Babingtons
CIVIL AND ENVIRONMENTAL CONSULTANTS

Infrastructure Report

Taha Auto Limited
395 Fitzgerald Road
Drury

July 2025

Document Control

Rev no.	Revision Description	Revision Date
0	For RC Application	15.04.25
1	For RC Application – S92 EW update	11.07.25
2	For RC Application – S92 Plans Update	07.08.25

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(Babingtons)
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Grey Lynn
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Contents

Appendices

1. Introduction

This report has been prepared in support of a resource consent application to permit the use of car storage and vehicle dismantling yard at 395 Fitzgerald Road, Drury. The proposed development involves the removal of an existing house and glasshouse and the construction of two 2000m^2 dismantling and storage buildings. Bulk earthworks will be required to create an aggregate storage yard over the remainder of the site.

Herein we will address matters in relation to earthworks, flooding and stormwater discharge quantity and quality control to show the proposal can proceed whilst avoiding significant effects on or offsite.

2. Site Identification

Address	395 Fitzgerald Road, Drury
Legal Description	Lot 3 DP 194356
Zone	Business - Light Industry Zone and Future Urban Zone
Property Area	27,679m^2

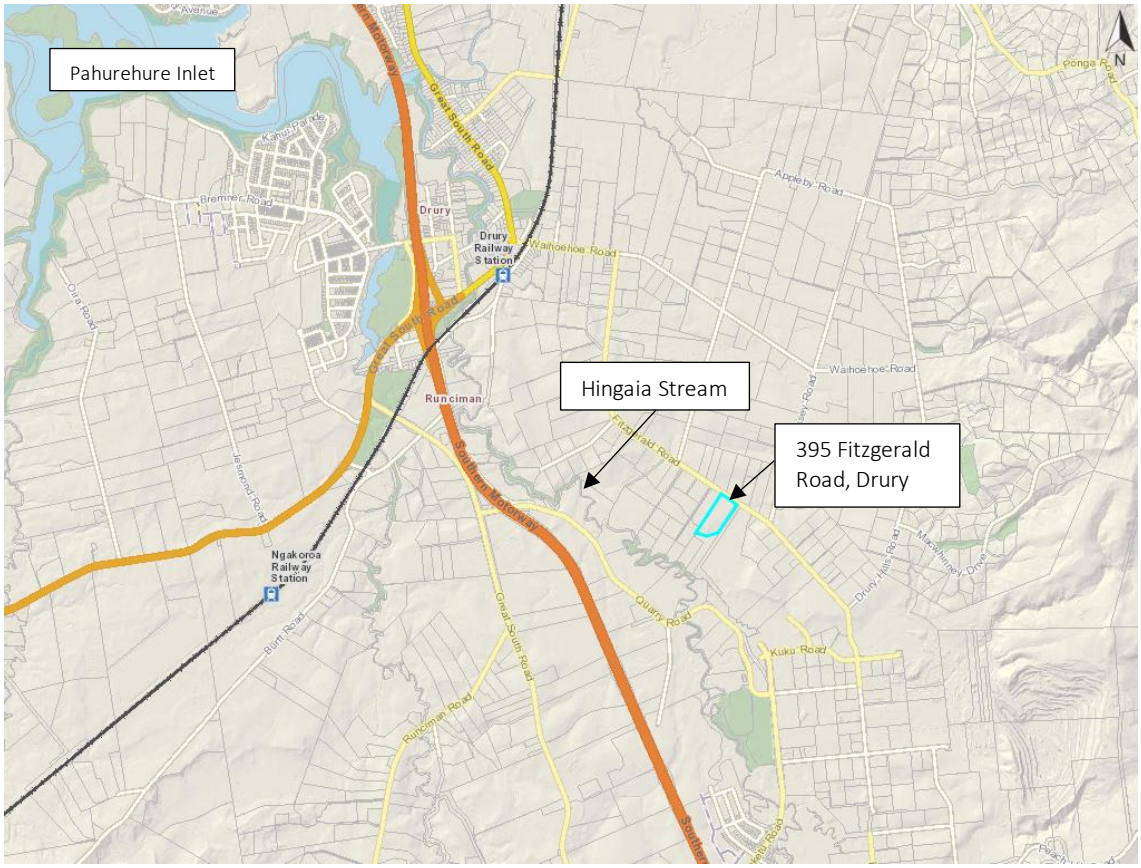


Figure 1 Locality Plan (Source: Auckland Council Geomaps)

3. Site description

The site is in a rural area on the south side of Fitzgerald Road. The property is irregular in shape and is generally flat. Buildings on site include a residence in the middle of the site and a greenhouse to the southwest of the site.

The property relies on roof water and utilises on site wastewater disposal

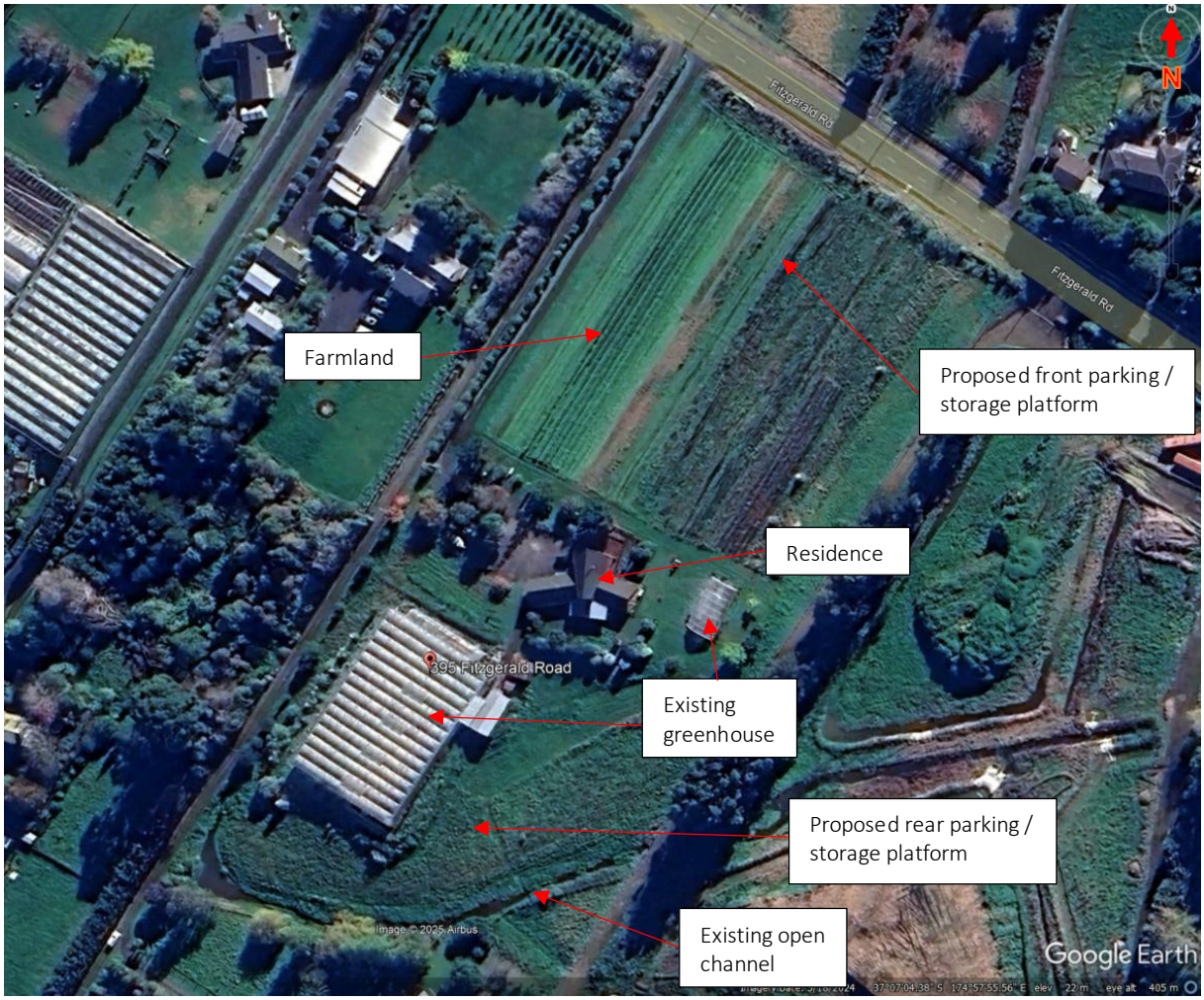


Figure 2: Site Layout (Source: Google Earth)

4. Catchment Setting and Receiving Environment

The site lies within the Hingaia Stream catchment. Runoff from the western half of the site discharges to a tributary of the Hingaia Stream. Flows from the eastern half discharge to a roadside swale and then into an overland flowpath in the property in the south (411 Fitzgerald) before reaching the Hingaia Stream tributary. The tributary connects with the Hingaia Stream which flows to the Pahurehure Inlet/Manukau Harbour approximately 16 km northwest of the site.

