PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2025/1637

Date: 11 August 2025

Queensland Government

ARCADIS Design & Consultancy for natural and built assets

SITE BASED STORMWATER MANAGEMENT PLAN

PROPOSED DEVELOPMENT OF LOT 14 OF THE FLAGSTONE LOGISTICS ESTATE



Proposed Development of Estate Lot 14 of the Flagstone Logistics Estate

SITE BASED STORMWATER MANAGEMENT PLAN

Author	Medha Khilnani	
Checker	Gary Ellis	
Approver	Brook Kitson RPEQ 07884	

Project No	30109334
Report No	GA0002
Revision	04
Date	8/07/2025

This report has been prepared for CH Hydrangea Pty Ltd in accordance with the terms and conditions of appointment. Arcadis Australia Pacific Pty Ltd (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

Revision	Date	Description	Prepared by	Approved by
01	19/05/2025	Draft Issue	MK	
02	22/05/2025	Draft Issue	MK	
03	30/05/2025	For Approval	MK	BK
04	08/07/2025	For Approval	MK	BK

Copyright © 2015 Arcadis. All rights reserved. arcadis.com

CONTENTS

1 EXECUTIVE SUMMARY 4
2 SITE CHARACTERISTICS 5
2.1 Location Details 5
2.2 Existing Site Topography 5
2.3 Site Development History 6
2.4 Flooding 6
3 PROPOSED DEVELOPMENT 6
4 LAWFUL POINT OF DISCHARGE AND DRAINAGE 8
4.1 Existing Stormwater Drainage 8
4.2 Proposed Drainage Characteristics and LPOD 8
5 STORMWATER QUANTITY 10
5.1 Catchments Parameters 10
5.2 Sensitivity Analysis 11
6 STORMWATER QUALITY 12
6.1 Stormwater Quality Treatment Approach 12
6.2 Proposed Stormwater Quality Improvement Devices 12
6.3 Modelling of the Development Site 13
7 STORMWATER QUALITY (CONSTRUCTION) 16
7.1 Water Quality Objectives 16
7.2 Erosion and Sediment Control Plan Purpose 17
7.3 Specific Activities 17
7.4 Project Personnel Responsibilities 19
7.5 Monitoring and Responsibility 19
8 ASSET MAINTENANCE AND HANDOVER 21
9 CONCLUSION 22

APPENDICES

APPENDIX A

Engineering Drawings

APPENDIX B

ATLAN MANUALS & DETAILS

APPENDIX C

STORMWATER QUANTITY -SENSITIVITY ANALYSIS

APPENDIX D

EDQ APPROVED SITE BASED STORMWATER MANAGEMENT PLAN BY ARCADIS

GLOSSARY OF TERMS

Australia Rainfall and Runoff (ARR) 2019 recommends adaptation of new terminology relating to storm events summarised in Table A below. As recommended, this report documents data with respect to AEP (%).

The following definitions should be noted:

EY = Number of exceedances per year.

AEP = Annual Exceedance Probability.

AEP (1 in x) = 1/AEP.

ARI = Average Recurrence Interval (years).

The below table should be refereed to for a comparison of storm events.

Table A – Adopted Terminology

EY	AEP (%)	AEP (1 in ….)	ARI
1	63.21	1.58	1
0.69	50	2	1.44
0.5	39.35	2.54	2
0.22	20	5	4.48
0.2	18.13	5.52	5
0.11	10	10	9.49
0.05	5	20	20
0.02	2	50	50
0.01	1	100	100

1 EXECUTIVE SUMMARY

This report has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over part of the land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as part of Lot 39 on SP338781 (site). This PDA Development Application seeks approval for a Development Permit for a Material Change of Use for a Warehouse (Distribution Centre) and Low impact industry.

The proposed development will function as distribution centre for the tenant, for the receival, warehousing, storing and distribution of products, and will include a facility that enables material to be printed for distribution, and limited storage of dangerous goods. The proposed development will operate 24 hours a day, 7 days a week and will be located within Stage 2 of the overarching PDA Development Approval for the Flagstone Logistics Estate (EDQ Reference: DEV2018/961/18).

Stage 2 works of the FLE development will be completed before commencement of use of the works outlined in this DA. As part of the Stage 2 FLE subdivision works a stormwater management strategy was prepared to detail the management of stormwater from the estate development which includes formal road pit and pipe drainage, overland flow paths, stormwater detention and/or bio-retention systems. The subject site for this DA will generally follow the overarching existing approval's conditions and strategies.

This report demonstrates the proposed development will be constructed and operated in accordance with the Water Sensitive Urban Design (WSUD) Requirements of Economic Development Queensland (EDQ), the South-East Queensland State Planning Policy (SPP), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM), Australian Rainfall and Runoff (2019) and the Environmental Protection (Water) Policy (2009). The primary objectives of this Site Based Stormwater Management Plan (SBSMP) are achieved as follows:

Lawful Point of Discharge (LPoD)

Stormwater will be discharged to the existing lawful points of discharge, being the southern detention basin proposed as part of Stage 2 works of the Flagstone Logistics Estate (FLE) development and the northeastern corner of the site into the infrastructure within Connect Way.

Stormwater Quantity

The site will use the approved stormwater strategy in the Site Based Stormwater Management Plan (SBSMP) prepared by Arcadis for the FLE subdivision as the overarching guideline. This report has re-calculated the sites area to confirm the correct stormwater parameter assumptions. Additionally, a sensitivity analysis of the southern detention basin has been carried out to ensure the conditions downstream of the development has not been adversely impacted. Therefore, the proposed development is considered consistent with the endorsed master SBSMP (Arcadis SBSMP EAG001-30109334-AAR, Rev 12) and is valid in terms of water quantity management.

Stormwater Quality

Primary and tertiary stormwater quality improvement devices (proprietary stormwater quality units) have been proposed to ensure the discharge of stormwater from the site is of adequate quality standards to comply with the requirements of Economic Development Queensland (EDQ), Logan City Council (LCC) and the South-East Queensland Healthy Waterways Partnership.

2 SITE CHARACTERISTICS

2.1 Location Details

The proposed industrial development is located over part of the land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as part of Lot 39 on SP338781 (site). The site is located within the Greater Flagstone development area.

The subject site is part of the Stage 2 of the Flagstone Logistics Estate (FLE), therefore the land surrounding the site consists of cleared land in preparation of future industrial developments. Stage 2 works of the FLE development will be completed before commencement of use of the works outlined in this DA.

The subject site is bordered by a new road named Connect Way to the north. To the east and west of the site, vacant industrial lots exist. A detention basin in located to the south of the development.

The total area of the subject site for this development is approximately 9.959ha.

2.2 Existing Site Topography

In its current state, the project site consists of cleared vacant lot. Figure 2-1 below provides a current locality plan of the site.

The majority of the site slopes southward at an approximate grade of 0.5%. Surface flows from the west of the site are directed to the proposed development's western boundary and then flow south towards the detention basin located to the south of the site. A small portion of the site slopes towards the road at the lot frontage.



Figure 2-1 Site Location (Source: Nearmap)

2.3 Site Development History

The site will be located within Stage 2 of the overarching PDA Development Approval for the Flagstone Logistics Estate (FLE). As part of the subdivision works a road network and civil services are proposed to be installed to service the proposed lots within the development. The estate infrastructure has been approved under the estate ROL approval (DEV2018/961/18 and respective compliance assessments).

2.4 Flooding

EDQ have previously endorsed the FLE development strategy in response to Logan City Council's Temporary Local Planning Instrument No. 1/2024.

In accordance with this strategy, the minimum flood planning level for the subject site is the defined flood level or the 1% annual exceedance probability (AEP) at 2100 flood event (RL27.0). It is noted the proposed development does not involve food storage.

The minimum finished surface level (FSL – top of 200mm sealed pavement) is elevated to RL28.15 (above 0.5% AEP at 2100 – RL 28.1) at the southern boundary, ramping up to a proposed building finished floor level (FSL for assumed minimum 300mm slab thickness) of RL29.50. It is noted that the building finished floor level is well above the 0.5% AEP at 2100 flood event (RL28.6).

3 PROPOSED DEVELOPMENT

The proposed development will function as a robotics fulfillment centre, being a distribution centre for the tenant, for the receival, warehousing, storing and distribution of products, and will include a print on demand facility that enables material (such as books) to be printed for distribution.

The proposed development sits within the currently proposed Stage 2 & 3 of the FLE, as shown in Figure 3-1 below. Accordingly, a separate development approval will be submitted to EDQ to adjust the staging boundaries.

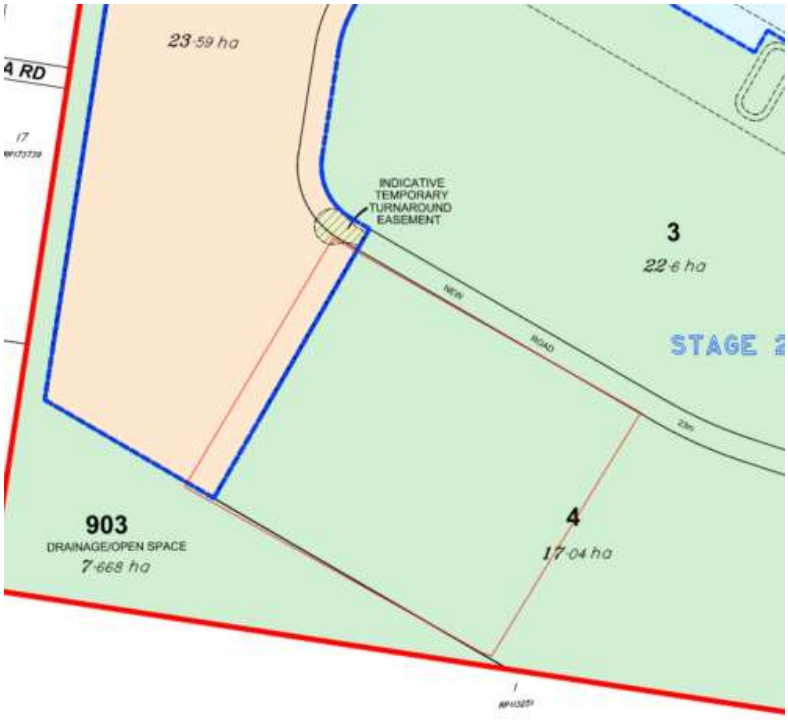


Figure 3-1 Proposed Development Proposed Plans

A plan extract of the proposed development has been provided in Figure 3-2.

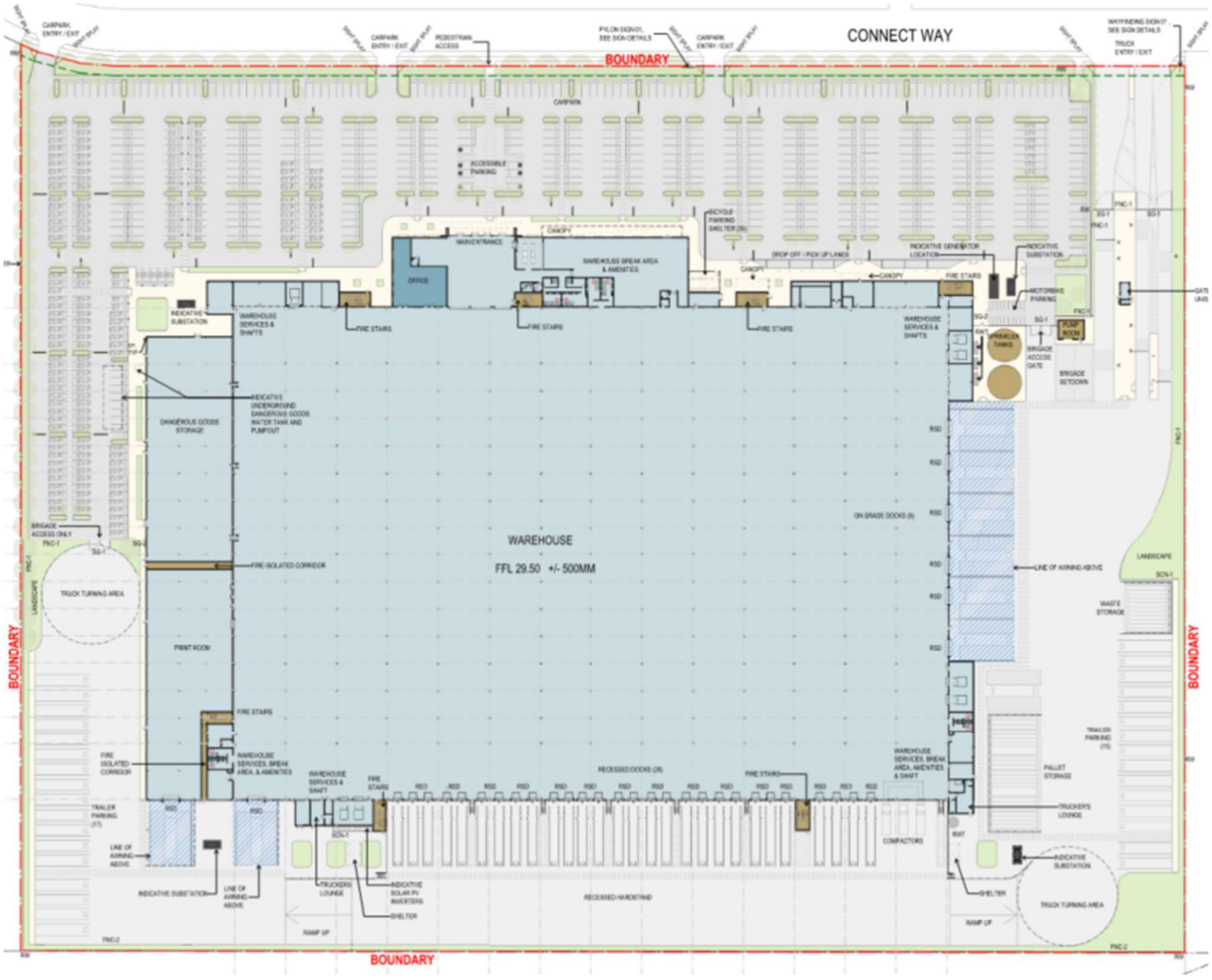


Figure 3-2 Proposed Development Proposed Plans

4 LAWFUL POINT OF DISCHARGE AND DRAINAGE

4.1 Existing Stormwater Drainage

As part of the FLE subdivision works a stormwater management strategy was prepared to detail the management of stormwater from the estate development which includes formal road pit and pipe drainage, overland flow paths and stormwater detention and/or bio-retention systems. The subject site for this DA will generally follow the overarching existing approval's conditions and strategies.

Currently majority of the stormwater from the subject site discharges generally south towards the detention basin for Stage 2 of the FLE, with a small catchment reporting to the road. A catchment from the west of the site sheet flows towards the subject site.

Refer to Appendix E for the EDQ approved Arcadis SBSMP. Refer Figure 4-1 for details of the available existing lawful point of discharge for the site.

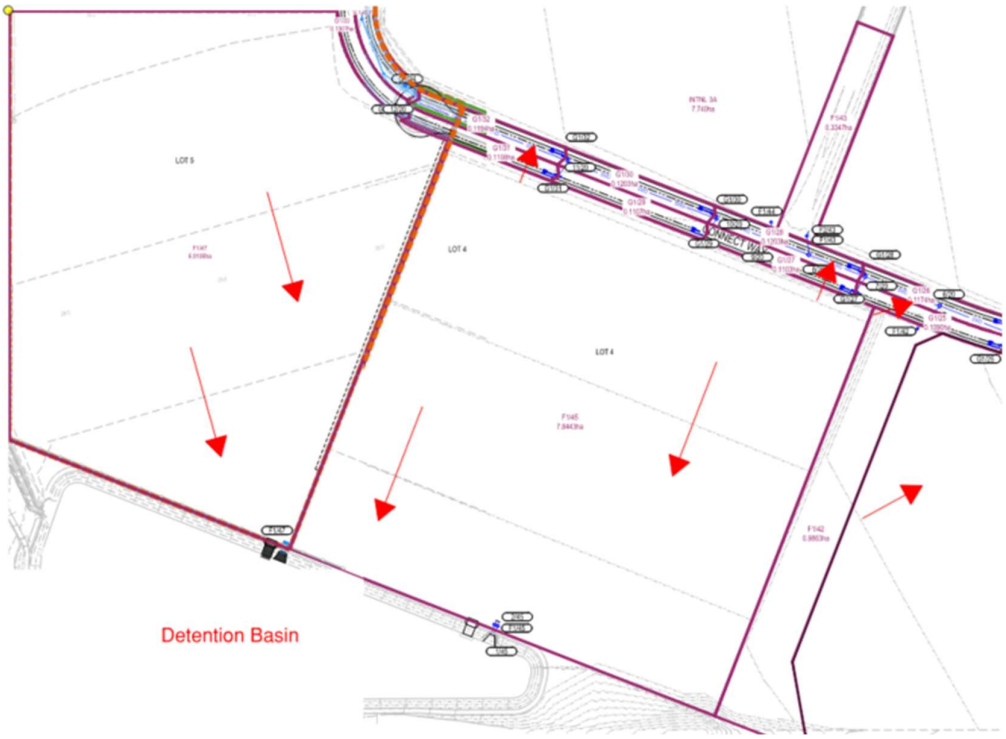


Figure 4-1 Existing Stormwater Catchments

4.2 Proposed Drainage Characteristics and LPOD

The proposed development has two lawful points of discharge. The first is to the south, to the detention basin and the second is to Connect Way. The proposed development site will capture and convey stormwater discharge via a private pit and pipe network as well as overland flow to the lawful points of discharge.

Majority of flows will be conveyed to the detention basin to the south of the site. The remaining minor sub-catchments C2 and C3 (refer to Arcadis drawing 0421- Rev B in Appendix A) will be directed to the existing drainage infrastructure located in Connect Way. Notably, C2 and C3 catchment areas are equivalent to INTNL-5 (refer to Figure 5-1) allotment catchment allowance (i.e. 0.9817ha of the total catchment 5.985ha) for this area with associated flows accommodated in the Connect Way designed road drainage infrastructure, and consistent with the EDQ endorsed SBSMP (EAG001-30109334-AAR, Rev 12) by Arcadis.

External catchments flowing towards the site area from the west will be intercepted by a bund along the western boundary of the site, and conveyed south, broadly similar to the existing flow patterns.

Proprietary devices have been proposed for this development to treat runoff prior to discharge. Refer to section 6 of the report for detailed water quality assessment.

Refer to Figure 4-2 for a conceptual indicative of the proposed stormwater drainage.

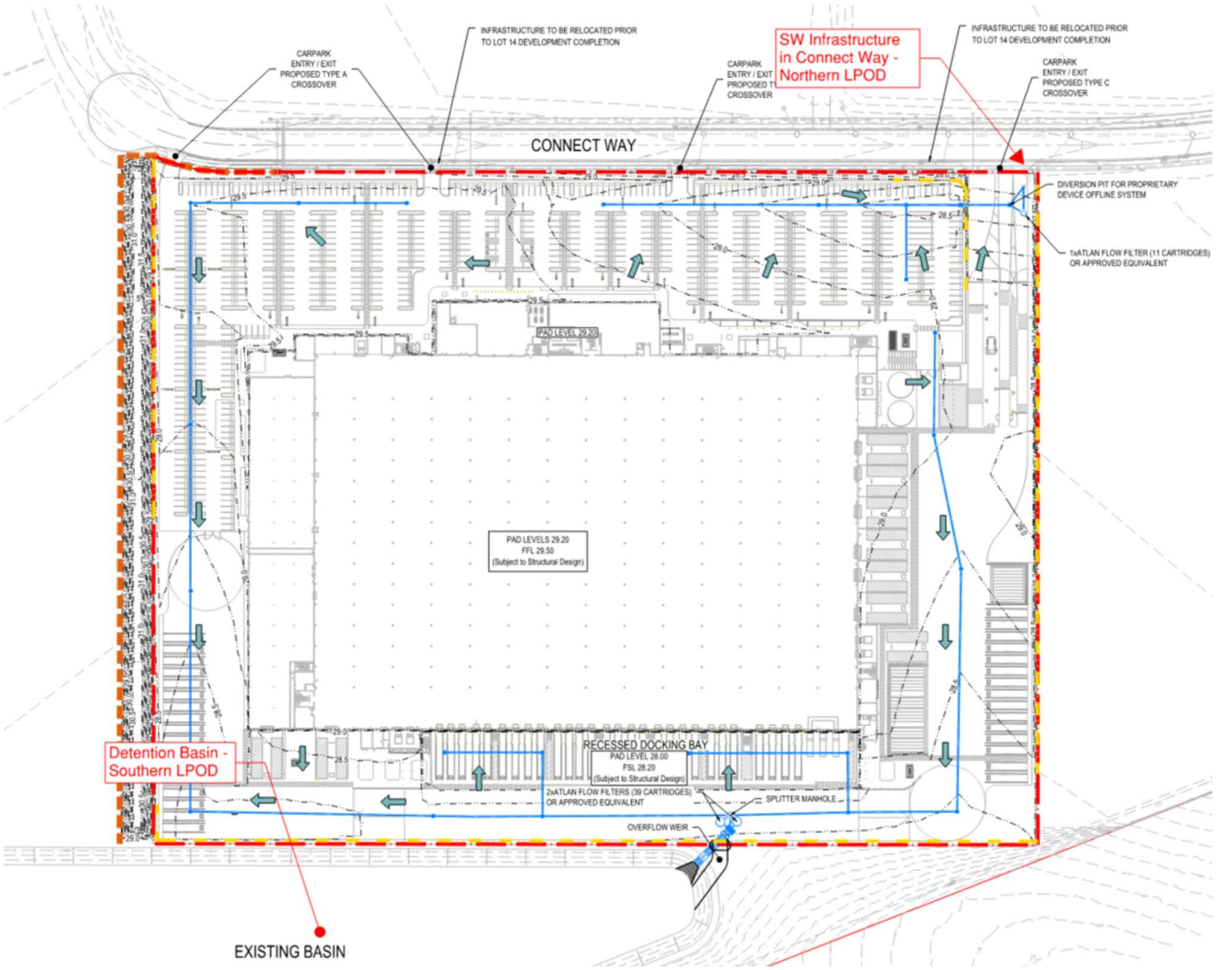


Figure 4-2 Drainage Schematic

Sections 5, 6, and 7 of this report now provide detailed calculations and discussions concerning the subject site and related stormwater management requirements. Please refer to engineering drawings in Appendix B for further details of the proposed stormwater management systems.

5 STORMWATER QUANTITY

The site will use the approved stormwater strategy in the Site Based Stormwater Management Plan (SBSMP) prepared by Arcadis for the FLE subdivision as the overarching guideline. This report has re-calculated the sites area to confirm the correct stormwater parameter assumptions. Additionally, a sensitivity analysis of the southern detention basin has been carried out to ensure the conditions downstream of the development have not been adversely impacted.

5.1 Catchments Parameters

The EDQ approved Arcadis SBSMP has assumed that the overall catchment applicable to the site has a 75% imperviousness for water quantity. Based on the refined proposed layout for development site it was found to have an imperviousness of 95%.

The subject site falls under catchment INTL4bii of the overarching SBSMP's catchment plan. Refer to Appendix E for the EDQ approved Arcadis SBSMP. A snippet of the FLE catchment plan is shown below:

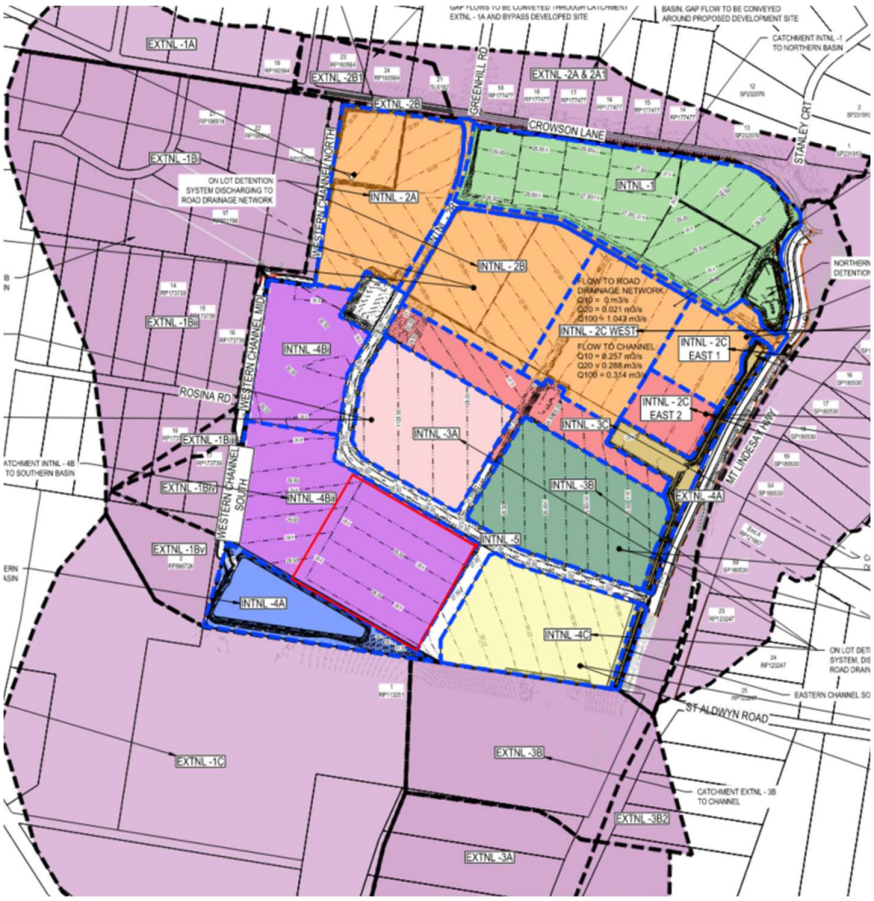


Figure 5-1 Existing Stormwater Catchments taken from Arcadis SBSMP (EAG001-30109334-AAR, Rev 12)

Table 5-1 below demonstrates that increasing the site to 95% impervious will create a change (20% increase) to the overall imperviousness of the FLE INTL 4bii catchment assumptions documented in Arcadis's EDQ approved SBSMP.

Table 5-1 Updated Catchment Parameters for this Site

Catchment	Area (ha)	Impervious Area (%)
INTL 4bii (Arcadis SBSMP EAG001-30109334-AAR, Rev 12)	13.967	75
Site (Lot 14)	9.952	95
Revised INTL 4bii (including site area)	**13.967**	**95**

5.2 Sensitivity Analysis

To assess the potential impacts of the stormwater discharge from the developed site, the original DRAINS model under EDQ approved Arcadis SBSMP for FLE subdivision, was adjusted to account for the increased imperviousness.

The updated results were incorporated into the TUFLOW model to evaluate any regional effects or changes in hydraulic performance. The analysis indicates that the increase in imperviousness resulting from the proposed development does not cause any adverse impacts on the overall site or surrounding areas. Therefore, the proposed development is considered consistent with the endorsed master SBSMP (Arcadis SBSMP EAG001-30109334-AAR, Rev 12) and is valid in terms of water quantity management.

For detailed information on the assessment, refer to **Appendix E**.

6 STORMWATER QUALITY

Water quality parameters and the proposed limits applicable for this site have been selected in accordance with South-East Queensland Healthy Waterways Partnership's Water by Design MUSIC Modelling Guidelines – Consultation Draft (Version 3, 2018). The Water Quality reduction targets stipulated by the State Planning Policy are presented in Table 6-1.

Table 6-1 Water Quality Operational Phase Performance Criteria

Pollutant	Criteria
Total Suspended Solids	80%
Total Phosphorus	60%
Total Nitrogen	45%
Gross Pollutants	90%

6.1 Stormwater Quality Treatment Approach

Table 6-2 Stormwater Catchments Areas

Catchment Name	Roof Area		Hardstand		Landscaping	
	[Ha]	% impervious	[Ha]	% impervious	[Ha]	% impervious
Site Runoff to Treatment Device (South)	4.16	100%	4.35	95%	0.45	10%
Site Runoff to to Treatment Device (North)	-	-	0.87	95%	0.10	10%

6.2 Proposed Stormwater Quality Improvement Devices

Water Sensitive Urban Design (WSUD) aims to minimise the impact of a development on the natural water cycle by reducing the export of pollutants, sediments and nutrients from the site into the natural watercourse. To treat the stormwater runoff from the site, various treatment devices can be used throughout the development area. Stormwater from the development will follow a specially designed stormwater quality treatment train prior to discharge from the site, which will ensure compliance with the water quality objectives.

6.2.1 Atlan FlowFilter Systems

Atlan FlowFilter is a stormwater filtration system that is purpose-built to reduce the footprint of WSUD on constrained projects. This approach to stormwater treatment uses an up-flow filtration process. With minimal head drop required between inlet and outlet, these devices are suitable for installation on flat sites or low gradient developments. The stormwater is treated within the unit by the following processes: sedimentation, filtration, adsorption, and precipitation.

The FlowFilter is a laboratory and field-tested device for the removal of pollutants – including heavy metals, total suspended solids (TSS), and nutrients (Phosphorous and Nitrogen).

Refer to Appendix D for further details on Atlan Systems.

6.2.2 Atlan Stormsacks

The Atlan StormSack filtration solutions are engineered water quality devices that are deployed directly in the stormwater system to capture contaminants close to the surface for ease of maintenance.

These devices are retrofitted into new or existing structures. Atlan StormSack filtration technology is a decentralised approach to stormwater treatment that essentially re-purposes traditional site infrastructure and customises it to meet specific site water quality goals.

Refer to Appendix D for further details on Atlan Systems.

6.3 Modelling of the Development Site

In developing the modelling parameters for the site, the Water Sensitive Design concepts for the developed site were produced with the proposed method of improvement as follows:

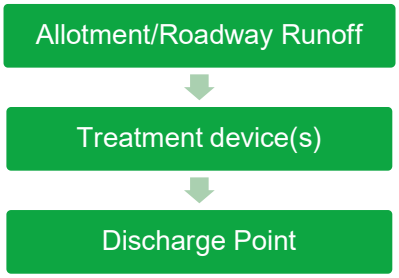


Figure 6-1 Modelling Strategy

This treatment train will be adopted to control stormwater quality from the development area. Modelling of the site was undertaken using the 'Model for Urban Stormwater Improvement Conceptualisation (MUSIC)' as promoted by the South-East Queensland Healthy Waterways Partnership. An appropriate type of land use was applied to all developed sub-catchments based on the proposed development's characteristics for an industrial land use. Each individual treatment system was assigned the relevant modelling treatment module. Consequently, a treatment train was established for each sub-catchment and ultimately combined to control the total discharge from the development area.

Meteorological data for input to MUSIC was obtained from the Bureau of Meteorology for the Thompson Road Greenbank station (40659), which is located approximately 9km north-west of the site. Six-minute time step rainfall data was obtained from the years 1980 to 1989.

The catchment parameters of the MUSIC modelling were amended in accordance with the South-East Queensland Healthy Waterways Partnerships' Water by Design MUSIC Modelling Guidelines – Consultation Draft (2018)'.

6.3.1 Pollutant Source Node Details

The following tables show the pollutant source node parameters that were input to the MUSIC model, as determined using the South-East Queensland Healthy Waterways Partnership's *Water by Design MUSIC Modelling Guidelines for South-East Queensland*.

Table 6-3 Industrial Rainfall-Runoff Parameters

Parameter	Industrial
Soil Storage Capacity (mm)	18
Initial Storage (%)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient A	243

Parameter	Industrial
Infiltration Capacity Coefficient B	0.6
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Baseflow Rate (%)	31

Table 6-4 Pollutant Export Parameters (Log Values)

Flow Type	Pollutant Source	TSS Log Values		TP Log Values		TN log values	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Industrial							
Baseflow	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Ground	0.78	0.45	-1.11	0.48	0.14	0.20
	Roads	0.78	0.45	-1.11	0.48	0.14	0.20
Stormflow	Roof	1.30	0.44	-0.89	0.36	0.25	0.32
	Ground	1.92	0.44	-0.59	0.36	0.25	0.32
	Roads	2.43	0.44	-0.30	0.36	0.25	0.32

6.3.2 Treatment Device Details

Stormwater runoff from the majority of the developed site will be collected via the piped drainage system, which will direct flows into an Atlan FlowFilter system before discharging to the designated reporting point. Primary treatment devices like Stormsacks will be installed within field inlets to capture gross pollutants before flows enter the private pit and pipe network.

A catchment area of approximately 0.9817 ha, located in the northeastern corner of the site, will flow towards the road reserve at the site frontage. Stormwater from this catchment will be treated by an Atlan FlowFilter system at the northeast corner of the site before discharging into the Connect Way stormwater infrastructure. The following section provides details of how each treatment device was modelled.

6.3.3 MUSIC Model Layout

The development site has been modelled in MUSIC based on the assumptions outlined in section 6.1. Appropriate percentage impervious factors have been applied to all nodes as per Table 6-2.

6.3.3.1 Primary & Tertiary Water Quality Systems

This report utilizes Atlan proprietary stormwater products to model a site-specific water quality treatment system for the site runoff. Should there be a need to change to an alternative product (e.g. OceanProtect) this will be at the discretion of the RPEQ Engineer who is responsible for the 'Issued for Construction' drawings. If an alternative proprietary product is selected during the course of detailed design, the product must be SQIDEP APPROVED (Stormwater Australia). In providing their certification, the RPEQ engineer is required to ensure that the proposed stormwater management quantity and quality objectives are achieved in accordance with the relevant industry standards.

Table 6-5 summarises the specifications of the treatment devices.

Details of the exact location and design of the proposed treatment device are also presented in the Engineering Drawings in Appendix B.

Table 6-5 Water Quality Treatment Requirements

Treatment Device	Quantity	Specifications
Atlan Flow Filter (South)	2 Flow Filters with 39 Cartridges	FLF.4000/39
Atlan Flow Filter (North)	1 Flow Filter with 11 Cartridges	FLF.2500/11
Atlan Stormsacks	15 StormSacks (minimum) – *Refer Note1*	200micron catchment bag Standard StormSack to be chosen as per pit sizes.

Note1 - Atlan StormSacks will be installed in pits located upstream of the Atlan FlowFilters. Locations of the StormSacks are not critical so recommendation is to begin installation from the first upstream pit nearest to the FlowFilters as shown on Arcadis Drawing DRG-0421[C].

A diagrammatic view of the MUSIC model layout is presented in **Figure 6-12** below.

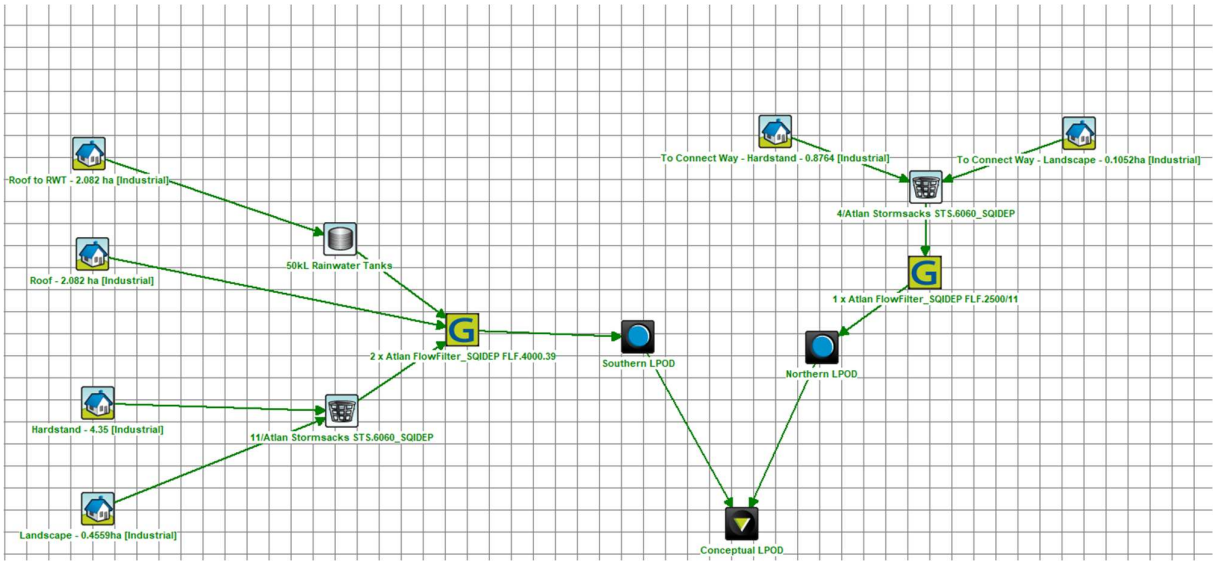


Figure 6-12 MUSIC Model Layout

6.3.4 MUSIC Results

The MUSIC model assumes a conceptual LPOD for the overall site for ease of analysis as shown in Figure 6-1.

The reduction in pollutant loadings at the discharge locations are presented in Tables 6-6 below.

Table 6-6 MUSIC Treatment Train Effectiveness

Reporting Location	Total Suspended Solids	Total Phosphorus	Total Nitrogen	Gross Pollutants
Conceptual LPOD of site	**84.5%**	**83.5%**	**45.0%**	**96.8%**

Careful consideration was given to the way in which the catchments were calculated based on site drainage and land use. The MUSIC model ensures the treatment devices are sufficiently sized to capture an adequate volume of pollutants, meeting the WQOs.

7 STORMWATER QUALITY (CONSTRUCTION)

7.1 Water Quality Objectives

Table 7-1 Construction Phase Quality Objectives (SPP and LCC LDG)

Pollutant	Criteria
Drainage Control	Design life and design storm of temporary drainage works: Disturbed area open for <12 months—1 in 2 ARI. Disturbed area open for 12-24 months—1 in 5 ARI. Disturbed area open for > 24 months—1 in 10 ARI.
Erosion Control	Minimise exposure of disturbed soils at any time. Avoid or minimise large construction activities in the wet season. Divert water run-off from undisturbed areas around disturbed areas. Use erosion risk ratings to determine appropriate erosion control measures.
Sediment Control	Use soil loss rates to determine appropriate sediment control measures Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water run-off Site discharge during sediment basin dewatering should not exceed 50 mg/L TSS and pH between 6.5–8.5
Stormwater Drainage / Flow Management	Hydraulics and hydrology—Take all reasonable and practicable measures to minimise significant changes to the natural waterway hydraulics and hydrology from: peak flow for the one-year and 100-year ARI event (respectively for aquatic ecosystems and flood protection). run-off frequency and volumes entering receiving waters. Uncontrolled release of contaminated stormwater.
Water Quality Outcomes	Stormwater flows from undisturbed and disturbed areas—manage to help protect environmental values Coarse sediment—coarse sediment is retained on site Fine sediment—Site discharge during sediment basin dewatering has a TSS concentration less than 50 mg/L Turbidity—Site discharge during sediment basin dewatering has a turbidity (NTU) less than 10% above receiving waters turbidity— measured immediately upstream of the site Nutrients (N & P)—Nitrogen and phosphorus are managed through sediment control. pH—Site discharge during sediment basin dewatering has a pH range 6.5–8.5 Litter and other waste—Prevent litter/waste entering the site, the stormwater system or watercourses that discharge from the site. Also minimise or sufficiently contain on-site litter and waste production and regularly clear waste bins Hydrocarbons and other contaminants—Hydrocarbons and other contaminants are prevented from entering the stormwater system or internal watercourses that discharge from the site. Wash down water—Wash down water is prevented from entering the stormwater system or internal

	watercourses that discharge from the site
	Cations and anions—Cations and anions including aluminium, iron and Sulfate are managed as required under an approved acid Sulfate soil management plan

Table 7-1 provides the construction phase stormwater quality objectives outline by the State Planning Policy. Additional relevant acts, policies and information that may be useful for construction phase planning include:

- Environmental Protection Act (1994).
- Environmental Protection (Water) Policy (2009).
- Queensland Development Code, Sediment and Erosion Control (2010).
- Best Practice Erosion and Sediment Control for Building and Construction Sites Guidelines (2008).

7.2 Erosion and Sediment Control Plan Purpose

During the construction phase it shall be the Principal Contractor's responsibility to ensure the objectives of Table 7-1 are achieved.

The following section of this report provides a suggested framework for an Erosion and Sediment Control Plan. This includes recommended actions and responses for specific activities; monitoring and reporting; and construction of specifically designed site-specific sediment basins.

7.3 Specific Activities

7.3.1 Erosion and Sediment Control of Disturbed Land

During the construction phase it shall be the Principal Contractor's responsibility to ensure the following:

- Diversion of any clean water runoff that may interfere with land disturbance by the use of earth bunds, or other control devices deemed appropriate by a suitable supervisor.
- Reduction of sediment migration from disturbed land parcels by implementing silt fences, sediment basins or other control devices as deemed appropriate by a suitable supervisor.
- Where cut to fill operations produce a spoil it is recommended that the excess material be placed upstream of the excavation location to ensure any sediment runoff is directed back into the trench. Earth bunds or sediment fences may be required to control direction of sediment flow should the spoil be placed on the downstream side of the excavation site.
- Control measures such as a gully pit sediment barrier shall be installed around inlet pits where required reducing the potential for sediment discharge into the surrounding stormwater system.
- Any sediment deposited from construction vehicles will be swept up and removed.
- Erosion and sediment control devices may only be removed once disturbed lands which they are protecting are rehabilitated and capable of resisting further erosion.

7.3.2 Spoil and Stockpile Management

It shall be the Principal Contractor's responsibility to oversee the following controls during the construction phase unless otherwise specified:

- The placement of spoil and stockpile material shall be kept at a maximum distance from stormwater inlets, gutters and stormwater pipes to reduce unnecessary sediment migration into nearby infrastructure.
- Spoil and stockpile material shall be placed in a way that reduces the likelihood of sedimentation, erosion and slippage. Advice from an appropriate project manager/representative shall be sought in this instance.

- Spoil or stockpile material that is deemed a contaminant shall be placed on a designated zone of either fill material, plastic or concrete with the installation of appropriate containment devices. Advice from an appropriate project manager/representative shall be sought in this instance as the resulting control will be highly dependent on the severity of contamination.
- It shall be the Project Manager's responsibility to foresee and develop appropriate control measures to prevent the impacts of spoil and stockpile material prior to construction activities. Monitoring and reporting shall also be required during the implementation of any given device associated with spoil and stockpile management.

7.3.3 Erosion Control

It shall be the Principal Contractor's responsibility to oversee the following controls during the construction phase:

- Traffic of any type shall be kept away from areas of rehabilitation to promote stabilisation of the zone.
- Where wind and water are acknowledged as potential erosion sources temporary protection shall be installed. Such measures only apply to zones of spoil, stockpile and land disturbance which are unlikely to receive works within a period of 6-8 weeks. Further advice from an appropriate project manager/representative shall be sought in this instance as the resulting control will be highly dependent on the disturbance type and erosion source.
- Once viable, final landscaping shall be undertaken on applicable zones to increase stability.

7.3.4 Personnel Training

It shall be the Principal Contractor's responsibility to oversee the following training protocols during the construction phase:

- Environmental management and incident reporting is to be included on all site induction courses.
- All personnel are to receive adequate training in; workplace health and safety issues, environmental management, best practice erosion and sediment control practices, incident reporting procedures and where applicable site inspection and maintenance procedures.

7.3.5 Miscellaneous

It is the Principal Contractor's responsibility to ensure erosion and sediment controls are operated and maintained in an effective operational condition. These structures are not allowed to accumulate sediment volume in excess of 70% sediment storage design capacity as per Section 6 of the Urban Stormwater Quality Planning Guidelines 2010.

Sediment removed from control measures must be disposed of in a manner approved by the local Council that does not cause pollution and forms part of the Contractor's obligation.

Any chemicals, fuel or oil stored on site shall be stored under cover in a bounded area or placed sufficiently above ground level to prevent contamination of surface water.

A waste concrete receptor (disposal area) must be established if significant concreting is to occur on site. The site must be surrounded by perimeter bunds and be clearly signed.

A general waste collection area shall be established which is to include appropriate pollutant runoff controls, dependent on the nature of the waste.

7.4 Project Personnel Responsibilities

A description of the key personnel involved with implementing the Erosion and Sediment Control Plan are listed in **Table 7-2**. It is recommended that all parties involved attend a pre-construction conference to discuss and clarify all issues associated with sediment and erosion control as well as this plan.

Table 7-2 Project Personnel Responsibilities

Project Role	Responsibilities
Superintendent	Authorisation of this plan; and Review and monitoring of this plan.
Contractor / Site Manager	Implementation of this plan; Monitoring of this plan; Supervising any activities or requirements required by this plan; and Ensuring all personnel are aware of the contractual agreements associated with this plan.
All Personnel	Ensuring they are aware of the contractual agreements associated with this plan; and Informing appropriate personnel of any issues that may arise with respect to the desired sediment and erosion control measures.

7.5 Monitoring and Responsibility

7.5.1 All Personnel

It is the obligation of all personnel to report any failures in the erosion and sediment control works utilised during the projects life cycle. Any identified errors within the sediment and erosion control system shall be reported in writing to a relevant project manager. A formal inquiry shall be undertaken in accordance with the reported issue as well as the relevant party procedures (i.e. Principal Contractor).

7.5.2 Contractor/Contractor's Foreman

It shall be the responsibility of the Contractor and Contractor's Foreman to monitor and report on the erosion and sediment control measures utilised in the construction phase. Inspections are to be undertaken:

- On a daily basis during earthworks, land disturbance, spoil or stockpile activities and rain events.
- Weekly during site inactivity.
- Within 24 hours prior to expected rainfall and 18 hours prior to intense rainfall events.

The following shall be inspected or reported on:

- Erosion and sediment control devices are in the correct location and are working as defined by this plan.
- Drainage systems both internal and external to the site are operating effectively or to pre-construction efficiencies.
- Spilled material is removed if it can potentially mobilise via stormwater runoff or wind.
- Stabilisation of disturbed land parcels has been undertaken in an effective manner.
- Excess sediment has been removed from erosion and sediment measures appropriately if the device is operation ineffectively or requires decommissioning.
- It is understood that repairs, maintenance or reinstallation may be required if any control measures are operating inadequately, or if infrastructure is damaged due to inefficient operation of the outlined measures.

7.5.3 Environmental Representative

It shall be the responsibility of the environment representative to periodically inspect and report on the effectiveness of the erosion and sediment controls during the construction phase of the project. Technical advice shall be given to personnel outlying any uncertainty with regards to the; applicability, installation, operation, maintenance, removal or rehabilitation of any sediment and erosion control.

8 ASSET MAINTENANCE AND HANDOVER

All the stormwater infrastructure detailed in this document are contained within the overall development site and will be remain as a private asset.

9 CONCLUSION

This SBSMP has been prepared to provide a design proposal and guide to the stormwater quantity and quality management techniques for the site.

The primary objectives of this report are achieved as follows:

Lawful Point of Discharge (LPoD)

Stormwater will be discharged to the existing lawful points of discharge, being the southern detention basin (southern LPOD) proposed as part of Stage 2 works of the Flagstone Logistics Estate (FLE) development. A small portion of the site will flow to the road from the northeastern corner of the site into the infrastructure within Connect Way (northern LPOD).

Stormwater Quantity

The site will use the approved stormwater strategy in the Site Based Stormwater Management Plan (SBSMP) prepared by Arcadis for the FLE subdivision as the overarching guideline. This report has re-calculated the sites area to confirm the correct stormwater parameter assumptions. Additionally, a sensitivity analysis of the southern detention basin has shown that the conditions downstream of the development have not been adversely impacted by the proposed development. Therefore, the proposed development is considered consistent with the endorsed master SBSMP (Arcadis SBSMP EAG001-30109334-AAR, Rev 12) and is valid in terms of water quantity management.

Stormwater Quality

Atlan primary and tertiary devices have been utilized to demonstrate that the discharge of stormwater from the site is of adequate quality standards to comply with the requirements of Economic Development Queensland (EDQ), Logan City Council (LCC) and the South-East Queensland Healthy Waterways Partnership.

Should there be a need to change to an alternative product (e.g. OceanProtect) this will be at the discretion of the RPEQ Engineer who is responsible for the 'Issued for Construction' drawings. If an alternative proprietary product is selected during the course of detailed design, the product must be SQIDEP APPROVED (Stormwater Australia). In providing their certification, the RPEQ engineer is required to ensure that the proposed stormwater management quantity and quality objectives are achieved in accordance with the relevant industry standards.

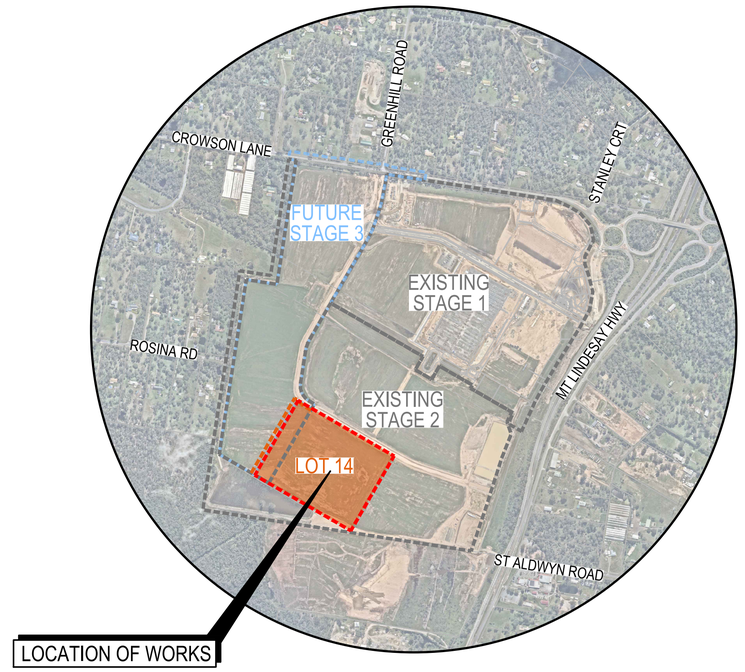
APPENDIX A

Engineering Drawings

FLAGSTONE LOGISTICS ESTATE - PROPOSED LOT 14

4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN
DEVELOPMENT APPROVAL (MATERIAL CHANGE OF USE)
ECONOMIC DEVELOPMENT QUEENSLAND (GREATER FLAGSTONE) & LOGAN CITY COUNCIL

DRAWING LIST	
DRAWING NUMBER	DESCRIPTION
GENERAL	
30109334-AAP-P302OP-CV-DRG-0001	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
EARTHWORKS	
30109334-AAP-P302OP-CV-DRG-0101	BULK EARTHWORKS PLAN
30109334-AAP-P302OP-CV-DRG-0121	BULK EARTHWORKS SECTIONS SHEET 1
30109334-AAP-P302OP-CV-DRG-0122	BULK EARTHWORKS SECTIONS SHEET 2
ROAD WORKS	
30109334-AAP-P302OP-CV-DRG-0201	ROADWORKS AND STORMWATER DRAINAGE LAYOUT PLAN
30109334-AAP-P302OP-CV-DRG-0421	STORMWATER CATCHMENT PLAN
SERVICES	
30109334-AAP-P302OP-CV-DRG-0501	COMBINED SERVICES LAYOUT PLAN



LOCALITY PLAN
SCALE 1:10000

LEVELS & GRID

LEVEL DATUM - AHD
ORIGIN - PM72575
R.L. - 10.664

nearmap.com IMAGERY EXTRACTED FROM nearmap.com

DISCLAIMER

THIS MAP HAS BEEN PREPARED USING nearmap.com IMAGERY. THIS DATA IS NOT GUARANTEED TO BE FREE FROM ERROR OR OMISSION. THEREFORE ARCADIS AND ITS EMPLOYEES DISCLAIM LIABILITY OF ANY ACT DONE OR OMISSION MADE ON THE INFORMATION CONTAINED IN THIS DATA AND ANY CONSEQUENCES OF SUCH ACTS OR OMISSIONS. THIS DRAWING IS PROVIDED FOR THE INFORMATION OF THE PERSON OR ORGANISATION TO WHOM ARCADIS PROVIDES IT. IT MAY NOT BE PROVIDED TO, OR USED BY, ANY OTHER PERSON WITHOUT ARCADIS'S PRIOR WRITTEN CONSENT.

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	G.E.	21.05.25

100mm on Original

Scales

N

0 100 200 400 600 800 1000m

1 : 10000

Surveyor

therefor GROUP

Client

Charter Hall

Status

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project

FLAGSTONE LOGISTICS ESTATE - LOT 14

Title

COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

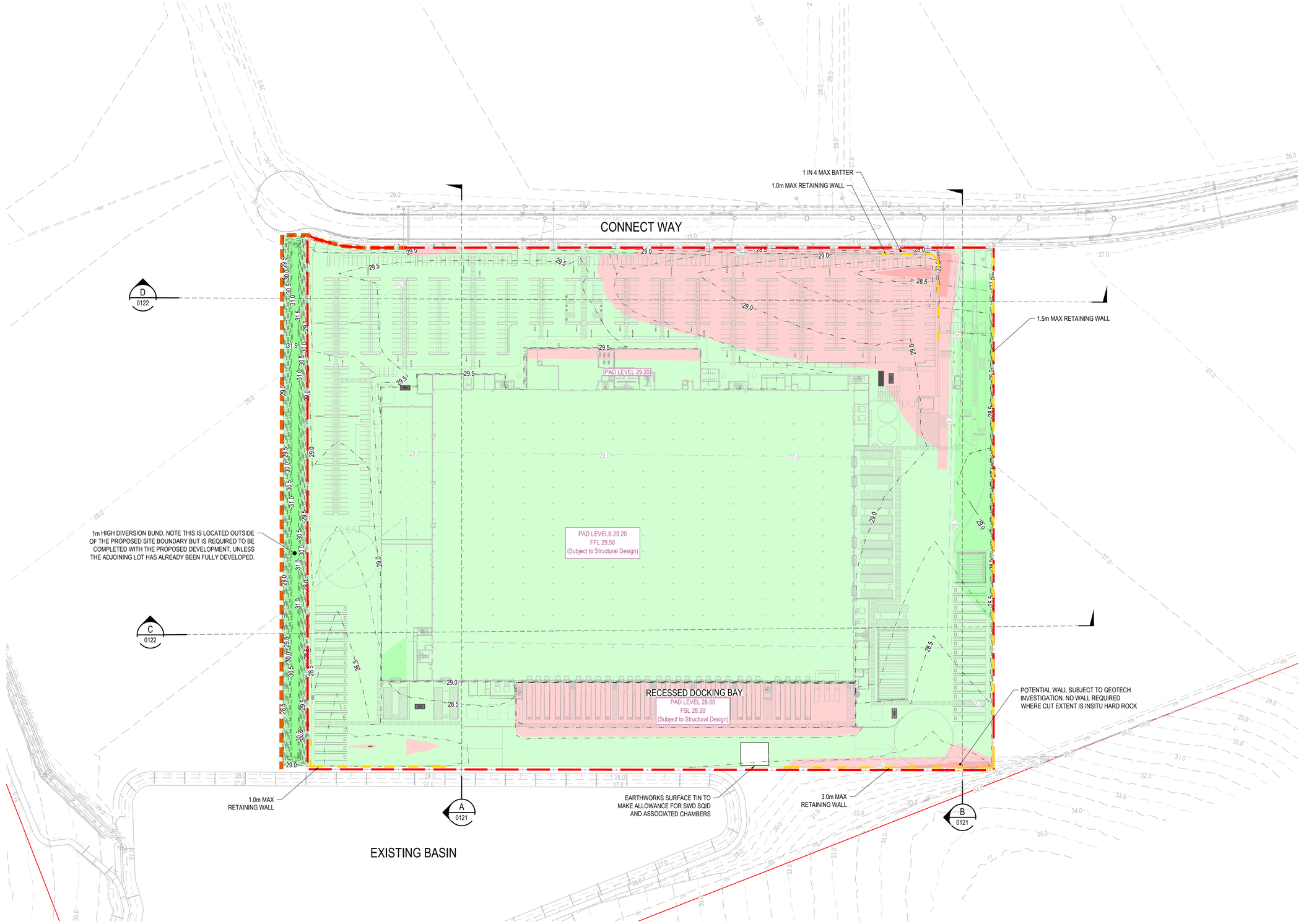
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0001

Issue: B

Date Plotted: 30 May 2025 - 11:25AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0001-Cover_Lot14 Copy.dwg



LEGEND

- EXISTING SURFACE CONTOUR
- EARTHWORKS SURFACE CONTOURS
- PROPOSED WORKS BOUNDARY
- SITE BOUNDARY
- PROPOSED RETAINING WALL 0.5m - 3.0m
- EXISTING SEWER RISING MAIN
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION

CUT / FILL VOLUMES

	SITE AREA (99,592m²)	BUND AREA (3,858m²)
CUT	-6,781.101m³	-0.007m³
FILL	32,123.567m³	5,723.944m³
BALANCE (IMPORT)	25,342.466m³	5,723.937m³

BOXING 50mm STRIPPED EARTHWORKS

NOTES

- CUT/FILL HATCH REPRESENTS SURFACE LEVEL CHANGES FROM EXISTING APPROVED BEW COMPLIANCE ENDORSEMENT.
- NO ALLOWANCE HAS BEEN MADE FOR TOPSOIL IN THE EARTHWORKS VOLUMES.
- NO COMPACTION FACTOR HAS BEEN ALLOWED FOR.

