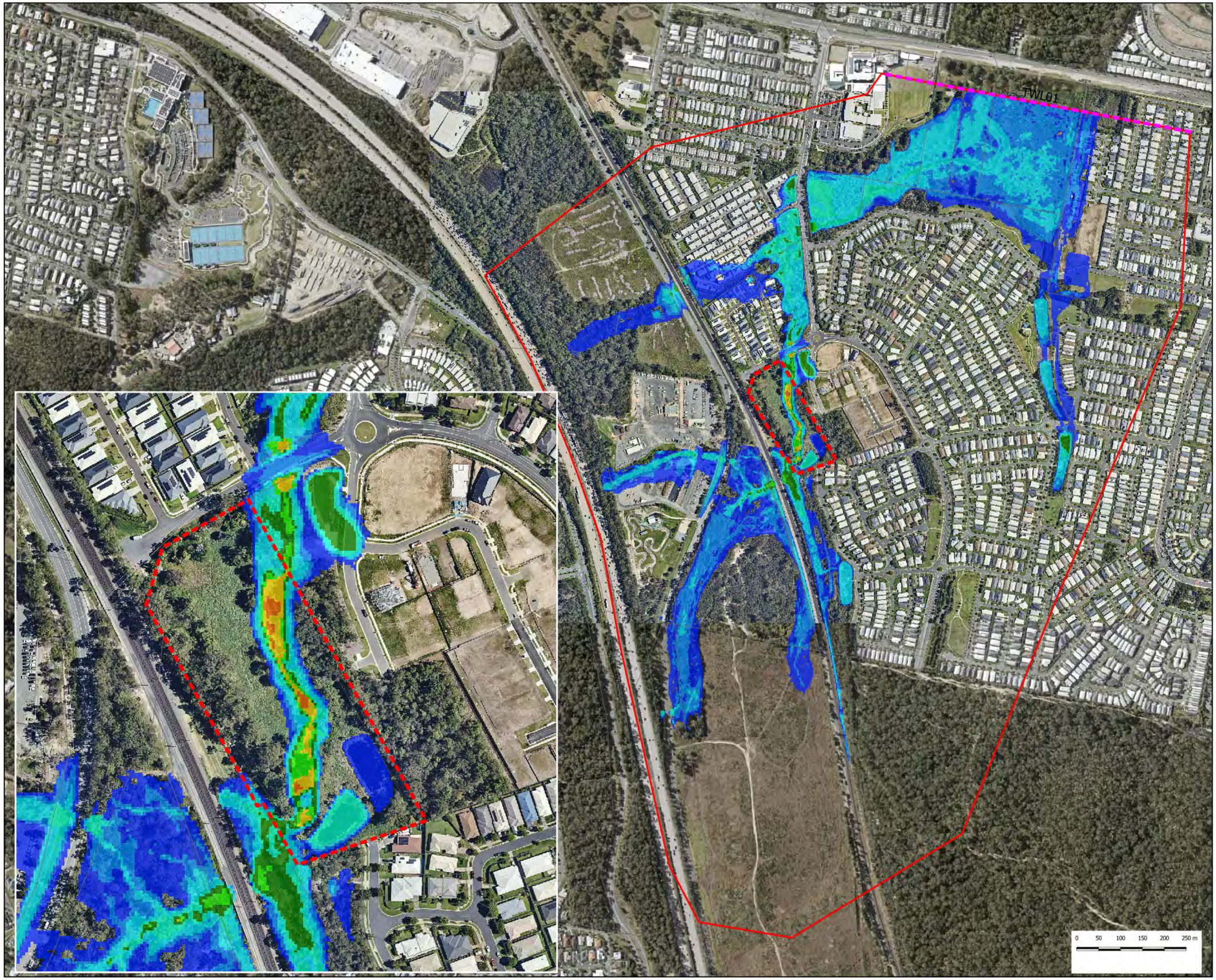
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# 2 Karingal Drive

FIG A05 PRE DEVELOPMENT
5%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

- 0.0 - 0.25
- 0.25 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2
- 2.0 - 2.5
- 2.5 - 3
- 3.0 - 3.5
- above 3.5

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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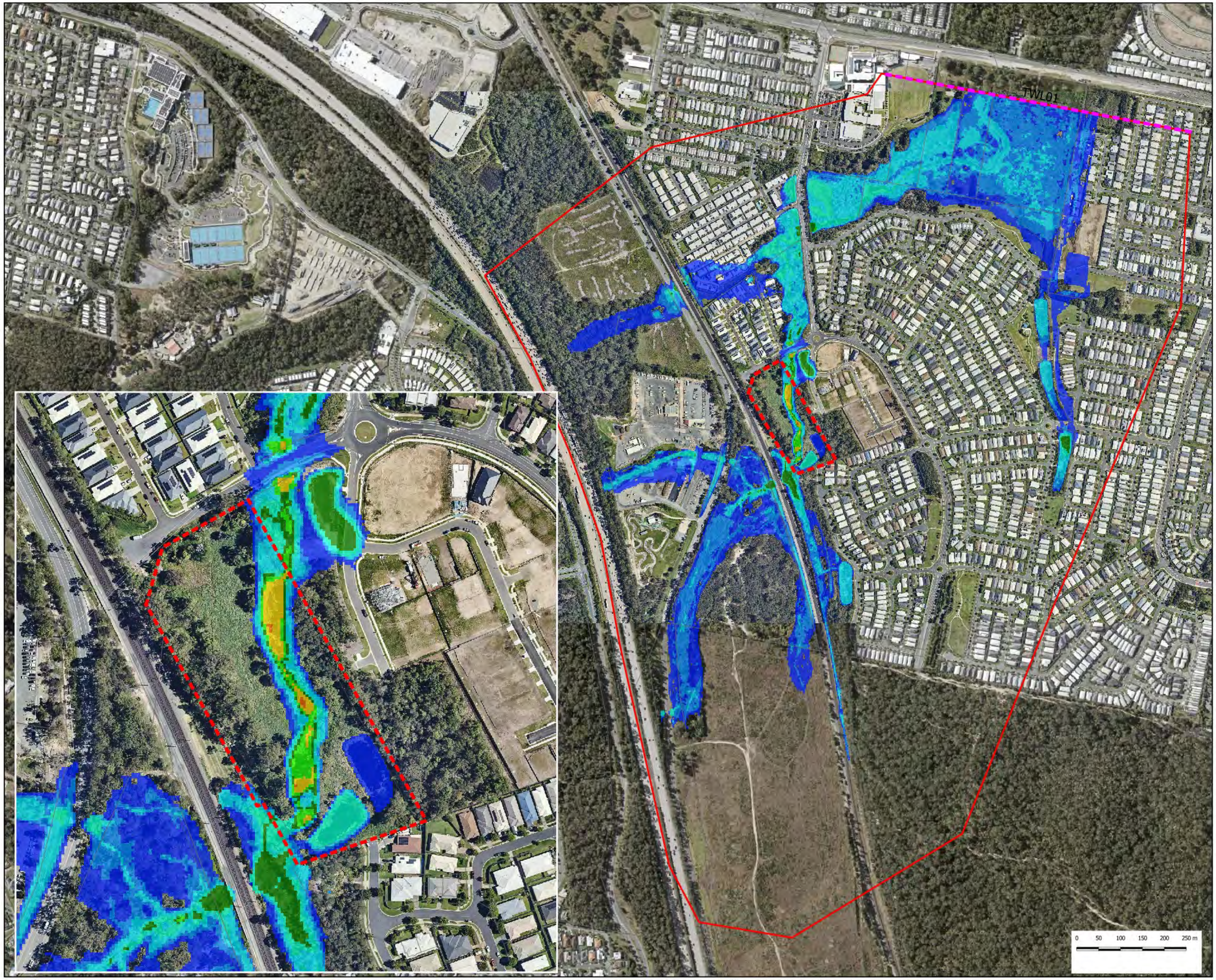
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# 2 Karingal Drive

FIG A06 PRE DEVELOPMENT
10%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

- 0.0 - 0.25
- 0.25 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2
- 2.0 - 2.5
- 2.5 - 3
- 3.0 - 3.5
- above 3.5

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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# 2 Karingal Drive

FIG A07 PRE DEVELOPMENT
20%AEP
FLOOD WATER DEPTH




Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

- 0.0 - 0.25
- 0.25 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2
- 2.0 - 2.5
- 2.5 - 3
- 3.0 - 3.5
- above 3.5

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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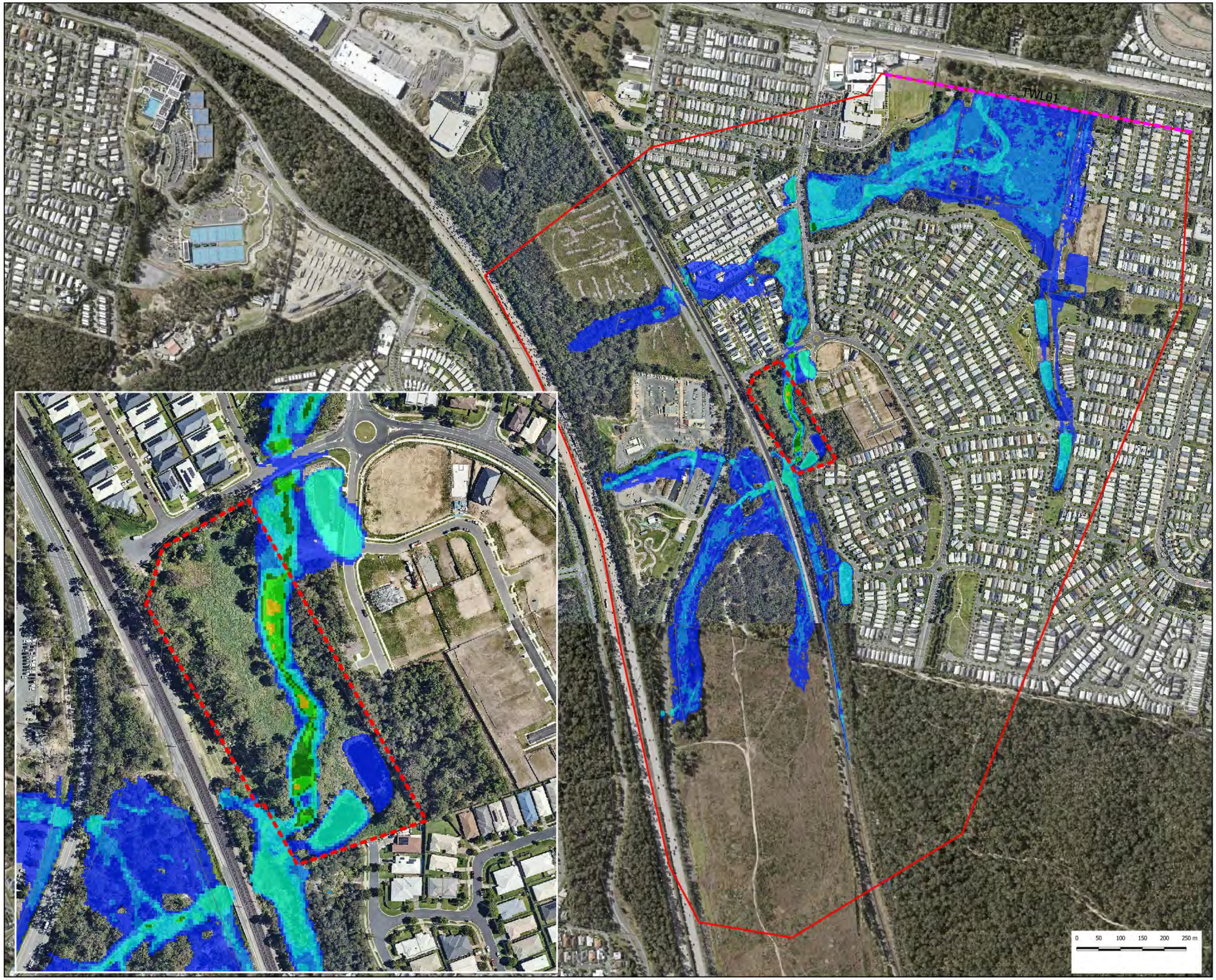
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# 2 Karingal Drive

FIG A08 PRE DEVELOPMENT
39%AEP
FLOOD WATER DEPTH





Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary

**Water Depth (m)**

| | |
|---|---|
| 0.0 - 0.25 | 2.0 - 2.5 |
| 0.25 - 0.5 | 2.5 - 3 |
| 0.5 - 1.0 | 3.0 - 3.5 |
| 1.0 - 1.5 | above 3.5 |
| 1.5 - 2 | |

| |
|---|
| Project: BE200223 |
| Date: March 2026 |
| Scale: 1:8000 at A3 |
| Projection: |
| Data Sources: |

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG B01 POST DEVELOPMENT
1%AEP
FLOOD WATER LEVEL

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Level (mAHD)**

| | |
|---|---|
| Band 1 | |
| below 2.0 | 8.0 - 10.0 |
| 2.0 - 4.0 | 10.0 - 12.0 |
| 4.0 - 6.0 | 12.0 - 14.0 |
| 6.0 - 8.0 | above 14.0 |

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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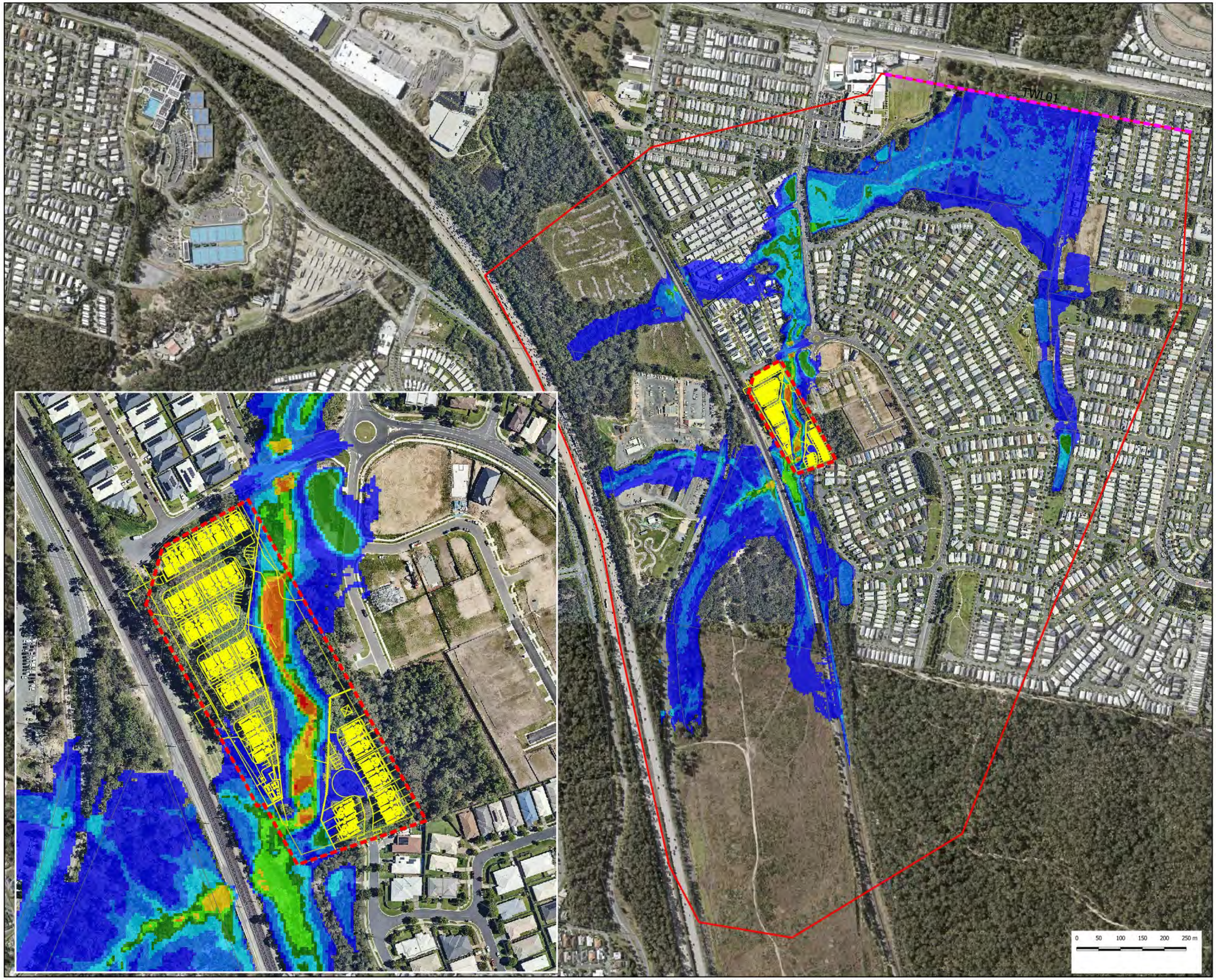
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# 2 Karingal Drive

FIG B02 POST DEVELOPMENT
1%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

- below 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- above 3.5

Project: BE200223

Date: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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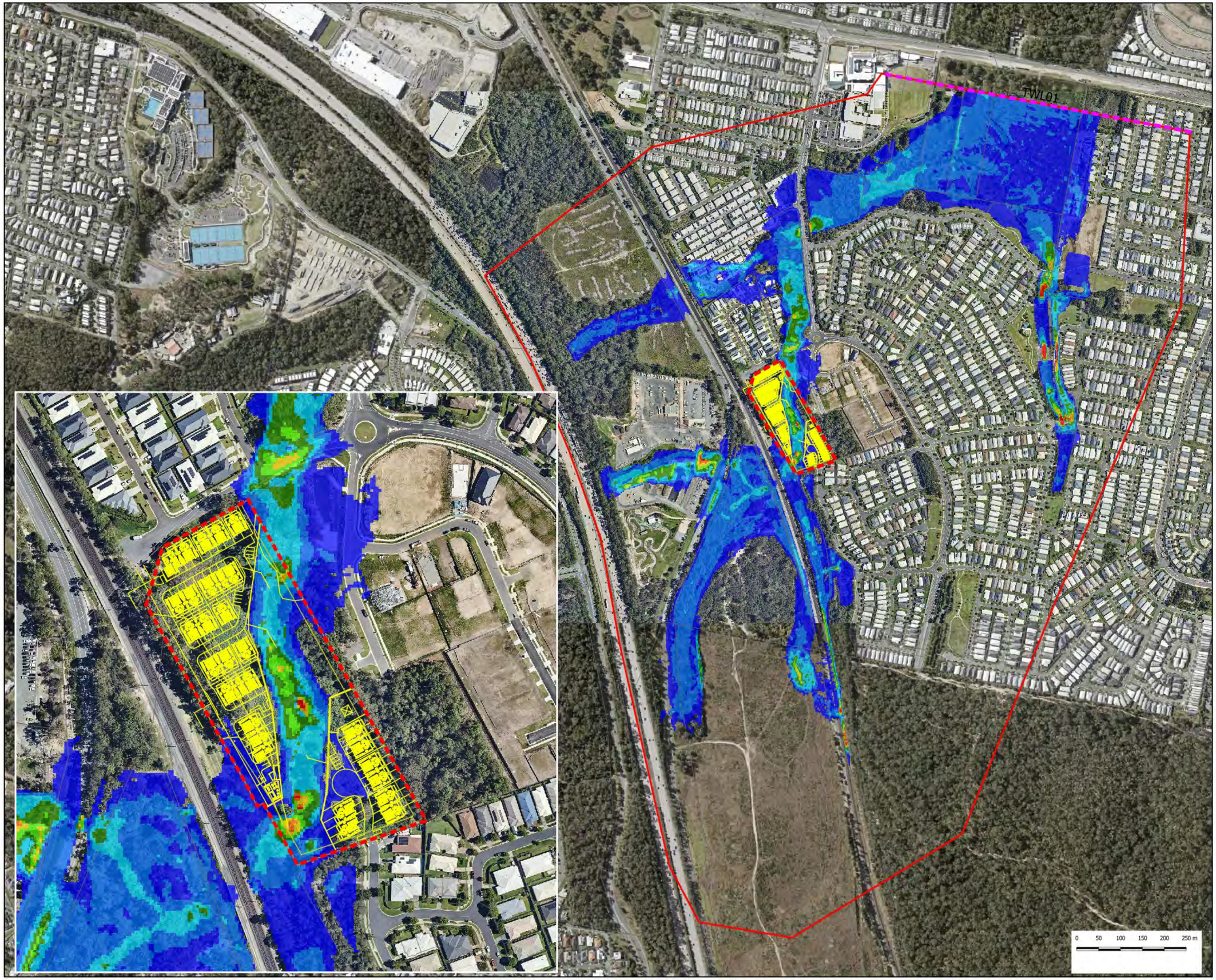
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# 2 Karingal Drive

FIG B03 POST DEVELOPMENT
1%AEP
FLOOD WATER VELOCITY







Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Velocity (m/s)

| | |
|---|---|
| below 0.3 | 1.2 - 1.5 |
| 0.3 - 0.6 | 1.5 - 1.8 |
| 0.6 - 0.9 | 1.8 - 2.1 |
| 0.9 - 1.2 | above 2.1 |

Project: BE200223

Date: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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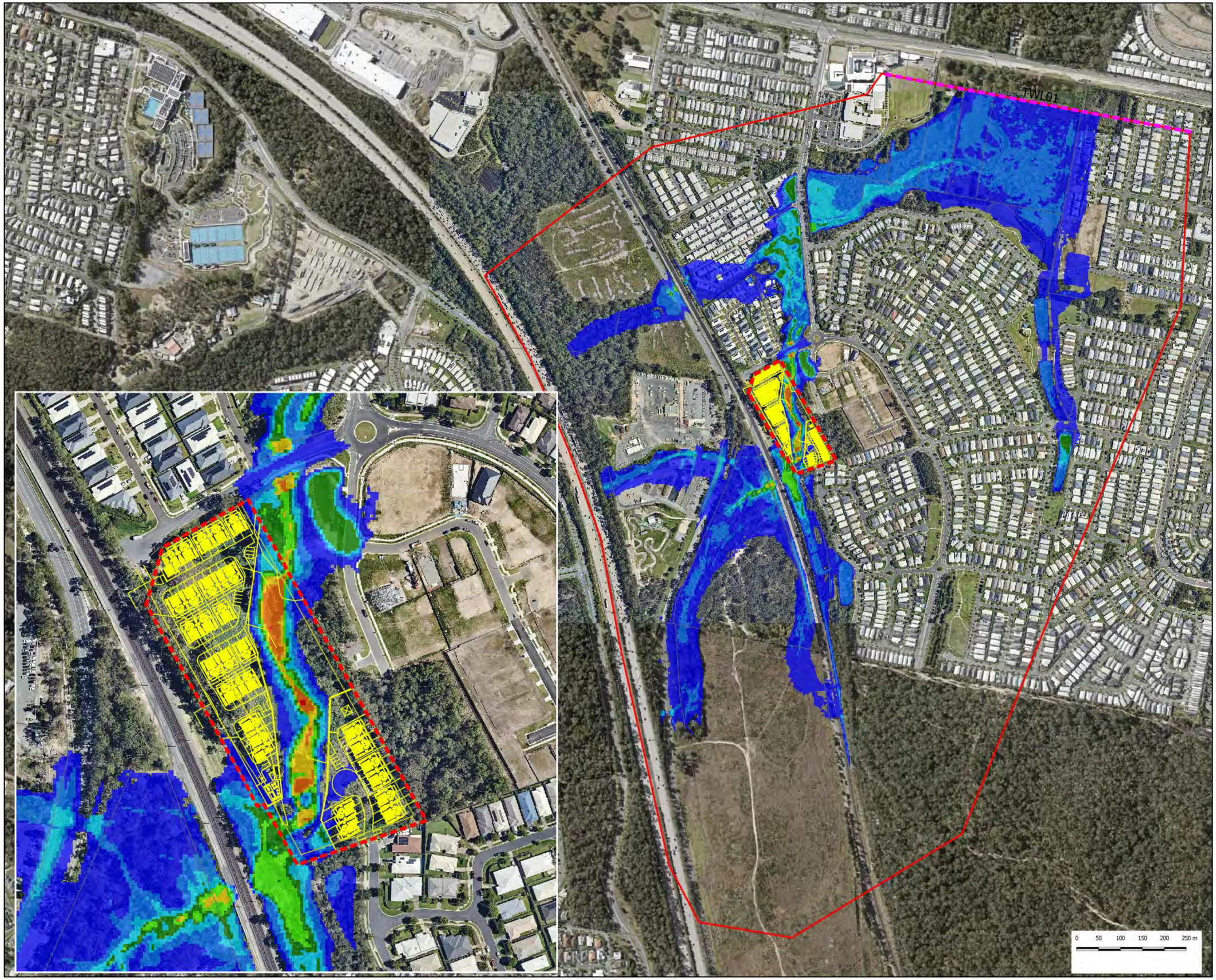
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# 2 Karingal Drive

FIG B04 POST DEVELOPMENT
2%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

| | |
|---|---|
| below 0.5 | 2.0 - 2.5 |
| 0.5 - 1.0 | 2.5 - 3.0 |
| 1.0 - 1.5 | 3.0 - 3.5 |
| 1.5 - 2.0 | above 3.5 |

| |
|---|
| Project: BE200223 |
| Date: March 2026 |
| Scale: 1:8000 at A3 |
| Projection: |
| Data Sources: |

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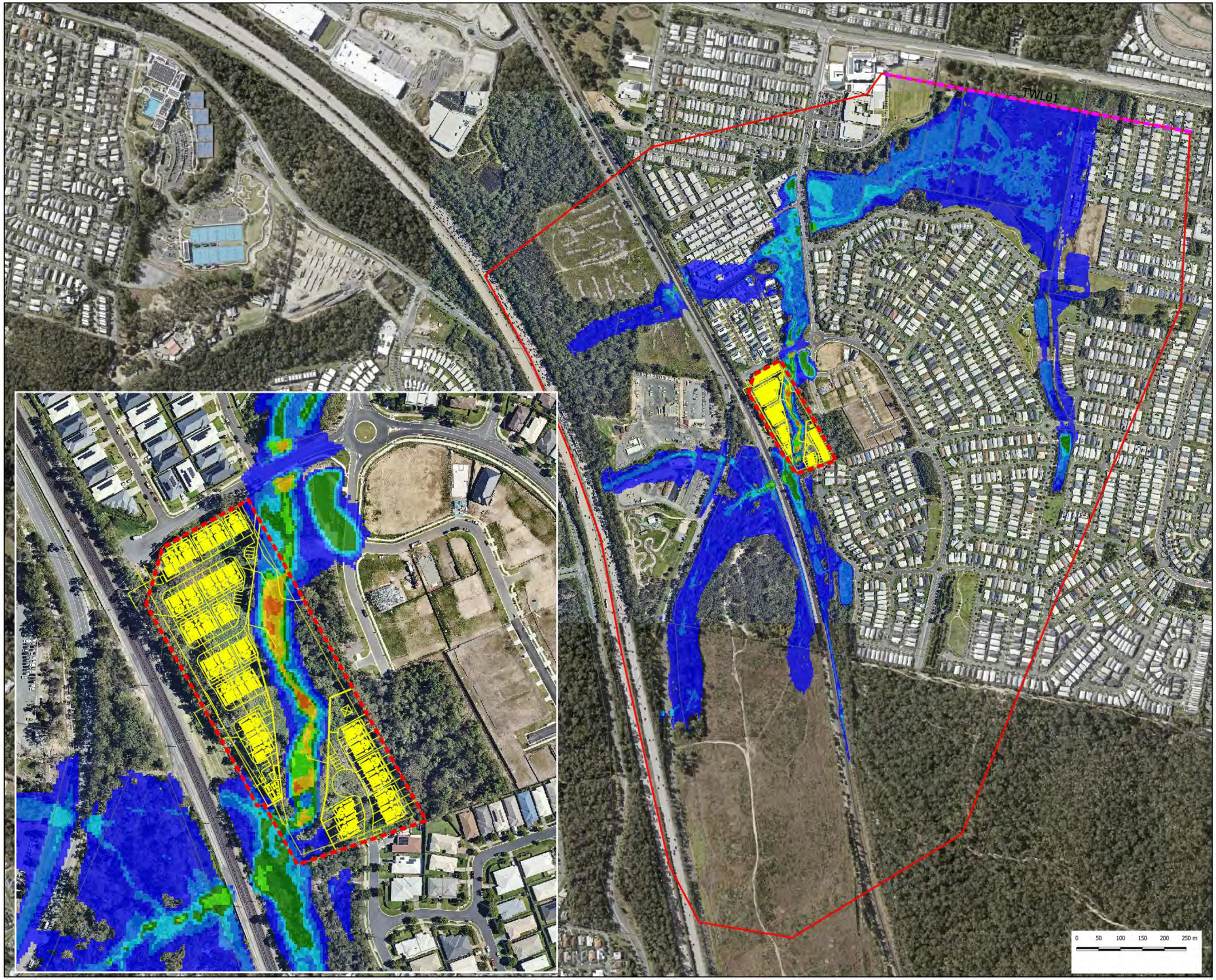
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# 2 Karingal Drive

FIG B05 POST DEVELOPMENT
5%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

| | |
|---|---|
| below 0.5 | 2.0 - 2.5 |
| 0.5 - 1.0 | 2.5 - 3.0 |
| 1.0 - 1.5 | 3.0 - 3.5 |
| 1.5 - 2.0 | above 3.5 |

Project: BE200223

Date: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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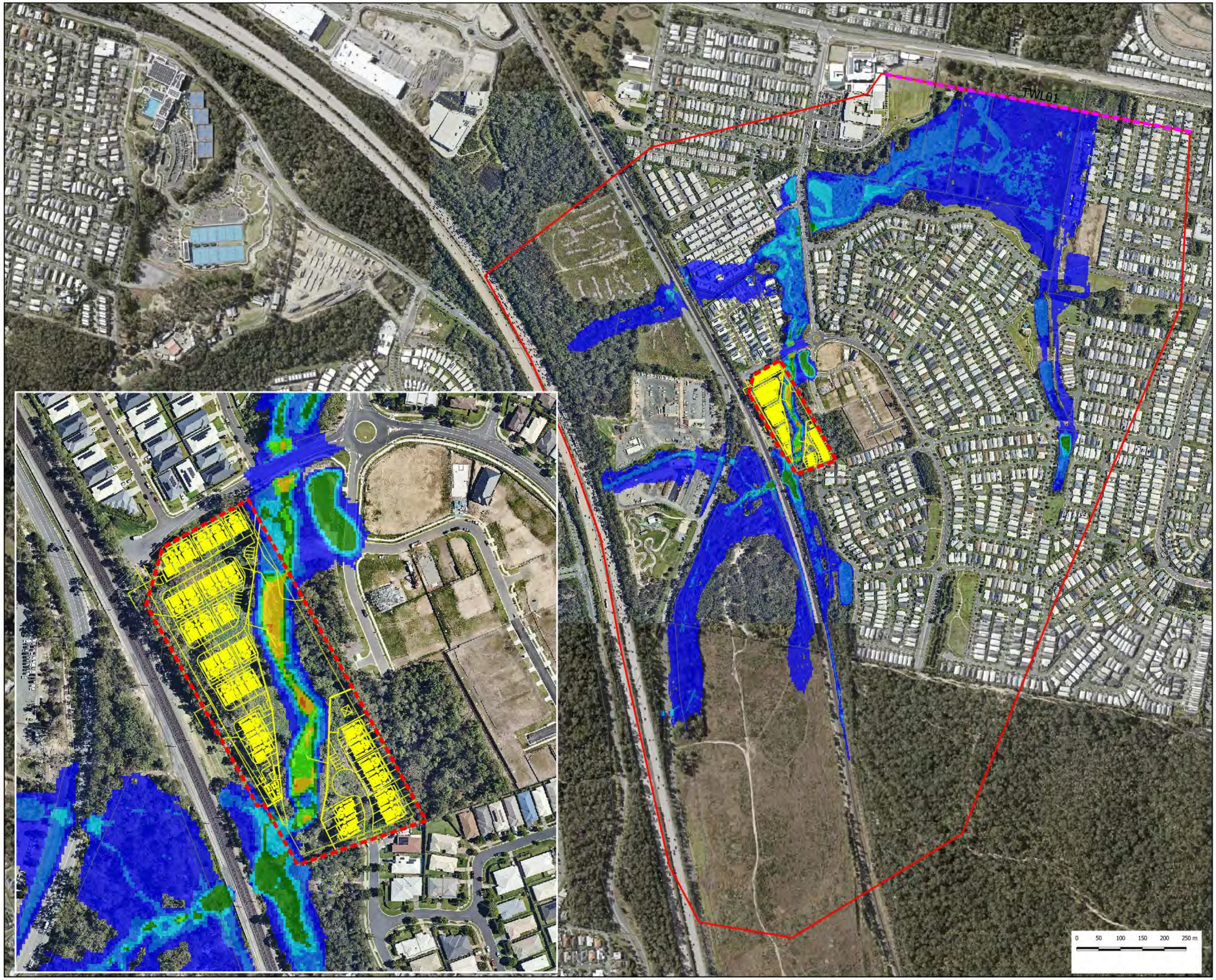
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# 2 Karingal Drive

FIG B06 POST DEVELOPMENT
10%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

| | |
|---|---|
| below 0.5 | 2.0 - 2.5 |
| 0.5 - 1.0 | 2.5 - 3.0 |
| 1.0 - 1.5 | 3.0 - 3.5 |
| 1.5 - 2.0 | above 3.5 |

| |
|---|
| Project: BE200223 |
| Date: March 2026 |
| Scale: 1:8000 at A3 |
| Projection: |
| Data Sources: |

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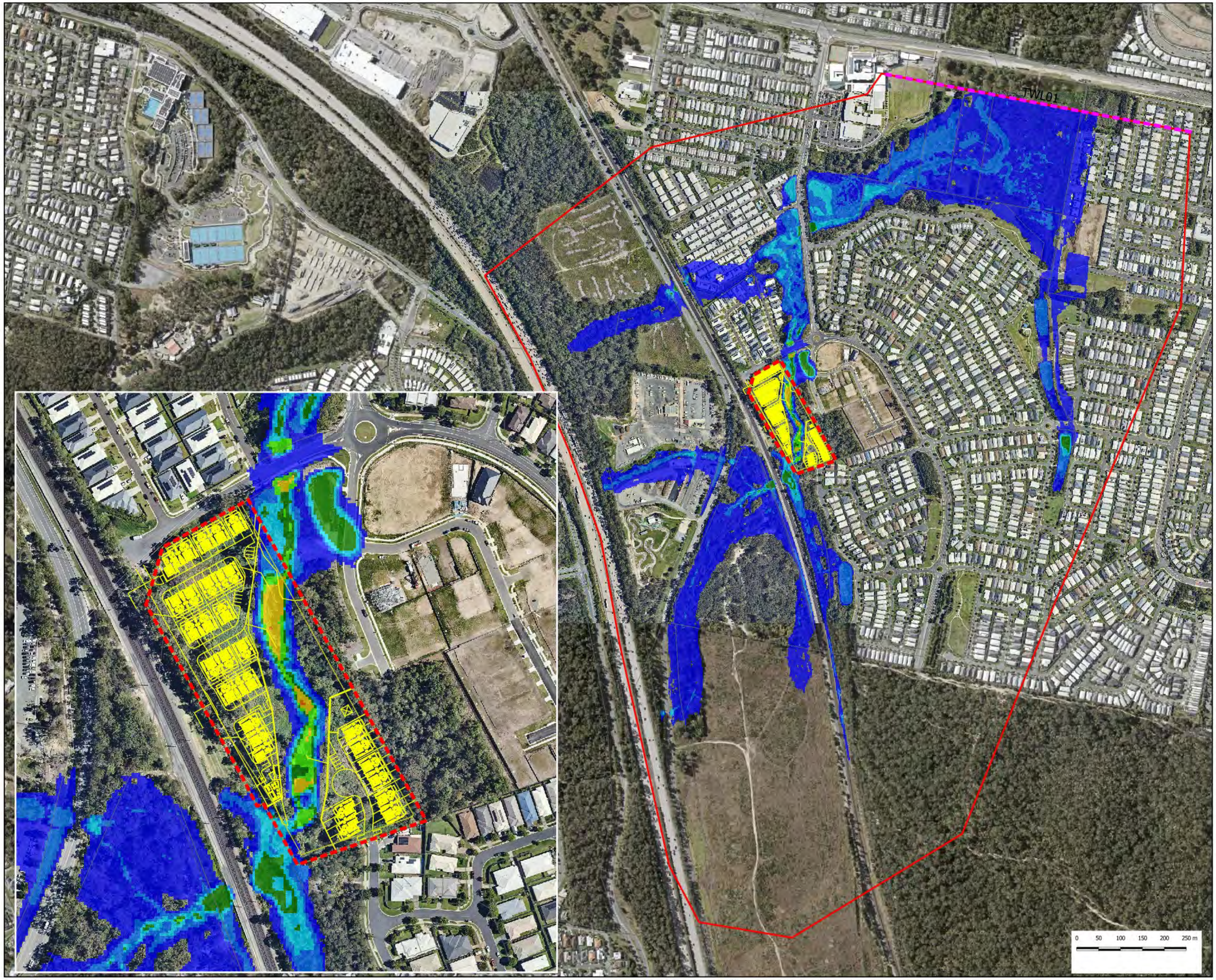
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# 2 Karingal Drive

FIG B07 POST DEVELOPMENT
20%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

| | |
|---|---|
| below 0.5 | 2.0 - 2.5 |
| 0.5 - 1.0 | 2.5 - 3.0 |
| 1.0 - 1.5 | 3.0 - 3.5 |
| 1.5 - 2.0 | above 3.5 |

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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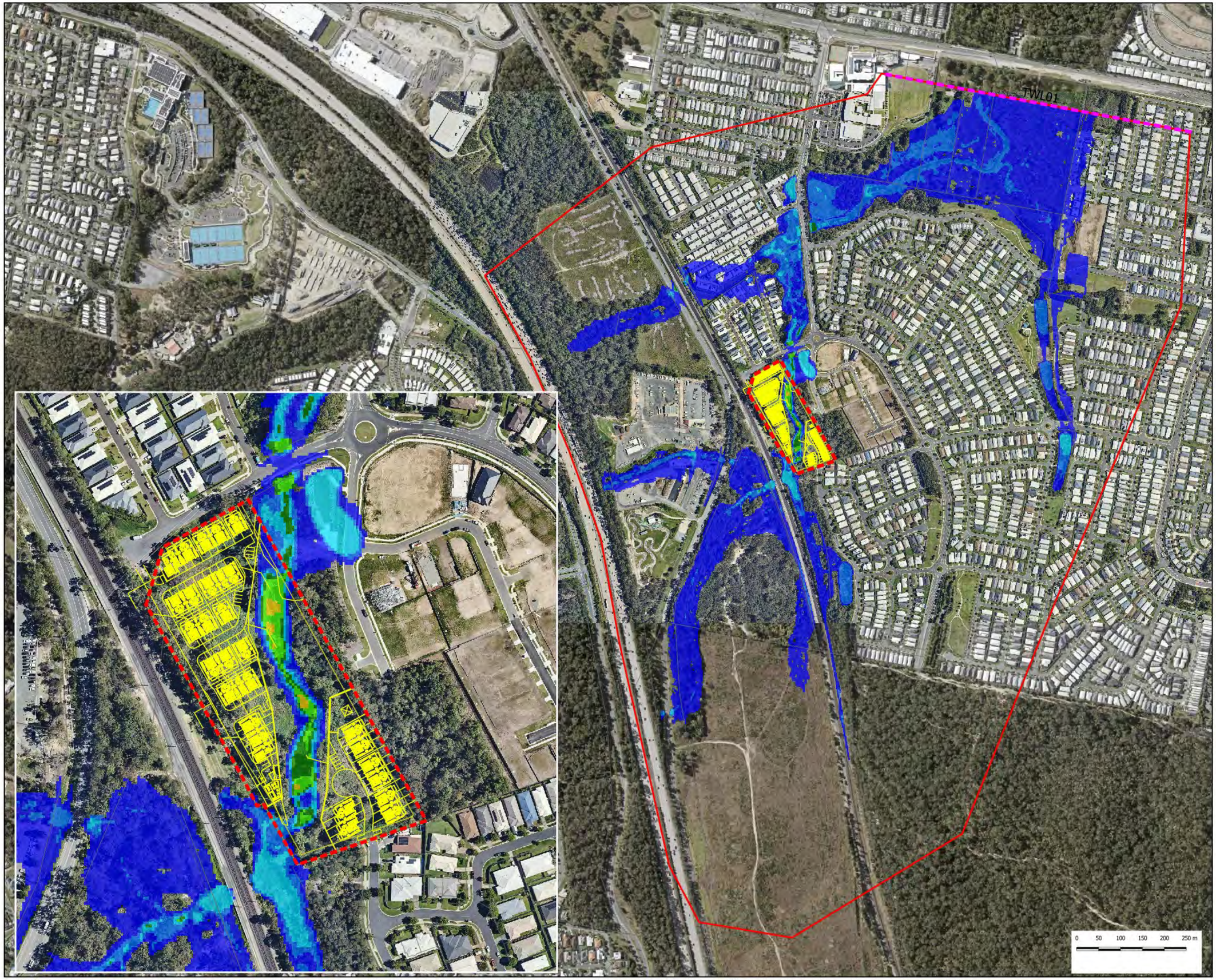
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# 2 Karingal Drive

FIG B08 POST DEVELOPMENT
39%AEP
FLOOD WATER DEPTH







Location of the site within the City of Gold Coast

**Legend**

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

**Water Depth (m)**

- below 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- 2.0 - 2.5
- 2.5 - 3.0
- 3.0 - 3.5
- above 3.5

| | |
|---|---|
| Project: | BE200223 |
| Date: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG C01 POST DEVELOPMENT
1%AEP
FLOOD WATER LEVEL AFFLUX

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary

### Water Level Afflux(mm)

- <= -0.10
- -0.1 - -0.05
- -0.05 - -0.03
- -0.03 - -0.02
- -0.02 - -0.01
- -0.01 - 0.01
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.1
- 0.10 - 0.40
- Was Wet Now Dry
- Was Dry Now Wet

Project: BE200223

DATE: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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FOR

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG C02 POST DEVELOPMENT
2%AEP
FLOOD WATER LEVEL AFFLUX

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Level Afflux(mm)

- <= -0.10
- -0.1 - -0.05
- -0.05 - -0.03
- -0.03 - -0.02
- -0.02 - -0.01
- -0.01 - 0.01
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.1
- 0.10 - 0.40
- Was Wet Now Dry
- Was Dry Now Wet

| | |
|---|---|
| Project: | BE200223 |
| DATE: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

BURCHILLS ENGINEERING SOLUTIONS

FOR

BOSFORM PTY LTD

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG C03 POST DEVELOPMENT
5%AEP
FLOOD WATER LEVEL AFFLUX

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Level Afflux(mm)

| | |
|---|---|
| <= -0.10 | 0.02 - 0.03 |
| -0.1 - -0.05 | 0.03 - 0.05 |
| -0.05 - -0.03 | 0.05 - 0.1 |
| -0.03 - -0.02 | 0.10 - 0.40 |
| -0.02 - -0.01 | Was Wet Now Dry |
| -0.01 - 0.01 | Was Dry Now Wet |
| 0.01 - 0.02 | |

Project: BE200223

DATE: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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TWL01

# 2 Karingal Drive

FIG C04 POST DEVELOPMENT
10%AEP
FLOOD WATER LEVEL AFFLUX




Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Level Afflux(mm)

| | |
|---|---|
| <= -0.10 | 0.02 - 0.03 |
| -0.1 - -0.05 | 0.03 - 0.05 |
| -0.05 - -0.03 | 0.05 - 0.1 |
| -0.03 - -0.02 | 0.10 - 0.40 |
| -0.02 - -0.01 | Was Wet Now Dry |
| -0.01 - 0.01 | Was Dry Now Wet |
| 0.01 - 0.02 | |

0 50 100 150 200 250 m

| | |
|---|---|
| Project: | BE200223 |
| DATE: | March 2026 |
| Scale: | 1:8000 at A3 |
| Projection: | |
| Data Sources: | |

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG C05 POST DEVELOPMENT
20%AEP
FLOOD WATER LEVEL AFFLUX

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Level Afflux(mm)

| | |
|---|---|
| <= -0.10 | 0.02 - 0.03 |
| -0.1 - -0.05 | 0.03 - 0.05 |
| -0.05 - -0.03 | 0.05 - 0.1 |
| -0.03 - -0.02 | 0.10 - 0.40 |
| -0.02 - -0.01 | Was Wet Now Dry |
| -0.01 - 0.01 | Was Dry Now Wet |
| 0.01 - 0.02 | |

Project: BE200223

DATE: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

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TWL01

0 50 100 150 200 250 m

# 2 Karingal Drive

FIG C06 POST DEVELOPMENT
39%AEP
FLOOD WATER LEVEL AFFLUX

N



Location of the site within the City of Gold Coast

## Legend

- Model Extent
- Cadastral
- Site
- Downstream Boundary
- Proposed Layout

### Water Level Afflux(mm)

| | |
|---|---|
| <= -0.10 | 0.02 - 0.03 |
| -0.1 - -0.05 | 0.03 - 0.05 |
| -0.05 - -0.03 | 0.05 - 0.1 |
| -0.03 - -0.02 | 0.10 - 0.40 |
| -0.02 - -0.01 | Was Wet Now Dry |
| -0.01 - 0.01 | Was Dry Now Wet |
| 0.01 - 0.02 | |

Project: BE200223

DATE: March 2026

Scale: 1:8000 at A3

Projection:

Data Sources:

BURCHILLS ENGINEERING SOLUTIONS

FOR

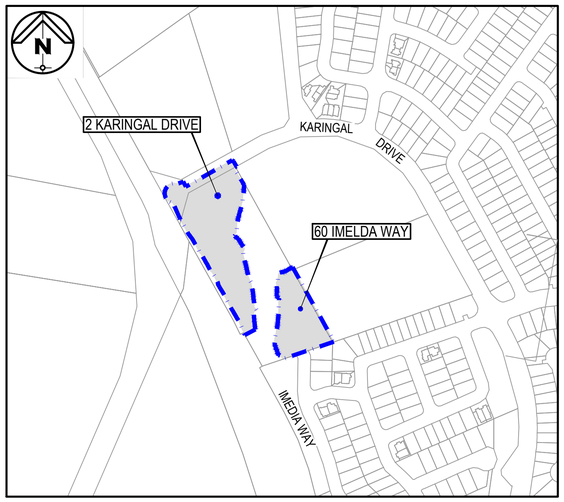
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# Appendix F - Burchills Engineering Solutions Preliminary Civil Engineering Drawings

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

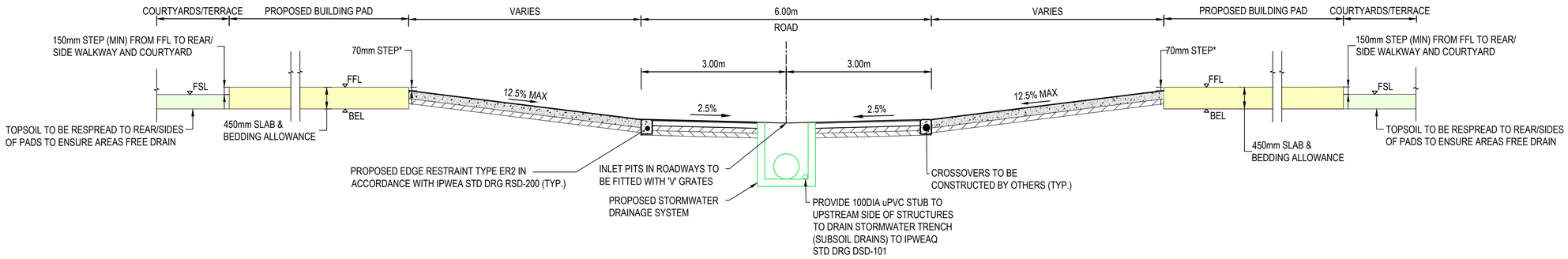
BOS

PREPARED BY

BURCHILLS ENGINEERING SOLUTIONS

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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NOTE
This is an uncontrolled document issued for information purposes only, unless the checked sections are signed or completed. Figured dimensions take precedence over scale. Do not scale reduced size drawings. Verify dimensions prior to commencing any on-site or off-site works or fabrication.

| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

BURCHILLS ENGINEERING SOLUTIONS
GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
PHONE: +61 7 5509 6400
FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

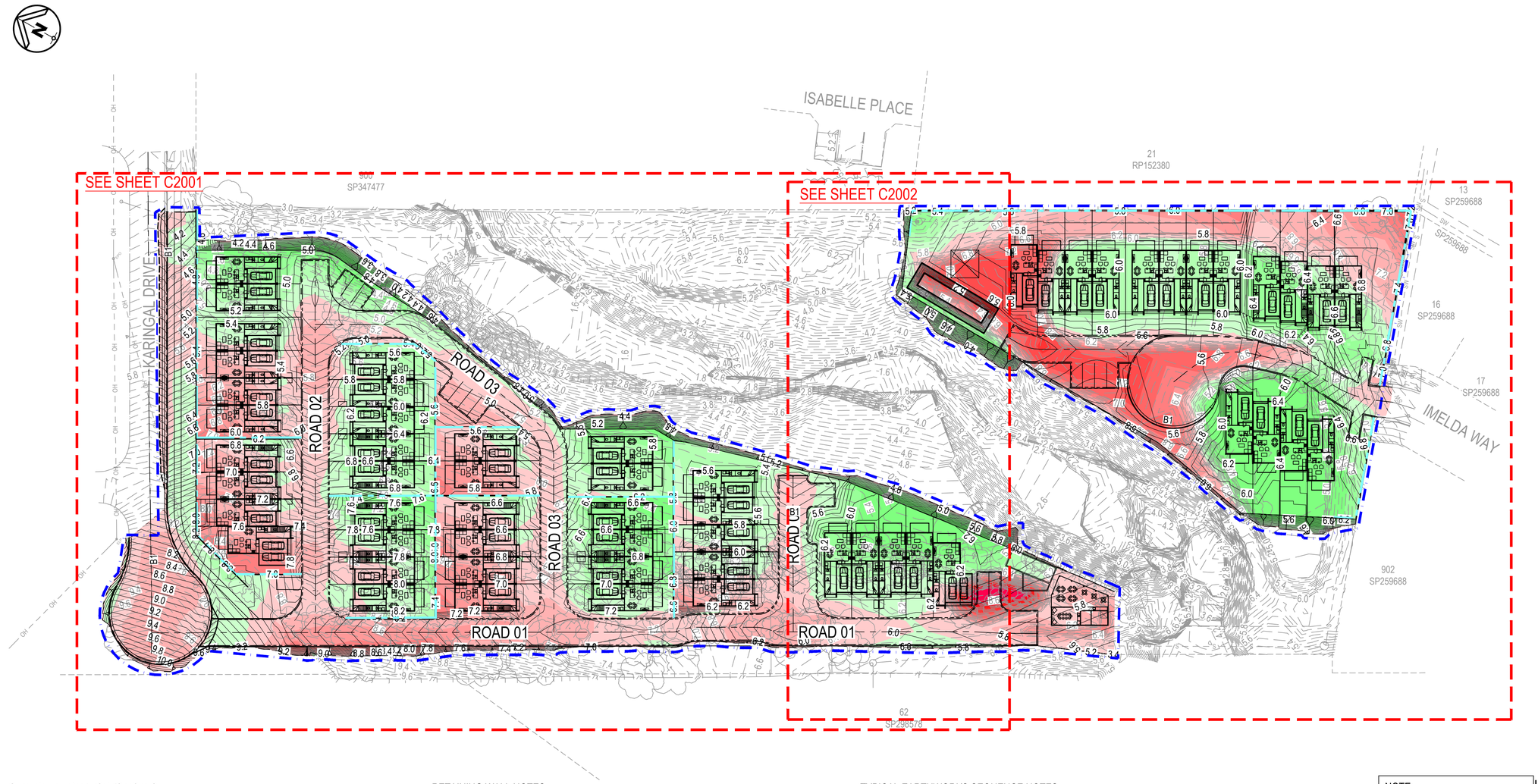
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

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|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

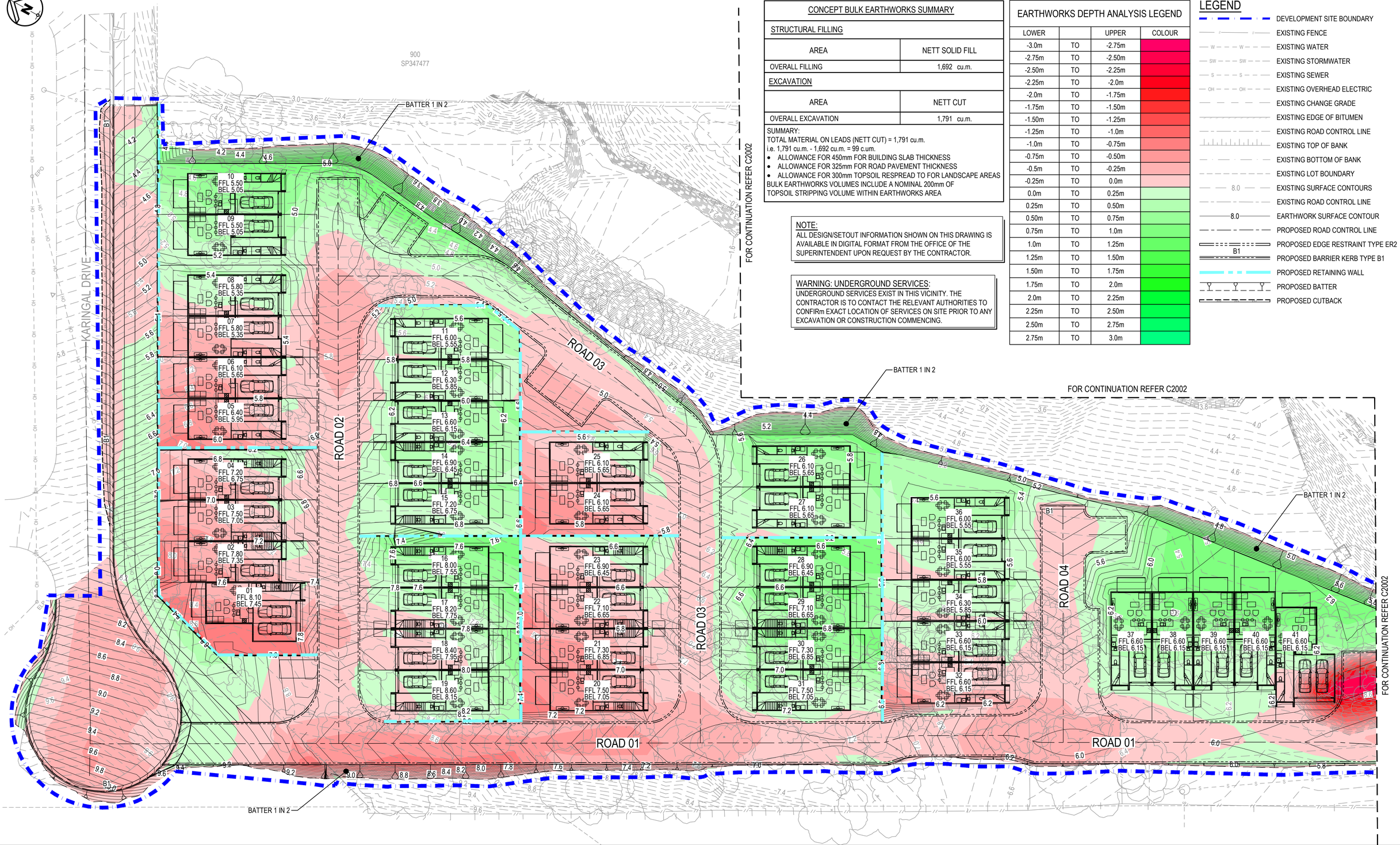
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
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| A | ORIGINAL ISSUE | 11-03-26 |


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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

**WARNING: UNDERGROUND SERVICES:**
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**NOTE:**
ULTIMATE FINISHED SURFACE PROFILES AND ASSOCIATED STORMWATER CAPTURE PITS TO LANDSCAPED AREAS SUCH AS PEDESTIAN LINKS AND COURTYARDS ARE BY LANDSCAPE ARCHITECT AND HYDRAULIC CONSULTANT AT TIME OF BUILDING WORKS.

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

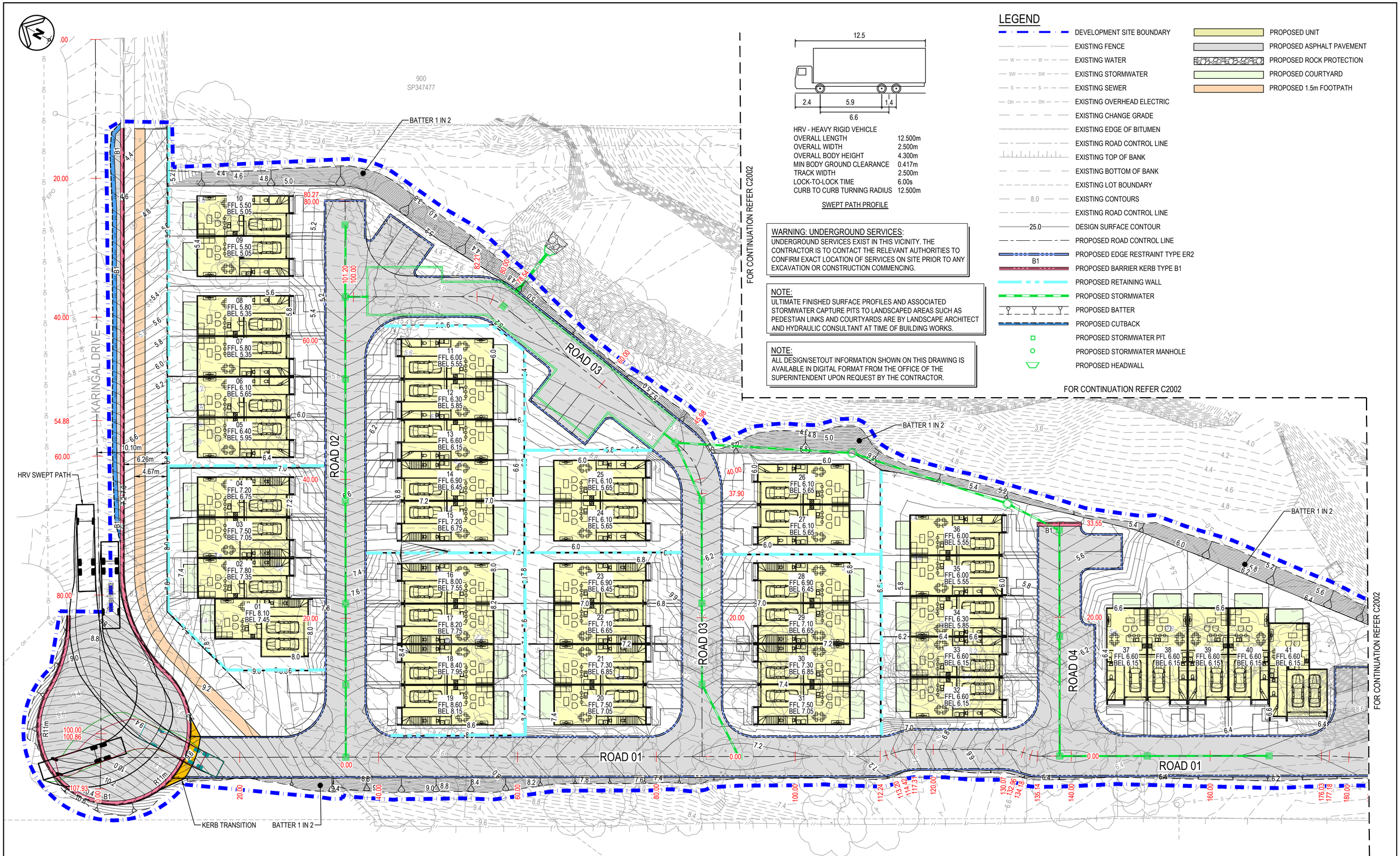
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3000 | A |




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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3001 | A |




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NOTE:
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT :
BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

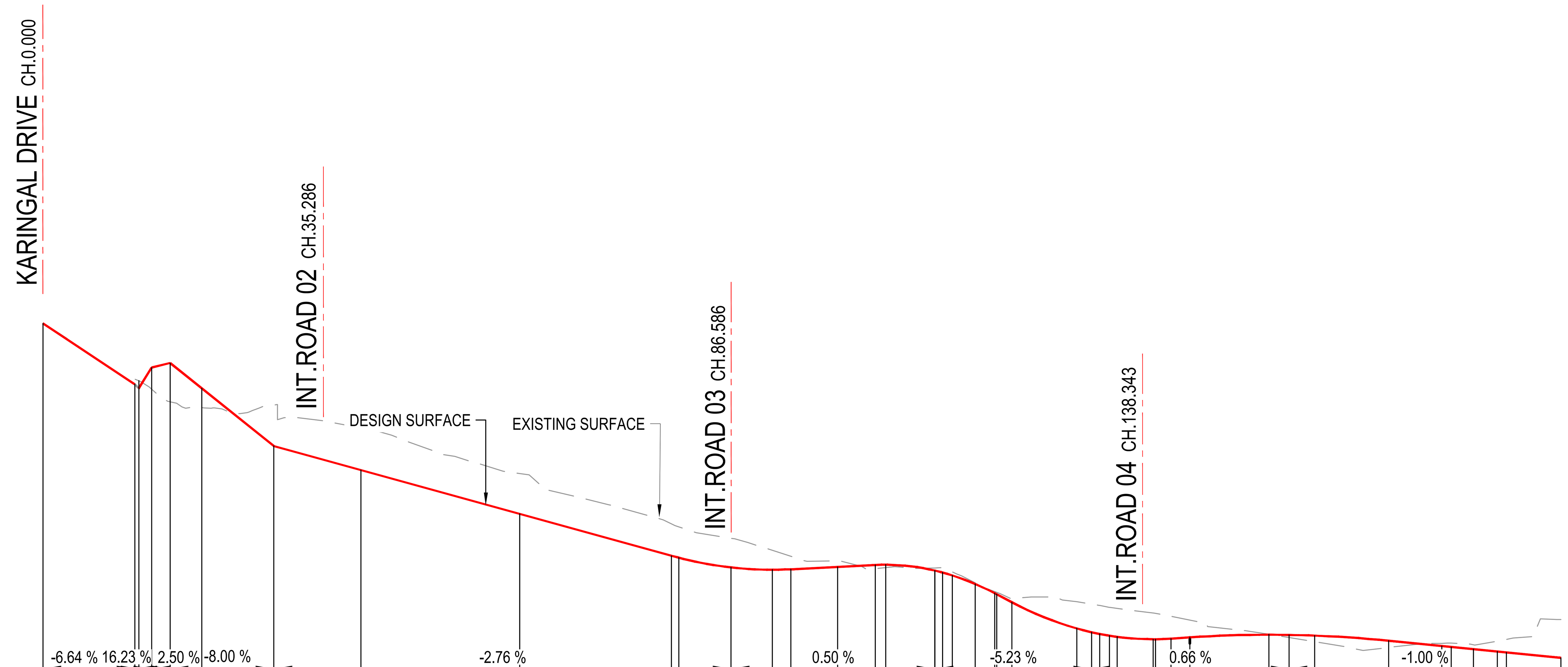
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |




VERTICAL GRADE (%): -6.64 % | 16.23 % | 2.50 % | -8.00 % | -2.76 % | 0.50 % | -5.23 % | 0.66 % | -1.00 %

VERTICAL CURVE LENGTH (m): 15mVC R=460.1 | 15mVC R=261.84 | 20mVC R=339.56 | 25mVC R=1504.77

DATUM R.L. 5.00

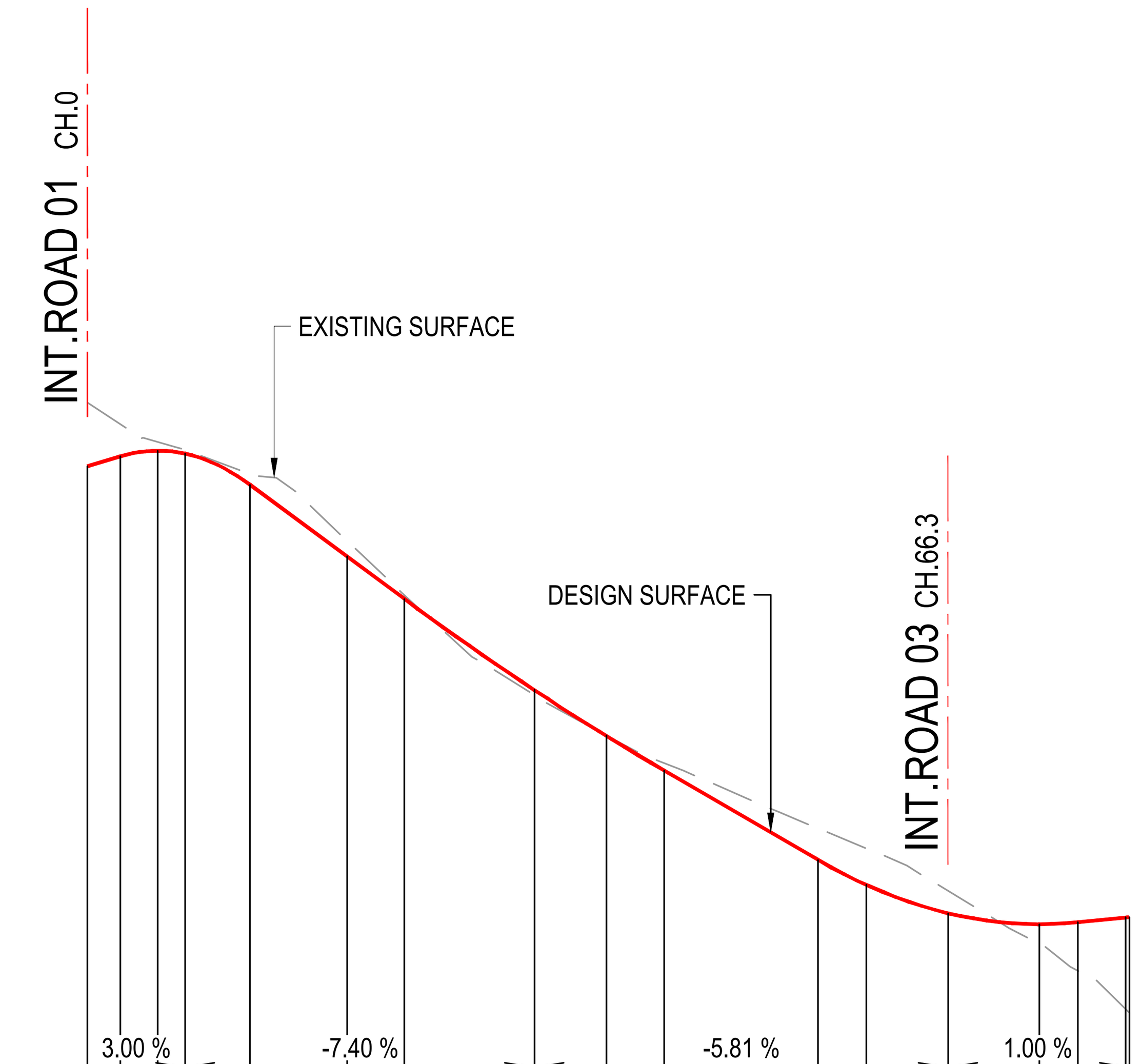
| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | 0.000 | 10.252 | 10.252 |
| 11.575 | 0.007 | 9.483 | 9.476 |
| 12.065 | -0.097 | 9.434 | 9.531 |
| 13.674 | 0.270 | 9.695 | 9.425 |
| 16.000 | 0.490 | 9.753 | 9.263 |
| 20.000 | 0.241 | 9.433 | 9.192 |
| 29.066 | -0.518 | 8.708 | 9.226 |
| 40.000 | -0.532 | 8.406 | 8.938 |
| 60.000 | -0.508 | 7.854 | 8.362 |
| 79.086 | -0.401 | 7.327 | 7.728 |
| 80.000 | -0.387 | 7.303 | 7.690 |
| 86.586 | -0.366 | 7.181 | 7.548 |
| 91.784 | -0.244 | 7.152 | 7.396 |
| 94.086 | -0.164 | 7.158 | 7.322 |
| 100.000 | -0.077 | 7.187 | 7.264 |
| 104.736 | 0.044 | 7.211 | 7.166 |
| 106.045 | 0.035 | 7.214 | 7.179 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 113.201 | -0.054 | 7.116 | 7.170 |
| 114.416 | -0.042 | 7.080 | 7.122 |
| 117.312 | -0.013 | 6.972 | 6.985 |
| 119.736 | -0.020 | 6.856 | 6.876 |
| 120.000 | -0.024 | 6.842 | 6.866 |
| 121.932 | -0.050 | 6.741 | 6.792 |
| 130.067 | -0.335 | 6.414 | 6.749 |
| 131.932 | -0.354 | 6.366 | 6.720 |
| 132.963 | -0.357 | 6.344 | 6.701 |
| 134.178 | -0.356 | 6.322 | 6.678 |
| 135.143 | -0.356 | 6.308 | 6.663 |
| 139.686 | -0.331 | 6.277 | 6.608 |
| 140.000 | -0.326 | 6.277 | 6.603 |
| 141.932 | -0.282 | 6.285 | 6.566 |
| 144.300 | -0.219 | 6.300 | 6.519 |
| 154.254 | -0.005 | 6.333 | 6.339 |
| 156.800 | 0.033 | 6.331 | 6.298 |
| 160.000 | 0.076 | 6.322 | 6.246 |
| 169.300 | 0.085 | 6.258 | 6.173 |
| 176.025 | -0.036 | 6.191 | 6.226 |
| 177.175 | -0.048 | 6.179 | 6.227 |
| 180.000 | -0.057 | 6.151 | 6.208 |
| 182.986 | -0.132 | 6.121 | 6.253 |
| 184.136 | -0.166 | 6.110 | 6.276 |
| 191.003 | -0.486 | 6.041 | 6.527 |

HORIZIONTALGEOMETRY

R-3.00m R9.00m / 0.97m 2.90m | R9.00m R-3.00m / 2.90m 0.97m | R20.00m R-20.00m / 1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES: 1 : 500 HORIZ. (5 0 5 10 15 20 25) ; 1 : 50 VERT. (0.5 0 0.5 1.0 1.5 2.0 2.5) (metres) (FULL SIZE)




VERTICAL GRADE (%): 3.00 % | -7.40 % | -5.81 % | 1.00 %

VERTICAL CURVE LENGTH (m): 10mVC R=96.15 | 20mVC R=1256.83 | 20mVC R=293.74

DATUM R.L. 3.00

| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | | 8.536 | |
| 2.535 | -0.248 | 8.612 | 8.859 |
| 5.419 | -0.068 | 8.655 | 8.723 |
| 7.535 | -0.026 | 8.632 | 8.658 |
| 12.535 | -0.083 | 8.392 | 8.475 |
| 20.000 | -0.123 | 7.839 | 7.962 |
| 24.434 | -0.030 | 7.511 | 7.541 |
| 34.434 | 0.040 | 6.811 | 6.771 |
| 40.000 | -0.004 | 6.456 | 6.460 |
| 44.434 | -0.056 | 6.190 | 6.246 |
| 56.300 | -0.243 | 5.501 | 5.745 |
| 60.000 | -0.281 | 5.309 | 5.591 |
| 66.300 | -0.173 | 5.090 | 5.264 |
| 73.363 | 0.150 | 5.006 | 4.855 |
| 76.300 | 0.373 | 5.020 | 4.648 |
| 80.000 | 0.708 | 5.057 | 4.349 |
| 80.266 | 0.737 | 5.060 | 4.322 |
| 80.274 | | | 4.322 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES: 1 : 500 HORIZ. (5 0 5 10 15 20 25) ; 1 : 50 VERT. (0.5 0 0.5 1.0 1.5 2.0 2.5) (metres) (FULL SIZE)

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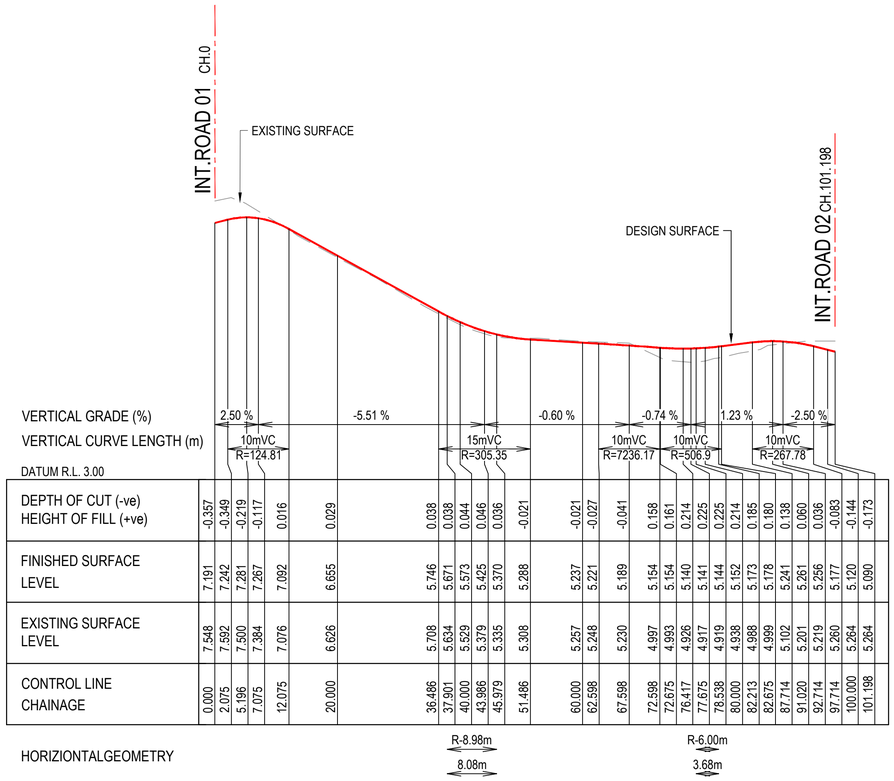
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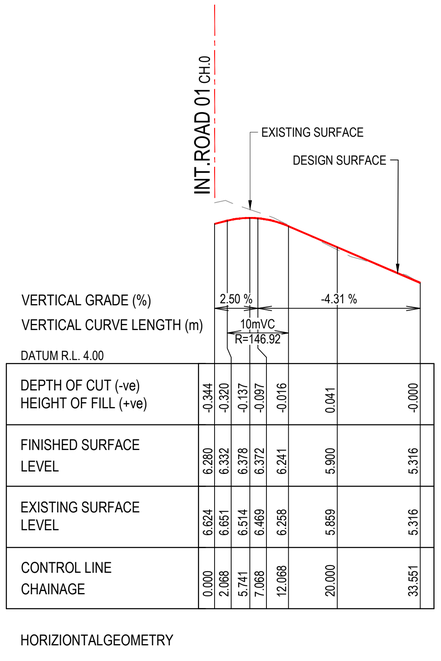
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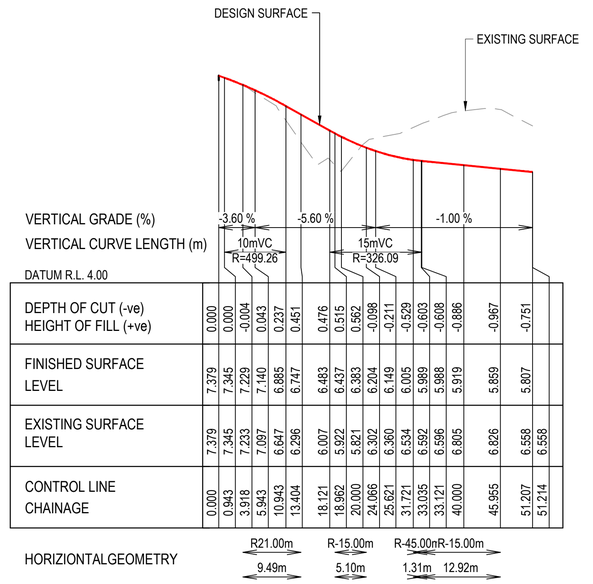

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(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
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(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

SCALES
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(metres) (FULL SIZE)

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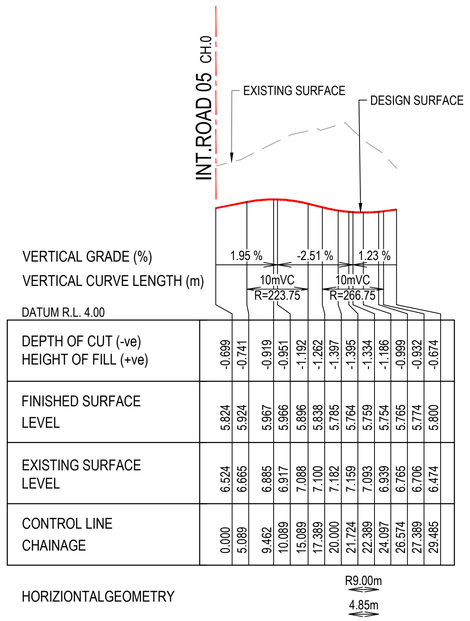
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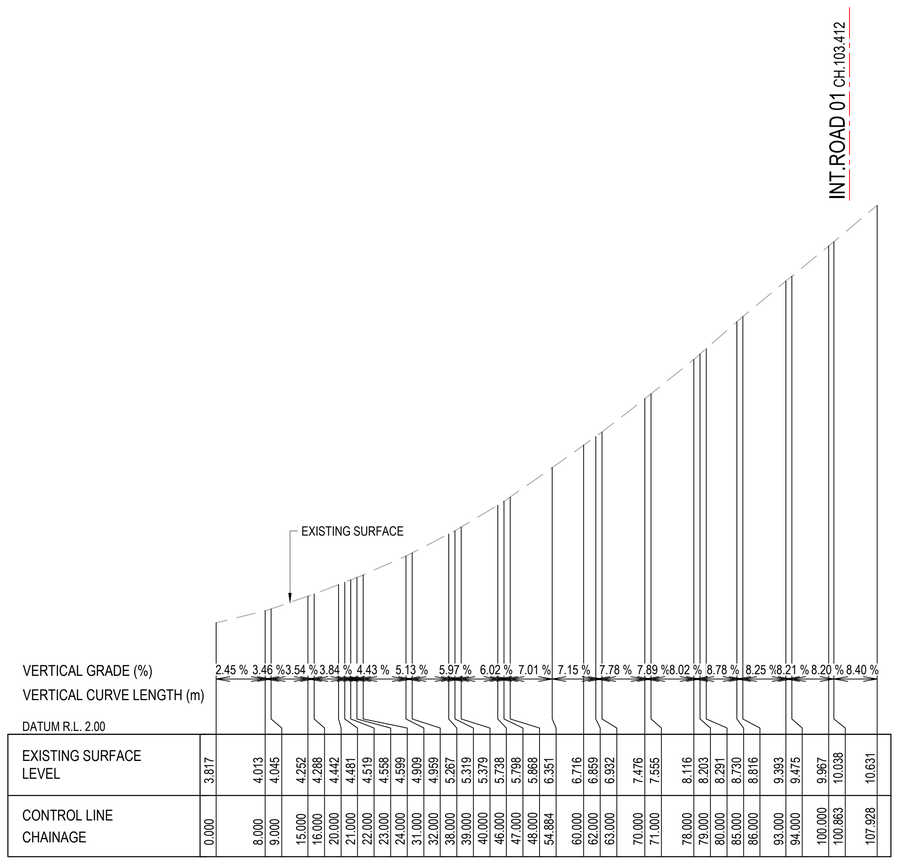
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0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)


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# 2 Karingal Drive, Pimpama
# Ecological Site Assessment

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-ESA-00 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
|---|---|
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| Date: | March 2026 |

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|---|---|
| Approved by: | Caroline Kelly |
| Position: | Principal Environmental Scientist |
| Date: | March 2026 |

| Version No. | Description | Date | Prepared | Approved |
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# Executive Summary

This report provides the results of an Ecological Site Assessment for a proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380).

Field surveys were undertaken during February and March 2026. Two (2) vegetation associations were classified and mapped across the site including:

- Vegetation Unit A – Urban Woodland and Anthropogenic Grassland; and
- Vegetation Unit B – Disturbed Riparian Woodland.

Due to historical and ongoing land management, existing vegetation does not represent the structure of remnant vegetation based on the Qld Herbarium benchmark criteria for the preclearing regional ecosystems.

A total of 142 species of flora were detected during the surveys including 72 non-native species, eight (8) of which are Restricted Invasive Plants under *Biosecurity Act 2014*. No conservation significant flora species were detected on-site.

Twenty-one fauna species were observed within the subject site during surveys, including two (2) amphibian species, one (1) reptile species, fourteen (14) bird species and four (4) mammal species. No conservation significant species of fauna were encountered on-site, nor was any direct or indirect evidence observed that would suggest the site is utilised by conservation significant fauna species.

The proposed development layout retains part of the site's vegetation within a reserve and common area protecting the waterbody, riparian habitat, waterway buffers and koala habitat.

The proposed development has avoided and minimised impacts on mapped Core Koala Habitat Areas as much as reasonably possible, and clearing of some koala habitat will be required to facilitate the development. The site is not within a Koala Priority Area and no evidence of koala activity was detected. The Koala Habitat Values Assessment (Burchills, 2026) found that the site is isolated and disconnected in the local landscape so values are limited to stepping stone / dispersal habitat. The habitat values for the koala and other fauna will be improved through restoration of the central riparian corridor that will be protected as open space.

In summary, the proposed development satisfactorily complies with the relevant performance outcomes of the Gold Coast City Plan Environmental Significance Overlay Code with potential impacts minimised as reasonably possible and residual impacts mitigated through the delivery of an offset compliant with the *Environmental Offsets Act 2014.*

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Appendix B – Desktop Review Search Results

Appendix C – Flora Species Identified On Site

Appendix D – Conservation Significant Fauna Species Likelihood of Occurrence Assessment

Appendix E – Gold Coast City Plan Version 13 Environmental Significance Overlay Code Response

Appendix F – Koala Spot Assessment Technique Results

# 1. Introduction

This Ecological Site Assessment (ESA) was prepared for a proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380), hereafter referred to as the subject site.

## 1.1 Objectives and Scope

The objectives of this assessment were to determine the site's ecological values, identify potential impacts on these values as a result of proposed development, and recommend strategies to avoid, minimise and mitigate these impacts. The scope of this ESA includes:

- Undertake a comprehensive desktop investigation for the subject site to determine potential ecological values;
- Undertake site investigations to verify these values and assess existing vegetation types and ecological values including matters of environmental significance (MES) at a local state and national level;
- Analyse and map field results to assess the potential impacts of the development on MES;
- Provide recommendations to avoid, minimise and mitigate impacts on MES; and
- Assess the final design against the Gold Coast City Plan Environmental Significance Overlay Code to ensure compliance.

## 1.2 Site Context

The subject site is at 2 Karingal Drive, Pimpama (Lot 19 on RP152380), located within Pimpama east of the Pacific Motorway and occupies an area of approximately 2.459 ha (Figure 1.1). The site is accessed from Karingal Drive on the northern boundary and is bounded to the west by the Gold Coast railway line.

The site is currently vacant with no improvements and is vegetated with grassland and woodland interspersed with a number of dams and waterbodies (Figure 1.2).

The site falls within the Urban Footprint under the *Southeast Queensland Regional Plan 2017* and is zoned as Medium Density Residential under the *Gold Coast City Plan Version 13* (Figure 1.3). The surrounding land use pattern is generally residential development with areas of open space. The future Coomera Town Centre is approximately 2km to the south-east.

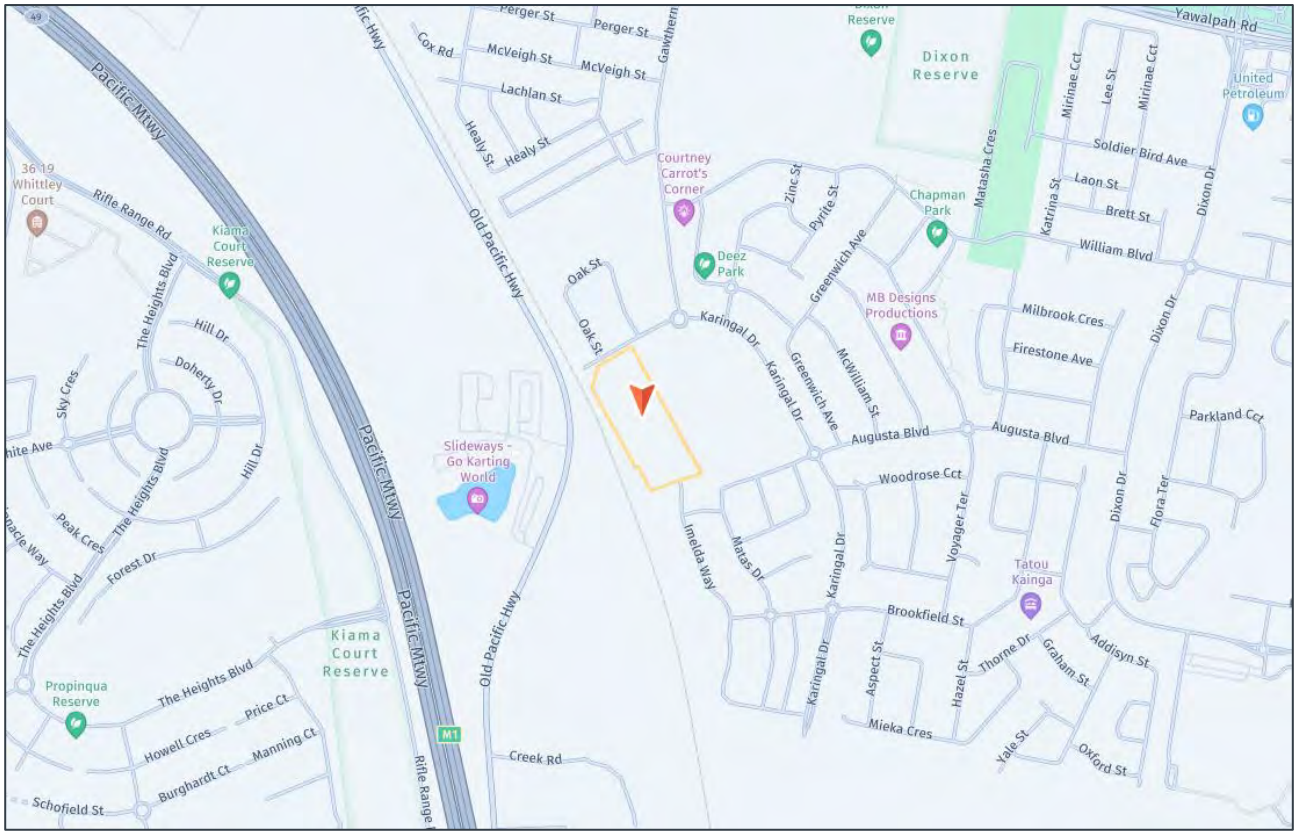



**Figure 1.1 Site location (Nearmap, 2026)**



**Figure 1.2 Recent aerial imagery of site and surrounding area (Nearmap, December 2025)**




**Figure 1.3 Site zoning (*Gold Coast City Plan Version 13*)**

## 1.3 Site Physical Description

### 1.3.1 Soils, Geology and Land Zone

The Geological Survey of Queensland: Beenleigh 1:100,000 Series Map indicates that the site's geology consists of Neranleigh-Fernvale Beds, comprising mudstone, shale, arenite, chert, jasper, basic metavolcanics, pillow lava and conglomerate. Gold Coast City Council soils mapping (Thomas, 2006) indicates local soils are predominantly Kurosols.

This geological and soils association aligns with Land Zone 11 under the Qld regional ecosystem (RE) framework for land classification.

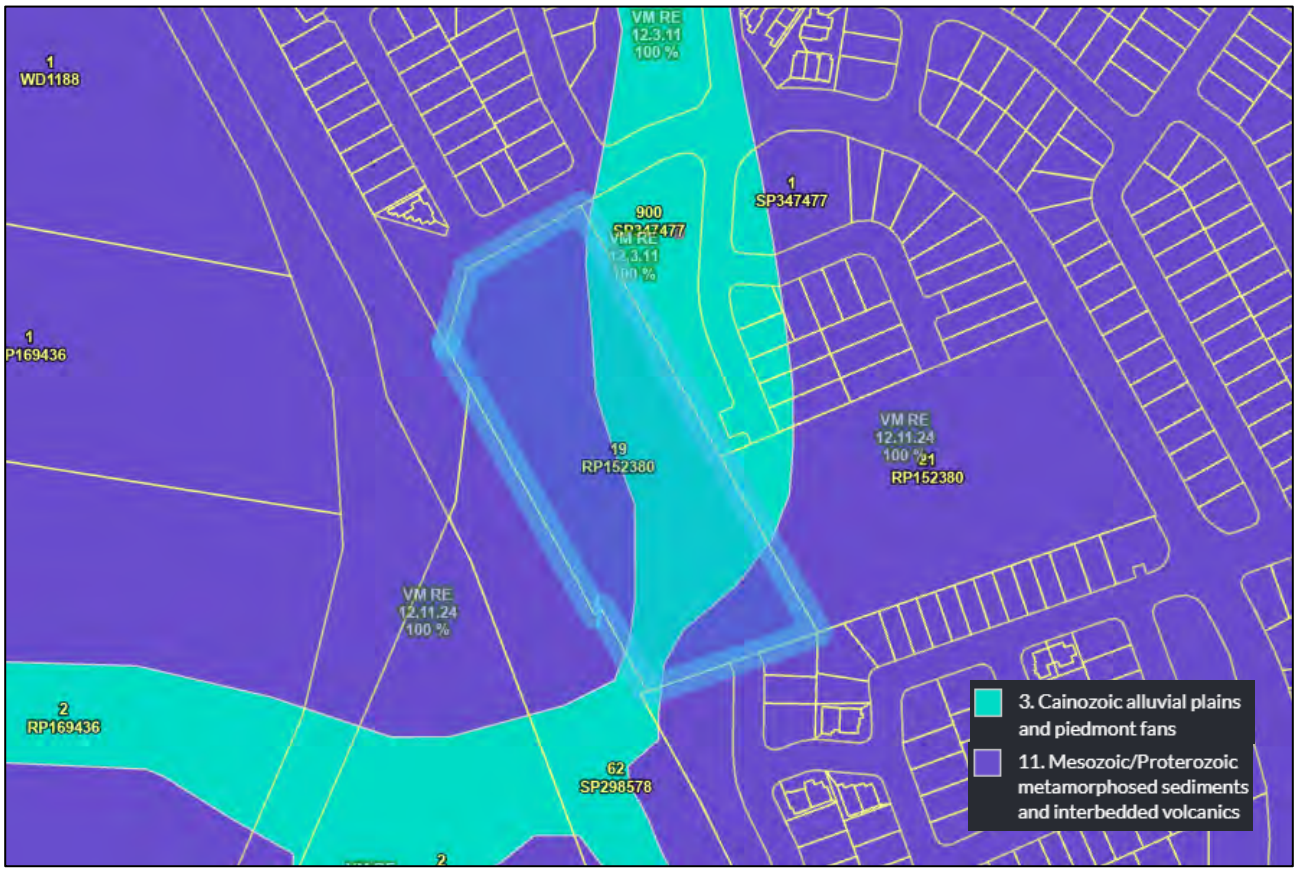



**Figure 1.4 Preclearing Land Zones (© *Qld Globe 2026*)**

### 1.3.2 Topography and Drainage

The site falls within the Pimpama River catchment. A tributary of the Pimpama River flows from the south-west northwards through the site to culverts under Karingal Drive in the north-eastern part of the site. The land rises moderately from the dam to the west. Site topography is characterised by gently inclined slopes with a westerly aspect. The site has extremely low relief, with elevation ranging from approximately 10 m AHD in the eastern extents of the site, to approximately 3 m AHD in the northwestern corner. A number of constructed dams are present in the southern part of the site.

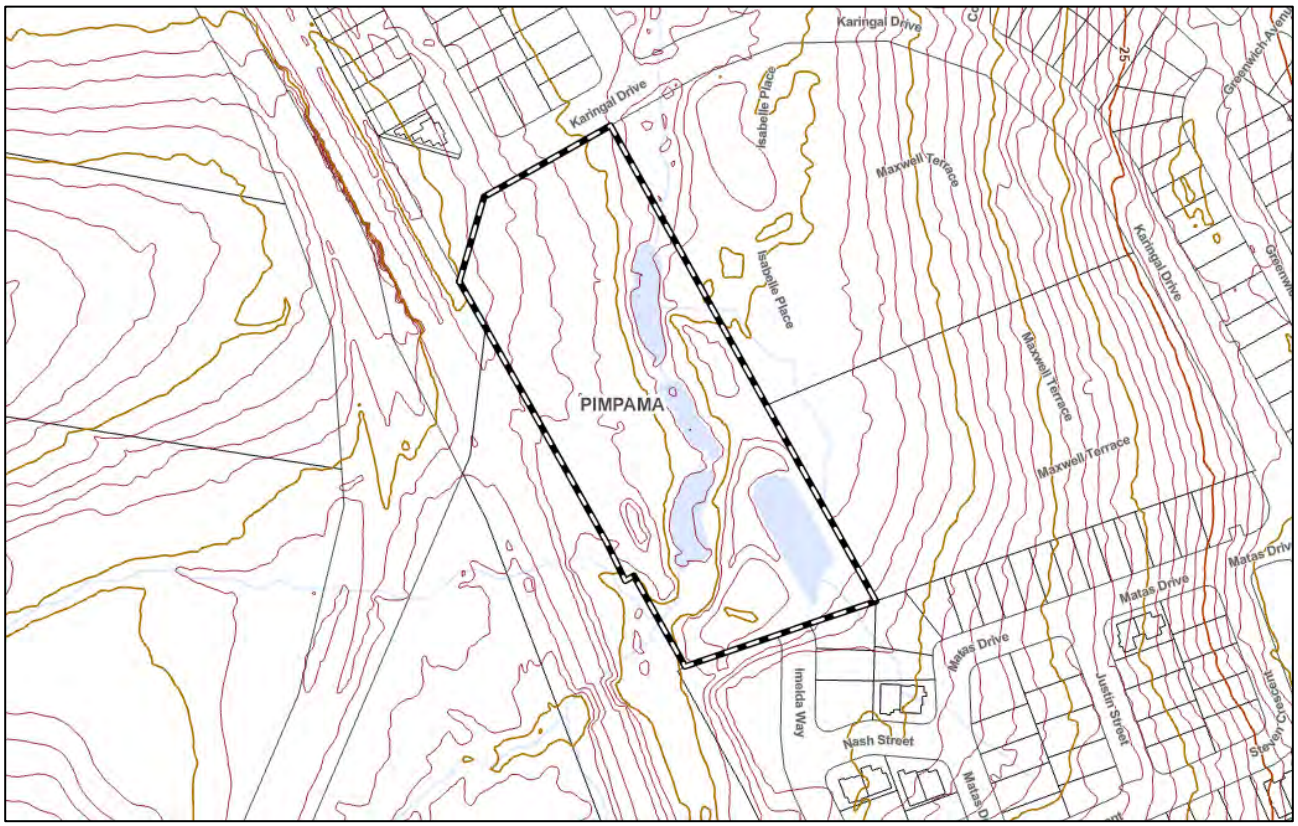



**Figure 1.5 Local contours and waterways (© *City of Gold Coast 2026*)**

## 1.4 Proposed Development

The proposed development is seeking Council approval for Material Change of Use (multiple dwellings), Reconfiguring a Lot (2 management lots and a park Lot) and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

For further details, please refer design drawings prepared by MPS Architects attached in Appendix A of this report. Figure 1.6 below provides an excerpt taken from the development's site plan (MPS Architects, 2026) and Figure 1.7 provides an extract of the proposed earthworks design (Burchills, 2026).

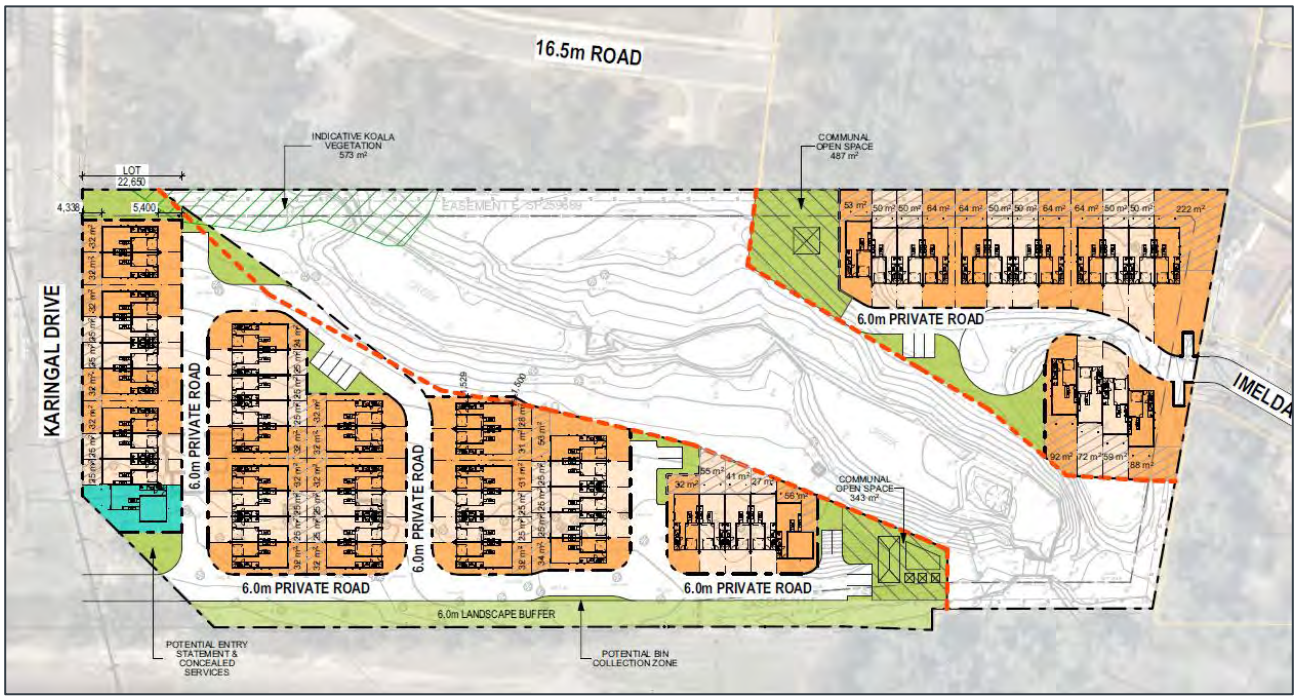



**Figure 1.6 Proposed plan of development (MPS Architects, 2026)**




**Figure 1.7 Proposed earthworks (Burchills, 2026)**

# 2. Desktop Review

## 2.1 Matters of National Environmental Significance

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is federal legislation that provides a national framework for the protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

If a proposed action is likely to have a significant impact on MNES it must be referred to the Australian Government Minister for the Environment for assessment against the EPBC Act. A significant impact is an impact which is important, notable, or of consequence, having regard to its context or intensity. All of these factors should be considered when determining whether an action is likely to have a significant impact on the environment.

The EPBC Act Protected Matters Search Tool (PMST) enables searches for MNES in a specified area. Results of a PMST query for the subject site identified:

- Four (4) listed threatened ecological communities may occur within the area:
  - Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland (**Endangered**);
  - Subtropical Eucalypt Floodplain Forest and Woodland of the New South Wales North Coast and South East Queensland bioregions (**Endangered**);
  - Lowland Rainforest of Sub-tropical Australia) (**Critically Endangered**); and
  - Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (**Endangered**).
- 64 threatened species may occur within the area, comprising 26 threatened flora species and 38 threatened fauna species; and
- 14 migratory species may occur within the area.

Results of this search are presented in Appendix B and Table 2.1 shows the threatened species identified in this search that may occur in the local area. Pelagic, shorebird and marine species were omitted from this assessment given suitable habitat does not occur on-site. An assessment of the likelihood of presence on and / or near the subject site for all species listed in Table 2.1 based on results of the surveys is presented in Table 3.11 and Appendix D.

**Table 2.1 EPBC Act Protected Matters Search Tool Results**

| Scientific Name | Common Name | Status* |
|---|---|---|
| **Flora** | | |
| *Acronychia littoralis* | Scented Acronychia | E |
| *Arthraxon hispidus* | Hairy-joint Grass | V |
| *Baloghia marmorata* | Marbled Balogia, Jointed Baloghia | V |
| *Bosistoa transversa* | Three-leaved Bosistoa, Yellow Satinheart | V |
| *Coleus (Plectranthus) habrophyllus* | Shaggy-leaved coleus | E |
| *Corchorus cunninghamii* | Native Jute | E |
| *Cryptocarya foetida* | Stinking Cryptocarya, Stinking Laurel | V |
| *Cryptostylis hunteriana* | Leafless Tongue-orchid | V |
| *Cupaniopsis shirleyana* | Wedge-leaf Tuckeroo | V |
| *Endiandra floydii* | Floyd's Walnut, Crystal Creek Walnut | E |
| *Leichhardtia longiloba* | Clear Milkvine | V |

| Scientific Name | Common Name | Status* |
|---|---|---|
| *Macadamia integrifolia* | Macadamia Nut | V |
| *Macadamia tetraphylla* | Rough-shelled Bush Nut, Macadamia Nut | V |
| *Notelaea lloydii* | Lloyd's Olive | V |
| *Owenia cepiodora* | Onionwood, Bog Onion, Onion Cedar | V |
| *Persicaria elatior* | Knotweed, Tall Knotweed | V |
| *Phaius australis* | Lesser Swamp-orchid | E |
| *Planchonella eerwah* | Shiny-leaved Condoo, Black Plum, Wild Apple | E |
| *Randia moorei* | Spiny Gardenia | E |
| *Rhodamnia rubescens* | Scrub Turpentine, Brown Malletwood | CE |
| *Rhodomyrtus psidioides* | Native Guava | CE |
| *Samadera bidwillii* | Quassia | V |
| *Sophora fraseri* | | V |
| *Syzygium hodgkinsoniae* | Smooth-bark Rose Apple, Red Lilly Pilly | V |
| *Thesium australe* | Austral Toadflax, Toadflax | V |
| *Vincetoxicum woollsii* | | E |
| **Birds** | | |
| *Cyclopsitta diophthalma coxeni* | Coxen's Fig-Parrot | CE |
| *Calidris ferruginea* | Curlew Sandpiper | CE |
| *Lathamus discolor* | Swift Parrot | CE |
| *Anthochaera phrygia* | Regent Honeyeater | CE |
| *Numenius madagascariensis* | Eastern Curlew, Far Eastern Curlew | CE |
| *Tringa nebularia* | Common Greenshank, Greenshank | E |
| *Erythrotriorchis radiatus* | Red Goshawk | E |
| *Limosa lapponica baueri* | Nunivak Bar-tailed Godwit | E |
| *Botaurus poiciloptilus* | Australasian Bittern | E |
| *Rostratula australis* | Australian Painted Snipe | E |
| *Geophaps scripta scripta* | Squatter Pigeon (southern) | V |
| *Climacteris picumnus victoriae* | Brown Treecreeper (south-eastern) | V |
| *Charadrius leschenaultii* | Greater Sand Plover, Large Sand Plover | V |
| *Calidris acuminata* | Sharp-tailed Sandpiper | V |
| *Sternula nereis nereis* | Australian Fairy Tern | V |
| *Calidris canutus* | Red Knot, Knot | V |
| *Hirundapus caudacutus* | White-throated Needletail | V |
| *Grantiella picta* | Painted Honeyeater | V |
| *Turnix melanogaster* | Black-breasted Button-quail | V |
| *Calyptorhynchus lathami lathami* | South-eastern Glossy Black-Cockatoo | V |
| *Falco hypoleucos* | Grey Falcon | V |
| *Gallinago hardwickii* | Latham's Snipe, Japanese Snipe | V |
| *Stagonopleura guttata* | Diamond Firetail | V |
| **Frogs** | | |
| *Litoria olongburensis* | Wallum sedge frog | V |
| *Mixophyes fleayi* | Fleay's frog | E |
| **Insects** | | |

| Scientific Name | Common Name | Status* |
|---|---|---|
| *Argynnis hyperbius inconstans* | Australian fritillary | CE |
| **Mammals** | | |
| *Chalinolobus dwyeri* | Large-eared pied bat | E |
| *Dasyurus maculatus maculatus* | Spot-tailed quoll | E |
| *Petauroides volans* | Greater glider | E |
| *Petaurus australis australis* | Yellow-bellied Glider (south-eastern) | V |
| *Petrogale penicillata* | Brush-tailed Rock-wallaby | V |
| *Phascolarctos cinereus* | Koala | E |
| *Potorous tridactylus tridactylus* | Long-nosed potoroo | V |
| *Pteropus poliocephalus* | Grey-headed flying-fox | V |
| *Xeromys myoides* | Water mouse | V |
| **Reptiles** | | |
| *Coeranoscincus reticulatus* | Three-toed snake-tooth skink | V |
| *Delma torquata* | Adorned delma | V |
| *Hemiaspis damelii* | Grey snake | E |

**As listed under the EPBC: CE = Critically Endangered, E = Endangered, V = Vulnerable, CD = Conservation Dependent, MTS = Migratory Terrestrial Species, MWS = Migratory Wetland, MM = Migratory Marine*

## 2.2 Matters of State Environmental Significance

Matters of state environmental significance (MSES) are a component of the biodiversity state interest that is defined under the State Planning Policy (SPP) and defined under the *Environmental Offsets Regulation 2014* (Offset Regulation). A summary of MSES that may occur within or close to the subject site based on State MSES mapping is listed in Table 2.2. Matters that are mapped as potentially occurring within or near the subject site are further detailed in the following sections.

**Table 2.2 MSES and potential presence on subject site**

| Matter | Mapped on/near site |
|---|---|
| 1. Protected areas under the *Nature Conservation Act 1992* and *Marine Parks Act 2004* | No |
| 2. Marine park (highly protected) *Marine Parks Act 2004* | No |
| 3. Declared Fish Habitat Areas A&B under the *Fisheries Act 1994* | No |
| 4. Strategic environmental area (designated precinct) *Regional Planning Interests Act 2014* | No |
| 5. High Ecological Significance wetlands *Environmental Protection Act 1994* | No |
| 6. Wetlands and watercourses in high ecological value waters identified in the *Environmental Protection (Water) Policy 2009*, Schedule 1 | No |
| ***7. Wildlife Habitat for Endangered, Vulnerable and Special least concern wildlife under the Nature Conservation Act 1992 - includes SEQ koala habitat (core and locally refined)*** | ***Yes - SEQ koala habitat*** |
| 8. Regulated Vegetation under the *Vegetation Management Act 1999* that is:<br>***a. Category B areas on the regulated vegetation management map, that are 'endangered' and 'of concern' regional ecosystems***<br>b. Category C areas on the regulated vegetation management map that are 'endangered' and 'of concern' regional ecosystems<br>c. Category R areas on the regulated vegetation management map | ***Yes - Of concern Category B and VM Watercourse*** |

| Matter | Mapped on/near site |
|---|---|
| *d. Areas of Essential Habitat on the essential habitat map for an animal that is 'endangered wildlife' or 'vulnerable wildlife' or a plant that is 'endangered wildlife' or 'vulnerable wildlife' wildlife prescribed as*<br>**e. Defined watercourse: Category A,B,C,R areas that are located within a defined distance from the defining banks of a relevant watercourse identified on the vegetation management watercourse and drainage feature map**<br>**f.** Wetland: Category A,B,C,R areas that are located within 100 metres from the defining bank of a wetland identified on the vegetation management wetlands map. | |
| 9. Legally secured offsets as defined under the *Environmental Offsets Act 2014* | No |
| 10. Marine plants under the *Fisheries Act 1994* (excluding marine plants in an urban area) | No |
| **11. Waterways that provide for fish passage under the *Fisheries Act 1994* (excluding waterways providing for fish passage in an urban area)** | **Yes but urban area** |
| **12. High risk area on the flora survey trigger map as described by the *Environmental Offsets Regulation 2014*, schedule 2, part6(1)** | **Yes** |

### *2.2.1* Threatened and Special Least Concern wildlife – *Nature Conservation Act 1992*

Threatened and Special Least Concern wildlife, as listed under the *Nature Conservation Act 1992* (NCA) include species listed as Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT; collectively 'EVNT' species) and fauna species listed as Special Least concern ('SL') under the NCA.

The site is not mapped as containing potential MSES Wildlife Habitat for Threatened / Special Least concern species. The site does however contain areas mapped as Core Koala Habitat Areas – habitat mapped as important for the Endangered koala (*Phascolarctos cinereus*; refer Section 2.2.2 below).

Desktop searches were undertaken to determine what EVNT/SL species may occur within or utilise the site based on historical records. The Department of Environment, Tourism, Science and Innovation (DETSI) Wildnet database was queried using a search radius of 2km from the centre of the site (-27.8305, 153.3061). The search results provide an indication of EVNT/SL species that typically occur in the local area. The database query identified six (6) species of EVNT/SL fauna and two (2) EVNT flora species that have been recorded within a 2km radius of the site as listed below in Table 2.3 (complete results provided in Appendix B).

**Table 2.3 Threatened wildlife and SL flora and fauna potentially occurring within or near the subject site**

| Class | Family | Scientific Name | Common Name | Status NCA | Status EPBCA |
|---|---|---|---|---|---|
| Birds | Cacatuidae | *Calyptorhynchus lathami* | glossy black-cockatoo | V | V |
| Birds | Strigidae | *Ninox strenua* | powerful owl | V | |
| Frogs | Myobatrachidae | *Crinia tinnula* | wallum froglet | V | |
| Mammals | Phascolarctidae | *Phascolarctos cinereus* | koala | E | E |
| Mammals | Pteropodidae | *Pteropus poliocephalus* | grey-headed flying-fox | C | V |
| Mammals | Tachyglossidae | *Tachyglossus aculeatus* | short-beaked echidna | SL | |
| Plants | Proteaceae | *Macadamia integrifolia* | macadamia nut | V | V |
| Plants | Myrtaceae | *Syzygium moorei* | Durobby | V | V |

*Status = As listed under the EPBCA/NCA: E = Endangered, V = Vulnerable, SL = Special Least Concern.

### 2.2.2 Koala Habitat

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable under the NCA. The Koala Protection Framework (KPF), administered by DES, is comprised of the *Nature Conservation Act 1992*, the *Nature Conservation (Animals) Regulation 2020*, the *Nature Conservation (Koala) Conservation Plan 2017*, the *Planning Act 2016* and the *Planning Regulation 2017*.

Under this framework, Koala Protection Areas (KPA) and Koala Habitat Areas (KHA) have been mapped in south east Qld. KPAs are large, connected areas that contain both koala habitat and restoration areas that will focus efforts for habitat protection, habitat restoration and threat mitigation actions to areas that have the highest likelihood of achieving conservation outcomes for koalas. Clearing KHA in a KPA is prohibited, while outside of a KPA, clearing KHA is assessable development (assessed against State Code 25) unless the clearing meets certain exemptions.

The site is not within a Koala Priority Area. The Koala Habitat Area mapping indicates the site contains 0.41 ha of Core Koala Habitat Area (Figure 2.1). The proposed development will impact Koala Habitat, and as such is assessable against State Code 25.




**Figure 2.1 Koala Habitat Areas within the site (Qld Globe, January 2026)**

### *2.2.3* Regulated Vegetation – *Vegetation Management Act 1999*

The *Vegetation Management Act 1999* (VMA), the *Vegetation Management Regulation 2012*, the *Planning Act 2016* and the *Planning Regulation 2017*, in conjunction with associated policies and codes, form the Vegetation Management Framework. This framework regulates the clearing of vegetation across Queensland mapped as

remnant or regrowth. The purpose of the VMA is mainly achieved through the classification of vegetation units and defining permissible clearing for each unit in accordance with its level of significance.

The Regulated Vegetation Map (RVM) for the subject site indicates that regulated vegetation on the site includes 0.06ha of Category B Of Concern Remnant Vegetation RE 12.3.11, and a very small area of RE 12.11.24 Least Concern. The remaining areas of the site are mapped as Category X – non-assessable (Figure 2.2, Table 2.4).

Category B – Of Concern regulated vegetation is identified as a Matter of State Environmental Significance (MSES) under the Queensland environmental planning framework. However, clearing of Category B – Of Concern regulated vegetation within an urban area for an urban purpose on a site less than 5 hectares is exempt development under the *Planning Regulation 2017*.




**Figure 2.2 Vegetation Management mapping for site (Qld Globe, January 2026)**

**Table 2.4 Regional ecosystems present on subject site**

| Regional Ecosystem | VMA Status | Category | Area (ha) | Short Description | Structure Category |
|---|---|---|---|---|---|
| **12.11.24** | Least Concern | B | < 0.01 | *Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics* | Spare |
| **12.3.11** | Of Concern | B | 0.06 | *Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast* | Mid-dense |

### *2.2.4* Protected Plants Flora Survey Trigger Map – Nature Conservation Act 1992

The NCA and subordinate regulations protect flora and fauna native to Queensland. The *Nature Conservation (Plants) Regulation 2020* regulates the clearing, growing, harvesting and trade of protected plants in

Queensland. A Protected Plant is a native plant listed as special least concern, near threatened, vulnerable, endangered or critically endangered under the NCA.

The Protected Plants Flora Survey Trigger Map (PPFST Map) shows high risk areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location. Areas shown on the map as high risk (green) are subject to particular requirements under the NCA. Under the *Nature Conservation (Plants) Regulation 2020*, a flora survey must be undertaken in a high-risk area and a clearing permit may be required for clearing critically endangered, endangered, vulnerable and near threatened plants (EVNT plants) and their supporting habitat.

If a flora survey identifies that EVNT plants are not present or can be avoided by 100m, the clearing activity may be exempt. An Exempt Clearing Notification form is required to be submitted to DES prior to the commencement of clearing. Clearing under this exemption must be conducted within two years of submitting the flora survey report.

The PPFST Map indicates that vegetation within the south east of the study area is mapped as a high-risk area for protected plants. This triggers the requirement for a protected plants flora survey prior to clearing.




**Figure 2.3 Protected Plants Flora Survey Trigger mapping for site (Qld Globe, January 2026)**

### 2.2.5 Other State Matters - Waterways

Waterway barrier works are regulated under the *Fisheries Act 1994* and the *Planning Act 2016* when barriers to fish movement, including partial barriers, are installed across waterways. Barrier works include construction,

raising, replacement and some maintenance works on structures such as culvert crossings, bed level and low-level crossings, weirs and dams, both permanent and temporary.

The Queensland Waterways for Waterway Barrier Works mapping classifies waterways based on their risk of impact on fish passage as low, moderate, high and major. The site's watercourse is identified as a low to moderate risk (Figure 2.4). A permit is required for works within a mapped waterway, unless the works can meet the accepted development requirements.

The site's watercourse is also mapped as a drainage feature under the Qld *Water Act 2000* Watercourse Identification Map (WIM) which classifies waterways, drainage features, lakes and springs to regulate water use authorisations (Figure 2.5).




**Figure 2.4 Fisheries Act WWBW Mapping (Qld Globe, January 2026)**




**Figure 2.5 Water Act Watercourse Identification Map (Qld Globe, January 2026)**

## 2.3 Matters of Local Environmental Significance

The *Gold Coast City Plan (v13)* identifies Matters of Local Environmental Significance (MLES) under the Environmental Significance Overlay. Assessable development is required to comply with the City Plan Environmental Significance Overlay Code (ESOC). The purpose of the ESOC is to ensure that development is consistent with, and contributes to, the achievement of the objectives of the *Gold Coast Nature Conservation Strategy*. The following sections review and detail MLES mapped for the subject site.

### 2.3.1 Biodiversity Areas

Biodiversity areas are identified in the City Plan as: *Core Habitat* Systems (Coastal Wetlands and Islands Core Habitat System; Hinterland Core Habitat System), Substantial Remnants and Hinterland to Coast Critical Corridor.

The *City Plan Version 13* Environmental Significance Overlay Map indicates that the site is not within a biodiversity area.

### 2.3.2 Priority Species

The City Plan Environmental Significance Priority Species overlay map indicates the site may comprise habitat for the Endangered koala (Matters of State Environmental Significance - MSES). No habitat is mapped for Local Significant Species within the site (Matters of Local Environmental Significance - MLES).




**Figure 2.6 Priority Species Overlay map (*Gold Coast City Plan Version 13*)**

### 2.3.3 Vegetation Management

The Vegetation Management overlay mapping provides a reference for the presence of vegetation considered to be MLES, identified through areas of High Priority, Medium Priority and General Priority Vegetation. Mapped MLES vegetation comprises:

- General Priority Vegetation – identifies areas of vegetation types where >30% pre-clear extent is protected and contains both disturbed and regrowth vegetation;
- Medium Priority Vegetation – identifies areas of vegetation types where >30% of pre-clear extent is remaining but less than 30% is protected; and
- High Priority Vegetation – identifies areas where 10% of pre-clear extent is remaining and cannot achieve 30% protection or where 10-30% of pre-clear extent is remaining and cannot achieve 30% protection.

The Vegetation Management overlay mapping also indicates areas of vegetation mapped as Regulated vegetation (MSES).

The *City Plan Version 13* Environmental Significance Overlay map for Vegetation Management indicates that parts of the site are mapped as Regulated (MSES), Medium (MLES) and General Priority (MLES) Vegetation (Figure 2.7).




**Figure 2.7 Vegetation Management Overlay map (*Gold Coast City Plan Version 13*)**

### 2.3.4 Wetlands and Watercourses

Natural watercourse lines and corridors, locally significant wetlands and canals / lakes are considered to be MLES under the City Plan. The Locally Significant Wetlands overlay map identifies local wetlands mapped according to the Queensland Wetlands Mapping and Classification Methodology and areas within watercourse channels have been classified as riverine wetlands. High Ecological Value (HEV) wetlands & waterways and High Ecological Significance (HES) wetlands under the Environmental Protection Act 1994 are identified as Matters of State Environmental Significance under the State Planning Policy. These wetlands are identified as State Significant Wetlands - Matters of State Environmental Significance (MSES) under the City Plan.

The wetlands and waterways overlay map identifies Major Watercourses as watercourses that are fourth order and above, including bed and banks, and Minor Watercourses as watercourses that are third order and below. The overlay map also indicates the 60m and 30m buffers to Major and Minor watercourses.

The environmental significance overlay maps for Wetlands and Watercourses identifies minor watercourses with 30m buffers within the site (Figure 2.8).




**Figure 2.8 Wetlands and Watercourse Overlay map (*Gold Coast City Plan Version 13*)**

# 3. Field Surveys

## 3.1 Flora Survey Methods

To ground-truth the information obtained through the desktop assessment, Burchills ecologists undertook field surveys within the subject site during February and March 2026. Where relevant, observations regarding floristic values outside the survey area were also recorded.

The survey methodology was consistent with the Queensland Herbarium's *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland* v.7 (Neldner et al., 2023) and consisted of an initial visual audit followed by a quantitative assessment of vegetation associations and communities.

The initial visual audit consisted of a random meander over the site to ground-truth desktop investigations. Survey site locations were determined based on information obtained from the initial visual audit. Quantitative assessments were undertaken at quaternary survey sites by collecting data associated with structural formations (i.e. growth form, stratum intervals, crown cover and height) and floristic associations (i.e. species diversity) for each broad vegetation type.

Unless otherwise noted, all quantitative observations were recorded as follows:

- Single point locations (except tree locations) – positions were estimated based on inferences from survey data, landform elements and / or aerial photography;
- Growth form – determined in accordance with pp 88-93 Hnatiuk et al. (2009);
- Stratum intervals – determined by recording the median height of each stratum using a hand-held clinometer. Strata were defined in accordance with Table 3.1 which is summarised from Hnatiuk *et al.* (2009);
- Stratum cover – determined using a field estimation of crown cover in accordance with Table 3.2 which is reproduced from Hnatiuk et al. (2009);
- Diameter at breast height (DBH) – measurements were taken using a Yamayo Enclosed Million 12 *Fibreglass Diameter Tape* and a methodology consistent with Appendix A of Australian Standard *AS4970-2009: Protection of trees on development sites*.

**Table 3.1 Criteria for Defining Vegetation Strata***

| Stratum | Description |
|---|---|
| Emergent | Tallest plants in vegetation associations / communities that are so sparsely distributed that they do not form the dominant or most significant layer (e.g. large trees that rise above a distinct canopy layer). |
| Dominant or Upper Stratum | In most cases the tallest stratum will be the dominant stratum (i.e. except when emergents are present). |
| Mid-stratum | If present, this stratum is between the dominant (upper) stratum and the ground stratum. There are no pre-conceived height limits for this stratum. Where multiple strata are present between the dominant (upper) stratum and the ground stratum, the mid-stratum can be subdivided in order of decreasing height (i.e. the highest mid-stratum is termed Mid-stratum 1, the next highest mid-stratum is termed Mid-stratum 2 etc). |
| Ground stratum | Typically consists of herbaceous ferns, forbs and graminoids; although can also include juvenile species from other strata. The ground stratum can also be the dominant stratum (e.g. where grass cover is closed and trees are very sparse). There are no pre-conceived height limits for this stratum; however, it is usually less than 2.0 m tall. |

*Table summarised from Hnatiuk et al. (2009).

Table 3.2 Crown Cover Classes

| Criteria Assessed in Field | Description | Crown Separation Ratio | Crown Cover (%) | Foliage Cover (%) |
|---|---|---|---|---|
| Crowns touching to overlapping | Closed or Dense | <0* | >80 | >70 |
| Crowns touching or slightly separated | Mid Dense | 0-0.25 | 50-80 | 30-70 |
| Crowns clearly separated | Sparse or Open | 0.25-1 | 20-50 | 10-30 |
| Crowns well separated | Very Sparse | 1-20 | 0.25-20 | 0.2-10 |
| Isolated plants (trees approximately 100m apart; shrubs approximately 20m apart) | Isolated Plants | >20 | <0.25 | <0.20 |
| Isolated clumps of two (2) to many plants approximately 200m apart | Isolated Clumps | >20 | <0.25 | <0.20 |
| Emergent | Emergents | >3 | <5 % total crown cover | <3% of total foliage cover |

*Where crown overlap occurs, the crown ratio has a negative value: the larger the negative value, the greater the overlap. Table reproduced from Table 17 in Hnatiuk et al. (2009).

### 3.1.1 Taxonomy and Nomenclature

Application of flora scientific names in this report follows the *Queensland Flora Census* (DETSI, 2024). Use of an asterisk (*) indicates the species is not native to Queensland or the local area.

## 3.2 Flora Survey Results

A total of 142 species of flora were detected during the surveys including 72 non-native and weed species, eight (8) of which are Restricted Invasive Plants under *Biosecurity Act 2014*.

The following vegetation associations were mapped over the entirety of the site as shown in Figure 3.1:

- Vegetation Association A – Urban Woodland and Anthropogenic Grassland; and
- Vegetation Association B – Disturbed Riparian Woodland.

Due to historical land management, existing vegetation does not represent the structure or cover of remnant vegetation based on the Qld Herbarium benchmark criteria for mapped remnant patch and preclearing regional ecosystems. No flora species of conservation significance (EVNT) at a national, state or local level was detected on-site.

The following sections describe the vegetation structure and floristics of each of the vegetation map associations including structure, floristics, condition, variation and significance.




# 2 Karingal Dve Pimpama

## Figure 3.1 Vegetation Associations and Habitat Features

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coast LGA

**Legend**

- Subject Lot
- Surveyed Contours (MGS 2026)
- Surveyed Top of Bank (MGS 2026)
- Habitat trees (NRZ*)
  * Notional Root Zone measured and calculated per AS4590:2025

Vegetation Associations

- A – Urban Woodland and Anthropogenic Grassland
- B – Disturbed Riparian Woodland
- Watercourse centreline
- Constructed dams

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### 3.2.1 Vegetation Association A – Urban Woodland and Anthropogenic Grassland

This association comprises areas of planted vegetation from previous nursery operations, retained canopy trees and areas of unmaintained exotic grassland. The results of the structural and floristic assessments are summarised in Table 3.3 and Table 3.4 respectively.

**Table 3.3 Vegetation Association A Quantitative Assessments**

| Stratum† | Growth Form | Avg Crown Cover (%) | Height range (m) | Median Height (m) |
|---|---|---|---|---|
| Canopy | Tree | 5 | 15-25 | 20 |
| Mid 1 | Tree | 50 | 5-15 | 15 |
| Mid 2 | Small Tree/Shrub | 20 | 1-5 | 4 |
| Ground | Grass | 60 | 0-1 | 0.5 |

†Strata that were not present have been omitted.

**Table 3.4 Vegetation Association A Floristic Formation**

| Stratum† | Species |
|---|---|
| Canopy | *Eucalyptus tereticornis* (forest red gum), *Corymbia intermedia* (pink bloodwood), *Eucalyptus siderophloia* (grey ironbark), *Archontophoenix alexandrae** (Alexander palm). |
| Mid 1 | *Lophostemon suaveolens* (swamp box), *Eucalyptus tereticornis* (forest red gum), *Melaleuca quinquenervia* (broad-leaved paperbark), *Archontophoenix alexandrae** (Alexander palm), *Corymbia intermedia* (pink bloodwood), *Syzygium luehmannii* (riberry), *Acacia disparrima* (hickory wattle), *Elaeocarpus grandis* (blue quandong), *Acacia concurrens* (late-flowering hickory), *Heptapleurum actinophyllum** (umbrella tree), *Syagrus romanzoffiana** (cocos palm), *Melaleuca viminalis* (weeping bottlebrush), *Flindersia australis* (crow's ash), *Eucalyptus siderophloia* (grey ironbark), *Glochidion ferdinandi* var. *ferdinandi* (cheese tree), *Syzygium francisii* (giant water gum), *Diospyros fasciculosa* (grey ebony), *Nauclea orientalis** (cheesewood), *Backhousia citriodora* (lemon scented myrtle), *Bismarckia nobilis** (Bismarck palm), *Blakella torelliana** (cadaghi), *Elaeocarpus reticulatus* (blueberry ash), *Lophostemon confertus* (Brush box), *Syzygium jambos** (rose apple), *Melaleuca salicina* (white bottlebrush), *Allocasuarina littoralis* (black sheoak), *Auranticarpa rhombifolia* (diamond leaf pittosporum), *Calodendrum capense** (Cape chestnut), *Cupaniopsis anacardioides* (tuckeroo), *Delonix regia** (poinciana), *Ficus benjamina** (weeping fig), *Casuarina glauca* (swamp oak), *Harpephyllum caffrum** (kaffir plum), *Harpullia pendula* (tulipwood), *Dypsis lutescens** (golden cane palm), *Inga edulis** (ice-cream bean tree), *Grevillea robusta* (silky oak), *Livistona chinensis** (Chinese fan palm), *Livistona australis* (cabbage tree palm), *Mangifera indica** (mango), *Stenocarpus sinuatus* (wheel of fire), *Sterculia quadrifida* (peanut tree), *Jagera pseudorhus subsp. pseudorhus* (foambark), *Acmena ingens* (red apple), *Spathodea campanulata** (African tulip tree), *Ficus obliqua var. petiolaris* (small-leaved fig), *Parsonsia straminea* (monkey rope vine). |
| Mid 2 | *Schinus terebinthifolius** (broad-leaved pepper), *Duranta erecta** (duranta), *Morus alba** (white mulberry), *Syzygium australe* (small leaved lily pilly), *Syzygium floribundum* (weeping lily pilly), *Eriobotrya japonica** (loquat), *Murraya paniculata* 'Exotica' (mock orange), *Eugenia uniflora** (Brazilian cherry), *Lantana camara** (lantana), *Senna pendula* var. *glabrata** (Easter cassia), *Flagellaria indica* (whip vine), *Trema tomentosa var. viridis* (native peach), *Philodendron bipinnatifidum** (philodendron), *Solanum torvum** (devil's fig), *Leucaena leucocephala** (leucaena), *Leptospermum polygalifolium* (wild may), *Parsonsia straminea* (Monkey rope vine). |
| Ground (dominants) | *Megathyrsus maximus** (green panic), *Setaria sphacelata** (South African pigeon grass), *Cynodon dactylon** (couch), *Ageratum houstonianum** (blue billy goat weed), *Imperata cylindrica* (blady grass), *Lomandra longifolia* (long-leaved mat-rush), *Asparagus aethiopicus* cv. *Sprengeri** (asparagus fern), *Bidens pilosa** (cobbler's pegs), *Callisia elegans** (striped inch plant), *Callisia fragrans** (purple succulent), *Commelina cyanea* (scurvey weed), *Desmodium incanum** (creeping beggarweed), *Eragrostis curvula** (African lovegrass), *Erigeron bonariensis** (flax-leaf fleabane), *Erigeron sumatrensis** (fleabane), *Monstera deliciosa** (monstera), *Muehlenbeckia platyclada* (tapeworm plant), *Neonotonia wightii** (glycine), *Philodendron bipinnatifidum** (tree philodendron), |

| Stratum† | Species |
|---|---|
| | *Sphagneticola trilobata** (Singapore daisy), *Syngonium podophyllum** (goosefoot), *Urochloa decumbens** (signal grass) and *Verbena littoralis** (common verbena). |
| Macrophytes and floating aquatic plants | *Eleocharis dulcis* (water chestnut), *Typha orientalis* (cumbungi), *Nymphaea caerulea** (blue waterlily), *Nymphoides indica* (water snowflake). |

†Species are listed in order of dominance.

*Non-local native

**Variation**

This association exhibits considerable variation across all strata. Historical land management and maintenance have caused uneven vertical structure and age classes throughout the canopy, sub-canopy and shrub layers. This association includes a number of constructed waterbodies in the south of the site that have been colonised by common macrophytes (water chestnut) and floating aquatics including *Nymphaea* spp.

**Disturbance**

This association is highly modified and degraded by historical clearing, abandoned horticultural infrastructure and significant weed incursion. Open anthropogenic grassland areas are dominated by *Megathyrsus maximus* (green panic) and *Setaria sphacelata* (South African pigeon grass) while nursery plantings dominate the Mid 1 and Mid 2 strata. Weeds were present canopy and shrub strata, including several restricted invasive species under the Qld Biosecurity Act.

**Conservation Significance**

The structure and floristics of this vegetation association do not meet remnant benchmark criteria as described in the Qld Herbarium Benchmarks for the preclearing Regional Ecosystems 12.3.11 (lower contours) and 12.11.24 (remaining parts of the site). The dominant floristics in the canopy and sub canopy strata however reflect RE 12.3.11a - Open forest of *Eucalyptus tereticornis* and/or *E. siderophloia, Lophostemon confertus* with vine forest understorey.

No EVNT flora were recorded in this vegetation association during field surveys.

Complete survey floristics are provided in Appendix C.



**Figure 3.2 Vegetation Association A – General Composition**



**Figure 3.3 Vegetation Association A – General Composition**



**Figure 3.4 Vegetation Association A – constructed water body in south of site**

### 3.2.2 Vegetation Association B – Disturbed Riparian Woodland

This association comprises disturbed and modified riparian vegetation. The results of the structural and floristic assessments are summarised in Table 3.5 and Table 3.6 respectively.

**Table 3.5 Vegetation Association B Quantitative Assessments**

| Stratum† | Growth Form | Avg Crown Cover (%) | Height range (m) | Median Height (m) |
|---|---|---|---|---|
| Canopy | Tree | 15 | 10-20 | 15 |
| Mid 1 | Tree | 40 | 8-10 | 8 |
| Mid 2 | Small Tree/Shrub | 10 | 1-3 | 2 |
| Ground | Grass | 80 | 0-1 | 0.5 |

†Strata that were not present have been omitted.

**Table 3.6 Vegetation Association B Floristic Formation**

| Stratum† | Species |
|---|---|
| Canopy | *Eucalyptus tereticornis* (forest red gum), *Corymbia intermedia* (pink bloodwood) |
| Mid 1 | *Lophostemon suaveolens* (swamp box), *Eucalyptus tereticornis* (forest red gum), *Melaleuca quinquenervia* (broad-leaved paperbark), *Corymbia intermedia* (pink bloodwood), *Acacia concurrens* (late-flowering hickory), *Heptapleurum actinophyllum** (umbrella tree), *Syagrus romanzoffiana** (cocos palm), *Melaleuca viminalis* (weeping bottlebrush), *Melaleuca salicina* (white bottlebrush), *Allocasuarina littoralis* (black sheoak), *Cupaniopsis anacardioides* (tuckeroo), *Casuarina glauca* (swamp oak), *Grevillea robusta* (silky oak), *Jagera pseudorhus subsp. pseudorhus* (foambark), *Ficus obliqua var. petiolaris* (small-leaved fig), *Parsonsia straminea* (monkey rope vine). |
| Mid 2 | *Schinus terebinthifolius** (broad-leaved pepper), *Murraya paniculata* 'Exotica' (mock orange), *Lantana camara** (lantana), *Senna pendula* var. *glabrata** (Easter cassia), *Trema tomentosa var. viridis* (native peach), *Solanum torvum** (devil's fig), *Leucaena leucocephala** (leucaena), *Leptospermum polygalifolium* (wild may), *Parsonsia straminea* (Monkey rope vine). |
| Ground (dominants) | *Commelina cyanea* (scurvey weed), *Neonotonia wightii** (glycine), *Megathyrsus maximus** (green panic), *Setaria sphacelata** (South African pigeon grass), *Sphagneticola trilobata** (Singapore daisy), *Cynodon dactylon** (couch), *Ageratum houstonianum** (blue billy goat weed), *Imperata cylindrica* (blady grass), *Lomandra longifolia* (long-leaved mat-rush), *Asparagus aethiopicus* cv. *Sprengeri** (asparagus fern), *Bidens pilosa** (cobbler's pegs), *Callisia elegans** (striped inch plant), *Desmodium incanum** (creeping beggarweed), *Erigeron bonariensis** (flax-leaf fleabane), *Erigeron sumatrensis** (fleabane), *Syngonium podophyllum** (goosefoot), *Urochloa decumbens** (signal grass) and *Verbena littoralis** (common verbena). |
| Macrophytes and floating aquatic plants | *Eleocharis dulcis* (water chestnut), *Typha orientalis* (cumbungi), *Nymphaea caerulea** (blue waterlily), *Nymphoides indica* (water snowflake). |

†Species are listed in order of dominance.