The northern corner and southern boundary of the site is shown to be affected by the 100 year ARI flood plain. A minor overland flowpath is shown to be generated within the sites “eastern catchment” (See Figure 3 below).

Figure 3:Floodplain and Overland Flow Path (Source: Auckland Council Geomaps)

5. Earthworks

Bulk earthworks will be carried out over an area of 26,255m^2 requiring 14,605m^3 of cut and 8,823m^3 of fill resulting in 23,248m^3 of disturbance. Retaining in cut and fill will be required on the north and south boundaries to a maximum height of 2.5m. Two sediment retention ponds (SRP) will be constructed in accordance with GD05 to provide sediment control during bulk earthworks.

Dirty water diversion bunds will be established to ensure any runoff generated during earthworks is directed to the correct SRP. Cut & fill operations may require these bunds to be temporarily removed, however, they will be re-established at the end of each day or when the site is not being earthworked.

Chemical treatment of the SRPs is proposed. We request conditions that require provision of a chemical treatment management plan (ChTMP) ahead of earthworks commencing, and implementation of that plan throughout the earthworks phase of the development.

Silt fences will be established along down gradient site boundaries to manage dirty water during construction of the SRPs, and once dirty water diversion bunds have been established to direct runoff to an SRP, the silt fences will remain in place to manage the small areas where runoff cannot be directed to an SRP. Catchment areas managed by silt fences alone, have been detailed on the ESCP.

6. Stormwater Drainage System

6.1. Existing Stormwater Management System

The existing house discharges roof water to reuse tanks and tank overflow is to the ground. The greenhouse discharges roof water to the ground.

6.2. Proposed Stormwater Management System

Stormwater Quantity Management

To mitigate the effect of increased runoff from the aggregate yard and buildings we have designed an attenuation system to limit peak flows to the predevelopment situation. The 2, 10 and 100 year storm events as well as SMAF stream erosion protection criteria will be addressed. This will be achieved by building a bund around the platform to capture rainfall and release it at a controlled rate via a pipe outlet and weir arrangement. Details of the containment and discharge control devices are included in appendix 1.

Stormwater Quality Management

The main risk to stormwater quality from the site activities is total suspended sediment and to a lesser degree metals and hydrocarbons. Stormwater treatment will be provided by swale treatment and sedimentation during extended detention within the ponding areas. Calculations are provided in appendix 2 to demonstrate the swales meet the treatment residence time requirement to remove great than 75% total suspended solids. The swale and extended detention is considered to be best practicable option in this situation.

7. Flooding and Overland Flow

Auckland Council "Geomaps" shows the rear of the site adjoining the stream is inundated during a 100 year storm event approximately to RL16. The proposed new rear building level is RL18.5 and minimum yard level RL17. Filling will occur within the floodplain to extend the usable yard, however, given the massive extent of the floodplain any displacement effects are expected to be insignificant. Figure 4 below gives an appreciation of the scale.

There is a small amount of flood water ponding in the front yard that appears to be generated by onsite runoff as indicated by the minor overland flowpath. This ponding area will be retained and enlarged to cater for the additional runoff generated by the creation of impervious surfaces.

Figure 4: 100yr floodplain extent

8. Water Supply and Wastewater Disposal

Water will be provided by roof water collection into reuse tanks. Wastewater will be treated on site with an aerated treatment station to provide secondary level treatment. Appendix 3 contains calculations for the wastewater generation and disposal field sizing. The anticipated staffing for the dismantling operation is 5 but we have future proofed the design conservatively sized the field to allow for 15 day staff at 40L/day (TP58 allowance). We have allowed for a conservative loading of 3L/m^2/day into the clayey silts – silty clay soils in accordance with TP58 requirements.

9. Conclusion

In conclusion it is considered that with the correct implementation and maintenance of the proposed best practicable option engineering controls that the proposed activities at 395 Fitzgerald Road can be carried out with minimal environmental effects.

10. Limitations

This report has been prepared for the sole benefit of our client, Taha Auto Limited, and Auckland Council for review purposes and shall not be relied upon or used out of context by any other person without permission from the Taha Auto Limited and Babington and Associates (2004) Limited.

Appendix 1: Site Layout and Drainage Plans

395 FITZGERALD ROAD, DRURY, AUCKLAND

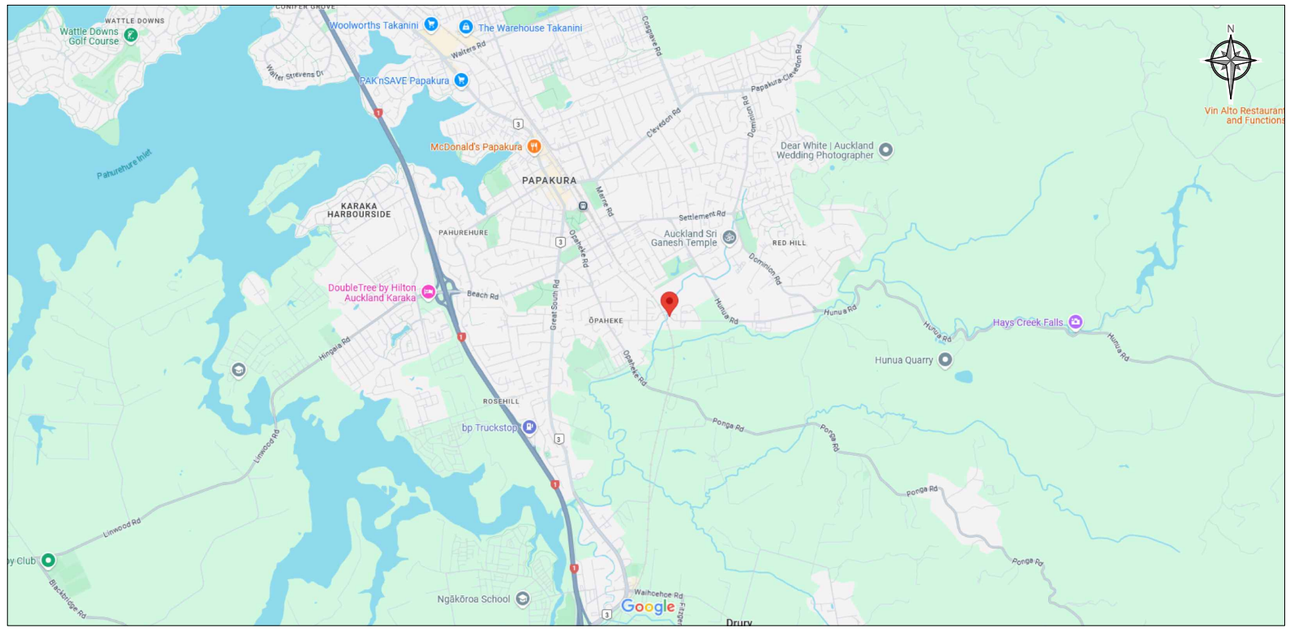
STATUS RESOURCE CONSENT

DATE FEB 2025

INFRASTRUCTURE DRAWINGS

DRAWING No	SHEET NAME	REVISION
C000	COVER SHEET	C
C100	SITE LAYOUT PLAN	DELETED
C200	PROPOSED CIVIL ENGINEERING PLAN OVERALL PLAN	C
C201	PROPOSED CIVIL ENGINEERING PLAN – SHEET 1	C
C202	PROPOSED CIVIL ENGINEERING PLAN – SHEET 2	C
C210	CUT AND FILL PLAN AND ESC PLAN	C
C221	PROPOSED EARTHWORKS CROSS SECTIONS – PART 1	B
C222	PROPOSED EARTHWORKS CROSS SECTIONS – PART 2	B
C420	PROPOSED STORMWATER LONGITUDINAL SECTIONS	A

LOCALITY PLAN



RESOURCE CONSENT

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED REVISIONS	08/07/25	JDT
C	UPDATED REVISIONS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: COVER SHEET

Babingtons CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY:	CHECKED BY:	DRAWN BY:
MT	LH	JDT
APPROVED BY:	ORIGIN:	
MT	18 SEPTEMBER 2024	
PROJECT NUMBER:		
395 FITZGERALD RD		
SCALE (@A3):	DRAWING NO.	REVISION:
N/A	C000	C