EARTHWORKS CUT & FILL

-3.00	to	-1.00	m
-1.00	to	0.00	m
0.00	to	1.00	m
1.00	to	2.00	m



KEY PLAN

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

100mm on Original

Scales

0 10 20 40 60 80 100m

1 : 1000

Surveyor: therefor GROUP

Client: Charter Hall

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures

Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project: FLAGSTONE LOGISTICS ESTATE - LOT 14

Title: BULK EARTHWORKS PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

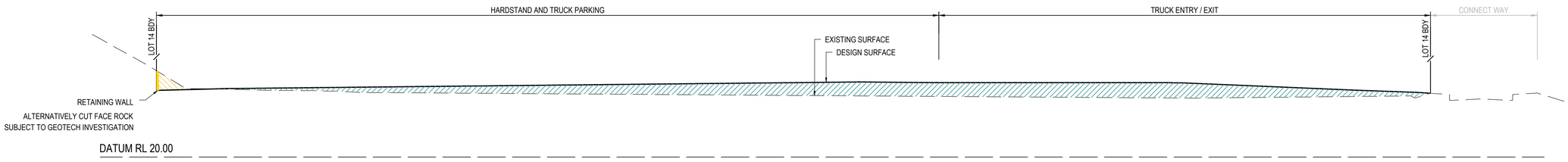
Drawing No.: 30109334-AAP-P302OP-CV-DRG-0101

Issue: B

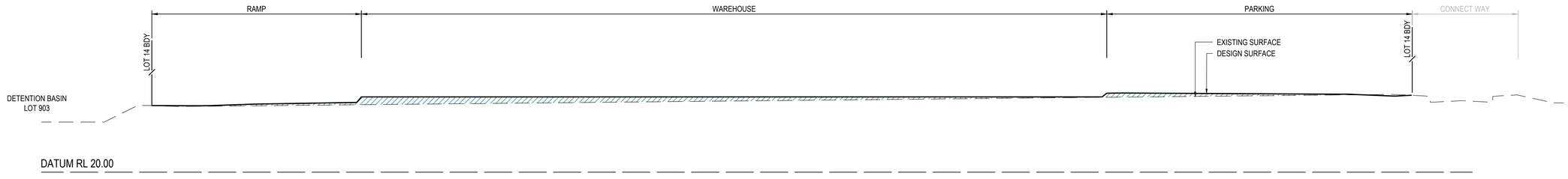
Date Plotted: 30 May 2025 - 09:37AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0101-EarthworksPlan_Lot14.dwg

LEGEND

- FILL AREA
- CUT AREA
- PROPOSED RETAINING WALL 0.5m - 3.0m



SECTION B
1 : 500 HORI.
1 : 250 VERT.
0101



SECTION A
1 : 500 HORI.
1 : 250 VERT.
0101

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

Scales

HORZ 0 5 10 20 30 40 50m
1 : 500

VERT 0 5 10 15 20 25m
1 : 250

Surveyor: therefor GROUP

Client: Charter Hall

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project: FLAGSTONE LOGISTICS ESTATE - LOT 14

Title: BULK EARTHWORKS SITE SECTIONS SHEET 1

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0121

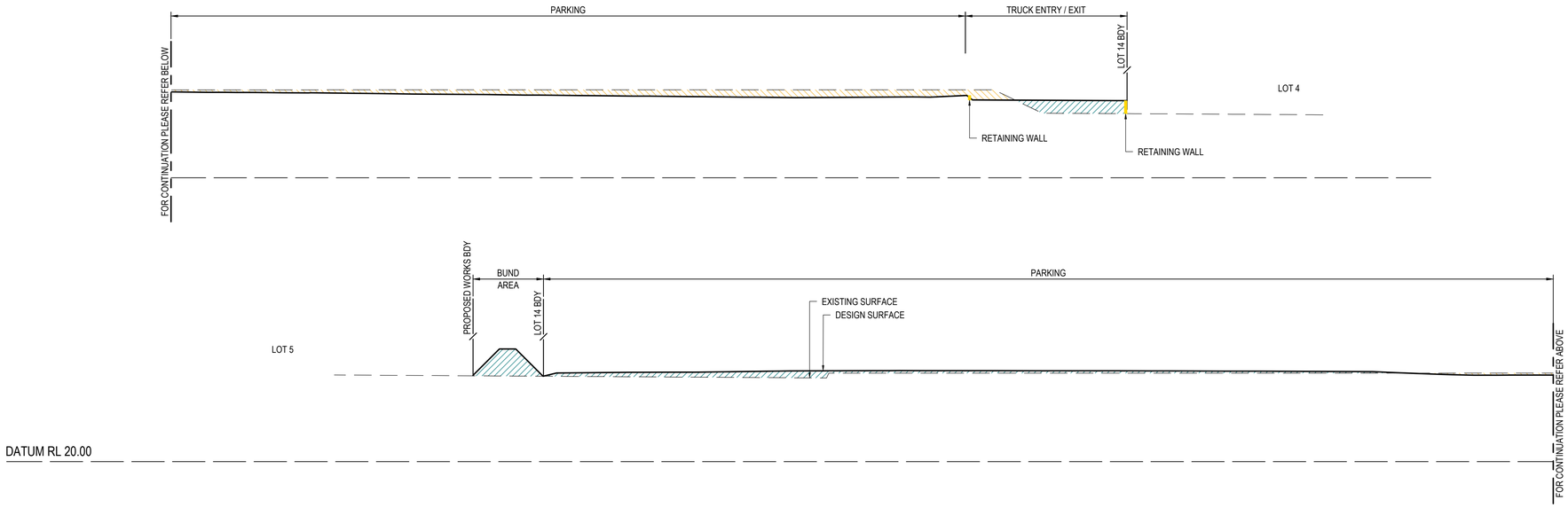
Issue: B

100mm on Original

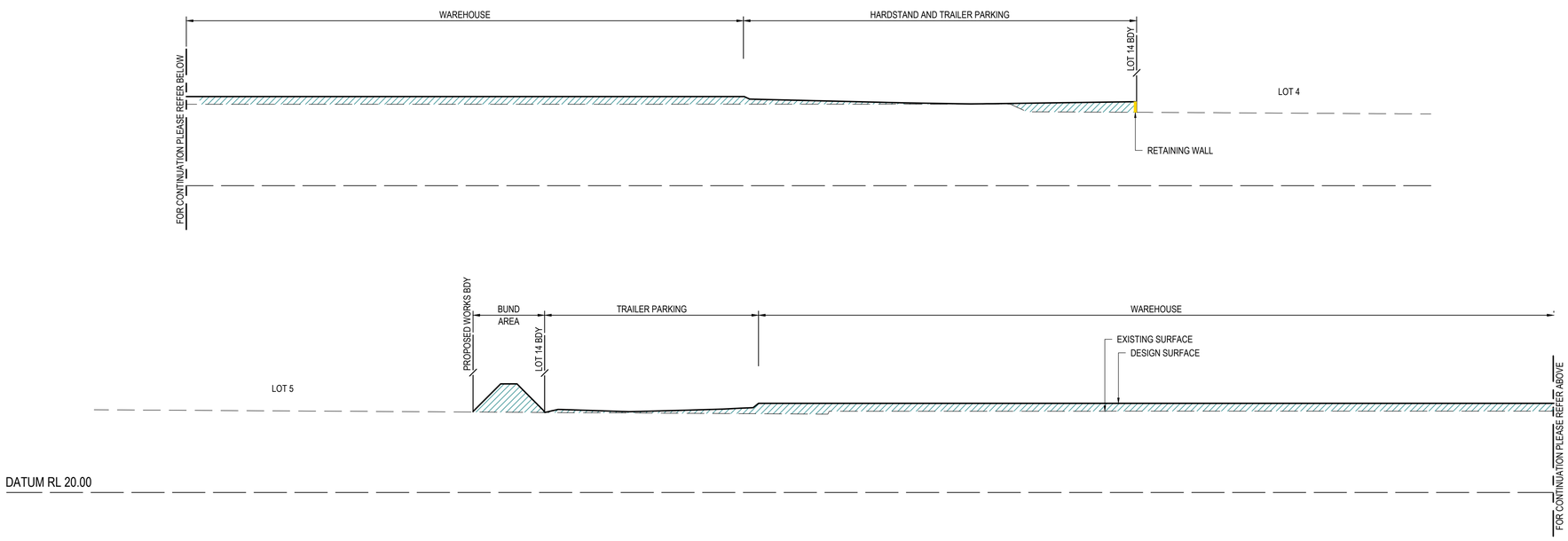
Date Plotted: 30 May 2025 - 11:59AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0121-EarthworksSiteSection_Lot14.dwg

LEGEND

- FILL AREA
- CUT AREA
- PROPOSED RETAINING WALL 0.5m - 3.0m



SECTION D
1 : 500 HORI.
1 : 250 VERT.
0101



SECTION C
1 : 500 HORI.
1 : 250 VERT.
0101

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

100mm on Original

Scales

HORZ 0 5 10 20 30 40 50m
1 : 500

VERT 0 5 10 15 20 25m
1 : 250

Surveyor: therefor GROUP

Client: Charter Hall

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures

Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project: FLAGSTONE LOGISTICS ESTATE - LOT 14

Title: BULK EARTHWORKS SITE SECTIONS SHEET 2

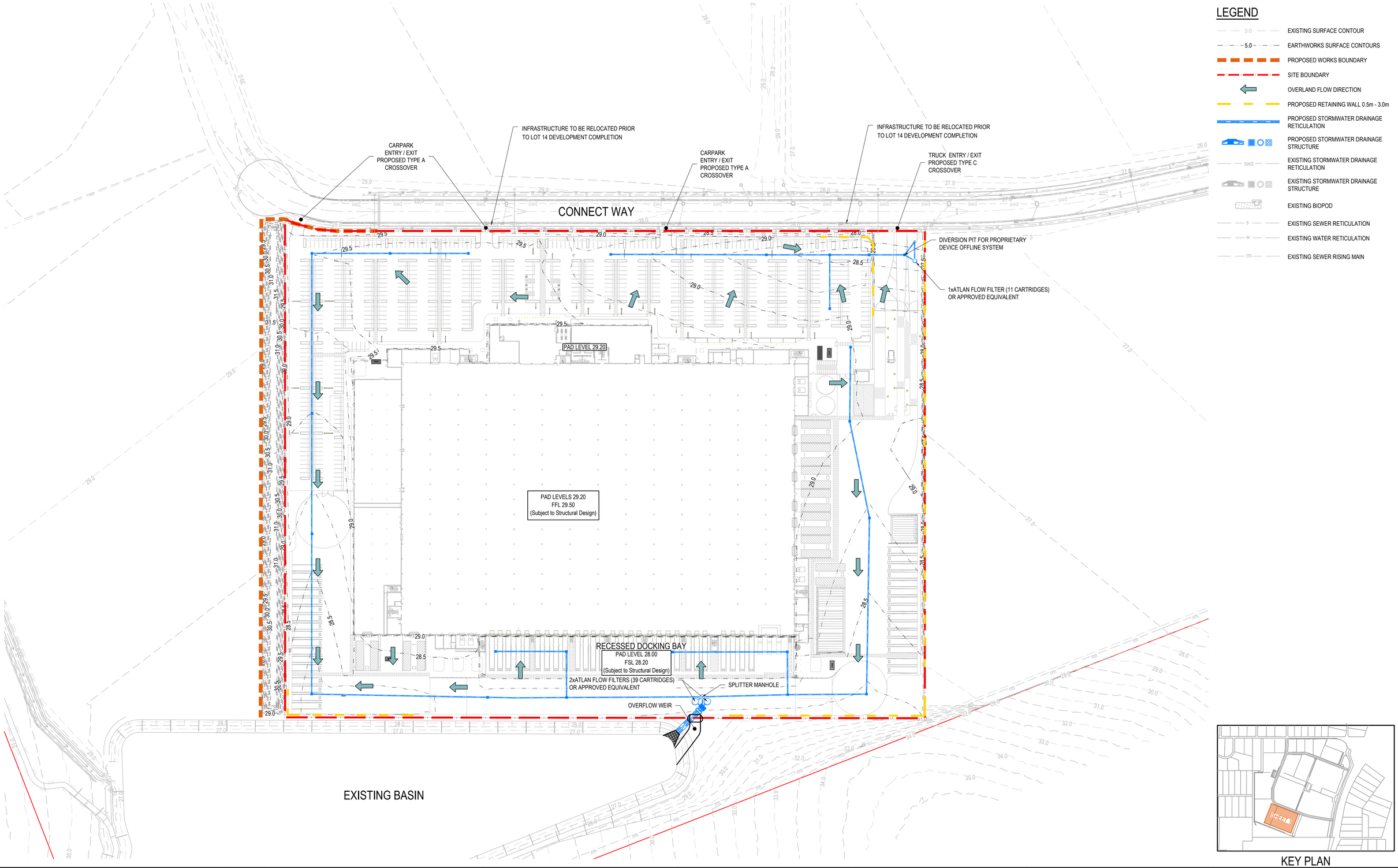
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0122

Issue: B

Date Plotted: 30 May 2025 - 11:59AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0121-EarthworksSiteSection_Lot14.dwg



LEGEND

- EXISTING SURFACE CONTOUR
- EARTHWORKS SURFACE CONTOURS
- PROPOSED WORKS BOUNDARY
- SITE BOUNDARY
- OVERLAND FLOW DIRECTION
- PROPOSED RETAINING WALL 0.5m - 3.0m
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING BIOPOD
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION
- EXISTING SEWER RISING MAIN

KEY PLAN

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

100mm on Original

Scales

0 10 20 40 60 80 100m

1 : 1000

Surveyor

therefor GROUP

Client

Charter Hall

Status

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project

FLAGSTONE LOGISTICS ESTATE - LOT 14

Title

ROADWORKS AND DRAINAGE LAYOUT PLAN

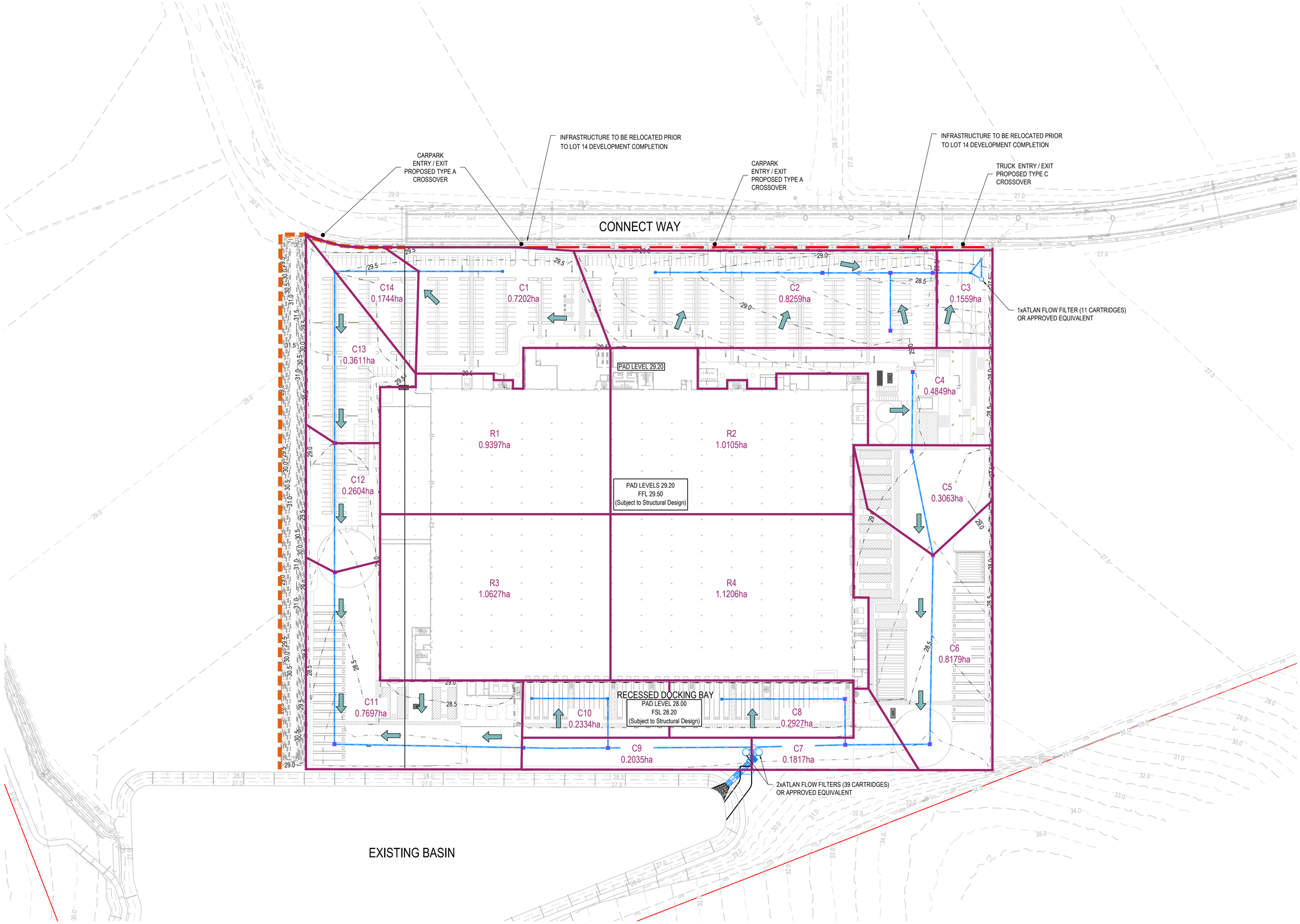
ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0201

Issue: B

Date Plotted: 30 May 2025 - 09:38AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0201-CivilWorksPlan_Lot14.dwg



LEGEND

- EXISTING SURFACE CONTOUR
- EARTHWORKS SURFACE CONTOURS
- PROPOSED WORKS BOUNDARY
- SITE BOUNDARY
- OVERLAND FLOW DIRECTION
- 2/7 0.3113ha — PROPOSED STORMWATER DRAINAGE CATCHMENT BOUNDARY AND AREA
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- FIELD INLET TO BE FITTED WITH ATLAN STORMSACK
- EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING SEWER RISING MAIN
- EXISTING SEWER RETICULATION
- EXISTING WATER RETICULATION

TREATMENT PLAN

CATCHMENT	AREA (Ha)	TREATMENT DEVICE
ROOF (R1-R4)	4.164	2 x ATLAN FLOW FLITER 11 x STORMSACKS
HARDSTAND (C1 & C4-C14)	4.357	
LANDSCAPING (C1 & C4-C14)	0.456	
HARDSTAND (C2 & C3)	0.876	1 x ATLAN FLOW FILTER 4x STORMSACKS
LANDSCAPE (C2 & C3)	0.105	

NOTE

THIS DESIGN UTILIZES ATLAN PROPRIETARY STORMWATER PRODUCTS TO MODEL A SITE-SPECIFIC WATER QUALITY TREATMENT SYSTEM FOR THE SITE RUNOFF. SHOULD THERE BE A NEED TO CHANGE TO AN ALTERNATIVE PRODUCT (E.G. OCEANPROTECT) THIS WILL BE AT THE DISCRETION OF THE RPEQ ENGINEER WHO IS RESPONSIBLE FOR THE 'ISSUED FOR CONSTRUCTION' DRAWINGS. IF AN ALTERNATIVE PROPRIETARY PRODUCT IS SELECTED DURING THE COURSE OF DETAILED DESIGN, THE PRODUCT MUST BE SQIDEP APPROVED (STORMWATER AUSTRALIA).



KEY PLAN

Issue	Description	DR	CH	VE	Date
C	FOR APPROVAL - UPDATED ATLAN FIELD INLETS	A.O.	S.S.	B.K.	07.07.25
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

100mm on Original

Scales: 0 10 20 40 60 80 100m — 1 : 1000

Surveyor: therefor GROUP

Client: Charter Hall

Status: FOR APPROVAL — NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date 07.07.2025	

Project: FLAGSTONE LOGISTICS ESTATE - LOT 14

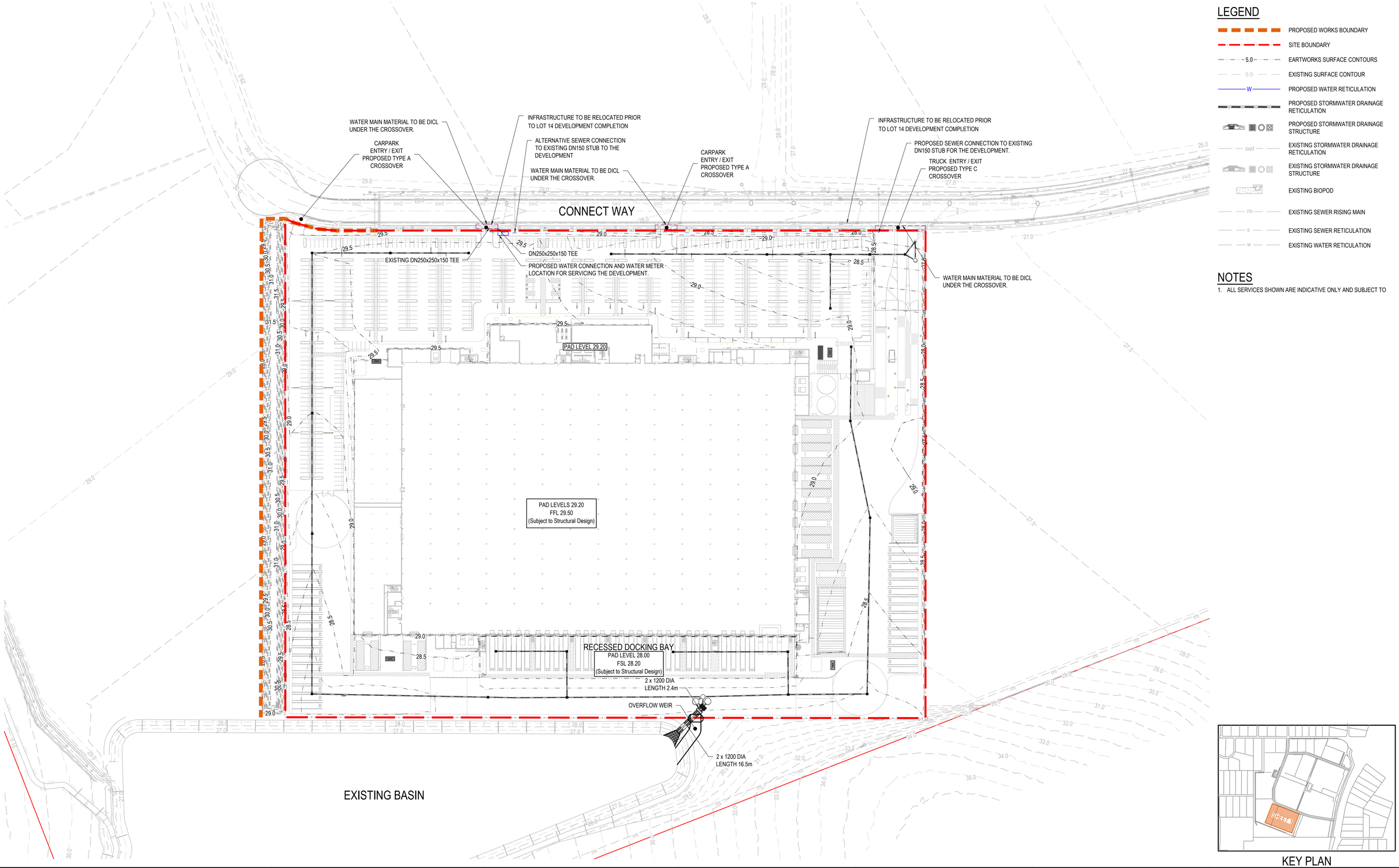
Title: STORMWATER CATCHMENT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0421 — Issue: C

Date Plotted: 7 Jul 2025 - 03:22PM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0421-CatchmentPlan_Lot14.dwg



LEGEND

- PROPOSED WORKS BOUNDARY
- SITE BOUNDARY
- 5.0 EARTWORKS SURFACE CONTOURS
- 5.0 EXISTING SURFACE CONTOUR
- W PROPOSED WATER RETICULATION
- PROPOSED STORMWATER DRAINAGE RETICULATION
- PROPOSED STORMWATER DRAINAGE STRUCTURE
- swd EXISTING STORMWATER DRAINAGE RETICULATION
- EXISTING STORMWATER DRAINAGE STRUCTURE
- EXISTING BIOPOD
- rm EXISTING SEWER RISING MAIN
- s EXISTING SEWER RETICULATION
- w EXISTING WATER RETICULATION

NOTES

1. ALL SERVICES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO

KEY PLAN

Issue	Description	DR	CH	VE	Date
B	FOR APPROVAL	A.O.	S.S.	B.K.	30.05.25
A	DRAFT ISSUE	J.S.	S.S.	B.K.	21.05.25

100mm on Original

Scales

0 10 20 40 60 80 100m

1 : 1000

Surveyor

therefor GROUP

Client

Charter Hall

Status

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	J.SANTOS	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	B.KITSON	R.P.E.Q. No: 07884 Date	

Project

FLAGSTONE LOGISTICS ESTATE - LOT 14

Title

COMBINED SERVICES LAYOUT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project Number: 30109334

Drawing No.: 30109334-AAP-P302OP-CV-DRG-0501

Issue: B

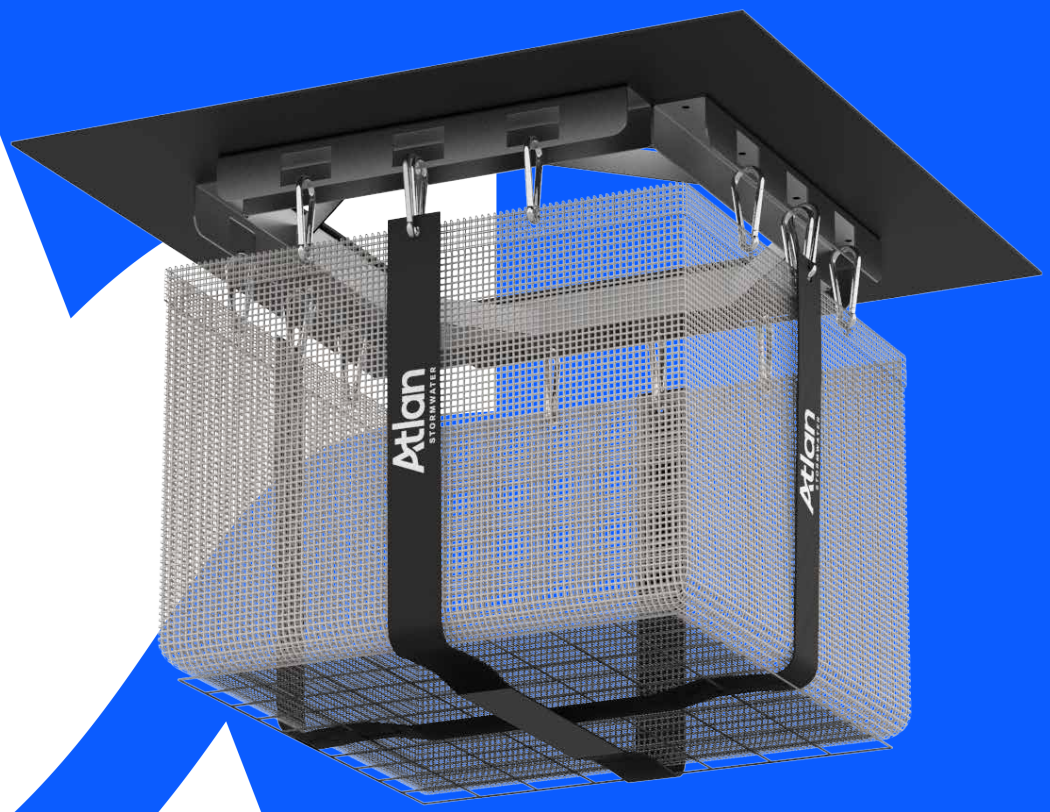
Date Plotted: 30 May 2025 - 09:39AM File Name: C:\Users\ao67297\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Stage-02_Internal Works\DRG\30109334-AAP-P302OP-CV-DRG-0501-CombinedServicesPlan_Lot14.dwg

APPENDIX B

ATLAN MANUALS & DETAILS

OPERATION & MAINTENANCE MANUAL

StormSack



atlan.com.au

Atlan
STORMWATER

INTRODUCTION

Maintenance of the Atlan StormSack is essential to preservation of its condition to ensure lifetime operational effectiveness.

The Atlan StormSack is a highly engineered water quality device that is deployed directly in the stormwater system as primary treatment to capture contaminants close to the surface for ease of maintenance.

To ensure full operational capacity, it is vital to ensure that the pollutants it captures are periodically removed, and filtration components are thoroughly cleaned.

This manual should be used in conjunction with the relevant site traffic management and safety plans, as well as any other provided documentation from Atlan.

The Atlan StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The StormSack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.



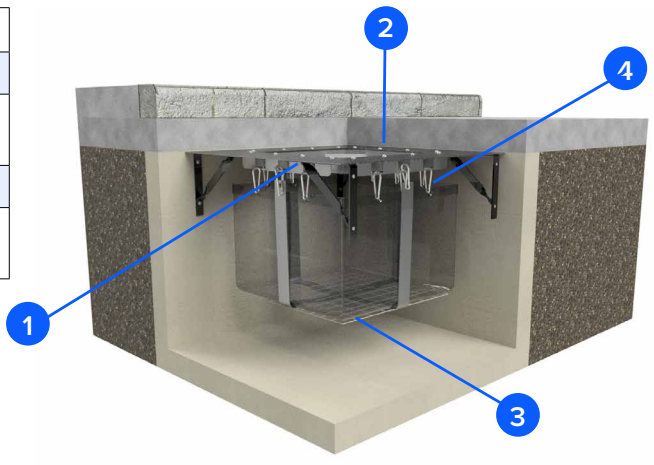
Typically the StormsSack is serviceable from the street level, and therefore maintenance does not usually require confined space entry into the catch basin structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or sucker truck.

COMPONENTS

- Adjustable Flange Deflector: Black HDPE attached to support frame
- Catchment Bag: 200micron woven poly fabric
- Support Hardware: Stainless steel 304
- Bag Support: Stainless steel 304 mesh
- Replaceable Oil Boom: Polypropylene 3 inch (76 mm) diameter (optional add-on)

Application	Regulatory Issue	Target Pollutants
Council Storm Drain Retrofits	At-source litter capture	Sediment, Litter, O&G
Commercial/Retail/Residential	Stormwater Compliance	Sediment, Litter, O&G
Litter Prone Urban Areas	Cost effective litter control	Litter ≥ 5 mm
Scrap Metal/Solid Waste/Oil Storage/Etc	Industrial Multi-Sector General Permit	Gross Pollutants, O&G
Part of Treatment Train	Council Stormwater Quality Improvement Targets	Sediment, Litter, O&G
Construction Sediment/Erosion	Sediment Control Plan	Sediment/Erosion Control

Features	
1.	Aluminium frame
2.	Black poly surround secured to frame • Can be cut to suit on site
3.	Reinforced StormSack bag
4.	Carabiners attach bag to frame for easy service and replacement



Standard StormSack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times.

HEALTH & SAFETY

IMPORTANT: A full site based risk assessment should be completed prior to commencing work on your Atlan StormSack.

PERSONAL HEALTH & SAFETY

When carrying out maintenance operations of the Atlan StormSack all contractors and staff personnel must comply with all current workplace health and safety legislation. The below measures should be adhered as practically as possible:

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

PERSONAL PROTECTIVE EQUIPMENT

When carrying out maintenance operations of the Atlan StormSack, wearing the appropriate personal protective equipment is vital to reducing potential hazards. Personal protective equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots

CAPTURED POLLUTANTS

The material captured by the Atlan StormSack can be harmful and needs to be handled correctly. The nature and amount of the captured pollutants depends on the characteristics of the site.

Pollutants can include from organic material such as leaves and sticks through to debris such as plastics, glass and other foreign objects such as syringes.

EQUIPMENT HANDLING

Handling activities such as a removing the drain grate a well as managing pedestrians and other non-worker personnel at the site should be exercised in accordance with specified safety procedures and guidelines.

CONFINED SPACES

Confined space entry procedures are not covered in this manual. It is requested that all personnel carrying out maintenance of the Atlan StormSack must evaluate their own needs for confined space entry and compliance with occupational health and safety regulations. Non trained staff are not permitted to participle in any confined space entries.

When maintenance operations cannot be carried out from the surface and there is a need to enter confined space, only personnel that currently hold a Confined Space Entry Permit are allowed to enter the confined space.

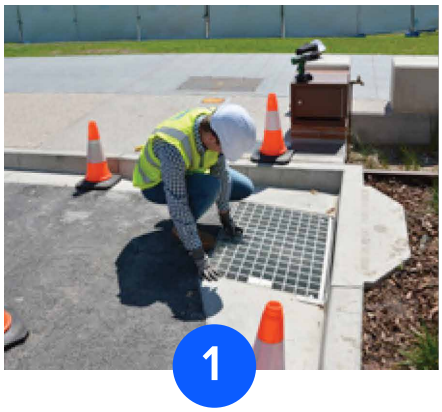
TRAFFIC MANAGEMENT

Typically stormwater gully pits are situated on roads and carparks, or adjacent to roads in a footpath or swale. As traffic requirements vary depending on the circumstance of the site, separate traffic control plans should be prepared for each site.

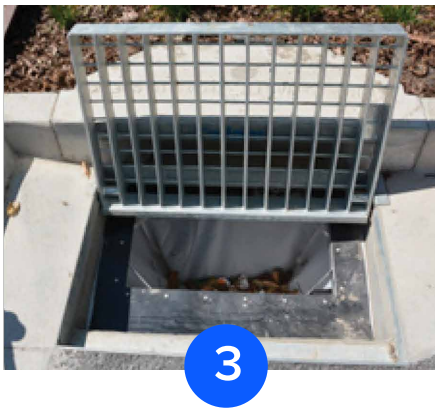
The specific road safety requirements for each site can be obtained from the relevant road authority to ensure all maintenance operations comply with the laws and regulations. State government publications can also be useful to find out the signage requirements, placement of safety cones and barricades that are required when working on public roads.

MAINTENANCE OF THE ATLAN STORMSACKS IS A SPECIALIST ACTIVITY

When carrying out maintenance operations of the Atlan StormSack, factors such as equipment handling methods, pollutants and site circumstances can impose potential risks to the maintainer and nearby civilians.







OPERATIONS

GENERAL MONITORING

The Atlan StormSack must be checked on a regular basis to analyse whether it requires maintenance or cleaning. As gully pit grates are usually quite heavy, it is vital to exercise the correct lifting techniques and also ensure that the area surrounding the open pit is shielded from access of non-work personnel.

To ensure optimal performance of the Atlan StormSack, the material collected by the filter bag should not exceed the level of approximately a half to two thirds of the total bag depth. When this material collected is showing signs of exceeding this level they should be scheduled to be emptied.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when previous months have had little or no rainfall.



GULLY PIT COVER REMOVAL

Opening a hinged pit cover

1. Insert the lifting hooks beneath the grate.
2. Check hinge points are not damaged and debris is not caught in the hinge area.
3. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held, should be removed or secured during maintenance activities.

Opening a non-hinged pit cover

1. Place lifting hooks beneath grate, where possible in the four corners of the grate. Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters. Alternatively if safe to do so grip the grade with your hands.
2. Position each person on either side of the grate.
3. Lift the grate, ensuring that good heavy lifting posture is used at all times.
4. Place the grate on angle on the gutter, to allow for the lifting hooks to be removed.
5. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back.





REPAIRS

Depending on the extent of the damage to the Atlan StormSack unit, it can usually be repaired.

Filter Bag Tears

Small tears to the filter bag can be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of filter material onto the filter bag.

Spill Procedures

In the event of a spill discharging into a gully pit, all effected sediment must be removed from the filter bags and the filter bags are to be removed and replaced with new filter bags.

Replacement Parts

If large tears or irreparable damage to the frame and structure are present, it is advisable to replace the components.

All required spare parts can be sourced directly from Atlan Stormwater.

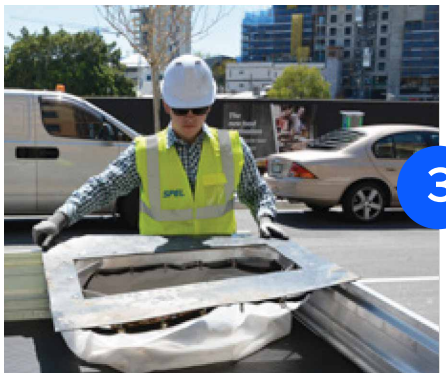
CLEANING METHODS

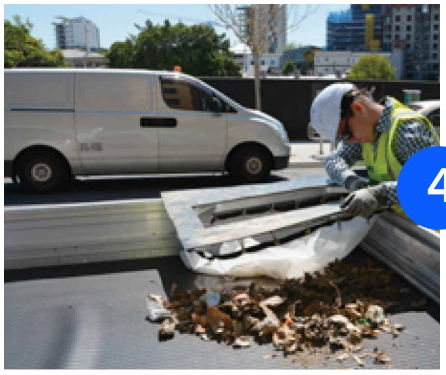
CLEANING USING AN VACUUM TRUCK

1. Open gully pit.
2. Place the vacuum hose, suck out all of the sediment, organic leaf material, litter and other materials that were collected in the filter bag.
3. Allow the filter bag to be sucked up in the vacuum hose for a few seconds to allow for the filter mesh pores to be cleaned.
4. Use the vacuum hose to remove any build-up of material around the overflows and in the bottom of the pit.
5. Remove filter back from pit.
6. Remove any sediment and litter caught in the gully pit grate.
7. Back opening channels are to be cleared of any debris to ensure flow is not hindered.
8. Thoroughly examine the structural integrity of the filter bag and frame.
9. Reinstate filter bag and gully pit covers.











CLEANING BY HAND

CAUTION: Correct PPE must be warn - refer to page three. Remain alert for dangerous objects and wildlife.

1. Open gully pit.
2. Using the correct lifting technique, lift the StormSack out by the diagonal lifting corners fitted to the frame. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the StormSack, or remove excess material using a shovel or etc. Take care not to damage the bag when removing litter form the bag.
3. Lift the StormSack clear of the stormwater pit and position over the collection bin or vehicle.
4. Lift and empty the bag by holding the bottom lifting loops only.
5. Brush the StormSack with a stiff brush to remove the sediment from the filter pores.
6. Thoroughly examine the structural integrity of the filter bag and frame.
7. Reinstate StormSack and gully pit covers.

MATERIAL DISPOSAL

Collected materials can be potentially harmful to humans and the environment. Once all captured material from the Atlan StormSack has been removed, it must be taken off site and disposed of at a transfer station or a similar approved disposal site.

BLOCKAGE TROUBLESHOOTING

In the unlikely event of surface flooding around a gully pit which has a Atlan StormSack fitted, the following steps should be carried out:

- Check the overflow bypass.
- If overflow is clear and surface flooding still exists remove the Atlan StormSack and check the outlet pipe for blockages.
- Removal of the Atlan StormSack can be difficult if clogged with sediment and holding water.
- If the filter is clogged brush the side walls to dislodge particles trapped at the interface allowing water to flow through the filter.
- If the outlet pipe is blocked a vacuum truck may be required to unblock it. Litter can be removed from the Atlan StormSack using the vacuum truck before removal. If a vacuum truck is not available please follow the hand maintenance cleaning steps prior to unblocking the outlet pipe.

ATLAN STORMSACK MAINTENANCE CHECKLIST

SITE DETAILS	
Client	
Location of system on site	
Site address	
Site contact name and number	

CHECKLIST ITEMS	YES/NO	COMMENTS
Is the pit free from pollutants and debris?	SELECT	
Is there movement or damage to the cage?	SELECT	
Is there movement or damage to the plastic pit seals?	SELECT	
Is structural integrity in good condition including fixings, joints and connections?	SELECT	
Is the filter bag pores clean and not clogged?	SELECT	
Is the filter bag damaged in any way?	SELECT	
Are the inlet and outlet pipes free from debris and damage?	SELECT	
Is the cover grate free from debris and damage?	SELECT	
Does the StormSack need repairs or replacement parts?	SELECT	
Has captured material been disposed of responsibly at an approved disposal site?	SELECT	

MAINTENANCE & REPAIR NOTES

SIGN OFF	
Name of service technician	
Date	

Joy in water

‘We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.’

Andy Hornbuckle

Atlan
STORMWATER

P 02 8705 0255
sales@atlan.com.au
100 Silverwater Rd,
Silverwater NSW 2128
atlan.com.au

0624

OPERATION & MAINTENANCE MANUAL

FlowFilter

(Formerly Hydrosystem)



atlan.com.au

Atlan®
STORMWATER







HEALTH & SAFETY

Operation may cause injury. Take all necessary precautions, wear protective equipment and refer to engineers department.

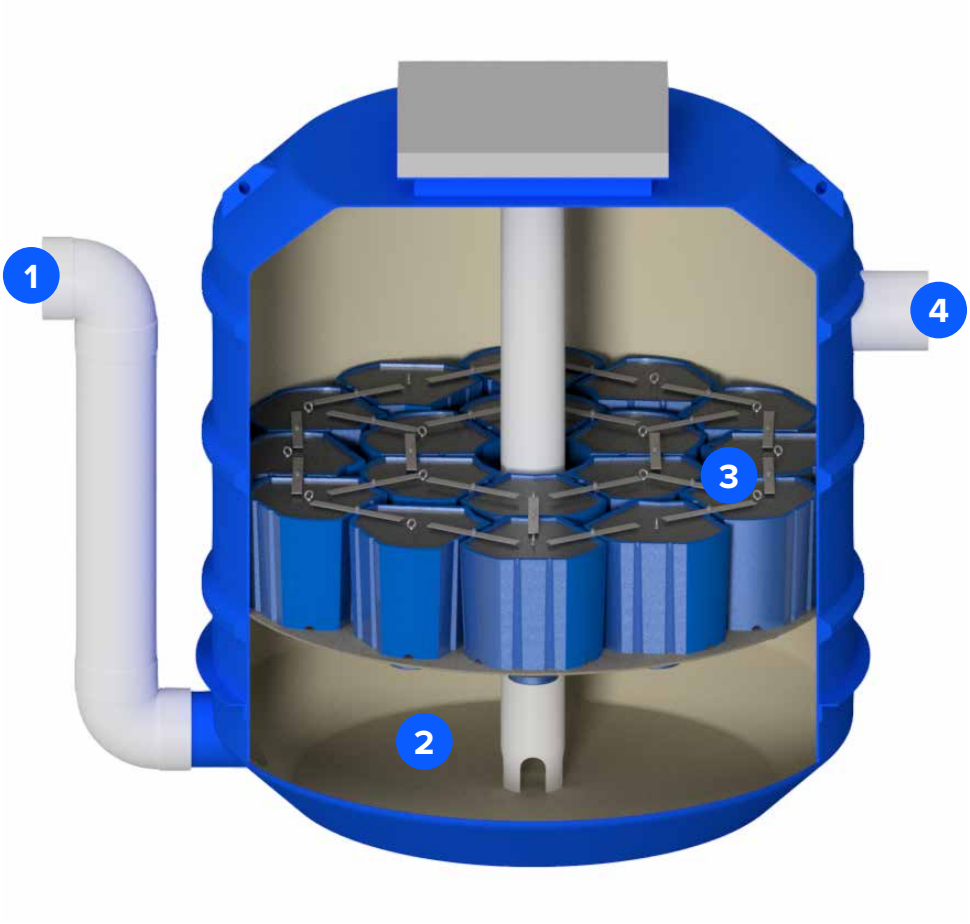
For your own safety, read all instruction manuals prior to working on equipment.

- Follow all “occupation, health and safety” regulations.
- Ensure maintenance personnel are aware of “Confined Spaces” guidelines, which must be followed.
- Make sure that there is sufficient oxygen and that there are no poisonous gases present.
- Check the explosion risk before wielding or using electric hand tools.
- Do not ignore health hazards. Observe strict cleanliness.
- Ensure that the lifting equipment (where required) is in good condition.
- All personnel who are to work with these systems should be vaccinated against diseases that can occur.
- Keep a first aid kit handy.

Maintenance should be carried out by a competent contractor in accordance with the above procedures.

Information contained in this manual is approximate and for general guidance only. In accordance with the companies policy of constant improvement and development Atlan Stormwater reserves the right to change the specification without prior notice.

HOW IT WORKS



1. Stormwater from the catchment flows into the FlowFilter through a PVC inlet pipe.
2. Heavy sediment is captured in the sump area.
3. The tank houses filter elements that operate using an up-flow process to filter out fine particles, while most dissolved pollutants are precipitated and adsorbed. The filter can be back-flushed from the top and is easy to replace if it becomes fully contaminated.
4. Clean water accumulates above the filter elements and exits through the outlet.

MAINTENANCE



FLOWFILTER MAINTENANCE SCHEDULE (POST COMMISSIONING)

This is a guide, every site differs and an individual maintenance plan will be provided by Atlan Stormwater.

QUARTERLY	ANNUALLY	5-7 YEARS
Visual Inspection Visually inspect the catchment, pretreatment and FlowFilter cartridges, and measure the depth of sediment and gross pollutants.	**Regular Clean** (As required) Use a vacuum truck to remove sump contents. **Note** Cleaning frequency may vary based on specific site conditions.	**Cartridge Replacement** (As required) As required typically 5 to 7 years, dependent on site specific pollutant loading and maintenance inspection results - as directed by Atlan maintenance technicians.

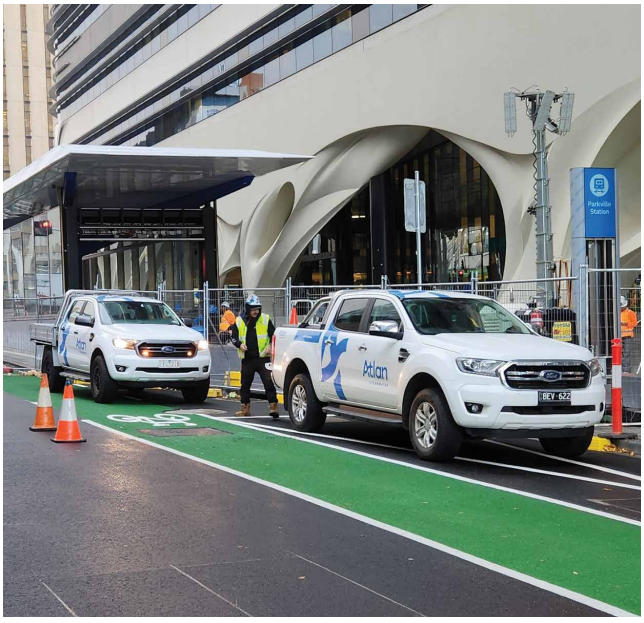
REQUIRED TOOLS AND MATERIALS

- Vacuum truck or submersible silt pump with hoses
- Power generator if connection to a power supply is not available
- High-pressure cleaner or flushing lance for connection to the pump
- Access tripod with 2 winches (for confined space access and filter exchange)
- Personnel harness
- Calibrated gas detector
- Additional safety observer / spotter
- Confined space documentation and safety check sheet

MAINTENANCE PROCEDURE

1. Position the access tripod above the opened shaft.
2. Check the air quality in the shaft using the gas detector and monitor constantly.
3. Evaluate the site and ensure that appropriate safety signage and notifications are in place, adhering to local and state regulations.
4. Remove the access cover and inspect the tank's interior, taking note of any residual water, the water's surface condition, and any visible contamination – use a water column sample to determine the water quality within.
5. Following confined space access OH&S protocol, remove all filters to allow access to the bottom of the FlowFilter. Proceed to extract water and solids from the sump of the tank.
6. Use clean water to back-flush all the filters individually, before they are reinstalled, ensuring the water flows across the full filter area. Continue back flushing each filter until the water runs clear. If the water doesn't pass through or run clear contact Atlan for replacement cartridges.
7. After flushing each filter, use the vacuum truck to remove the back flushed water from the sump.
8. Document all service data including photos of each step on Atlan inspection reporting forms.
9. Replace the access cover.
10. Remove all safety signage and notifications.
11. Based on this outcome, recommend a date for the next scheduled maintenance.





REMOVING FILTER ELEMENTS

1. Remove retaining brackets.
2. Hook the cable onto the filter lifting eye and lift the filter completely out of the shaft.

REPLACING FILTER ELEMENTS

1. Lower the filters into the shaft with the winch and push into seals.
2. Begin with the filters underneath the outlet pipe and then fasten the others.
3. Insert the retaining brackets when all filters have been reinstalled.

MAINTENANCE CHECK LIST

FLOWFILTER		
SITE DETAILS		
Service Date		
CHECKLIST	**YES/NO**	**COMMENTS**
Residual water in FlowFilter tank?		
Evidence of contamination?		
Sump water colour and turbidity.		
Filter checked for visible external damage?		
Filter elements cleaned?		
Filter elements replaced?		
Silt trap sucked out?		
SERVICE NOTES		
SIGN OFF		
Completed by		
Next service date		


SIENNA

Joy in water

‘We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.’

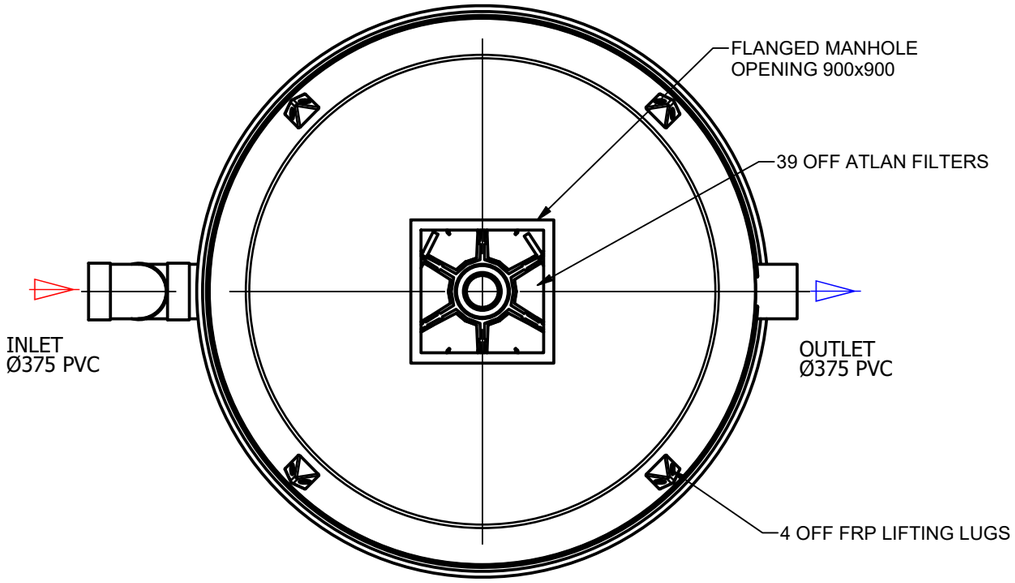
Andy Hornbuckle

Atlan®
STORMWATER

AUSTRALIA
100 Silverwater Rd, Silverwater NSW 2128 Australia
P 02 8705 0255 | sales@atlan.com.au | atlan.com.au

NEW ZEALAND
100 Montgomerie Road Airport Oaks Auckland
P: +64 9 276 9045 | sales@atlan.co.nz | atlan.co.nz

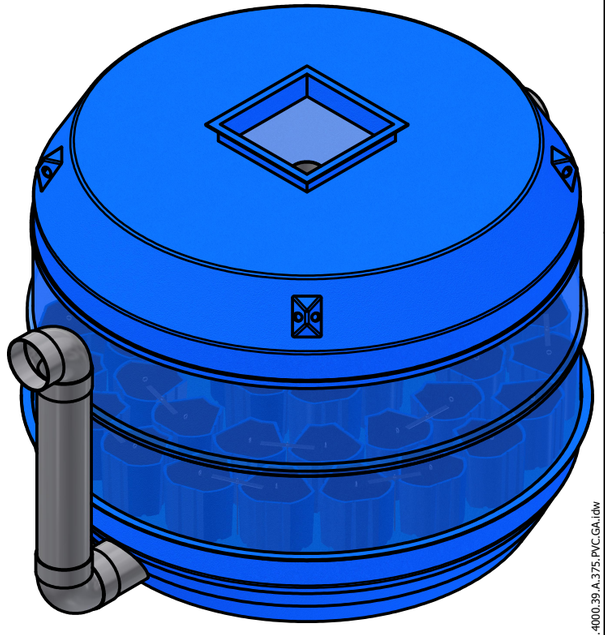
1024



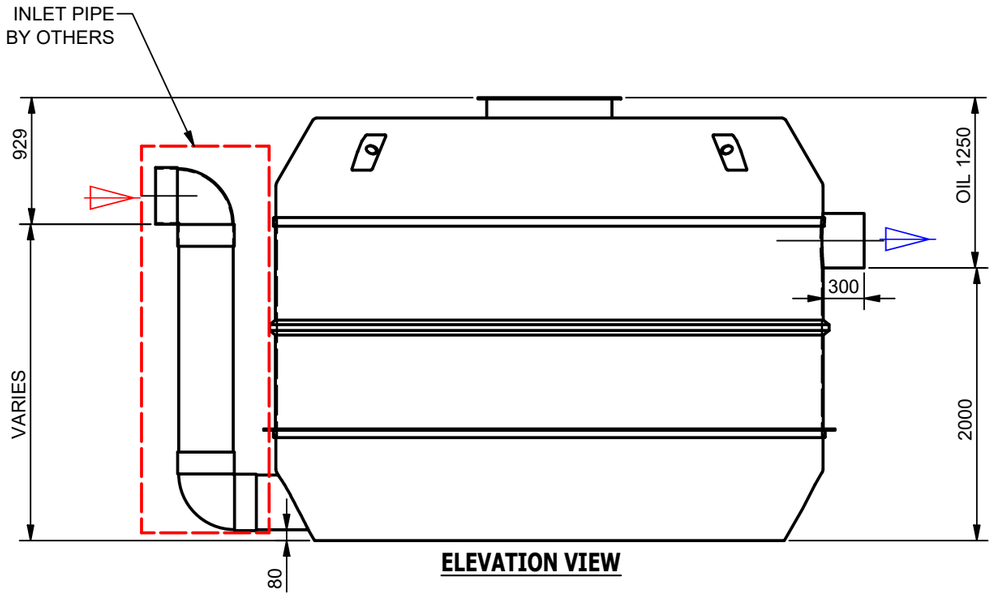
PLAN VIEW

Site Level Confirmation	
Finished Surface Level (FSL)	RL:
Access Cover Thickness	mm
Inlet Invert Level	RL:
Outlet Invert Level	RL:
Company:	
Name:	
Date:	

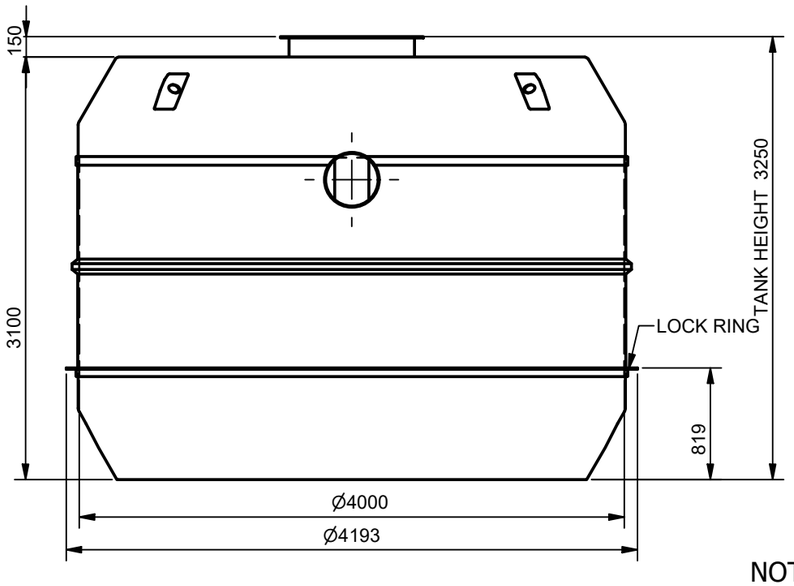
ISSUE FOR APPROVAL
NOT FOR CONSTRUCTION



ISOMETRIC VIEW



ELEVATION VIEW



END VIEW
OUTLET

NOTE:
- BYPASS PIPEWORK MUST HAVE AT LEAST 250 MM OF FALL TO OPERATE CORRECTLY.

TOLERANCE: All Dimensions to Closest 10 mm & +/- 30 mm

ALL INTERCONNECTING PIPEWORK, PITS AND ASSOCIATED DRAINAGE BY OTHERS

REV	DATE	BY	DESCRIPTION	CHK
1	30/09/2024	R.J.	INITIAL RELEASE	

CLIENT:

CONFIDENTIAL - The drawings must not be disclosed to any third parties without written permission from ATLAN STORMWATER . Unauthorised disclosure may result in prosecution.
© ATLAN STORMWATER - This drawing is the property of ATLAN STORMWATER ABN: 83 151 832 629 and is subject to return on demand. It is submitted for the use only in connection with the proposal and contracts of ATLAN STORMWATER with the expressed conditions that it is not to be reproduced or copied in any form. This data must only be used in accordance with our standard terms and conditions.
© Copyright
ATLAN STORMWATER accepts no responsibility for any loss or damage resulting from any person acting on this information. The details and dimensions contained in this document may change, please check with ATLAN STORMWATER for confirmation of current specifications.

Drawn	R.J.	Date 30/09/2024
Check		Date
Verified		Date
Approved		Date
Request No.		

Atlan STORMWATER

PROJECT :

TITLE
FLOWFILTER 4000
FLF.4000.39.A.375.PVC
FRP TANK 4000 DIA.- 39 FILTER CARTRIDGES
GENERAL ARRANGEMENT

SCALE	SIZE	SHEET	REV
N.T.S	A3	1	1

CUSTOMER CODE :
DWG No. FLF.4000.39.A.375.PVC.GA

C:\Users\smart\OneDrive\Documents\Vault\Designs\ATLAN\01 - STANDARDS\FLOWFILTER\4000 SERIES\FLF.4000.39.A.375.PVC\FLF.4000.39.A.375.PVC.GA.idw

APPENDIX C

STORMWATER QUANTITY - SENSITIVITY ANALYSIS

Economic Development Queensland
Level 14, 1 William Street
BRISBANE QLD 4000

Arcadis Australia Pacific Pty Ltd
On the Lands of the Turrbal
Level 35, 111 Eagle St
Brisbane QLD 4000
Tel. +61 7 3337 0000

www.arcadis.com

Subject: **Sensitivity Assessment of Imperviousness – 4499–4651 Mount Lindesay Highway, North Maclean QLD 4280**
Lot 39 on SP338781 | PDA Development Application for Warehouse and Low Impact Industry

Date: 29/05/2025

Dear EDQ Assessment Team,

This letter outlines the sensitivity assessment undertaken to address a variation in assumed imperviousness associated with the proposed development over part of Lot 39 on SP338781, located at 4499–4651 Mount Lindesay Highway, North Maclean. The application is made by CH Hydrangea Pty Ltd and seeks approval for a Development Permit for a Material Change of Use for a Warehouse (Distribution Centre) and Low Impact Industry. The proposed development will operate continuously and support warehousing, printing operations, and limited storage of dangerous goods. This site forms part of Stage 2 within the broader Flagstone Logistics Estate (FLE), subject to EDQ reference DEV2018/961/18.

Background

The site is located within catchment INTL4bii as defined under the EDQ-approved Site Based Stormwater Management Plan (SBSMP) prepared by Arcadis (Reference: EAG001-30109334-AAR, Rev 12). The SBSMP adopted a design imperviousness of 75% for water quantity management across the catchment. As part of the detailed design and refinement of the proposed development layout, a reassessment of impervious area was undertaken.

The recalculated imperviousness for the development site is approximately 95%, reflecting the built-form and hardstand areas required to support the intended distribution and industrial operations. This is higher than the value assumed under the approved master plan and therefore warranted further assessment.

Sensitivity Assessment

To quantify the potential impact of the increased imperviousness, the existing DRAINS model developed for the overarching FLE subdivision was modified to reflect the updated 95% imperviousness value for this sub-catchment. All other modelling parameters remained consistent with the original approved version.

The revised DRAINS model hydrographs were then incorporated into the broader TUFLOW hydraulic model used to assess regional stormwater performance. This was done to evaluate whether the increase in runoff would result in adverse hydraulic effects either within the site or downstream of it.

Findings

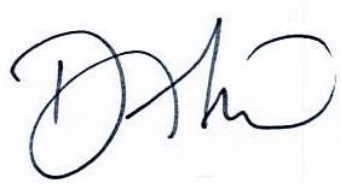
The hydraulic modelling indicates that the increase in impervious area from 75% to 95% does not result in any significant change to flood levels or flow distribution within the overall catchment. Key outcomes include:

- No increase in peak minor and major flood levels in adjacent or downstream areas;
- No increase in the extent of inundation or duration of flood events;
- Continued compliance with the overarching stormwater design strategy and regional objectives outlined in the Arcadis SBSMP.

Based on the results of this sensitivity assessment, the proposed development remains consistent with the intent and assumptions of the endorsed SBSMP. The variation in imperviousness does not compromise the regional stormwater management outcomes and is considered acceptable from a flooding perspective.

Should you require any further information, please don't hesitate to contact us.

Kind regards,
Arcadis Australia Pacific Pty Ltd



Darlan Castro
Associate Technical Director - CPEng, NER, RPEQ

Email: Darlan.Castro@arcadis.com
Direct Line: 07 55034822
Mobile: 0410720757

APPENDIX D

EDQ APPROVED SITE BASED STORMWATER MANAGEMENT PLAN BY ARCADIS

ARCADIS Design & Consultancy for natural and built assets

4499 – 4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Site Based Stormwater Management Plan (Quantity)

19 JUNE 2024



Incorporating Hyder

CONTACT



DARLAN CASTRO
Associate Technical Director

T + 61 7 5503 4822
M + 61 410 720 757
E darlan.castro@arcadis.com



GARY ELLIS
Technical Director

T + 61 7 3337 0859
M + 61 41 817 290
E gary.ellis@arcadis.com



THEA FANNING
Civil Engineer

T + 07 3337 0803
M + 61 405 972 982
E thea.fanning@arcadis.com

Arcadis
Level 35, 111 Eagle Street
Brisbane City, QLD 4000

CHARTER HALL PRIME INDUSTRIAL FUND 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Site Based Stormwater Management Plan (Quantity)

Author	Thea Fanning	
Checker	Brook Kitson	
Approver	Darlan Castro RPEQ 19918	
Report No	EAG001-30109334-AAR	
Date	19/06/2024	
Revision Text	12	

This report has been prepared for Charter Hall Prime Industrial Fund in accordance with the terms and conditions of appointment for 4499-4651 Mount Lindesay Highway – North Maclean – Civil Engineering dated 18/10/2021. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
01	30/09/2022	DRAFT Issue	TF	DC
02	14/10/2022	Issue for Approval	TF	DC
03	06/02/2023	Response to RFI	TF	DC
04	22/02/2023	Amended Southern Basin Outlet	EP	DC
05	23/06/2023	Response to Peer Review Comments	TF/DC	DC
06	04/07/2023	Table 5-9 Updated	TF	DC
07	06/07/2023	Weir Width Updated and Inundation Curve Added	TF	DC
08	03/08/2023	Overall Site Layout Updated	TF	DC
09	15/08/2023	ROL Update	TF	DC
10	16/02/2024	ROL Update	TF	DC
11	27/02/2024	Fixed Appendix D Missing Flood Maps	TF	DC
12	19/06/2024	Updated Eastern Channel Drainage Strategy	TF	DC

CONTENTS

1 EXECUTIVE SUMMARY 2
1.1 Revision 03 3
1.2 Revision 05 3
1.3 Revision 08 3
1.4 Revision 09 3
1.5 Revision 10 3
1.6 Revision 11 4
1.7 Revision 12 4

2 INTRODUCTION 5

3 SITE CHARACTERISTICS 6
3.1 Site Description 6
3.2 Existing Land Usage 6
3.3 Existing Topography and Site Drainage 7
3.4 Existing Approval 8
3.5 Geotechnical Investigation 9
3.6 Flooding 10
3.7 Existing and Planned Stormwater Infrastructure 10

4 DISCHARGE LOCATIONS 12
4.1 Pre-Developed Discharge Characteristics 12
4.2 Proposed Discharge Characteristics and Objectives 12

5 HYDROLOGICAL ASSESSMENT 13
5.1 Temporal Patterns 13
5.2 Preburst Data 13
5.3 Catchment Analysis 14
5.4 Model Verification 18
5.5 Drainage Strategy 19
5.6 Detention Sizing 20
5.6.1 Allotment Detention 20
5.6.2 Southern Detention Basin 22
5.6.3 22
5.6.4 Northern Detention Basin 23
5.6.5 Conveyance Channel 23

6 HYDRAULIC ASSESSMENT 24
6.1 Methodology 24
6.2 Objectives 24
6.3 Model Set Up and Adopted Data 24
6.3.1 Hydrology 24

6.3.2 Boundary Conditions 25
6.3.3 Grid Size 26
6.3.4 Manning's Values 26
6.3.5 Existing Downstream Drainage Infrastructure 26
6.3.6 Planned Upstream Drainage Infrastructure 26
6.3.7 Existing Model Scenario 27
6.3.8 Developed Model Scenario 27
6.4 Assumptions and Limitations 27
6.4.1 Key Limitations 27
6.4.2 Key Assumptions 27
6.5 Model Results 27
6.5.1 Flood Depths 27
6.5.2 Peak Water Surface Level Change 30
6.5.3 Peak Velocities 31
6.5.4 Blockage Sensitivity 33
6.5.5 Regional Flood Sensitivity 34
6.5.6 Historical Flood Sensitivity 34
6.6 Objective Discussion 38
6.7 Drainage System Safety 38
7 CONCLUSION 39

APPENDICES

APPENDIX A

Site Layout Plan

APPENDIX B

Engineering Drawings and Site Topography

APPENDIX C

Existing Decision Notice Approval

APPENDIX D

TUFLOW Mapping

APPENDIX E

Stormwater Drainage Safety Audit

1 EXECUTIVE SUMMARY

Arcadis has been engaged by Charter Hall Prime Industrial Fund to prepare a Site Based Stormwater Management Plan (Quantity) (SBSMPQ) for the proposed industrial development, situated at 4499-4651 Mount Lindesay Highway, North Maclean. The site is located in the Greater Flagstone Priority Development Area located within the Logan City Council local government area. On 21 September 2021, the Minister for Economic Development Queensland (EDQ) granted approval for a PDA development application over the site for a Development Permit for Reconfiguring a Lot – 1 into 4 lots, plus roads and open space. On 27 September EDQ granted approval for an amendment to the previous Reconfiguring a Lot application (DEV2018/961/8). The new approval was for reconfiguring a lot - one (1) lot into eleven (11) lots and new roads and open space.

