



E chris@taylorenviro.com.au
P 0400 301 364
W taylorenviro.com.au
M PO Box 4291, Springfield QLD 4300
ABN 37 147 807 420
QBCC Licence Number 15055672

Reconfiguring a Lot

On-Site Wastewater and Effluent Disposal System Design

17 Courtney Drive,
Upper Coomera QLD 4209

Report #	TE222215
Date	14 October 2022

Document Control Table

		Taylor Environmental Project Number: TE222215 Reconfiguring a Lot On-Site Wastewater and Effluent Disposal Assessment 17 Courtney Drive, Upper Coomera QLD 4209		
Revision	Date	Revision Details	Author	Approver
A	14 October 2022	Issue A	M. Mahony	Chris Taylor

Table of Contents

1	Introduction	3
1.1	Background	3
1.2	Proposal	3
1.3	Scope of Works	3
1.4	Assumptions	3
1.5	Legislation and Standards	3
2	Site and Soil Evaluation	4
2.1	Site Details	4
2.2	Soil Investigation	4
2.3	Site constraints	4
2.4	Existing Dwellings	5
3	Wastewater System Solution Design	5
3.1	Treatment Plant	5
3.2	Setback Distances	5
3.3	Design volume	6
3.4	Land Application Area	6
4	Comments and Recommendations	7
Appendix A	System Design Drawings	8
Appendix B	Development Plan	10

1 Introduction

1.1 Background

Taylor Environmental (Australia) Pty Ltd was engaged to undertake an on-site wastewater system assessment for the proposed reconfiguration of 17 Courtney Drive, Upper Coomera QLD 4209. This property is not serviced by a municipal water or sewer network and requires all wastewater to be managed on site.

This report will provide an assessment to support the Development Application for the reconfiguration of Lot 182 on RP156422 with regards to domestic onsite wastewater treatment and effluent disposal.

1.2 Proposal

It is proposed to reconfigure the existing property into 2 Lots:

- Lot 1 – Existing dwelling
- Lot 2 – Vacant

1.3 Scope of Works

The scope of works for this assessment are outlined below:

- Undertake a desktop study of the property, including a review of the development, sensitive environments, geology and slope
- Carry out a site inspection
- Investigate the receiving soil
- Determine a suitable location and method of effluent disposal for the proposed Lots
- Prepare plans for the wastewater management system for Council consideration

1.4 Assumptions

For the purposes of this assessment, the following assumptions have been made:

- The new vacant Lot will have a 5-bedroom dwelling
- Each Lot will have rainwater supply
- Each Lot requires onsite wastewater management

1.5 Legislation and Standards

This report has been completed in accordance with the relevant legislative requirements:

- Plumbing and Drainage Act
- Plumbing and Drainage Regulation
- Queensland Plumbing and Wastewater Code
- AS/NZS 1547:2012 On-site Domestic Wastewater Management
- Plumbing Code of Australia (PCA)

2 Site and Soil Evaluation

2.1 Site Details

Details of the subject property are presented in Table 1, below.

Table 1: Property Details

Feature	Details
Property Address	17 Courtney Drive, Upper Coomera QLD 4209
Property Description	Lot 182 on RP156422
Local Authority	City of Gold Coast
Property size	33,410 m ²
Water Supply	Rainwater

2.2 Soil Investigation

The design characteristics for effluent disposal are presented in Table 2.

Table 2: Soil Type

	BH1	BH2	BH3
Topsoil	0 – 400 Sandy Silty Loam <i>Category 3</i>	0 – 400 Sandy Silty Loam <i>Category 3</i>	0 – 400 Sandy Silty Loam <i>Category 3</i>
Subsoil	400 – 1000 Clay Loam <i>Category 4</i>	400 – 1000 Clay Loam <i>Category 4</i>	400 – 1000 Clay Loam <i>Category 4</i>
Structure	Weak	Weak	Weak
Permeability	0.12 – 0.5 m/day	0.12 – 0.5 m/day	0.12 – 0.5 m/day
Design Irrigation Rate (DIR)	3.5 mm/day	3.5 mm/day	3.5 mm/day
Design Irrigation Rate (DIR) with slope reduction	2.8 mm/day	2.8 mm/day	2.8 mm/day
Design Loading Rate (DLR)	20 mm/day	20 mm/day	20 mm/day

2.3 Site constraints

Table 3 presents the details of the proposed Lots and their constraints with regards to onsite wastewater treatment and disposal.

