Water Cycle Management Study
Proposed Rural Residential Subdivision
No.80 Silverdale Road, The Oaks
23130 – April 2024

siteplus

engineering . flooding . landscape . design . management

WATER CYCLE MANAGEMENT STUDY

80 SILVERDALE ROAD, THE OAKS

PREPARED FOR

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Document Tracking

Document Status		Report					
File Location		T:\Projects\23130 80 Silverdale Road, The Oaks\Water Cycle Management Study\23130_Water Cycle Management Study.doc					
Project No.		23130			Date	April 2024	
Rev No	Issue	Author			Approved		
		Name	Signature	Date	Name	Signature	Date
1	Draft	A.Craddock		March 2024	A.Craddock		March 2024
2	DA Issue	I. Bennett		March 2024	A Craddock		March 2024
3	DA Issue	I. Bennett		April 2024	A Craddock		April 2024

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EXECUTIVE SUMMARY

On behalf of Mr and Mrs Nocera C/- Proficient Constructions (Aust) Pty Ltd a flood study has been prepared to accompany the rezoning for the rural residential subdivision at 80 Silverdale Road, The Oaks.

An XP Rafts Hydrological and TUFLOW 2D Hydraulic models were utilised to develop the flood study for the area surrounding the subject site. Model parameters were adopted based on the Draft Wollondilly Shire Flood Study by Advisian, to ensure an accurate and valid model of the Site.

The subject site is influenced by an overland flow path off Browns Road which bisects the site. An existing basin lies at the northern end of the development extents and is to remain. Road grading from Browns Road diverts the existing flow away from the proposed lots via a perimeter road which caters for the 1%AEP flows into the site.

All proposed lots are located outside the proposed 1% AEP flood extents plus 0.5m freeboard. All flood flows are located within the road reserve and outside of the carriage way.

The proposed development will not impact flooding in or surrounding the site as all dwellings and associated works are outside the flood extents. The existing detention basin is to remain and detain flow prior to discharge off the subject site.

Stormwater peak flows and stormwater quality from the proposed development have been considered. TUFLOW has been used for stormwater quantity assessment and the computer model MUSIC (Model for Urban Stormwater Improvement Conceptualisation) has been used for the stormwater quality assessment.

Stormwater peak flows will be controlled via the existing dam, which acts as onsite detention. The dam adequately attenuates post-development flows to pre-development levels.

A concept WSUD strategy for the site has been developed incorporating elements such rainwater tanks, infiltration swales and the existing dam acting as a sediment basin. The strategy has been designed and assessed to meet and comply with Council's Engineering Design Specifications and WSUD guidelines. The WSUD elements will reduce stormwater pollutant generation to the water quality targets specified by Council.

1 INTRODUCTION

1.1. Siteplus Engagement

Mr and Mrs Nocera C/- Proficient Constructions (Aust) requested a Water Cycle Management Study to support the proposed Rural Residential Subdivision at No.80 Silverdale Road, The Oaks.

1.2. Scope of Work

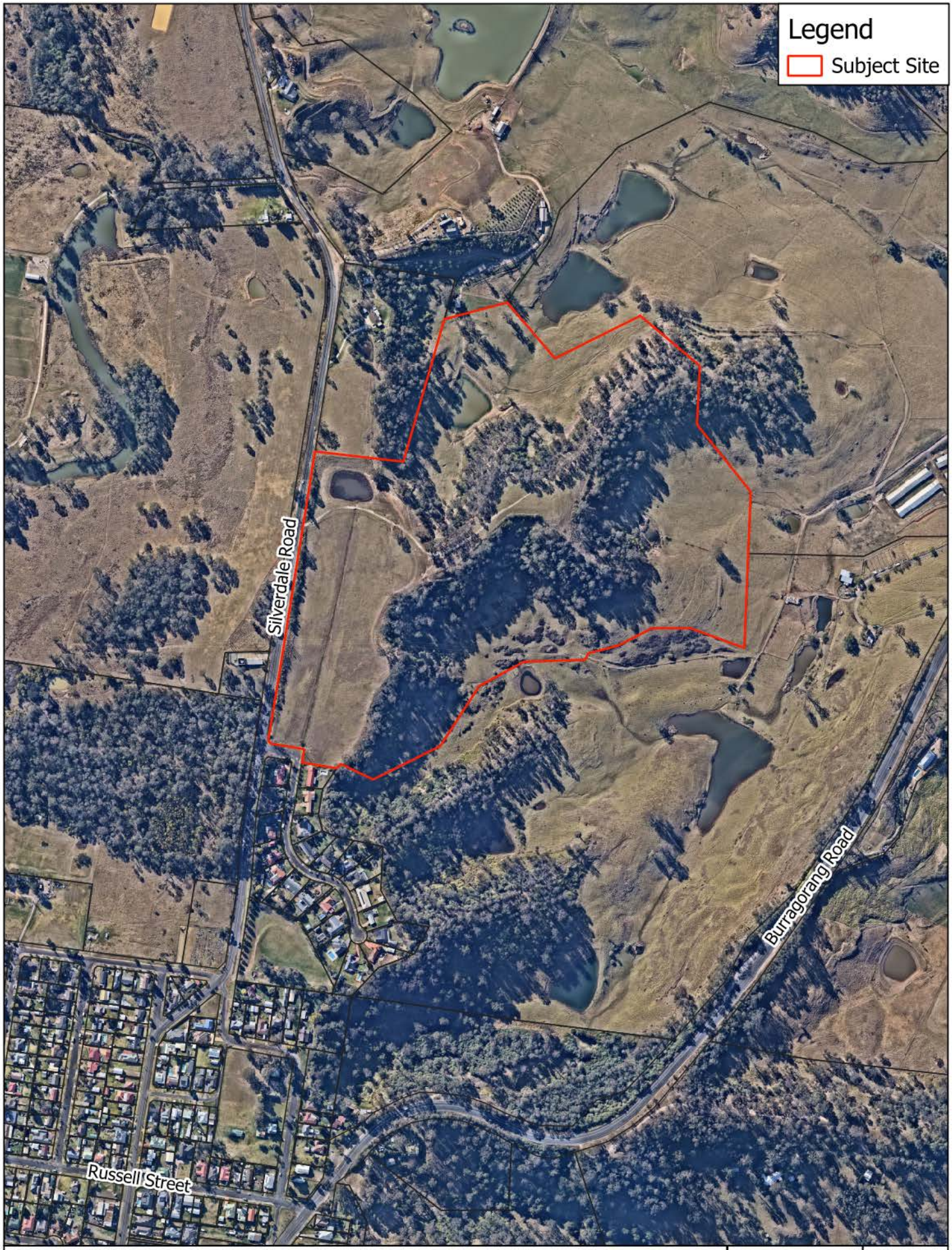
Siteplus determined the following investigations were required to complete a thorough flood study of the site:

- Construct a Hydrological model to determine the critical flow rate for the 1% AEP and PMF (Probable Maximum Flood) event.
- Develop a 2D TUFLOW model to calculate the 1% AEP and PMF flood extents, levels, velocities and hazards for the existing and proposed development scenarios.
- Evaluate the proposal in terms of Wollondilly Shire Council's Development Control Plan 2016 Volume 1 General – Part 8 Flooding;
- Examine existing site to determine how peak flows and mean annual pollutant loads will be controlled to meet Council standards;
- Provide Council with a drainage concept that complies with all relevant Council policies and requirements;
- Assess the proposed storm water quality devices to meet the environmental standards sought by Council;
- Provide maintenance guidelines and procedures to ensure the functional longevity of the stormwater quality system; and
- Prepare a Water Cycle Management Study which summarising the findings of the analysis.

1.3. Subject Land

The lot lies upslope to the north of Wattle Creek, a tributary of the Nepean River. The site is surrounded rural residential properties and the Nepean River Riparian Corridor to the east.

Figure 1-1 illustrates the location of the subject site.



Title:
Site Location - 80 Silverdale Road, The Oaks

Figure: **1.1**

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0 100 200 300 400 500 m

siteplus

2 DATA COLLECTION

2.1 Topographic Data

Topographic Data was collated and used for the study which includes:

- 2019, 1.0m DEM, ALS data provided by NSW Government Spatial Services.
- Detailed survey of the site and surround area. Appendix A.

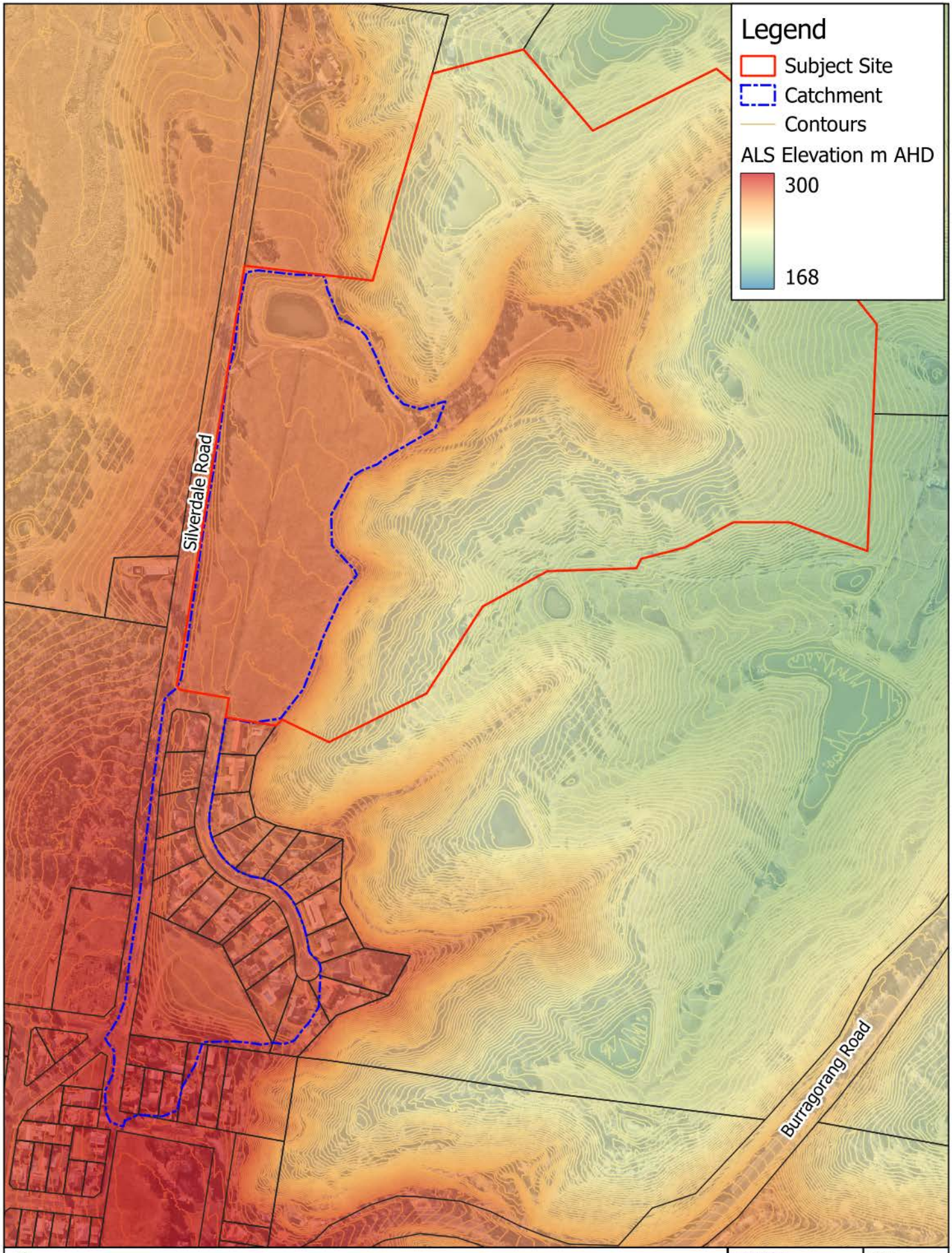
The above sources have been ground proven through onsite delineation.

2.2 DEM Development

The DEM data provided by the NSW Government Spatial Service was fed directly into the TUFLOW model and formed the existing topography. Modifications were made to the surface via the site survey to accurately model the existing land topography.

Figure 2-1 shows the ALS data used to define the catchment and sub catchments. The elevation ranges within the catchment from 200m AHD to 300m AHD.

Figure 4-5 illustrates the DEM used within the TUFLOW Model.



Title:
Catchment Digital Elevation Model

Figure: **2.1**

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0 100 200 300 400 500 m

siteplus

3 HYDROLOGICAL MODELLING

XP Rafts was chosen as the hydrological model for the subject study. XP RAFTS has been used in several council adopted flood studies and is considered appropriate for the catchment size and type.

Figure 3-1 and Figure 3-2 Illustrates the contributing sub catchments to the subject site. The sub catchments were defined by the catchment topography and hydraulic structures such as roads and existing overland flow paths.

3.1 Design Rainfall

Using ARR16 design rainfall parameters were ultilied for the model with a nearest grid cell latitude of 34.0625(S) and Longitude of 150.5625 (E).

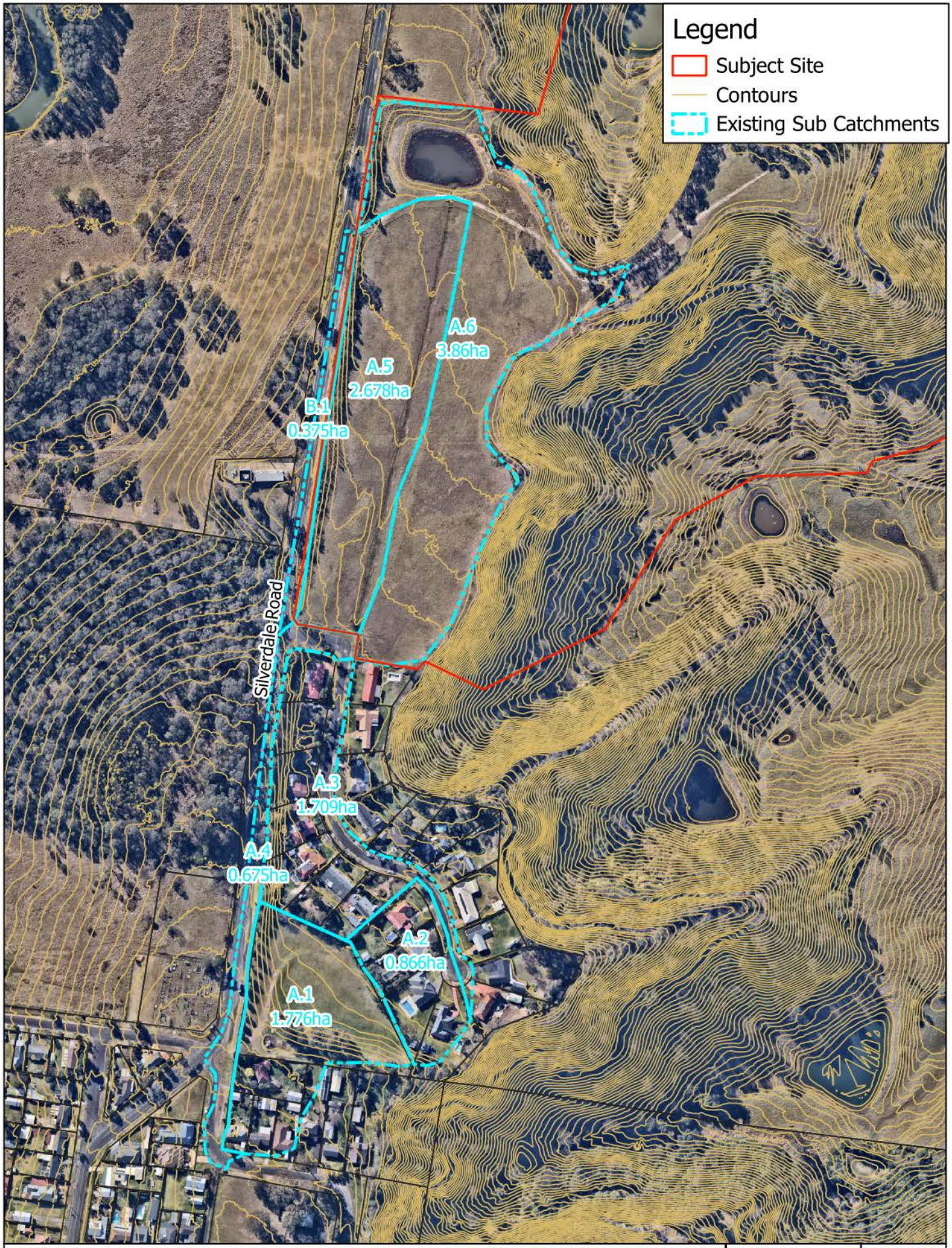
ARR16 East Coast rainfall patterns were produced and used within the model.

3.2 Design Rainfall Losses

Design Rainfall losses were applied to the XP Rafts model as per Table 3-1. These numbers are based on the draft Wollondilly Shire Flood Study by Advision in 2021.

Table 3-1 Design Rainfall Losses

Design Flood Event	Loss Parameter	Value (mm/hr)
1% AEP	Initial Loss (Pervious)	12.8
	Initial Loss (Impervious)	1.0
	Continuing Loss (Pervious)	1.56
	Continuing Loss (Impervious)	0.0
PMF	Initial Loss (Pervious)	0.0
	Initial Loss (Impervious)	1.0
	Continuing Loss (Pervious)	1.0
	Continuing Loss (Impervious)	0.0



Title:
Existing Sub Catchment Plan

Figure: **3.1**

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0 50 100 150 200 250 m

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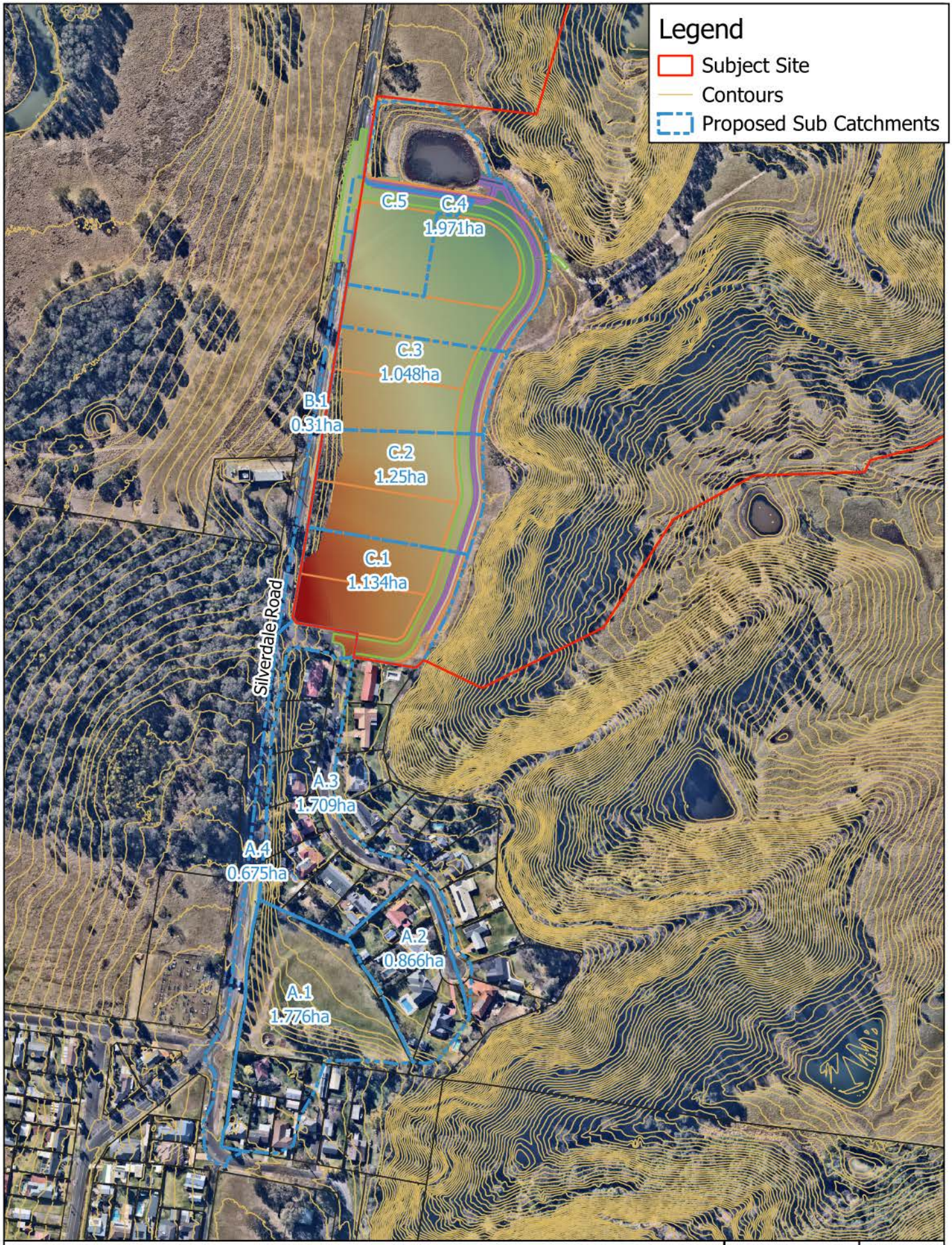

Title:
Proposed Sub Catchment Plan

Figure: **3.2**

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0 50 100 150 200 250 m

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3.3 Sub - Catchments

The subject catchment was divided into six (6) and ten (10) sub catchments in the existing and proposed scenarios.

In order to identify the catchment boundaries a 1.0m DEM was accessed via ASL 2019 data provided by the NSW Government Spatial Service.

The DEM was used to determine the sub-catchment boundaries and overland flow paths.

Table 3-2 Existing Sub-Catchment Summary

Sub Catchment	Area (Ha)	Impervious %	Vectored Slope %	Catchment Manning's 'n' Pervious	Catchment Manning's 'n' Impervious
A.1	1.776	35	6.47	0.05	0.015
A.2	0.866	70	3.90	0.05	0.015
A.3	1.709	70	4.72	0.05	0.015
A.4	0.675	70	3.77	0.05	0.015
A.5	2.678	0	2.44	0.05	0.015
A.6	3.86	0	1.85	0.05	0.015
B.1	0.375	70	2.07	0.05	0.015

Table 3-3 Proposed Sub-Catchment Summary

Sub Catchment	Area (Ha)	Impervious %	Vectored Slope %	Catchment Manning's 'n' Pervious	Catchment Manning's 'n' Impervious
A.1	1.776	35	6.47	0.05	0.015
A.2	0.866	70	3.90	0.05	0.015
A.3	1.709	70	4.72	0.05	0.015
A.4	0.675	70	3.77	0.05	0.015
C.1	1.134	40	1.08	0.05	0.015
C.2	1.25	40	4.55	0.05	0.015
C.3	1.048	40	4.27	0.05	0.015
C.4	1.97	40	2.75	0.05	0.015
C.5	0.624	40	2.40	0.05	0.015
B.1	0.375	70	2.07	0.05	0.015

3.4 Results of Hydrological Modelling

Numerous durations were modelled ranging from 10min to 4.5hrs for the 1% AEP event.

Based on ARR16 procedures the median storm from each sub catchment was selected and hydrograph exported into the TUFLOW Model. The results are summaries in Table 3-4 below.

The critical storm duration during the 1% AEP and PMF events were 10 minutes and 30 minutes, respectively.

Table 3-4 Existing Peak Flow Summary

SUB Catchment	XP RAFTS Peak 1% AEP Flowrate (m^3/s)	XP RAFTS Peak 1% AEP Climate Flowrate (m^3/s)	XP RAFTS Peak PMF Flowrate (m^3/s)
A.1	1.061	1.306	3.855
A.2	0.467	0.638	2.084
A.3	1.186	1.259	3.931
A.4	0.364	0.497	1.641
A.5	1.435	1.965	4.269
A.6	2.386	2.832	5.862
B.1	0.233	0.276	0.875

Table 3-5 Proposed Peak Flow Summary

SUB Catchment	XP RAFTS Peak 1% AEP Flowrate (m^3/s)	XP RAFTS Peak 1% AEP Climate Flowrate (m^3/s)	XP RAFTS Peak PMF Flowrate (m^3/s)
A.1	1.061	1.306	3.855
A.2	0.467	0.638	2.084
A.3	1.186	1.259	3.931
A.4	0.364	0.497	1.641
A.5	1.435	1.965	4.269
A.6	2.386	2.832	5.862
B.1	0.233	0.276	0.875
C.1	0.610	0.919	2.304
C.2	0.670	0.797	3.020
C.3	0.563	0.771	2.472
C.4	1.069	1.449	4.440
C.5	0.335	0.459	1.488

4 HYDRAULIC MODELLING

4.1 Modelling Technique

Siteplus, has adopted a 2D hydrodynamic numerical model as they are currently the most accurate, cost effective and efficient tools to predict flood behaviour.

For this Study TUFLOW was chosen for the modelling for the following reasons:

- Accurately representation of the overland flow paths.
- Produces high quality map outs.
- Is widely accepted by councils as the preferred 2D model.
- Utilised by the Wollondilly Shire Flood Study by Advision in 2021.

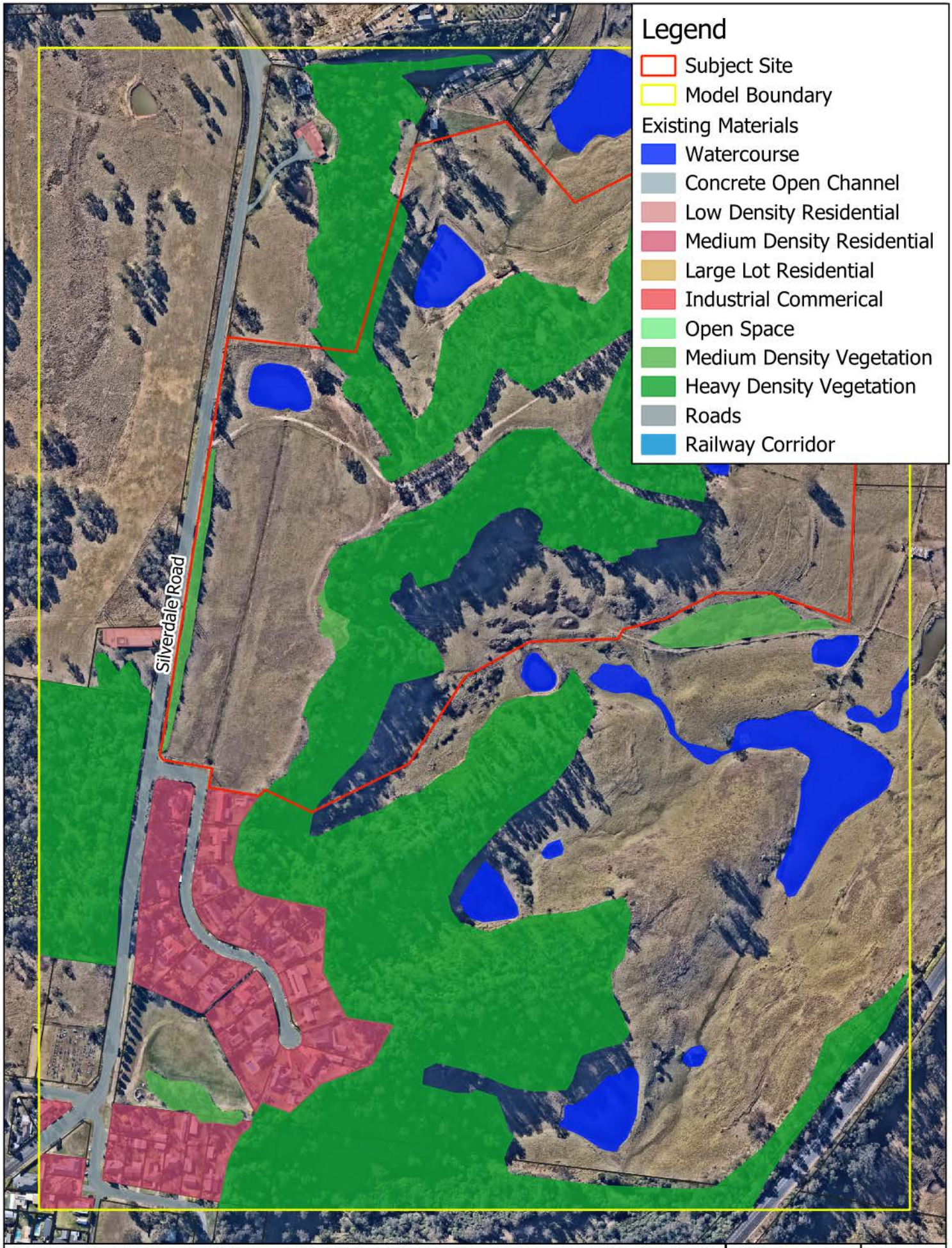
4.2 Hydraulic Roughness

Roughness coefficients represent the resistance to flood flows in channels and floodplains. The land use delineation for the model is based on aerial photography and a detailed site survey. The land use delineation used in the TUFLOW model is presented in Figures 4-1 and 4-2.