This report demonstrates the proposed development will be constructed and operated in accordance with the requirements of Council, the South-East Queensland State Planning Policy (SPP), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM) Economic Development Queensland (EDQ) PDA guidelines and the Environmental Protection (Water) Policy (2009). This report also demonstrates the proposed amendment will not result in substantially different development to the existing approval.

The primary objective of this SBSMPQ is to ensure that:

1. Suitable measures are incorporated into the development to ensure that there are no adverse impacts to downstream receiving waterways, property or infrastructure resulting from any increase to stormwater runoff peak flow rates.

This report therefore includes hydraulic and hydrological modelling which demonstrate, that due to change in stormwater catchment parameters, there is an increase in peak flow rate during the post development scenario. Subsequently, three regional detention structures have been proposed and designed in conjunction with numerous on-site detention systems for Lots 2 - 5 such that flow rates discharged from the development site are no greater than the corresponding catchment existing peak flow rates at the proposed points of interest, from 50% to 1% Average Exceedance Probability (AEP) storm events.

The impact of the proposed development against the existing condition at the areas immediately downstream and upstream of the site have been assessed using TUFLOW. The assessment considers the changes and if they would cause corresponding changes to the existing flood behaviour and thereby would cause any actionable nuisance.

In assessing the area constraints and the flood characteristics surrounding the site, Arcadis assigned a 2m grid size to the TUFLOW model, with resulting increased accuracy of the results in flood sensitive areas compared to larger grid sizes. Results from the model were assessed for peak water surface level afflux between the existing and developed scenarios.

This report presents the methodology and results of a flood modelling assessment which has included the analysis of the impacts of the proposed development in comparison to the existing scenario. In particular, this assessment has focused on the impact immediately upstream and downstream of the site where complex flood behaviour, with flows currently draining through private properties, is present.

Results indicate that the proposed development will generally improve flood conditions downstream of the site by applying the reduction of site stormwater discharge via the proposed detention systems and augmenting the proposed earthworks to allow adequate flood storage and conveyance through the site.

Note: The proposed operational stormwater quality treatment train is detailed in the Site Based Stormwater Quality Management Plan (SBSQMP) (EAG003-30109334-AAR-01).

1.1 Revision 03

Revision 03 of this report was prepared in response to the Information Request received from EDQ via email on 22 November 2022, related to the Compliance Assessment for Condition 21 of the Decision Notice received for the PDA Development Permit for reconfiguring a lot – 1 lot into 4 lots, plus roads and open space. Specifically includes changes to the Western Swale configuration to reduce clearing impacts within the 25m buffer.

1.2 Revision 05

Revision 05 of this report has been prepared in response to the comments received from Water Tech following their peer review of this report, as well as the Further Clarification Request received from EDQ on 31 March 2023 related to the Compliance Assessment for Condition 21 of the Decision Notice received for the PDA Development Permit for reconfiguring a lot – 1 lot into 4 lots, plus roads and open space.

1.3 Revision 08

The Overall Site Layout in Appendix A has been updated for Revision 08 of this report. The Overall Site Layout has been updated to reflect the adjustment to the northern site boundary which has been realigned to reflect the minimum 11m clear zone required by Council for safety purposes pertaining to the proposed upgrade of Crowson Lane. This has adjusted the size of Lots 1 and 4.

The above change results in a minor reallocation of land from the allotment catchments to the Crowson Lane catchments. No changes have been made to the modelling undertaken as part of this report as the change is considered negligible in relation to the catchment as a whole and the modelling undertaken is more conservative.

Revision 08 of this report was submitted to EDQ as part of the Compliance Assessment for Condition 21 of the Decision Notice received for the PDA Development Permit for reconfiguring a lot – 1 lot into 4 lots, plus roads and open space.

1.4 Revision 09

Revision 09 of this report has been prepared to support the amended ROL application, increasing the number of proposed allotments from four (4) to eleven (11) and new roads, consisting of five super lots and six auxiliary lots, comprising drainage, open space and a sewer pumpstation. The proposed amendments to the existing ROL development approval do not result in substantially different development from either a stormwater management or a flooding perspective. No changes were made to the DRAINS or TUFLOW models as a result of this amendment.

1.5 Revision 10

Revision 10 of this report has been prepared in response to detailed design of the allotments, adjusting the stormwater catchments referred to as INTNL-2R, INTNL-2B, INTNL-2C and INTNL-3C with respect to size and direction of flow. INTNL-2B and INTNL-2R was reduced in size. INTNL-3C changed configuration. INTNL-2C increased in size and was divided into three sub-catchments with minor flows directed to the channel. The major and minor flows were divided for these three catchments to direct the minor flows through a longer travel path (passes through two weir structures within the channel), in order to create a non-worsening effect on the downstream properties, east of Mount Lindesay Highway during the 0.5EY storm event. DRAINS and TUFLOW modelling and reporting have been updated accordingly.

1.6 Revision 11

Revision 11 of this report has been prepared to include the missing Flood Maps from Appendix D.

1.7 Revision 12

Revision 12 of this report reflects the changes to the Eastern Channel drainage strategy. The weirs (Weir 01 and 02) and bund previously proposed for the Eastern Channel have been removed to allow the channel to drain in a timely manner. This results in a minor increase in flows downstream of the development site during the 0.5EY storm event; however, it has been demonstrated that such afflux is minor and corresponds to an inundation reduction where viewed in the context of historical earthworks which were undertaken south of the development site.

Minor changes have been made to the internal sub-catchments and allotment detention as details of the final land use and topography have emerged.

2 INTRODUCTION

Arcadis has been engaged by Charter Hall Prime Industrial Fund to prepare a Site Based Stormwater Management Plan (Quantity) (SBSMPQ) for the proposed industrial development, situated at 4499 - 4651 Mount Lindesay Highway, North Maclean. The site is situated within the Greater Flagstone Priority Development Area (PDA) located within the Logan City Council (LCC) local government area.

On 21 September 2021, the Minister for Economic Development Queensland (EDQ) granted approval for a PDA development application over the site for a Development Permit for Reconfiguring a Lot – 1 into 4 lots, plus roads and open space. On 27 September EDQ granted approval for an amendment to the previous Reconfiguring a Lot application (DEV2018/961/8). The new approval was for reconfiguring a lot - one (1) lot into eleven (11) lots and new roads and open space. The proposed amended ROL layout is shown in Figure 2-1, below.

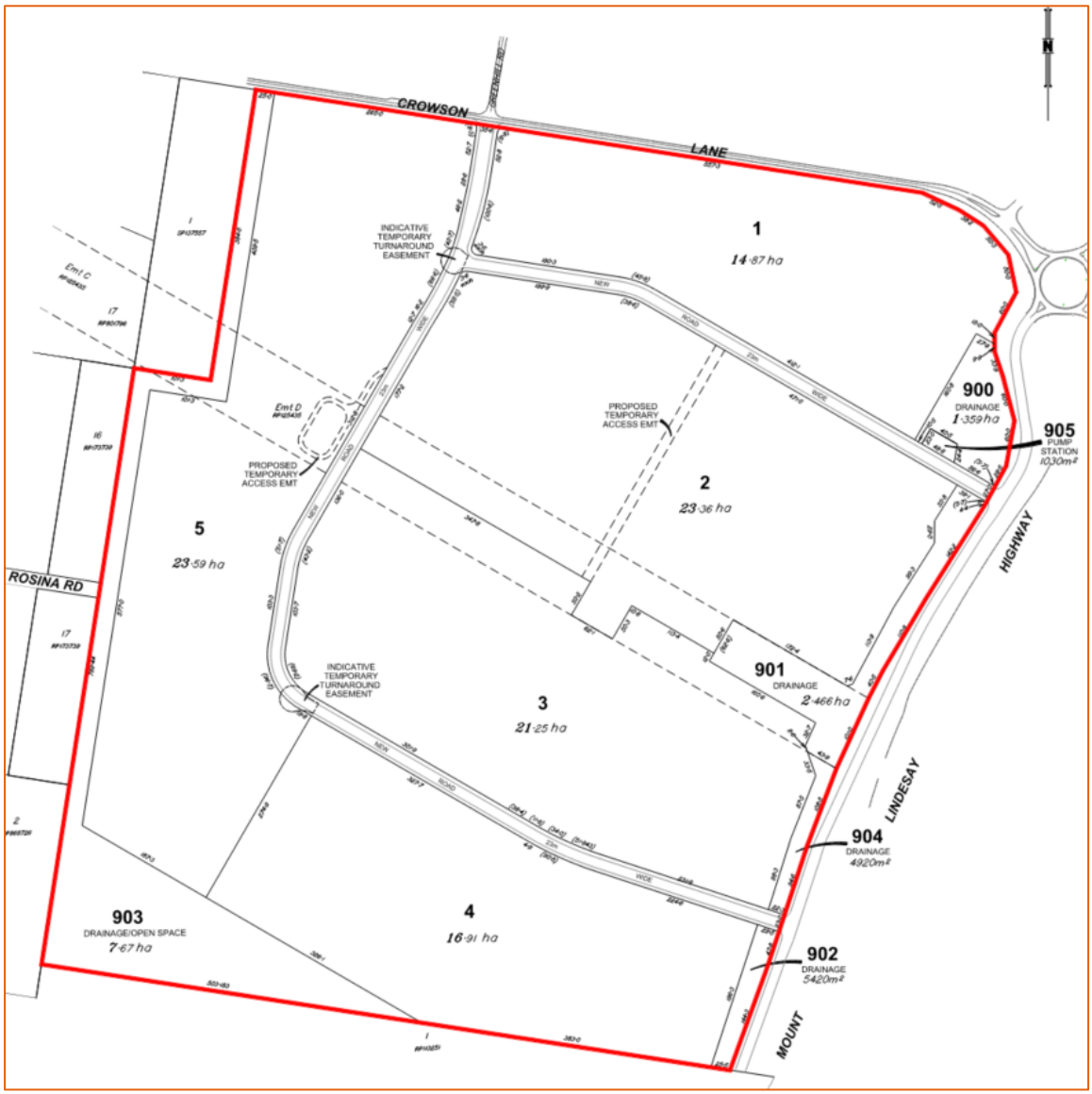


Figure 2-1 – Approved Amended ROL Layout (Source: Wolters, August 2023)

The following report demonstrates the proposed development will be constructed and operated in accordance with the Queensland State Planning Policy (SPP 2017), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM), Economic Development Queensland (EDQ) PDA guidelines and the Environmental Protection (Water) Policy (2009) with respect to the attenuation of stormwater runoff. This report also demonstrates the proposed amendment will not result in substantially different development to the existing approval.

3 SITE CHARACTERISTICS

3.1 Site Description

The subject site is located within Logan, South-East Queensland, Australia on the following lot:

- Lot 39 on SP258739 (4499-4651 Mount Lindesay Highway, North Maclean)

The site in generally bounded by the following co-ordinates (GDA94 / MGA zone 56)

- South-West: 500708, 6928700
- North-East: 501974, 6929628

The proposed area for the development is approximately 117.9ha.

3.2 Existing Land Usage

The site is predominantly vegetated with cleared areas relating to the existing residential dwelling and associated land use and High Voltage Electrical Power transmission lines and towers.

The site currently has direct property frontage to Mount Lindesay Highway to the east, predominantly trees and vegetation to the south and rural residential developments to the north and west. A MEDQ Approved context plan published 10 September 2021 includes the subject site. The site is approved for specific land use "*Industry and Business Zone*" with overlay for indicative future bio-diversity corridor. An existing high voltage easement running through the site from the south into the existing rural residential dwelling to the north. A further high voltage (275kV) easement runs through the site within the cleared area.

A site locality plan is provided in Figure 3-1 below:

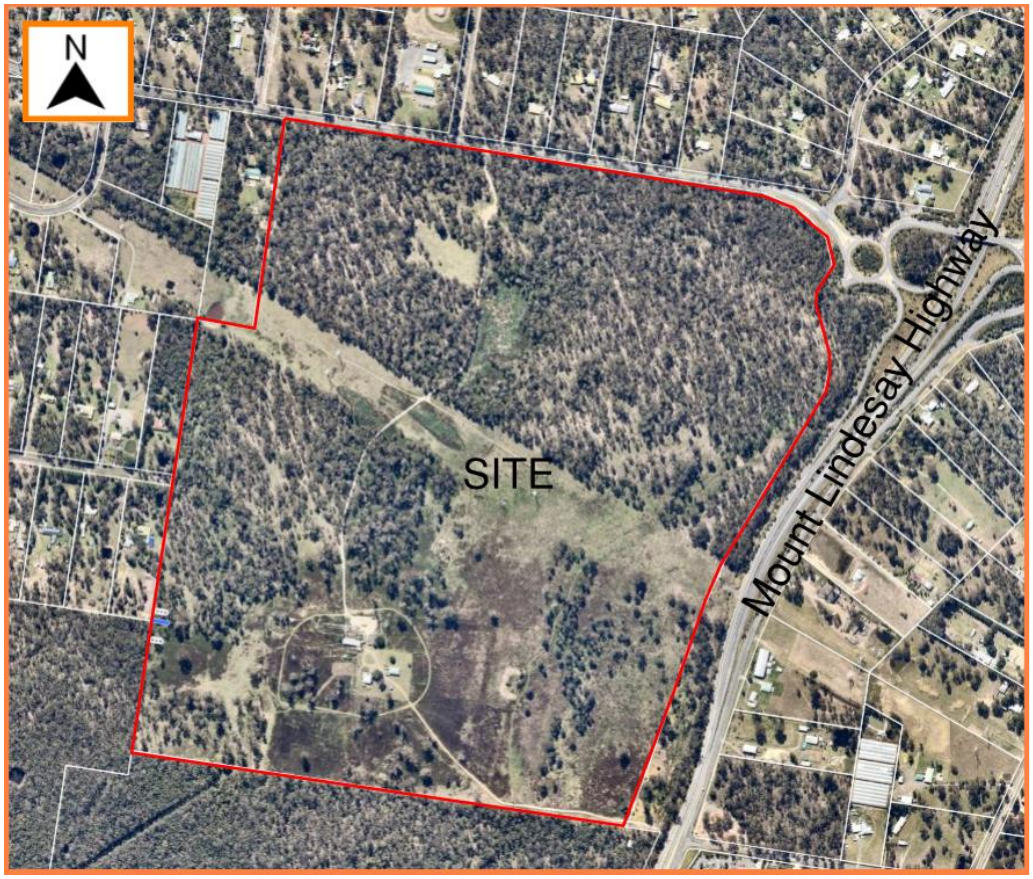


Figure 3-1- Development Locality Plan (Source: NearMap, June 2022)

3.3 Existing Topography and Site Drainage

In its current state, a ridge traverses the development site from the north-western corner to the southern site boundary, with further undulations dividing the site into three sub-catchments, as shown in Figure 3-2. The northern catchment slopes east at an average of 2% from RL44.0 to a culvert with a minimum invert level of RL20.90 which allows flows to pass beneath Mount Lindesay Highway to the opposite side. From here, water is ultimately discharged east of Mount Lindesay Highway towards the Logan River located approximately 1.1km east of the site.

The western portion of the site slopes south from RL44.0 to RL26.5 at an average grade of 1.6%. An overland flow path commences in this portion of the site, exiting the site across the southern boundary before re-entering the site in the east through the third catchment area. The overland flow path flows north-east to the abovementioned culverts. The third catchment area site also slopes to this culvert at an average grade of 1.2%.

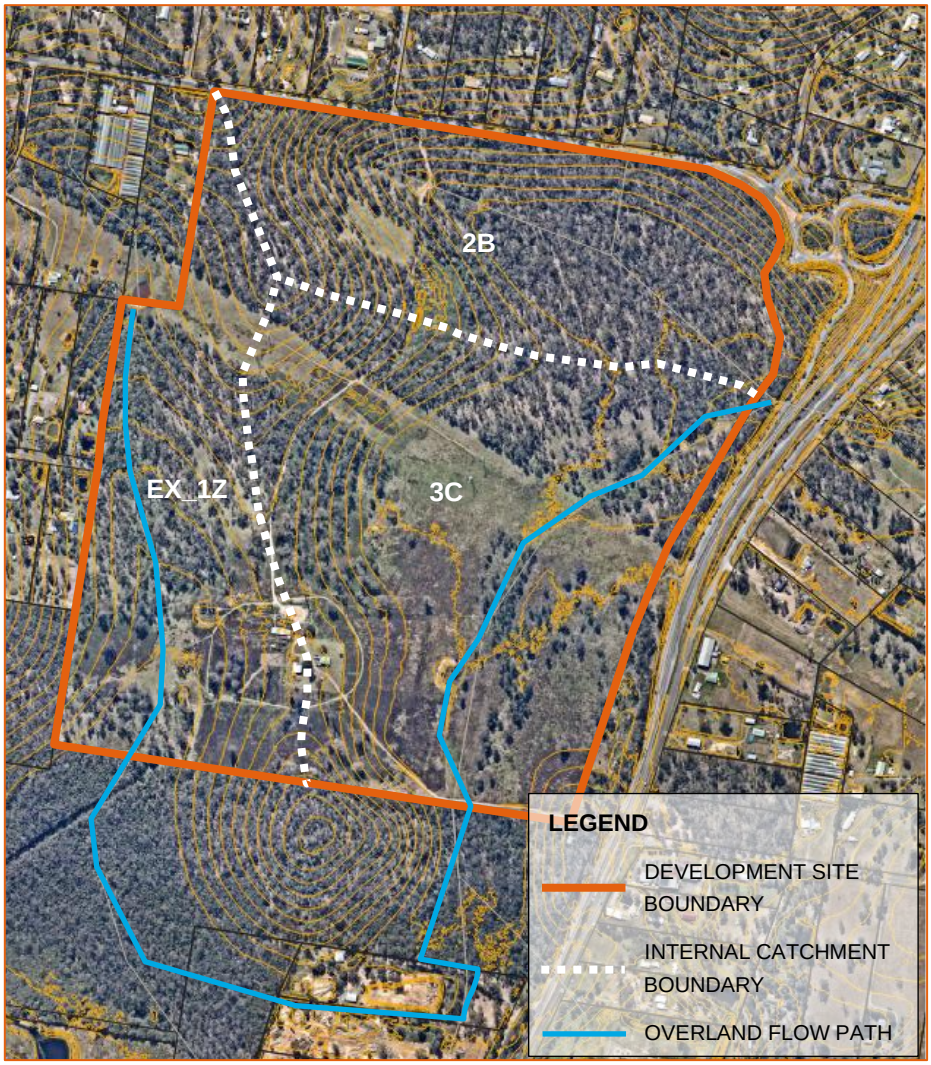


Figure 3-2- Internal Catchment Plan (Source: NearMap, June 2022)

Stormwater runoff from upstream external catchments enter the site from the north, south and west. The extent of the external catchments is shown in Figure 3-3.

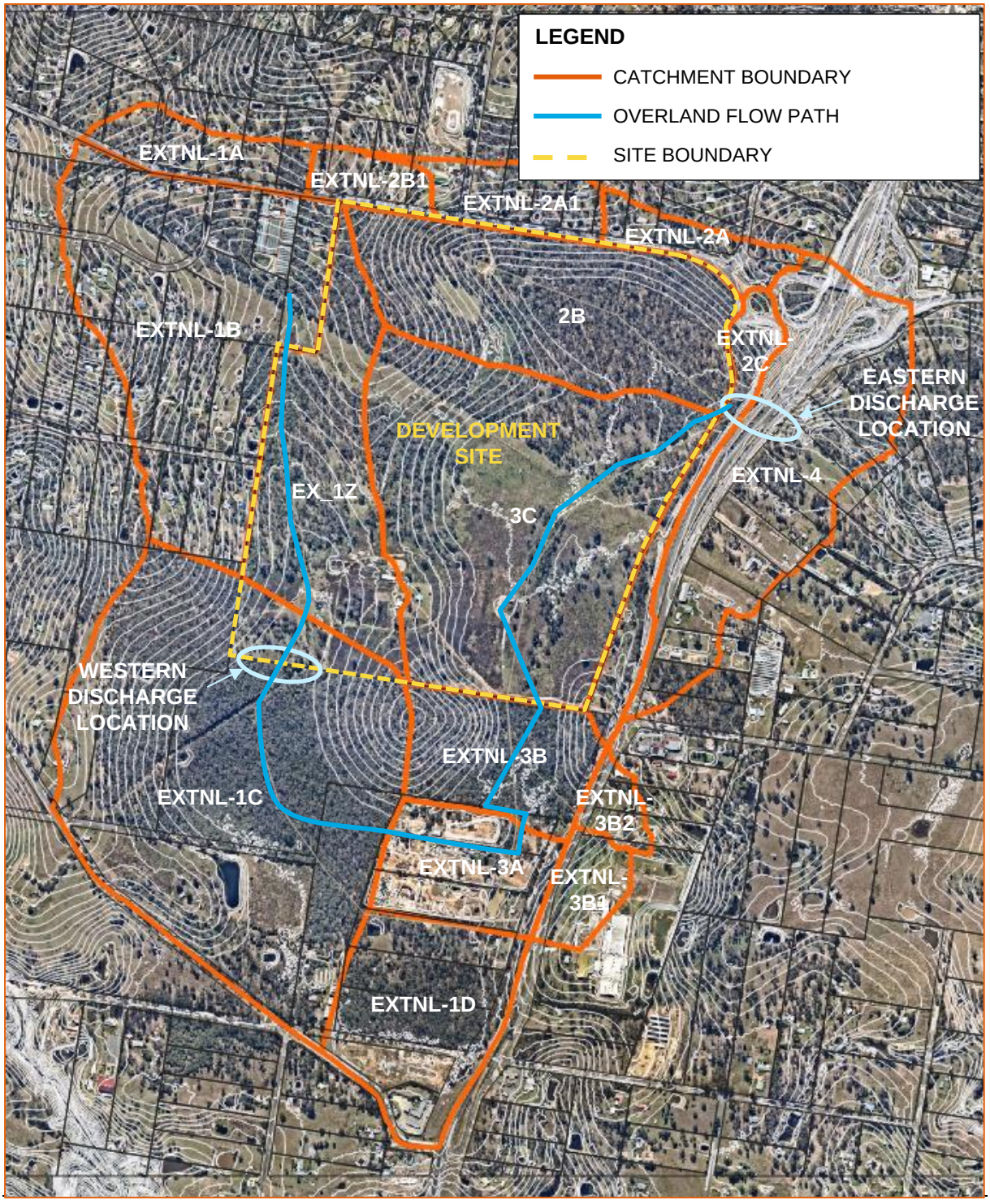


Figure 3-3: Existing Catchment Plan

3.4 Existing Approval

It is understood that the existing EDQ approval (DEV 2018/961/8) over the site is for a reconfiguring a lot – 1 lot into eleven (11) lots, plus roads and open space. As part of this approval key services to support the development were identified with associated works including:

- Construction of a service road along the western side of the Mount Lindesay Highway accessed via the existing Crowson Lane / Mount Lindesay Highway off ramp roundabout;

- Construction of a trunk rising sewer main running through the existing electrical main of the proposed development, ending at Greenbank Road.
- Connection to existing potable water mains along Crowson Lane and the Mount Lindesay Highway
- Proposed stormwater infrastructure;
- Construction of internal roads; and
- Proposed connection to existing underground electrical and telecommunication services along Crowson Lane and the Mount Lindesay Highway.

Further details on the works associated with the adjacent property approval can be found within the relevant Decision Notice attached within Appendix C. The approved EDQ Structure Plan is shown below in Figure 3-4 below.

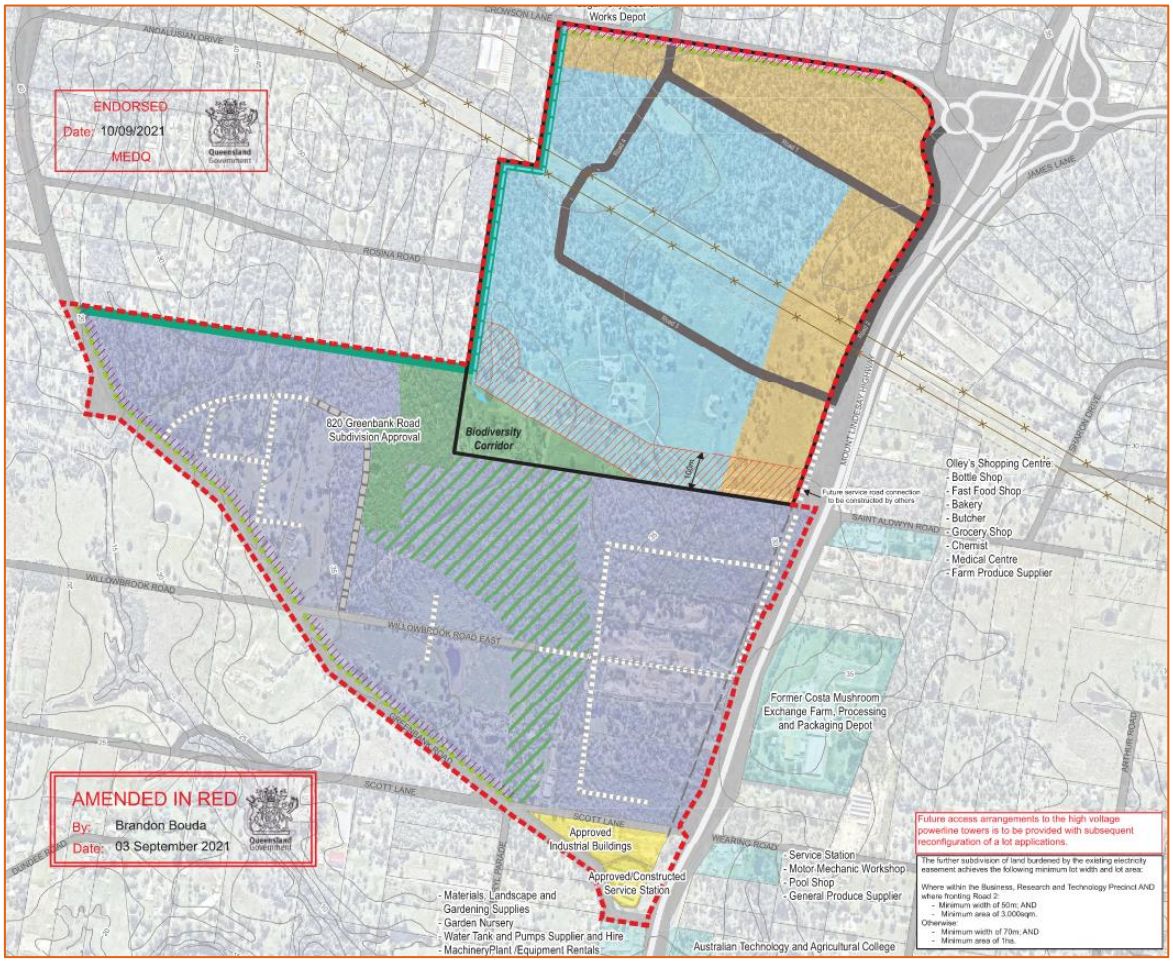


Figure 3-4- North Maclean Enterprise Context Plan (Source: Reel Planning, September 2021)

3.5 Geotechnical Investigation

A geotechnical investigation was completed separately by Protest Engineering in October 2021. Borehole testing revealed the ground profile generally comprises of silty sand (Emerson Class 6) up to 0.6m depth, overlaying silty/sandy clay up to 4m depth followed by low to high strength sandstone. Groundwater was not encountered during the investigation; however, Protest Engineering noted that groundwater levels can be seasonal and fluctuate during and after heavy rainfall events. Refer to Protest Engineering Report PTP/07651-0001-Rev3 for further details.

3.6 Flooding

A review of LCC's Flood Hazard Tigger Overlay Map (OM-05) revealed that the site is identified as a Flooding and inundation area with a large portion of the site being prone to flooding. Figure 3-5 below shows LCC's Flood Hazard Overlay for the site. Detailed flood modelling has been undertaken to ensure modifications to the overland flow path does not have adverse impacts on properties upstream or downstream of the development site. The overland flow path has also been modified to include adequate storage of flows from the eastern developed catchment to ensure flows discharged from the development site do not exceed pre-development flows.

It is noted that the Logan City Council riverine flood modelling and flood overlay mapping is reflective of the previous natural ground levels and not the current approved finish surface levels (bulk earthworks) across the subject land. Arcadis have prepared a supplementary memo titled *Flagstone Estate: LCC TLPI No 1/2023 Response – Flood Overlay Code* dated 1 March 2024, which includes updated flood risk mapping in accordance with the Logan City Council Planning Scheme Policy. Reference should be made to this document for details of the revised flood mapping applicable to the development.

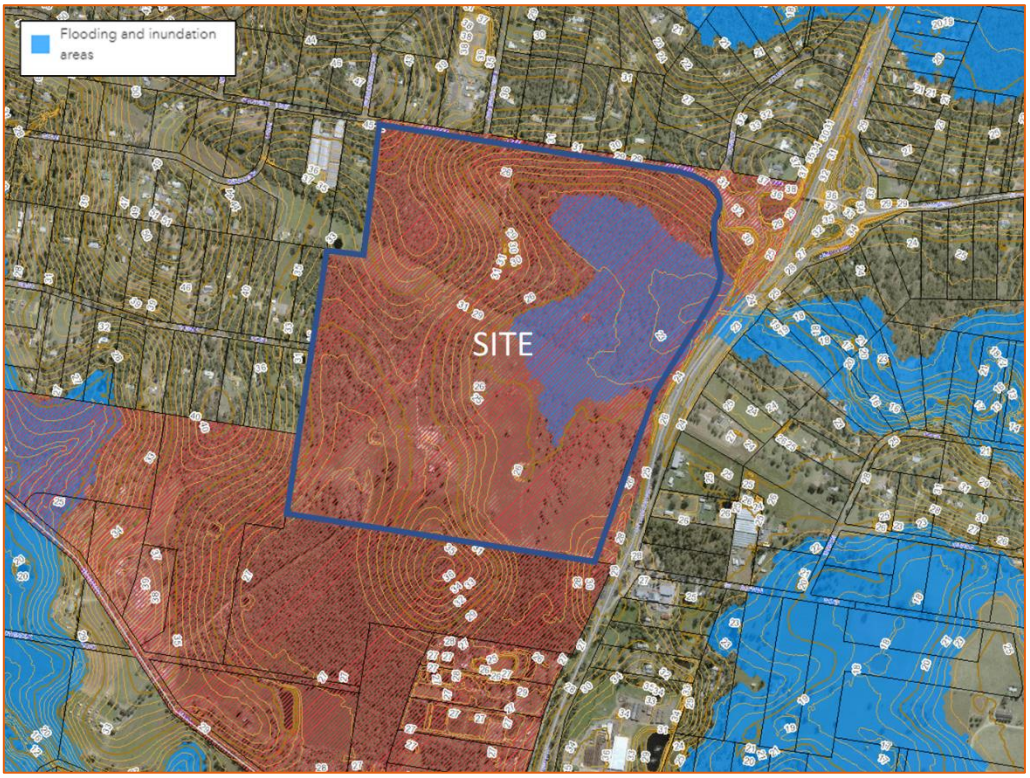


Figure 3-5- Flood Hazard Overlay (Source: Logan City Council, June 2022)

3.7 Existing and Planned Stormwater Infrastructure

Limited stormwater drainage infrastructure is present within the vicinity of the development site. A set of culverts is situated near the eastern property boundary discharging stormwater under the Mount Lindsay Highway and ultimately towards the Logan River located approximately 1.1km east of the site. The culverts comprise two 1.75m high, 2.1m wide reinforced concrete box culverts at RL21.09m AHD, between which sit two 1.75m high, 2.1m wide reinforced concrete box culverts at RL20.90m AHD

Smaller culverts are present within Crowson Lane, directing stormwater runoff from the northern upstream catchments beneath the road and discharging into the subject site. The pipes vary in size from approximately 375mm dia to 4 x 675mm dia.

Crowson Lane and the adjacent streets are to be upgraded by Logan City Council in the near future. The proposed stormwater drainage upgrades are shown in Figure 3-6 below and in Appendix B.

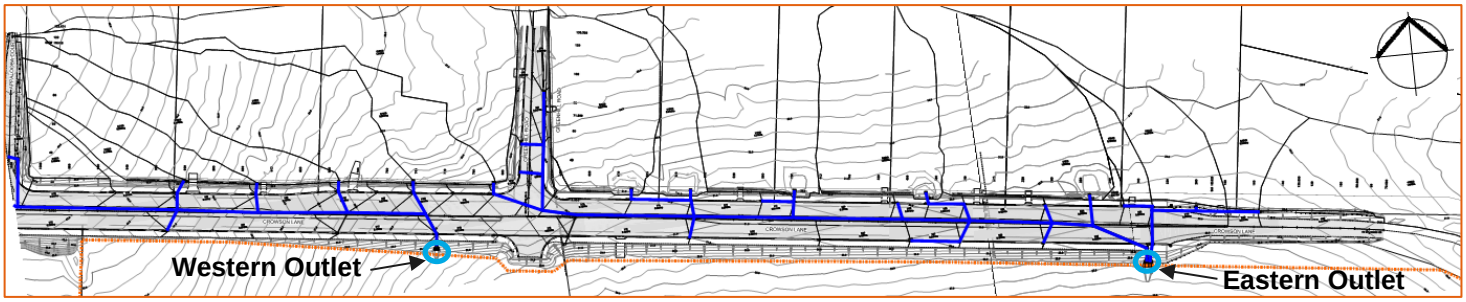


Figure 3-6- Proposed Crowson Lane Stormwater Drainage Upgrade (Source: Logan City Council, August 2022)

Following the proposed stormwater drainage upgrades, the Crowson Lane piped network will discharge flows into the development site at two locations, circled in the figure above. The western discharge pipe is 1050mm dia. The eastern outlet consists of two pipes – a 1350mm dia pipe and a 900mm dia pipe.

The proposed internal drainage network has been designed to convey the developed flows associated with Crowson Lane upgrade through the site to the legal point of discharge.

4 DISCHARGE LOCATIONS

4.1 Pre-Developed Discharge Characteristics

As previously outlined in this report, the site in its pre-developed state consists of multiple catchments, discharging via concentrated flows into either local flood plain area to the south (Catchment EX_1Z) (referred to as “Southern Discharge Location” in Figure 3-3) and/or ultimately to the highway infrastructure to the east (Catchments 2B and 3C) (referred to as “Eastern Discharge Location” in Figure 3-3).

4.2 Proposed Discharge Characteristics and Objectives

The proposed development will retain the existing discharge locations, as marked on Figure 3-3 and Figure 5-1. To comply with the requirements of Council, the Queensland State Planning Policy (SPP 2017), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM) and the Environmental Protection (Water) Policy (2009), the following primary objectives are to be achieved:

- Suitable measures are incorporated into the development to ensure that there are no adverse impacts to downstream receiving waterways, property or infrastructure resulting from any increase to stormwater runoff peak flow rates; and
- waterway flow management measures are implemented to ensure no adverse stability impacts to downstream receiving unlined waterways;

For all standard Average Exceedance Probability (AEP) design events attenuation is proposed for the 4499 - 4651 Mount Lindesay Highway, North Maclean development. The site assessment will demonstrate compliance with LCC Policy by discharging pre-detained 50%, 20%, 10%, 2% and 1% AEP flows to the points of interest.

5 HYDROLOGICAL ASSESSMENT

The hydrological assessment presented in this report has been undertaken in accordance with the methodology documented in the Australian Rainfall & Runoff 2019. This methodology replaces the Average Variability Method (AVM) temporal patterns of ARR1987 with a fundamentally changed ensemble approach (i.e. 10 temporal distributions per storm duration). This methodology also uses the updated design rainfall inputs sourced from the AR&R (2019) data hub.

5.1 Temporal Patterns

Rainfall Intensities Frequency Duration data were obtained from The Bureau of Meteorology (http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016). The Latitude and Longitude of used for the site is summarised in Table 5-1 below.

Table 5-1 Site Latitude & Longitude

Parameter	Value
Latitude	-27.761
Longitude	153.013

5.2 Preburst Data

Preburst depths and ratios were obtained from the Australian Rainfall and Runoff Data Hub for the coordinates shown in the table above. The preburst depths are listed in Table 5-2.

Table 5-2 Preburst Depths (mm)

Duration (hour)	% AEP					
	50	20	10	5	2	1
1	0.4	2.9	4.6	6.2	7.6	8.7
1.5	0.1	1.3	2.1	2.8	11.4	17.7
2	0.1	2.5	4.1	5.6	12.5	17.7
3	0.3	2.2	3.4	4.6	16.7	25.8
6	0	2.6	4.4	6	16.1	23.6
12	2.5	8.9	13.2	17.3	24	29.1
18	0.6	8.2	13.3	18.1	23.4	27.4
24	0	5.2	8.6	11.9	16.2	19.4
36	0	2.3	3.9	5.4	12.1	17.1
48	0	0.9	1.5	2.1	6.9	10.4
72	0	0	0	0	2	3.4

5.3 Catchment Analysis

As previously discussed, the development site drains to two points of interest (Western Discharge Location and Eastern Discharge Location). The development site has been assessed under the following two scenarios:

- **Pre-development Scenario** – Site and external catchment in their current state. The pre development scenario also includes the proposed upgrades to Crowson Lane and Eastern Trunk service road. As all the catchments modelled in this scenario have a rural/rural residential land use, the RAFTS method has been adopted as the most appropriate method to model the catchments.
- **Mitigated Scenario** – The proposed industrial development (divided into the catchments shown in Figure 5-1) with the calculated detention infrastructure in place and no changes to the external catchment areas. The RAFTS method has continued to be used to model the external catchments in the mitigated scenario. The ILSAX method has been used to model the industrialised internal catchments.

The scenarios listed above have been modelled in TUFLOW to assess the impact on the properties upstream and downstream of the site boundaries beyond identified points of interest. The catchments were first modelled in DRAINS with the hydrographs exported and imported into TUFLOW. This methodology ensures that peak flow concentrations from the catchments are assessed and mitigated appropriately.

Table 5-3 and Table 5-4, below, list the loss parameters adopted in DRAINS for the RAFTS and ILSAX models. The pervious initial and continuing losses were sourced from the AR&R Data Hub.

Table 5-3 RAFTS Initial and Continuing Losses

Parameter	Initial Loss (mm)	Continuing Loss (mm/h)
Impervious Area	1	0
Pervious Area	26	1.9

Table 5-4 ILSAX Depression Storage

Parameter	Depression Storage (mm)
Impervious Area	1
Pervious Area	5

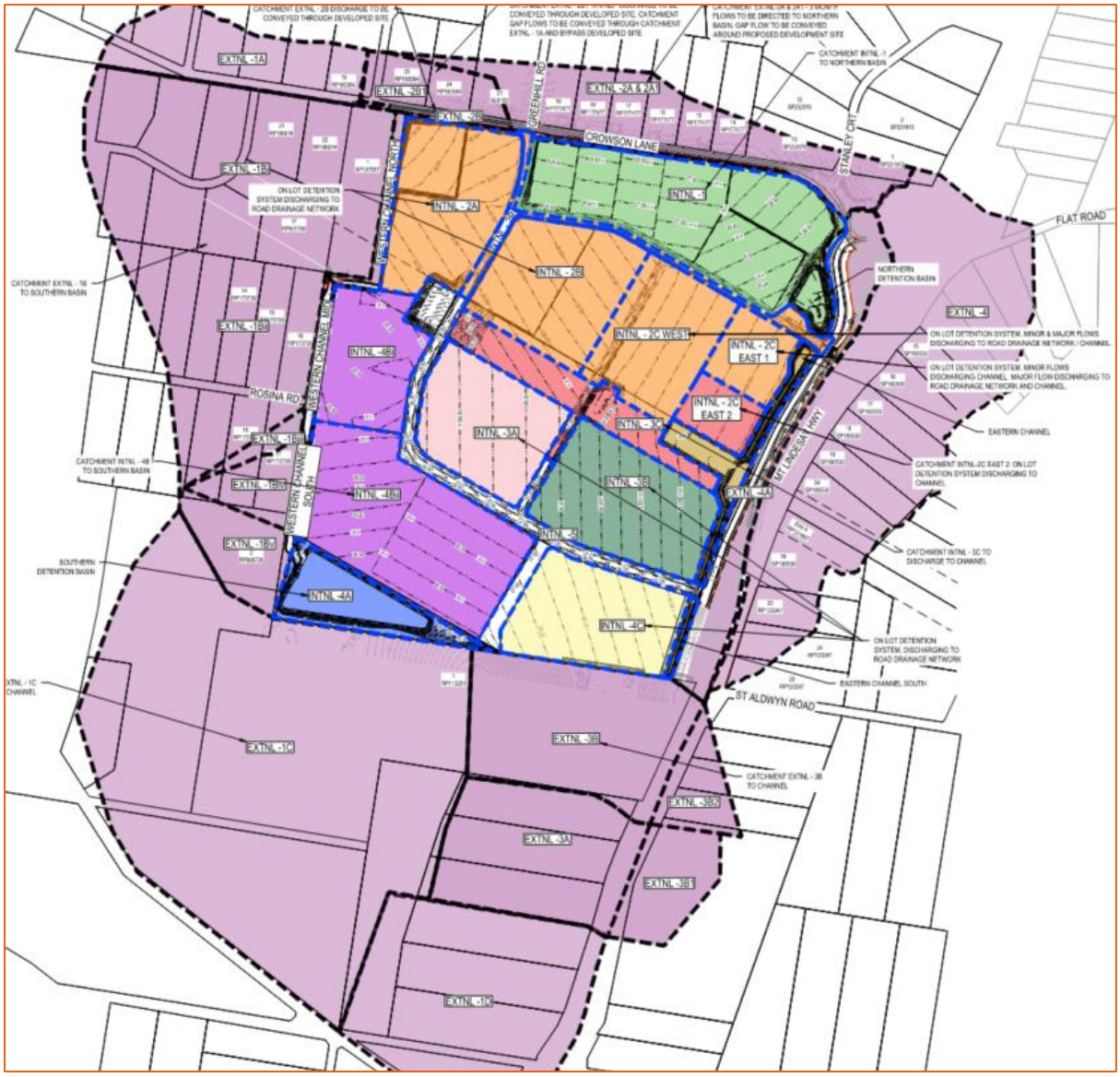


Figure 5-1: Developed Catchment Plan (refer to Appendix B)

Tables 5-5 and 5-6, below, summarise the catchment parameters used to assess the pre and post development flows.

Table 5-5 – Pre-development Catchment Parameters

Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
EXTNL-1A	7.224	1	2.65	0.050
EXTNL-1Bi	23.636	10	2.49	0.050
EXTNL-1Bii	16.974	5	4.19	0.050
EXTNL-1Biii	0.9034	5	4.22	0.050
EXTNL-1Biv	3.3656	5	4.44	0.050
EXTNL-1C	74.256	0.5	1.26	0.100
EXTNL-1D	19.78	10	0.26	0.055
EX_1Z	25.142	0.5	0.98	0.055
EXTNL-2A	5.218	2	2.01	0.045
EXTNL-2A1	7.434	2	2.01	0.055
EXTNL-2B	32.26	0	2.05	0.060
EXTNL-2B1	4.077	2	3.71	0.045
EXTNL-2C	8.764	10	3.55	0.050
EXTNL-3A	12.15	0	1.64	0.055
EXTNL-3B	14.09	0	2.91	0.100
EXTNL-3B1	4.83	25	2.17	0.035
EXTNL-3B2	2.81	5	1.56	0.040
3C	55.53	1	1.62	0.050
EXTNL-4	34.632	25	3.76	0.040

Table 5-6 – Post-development Catchment Parameters

Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
EXTNL-1A	7.224	1	2.65	0.050
EXTNL-1Bi	23.636	10	2.48	0.050
EXTNL-1Bii	16.974	5	4.19	0.050
EXTNL-1Biii	0.9034	5	4.22	0.050
EXTNL-1Biv	3.3656	5	4.44	0.050
EXTNL-1Bv	4.2025	5	4.02	0.050
EXTNL-1C	64.974	0.5	1.26	0.100
EXTNL-1D	19.780	10	0.26	0.055
EXTNL-2A	5.218	2	2.01	0.045
EXTNL-2A1	7.434	2	2.01	0.055
EXTNL-2B1	3.6801	2	3.71	0.045
EXTNL-2B (Crowson Lane)	0.3972	90	3.14	0.015
EXTNL-3A	12.15	0	1.64	0.055
EXTNL-3B	14.09	0.001	2.91	0.100
EXTNL-3B1	4.83	25	2.17	0.035
EXTNL-3B2	2.81	5	1.56	0.040
EXTNL-4A	8.764	10	3.55	0.050
EXTNL-4	34.632	25	3.76	0.040
Western Channel North	1.244	7.4	2.16	0.05
Western Channel Mid	0.960	36	0.66	0.037
Western Channel South	0.517	36	0.5	0.037

Catchment	Area (ha)	Impervious (%)	Impervious Time of Concentration (minutes)	Pervious Time of Concentration (minutes)
INTNL-1	17.052	85	15	15
INTNL-2A	8.918	90	10	10
INTNL-2B	8.8808	90	10	10

Catchment	Area (ha)	Impervious (%)	Slope (%)	Mannings 'n'
INTNL-2CW	7.5559	90	10	10
INTNL-2CE1	2.9479	90	10	10
INTNL-2CE2	2.1702	90	10	10
INTNL-2R	2.3818	75	20	20
INTNL-3A	7.740	90	10	10
INTNL-3B	9.165	90	10	10
INTNL-3C	5.1039	90	17	17
INTNL-4A	5.529	0	1	0.035
INTNL-4Bi	6.5529	75	15	24
INTNL-4Bii	13.9671	75	15	24
INTNL-4C	7.916	90	10	10
INTNL-5	5.958	75	20	20
Channel South	0.5458	0	0.5	0.035
Channel North	2.9041	0	0.5	0.035

5.4 Model Verification

Catchment EXTNL-1B was selected for a comparative exercise to validate the adoption of the RAFTS hydrological models for the rural/rural residential catchments. Catchment EXTNL-1B has been adopted as it does not contain large depression/storage areas which would distort the results. In addition to the RAFTS method, Catchment EXTNL-1B has been modelled using the Rational Method, ILSAX, Initial and Continuing Loss hydrological models.

A time of concentration of 31.7 minutes was applied to pervious and impervious portions of the catchment, alike, as the impervious areas traverse large tracks of pervious area before reaching the edge of the catchment boundary.

A 15mm grass depression storage was adopted for the ILSAX model. This is larger than the value listed in Table 5-4 as Catchment EXTNL-1B has a rural residential land use and is predominantly pervious with an uneven surface.

Refer to Table 5-7, below for the results.

Table 5-7 Catchment EXTNL-1B 1% AEP Hydrological Model Verification

Hydrological Model	1% AEP Flow (m^3/s)
RAFTS	9.95
ILSAX	11.8
Initial and Continuing Loss	13.7
Rational Method	11.2

As can be seen in Table 5-7, the RAFTS model produced the lowest 1% AEP flow and as such is considered the most conservative hydrological model with respect to detention volume calculations and is therefore appropriate for modelling the rural/rural residential catchments.

5.5 Drainage Strategy

As discussed in Section 4 of this report, the development site drains to two discharge locations (refer to Figure 3-3 and Figure 5-1). The proposed development will result in the redefinition of the catchment boundaries and characteristics draining to each discharge location, and as such, detention structures are required to attenuate flows to pre-development flow rates.

A regional detention basin is proposed to be constructed in the south-west corner of the development site to attenuate flows from Catchment INTNL-4B for all storm events, up to and including the 1% AEP storm event. Flows from external catchments EXTNL-1A, EXTNL-2B and EXTNL-1B are also conveyed through this detention basin. This detention basin was previously documented in Arcadis report *'4499-4651 Mount Lindesay Highway, North Maclean SBSMP (Southern Catchment Discharge Area)*' (11-0001-30101970-AAR-04); however, owing to changes to the contributing catchment, and proposed preservation measures to the southern wetland areas this basin has been remodelled. The proposed southern catchment management strategy and mitigation measures still comply with the general outcomes of the previous report (11-0001-30101970-AAR-04).

A second regional detention basin is proposed to be constructed in the north-eastern corner of the site to attenuate flows from Catchment INTNL-1. As such, the minor flows from the road network will by-pass the Northern Detention Basin.

A third regional detention system is proposed in the form of the conveyance channel situated along the eastern site boundary. The channel conveys flows from Catchments INTNL-2C WEST (minor flows only), INTNL-2C EAST 1 (minor flows only), INTNL-2C EAST 2, INTNL-3A, INTNL-3B, INTNL-3C, INTNL-4C, INTNL-5 and external catchments EXTNL-1C (including flows discharged from the southern detention basin), EXTNL-1D, EXTNL-3A, EXTNL-3B, EXTNL-3B1 and EXTNL-3B2. The proposed outlet configuration controls the flows discharging immediately upstream of the existing culverts situated beneath the Mount Lindesay Highway (eastern discharge location).

Catchments INTNL-2A – INTNL3B and INTNL-4C are to provide on-site allotment detention. For the purpose of sizing the three regional detention systems, an estimate of the detention volumes for the INTNL-2A – INTNL3B and INTNL-4C on-site detention systems has been calculated using the DRAINS software and is documented as part of this report; however, this is to be confirmed through a site specific SBSMP created for each individual lot. An allowance has been made for a portion of Lots 2, 3 and 4 to bypass the on-site allotment detention, discharging undetained to the drainage infrastructure in the road corridor. As such Catchments INTNL-2R and INTNL-5 extend slightly beyond the road corridor, and catchments INTNL-2B, INTNL-3A, INTNL-3B and INTNL-4C do not encompass the full allotment extents.

Catchment 2C has split into three catchments: INTNL_2C WEST, INTNL_2C EAST 1 and INTNL_2C EAST 2. Catchments INTNL_2C WEST and INTNL_2C EAST 1 discharge major and minor flow to separate points of discharge where minor flows discharge to the eastern conveyance channel on Lot 901 and major flows discharge to the proposed internal road drainage network. Catchment INTNL_2C EAST 2 discharges both major and minor flows to the eastern conveyance channel.

Note that internal catchment INTNL-3C does not require lot scale detention and is included in the regional mitigation system.

The proposed detention systems work in union to ensure the flows discharged from the development site do not cause adverse impacts upstream or downstream of the development site, for all storm events, up to and including the 1% AEP storm event.

Owing to the extensive external catchments conveyed through the regional detention systems, the complexity of the outlet structures, obstructions and drowned orifices, DRAINS was not considered the most appropriate software to model the regional detention systems. As such, the regional detention systems have been modelled in TUFLOW with input from DRAINS for the discharge flows from the allotment detention systems proposed for Catchments INTNL-2A – INTNL3B and INTNL-4C.

5.6 Detention Sizing

5.6.1 Allotment Detention

5.6.1.1 Methodology

The allotment detention systems proposed for Catchments INTNL-2A – INTNL3B and INTNL-4C were sized using DRAINS. The DRAINS models utilise a combination of the RAFTS and ILSAX methods to more accurately represent the different land use types. ILSAX was used to model the developed catchments with RAFTS used to model the relatively undeveloped existing and external catchments. The rainfall hydrographs generated for each catchment were exported from DRAINS and imported into the TUFLOW model.

The critical storm events were determined via an investigation of storm durations ranging from 10mins to 1080mins. The models were then used to route post-developed runoff from the eastern catchment through the proposed detention structure to determine the most efficient onsite detention system to comply with aforementioned objective.

Each catchment was modelled using a split catchment approach, with the first sub-catchment representing impervious areas and the second pervious. This allows for an accurate representation of Manning's roughness coefficients and applicable loss parameters.

5.6.1.2 Allotment Detention System Design Sizing

As stated in section 5.3, Catchments INTNL-2A – INTNL-3B and INTNL-4C are to provide individual on-site detention. Site specific SBSMPs will be required for each individual lot to determine the detention volumes and configurations required; however, for the purposes of sizing the northern and southern detention basins and the detentions storage in the conveyance channel, the detention volumes has been estimated and modelled in DRAINS. The discharge from each allotment detention system was extracted from DRAINS and imported into TUFLOW.

Table 5-8 provides a summary of the design parameters adopted for each individual allotment detention system. The allotment detention system design parameters were determined by modelling the pre and post development areas specific to Catchments INTNL-2A – INTNL-3B and INTNL-4C in DRAINS and ensuring the detention systems are adequately sized such that the post development flows do not exceed the pre-development flows.

Table 5-8 Allotment Detention System Design Parameters

Catchments	Internal Base Area	Maximum Water Depth	Detention Storage Volume	Control Outlets
INTNL-2A	2,400 m^2	1.99m (RL31.99m AHD)	4,151 m^3	• 375mm dia outlet @ RL30m AHD (base level); • 3m wide weir @ RL31.5m AHD
INTNL-2B	3,250 m^2	1.80m (RL27.80m AHD)	5,854m^3	• 300mm dia outlet @ RL26m AHD (base level); • 4.25m wide weir @RL27.4m AHD
INTNL-2CE1	2,600 m^2	0.8m (RL26.80m AHD)	2,074m^3	• 300mm dia outlet @ RL26m AHD (base level); • 8.9m wide weir @RL26.7m AHD
INTNL-2CE2	2,100 m^2	0.73m (RL26.73mAHD)	1,533 m^3	• 280mm dia outlet @ RL26m AHD (base level); • 7.5m wide weir @RL26.65m AHD
INTNL-2CW	3,350 m^2	1.71m (RL27.71mAHD)	4,883 m^3	• 2 x 225mm dia outlet @ RL26mAHD (base level) • 4.75m wide weir @RL27.45m AHD
INTNL-3A	4,800 m^2	0.86m (RL28.86m AHD)	4,132m^3	• 2x525mm dia outlet @ RL28m AHD (base level); • 4m wide weir @RL28.65m AHD
INTNL-3B	5,110 m^2	1.67m (RL25.67m AHD)	8,627m^3	• 375mm dia outlet @ RL24m AHD (base level); • 4m wide weir @RL25.5m AHD
INTNL-4C	1,800 m^2	1.86m (RL26.36m AHD)	3,495m^3	• 2x375mm dia outlet @ RL24.5m AHD (base level); • 4m wide weir @RL26m AHD

The peak water level estimated for each system is provided in Figure 5-2 below.

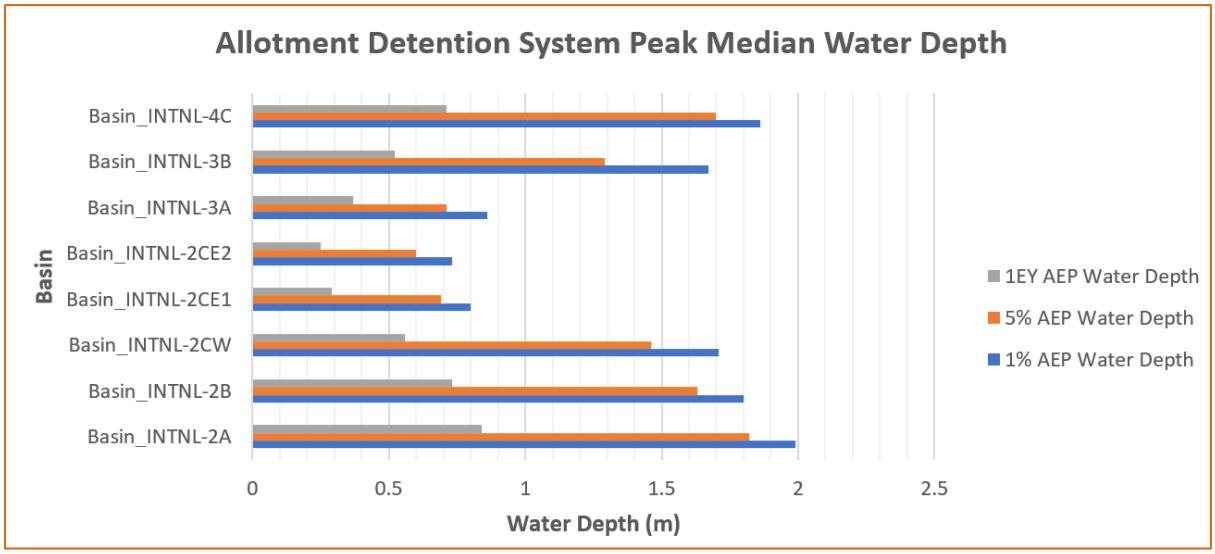


Figure 5-2: Allotment Detention System Peak Median Water Level

We note that should the individual lots adopt a different basin configuration other than what is specified in Table 5-8, the proposed basins shall be designed to ensure no increase in discharge rates up to the 540min duration for all the design events to ensure no impacts downstream.

5.6.2 Southern Detention Basin

Table 5-9 presents the parameters for the proposed southern on-site detention basin, as modelled in TUFLOW, which attenuates flows from Catchment INTNL-4B for all storm events, up to and including the 1% AEP storm event, prior to release to the southern discharge location. External catchments EXTNL-1A and EXTNL-1B are also conveyed through this basin.

This basin was previously documented in Arcadis report *'4499-4651 Mount Lindesay Highway, North Maclean SBSMP (Southern Catchment Discharge Area)'* (11-0001-30101970-AAR-04); however, owing to changes to the contributing catchment, this basin has been remodelled as part of this report, resulting in a larger and higher weir. This adjustment to the outlet configuration ensures that the flows discharged from the basin continue to be restricted to pre-development flows. The proposed southern catchment management strategy and mitigation measures still comply with the general outcomes of the previous report (11-0001-30101970-AAR-04).

Reference should be made to Engineering Drawings in Appendix B for a conceptual illustration of how the detention basin will operate.

Table 5-9 Southern Detention System Design Parameters

Contributing Catchments	Internal Base Area	Maximum Water Depth	Detention Storage Volume	Control Outlets
EXTNL-1A, EXTNL-1B & INTNL-4B	26,672 m^2	1.58 m (RL28.19m AHD)	32,706m^3	• 3 x 900mm dia pipe low flow outlets @ RL26.61m AHD (base level) with 800mm dia orifice fit to one of the 900mm dia low flow pipes • 64m wide weir @ RL28.0m AHD

5.6.3 Northern Detention Basin

The northern on-site detention basin is situated in the north-east corner of the proposed development and attenuates flows from INTNL-1 and the major flows from the northern portion of the internal road network, prior to discharge to the northernmost portion of the eastern conveyance channel. Bio-retention filter media is proposed to be included in the base of this basin to achieve the water quality objectives for Lot 1. The detention volume modelled was above the extended detention required for water quality (0.3 m).

Reference should be made to Figure 5-1 for the catchment plan and the Engineering Drawings in Appendix B for a conceptual illustration of how the detention basin will operate. Table 5-10 provides a summary of the design parameters adopted for the northern detention basin in TUFLOW.

Table 5-10 Northern Detention System Design Parameters (Depths and Areas include extended detention for water quality)

Contributing Catchments	Internal Base Area	Maximum Water Depth (including extended detention depth)	Detention Storage Volume	Control Outlets
INTNL-1	5,200 m^2	1.94m (RL24.48m AHD)	7,402m^3	• 2 x 300mm dia low flow pipe outlets @ RL22.54m AHD; • 2 x 900x450 RCBC @ RL23.40m AHD

5.6.4 Conveyance Channel

A conveyance channel (East) is proposed to be constructed along the eastern site boundary to convey flows from the following catchments to the eastern discharge location, being the four 1.75m high, 2.1m wide reinforced concrete box culverts which convey flows beneath Mount Lindesay Highway to the receiving waterway:

- INTNL-2C WEST (minor flow only)
- INTNL-2C EAST 1 (Minor Flow only)
- INTNL-2C EAST 2
- INTNL-3A
- INTNL-3B
- INTNL-3C
- INTNL-4C
- INTNL-5
- EXTNL-1D
- EXTNL-3A
- EXTNL-1C (including flows discharged from the Southern Detention Basin)
- EXTNL-3B
- EXTNL-3B1
- EXTNL-3B2

An outlet pit structure will be constructed upstream of the receiving stormwater drainage culverts, to control the flows released to the eastern discharge location, thus converting the conveyance channel into a combined conveyance and detention structure. This configuration was represented in the TUFLOW model to ensure flows are safely conveyed through the site and no adverse impacts occur upstream or downstream of the site.