*Non-native

#### Variation

The site exhibits considerable variation across all strata. Historical land management and maintenance have caused uneven vertical structure and age classes throughout the canopy, sub-canopy and shrub layers. Commonly occurring species were noted, however no dominant native species is present in any strata.

This association includes a watercourse with water pooling in some areas during the time of survey. The shallows are colonised by common macrophytes (water chestnut) and floating aquatics including *Nymphaea* spp.

**Disturbance**

This association is highly modified and degraded by historical clearing, earthworks and significant weed incursion. Weeds dominate the ground stratum, including several restricted invasive species under the Qld Biosecurity Act including *Lantana camara* (Lantana), *Asparagus aethiopicus* 'Sprengeri' (Asparagus fern).

Based on the prevalence of environmental weeds within this association it is expected that the native seed bank and capacity for recovery is low.

**Conservation Significance**

The structure of this association does not meet remnant benchmark criteria for the preclearing Of concern Regional Ecosystem 12.3.11 *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains. The dominant floristics in the canopy and sub canopy strata however reflect RE 12.3.11a - Open forest of *Eucalyptus tereticornis* and/or *E. siderophloia, Lophostemon confertus* with vine forest understorey.

No EVNT flora were recorded in this vegetation association during field surveys.

Complete survey floristics are provided in Appendix C.



**Figure 3.5 Vegetation Association B – General Composition**



**Figure 3.6 Vegetation Association B – General Composition**

### 3.2.3 Weed Infestations

For the purposes of this report, a weed is defined as a species that is not native to the Gold Coast region and is recognised as an environmental weed in Southeast Queensland by DETSI in their Wildnet database.

A total 65 weed species were recorded during surveys including eight (8) species identified as Restricted Invasive Plants under the *Biosecurity Act 2014*. Weeds recorded including Qld status (*Biosecurity Act 2014*) are listed in Table 3.7.

**Table 3.7 Weeds Observed On-Site**

| Scientific Name | Common Name | Qld Status* |
|---|---|---|
| *Ageratina adenophora** | Crofton weed | |
| *Ageratum houstonianum** | Blue billy goat weed | |
| *Alternanthera denticulata** | lesser joyweed | |
| *Ambrosia artemisiifolia** | Annual ragweed | **R** |
| *Asparagus aethiopicus cv. Sprengeri** | Asparagus fern | **R** |
| *Bidens pilosa** | cobbler's pegs | |
| *Callisia elegans** | Striped inch plant | |
| *Callisia fragrans** | Purple succulent | |
| *Calodendrum capense* | Cape chestnut | |
| *Cecropia peltata** | Mexican bean tree | **R** |
| *Chloris gayana** | Rhodes grass | |
| *Cinnamomum camphora** | Camphor laurel | **R** |
| *Cynodon dactylon** | couch | |
| *Delonix regia** | Poinciana | |
| *Desmodium incanum** | creeping beggarweed | |
| *Desmodium uncinatum** | silver-leaved desmodium | |
| *Duranta erecta** | Duranta | |
| *Eragrostis curvula** | African lovegrass | |
| *Erigeron bonariensis** | flax-leaf fleabane | |
| *Erigeron sumatrensis** | fleabane | |
| *Eriobotrya japonica** | Loquat | |
| *Eugenia uniflora** | Brazilian cherry | |
| *Lantana camara** | Lantana | **R** |
| *Lepidium bonariense** | Argentine peppercress | |
| *Leucaena leucocephala** | Leucaena | |
| *Livistona chinensis** | Chinese fan palm | |
| *Lotononis bainesii** | lotononis | |
| *Macroptilium atropurpureum** | siratro | |
| *Macroptilium lathyroides** | phasey bean | |
| *Macrotyloma axillare** | perennial horse gram | |
| *Megathyrsus maximus** | Green panic | |
| *Melinis minutiflora** | Molasses grass | |
| *Melinis repens** | red natal grass | |

| Scientific Name | Common Name | Qld Status* |
|---|---|---|
| *Monstera deliciosa** | monstera | |
| *Morus alba** | white mulberry | |
| *Murraya paniculata 'Exotica'** | Mock orange | |
| *Neonotonia wightii** | glycine | |
| *Nymphaea caerulea** | blue waterlily | |
| *Ochna serrulata** | Mickey Mouse bush | |
| *Oxalis corniculata** | creeping oxalis | |
| *Passiflora suberosa** | Corky passion flower | |
| *Philodendron bipinnatifidum** | tree philodendron | |
| *Portulaca pilosa** | hairy pigweed | |
| *Ricinus communis** | castor-oil plant | |
| *Roystonea regia* | Cuban royal palm | |
| *Schinus terebinthifolius** | Broadleaved pepper bush | **R** |
| *Setaria sphacelata** | South African pigeon grass | |
| *Sida rhombifolia** | Paddy's lucerne | |
| *Sida spinosa** | spiny sida | |
| *Solanum chrysotrichum** | giant devil's fig | |
| *Solanum mauritianum** | wild tobacco | |
| *Solanum nigrum** | black-berry nightshade | |
| *Solanum seaforthianum** | Brazilian nightshade | |
| *Solanum torvum** | devil's fig | |
| *Sonchus oleraceus** | sow thistle | |
| *Spathodea campanulata** | African tulip tree | **R** |
| *Sphagneticola trilobata** | Singapore daisy | **R** |
| *Syagrus romanzoffiana** | Cocos palm | |
| *Syngonium podophyllum** | Goosefoot | |
| *Syzygium jambos** | rose apple | |
| *Tipuana tipu** | tipuana | |
| *Urochloa decumbens** | Signal grass | |
| *Verbena bonariensis** | purpletop | |
| *Verbena littoralis** | common verbena | |
| *Yucca aloifolia** | Spanish bayonet | |

*Qld Status per the *Biosecurity Act 2014,* where:

R = Restricted invasive plants must not be given away, sold or released into the environment without a permit. The Biosecurity Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control. At a local level, each local government must have a biosecurity plan that covers invasive plants and animals in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws.

## 3.3 Fauna Survey Methods

With consideration given to the information obtained within the desktop assessment Burchills ecologists undertook fauna surveys over the site in February and March 2026.

The survey methodology incorporated the following survey techniques:

- Assessment of habitat features and functions;
- Opportunistic records and observations of inferential evidence;
- Diurnal bird surveys;
- Ground dwelling reptile surveys;
- Nocturnal (including Anabat and spotlighting) surveys;
- Amphibian (including call playback) surveys; and
- Targeted Conservation Significant Species surveys.

### 3.3.1 Fauna Habitat Features and Functions

The site was surveyed to verify presence of any features and functions of faunal habitat significance. This can include significant features such as hollow-bearing trees, waterways / wetlands and riparian areas and functions such as corridors and buffers.

### 3.3.2 Opportunistic Observations and Inferential Evidence

Observations of inferential evidence and opportunistic fauna encounters were recorded throughout the duration of the flora survey. Inferential evidence included observation of scratches, scats, tracks, shed skins, diggings and nests, as well as targeted inspected and searches for potential habitat features such as hollow bearing limbs and trunks, arboreal termite mounds with holes, stick or mud nests and dreys.

### 3.3.3 Diurnal Bird Surveys

Diurnal bird surveys were undertaken within the site, with survey effort comprising one (1) hour observations by one (1) observer walking slowly and quietly along 100m transects. Surveys were undertaken at dawn, mid-morning, mid-afternoon and late-afternoon. Bird species were identified through direct observations (i.e. visual sighting) and / or vocalisations.

### 3.3.4 Ground Dwelling Reptile Search

Active Ground Dwelling Reptile Searches (GDRS) can detect many reptile species that trapping rarely does. Active searching primarily focuses on detecting reptiles and amphibians but will also detect small terrestrial mammals and signs of other somewhat cryptic species (e.g. tracks, scats, nests and feeding signs) (Eyre et. al., 2018). Active searching involves scanning for active animals as well as turning rocks and logs, raking through leaf litter, looking under bark and in crevices and other suitable microhabitat for cryptic animals. One (1) GDRS was undertaken within the site.

### 3.3.5 Nocturnal Spotlighting and Anabat Survey

Spotlighting walking transects were undertaken to detect nocturnal mammals, reptiles and amphibians in late February 2026. The survey night was selected for clear, dry conditions with low light (e.g. new moon). Searches were conducted on foot using spotlights for 30 person minutes at and following dusk. Call playback for the koala and other possum/glider species was broadcast prior to spotlighting. This comprised broadcasting the call for three minutes followed by a two-minute listening period.

### 3.3.6 Amphibian and Targeted Amphibian Surveys

Amphibian surveys were undertaken for two (2) person-hours, comprising one hour within the drainage line and one hour around the waterbodies, during and after dusk. Recent rainfall and warm temperatures resulted

in optimal amphibian survey conditions. A combination of call playback surveys and nocturnal searches were undertaken targeting all species known/expected to occur in the area from the desktop surveys including conservation significant species (*Crinia tinnula*). Methodology employed during the frog surveys followed that recommended within the *Threatened species survey and assessment guidelines: field survey methods for fauna – amphibians* (DECC, 2009). Present, but non-calling males were stimulated to call by playing a previously recorded call. Initially, an observer listened for the calls of frogs from a static point for a 10-minute period. If no calls were heard, attempts were made to elicit a response to call-playback. After playing calls for 60 seconds, a further 10-minute listening period followed. The volume of the call playback was audible over a distance of approximately 20m.

### 3.3.7 Targeted Glossy Black-Cockatoo Surveys

Glossy black-cockatoos inhabit open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. They feed almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species) (NSW Environment and Heritage, 2014a). On the Gold Coast the preferred feed tree species are *Allocasuarina littoralis* in the lowlands and *Allocasuarina torulosa* in the non-coastal areas (Murdoch 2012). Evidence also indicates that mature (greater than 14cm DBH and 12m height per Murdoch 2012) trees are preferred over smaller trees. As the birds feed, they drop the chewed cones after stripping them of seeds. These distinctive 'orts' are used to determine if glossy black-cockatoos have been feeding recently in the area. The colour of the ort can indicate how long ago the feeding occurred with cream, red/orange colours attributed to recent feeding (Murdoch 2012).

Within the subject site, searches were undertaken for female (cone producing) she-oaks of the above species with a minimum DBH of 10cm. The tree drip zones were then searched for orts for 2 minutes.

### 3.3.8 Targeted Powerful Owl Surveys

Nocturnal call playback surveys were undertaken during the nocturnal surveys. This survey technique involved broadcasting pre-recorded species vocalisations. Calls were broadcast for three (3) minutes and followed by a two (2) minute listening period, after which the immediate vicinity of the playback site was surveyed using a handheld spotlight for approximately 10 minutes. Daytime searches were conducted on foot to locate roost or nest sites in areas of densely foliaged trees, tall shrubs and within the Eucalypt canopy. Ground searches for owl scat / 'whitewash' and regurgitated pellets were also undertaken to assist with locating roost/nest sites.

### 3.3.9 Targeted Koala Surveys - Spot Assessment Technique

Two (2) Koala Spot Assessment Technique (KSAT) (Phillips and Callaghan, 2011) surveys were undertaken within the site in March 2026. KSAT involves searching the base of Koala habitat trees for Koala scats to determine the presence and relative activity level of koalas within an area (Phillips and Callaghan, 2011). A centre tree was selected for the KSAT survey on the basis of being (Philips and Callaghan, 2011):

- A tree beneath one (1) or more koala faecal pellets were observed; or
- A preferred koala food tree.

The closest 29 koala habitat/feed trees to the centre tree, with a DBH of 10cm or greater, were selected and searches were undertaken for faecal pellets within a radial distance of up to 1m from the base of each tree. Survey effort dedicated to the faecal pellet search ceased after two (2) person minutes, or until a Koala faecal pellet was found – whichever occurred first.

Activity level for each of the SAT sites is expressed as a percentage of trees under which koala faecal pellets were found. The use classification is taken from Phillips and Callaghan (2011) for east coast areas; Low < 22.52%; Med ≥ 22.52% but ≤ 32.84%; and High > 32.84%.

Preferred Koala food trees in the Gold Coast area was established from research conducted by Council (CGC, 2014) and the Australian Koala Foundation (AKF, 2015). These species are listed in Table 3.8.

**Table 3.8 Preferred Koala Food Trees (CGC, 2014; AKF, 2015)**

| Scientific Name | Common Name | Source |
|---|---|---|
| *Eucalyptus major* | Grey gum | AKF |
| *Eucalyptus microcorys* | Tallowwood | AKF, CGC |
| *Eucalyptus moluccana* | Coastal grey box | AKF |
| *Eucalyptus propinqua* | Small-fruited grey gum | AKF, CGC |
| *Eucalyptus robusta* | Swamp mahogany | AKF, CGC |
| *Eucalyptus siderophloia* | Grey ironbark | CGC |
| *Eucalyptus seeana* | Narrow-leaved red gum | AKF |
| *Eucalyptus tereticornis* | Qld blue gum | AKF, CGC |
| *Corymbia intermedia* | Pink bloodwood | CGC |
| *Lophostemon confertus* | Brush box | CGC |
| *Lophostemon suaveolens* | Swamp box | CGC |
| *Melaleuca quinquenervia* | Broad-leaved paperbark | CGC |

### 3.3.10 Survey Limitations

It should be noted that the fauna survey that was undertaken only provides a very limited 'snap-shot' of the species present and detectable on the subject site at the time of the field investigations. Weather and time constraints impact on the detectability of some species. Failure to detect a species during a single survey does not mean it is absent from the site.

## 3.4 Fauna Survey Results

A total of twenty-one fauna species were observed within the subject site during surveys including two (2) amphibian species, one (1) reptile species, fourteen (14) bird species and four (4) mammal species (Table 3.9). These results are discussed further in the following sections.

### 3.4.1 Amphibians

A total of two (2) species of amphibian were recorded during the field survey: *Litoria fallax* (eastern sedge frog) and the introduced *Rhinella marina** (Cane toad). These species were all detected within the vicinity of the dams and drainage line.

### 3.4.2 Reptiles

One (1) reptile species was identified during field surveys: *Lampropholis delicata* (delicate skink), which was observed through ground dwelling reptile surveys and opportunistic observations across the balance of the site. The delicate skink is ubiquitous on the Gold Coast, commonly found in most terrestrial environments.

### 3.4.3 Birds

Of the 14 bird species identified on-site, all species were native with no introduced species detected. No EVNT or SL avifauna detected. The site's conditions provide shelter, foraging and breeding opportunities for species with broad habitat requirements, common in peri-urban environments.

The targeted surveys for Glossy black-cockatoos did not result in detection of activity by this species. Although small numbers of *Allocasuarina littoralis* (Black she-oak) were observed on-site, these were present in very low densities and no orts were observed.

### 3.4.4 Mammals

Three (3) native mammal species were recorded on the subject site: *Wallabia bicolor* (swamp wallaby), *Pteropus alecto* (Black-flying fox) and *Trichosurus vulpecula* (Brushtail possum). Evidence (scats) of *Canis familiaris** (domestic dog) was also detected.

Despite the presence of preferred feed trees (e.g. tallowwoods), no evidence of use of the site by the Koala was detected during targeted surveys (KSAT).

**Table 3.9 Fauna Species Survey List**

| Family | Scientific Name | Common Name | Status* | Method** | Location† | Survey Type†† |
|---|---|---|---|---|---|---|
| **Amphibians** | | | | | | |
| Bufonidae | *Rhinella marina* | Cane toad | I | V | W | OO |
| Hylidae | *Litoria fallax* | Eastern sedge frog | C | H | W | A |
| **Reptiles** | | | | | | |
| Scincidae | *Lampropholis delicata* | Grass skink | C | V | W | GDRS |
| **Birds** | | | | | | |
| Anatidae | *Chenonetta jubata* | Australian wood duck | C | V | W | DBS |
| Artamidae | *Cracticus nigrogularis* | pied butcherbird | C | V | W | DBS |
| Artamidae | *Gymnorhina tibicen* | Magpie | C | V | W | DBS |
| Cacatuidae | *Cacatua galerita* | sulphur-crested cockatoo | C | V | W | DBS |
| Columbidae | *Ocyphaps lophotes* | Crested pigeon | C | V | W | DBS |
| Corvidae | *Corvus orru* | Torresian crow | C | V | W | DBS |
| Dicruridae | *Grallina cyanoleuca* | Magpie lark | C | V | W | DBS |
| Dicruridae | *Rhipidura leucophrys* | Willie wagtail | C | V | W | DBS |
| Halcyonidae | *Dacelo novaeguineae* | Laughing kookaburra | C | V | W | DBS |
| Hirundinidae | *Hirundo neoxena* | welcome swallow | C | V | W | DBS |
| Maluridae | *Malurus melanocephalus* | red-backed fairy-wren | C | V | W | DBS |
| Meliphagidae | *Manorina melanocephala* | Noisy miner | C | V | W | DBS |
| Meliphagidae | *Meliphaga lewinii* | Lewin's honeyeater | C | V | W | DBS |
| Psittacidae | *Trichoglossus moluccanus* | Rainbow lorikeet | C | H | W | DBS |
| **Mammals** | | | | | | |
| Pteropodidae | *Pteropus alecto* | Black flying-fox | C | V | E | N |
| Macropodidae | *Wallabia bicolor* | Swamp wallaby | C | S | W | OO |
| Phalangeridae | *Trichosurus vulpecula* | Brush tail possum | C | V | W | N |
| Felidae | *Canis familiaris* | Domestic dog | I | S | W | OO |

*Status: As listed under the NCA: C = Least Concern. I = Introduced Species

**Primary method of identification: C = hand caught, H = heard, V = visually observed, T = trapped, S = other signs of presence (e.g. scats, traces etc).

†Survey type: DBS = bird survey; GDRS = ground dwelling reptile survey; OO = opportunistic observation, A = Amphibian aural, N = Nocturnal/spotlighting

††Location: W = species observed within subject property; E = species observed external but close (within 100m) to subject site.

### 3.4.5 Habitat Trees

Under the City Plan, a habitat tree is defined as "*a living or dead tree greater than 80 centimetres diameter at 1.4 metres that has one or more hollows within its trunk or branches greater than 10 centimetres in entrance diameter*".

Eight (8) trees on site met the minimum Diameter at Breast Height (DBH) requirements for a habitat tree under the Gold Coast City Plan. None of these trees had hollows visible from the ground. These trees are listed in Table 3.10 and shown in Figure 3.1.

**Table 3.10 Habitat Trees Present On-Site**

| Plan ID. | Trunk Diameter | Species | Habitat Feature | Location |
|---|---|---|---|---|
| 4 | 1.0m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Karingal Dve road reserve |
| 151 | 0.8m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot |
| 152 | 0.8m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot |
| 211 | 0.9m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot (within 6m of boundary) |
| 214 | 0.8m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot |
| 217 | 0.9m | *Eucalyptus siderophloia* | Age (>80cm DBH) | Within lot |
| 230 | 1.0m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot |
| 274 | 0.8m | *Eucalyptus tereticornis* | Age (>80cm DBH) | Within lot |

### 3.4.6 Conservation Significant Fauna Species

No species (nor evidence of) scheduled as Endangered, Vulnerable or Near Threatened (EVNT) under the Queensland NCA and / or Commonwealth EPBC Act were observed within the subject site during surveys.

Table 3.11 presents the results of an assessment of the likelihood of presence of conservation significant fauna species identified by the desktop analysis based on the results of the field surveys, refined to include species which based on desktop and field assessment were observed or are considered to potentially occur on the site. Four (4) conservation significant species are identified as possibly utilising the site on a transient basis, based on presence of suitable habitat and foraging resources. The complete results for this analysis including a description of habitat requirements for each species are presented in Appendix D.

**Table 3.11 Expected and Observed Conservation Significant Fauna Species within Subject Site**

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Calyptorhynchus lathami lathami* | Glossy black-cockatoo | V | **POSSIBLE** |
| *Hirundapus caudacutus* | White-throated needletail | V, MTS | **POSSIBLE** |
| *Phascolarctos cinereus* | Koala | E, E# | **POSSIBLE** |
| *Pteropus poliocephalus* | Grey-headed flying-fox | V | **POSSIBLE** |

*Status: As listed within the Queensland *Nature Conservation Act 1992*): CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SL = Special Least Concern, C = Least Concern. As listed in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*: CE# = Critically Endangered, E# = Endangered, V# = Vulnerable, CD# = Conservation Dependent, MT = Migratory (Terrestrial Species), MW = Migratory (Wetland Species), M = Marine Species

# 4. Impacts and Recommendations

## 4.1 Proposed Works

The proposed works comprise clearing and earthworks to facilitate residential development. The works will require clearing existing vegetation in the disturbance footprint as presented in Figures 4.1-4.4. The disturbance footprint includes all new building bads, earthworks and civil infrastructure (eg. Stormwater treatment areas) as shown in Section 1.4. Impacts on trees were assessed (including NRZ/SRZ calculations) in accordance with AS4590:2025. Some trees indicated as impacted may be retained subject to micro-siting of earthworks and arborist supervision – in particular native trees in the proposed reserve.

The site ecological surveys found the disturbance footprint area to be highly modified and not representative of remnant vegetation or a threatened ecological community. Additionally, no protected plants were detected during the flora surveys. The results of the surveys indicate that the proposed works will not impact matters of environmental significance. The following summarises the potential impacts on matters of national, state and local environmental significance.

## 4.2 Impacts on Matters of National Environmental Significance

The results of the desktop surveys and field investigations indicate that the proposed development is unlikely to result in a significant impact on values identified as matters of national environmental significance (MNES). As summarised in Table 3.11 five (5) MNES species were identified as possibly utilising the site on a transient basis. These species are either disturbance tolerant and/or have broad habitat requirements widely available in the local region. A preliminary test against the Significant Impact Guidelines Version 1.1 determined that the proposal will not significantly impact these MNES since it will not:

- Lead to a long-term decrease in the size of a population;
- Reduce the area of occupancy of the species;
- Fragment an existing population into two or more populations;
- Adversely affect habitat critical to the survival of a species;
- Disrupt the breeding cycle of a population;
- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- Result in invasive species that are harmful to an endangered species becoming established in the endangered or critically endangered species' habitat; or
- Introduce disease that may cause the species to decline.

Further details regarding the likelihood of occurrence of MNES species are provided in Appendix D.

## 4.3 Impacts on Matters of State Environmental Significance

### 4.3.1 Impacts on Threatened Wildlife

Threatened wildlife under the NCA (EVNT) and Special Least Concern (SL) fauna under the *Nature Conservation (Animals) Regulation 2020* are defined as MSES under the Qld SPP and Offset Regulation. The results of the desktop review indicate that EVNT and SL fauna may occur on the site based on nearby historical records. This includes the glossy black cockatoo and the koala. No evidence of use of the site by the koala was detected during surveys, possibly due to disconnection with suitable habitat and nearby threats (domestic animals and cars). Potential impacts on this species are discussed further in Section 5.3 below.

No other EVNT/SL fauna were detected during the surveys. Surveys under suitable she oaks (*Allocasuarina littoralis* trees were recorded on site) did not detect any chewed seed cones (orts) and the nocturnal surveys

only detected common fauna. Further details regarding the likelihood of occurrence of EVNT species are provided in Appendix D.

### 4.3.2 Impacts on Regulated Vegetation

The Regulated Vegetation Map (RVM) indicates that regulated vegetation within the subject site includes Category B remnant vegetation mapped as Regional Ecosystems (RE) 12.3.11 (Of Concern) and RE 12.11.24 (Least Concern). RE 12.3.11 occurs across approximately 0.06 ha, while RE 12.11.24 occurs across a very small area (<0.01 ha). The remaining 2.399 ha of the site is mapped as Category X – non-assessable vegetation.

Category B – Of Concern remnant vegetation (RE 12.3.11) is identified as a Matter of State Environmental Significance (MSES) under the Queensland environmental planning framework (Figure 2.2, and Table 2.4)

The on-ground extent of the mapped regional ecosystems varies from the Vegetation Management Supporting Map (refer to Figure 2.2). though the dominant canopy floristics reflect RE 12.3.11 (Of concern), field surveys found the height and canopy cover criteria do not meet the remnant benchmarks for this regional ecosystem.

All reasonable attempts to minimise impacts on regulated vegetation were made by locating the development footprint in disturbed and mostly cleared areas, or areas subject to fragmentation and edge effects from the adjoining road and neighbouring residences. Impacts on mapped Regulated Vegetation are anticipated to meet the definition of 'exempt clearing' being for an 'urban purpose in an urban area' and relating to a reconfiguration of lot application for a lot less than 5ha in size.

## 4.4 Impacts on Core Koala Habitat

Under the South East Queensland Koala Conservation Strategy mapping, the site is mapped as containing 0.41ha / 4,095m$^2$ of Koala Habitat Area. No evidence of koala activity was detected during surveys, possibly due to lack of quality connectivity to large habitat areas and existing threats (domestic animals and roads).

The proposed development impacts 2,683m2 of mapped koala habitat area (KHA) with 136m$^2$ of impacted KHA within 6m of the lot boundary (exempt clearing), resulting in a net impact on 2547m$^2$. A total 78 NJKHT (in mapped KHA, excluding trees in 6m exempt clearing boundary setback) will be impacted by the proposed development.

The layout protects the koala habitat (not mapped as KHA) within the central riparian park, retaining the site's potential broader landscape function as part of a 'stepping stone' for koala movement.

The residual impacts on KHA are considered a 'Significant Residual Impact' (SRI) on a prescribed matter (koala habitat) under the Queensland Environmental Offsets Policy and will be offset in accordance with this policy. The SRI for the proposed development is calculated to be 78 NJKHT.

Given the site's designation within the Southeast Queensland Regional Plan Urban Footprint and zoning as Medium Density Residential under the *Gold Coast City Plan Version 13*, the density and type of the development is appropriate for the site's zoning. The design and siting of the proposed development retains some koala trees in the proposed riparian reserve.

Impacts on Koala Habitat and proposed mitigation and management measures associated with the development are detailed in the Koala Habitat Values Assessment and Koala Management Plan (Burchills 2026).

## 4.5 Impacts on State Mapped Waterways

The site's watercourse is mapped as low and moderate hazard for waterway barrier works under the Fisheries Act. No works are proposed in the creek or riparian area so a waterway barrier works permit is not required.

### 4.5.1 Impacts on Protected Plants

The south-eastern part of the site falls within the NCA Protected Plants Flora Survey Trigger area. The flora surveys did not detect any protected plants (species listed as threatened under the NCA) within or outside of the disturbance footprint. Protected plants will not be impacted by the proposed development. An exempt clearing notification is required to be lodged with DETSI two (2) weeks prior to clearing.

## 4.6 Impacts on Matters of Local Environmental Significance

### 4.6.1 Vegetation Management

The *City Plan Version 13* Environmental Significance Overlay map for Vegetation Management indicates that parts of the site are mapped as Regulated (MSES), Medium (MLES) and General Priority (MLES) Vegetation (Figure 2.7). Surveys however found that the site's mapped vegetation, comprising Vegetation Association A, reflects non-remnant vegetation. Though some areas comprise canopy floristics resembling RE 12.3.11, the composition of Vegetation Association A is too modified and disturbed to be considered Medium or General Priority Vegetation due to historical clearing, nursery plantings and weed incursion. Areas of Vegetation Association B however more closely resemble the structure and floristics of General Priority Vegetation.

The proposal will impact 2,561m$^2$ of General Priority Vegetation (GPV) however the proposed 0.74ha reserve will protect and restore vegetation that will achieve the structural and floristic benchmarks of Regional Ecosystem 12.3.11 (MPV). This ensures a net gain in MLES vegetation. The development minimises impacts on GPV as much as feasible and therefore is compliant with PO 11 of the City Plan Environmental Significance Overlay Code.

### 4.6.2 Priority Species

Koala Habitat is mapped on-site under the City Plan as outlined in Section 3.2.3. Suitable and preferred food trees for this species (constituting NJKHT) were present throughout the site, including *Eucalyptus tereticornis* (Qld blue gum), *Eucalyptus siderophloia* (Grey ironbark), *Corymbia intermedia* (Pink bloodwood) and *Lophostemon* / *Melaleuca spp*. No State Significant Species, including Koalas, were observed on the site.

The proposal protects 0.74ha of potential habitat in the proposed reserve and common areas. The development minimises impacts on priority species habitat as much as feasible and therefore is compliant with AO1 and PO18 of the City Plan Environmental Significance Overlay Code.

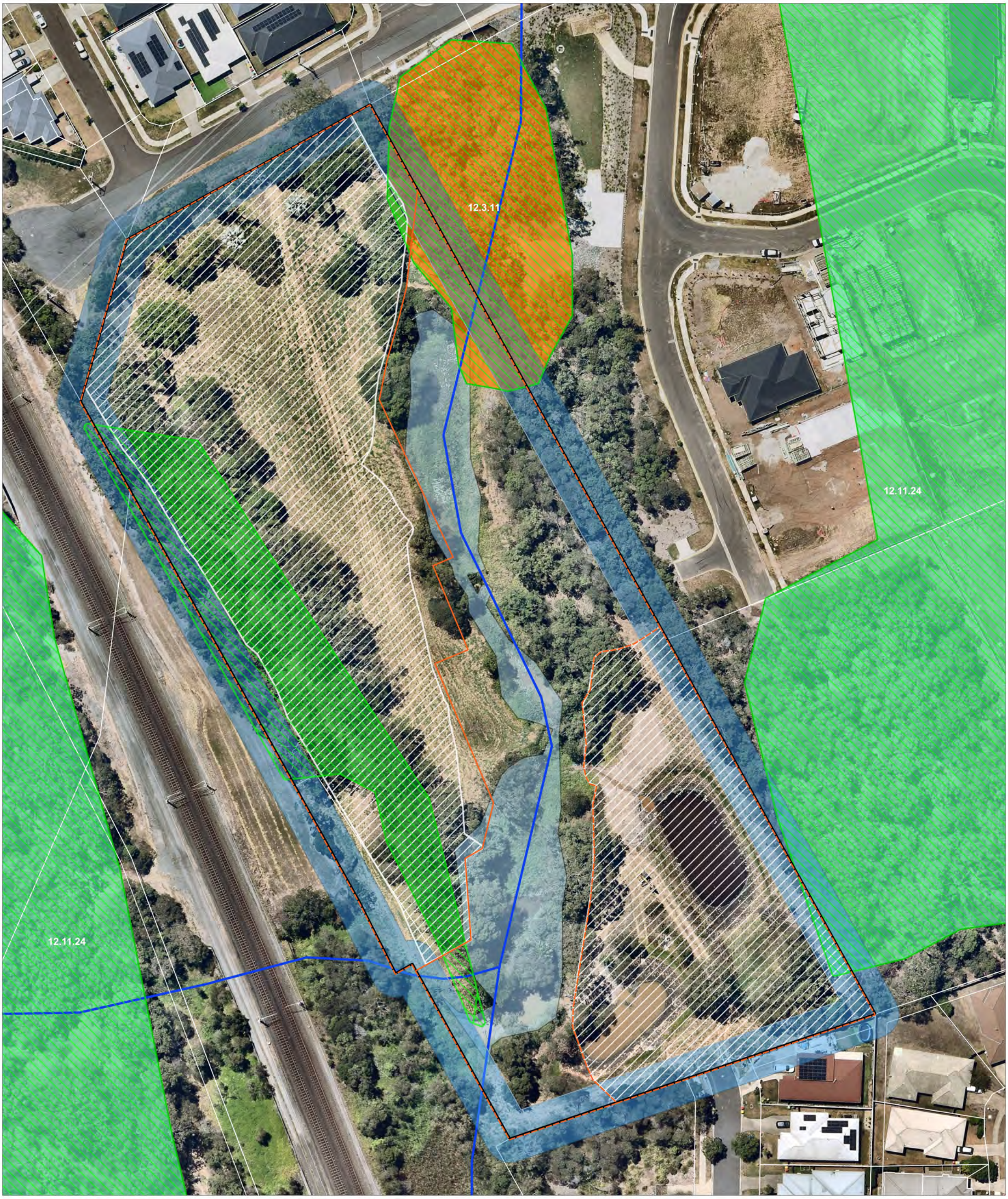
### 4.6.3 Wetlands and Waterways

A minor waterway is mapped through the site and is represented on-ground by a drainage feature. This drainage feature has been highly disturbed through historic clearing, weed incursion and significant modification of the upstream and downstream catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping. The development protects the waterway in the proposed reserve and all site stormwater will be treated for quality and quantity before discharging into the downstream environment. The width of the waterway reserve varies from 24m at its narrowest point to 116m at its widest. The proposed setback between the development footprint and the mapped waterway is considered adequate to protect the riparian values and therefore complies with AO1 and AO5.5 of the City Plan Environmental Significance Overlay Code. Compliance of the proposed development with the performance outcomes of the City Plan v13 *Environmental Significance Overlay Code* is further detailed in Appendix D.

### 4.6.4 Habitat Trees

As detailed in Section 3.4.5, eight (8) habitat trees were detected during site surveys. None of these trees had hollows visible from the ground on site, however they met the minimum Diameter at Breast Height (DBH)

requirements for a habitat tree under the Gold Coast City Plan. These trees are listed in Table 3.10 and shown in Figure 3.1. All trees excluding one (in road reserve) are impacted by the proposed development.




# 2 Karingal Dve Pimpama

## Figure 4.1 MSES Impact Assessment

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coasl LGA

**Legend**

- Subject Lot
- Proposed Lots
- Earthworks
- 6m Exempt Clearing
- VMA Watercourse
- Core Koala Habitat Areas (KHA; DETSI v4)
- KHA Impacted Excluding Exempt (2,535m2)

Regional Ecosystems (RE; DETSI v13)

- Category B Endangered
- Category B Of concern
- Category B Least concern
- RE Impact (34m2)

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7,439 m2

# 2 Karingal Dve Pimpama

## Figure 4.2 Koala Habitat Values Impact Assessment

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coasl LGA

**Legend**

- Subject Lot
- Proposed Lots
- 6m Exempt Clearing
- Conservation Lot (7,439m2)
- Core Koala Habitat Areas DETSI v4 (2,547m2 net impact excluding exempt clearing)
- Earthworks
- NJKHT Exempt [6]

NJKHT NRZ [85]

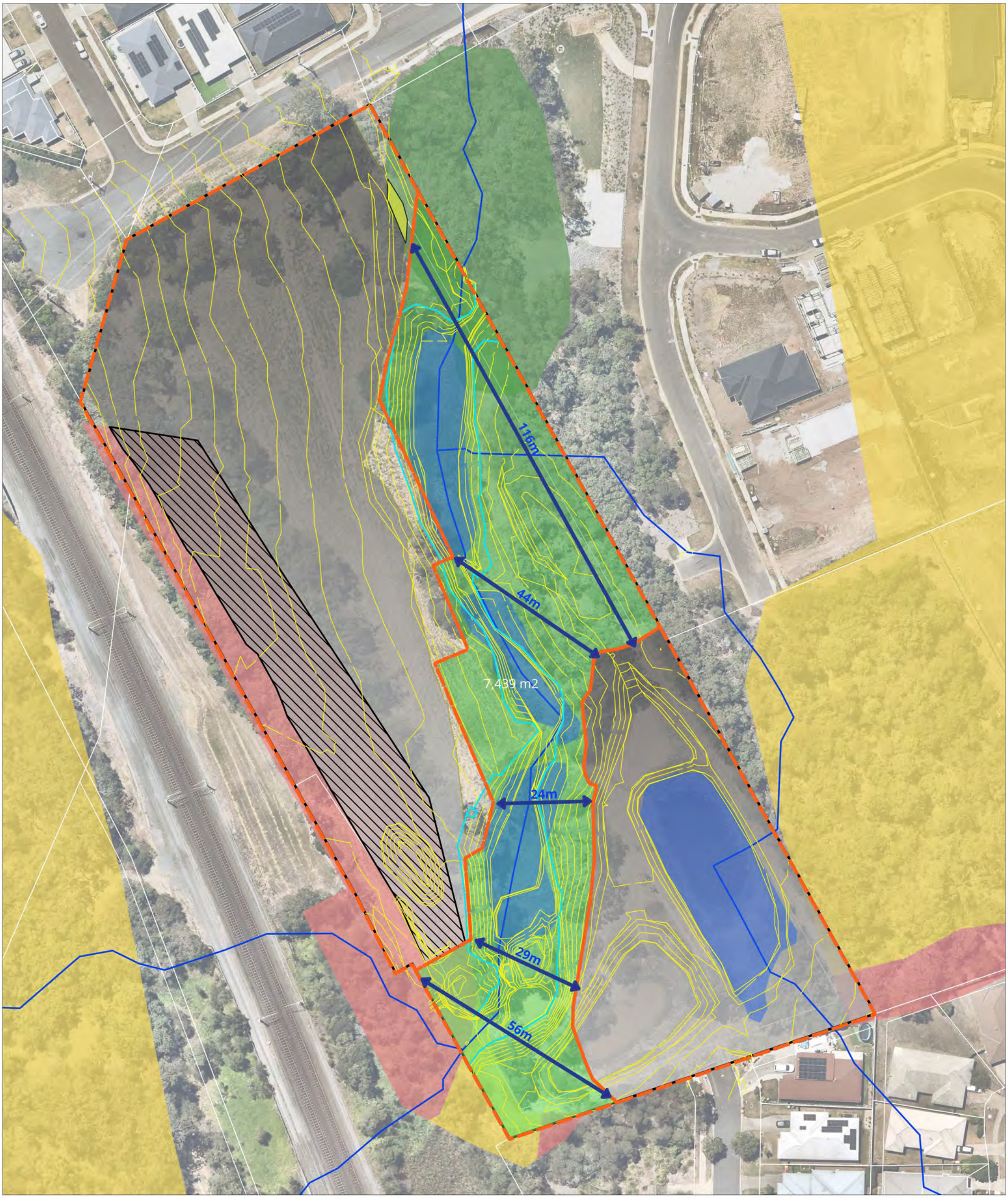
- Retain [2]
- Impacted* [83] **includes 5 NJKHT in exempt clearing setback*

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# 2 Karingal Dve Pimpama

## Figure 4.3 MLES Impact Assessment

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coasl LGA

**Legend**

- Subject Lot
- Proposed Lots
- Conservation Lot (7,439m2)
- Earthworks
- Top of Bank (MGS, 2026)
- City Plan Waterway
- City Plan Waterway
- Regulated Vegetation City Plan v13 (34m2 impacted)

MLES Vegetation management City Plan v13

- High priority vegetation
- Medium priority vegetation
- General priority vegetation
- General priority vegetation Impact (2,561m2)

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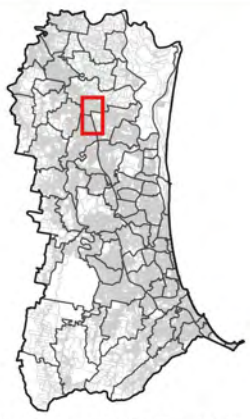
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# 2 Karingal Dve Pimpama

## Figure 4.4 Impact Assessment - Site Values

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coasl LGA

**Legend**

- Subject Lot
- Proposed Lots
- Earthworks
- Top of Bank (MGS, 2026)
- Watercourse centreline
- Constructed dams
- Contours MGS 2026
- Habitat trees (7 impacted) [8]
- Habitat trees NRZ

Vegetation Associations

- A – Urban Woodland and Anthropogenic Grassland
- B – Disturbed Riparian Woodland (protected)

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## 4.7 Management of Impacts

The following sections identify management actions mitigating impacts for the construction and operational stages of the development.

### 4.7.1 Fauna Management

Management of fauna during the construction stage will be supervised by a licensed spotter catcher in accordance with their license conditions and the development permit conditions.

### 4.7.2 Sediment and Erosion Control

Site works have the potential to result in erosion/sedimentation of the receiving waters if site runoff is not controlled appropriately. To avoid these impacts all works should be undertaken in accordance with an approved Erosion and Sediment Control Plan, prepared as per the *Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites* (Institution of Engineers, Australia (Qld); 1996 or later version). This involves ensuring sediment fences (and other devices as required in an approved Sediment and Erosion Control plan) are in place prior to works commencing, clean flows are diverted around the works area, immediately stabilising any disturbed areas and ensuring any flows from the works area are temporarily detained using sediment fencing and sand bags to ensure that sediment laden runoff does not enter the waterway prior to treatment.

### 4.7.3 General Requirements for all Works

To ensure the ongoing viability of ecological values in close proximity to the works area, the following procedures are to be implemented:

- All sediment and tree protection fencing is to be inspected daily and maintained throughout the course of the works and following each incidence of heavy rainfall. If the fence shows signs of failure, the fence is to be fixed or replaced;
- No non-essential works, placement of fill, storage of equipment or access is to be permitted within the tree protection zone;
- Fencing and signage is to remain in place for the duration of works;
- Should works be required within the vegetation protection zone be unavoidable, an ecologist or qualified (minimum AQF5) Arborist (for trees) should be contracted to provide advice regarding protection of the vegetation and monitoring if required;
- Erosion and sediment control measures are to be installed and maintained to prevent the release of contaminants and / or sediment to waterways;
- Any disturbed or oxidised acid sulfate soil must be treated and managed in accordance with the current Queensland *Acid Sulfate Soil Technical Manual: Soil Management Guidelines 4.0*, prepared by the Department of Science, Information Technology, Innovation and the Arts, 2014;
- Spoil and disturbed substrate are managed to prevent acid sulfate soil oxidation and movement of sediment, runoff and leachate to fish habitats;
- During construction activities only use materials which are clean and free of silt and free from pests, chemicals and other contaminants as defined under section 11 of the *Environmental Protection Act 1994*;
- Soil and sediment must not be removed from areas subject to quarantine restrictions e.g. declared fire ant areas;
- Chemicals are not to be used in a riparian area.

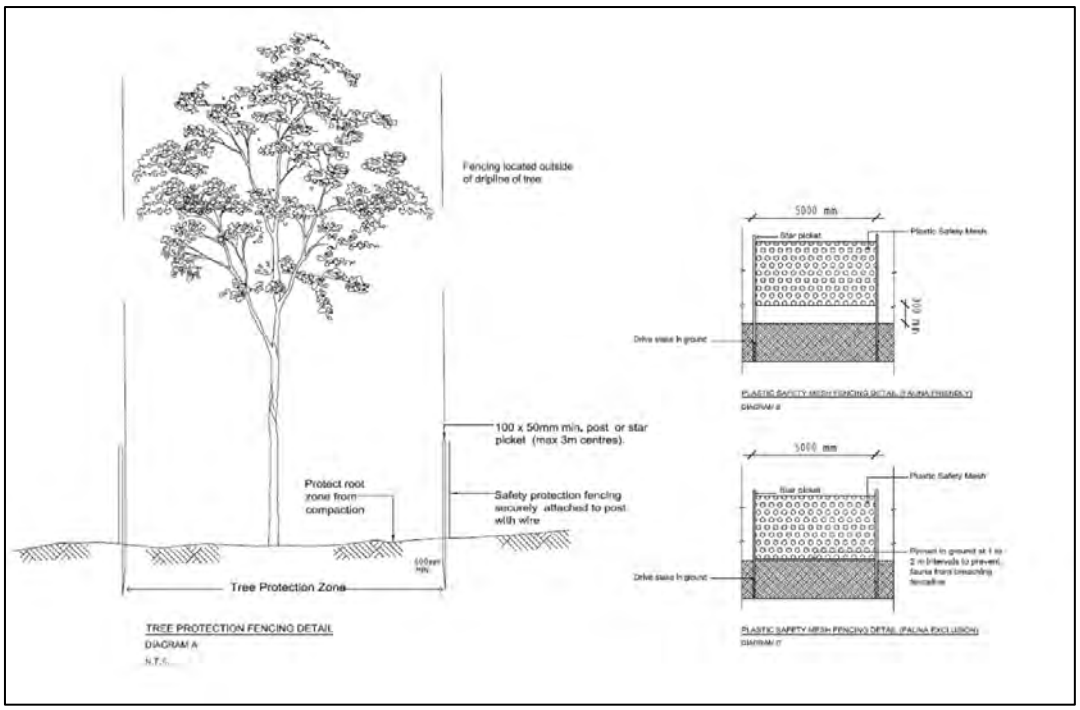



**Figure 4.5 Example of tree protection fencing**

### 4.7.4 Impact Summary

The proposed works will impact existing trees within impact footprint, however no significant flora species or communities were detected in this area during surveys. Existing vegetation is limited to disturbed and modified vegetation, including within the riparian area. Construction works that have the potential to directly and / or indirectly impact area the waterway, downstream values and vegetation on the adjoining site to the west should be managed in accordance with an approved management plan that guides the operational works stage of the development.

The proposed development does not impact State or Council mapped environmental values and no matters of ecological significance were detected during surveys in or near the impact footprint. The design protects riparian values by retaining a setback to the high bank.

Construction works that have the potential to impact the waterway, downstream values and vegetation on the adjoining sites, should be managed in accordance with an approved management plan that guides the operational works stage of the development.

In summary, the proposed development satisfactorily complies with the relevant performance outcomes of the *City Plan* provided construction works are managed to ensure potential impacts will be avoided, minimised and/or mitigated to the greatest extent possible.

# 5. Permits and Approvals

Table 5.1 provides an assessment of the permits and approvals applicable to the project works (clearing) based on the potential impacts as detailed in Section 4.

**Table 5.1 Permits and Approvals**

| Statutory trigger | Assessment and Permits/Approvals | Actions |
|---|---|---|
| **Marine Plants and Fish Habitat Areas (FHA)**<br>*Fisheries Act 1994*<br>Impact to a (A) marine plant, (B) FHA, or (C) Fish passages may be subject to an approval or notification process. | The investigation area does not include tidal waterways or marine plants | None |
| **Building waterway barriers**<br>This includes fresh and tidal water, permanent and temporary dams, weirs or other structures that form a barrier or interference to the flow of water (and therefore fish passage).<br>*Fisheries Act 1994* | Waterway identified as a low/moderate mapped WWBW waterway. A permit is required for works within a WWBW waterway, unless the works can meet the accepted development requirements. No earthworks are required within the creek so no Waterway Barrier Works permit is required. | None |
| **Riverine protection**<br>Activities within natural watercourses (non-tidal), wetlands, lakes and springs. Typically only applies to fresh water systems.<br>*Water Act* | Waterway identified as Drainage line under the Qld Water Act 2000. No works within the creek are proposed so the provisions of this Act do not apply to works. | None |
| **Matters of national environmental significance** (MNES) includes world/national heritage parks/wetlands, nationally threatened species, ecological communities and migratory species.<br>*Environment Protection and Biodiversity Conservation Act 1999* | Protected Matters search completed – refer Appendix B. A number of MNES are modelled as occurring within/near the study area however a likelihood of occurrence based on the results of the site surveys determined that no MNES would utilise the project area on a regular basis. | None |
| **Impacts to plant communities under the vegetation management framework**<br>*Vegetation Management Act 1999* | Existing vegetation within the study area includes both Category X (non-assessable) and a small amount of Category B vegetation under the Qld *Vegetation Management Act 1999*. No clearing of Category B vegetation is proposed so no referral or approval is required for this matter. | None |
| **Impacts to Protected Plants**<br>*Nature Conservation Act 1994* | Study area falls within Protected Plants Flora Survey trigger (PPFST) area however no protected plants were detected during surveys. | None |

| Statutory trigger | Assessment and Permits/Approvals | Actions |
|---|---|---|
| **Weeds and Pests**<br>*Biosecurity Act 2014* | A high diversity of weeds were recorded during surveys - Restricted Matter under the Qld *Biosecurity Act 2014*. Management of weeds during construction must be undertaken to ensure that no spread of these species occurs. All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter. | Implement CEMP |
| **Impacts on Native Fauna**<br>*Nature Conservation Act 1994* | Habitat trees were detected within the works area, mature trees providing breeding / nesting opportunities for native fauna and should be inspected by a spotter catcher prior to works commencing.<br>All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter.<br>A Species Management Program may be required for disturbance to breeding places (eg. nests, frog habitat). This should be determined during the spotter catcher pre-clearing surveys. | Implement CEMP<br>Spotter Catcher pre-clearing survey to check SMP requirement |
| **Koala Conservation SEQ**<br>*Planning Act 2016* | The study area contains vegetation mapped as Core Koala Habitat but is not within a Koala Priority Area under the provisions of the Qld Koala Conservation Plan. Clearing is regulated and assessed under State Code 25 by SARA. Development may require offsets and clearing should be undertaken in accordance with SARA conditions and NCA sequential clearing provisions. | Implement CEMP and SARA conditions |
| **Flying-foxes**<br>*Nature Conservation Act* | No registered DETSI flying fox roosts are recorded within a 1km radius of the study area.<br>- | None |
| **Red fire ant**<br>*Biosecurity Act* | The study area is within the Fire ant biosecurity zone 2. Works are to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter. | Implement CEMP |
| **Acid Sulfate Soils (ASS) and Potential Acid Sulfate Soils (PASS)** | The study area is not mapped as containing Acid Sulfate Soils (ASS) or Potential Acid Sulfate Soils (PASS). | None |
| **Erosion & sediment control management**<br>*Environmental Protection Act* | All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter. | Implement CEMP |
| **Dust**<br>*Environmental Protection Act* | All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter. | Implement CEMP |
| **Waste management**<br>*Environmental Protection Act* | All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses this matter. | Implement CEMP |
| **Noise and Light**<br>*Environmental Protection Act* | All works to be undertaken in accordance with a Construction Environmental Management Plan that addresses these matters. | Implement CEMP |

# 6. Conclusions

This report provides the results of an Ecological Site Assessment for a proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380).

Field surveys were undertaken during February and March 2026. Two (2) vegetation associations were classified and mapped across the site including:

- Vegetation Unit A – Urban Woodland and Anthropogenic Grassland; and
- Vegetation Unit B – Disturbed Riparian Woodland.

Due to historical and ongoing land management, existing vegetation does not represent the structure of remnant vegetation based on the Qld Herbarium benchmark criteria for the preclearing regional ecosystems.

A total of 142 species of flora were detected during the surveys, including 72 non-native species, eight (8) of which are Restricted Invasive Plants under *Biosecurity Act 2016*. No conservation significant flora species were detected on-site.

Twenty-one fauna species were observed within the subject site during surveys, including two (2) amphibian species, one (1) reptile species, fourteen (14) bird species and four (4) mammal species. No conservation significant species of fauna were encountered on-site, nor was any direct or indirect evidence observed that would suggest the site is utilised by conservation significant fauna species.

The proposed development layout retains part of the site's vegetation within a reserve and common area protecting the waterbody, riparian habitat, waterway buffers and koala habitat.

The proposed development has avoided and minimised impacts on mapped Core Koala Habitat Areas as much as reasonably possible, and clearing of some koala habitat will be required to facilitate the development. The site is not within a Koala Priority Area and no evidence of koala activity was detected. The Koala Habitat Values Assessment (Burchills, 2026) found that the site is isolated and disconnected in the local landscape so values are limited to stepping stone / dispersal habitat. The habitat values for the koala and other fauna will be improved through restoration of the central riparian corridor that will be protected as open space.

In summary, the proposed development satisfactorily complies with the relevant performance outcomes of the Gold Coast City Plan Environmental Significance Overlay Code with potential impacts minimised as reasonably possible and residual impacts mitigated through the delivery of an offset compliant with the *Environmental Offsets Act 2014.*

# 7. Definitions

| | |
|---|---|
| **DAF** | Queensland Department of Agriculture and Fisheries |
| **DBH** | Diameter at Breast Height |
| **DETSI** | Department of Environment, Tourism, Science and Innovation |
| **EHP** | Queensland Department of Environment and Heritage Protection (now DES) |
| **EPBCA** | *Environmental Protection and Biodiversity Conservation Act 1999* |
| **EVNT** | Endangered, Vulnerable or Near Threatened |
| **EOA** | *Environmental Offsets Act 2014* |
| **Koala SPRP** | Koala State Planning Regulatory Provisions |
| **MES** | Matters of Environmental Significance |
| **MLES** | Matters of Local Environmental Significance |
| **MNES** | Matters of National Environmental Significance |
| **MSES** | Matters of State Environmental Significance |
| **NCA** | *Nature Conservation Act 1992* |
| **NJKHT** | *Non-Juvenile Koala Habitat Tree* |
| **PPFST** | Protected Plants Flora Survey Trigger Map |
| **RE** | Regional Ecosystem |
| **RVM** | Regulated Vegetation Map |
| **SARA** | State Assessment Referral Agency |
| **KSAT** | Koala Spot Assessment Technique |
| **SDAP** | State Development Assessment Provisions |
| **SEQKPA** | South East Queensland Koala Protection Area |
| **SPP** | State Planning Policy |
| **SPRP** | State Planning Regulatory Provisions |
| **VMA** | *Vegetation Management Act 1999* |
| **VMS Map** | Vegetation Management Support Map |

# 8. References

Australian Koala Foundation (AKF) (2015). National Koala Tree Planting List. Online resource. <https://www.savethekoala.com/sites/savethekoala.com/files/uploads/20150212_AKF_National_Koala_Tree_Planting_List.pdf> Accessed April 2021

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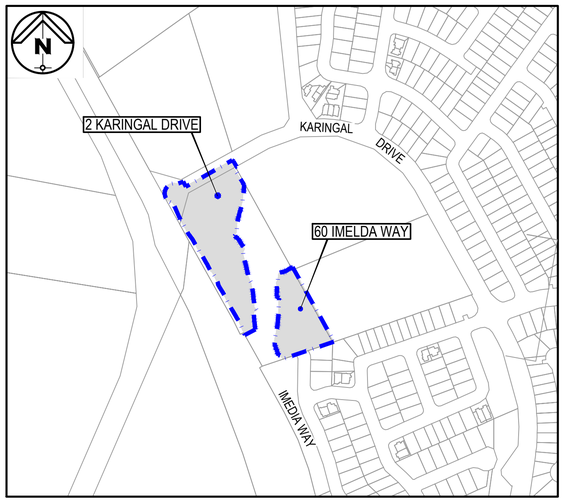
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Thomas, Evan (2006). *Gold Coast Soil Association Map*. Prepared for Gold Coast City Council.

# Appendix A – Proposed Plan of Development and Earthworks

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

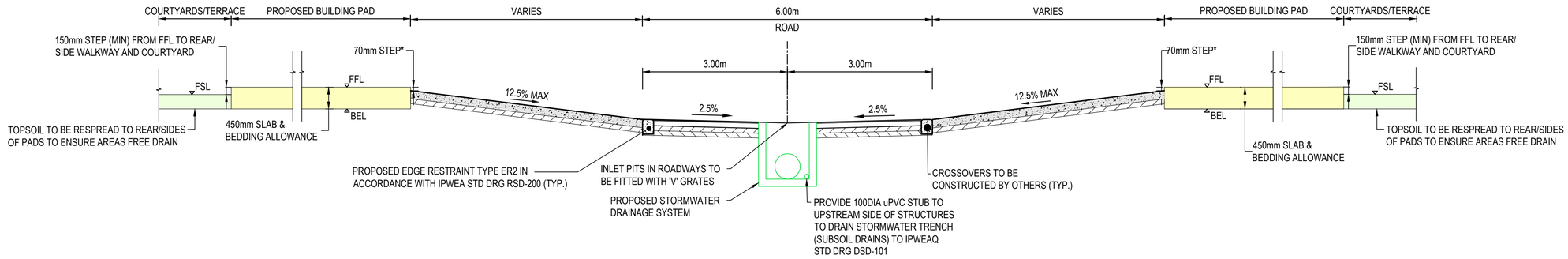
BOS

PREPARED BY

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ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

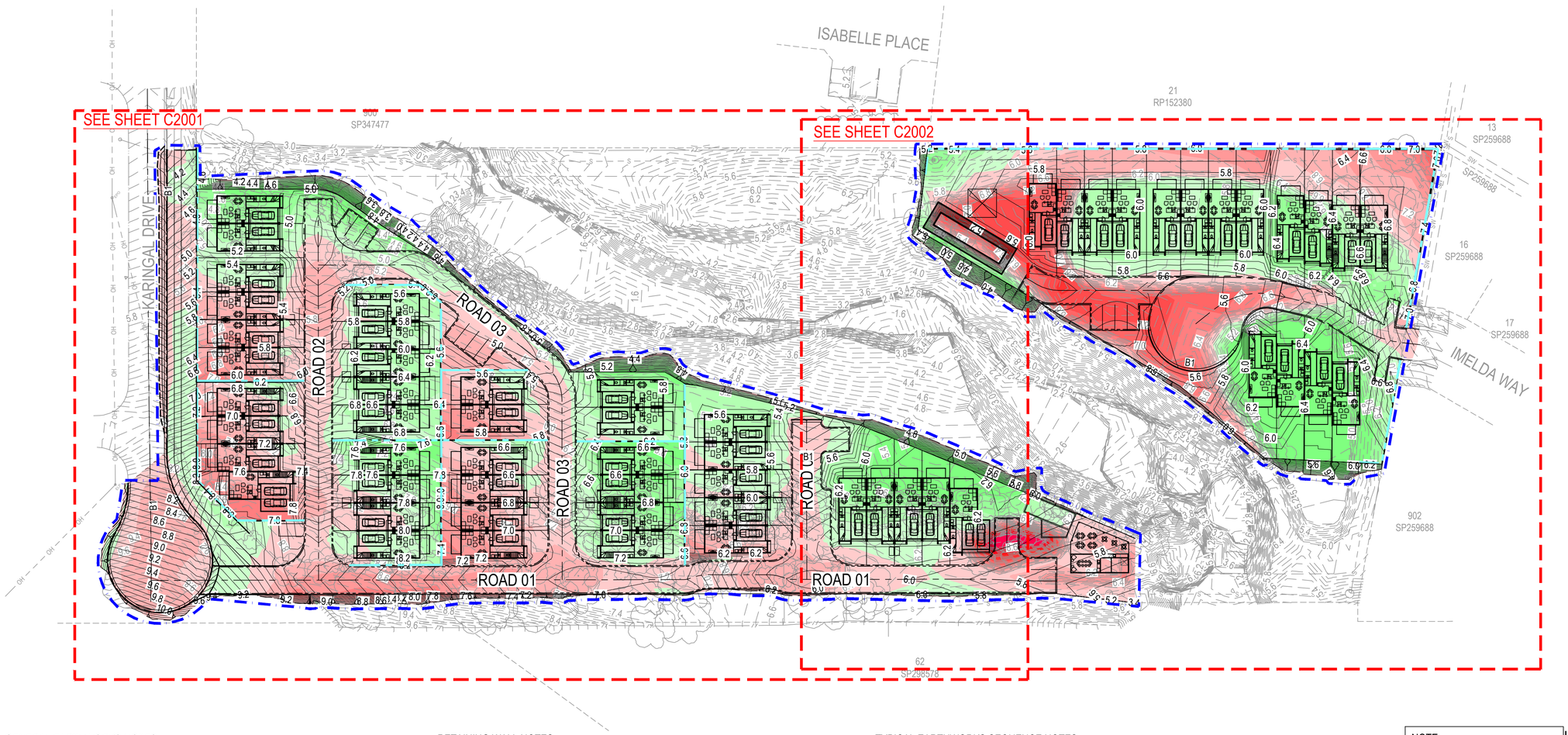
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

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| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRm EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

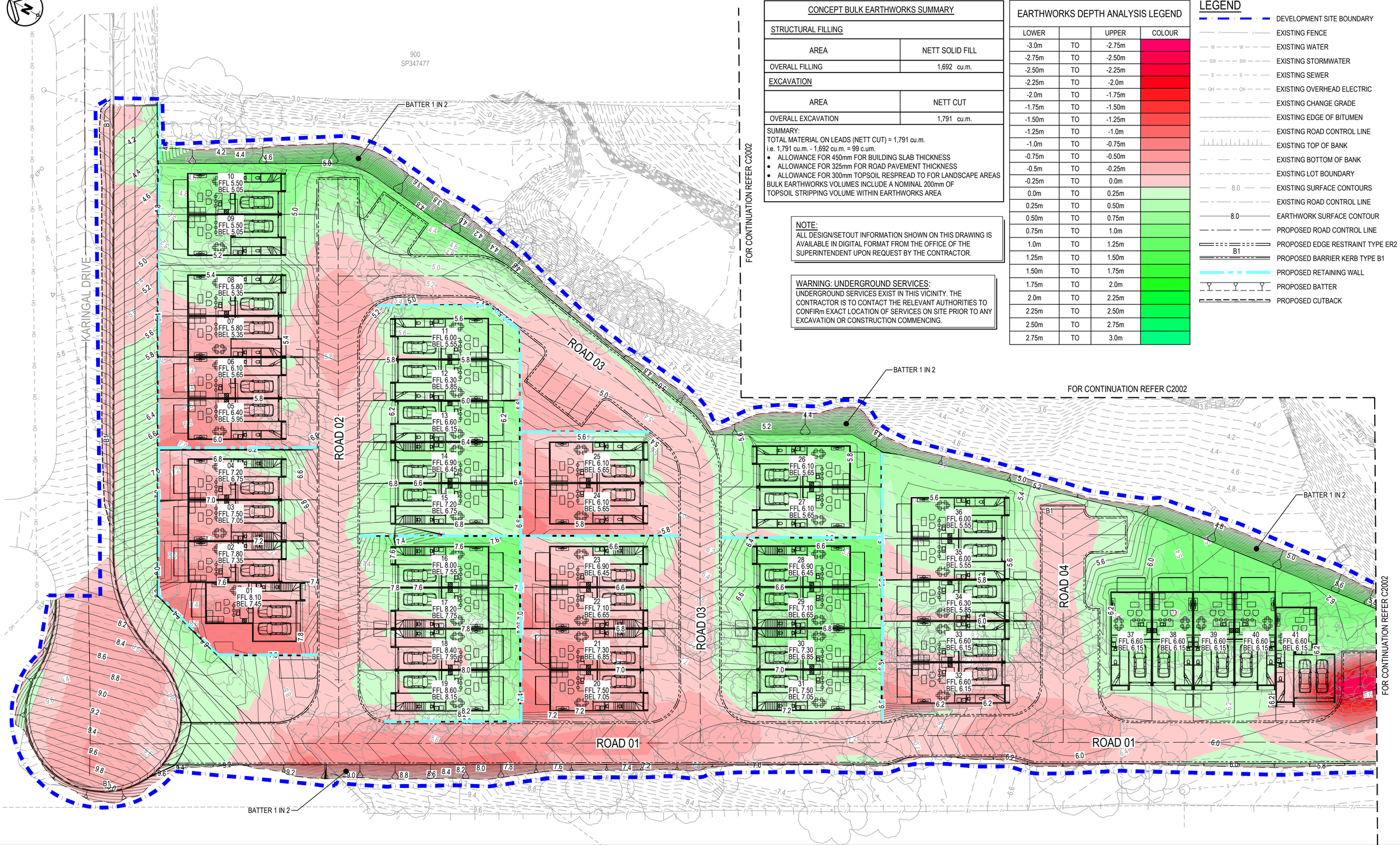
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

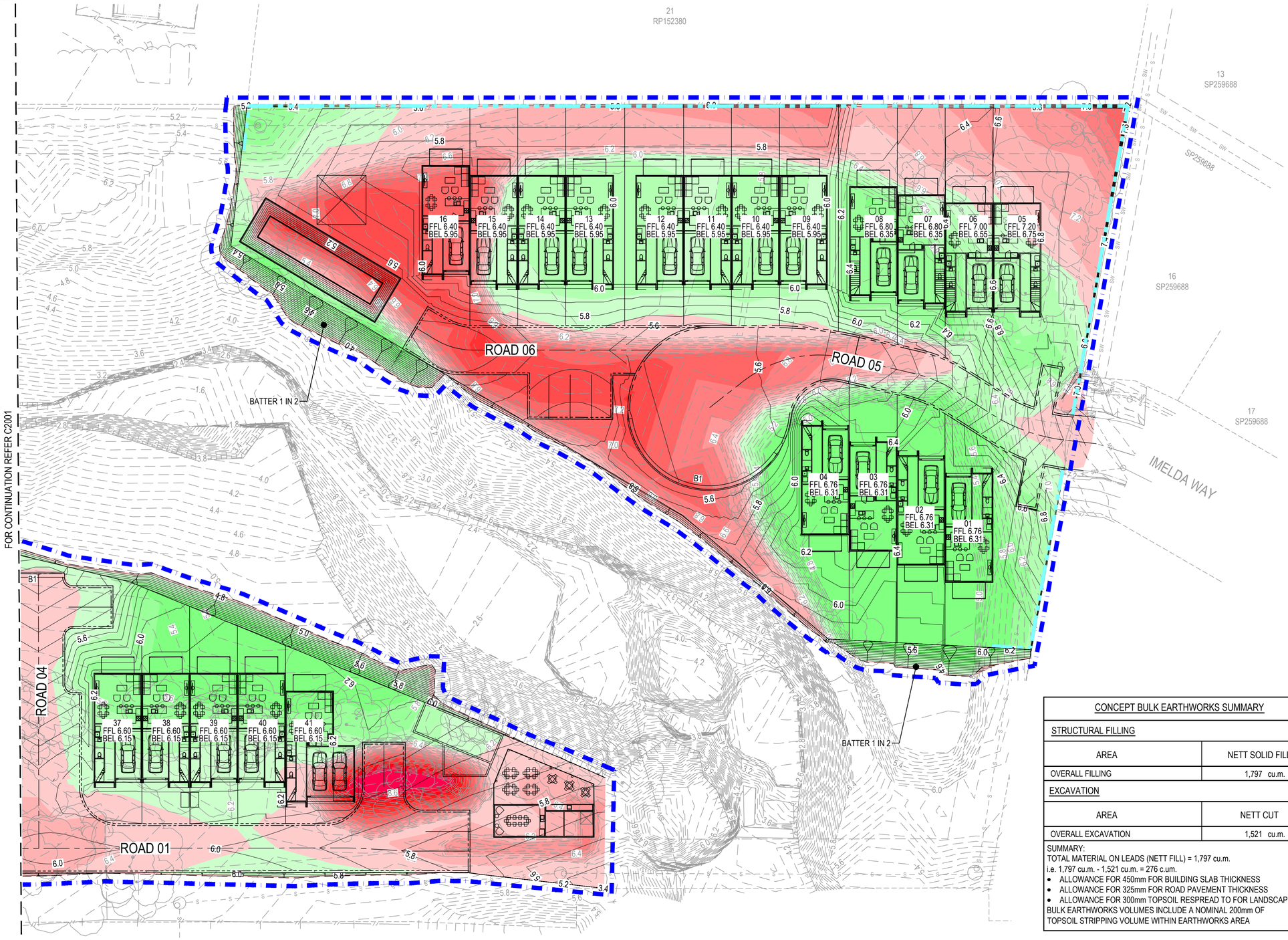
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

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|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

**WARNING: UNDERGROUND SERVICES:**
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

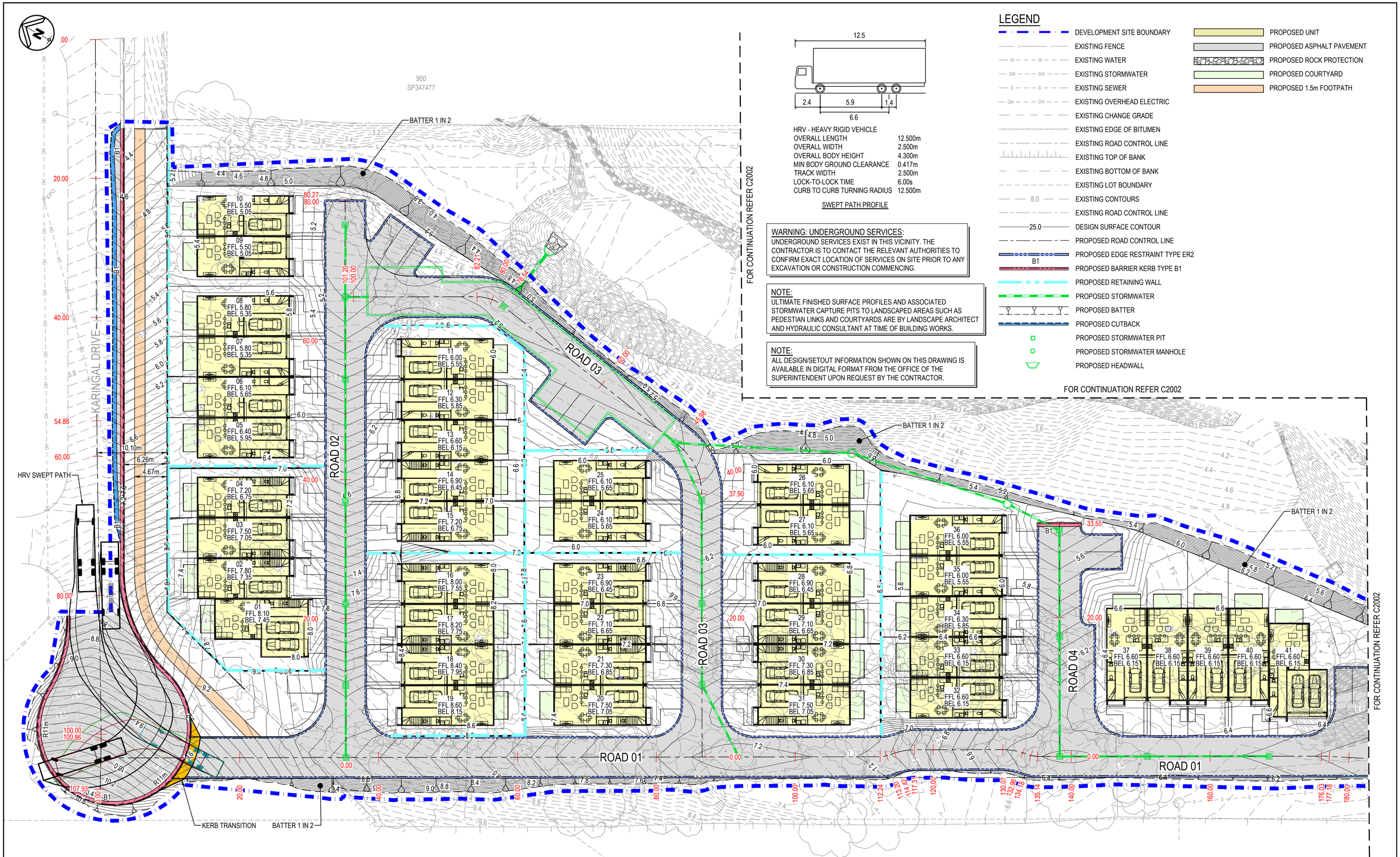
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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| BE20023 | C3000 | A |




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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

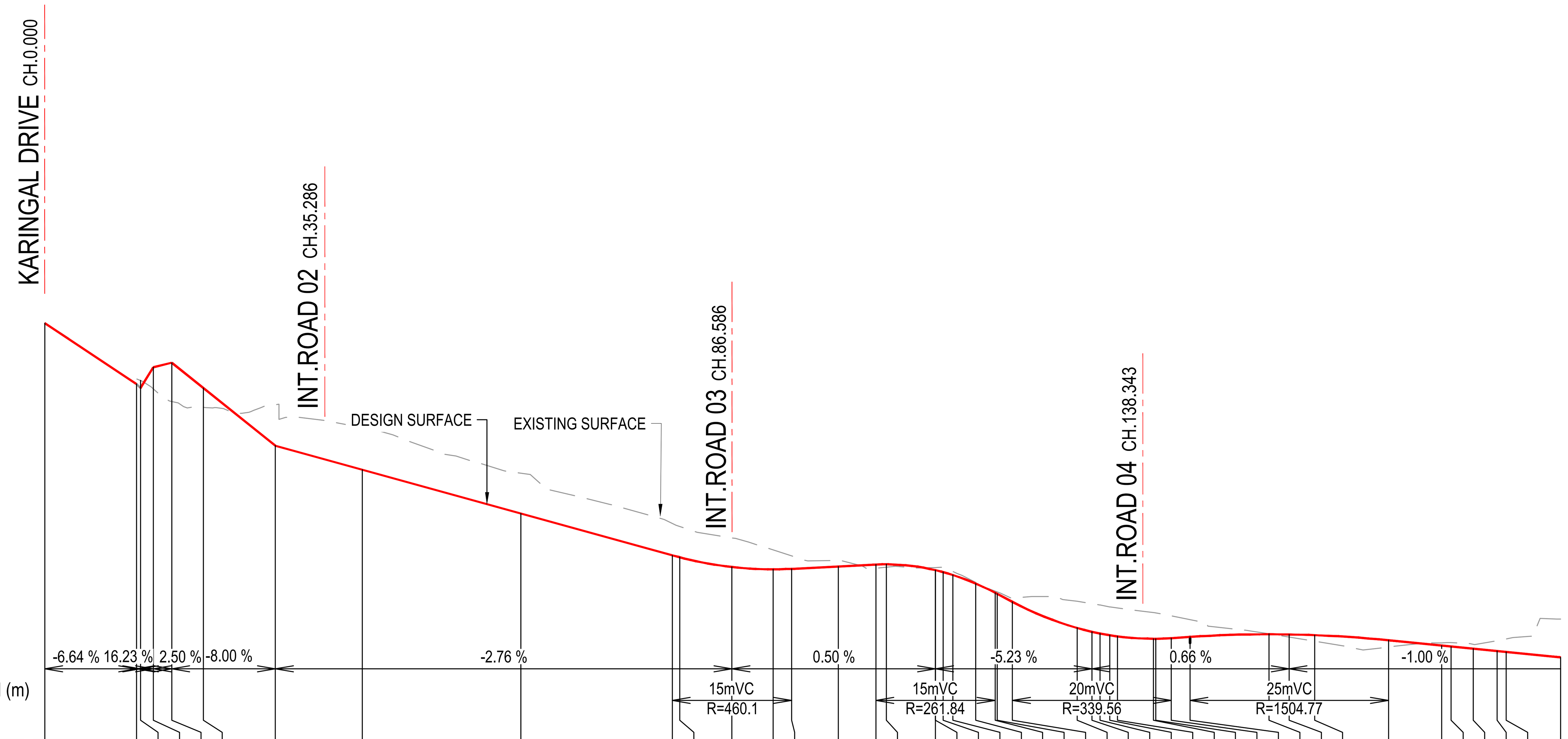
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |




| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | 0.000 | 10.252 | 10.252 |
| 11.575 | 0.007 | 9.483 | 9.476 |
| 12.065 | -0.097 | 9.434 | 9.531 |
| 13.674 | 0.270 | 9.695 | 9.425 |
| 16.000 | 0.490 | 9.753 | 9.263 |
| 20.000 | 0.241 | 9.433 | 9.192 |
| 29.066 | -0.518 | 8.708 | 9.226 |
| 40.000 | -0.532 | 8.406 | 8.938 |
| 60.000 | -0.508 | 7.854 | 8.362 |
| 79.086 | -0.401 | 7.327 | 7.728 |
| 80.000 | -0.387 | 7.303 | 7.690 |
| 86.586 | -0.366 | 7.181 | 7.548 |
| 91.784 | -0.244 | 7.152 | 7.396 |
| 94.086 | -0.164 | 7.158 | 7.322 |
| 100.000 | -0.077 | 7.187 | 7.264 |
| 104.736 | 0.044 | 7.211 | 7.166 |
| 106.045 | 0.035 | 7.214 | 7.179 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 113.201 | -0.054 | 7.116 | 7.170 |
| 114.416 | -0.042 | 7.080 | 7.122 |
| 117.312 | -0.013 | 6.972 | 6.985 |
| 119.736 | -0.020 | 6.856 | 6.876 |
| 120.000 | -0.024 | 6.842 | 6.866 |
| 121.932 | -0.050 | 6.741 | 6.792 |
| 130.067 | -0.335 | 6.414 | 6.749 |
| 131.932 | -0.354 | 6.366 | 6.720 |
| 132.963 | -0.357 | 6.344 | 6.701 |
| 134.178 | -0.356 | 6.322 | 6.678 |
| 135.143 | -0.356 | 6.308 | 6.663 |
| 139.686 | -0.331 | 6.277 | 6.608 |
| 140.000 | -0.326 | 6.277 | 6.603 |
| 141.932 | -0.282 | 6.285 | 6.566 |
| 144.300 | -0.219 | 6.300 | 6.519 |
| 154.254 | -0.005 | 6.333 | 6.339 |
| 156.800 | 0.033 | 6.331 | 6.298 |
| 160.000 | 0.076 | 6.322 | 6.246 |
| 169.300 | 0.085 | 6.258 | 6.173 |
| 176.025 | -0.036 | 6.191 | 6.226 |
| 177.175 | -0.048 | 6.179 | 6.227 |
| 180.000 | -0.057 | 6.151 | 6.208 |
| 182.986 | -0.132 | 6.121 | 6.253 |
| 184.136 | -0.166 | 6.110 | 6.276 |
| 191.003 | -0.486 | 6.041 | 6.527 |

HORIZIONTALGEOMETRY

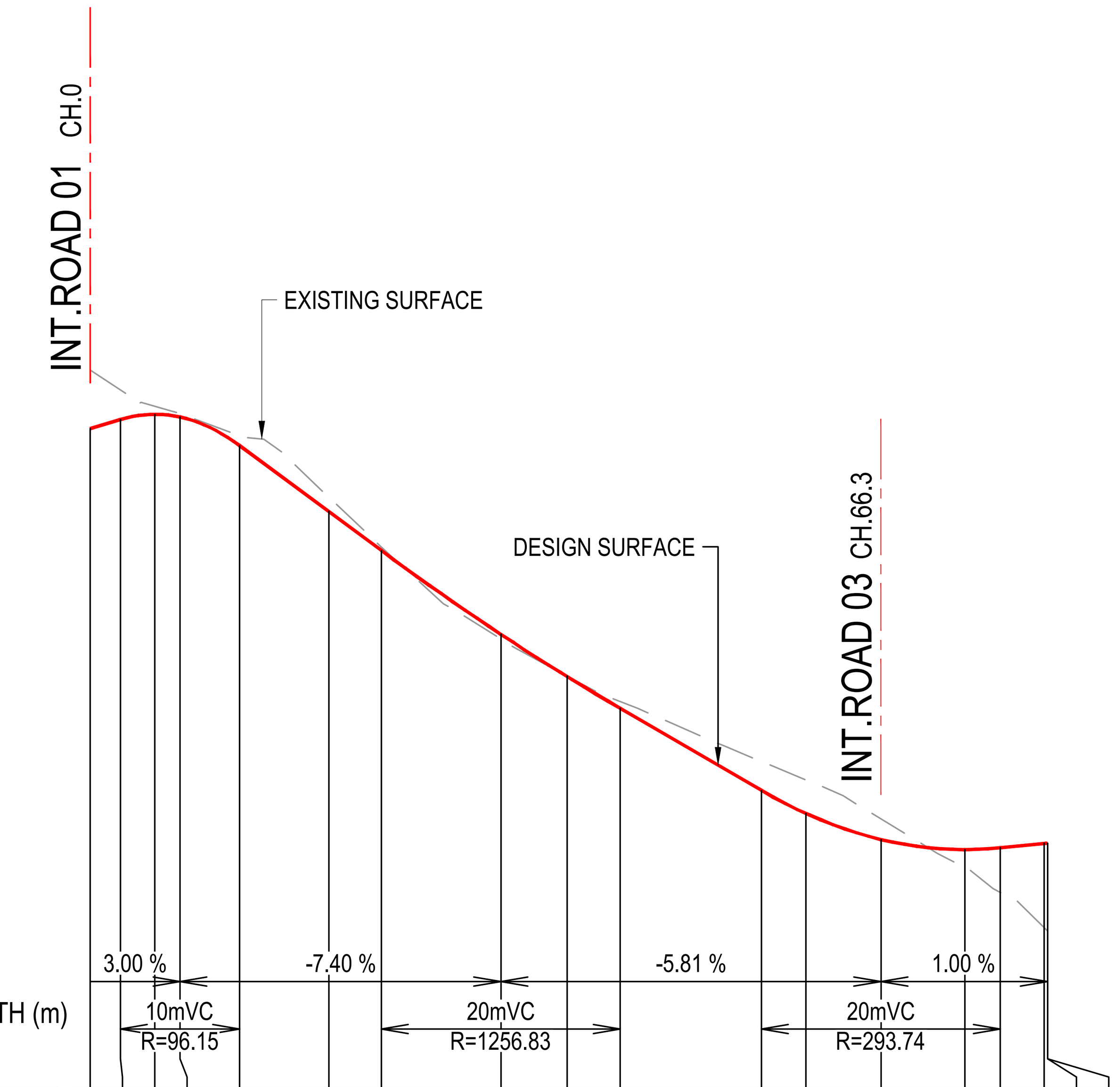
R-3.00m R9.00m 0.97m 2.90m

R9.00m R-3.00m 2.90m 0.97m

R20.00m R-20.00m 1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | | 8.536 | |
| 2.535 | -0.248 | 8.612 | 8.859 |
| 5.419 | -0.068 | 8.655 | 8.723 |
| 7.535 | -0.026 | 8.632 | 8.658 |
| 12.535 | -0.083 | 8.392 | 8.475 |
| 20.000 | -0.123 | 7.839 | 7.962 |
| 24.434 | -0.030 | 7.511 | 7.541 |
| 34.434 | 0.040 | 6.811 | 6.771 |
| 40.000 | -0.004 | 6.456 | 6.460 |
| 44.434 | -0.056 | 6.190 | 6.246 |
| 56.300 | -0.243 | 5.501 | 5.745 |
| 60.000 | -0.281 | 5.309 | 5.591 |
| 66.300 | -0.173 | 5.090 | 5.264 |
| 73.363 | 0.150 | 5.006 | 4.855 |
| 76.300 | 0.373 | 5.020 | 4.648 |
| 80.000 | 0.708 | 5.057 | 4.349 |
| 80.266 | 0.737 | 5.060 | 4.322 |
| 80.274 | | | 4.322 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

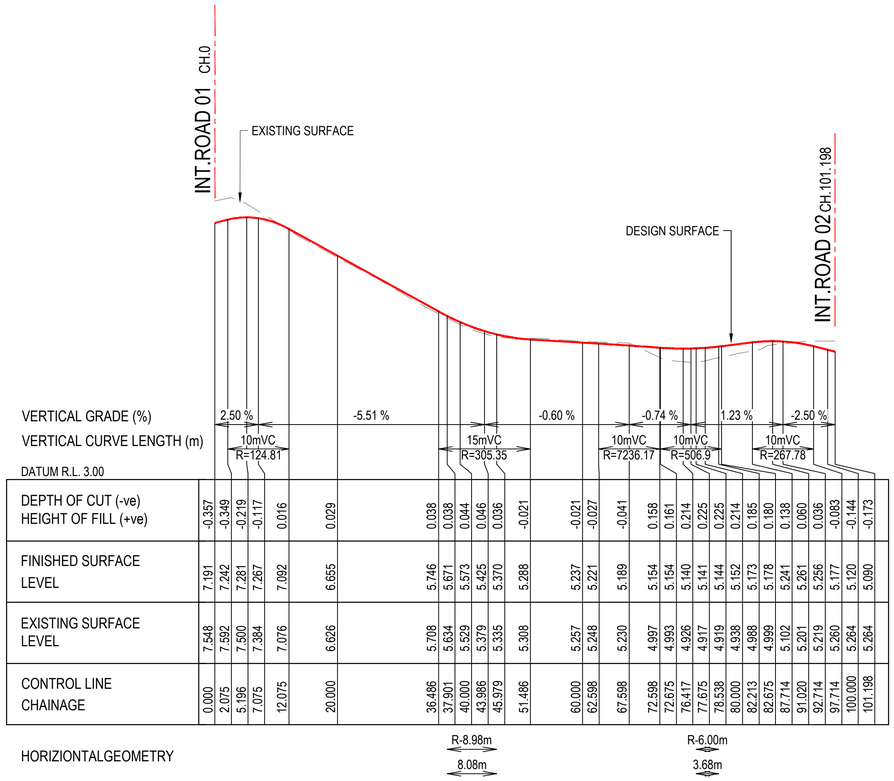
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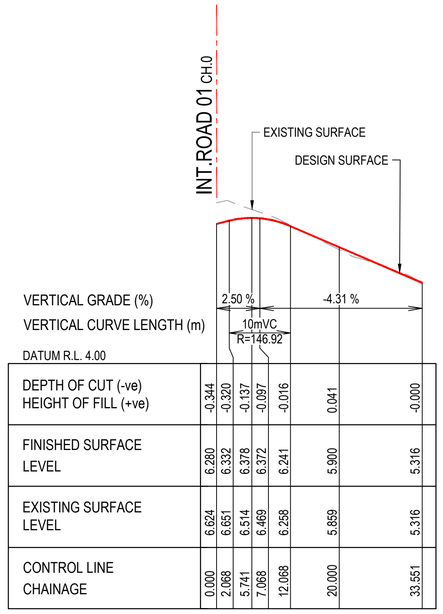
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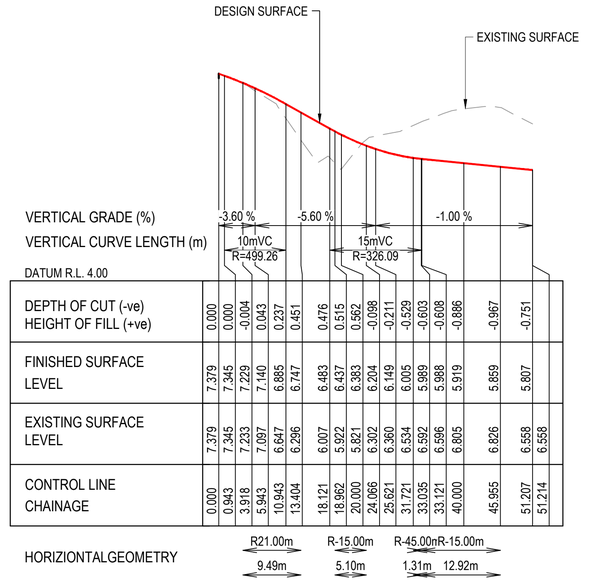

## ROAD 03 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)

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DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

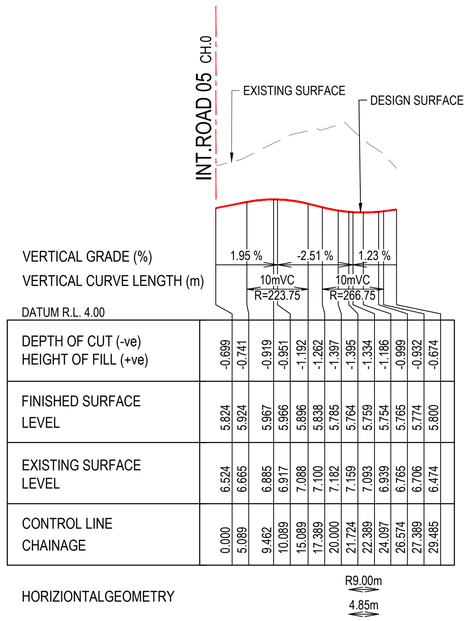
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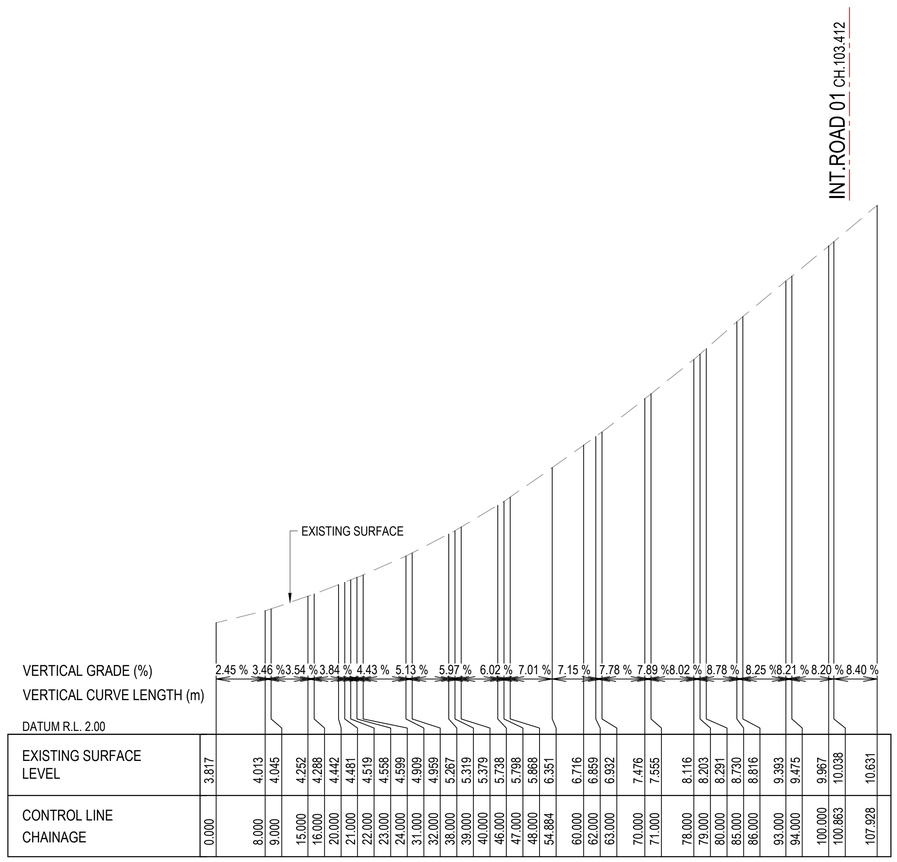
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## ROAD 06 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)


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CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

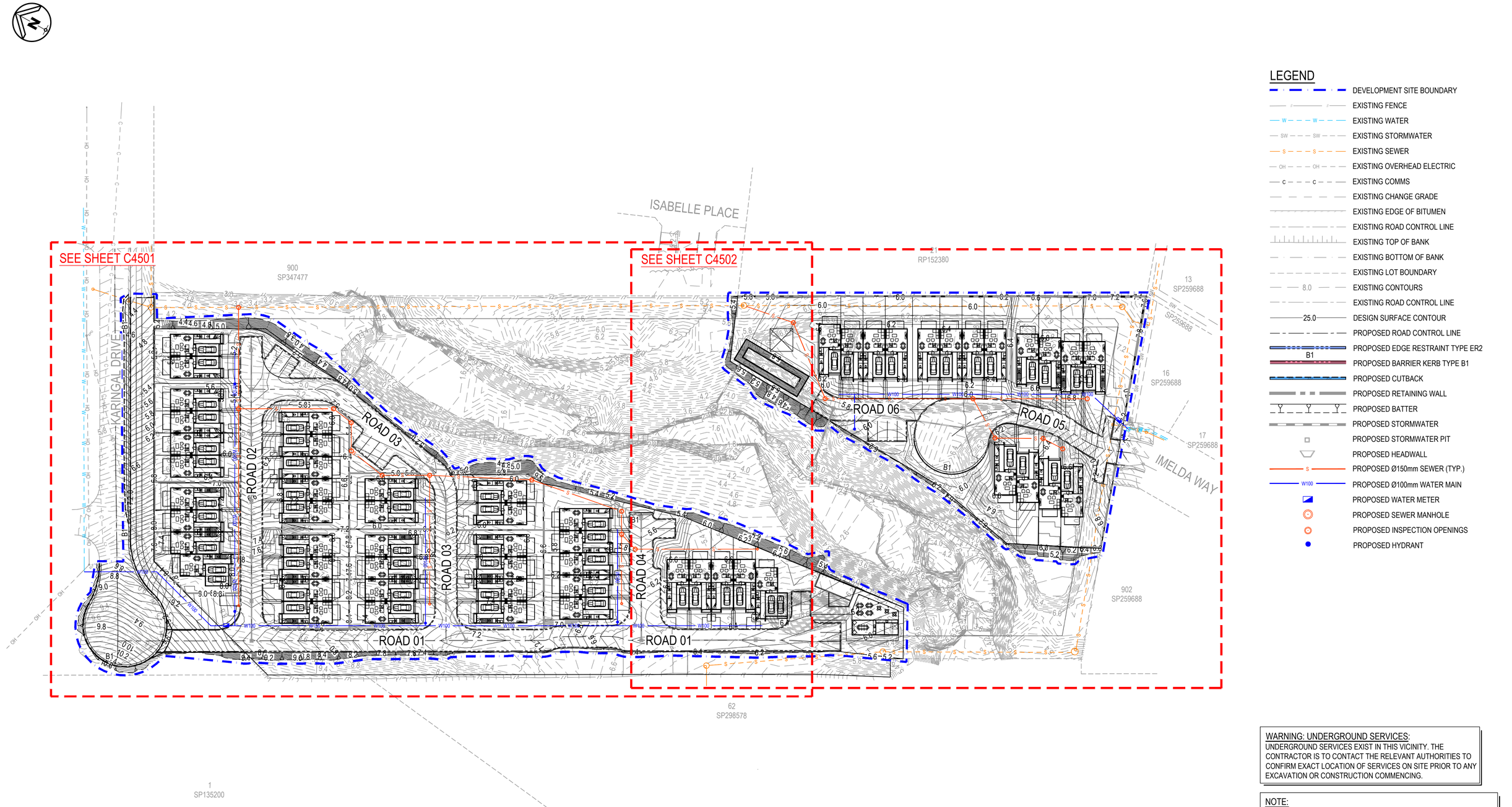
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SCALE AT FULL SIZE (A1) :

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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3202 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED HEADWALL
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
- PROPOSED WATER METER
- PROPOSED SEWER MANHOLE
- PROPOSED INSPECTION OPENINGS
- PROPOSED HYDRANT

**WARNING: UNDERGROUND SERVICES:**
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CLIENT : BOS

DRAWING TITLE : OVERALL SEWER AND WATER RETICULATION

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

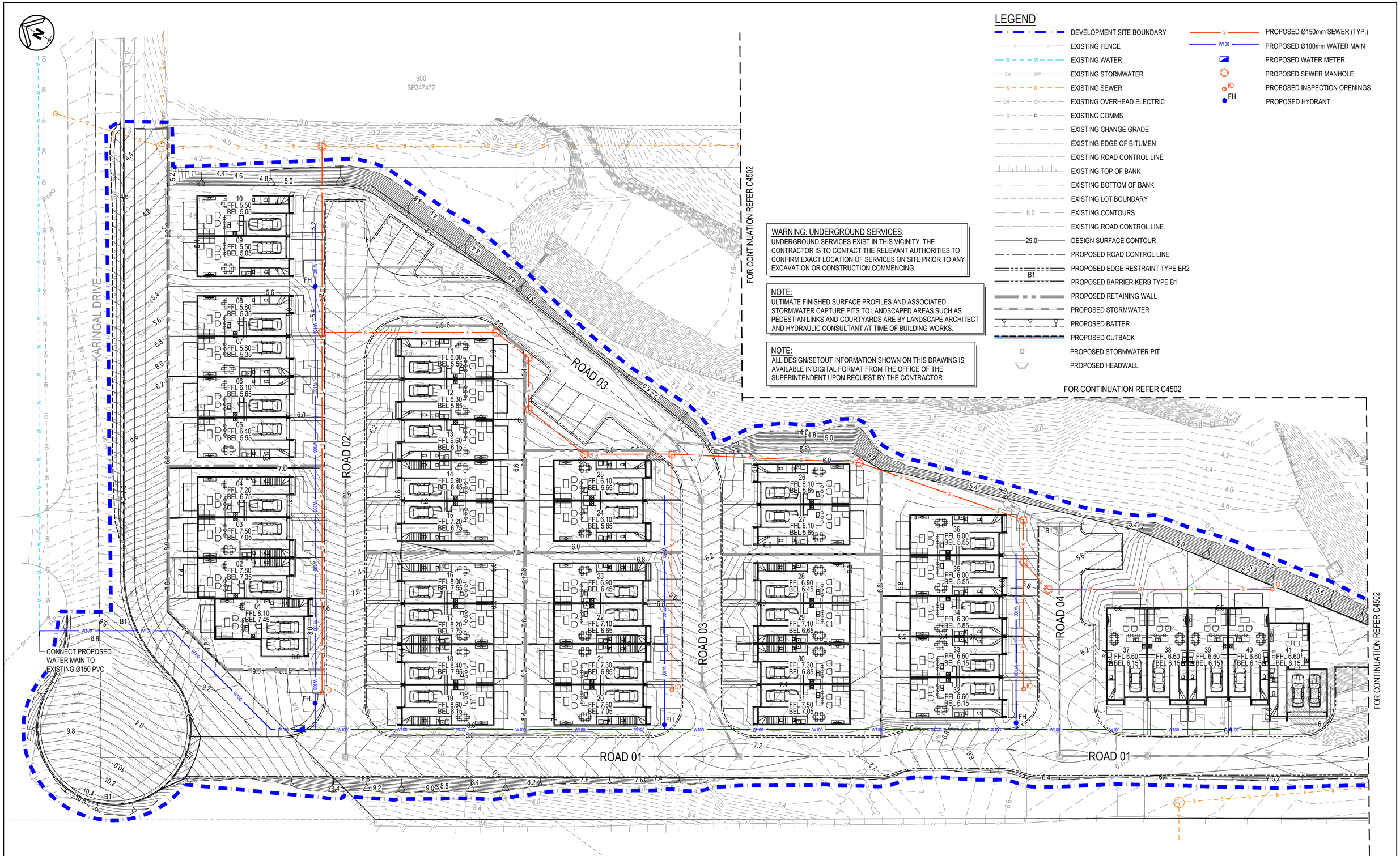
PRELIMINARY
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SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
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CLIENT :

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DRAWING TITLE :

SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 1 OF 2

PROJECT :

2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C4501 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
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- PROPOSED STORMWATER
- PROPOSED HEADWALL
- PROPOSED STORMWATER PIT
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
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- PROPOSED INSPECTION OPENINGS
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CLIENT : BOS

DRAWING TITLE :
SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
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# QMS RISK & OPPORTUNITIES REGISTER
# SAFETY IN DESIGN – NORMAL DESIGN RISKS - CIVIL

| Design Element | Associated risks & opportunities | Raw risk assessment | | Raw risk rating | Treatment Measures to avoid, minimize or treat the risk. | Responsibility | Residual risk rating |
|---|---|---|---|---|---|---|---|
| | | Likelihood | Consequence | | | | |
| **CONSTRUCTION PHASE** | | | | | | | |
| **SITE ACCESS** | Unsafe site access and egress point, restricted access, flooding, unauthorised access from persons or animals | L | M | L-M | Prepare site specific Construction Traffic Management Plan and Workplace Health and Safety Management Plan | Principal Contractor | L |
| **CLEARING & DEMOLITION** | Removal of existing structures, decommision of services, vegetation clearing and fauna management | M | H | M-H | Contractor to obtain Demolition Permit, arrange all service disconnections with asset ownerand carry out vegetation works in accordance with Vegetation and Fauna Management Plan | Principal Contractor | L |
| **EXISTING SERVICES** | Distrub or damage existing services and infrastructure, overhead powerlines, work adjacent to existing services, existing service relocations | M | H | M-H | Client to commission detailed site survey and service potholing at critical locations. Contractor to undertake Dial Before You Dig and service verification with service authoritiy providers and undertake additional potholing prior to construction | Client and Principal Contractor | L-M |
| **EXCAVATION & TRENCHING** | Unstable existing slopes and landslip, steep cut profiles, deep trench excavations, working at heights, intercept water table, dispersive soils, acid sulphate soils | M | H | M-H | Client to commission a geotechnical investigation and contractors to undertake own investigations. Temporary and final earthworks profiles confirmed by client's geotechnical consultant. Tempory earthworks profile to be confirmed by Contractor's geotechnical consultant. Contractor to provide temporary benching, fencing, stabilisation and shoring. | Client and Principal Contractor | L |
| **MATERIALS HANDLING** | Manual handling, handling and disposal of sharps, repeative work processeds, hazardous substances | H | M | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including Material Safety Data Sheets | Principal Contractor | L |
| **PLANT & EQUIPMENT** | Operation of plant and machinery, site access by visitors, material deliveries and waste removal | M | H | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including register of operator machinery tickets. Contractor to maintain a site visitor register and provide site specific induction to all visitors | Principal Contractor | L |
| **OPERATIONAL PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | General road safety, flood free access, pedestrian and cyclist injuries, inadequate signage | L | H | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **STORWATER / FLOODING** | Hazard from storm and flood water depths and velocities, ponding and access to inlets, outlets and basins | M | H | M-H | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WATER & SEWER** | Blockages, contamination, interuption to service, access to fittings, confined space access | L | M | L-M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WALLS & FENCING** | Risk of falls, unauthoried access from persons and animals, structural failure | M | M | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **MAINTENANCE PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **REFURBISHMENT PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **DEMOLITION PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |


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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : HAZARD RISK REGISTER - DESIGN RISKS

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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SCALE AT FULL SIZE (A1) :

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DRAFTSPERSON : BNB | CHECKED : -

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# Appendix B – Desktop Review Search Results

Queensland Government

**Department of the Environment, Tourism, Science and Innovation**

Environmental Reports

# Matters of State Environmental Significance

For the selected area of interest

Lot: 19 Plan: RP152380

# Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and a field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@detsi.qld.gov.au

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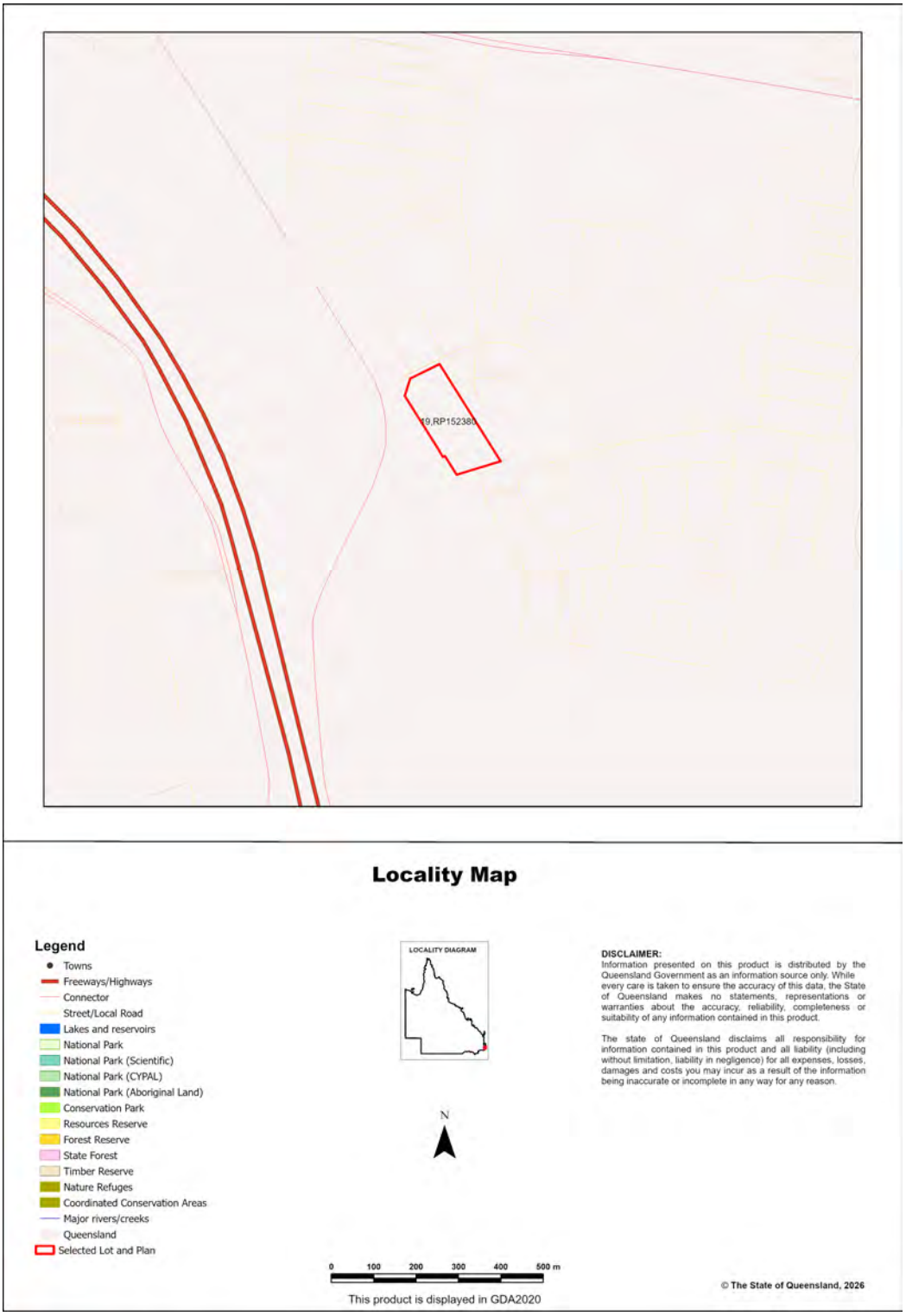

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# Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

**Table 1: Summary table, details for AOI: Lot: 19 Plan: RP152380, with area 2.46 ha**

| Local Government(s) | Catchment(s) | Bioregion(s) | Subregion(s) |
|---|---|---|---|
| Gold Coast City | South Coast | Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| | | Southeast Queensland | Burringbar - Conondale Ranges |



# Matters of State Environmental Significance (MSES)

## MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992;*

*- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the Marine Parks Act 2004 ;*

*- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;*

- *Threatened wildlife under the Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

  - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
  - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
  - Category R areas on the regulated vegetation management map;
  - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
  - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

## MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

**Table 2: Summary of MSES present within the AOI**

| | | |
|---|---|---|
| 1a Protected Areas- estates | 0 ha | 0.0% |
| 1b Protected Areas- nature refuges | 0 ha | 0.0% |
| 1c Protected Areas- special wildlife reserves | 0 ha | 0.0% |
| 2 State Marine Parks- highly protected zones | 0 ha | 0.0% |
| 3 Fish habitat areas (A and B areas) | 0 ha | 0.0% |
| 4 Strategic Environmental Areas (SEA) | 0 ha | 0.0% |
| 5 High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values | 0 ha | 0.0% |
| 6a High Ecological Value (HEV) wetlands | 0 ha | |
| 6b High Ecological Value (HEV) waterways | 0 km | Not applicable |
| 7a Threatened (endangered or vulnerable) wildlife | 0 ha | 0.0% |
| 7b Special least concern animals | 0 ha | 0.0% |
| 7c i Koala habitat area - core (SEQ) | 0.36 ha | 14.6% |
| 7c ii Koala habitat area - locally refined (SEQ) | 0 ha | 0.0% |
| 7d Sea turtle nesting areas | 0 km | Not applicable |
| 8a Regulated Vegetation - Endangered/Of concern in Category B (remnant) | 0.06 ha | 2.4% |
| 8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth) | 0 ha | 0.0% |
| 8c Regulated Vegetation - Category R (GBR riverine regrowth) | 0 ha | 0.0% |
| 8d Regulated Vegetation - Essential habitat | 0.01 ha | 0.4% |
| 8e Regulated Vegetation - intersecting a watercourse | 0.5 km | Not applicable |
| 8f Regulated Vegetation - within 100m of a Vegetation Management Wetland | 0 ha | 0.0% |
| 9a Legally secured offset areas- offset register areas | 0 ha | 0.0% |
| 9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation | 0 ha | 0.0% |

## Additional Information with Respect to MSES Values Present

## MSES - State Conservation Areas

**1a. Protected Areas - estates**

(No results)

**1b. Protected Areas - nature refuges**

(No results)

**1c. Protected Areas - special wildlife reserves**

(No results)

**2. State Marine Parks - highly protected zones**

(No results)

**3. Fish habitat areas (A and B areas)**

(No results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

## MSES - Wetlands and Waterways

**4. Strategic Environmental Areas (SEA)**

(No results)

**5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values**

(no results)

**6a. Wetlands in High Ecological Value (HEV) waters**

(no results)

**6b. Waterways in High Ecological Value (HEV) waters**

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

## MSES - Species

**7a. Threatened (endangered or vulnerable) wildlife**

Not applicable

**7b. Special least concern animals**

Not applicable

**7c i. Koala habitat area - core (SEQ)**

Values are present

**7c ii. Koala habitat area - locally refined (SEQ)**

Not applicable

**7d. Wildlife habitat (sea turtle nesting areas)**

Not applicable

**Threatened (endangered or vulnerable) wildlife habitat suitability models**

| Species | Common name | NCA status | Presence |
|---|---|---|---|
| *Boronia keysii* | Keys boronia | V | None |
| *Calyptorhynchus lathami* | Glossy black cockatoo | V | None |
| *Casuarius casuarius johnsonii* | Sthn population cassowary | E | None |
| *Crinia tinnula* | Wallum froglet | V | None |
| *Denisonia maculata* | Ornamental snake | V | None |
| *Euastacus bindal* | Mount Elliot crayfish | CR | None |
| *Euastacus binzayedi* | | CR | None |
| *Euastacus eungella* | | E | None |
| *Euastacus hystricosus* | | E | None |
| *Euastacus jagara* | Jagara hairy crayfish | CR | None |
| *Euastacus maidae* | | CR | None |
| *Euastacus monteithorum* | | E | None |
| *Euastacus robertsi* | | E | None |
| *Taudactylus pleione* | Kroombit tinkerfrog | E | None |
| *Litoria freycineti* | Wallum rocketfrog | V | None |
| *Litoria olongburensis* | Wallum sedgefrog | V | None |
| *Macadamia integrifolia* | | V | None |
| *Melaleuca irbyana* | swamp tea-tree | E | None |
| *Macadamia ternifolia* | | V | None |
| *Macadamia tetraphylla* | bopple nut | V | None |
| *Petrogale penicillata* | brush-tailed rock-wallaby | V | None |
| *Petrogale coenensis* | Cape York rock-wallaby | E | None |
| *Petrogale purpureicollis* | purple-necked rock-wallaby | V | None |
| *Petrogale sharmani* | Sharmans rock-wallaby | V | None |
| *Petrogale xanthopus celeris* | yellow-footed rock-wallaby (Qld subspecies) | V | None |
| *Petaurus gracilis* | Mahogany Glider | E | None |
| *Petrogale persephone* | Proserpine rock-wallaby | E | None |
| *Phascolarctos cinereus* | Koala - outside SEQ* | E | None |
| *Pezoporus wallicus wallicus* | Eastern ground parrot | V | None |
| *Xeromys myoides* | Water Mouse | V | None |

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

**Threatened (endangered or vulnerable) wildlife species records**

(No results)

**Special least concern animal species records**

(No results)

**Shorebird habitat (critically endangered/endangered/vulnerable)**

Not applicable

**Shorebird habitat (special least concern)**

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

*Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)*

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

## MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

**8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)**

| Regional ecosystem | Vegetation management polygon | Vegetation management status |
|---|---|---|
| 12.3.11 | O-dom | rem_oc |

**8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)**

Not applicable

**8c. Regulated Vegetation - Category R (GBR riverine regrowth)**

Not applicable

**8d. Regulated Vegetation - Essential habitat**

Values are present

**8e. Regulated Vegetation - intersecting a watercourse****

A vegetation management watercourse is mapped as present

**8f. Regulated Vegetation - within 100m of a Vegetation Management wetland**

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

## MSES - Offsets

**9a. Legally secured offset areas - offset register areas**

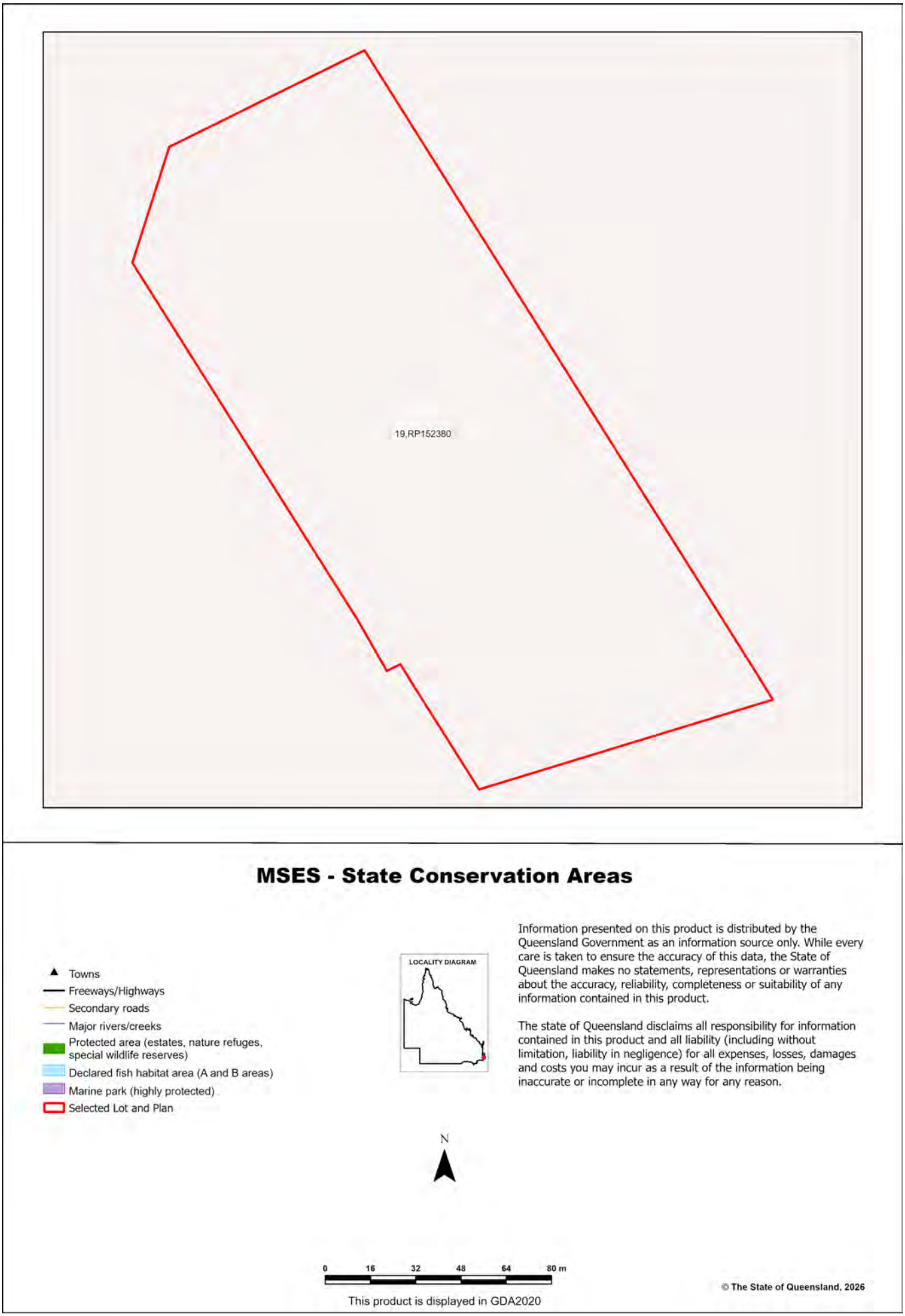
(No results)

**9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation**

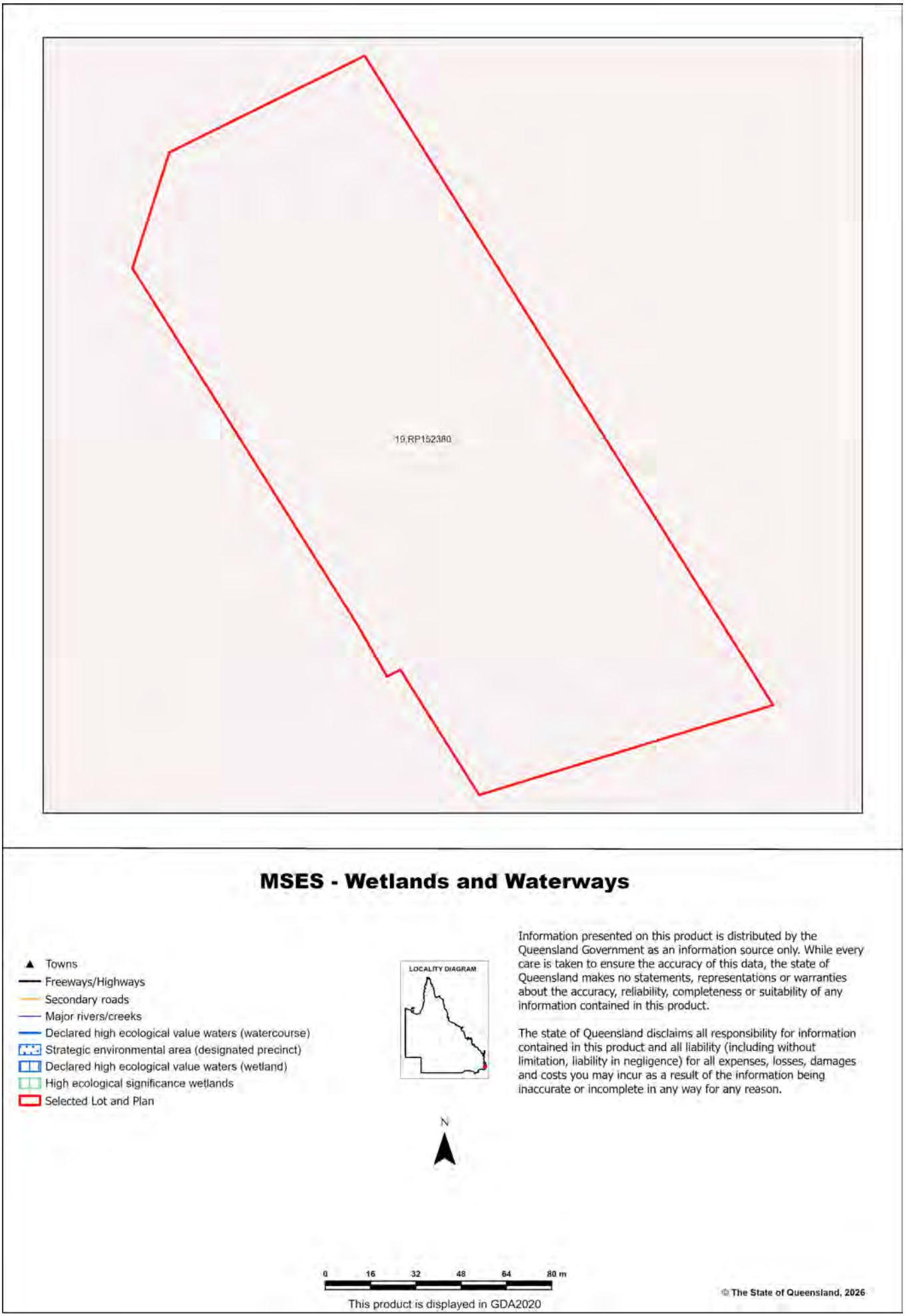
(No results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

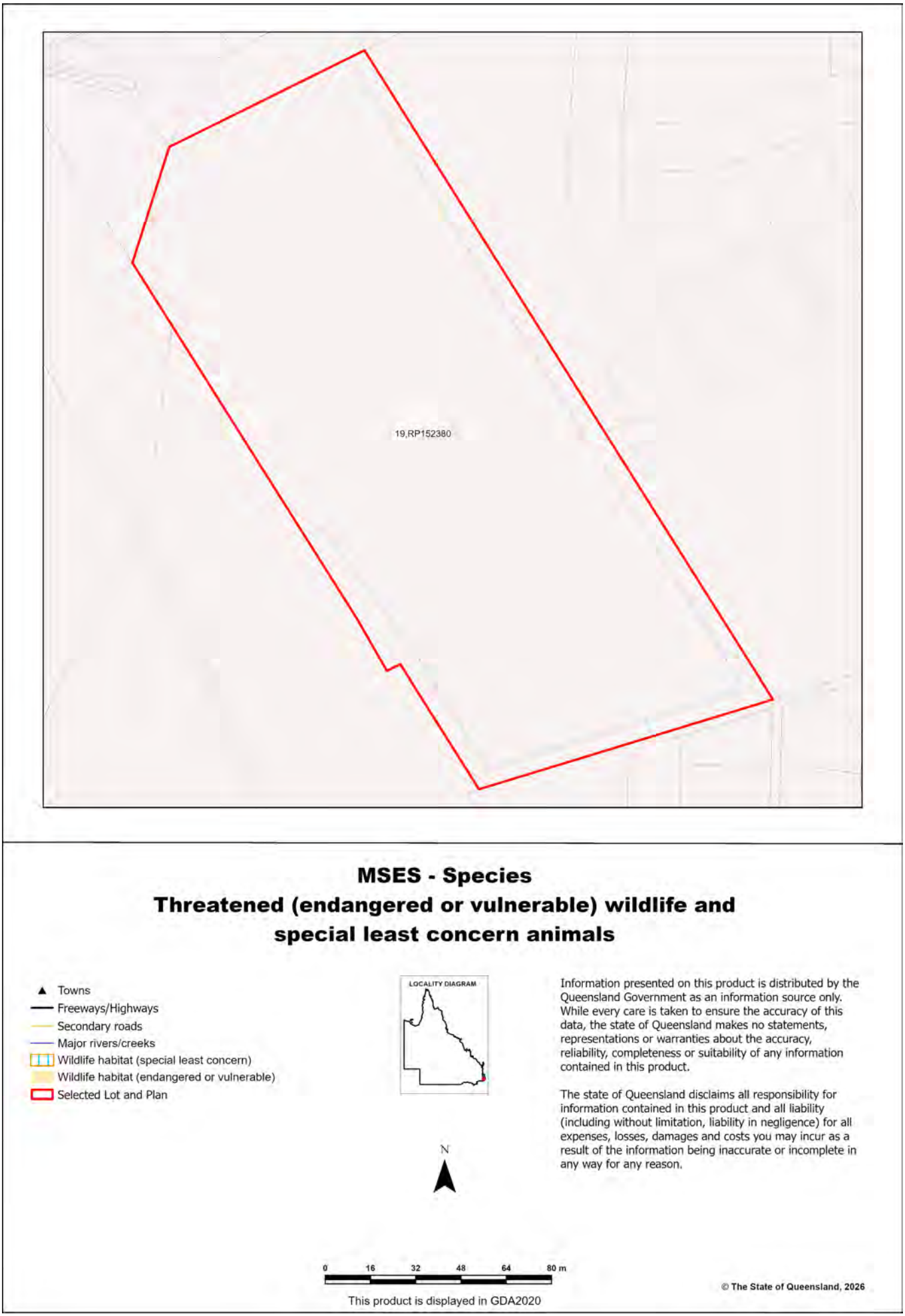
### Map 1 - MSES - State Conservation Areas



**Map 2 - MSES - Wetlands and Waterways**



**Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals**



## Map 3b - MSES - Species - Koala habitat area (SEQ)




### MSES - Species
### Koala habitat area (SEQ)

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)
- Selected Lot and Plan

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 14 28 42 56 70 m

This product is displayed in GDA2020

### Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)




## MSES - Wildlife habitat (sea turtle nesting areas)

Towns
Freeways/Highways
Secondary roads
Major rivers/creeks
Wildlife habitat (sea turtle nesting areas)
Selected Lot and Plan

LOCALITY DIAGRAM



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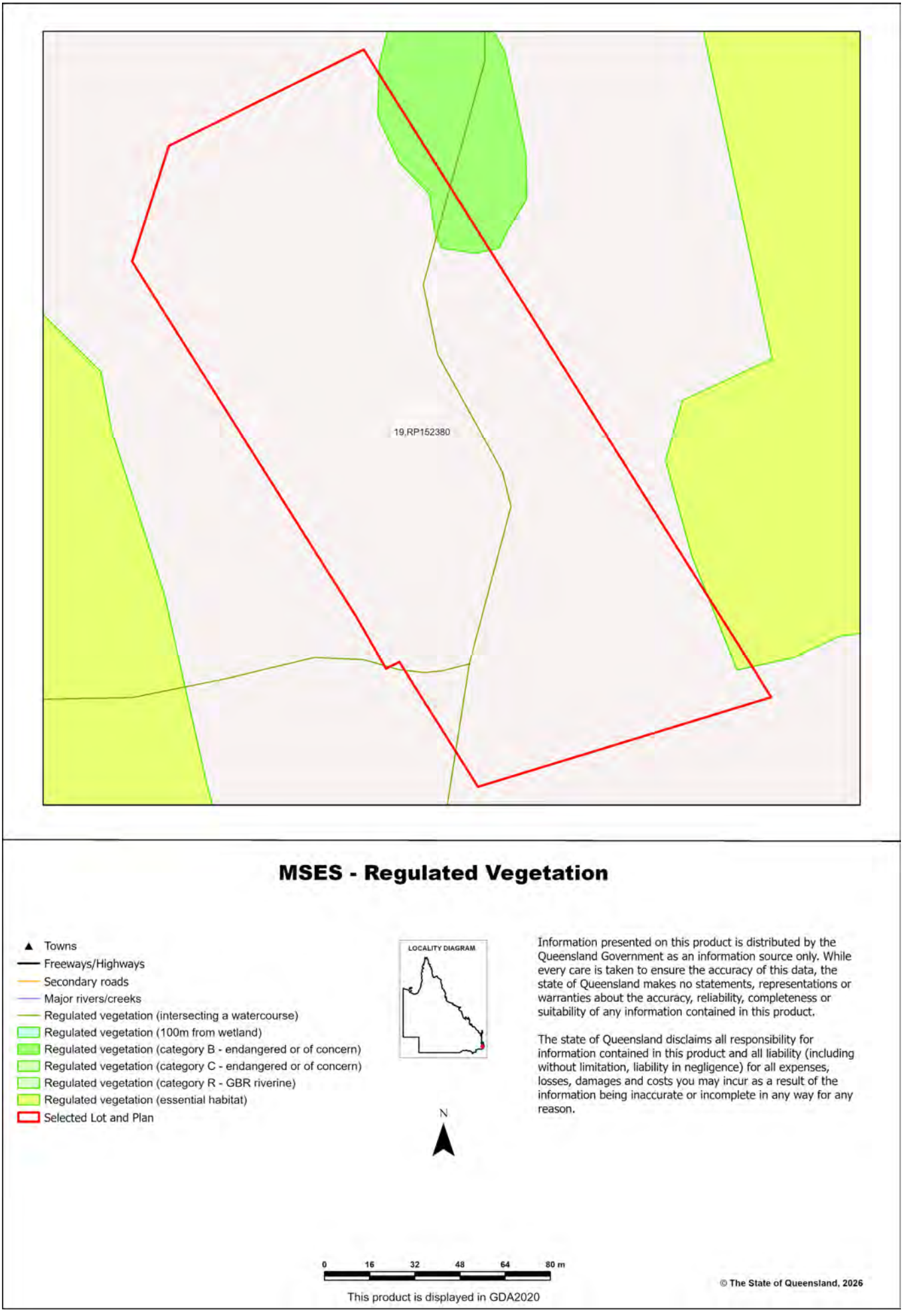
MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.

0 14 28 42 56 70 m

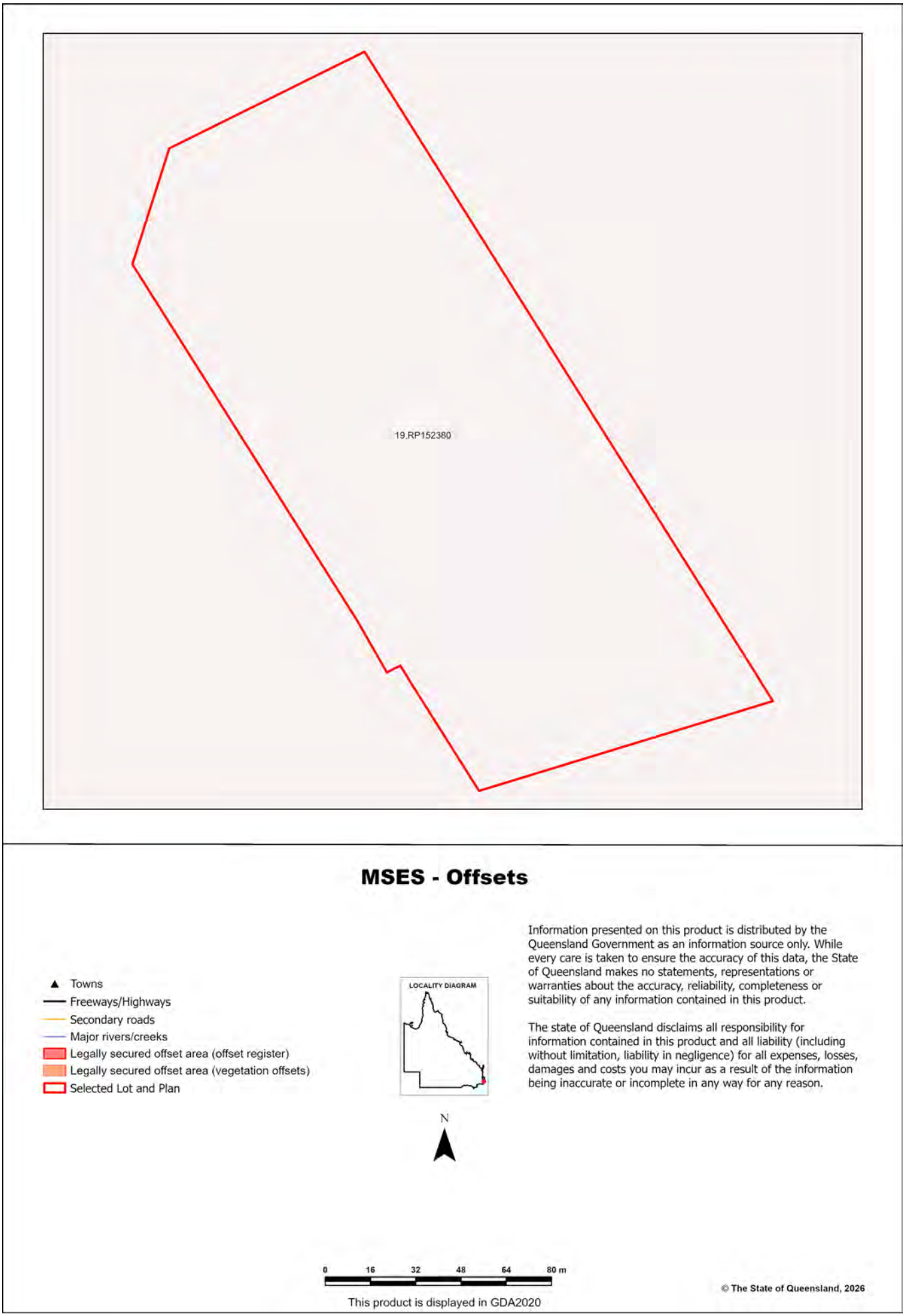
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### Map 4 - MSES - Regulated Vegetation



### Map 5 - MSES - Offset Areas



# Appendices

### Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). Its primary purpose is to support implementation of the SPP biodiversity policy.

MSES mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

MSES mapping does not determine whether state or local development assessment is required. For state assessment triggers refer to the Development Assessment Mapping System (DAMS). For local assessment triggers, refer to the relevant local planning scheme.