Table 3: Environmental Constraints

Lot	Type	Size	Slope	BLE	Drainage Path	Dam	MSES
1	Existing House	1.255 ha	17 %	✗	✗	✗	✗
2	Vacant	2.085 ha	15 %	✓	✓	✓	✓

The main constraint for both properties is the slope, however the Lots are large enough that there is sufficient space for a sustainable land application area with consideration to the grade and surface waters.

2.4 Existing Dwellings

The existing primary dwelling on Lot 1 has a greywater pumpout tank and a septic tank and trenches. The cottage has an all-waste septic tank and trenches. All systems are in sound working order and are located within the proposed property boundary.

The proposed Lot can accommodate a new land application area in the future if the septic systems need replacing.

3 Wastewater System Solution Design

3.1 Treatment Plant

For the new Lot, it is required to install a treatment plant with a Treatment Plant Approval for Advanced Secondary Effluent Quality such as Taylex ABS, due to the dam. Primary septic systems are not feasible. Table 4 presents the effluent standards produced by approved wastewater treatment systems with advanced secondary effluent.

Table 4: Effluent Quality: Advanced Secondary

Parameter	Advanced Secondary Effluent	
	90% of samples	Maximum
BOD ₅	≤ 10 mg/L	20 mg/L
TSS	≤ 10 mg/L	20 mg/L
E. coli (Where disinfection is required)	≤ 10 cfu/100mL	30 cfu/100mL
Free Available Chlorine (chlorine disinfection)	Minimum 0.5 mg/L	
Turbidity (UV disinfection)	n/a	10 NTU

3.2 Setback Distances

The *Queensland Plumbing and Wastewater Code V1:2019* Appendix Part 2, Table T3 and Table T5, outlines minimum setback separation distances required for land application areas. These distances are presented in Table 5.

Table 5: Separation Distances: Advanced Secondary

Type	Feature	Separation Distance		
		Up Slope	Down Slope	Level
Subsurface	Property boundaries, pedestrian paths, walkways, recreation areas, retaining walls, footings	2 m	4 m	2 m
	Inground swimming pool	6 m	6 m	6 m
	Inground potable water tank	6 m	6 m	6 m
Surface	Property boundaries, pedestrian paths	2 m		
	Water edge of swimming pool	6 m		
	Dwellings, recreation area	10 m		
All	Top of bank of watercourse / waterbody	10 m		
	Open stormwater drainage channel or drain	10 m		
	Bore or dam	10 m		
	Permanent water table (vertical)	0.3 m		

3.3 Design volume

Assuming the new vacant Lot has a 5-bedroom dwelling with rainwater supply, the design volume will be 960 L/day/Lot:

- 5 bedrooms = 8 persons
- Rainwater = 120 L/p/day
- Total design volume = $8 \times 120 = 960$ L/day

3.4 Land Application Area

Based on the assumptions in this assessment, the proposed vacant Lot can support a land application area of irrigation or subsurface infiltration.

A 375m² 'effluent disposal envelope' has been nominated that can sufficiently accommodate a land application area and reserve area (where required) for a future 5-bedroom dwelling. The characteristics of the envelope are:

- 25m x 15m = 375m²
- 15% slope
- Open grassy area with good sun and wind exposure
- Suitable to accommodate different types of advanced secondary effluent disposal
- Located next to the building envelope (around the hillside) and out of the way of potential pedestrian and vehicle movement
- Located downslope of the dam
- No obstruction to MSES
- The envelope boundary adheres to all setback distances of the QPWC, therefore any LAA within the envelope will also comply

The OSSF tank is to be installed inside the building envelope.