Reference should be made to Figure 5-1 for the catchment plan and to the Engineering Drawings in Appendix B for catchment plans, channel dimensions, outlet details and a conceptual illustration of how the detention structure will operate.

6 HYDRAULIC ASSESSMENT

6.1 Methodology

The hydraulic assessment has been undertaken to evaluate how the proposed on-site detention basin and proposed development pad will manage flows being conveyed through the overland flow path.

The hydraulic assessment of the proposed overland flow path required a detailed understanding of the hydraulic and hydrological characteristics under a series of storm events.

To assess the complex flood behaviour around the site a TUFLOW two-dimensional flood model has been identified as the preferred method to accurately determine any impacts caused by the proposed development.

The hydraulic and hydrological impact assessment undertaken via a two-dimensional model presents more accurate results through utilising a grid to represent the catchment topography and complex existing flow distribution. The results are particularly relevant around the inflow and outflow locations of the site, determining peak flow rates, the extent of flood inundation as well as flow distribution.

6.2 Objectives

The primary objective of this assessment is to ensure the proposed stormwater management will not significantly change the flood behaviour against the existing condition at the areas immediately downstream and upstream of the site. The assessment considers the changes and if they would cause any actionable nuisance.

6.3 Model Set Up and Adopted Data

A TUFLOW 2D flood model has been created to assess any changes in flood behaviour caused by the proposed development as well as the conveyance of external flows through the site and flood impacts upstream and downstream of the site. The following sections provide discussion on the adopted inputs into the TUFLOW model.

6.3.1 Hydrology

Due to intrinsic complexity of 2D modelling and particularly modelling time, a DRAINS rainfall runoff model was used to determine the hydrograph for each Annual Exceedance Probability (AEP) event: 50%, 20%, 10%, 5%, 2% and 1% AEP. The results for this model were then used to give an indication of which duration would be critical at the assessment point (i.e. northern site boundary) however, the routing of flows through the catchment and determination of median temporal pattern has been undertaken in TUFLOW.

6.3.1.1 Determination of Critical Durations and Median Temporal Pattern

TUFLOW was run initially for the storm durations ranging from 60 minutes to 540 minutes using all 10 temporal patterns based on the results of the DRAINS modelling. Although the critical durations throughout the model were found to vary, at the downstream portion of the model, the critical durations would vary from 90min to 540min in the existing and developed case. As such, the model was then run for all these durations to determine potential impacts.

Once the critical durations were selected, the simulation output was processed as follows:

- For each storm duration, the median flood grid was extracted from the 10 temporal pattern flood grids using the TUFLOW utility asc_to_asc.exe, -statMedian switch.
- The median flood grids for each of the simulated durations were combined to form the maximum median flood grid for each AEP (max max).

6.3.1.2 Modelling Results

Modelling results have been assessed to compare the peak flow rates downstream of Mount Lindesay Highway and at the outlet of the Southern Detention Basin in the Existing Model Scenario and Developed Model Scenario, shown in Table 6-1.

Table 6-1 Peak Flow Rates Downstream

Scenario	Peak Flow Rate for Annual Exceedance Probability (m^3/s)					
	50%	20%	10%	5%	2%	1%
Downstream of Mount Lindesay Highway						
Existing	2.90	6.24	8.26	10.50	13.07	16.15 (16.16)
Developed	3.01	4.87	6.79	9.36	12.72	15.85 (14.99)
Difference	+0.11	-1.37	-1.47	-1.14	-0.35	-0.3
Outlet of Southern Detention Basin						
Existing	2.87	3.54	3.74	4.54	8.13	8.84 (9.41)
Developed	1.58	2.71	2.85	3.55	3.83	4.49 (6.68)
Difference	-1.29	-0.83	-0.89	-0.99	-4.3	-4.35

*Flow presented in this table are peak median values “Rank 6”
1% AEP Mean flows provided in ( )

Table 6-2 Critical Temporal Pattern

AEP	Scenario	Duration	Selected Temporal Pattern(s)
50%	Existing	540 min	TP06
	Developed	270 min	TP01
20%	Existing	540 min	TP05
	Developed	540 min	TP05
10%	Existing	180 min	TP08
	Developed	120 min	TP08
5%	Existing	180 min	TP08
	Developed	120 min	TP03
2%	Existing	270 min	TP09
	Developed	120 min	TP02
1%	Existing	90 min	TP03
	Developed	120 min	TP02

6.3.2 Boundary Conditions

The downstream boundary condition has been set approximately 1150m downstream of the Mount Lindesay Highway drainage crossing (west to east). This set up has allowed the system to be generally free discharging with the main hydraulic control being the culvert crossing beneath Mount Lindesay Highway. It is noted however that an existing access road adjacent to the site boundary acts like a ‘weir’ in the existing and developed case allowing additional ponding within the site.

Due to recent updates to the Logan River flood model, Arcadis has conducted a sensitivity assessment based on water level information extracted from this model and applied at the boundary. Further discussion is provided in section 6.5.5 below.

6.3.3 Grid Size

A 2m grid has been adopted in the model to accurately represent the hydraulic features of the existing and proposed overland flow path.

To accurately depict the proposed western channel, the QUADTREE option in TUFLOW has been employed. This function has reduced the grid to 0.5m around the channel, ensuring the accurate representation of channel dimensions. To maintain consistency in the final comparison, the same approach was applied to the modelling of the existing condition.

6.3.4 Manning's Values

The Manning's values adopted as part of this assessment are provided in Table 6-3.

Table 6-3 Manning's Values

Land use	Manning's n
Medium Scrub	0.055 – 0.06
Dense Vegetation	0.1
Scattered Scrub	0.05
Open Ground (sparce grass)	0.027
Road	0.018
Swales	0.06 / 0.02
Eastern Channel*	0.15

*Does not include Powerlink easement area

6.3.5 Existing Downstream Drainage Infrastructure

Mount Lindesay Highway drainage crossing (west to east)– 4 x 1.8 m high x 2.1m wide box culverts.

6.3.6 Planned Upstream Drainage Infrastructure

As discussed in section 3.5, Logan City Council will soon be upgrading the stormwater drainage infrastructure in Crowson Lane. As such the following planned and/or existing drainage infrastructure has been modelled in TUFLOW:

Mount Lindesay Highway drainage crossing (east to west)– 900mm dia RCP.

Crowson Lane West (north to south) – 1050mm dia RCP.

Crowson Lane East (north to south) – 1350mm dia RCP

Crowson Lane East (north to south) – 900mm dia RCP

6.3.7 Existing Model Scenario

The existing terrain has been represented based on LiDAR information for the area. Aerial photos as well as site visits have been used to determine the existing condition roughness.

6.3.8 Developed Model Scenario

The TUFLOW model has been modified to include the proposed industrial development including the proposed overland flow path.

6.4 Assumptions and Limitations

6.4.1 Key Limitations

6.4.1.1 LiDAR Ground Survey

The model topography has been based on LiDAR survey information (2018) provided in digital format with a 1m grid resolution. It is recommended this report be reviewed and amended as required in conjunction with the detailed design once detailed survey of the site and its boundaries is obtained.

6.4.1.2 Climate Change

Climate change has not been considered in this assessment.

6.4.1.3 Sensitivity

No sensitivity assessment for roughness has been considered in this assessment.

6.4.2 Key Assumptions

6.4.2.1 Proposed Development

This report has made assumptions on finished surface levels and roughness values of particular land use areas to show that a potential solution is available for the proposed development. In the event that the development proposal changes in any form or further applications are lodged with Council or EDQ, this report **must** be updated to reflect the changes made to the hydraulic conveyance capacity of the development site.

6.5 Model Results

The primary assessment of flood impacts has been undertaken using a comparison of the peak water surface levels resulting from the proposed development stormwater management and earthworks against the existing scenario terrain, under a variety of flood events. Appendix D of this report shows existing and developed scenario peak water depth ranges along with peak water surface level changes for a range of flood events (50%, 20%, 10%, 5%, 2% and 1% AEP). Additionally, the results section includes peak velocity maps for the existing and proposed scenarios.

6.5.1 Flood Depths

The project site hydraulic properties have been designed with the aim of minimising changes in flood behaviour both upstream and downstream of the site. Maximum depths in the existing case 1% AEP storm event are seen to reach approximately 1.1m adjacent to Mount Lindesay Highway.

Immediately downstream of the site flood depth in the 1% AEP reaches approximately 2.4m in both existing and developed cases. The proposed earthworks changes, creates and overland flow channel crossing the site from south to north. Depth within this channel is approximately 2.9m in the 1% AEP within the bounds of the site.

Figure 6-1 and Figure 6-2, below, provide the 1% AEP peak flood depths for both existing and developed cases respectively.



Figure 6-1 - Existing Peak Water Depth - 1% AEP

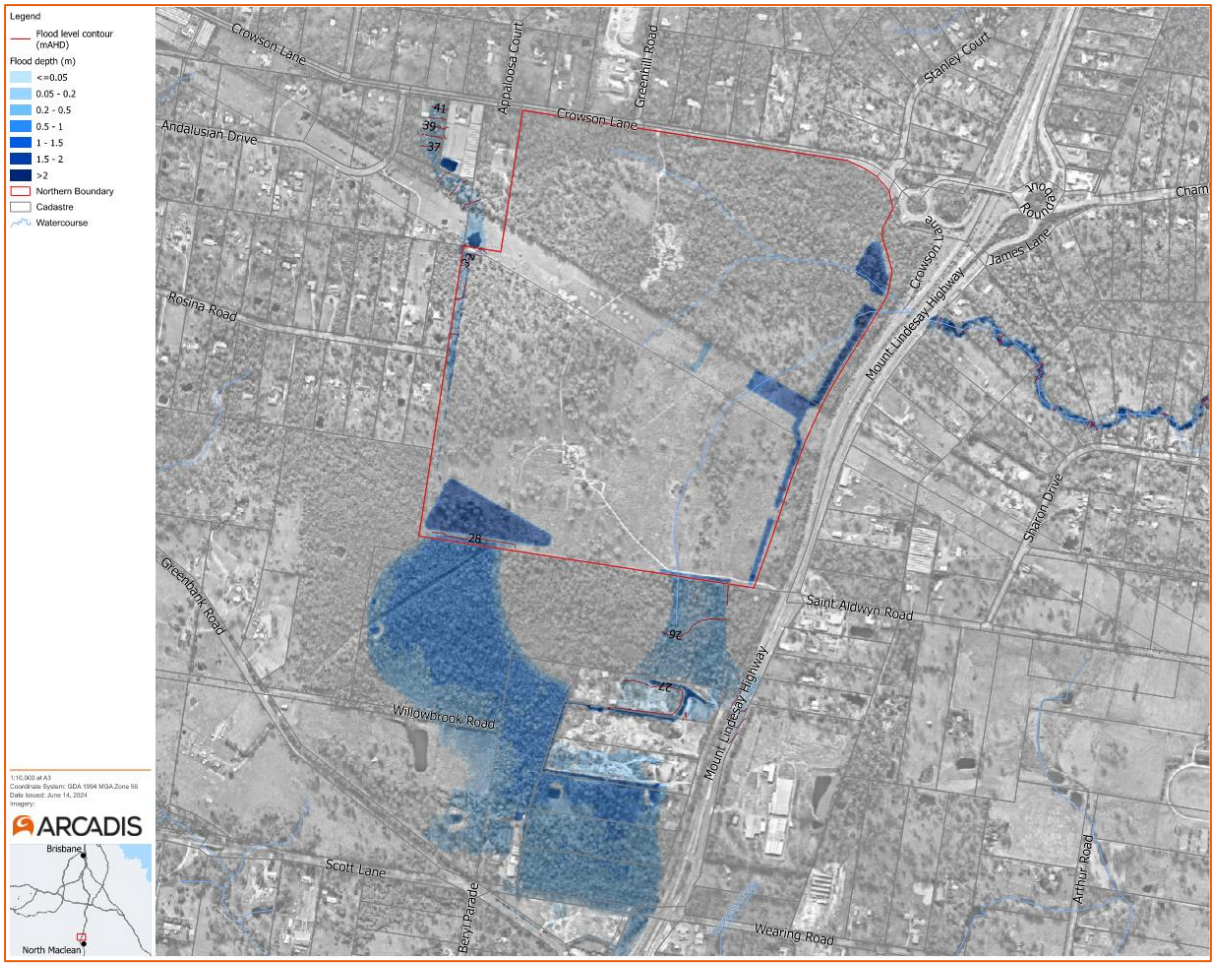


Figure 6-2 - Developed Peak Water Depth - 1% AEP

Table 6-4 1% AEP Channel Water Level

MD01		MD04	
Chainage	1% AEP Water Level	Chainage	1% AEP Water Level
0	25.10	0	25.64
100	24.84	40	25.50
200	24.63	80	25.43
300	24.57	120	25.37
400	24.51	180	25.33
500	24.47	-	-
600	24.46	-	-

Note: Refer to Appendix B DWG SKT011-06 for Chainage references concerning Channels MD01 and MD04. Refer to Arcadis supplementary memo titled Flagstone Estate: LCC TLPI No 1/2023 Response – Flood Overlay Code dated 1 March 2024 for details concerning 1% AEP at 2100 and larger events.

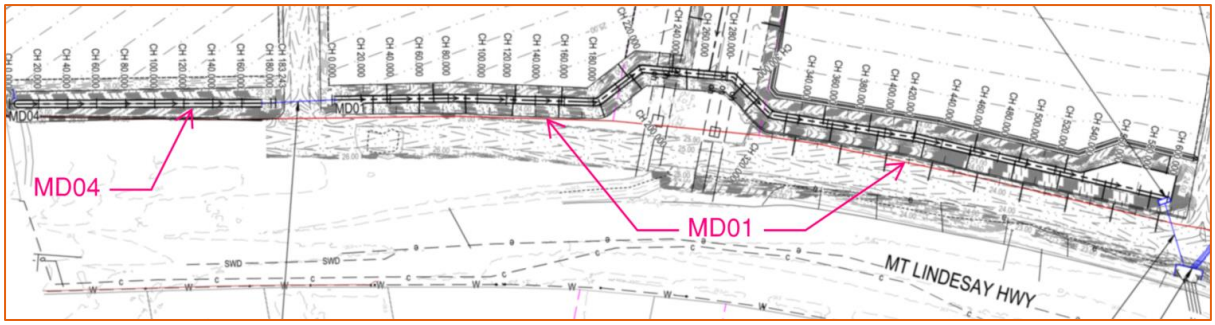


Figure 6-3 – Channels MD01 and MD04 Reference Chainages.

6.5.2 Peak Water Surface Level Change

Modelling results show that generally, the existing flood behaviour outside of the site is maintained as per the existing condition. Changes in the water surface levels are generally negative with a reduction in levels in the proposed case scenario. Increase in water surface levels are contained to the site boundary, where earthworks are proposed. A minor positive afflux is shown downstream of the site in the 50% AEP event however this is considered negligible (11mm) and localised. An additional sensitivity assessment is provided in Section 6.5.6 of this report showing that when compared to Historical events, no negative afflux is noticed.

Modelling results for all storm events up to the 1% AEP have been included in Appendix D.



Figure 6-4 - Developed Peak Water Surface Level Change - 50% AEP

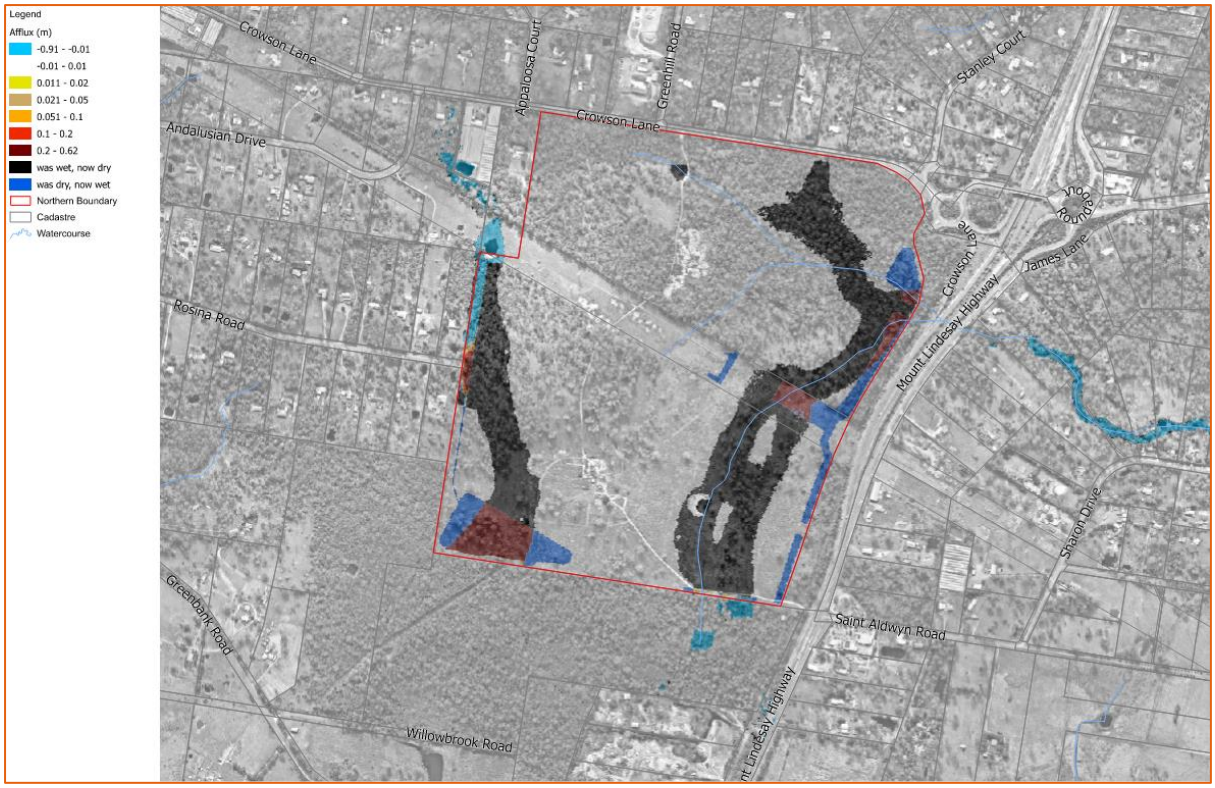


Figure 6-5 - Developed Peak Water Surface Level Change - 1% AEP

6.5.3 Peak Velocities

Modelling results are presented in Appendix D to show the peak velocities reached within the assessment area. Figure 6-6 and 6-7, show an extract of the 1% AEP flood event peak velocity, with the results indicating that velocities are generally below 1m/s and unchanged upstream and downstream of the site. Within the proposed overland flow channel created by the earthworks, velocities are higher than existing case reaching 1.5m/s.



Figure 6-6 - Existing Peak Water Velocity - 1% AEP



Figure 6-7 - Developed Peak Water Velocity - 1% AEP

No significant change in flow velocity is observed outside of the site. Modelling results are presented in Appendix D showing change in velocity for all events up to the 1% AEP.



Figure 6-8 – Change in Flow Velocity - 1% AEP

6.5.4 Blockage Sensitivity

A sensitivity assessment for pipe blockage has been conducted, modelling two scenarios: a 20% pipe blockage and a 50% pipe blockage. The results presented in Appendix D indicate that in the 20% blockage scenario, the flow is generally contained within the channel. In the 50% blockage scenario, minor spillage is observed at the downstream end of the eastern and western channels. However, it is worth noting that water levels are still below the finished floor level and the proposed sewer pump station.

Figure 6-9 demonstrates that the peak water level in the Southern Detention Basin increases slightly under the blocked scenario and the inundation time increases from approximately 6.5 hours to 9.5 hours during the 1% AEP event.

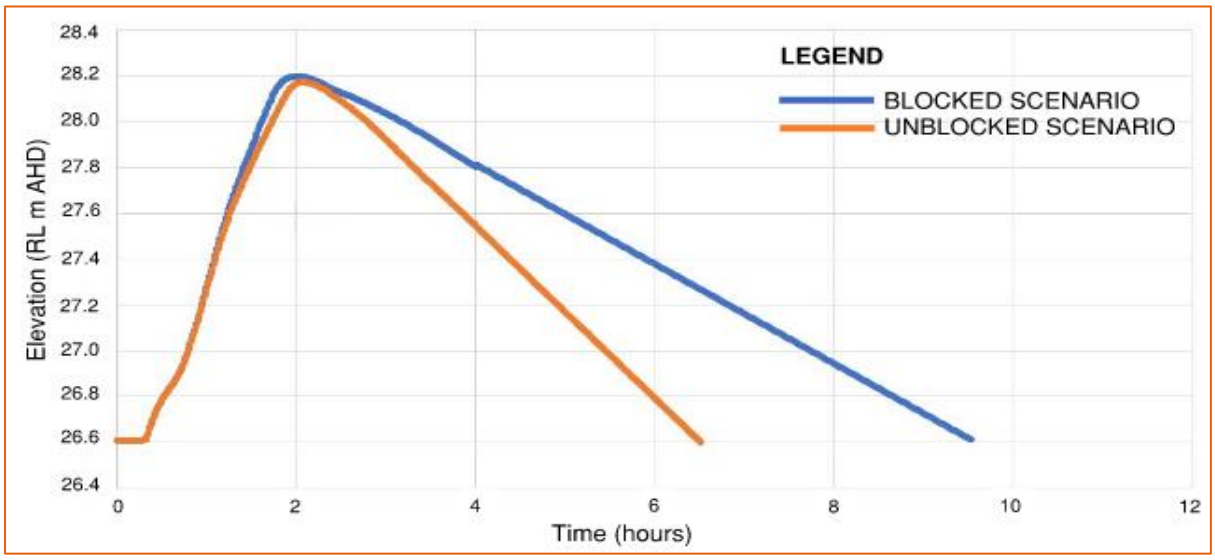


Figure 6-9 – Southern Basin Inundation Curves - 1% AEP

6.5.5 Regional Flood Sensitivity

A regional sensitivity has been undertaken based on the recently updated Logan River Flood Model. To undertake this assessment Arcadis has purchased the TUFLOW model and accompanying report. Based on this information Arcadis has determined that the peak water level for the site area occurs in the 72hr event.

Water levels for this event was then extracted and applied to the site-specific flood model as a boundary condition. Whilst the results indicated a higher water level downstream of the site, flood levels were generally below the peak water level for the site (540min). It is also noted that results indicated that the peak for the river occurs approximately 20hrs past the site peak which validates the assessment with a lower boundary.



Figure 6-10 - 1% AEP 72hr Regional Flood Depth and Extents

6.5.6 Historical Flood Sensitivity

A historical sensitivity has been undertaken based on the catchment configuration south of the site. Arcadis investigated the impact of existing earthworks to the south of the site as it currently causes some unintentional flow attenuation. This external catchment feature is not accounted for in Council's regional flood model. Two figures are provided to show catchment features.

Figure 6-.11 below shows the existing earthworks as represented in the site-specific assessment presented in this report. Figure 6-.12, from 1983, shows the catchment without the earthworks.

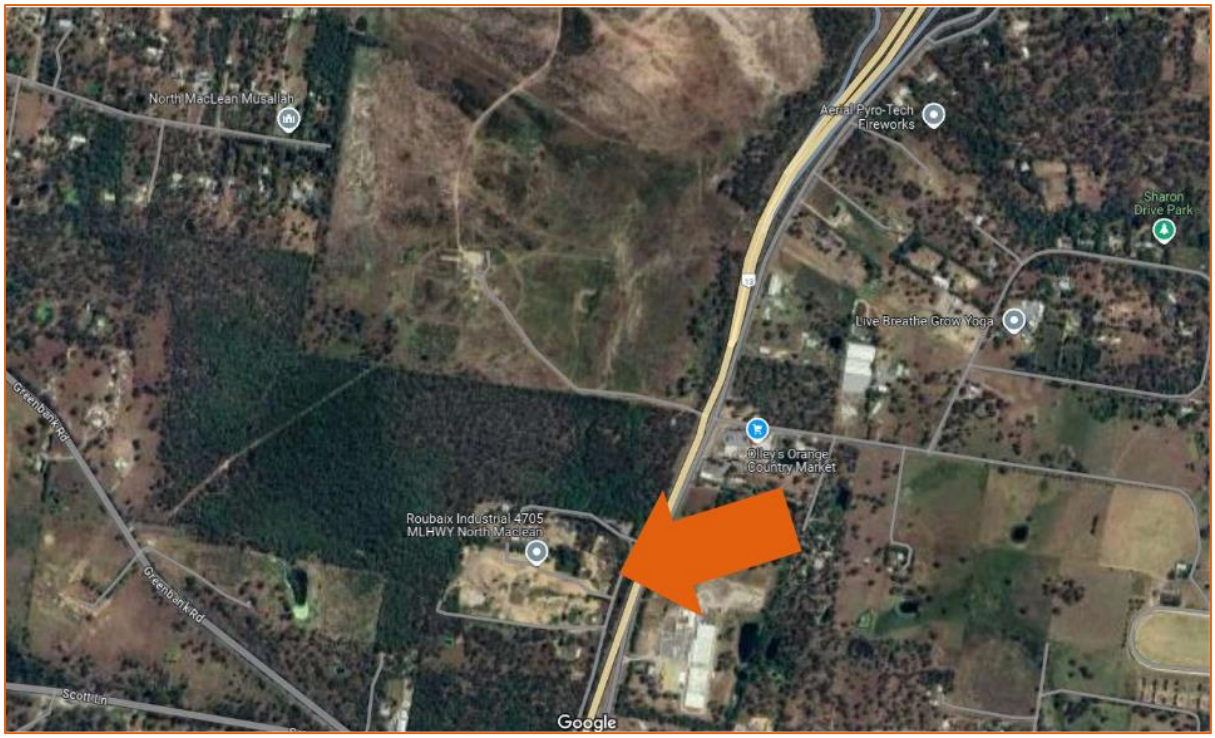


Figure 6-11 – Current Earthworks Extents South of the Site



Figure 6-12 – Catchment condition in 1983

Results indicate that compared to the historical results, the proposed development will significantly reduce flood levels. Afflux figures below show a reduction in water level of up to 200mm in the 1% AEP and 140mm in the 50% AEP for historical comparison.

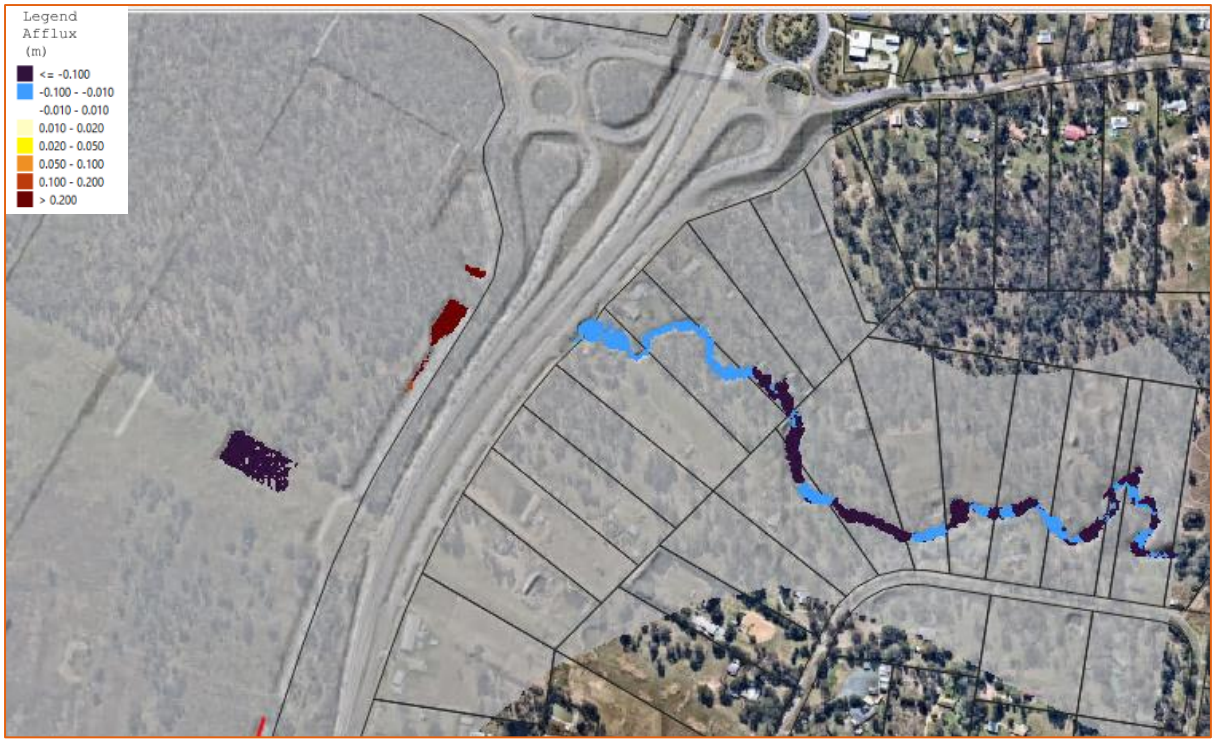


Figure 6-13 - Developed Peak Water Surface Level Change - 50% AEP



Figure 6-14 - Developed Peak Water Surface Level Change - 1% AEP

Arcadis also investigated the area where, when compared to the current existing condition, a minor afflux is shown. The cross-section below shows the levels for all three scenarios, and while an 11mm increase in water level is shown when compared to existing conditions, a 44mm reduction is shown when compared to the historical event.

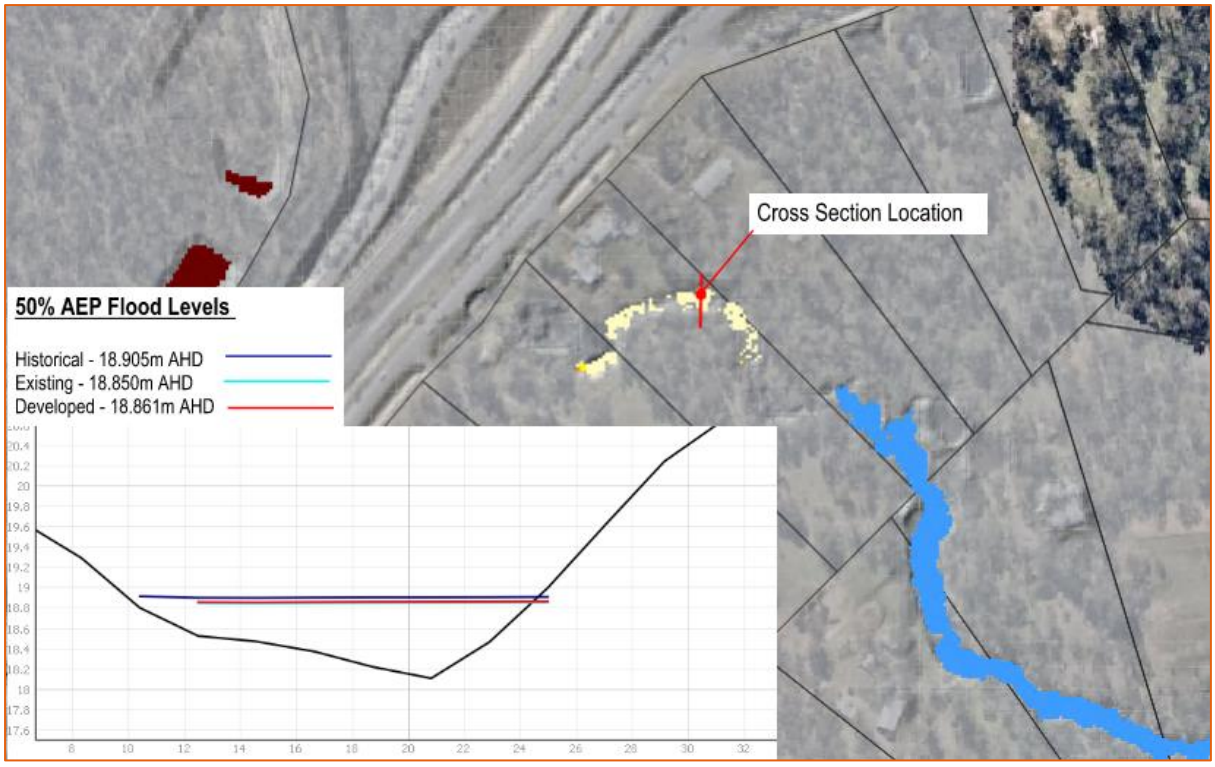


Figure 6-15 – 50 % AEP Flood Level Comparison

The subject minor 50% AEP afflux corresponds to no adverse or discernible velocity change for the associated 11mm WSL increase. Further, the maximum 50% AEP velocity is recorded along this reach as 1.4 m/s and is anticipated to cause no waterway instability issue. Figure 6-16 shows the velocity vector along the longitudinal section of this particular reach of the downstream waterway.

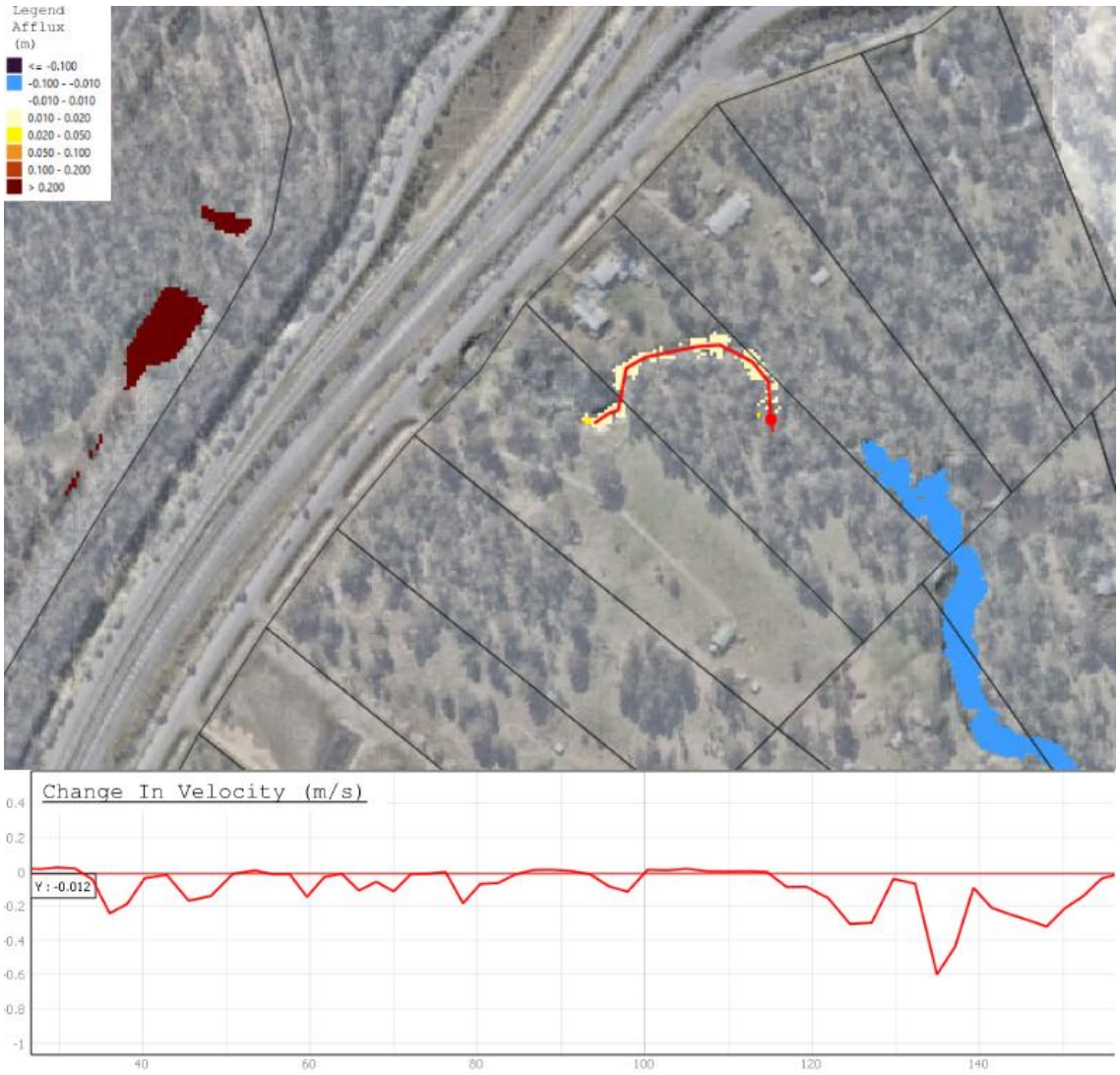


Figure 6-16 – 50 % AEP Velocity Change for afflux reach section.

6.6 Objective Discussion

The above hydraulic investigation has demonstrated that suitable measures can be included in the design of the proposed development, to ensure that there is no increase in peak 1% AEP discharge being directed off-site to existing downstream infrastructure and no actionable nuisance caused to neighbouring properties as a result of the development.

6.7 Drainage System Safety

Urban drainage systems can present a risk to community during storms and times of flood. The consequences of interaction with the proposed drainage system and treatment areas can lead to physical harm and trauma. Notwithstanding the safety risks associated with the proposed stormwater structures can be managed though design and management techniques. In this instance it is considered necessary to develop risk assessment profile and implement where required appropriate design and management techniques. Refer to supplied Bulk Earthworks Engineering Plans for associated risk analysis and proposed management actions.

7 CONCLUSION

This SBSMPQ has been prepared to provide a design proposal and guide to the stormwater quantity management techniques and strategies for the site.

The primary objective of this SBSMPQ has been to ensure that:

1. **Suitable measures are incorporated in the development to ensure that there are no adverse impacts to downstream receiving waterways, property or infrastructure resulting from any increase to peak discharging stormwater flow rates.**

This report has presented the methodology and results of a flood modelling assessment which has included the analysis of the impacts of the proposed development in comparison to the existing scenario. In particular this assessment has concentrated to the impact immediately upstream and downstream of the site where complex flood behaviour exists.

To undertake the assessment of the hydraulic conveyance changes as a result of the proposed development, Arcadis has created a TUFLOW model using results documented in the 4499 - 4651 Mount Lindesay Highway, North Maclean Site Based Stormwater Management Plan Report, EAG001-30139050-AAR-01. The assumptions and limitations associated with the modelling exercises undertaken are highlighted in this report and the subsequent results are summarised as follows.

Results indicate that the proposed development will generally improve flood conditions downstream of the site by applying the reduction of site stormwater discharge via the proposed detention systems.

Note: The proposed operational stormwater quality treatment train is detailed in the Site Based Stormwater Quality Management Plan (SBSQMP) (EAG003-30109334-AAR-05).

APPENDIX A

Site Layout Plan

FUTURE STORMWATER PIPE TO BE CONSTRUCTED:
2 NO. 0.9m x 0.45 RCBC
USIL = 23.400
DSIL = 22.500
LENGTH = 60.0m
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

FUTURE STORMWATER PIPE TO BE CONSTRUCTED:
2 NO. 300mm DIA PIPE CLASS 4
USIL = 22.540
DSIL = 21.550
LENGTH = 60.0m
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

PROPOSED OUTLET STRUCTURE: Ø900mm ORIFICE AT RL21.55 AND 1700mm (W) x 900mm (H) ORIFICE AT RL22.90
1 NO. 2100mm X 1200mm RCBC:
USIL = 21.55
DSIL = 21.00
LENGTH = 40.0m
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING FOR EACH SCREEN SHALL BE LESS THAN 125mm).

1 NO. 1050mm DIA PIPE CLASS 4
USIL = 28.00
DSIL = 27.55
LENGTH = 70m

2 NO. 750mm DIA PIPE CLASS 4
USIL = 27.52
DSIL = 27.46
LENGTH = 5m

1 NO. 3.6 x 1.2 RCBC
USIL = 27.56
DSIL = 26.6
LENGTH = 280m

DETENTION BASIN TO BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SITE BASED STORMWATER MANAGEMENT PLAN (SOUTHERN CATCHMENT) REF. 11-0001-30101970 (DAWE REF. EPBC 2013/6941)

BASIN
RL=26.607

3 NO. 900mm DIA PIPES CLASS 4 (SINGLE 800mm ORIFICE ON SINGLE PIPE)
USIL = 26.607
DSIL = 26.48
LENGTH = 14.3m

WEIR WIDTH = 64m AT RL28.0m AHD

INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

2 NO. 2.1m x 1.2m RCBC,
USIL = 24.50
DSIL = 24.25
LENGTH = 56.5m.
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING SHALL BE LESS THAN 125mm).

2 NO. 2.1m x 0.9m RCBC
USIL = 23.64
DSIL = 23.62
LENGTH = 43.0m

INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING SHALL BE LESS THAN 125mm).

FUTURE INTERNAL ROAD DRAINAGE CONNECTION TO EXISTING HIGHWAY CULVERTS. DETAILS TO BE INCLUDED IN SERVICE ROAD DESIGN PACKAGE WHICH IS SUBJECT TO DTMR APPROVAL

FUTURE EXTENSION OF EXISTING HIGHWAY CULVERTS. DETAILS TO BE INCLUDED IN SERVICE ROAD DESIGN PACKAGE WHICH IS SUBJECT TO DTMR APPROVAL

BASIN
RL=22.539

LEGEND

- EXISTING SURFACE CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- PROPOSED STORMWATER DRAINAGE
- PROPOSED STORMWATER HEADWALL
- EXISTING STORMWATER DRAINAGE
- EXISTING WATER RETICULATION
- EXISTING COMMUNICATIONS
- EXISTING OVERHEAD ELECTRICAL
- EXISTING UNDERGROUND ELECTRICAL
- POWERLINK EASEMENT
- EXISTING FENCE
- TOP OF BANK
- TOE OF BANK
- FAUNA EXCLUSION FENCE
- PROPOSED SLEEPER RETAINING WALL
- PROPOSED BLOCKWORK RETAINING WALL
- PROPOSED A-GRADE SANDSTONE BOULDER RETAINING WALL

OSINA RD
MT LINDESAY HWY
MIDDLE CREEK

15 RP173739
16 RP173739
17 RP173739
18 SP180530
19 SP180530
54 SP180530
Emt A RP121667
59 SP180530
23 RP123247
24 RP123247
25 RP123247

Issue	Description	DR	CH	VE	Date
06	DESIGN UPDATES	G.P.	G.P.	G.E.	12.06.24
05	WEIR WIDTH ADDED	A.O.	T.F.	B.K.	06.07.23
04	DESIGN UPDATES	A.O.	T.F.	G.E.	20.06.23
03	DESIGN UPDATES	A.O.	E.P.	G.E.	21.02.23
02	DESIGN UPDATES	J.G.	E.P.	G.E.	08.02.23
01	ORIGINAL ISSUE	J.G.	E.P.	G.E.	24.10.22

Scales
0 50 100 150 200m
1 : 2000

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying
Architect: -
Client: Charter Hall

Status: CONCEPTUAL DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION
© Copyright reserved

Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	G. ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

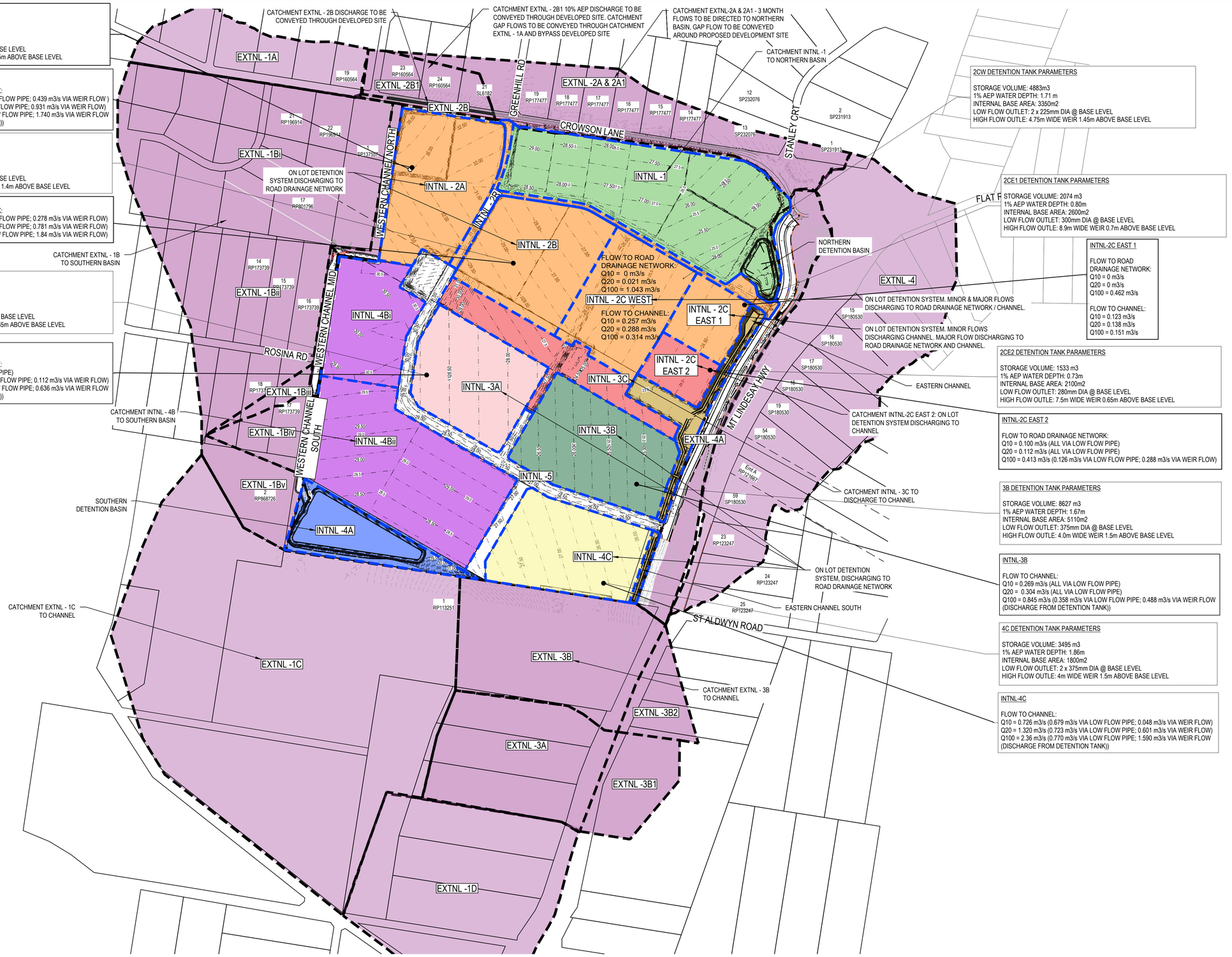
Title: CHANNEL SKETCH PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone | Stage | Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00OP	CV	SKT	011	06

100mm on Original

Date Plotted: 14 Jun 2024 - 04:39PM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-011-ChannelSketch.dwg V1



2A DETENTION TANK PARAMETERS

STORAGE VOLUME: 4151 m3
1% AEP WATER DEPTH: 1.99m
INTERNAL BASE AREA: 2400m2
LOW FLOW OUTLET: 375mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 3m WIDE WEIR 1.5m ABOVE BASE LEVEL

INTNL-2A

FLOW TO ROAD DRAINAGE NETWORK:
Q10 = 0.800 m3/s (0.361 m3/s VIA LOW FLOW PIPE; 0.439 m3/s VIA WEIR FLOW)
Q20 = 1.310 m3/s (0.378m3/s VIA LOW FLOW PIPE; 0.931 m3/s VIA WEIR FLOW)
Q100 = 2.140 m3/s (0.399 m3/s VIA LOW FLOW PIPE; 1.740 m3/s VIA WEIR FLOW (DISCHARGE FROM DETENTION TANK))

2B DETENTION TANK PARAMETERS

STORAGE VOLUME: 5854 m3
1% AEP WATER DEPTH: 1.80m
INTERNAL BASE AREA: 3250m2
LOW FLOW OUTLET: 300mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 4.25m WIDE WEIR 1.4m ABOVE BASE LEVEL

INTNL-2B
FLOW TO ROAD DRAINAGE NETWORK:
Q10 = 0.501 m3/s (0.224 m3/s VIA LOW FLOW PIPE; 0.278 m3/s VIA WEIR FLOW)
Q20 = 1.010 m3/s (0.232 m3/s VIA LOW FLOW PIPE; 0.781 m3/s VIA WEIR FLOW)
Q100 = 2.080 m3/s (0.245 m3/s VIA LOW FLOW PIPE; 1.84 m3/s VIA WEIR FLOW)

3A DETENTION TANK PARAMETERS

STORAGE VOLUME: 4132 m3
1% AEP WATER DEPTH: 0.86m
INTERNAL BASE AREA: 4800m2
LOW FLOW OUTLET: 2 x 525mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 4m WIDE WEIR 0.65m ABOVE BASE LEVEL

INTNL-3A

FLOW TO ROAD DRAINAGE NETWORK:
Q10 = 0.713 m3/s (ALL VIA LOW FLOW PIPE)
Q20 = 0.898 m3/s (0.786 m3/s VIA LOW FLOW PIPE; 0.112 m3/s VIA WEIR FLOW)
Q100 = 1.520 m3/s (0.880 m3/s VIA LOW FLOW PIPE; 0.636 m3/s VIA WEIR FLOW (DISCHARGE FROM DETENTION TANK))

2CW DETENTION TANK PARAMETERS

STORAGE VOLUME: 4883m3
1% AEP WATER DEPTH: 1.71 m
INTERNAL BASE AREA: 3350m2
LOW FLOW OUTLET: 2 x 225mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 4.75m WIDE WEIR 1.45m ABOVE BASE LEVEL

2CE1 DETENTION TANK PARAMETERS

STORAGE VOLUME: 2074 m3
1% AEP WATER DEPTH: 0.80m
INTERNAL BASE AREA: 2600m2
LOW FLOW OUTLET: 300mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 8.9m WIDE WEIR 0.7m ABOVE BASE LEVEL

INTNL-2C EAST 1

FLOW TO ROAD DRAINAGE NETWORK:
Q10 = 0 m3/s
Q20 = 0 m3/s
Q100 = 0.462 m3/s

FLOW TO CHANNEL:
Q10 = 0.123 m3/s
Q20 = 0.138 m3/s
Q100 = 0.151 m3/s

2CE2 DETENTION TANK PARAMETERS

STORAGE VOLUME: 1533 m3
1% AEP WATER DEPTH: 0.73m
INTERNAL BASE AREA: 2100m2
LOW FLOW OUTLET: 280mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 7.5m WIDE WEIR 0.65m ABOVE BASE LEVEL

INTNL-2C EAST 2

FLOW TO ROAD DRAINAGE NETWORK:
Q10 = 0.100 m3/s (ALL VIA LOW FLOW PIPE)
Q20 = 0.112 m3/s (ALL VIA LOW FLOW PIPE)
Q100 = 0.413 m3/s (0.126 m3/s VIA LOW FLOW PIPE; 0.288 m3/s VIA WEIR FLOW)

3B DETENTION TANK PARAMETERS

STORAGE VOLUME: 8627 m3
1% AEP WATER DEPTH: 1.67m
INTERNAL BASE AREA: 5110m2
LOW FLOW OUTLET: 375mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 4.0m WIDE WEIR 1.5m ABOVE BASE LEVEL

INTNL-3B

FLOW TO CHANNEL:
Q10 = 0.269 m3/s (ALL VIA LOW FLOW PIPE)
Q20 = 0.304 m3/s (ALL VIA LOW FLOW PIPE)
Q100 = 0.845 m3/s (0.358 m3/s VIA LOW FLOW PIPE; 0.488 m3/s VIA WEIR FLOW (DISCHARGE FROM DETENTION TANK))

4C DETENTION TANK PARAMETERS

STORAGE VOLUME: 3495 m3
1% AEP WATER DEPTH: 1.86m
INTERNAL BASE AREA: 1800m2
LOW FLOW OUTLET: 2 x 375mm DIA @ BASE LEVEL
HIGH FLOW OUTLE: 4m WIDE WEIR 1.5m ABOVE BASE LEVEL

INTNL-4C

FLOW TO CHANNEL:
Q10 = 0.726 m3/s (0.679 m3/s VIA LOW FLOW PIPE; 0.048 m3/s VIA WEIR FLOW)
Q20 = 1.320 m3/s (0.723 m3/s VIA LOW FLOW PIPE; 0.601 m3/s VIA WEIR FLOW)
Q100 = 2.36 m3/s (0.770 m3/s VIA LOW FLOW PIPE; 1.590 m3/s VIA WEIR FLOW (DISCHARGE FROM DETENTION TANK))

LEGEND

- EXISTING SURFACE CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- EXTERNAL STORMWATER CATCHMENT
- POST DEVELOPMENT STORMWATER CATCHMENT

CATCHMENT AREAS

LABEL	AREA (Ha)
EXTNL - 1A	7.224
EXTNL - 1Bi	23.636
EXTNL - 1Bii	16.974
EXTNL - 1Biii	0.903
EXTNL - 1Biv	3.366
EXTNL - 1Bv	4.203
WESTERN CHANNEL NORTH	1.244
WESTERN CHANNEL MID	0.960
WESTERN CHANNEL SOUTH	0.517
EXTNL - 1C	64.974
EXTNL - 1D	19.78
EXTNL - 2A & 2A1	12.652
EXTNL - 2B	0.3972
EXTNL - 2B1	3.680
EXTNL - 3A	12.150
EXTNL - 3B	14.090
EXTNL - 3B1	4.830
EXTNL - 3B2	2.810
EXTNL - 4	34.632
EXTNL - 4A	8.764
INTNL - 1	17.052
INTNL - 2A	8.918
INTNL - 2B	8.8808
INTNL - 2C WEST	7.5559
INTNL - 2C EAST 1	2.9479
INTNL - 2C EAST 2	2.1702
INTNL - 2R	2.382
INTNL - 3A	7.740
INTNL - 3B	9.165
INTNL - 3C	5.104
INTNL - 4A	5.529
INTNL - 4Bi	6.553
INTNL - 4Bii	13.967
INTNL - 4C	7.916
INTNL - 5	5.958
EASTERN CHANNEL	2.904
EASTERN CHANNEL SOUTH	0.546

Issue	Description	DR	CH	VE	Date
04	CATCHMENTS AMENDED	G.P.	T.F.	G.E.	12.06.24
03	CATCHMENTS AMENDED	G.P.	T.F.	G.E.	16.02.24
02	RFI RESPONSE	T.F.	D.C.	G.E.	20.06.23
01	FOR APPROVAL	J.G.	E.P.	G.E.	24.01.23

Scales

0 50 100 200 300 400 500m

1 : 5000

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying

Architect: -

Client: Charter Hall

Status: CONCEPT DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION

© Copyright reserved

Original Issue Signatures			
Drawn	L. STAUNTON	Original Size	A1
Designed	L. STAUNTON	Height Datum	AHD
Project Manager	T. FANNING	Grid	LOCAL
Verified	G. ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

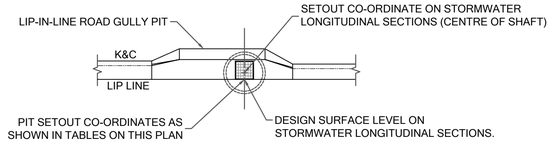
Title: POST-DEVELOPMENT CATCHMENT PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone	Stage	Phase	Discipline	Type	Drawing No.	Issue
30109334	- AAP	- WS00	OP	- CV	- SKT	- 024	A	- 04

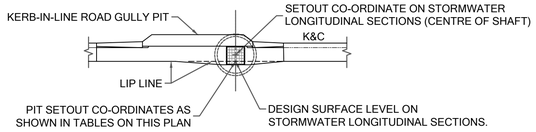
100mm on Original

Date Plotted: 14 Jun 2024 - 10:09AM File Name: C:\Users\gp117798\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-024-SWDReportCatchments.dwg V1



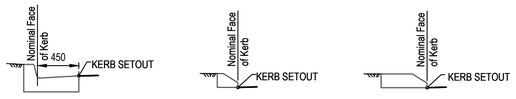
LIP IN LINE GULLY PIT SETOUT DETAIL

Not to Scale



KERB IN LINE GULLY PIT SETOUT DETAIL

Not to Scale



450mm TYPE B1 KERB AND CHANNEL | TYPE SM4 MOUNTABLE KERB | TYPE SM5 MOUNTABLE KERB

KERB SETOUT DETAIL

N.T.S.

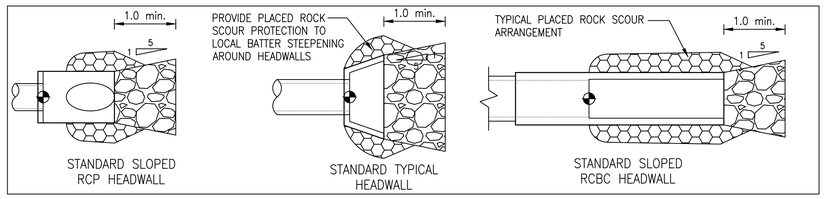
LEGEND

- EXISTING TREE TO REMAIN
- ENVIRONMENTALLY / CULTURALLY SIGNIFICANT TREE
- EXIST. ELECTRICAL OVERHEAD
- EXIST. ELECTRICAL UNDERGROUND
- EXIST. UNDERGROUND GAS
- EXIST. TELECOMMUNICATIONS OVERHEAD
- EXIST. TELECOMMUNICATIONS UNDERGROUND
- EXIST. SEWER LINE
- EXIST. WATER MAIN
- EXIST. STORMWATER PIPE (RCP 375Ø)
- EXIST. INVERT
- EXIST. TOP OF BANK
- EXIST. BOTTOM OF BANK
- EXIST. POWER / PROPERTY / LIGHT / STAY POLE
- EXIST. TELECOMMUNICATIONS PIT
- EXIST. PROPERTY BOUNDARY
- EXIST. KERB & CHANNEL – BARRIER TYPE (B1)
- EXIST. KERB – SEMI MOUNTABLE TYPE (SM5)
- EXIST. EDGE OF BITUMEN
- EXIST. FENCE TO REMAIN
- PROPOSED ELECTRICAL OVERHEAD
- PROPOSED ELECTRICAL UNDERGROUND
- PROPOSED UNDERGROUND GAS
- PROPOSED TELECOMMUNICATIONS OVERHEAD
- PROPOSED TELECOMMUNICATIONS UNDERGROUND
- PROPOSED SEWER LINE
- PROPOSED WATER MAIN
- PROPOSED STORMWATER PIPE (375mm)
- PROPOSED INVERT
- PROPOSED TELECOMMUNICATIONS PIT
- PROPOSED PROPERTY / POWER / LIGHT POLE
- PROPOSED ELECTRICAL PITS / PILLAR
- PROPOSED PROPERTY BOUNDARY / RESUMPTION
- PROPOSED DRAINAGE EASEMENT BOUNDARY
- PROPOSED KERB & CHANNEL – BARRIER TYPE (B1)
- PROPOSED KERB – SEMI MOUNTABLE TYPE (SM4)
- PROPOSED KERB – SEMI MOUNTABLE TYPE (SM5)
- PROPOSED EDGE OF BITUMEN
- PROPOSED BOUNDARY FENCE LINE
- PROPOSED GUARDRAIL
- PROPOSED PEDESTRIAN FENCE
- PROPOSED TYPE 1 FAUNA FENCE
- PROPOSED TYPE 2 FAUNA FENCE
- PROPOSED RETAINING WALL
- PROPOSED SUBSOIL DRAIN

SURFACES LEGEND

- PAVEMENT CONSTRUCTION – ASPHALTIC CONCRETE
- DRIVEWAYS – REFER TO DRAWING SET "DW" FOR DRIVEWAY PAVEMENT DETAILS
- CONCRETE FOOTPATH / SHARED PATH
- CONCRETE CAPPING – 100mm tk. 25MPa SL62 MESH
- MEDIAN LANDSCAPING – REFER TO LANDSCAPING PLANS (BY OTHERS)

PAVEMENT NOTES:
1. REFER TO DRAWING SET "R" FOR ROAD PAVEMENT DETAILS.
2. REFER TO DRAWING SET "DW" FOR DRIVEWAY PAVEMENT DETAILS



SINGLE CULVERT TYPICAL SETOUT POINT DETAIL

ROCK SCOUR PROTECTION

LOCATION	D_{50} ROCK SIZE (mm)	DEPTH (mm)	Approx. Vol (m^3)
Outlet 1/03	300	600	9.4
Outlet 1/17	200	400	1.7
Outlet 1/25	200	400	2.3
Outlet 1/32	200	400	0.7
Outlet 1/36	200	400	0.6
Outlet 1/39	200	400	1.4
CC01 inlet	200	400	7.6
CC01 outlet	200	400	26.4
CC03 inlet	300	600	35.1
CC03 outlet	300	600	34.9

ROCK SCOUR PROTECTION

LOCATION	D_{50} ROCK SIZE (mm)	DEPTH (mm)	Approx. Vol (m^3)
CC04 inlet	400	800	403.3
CC04 outlet	400	800	700.9
CC05 inlet	200	400	55.2
CC05 outlet	200	400	55.2
CC06 inlet	200	400	33.3
CC06 outlet	200	400	21.9
Outlet 1/121	300	600	53.0
CC08 inlet	200	400	7.1
CC08 outlet	200	400	7.1
all driveway culverts (in/outlet)	100	200	1.0 (each culvert)

CROSS DRAINAGE SETOUT TABLE

ITEM I.D	INLET			OUTLET			PIPE DETAILS				SCOUR PROTECTION	
	EASTING	NORTHING	I.L	EASTING	NORTHING	I.L	PIPE TYPE	PIPE SIZE (mm)	No. of CELLS	PIPE LENGTH (m)	INLET	OUTLET
CC09	499617.826	6929993.19	44.342	499593.899	6929988.566	43.33	RCP CL3	375	2	24.37	YES	YES
DC01	499424.366	6930385.895	52.293	499428.587	6930378.473	52.25	RCP CL3	375	1	8.54	YES	YES
DC04	499588.685	6930106.889	46.771	499593.423	6930095.651	46.61	RCP CL3	375	1	12.2	YES	YES
DC05	499617.719	6930010.003	44.778	499618.511	6930000.276	44.726	RCP CL3	450	1	9.76	YES	YES
DC06	499397.92	6930430.81	52.815	499393.379	6930438.041	52.77	RCP CL3	375	1	8.54	YES	YES
DC07	499394.117	6930468.096	52.97	499398.009	6930461.898	52.93	RCP CL3	375	1	7.32	YES	YES
DC08	499589.246	6929942.696	41.835	499588.322	6929935.44	41.72	RCP CL3	450	1	7.31	YES	YES
DC09	498596.573	6929056.011	27.541	498598.643	6929063.032	27.516	RCP CL3	375	1	7.32	YES	YES
DC10	498612.043	6929043.699	27.647	498614.478	6929050.601	27.605	RCP CL3	375	1	7.32	YES	YES
DC11	500111.525	6930131.905	48.075	500117.242	6930129.776	48.054	RCP CL3	450	1	6.1	YES	YES
DC12	498726.144	6929504.568	23.298	498728.019	6929512.896	23.206	RCP CL3	450	1	8.54	YES	YES
DC13	498722.343	6930248.904	30.832	498719.759	6930255.745	30.67	RCP CL3	450	1	7.31	YES	YES
DC14	498718.386	6930259.685	30.208	498714.804	6930270.059	30.05	RCP CL3	450	1	10.97	YES	YES
DC15	498673.369	6930406.825	28.808	498674.944	6930399.678	28.771	RCP CL3	450	1	7.32	YES	YES
DC16	499464.006	6930362.793	51.669	499468.297	6930356.865	51.595	RCP CL3	375	1	7.32	YES	YES
DC17	501600.736	6929778.919	29.916	501606.664	6929778.002	29.86	RCBC	600x300	1	6.00	YES	YES

WARNING!

