



Lot 11 DP 1197316 Metford Road, Tenambit
STORMWATER DRAINAGE STRATEGY: ADDENDUM
10th December 2021
Metford Road Pty Ltd

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1. INTRODUCTION

1.1. BACKGROUND

In November 2016, Metford Road Pty Ltd engaged Fisher Consulting Engineers (FCE) to prepare a stormwater strategy (report) for a manufactured home estate including manufactured home sites, associated managers residence and community facilities over Lot 11 DP 1197316. This stormwater report was approved by Maitland City Council under DA16/2715 and the project is in the construction phase.

Our client has acquired additional land to the south (Lot 12 DP 1197316) and would like to combine the development area.

1.2. Objective

The natural flow of the land within Lot 12 DP 1197316 drains towards an existing basin created for Lot 11.

Sky Engineering has been engaged to formulate a stormwater strategy to increase the size of the existing basin (for Lot 11) as noted in Fisher Consulting Engineers' Report (FCER).

This report is an addendum to support the modification works to the existing stormwater infrastructure. It will be a support document to the existing and approved Stormwater Drainage Strategy by Fisher Consulting Engineers (FCE).

The purpose of this report is to assess the impacts of the additional lots in the context of the stormwater requirements and will be prepared in accordance with Maitland City Council's design guidelines, relevant Australian Standards and Austroads Guidelines.

This report will assess the requirements for stormwater management for the new lot.

As part of considering the abovementioned elements at the site, this report will consider the following:

- Stormwater Management Strategy
 - On Site Detention (OSD)
 - Water Sensitive Urban Design (WSUD)

1.3. SITE LOCATION AND DEVELOPMENT PROPOSAL

The site of the proposed development is described as Lot 12 in DP 1197316. The additional lots and catchment area is located south of Lot 11. The location of the site is shown in Figure 1 below.

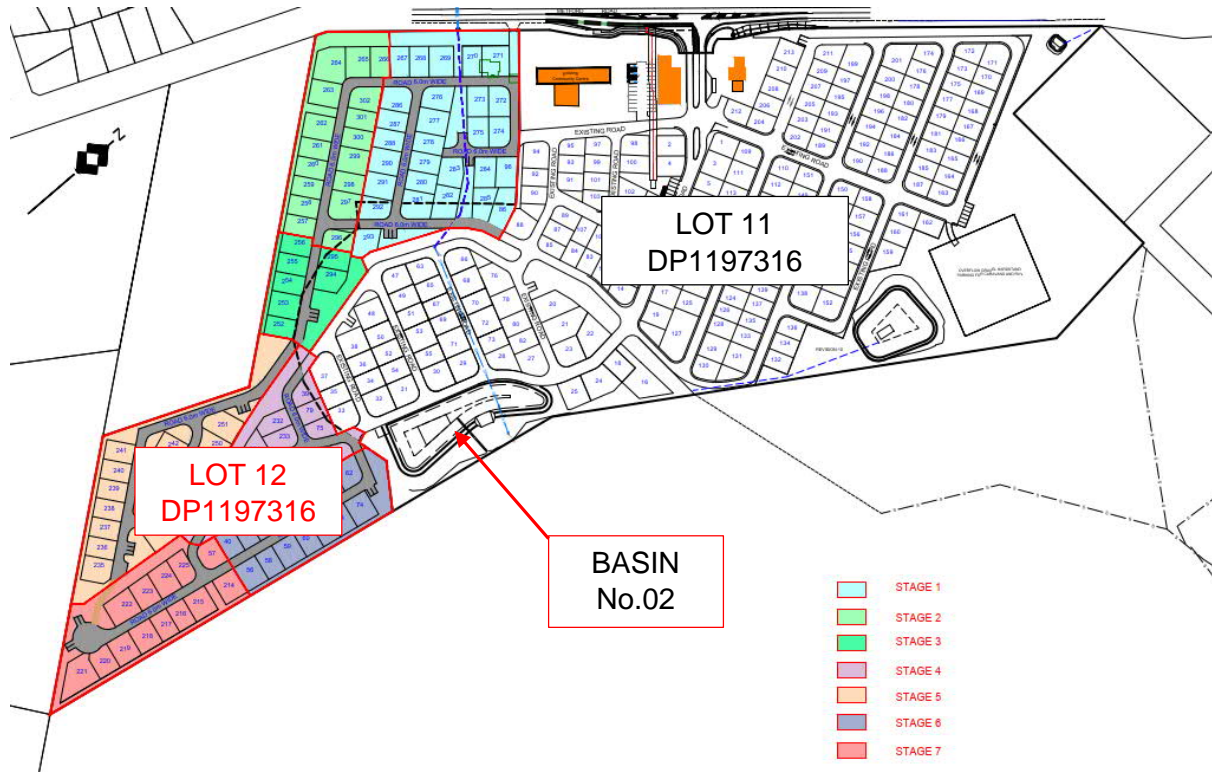


Figure 1: Location of Site

The existing Lot 11 DP 1197316 consists of approximately 193 lots, access roads, basins and parking for caravans. The site is approximate 10.05Ha.