PRINTED ON: 16/10/2023

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

LOT 1
DP 105774
#341 FITZGERALD ROAD

B
C222

CATCHMENT BOUNDARY

REAR CATCHMENT

FRONT CATCHMENT

SHEET 2 - SCALE: 1:500 (A3)

SHEET 1 - SCALE: 1:500 (A3)

RW HEIGHT: 2.30m

RW HEIGHT: 1.50m

RW HEIGHT: 2.50m

RW HEIGHT: 1.80m

TREATMENT SWALE

REAR BUND

LANDSCAPE BATTER

A
C221

REAR BUND OUTLET STRUCTURE

PROP. TWO LANE METAL DRIVEWAY

EX. METAL DRIVEWAY

FRONT BUND OUTLET STRUCTURE

PROPOSED WAREHOUSE BUILDING
FFL: 18.50m
AREA: 2,016m²

ACTIVITY AREA:
18,406m²
(OUTLINE OFFSET FOR CLARITY)

BUNDED OIL AND COOLANT STORE

VEHICLE DISMANTLING AND PART STORAGE
FFL: 20.00m
AREA: 2,016m²

FRONT BUND

PROPOSED SPILL KIT LOCATION

CREEK

LOT 1
DP 194356
#377 FITZGERALD ROAD

FITZGERALD ROAD

SECTION 10 SO 543175

AC GIS
FLOOD PLAIN
OVERLAY AREA

LOT 2
DP 197449
#441 FITZGERALD ROAD

C

RESOURCE CONSENT

0 12.5 25 37.5 50
SCALE 1:1000 @A3

LEGEND:

- EX. ABBUTALS
- EX. SITE BOUNDARY
- EX. EASEMENT
- PROP. BOUNDARY
- PROP. EASEMENTS
- EX. CONTOUR MAJ 24.50
- EX. CONTOUR MIN 24.75
- PROP. CONTOUR MAJ 24.50
- PROP. CONTOUR MIN 24.75
- EARTHWORKS EXTENT
- PROP. RETNG WALL
- EX. METAL SURFACE
- PROP. VEHICLE CROSSING
- PROP. METAL SURFACE
- EX. PUB. SWMH
- EX. CESSPIT
- EX. PUBLIC SW PIPE
- EX. PRIV SW PIPE
- EX. SUBSOIL DRAIN
- EX. OLFP (GIS)
- PROP. PUB. SWMH
- PROP. TYPE 1 CESSPIT
- PROP. TYPE 2 CESSPIT
- PROP. WINGWALL
- PROP. PUBLIC SW PIPE
- PROP. PRIVE SW PIPE
- EX. PUB. WWMH
- EX. PUBLIC WW PIPE
- EX. PRIV WW PIPE
- PROP. PUB. WWMH
- PROP. PUB. ENDCAP
- PROP. PUBLIC WW PIPE
- PROP. PRIV WW PIPE
- PRIMARY WASTEWATER FIELD
- RESERVE WASTEWATER FIELD
- EX. HYDRANT
- EX. WATER METER
- EX. PEAT VALVE
- EX. SLUICE VALVE
- EX. PUBLIC WS PIPE
- EX. PRIVATE WS PIPE
- PROP. WATER METER
- PROP. PUB WS PIPE
- PROP. PRIV WS PIPE
- EX. POWER
- EX. TELECOM
- EX. GAS VALVE
- EX. POWER LINE
- EX. TELECOM LN
- EX. GAS LINE
- EX. POWER POLE
- EX. OVERHEAD POWER
- EX. BUILDING / STRUCTURES
- PROP ARCHITECTURE

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED WASTEWATER FIELD	08/07/25	JDT
C	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED CIVIL ENGINEERING OVERALL PLAN

Babingtons
CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY:	CHECKED BY:	DRAWN BY:
MT	LH	JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): 1:1000	DRAWING NO. C200	REVISION: C

PRINTED ON: 16/10/2023

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

LOT 1 DP 105774 #341 FITZGERALD ROAD

JOINS TO SHEET 2

RW HEIGHT: 1.50m

C LANDSCAPE BERM

0.50 RW

1.00 SWALE

PROP. TWO LANE METAL DRIVEWAY

EX. METAL DRIVEWAY

150.00 135.00 120.00 105.00 90.00 75.00 60.00 45.00 30.00 15.00 0.00

28.00

72.00

VEHICLE DISMANTLING AND PART STORAGE
FFL: 20.00m
AREA: 2,016m²

1.50

WW DRIPPER FIELD
AREA: 200m²
RESERVE: 100m²

10.00

TREATMENT SWALE

FRONT BUND

RW HEIGHT: 1.80m

FRONT BUND OUTLET STRUCTURE

TREATMENT SWALE

FRONT BUND

FITZGERALD ROAD

AC GIS FLOOD PLAIN OVERLAY AREA

RESOURCE CONSENT

TION 10 SO 543175

JOINS TO SHEET 2

0 6.25 12.5 18.75 25
SCALE 1:500 @A3

LEGEND:

- EX. ABBUTALS
- EX. SITE BOUNDARY
- EX. EASEMENT
- PROP. BOUNDARY
- PROP. EASEMENTS
- EX. CONTOUR MAJ
- EX. CONTOUR MIN
- PROP. CONTOUR MAJ
- PROP. CONTOUR MIN
- EARTHWORKS EXTENT
- PROP. RETNG WALL
- EX. METAL SURFACE
- PROP. VEHICLE CROSSING
- PROP. METAL SURFACE
- EX. PUB. SWMH
- EX. CESSPIT
- EX. PUBLIC SW PIPE
- EX. PRIV SW PIPE
- EX. SUBSOIL DRAIN
- EX. OLFP (GIS)
- PROP. PUB. SWMH
- PROP. TYPE 1 CESSPIT
- PROP. TYPE 2 CESSPIT
- PROP. WINGWALL
- PROP. PUBLIC SW PIPE
- PROP. PRIVE SW PIPE
- EX. PUB. WWMH
- EX. PUBLIC WW PIPE
- EX. PRIV WW PIPE
- PROP. PUB. WWMH
- PROP. PUB. ENDCAP
- PROP. PUBLIC WW PIPE
- PROP. PRIV WW PIPE
- PRIMARY WASTEWATER FIELD
- RESERVE WASTEWATER FIELD
- EX. HYDRANT
- EX. WATER METER
- EX. PEAT VALVE
- EX. SLUICE VALVE
- EX. PUBLIC WS PIPE
- EX. PRIVATE WS PIPE
- PROP. WATER METER
- PROP. PUB WS PIPE
- PROP. PRIV WS PIPE
- EX. POWER
- EX. TELECOM
- EX. GAS VALVE
- EX. POWER LINE
- EX. TELECOM LN
- EX. GAS LINE
- EX. POWER POLE
- EX. OVERHEAD POWER
- EX. BUILDING / STRUCTURES
- PROP ARCHITECTURE

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED VARIOUS	08/07/25	JDT
C	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED CIVIL ENGINEERING PLANT - SHEET 1

Babingtons CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): 1:500	DRAWING NO. C201	REVISION: C

PRINTED ON: 16/10/2023

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

C

1.50 LANDSCAPE BERM

JOINS TO SHEET 1

LOT 1 DP 105774 #341 FITZGERALD ROAD

PROP. TWO

RW HEIGHT: 2.30m

0.50 RW

1.00 SWALE

184.58 180.00 165.00 150.00 135.00 120.00

32.00

63.00

PROPOSED WAREHOUSE BUILDING FFL: 18.50m AREA: 2,016m²

REAR BUND

TREATMENT SWALE

6.77

REAR BUND OUTLET STRUCTURE

AC GIS FLOOD PLAIN OVERLAY AREA

CREEK

LOT 1 DP 194356 #377 FITZGERALD ROAD

RW HEIGHT: 2.50m

JOINS TO SHEET 1

SECTION

0 6.25 12.5 18.75 25

SCALE 1:500 @A3

RESOURCE CONSENT

LEGEND:

- EX. ABBUTALS
- EX. SITE BOUNDARY
- EX. EASEMENT
- PROP. BOUNDARY
- PROP. EASEMENTS
- EX. CONTOUR MAJ
- EX. CONTOUR MIN
- PROP. CONTOUR MAJ
- PROP. CONTOUR MIN
- EARTHWORKS EXTENT
- PROP. RETNG WALL
- EX. METAL SURFACE
- PROP. VEHICLE CROSSING
- PROP. METAL SURFACE
- EX. PUB. SWMH
- EX. CESSPIT
- EX. PUBLIC SW PIPE
- EX. PRIV SW PIPE
- EX. SUBSOIL DRAIN
- EX. OLFP (GIS)
- PROP. PUB. SWMH
- PROP. TYPE 1 CESSPIT
- PROP. TYPE 2 CESSPIT
- PROP. WINGWALL
- PROP. PUBLIC SW PIPE
- PROP. PRIVE SW PIPE
- EX. PUB. WWMH
- EX. PUBLIC WW PIPE
- EX. PRIV WW PIPE
- PROP. PUB. WWMH
- PROP. PUB. ENDCAP
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- PROP. PRIV WW PIPE
- PRIMARY WASTEWATER FIELD
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- EX. HYDRANT
- EX. WATER METER
- EX. PEAT VALVE
- EX. SLUICE VALVE
- EX. PUBLIC WS PIPE
- EX. PRIVATE WS PIPE
- PROP. WATER METER
- PROP. PUB WS PIPE
- PROP. PRIV WS PIPE
- EX. POWER
- EX. TELECOM
- EX. GAS VALVE
- EX. POWER LINE
- EX. TELECOM LN
- EX. GAS LINE
- EX. POWER POLE
- EX. OVERHEAD POWER
- EX. BUILDING / STRUCTURES
- PROP ARCHITECTURE

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED VARIOUS	08/07/25	JDT
C	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED CIVIL ENGINEERING PLANT - SHEET 2

Babingtons CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): 1:500	DRAWING NO. C202	REVISION: C

PRINTED ON: 16/10/2023

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

LEGEND:

- EX. ABBUTALS
- EX. SITE BOUNDARY
- EX. EASEMENT
- PROP. BOUNDARY
- PROP. EASEMENTS
- EX. CONTOUR MAJ
- EX. CONTOUR MIN
- PROP. ISOPACH MAJ
- PROP. ISOPACH MIN
- EARTHWORKS AREA
- AREA OF CUT
- AREA OF FILL

CUT AND FILL CALCULATIONS:

BULK CUT:	14,605m³
BULK FILL:	8,823m³
EX. UNSUITABLES: (EST 200mm THICK)	5,251m³
METAL YARD: (EST 300mm THICK)	5,604m³
BUILDINGS: (EST 300mm THICK)	1,209m³
BALANCE: [TO EXPORT]	7,344m³
EARTHWORKS AREA:	26,255m²

NOTES:

- CUT AND FILL ISOPACHS ARE A COMPARISON BETWEEN THE EXISTING GROUND AND THE FINISHED GROUND SURFACES
- NO ALLOWANCE HAS BEEN MADE FOR CONTAMINATED MATERIAL
- NO BULKING OR COMPACTION FACTORS HAVE BEEN ASSUMED
- EXISTING TOPSOIL AND UNSUITABLE MATERIAL HAS BEEN ESTIMATED AT 200mm

- SILT FENCE
- SUPER SILT FENCE
- COLD WATER DIV
- DIRTY WATER
- DRAIN COIL
- STABILISED ENTRANCE
- STOCKPILE
- ESC POND

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD WORKING FOLDER\395 FITZGERALD RD-C.DWG

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED ESCP LAYOUT	08/07/25	JDT
C	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

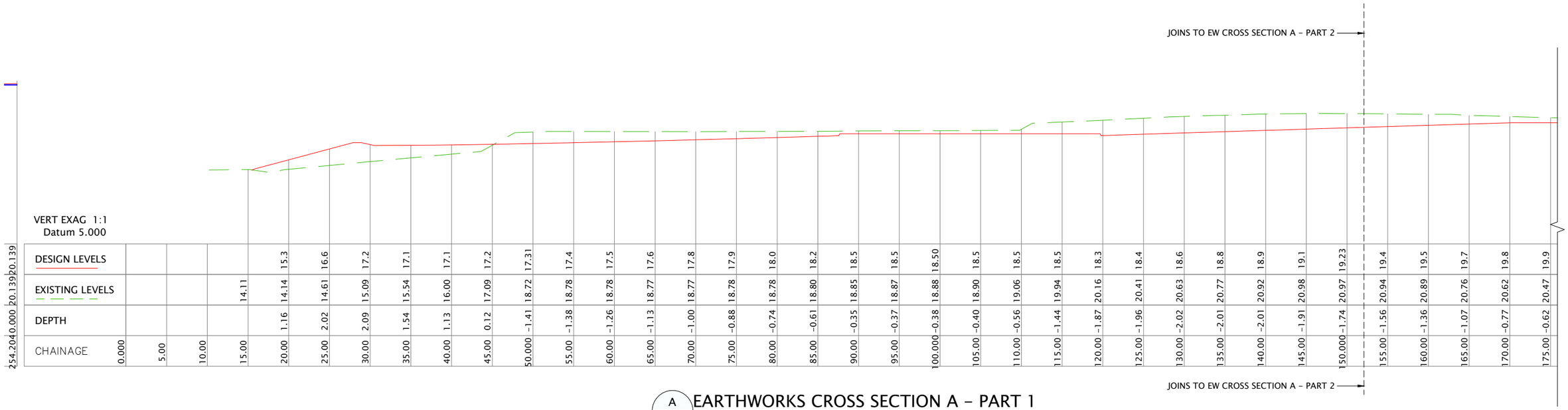
PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: CUT AND FILL AND EROSION AND SEDIMENT CONTROL PLAN

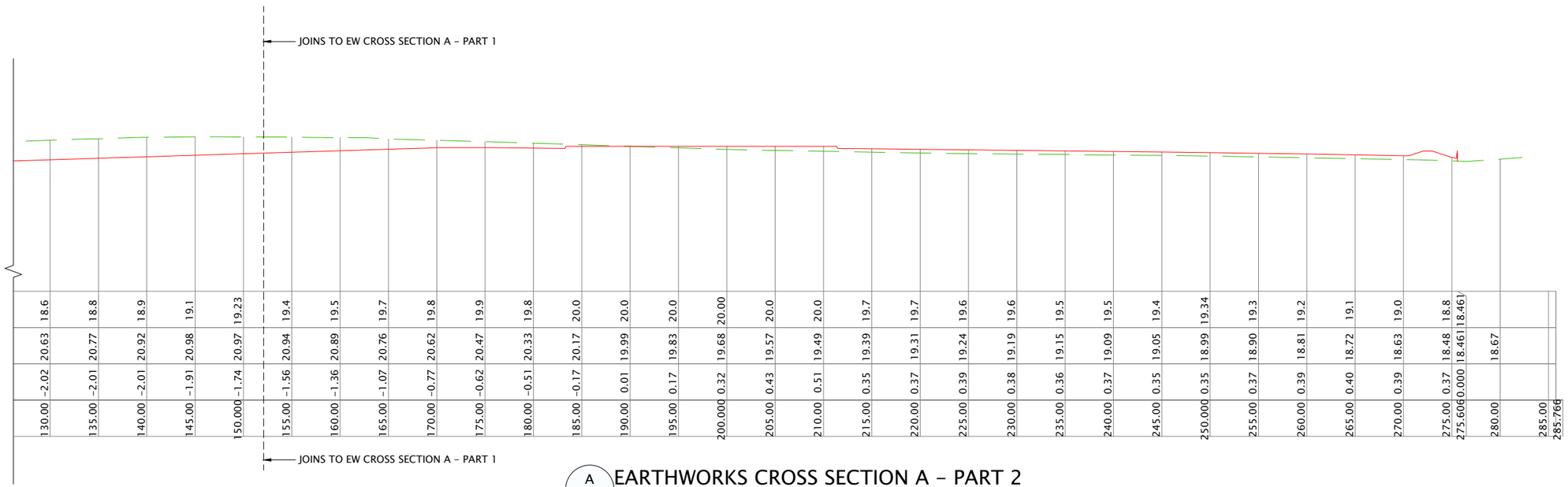
Babingtons
CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): 1:1000	DRAWING NO. C210	REVISION: C

PRINTED ON: 16/10/2023



A C200 EARTHWORKS CROSS SECTION A – PART 1
SCALE: 1:500 @ A3



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SCALE: 1:500 @ A3

RESOURCE CONSENT

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED EARTHWORKS CROSS SECTIONS – PART 1

Babingtons CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): AS SHOWN	DRAWING NO. C221	REVISION: B