BEWARE OF UNDERGROUND SERVICES. THE LOCATIONS OF UNDERGROUND SERVICES HAS BEEN INTERPOLATED FROM EASIMAP DATA OR KNOWN POSITIONS OF VALVES, MANHOLES ETC. OR INFORMATION SUPPLIED BY SERVICE AUTHORITIES. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF THE INTERPOLATED INFORMATION SUPPLIED. ENSURE ALL SERVICES ARE ACCURATELY LOCATED PRIOR TO COMMENCEMENT OF WORK.

NOTES

1. REFER TO DRAWING SET "G" FOR GENERAL NOTES.
2. REFER TO DRAWING SET "D" FOR ROAD LAYOUT PLANS.
3. REFER TO DRAWING SET "CL" FOR CONTROL LINE SETOUT PLANS.
4. REFER TO DRAWING SET "LM" FOR LINEMARKING & SIGNAGE PLANS.
5. REFER TO DRAWING SET "E" FOR SERVICES PLANS.
6. REFER TO DRAWING SET "EW" FOR EARTHWORKS PLANS.
7. REFER TO DRAWING SET "GR" FOR GUARDRAILS, RETAINING WALLS AND FENCING NOTES, PLANS AND DETAILS.
8. REFER TO DRAWING SET "DD" FOR CROSS CULVERT DETAILS.
9. REFER TO DRAWING SET "DS" FOR STORMWATER PIPE CLASSES, INVERT LEVELS AND MANHOLE SIZES.
10. REFER TO SHEETS 31&32 FOR STORMWATER GULLY PIT SETOUT TABLES.
11. CONTOURS SHOWN ON THE PLAN ARE FINISHED SURFACE CONTOURS.
12. ROCK SCOUR PROTECTION DEPTH & SIZE AS PER TABLE THIS SHEET, WITH BIDIM A34 GEOFABRIC 50 MATERIAL OR APPROVED ALTERNATIVE U.N.O.
13. EXISTING SWALE DRAINS BEYOND THE LIMITS OF CONSTRUCTION ARE TO REMAIN UNDISTURBED DURING CONSTRUCTION. IF DISTURBED, DRAINS ARE TO BE REINSTATED TO PREVIOUS CONDITION, AS PER IPWEA STD. DWG. RS-056. REFER TO "TYPICAL DRIVEWAY SECTION – ROAD IN CUT" AND "TYPICAL DRIVEWAY SECTION – ROAD IN FILL".
14. ALL REINFORCED CONCRETE PIPE (RCP) CULVERTS ARE TO BE MINIMUM CLASS 3 U.N.O.
15. ALL INSTALLATION, BEDDING AND BACKFILLING OF PROPOSED STORMWATER PIPES, REFER IPWEA STD DWG DS-030.
16. ALL ROAD CROSSING CULVERTS WITH PRECAST HEADWALLS ARE TO BE FITTED WITH CAST INSITU HEADWALL EXTENSIONS AND CUTOFF WALLS IN ACCORDANCE WITH MAIN ROADS STANDARD DRAWING 1243.
17. DESIGN BASED ON MANUFACTURER HUMES. ALTERNATE SHOULD BE CHECKED AGAINST THIS DESIGN.
18. SUBSOIL DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD. DWG. RS-140, RS-142.

Δ NOTE: Setout of box culvert structures is based on "ROCLA" products. Adjustments to setout points to be made by contractor if selected product dimensions vary.

MAJOR CULVERT SETOUT TABLE Δ

POINT No.	EASTING	NORTHING	HEIGHT	COMMENT
4B1	498819.626	6929691.556	19.060	CC04 BASE
4B2	498818.218	6929677.564	19.029	CC04 BASE
4B3	498816.472	6929674.609	19.029	CC04 BASE
4B4	498766.732	6929703.990	19.318	CC04 BASE
4B5	498768.141	6929717.985	19.348	CC04 BASE
4B6	498769.885	6929720.938	19.348	CC04 BASE
4H1	498763.633	6929728.448	19.348	CC04 HW
4H2	498768.564	6929706.895	23.300	CC04 HW
4H3	498761.257	6929704.082	19.317	CC04 HW
4H4	498822.724	6929667.099	19.029	CC04 HW
4H5	498817.793	6929688.651	23.044	CC04 HW
4H6	498820.658	6929693.501	19.061	CC04 HW
4H7	498825.331	6929693.455	19.061	CC04 HW
5B1	498811.958	6929652.750	21.915	CC05 BASE
5B2	498766.843	6929658.812	22.206	CC05 BASE
5B3	498762.230	6929624.480	22.206	CC05 BASE
5B4	498807.345	6929618.419	21.915	CC05 BASE
5H1	498811.615	6929615.170	21.890	CC05 HW
5H2	498816.935	6929654.756	21.890	CC05 HW
5H3	498762.574	6929662.061	22.230	CC05 HW
5H4	498757.254	6929622.474	22.230	CC05 HW
6B1	498803.742	6929595.439	22.947	CC06 BASE
6B2	498797.009	6929559.291	22.947	CC06 BASE
6B3	498752.477	6929567.807	23.258	CC06 BASE
6B4	498759.210	6929603.955	23.258	CC06 BASE
6H1	498806.286	6929596.285	22.949	CC06 HW
6H2	498799.084	6929557.546	22.949	CC06 HW
6H3	498749.941	6929566.959	23.260	CC06 HW
6H4	498757.142	6929605.698	23.260	CC06 HW
1H1	499137.054	6930113.714	35.365	CC01 HW
1H2	499131.492	6930112.208	35.365	CC01 HW
1H3	499118.637	6930159.657	35.780	CC01 HW
1H4	499124.199	6930161.163	35.780	CC01 HW
1B1	499134.333	6930116.966	35.364	CC01 BASE
1B2	499132.200	6930116.388	35.364	CC01 BASE
1B3	499121.311	6930156.579	35.781	CC01 BASE
1B4	499123.444	6930157.157	35.781	CC01 BASE
3B1	498658.195	6930343.912	25.765	CC03 BASE
3B2	498657.084	6930348.705	25.765	CC03 BASE
3B3	498690.565	6930356.466	26.302	CC03 BASE
3B4	498691.676	6930351.673	26.302	CC03 BASE
3H1	498695.615	6930360.554	26.300	CC03 HW
3H2	498698.010	6930350.223	26.300	CC03 HW
3H3	498653.418	6930339.887	25.507	CC03 HW
3H4	498651.023	6930350.218	25.507	CC03 HW
8B1	498647.604	6929115.133	26.268	CC08 BASE
8B2	498646.074	6929110.795	26.268	CC08 BASE
8B3	498611.803	6929122.884	26.628	CC08 BASE
8B4	498613.334	6929127.222	26.628	CC08 BASE
8H1	498648.590	6929115.525	26.269	CC08 HW
8H2	498646.594	6929109.866	26.269	CC08 HW
8H3	498610.816	6929122.489	26.631	CC08 HW
8H4	498612.812	6929128.148	26.631	CC08 HW

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
NOT TO SCALE

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD
UPGRADE & EXTENSION
DRAINAGE NOTES AND LEGEND, CROSS DRAINAGE SETOUT TABLE
SHEET 1 OF 1

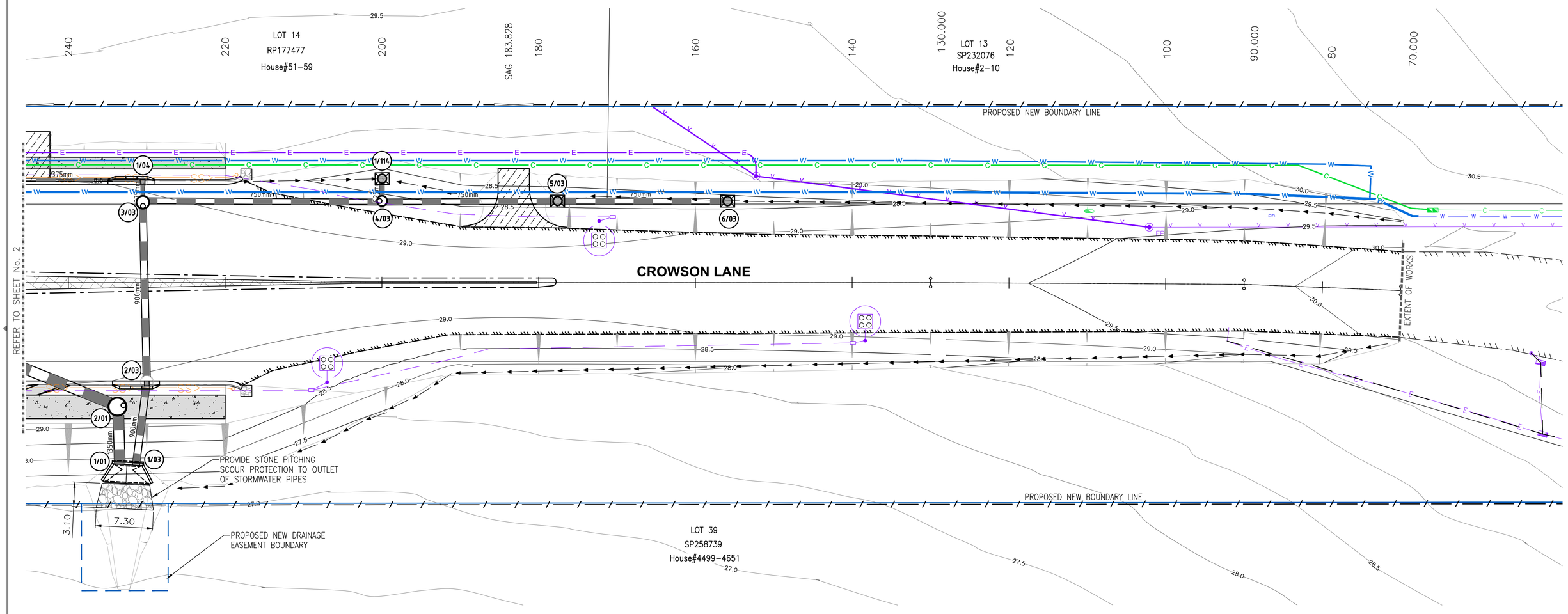
APPROVED
DESIGN ENGINEER DATE

SHEET 1 OF 1

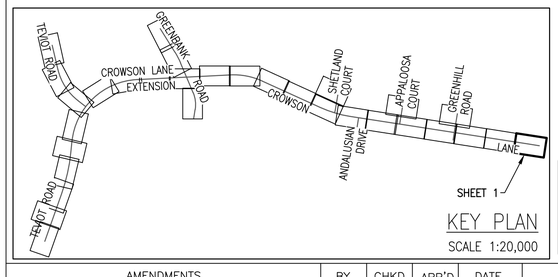
DRAWING NUMBER
1 | B19175-DR00 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1



PLAN 1
SCALE 1:250



KEY PLAN
SCALE 1:20,000

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

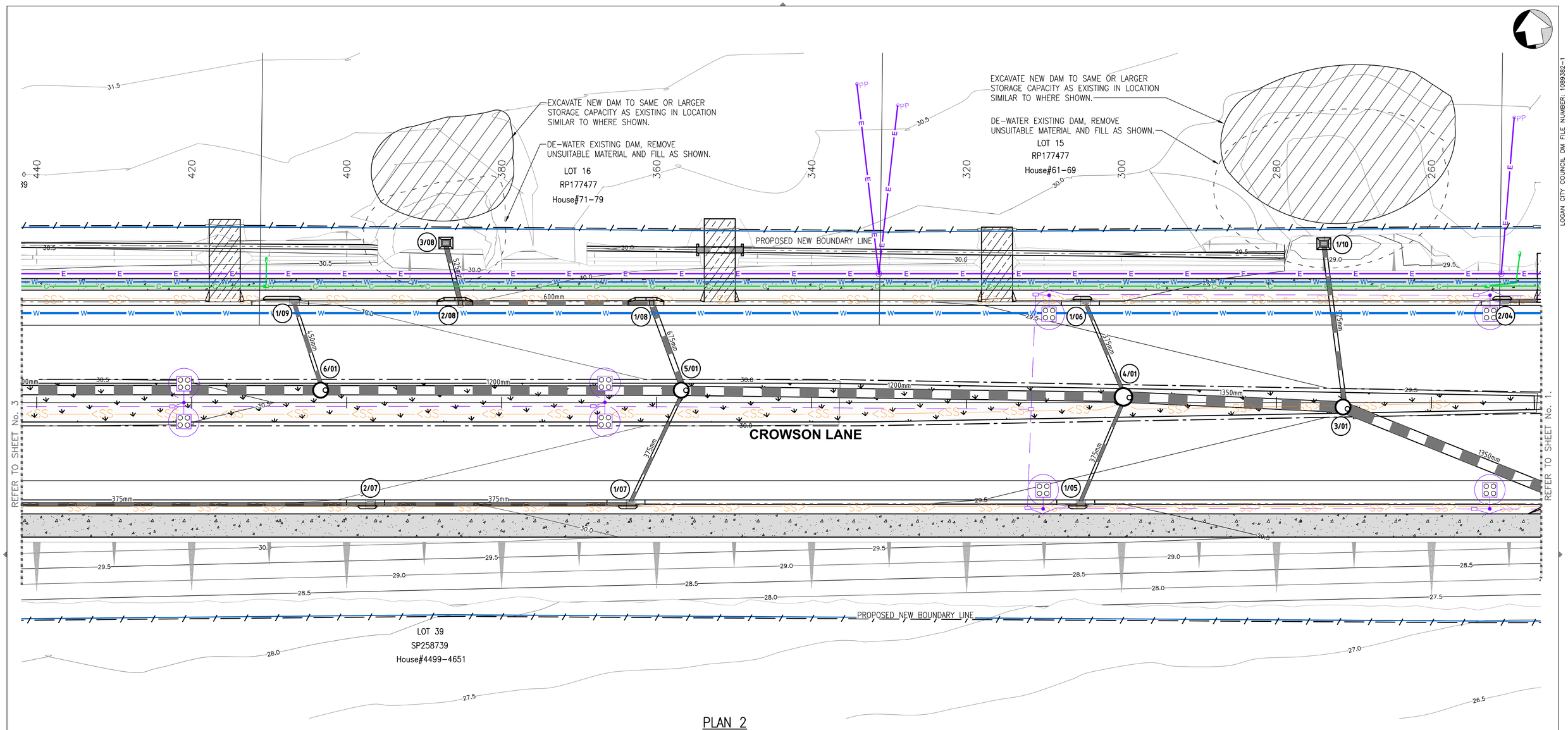
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 1 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 1 OF 33

DRAWING NUMBER
1 | B19175-DR01 | –

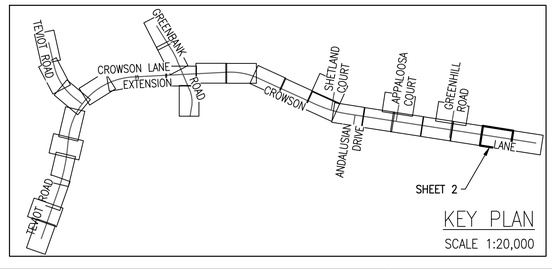


PLAN 2

SCALE 1:250

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 2 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 2 OF 33

DRAWING NUMBER
1 | B19175-DR02 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

DE-WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

LOT 19
RP177477
House#101-109

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

LOT 18
RP177477
House#91-99

DE-WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

LOT 17
RP177477
House#81-89

DE-WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

PROPOSED NEW BOUNDARY LINE

CROWSON LANE

PROPOSED NEW BOUNDARY LINE

LOT 39
SP258739
House#4499-4651

REFER TO SHEET No. 5

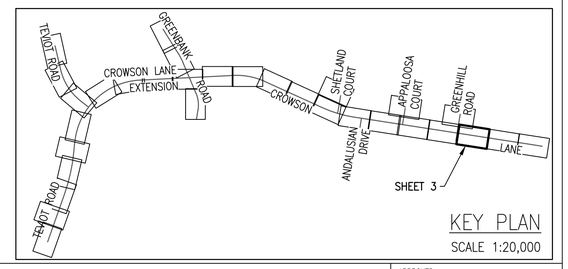
REFER TO SHEET No. 2.

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

PLAN 3
SCALE 1:250

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION

REFER TO DRAWING SET "CL" FOR DETAILS

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

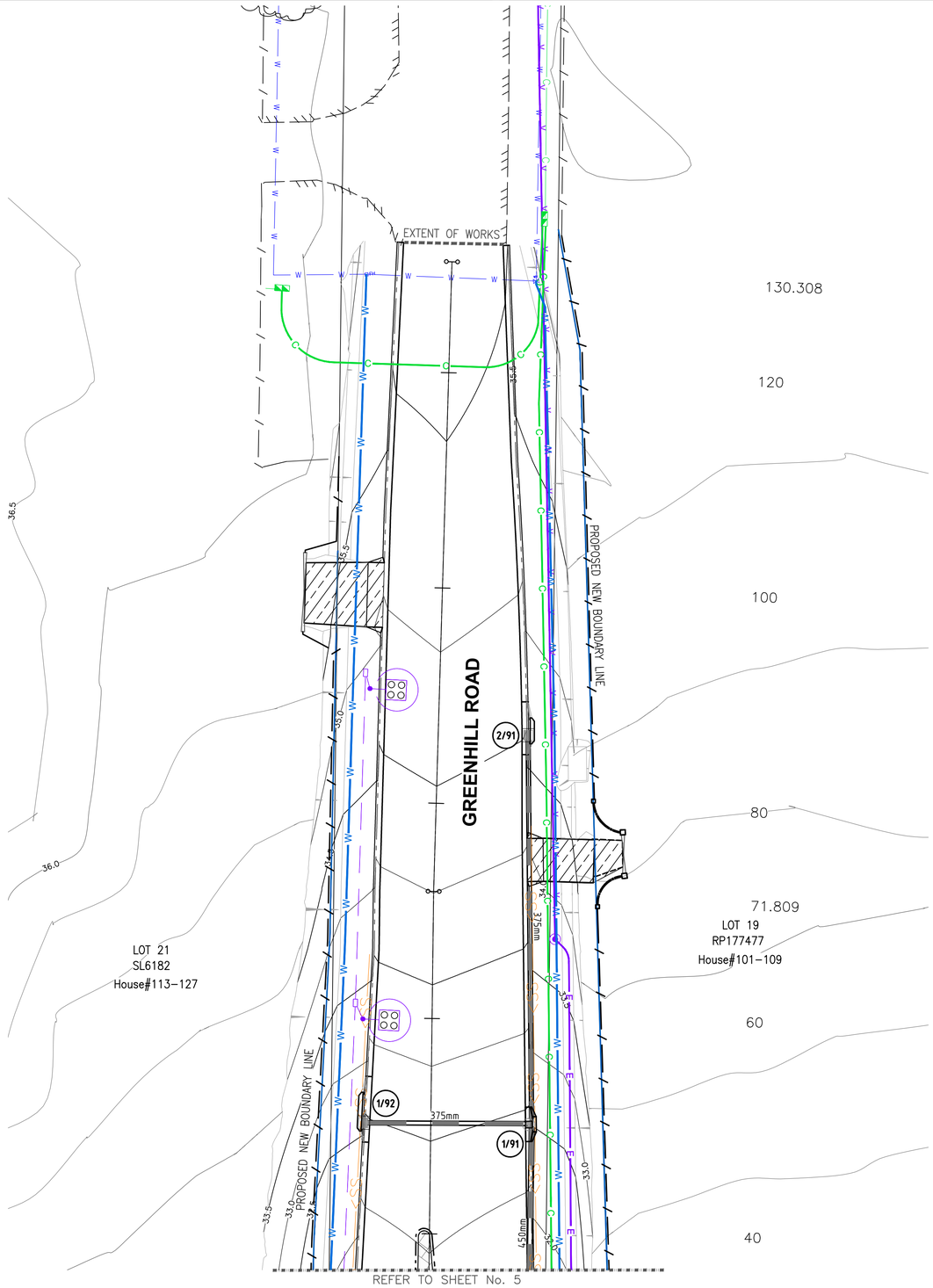
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 3 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 3 OF 33

DRAWING NUMBER
1 | B19175-DR03 | -

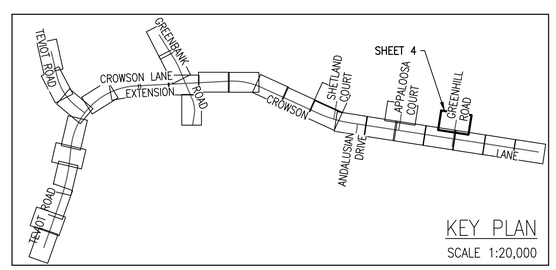


PLAN 4

SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN

SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION

REFER TO DRAWING SET "CL" FOR DETAILS

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 4 OF 31

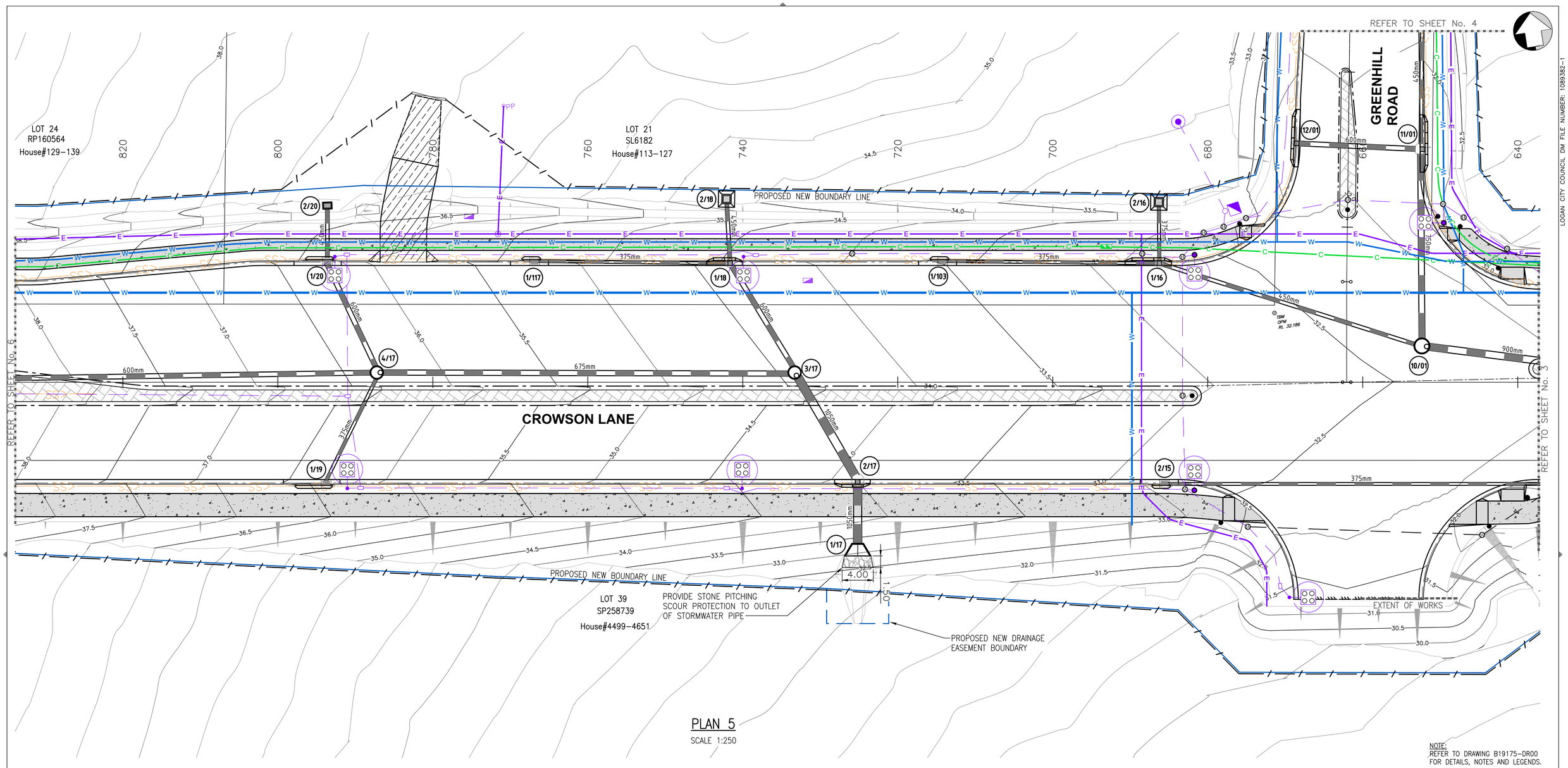
APPROVED
DESIGN ENGINEER DATE

SHEET 4 OF 33

DRAWING NUMBER

1	B19175–DR04	–

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

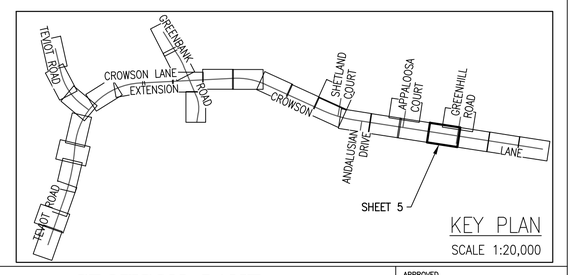


PLAN 5

SCALE 1:250

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 5 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 5 OF 33

DRAWING NUMBER

1 | B19175-DR05 | -

REFER TO SHEET No. 7

REFER TO SHEET No. 8

REFER TO SHEET No. 5

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

APPALOOSA COURT

CROWSON LANE

PROPOSED NEW BOUNDARY LINE

LOT 23
RP160564
House#1–23

LOT 24
RP160564
House#129–139

LOT 1
SP137557
House#142–152

LOT 39
SP258739
House#4499–4651

2/24 1/24 1/115 2/21 2/23 1/23 1/21 7/17 8/17 6/17 5/17 1/22

450mm 375mm 525mm

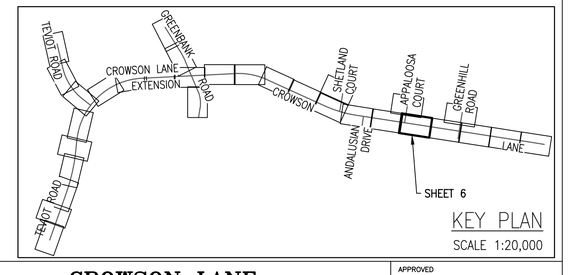
0.000

PLAN 6

SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

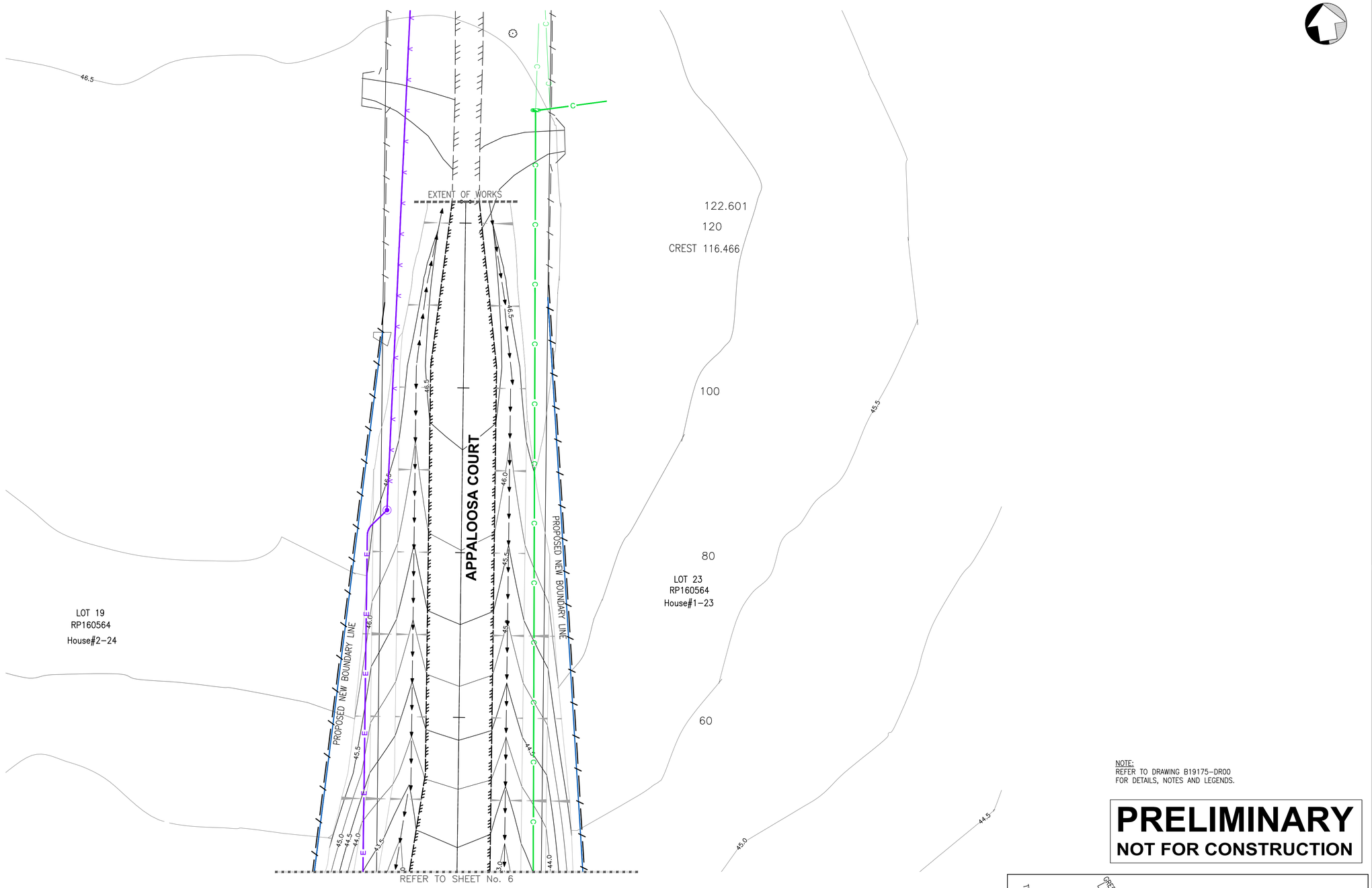
ROAD DRAINAGE LAYOUT
SHEET 6 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 6 OF 33

DRAWING NUMBER

1	B19175–DR06	–

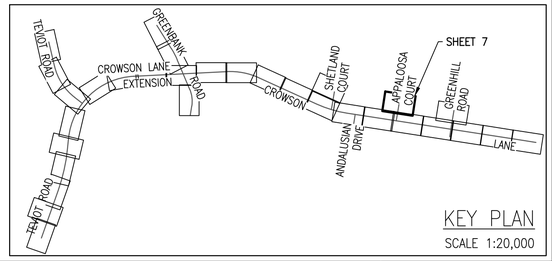


PLAN 7

SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN

SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

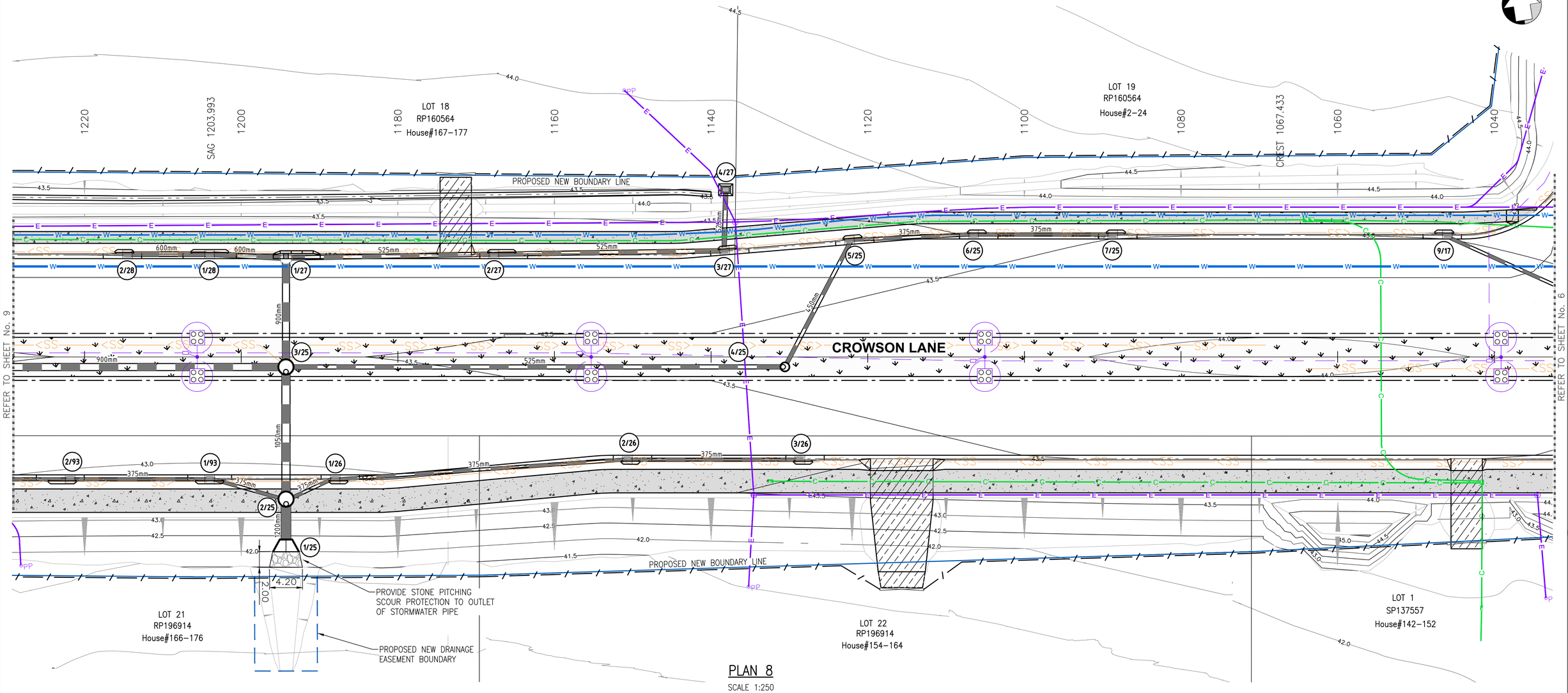
ROAD DRAINAGE LAYOUT
SHEET 7 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 7 OF 33

DRAWING NUMBER
1 | B19175–DR07 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

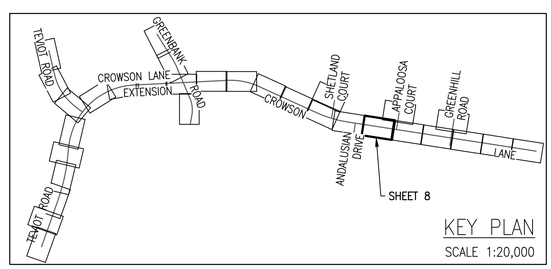


PLAN 8

SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN

SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION

REFER TO DRAWING SET "CL" FOR DETAILS

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 8 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 8 OF 33

DRAWING NUMBER
1 | B19175–DR08 | –

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

DE-WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

LOT 16
RP160564
House#1-23

LOT 17
RP160564
House#179-189

PROPOSED NEW BOUNDARY LINE

CROWSON LANE

REFER TO SHEET No. 10

REFER TO SHEET No. 8

PROVIDE STONE PITCHING SCOUR PROTECTION TO OUTLET OF STORMWATER PIPE

PROPOSED NEW DRAINAGE EASEMENT BOUNDARY

LOT 1
SP185436
House#190-202

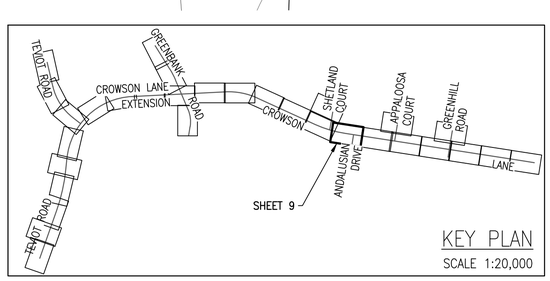
LOT 13
SP185436
House#180-188

LOT 21
RP196914
House#166-176

ANDALUSIAN DRIVE

EXTENT OF WORKS

PLAN 9
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN
CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 9 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 9 OF 33

DRAWING NUMBER
1 | B19175-DR09 | -

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

REFER TO SHEET No. 11

REFER TO SHEET No. 12

REFER TO SHEET No. 9

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

SHETLAND COURT

CROWSON LANE

LOT 12
RP160564
House#2–24

LOT 16
RP160564
House#1–23

LOT 28
RP160564
House#204–248

LOT 12
RP801796
House#47–55

LOT 1
SP185436
House#190–202

PROPOSED NEW BOUNDARY LINE

CMA
10.5
MH

R180.000

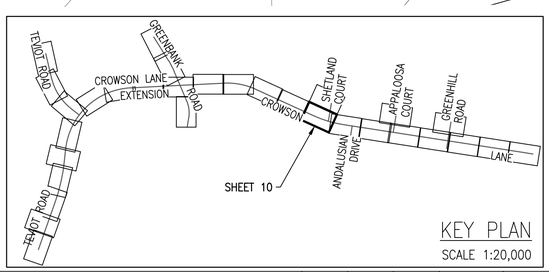
R750.000

23.780

0.420

0.000

PLAN 10
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

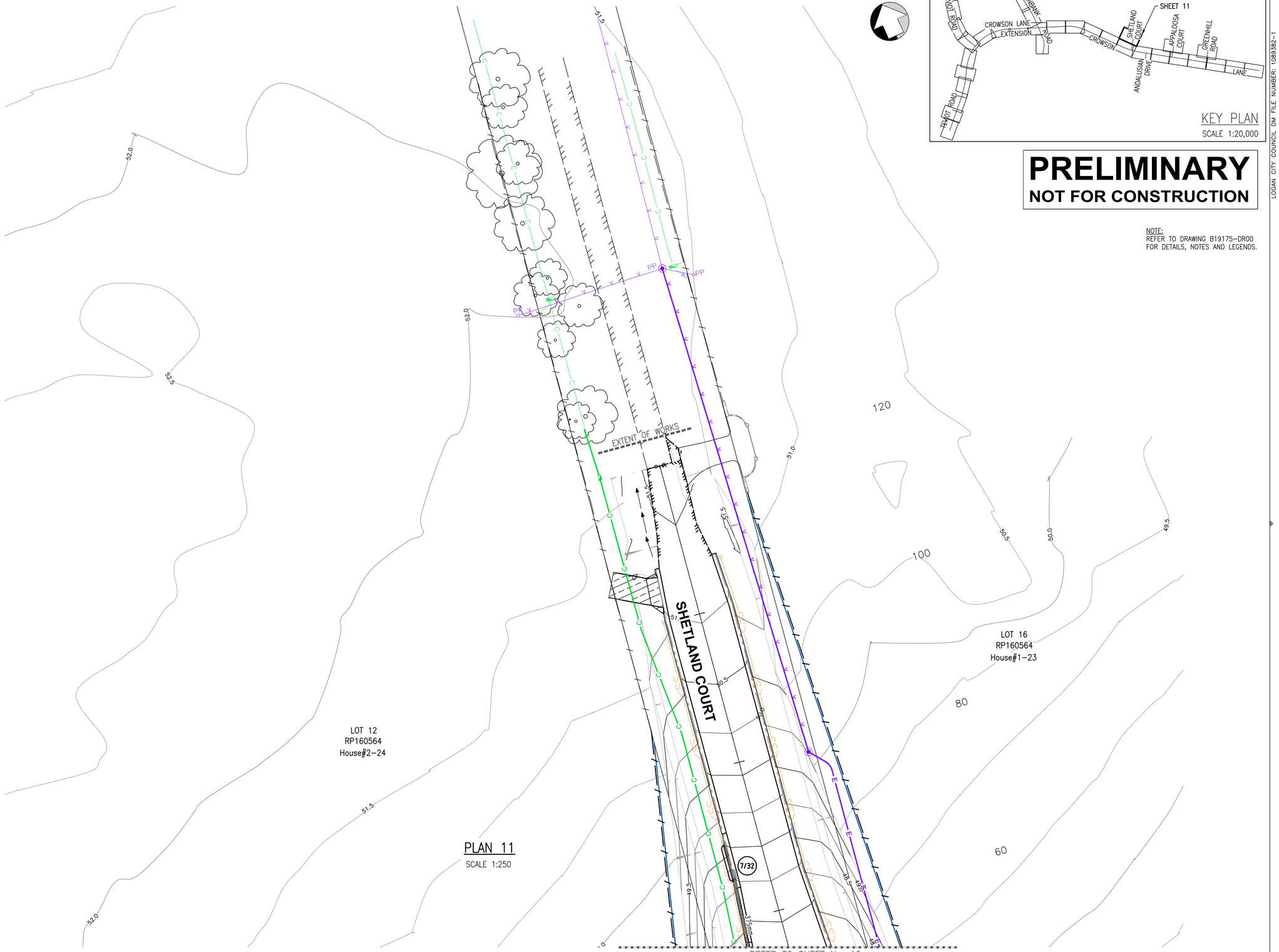
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 10 OF 31

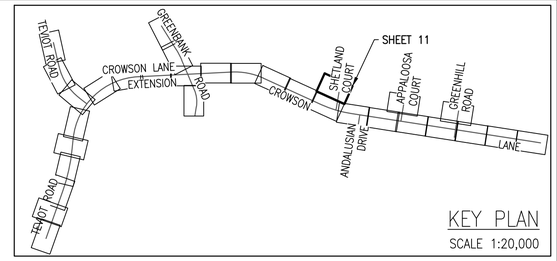
APPROVED
DESIGN ENGINEER DATE

SHEET 10 OF 33

DRAWING NUMBER
1 | B19175-DR10 | –



PLAN 11
SCALE 1:250



KEY PLAN
SCALE 1:20,000

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

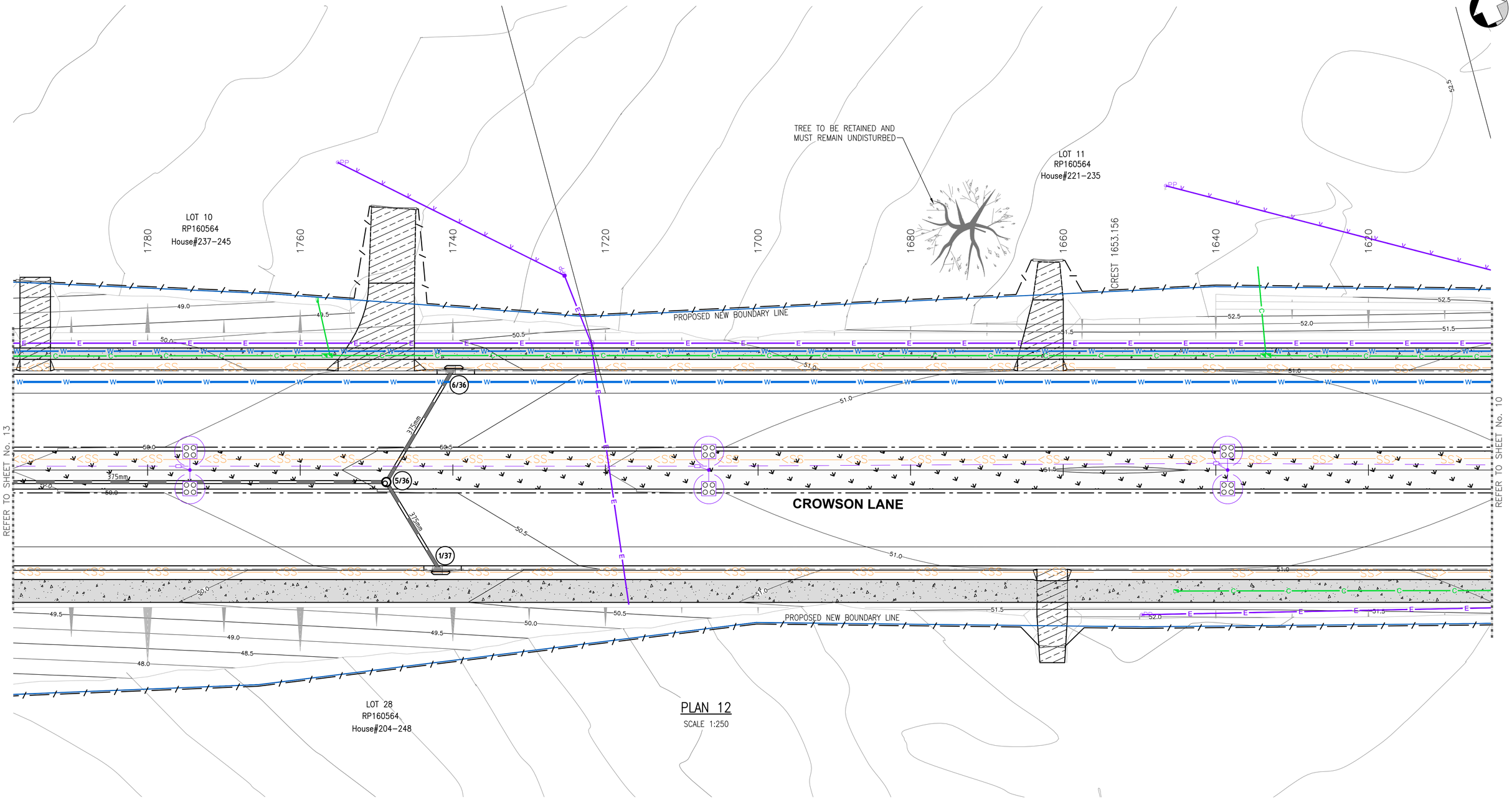
ROAD DRAINAGE LAYOUT SHEET 11 OF 31

APPROVED
DESIGN ENGINEER DATE

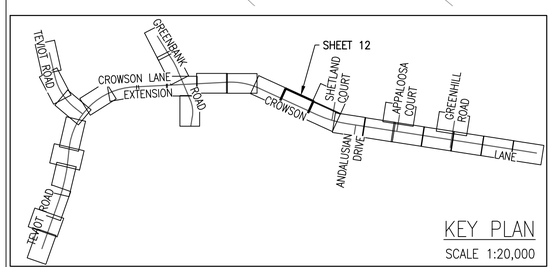
SHEET 11 OF 33

DRAWING NUMBER
1 | B19175-DR11 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1



PLAN 12
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

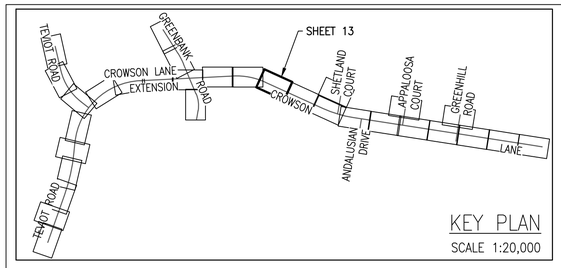
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 12 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 12 OF 33

DRAWING NUMBER
1 | B19175-DR12 | –



KEY PLAN
SCALE 1:20,000

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

LOGAN CITY COUNCIL DM FILE NUMBER: 10893382-1

REFER TO SHEET No. 14

REFER TO SHEET No. 12

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

LOT 7
RP160563
House#267-283

DE-WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

LOT 8
RP160563
House#257-265

LOT 9
RP160563
House#247-255

DRIVEWAY CULVERT 11 (DC11)

PROPOSED NEW BOUNDARY LINE

CROWSON LANE

PROPOSED NEW BOUNDARY LINE

LOT 27
RP160563
House#250-268

PROVIDE STONE PITCHING SCOUR PROTECTION TO OUTLET OF STORMWATER PIPES

EXISTING DRAINAGE EASEMENT BOUNDARY

LOT 27
RP160563
House#250-268

LOT 28
RP160564
House#204-248

PLAN 13
SCALE 1:250

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION

REFER TO DRAWING SET "CL" FOR DETAILS

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 13 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 13 OF 33

DRAWING NUMBER
1 | B19175-DR13 | –

LOT 6
RP160563
House#285–293

LOT 7
RP160563
House#267–283

PROPOSED NEW BOUNDARY LINE

CROWSON LANE

REFER TO SHEET No. 15

REFER TO SHEET No. 13

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

PROPOSED NEW BOUNDARY LINE

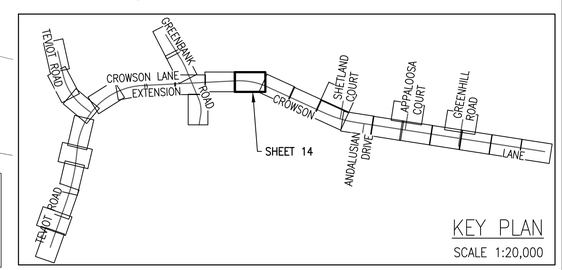
LOT 25
RP160563
House#566–580

LOT 1
RP108335
House#270–292

PLAN 14
SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION

REFER TO DRAWING SET "CL" FOR DETAILS

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

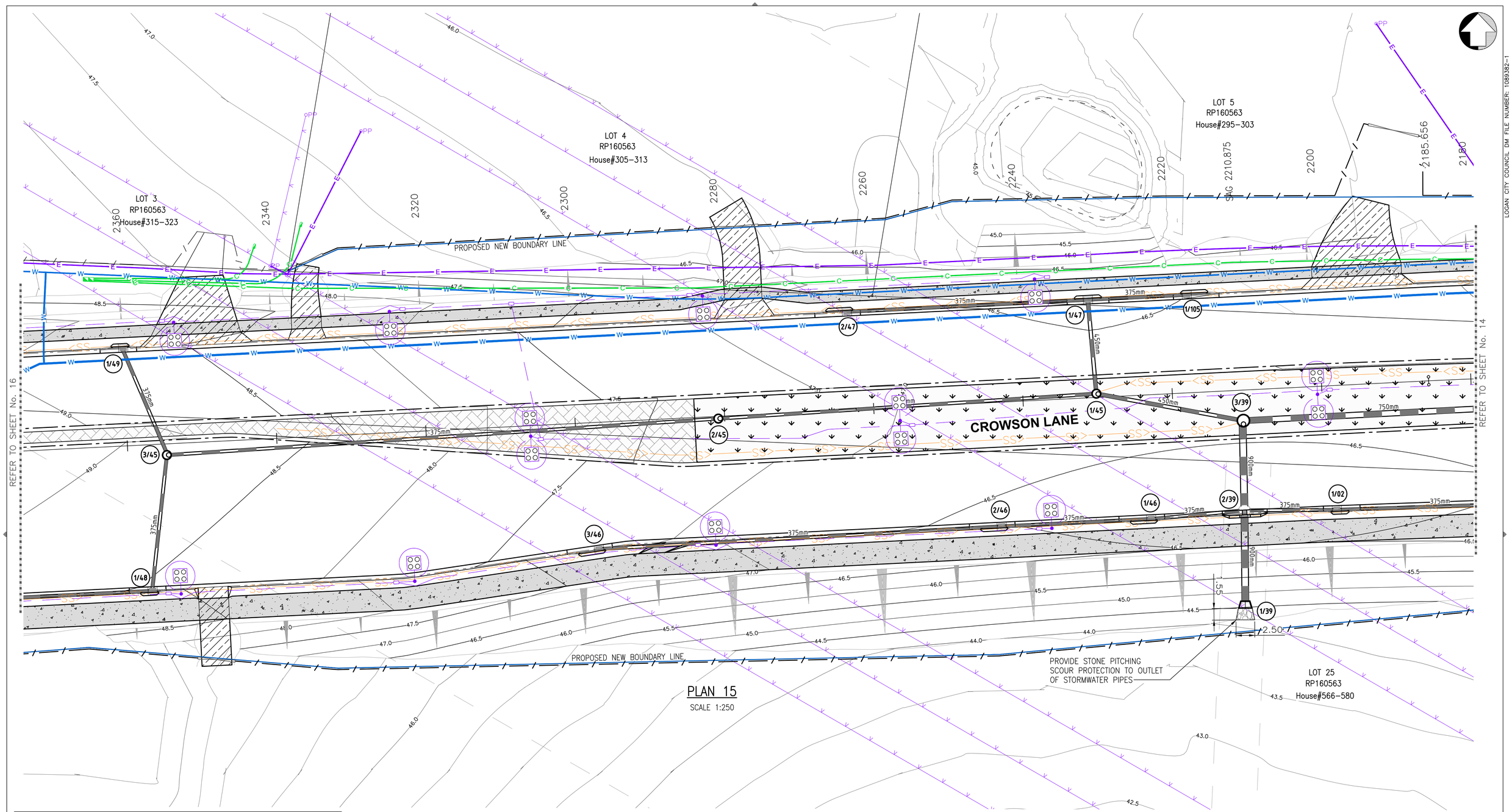
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 14 OF 31

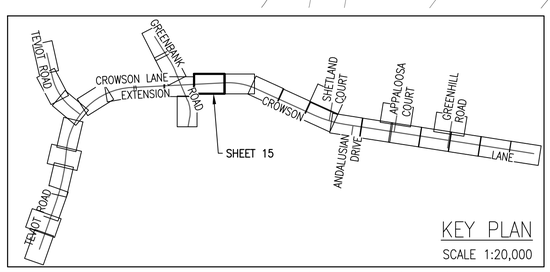
APPROVED
DESIGN ENGINEER DATE

SHEET 14 OF 33

DRAWING NUMBER
1 | B19175–DR14 | –



PLAN 15
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 15 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 15 OF 33

DRAWING NUMBER
1 | B19175–DR15 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

REFER TO SHEET No. 18

REFER TO SHEET No. 20

REFER TO SHEET No. 15

REFER TO SHEET No. 17

LOT 9
RP105545
House#555–567

LOT 2
RP160563
House#325–333

LOT 3
RP160563
House#315–323

LOT 25
RP160563
House#566–580

LOT 10
RP105545
House#569–581

PROPOSED NEW BOUNDARY LINE

POWERLINK EASEMENT BDY

CROWSON LANE
EXTENSION

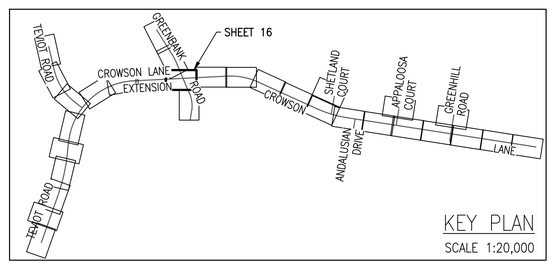
CROWSON LANE

GREENBANK ROAD

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 04 (DC04)

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PLAN 16
SCALE 1:250

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 16 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 16 OF 33

DRAWING NUMBER
1 | B19175–DR16 | –

LOT 12
RP105545
House#597–609

LOT 2
RP206779
House#595

LOT 1
RP206779
House#583–593

LOT 10
RP105545
House#569–581

LOT 25
RP160563
House#566–580

LOT 9
RP196914
House#582–600

DRIVEWAY CULVERT 08 (DC08)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

PROVIDE STONE PITCHING SCOUR PROTECTION TO OUTLET OF STORMWATER PIPE

PROPOSED NEW BOUNDARY LINE

EXTENT OF WORKS

GREENBANK ROAD

MATCH NEATLY INTO EXISTING ROAD PAVEMENT

DRIVEWAY CULVERT 05 (DC05)

CROSS CULVERT 09 (CC09)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

R200.000

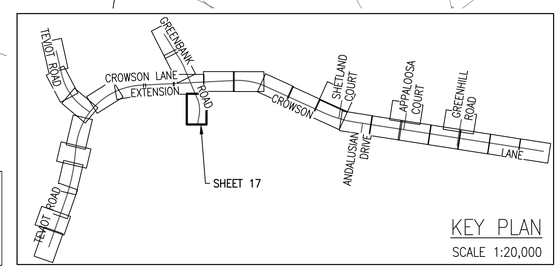
375mm

1/125 2/125 3/125 4/125 1/126

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

REFER TO SHEET No. 16

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1



KEY PLAN
SCALE 1:20,000

PLAN 17
SCALE 1:250

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 17 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 17 OF 33

DRAWING NUMBER
1 | B19175-DR17 | –

LOT 2
RP160563
House#325-333

LOT 18
RP109794
House#533-553

LOT 9
RP105545
House#555-567

POWERLINK EASEMENT BDY

PROPOSED NEW BOUNDARY LINE

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 16 (DC16)

GREENBANK ROAD

R=500.000

SAG 42.637

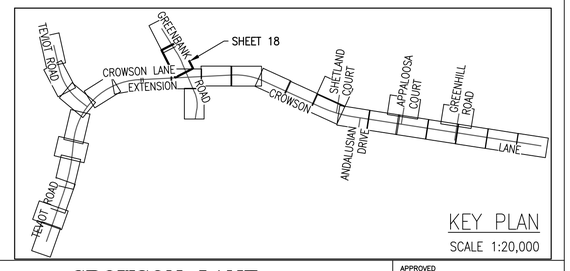
REFER TO SHEET No. 19

REFER TO SHEET No. 16

PLAN 18
SCALE 1:250

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS				
PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 18 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 18 OF 33

DRAWING NUMBER
1 | B19175-DR18 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

GREENBANK ROAD

EXTENT OF WORKS

LOT 1
RP160563
House#522–538

LOT 17
RP109794
House#527–531

LOT 18
RP109794
House#533–553

DRIVEWAY CULVERT 16 (DC16)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 07 (DC07)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 06 (DC06)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 01 (DC01)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

MATCH NEATLY INTO EXISTING ROAD PAVEMENT

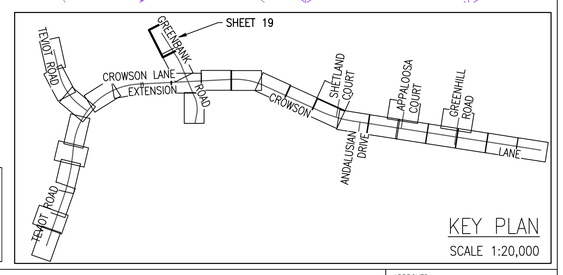
POWERLINK EASEMENT BDY

REFER TO SHEET No. 18

PLAN 19
SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00 FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 19 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 19 OF 33

DRAWING NUMBER
1 | B19175–DR19 | –

LOT 9
RP105545
House#555–567

PROPOSED NEW BOUNDARY LINE

CROWSON LANE EXTENSION

LOT 10
RP105545
House#569–581

PROPOSED NEW BOUNDARY LINE

REFER TO SHEET No. 21

REFER TO SHEET No. 16

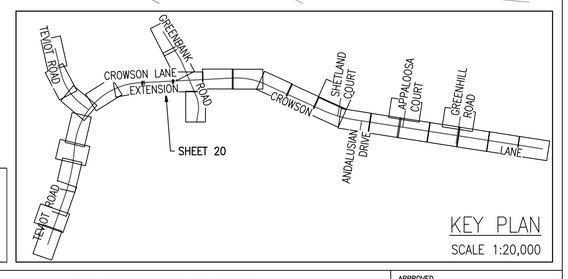
LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

PLAN 20

SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD
UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 20 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 20 OF 33

DRAWING NUMBER
1 | B19175–DR20 | –

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

LOT 2
RP105545
House#282–294

PROPOSED NEW BOUNDARY LINE

CROSS CULVERT 01 (CC01)

7.55 | 2.70 | 12.40

SAG 2849.210

EXCAVATE NEW DAM TO SAME OR LARGER STORAGE CAPACITY AS EXISTING IN LOCATION SIMILAR TO WHERE SHOWN.