Table 6 presents the indicative land application area options for installation inside the 375m² disposal envelope.

Table 6: Design Options

LAA Type	Design Volume (Q)	Application Rate	Required Land Application Area	Install As
Fixed Wobbler Surface Irrigation	960 L/day	DIR = 3.5 mm/day	$A = Q / \text{DIR}$ $= 960 / 3.5$ $= 274 \text{ m}^2$	12m x 23m 4 rows of 7 wobblers
Subsurface Drip Irrigation	960 L/day	DIR = 2.8 mm/day (20% slope reduction – AS1547 Appendix M)	$A = Q / \text{DIR}$ $= 960 / 2.8$ $= 343 \text{ m}^2$	14m x 24.5m
Trenches	960 L/day	DLR = 20 mm/day	$A = Q / \text{DLR}$ $= 960 / 20$ $= 48 \text{ m}^2$	4x 20m long trenches Allow for 1 – 2m gap between trenches
AES Bed	960 L/day	DLR = 20 mm/day	$A = Q / \text{DLR}$ $= 960 / 20$ $= 48 \text{ m}^2$	2.6m x 18.6m (AES Design Calculator) Pump required

Additional Requirements:

- Allow for a 100% reserve area for infiltration systems
- Construct stormwater diversion upslope of land application area
- Establish grass or suitable vegetation in land application area
- Pedestrians, animal and vehicles to be generally excluded from land application area

4 Comments and Recommendations

The proposed reconfiguration of Lot 182 on RP156422 is feasible with regards to onsite wastewater management. The following recommendations and comments have been made:

- An advanced secondary effluent quality treatment system is required
- A 375m² 'effluent disposal envelope' on Lot 2 can sufficiently accommodate a land application area for a 5-bedroom dwelling
- All effluent disposal on Lot 2 is to be undertaken within the nominated envelope
- The existing wastewater systems at Lot 1 are located within the proposed boundary and can be retained
- The outcomes of this report are indicative only and do not preclude the use of other types of wastewater systems on the proposed Lots, subject to future investigations
- A site-specific effluent disposal report and council permit is required before the installation of any wastewater system

The design was completed by Chris Taylor (Director, Taylor Environmental (Australia) Pty Ltd, QBCC Licence Number 150 556 72).



Chris Taylor MEnvMan, BAppSc(Chem), ADCivEng Cert IV DWM003
Director | Taylor Environmental (Australia) Pty Ltd
14 October 2022

Appendix A System Design Drawings

SOIL CHARACTERISTICS	
TEXTURE	0 - 400 SANDY SILTY LOAM 400 - 1000 CLAY LOAM
DESIGN CATEGORY	4
STRUCTURE	WEAK
KSAT	0.12 - 0.5 m/DAY
DESIGN IRRIGATION RATE (DIR)	3.5 mm/DAY
DESIGN LOADING RATE (DLR)	20 mm/DAY
DESIGN VOLUME	
WATER SUPPLY	RAIN WATER
VOLUME ALLOWANCE	120 L/P/DAY
NUMBER OF BEDROOMS	5 ASSUMED
DESIGN POPULATION	8 PEOPLE
TOTAL DESIGN VOLUME	960 L/DAY
TREATMENT SYSTEM	
TYPE OF FACILITY	DOMESTIC TREATMENT PLANT
TREATMENT PLANT APPROVAL	REQUIRED
TREATMENT LEVEL	ADVANCED SECONDARY
LAND APPLICATION AREA EXAMPLES	
PROPOSED EFFLUENT DISPOSAL ENVELOPE	25m x 15m = 375m ²
FIXED WOBBLER SURFACE IRRIGATION	A = 960/3.5 = 274m ²
SUBSURFACE DRIP IRRIGATION (WITH DIR-SLOPE REDUCTION)	A =960/2.8 = 343m ²
TRENCHES	A = 960/20 = 48m ² (4x 20m TRENCHES) PLUS 48m ² RESERVE AREA
AES BED	A = 960/20 = 48m ² (18.6m x 2.6m AES BED) PLUS 48m ² RESERVE AREA