The proposed Lot 12 DP 1197316 consists of approximately 109 lots which brings the development to a total of 302 lots plus access roads. The site is approximately 4.48Ha.

2. STORMWATER MANAGEMENT & ADDENDUM

The stormwater management strategy for the additional catchment of Lot 12 will focus on OSD/ Bio-Retention basin 02, as noted in figure 1. The proposed Strata lots will drain into the road frontage and be conveyed by road drainage to Basin 02 by an underground piped network.

As mentioned in section 1.1, the design of the OSD/ bio-retention basin 02 is complete and approved. This report will not change the stormwater strategy outlined in the FCER, however, it will outline the amendments required to Basin 02 to suit the additional catchment.

2.1. Stormwater Runoff Quantity - Addendum

Following the stormwater strategy of Sections 2 and 3 of the FCE Report, we have identified the additional catchment areas and revised the DRAINS model mentioned in Section 4.

Table 8: FCE Report

Table 8: DRAINS Peak Flow Results for Catchment A

ARI (years)	Existing State		Developed State		% Change
	Peak Flowrate (m ³ /s)	Critical Storm Duration (mins)	Peak Flowrate (m ³ /s)	Critical Storm Duration (mins)	
1	0.388	90	1.23	25	+217%
10	1.60	60	3.12	25	+95%
100	3.03	25	4.95	25	+63%

New DRAINS Results – Including Lot 12 Catchment

Table 8: DRAINS Peak Flow results for Catchment A

ARI (years)	Existing State		Developed State		% Change
	Peak Flowrate (m ³ /s)	Critical Storm Duration (min)	Peak Flowrate (m ³ /s)	Critical Storm Duration (min)	
1	0.469	60	1.86	25	+252%
10	1.96	60	3.97	25	+102%
100	3.7	25	5.78	25	+56%

Table 9 – Unchanged, as catchment B is unaffected by Lot 12.

Table 10: FCE Report

Table 10: DRAINS Peak Flow Results with Detention for Catchment A

ARI (years)	Existing State		Developed State with Detention		% Change
	Peak Flowrate (m ³ /s)	Critical Storm Duration (mins)	Peak Flowrate (m ³ /s)	Critical Storm Duration (mins)	
1	0.388	90	0.385	60	-0.8%
10	1.60	60	1.50	120	-6.3%
100	3.03	25	2.90	90	-4.3%

Table 10: DRAINS Peak Flow results with Detention for Catchment A

ARI (years)	Existing State		Developed State		% Change
	Peak Flowrate (m ³ /s)	Critical Storm Duration (min)	Peak Flowrate (m ³ /s)	Critical Storm Duration (min)	
1	0.469	60	0.418	60	-10.8%
10	1.96	60	1.75	120	-10.7%
100	3.7	25	3.69	120	-1%

Table 11: Detention Volume

Detention Basin	Detention Volume
1	1171 (unchanged)
2	1759 increased to 2831

Table 12: Summary of Basin and Outlet Structure (with new description)

Basin 1 parameters and results remains unchanged, as Lot 12 Catchment does not affect Basin 1.

Basin	Parameters	Description – FCE Report	New Description
2	Detention basin storage area invert level	R.L 5.10	R.L 5.10 (no change)
	Top Water Level	R.L 6.50	R.L 7.00
	Top Of Bank	R.L 7.00	R.L 7.30
	Outlet Structure Size (4-sided weir)	1.2m long x 1.2m wide x 2.1m deep	1.2m long x 1.2m wide x 2.1m deep With 0.45x0.45 inlet pit @ R.L. 6.20
	Outlet Structure Invert Level	R.L 4.00	R.L 4.00 (no change)
	Outlet Structure Inlet No. 1 Orifice Size	2 x DN300mm	2 x DN310mm
	Outlet Structure Inlet No. 1 Orifice Invert Level	R.L 5.10	R.L. 5.10
	Outlet Structure Inlet No. 2 Orifice Size	2 x DN300mm	Deleted
	Outlet Structure Inlet No. 2 Orifice Invert Level	R.L 5.70	Deleted
	Outlet Structure Outlet Pipe Size	DN1050mm RCP	DN1050mm RCP (no change)
	Outlet Pipe Invert Level	R.L 4.00	R.L 4.00 (no change)
	Spillway Length	8.50m	8.50m (no change)
Spillway Invert Level	R.L 6.50	R.L 6.85	

2.2. Stormwater Runoff Quality - Addendum

Using the Lot 11 MUSIC model supplied by FCE, the new Lot 12 catchment was added to the model to check if amendments to OSD/ Bio-Retention Basin 02 are required. See below for revisions to the relevant tables:

Table 13: FCE Report

Table 13: MUSIC Model Results for the Site's Post Development Land Use (No Treatment)

Land Use	Average Annual Pollutant Load (kg/yr)		
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Post Development (Catchment A)	11300	19.2	140
Post Development (Catchment B)	1080	1.81	13.1

Table 13: MUSIC Model Results for the Site's Post Development Land Use (No Additional Treatment)

Land use	Average Annual Pollutant Load (kg/yr)		
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Post Development (Catchment A)	15500	27.4	198
Post Development (Catchment B)	No Change required		

Table 14: Humegard Treatment Parameters – No Change

Table 15: MUSIC Swale Parameters – No Change

Table 16: Bioretention Basin Treatment Parameters – No Change

Table 17: FCE Report

Table 17: MUSIC Model Results for the Site's Post Development Land Use (with Treatment)

Land Use	Average Annual Pollutant Load (kg/yr)		
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Post Development (Catchment A)	1850	8.57	71.9
Post Development (Catchment B)	206	0.831	7.02

Table 17: MUSIC Model Results for the Site's Post Development Land Use (With Treatment)

Land use	Average Annual Pollutant Load (kg/yr)		
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)
Post Development (Catchment A)	3000	12.3	108
Post Development (Catchment B)	No Change required		

Table 18: FCE Report

Table 18: MUSIC Model Treatment Train Effectiveness Results

Catchment	Pollutant	Export Value		Treatment Train Effectiveness
		Post Development	Post Development with treatment measures	
A	TSS (kg/yr)	11300	1850	83.7%
	TP (kg/yr)	19.2	8.57	55.3%
	TN (kg/yr)	140	71.9	48.5%
B	TSS (kg/yr)	1080	206	81.0%
	TP (kg/yr)	1.81	0.831	54.0%
	TN (kg/yr)	13.1	7.02	46.5%

Table 18: MUSIC Model Treatment Train Effectiveness Results

Catchment	Pollutant (kg/yr)	Export Value		Treatment Train Effectiveness
		Post Development	Post Development with Treatment Measures	
A	TSS	15500	3000	80.6
	TP	27.4	12.3	55
	TN	198	108	45.5
B	TSS	No Change Required		
	TP			
	TN			

3. CONCLUSION

Stormwater Quantity

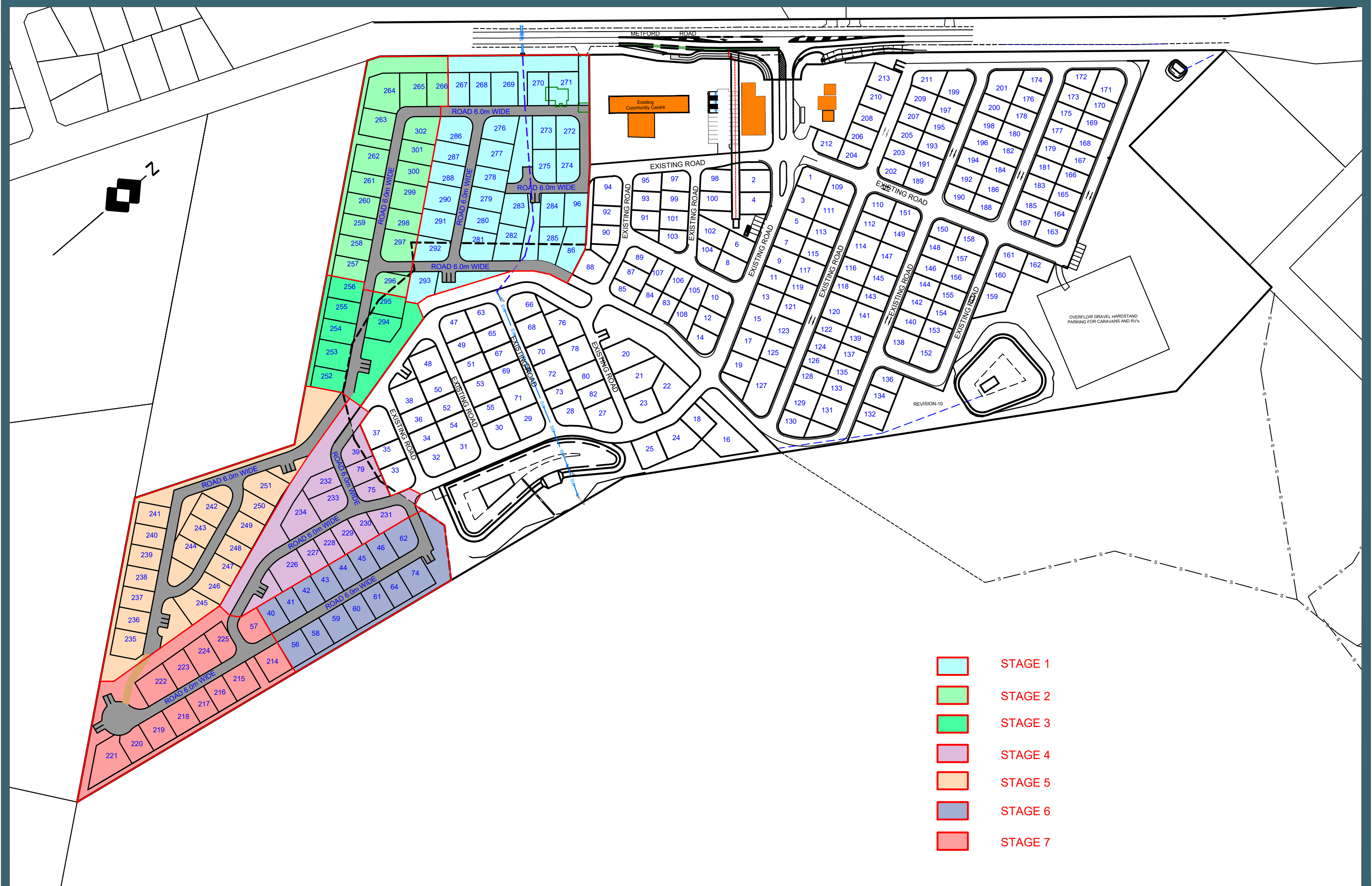
The proposed development (Lot 12) has increased the peak flow into Basin 02. Therefore, the volume of the basin will need to increase to accommodate the additional flow. This is achieved by raising the top water level and berm of the existing basin, as noted in section 2.1 Table 12.