The Queensland Government's "Method for mapping - matters of state environmental significance can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

**Appendix 2 - Source Data**

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

| **MSES layers** | **current QSpatial data (http://qspatial.information.qld.gov.au)** |
|---|---|
| Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves | - Protected areas of Queensland<br>- Nature Refuges - Queensland<br>- Special Wildlife Reserves- Queensland |
| Marine Park-Highly Protected Zones | Moreton Bay marine park zoning 2008 |
| Fish Habitat Areas | Queensland fish habitat areas |
| Strategic Environmental Areas-designated | Regional Planning Interests Act - Strategic Environmental Areas |
| HES wetlands | Map of Queensland Wetland Environmental Values |
| Wetlands in HEV waters | HEV waters:<br>- EPP Water intent for waters<br>Source Wetlands:<br>- Queensland Wetland Mapping (Current version 5)<br>Source Watercourses:<br>- Vegetation management watercourse and drainage feature map (1:100000 and 1:250000) |
| Wildlife habitat (threatened and special least concern) | -WildNet database species records<br>- habitat suitability models (various)<br>- SEQ koala habitat areas under the Koala Conservation Plan 2019 |
| VMA regulated regional ecosystems | Vegetation management regional ecosystem and remnant map |
| VMA Essential Habitat | Vegetation management - essential habitat map |
| VMA Wetlands | Vegetation management wetlands map |
| Legally secured offsets | Vegetation Management Act property maps of assessable vegetation.<br>For offset register data-contact DETSI |
| Regulated Vegetation Map | Vegetation management - regulated vegetation management map |

**Appendix 3 - Acronyms and Abbreviations**

| | |
|---|---|
| AOI | - Area of Interest |
| DETSI | - Department of the Environment, Tourism, Science and Innovation |
| EP Act | - Environmental Protection Act 1994 |
| EPP | - Environmental Protection Policy |
| GDA2020 | - Geocentric Datum of Australia 2020 |
| GEM | - General Environmental Matters |
| GIS | - Geographic Information System |
| MSES | - Matters of State Environmental Significance |
| NCA | - Nature Conservation Act 1992 |
| RE | - Regional Ecosystem |
| SPP | - State Planning Policy |
| VMA | - Vegetation Management Act 1999 |

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Feb-2026

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance (Ramsar | 1 |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 4 |
| Listed Threatened Species: | 64 |
| Listed Migratory Species: | 14 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Lands: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 25 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |
| Habitat Critical to the Survival of Marine Turtles: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have

| | |
|---|---|
| State and Territory Reserves: | None |
| Regional Forest Agreements: | None |
| Nationally Important Wetlands: | None |
| EPBC Act Referrals: | 30 |
| Key Ecological Features (Marine): | None |
| Biologically Important Areas: | None |
| Bioregional Assessments: | None |
| Geological and Bioregional Assessments: | None |

# Details

## Matters of National Environmental Significance

### Wetlands of International Importance (Ramsar Wetlands) [ Resource Information ]

| Ramsar Site Name | Proximity | Buffer Status |
|---|---|---|
| Moreton bay | Within 10km of Ramsar site | In feature area |

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

| Community Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community | Endangered | Community likely to occur within area | In feature area |
| Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland | Endangered | Community likely to occur within area | In feature area |
| Lowland Rainforest of Subtropical Australia | Critically Endangered | Community may occur within area | In feature area |
| Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions | Endangered | Community likely to occur within area | In feature area |

### Listed Threatened Species [ Resource Information ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| BIRD | | | |
| Anthochaera phrygia | | | |
| Regent Honeyeater [82338] | Critically Endangered | Foraging, feeding or related behaviour likely to occur within area | In feature area |
| Botaurus poiciloptilus | | | |
| Australasian Bittern [1001] | Endangered | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Calidris canutus<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Calyptorhynchus lathami lathami<br>South-eastern Glossy Black-Cockatoo [67036] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Charadrius leschenaultii<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Climacteris picumnus victoriae<br>Brown Treecreeper (south-eastern) [67062] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Cyclopsitta diophthalma coxeni<br>Coxen's Fig-Parrot [59714] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Endangered | Species or species habitat known to occur within area | In feature area |
| Falco hypoleucos<br>Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Geophaps scripta scripta<br>Squatter Pigeon (southern) [64440] | Vulnerable | Species or species habitat may occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Lathamus discolor<br>Swift Parrot [744] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |
| Limosa lapponica baueri<br>Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380] | Endangered | Species or species habitat known to occur within area | In buffer area only |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Stagonopleura guttata<br>Diamond Firetail [59398] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Sternula nereis nereis<br>Australian Fairy Tern [82950] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Turnix melanogaster<br>Black-breasted Button-quail [923] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| FROG | | | |
| Litoria olongburensis<br>Wallum Sedge Frog [1821] | Vulnerable | Species or species habitat may occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Mixophyes fleayi](#)<br>Fleay's Frog [25960] | Endangered | Species or species habitat likely to occur within area | In feature area |
| INSECT | | | |
| [Argynnis hyperbius inconstans](#)<br>Australian Fritillary [88056] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| MAMMAL | | | |
| [Chalinolobus dwyeri](#)<br>Large-eared Pied Bat, Large Pied Bat [183] | Endangered | Species or species habitat may occur within area | In feature area |
| [Dasyurus maculatus maculatus (SE mainland population)](#)<br>Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Petauroides volans](#)<br>Greater Glider (southern and central) [254] | Endangered | Species or species habitat known to occur within area | In feature area |
| [Petaurus australis australis](#)<br>Yellow-bellied Glider (south-eastern) [87600] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Petrogale penicillata](#)<br>Brush-tailed Rock-wallaby [225] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| [Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)<br>Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Endangered | Species or species habitat known to occur within area | In feature area |
| [Potorous tridactylus tridactylus](#)<br>Long-nosed Potoroo (northern) [66645] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Pteropus poliocephalus](#)<br>Grey-headed Flying-fox [186] | Vulnerable | Foraging, feeding or related behaviour known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Xeromys myoides](#)<br>Water Mouse, False Water Rat, Yirrkoo [66] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| PLANT | | | |
| [Acronychia littoralis](#)<br>Scented Acronychia [8582] | Endangered | Species or species habitat may occur within area | In feature area |
| [Arthraxon hispidus](#)<br>Hairy-joint Grass [9338] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Baloghia marmorata](#)<br>Marbled Balogia, Jointed Baloghia [8463] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Bosistoa transversa](#)<br>Three-leaved Bosistoa, Yellow Satinheart [16091] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Coleus habrophyllus listed as Plectranthus habrophyllus](#)<br>[91378] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Corchorus cunninghamii](#)<br>Native Jute [14659] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Cryptocarya foetida](#)<br>Stinking Cryptocarya, Stinking Laurel [11976] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Cryptostylis hunteriana](#)<br>Leafless Tongue-orchid [19533] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Cupaniopsis shirleyana](#)<br>Wedge-leaf Tuckeroo [3205] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Endiandra floydii](#)<br>Floyd's Walnut, Crystal Creek Walnut [52955] | Endangered | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Leichhardtia longiloba listed as Marsdenia longiloba | | | |
| Clear Milkvine [91911] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Macadamia integrifolia | | | |
| Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Macadamia tetraphylla | | | |
| Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Notelaea lloydii | | | |
| Lloyd's Olive [15002] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Owenia cepiodora | | | |
| Onionwood, Bog Onion, Onion Cedar [11344] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Persicaria elatior | | | |
| Knotweed, Tall Knotweed [5831] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Phaius australis | | | |
| Lesser Swamp-orchid [5872] | Endangered | Species or species habitat may occur within area | In feature area |
| Planchonella eerwah | | | |
| Shiny-leaved Condoo, Black Plum, Wild Apple [17340] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Randia moorei | | | |
| Spiny Gardenia [10577] | Endangered | Species or species habitat likely to occur within area | In buffer area only |
| Rhodamnia rubescens | | | |
| Scrub Turpentine, Brown Malletwood [15763] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |
| Rhodomyrtus psidioides | | | |
| Native Guava [19162] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Samadera bidwillii | | | |
| Quassia [29708] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Sophora fraseri | | | |
| [8836] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Syzygium hodgkinsoniae | | | |
| Smooth-bark Rose Apple, Red Lilly Pilly [3539] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Thesium australe | | | |
| Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Vincetoxicum woollsii listed as Tylophora woollsii | | | |
| [40080] | Endangered | Species or species habitat may occur within area | In feature area |
| REPTILE | | | |
| Coeranoscincus reticulatus | | | |
| Three-toed Snake-tooth Skink [59628] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Delma torquata | | | |
| Adorned Delma, Collared Delma [1656] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Hemiaspis damelii | | | |
| Grey Snake [1179] | Endangered | Species or species habitat may occur within area | In feature area |

| Listed Migratory Species | | | [ Resource Information ] |
|---|---|---|---|
| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| Migratory Marine Birds | | | |
| Apus pacificus | | | |
| Fork-tailed Swift [678] | | Species or species habitat likely to occur within area | In feature area |
| Migratory Terrestrial Species | | | |
| Cuculus optatus | | | |
| Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| **Migratory Wetlands Species** | | | |
| [Actitis hypoleucos](#)<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |
| [Calidris acuminata](#)<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris canutus](#)<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris ferruginea](#)<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| [Calidris melanotos](#)<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area | In feature area |
| [Charadrius leschenaultii](#)<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Gallinago hardwickii](#)<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Limosa lapponica](#)<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area | In buffer area only |
| [Numenius madagascariensis](#)<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| [Pandion haliaetus](#)<br>Osprey [952] | | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Tringa nebularia](#)<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area | In feature area |

## Other Matters Protected by the EPBC Act

| Listed Marine Species | | | [ Resource Information ] |
|---|---|---|---|
| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| Bird | | | |
| [Actitis hypoleucos](#)<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |
| [Anseranas semipalmata](#)<br>Magpie Goose [978] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Apus pacificus](#)<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Bubulcus ibis as Ardea ibis](#)<br>Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Calidris acuminata](#)<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris canutus](#)<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area overfly marine area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Calidris ferruginea](#)<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area overfly marine area | In feature area |
| [Calidris melanotos](#)<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Charadrius leschenaultii](#)<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Gallinago hardwickii](#)<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Haliaeetus leucogaster](#)<br>White-bellied Sea-Eagle [943] | | Species or species habitat known to occur within area | In feature area |
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area overfly marine area | In feature area |
| [Lathamus discolor](#)<br>Swift Parrot [744] | Critically Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Limosa lapponica](#)<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area | In buffer area only |
| [Merops ornatus](#)<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Monarcha melanopsis](#)<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area overfly marine area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| --- | --- | --- | --- |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Pandion haliaetus<br>Osprey [952] | | Species or species habitat known to occur within area | In feature area |
| Pterodroma cervicalis<br>White-necked Petrel [59642] | | Species or species habitat may occur within area | In feature area |
| Rhipidura rufifrons<br>Rufous Fantail [592] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Rostratula australis as Rostratula benghalensis (sensu lato)<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |
| Sterna striata<br>White-fronted Tern [799] | | Migration route may occur within area | In feature area |
| Symposiachrus trivirgatus as Monarcha trivirgatus<br>Spectacled Monarch [83946] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |

## Extra Information

| EPBC Act Referrals | | | | [ Resource Information ] |
|---|---|---|---|---|
| Title of referral | Reference | Referral Outcome | Assessment Status | Buffer Status |
| | | | | |
| Coomera Woods Master Planned Development, 49 & 51 George Alexander Way, Coomera, Qld | 2017/8134 | | Assessment | In feature area |
| Kerkins Levee Rehabilitation Project, Phases 2-8 | 2004/1435 | | Completed | In feature area |
| Low impact industrial development and associated infrastructure, Old Pacific Highway, Coomera | 2013/6819 | | Completed | In feature area |
| Controlled action | | | | |
| Clearing of vegetation for the Gainsborough Greens residential subdivision | 2013/6751 | Controlled Action | Post-Approval | In feature area |
| Coomera Woods master planned residential development, Qld | 2015/7610 | Controlled Action | Completed | In feature area |
| Jacobs Well Airport | 2004/1361 | Controlled Action | Completed | In feature area |
| Jacobs Well Airport Project | 2003/947 | Controlled Action | Completed | In feature area |
| Nambucca Crescent residential subdivision Pimpama, QLD | 2014/7190 | Controlled Action | Post-Approval | In feature area |
| Not controlled action | | | | |
| Clearing of vegetaion for a residential subdivision on Karingal Drive, Pimpama, QLD | 2013/6716 | Not Controlled Action | Completed | In feature area |
| Coomera Hospital and Health Precinct | 2021/8946 | Not Controlled Action | Completed | In buffer area only |
| Coomera Town Centre shopping centre development, Coomera Qld | 2014/7292 | Not Controlled Action | Completed | In buffer area only |
| Coomera Woods Protection Zone, 49 George Alexander Way, Coomera Qld | 2018/8214 | Not Controlled Action | Completed | In feature area |
| Development of the Heritage Park Sporting Precinct, Rifle Range Road, Pimpama, Qld | 2016/7831 | Not Controlled Action | Completed | In buffer area only |
| Development of the Pimpama Junction Shopping Centre Precinct | 2013/6772 | Not Controlled Action | Completed | In buffer area only |

| Title of referral | Reference | Referral Outcome | Assessment Status | Buffer Status |
|---|---|---|---|---|
| Not controlled action | | | | |
| Develop Stage 1 & 2 (Lots 21, 23 & 24), Coomera Urban Village, Cnr Foxwell Rd & Finnegan Wy, Coomera | 2014/7124 | Not Controlled Action | Completed | In buffer area only |
| Dreamworld Town Centre Development | 2001/484 | Not Controlled Action | Completed | In buffer area only |
| GCCC Northern Wastewater Strategy and associated Reclaimed Water Scheme - Stage | 2001/282 | Not Controlled Action | Completed | In feature area |
| Heavy Rail Duplication Project, Coomera to Helensvale, Qld | 2014/7392 | Not Controlled Action | Completed | In buffer area only |
| Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia | 2015/7522 | Not Controlled Action | Completed | In feature area |
| Mixed use development, Lot 138, 62 Finnegan Way, Coomera, Qld | 2015/7488 | Not Controlled Action | Completed | In buffer area only |
| Pimpama School, Coomera, Qld | 2018/8252 | Not Controlled Action | Completed | In feature area |
| Prawn Aquaculture Expansion | 2001/322 | Not Controlled Action | Completed | In buffer area only |
| Residential development, Big Sky Estate (Stages 5-8), Coomera | 2015/7535 | Not Controlled Action | Completed | In buffer area only |
| Residential Development Stages 4 & 9-10 Big Sky Estate, Coomera, QLD | 2014/7192 | Not Controlled Action | Completed | In buffer area only |
| Residential subdivision, 152 Yawalpah Road, Pimpama, Qld | 2013/6914 | Not Controlled Action | Completed | In feature area |
| Residential subdivision, 54-64 Karingal Drive, Pimpama, Qld | 2013/6739 | Not Controlled Action | Completed | In feature area |
| Road Extension - Foxwell Road, Coomera | 2021/8990 | Not Controlled Action | Completed | In buffer area only |
| To develop high and medium density residential dwellings, commercial precincts and open space areas, | 2014/7291 | Not Controlled Action | Completed | In buffer area only |
| Vegetation clearing for the Gainsborough Park Residential Estate | 2012/6667 | Not Controlled Action | Completed | In buffer area only |
| Referral decision | | | | |
| Residential Development on Finnegan Way, Coomera, QLD | 2012/6685 | Referral Decision | Completed | In buffer area only |

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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**Department of the Environment, Tourism, Science and Innovation**

Environmental Reports

# Regional Ecosystems

## *Biodiversity Status*

For the selected area of interest
Lot: 19 Plan: RP152380

# Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

# Important Note to User

Information presented in this report is based upon the Queensland Herbarium & Biodiversity Science's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium & Biodiversity Science's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website https://www.nrmmrrd.qld.gov.au/

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

# Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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## Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

**Table 1: Details for area of interest:**
**Lot: 19 Plan: RP152380, with area 2.46 ha**

| Local Government(s) | Catchment(s) | Bioregion(s) | Subregion(s) |
|---|---|---|---|
| Gold Coast City | South Coast | Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| | | Southeast Queensland | Burringbar - Conondale Ranges |

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

**Table 2: Summary table, biodiversity status of regional ecosystems within the AOI**

| Biodiversity Status | Area (Ha) | % of AOI |
|---|---|---|
| Endangered | 0.00 | 0.00 |
| Of concern | 0.06 | 2.34 |
| No concern at present | less than 0.01 | 0.27 |
| Total remnant vegetation | 0.06 | 2.61 |

Refer to **Map 2** for further information.

# Regional Ecosystems

## 1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and may be distinguished by differences in structure or sub-dominant species in the ecologically dominant layer. Vegetation communities with different dominant species in the ecologically dominant layer may be amalgamated in to a regional ecosystem if they are not mappable and predictable in the landscape at 1:100 000 scale. Vegetation communities may be mappable at a scale larger than 1:100 000. Vegetation communities within a regional ecosystem are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2023) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium & Biodiversity Science's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website https://www.nrmmrrd.qld.gov.au/.

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 percent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 percent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (<1000 ha); or patch size (<100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

*****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.*

## 2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

**Table 3: Remnant regional ecosystems, description and status within the AOI**

| Regional Ecosystem | Short Description | BD Status | Area (Ha) | % of AOI |
|---|---|---|---|---|
| 12.11.24 | Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics | No concern at present | less than 0.01 | 0.27 |
| 12.3.11 | Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast | Of concern | 0.06 | 2.34 |
| non-remnant | None | None | 2.39 | 97.28 |

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

**Table 4** provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

**Table 4: Remnant regional ecosystems within the AOI, additional information**

| Regional Ecosystem | Remnant Extent | BVG (1 Million) | Wetland | Representation in protected estate |
|---|---|---|---|---|
| 12.11.24 | Pre-clearing 28000 ha; Remnant 2023 14000 ha | 9g | Not a Wetland | Medium |
| 12.3.11 | Pre-clearing 159000 ha; Remnant 2023 39000 ha | 16c | Contains Palustrine | Low |
| non-remnant | None | None | None | None |

*Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.*

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

**Table 5: Remnant regional ecosystems within the AOI, special values**

| Regional Ecosystem | Special Values |
|---|---|
| 12.11.24 | 12.11.24: Potential habitat for NCA listed species: Corchorus cunninghamii, Endiandra floydii and Eucalyptus curtisii. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). |
| 12.3.11 | 12.3.11: Potential habitat for NCA listed species: Acronychia littoralis, Alectryon ramiflorus, Arthraxon hispidus, Cupaniopsis shirleyana, Eulophia bicallosa, Gossia gonoclada, Macrozamia lomandroides, Macrozamia pauli-guilielmi, Marsdenia coronata, Maundia triglochinoides. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).<br>12.3.11a: Habitat for threatened fauna species including the Black-breasted Button-quail Turnix melanogaster (Aridis, Melzer and Hamley, 1998). This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).<br>12.3.11b: This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). |
| non-remnant | None |

## 3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at: https://publications.qld.gov.au/dataset/redd/resource/

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

**Table 6: Broad vegetation groups (1 million) within the AOI**

| BVG (1 Million) | Description | Area (Ha) | % of AOI |
|---|---|---|---|
| None | None | 2.39 | 97.28 |
| 16c | Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. | 0.06 | 2.34 |
| 9g | Moist to dry woodlands to open forest dominated by stringybarks or mahoganies such as Eucalyptus tindaliae (Queensland white stringybark), E. latisinensis (white mahogany), E. acmenoides (narrow-leaved white stringybark); or E. racemosa (scribbly gum) or E. seeana or E. tereticornis (blue gum) and Corymbia intermedia (pink bloodwood). | less than 0.01 | 0.27 |

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

## 4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See: http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

The descriptions are compiled using site survey data from the Queensland Herbarium & Biodiversity Science's QBEIS database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2023 (PDF)* section 3.3 of: https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community. http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

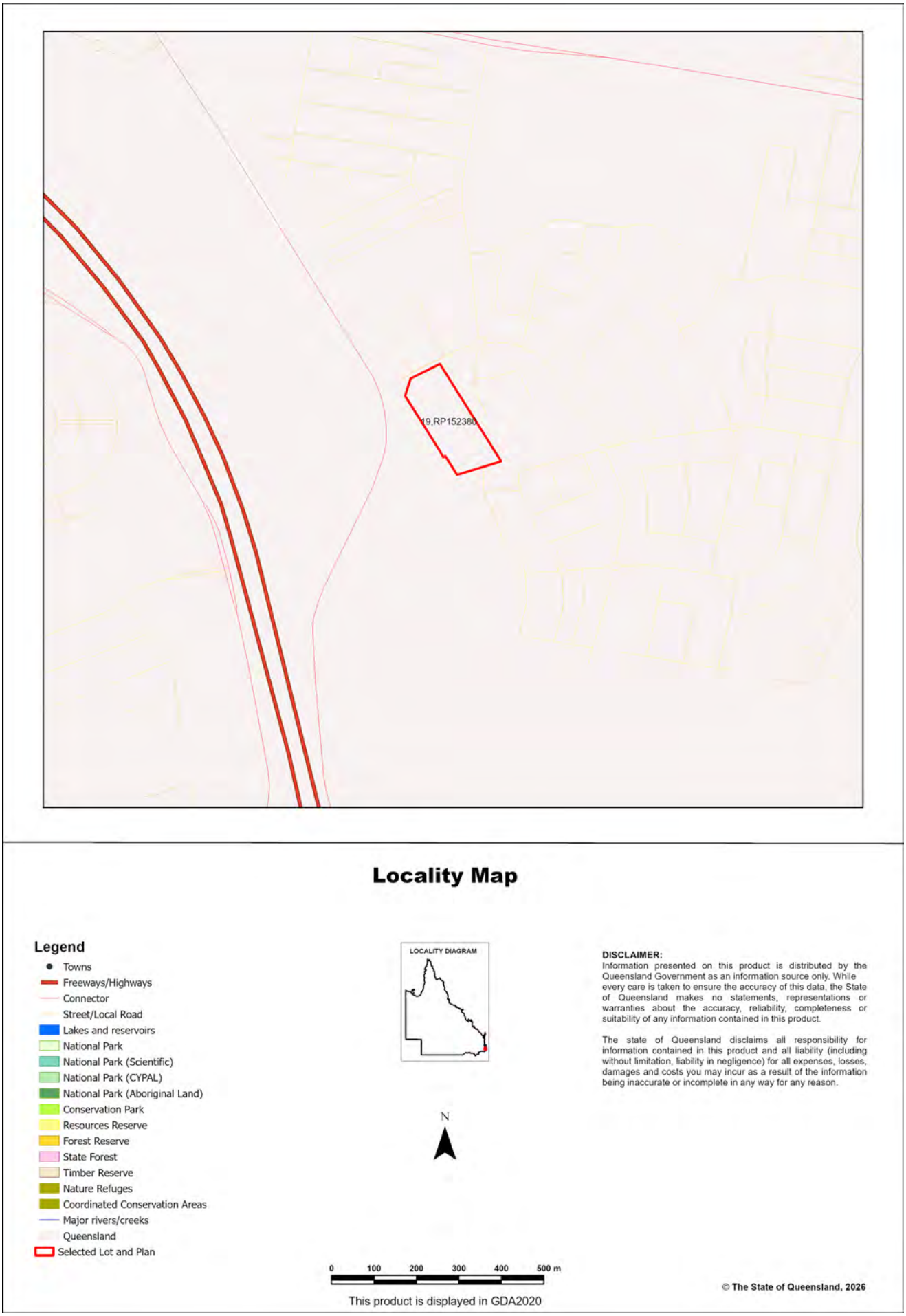
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

**Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available**

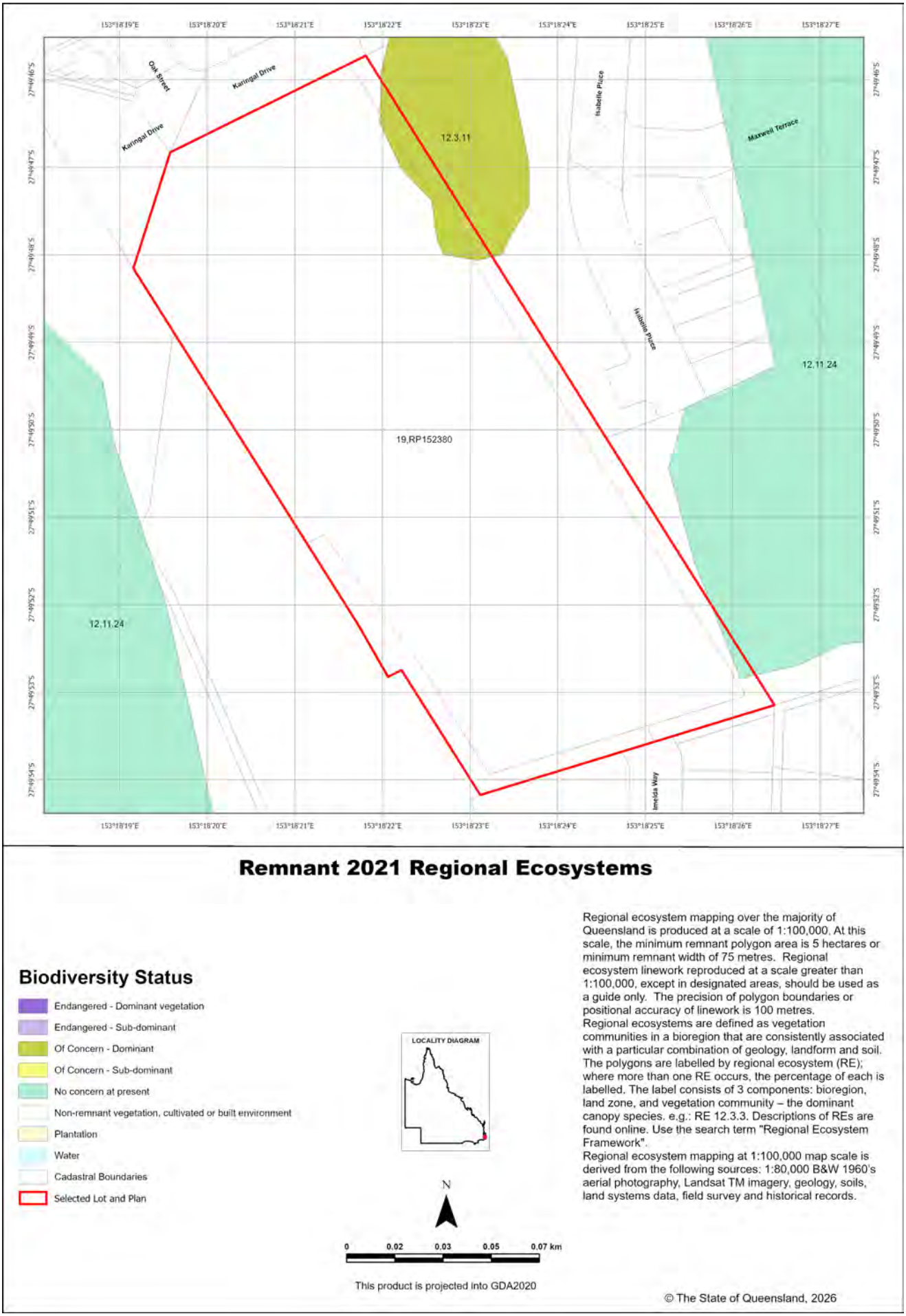
| Regional ecosystems mapped as within the AOI | Technical Descriptions | Biocondition Benchmarks |
|---|---|---|
| 12.11.24 | Not currently available | Available |
| 12.3.11 | Available | Available |
| non-remnant | Not currently available | Not currently available |

# Maps

## Map 1 - Location



## Map 2 - Remnant 2021 regional ecosystems




### Remnant 2021 Regional Ecosystems

**Biodiversity Status**

- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Non-remnant vegetation, cultivated or built environment
- Plantation
- Water
- Cadastral Boundaries
- Selected Lot and Plan

LOCALITY DIAGRAM

N

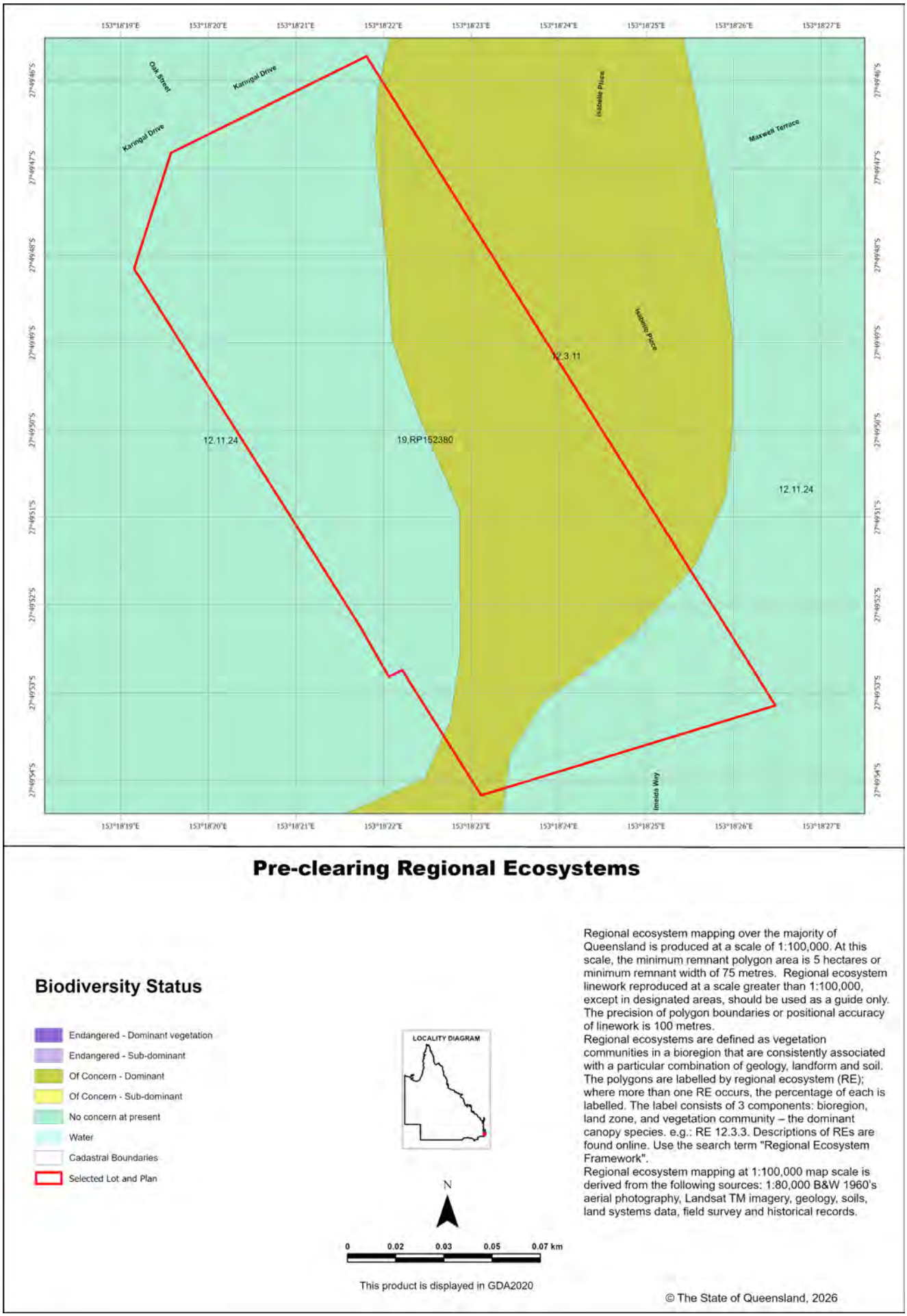
0 0.02 0.03 0.05 0.07 km

This product is projected into GDA2020

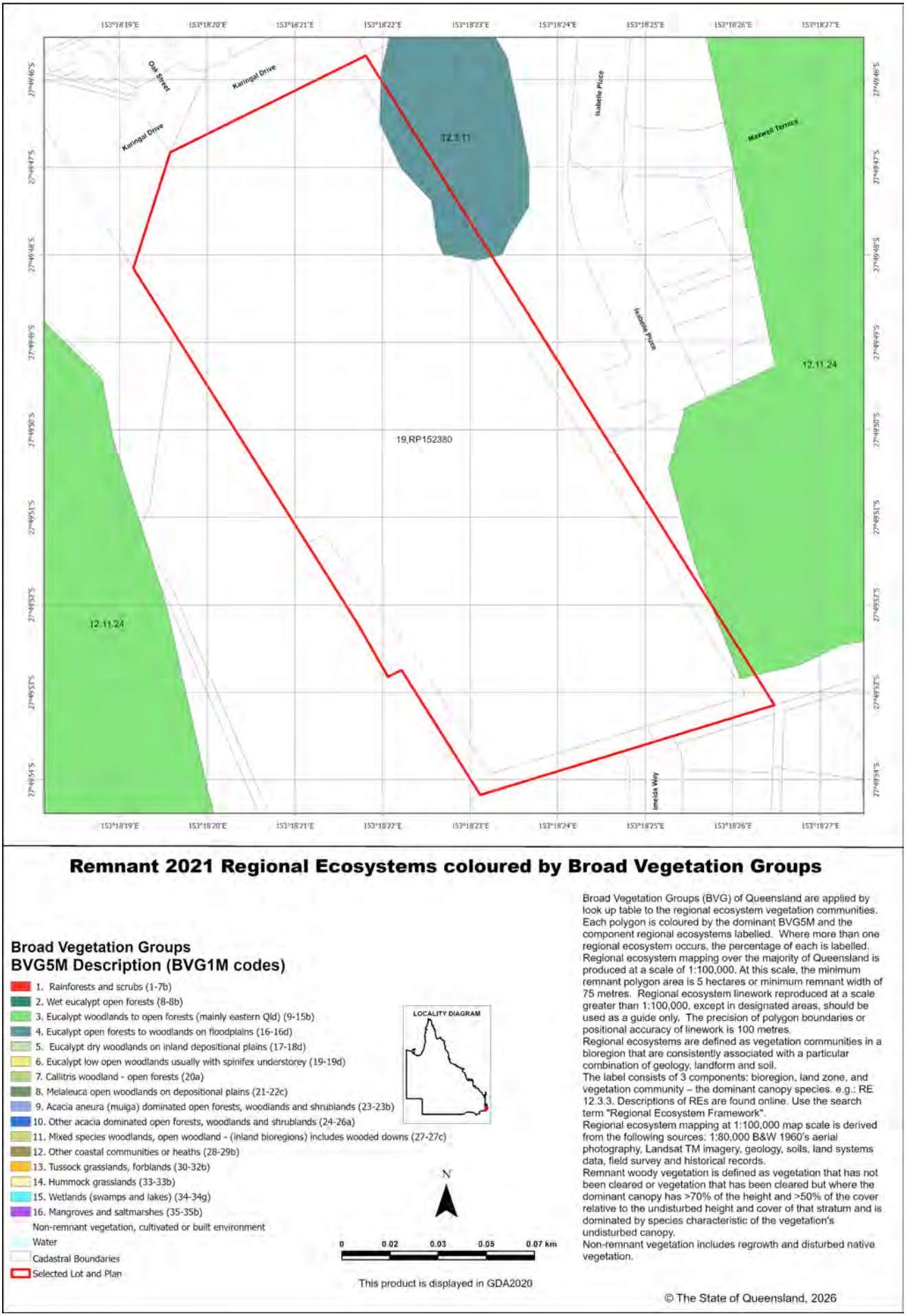
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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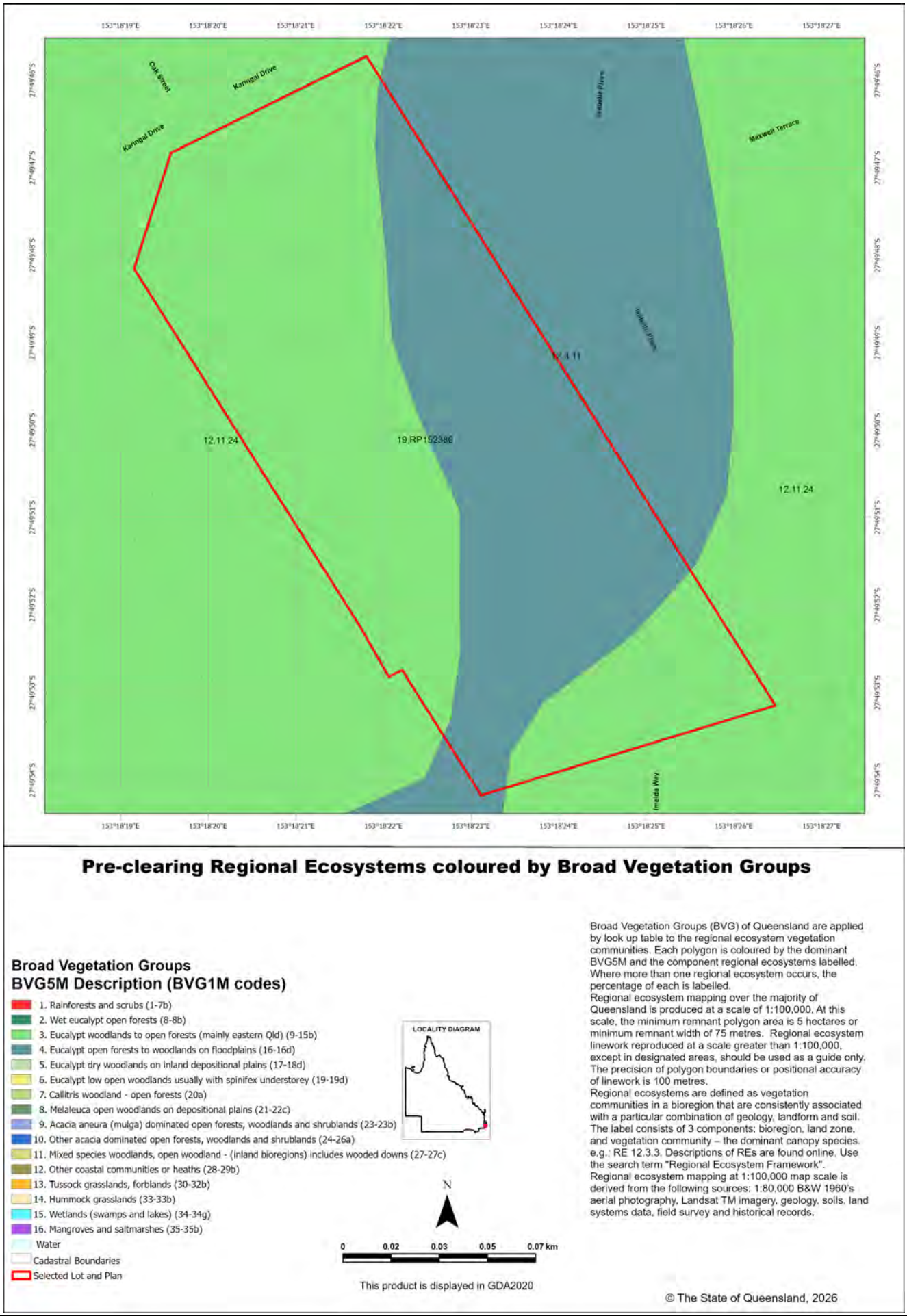
## Map 3 - Pre-clearing regional ecosystems



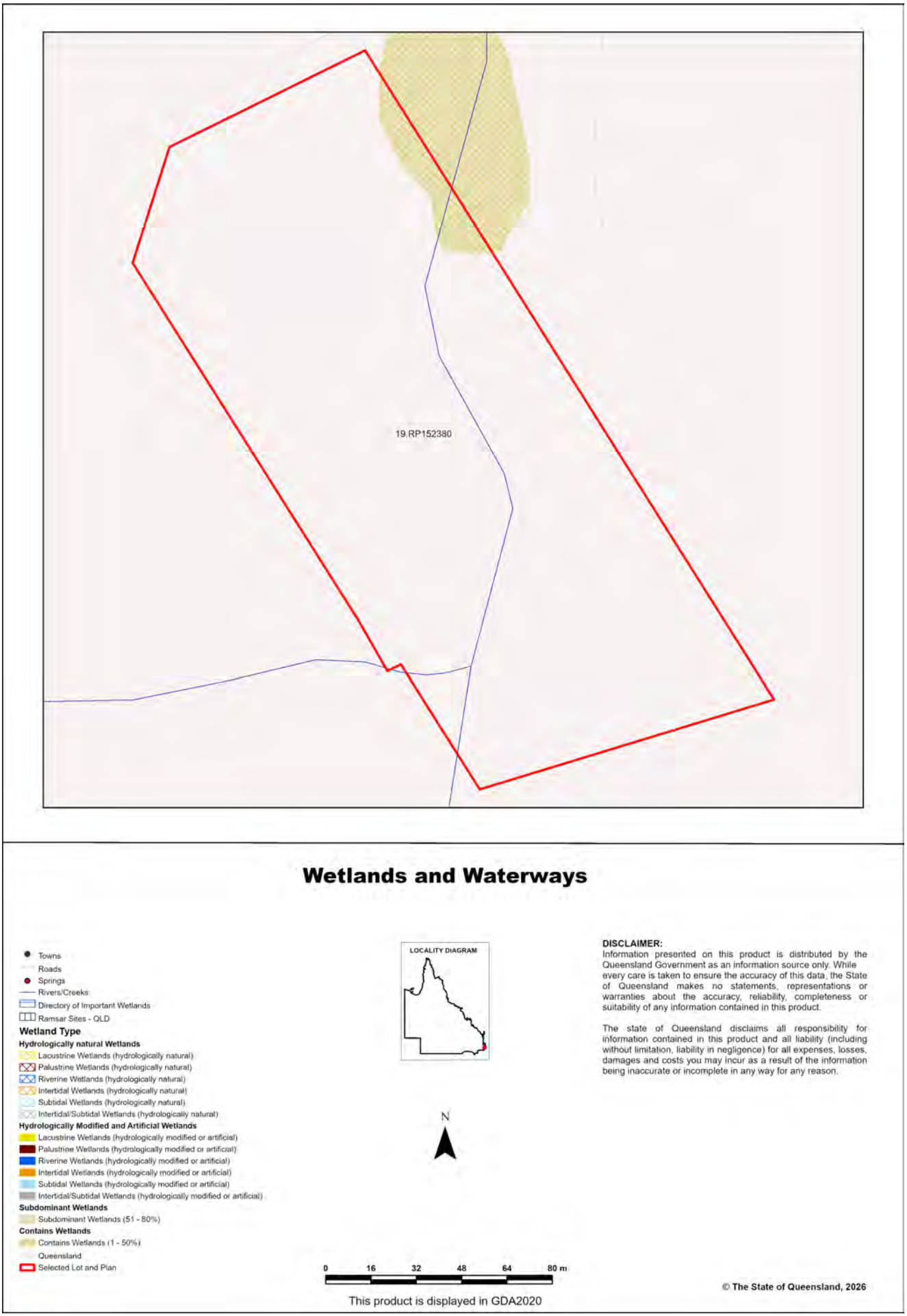
## Map 4 - Remnant 2021 regional ecosystems by BVG (5M)



## Map 5 - Pre-clearing regional ecosystems by BVG (5M)



## Map 6 - Wetlands and waterways



## Links and Other Information Sources

The Department of the Environment, Tourism, Science and Innovation's Website - http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/ provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from: https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/broad-vegetation

The methodology for mapping regional ecosystems can be downloaded from: https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

Technical descriptions for regional ecosystems can be obtained from: http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

Benchmarks can be obtained from: http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Spatial Catalogue, Queensland Spatial Catalogue : Queensland Government (information.qld.gov.au)

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link: https://qldglobe.information.qld.gov.au/

## References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2023). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 6.0. Queensland Herbarium, Department of Environment and Science. (https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Richter,D., Addicott, E.P. and Appelman, C.N. (2023) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0. Updated December 2023. Queensland Herbarium, Queensland Department of Environment, Science and Innovation, Brisbane. (https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf).

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems.* Environmental Protection Agency, Brisbane.

# Appendices

## Appendix 1 - Source Data

**The dataset listed below is available for download from:**
http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/

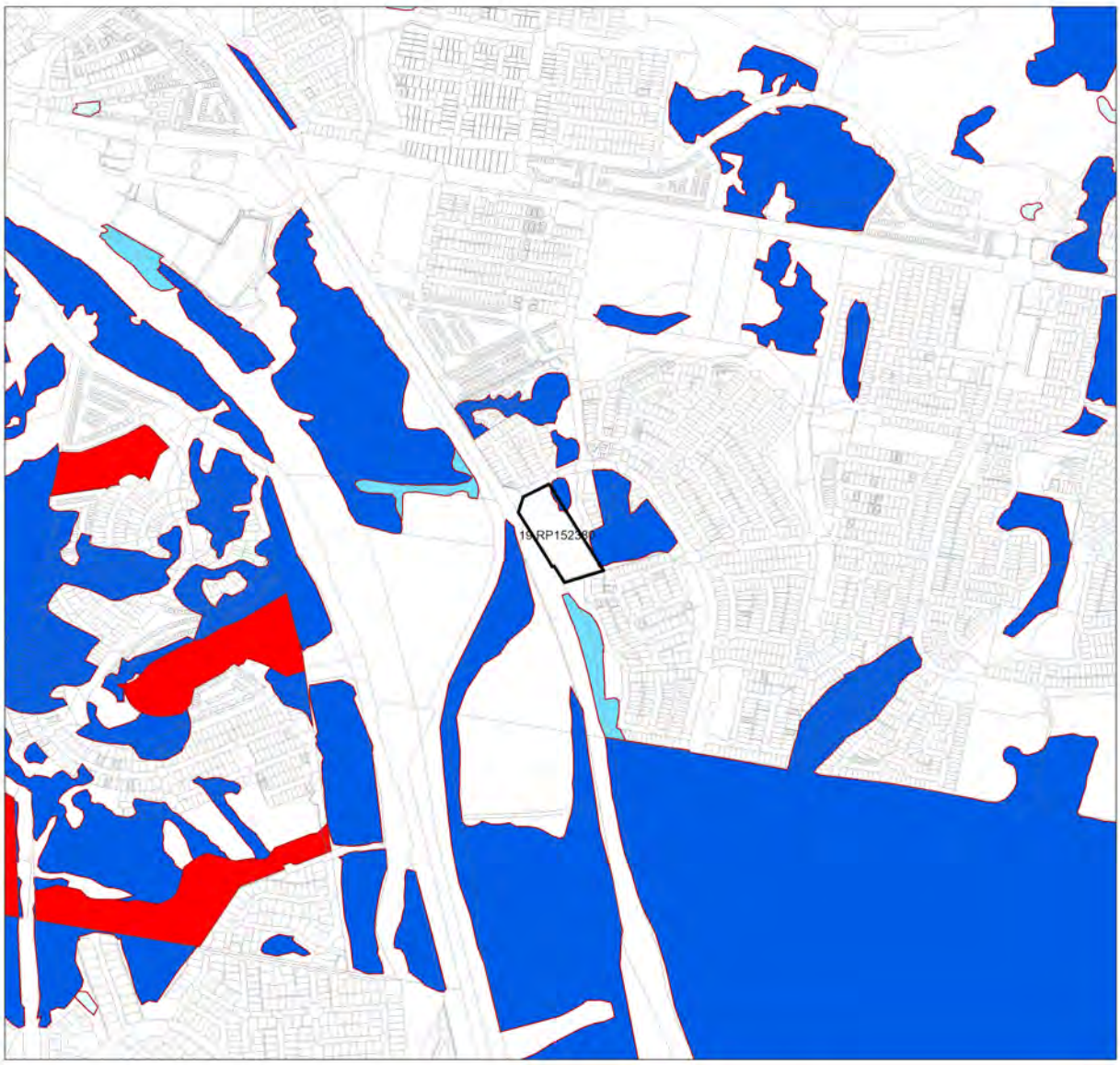
- Regional Ecosystem Description Database

**The datasets listed below are available for download from:**
Queensland Spatial Catalogue : Queensland Government (information.qld.gov.au)

- Biodiversity status of pre-clearing and 2021 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas
- Pre-clearing broad vegetation groups of Queensland
- Remnant 2021 broad vegetation groups of Queensland

## Appendix 2 - Acronyms and Abbreviations

AOI - Area of Interest
GIS - Geographic Information System
RE - Regional Ecosystem
REDD - Regional Ecosystem Description Database
VMA - *Vegetation Management Act 1999*




# Regulated Vegetation Management Map

Queensland Government

- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries
- Selected Lot and Plan

LOCALITY DIAGRAM



N

0 160 320 480 640 800 m

This product is displayed in: GDA2020

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

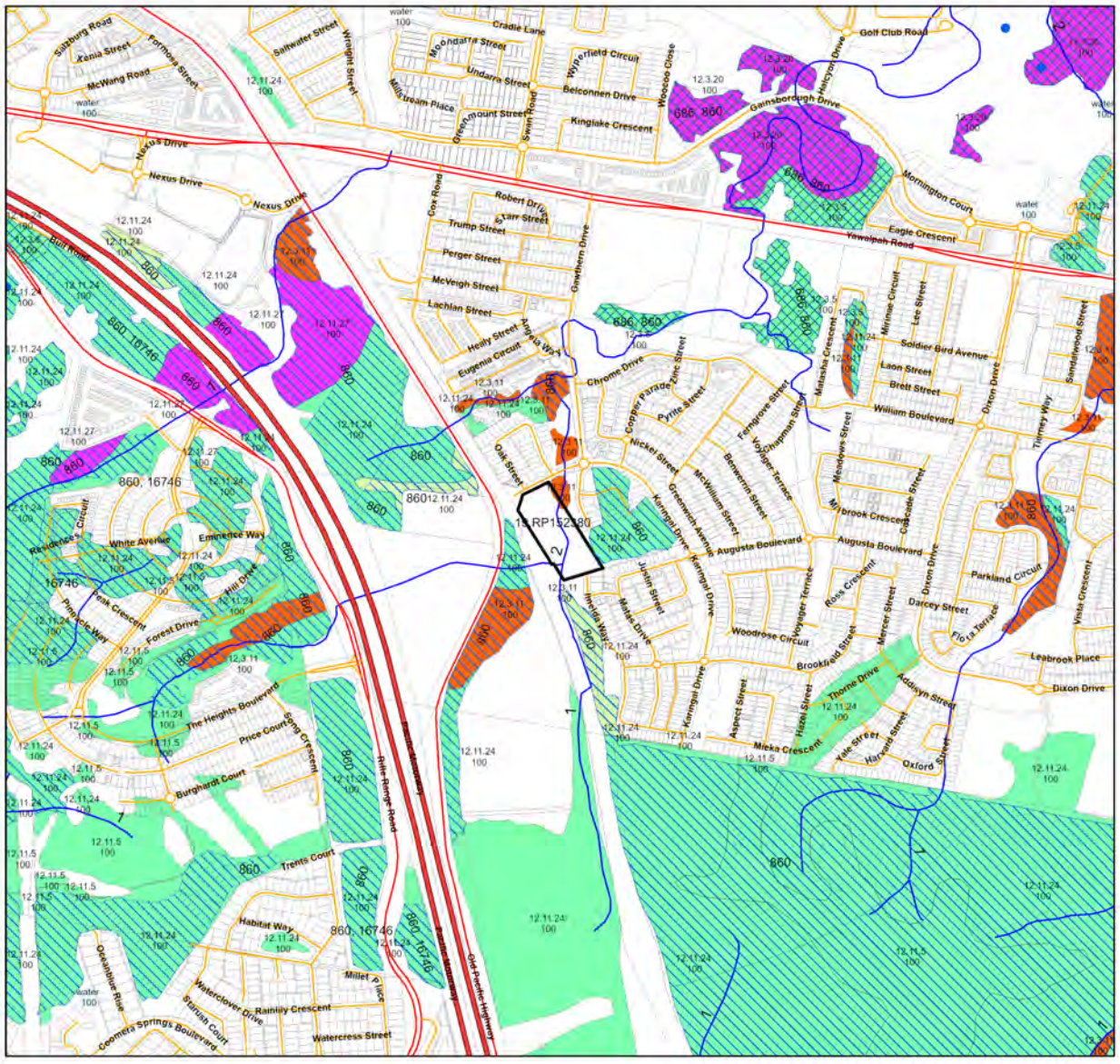
Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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# Vegetation Management Supporting Map

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 110 220 330 440 550 m

This product is displayed in: GDA2020

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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# Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website http://www.nrmmrrd.qld.gov.au has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1. that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
2. in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

### Essential habitat in Category A and/or Category B and/or Category C

| Label | Scientific Name | Common Name | NCA Status | Vegetation Community | Altitude | Soils | Position in Landscape |
|---|---|---|---|---|---|---|---|
| 860 | Phascolarctos cinereus | koala | E | Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia. | Sea level to 1000m. | | Riparian areas, plains and hill/escarpment slopes. |

| Label | Regional Ecosystem (mandatory unless otherwise specified) |
|---|---|
| 860 | 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.8, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.20, 10.3.22, 10.3.27, 10.3.28, 10.4.2, 10.4.3, 10.4.5, 10.4.8, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 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12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10. |



Queensland Government



# Vegetation management report

For Lot: 19 Plan: RP152380
27/02/2026

nrmmrrd.qld.gov.au

Queensland Government

This publication has been compiled by Operations Support, Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

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# Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

# Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
***Property details*** - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

***Vegetation management framework*** - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

***Vegetation management framework details for the specified Lot on Plan*** including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

***Protected plant framework*** - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

***Koala protection framework*** - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

***Koala protection framework details for the specified Lot on Plan*** including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

# Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing.  You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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# 1. Property details

## 1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 19 Plan: RP152380 are listed in Table 1.

**Table 1: Lot, plan, tenure and title area information for the property**

| Lot | Plan | Tenure | Property title area (sq metres) |
|---|---|---|---|
| 19 | RP152380 | Freehold | 24,590 |
| E | SP259689 | Easement | 1,768 |
| F | SP279637 | Easement | 1,052 |

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

**Does the property Lot: 19 Plan: RP152380 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?**

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

## 1.2 Property location

Table 2 provides a summary of the locations for property Lot: 19 Plan: RP152380, in relation to natural and administrative boundaries.

**Table 2: Property location details**

| Local Government(s) |
|---|
| Gold Coast City |

| Catchment(s) |
|---|
| South Coast |

| Bioregion(s) | Subregion(s) |
|---|---|
| Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| Southeast Queensland | Burringbar - Conondale Ranges |

# 2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

## 2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

## 2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

## 2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

## 2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

## 2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

**Phone** 135VEG (135 834)

**Email** vegetation@nrmmrrd.qld.gov.au

**Visit** https://www.nrmmrrd.qld.gov.au/?contact=vegetation to submit an online enquiry.

# 3. Vegetation management framework for Lot: 19 Plan: RP152380

## 3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

**Table 3: Vegetation categories for subject property**

| Vegetation category | Area (ha) |
|---|---|
| Category B | 0.06 |
| Category X | 2.39 |

**Table 4: Description of vegetation categories**

| Category | Colour on Map | Description | Requirements / options under the vegetation management framework |
|---|---|---|---|
| A | red | Compliance areas, environmental offset areas and voluntary declaration areas | Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area. |
| B | dark blue | Remnant vegetation areas | Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval. |
| C | light blue | High-value regrowth areas | Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code. |
| R | yellow | Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas | Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans. |
| X | white | Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures. | No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures. |

**Property Map of Assessable Vegetation (PMAV)**

There is no Property Map of Assessable Vegetation (PMAV) present on this property.

## 3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

**Table 5: Regional ecosystems present on subject property**

| Regional Ecosystem | VMA Status | Category | Area (Ha) | Short Description | Structure Category |
|---|---|---|---|---|---|
| 12.11.24 | Least concern | B | 0.01 | Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics | Sparse |
| 12.3.11 | Of concern | B | 0.06 | Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast | Mid-dense |
| non-rem | None | X | 2.39 | None | None |

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

## 3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

## 3.4 Wetlands

There are no vegetation management wetlands present on this property.

## 3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

**Category A and/or Category B and/or Category C**

**Table 6: Essential habitat in Category A and/or Category B and/or Category C**

| Label | Scientific Name | Common Name | NCA Status | Vegetation Community | Altitude | Soils | Position in Landscape |
|---|---|---|---|---|---|---|---|
| 860 | Phascolarctos cinereus | koala | E | Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia. | Sea level to 1000m. | | Riparian areas, plains and hill/escarpment slopes. |

| Label | Regional Ecosystem (mandatory unless otherwise specified) |
|---|---|
| 860 | 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 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## 3.6 Area Management Plan(s)

Nil

## 3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 4.3

## 3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

**Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?**

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 19 Plan: RP152380.

# 4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

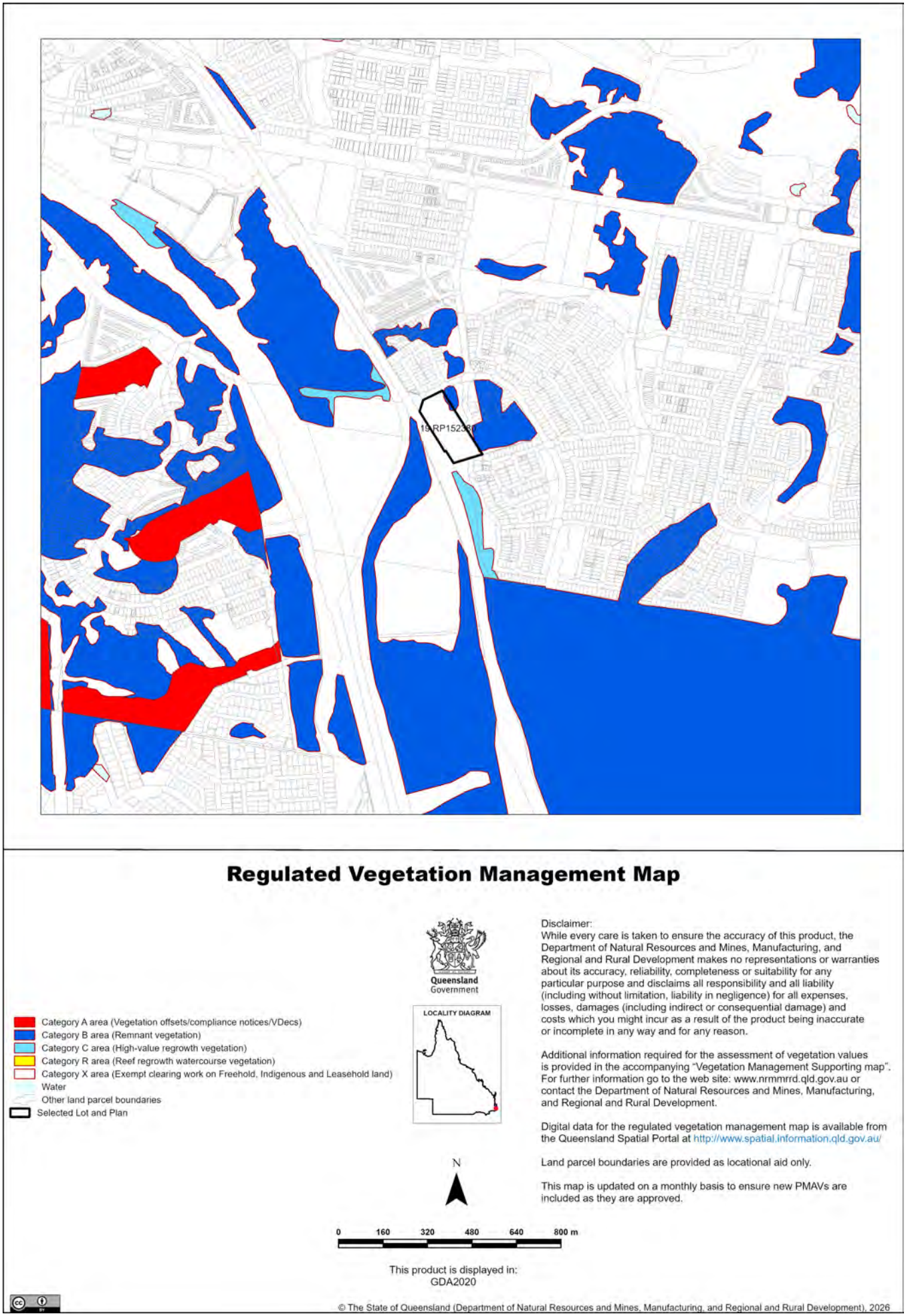
**Regulated vegetation management map**
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

**Vegetation management supporting map**
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

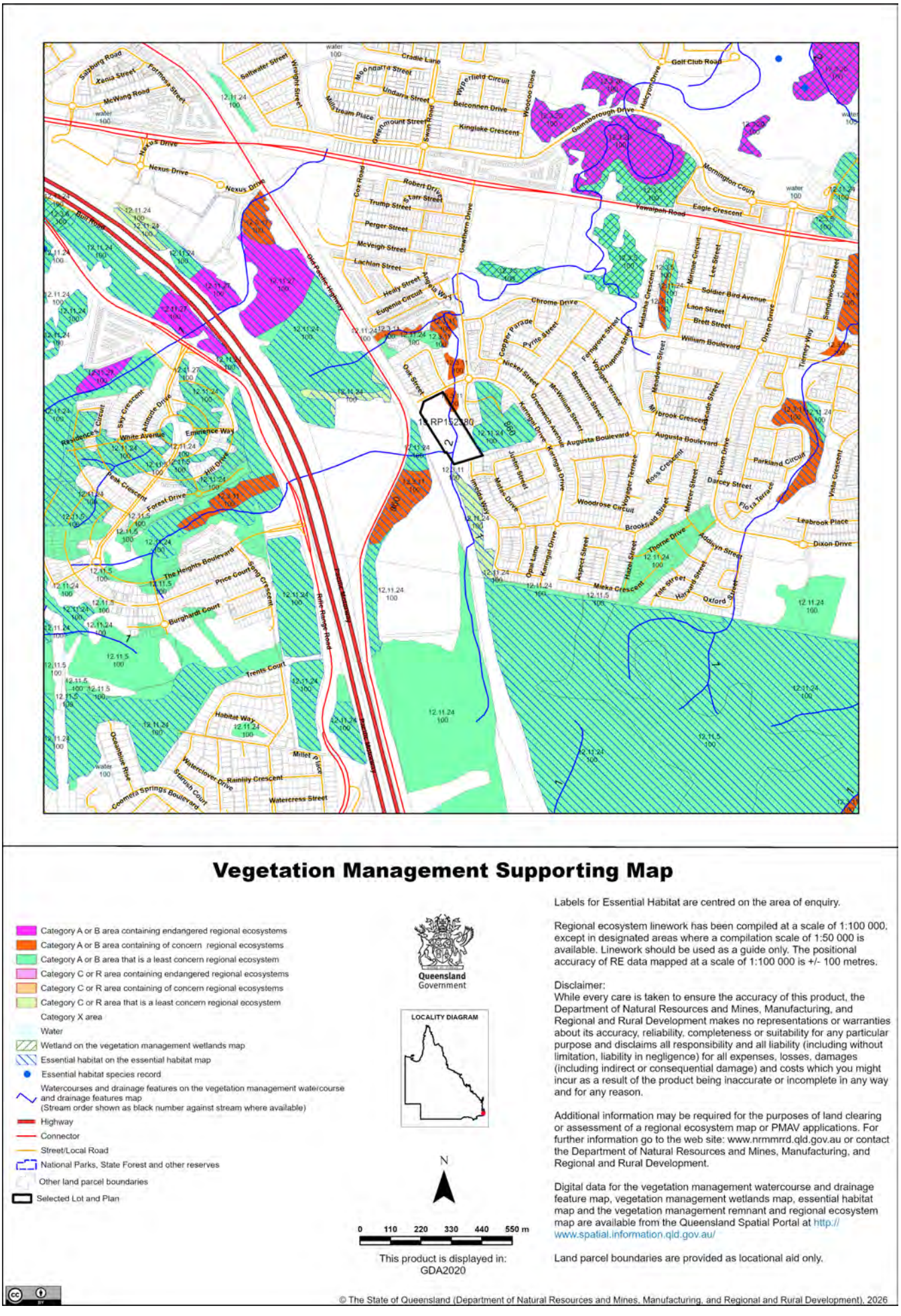
**Coastal/non-coastal map**
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

**Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture**
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

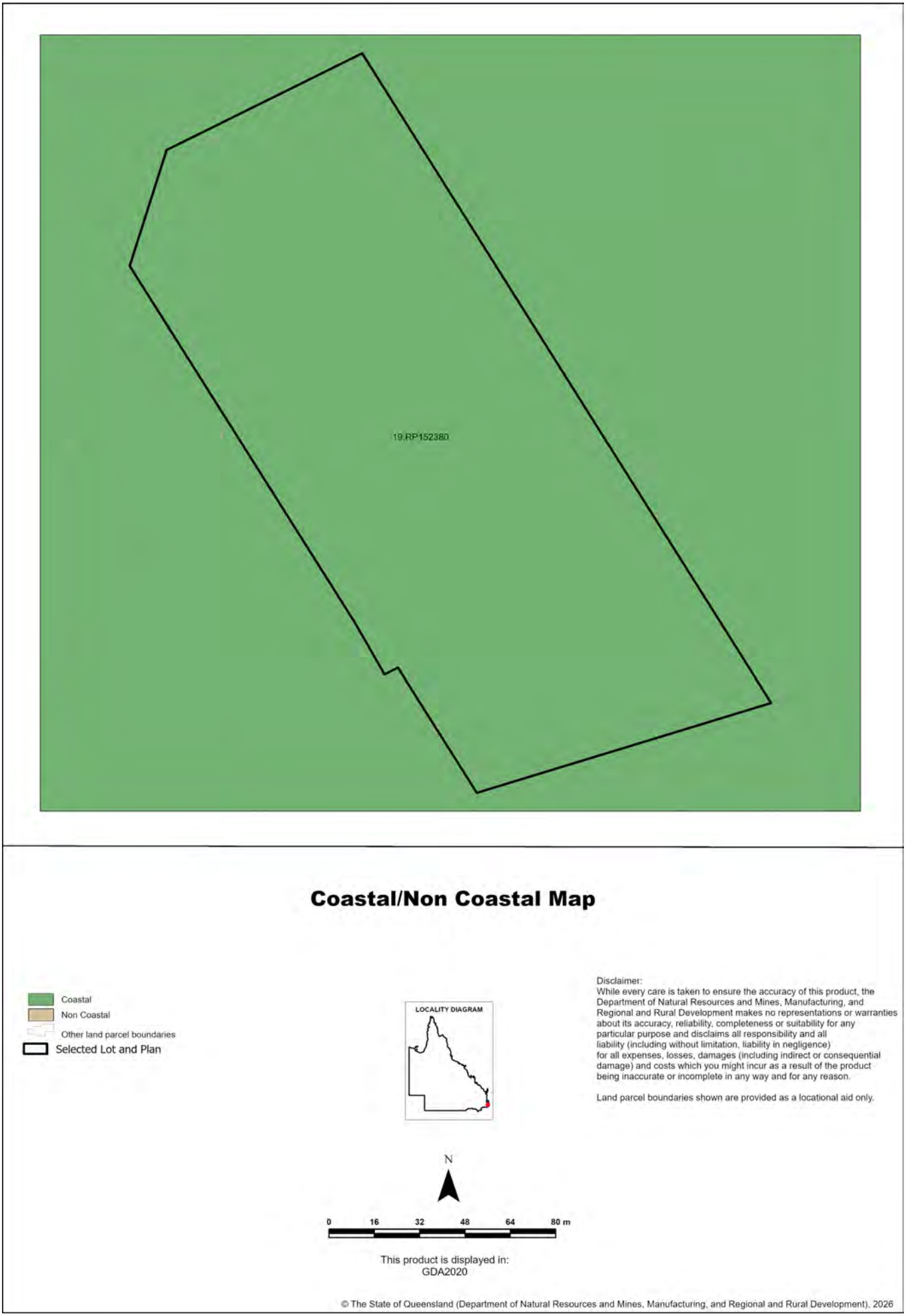
## 4.1 Regulated vegetation management map



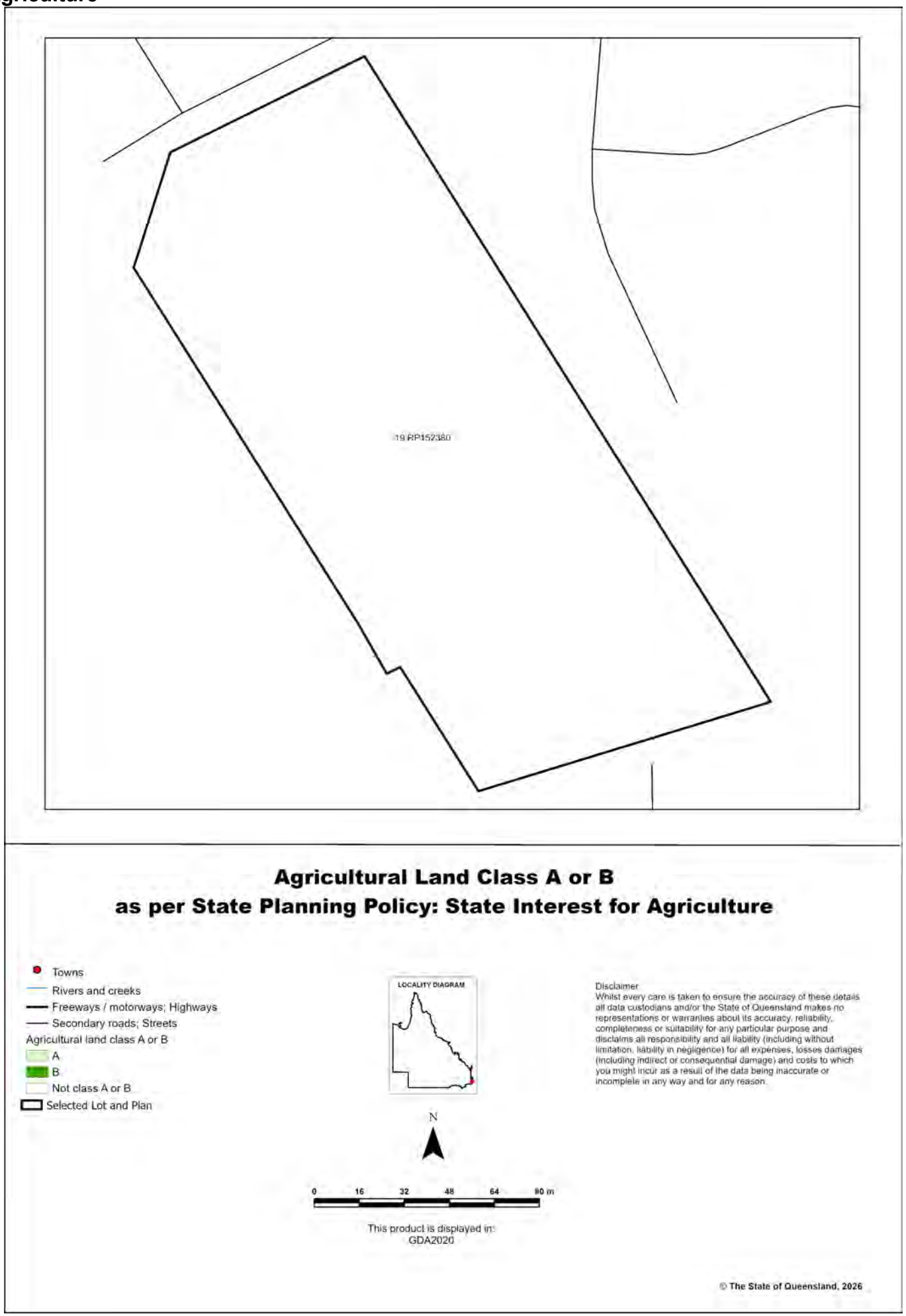
## 4.2 Vegetation management supporting map



## 4.3 Coastal/non-coastal map



## 4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



# 5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

## 5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

## 5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

## 5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

## 5.4 Contact information for DETSI

For further information on the protected plants framework:
**Phone** 1300 130 372 (and select option four)
**Email** palm@detsi.qld.gov.au
**Visit** https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

## 5.5 Protected plants flora survey trigger map

This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

**Updates to the data informing the flora survey trigger map**

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

**Species information**

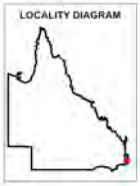
Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.




# Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 10 20 30 40 50 m

This product is displayed in: GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@detsi.qld.gov.au

Disclaimer: While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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# 6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

## 6.1 Koala mapping

### 6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

### 6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

### 6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

#### 6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

### 6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

**Interfering with koala habitat** means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

## 6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

## 6.4 Contact information for DETSI

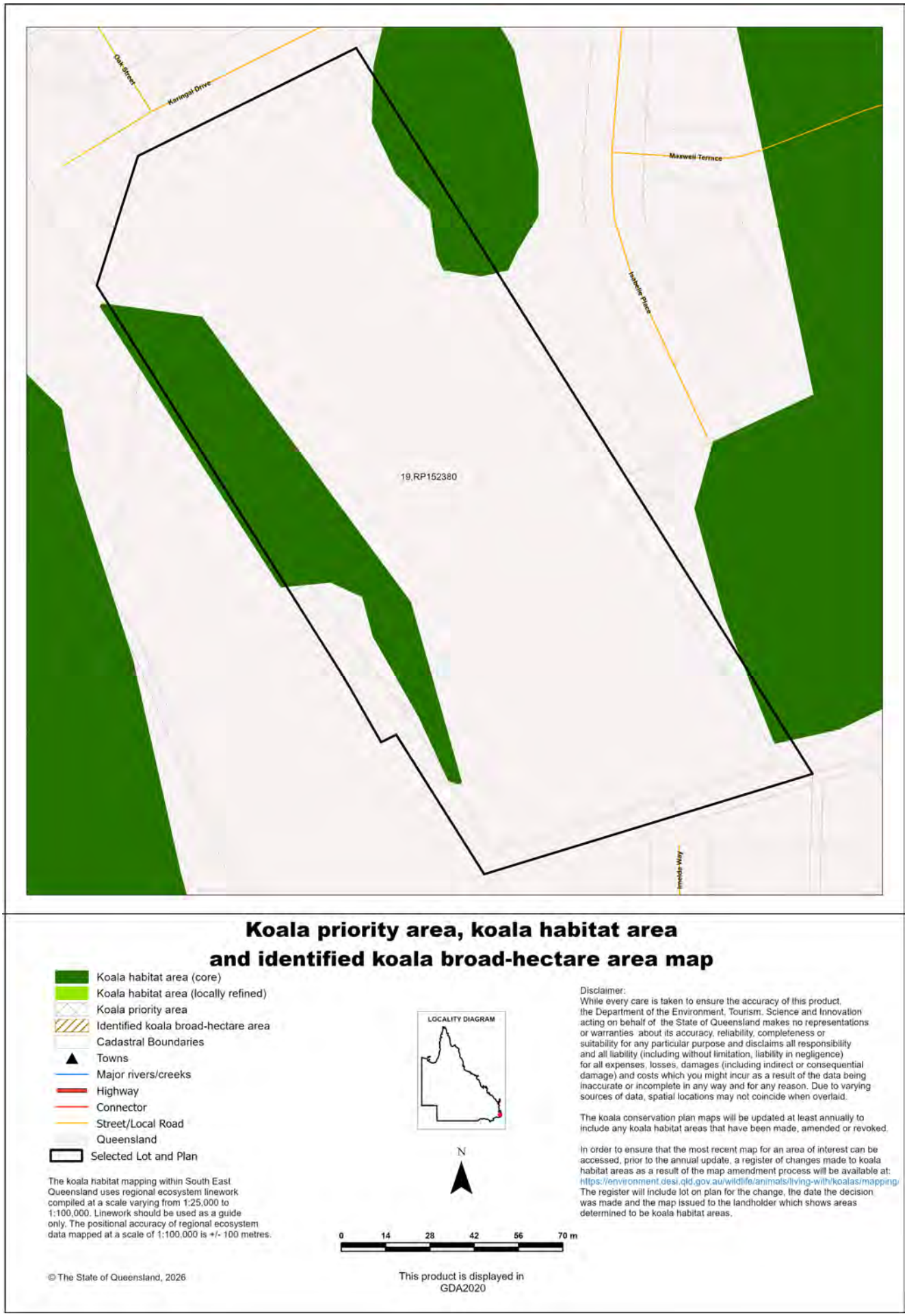
For further information on the koala protection framework:
**Phone** 13 QGOV (13 74 68)
**Email** koala.assessment@detsi.qld.gov.au
**Visit** https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

# 7. Koala protection framework details for Lot: 19 Plan: RP152380

## 7.1 Koala districts

Koala District A

## 7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



## 7.3 Koala habitat regional ecosystems for core koala habitat areas




# Koala habitat regional ecosystems for core koala habitat areas

Koala habitat area (core)
Towns
Highway
Connector
Street/Local Road
Major rivers/creeks
Queensland
Selected Lot and Plan

LOCALITY DIAGRAM

N

0 14 28 42 56 70 m

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Due to varying sources of data, spatial locations may not coincide when overlaid.

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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# 8. Other relevant legislation contacts list

| Activity | Legislation | Agency | Contact details |
|---|---|---|---|
| Interference with overland flow | *Water Act 2000* | Department of Local Government, Water and Volunteers | Ph: 13 QGOV (13 74 68)<br>www.dlgwv.qld.gov.au |
| Earthworks, significant disturbance | *Soil Conservation Act 1986* | Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development | Ph: 13 QGOV (13 74 68)<br>www.nrmmrrd.qld.gov.au |
| Fire Permits | *Fire and Emergency Services Act 1990* | Queensland Fire Department | Ph: 13 QGOV (13 74 68)<br>www.fire.qld.gov.au |
| Indigenous Cultural Heritage | *Aboriginal Cultural Heritage Act 2003*<br>*Torres Strait Islander Cultural Heritage Act 2003* | Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism | Ph: 13 QGOV (13 74 68)<br>www.tatsipca.qld.gov.au |
| Mining and environmentally relevant activities<br>Infrastructure development (coastal)<br>Heritage issues | *Environmental Protection Act 1994*<br>*Coastal Protection and Management Act 1995*<br>*Queensland Heritage Act 1992* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 13 QGOV (13 74 68)<br>www.detsi.qld.gov.au |
| Protected plants and protected areas | *Nature Conservation Act 1992*<br>*Planning Act 2016* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 1300 130 372 (option 4)<br>palm@detsi.qld.gov.au<br>www.detsi.qld.gov.au |
| Koala mapping and regulations | *Nature Conservation Act 1992* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 13 QGOV (13 74 68)<br>Koala.assessment@detsi.qld.gov.au |
| Interference with fish passage in a watercourse, mangroves<br>Forestry activities | *Fisheries Act 1994*<br>*Forestry Act 1959* | Queensland Department of Primary Industries | Ph: 13 QGOV (13 74 68)<br>www.dpi.qld.gov.au |
| Matters of National Environmental Significance including listed threatened species and ecological communities | *Environment Protection and Biodiversity Conservation Act 1999* | Department of Climate Change, Energy, the Environment and Water (Australian Government) | Ph: 1800 920 528<br>www.dcceew.gov.au |
| Development and planning processes | *Planning Act 2016*<br>*State Development and Public Works Organisation Act 1971* | Queensland Department of State Development, Infrastructure and Planning | Ph: 13 QGOV (13 74 68)<br>www.planning.qld.gov.au |
| Coordinated projects | *Planning Act 2016*<br>*State Development and Public Works Organisation Act 1971* | Office of the Coordinator-General | Ph: 13 QGOV (13 74 68)<br>www.statedevelopment.qld.gov.au/coordinator-general |
| Wet Tropics World Heritage Area | *Wet Tropics World Heritage Protection and Management Act 1993* | Queensland Wet Tropics Management Authority | Ph: (07) 4241 0500<br>www.wettropics.gov.au |
| Requirements on State controlled road | *Transport Infrastructure Act 1994* | Queensland Department of Transport and Main Roads | Ph: 13 QGOV (13 74 68)<br>https://www.tmr.qld.gov.au |
| Local government requirements | *Local Government Act 2009*<br>*Planning Act 2016* | Your relevant local government office | Local Government Contact Directory |

## Table B1: Wildlife Online Search Results – EVNT / SL Species

A search of the Queensland Government Wildlife Online database was undertaken to identify flora and fauna species previously recorded in the locality. The database was queried using a 2 km radius centred on the subject site (latitude -27.8305, longitude 153.3061) and included all species listed as conservation significant. The search was conducted on 27 February 2026 and returned a total of 16 records, comprising 6 fauna species and 10 flora species.

| Kingdom | Class | Family | Scientific name | Common name | NCA status | EPBC status | Conservation significant | Establishment |
|---|---|---|---|---|---|---|---|---|
| Animalia | Amphibia | Myobatrachidae | *Crinia tinnula* | wallum froglet | V | | Yes | QA |
| Animalia | Aves | Cacatuidae | *Calyptorhynchus lathami lathami* | glossy black-cockatoo | V | V | Yes | QA |
| Animalia | Aves | Strigidae | *Ninox strenua* | powerful owl | V | | Yes | QA |
| Animalia | Mammalia | Phascolarctidae | *Phascolarctos cinereus* | koala | E | E | Yes | QA |
| Animalia | Mammalia | Pteropodidae | *Pteropus poliocephalus* | grey-headed flying-fox | C | V | Yes | QA |
| Animalia | Mammalia | Tachyglossidae | *Tachyglossus aculeatus* | short-beaked echidna | SL | | Yes | QAI |
| Plantae | Equisetopsida | Arecaceae | *Livistona australis* | cabbage tree palm | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Blechnaceae | *Blechnum medium* | | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Blechnaceae | *Telmatoblechnum indicum* | | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Campanulaceae | *Lobelia purpurascens* | white root | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Myrtaceae | *Syzygium moorei* | Durobby | V | V | Yes | NTQ |
| Plantae | Equisetopsida | Polypodiaceae | *Platycerium bifurcatum* | | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Polypodiaceae | *Platycerium superbum* | staghorn fern | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Proteaceae | *Macadamia integrifolia* | macadamia nut | V | V | Yes | NTQ |
| Plantae | Equisetopsida | Pteridaceae | *Adiantum hispidulum var. hispidulum* | | SL | | Yes | NTQ |
| Plantae | Equisetopsida | Thelypteridaceae | *Christella dentata* | creek fern | SL | | Yes | NTQ |

***Key**: NCA status (Q): Conservation status under the Nature Conservation Act 1992 (Queensland), CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, C =Least Concern.*

*EPBC status (A): Conservation status under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) CE = Critically Endangered, E = Endangered, V = Vulnerable, CD = Conservation Dependent.*

*Establishment: QA = Native — naturally occurring in the area, QAI = Native — indigenous to the immediate region, NTQ = Native to Queensland but may occur outside its typical local range, I = Introduced species*

## Appendix C – Flora Species Identified On Site

### Table C1: Flora Species Observed On-Site

| Family | Scientific Name | Common Name | Status^ |
|---|---|---|---|
| Fabaceae | *Acacia concurrens* | late-flowering hickory | C |
| Fabaceae | *Acacia disparrima* | hickory wattle | C |
| Fabaceae | *Acacia fimbriata* | Brisbane wattle | C |
| Fabaceae | *Acacia leiocalyx subsp. leiocalyx* | early flowering black wattle | C |
| Fabaceae | *Acacia longissima* | long-leaved wattle | C |
| Myrtaceae | *Acmena ingens* | red apple | C |
| Asteraceae | *Ageratina Adenophora** | crofton weed | |
| Asteraceae | *Ageratum houstonianum** | blue billy goat weed | |
| Euphorbiaceae | *Alchornea ilicifolia* | native holly | C |
| Casuarinaceae | *Allocasuarina littoralis* | black she-oak | C |
| Rhamnaceae | *Alphitonia excelsa* | soap tree | C |
| Amaranthaceae | *Alternanthera denticulata** | lesser joyweed | |
| Asteraceae | *Ambrosia artemisiifolia** | annual ragweed | R |
| Myrtaceae | *Angophora leiocarpa* | smooth-barked apple | C |
| Arecaceae | *Archontophoenix alexandrae* | Alexander palm | C, NLN |
| Asparagaceae | *Asparagus aethiopicus cv. Sprengeri** | asparagus fern | R |
| Asteraceae | *Aster subulatus* | wild aster | |
| Pittosporaceae | *Auranticarpa rhombifolia* | diamond leaf pittosporum | C |
| Myrtaceae | *Backhousia citriodora* | lemon myrtle | C |
| Asteraceae | *Bidens pilosa** | cobbler's pegs | |
| Arecaceae | *Bismarckia nobilis* | Bismarck palm | |
| Asteraceae | *Blakella torelliana* | cadaghi | C, NLN |
| Blechnaceae | *Blechnum cartilagineum* | gristle fern | C |
| Malvaceae | *Brachychiton acerifolius* | flame tree | C |
| Malvaceae | *Brachychiton australis* | broad-leaved bottle tree | C |
| Commelinaceae | *Callisia elegans** | striped inch plant | |
| Commelinaceae | *Callisia fragrans** | purple succulent | |
| Rutaceae | *Calodendrum capense* | Cape chestnut | |
| Fabaceae | *Castanospermum australe* | black bean | C |
| Casuarinaceae | *Casuarina glauca* | swamp oak | C |
| Urticaceae | *Cecropia peltata** | Mexican bean tree | R |
| Poaceae | *Chloris gayana** | Rhodes grass | |
| Lauraceae | *Cinnamomum camphora** | Camphor laurel | R |
| Commelinaceae | *Commelina cyanea* | scurvey weed | C |
| Commelinaceae | *Commelina diffusa* | native wandering jew | C |
| Myrtaceae | *Corymbia intermedia* | pink bloodwood | C |
| Sapindaceae | *Cupaniopsis anacardioides* | tuckeroo | C |
| Poaceae | *Cynodon dactylon** | couch | |
| Fabaceae | *Delonix regia** | poinciana | |

| Family | Scientific Name | Common Name | Status^ |
|---|---|---|---|
| Fabaceae | *Desmodium incanum** | creeping beggarweed | |
| Fabaceae | *Desmodium uncinatum** | silver-leaved desmodium | |
| Ebenaceae | *Diospyros fasciculosa* | grey ebony | C |
| Verbenaceae | *Duranta erecta** | duranta | |
| Arecaceae | *Dypsis lutescens* | golden cane palm | |
| Elaeocarpaceae | *Elaeocarpus grandis* | blue quandong | C |
| Elaeocarpaceae | *Elaeocarpus reticulatus* | blueberry ash | C |
| Cyperaceae | *Eleocharis dulcis* | water chestnut | C |
| Poaceae | *Eragrostis curvula** | African lovegrass | |
| Asteraceae | *Erigeron bonariensis** | flax-leaf fleabane | |
| Asteraceae | *Erigeron sumatrensis** | fleabane | |
| Rosaceae | *Eriobotrya japonica** | loquat | |
| Myrtaceae | *Eucalyptus siderophloia* | grey ironbark | C |
| Myrtaceae | *Eucalyptus tereticornis* | Qld blue gum | C |
| Myrtaceae | *Eugenia uniflora** | Brazilian cherry | |
| Asparagaceae | *Eustrephus latifolius* | wombat berry | C |
| Moraceae | *Ficus benjamina* | weeping fig | C |
| Moraceae | *Ficus obliqua var. petiolaris* | small-leaved fig | C |
| Flagellariaceae | *Flagellaria indica* | whip vine | C |
| Rutaceae | *Flindersia australis* | crow's ash | C |
| Phyllanthaceae | *Glochidion ferdinandi var. ferdinandi* | cheese tree | C |
| Phyllanthaceae | *Glochidion sumatranum* | umbrella cheese tree | C |
| Proteaceae | *Grevillea robusta* | silky oak | C |
| Anacardiaceae | *Harpephyllum caffrum* | kaffir plum | |
| Sapindaceae | *Harpullia pendula* | tulipwood | C |
| Araliaceae | *Heptapleurum actinophyllum* | Umbrella tree | C, NLN |
| Poaceae | *Imperata cylindrica* | blady grass | C |
| Araceae | *Inga edulis* | ice-cream bean tree | |
| Sapindaceae | *Jagera pseudorhus subsp. pseudorhus* | foambark | C |
| Verbenaceae | *Lantana camara** | lantana | R |
| Brassicaceae | *Lepidium bonariense** | Argentine peppercress | |
| Myrtaceae | *Leptospermum petersonii* | lemon scented tea tree | C |
| Myrtaceae | *Leptospermum polygalifolium* | wild may | C |
| Fabaceae | *Leucaena leucocephala** | leucaena | |
| Arecaceae | *Livistona australis* | cabbage tree palm | SL |
| Arecaceae | *Livistona chinensis** | Chinese fan palm | |
| Asparagaceae | *Lomandra longifolia* | long-leaved mat-rush | C |
| Myrtaceae | *Lophostemon confertus* | brush box | C |
| Myrtaceae | *Lophostemon suaveolens* | swamp box | C |
| Fabaceae | *Lotononis bainesii** | lotononis | |
| Moraceae | *Maclura cochinchinensis* | cockspur thorn | C |
| Fabaceae | *Macroptilium atropurpureum** | siratro | |

| Family | Scientific Name | Common Name | Status^ |
|---|---|---|---|
| Fabaceae | *Macroptilium lathyroides** | phasey bean | |
| Fabaceae | *Macrotyloma axillare** | perennial horse gram | |
| Anacardiaceae | *Mangifera indica* | mango | |
| Poaceae | *Megathyrsus maximus** | green panic | |
| Myrtaceae | *Melaleuca bracteata* | black tea tree | C |
| Myrtaceae | *Melaleuca linariifolia var. linariifolia* | snow in summer | C |
| Myrtaceae | *Melaleuca quinquenervia* | broad-leaved paperbark | C |
| Myrtaceae | *Melaleuca salicina* | white bottlebrush | C |
| Myrtaceae | *Melaleuca viminalis* | weeping bottlebrush | C |
| Poaceae | *Melinis minutiflora** | molasses grass | |
| Poaceae | *Melinis repens** | red natal grass | |
| Araceae | *Monstera deliciosa** | monstera | |
| Moraceae | *Morus alba** | white mulberry | |
| Polygonaceae | *Muehlenbeckia platyclada* | tapeworm plant | |
| Rutaceae | *Murraya paniculata 'Exotica'** | mock orange | |
| Rubiaceae | *Nauclea orientalis* | cheesewood | C, NLN |
| Fabaceae | *Neonotonia wightii** | glycine | |
| Nymphaeaceae | *Nymphaea caerulea** | blue waterlily | |
| Menyanthaceae | *Nymphoides indica* | water snowflake | SL |
| Ochnaceae | *Ochna serrulata** | Mickey Mouse bush | |
| Oxalidaceae | *Oxalis corniculata** | oxalis | |
| Passifloraceae | *Passiflora suberosa** | corky passion flower | |
| Polygonaceae | *Persicaria attenuata* | knotweed | C |
| Araceae | *Philodendron bipinnatifidum** | tree philodendron | |
| Pittosporaceae | *Pittosporum tinifolium* | | C |
| Polypodiaceae | *Platycerium bifurcatum* | elkhorn | SL |
| Podocarpaceae | *Podocarpus elatus* | brown pine | C |
| Portulacaceae | *Portulaca pilosa** | hairy pigweed | |
| Euphorbiaceae | *Ricinus communis** | castor-oil plant | |
| Arecaceae | *Roystonea regia* | Cuban royal palm | |
| Anacardiaceae | *Schinus terebinthifolius** | broadleaved pepper bush | R |
| Poaceae | *Setaria sphacelata** | South African pigeon grass | |
| Malvaceae | *Sida rhombifolia** | Paddy's lucerne | |
| Malvaceae | *Sida spinosa** | spiny sida | |
| Solanaceae | *Solanum chrysotrichum** | giant devil's fig | |
| Solanaceae | *Solanum mauritianum** | wild tobacco | |
| Solanaceae | *Solanum nigrum** | black-berry nightshade | |
| Solanaceae | *Solanum seaforthianum** | Brazilian nightshade | |
| Solanaceae | *Solanum torvum** | devil's fig | |
| Asteraceae | *Sonchus oleraceus** | sow thistle | |
| Bignoniaceae | *Spathodea campanulata** | African tulip tree | R |
| Asteraceae | *Sphagneticola trilobata** | Singapore daisy | R |

| Family | Scientific Name | Common Name | Status^ |
|---|---|---|---|
| Proteaceae | *Stenocarpus sinuatus* | wheel of fire | C |
| Malvaceae | *Sterculia quadrifida* | peanut tree | C |
| Arecaceae | *Syagrus romanzoffiana** | Cocos palm | |
| Araceae | *Syngonium podophyllum** | goosefoot | |
| Myrtaceae | *Syzygium australe* | small leaved lily pilly | C |
| Myrtaceae | *Syzygium floribundum* | weeping lily pilly | C |
| Myrtaceae | *Syzygium francisii* | giant water gum | C |
| Myrtaceae | *Syzygium jambos** | rose apple | |
| Myrtaceae | *Syzygium luehmannii* | riberry | C |
| Fabaceae | *Tipuana tipu** | tipuana | |
| Cannabaceae | *Trema tomentosa var. viridis* | native peach | C |
| Typhaceae | *Typha orientalis* | cumbungi | C |
| Poaceae | *Urochloa decumbens** | signal grass | |
| Verbenaceae | *Verbena bonariensis** | purpletop | |
| Verbenaceae | *Verbena littoralis** | common verbena | |
| Arecaceae | *Washingtonia robusta* | Mexican fan palm | |
| Thymelaeaceae | *Wikstroemia indica* | tie bush | C |
| Myrtaceae | *Xanthostemon chrysanthus* | golden penda | C, NLN |
| Asparagaceae | *Yucca aloifolia** | Spanish bayonet | |

*Environmental weed per DETSI (Wildnet 2026)

^Status: R/P = Restricted / Prohibited invasive plants under Qld *Biosecurity Act 2014*
CWS = City Wide Significant species per Gold Coast City Plan
C = Least Concern under NCA
SL = Significant Least Concern under NCA
NLN = Not local-native

## Appendix D – Conservation Significant Fauna Species Likelihood of Occurrence Assessment

### Table D1: Likelihood of Occurrence of Conservation Significant Fauna Species on Site

This table incorporates the results of the desktop assessment and the site survey results to determine whether species recorded in the desktop survey results are likely to occur on or near the site based on existing habitat and resources available. Species' habitat descriptions are summarised from the Commonwealth DoEE EPBC SPRAT (Species Profile and Threat) Database (https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl or for species not listed under the EPBC – the Qld Dept of Environment and Science 'Threatened Species Profiles' https://environment.des.qld.gov.au/wildlife/threatened-species/ and or the NSW OEH Threatened Species Profiles database https://www.environment.nsw.gov.au/threatenedspeciesapp/. Additional information on local records and habitat preferences in the Gold Coast region is provided where available from the CoGC 'Gold Coast Flora & Fauna Database' http://www.goldcoastflorafauna.com.au/.

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Anthochaera phrygia* | Regent honeyeater | CR, CE# | **UNLIKELY**<br>The Regent Honeyeater is endemic to south-east Australia, where it is widespread but with an extremely patchy distribution. Its range extends from south-east Queensland to central Victoria. In Queensland, the Regent Honeyeater has been recorded from 15 sites, primarily south Chinchilla and the Sunshine Coast. Regent Honeyeaters mostly occur in dry Box-Ironbark eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, especially along creek flats, or in broad river valleys and foothills.<br>Although marginal habitat for this species exists on the site, they were not observed. Known breeding sites for this species are restricted to areas west of the Great Dividing Range.' |
| *Argynnis hyperbius inconstans* | Australian fritillary | CE | **UNLIKELY**<br>*Argynnis hyperbius inconstans* predominately occurs around river estuaries or open, swampy coastal areas. The species is restricted to areas where the larval *Viola betonicifolia* (the arrowhead violet), occurs. Moderate densities are required to support a breeding population. The leaves of the arrowhead violet are food for the caterpillars, while adults forage in swampy areas with arrow head violets feeding on various flowering plants<br>The arrowhead violet typically grows in damp, shaded forest habitats and in association with *Lomandra longifolia* (long leaved matrush) and *Imperata cylindrica* (bladey grass).<br>It is unlikely that this species utilises the subject site due to the marginal nature of the habitat and absence of its primary food source . |
| *Botaurus poiciloptilus* | Australasian bittern | C, E# | **UNLIKELY**<br>The Australasian Bittern occurs from south-east Queensland to south-east South Australia, Tasmania and the south-west of Western Australia. The species is rarely recorded in Queensland, and possibly survives only in protected areas such as the Cooloola and Fraser regions. The Australasian Bittern occurs in terrestrial freshwater wetlands and, rarely, estuarine habitats. It favours wetlands with tall, dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| | | | mats of vegetation over deep water. The Australasian Bittern has been recorded feeding on freshwater crayfish, fish (including goldfish), beetles, snakes, leaves and fruit.<br>The waterway on the subject site is not considered suitable habitat due to the absence of tall dense riparian vegetation. |
| *Calidris acuminata* | sharp-tailed sandpiper | V, MWS | **UNLIKELY**<br>*Calidris acuminata* is a non-breeding spring/summer northern-hemisphere migrant shorebird that inhabits muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.<br>Suitable habitat is not present. |
| *Calidris ferruginea* | curlew sandpiper | CR, CE#, MWS | **UNLIKELY**<br>*Calidris ferruginea* is a non-breeding spring/summer northern-hemisphere migrant shorebird that inhabits sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. They sometimes use saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland flooded paddocks / damp grasslands.<br>Suitable habitat is not present. |
| *Calyptorhynchus lathami lathami* | Glossy black-cockatoo | V | **POSSIBLE**<br>*Calyptorhynchus lathami lathami* inhabit open forests and woodlands of the coast and the Great Dividing Range (up to 1000 metres elevation), preferring drier forests within intact landscapes. Glossy Black-Cockatoo habitat typically includes stands of Sheoak species such as Black Sheoak (*Allocasuarina littoralis*), Forest Sheoak (*A. torulosa*), or Drooping Sheoak (*A. verticillata*). This species' diet only consists of the seeds from Casuarina and Allocasuraina trees.<br>Glossy Black-Cockatoos are social birds and are typically observed in pairs or family groups.<br>They are dependent on large hollow-bearing eucalypts for nest sites. The hollows used by the birds are usually at least 14 cm in diameter. The same hollow may be reused in subsequent years by the same or different females. Breeding occurs from March to August, with laying in autumn and nesting over winter.<br>Suitable nest trees for this species were present on the subject site however no indication of feeding was sighted during targeted surveys. |
| *Chalinolobus dwyeri* | Large-eared Pied Bat | E, E# | **UNLIKELY**<br>The distribution of the large-eared pied bat is discontinuous and ranges from Shoalwater Bay in Queensland through to Ulladulla in New South Wales. In south-east Queensland *Chalinolobus dwyeri* predominately inhabits caves, hollows of trees, mine shafts, overhangs and disused Fairy Martin (*Hirundo ariel*) nests in high altitude, moist eucalypt forest and rainforest. The NSW OEH profile for this species indicates that it is not been recorded in the Sunshine Coast-Gold Coast Lowlands, however the CoGC Nature conservation Database has a single record of this species in the Gold Coast area from Springbrook.<br>Suitable habitat for this species is not present on the subject site. |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Climacteris picumnus victoriae* | Brown Treecreeper | V, V# | **UNLIKELY**<br>The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges.<br>The subspecies mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. The subspecies is not usually found in woodlands with a dense shrub layer, and it is absent from heavily degraded woodlands and steep rocky hills.<br>It is unlikely that this species utilises the subject site. |
| *Coeranoscincus reticulatus* | Three-toed Snake-tooth Skink | V | **UNLIKELY**<br>*Coeranoscincus reticulatus* occurs in loose, well mulched friable soil, in and under rotting logs, in forest litter, under fallen pine bark and under decomposing cane mulch. In Queensland this species has been found in tall layered open eucalypt forest, rainforest, wet sclerophyll forest, closed forest, tall open Blackbutt (*Eucalyptus pilularis*) forest and closed Brush box (*Lophostemon confertus*) forest.<br>Records indicated that this species has adaptability to modified environments as a result of clearing and can occur in fragmented habitat and restored riparian vegetation.<br>It is unlikely that this species utilises the subject site. |
| *Crinia tinnula* | wallum froglet | V | **UNLIKELY**<br>This species is found along drainage lines in sub-coastal wet heath, in acid Melaleuca swamps, as well as sedge swamps in areas of sandy soil and sandstone (Meyer et al., 2006; Cogger, 2000). Currently within the scientific literature, there is there is little information regarding non-breeding habitat requirements, factors limiting distribution or population structure, dynamics and genetics for this species (Hero et al., 2002, edited 2008). However, specific habitat attributes that are known requirements for this species include ephemeral to temporary water bodies that are generally shallow (i.e. >1 m), acidic (i.e. pH >6.0) and tannin stained (Meyer et al., 2006).<br>It is unlikely that this species utilises the subject site due to the absence of suitable habitat. |
| *Cyclopsitta diophthalma coxeni* | Coxen's fig-parrot | CR, CE# | **UNLIKELY**<br>*Cyclopsitta diophthalma coxeni* is most commonly found in habitats that occur from sea level to roughly 900m above sea level. This species inhabits dry rainforest, subtropical rainforest, littoral and developing littoral rainforest and vine forest. Within these rainforests *Cyclopsitta diophthalma coxeni* is likely to favour alluvial areas that support figs and other trees with fleshy fruits. Other habitats this species have been recorded in include corridors of riparian vegetation in woodland; sub-littoral mixed scrub; isolated stands of fig or other trees on urban, agricultural or cleared land; and open woodland or other types of cleared or partially cleared habitat. The diet of *Cyclopsitta diophthalma coxeni* mainly consists seeds predominantly taken from fig trees, especially *Ficus macrophylla* and *F. watkinsiana*. However, it also feeds on nectar and lichens.<br>Marginal habitat for this species is present on the subject site and no records are present on the northern Gold Coast. |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Dasyurus maculatus maculatus* | Spotted-tail Quoll, Tiger Quoll | V, E# | **UNLIKELY**<br>The species occurs along the coast and western slopes from southern Queensland to Tasmania. In SEQ this species is restricted to remnant wet eucalypt forest and rainforest in relatively remote, mountainous regions. This predominantly nocturnal species rests in family groups during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.<br>Suitable habitat does not occur on the subject site and there are no ALA records within a 30km radius. |
| *Delma torquata* | Collared Delma | V, V# | **UNLIKELY**<br>*Delma torquata* is endemic to Qld where it typically inhabits Poplar Box woodland on alluvial plains, Brigalow open forest on fine-grained sedimentary rocks and Spotted Gum open forest on coarse-grained sedimentary rocks in the Brigalow Belt bioregion (land zones 3,9 and 10). This species has also been recorded in the north-western parts of Brisbane (Mt Crosby and Moggill State Forest). This species has not been recorded in the Gold Coast region.<br>Suitable habitat for this species is not present on the subject site. |
| *Erythrotriorchis radiatus* | Red goshawk | E, V# | **UNLIKELY**<br>The Red Goshawk is endemic to Australia where it is sparsely dispersed across approximately 15% of coastal and sub-coastal Australia, from western Kimberley Division (north of 19°S) to northeastern NSW (north of 33°), and occasionally on continental islands. The Red Goshawk occurs in large bushland remnants of coastal and sub-coastal open forest and rainforest usually near watercourses. Such habitats typically support high bird numbers and biodiversity, especially medium to large bird species which the goshawk requires for prey. The Red Goshawk nests in large trees within 1km of permanent water.<br>Suitable connected habitat for this species is not present on the subject site. |
| *Falco hypoleucos* | Grey Falcon | V | **UNLIKELY**<br>The distribution of this species is restricted largely to areas of the highest annual average temperatures where there is an average annual rainfall of less than 500 mm. It favours lightly timbered and untimbered lowland plains that are crossed by tree-lined watercourses, but frequents other habitats including grassland and sand dune habitats.<br>The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.<br>It is unlikely that this species utilises the subject site. |
| *Gallinago hardwickii* | Latham's snipe | V, V#, SL, MWS | **UNLIKELY**<br>*Gallinago hardwickii* prefers permanent and ephemeral wetlands up to 2,000 m above sea-level. Usually the species inhabits open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around water bodies). However, they can also occur in modified or artificial habitats, and in habitats |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| | | | located close to humans or human activity. Latham's snipe feeds mostly on seeds, other plant material primarily from Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae and Fabaceae and insects.<br>Suitable habitat for this species is not present on or adjacent to the subject site |
| *Geophaps scripta scripta* | Squatter Pigeon (southern) | V | **UNLIKELY**<br>The known distribution of *Geophaps scripta scripta* extends south from the southern region of Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville, Queensland. This species' habitat is defined as open-forests to sparse, open-woodlands and scrub that are dominated in the overstorey by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species with remnant, regrowth or partly modified vegetation communities, and within 3 km of water bodies or courses. In Qld, Squatter Pigeon (southern) foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (Land Zone 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (Land Zone 7). There are no known records for this species on the Gold Coast.<br>Suitable habitat for this species is not present on the subject site. |
| *Grantiella picta* | Painted Honeyeater | V | **UNLIKELY**<br>The painted honeyeater is sparsely distributed from south-eastern Australia to north-western Queensland and the eastern Northern Territory, being more common west of the Great Dividing Range. The Queensland population is augmented in winter by migrants from the south.<br>The painted honeyeater lives in dry, open forests and woodlands (box, ironbark, yellow gum, melaleuca, casuarina, callitris, acacia). The species usually occurs in areas with flowering and fruiting mistletoe and flowering eucalypts.<br>It is unlikely that this species utilises the subject site. |
| *Hemiaspis damelii* | Grey Snake | E, E# | **UNLIKELY**<br>The Grey Snake occurs in Brigalow Acacia harpophylla and Belah Casuarina cristata woodlands on heavy, cracking clay soils, particularly in association with water bodies, areas with small gullies and ditches, and floodplain environments where it shelters beneath logs, rocks and soil cracks. The species has a broader dispersed distribution, but records indicate it is still closely associated with floodplain habitat, especially along the Macintyre River and Condamine River. Specific areas the species is found include the Goondiwindi area and the adjacent Darling-Riverine Plain, from the Darling Downs and from the Lockyer Valley with an isolated sub-population near Rockhampton. The core area for the Grey Snake in the Brigalow Belt is south of the Great Dividing Range between Dalby and Glenmorgan.<br>It is unlikely that this species utilises the subject site. |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Hirundapus caudacutus* | White-throated Needletail | V, MTS | **POSSIBLE**<br>*Hirundapus caudacutus* migrates to Australia in Summer where it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. This species is almost exclusively aerial, most often seen at heights of less than 1 m up to more than 1000 m above the ground. Foraging in flight above a wide variety of more often wooded habitats but including, farmland, heathland, mudflats, open habitats, recently disturbed areas, updraughts near ridges or cliffs or sand-dunes. This species roosts in tree hollows or the canopy of open forests and woodlands.<br>*Hirundapus caudacutus* was not seen during surveys, but the site may provide habitat for this species. |
| *Lathamus discolor* | Swift Parrot | E, CE[#] | **UNLIKELY**<br>*Lathamus discolor* breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Qld Blue gum / Forest Red Gum, Mugga Ironbark, and White Box. The CoGC NCS database reports that this species is a rare summer visitor with known locations including Southport, Elanora, Palm Beach, Mudgeeraba and Albert River.<br>Suitable habitat for this species is not present on the subject site. |
| *Litoria olongburensis* | wallum sedge frog | V, V[#] | **UNLIKELY**<br>*Litoria olongburensis* is found in ephemeral and semi-permanent swamps in undisturbed coastal wallum vegetation. The species is associated with emergent reeds, ferns and / or sedges in suitable habitat. *Litoria olongburensis* is most commonly associated with swamps and ephemeral water bodies but is also found around creeks and freshwater lakes in coastal wallum.<br>It is unlikely that this species utilises the subject site as wallum habitat is absent. |
| *Mixophyes fleayi* | Fleay's frog | E | **UNLIKELY**<br>*Mixophyes fleayi* inhabits stream habitats from first to third order streams and is not found in ponds or ephemeral pools. The majority of *Mixophyes fleayi* inhabit areas at altitudes above 400m, however it is known to inhabit lowland forest at altitudes of 200m, 150m and 90m. Adults may be found in leaf litter near the watercourse, with females traveling distances of up to 35m from the stream and males traveling up to 58 meters from the stream. Tadpoles occur with several species of native fish but not introduced fish species.<br>This species occurs in montane rainforest, open forest communities adjoining rainforest, rainforest and adjoining wet sclerophyll forests and marginal habitat where riparian habitat has been replaced by weeds.<br>Suitable, marginal habitat for this species occurs on the subject site however the waterway is not within the elevational range of this species. |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Ninox strenua* | powerful owl | V | **UNLIKELY**<br>*Ninox strenua* occupies a large home range in mountain forest, open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. This species feeds on medium to large tree-dwelling mammals, flying foxes and roosting birds. It will also take small ground-dwelling mammals such as rabbits or small marsupials. Habitat requirements include hollow bearing trees for breeding and to a lesser extent, hunting.<br>*Ninox strenua* roosts in dense vegetation along creeks and gully lines where the canopy provides refuge from aggressive, edge specialist bird species. For nesting, this species prefers hollow with diameter of greater than 45 cm and a depth 100 cm located in old growth eucalypt forests associated with gullies and / or lower slopes within 100 m of streams or minor drainage lines.<br>It is unlikely that this species utilises the subject site. |
| *Petauroides volans* /<br>*Petauroides armillatus* | Greater Glider / Central glider | V, V# | **UNLIKELY**<br>*Petauroides volans/ armillatus* are found in a variety of eucalypt forest and woodlands preferring taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. This species is nocturnal, sheltering in tree hollows during the day, and requires areas of undisturbed and unfragmented native forest of at least 160km2 to maintain viable populations.<br>Suitable extensive habitat for this species is not present on the subject site. |
| *Petaurus australis* | yellow-bellied glider | V, V# | **UNLIKELY**<br>*Petaurus australis* is found in a variety of eucalypt forest and woodlands preferring taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. This species is nocturnal, sheltering in tree hollows during the day, and requires areas of undisturbed and unfragmented native forest of at least 160km2 to maintain viable populations.<br>Suitable habitat for this species is not present on the subject site. |
| *Phascolarctos cinereus* | Koala | E, E# | **POSSIBLE**<br>*Phascolarctos cinereus* inhabits dry open sclerophyll forests and woodlands occurring on fertile soils. Communities containing denser vegetation and larger trees are generally preferred; however *Phascolarctos cinereus* can also inhabit less optimal habitat such as young forests, highly fragmented vegetation communities, and small remnants. This species prefers to forage on leaves of *Eucalyptus* species (Grey gum most favoured on the Gold Coast) but will also feed leaves of *Corymbia*, *Angophora*, *Lophostemon* and *Melaleuca* species.<br>The flora survey results demonstrate that preferred koala feed trees are present on the site, however the isolated and disconnected nature of the site in the local landscape means that the site's vegetation would only be suitable as dispersal habitat. Its suitability as dispersal habitat however is limited by the lack of connectivity or viable movement corridors to/from large core habitat areas. |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| *Potorous tridactylus tridactylus* | Long-nosed Potoroo | V, V# | **UNLIKELY**<br>*Potorous tridactylus tridactylus* are found in a variety of habitats from wet eucalypt forests to coastal heaths and scrubs along the eastern coast of Australia. Primary factors that determine habitat suitability include access to some form of dense vegetation for shelter and the presence of an abundant supply of fungi for food. The CoGC NCS database reports that this species is a shy and rarely seen inhabitant of higher altitude wet eucalypt forests with a thick understorey. Population numbers are likely underreported due to this species' secretive nature. Known locations in this region include Springbrook NP, Eagle Heights, Burleigh Heads, Lamington NP and Coolangatta (Cobaki wetlands).<br>Suitable habitat for this species is not present on the subject site. |
| *Pteropus poliocephalus* | Grey-headed flying-fox | C, V# | **POSSIBLE**<br>The grey-headed flying-fox occurs in the coastal belt from Rockhampton to Melbourne. It requires foraging resources (typically flowering gums and paperbark) and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and *Banksia* woodlands. None of the vegetation communities used by the Grey-headed Flying-fox produce continuous foraging resources throughout the year, so the species selectively forages where food is available. As a result, patterns of occurrence and relative abundance within its distribution vary widely between seasons and between years. At a local scale, the species is generally present intermittently and irregularly. The Grey-headed Flying-fox roosts in camps – often mixed species (black and little red flying foxes) and of various sizes. They most frequently travel around 15km from a roost site to feed although are capable of traveling up to 50km as food resources change.<br>While no roost sites were found on-site, grey-headed flying-fox may periodically forage on the site when suitable food resources (i.e. flowering Eucalypts) are available. |
| *Stagonopleura guttata* | Diamond Firetail | V, V# | **UNLIKELY**<br>The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. The bird is mostly sedentary and lives in open grassy eucalypt forest and woodland, heath, mallee country, farmland and grassland with scattered trees. It is also often found in riparian areas (rivers and creeks).<br>This species is considered unlikely to be using the site and there are no recent records within the region. |
| *Tringa nebularia* | Common Greenshank | E, E#, SL, MWS | **UNLIKELY**<br>*Tringa nebularia* occurs in all types of wetlands including inland wetlands (e.g. swamps, lakes, dams, rivers, creeks, inundated floodplains) and sheltered coastal habitats of varying salinity (e.g. tidal pools, harbours, river estuaries, lagoons) (Higgins & Davies 1996). The species prefer wetlands with mud or clay edges with bare, emergent or fringing vegetation including short sedges and saltmarsh, mangroves, thickets of rushes and dead or live trees. The Common Greenshank does not breed in Australia, however a population of 18,000–19,000 spend the non-breeding season in Australia (Bamford et al. 2008; Clemens et al. 2008; Higgins & Davies 1996). It is typically seen singly or in small to large flocks, foraging at the edges of wetland, mudflats, channels |

| Scientific Name | Common Name | Status* | Likelihood of Occurrence on Site |
|---|---|---|---|
| | | | or among mangrove pneumatophores, occasionally feeding on exposed seagrass beds (Higgins & Davies 1996). Its diet consists of molluscs, crustaceans, insects and occasionally fish and frogs.<br>Suitable habitat for this species is not present on the subject site. |
| *Turnix melanogaster* | Black-breasted Button-quail | V, V# | **UNLIKELY**<br>*Turnix melanogaster* is restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. This species prefers semi-evergreen vine thicket, low microphyll vine forest, araucarian microphyll vine forest and araucarian notophyll vine forest. It also occurs in dense acacia thickets and, littoral area, lantana which is used for diurnal foraging and nocturnal roosting and pasture grass adjacent to habitat areas. Extensive leaf-litter is required for foraging, fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding.<br>Suitable habitat for this species is not present on the subject site. |
| *Xeromys myoides* | False water rat | V, V# | **UNLIKELY**<br>*Xeromys myoides* inhabit mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands. In south-east Queensland the upper tidal areas on the shoreward side of the mangrove zone often support saltmarsh adjoining terrestrial communities including freshwater wetland, coastal woodland or wet heathland. These communities are all utilised by the water mouse for foraging and nesting. Essential Habitat for the water mouse includes the Regional Ecosystems 12.1.1, 12.1.2, 12.1.3, 12.2.5, 12.2.7, 12.2.11, 12.2.12 and 12.2.14. This species' diet typically includes a variety of crustaceans, marine polyclads, marine pulmonates, mud lobster *Laomedia healyi*, mottled shore crab *Peragrapsis laevis* and marine bivalves.<br>Suitable habitat and foraging resources for this species are not present. |

**Status: As listed within the Queensland Nature Conservation Act 1992: CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SL = Special Least Concern, C = Least Concern. As listed in the Commonwealth Environment Protection and Biodiversity Conservation Act 1999: CE# = Critically Endangered, E# = Endangered, V# = Vulnerable, CD# = Conservation Dependent, I# = Introduced Species, MTS = Migratory Terrestrial Species, MWS = Migratory Wetland Species, M = Marine*

# Appendix E – Gold Coast City Plan Version 13 Environmental Significance Overlay Code Response

## PART B – ASSESSABLE DEVELOPMENT BENCHMARKS

### Table 8.2.6-2: Environmental significance overlay code – for assessable development

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Ecological site assessment** | | | |
| **PO1**<br>All matters of environmental significance on and adjacent to the development site are identified and protected.<br>**Note - An Ecological Site Assessment prepared in accordance with SC6.7 City Plan policy – Ecological site assessments, is Council's preferred method for addressing this performance outcome.** | **AO1**<br>Proposed works do not impact on:<br>(a) areas identified on **Environmental significance – vegetation management overlay map**;<br>(b) buffers to wetlands and waterways being:<br>(i) 100m from the mapped boundary of a State significant aquatic area, as identified on **Environmental significance – wetlands and waterways overlay map**;<br>(ii) 100m from the outer landward boundary of a State significant wetland, as identified on **Environmental significance – wetlands and waterways overlay map**;<br>(iii) 100m from the outer landward boundary of a Local significant wetland, as identified on **Environmental significance – wetlands and waterways overlay map**;<br>(iv) 60m from the outer bank of a Major Waterway identified on **Environmental significance – wetlands and waterways overlay map**; or<br>(v) 30m from the outer bank of a Waterway identified on **Environmental significance – wetlands and waterways overlay map**; and<br>(c) individual trees within areas mapped on the **Environmental significance – priority species overlay map**. | **GENERALLY COMPLIANT PO1 AND AO1**<br>This code response is appended to the Ecological Site Assessment prepared in accordance with SC6.7 City Plan policy – Ecological site assessments.<br><br>The ESA has identified the mapped waterway on site as a highly degraded drainage feature modified through historic clearing, weed incursion and significant modification of the upstream and downstream catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping. The development protects the waterway in the proposed reserve and all site stormwater will be treated for quality and quantity before discharging into the downstream environment. The width of the waterway reserve varies from 24m at its narrowest point to 116m at its widest.<br><br>The proposed setback of variable widths between the development footprint and the mapped waterway is considered adequate to protect the riparian values of this drainage feature.<br><br>The proposal protects 0.74ha of potential habitat in the proposed reserve and common areas. The development minimises impacts on priority species habitat as much as feasible and therefore is compliant with AO1 and PO18 of the City Plan Environmental Significance Overlay Code. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | | | |
| **Biodiversity areas** | | | |
| **PO2**<br>Development does not impact on Protected Areas as identified on the **Environmental significance– biodiversity areas overlay map**. | **AO2.1**<br>No acceptable outcome provided. | **N/A**<br>The site is not within the Environmental significance–biodiversity areas overlay map**.** | |
| **PO3**<br>Development within the Hinterland to Coast Critical Corridors as identified on the **Environmental significance – biodiversity areas overlay map** is located and designed to: | **AO3.1**<br>No acceptable outcome provided. | **N/A**<br>The site is not within the Hinterland to Coast Critical Corridors as identified on the Environmental significance–biodiversity areas overlay map**.** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (a) provide corridors of sufficient dimensions and characteristics that will enable adequate movement of fauna through the site;<br>(b) protect in situ matters of environmental significance and associated buffers;<br>(c) protect in situ, vegetation identified on the **Environmental significance – vegetation management overlay map** and habitat for native flora and fauna;<br>(d) link matters of environmental significance, existing corridors and/or conservation estate/reserves on adjacent properties;<br>(e) maintain and improve upon the regional connectivity of the Hinterland to Coast Critical Corridors; and<br>(f) allow for the rehabilitation of disturbed, cleared or modified areas that form part of the Hinterland to Coast Critical Corridors.<br>**Note: Recommendations provided in an ecological site assessment (prepared in accordance with SC6.7 City Plan policy – Ecological site assessments) are Council's preferred method for determining corridor dimensions.** | | | |
| **PO4**<br>Development within Hinterland Core Habitat Systems, Coastal Wetlands and Islands Core Habitat Systems and | **AO4**<br>No acceptable outcome provided. | **N/A**<br>The site is not within the Environmental significance– biodiversity areas overlay map. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| Substantial Remnant Areas as identified on the **Environmental significance – biodiversity areas overlay map** is located and designed to:<br>(a) protect in situ matters of environmental significance and associated buffers;<br>(b) protect in situ vegetation identified on the **Environmental significance – vegetation management overlay map** and habitat for native flora and fauna; and<br>(c) allow for the rehabilitation of disturbed, cleared or modified areas. | | | |
| **Wetland and waterway** | | | |
| **PO5**<br>Buffers are provided to wetlands and waterways identified on the **Environmental significance – wetlands and waterways overlay map** to ensure the: | **AO5.1**<br>Buffers at least 100m wide are provided between the development and the mapped boundary of a State significant aquatic area, as identified on **Environmental significance – wetlands and waterways overlay map**. | **N/A**<br>No state significant aquatic areas are present. | |
| | **AO5.2**<br>Buffers at least 100m wide are provided between the development and the outer landward boundary of a State significant wetland, as identified on **Environmental significance – wetlands and waterways overlay map**. | **N/A**<br>No state significant wetlands are present. | |
| | **AO5.3**<br>Buffers at least 100m wide are provided between the development and the outer landward boundary of a Local significant wetland as identified on the **Environmental significance – wetlands and waterways overlay map**. | **N/A**<br>No local significant wetlands are present. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (a) protection of matters of environmental significance mapped onsite or identified through an ecological site assessment;<br>(b) unimpeded movement of fauna along the waterway;<br>(c) water quality is maintained;<br>(d) bank stability; and<br>(e) protection of property and infrastructure.<br>**Note: The buffer width for wetlands is measured from the outer, landward boundary of the mapped wetland, as shown on Environmental significance – wetlands and waterways overlay map.**<br>**Note: Recommendations provided in an ecological site assessment (prepared in accordance with SC6.7 City Plan policy – Ecological site assessments) is Council's preferred method for determining alternative buffer widths.**<br>**Note Artificial waterways are to be addressed through the Coastal erosion hazard overlay code and map. Where a waterbody contains both natural and artificial banks, the natural banks are to be assessed in accordance with this performance outcome.** | **AO5.4**<br>Buffers at least 60m wide are provided between the development and the outer bank of a Major Waterway as identified on the **Environmental significance – wetlands and waterways overlay map**. | **N/A**<br>No major waterways are present. | |
| | **AO5.5**<br>Buffers at least 30m wide are provided between the development and the outer bank of a waterway as identified on the **Environmental significance – wetlands and waterways overlay map**. | **COMPLIES PO5/AO5.5**<br>The ESA has identified the mapped waterway on site as a highly degraded drainage feature modified through historic clearing, weed incursion and significant modification of the upstream and downstream catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping. The development protects the waterway in the proposed reserve and all site stormwater will be treated for quality and quantity before discharging into the downstream environment. The width of the waterway reserve varies from 24m at its narrowest point to 116m at its widest.<br>The proposed alternative setback (of variable widths) between the development footprint and the mapped waterway is considered adequate to protect the riparian values of this drainage feature. | |
| **Vegetation management** | | | |
| **PO6**<br>Regulated vegetation is protected in situ | **AO6**<br>Development does not impact on regulated vegetation. | **N/A** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| when it is:<br>(a) identified on the **Environmental significance – vegetation management overlay map**; and<br>(b) within biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | | The site is not within biodiversity areas as identified on the **Environmental significance –biodiversity areas overlay map.** | |
| **PO7**<br>Development is designed to maintain regulated vegetation and minimise disturbance when it is:<br>(a) identified on the **Environmental significance – vegetation management overlay map**; and<br>(b) outside of biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO7**<br>Development avoids impacts on regulated vegetation. | **GENERALLY COMPLIES PO7/AO7**<br>A small impact on mapped regulated vegetation will result from the proposal of 34m$^2$. The ESA has identified that the site's mapped vegetation, comprising Vegetation Association A, reflects non-remnant vegetation however the proposed 0.74ha reserve will protect and restore vegetation that will achieve the structural and floristic benchmarks of Regional Ecosystem 12.3.11 and ensures a net gain in MLES vegetation. | |
| **PO8**<br>High priority vegetation as identified on the **Environmental significance – vegetation management overlay map** is protected in situ. | **AO8**<br>No acceptable outcome provided. | **N/A**<br>High priority vegetation is not present. | |
| **PO9**<br>Medium and general priority vegetation as identified on the **Environmental significance – vegetation management overlay map** within biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map** is protected in situ. | **AO9**<br>No acceptable outcome provided. | **N/A**<br>The site is not within biodiversity areas as identified on the **Environmental significance –biodiversity areas overlay map.** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO10**<br>Vegetation is protected when it is:<br>(a) identified as medium priority vegetation on the **Environmental significance – vegetation management overlay map**; and<br>(b) located outside the biodiversity areas identified on the **Environmental significance – biodiversity areas overlay map**. | **AO10**<br>Vegetation is not damaged when it is:<br>(a) identified as medium priority vegetation on the **Environmental significance – vegetation management overlay map**; and<br>(b) located outside the **Environmental significance – biodiversity areas overlay map**.<br>OR<br>Where all attempts have been made to avoid and minimise damage to vegetation as stated above, any significant residual impact is offset consistent with the *Environmental Offsets Act 2014*, at a ratio of 3:1 (area) in accordance with **SC6.9 City Plan policy – Environmental offsets**.<br>OR<br>Damage to medium priority vegetation identified on the **Environmental significance – vegetation management overlay map** and located outside the biodiversity areas identified on the **Environmental significance – biodiversity areas overlay map** is for committed development. | **COMPLIES PO10/AO10**<br>Medium priority vegetation is present adjacent to the southern-eastern and western boundaries. Surveys however found that the site's mapped vegetation, comprising Vegetation Association A, reflects non-remnant vegetation and is too modified and disturbed to be considered Medium or General Priority Vegetation due to historical clearing, nursery plantings and weed incursion. This vegetation is captured within exempt clearing areas adjacent to the existing boundaries or within the proposed reserve. | |
| **PO11**<br>Disturbance to vegetation is minimised when it is:<br>(a) identified as General priority vegetation on the **Environmental significance – vegetation management overlay map**; and<br>(b) located outside the **Environmental significance – biodiversity areas overlay map**. | **AO11**<br>Development avoids impacts on general priority vegetation. Any damage is minimised to the greatest extent possible. | **COMPLIES PO11/AO11**<br>General priority vegetation is present adjacent to the western boundary however as described above the site's mapped vegetation, comprising Vegetation Association A, reflects non-remnant vegetation and is too modified and disturbed to be considered Medium or General Priority Vegetation due to historical clearing, nursery plantings and weed incursion.<br>The proposal will impact 2,561m2 of General Priority Vegetation (GPV) however the proposed 0.74ha reserve will protect and restore vegetation that will achieve the structural and floristic benchmarks of Regional Ecosystem 12.3.11 (MPV). This ensures a net gain in MLES vegetation. The development | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | | minimises impacts on GPV as much as feasible and therefore is compliant with PO 11 of the City Plan Environmental Significance Overlay Code. | |
| **PO12**<br>Buffers are provided that protect the long term viability of high priority and regulated vegetation located on or adjacent to the site. | **AO12**<br>Buffers at least 30m wide are provided between the development and any retained vegetation identified as high priority or regulated vegetation on the **Environmental significance – vegetation management overlay map** on or adjacent to the site. | **COMPLIES PO12/1012**<br>A small impact on mapped regulated vegetation will result from the proposal of 34m$^2$. The ESA has identified that the site's mapped vegetation, comprising Vegetation Association A, reflects non-remnant vegetation however the proposed 0.74ha reserve will protect and restore vegetation that will achieve the structural and floristic benchmarks of Regional Ecosystem 12.3.11 and ensures a net gain in MLES vegetation. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Priority species** | | | |
| **PO13**<br>Assessable koala feed and shelter trees are protected in situ when they are located:<br>(a) in koala habitat areas as identified on the **Environmental significance – priority species overlay map**; and<br>(b) within biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO13**<br>Development does not impact on assessable koala feed and shelter trees. | **N/A**<br>The site is not within biodiversity areas as identified on the **Environmental significance –biodiversity areas overlay map.** | |
| **PO14**<br>Assessable koala feed and shelter trees are protected when they are:<br>(a) in koala habitat areas as identified on the **Environmental significance – priority species overlay map**; and<br>(b) outside biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO14**<br>Development avoids impacts on assessable koala feed and shelter trees. Any damage is minimised to the greatest extent possible. | **COMPLIES PO14/AO14**<br>Koala Habitat is mapped on-site under the City Plan as outlined in Section 3.2.3. Suitable and preferred food trees for this species (constituting NJKHT) were present throughout the site, including Eucalyptus tereticornis (Qld blue gum), Eucalyptus siderophloia (Grey ironbark), Corymbia intermedia (Pink bloodwood) and Lophostemon / Melaleuca spp. No State Significant Species, including Koalas, were observed on the site.<br>The proposal protects 0.74ha of potential habitat in the proposed reserve and common areas. The development minimises impacts on priority species habitat as much as feasible and therefore is compliant with AO1 and PO18 of the City Plan Environmental Significance Overlay Code. | |
| **PO15**<br>Site design provides safe koala movement opportunities by incorporating measures to maintain connectivity between areas of koala | **AO15**<br>No acceptable outcome provided. | **GENERALLY COMPLIES PO15** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| habitat on and adjacent to the site.<br>**Note : *DEHP's Koala-Sensitive Design Guideline* should be consulted for suitable measures to provide for safe koala movement.** | | Koala Habitat is mapped on-site under the City Plan as outlined in Section 3.2.3. Suitable and preferred food trees for this species (constituting NJKHT) were present throughout the site, including *Eucalyptus tereticornis* (Qld blue gum), *Eucalyptus siderophloia* (Grey ironbark), *Corymbia intermedia* (Pink bloodwood) and *Lophostemon / Melaleuca* spp. No State Significant Species, including Koalas, were observed on the site - possibly due to lack of quality connectivity to large habitat areas and existing threats (domestic animals and roads).<br>The layout protects the koala habitat (not mapped as KHA) within the central riparian park, retaining the site's potential broader landscape function as part of a 'stepping stone' for koala movement. | |
| **PO16**<br>During the clearing and construction phases, measures are incorporated to protect koalas from death or injury. | **AO16**<br>Threats to koalas as a result of clearing and construction activities are mitigated by:<br>(a) ensuring no tree in which a koala is present or a tree with a crown overlapping a tree containing a koala is cleared;<br>(b) undertaking clearing of vegetation in stages, and ensuring:<br>(i) no more than 1 ha is cleared per day for sites less than 6 ha in size;<br>(ii) no more than 2 ha is cleared per day for sites greater than 6 ha in size;<br>(iii) that between each stage there is at least 12 hours where no clearing occurs; and<br>(iv) koala habitat is always linked to allow koalas to move out of the site; | **WILL COMPLY PO16**<br>This will be addressed in the preparation of a Koala and Fauna Management Plan (KFMP) prepared at the Operational Works stage. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | (c) use of qualified koala spotters;<br>(d) prohibition of domestic dogs and security dogs on site; and<br>(e) use of koala safety fencing. | | |
| **PO17**<br>State significant species, and their habitat, are protected in situ when it is:<br>(a) identified on the **Environmental significance – priority species overlay map**, or through an ecological site assessment; and<br>(b) within biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO17**<br>Development does not impact on State significant species, and their habitat. | **N/A**<br>The site is not within biodiversity areas as identified on the Environmental significance –biodiversity areas overlay map. | |
| **PO18**<br>Development protects state significant species, and their habitat or is designed to minimise and mitigate impacts on habitat values when it is:<br>(a) identified on the **Environmental significance – priority species overlay map**; and<br>(b) outside of biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO18.1**<br>Development avoids impacts on state significant species, and their habitat. | **N/A**<br>The site does not contain mapped habitat for state significant species – koala habitat areas are mapped separately. | |
| | **AO18.2**<br>Where development impacts on state significant species and their habitat, the following occurs:<br>(a) flora species are propagated and used in rehabilitation and landscaping onsite; and<br>(b) fauna species are safely relocated by a qualified fauna spotter catcher. | **N/A** | |
| **PO19**<br>Local significant species, and their habitat, are protected in situ when it is: | **AO19**<br>Development does not impact on local significant species, and their habitat. | **N/A**<br>The site does not contain mapped habitat for local significant species – koala habitat areas are mapped separately. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (a) identified on the **Environmental significance – priority species overlay map**, or through an ecological site assessment; and<br>(b) within biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map.** | | | |
| **PO20**<br>Development protects local significant species, and their habitat or is designed to minimise and mitigate impacts on habitat values when it is:<br>(a) identified on the **Environmental significance – priority species overlay map**; and<br>(b) outside of biodiversity areas as identified on the **Environmental significance – biodiversity areas overlay map**. | **AO20.1**<br>Development avoids impacts on local significant species, and their habitat. | **N/A**<br>The site does not contain mapped habitat for state significant species – koala habitat areas are mapped separately. | |
| | **AO20.2**<br>Where development impacts on local significant species and their habitat, the following occurs:<br>(a) flora species are propagated and used in rehabilitation and landscaping onsite; and<br>(b) fauna species are safely relocated by a qualified fauna spotter catcher. | **N/A** | |
| **Fauna management** | | | |
| **PO21**<br>Development design and location provides for the safe movement of native fauna through the site. | **AO21**<br>Where infrastructure crosses native fauna movement paths, the design of new development incorporates fauna friendly movement solutions.<br>**Note: Fauna friendly movement solutions developed in accordance with the *Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices; and the QLD Government Koala-Sensitive Design Guidelines* is Council's preferred method for addressing this outcome.** | **COMPLIES PO21/AO21**<br>Fauna movement is provided for within the central riparian park, retaining the site's potential broader landscape function as part of a 'stepping stone' for fauna movement. | |
| **PO22**<br>Where fauna habitat is proposed to be | **AO22** | **WILL COMPLY PO22/AO22** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| damaged, management strategies must be implemented to ensure:<br>(a) the native fauna is safely relocated to an area of similar habitat;<br>(b) the sequence of habitat disturbance ensures that fauna is not isolated from adjoining areas of habitat;<br>(c) fauna relocation occurs immediately prior to habitat disturbance;<br>(d) accredited and experienced spotter catchers, licensed by the Queensland Parks and Wildlife Service, are to be present on the site to direct and undertake the removal and relocation of fauna; and<br>(e) where possible, damaged habitat and nesting sites are rehabilitated outside of development areas.<br>**Note: A Fauna Management Plan prepared by a suitably qualified person and in accordance with SC6.8 City Plan policy – Environmental management plans is Council's preferred method for addressing this outcome.** | No acceptable outcome provided. | This will be addressed in the preparation of a Koala and Fauna Management Plan (KFMP) prepared at the Operational Works stage. | |
| **Tenure, ownership and management arrangements** | | | |
| **PO23**<br>Matters of environmental significance and associated buffers, mapped areas as identified on the **Environmental significance – vegetation management overlay map** proposed for retention and areas requiring rehabilitation are suitably protected in | **AO23**<br>Matters of environmental significance and associated buffers, mapped areas as identified on the **Environmental significance – vegetation management overlay map** proposed for retention and areas requiring rehabilitation are transferred to Council ownership as Public Open Space.<br>OR | **COMPLIES PO23/AO23**<br>Matters of environmental significance; identified as the drainage corridor and associated variable buffer will be protected and retained as Public Open Space. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| perpetuity and will:<br>(a) enable necessary fire management in accordance with an approved fire management plan and any adopted bushfire management plan;<br>(b) allow unimpeded movement of native fauna through matters of environmental significance and associated buffers;<br>(c) enable maintenance access and regular management;<br>(d) enable auditing and reporting of maintenance and management activities;<br>(e) provide for public access along major waterways, where such access is consistent with the ecological functions;<br>(f) allow for linkages and buffers to adjacent areas of ecological significance; and<br>(g) allow for a coordinated approach to the management of adjacent areas of conservation estate. | Where not required for public access, matters of environmental significance and associated buffers, and mapped areas as identified on the **Environmental significance – vegetation management overlay map** proposed for retention and areas requiring rehabilitation are retained in private ownership and protected under a statutory covenant (under the *Land Title Act 1994*).<br>**Note: Where the area is adjacent to existing public open space, or is a buffer to a major waterway, Council's preference is for the land to be dedicated as Public Open Space.** | | |
| **PO24**<br>An Open Space Management Plan prepared in accordance with **SC6.13 City Plan policy – Landscape work** is prepared for areas to be dedicated to Council as Public Open Space. | **AO24**<br>No acceptable outcome provided. | **WILL COMPLY PO24/AO24**<br>An Open Space Management Plan prepared in accordance with **SC6.13 City Plan policy – Landscape work** is prepared for areas to be dedicated to Council as Public Open Space at the Operational Works Stage. | |
| **PO25**<br>A Covenant Management Plan is prepared for areas to be protected | **AO25**<br>No acceptable outcome provided. | **N/A**<br>A covenant is not proposed. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| under a statutory covenant. The management plan must include the following details:<br>(a) rehabilitation area and strategy of works;<br>(b) weed eradication and control requirements;<br>(c) how the covenant area will be maintained and managed in perpetuity;<br>(d) feral and domestic animal exclusion requirements; and<br>(e) required maintenance access.<br>**Note: A Covenant Management Plan is prepared by a suitably qualified person and in accordance with SC6.8 City Plan policy – Environmental management plans is Council's preferred method for addressing this performance outcome.** | | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Rehabilitation** | | | |
| **PO26**<br>Disturbed, cleared or modified areas are rehabilitated where they form part of:<br>(a) an ecological corridor; or<br>(b) matters of environmental significance and associated buffers; or<br>(c) areas identified within an Ecological Site Assessment as requiring rehabilitation.<br>**Note: A Rehabilitation Management Plan prepared in accordance with the *South East Queensland Ecological Restoration Framework* and SC6.8 City Plan policy – Environmental management plans is Council's preferred method for addressing this outcome.** | **AO26**<br>No acceptable outcome provided. | **COMPLIES PO26**<br>A Rehabilitation Management Plan (RMP) has been prepared by Burchills (2026) to address this PO and accompanies this application. The RMP addresses the rehabilitation of the proposed reserve dedicated as public open space. | |

## State Planning Policy July 2017

| Policies | Demonstrate how the proposal meets the policy? | Internal use |
|---|---|---|
| **State interest – water quality** | | |
| **ASSESSMENT BENCHMARK 4 (POLICY 4):**<br>At the construction phase, development achieves the applicable stormwater management design objectives in table A (appendix 2) of the State Planning Policy. | | **WILL COMPLY POLICY 4**<br>Construction water quality will be managed under relevant management plans including a sediment and erosion control plan. |

| Policies | Demonstrate how the proposal meets the policy? | Internal use |
|---|---|---|
| **ASSESSMENT BENCHMARK 5 (POLICY 5):**<br>(5) At the post-construction phase, development:<br>a) achieves the applicable stormwater management design objectives on-site, as identified in table B (appendix 2) of the State Planning Policy; or<br>b) achieves an alternative locally appropriate solution off-site that achieves an equivalent or improved water quality outcome to the relevant stormwater management design objectives in table B (appendix 2) of the State Planning Policy. | | **WILL COMPLY POLICY 5**<br>The design will comply with the applicable stormwater management design objectives on site as identified in Table B, Appendix 2 of the SPP; additionally, the works will result in improved water quality due to the rehabilitation of the existing degraded drainage line. |

## Appendix F – Koala Spot Assessment Technique Results

| Date: | 3.3.2026 | Site: | KSAT 1 |
|---|---|---|---|
| **Observers:** | CK | **Latitude Longitude** | -27.8305, 153.3061 |

| Tree ID No. | Scientific Name | Koala Scat (Yes/No) | Notes |
|---|---|---|---|
| 1 | *Eucalyptus tereticornis* | N | Centre Tree |
| 2 | *Corymbia intermedia* | N | |
| 3 | *Lophostemon suaveolens* | N | |
| 4 | *Lophostemon suaveolens* | N | |
| 5 | *Eucalyptus tereticornis* | N | |
| 6 | *Lophostemon suaveolens* | N | |
| 7 | *Eucalyptus tereticornis* | N | |
| 8 | *Eucalyptus tereticornis* | N | |
| 9 | *Lophostemon suaveolens* | N | |
| 10 | *Eucalyptus tereticornis* | N | |
| 11 | *Eucalyptus tereticornis* | N | |
| 12 | *Lophostemon suaveolens* | N | |
| 13 | *Eucalyptus tereticornis* | N | |
| 14 | *Lophostemon suaveolens* | N | |
| 15 | *Melaleuca quinquenervia* | N | |
| 16 | *Melaleuca quinquenervia* | N | |
| 17 | *Eucalyptus tereticornis* | N | |
| 18 | *Corymbia intermedia* | N | |
| 19 | *Lophostemon suaveolens* | N | |
| 20 | *Eucalyptus tereticornis* | N | |
| 21 | *Eucalyptus tereticornis* | N | |
| 22 | *Lophostemon suaveolens* | N | |
| 23 | *Eucalyptus siderophloia* | N | |
| 24 | *Corymbia citriodora* subsp. *variegata* | N | |
| 25 | *Melaleuca quinquenervia* | N | |
| 26 | *Melaleuca quinquenervia* | N | |
| 27 | *Eucalyptus tereticornis* | N | |
| 28 | *Melaleuca quinquenervia* | N | |
| 29 | *Melaleuca salicina* | N | |
| 30 | *Corymbia intermedia* | N | |

| Date: | 3.3.2026 | Site: | KSAT 2 |
|---|---|---|---|
| **Observers:** | CK | **Latitude Longitude** | -27.8305, 153.3061 |

| Tree ID No. | Scientific Name | Koala Scat (Yes/No) | Notes |
|---|---|---|---|
| 1 | *Melaleuca quinquenervia* | N | Centre Tree |
| 2 | *Melaleuca quinquenervia* | N | |
| 3 | *Lophostemon suaveolens* | N | |
| 4 | *Melaleuca quinquenervia* | N | |
| 5 | *Melaleuca quinquenervia* | N | |
| 6 | *Lophostemon suaveolens* | N | |
| 7 | *Melaleuca quinquenervia* | N | |
| 8 | *Lophostemon suaveolens* | N | |
| 9 | *Lophostemon confertus* | N | |
| 10 | *Eucalyptus tereticornis* | N | |
| 11 | *Eucalyptus tereticornis* | N | |
| 12 | *Eucalyptus tereticornis* | N | |
| 13 | *Eucalyptus tereticornis* | N | |
| 14 | *Lophostemon suaveolens* | N | |
| 15 | *Lophostemon suaveolens* | N | |
| 16 | *Eucalyptus tereticornis* | N | |
| 17 | *Lophostemon suaveolens* | N | |
| 18 | *Corymbia intermedia* | N | |
| 19 | *Corymbia intermedia* | N | |
| 20 | *Melaleuca quinquenervia* | N | |
| 21 | *Melaleuca quinquenervia* | N | |
| 22 | *Eucalyptus tereticornis* | N | |
| 23 | *Melaleuca quinquenervia* | N | |
| 24 | *Lophostemon suaveolens* | N | |
| 25 | *Melaleuca quinquenervia* | N | |
| 26 | *Eucalyptus tereticornis* | N | |
| 27 | *Eucalyptus tereticornis* | N | |
| 28 | *Melaleuca quinquenervia* | N | |
| 29 | *Melaleuca quinquenervia* | N | |
| 30 | *Lophostemon suaveolens* | N | |

BURCHILLS
SCIENCE AND ENGINEERING



# 2 Karingal Drive, Pimpama
# Rehabilitation Management Plan

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-RMP-00 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
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| Date: | March 2026 |

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| Position: | Principal Environmental Scientist |
| Date: | March 2026 |

| Version No. | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 00 | Initial issue | 19.03.2026 | KE | CK |

***Recipients are responsible for eliminating all superseded documents in their possession.***


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**MORETON BAY I SUNSHINE COAST I IPSWICH I BANGALOW**



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# Executive Summary

Burchills were engaged by Bosform Pty Ltd to prepare a Rehabilitation Management Plan for a residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380), within the City of Gold Coast local government area.