- NOTES:
- LOCATION AND SIZE OF DWELLINGS IS INDICATIVE ONLY BASED ON PREDICTIONS OF FUTURE CONSTRUCTION
 - LOCATION OF HSTP, ORG, VENT PIPE AND OTHER WASTE PIPES TO BE DETERMINED BY PLUMBER
 - SITE SPECIFIC EFFLUENT DISPOSAL REPORT AND COUNCIL PERMIT REQUIRED BEFORE INSTALLATION OF ANY WASTEWATER SYSTEM

REVISIONS			
#	DATE	SUBJECT	AUTHORISED
A	14/10/2022	REVISION A	C. TAYLOR

TAYLOR ENVIRONMENTAL

taylor
environmental

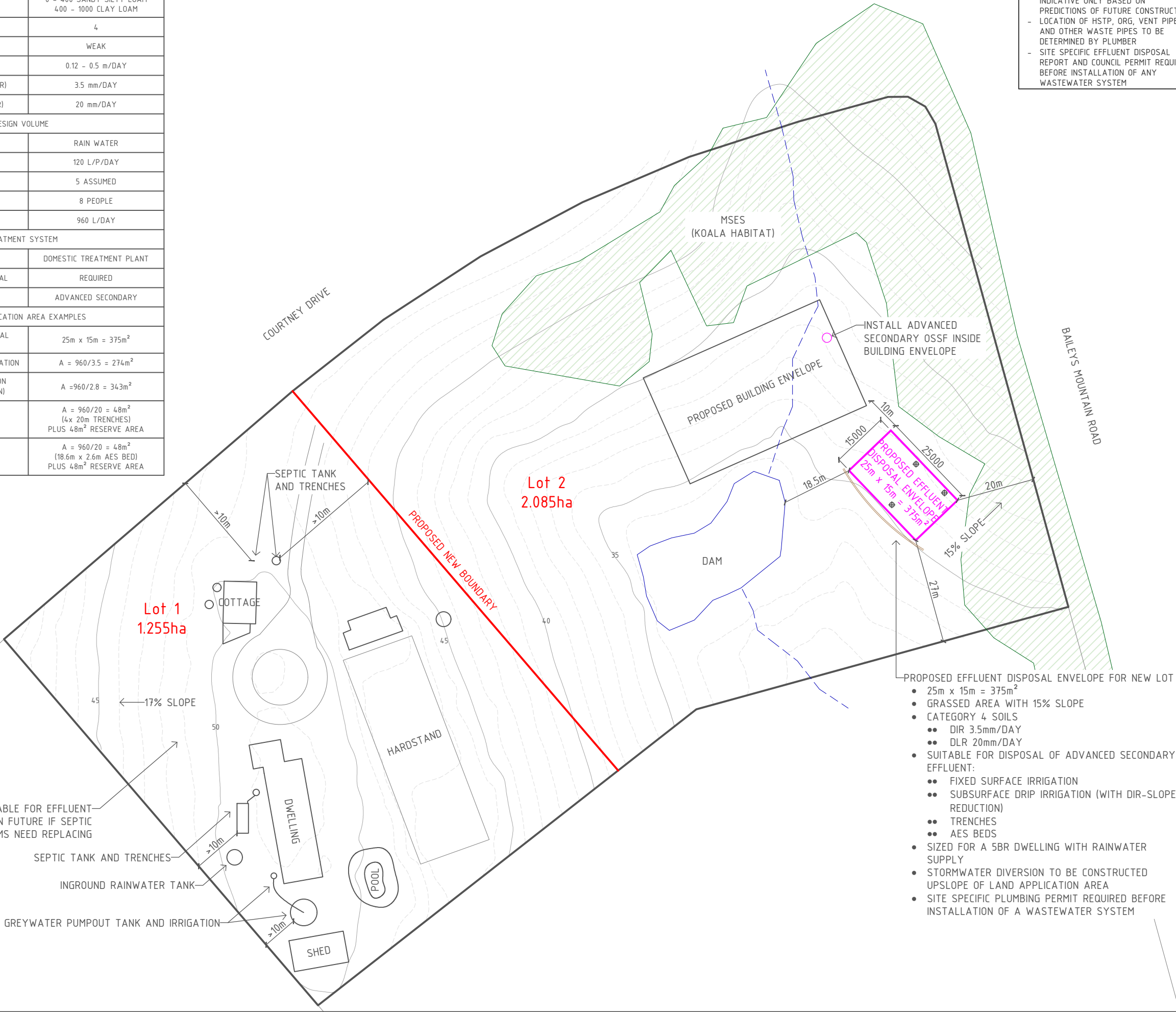
QBCC LICENCE NUMBER 150 556 72
ABN NUMBER 95268308955