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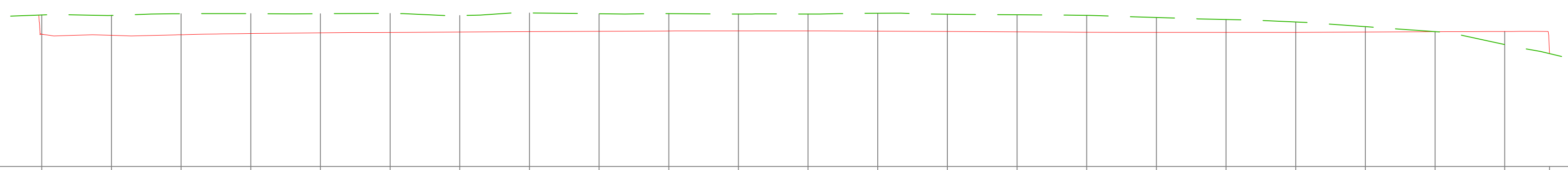


VERT EXAG 1:1
Datum 10.000

CHAINAGE	DESIGN LEVELS	EXISTING LEVELS	DEPTH
0.000			
5.00	19.5	20.84	-1.38
10.00	19.4	20.81	-1.43
15.00	19.4	20.93	-1.51
20.00	19.5	20.93	-1.42
25.00	19.6	20.93	-1.37
30.00	19.6	20.94	-1.35
35.00	19.6	20.80	-1.18
40.00	19.6	20.98	-1.33
45.00	19.7	20.93	-1.26
50.000	19.69	20.93	-1.24
55.00	19.7	20.91	-1.21
60.00	19.7	20.91	-1.21
65.00	19.7	20.96	-1.28
70.00	19.7	20.89	-1.24
75.00	19.6	20.85	-1.22
80.00	19.6	20.81	-1.21
85.00	19.6	20.66	-1.07
90.00	19.6	20.52	-0.93
95.00	19.6	20.34	-0.74
100.000	19.62	20.01	-0.39
105.00	19.6	19.65	-0.01
110.00	19.7	18.73	0.93
113.220	18.079	18.079	0.000
115.00			
117.601			

B / C200 EARTHWORKS CROSS SECTION B
SCALE: 1:500 @ A3

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

RESOURCE CONSENT

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT
B	UPDATED VARIOUS	16/07/25	JDT

CLIENT: TAHA AUTO LIMITED

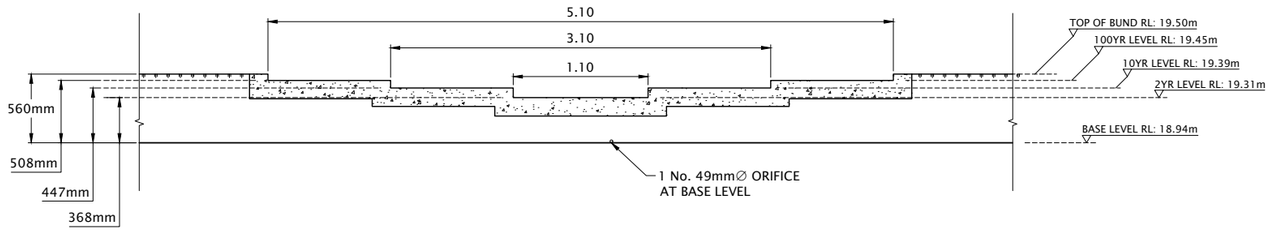
PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED EARTHWORKS CROSS SECTIONS - PART 2

Babingtons
CIVIL AND ENVIRONMENTAL CONSULTANTS

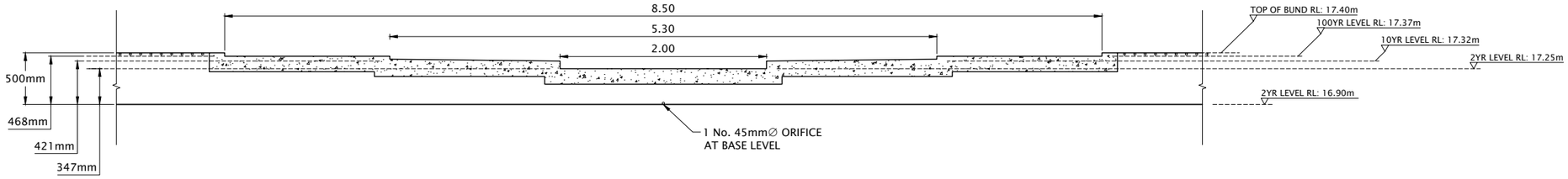
DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): AS SHOWN	DRAWING NO. C222	REVISION: B

PRINTED ON: 16/10/2023



FRONT BUND OUTLET STRUCTURE DETAIL

SCALE: 1:50 @ A3



REAR BUND OUTLET STRUCTURE DETAIL

SCALE: 1:50 @ A3

RESOURCE CONSENT

REV	REVISION DETAILS	DATE	BY
A	INITIAL ISSUE	18/09/24	JDT

CLIENT: TAHA AUTO LIMITED

PROJECT / ADDRESS: 395 FITZGERALD ROAD, DRURY, AUCKLAND

DRAWING TITLE: PROPOSED STORMWATER DETAILS

Babingtons CIVIL AND ENVIRONMENTAL CONSULTANTS

DESIGNED BY: MT	CHECKED BY: LH	DRAWN BY: JDT
APPROVED BY: MT	ORIGIN: 18 SEPTEMBER 2024	
PROJECT NUMBER: 395 FITZGERALD RD		
SCALE (@A3): AS SHOWN	DRAWING NO. C420	REVISION: A

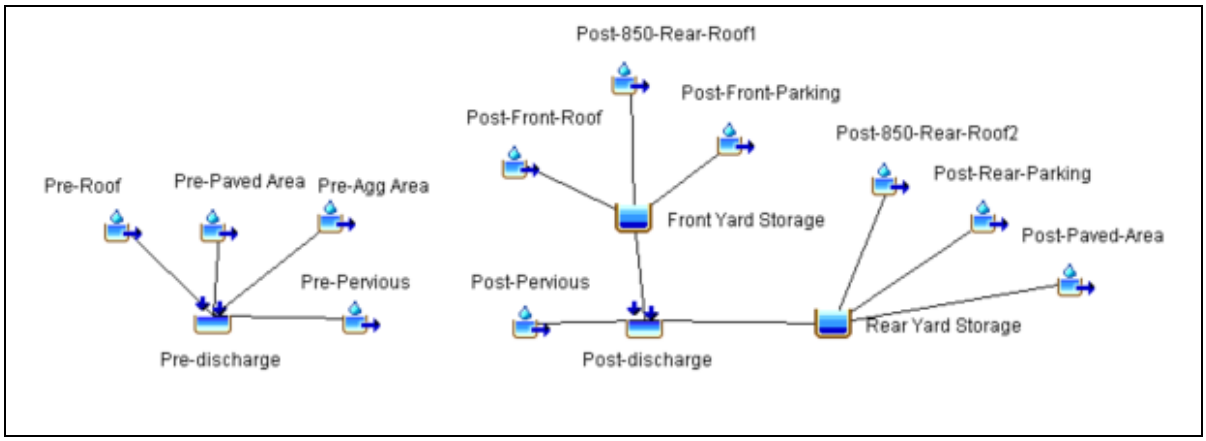
PRINTED ON: 16/10/2023

FILE LOCATION: Y:\03 ITA\395 FITZGERALD ROAD, DRURY\CAD\WORKING FOLDER\395 FITZGERALD RD-C.DWG

Appendix 2: Stormwater Calculations

HEC HMS MODEL

Modelling was carried out using HEC HMS to determine the required detention volumes to maintain the existing 2, 10 and 100-year peak flows.



Inputs:

- Rainfall depth (mm)

SMAF1	34
2 year ARI + CC (15.1%)	59.85
10 year ARI + CC (17%)	132.21
100 year ARI + CC (18.1%)	224.39

NB: Rainfall figures are taken from TP108 with the appropriate adjustment for climate change.