DE–WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

LOT 9
RP105545
House#555–567

PROPOSED NEW BOUNDARY LINE

CROWSON LANE EXTENSION

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

DE–WATER EXISTING DAM, REMOVE UNSUITABLE MATERIAL AND FILL AS SHOWN.

LOT 3
RP105545
House#296–308

LOT 10
RP105545
House#569–581

PROPOSED NEW BOUNDARY LINE

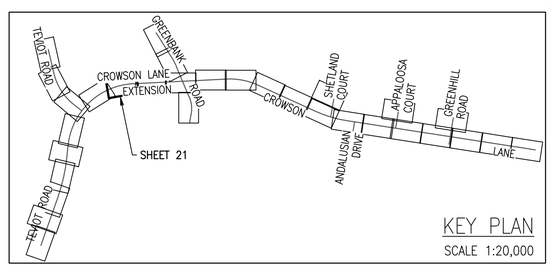
REFER TO SHEET No. 22

REFER TO SHEET No. 20

PLAN 21
SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 21 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 21 OF 33

DRAWING NUMBER
1 | B19175–DR21 | –

LOT 3
RP105545
House#296–308

LOT 2
RP105545
House#282–294

PROPOSED NEW BOUNDARY LINE

CROWSON LANE EXTENSION

LOT 3
RP105545
House#296–308

PROPOSED NEW BOUNDARY LINE

LOT 4
RP105545
House#310–322

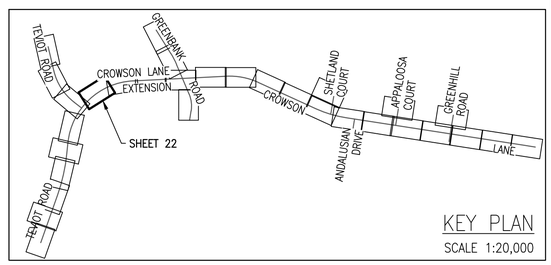
REFER TO SHEET No. 23

REFER TO SHEET No. 21

PLAN 22
SCALE 1:250

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 22 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 22 OF 33

DRAWING NUMBER
1 | B19175–DR22 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

REFER TO SHEET No. 22

REFER TO SHEET No. 24

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

CROWSON LANE EXTENSION

TEVIOT ROAD

PROPOSED NEW BOUNDARY LINE

LOT 3
RP105545
House#296–308

LOT 4
RP105545
House#310–322

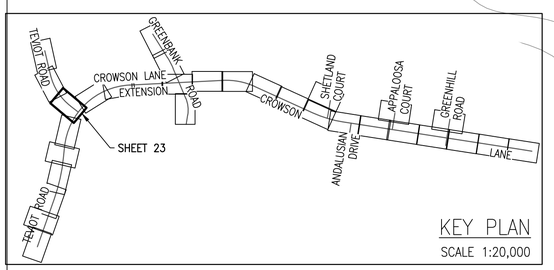
LOT 4
RP105545
House#310–322

1/83 · 11/81 · 1/68 · 12/81 · 1/82 · 13/81 · 14/81 · 15/81 · 1/127 · 15/63 · 14/63 · 1/64 · 2/65 · 1/65 · 13/63 · 12/63

375mm · 450mm · 525mm

PLAN 23
SCALE 1:250

KEY PLAN
SCALE 1:20,000



NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD
UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT
SHEET 23 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 23 OF 33

DRAWING NUMBER
1 | B19175–DR23 | –

REFER TO SHEET No. 26

LOT 2
RP105545
House#282–294

NEW RETAINING WALL. REFER TO "GR" SET FOR DETAILS.

PROPOSED NEW BOUNDARY LINE

REFER TO SHEET No. 25

REFER TO SHEET No. 23

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

TEVIOT ROAD

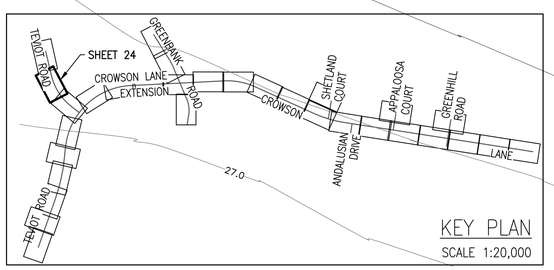
GRACELANDS DRIVE

EXTENT OF WORKS

LOT 32
SP128051
House#1–11

LOT 50
SP128051
House#2–8

PLAN 24
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175–DR00 FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 24 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 24 OF 33

DRAWING NUMBER
1 | B19175–DR24 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOT 1
RP8047.
House#2

LOT 1
RP804731
House#268–278

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPE

DRIVEWAY CULVERT 15 (DC15)

DRIVEWAY CULVERT 13 (DC13)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

DRIVEWAY CULVERT 14 (DC14)

EXTENT OF WORKS

TEVIOT ROAD

CROSS CULVERT 03 (CC03)

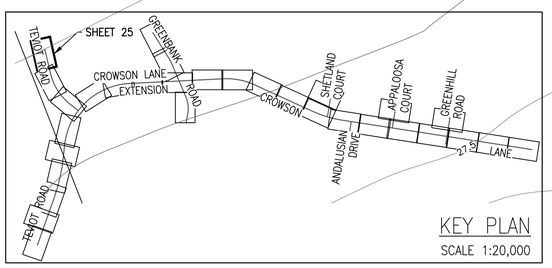
PLAN 25
SCALE 1:250

LOT 32
SP128051
House#1–11

REFER TO SHEET No. 24

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 25 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 25 OF 33

DRAWING NUMBER
1 | B19175-DR25 | –

LOT 50
SP128051
House#2–8

LOT 6
RP105545
House#338–348

LOT 5
RP105545
House#324–336

TEVIOT ROAD

PROPOSED NEW BOUNDARY LINE

REFER TO SHEET No. 27

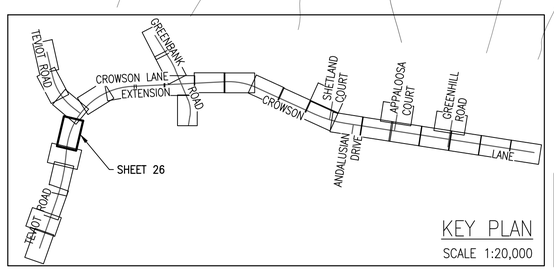
REFER TO SHEET No. 23

600mm 525mm 450mm

6/63 7/63 8/63 9/63 10/63 11/63 1/69 1/67

EP PP

PLAN 26
SCALE 1:250



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175–DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 26 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 26 OF 33
DRAWING NUMBER
1 B19175–DR26 –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382–1

REFER TO SHEET No. 26

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOT 46
SP128051
House#26

LOT 6
RP105545
House#338-348

LOT 7
RP105545
House#350-362

PROPOSED NEW BOUNDARY LINE

PROPOSED NEW BOUNDARY LINE

CROSS CULVERT 04 (CC04)

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

CROSS CULVERT 05 (CC05)

PROPOSED NEW DRAINAGE EASEMENT BOUNDARY

TEVIOT ROAD

11.60
5.05
23.30
18.05
30.50
3.85
5.40
7.85
43.90
35.70
21.65

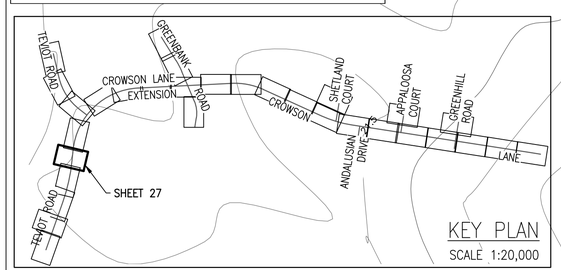
3420
3435.031
3440
3460
3480
3501.421
3500
3520

4/96
5/63
3/96
4/63
2/96
1/96
3/63
2/63
1/63
2/79
1/79
1/123
1/71
2/71
3/71
1/122
4/71

600mm
375mm
675mm

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION



KEY PLAN
SCALE 1:20,000

PLAN 27
SCALE 1:250

REFER TO SHEET No. 28

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 27 OF 31

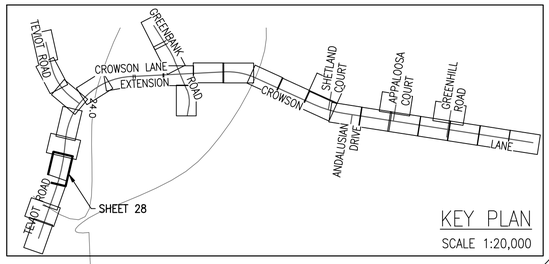
APPROVED
DESIGN ENGINEER DATE

SHEET 27 OF 33

DRAWING NUMBER
1 | B19175-DR27 | –

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.



KEY PLAN
SCALE 1:20,000

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

PROVIDE STONE PITCHING SCOUR PROTECTION TO OUTLET OF STORMWATER PIPES

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER CULVERTS

CROSS CULVERT 06 (CC06)

CROSS CULVERT 05 (CC05)

DRIVEWAY CULVERT 12 (DC12)

PROPOSED NEW BOUNDARY LINE

LOT 1
RP147592
House#1-7

TEVIOT ROAD

TREE TO BE RETAINED AND MUST REMAIN UNDISTURBED

LOT 8
RP105545
House#364-376

PROPOSED NEW BOUNDARY LINE

PROPOSED NEW DRAINAGE EASEMENT BOUNDARY

LOT 7
RP105545
House#350-362

PLAN 28
SCALE 1:250

REFER TO SHEET No. 29

REFER TO SHEET No. 27

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

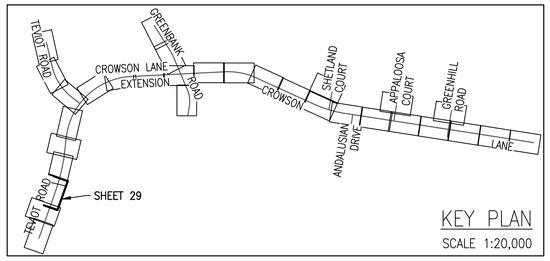
CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 28 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 28 OF 33

DRAWING NUMBER
1 | B19175-DR28 | –



KEY PLAN
SCALE 1:20,000

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
REFER TO DRAWING B19175-DR00 FOR DETAILS, NOTES AND LEGENDS.

LOT 1
RP147592
House#1-7

REFER LCC FOR ADVICE REGARDING CULTURAL HERITAGE.

PROPOSED NEW BOUNDARY LINE

SAG 3841.154
CREST 3735.806

TEVIOT ROAD

LOT 2
RP851321
House#2

REFER TO SHEET No. 30

REFER TO SHEET No. 28

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

PLAN 29
SCALE 1:250

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 29 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 29 OF 33

DRAWING NUMBER
1 | B19175-DR29 | -

REFER TO SHEET No. 29

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOT 1
RP147592
House#1-7

LOT 62
RP147592
House#555-561

LOT 1
RP129000
House#402-426

HIVES ROAD

TEVIOT ROAD

EXTENT OF WORKS

80.000

41.731

14.430

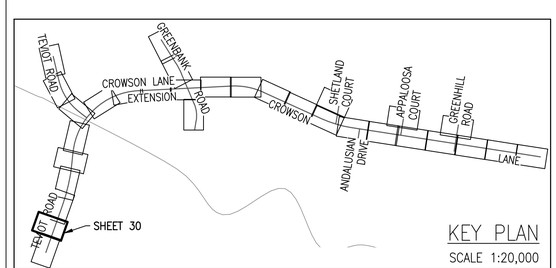
0.000

R150.000

3880
3900
3920
3940
3960
3980
4000

1/97 2/97 7/121 8/121 9/121 10/121 11/121 1/108 2/70 1/72 2/72

375mm 450mm 525mm 600mm 675mm



KEY PLAN
SCALE 1:20,000

NOTE:
REFER TO DRAWING B19175-DR00
FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN 30
SCALE 1:250

REFER TO SHEET No. 31

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 30 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 30 OF 33

DRAWING NUMBER
1 | B19175-DR30 | –

LOGAN CITY COUNCIL DM FILE NUMBER: 1089382-1

LOT 59
RP147592
House#585

LOT 60
RP147592
House#571–577

LOT 61
RP147592
House#563–569

4178.503

4160 4140 4120 4100 4080 4060 4040 4020

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

DRIVEWAY CULVERT 09 (DC09)

CROSS CULVERT 08 (CC08)

11.55

2.70

375mm

14/12 13/12 12/12

TEVIOT ROAD

LIMIT OF WORKS

DRIVEWAY CULVERT 10 (DC10)

2x RCP 450ø

IL 27.39

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER PIPES

EXISTING 2x 450ø RCP TO REMAIN

3.60

2.70

7.10

8.50

PROVIDE STONE PITCHING SCOUR PROTECTION TO INLET AND OUTLET OF STORMWATER CULVERT

LP

EP

LOT 8
RP217053
House#438

LOT 9
RP217053
House#430

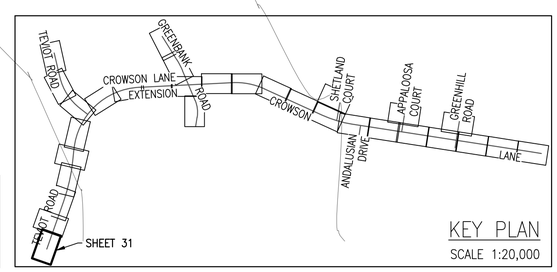
LOT 1
RP129000
House#402–426

REFER TO SHEET No. 30

NOTE:
REFER TO DRAWING B19175–DR00 FOR DETAILS, NOTES AND LEGENDS.

PRELIMINARY
NOT FOR CONSTRUCTION

PLAN 31
SCALE 1:250



KEY PLAN
SCALE 1:20,000

AMENDMENTS	BY	CHKD	APP'D	DATE

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

SURVEY CONTROL POINTS

PT	EASTING	NORTHING	RL	DESCRIPTION
REFER TO DRAWING SET "CL" FOR DETAILS				

BAR SCALES (A1 UNREDUCED)
0 5 10 15 20m
SCALE IN METRES (1:250 BEFORE REDUCTION)

CITY OF LOGAN

CITY ADMINISTRATION CENTRE
150 Wembley Road,
Logan Central, QLD 4114
Ph:(07)3412 3412
Fax:(07)3412 3444
SENIOR DESIGN ENGINEER
Ph:(07)3412 4279
Email:
Infradelivery@logan.qld.gov.au

PROJECT NO.	B19175	
COMP. REF.	SWDLAY.dwg	
SURVEYOR	T.J.K.	26.08.20
SURVEY REF.	CD45	
DESIGNED	R.vdB	10.05.21
CHECKED	S.T.	10.05.21
DRAWN	MJP	02.09.22
CHECKED	S.T.	02.09.22

CROWSON LANE
MT LINDESAY HWAY TO TEVIOT RD UPGRADE & EXTENSION

ROAD DRAINAGE LAYOUT SHEET 31 OF 31

APPROVED
DESIGN ENGINEER DATE

SHEET 31 OF 33

DRAWING NUMBER
1 | B19175–DR31 | –

Existing Decision Notice Approval

APPENDIX C

Queensland Government

Department of
State Development, Infrastructure, Local Government and Planning

Our ref: DEV2018/961/8

27 September 2023

CH Hydrangea Pty Ltd
C/- Wolter Consulting Group Pty Ltd
Att: Ms Jen Taylor
PO Box 436
NEW FARM QLD 4005

Email: jtaylor@wolterconsulting.com.au

Dear Ms Taylor

Section 99 Approval - Application to Change PDA Development Approval
PDA Development Permit for Reconfiguring a Lot – 1 Lot into 11 Lots, New Roads and Open Space and Context Plan at 4499-4651 Mount Lindesay Highway, North Maclean described as Lot 39 on RP253739

On 27 September 2023 the Minister for Economic Development Queensland (MEDQ) decided to grant **all** of the amendment application applied for, subject to PDA development conditions set out in this PDA decision notice.

The PDA decision notice and approved plans/documents can be viewed in the MEDQ Development Approvals Register via the Department website www.dsdilgp.qld.gov.au/pda-da-applications.

If you require any further information, please contact Mrs Jennifer Davison, Principal Planner Development Assessment, in Economic Development Queensland, by telephone on (07) 3452 7127 or at Jennifer.davison@dsdilgp.qld.gov.au, who will assist.

Yours sincerely

Brandon Bouda
A/Director
Development Assessment
Economic Development Queensland

Economic Development Queensland
GPO Box 2202
Brisbane Queensland 4001 Australia
Website www.edq.qld.gov.au
ABN 76 590 288 697

PDA Decision Notice – Approval

Site information		
Name of priority development area (PDA)	Greater Flagstone PDA	
Site address	4499-4651 Mount Lindesay Highway, North Maclean	
Lot on plan description	Lot number	Plan description
	39	SP258739
PDA development application details		
DEV reference number	DEV2018/961	
'Properly made' date	29 August 2023	
Type of application	☐ PDA development application for: ☐ Material change of use ☐ Preliminary approval ☐ Development permit ☐ Reconfiguring a lot ☐ Preliminary approval ☐ Development permit ☐ Operational work ☐ Preliminary approval ☐ Development permit ☒ Application to change PDA development approval ☐ Application to extend currency period	
Description of proposal applied for	Reconfiguring a Lot - 1 into 11 Lots, New Road, and Open Space; and Context Plan	
PDA development approval details		
Decision of the MEDQ	The MEDQ has decided to grant **all** of the PDA development approval applied for, **subject to** PDA development conditions forming part of this decision notice. The changes relate to the inclusion of new drainage lots, pump station lot, additional industrial lot, temporary access easements and amended lot sizes.	
Original Decision date	10 September 2021	
Change to approval date	27 September 2023	
Currency period	6 years from the original decision date	

Economic Development Queensland
GPO Box 2202
Brisbane Queensland 4001 Australia
Website www.edq.qld.gov.au
ABN 76 590 288 697

Approved Plans and Documents			
The plans and documents approved by the MEDQ and referred to in the PDA development conditions for the PDA development approval are detailed below.			
Approved plans and documents		**Number**	**Date**
1.	Plan of Reconfiguration, prepared by Wolter Consulting	22-0007P/01-02 Version E	14/08/2023
2.	Staging Sketch Plan, prepared by Wolter Consulting	22-0007P/01-03 Version E	14/08/2023
3.	Traffic Impact Assessment, prepared by Bitzos Consulting	P5708.001R North Maclean Industrial Estate TIA	15 August 2023
4.	Site Based Stormwater Management Plan (Quantity), prepared by Arcadis	EAG001-30109334-AAR Revision 9	15 August 2023
5.	Site Based Stormwater Quality Management Plan, prepared by Arcadis	EAG003-30109334-AAR Revision 4	15 August 2023
6.	Overall Bulk Earthworks Sketch Layout Plan, prepared by Arcadis	30109334-AAP-WS00OP-CV-SKT-030 Issue 1	15 August 2023
7.	Overall Water Main Sketch Layout Plan, prepared by Arcadis	30109334-AAP-WS00OP-CV-SKT-031 Issue 1	8/08/2023
8.	Overall Sewer Sketch Layout Plan, prepared by Arcadis	3010933-AAP WS00OP-CV-SKT-032 Issue 1	22/08/2023
9.	Swale and Channel Typical Details, prepared by Arcadis	30109334-AAP-WS00OP-CV-DRG-0164 Issue 5	31/07/2023
10.	Swale and Channel Longitudinal Section Sheet 2, prepared by Arcadis	30109334-AAP-WS00OP-CV-DRG-0162 Issue 5	31/07/2023
Plans and documents previously approved on 10 September 2021		**Number**	**Date**
11.	Bushfire Management Plan	Report 16014, Final V3	13 July 2018
12.	Addendum to the Bushfire Management Plan for the proposed development at 4499-4651 Mount Lindsay Highway, North Maclean	N/A	18 February 2019
13.	North Maclean Enterprise Precinct (4499-4651 Mount Lindesay Highway, North Maclean) – Progression of Ecological Issues	N/A	31 March 2017

Supporting Plans and Documents

To remove any doubt, the following documents are not approved documents for the purposes of this PDA development approval, but rather are supporting documents.

Supporting Plans, Reports and Specifications		Number	Date
Endorsed Context Plan			
1.	North Maclean Enterprise Context Plan Land Use and Road Network	N/A	12/07/2021 (as amended in red dated 03/09/2021)
2.	North Maclean Enterprise Context Plan Land Use and Road Network (Wider Locality)	N/A	12/07/2021
3.	North Maclean Enterprise Context Plan Ultimate Water and Sewer Network	N/A	12/07/2021
4.	North Maclean Enterprise Context Plan Ultimate Stormwater Network	N/A	12/07/2021 (as amended in red dated 03/09/2021)
Supporting Plans, Reports and Specifications			
5.	Site Based Stormwater Management Plan	TEL202159, Issue A	08 July 2021
6.	Engineering Services Report	TEL202159, Issue A	06/07/21.

PDA Development Conditions

PREAMBLE AND ABBREVIATIONS

PREAMBLE

For the purpose of interpreting this PDA Development Approval, including the PDA Development Conditions, the following applies:

COMPLIANCE ASSESSMENT

Where a condition of this approval requires Compliance Assessment, Compliance Assessment is required in accordance with the following:

a) The applicant must:

   i) pay to MEDQ at the time of submission the relevant fee for Compliance Assessment, including any third party peer review costs which will be charged on a 100% cost recovery basis. The Compliance Assessment fees are set out in EDQ Development Assessment Fees and Charges Schedule[1] (as amended from time to time).
   ii) submit to EDQ DA a duly completed Compliance Assessment form[2].
   iii) submit to EDQ DA the documentation as required under the relevant condition.

b) Where EDQ is satisfied the documentation submitted for Compliance Assessment meets the requirements of the relevant condition (or element of the condition), EDQ will endorse the documentation and advise by written notice.

c) Compliance Assessment and endorsement can be repeated where a different design or solution, to that already endorsed, is sought.

[1] The EDQ Development Assessment Fees and Charges Schedule is available at EDQ's website.

[2] The Compliance Assessment form is available at EDQ's website. It sets out how to submit documentation for Compliance Assessment and how to pay Compliance Assessment fees.

d) The process and timeframes that apply to Compliance Assessment are as follows:

i) applicant submits items required under a) above to EDQ DA for Compliance Assessment.
ii) **within 30 business days** – EDQ assesses the documentation and:
    1. if satisfied, endorses the documentation; or
    2. if not satisfied, notifies the applicant accordingly.
iii) if the applicant is notified under ii.2. above, revised documentation must be submitted **within 30 business days** from the date of notification.
iv) **within 30 business days** – EDQ assesses the revised documentation and:
    1. if satisfied, endorses the revised documentation; or
    2. if not satisfied, notifies the applicant accordingly.
v) where EDQ notifies the applicant as stated under iv.2. above, repeat steps iii. and iv. above. If either party is not satisfied by the outcome of this process, that party can elect to enter into a mediation process with an independent mediator agreed to by both parties.

Despite note v. above, the condition (or element of the condition) is determined to have been met only when EDQ endorses relevant documentation.

SUBMITTING DOCUMENTATION TO EDQ:

Where a condition of this approval requires documentation to be submitted to either EDQ DA or EDQ IS, submit the documentation to:

a) EDQ DA at: pdadevelopmentassessment@dsdmip.qld.gov.au.
b) EDQ IS at: EDQ_PrePostConstruction@dsdmip.qld.gov.au.

ABBREVIATIONS

For the purposes of interpreting the PDA Development Conditions, the following is a list of abbreviations utilised:

1. **AILA** means a Landscape Architect registered Australian Institute Landscape Architect.

2. **Certification Procedures Manual** means the document titled *Certification Procedures Manual*, prepared by the Department of Infrastructure, Local Government and Planning, dated 16 October 2017 (as amended from time to time).

3. **Contributed Asset** means an asset constructed under a PDA development approval or Infrastructure Agreement that will become the responsibility of an External Authority. For the purposes of operational works for a Contributed Asset, the following definitions apply:
    a. **External Authority** means a public-sector entity other than the MEDQ;
    b. **Parkland** means carrying out operational work related to the provision of parkland infrastructure;
    c. **Roadworks** means carrying out any operational work within existing or proposed road(s), to a depth of 1.5m measured from the top of kerb, and includes Streetscape Works;
    d. **Sewer Works** means carrying out any operational work related to the provision of wastewater infrastructure;
    e. **Streetscape Works** means carrying out any operational work within the verge of a road, including footpath surface treatments, street furniture, street lighting and landscaping;
    f. **Stormwater Works** means carrying out any operational work related to the provision of stormwater infrastructure; and
    g. **Water Works** means carrying out any operational work related to the provision of water infrastructure.

4. **Council** means Logan City Council.

5. **DSDILGP** means The Department of State Development, Infrastructure, Local Government and Planning.

6. **EDQ** means Economic Development Queensland.

7. **EDQ DA** means Economic Development Queensland's – Development Assessment team.

8. **EDQ IS** means Economic Development Queensland's – Infrastructure Services team.

9. **IFF** means Infrastructure Funding Framework.

10. **MEDQ** means The Minister of Economic Development Queensland.

11. **PDA** means Priority Development Area.

12. **RPEQ** means Registered Professional Engineer of Queensland.

No.	Condition	Timing
General		
1.	**Carry out the Approved Development** Carry out the approved development generally in accordance with the approved plans and documents; and any other documentation endorsed via Compliance Assessment as required by these conditions.	Prior to survey plan endorsement for the relevant stage
2.	**Street Naming** Submit to EDQ DA a schedule of street names approved by Council.	Prior to survey plan endorsement for the relevant stage
Construction		
3.	**Hours of Work – Construction** Unless otherwise endorsed, via Compliance Assessment for out of hours work, construction hours for the approved development are limited to Monday to Saturday between 6:30am to 6:30pm, excluding public holidays.	During construction unless otherwise endorsed
4.	**Out of Hours Work – Compliance Assessment** Where out of hours work is proposed, submit to EDQ DA, for Compliance Assessment, an out of hours work request. The out of hours work request must include a duly completed out of hours work request form[3].	Minimum of 10 business days prior to proposed out of hours work commencement date
5.	**Certification of Operational Work** Carry out all Operational Work under this approval in accordance with the *Certification Procedures Manual.*	At all times

[3] The out of hours work request form is available at EDQ's website.

6.	**Construction Management Plan**	
	a) Submit to EDQ IS a site-based Construction Management Plan (CMP), prepared by the principal site contractor and reviewed by a suitably qualified and experienced person responsible for overseeing the site works, to manage construction impacts, including: i) noise and dust in accordance with the EP Act; ii) stormwater flows around and through the site without increasing the concentration of total suspended solids or Prescribed Water Contaminants (as defined in the EP Act), causing erosion, creating any ponding and causing any actionable nuisance to upstream and downstream properties; iii) contaminated land, where required under a site suitability statement prepared in accordance with section 389 of the EP Act; iv) complaints procedures; v) site management: 1. for the provision of safe and functional alternative pedestrian routes, past, through or around the site; 2. to mitigate impacts to public sector entity assets, including street trees, on or external to the site; 3. for safe and functional temporary vehicular access points and frequency of use; 4. for the safe and functional loading and unloading of materials including the location of any remote loading sites; 5. for the location of materials, structures, plant and equipment; 6. of waste generated by construction activities; 7. detailing how materials are to be loaded/unloaded; 8. of proposed external hoardings and gantries (with clearances to street furniture and other public sector entity assets); 9. of employee and visitor parking areas; 10. of anticipated staging and programming; 11. for the provision of safe and functional emergency exit routes; and 12. any out of hours work as endorsed via Compliance Assessment.	a) Prior to commencing work for the relevant stage
	b) A copy of the CMP submitted under part a) of this condition must be current and available on site.	b) During construction
	c) Carry out all construction work generally in accordance with the CMP submitted under part a) of this condition.	c) During construction
7.	**Erosion and Sediment Management**	
	a) Submit to EDQ IS an Erosion and Sediment Control Plan (ESCP), certified by a RPEQ or an accredited professional in erosion and sediment control, and prepared generally in accordance with the following: i) construction phase stormwater management design objectives of the *State Planning Policy 2017* (Appendix 2 Table A);	a) Prior to commencing work for the relevant stage

	ii) *Healthy Land and Water Technical Note: Complying with the SPP – Sediment Management on Construction Sites*. b) Implement the certified ESCP submitted under part a) of this condition.	 b) During construction
8.	**Dispersive Soil Management** a) Submit to EDQ IS a Dispersive Soil Management Plan, prepared by a soil science/soil chemistry specialist that details for the design, construction, and operational phases of the development including: i) the suite of methods required to identify and address potential issues associated with the exposure and re-use of dispersive soils, ii) details of the areas where dispersive soils will be disturbed and treated/rehabilitated. b) Implement and monitor the actions identified in the Dispersive Soil Management Plan as required under part a) of this condition.	 a) Prior to commencing site works b) At all times during construction
9.	**Traffic Management Plan** a) Submit to EDQ IS a Traffic Management Plan (TMP), certified by a person holding a current Traffic Management Design qualification. The TMP must include the following: i) provision for the safe and functional management of traffic around and through the site during and outside of construction work hours; ii) provision for the safe and functional management of pedestrian traffic, including alternative pedestrian routes past, through or around the site; iii) provision of parking for workers and materials delivery; iv) risk identification, assessment and identification of mitigation measures; v) ongoing monitoring, management review and certified updates (as required); and vi) traffic control plans and/or traffic control diagrams, prepared in accordance with *Austroads Guide to Temporary Traffic Management*, for any temporary part or full road closures. b) Carry out all construction work generally in accordance with the certified TMP submitted under part a) of this condition, which is to be current and available on site. ***Advice Note**: Operational traffic changes, such as temporary and permanent lane modifications, relaxation of clearway zone hours or footpath closures may require authorisation from Council or DTMR as road manager. It is recommended that applicants engage directly with the applicable road manager.*	 a) Prior to commencing work for the relevant stage b) During construction
10.	**Public Infrastructure (Damage, Repairs and Relocation)** a) Repair any damage to existing public infrastructure caused by works carried out in association with the approved development.	 a) Prior to survey plan endorsement for the relevant stage

	b) Where existing public infrastructure require repair or relocation, due to the approved development and/or works associated with the approved development, repair and/or relocate the public infrastructure at no cost to others and in accordance with statutory requirements and adopted design standards. ***Advice Note**: It is recommended applicants record their own dated photographic evidence of the condition of relevant existing public infrastructure both before and after works carried out in association with the approved development.*	b) Prior to survey plan endorsement for the relevant stage
Earthworks and retaining walls		
11.	**Compliance Assessment – Earthworks** a) Submit to EDQ DA for Compliance Assessment detailed earthworks plans, certified by a RPEQ, and designed generally in accordance with: i) Australian Standard AS3798 – 2007 Guidelines on Earthworks for Commercial and Residential Developments and ii) the approved Overall Bulk Earthworks Sketch Layout Plan, 30109334-AAP-WS00OP-CV-SKT-030 Issue 1, prepared by Wolter Consulting. The certified earthworks plans are to: i) include a geotechnical soils assessment of the site; ii) accord with the Erosion and Sediment Control Plan, as required by condition 7 – Erosion and sediment management; iii) accord with the Dispersive Soil Management Plan, as required by condition 8 – Dispersive soil management; iv) include the location and finished surface levels of any cut and/or fill; v) provide details of any areas where surplus soils are to be stockpiled; vi) detail protection measures to: 1. ensure adjoining properties and roads are not impacted by ponding or nuisance stormwater resulting from earthworks associated with the approved development; 2. preserve all drainage structures from structural loading impacts resulting from earthworks associated with the approved development. b) Carry out earthworks generally in accordance with the certified plans endorsed by EDQ through part a) of this condition. c) Submit to EDQ IS RPEQ certification that: i) all earthworks have been carried out generally in accordance with the certified plans submitted under part a) of this condition; and ii) any unsuitable material encountered has been treated or replaced with suitable material.	a) Prior to commencing earthworks for the relevant stage b) Prior to survey plan endorsement for the relevant stage c) Prior to survey plan endorsement for the relevant stage

12.	**Retaining Walls (Excluding the Western Boundary Retaining Wall)**	
	a) Submit to EDQ IS detailed engineering plans, certified by a RPEQ, of all retaining walls 1m or greater in height. Retaining walls must be: i) certified to achieve a minimum 50 year design life; ii) designed generally in accordance with *AS4678 – Earth Retaining Structures* and relevant material standards (e.g., *AS3600 – Concrete Structures*);	a) Prior to commencing earthworks for the relevant stage
	b) Construct retaining walls generally in accordance with the certified plans required under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
	c) Submit to EDQ IS certification from an RPEQ that all retaining wall works 1.0m or greater in height have been constructed generally in accordance with the certified plans submitted under part a) of this condition.	c) Prior to survey plan endorsement for the relevant stage
13.	**Compliance Assessment – Western Boundary Retaining Wall**	
	a) Submit to EDQ DA for Compliance Assessment preliminary engineering plans, certified by a RPEQ, of the proposed western boundary retaining wall adjoining the swale. The retaining wall must be: i) fully contained, including footings, within the private lots; ii) designed based on a professional geotechnical advice; iii) take into consideration scour and flood impacts from the adjoining swale; and iv) appropriately fenced (fauna exclusion).	a) Prior to commencing earthworks for Stage 2
	b) Submit to EDQ IS detailed engineering plans, certified by a RPEQ, of the proposed retaining wall along the western swale, generally in accordance with the endorsed plans required under part a) of this condition. The retaining wall must be: i) certified to achieve a minimum 100 year design life; ii) designed generally in accordance with *AS4678 – Earth Retaining Structures* and relevant material standards (e.g., *AS3600 – Concrete Structures*);	b) Prior to survey plan endorsement for Stage 2
	c) Construct retaining walls generally in accordance with the certified plans required under part b) of this condition.	c) Prior to survey plan endorsement for Stage 2
	d) Submit to EDQ IS: i) 'as-constructed' plans, certified by a RPEQ, demonstrating that the retaining wall has been constructed generally in accordance with the certified plans submitted under part a) of this condition. ii) A survey plan identifying the location of wall and footings to the property boundary.	d) Prior to survey plan endorsement for Stage 2

Roadworks, Urban Servicing and Stormwater Management		
14.	**Compliance Assessment – Internal Roads**	
	a) Submit to EDQ DA for Compliance Assessment functional layout plans, certified by a RPEQ, for the internal roads generally in accordance with: i) PDA Guideline No. 13 Engineering standards; and ii) Plan of Reconfiguration, Ref No. 22-0007P/01-02 Version E prepared by Wolter Consulting and dated 14/08/2023; and iii) Industrial Connector Street Cross-Section as identified in the Engineering Services Report prepared by Telford Civil and dated 06/07/21. The roads are to be designed to allow for the use of heavy vehicles (B-doubles).	a) Prior to commencing site works
	b) Submit to EDQ IS detailed engineering plans, certified by a RPEQ, for roadworks for the internal roads, including parking bays, traffic devices and footpaths generally in accordance with: i) PDA Guideline No. 13 Engineering standards; and ii) functional layout plans endorsed under part a) of this condition.	b) Prior to commencing roadworks for the relevant stage
	c) Construct roadworks generally in accordance with the certified plans submitted under part b) of this condition.	c) Prior to survey plan endorsement for the relevant stage
	d) Submit to EDQ IS: i) certification from a RPEQ that all roadworks have been constructed generally in accordance with the certified plans submitted under part a) of this condition; and ii) all documentation as required by the *Certification Procedures Manual*. iii) as-constructed drawings, asset register and test results, certified by a RPEQ, in a format acceptable to the end asset owners for all roadworks constructed under this condition.	d) Prior to survey plan endorsement for the relevant stage
15.	**Compliance Assessment – Crowson Lane and Greenhill Road Intersection Interim Layout** Unless ultimate intersection works are already delivered by Council as part of the Crowson Lane augmentation project:	
	a) Submit to EDQ DA for Compliance Assessment engineering design and construction drawings, certified by a RPEQ, for the auxiliary left-turn treatment and channelised right turn lane treatment at the Crowson Lane/Greenhill Road intersection, generally in accordance with the following plans/documents: i) PDA Guideline No. 13 Engineering standards; and ii) Traffic Impact Assessment, document reference P5708.001R North Maclean Industrial Estate TIA prepared Bitzos Consulting and dated 15 August 2023	a) Prior to commencing intersection works
	b) Construct the works generally in accordance with the endorsed plans submitted under part a) of this condition.	b) Prior to survey plan endorsement for the first stage

	c) Submit to EDQ IS: i) certification from a RPEQ that the intersection works have been constructed generally in accordance with the certified plans submitted under part b) of this condition; and ii) all documentation as required by the Certification Procedures Manual. iii) as-constructed drawings, asset register and test results, certified by a RPEQ, in a format acceptable to the end asset owners for all roadworks constructed under this condition.	c) Prior to survey plan endorsement for the first stage
16.	**Mount Lindesay Highway Service Road** a) Submit to EDQ IS, approval from the Department of Transport and Main Roads for the entirety of the Mount Lindesay Highway service lane as shown on Staging Sketch Plan, document reference 22-0007P/01-03 Version E, prepared by Wolter Consulting and dated 14/08/2023. The service lane is to be designed to allow for the use of heavy vehicles (B-doubles). b) Construct the extent of the service road as shown on Staging Sketch Plan, document reference 22-0007P/01-03 Version E, prepared by Wolter Consulting and dated 14/08/2023 from the intersection with the new internal road in Stage 1 to the Crowson Lane Interchange with the first stage of development in accordance with the approval from DTMR as required under part a). c) Construct the remainder of the service road as shown on staging Sketch Plan, document reference 22-0007P/01-03 Version E, prepared by Wolter Consulting and dated 14/08/2023 with the second stage of development in accordance with the approval from DTMR as required under part a). d) Submit to EDQ IS, certification from a RPEQ that all roadworks have been constructed generally in accordance part a) of this condition. ***Advice Note****: Construction of this service lane in accordance with the Industrial Connector cross-section or as alternatively agreed to by EDQ and meets EDQ's minimum requirements for offsetable infrastructure, can be considered offsetable.*	a) Prior to commencing works for Stage 1 b) As indicated c) As indicated d) Prior to survey plan endorsement for the relevant stage
17.	**Street lighting** Comply with either parts a) and c) or parts b) and c) of this condition. a) Design and install a <u>Rate 2</u> street lighting system, certified by a RPEQ, to all roads, including footpaths/bikeways within road reserves. The design of the street lighting system must: i) meet the relevant standards of Energex; ii) be endorsed by Energex as 'Rate 2 Public Lighting'; iii) be endorsed by Council as the Energex 'billable customer'; iv) be generally in accordance with *Australian Standards AS1158 – 'Lighting for Roads and Public Spaces*.	a) Prior to survey plan endorsement for the relevant stage

	b) Design and install a Rate 3 street lighting system, certified by a suitably qualified and experienced RPEQ, to all roads, including footpaths/bikeways within road reserves. The design of the street lighting system must: i) be in accordance with *Australian Standards AS1158 – 'Lighting for Roads and Public Spaces'* ii) meet the requirements of AS3000 – '*SAA Wiring Rules'.* iii) meet the requirements of Energex for unmetered supply iv) be endorsed by the relevant ownership authority.	b) Prior to survey plan endorsement for the relevant stage
	c) Submit to EDQ IS 'as-constructed' plans and test documentation, certified by a RPEQ, in a format acceptable to Council.	c) Prior to survey plan endorsement for the relevant stage
18.	**Compliance Assessment - Water reticulation**	
	a) Submit to EDQ DA for Compliance Assessment a detailed water network plan, supported by hydraulic analysis, certified by RPEQ. The water network plan shall be prepared in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Cod*e; and ii) Overall Water Main Sketch Layout Plan, Plan no. 30109334-AAP-WS00OP-CV-SKT-031, Issue 1, prepared by Arcadis and dated 08/08/2023.	a) Prior to commencing works for Stage 1
	b) Submit to EDQ IS detailed water reticulation design plans, certified by a RPEQ. The certified water reticulation design plans must be designed generally in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Cod*e; and ii) the endorsed water network analysis required under part a) of this condition.	b) Prior commencing water reticulation work for the relevant stage
	c) Construct water reticulation works generally in accordance with the certified plans submitted under part a) of this condition.	c) Prior to survey plan endorsement for the relevant stage
	d) Submit to EDQ IS 'as constructed' plans, certified by a RPEQ, of all water reticulation infrastructure constructed in accordance with this condition, including an asset register, pressure and bacterial test results in accordance with SEQ Water Supply and Sewerage Design and Construction Code – Asset Information.	d) Prior to survey plan endorsement for the relevant stage
19.	**Compliance Assessment – Internal Sewer Reticulation**	
	a) Submit to EDQ DA for Compliance Assessment a detailed internal sewerage network plan, supported by hydraulic analysis, certified by RPEQ. The internal sewer network plan shall be prepared in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code*; and ii) Overall Sewer Sketch Layout Plan, Plan No. 3010933-AAP-WS00OP-CV-SKT-032, Issue 1, prepared by Arcadis and dated 22/08/23. The sewerage network plan shall include the extension of the internal sewer reticulation to the southern boundary to service the external catchment falling to the site.	a) Prior to commencing works for the relevant stage

	b) Submit to EDQ IS detailed sewer reticulation design plans, certified by a RPEQ. The certified sewer reticulation design plans must be designed generally in accordance with: i) *SEQ Water Supply and Sewerage Design and Construction Code;* and ii) the endorsed sewer network plan required under part a) of this condition	b) Prior to commencing works for the relevant stage
	c) Construct the internal sewer reticulation works generally in accordance with the certified plans submitted under part b) of this condition.	c) Prior to survey plan endorsement for the relevant stage
	d) Submit to EDQ IS 'as constructed' plans, certified by an RPEQ, of all internal sewer reticulation infrastructure constructed in accordance with this condition, including an asset register, pressure and CCTV results in accordance with *SEQ Water Supply and Sewerage Design and Construction Code - Asset Information.* **Advice Note:** *The Sub-Regional sewerage pump station NM1 and external sewer rising main will be constructed and put in operation by Council.*	d) Prior to survey plan endorsement for the relevant stage
20.	**Temporary Sewage Tankering of Wastewater** Unless the Sub-Regional sewerage pump station NM1 and external rising main is completed and in operation by Council:	
	a) Enter into a tankering agreement with Council for the collection and disposal of wastewater for any lots created; and	a) Prior to survey plan endorsement for the first stage
	b) Maintain the tankering agreement required by part a) of this condition until Sub-Regional sewerage pump station NM1 is commissioned.	b) As indicated
21.	**Compliance Assessment – Updated Site Based Stormwater Management Plan** Submit to EDQ DA for Compliance Assessment an updated Site Base Stormwater Management Plan (SBSMP), certified by a RPEQ, for the management of stormwater within the site to ensure non-worsening to downstream properties, including Mt Lindesay Highway, generally in accordance with *PDA Guideline No. 13 Engineering standards, Stormwater Quantity and Stormwater Quality*. The updated SBSMP shall include the following: i) Confirmation that the subject site is not impacted by flooding. This confirmation is to be provided through the undertaking of a site based flood model. If impacted by flood, provide further details on the Q100 line and the type of inundation – conveyance and/or storage; OR Demonstrate that the updated current solution identified in the SBSMP ensures that there is no worsening at lawful point of discharge based on Council's nominated 1% AEP flood level at Mt Lindesay Highway. ii) the on-site detention/bio-retention basins form part of the overall solution. Provide an engineering and legal	Prior to commencing works

	strategy/mechanism (e.g., Easement) to ensure that these devices can continue to perform as designed into the future. iii) Demonstrate that the design of the road stormwater system will convey runoff from the road reserve and the pre-developed lots to the proposed detention / bio-retention basin. iv) Demonstrate that the configuration, sizing and operation of the proposed detention / bio-retention basin system will accommodate runoff from the road stormwater system as per part (iii) above and result in no net worsening downstream of the site. v) Conveyance of existing external flows to the existing lawful point of discharge, ensuring no-net worsening downstream of the site.	
22.	**Stormwater Conveyance System** a) Submit to EDQ IS detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the stormwater conveyance system designed generally in accordance with: i) *PDA Guideline No. 13 Engineering standards* – Stormwater quantity; and ii) Updated Site Based Stormwater Management Plan, required by Condition 21 of this approval. b) Construct stormwater network generally in accordance with the certified plans submitted under part a) of this condition. c) Submit to EDQ IS "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council.	a) Prior to commencing works for the relevant stage b) Prior to survey plan endorsement for the relevant stage c) Prior to survey plan endorsement for the relevant stage
23.	**Compliance Assessment - Stormwater detention/bio-retention basin** a) Submit to EDQ DA for Compliance Assessment detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the proposed detention/bio-retention basin designed generally in accordance with: i) PDA Guideline No. 13 Engineering standards – Stormwater Quantity and Stormwater Quality; and ii) Updated Site Based Stormwater Management Plan, required by Condition 21 of this approval. b) Construct the basin generally in accordance with the endorsed plans required under part a) of this condition. c) Submit to EDQ IS "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council. **Advice Note:** *The proposed industrial allotments will have lot-based on-site stormwater detention and water quality treatment measures in the post-development phase. These treatment devices will be installed by the future lot owner with their size and location being allocated to suit the end use. Maintenance of these devices will be the responsibility of the future lot owners.*	a) Prior to commencing works b) Prior to survey plan endorsement for the first stage c) Prior to survey plan endorsement for the first stage

24.	**Compliance Assessment – Swale**	
	a) Submit to EDQ DA for Compliance Assessment detailed engineering drawings and hydraulic calculations, certified by a RPEQ, for the stormwater swale on the western boundary of the land designed generally in accordance with: i) PDA Guideline No. 13 Engineering standards – Stormwater quantity and: ii) Swale and Channel Longitudinal Section, Plan No. 30109334-AAP-WS00OP-CV-DRG-0162, Issue 5, Prepared by Arcadis and dated 31/07/2023 iii) Swale and Channel Typical Sections, Plan No. 30109334-AAP-WS00OP-CV-DRG-0164, Issue 5, Prepared by Arcadis and dated 31/07/2023 The detailed design shall ensure that the swale: iv) has adequate capacity to convey overland flow up to including the 1 in 100 year event with appropriate freeboard v) is free flowing with no ponding vi) is provided with an adjacent track to allow future maintenance vii) maintain a depth*velocity product not exceeding 0.6 up to including 1 in 100 year event unless agreed in writing by Council viii) is appropriately fenced (fauna exclusion) along the eastern side of the swale.	a) Prior to commencing works
	b) Construct the swale generally in accordance with the endorsed plans required under part a) of this condition.	b) Prior to survey plan endorsement for Stage 2
	c) Submit to EDQ IS swale "as constructed" plans, certified by a RPEQ including an asset register in a format acceptable to Council.	c) Prior to survey plan endorsement for Stage 2
25.	**Electricity**	
	a) Submit to EDQ IS a Certificate of Electricity Supply from ENERGEX for the provision of electricity supply to the approved development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the approved development in accordance with the Certificate of Electricity Supply submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
26.	**Telecommunications**	
	a) Submit to EDQ IS documentation from an authorised telecommunication service provider confirming that an agreement has been entered into for the provision of underground telecommunication services to the approved development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the approved development in accordance with the documentation submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage

27.	**Broadband**	
	a) Submit to EDQ IS written agreement, from an authorised telecommunications service provider, confirming that fibre-ready pit and pipe infrastructure designed to service the approved development can accommodate services compliant with *Industry Guideline G645:2017 Fibre-Ready Pit and Pipe Specification for Real Estate Development Projects*.	a) Prior to survey plan endorsement for the relevant stage
	b) Construct the fibre-ready pit and pipe infrastructure specified in the agreement submitted under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
28.	**Gas**	
	a) Submit to EDQ IS, documentation from an authorised gas service provider, confirming that an agreement has been entered into for the provision of underground gas services to the proposed development.	a) Prior to survey plan endorsement for the relevant stage
	b) Connect the development to underground gas services in accordance with the agreement mentioned in part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
Landscape and Environment		
29.	**Streetscape Works – Compliance Assessment**	
	a) Submit to EDQ DA, for Compliance Assessment, detailed streetscape works drawings, certified by an AILA, for proposed streetscape works for all internal roads, including a schedule of proposed standard and non-standard Contributed Assets to be transferred to Council. The certified drawings are to include, where relevant: i) location and type of street lighting in accordance with *AS1158 – 'Lighting for Roads and Public Spaces';* ii) footpath treatments; iii) location and specifications of streetscape furniture; iv) location and size of stormwater treatment devices; and v) street trees and plants, including species, size and location generally in accordance with Council's adopted planting schedules and guidelines.	a) Prior to commencing streetscape work for the relevant stage
	b) Construct streetscape works generally in accordance with the streetscape plans endorsed under part a) of this condition.	b) Prior to survey plan endorsement for the relevant stage
	c) Submit to EDQ IS 'as constructed' plans, certified by an AILA, and asset register in a format acceptable to Council.	c) Prior to survey plan endorsement for the relevant stage
30.	**Vegetation Clearing**	
	a) Submit to EDQ IS a vegetation clearing plan prepared by an ecologist for each stage that excludes the 25m buffer corridor and lot identified for open space.	a) Prior to commencement of clearing for relevant stage

	b) Undertake vegetation clearing generally in accordance with the plan submitted under part a) of this condition. The clearing is to be undertaken with the stage to be developed.	b) At all times
	c) Vegetation clearing is to be supervised by an Ecologist.	c) At all times
	d) Submit to EDQ IS written certification from an Ecologist that vegetation clearing has been carried out generally in accordance with part b) of this condition.	d) Within 3 months of completion of clearing of the relevant stage
31.	**Fauna Spotter**	
	a) A licensed Wildlife Spotter/Catcher under the *Nature Conservation Act 1992* is to undertake a survey of the site to identify any fauna or habitat features (e.g., nests, tree hollows) and certify that any necessary fauna protection measures or relocation procedures have been implemented.	a) Prior to commencement of vegetation clearing for the relevant stage
	b) A licensed Wildlife Spotter/Catcher must be present during the vegetation clearing.	b) At all times during vegetation clearing
	c) Submit to EDQ IS certification from the licensed Wildlife Spotter/Catcher that vegetation clearing, and fauna protection measures was carried out generally in accordance with the conditions of approval.	c) Within 3 months of the completion of vegetation clearing of the relevant stage
	Advice Note: *Where an Environmental Protection and Biodiversity Conservation Act 1999 (EPBC) approval has been granted and includes fauna spotter requirements, the fauna spotter requirements under this condition will not be applicable for the same matters under the EPBC approval*.	
32.	**Vegetation – Compensatory Planting**	
	a) Submit to EDQ IS a planting plan certified by an ecologist showing the extent of compensatory planting to be undertaken in lot identified as 'Open Space' on Proposed Development Layout Plan, Plan No. TIEL2020159.CIV.DA, Dwg 10, Issue H dated 07/07/2021, excluding the minimum 25m buffer on the western boundary, including, type and extent of planting, as set out in the EDQ Guideline 17: Remnant Vegetation and Koala Habitat Obligations in Greater Flagstone and Yarrabilba PDAs dated May 2015.	a) Prior to commencement of vegetation clearing for the relevant stage
	b) Undertake compensatory planting in accordance with a) of this condition.	b) Within 3 months of commencement of vegetation clearing
	c) Once compensatory planting has been undertaken, submit to EDQ IS confirmation from a qualified arborist (AQF Level 5) or ecologist that the compensatory planting has been undertaken in accordance with b) of this condition.	c) Within 12 months of commencement of vegetation clearing of the relevant stage

33.	**Bushfire Management** a) Carry out Bushfire Management Works in accordance with: i) Section 6 of the approved Bushfire Management Plan, Report 16014, Final V3, dated 13 July 2018; and ii) Addendum to the Bushfire Management Plan for the proposed development at 4499-4651 Mount Lindsay Highway, North Maclean dated 18 February 2021. b) Submit to EDQ IS verification from a suitably qualified professional that the works required for bushfire management and mitigation within the relevant stages have been carried out generally in accordance with the relevant approved plans and documents. **Advice Note**: *If the adjoining landowner obtains approval for vegetation clearing that reduces bushfire impact, then this can be articulated though an updated context plan supported by a new bushfire advice.*	a) Prior to survey plan endorsement for the relevant stage b) Prior to survey plan endorsement for the relevant stage
Surveying, Land Transfers and Easements		
34.	**Land Transfers – Contaminated Land** Submit to EDQ IS a copy of a site suitability statement, as required under the EP Act, confirming that all land conditioned to be transferred to a trustee is suitable for the intended purpose(s). The site suitability statement must be prepared by a suitably qualified person and be certified by an approved auditor in accordance with the EP Act. *NOTES:* *For the purpose of this condition a suitably qualified person is defined in the EP Act. A list of approved auditors can be found at the following website:* https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditor-engagement.	Prior to survey plan endorsement for the relevant stage
35.	**Land Transfers – Drainage and Offset Area** Transfer, in fee simple, to Council as trustee, the Lot identified as Open Space as shown on the approved plans for drainage and offset open space purposes.	At registration of survey plan for Stage 2
36.	**Land transfers – Sewerage pump station** Transfer in fee simple, to Council as trustee, Lot 905 as shown on Plan of Subdivision, Plan No. 22-0007P/01-02, Version E prepared by Wolter Consulting and dated 14/08/23. The land metes and bounds must be to the satisfaction of the Chief Executive Officer of the authority. ***Advice Note****: This land forms part of the sub-regional sewer infrastructure to be delivered by Council. Offsets for the land may be available.*	At registration of survey plan for the first stage

37.	**Rising Main Easement** Provide a 6m wide easement, in favour of and at no cost to the Council, along the southern boundary for the proposed sub-regional sewerage rising main generally in accordance as shown on Overall Sewer Sketch Layout Plan, Plan No. 3010933-AAP-WS00OP-CV-SKT-032, Issue 1, prepared by Arcadis and dated 22/08/23. The terms of public utility easements are to be to the satisfaction of the Chief Executive Officer of the authority which is to accept and maintain the Contributed Assets. ***Advice Note:*** *If an alternative route for the rising main is pursued, the easement can be cancelled at the agreement of Council.*	At registration of survey plan for the first stage
38.	**Easements over Infrastructure** Provide public utility easements, in favour of and at no cost to the grantee, over infrastructure located in land (other than road) for Contributed Assets. The terms of public utility easements are to be to the satisfaction of the Chief Executive Officer of the authority which is to accept and maintain the Contributed Assets.	At registration of survey plan for the relevant stage

STANDARD ADVICE

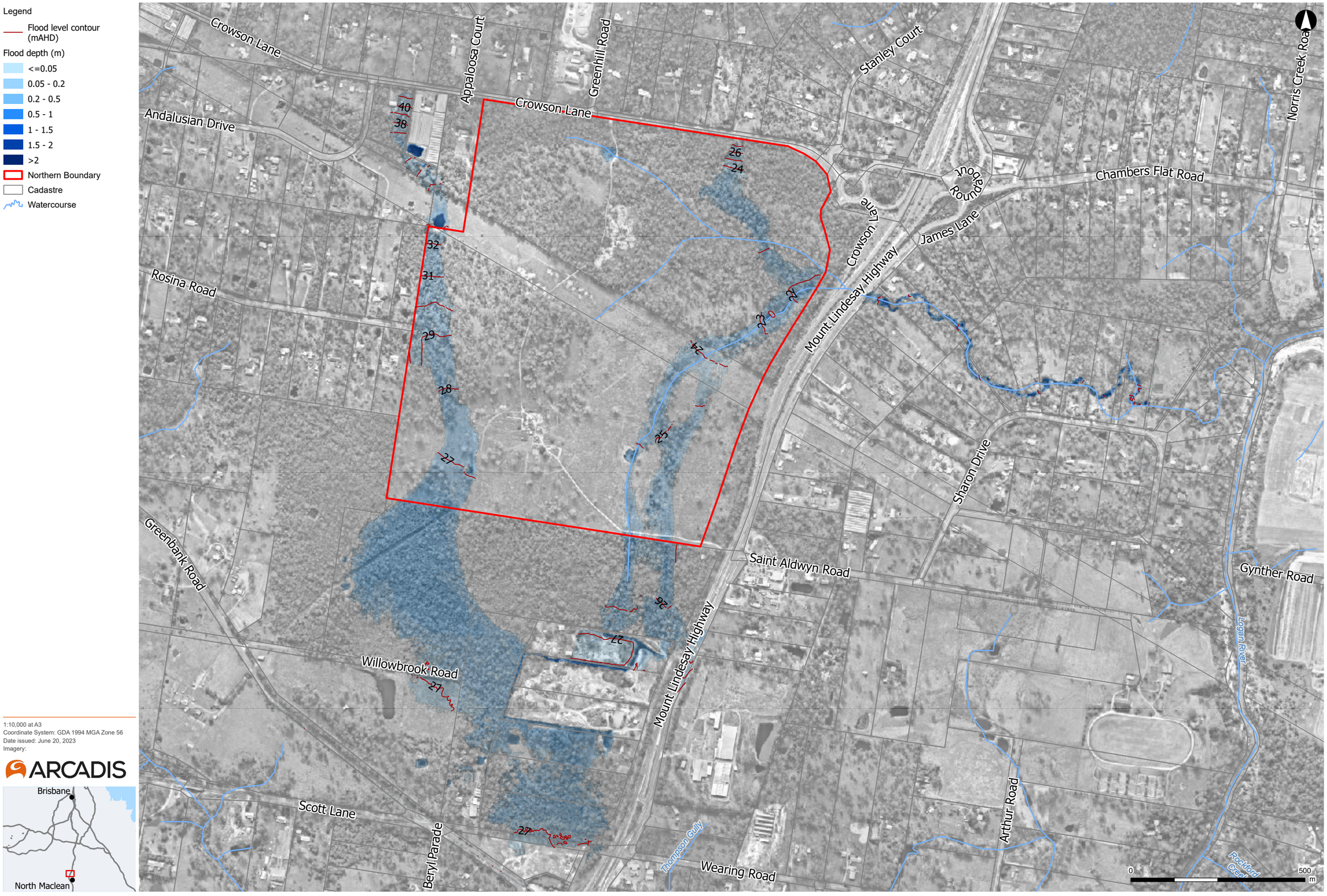
Please note that to lawfully undertake development, it may be necessary to obtain approvals other than this PDA development approval. For advice on other approvals that may be necessary in relation to your proposal, it is recommended that you seek professional advice.