Phone: +61 400 301 364
Email: chris@taylorenviro.com.au
Web: www.taylorenviro.com.au

WASTE WATER TREATMENT & EFFLUENT DISPOSAL SYSTEM

AUTHORISED FOR ISSUE	DATE
	14/10/2022
STREET ADDRESS	17 COURTNEY DRIVE, UPER COOMERA
LOT & PLAN	182 RP156422
COUNCIL	GOLD COAST CITY COUNCIL
NAME OF CLIENT	ELEVATE DEVELOPMENT SOLUTIONS
DESIGNER	C. TAYLOR
DRAWN	M. MAHONY
DRAWING DETAILS	SITE PLAN
JOB NUMBER	TE222215

SCALE	REVISION	DWG #
1:1000	A	SL1



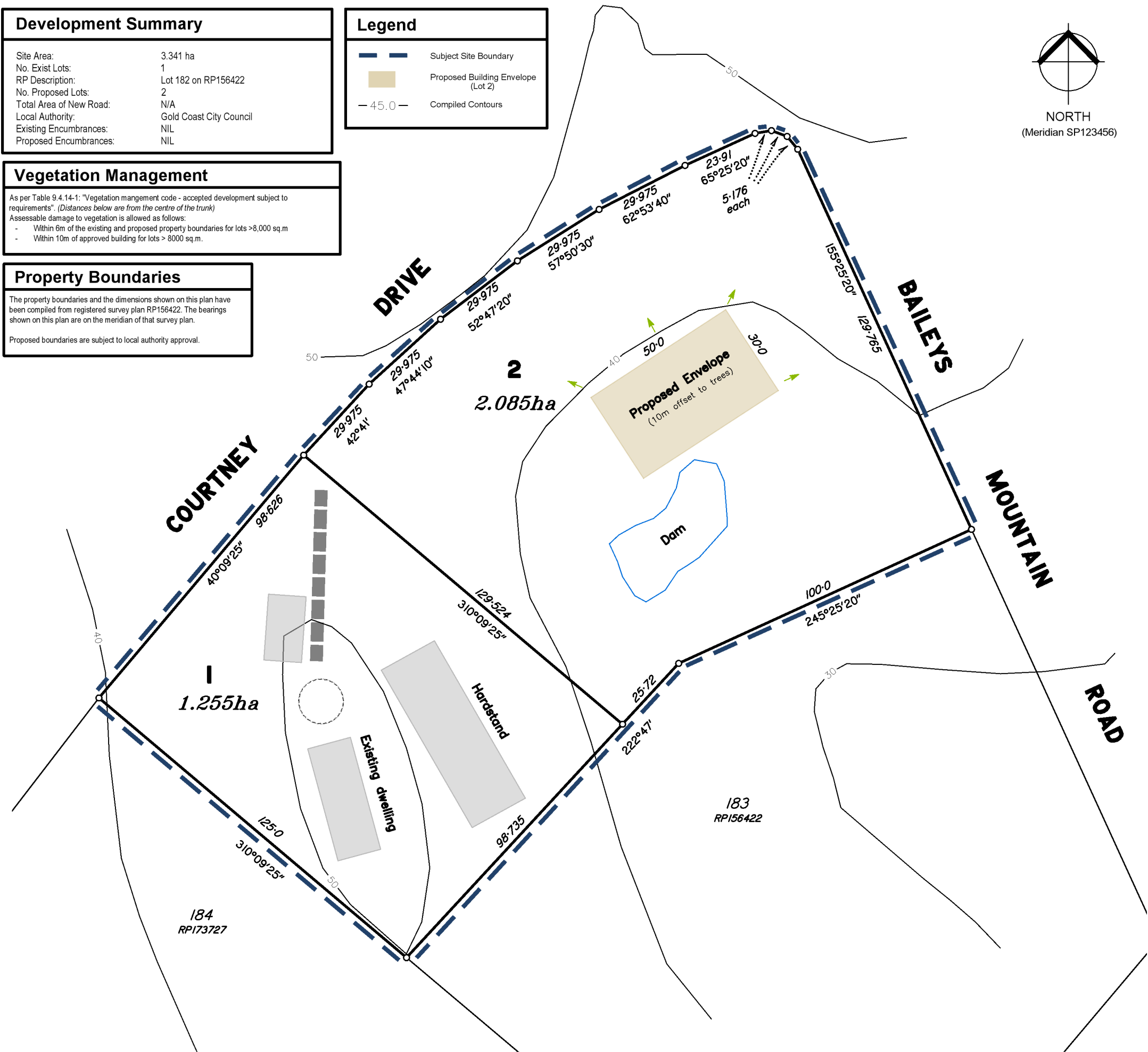
Appendix B Development Plan

Development Summary	
Site Area:	3.341 ha
No. Exist Lots:	1
RP Description:	Lot 182 on RP156422
No. Proposed Lots:	2
Total Area of New Road:	N/A
Local Authority:	Gold Coast City Council
Existing Encumbrances:	NIL
Proposed Encumbrances:	NIL

Vegetation Management
As per Table 9.4.14-1: "Vegetation mangement code - accepted development subject to requirements". (Distances below are from the centre of the trunk)
Assessable damage to vegetation is allowed as follows:
- Within 6m of the existing and proposed property boundaries for lots >8,000 sq.m
- Within 10m of approved building for lots > 8000 sq.m.

Property Boundaries
The property boundaries and the dimensions shown on this plan have been compiled from registered survey plan RP156422. The bearings shown on this plan are on the meridian of that survey plan.
Proposed boundaries are subject to local authority approval.

Legend	
	Subject Site Boundary
	Proposed Building Envelope (Lot 2)
	Compiled Contours





Trilogy

Survey Solutions