Stormwater Quality

The additional catchment of Lot 12 did produce additional pollutant into Basin 02, however with the existing basin area we are able to achieve the reduction targets. Therefore, no change to the basin is required.

APPENDIX A

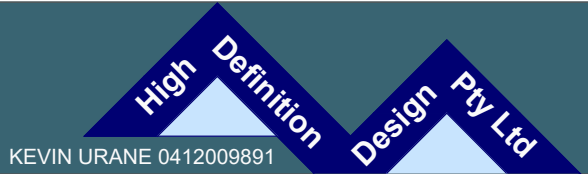
Site Layout (HDD) & Catchment Plan



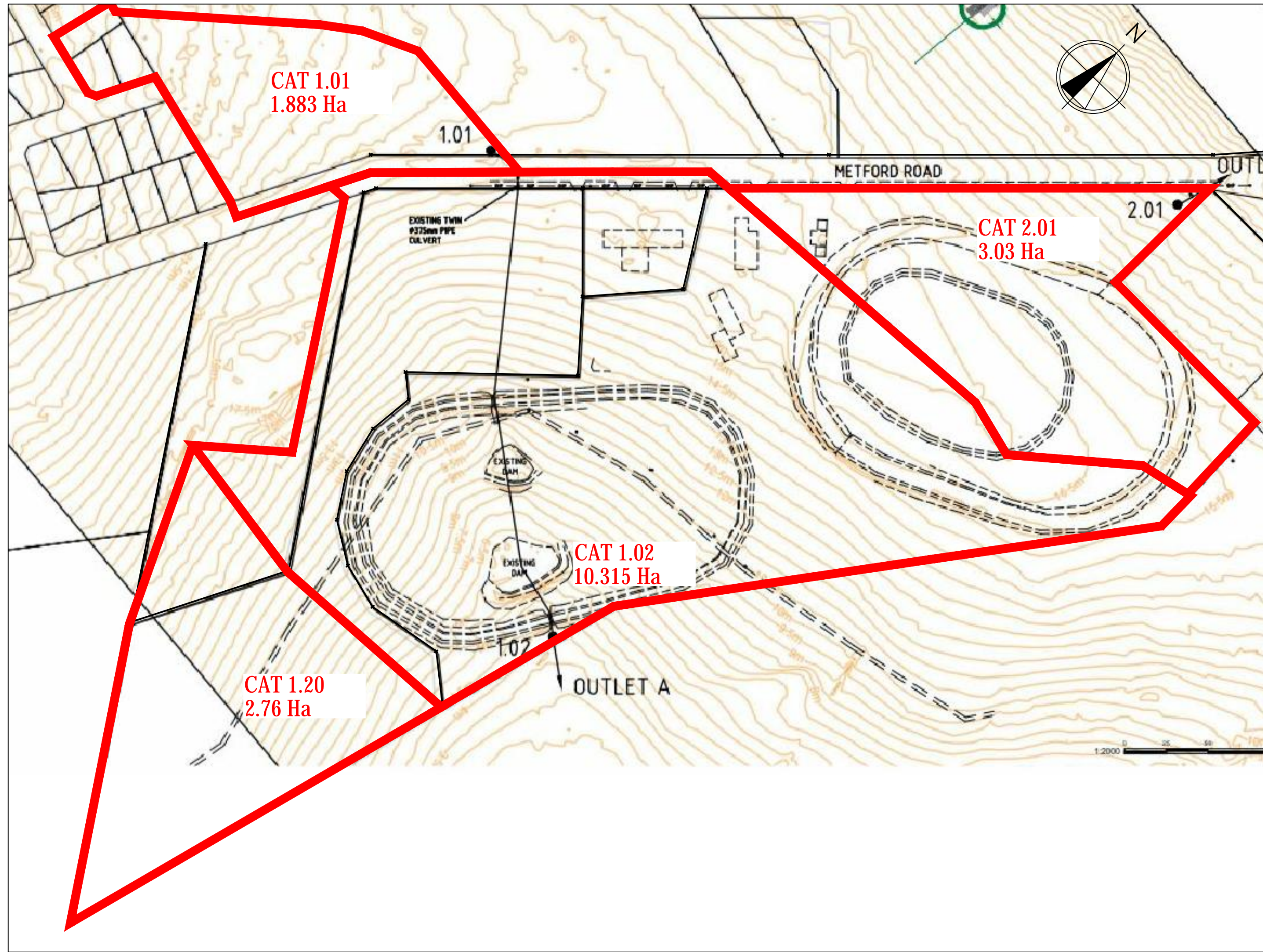
- STAGE 1
- STAGE 2
- STAGE 3