- Runoff Curve (CN)

Pervious Area	74
Aggregate Area	89
Roof & Conc. Paved	98

- Outflow structures and trial and error used to determine outlet structure dimensions and detention volumes
- Coefficient for Outlet Orifice = 0.62
- Coefficient for Spillway = 1.48
- Time of concentration (TP108 method) = 0.17hr

- Outlet Structure

	Front Yard		Rear Yard	
		Depth, m (above the base)		Depth, m (above the base)
SMAF Orifice	49mm dia	0	45mm dia	0
	Spillway Length, m	Depth, m (above the base)	Spillway Length, m	Depth, m (above the base)
2 year ARI + CC	1.1	0.3684	2.0	0.3471
10 year ARI + CC	2.0	0.4465	3.3	0.4213
100 year ARI + CC	2.0	0.5084	3.2	0.4675

Top water level - Front Yard Storage = 0.5527m above the base
Rear Yard Storage = 0.4999m above the base

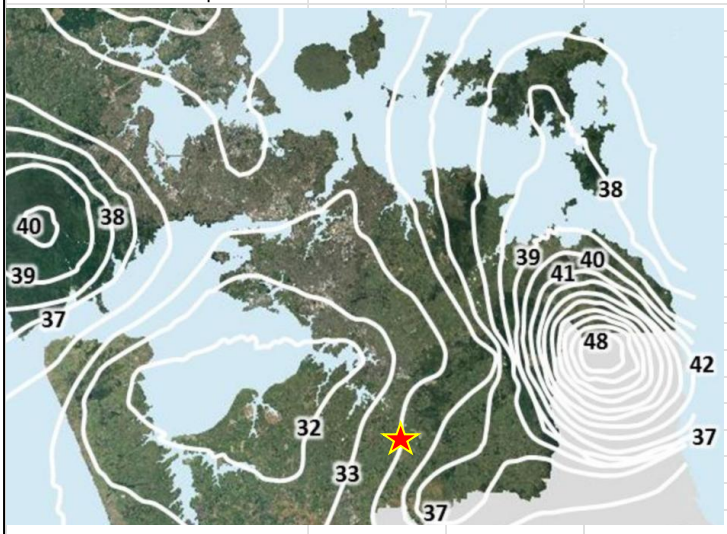
Results

	Pre-Development Peak Flow (L/s)	Post-Development Peak Flow (L/s)	Front Yard Required Attenuation Volume (m^3)	Rear Yard Required Attenuation Volume (m^3)
SMAF (Ret/Detention)	-	-	138.14	111.62
2 year ARI + CC	113.77	108.05	131.81	82.53
10 year ARI + CC	380.55	349.87	129.24	59.55
100 year ARI + CC	772.61	664.94	143.87	46.48
		Total volume	573.06	300.18

SMAF Calculation

SMA Flow 1 Analysis - Front Yard and Roof

SMA Flow 1 rainfall depth	34	mm



Catchmemt	*Existing*	*Proposed*	Gravel Paving
SCS Curve Number	81.97	92.62	+ Roof
Initial Abstraction, Ia	5	0	mm
Catchmemt Storage, S	55.85	20.24	mm
24hr rainfall depth, P24	34	34	mm
c*	0.177	0.456	
Runoff Depth, Q24	9.911	21.313	mm
	Retention	Detention	
	5.0	6.40	mm

Retention calculation for front yard and roof

SMA Flow 1

Detention Volume:		
Impervious area	12115.7	m^2
Detention runoff depth	5.00	mm
Detention volume	60.58	m^3

Detention calculation for front yard roof

SMA Flow 1

Detention Volume:		
Impervious area	12115.7	m^2
Detention runoff depth	6.40	mm
Detention volume	77.56	m^3
Total Ret/Detention volume	138.14	m^3

SMAF Detention Orifice Sizing

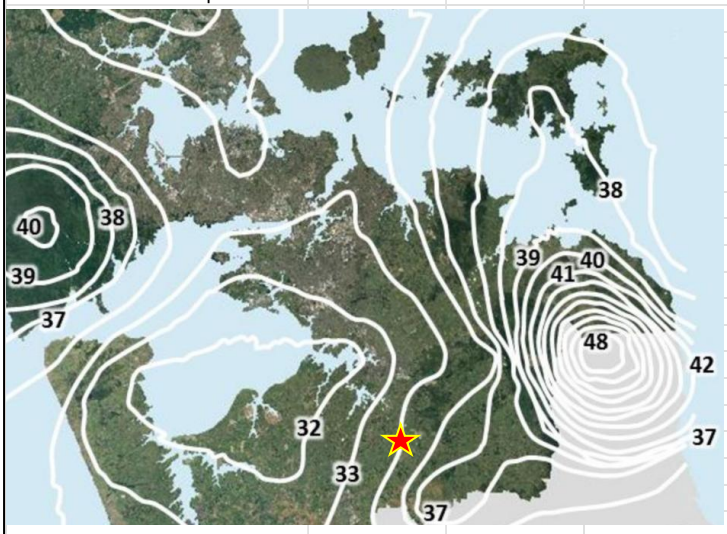
: $Q_i = 0.62A(2gh_i)^{0.5}$

Orifice Sizing

Vol to be stored and released over 24 hrs	**138.14**		m^3
Q design (Peak Flow)	0.003198		m^3/s
	3.198		*l/s*
h (Orifice Head)	0.3584		*m*
Orifice diameter, m	0.049	*49.0*	*mm*
Orifice flow	0.003100	*Ok*	m^3/s

SMA Flow 1 Analysis - Rear Yard and Roof

SMA Flow 1 rainfall depth 34 mm



Catchmemt	*Existing*	*Proposed*	Gravel Paving
SCS Curve Number	78.27	89.99	+ conc. Paved
Initial Abstraction, Ia	5	0	mm
Catchmemt Storage, S	70.54	28.27	mm
24hr rainfall depth, P24	34	34	mm
c*	0.145	0.376	
Runoff Depth, Q24	8.449	18.565	mm
	Retention	Detention	
	5.0	5.12	mm

Retention calculation for rear yard

SMA Flow 1

Detention Volume:		
Impervious area	11033.6	m^2
Detention runoff depth	5.00	mm
Detention volume	55.17	m^3

Detention calculation for rear yard

SMA Flow 1

Detention Volume:		
Impervious area	11033.6	m^2
Detention runoff depth	5.12	mm
Detention volume	56.45	m^3
Total Ret/Detention volume	111.62	m^3

SMAF Detention Orifice Sizing

$: Q_i = 0.62A(2gh_i)^{0.5}$

Orifice Sizing

Vol to be stored and released over 24 hrs	**111.62**		*m^3*
Q design (Peak Flow)	0.002584		*m^3/s*
	2.584		*l/s*
h (Orifice Head)	0.3471		*m*
Orifice diameter, m	0.045	*45.0*	*mm*
Orifice flow	0.002573	*Ok*	*m^3/s*

2yr CC Model Result

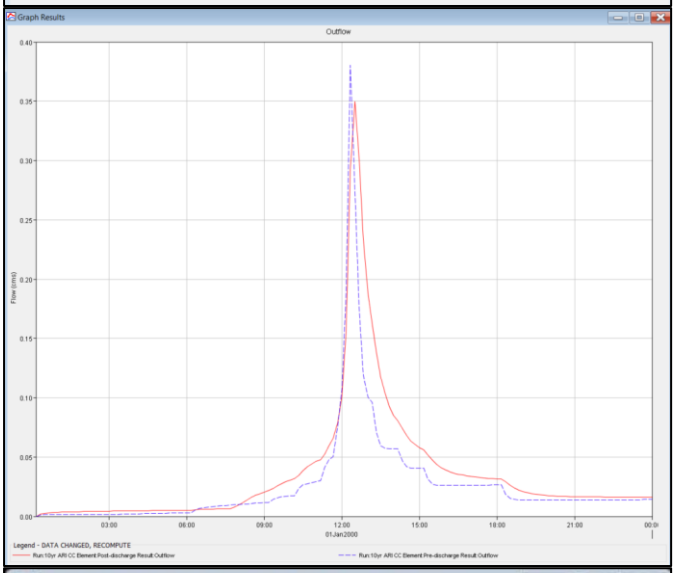
Global Summary Results for Run "2yr ARI CC"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 2yr ARI CC

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE
Basin Model: Basin 1
Meteorologic Model: 2yr CC
Control Specifications: Control 1

Show Elements: All Elements Volume Units: MM 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Post-Front-Parking	0.0072430	0.06492	01Jan2000, 12:20	0.41592
Post-Front-Roof	0.0040227	0.03719	01Jan2000, 12:20	0.24010
Post-850-Rear-Roof1	0.0008500	0.00786	01Jan2000, 12:20	0.05073
Front Yard Storage	0.0121157	0.03892	01Jan2000, 12:50	0.56349
Post-Rear-Parking	0.0098251	0.08806	01Jan2000, 12:20	0.56420
Post-850-Rear-Roof2	0.0008500	0.00786	01Jan2000, 12:20	0.05073
Post-Paved-Area	0.0003585	0.00331	01Jan2000, 12:20	0.02140
Rear Yard Storage	0.0110336	0.06257	01Jan2000, 12:30	0.51768
Post-Pervious	0.0045297	0.01562	01Jan2000, 12:20	0.09412
Post-discharge	0.0276790	0.10805	01Jan2000, 12:30	1.17530
Pre-Pervious	0.0244970	0.08448	01Jan2000, 12:20	0.50902
Pre-Roof	0.0023818	0.02202	01Jan2000, 12:20	0.14216
Pre-Agg Area	0.0004417	0.00396	01Jan2000, 12:20	0.02536
Pre-Paved Area	0.0003585	0.00331	01Jan2000, 12:20	0.02140
Pre-discharge	0.0276790	0.11377	01Jan2000, 12:20	0.69794