This Rehabilitation Management Plan provides guidance for the restoration of disturbed areas within a proposed drainage reserve that will be restored and protected as open space. The proposed rehabilitation area is mapped as having koala habitat and assessable vegetation under the Gold Coast City Plan. Rehabilitation works will comprise weeding and revegetation with species from the pre-clearing regional ecosystems.

Specific restoration objectives include:

- Restore existing vegetation within the rehabilitation area to stabilise disturbed areas and mitigate erosion;
- Restore vegetation communities to resemble pre-clearing vegetation and enhance biodiversity and wildlife habitat; and
- Use best practice methods for restoration works to minimise impacts on existing ecological values.

All restoration works will be undertaken by a suitably experienced and qualified bushland restoration contractor. Monitoring and reporting for the rehabilitation works will be conducted by an ecologist experienced in ecological restoration monitoring.

This Rehabilitation Management Plan is operational for a minimum period of 12 months including six (6) months Establishment and six (6) months On-Maintenance period. Any amendments to the plan must be approved by Council.

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# 1. Introduction

Burchills were engaged by Bosform Pty Ltd to prepare a Rehabilitation Management Plan for a residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380) within the City of Gold Coast local government area. This RMP has been prepared in accordance with:

- *Gold Coast City Plan Policy SC6.8.7* – Rehabilitation Management Plans; and
- The South-East Queensland Ecological Restoration Framework (Chenoweth EPLA and Bushland Restoration Services, 2012).

## 1.1 Scope and Objectives

The scope and objectives of this RMP are to provide guidance and management strategies for the restoration of the proposed restoration area within the drainage reserve. Specifically, the scope of the report is to:

- Provide an appraisal of the current condition of the vegetation in and adjoining the restoration area;
- Provide a scaled plan of the proposed restoration zones;
- Provide a management strategy for the restoration works;
- Provide a list of appropriate species to be used in the restoration works;
- Provide recommendations for the control of weeds identified on the site; and
- Provide recommendations for the maintenance, monitoring and reporting.

## 1.2 Site Location

The subject site is located at 2 Karingal Drive, Pimpama (Lot 19 on RP152380), within the Gold Coast suburb of Pimpama (Figure 1.1) and comprises an area of approximately 2.459 ha. The site is accessed from Karingal Drive along the northern boundary and is bounded to the west by the Gold Coast–Brisbane rail line. The site is currently vacant with no improvements and is vegetated with grassland and woodland interspersed with several dams and waterbodies (Figure 1.2).

## 1.3 Mapped Vegetation and Habitat Values

The Regulated Vegetation Map (RVM) for the subject site indicates that regulated vegetation on the site includes 0.06ha of Category B Of Concern Remnant Vegetation RE 12.3.11, and small area of RE 12.11.24 Least Concern. The remaining areas of the site are mapped as Category X – non-assessable as shown in Figure 1.3 and Table 1.1. This regulated vegetation is also mapped as koala habitat (Figure 1.4).

Pre-clearing mapping from Qld Globe indicates that the watercourse and adjacent riparian areas are mapped as 12.3.11 *Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains usually near coast; with the remaining part of the site mapped as RE 12.11.24 *Eucalyptus carnea, E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra* woodland on metamorphics +/- interbedded volcanics.

The *Gold Coast City Plan* identifies the site's vegetation as containing Regulated (MSES), Medium (MLES) and General Priority (MLES) Vegetation with values for state significant species, and a minor watercourse line and 30m buffer within the site (Figure 1.5 to Figure 1.7).

## 1.4 Soils and Geology

The Geological Survey of Queensland: Beenleigh 1:100,000 Series Map indicates that the site's geology consists of Neranleigh-Fernvale Beds, comprising mudstone, shale, arenite, chert, jasper, basic metavolcanics, pillow lava and conglomerate. Gold Coast City Council soils mapping (Thomas, 2006) indicates local soils are predominantly Kurosols.

This geological and soils association aligns with Land Zone 11 under the Qld regional ecosystem (RE) framework for land classification.

### 1.5 Topography and Drainage

The site falls within the Pimpama River catchment. A tributary of the Pimpama River flows from the south-west northwards through the site to culverts under Karingal Drive in the north-eastern part of the site. The land rises moderately from the dam to the west. Site topography is characterised by gently inclined slopes with a westerly aspect. The site has extremely low relief, with elevation ranging from approximately 10 m AHD in the eastern extents of the site, to approximately 3 m AHD in the northwestern corner. A number of constructed dams are present in the southern part of the site (Figure 1.8).

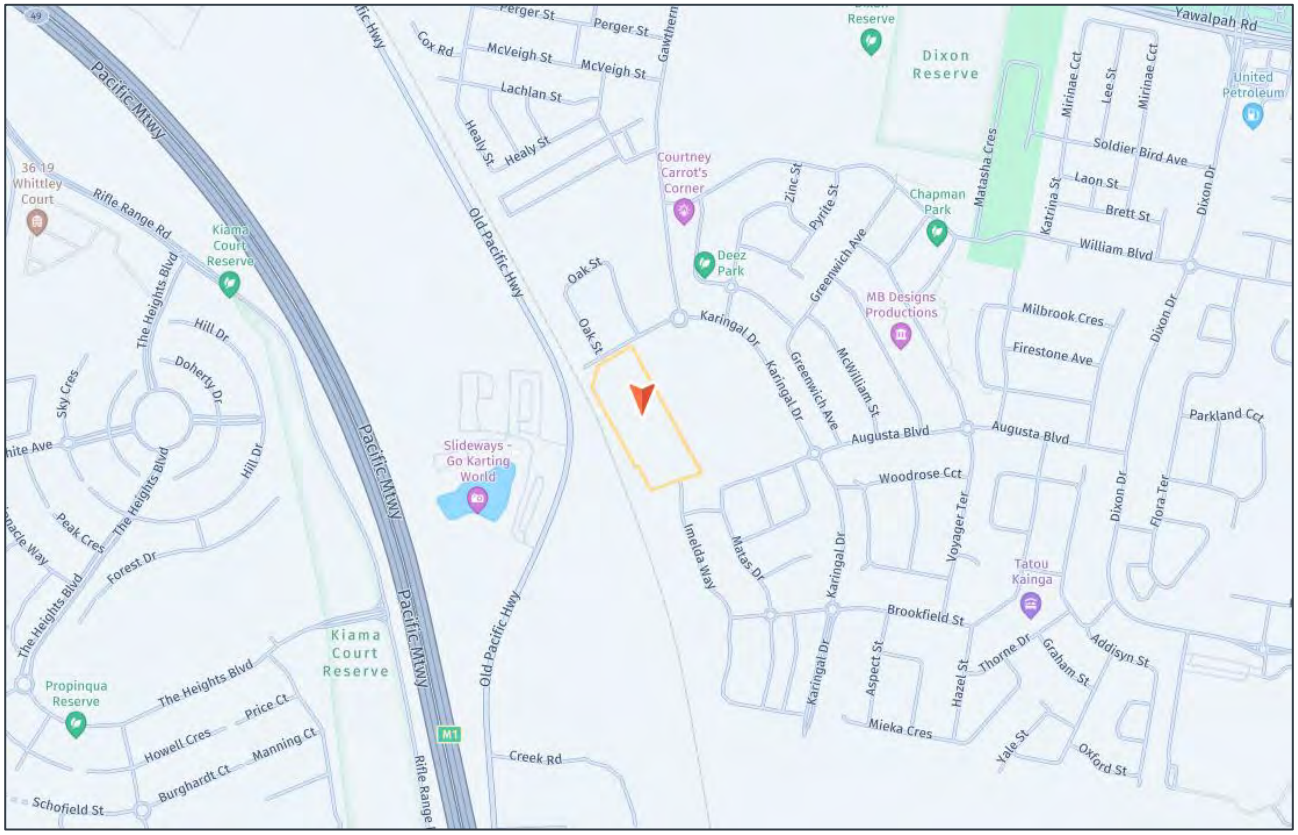



**Figure 1.1 Site Location (Nearmap, 2026)**



**Figure 1.2 Recent aerial imagery of subject site (Nearmap, December 2025)**




**Figure 1.3 Regional Ecosystems mapped within the site (Qld Globe, January 2026)**

**Table 1.1 Regional Ecosystems within the site (Qld Dept Resources, 2025)**

| Regional Ecosystem | VMA Status | Category | Area (ha) | Short Description | Structure Category |
|---|---|---|---|---|---|
| **12.11.24** | Least Concern | B | < 0.01 | *Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics* | Spare |
| **12.3.11** | Of Concern | B | 0.06 | *Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest* on alluvial plains usually near coast | Mid-dense |




**Figure 1.4 Koala Areas within the site (Qld Globe, January 2026)**




**Figure 1.5 City Plan Priority Species Overlay Map (Gold Coast City Plan V13 2026)**




**Figure 1.6 City Plan Priority Vegetation Management Overlay Map (Gold Coast City Plan V13 2026)**




**Figure 1.7 City Plan Wetlands and Watercourse Overlay Map (Gold Coast City Plan V13 2026)**

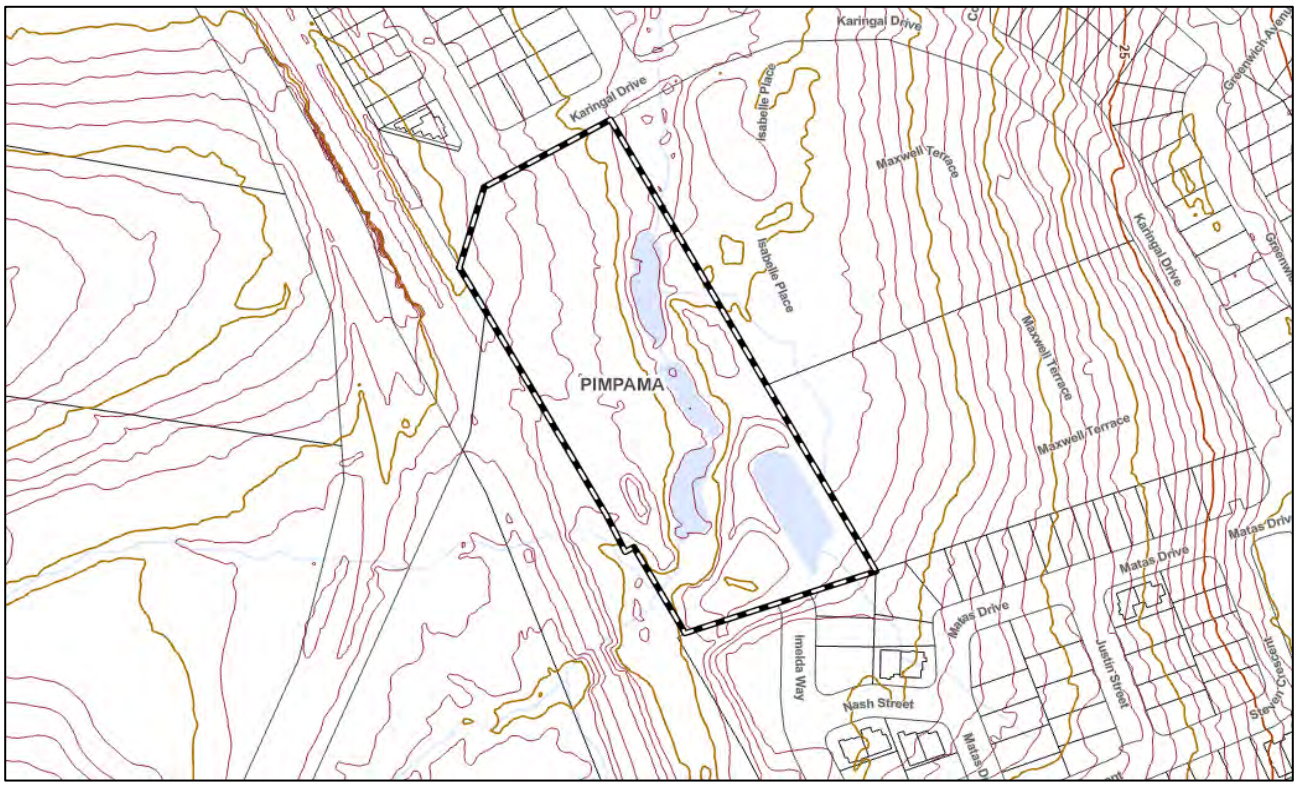



**Figure 1.8 Local contours and waterways (© *City of Gold Coast 2026*)**

## 1.6 Development Description

The proposed development is seeking Council approval for Material Change of Use (multiple dwellings), Reconfiguring a Lot (2 management lots and a park Lot) and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

For further details, please refer design drawings prepared by MPS Architects attached in Appendix A of this report. Figure 1.9 below provides an excerpt taken from the development's site plan (MPS Architects, 2026) and Figure 1.10 provides an extract of the proposed earthworks design (Burchills, 2026).

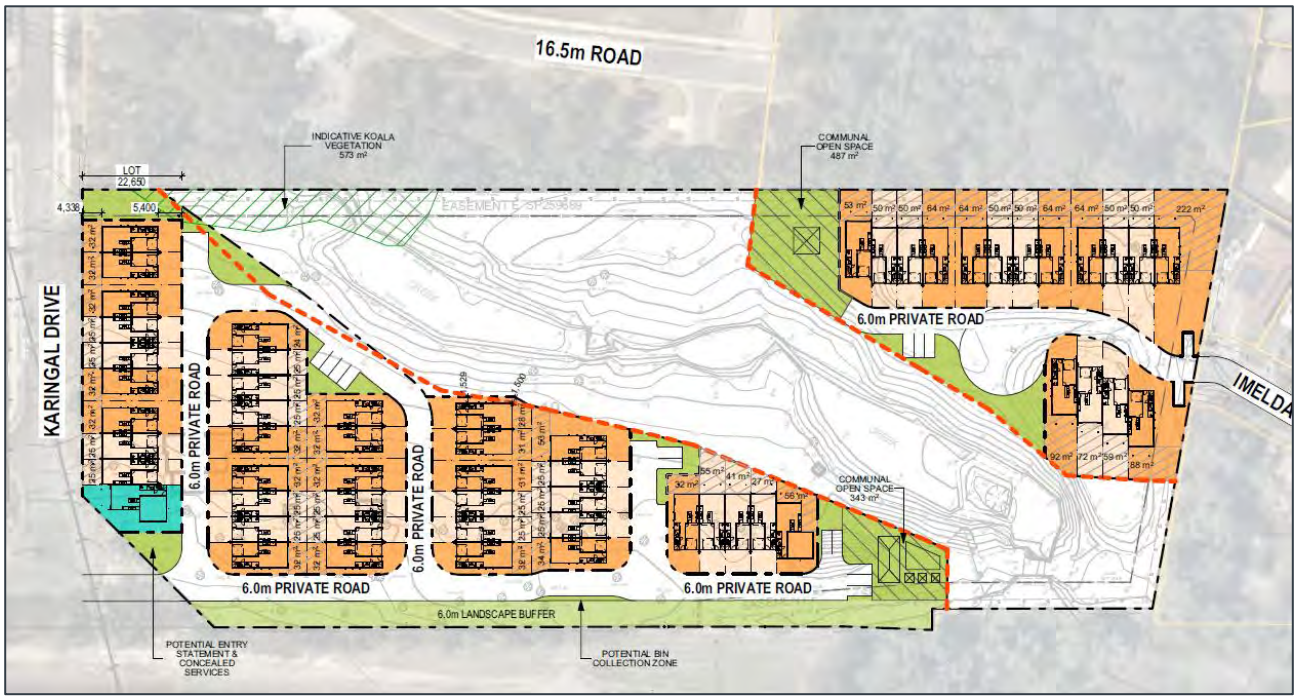



**Figure 1.9 Proposed plan of development (MPS Architects, 2026)**

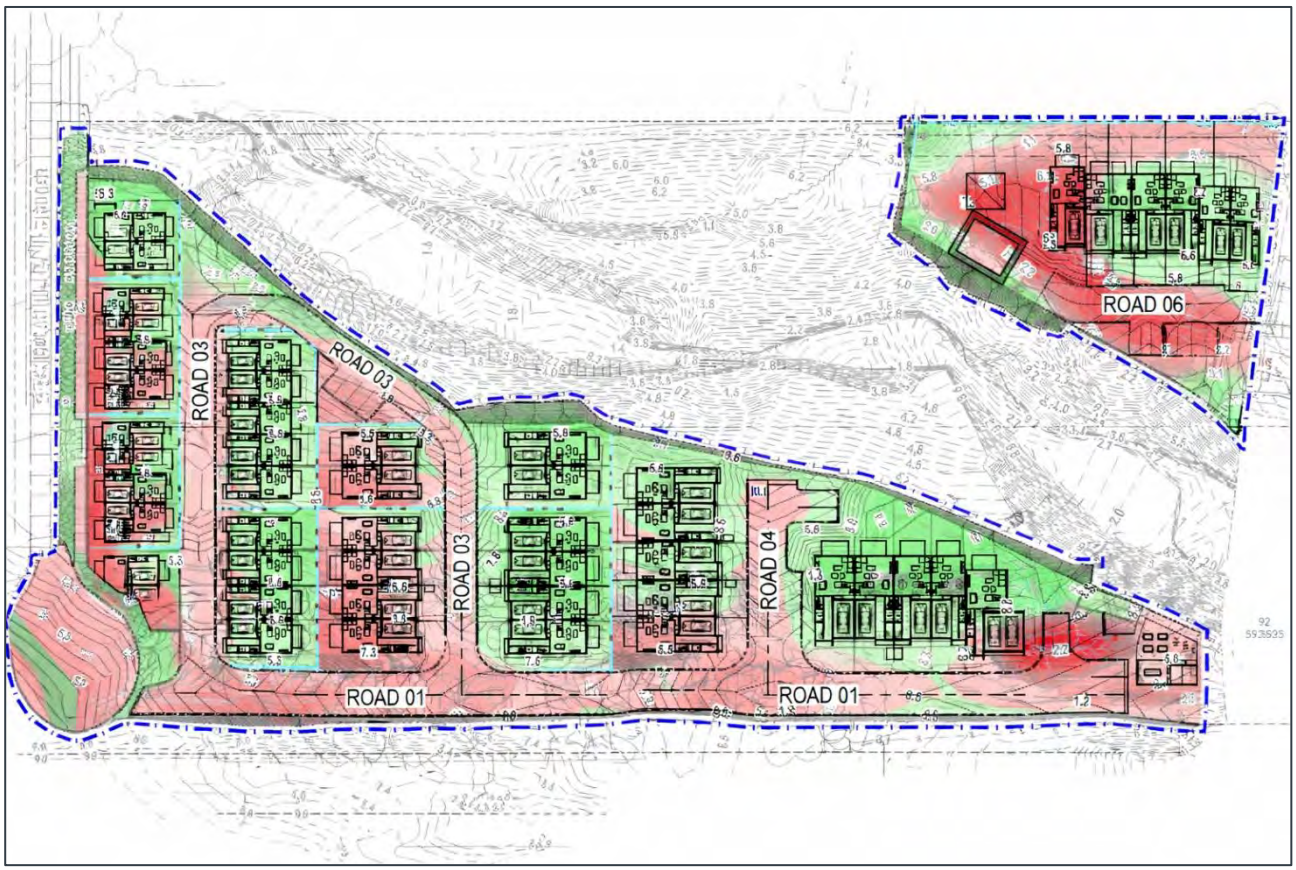



**Figure 1.10 Proposed earthworks (Burchills, 2026)**

## 2. Regulatory Provisions and Constraints

A review of regulatory provisions and other potential constraints that apply to the subject site was undertaken with the results summarised below in Table 2.1. Complete desktop review search results are provided in Appendix B.

**Table 2.1 Potential Regulatory and Other Constraints for Subject Site**

| Constraint | Present | Absent | Comments |
|---|---|---|---|
| Easements and / or Restrictions on Title | x | | An easement parcel is present on the southern, eastern and part of the western boundaries [1]. |
| City Plan Environmental Significance Overlay Map - Biodiversity | x | | The site is mapped as containing habitat for priority species on the Biodiversity priority species overlay map[2]. |
| City Plan Environmental Significance Overlay Map – Waterways and Wetlands | x | | The site is mapped as containing a minor watercourse line and 30m buffer[2] (refer Figure 1.5). |
| City Plan Environmental Significance Overlay Map – Vegetation | x | | The site is mapped as containing Regulated, Medium and General priority Vegetation [2] (refer Figure 1.5). |
| City Plan – Bushfire Risk | x | | The site contains a small area of Medium potential bushfire hazard area with the balance mapped as Potential bushfire impact buffer[2]. |
| City Plan – Acid Sulfate Soils Risk | x | | All of the site is mapped as containing potential for Acid sulfate soils (predominantly land at or below 5m AHD with the remaining portion at or below 20m AHD)[2]. |
| City Plan – Flood Prone | x | | The site is not subject to flooding excepting a very minor area adjacent to the eastern boundary [2]. |
| City Plan – Landslide Hazard and Steep Land | | x | The site is not mapped as containing Landslide hazard areas[2]. |
| State Mapped Waterways | x | | The site contains two green (low risk) waterways in the south-eastern corner of the site that converge into an orange (moderate risk) waterway for waterway barrier works. |
| State Mapped Vegetation | x | | The site's vegetation is mapped as predominantly Category X – non-remnant vegetation with a small area of 'Of concern' Regional Ecosystem 12.3.11 under the Qld *Vegetation Management Act 1999* (VMA)[1] (refer Figure 1.3). |
| State Mapped Essential Habitat | x | | The site's regulated vegetation is mapped as Essential Habitat for *Phascolarctos cinereus* (Koala) [4]. |
| State Mapped Koala Habitat | x | | Part of the site is mapped as Core Koala Habitat[1] (refer Figure 1.4). |
| State Mapped Threatened Species | x | | Six (6) species of threatened fauna and one (1) species of threatened flora have been recorded within 2km of the subject site[3]. |

*Notes:*

*[1] – As identified in Queensland Globe (2026)*

*[2] – As identified in the Gold Coast City Plan*

*[3] – As identified by Wildlife Online Species Search results (2026) – refer Appendix B*

*[4] – As identified in the Vegetation Management Report (2026) – refer Appendix B*

# 3. Restoration Strategy

Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. The main objective of restoration is to rehabilitate vegetation communities to the extent that they will be self-sustaining and resilient to environmental stressors (such as drought, fire and flood).

The variety in the nature and severity of disturbances that can occur within natural ecosystems dictates that a generic approach to rehabilitating ecological functions and processes is unlikely to be effective. The likelihood of successfully realising the objectives of a rehabilitation project will be greatly increased if the project is managed in accordance with a strategy that is responsive to the specific ecological parameters, functions and processes within the rehabilitation area.

A restoration strategy that is targeted toward site-specific conditions should not only prevent the inefficient expenditure of resources, but also effectively utilise natural ecological processes to enhance the integrity of the native plant community. The main objective of ecological restoration is to restore an ecosystem to the point where it becomes self-sustaining. The approach taken to achieve this objective is dependent on the existing biotic and abiotic conditions and the transitional state of the ecosystem (Figure 3.1).

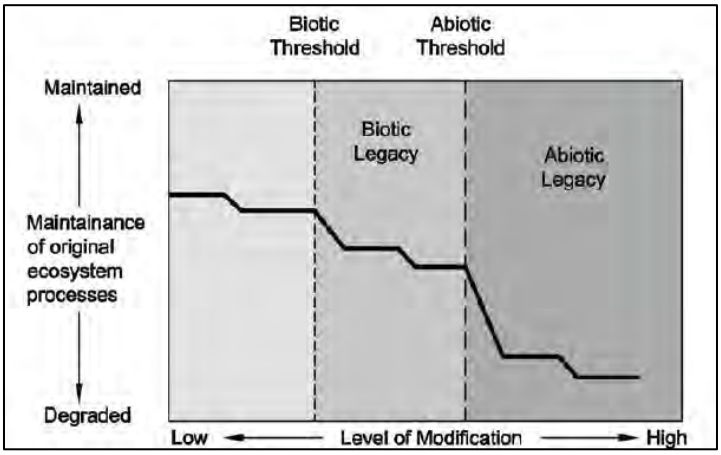



**Figure 3.1 Graphical Representation of Ecosystem Transitional States (Chenoweth EPLA and Bushland Restoration Services, 2012)**

There are generally two (2) main types of natural bushland restoration – **assisted natural regeneration** and **reconstruction** (Chenoweth EPLA and Bushland Restoration Services, 2012). Assisted natural regeneration is appropriate for areas that may require weed removal, but with a healthy seedbank and signs of active natural regeneration of the preclearing community. Targeted revegetation may be required where intensive weed removal has resulted in an area denuded of cover with little capacity to naturally regenerate.

Reconstruction is suited to areas that need assistance with recruitment due to factors such as a lack of canopy cover, lack of connectivity and / or highly disturbed conditions. Reconstruction typically includes initial weed treatment followed by revegetation that may be required in a number of stages. This method is appropriate for areas that have little to no natural canopy cover due to weed removal and very low natural regeneration due to seedbank suppression from weeds.

## 3.1 Existing vegetation

A site inspection of the area proposed to be restored was undertaken by the authors of this report in February and March 2026 and was focused upon the mapped minor waterway/drainage feature that is to be protected in environmental reserve and subject to rehabilitation. It is noted that this area has been highly disturbed through historic clearing, weed incursion and significant modification of the upstream and downstream

catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping. The development protects the waterway in the proposed reserve and all site stormwater will be treated for quality and quantity before discharging into the downstream environment. The width of the waterway reserve varies from 24m at its narrowest point to 116m at its widest.

A total A total of 142 species of flora were detected during the surveys including 72 non-native species, eight (8) of which are Restricted Invasive Plants under the '*Biosecurity Act 2016'*. The sites vegetation can be classed as one association – anthropogenic grassland with irregular patches/copses of native canopy and landscaped trees. This association is highly modified and degraded by historical clearing, abandoned horticultural infrastructure and significant weed incursion. In particular, *Setaria sphacelata* (South African pigeon grass) is present throughout this association, and is present as dense stands across much of the site.

The canopy layer where present comprised patches and copses with irregular height and cover. Common species include *Eucalyptus tereticornis* (forest red gum), *Eucalyptus siderophloia* (grey ironbark), *Corymbia intermedia* (pink bloodwood), *Lophostemon confertus* (brush box), *Lophostemon suaveolens* (swamp box), *Elaeocarpus grandis* (blue quandong), **Syagrus romanzoffiana* (cocos palm) and **Roystonea regia* (Cuban royal palm). Exotic vine species were found to be smothering trees and, in some instances, causing tree failure within the waterway corridor.

The shrub layer was also unevenly distributed with species including *Archontophoenix alexandrae* (Alexander palm), *Acacia concurrens* (late-flowering hickory), *Acacia disparrima* (hickory wattle), *Glochidion ferdinandi var.ferdinandi* (cheese tree), *Lantana camara* (lantana), *Senna pendula var. glabrata* (Easter cassia), *Delonix regia* (poinciana), *Schefflera actinophylla* (umbrella tree), *Solanum torvum* (devil's fig) and *Tipuana tipu* (tipuana) and *Melaleuca quinquenervia* (broad-leaved paperbark).

The ground layer, as per all other strata is highly variable in terms of composition, height and structure and is dominated by weedy/pasture grasses – predominantly *Setaria sphacelata* (South African pigeon grass), Melinis *minutiflora* (molasses grass), *Megathyrsus maximus* (Guinea grass), and other environmental weeds including *Asparagus aethiopicus cv. Sprengeri* (asparagus fern).

No part of the site meets remnant benchmark criteria as presented in the Qld Herbarium Benchmarks (2019) - including the small area adjacent to the north-east boundary that is mapped as remnant (Category B) of concern Regional Ecosystem 12.3.11 *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains. Additionally, the composition of the vegetation was not found to reflect the preclearing Regional Ecosystems 12.3.11 (associated with the waterway) and 12.11.24 (the remaining parts of the site). No flora species of conservation significance (EVNT) at a national, state or local level was detected on-site.

Based on the prevalence of environmental weeds within this community it is expected that a native seed bank is largely absent across the majority of the site. Due to the likelihood of a low native seed bank within the existing topsoil, significant restoration intervention will be required.

### 3.2 Restoration Strategy

The restoration area is located within the proposed reserve and covers approximately 7,439 m² of the site, surrounding the existing local mapped waterway/drainage feature. The restoration strategy comprises extensive weed removal followed by reconstruction.

The revegetation works will include planting of native canopy, understorey, shrub and groundcover species representative of the pre-clearing regional ecosystem (RE) 12.3.11a within the inner riparian zone (5 m from the top of bank) and the outer riparian zone across the remaining restoration area.

Planting will occur at an average density of one (1) plant per 5m² for trees and 1 plant per 10m² for shrubs and one (1) plant per 1m² for groundcovers. These densities will incorporate existing native vegetation to avoid over-planting in areas where native species are already established. Planting will be undertaken in areas lacking native vegetation cover, including areas targeted for weed removal.

The revegetation will ensure a net gain in native vegetation cover over the short term and facilitate long-term natural regeneration of slower growing species through natural recruitment.

### 3.3 Restoration Management Plan

The restoration strategy comprises weed control and reconstruction and includes one (1) restoration management zone based on the restoration approach and site values. Actions required for the proposed works in the RMZ are summarised in Table 3.1 and the location of the RMZ within the site is shown below in Figure 3.2.

**Table 3.1 Restoration Management Action Plan**

| Area (m²) | Existing Vegetation | Target Vegetation Community | Ecosystem Resilience | Strategy | Actions Required |
|---|---|---|---|---|---|
| 7,439 $m^2$ | Anthropogenic grassland with native canopy and landscaped trees | RE 12.3.11a | Mostly low | Reconstruction | Restoration of this zone will include:<br>• Broadscale weed control targeting weeds per this report;<br>• Monitor for weeds and natural recruitment of local native species as per this report; and<br>• Reconstruction planting in areas subjected to weed control and /or with denuded native vegetation cover in accordance with planting palette in Appendix C.<br>• Revegetation should ensure average density of one (1) plant per 5 $m^2$ for trees and shrubs and one (1) plant per 3$m^2$ for groundcover. Densities should include existing native plants to avoid over-planting in vegetated areas. |




# 2 Karingal Dve Pimpama

## Figure 3.1 Rehabilitation Zone Plan

| | |
|---|---|
| Project: BE200223 | Date: 17-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coast LGA

**Legend**

- Subject Lot
- Proposed Lots
- Surveyed Contours (MGS 2026)
- Surveyed Top of Bank (MGS 2026)
- Watercourse centreline
- Restoration Area (7,439m2)
- Earthworks

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# 4. Restoration Methodology

The following sections outline the actions that are to be implemented to achieve a successful restoration outcome on the site.

## 4.1 Compliance

It is the contractor's responsibility to ensure that the regeneration works required on the site comply with all current and relevant legislation and standards requirements, including, but not limited to:

- *Environmental Protection Act 1994* (EP Act.);
- Work and Healthy Safety *Act 2011* (the WHS Act);
- Construction Work: Code of Practice (Safe Work Australia);
- Excavation – Work Code of Practice (Safe Work Australia);
- *Environmental Protection (Water) Policy 2009*;
- City of Gold Council Legislation, Local Laws and Policies, including the Gold Coast *City Plan;*
- *Australian Standard AS 4373 Pruning of amenity trees;*
- *Australian Standard AS 4419 Soils for landscaping and garden use;*
- *Australian Standard AS 4454 Composts, soil conditioners and mulches;* and
- *Australian Standard AS 4970 Protection of trees on development sites.*

## 4.2 Vegetation Protection

The following provides general requirements applied to any vegetation to be retained on-site:

- As above, all vegetation protection measures must conform to the requirements of *Australian Standard 4970-2009: Protection of Trees on Development Sites* (AS 4970-2009);
- Prior to the commencement of any vegetation clearing operations, the limits of all vegetation to be retained must be clearly delineated. The storage and operation of construction equipment and machinery is to be located within the extent of earthworks delineation. No construction equipment and machinery are to disturb retained trees, waterways and remnant vegetation where approval to clear has not been received;
- Sediment runoff from all earthworks is to be prevented from entering the areas of retained vegetation (e.g. through use of filter cloth fences);
- All batters are to be erosion protected and planted with appropriate species; and
- The Principal Contractor is responsible for ensuring that all operational works are undertaken in accordance with approved Development Permits.

## 4.3 Weed Control

For the purposes of this report, a weed has been defined as a species that is not native to the Gold Coast and is recognised as an invasive under *Biosecurity Act 2014*, recognised as an invasive species in South East Queensland by the Queensland Herbarium (Batianoff and Butler, 2002); or recognised as an environmental weed or undesirable species by the South East Queensland Local Government Authority by way of policy. The Queensland *Biosecurity Act 2014* requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control.

The site surveys recorded a total of 65 invasive weeds present within the subject site, including eight (8) Restricted Invasive Plants. Table 4.1 provides specific weed control and removal methods for weed species recorded. Where additional weed species are observed on-site that do not have a control technique listed in Table 4.1 an appropriate weed control methodology will be used based on the general guidelines provided in Table 4.2.

Herbicide application is to be undertaken in accordance with the *South East Queensland Restoration Framework* (Chenoweth EPLA and Bushland Restoration Services, 2012). Treatment is to target introduced species only and be carried out in a manner that minimises disturbance to native plants. When undertaking herbicide application for weed control, care will be taken to ensure that no off-target damage occurs to native vegetation. All weed control on-site must be undertaken in a manner that does not promote erosion or instability of soil, particularly in and around waterways and / or high velocity flow areas.

**Table 4.1 Specific Weed Control Methodology**

| Scientific Name | Common Name | Qld Status* | Treatment Method |
|---|---|---|---|
| *Ageratina adenophora* | crofton weed | OIP | Hand pull and hang to dry; spray G1:200 or G1:200 + MM or MM. |
| *Ageratum houstonianum* | blue billygoat weed | | Hand pull; spray G1:100. |
| *Ambrosia artemisiifolia* | annual ragweed | RIP | Hand pull; spray G1:100 or G1:100 + MM or MM. |
| *Archontophoenix alexandrae* | Alexander palm | | Seedlings: Hand pull; crown out; spray G1:200 + MM. Trees: Cut below growing point or SI G1:1.5 |
| *Asparagus aethiopicus cv. Sprengeri* | ground asparagus | RIP | Crown then hang up to dry; spray G1:100 + MM or MM. Best results from herbicide application will be obtained when plant is between flowering and berry formation. |
| *Bidens pilosa* | cobbler's pegs | | Hand pull; spray G1:100 or G1:100 + MM or MM. |
| *Callisia elegans* | striped inch plant | | Hand pull, roll or rake, ensure all segments are removed, bag and dispose off-site; spray G1:200 or G1:200 + MM. |
| *Callisia fragrans* | purple succulent | | Hand pull, roll or rake, ensure all segments are removed, bag and dispose off-site; spray G1:200 or G1:200 + MM. |
| *Cecropia peltata* | trumpet tree | | Seedlings and regrowth: Hand pull or spray G1:100 + MM. Shrubs: CSP G1:1.5 or SI G1:1.5. Trees: SI G1:1.5. |
| *Chloris gayana* | Rhodes grass | | Hand pull or dig up; spray G1:100. |
| *Cinnamomum camphora* | camphor laurel | RIP | Regrowth and seedlings: Hand pull; spray G1:200 or G1:200 + MM. Saplings: CSP G1:1.5 or G100%. Trees: SI G1:1.5 or G100%. |
| *Conyza bonariensis* | flax-leaf fleabane | | Hand pull; spray G1:100 or G1:100 + MM or MM. |
| *Conyza sumatrensis* | fleabane | | Hand pull; spray G1:100 or G1:100 + MM or MM; CSP G1:1.5. |
| *Delonix regia* | poinciana | | Seedlings and regrowth: Hand pull or spray G1:200 or G1:200 + MM or MM. Shrubs: CSP G1:1.5 or SI G1:1.5. |
| *Desmodium uncinatum* | silver-leaved desmodium | | Trees: SI G1:1.5. Where possible, bag seed pods and dispose off-site. |
| *Duranta erecta* | duranta | | Seedlings: Hand pull; spray G1:100. Shrubs: CSP 1:1.5. Where practical, collect and bag seeds, dispose off-site. |

| Scientific Name | Common Name | Qld Status* | Treatment Method |
|---|---|---|---|
| *Eragrostis curvula* | African lovegrass | | Seedlings: Hand pull; crown out; spray G1:200 + MM. Trees: Cut below growing point or SI G1:1.5 |
| *Eriobotrya japonica* | loquat | | Hand pull or dig up; spray G1:100. |
| *Eugenia uniflora* | Brazilian cherry | | Seedlings: Hand pull; spray G1:200 or G200 + MM or MM. Saplings: CSP G1:1.5. Trees: SI G1:1.5. |
| *Lantana camara* | lantana | RIP | Seedlings: Spray G1:200 or G200 + MM or MM. Shrubs: CSP G1:1.5; SI 1:1.5. Seedlings and regrowth: Spray G1:100. Shrubs: Lop into 50 cm pieces and CSP base G1:1.5. Dense and large infestations: Overspray using G1:100. Best results will be obtained when plants are undergoing active growth. |
| *Lepidium bonariense* | Argentine peppercress | | Hand pull; spray G1:100 or G1:100 + MM. |
| *Leucaena leucocephala* | leucaena | | Seedlings: Hand pull; spray G1:200 or 1:200 + MM. Saplings: CSP 1:1.5. Trees: SI G1:1.5. |
| *Livistona chinensis* | Chinese fan palm | | Seedlings: Hand pull; crown out; spray G1:200 + MM. Trees: Cut below growing point or SI G1:1.5 |
| *Lotononis bainesii* | lotononis | | Hand pull, bag and dispose offsite; spray G1:200 + MM or MM. |
| *Macroptilium atropurpureum* | siratro | | Seedlings: Spray G1:100 + MM or MM. Vines CSP 1:1.5. |
| *Macroptilium lathyroides* | phasey bean | | Seedlings: Spray G1:100 + MM or MM. Vines CSP 1:1.5. |
| *Macrotyloma axillare* | perennial horse gram | | Minor infestations: Hand pull or crown; spray G1:200 or G1:200 + MM or MM. Tubers: CSP G1:1.5. Dense infestations: Spray G1:200 or G1:200 + MM or MM. Bag seeds and dispose off-site. |
| *Megathyrsus maximus* | Guinea grass | | Hand pull or dig up; spray G1:100. |
| *Melinis minutiflora* | molasses grass | OIP | Hand pull or dig up; spray G1:100. |
| *Melinis repens* | red natal grass | | Hand pull or dig up; spray G1:100. |
| *Monstera deliciosa* | monstera | | Scrape and paint stems G100% |
| *Morus alba* | white mulberry | | Seedlings: Hand pull, spray G1:200. Saplings: CSP G1:1.5, stack branches above the ground to dry and prevent reshooting. Trees: SI G1:1.5. |
| *Murraya paniculata* | orange jessamine | OIP | Seedlings: Hand pull, spray G1:200. Shrubs: CSP G1:1.5; SI G1:1.5. |
| *Neonotonia wightii* | glycine | | Seedlings: Hand pull; spray G1:100 + MM or MM. Vines: CSP G1:1.5. |

| Scientific Name | Common Name | Qld Status* | Treatment Method |
|---|---|---|---|
| *Nymphaea caerulea subsp. Zanzibarensis* | blue waterlily | | Hand pull and/or rake out of water, roll up and hang to dry; spray G1:100 or G1:100 + MM. Bag and dispose safely off site. |
| *Ochna serrulata* | ochna | | Seedlings and regrowth: Spray G200 + MM or MM. Stems: CSP G1:1.5; scrape and paint G1:1.5; SI G1:1.5. Has very long tap root do not try to hand pull. |
| *Oxalis corniculata* | yellow wood-sorrell | | Crown out; spray G1:100 or G1:100 + MM. |
| *Passiflora suberosa* | corky passionflower | OIP | Seedlings: Spray G200 or G200 + MM. Vines: Hand pull; CSP G1:1.5. |
| *Philodendrum bipinnatifidum* | tree philodendron | | Scrape and paint stems G100% or cut stems high and low. It takes a long time to die and requires repeated monitoring and treatment. |
| *Ricinus communis* | Castor-oil plant | | Seedlings: Hand pull; spray G1:200. Shrubs and small trees: CSP G1:1.5; SI G1:1.5. |
| *Roystonea regia* | Cuban royal palm | | Seedlings and regrowth: Spray G1:200. Shrubs and thickets: Lop into 50 cm pieces and CSP base G1:1.5. Dense and large infestations: Overspray using G1:200. |
| *Schinus terebinthifolius* | broad-leaved pepper tree | RIP | Seedlings: Hand pull; spray G1:200. Saplings: CSP G1:1.5. Trees: SI G1:1.5. |
| *Setaria sphacelata* | South African pigeon grass | | Hand pull or dig up; spray G1:100. |
| *Sida rhombifolia* | Paddy's lucerne | | Seedlings and small plants: Hand pull; spray G1:100 or G1:100 + MM. Shrubs: CSP G1:1.5. |
| *Sida spinosa* | spiny sida | | Hand pull; spray G1:100 or G100 + MM. |
| *Solanum chrysotrichum* | giant devil's fig | | Seedlings: Hand pull or spray G1:200. Shrubs: CSP G1:1.5; SI G1:1.5. |
| *Solanum mauritianum* | wild tobacco | OIP | Seedlings: Hand pull or spray G1:200. Shrubs: CSP G1:1.5; SI G1:1.5. |
| *Solanum nigrum* | black-berry nightshade | | Hand pull; spray G1:100. |
| *Solanum seaforthianum* | Brazilian nightshade | | Seedlings and regrowth: Spray G1:200 or G1:200 + MM. Vines: CSP G1:1.5. |
| *Solanum torvum* | devil's fig | | Seedlings: Hand pull or spray G1:200. Shrubs: CSP G1:1.5; SI G1:1.5. |
| *Sonchus oleraceus* | sow thistle | | Hand pull; spray G1:100 or G1:100 + MM or MM. |
| *Spathodea campanulata* | African tulip tree | RIP | Seedlings: Spray G1:200. Saplings: CSP G1:1.5. Trees: SI G1:1.5. |
| *Sphagneticola trilobata* | Singapore daisy | RIP | Hand pull, ensure all root nodes are removed, bag and dispose off-site; spray G1:200 + MM. |

| Scientific Name | Common Name | Qld Status* | Treatment Method |
|---|---|---|---|
| *Syagrus romanzoffiana* | cocos palm | OIP | Seedlings: Hand pull; crown out; spray G1:200 + MM. Trees: Cut below growing point or SI G1:1.5 |
| *Syzygium jambos* | rose apple | | Seedlings: Hand pull; crown out; spray G1:200 + MM. Trees: Cut below growing point or SI G1:1.5 |
| *Tipuana tipu* | tipuana | | Seedlings: Hand pull; spray G1:200. Saplings: CSP G1:1.5. Trees: SI G1:1.5. |
| *Urochloa decumbens* | signal grass | | Dig up; spray G1:100. |
| *Verbena bonariensis* | purpletop | | Hand pull; spray G1:100 or G100 + MM. |
| *Verbena littoralis* | common verbena | | Hand pull; spray G1:100 or G100 + MM. |
| *Yucca aloifolia* | Spanish bayonet | | Dig out plants by hand or machine; cut and paint near ground G1:1.5; spray MM. |

*Notes:

1. Species specific weed control methodology has been extracted from the *South East Queensland Restoration Framework* (Chenoweth EPLA and Bushland Restoration Services, 2012).
2. Control Methods: G = Glyphosate (e.g. Weedmaster Duo ®, Roundup Biactive ®), MM = Metsulfuron Methyl (e.g. Brushoff ®, Brushkiller ®, Associate ®), S = Surfactant (e.g. L1700 ®, Prosil ®, Pulse ®), A = spray adjuvant (e.g. Agral ®, Protec ®, Codacide ®), D = colour marking dye (e.g. Herbi [red or blue] Liquid Dye ®), CSP = cut, scrape and paint, SI = stem inject.
3. Rates: G1:100 = Glyphosate at a rate of 100mL/10L, G1:200 = Glyphosate at a rate of 100mL/20L, G1:1.15 = Glyphosate at a rate of 400mL/600mL and MM = Metsulfuron Methyl at a rate of 1.5g/10L.
4. Glyphosate formulations, as referred to above, will be “frog-friendly”.
5. It is recommended to add spray adjuvant to improve adhesion to and penetration of herbicide spray into the target species.
6. Adjuvants are not to be allowed to come into contact with natural water bodies when either mixing or spraying herbicide.
7. When not spraying directly adjacent to natural water bodies, the recommended broad-spectrum herbicide mix for treatment of all species is Glyphosate 1:100 for seedlings and Metsulfuron Methyl 1g/10L plus adjuvant.

**Table 4.2 General Weed Control Methods**

| Method | Application | Procedure |
|---|---|---|
| Cut-scrape-paint | All woody shrubs and trees<br>Some vines | Prepare herbicide with 1-part of Glyphosate[1] to 1.5-parts water;<br>Cut plant low to ground at an angle and apply herbicide with a paintbrush;<br>Scrape sides lightly to reveal green tissue and apply the herbicide to the scraped area;<br>Ensure that the brush is not contaminated with soil; and<br>All species with seeds that have high viability or longevity (e.g. *Senna spp*., some members of the Fabaceae family, or plants with high invasive potential such as *Heptapleurum actinophyllum*) must be removed from the parent and either composted on-site or removed from the site. |
| Stem injection | All woody trees and shrubs with a diameter of 6-10cm or greater | Prepare herbicide with 1-part of Glyphosate[1] to 1.5-parts water;<br>With a tomahawk or saw, make a slightly angled cut approximately 1.5cm wide and 1.5cm deep into the trunk and apply herbicide immediately into the cut using a tree-injecting device;<br>Repeat this process in a brickwork pattern around the circumference of the tree, as close to the ground as possible; and<br>Two (2) rows of cuts will be sufficient for trees with trunks of 6-10cm; larger trunk diameters will require more rows. |
| Spraying | Dense infestations of shrubs and groundcover with no native species interspersed. | Using a 15L spray backpack with a nozzle providing a solid spray pattern, spray herbicide on the infestation[2]; and<br>If Glyphosate[1] is to be utilised as the herbicide, dilution rates are to be in accordance with the manufacturer's recommendations. |
| Overspray | Plants with large, dense infestations (such as Lantana camara)<br>Where dead plants should be intact to prevent erosion and over-exposure of large areas, protect native seedlings from predators and avoid trampling of the area by humans | Prepare a solution of 1-part Glyphosate[1] to 100-parts water;<br>Spray over the top of the infestation[2];<br>Leave the sprayed plants intact so that native seedlings can establish under the shelter provided; and<br>Weeds can be cut and flattened with bush-hooks or loppers and the subsequent regrowth sprayed with Glyphosate |
| Crowning | Weeds which have their growing points beneath the surface in the form of corms, bulbs, rhizomes, clumped or fibrous root systems or similar structures (e.g. *Asparagus aethiopicus, Chlorophytum comosum* and Poaceae species) | Grasp the leaves or stems and hold them tightly so that the base of the plant is visible. Plants with sharp leaves or stems should be cut back first;<br>Insert a knife close to the base of the plant at a slight angle with the tip well under the system;<br>Cut through the roots close to the base. Depending on the size of the plant, two (2) or more cuts may be needed to sever the roots; and<br>Remove the plant and make sure that the base of the plant where the roots begin is completely removed |

Notes:

[1] – Due to the proximity of the site to watercourses, where Glyphosate is indicated for use in chemical treatments, Glyphosate Biactive or an equivalent 'Frog Friendly' herbicide must be used. Dilution rates should always be in line with the manufacturer's recommendations and any variation requires a permit from the National Registration Authority.

[2] - To prevent any unnecessary and excessive use of herbicides during weed control activities, a vegetable-based dye will be mixed with all herbicides to be used for spraying and over spraying.

## 4.4 Revegetation

A planting palette for the revegetation works representing the preclearing Regional Ecosystems (12.3.11 and 12.11.24) is provided in Appendix C. The palette includes understorey, shrub and groundcover species. The revegetation works should be result in an average density of one (1) plant per 5 $m^2$ for trees; 10m for shrubs and one (1) plant per 1$m^2$ for groundcovers. **Densities should include existing native plants to avoid over-planting in vegetated areas.**

### 4.4.1 Revegetation Protocol

Table 4.3 outlines the procedure for revegetation planting works.

**Table 4.3 Revegetation Protocol**

| Item | Description |
|---|---|
| 1 | Local provenance tube stock is to be utilised for all restoration works. Where this is not possible due to circumstances out of the control of the applicant, Council approval must be sought. |
| 2 | Plants are to be vigorous, well established, hardened off, consistent with naturally occurring species or varieties (no cultivars), free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged. |
| 3 | Plants are to be planted immediately after delivery to the planting site. If not possible, they are to be stored in the shade and watered sufficiently daily. |
| 4 | Excavate planting medium to a depth suitable for the installation of tube or pot specimens (Figure 4.1). In areas where the planting substrate is deemed to be very poor (compacted, nutrient depauperate, hydrophobic, etc.) and above areas of potential frequent inundation and water flow, soil shall be suitably prepared (e.g. through use of fertiliser, and mechanical ripping where required) and sufficient topsoil to sustain long term plant growth shall be used. |
| 5 | Pre-water plant hole if soil is dry in order to decrease root stress upon planting and assess the infiltration of water through the soil. |
| 6 | A complete, slow release fertiliser is recommended, and is to be administered appropriately during planting. Top dressing with slow release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots. |
| 7 | Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10mm or any more than 20mm of planting medium. |
| 8 | Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots. |
| 9 | To ensure successful establishment, all planting surfaces must be covered in either a 10cm layer of high quality composted chip mulch free of weeds and debris (Note: to avoid possible stem rot in some 'drier' species ensure mulch is 'dished' and not covering plant stem by more than 2cm); or suitable individual anchored natural fibre weed mat (e.g. jute mat) in areas subject to high velocity flows or on slopes greater than 1:3 (Figure 4.2). |
| 10 | As presented within other sections, where available mulch material will be sourced from cleared vegetation material if adequately seasoned (i.e. stockpiled for at least 6 weeks to prevent nitrogen drawdown). |
| 11 | Monitoring and maintenance (watering, weed control, stock replacement, fertilising, managing inappropriate site access, etc.) is to occur monthly for the period from October to May and bi-monthly for June to September during the Establishment period. |
| 12 | Where specimens show signs of very poor health, do not replace unless the plant is determined to be dead below ground. Many species are capable of strongly recovering from transplant stress or adjustment to site conditions. If a particular species is consistently doing poorly in certain site conditions, it is recommended to replace with an alternate species. |
| 13 | A minimum 90% survival rate must be achieved for all planted stock at all milestones. Where this is not achieved, supplementary planting must be undertaken (refer to Section 5.7). |

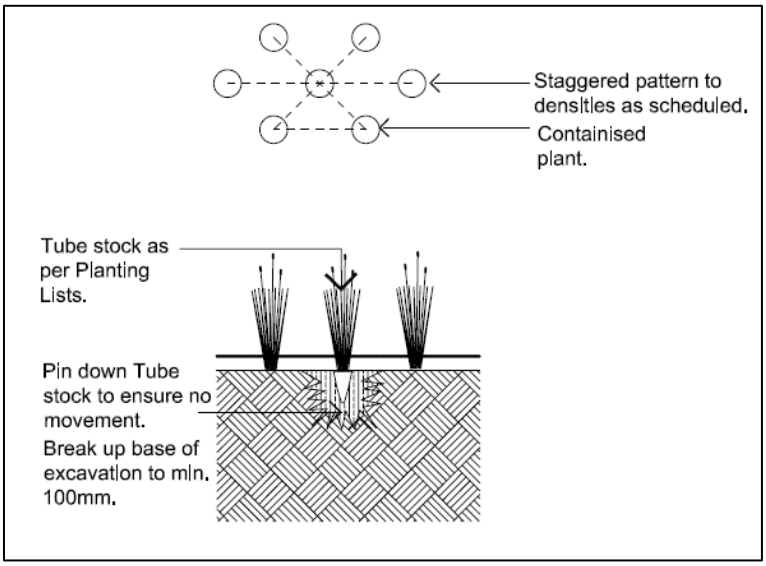



**Figure 4.1 Typical Tubestock Planting Details**

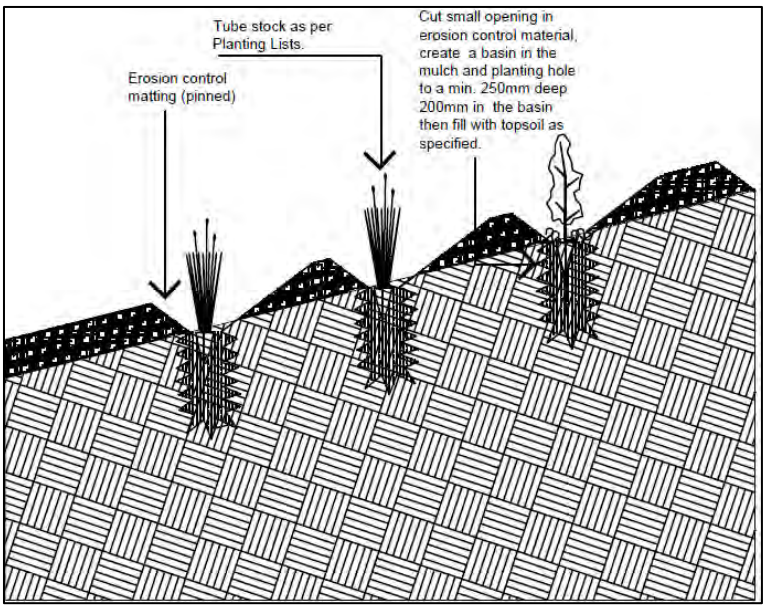



**Figure 4.2 Planting Method for Slopes Greater than 1:3**

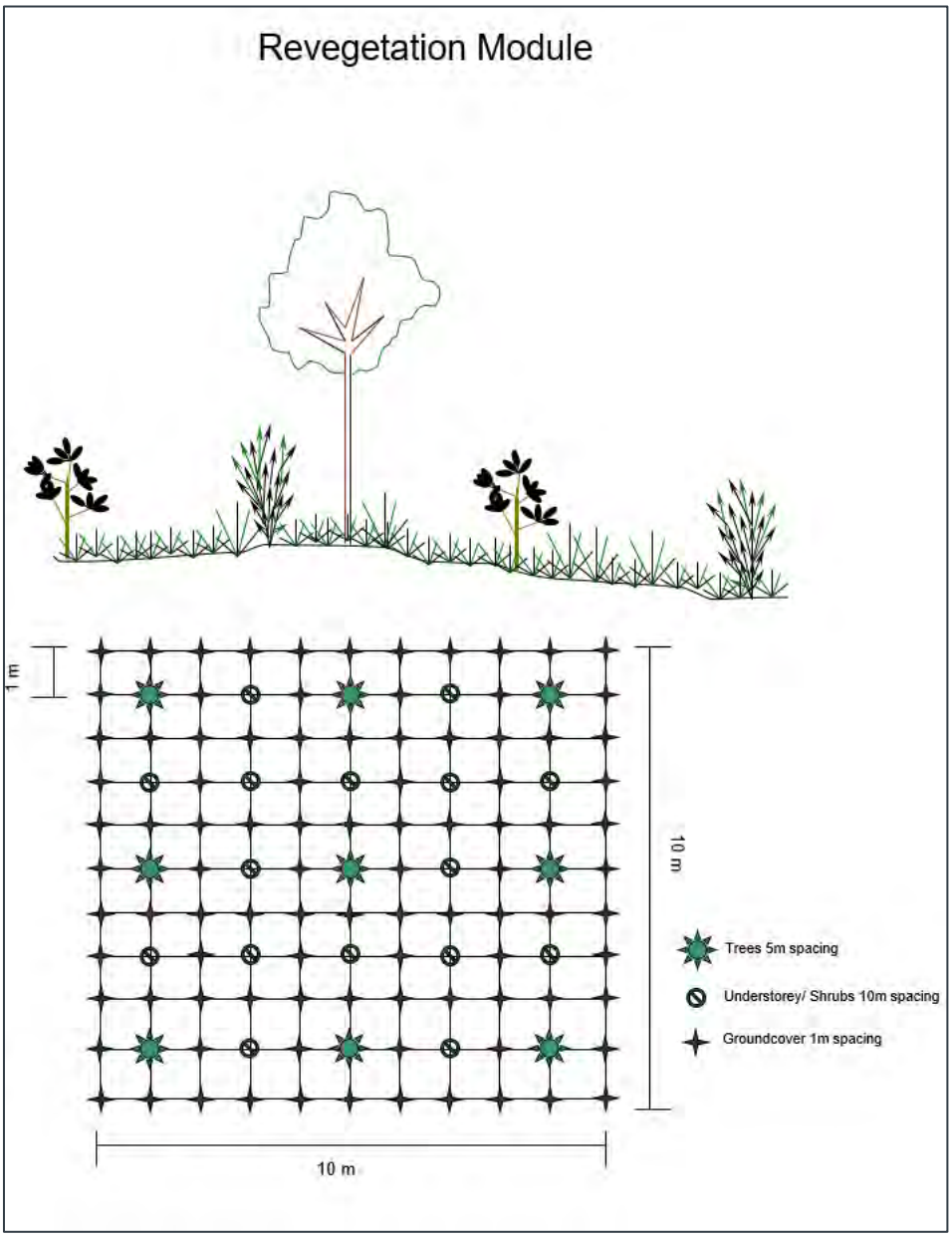



**Figure 4.3 Revegetation Planting Module**

## 4.5 Schedule of Rehabilitation Works

### 4.5.1 Establishment Period

Following initial rehabilitation works, the area is to undergo an Establishment period of six (6) months, during which time the developer will be responsible for undertaking and / or organising monitoring and maintenance requirements. All fencing, signage, initial weed control and initial revegetation would be undertaken in order to achieve on-establishment of the proposed works prior to bonding being proposed.

Table 4.4 outlines the schedule of maintenance and benchmarks for the Establishment Period.

**Table 4.4 Establishment Period Schedule of Works**

| Activity | Frequency | Commencement | Details |
|---|---|---|---|
| Fencing and Signage | Once | Prior to Works | Temporary fencing and signage may be required to deter access to the revegetation areas where deemed appropriate by the revegetation contractor. |
| Weed Control | Monthly | Initial period | This will comprise initial weed control and following up treatments. By the end of the Establishment Period, the restoration area will be 90% free of weeds. |
| Initial Revegetation Works | Once but follow up required | Following weed control | Works to include soil preparation (soil wetting agent may be required), planting, fertilising (slow release for native plants), mulching and installation of stakes and seedling protection covers where deemed appropriate by the revegetation contractor.<br>All reconstruction works are to achieve a minimum survival rate of 90% at the end of the establishment period. |
| Irrigation | Weekly/As required | At reconstruction planting | Irrigation requirements will depend on rainfall events.<br>Irrigation will be undertaken at a minimum every three (3) to five (5) days for first eight (8) weeks depending on rainfall. |
| Routine Inspections | Weekly/Monthly | Following weeding and planting out | Inspections will be undertaken weekly for the first month following reconstruction works; then monthly for the remainder of the establishment period. |
| Follow up Revegetation Planting | As required | Following inspection and as required | Replace dead plants; and/or add additional mulch/fertiliser; and/or replace stakes/protective covers where required as determined at the routine inspections. |
| Photo-monitoring | Every three (3) months | Prior to rehabilitation works, then immediately upon completion of reconstruction works. | Photographs taken from fixed points, determined by the landowner, to record changes in the rehabilitating vegetation community every three (3) months for the duration of the Establishment Period. |

### 4.5.2 On-Maintenance Period

Following completion and acceptance by Council of the 6-month Establishment period, the developer will be responsible for maintenance and monitoring for the 6-month On Maintenance period. Council will undertake a final inspection at the end of the On-Maintenance period to determine whether the area meets the restoration benchmarks and objectives outlined in this RMP. This inspection will determine whether the restoration works can go 'Off Maintenance' and the works moves into the Management phase. It should be noted that once the area is in Management (Off Maintenance), the restoration contractor may still access the area for routine / spot inspections to ensure ongoing compliance with this RMP. The landowner may also wish to bond this period in accordance with Council requirements to facilitate early plan sealing. All establishment works (outlined in Section 4.5.1) will be completed prior to proposing bonding of the on-maintenance period of the works.

Table 4.5 outlines the schedule of activities and maintenance to be undertaken during the On-Maintenance period.

**Table 4.5 On-Maintenance Period Schedule of Works**

| Activity | Frequency | Commencement | Details |
|---|---|---|---|
| Weed Control | Every three (3) months | Following completion of establishment period | Three (3) monthly and reactive based on monitoring results. |
| Irrigation | As required | Following completion of establishment period | Irrigation requirements during this stage will be reactive based on the monitoring results and rainfall events. |
| Routine Inspections | Every three (3) months | Following completion of establishment period | Inspections will be undertaken every three (3) months during this period. |
| Follow up Revegetation Planting | As required | Following completion of establishment period | Replace dead plants; and/or add additional mulch/fertiliser; and/or replace stakes/protective covers where required as determined at the routine inspections. |
| Photo-monitoring | Every three (3) months | Following completion of establishment period | Photographs taken from fixed points, determined by the landowner, to record changes in the rehabilitating vegetation community every three (3) months during this period. |

## 4.6 Qualifications of Personnel Involved in RMP Implementation

On-ground restoration works must be undertaken and / or supervised by persons with qualifications in the field of bush regeneration. Minimum qualifications and experience for bush regenerators to undertake on-ground restoration works should comprise Certificate III in Conservation Land Management (Natural Area Restoration) or equivalent and two (2) years' experience working on the vegetation type(s) at the site. Equivalent qualifications and / or experience will require the provision of successful on-ground examples under the responsibility of the applicant or referee reports from experienced practitioners eligible for Australian Association of Bush Regeneration accreditation. Proof of qualifications and experience of on-ground personnel is required to be submitted to Council prior to commencement of works.

Bush regenerators are to hold a current Chemical Users Certificate and other relevant legislative requirements (e.g. harvesters' licence to work with threatened flora).

Monitoring and reporting are to be undertaken by a suitably qualified ecologist with experience in monitoring natural areas and quantitative analysis.

### 4.7 Daily Record Keeping

To comply with the *Chemical Usage (Agricultural and Veterinary) Control Act 1988*, a daily record sheet which includes records of chemicals used must be kept. An example of a Daily Record Sheet is included as Appendix D.

To comply with the *Work Health & Safety Act 2011* a daily record sheet for on-site staff involved in the restoration work will need to be kept. A sample Job Risk Assessment Form and Matrix is included within Appendix E

# 5. Monitoring and Reporting

It is critical to the success of any restoration project to undertake regular monitoring of the works' progression. Recording and evaluating the progress and effectiveness of work that has been undertaken provides valuable opportunities for adaptive management which will enable improvements of strategic and operational methods.

A record of each management event will be kept and used to describe any activities undertaken including:

- Weeding and methods used;
- General location of activities; and
- Any other general observations / comments (such as fire or weather conditions such as drought, significant rainfall events, etc.).

A sample of a monitoring record sheet has been provided in Appendix F of this report.

The following measures will facilitate effectiveness of the restoration program:

- Establish a baseline monitoring program before restoration commences;
- Prepare an inspection and monitoring program; and
- Ensure that remedial action is taken promptly when the results of monitoring, auditing or inspections reveal a problem or environmental risk.

When evaluating the progress of the rehabilitation project, key indicators of positive progress include:

- Reductions in the severity and extent of weed infestations;
- Improvements in vegetation structure;
- Increases in species diversity through natural recruitment;
- Increases in the diversity of, and species within, successional stages (e.g. pioneer, secondary and mature phases); and
- Improvements in vegetation community health.

Monitoring and reporting are to be undertaken by a suitably qualified ecologist or restoration professional with experience in monitoring natural areas.

## 5.1 Monitoring Methodology

Data collected for this restoration project will use qualitative methods (e.g. observations on daily record sheets and photo point monitoring).

Photo-monitoring points are to consist of a marker or a feature (e.g. a survey peg or stake in the ground) that is not likely to change dramatically over time. To provide accurate and reliable data, photographs should be taken from exactly the same location, height and direction, and with the same lens and / or camera. GPS co-ordinates of each photo-monitoring point should be accurately recorded. A prominent feature that is unlikely to change over time (e.g. a large dead tree) should be visible in each photo, which will assist with the recognition and comparison of any changes in the vegetation.

Data collection to measure restoration outcomes will be based on the performance indicators (refer to Section 6.2). An example monitoring and evaluation datasheet has been provided in Appendix F of this report.

A monitoring report is required to be submitted to Council for certification at the end of both the Establishment and On-Maintenance periods. The certification is to demonstrate that the restoration works have achieved the required performance indicators.

## 5.2 Performance Indicators

Performance indicators or benchmarks are tools to measure the effectiveness of prescribed management and restoration actions. Performance indicators for this restoration project are as follows:

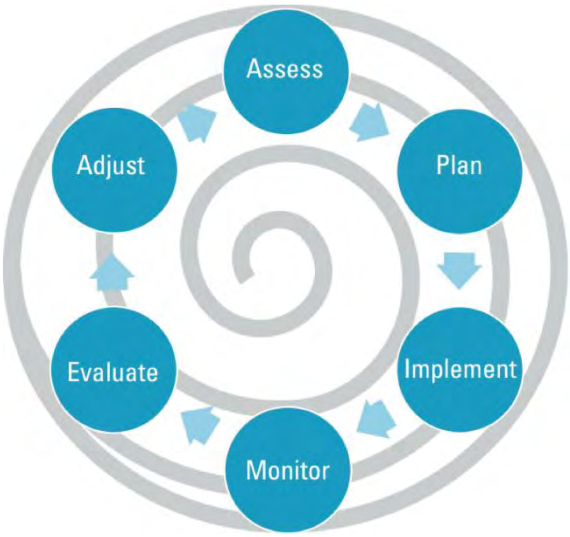
- Primary treatment of all weeds in the riparian zone by the end of the on-maintenance period;
- Nil fruiting of weed species after primary treatment;
- Increased abundance and diversity of native species;
- Increased recruitment of native species;
- Increased canopy percentage of native species;
- No inappropriate genetic material used in plantings;
- >90% survival rate of planted stock and naturally recruited native species; and
- Increased colonisation and use of the site by native fauna.

When the management obligations for the site have been completed (i.e. the management period has come to an end and the performance criteria have been achieved), certification of completion of works and maintenance requires:

- Documentation to demonstrate that all performance criteria have been achieved;
- A site visit with Council officers, the proponent and the consultant; and
- Formal correspondence will be forwarded to the proponent notifying Council acceptance of the management of the RMP site and release of any bond if applicable.

## 6. Adaptive Management and Contingency Planning

Adaptive management allows for flexible management responses by either adopting or amending management actions over the duration of the project. This approach allows managers to learn from mistakes and adapt to unexpected events such as drought, floods and fire. Changes in industry best practice may also influence the management strategies.




Any minor alterations to any component of the RMP must be approved by the relevant authority.

Approval of an amended RMP will be subject to the same assessment process as the original RMP. Justification for the amendments, including an analysis of the implementation, maintenance and success of the existing RMP will be considered in assessment of the amended RMP.

An application for minor alterations must be accompanied by an Adaptive Management Statement (AMS) which clearly outlines the plan component to be altered and the reasoning for the alteration. Reasoning would usually be for an improved environmental outcome. A completed signed copy of each AMS must be forwarded to the relevant authority.

## 7. Definitions

| | |
|---|---|
| **AMS** | Adaptive Management Strategy |
| **DES** | Department of Environment and Science |
| **RE** | Regional Ecosystem |
| **RMP** | Rehabilitation Management Plan |
| **VMA** | *Vegetation Management Act 1999* |

## 8. References

Chenoweth EPLA and Bushland Restoration Services (2012). *South East Queensland Ecological Restoration Framework: Code of Practice*. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.

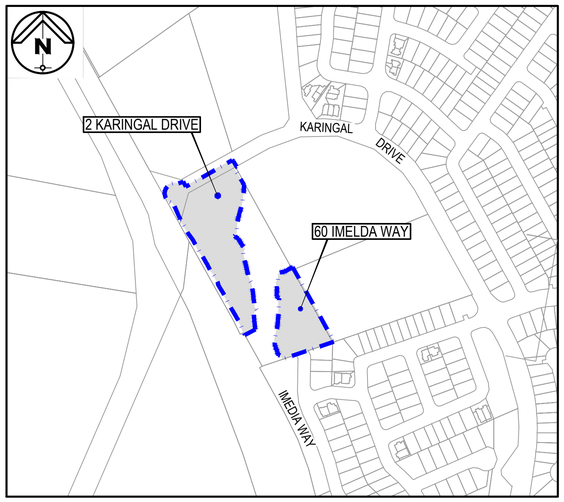
Burchills, (2026). Ecological Site Assessment – 2 Karingal Drive, Pimpama. Prepared for Bosform Pty Ltd.

Thomas, Evan (2006). *Gold Coast Soil Association Map*. Prepared for Gold Coast City Council.

# Appendix A – Plan of Development

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

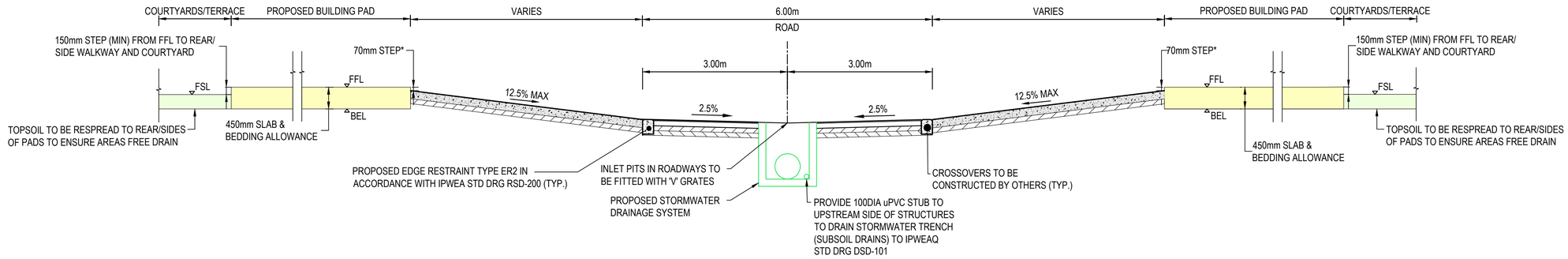
BOS

PREPARED BY

BURCHILLS
ENGINEERING SOLUTIONS

GOLD COAST | BRISBANE | TOOWOOMBA
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

BURCHILLS ENGINEERING SOLUTIONS
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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

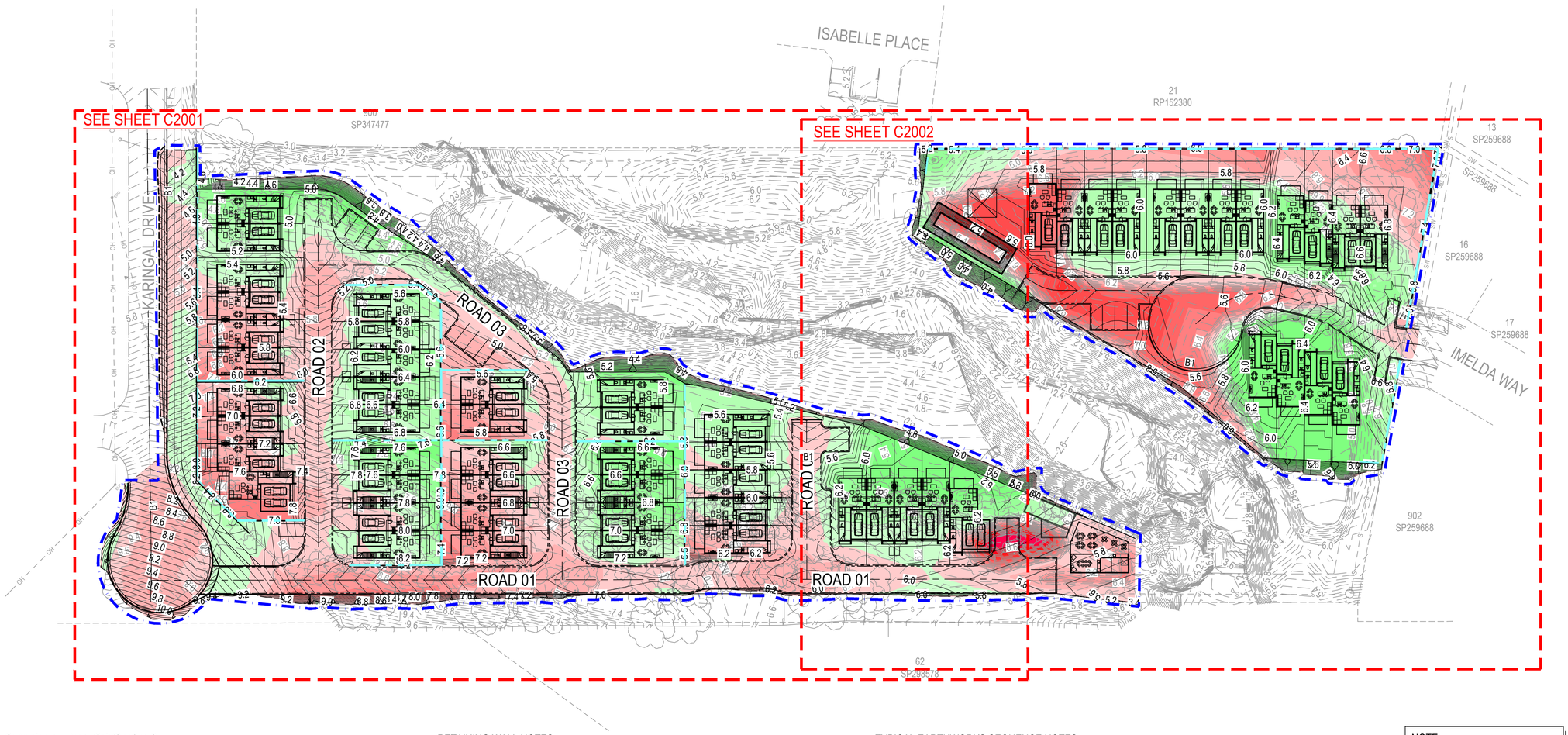
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRm EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

BURCHILLS ENGINEERING SOLUTIONS
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

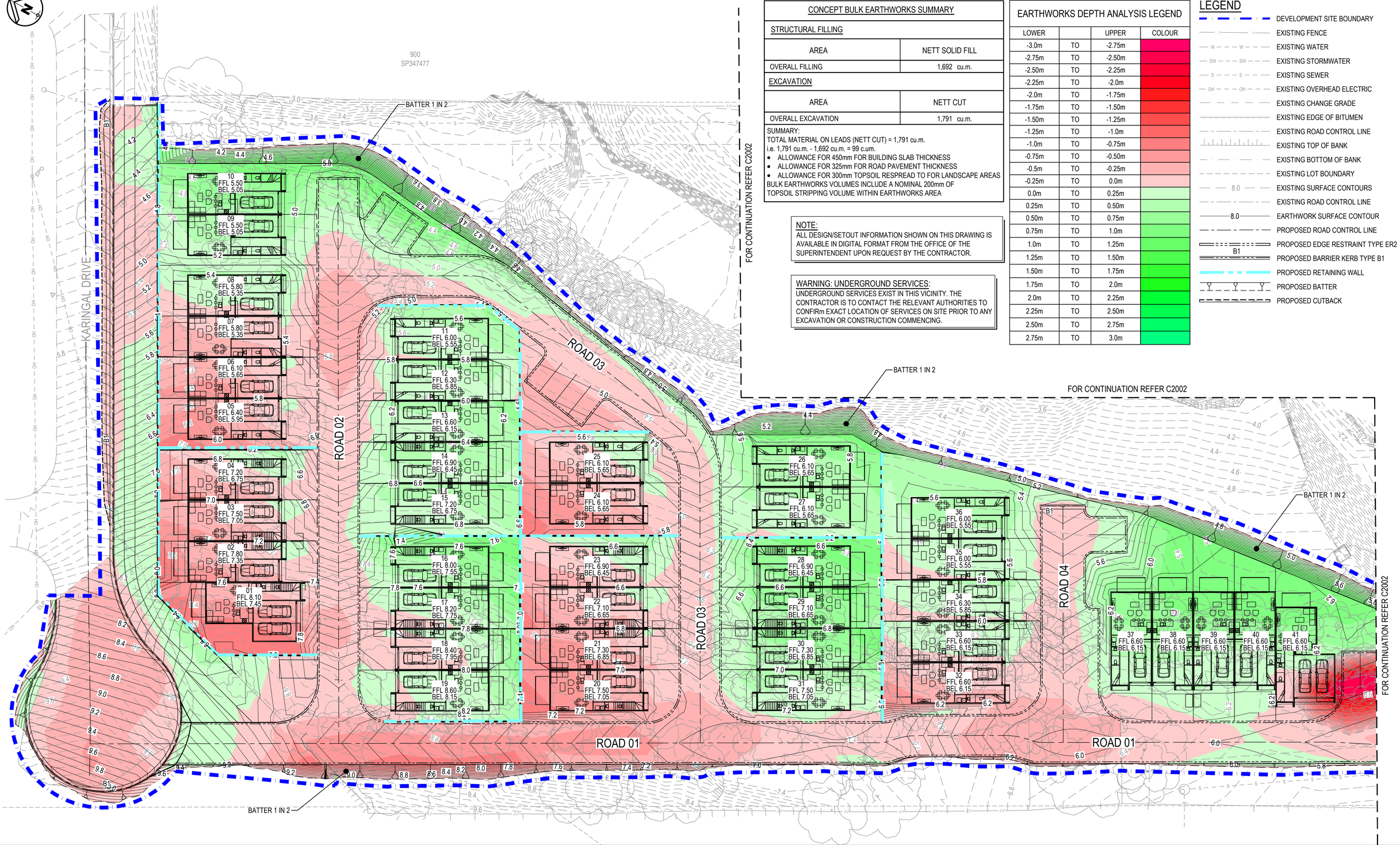
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
ALL DESIGN/SETOUT INFORMATION SHOWN ON THIS DRAWING IS AVAILABLE IN DIGITAL FORMAT FROM THE OFFICE OF THE SUPERINTENDENT UPON REQUEST BY THE CONTRACTOR.

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRm EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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| VER. | DESCRIPTION | DATE |
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| A | ORIGINAL ISSUE | 11-03-26 |


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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

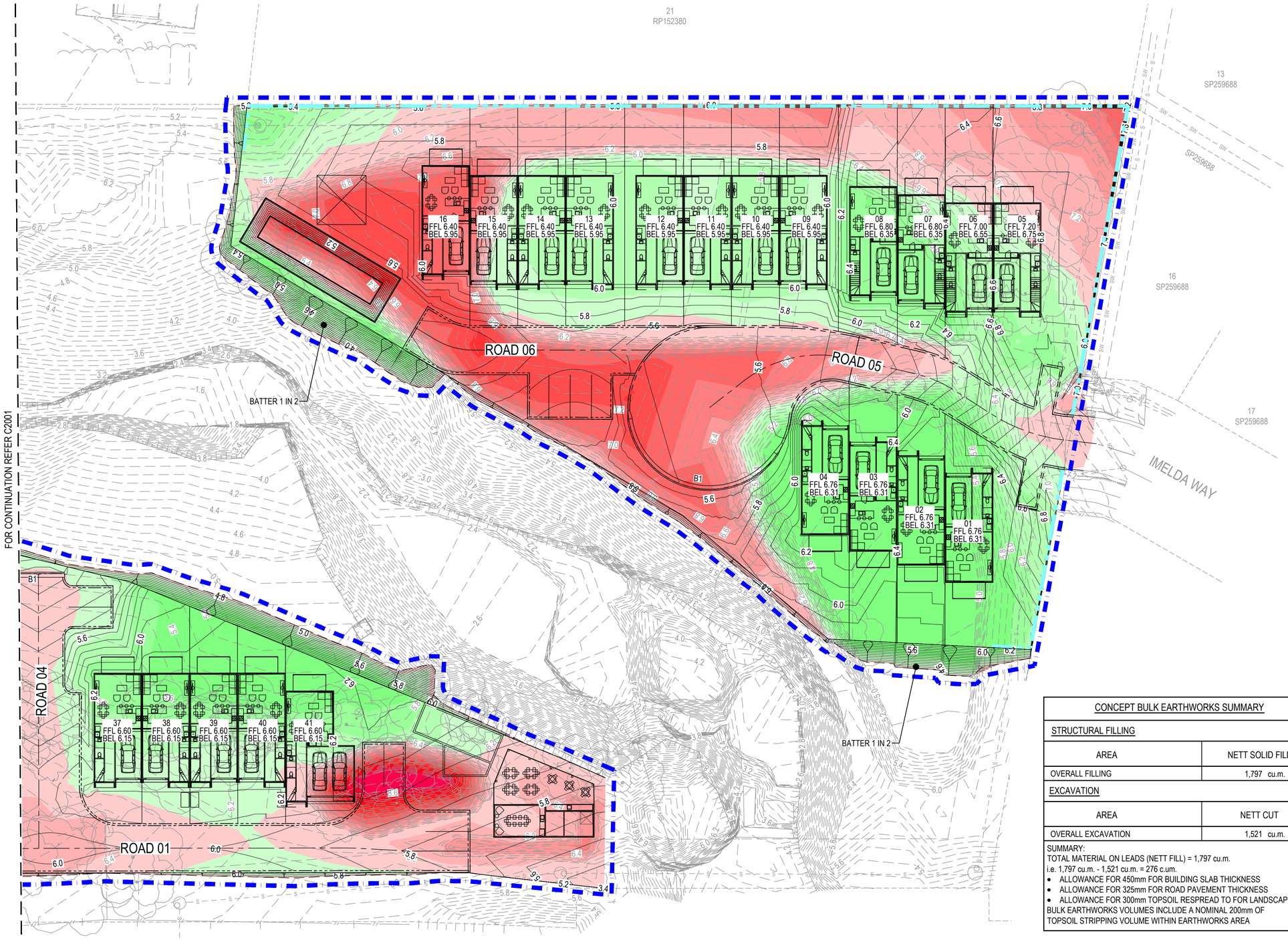
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

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BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

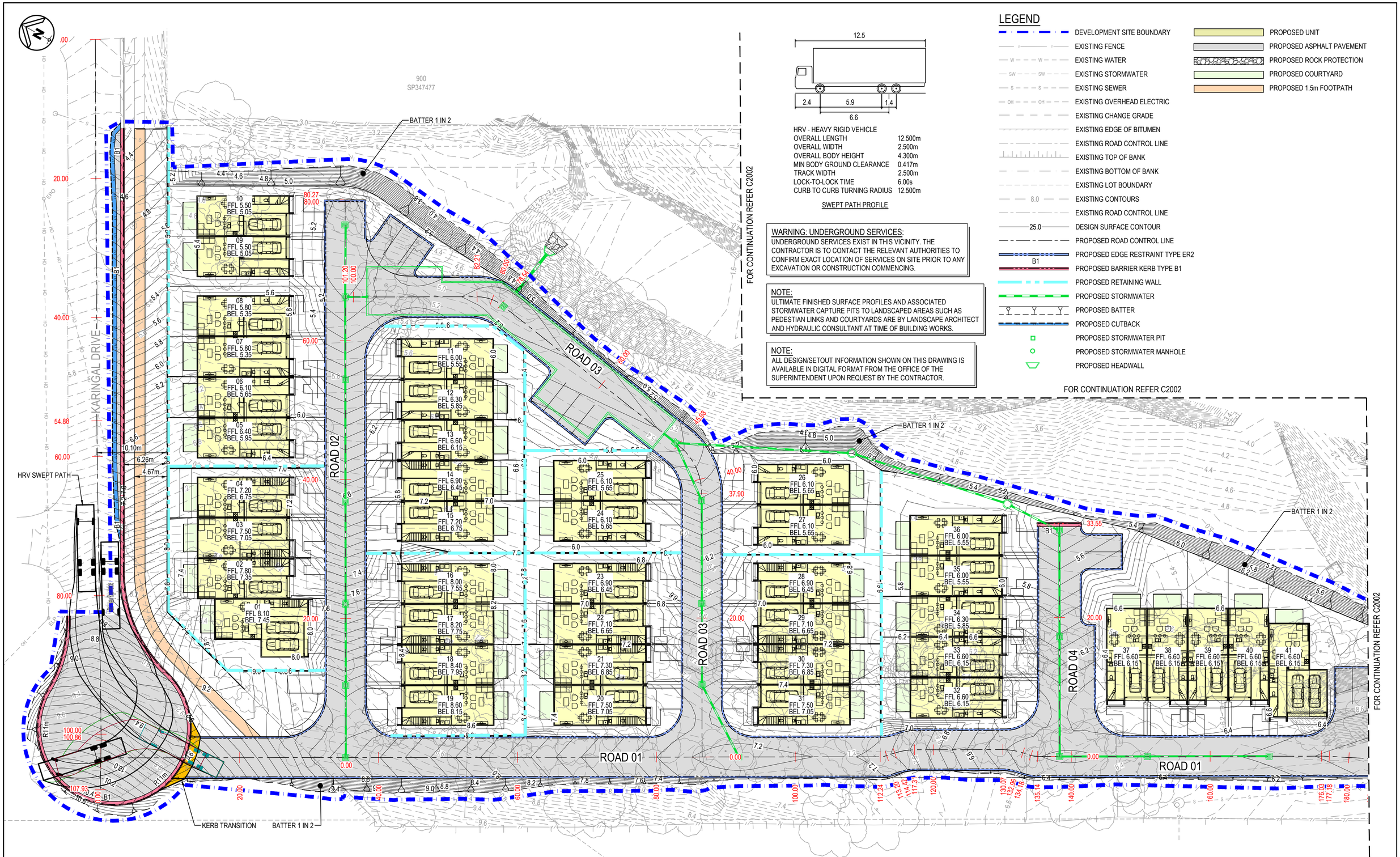
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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| BE20023 | C3000 | A |




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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3001 | A |




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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

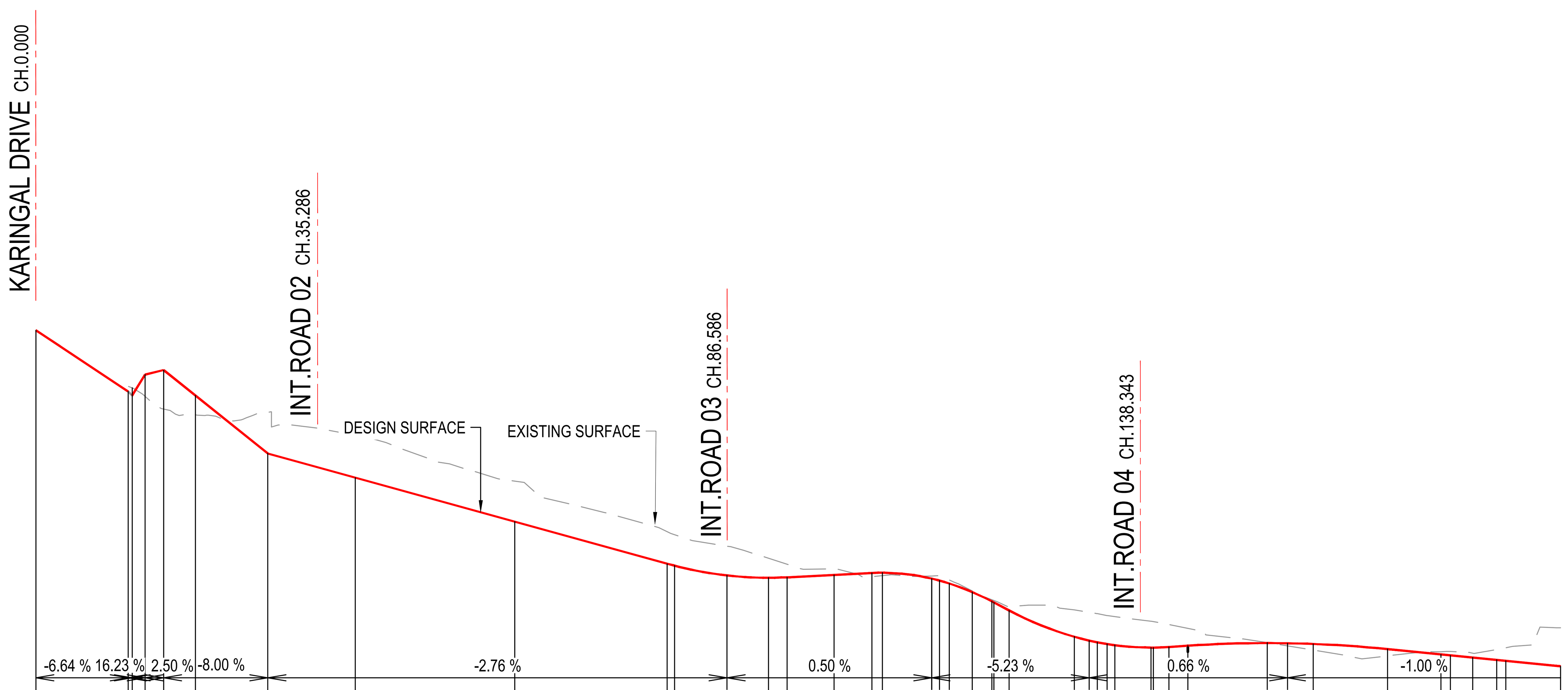
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |




DATUM R.L. 5.00

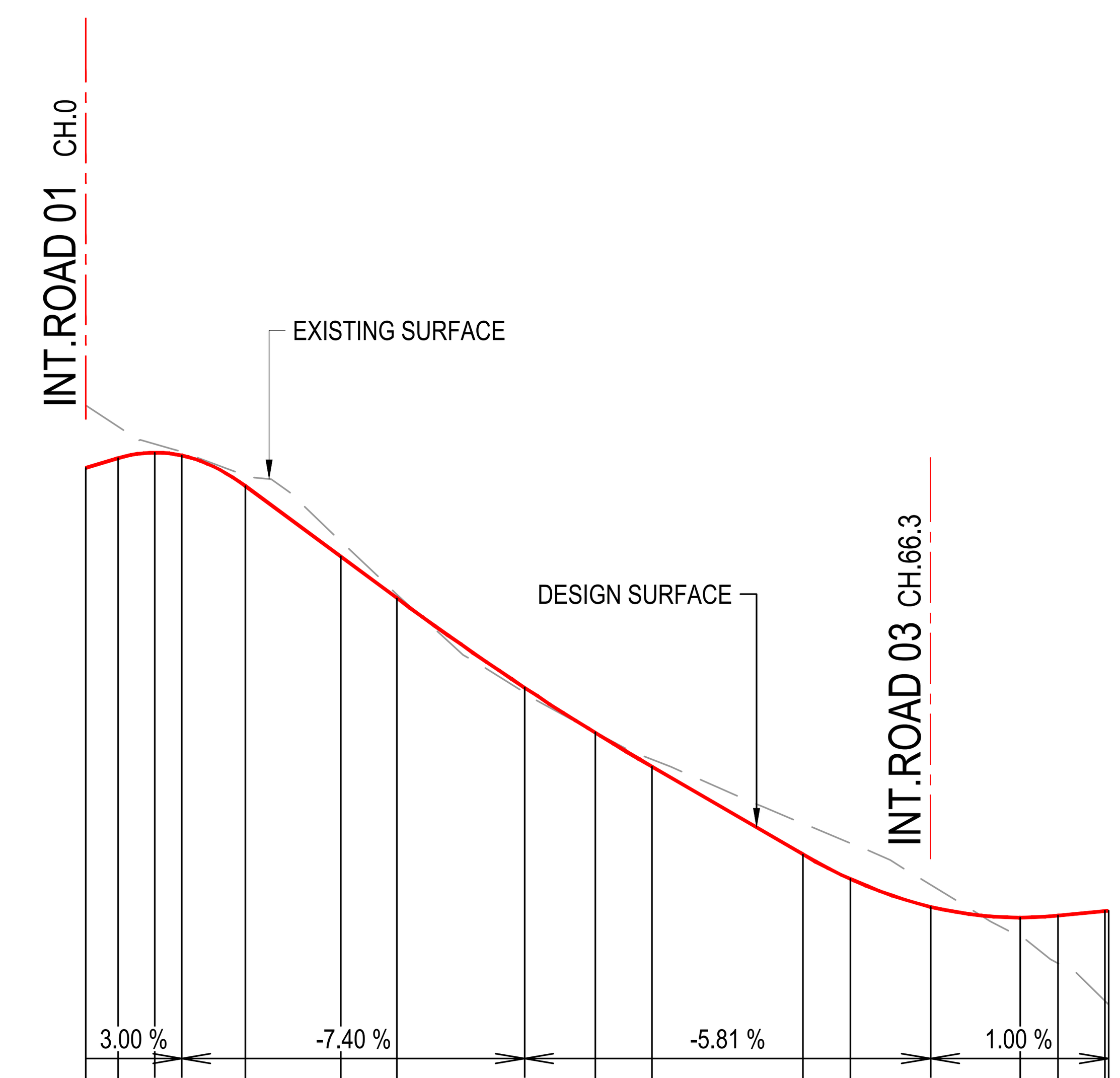
| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | 0.000 | 10.252 | 10.252 |
| 11.575 | 0.007 | 9.483 | 9.476 |
| 12.065 | -0.097 | 9.434 | 9.531 |
| 13.674 | 0.270 | 9.695 | 9.425 |
| 16.000 | 0.490 | 9.753 | 9.263 |
| 20.000 | 0.241 | 9.433 | 9.192 |
| 29.066 | -0.518 | 8.708 | 9.226 |
| 40.000 | -0.532 | 8.406 | 8.938 |
| 60.000 | -0.508 | 7.854 | 8.362 |
| 79.086 | -0.401 | 7.327 | 7.728 |
| 80.000 | -0.387 | 7.303 | 7.690 |
| 86.586 | -0.366 | 7.181 | 7.548 |
| 91.784 | -0.244 | 7.152 | 7.396 |
| 94.086 | -0.164 | 7.158 | 7.322 |
| 100.000 | -0.077 | 7.187 | 7.264 |
| 104.736 | 0.044 | 7.211 | 7.166 |
| 106.045 | 0.035 | 7.214 | 7.179 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 113.201 | -0.054 | 7.116 | 7.170 |
| 114.416 | -0.042 | 7.080 | 7.122 |
| 117.312 | -0.013 | 6.972 | 6.985 |
| 119.736 | -0.020 | 6.856 | 6.876 |
| 120.000 | -0.024 | 6.842 | 6.866 |
| 121.932 | -0.050 | 6.741 | 6.792 |
| 130.067 | -0.335 | 6.414 | 6.749 |
| 131.932 | -0.354 | 6.366 | 6.720 |
| 132.963 | -0.357 | 6.344 | 6.701 |
| 134.178 | -0.356 | 6.322 | 6.678 |
| 135.143 | -0.356 | 6.308 | 6.663 |
| 139.686 | -0.331 | 6.277 | 6.608 |
| 140.000 | -0.326 | 6.277 | 6.603 |
| 141.932 | -0.282 | 6.285 | 6.566 |
| 144.300 | -0.219 | 6.300 | 6.519 |
| 154.254 | -0.005 | 6.333 | 6.339 |
| 156.800 | 0.033 | 6.331 | 6.298 |
| 160.000 | 0.076 | 6.322 | 6.246 |
| 169.300 | 0.085 | 6.258 | 6.173 |
| 176.025 | -0.036 | 6.191 | 6.226 |
| 177.175 | -0.048 | 6.179 | 6.227 |
| 180.000 | -0.057 | 6.151 | 6.208 |
| 182.986 | -0.132 | 6.121 | 6.253 |
| 184.136 | -0.166 | 6.110 | 6.276 |
| 191.003 | -0.486 | 6.041 | 6.527 |

HORIZIONTALGEOMETRY

R-3.00m R9.00m
0.97m 2.90m
R9.00m R-3.00m
2.90m 0.97m
R20.00m R-20.00m
1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




DATUM R.L. 3.00

| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | | 8.536 | |
| 2.535 | -0.248 | 8.612 | 8.859 |
| 5.419 | -0.068 | 8.655 | 8.723 |
| 7.535 | -0.026 | 8.632 | 8.658 |
| 12.535 | -0.083 | 8.392 | 8.475 |
| 20.000 | -0.123 | 7.839 | 7.962 |
| 24.434 | -0.030 | 7.511 | 7.541 |
| 34.434 | 0.040 | 6.811 | 6.771 |
| 40.000 | -0.004 | 6.456 | 6.460 |
| 44.434 | -0.056 | 6.190 | 6.246 |
| 56.300 | -0.243 | 5.501 | 5.745 |
| 60.000 | -0.281 | 5.309 | 5.591 |
| 66.300 | -0.173 | 5.090 | 5.264 |
| 73.363 | 0.150 | 5.006 | 4.855 |
| 76.300 | 0.373 | 5.020 | 4.648 |
| 80.000 | 0.708 | 5.057 | 4.349 |
| 80.266 | 0.737 | 5.060 | 4.322 |
| 80.274 | | | 4.322 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3

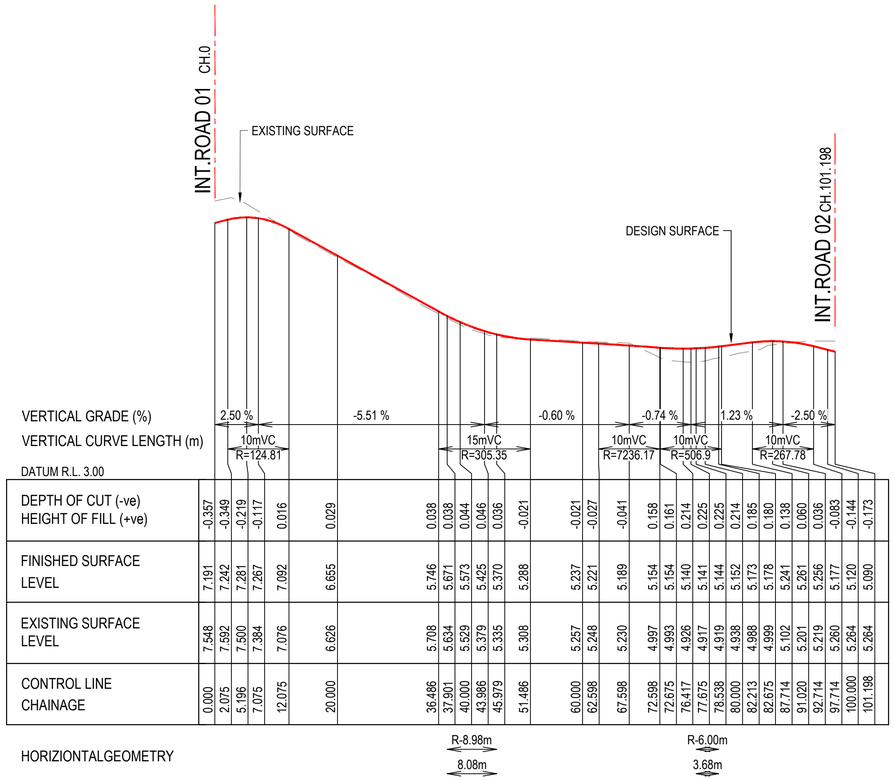
PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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SCALE AT FULL SIZE (A1) :

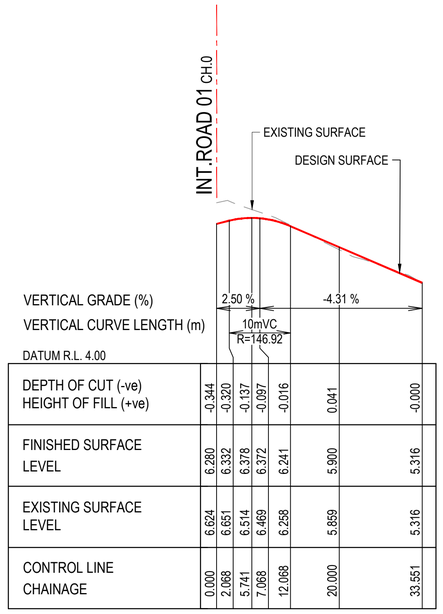
DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE20023
DRAWING No. : C3200
VERSION: A



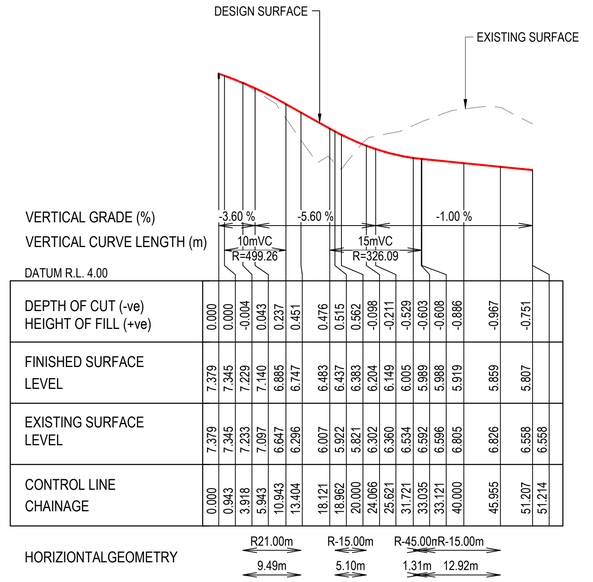

## ROAD 03 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

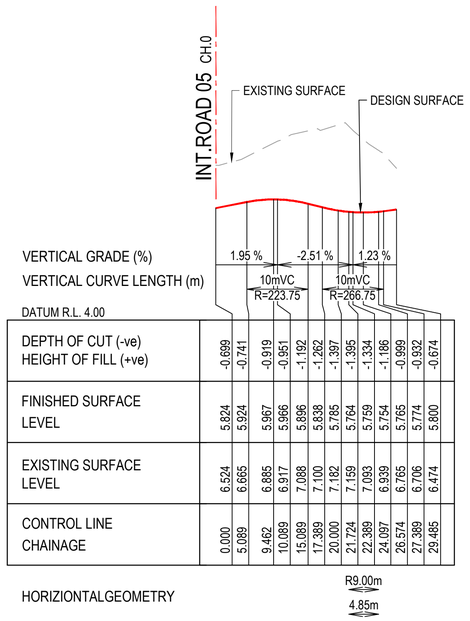
PRELIMINARY
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SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : | DATE : 11-03-26
PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

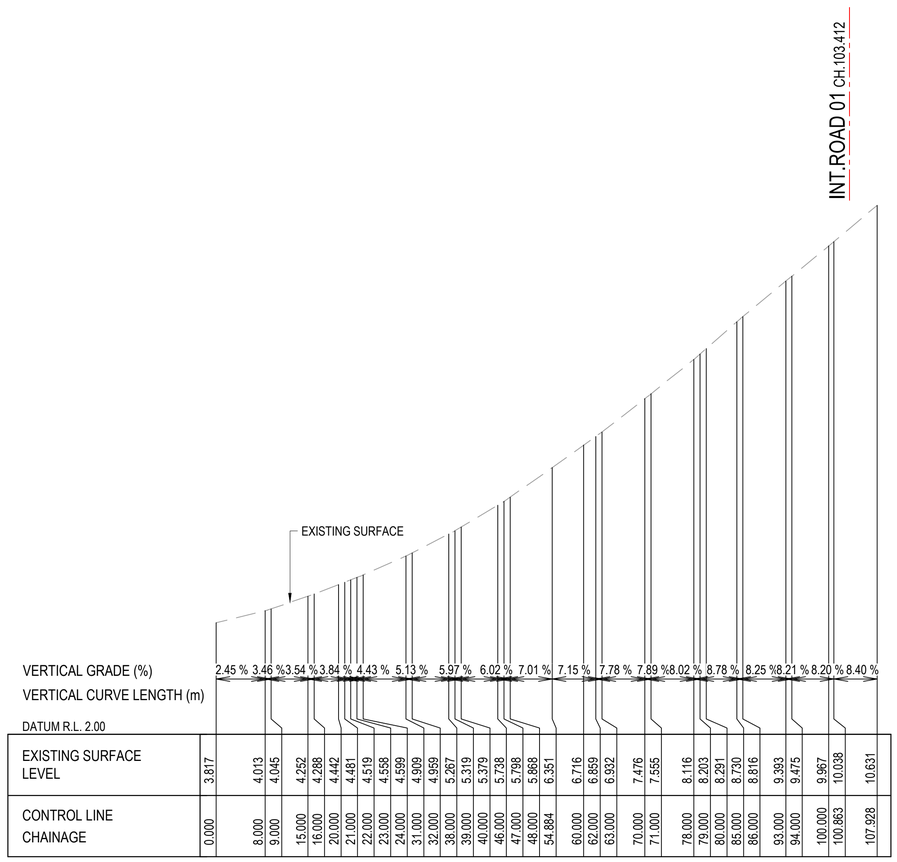
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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3201 | A |




## ROAD 06 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)


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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

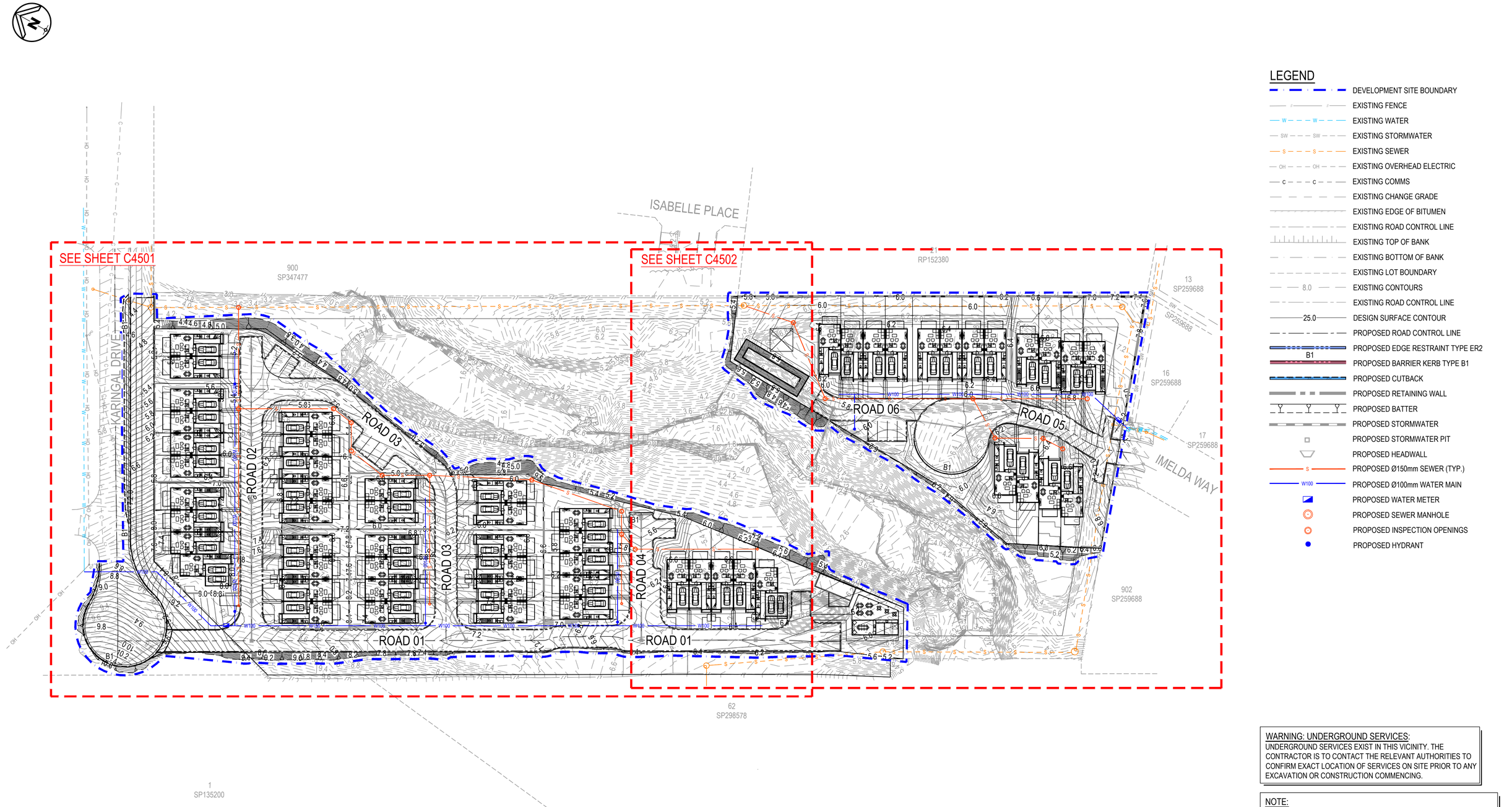
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : — DATE : 11-03-26
PROJECT LEADER : - — DESIGNER : BNB
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BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3202 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED HEADWALL
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
- PROPOSED WATER METER
- PROPOSED SEWER MANHOLE
- PROPOSED INSPECTION OPENINGS
- PROPOSED HYDRANT

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL SEWER AND WATER RETICULATION

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

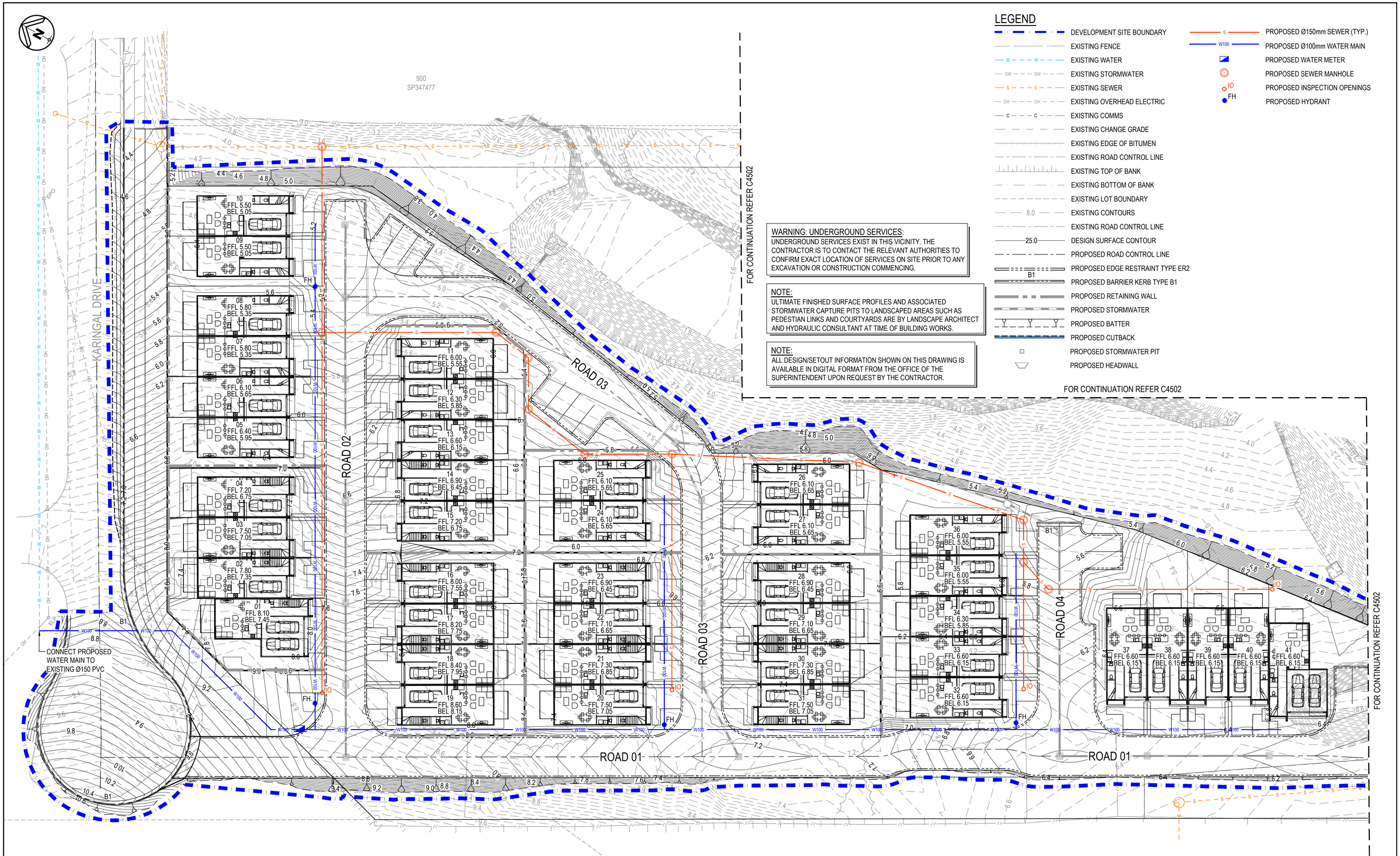
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SCALE (metres)
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1 : 500 (FULL SIZE)

| | |
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ABN 76 166 942 365


CLIENT :

BOS

DRAWING TITLE :

SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 1 OF 2

PROJECT :

2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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SCALE AT FULL SIZE (A1) :

SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
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## LEGEND

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- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
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- PROPOSED BARRIER KERB TYPE B1
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CLIENT : BOS

DRAWING TITLE :
SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

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# QMS RISK & OPPORTUNITIES REGISTER
# SAFETY IN DESIGN – NORMAL DESIGN RISKS - CIVIL

| Design Element | Associated risks & opportunities | Raw risk assessment | | Raw risk rating | Treatment Measures to avoid, minimize or treat the risk. | Responsibility | Residual risk rating |
|---|---|---|---|---|---|---|---|
| | | Likelihood | Consequence | | | | |
| **CONSTRUCTION PHASE** | | | | | | | |
| **SITE ACCESS** | Unsafe site access and egress point, restricted access, flooding, unauthorised access from persons or animals | L | M | L-M | Prepare site specific Construction Traffic Management Plan and Workplace Health and Safety Management Plan | Principal Contractor | L |
| **CLEARING & DEMOLITION** | Removal of existing structures, decommision of services, vegetation clearing and fauna management | M | H | M-H | Contractor to obtain Demolition Permit, arrange all service disconnections with asset ownerand carry out vegetation works in accordance with Vegetation and Fauna Management Plan | Principal Contractor | L |
| **EXISTING SERVICES** | Distrub or damage existing services and infrastructure, overhead powerlines, work adjacent to existing services, existing service relocations | M | H | M-H | Client to commission detailed site survey and service potholing at critical locations. Contractor to undertake Dial Before You Dig and service verification with service authoritiy providers and undertake additional potholing prior to construction | Client and Principal Contractor | L-M |
| **EXCAVATION & TRENCHING** | Unstable existing slopes and landslip, steep cut profiles, deep trench excavations, working at heights, intercept water table, dispersive soils, acid sulphate soils | M | H | M-H | Client to commission a geotechnical investigation and contractors to undertake own investigations. Temporary and final earthworks profiles confirmed by client's geotechnical consultant. Tempory earthworks profile to be confirmed by Contractor's geotechnical consultant. Contractor to provide temporary benching, fencing, stabilisation and shoring. | Client and Principal Contractor | L |
| **MATERIALS HANDLING** | Manual handling, handling and disposal of sharps, repeative work processeds, hazardous substances | H | M | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including Material Safety Data Sheets | Principal Contractor | L |
| **PLANT & EQUIPMENT** | Operation of plant and machinery, site access by visitors, material deliveries and waste removal | M | H | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including register of operator machinery tickets. Contractor to maintain a site visitor register and provide site specific induction to all visitors | Principal Contractor | L |
| **OPERATIONAL PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | General road safety, flood free access, pedestrian and cyclist injuries, inadequate signage | L | H | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **STORWATER / FLOODING** | Hazard from storm and flood water depths and velocities, ponding and access to inlets, outlets and basins | M | H | M-H | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WATER & SEWER** | Blockages, contamination, interuption to service, access to fittings, confined space access | L | M | L-M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WALLS & FENCING** | Risk of falls, unauthoried access from persons and animals, structural failure | M | M | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **MAINTENANCE PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **REFURBISHMENT PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **DEMOLITION PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |


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CLIENT : BOS

DRAWING TITLE : HAZARD RISK REGISTER - DESIGN RISKS

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
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# Appendix B – Desktop Review Search Results

Queensland Government

**Department of the Environment, Tourism, Science and Innovation**

Environmental Reports

# Matters of State Environmental Significance

For the selected area of interest

Lot: 19 Plan: RP152380

# Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and a field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@detsi.qld.gov.au

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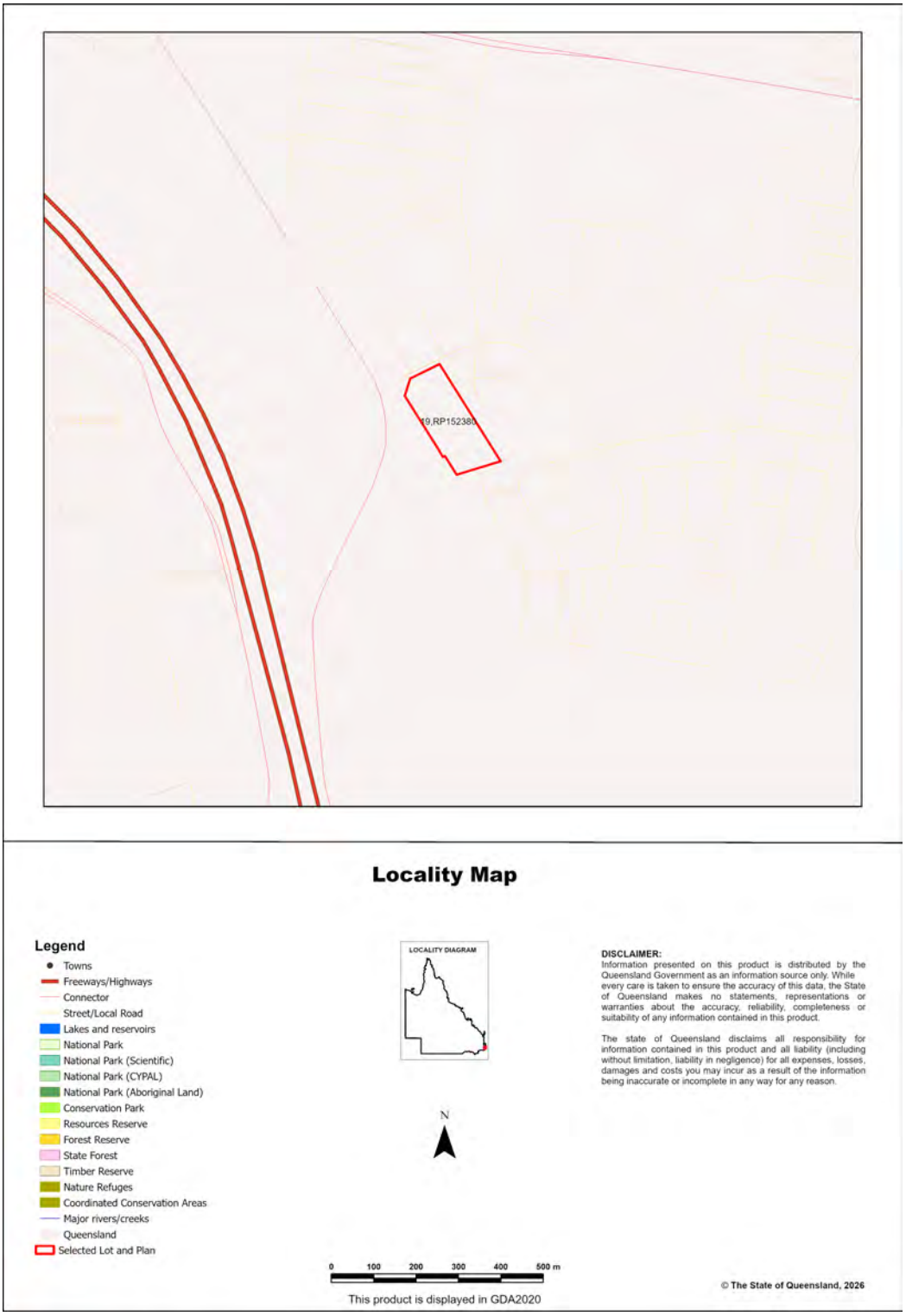

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# Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

**Table 1: Summary table, details for AOI: Lot: 19 Plan: RP152380, with area 2.46 ha**

| Local Government(s) | Catchment(s) | Bioregion(s) | Subregion(s) |
|---|---|---|---|
| Gold Coast City | South Coast | Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| | | Southeast Queensland | Burringbar - Conondale Ranges |



# Matters of State Environmental Significance (MSES)

## MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992;*

*- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the Marine Parks Act 2004 ;*

*- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;*

- *Threatened wildlife under the Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

  - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
  - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
  - Category R areas on the regulated vegetation management map;
  - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
  - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

## MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

**Table 2: Summary of MSES present within the AOI**

| | | |
|---|---|---|
| 1a Protected Areas- estates | 0 ha | 0.0% |
| 1b Protected Areas- nature refuges | 0 ha | 0.0% |
| 1c Protected Areas- special wildlife reserves | 0 ha | 0.0% |
| 2 State Marine Parks- highly protected zones | 0 ha | 0.0% |
| 3 Fish habitat areas (A and B areas) | 0 ha | 0.0% |
| 4 Strategic Environmental Areas (SEA) | 0 ha | 0.0% |
| 5 High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values | 0 ha | 0.0% |
| 6a High Ecological Value (HEV) wetlands | 0 ha | |
| 6b High Ecological Value (HEV) waterways | 0 km | Not applicable |
| 7a Threatened (endangered or vulnerable) wildlife | 0 ha | 0.0% |
| 7b Special least concern animals | 0 ha | 0.0% |
| 7c i Koala habitat area - core (SEQ) | 0.36 ha | 14.6% |
| 7c ii Koala habitat area - locally refined (SEQ) | 0 ha | 0.0% |
| 7d Sea turtle nesting areas | 0 km | Not applicable |
| 8a Regulated Vegetation - Endangered/Of concern in Category B (remnant) | 0.06 ha | 2.4% |
| 8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth) | 0 ha | 0.0% |
| 8c Regulated Vegetation - Category R (GBR riverine regrowth) | 0 ha | 0.0% |
| 8d Regulated Vegetation - Essential habitat | 0.01 ha | 0.4% |
| 8e Regulated Vegetation - intersecting a watercourse | 0.5 km | Not applicable |
| 8f Regulated Vegetation - within 100m of a Vegetation Management Wetland | 0 ha | 0.0% |
| 9a Legally secured offset areas- offset register areas | 0 ha | 0.0% |
| 9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation | 0 ha | 0.0% |

## Additional Information with Respect to MSES Values Present

## MSES - State Conservation Areas

**1a. Protected Areas - estates**

(No results)

**1b. Protected Areas - nature refuges**

(No results)

**1c. Protected Areas - special wildlife reserves**

(No results)

**2. State Marine Parks - highly protected zones**

(No results)

**3. Fish habitat areas (A and B areas)**

(No results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

## MSES - Wetlands and Waterways

**4. Strategic Environmental Areas (SEA)**

(No results)

**5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values**

(no results)

**6a. Wetlands in High Ecological Value (HEV) waters**

(no results)

**6b. Waterways in High Ecological Value (HEV) waters**

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

## MSES - Species

**7a. Threatened (endangered or vulnerable) wildlife**

Not applicable

**7b. Special least concern animals**

Not applicable

**7c i. Koala habitat area - core (SEQ)**

Values are present

**7c ii. Koala habitat area - locally refined (SEQ)**

Not applicable

**7d. Wildlife habitat (sea turtle nesting areas)**

Not applicable

**Threatened (endangered or vulnerable) wildlife habitat suitability models**

| Species | Common name | NCA status | Presence |
|---|---|---|---|
| *Boronia keysii* | Keys boronia | V | None |
| *Calyptorhynchus lathami* | Glossy black cockatoo | V | None |
| *Casuarius casuarius johnsonii* | Sthn population cassowary | E | None |
| *Crinia tinnula* | Wallum froglet | V | None |
| *Denisonia maculata* | Ornamental snake | V | None |
| *Euastacus bindal* | Mount Elliot crayfish | CR | None |
| *Euastacus binzayedi* | | CR | None |
| *Euastacus eungella* | | E | None |
| *Euastacus hystricosus* | | E | None |
| *Euastacus jagara* | Jagara hairy crayfish | CR | None |
| *Euastacus maidae* | | CR | None |
| *Euastacus monteithorum* | | E | None |
| *Euastacus robertsi* | | E | None |
| *Taudactylus pleione* | Kroombit tinkerfrog | E | None |
| *Litoria freycineti* | Wallum rocketfrog | V | None |
| *Litoria olongburensis* | Wallum sedgefrog | V | None |
| *Macadamia integrifolia* | | V | None |
| *Melaleuca irbyana* | swamp tea-tree | E | None |
| *Macadamia ternifolia* | | V | None |
| *Macadamia tetraphylla* | bopple nut | V | None |
| *Petrogale penicillata* | brush-tailed rock-wallaby | V | None |
| *Petrogale coenensis* | Cape York rock-wallaby | E | None |
| *Petrogale purpureicollis* | purple-necked rock-wallaby | V | None |
| *Petrogale sharmani* | Sharmans rock-wallaby | V | None |
| *Petrogale xanthopus celeris* | yellow-footed rock-wallaby (Qld subspecies) | V | None |
| *Petaurus gracilis* | Mahogany Glider | E | None |
| *Petrogale persephone* | Proserpine rock-wallaby | E | None |
| *Phascolarctos cinereus* | Koala - outside SEQ* | E | None |
| *Pezoporus wallicus wallicus* | Eastern ground parrot | V | None |
| *Xeromys myoides* | Water Mouse | V | None |

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

**Threatened (endangered or vulnerable) wildlife species records**

(No results)

**Special least concern animal species records**

(No results)

**Shorebird habitat (critically endangered/endangered/vulnerable)**

Not applicable

**Shorebird habitat (special least concern)**

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

*Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)*

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

## MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

**8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)**

| Regional ecosystem | Vegetation management polygon | Vegetation management status |
|---|---|---|
| 12.3.11 | O-dom | rem_oc |

**8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)**

Not applicable

**8c. Regulated Vegetation - Category R (GBR riverine regrowth)**

Not applicable

**8d. Regulated Vegetation - Essential habitat**

Values are present

**8e. Regulated Vegetation - intersecting a watercourse****

A vegetation management watercourse is mapped as present

**8f. Regulated Vegetation - within 100m of a Vegetation Management wetland**

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

## MSES - Offsets

**9a. Legally secured offset areas - offset register areas**

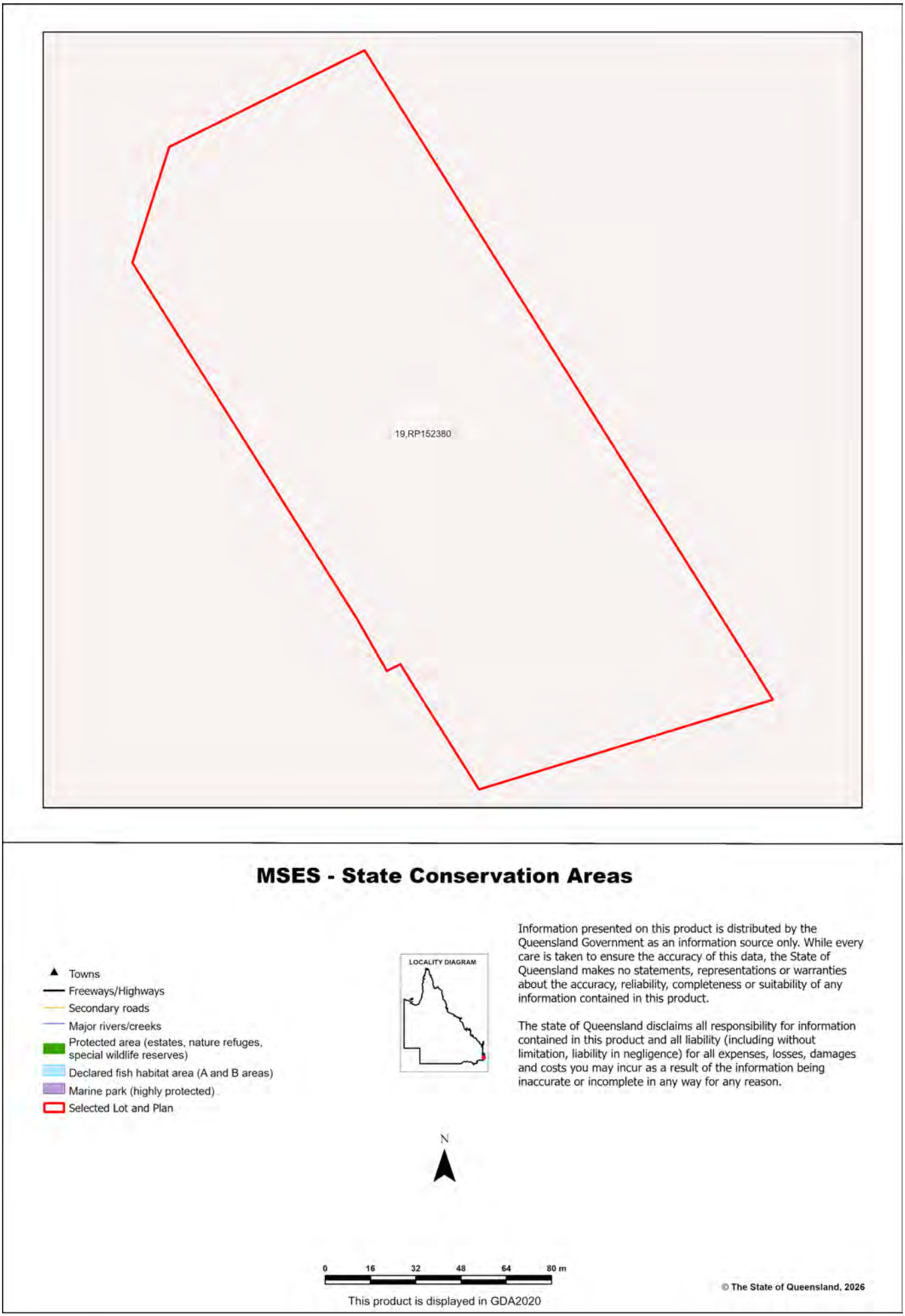
(No results)

**9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation**

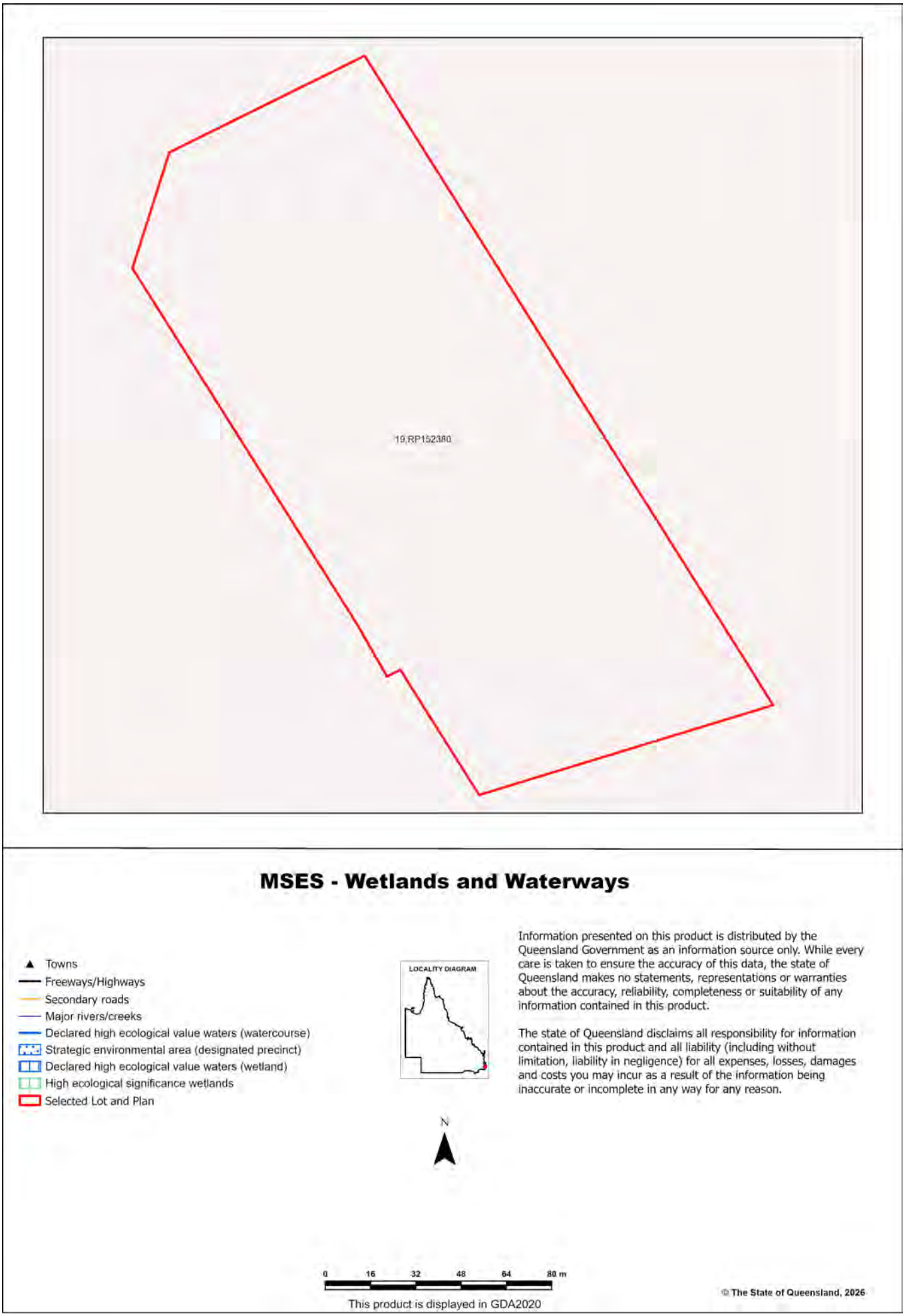
(No results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

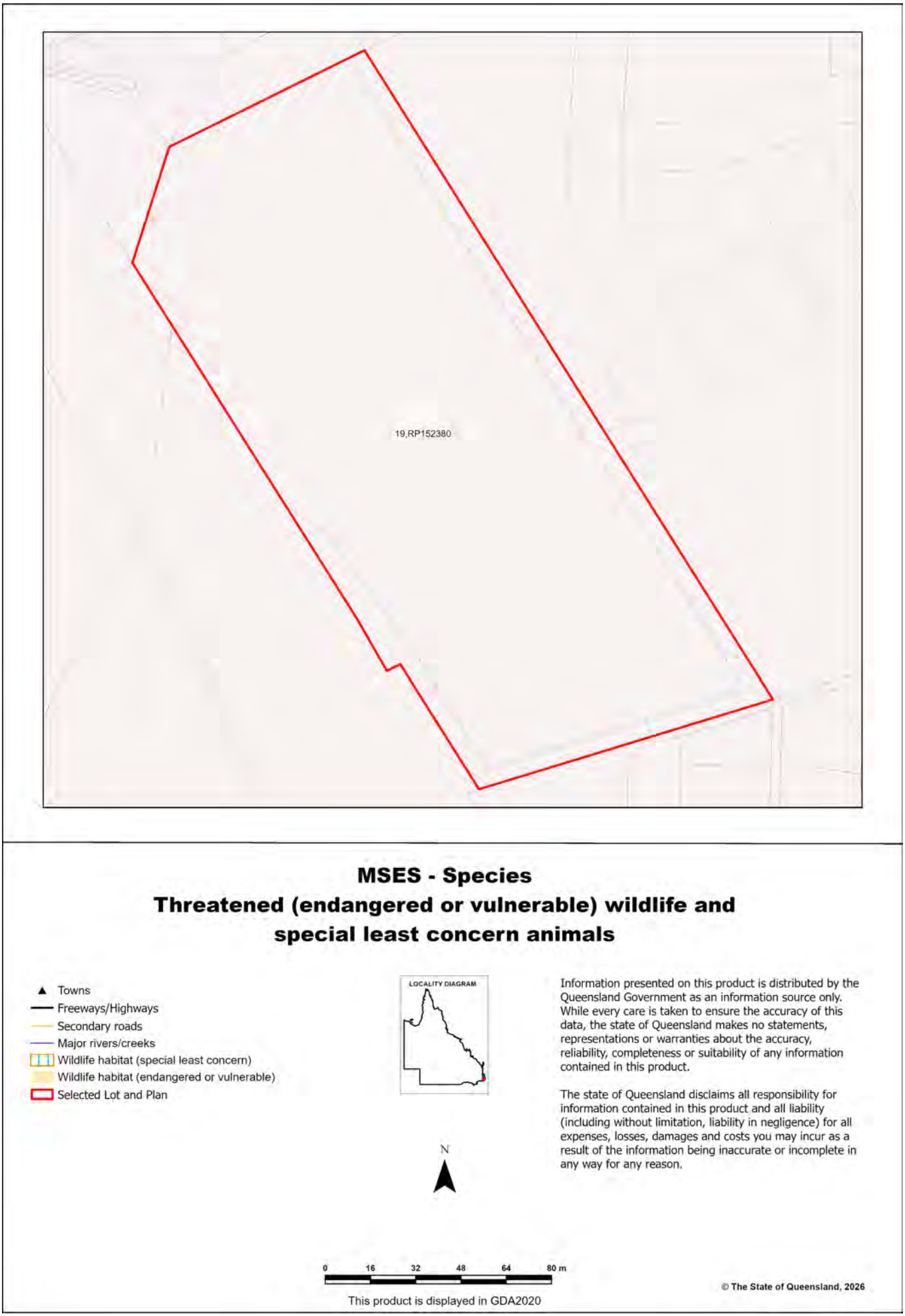
### Map 1 - MSES - State Conservation Areas



**Map 2 - MSES - Wetlands and Waterways**



**Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals**



## Map 3b - MSES - Species - Koala habitat area (SEQ)




### MSES - Species
### Koala habitat area (SEQ)

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)
- Selected Lot and Plan

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 14 28 42 56 70 m

This product is displayed in GDA2020

### Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)




## MSES - Wildlife habitat (sea turtle nesting areas)

Towns
Freeways/Highways
Secondary roads
Major rivers/creeks
Wildlife habitat (sea turtle nesting areas)
Selected Lot and Plan

LOCALITY DIAGRAM



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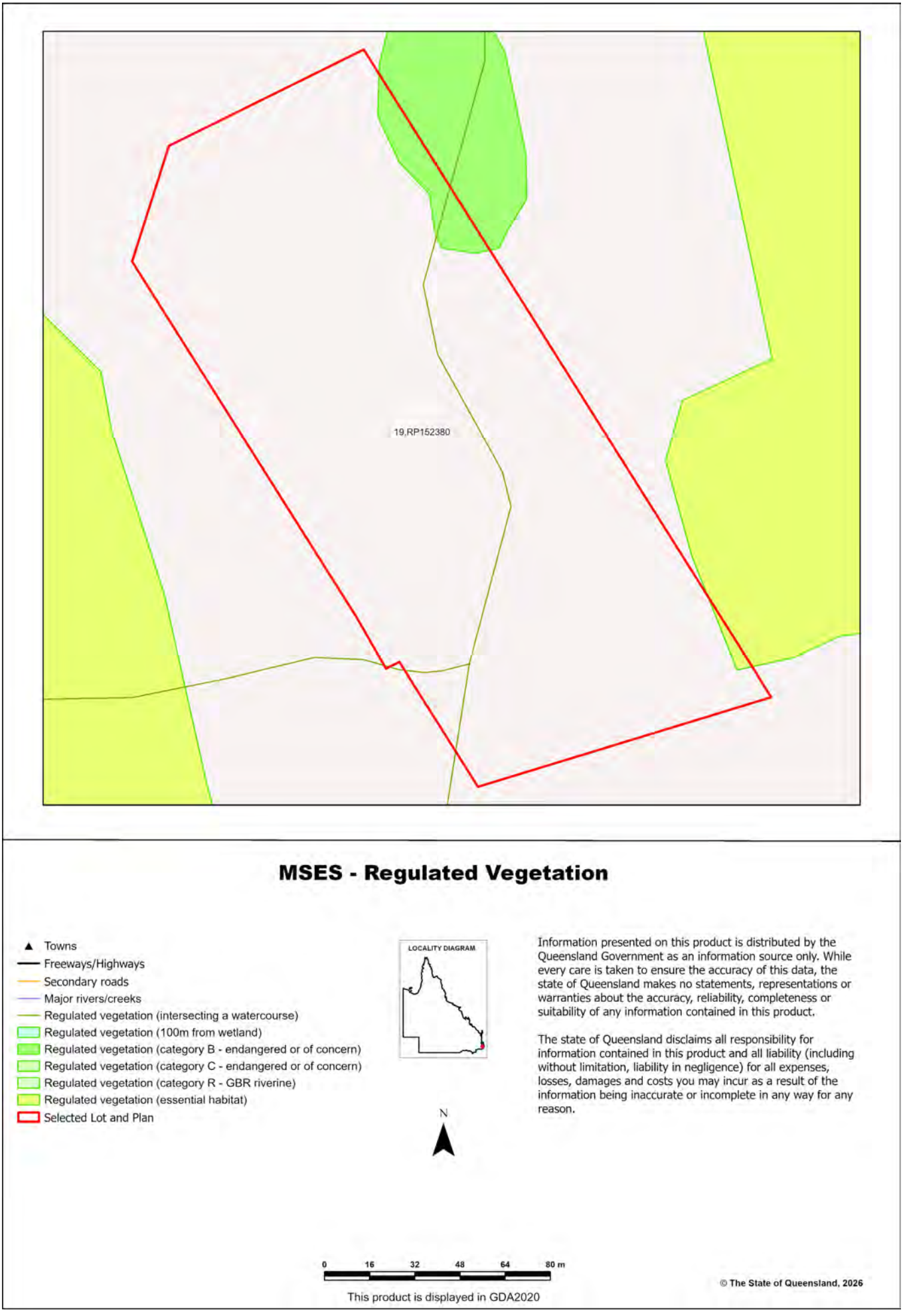
MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.