The adopted depth varied Manning's 'n' roughness coefficients for the land uses within the 2D hydraulic model extent are listed in Table 4-1.

Table 4-1 Land Use Table

Material	Depth 'y1'	Manning's 'n1'	Depth 'y2'	Manning's 'n2'
Watercourses	0.5	0.1	1.0	0.04
Medium Density Residential	0.15	0.2	0.3	0.1
Medium Density Vegetation	0.15	0.16	0.3	0.08
Road Corridor	0.1	0.16	0.2	0.08
Open Space	0.1	0.06	0.2	0.04
Rock Lined Channel	-	0.06	-	-
Unshaded areas of Figure 4-1 are modelled as Open Space.				



Title:
Existing Land Use Delineation

Figure: **4.1**

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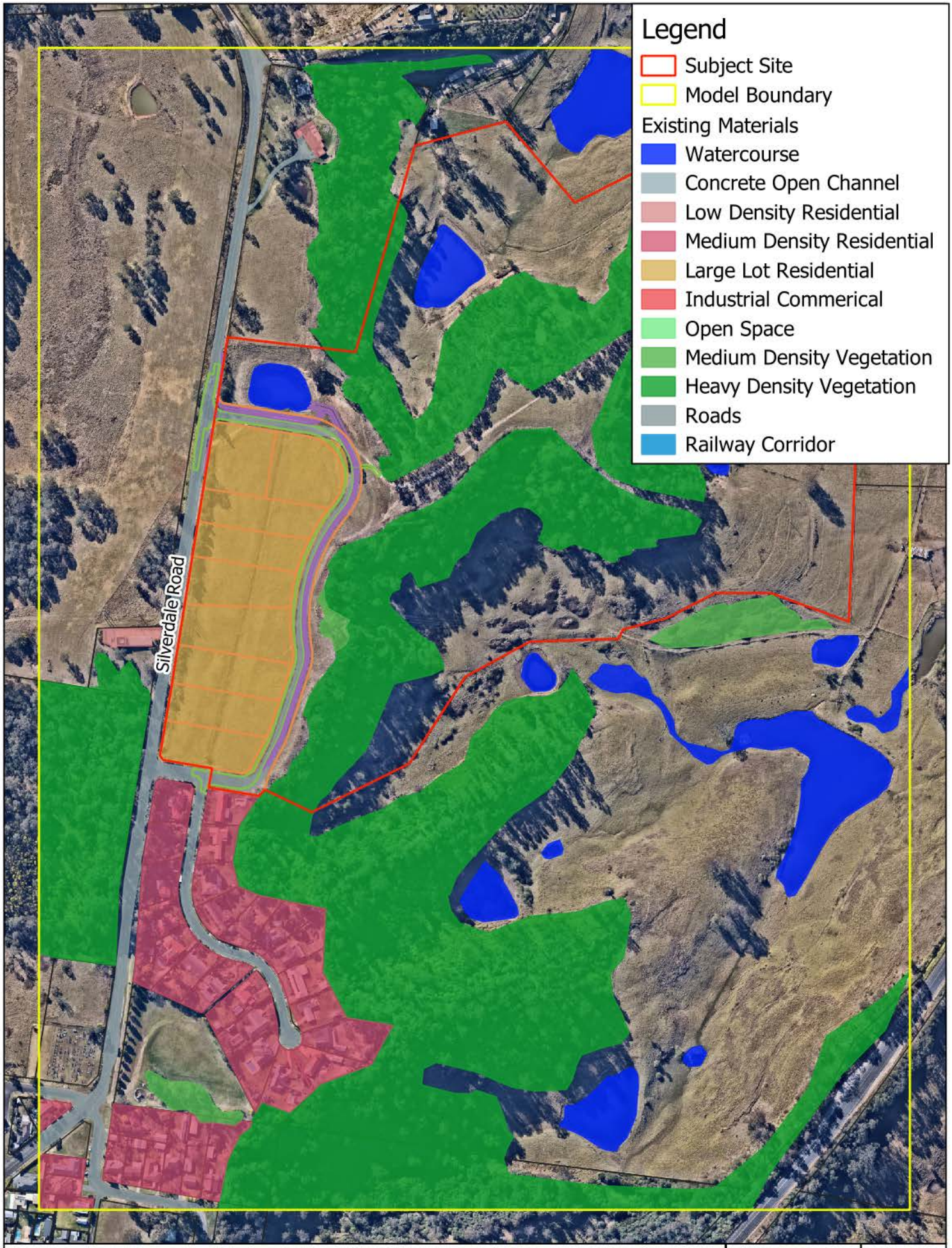

Title:
Proposed Land Use Delineation

Figure: **4.2**

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4.3 Boundary Conditions

Inflow and outflow boundary conditions are required for the TUFLOW model.

The TUFLOW model created for the subject site includes three (3) boundary conditions, including:

1. Inflow hydrographs; and
2. Downstream slope boundary downstream of the site.

4.3.1 Inflow Boundary Condition

To increase the stability of the model and reduce unnecessary run times the upstream catchments were modelled in XP RAFTS and applied as an inflow hydrograph at the appropriate location as shown in Figure 4-4.

The model covers the entire upstream catchment which is approximately 400m south of subject site. The upstream inflow locations allow for the best representation of overland flow impacting the site from the upstream sub catchments.

4.3.2 2D Downstream Boundary Condition

A 2D downstream boundary condition has been applied to the model. The purpose of this boundary is to allow water to flow out of the model, replicating flows in a flood event. The location of the downstream boundary is 500m downslope of the proposed subdivision which ensures any affectation by the development is fully modelled and the downstream boundary has no impact on flooding within the site.

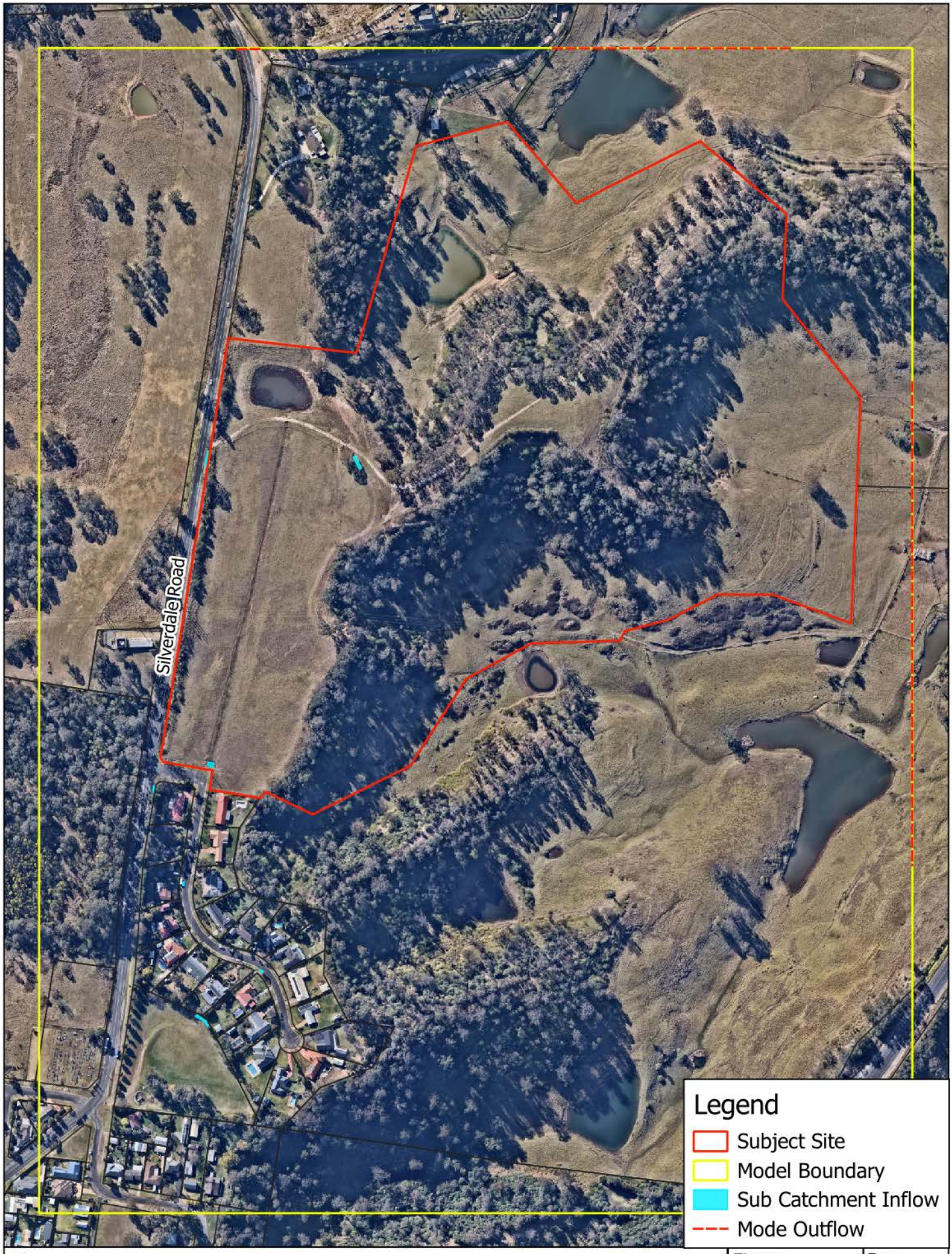
The location of the downstream boundaries are shown within Figure 4-4.

A slope boundary condition was used on Werombi Road to replicate flow leaving the model west to Wattle Creek the boundary condition has an effective slope of 1%.

4.4 Hydraulic Structures

Existing pit and pipe network was modelled within the subject model. Road drainage was modelled as 1d pipe networks with 2d links at the headwalls. Blockage factors were applied in the pipe network.

All pipes within the model have been modelled in both blocked and unblocked scenarios. The blocked scenario blocked all pipes within the model by 60%. With the maximum results from each scenario adopted throughout the model.



Title:
Existing Model Boundary Conditions

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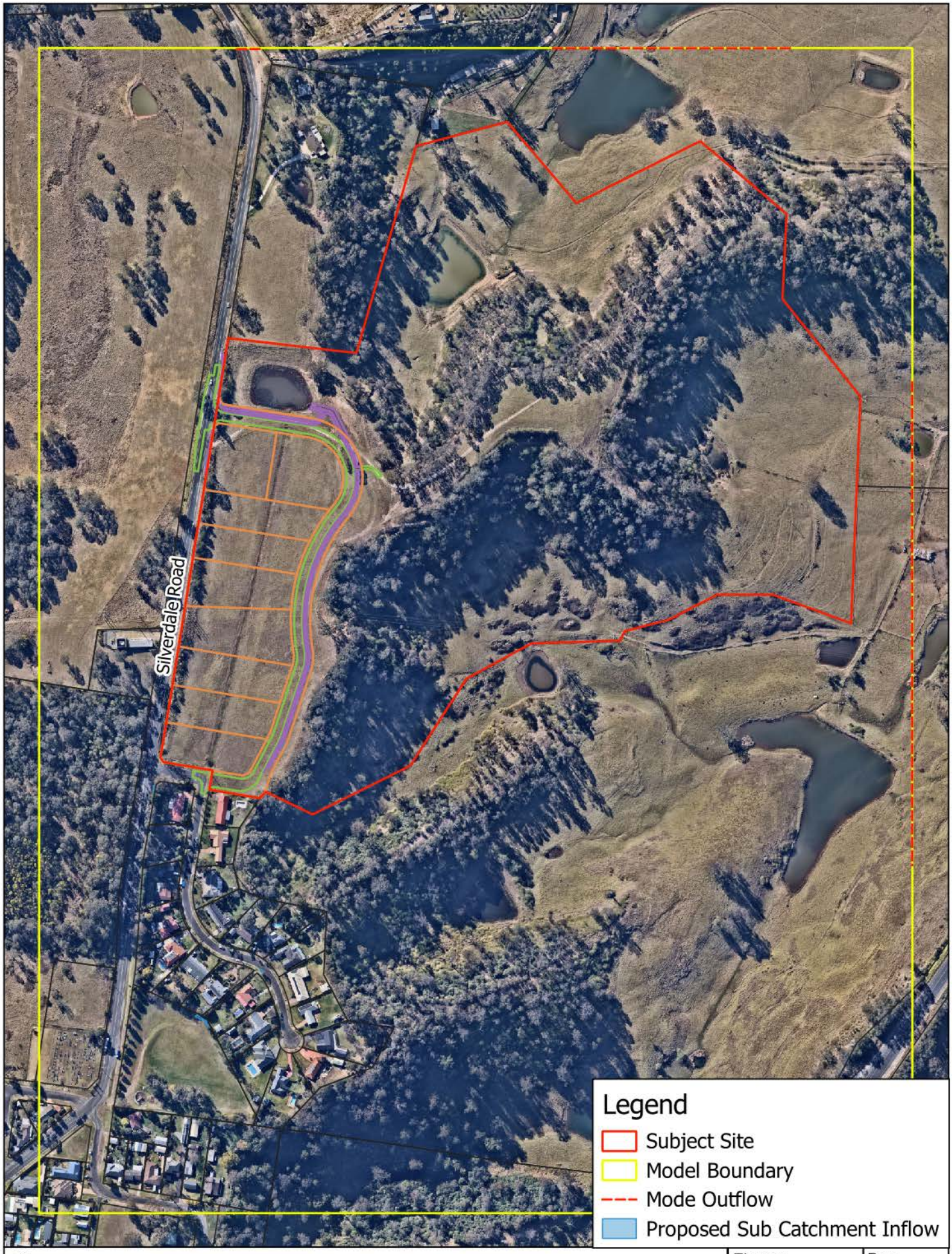

Title:
Proposed Model Boundary Conditions

Figure: **4.4**

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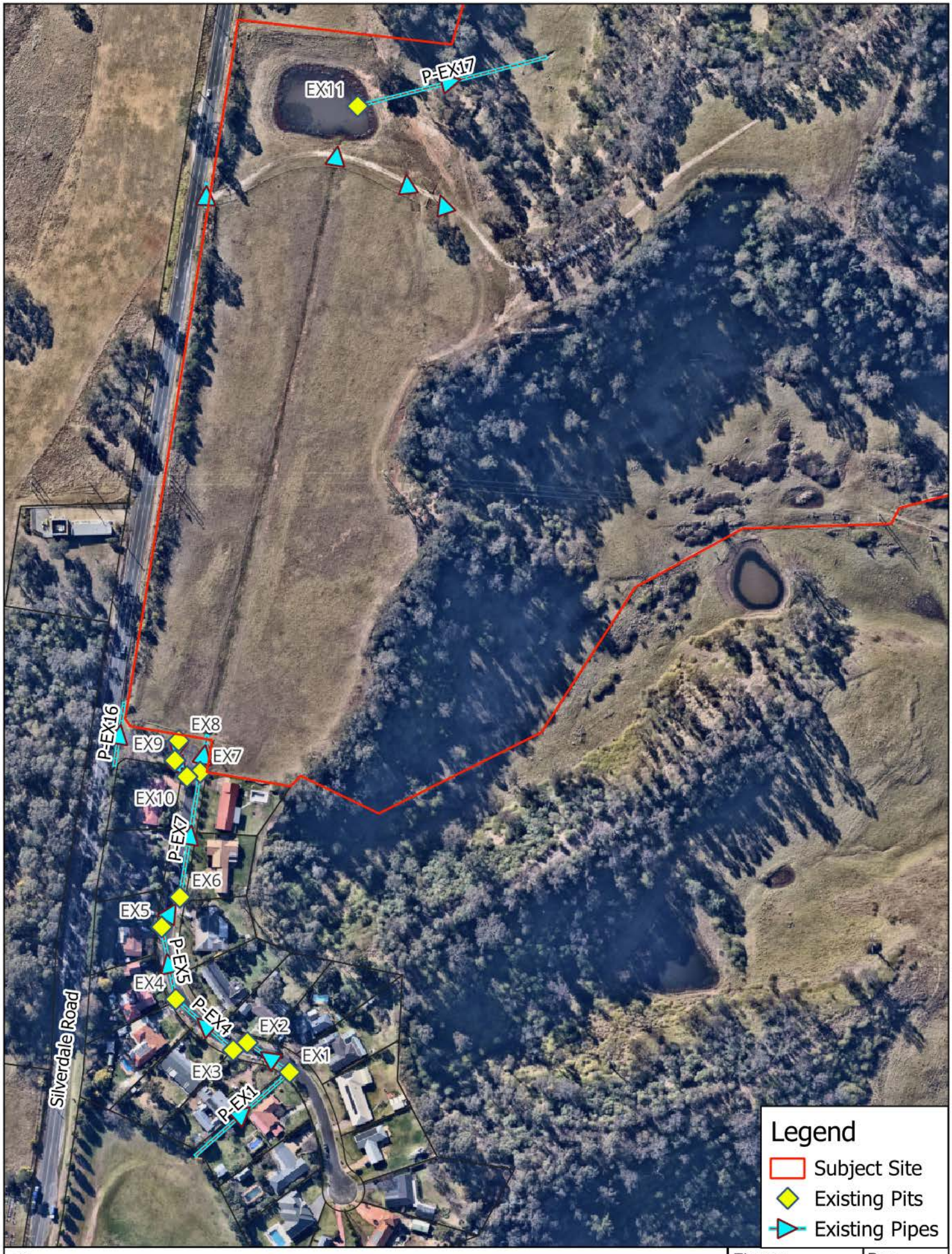

Title:
Existing Hydraulic Structures

Figure: **4.5**

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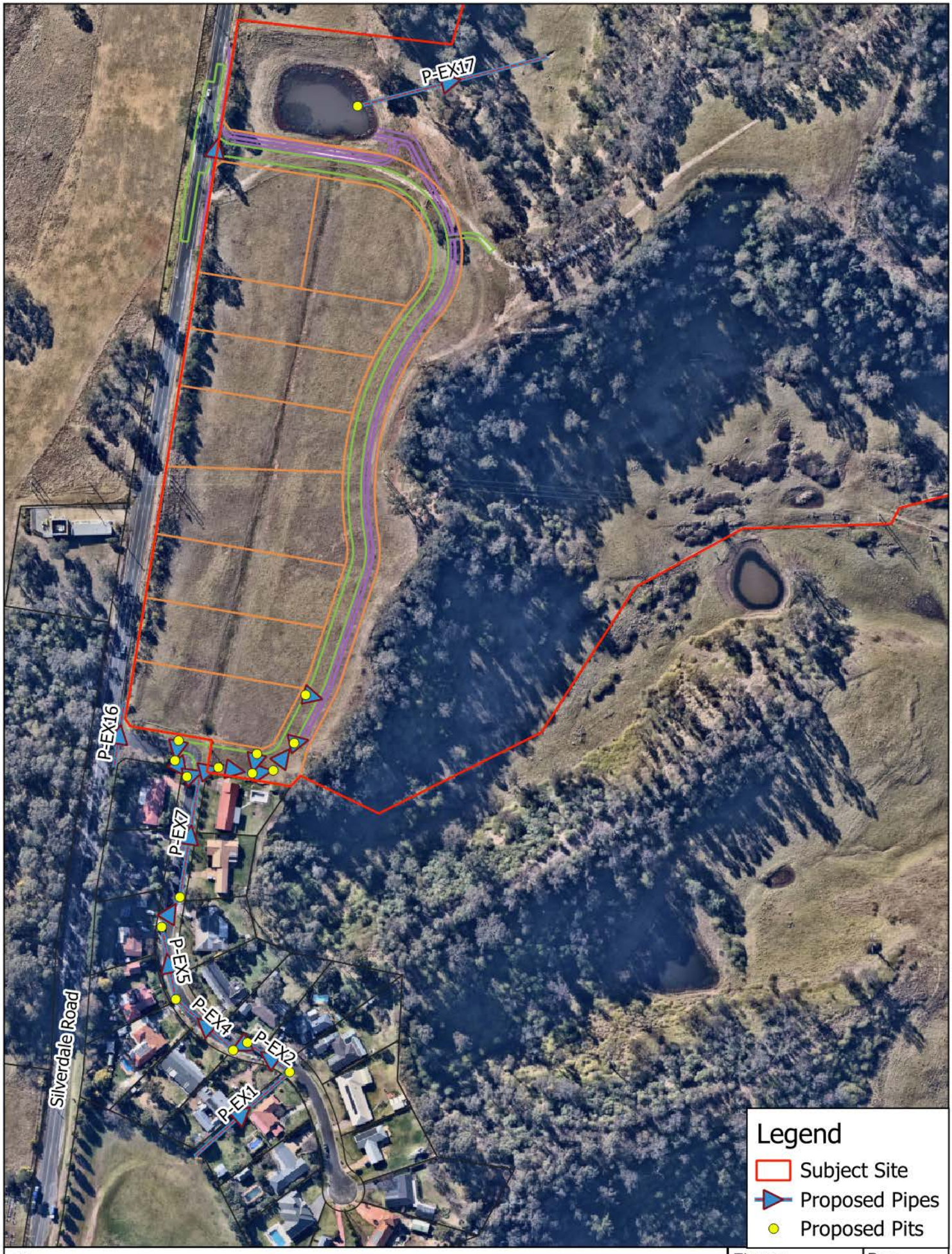

Title:
Proposed Hydraulic Structures

Figure: **4.6**

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5 MODEL RESULTS

Flood mapping is shown in Appendix C.

5.1 Existing Model Results

Flooding of the subject site is bisected by a single overland flow path from Browns Road north to the existing dam and detention basin.

Flows overtop the existing road reserve from Browns Road in both a north and east direction. The existing grass lined channel contains the 1% AEP flows to the existing dam at the northern end of the proposed subdivision.

Two smaller table drains with the development extent convey minor flows to the existing dam. However, due to the table drains capacity sheet flow overtops the drain and falls east down the steep embankment to the existing drains.

5.2 Proposed Model Results

The proposed road intersection with Browns Road. Directs overland flow from Browns Road east to a new roadside swale on the eastern extends of the development area. The roadside swale has been designed to cater for the 1%AEP flow and directs all of the upstream catchment into the existing dam and detention storage system at the northern end of the development extents.

6 FLOOD PLANNING – WOLLONDILLY COUNCIL DCP

Using Wollondilly Shire Councils Development Control Plan 2016 Volume 1 – General, Part 8 – Flooding. The following section addresses each of the flood planning controls within the DCP.

6.1 Flood Risk Precinct Definition

Based on the Siteplus Flood Study results, the proposed site is located within the Flood Planning Area (1% AEP plus 0.5m) and subject site contains both low and medium hydraulic hazard flood waters. Therefore, the site is to be considered within a Medium Flood Risk Precinct.

6.2 Floor Levels

Only lots 101 and 109 are flood control lots as they are affected by PMF flood waters. Floor levels are proposed 500mm above the 1% AEP level as shown in Table 6-1.

Table 6-1 Floor Level Summary

Proposed Lot	1% AEP Level (m AHD)	Flood Planning Level (m AHD)	PMF flood level (m AHD)
101	281.37	281.87	281.50
109	278.09	278.59	278.12

6.3 Flood Compatible Materials

Flood compatible materials will be provided up and including the flood planning level. All structures will need to be constructed of either reinforced concrete or masonry. This only applies to lots 101 and 109 as the lots are impacted by the PMF flood extents. The remaining dwellings are greater than 0.75m above the flood planning level and PMF flood level.

6.4 Flood Forces

The dwelling proposed on lot 101 and 109, will need to be conducted by registered structural engineer to analyse the forces of floodwaters, debris and buoyancy.

6.5 Evacuation

During the 1% AEP and PMF flood events results illustrate that access to Browns Road and Silverdale Road is achievable from the proposed development. Only in the PMF do occupants need to travel through safe H1 floodwaters. Therefore, all the proposed lots can be evacuated safely during all storm events.

6.6 Flood Affectation

Appendix C and D illustrates that the proposed development results in no changes in flood behaviour or increases in levels will result from the development.

6.7 Filling of Land Below the Flood Planning Level

Based on the results illustrated in Appendix C and D the following conclusions can be made:

i. Accumulative impacts are negligible as the proposed lots are outside the 1%AEP flood extents.
ii. Flood storage has been maintained as the dams are to be maintain onsite.
iii. No surrounding properties are impacts by either an increased hazard or flood level.
iv. No increased flood liability occurs surrounding the site.

7 FLOOD PLANNING – WOLLONDILLY LEP

Referring to the Wollondilly Local Environment Plan 2011, clause 5.21 Flood planning, the following section addresses each of the flood planning requirements.

(2)(a) Flood Function and Behaviour Compatibility

All of the proposed dwellings are located out of the extents of the 1%AEP. The PMF flooding isn't obstructed the flood behaviour on the land is maintained post development.

(2)(b) Potential Flood Affectation of Other Developments or Properties

All of the proposed dwellings are located out of the extents of the 1%AEP extents. Therefore, no change to the hazard zones occurs with no increase in hazard category over the study area.

(2)(c) Safe Occupation and Efficient Evacuation

Safe access for all the proposed lots can be achieved through safe flood waters 0.1m deep during the PMF flood event on Brown Road. Flood free access has been provided to Silverdale Road. Egress to Silverdale Road during a PMF event is safe and allows occupants from all lots to exit the site safely during the PMF event.

Appendix C illustrates the area identified has no vulnerability constraints and is safe for wading.

(2)(d) & (3)(c) Risk Management Measures

The flood planning controls outlined in the Wollondilly Shire Council's DCP have been strictly followed to ensure the appropriate flood risk mitigation measure have been implemented.

(2)(e) Environmental Affect

The proposed development will not increase the amount of erosion, siltation, destruction to riparian vegetation or reduction in the stability of riverbanks or watercourses, in comparison to the existing development.