Summary Results for Reservoir "Front Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 2yr ARI CC
Reservoir: Front Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE
Basin Model: Basin 1
Meteorologic Model: 2yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.10996 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.03892 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:50
Inflow Volu...	0.70676 (1000 M3)	Peak Storage:	0.26995 (1000 M3
Discharge Volu...	0.56349 (1000 M3)	Peak Elevation:	0.4465 (M)

Summary Results for Reservoir "Rear Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 2yr ARI CC
Reservoir: Rear Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: 03Apr2025, 09:09:03
Basin Model: Basin 1
Meteorologic Model: 2yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.09923 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.06257 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:30
Inflow Volu...	0.63633 (1000 M3)	Peak Storage:	0.19415 (1000 M3
Discharge Volu...	0.51768 (1000 M3)	Peak Elevation:	0.4213 (M)

10yr CC Model Result

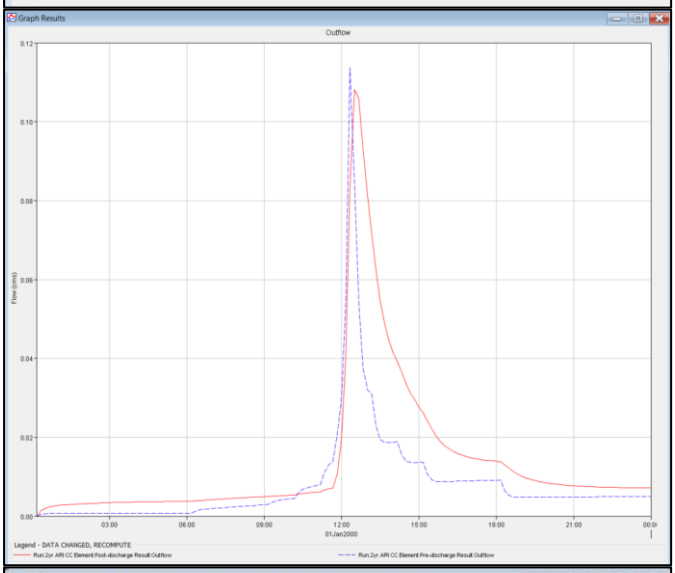
Global Summary Results for Run "10yr ARI CC"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 10yr ARI CC

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE
Basin Model: Basin 1
Meteorologic Model: 10yr CC
Control Specifications: Control 1

Show Elements: All Elements Volume Units: MM 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Post-Front-Parking	0.0072430	0.14608	01Jan2000, 12:20	0.93479
Post-Front-Roof	0.0040227	0.08214	01Jan2000, 12:20	0.53039
Post-850-Rear-Roof1	0.0008500	0.01736	01Jan2000, 12:20	0.11207
Front Yard Storage	0.0121157	0.13450	01Jan2000, 12:40	1.41440
Post-Rear-Parking	0.0098251	0.19816	01Jan2000, 12:20	1.26804
Post-850-Rear-Roof2	0.0008500	0.01736	01Jan2000, 12:20	0.11207
Post-Paved-Area	0.0003585	0.00732	01Jan2000, 12:20	0.04727
Rear Yard Storage	0.0110336	0.17509	01Jan2000, 12:30	1.30060
Post-Pervious	0.0045297	0.05837	01Jan2000, 12:20	0.33730
Post-discharge	0.0276790	0.34987	01Jan2000, 12:30	3.05230
Pre-Pervious	0.0244970	0.31568	01Jan2000, 12:20	1.82412
Pre-Roof	0.0023818	0.04864	01Jan2000, 12:20	0.31404
Pre-Agg Area	0.0004417	0.00891	01Jan2000, 12:20	0.05701
Pre-Paved Area	0.0003585	0.00732	01Jan2000, 12:20	0.04727
Pre-discharge	0.0276790	0.38055	01Jan2000, 12:20	2.24244



Summary Results for Reservoir "Front Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 10yr ARI CC
Reservoir: Front Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: DATA CHANGED, RECOMPUTE
Basin Model: Basin 1
Meteorologic Model: 10yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.24558 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.13450 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:40
Inflow Volu...	1.57725 (1000 M3)	Peak Storage:	0.42919 (1000 M3
Discharge Volu...	1.41440 (1000 M3)	Peak Elevation:	0.5084 (M)

Summary Results for Reservoir "Rear Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 10yr ARI CC
Reservoir: Rear Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: 03Apr2025, 09:09:46
Basin Model: Basin 1
Meteorologic Model: 10yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.22283 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.17509 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:30
Inflow Volu...	1.42738 (1000 M3)	Peak Storage:	0.25370 (1000 M3
Discharge Volu...	1.30060 (1000 M3)	Peak Elevation:	0.4675 (M)

100yr CC Model Result

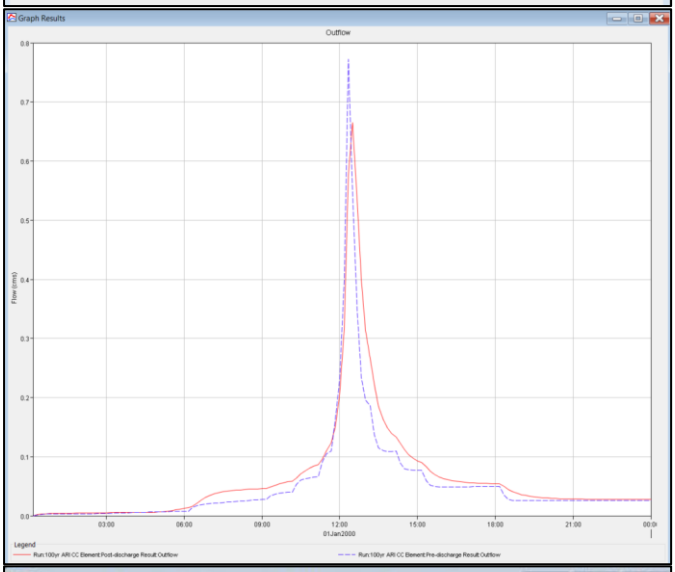
Global Summary Results for Run "100yr ARI CC"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 100yr ARI CC

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: 03Apr2025, 09:10:18
Basin Model: Basin 1
Meteorologic Model: 100yr CC
Control Specifications: Control 1

Show Elements: All Elements Volume Units: MM 1000 M3 Sorting: Hydrologic

Hydrologic Element	Drainage Area (KM2)	Peak Discharge (M3/S)	Time of Peak	Volume (1000 M3)
Post-Front-Parking	0.0072430	0.24957	01Jan2000, 12:20	1.59890
Post-Front-Roof	0.0040227	0.13942	01Jan2000, 12:20	0.90020
Post-850-Rear-Roof1	0.0008500	0.02946	01Jan2000, 12:20	0.19021
Front Yard Storage	0.0121157	0.26272	01Jan2000, 12:30	2.50911
Post-Rear-Parking	0.0098251	0.33855	01Jan2000, 12:20	2.16890
Post-850-Rear-Roof2	0.0008500	0.02946	01Jan2000, 12:20	0.19021
Post-Paved-Area	0.0003585	0.01242	01Jan2000, 12:20	0.08022
Rear Yard Storage	0.0110336	0.31516	01Jan2000, 12:30	2.30726
Post-Pervious	0.0045297	0.12249	01Jan2000, 12:20	0.70388
Post-discharge	0.0276790	0.66494	01Jan2000, 12:30	5.52026
Pre-Pervious	0.0244970	0.66241	01Jan2000, 12:20	3.80665
Pre-Roof	0.0023818	0.08255	01Jan2000, 12:20	0.53300
Pre-Agg Area	0.0004417	0.01522	01Jan2000, 12:20	0.09751
Pre-Paved Area	0.0003585	0.01242	01Jan2000, 12:20	0.08022
Pre-discharge	0.0276790	0.77261	01Jan2000, 12:20	4.51738