- STAGE 4
- STAGE 5
- STAGE 6
- STAGE 7

TITLE: PROPOSED LIFE STYLE VILLAGES
 METFORD ROAD TENAMBIT
 STAGING PLAN
 METFORD ROAD Pty Ltd

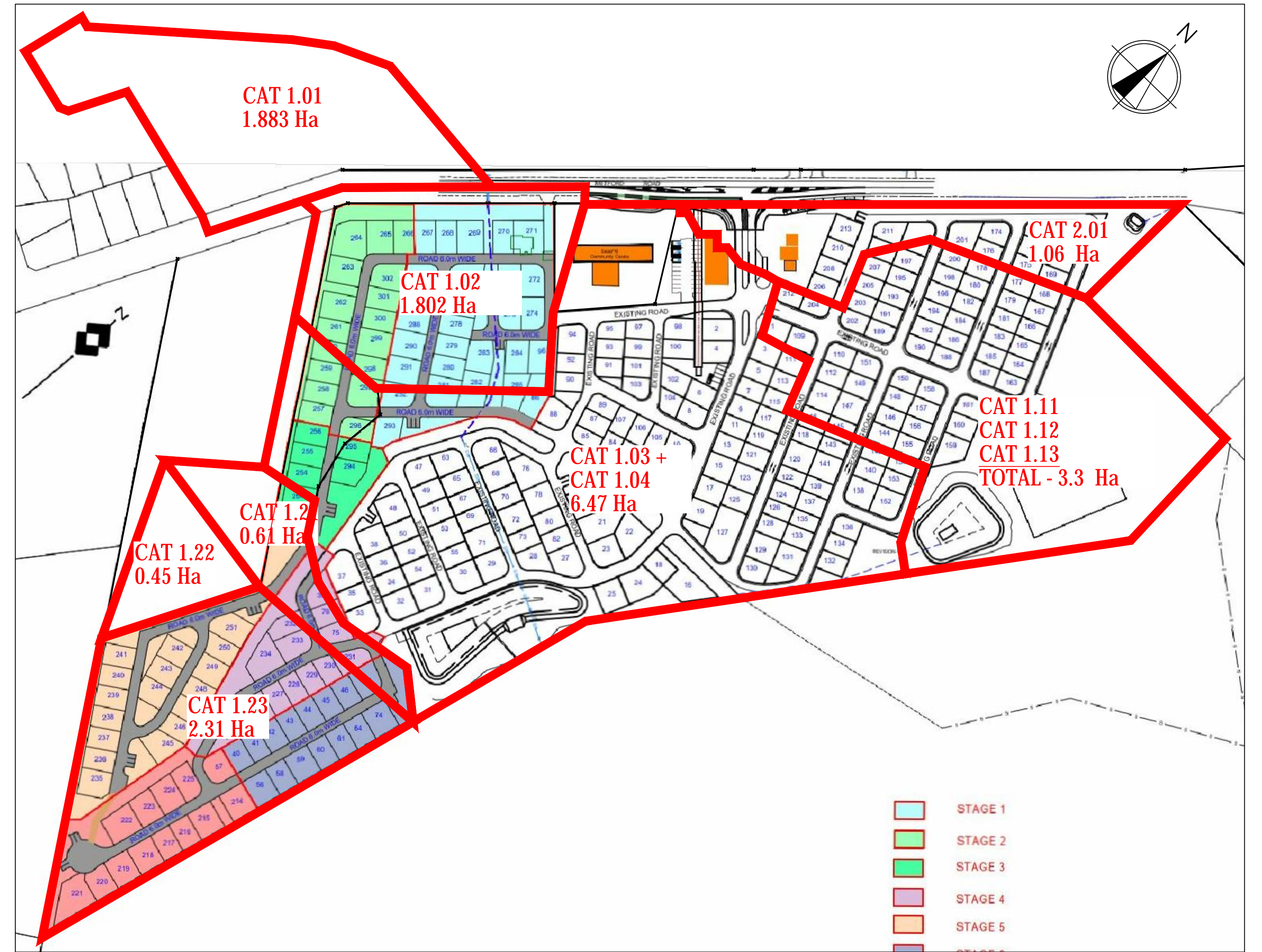
MORPETH GARDENS



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7	ADD ACOUSTIC FENCE	KU	21.10.21					Drawing No	Revision
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8	ADJUST AREAS	KU	03.11.21						