8 ONSITE DETENTION

8.1 Onsite Detention Requirements

Wollondilly Council requires the peak flow rate of stormwater runoff in the post-developed state to be no more than the pre-developed state. This condition is to be met with the use of onsite detention storage.

8.2 Onsite Detention System

To reduce the peak flows leaving the site to pre-development levels, an existing dam at the northern end of the site will be utilised and act as onsite detention.

8.3 Proposed Stormwater Design

The existing contours of the site showed a number of natural sub-catchments within the development site. An existing swale bisects the site draining to an existing dam.

For the proposed development, the existing swale is to be removed, and water from the proposed subdivision is to be conveyed via a roadside swale which drains the existing dam. All lots within the proposed development are graded such that all stormwater runoff will discharge to the roadside swale via pipe outlets with scour protection.

The invert of the existing dam is required to be lowered to RL. 272.967m AHD to allow 1% fall for the upstream swale. An existing pit with a Ø375mm outlet pipe is to be maintained within the existing dam and is utilised to discharge water from the dam.

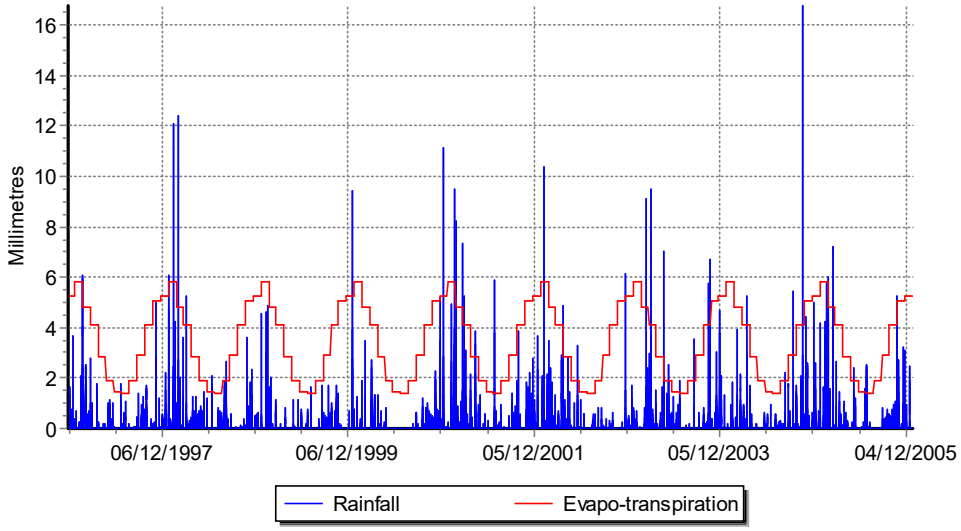
Post development flows were input into the TUFLOW model with increased impervious areas. The flood impact mapping indicates that post development flows were attenuated to pre-development levels and shows no adverse impacts downstream of the subject site.

Refer to impact mapping in Appendix C for details. The Civil Engineering Plans are included in Appendix D illustrates the above features.

9 WATER QUALITY

9.1 Meteorological Template

MUSIC requires historical rainfall data to determine the mean annual pollutant loadings leaving the site. The subject site is closest to Penrith rainfall gauge where the appropriate corresponding data has been used from 1997 to 2005.



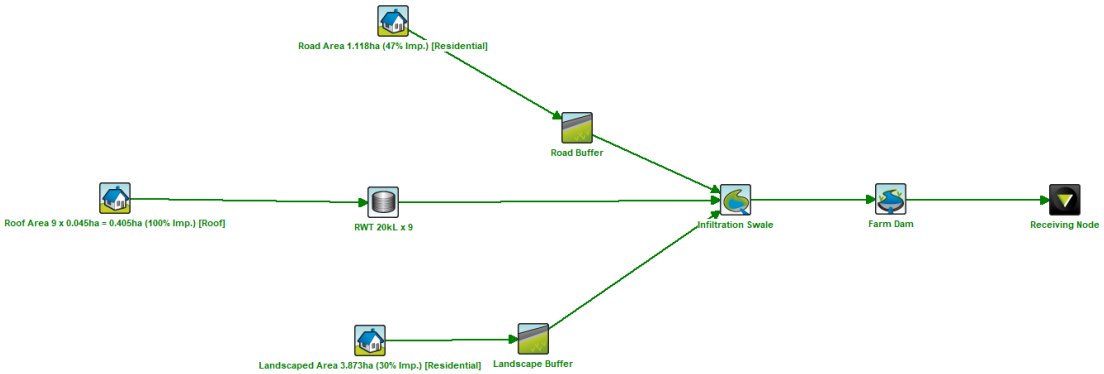
9.2 Source Nodes

9.2.1 Existing Site

The existing site has been assumed to produce similar pollutants as residential development with the corresponding impervious areas. The residential parameters have been used from the Draft Western Sydney MUSIC modelling guidelines.

9.2.2 Urban Node

The existing and proposed site has been modelled within MUSIC as an urban node with the required residential parameters. Due to the current use of the site it has been assumed that the site will produce similar gross pollutants, suspended solids, nitrogen and phosphorus as roof and paved surfaces as per the modelling guidelines. The MUSIC model is shown below.



9.3 Proposed Development Sources

9.3.1 Urban Nodes

The site has been divided into three residential catchments that all drain to the proposed infiltration trench. The three catchments represent the main catchment areas within the site namely roof, road reserve and landscaped areas. The catchment areas have been divided up based on the input parameters required for the MUSIC modelling Guidelines with the zoning areas of the catchments forming the model as shown in Figure 3.

Each urban node has a calculated impervious percentage based on the impervious surface areas within each catchment. The roof, road reserve and landscape catchments have been modelled as 100%, 47%, 30% impervious respectively.

9.4 Treatment Nodes

9.4.1 Infiltration Trench

Infiltration trenches are used to slow down flow, allow sediment to drop out and allow low flows to infiltrate.

The proposed road contains a 6.5m wide swale with a 0.7m deep infiltration trench at the base. All stormwater runoff from the proposed developments discharges to these infiltration trenches and is conveyed to the existing dam.

9.4.2 Rainwater Tanks

Rainwater tanks are used to collect roof runoff for reuse, reduce stormwater runoff volumes and also remove pollutants.

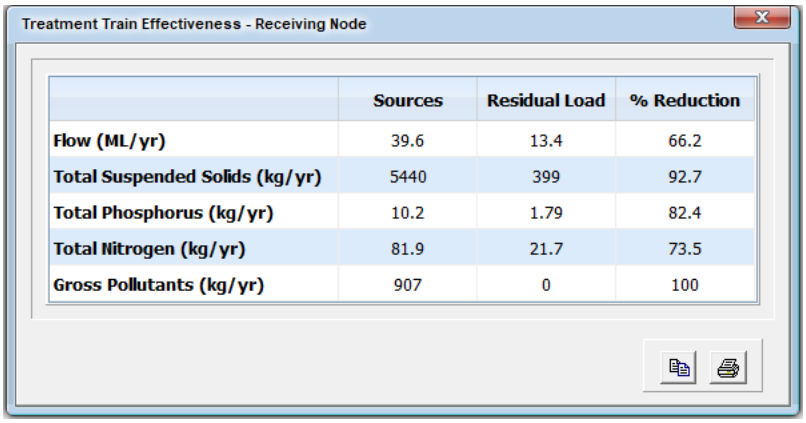
The sizing of the tanks was based on the table outlined in Wollondilly Council's WSUD document. The assumed roof size of each lot was estimated to be 450m². From Council's table, a minimum average daily demand was calculated to be 2,700 L/day.

The minimum size of the rainwater tanks for each lot is to be 18,000 L. 20,000 L tanks have been proposed for each lot.

9.4.3 Sediment Basin

For this development application the dam will be acting as a single sediment basin. The treatment train prior to discharging to the basin ensures that water entering the permanent water body is of very good quality. The swales with infiltration trenches are to be planted out to landscape architects' requirements.

9.4.4 MUSIC Results



	Sources	Residual Load	% Reduction
Flow (ML/yr)	39.6	13.4	66.2
Total Suspended Solids (kg/yr)	5440	399	92.7
Total Phosphorus (kg/yr)	10.2	1.79	82.4
Total Nitrogen (kg/yr)	81.9	21.7	73.5
Gross Pollutants (kg/yr)	907	0	100

The results confirm that the proposed swales, rainwater tanks, and dam have an impact on the water quality discharging from the site. Improvements are achieved for all pollutants.

The above table demonstrates that the results in fact improve the quality of stormwater runoff over the existing situation. There are benefits across the full suite of pollutants modelled.

9.5 Monitoring and Maintenance Procedures

Monitoring and maintenance of water sensitive urban design control is critical to ensure their performance is retained throughout its life cycle. Unmaintained stormwater quality controls can fail leading to an increase of pollutant loads on receiving waters. The following section provides a guide into the monitoring and maintenance of both the rainwater tanks and swale proposed within the development.

9.5.1 Swale areas

Predictive and regular inspections should be carried out on a regular basis for each swale system. The predictive inspection is based on a storm event that enables sediment transport roughly 35mm.

The performance of the swale system can be based on the following performance indicators:

- Pounding Time, a maximum of 12 hours.
- Even flow distribution across the filter area. No concentrated flow paths should be present.

During the vegetation establishment period the systems should be inspected every 3 months or after a major rainfall event. During the establishment period the following should be monitored:

- Pounding, clogging or blockage of filter media. Untreated water should not be pooling on the surface of the system for extended periods of time.
- Vegetation and density of plants should be at the desired level. No bare patches or sand filter media should be visible on the surface of the system.
- Outlet should be free of debris and free flowing.
- Structures such as pits and weirs should be clear of debris and functioning correctly.
- Any litter should be removed from the filter area.
- Remove all weeds from both the batter slope and filter area. This should be carried out by hand or with targeted herbicide.
- All sedges and native grasses should be maintained or trimmed at an approximately 200mm high to ensure that both fuel load requirements and water treatment is constant.

(Upper Parramatta River Trust, 2004)

After plants are established correct monitoring and maintenance of the systems can be reduced to a 6 monthly interval. During these inspections the following activities should be recorded and documented:

- Maintain free flow through the system.

- Maintain the surface vegetation as vigorous plant growth is important for treatment. This includes scheduled watering in dry periods.
- Prevent undesired growth of weeds and vegetation.
- Removal of debris and sediment.
- Any litter should be removed from the filter area.
- Remove all weeds from both the batter slope and filter area. This should be carried out by hand or with targeted herbicide.
- Remove excess or dead plant material which will increase the nutrient load on the system.

(Upper Parramatta River Trust, 2004)

9.6 Treatment Device Life Cycle Costings

9.6.1 Swale systems

The following preliminary costings are based on the standard rates applied by MUSIC with a 25yr renewal period and a total life cycle length of 50yrs.

The initial cost includes complete commissioning of the system, however it does not allow for rock excavation. The cost of each swale is detailed in the table below.

Structure	Area (m^2)	Life Cycle Cost	Initial cost	Maintenance Cost (yr)
Swale	258	$245,938	$72,000	$8,425

10 CONCLUSION

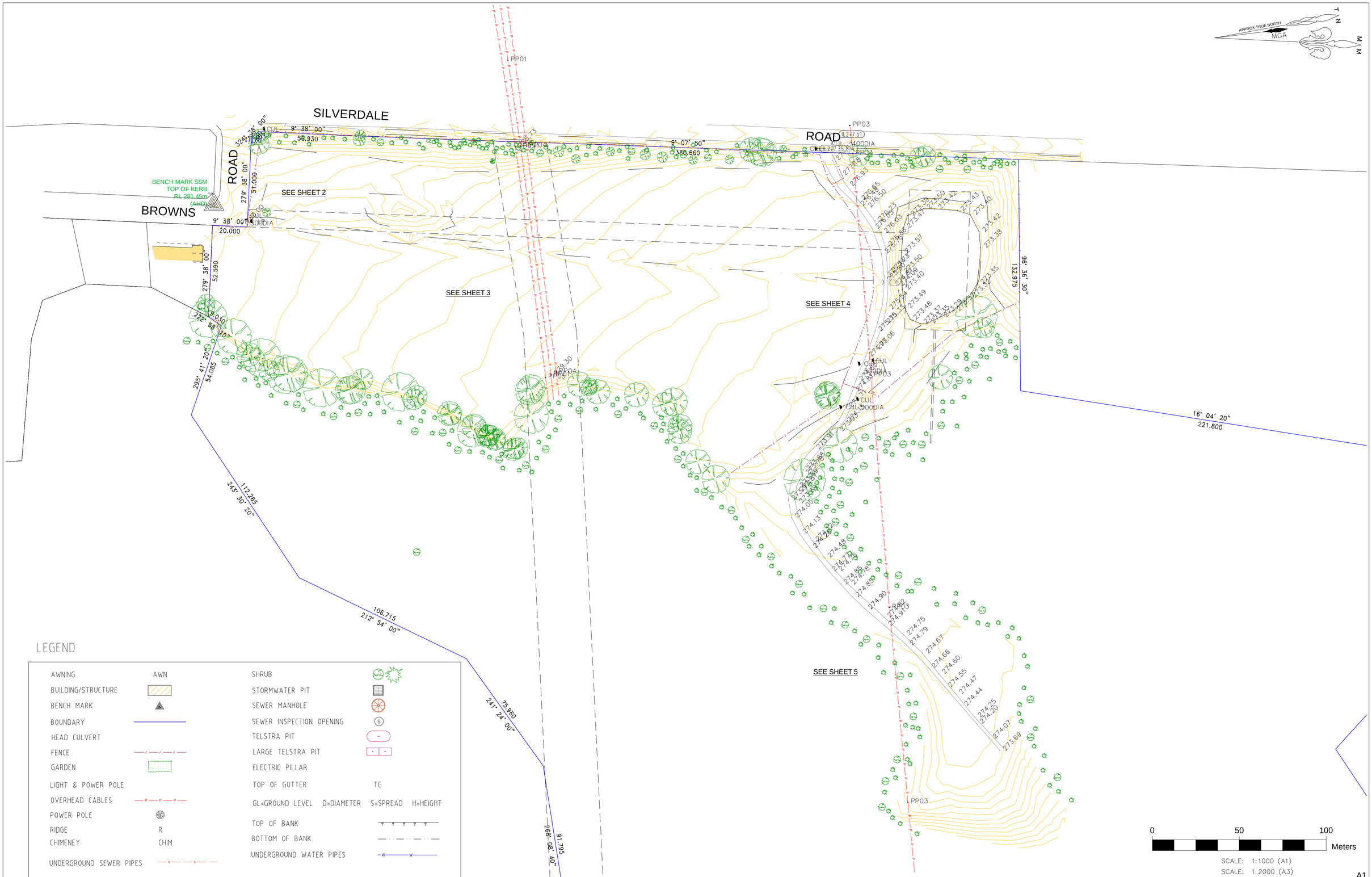
Mr and Mrs Nocera C/- Proficient Constructions (Aust) is seeking a rezoning approval for a proposed rural residential subdivision at No.80 Silverdale Road, The Oaks. The site contains an existing overland flow path and is therefore subject to the Wollondilly Shire Council flood planning controls.

The following conclusions can be made regarding the water cycle management study:

- All of the proposed lots are located outside the of 1%AEP flood extents.
- Proposed habitable floor levels are to be a minimum of 0.5m above the 1% AEP flood level.
- During the PMF occupants from the proposed lots can safely access Silverdale Road which is floor free.
- The existing Dam attenuates flow from the development in its current state and leads to no increases in flood levels or hazard downstream of the development.
- The existing dam (OSD) adequately attenuates the post-development flows to pre-development levels.
- The proposed stormwater treatment measures effectively remove pollutants to Council requirements.

The flood extents are graphically illustrated in Appendix C.

APPENDIX A
Site Survey



LEGEND

AWNING	AWN	SHRUB	
BUILDING/STRUCTURE		STORMWATER PIT	
BENCH MARK		SEWER MANHOLE	
BOUNDARY		SEWER INSPECTION OPENING	S
HEAD CULVERT		TELSTRA PIT	-
FENCE		LARGE TELSTRA PIT	- -
GARDEN		ELECTRIC PILLAR	
LIGHT & POWER POLE		TOP OF GUTTER	TG
OVERHEAD CABLES	P P P	GL=GROUND LEVEL D=DIAMETER S=SPREAD H=HEIGHT	
POWER POLE		TOP OF BANK	
RIDGE	R	BOTTOM OF BANK	
CHIMENEY	CHIM	UNDERGROUND WATER PIPES	W W
UNDERGROUND SEWER PIPES	S S		

NOTES:

0.5m AND 1m CONTOURS SHOWN.

THIS PLAN IS PREPARED FOR DETAIL AND LEVEL PURPOSES ONLY AND THE INFORMATION SHOWN ON THIS PLAN MUST NOT BE USED FOR CONSTRUCTION SETOUT.

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ABN 59607099534

PROJECT : DETAIL AND LEVEL SURVEY
ON LOT 3 IN DP 1201486
AT THE OAKS

CLIENT : DOMENICO NOCERA

SHEET 1 OF 5

DRAWING No. : 1817Det.dwg

JOB REF : 1817Det

DATE : 8 February 2024

SILVERDALE ROAD

BROWNS ROAD

BROWNS ROAD

LOT 1
DP 775993

LOT 22
DP 775993

BENCH MARK SSM
TOP OF KERB
RL 281.45m
(AHD)

SINGLE STOREY
BRICK
RESIDENCE
TILE ROOF
No. 1

TG: 283.75

R: 285.95

GRASS

GL:283.25
D:.3mø
S:6m
H:5m

GL:283.79
D:.2mø
S:9m
H:7m

GL:283.56
D:.6mø
S:12m
H:14m

GL:283.48
D:0.4mø
S:7m
H:9m

GL:280.52
D:.1mø
S:5m
H:4m

IL 283.01
CUL

IL 280.30
SL:281.17
0.6x0.45 GIP

IL 280.15
SL:281.15
0.6x0.45 GIP

IL 280.03
SL:281.60
0.6x0.45 GIP

IL 280.07
SL:281.55
0.6x0.45 GIP

IL279.66
CUL
500DIA

9° 38' 06"
56.930

279° 38' 00"
51.000

9° 38' 00"
20.000

279° 38' 00"
52.590

SMH

PP

LP

SV

HYD

0 10 20 Meters

SCALE: 1:200 (A1)
SCALE: 1:400 (A3)

A1

NOTES:

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ABN 59607099534

PROJECT : DETAIL AND LEVEL SURVEY
ON LOT 3 IN DP 1201486
AT THE OAKS

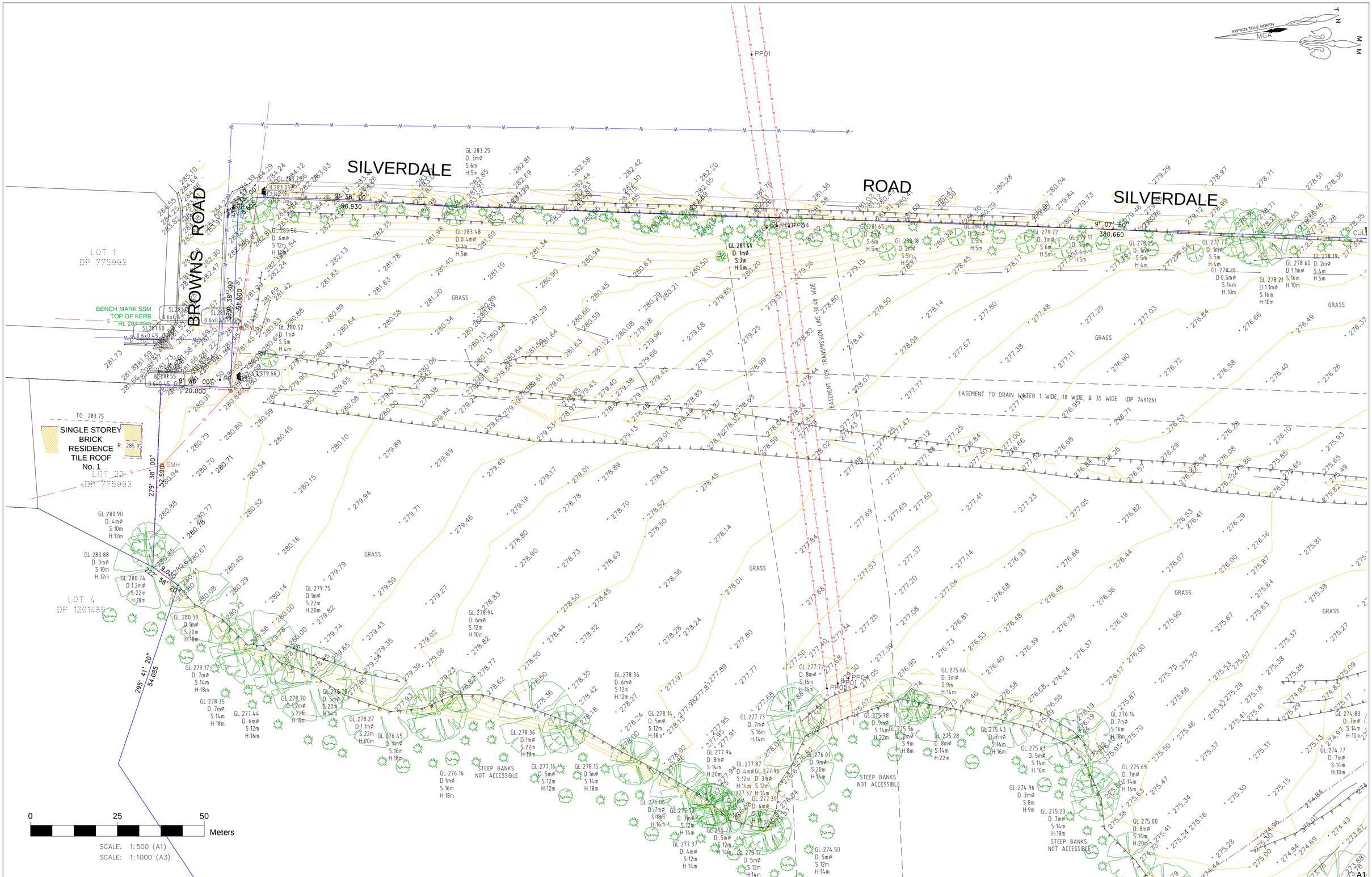
CLIENT : MR & MRS NOCERA

SHEET 2 OF 5

DRAWING No. : 1817Det.dwg

JOB REF : 1817Det

DATE : 8 February 2024



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PROJECT : DETAIL AND LEVEL SURVEY ON LOT 3 IN DP 1201486 AT THE OAKS

CLIENT : MR & MRS NOCERA

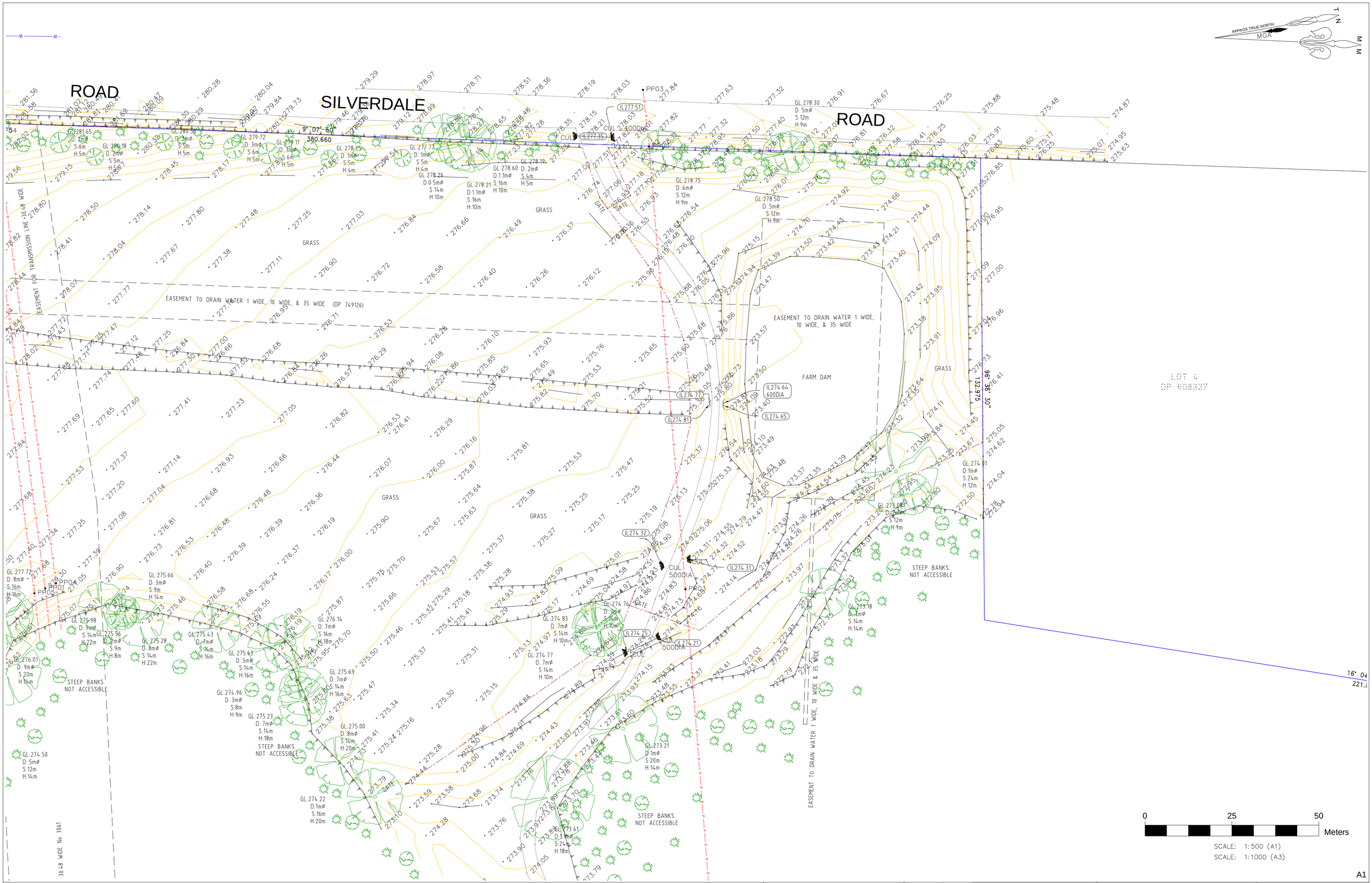
SHEET 3 OF 5

DRAWING No. : 1817Det.dwg

JOB REF : 1817Det

DATE : 8 February 2024

A1



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CLIENT : MR & MRS NOCERA

SHEET 4 OF 5

DRAWING No. : 1817Det.dwg

JOB REF : 1817Det

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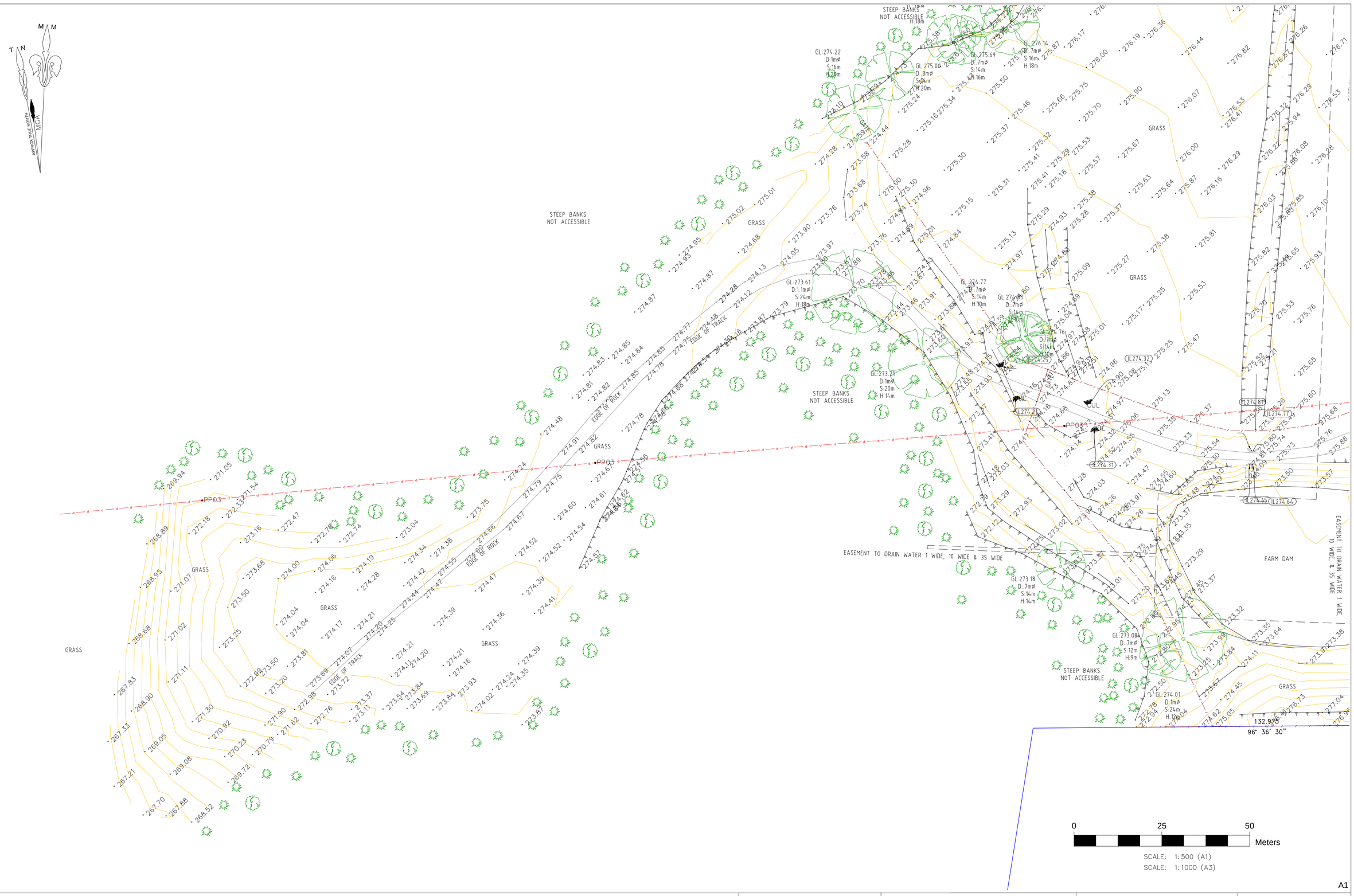