Summary Results for Reservoir "Front Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 100yr ARI CC
Reservoir: Front Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: 03Apr2025, 09:10:18
Basin Model: Basin 1
Meteorologic Model: 100yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.41845 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.26272 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:30
Inflow Volu...	2.68931 (1000 M3)	Peak Storage:	0.57306 (1000 M3
Discharge Volu...	2.50911 (1000 M3)	Peak Elevation:	0.5527 (M)

Summary Results for Reservoir "Rear Yard Storage"

Project: 395_Fitzgerald_Rd_HMS_model Simulation Run: 100yr ARI CC
Reservoir: Rear Yard Storage

Start of Run: 01Jan2000, 00:10
End of Run: 02Jan2000, 00:00
Compute Time: 03Apr2025, 09:10:18
Basin Model: Basin 1
Meteorologic Model: 100yr CC
Control Specifications: Control 1

Volume Units: MM 1000 M3

Computed Results

Peak Inflo...	0.38043 (M3/S)	Date/Time of Peak Inflow:	01Jan2000, 12:20
Peak Dischar...	0.31516 (M3/S)	Date/Time of Peak Discharge:	01Jan2000, 12:30
Inflow Volu...	2.43934 (1000 M3)	Peak Storage:	0.30018 (1000 M3
Discharge Volu...	2.30726 (1000 M3)	Peak Elevation:	0.4999 (M)

Swale Calculations - Front Yard

Peak flow for treatment swale

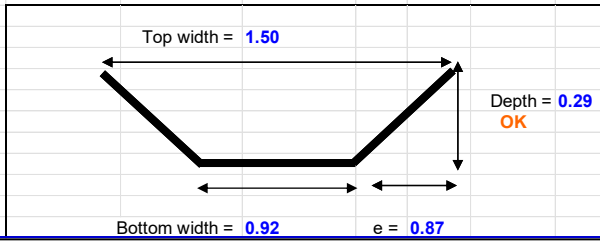
Impervious area	ha	1.2116
Pervious area	ha	0
Total area	ha	1.2116
Impervious SCS curve number		98
Hydrological soil group		Group C
Pervious SCS curve number		74
2 yr 24-hour rainfall depth	mm	59.85
Reticulation design rainfall depth	mm	132.2
Water Quality Storm (WQS) rainfall depth (2yr/3)	mm	19.95
WQS peak rainfall rate from TP108 (10-minute duration)	mm/hr	13.5
Reticulation design rainfall rate (e.g. 5yr, 10yr)	mm/hr	89.2
Impervious surfaces		
Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.88
Peak runoff rate (WQS)	m^3/s	0.0400
Peak runoff rate (Reticulation design storm)	m^3/s	0.2988
Pervious surfaces		
Storage S	mm	89.2
Runoff/Rainfall at peak of rainfall		0.10
Peak runoff rate (WQS)	m^3/s	0.0000
Peak runoff rate (Reticulation design storm)	m^3/s	0.0000
Combined flow for Water Quality Storm		
Peak runoff from surfaces	m^3/s	0.0400
Peak outflow from catchment (allowing for lag)	m^3/s	0.0356
Combined flow for reticulation design storm		
Peak runoff from surfaces	m^3/s	0.2988
Peak outflow from catchment (allowing for lag)	m^3/s	0.2659

Swale – 150mm Grass Length

Water Quality Flow				**Reticulation**	**Design (e.g. 5yr,10yr)**		
Flow rate Q	m^3/s	**0.036**		Q	m^3/s	**0.266**	
Channel slope S	m/m	**0.01**					
Depth d	m	**0.15**		d	m	**0.29**	OK
Sideslope Z=1/?		**1**					
Manning's n for 150mm grass		0.127		n		0.057	
Base width b=Qn/d^1.67.S^0.5-Zd	m	0.92					
Is b< 2m ? (required for grassed swales)		**OK**					
Width at water level T=b+2dZ	m	1.222		T	m	1.502	
Cross-sectional area A=bd+Zd^2	m^2	0.161		A	m^2	0.352	
Velocity V=Q/A	m/s	0.221		V	m/s	0.763	
Is velocity V < 0.8m/s ?		**OK**			**V < 1.5m/s ?**	**OK**	
To meet TP10 stormwater treatment specification:							
Required Swale Length	m	119.60					
Swale Length Provided	m	**264.00**					
Travel time t (should be >9 mins)	minutes	**19.87**	OK				

Adjust depth until "OK". This excludes freeboard allowance for settling, construction tolerances, etc.

Swale Dimensions (m)



Swale Calculations - Rear Yard

Peak flow

Impervious area	ha	**1.1034**
Pervious area	ha	**0**
Total area	ha	**1.1034**
Impervious SCS curve number		**98**
Hydrological soil group		Group C
Pervious SCS curve number		**74**
2 yr 24-hour rainfall depth	mm	**59.85**
Reticulation design rainfall depth	mm	**132.2**
Water Quality Storm (WQS) rainfall depth (2yr/3)	mm	**19.95**
WQS peak rainfall rate from TP108 (10-minute duration)	mm/hr	13.5
Reticulation design rainfall rate (e.g. 5yr, 10yr)	mm/hr	89.2
Impervious surfaces		
Storage S	mm	5.2
Runoff/Rainfall at peak of rainfall		0.88
Peak runoff rate (WQS)	m^3/s	0.0364
Peak runoff rate (Reticulation design storm)	m^3/s	0.2721
Pervious surfaces		
Storage S	mm	89.2
Runoff/Rainfall at peak of rainfall		0.10
Peak runoff rate (WQS)	m^3/s	0.0000
Peak runoff rate (Reticulation design storm)	m^3/s	0.0000
Combined flow for Water Quality Storm		
Peak runoff from surfaces	m^3/s	0.0364
Peak outflow from catchment (allowing for lag)	m^3/s	**0.0324**
Combined flow for reticulation design storm		
Peak runoff from surfaces	m^3/s	0.2721
Peak outflow from catchment (allowing for lag)	m^3/s	**0.2422**

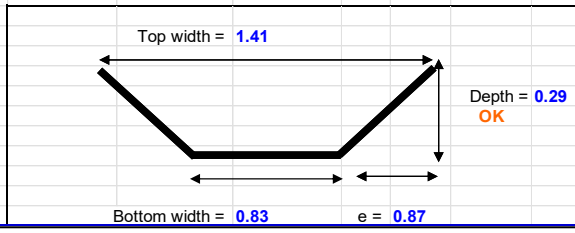
Swale – 150mm Grass Length

Water Quality Flow				**Reticulation**	**Design (e.g. 5yr,10yr)**		
Flow rate Q	m^3/s	**0.032**		Q	m^3/s	**0.242**	
Channel slope S	m/m	**0.01**					
Depth d	m	**0.15**		d	m	**0.29**	OK
Sideslope Z=1/?		**1**					
Manning's n for 150mm grass		0.127		n		0.057	
Base width b=Qn/d^1.67.S^0.5-Zd	m	0.83					
Is b< 2m ? (required for grassed swales)		**OK**					
Width at water level T=b+2dZ	m	1.126		T	m	1.406	
Cross-sectional area A=bd+Zd^2	m^2	0.146		A	m^2	0.324	
Velocity V=Q/A	m/s	0.221		V	m/s	0.763	
Is velocity V < 0.8m/s ?		**OK**			**V < 1.5m/s ?**	**OK**	

Adjust depth until "OK". This excludes freeboard allowance for settling, construction tolerances, etc.

To meet TP10 stormwater treatment specification:		
Required Swale Length	m	119.60
Swale Length Provided	m	**250.00**
Travel time t (should be >9 mins)	minutes	**18.81** OK

Swale Dimensions (m)



Appendix 3: Onsite Wastewate Calculations

SECTION 1 - DAILY FLOW DESIGN				Site Area		27679
NO. BEDROOMS =	0			Consent Required if Lot area/discharge is <1.5		46 OK
NO. DAY STAFF =	15					
DAILY USAGE PER PERSON =	40					
DAILY FLOW , Q =	600	litres/day				
SECTION 2 - IRRIGATION FIELD SIZING DESIGN						
APPLICATION RATE =	3	mm/day or litres/m^2				
DISCHARGE RATE =	3.6	litres/hour				
DISPOSAL AREA REQUIRED =	200	m^2				
AREA FOR IRRIGATION FIELD =	200	m^2	Okay			
DRIPLINE SPACING =	1	m	(1m unless by special design)			
TOTAL LENGTH OF DRIPLINE =	200	m				
TOTAL FLOW RATE =	6	m3/hour	21.6 l/s	100 l/m		