0 14 28 42 56 70 m

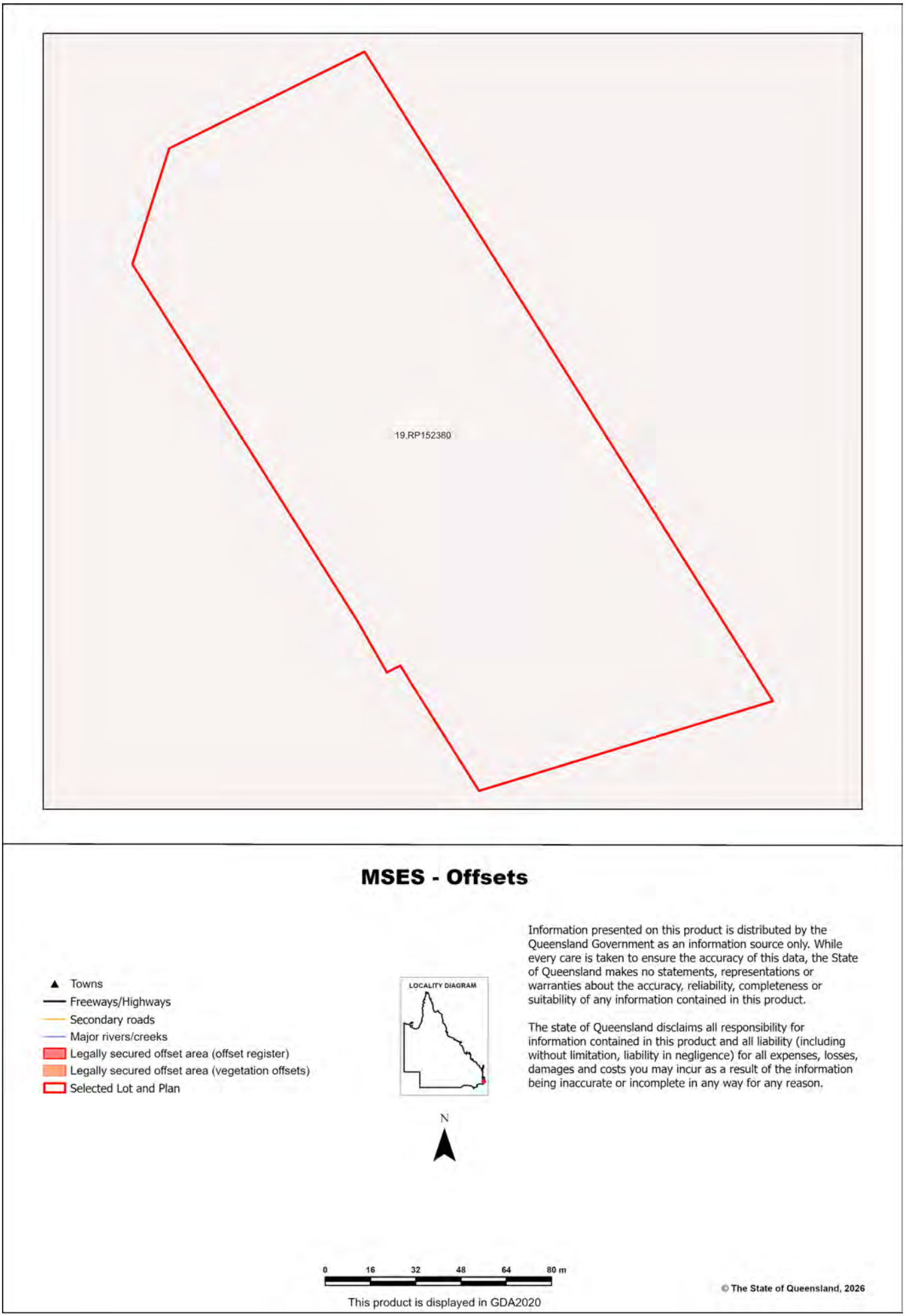
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This product is displayed in GDA2020

### Map 4 - MSES - Regulated Vegetation



### Map 5 - MSES - Offset Areas



# Appendices

### Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). Its primary purpose is to support implementation of the SPP biodiversity policy.

MSES mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

MSES mapping does not determine whether state or local development assessment is required. For state assessment triggers refer to the Development Assessment Mapping System (DAMS). For local assessment triggers, refer to the relevant local planning scheme.

The Queensland Government's "Method for mapping - matters of state environmental significance can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

**Appendix 2 - Source Data**

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

| **MSES layers** | **current QSpatial data (http://qspatial.information.qld.gov.au)** |
|---|---|
| Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves | - Protected areas of Queensland<br>- Nature Refuges - Queensland<br>- Special Wildlife Reserves- Queensland |
| Marine Park-Highly Protected Zones | Moreton Bay marine park zoning 2008 |
| Fish Habitat Areas | Queensland fish habitat areas |
| Strategic Environmental Areas-designated | Regional Planning Interests Act - Strategic Environmental Areas |
| HES wetlands | Map of Queensland Wetland Environmental Values |
| Wetlands in HEV waters | HEV waters:<br>- EPP Water intent for waters<br>Source Wetlands:<br>- Queensland Wetland Mapping (Current version 5)<br>Source Watercourses:<br>- Vegetation management watercourse and drainage feature map (1:100000 and 1:250000) |
| Wildlife habitat (threatened and special least concern) | -WildNet database species records<br>- habitat suitability models (various)<br>- SEQ koala habitat areas under the Koala Conservation Plan 2019 |
| VMA regulated regional ecosystems | Vegetation management regional ecosystem and remnant map |
| VMA Essential Habitat | Vegetation management - essential habitat map |
| VMA Wetlands | Vegetation management wetlands map |
| Legally secured offsets | Vegetation Management Act property maps of assessable vegetation.<br>For offset register data-contact DETSI |
| Regulated Vegetation Map | Vegetation management - regulated vegetation management map |

**Appendix 3 - Acronyms and Abbreviations**

| | |
|---|---|
| AOI | - Area of Interest |
| DETSI | - Department of the Environment, Tourism, Science and Innovation |
| EP Act | - Environmental Protection Act 1994 |
| EPP | - Environmental Protection Policy |
| GDA2020 | - Geocentric Datum of Australia 2020 |
| GEM | - General Environmental Matters |
| GIS | - Geographic Information System |
| MSES | - Matters of State Environmental Significance |
| NCA | - Nature Conservation Act 1992 |
| RE | - Regional Ecosystem |
| SPP | - State Planning Policy |
| VMA | - Vegetation Management Act 1999 |

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Feb-2026

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance (Ramsar | 1 |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 4 |
| Listed Threatened Species: | 64 |
| Listed Migratory Species: | 14 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Lands: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 25 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |
| Habitat Critical to the Survival of Marine Turtles: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have

| | |
|---|---|
| State and Territory Reserves: | None |
| Regional Forest Agreements: | None |
| Nationally Important Wetlands: | None |
| EPBC Act Referrals: | 30 |
| Key Ecological Features (Marine): | None |
| Biologically Important Areas: | None |
| Bioregional Assessments: | None |
| Geological and Bioregional Assessments: | None |

# Details

## Matters of National Environmental Significance

### Wetlands of International Importance (Ramsar Wetlands) [ Resource Information ]

| Ramsar Site Name | Proximity | Buffer Status |
|---|---|---|
| Moreton bay | Within 10km of Ramsar site | In feature area |

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

| Community Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community | Endangered | Community likely to occur within area | In feature area |
| Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland | Endangered | Community likely to occur within area | In feature area |
| Lowland Rainforest of Subtropical Australia | Critically Endangered | Community may occur within area | In feature area |
| Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions | Endangered | Community likely to occur within area | In feature area |

### Listed Threatened Species [ Resource Information ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| BIRD | | | |
| Anthochaera phrygia | | | |
| Regent Honeyeater [82338] | Critically Endangered | Foraging, feeding or related behaviour likely to occur within area | In feature area |
| Botaurus poiciloptilus | | | |
| Australasian Bittern [1001] | Endangered | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Calidris canutus<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Calyptorhynchus lathami lathami<br>South-eastern Glossy Black-Cockatoo [67036] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Charadrius leschenaultii<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Climacteris picumnus victoriae<br>Brown Treecreeper (south-eastern) [67062] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Cyclopsitta diophthalma coxeni<br>Coxen's Fig-Parrot [59714] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Endangered | Species or species habitat known to occur within area | In feature area |
| Falco hypoleucos<br>Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Gallinago hardwickii<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Geophaps scripta scripta<br>Squatter Pigeon (southern) [64440] | Vulnerable | Species or species habitat may occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Grantiella picta<br>Painted Honeyeater [470] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Hirundapus caudacutus<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Lathamus discolor<br>Swift Parrot [744] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |
| Limosa lapponica baueri<br>Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380] | Endangered | Species or species habitat known to occur within area | In buffer area only |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Stagonopleura guttata<br>Diamond Firetail [59398] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Sternula nereis nereis<br>Australian Fairy Tern [82950] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Turnix melanogaster<br>Black-breasted Button-quail [923] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| FROG | | | |
| Litoria olongburensis<br>Wallum Sedge Frog [1821] | Vulnerable | Species or species habitat may occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Mixophyes fleayi](#)<br>Fleay's Frog [25960] | Endangered | Species or species habitat likely to occur within area | In feature area |
| INSECT | | | |
| [Argynnis hyperbius inconstans](#)<br>Australian Fritillary [88056] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| MAMMAL | | | |
| [Chalinolobus dwyeri](#)<br>Large-eared Pied Bat, Large Pied Bat [183] | Endangered | Species or species habitat may occur within area | In feature area |
| [Dasyurus maculatus maculatus (SE mainland population)](#)<br>Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Petauroides volans](#)<br>Greater Glider (southern and central) [254] | Endangered | Species or species habitat known to occur within area | In feature area |
| [Petaurus australis australis](#)<br>Yellow-bellied Glider (south-eastern) [87600] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Petrogale penicillata](#)<br>Brush-tailed Rock-wallaby [225] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| [Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)<br>Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Endangered | Species or species habitat known to occur within area | In feature area |
| [Potorous tridactylus tridactylus](#)<br>Long-nosed Potoroo (northern) [66645] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Pteropus poliocephalus](#)<br>Grey-headed Flying-fox [186] | Vulnerable | Foraging, feeding or related behaviour known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Xeromys myoides](#)<br>Water Mouse, False Water Rat, Yirrkoo [66] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| PLANT | | | |
| [Acronychia littoralis](#)<br>Scented Acronychia [8582] | Endangered | Species or species habitat may occur within area | In feature area |
| [Arthraxon hispidus](#)<br>Hairy-joint Grass [9338] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Baloghia marmorata](#)<br>Marbled Balogia, Jointed Baloghia [8463] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Bosistoa transversa](#)<br>Three-leaved Bosistoa, Yellow Satinheart [16091] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Coleus habrophyllus listed as Plectranthus habrophyllus](#)<br>[91378] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Corchorus cunninghamii](#)<br>Native Jute [14659] | Endangered | Species or species habitat likely to occur within area | In feature area |
| [Cryptocarya foetida](#)<br>Stinking Cryptocarya, Stinking Laurel [11976] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Cryptostylis hunteriana](#)<br>Leafless Tongue-orchid [19533] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Cupaniopsis shirleyana](#)<br>Wedge-leaf Tuckeroo [3205] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Endiandra floydii](#)<br>Floyd's Walnut, Crystal Creek Walnut [52955] | Endangered | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Leichhardtia longiloba listed as Marsdenia longiloba | | | |
| Clear Milkvine [91911] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Macadamia integrifolia | | | |
| Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| Macadamia tetraphylla | | | |
| Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Notelaea lloydii | | | |
| Lloyd's Olive [15002] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Owenia cepiodora | | | |
| Onionwood, Bog Onion, Onion Cedar [11344] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Persicaria elatior | | | |
| Knotweed, Tall Knotweed [5831] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Phaius australis | | | |
| Lesser Swamp-orchid [5872] | Endangered | Species or species habitat may occur within area | In feature area |
| Planchonella eerwah | | | |
| Shiny-leaved Condoo, Black Plum, Wild Apple [17340] | Endangered | Species or species habitat likely to occur within area | In feature area |
| Randia moorei | | | |
| Spiny Gardenia [10577] | Endangered | Species or species habitat likely to occur within area | In buffer area only |
| Rhodamnia rubescens | | | |
| Scrub Turpentine, Brown Malletwood [15763] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |
| Rhodomyrtus psidioides | | | |
| Native Guava [19162] | Critically Endangered | Species or species habitat likely to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| Samadera bidwillii | | | |
| Quassia [29708] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Sophora fraseri | | | |
| [8836] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Syzygium hodgkinsoniae | | | |
| Smooth-bark Rose Apple, Red Lilly Pilly [3539] | Vulnerable | Species or species habitat may occur within area | In buffer area only |
| Thesium australe | | | |
| Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Vincetoxicum woollsii listed as Tylophora woollsii | | | |
| [40080] | Endangered | Species or species habitat may occur within area | In feature area |
| REPTILE | | | |
| Coeranoscincus reticulatus | | | |
| Three-toed Snake-tooth Skink [59628] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| Delma torquata | | | |
| Adorned Delma, Collared Delma [1656] | Vulnerable | Species or species habitat may occur within area | In feature area |
| Hemiaspis damelii | | | |
| Grey Snake [1179] | Endangered | Species or species habitat may occur within area | In feature area |

| Listed Migratory Species | | | [ Resource Information ] |
|---|---|---|---|
| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| Migratory Marine Birds | | | |
| Apus pacificus | | | |
| Fork-tailed Swift [678] | | Species or species habitat likely to occur within area | In feature area |
| Migratory Terrestrial Species | | | |
| Cuculus optatus | | | |
| Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area | In feature area |
| **Migratory Wetlands Species** | | | |
| [Actitis hypoleucos](#)<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |
| [Calidris acuminata](#)<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris canutus](#)<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris ferruginea](#)<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| [Calidris melanotos](#)<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area | In feature area |
| [Charadrius leschenaultii](#)<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Gallinago hardwickii](#)<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Limosa lapponica](#)<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area | In buffer area only |
| [Numenius madagascariensis](#)<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| [Pandion haliaetus](#)<br>Osprey [952] | | Species or species habitat known to occur within area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Tringa nebularia](#)<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area | In feature area |

## Other Matters Protected by the EPBC Act

| Listed Marine Species | | | [ Resource Information ] |
|---|---|---|---|
| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| Bird | | | |
| [Actitis hypoleucos](#)<br>Common Sandpiper [59309] | | Species or species habitat may occur within area | In feature area |
| [Anseranas semipalmata](#)<br>Magpie Goose [978] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Apus pacificus](#)<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Bubulcus ibis as Ardea ibis](#)<br>Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Calidris acuminata](#)<br>Sharp-tailed Sandpiper [874] | Vulnerable | Species or species habitat may occur within area | In feature area |
| [Calidris canutus](#)<br>Red Knot, Knot [855] | Vulnerable | Species or species habitat may occur within area overfly marine area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
|---|---|---|---|
| [Calidris ferruginea](#)<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area overfly marine area | In feature area |
| [Calidris melanotos](#)<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Charadrius leschenaultii](#)<br>Greater Sand Plover, Large Sand Plover [877] | Vulnerable | Species or species habitat likely to occur within area | In feature area |
| [Gallinago hardwickii](#)<br>Latham's Snipe, Japanese Snipe [863] | Vulnerable | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Haliaeetus leucogaster](#)<br>White-bellied Sea-Eagle [943] | | Species or species habitat known to occur within area | In feature area |
| [Hirundapus caudacutus](#)<br>White-throated Needletail [682] | Vulnerable | Species or species habitat known to occur within area overfly marine area | In feature area |
| [Lathamus discolor](#)<br>Swift Parrot [744] | Critically Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |
| [Limosa lapponica](#)<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area | In buffer area only |
| [Merops ornatus](#)<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area overfly marine area | In feature area |
| [Monarcha melanopsis](#)<br>Black-faced Monarch [609] | | Species or species habitat known to occur within area overfly marine area | In feature area |

| Scientific Name | Threatened Category | Presence Text | Buffer Status |
| --- | --- | --- | --- |
| Myiagra cyanoleuca<br>Satin Flycatcher [612] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area | In feature area |
| Pandion haliaetus<br>Osprey [952] | | Species or species habitat known to occur within area | In feature area |
| Pterodroma cervicalis<br>White-necked Petrel [59642] | | Species or species habitat may occur within area | In feature area |
| Rhipidura rufifrons<br>Rufous Fantail [592] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Rostratula australis as Rostratula benghalensis (sensu lato)<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |
| Sterna striata<br>White-fronted Tern [799] | | Migration route may occur within area | In feature area |
| Symposiachrus trivirgatus as Monarcha trivirgatus<br>Spectacled Monarch [83946] | | Species or species habitat known to occur within area overfly marine area | In feature area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | Endangered | Species or species habitat likely to occur within area overfly marine area | In feature area |

## Extra Information

| EPBC Act Referrals | | | | [ Resource Information ] |
|---|---|---|---|---|
| Title of referral | Reference | Referral Outcome | Assessment Status | Buffer Status |
| | | | | |
| Coomera Woods Master Planned Development, 49 & 51 George Alexander Way, Coomera, Qld | 2017/8134 | | Assessment | In feature area |
| Kerkins Levee Rehabilitation Project, Phases 2-8 | 2004/1435 | | Completed | In feature area |
| Low impact industrial development and associated infrastructure, Old Pacific Highway, Coomera | 2013/6819 | | Completed | In feature area |
| Controlled action | | | | |
| Clearing of vegetation for the Gainsborough Greens residential subdivision | 2013/6751 | Controlled Action | Post-Approval | In feature area |
| Coomera Woods master planned residential development, Qld | 2015/7610 | Controlled Action | Completed | In feature area |
| Jacobs Well Airport | 2004/1361 | Controlled Action | Completed | In feature area |
| Jacobs Well Airport Project | 2003/947 | Controlled Action | Completed | In feature area |
| Nambucca Crescent residential subdivision Pimpama, QLD | 2014/7190 | Controlled Action | Post-Approval | In feature area |
| Not controlled action | | | | |
| Clearing of vegetaion for a residential subdivision on Karingal Drive, Pimpama, QLD | 2013/6716 | Not Controlled Action | Completed | In feature area |
| Coomera Hospital and Health Precinct | 2021/8946 | Not Controlled Action | Completed | In buffer area only |
| Coomera Town Centre shopping centre development, Coomera Qld | 2014/7292 | Not Controlled Action | Completed | In buffer area only |
| Coomera Woods Protection Zone, 49 George Alexander Way, Coomera Qld | 2018/8214 | Not Controlled Action | Completed | In feature area |
| Development of the Heritage Park Sporting Precinct, Rifle Range Road, Pimpama, Qld | 2016/7831 | Not Controlled Action | Completed | In buffer area only |
| Development of the Pimpama Junction Shopping Centre Precinct | 2013/6772 | Not Controlled Action | Completed | In buffer area only |

| Title of referral | Reference | Referral Outcome | Assessment Status | Buffer Status |
|---|---|---|---|---|
| Not controlled action | | | | |
| Develop Stage 1 & 2 (Lots 21, 23 & 24), Coomera Urban Village, Cnr Foxwell Rd & Finnegan Wy, Coomera | 2014/7124 | Not Controlled Action | Completed | In buffer area only |
| Dreamworld Town Centre Development | 2001/484 | Not Controlled Action | Completed | In buffer area only |
| GCCC Northern Wastewater Strategy and associated Reclaimed Water Scheme - Stage | 2001/282 | Not Controlled Action | Completed | In feature area |
| Heavy Rail Duplication Project, Coomera to Helensvale, Qld | 2014/7392 | Not Controlled Action | Completed | In buffer area only |
| Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia | 2015/7522 | Not Controlled Action | Completed | In feature area |
| Mixed use development, Lot 138, 62 Finnegan Way, Coomera, Qld | 2015/7488 | Not Controlled Action | Completed | In buffer area only |
| Pimpama School, Coomera, Qld | 2018/8252 | Not Controlled Action | Completed | In feature area |
| Prawn Aquaculture Expansion | 2001/322 | Not Controlled Action | Completed | In buffer area only |
| Residential development, Big Sky Estate (Stages 5-8), Coomera | 2015/7535 | Not Controlled Action | Completed | In buffer area only |
| Residential Development Stages 4 & 9-10 Big Sky Estate, Coomera, QLD | 2014/7192 | Not Controlled Action | Completed | In buffer area only |
| Residential subdivision, 152 Yawalpah Road, Pimpama, Qld | 2013/6914 | Not Controlled Action | Completed | In feature area |
| Residential subdivision, 54-64 Karingal Drive, Pimpama, Qld | 2013/6739 | Not Controlled Action | Completed | In feature area |
| Road Extension - Foxwell Road, Coomera | 2021/8990 | Not Controlled Action | Completed | In buffer area only |
| To develop high and medium density residential dwellings, commercial precincts and open space areas, | 2014/7291 | Not Controlled Action | Completed | In buffer area only |
| Vegetation clearing for the Gainsborough Park Residential Estate | 2012/6667 | Not Controlled Action | Completed | In buffer area only |
| Referral decision | | | | |
| Residential Development on Finnegan Way, Coomera, QLD | 2012/6685 | Referral Decision | Completed | In buffer area only |

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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**Department of the Environment, Tourism, Science and Innovation**

Environmental Reports

# Regional Ecosystems

## *Biodiversity Status*

For the selected area of interest
Lot: 19 Plan: RP152380

# Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

# Important Note to User

Information presented in this report is based upon the Queensland Herbarium & Biodiversity Science's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium & Biodiversity Science's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website https://www.nrmmrrd.qld.gov.au/

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

# Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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## Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

**Table 1: Details for area of interest:**
**Lot: 19 Plan: RP152380, with area 2.46 ha**

| Local Government(s) | Catchment(s) | Bioregion(s) | Subregion(s) |
|---|---|---|---|
| Gold Coast City | South Coast | Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| | | Southeast Queensland | Burringbar - Conondale Ranges |

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

**Table 2: Summary table, biodiversity status of regional ecosystems within the AOI**

| Biodiversity Status | Area (Ha) | % of AOI |
|---|---|---|
| Endangered | 0.00 | 0.00 |
| Of concern | 0.06 | 2.34 |
| No concern at present | less than 0.01 | 0.27 |
| Total remnant vegetation | 0.06 | 2.61 |

Refer to **Map 2** for further information.

# Regional Ecosystems

## 1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and may be distinguished by differences in structure or sub-dominant species in the ecologically dominant layer. Vegetation communities with different dominant species in the ecologically dominant layer may be amalgamated in to a regional ecosystem if they are not mappable and predictable in the landscape at 1:100 000 scale. Vegetation communities may be mappable at a scale larger than 1:100 000. Vegetation communities within a regional ecosystem are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2023) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium & Biodiversity Science's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website https://www.nrmmrrd.qld.gov.au/.

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 percent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 percent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (<1000 ha); or patch size (<100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

*****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.*

## 2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

**Table 3: Remnant regional ecosystems, description and status within the AOI**

| Regional Ecosystem | Short Description | BD Status | Area (Ha) | % of AOI |
|---|---|---|---|---|
| 12.11.24 | Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics | No concern at present | less than 0.01 | 0.27 |
| 12.3.11 | Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast | Of concern | 0.06 | 2.34 |
| non-remnant | None | None | 2.39 | 97.28 |

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

**Table 4** provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

**Table 4: Remnant regional ecosystems within the AOI, additional information**

| Regional Ecosystem | Remnant Extent | BVG (1 Million) | Wetland | Representation in protected estate |
|---|---|---|---|---|
| 12.11.24 | Pre-clearing 28000 ha; Remnant 2023 14000 ha | 9g | Not a Wetland | Medium |
| 12.3.11 | Pre-clearing 159000 ha; Remnant 2023 39000 ha | 16c | Contains Palustrine | Low |
| non-remnant | None | None | None | None |

*Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.*

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

**Table 5: Remnant regional ecosystems within the AOI, special values**

| Regional Ecosystem | Special Values |
|---|---|
| 12.11.24 | 12.11.24: Potential habitat for NCA listed species: Corchorus cunninghamii, Endiandra floydii and Eucalyptus curtisii. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). |
| 12.3.11 | 12.3.11: Potential habitat for NCA listed species: Acronychia littoralis, Alectryon ramiflorus, Arthraxon hispidus, Cupaniopsis shirleyana, Eulophia bicallosa, Gossia gonoclada, Macrozamia lomandroides, Macrozamia pauli-guilielmi, Marsdenia coronata, Maundia triglochinoides. This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).<br>12.3.11a: Habitat for threatened fauna species including the Black-breasted Button-quail Turnix melanogaster (Aridis, Melzer and Hamley, 1998). This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).<br>12.3.11b: This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus). |
| non-remnant | None |

## 3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at: https://publications.qld.gov.au/dataset/redd/resource/

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

**Table 6: Broad vegetation groups (1 million) within the AOI**

| BVG (1 Million) | Description | Area (Ha) | % of AOI |
|---|---|---|---|
| None | None | 2.39 | 97.28 |
| 16c | Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. | 0.06 | 2.34 |
| 9g | Moist to dry woodlands to open forest dominated by stringybarks or mahoganies such as Eucalyptus tindaliae (Queensland white stringybark), E. latisinensis (white mahogany), E. acmenoides (narrow-leaved white stringybark); or E. racemosa (scribbly gum) or E. seeana or E. tereticornis (blue gum) and Corymbia intermedia (pink bloodwood). | less than 0.01 | 0.27 |

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

## 4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See: http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

The descriptions are compiled using site survey data from the Queensland Herbarium & Biodiversity Science's QBEIS database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2023 (PDF)* section 3.3 of: https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community. http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

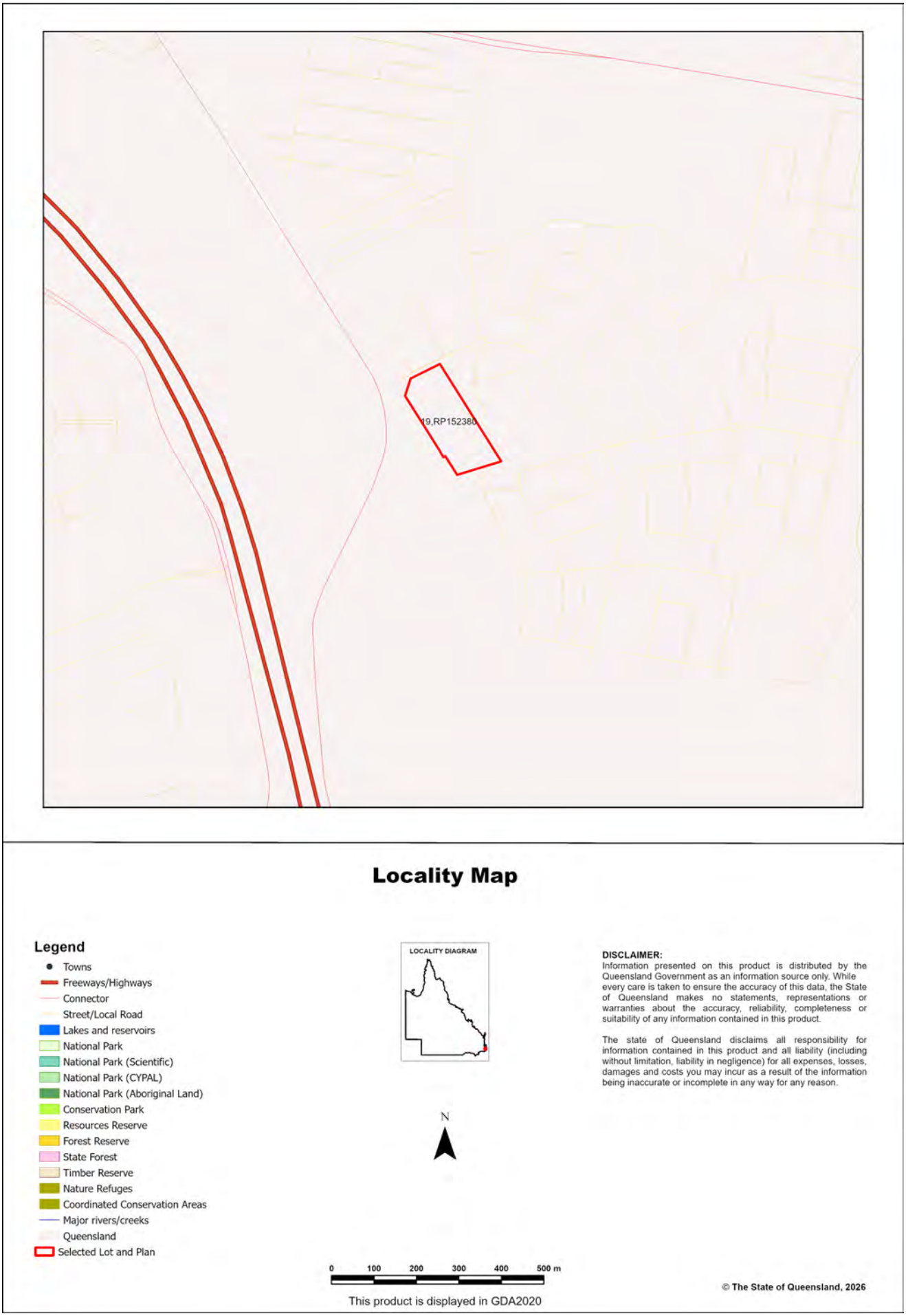
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

**Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available**

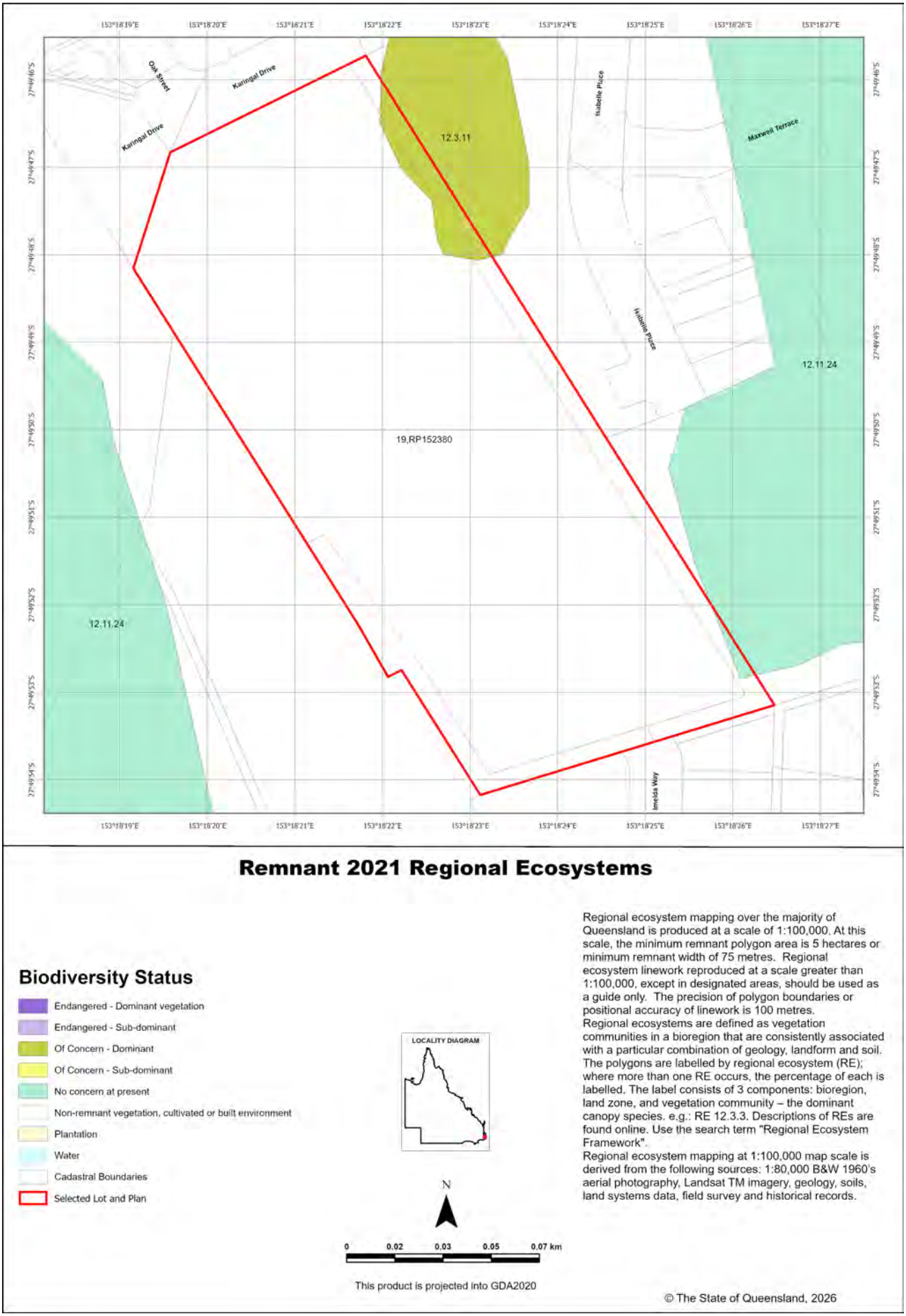
| Regional ecosystems mapped as within the AOI | Technical Descriptions | Biocondition Benchmarks |
|---|---|---|
| 12.11.24 | Not currently available | Available |
| 12.3.11 | Available | Available |
| non-remnant | Not currently available | Not currently available |

# Maps

## Map 1 - Location



## Map 2 - Remnant 2021 regional ecosystems




### Remnant 2021 Regional Ecosystems

**Biodiversity Status**

- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Non-remnant vegetation, cultivated or built environment
- Plantation
- Water
- Cadastral Boundaries
- Selected Lot and Plan

LOCALITY DIAGRAM

N

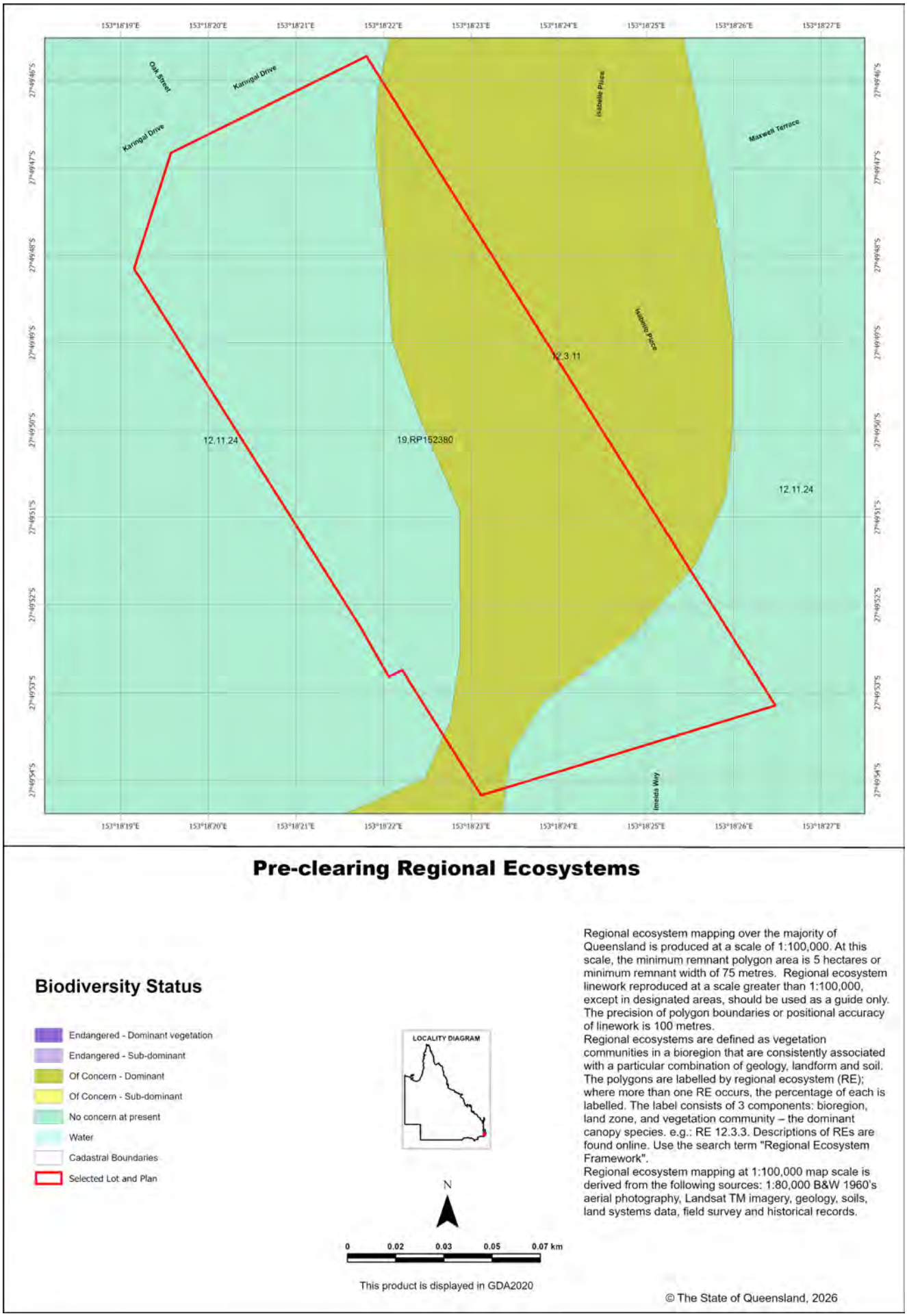
0 0.02 0.03 0.05 0.07 km

This product is projected into GDA2020

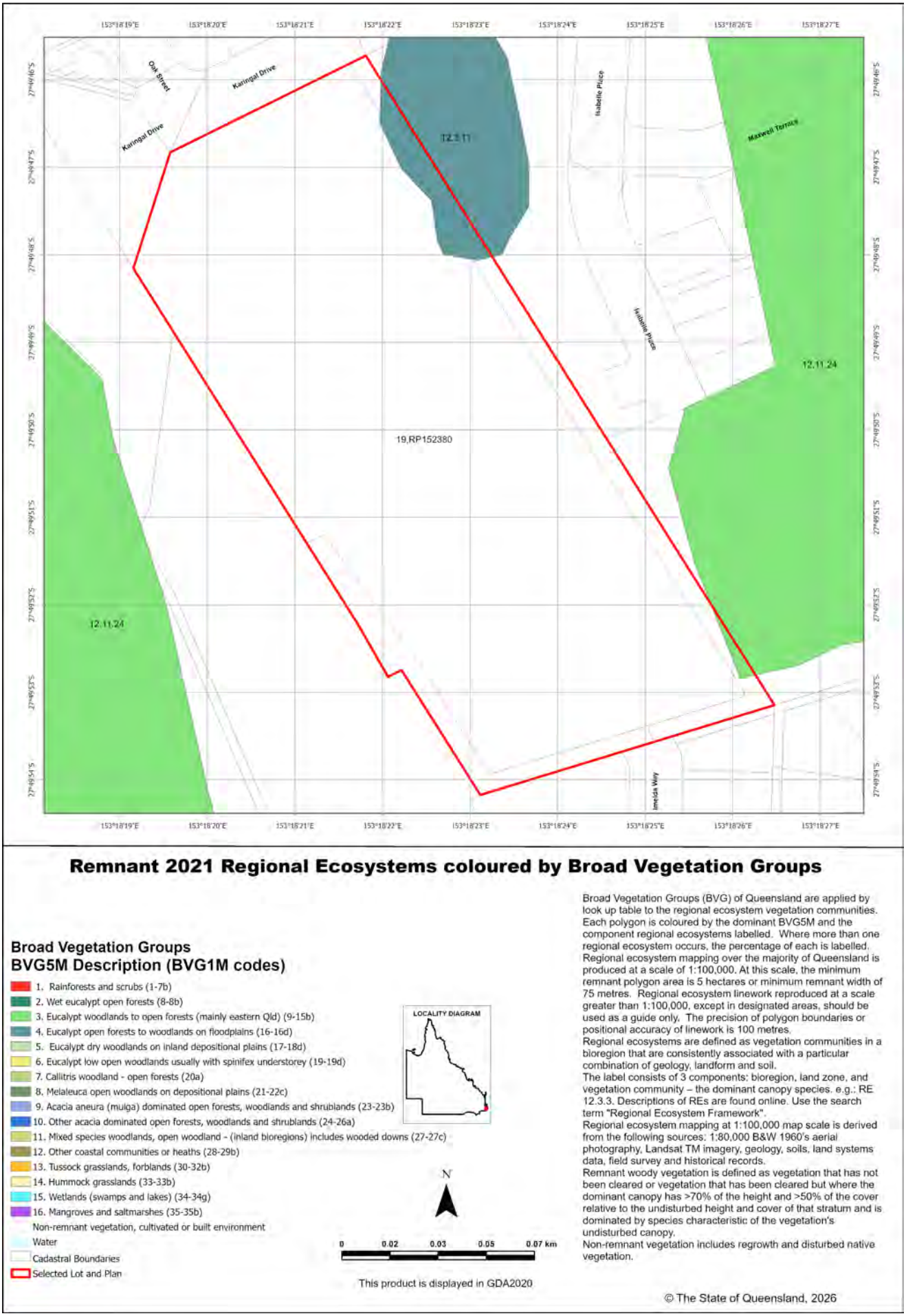
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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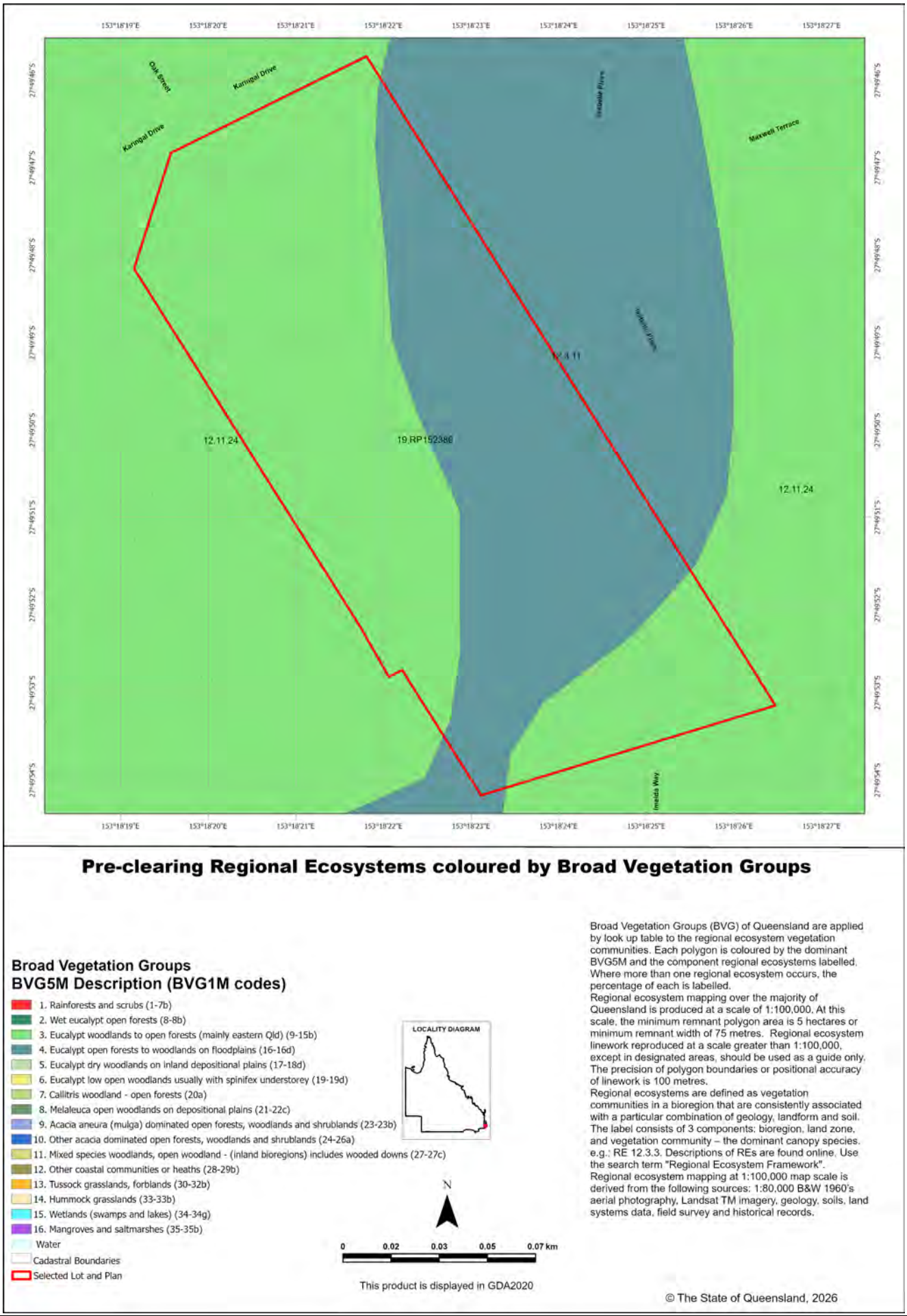
## Map 3 - Pre-clearing regional ecosystems



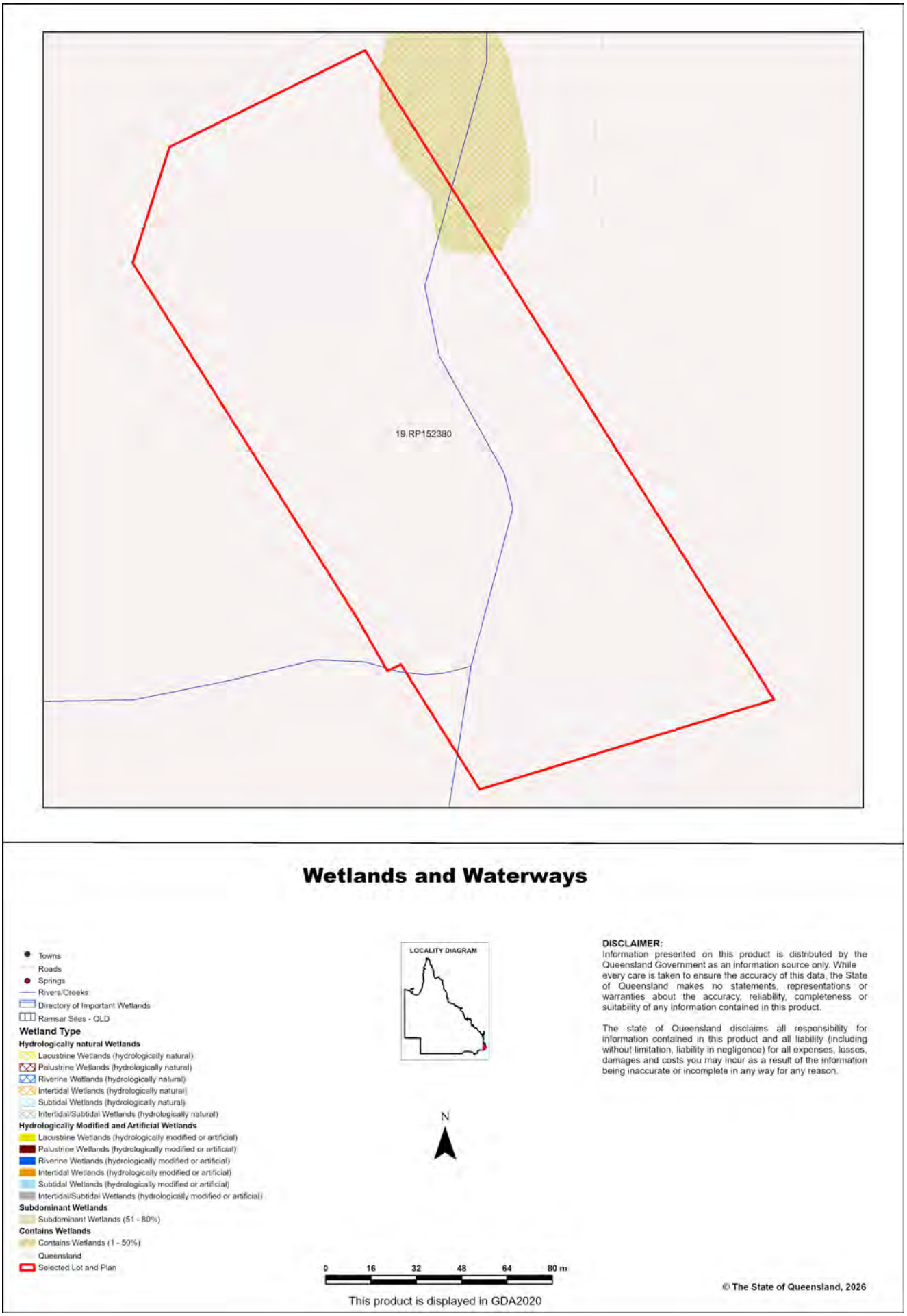
## Map 4 - Remnant 2021 regional ecosystems by BVG (5M)



## Map 5 - Pre-clearing regional ecosystems by BVG (5M)



## Map 6 - Wetlands and waterways



## Links and Other Information Sources

The Department of the Environment, Tourism, Science and Innovation's Website - http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/ provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from: https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/broad-vegetation

The methodology for mapping regional ecosystems can be downloaded from: https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf

Technical descriptions for regional ecosystems can be obtained from: http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

Benchmarks can be obtained from: http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Spatial Catalogue, Queensland Spatial Catalogue : Queensland Government (information.qld.gov.au)

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link: https://qldglobe.information.qld.gov.au/

## References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2023). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 6.0. Queensland Herbarium, Department of Environment and Science. (https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Richter,D., Addicott, E.P. and Appelman, C.N. (2023) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0. Updated December 2023. Queensland Herbarium, Queensland Department of Environment, Science and Innovation, Brisbane. (https://www.qld.gov.au/__data/assets/pdf_file/0033/459186/methodology-mapping-surveying-v7.pdf).

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems.* Environmental Protection Agency, Brisbane.

# Appendices

## Appendix 1 - Source Data

**The dataset listed below is available for download from:**
http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/

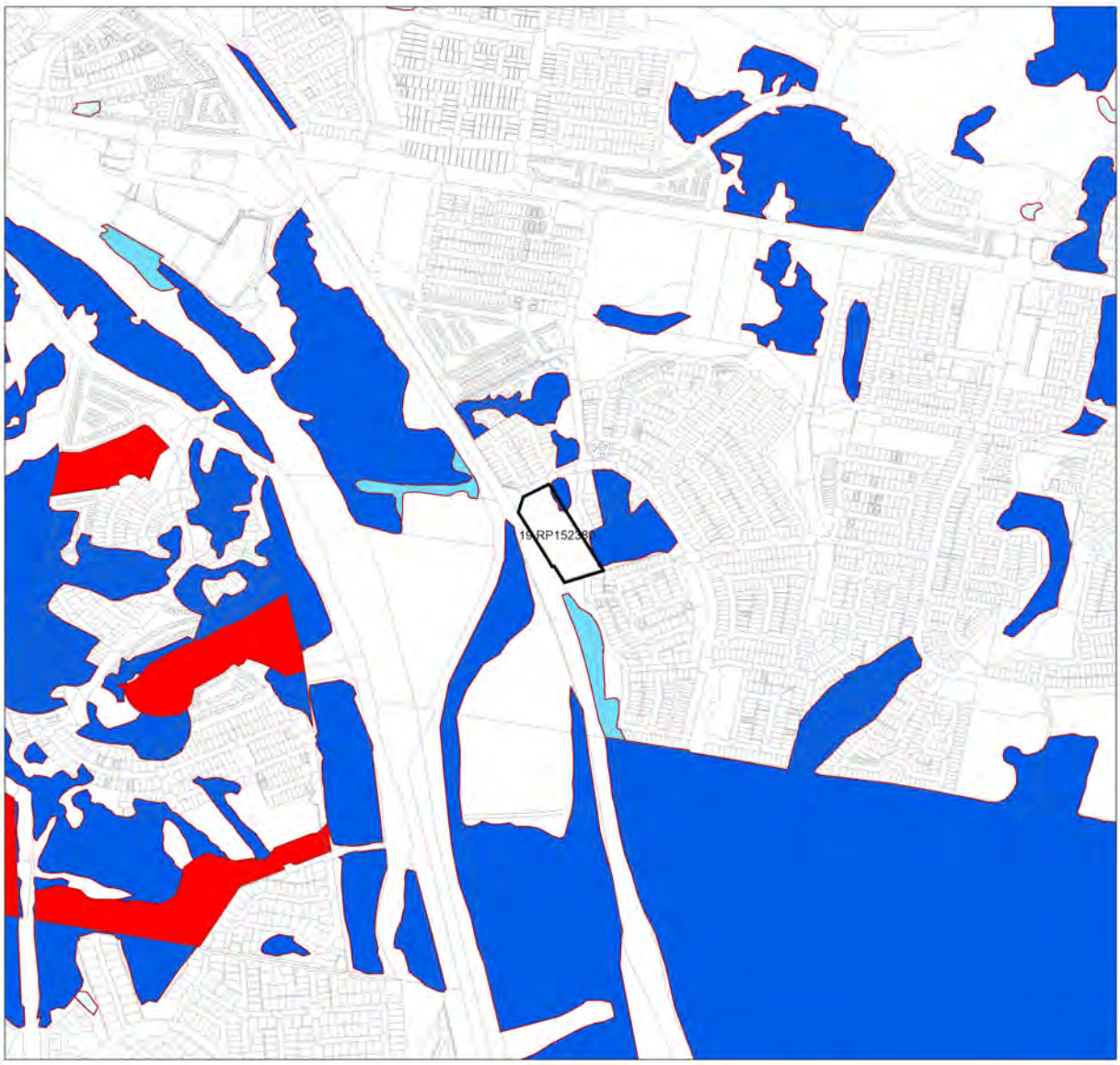
- Regional Ecosystem Description Database

**The datasets listed below are available for download from:**
Queensland Spatial Catalogue : Queensland Government (information.qld.gov.au)

- Biodiversity status of pre-clearing and 2021 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas
- Pre-clearing broad vegetation groups of Queensland
- Remnant 2021 broad vegetation groups of Queensland

## Appendix 2 - Acronyms and Abbreviations

AOI - Area of Interest
GIS - Geographic Information System
RE - Regional Ecosystem
REDD - Regional Ecosystem Description Database
VMA - *Vegetation Management Act 1999*




# Regulated Vegetation Management Map

Queensland Government

- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries
- Selected Lot and Plan

LOCALITY DIAGRAM



N

0 160 320 480 640 800 m

This product is displayed in: GDA2020

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

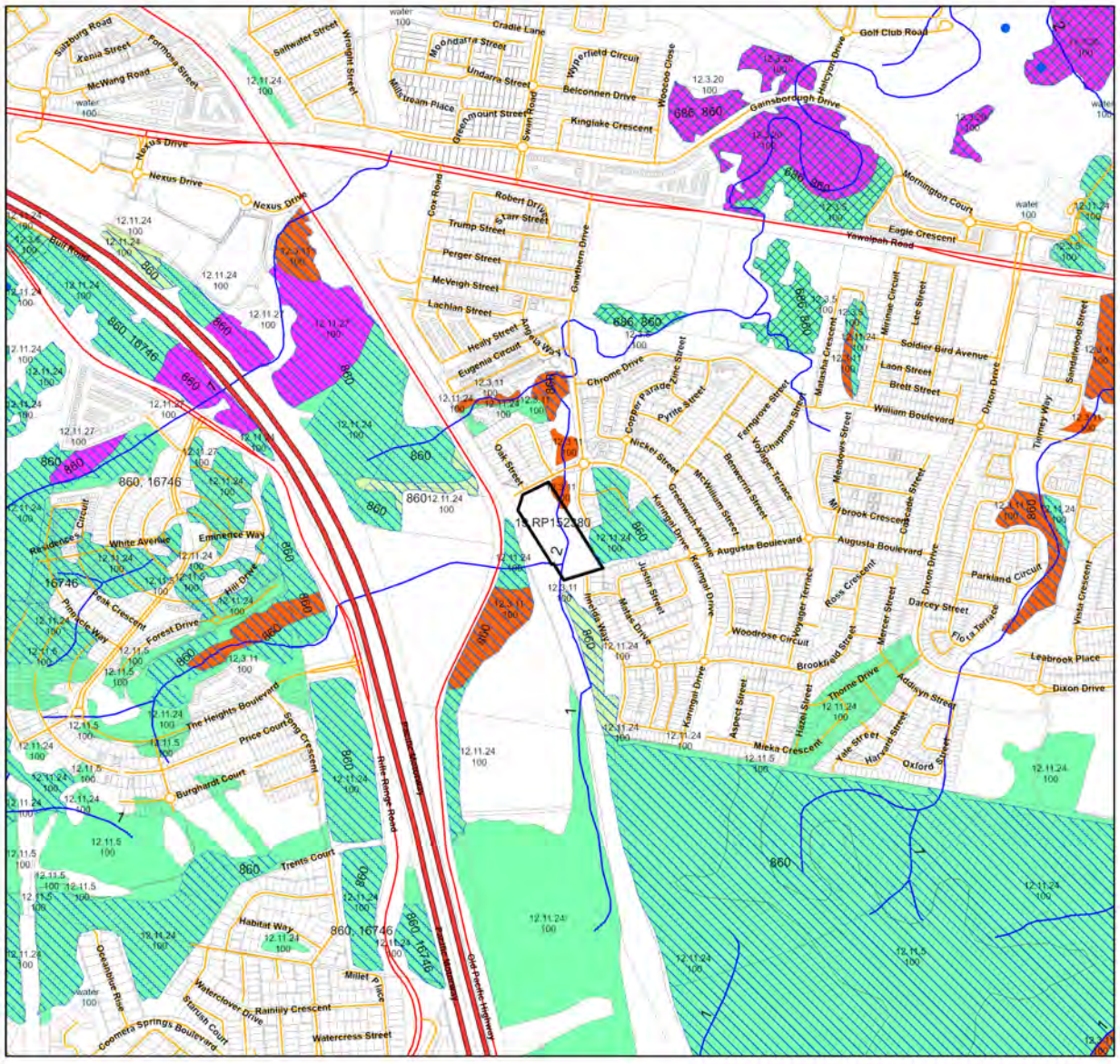
Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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# Vegetation Management Supporting Map

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 110 220 330 440 550 m

This product is displayed in: GDA2020

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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# Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website http://www.nrmmrrd.qld.gov.au has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1. that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
2. in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

### Essential habitat in Category A and/or Category B and/or Category C

| Label | Scientific Name | Common Name | NCA Status | Vegetation Community | Altitude | Soils | Position in Landscape |
|---|---|---|---|---|---|---|---|
| 860 | Phascolarctos cinereus | koala | E | Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia. | Sea level to 1000m. | | Riparian areas, plains and hill/escarpment slopes. |

| Label | Regional Ecosystem (mandatory unless otherwise specified) |
|---|---|
| 860 | 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 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9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.8, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.20, 10.3.22, 10.3.27, 10.3.28, 10.4.2, 10.4.3, 10.4.5, 10.4.8, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 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Queensland Government



# Vegetation management report

For Lot: 19 Plan: RP152380
27/02/2026

nrmmrrd.qld.gov.au

Queensland Government

This publication has been compiled by Operations Support, Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

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# Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

# Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
***Property details*** - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

***Vegetation management framework*** - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

***Vegetation management framework details for the specified Lot on Plan*** including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

***Protected plant framework*** - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

***Koala protection framework*** - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

***Koala protection framework details for the specified Lot on Plan*** including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

# Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing.  You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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# 1. Property details

## 1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 19 Plan: RP152380 are listed in Table 1.

**Table 1: Lot, plan, tenure and title area information for the property**

| Lot | Plan | Tenure | Property title area (sq metres) |
|---|---|---|---|
| 19 | RP152380 | Freehold | 24,590 |
| E | SP259689 | Easement | 1,768 |
| F | SP279637 | Easement | 1,052 |

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

**Does the property Lot: 19 Plan: RP152380 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?**

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

## 1.2 Property location

Table 2 provides a summary of the locations for property Lot: 19 Plan: RP152380, in relation to natural and administrative boundaries.

**Table 2: Property location details**

| Local Government(s) |
|---|
| Gold Coast City |

| Catchment(s) |
|---|
| South Coast |

| Bioregion(s) | Subregion(s) |
|---|---|
| Southeast Queensland | Sunshine Coast - Gold Coast Lowlands |
| Southeast Queensland | Burringbar - Conondale Ranges |

# 2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

## 2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

## 2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

## 2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

## 2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

## 2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

**Phone** 135VEG (135 834)

**Email** vegetation@nrmmrrd.qld.gov.au

**Visit** https://www.nrmmrrd.qld.gov.au/?contact=vegetation to submit an online enquiry.

# 3. Vegetation management framework for Lot: 19 Plan: RP152380

## 3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

**Table 3: Vegetation categories for subject property**

| Vegetation category | Area (ha) |
|---|---|
| Category B | 0.06 |
| Category X | 2.39 |

**Table 4: Description of vegetation categories**

| Category | Colour on Map | Description | Requirements / options under the vegetation management framework |
|---|---|---|---|
| A | red | Compliance areas, environmental offset areas and voluntary declaration areas | Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area. |
| B | dark blue | Remnant vegetation areas | Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval. |
| C | light blue | High-value regrowth areas | Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code. |
| R | yellow | Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas | Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans. |
| X | white | Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures. | No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures. |

**Property Map of Assessable Vegetation (PMAV)**

There is no Property Map of Assessable Vegetation (PMAV) present on this property.

## 3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

**Table 5: Regional ecosystems present on subject property**

| Regional Ecosystem | VMA Status | Category | Area (Ha) | Short Description | Structure Category |
|---|---|---|---|---|---|
| 12.11.24 | Least concern | B | 0.01 | Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics | Sparse |
| 12.3.11 | Of concern | B | 0.06 | Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast | Mid-dense |
| non-rem | None | X | 2.39 | None | None |

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

## 3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

## 3.4 Wetlands

There are no vegetation management wetlands present on this property.

## 3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

**Category A and/or Category B and/or Category C**

**Table 6: Essential habitat in Category A and/or Category B and/or Category C**

| Label | Scientific Name | Common Name | NCA Status | Vegetation Community | Altitude | Soils | Position in Landscape |
|---|---|---|---|---|---|---|---|
| 860 | Phascolarctos cinereus | koala | E | Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia. | Sea level to 1000m. | | Riparian areas, plains and hill/escarpment slopes. |

| Label | Regional Ecosystem (mandatory unless otherwise specified) |
|---|---|
| 860 | 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.8, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.20, 10.3.22, 10.3.27, 10.3.28, 10.4.2, 10.4.3, 10.4.5, 10.4.8, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 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11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10. |

## 3.6 Area Management Plan(s)

Nil

## 3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 4.3

## 3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

**Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?**

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 19 Plan: RP152380.

# 4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

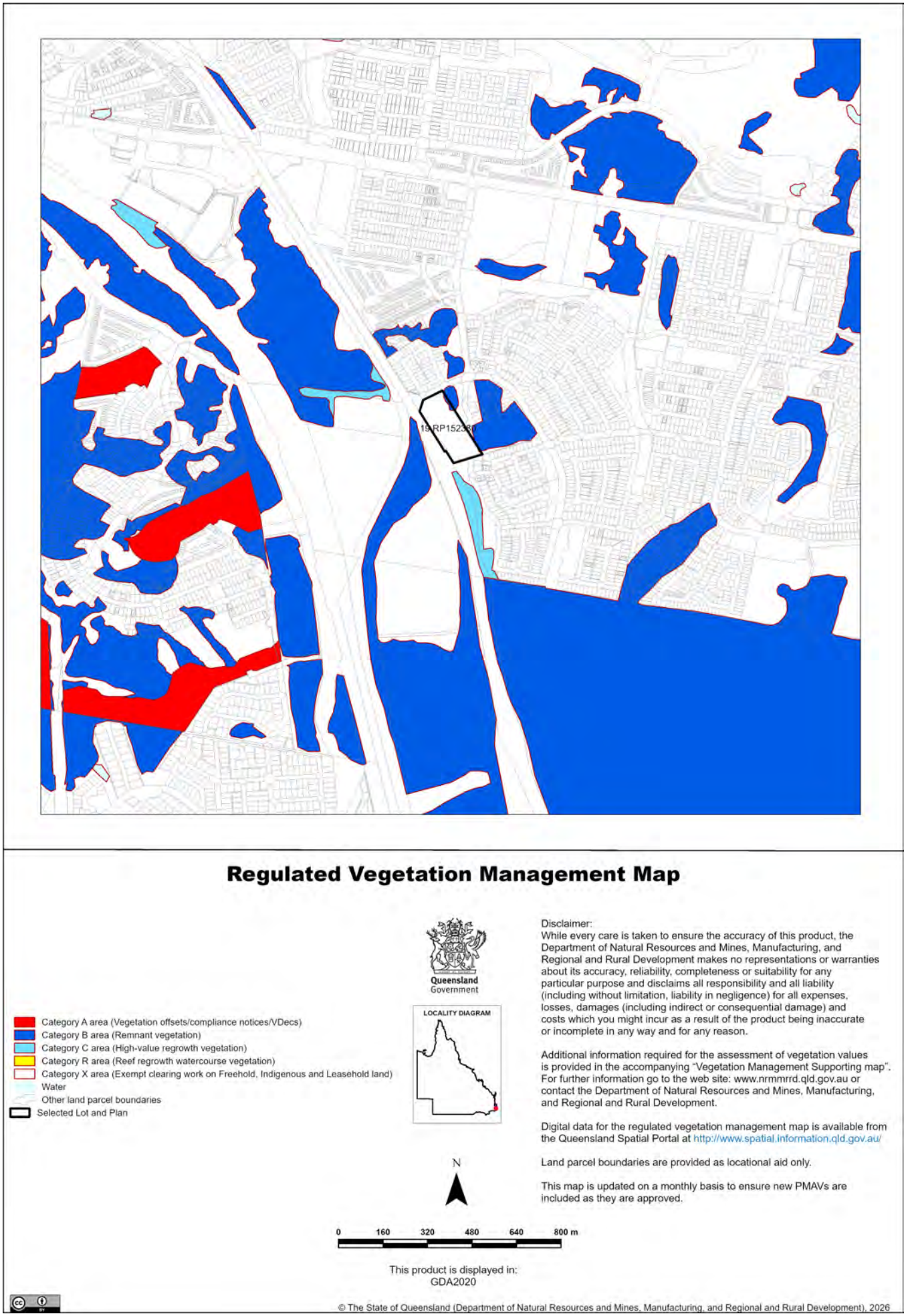
**Regulated vegetation management map**
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

**Vegetation management supporting map**
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

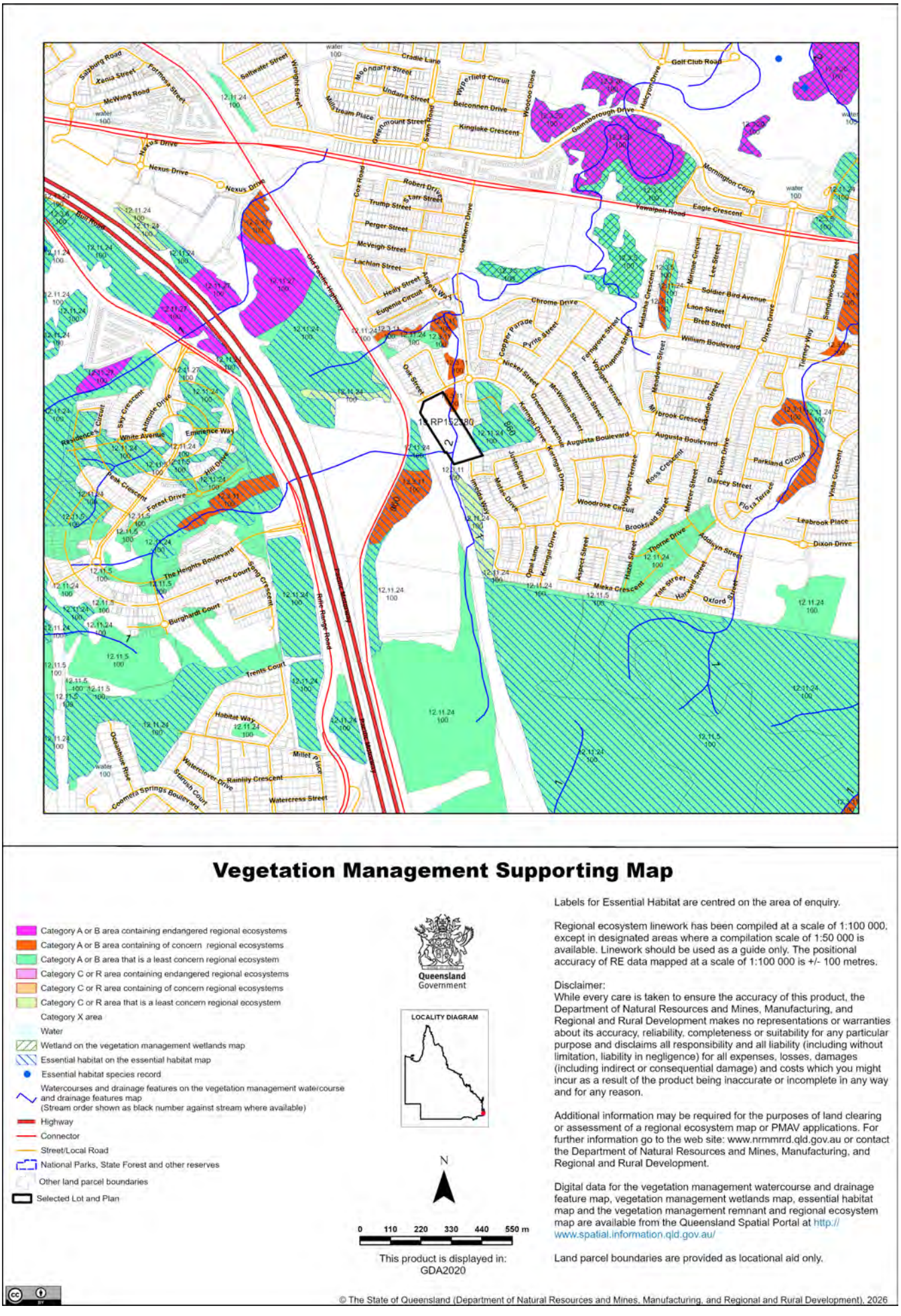
**Coastal/non-coastal map**
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

**Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture**
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

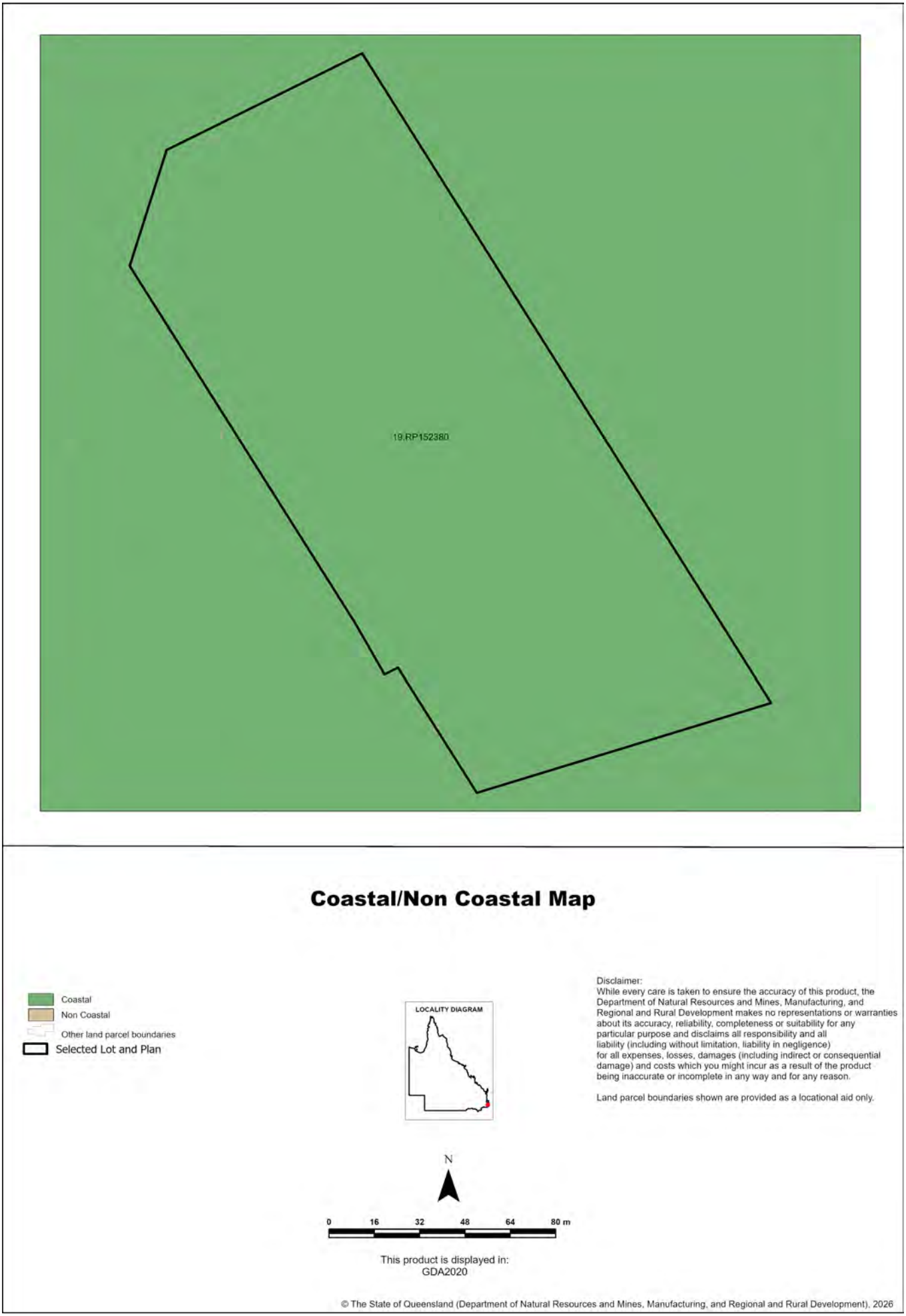
## 4.1 Regulated vegetation management map



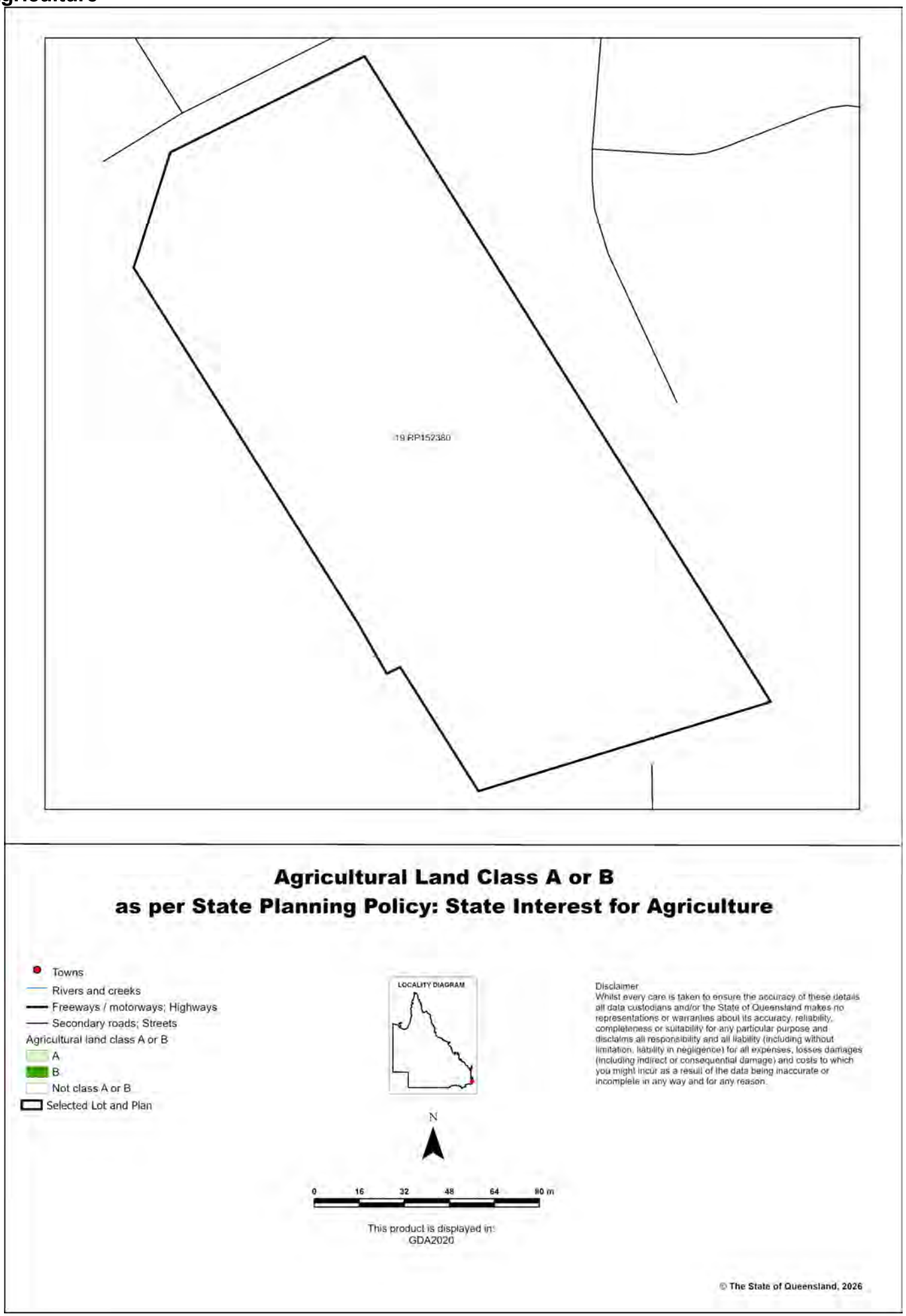
## 4.2 Vegetation management supporting map



## 4.3 Coastal/non-coastal map



## 4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



# 5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

## 5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

## 5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

## 5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

## 5.4 Contact information for DETSI

For further information on the protected plants framework:
**Phone** 1300 130 372 (and select option four)
**Email** palm@detsi.qld.gov.au
**Visit** https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

## 5.5 Protected plants flora survey trigger map

This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

**Updates to the data informing the flora survey trigger map**

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

**Species information**

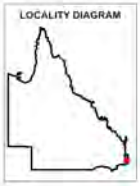
Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.




# Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 10 20 30 40 50 m

This product is displayed in: GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@detsi.qld.gov.au

Disclaimer: While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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# 6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

## 6.1 Koala mapping

### 6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

### 6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

### 6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

#### 6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

### 6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

**Interfering with koala habitat** means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

## 6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

## 6.4 Contact information for DETSI

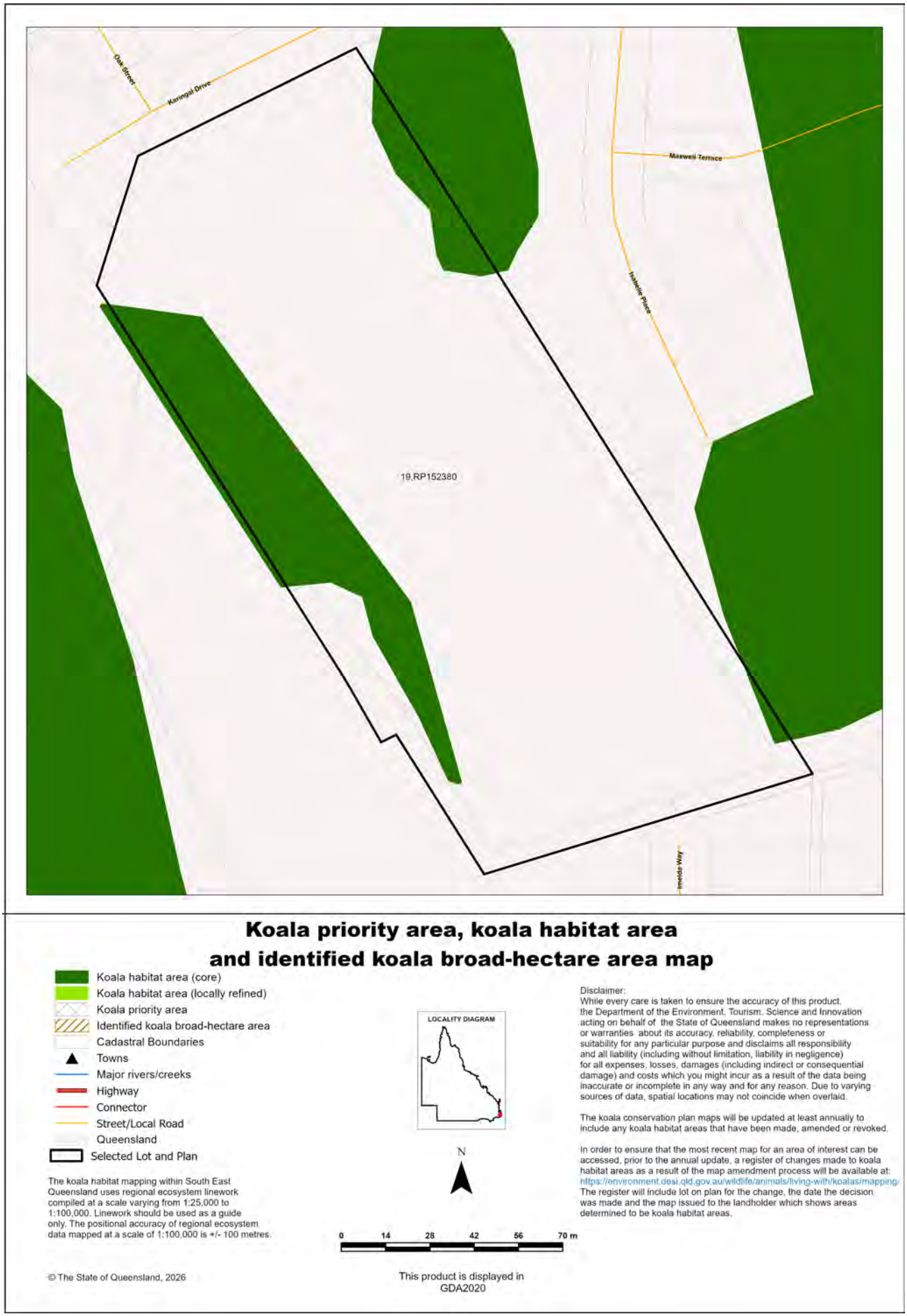
For further information on the koala protection framework:
**Phone** 13 QGOV (13 74 68)
**Email** koala.assessment@detsi.qld.gov.au
**Visit** https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

# 7. Koala protection framework details for Lot: 19 Plan: RP152380

## 7.1 Koala districts

Koala District A

## 7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



## 7.3 Koala habitat regional ecosystems for core koala habitat areas




# Koala habitat regional ecosystems for core koala habitat areas

Koala habitat area (core)
Towns
Highway
Connector
Street/Local Road
Major rivers/creeks
Queensland
Selected Lot and Plan

LOCALITY DIAGRAM

N

0 14 28 42 56 70 m

This product is displayed in GDA2020

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Due to varying sources of data, spatial locations may not coincide when overlaid.

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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# 8. Other relevant legislation contacts list

| Activity | Legislation | Agency | Contact details |
|---|---|---|---|
| Interference with overland flow | *Water Act 2000* | Department of Local Government, Water and Volunteers | Ph: 13 QGOV (13 74 68)<br>www.dlgwv.qld.gov.au |
| Earthworks, significant disturbance | *Soil Conservation Act 1986* | Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development | Ph: 13 QGOV (13 74 68)<br>www.nrmmrrd.qld.gov.au |
| Fire Permits | *Fire and Emergency Services Act 1990* | Queensland Fire Department | Ph: 13 QGOV (13 74 68)<br>www.fire.qld.gov.au |
| Indigenous Cultural Heritage | *Aboriginal Cultural Heritage Act 2003*<br>*Torres Strait Islander Cultural Heritage Act 2003* | Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism | Ph: 13 QGOV (13 74 68)<br>www.tatsipca.qld.gov.au |
| Mining and environmentally relevant activities<br>Infrastructure development (coastal)<br>Heritage issues | *Environmental Protection Act 1994*<br>*Coastal Protection and Management Act 1995*<br>*Queensland Heritage Act 1992* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 13 QGOV (13 74 68)<br>www.detsi.qld.gov.au |
| Protected plants and protected areas | *Nature Conservation Act 1992*<br>*Planning Act 2016* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 1300 130 372 (option 4)<br>palm@detsi.qld.gov.au<br>www.detsi.qld.gov.au |
| Koala mapping and regulations | *Nature Conservation Act 1992* | Queensland Department of the Environment, Tourism, Science and Innovation | Ph: 13 QGOV (13 74 68)<br>Koala.assessment@detsi.qld.gov.au |
| Interference with fish passage in a watercourse, mangroves<br>Forestry activities | *Fisheries Act 1994*<br>*Forestry Act 1959* | Queensland Department of Primary Industries | Ph: 13 QGOV (13 74 68)<br>www.dpi.qld.gov.au |
| Matters of National Environmental Significance including listed threatened species and ecological communities | *Environment Protection and Biodiversity Conservation Act 1999* | Department of Climate Change, Energy, the Environment and Water (Australian Government) | Ph: 1800 920 528<br>www.dcceew.gov.au |
| Development and planning processes | *Planning Act 2016*<br>*State Development and Public Works Organisation Act 1971* | Queensland Department of State Development, Infrastructure and Planning | Ph: 13 QGOV (13 74 68)<br>www.planning.qld.gov.au |
| Coordinated projects | *Planning Act 2016*<br>*State Development and Public Works Organisation Act 1971* | Office of the Coordinator-General | Ph: 13 QGOV (13 74 68)<br>www.statedevelopment.qld.gov.au/coordinator-general |
| Wet Tropics World Heritage Area | *Wet Tropics World Heritage Protection and Management Act 1993* | Queensland Wet Tropics Management Authority | Ph: (07) 4241 0500<br>www.wettropics.gov.au |
| Requirements on State controlled road | *Transport Infrastructure Act 1994* | Queensland Department of Transport and Main Roads | Ph: 13 QGOV (13 74 68)<br>https://www.tmr.qld.gov.au |
| Local government requirements | *Local Government Act 2009*<br>*Planning Act 2016* | Your relevant local government office | Local Government Contact Directory |

## Appendix C – Planting Palette – RE 12.3.11

**Notes:**

1. Local provenance tubestock only and no cultivars.
2. Not all species will be available at the time of planting however at least 50% of the species specified should be utilised. Alternative substitutions are to be approved by Council.
3. This palette reflects species typically occurring in the following preclearing regional ecosystems:
    a. Of concern RE 12.3.11a: *Eucalyptus tereticornis* +/- *Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast (outer riparian zone).
4. Generally palustrine wetlands in floodplains, fringing drainage lines, swales and depressions, but can include lacustrine water bodies associated with the construction of bunding and levees.
5. This ecosystem is also known to provide suitable habitat for the Vulnerable koala *Phascolarctos cinereus*.

| Scientific Name | Common Name | Stratum/Zone |
|---|---|---|
| *Angophora leiocarpa* | Smooth Barked Apple | Canopy |
| ***Corymbia intermedia*[k]** | **Pink Bloodwood** | **Canopy** |
| ***Corymbia tesselaris*[k]** | **Moreton Bay Ash** | **Canopy** |
| *Elaeocarpus obovatus* | Hard quandong | Canopy |
| ***Eucalyptus robusta*[k]** | **Swamp mahogany** | **Canopy** |
| *Endiandra sieberi* | Hard Corkwood | Canopy |
| *Eucalyptus seeana*[k] | Narrow leaved redgum | Canopy |
| ***Eucalyptus siderophloia*[k]** | **Grey Ironbark** | **Canopy** |
| ***Eucalyptus tereticornis*[k]** | **Forest Red Gum** | **Canopy** |
| ***Lophostemon suaveolens*[k]** | **Swamp Box** | **Canopy** |
| ***Melaleuca quinquenervia*[k]** | **Broad Leaved Paperbark** | **Canopy** |
| ***Melaleuca salicina*[k]** | **White bottlebrush** | **Canopy** |
| ***Acacia disparrima subsp. disparrima*** | **Brush ironbark wattle** | **Understorey** |
| *Acmena smithii* | Lily Pilli | Understorey |
| ***Allocasuarina littoralis*** | **Black She-Oak** | **Understorey** |
| *Alphitonia excelsa* | Red Ash | Understorey |
| *Banksia integrifolia subsp. integrifolia* | Coastal Banksia | Understorey |
| *Commersonia bartramia* | Brown kurrajong | Understorey |
| ***Cupaniopsis anacardioides*** | **Tuckeroo** | **Understorey** |
| *Elaeocarpus reticulatus* | Blueberry Ash | Understorey |
| *Ficus coronata* | Sandpaper fig | Understorey |
| ***Glochidion ferdinandi*** | **Cheese Tree** | **Understorey** |
| *Glochidion sumatranum* | Umbrella cheese tree | Understorey |
| *Melaleuca sieberi* | Sieber's paperbark | Understorey |
| *Acacia leiocalyx* | Black Wattle | Shrub |
| *Alpinia caerulea* | Native ginger | Shrub |
| *Austromyrtus dulcis* | Midgen Berry | Shrub |
| *Banksia robur* | Swamp banksia | Shrub |
| *Breynia oblongifolia* | Coffee Bush | Shrub |
| *Clerodendrum floribundum* | Lolly Bush | Shrub |

| Scientific Name | Common Name | Stratum/Zone |
|---|---|---|
| *Dodonaea triquetra* | Large-leaf Hop-bush | Shrub |
| *Hakea florulenta* | Willow hakea | Shrub |
| *Hibiscus heterophyllus* | Rosella | Shrub |
| *Hovea acutifolia* | Pointed-leaved Hovea | Shrub |
| *Leptospermum polygalifolium* | A Teatree | Shrub |
| *Melastoma malabathricum* | Blue tongue | Shrub |
| *Myoporum acuminatum* | Boobialla | Shrub |
| *Persoonia adenantha* | A Geebung | Shrub |
| *Persoonia stradbrokensis* | A Geebung | Shrub |
| *Pittosporum revolutum* | Rough Fruit Pittosporum | Shrub |
| *Pultenaea villosa* | Hairy Bush-pea | Shrub |
| *Sannantha similis* | Twiggy heath myrtle | Shrub |
| *Maclura cochinchinensis* | Cockspur Thorn | Shrub |
| *Alloteropsis semialata* | Cockatoo grass | Groundcover |
| *Cymbopogon refractus* | Barbed Wire Grass | Groundcover |
| *Dianella caerulea* | Blue Flax-lily | Groundcover |
| *Dianella revoluta* | Blueberry Lily | Groundcover |
| *Digitaria didactyla* | Queensland Blue Couch | Groundcover |
| *Gahnia aspera* | Rough Saw-sedge | Groundcover |
| *Gahnia clarkei* | Tall saw-sedge | Groundcover |
| *Gahnia sieberiana* | Red-fruit saw-sedge | Groundcover |
| *Imperata cylindrica* | blady grass | Groundcover |
| *Lepidosperma laterale* | Variable Swordsedge | Groundcover |
| *Lomandra longifolia* | Spiny-headed Mat-rush | Groundcover |
| *Lomandra multiflora* | Many flowered matrush | Groundcover |
| *Ottochloa gracillima* | Pademelon grass | Groundcover |
| *Pimelea linifolia* | Rice flower | Groundcover |
| *Themeda triandra* | Kangaroo Grass | Groundcover |
| *Viola banksii* | Wild Violet | Groundcover |
| *Viola hederacea* | Ivy-leaved Violet | Groundcover |
| *Xanthorrhoea fulva* | Swamp grasstree | Groundcover |
| *Bolboschoenus fluviatilis* | marsh clubrush | Riparian |
| *Carex appressa* | Tall sedge | Riparian |
| *Carex fascicularis* | Tassel sedge | Riparian |
| *Crinum pendunculatum* | River lily | Riparian |
| *Cyperus exaltatus* | Giant sedge | Riparian |
| *Eleocharis cylindrostachys* | Spikerush | Riparian |
| *Eleocharis philippinensis* | Spikerush | Riparian |
| *Eleocharis sphacelata* | Tall spikerush | Riparian |
| *Isolepis inundata* | Swamp clubrush | Riparian |
| *Leersia hexandra* | Swamp Ricegrass | Riparian |
| *Lepironia articulata* | Frey rush | Riparian |

| Scientific Name | Common Name | Stratum/Zone |
|---|---|---|
| *Lomandra hystrix* | Stream Mat-rush | Riparian |
| *Juncus continuus* | A reed | Riparian |
| *Juncus polyanthemus* | A reed | Riparian |
| *Machaerina articulata (syn. Baumea articulata)* | Jointed rush | Riparian |
| *Philydrum lanuginosum* | Frogmouth | Riparian |
| *Schoenoplectiella mucronate (Syn. Schoenoplectus mucronatus)* | Triangular clubrush | Riparian |
| *Schoenoplectus subulatus* | Clubrush | Riparian |

***Notes: k = Koala tree; Canopy dominants in bold***

## Appendix D – Daily Record Sheet

DAILY RECORD SHEET

Site Name / Location: _____

Date: _____ Time: _____ to _____

Team / Staff: _____

| Growing Conditions | Temperature / Humidity | Weather Conditions | Wind Speed and direction |
|---|---|---|---|
| | | | |

| Zone | Hours | Weeds treated | Method | New species encountered / location |
|---|---|---|---|---|
| | | | | |

CHEMICAL INFORMATION

| Equipment used | Glyphosate | Met-methyl | Herbicide | Additive | Other | Water | Number mixed |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Daily chemical totals** | | | | | | | |

## Appendix E – Risk Assessment Form and Matrix

| HAZARD IDENTIFIED | RISK RATING | CONTROL MEASURE RISK ASSESSMENT |
|---|---|---|
| Traffic Hazard<br>Working in close proximity to roads | | ☐Use traffic controller<br>☐Use of safety signs<br>☐Use of witches hats or temporary barrier<br>☐High visibility clothing |
| Sun Exposure<br>Hot conditions | | ☐Reduce exposure time – rest breaks<br>☐Provide ample water<br>☐Protective clothing and sunscreen |
| Working With Chemicals | | ☐Current MSDS held<br>☐Adequate washing facilities<br>☐Hazardous substances stored and labelled correctly<br>☐Use of personal protective clothing<br>☐Rotate tasks to avoid prolonged exposure |
| Biological Hazard<br>Needle stick injury | | ☐Inspect site before work commences<br>☐Provide appropriate waste disposal container<br>☐Personal protective equipment |
| Manual Handling<br>Handling heavy objects | | ☐Use correct lifting and carrying techniques<br>☐Use lifting aids<br>☐Use wheelbarrow etc wherever possible<br>☐Ensure clear area before lifting<br>☐Share the load<br>☐Rotate activities or rest breaks<br>☐Appropriate personal protective clothing |
| Crush Impact<br>Cut, crush and impact | | ☐Knowledge and correct use of tools<br>☐Appropriate personal protective clothing<br>☐Correct tool for job |
| Slips, Trips and Falls | | ☐Avoid carrying awkward or heavy objects on uneven ground<br>☐Remove all potential hazards if possible or mark with coloured tape<br>☐Do not leave tools lying in pathways<br>☐Do not run<br>☐Ensure boots are firmly laced |

| HAZARD IDENTIFIED | RISK RATING | CONTROL MEASURE RISK ASSESSMENT |
|---|---|---|
| Hazardous Plants<br>Plants that may cause allergic reaction | | ☐Identify plants which may cause allergic reactions<br>☐Mark area with coloured tape |
| Bites and Stings | | ☐Create disturbance on site before beginning work<br>☐Apply insect repellent<br>☐Wear appropriate personal protective equipment |

## Risk Assessment Matrix

| How severely could it hurt someone Or How ill could it make someone | Very likely - could happen anytime | Likely - could happen sometime | Unlikely - could happen, but very rarely | Very unlikely - could happen, but probably never will |
|---|---|---|---|---|
| Kill or cause permanent disability or ill health | 1 | 1 | 2 | 3 |
| Long term illness or serious injury | 1 | 2 | 3 | 4 |
| Medical attention and several days off work | 2 | 3 | 4 | 5 |
| First aid needed | 3 | 4 | 5 | 6 |

## Appendix F – Monitoring and Evaluation Proforma

This form should be completed for each management zone within a work site. Assessment should be made of the zone as a whole.

| | | | |
|---|---|---|---|
| **Date** | | **Observer** | |
| **Site name** | | **Site location** | |
| **Zone** | | **Area** | |

**Dominant vegetation community**

| |
|---|
| |

| | | | |
|---|---|---|---|
| **Dominant Species Canopy** | | | |
| **Dominant Species Mid** | | | |
| **Dominant Species Ground** | | | |

**Notes and Comments**

| |
|---|
| |

| Quad | Species | Height (m) | Veg type | No. in quad | Stems/100m2 | Av health (outlier) | Mulch depth % cover |
|---|---|---|---|---|---|---|---|
| X | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| Y | | | | | | | |

BURCHILLS
SCIENCE AND ENGINEERING



# 2 Karingal Drive, Pimpama
# Vegetation and Fauna Management Plan

| | |
|---|---|
| **Client:** | Bosform Pty Ltd |
| **Project Number:** | BE200223 |
| **Document Number:** | BE200223-RP-VFMP-00 |
| **Date of Issue:** | March 2026 |

# Document Control Record

| | |
|---|---|
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| Position: | Environmental Scientist<br>Principal Ecologist<br>Principal Environmental Scientist |
| Date: | March 2026 |

| | |
|---|---|
| Approved by: | Caroline Kelly |
| Position: | Principal Environmental Scientist |
| Date: | March 2026 |

| Version No. | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 00 | Initial issue | 24.03.2026 | CE | CK |

***Recipients are responsible for eliminating all superseded documents in their possession.***


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# Executive Summary

This Vegetation and Fauna Management Plan has been prepared to support a proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380). Clearing is required to facilitate the construction of the proposed development.

A desktop review determined mapped values within the project area under State and Council regulatory provisions including the Qld *Vegetation Management Act 1999*, Qld *Nature Conservation Act 1992* and the Gold Coast City Plan.

Field surveys were undertaken in February and March 2026 to assess all protected trees (as defined in the Gold Coast City Plan) within the proposed works impact area. The impact area includes the proposed earthworks footprint and a five (5) metre construction access buffer. Trees surveyed are predominantly native canopy trees. No conservation significant species were encountered.

A total of 282 trees were surveyed within the project area as being potentially impacted by the works with 248 identified to be removed. All trees require removal to facilitate the proposed works due to either poor structural form, earthworks impacts on the Structural Root Zone (SRZ) and/or moderate/major impacts on the Notional Root Zone (NRZ), or to facilitate construction access.

To ensure potential impacts on native wildlife and breeding places are avoided, a licensed spotter-catcher is to undertake a pre-clearing survey no more than two (2) weeks prior to the clearing to identify any nests, habitat features or fauna breeding places that may be impacted, to determine actions required prior, during and following clearing works. The Project Arborist should supervise all works to ensure that retained, protected vegetation is not impacted by the works.

All vegetation clearing works are to be undertaken in accordance with the provisions of this Vegetation and Fauna Management Plan and conditions of approval.

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Appendix C – Local Veterinarian Clinics and Wildlife Hospitals

# 1. Introduction

This Vegetation and Fauna Management Plan (VFMP) has been prepared for a proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380), within the City of Gold Coast local government area.

This plan has been prepared in accordance with the *SC6.8 City Plan Policy – Environmental Management Plans* and outlines all measures to be undertaken during the construction phase to avoid and minimise harm to native fauna and flora within and adjacent to the project area.

## 1.1 Scope and Objectives

The scope and objectives of this VFMP are to:

- Undertake a desktop assessment for the project area;
- Summarise the results of surveys of the site's vegetation and provide a description of vegetation and habitat features impacted by proposed clearing;
- Determine the level of fauna management required based on site observations; and
- Outline management strategies and actions to be implemented to mitigate the risk of harm to native fauna and retained vegetation.

## 1.2 Site Description

The project area is located within the road reserve of Beattie Rd at Coomera (Figure 1.1 and Figure 1.2).

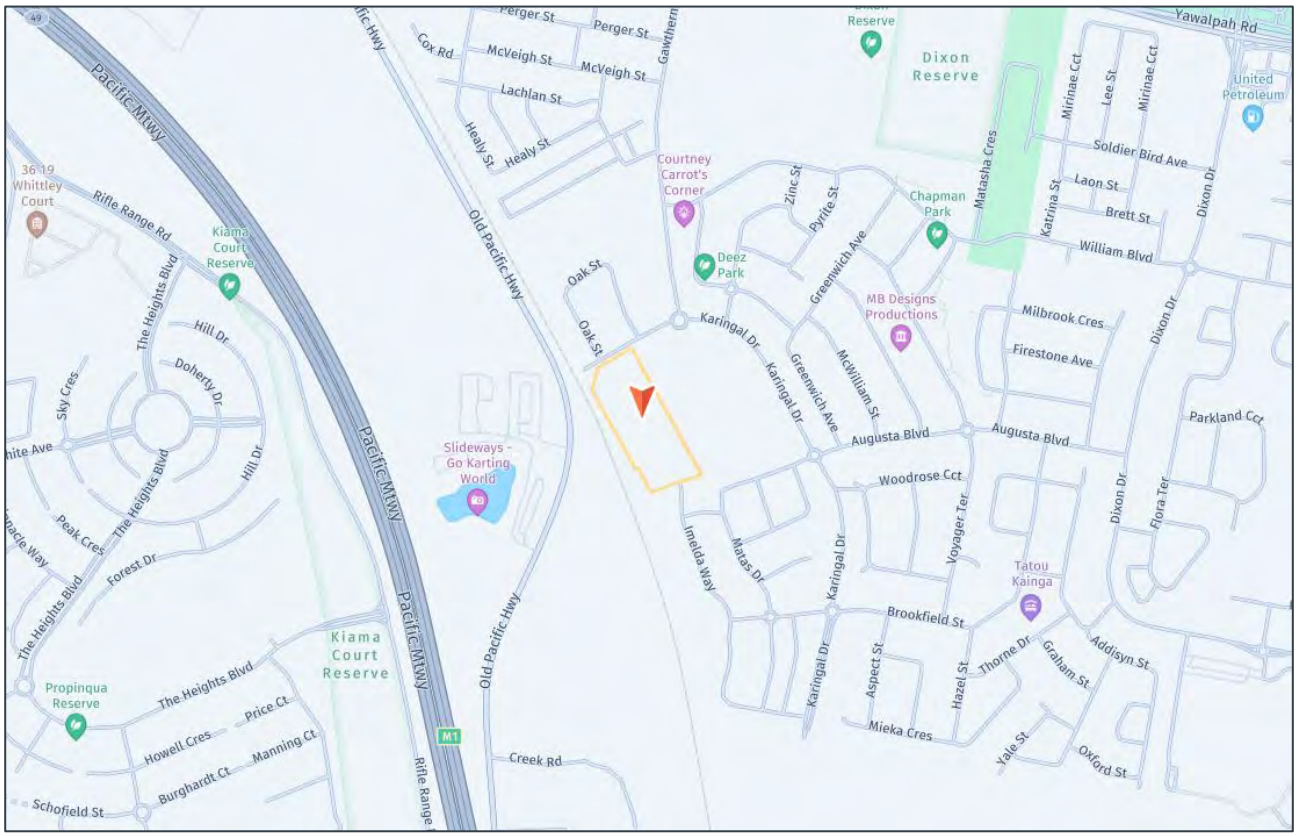



**Figure 1.1 Project Area location (Google maps, 2026)**

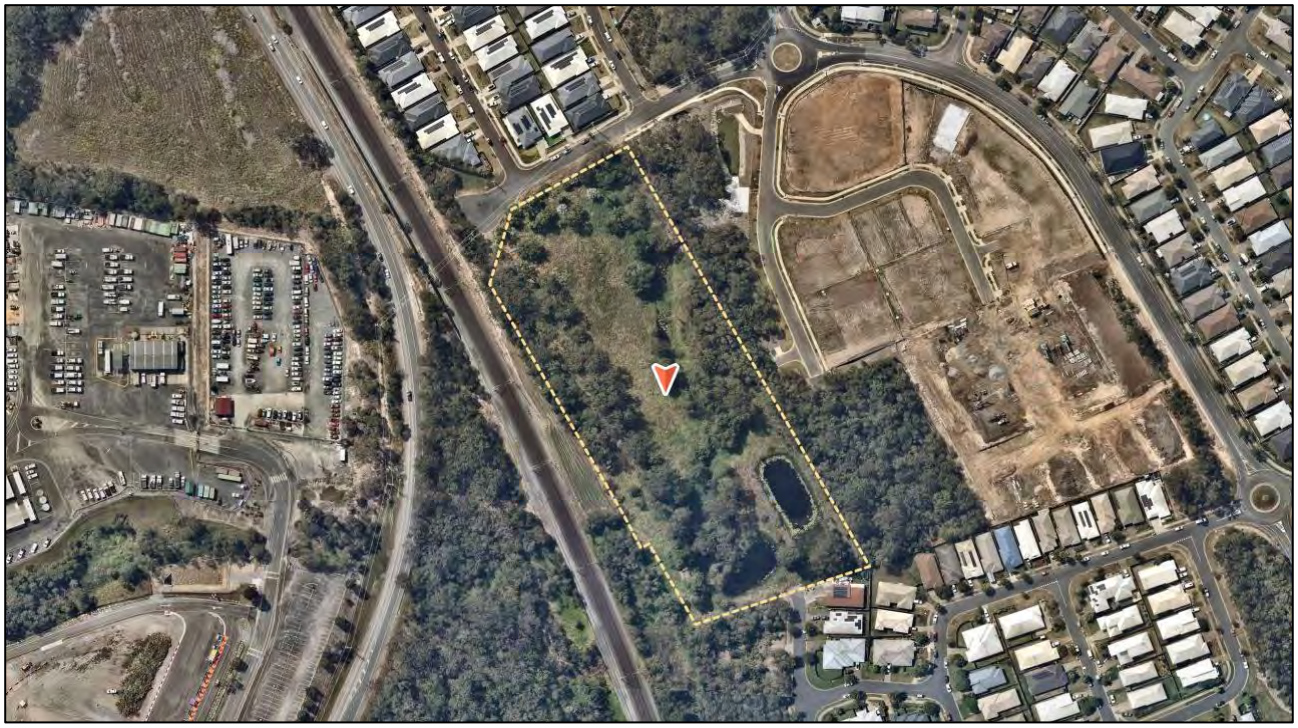


**Figure 1.2 Recent aerial photo of Project Area (Qld Globe, 2026)**




**Figure 1.3 Site zoning (*Gold Coast City Plan Version 13*)**

## 1.3 Proposed Development

A Development Approval is sought for a Material Change of Use, Reconfiguration of a Lot and Operational Works (change to ground level and vegetation clearing). Specifically, the proposal involves a new townhouse development which comprises a complex of 16 townhouses with access from Imelda Way; and 41 townhouses with access from Karingal Drive and internal private roads. The development includes creation of management lots for the townhouse components and a park lot to be dedicated to Council for the drainage reserve traversing the site.

For further details, please refer to design drawings prepared by MPS Architects attached in Appendix A of this report. Figure 1.4 below provides an excerpt taken from the development's site plan (MPS Architects, 2026) and Figure 1.5 provides an extract of the proposed earthworks design (Burchills, 2026).

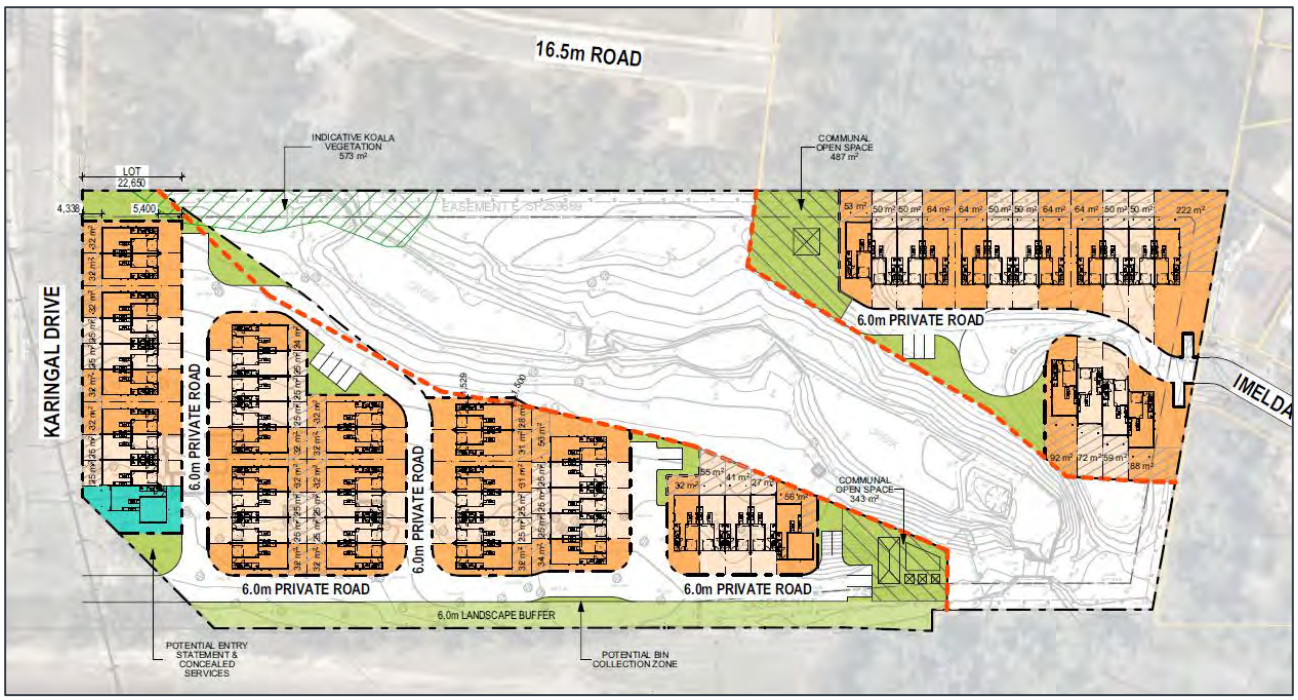



**Figure 1.4 Proposed plan of development (MPS Architects, 2026)**

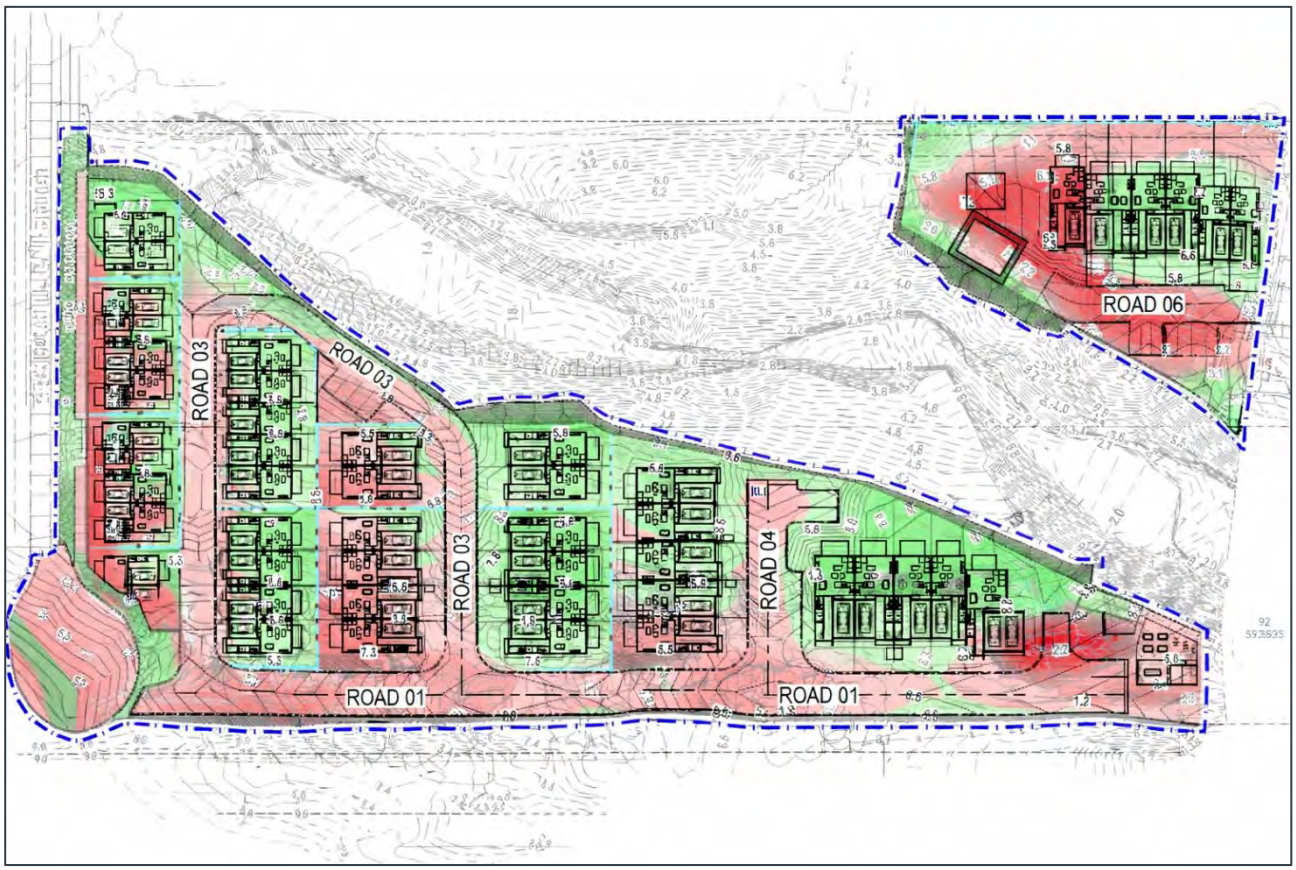



**Figure 1.5 Proposed earthworks (Burchills, 2026)**

## 2. Desktop Review – Environmental Site Constraints

A desktop review was undertaken to verify current environmental overlay constraints at a State and local level that may apply to the proposed works as summarised below in Table 2.1.

**Table 2.1 Environmental Overlay Constraints for Subject Site**

| Constraint | Present | Absent | Comments |
|---|---|---|---|
| Regulated Vegetation (VMA) | x | | The site contains regulated vegetation under the *Vegetation Management Act 1999,* including approximately 0.06 ha of Category B – Of Concern remnant vegetation (RE 12.3.11) and a minor area of RE 12.11.24 (Least Concern). [1] |
| Koala Habitat SEQ | x | | The site is not within a Koala Priority Area but does contain 0.41 ha (4,095m$^2$) of Core Koala Habitat Area. |
| NCA Essential Habitat | x | | Mapping under the *Nature Conservation Act 1992 (NCA)* shows a small portion of the south-eastern corner of the site is mapped as Essential Habitat [1.] |
| NCA Protected Plants | x | | The Protected Plants Flora Survey Trigger Map identifies a small portion of the site (south-eastern area) is mapped as a high-risk area for protected plants. This triggers the requirement for a protected plants flora survey prior to clearing in accordance with the *Nature Conservation Act 1992*. [1] |
| NCA Threatened Species - Observed | | x | No threatened species were observed on site during the site assessments. |
| Fisheries Act Waterway Barrier Works | x | | Mapping under the *Fisheries Act 1994* indicates that low-order and moderate risk waterways traverse portions of the subject site. [1] |
| Water Act 2000 Waterways | x | | Mapping under the Water Act 2000 indicates a drainage feature that traverses the subject site. [1] |
| City Plan Acid Sulfate Soils | x | | The site is mapped as containing potential acid sulfate soils (Land at or below 5mAHD).[2] |
| City Plan Biodiversity | | x | The site is not in the City Plan Biodiversity overlay. [2] |
| City Plan Bushfire Risk | x | | The site is partially mapped as containing medium potential bushfire hazard.[2] |
| City Plan Flood | x | | The site is partially mapped as being subject to flooding during the design flood event, with a small area affected in the north-eastern portion of the subject site.[2] |
| City Plan Landslide Hazard | | x | The site is not mapped within a Landslide Hazard area. [2] |
| City Plan Vegetation | x | | The Vegetation Management Overlay indicates areas of mapped vegetation within the subject site, including general and medium priority vegetation. [2] |
| City Plan Waterways and Wetlands | x | | The Waterways and Wetlands Overlay indicates a mapped waterway runs through the subject site, with the associated buffer extending across the site. [2] |

*Notes:*
[1] as identified on Queensland Globe (2026)
[2] as identified by the *Gold Coast City Plan Version 13* Interactive Mapping (2026)




**Figure 2.1 Acid Sulfate Soils overlay (Gold Coast City Plan V13, 2026)**




**Figure 2.2 Minor Waterway and Buffer Mapped on Site (Gold Coast City Plan V13, 2026)**

## 3. Summary of Site Investigations

A site inspection of the area proposed to be restored was undertaken by the authors of this report in February and March 2026 and was focused upon the mapped minor waterway/drainage feature that is to be protected in environmental reserve and subject to rehabilitation. It is noted that this area has been highly disturbed through historic clearing, weed incursion and significant modification of the upstream and downstream catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping. The development protects the waterway in the proposed reserve and all site stormwater will be treated for quality and quantity before discharging into the downstream environment. The width of the waterway reserve varies from 24m at its narrowest point to 116m at its widest.

A total of 142 species of flora were detected during the surveys including 72 non-native species, eight (8) of which are Restricted Invasive Plants under the '*Biosecurity Act 2016'*. The sites vegetation can be classed as

- Vegetation Association A – Urban Woodland and Anthropogenic Grassland; and
- Vegetation Association B – Disturbed Riparian Woodland.

These associations are highly modified and degraded by historical clearing, abandoned horticultural infrastructure and significant weed incursion. In particular, *Setaria sphacelata* (South African pigeon grass) is present throughout this association, and is present as dense stands across much of the site.