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PROJECT : DETAIL AND LEVEL SURVEY ON LOT 3 IN DP 1201486 AT THE OAKS

CLIENT : MR & MRS NOCERA

SHEET 5 OF 5

DRAWING No. : 1817Det.dwg

JOB REF : 1817Det

DATE : 8 February 2024

APPENDIX B
Flood Mapping

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Depth
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F01

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Height
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F02

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Flood Velocity (m/s)

- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Velocity
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F03

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Hazard
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F04

Rev: B

Date: 13.03.24

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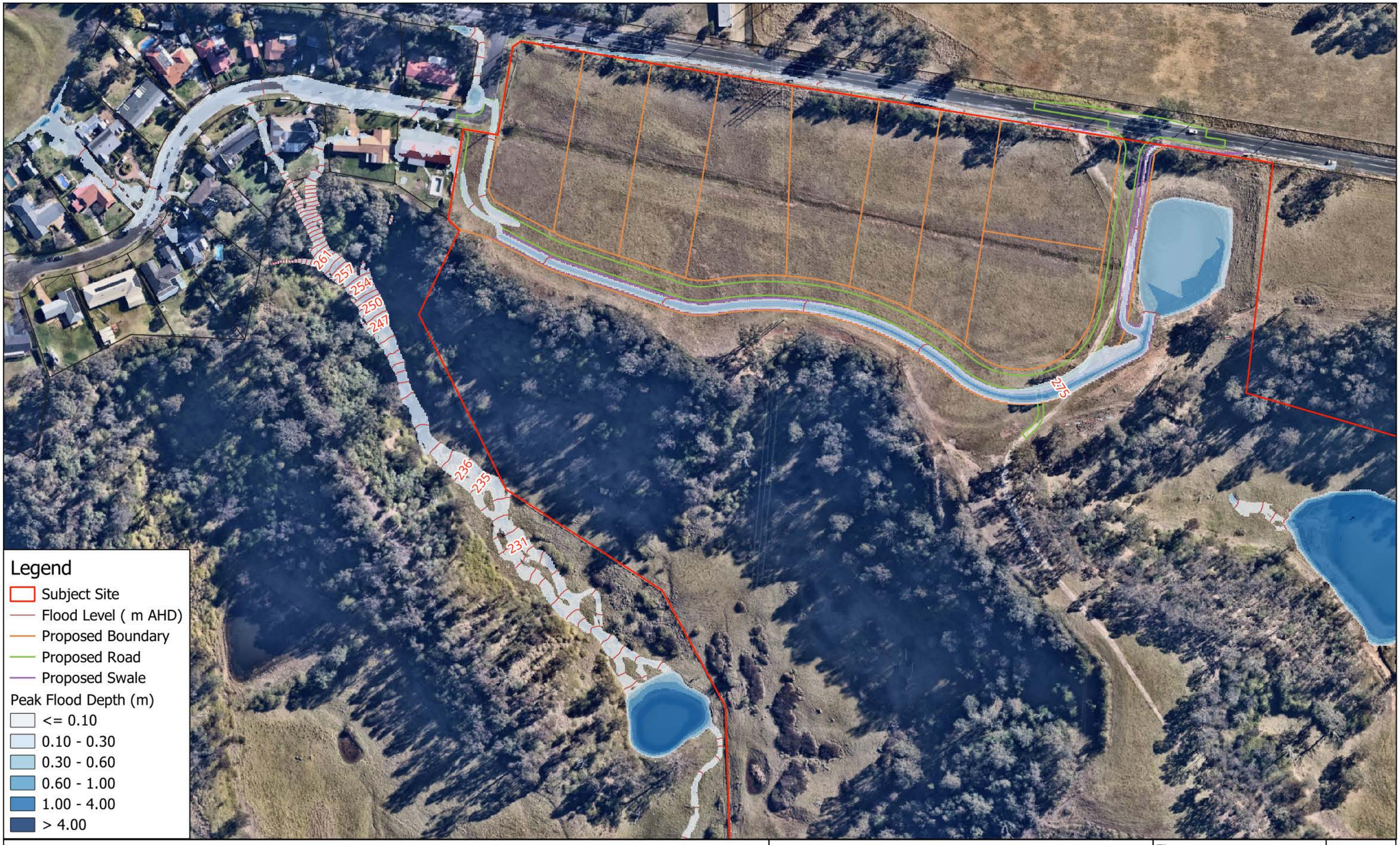

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Depth
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F05

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Height
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F06

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Velocity (m/s)

- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Velocity
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F07

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
1% AEP Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F08

Rev: B

Date: 13.03.24

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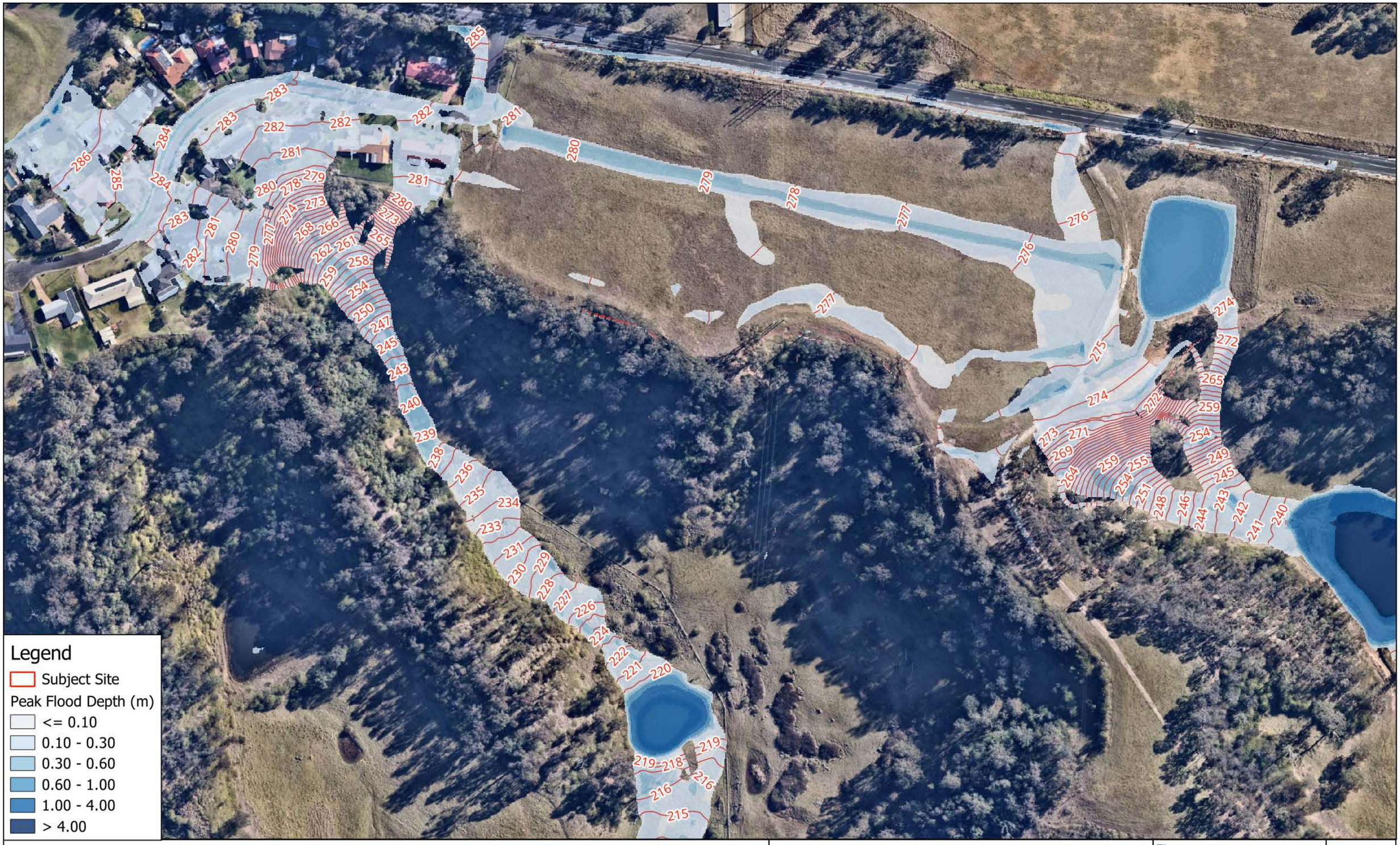


Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Depth
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F09

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Height
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F10

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site

Peak Flood Velocity (m/s)

- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Velocity
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig:	23130.F11
Date:	13.03.24
Rev:	B

siteplus

Legend

- Subject Site

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Hazard
PMF Event

0 25 50 75 100 m

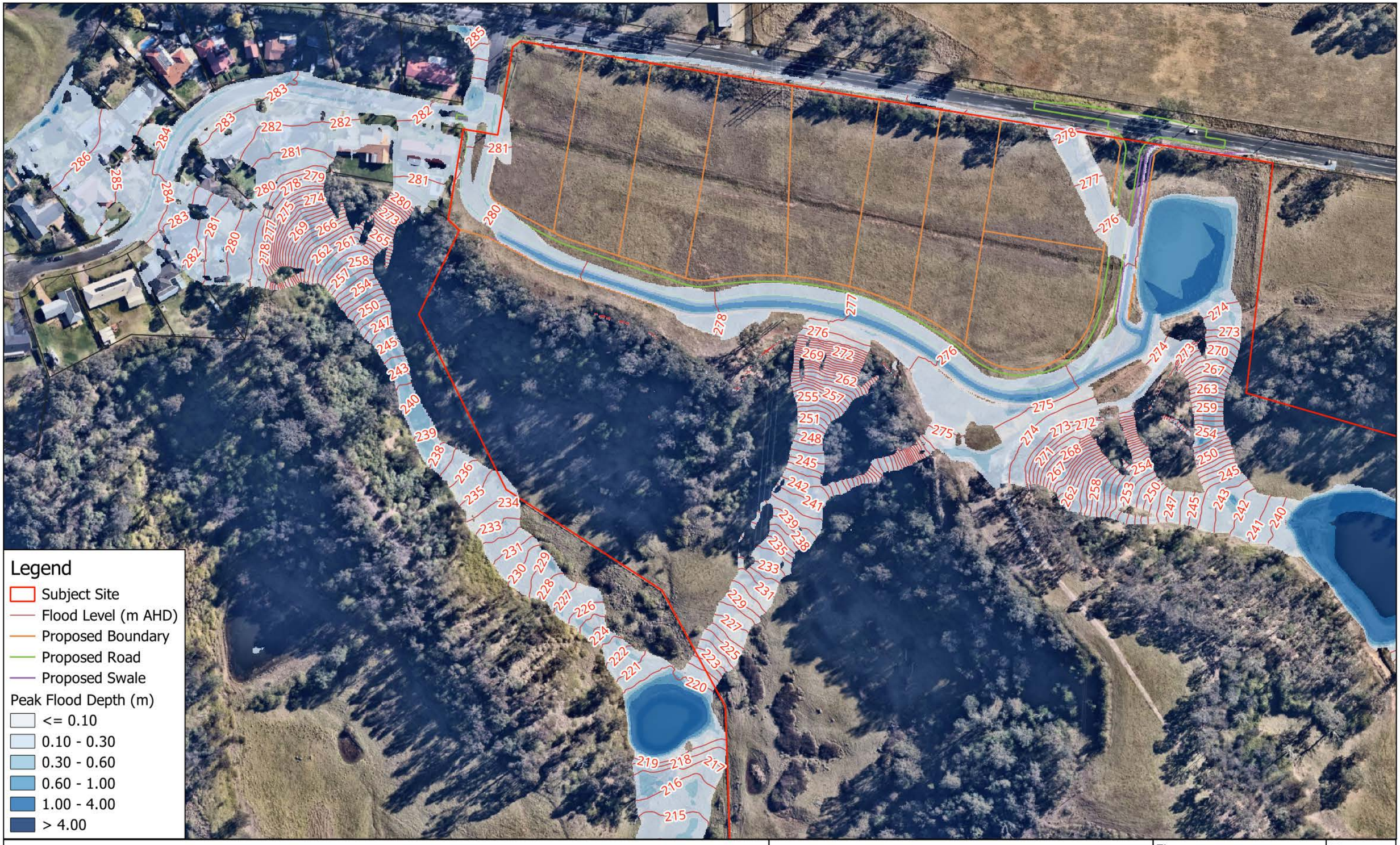
Scale: 1:2,000 @ A3

Fig: 23130.F12

Rev: B

Date: 13.03.24

siteplus



Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Depth
PMF Event

Fig: 23130.F13

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Height
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F14

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Velocity (m/s)

- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Velocity
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F15

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
PMF Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F16

Rev: B

Date: 13.03.24

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Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Depth
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F17

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Height
1% AEP Climate Chnage Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F18

Rev: B

Date: 13.03.24

siteplus

Legend

Subject Site

Peak Flood Velocity (m/s)

- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Velocity
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F19

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Existing Development - Peak Flood Hazard
1%AEP Climate Change Event

0 25 50 75 100 m

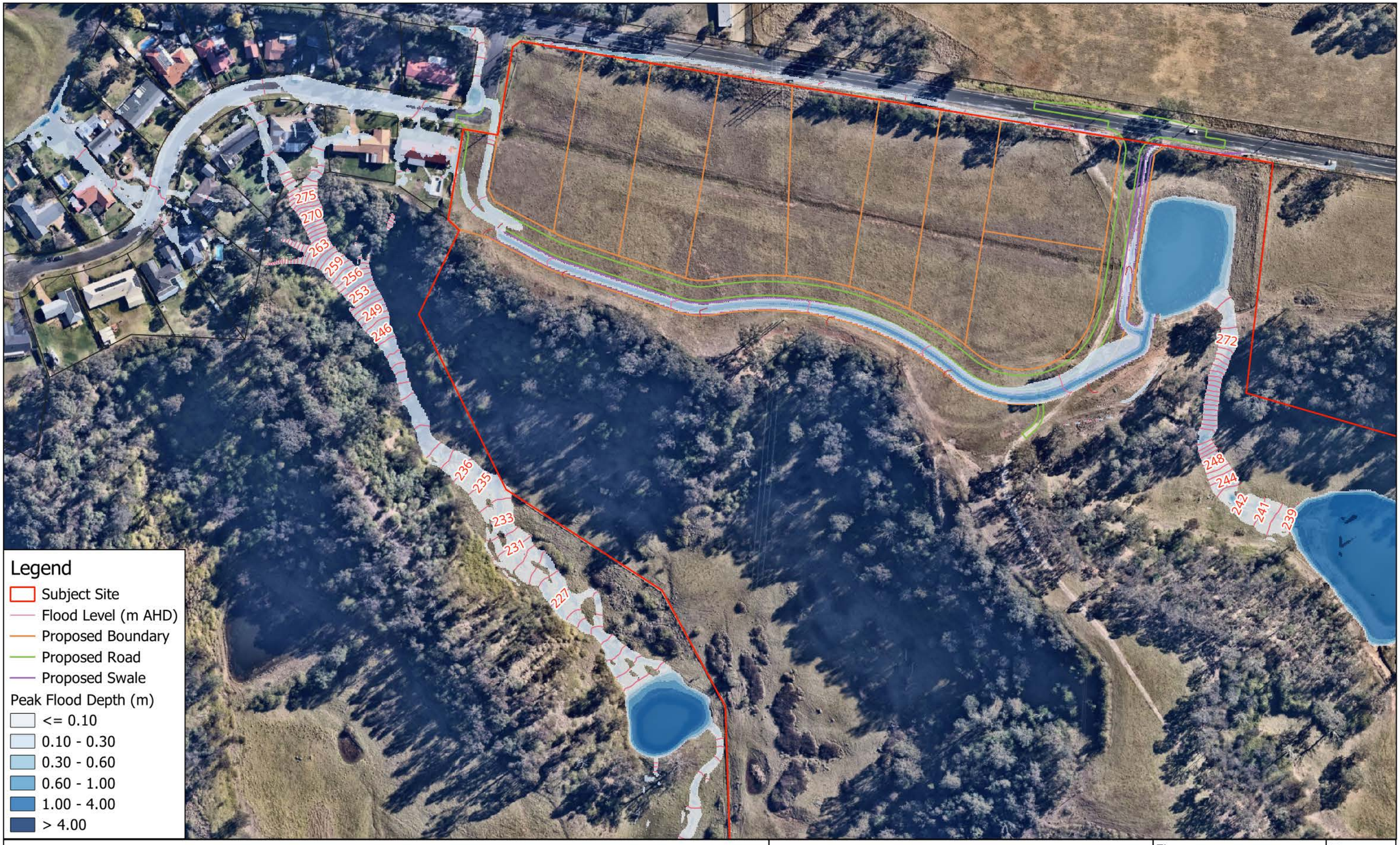
Scale: 1:2,000 @ A3

Fig: 23130.F20

Rev: B

Date: 13.03.24

siteplus



Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Depth
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig:	23130.F21	Rev: B
Date:	13.03.24	

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Height (mAHD)

- <= 276.0
- 276.0 - 277.0
- 277.0 - 278.0
- 278.0 - 279.0
- 279.0 - 280.0
- 280.0 - 281.0
- 281.0 - 282.0
- 282.0 - 283.0
- 283.0 - 284.0
- > 284.0

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Height
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F22

Rev: B

Date: 13..03.24

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Legend
- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Flood Velocity (m/s)
- <= 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- > 4

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Velocity
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F23

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Peak Hazard

- H1: No vunerability constraints
- H2: Unsafe for small vehicles
- H3: Unsafe for all vehicles, children & elderly
- H4: Unsafe for all people and all vehicles
- H5: Building require special design & construction
- H6: Not suitable for any type of development

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
1%AEP Climate Change Event

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F24

Rev: B

Date: 13.03.24

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APPENDIX C
Flood Impact Mapping

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Level Impact (m)

- -0.5
- -0.3
- -0.05
- No Impact
- +0.05
- +0.3
- +0.5

Wet/Dry Impact

- Was Wet now Dry
- Was Dry Now Wet

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
1%AEP Level Impacts

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F25

Rev: B

Date: 13.03.24

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Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Level Impact (m)

- -0.5
- -0.3
- -0.05
- No Impact
- +0.05
- +0.3
- +0.5

Wet/Dry Impact

- Was Wet now Dry
- Was Dry Now Wet

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
PMF Level Impacts

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F26

Rev: B

Date: 13.03.24

siteplus

Legend

- Subject Site
- Proposed Boundary
- Proposed Road
- Proposed Swale

Level Impact (m)

- -0.5
- -0.3
- -0.05
- No Impact
- +0.05
- +0.3
- +0.5

Wet/Dry Impact

- Was Wet now Dry
- Was Dry Now Wet

Title:

80 Silverdale Road, The Oaks
Proposed Development - Peak Flood Hazard
1%AEP Climate Change Level Impacts

0 25 50 75 100 m

Scale: 1:2,000 @ A3

Fig: 23130.F27

Rev: B

Date: 13.03.24

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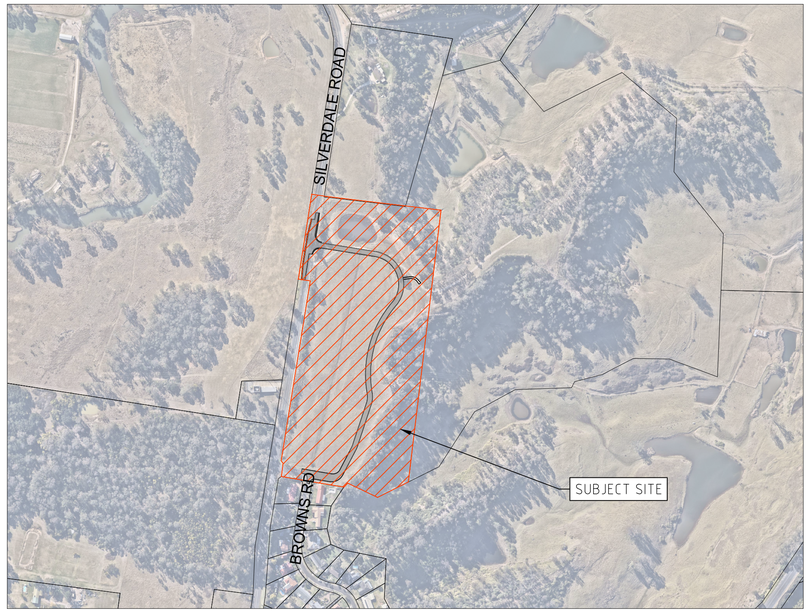
APPENDIX D
Civil Engineering Plans

PROPOSED RESIDENTIAL SUBDIVISION
LOT 3 DP 1201486, 80 SILVERDALE ROAD, THE OAKS
DEVELOPMENT APPLICATION CIVIL PLANS
MR & MRS NOCERA C/-
PROFICIENT CONSTRUCTIONS (AUST) PTY LTD

Sheet List Table	
Sheet Number	Sheet Title
01	TITLE PAGE
02	CIVIL WORKS PLAN
03	BULK EARTHWORKS
04	ROAD LONG SECTIONS
05	INTERSECTION PLAN
06	ROAD TYPICAL SECTIONS
07	CATCHMENT PLAN
08	DRAINAGE CALCULATIONS
09	DRAINAGE LONG SECTIONS
10	MUSIC CATCHMENT PLAN
11	INTERSECTION SIGHT DISTANCE
12	INTERSECTION SWEPT PATHS
13	SOIL & WATER MANAGEMENT PLAN
14	SOIL & WATER MANAGEMENT DETAILS



LOCALITY SKETCH
1:2500 @ A1

GENERAL NOTES

G1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH WOLLONDILLY SHIRE COUNCIL DEVELOPMENT CODE AND TO THE REQUIREMENTS OF COUNCIL'S AUTHORISED OFFICER.
G2. INSPECTIONS BY THE AUTHORISED OFFICER SHALL BE CARRIED OUT AT THE FOLLOWING STAGES:
- (a) PRIOR TO INSTALLATION OF EROSION AND SEDIMENT CONTROL STRUCTURES
- (b) PRIOR TO BACKFILLING PIPELINES, SUBSOIL DRAINS, TRENCH BEDDING AND DAMS
- (c) PRIOR TO CASTING OF PITS AND OTHER CONCRETE STRUCTURES, INCLUDING KERB AND GUTTER
- (d) PROOF ROLLER TEST OF SUBGRADE AND SUB-BASE
- (e) ROLLER TEST OF COMPLETED PAVEMENT PRIOR TO PLACEMENT OF WEARING COURSE
- (f) FORMWORKS PRIOR TO POURING CONCRETE IN PARKING AREA FOR FOOTPATH CROSSING AND OTHER ASSOCIATED WORK
- (g) PRIOR TO BACKFILLING PUBLIC UTILITY CROSSINGS IN ROAD RESERVES
- (h) PRIOR TO PLACEMENT OF ASPHALTIC CONCRETE
- (i) FINAL INSPECTION AFTER ALL WORKS ARE COMPLETED AND 'WORKS AS EXECUTED' PLANS HAVE BEEN SUBMITTED TO COUNCIL

G3. NO TREES TO BE REMOVED UNLESS APPROVAL IS GRANTED BY COUNCIL.
G4. MAKE SMOOTH JUNCTIONS WITH EXISTING WORKS.
G5. NO WORK TO BE CARRIED OUT ON COUNCIL PROPERTY OR ADJOINING PROPERTIES WITHOUT THE WRITTEN PERMISSION FROM THE OWNER.
G6. VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION.
G7. ALL RUBBISH, BUILDINGS, SHEDS AND FENCES TO BE REMOVED TO SATISFACTION OF COUNCIL'S ENGINEER AT COMPLETION OF WORKS.
G8. A TRAFFIC CONTROL PLAN IS TO BE SUBMITTED TO COUNCIL WITH A SECTION 138 APPLICATION PRIOR TO COMMENCEMENT OF WORKS.
G9. ALL FILL AREAS ARE TO BE INSPECTED BY A GEOTECHNICAL ENGINEER PRIOR TO STRIPPING AND ANY RECOMMENDATIONS REGARDING TREATMENT OF SALINE AFFECTATION ARE TO BE IMPLEMENTED.
G10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF THE LOCATION OF ANY EXISTING SERVICES AFFECTING THE WORKS AREA, ANY DAMAGED SERVICES SHALL BE REPAIRED AT THE CONTRACTORS COST.