Over 30 years experience

 SURVEY SERVICES

 CADASTRAL /
TITLING ADVICE

GOLD COAST

 0431 400 670

 wayneg@trilogys.com.au

Revision:	Notes:

Proposal Plan

17 Courtney Drive
Upper Coomera

Scale:



1:1250 @ A3
1 : 1250@A3 (Before Reduction)

Drawing No:	TSS-221051-001-C
Date:	27 / 9 /2022
Client:	Elevate Development Solutions

Notes
Any licence to use, reference or reproduce this document for any purpose whatsoever is restricted to the terms of the agreement between Trilogy Survey Solutions and the instructing party.
Design is subject to Local Authority approval and detailed engineering design requirements. Areas and dimensions are approximate only and are subject to final survey.
This plan and the information contained within have been provided for the use of the intended person/s only and has been prepared specific for thier use. As such information shown is per the scope only and may not be inclusive of all detail on site.
Trilogy Survey Solutions accept no responsibility for the misuse or misunderstanding of information contained on this plan. Anyone referring to the plan must make thier own judgements and site analysis to determine if the information is current and correct.
Contours and improvements plotted from Queensland Globe

Improvements / Site Contours
The improvements and the outline of the existing dam shown on site have been plotted from aerial imagery and are therefore indicative only.
Contours shown are indicative only and have been compiled from Queensland Globe.