No	Amendment	Drawn	Date						

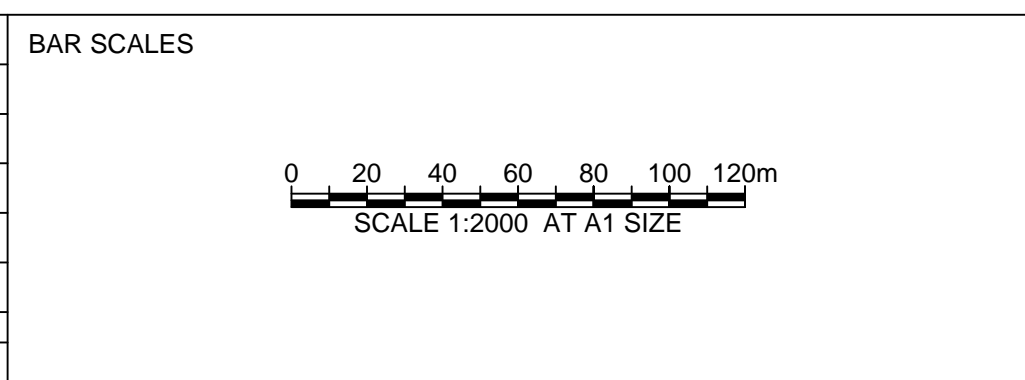


EXISTING CATCHMENT



PROPOSED CATCHMENT

REV	DESCRIPTION	DATE



CLIENT
HUNTERLAND

PROJECT
**METFORD ROAD
TENAMBIT**

TITLE
CATCHMENT PLAN

STATUS
ISSUED FOR INFORMATION

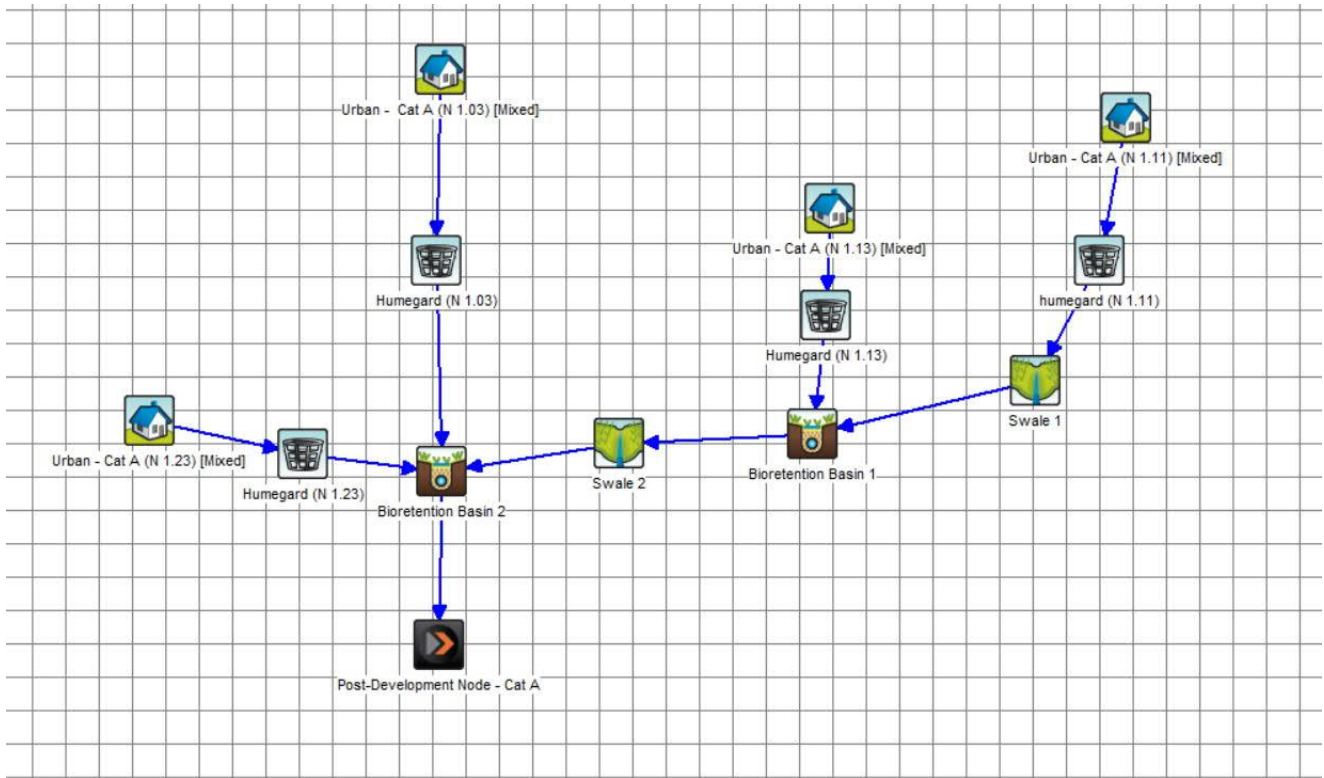
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Height Datum AHD	Grid MGA	SCALE	AT A1 SIZE