EARTHWORKS NOTES

E1. EARTHWORKS TO BE CARRIED OUT TO THE SATISFACTION OF THE PCA AND GEOTECHNICAL ENGINEER. UNSOUND MATERIALS ARE TO BE REMOVED FROM ROADS AND LOTS PRIOR TO FILLING. THE CONTRACTOR IS TO ARRANGE AND MAKE AVAILABLE COMPACTION CERTIFICATES WHERE REQUIRED.
E2. WHERE THE SLOPE OF THE NATURAL SURFACE EXCEEDS ONE IN FOUR (1:4), BENCHES ARE TO BE CUT TO PREVENT SLIPPING OF THE PLACED FILL MATERIAL AS REQUIRED BY THE PCA AND GEOTECHNICAL ENGINEER.
E3. ALL BATTERS ARE TO BE SCARIFIED TO ASSIST WITH ADHESION OF TOP SOIL TO BATTER FACE.
E4. PROVIDE MINIMUM 150mm AND MAXIMUM 300mm TOPSOIL WITH GRASS SEEDING ON FOOTPATHS, FILLED AREAS AND ALL OTHER AREAS DISTURBED DURING CONSTRUCTION.
E5. THE CONTROL TESTING OF EARTHWORKS SHALL BE IN ACCORDANCE WITH THE GUIDELINES IN AUSTRALIAN STANDARD 3798 – 2007. WHERE IT IS PROPOSED TO USE TEST METHOD AS1289 E8.1 OR AS1289 E8.2 TO DETERMINE THE FIELD DENSITY, A SAND REPLACEMENT METHOD SHALL BE USED TO CONFIRM THE RESULTS AS DIRECTED BY COUNCIL.
THE GEOTECHNICAL TESTING AUTHORITY SHALL HAVE A LEVEL 1 RESPONSIBILITY FOR ALL FILLING AS DEFINED IN APPENDIX B AS 3798-2007, AND AT THE END OF THE WORKS SHALL CONFIRM THE EARTHWORKS COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION AND DRAWINGS.
E6. THE CONTRACTOR SHALL CONTROL SEDIMENTATION, EROSION AND POLLUTION DURING CONSTRUCTION IN ACCORDANCE WITH MANAGING URBAN STORWATER: SOILS AND CONSTRUCTION VOLUME 1 (LANDCOM 2004) AND: MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION VOLUME 2 (DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE 2007).

ROADWORKS NOTES

R1. SUBGRADE, SUB-BASE, AND BASE TO BE COMPACTED IN ACCORDANCE WITH WOLLONDILLY SHIRE COUNCILS DEVELOPMENT CODE.
R2. SUBSOIL DRAINS TO BE PROVIDED ON BOTH SIDES OF ROADS (EXCEPT WHERE THERE IS STORM WATER DRAINAGE).
R3. 150 X 50 H.D. GALVANISED STEEL KERB OUTLETS TO BE PLACED IN LAYBACK KERB AND 90mm DIA. GALVANISED STEEL PIPE SECTION TO BE PLACED IN UPRIGHT KERB ON LOW SIDE OF LOTS. PROVIDE SUITABLE ADAPTOR TO ALLOW CONNECTION OF 90mm DIA. STORM WATER PIPE.
R4. PERAMBULATOR CROSSINGS TO BE PROVIDED IN ALL KERB RETURNS OR WHERE REQUIRED BY COUNCIL.
R5. SERVICE CONDUITS TO BE PLACED AS DIRECTED BY ENDEAVOUR ENERGY, TELECOMMUNICATIONS AND AS REQUIRED BY THE SYDNEY WATER.
R6. PROPOSED SERVICES CROSSING EXISTING ROADS SHALL BE THRUST BORED UNDER THE ROAD SO AS NOT TO DAMAGE EXISTING SURFACE.
R7. SIGNPOSTING AND LINEMARKING TO CONFORM WITH AS1742.2 RAISED RETRO- REFLECTIVE PAVEMENT MARKERS TO CONFORM WITH AS1906.
R8. STREET SIGNS TO COMPLY WITH COUNCIL'S SPECIFICATION FOR STREET NAME SIGNS AND MUST BE INSTALLED BY THE DEVELOPER.
R9. ALL LEVELS ARE TO BE SET OUT FROM ESTABLISHED STATE SURVEY MARKS.

STORMWATER NOTES

S1. ALL PIPES TO BE SPIGOT AND SOCKET, RUBBER RING JOINTED. ALL PIPES IN ROAD RESERVES (OTHER THAN ROOF WATER AND SUBSOIL) ARE TO BE STEEL REINFORCED CONCRETE PIPES.
S2. ALL LONGITUDINAL PIPELINES IN ROADS MUST BE LOCATED UNDER KERB AND GUTTER AND BE BACKFILLED WITH 7mm AGGREGATE WHERE 10-15% OF FINES IS ALLOWABLE UNLESS OTHERWISE INDICATED ON PLANS AND APPROVED BY COUNCIL.
S3. DRAINAGE LINES MUST BE BACKFILLED AS PER WOLLONDILLY SHIRE COUNCILS DEVELOPMENT CODE. THREE (3) METRES OF AGLINE WRAPPED IN GEOTECH STOCKING MUST BE PROVIDED TO ALL DOWNSTREAM PITS.
S4. ALL GULLY PITS TO COUNCIL'S STANDARD AND LINTELS CENTRALLY PLACED AT SAG PITS.
S5. ALL PITS MUST BE BENCHED AND STREAMLINED. PROVIDE SL72 REINFORCEMENT AND STEP IRONS IN ALL PITS OVER 1.2M DEEP.
S6. CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 25 MPA AT 28 DAYS UNLESS SPECIFIED OTHERWISE BY COUNCIL ENGINEER.
S7. ALL INTER ALLOTMENT DRAINAGE MUST HAVE A MINIMUM COVER OF 300mm TO THE TOP OF PIPE UNLESS OTHERWISE APPROVED BY THE COUNCIL ENGINEER.
S8. CATCH DRAINS MUST BE CONSTRUCTED AS PER SWMP.
S9. ALL COMMON DRAINAGE LINES MUST BE LAID CENTRALLY WITHIN 1.2m-3.0m EASEMENTS. CLEANING EYES MUST BE PROVIDED IMMEDIATELY DOWNSTREAM OF ALL SLOPE JUNCTIONS.
S10. ONE HUNDRED (100) YEAR OVERLAND FLOW PATHS MUST BE FORMED AND SHOWN ON WORK AS EXECUTED DRAWINGS.
S11. ADEQUATE PROVISION TO BE MADE FOR SCOURING AND SEDIMENTATION TO ALL DRAINAGE WORKS IN ACCORDANCE WITH WOLLONDILLY SHIRE COUNCILS DEVELOPMENT CODE.
S12. COMMON DRAINAGE LINES MUST BE INSTALLED AFTER SEWERAGE LINES HAVE BEEN INSTALLED WHERE SEWER IS PROPOSED ADJACENT TO INTER ALLOTMENT

GEOTECHNICAL NOTES

GT1. THE CONTRACTOR SHALL IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY, AND TO THE SATISFACTION OF COUNCIL PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND DURING CONSTRUCTION SEE SWMP.
GT2. TESTS SHALL BE UNDERTAKEN ON ANY PROPOSED FILL MATERIALS TO ENSURE THAT THEY DO NOT HAVE A HIGH DISPERSION POTENTIAL AS DEFINED BY EMERSON CRUMB/DISPERSION TESTS (AS1289 C8-1980)
GT3. ALL FILLING AND PAVEMENT CONSTRUCTION MUST BE UNDERTAKEN TO THE REQUIREMENTS OF AS3798-2007 THE FOLLOWING COMPACTION LEVELS ARE RECOMMENDED:

LOT FILLING	98%	STANDARD
ROAD SUB-GRADE	100%	STANDARD
ROAD SUB-BASE	95%	MODIFIED
ROAD BASE	98%	MODIFIED

GT4. ALL TESTING WORKS SHALL BE CONTROLLED AND CERTIFIED BY A N.A.T.A REGISTERED LABORATORY. A COLLATED COPY OF ALL TEST CERTIFICATES, ACCOMPANIED BY AN OVERALL SITE PLAN, CLEARLY INDICATING THE LOCATION OF EACH TEST AND FILL AREAS ETC, AND THE LABORATORY CERTIFICATE COVERING THE WHOLE OF THE AREA TESTED ARE TO BE FORWARDED TO COUNCIL UPON COMPLETION.
GT5. FINAL PAVEMENT THICKNESS TO BE DETERMINED AFTER BOXING OUT BY JOINT INSPECTION BY N.A.T.A REGISTERED LABORATORY AND COUNCIL'S ENGINEER. PAVEMENT REPORT TO BE AVAILABLE TO COUNCIL A MINIMUM OF TWO CLEAR DAYS PRIOR TO INSPECTION.

LEGEND PROPOSED

- STORMWATER PIPE
- GRATED PIT
- JUNCTION PIT
- KERB INLET PIT
- SEDIMENT FENCE
- SEDIMENT TRAP (ST)
- TEMPORARY CONSTRUCTION EXIT
- RAINWATER TANK
- +10.00 PAVEMENT LEVEL
- CONTOURS
- CATCHMENT BOUNDARY
- EDGE STRIP
- KERB & GUTTER
- RETAINING WALL
- SUBSOIL DRAINAGE
- SWALE WITH INFILTRATION TRENCH
- ROADSIDE GUARD RAIL

LEGEND EXISTING

- STORMWATER LINE
- STORMWATER PIT
- WATER LINE
- SEWER LINE
- TELSTRA LINE
- +10.00 EXISTING SPOT LEVEL
- EXISTING CONTOURS
- GAS LINE
- ELECTRICAL LINE

SERVICES ARE SHOWN INDICATIVE ONLY. CONTRACTOR TO CONFIRM ALL SERVICE LOCATIONS PRIOR TO CONSTRUCTION

DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THIS SET OF PLANS

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REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.

Client Title: MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----

Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS — TITLE PAGE

Ref & Dwg No: 23130.DA.C01

Sheet No: Sheet 01 of 14

Scale: AS NOTED @ A1

Date: 23.04.24

Rev: C

A1

CONNECT EXISTING BROWNS ROAD DRAINAGE INTO PROPOSED DRAINAGE NETWORK. EXISTING KERB INLET PITS IN BROWNS ROAD TO BE MAINTAINED

MAKE SMOOTH JOIN WITH EXISTING KERB AND GUTTER ON BROWNS ROAD

INTERSECTION TO DETAILS ON SHEET 05

REMOVE EXISTING HEADWALL

PROVIDE ARMCO GUARD RAIL OR SIMILAR ALONG WESTERN SHOULDER OF INTERSECTION TO DETAILS AT CC STAGE

SILVERDALE ROAD

BROWNS ROAD

BENCH MARK SSM
TOP OF KERB
RL 281.45m
(AHD)

20,000L RAIN WATER TANKS ON EACH LOT. LOCATION TO BE CONFIRMED

REMOVE EXISTING EASEMENT FOR STORMWATER

LOT 101 4006m²
LOT 102 4264m²
LOT 103 4620m²
LOT 104 5663m²
LOT 105 4728m²
LOT 106 4009m²
LOT 107 4298m²
LOT 108 4530m²
LOT 109 4826m²

EXISTING FARM DAM TO REMAIN. INVERT OF DAM TO BE LOWERED TO RL. 272.967m AHD.

EXISTING PIT AND Φ375mm OUTLET PIPE TO BE MAINTAINED

HEADWALL AND SCOUR PROTECTION TO DETAILS ON SHEET 07

CONSTRUCT SWALE TO DIRECT OVERLAND FLOW INTO EXISTING FARM DAM. DETAILS ON SHEET 06

"MAGNUM STONE" RETAINING WALL TO DETAILS AT CC STAGE

TREES TO BE REMOVED CIRCLED IN RED

EACH LOT TO DISCHARGE STORMWATER TO PROPOSED SWALE VIA PIPE OUTLET WITH SCOUR PROTECTION TO DETAILS ON SHEET 07

BIODIVERSITY LAYER. NO TREES WITHIN BIODIVERSITY LAYER ARE REMOVED AS A RESULT OF THE PROPOSED WORKS

PROPOSED INFILTRATION TRENCH WITHIN SWALE TO TREAT STORMWATER FROM THE ROAD RESERVE AND LOTS

CIVIL WORKS PLAN

SCALE 1:750

0 5 10 20 30 50 70
METRES

SCALE 1:750 @A1
1:1500 @A3

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REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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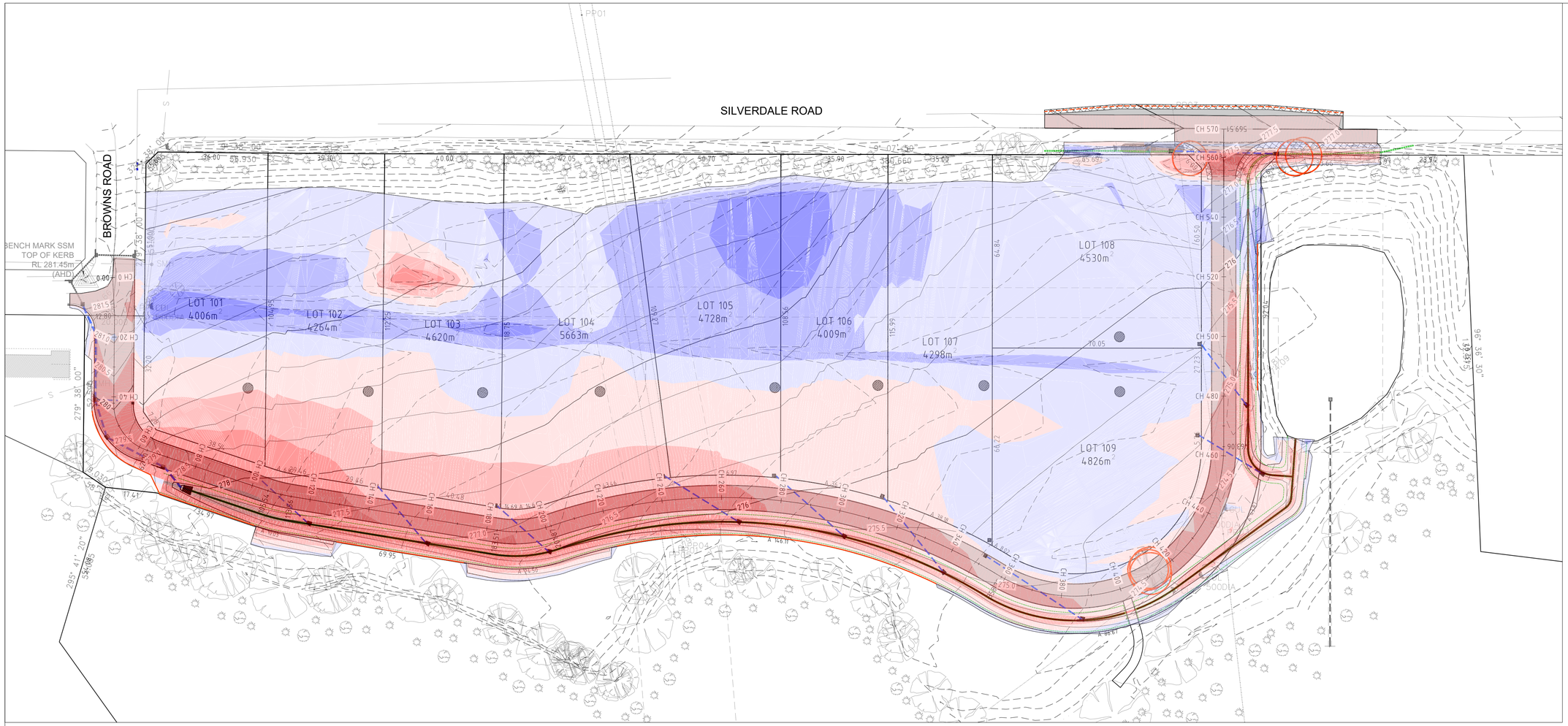
Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.
Client Title	MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----
Dwg Status	DA
Local Authority	WOLLONDILLY
Dwg Title	PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS — CIVIL WORKS PLAN
Ref & Dwg No	23130.DA.C02
Sheet No	Sheet 02 of 14
Scale	1:750 @ A1
Date	23.04.24
Rev	C
	A1



BULK EARTHWORKS PLAN

SCALE 1:750

0 5 10 20 30 50 70

METRES

SCALE 1:750 @A1
1:1500 @A3

SURFACE ELEVATION DATA

NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
1	-3.09	-2.50	
2	-2.50	-2.00	
3	-2.00	-1.50	
4	-1.50	-1.00	
5	-1.00	-0.50	
6	-0.50	0.00	
7	0.00	0.50	
8	0.50	1.00	
9	1.00	1.50	
10	1.50	1.80	

CUT/FILL SUMMARY

- CUT/FILL SUMMARY ASSUMED 200mm TOP SOIL STRIPPING PRIOR TO EXCAVATION OF CUT OR PLACEMENT OF FILL.

- NO ALLOWANCE MADE FOR UNSUITABLE MATERIAL THAT MAY BE ENCOUNTERED ON SITE.

SUMMARY

CUT=	14,095	cu.m
FILL=	17,107	cu.m
EXCAVATION OF TRENCHES=	275	cu.m
EXCAVATION OF PAVEMENT=	1957	cu.m
TOTAL IMPORT OF MATERIAL TO SITE=	780	cu.m

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REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.

Client Title: MR & MRS NOCERA C/-
PROFICIENT CONSTRUCTIONS (AUST)

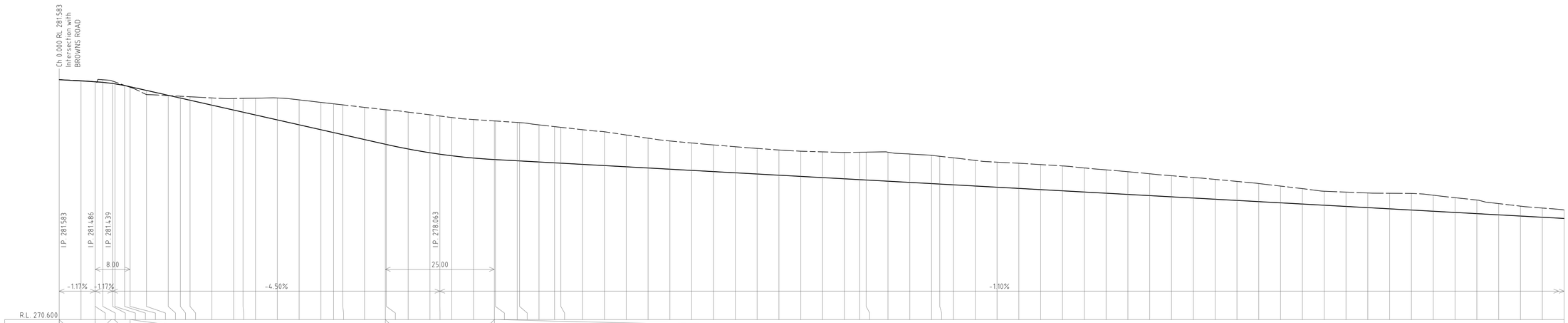
Dwg Status: DA

Local Authority: WOLLONDILLY

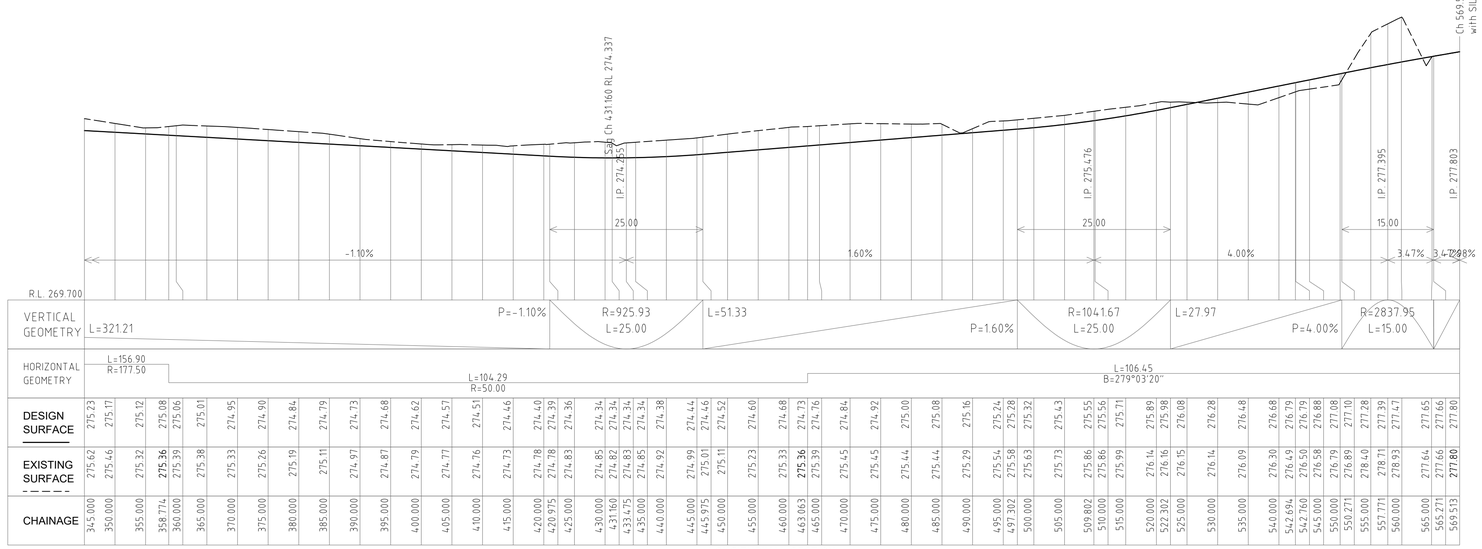
Dwg Title: PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS

BULK EARTHWORKS

Ref & Dwg No	23130.DA.C03
Sheet No	Sheet 03 of 14
Scale	1:750 @ A1
Date	23.04.24
Rev	C
	A1



LONGITUDINAL SECTION
ROAD No. 1 Ch 0.000 to Ch 345.000
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



LONGITUDINAL SECTION
ROAD No. 1 Ch 345.000 to Ch 569.513
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

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REVISIONS No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
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C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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Approved	A.C.

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Dwg Status: DA

Local Authority: WOLLONDILLY

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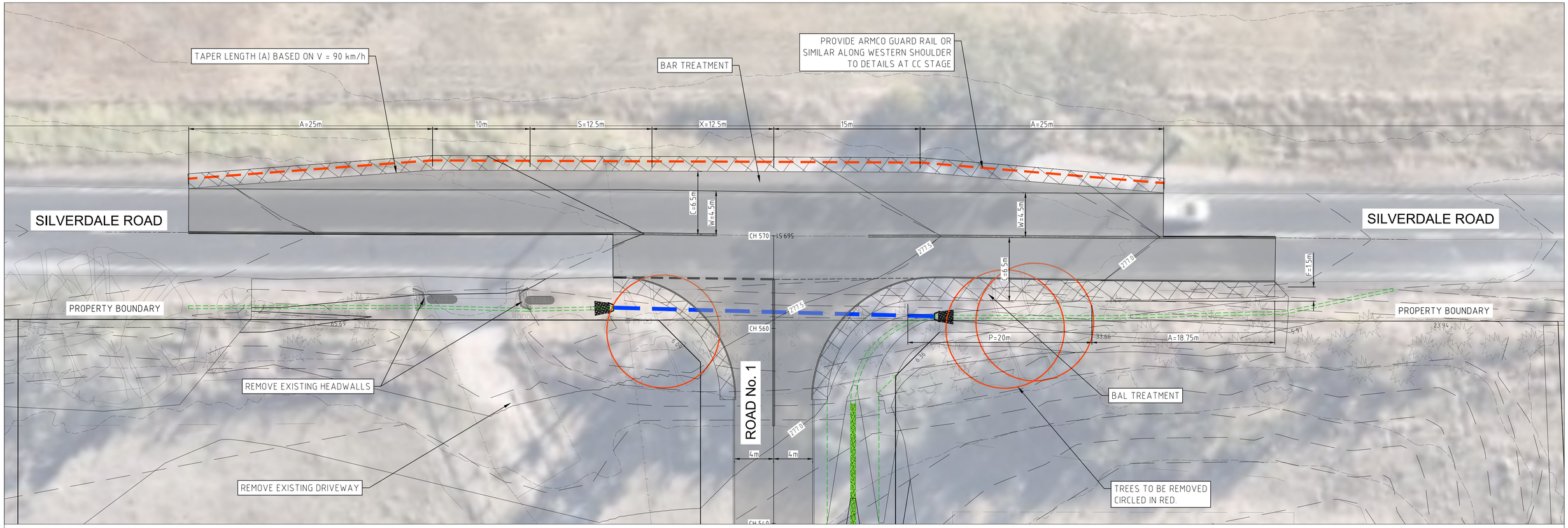
80 SILVERDALE ROAD, THE OAKS

ROAD LONG SECTIONS

Ref & Dwg No	23130.DA.C04
Sheet No	Sheet 04 of 14
Scale	AS NOTED @ A1
Date	23.04.24
Rev	C
	A1



LEGEND

- 40mm AC
- UNSEALED SHOULDER

INTERSECTION PLAN

SCALE 1:200

0 5 10 15 20 25

METRES

SCALE 1:200 @A1
1:400 @A3

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REVISIONS	No.	DESCRIPTION	DRN	APP	DATE
	A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
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PROFICIENT CONSTRUCTIONS (AUST)

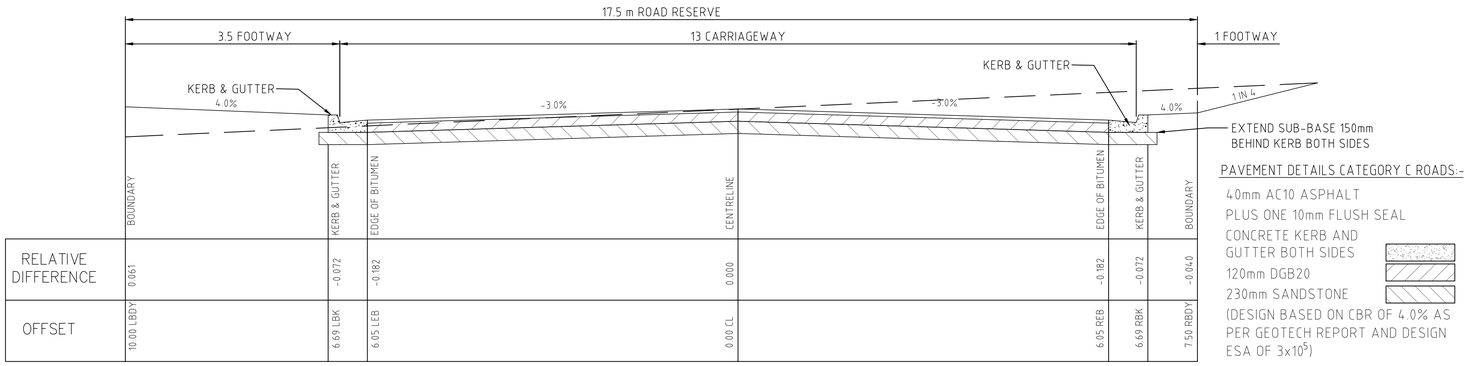
Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS

INTERSECTION PLAN

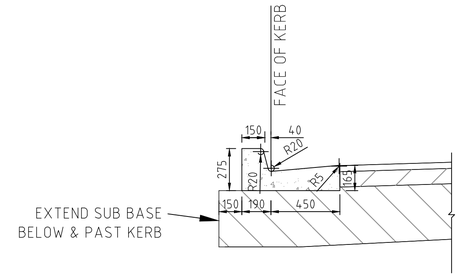
Ref & Dwg No	23130.DA.C05
Sheet No	Sheet 05 of 14
Scale	1:200 @ A1
Date	23.04.24
Rev	C
	A1



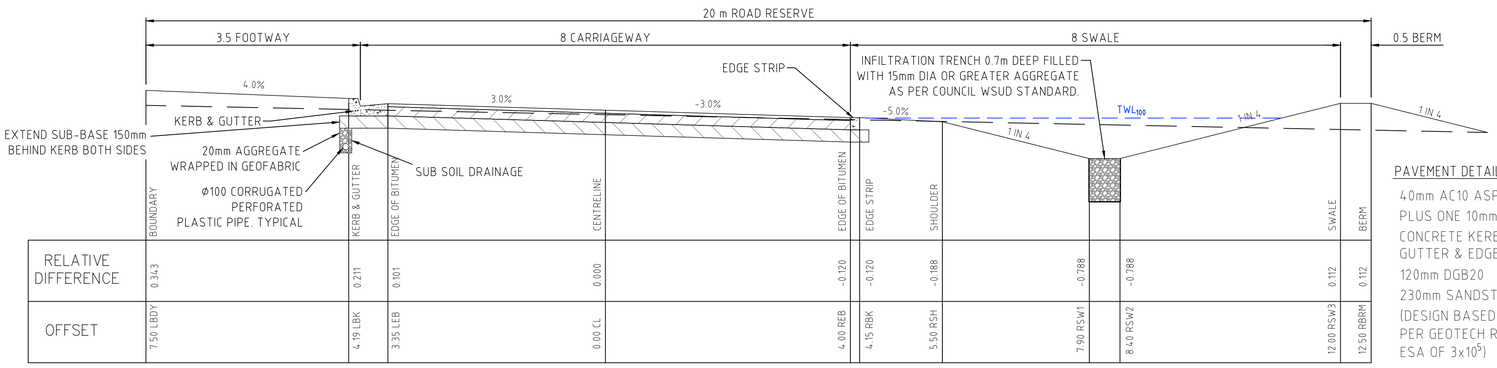
ROAD NO.1, CHAINAGES 0.000 - 71.306
TYPICAL CROSS SECTION
SCALE 1:50

PAVEMENT DETAILS CATEGORY C ROADS:-

40mm AC10 ASPHALT
PLUS ONE 10mm FLUSH SEAL
CONCRETE KERB AND GUTTER BOTH SIDES
120mm DGB20
230mm SANDSTONE
(DESIGN BASED ON CBR OF 4.0% AS PER GEOTECH REPORT AND DESIGN ESA OF $3x10^5$)



KERB AND GUTTER (K&G)
SCALE 1:20



ROAD NO.1, CHAINAGES 71.306 - 101.000
TYPICAL CROSS SECTION
SCALE 1:50

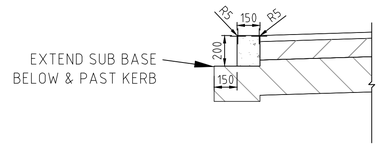
PAVEMENT DETAILS CATEGORY C ROADS:-

40mm AC10 ASPHALT
PLUS ONE 10mm FLUSH SEAL
CONCRETE KERB AND GUTTER & EDGE STRIP
120mm DGB20
230mm SANDSTONE
(DESIGN BASED ON CBR OF 4.0% AS PER GEOTECH REPORT AND DESIGN ESA OF $3x10^5$)

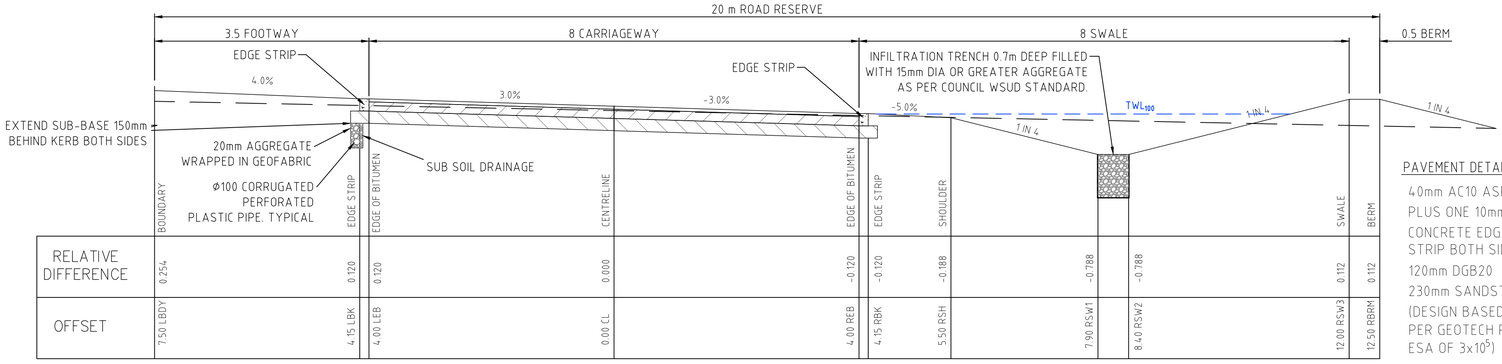
MANNING'S CALCULATIONS

S_0= 1.4% AVERAGE
'n'= 0.03
Q_{cap}= 4.16 m^3/s
V_A= 1.92 m/s
W.P.= 5.91 m
T.W.= 5.75 m
d= 0.66 m
$V.D_{max}$=1.27 m

FLOW CALCULATIONS:
Q_{100YR} = 3.94m^3/s



EDGE STRIP
SCALE 1:20



ROAD NO.1, CHAINAGES 101.000 - 569.513
TYPICAL CROSS SECTION
SCALE 1:50

PAVEMENT DETAILS CATEGORY C ROADS:-

40mm AC10 ASPHALT
PLUS ONE 10mm FLUSH SEAL
CONCRETE EDGE STRIP BOTH SIDES
120mm DGB20
230mm SANDSTONE
(DESIGN BASED ON CBR OF 4.0% AS PER GEOTECH REPORT AND DESIGN ESA OF $3x10^5$)

MANNING'S CALCULATIONS

S_0= 1.4% AVERAGE
'n'= 0.03
Q_{cap}= 4.16 m^3/s
V_A= 1.92 m/s
W.P.= 5.91 m
T.W.= 5.75 m
d= 0.66 m
$V.D_{max}$=1.27 m

FLOW CALCULATIONS:
Q_{100YR} = 3.94m^3/s

No.	DESCRIPTION	DRN	APP	DATE
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Designed	A.C.
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Approved	A.C.

Client Title: MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----

Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS

ROAD TYPICAL SECTIONS

Ref & Dwg No	23130.DA.C06
Sheet No	Sheet 06 of 14
Scale	AS NOTED @ A1
Date	23.04.24
Rev	C
	A1

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CONNECT EXISTING BROWNS ROAD DRAINAGE INTO PROPOSED DRAINAGE NETWORK. EXISTING KERB INLET PITS IN BROWNS ROAD TO BE MAINTAINED

CONSTRUCT HEADWALL AND SCOUR PROTECTION TO PIPE OUTLET DETAIL BELOW TO CONVEY STORMWATER FROM SILVERDALE ROAD INTO ROAD SIDE SWALE. HEADWALL TO SUIT ⌀375mm RCP.

REFER TO FLOOD STUDY FOR DETAILS

SILVERDALE RD

BROWNS RD

BENCH MARK SSM
TOP OF KERB
RL 281.45m
(AHD)

LOT 101 4006m²
LOT 102 4264m²
LOT 103 4620m²
LOT 104 5663m²
LOT 105 4728m²
LOT 106 4009m²
LOT 107 4298m²
LOT 108 4530m²
LOT 109 4826m²

CAT - A/1 0.050ha
CAT - A/2 0.070ha
CAT - A/3 0.022ha
CAT - A/4 0.013ha
CAT - A/5 0.013ha
CAT - B/1 0.050ha
CAT - C/1 0.401ha
CAT - C/2 0.038ha
CAT - D/1 0.426ha
CAT - E/1 0.462ha
CAT - F/1 0.566ha
CAT - G/1 0.473ha
CAT - H/1 0.401ha
CAT - I/1 0.430ha
CAT - J/1 0.483ha
CAT - K/1 0.453ha
CAT - L/1 0.317ha

HEADWALL AND SCOUR PROTECTION TO DETAILS BELOW

WHOLE SITE TO DRAIN TO EXISTING FARM DAM

CONSTRUCT SWALE TO DETAILS ON SHEET 06 TO DIRECT OVERLAND FLOW INTO EXISTING FARM DAM

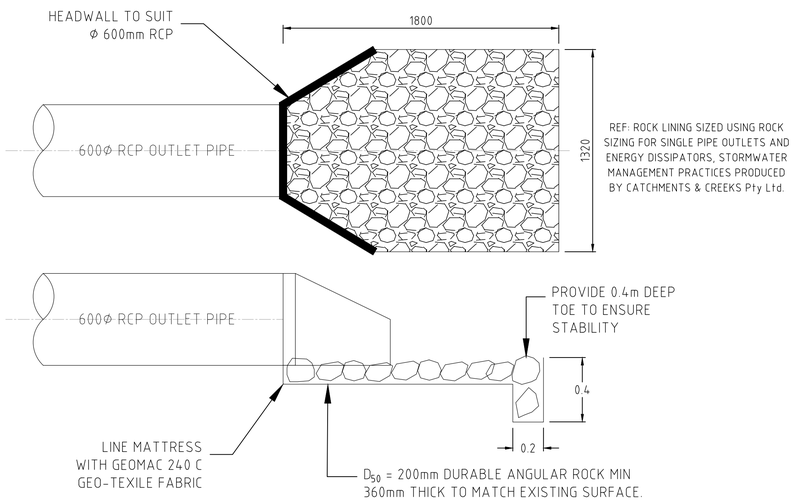
EACH LOT TO DISCHARGE STORMWATER TO PROPOSED SWALE VIA PIPE OUTLET WITH SCOUR PROTECTION TO DETAILS BELOW

CATCHMENT PLAN

SCALE 1:750

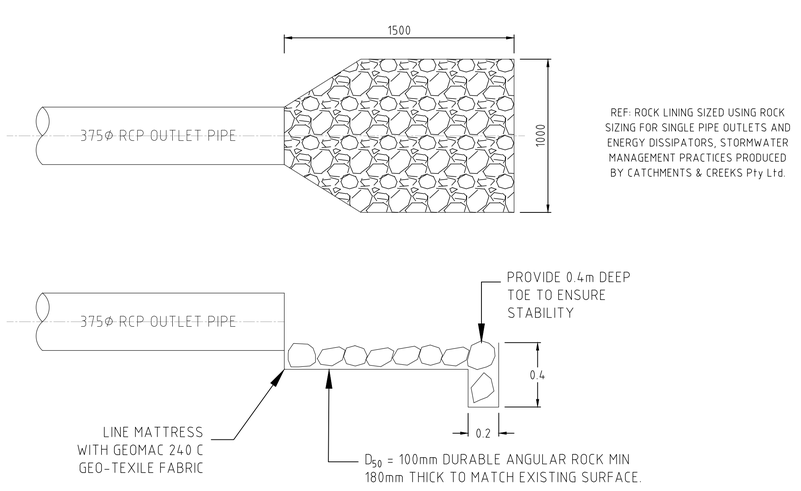
0 5 10 20 30 50 70 METRES

SCALE 1:750 @A1
1:1500 @A3



HEADWALL SCOUR PROTECTION DETAIL

SCALE 1:20



PIPE OUTLET SCOUR PROTECTION DETAIL

SCALE 1:20

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REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
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Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS

CATCHMENT PLAN

Ref & Dwg No	23130.DA.C07
Sheet No	Sheet 07 of 14
Scale	1:750 @ A1
Date	23.04.24
Rev	C
	A1

Pit Schedule - Site Drainage

Pit No.	Pit Type	Pit Width	Pit Length	Outlet Diameter	Outlet Invert RL	Inlet Diameter	Inlet Invert RL	Pit Depth	Pit Lid Level	Easting	Northing	Comment
		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
A/6	HEADWALL					600	277.410	0.165	277.575	276228.01	6227528.060	
A/5	KIP 2.4m Lintel	600	900	600	277.473	600	277.503	1.278	278.751	276218.38	6227519.980	
A/4	KIP 1.2m Lintel	600	900	600	278.244	600	278.269	1.278	279.522	276205.52	6227503.018	
A/3	KIP 2.4m Lintel	600	900	600	278.686	600	278.716	1.278	279.964	276192.60	6227501.243	
A/2	KIP 2.4m Lintel	600	900	600	279.664	600	279.694	1.298	280.962	276171.64	6227504.853	
B/1	KIP 2.4m Lintel	600	900	375	278.783			1.010	279.793	276195.11	6227513.365	
A/1	EXISTING PIT			600	280.070			1.525	281.595	276160.29	6227501.904	
C/3	PIPE OUTLET					225	276.910	0.033	276.943	276244.51	6227564.859	
C/2	KIP 2.4m Lintel	600	900	225	277.050	225	277.080	0.962	278.012	276225.63	6227549.698	
C/1	GSIP 900x900	900	900	225	277.105			1.200	278.305	276221.97	6227552.953	
D/2	PIPE OUTLET					225	276.420	0.059	276.479	276257.22	6227602.852	
D/1	GSIP 900x900	900	900	225	276.546			1.200	277.746	276235.94	6227589.544	
E/2	PIPE OUTLET					225	275.955	0.102	276.057	276266.61	6227643.070	
E/1	GSIP 900x900	900	900	225	276.074			1.200	277.274	276248.68	6227627.955	
F/2	PIPE OUTLET					225	275.300	0.034	275.334	276266.64	6227707.255	
F/1	GSIP 900x900	900	900	225	275.447			1.200	276.647	276247.88	6227685.002	
G/2	PIPE OUTLET					225	274.900	0.064	274.964	276276.74	6227741.277	
G/1	GSIP 900x900	900	900	225	275.052			1.200	276.252	276253.55	6227721.755	
H/2	PIPE OUTLET					225	274.494	0.035	274.529	276294.05	6227772.522	
H/1	GSIP 900x900	900	900	225	274.656			1.200	275.856	276266.11	6227756.356	
I/3	PIPE OUTLET					225	273.966	0.054	274.020	276317.27	6227815.989	
I/2	JP 900x900	600	600	225	274.183	225	274.184	1.087	275.270	276291.18	6227787.473	
I/1	GSIP 900x900	900	900	225	274.238			1.200	275.438	276286.25	6227789.604	
J/2	PIPE OUTLET					225	273.484	0.000	273.484	276278.20	6227882.826	
J/1	GSIP 900x900	900	900	225	273.862			1.200	275.062	276262.52	6227863.996	
K/2	PIPE OUTLET					225	274.209	0.028	274.237	276255.11	6227881.785	
K/1	GSIP 900x900	900	900	225	274.338			1.200	275.538	276232.47	6227869.665	
L/2	HEADWALL					375	275.927	1.030	276.957	276173.36	6227904.242	
L/1	HEADWALL			375	276.265			1.201	277.466	276167.17	6227871.048	

HGL Report - Site Drainage Return Period: 20%yrs Location: depths The Oaks-2016

Pipe Connecting Pits (Downstream Upstream)	Pipe ID	Pipe Class	Pipe Diameter	Pipe Length	Pipe Design Flow	Mannings n	Pipe Velocity	Pipe Part Velocity	Pipe Velocity Head	HGL at Downstream Pit	Pipe Friction Slope	Pipe Friction Loss	HGL at Upstream Pit	Pit Loss Coefficient	Pipe Head Loss	Adopted Upstream Water Level	Pit Surcharge Level (Pit Inlet/Outlet Level)	Downstream Pipe Obvert	Upstream Pipe Obvert	Downstream Pipe Invert	Upstream Pipe Invert	Pipe Slope	Pipe Design Flow	Pipe HGL Capacity	Pipe Manning Capacity
			(mm)	(m)	(l/s)		(m/s)	(m/s)	(m)	(m)	(%)	(m)	(m)	Ku	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(l/s)	(l/s)	(l/s)
A/2 A/1		Class 3 RCP	600	11.724	0.0	0.013	0.00	0.000	0.000	280.292	0.00	0.000	280.668	18.000	0.000	280.668	281.595	280.292	280.668	279.694	280.070	3.207	0.0	1500.5	0.0
A/3 A/2		Class 3 RCP	600	21.267	13.3	0.013	0.05	1.478	0.000	279.169	0.00	0.000	280.117	2.200	0.000	280.117	280.962	279.314	280.262	278.716	279.664	4.458	13.3	1773.9	1284.9
A/4 A/3		Class 3 RCP	600	13.046	27.0	0.013	0.10	1.634	0.000	278.751	0.00	0.000	279.168	2.650	0.001	279.169	279.964	278.867	279.284	278.269	278.686	3.196	27.0	1497.9	1088.0
A/5 A/4		Class 3 RCP	600	21.282	29.5	0.013	0.10	1.727	0.001	278.009	0.00	0.000	278.750	1.014	0.001	278.751	279.522	278.101	278.842	277.503	278.244	3.482	29.5	1564.6	1135.6
A/6 A/5		Class 3 RCP	600	12.571	31.9	0.013	0.11	0.900	0.001	278.008	0.00	0.000	278.008	1.000	0.001	278.009	278.751	278.008	278.071	277.410	277.473	0.501	31.9	578.9	430.8
A/3 B/1		Class 3 RCP	375	12.380	16.5	0.013	0.15	1.195	0.001	279.366	0.00	0.001	279.367	17.659	0.020	279.387	279.793	279.366	279.158	278.991	278.783	-1.680	16.5	318.3	227.3
C/2 C/1		Class 3 RCP	225	4.901	55.6	0.013	1.35	1.349	0.093	277.806	0.01	0.035	277.840	4.394	0.408	278.248	278.305	277.309	277.334	277.080	277.105	0.510	55.6	46.8	33.6
C/3 C/2		Class 3 RCP	225	24.211	83.3	0.013	2.02	2.023	0.209	277.139	0.02	0.373	277.512	1.407	0.294	277.806	278.012	277.139	277.279	276.910	277.050	0.578	83.3	50.0	35.8
D/2 D/1		Class 3 RCP	225	25.099	59.1	0.013	1.44	1.436	0.105	276.649	0.01	0.200	276.849	4.144	0.436	277.285	277.746	276.649	276.775	276.420	276.546	0.502	59.1	46.4	33.3
E/2 E/1		Class 3 RCP	225	23.452	64.1	0.013	1.56	1.556	0.123	276.184	0.01	0.218	276.402	3.838	0.474	276.876	277.274	276.184	276.303	275.955	276.074	0.507	64.1	46.6	33.5
F/2 F/1		Class 3 RCP	225	29.106	78.5	0.013	1.91	1.907	0.186	275.529	0.01	0.400	275.929	3.158	0.586	276.515	276.647	275.529	275.676	275.300	275.447	0.505	78.5	46.5	33.4
G/2 G/1		Class 3 RCP	225	30.320	65.6	0.013	1.59	1.592	0.129	275.129	0.01	0.295	275.424	3.754	0.485	275.909	276.252	275.129	275.281	274.900	275.052	0.501	65.6	46.3	33.3
H/2 H/1		Class 3 RCP	225	32.278	55.6	0.013	1.35	1.350	0.093	274.723	0.01	0.229	274.952	4.391	0.408	275.360	275.856	274.723	274.885	274.494	274.656	0.502	55.6	46.4	33.3
I/2		Class 3 RCP	225	38.650	59.6	0.013	1.45	1.447	0.107	274.195	0.01	0.313	274.508	1.545	0.165	274.673	275.270	274.195	274.412	273.966	274.183	0.562	59.6	49.2	35.3
I/1		Class 3 RCP	225	5.379	59.6	0.013	1.45	1.447	0.107	274.673	0.01	0.044	274.717	4.113	0.440	275.156	275.438	274.413	274.467	274.184	274.238	1.000	59.6	66.6	47.1
J/2 J/1		Class 3 RCP	225	24.504	66.9	0.013	1.63	1.625	0.135	273.713	0.01	0.248	274.091	3.680	0.496	274.587	275.062	273.713	274.091	273.484	273.862	1.543	66.9	83.4	58.5
K/2 K/1		Class 3 RCP	225	25.683	62.8	0.013	1.53	1.526	0.119	274.438	0.01	0.230	274.668	3.912	0.464	275.132	275.538	274.438	274.567	274.209	274.338	0.502	62.8	46.4	33.4
L/2 L/1		Class 3 RCP	375	33.767	60.2	0.013	0.55	1.441	0.015	276.302	0.00	0.024	276.416	11.235	0.170	276.587	277.466	276.302	276.640	275.927	276.265	1.000	60.2	243.5	175.3

Hydrologic Design Sheet -Site Drainage Return Period: 20% Location: depths The Oaks-2016

Pit	Catchment Flow Length	Catchment Slope	Catchment Roughness	Catchment Flow Time	Gutter Flow Time	Total Time	Pit C Factor	Total Catchment Area	Aera Contributing	Rainfall Intensity	Total Catchment Flow	Pit Type	Gutter Pit Inflow	Gutter Slope	Total Upstream Catchment
	(m)	(%)	'n'	(min)	(min)	(min)		(ha)	(l/s)	(mm/hr)	(l/s)		(l/s)	(%)	(ha)
A/1									0.0	118.9		SITEPLUS			0.0
A/2				20.00		20	1.000	0.07	0.1	68.4	13.3	SITEPLUS	9.3		0.1
	93.45	5.3	0.012				1.000	0.05							
							0.000								
	93.45	5.3	0.300				1.000	0.02							
A/3				5.00		5	1.000	0.02	0.1	118.9	7.3	SITEPLUS	5.1		0.1
	30.55	4.5	0.012				1.000	0.02							
							0.000								
	4.85	4.0	0.300				1.000	0.01							
A/4				5.00		5	1.000	0.01	0.2	118.9	4.3	SITEPLUS	3.0		0.2
	20.63	3.1	0.012				1.000	0.01							
							0.000								
	9.22	4.0	0.300				1.000	0.00							
A/5				5.00		5	1.000	0.01	0.2	118.9	4.3	SITEPLUS	3.0		0.2
	26.69	1.8	0.012				1.000	0.01							
							0.000								
	1.99	9.3	0.300				1.000	0.00							
B/1				5.00		5	1.000	0.05	0.1	118.9	16.5	SITEPLUS	11.6		0.1
	56.03	3.0	0.012				1.000	0.04							
							0.000								
	4.78	7.8	0.300				1.000	0.02							
C/1				20.00		20	1.000	0.40	0.4	68.4	76.1	SITEPLUS	22.8		0.4
	109.38	3.9	0.012				1.000	0.12							
							0.000								
	109.38	3.9	0.300				1.000	0.28							
C/2				5.00		5	1.000	0.04	0.4	118.9	12.6	SITEPLUS	8.8		0.4
	57.14	1.9	0.012				1.000	0.03							
							0.000								
	4.23	6.1	0.300				1.000	0.01							
D/1				20.00		20	1.000	0.43	0.4	68.4	81.0	SITEPLUS	24.3		0.4
	112.45	3.5	0.012				1.000	0.13							
							0.000								
	112.45	3.5	0.300				1.000	0.30							
E/1				20.00		20	1.000	0.46	0.5	68.4	87.8	SITEPLUS	26.3		0.5
	121.66	3.0	0.012				1.000	0.14							
							0.000								
	121.66	3.0	0.300				1.000	0.32							
F/1				20.00		20	1.000	0.57	0.6	68.4	107.6	SITEPLUS	32.3		0.6
	116.70	3.0	0.012				1.000	0.17							
							0.000								
	116.70	3.0	0.300				1.000	0.40							
G/1				20.00		20	1.000	0.47	0.5	68.4	89.8	SITEPLUS	26.9		0.5
	116.04	3.0	0.012				1.000	0.14							
							0.000								
	116.04	3.0	0.300				1.000	0.33							
H/1				20.00		20	1.000	0.40	0.4	68.4	76.2	SITEPLUS	22.9		0.4
	235.82	3.0	0.012				1.000	0.12							
							0.000								
	235.82	3.0	0.300				1.000	0.28							
I/2									0.4	118.9		SITEPLUS			0.4
I/1				20.00		20	1.000	0.43	0.4	68.4	81.7	SITEPLUS	24.5		0.4
	129.77	2.6	0.012				1.000	0.13							
							0.000								
	129.77	2.6	0.300				1.000	0.30							
J/1				20.00		20	1.000	0.48	0.5	68.4	91.7	SITEPLUS	27.5		0.5
	73.99	2.8	0.012				1.000	0.14							
							0.000								
	73.99	2.8	0.300				1.000	0.34							
K/1				20.00		20	1.000	0.45	0.5	68.4	86.1	SITEPLUS	25.8		0.5
	93.04	3.0	0.012				1.000	0.14							
							0.000								
	93.04	3.0	0.300				1.000	0.32							
L/1				20.00		20	1.000	0.32	0.3	68.4	60.2	SITEPLUS	42.2		0.3
	357.76	8.6	0.012				1.000	0.22							
							0.000								
	357.76	8.6	0.300				1.000	0.10							

T:\Projects\23130 80 Silverdale Road, The Oaks\Dwg\DA\23130_Drainage.dwg

REVISIONS	No.	DESCRIPTION	DRN	APP	DATE
	A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
	B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
	C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.