The canopy layer where present in both associations comprised patches and copses with irregular height and cover. Common species include *Eucalyptus tereticornis* (forest red gum), *Eucalyptus siderephloia* (grey ironbark), *Corymbia intermedia* (pink bloodwood), *Lophostemon confertus* (brush box), *Lophostemon suaveolens* (swamp box), *Elaeocarpus grandis* (blue quandong), **Syagrus romanzoffiana* (cocos palm) and **Roystonea regia* (Cuban royal palm). Exotic vine species were found to be smothering trees and, in some instances, causing tree failure within the waterway corridor.

The shrub layer across the site was also unevenly distributed with species including *Archontophoenix alexandrae* (Alexander palm), *Acacia concurrens* (late-flowering hickory), *Acacia disparrima* (hickory wattle), *Glochidion ferdinandi var. ferdinandi* (cheese tree), *Lantana camara* (lantana), *Senna pendula var. glabrata* (Easter cassia), *Delonix regia* (poinciana), *Schefflera actinophylla* (umbrella tree), *Solanum torvum* (devil's fig) and *Tipuana tipu* (Tipuana) and *Melaleuca quinquenervia* (broad-leaved paperbark).

The ground layer, as per all other strata is highly variable in terms of composition, height and structure and is dominated by weedy/pasture grasses – predominantly *Setaria sphacelata* (South African pigeon grass), Melinis *minutiflora* (molasses grass), *Megathyrsus maximus* (Guinea grass), and other environmental weeds including *Asparagus aethiopicus cv. Sprengeri* (asparagus fern).

No part of the site meets remnant benchmark criteria as presented in the Qld Herbarium Benchmarks (2019) - including the small area adjacent to the north-east boundary that is mapped as remnant (Category B) of concern Regional Ecosystem 12.3.11 *Eucalyptus tereticornis* +/- *Eucalyptus siderephloia, Corymbia intermedia* open forest on alluvial plains. Additionally, the composition of the vegetation was not found to reflect the preclearing Regional Ecosystems 12.3.11 (associated with the waterway) and 12.11.24 (the remaining parts of the site). No flora species of conservation significance (EVNT) at a national, state or local level was detected on-site.

Images of site vegetation are presented in the subsequent pages.



**Figure 3.1 Vegetation Association A – General Composition**



**Figure 3.2 Vegetation Association A – General Composition**



**Figure 3.3 Vegetation Association B – General Composition**



**Figure 3.4 Vegetation Association B – General Composition**

# 4. Vegetation Clearing

A total of 282 trees were surveyed within the project area as being potentially impacted by the works with 248 identified to be removed (refer Figure 4.1). The Project Arborist will supervise the works and identify where trees may be retained subject to micro-siting of earthworks and/or other strategies to protect trees.

## 4.1 Justification for Clearing Works

The tree clearing is required to facilitate proposed works and construction access as detailed in Section 1.3. The proposed operational works design is provided in Appendix A and the Construction Access Plan in Appendix B. Vegetation Clearing Plans and the tree schedule are provided in Appendix C.

## 4.2 Management of Vegetation Impacts

To ensure the ongoing viability of protected vegetation within the project area and adjoining areas during site works, impacts will be avoided and minimised through the following measures:

- All contractors will be made aware of the provisions of this **Vegetation and Fauna Management Plan (VFMP)** and relevant approval conditions during site induction.
- Tree protection fencing will be installed around vegetation to be retained and inspected daily throughout the works, and following any significant rainfall events. Any damage or signs of failure must be promptly repaired or replaced.
- No storage of materials, fill, construction machinery or vehicles is permitted within designated **tree protection zones**.

## 4.3 Vegetation Protection and Site Responsibilities

Prior to the commencement of clearing operations, the limits of all vegetation to be retained must be clearly delineated on site. The Site Supervisor, in consultation with the Project Arborist, will be responsible for:

- Overseeing implementation of this VFMP;
- Ensuring tree protection measures are installed and maintained;
- Provision of advice regarding tender and contract documentation where relevant;
- Supervising tree-related works;
- Providing guidance to contractors regarding vegetation protection; and
- Ensuring contractors clearly understand the approved clearing limits and vegetation management requirements.

The Site Supervisor must also ensure the area of approved vegetation clearing is clearly identified to the clearing contractor and that all contractors and sub-contractors comply with vegetation protection requirements during site works.

## 4.4 Erosion and Sediment Control

An **Erosion and Sediment Control Plan (ESCP)** will be prepared for the works by a **Certified Professional in Erosion and Sediment Control (CPESC)**.

The ESCP will be prepared in accordance with the *Soil Erosion and Sediment Control Engineering Guidelines for Queensland Construction Sites* (The Institution of Engineers, Australia Queensland Division, June 1996) and industry best practice.

All ESCP controls should be installed and checked by the Site Supervisor prior to the prestart for clearing works.

### 4.5 Compensatory Replanting

A total of 282 trees were surveyed within the project area as being potentially impacted by the works with 248 identified to be removed. To ensure no net loss of native tree cover as a result of the proposed works, each native tree removed will be replaced as specified in the proposed Rehabilitation Management Plan prepared by Burchills (2026).

This includes planting of endemic canopy trees, shrubs and groundcovers from the Pre-clearing Regional Ecosystems.

# 2 Karingal Dve Pimpama

## Figure 4.1 Vegetation Impacts

| | |
|---|---|
| Project: BE200223 | Date: 24-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coast LGA

**Legend**

- Subject Lot
- Cadastre
- Surveyed Tree Trunk [282]
- Habitat trees (NRZ*)
  - * Notional Root Zone measured and calculated per AS4590:2025

**Actions - Retain/Remove [282]**

- Retain [34]
- Impacted [248]

**Vegetation Associations**

- A – Urban Woodland and Anthropogenic Grassland
- B – Disturbed Riparian Woodland
- Watercourse centreline
- Constructed dams

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BOSFORM 30 YEARS

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### 4.5.1 Site Inductions

A responsibility of the Site Supervisor will include provision of site inductions for all staff who will be working on site. The purpose of the site induction is to instruct all contractors and sub-contractors on their responsibilities regarding the protection of vegetation. All site workers must attend an induction; a record will be kept of all persons attending inductions and cards will be issued to site workers upon completion. This procedure will enable Council Officers to ensure that all site workers have been made fully aware of their responsibilities associated with vegetation management.

### 4.5.2 Tree Protection Fencing

The appointed Project Arborist (minimum AQF Level 5) will be responsible for ensuring the ongoing viability of trees to be retained. As required by the Project Arborist, any tree protection fencing is to be installed in accordance with *AS4590-2025: Protection of Trees on Development Sites* (Figure 4.2). The fencing will ensure that no earthworks or prohibited activities occur within areas that could adversely impact upon trees to be retained. The fencing will also protect and redirect fauna away from the works area depending on the fencing type required – fauna friendly or fauna exclusion.

Tree Protection Fencing is to be fauna exclusion around any potential threats to displaced fauna (e.g. roads, areas of active clearing works). This will be determined by the Project Spotter Catcher. Areas that will provide refuge for displaced fauna (e.g. areas of retained vegetation) are to be fenced with fauna friendly Tree Protection Fencing.

Tree protection fencing must comply with the following:

- In accordance with *AS4590-2025 Protection of trees on development sites*, fencing is to be installed before any machinery or materials are brought onto the site;
- Fencing is to be installed prior to any pre-start meetings with Council Officers;
- Fencing is to remain in place for the duration of operational works (as determined by the Site Supervisor);
- Signage is to be displayed on the exterior of the tree protection fence that displays contact details for the civil contractor;
- Signs must be made in accordance with *Australian Standard AS 1319-1994; Safety signs for the occupational environment*; and
- Signage is to remain in place for the duration of the operational works.

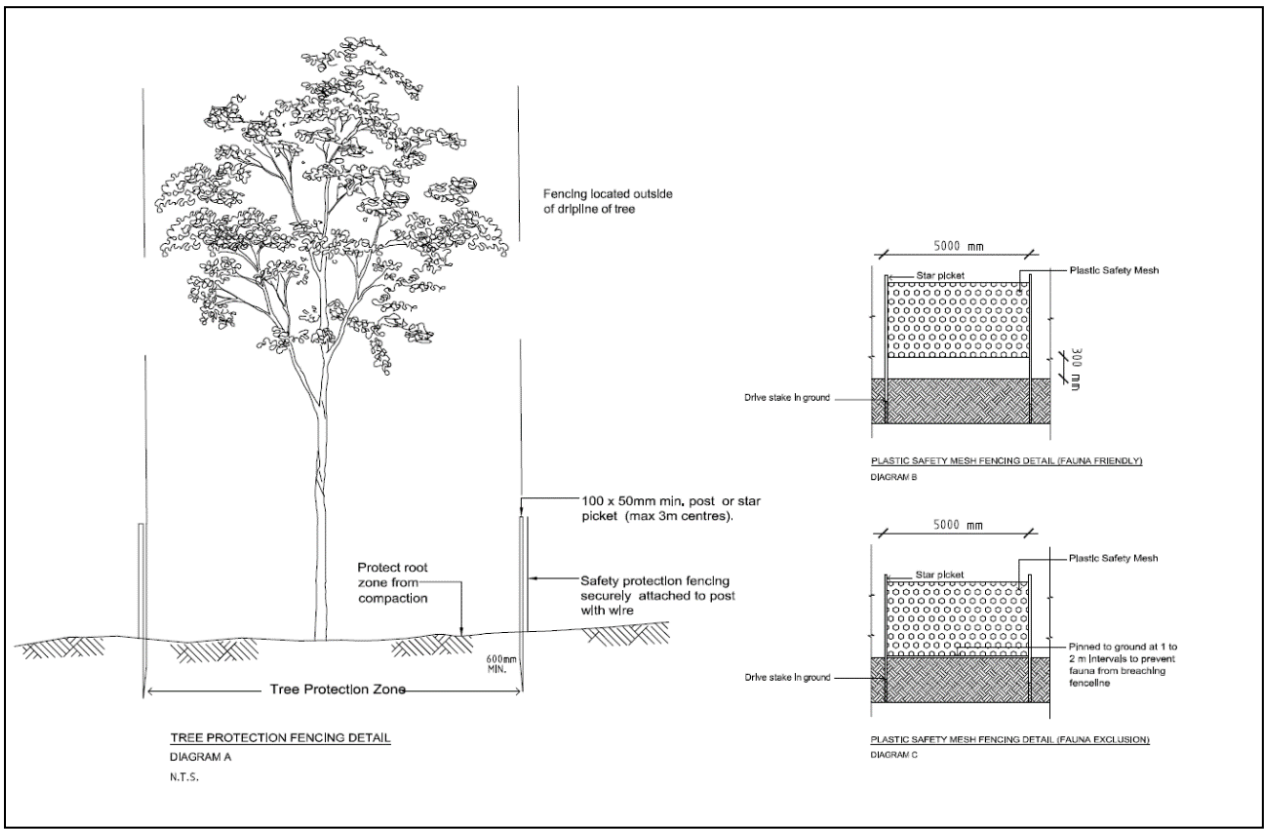



**Figure 4.2 Tree Protection Fencing Detail – Fauna Exclusion and Fauna Friendly**

Non-essential works are to be excluded from the Tree Protection Zones and all construction related activities are to be in accordance with approved plans. If temporary or permanent vehicle access is required through Tree Protection Zones, compaction bridging is to be installed and maintained in accordance with AS4970-2025.

Within the NRZ/TPZ, the following activities are not permitted:

- Storage and mixing of materials;
- Construction of unapproved pathways / trails;
- Vehicle parking;
- Earthworks;
- Construction of site office or shed;
- Storage of machinery and / or vehicles;
- Dumping of site waste;
- Liquid disposal;
- Stockpiling of mulch / chipped material / soil, rubble or debris;
- Refuelling of machinery;
- Wash down and clearing of equipment;
- Lighting of fires;
- Unauthorised application of pesticide, herbicides or chemicals;
- Erosion resulting from site works;
- Unauthorised vegetation removal; and
- Introduction of non-native species.

### 4.6 Methods of Vegetation Removal and Disposal

To minimise waste from the site, all felled timber will be recycled. Tree species suitable for milling will be removed from the site and transported to a timber milling establishment. Remaining timber is to be chipped and mulched on-site. Where possible, chipped and mulched material is to be used on site and incorporated into restoration areas, landscape features, batter stabilisation techniques or other approved site works. This material will be stockpiled for a minimum of six (6) weeks prior to use on-site to prevent nitrogen drawdown.

Non-recyclable debris is to be transported from the site and disposed of at an approved Council waste facility. Pit burning or any other method of combustion of vegetation is prohibited, both on or off-site. Any declared and / or environmental weeds removed from the site are to be disposed of at an approved Council green waste facility.

### 4.7 General Management of Trees to be Retained

Vegetation on adjoining properties will be protected during the clearing and operational stages of the development. The following general protective measures apply to this vegetation:

- Tree Protection Fencing to be installed as required by the Project Arborist and construction activities are to be confined to the approved development footprint;
- Stem wraps or other protective devices are to be implemented where deemed necessary by the Site Supervisor to protect trunks and branches from damage during specific demolition and construction activities;
- Where a protected tree's root zone and / or trunk could be damaged by the proposed earthworks, the Project Arborist will:
    - Provide advice regarding the protection of the subject tree(s);
    - Treat any roots that may be exposed during the construction; and
    - Treat any damage that may occur during construction.
- No materials, substances (e.g. herbicides, fuel, concrete, etc.) or machinery are to be stored within NRZ/TPZ. Any potentially hazardous substances are to be safely stored within a secure area away from vegetation to be retained;
- Sufficient training is to be provided to all site staff in relation to vegetation protection measures;
- Pruning of protected trees is to occur as only where determined necessary by the Project Arborist (e.g. crown thinning, removal of dead wood or damaged or overhanging limbs to promote sound tree form and health) – any such work on the trunk, foliage, or root system of the tree must adhere to the *Australian Standard AS 4373-2007: Pruning of amenity trees;*
- No protected tree is to be 'topped' and 'spur' or 'spike' climbing of any protected tree is to be avoided;
- If root pruning of a protected tree is required, it is to be undertaken using a high pressure, needle point water jet; and
- Regular assessment of trees is to occur to ensure ongoing health during operational works.

Any damage to protected trees, or surrounding soil, is to be remedied as soon as is practicable.

### 4.8 Control of Invasive and Environmental Weeds

For the purposes of this report, a weed has been defined as a species that is not native to the Gold Coast and is recognised as an environmental weed by DETSI in the Wildnet database.

Weed species are not to be introduced to the site during construction activities; this includes introduction in topsoil and / or mulch. Invasive and environmental weeds are to be controlled using appropriate methods. It is expected weeds within the development footprint will be removed as part of the earthworks however

suggested methods for weed control for are provided in Table 4.1 Weed Control Methods for the purposes of ongoing management during the construction stage.

Herbicide application is to be undertaken in accordance with the South East Queensland Restoration Framework (Chenoweth EPLA and Bushland Restoration Services, 2012). Treatment is to target introduced species only and be carried out in a manner that minimises disturbance to native plants. When undertaking herbicide application for weed control, care will be taken to ensure that no off-target damage occurs to native vegetation. To prevent any unnecessary and excessive use of herbicides during weed control activities, a vegetable-based dye will be mixed with all herbicides to be used for spray application.

All weed control on-site must be undertaken in a manner that does not promote erosion or instability of soil, particularly within drainage lines.

*Note: Where Glyphosate is indicated for use in chemical treatments, Glyphosate Biactive or an equivalent 'Frog Friendly' herbicide is recommended.*

**Table 4.1 Weed Control Methods**

| Method | Application | Procedure |
|---|---|---|
| Cut-scrape-paint | All woody shrubs and trees<br>Some vines | Prepare herbicide with 1-part of Glyphosate[1] to 1.5-parts water;<br>Cut plant low to ground at an angle and apply herbicide with a paintbrush;<br>Scrape sides lightly to reveal green tissue and apply the herbicide to the scraped area;<br>Ensure that the brush is not contaminated with soil; and<br>All species with seeds that have high viability or longevity (e.g. *Senna spp*., some members of the Fabaceae family, or plants with high invasive potential such as *Heptapleurem actinophyllum*) must be removed from the parent and either composted on-site or removed from the site. |
| Stem injection | All woody trees and shrubs with a diameter of 6-10cm or greater | Prepare herbicide with 1-part of Glyphosate[1] to 1.5-parts water;<br>With a tomahawk or saw, make a slightly angled cut approximately 1.5cm wide and 1.5cm deep into the trunk and apply herbicide immediately into the cut using a tree-injecting device;<br>Repeat this process in a brickwork pattern around the circumference of the tree, as close to the ground as possible; and<br>Two (2) rows of cuts will be sufficient for trees with trunks of 6-10cm; larger trunk diameters will require more rows. |
| Spraying | Dense infestations of shrubs and groundcover with no native species interspersed. | Using a 15L spray backpack with a nozzle providing a solid spray pattern, spray herbicide on the infestation[2]; and<br>If Glyphosate[1] is to be utilised as the herbicide, dilution rates are to be in accordance with the manufacturer's recommendations. |
| Overspray | Plants with large, dense infestations (such as Lantana camara)<br>Where dead plants should be intact to prevent erosion and over-exposure of large areas, protect native seedlings from predators and avoid trampling of the area by humans | Prepare a solution of 1-part Glyphosate[1] to 100-parts water;<br>Spray over the top of the infestation[2];<br>Leave the sprayed plants intact so that native seedlings can establish under the shelter provided; and<br>Weeds can be cut and flattened with bush-hooks or loppers and the subsequent regrowth sprayed with Glyphosate |

| Method | Application | Procedure |
|---|---|---|
| Crowning | Weeds which have their growing points beneath the surface in the form of corms, bulbs, rhizomes, clumped or fibrous root systems or similar structures (e.g. *Asparagus aethiopicus, Chlorophytum comosum* and Poaceae species) | Grasp the leaves or stems and hold them tightly so that the base of the plant is visible. Plants with sharp leaves or stems should be cut back first;<br>Insert a knife close to the base of the plant at a slight angle with the tip well under the system;<br>Cut through the roots close to the base. Depending on the size of the plant, two (2) or more cuts may be needed to sever the roots; and<br>Remove the plant and make sure that the base of the plant where the roots begin is completely removed |

Notes:

[1] –Dilution rates should always be in line with the manufacturer's recommendations and any variation requires a permit from the National Registration Authority.

[2] - To prevent any unnecessary and excessive use of herbicides during weed control activities, a vegetable-based dye should be mixed with all herbicides to be used for spraying and over spraying

# 5. Fauna Management

The actions outlined in the following sections are to be adhered to during the operational works on the subject site. They have been adapted or directly taken from the Queensland Code of Practice for the Welfare of Wild Animals Affected by Land-Clearing and other Habitat Impacts and Wildlife Spotter/Catchers (Hanger and Nottidge, 2009).

The principal management strategies are to:

- Identify wildlife and habitat features;
- Avoid impacting wildlife and habitat features where possible; and
- Mitigate and minimise these impacts.

Habitat features such as hollows were located during site assessment. Wildlife is often unpredictable and highly mobile. Mitigating impacts is necessary in the overall management of fauna as it recognised that fauna may colonise trees in the project footprint in the time from when this report was prepared and the clearing works commence post-approval. Where wildlife is present, vegetation clearing should not commence until fauna have relocated or appropriate mitigation and management measures have been implemented.

## 5.1 Pre-operational Works Actions

All fauna management procedures shall be undertaken by a qualified wildlife specialist who holds a valid DETSI issued spotter-catcher licence. The spotter-catcher must undertake a pre-clearing clearing inspection of the site to identify and mark (i.e. using flagging tape) all potential habitat values (e.g. tree hollows, nests, fissures, dreys, arboreal termitaria, ground resources) that require specific management during clearing operations. A pre-clearing assessment must be undertaken by the spotter-catcher no earlier than two (2) weeks of the commencement of clearing and the pre-clearing inspection report provided to Council one (1) week prior to the pre-start meeting.

The spotter-catcher Pre-Clearing report should identify the location of habitat features and specific operational works actions required prior to / during and after clearing.

The Pre-Clearing Report will include at a minimum:

- Breeding places and habitat features identified and / or marked on site (hollow-bearing trees, nests, water bodies etc.);
- Fauna species observed during the assessment and expected to be encountered during works;
- Available nearby refugial habitat suitable for release of fauna expected to be encountered; and
- Protection measures to be implemented including emergency contact information for nearest vet clinic and / or wildlife carer.

The spotter-catcher will be engaged to assess the level of use of native fauna and management of fauna during construction activities. The number of wildlife specialists contracted during works shall be determined by the number of machinery pieces in operation used for clearing. Typically, one (1) spotter-catcher will be required per machine.

A summary of the pre-clearing fauna mitigation strategies is presented in Table 5.1.

Vehicle exclusions and vegetation protection fencing measures must be in place prior to the pre-start meeting. All site staff are to be made aware of the no-go zones on site and the management measures adopted to minimize impacts to both fauna and flora.

**Table 5.1 Pre-clearing Fauna Mitigation Strategy**

| Activity | Management Measure | Responsibility |
|---|---|---|
| Engage a registered fauna spotter-catcher | A registered spotter-catcher will need to be present on site for the duration of vegetation clearing activities.<br>One spotter-catcher is required per machine.<br>The spotter-catcher is the only person permitted to handle wildlife.<br>The spotter-catcher is to be present at the pre-start meeting. | Site Supervisor |
| Awareness of roles and responsibilities | At the pre-start meeting, all site personnel will be made aware of their roles and responsibilities in relation to the welfare of wildlife. | Site Supervisor |
| Mark all habitat features such as hollows, wood stockpiles and nest sites | Nest and hollows should be clearly marked prior to clearing if present.<br>Machinery operators made aware of these markings.<br>Active nests should be avoided where possible.<br>Marked trees / habitat features to be removed in the presence of the spotter-catcher. | Spotter-catcher |
| Mark 'no-go' zones around vegetation to be retained | Tree protection fencing should be erected around vegetation that is to be retained. Spotter Catcher to advise of any amendments required to fencing.<br>All site personnel made aware of the no-go zones on site. | Site Supervisor |
| Relocate habitat features | Immediately prior to the commencement of clearing works ground hollows are to be relocated to the Environmental Corridor Park. | Spotter-catcher |
| Fauna flushed or hand caught prior to clearing | Immediately prior to the commencement of clearing works each day, the spotter-catcher is to examine the canopy and area to be cleared (including any stockpiles) and flush fauna / remove nests or habitat features as required.<br>Mobile species should be flushed towards retained vegetation on site or in adjacent areas.<br>Species that are not highly mobile (e.g. skinks, snakes, small mammals), should be hand caught and relocated to suitable vegetation.<br>Any dams or waterbodies to be filled are to be netted and fauna relocated in accordance with the conditions of the Spotter Catcher's license. | Spotter-catcher |

## 5.2 Operational Works Actions

A licensed spotter-catcher must be present during all clearing activities. The site should be inspected by a spotter-catcher prior to clearing and trees with hollows, termitaria and / or active nests clearly marked. The spotter-catcher will be in constant radio communication with machinery operators and on-ground clearing crews.

Prior to the commencement of works for clearing each day, the spotter-catcher is to examine the canopy and area to be cleared for arboreal mammals, nests and terrestrial habitat features, and remove and relocate fauna, nests or habitat features as required. All terrestrial fauna should be flushed from the vegetation immediately prior to clearing.

A cherry-picker is unlikely to be required as no nests or hollow bearing trees were identified. However, this will only be undertaken where access and stable foundations for the cherry picker are available and where the operation of the cherry picker will achieve compliance with Interim Australian Standard AS1418.10 [Int-2004]:

Cranes, hoists and winches. Part 10: Elevating work platforms and any other applicable Occupational Health and Safety requirements. The wildlife specialist will determine the requirement for use of the cherry picker on a case-by-case basis, considering the associated access and safety considerations. The instances in which the cherry picker will be used during clearing activities will be at the sole discretion of the wildlife specialist.

In instances where a cherry-picker cannot safely be used, an alternative is to leave hollow-bearing trees and remove surrounding vegetation. Hollow-bearing trees should be left standing at least overnight to allow for hollow-dwelling species, such as possums and gliders, to move from the site. Any hollow-bearing trees or those with arboreal termitaria are to be felled under the supervision of the spotter-catcher.

It is the responsibility of the spotter-catcher to identify significant wildlife safety risks both for wildlife retained on-site, as well as wildlife in adjacent areas or widely ranging wildlife that may use, or move through, the site during operational works.

Under-scrubbing of shrub and understorey vegetation is to take place prior to the clearing of mature and over-mature trees.

Clearing is to be directed towards retained vegetation to flush wildlife towards protected habitat. Clearing must be completed by 6 p.m. and not commence before 6 a.m.

For this site, relocation of fauna to retained vegetation is suitable within the northern sections and within the adjacent bushland to the south of site of site. However, the final relocation site will be determined at the discretion of the spotter-catcher.

Euthanasia should not be undertaken unless the animal is severely injured, or a listed pest species under local, State or Commonwealth legislation. In order of preference, outcomes for removed wildlife are as follows:

- Translocation to suitable retained vegetation on-site within the nominated area;
- Translocation to distant suitable habitat;
- Placement in an institution for rehabilitation and release, or where this is not possible for educational, conservation or research purposes; or
- Euthanasia.

Note: Euthanasia of animals must be carried out in accordance with the provisions of the Queensland *Animal Care and Protection Act 2001*. This will generally involve euthanasia being performed by a registered veterinarian following anaesthesia of the animal. Contact details of veterinarians located within the vicinity of the site are provided in Appendix D.

Where project timelines allow for flexibility in the scheduling of operational works, clearing should be timed to not take place in the main breeding period of Spring-Summer.

Dogs are not allowed into the work site. Any resident dogs on the premise are to be restrained appropriately and not allowed to move freely within the site to avoid harm to native wildlife. All site personnel will be made aware of this requirement during site induction.

A summary of the vegetation clearing fauna mitigation strategy is presented in Table 5.2.

**Table 5.2 Vegetation Clearing General Fauna Management Measures**

| Activity | Management Measure | Responsibility |
|---|---|---|
| Communication | The spotter-catcher is required to be in communication with machinery operators during the clearing operations, either by hand signals or two-way radio. | Spotter-catcher<br>Machinery operator(s) |
| Check fencing | Prior to commencement of works, daily check of all fencing to ensure it is in place in accordance with this plan (including conditions of approval) and/or Spotter Catcher recommendations. | Spotter-catcher<br>Site Supervisor |
| Direction of clearing | Clearing is to be directed towards retained vegetation west of the site.<br>Flushing of wildlife towards the road corridor is to be avoided.<br>Machine operators are to be made aware of the direction of clearing at the site pre-start meeting. | Site Supervisor |
| Clearing hollow-bearing trees or those with termitaria | Hollow-bearing trees should be left standing for at least 24 hours after surrounding vegetation has been cleared. This will allow any resident fauna a chance to move on their own volition.<br>Trees with hollows should first be 'shaken' using the blades of the machinery where possible. This is to allow any resident arboreal fauna to escape prior to the tree being felled.<br>Where possible, trees should be felled with the hollows / termitaria receiving minimal contact on impact. This can often be achieved through strategic excavation of select root structure and the weight of the machine incorporated to assist in the laying down of the tree on the ground. Adjacent felled trees may also be used to absorb the impact.<br>Trees are to be inspected post felling. If an animal remains within the hollow / termitaria, the spotter-catcher will decide to either remove the animal or remove the section of tree containing the animal. This will then be relocated to a nearby protected area. Empty hollows are to be relocated to the corridor as ground hollows. | Spotter-catcher<br>Machine operator(s) |
| Restraining fauna | Terrestrial species captured during clearing shall be restrained using appropriate bags or traps and released into habitat at the discretion of the spotter-catcher.<br>Any nocturnal species will be kept in a bag in a dark, well ventilated, quiet area and released within 1km of the subject site at dusk in suitable habitat. | Spotter-catcher |
| Injured wildlife | Any injured animal will be taken directly to a veterinary clinic for treatment. Treatment costs will be the responsibility of the site developers. Displaced young will be taken to a registered Wildlife Carer. Locations of nearby vet clinics are provided in Appendix D. | Spotter-catcher |
| Removing trees with nests | Where project timelines allow, vegetation clearing be conducted outside of the main breeding season of many wildlife species (spring and early summer).<br>Trees with active nests should be retained where possible.<br>A crane platform or cherry picker should be used to remove the nest and / or eggs or chicks prior to felling. However, this will only be undertaken where access and stable foundations for the cherry picker are available and where the operation of the cherry picker will achieve compliance with *Interim Australian Standard AS1418.10 [Int-2004]: Cranes, hoists and winches. Part 10: Elevating work platforms* and any other Occupational Health and Safety requirements. The spotter-catcher will determine the requirement for use of the cherry picker on a case-by-case basis, considering the associated access and safety considerations. | Spotter-catcher |

| Activity | Management Measure | Responsibility |
|---|---|---|
| Removing habitat features | A spotter-catcher needs to be present when potential habitat such as log piles, mulch heaps or rock piles are removed to check for any sheltering wildlife. All potential habitat features are to be relocated to the Environmental Corridor Park at the discretion of the Spotter Catcher. | Spotter-catcher |
| Stockpiles | Cleared vegetation and construction equipment should not be stockpiled where it will impede fauna movement into adjacent habitat. | Site Supervisor |
| Reporting | All wildlife that is hand-caught and moved to adjacent habitat will be recorded and details reported to QPWS. | Spotter-catcher |

### 5.2.1 Habitat Features

Piles of rubble, felled timber or any other material, proposed to be chipped, are not to be left to serve as a refuge for displaced or roaming wildlife unless they are in a protected area. Old piles of felled vegetation or other material must be treated in the same way as any other potential wildlife habitat, and must be assumed to be inhabited by wildlife, unless proven otherwise. Appropriate risk mitigation measures include immediate destruction or removal of such materials, or erection of wildlife-proof barriers to prevent wildlife use.

Any hollow bearing limbs or branches identified during clearing operations must be utilised as ground hollows within the reserve – refer to Appendix B which includes the tree table with identified habitat trees and location. Locations for ground hollows are to be determined on-site by either a Council Environmental Assessment Officer or a DETSI-approved spotter-catcher.

### 5.2.2 Terrestrial Species

Terrestrial species captured during clearing shall be restrained using appropriate bags or traps and released into habitat at the discretion of the spotter-catcher. Retained vegetation within the site, or other retained vegetation in the immediate area is considered a suitable option for the relocation of most terrestrial species. Nocturnal species shall be released after dusk. Until they can be released, these animals should be placed in a soft bag in a cool, quiet place.

### 5.2.3 Native Bees

Any native bee hives identified during clearing operations are to be preserved without damage, whether the hives are in limbs or tree trunks. Native bee hives are to be relocated by a DETSI-approved spotter-catcher from areas to be cleared, prior to any works commencing on the site, to those areas where vegetation is to be retained and / or rehabilitated.

The new location of the native bee hive is to be submitted to Council (with GPS coordinates) and included within the post clearing fauna summary, prior to the release of the vegetation performance bond.

### 5.2.4 Injured Wildlife

In some cases, a native animal captures by the spotter-catcher may require hand-rearing (in the case of dependent young) or rehabilitation because of injury or illness. In such cases, the animal shall be placed in the care of a suitable qualified wildlife carer or wildlife hospital, preferably in the vicinity of the subject site. Any costs associated with the care of displaced or injured wildlife will be the responsibility of the proponent. Appendix D provides a list of local vet clinics and wildlife hospitals.

### 5.2.5 Reporting

A post-clearing spotter-catcher report must be submitted to Council within five (5) business days of vegetation clearing being completed. The post-clearing report is to be undertaken by the DETSI-approved spotter-catcher present on site during the clearing works and must include the following as a minimum:

- Fauna species identified during clearing;
- Fauna species captured, including any native bees captured and relocated;
- Release sites for any fauna relocated with GPS coordinates to be provided for native bee hives; and
- Details of any fauna injuries or incidents.

## 6. Project Management

The site supervisor is responsible for all site works including overseeing vegetation clearing, health and safety of fauna and adhering to the development Conditions, Council guidelines and Australian Standards including AS4970-2025: Protection of trees on development sites.

The Project Arborist is responsible for ensuring appropriate arboricultural measures are undertaken to ensure the long-term health of the surrounding environment. This includes the supervision of all works within and adjacent to the NRZ as well as other measures required such as soil decompaction / aeration, mulching, crown reduction etc. as determined by the Project Arborist.

Roles and Responsibilities are summarised in Table 6.1. The Contractor is the enter contact details prior to commencement of works. Additional measures required for fauna management are detailed in section 5 of this VFMP.

**Table 6.1 Roles and Responsibilities**

| Requirement | Responsibility | Contact |
|---|---|---|
| Engage Project Arborist | Site Supervisor | TBC |
| Engage a registered fauna spotter-catcher | Site Supervisor | TBC |
| Undertake arboricultural impact assessment of trees to be retained – complete | Project Arborist | TBC |
| Undertake Preclearing Fauna Assessment | Spotter Catcher | TBC |
| Awareness of roles and responsibilities | Site Supervisor | TBC |
| Supervise works within/near TPZs | Project Arborist | TBC |
| Mark all habitat features such as hollows, wood stockpiles and nest sites | Spotter-catcher | TBC |
| Mark 'no-go' zones around vegetation to be retained | Site Supervisor | TBC |
| Relocate habitat features | Spotter-catcher | TBC |
| Fauna flushed or hand caught prior to clearing | Spotter-catcher | TBC |

## 7. Conclusions

This Vegetation and Fauna Management Plan has been prepared to support an operational works vegetation clearing application for proposed residential community title development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380). Clearing is required to facilitate the construction of the proposed development.

A site inspection of the area proposed to be restored was undertaken by the authors of this report in February and March 2026 and was focused upon the mapped minor waterway/drainage feature that is to be protected in environmental reserve and subject to rehabilitation. It is noted that this area has been highly disturbed through historic clearing, weed incursion and significant modification of the upstream and downstream catchment. This modification includes channelisation, damming, construction of stormwater infrastructure (e.g. swales, detention basins) and piping.

A total A total of 142 species of flora were detected during the surveys including 72 non-native species, eight (8) of which are Restricted Invasive Plants under the '*Biosecurity Act 2016'*. No conservation significant flora species were identified during the survey. The sites vegetation can be classed as one association – anthropogenic grassland with irregular patches/copses of native canopy and landscaped trees. This association is highly modified and degraded by historical clearing, abandoned horticultural infrastructure and significant weed incursion. In particular, *Setaria sphacelata* (South African pigeon grass) is present throughout this association, and is present as dense stands across much of the site.

A total of 282 trees were surveyed within the project area as being potentially impacted by the works with 248 identified to be removed. All trees require removal to facilitate the proposed works due to either poor structural form, earthworks impacts on the Structural Root Zone (SRZ) and/or moderate/major impacts on the Notional Root Zone (NRZ), or to facilitate construction access.

To ensure potential impacts on native wildlife and breeding places are avoided, a licensed spotter-catcher is to undertake a pre-clearing survey no more than two (2) weeks prior to the clearing to identify any nests, habitat features or fauna breeding places that may be impacted, to determine actions required prior, during and following clearing works. The Project Arborist should supervise all works to ensure that retained, protected vegetation is not impacted by the works.

All vegetation clearing works are to be undertaken in accordance with the provisions of this Vegetation and Fauna Management Plan and conditions of approval.

## 8. References

Batianoff, G.N. and Butler, D.W. (2002). Assessment of invasive naturalised plants in south-east Queensland. Environmental Protection Agency, Brisbane.

Chenoweth EPLA Bushland Restoration Services (2012) South East Queensland Ecological Restoration Framework: Guideline. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.

Eyre TJ, Ferguson DJ, Smith GC, Mathieson MT, Venz MF, Hogan, LD, Hourigan CL, Kelly, AL & Rowland, J. (2022). Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland, Version 4.0. Brisbane: Department of Environment and Science, Queensland Government.

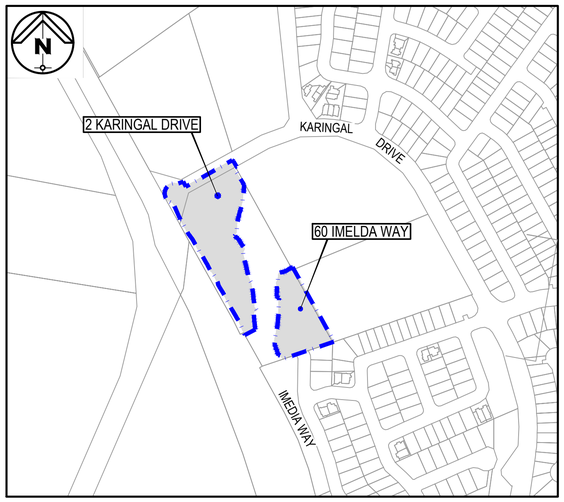
Hanger, J. and Nottidge, B. (2009). Queensland Code of Practice for the Welfare of Wild Animals Affected by Land-Clearing and other Habitat Impacts and Wildlife Spotter/Catchers. Australia Zoo Wildlife Warriors Worldwide Ltd.

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Richter, D., Addicott, E.P. and Appelman, C.N. (2022) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 6.0. Updated April 2022. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

# Appendix A – Proposed Development Design

# PROPOSED LOT DEVELOPMENT
# AT 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

## ROADWORKS & CIVIL SERVICES
## CONTRACT BE200223




LOCALITY PLAN

N.T.S.

| DRAWING INDEX | |
|---|---|
| DRG. NO | DESCRIPTION |
| C1000 | COVER SHEET |
| C1101 | TYPICAL SECTIONS & GENERAL NOTES |
| C2000 | OVERRALL BULK EARTHWORKS LAYOUT PLAN |
| C2001 | BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2 |
| C2002 | BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2 |
| C3000 | OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN |
| C3001 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2 |
| C3002 | ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2 |
| C3200 | ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3 |
| C3201 | ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3 |
| C3202 | ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3 |
| C4500 | OVERALL SEWER AND WATER RETICULATION |
| C4501 | SEWER AND WATER RETICULATION - SHEET 1 OF 2 |
| C4502 | SEWER AND WATER RETICULATION - SHEET 2 OF 2 |
| C9000 | HAZARD RISK REGISTER - DESIGN RISKS |

SURVEY

| | |
|---|---|
| PROVIDED BY: | MICHEL GROUP SERVICES |
| REPORT No: | 25218-2 Rev.A |
| DATE: | 03/02/2026 |
| SYSTEM: | PM 197770 RL 4.521 MGA 2020 |

PREPARED FOR

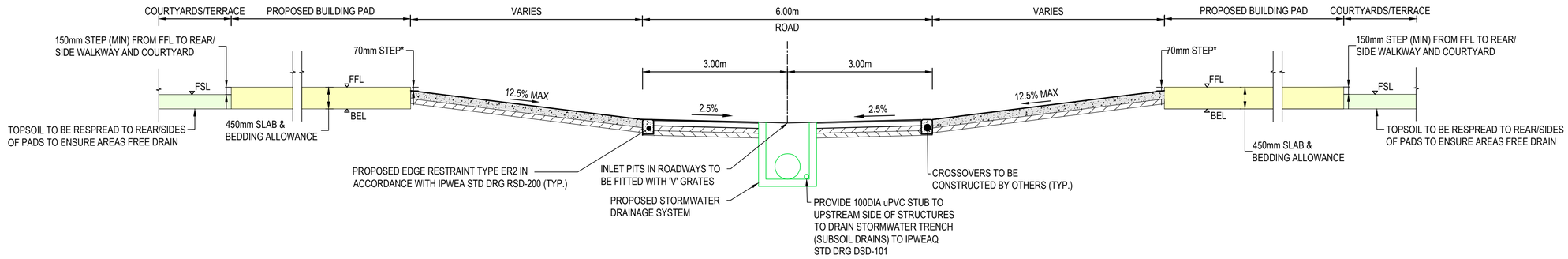
BOS

PREPARED BY

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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: | DATE : |
|---|---|---|---|
| BE20023 | C1000 | A | 11-03-26 |




## ROAD TYPICAL SECTION

SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

## LOCAL AUTHORITY

1. THE LOCAL AUTHORITY IS MORETON BAY REGIONAL COUNCIL.

## GENERAL NOTES:

1. CONTRACT DOCUMENTATION
   ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.
2. SURVEY INFORMATION
   CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).
4. EXISTING SURVEY CONTROL STATIONS
   THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.
5. EXISTING SERVICES
   EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES AND UNDERTAKE A DIAL-BEFORE-YOU-DIG SEARCH TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.
6. SITE ACCESS
   THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT. FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE SHALL BE MAINTAINED AT ALL TIMES.
7. PROVISION FOR TRAFFIC
   PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.
8. WORK BOUNDARIES
   THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS WORK AREAS UNDER THIS CONTRACT. AT NO TIME SHALL THE CONTRACTOR ENTER ADJOINING PROPERTIES OR CONTRACT WORK AREAS ON THE SITE WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT.
9. TOPSOIL STRIPPING
   ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND ALLOTMENTS.
10. EARTHWORKS (GENERAL)
    ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION.
    ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
11. COMPACTION STANDARDSALL FILL MATERIAL PLACED UNDER THIS CONTRACT SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND CURRENT COUNCIL STANDARDS.
12. STORMWATER DRAINAGELOCATION AND ALIGNMENT OF ALL STORMWATER DRAINLINES IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. THE DESIGN SURFACE LEVELS OF MANHOLES AND OTHER STRUCTURES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT. ALL DRAINAGE CONSTRUCTION SHALL BE IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS AND SPECIFICATION.
13. SEWERAGE RETICULATIONTHE DESIGN SURFACE LEVELS OF SEWER MANHOLES ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION. ALL SEWERAGE RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
14. WATER RETICULATIONALL WATER RETICULATION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE (SEQ CODE) AND ASSOCIATED STANDARD DRAWINGS.
15. ELECTRICAL RETICULATIONALIGNMENTS OF ALL CONDUIT CROSSINGS ARE TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO EXCAVATION. ALL TRENCHING AND CONDUIT WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT CONSULTANT'S DRAWINGS AND ENERGEX SPECIFICATION "UNDERGROUND DISTRIBUTION CONSTRUCTION."
16. TESTINGALL TESTING SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. TESTING AUTHORITY IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND COUNCIL STANDARDS.
17. "AS CONSTRUCTED" SURVEY"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.
18. MAINTENANCE OF SITE CONDITIONAT THE COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND RELEVANT COUNCIL REPRESENTATIVE.
19. REFERENCED DOCUMENTSALL DRAWINGS TO BE READ IN CONJUNCTION WITH:- LANDSCAPE ARCHITECTS DRAWINGS- ELECTRICAL DRAWINGS- VEGETATION MANAGEMENT AND TREE CLEARING REQUIREMENTS
    - HYDRAULIC CONSULTANTS DRAWINGS
    - STRUCTURAL DRAWINGS

## PAVEMENT & KERB NOTES:

1. THE COMPACTED DEPTHS OF PAVEMENT SHOWN ON THE DRAWINGS ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED AFTER SUBGRADE TESTS ARE TAKEN.
2. PAVEMENT MATERIAL SHALL CONFORM TO THE CURRENT MORETON BAY COUNCIL LAND DEVELOPMENT GUIDELINES.
3. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
4. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE PRELIMINARY DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
5. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS N32, AND THE MIX DESIGNED SPECIFCALLY FOR EXTRUSION.
6. REFER IPWEAQ STD. DRG. RSD-200 FOR TYPICAL KERB DETAILS AND NOTES.
7. IF CLAY BACKFILL IS USED, PROVIDE A BOND BREAKER (PLASTIC MEMBRANE OR EQUIV.) TO BACK OF KERB.

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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |

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IPSWICH | MORETON BAY
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : TYPICAL SECTIONS & GENERAL NOTES

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

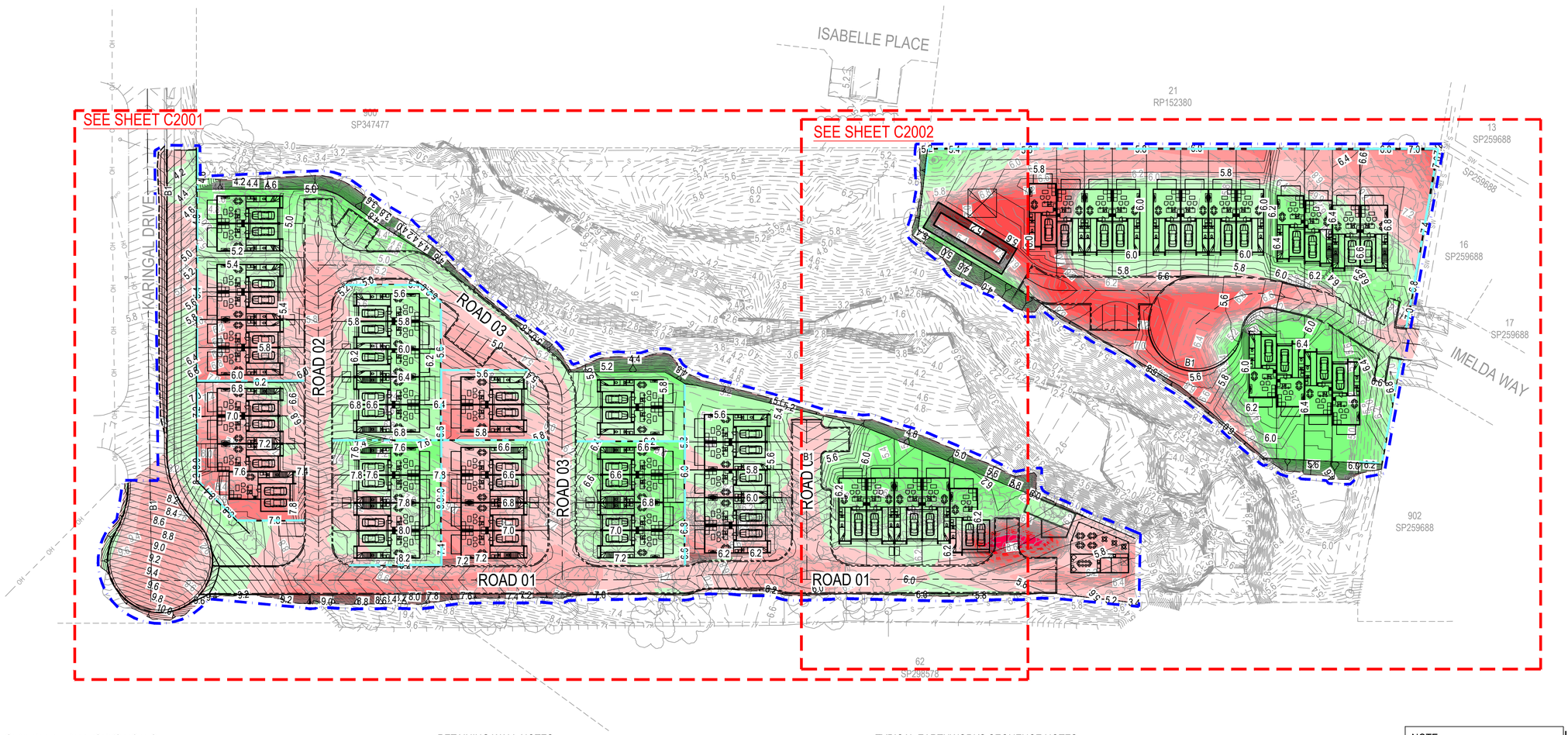
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
1.0 0 1.0 2.0
1 : 50 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 11-03-26
PROJECT LEADER : -
DESIGNER : BNB
DRAFTSPERSON : BNB
CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C1101 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:
   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

## RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ.
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONTRACTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

## TYPICAL EARTHWORKS SEQUENCE NOTES:

1. CONSTRUCT DIVERSION DRAINS AS DIRECTED TO DIVERT SITE RUNOFF AWAY FROM CONSTRUCTION AREAS. ESTABLISH DE-WATERING CONTROLS TO ENSURE THAT THE CONSTRUCTION AREAS REMAIN FREE OF SURFACE WATER AND PONDING.
2. FOLLOWING COMPLETION OF CLEARING OPERATIONS AND REMOVAL OF RESIDUAL VEGETATION AND DEBRIS, STRIP TOPSOIL TO A NOMINAL 200mm DEPTH AND PLACE IN TEMPORARY STOCKPILES IN LOCATIONS APPROVED BY THE SUPERINTENDENT.
3. PROOF-ROLL AND COMPACT THE PROPOSED FILL AREAS FOLLOWING TOPSOIL STRIPPING, TO THE SATISFACTION OF THE SUPERINTENDENT.
4. ANY STRIPPED AREAS WHICH DEMONSTRATE EXCESSIVE MOVEMENT OR DO NOT IMPROVE SUFFICIENTLY UNDER PROOF-ROLLING ARE TO BE REMOVED, REPLACED WITH APPROVED SITE MATERIAL AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
5. ANY UNSUITABLE MATERIAL ENCOUNTERED, INCLUDING SILTY MATERIAL AND UN-CONTROLLED FILL IS TO BE EXCAVATED TO THE EXTENTS AND DEPTHS NOMINATED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT, REMOVED TO NON-STRUCTURAL FILL AREAS OR TAKEN OFF-SITE AS DIRECTED AND REPLACED WITH APPROVED, COMPACTED FILL MATERIAL.
6. PLACE STRUCTURAL FILL MATERIAL FROM SITE EXCAVATIONS TO NOMINATED SITE FILL AREAS, INCLUDING BENCHING AND COMPACTION IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND TRIMMING AND FINAL PROFILING OF BATTERS.

**NOTE:**
ALL RETAINING WALL AGGREGATE PIPES TO BE CONNECTED TO THE STORMWATER DRAINAGE SYSTEM.

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 3,489 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 3,312 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 3,489 cu.m.
i.e. 3,489 cu.m. - 3,312 cu.m. = 177 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

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| A | ORIGINAL ISSUE | 11-03-26 |

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : SITE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

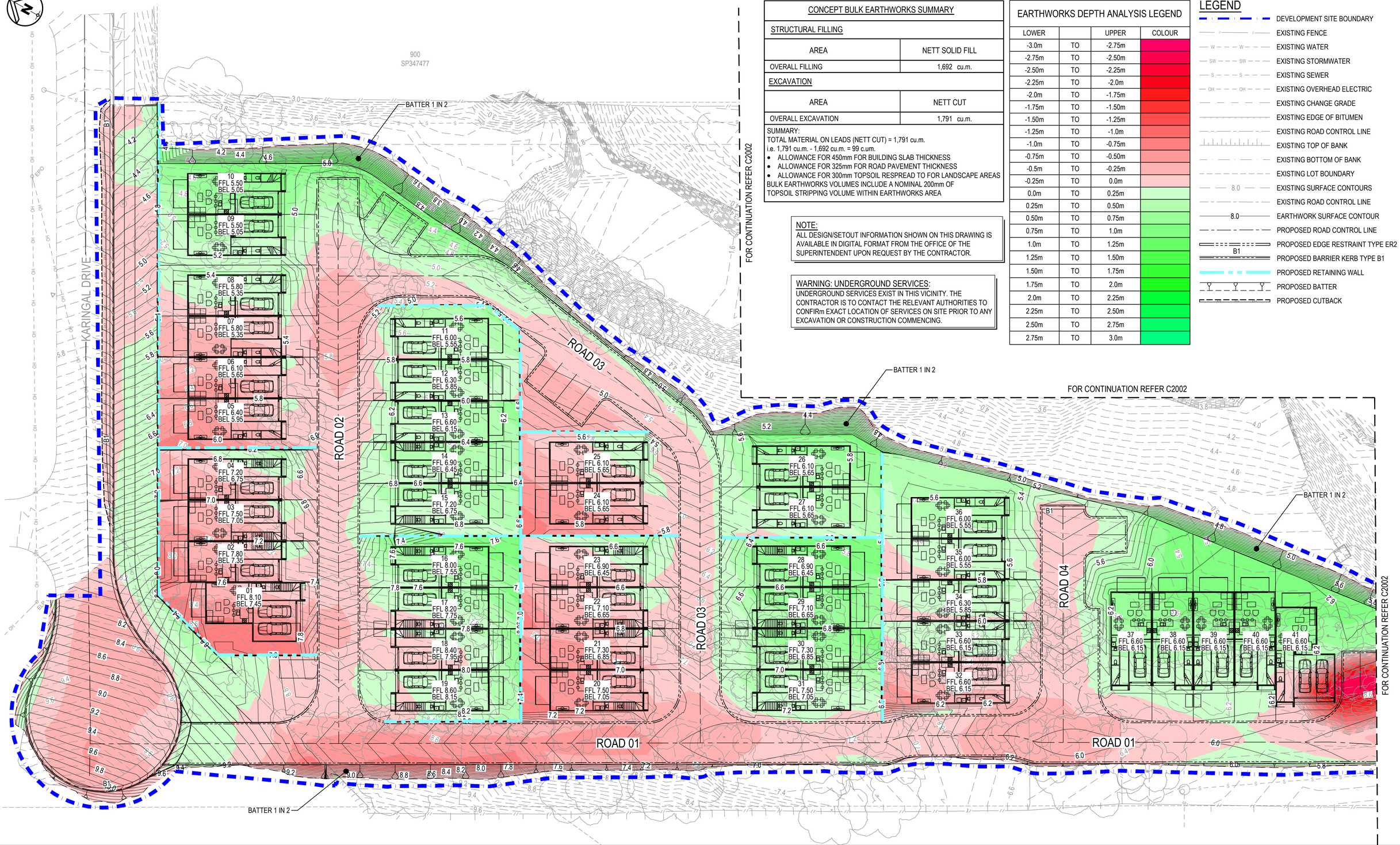
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-06 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2000 | A |




## CONCEPT BULK EARTHWORKS SUMMARY

### STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,692 cu.m. |

### EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,791 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT CUT) = 1,791 cu.m.
i.e. 1,791 cu.m. - 1,692 cu.m. = 99 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
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## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED CUTBACK


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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
# BULK EARTHWORKS LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
## 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

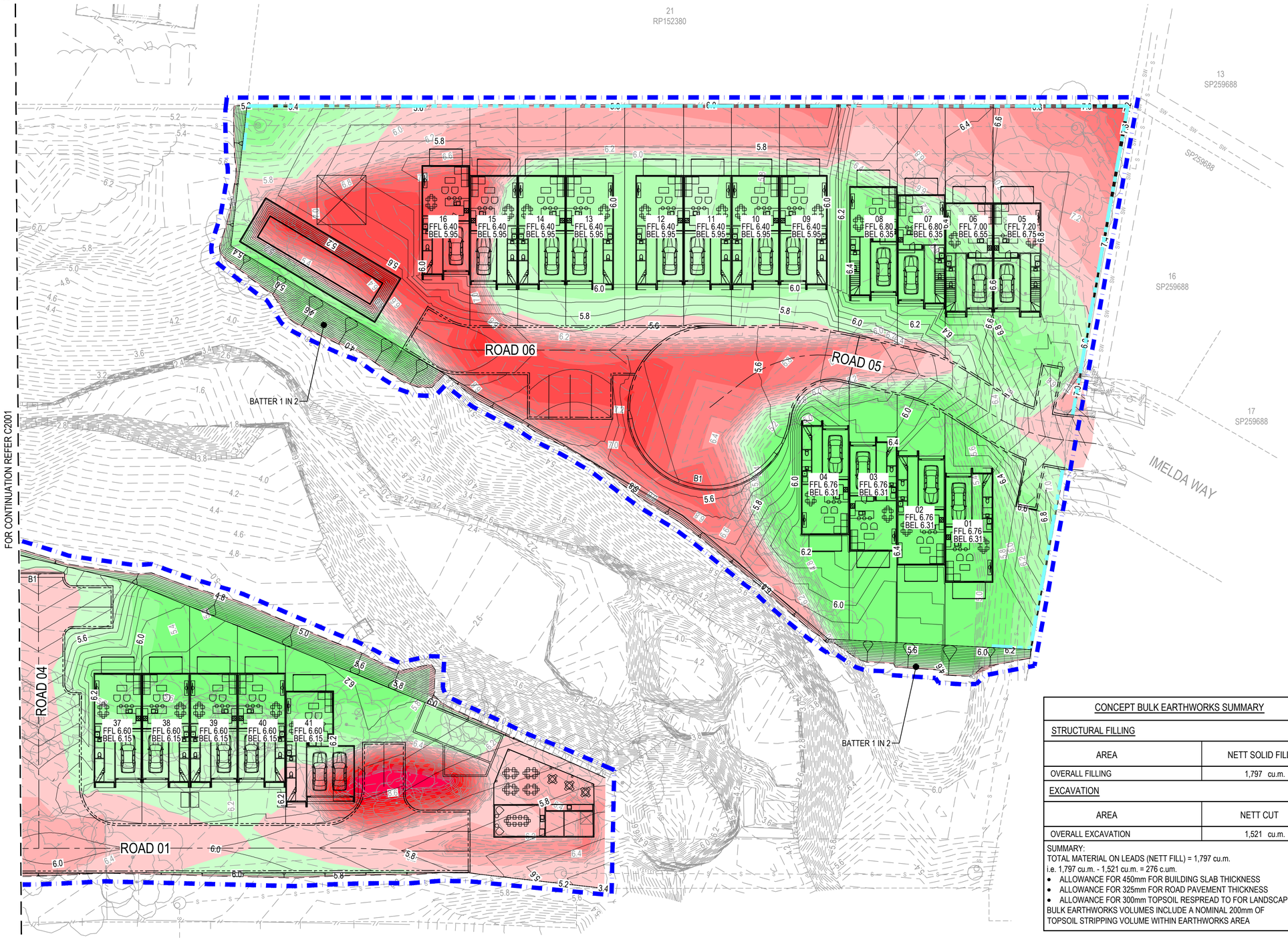
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2001 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING SURFACE CONTOURS
- EXISTING ROAD CONTROL LINE
- EARTHWORK SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER

## EARTHWORKS DEPTH ANALYSIS LEGEND

| LOWER | | UPPER | COLOUR |
|---|---|---|---|
| -3.0m | TO | -2.75m | |
| -2.75m | TO | -2.50m | |
| -2.50m | TO | -2.25m | |
| -2.25m | TO | -2.0m | |
| -2.0m | TO | -1.75m | |
| -1.75m | TO | -1.50m | |
| -1.50m | TO | -1.25m | |
| -1.25m | TO | -1.0m | |
| -1.0m | TO | -0.75m | |
| -0.75m | TO | -0.50m | |
| -0.5m | TO | -0.25m | |
| -0.25m | TO | 0.0m | |
| 0.0m | TO | 0.25m | |
| 0.25m | TO | 0.50m | |
| 0.50m | TO | 0.75m | |
| 0.75m | TO | 1.0m | |
| 1.0m | TO | 1.25m | |
| 1.25m | TO | 1.50m | |
| 1.50m | TO | 1.75m | |
| 1.75m | TO | 2.0m | |
| 2.0m | TO | 2.25m | |
| 2.25m | TO | 2.50m | |
| 2.50m | TO | 2.75m | |
| 2.75m | TO | 3.0m | |

## CONCEPT BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING

| AREA | NETT SOLID FILL |
|---|---|
| OVERALL FILLING | 1,797 cu.m. |

EXCAVATION

| AREA | NETT CUT |
|---|---|
| OVERALL EXCAVATION | 1,521 cu.m. |

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 1,797 cu.m.
i.e. 1,797 cu.m. - 1,521 cu.m. = 276 c.um.

- ALLOWANCE FOR 450mm FOR BUILDING SLAB THICKNESS
- ALLOWANCE FOR 325mm FOR ROAD PAVEMENT THICKNESS
- ALLOWANCE FOR 300mm TOPSOIL RESPREAD TO FOR LANDSCAPE AREAS

BULK EARTHWORKS VOLUMES INCLUDE A NOMINAL 200mm OF TOPSOIL STRIPPING VOLUME WITHIN EARTHWORKS AREA

**NOTE:**
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GOLD COAST | BRISBANE | TOOWOOMBA
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : BULK EARTHWORKS LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | | |
|---|---|---|
| DEVEL. APPLIC. No. : | | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB | |
| DRAFTSPERSON : BNB | CHECKED : - | |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C2002 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED STORMWATER MANHOLE
- PROPOSED HEADWALL
- PROPOSED UNIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED ROCK PROTECTION
- PROPOSED COURTYARD
- PROPOSED 1.5m FOOTPATH
- PROPOSED BIORETENTION BASIN

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**NOTE:**
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL ROADWORKS AND DRAINAGE LAYOUT PLAN

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

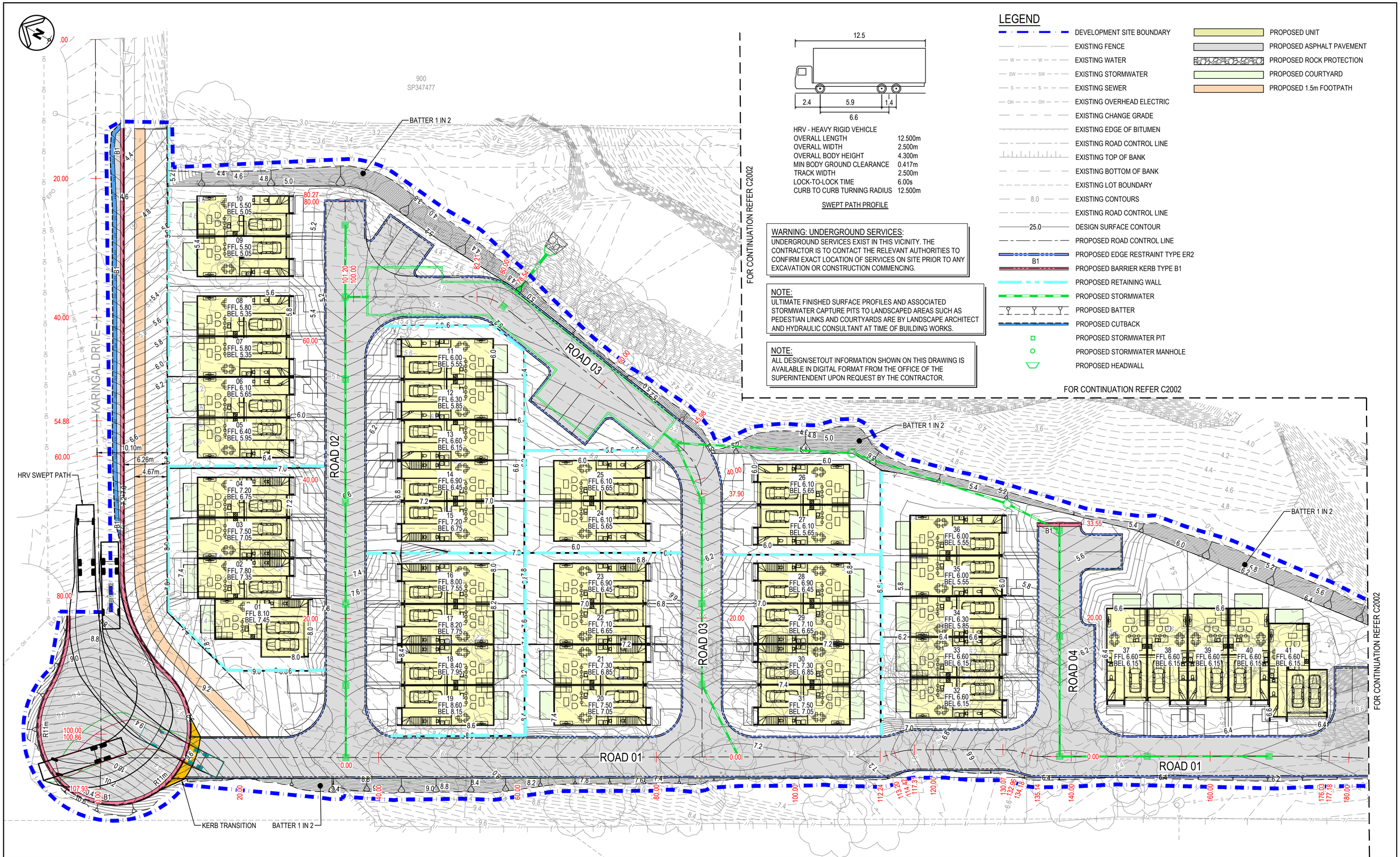
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3000 | A |




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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE :
ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 1 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3001 | A |




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NOTE:
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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROADWORKS AND DRAINAGE LAYOUT PLAN - SHEET 2 OF 2

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

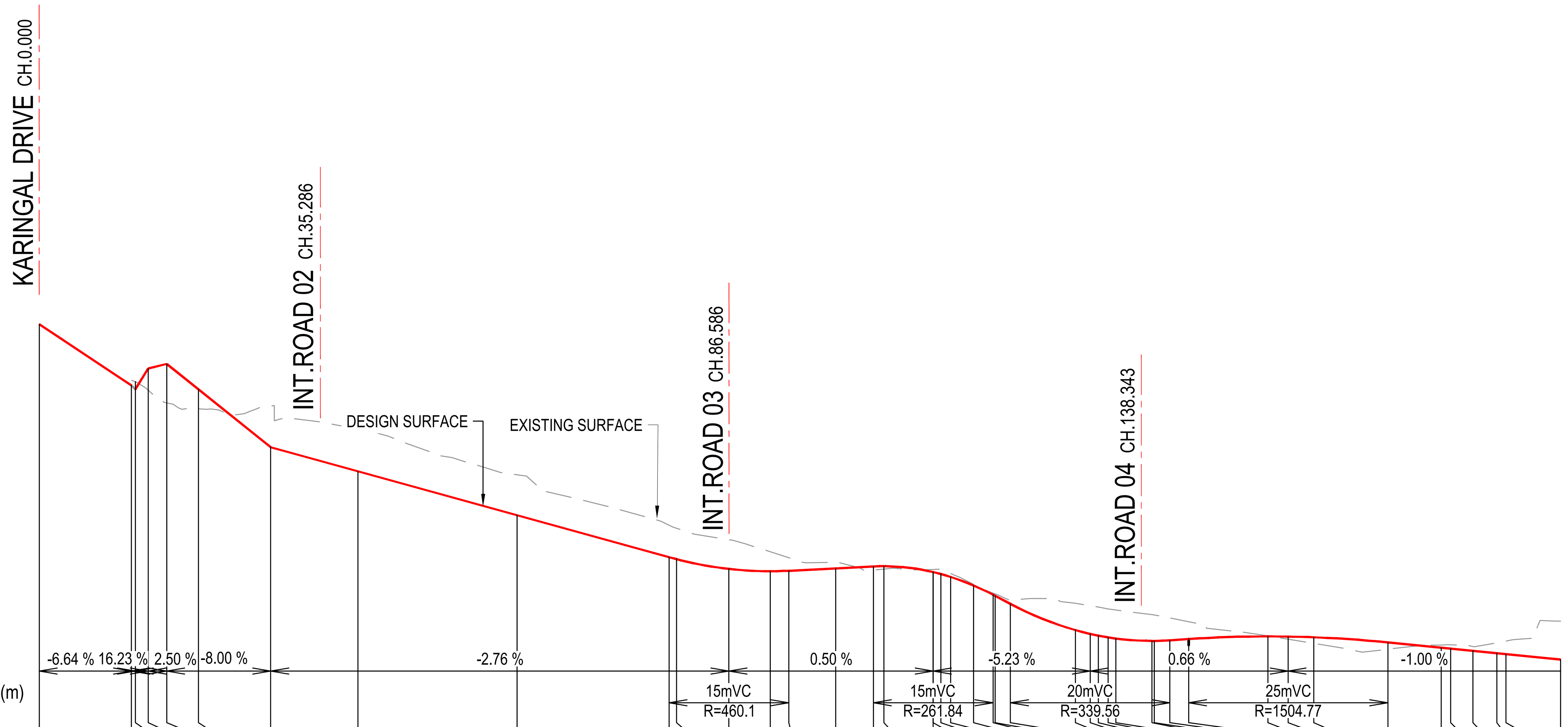
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres) 5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3002 | A |




DATUM R.L. 5.00

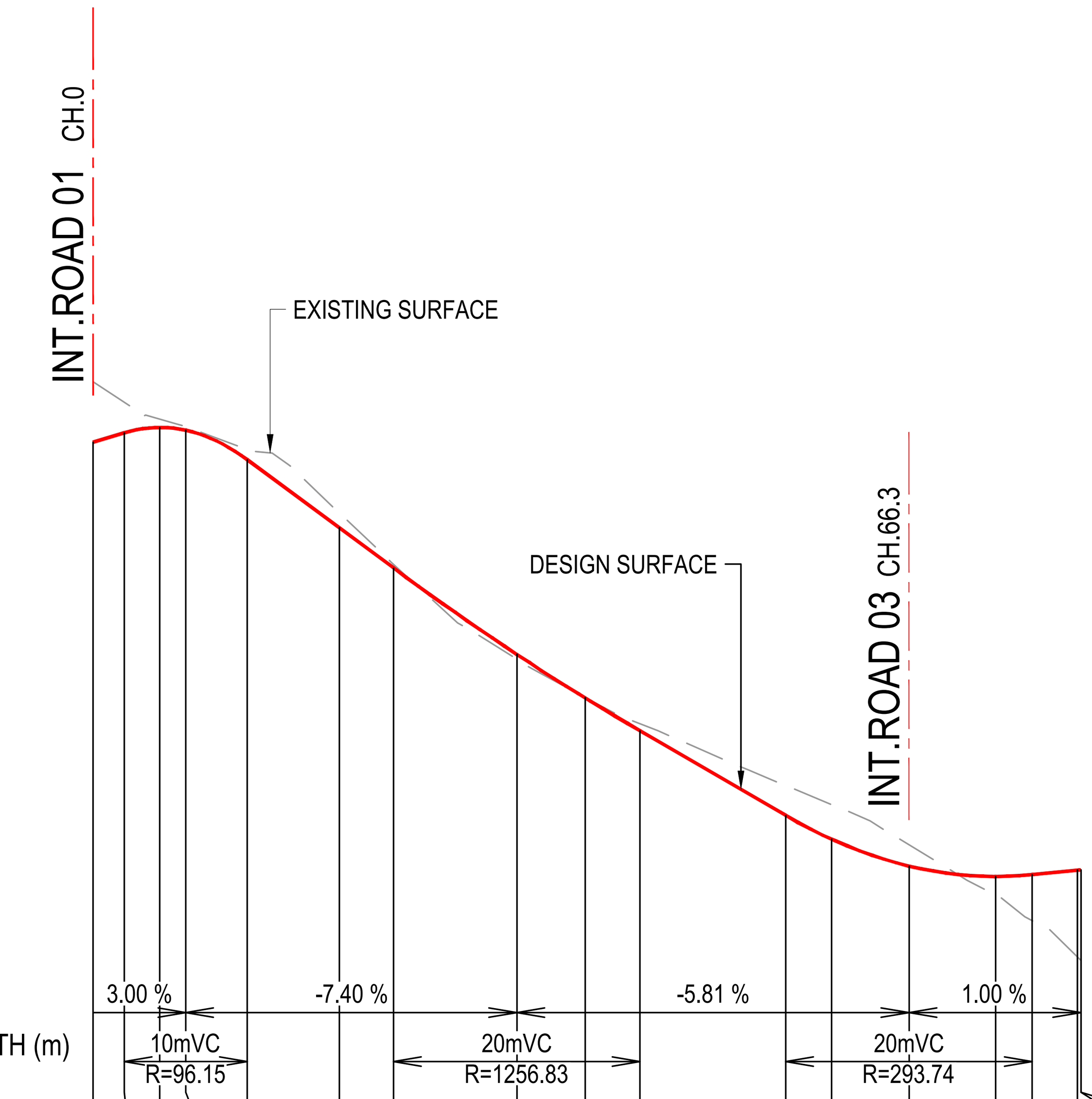
| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | 0.000 | 10.252 | 10.252 |
| 11.575 | 0.007 | 9.483 | 9.476 |
| 12.065 | -0.097 | 9.434 | 9.531 |
| 13.674 | 0.270 | 9.695 | 9.425 |
| 16.000 | 0.490 | 9.753 | 9.263 |
| 20.000 | 0.241 | 9.433 | 9.192 |
| 29.066 | -0.518 | 8.708 | 9.226 |
| 40.000 | -0.532 | 8.406 | 8.938 |
| 60.000 | -0.508 | 7.854 | 8.362 |
| 79.086 | -0.401 | 7.327 | 7.728 |
| 80.000 | -0.387 | 7.303 | 7.690 |
| 86.586 | -0.366 | 7.181 | 7.548 |
| 91.784 | -0.244 | 7.152 | 7.396 |
| 94.086 | -0.164 | 7.158 | 7.322 |
| 100.000 | -0.077 | 7.187 | 7.264 |
| 104.736 | 0.044 | 7.211 | 7.166 |
| 106.045 | 0.035 | 7.214 | 7.179 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 112.236 | -0.033 | 7.141 | 7.174 |
| 113.201 | -0.054 | 7.116 | 7.170 |
| 114.416 | -0.042 | 7.080 | 7.122 |
| 117.312 | -0.013 | 6.972 | 6.985 |
| 119.736 | -0.020 | 6.856 | 6.876 |
| 120.000 | -0.024 | 6.842 | 6.866 |
| 121.932 | -0.050 | 6.741 | 6.792 |
| 130.067 | -0.335 | 6.414 | 6.749 |
| 131.932 | -0.354 | 6.366 | 6.720 |
| 132.963 | -0.357 | 6.344 | 6.701 |
| 134.178 | -0.356 | 6.322 | 6.678 |
| 135.143 | -0.356 | 6.308 | 6.663 |
| 139.686 | -0.331 | 6.277 | 6.608 |
| 140.000 | -0.326 | 6.277 | 6.603 |
| 141.932 | -0.282 | 6.285 | 6.566 |
| 144.300 | -0.219 | 6.300 | 6.519 |
| 154.254 | -0.005 | 6.333 | 6.339 |
| 156.800 | 0.033 | 6.331 | 6.298 |
| 160.000 | 0.076 | 6.322 | 6.246 |
| 169.300 | 0.085 | 6.258 | 6.173 |
| 176.025 | -0.036 | 6.191 | 6.226 |
| 177.175 | -0.048 | 6.179 | 6.227 |
| 180.000 | -0.057 | 6.151 | 6.208 |
| 182.986 | -0.132 | 6.121 | 6.253 |
| 184.136 | -0.166 | 6.110 | 6.276 |
| 191.003 | -0.486 | 6.041 | 6.527 |

HORIZIONTALGEOMETRY

R-3.00m R9.00m  
0.97m 2.90m  
R9.00m R-3.00m  
2.90m 0.97m  
R20.00m R-20.00m  
1.15m 1.15m

## ROAD 01 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.  
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)  
(metres)




DATUM R.L. 3.00

| CONTROL LINE CHAINAGE | DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve) | FINISHED SURFACE LEVEL | EXISTING SURFACE LEVEL |
|---|---|---|---|
| 0.000 | | 8.536 | |
| 2.535 | -0.248 | 8.612 | 8.859 |
| 5.419 | -0.068 | 8.655 | 8.723 |
| 7.535 | -0.026 | 8.632 | 8.658 |
| 12.535 | -0.083 | 8.392 | 8.475 |
| 20.000 | -0.123 | 7.839 | 7.962 |
| 24.434 | -0.030 | 7.511 | 7.541 |
| 34.434 | 0.040 | 6.811 | 6.771 |
| 40.000 | -0.004 | 6.456 | 6.460 |
| 44.434 | -0.056 | 6.190 | 6.246 |
| 56.300 | -0.243 | 5.501 | 5.745 |
| 60.000 | -0.281 | 5.309 | 5.591 |
| 66.300 | -0.173 | 5.090 | 5.264 |
| 73.363 | 0.150 | 5.006 | 4.855 |
| 76.300 | 0.373 | 5.020 | 4.648 |
| 80.000 | 0.708 | 5.057 | 4.349 |
| 80.266 | 0.737 | 5.060 | 4.322 |
| 80.274 | | | 4.322 |

HORIZIONTALGEOMETRY

## ROAD 02 LONGITUDINAL SECTION

SCALES 5 0 5 10 15 20 25 — 1 : 500 HORIZ.  
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)  
(metres)

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| A | ORIGINAL ISSUE | 11-03-26 |

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 1 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

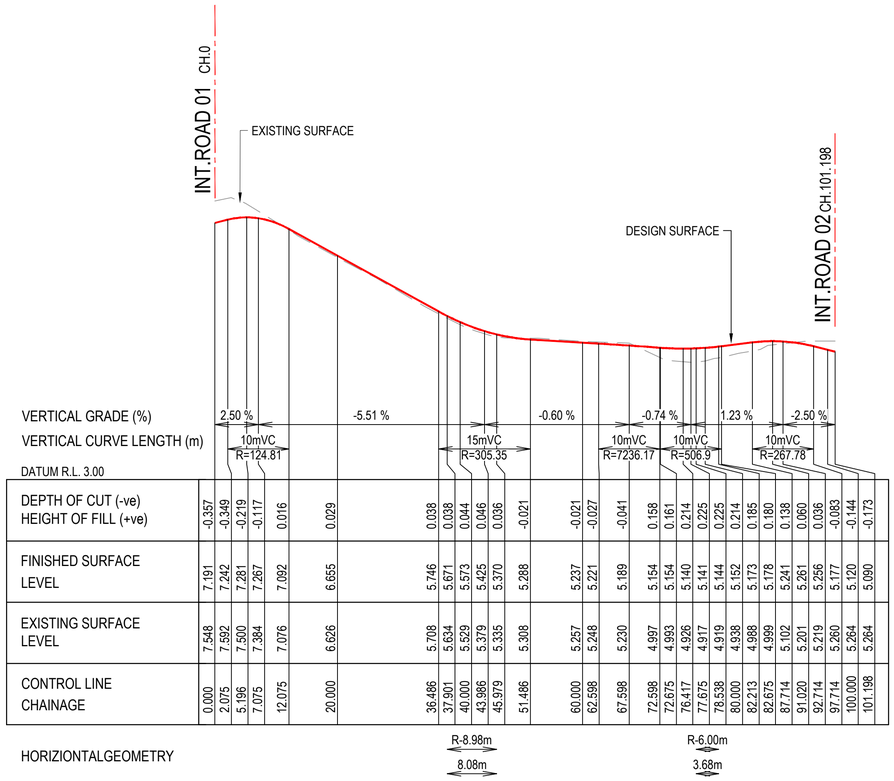
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : | DATE : 11-03-26
PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

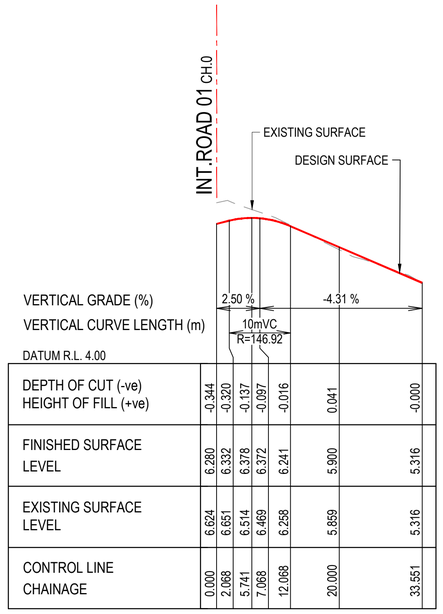
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PROJECT No.: BE20023 | DRAWING No. : C3200 | VERSION: A



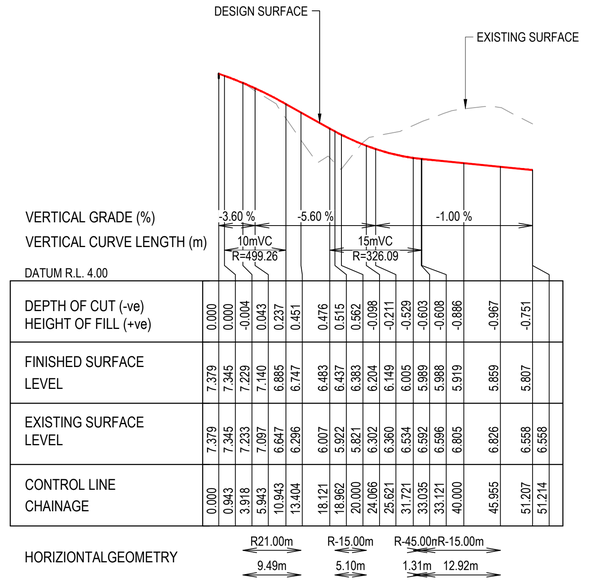

## ROAD 03 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 04 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)




## ROAD 05 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT.
(metres) (FULL SIZE)

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ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 2 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

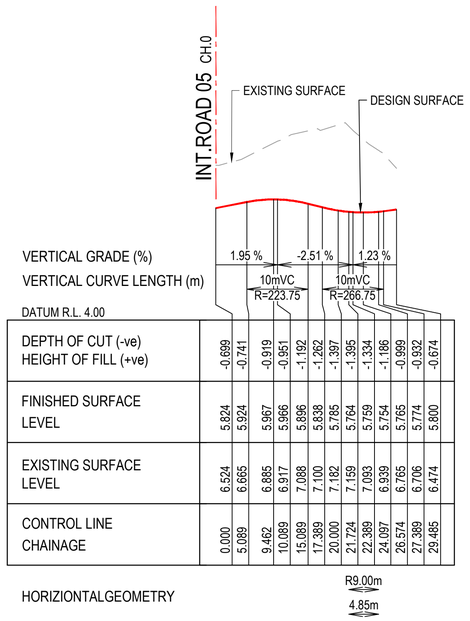
PRELIMINARY
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SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : | DATE : 11-03-26
PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

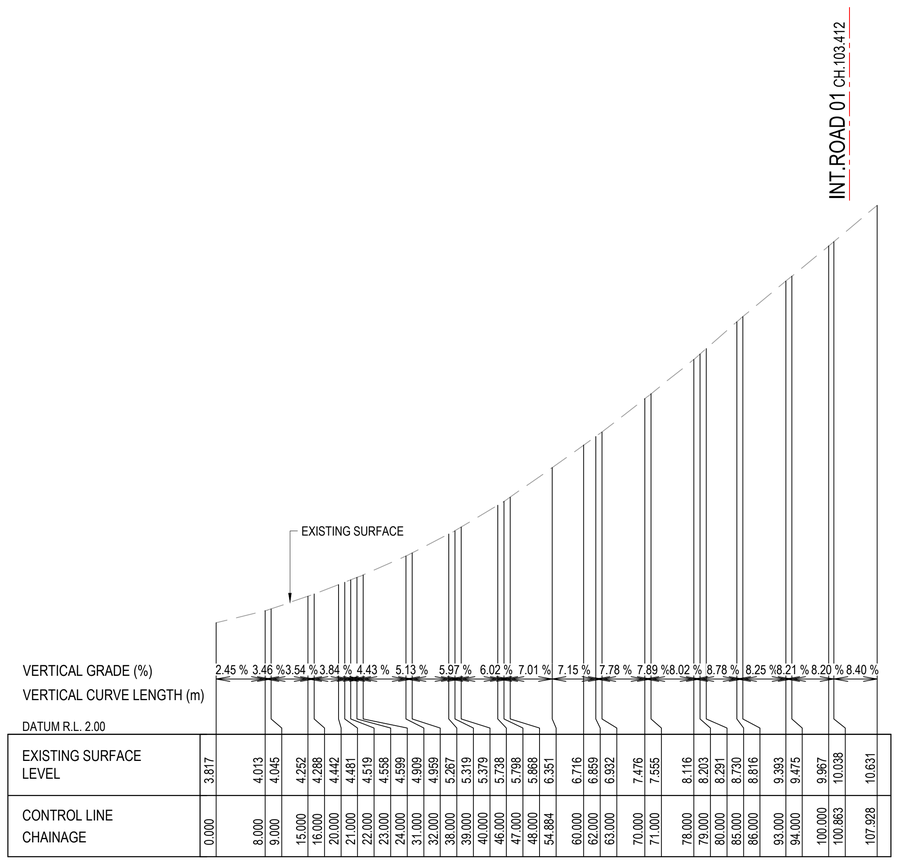
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| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3201 | A |




## ROAD 06 LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)




## KARINGAL DRIVE LONGITUDINAL SECTION

SCALES
5 0 5 10 15 20 25 — 1 : 500 HORIZ.
0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)
(metres)


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ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE : ROAD LONGITUDINAL SECTIONS - SHEET 3 OF 3

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

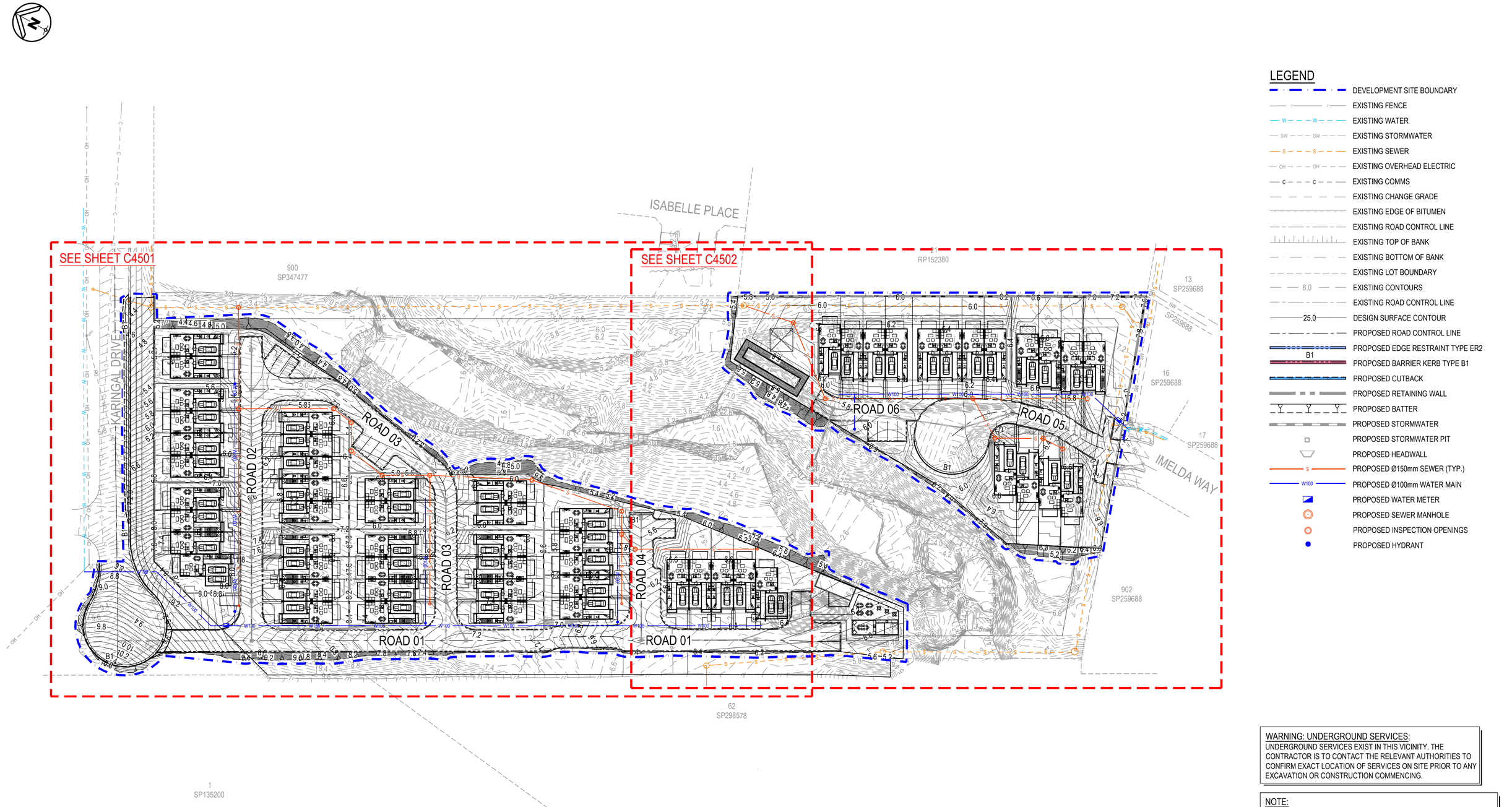
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : — DATE : 11-03-26
PROJECT LEADER : - — DESIGNER : BNB
DRAFTSPERSON : BNB — CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C3202 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED CUTBACK
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED STORMWATER PIT
- PROPOSED HEADWALL
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
- PROPOSED WATER METER
- PROPOSED SEWER MANHOLE
- PROPOSED INSPECTION OPENINGS
- PROPOSED HYDRANT

**WARNING: UNDERGROUND SERVICES:**
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

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EMAIL: ADMIN@BURCHILLS.COM.AU
**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365

CLIENT : BOS

DRAWING TITLE : OVERALL SEWER AND WATER RETICULATION

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

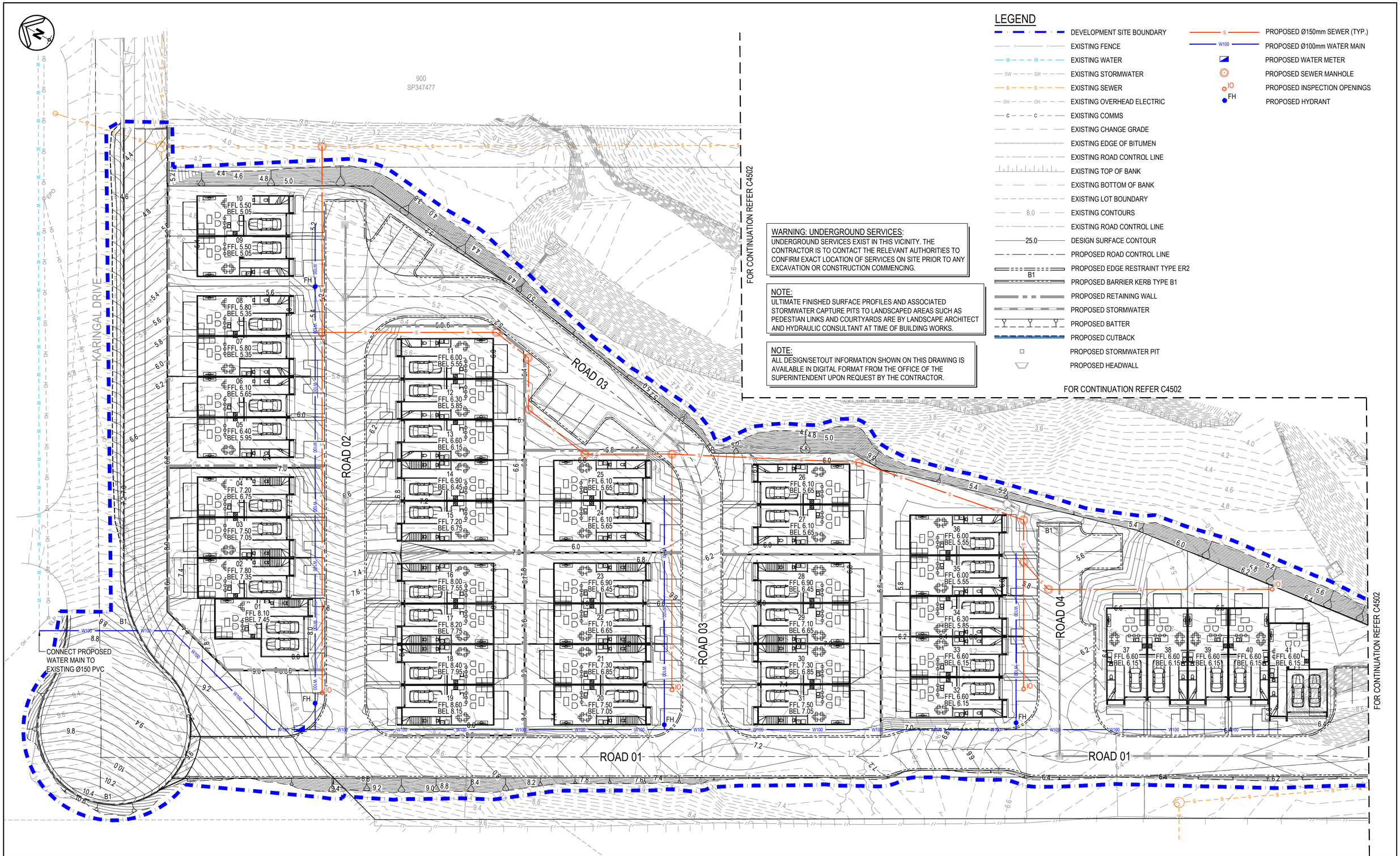
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
2.5 0 2.5 5 7.5 10 12.5
1 : 500 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

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| PROJECT No.: | DRAWING No. : | VERSION: |
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| BE20023 | C4500 | A |





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ABN 76 166 942 365


CLIENT :

BOS

DRAWING TITLE :

SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 1 OF 2

PROJECT :

2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C4501 | A |




## LEGEND

- DEVELOPMENT SITE BOUNDARY
- EXISTING FENCE
- EXISTING WATER
- EXISTING STORMWATER
- EXISTING SEWER
- EXISTING OVERHEAD ELECTRIC
- EXISTING COMMS
- EXISTING CHANGE GRADE
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CONTROL LINE
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING LOT BOUNDARY
- EXISTING CONTOURS
- EXISTING ROAD CONTROL LINE
- DESIGN SURFACE CONTOUR
- PROPOSED ROAD CONTROL LINE
- PROPOSED EDGE RESTRAINT TYPE ER2
- PROPOSED BARRIER KERB TYPE B1
- PROPOSED RETAINING WALL
- PROPOSED BATTER
- PROPOSED STORMWATER
- PROPOSED HEADWALL
- PROPOSED STORMWATER PIT
- PROPOSED Ø150mm SEWER (TYP.)
- PROPOSED Ø100mm WATER MAIN
- PROPOSED WATER METER
- PROPOSED SEWER MANHOLE
- PROPOSED INSPECTION OPENINGS
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**COOTE BURCHILLS ENGINEERING PTY LTD**
ABN 76 166 942 365


CLIENT : BOS

DRAWING TITLE :
SITE LAYOUT PLAN
SEWER AND WATER RETICULATION - SHEET 2 OF 2

PROJECT :
2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
SCALE (metres)
5 0 5 10
1 : 250 (FULL SIZE)

| | |
|---|---|
| DEVEL. APPLIC. No. : | DATE : 11-03-26 |
| PROJECT LEADER : - | DESIGNER : BNB |
| DRAFTSPERSON : BNB | CHECKED : - |

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C4502 | A |

# QMS RISK & OPPORTUNITIES REGISTER
# SAFETY IN DESIGN – NORMAL DESIGN RISKS - CIVIL

| Design Element | Associated risks & opportunities | Raw risk assessment | | Raw risk rating | Treatment Measures to avoid, minimize or treat the risk. | Responsibility | Residual risk rating |
|---|---|---|---|---|---|---|---|
| | | Likelihood | Consequence | | | | |
| **CONSTRUCTION PHASE** | | | | | | | |
| **SITE ACCESS** | Unsafe site access and egress point, restricted access, flooding, unauthorised access from persons or animals | L | M | L-M | Prepare site specific Construction Traffic Management Plan and Workplace Health and Safety Management Plan | Principal Contractor | L |
| **CLEARING & DEMOLITION** | Removal of existing structures, decommision of services, vegetation clearing and fauna management | M | H | M-H | Contractor to obtain Demolition Permit, arrange all service disconnections with asset ownerand carry out vegetation works in accordance with Vegetation and Fauna Management Plan | Principal Contractor | L |
| **EXISTING SERVICES** | Distrub or damage existing services and infrastructure, overhead powerlines, work adjacent to existing services, existing service relocations | M | H | M-H | Client to commission detailed site survey and service potholing at critical locations. Contractor to undertake Dial Before You Dig and service verification with service authoritiy providers and undertake additional potholing prior to construction | Client and Principal Contractor | L-M |
| **EXCAVATION & TRENCHING** | Unstable existing slopes and landslip, steep cut profiles, deep trench excavations, working at heights, intercept water table, dispersive soils, acid sulphate soils | M | H | M-H | Client to commission a geotechnical investigation and contractors to undertake own investigations. Temporary and final earthworks profiles confirmed by client's geotechnical consultant. Tempory earthworks profile to be confirmed by Contractor's geotechnical consultant. Contractor to provide temporary benching, fencing, stabilisation and shoring. | Client and Principal Contractor | L |
| **MATERIALS HANDLING** | Manual handling, handling and disposal of sharps, repeative work processeds, hazardous substances | H | M | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including Material Safety Data Sheets | Principal Contractor | L |
| **PLANT & EQUIPMENT** | Operation of plant and machinery, site access by visitors, material deliveries and waste removal | M | H | M-H | Contractor or provide a site specific Workplace Health and Safety Management Plan including register of operator machinery tickets. Contractor to maintain a site visitor register and provide site specific induction to all visitors | Principal Contractor | L |
| **OPERATIONAL PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | General road safety, flood free access, pedestrian and cyclist injuries, inadequate signage | L | H | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **STORWATER / FLOODING** | Hazard from storm and flood water depths and velocities, ponding and access to inlets, outlets and basins | M | H | M-H | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WATER & SEWER** | Blockages, contamination, interuption to service, access to fittings, confined space access | L | M | L-M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **WALLS & FENCING** | Risk of falls, unauthoried access from persons and animals, structural failure | M | M | M | Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice | Asset Owner | L |
| **MAINTENANCE PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **REFURBISHMENT PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |
| **DEMOLITION PHASE** | | | | | | | |
| **ROADS & PATHWAYS** | All as for construction and operation phases | | | | | Asset Owner | |
| **STORWATER / FLOODING** | All as for construction and operation phases | | | | | Asset Owner | |
| **WATER & SEWER** | All as for construction and operation phases | | | | | Asset Owner | |
| **WALLS & FENCING** | All as for construction and operation phases | | | | | Asset Owner | |


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| VER. | DESCRIPTION | DATE |
|---|---|---|
| A | ORIGINAL ISSUE | 11-03-26 |


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CLIENT : BOS

DRAWING TITLE : HAZARD RISK REGISTER - DESIGN RISKS

PROJECT : 2 KARINGAL DRIVE & 60 IMELDA WAY, PIMPAMA

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. : | DATE : 11-03-26
PROJECT LEADER : - | DESIGNER : BNB
DRAFTSPERSON : BNB | CHECKED : -

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

| PROJECT No.: | DRAWING No. : | VERSION: |
|---|---|---|
| BE20023 | C9000 | A |

## Appendix B – Vegetation Clearing Plan and Tree Schedule

0 25 50 m

# 2 Karingal Dve Pimpama

## Appendix B
## Vegetation Clearing Plan

| | |
|---|---|
| Project: BE200223 | Date: 24-03-2026 |
| Scale: 1:900 at A3 | Projection: GDA 2020/MGA Zone 56 |
| Data Sources: Nearmap February 2026 | |



Location of site within Gold Coast LGA

**Legend**

- Subject Lot
- Cadastre
- Watercourse centreline
- Constructed dams
- Disturbance footprint
- Conservation Lot [7,439m2]
- Surveyed Tree Trunk [282]

**Tree impacts**
**Actions - Retain/Remove [282]**

- Retain [34]
- Impacted [248]
- Habitat trees (NRZ*)
  * Notional Root Zone measured and calculated per AS4590:2025

**Vegetation Associations Impacts**

- A – Urban Woodland and Anthropogenic Grassland [14,862 m2]
- B – Disturbed Riparian Woodland [289 m2]

**Tree protection fencing type**

- fauna exclusion
- fauna friendly
- Clearing direction

BURCHILLS SCIENCE AND ENGINEERING

BOSFORM 30 YEARS

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## Table B1 - Tree Schedule

| ID | Diam (m) | TPZ_m | SRZ | Ht | Species | Impacted | Habitat Tree | Feature |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.7 | 8.4 | 2.85 | >4m | *Eucalyptus tereticornis* | FALSE | | |
| 2 | 0.1 | 1.2 | 1.5 | >4m | *Acacia concurrens* | FALSE | | |
| 3 | 0.15 | 1.8 | 1.5 | >4m | *Acacia concurrens* | FALSE | | |
| 4 | 1 | 12 | 3.31 | >4m | *Eucalyptus tereticornis* | FALSE | Yes | Age (>80cm DBH) |
| 5 | 0.6 | 7.2 | 2.67 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 6 | 0.55 | 6.6 | 2.57 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 7 | 0.275 | 3.3 | 1.92 | >4m | *Syagrus romanzoffiana* | TRUE | | |
| 8 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 9 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 11 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 12 | 0.3 | 3.6 | 2 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 13 | 0.275 | 3.3 | 1.92 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 14 | 0.25 | 3 | 1.85 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 15 | 0.5 | 6 | 2.47 | >4m | *Corymbia intermedia* | TRUE | | |
| 16 | 0.3 | 3.6 | 2 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 17 | 0.3 | 3.6 | 2 | >4m | *Corymbia intermedia* | TRUE | | |
| 18 | 0.6 | 7.2 | 2.67 | >4m | *Glochidion ferdinandi* | TRUE | | |
| 19 | 0.2 | 2.4 | 1.68 | >4m | *Glochidion ferdinandi* | TRUE | | |
| 20 | 0.25 | 3 | 1.85 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 21 | 0.5 | 6 | 2.47 | >4m | *Glochidion ferdinandi* | TRUE | | |
| 22 | 0.25 | 3 | 1.85 | >4m | *Syagrus romanzoffiana* | TRUE | | |
| 23 | 0.5 | 6 | 2.47 | >4m | *Syzygium jambos* | TRUE | | |
| 24 | 0.25 | 3 | 1.85 | >4m | *Pittosporum tinifolium* | TRUE | | |
| 25 | 0.5 | 6 | 2.47 | >4m | *Backhousia citriodora* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26 | 0.5 | 6 | 2.47 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 27 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 28 | 0.7 | 8.4 | 2.85 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 29 | 0.1 | 1.2 | 1.5 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 30 | 0.3 | 3.6 | 2 | >4m | *Blakella torelliana* | TRUE | | |
| 31 | 0.35 | 4.2 | 2.13 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 32 | 0.45 | 5.4 | 2.37 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 33 | 0.3 | 3.6 | 2 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 34 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 35 | 0.3 | 3.6 | 2 | >4m | *Livistona australis* | TRUE | | |
| 36 | 0.5 | 6 | 2.47 | >4m | *Bismarckia nobilis* | TRUE | | |
| 37 | 0.45 | 5.4 | 2.37 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 38 | 0.4 | 4.8 | 2.25 | >4m | *Auranticarpa rhombifolia* | TRUE | | |
| 39 | 0.3 | 3.6 | 2 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 40 | 0.4 | 4.8 | 2.25 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 41 | 0.25 | 3 | 1.85 | >4m | *stag* | TRUE | | |
| 42 | 0.4 | 4.8 | 2.25 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 43 | 0.2 | 2.4 | 1.68 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 44 | 0.2 | 2.4 | 1.68 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 45 | 0.5 | 6 | 2.47 | >4m | *Mangifera indica* | TRUE | | |
| 46 | 0.5 | 6 | 2.47 | >4m | *Bismarckia nobilis* | TRUE | | |
| 47 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 48 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 49 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 50 | 0.15 | 1.8 | 1.5 | >4m | *Syzygium australe* | TRUE | | |
| 51 | 0.3 | 3.6 | 2 | >4m | *Acacia disparrima* | FALSE | | |
| 52 | 0.15 | 1.8 | 1.5 | >4m | *Syzygium francisii* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 53 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium francisii* | TRUE | | |
| 54 | 0.15 | 1.8 | 1.5 | >4m | *Blakella torelliana* | FALSE | | |
| 55 | 0.3 | 3.6 | 2 | >4m | *Murraya paniculata 'Exotica'* | TRUE | | |
| 56 | 0.25 | 3 | 1.85 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 57 | 0.25 | 3 | 1.85 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 58 | 0.15 | 1.8 | 1.5 | >4m | *Syagrus romanzoffiana* | TRUE | | |
| 59 | 0.2 | 2.4 | 1.68 | >4m | *Diospyros fasciculosa* | TRUE | | |
| 60 | 0.2 | 2.4 | 1.68 | >4m | *Diospyros fasciculosa* | TRUE | | |
| 61 | 0.15 | 1.8 | 1.5 | >4m | *Syzygium luehmannii* | TRUE | | |
| 62 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium luehmannii* | TRUE | | |
| 63 | 0.7 | 8.4 | 2.85 | >4m | *Syagrus romanzoffiana* | FALSE | | |
| 64 | 0.2 | 2.4 | 1.68 | >4m | *Syagrus romanzoffiana* | FALSE | | |
| 65 | 0.3 | 3.6 | 2 | >4m | *Nauclea orientalis* | FALSE | | |
| 66 | 0.25 | 3 | 1.85 | >4m | *Nauclea orientalis* | FALSE | | |
| 67 | 0.7 | 8.4 | 2.85 | >4m | *Flindersia australis* | FALSE | | |
| 68 | 0.2 | 2.4 | 1.68 | >4m | *Flindersia australis* | FALSE | | |
| 69 | 0.2 | 2.4 | 1.68 | >4m | *Elaeocarpus grandis* | FALSE | | |
| 70 | 0.6 | 7.2 | 2.67 | >4m | *Flindersia australis* | FALSE | | |
| 71 | 0.25 | 3 | 1.85 | >4m | *Syagrus romanzoffiana* | FALSE | | |
| 72 | 0.1 | 1.2 | 1.5 | >4m | *Elaeocarpus grandis* | FALSE | | |
| 73 | 0.3 | 3.6 | 2 | >4m | *Heptapleurum actinophyllum* | FALSE | | |
| 74 | 0.15 | 1.8 | 1.5 | >4m | *Diospyros fasciculosa* | FALSE | | |
| 75 | 0.2 | 2.4 | 1.68 | >4m | *Sterculia quadrifida* | FALSE | | |
| 76 | 0.3 | 3.6 | 2 | >4m | *stag* | FALSE | | |
| 77 | 0.6 | 7.2 | 2.67 | >4m | *Syzygium floribundum* | FALSE | | |
| 78 | 0.7 | 8.4 | 2.85 | >4m | *Syzygium floribundum* | FALSE | | |
| 79 | 0.25 | 3 | 1.85 | >4m | *Syzygium australe* | FALSE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 80 | 0.25 | 3 | 1.85 | >4m | *Syzygium luehmannii* | FALSE | | |
| 81 | 0.3 | 3.6 | 2 | >4m | *Syzygium luehmannii* | FALSE | | |
| 82 | 0.3 | 3.6 | 2 | >4m | *Syzygium luehmannii* | FALSE | | |
| 83 | 0.1 | 1.2 | 1.5 | >4m | *Syzygium luehmannii* | TRUE | | |
| 84 | 0.1 | 1.2 | 1.5 | >4m | *Harpullia pendula* | FALSE | | |
| 85 | 0.1 | 1.2 | 1.5 | >4m | *Eucalyptus siderophloia* | FALSE | | |
| 86 | 0.4 | 4.8 | 2.25 | >4m | *Flindersia australis* | TRUE | | |
| 87 | 0.5 | 6 | 2.47 | >4m | *Delonix regia* | TRUE | | |
| 88 | 0.5 | 6 | 2.47 | >4m | *Nauclea orientalis* | TRUE | | |
| 89 | 0.25 | 3 | 1.85 | >4m | *Calodendrum capense* | TRUE | | |
| 90 | 0.3 | 3.6 | 2 | >4m | *Inga edulis* | TRUE | | |
| 91 | 0.25 | 3 | 1.85 | >4m | *stag* | TRUE | | |
| 92 | 0.1 | 1.2 | 1.5 | >4m | *Acacia concurrens* | TRUE | | |
| 93 | 0.3 | 3.6 | 2 | >4m | *Melaleuca quinquenervia* | FALSE | | |
| 94 | 0.15 | 1.8 | 1.5 | >4m | *Acacia concurrens* | TRUE | | |
| 95 | 0.15 | 1.8 | 1.5 | >4m | *Acacia concurrens* | TRUE | | |
| 96 | 0.15 | 1.8 | 1.5 | >4m | *Melaleuca quinquenervia* | FALSE | | |
| 97 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium francisii* | TRUE | | |
| 98 | 0.25 | 3 | 1.85 | >4m | *Syzygium francisii* | TRUE | | |
| 99 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium luehmannii* | TRUE | | |
| 100 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium luehmannii* | TRUE | | |
| 101 | 0.15 | 1.8 | 1.5 | >4m | *Syzygium luehmannii* | TRUE | | |
| 102 | 0.25 | 3 | 1.85 | >4m | *Backhousia citriodora* | TRUE | | |
| 103 | 0.2 | 2.4 | 1.68 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 104 | 0.5 | 6 | 2.47 | >4m | *stag* | TRUE | | |
| 105 | 0.25 | 3 | 1.85 | >4m | *Schinus terebinthifolius* | TRUE | | |
| 106 | 0.2 | 2.4 | 1.68 | >4m | *Schinus terebinthifolius* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 107 | 0.5 | 6 | 2.47 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 108 | 0.1 | 1.2 | 1.5 | >4m | *Glochidion ferdinandi* | TRUE | | |
| 109 | 0.5 | 6 | 2.47 | >4m | *Corymbia intermedia* | TRUE | | |
| 110 | 0.35 | 4.2 | 2.13 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 111 | 0.15 | 1.8 | 1.5 | >4m | *Eriobotrya japonica* | TRUE | | |
| 112 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 113 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 114 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 115 | 0.25 | 3 | 1.85 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 116 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca viminalis* | TRUE | | |
| 117 | 0.6 | 7.2 | 2.67 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 118 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 119 | 0.3 | 3.6 | 2 | >4m | *Lophostemon confertus* | TRUE | | |
| 120 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon confertus* | TRUE | | |
| 121 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 122 | 0.4 | 4.8 | 2.25 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 123 | 0.25 | 3 | 1.85 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 124 | 0.3 | 3.6 | 2 | >4m | *Melaleuca salicina* | TRUE | | |
| 125 | 0.2 | 2.4 | 1.68 | >4m | *Syagrus romanzoffiana* | TRUE | | |
| 126 | 0.4 | 4.8 | 2.25 | >4m | *Corymbia intermedia* | TRUE | | |
| 127 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 128 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 129 | 0.4 | 4.8 | 2.25 | >4m | *stag* | TRUE | | |
| 130 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 131 | 0.4 | 4.8 | 2.25 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 132 | 0.6 | 7.2 | 2.67 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 133 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 134 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 135 | 0.3 | 3.6 | 2 | >4m | *Cupaniopsis anacardioides* | TRUE | | |
| 136 | 0.2 | 2.4 | 1.68 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 137 | 0.2 | 2.4 | 1.68 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 138 | 0.4 | 4.8 | 2.25 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 139 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 140 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 141 | 0.3 | 3.6 | 2 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 142 | 0.15 | 1.8 | 1.5 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 143 | 0.25 | 3 | 1.85 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 144 | 0.4 | 4.8 | 2.25 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 145 | 0.35 | 4.2 | 2.13 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 146 | 0.25 | 3 | 1.85 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 147 | 0.5 | 6 | 2.47 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 148 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 149 | 0.15 | 1.8 | 1.5 | >4m | *Stenocarpus sinuatus* | TRUE | | |
| 150 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 151 | 0.8 | 9.6 | 3.01 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |
| 152 | 0.8 | 9.6 | 3.01 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |
| 153 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 154 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 155 | 0.3 | 3.6 | 2 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 156 | 0.3 | 3.6 | 2 | >4m | *Livistona chinensis* | TRUE | | |
| 157 | 0.25 | 3 | 1.85 | >4m | *Ficus benjamina* | TRUE | | |
| 158 | 0.4 | 4.8 | 2.25 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 159 | 0.5 | 6 | 2.47 | >4m | *Flindersia australis* | FALSE | | |
| 160 | 0.6 | 7.2 | 2.67 | >4m | *Harpephyllum caffrum* | FALSE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 161 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 162 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 163 | 0.2 | 2.4 | 1.68 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 164 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 165 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 166 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 167 | 0.35 | 4.2 | 2.13 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 168 | 0.7 | 8.4 | 2.85 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 169 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 170 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 171 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 172 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 173 | 0.4 | 4.8 | 2.25 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 174 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 175 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 176 | 0.5 | 6 | 2.47 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 177 | 0.1 | 1.2 | 1.5 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 178 | 0.35 | 4.2 | 2.13 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 179 | 0.65 | 7.8 | 2.76 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 180 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 181 | 0.35 | 4.2 | 2.13 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 182 | 0.65 | 7.8 | 2.76 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 183 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 184 | 0.4 | 4.8 | 2.25 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 185 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 186 | 0.45 | 5.4 | 2.37 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 187 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 188 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 189 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 190 | 0.2 | 2.4 | 1.68 | >4m | *Heptapleurum actinophyllum* | TRUE | | |
| 191 | 0.2 | 2.4 | 1.68 | >4m | *Syzygium jambos* | TRUE | | |
| 192 | 0.25 | 3 | 1.85 | >4m | *Elaeocarpus reticulatus* | TRUE | | |
| 193 | 0.45 | 5.4 | 2.37 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 194 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 195 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 196 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 197 | 0.6 | 7.2 | 2.67 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 198 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 199 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 200 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 201 | 0.5 | 6 | 2.47 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 202 | 0.3 | 3.6 | 2 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 203 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 204 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 205 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 206 | 0.7 | 8.4 | 2.85 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 207 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 208 | 0.2 | 2.4 | 1.68 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 209 | 0.3 | 3.6 | 2 | >4m | *Elaeocarpus grandis* | TRUE | | |
| 210 | 0.5 | 6 | 2.47 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 211 | 0.9 | 10.8 | 3.17 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |
| 212 | 0.1 | 1.2 | 1.5 | >4m | *Elaeocarpus reticulatus* | TRUE | | |
| 213 | 0.6 | 7.2 | 2.67 | >4m | *Lophostemon confertus* | TRUE | | |
| 214 | 0.8 | 9.6 | 3.01 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 215 | 0.25 | 3 | 1.85 | >4m | *Lophostemon confertus* | TRUE | | |
| 216 | 0.4 | 4.8 | 2.25 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 217 | 0.9 | 10.8 | 3.17 | >4m | *Eucalyptus siderophloia* | TRUE | Yes | Age (>80cm DBH) |
| 218 | 0.4 | 4.8 | 2.25 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 219 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 220 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 221 | 0.4 | 4.8 | 2.25 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 222 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 223 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 224 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 225 | 0.35 | 4.2 | 2.13 | >4m | *Corymbia intermedia* | TRUE | | |
| 226 | 0.2 | 2.4 | 1.68 | >4m | *Corymbia intermedia* | TRUE | | |
| 227 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 228 | 0.45 | 5.4 | 2.37 | >4m | *Corymbia intermedia* | TRUE | | |
| 229 | 0.4 | 4.8 | 2.25 | >4m | *Corymbia intermedia* | TRUE | | |
| 230 | 1 | 12 | 3.31 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |
| 231 | 0.25 | 3 | 1.85 | >4m | *Archontophoenix alexandrae* | TRUE | | |
| 232 | 0.3 | 3.6 | 2 | >4m | *Eucalyptus siderophloia* | TRUE | | |
| 233 | 0.15 | 1.8 | 1.5 | >4m | *Eucalyptus siderophloia* | TRUE | | |
| 234 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 235 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 236 | 0.4 | 4.8 | 2.25 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 237 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 238 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 239 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 240 | 0.45 | 5.4 | 2.37 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 241 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 242 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 243 | 0.35 | 4.2 | 2.13 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 244 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 245 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 246 | 0.4 | 4.8 | 2.25 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 247 | 0.1 | 1.2 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 248 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 249 | 0.25 | 3 | 1.85 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 250 | 0.35 | 4.2 | 2.13 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 251 | 0.4 | 4.8 | 2.25 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 252 | 0.15 | 1.8 | 1.5 | >4m | *Acacia disparrima* | TRUE | | |
| 253 | 0.2 | 2.4 | 1.68 | >4m | *Allocasuarina littoralis* | TRUE | | |
| 254 | 0.15 | 1.8 | 1.5 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 255 | 0.15 | 1.8 | 1.5 | >4m | *Corymbia intermedia* | TRUE | | |
| 256 | 0.15 | 1.8 | 1.5 | >4m | *Corymbia intermedia* | TRUE | | |
| 257 | 0.1 | 1.2 | 1.5 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 258 | 0.15 | 1.8 | 1.5 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 259 | 0.35 | 4.2 | 2.13 | >4m | *Eucalyptus tereticornis* | FALSE | | |
| 260 | 0.15 | 1.8 | 1.5 | >4m | *stag* | TRUE | | |
| 261 | 0.2 | 2.4 | 1.68 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 267 | 0.25 | 3 | 1.85 | >4m | *Acacia disparrima* | TRUE | | |
| 268 | 0.6 | 7.2 | 2.67 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 269 | 0.4 | 4.8 | 2.25 | >4m | *Acacia disparrima* | TRUE | | |
| 270 | 0.1 | 1.2 | 1.5 | >4m | *Acacia concurrens* | TRUE | | |
| 271 | 0.1 | 1.2 | 1.5 | >4m | *Acacia concurrens* | TRUE | | |
| 272 | 0.25 | 3 | 1.85 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 273 | 0.15 | 1.8 | 1.5 | >4m | *Acacia disparrima* | TRUE | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 274 | 0.8 | 9.6 | 3.01 | >4m | *Eucalyptus tereticornis* | TRUE | Yes | Age (>80cm DBH) |
| 275 | 0.15 | 1.8 | 1.5 | >4m | *Acacia disparrima* | TRUE | | |
| 276 | 0.25 | 3 | 1.85 | >4m | *Acacia disparrima* | TRUE | | |
| 277 | 0.15 | 1.8 | 1.5 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 278 | 0.1 | 1.2 | 1.5 | >4m | *Acacia disparrima* | TRUE | | |
| 279 | 0.5 | 6 | 2.47 | >4m | *Eucalyptus tereticornis* | TRUE | | |
| 280 | 0.1 | 1.2 | 1.5 | >4m | *stag* | TRUE | | |
| 281 | 0.15 | 1.8 | 1.5 | >4m | *stag* | TRUE | | |
| 282 | 0.1 | 1.2 | 1.5 | >4m | *Melaleuca quinquenervia* | TRUE | | |
| 283 | 0.1 | 1.2 | 1.5 | >4m | *stag* | TRUE | | |
| 284 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 285 | 0.5 | 6 | 2.47 | >4m | *Corymbia intermedia* | TRUE | | |
| 286 | 0.15 | 1.8 | 1.5 | >4m | *Lophostemon suaveolens* | TRUE | | |
| 287 | 0.4 | 4.8 | 2.25 | >4m | *Corymbia intermedia* | TRUE | | |
| 288 | 0.2 | 2.4 | 1.68 | >4m | *Lophostemon suaveolens* | TRUE | | |

***Trunk Diameter at Standard Height (DSH), Structural Root Zone (SRZ) and Notional Root Zone (NRZ) measured and assessed in accordance with AS 4970-2025: Protection of Trees on Development Sites.***

## Appendix C – Local Veterinarian Clinics and Wildlife Hospitals

### Greencross Vets Upper Coomera

Shop 9/1-13 Coomera Grand Drive
Upper Coomera QLD 4209

**Phone: (07) 5580 6360**

**Operating Hours:**

Mon-Fri: 8:00am to 6pm
Saturday: Closed
Sunday: Closed

### Foxwell Vet Coomera

Suite 11/334 Foxwell Road
Coomera QLD 4209

**Phone: (07) 5502 6699**

**Operating Hours:**

Mon-Fri: 8:00am to 6pm
Saturday: 8:00am to 1pm
Sunday: Closed

### Lawfully captured koalas must be taken to:

Currumbin Wildlife Hospital
Address*: 27 Millers Dr, Currumbin QLD 4223*
Phone*: (07) 5534 0813*
*7 days a week (8am-5pm)*

or the following after hours:

Wildcare Australia
*Wildlife rescue service*
Phone*: (07) 5527 244*




**Queensland Bushfire Risk Assessments**
**147 Repeater Station Road**
**Springbrook, QLD. 4213**

**Office:** 07 5533 5276
**Ray:** 0407 652 899
**Max:** 0458 250 661
**Email:** qldbushfire.ra@yahoo.com

# BUSHFIRE RISK ASSESSMENT AND RISK MITIGATION COMPLIANCE REPORT

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## Prepared in accordance with:

State Planning Policy Guideline - 2017
Queensland Development Code - 2009
Australian Standard AS3959 - 2018
Construction of Buildings in Bushfire Prone Areas
The Gold Coast City Council Planning Scheme - 2016

## Report prepared for:

Bosform Pty Ltd
c/ Michel Group Services

## For property:

(Lot 19) 2 Karingal Drive,
Pimpama. 4209

## Prepared by:

Queensland Bushfire Risk Assessments
Ray Cavanough and Max Gray

## Date: 09/03/2026

Valid for adoption for 36 months from date of site inspection

Note: Whilst every care has been taken in the preparation of this report, it has been drawn up within the guidelines provided, and is a risk assessment only, recommending risk reduction measures, and should the recommendations be adopted fully, neither implies nor guarantees any warranty of any kind in respect to life, property, or any other matter.

## Document Control:

| Date | Rev | Comment | Prepared By | Checked By | Authorised by |
|---|---|---|---|---|---|
| 09/03/26 | 1 | First version. | Max Gray | Max Gray | Max Gray and Ray Cavanough |

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## Property: Location and Details

A site inspection was conducted on the 02/02/2026.

**Local Government Authority:** City of Gold Coast Council
**Street Address:** 2 Karingal Drive, Pimpama. 4209
**Real Property Description:** Lot 19 – RP 152380
**Site Area:** 24,590m$^2$

## Proposal:

The proposal involves a material change of use for multiple dwellings, reconfiguring a lot into two management lots and a park lot, and operational works including ground level modifications and vegetation clearing. It features a new townhouse development with 16 units accessible via Imelda Way and 41 units accessible from Karingal Drive. The reconfiguration creates management lots for these townhouse complexes and a park lot to be transferred to the Council, designated for a drainage reserve that crosses the site, as per the site plan under appendix 1. Base plans outlining the development, and any other documentation have been supplied by Michel Group Services.




**Site Overview (Fig. 1)**
CGCC Interactive Mapping System 2016 Overlay Map, indicating Potential Bushfire Impact Buffer Zone, Medium, High, Very High Bushfire Hazard areas and slope contour.




**Site Overview (Fig. 2)**

The State Planning Policy interactive mapping system indicating bushfire hazard areas.

CITY OF GOLDCOAST.




**Regulated vegetation**
Regulated vegetation
**Vegetation management**
High priority vegetation
Medium priority vegetation
General priority vegetation
**Koala habitat areas**
**Waterways**
Major waterway
Waterway

City Plan: v13

Disclaimer:
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This is not an official City Plan Property Report.

Page 1 of 2

**Site Overview (Fig. 3)**
CGCC Interactive Mapping System 2016 Overlay Map, indicating Environmental significance overlays.

# 2 Karingal Drive

## Regional Ecosystems




| | Short Description | Full Description | Common Names | Fire Guidelines |
|---|---|---|---|---|
| **Regional Ecosystem 12.11.24** | Eucalyptus carnea or E. tindaliae, Corymbia intermedia +/- E. siderophloia or E. crebra woodland on metamorphics +/- interbedded volcanics | Eucalyptus carnea or E. tindaliae, Corymbia intermedia woodland +/- E. crebra or E. siderophloia, Eucalyptus resinifera, Eucalyptus major, E. helidonica, Angophora woodsiana, C. trachyphloia, E. microcorys, Corymbia citriodora subsp. Variegata, C. henryi. Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics usually at altitudes <300 metres. (BVG1M: 9g) | **Woodland**<br>• Thick leaved mahogany<br>• Tindal's stringybark<br>• Pink bloodwood<br>• Northern grey ironbark<br>• Narrow leaved ironbark | **SEASON:** Summer to winter.<br><br>**INTENSITY:** Low to moderate.<br><br>**INTERVAL:** 4-25 years.<br><br>**STRATEGY:** Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved.<br><br>**ISSUES:** The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics. |

| | | | | |
|---|---|---|---|---|
| **Regional Ecosystem 12.3.11** | Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast | Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. Corymbia trachyphloia and/or C. citriodora subsp. Variegata may dominate on areas of Pleistocene alluvia. Eucalyptus seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c) | **Open Forest**<br>• Blue gum<br>• Northern grey ironbark<br>• Pink bloodwood | **SEASON:** Summer to late-autumn.<br><br>**INTENSITY:** Low.<br><br>**INTERVAL:** 3-6 years.<br><br>**STRATEGY:** Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics.<br><br>**ISSUES:** Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. |

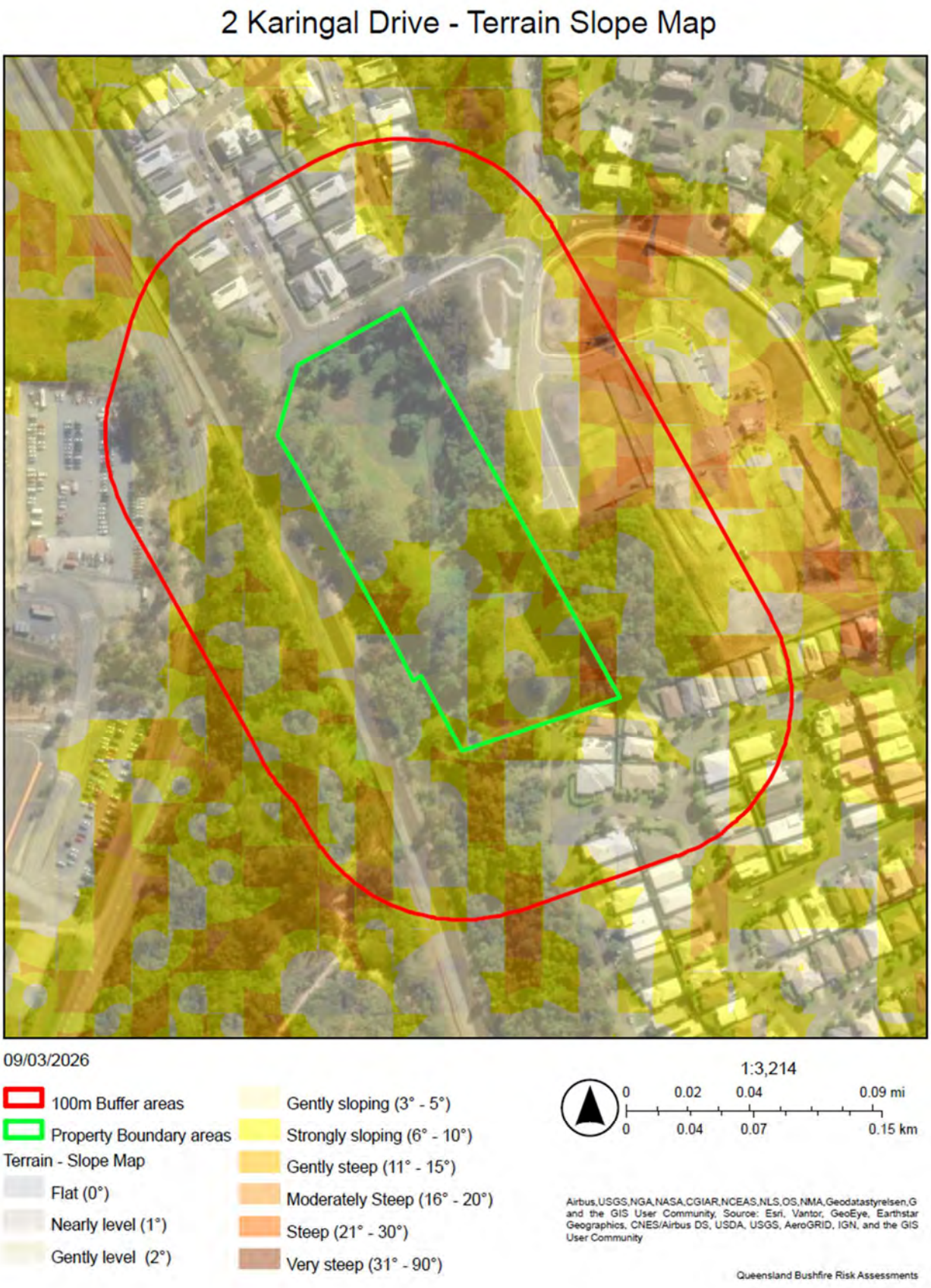
## Site Overview (Fig. 4)

Queensland Globe indicating regional ecosystems within 100 metres of the proposed development.




| Vegetation Hazard Class | Description |
|---|---|
| 9.2 | Moist to dry eucalypt woodland on coastal lowlands and ranges |
| 16.1 | Eucalyptus dominated forest on drainage lines and alluvial plains |
| 40.4 | Continuous low grass or tree cover |
| 41.4 | Discontinuous low grass or tree cover |
| 42.6 | Nil to very low vegetation cover |
| 43.6 | Water bodies or very low vegetation cover |

**Site Overview (Fig. 5)**
BRC MapViewer online mapping system indicating vegetation hazard classes.




**Site Overview (Fig. 6)**
Terrain slope map detailing surrounding landscape slopes.




**Site Overview (Fig. 7)**
Google Earth illustrating a 3D visual of the property.




**BAL Map (Fig. 8)**

Aerial image showing classifiable vegetation within a 100-metre radius of development.

## General Description:

The property number 2 is located on the southern side of Karingal Drive in a medium density residential zoned area. The property currently has pre-existing infrastructure located onsite in the way of two dams that are to be filled as a part of the project. The proposed development will implement 57 new townhouses at the site. The property is generally flat with a southerly aspect but has some small slope runs into a wet gulley in the centre of the block (this wet gulley is proposed to be rehabilitated as a part of the proposed development).

The Queensland Globe state mapping system shows the regional ecosystems 12.11.24 and 12.3.11 to be located within 100 metres of the property. The BRC MapViewer online mapping system shows the vegetation hazard classes 9.2, 16.1, 40.4, 41.4, 42.6 and 43.6 to be located within 100 metres of the property.

Upon the conduction of a site inspection, five plots of classifiable vegetation were found within 100 metres of the property.

**Plot 1:**
Classifiable vegetation classed as (VHC 16.1) eucalyptus dominated forest on drainage lines and alluvial plains consisting of grey gum, iron bark, bloodwood and paperbark top storey, regrowth eucalyptus species, wattle and escaped garden ornamentals mid storey, with a leaf litter and grass ground cover. This plot of vegetation is located to the north across Karingal Drive and is located along a mapped council waterway.

**Plot 2:**
Classifiable vegetation classed as (VHC 16.1) eucalyptus dominated forest on drainage lines and alluvial plains consisting of grey gum, iron bark, bloodwood and paperbark top storey, regrowth eucalyptus species, wattle and escaped garden ornamentals mid storey, with a predominantly managed grass ground cover. This plot of vegetation is located along the mapped waterway within the property and is proposed to be rehabilitated with species present in the regional ecosystems 12.3.11 and 12.3.6. Details regarding the rehabilitation area and planting palette can be found under appendix 2 of this report.

**Plot 3:**
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of bloodwood, grey gum and paperbark top storey, wattle, paperbark and regrowth eucalyptus species mid storey, with a grass ground cover. This plot of vegetation is located to the west of the property across the Gold Coast train line.

**Plot 4:**
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of predominantly wattle and paperbark top and mid storey, with a leaf litter ground cover. This plot of vegetation is located to the south of the property beyond a bio basin implemented as a part of the neighbouring residential development.

**Plot 5:**
Classifiable vegetation classed as (VHC 9.2) moist to dry eucalypt woodland on coastal lowlands and ranges consisting of flooded gum and bloodwood top storey, wattle, paperbark and escaped garden ornamentals mid storey, with a grass ground cover. This plot of vegetation is located to the east of the site being a small patch that will connect with the proposed rehabilitation area in the centre of the property.

Vegetation within the property consists of scattered grey gum, bloodwood, wattle, escaped garden ornamentals, paperbark weeds and managed grass. Much of the

vegetation within the site is proposed to be removed to make way for the new townhouse development.

Excluded areas within 100 metres of the property consist of roads and dwellings or areas with a managed ground cover deemed to be low threat.

Adjoining properties are of similar size and are developed. Access to the site will be via a new driveway network from both Karingal Drive and Imelda Way. Reticulated water is available to the site, therefore, water storage for firefighting purposes will not be a requirement for this proposal.