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Project No. SY21-034	Drawing No. C-0001	Issue
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APPENDIX B

MUSIC Layout and Results

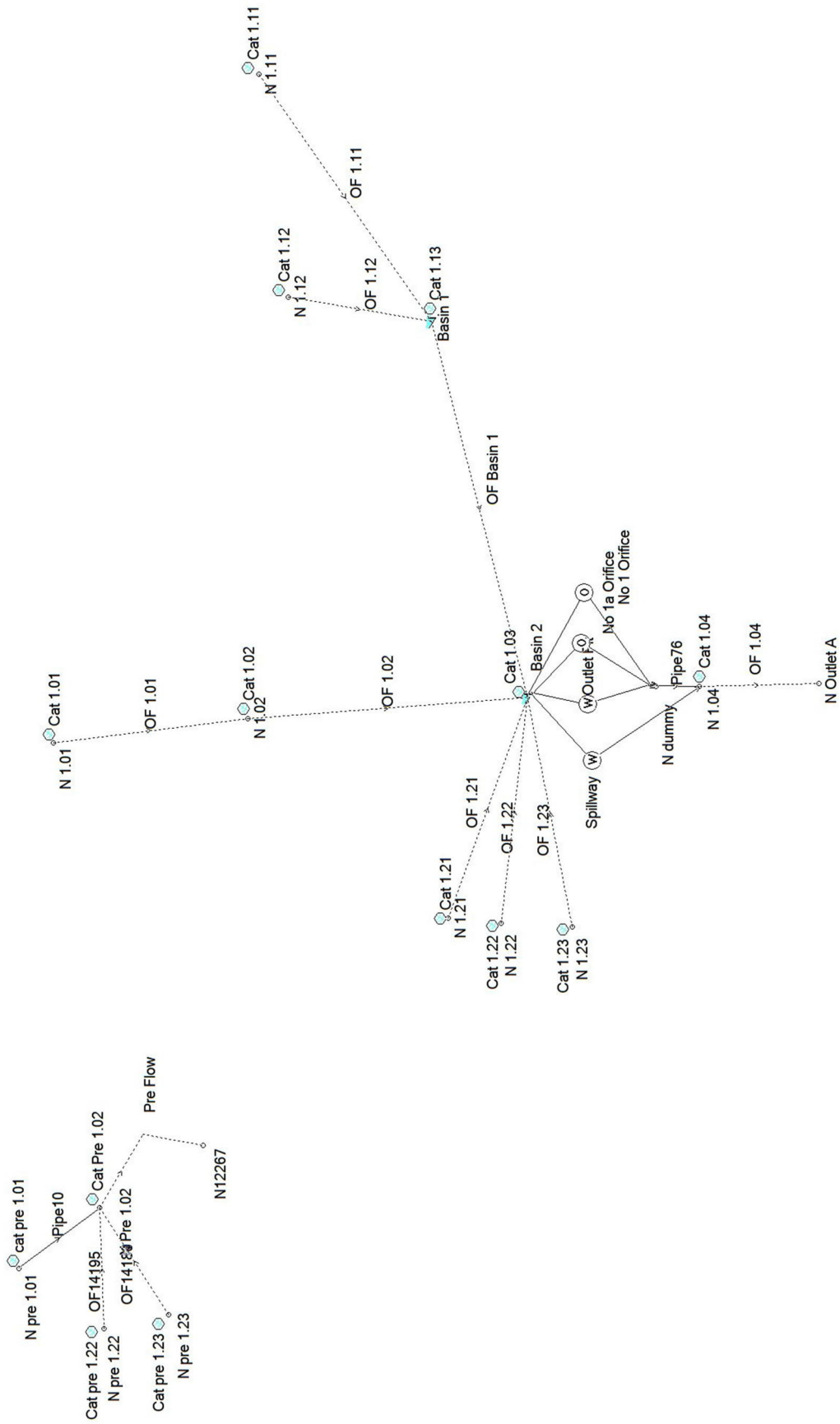


	Sources	Residual Load	% Reduction
Flow (ML/yr)	84	83.5	0.7