Client Title: MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----

Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS

DRAINAGE CALCULATIONS

Ref & Dwg No: 23130.DA.C08

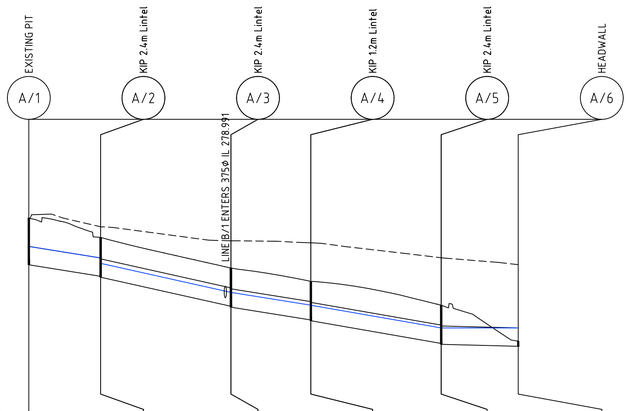
Sheet No: Sheet 08 of 14

Scale: AS NOTED @ A1

Date: 23.04.24

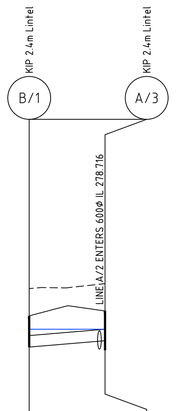
Rev: C

A1



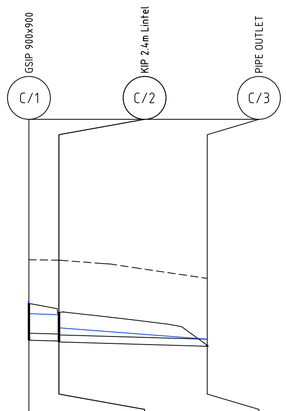
CAPACITY (l/sec)		0		1285		1088		1136		431	
FLOW (l/sec)		0.00		13.30		26.98		29.45		31.92	
PIPE DETAILS		600ø Class 3 RCP		600ø Class 3 RCP		600ø Class 3 RCP		600ø Class 3 RCP		600ø Class 3 RCP	
GRADE		3.207%		4.458%		3.196%		3.482%		0.501%	
DATUM RL 272.4											
HGL	280.668		280.292	280.117		279.169	279.168		278.751	278.750		278.009	278.008		278.008
DEPTH TO INVERT	1.525		1.268	1.298		1.248	1.278	1.253	1.278	1.248	1.278		0.165
INVERT LEVEL	280.070		279.694	279.664		278.716	278.686	278.269	278.244	277.503	277.473		277.410
FINISHED SURFACE	281.595		280.962			279.964		279.522		278.751			277.575
EXISTING SURFACE	281.557		281.311			280.854		280.789		280.299			280.074
CHAINAGE	0.000		11.724	11.724		21.267	32.991		13.046	46.037		21.282	67.319		12.571	79.890

LINE A
SCALES: HORIZ 1:500 VERT 1:100



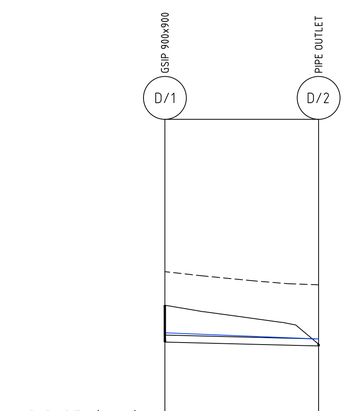
CAPACITY (l/sec)		227	
FLOW (l/sec)		16.52	
PIPE DETAILS		375ø Class 3 RCP	
GRADE		-1.680%	
DATUM RL 273.8			
HGL	279.387		279.366
DEPTH TO INVERT	1.010		0.973
INVERT LEVEL	278.783		278.991
FINISHED SURFACE	279.793		279.964
EXISTING SURFACE	280.691		280.854
CHAINAGE	0.000		12.380	12.380

LINE B
SCALES: HORIZ 1:500 VERT 1:100



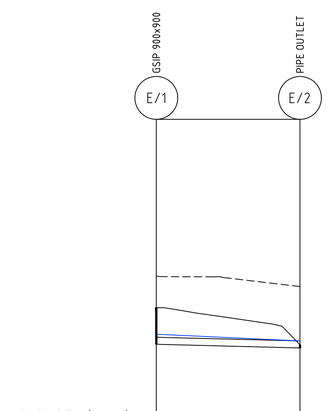
CAPACITY (l/sec)		34		36	
FLOW (l/sec)		55.56		83.33	
PIPE DETAILS		225ø Class 3 RCP		225ø Class 3 RCP	
GRADE		0.510%		0.578%	
DATUM RL 271.9					
HGL	278.383		277.940	277.512		277.139
DEPTH TO INVERT	1.200		0.932	0.962		0.033
INVERT LEVEL	277.105		277.080	277.050		276.910
FINISHED SURFACE	278.305		278.012			276.943
EXISTING SURFACE	279.734		279.719			279.125
CHAINAGE	0.000		4.901	4.901		29.112

LINE C
SCALES: HORIZ 1:500 VERT 1:100



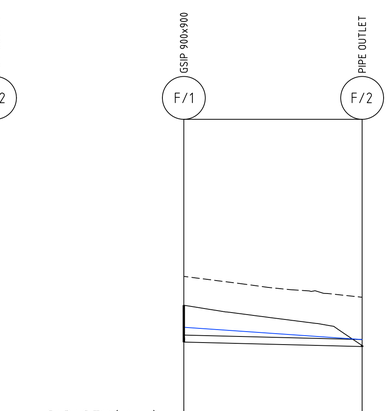
CAPACITY (l/sec)		33	
FLOW (l/sec)		59.14	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.502%	
DATUM RL 271.4			
HGL	277.285		276.649
DEPTH TO INVERT	1.200		0.059
INVERT LEVEL	276.546		276.420
FINISHED SURFACE	277.746		276.479
EXISTING SURFACE	278.845		278.415
CHAINAGE	0.000		25.099	25.099

LINE D
SCALES: HORIZ 1:500 VERT 1:100



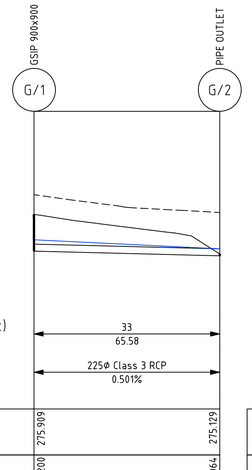
CAPACITY (l/sec)		34	
FLOW (l/sec)		64.08	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.507%	
DATUM RL 271			
HGL	276.876		276.184
DEPTH TO INVERT	1.200		0.102
INVERT LEVEL	276.074		275.955
FINISHED SURFACE	277.214		276.057
EXISTING SURFACE	278.296		277.959
CHAINAGE	0.000		23.452	23.452

LINE E
SCALES: HORIZ 1:500 VERT 1:100



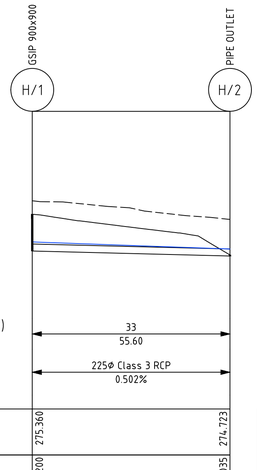
CAPACITY (l/sec)		33	
FLOW (l/sec)		78.55	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.505%	
DATUM RL 270.3			
HGL	276.515		275.529
DEPTH TO INVERT	1.200		0.034
INVERT LEVEL	275.447		275.300
FINISHED SURFACE	276.647		275.334
EXISTING SURFACE	277.590		276.909
CHAINAGE	0.000		29.106	29.106

LINE F
SCALES: HORIZ 1:500 VERT 1:100



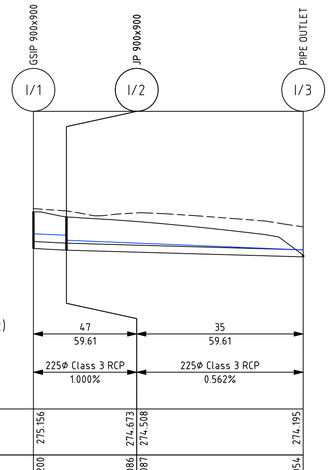
CAPACITY (l/sec)		33	
FLOW (l/sec)		65.58	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.501%	
DATUM RL 269.9			
HGL	275.909		275.129
DEPTH TO INVERT	1.200		0.064
INVERT LEVEL	275.052		274.900
FINISHED SURFACE	276.252		274.964
EXISTING SURFACE	276.896		276.313
CHAINAGE	0.000		30.320	30.320

LINE G
SCALES: HORIZ 1:500 VERT 1:100



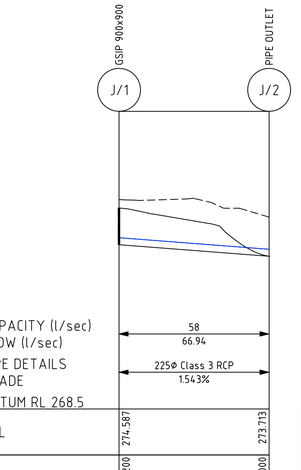
CAPACITY (l/sec)		33	
FLOW (l/sec)		55.60	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.502%	
DATUM RL 269.5			
HGL	275.360		274.723
DEPTH TO INVERT	1.200		0.035
INVERT LEVEL	274.656		274.494
FINISHED SURFACE	275.856		274.529
EXISTING SURFACE	276.297		275.687
CHAINAGE	0.000		32.278	32.278

LINE H
SCALES: HORIZ 1:500 VERT 1:100



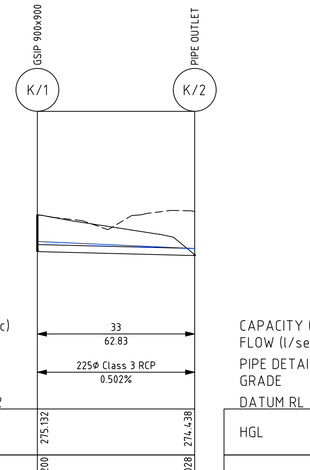
CAPACITY (l/sec)		47		35	
FLOW (l/sec)		59.61		59.61	
PIPE DETAILS		225ø Class 3 RCP		225ø Class 3 RCP	
GRADE		1.000%		0.562%	
DATUM RL 269					
HGL	275.156		274.673	274.508		274.095
DEPTH TO INVERT	1.200		1.086	1.087		0.054
INVERT LEVEL	274.238		274.184	274.183		273.966
FINISHED SURFACE	275.438		275.270			274.020
EXISTING SURFACE	275.541		275.465			274.946
CHAINAGE	0.000		5.379	5.379		38.650	44.029

LINE I
SCALES: HORIZ 1:500 VERT 1:100



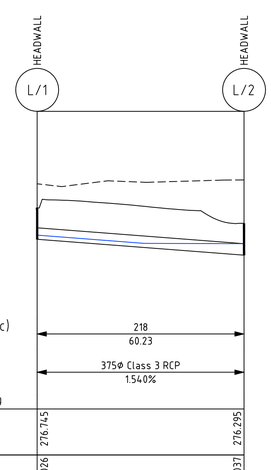
CAPACITY (l/sec)		58	
FLOW (l/sec)		66.94	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		1.543%	
DATUM RL 268.5			
HGL	274.587		273.713
DEPTH TO INVERT	1.200		0.000
INVERT LEVEL	273.862		273.484
FINISHED SURFACE	275.062		273.484
EXISTING SURFACE	275.337		274.761
CHAINAGE	0.000		24.504	24.504

LINE J
SCALES: HORIZ 1:500 VERT 1:100



CAPACITY (l/sec)		33	
FLOW (l/sec)		62.83	
PIPE DETAILS		225ø Class 3 RCP	
GRADE		0.502%	
DATUM RL 269.2			
HGL	275.132		274.438
DEPTH TO INVERT	1.200		0.028
INVERT LEVEL	274.338		274.209
FINISHED SURFACE	275.538		274.237
EXISTING SURFACE	275.543		275.647
CHAINAGE	0.000		25.683	25.683

LINE K
SCALES: HORIZ 1:500 VERT 1:100



CAPACITY (l/sec)		218	
FLOW (l/sec)		60.23	
PIPE DETAILS		375ø Class 3 RCP	
GRADE		1.540%	
DATUM RL 270.9			
HGL	276.745		276.295
DEPTH TO INVERT	1.026		1.037
INVERT LEVEL	276.440		275.920
FINISHED SURFACE	277.468		276.957
EXISTING SURFACE	278.250		278.377
CHAINAGE	0.000		33.767	33.767

LINE L
SCALES: HORIZ 1:500 VERT 1:100

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REVISIONS	No.	DESCRIPTION	DRN	APP	DATE
	A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
	B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
	C	REVISED TO COMMENTS	I.B.	A.C.	23.04.24
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	----	----	----	----	----

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Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.

Client Title: MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----

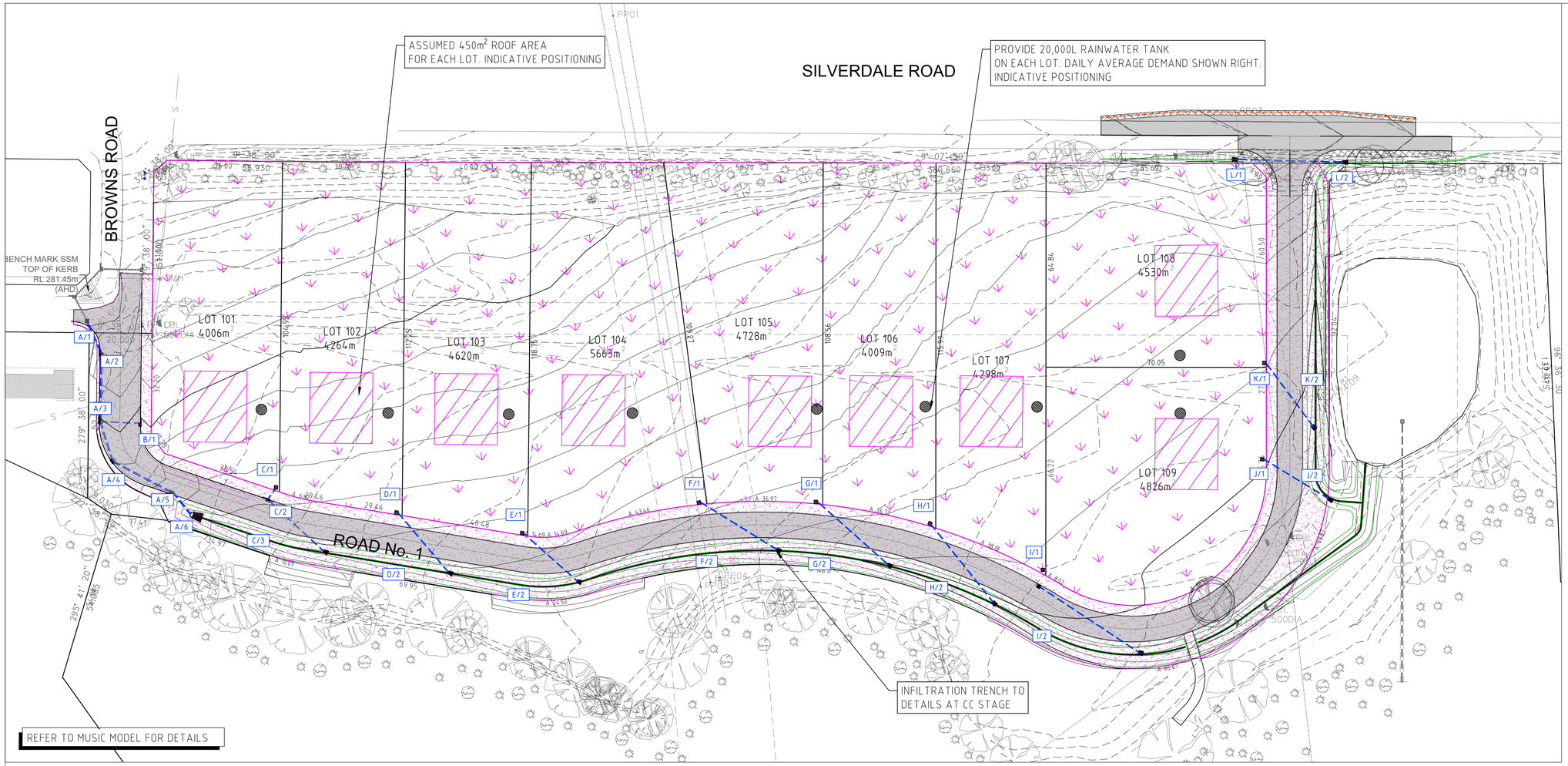
Dwg Status: DA

Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS

DRAINAGE LONG SECTIONS

Ref & Dwg No	23130.DA.C09
Sheet No	Sheet 09 of 14
Scale	AS NOTED @ A1
Date	23.04.24
Rev	C
	A1



MUSIC CATCHMENT PLAN

SCALE 1:750

0 5 10 20 30 50 70

METRES

SCALE 1:750 @A1
1:1500 @A3

WATER QUALITY MUSIC MODEL RESULTS

BASED ON THE WATER QUALITY MEASURES OUTLINED IN THE WOLLONDILLY WUSD GUIDELINE, THE FOLLOWING FLOW REDUCTION WAS ATTAINED:

FLOW	13.400 ML/yr

REFER TO SITEPLUS'S MUSIC MODEL FOR DETAILS. WOLLONDILLY WUSD GUIDELINES REQUIRES RESIDUAL FLOW RANGING BETWEEN 2.5-3.0 ML/yr/ha

SITE REQUIREMENT CALCULATION:

DEVELOPMENT AREA	= 5.193 ha
RESIDUAL FLOW RANGE	= 12.983 - 15.579 ML/yr

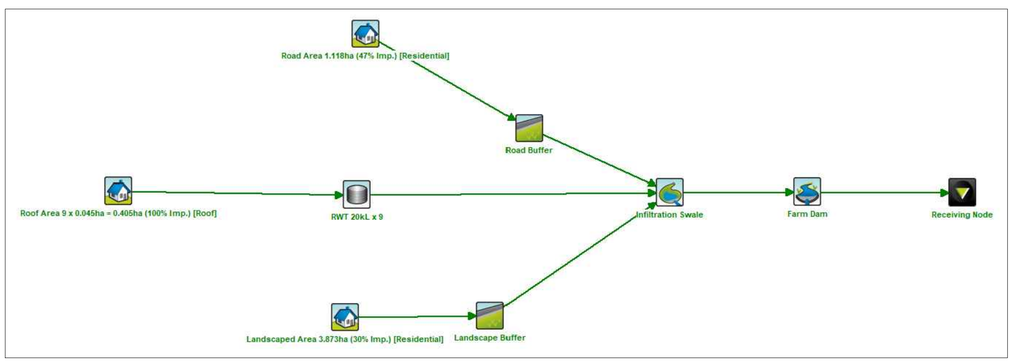
RAINWATER TANK AVERAGE DAILY DEMAND

RAINWATER REUSE WAS BASED ON THE METHODOLOGY OUTLINED IN THE WOLLONDILLY WUSD GUIDELINE:

SIZE OF ROOF	= 450 m²
MIN SIZE OF RWT	= 18,000 L
MIN AVG DAILY DEMAND	= 2,700 L/day

LEGEND

- ROOF AREA 450m² 100% IMPERVIOUS
- LANDSCAPE AREA 30% IMPERVIOUS
- ROAD RESERVE AREA 47% IMPERVIOUS



MUSIC SCHEMATIC

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	39.6	13.4	66.2
Total Suspended Solids (kg/yr)	5440	399	92.7
Total Phosphorus (kg/yr)	10.2	1.79	82.4
Total Nitrogen (kg/yr)	81.9	21.7	73.5
Gross Pollutants (kg/yr)	907	0	100

MUSIC RESULTS

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REVISIONS

No.	DESCRIPTION	DRN	APP	DATE
A	PRELIMINARY CLIENT ISSUE	I.B.	A.C.	14.03.24
B	REVISED EARTHWORKS	I.B.	A.C.	05.04.24
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Height Datum	A.H.D
Drawn	I.B.
Designed	A.C.
Checked	A.C.
Approved	A.C.
Client Title	MR & MRS NOCERA C/- PROFICIENT CONSTRUCTIONS (AUST) ----
Dwg Status	DA
Local Authority	WOLLONDILLY
Dwg Title	PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS — MUSIC CATCHMENT PLAN
Ref & Dwg No	23130.DA.C10
Sheet No	Sheet 10 of 14
Scale	1:750 @ A1
Date	23.04.24
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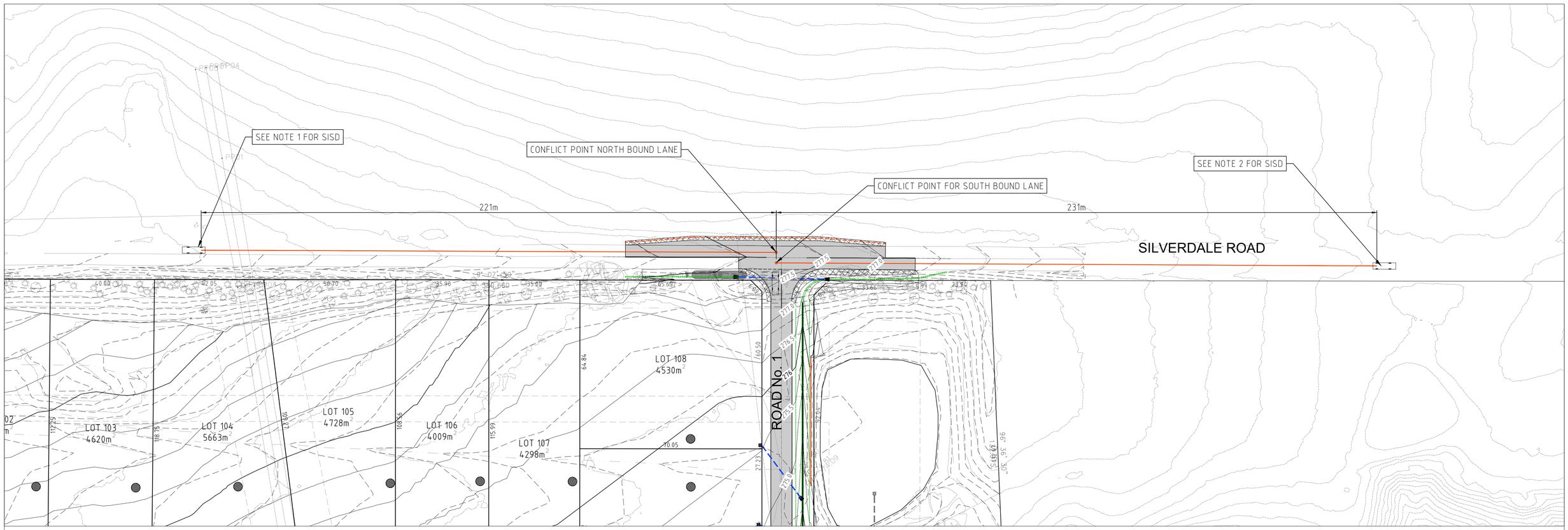

SAFE INTERSECTION SIGHT DISTANCE

SCALE 1:750

0 5 10 20 30 50 70

METRES

SCALE 1:750 @A1
1:1500 @A3

NOTE 1: HORIZONTAL SAFE INTERSECTION SIGHT DISTANCE

TABLE 3.2 AND TABLE 3.3 FROM AUSTROADS UNSIGNALLED INTERSECTIONS SAFE INTERSECTION SIGHT DISTANCE (SISD):

RURAL SISD FOR 90km/h = 226 m

APPROXIMATE ROAD GRADIENT = 1.8 %
UPGRADE CORRECTION TO SISD = -5 m

THEREFORE SISD FOR 90km/h = 221 m

NOTE 2: HORIZONTAL SAFE INTERSECTION SIGHT DISTANCE

TABLE 3.2 AND TABLE 3.3 FROM AUSTROADS UNSIGNALLED INTERSECTIONS SAFE INTERSECTION SIGHT DISTANCE (SISD):

RURAL SISD FOR 90km/h = 226 m

APPROXIMATE ROAD GRADIENT = -2.0 %
DOWNGRADE CORRECTION TO SISD = + 5 m

THEREFORE SISD FOR 90km/h = 231 m

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PROFICIENT CONSTRUCTIONS (AUST)

Dwg Status: DA
Local Authority: WOLLONDILLY

Dwg Title: PROPOSED SUBDIVISION
80 SILVERDALE ROAD, THE OAKS

INTERSECTION SIGHT DISTANCE

Ref & Dwg No	23130.DA.C11
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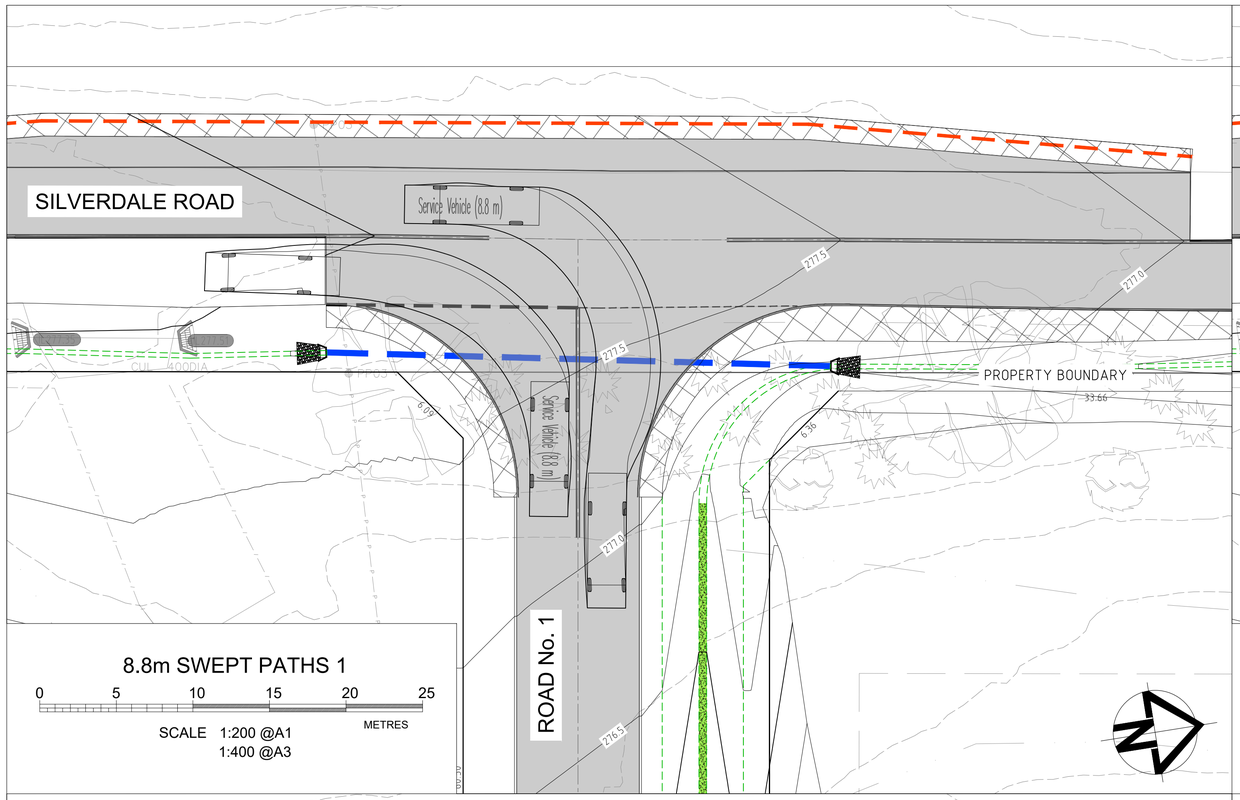
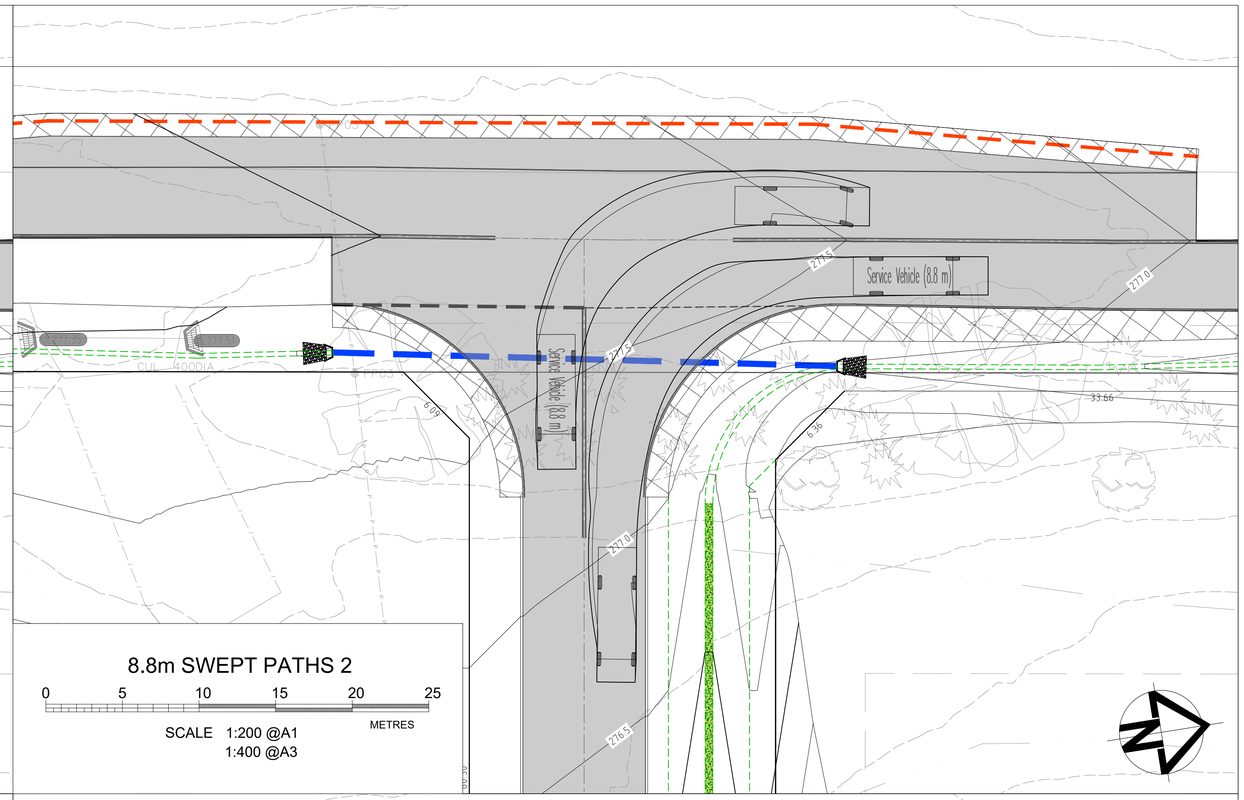