**** End of Package ****

TUFLOW Mapping

APPENDIX D

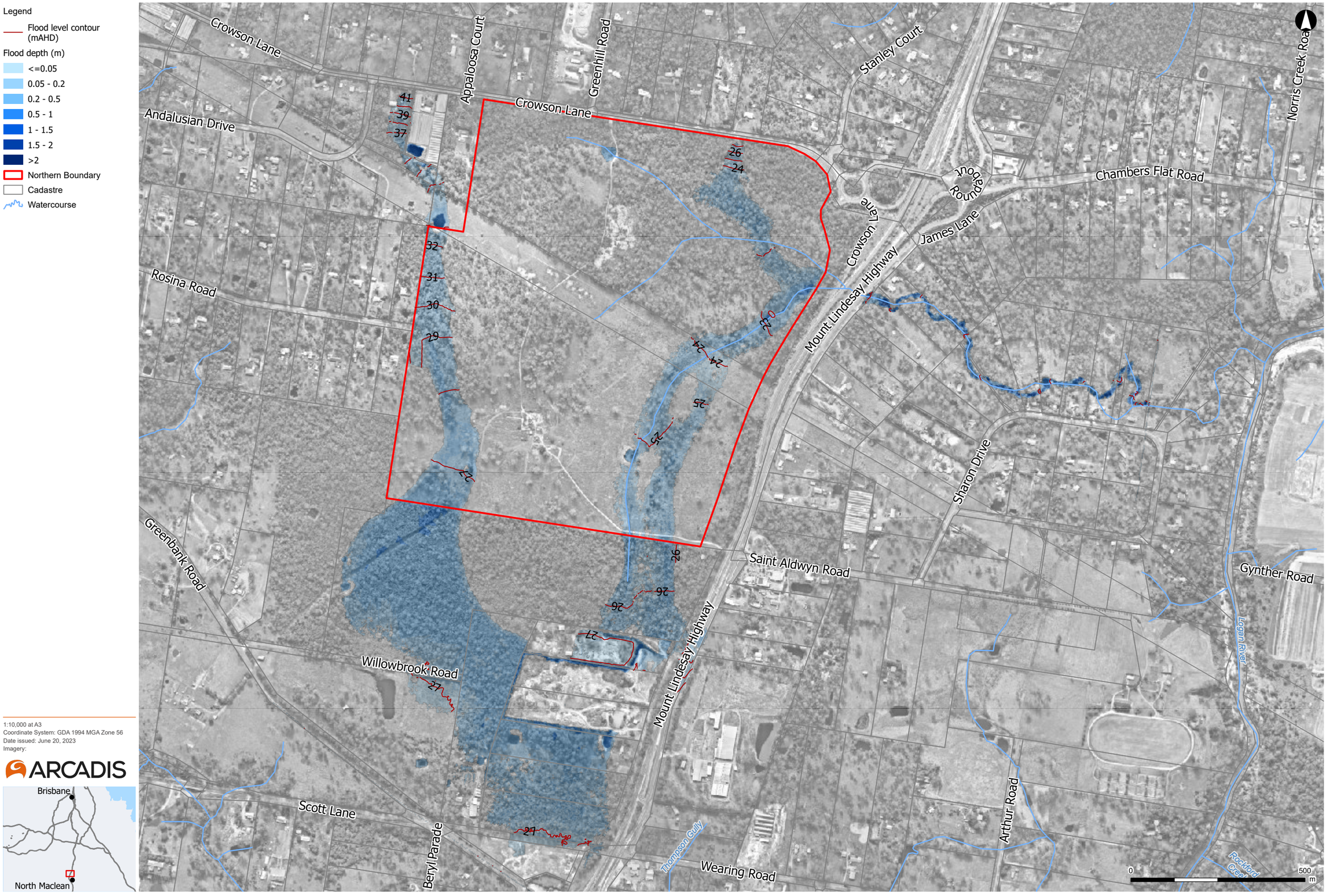
Figure E-1 - Flood Depths - Existing Case 2 year ARI - 50% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS

Figure E-2 - Flood Depths - Existing Case 5 year ARI - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS

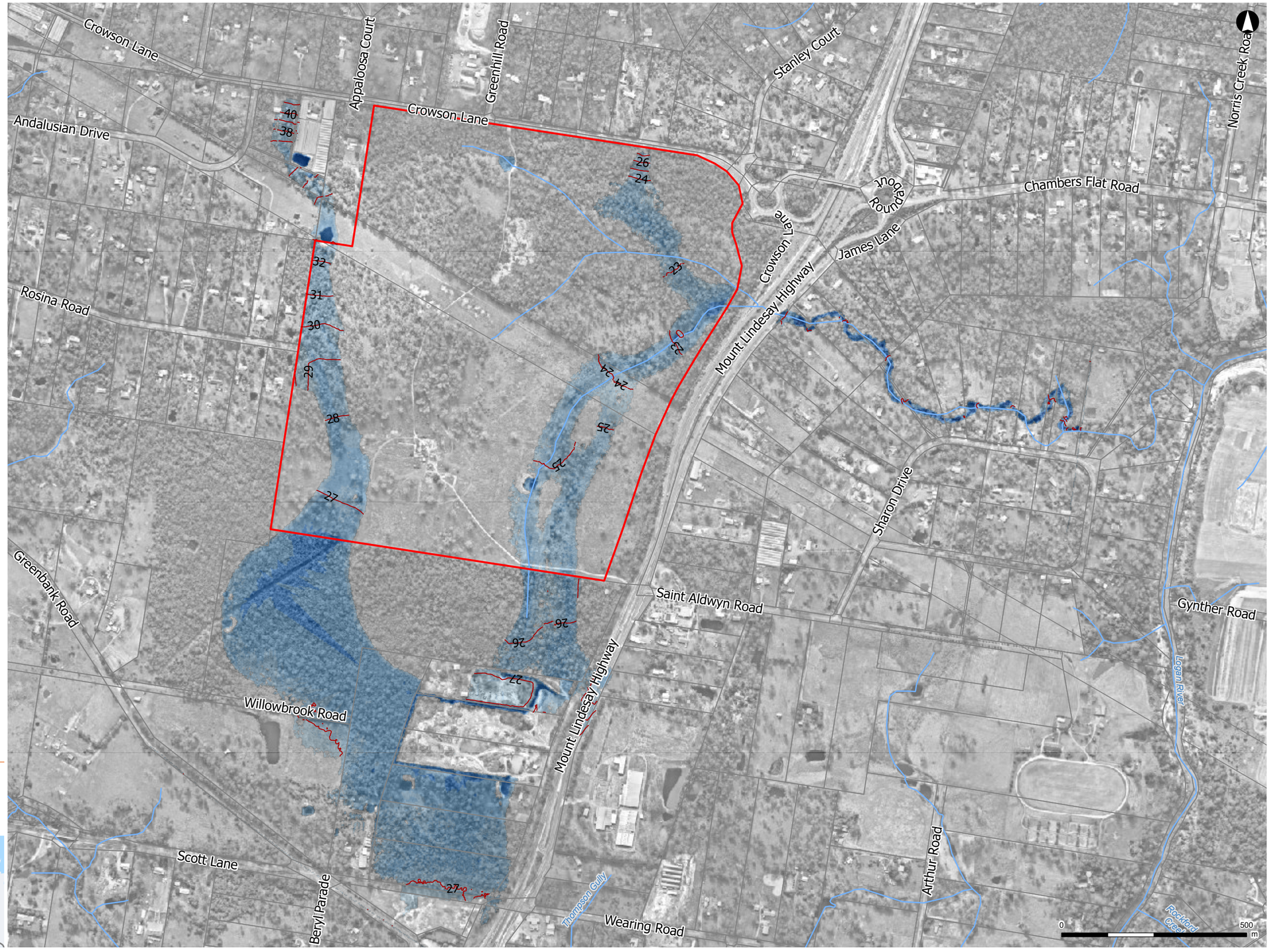
Figure E-3 - Flood Depths - Existing Case 10 year ARI - 10% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS



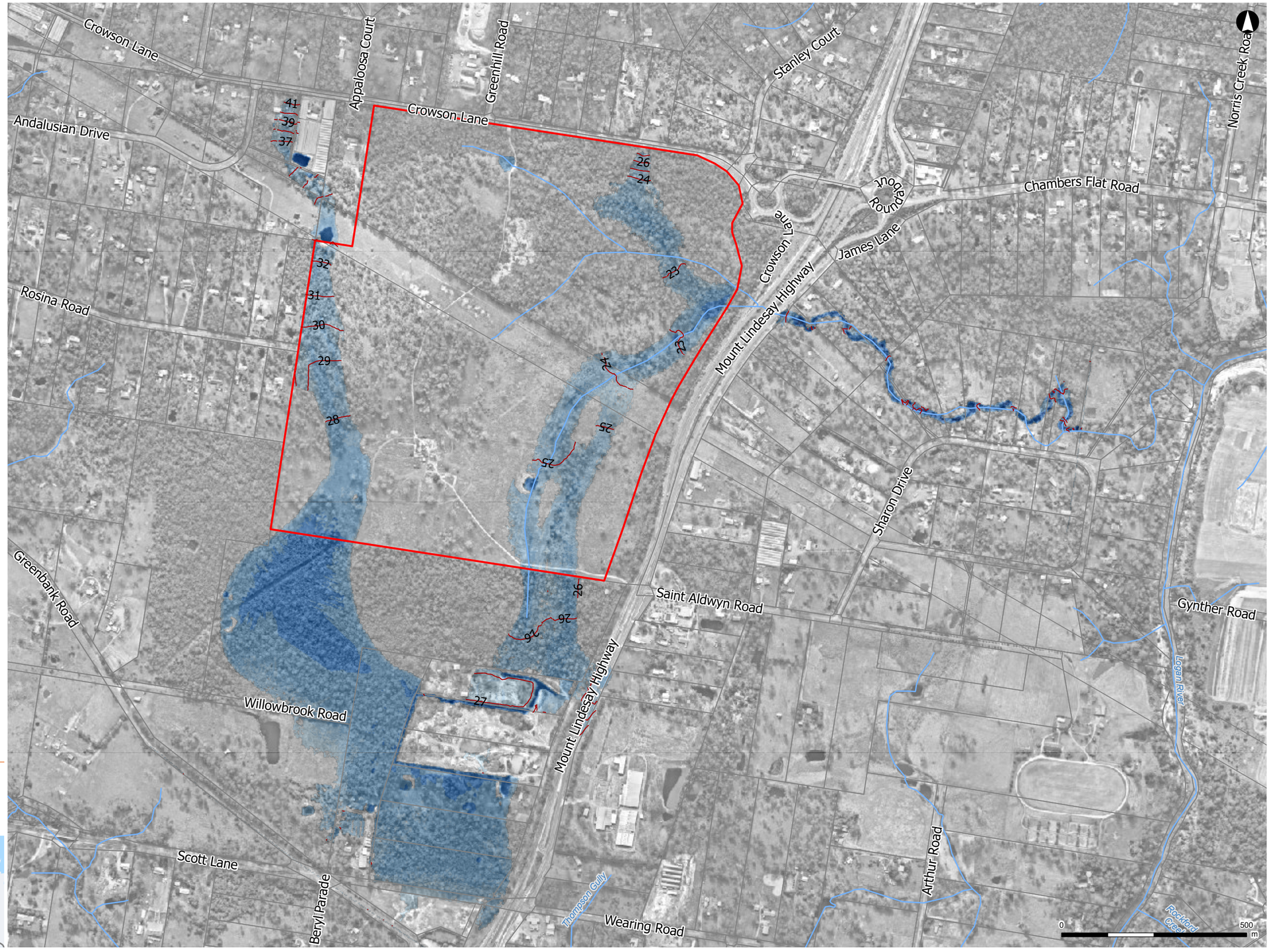
Figure E-4 - Flood Depths - Existing Case 20 year ARI - 5% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse

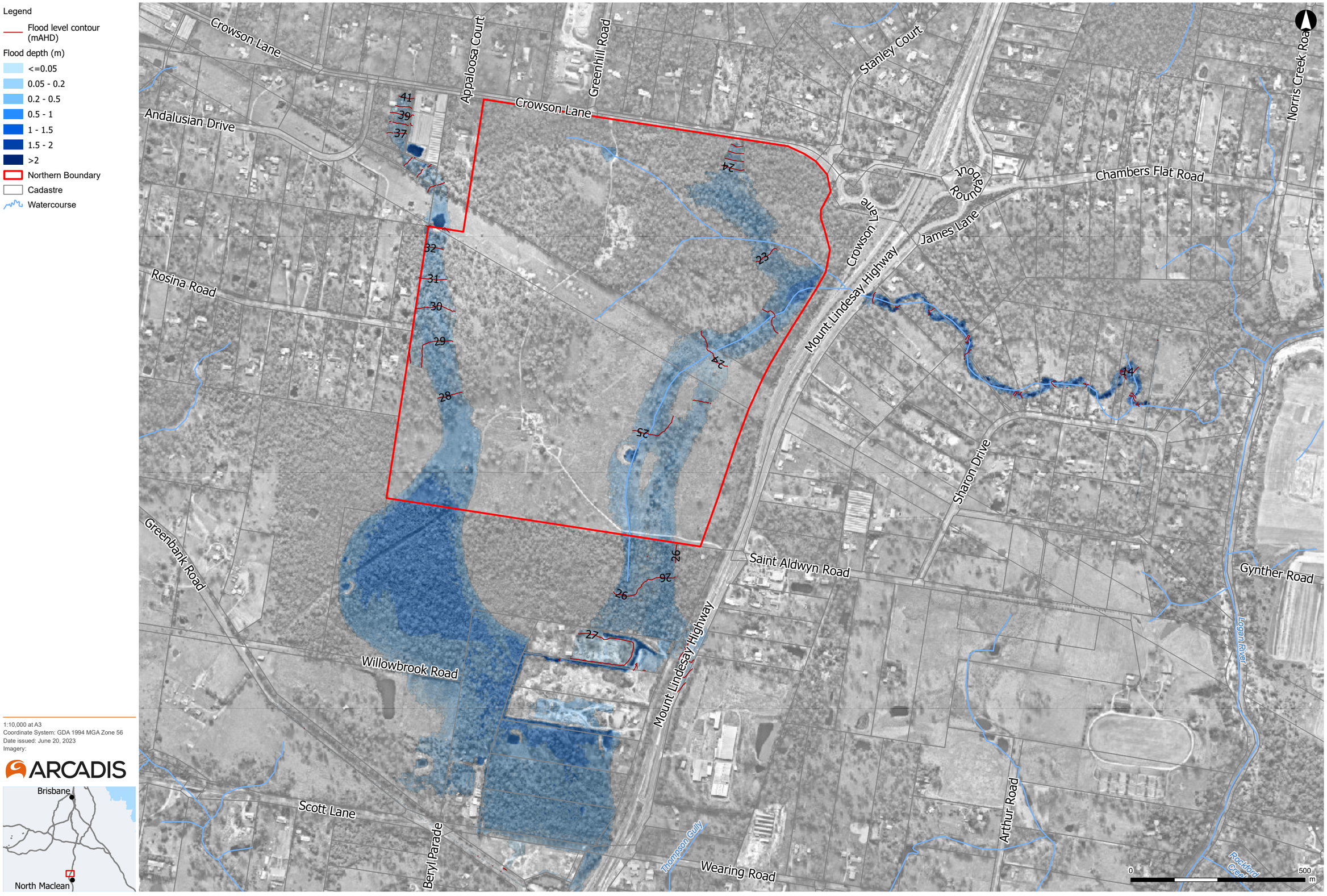


1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS



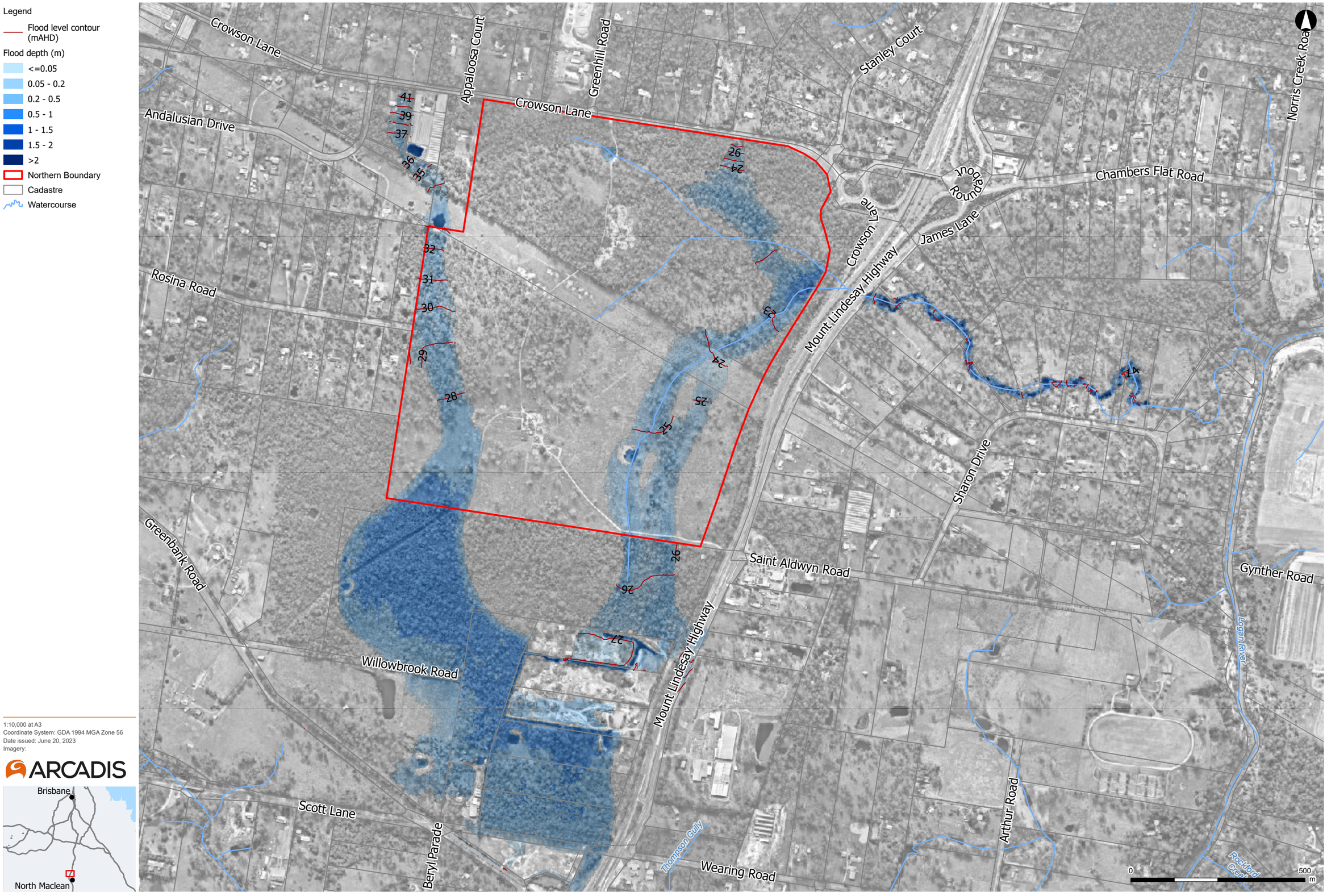
Figure E-5 - Flood Depths - Existing Case 50 year ARI - 2% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS

Figure E-6 - Flood Depths - Existing Case 100 year ARI - 1% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS

Figure E-7- FlowVelocity - Existing Case - 50% AEP



Figure E-8 - FlowVelocity - Existing Case - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

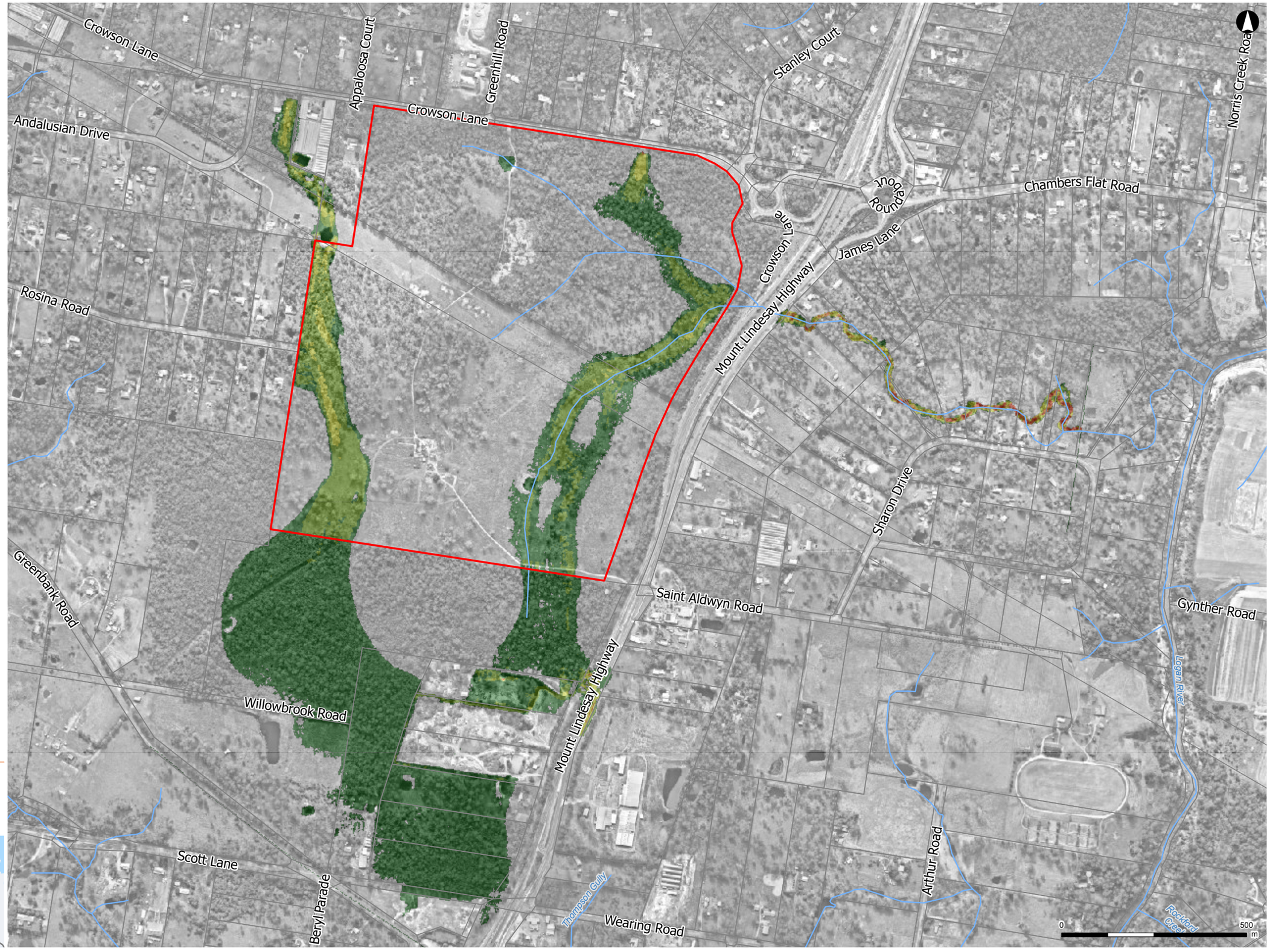
ARCADIS

Figure E-9 - FlowVelocity - Existing Case - 10% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS

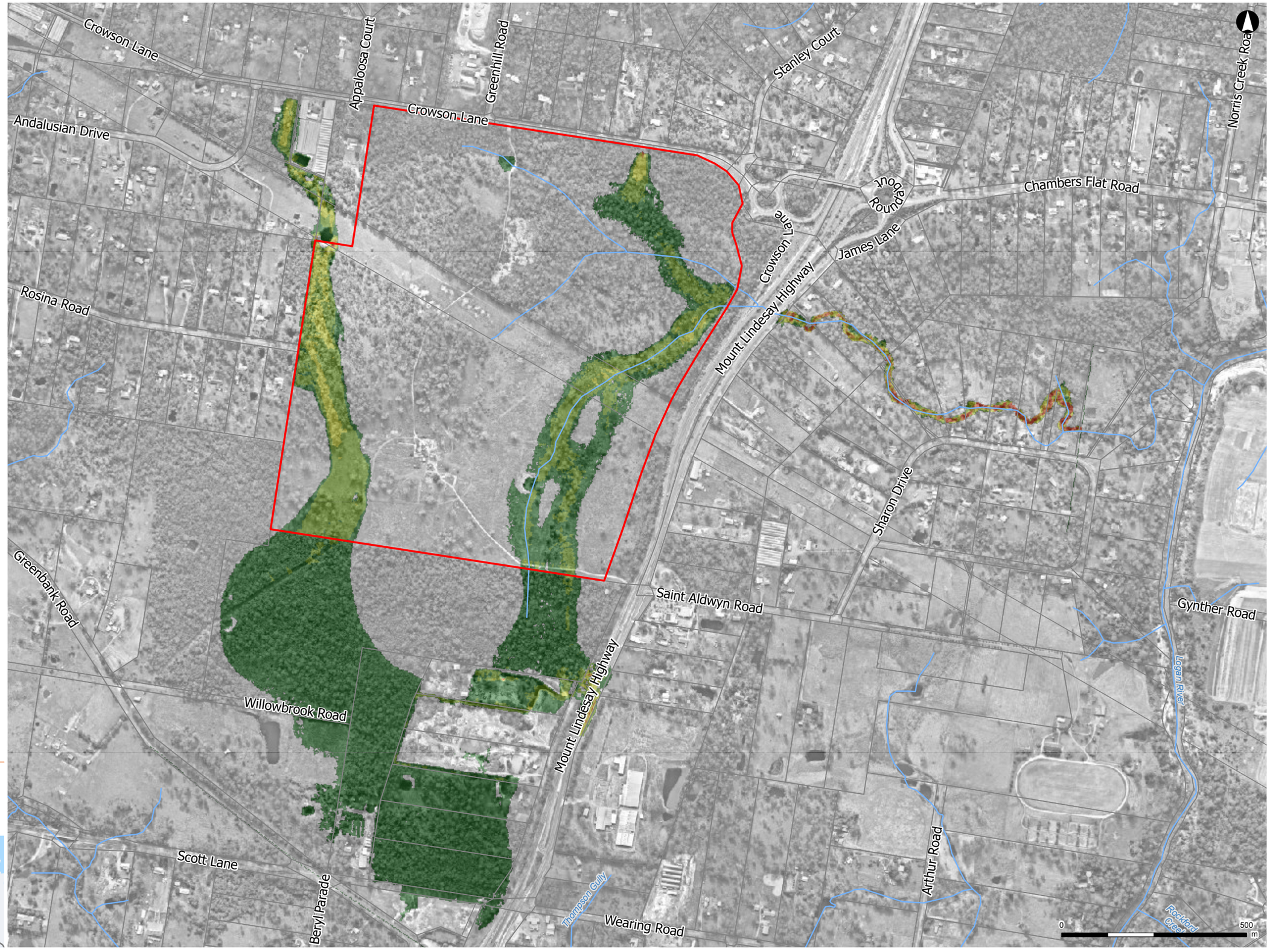


Figure E-10 - FlowVelocity - Existing Case - 5% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 20, 2023
Imagery:

ARCADIS



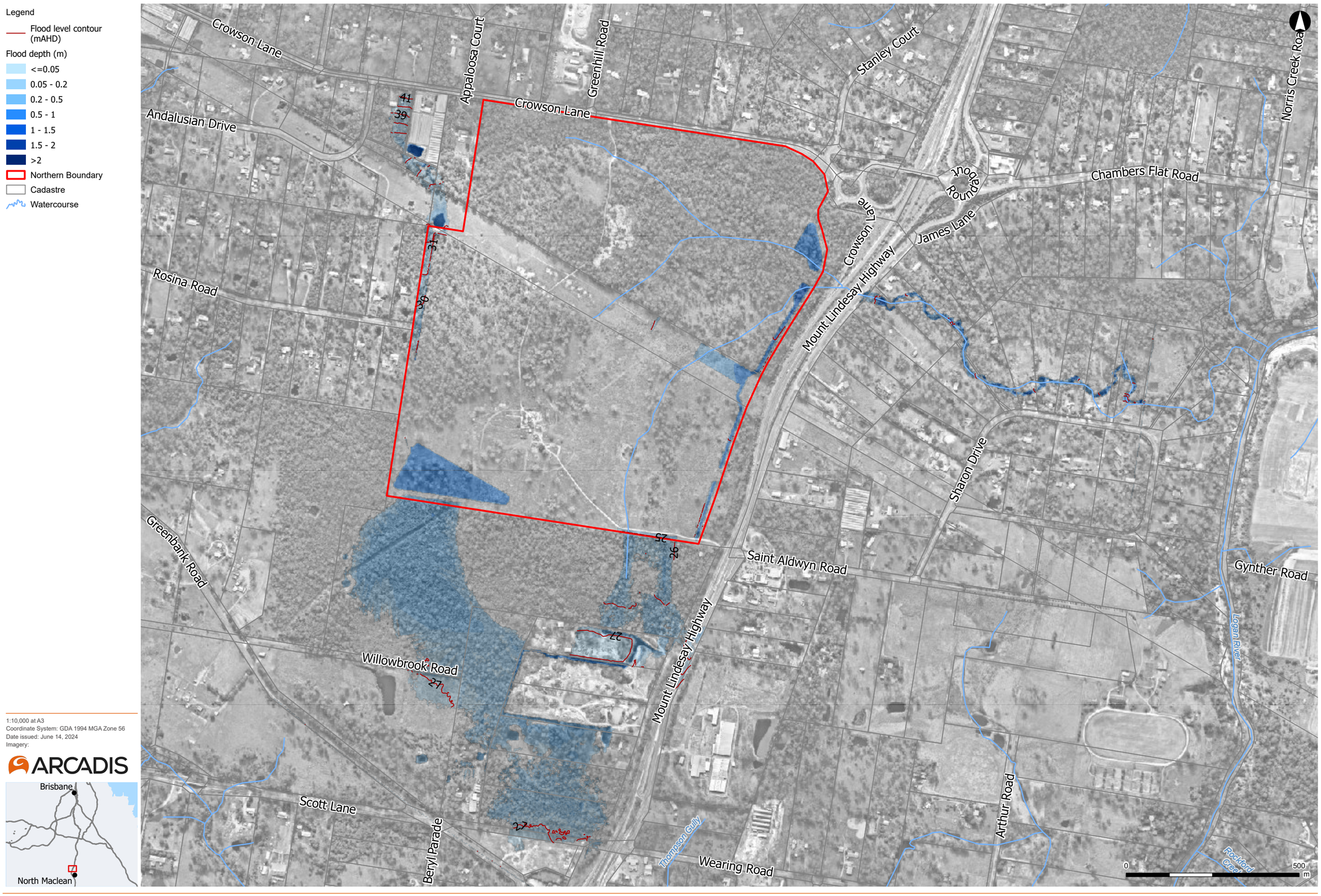
Figure E-11 - FlowVelocity - Existing Case - 2% AEP



Figure E-12 - FlowVelocity - Existing Case - 1% AEP



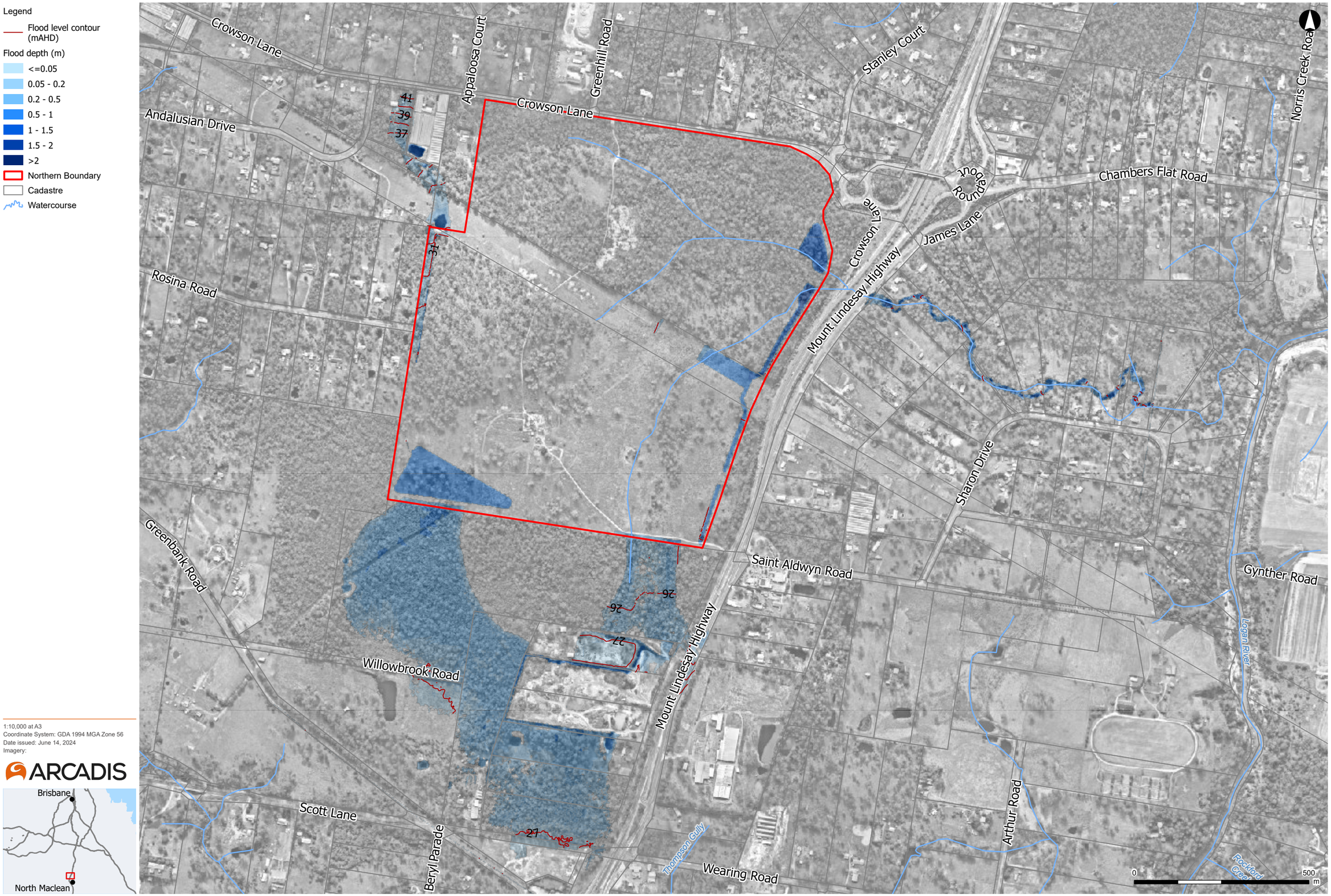
Figure D-1 - Flood Depths - Design Case - 50% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

Figure D-2 - Flood Depths - Design Case - 20% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

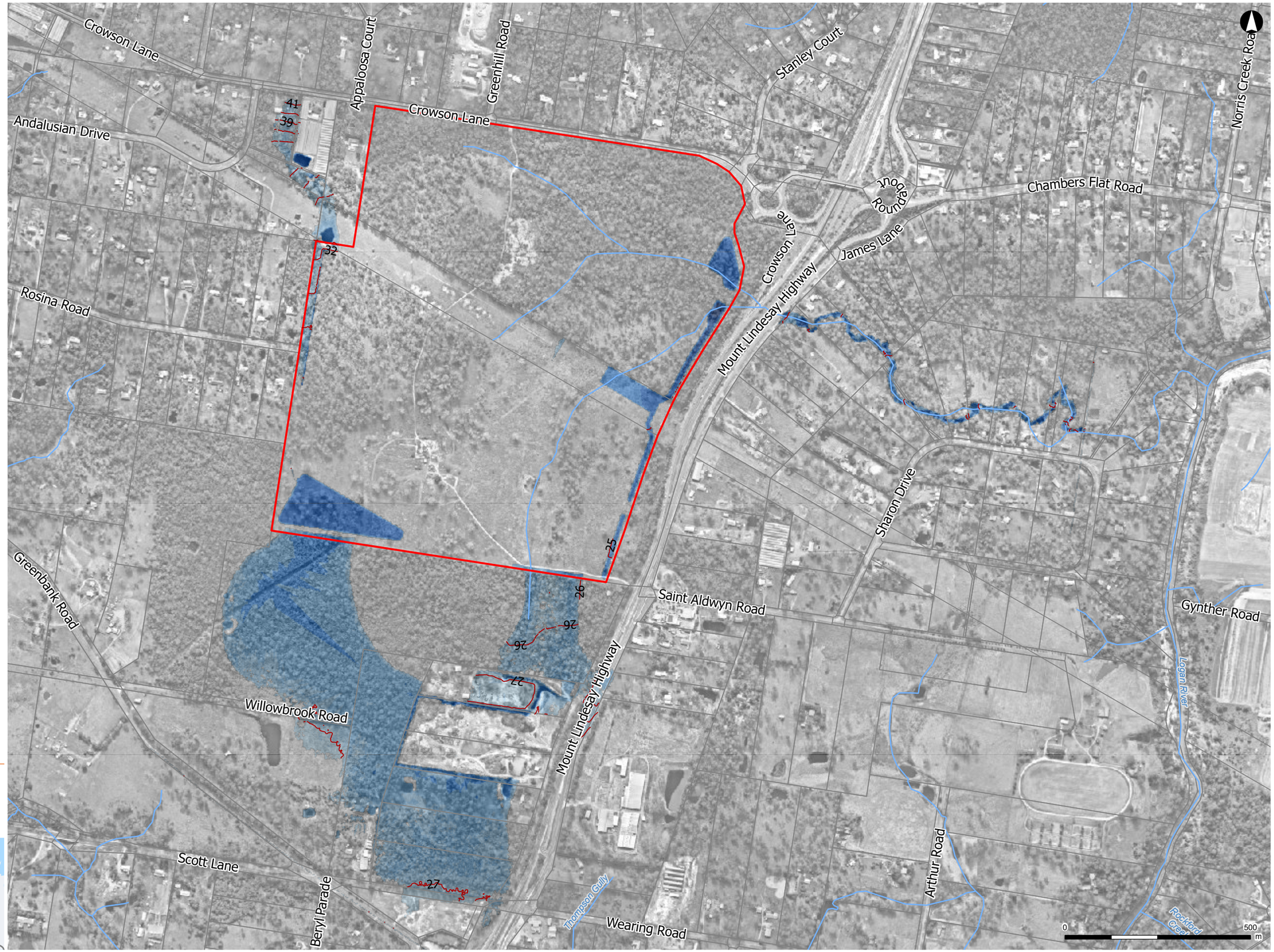
Figure D-3 - Flood Depths - Design Case - 10% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



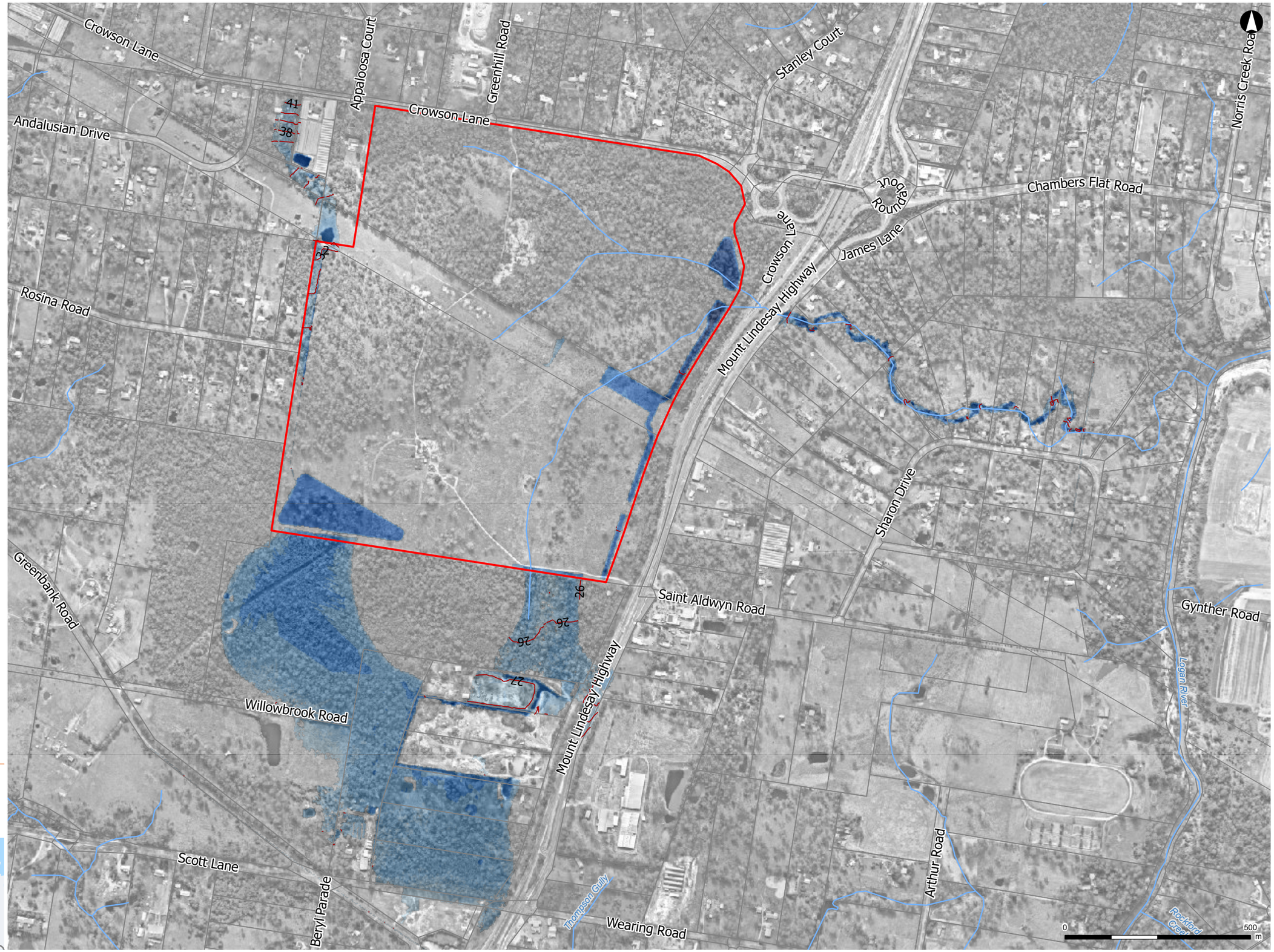
Figure D-4 - Flood Depths - Design Case - 5% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



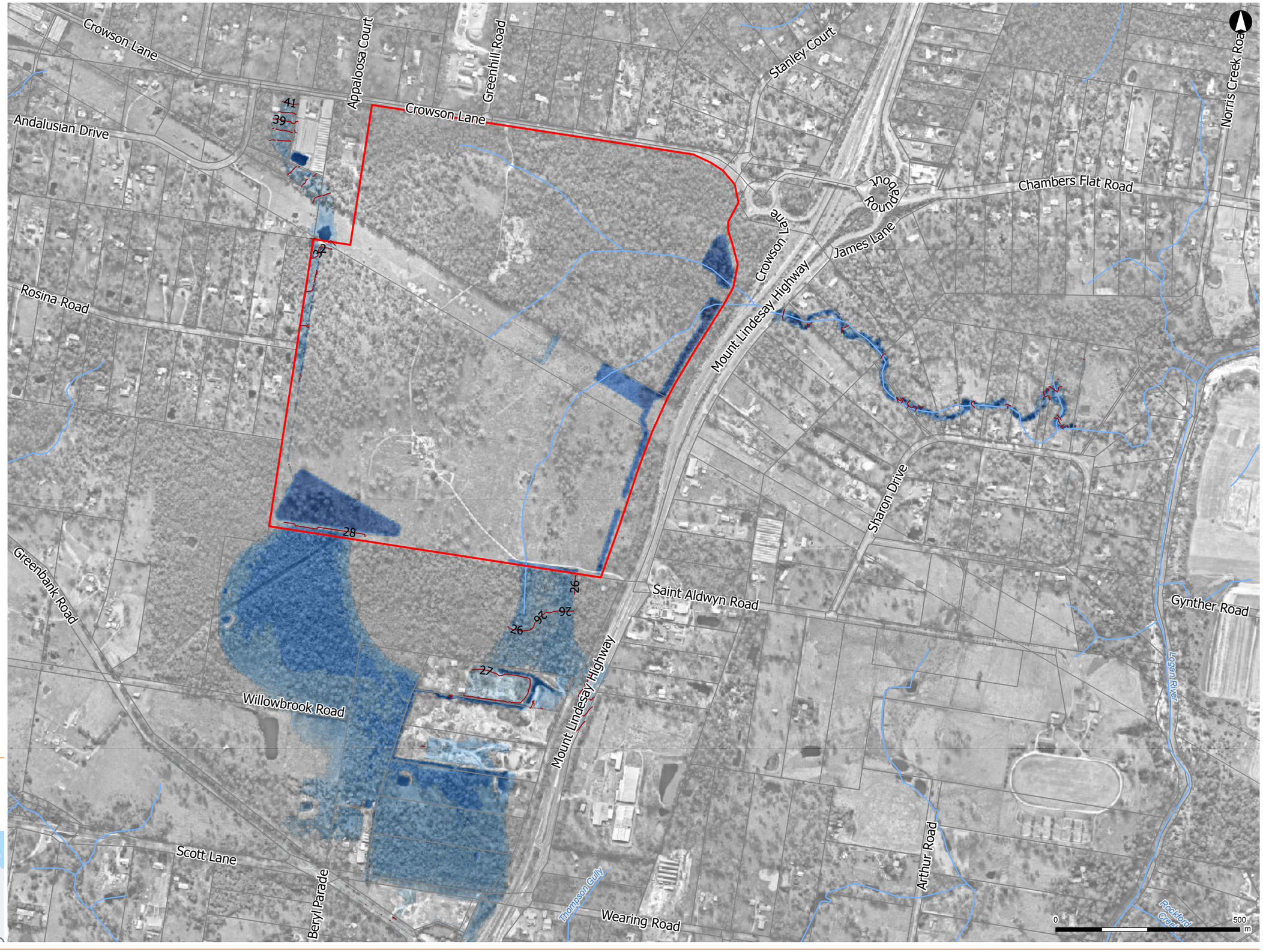
Figure D-5 - Flood Depths - Design Case - 2% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

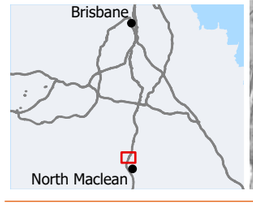


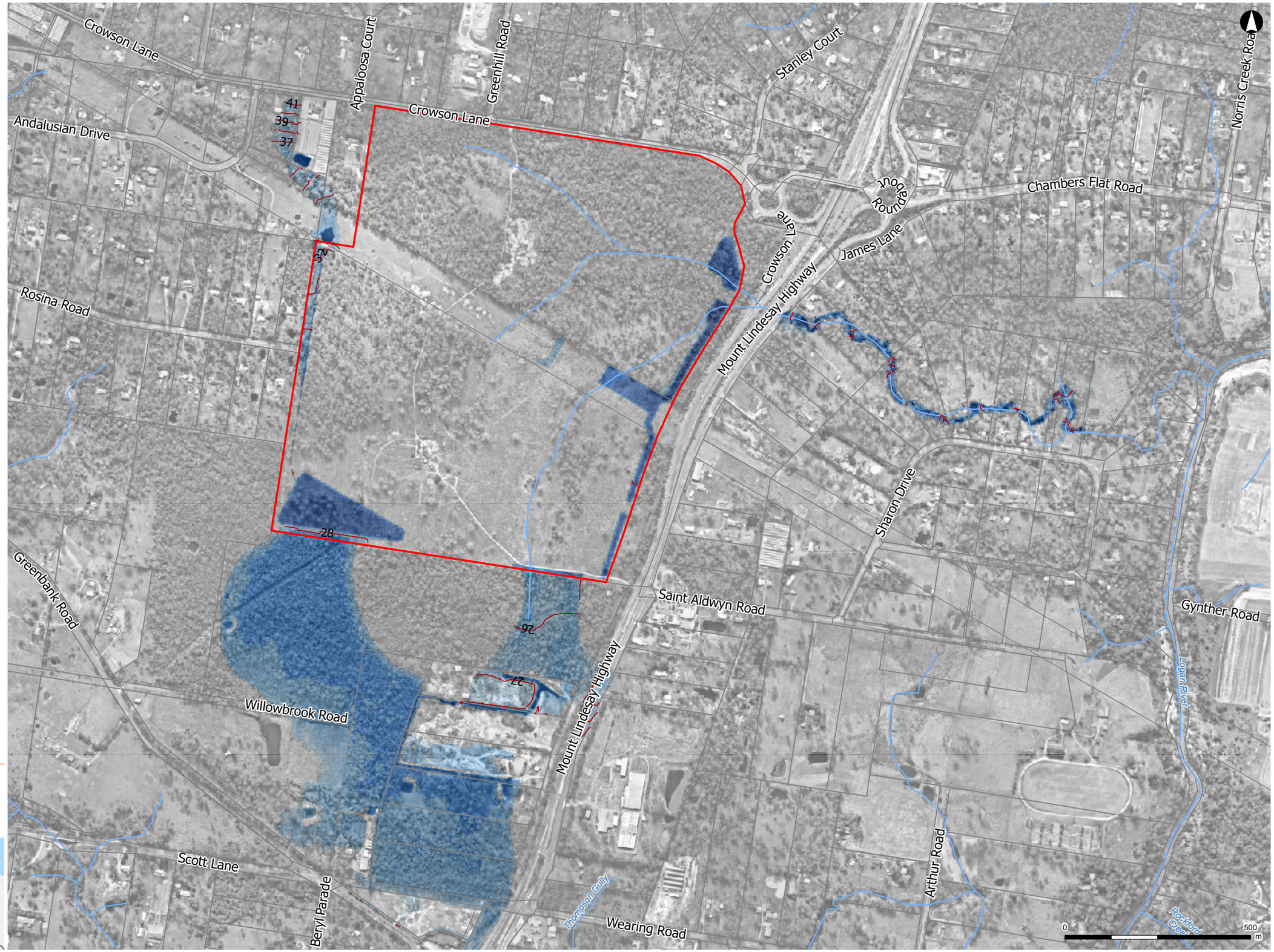
Figure D-6 - Flood Depths - Design Case - 1% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse

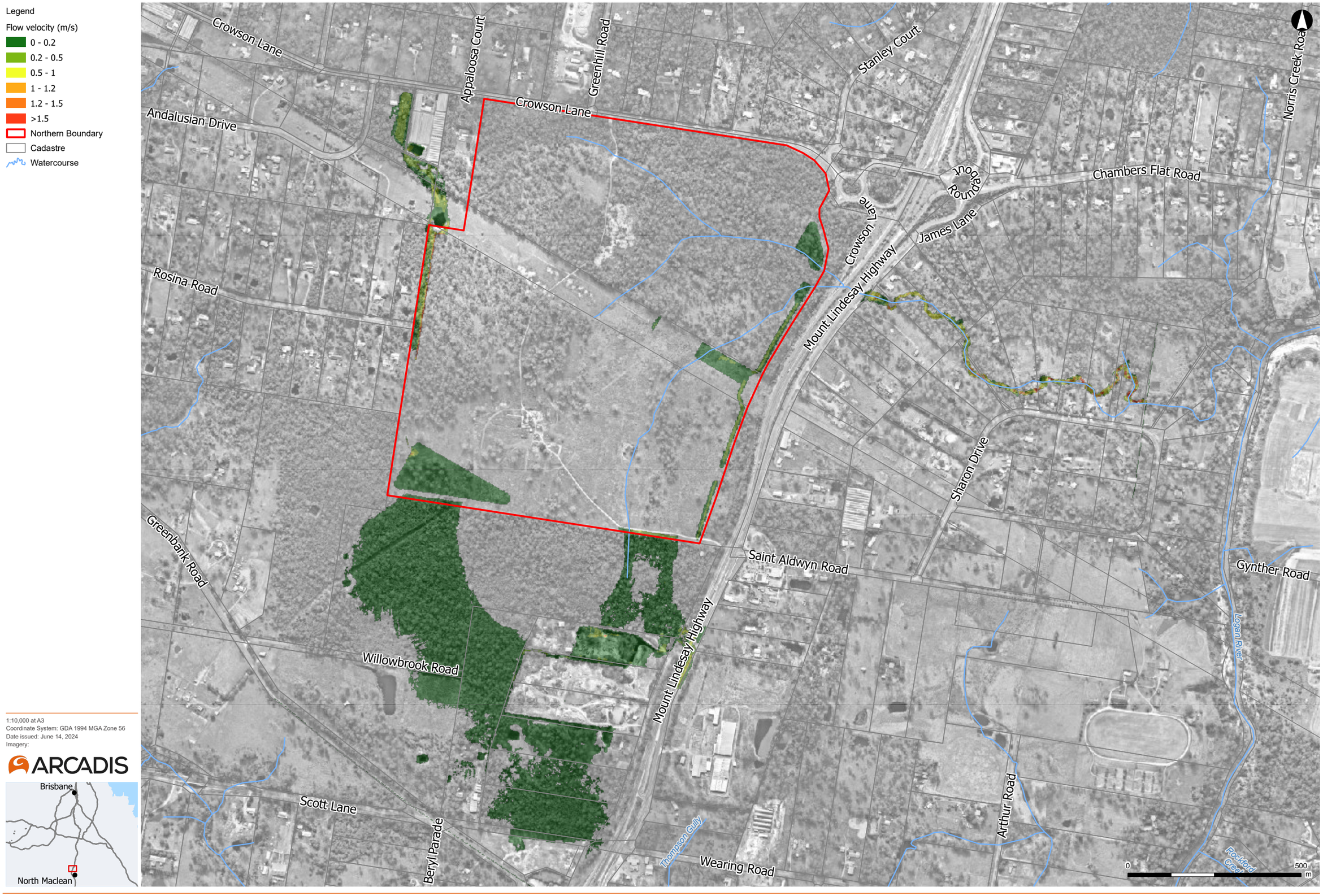


1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



Figure D-7 - Flow Velocity - Design Case - 50% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

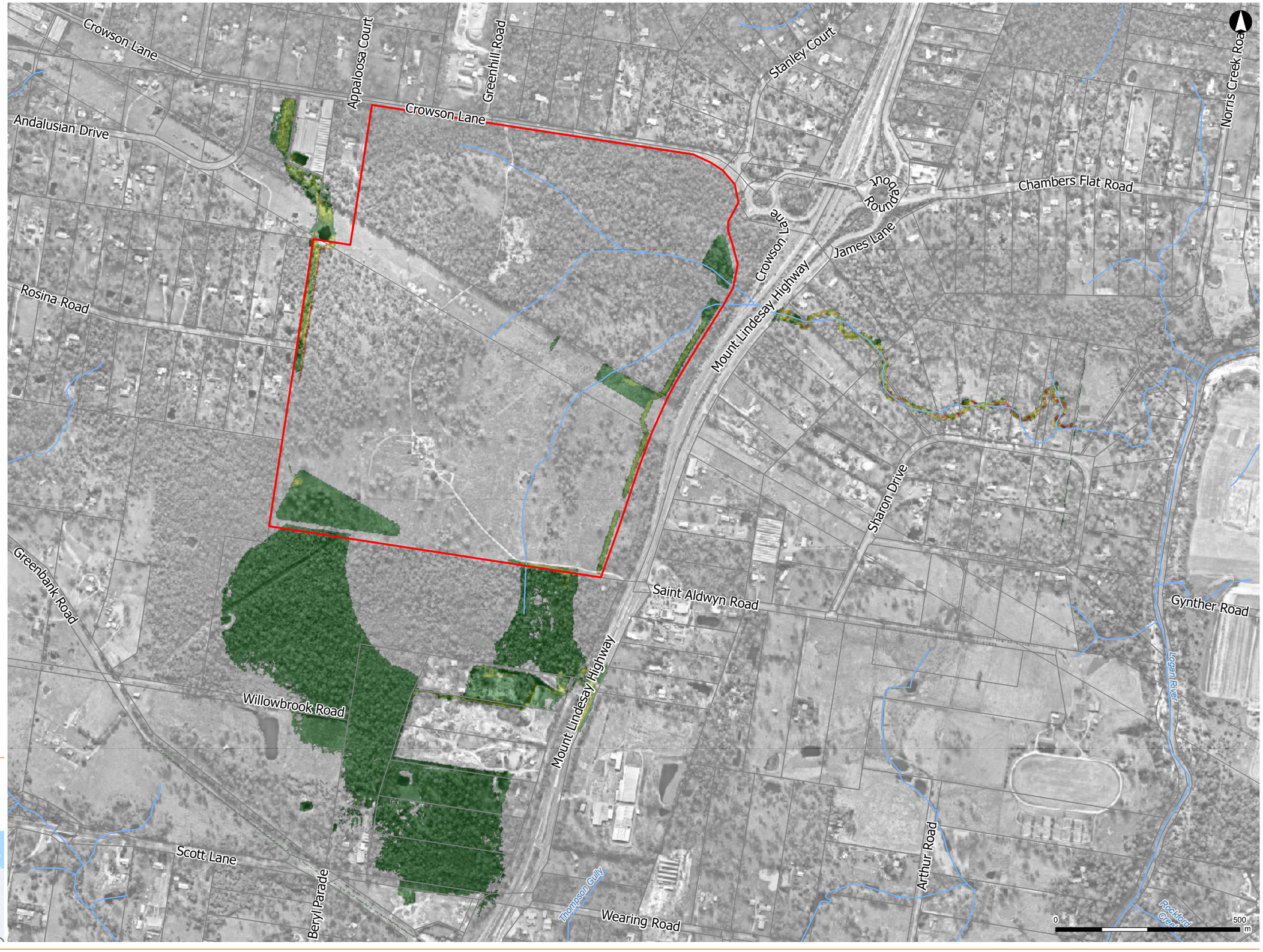
ARCADIS

Figure D-8 - Flow Velocity - Design Case - 20% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

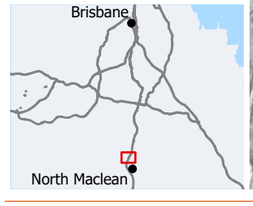
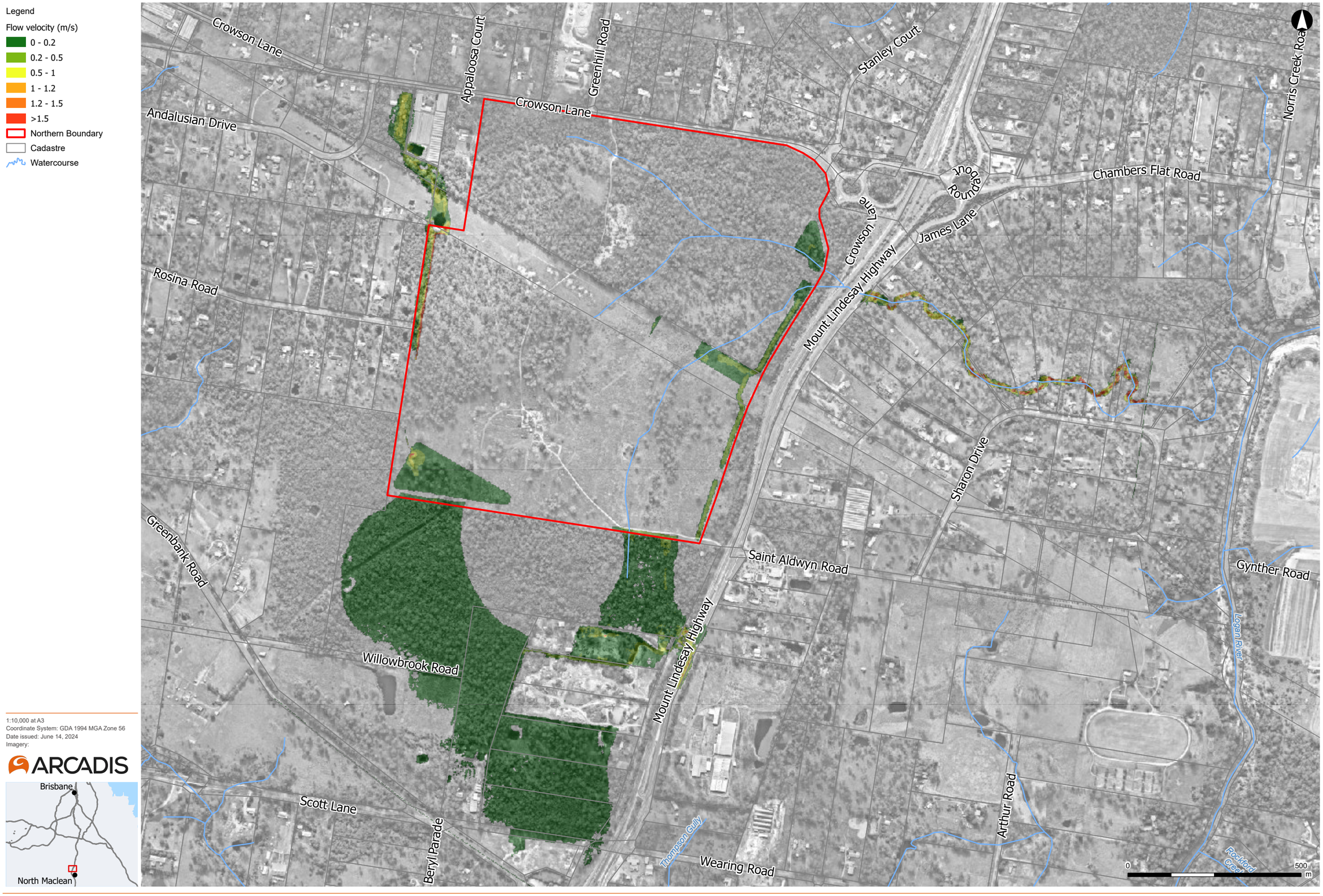