Total Suspended Solids (kg/yr)	15500	3000	80.6
Total Phosphorus (kg/yr)	27.4	12.3	55
Total Nitrogen (kg/yr)	198	108	45.5
Gross Pollutants (kg/yr)	2370	0	100

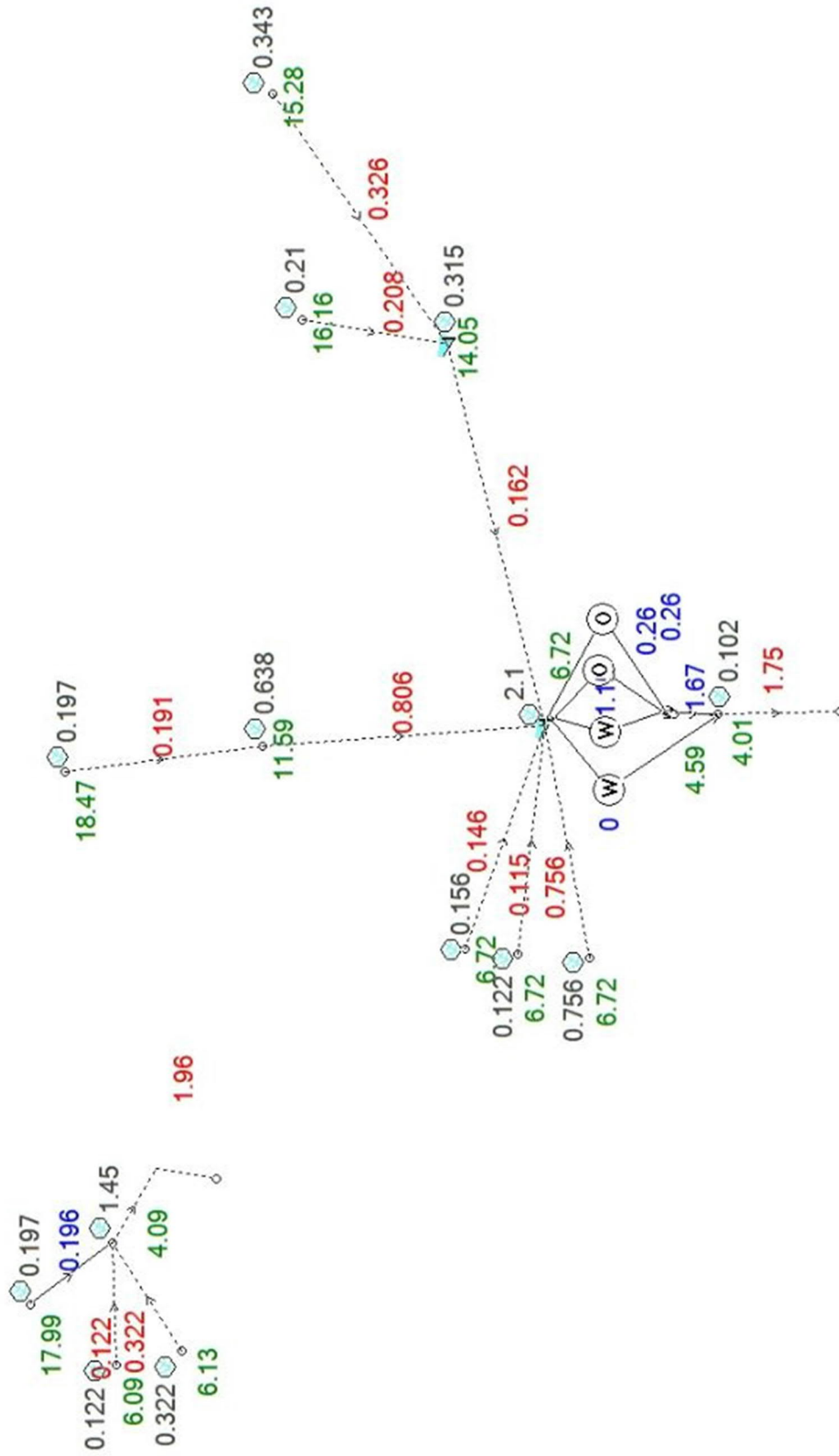
APPENDIX C

DRAINS Data and Results

DRAINS LAYOUT



DRAINS 10YR RESULTS



DRAINS 100 YR RESULTS