8.8m SWEPT PATHS 1

0 5 10 15 20 25 METRES

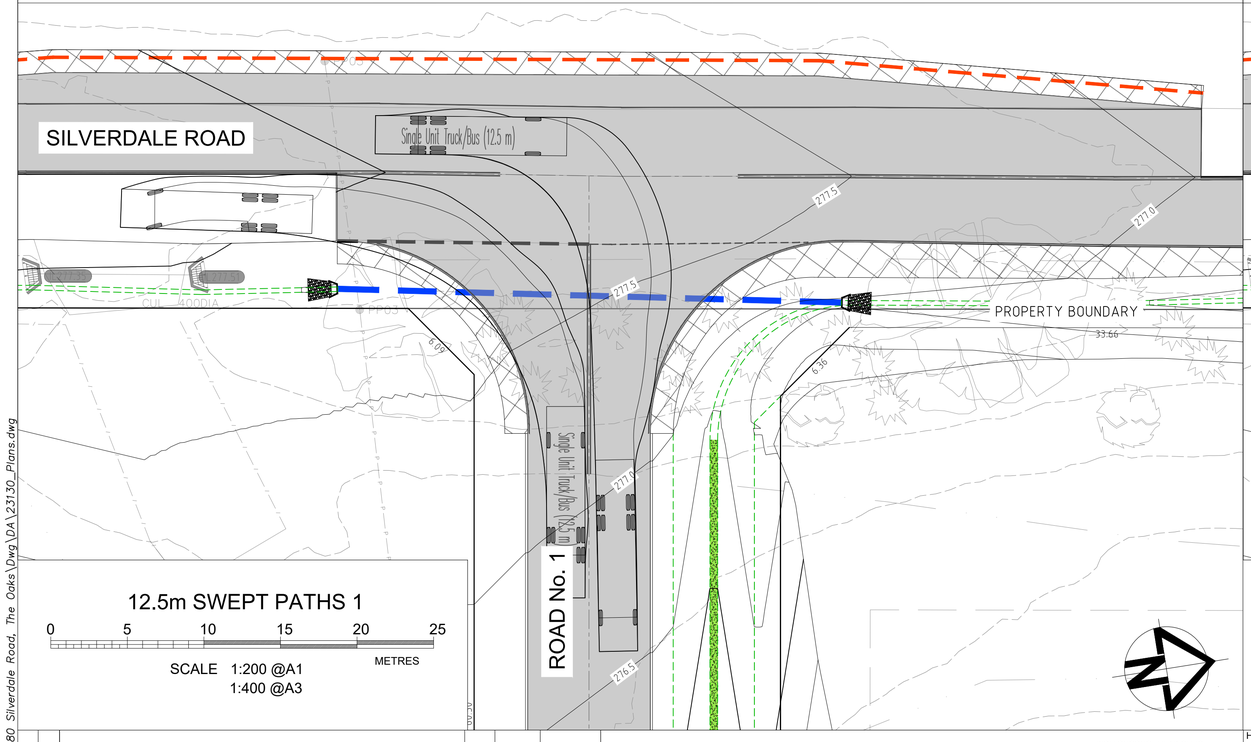
SCALE 1:200 @A1
1:400 @A3



8.8m SWEPT PATHS 2

0 5 10 15 20 25 METRES

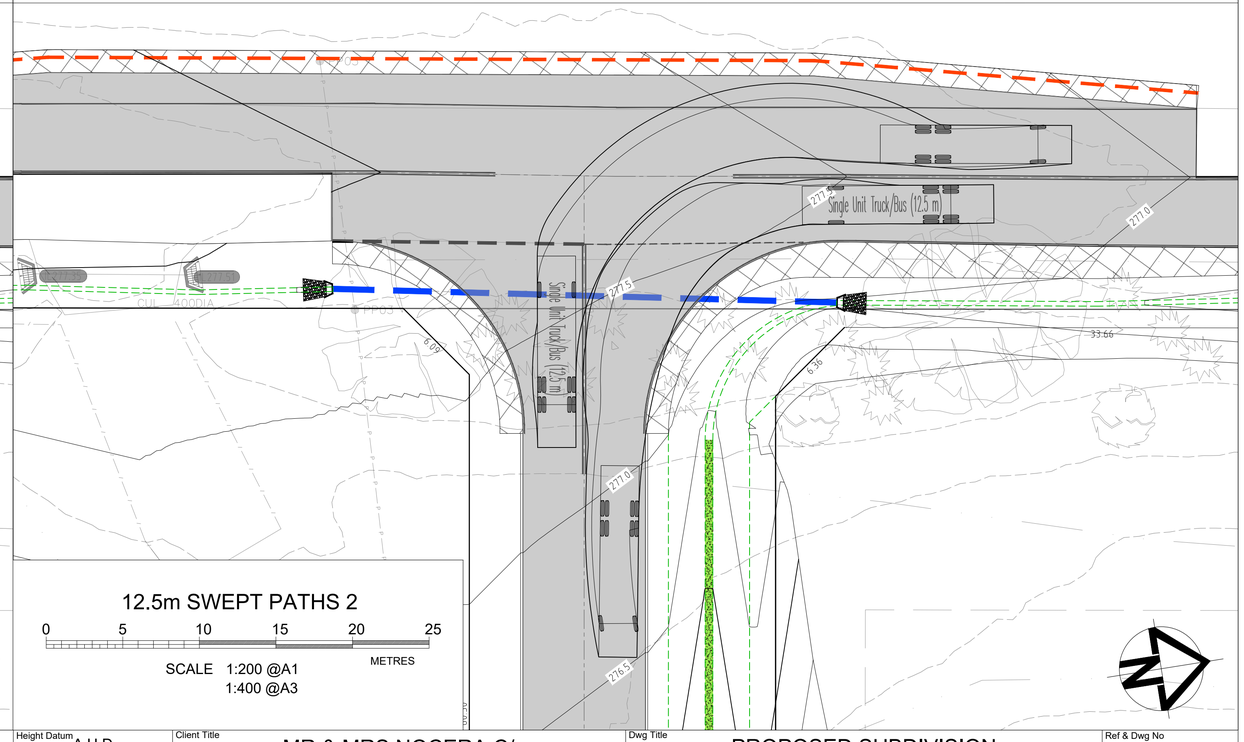
SCALE 1:200 @A1
1:400 @A3



12.5m SWEPT PATHS 1

0 5 10 15 20 25 METRES

SCALE 1:200 @A1
1:400 @A3



12.5m SWEPT PATHS 2

0 5 10 15 20 25 METRES

SCALE 1:200 @A1
1:400 @A3

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Dwg Title	PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS INTERSECTION SWEPT PATHS
Ref & Dwg No	23130.DA.C12
Sheet No	Sheet 12 of 14
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Date	23.04.24
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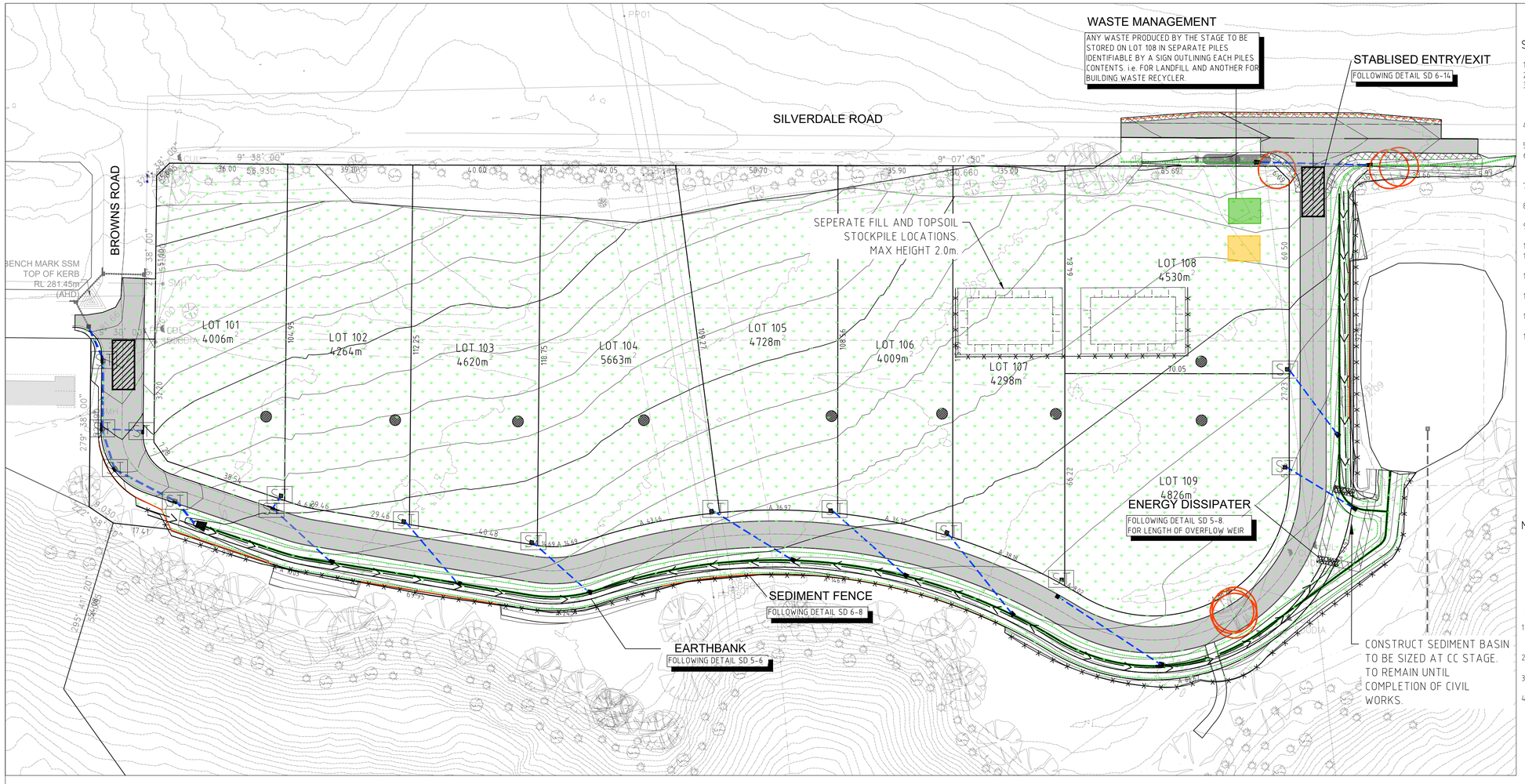

STATEMENT OF SOIL MANAGEMENT

1 ALL TOPSOIL IS TO BE STOCKPILED IN AREAS DESIGNATED ON PLAN.
2 ALL FORMED EMBANKMENTS (CUT & FILL) ARE TO BE SEEDED WITHIN 7 DAYS.
3 ALL DISTURBED AREAS INCLUDING ANY CONTROLLED FILL ARE TO BE TOPSOILED & SEEDED PRIOR TO COMPLETION OF WORKS. ALL DISTURBED AREAS THAT WILL NOT BE STABILIZED WITHIN 2 MONTHS MUST BE TEMPORARILY REVEGETATED WITHIN 7 DAYS OF CLEARING. AREAS THAT FAIL TO ESTABLISH MUST BE RESOWN IMMEDIATELY.
4 ALL GULLY PITS ARE TO BE PROVIDED WITH SEDIMENT FILTER BARRIERS SUCH AS STRAW BAIL OR SANDBAGS.
5 PROVIDE TEMPORARY DIVERSION BANKS ON SITE AS DIRECTED.
6 AT THE TOP OF ALL FILL EMBANKMENTS, PROVIDE A BERM TO PREVENT WATER RUNNING DOWN EMBANKMENTS, BERM IS TO BE MAINTAINED AT ALL TIMES AS THE FILL EMBANKMENT PROGRESSES TO FINAL LEVEL.
7 ALL FORMED EMBANKMENTS (CUT & FILL) TO BE TOPSOILED & SEEDED/FERTILIZED ON FINAL TRIMMING.
8 FOR TEMPORARY REVEGETATION PURPOSES, THE REVEGETATION MIXTURE SHOULD BE TO COUNCIL SPECIFICATIONS
9 TRENCHES FOR INTERLOT DRAINAGE LINES ARE TO BE REINSTATED WITH TOPSOIL FOLLOWING PIPE INSTALLATION & BACKFILLING & IMMEDIATELY SEEDED/FERTILIZED
10 THE GROUND SHALL BE TYNED / SCARIFIED TO A MIN DEPTH 100mm PRIOR TO SEEDING
11 CONTRACTOR SHOULD LIASE REGULARLY WITH ENGINEER TO DETERMINE AREAS WHICH CAN BE PROGRESSIVELY REVEGETATED
12 TO ASSIST IN DUST CONTROL/WIND EROSION A TRACKIFIER SUCH AS CUROSOL SHOULD BE USED. OR EQUIVALENT ENDORSED PRODUCT BY EPA, RATES AS PER MANUFACTURES SPECIFICATION
13 DESIGNATED PLANT AND MACHINERY ACCESSWAYS TO BE DEFINED ONSITE BY THE INSTALLATION OF PARAWEBBING FENCING TO MINIMIZE UNNECESSARY SITE DISTURBANCE.
14 IT IS THE CONTRACTORS RESPOSIBILITY TO MAINTAIN SOIL EROSION CONTROL DEVICES AND CONTROL DUST.
15 A LOG BOOK IS TO BE MAINTAINED ON SITE, MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
(i) THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS;
(ii) THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS AND WETHER IT IS LIKELY TO BE EFFECTIVE UNTIL THE NEXT AUDIT;
(iii) INSTALLATION, REMOVAL & REPAIRS OF ANY EROSION CONTROLS;
(iv) THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE;
(v) THE NEED FOR DUST PREVENTION STRATERGIES;
(vi) ANY REMEDIAL WORKS TO BE UNDERTAKEN;
(vii) INSTANCES RESULTING IN DAMAGE TO CONTROLS, ACCIDENTAL OR OTHERWISE;
(viii) TIME, DATE, VOLUME AND TYPE OF ANY FLOCCULANTS;
(ix) TIME, DATE, VOLUME AND TYPE OF SEDIMENT REMOVED FROM CONTROL STRUCTURES AND WHERE IT HAS BEEN DISPOSED;

THE LOG BOOK IS TO KEPT ON-SITE AND MADE AVAILABLE ON SITE TO ANY ONE REQUIRING IT. IT SHOULD ALSO CONTAIN MAINTAINENCE REQUIREMENTS AND PROCEDURES FOR ANY CONTROL REQUIRING IT.

MAINTENANCE PROCEDURES DURING CONSTRUCTION

1 ALL EROSION CONTROL MEASURES ARE TO BE MAINTAINED AT ALL TIMES SO THAT THOSE MEASURES ARE FULLY FUNCTIONAL / OPERATIONAL DURING THE CURRENCY OR WORKS. ALL SUCH CONTROLS MUST ALSO BE FULLY FUNCTIONAL / OPERATIONAL SHOULD WORK OPERATIONS CEASE TEMPORARILY, (e.g. WEEKENDS, ROSTERED DAYS OFF, etc.) 2 RESPREAD MATERIAL GAINED DURING MAINTENANCE OPERATION OR ALTERNATIVELY PLACE ON STOCKPILES.

GENERAL NOTES

1 REMOVE ALL SOIL & SPOIL MATERIAL FROM THE ROADWAY & GUTTER SYSTEM FOR THAT SECTION OF TRENCHING & / OR OTHER WORKS CARRIED OUT ON ANY ONE DAY. THIS IS TO BE UNDERTAKEN ON THE COMPLETION OF EACH DAY'S WORK.
2 ABSTAIN FROM PLACING SPOIL / STOCKPILES ON OR IN THE IMMEDIATE VICINITY OF THE KERB & GUTTER SYSTEM. A MINIMUM SET BACK OF THREE (3) METRES WILL BE REQUIRED.
3 STOCKPILES REFERED TO IN ITEM 2 ARE NOT TO BE PLACED WITHIN FIFTEEN (15) METRES EITHER SIDE OF KERB INLET PITS. THIS IS TO BE REGARDED AS A DESIGNATED EXCLUSION ZONE.
4 WHERE ROCK IS ENCOUNTERED DURING THE TRENCHING OPERATIONS & THIS MATERIAL IS CONSIDERED TO BE UNSUITABLE AS BACKFILL, THEN ALL OVERSIZED ROCK WILL BE REQUIRED TO BE REMOVED FROM THE SITE & WILL NOT BE PERMITTED TO REMAIN ON THE SURFACE OF REGRADING & SURFACE PREPARATION PRIOR TO SEEDING DISTURBED AREAS.

LEGEND PROPOSED

- LEVEL SPREADER
- STORMWATER PIPE
- GRATED PIT
- JUNCTION PIT
- KERB INLET PIT
- SEDIMENT FENCE
- SEDIMENT TRAP
- STABILISED CONSTRUCTION EXIT
- DISTURBED AREA
- DIVERSION BANK AND CHANNEL
- BARRIER FENCE
- DIVERSION BANK ONLY

SOIL AND WATER MANAGEMENT PLAN

SCALE 1:750

0 5 10 20 30 50 70 METRES

SCALE 1:750 @A1
1:1500 @A3

NOTE: All erosion and sediment controls must be in accordance with Landcom's Managing Urban Stormwater, Soils and Construction, Volume 1, 4th Edition, March 2004

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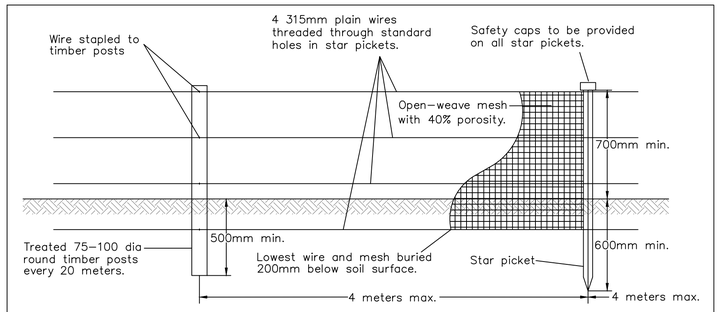
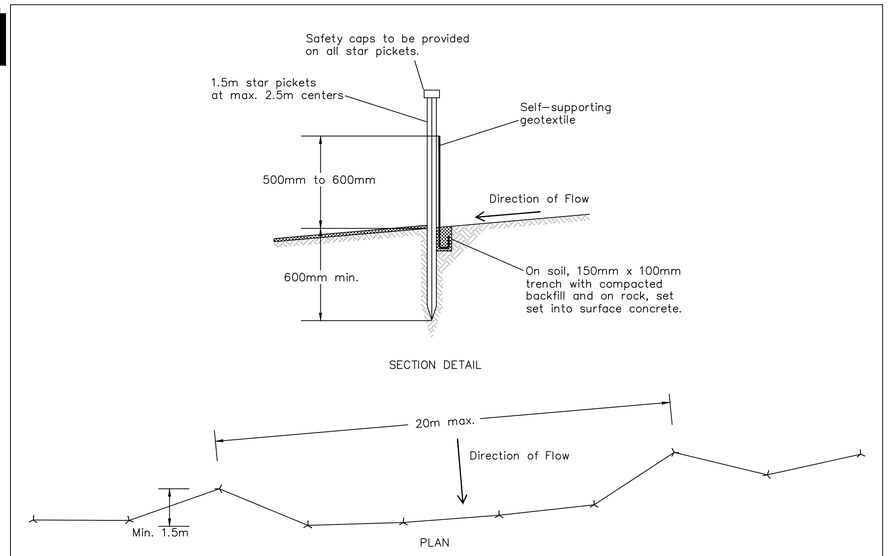
Dwg Status	DA
Local Authority	WOLLONDILLY
Dwg Title	PROPOSED SUBDIVISION 80 SILVERDALE ROAD, THE OAKS SOIL & WATER MANAGEMENT PLAN
Ref & Dwg No	23130.DA.C13
Sheet No	Sheet 13 of 14
Scale	1:750 @ A1
Date	23.04.24
Rev	C
	A1

NOTE: All erosion and sediment controls must be in accordance with Landcom's Managing Urban Stormwater, Soils and Construction, Volume 1, 4th Edition, March 2004



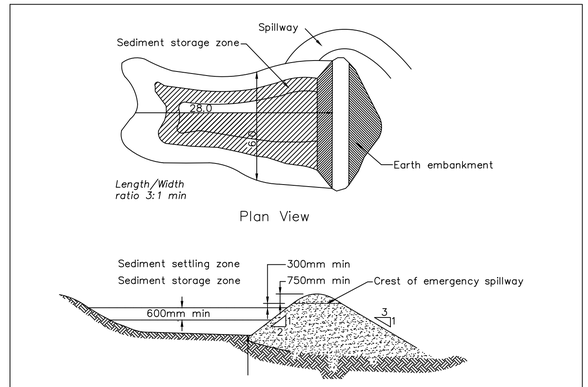
CONTROL OF WIND EROSION – SD 6–15

NOT TO SCALE



SEDIMENT FENCE – SD 6–8

NOT TO SCALE

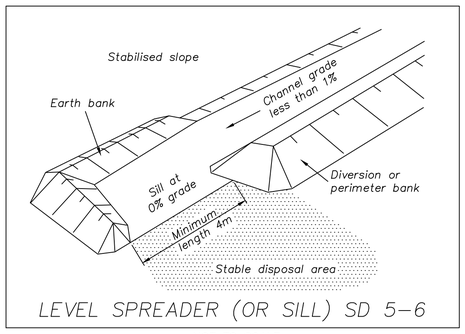


NOTES:

1. *Remove all vegetation and topsoil from under dam wall and from within storage area.*
2. *Construct cut–off trench 500mm deep and 1200mm wide along centreline of the embankment extending to a point on the gully wall level with riser crest.*
3. *Maintain the trench free of water and recompact the materials with equipment specified in the S SWMP to 95 per cent Standard Proctor Density.*
4. *Select fill according to the directions of the SWMP that is free of roots, wood, rock, large stones or foreign material.*
5. *Prepare the site under the embankment by ripping at least 100mm deep to help bond compacted fill to existing substrate.*
6. *Spread fill in 100mm to 150mm layers and compact at optimum moisture content in accordance with the SWMP.*
7. *Construct emergency spillway.*
8. *Rehabilitate structure in accordance with SWMP.*
9. *Place a "Full of Sediment" marker to show when less than design capacity occurs and sediment removal is required.*

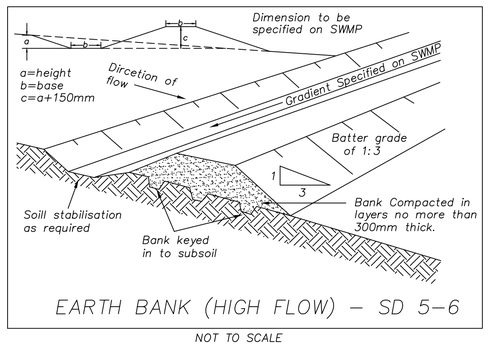
WET SEDIMENT BASIN – SD 6–4

NOT TO SCALE



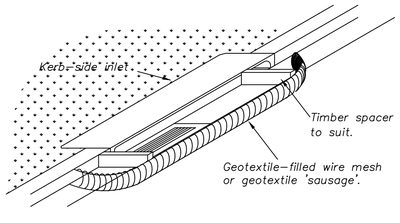
LEVEL SPREADER (OR SILL) SD 5–6

NOT TO SCALE



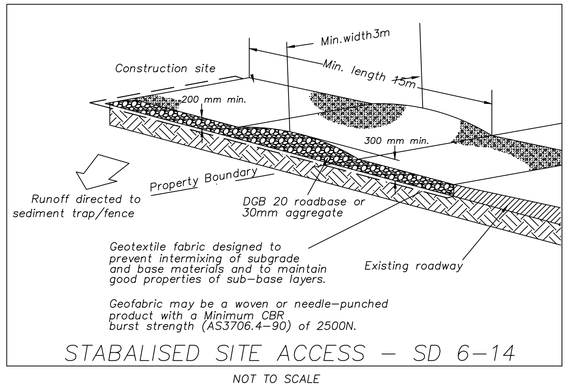
EARTH BANK (HIGH FLOW) – SD 5–6

NOT TO SCALE



MESH AND GRAVEL INLET FILTER – SD 6–11

NOT TO SCALE



STABALISED SITE ACCESS – SD 6–14

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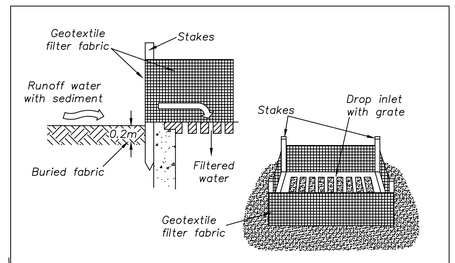

GEOTEXTILE INLET FILTER – SD 6–12

NOT TO SCALE

BASIN TO BE TREATED WITH GYPSUM FLOCCULANT AT THE RATE OF 32 kg/100 m^3 OF STORED WATER. THE BASIN SHOULD THEN BE DRAINED FOLLOWING A PERIOD OF AT LEAST 3 DAYS, PROVIDING WATER ANALYSIS TESTS SHOW SUSPENDED SEDIMENT CONCENTRATIONS ARE BELOW 50 mg/l.

Flocculation

NOT TO SCALE

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SOIL & WATER MANAGEMENT DETAILS

Ref & Dwg No	23130.DA.C14
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