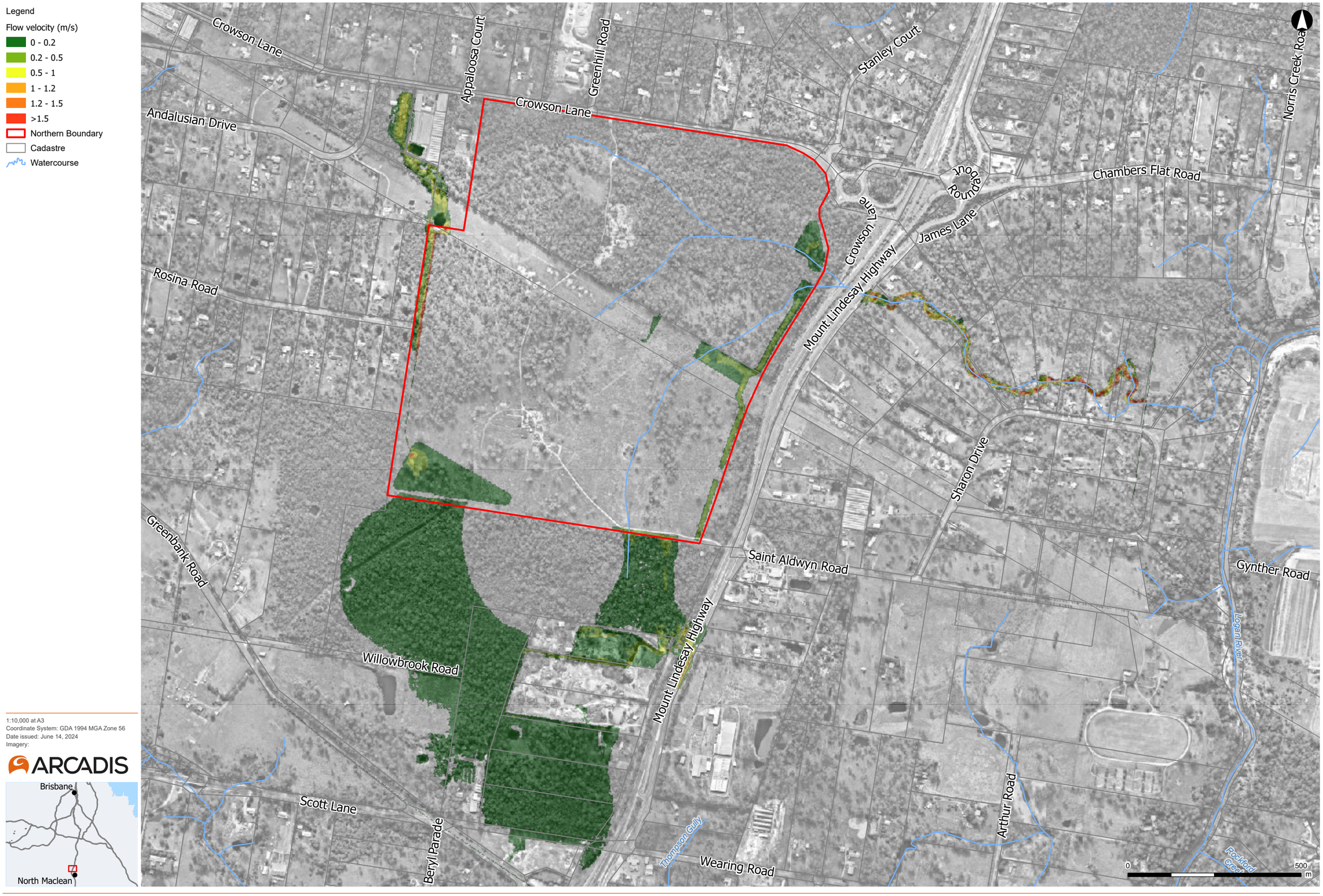
Figure D-9 - Flow Velocity - Design Case - 10% AEP



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

Figure D-10 - Flow Velocity - Design Case - 5% AEP



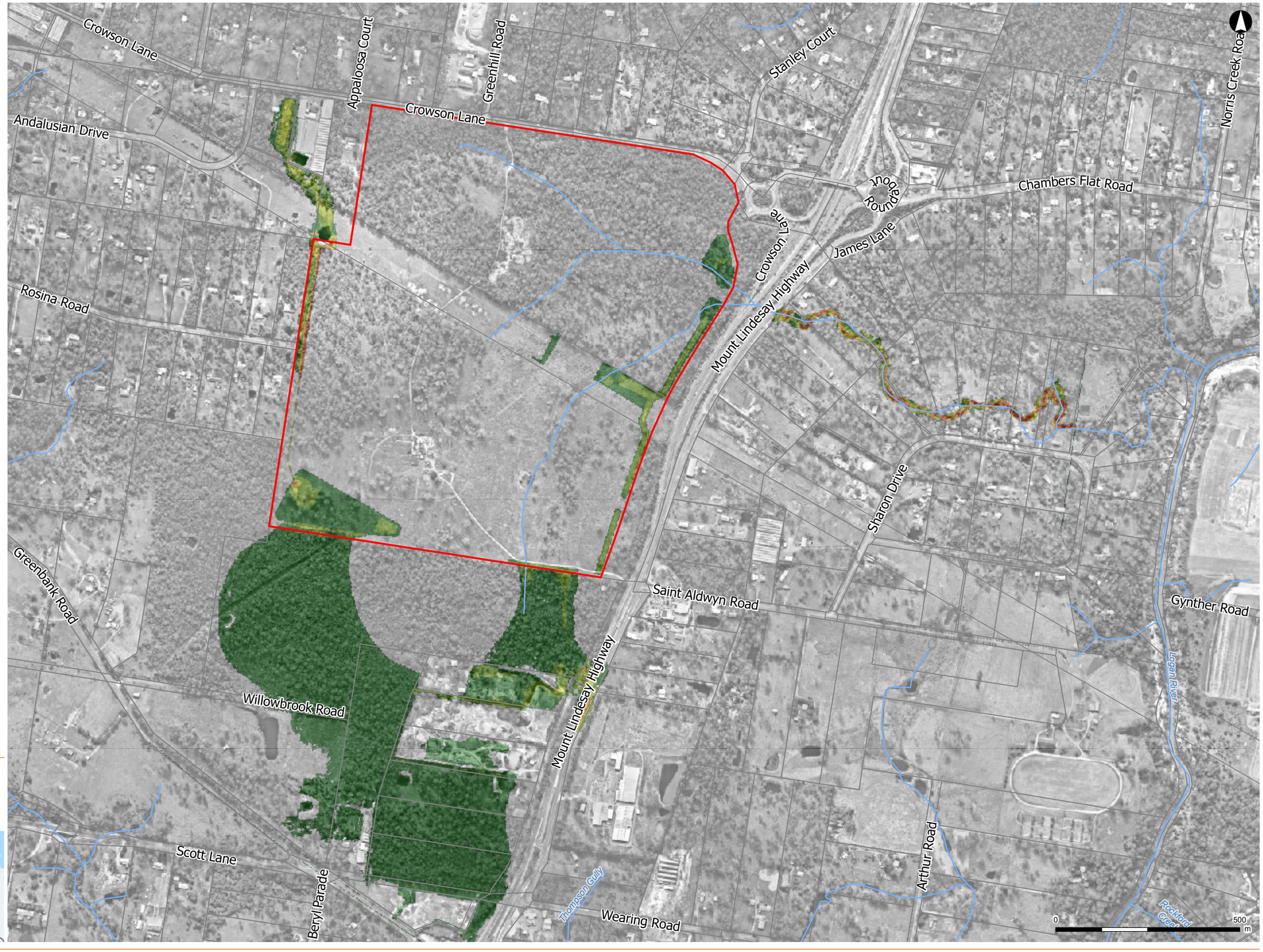
1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

Figure D-11 - Flow Velocity - Design Case - 2% AEP

Legend

Flow velocity (m/s)
- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

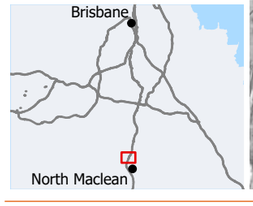
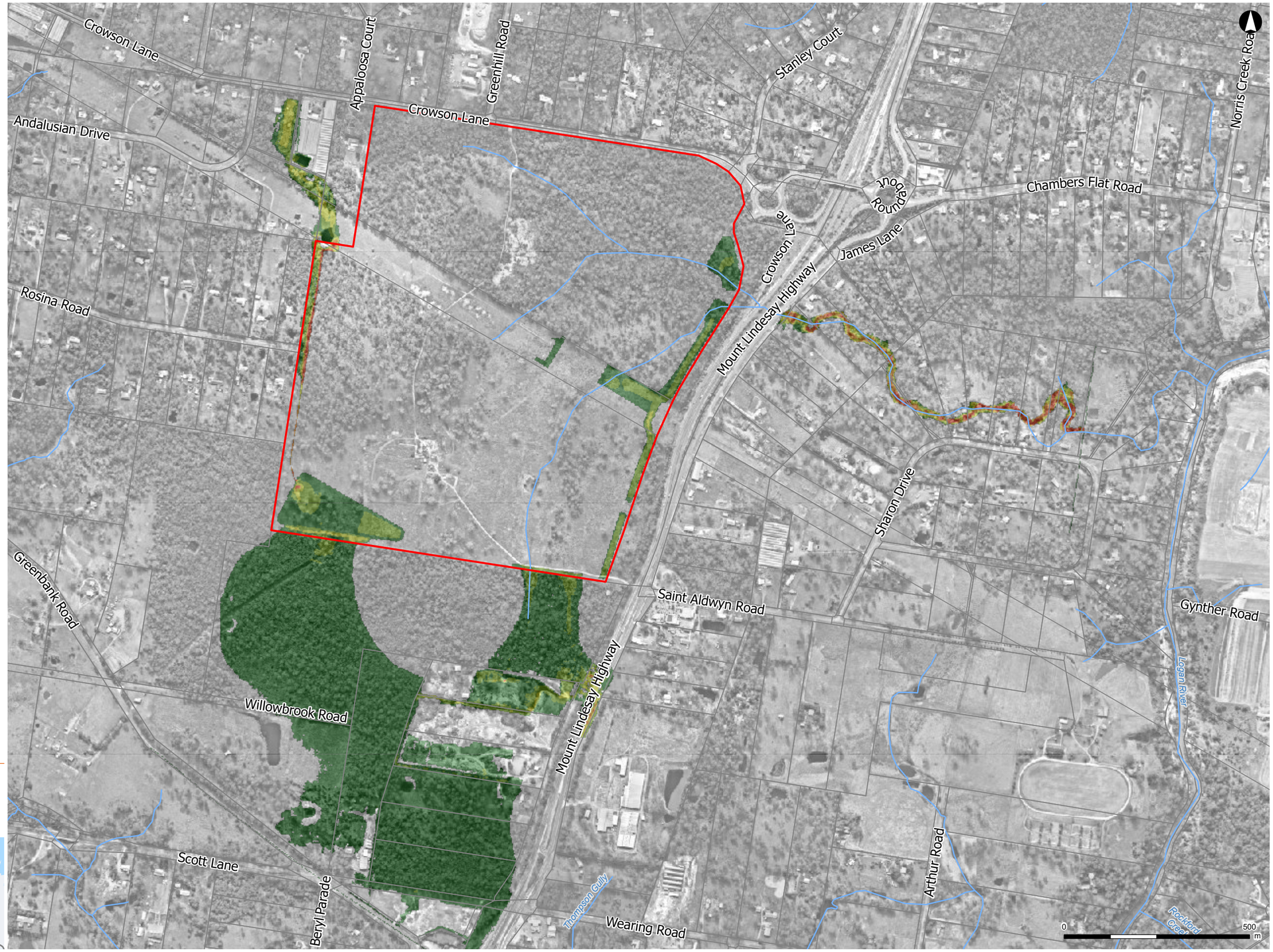


Figure D-12 - Flow Velocity - Design Case - 1% AEP

Legend

Flow velocity (m/s)

- 0 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.2
- 1.2 - 1.5
- >1.5
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

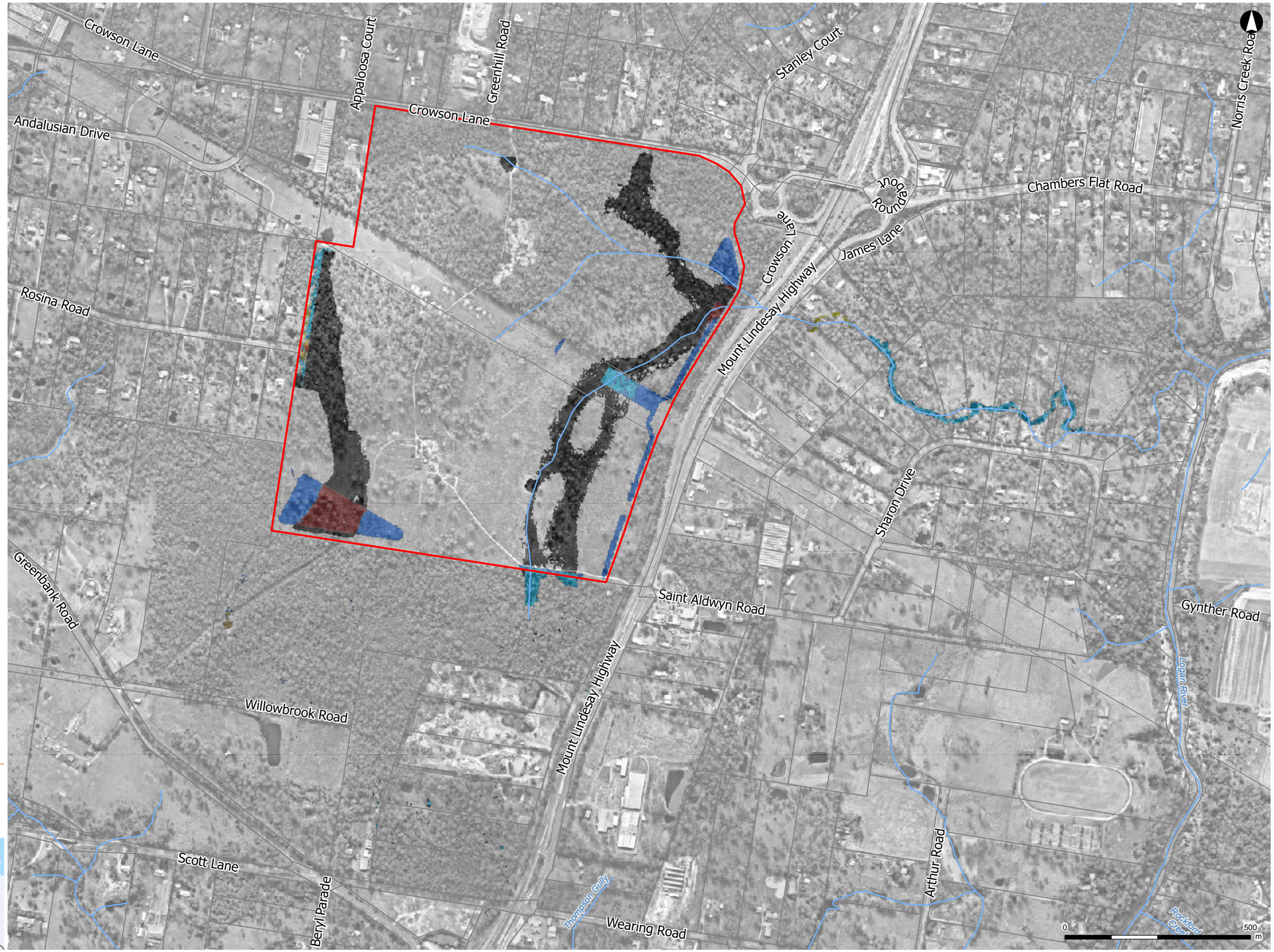


Figure D-13 - Flood Level Afflux - 50% AEP

Legend

Afflux (m)

- -0.91 - -0.01
- -0.01 - 0.01
- 0.011 - 0.02
- 0.021 - 0.05
- 0.051 - 0.1
- 0.1 - 0.2
- 0.2 - 0.62
- was wet, now dry
- was dry, now wet
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



Figure D-14 - Flood Level Afflux - 20% AEP

Legend

Afflux (m)

- -0.91 - -0.01
- -0.01 - 0.01
- 0.011 - 0.02
- 0.021 - 0.05
- 0.051 - 0.1
- 0.1 - 0.2
- 0.2 - 0.62
- was wet, now dry
- was dry, now wet
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



Figure D-15 - Flood Level Afflux - 10% AEP



Figure D-16 - Flood Level Afflux - 5% AEP



Figure D-17 - Flood Level Afflux - 2% AEP

Legend

Afflux (m)

- -0.91 - -0.01
- -0.01 - 0.01
- 0.011 - 0.02
- 0.021 - 0.05
- 0.051 - 0.1
- 0.1 - 0.2
- 0.2 - 0.62
- was wet, now dry
- was dry, now wet
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



Figure D-18 - Flood Level Afflux - 1% AEP

Legend

Afflux (m)

- -0.91 - -0.01
- -0.01 - 0.01
- 0.011 - 0.02
- 0.021 - 0.05
- 0.051 - 0.1
- 0.1 - 0.2
- 0.2 - 0.62
- was wet, now dry
- was dry, now wet
- Northern Boundary
- Cadastre
- Watercourse

Crowson Lane
Appaloosa Court
Greenhill Road
Stanley Court
Norris Creek Road
Andalusian Drive
Crowson Lane
Chambers Flat Road
Roundabout
Crowson Lane
James Lane
Mount Lindesay Highway
Rosina Road
Sharon Drive
Greenbank Road
Saint Aldwyn Road
Gynther Road
Willowbrook Road
Mount Lindesay Highway
Logan River
Scott Lane
Beryl Parade
Thompson Gully
Wearing Road
Arthur Road
Rockford Creek

0 500 m

1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

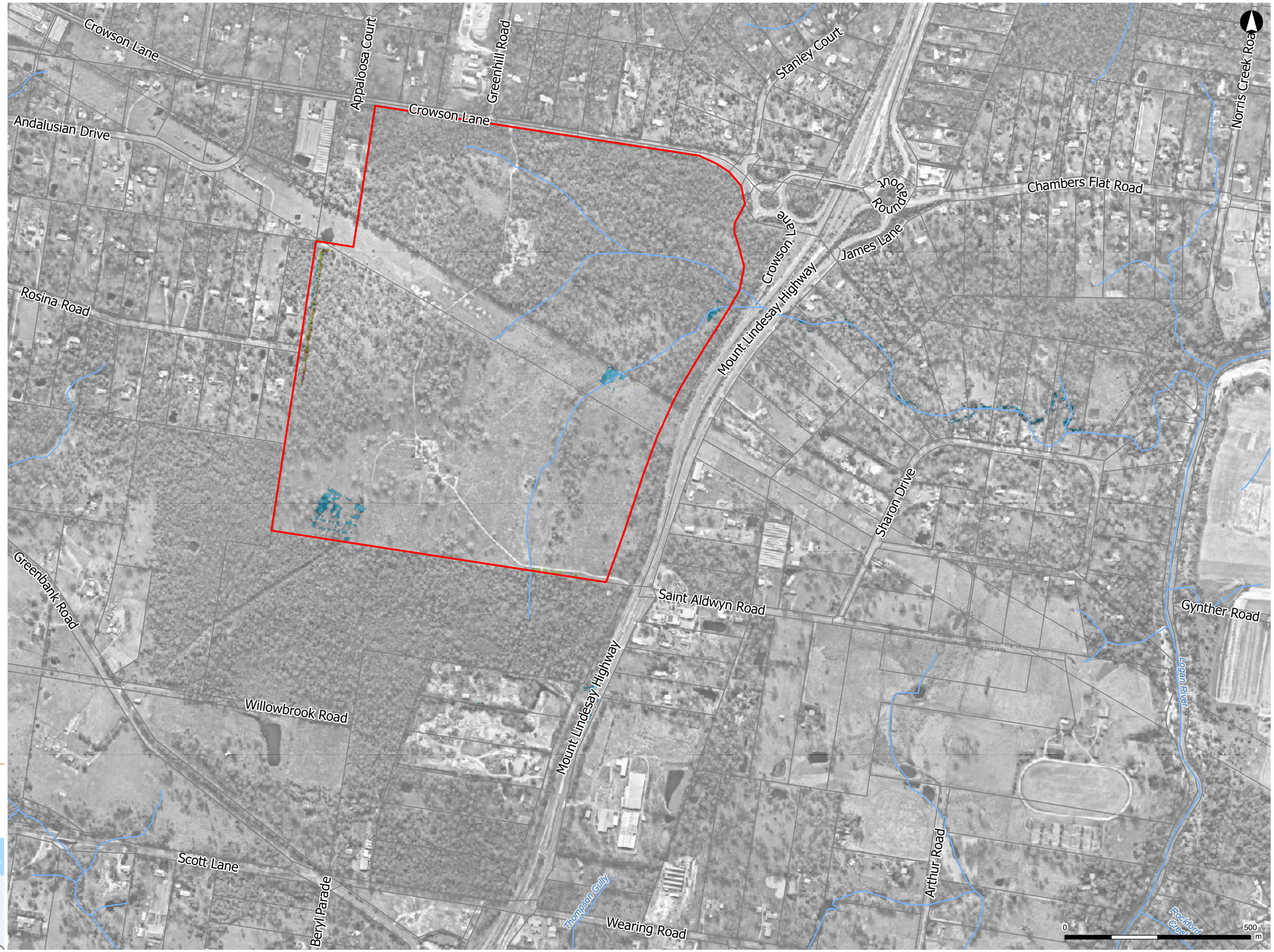


Figure D-19 - Velocity Change - 50% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

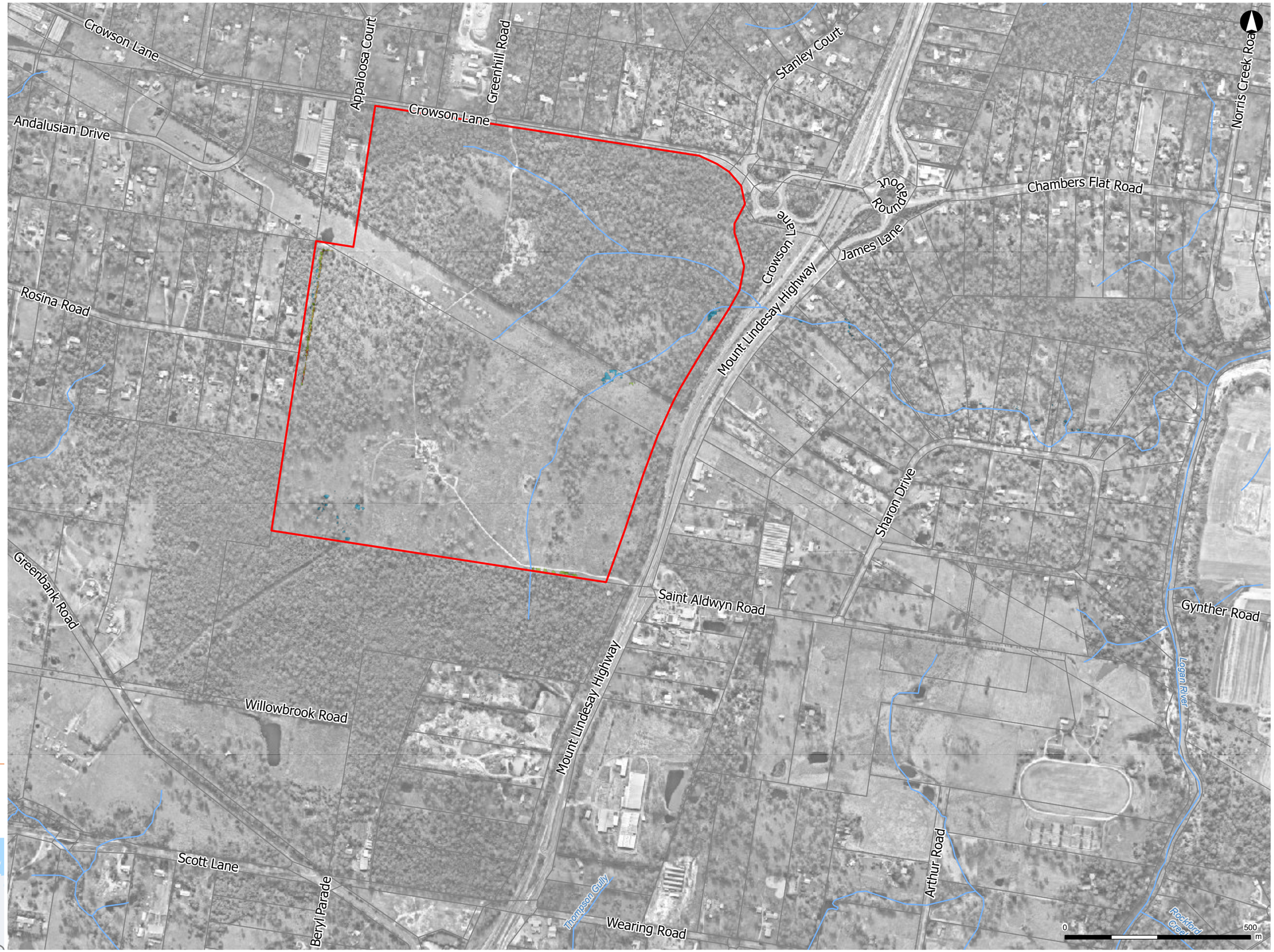


Figure D-20 - Velocity Change - 20% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

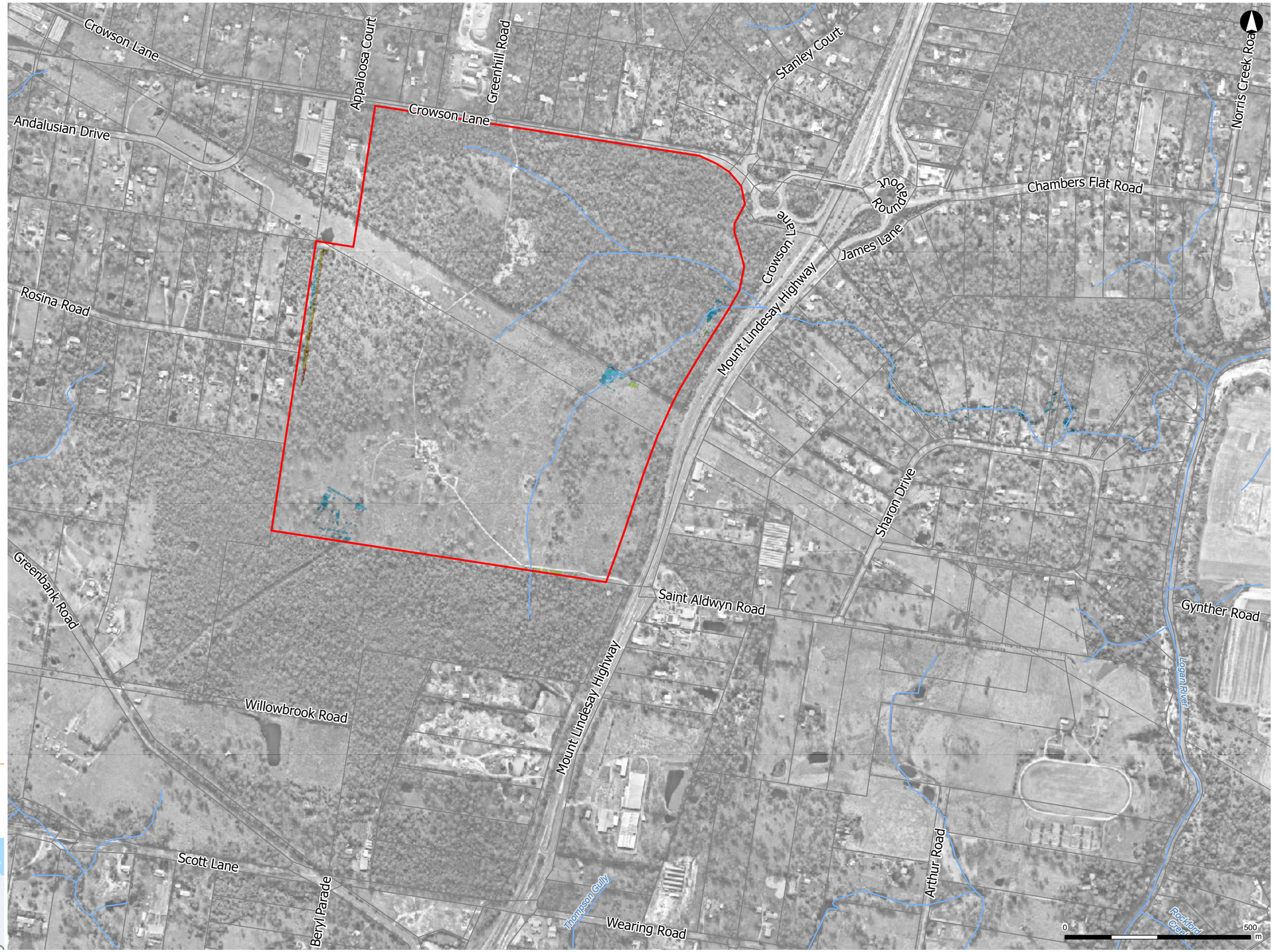


Figure D-21 - Velocity Change - 10% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

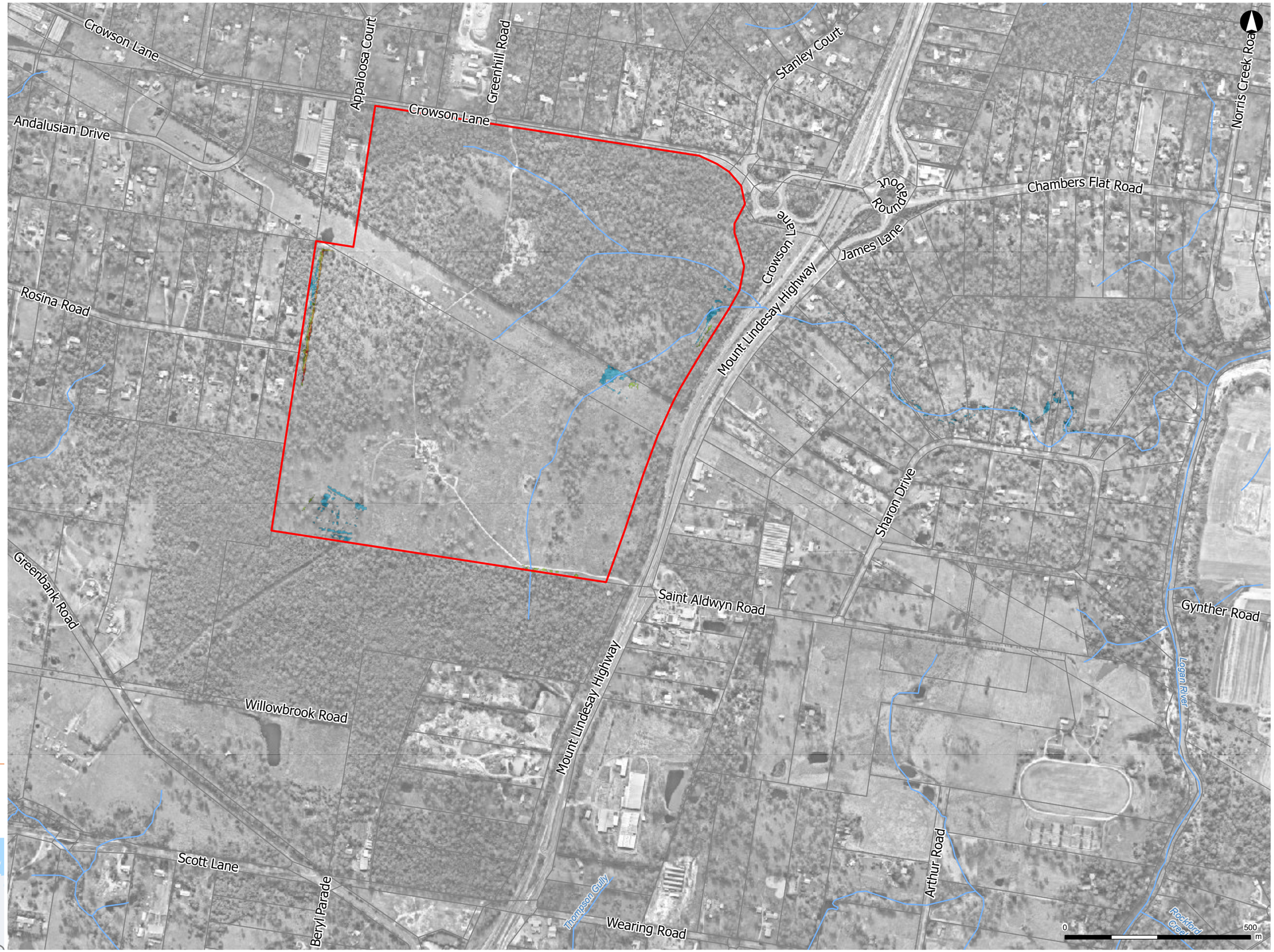


Figure D-22 - Velocity Change - 5% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

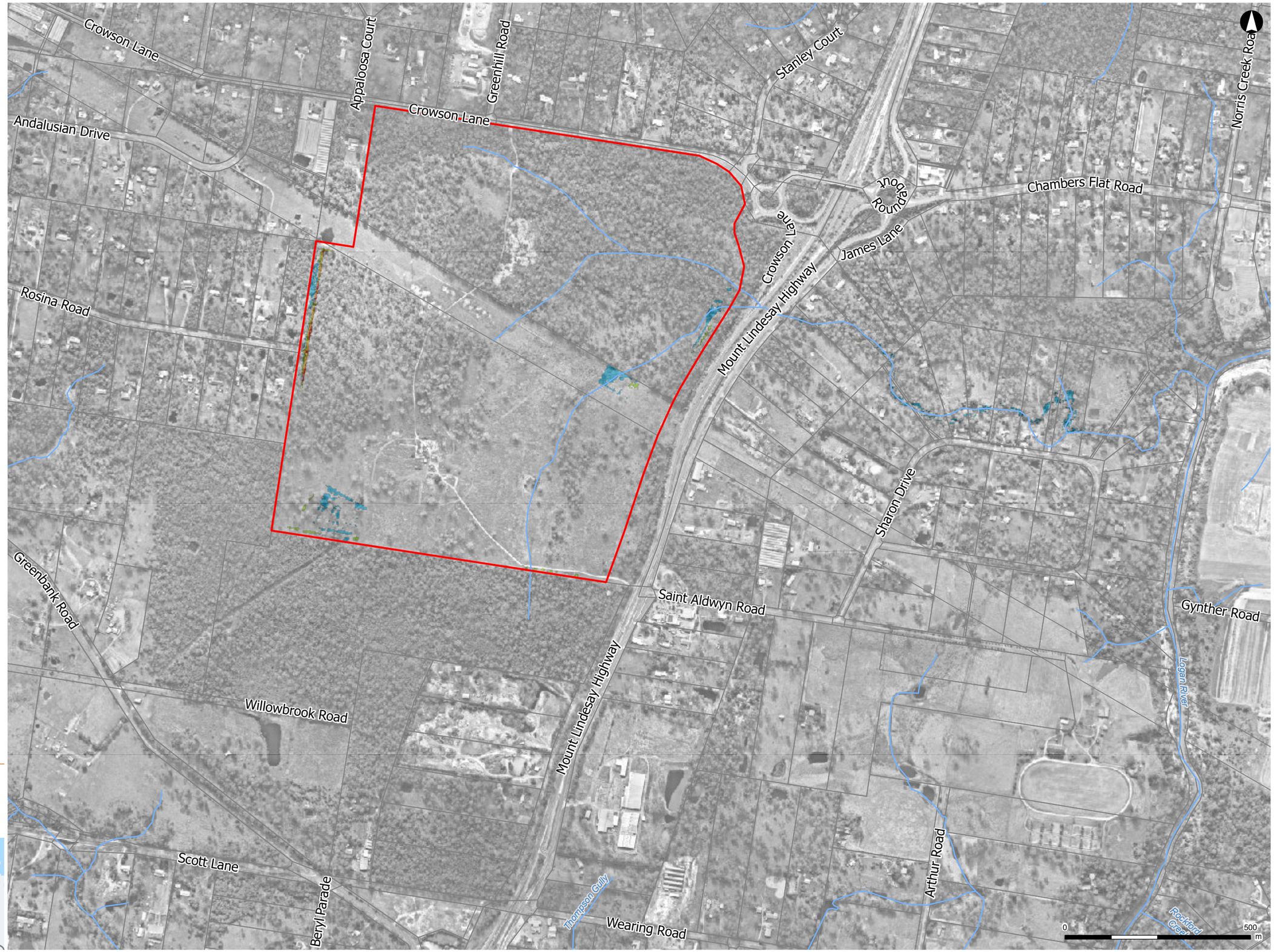


Figure D-23 - Velocity Change - 2% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS

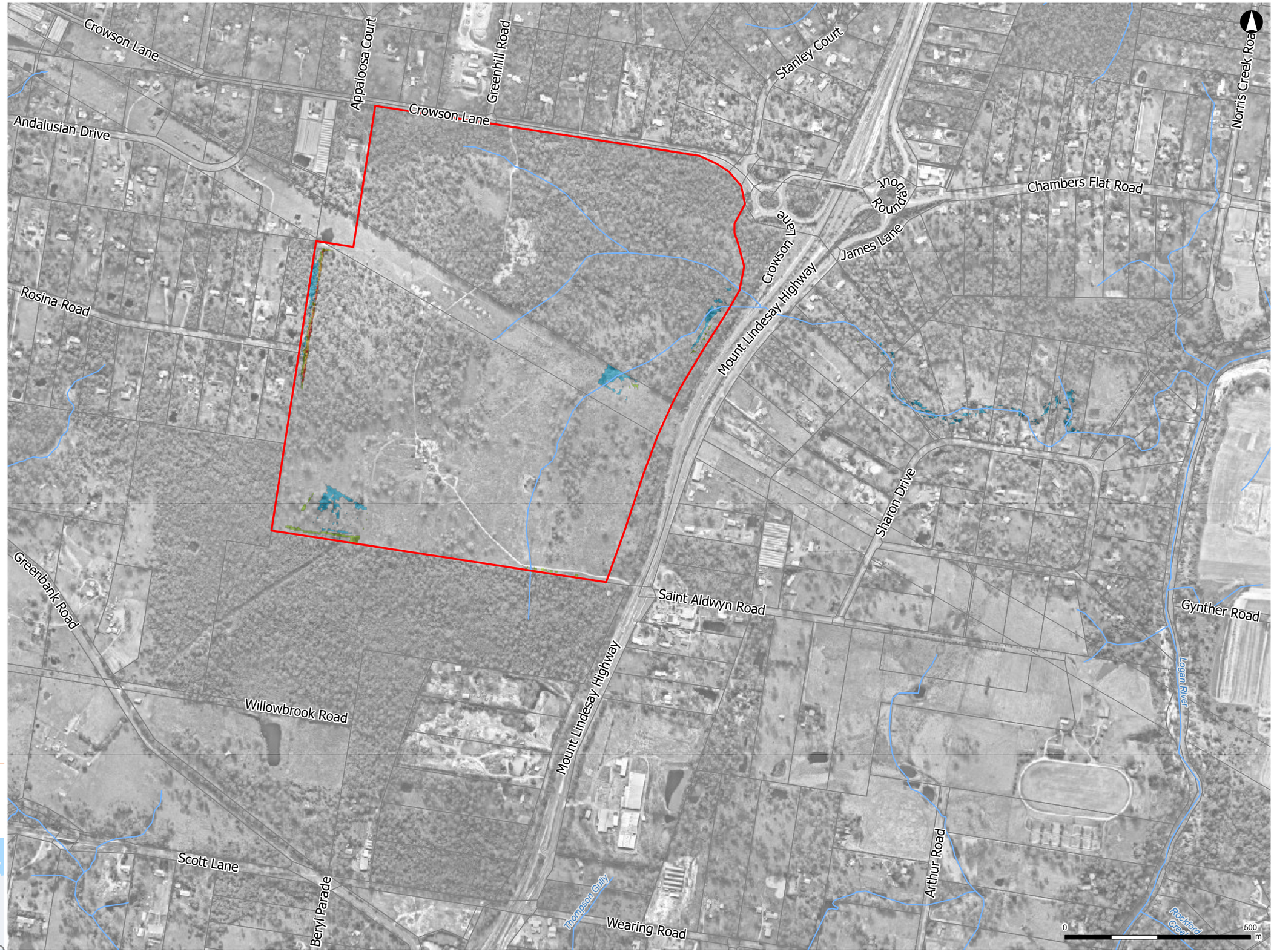


Figure D-24 - Velocity Change - 1% AEP

Legend

Velocity Change (m/s)

- -0.91 - -0.21
- -0.21 - 0.2
- 0.21 - 0.5
- 0.51 - 1
- 1.1 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



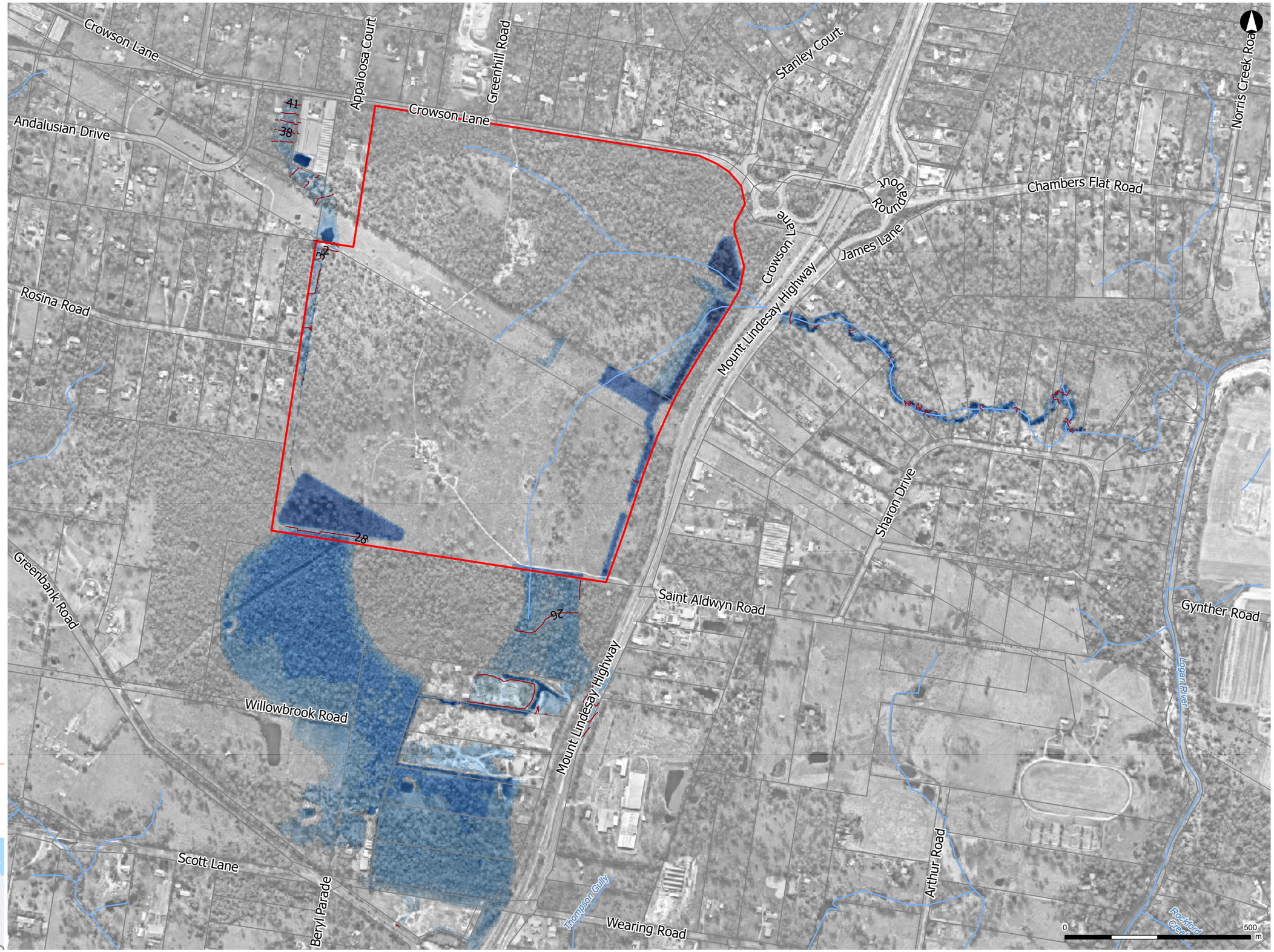
Figure S-1 - Flood Depths - Sensitivity BLK 20% - 1% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



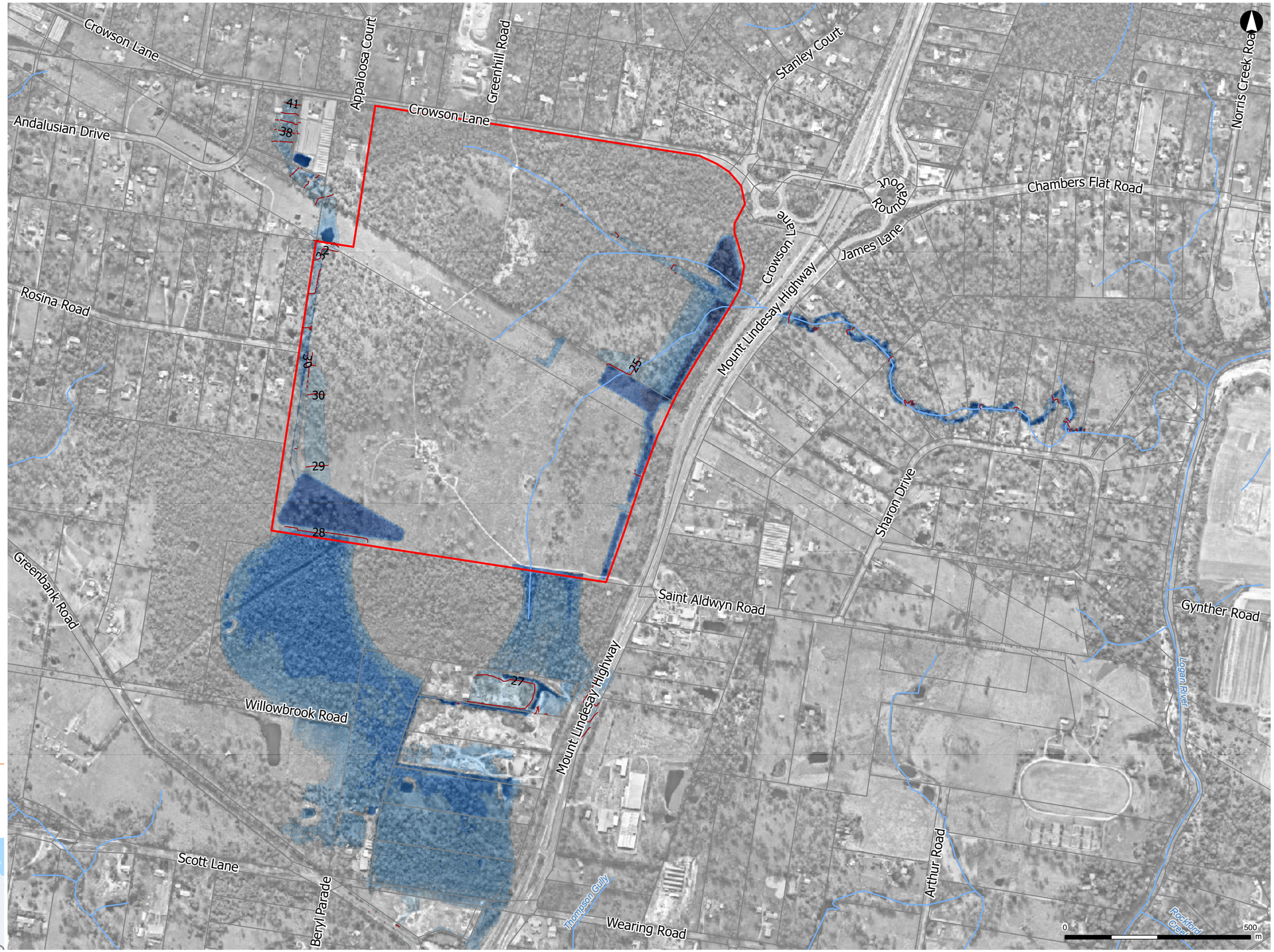
Figure S-2 - Flood Depths - Sensitivity BLK 50%- 1% AEP

Legend

- Flood level contour (mAHD)

Flood depth (m)

- <=0.05
- 0.05 - 0.2
- 0.2 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- >2
- Northern Boundary
- Cadastre
- Watercourse



1:10,000 at A3
Coordinate System: GDA 1994 MGA Zone 56
Date issued: June 14, 2024
Imagery:

ARCADIS



APPENDIX E

MEMO

ARCADIS Design & Consultancy for natural and built assets

Date	17/06/2024
To	Gary Ellis – Technical Director
From	Thea Fanning – Civil Engineer / Darlan Castro – Associate Technical Director
Copy to	
Subject	North Maclean – Stormwater Drainage Infrastructure (structures/conduits) Safety Audit

INTRODUCTION

This Technical Memo assesses the proposed stormwater overland conveyance and attenuation drainage infrastructure, specifically associated structures (hydraulic hazards) proposed as part of the Flagstone Industrial Subdivision at North Maclean and provides recommendations on any safety mitigation measures for the proposed stormwater drainage network structures.

This assessment excludes other stormwater drainage structures associated with road system design and minor and major flows which are to be designed in accordance with QUDM with road gully pit inlets to include standard pin-lock inlet grates to deter entry or interference.

This analysis has been prepared in accordance with the Queensland Urban Drainage Manual (QUDM) section 12. The table below provides the Contact Classification as per QUDM Table 12.3.1 for the stormwater conveyance system as presented in Appendix A – Channel Sketch Plan.

Table 1 – Contact Classification for Stormwater Drainage Infrastructure

Stormwater Drainage Infrastructure	Contact Classification
Northern combined bioretention and detention basin - Outlets	Class C1
Southern detention basin - Outlets	Class C2
Western diversion channel - Box culvert	Class C1
Eastern conveyance channel – outlet Structure	Class C1
Eastern Channel – Road 02 Culvert	Class C1
Service Road Outlet/Existing Highway culvert Inlet	Class D

QUDM Table 12.3.1 defines Class C1 as follows:

More than 100 metres from a school, park, childcare centre, or existing or future urban residential area. Access to the inlet or upstream channel is unrestricted and/or there is reasonable risk of a person being swept towards the inlet during a storm or flood.

QUDM Table 12.3.1 defines Class C2 as follows:

As above except access to potentially dangerous waters or inlets is unlikely and/or severely restricted.

QUDM Table 12.3.1 defines Class D as follows:

> *Within an area surrounded by heavily trafficked arterial roads, childproof fencing, or is otherwise considered inaccessible (legally or illegally) to the general public.*

Arcadis considers the classifications listed in Table 1, above, are appropriate given the proposed development land use is industrial, the Mount Lindesay Highway forms the eastern site boundary and the remaining adjacent land is either heavily vegetated buffer/bio-diversity corridor or comprises a low density rural residential land use. Class C2 has been applied to the southern detention basin given the remote location adjoining the bio-diversity corridor.

Table 2, below, assesses each of the stormwater drainage elements against the assessment criteria recommended by QUDM Table 12.3.2.

Table 2 – Stormwater Drainage Infrastructure Risk Ranking

Stormwater Drainage Infrastructure	Potential Safety Risk (QUDM Table 12.3.2)					Cumulative Consequence Score
	Conduit Flowing Full	Length	Velocity (m/s)	Flow Conditions Within a Conduit	Flow Conditions at the Outlet of a Conduit	
Northern basin – outlets (single inlet structure)						
0.3m RCP (x2)	High (6)	Medium (3)	2.62	High (6)	High (6)	21
0.9m x 0.45m RCBC	High (6)	Medium (3)	3.94	High (6)	High (6)	21
Southern detention basin – Multiple outlets						
0.9m RCP (x2)	High (6)	Low (1)	2.80	High (6)	Low (1)	14
0.9m RCP (800mm orifice plate in front)						
Western Swale - Box culvert (2.4m x 1.2m RCBC)	Medium (3)	High (6)	3.26	High (6)	Low (1)	16
Eastern conveyance channel (outlet structure)						
1.7m x 0.9m opening, at 1.35 m above channel invert	Low (1)	Medium (3)	3.85	High (6)	High (6)	16
900mm diameter Orifice at invert level	High (6)	Medium (3)	4.39	High (6)	High (6)	21
Eastern Channel – Road 02 Culvert						
2.1m x 1.2m RCBC (x2)	Low (1)	Medium (3)	1.5	High (6)	Low (1)	11
Service Road Outlet/Existing Highway culvert Inlet	Low (1)	High (6)		Medium (3)	Low (1)	11

The Risk Ranking Matrix included in Table 12.3.6 of QUDM has been replicated in Table 3.

Table 3 – Risk Ranking Matrix

Contact Class	Cumulative Consequence Score				
	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24
	Risk Ranking				
A1	13	7	4	2	1
A2, B1	16	12	8	5	3
B2, C1	18	14	11	9	6
C2, D	20	19	17	15	10

The below table provides a summary of each stormwater drainage element, the risk ranking and mitigation case, in conjunction with the proposed risk mitigation measure(s). The mitigation case was determined from QUDM Table 12.3.7.

Notably, a ranking of “1” represents the highest risk. A ranking of ‘20’ represents the lowest risk.

Table 4 – Cumulative Consequence Score

Stormwater Drainage Infrastructure	Contact Classification	Cumulative Consequence Score	Risk Ranking	Mitigation Option Case	Proposed Risk Mitigation Measure(s)
Northern basin – outlets (single inlet structure)	C1	21	6	Case 4	Liberal placement of Warning signs to be erected around perimeter of basin with water depth measuring stick. Single inlet screen applied to upstream end of stormwater inlets with openings exceeding 300mm diameter. Detailed design to maintain maximum 1200mm depth for 5% AEP design storm event. Basin batters which are steeper than 1 in 6 are to include high density plantings to assist individual egressing basin (note wet turf can be slippery under foot where steeper than 1 in 6). No batter slope to exceed 1 in 4.
Southern detention basin – outlets 0.9m RCP (x2) 0.9m RCP (800mm orifice plate in front)	C2	14	17	Case 7	Liberal placement of Warning signs to be erected along with water depth measuring stick. Basin batters and floor to include high density plantings to discourage person/child wishing to enter during storm events. Plantings / trees provide assistance for egress on batter slopes. Provide property boundary fence for adjoining development lots to discourage a person/child wishing to enter swale area during storm events. Detailed design to maintain maximum 1200mm depth for 5% AEP design storm event with maximum 1 in 4 batters.

Stormwater Drainage Infrastructure	Contact Classification	Cumulative Consequence Score	Risk Ranking	Mitigation Option Case	Proposed Risk Mitigation Measure(s)
Box culverts beneath western diversion swale (2.4m x 1.2m RCBC)	C1	16	9	Case 4	Inlet screen applied to upstream end of culvert designed in accordance with QUDM. Additionally, provision of fauna exclusion fencing (and acoustic barrier) which interfaces with development lots will discourage a person/child wishing to enter swale area during storm events from the development area.
Eastern conveyance channel (outlet structure) 1.7m x 0.9m opening, at 1.35 m above channel invert 900mm diameter Orifice at invert level	C1	16 21	9 6	Case 4 Case 4	Inlet screens applied to upstream end of stormwater inlets with openings exceeding 300mm diameter. Designed in accordance with QUDM. Provide liberal warning signage along channel. Maximum batter slope (conveyance) to be 1 in 4. Tree planting to be provided to provide egress assistance.
Eastern Channel – Road 02 Culvert 2.1m x 1.2m RCBC (x2)	C1	11	11	Case 4	Inlet screen applied to upstream end of culvert configuration, designed in accordance with QUDM. Provide barrier fencing to culvert headwall (DS and US) and associated batter (fall hazard and discourage access to slip risk batter). Provide high density plantings to these batters – outside conveyance areas.
Service Road Outlet/Existing Highway culvert Inlet	D	11	17	Case 7	In conjunction with existing fauna exclusion fencing located along highway, provide exclusion fence to new headwall and immediate surrounds. In conjunction provide high density planting for disturbed areas (including batter) to screen and discourage person/child wishing to enter during storm events.

MEMO

ARCADIS Design & Consultancy for natural and built assets

This Stormwater Drainage Safety Audit has provided a risk assessment of the stormwater conveyance drainage elements (Structures/Conduits) and proposed mitigation measures to be implemented for the detailed design of the Industrial Subdivision proposed to be constructed at 4499 – 4651 Mount Lindesay Highway, North Maclean.

Kind regards,



Darlan Castro

Associate Technical Director

I concur with this assessment and recommended mitigation measures.



Gary Ellis

Technical Director - RPEQ

APPENDIX A

Channel Sketch Plan

FUTURE STORMWATER PIPE TO BE CONSTRUCTED:
2 NO. 0.9m x 0.45 RCBC
USIL = 23.400
DSIL = 22.500
LENGTH = 60.0m
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

FUTURE STORMWATER PIPE TO BE CONSTRUCTED:
2 NO. 300mm DIA PIPE CLASS 4
USIL = 22.540
DSIL = 21.550
LENGTH = 60.0m
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

PROPOSED OUTLET STRUCTURE: Ø900mm ORIFICE AT RL21.55 AND 1700mm (W) x 900mm (H) ORIFICE AT RL22.90
1 NO. 2100mm X 1200mm RCBC:
USIL = 21.55
DSIL = 21.00
LENGTH = 40.0m
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING FOR EACH SCREEN SHALL BE LESS THAN 125mm).

1 NO. 1050mm DIA PIPE CLASS 4
USIL = 28.00
DSIL = 27.55
LENGTH = 70m

2 NO. 750mm DIA PIPE CLASS 4
USIL = 27.52
DSIL = 27.46
LENGTH = 5m

1 NO. 3.6 x 1.2 RCBC
USIL = 27.56
DSIL = 26.6
LENGTH = 280m

DETENTION BASIN TO BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SITE BASED STORMWATER MANAGEMENT PLAN (SOUTHERN CATCHMENT) REF. 11-0001-30101970 (DAWE REF. EPBC 2013/6941)

BASIN
RL=26.607

3 NO. 900mm DIA PIPES CLASS 4 (SINGLE 800mm ORIFICE ON SINGLE PIPE)
USIL = 26.607
DSIL = 26.48
LENGTH = 14.3m

WEIR WIDTH = 64m AT RL28.0m AHD

INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
INLET SCREENS TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLETS IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACINGS FOR EACH SCREEN SHALL BE LESS THAN 125mm).

2 NO. 2.1m x 1.2m RCBC,
USIL = 24.50
DSIL = 24.25
LENGTH = 56.5m.
INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING SHALL BE LESS THAN 125mm).

2 NO. 2.1m x 0.9m RCBC
USIL = 23.64
DSIL = 23.62
LENGTH = 43.0m

INLET AND OUTLET PRECAST HEADWALLS (INCLUDING WINGWALLS AND APRON) TO BE IN ACCORDANCE WITH TMR STANDARD DRAWING 1243.
RCBC CAST IN SITU BASE SLAB IN ACCORDANCE WITH TMR STANDARD DRAWING 1250.
INLET SCREEN TO BE INSTALLED ON UPSTREAM END OF PIPE OUTLET IN ACCORDANCE WITH QUDM CLAUSE 12.5.5 (BAR SPACING SHALL BE LESS THAN 125mm).

FUTURE INTERNAL ROAD DRAINAGE CONNECTION TO EXISTING HIGHWAY CULVERTS. DETAILS TO BE INCLUDED IN SERVICE ROAD DESIGN PACKAGE WHICH IS SUBJECT TO DTMR APPROVAL

FUTURE EXTENSION OF EXISTING HIGHWAY CULVERTS. DETAILS TO BE INCLUDED IN SERVICE ROAD DESIGN PACKAGE WHICH IS SUBJECT TO DTMR APPROVAL

BASIN
RL=22.539

LEGEND

- EXISTING SURFACE CONTOURS
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- PROPOSED STORMWATER DRAINAGE
- PROPOSED STORMWATER HEADWALL
- EXISTING STORMWATER DRAINAGE
- EXISTING WATER RETICULATION
- EXISTING COMMUNICATIONS
- EXISTING OVERHEAD ELECTRICAL
- EXISTING UNDERGROUND ELECTRICAL
- POWERLINK EASEMENT
- EXISTING FENCE
- TOP OF BANK
- TOE OF BANK
- FAUNA EXCLUSION FENCE
- PROPOSED SLEEPER RETAINING WALL
- PROPOSED BLOCKWORK RETAINING WALL
- PROPOSED A-GRADE SANDSTONE BOULDER RETAINING WALL

OSINA RD

MT LINDESAY HWY

15 RP173739
16 RP173739
17 RP173739
18 SP180530
19 SP180530
54 SP180530
59 SP180530
23 RP123247
24 RP123247
25 RP123247
Emt A RP121667

Issue	Description	DR	CH	VE	Date
06	DESIGN UPDATES	G.P.	G.P.	G.E.	12.06.24
05	WEIR WIDTH ADDED	A.O.	T.F.	B.K.	06.07.23
04	DESIGN UPDATES	A.O.	T.F.	G.E.	20.06.23
03	DESIGN UPDATES	A.O.	E.P.	G.E.	21.02.23
02	DESIGN UPDATES	J.G.	E.P.	G.E.	08.02.23
01	ORIGINAL ISSUE	J.G.	E.P.	G.E.	24.10.22

Scales
0 50 100 150 200m
1 : 2000

Surveyor: WOLTER consulting group — Planning, Urban Design, Landscape, Environment, Surveying
Architect: -
Client: Charter Hall

Status: CONCEPTUAL DESIGN ONLY
NOT TO BE USED FOR CONSTRUCTION
© Copyright reserved

Original Issue Signatures			
Drawn	A.OSORIO	Original Size	A1
Designed	S.SEM	Height Datum	AHD
Project Manager	T.FANNING	Grid	LOCAL
Verified	G. ELLIS		

Project: 4499-4651 MOUNT LINDESAY HIGHWAY, NORTH MACLEAN

Title: CHANNEL SKETCH PLAN

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 35, 111 Eagle Street
BRISBANE QLD 4000
ABN 76 104 485 289
Tel No: +61 7 3337 0000
www.arcadis.com/au

Project No.	Folder Prefix	Zone	Stage	Phase	Discipline	Type	Drawing No.	Issue
30109334	AAP	WS00	OP	CV	SKT	011	06	

100mm on Original

Date Plotted: 14 Jun 2024 - 04:39PM File Name: C:\Users\gp1177986\DC\ACCDocs\Arcadis\AAU-30109334-4499-4651 Mount Lindesay Highway\Project Files\01_WIP\01_Package-00_Civil_CV\Drawings\30109334-AAP-WS00OP-CV-SKT-011-ChannelSketch.dwg V1