## AS3959-2018 BAL Calculations Method 2 – Minimum Setback Distances

| | | |
|---|---|---|
| 2.2.2 | Fire Danger Index – QLD | **53**<br>*Variable FDI retrieved from the QFES Catalyst online mapping system.* |
| 2.2.3 | Classified Vegetation Types | **VHC 9.2 – moist to dry eucalypt woodland on coastal lowlands and ranges**<br><br>Understorey Fuel Load: 14.9 t/ha<br>Total Fuel Load: 17.2 t/ha |
| | | **VHC 16.1 – Eucalyptus dominated forest on drainage lines and alluvial plains**<br><br>Understorey Fuel Load: 13.8 t/ha<br>Total Fuel Load: 16 t/ha |
| | | **Exclusion Clause – 2.2.3.2**<br>*e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.*<br>*f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.* |
| | | **National Construction Code Queensland Variation Clause H7D4**<br>*The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300mm high.* |
| 2.2.4 | Distance From Classified Vegetation | **Plot 1: VHC 16.1** |
| | | **Plot 2: VHC 16.1** |
| | | **Plot 3: VHC 9.2** |
| | | **Plot 4: VHC 9.2** |
| | | **Plot 5: VHC 9.2** |
| 2.2.5 | Effective Slopes | **Plot 1: VHC 16.1** – Flat |
| | | **Plot 2: VHC 16.1** – Flat (short downslopes on either side of waterway) |
| | | **Plot 3: VHC 9.2** – Flat |
| | | **Plot 4: VHC 9.2** – Flat |
| | | **Plot 5: VHC 9.2** – Flat |
| 2.2.6 | Bushfire Attack Level | **Minimum setbacks for Bushfire Attack Levels shown below.** |
| 2.2.7 | Construction Requirements | **Dependent on Bushfire Attack Level.** |

## Plot 1:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:41 pm (MDc v.4.9)

**Plot 1: VHC 16.1**

| Minimum Distance Calculator - AS3959-2018 (Method 2) | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.87 km/h |
| Vegetation Classification | Forest | Flame length | 7.62 m |
| Understorey fuel load | 13.8 t/ha | Flame angle | 54 °, 64 °, 73 °, 78 °, 80 ° & 85 ° |
| Total fuel load | 16 t/ha | Elevation of receiver | 3.08 m, 3.42 m, 3.64 m, 3.72 m, 3.75 m & 3.79 m |
| Vegetation height | n/a | Fire intensity | 7,255 kW/m |
| Effective slope | 0 ° | Transmissivity | 0.886, 0.874, 0.856, 0.836, 0.823 & 0.751 |
| Site slope | 0 ° | Viewfactor | 0.5863, 0.4326, 0.2893, 0.1959, 0.1591 & 0.0437 |
| Flame width | 100 m | Minimum distance to < 40 kW/m² | 6.4 m |
| Windspeed | n/a | Minimum distance to < 29 kW/m² | 8.699999999999999 m |
| Heat of combustion | 18,600 kJ/kg | Minimum distance to < 19 kW/m² | 13 m |
| Flame temperature | 1,090 K | Minimum distance to < 12.5 kW/m² | 19.1 m |
| | | Minimum distance to < 10 kW/m² | 23.2 m |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 7 Metres |
| BAL – 29 | 9 Metres |
| BAL – 19 | 14 Metres |
| BAL – 12.5 | 20 Metres |
| BAL – Low | >100 Metres |

## Plot 2:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:17 pm (MDc v.4.9)

**Plot 2: VHC 16.1**

| Minimum Distance Calculator - AS3959-2018 (Method 2) | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.87 km/h |
| Vegetation Classification | Forest | Flame length | 7.62 m |
| Understorey fuel load | 13.8 t/ha | Flame angle | 54 °, 64 °, 73 °, 78 °, 80 ° & 85 ° |
| Total fuel load | 16 t/ha | Elevation of receiver | 3.08 m, 3.42 m, 3.64 m, 3.72 m, 3.75 m & 3.79 m |
| Vegetation height | n/a | Fire intensity | 7,255 kW/m |
| Effective slope | 0 ° | Transmissivity | 0.886, 0.874, 0.856, 0.836, 0.823 & 0.751 |
| Site slope | 0 ° | Viewfactor | 0.5863, 0.4326, 0.2893, 0.1959, 0.1591 & 0.0437 |
| Flame width | 100 m | Minimum distance to < 40 kW/m² | 6.4 m |
| Windspeed | n/a | Minimum distance to < 29 kW/m² | 8.699999999999999 m |
| Heat of combustion | 18,600 kJ/kg | Minimum distance to < 19 kW/m² | 13 m |
| Flame temperature | 1,090 K | Minimum distance to < 12.5 kW/m² | 19.1 m |
| | | Minimum distance to < 10 kW/m² | 23.2 m |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 7 Metres |
| BAL – 29 | 9 Metres |
| BAL – 19 | 14 Metres |
| BAL – 12.5 | 20 Metres |
| BAL – Low | >100 Metres |

## Plot 3:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:18 pm (MDc v.4.9)

**Plot 3: VHC 9.2**

| Minimum Distance Calculator - AS3959-2018 (Method 2) | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.9399999999999999 km/h |
| Vegetation Classification | Woodland | Flame length | 8.220000000000001 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 54 °, 64 °, 73 °, 78 °, 79 ° & 85 ° |
| Total fuel load | 17.2 t/ha | Elevation of receiver | 3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m |
| Vegetation height | n/a | Fire intensity | 8,421 kW/m |
| Effective slope | 0 ° | Transmissivity | 0.885, 0.873, 0.853, 0.832, 0.82 & 0.748 |
| Site slope | 0 ° | Viewfactor | 0.5871, 0.4367, 0.2916, 0.1971, 0.1603 & 0.0438 |
| Flame width | 100 m | Minimum distance to < 40 kW/m² | 6.9 m |
| Windspeed | n/a | Minimum distance to < 29 kW/m² | 9.300000000000001 m |
| Heat of combustion | 18,600 kJ/kg | Minimum distance to < 19 kW/m² | 13.9 m |
| Flame temperature | 1,090 K | Minimum distance to < 12.5 kW/m² | 20.4 m |
| | | Minimum distance to < 10 kW/m² | 24.7 m |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 8 Metres |
| BAL – 29 | 10 Metres |
| BAL – 19 | 15 Metres |
| BAL – 12.5 | 21 Metres |
| BAL – Low | >100 Metres |

## Plot 4:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:43 pm (MDc v.4.9)

**Plot 4: VHC 9.2**

| Minimum Distance Calculator - AS3959-2018 (Method 2) | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.9399999999999999 km/h |
| Vegetation Classification | Woodland | Flame length | 8.220000000000001 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 54 °, 64 °, 73 °, 78 °, 79 ° & 85 ° |
| Total fuel load | 17.2 t/ha | Elevation of receiver | 3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m |
| Vegetation height | n/a | Fire intensity | 8,421 kW/m |
| Effective slope | 0 ° | Transmissivity | 0.885, 0.873, 0.853, 0.832, 0.82 & 0.748 |
| Site slope | 0 ° | Viewfactor | 0.5871, 0.4367, 0.2916, 0.1971, 0.1603 & 0.0438 |
| Flame width | 100 m | Minimum distance to < 40 kW/m² | 6.9 m |
| Windspeed | n/a | Minimum distance to < 29 kW/m² | 9.300000000000001 m |
| Heat of combustion | 18,600 kJ/kg | Minimum distance to < 19 kW/m² | 13.9 m |
| Flame temperature | 1,090 K | Minimum distance to < 12.5 kW/m² | 20.4 m |
| | | Minimum distance to < 10 kW/m² | 24.7 m |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 8 Metres |
| BAL – 29 | 10 Metres |
| BAL – 19 | 15 Metres |
| BAL – 12.5 | 21 Metres |
| BAL – Low | >100 Metres |

## Plot 5:

FLAMESOL
FPA AUSTRALIA

Calculated February 13, 2026, 3:19 pm (MDc v.4.9)

**Plot 5: VHC 9.2**

| Minimum Distance Calculator - AS3959-2018 (Method 2) | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.9399999999999999 km/h |
| Vegetation Classification | Woodland | Flame length | 8.220000000000001 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 54 °, 64 °, 73 °, 78 °, 79 ° & 85 ° |
| Total fuel load | 17.2 t/ha | Elevation of receiver | 3.32 m, 3.69 m, 3.93 m, 4.02 m, 4.03 m & 4.09 m |
| Vegetation height | n/a | Fire intensity | 8,421 kW/m |
| Effective slope | 0 ° | Transmissivity | 0.885, 0.873, 0.853, 0.832, 0.82 & 0.748 |
| Site slope | 0 ° | Viewfactor | 0.5871, 0.4367, 0.2916, 0.1971, 0.1603 & 0.0438 |
| Flame width | 100 m | Minimum distance to < 40 kW/m² | 6.9 m |
| Windspeed | n/a | Minimum distance to < 29 kW/m² | 9.300000000000001 m |
| Heat of combustion | 18,600 kJ/kg | Minimum distance to < 19 kW/m² | 13.9 m |
| Flame temperature | 1,090 K | Minimum distance to < 12.5 kW/m² | 20.4 m |
| | | Minimum distance to < 10 kW/m² | 24.7 m |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

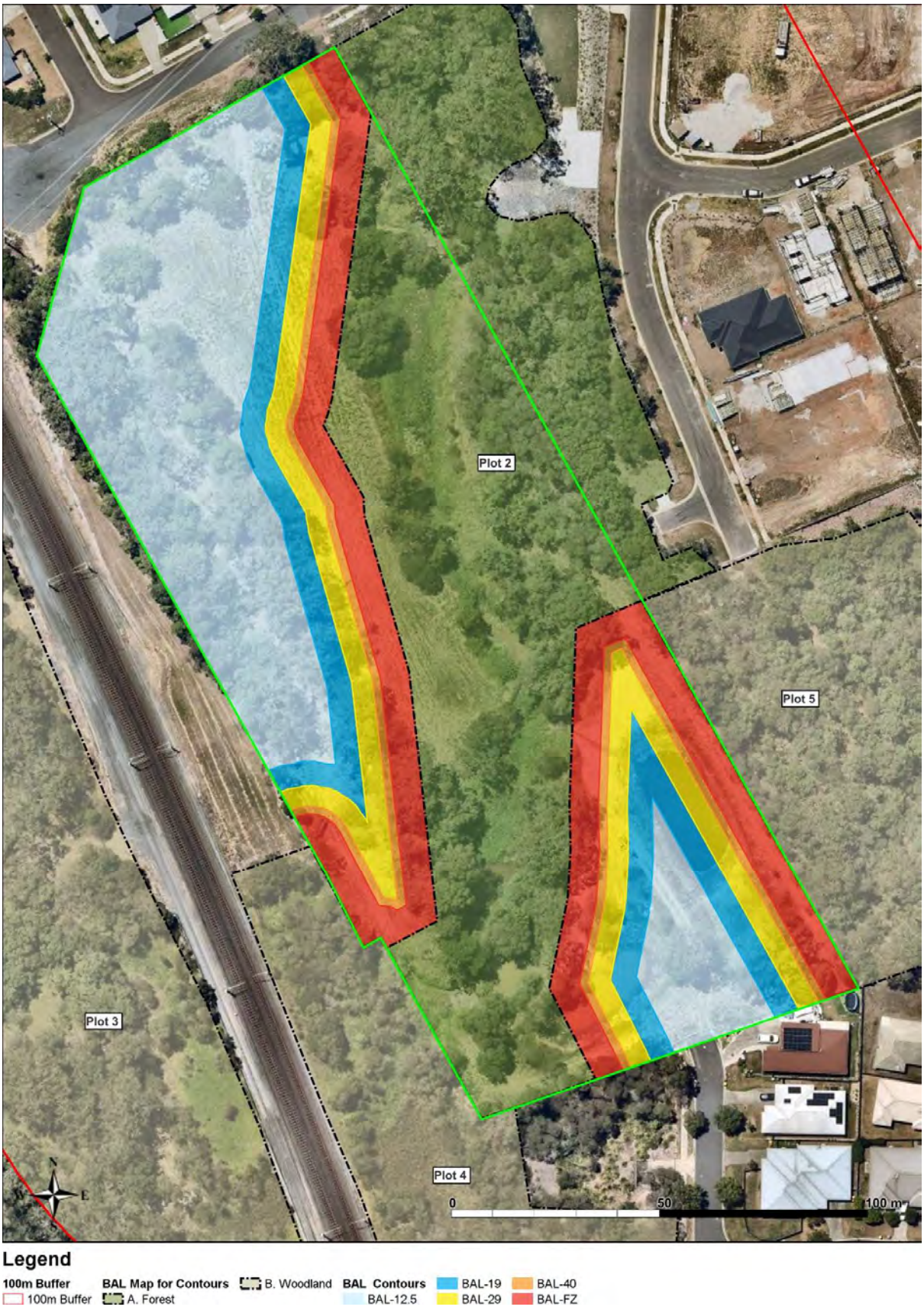
Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 8 Metres |
| BAL – 29 | 10 Metres |
| BAL – 19 | 15 Metres |
| BAL – 12.5 | 21 Metres |
| BAL – Low | >100 Metres |

## BAL Contours:




*For setback distances from classifiable vegetation, refer to the minimum setbacks section above for the applicable plot.*

## BAL Contours (Development Overlay):




**Legend**

| 100m Buffer | BAL Map for Contours | | BAL Contours | | |
|---|---|---|---|---|---|
| 100m Buffer | A. Forest | B. Woodland | BAL-12.5 | BAL-19 | BAL-29 | BAL-40 | BAL-FZ |

# Bushfire Attack Levels and Corresponding Sections for Specific Construction Requirements

| Bushfire Attack Level (BAL) | Classified vegetation within 100m of the site and heat flux exposure thresholds | Description of predicted bushfire attach and levels of exposure | Construction Section |
|---|---|---|---|
| **BAL – Low** | See clause 2.2.3.2 | There is insufficient risk to warrant specific construction requirements | 4 |
| **BAL – 12.5** | ≤12.5 kW/m$^2$ | Ember attack | 3 and 5 |
| **BAL – 19** | >12.5 kW/m$^2$ ≤19 k W/m$^2$ | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux | 3 and 6 |
| **BAL – 29** | >19 kW/m$^2$ ≤29 kW/m$^2$ | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux | 3 and 7 |
| **BAL – 40** | >29 kW/m$^2$ ≤40 kW/m$^2$ | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with increased likelihood of direct contact with flames | 3 and 8 |
| **BAL – Flame Zone** | > 40 kW/m$^2$ | Direct exposure to flames from fire front in addition to heat flux and ember attack | 3 and 9 |

*Table 3.1, AS3959-2018.*



# AS3959 Shielding Principle

Section 3.5 of AS3959 states the following:

*Where an elevation is not exposed to the source of bushfire attack, then the construction requirements for that elevation can reduce to the next BAL. However, it shall not reduce to below BAL-12.5.*

*An elevation is deemed to be not exposed to the source of bushfire if all of the straight lines between that elevation and the source of bushfire attach are obstructed by another part of the same building. However, it shall not reduce to below BAL-12.5.*



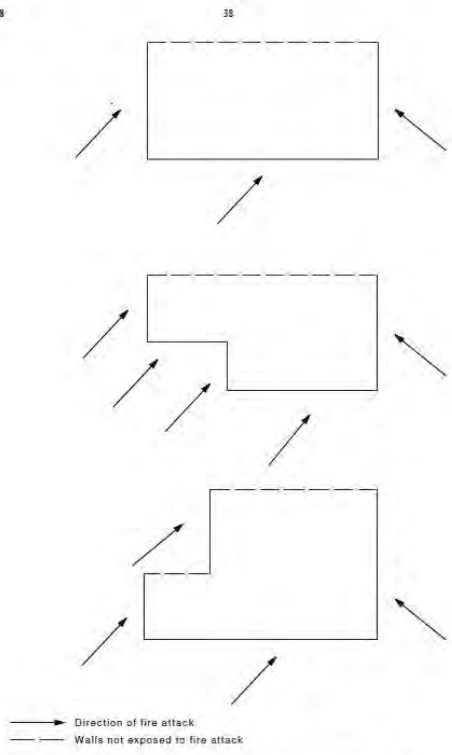



FIGURE 3.1 EXAMPLES OF WALLS SUBJECT TO SHIELDING

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*The shielding of an elevation shall apply to all elements of the wall, including openings, but shall not apply to subfloors or roofs.*

The above shielding principle cannot be applied to the proposed townhouses as they are exposed to multiple potential fire fronts.

# Radiant Heat Barrier:

To reduce the potential radiant heat flux exposure to proposed townhouses number 5 through 16, a radiant heat barrier will be implemented along the eastern property boundary for the extent of plot 5 classifiable vegetation and for a small portion of plot 2 classifiable vegetation. The radiant heat barrier will provide a radiant heat flux reduction for classifiable vegetation plot 5 only due to its length and location. The radiant heat barrier will be located as shown below.




**Legend**

**100m Buffer**
100m Buffer

**Radiant Heat Barrier**
Radiant Heat Barrier (Colourbond Fence 1.8m Tall)

**BAL Map for Contours**
A. Forest
B. Woodland

There are limitations to the implementation of a radiant heat barrier that need to be considered. These limitations are as follows:

- The barrier is the same width as the emitter itself (the barrier width is the same as the flame width, the barrier must provide protection for the entire front of the plot of vegetation it is shielding from),
- The barrier is uniform in height (for example, 1.8m in height for its full length) and
- The barrier is constructed to be able to withstand the amount and duration of bushfire attack expected and will not become an emitter of radiant heat itself (concrete or masonry radiant heat barriers are best suited, but Colourbond steel is also an acceptable solution).

With regard to the above limitations, the radiant heat barrier must be implemented as described below:

- **Implemented for the full length of the shielded vegetation plots (plot 5),**
- **Be a uniform height of 1.8 metres for its full length,**
- **Be constructed out of concrete, masonry or Colourbond steel, and**
- **be located along the edge of classifiable vegetation plot 5, not at a midway point between the vegetation edge and the shielded structures.**

If the radiant heat barrier is not designed and implemented as described above, it will not adequately provide shielding to the affected structures and the below adjusted radiant heat calculations will be considered inaccurate.

**Adjusted Radiant Heat Flux Calculations for Classifiable Vegetation Plot 5:**

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Calculated March 8, 2026, 11:30 pm (RHBc v.1.4)

**BAL-40**

| Radiant Heat Barrier calculator - AS3959-2018 | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.94 km/h |
| Vegetation Classification | Woodland | Flame length | 8.22 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 44 ° |
| Total fuel load | 17.2 t/ha | Panel height | 5.71 m |
| Vegetation height | n/a | Elevation of receiver | 2.85 m |
| Effective slope | 0 ° | Effective barrier height | 1.8 m |
| Site slope | 0 ° | Fire intensity | 8,421 kW/m |
| Distance to vegetation | 5.7 m | Transmissivity | 0.892 |
| Flame width | 100 m | Viewfactor | 0.7212 |
| Windspeed | n/a | Radiant heat flux | 48.96 kW/m² |
| Heat of combustion | 18,600 kJ/kg | Viewfactor of barrier | 0.1327 |
| Flame temperature | 1,090 K | Adjusted viewfactor | 0.5885 |
| Actual barrier height | 1.8 m | Adjusted radiant heat flux | 39.95 kW/m² |
| | | Bushfire Attack Level | BAL-40 |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

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Calculated March 8, 2026, 11:32 pm (RHBc v.1.4)

**BAL-29**

| Radiant Heat Barrier calculator - AS3959-2018 | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.94 km/h |
| Vegetation Classification | Woodland | Flame length | 8.22 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 58 ° |
| Total fuel load | 17.2 t/ha | Panel height | 6.97 m |
| Vegetation height | n/a | Elevation of receiver | 3.48 m |
| Effective slope | 0 ° | Effective barrier height | 1.8 m |
| Site slope | 0 ° | Fire intensity | 8,421 kW/m |
| Distance to vegetation | 7.8 m | Transmissivity | 0.88 |
| Flame width | 100 m | Viewfactor | 0.5267 |
| Windspeed | n/a | Radiant heat flux | 35.28 kW/m² |
| Heat of combustion | 18,600 kJ/kg | Viewfactor of barrier | 0.0981 |
| Flame temperature | 1,090 K | Adjusted viewfactor | 0.4286 |
| Actual barrier height | 1.8 m | Adjusted radiant heat flux | 28.7 kW/m² |
| | | Bushfire Attack Level | BAL-29 |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

FLAMESOL
FPA AUSTRALIA

Calculated March 8, 2026, 11:34 pm (RHBc v.1.4)

**BAL-19**

| **Radiant Heat Barrier calculator - AS3959-2018** | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.94 km/h |
| Vegetation Classification | Woodland | Flame length | 8.22 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 69 ° |
| Total fuel load | 17.2 t/ha | Panel height | 7.67 m |
| Vegetation height | n/a | Elevation of receiver | 3.83 m |
| Effective slope | 0 ° | Effective barrier height | 1.8 m |
| Site slope | 0 ° | Fire intensity | 8,421 kW/m |
| Distance to vegetation | 11.4 m | Transmissivity | 0.864 |
| Flame width | 100 m | Viewfactor | 0.3594 |
| Windspeed | n/a | Radiant heat flux | 23.62 kW/m² |
| Heat of combustion | 18,600 kJ/kg | Viewfactor of barrier | 0.0711 |
| Flame temperature | 1,090 K | Adjusted viewfactor | 0.2882 |
| Actual barrier height | 1.8 m | Adjusted radiant heat flux | 18.94 kW/m² |
| | | Bushfire Attack Level | BAL-19 |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

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Calculated March 8, 2026, 11:38 pm (RHBc v.1.4)

**BAL-12.5**

| Radiant Heat Barrier calculator - AS3959-2018 | | | |
|---|---|---|---|
| Inputs | | Outputs | |
| Fire Danger Index | 53 | Rate of spread | 0.94 km/h |
| Vegetation Classification | Woodland | Flame length | 8.22 m |
| Understorey fuel load | 14.9 t/ha | Flame angle | 75 ° |
| Total fuel load | 17.2 t/ha | Panel height | 7.94 m |
| Vegetation height | n/a | Elevation of receiver | 3.97 m |
| Effective slope | 0 ° | Effective barrier height | 1.8 m |
| Site slope | 0 ° | Fire intensity | 8,421 kW/m |
| Distance to vegetation | 16.7 m | Transmissivity | 0.844 |
| Flame width | 100 m | Viewfactor | 0.2432 |
| Windspeed | n/a | Radiant heat flux | 15.61 kW/m² |
| Heat of combustion | 18,600 kJ/kg | Viewfactor of barrier | 0.0504 |
| Flame temperature | 1,090 K | Adjusted viewfactor | 0.1927 |
| Actual barrier height | 1.8 m | Adjusted radiant heat flux | 12.37 kW/m² |
| | | Bushfire Attack Level | BAL-12.5 |

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

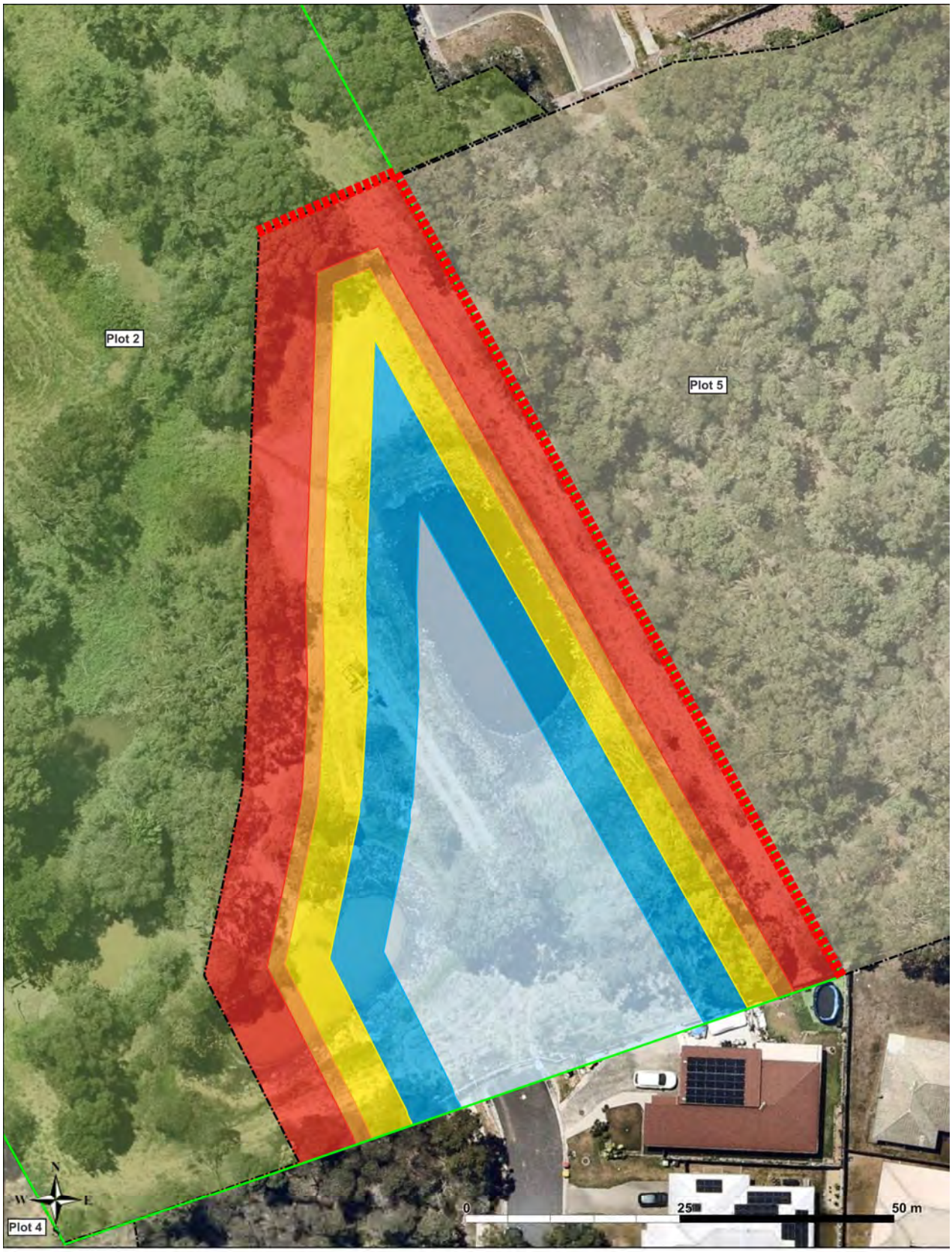
Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

| Bushfire Attack Level | Separation Required |
|---|---|
| BAL – FZ | 0 Metres |
| BAL – 40 | 5.7 Metres |
| BAL – 29 | 7.8 Metres |
| BAL – 19 | 11.4 Metres |
| BAL – 12.5 | 16.7 Metres |
| BAL – Low | >100 Metres |

## Adjusted BAL Contours After Radiant Heat Barrier:




**Legend**

**100m Buffer**
100m Buffer

**Radiant Heat Barrier**
Radiant Heat Barrier (Colourbond Fence 1.8m Tall)

**BAL Map for Contours (Radiant Heat Barrier)**
A. Forest
B. Woodland

**BAL Contours (Radiant Heat Barrier)**
BAL-12.5
BAL-19
BAL-29
BAL-40
BAL-FZ

# Recommendations:

1. **Access to Water for Firefighting Purposes:**

   Reticulated water is available to the site and will be extended throughout the property as a part of the proposed development; therefore, providing a static water storage supply for firefighting purposes is not a requirement from this proposal.

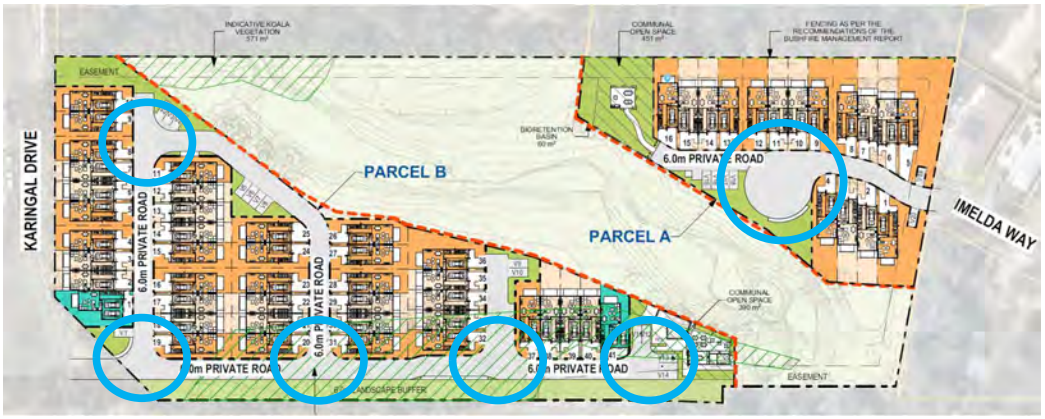
2. **Vehicular Access:**

   The proposed internal road network is considered compliant and can adequately provide access for firefighting and emergency appliances. The minimum criterion for these internal roads is shown below.

   a. a minimum cleared width of 6m and a height of 4.8m;
   b. a minimum formed width of 4m;
   c. a maximum gradient of 12.5% constructed to an all-weather standard; and
   d. culverts and/or bridges with a minimum load bearing of 15 tonnes (if applicable).

   Passing bays will not be required along the proposed internal road network as there are many areas for vehicles to simultaneously pass within the property.

   Hard stand turning areas will be made available throughout the property as circled in the below site plan.




3. **Open Space:**

   The proposed development proposes small areas of communal open space located close to the northern and southern property boundaries. The proposed open space area can include mature canopy trees but must have a ground cover managed to a maximum height of 150mm at all times. The mature canopy trees within the open space area should be located where the canopies do not overlap.

4. **Vegetation Management:**

Due to the nature of the proposed development and proposed rehabilitation areas, landscape buffers and dedicated koala habitat areas, conditioned radiation zones are not a requirement for this proposal. Setbacks for BAL contours are taken from the edges of the rehabilitation area along the gulley, classifiable vegetation outside the property boundaries and any other dedicated green space areas. Some reductions in the proposed rehabilitation area have been proposed in order for particular structures to achieve ≤29kW/$m^2$ of potential radiant heat flux as described under recommendation five below.

5. **Acceptable Bushfire Risk (≤29kW/$m^2$ of Potential Radiant Heat Flux)**

All habitable structures within the proposed development must meet a maximum radiant heat flux exposure of ≤29kW/$m^2$. Class 10 or other non-habitable structures can be erected with a radiant heat flux exposure greater than 29kW/$m^2$ but must be individually assessed for Bushfire Attack Level. The proposed townhouses number 1, 4, 9-16, 10, 11, 25, 26, 27, 35, 36 and 38-41 currently do not meet ≤29kW/$m^2$ of potential radiant heat flux (without consideration to the radiant heat barrier along plot 5 classifiable vegetation).

**All below required setback distances are measured to the wall line of the proposed townhouse structure, not to the support of the proposed awnings which are considered to be class 10 and can be exposed to >29kW/$m^2$ of potential radiant heat flux.**

Proposed townhouses 5-16 on parcel A must be setback at least 7.8 metres (after the implementation of the radiant heat barrier) from the eastern property boundary (classifiable vegetation plot 5) to achieve ≤29kW/$m^2$ of potential radiant heat flux. Proposed townhouses 1 and 4 on parcel A and 10, 11, 25, 26, 27, 35, 36 and 38-41 on parcel B are all exposed to >29kW/$m^2$ of potential radiant heat flux from the proposed rehabilitation area (classifiable vegetation plot 2). A reduction to the rehabilitation area of 9 metres from the structures exposed to >29kW/$m^2$ of potential radiant heat flux as noted above will allow these structures to be considered an acceptable level of bushfire risk. These reduced threat zones of the proposed rehabilitation area can consist of canopy trees with a mown grass ground cover. A map illustrating this reduction is shown below.




**Legend**

**100m Buffer**
100m Buffer

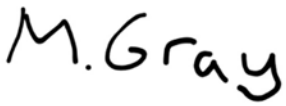
**BAL Map for Contours (Post Rehab Reduction and After RHB)**
A. Forest
B. Woodland

**BAL Contours (Post Rehab Reduction and RHB)**
BAL-12.5
BAL-19
BAL-29
BAL-40
BAL-FZ

6. Where possible and ecologically viable, non-combustible high moisture content species should be utilised when planting within the property.

7. It is recommended that an alert be placed on the Title or Council Rate searches noting that an approved Bushfire Risk Assessment is in existence, is made available to ensuing owners, and must be complied with by ensuing owners.





Ray Cavanough and Max Gray

# Appendix 1 – Site Plan

# Appendix 2 – Rehabilitation Management Plan and Planting Palette



## Appendix C – Planting Palette – RE 12.3.11 / 12.3.6

**Notes:**

1. Local provenance tubestock only and no cultivars.
2. Not all species will be available at the time of planting however at least 50% of the species specified should be utilised. Alternative substitutions are to be approved by Council.
3. This palette reflects species typically occurring in the following preclearing regional ecosystems:
   a. Of concern RE 12.3.11: *Eucalyptus tereticornis +/- Eucalyptus siderophloia*, *Corymbia intermedia* open forest on alluvial plains usually near coast (outer riparian zone)
   b. Least concern RE 12.3.6: *Melaleuca quinquenervia +/- Eucalyptus tereticornis*, *Lophostemon suaveolens*, *Corymbia intermedia* open forest to woodland on coastal alluvial plains (inner riparian zone – 5m from top of bank to bed).
4. Generally palustrine wetlands in floodplains, fringing drainage lines, swales and depressions, but can include lacustrine water bodies associated with the construction of bunding and levees.
5. This ecosystem is also known to provide suitable habitat for the Vulnerable koala *Phascolarctos cinereus*.

| Scientific Name | Common Name | Stratum/Zone |
|---|---|---|
| *Angophora leiocarpa* | Smooth Barked Apple | Canopy |
| ***Corymbia intermedia***[k] | **Pink Bloodwood** | **Canopy** |
| ***Corymbia tesselaris***[k] | **Moreton Bay Ash** | **Canopy** |
| *Elaeocarpus obovatus* | Hard quandong | Canopy |
| ***Eucalyptus robusta***[k] | **Swamp mahogany** | **Canopy** |
| *Endiandra sieberi* | Hard Corkwood | Canopy |
| *Eucalyptus seeana*[k] | Narrow leaved redgum | Canopy |
| ***Eucalyptus siderophloia***[k] | **Grey Ironbark** | **Canopy** |
| ***Eucalyptus tereticornis***[k] | **Forest Red Gum** | **Canopy** |
| ***Lophostemon suaveolens***[k] | **Swamp Mahogany** | **Canopy** |
| ***Melaleuca quinquenervia***[k] | **Broad Leaved Paperbark** | **Canopy** |
| ***Melaleuca salicina***[k] | **White bottlebrush** | **Canopy** |
| ***Acacia disparrima subsp. disparrima*** | **Brush ironbark wattle** | **Understorey** |
| *Acmena smithii* | Lily Pilli | Understorey |
| ***Allocasuarina littoralis*** | **Black She-Oak** | **Understorey** |
| *Alphitonia excelsa* | Red Ash | Understorey |
| *Banksia integrifolia subsp. integrifolia* | Coastal Banksia | Understorey |
| *Commersonia bartramia* | Brown kurrajong | Understorey |
| ***Cupaniopsis anacardioides*** | **Tuckeroo** | **Understorey** |
| *Elaeocarpus reticulatus* | Blueberry Ash | Understorey |
| *Ficus coronata* | Sandpaper fig | Understorey |
| ***Glochidion ferdinandi*** | **Cheese Tree** | **Understorey** |
| *Glochidion sumatranum* | Umbrella cheese tree | Understorey |
| *Melaleuca sieberi* | Sieber's paperbark | Understorey |
| *Acacia leiocalyx* | Black Wattle | Shrub |
| *Alpinia caerulea* | Native ginger | Shrub |
| *Austromyrtus dulcis* | Midgen Berry | Shrub |

| Scientific Name | Common Name | Stratum/Zone |
|---|---|---|
| *Banksia robur* | Swamp banksia | Shrub |
| *Breynia oblongifolia* | Coffee Bush | Shrub |
| *Clerodendrum floribundum* | Lolly Bush | Shrub |
| *Dodonaea triquetra* | Large-leaf Hop-bush | Shrub |
| *Hakea florulenta* | Willow hakea | Shrub |
| *Hibiscus heterophyllus* | Rosella | Shrub |
| *Hovea acutifolia* | Pointed-leaved Hovea | Shrub |
| *Leptospermum polygalifolium* | A Teatree | Shrub |
| *Melastoma malabathricum* | Blue tongue | Shrub |
| *Myoporum acuminatum* | Boobialla | Shrub |
| *Persoonia adenantha* | A Geebung | Shrub |
| *Persoonia stradbrokensis* | A Geebung | Shrub |
| *Pittosporum revolutum* | Rough Fruit Pittosporum | Shrub |
| *Pultenaea villosa* | Hairy Bush-pea | Shrub |
| *Sannantha similis* | Twiggy heath myrtle | Shrub |
| *Maclura cochinchinensis* | Cockspur Thorn | Shrub |
| *Alloteropsis semialata* | Cockatoo grass | Groundcover |
| *Cymbopogon refractus* | Barbed Wire Grass | Groundcover |
| *Dianella caerulea* | Blue Flax-lily | Groundcover |
| *Dianella revoluta* | Blueberry Lily | Groundcover |
| *Digitaria didactyla* | Queensland Blue Couch | Groundcover |
| *Gahnia aspera* | Rough Saw-sedge | Groundcover |
| *Gahnia clarkei* | Tall saw-sedge | Groundcover |
| *Gahnia sieberiana* | Red-fruit saw-sedge | Groundcover |
| *Imperata cylindrica* | blady grass | Groundcover |
| *Lepidosperma laterale* | Variable Swordsedge | Groundcover |
| *Lomandra longifolia* | Spiny-headed Mat-rush | Groundcover |
| *Lomandra multiflora* | Many flowered matrush | Groundcover |
| *Ottochloa gracillima* | Pademelon grass | Groundcover |
| *Pimelea linifolia* | Rice flower | Groundcover |
| *Themeda triandra* | Kangaroo Grass | Groundcover |
| *Viola banksii* | Wild Violet | Groundcover |
| *Viola hederacea* | Ivy-leaved Violet | Groundcover |
| *Xanthorrhoea fulva* | Swamp grasstree | Groundcover |
| *Bolboschoenus fluviatilis* | marsh clubrush | Riparian |
| *Carex appressa* | Tall sedge | Riparian |
| *Carex fascicularis* | Tassel sedge | Riparian |
| *Crinum pendunculatum* | River lily | Riparian |
| *Cyperus exaltatus* | Giant sedge | Riparian |
| *Eleocharis cylindrostachys* | Spikerush | Riparian |
| *Eleocharis philippinensis* | Spikerush | Riparian |
| *Eleocharis sphacelata* | Tall spikerush | Riparian |

# Appendix 3 – Photos of Main Aspects




1. Classifiable vegetation plot 1 (VHC 16.1).




2. Classifiable vegetation plot 1 (VHC 16.1).



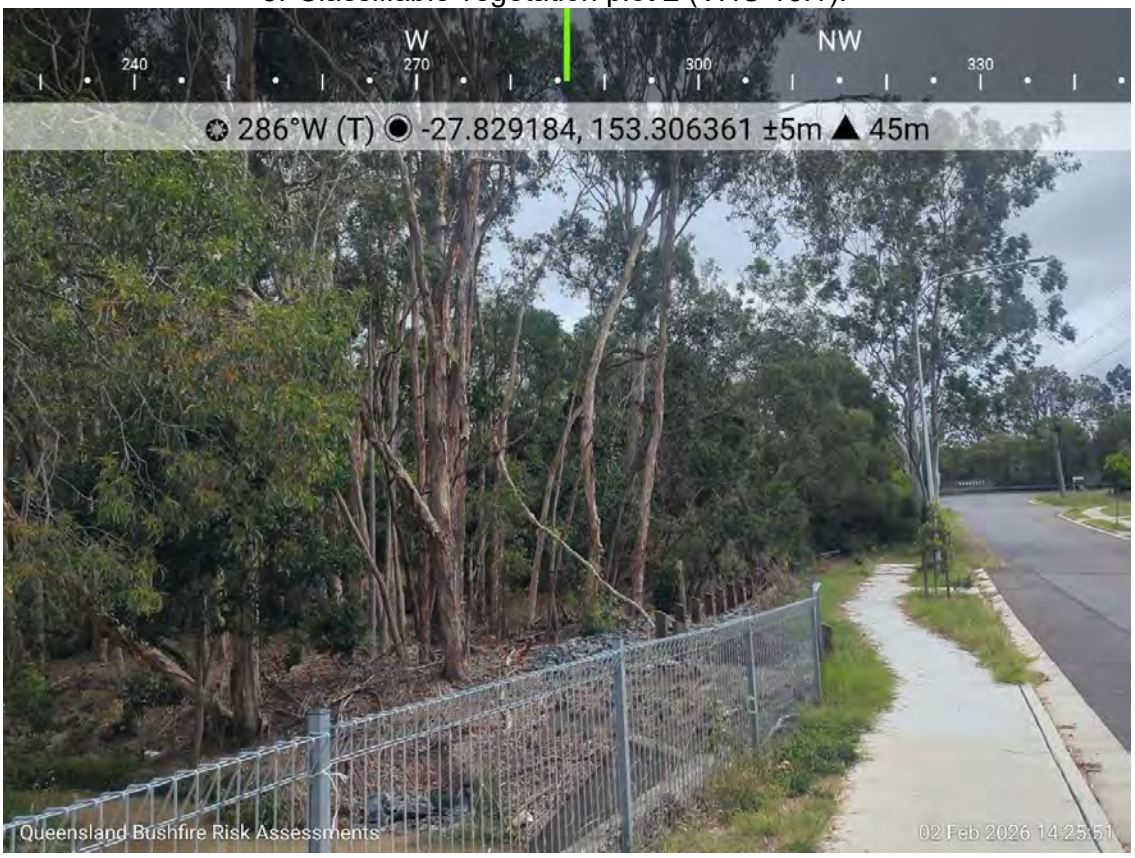

3. Classifiable vegetation plot 1 (VHC 16.1).




4. Classifiable vegetation plot 2 (VHC 16.1).




5. Classifiable vegetation plot 2 (VHC 16.1).




6. Classifiable vegetation plot 2 (VHC 16.1).




7. Vegetation currently present onsite.




8. Vegetation currently present onsite.




9. Vegetation currently present onsite.




10. Vegetation currently present onsite.




11. Vegetation currently present onsite.




12. Vegetation currently present onsite.




13. Vegetation currently present onsite.




14. Vegetation currently present onsite.




15. Vegetation currently present onsite.




16. Vegetation currently present onsite.




17. Vegetation currently present onsite.




18. Classifiable vegetation plot 3 (VHC 9.2).




19. Classifiable vegetation plot 3 (VHC 9.2).




20. Classifiable vegetation plot 4 (VHC 9.2) beyond a bio basin.




21. Classifiable vegetation plot 4 (VHC 9.2) beyond a bio basin.




22. Classifiable vegetation plot 4 (VHC 9.2).




23. Classifiable vegetation plot 4 (VHC 9.2).




24. Classifiable vegetation plot 4 (VHC 9.2).




25. Classifiable vegetation plot 5 (VHC 9.2).




26. Classifiable vegetation plot 5 (VHC 9.2).




27. Classifiable vegetation plot 5 (VHC 9.2).

# Photo Points




**Legend**

Photopoints

# Appendix 4 – Bushfire Hazard Overlay Code

### 8.2.3.3 Specific benchmarks for assessment

**Table 8.2.3-2: Bushfire hazard overlay code – for assessable development**

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>if not, justify how the proposal meets either the performance outcome or overall outcome |
|---|---|---|
| **PO1**<br>In a bushfire hazard area, the fire mitigation methods used at the site are adequate for the bushfire hazard of the individual site, having regard to:<br>(a) vegetation type;<br>(b) slope;<br>(c) aspect;<br>(d) bushfire history;<br>(e) conservation values of the site;<br>(f) ecological restoration, including forest succession;<br>(g) ongoing maintenance;<br>(h) climate change; and<br>(i) on site and off-site[1] fire hazard implications.<br>[1]**Note: This includes potential hazard from land up to 10kms away from the site. For example, how might large tracts of forest away from the site impact on the bushland that surrounds the site.** | **AO1**<br>A written assessment by a suitably qualified and experienced bushfire management consultant confirms that the site is not in a bushfire hazard area.<br>OR<br>The development complies with an approved Bushfire management plan prepared in accordance with **SC6.3 City Plan policy – Bushfire management plans**.<br>OR<br>The development complies with an existing approved Bushfire management plan as referenced within the approved reconfiguration of a lot.<br>**Note: Prior to:**<br>**(a) plan sealing for a Reconfiguration of a lot; or**<br>**(b) the issue of a Building final or Certificate of classification for Building work; or**<br>**(c) the commencement of use where building work is not proposed.**<br>**Whichever comes first, the applicant must submit to Council, certification from an appropriately qualified and experienced person that the development has been completed in accordance with, and complies with the approved Bushfire management plan and that all risk treatments are functioning in accordance with the approved plan.** | **The proposed development is accompanied by a bushfire management plan prepared by Queensland Bushfire Risk Assessments dated the 09/03/26.** |
| | | |

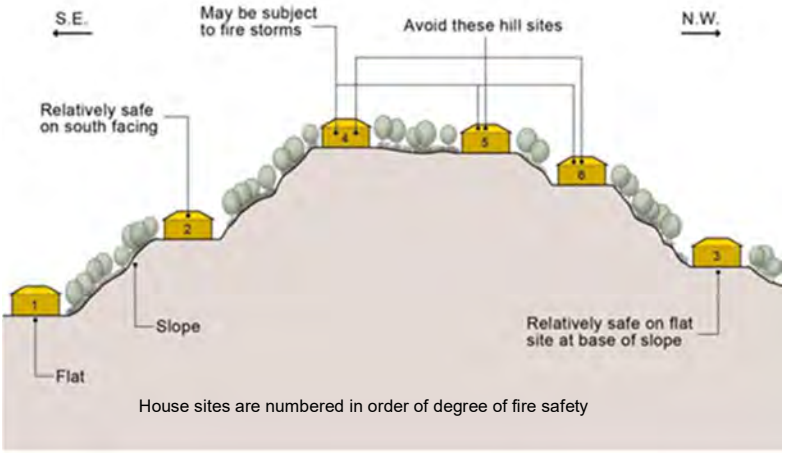



**Figure 8.2.3-1**
Bushfire hazard overlay – Preferred house site location in bushfire hazard areas. Image adapted from QDHLGP (1993) Bushfire Hazard Planning in Queensland.

| | | |
|---|---|---|
| **PO2**<br>In a bushfire hazard area, development:<br>(a) does not result in a high concentration of people living, working or congregating in a bushfire hazard area;<br>(b) does not result in the bulk manufacture or storage of hazardous materials; and<br>(c) 'essential' community infrastructure is able to function effectively during and immediately after a bushfire event. | **AO2**<br>The following land uses are not located in a bushfire hazard area:<br>(a) Child care centre;<br>(b) Community care centre;<br>(c) Community use;<br>(d) Development involving the manufacture or storage of hazardous material in bulk;<br>(e) Educational establishment;<br>(f) Hospital;<br>(g) Residential care facility;<br>(h) Retirement facility;<br>(i) Rooming accommodation;<br>(j) Sport and recreation uses;<br>(k) Tourist attraction;<br>(l) Tourist park; and<br>(m) Utility installation (waste management facilities).<br>AND<br>In a bushfire hazard area permitted essential community infrastructure is designed to function effectively during and immediately after bushfire events, as demonstrated in a Bushfire management plan.<br>**Note: A Bushfire management plan prepared by a suitably qualified person and in accordance with SC6.3 City Plan policy – Bushfire management plans is Council's preferred method for addressing this acceptable outcome.** | **Compliant**<br>The proposed development does not fall under a use detailed in A02; however, the proposed development will result in a higher concentration of residents at the property. The accompanying bushfire risk assessment has demonstrated that the proposed development meets an acceptable bushfire risk and can effectively function in the event of a bushfire. |
| **PO3**<br>In a bushfire hazard area, developments, including lot layout are designed to avoid bushfire hazard and provide safe sites for people, property and buildings.<br>Editor's note – The development should be located:<br>(a) away from the most likely direction of a fire front (refer Figure 8.2.3-1: Preferred house site location in bushfire hazard areas); and<br>(b) so that elements of the development least susceptible to fire are sited closest to the bushfire hazard. | **AO3**<br>Development, Lots and/or building envelopes are not located within bushfire hazard areas.<br>OR<br>The development is located in accordance with the approved Bushfire management plan as referenced within the approved reconfiguration of a lot.<br>OR<br>The development is designed to adequately demonstrate that the risk to life and property is minimised to achieve acceptable levels and ensure ongoing site management. | **Compliant**<br>All of the proposed new townhouse buildings can adequately meet 29kW/$m^2$ of potential radiant heat flux or less with the implementation of a radiant heat barrier and a reduction in the proposed rehabilitation area. Details regarding these requirements are located under the recommendations section of this report. |

| | | |
|---|---|---|
| | **AO3.2**<br>The development design incorporates bushfire radiation zone/s that:<br>(a) use existing or natural fire breaks & minimise the need to clear native vegetation;<br>(b) do not impact matters of environmental significance;<br>(c) are located entirely within the boundaries of the private property of the development site; and<br>(d) incorporates landscaping species that are less likely to exacerbate a bushfire event. | **Compliant**<br>The proposed development does not rely on radiation zones in order to mitigate against potential bushfire risk. |
| **PO4**<br>In a bushfire hazard area, when designing for bushfire hazard mitigation the lot layout must avoid impacts on matters of environmental significance. | **AO4**<br>Development design, Lot size, and layout avoids impact on matters of environmental significance and minimises impacts such as fragmentation, habitat loss and edge effects for any matters of environmental significance. | **Compliant**<br>The proposed development does not have impacts on matters of environmental significance due to a lack of conditioned vegetation management for bushfire mitigation. |

| | | |
|---|---|---|
| **PO5**<br>Development uses fencing that:<br>(a) does not contribute to the spread of bushfire;<br>(b) facilitates the safe movement of fauna; and<br>(c) provides access for fire-fighting purposes. | **AO5**<br>Fences are constructed:<br>(a) using non-combustible or fire retardant materials within 20m of any building used for accommodation;<br>(b) that do not impede the safe movement of fauna (where applicable); and<br>(c) has gates that can be freely accessed for fire-fighting purposes (if applicable). | **Compliant**<br>A radiant heat barrier has been conditioned as a part of this proposal which must consist of steel, concrete or masonry. Any other fencing constructed within the property is recommended to consist of a non-combustible material such as concrete, masonry or Colourbond steel. |
| **PO6**<br>In a bushfire hazard area, vehicular access (including internal roads) is designed to mitigate against bushfire hazard by ensuring adequate access for:<br>(a) fire-fighting and other emergency vehicles, and<br>(b) the evacuation of residents and emergency personnel, during a bushfire event. | **AO6.1**<br>The development design incorporates a perimeter road that:<br>(a) is located between the boundary of the lots and/or buildings and the adjacent natural area and/or bushfire hazard area;<br>(b) has a minimum cleared width of 20m;<br>(c) has a constructed minimum road width of 6m;<br>(d) has a maximum gradient of 12.5%;<br>(e) is constructed to an all-weather standard; and<br>(f) is constructed to ensure all culverts and bridges have a minimum load bearing of 15 tonnes (if applicable).<br>(refer **Figure 8.2.3-2b**). | **Compliant**<br>The proposed internal driveway design is considered adequate for providing access for firefighting and other emergency vehicles. The proposed driveway also provides efficient evacuation to Karingal Drive and Imelda Way for all onsite structures. |
| | **AO6.2**<br>The road design is capable of providing access for fire-fighting and other emergency vehicles, in accordance with **SC6.11 City Plan policy – Land development guidelines, Section 2 – Transport network standards**. | **Compliant**<br>The proposed driveway design is capable of providing access for firefighting appliances and other emergency vehicles. |
| | **AO6.3**<br>The road design does not include dead end roads (refer **Figure 8.2.3-2a**). | **Compliant**<br>The proposed internal driveway design includes a dead end in parcel A but provides a turning circle in the way of a cul-de-sac. Other 'T' shaped areas are readily available within proposed parcel B. |

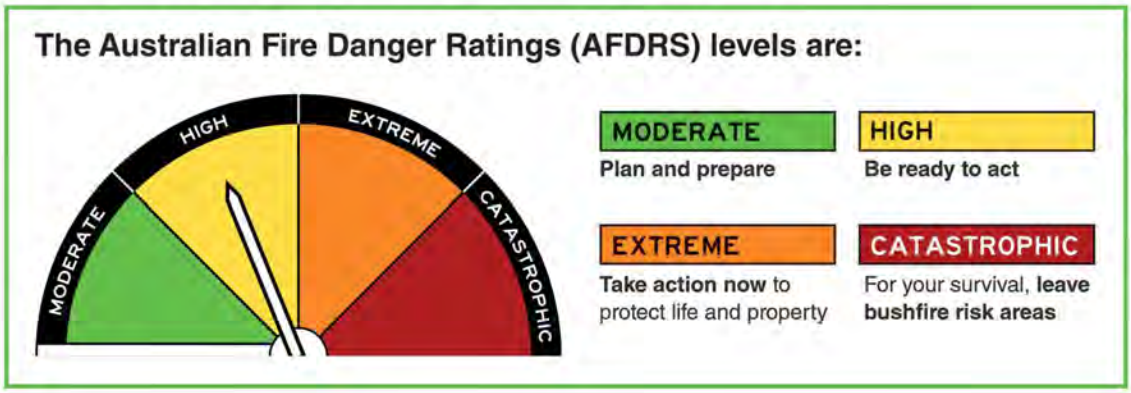
| | | |
|---|---|---|
| **Figures 8.2.3-2a and 8.2.3-2b: Examples of acceptable and unacceptable road layout designs in bushfire hazard areas**<br>  <br><br>**Figure 8.2.3-2a**<br>Unacceptable design – along a ridge top in a bushfire hazard area – the ridge top development has no fire control lines and obstructs fire fighters.<br>  <br><br>**Figure 8.2.3-2b**<br>Acceptable design – Ring road system provides a fire control line and access for fire fighters with all lots located on the inside of the ring-road. | | |
| **PO7**<br>In a bushfire hazard area, the development layout is designed to avoid the requirement to clear vegetation to achieve risk reduction. | **AO7**<br>The Bushfire management plan details the required extent of vegetation clearing and landscaping and where required modify development design and/or lot layout to minimise clearing of vegetation.<br>**Note: For guidance on how to prepare a Bushfire management plan refer to SC6.3 City Plan Policy – Bushfire management plans.** | **Compliant**<br>No vegetation is required to be removed for bushfire mitigation purposes. |
| **PO8**<br>For areas to be dedicated to Council as open space, management strategies to mitigate bushfire risk must be identified. | **AO8**<br>The Bushfire management plan contains a separate section detailing management strategies for areas to be dedicated to Council that can be included within the Open space management plan.<br>**Note: For guidance on how to prepare a Bushfire management plan refer to SC6.3 City Plan Policy – Bushfire management plans.** | **Compliant**<br>There are two small sections of open space dedicated to council as a part of this proposal. Management conditions of the open space area are located under the recommendations section of this report. |
| **PO9**<br>In a bushfire hazard area, fire trails must be provided to:<br>(a) enable access for fire fighters, residents and equipment;<br>(b) contribute to (where required) bushfire radiation zone(s);<br>(c) mitigate against bushfire hazard; and<br>(d) allow access for hazard reduction management programs.<br>**Note: fire trails should be located, constructed and maintained with due regard for landscape and ecological values and should not result in soil disturbance or erosion.** | **AO9.1**<br>Fire trails are located on public land (including public open space areas) to facilitate access for fire brigades.<br>OR<br>Fire trails located on private property are located as close as possible to the property boundaries and the adjoining bushfire hazard area, and an access easement is granted in favour of City of Gold Coast and Queensland Fire and Emergency Services.<br>**Note: Design and construction of all fire trails located on land to be** | **Compliant**<br>Due to the proposed driveway network, fire trails have not been recommended as a part of this proposal. |

| | | |
|---|---|---|
| | **dedicated to the City as Conservation Estate are in accordance with SC6.3 City Plan policy – Bushfire management plans, Section 3.5(f). For other fire trails, AO9.2 – AO9.6 apply.** | |
| | **AO9.2**<br>The fire trail has:<br>(a) a minimum cleared width of 6m;<br>(b) a minimum of 4.8m vertical clearance;<br>(c) a cross fall of no greater than 10 degrees;<br>(d) a minimum formed width of 4m;<br>(e) a maximum gradient of 12.5%, with adequate drainage to prevent soil erosion and minimise ongoing trail maintenance; and<br>(f) culverts and/or bridges with a minimum load bearing of 8 tonnes (if applicable). | **Not applicable** |
| | **AO9.3**<br>Vehicular links are provided along the fire trail either to existing fire trails or roads, and these links are designed having regard to the topography of the site, fire fighter safety and the need to regularly access water supplies.<br>**Note: where possible, these links should be at intervals of approximately 200m** | **Not applicable** |
| | **AO9.4**<br>The fire trail has vehicular access at each end, and links either to existing fire trails or public roads. | **Not applicable** |
| | **AO9.5**<br>The fire trail provides turning areas for fire-fighting appliances. The turning bay can be either:<br>(a) a turning circle;<br>(b) a 'T' shaped turning bay; or<br>(c) a 'Y' shaped turning bay. | **Not applicable** |
| | **AO9.6**<br>The fire trail provides areas for vehicles to pass or turn at intervals of not more than 200m and with a maximum grade of 5% (1 in 20). | **Not applicable** |
| **PO10**<br>In a bushfire hazard area, the development maintains the safety of people and property by ensuring that the water supply is reliable and has sufficient flow and pressure | **AO10.1**<br>The development is proposed in a bushfire hazard area, and reticulated water is supplied in accordance with **SC6.11 City Plan policy – Land** | **Compliant**<br>The property has access to reticulated water and fire hydrants along Karingal Drive and Imelda Way. The reticulated water access will be further implemented throughout the site including the installation of fire |

| | | |
|---|---|---|
| requirements for fire-fighting purposes at all times. | **development guidelines, Section 6 – Water supply and sewerage reticulation standards**. | hydrants. Therefore, water storage for firefighting purposes will not be a requirement for this proposal. |
| | **AO10.2**<br>Development involving new or existing buildings with a gross floor area of greater than 50m$^2$, each lot has a reliable reticulated water supply that has sufficient flow and pressure characteristics for fire-fighting purposes at all times. It must have a minimum pressure and flow of 10 litres a second at 200 kPa. | **Compliant**<br>The proposed development will have access to an adequate reticulated water supply. |
| **PO11**<br>In a bushfire hazard area, the development maintains the safety of people and property by ensuring that an adequate water supply for fire-fighting purposes is provided. | **AO11.1**<br>For development with a combined GFA less than 500m$^2$ where one or more buildings are proposed, dedicated fire-fighting water storage is provided to protect each individual building. Each dedicated fire-fighting water storage must have a volume of water not less than 10,000 litres for each building, be provided within 10m of each building and be:<br>(a) a separate tank that is either below ground level or of non -flammable construction; or<br>(b) a reserve section in the bottom part of the main water supply tank that is either below ground level or of non -flammable construction.<br>**Note: dedicated fire-fighting water storage is in addition to water supply for household use and does not include swimming pools, creeks and dams.** | **Not applicable** |
| | **AO11.2**<br>For development that proposes one or more buildings with a combined GFA greater than 500m$^2$ there is no acceptable outcome provided. | **Not applicable** |
| **PO12**<br>In a bushfire hazard area, all fire-fighting water storage tanks, including domestic water supply tanks, are fitted with the standard rural fire brigade fittings. | **AO12**<br>The outlet pipe is 50mm in diameter, fitted with a 50mm male camlock (standard rural fire brigade fitting) and an isolating valve. | **Not applicable** |
| **PO13**<br>In a bushfire hazard area, water storage provided for fire-fighting purposes is safely located and accessible at all times. | **AO13.1**<br>The water supply outlet is located at least 9m from any potential fire hazards, such as venting gas bottles and combustible structures. | **Not applicable** |
| | **AO13.2**<br>A safe and accessible hard stand area capable of | **Not applicable** |

| | | |
|---|---|---|
| | accommodating a fire fighting vehicle is provided not more than 3m from the water supply outlet. | |
| **PO14**<br>Development in a bushfire hazard area must provide adequate fire-fighting water storage. This infrastructure must be provided on public land so as to be readily accessible to fire brigades for hazard reduction and fire-fighting purposes. | **AO14.1**<br>Where public water supplies (e.g. fire hydrants or public water storage) do not exist, water supply tanks are provided for fire-fighting purposes on public land within the development. The water tanks must:<br>(a) Be installed on land dedicated to Council;<br>(b) hold a volume of at least 22,500 litres per every 20 dwellings;<br>(c) be of concrete construction; and<br>(d) have an outlet pipe of 50mm in diameter, fitted with a 50mm male camlock (standard rural fire brigade fitting) and an isolating valve. | **Not applicable** |
| | **AO14.2**<br>Development on public land provides a safe and accessible hardstand area capable of accommodating a fire fighting vehicle not more than 3m from the water supply outlet. | **Compliant**<br>The proposed internal driveway design is wide enough to accommodate the three-point turn of firefighting appliances. Multiple 'T' shaped turning bays also facilitate the movement of vehicles within the property. |
| **PO15**<br>Development does not cause:<br>(a) an unacceptable risk to people, property and the environment due to the impact of bushfire on hazardous chemicals;<br>(b) excess danger or difficulty to emergency services for emergency response or evacuation. | **AO15**<br>Development involving the storage, handling or manufacture of hazardous chemicals is not located within a Bushfire hazard area. | **Compliant (with conditions)**<br>The proposed development is not permitted to store or manufacture hazardous chemicals within the site. |
| **PO16**<br>In a bushfire hazard area, new residents/occupants of a development in a bushfire hazard area are informed about:<br>(a) the potential bushfire hazard on their site;<br>(b) their responsibility for fire management;<br>(c) the measures required for ongoing fire hazard mitigation; and<br>(d) emergency procedures during a bushfire or on bad fire weather days.<br>**Editor's note - Further information on bushfire preparation can be found at www.ruralfire.qld.gov.au** | **AO16**<br>A copy of the Bushfire management plan, complete with the Queensland Fire and Emergency Services cover sheet and any other addendums is provided to each resident/occupant for their information.<br>**Note: the QFES cover sheet is attached to the approved Bushfire management plan and a notification will be placed on the property's rates notice.** | **Compliant (with conditions)**<br>The bushfire management plan must be made available to all residents of the site and a notice must be placed on the Council rate search. |

# Appendix 5 – The Australian Fire Danger Rating System (AFDRS)




The Australian Fire Danger Rating System is a simplified way for members of the public to understand the potential day-to-day bushfire risk based on many factors including up-to-date state fuel data, spatial and satellite data and weather data. The four levels as shown above are:

- Moderate,
- High,
- Extreme and
- Catastrophic.

Each danger level should be treated differently and requires homeowners to be actively aware of each level day to day.

| MODERATE | HIGH | EXTREME | CATASTROPHIC |
|---|---|---|---|
| Plan and prepare.<br>Most fires can be controlled. | Be ready to act.<br>Fires can be dangerous. | Take action now<br>to protect your life and property.<br>Fires will spread quickly and be extremely dangerous. | For your survival,<br>leave bushfire risk areas<br>If a fire starts and takes hold, lives are likely to be lost. |
| Stay up to date and be ready to act if there is a fire | There's a heightened risk. Be alert for fires in your area.<br>Decide what you will do if a fire starts.<br>If a fire starts, your life and property may be at risk. The safest option is to avoid bushfire risk areas. | These are dangerous fire conditions.<br>Check your bushfire plan and ensure that your property is fire ready.<br>If a fire starts, take immediate action. If you and your property are not prepared to the highest level, go to a safer location well before the fire impacts.<br>Reconsider travel through bushfire risk areas. | These are the most dangerous conditions for a fire.<br>Your life may depend on the decisions you make, even before there is a fire.<br>Stay safe by going to a safer location early in the morning or the night before.<br>Homes cannot withstand fires in these conditions. You may not be able to leave, and help may not be available. |

Shown above is a breakdown of each risk level from the Australian Fire Danger Rating System website (https://afdrs.com.au/). It's important to understand that as the levels rise, there is a requirement for fire wardens and employees to heighten their bushfire awareness and prepare adequately.

Updated fire danger ratings can be found at the below websites and should be checked every four days at a minimum to stay aware of what potential fire weather is ahead.

**Bureau of Meteorology – Queensland Fire Danger Ratings**
http://www.bom.gov.au/qld/forecasts/fire-danger-ratings.shtml

The above website provided by the Bureau of Meteorology breaks down Queensland into 15 sections and provides an FBI (Fire Behaviour Index) rating of which each danger rating has a range. The ranges are as follows.

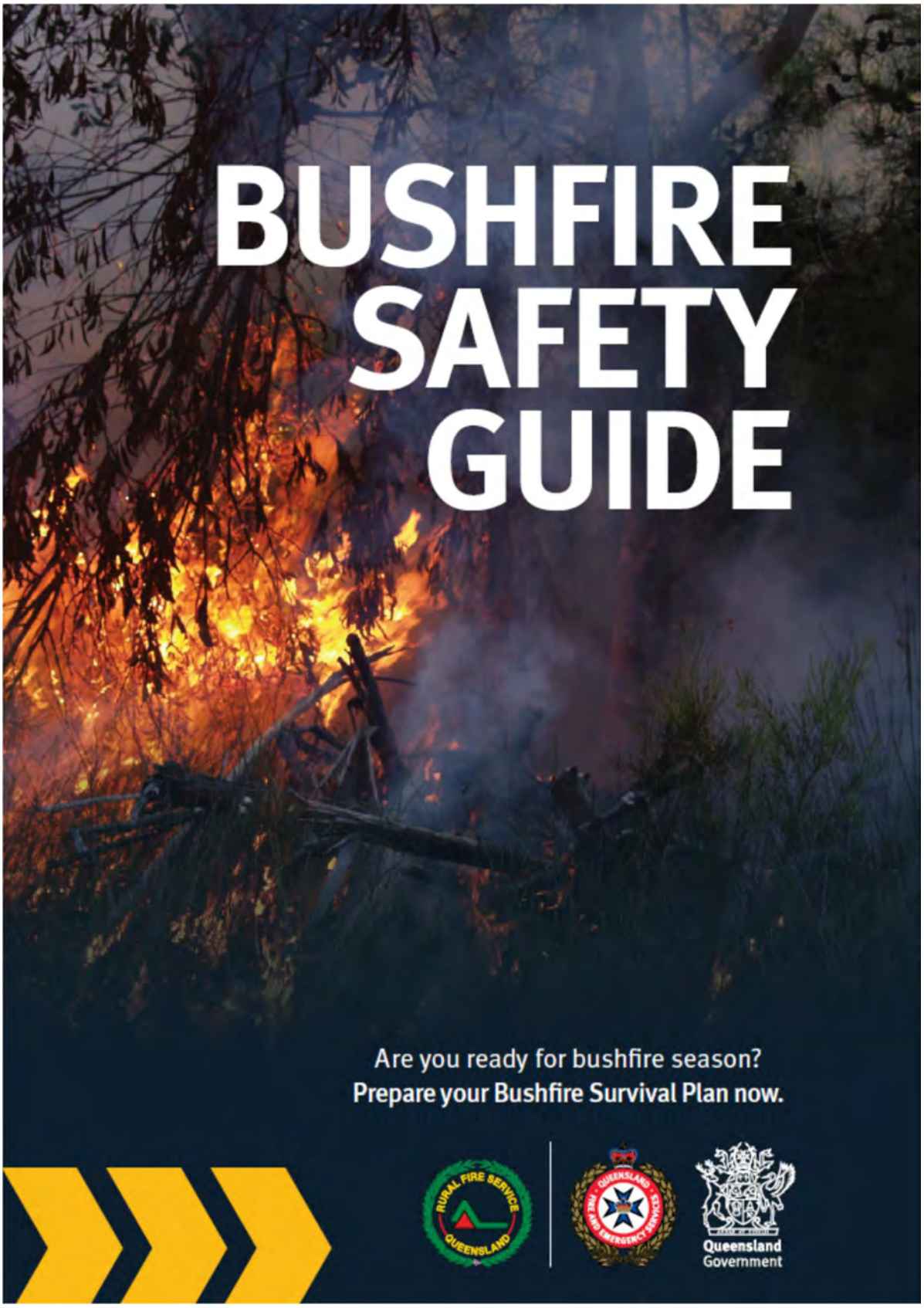
- No Rating (<12)
- Moderate (12-23)
- High (24-49)
- Extreme (50-99)
- Catastrophic (>=100)

**Queensland Fire and Emergency Services – Fire Danger Ratings**
https://www.qfes.qld.gov.au/prepare/bushfire/fire-danger-ratings

The above QFES website provides some more information on the fire danger ratings as well as an interactive map for each section of Queensland. This can act as a great visual alternative to the Bureau of Meteorology which is presented as a table of figures.

Overall, homeowners, fire wardens and community members should pay special attention to the current fire danger ratings in order to be readily prepared for bushfire weather. Correspondence with the local rural fire brigade may be helpful in order to stay ready and prepared for potential bushfires.

# Appendix 6 – Queensland Fire and Emergency Services Bushfire Safety Guide





**Bushfires can affect you no matter where you live in Queensland.**

**Bushfires move fast, can be highly destructive and pose a serious threat to life, property, and the environment.**

Queensland Fire and Emergency Services (QFES) are committed to protecting lives and properties, however in a state as big as Queensland, a fire crew may not be available to assist every home.

It's important you have a plan in place and know exactly what you can do to protect yourself, your family, and your property.

During a bushfire, your safety depends on your preparations and the decisions you make.

The first step is to understand your level of risk to help you make informed decisions that are right for you and your family.

### *When is bushfire season?*

***Fire season in Queensland often begins in July and runs through until October, but can extend into February. However, bushfires in Queensland can occur at any time.***

***These times can vary each year depending on the condition of local bushland, long-term climate conditions, and short-term weather events. The impacts of climate change are creating extended fire seasons that include higher temperatures with more frequent hot days, and increased fire danger across the state.***

# KNOW YOUR RISK

## Is your property at risk?

All Queenslanders need to be prepared for bushfire. You don't have to live in the bush to be threatened by bushfires, just close enough to be affected by burning material, embers, and smoke.

If you answer yes to any of the questions below you are at a heightened risk of bushfire.

- Do you live within a few kilometres of bushland?
- Does your local area have a history of bushfire?
- Do you have trees and shrubs within 20 metres of your home?
- Do you live along the coast near scrub?
- Do you live on a farm or near paddocks?

Visit the QFES website at www.qfes.qld.gov.au and use the post code checker to see the bushfire potential in your neighbourhood.

## It's not just fire

Bushfires can lead to loss of life and cause serious damage to property and infrastructure, but the fire itself is only one part of the danger.

- Fire embers (small pieces of burning bark, leaves and twigs) can be caught in the wind and travel many kilometres from where the bushfire is burning and cause spot fires to start.
- The radiant heat from a large bushfire can be felt more than 100 metres away and can melt or crack objects such as glass windows, allowing embers into buildings and vehicles.
- Radiant heat can also be deadly to people and animals, causing dehydration and even heatstroke.
- Toxic fumes and heavy smoke from bushfires can make seeing and breathing difficult.



## Is your home at risk?

Use the risk factors checklist to assess the vulnerability to your home in the event of a bushfire. Consider what changes you could make to your home to reduce your risk. The more boxes you tick, the more prepared your home may be.

### Does your home have:

- ☐ Non-combustible exterior walls.
- ☐ Sealed roof ridge capping.
- ☐ Enclosed eaves.
- ☐ An enclosed underfloor.
- ☐ Metal screened vents.
- ☐ Non-combustible window trimmings.
- ☐ Non-combustible deck or verandah.

### If firefighters need to access your property, does it have:

- ☐ Access route clear of overhanging trees.
- ☐ Access route clear of overhead powerlines.
- ☐ Unrestricted driveway access (gates can be opened without restriction).
- ☐ Room for large vehicles to reverse in (Approximately four metres wide).
- ☐ Turning or passing areas for large vehicles.
- ☐ Heavy vehicle access on cattle grids and bridges.
- ☐ Two-wheel drive vehicle access.
- ☐ An alternative way out for vehicles.

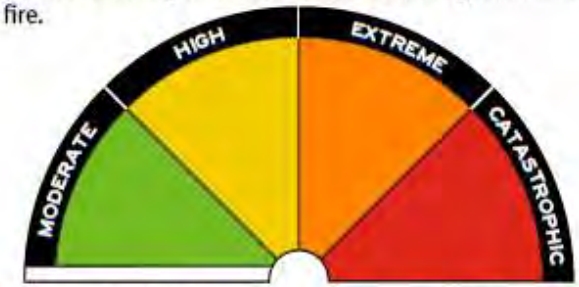
### Do you have accessible water supply:

- ☐ Reticulated water supply.
- ☐ Tank supply suitable for firefighter access - 50mm male camlock fitting with shut-off valve.
- ☐ Accessible open water supply such as a dam or pool.
- ☐ Firefighting pump and hose connected to a water supply.

## Know your Fire Danger Ratings

A Fire Danger Rating (FDR) describes the potential level of danger should a bushfire start. They are important because they provide you with information so you can take action to protect yourself, your family, and your home from the potentially dangerous impacts of bushfire.

They do not indicate the chance of a fire occurring, although this is a common misconception. Ratings are calculated using a combination of weather forecasting and information about vegetation that could fuel a fire.




Find your local FDR forecast by visiting the QFES website at www.qfes.qld.gov.au.

**Moderate** — PLAN AND PREPARE

Plan and prepare.
Most fire can be controlled.

**High** — BE READY TO ACT

Be ready to act.
Fires can be dangerous.

**Extreme** — TAKE ACTION NOW

Take action now to protect your life and property.
Fires will spread quickly and be extremely dangerous.

**Catastrophic** — LEAVE BUSHFIRE RISK AREA

For your survival, leave bushfire risk areas.
If a fire starts and takes hold, lives are likely to be lost.




# WILL YOU LEAVE EARLY?

One of the most important things to do before bushfire season is to decide what you will do if a bushfire threatens your home or property.

## Leave early? Or stay and defend?

Discuss with your family if you are capable and prepared to stay and defend your home or if leaving is the best choice for your family.

You need to consider:

- **Your health.**
  Fire conditions may aggravate conditions, such as breathing conditions that may make it difficult to defend your property for an extended period of time.
- **Your physical abilities.**
  You may need to defend your home for several hours in extreme heat and smoke which may require intense physical activity.
- **Your mobility.**
  You will need to move around your property with ease, potentially in dark, windy, and noisy conditions.
- **Your mental health.**
  The impact of bushfire can be traumatic and you will need to be mentally prepared.
- **Your ability** to make critical and informed decisions under stressful conditions.

## Your decisions

**You have decided to leave early.** You need to prepare for the season ahead and make your Bushfire Survival Plan with your family. The decisions you make now will help you be prepared in the event your home and family are impacted by bushfire.

- What will be your trigger to leave? This could be a Fire Danger Rating. Don't rely on an official warning to leave. Bushfires can start quickly and threaten lives and homes within minutes.
- Do you or your family members have any disabilities or medical conditions that you need to take into consideration?
- Will you leave early that morning or the night before?
- Where will you go? Can you stay with family and friends or at a hotel in a safe location?
- Who will you tell? You should let your family, friends, and neighbours know where you have relocated to in case you need to be contacted.
- What route will you take and what is your back up route if a fire is already in the area?
- What will you take with you?
- What are you going to do with your pets or livestock?
- Who else do you need to talk to about where you are going?
- How will you stay informed about warnings and updates?
- What do you need to do to prepare your home before you leave?
- What will you do if there is a fire in the area and you cannot leave? Make sure you have a contingency plan.

**If you plan to leave early, then you must leave your home well before a bushfire threatens and travelling by road becomes hazardous.**

# YOUR BUSHFIRE EVACUATION KIT

You must prepare a Bushfire Evacuation Kit to ensure you and your family have important items and equipment ready to relocate until you can return to your home.

Include items such as:

- Hat
- Long sleeve shirt (natural fibres)
- Jeans or long pants (natural fibres)
- Drinking water
- Medication and prescriptions
- Boots
- Radio (battery operated)
- Batteries
- Important documents (e.g. insurance papers)
- Safety glasses
- Wallets and purses
- Passports and birth certificates
- Torch (battery operated)
- Children's toys
- Blankets (natural fibres)
- Family photos and valuables
- Pet supplies
- Mobile phone and charger

**LEAVE EARLY**




# WILL YOU STAY?

Defending your home through a bushfire is a demanding task. You need to be mentally and physically ready and you need to have a plan.

## What to expect

A bushfire is a terrifying and stressful experience. Understanding what to expect and planning what you will do will help you cope.

- It will be hot and dark. The sky may turn orange.
- Strong gusty winds and intense heat will make you tired quickly.
- Thick, heavy smoke will sting your eyes.
- Smoke will make it hard to breathe easily.
- Strong winds will push you around.
- The roaring sound of the wind and fire approaching will make it hard to hear.
- Embers will rain down causing spot fires all around you.
- Power, water and internet may be cut off.
- You may be isolated.
- The fire could impact you very fast, so you need to remain calm and stay focused.
- You may hear explosions nearby.
- While the fire front may pass quite quickly, it could be hours before the danger is over and you can rest.

## Your decisions

You need to discuss your options with your family and prepare your Bushfire Survival Plan so that your whole household knows their roles. Some things that you need to consider are:

- How will you stay informed about warnings and updates?
- Is your property able to withstand the impact of a bushfire? What can you do to better prepare you home?
- Do you have any experience with or knowledge of defending a property during a bushfire?
- Do you have the supplies you need to defend your home, and know how to use them?
- Do you have an independent water supply or will you rely on water mains?
- How many people will be defending the property in the event of a bushfire? It is unsafe to defend a property on your own - if you are injured you may not be able to seek medical assistance and there may be too many locations that need attention for just one person.
- Do you or your family members have any disabilities or medical conditions that you need to take into consideration?
- Will someone else be responsible for looking after others (young, elderly, or disabled)? If you are defending the property, it is preferable that someone else is available to provide supervision or assistance to dependents.
- Is there anyone outside your neighbourhood that you need to help or check up on?
- What are you going to do with your pets or livestock? Will you have someone dedicated to looking after your animals so that you can focus on defending your property?
- What will you do if it's too dangerous to stay? Where will you go? Do you have any family or friends you can stay with? What will you take? Make sure you have a contingency plan.

If you choose to or are forced to stay at your property it is essential you are prepared for the oncoming bushfire.

## Before the fire front arrives:

- ☐ Ensure vehicles have sufficient fuel and move them to a safe location.
- ☐ Relocate garden furniture, door mats and other outdoor items indoors.
- ☐ Block downpipes at the top and fill gutters with water if possible.
- ☐ Wet down the sides of buildings, decks and plants close to your home in the likely path of the bushfire.
- ☐ Move animals and livestock to a well-grazed or ploughed area.
- ☐ Turn on garden sprinklers for 30 minutes to soak the ground.
- ☐ Close windows, doors, and vents. Shut blinds.
- ☐ Take down curtains and move furniture away from windows.
- ☐ Seal gaps under doors and windows with wet towels.
- ☐ Fill containers with water, e.g. sinks, bathtub, buckets, bins.
- ☐ Bring pets inside, contain them in one room and provide them with plenty of water.
- ☐ Tune in to warnings to monitor local radio, websites or social media for updates.
- ☐ Put on protective clothing.
- ☐ Drink lots of water.
- ☐ Notify friends and family of your intent to stay.

## As the fire front arrives:

- ☐ Disconnect hose and fittings and bring inside.
- ☐ Go inside for shelter.
- ☐ Drink lots of water.
- ☐ Shelter in your house on the opposite side from the approaching fire, in a room with multiple escape points.
- ☐ Patrol and check for embers inside, particularly in the roof space.
- ☐ Check on family and pets.
- ☐ Maintain a means of escape.
- ☐ Continually monitor conditions.
- ☐ Stay tuned to information channels.




## After the fire front passes:

- ☐ Stay tuned to information channels.
- ☐ Contact friends and family to tell them you are safe.
- ☐ Continue to check for small spot fires and burning embers:
  - » Inside your roof space.
  - » Under the house.
  - » On verandahs and decks.
  - » In roof lines and gutters.
  - » Under floorboards.
  - » In wood piles.
  - » In garden beds.



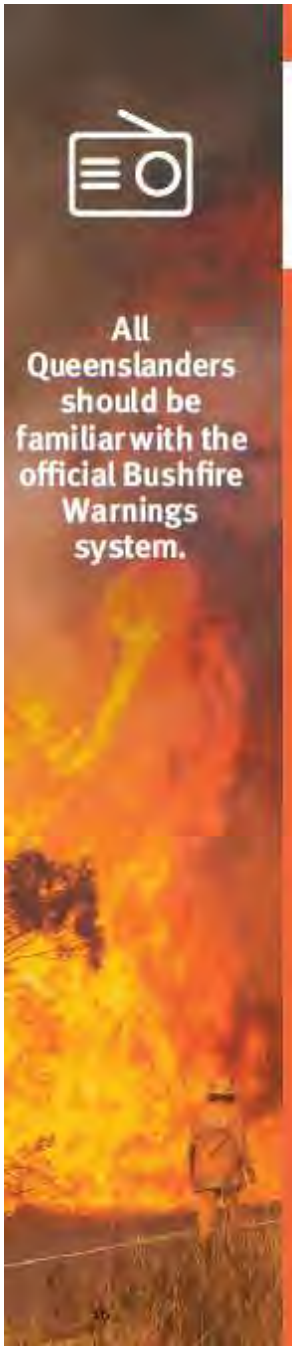
# YOUR BUSHFIRE EMERGENCY KIT

If you choose or are forced to stay at your home, a Bushfire Emergency Kit will equip you to extinguish small fires and provide you with basic protection from heat, smoke, and flames. Make sure you have enough supplies for everyone staying.

| | |
|---|---|
|  Hat |  Safety glasses |
|  Smoke mask |  Long sleeve shirt (natural fibres) |
|  Water bottle |  Gloves |
|  Jeans or long pants (natural fibres) |  Boots |

- Batteries
- Blankets (natural fibres)
- Bucket
- Drinking water
- Fire extinguisher
- First aid kit
- Hoses
- Knapsack sprayer
- Ladder
- Medication and prescriptions
- Mop
- Mobile phone and charger
- Radio (battery operated)
- Shovel
- Torch
- Towels





All Queenslanders should be familiar with the official Bushfire Warnings system.

# TUNE IN TO WARNINGS

When there's a bushfire in your area, it's up to you to take notice, stay informed, make decisions, and act. Tune into local media including radio, official social media feeds and websites. Don't assume you will receive an official warning as a fire approaches.

- Current Bushfires Map
  www.qfes.qld.gov.au/Current_Incidents
- Find your local ABC radio station
  www.abc.net.au/newsradio
- Find your local commercial radio
  www.commercialradio.com.au
- QFES Facebook
  @QldFireandEmergencyServices
- QFES Twitter
  @QldFES
- QFES website
  www.qfes.qld.gov.au

**Call Triple Zero (000) if your life or property is under threat.**

## ADVICE

If you get an Advice warning, you'll be asked to **STAY INFORMED** or **AVOID SMOKE**. You should:

- Stay inside and close windows and doors.
- Keep respiratory medication close by.
- Follow your bushfire survival plan now or learn how to make one on the QFES website.
- Stay informed and decide what you will do if the bushfire gets closer.

## WATCH and ACT

A Watch and Act warning will advise you to **PREPARE TO LEAVE** or **NOT SAFE TO RETURN**. You should:

- Follow your bushfire survival plan now.
- Prepare now so you can leave quickly if the bushfire gets close.
- If you find it hard to move quickly, leaving now is your safest option.
- Keep medications close by.
- Move flammable items away from your house if you can.
- Do not fly drones near the fire or in the warning area.
- Help others if it's safe to do so.
- If you left the area, it is not safe to return.
- Stay informed by listening to warnings.

## EMERGENCY WARNING

An Emergency warning will prompt you to **LEAVE IMMEDIATELY** or **SEEK SHELTER IMMEDIATELY**. You should:

- Wear protective clothing and stay hydrated.
- Keep medications close by.
- Listen to warnings.
- If you can't leave safely or a SEEK SHELTER warning is issued for your area:
  - Seek shelter inside a brick building in a room with multiple escape points on the opposite side from the approaching fire.
  - As the fire approaches and passes, the safest place will change, so be ready to move quickly.
  - Close windows and doors. Seal any gaps with wet towels.
  - Check for embers inside, particularly in the roof space. Put them out quickly.
  - Keep pets inside with you.




# PREPARE

**Preparation is the key to survival.**

Use this checklist as a guide to start preparing your home before the start of bushfire season.

**Structure:**

- ☐ Clear gutters and roof of leaves, twigs, bark and other debris. Consider installing gutter guards.
- ☐ Enclose open areas under decks and floors.
- ☐ Install steel wire mesh screens on windows, doors, vents, and weep holes.
- ☐ Point LPG cylinder relief valves away from your house.
- ☐ Check and maintain firefighting pumps, generators, and water systems.
- ☐ Seal gaps in external roof and cladding.
- ☐ Remove flammable items away from your home (such as woodpiles, mulch, boxes, hanging baskets, and outdoor furniture).

**Vegetation:**

- ☐ Reduce vegetation along access paths.
- ☐ Mow your lawn regularly.
- ☐ Remove excess flammable materials such as long dry grass, dead leaves, and branches.
- ☐ Trim low-lying branches around your home to a height of two metres from the ground.

**Access:**

- ☐ Display house number at road.
- ☐ Ensure adequate space for fire trucks to access your home (at least four metres wide and high with turn-around area).

**Personal:**

- ☐ Gather sufficient personal protective clothing and equipment for all persons and store so that they are readily accessible.
- ☐ Prepare your evacuation kit or emergency kit.
- ☐ Stock your first aid kit.
- ☐ Check insurance policies are adequate for home and vehicles.
- ☐ Review and update your Bushfire Survival Plan as a family each year.
- ☐ Make a contingency plan.
- ☐ Note your Neighbourhood Safer Place, if available.

**An unprepared property is not only at risk itself but may also present an increased danger for your neighbours.**





# CREATE YOUR BUSHFIRE SURVIVAL PLAN TODAY

Make your Bushfire Survival Plan together as a family, tear out and display it for everyone to note. Share your plan with your family and friends.

**Bushfire is a very real risk across Queensland, so make sure you are prepared now.**

**Don't wait until it's too late.**

## Include a contingency plan

Bushfires are unpredictable and plans can fail. A contingency plan that identifies your alternate options may save your life if you are caught in a fire. You need to consider:

- What will you do if you are away from home (work, school, shopping)?
- What if your pet is scared and you cannot find them?
- What if you are home alone?
- What if you have guests staying with you?
- What will you do if your travel route is cut off?
- What will you do if you are trapped in your home?
- Where will you go if you had planned to stay but it is now unsafe and you need to leave?

# OUR BUSHFIRE SURVIVAL PLAN

Date: _____

## OUR DETAILS

Names: Contact Number:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Address: _____

_____

Lot / Plan No. _____

## EMERGENCY DETAILS *(name / phone / policy / account)*

Fire, Police, Ambulance: 000

Insurance Provider: _____

Local Council: _____

Electricity Provider: _____

Gas Provider: _____

Water Supplier: _____

Phone Company: _____

Internet Provider: _____

Bank: _____

Doctor: _____

Vet: _____

Work: _____

School: _____

Neighbours: _____

_____

_____

Other: _____

_____

## LEAVING

Who will leave early?

What will be your trigger to leave?

Where will you go?

How will you get there?

☐ Do you have your evacuation kit ready?

What else will you take?

What is your plan for your pets or livestock?

## STAYING

Who will stay?

What is the plan for livestock and pets?

Before there is a fire, how will you get yourself and your property ready?

As the fire approaches, what steps will you take so you and your home can withstand the fire?

As the fire front arrives, where will you safely monitor the fire from inside your home?

After the fire has passed, what areas of your property will you check for spot fires and burning embers?

## CONTINGENCY PLAN

What will you do if things don't go to plan?

## Neighbourhood Safer Place - a last resort

A Neighbourhood Safer Place (NSP) is a last resort option. It is an identified local open space or building where people may gather to seek shelter from a bushfire. Before bushfire season, you should:

- Make sure you know if a NSP is available in your local government area. NSPs are not available in every area.
- Note the travel time and distance to your local NSP.
- Include your NSP details in your Bushfire Survival Plan contingency plan.

The main purpose of a NSP is to provide some level of protection to communities from the effects of a bushfire. Your NSP will not guarantee safety in all circumstances, and the following limitations need to be considered if you plan to use one as a last resort:

- Firefighters may not be present if they are involved in the operational response at other locations.
- Support personnel may not be present at the NSP.
- NSPs do not cater for animals or pets.
- NSPs do not provide meals or amenities.
- NSPs may not provide shelter from the elements, particularly flying embers.

If you have special needs you should think about what assistance you may require. A NSP may not be a suitable location for your evacuation. You will need to make appropriate arrangements with friends, family, or carers.

Visit the QFES website at www.qfes.qld.gov.au to find out about NSPs in your local government area.

**If you're unsure about your level of risk or require assistance, call 13 QGOV (13 74 68) to book a Property Advice Visit.**

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# Some Fire Resistant Native Trees and Shrubs

(www.bushfire.nsw.gov.au)

| Scientific Name: | Common Name: |
|---|---|
| Acacia Cyclops | West Australian Coastal Wattle |
| Acacia Glandulicarpa | Hairy Pod Wattle |
| Acacia Howittii | Sticky Wattle |
| Acacia Iteaphyla | Gawler Range Wattle |
| Acacia Melanoxyion | Blackwood |
| Acacia Pravissima | Ovens Wattle |
| Acacia Prominens | Golden Rain Wattle |
| Acacia Vestita | Cedar Wattle |
| Acacia Terminalis | Hairy Wattle |
| Acmena Smithii | Lilly Pilly |
| Agonis Juniperina | Juniper Myrtle |
| Angophora Costata | Apple Jack |
| Atriplex Spp | Saltbush |
| Brachychiton Populneus | Kurrajong |
| Casuarina Cristata | Belah |
| Casuarina Cunninghamiana | River She Oak |
| Eucalyptus Maculata | Spotted Gum |
| Ficus Macrophylla | Moreton Bay Fig |
| Hakea Salicifolia | Willow Hakea |
| Hakea Suaveolens | Sweet Hakea |
| Heterogeneric Oleifolium | Cattlebush |
| Lagunaria Patersonii | Pyramid Tree |
| Melaleuca Lanceolata | Moonah |
| Melia Azedarach | White Cedar |
| Myoporum Insulare | Boobialla |
| Pittosporum Undulatum | Sweet Pittosporum |
| Tristania Conferta | Brush Box |

It should be noted that there are a large variety of non-native or introduced plants available that are also hard to burn. When using non-native plants care must be taken that they are not introduced into situations where they may become an environmental weed therefore these plants are not listed here.




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**Springbrook, QLD. 4213**

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**Ray:** 0407 652 899
**Max:** 0458 250 661
**Email:** qldbushfire.ra@yahoo.com

**Bushfire Compliance Reports for South East Queensland**

# Statement of Competency for Ray Cavanough and Max Gray

Queensland Bushfire Risk Assessments has been operating for 20 years**,** carrying out assessments across the Gold Coast, Logan, Beaudesert, Brisbane, Redlands, and Pine Rivers areas. The business has also worked in collaboration with local government authorities on a range of fire management and planning projects**,** contributing to community safety and the effective implementation of bushfire mitigation strategies.

**Ray Cavanough**

Ray Cavanough has been involved with bushfire management and control for 39 years, including 6 years as a rural fire brigade member in western Queensland before joining the Springbrook Rural Fire Brigade in 1981. From 1981 to the present, Ray has spent 6 years as First Officer (Officer in Charge) of the Springbrook Rural Fire Brigade, 7 years as Logistics and Training Officer, and is currently President of the brigade.

Ray is a Level 2 Firefighter and a Specialist Instructor, with extensive experience as Incident Controller for several major fires during 1994, 1996, 2000, and 2002. He has completed numerous courses on bushfire management and behaviour, weather influences, structural fires, breathing apparatus, vegetation fuel loadings, fire control, and backburning operations.

He has also contributed to the Gold Coast City Council Bushfire Management Strategy, hazard reduction programs, and community awareness initiatives. Ray's risk assessments and bushfire plans include Camping and Motocross recreational parks, small subdivisions, and numerous dwelling sites.

Ray is a member of the Rural Fires Association Queensland, a professional group that regularly consults and provides submissions to state and local government on bushfire management planning schemes.

**Max Gray**

Max Gray has worked under the direct supervision and mentorship of Ray Cavanough for the past 7 years, assisting in the preparation of bushfire management plans in accordance with *AS3959–2018*. His experience spans data collection, site inspections, assessment of vegetation types, slope analysis, and separation distances for residential and subdivision developments across South East Queensland.

Max is currently completing a Bachelor of Building Surveying (Honours), equipping him with a strong understanding of the interaction between planning, construction standards, and bushfire resilience.

In addition to his technical and academic experience, Max serves as the Secretary for the Rural Fires Association Queensland (RFAQ), contributing to the coordination of consultant engagement, policy review, and communication between members and government agencies on bushfire management and planning matters.

Through his ongoing professional, academic, and association involvement, Max has developed strong technical competency in applying bushfire assessment methodologies, interpreting planning and building legislation, and preparing clear, compliant bushfire reports. His combination of hands-on experience and formal education supports a high standard of professional practice within Queensland Bushfire Risk Assessments.

# Traffic and Transport Assessment

## Proposed Multiple Dwelling Development

### 2 Karingal Drive, Pimpama



18 March 2026

**Prepared for:**
Bosform (QLD) Pty Ltd
Report: 51033-RP01-A

GELEON

# Document control information

**Document title:** Traffic and Transport Assessment
**Document reference:** Report 51033-RP01-A
**Prepared for:** Bosform (QLD) Pty Ltd
**Prepared by:** Alex Williams
**Reviewed by:** James Goodman
**Project reference:** 51033

# Revision history

Authorised for issue

| Version | Issue Date | Details | Approved for Issue |
|---|---|---|---|
| A | 18 March 2026 | Original Issue | James Goodman \| RPEQ 29448 |

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# 1 Introduction

## 1.1 Project background

Geleon has been engaged by Bosform (QLD) Pty Ltd (the **Applicant**) to prepare a Traffic and Transport Assessment (TTA) to accompany a Development Application (DA) to establish a multiple dwelling development at 2 Karingal Drive, Pimpama (Lot 19 on RP152380) (**Figure 1.1**). The existing 24,590m$^2$ site is currently vacant.




Figure 1.1 Locality Plan

## 1.2 Development details

The proposal seeks Council approval for a Material Change of Use (Multiple Dwelling land use), Reconfiguring a Lot (two management lots and one park lot), and Operational Works (change to ground levels and vegetation clearing).

Specifically, the development comprises a new townhouse project consisting of 16 townhouses with access from Imelda Way and 41 townhouses with access from Karingal Drive. The Reconfiguring a Lot component involves the creation of separate management lots for each townhouse development, as well as a park lot to be dedicated to Council for the drainage reserve traversing the site.

Details of the existing and proposed developments are provided in **Table 1.2**, with the proposed site plan shown in **Figure 1.2**.

Relevant plans of development have been included in **Appendix A**.

Table 1.2 Development details

| Land use | Parcel | Site | 3-bedroom dwellings |
|---|---|---|---|
| Multiple dwelling | A | The Fernhurst | 16 |
| | B | The Brookfield | 41 |
| | | **Total** | **57** |

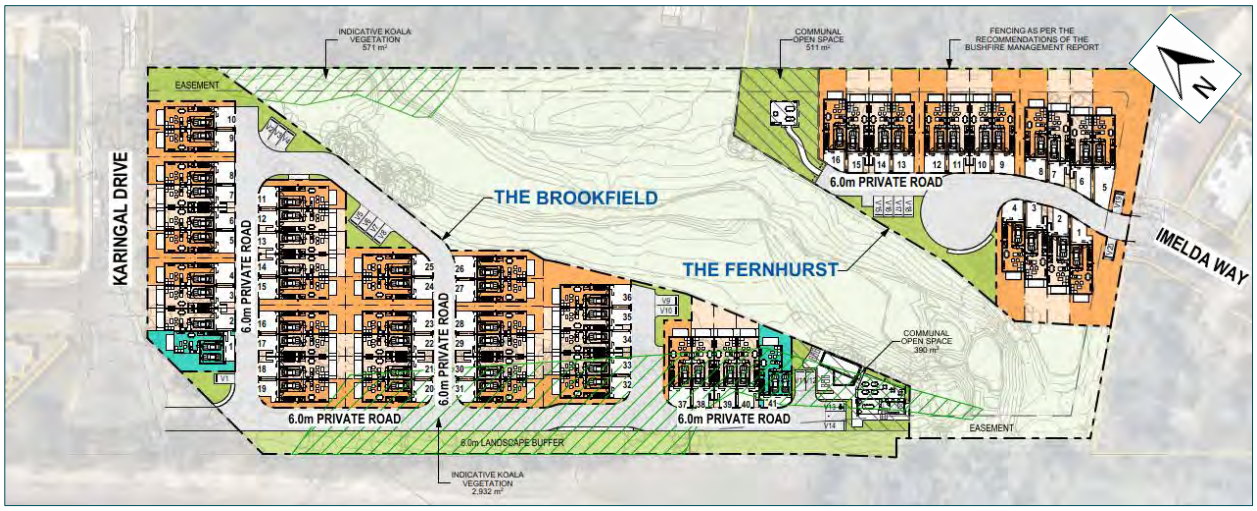



Figure 1.2 Plans of development

## 1.3 Applicable planning scheme

The proposed development site falls under the jurisdiction of the City of Gold Coast (**Council**) and is governed by the *City Plan – Version 13 (December 2025)*.

## 1.4 Scope

The scope of the assessment presented in this report is as follows:

- assess public transport, pedestrian and cycling accessibility to / from site and on-site
- calculate the anticipated development traffic generation and its impact to the external road network
- assess proposed car and bicycle parking supply against relevant Council requirements
- review design of on-site traffic and transport operations against Australian Standards and Council's requirements
- assess site access and access configuration against Council requirements
- assess servicing arrangements, and
- complete Council development code templates to accompany the development application.

# 2 Existing conditions

## 2.1 Road network

The hierarchy of the road network surrounding the development is shown in **Table 2.1**.

Table 2.1 Surrounding road network

| Road name | Jurisdiction | No. of lanes (two-way) | Posted speed limit | Median divided | Hierarchy | Footpath / bicycle lanes | On-street parking |
|---|---|---|---|---|---|---|---|
| Karingal Drive | Council | 2 | 50km/h | No | Distributor [1] | Footpaths and bicycle lanes on both sides[2] | Formal and informal parking |
| Imelda Way | Council | 2 | 50km/h | No | Local road | Footpaths on western side / no bicycle lanes | Informal parking |

*Notes:*

1. *West of Gawthern Drive, Karingal Drive is a local access road*
2. *Bicycle lanes provided east of Karingal Drive and Gawthern Drive roundabout*

## 2.2 Public transport

The development is located within walking distance (<400m) of two public transport facilities. The closest bus stop, known as 'Chrome Drive near Nickel Street hail 'n' ride, Pimpama' (Stop ID: 321276) is located approximately 360m walking distance northeast of Parcel B (**Figure 2.2**). This bus stop is serviced by one bus route known as '3076'.




Figure 2.2 Public transort in promity to site

## 2.3 Active transport

The subject site is serviced by a comprehensive network of pedestrian footpaths as shown in **Figure 2.3.1** which illustrates the active transport network surrounding the proposed development.

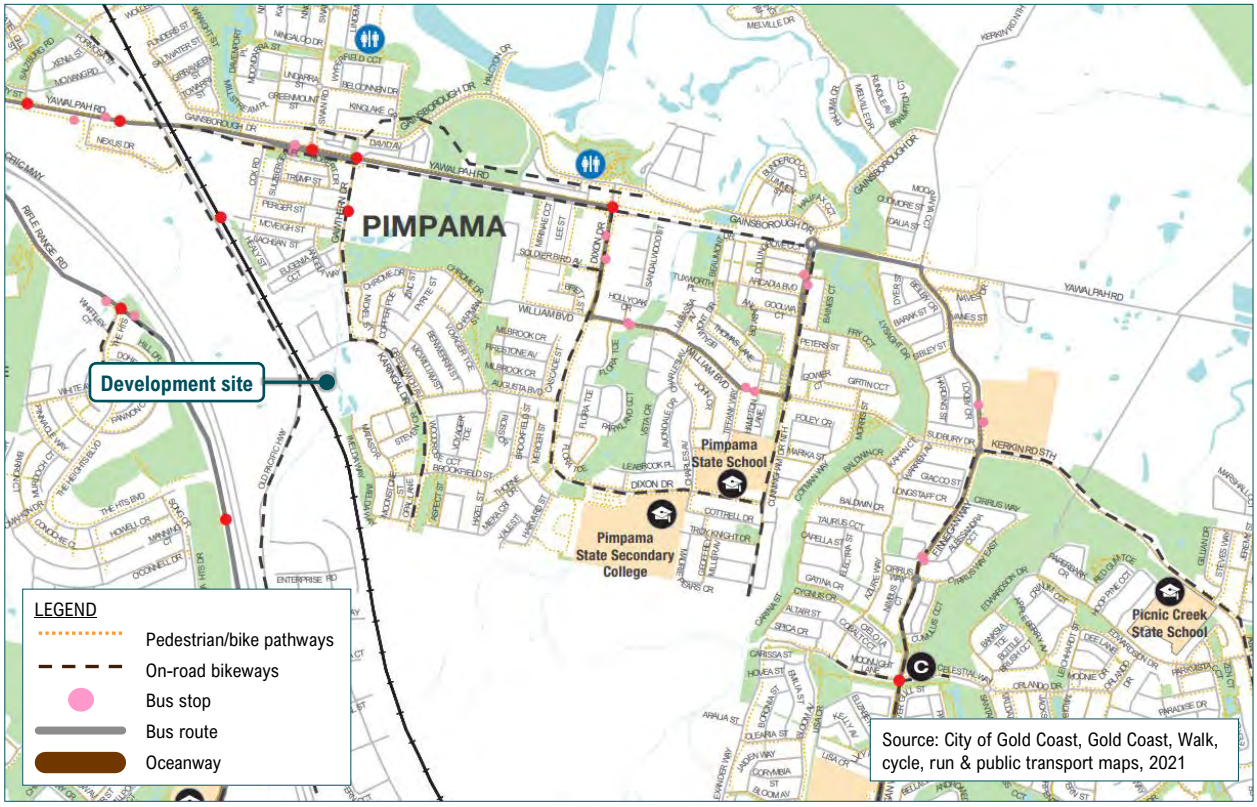



Figure 2.3.1 Active transport network

The subject site is in proximity to Yawalpah Road and the Old Pacific Highway which forms part of TMR's Southeast Queensland Principal Cycle Network. The principal cycle network surrounding the proposed development and route priorities are illustrated in **Figure 2.3.2** and **Figure 2.3.3**.

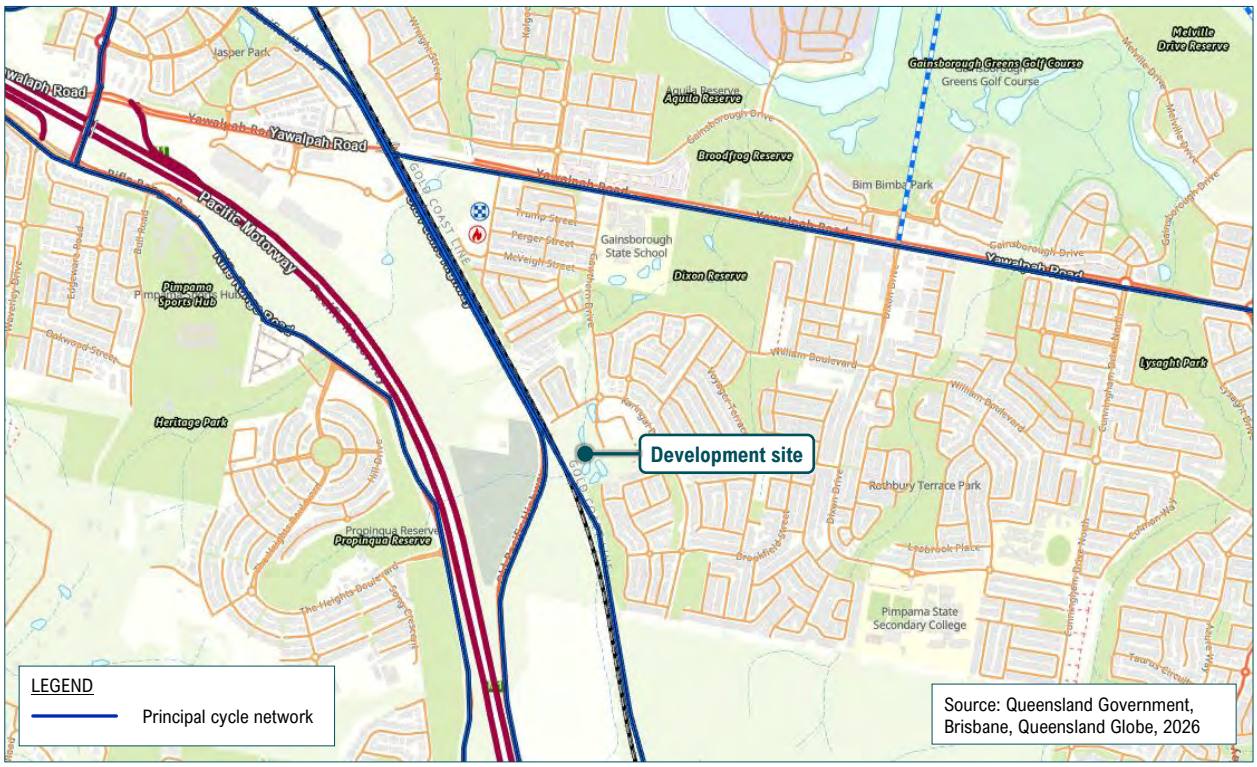



Figure 2.3.2 Principal cycle network

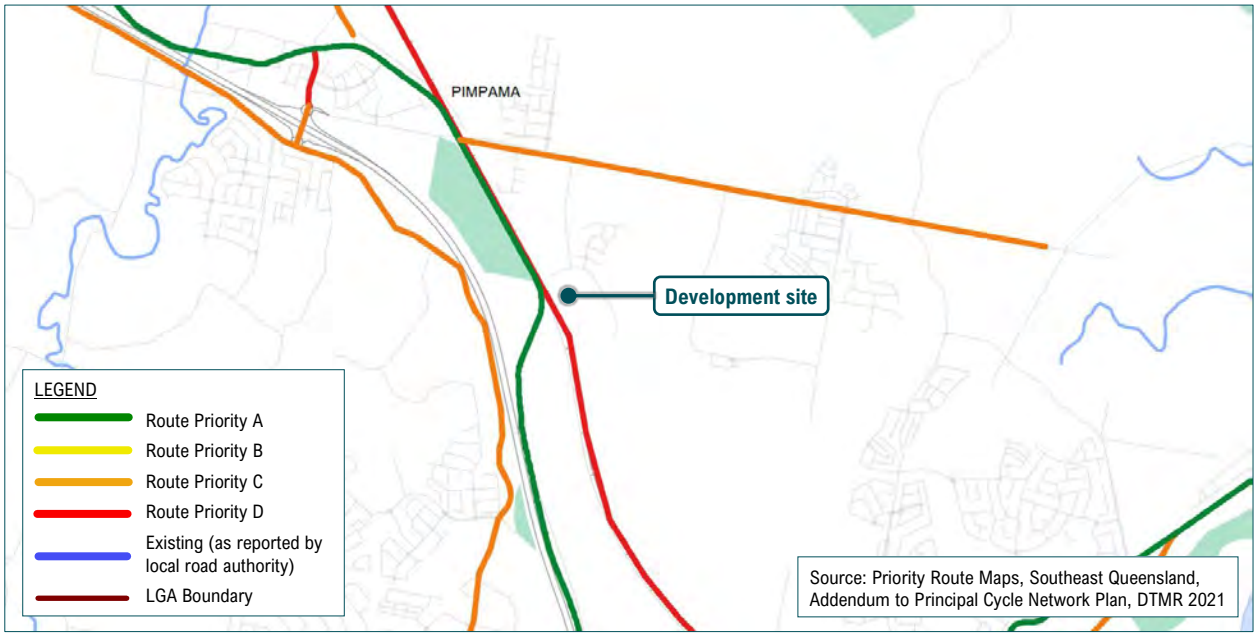



Figure 2.3.3 Priorty route map

# 3 Traffic impact assessment

## 3.1 Traffic generation

A review of Council's *City Plan – 9.4.13 Transport code (V13)* has not identified traffic generation rates for the proposed land use. In lieu of Council specific traffic generation rates, traffic generation rates for the proposed development have been based on the rates for a medium density residential dwelling land use as provided in the Transport for NSW's *Guide to Transport Impact Assessment (GTIA 2024)*.

A summary of the expected development traffic generation is shown in **Table 3.1**.

Table 3.1 Development traffic generation

| Land Use | Parcel | Dwellings | Peak Period | Traffic Generation Rate | Traffic Generation Volume |
|---|---|---|---|---|---|
| Multiple dwelling | A | 16 | AM | 0.41 trips per dwelling | 7 |
| | | | PM | 0.60 trips per dwelling | 10 |
| | | | Daily | 3.67 trips per dwelling | 59 |
| | B | 41 | AM | 0.41 trips per dwelling | 17 |
| | | | PM | 0.60 trips per dwelling | 25 |
| | | | Daily | 3.67 trips per dwelling | 151 |
| | | | | **Total AM Peak Hour Trips** | **24** |
| | | | | **Total PM Peak Hour Trips** | **35** |
| | | | | **Total Daily Trips** | **210** |

## 3.2 Traffic distribution

TMR's guide to Traffic Impact Assessment (GTIA) stipulates[1]:

"*Peak hour development-generated traffic volumes need to be split into entry (IN) and exit (OUT) volumes for assignment of this traffic to the access intersection and to the surrounding road network.*"

Typical residential In / Out traffic splits were adopted for the multiple dwelling land use (i.e. 30% In / 70% Out in the AM peak hour, and 60% In / 40% Out during the PM peak hour).

Based on the above, the AM and PM In / Out traffic splits are provided in **Table 3.2**.

Table 3.2 Development traffic spilts

| Land Use | Parcel | Traffic Generation (trips) | Peak Period | IN% | IN Trips | OUT % | OUT TRIPS |
|---|---|---|---|---|---|---|---|
| Multiple dwelling | A | 7 | AM Peak | 30% | 2 | 70% | 5 |
| | | 10 | PM Peak | 60% | 6 | 40% | 4 |
| | B | 17 | AM Peak | 30% | 5 | 70% | 12 |
| | | 25 | PM Peak | 60% | 15 | 40% | 10 |
| | | | | **Total AM In Trips** | **7** | **Total AM Out Trips** | **17** |
| | | | | **Total PM In Trips** | **21** | **Total PM Out Trips** | **14** |

[1] Department of Transport and Main Roads (December 2018), Guide to Traffic Impact Assessment (Version no. 1.2) s.8.2.2, p.31.

## 3.3 Traffic impacts

The total traffic generation in the AM peak hour for Parcel A is 7 trips, which equates to one external vehicle movement every 8.6 minutes. For the PM peak hour, the total traffic generation is 10 trips, which equates to one external vehicle movement every 6 minutes. It is expected that vehicles will access Imelda Way via Nash Street and Matas Drive to access Parcel A.

The total traffic generation in the AM peak hour for Parcel B is 17 trips, which equates to one external vehicle movement every 3.5 minutes. For the PM peak hour, the total traffic generation is 25 trips, which equate to one external vehicle movement every 2.4 minutes. Vehicles will utilise Karingal Drive to access Parcel B.

The development is expected to generate 151 vpd along Karingal Drive. Analysis of the surrounding catchment indicates that a further 49 lots currently utilise Karingal Drive west of Gawthern Drive for access, as shown in **Figure 3.3**. This results in an estimated 520 vpd along Karingal Drive west of Gawthern Drive in a post development scenario. Karingal Drive is intended to be widened on the development side to form a carriageway consistent with a residential access street, which has a listed capacity of 750 vpd. It can therefore be concluded that Karingal Drive has sufficient capacity to cater for development generated traffic.

With regard to Imelda Way, Nash Street and Matas Drive, the development is expected to generate 59 vpd along the identified roads. Analysis of the catchment area indicates that a further 75 lots may currently utilise Imelda Way, Nash Street and / or Matas Drive for access. This results in an estimated 625 vpd within the catchment area. Imelda Way, Nash Street and Matas Drive have a formation consistent with a residential access street, which has a listed capacity of 750 vpd. Accordingly, it can be concluded that Imelda Way, Nash Street and Matas Drive have sufficient capacity to cater for development generated traffic, and no further investigations are warranted.

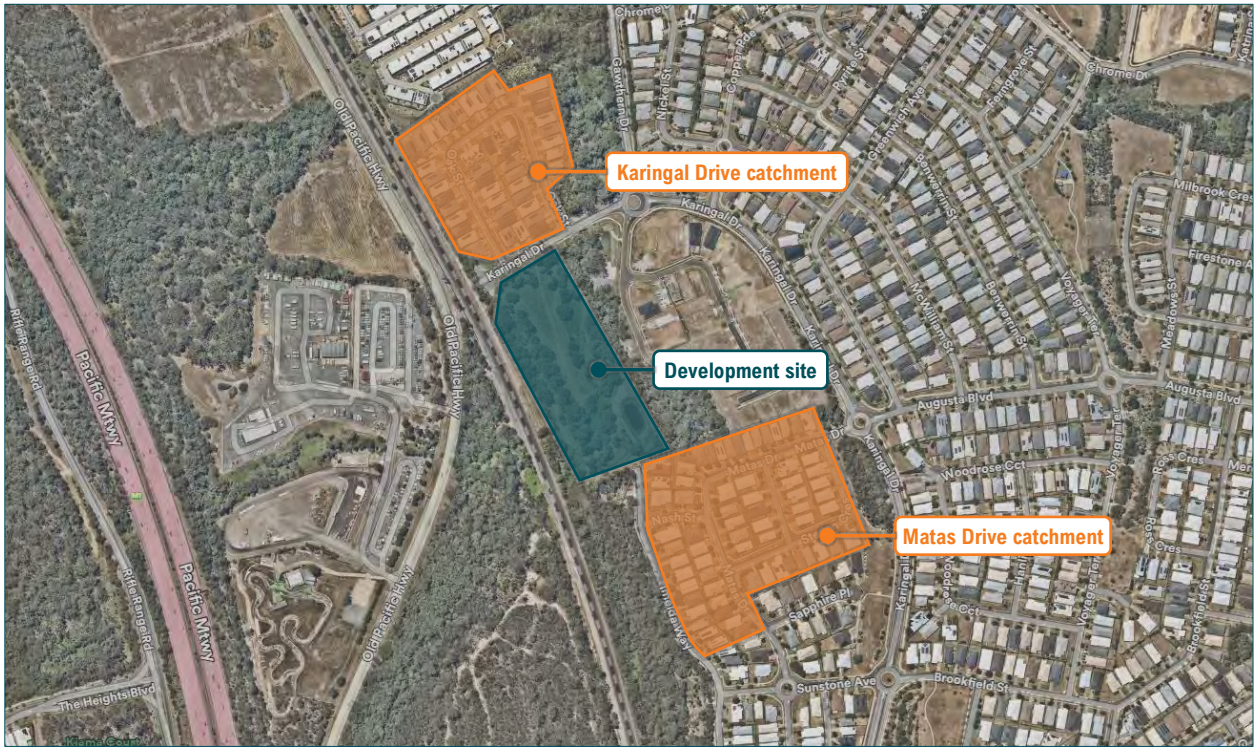



Figure 3.3 Traffic impact assessment catchment areas

# 4 Parking assessment

## 4.1 Car requirements

The car parking requirements for the development have been calculated in accordance with the land use requirements stipulated in Council's *City Plan – Transport code (V13)* as shown in **Table 4.1**.

Table 4.1 Car parking requirement

| Land use | Parcel | 3-Bedroom units | Car parking rate | Parking requirement |
|---|---|---|---|---|
| Multiple dwelling | A | 16 | 1.5 per 3-bedroom unit | 24 |
| | | | where 10 or more dwellings, 3 plus 1 per 10 dwellings for visitors | 4 |
| | B | 41 | 1.5 per 3-bedroom unit | 62 |
| | | | where 10 or more dwellings, 3 plus 1 per 10 dwellings for visitors | 7 |
| | | | **Total car parking requirement** | **97** |

The total car parking requirement for the development is 97 car parking spaces comprising of 86 resident spaces and 11 visitor spaces. In accordance with the *National Construction Code (NCC) – Volume 1* for a Class 1 building, there is no requirement to provide parking spaces for People with Disabilities (PWD).

## 4.2 Car parking provision

The development provides a total of 134 car parking spaces, comprising 114 resident spaces, 19 visitor spaces, and one PWD parking space, and therefore complies with Council requirements. Resident spaces will be provided either in a dual garage arrangement or in a tandem configuration.

Overall, 32 resident spaces and six visitor spaces will be provided within Parcel A, and 82 resident spaces and 14 visitor spaces will be provided within Parcel B.

Car parking design for the proposed development has been undertaken generally in accordance with Australian Standard *AS2890.1 – Parking Facilities* and Council's *City Plan – Transport code (V13)*. **Table 4.2** shows design parameters for each user class in accordance with *AS2890.1*.

Table 4.2 Car parking design requirements

| User class | Parking bay width (m) | Parking bay length (m) | Aisle width (m) | Use |
|---|---|---|---|---|
| 1A | 2.4 | 5.4 | 5.8 | Resident |
| 2 | 2.5 | 5.4 | 5.8 | Residential visitor |

For further details regarding the design of the internal roadways and townhouse garages, refer to the civil engineering design package.

## 4.3 Bicycle parking

Bicycle parking for the proposed land uses has been calculated in accordance with the land use requirements stipulated in Council's *City Plan – Transport code (V13)* as shown in **Table 4.3**. There are no requirements for end of trip facilities for the proposed land use.

Table 4.3 Bicycle parking requirement

| Land use | Parcel | 3-Bedroom units | Class | Bicycle Parking Rate | Parking Requirement |
|---|---|---|---|---|---|
| Multiple dwelling | A | 16 | Resident - Class 2 | 1 per dwelling | 16 |
| | | | Visitor - Class 3 | 1 per 12 dwellings | 2 |
| | B | 41 | Resident - Class 2 | 1 per dwelling | 41 |
| | | | Visitor - Class 3 | 1 per 12 dwellings | 4 |
| | | | | Total class 2 spaces | 57 |
| | | | | Total class 3 spaces | 6 |
| | | | | **Total spaces** | **63** |

## 4.4 Bicycle parking provision

The development provides a total of 63 bicycle parking spaces comprising 57 resident spaces (Class 2) and six visitor spaces (Class 3) and therefore complies with Council requirements.

Residents will store bicycles within the enclosed garages (Class 2) and visitor parking (Class 3) will be provided adjacent to the internal roadway (**Appendix A**). Visitor bicycle parking spaces will be provided via horizontal floor mounted bicycle rails. Bicycle parking will be appropriately signed in accordance with relevant Council requirements.

Bicycle parking for the proposed development has been designed to comply with *AS2890.3* as shown in **Table 4.4.**

Table 4.4 Bicycle parking design requirements

| User | Security level | Min. parking envelope width (m) | Min. parking envelope length | Min. aisle width (m) |
|---|---|---|---|---|
| Residents | B [1] | 0.5 | 1.8 | 1.5 |
| Visitors | C [1] | 0.5 | 1.8 | 1.5 |

*Notes:*

*1. Parking requirement based on a horizontal parking layout with floor mounted rails*

# 5 Access and servicing assessment

## 5.1 Access arrangement

Access to the development site is proposed via two accesses, with one access being provided from Karingal Drive and the other access being provided from Imelda Way (**Appendix A**). Details of the subject site's access arrangement post development are detailed below and illustrated in **Figure 5.1:**

1. Karingal Drive – proposed 6.0m vehicle crossing designed generally in accordance with IPWEA *Standard Drawing RS-102, Vehicle Crossings – Heavy Duty* in the form of a 'General Wide' arrangement, catering for all movements, and
2. Imelda Way – new road connection from Imelda Way into the development site. For further details of the road formation, refer to civil engineering design package.

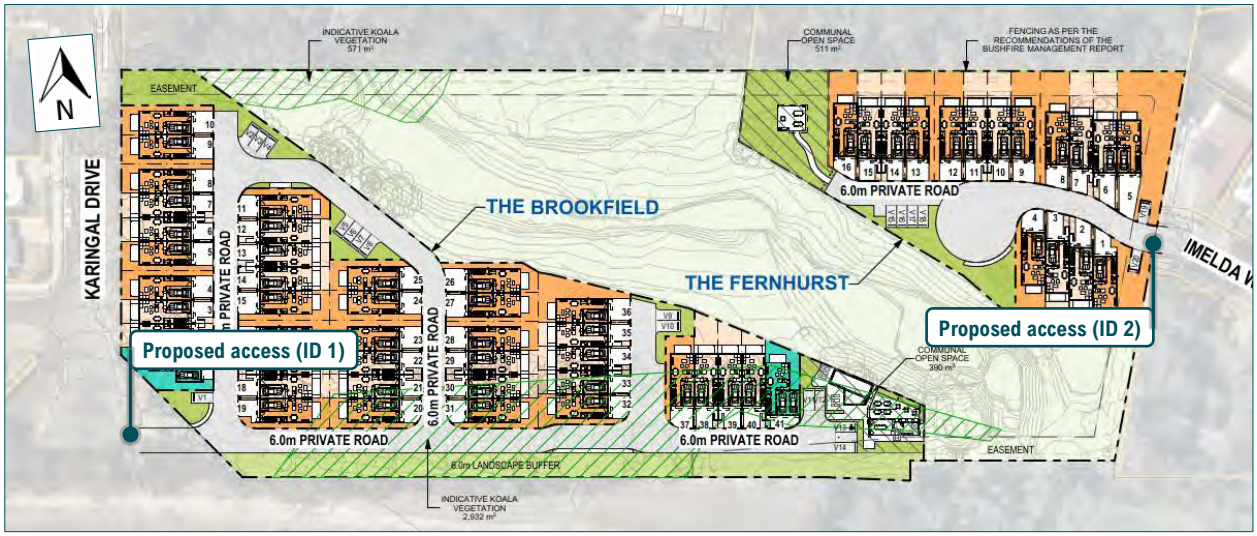



Figure 5.1 Access arrangement

## 5.2 Sight distance assessment

A sight distance assessment has been undertaken in accordance with *AS2890.2* to ensure that the location of the proposed vehicle crossing provides sufficient sight distance for road users to find a safe gap in oncoming traffic when leaving the site. The minimum gap sight distance requirements (MGSD) for a vehicle departing the site are provided in **Table 5.2**.

As the Imelda Way access comprises a new road connection, a sight distance assessment is not warranted. In addition, the proposed Karingal Drive access is located at the end of the road, where there is limited need to give way to oncoming vehicles.

Notwithstanding this, a sight distance assessment has been undertaken for the Karingal Drive access, based on a frontage road speed of 50 km/h. With respect to vehicles turning into Karingal Drive from Oak Way, it is expected that vehicles would be travelling at no more than 30 km/h while traversing the Karingal Drive / Oak Way priority-controlled intersection.

Table 5.2 Sight distance requirements

| Frontage road | Vehicle speed assessed (km/h) | Sight distance requirement |
|---|---|---|
| Karingal Drive | 50km/h | 69m |
| Vehicle entering Karingal Drive from Oak Way | 30km/h | 42m |

**Figure 5.2** shows the required sight distance and associated sight lines for vehicles travelling along Karingal Drive to vehicles departing the development site, demonstrating compliance with specified requirements.

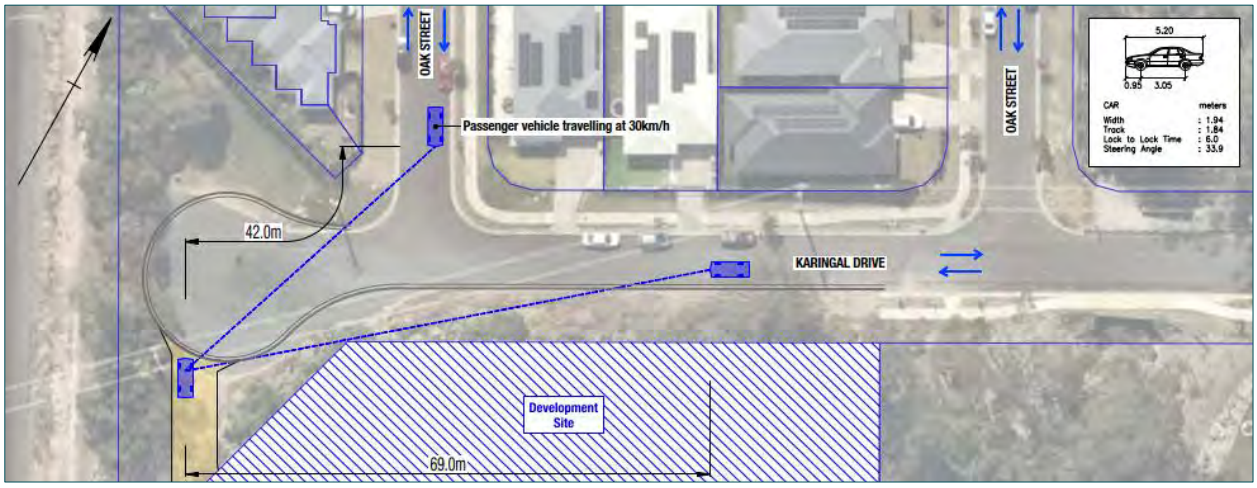



Figure 5.2 Karingal Drive frontage - sight distance assessment

## 5.3 Servicing

Council's *City Plan – Transport code (V13)* stipulates that for a multiple dwelling land use with more than 3 dwellings, provision for an 8.8m Medium Rigid Vehicle (MRV) to stand on site for servicing (i.e. no dedicated loading bay required) shall be provided. The roadway within the development site is of sufficient width to allow an MRV to stand on site without interfering with the internal traffic flow as shown in **Figure 5.3**. In addition to the above, provision for on site servicing by Council's 9.8m side loading Refuse Collection Vehicle (RCV) is required to be accommodated.

A swept path assessment has been undertaken using AutoTURN software demonstrating that a 9.8m RCV can satisfactorily enter the development site, circulate the bin collection route and exit the development site in a forward gear (**Appendix C**). Given that a 9.8m RCV is larger than an MRV, swept paths for a MRV have not been provided.

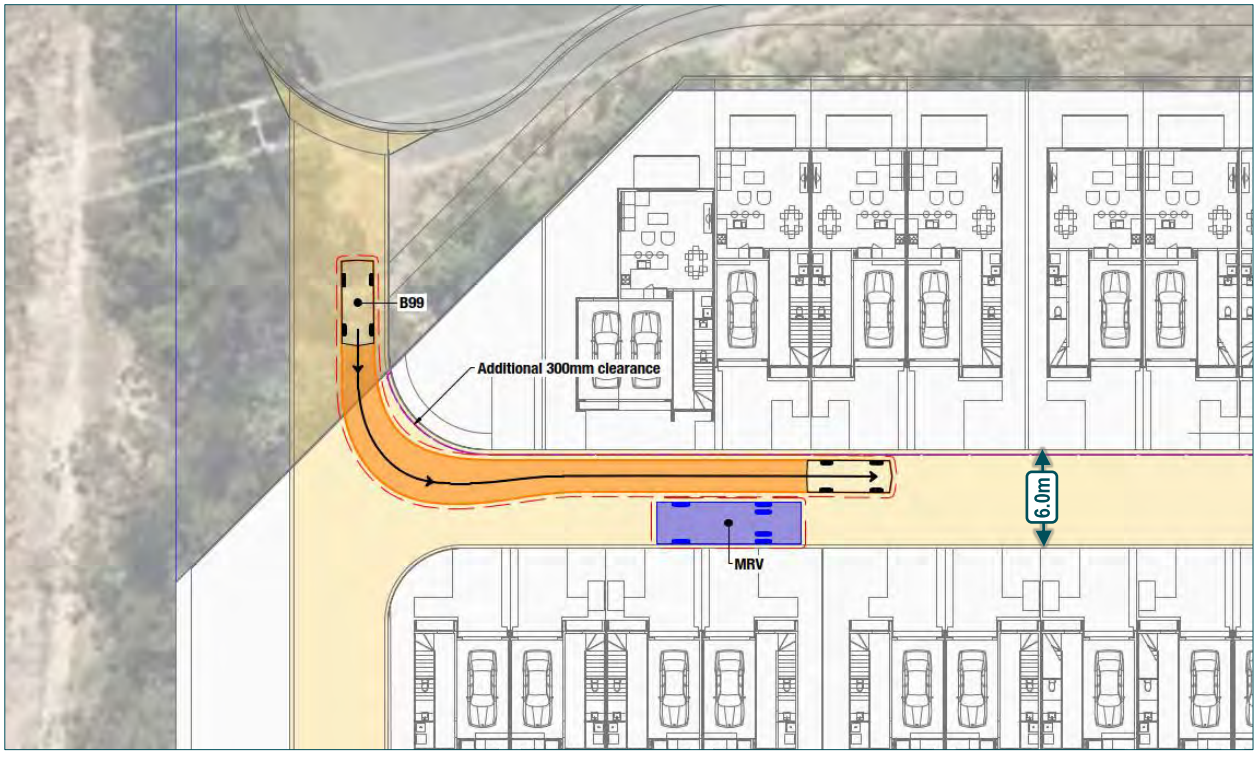



Figure 5.3 B99 passing a MRV

# 6 Response to development codes

A detailed review of the proposed development against Council's *Driveways and vehicle crossings code (V13)* and *Transport code (V13)* is provided in **Appendix C**.

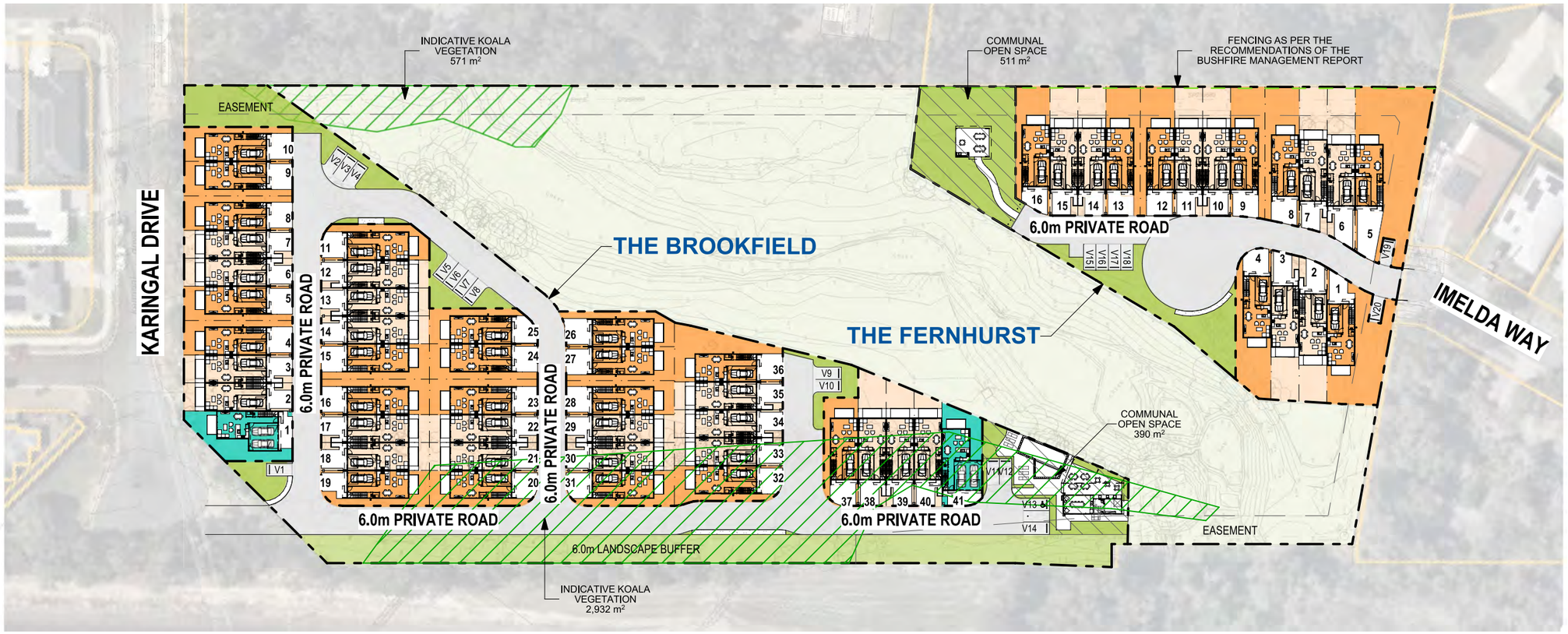
# 7 Conclusion

This report presents the findings related to assessment of traffic and transport related matters for a proposed development located at 2 Karingal Drive, Pimpama. Based on the assessment undertaken, it can be concluded that the proposed development will not introduce any adverse traffic or transport impacts which would prevent its approval with appropriate conditions.

# 8 References

1. City of Gold Coast, *City Plan – Version 13 (December 2025)*, Gold Coast.
2. Queensland Government (Department of Transport and Main Roads), *Guide to Traffic Impact Assessment*, December 2018, Brisbane.
3. New South Wales Government (Transport for NSW), *Guide to Traffic Impact Assessment – Version 1.1*, November 2024, Sydney.
4. Australian Building Codes Board, *National Construction Code (NCC) Volume 1*, May 2023.
5. Standards Australia/Standards New Zealand 2004, *AS2890.1: Off-street Car Parking Facilities*.
6. Standards Australia/Standards New Zealand 2018, *AS2890.2: Off-street Commercial Vehicle Facilities*.
7. Standards Australia/Standards New Zealand 2015, *AS2890.3: Bicycle Parking*.

# Appendix A Plans of development




## PARCEL A - THE FERNHURST
**60 IMELDA WAY**

### SITE SUMMARY
APPROX. NET SITE AREA 0.491 ha
APPROX. NET DENSITY 32.59 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **TYPE A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **TYPE A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 8 |
| **TOTAL** | 16 |

## PARCEL B - THE BROOKFIELD
**2 KARINGAL DRIVE**

### SITE SUMMARY
APPROX. NET SITE AREA 1.073 ha
APPROX. NET DENSITY 38.21 du/ha

### DEVELOPMENT SUMMARY

| | |
|---|---|
| **TYPE A**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 19 |
| **TYPE A END**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 20 |
| **TYPE B**<br>3 BEDROOM<br>1+1 CAR<br>2 STOREY | 2 |
| **TOTAL** | 41 |

**NOTE:** GCCC

LOT BOUNDARIES AND AREAS ARE BASED OFF PDF PLAN AND ARE INDICATIVE ONLY SIZES TO BE CONFIRMED

INDICATIVE KOALA VEGETATION AREA

# SITED STRUCTURE PLAN

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Scale 1:1000 @ A3

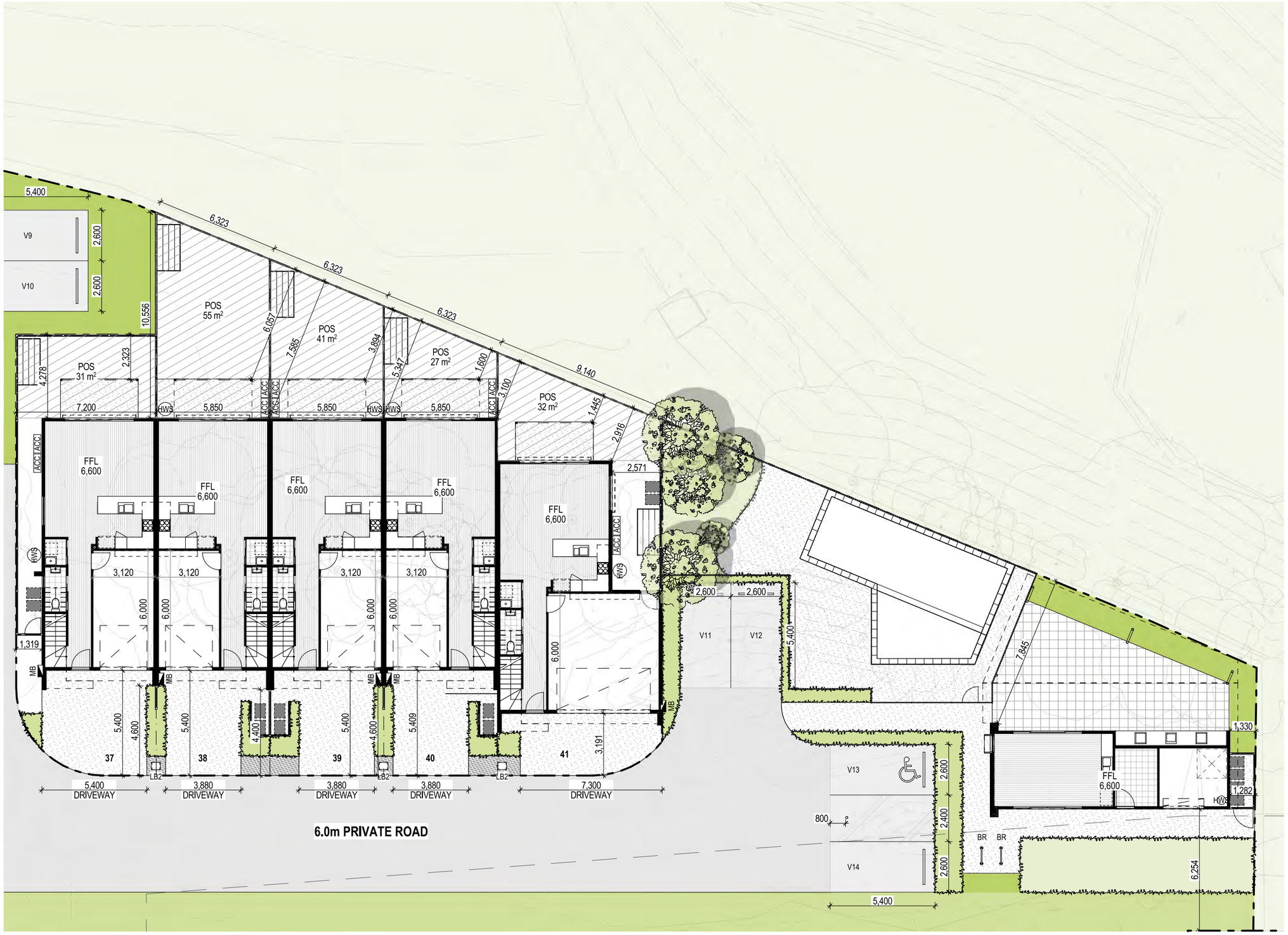
F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260313 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY
## PIMPAMA

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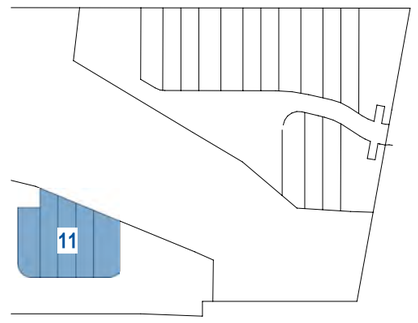
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- INDICATIVE LANDSCAPING
- PEBBLE MULCH
- PRIVATE OPEN SPACE
- CLOTHESLINE
- ACC — AIR CON CONDENSER
- HWS — HOT WATER SYSTEM
- MB — METER BOX
- LB1 — SUNNI LETTERBOX 'KEY LARGO' H 830mm x W 470mm x D 370mm (OR SIMILAR)
- LB2 — SUNNI LETTERBOX 'KEY LARGO DUPLEX' H 1000mm x W 470mm x D 370mm (OR SIMILAR)
- GARBAGE BIN STORAGE LOCATION (REFER TO REFUSE PLAN)
- BR — BIKE RACK (2 SPACES EACH)




# GROUND FLOOR PLAN (LOTS 37 - 41)

0 2 4 6 8 10m

Scale 1:200 @ A3

# 2 KARINGAL DRIVE & 60 IMELDA WAY

## PIMPAMA

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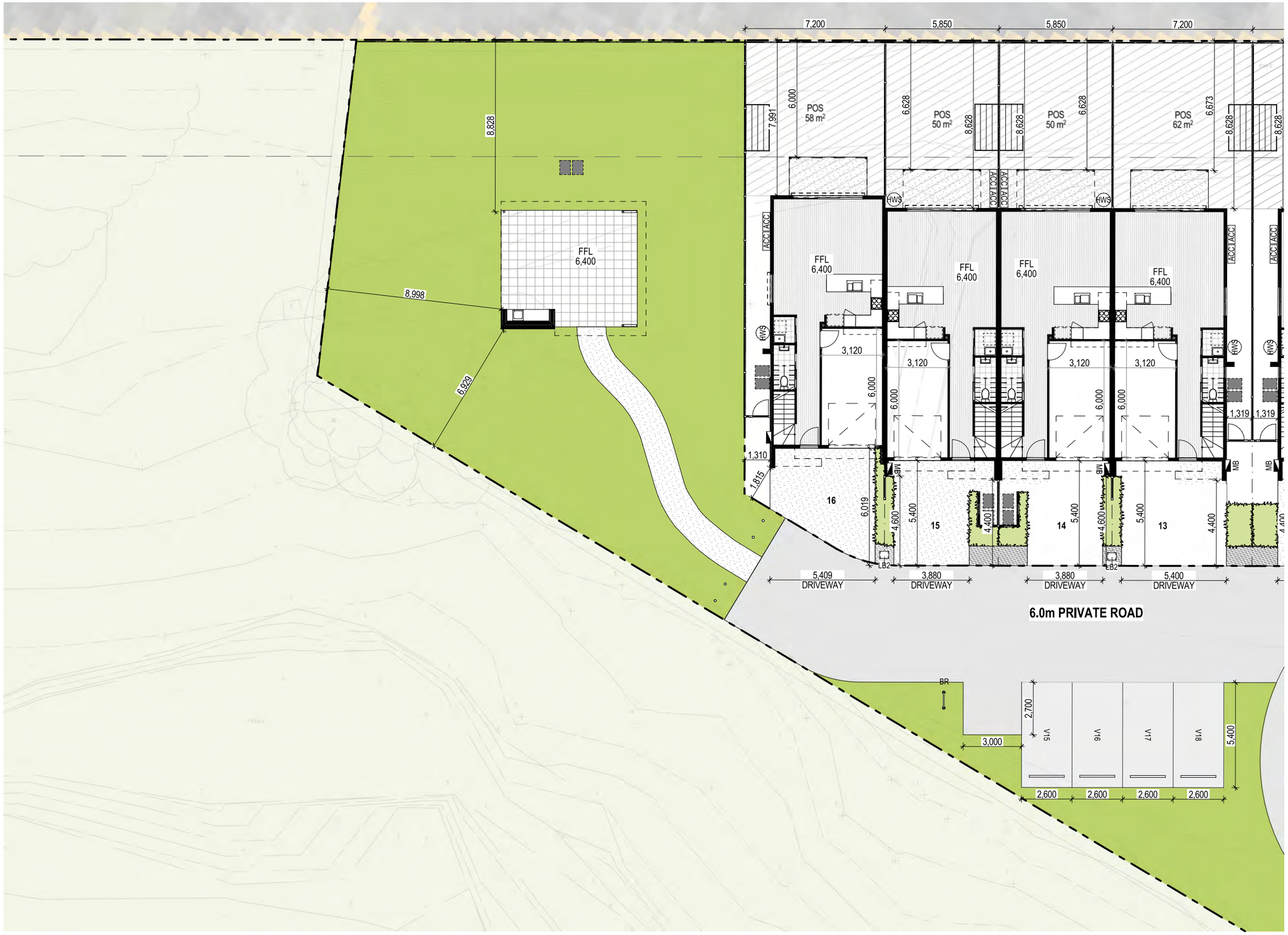
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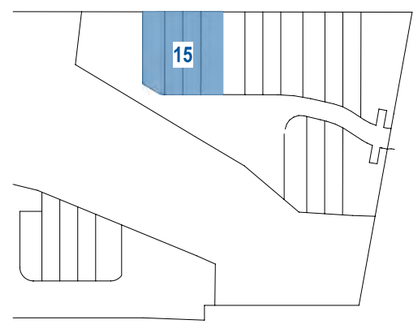
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- INDICATIVE LANDSCAPING
- PEBBLE MULCH
- PRIVATE OPEN SPACE
- CLOTHESLINE
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- HWS — HOT WATER SYSTEM
- MB — METER BOX
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- LB2 — SUNNI LETTERBOX 'KEY LARGO DUPLEX' H 1000mm x W 470mm x D 370mm (OR SIMILAR)
- GARBAGE BIN STORAGE LOCATION (REFER TO REFUSE PLAN)
- BR — BIKE RACK (2 SPACES EACH)

# GROUND FLOOR PLAN (LOTS 13 - 16)

0 2 4 6 8 10m

Scale 1:200 @ A3

F:\Projects\4104-Karingal Drive, Pimpama\03 Drawings\02 Da\260313 KARINGAL DRIVE, PIMPAMA.pln

# 2 KARINGAL DRIVE & 60 IMELDA WAY

## PIMPAMA

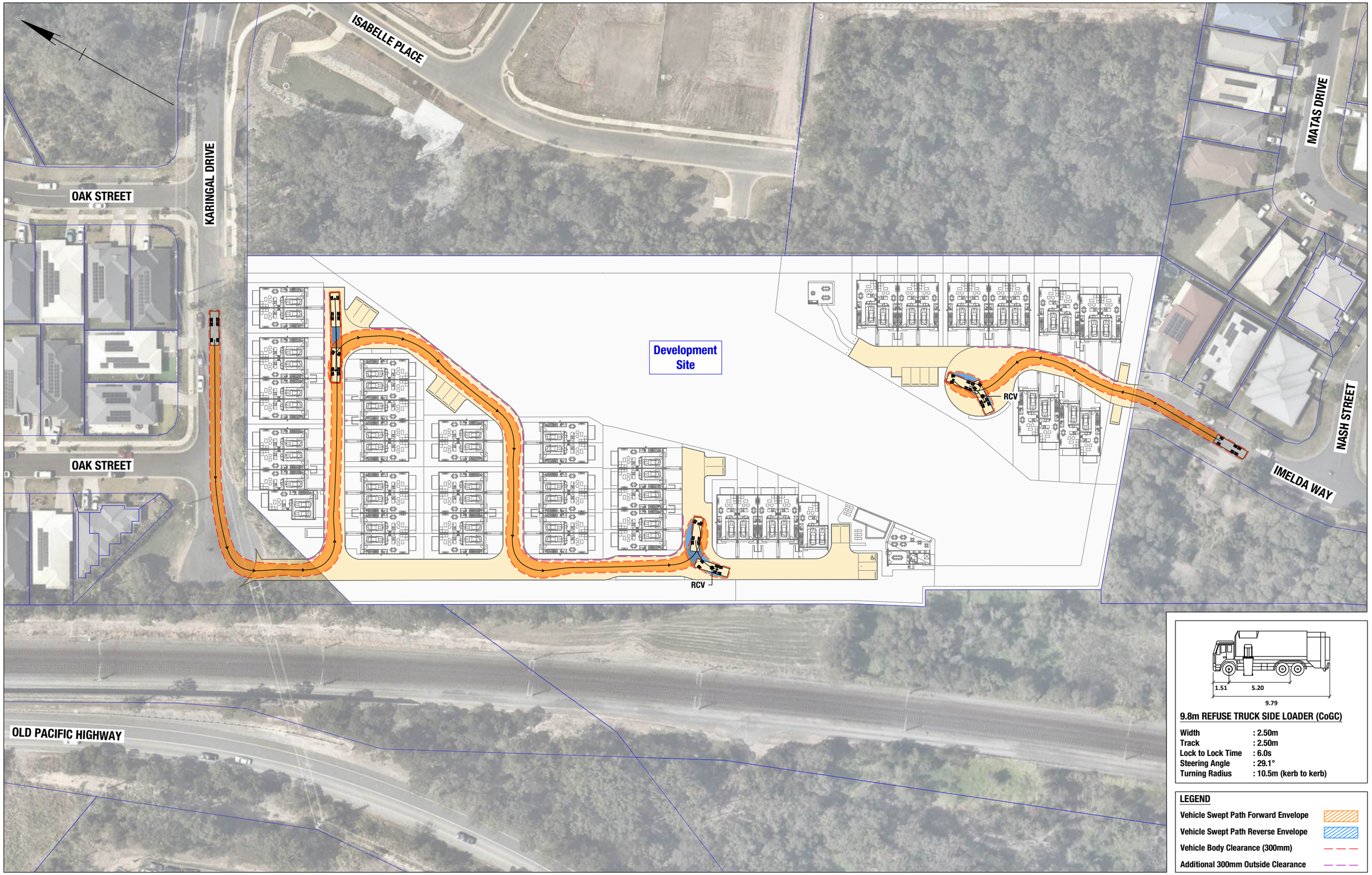
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# Appendix B Swept path assessment

F:7330 A (06.01.2015)







**9.8m REFUSE TRUCK SIDE LOADER (CoGC)**

| | |
|---|---|
| Width | : 2.50m |
| Track | : 2.50m |
| Lock to Lock Time | : 6.0s |
| Steering Angle | : 29.1° |
| Turning Radius | : 10.5m (kerb to kerb) |

**LEGEND**

- Vehicle Swept Path Forward Envelope
- Vehicle Swept Path Reverse Envelope
- Vehicle Body Clearance (300mm)
- Additional 300mm Outside Clearance

GELEON
ABN 58 668 001 303
Suite 12, Level 1, 3029 The Boulevard
Emerald Lakes, Carrara
PO Box 454 Nerang Qld 4211
tel +61 7 5594 4473

0 5 10 15 20m

2 KARINGAL DRIVE, PIMPAMA
PROPOSED MULTIPLE DWELLING DEVELOPMENT

Project No. 51033
Issue Date 18/03/26

SWEPT PATH ASSESSMENT
9.8m SIDE LOADER REFUSE COLLECTION VEHICLE (RCV)
RCV CIRCULATION

Drawing No. 51033-SP001-A

Series No. 1 of 4

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3:37:07 PM 18 March 2026

F:7330 A (06.01.2015

ISABELLE PLACE

KARINGAL DRIVE

OAK STREET

OAK STREET

MATAS DRIVE

NASH STREET

IMELDA WAY

Development Site

RCV

RCV

OLD PACIFIC HIGHWAY




**9.8m REFUSE TRUCK SIDE LOADER (CoGC)**

| | |
|---|---|
| Width | : 2.50m |
| Track | : 2.50m |
| Lock to Lock Time | : 6.0s |
| Steering Angle | : 29.1° |
| Turning Radius | : 10.5m (kerb to kerb) |

**LEGEND**

- Vehicle Swept Path Forward Envelope
- Vehicle Swept Path Reverse Envelope
- Vehicle Body Clearance (300mm)
- Additional 300mm Outside Clearance

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3:37:56 PM 18 March 2026

GELEON
ABN 58 668 001 303
Suite 12, Level 1, 3029 The Boulevard
Emerald Lakes, Carrara
PO Box 454 Nerang Qld 4211
tel +61 7 5594 4473

0 5 10 15 20m

2 KARINGAL DRIVE, PIMPAMA
PROPOSED MULTIPLE DWELLING DEVELOPMENT

Project No. 51033

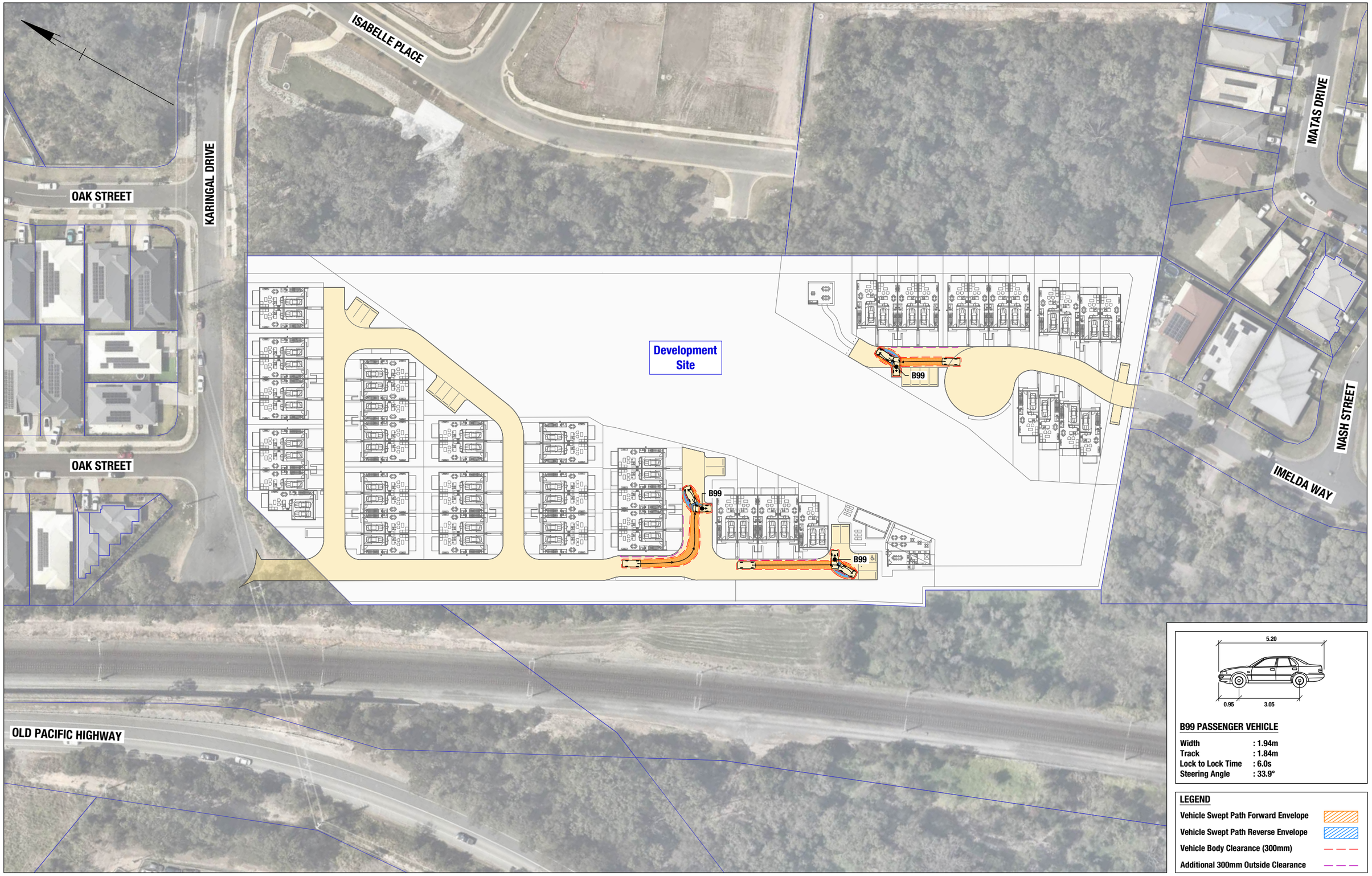
Issue Date 18/03/26

# SWEPT PATH ASSESSMENT
## 9.8m SIDE LOADER REFUSE COLLECTION VEHICLE (RCV)
## RCV CIRCULATION

Drawing No. 51033-SP002-A

Series No. 2 of 4

F:7330 A (06.01.2015







**B99 PASSENGER VEHICLE**

| | |
|---|---|
| Width | : 1.94m |
| Track | : 1.84m |
| Lock to Lock Time | : 6.0s |
| Steering Angle | : 33.9° |

**LEGEND**

- Vehicle Swept Path Forward Envelope
- Vehicle Swept Path Reverse Envelope
- Vehicle Body Clearance (300mm)
- Additional 300mm Outside Clearance

GELEON
ABN 58 668 001 303
Suite 12, Level 1, 3029 The Boulevard
Emerald Lakes, Carrara
PO Box 454 Nerang Qld 4211
tel +61 7 5594 4473

0 5 10 15 20m

2 KARINGAL DRIVE, PIMPAMA
PROPOSED MULTIPLE DWELLING DEVELOPMENT

Project No. 51033

Issue Date 18/03/26

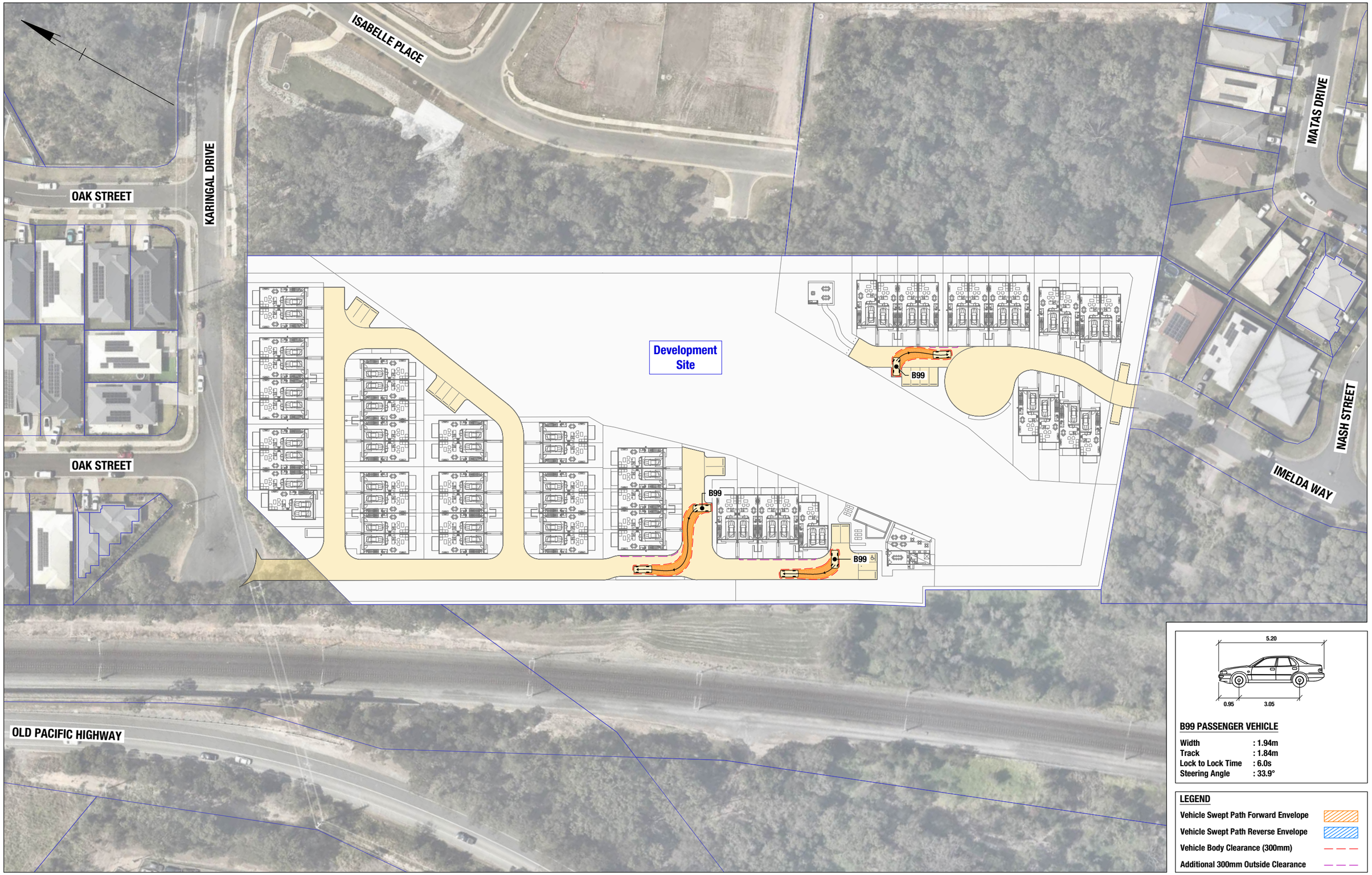
# SWEPT PATH ASSESSMENT B99 PASSENGER VEHICLE TURNAROUND MANOEUVRE

Drawing No. 51033-SP003-A

Series No. 3 of 4

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F:7330 A (06.01.2015







**B99 PASSENGER VEHICLE**

| | |
|---|---|
| Width | : 1.94m |
| Track | : 1.84m |
| Lock to Lock Time | : 6.0s |
| Steering Angle | : 33.9° |

**LEGEND**

- Vehicle Swept Path Forward Envelope
- Vehicle Swept Path Reverse Envelope
- Vehicle Body Clearance (300mm)
- Additional 300mm Outside Clearance

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2 KARINGAL DRIVE, PIMPAMA
PROPOSED MULTIPLE DWELLING DEVELOPMENT

Project No. 51033

Issue Date 18/03/26

# SWEPT PATH ASSESSMENT
# B99 PASSENGER VEHICLE
# TURNAROUND MANOEUVRE

Drawing No. 51033-SP004-A

Series No. 4 of 4

# Appendix C Development code responses

# City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

**Please note:**

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

## 9.4.2 Driveways and vehicle crossings code

### 9.4.2.1 Application

This code applies to assessing operational work for vehicle access works and material change of use for any development involving vehicle access works where indicated within **Part 5 Tables of assessment**.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5**.

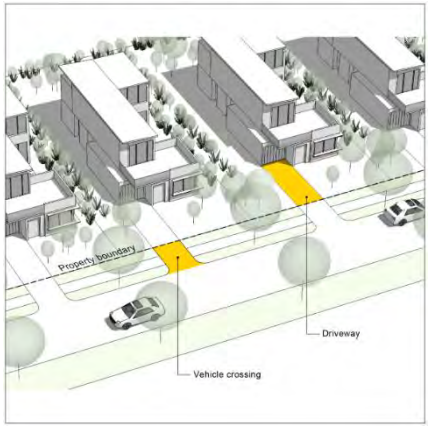



**Figure 9.4.2-1**

Illustration showing the driveway and vehicle crossing components of vehicle access works

### 9.4.2.2 Purpose

(1) The purpose of the Driveways and vehicle crossings code is to provide design standards for the construction, repair or modification to a driveway and/or a vehicle crossing.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) Vehicle crossings are designed to a standard in accordance with **SC6.12 City Plan policy – Land development guidelines** or with RPEQ certification to provide safe access for vehicles required to access the site from the edge of the road carriageway to the property boundary.

(b) Driveways provide safe access for all vehicles required to access the site from the property boundary to the on-site vehicle accommodation or standing area.

(c) Vehicle crossings avoid adverse impacts on City or utility infrastructure.

(d) Driveways and vehicle crossings are of an appropriate standard to meet the needs of the development.

(e) Vehicle crossings ensure that there is minimal loss of on-street car parking spaces.

(f) Driveways and vehicle crossings are designed and sited to maintain streetscape elements and retain space for the future planting of street trees.

(g) Vehicle crossings allow for the safety of all users of the existing and planned road and active transport networks.

(h) Driveways and vehicle crossings are designed such that vertical and horizontal alignments provide a continuous, smooth access of good rideability and clearance for all vehicles required to access the site.

(i) Driveways and vehicle crossings are designed and sited to mitigate stormwater drainage impacts.

### 9.4.2.3 Specific benchmarks for assessment

## PART B – ASSESSABLE DEVELOPMENT BENCHMARKS

### Table 9.4.2-2: Driveways and vehicle crossings code – assessable development

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome</th><th>Internal use</th></tr>
<tr><td colspan="2">Design</td><td></td><td></td></tr>
<tr><td>PO1<br>The driveway is designed in accordance with the applicable requirements in AS2890:2009 – Parking Facilities.</td><td>AO1<br>No acceptable outcome provided.</td><td>COMPLIES WITH PO1<br>Access to the development site will be designed in accordance with the requirements stipulated in AS2890:2009 – Parking Facilities.<br>For further details in this regard, refer to Section 5 of Geleon Traffic and Transport Assessment report 51033-RP01-A.</td><td></td></tr>
<tr><td>PO2<br>Design of the vehicle crossing is certified by a RPEQ confirming compliance with:<br>(a) Disability Discrimination Act 1992;<br>(b) Applicable requirements in AS2890: 2009 – Parking Facilities; and<br>(c) QUDM (Queensland Urban Drainage Manual).</td><td>AO2<br>The vehicle crossing is designed in accordance with SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards.</td><td>COMPLIES WITH AO2<br>The proposed accesses have been designed in accordance Council’s SC6.12 City Plan policy – Land development guidelines.<br>For further details in this regard refer to Section 5 of Geleon Traffic and Transport Assessment report 51033-RP01-A.</td><td></td></tr>
<tr><td></td><td>AO3<br>Vehicle crossings are separated from:<table><tr><th>Instance</th><th>Minimum distance</th></tr></table></td><td>COMPLIES WITH AO3</td><td></td></tr>
</table>

| Performance outcomes | Acceptable outcomes | | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets **either** the performance outcome or overall outcome | Internal use |
|---|---|---|---|---|
| **PO3**<br>The vehicle crossing avoids damage to utility services, pathways, kerbs, road pavement and seal and other city infrastructure. | Traffic management devices and transport services, stormwater management devices, power supply services and telecommunication supply services | 1m | The proposed accesses have been located with appropriate separation from utility services, pathways, kerbs, road pavement and seal and other city infrastructure. Where required, utility services will be relocated.<br>For further details in this regard refer to **Section 5** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | Water and sewerage service assets on the surface (including water meter enclosures, sewerage inspection or maintenance pits, fire hydrants and valves) | 300mm (horizontal distance) | | |

<table>
<tr><th>Performance outcomes</th><th>Acceptable outcomes</th><th>Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome</th><th>Internal use</th></tr>
<tr><td colspan="2">Maximum number of vehicle crossings</td><td></td><td></td></tr>
<tr><td>PO4<br>The number of vehicle crossings are minimised to avoid loss of streetscape elements and on-street car parking spaces and to prevent adverse interference with:<br>(a) the safety, capacity and operations of the existing or planned road network; and<br>(b) cycleways or pedestrian footpaths.</td><td>AO4<br>The maximum number of vehicular crossings per site, for the following land uses, is as follows:<table><tr><th>Land use</th><th>Maximum number of vehicle crossings</th></tr><tr><td>Dwelling house</td><td>1<br>OR<br>2 - when the road frontage at the kerb is at least 40m subject to achieving a minimum of 7m between the crossings</td></tr><tr><td>Dual occupancy<br>Multiple dwelling</td><td>1<br>OR<br>2 - where the road frontage at the kerb is greater than 20m subject to achieving a minimum of 7m between the crossings</td></tr><tr><td>Non–residential use</td><td>2</td></tr></table>Note: the maximum number of vehicle crossings and separation distance is shown above unless otherwise approved in a current development approval.</td><td>COMPLIES WITH AO4<br>The development proposes access from Karingal Drive and Imelda Way.<br>For further details in relation to the location and form of the proposed vehicle crossing, refer to Section 5 of Geleon Traffic and Transport Assessment report 51033-RP01-A.</td><td></td></tr>
<tr><td colspan="2">Separation distances</td><td></td><td></td></tr>
<tr><td>PO5<br>Vehicle crossings are appropriately separated from other vehicle</td><td>AO5<br>Vehicle crossings are separated from:<table><tr><th>Instance</th><th>Minimum distance (m)</th></tr></table></td><td>COMPLIES WITH AO5</td><td></td></tr>
</table>

| Performance outcomes | Acceptable outcomes | | Does the proposal meet the acceptable outcome?<br>**If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome** | Internal use |
|---|---|---|---|---|
| crossings and side property boundaries to prevent interference with:<br>(a) the safety, capacity and operations of the existing or planned road network;<br>(b) adjoining properties; and<br>(c) cycleways or pedestrian footpaths. | Vehicle crossings on adjoining properties | 1m | The vehicle crossing will be located greater than 1m from adjacent property boundaries and neighbouring vehicle crossings.<br>For further details in relation to the location and form of the proposed vehicle crossing, refer to **Section 5** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | Any side property boundary: | | | |
| | • for residential development with approved built-to-boundary setback | 0.5m | | |
| | • for all other developments | 1m | | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Location** | | | |
| **PO6**<br>Vehicle access to a public roadway is safe and does not compromise the efficiency, function, convenience of use or capacity of the road network. | **AO6.1**<br>The location of the vehicle crossing to a public roadway is consistent with the applicable requirements in *AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking* and *AS 2890.2–2002 Parking facilities Part 2: Off-street commercial vehicle facilities*. | **COMPLIES WITH AO6.1**<br>The location of the vehicle crossing is consistent with *AS2890.1:2004*.<br>For further details in relation to the proposed vehicle crossing, refer to **Section 5** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | **AO6.2**<br>No new vehicle crossings are created on roads identified on the **Functional road hierarchy** as shown on the Zone maps or the **Pacific motorway service road types overlap map**. | **COMPLIES WITH AO6.2**<br>Karingal Drive and Imelda Way are the development's only road frontages. Karingal Drive is not identified on Council's Functional Road Hierarchy map along the development sites frontage. Imelda Way is not identified on Council's Functional Road Hierarchy.<br>For further details in this regard, refer to **Section 4** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO7**<br>Driveways and vehicle crossings:<br>(a) ensure existing street trees within the verge are retained;<br>(b) provide an appropriate separation distance to existing street trees within the verge in accordance with *AS4970:2009 – Protection of trees on development site*; and<br>(c) retain space for the future planting of street trees within the verge in accordance with **SC6.13 City Plan policy – Landscape work**.<br>**Note: The location of the driveway and vehicle crossing is considered at the design stage of the development.** | **AO7**<br>No acceptable outcome provided. | **COMPLIES WITH PO7**<br>The proposed vehicle crossing location has been designed to ensure existing street trees within the verge are retained, provides an appropriate separation distance to existing street trees within the verge in accordance with *AS4970:2009 – Protection of Trees on Development Sites* and retains space for the future planting of street trees within the verge in accordance with SC6.13 City Plan Policy – Landscape Work.<br>For further details in relation to the proposed vehicle crossing, refer to plans of development and **Section 5** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| **Sight distances and lines** | | | |
| **PO8**<br>Vehicle crossings are designed to provide safe travel for vehicles, cyclists and pedestrians. | **AO8**<br>Vehicle crossings are designed to provide sight distances and lines in accordance with *AS 2890.2-2002 Parking facilities Part 2: Off-street commercial vehicle facilities*. | **COMPLIES WITH AO8**<br>At the proposed accesses, Minimum Gap Sight Distance (MGSD) requirements are achieved where required.<br>For further details in this regard, refer to **Section 5.2** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |

# City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

**Please note:**

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

## 9.4.13 Transport code

### 9.4.13.1 Application

This code applies to assessing a material change of use where indicated within **Part 5 Tables of assessment** unless the development is listed as accepted subject to requirements and is:

(a) establishing in an existing lawful non-residential premises; and

(b) involving:

  (i) no building work (other than an internal fit-out); or

  (ii) only minor building work; and

(c) the development results in no loss of car parking spaces.

When using this code, reference should be made to **Section 5.3.2** and, where applicable, **Section 5.3.3**, in **Part 5.**

### 9.4.13.2 Purpose

(1) The purpose of the Transport code is to ensure transport needs associated with the development of land are met.

(2) The purpose of the code will be achieved through the following overall outcomes:

  (a) Development ensures that:

    (i) on-site access, parking and facilities, manoeuvring and servicing areas are designed to:

(A) meet the needs of the development;

(B) result in a functional and efficient site layout that minimises impacts on surrounding areas and traffic movement;

(C) create a safe pedestrian and cyclist focussed environment; and

(D) promote a high quality public realm.

(ii) the function and capacity of the road network is not compromised and impacts on amenity, safety and operation of existing and planned roads are appropriately mitigated.

(b) An integrated transport system is provided that:

(i) is convenient, efficient and flexible, being able to accommodate major events and provide a high level of connectivity between all activity centres, urban neighbourhoods, mixed use and industrial areas, inclusive of all modes, including active transport networks;

(ii) supports well designed urban development, which is concentrated within activity centres and urban neighbourhoods, that is easy to access via frequent public transport, walking and cycling, thereby reducing the need to travel by car;

(iii) supports community and privately operated transport services as viable alternatives to the private car;

(iv) reduces congestion and car dependency and significantly increases levels of walking, cycling and public transport use; and

(v) ensures existing and future transport corridors are protected.

(c) Active transport networks are provided that:

(i) are direct, safe, pleasant and comfortable to make walking and cycling an attractive alternative to the car;

(ii) ensure development within centres and urban neighbourhoods, including the light rail corridor have access to high quality active transport infrastructure including paths, bicycle parking and end of trip facilities;

(iii) are directly connected to local attractions and services;

(iv) are clear and easily accessed; and

(v) ensure the active transport infrastructure are completed in the early stages of development.

(d) Public transport networks are provided that:

(i) are of a standard and quality to provide an attractive alternative to the car;

(ii) ensure district and regional level community uses are within walking distance of public transport facilities; and

(iii) are clear and easily accessed.

(e) A road network is provided that:

(i) is developed and managed efficiently and meets the city's needs for the movement of people and goods, and can be safely shared by all users;

(ii) ensures development impacts on amenity caused by traffic and parking is consistent with the community's reasonable expectations for the intended use;

(iii) develops local road networks that are permeable and legible to facilitate a high level of connectivity, are safe and are shared with active and public transport;

(iv) ensures developments are designed for safe and efficient waste collection, carried out with minimal disruption or impact to the road network; and

(v) within the Coomera Town Centre area, provides an integrated network of predominantly public streets to ensure efficient movement of pedestrians, cyclists, vehicles and strong public transport connections that is guided by the indicative access and mobility outcomes in Figure 9.4.13-2 Coomera Town Centre Indicative Access and Mobility.

(f) Major freight corridors and haulage routes:

(i) are protected from incompatible uses and ensure their safe and efficient operation.

(g) Navigable waterways:

(i) support active and public transport facilities in waterfront locations for public water transport and enhance access to the city's waterways.

### 9.4.13.3 Specific benchmarks for assessment

**PART B – ASSESSABLE DEVELOPMENT BENCHMARKS**

**Table 9.4.13-2: Transport code – for assessable development**

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Car parking and travel demand** | | | |
| **PO1**<br>Development provides off-street car parking to accommodate the parking demand and allows for various modes of | **AO1**<br>Off- street car parking spaces are provided in accordance with the identified relevant table as follows: | **COMPLIES WITH AO1**<br>The total car parking requirement for the development is 97 spaces, comprising 86 resident spaces and 11 visitor spaces. | |

<table>
<tr><th>Performance outcomes</th><th colspan="2">Acceptable outcomes</th><th>Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome</th><th>Internal use</th></tr>
<tr><td rowspan="5">travel to reduce dependency on private vehicle usage.<br>OR<br>Where located in the Centre zone or the Southport Priority Development Area, development:<br>(a) maximises the efficiency of car parking provided;<br>(b) reduces congestion and car dependency; and<br>(c) encourages alternative transport options such as walking, cycling and the use of public transport.<br><br>Note: For an increase in scale or intensity of an existing lawful use, this PO and AO applies to the extent of the increase, provided existing car parking areas are not reduced or disturbed.</td><td colspan="2"></td><td>The development provides a total of 134 car parking spaces, including 114 resident spaces and 20 visitor spaces. 14 visitor spaces are provided within Parcel B inclusive of one PWD space and six are provided within Parcel A. The proposed parking provision therefore complies with Council requirements.<br>For further details in this regard refer to Section 4 of Geleon Traffic and Transport Assessment report 51033-RP01-A.</td><td></td></tr>
<tr><td>Location</td><td>Off-street car parking rate</td><td rowspan="4"></td><td rowspan="4"></td></tr>
<tr><td>Centre zone and High density residential zone where nominated in the Transport hub area in Figure 9.4.13-1: Transport hub area</td><td>Table 9.4.13-4: Car parking rates – Centre zone and High density residential zone – Transport hub</td></tr>
<tr><td>Centre zone not nominated in the Transport hub area in Figure 9.4.13-1: Transport hub area</td><td>Table 9.4.13-5: Car parking rates – Centre zone – outside Transport hub area</td></tr>
<tr><td>Special purposes zone – Special development area precinct – Southport Priority Development Area</td><td>Table 9.4.13-6: Car parking rates – Southport Priority Development Area</td></tr>
</table>

| Performance outcomes | Acceptable outcomes | | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|---|
| | All other zones | **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** | | |
| **PO2**<br><br>Car parking spaces for employees and visitors to the development are maximised and allow for efficient functioning of the site and surrounding traffic network. | **AO2**<br>Car parking spaces for employees and visitors to the development are accessible at all times and not restricted by allocation of spaces, gateways, doors or similar devices. | | **COMPLIES WITH AO2**<br>Visitor car parking will remain accessible at all times.<br>For further details in this regard, refer to the plans of development. | |
| **Servicing** | | | | |
| **PO3**<br>Development accommodates the required design service vehicle (including waste collection) in accordance with:<br>(a) **Table 9.4.13-8: Service vehicle requirements**; and<br>(b) **Table 9.4.13-9: Minimum class of service vehicle**; and<br>(c) *AS2890.2: Parking facilities Part 2: Off-street commercial vehicle facilities* to allow for: | **AO3**<br>No acceptable outcome provided. | | **COMPLIES WITH** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (i) loading and unloading of service vehicles wholly within the site;<br>(ii) pathways from service areas to tenancies at a width and grade that allows for unimpeded manoeuvring of goods (i.e. clear of doors, gates or landscaping);<br>(iii) waste collection vehicles to appropriately service the development;<br>(iv) safe pickup and set-down of passengers on-site;<br>(v) unobstructed access to off-street parking areas; and<br>(vi) an efficient and safe traffic network. | | | |
| **PO4**<br>Development ensures that service vehicle routes to and from the development minimise impacts on residential safety and amenity. | **AO4**<br>No acceptable outcome provided. | **COMPLIES WITH PO4**<br>Service vehicle routes will be designed to minimise impacts on residential uses. | |
| **Public transport network** | | | |
| **PO5**<br>Development that attracts large numbers of people, integrates the provision of on-site public transport facilities which are connected to:<br>(a) adjoining uses;<br>(b) the existing road network; | **AO5.1**<br>On-site public transport facilities (including stops) are integrated with the following land uses:<br>(a) Air services;<br>(b) Educational establishment (new and existing);<br>(c) Hospital; | **NOT APPLICABLE**<br>The development does not attract a high proportion of people using high frequency public transport. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (c) existing or future public transport facilities; and<br>(d) public areas. | (d) Major sport, recreation and entertainment facility;<br>(e) Shop (2,000m² or greater); and<br>(f) Tourist attraction. | | |
| | **AO5.2**<br>Development provides safe, attractive and convenient pedestrian and cycle pathways connected to:<br>(a) adjoining uses;<br>(b) the existing road network;<br>(c) existing or future public transport facilities; and<br>(d) public areas. | **COMPLIES WITH AO5.2**<br>Refer to plans of development. | |
| **PO6**<br><br>Development within 400m walking distance of a high frequency public transport stop or rail station provides attractive, safe and convenient linkages to this infrastructure. | **AO6**<br><br>No acceptable outcome provided. | **NOT APPLICABLE**<br>The development is not located within 400m walking distance to a high frequency public transport stops or rail stations. | |
| **Active transport network** | | | |
| **PO7**<br><br>Off-street bicycle parking and off-street end-of-trip facilities are provided to encourage active transport and are: | **AO7.1**<br>Development provides off-street bicycle parking and off-street end-of-trip facilities in accordance with **Table 9.4.13-10: Bicycle parking rates** and **Table 9.4.13-** | **COMPLIES WITH AO7.1**<br>The bicycle parking requirement for the development is 57 resident spaces (Class 2) and six (6) visitor spaces (Class 3). The development provides 57 resident spaces and six (6) visitor spaces and therefore complies with Council requirements. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (a) designed to meet the needs and volumes of pedestrians and cyclists; and<br>(b) located in safe, convenient and highly accessible areas.<br><br>**Note: This PO does not apply to the following uses:**<br>• **Dwelling house;**<br>• **Dual occupancy; or**<br>• **Multiple dwelling (where there are 3 dwellings)** | **11: End-of-trip facilities for active travel users**. | For further details, refer to **Section 4** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | **AO7.2**<br><br>Location of off-street, end-of-trip facilities are:<br>(a) within 50m to off-street bicycle parking; and<br>(b) clearly signed off-street bicycle parking areas. | **NOT APPLICABLE**<br>The proposed multiple dwelling land use does not require end-of-trip facilities. | |
| | **AO7.3**<br><br>Signage indicating location of off-street bicycle parking is:<br>(a) clearly identifiable within the site;<br>(b) at ground level, external to buildings; and<br>(c) in accordance with *AS2890.3:Parking facilities Part 3: Bicycle parking*. | **COMPLIES WITH AO7.3**<br>Bicycle parking will be appropriately signed in accordance with relevant Council requirements. | |
| | **AO7.4**<br>Off-street bicycle parking areas are:<br>(a) clear of pedestrian movement paths;<br>(b) visible from the street to allow casual surveillance;<br>(c) located clear of vehicle movement;<br>(d) well lit;<br>(e) protected from the weather; | **COMPLIES WITH AO7.4**<br>Refer to plans of development and **Section 4** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | (f) connected from the road via direct pathways/ramps; and<br>(g) in accordance with the cycling aspects of austroads and *AS2890.3:Parking facilities Part 3: Bicycle parking.* | | |
| **PO8**<br>Development provides pedestrian and cyclist pathways to all street frontages and set down areas, and:<br>(a) allows for safe movement;<br>(b) is convenient and direct;<br>(c) is clearly identifiable; and<br>(d) is clear of potential vehicle movements. | **AO8.1**<br>Development provides a pathway from the primary street frontage and car parking set-down areas, to connect to the main entry of the building.<br>OR<br>For development with 21 dwellings or more, a pathway is provided for each road frontage and car parking set-down area(s) to the main entry of the building. | **COMPLIES WITH AO8.1**<br>Refer to the plans of development. | |
| | **AO8.2**<br>Pathways are to be designed and constructed in accordance with *AS 1428.1: Design for access and mobility Part 1: General requirements for access – New building work*. | **COMPLIES WITH AO8.2**<br>Where new pathways are required, these will be designed and constructed in accordance with *AS1428.1*. | |
| | **AO8.3**<br>Pathways are separated from vehicle movements. | **COMPLIES WITH AO8.3**<br>Refer to the plans of development. | |
| **PO9**<br>Public pathways are provided: | **AO9**<br>No acceptable outcome provided. | **COMPLIES WITH PO9**<br>Refer to the plans of development. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| (a) within the road reserve, adjacent to, and for the full length of, the sites road frontage; and<br>(b) in accordance with **SC6.12 City Plan policy – Land development guidelines**.<br>**Note: This PO does not apply to the following uses:**<br>• **Dwelling house;**<br>• **Dual occupancy; or**<br>• **Multiple dwelling (where there are 3 dwellings).** | | | |
| **PO10**<br>Development contributes to the safe and efficient provision and operation of the bicycle and pedestrian network. | **AO10.1**<br>Pathways and on-road cycle lanes are designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards**. | **COMPLIES WITH AO10.1**<br>Refer to the plans of development. | |
| | **AO10.2**<br>Development does not remove or compromise existing on-road and off-road bicycle and pedestrian infrastructure and facilities. | **COMPLIES WITH AO10.2**<br>Refer to the plans of the development. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **Roads and freight** | | | |
| **PO11**<br>Public roads including upgrades are designed to an appropriate standard and are designed to:<br>(a) prevent the need for traffic calming devices to manage vehicle design speed;<br>(b) deter through traffic if the roads function is primarily for access; and<br>(c) create safe conditions for pedestrians and cyclists. | **AO11**<br>New roads and upgrades to roads are designed and constructed in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards.** | **COMPLIES WITH AO11**<br>Refer to Civil design package. | |
| **PO12**<br>Corner lots include truncations at each roadway intersection to ensure the intersection and sight lines are safe and functional. | **AO12.1**<br>Corner lots are truncated at each roadway intersection by:<br>(a) three equal chords of a 6m radius for non-industrial lots and are dedicated to Council as public road; or<br>(b) three equal chords of a 8m radius for industrial lots and are dedicated to Council as public road. | **NOT APPLICABLE** | |
| | **AO12.2**<br>At roundabouts and intersections, corner truncations are wider to maintain verge widths and sight line requirements. | **NOT APPLICABLE** | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO13**<br>New intersections:<br>(a) are safe and do not compromise the efficiency, function, convenience of use or capacity of the road network;<br>(b) have verge areas that provide sufficient area for safe pedestrian and cycling movement; and<br>(c) have sufficient area to provide essential services and infrastructure, including traffic management. | **AO13**<br>New intersections are designed and constructed in accordance with *Austroads* and **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards**. | **NOT APPLICABLE** | |
| **Ingress and egress** | | | |
| **PO14**<br>All vehicles enter and exit the site in a forward gear (restricted manoeuvring is allowed for service vehicles identified in **Table 9.4.13-8: Service vehicle requirements**).<br>**Note: This PO does not apply to the following uses:**<br>• **Dwelling house;**<br>• **Dual occupancy; or**<br>• **Multiple dwelling (where there are 3 dwellings).**<br>**Editor's note – Access to State controlled roads may require additional approvals in accordance with the *Transport Infrastructure Act 1994***<br>**PO15**<br>Where identified on the functional road hierarchy (as shown on the zone maps in Schedule 2) and a lot has two or more | **AO14**<br>No acceptable outcome provided.<br>**AO15**<br>No acceptable outcome provided. | **COMPLIES WITH PO14**<br>All vehicles can enter and exit the development site in a forward gear.<br>Refer to plans of development and **Section 5.3** and **Appendix B** of Geleon Traffic and Transport Assessment report **51033-RP01-A**.<br>**COMPLIES WITH PO15**<br>Karingal Drive and Imelda Way are the development's only road frontages. Karingal Drive is | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| road frontages, vehicle access is provided from the road with the least on-road traffic. | | not identified on Council's Functional Road Hierarchy along the development site frontage.<br>For further details in this regard, refer to **Section 4** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| **Integrated transport and land use** | | | |
| **PO16**<br>Development:<br>(a) does not compromise the function and capacity of the existing and planned road network; and<br>(b) appropriately mitigates impacts on the safety and operation of the existing and planned road network.<br>**Note: A Traffic Impact Assessment is Council's preferred method of addressing the above Performance outcome particularly in the following instances:**<br>**(a) when the development is identified as "any other use not listed in this table" or "any other undefined use" in Part 5 – Tables of assessment;**<br>**(b) freight dependent development; or**<br>**(c) site access is to a road identified on the Functional road hierarchy (indicated on the Zone maps in Schedule 2);**<br>**(d) site access is from a road identified on the Pacific motorway service road types overlay map;** | **AO16**<br>No acceptable outcome is provided. | **COMPLIES WITH PO16**<br>The development is expected to generate an additional 151 vpd along Karingal Drive and 59 vpd along Imelda Way and Matas Drive. When added to the estimated AADT of the external road network, Karingal drive and Imelda Way / Matas Drive have sufficient capacity to cater for development generated traffic.<br>For further details, refer to **Section 3** of Geleon Traffic and Transport Assessment report **51033-RP01-A** which presents the findings of a traffic impact assessment. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **(e) site access is within 100m of a signalised intersection;**<br>**(f) site access is within 50m of a roundabout; or**<br>**(g) a new intersection is proposed;**<br>**(h) density outcomes in a Zone code are exceeded; or**<br>**(i) development has the potential to increase existing background traffic (peak period or daily traffic movements) ≥ 5 percent.** | | | |
| **PO17**<br>Development within the Coomera Town Centre area provides an integrated network of predominantly public streets to ensure efficient movement of pedestrians, cyclists, vehicles and strong public transport connections.<br>**Note: Indicative access and mobility outcomes for the Coomera Town Centre area are identified on Figure 9.4.13-2.** | **AO17**<br>No acceptable outcome provided. | **NOT APPLICABLE**<br>The development is not located in the Coomera Town Centre area. | |
| **General** | | | |
| **PO18**<br>Continuous circulation aisles are provided within carparking areas to avoid the use of the road network when accessing areas within the development. | **AO18.1**<br>All off-street car parking modules and service areas are accessed by internal circulation aisles. | **COMPLIES WITH AO18.1**<br>Refer to the plans of development and **Section 4.2** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | **AO18.2**<br>Circulation aisles are not disconnected by car parking modules or service areas. | **COMPLIES WITH AO18.2**<br>Refer to the plans of development and **Section 4.2** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets <u>either</u> the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| | **AO18.3**<br>All access driveways are linked by circulation aisles and free from parking manoeuvres. | **COMPLIES WITH AO18.3**<br>Refer to plans of development | |
| | **AO18.4**<br>All vehicles can circulate throughout the site in a forward gear without performing reverse manoeuvres. | **COMPLIES WITH AO 18.4**<br>Refer to plans of development and **Appendix B** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| **PO19**<br>Off street car parking areas:<br>(a) provide a legible and efficient internal layout;<br>(b) ensure the safety and security of users;<br>(c) are clearly distinguishable from pedestrian paths and entry points;<br>(d) are easily negotiated by vehicles and pedestrians including persons with a disability;<br>(e) ensure that there are no disruptions to or queues onto the public road network;<br>(f) provide sight distances from driveways to ensure visibility between vehicles on the driveway and pedestrians on the verge;<br>(g) are designed, marked and maintained to the current relevant standard; and<br>(h) promote driver expectations consistent with conventional road rules (e.g. keep to the left). | **AO19.1**<br>Off street car parking provided in accordance with *AS 2890.1: Parking facilities – Part 1: Off-street car parking*, *AS 2890.2: Parking facilities – Part 2: Off-street commercial vehicle facilities, AS/NZS 2890.6: Parking facilities Part 6: Off-street parking for people with disabilities* and *AS 1428.1: Design for access and mobility Part 1: General requirements for access – New building work*. | **COMPLIES WITH AO19.1**<br>Refer to the plans of development and **Section 4.2** of Geleon Traffic and Transport Assessment report **51033-RP01-A**. | |
| | | | |
| | **AO19.2**<br>Development does not provide pavement humps or raised platforms in queuing areas. | **COMPLIES WITH AO19.2**<br>Refer to the plans of development. | |
| | **AO19.3**<br>Development is designed so that vehicles do not reverse across marked pedestrian crossings. | **COMPLIES WITH AO19.3**<br>All vehicles can manoeuvre throughout the development site without being required to reverse across pedestrian crossings.<br>Refer to the plans of development. | |

| Performance outcomes | Acceptable outcomes | Does the proposal meet the acceptable outcome?<br>If not, justify how the proposal meets either the performance outcome or overall outcome | Internal use |
|---|---|---|---|
| **PO20**<br>Any proposed porte-cocheres are designed to enable safe manoeuvring and access of vehicles on-site. | **AO20**<br>Any proposed porte-cocheres are designed to:<br>(a) have a minimum vertical clearance of 4.5m;<br>(b) accommodate vehicles entirely within the site, including the queuing of vehicles; and<br>(c) allow vehicles to circulate in a forward direction at all times. | **NOT APPLICABLE** | |
| **PO21**<br>Staged development is planned, designed and constructed to ensure that for each stage:<br>(a) sufficient car parking is provided; and<br>(b) appropriate connections to active and public transport facilities are provided. | **AO21**<br>No acceptable outcome is provided. | **COMPLIES WITH AO21**<br>The development will be staged appropriately. | |

### Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area

This table sets out the minimum number of car parking spaces required according to the use applied for. Where the calculated number of car spaces is not a whole number, the number of car parking spaces required must be the next higher whole number.

| Land use | Minimum number of off-street car parking spaces |
|---|---|
| **Adult store** | 5 per 100m² of TUA (total use area) |
| **Agricultural supplies store** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² |
| **Animal husbandry** | 1 per staff in addition to parking provided for the primary dwelling |
| **Animal keeping** | 1 per staff in addition to parking provided for the primary dwelling |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| **Bar** | 5 per 100m² of TUA | |
| **Brothel** | 1 per each room plus 1 per 2 staff | |
| **Bulk landscape supplies** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Caretaker's accommodation** | 2 | |
| **Car wash** | **DIY car wash** | 0 |
| | **Hand-wash** | 1 per 2 staff |
| **Child care centre** | 1 per 4 children, which may be provided as a passenger set-down/pick-up area | |
| **Club** | 6 per 100m² of TUA | |
| **Community care centre** | 14, plus 5 per 100m² of TUA | |
| **Community use** | 6 per 100m² of TUA | |
| **Crematorium** | 10 per 100m² of TUA | |
| **Cropping** | 1 per staff in addition to parking provided for the primary dwelling | |
| **Dual occupancy** | 2 per dwelling | |
| **Dwelling house** | **Dwelling house** | 1 per 1 bedroom dwelling |
| | | 2 per dwelling with 2 or more bedrooms |
| | **Secondary dwelling** where 80m² or less | 1 |
| | **Secondary dwelling** where greater than 80m² | 2 |
| **Dwelling unit** | 2 | |
| **Educational establishment** | **Preparatory** | 1 per staff, plus 1 per 5 children enrolled which may be provided as a passenger set-down/pick-up area |
| | **Primary** | 1 per staff |
| | **Secondary** | 1 per staff plus 1 per 10 Year 12 students |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| | **Before and after school care** | 1 per staff, plus 1 per 5 children enrolled which may be provided as a passenger set-down/pick-up area |
| | **Tertiary and further education** | To be determined upon submission of a Car Parking Assessment to Council |
| | In addition to the car parking requirements a set down/pick-up area is provided. | |
| **Food and drink outlet** | 5 per 100m² of TUA, plus queuing area for 10 vehicles for any drive-thru facility from the collection point | |
| **Function facility** | 10 per 100m² of TUA | |
| **Funeral parlour** | The greater of:<br>(a) 1 per 10m² of TUA; or<br>(b) 1 per 2.5 persons, based on maximum occupancy | |
| **Garden centre** | 10, plus 1 space per 100m² of TUA in excess of 3,000m² | |
| **Hardware and trade supplies** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Health care services** | The greater of:<br>(a) 1 per 20m² of TUA; or<br>(b) 2 per consulting room, plus 1 space per staff | |
| **High impact industry** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Home based business** | **Bed and breakfast** | 1 per guest room in addition to parking provided for the primary dwelling |
| | **Home office** | 1, in addition to parking provided for the primary dwelling |
| | **Home based child care** | 0 |
| | **Home based business n.e.i.** | 2, in addition to parking provided for the primary dwelling |
| **Hospital** | 0.8 per staff plus 1 per 2 beds | |
| **Hotel** | 6 per 100m² of TUA and 1 space per short term/serviced apartment plus queuing area for 10 vehicles for any drive-through facility from the collection point | |
| **Indoor sport and recreation** | **Gymnasium (where 24hr and no classes)** | 1 per 20m² of TUA |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| | **Amusement parlour** | 5 per 100m² TUA |
| | **Squash or enclosed tennis court** | 6 per court |
| | **Indoor cricket or other court game** | 20 per court |
| | **Swimming pool or skating rink** | 15, plus 1 per 100m² of TUA |
| | **Any other operation** | 1 per 10m² of TUA |
| **Intensive animal industry** | 1 per staff in addition to parking provided for primary dwelling | |
| **Intensive horticulture** | 1 per staff in addition to parking provided for primary dwelling | |
| **Low impact industry** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Marine industry** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Market** | 1 per 2 stalls | |
| **Medium impact industry** | **Medium impact industry** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² |
| | **Salvage Yard** | 0.7 per 100m² of TUA, with a minimum of 5 spaces |
| **Multiple dwelling** | (a) 1 per 1 bedroom unit or dwelling;<br>(b) 1.25 per 2 bedroom unit or dwelling;<br>(c) 1.5 per 3 bedroom unit or dwelling;<br>(d) 2 per 4 bedroom unit or dwelling;<br>Plus:<br>(a) where 3 to 4 dwellings, 1 for visitor parking; or<br>(b) where 5 to 6 dwellings, 2 for visitor parking; or<br>(c) where 7 to 9 dwellings, 3 for visitor parking; or<br>(d) where 10 or more dwellings, 3 plus 1 per 10 dwellings for visitor parking thereafter<br>**Note: At least 50% of visitor parking to be provided in a single location** | |
| **Nightclub** | 5 per 100m² of TUA | |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| **Office** | **Office, if real estate agent** | To be determined upon submission of a Car Parking Assessment to Council |
| | **Office, if call centre** | To be determined upon submission of a Car Parking Assessment to Council |
| | **Office n.e.i** | 3 per 100m² of TUA |
| **Outdoor sales** | **Vehicle hire** | 3 per 100m² of TUA plus 1 per 1.5 vehicles in the vehicle hire fleet and 1 on-site wash bay |
| | **Motor vehicles sale yard** | 3 per 100m² of TUA plus 0.5 per 100m² of display area |
| **Outdoor sport and recreation** | **Tennis court** | 4 per court |
| | **Lawn bowls (stand-alone)** | 20 per green |
| | **Swimming pool** | 15, plus 1 per 100m² of TUA |
| | **Golf course** | The greater of:<br>(a) 4 per hole, plus 3 per 100m² of TUA of clubhouse; or<br>(b) 6 per 100m² of TUA of clubhouse |
| | **Football ground** | 50 per field |
| | **Any other court game** | 20 per court |
| **Permanent plantation** | 1 per staff in addition to parking provided for the primary dwelling | |
| **Place of worship** | 1 per 2.5 persons, based on maximum occupancy | |
| **Port services** | **Marina** | (a) 0.6 per wet berth designed for boats 10m and under;<br>(b) 0.8 per wet berth designed for boats between 10m and 15m;<br>(c) 1 per wet berth designed for boats greater than 15m;<br>(d) 0.2 per dry berth or swing mooring; plus<br>(e) 0.5 per staff;<br>(f) 1 per 50m² TUA of ancillary activities associated with the marina. |
| **Relocatable home park** | **Relocatable home park** | 1 per relocatable home plus 1 per 5 homes for visitors |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| **Research and technology industry** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Residential care facility** | 1 per 2 beds for visitor car parking, and 1 per staff based on maximum residential occupancy<br>**Note: 50% of visitor parking to be provided in a single location** | |
| **Resort complex** | 1 per 4 dwellings | |
| **Retirement facility** | (a) 1 per independent living, self contained dwelling; plus<br>(b) 1 per 4 independent living, self contained dwellings for visitor car parking; plus<br>(c) 1 per staff based on maximum residential occupancy<br>**Note: 50% of visitor parking to be provided in a single location** | |
| **Roadside stall** | 4 | |
| **Rooming accommodation** | **Off-site Student accommodation** | 1 per 2 students, based on maximum occupancy plus 1 for a manager residence |
| | **Hostel** | 1 per room, excluding communal areas, plus 1 for a manager residence |
| | **Other** | To be determined upon submission of a Car Parking Assessment to Council |
| **Rural industry** | 1 per staff in addition to parking provided for primary dwelling plus 1 visitor space | |
| **Sales office** | **Sales office** | 5 |
| | **Display dwelling** | 0 |
| **Service industry** | **Service industry** | 5 per 100m² of TUA |
| | **Laundromat** | 5 per 100m² of TUA |
| **Service station** | 2, plus 5 per 100m² of TUA | |
| **Shop** | 5 per 100m² of TUA | |
| **Short-term accommodation** | **Backpackers accommodation** | 1 per 8 beds plus 1 for a shuttle bus |
| | **Other** | 1 per room plus 1 per managers residence |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| **Showroom** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² | |
| **Theatre** | **Stand-alone** | To be determined upon submission of a Car Parking Assessment to Council |
| | **Where part of a shopping centre** | 1 per 8 seats |
| **Tourist attraction** | **Existing** | To be determined upon submission of a Car Parking Assessment to Council |
| **Tourist park** | **Caravan park** | 11 per 10 sites plus 1 per 10 sites for visitors |
| | **Holiday cabins** | 1 per site or cabin plus 1 per 10 sites for visitors |
| **Transport depot** | To be determined upon submission of a Car Parking Assessment to Council | |
| **Veterinary services** | 5 per 100m² of TUA | |
| **Warehouse** | **Warehouse** | 2 per tenancy or lot plus 1 per 50m² of TUA up to and including 500m², and 1 per 100m² of TUA over 500m² |
| | **Self storage sheds**<br>**0 – 3,000m² GLA** | (a) 3 plus 1 for trailer<br>(b) This rate includes staff parking requirements<br>(c) All spaces are located beside or adjacent to the office administration building<br>(d) Where storage units are proposed to be located in a multi-storey building and access to the units is via stairs or lifts, an additional 2 parking spaces are to be provided behind a secured gate and at the entry to the building |
| | **Self storage sheds**<br>**3,001m² - 6,000m² GLA** | (a) 4 plus 1 for trailer<br>(b) This rate includes staff parking requirements<br>(c) All spaces are located beside or adjacent to the office administration building<br>(d) Where storage units are proposed to be located in a multi-storey building and access to the units is via stairs or lifts, an additional 5 parking spaces are to be provided behind a secured gate |

| Land use | Minimum number of off-street car parking spaces | |
|---|---|---|
| | **Self storage sheds**<br>**6,001m² - 9,500m² GLA** | (a) 5 plus 1 for trailer<br>(b) This rate includes staff parking requirements<br>(c) All spaces are located beside or adjacent to the office administration building<br>(d) Where storage units are proposed to be located in a multi-storey building and access to the units is via stairs or lifts, an additional 5 parking spaces are to be provided behind a secured gate |
| | **Self storage sheds**<br>**≥ 9,501m² GLA** | To be determined upon submission of a Car Parking Assessment to Council |
| **Wholesale nursery** | 10, plus 1 space per 100m² of TUA in excess of 3,000m² | |
| **Winery** | To be determined upon submission of a Car Parking Assessment to Council | |
| **Any other land use or land use operation** | To be determined upon submission of a Car Parking Assessment to Council | |

**Note: The Car sharing travel demand measure may be applied to reduce car parking requirements in accordance with Table 9.4.13-7: Travel demand measures.**

**Note: Tandem car parking spaces (limited to 2 vehicles parked one behind the other) can be counted as 2 spaces in the following instances:**

**(a) the spaces are designated and signed for the occupants of the same dwelling or the same non-residential tenancy;**

**(b) the minimum length of the tandem car space is 10.4m; and**

**(c) the minimum length of a tandem garage (if proposed) is 11m.**

### Table 9.4.13-4: Car parking rates – Centre zone and High density residential zone – Transport Hub Area

This table sets out the minimum number of car parking spaces required according to the use applied for. Where the calculated number of car spaces is not a whole number, the number of car parking spaces required must be the next higher whole number.

| Zone | Site proximity to a light rail station | Land use | Minimum number of off-street car parking spaces |
|---|---|---|---|
| Centre zone | Where the property boundary of a development directly adjoins a Light rail station platform | Non-residential | 0 |
| Centre zone | Within 400m walking distance | Residential – permanent/long-term accommodation | 0.75 per unit or dwelling and 1 per 10 units or dwelling for visitors. |

| Zone | Site proximity to a light rail station | Land use | Minimum number of off-street car parking spaces |
|---|---|---|---|
| | | | A minimum of 17.5% residential parking, excluding visitor, is to be unbundled. |
| | | Residential –Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 100m² of TUA |
| Centre zone | Within 800m walking distance | Residential – permanent/long-term accommodation | 0.9 per unit or dwelling and 1 per 10 units or dwelling for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 75m² of TUA |
| High density residential zone | Within mapped boundaries of the Transport hub area | Residential – permanent/long-term accommodation | 1 per unit or dwelling and 1 per 10 units or dwelling for visitors |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |

| Zone | Site proximity to a light rail station | Land use | Minimum number of off-street car parking spaces |
|---|---|---|---|
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| High density residential zone | Within 400m walking distance | Non-residential | 1 per 100m² of TUA |
| High density residential zone | Within 800m walking distance | Non-residential | 1 per 75m² of TUA |

**Note: Where 1 space is provided per unit or dwelling, there is no requirement to unbundle car parking.**

**Note: The Car sharing travel demand measure may be applied to reduce car parking requirements in accordance with Table 9.4.13-7: Travel demand measures.**

**Note: Tandem car parking spaces (limited to 2 vehicles parked one behind the other) can be counted as 2 spaces in the following instances:**

**(a) the spaces are designated and signed for the occupants of the same dwelling or the same non-residential tenancy;**

**(b) the minimum length of the tandem car space is 10.4m; and**

**(c) the minimum length of a tandem garage (if proposed) is 11m.**

### Table 9.4.13-5: Car parking rates – Centre zone – outside Transport hub area

This table sets out the minimum number of car parking spaces required according to the use applied for. Where the calculated number of car spaces is not a whole number, the number of car parking spaces required must be the next higher whole number.

| Centre zone | Land Use | Minimum number of off-street car parking spaces |
|---|---|---|
| **Principal centre** | | |
| **Coomera** | Residential – permanent/long-term accommodation | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Residential – serviced and short-term accommodation | 1 per 4 units |
| | Non-residential | 1 per 100m² of TUA |
| **Specialist centre** | | |
| **Bundall** | Office | 2.5 per 100m² of TUA |
| | Food and drink outlet, shop, service industry | 2.5 per 100m² of TUA |

| Centre zone | Land Use | Minimum number of off-street car parking spaces |
|---|---|---|
| | Any other land use | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Varsity Central/ Bond University** | Residential – permanent/long-term accommodation | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Residential – serviced and short-term accommodation | 1 per 2 units, plus 1 for a manager residence |
| | Non-residential | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Bond University campus** | Residential – serviced and short-term accommodation where on Lot 10 on SP148599 | 1 per 4 units, plus 1 for a manager residence |
| **Varsity Station Village** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 1 per 100m² of TUA |
| **Biggera Waters (Harbour Town)** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 3.3 per 100m² of TUA |
| **Major centre** | | |
| **Nerang** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 3.3 per 100m² of TUA |
| **Coolangatta** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 3.3 per 100m² of TUA |
| **Helensvale** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 1 per 100m² of TUA |
| **District centres** | | |
| **Burleigh** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 3.3 per 100m² of TUA |

| Centre zone | Land Use | Minimum number of off-street car parking spaces |
|---|---|---|
| **Oxenford** | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Ormeau** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 5 per 100m² |
| **Pimpama**<br>Old Pacific Highway, Pimpama | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Coomera City Centre**<br>Days Rd and City Centre Drive | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Hope Island**<br>Marina Quays Dr | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Runaway Bay Shopping Centre**<br>Cnr Morala and Lae Dr | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Ashmore City**<br>Cnr Southport-Nerang Rd and Currumburra Rd | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Ashmore Plaza**<br>Cotlew St | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Southport Park Shopping Centre**<br>Cnr Drury Av, Ferry Rd and Benowa Rd | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Q-Superstore**<br>Cnr Bermuda and Markeri St | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |

| Centre zone | Land Use | Minimum number of off-street car parking spaces |
|---|---|---|
| **Mudgeeraba Village** | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Treetops (Urbia)**<br>Cnr Bermuda Street and Reedy Creek Rd | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **West Burleigh Shopping Centre**<br>Reedy Creek Rd, Burleigh Waters | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Palm Beach** | Residential | 1 per unit or dwelling and 1 per 10 units or dwellings for visitors |
| | Non-residential | 3.3 per 100m² of TUA |
| **The Pines Shopping Centre**<br>Cnr K P McGrath Dr and Guineas Creek | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |
| **Tugun** | Residential | 1 per unit or dwelling plus 1 per 10 for visitors |
| | Non-residential | 3.3 per 100m² of TUA |
| All other centres | All | Refer to **Table 9.4.13-3: Car parking rates – all zones except Centre zone or Special purpose zone – Special development area precinct – Southport Priority Development Area** |

**Note:** **The Car sharing travel demand measure may be applied to reduce car parking requirements in accordance with Table 9.4.13-7: Travel demand measures.**

**Note:** **Tandem car parking spaces (limited to 2 vehicles parked one behind the other) can be counted as 2 spaces in the following instances:**

**(a) the spaces are designated and signed for the occupants of the same dwelling or the same non-residential tenancy;**

**(b) the minimum length of the tandem car space is 10.4m; and**

**(c) the minimum length of a tandem garage (if proposed) is 11m.**

### Table 9.4.13-6: Car parking rates – Southport Priority Development Area

This table sets out the minimum number of car parking spaces required according to the use applied for. Where the calculated number of car spaces is not a whole number, the number of car parking spaces required must be the next higher whole number.

| Precinct | Site proximity to a light rail station | Land use | Minimum number of off-street car parking spaces |
|---|---|---|---|
| Precinct 1 | Where the property boundary of a development directly adjoins a Light rail station platform | Residential – permanent/long term accommodation | 0.75 per unit or dwelling and 1 per 10 units or dwelling for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 0 |
| | Within 400m walking distance | Residential – permanent/long-term accommodation | 0.75 per unit or dwelling and 1 per 10 units or dwelling for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 100m² of TUA |
| | Outside 400m walking distance and within the boundaries of the precinct | Residential – permanent/long term accommodation | 0.9 per unit or dwelling and<br>1 per 10 units or dwellings for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |

| Precinct | Site proximity to a light rail station | Land use | Minimum number of off-street car parking spaces |
|---|---|---|---|
| | | Non-residential | 1 per 75m² TUA |
| Precinct 2 | Within the boundaries of the precinct | Residential – permanent/long-term accommodation | 0.9 per unit or dwelling and<br>1 per 10 units or dwellings for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 75m² TUA |
| Precinct 3 | Within 400m walking distance | Residential – permanent/long term accommodation | 0.75 per unit or dwelling and<br>1 per 10 units or dwellings for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 100m² TUA |
| | Outside 400m walking distance and within the boundaries of the precinct | Residential – permanent/long term accommodation | 0.9 per unit or dwelling and<br>1 per 10 units or dwellings for visitors.<br>A minimum of 17.5% residential parking, excluding visitor, is to be unbundled and provided in a pooled parking arrangement. |
| | | Residential – Short-term accommodation (not including Backpackers accommodation) and Rooming accommodation | 1 per 4 units or dwellings |
| | | Residential – Short-term accommodation if Backpackers accommodation | 1 per 8 beds plus 1 for a shuttle bus |
| | | Non-residential | 1 per 75m² TUA |

**Note: The Car sharing travel demand measure may be applied to reduce car parking requirements in accordance with Table 9.4.13-7: Travel demand measures.**

**Note: Tandem car parking spaces (limited to 2 vehicles parked one behind the other) can be counted as 2 spaces in the following instances:**

**(a) the spaces are designated and signed for the occupants of the same dwelling or the same non-residential tenancy;**

**(b) the minimum length of the tandem car space is 10.4m; and**

**(c) the minimum length of a tandem garage (if proposed) is 11m.**

### Table 9.4.13-7: Travel demand measures

This table sets out the travel demand measures that can be applied to development. The indicative reduction of each travel demand measure is to be subtracted from the car parking requirement indicated in the tables: Table 9.4.13-3 to Table 9.4.13-6.

| Travel demand measure | Indicative reduction to car parking rates |
|---|---|
| Car sharing | Each car share vehicle off-sets 5 spaces (equates to a relaxation of 4 spaces) |
| Unbundled parking | 20% to 50% unbundled – 30% reduction in minimum rate |
| Motorcycle/motor scooter parking | Every 2 motorcycles spaces can replace 1 car space, up to 15% of the minimum parking requirement |
| Bicycle parking (where provided in excess of the requirement under relevant section of this code) | Every 6 bicycles offsets 1 car space, up to 15% of the minimum parking requirement |
| Any other travel demand measure<br>**Note: This travel demand measure only applies to assessable development** | To be approved by Council |

**Table 9.4.13-8: Service vehicle requirements**

| Site area (m²) | Service vehicle requirements |
|---|---|
| Less than 1,000m² | Demonstrate that the development can accommodate the design service vehicle – in accordance with **Table 9.4.13-9: Minimum class of service vehicle** – a separate service bay is not required and restricted manoeuvring areas from a public roadway are allowed. |
| 1,000m² to < 2,000m² | (a) Service bay to accommodate the design service vehicle in accordance with **Table 9.4.13-9: Minimum class of service vehicle**.<br>(b) Restricted manoeuvring from a public roadway is allowed for a heavy rigid vehicle (HRV) and/or articulated vehicle (AV) is the design service vehicle.<br>(c) Full on-site manoeuvring is required for all other classes of service vehicle (Van, SRV & MRV). |
| 2,000m² to <4,000m² | (a) Service bay to accommodate the design service vehicle in accordance with **Table 9.4.13-9: Minimum class of service vehicle**.<br>(b) Restricted manoeuvring from a public roadway is allowed for an articulated vehicle.<br>(c) Full on-site manoeuvring is required for all other classes of service vehicle (Van, SRV, MRV, LRV, RCV & HRV). |
| 4,000m² and greater | (a) Service bay to accommodate the design service vehicle in accordance with **Table 9.4.13-9: Minimum class of service vehicle**.<br>(b) Full on-site manoeuvring is required for all classes of service vehicle. |

Editor's note – Restricted manoeuvring is designed as a single point reverse manoeuvre from the public roadway into the site to access a servicing area. This manoeuvre may be performed from the kerbside lane where it is clearly demonstrated that the design vehicle can achieve the manoeuvre to access the service area.

**Table 9.4.13-9: Minimum class of service vehicle**

Where waste collection is required to be provided for on-site, and the stated service vehicle in the table below is less than a Council refuse collection vehicle, then the development must be designed to cater for a waste collection vehicle in accordance with **SC6.15 City Plan policy – Solid waste management** (or as amended) and **SC6.12 City Plan policy – Land development guidelines, Section 2 – Transport network standards** (or as amended) as required.

| Land use | Minimum class of service vehicle |
|---|---|
| **Adult store** | SRV |
| **Agricultural supplies store** | AV |
| **Animal husbandry** | AV |
| **Animal keeping** | Van |

| Land use | Minimum class of service vehicle |
|---|---|
| **Brothel** | Van |
| **Bulk landscape supplies** | AV |
| **Caretaker's accommodation** | Not applicable |
| **Car wash** | SRV |
| **Child care centre** | Van |
| **Club** | SRV |
| **Community care centre** | SRV |
| **Community residence** | Van |
| **Community use** | SRV |
| **Crematorium** | SRV |
| **Cropping** | Not applicable |
| **Dual occupancy** | Not applicable |
| **Dwelling house** | Not applicable |
| **Dwelling unit** | Not applicable |
| **Educational establishment** | SRV |
| **Food and drink outlet** | SRV |
| **Food and drink outlet** if:<br>(a) a take away food premises; or<br>(b) including a drive through facility | HRV |
| **Function facility** | MRV |
| **Funeral parlour** | SRV |
| **Garden centre** | HRV |
| **Hardware and trade supplies** | AV |
| **Health care services** | SRV |
| **High impact industry** | AV |

| Land use | Minimum class of service vehicle |
|---|---|
| **Home based business** | Not applicable |
| **Hospital** | AV |
| **Hotel** | HRV |
| **Indoor sport and recreation** | SRV |
| **Intensive animal industry** | AV |
| **Intensive horticulture** | AV |
| **Low impact industry** | AV |
| **Marine Industry** | AV |
| **Market** | Not applicable |
| **Medium impact industry** | AV |
| **Multiple dwelling** if:<br>(a) 3 dwellings | Not applicable |
| **Multiple dwelling** if:<br>(a) more than 3 dwellings | Standing area for an MRV on-site |
| **Nightclub** | SRV |
| **Office** | Van |
| **Outdoor sales** | AV |
| **Outdoor sport and recreation** | SRV |
| **Permanent plantation** | AV |
| **Place of worship** | SRV |
| **Relocatable home park** | Van |
| **Research and technology industry** | AV |
| **Residential care facility** | HRV |
| **Resort complex** | HRV |
| **Retirement facility** | HRV |

| Land use | Minimum class of service vehicle |
|---|---|
| **Roadside stall** | Not applicable |
| **Rooming accommodation** | SRV |
| **Student accommodation** | SRV |
| **Hostel accommodation** | SRV |
| **Rural industry** | AV |
| **Sales office** | Not applicable |
| **Service industry** | SRV |
| **Service station** | SRV and AV (fuel tanker) |
| **Shop** | SRV |
| **Shop (GFA less than 400m²)** | SRV |
| **Shop (GFA 400m² - 1,500m²)** | HRV |
| **Shop (GFA greater than 1,500m²)** | AV |
| **Short-term accommodation** | Coach |
| **Showroom** | AV |
| **Tourist park** | Coach |
| **Tourist park** if:<br>(a) a caravan park | Van |
| **Transport depot** | AV |
| **Veterinary services** | Van |
| **Veterinary hospital** | MRV |
| **Warehouse** | AV |
| **Warehouse** if:<br>(a) for self storage sheds | Not applicable |
| **Wholesale nursery** | AV |
| **Any other land use** | As determined upon submission of a Service vehicle assessment |

| Land use | Minimum class of service vehicle |
|---|---|
| Editor's note – A Van is a 99.8th percentile vehicle equivalent to the *AS2890.1:2004 – Parking facilities – Part 1: Off-street car parking* B99 vehicle or large car. | |
| Editor's note – A Coach is an inter-city 12.5m tourist bus from *Austroads*. | |

### Table 9.4.13-10: Bicycle Parking Rates

This table sets out the minimum number of bicycle spaces required according to the use applied for. Where the calculated number of spaces is not a whole number, the number of bicycle spaces required is the next highest whole number.

| Land use | Long and medium term off-street bicycle parking (staff and residents – Security level B) | Short term off-street bicycle parking (visitors – Security level C) | Additional end-of-trip facilities required (refer to Table 9.4.13-11: End of trip facilities for active travel users) |
|---|---|---|---|
| **Adult store** | 1 per 100m² TUA | 1 per 50m² TUA | No |
| **Child care centre** | 1 per 10 staff | 2 per centre | Yes |
| **Club** | 1 per 25m² TUA public bar area plus 1 per 100m² public lounge and beer garden area | 1 per 100m² TUA | Yes |
| **Educational establishment** | 1 per 3 students Year 4 and above plus 1 per 10 staff | N/A | Yes |
| **Food and drink outlet** | 1 per 100m² TUA | 1 per 50m² TUA | No |
| **Health care services** | 1 per 8 consultation rooms | 1 per 4 consultation rooms | Yes |
| **High impact industry** | 1 per 800m² TUA | N/A | No |
| **Hotel** | 1 per 25m² TUA public bar area plus 1 per 100m² public lounge and beer garden area | 1 per 100m² TUA | No |
| **Indoor sport and recreation** | 1 per 4 employees | 1 per 200m² TUA | Yes |
| **Low impact industry** | 1 per 150m² TUA | N/A | No |

| Land use | Long and medium term off-street bicycle parking (staff and residents – Security level B) | Short term off-street bicycle parking (visitors – Security level C) | Additional end-of-trip facilities required (refer to Table 9.4.13-11: End of trip facilities for active travel users) |
|---|---|---|---|
| **Medium impact industry** | 1 per 150m² TUA | N/A | No |
| **Multiple dwelling** | 1 per dwelling | 1 per 12 dwellings, to a maximum of 20 spaces | No |
| **Office** | 1 per 100m² where within 800m walking distance to light rail station, otherwise 1 per 200m² TUA | 1 per 500m² TUA | Yes |
| **Rooming accommodation** | 1 per bedroom | N/A | No |
| **Rooming accommodation if for a hostel** | 1 per 3 rooms | 1 per 12 rooms | No |
| **Residential care facility** | 1 per 5 beds | 1 per 10 staff, based on maximum residential occupancy | No |
| **Retirement facility** | 1 per dwelling | 1 per 3 dwellings | No |
| **Service industry** | 1 per 100m² TUA | 1 per 50m² TUA | No |
| **Service station** | 1 per 200m² TUA | 2 per Service station | No |
| **Shop** | 1 per 100m² TUA | 1 per 50m² TUA | No |
| **Short-term accommodation** | 1 per 40 dwellings | 1 per 20 dwellings | No |
| **Showroom** | 1 per 800m² TUA | 1 per 200m² TUA | No |
| **Warehouse** | 1 per 800m² TUA | 1 per 200m² TUA | No |
| **Waterfront industry** | 1 per 150m² TUA | N/A | No |

**Note: User Class as referred to and defined in *AS 2890.3:2015 Parking facilities Part 3: Bicycle parking.***

### Table 9.4.13-11: End of trip facilities for active travel users

This table sets out the minimum number of end of trip facilities required according to the number of long-term bicycle spaces to be provided. Where the calculated number is not a whole number, the number required is the next highest whole number.

| Number of long-term bicycle spaces to be provided | Number of lockers to be provided | Number of showers (within an associated change room) to be provided | | Number of toilets to be provided | Number of wash basin stations (including mirrors, electrical outlet & counter top |
|---|---|---|---|---|---|
| 1-5 | 1.5 per bicycle space | 1 shower and change room of unisex design | | 1 | 1 |
| | | **Male** | **Female** | | |
| 6-10 | 1.5 per bicycle space | 1 plus change room | 1 plus change room | 1 | 2 |
| 11-20 | 1.5 per bicycle space | 2 plus change room | 2 plus change room | 2 | 4 |
| 21-30 | 1.5 per bicycle space | 3 plus change room | 3 plus change room | 2 | 6 |
| 31-40 | 1.5 per bicycle space | 4 plus change room | 4 plus change room | 3 | 8 |
| 41-50 | 1.5 per bicycle space | 5 plus change room | 5 plus change room | 1 per 3 showers required or part thereof | 1 per shower |
| 50+ | 1.5 per bicycle space | 4 showers, plus 1 shower for each 10 bicycle spaces provided | 4 showers, plus 1 shower for each 10 bicycle spaces provided | 1 per 3 showers required or part thereof | 1 per shower |

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acousticworks

# Material Change of Use
# Multiple Dwellings
# Reconfiguring a Lot
# Operation Works
# 6 Karingal Drive
# Pimpama

## ACOUSTIC REPORT






**Client:**
Bosform Pty Ltd

Reference:
*2026054 R01C 6 Karingal Drive, Pimpama RAIL .docx*

**Date Issued:**
13 March 2026

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# 1. Introduction

This report is in response to a request by Bosform Nature Pty Ltd for a rail noise assessment of a proposed residential subdivision to be located at 6 Karingal Drive, Pimpama. To facilitate the assessment, unattended and attended noise monitoring was conducted in the vicinity of the Gold Coast rail line to establish rail noise impacts to the proposed development. Based on the results of the assessment, recommendations for acoustic treatments are specified in this report.

# 2. Site Description

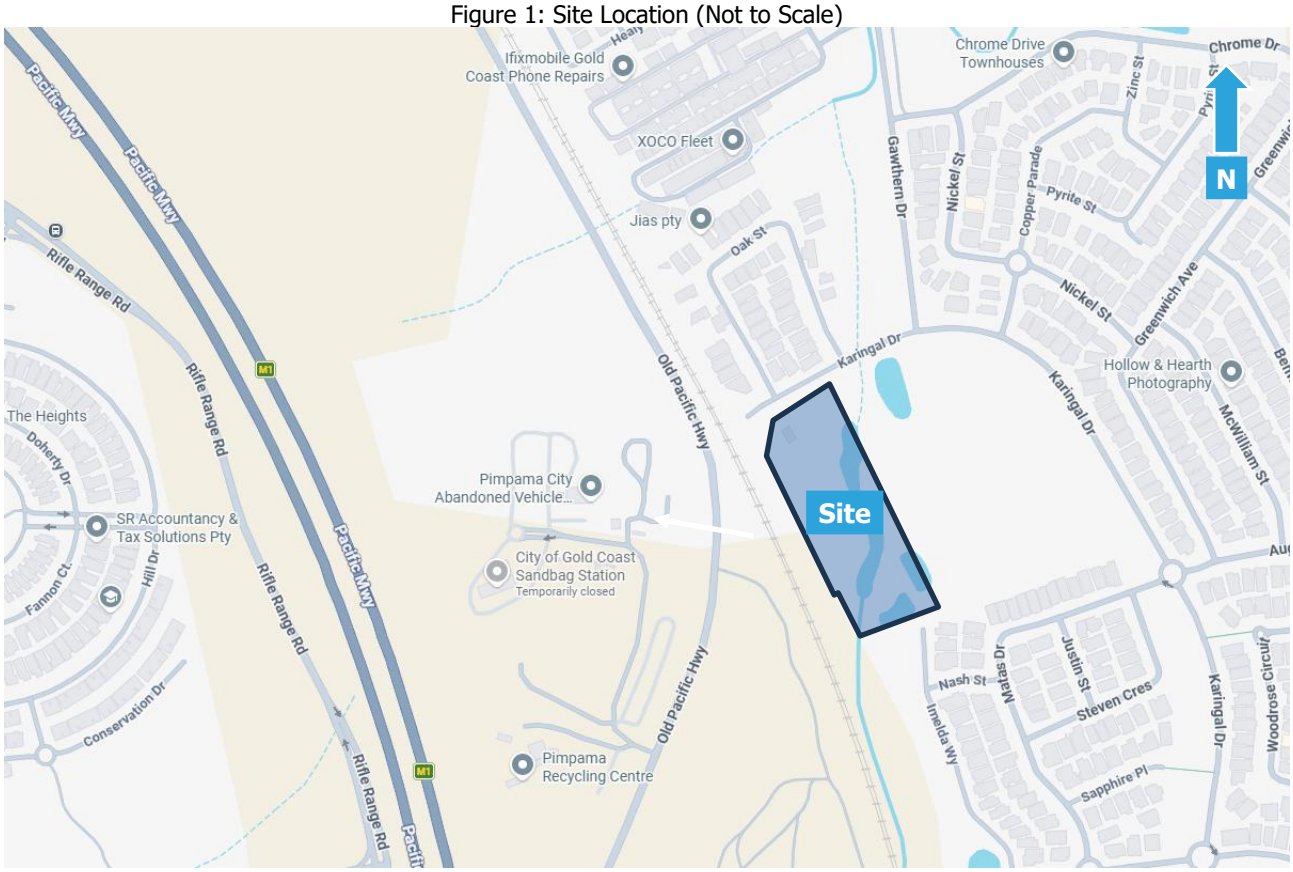
## 2.1 Site Location

The site is described by the following:

6 Karingal Drive, Pimpama
Lot 19 on RP152380

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A site survey was conducted on 26 February 2026 and identified the following:

a) The site is currently vacant.
b) Residential dwellings are located to the north, south and east of the site.
c) The site is located approximately 37m from the nearest lane of Old Pacific Highway and 400m from the nearest lane of the Pacific Motorway.
d) The Gold Coast Railway line is located 10m from the site.

## 2.2 Proposal

New townhouse development which comprises a complex of 16 townhouses accessing from Imelda Way and a complex of 41 townhouses accessing from Karingal Drive. The reconfiguring a lot component involves creation of management lots for these two townhouses developments and a park lot to be dedicated to Council for the drainage reserve traversing the site.

Total site area of 24,590m$^2$.

Refer to the Appendices for development plans.

## 2.3 Acoustic Environment

The surrounding area is primarily affected by road traffic noise from the Pacific Motorway and the Old Pacific highway, rail noise from the Gold Coast Rail Line and fauna noise.

# 3. Equipment

The following equipment was used to record noise levels:

- 1x Rion NL42 Environmental Noise Monitor
- Pulsar Model 105 Sound Calibrator
- Norsonic Nor140 Sound Level Meter

The Rion NL42 environmental noise monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signals recorded.

# 4. Noise Monitoring

## 4.1 Unattended Noise Monitoring

### 4.1.1 Rail Noise Levels – Monitor 1

A Rion NL-42 noise monitor was placed onsite at 6 Karingal Drive, approximately 10m from the nearest railway line with the microphone positioned 1.4 metres above ground level. The noise monitor was set to record noise levels on the 2 and 4 March 2026.

Noise measurements were conducted in "A" weighting "Fast" response, 1-minute statistical interval which recorded the $L_{Amax}$. Noise measurements were conducted in "A" weighting, "Fast" response, 1/3 octave, 1-minute statistical interval which recorded the $L_{Amax}$ and SEL/$L_{AE}$, (used to calculate the 24-hour $L_{Aeq}$).

Based on the measured $L_{AE}$ level, calculations were conducted utilising the number of trains per day to determine the $L_{Aeq,24hr}$ and $L_{Aeq,1hr}$ noise impacts at the proposed development.

Refer to Figure 2 for noise monitoring location.

## 4.2 Attended Noise Monitoring

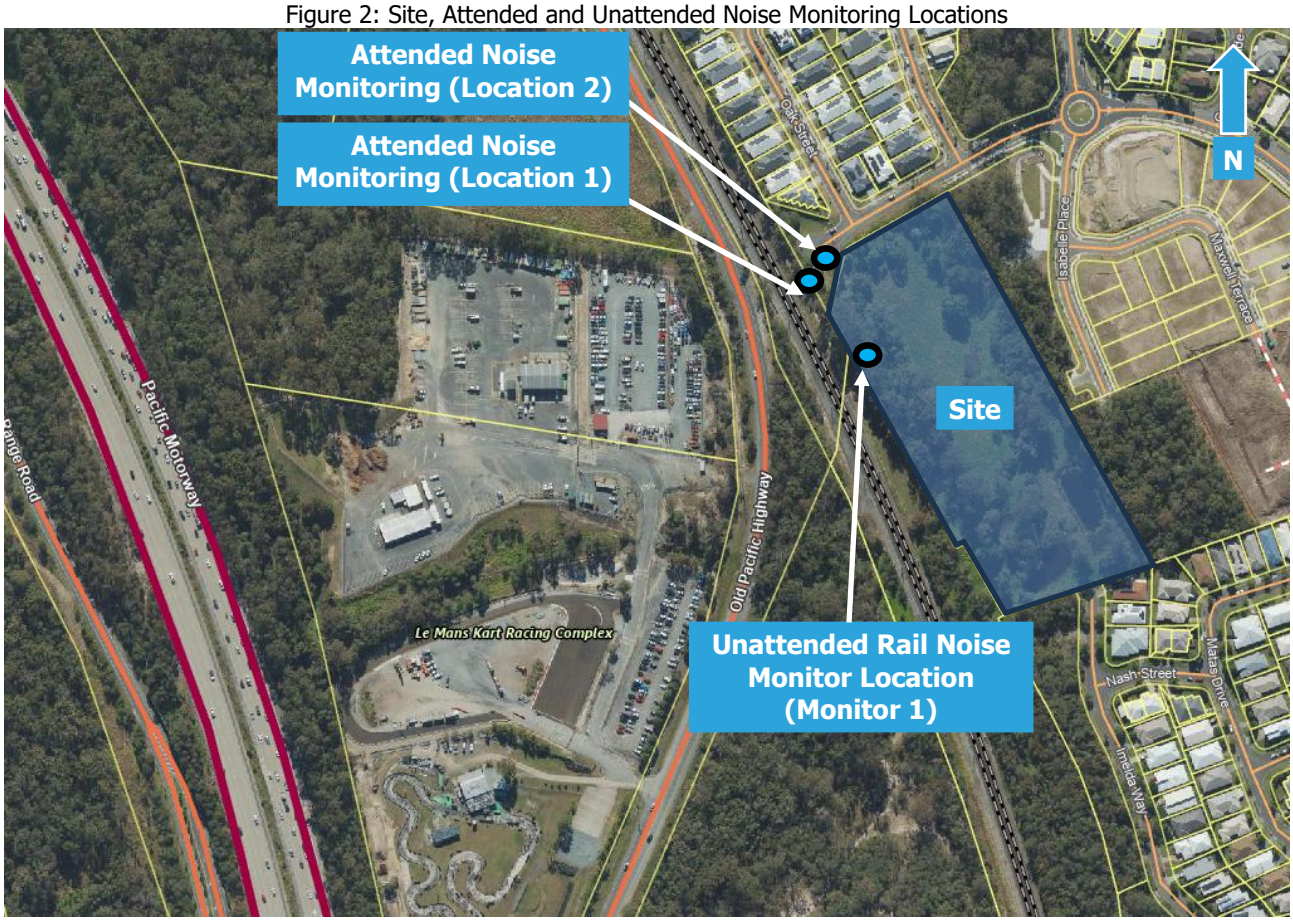
### 4.2.1 Rail Noise Levels

Attended noise measurements of the Gold Coast Rail Line were conducted onsite at 6 Karingal Drive on 26 February and 2 and 4 March 2026, approximately 10m and 20m from the nearest railway line.

The noise measurements were conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise.* Refer to Section 5.3 for the measured noise levels.

Refer to Figure 2 for noise monitoring location.

Figure 2: Site, Attended and Unattended Noise Monitoring Locations



# 5. Measured Noise Levels

The following tables present the measured rail noise levels from the unattended noise survey. Any periods of inclement weather or extraneous noise were omitted from the measured data prior to determining the results.

## 5.1 Meteorological Conditions

Meteorological observations during the unattended noise monitoring period were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological Conditions – Gold Coast Seaway

| Day | Date | Rainfall (mm) | Wind | | | |
|---|---|---|---|---|---|---|
| | | | 9am | | 3pm | |
| | | | Direction | Speed (km/h) | Direction | Speed (km/h) |
| Monday | 2/03/2026 | 28.4 | SSW | 11 | ESE | 28 |
| Tuesday | 3/03/2026 | 28.7 | SSE | 13 | ESE | 17 |

Note that the wind at Gold Coast Seaway is generally higher than at Pimpama particularly when the wind direction has southerly components.

## 5.2 Unattended Rail Noise Levels – Monitor 1

Table 2 presents the measured single event average $L_{Amax}$ noise level calculated using the maximum levels from the highest 15 single events over the 24-hour period.

Table 2: Unattended Measurements of Rail Noise Levels – Monitor 2

| No. | Date | Time | Train Type | $L_{Amax}$ dB(A) | LAE dB(A) |
|---|---|---|---|---|---|
| 1 | 2/03/2026 | 8:30pm | Passenger | 89 | 92 |
| 2 | 2/03/2026 | 10:59pm | Passenger | 88 | 91 |
| 3 | 2/03/2026 | 7:59pm | Passenger | 87 | 91 |
| 4 | 2/03/2026 | 8:29pm | Passenger | 87 | 92 |
| 5 | 2/03/2026 | 8:59pm | Passenger | 87 | 92 |
| 6 | 2/03/2026 | 10:00pm | Passenger | 87 | 92 |
| 7 | 2/03/2026 | 11:00pm | Passenger | 87 | 92 |
| 8 | 3/03/2026 | 5:30pm | Passenger | 88 | 94 |
| 9 | 3/03/2026 | 2:32pm | Passenger | 88 | 92 |
| 10 | 3/03/2026 | 4:31am | Passenger | 87 | 92 |
| 11 | 3/03/2026 | 5:59am | Passenger | 87 | 92 |
| 12 | 3/03/2026 | 6:32am | Passenger | 87 | 92 |
| 13 | 3/03/2026 | 6:51am | Passenger | 87 | 91 |
| 14 | 3/03/2026 | 6:59am | Passenger | 87 | 92 |
| 15 | 3/03/2026 | 7:04am | Passenger | 87 | 91 |
| Highest $L_{Amax}$ | | | | 89 | |
| Average $L_{Amax}$* | | | | 87 | |
| $L_{eq}$(24hr) | | | | 62 | |

*Single event maximum sound pressure level ($L_{Amax}$) is the arithmetic average of maximum levels from the highest 15 single events over a 24-hr period.

The number of trains as advised by Queensland Rail is approximately 94 passenger trains per day.

## 5.3 Attended Rail Measurements

Table 3 presents the measured average $L_{Amax}$ noise levels from the attended noise monitoring location.

Table 3: Measured rail noise levels

| No. | Date | Time | Train Type | $L_{Amax}$ dB(A) | LAE dB(A) |
|---|---|---|---|---|---|
| 1 | 26/02/26 | 6:17am | Passenger | 83 | 88 |
| 2 | 26/02/26 | 6:24am | Passenger | 85 | 86 |
| 3 | 26/02/26 | 6:32am | Passenger | 82 | 87 |
| 4 | 26/02/26 | 6:33am | Passenger | 83 | 87 |
| 5 | 26/02/26 | 6:46am | Passenger | 81 | 87 |
| 6 | 26/02/26 | 6:56am | Passenger | 85 | 89 |
| 7 | 26/02/26 | 7:01am | Passenger | 80 | 85 |
| 8 | 26/02/26 | 7:03am | Passenger | 82 | 87 |
| 9 | 26/02/26 | 7:15am | Passenger | 84 | 89 |
| 10 | 26/02/26 | 7:30am | Passenger | 80 | 85 |
| 11 | 02/02/26 | 4:33pm | Passenger | 74 | 80 |
| 12 | 02/02/26 | 4:44pm | Passenger | 82 | 86 |
| 13 | 04/03/26 | 9:30am | Passenger | 83 | 88 |
| 14 | 04/03/26 | 9:39am | Passenger | 81 | 86 |
| 15 | 04/03/26 | 10:01am | Passenger | 83 | 88 |
| Highest $L_{Amax}$ | | | | 85 | |
| Average $L_{Amax*}$ | | | | 82 | |
| $L_{eq}$(24hr) | | | | 58 | |

*Single event maximum sound pressure level ($L_{Amax}$) is the arithmetic average of maximum levels from the highest 15 single events.

Based on the current rail volumes and measured noise levels, the predicted $L_{Aeq}$(24h) at the measurement location due to train passes is 58 dB(A).

# 6. Noise Criteria

## 6.1 Rail Noise Criteria

As the development is located near a railway corridor, the criteria detailed in Section 6.1.1 applies.

### 6.1.1 State Development Assessment Provisions (SDAP)

The criteria applied are in accordance with the SDAP Version 3.5 dated 12 December 2025 by the Department of State Development, Manufacturing, Infrastructure and Planning. The SDAP *State Code 2: Development in a railway environment* sets out matters of interest for the assessment of developments near rail corridors. The applicable criteria for the development require rail noise to be assessed in accordance with Table 2.2.2 of the policy as follows;

Table 4: SDAP Rail Noise Criteria

| Reconfiguring a Lot | |
|---|---|
| Involving the creation of 6 or more new residential lots adjacent to a railway or type 2 multi-modal corridor | |
| **PO40** Reconfiguring a lot minimise free field noise intrusion from a **railway**. | **AO40.1** Development provides a noise barrier or earth mound which is designed, sited and constructed:<br>1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1);<br>2. in accordance with:<br>a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013;<br>b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019;<br>c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020.<br>OR<br><br>**AO40.2** Development achieves the maximum free field acoustic level in reference table 2 (item 2.1) by **alternative noise attenuation** measures where it is not practical to provide a noise barrier or earth mound. |

Table 5: Table 2 of SDAP Maximum Free Field Acoustic Levels

| Applicable use | Acoustic levels |
|---|---|
| 2.1: Private open space for residential lots | a. ≤62 dB(A) Leq (24 hour) free field<br><br>AND<br><br>b. ≤84 dB(A) (single event maximum sound pressure level) free field |

### 6.1.2 Queensland Development Code MP4.4 – Rail Noise

To determine the minimum design requirements for any new accommodation buildings located in a rail transport noise corridor, the Queensland Development Code Part 4.4 may be applied if no alternative solutions are provided. In accordance with MP4.4, the noise categories are stated in Table 6.

Table 6: Queensland Development Code Part 4.4 Criteria - Rail

| Noise Category | Single event maximum noise ($L_{Amax}$) for railway land |
|---|---|
| Category 4 | ≥85 dB(A) |
| Category 3 | 80-84 dB(A) |
| Category 2 | 75-79 dB(A) |
| Category 1 | 70-74 dB(A) |
| Category 0 | ≤69 dB(A) |

The building treatment for any future development onsite shall be determined at Building Approval stage, in general accordance with the Queensland Development Code. Alternative solution may be provided on request.

# 7. Rail Noise Assessment

## 7.1 Predicted Rail Noise Levels

Rail noise modelling for the proposed development was based on the following information:

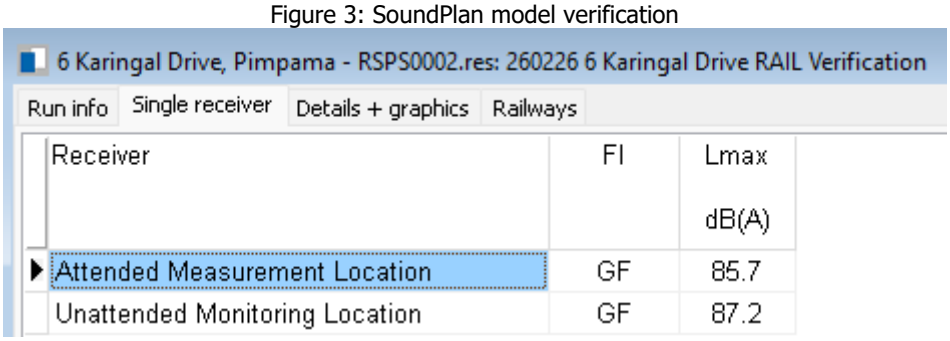
- SoundPlan 8.2 model "*Nordic Prediction Method for Train Noise"*
- Site layout plans have been provided by MPS Architects dated 12 November 2025.
- Receiver heights were based on 1.6m above finished ground level.
- Speed assessed as 60km/hr and 147m train length.
- +2.5db façade corrected.

The model used to generate predictions was SoundPLAN 8.2 "Nordic Prediction Method for Train Noise" with the verification of the measured noise levels presented in Figure 3.

Table 7: Comparison of measured and predicted noise levels

| Location | Measured Unattended Rail Noise Level dB(A) | Predicted Rail Noise Level dB(A) | Correction |
|---|---|---|---|
| | $L_{Amax}$ | $L_{Amax}$ | |
| Gold Coast Railway Line | 87.0 | 87.2 | 0 |

Figure 3: SoundPlan model verification




The SoundPLAN Nordic noise model predicts LAmax levels which are presented in Table 8. Predicted rail noise contours are illustrated in Figure 4 and Figure 5.

Based on the predicted noise impacts, additional facade treatments are required in accordance with QDC MP4.4. Refer to Section 8 for further recommendations.

Table 8: Predicted Rail Noise Levels

| Lot | Floor | Predicted single event maximum noise dB(A) LAmax (façade corrected) | $L_{Aeq\ (24hr)}$ | QDC Category | Complies with Free Field $LA_{max}$ ≤84dBA Yes or No | Complies with Free Field $L_{Aeq}$(24hr) ≤62dBA Yes or No |
|---|---|---|---|---|---|---|
| Lot 1 | GF | 73 | 46 | 1 | yes | yes |
| Lot 1 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 2 | GF | 72 | 45 | 1 | yes | yes |
| Lot 2 | F 1 | 74 | 47 | 1 | yes | yes |
| Lot 3 | GF | 71 | 44 | 1 | yes | yes |
| Lot 3 | F 1 | 72 | 45 | 1 | yes | yes |
| Lot 4 | GF | 70 | 43 | 1 | yes | yes |
| Lot 4 | F 1 | 71 | 44 | 1 | yes | yes |
| Lot 5 | GF | 69 | 42 | 0 | yes | yes |
| Lot 5 | F 1 | 71 | 44 | 1 | yes | yes |
| Lot 6 | GF | 68 | 41 | 0 | yes | yes |
| Lot 6 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 7 | GF | 67 | 40 | 0 | yes | yes |
| Lot 7 | F 1 | 69 | 42 | 1 | yes | yes |
| Lot 8 | GF | 70 | 43 | 1 | yes | yes |
| Lot 8 | F 1 | 71 | 44 | 1 | yes | yes |
| Lot 9 | GF | 71 | 44 | 1 | yes | yes |
| Lot 9 | F 1 | 72 | 45 | 1 | yes | yes |
| Lot 10 | GF | 71 | 44 | 1 | yes | yes |
| Lot 10 | F 1 | 73 | 46 | 1 | yes | yes |
| Lot 11 | GF | 72 | 45 | 1 | yes | yes |
| Lot 11 | F 1 | 73 | 46 | 1 | yes | yes |
| Lot 12 | GF | 73 | 46 | 1 | yes | yes |
| Lot 12 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 13 | GF | 74 | 47 | 1 | yes | yes |
| Lot 13 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 14 | GF | 75 | 48 | 2 | yes | yes |
| Lot 14 | F 1 | 77 | 50 | 2 | yes | yes |
| Lot 15 | GF | 76 | 49 | 2 | yes | yes |
| Lot 15 | F 1 | 78 | 51 | 2 | yes | yes |
| Lot 16 | GF | 78 | 51 | 2 | yes | yes |
| Lot 16 | F 1 | 79 | 52 | 3 | yes | yes |
| Lot 17 | GF | 78 | 51 | 2 | yes | yes |
| Lot 17 | F 1 | 79 | 52 | 2 | yes | yes |
| Lot 18 | GF | 76 | 49 | 2 | yes | yes |
| Lot 18 | F 1 | 78 | 51 | 2 | yes | yes |
| Lot 19 | GF | 75 | 48 | 2 | yes | yes |
| Lot 19 | F 1 | 77 | 50 | 2 | yes | yes |
| Lot 20 | GF | 74 | 47 | 1 | yes | yes |
| Lot 20 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 21 | GF | 73 | 46 | 1 | yes | yes |
| Lot 21 | F 1 | 74 | 47 | 1 | yes | yes |
| Lot 22 | GF | 72 | 45 | 1 | yes | yes |
| Lot 22 | F 1 | 73 | 46 | 1 | yes | yes |
| Lot 23 | GF | 74 | 47 | 1 | yes | yes |
| Lot 23 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 24 | GF | 75 | 48 | 2 | yes | yes |
| Lot 24 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 25 | GF | 76 | 49 | 2 | yes | yes |
| Lot 25 | F 1 | 77 | 50 | 2 | yes | yes |
| Lot 26 | GF | 77 | 50 | 2 | yes | yes |
| Lot 26 | F 1 | 78 | 51 | 2 | yes | yes |

| Lot | Floor | Predicted single event maximum noise dB(A) LAmax (façade corrected) | $L_{Aeq\ (24hr)}$ | QDC Category | Complies with Free Field $LA_{max}$ ≤84dBA Yes or No | Complies with Free Field $L_{Aeq}$(24hr) ≤62dBA Yes or No |
|---|---|---|---|---|---|---|
| Lot 27 | GF | 78 | 51 | 2 | yes | yes |
| Lot 27 | F 1 | 79 | 52 | 2 | yes | yes |
| Lot 28 | GF | 78 | 51 | 2 | yes | yes |
| Lot 28 | F 1 | 79 | 52 | 2 | yes | yes |
| Lot 29 | GF | 77 | 50 | 2 | yes | yes |
| Lot 29 | F 1 | 77 | 50 | 2 | yes | yes |
| Lot 30 | GF | 76 | 49 | 2 | yes | yes |
| Lot 30 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 31 | GF | 75 | 48 | 2 | yes | yes |
| Lot 31 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 32 | GF | 74 | 47 | 1 | yes | yes |
| Lot 32 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 33 | GF | 75 | 48 | 2 | yes | yes |
| Lot 33 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 34 | GF | 76 | 49 | 2 | yes | yes |
| Lot 34 | F 1 | 76 | 49 | 2 | yes | yes |
| Lot 35 | GF | 76 | 49 | 2 | yes | yes |
| Lot 35 | F 1 | 77 | 50 | 2 | yes | yes |
| Lot 36 | GF | 78 | 51 | 2 | yes | yes |
| Lot 36 | F 1 | 78 | 51 | 2 | yes | yes |
| Lot 37 | GF | 75 | 48 | 2 | yes | yes |
| Lot 37 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 38 | GF | 75 | 48 | 2 | yes | yes |
| Lot 38 | F 1 | 75 | 48 | 2 | yes | yes |
| Lot 39 | GF | 68 | 41 | 0 | yes | yes |
| Lot 39 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 40 | GF | 70 | 43 | 1 | yes | yes |
| Lot 40 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 41 | GF | 70 | 43 | 1 | yes | yes |
| Lot 41 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 42 | GF | 70 | 43 | 1 | yes | yes |
| Lot 42 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 43 | GF | 70 | 43 | 1 | yes | yes |
| Lot 43 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 44 | GF | 70 | 43 | 1 | yes | yes |
| Lot 44 | F 1 | 69 | 42 | 1 | yes | yes |
| Lot 45 | GF | 70 | 43 | 1 | yes | yes |
| Lot 45 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 46 | GF | 69 | 42 | 1 | yes | yes |
| Lot 46 | F 1 | 70 | 43 | 1 | yes | yes |
| Lot 47 | GF | 73 | 46 | 1 | yes | yes |
| Lot 47 | F 1 | 72 | 45 | 1 | yes | yes |
| Lot 48 | GF | 73 | 46 | 1 | yes | yes |
| Lot 48 | F 1 | 73 | 46 | 1 | yes | yes |
| Lot 49 | GF | 74 | 47 | 1 | yes | yes |

Compliance is predicted with external criteria for outdoor recreation areas on both ground and level 1 for all proposed lots.

Figure 4: Rail Noise Contours – LAmax– Ground Floor

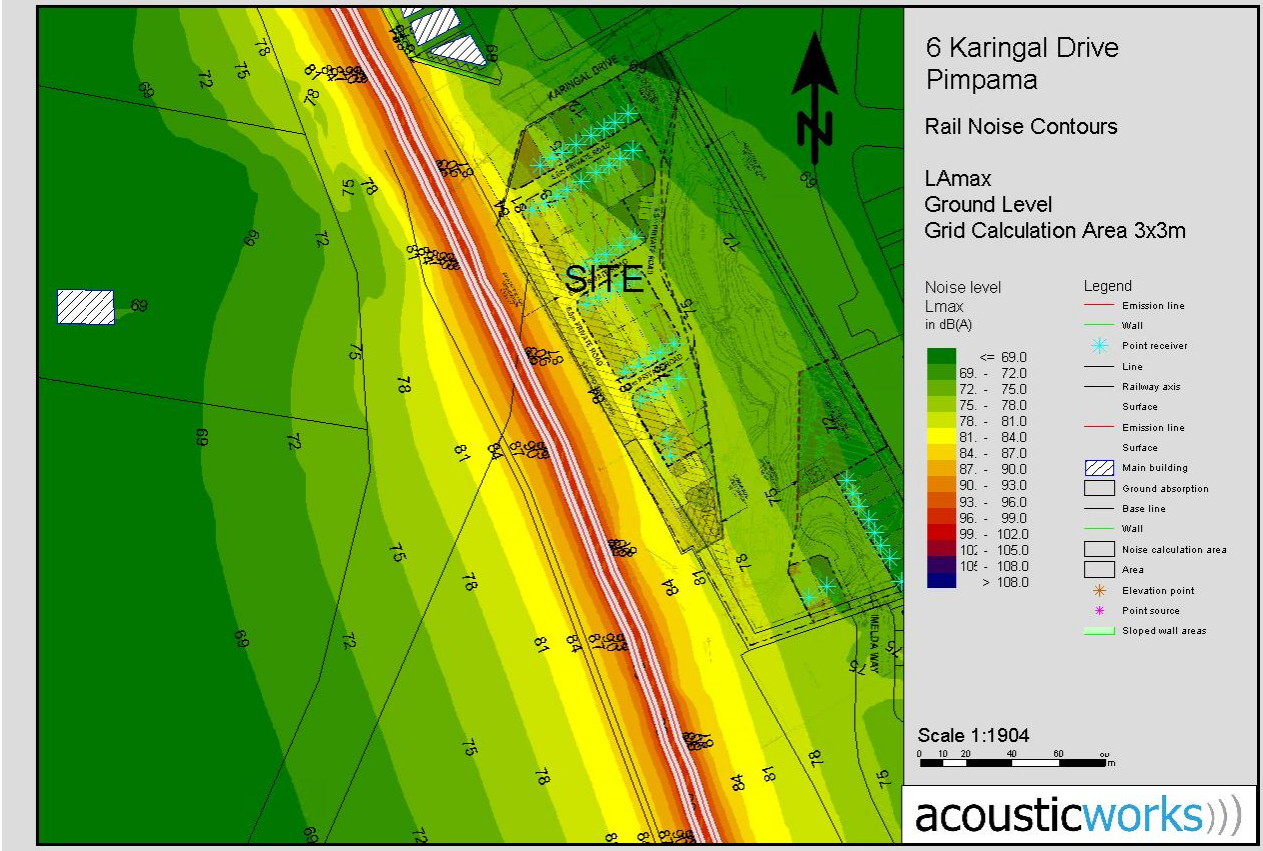
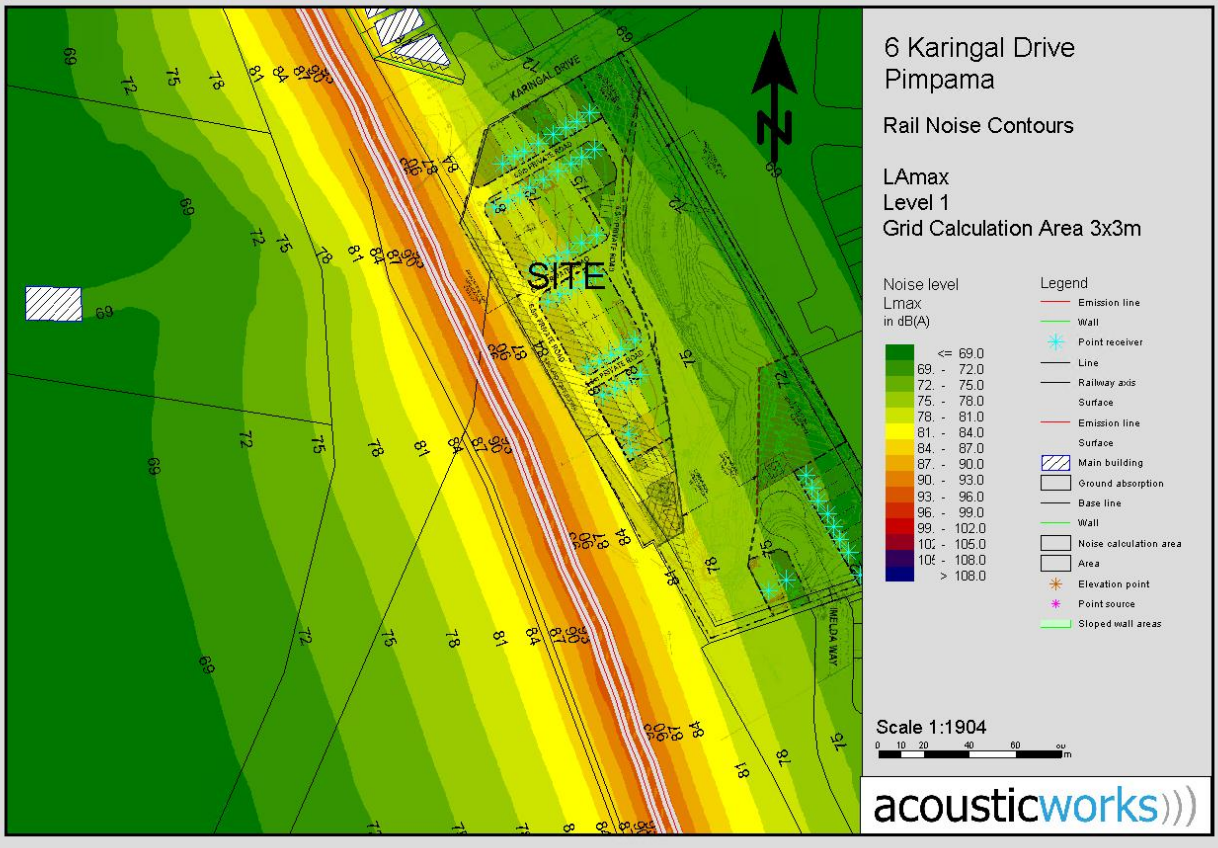



Figure 5: Rail Noise Contours – LAmax– Level 1



# 8. Recommendations

## 8.1 Building Façade Construction

Building façade treatments are not required as part of PO38 for reconfiguring a lot. However, preliminary QDC categories have been provided as a guide for expected treatments when accommodation activities are constructed. All building treatments for rail noise shall be determined at the Building Approval stage in accordance with the assessment requirements of the Queensland Development Code Part 4.4. For reference, preliminary noise categories are nominated in Table 9.

### 8.1.1 Glazing

The minimum glazing treatments presented in Table 9 are required to comply with the following:

- The minimum glass thickness specified shall not be reduced regardless of the $R_w$ performance of the glass unless the glazier can provider a specific (non-generic) NATA Test report proving the proposed glazing system complies (the test report must be based on the same configuration proposed for the development). Note an estimation or calculated performance will not be accepted.
- If compliance cannot be achieved with the minimum $R_w$ ratings, the glazing system shall be upgraded until compliance is achieved.
- Glazing specified with acoustic seals requires a seal that has been tested with a glazing system or door to achieve an Rw rating in accordance with AS/NZS ISO 717.1 (Q-lon seals or an equivalent product), mohair seals are not acceptable.
- The glazier shall provide NATA test reports on request to verify compliance with the minimum $R_w$ ratings. Generic reports are not acceptable.
- Living areas are defined as habitable rooms other than bedrooms (excluding garages, kitchens, bathrooms & hallways).

Table 9: QDC Noise Categories – Rail Noise

| Lot | Level | QDC Category | Rw Ratings | | | | | QDC Glazing | Acoustic seals |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wall | Roof | Glazing* | Entry door | Floors | Glazing* | |
| Lot 1 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 1 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 2 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 2 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 3 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 3 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 4 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 4 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 5 | GF | 0 | - | - | - | - | - | standard | no |
| Lot 5 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 6 | GF | 0 | - | - | - | - | - | standard | no |
| Lot 6 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 7 | GF | 0 | - | - | - | - | - | standard | no |
| Lot 7 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 8 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 8 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 9 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 9 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 10 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 10 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 11 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 11 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |

| Lot | Level | QDC Category | Rw Ratings | | | | | QDC Glazing | Acoustic seals |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wall | Roof | Glazing* | Entry door | Floors | Glazing* | |
| Lot 12 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 12 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 13 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 13 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 14 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 14 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 15 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 15 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 16 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 16 | F 1 | 3 | 47 | 41 | 38 | 33 | 45 | 12.5 Vlam or 13.52 lam or 14.38 lam | yes |
| Lot 17 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 17 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 18 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 18 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 19 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 19 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 20 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 20 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 21 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 21 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 22 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 22 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 23 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 23 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 24 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 24 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 25 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 25 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 26 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 26 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 27 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 27 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 28 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 28 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 29 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 29 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 30 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 30 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 31 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 31 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 32 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 32 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 33 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 33 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 34 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 34 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 35 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 35 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 36 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 36 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 37 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 37 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 38 | GF | 2 | 41 | - | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 38 | F 1 | 2 | 41 | 38 | 35 | 33 | 45 | 10.38 lam | yes |
| Lot 39 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 39 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |

| Lot | Level | QDC Category | Rw Ratings | | | | | QDC Glazing | Acoustic seals |
|---|---|---|---|---|---|---|---|---|---|
| | | | Wall | Roof | Glazing* | Entry door | Floors | Glazing* | |
| Lot 40 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 40 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 41 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 41 | F 1 | 1 | 35 | -35 | 27 | 28 | - | 4mm float | yes |
| Lot 42 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 42 | F 1 | 1 | 35 | -35 | 27 | 28 | - | 4mm float | yes |
| Lot 43 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 43 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 44 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 44 | F 1 | 1 | 35 | -35 | 27 | 28 | - | 4mm float | yes |
| Lot 45 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 45 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 46 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 46 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 47 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 47 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 48 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |
| Lot 48 | F 1 | 1 | 35 | 35 | 27 | 28 | - | 4mm float | yes |
| Lot 49 | GF | 1 | 35 | - | 27 | 28 | - | 4mm float | yes |

*If the total glazing area of a habitable room (living areas/bedrooms) is less than 1.8m$^2$, glazing with minimum Rw 24 (4mm float with standard weather seals) can be used for QDC Noise Category 1, glazing with minimum Rw 32 (6.38mm laminate glass with acoustic seals) can be used for Noise Category 2.

Note: As there are currently no plans available for any proposed dwellings, all residential lots were assessed in accordance with QDC. Once dwelling locations and plans are finalised an additional assessment for each dwelling should be conducted to determine if QDC Noise Categories can be further reduced.

### 8.1.2 Alternative Ventilation

We recommend that all locations nominated in Table 9 as QDC Noise Category 1 – 3 have the provision for an alternative ventilation system similar to air-conditioning or mechanical ventilation to allow windows and doors to be closed.

### 8.1.3 Wall Construction

The wall construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 9.

Table 10: QDC typical wall construction

| QDC Noise Category | Wall Rw | Minimum Wall Treatments |
|---|---|---|
| 3 | 47 | Two leaves of clay brick masonry at least 110mm thick with:<br>(i) cavity not less than 50mm between leaves; and<br>(ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/$m^3$ or 50mm thick polyester insulation with a density of 20kg/$m^3$ in the cavity.<br>OR<br>Two leaves of clay brick masonry at least 110mm thick with:<br>(i) cavity not less than 50mm between leaves; and<br>(ii) at least 13mm thick cement render on each face.<br>OR<br>Single leaf of clay brick masonry at least 110mm thick with:<br>(i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and<br>(ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11kg/$m^3$ positioned between studs; and<br>(iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs.<br>OR<br>Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging. |
| 2 | 41 | Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves<br>OR<br>Single leaf of clay brick masonry at least 110mm thick with:<br>(i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and<br>(ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11kg/$m^3$ positioned between studs; and<br>(iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs<br>OR<br>Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face<br>OR<br>Concrete brickwork at least 110mm thick<br>OR<br>1 layer of 9mm FC externally with 90mm timber stud and 75mm glasswool batts (14kg/m3) in the cavity with 13mm plasterboard internally. |
| 1 | 35 | Single leaf of clay brick masonry at least 110mm thick with:<br>(i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and<br>(ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs<br>OR<br>Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally. |
| 0 | N/A | Standard Construction |

### 8.1.4 Roof Construction

The roof construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 9.

Table 11: QDC typical roof construction

| QDC Noise Category | Roof Rw | Minimum Roof Treatments |
|---|---|---|
| 3 | 41 | Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/$m^3$ or polyester insulation at least 50mm thick with a density of at least 20kg/$m^3$ in the cavity.<br>OR<br>Concrete suspended slab at least 100mm thick. |
| 2 | 38 | Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m3. |
| 1 | 35 | Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity. |
| 0 | n/a | Standard Construction |

### 8.1.5 Entry Doors

The entry door construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 9.

Table 12: QDC typical entry door construction

| QDC Noise Category | Entry Door $R_w$ | Minimum Entry Door Treatments |
|---|---|---|
| 2/3 | 33 | Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with the full perimeter *acoustically rated seals* and constructed of –<br>(i) solid core, wood, particleboard or blockboard not less than 45mm thick; and/or<br>(ii) acoustically laminated glass not less than 10.38mm thick. |
| 1 | 28 | Fixed so as to overlap the frame or rebate of the frame, constructed of –<br>(i) wood, particleboard or blockboard not less than 33mm thick; or<br>(ii) compressed fibre reinforced sheeting not less than 9mm thick; or<br>(iii) other suitable material with a mass per unit area not less than 24.4kg/$m^2$; or<br>(iv) solid core timber door not less than 35mm thick fitted with full perimeter *acoustically rated seals*. |
| 0 | N/A | Standard Construction |

### 8.1.6 Floors (if applicable)

The exposed floor construction recommendations from QDC MP4.4 are included in the table below. Note that these are not the only allowable methods of construction for the development, and alternative constructions to achieve the required Rw ratings may also be provided. QDC Noise Categories are nominated in Table 9.

Table 13: QDC typical exposed floor construction

| QDC Noise Category | Floor $R_w$ | Minimum Floor Treatments |
|---|---|---|
| 2/3 | 45 | Concrete slab at least 100mm thick<br>OR<br>Tongued and grooved boards at least 19mm thick with:<br>(i) timber joists not less than 175mm x 50mm; and<br>(ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/$m^3$ positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists;<br>and<br>(iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/$m^3$ laid over entire floor, including tops of joists before flooring is laid; and<br>(iv) secured to battens at least 75mm x 50mm; and<br>(v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists. |
| 0/1 | N/A | Standard Construction |

Refers to floors of habitable rooms which are part of the external façade of the building i.e. rooms which overhang the level below.

# 9. Conclusion

A rail noise assessment was conducted for the proposed residential subdivision to be located at 6 Karingal Drive, Pimpama. On the condition the recommendations detailed in Section 8 are implemented, compliance is predicted with SDAP assessment criteria.

If you should have any queries, please do not hesitate to contact us.

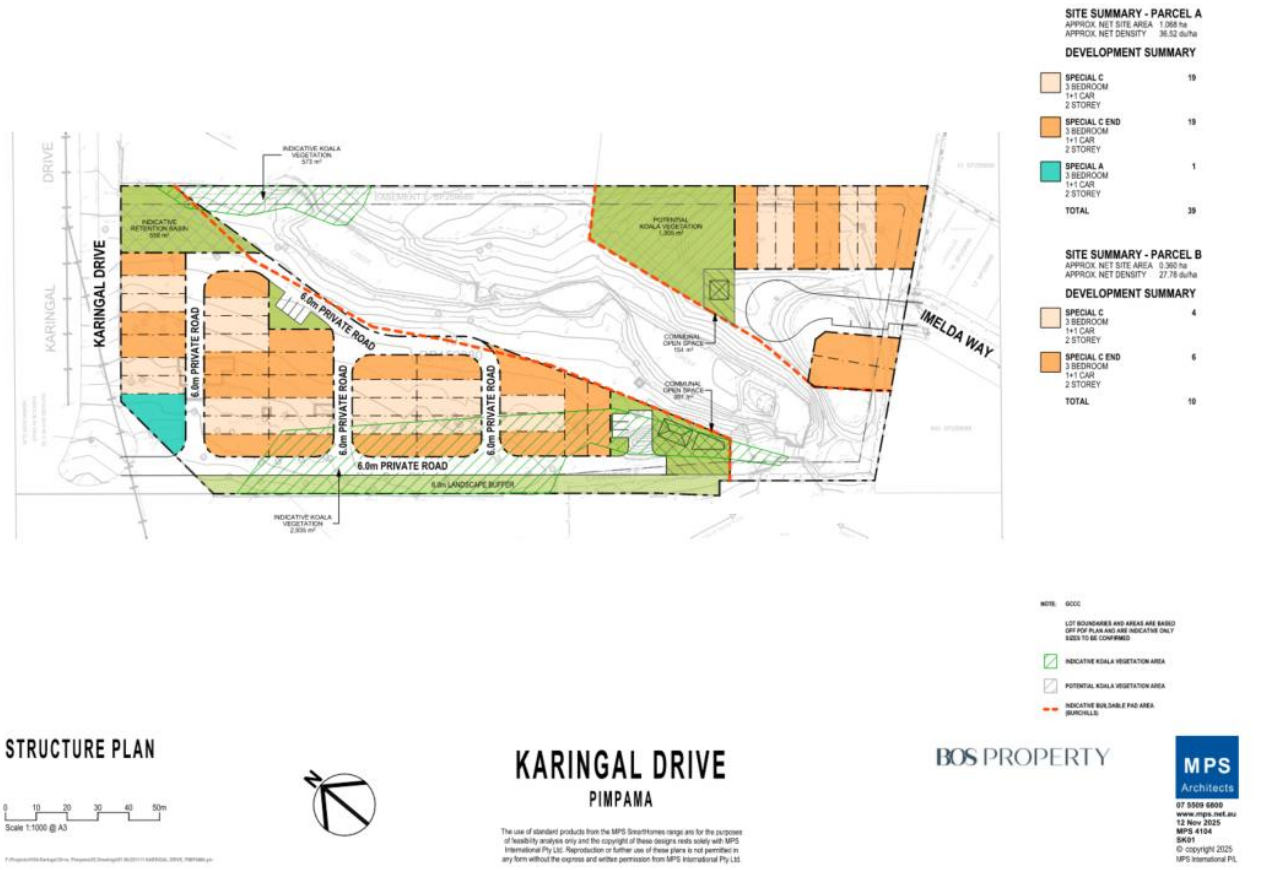
Report prepared by;



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Acoustic Consultant
acousticworks)))

# 10. Appendices

## 10.1 Development Plans




## 10.2 Lot Numbering

